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# SATURN SA-9/PEGASUS A POSTFLIGHT TRAJECTORY

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## ABSTRACT

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This report presents the postflight trajectory for the Saturn SA-9/PEGASUS A test flight. Fourth of the Block II series, SA-9 was the first vehicle to carry a Pegasus payload. Trajectory dependent parameters are given in earth-fixed, space-fixed ephemeris, and geographic coordinate systems. A complete time history of the powered flight trajectory is presented at 1.0 sec intervals from first motion to S-I/S-IV separation and at 5.0 sec intervals from S-I/S-IV separation to insertion. Tables of insertion conditions and various orbital parameters are included in a discussion of the orbital portion of flight.

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## SUMMARY

The powered flight trajectory presented here was established from the information provided by external electrical and optical tracking systems and the onboard telemetry system. External tracking data were available from fixed cameras, C-band radar, ODOP, Azusa/GLOTRAC and MISTRAM. Onboard data were obtained from the radar altimeter and the guidance system. The final powered flight trajectory was determined from fixed camera, ODOP, Azusa, C-band radar and radar altimeter data in conjunction with the guidance system output. The MISTRAM system provided more reliable data than any other external tracking system; however, it was not used in the construction of the final trajectory because of its late delivery date. All of the radars furnished consistent, reliable range data; however, some of the angle measurements contained relatively large biases.

SA-9/PEGASUS A was the fifth engineering test of the radar altimeter. The altimeter acquired reliable data from 175 to 240 sec, 420 to 490 sec, and 520 to 631 sec. Although not as continuous as on SA-7, the altimeter data provided a very good altitude trend and was used extensively in stabilizing the vertical component of the reference trajectory.

The S-IV payload at insertion (631.659 sec) had a space-fixed velocity 0.3 m/s (1 ft/s) less than nominal, a perigee altitude of 496.5 km (268.1 nm) and an apogee altitude of 745.0 km (402.3 nm). The estimated lifetime of the S-IV/PEGASUS A orbiting vehicle is approximately 1188 days, which is 62 days less than the nominal lifetime.

## 1.0 INTRODUCTION

The SA-9 Saturn vehicle was launched from Cape Kennedy on February 16, 1965, at 9:37:03 Eastern Standard Time. Approximately 10 min and 31 sec after launch, the S-IV stage, instrument unit, boilerplate Apollo, and the Pegasus A Meteroid Technology Satellite were inserted into orbit. The Apollo and shroud were first separated from the S-IV/IU and Pegasus combination and wing deployment on the Pegasus was completed $4\frac{1}{2}$ minutes after insertion.

SA-9 was the fourth flight test of the Saturn I, Block II vehicle, which includes an active S-IV stage. This was the first flight test with a micrometeoroid experiment, Pegasus A. In addition, this was the third flight test with the adaptive guidance in closed loop during the S-IV powered flight phase.

This report presents the postflight mass point trajectory in tabular form from first motion to insertion in Tables IX through XIII and XV through XIX. Also presented are detailed discussions of data sources and their utilization, estimated accuracies of the trajectory, and the booster free flight trajectory. A table of orbital data available on the first 5 revolutions is included in the discussion of the orbital portion of flight. An analysis of the various orbital tracking networks is also presented.

All times listed in the tables are referenced to Range Zero (9:37:03 EST), unless otherwise noted. The time of first motion was defined, from stub fin displacement measurements, as occurring 0.08 sec after Range Zero.

Acknowledgement is given to the Data Reduction Branch of the Computation Laboratory for their efforts in the preparation of the tabulated trajectory data and to the General Electric Trajectories Programming Unit for programmer support in orbit determination.

## 2.0 COORDINATE SYSTEMS AND TRAJECTORY PARAMETERS

The translational motion of the vehicle's center of gravity is described in several coordinate systems. An initial displacement of 31.9 m (104.7 ft) locates the center of gravity in the coordinate system whose origin lies on the reference ellipsoid. Definitions of the coordinate systems are found in the Appendix.

The Fischer Ellipsoid was used to represent the earth and its gravitational field. Launch pad coordinates are defined with respect to this ellipsoid.

The geographic coordinates and gravity data for Launch Pad 37B at Cape Kennedy are:

| | |
|---|---|
| Geodetic Latitude: | 28.531854 deg N |
| Longitude: | 80.564953 deg W |
| Gravity: | 9.818 m/s$^2$ (32.21 ft/s$^2$) |

Elevations above the reference ellipisoid are:

| | |
|---|---|
| Base of launch pedestal: | 4.9 m (16.1 ft) |
| C.G. at First Motion: | 31.9 m (104.7 ft) |

| | |
|---|---|
| Launch Azimuth: | 90 deg E of N |
| Flight Azimuth: | 105 deg E of N |
| ST-124 Platform Azimuth: | 104.998 deg E of N |

## 3.0 POWERED FLIGHT TRAJECTORY ANALYSIS

### 3.1 Data Sources

Tracking data were available from first motion through insertion. The tracking coverage is illustrated in Figure 1 and itemized in Table I. The relation between the SA-9 flight path and the various tracking sites is shown in Figure 2.

All tracking systems experienced difficulty in maintaining track during S-I cutoff and separation. The drop in signal strength experienced at approximately 480 sec by all C-Band radars tracking the IU beacon on vehicles SA-5 and SA-6 has not occurred on SA-7 and SA-9. Apparently testing the cabling and connectors linking the radar beacon to the antenna under vacuum conditions for voltage breakdown solved the problem.

#### 3.1.1 Antenna Locations

Figure 3 shows the locations of the antennae for the various tracking systems and the vehicle's center of gravity versus time. The tracking data used in establishing the trajectory were transferred to the

vehicle's center of gravity to provide a common reference point for all of the tracking systems.

### 3.1.2 MISTRAM

Missile Trajectory Measurement (MISTRAM) System tracking data were used for comparisons only and not in the construction of the reference trajectory due to their late reduction. The data were reduced during the following intervals:

| Range Time (sec) | Source |
|---|---|
| 39.00 - 146.10 | Valkaria (active) |
| 151.00 - 280.55 | |
| 283.9 - 685.20 | |
| 184.00 - 280.50 | Eleuthera (passive) |
| 284.00 - 683.00 | |

The data were reliable for the periods of powered flight for which they were available. Random error was estimated to be less than 7 m (23 ft). Ground station difficulty prevented the acquisition of active data from the Eleuthera station which caused some reduction in the quality of the data near the end of powered flight. Comparisons between the MISTRAM and reference trajectory are shown in Figures 8 through 10.

### 3.1.3 GLOTRAC

SA-9 was the third engineering test of the GLOTRAC system on a Saturn vehicle. The GLOTRAC metric data were reduced much too late to be used in the construction of the reference trajectory. The data received were continuous from 20 sec throughout powered flight, making GLOTRAC the only high precision system that provided continuous data during the S-IV powered flight. Comparisons between GLOTRAC and the reference trajectory (Figures 8 through 10) show very good agreement with deviations less than 20 m (66 ft).

### 3.1.4 Radar Altimeter

An engineering test of the radar altimeter was performed on SA-9. Valid data were obtained from 175 sec throughout powered flight

except for the intervals between 240 and 420 sec and 490 and 520 sec. The random error in the altimeter was estimated to be 75 m (246 ft). Comparisons of the altimeter output with the reference trajectory and several tracking systems are shown in Figure 4. Only the smoothed trends are shown to avoid confusion. This comparison shows a bias of approximately 130 m (426 ft) which is about the magnitude of the bias observed on SA-7.

After the bias was removed, the altimeter data were used in the MARLOCK trajectory program. The altimeter was especially valuable in determining the vertical component of the trajectory, particularly since MISTRAM, GLOTRAC and downrange ODOP were not available in time for the trajectory determination.

### 3.1.5 ODOP

The ODOP tracking data used in the establishment of the SA-9 reference trajectory were the uprange data which were reduced at MSFC. The ODOP metric data were not received from ETR in time to be used in the reference trajectory. Figures 8 through 10 show comparisons of the ODOP final metric data with the reference trajectory. The X and Z components deviate less than 20 m (66 ft) from the reference trajectory. The Y component, which is normally the worst, drifts off and attains a maximum deviation of 50 m (164 ft) by 580 sec.

### 3.1.6 Radar

The Grand Bahama (3.16) radar provided the best radar data that were available on SA-9. The systematic errors that showed up on previous flights apparently had been eliminated. Measured parameter and reduced metric data comparisons are shown in Figures 5 through 10.

The Grand Turk (7.18) radar reduced metric data were completely unusable. They are not shown in the earth-fixed Cartesian position comparisons (Figures 8 through 10) because they are completely off the scale of these figures. The measured parameter comparisons (Figures 5 through 7) show the range measurement to be valid, but very large biases are apparent in the angle measurements. The elevation angle is biased 0.05 deg and the azimuth angle is biased 0.06 deg. These are by far the largest biases that have been observed in angle measurements for any radar on Saturn flights. Comparing the

preliminary measured parameters (corrected for refraction only) and the reference trajectory, the angle biases are approximately half of the magnitude shown in Figures 6 and 7. This indicates that in the final reduction the bias corrections were applied in the wrong direction.

Uncorrected measured parameters from the Bermuda (BDA) radar were received from GSFC. A refraction correction was applied to these data. The azimuth angle contained a bias of about 0.025 deg, but the elevation angle compared quite favorably with the reference trajectory. The range measurement deviated from the reference trajectory more than any other radar.

The Merritt Island (19.18) radar provided usable tracking data for the first time on SA-9. Both the elevation and azimuth angles deviated about 0.02 deg from the reference trajectory. The range deviation was less than 20 m (66 ft).

The Antigua (91.18) radar provided excellent range and azimuth measurements; however, the elevation angle was biased about 0.025 deg. This bias produced considerable deviations in the reduced metric data.

The Cape Kennedy (1.16) radar provided good data for the interval it tracked.

The Patrick (0.18) radar was programmed to track the discarded S-I stage after separation. Reliable tracking data were received until 500 sec. Before separation, the 0.18 radar agreed with the reference trajectory to within 25 m (82 ft) in position components and less than 1 m/s (3.28 ft/s) in velocity components.

## 3.2 Trajectory Composition

External tracking data, telemetered guidance data, radar altimeter data and the insertion point coordinates from orbital tracking were used to establish the postflight trajectory. This trajectory was constructed in the following manner:

| Interval (sec) | Description |
|---|---|
| 0.0 - 19.0 | Fixed Camera and ODOP data were used in a least squares curve fit. The differences between the resulting curve fit and the actual data were negligible. (Reference 1 discusses in detail the least squares program used to establish this portion of the trajectory.) |

| | |
|---|---|
| 19.0 - 95.0 | ODOP data processed by the smoothing and differentiation program (see the following paragraphs for more discussion on the smoothing and differentiation program). |
| 95.0 -135.0 | Azusa data processed by the smoothing and differentiation program. |
| 135.0 -146.5 | Azusa position data processed by the smoothing and differentiation program. Telemetered guidance data were used to determine the velocity and acceleration component profiles. |
| 146.5 -631.659 | A computed trajectory was determined with the MARLOCK program using a composite of telemetered guidance velocity data, external tracking data, the altimeter output and the insertion point determined from orbital tracking. (The following paragraphs include a discussion of the MARLOCK program.) |

Since the trajectory was constructed from several different sources, it was necessary to provide for a merging or blending process to compensate for small biases that existed between data from the various sources. A merging program (a least squares technique) was used to correct the data from the different sources without creating a sharp transient.

The MARLOCK trajectory construction program uses the telemetered guidance velocity data as the generating parameter to compute a trajectory which will best fit the tracking observations yet retain the smoothness of the guidance data. The guidance data can vary only in accordance with a fifteen term guidance error model and the variances assigned to each term. Radar measured parameters, Azusa measured parameters, altimeter data and earth-fixed Cartesian coordinate position data may be used as observations with weights being assigned to each parameter. The guidance error terms are determined using the Kalman linear filter technique and the guidance error terms are applied to the telemetered guidance data to yield the final continuous and smooth best estimate type trajectory.

On SA-9, the following data were used as observations for the MARLOCK program.

| System | Type Observations | Interval (sec) |
|---|---|---|
| 1.16 Radar | Measured Parameters | 160.0 - 300.0 |
| 3.16 Radar | Measured Parameters | 75.0 - 550.0 |
| 19.18 Radar | Measured Parameters | 192.0 - 600.0 |
| 91.18 Radar | Measured Parameters | 350.0 - 630.0 |
| ODOP | Earth-Fixed Positions | 10.0 - 115.0 |
| | | 122.0 - 140.0 |
| | | 160.0 - 550.0 |
| Azusa | Measured Parameters | 160.0 - 250.0 |
| Altimeter | Altitude | 175.0 - 240.0 |
| | | 420.0 - 490.0 |
| | | 520.0 - 625.0 |
| Insertion | Space-Fixed Ephemeris Positions and Velocities | 631.659 |

The output of this program was used as the postflight trajectory from 146.5 sec to insertion.

The ODOP, Azusa, and computed trajectory earth-fixed Cartesian position data were smoothed over a 10 sec interval using coefficients which are the average of fourth and second degree smoothing coefficients. These coefficients filter the data very satisfactorily as shown by the frequency response curve in Figure 11. The velocity and acceleration data were obtained using fourth degree coefficients because significant bias error would be induced if the average derivative coefficients were used. A more detailed discussion of the smoothing and differentiation techniques can be found in Reference 2.

### 3.2.1 First Motion Time

Pad measurements 32-B01 and 32-B02 (Displacement at Stub Fins I and III) and vehicle displacement as measured from camera data were available for the determination of first motion time. The first motion times, indicated by these sources, are given in the following table.

| Measurement | Range Time (sec) |
|---|---|
| 32-B01 and 32-B02 | 0.08 |
| Camera Data | 0.085 |

The decision was made by the Flight Evaluation Working Group to use the pad measurements for the determination of the first motion time. The agreement of the two independent measurements in the above table were quite good.

### 3.2.2 Powered Flight Trajectory

Table II presents a comparison of actual and nominal times of some of the vehicle events in sequential order. The actual altitude and range are shown in Figures 12 and 13, respectively, for the entire powered flight. The actual total inertial acceleration profiles for the S-I stage and the S-IV stage are shown in Figure 14. The actual earth-fixed velocity vector, along with the angle between the earth-fixed velocity vector and the local horizontal plane, is shown in Figure 15. The actual space-fixed velocity and the angle between the space-fixed velocity vector and the local horizontal plane are shown in Figure 16. Mach number and dynamic pressure are shown for the S-I stage powered flight in Figure 17. These parameters were calculated using measured meteorological data to an altitude of 34 km (111,549 ft). Above this altitude, the U.S. Standard reference atmosphere was used.

Various trajectory parameters are given at significant event times in Table III. It should be noted that apex, loss of telemetry signal, and impact apply only to the discarded S-I stage. Several trajectory parameters are given for S-I stage inboard engine cutoff (IECO), S-I stage outboard engine cutoff (OECO) and S-IV stage guidance cutoff (S-IV CO) in Table IV. The velocity gain between OECO and separation due to thrust decay was 2.4 m/s (7.9 ft/s). The velocity gain from S-IV CO to end of thrust decay as defined by this trajectory was 3.3 m/s (10.8 ft/s). Telemetered guidance data indicates that this velocity gain may have been closer to 3.2 m/s (10.5 ft/s).

A comparison of the actual and nominal trajectory can be found in Reference 3. The nominal SA-9 trajectory can be found in Reference 4.

The actual trajectory is presented in the metric system of units in Tables IX through XIII and in the English system of units in Tables XV through XIX.

## 3.3 Error Analysis of Reference Trajectory

During the S-I powered portion of flight, good coverage was provided by ODOP, Azusa, MISTRAM and several radars. ODOP and Azusa data were used to establish the majority of the reference trajectory during this period. There were no data from high precision systems, except uprange ODOP, available in the required time frame after launch to furnish data during the S-IV powered flight. Therefore, the trajectory was constructed without using MISTRAM or Azusa/GLOTRAC data.

Data from the various tracking systems are compared in the earth-fixed plumbline coordinate system with the reference trajectory in Figures 8 through 10. All data were smoothed and transferred from the point of track (antenna locations) to a common point, the vehicle's center of gravity. These curves show only the trend of the data relative to the reference trajectory. The dispersion of the various data gives an indication of the validity of the reference trajectory. Azusa, ODOP, MISTRAM, 1.16 radar and 0.18 radar deviate less than 20 m (66 ft) in all components from the reference trajectory during the S-I powered flight. The comparisons of all systems throughout the S-IV powered flight show deviations of less than 200 m (656 ft) with the exception of three radars (BDA, 7.18, and 91.18). These radars show significant biases in their angle measurements.

Comparisons of the radar measured parameters and the Azusa range measurement with the reference trajectory are shown in Figures 5 through 7. The range measurements deviate less than 20 m (66 ft) from the reference trajectory except for Bermuda which deviates up to 50 m (164 ft). The azimuth and elevation angle comparisons show considerable biases in some of the systems with 7.18 radar being by far the worst.

A comparison of altitudes from the various systems with the radar altimeter data is presented in Figure 4. This comparison shows the altimeter to be biased about 130 m (427 ft) from the reference trajectory. The systems that show large differences are radars which contain biases in the elevation angle measurements.

An estimate of the probable total uncertainty in the powered flight reference trajectory is presented in Figure 18. At OECO, the position components are probably accurate to 20 m (66 ft) and the velocity components to 0.2 m/s (0.7 ft/s). By S-IV CO, the maximum uncertainties increase to about 0.5 m/s (1.6 ft/s) in velocity components and 200 m (656 ft) in position components. On previous vehicles the uncertainty in the vertical component (YE) was greater than the other components; however, it is felt that the altimeter reduced this uncertainty considerably on SA-9.

## 4.0 S-I STAGE FREE FLIGHT TRAJECTORY

A theoretical free flight trajectory was computed for the discarded S-I stage using initial conditions from the Patrick (0.18) radar at 180 sec. The radar data were numerically smoothed using least squares coefficients (see Figure 11 for frequency response of coefficients). The smoothed velocities were then manually plotted to remove low frequency oscillations. The radar tracking data became invalid after 500 sec. At this time the computed trajectory deviated from tracking by less than 10 m (33 ft) in position components.

Since the attitude of the booster during re-entry is unknown, a nominal tumbling drag coefficient was assumed. In addition, nominal coefficients of drag were used assuming the booster (1) stabilized at an angle of attack of 90 deg and (2) stabilized at an angle of attack of 0 deg. These provide the following possible dispersions:

| Drag Condition | Impact Range | Impact Time |
|---|---|---|
| 0 deg Angle of Attack | 967.67 km (522.50 nm) | 657.4 sec |
| Tumbling | 961.28 km (519.05 nm) | 718.9 sec |
| 90 deg Angle of Attack | 957.87 km (517.21 nm) | 772.8 sec |

The theoretical free flight trajectory utilizing the tumbling drag coefficient data will be considered as the actual trajectory of the S-I booster stage. The impact location relative to the launch site is shown in Figure 19. The trajectory is presented in tabular from in Tables VIII (metric units) and XIV (English units).

# 5.0 ORBITAL FLIGHT

## 5.1 Orbital Trajectory

The S-IV-9 stage with Pegasus, Instrument Unit and an Apollo boilerplate payload was inserted into orbit on February 16, 1965, at 14:47:34.659 U.T. (631.659 sec range time). Figure 20 is a ground projection plot showing the locus of the first three orbital revolutions. The orbital insertion parameters for SA-9 were determined by a least squares differential correction procedure using C-Band radar beacon and skin track data over the first revolution.

The classical osculating two-body elements and the corresponding position and space-fixed velocity vectors at orbital insertion are shown in Table V. The orbital elements are referenced to the mean equinox and equator at 0 hr U.T. the day of launch.

A comparison between some of the actual and nominal (preflight trajectory) orbital insertion parameters is shown in Table VI.

The RMS error of the data residuals and the number of data observations utilized are listed in the following table.

INSERTION SOLUTION TRACKING

| Station | Time of Track (Universal Time) | Data Types | No. of Valid Observations | RMS Error of Residuals |
|---|---|---|---|---|
| Grand Turk Island | 14:47:39- | AZ | 27 | 0.057 deg |
| (TPQ-18) | 14:51:24 | EL | 27 | 0.045 deg |
| BEACON TRACK | (636-861 sec R.T.) | RA | 26 | 8 m (26 ft) |
| Antigua Island | 14:47:39- | AZ | 50 | 0.005 deg |
| (FPQ-6) | 14:53:33 | EL | 60 | 0.021 deg |
| BEACON TRACK | (636-990 sec R.T.) | RA | 46 | 4 m (13 ft) |
| Bermuda Island | 14:47:35- | AZ | 26 | 0.025 deg |
| (FPS-16) | 14:50:19 | EL | 23 | 0.009 deg |
| BEACON TRACK | (632-796 sec R.T.) | RA | 24 | 12 m (39 ft) |
| Onboard Radar Altimeter | 14:47:38- 14:48:45 (635-702 sec R.T.) | AE* | 55 | 48 m (157 ft) |

INSERTION SOLUTION TRACKING (CONT'D)

| Station | Time of Track (Universal Time) | Data Types | No. of Valid Observations | RMS Error of Residuals |
|---|---|---|---|---|
| Carnarvon, Australia | 15:38:00- | AZ | 16 | 0.021 deg |
| (FPQ-6) | 15:40:18 | EL | 20 | 0.030 deg |
| SKIN TRACK | | RA | 21 | 6 m (20 ft) |
| Merritt Island, Fla. | 16:23:13- | AZ | 47 | 0.017 deg |
| (TPQ-18) | 16:29:46 | EL | 42 | 0.014 deg |
| SKIN TRACK | | RA | 44 | 5 m (16 ft) |

*AE is the altitude above the Earth's surface.

The RMS residual errors quoted represent the difference between actual radar observations and the predicted observations based on the orbital ephemeris defined by the orbital insertion parameters. In addition, the orbital ephemeris, which was used to generate the predicted tracking, had a velocity impulse of - 0.36 m/s applied at the separation time of the Apollo and shroud from the S-IV/Pegasus (804 sec R.T.). The magnitude and direction of this impulse were determined from the telemetered output of the guidance system. The RMS residual errors were from 1 to 3 times higher than the expected high frequency errors of the measuring systems employed for range measurements and from 1 to 20 times higher for the angle measurements. Included in the RMS residual errors are high frequency errors (assumed gaussian) and systematic errors due to possible instrumentation bias, mathematical model errors and atmospheric refraction errors. The maximum RMS error of the radar residuals was 12 m (40 ft) in range, 0.05 deg in elevation and 0.06 deg in azimuth. The onboard altimeter RMS error was approximately 50 m (160 ft). Expected high frequency errors of the measuring systems are 3 m (10 ft) in range and 0.003 deg in angles for the FPQ-6 and TPQ-18 radars (design specifications), 6 m (20 ft) in range and 0.01 deg in angles for the FPS-16 radars (from prior experience) and 50 m (160 ft) in the altimeter data (from previous experience).

Obvious systematic bias errors are present in the Grand Turk azimuth and elevation residuals. A bias of 0.06 deg in azimuth and 0.05 deg in elevation, when removed, reduced the residuals to high

frequency errors with an RMS residual error of 0.01 deg and 0.02 deg, respectively. A bias of 0.02 deg is also apparent in the Antigua elevation residuals; when removed the RMS residual error decreased to 0.01 deg. Removing these large bias errors reduced the RMS residual errors for the angle measurements from 1 to 10 times the expected high frequency errors. The relative weighting of the observations used in the insertion solutions, according to the expected high frequency errors,requires that the solutions be primarily determined by the range observations. Therefore, biases of the magnitudes and type quoted do not greatly affect the solution parameters.

A systematic bias of + 130 m (426 ft) was removed from the onboard radar altimeter observations before these data were used in the orbital insertion solutions. This bias was also seen in the powered flight altimeter data and was of the same approximate magnitude. A systematic bias of approximately + 100 m (328 ft) was also noted in the SA-7 altimeter data.

## 5.2 Orbital Insertion Analysis

Insertion condition solutions were made using the Antigua, Grand Turk, Bermuda and the onboard radar altimeter data at insertion and the Carnarvon and Merritt Island tracking data over the first orbit in various combinations. Solutions were obtained for all data sources with and without solving for effective drag. These solutions indicate a maximum deviation from the insertion elements quoted of 0.3 m/s (1.0 ft/s) and 200 m (650 ft) in any velocity or position component.

An independent solution of the orbital insertion parameters using powered flight tracking and guidance data show a maximum deviation of 30 m (100 ft) and 0.5 m/s (1.5 ft/s) in any position or velocity component compared to the orbital tracking insertion solution quoted. The powered flight tracking and guidance data trajectory quoted was constrained to the orbital tracking insertion elements shown in Table V.

The relative agreements in all solutions indicate a maximum error in the quoted insertion position and velocity components of 200 m (650 ft) and 0.5 m/s (1.5 ft/s),respectively.

## 5.3 Orbital Tracking Summary

Due to the long lifetime of the SA-9 orbiting vehicle, radar tracking coverage was only requested for the first five revolutions. This tracking summary covers all tracking over these five revolutions beginning at insertion (14:47:34.659 U. T. ). It also includes optical sightings reported during the first 24 hours.

Orbital tracking of the SA-9 vehicle was conducted by the NASA Space Tracking and Data Acquisition Network (STADAN), which is composed of the global network of Minitrack stations and Minitrack Optical Tracking Stations (MOTS), and the Manned Space Flight Network (MSFN), which is a global network of radar tracking stations and utilizes available DOD elements. Additional tracking support was provided by the Smithsonian Astrophysical Observatory (SAO), and the North American Air Defense (NORAD).

Table VII summarizes the radar and Minitrack tracking during the first five revolutions. The last radar C-Band beacon track of the orbiting vehicle was reported by Pretoria, South Africa at approximately 15:19 U. T. (42 min after liftoff). All subsequent radar tracking was skin track.

Several MOTS optical sightings and twelve optical Baker Nunn observations were reported over the first 24 hours. Stellar magnitudes reported were 2 for the Pegasus and 6 for the Apollo module. No NORAD observations were reported over this first 24 hour period.

Minitrack observations will continue to be made on the orbiting vehicle during the vehicle's lifetime or until termination of the Pegasus experiment.

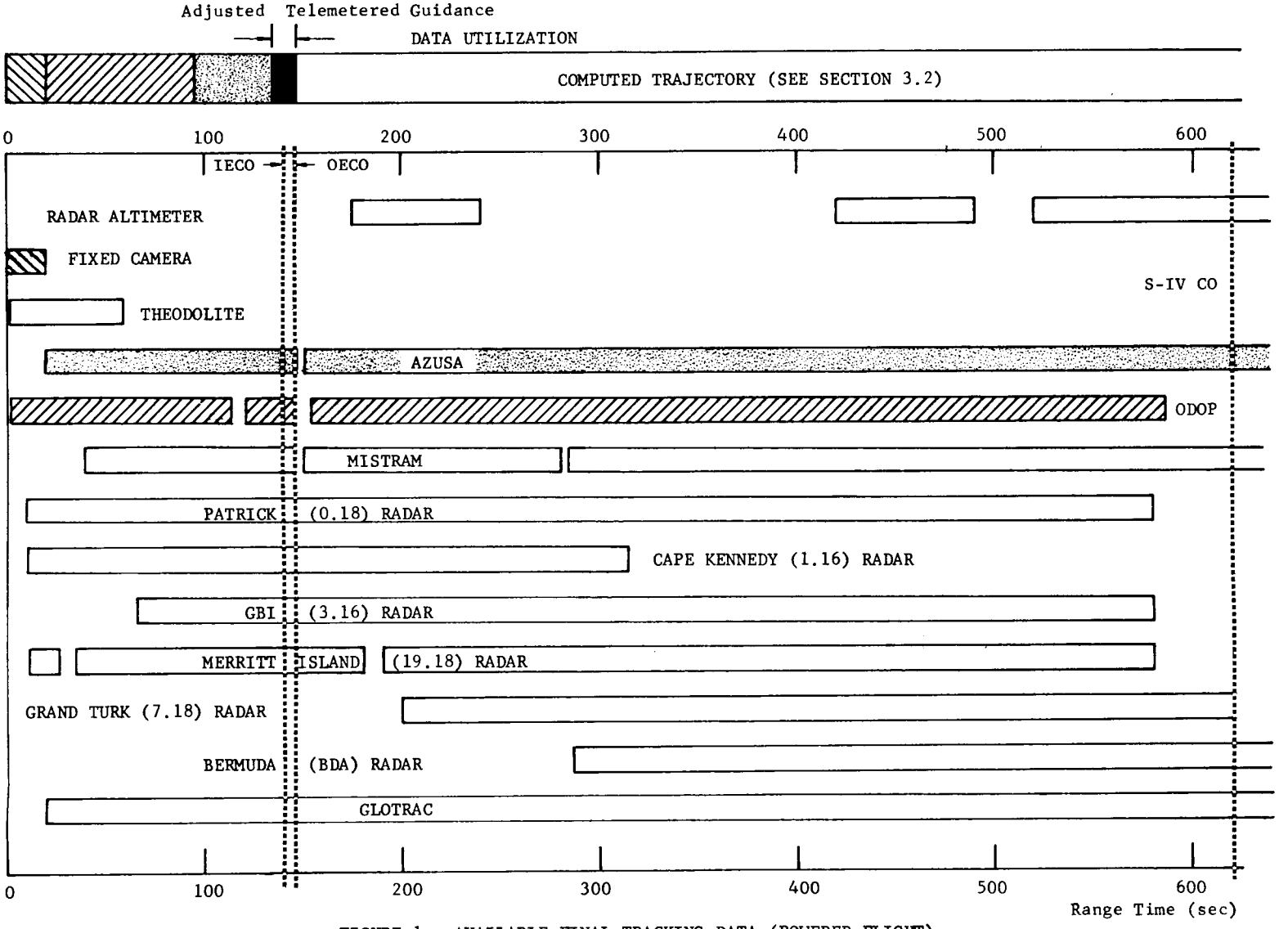



FIGURE 1 AVAILABLE FINAL TRACKING DATA (POWERED FLIGHT)

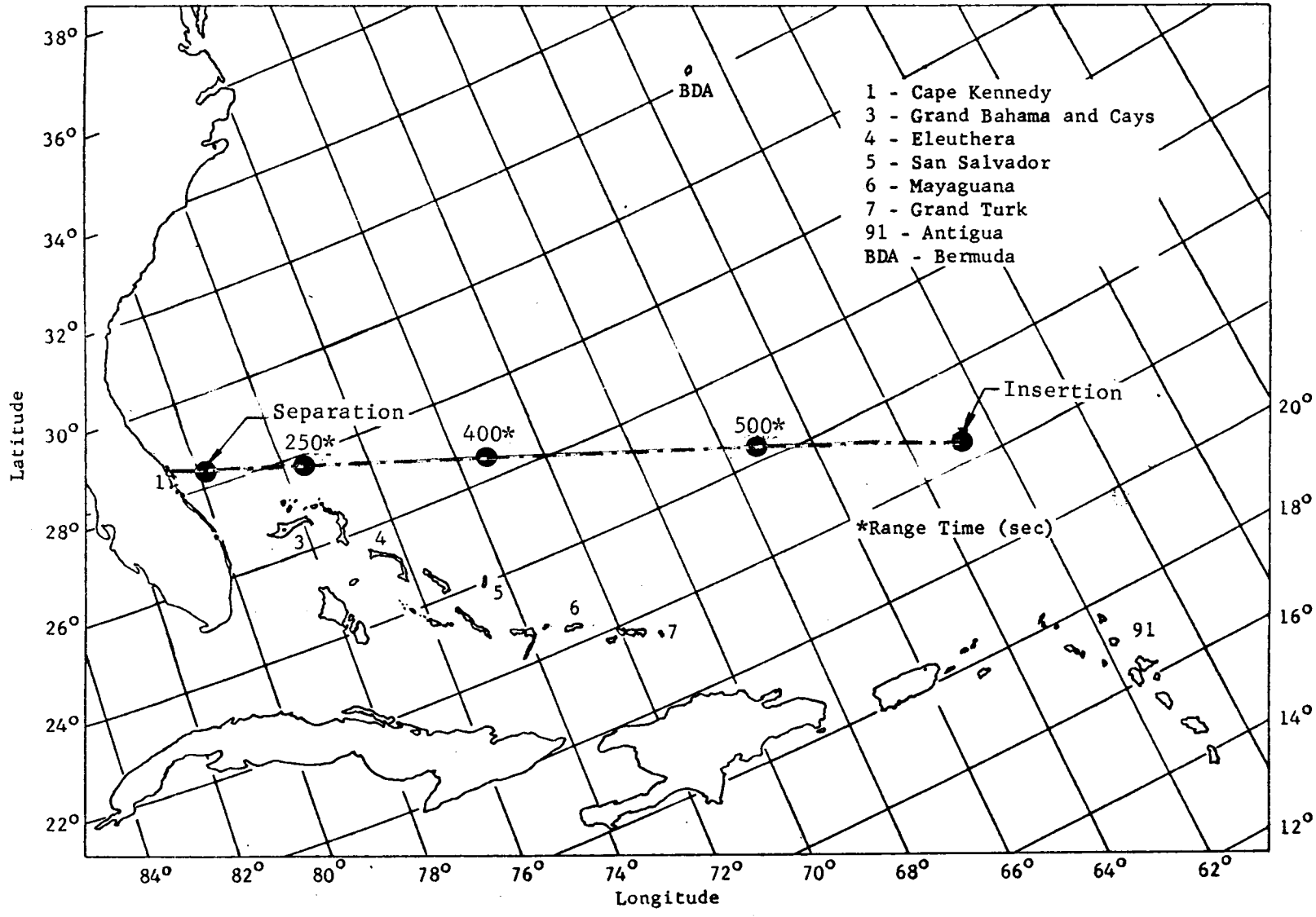



**FIGURE 2 TRACKING STATIONS**

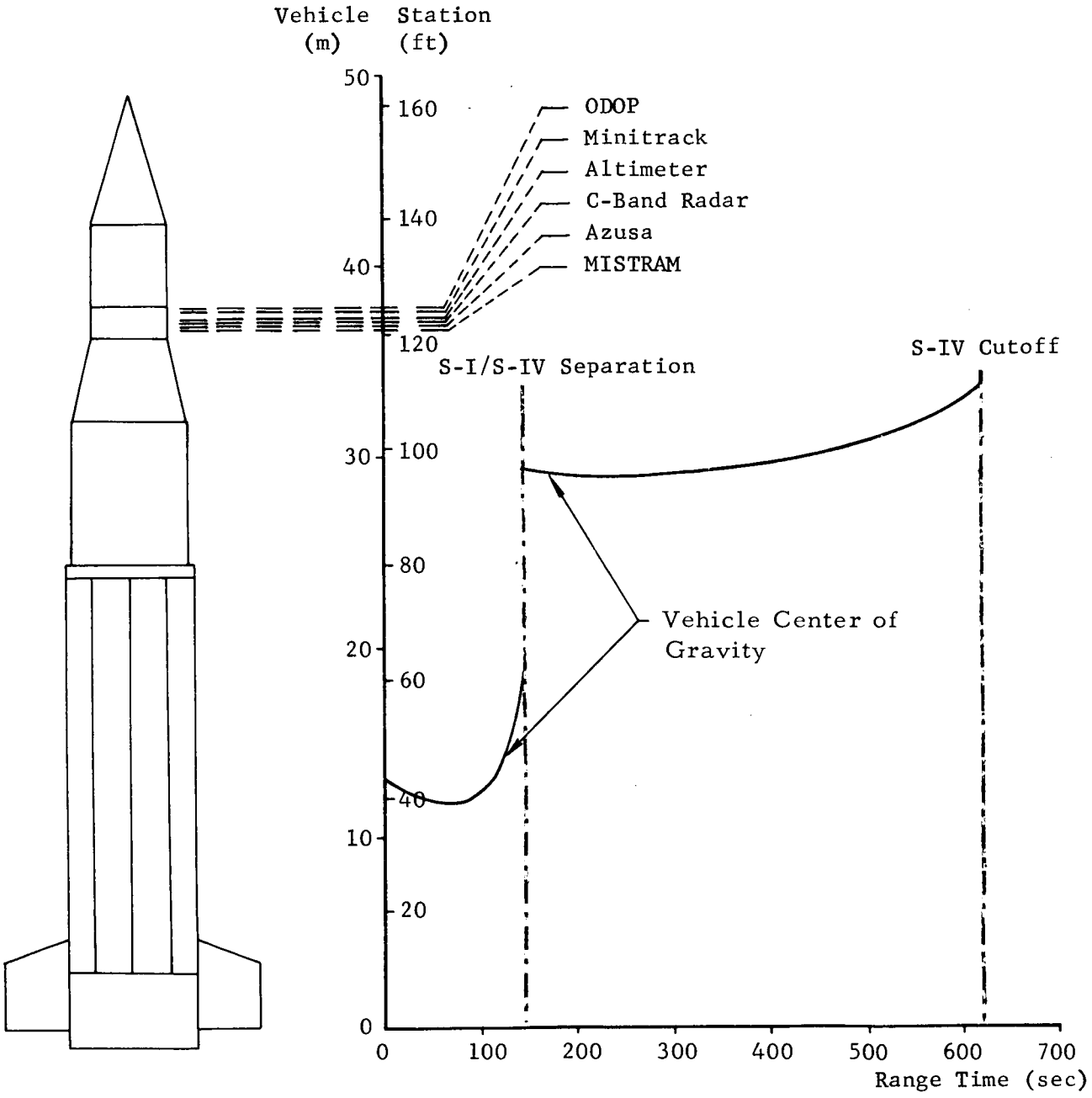



FIGURE 3 ANTENNA LOCATIONS AND VEHICLE CENTER OF GRAVITY VERSUS RANGE TIME

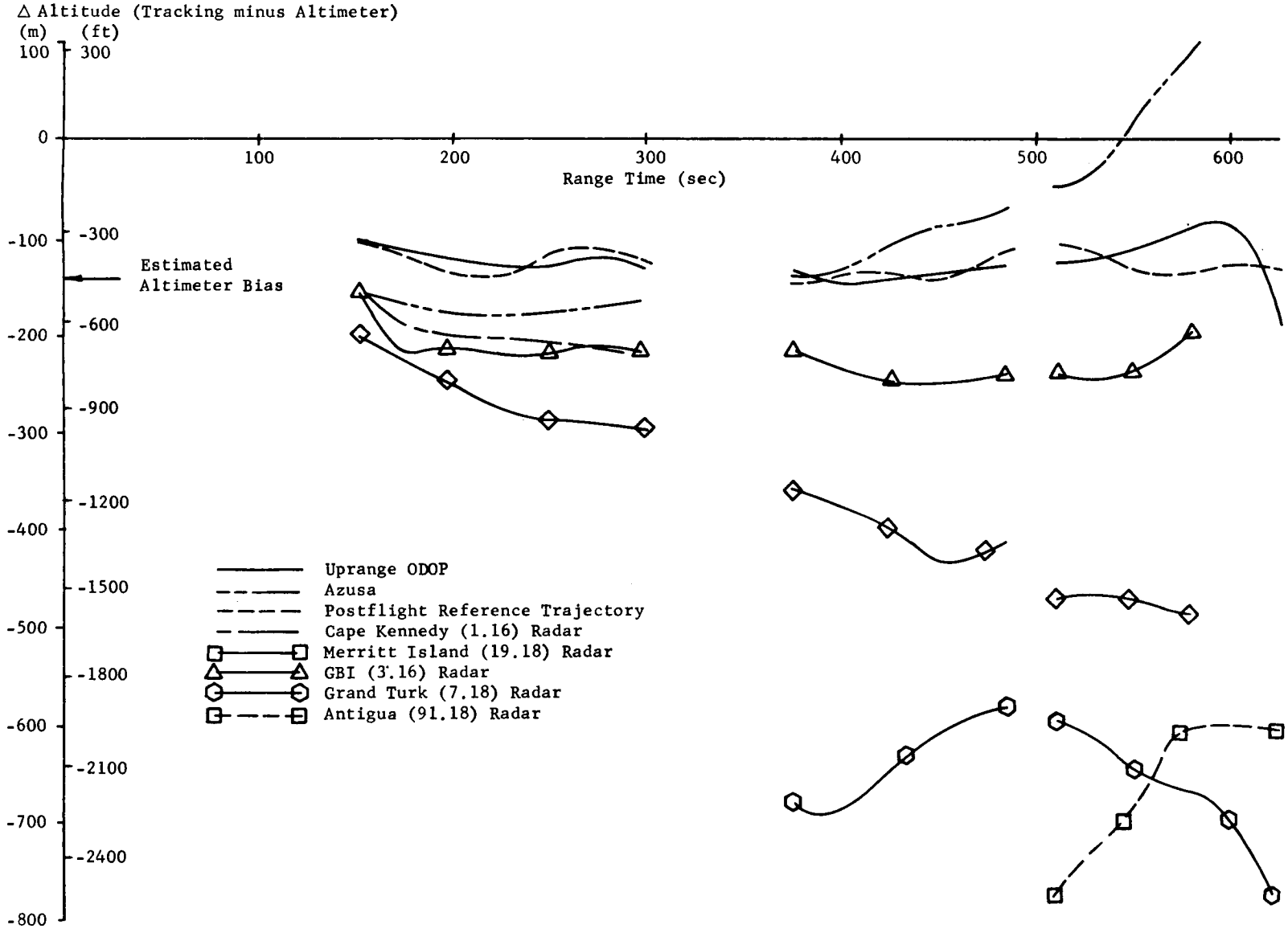



FIGURE 4 ALTITUDE COMPARISONS

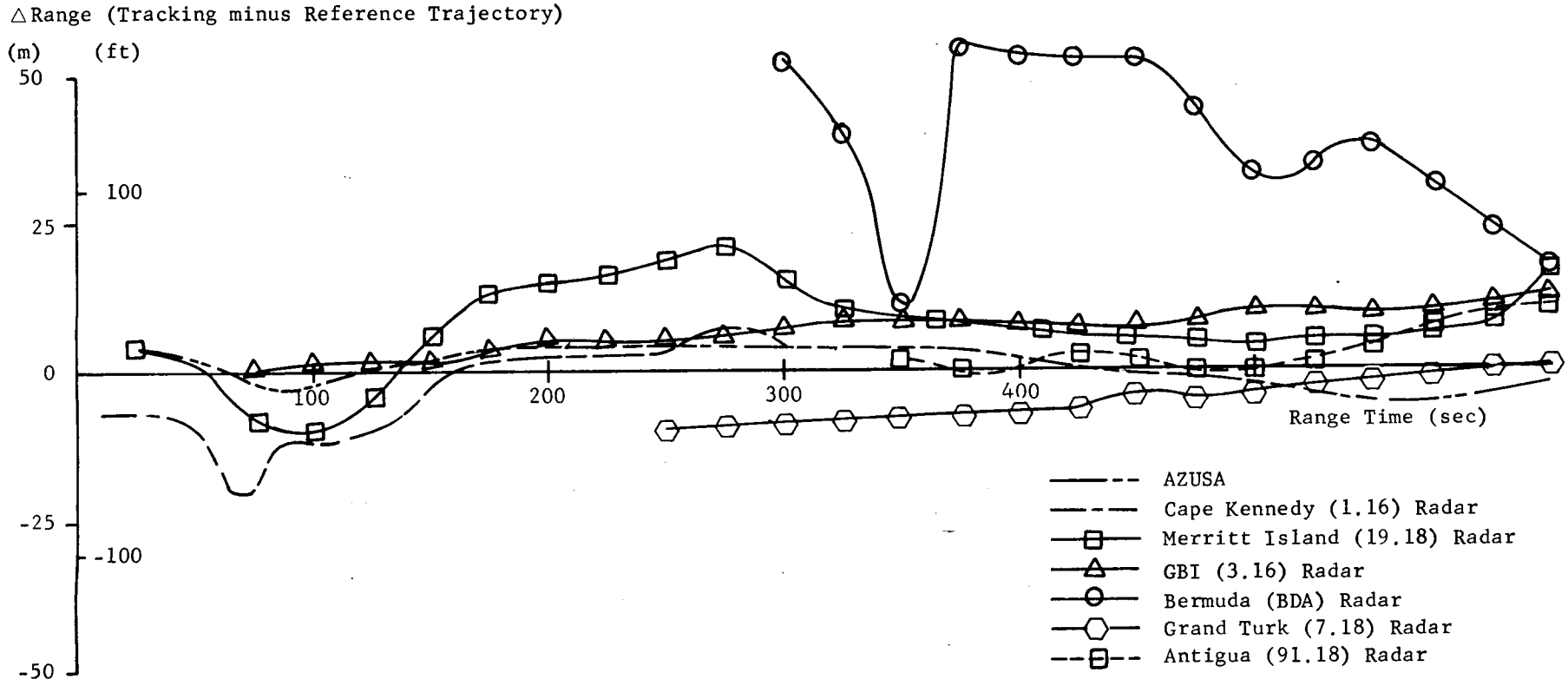



FIGURE 5 MEASURED PARAMETER TRACKING COMPARISONS (RANGE)

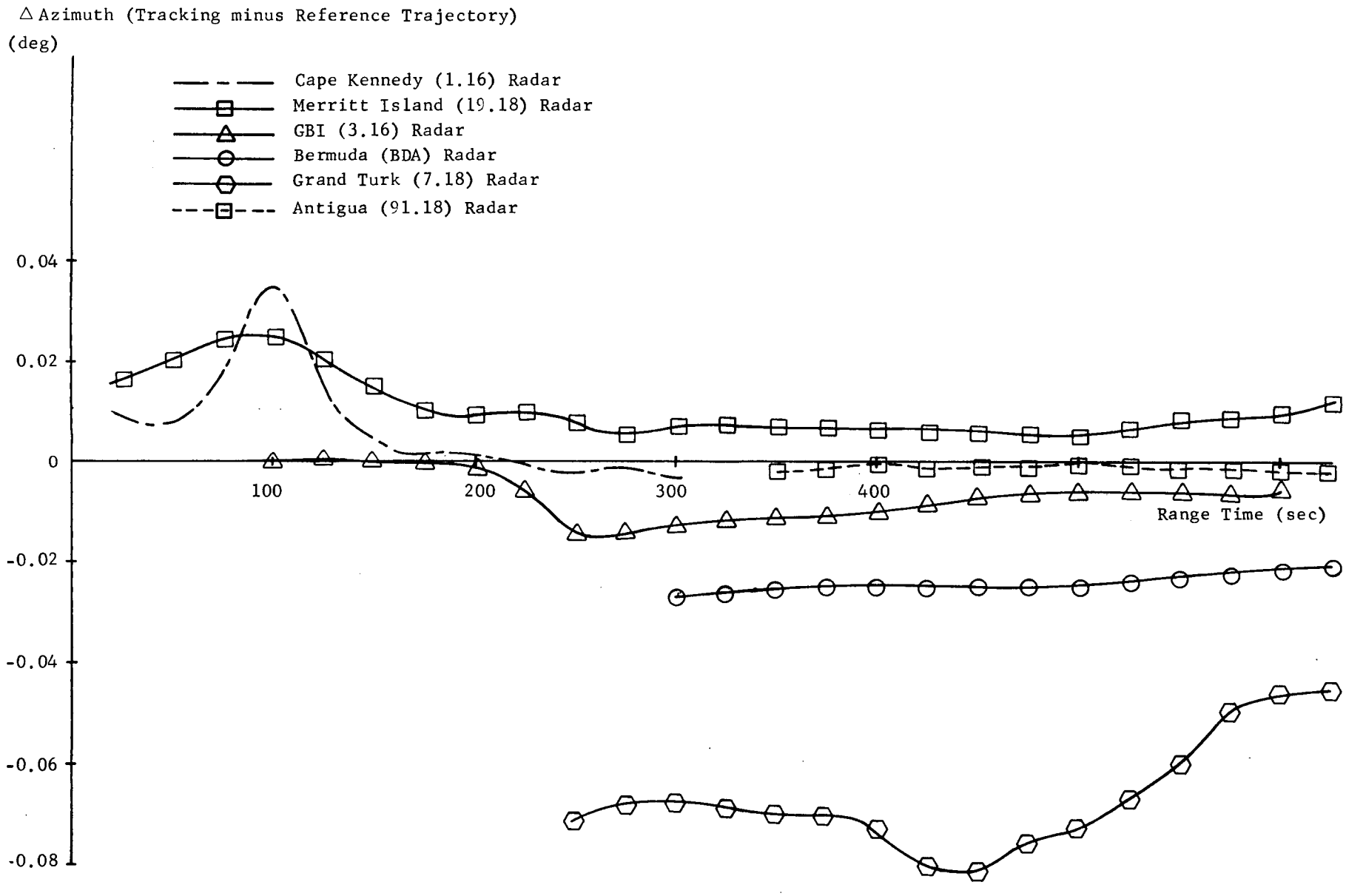



FIGURE 6 MEASURED PARAMETER TRACKING COMPARISONS (AZIMUTH)

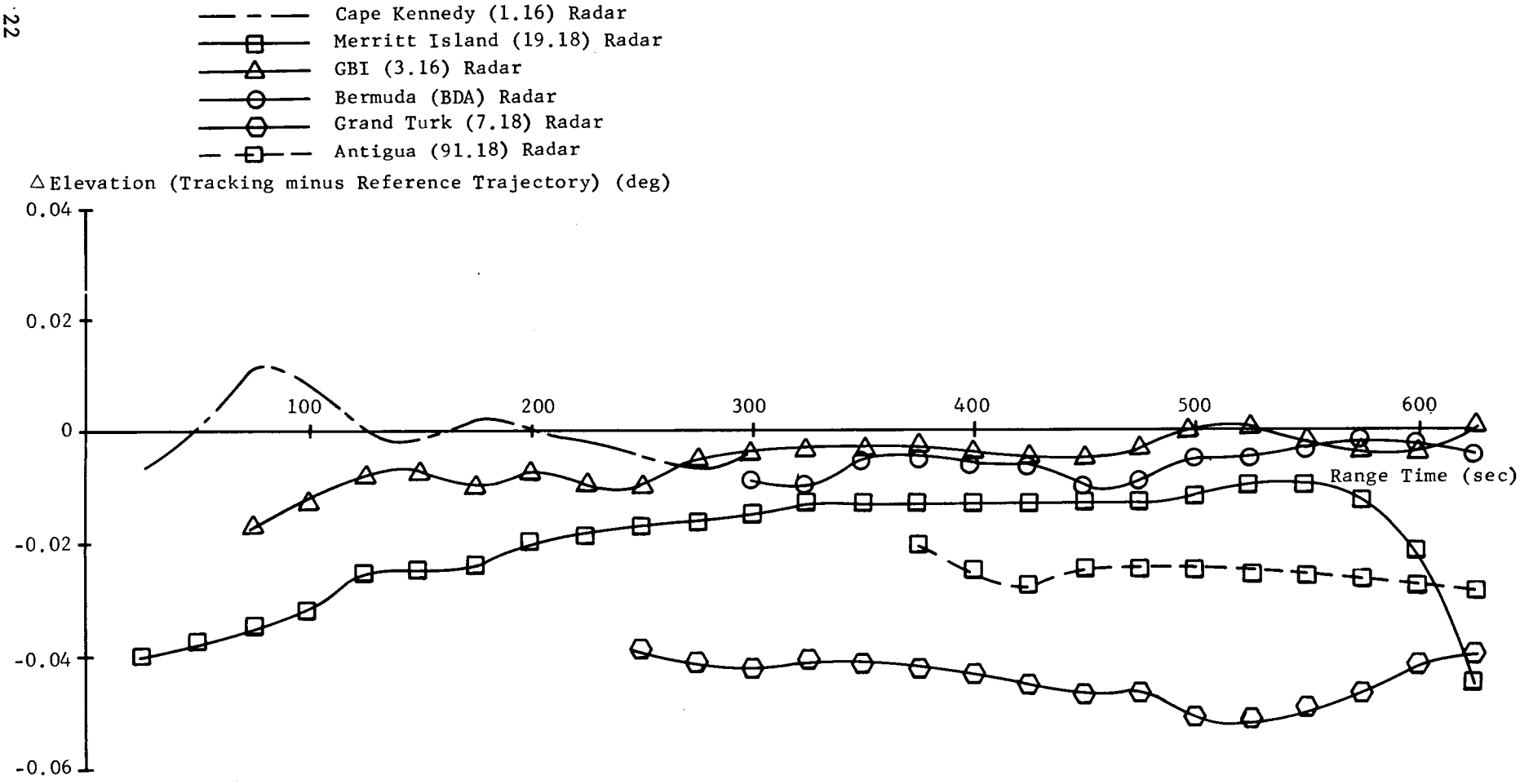



FIGURE 7 MEASURED PARAMETER TRACKING COMPARISONS (ELEVATION)

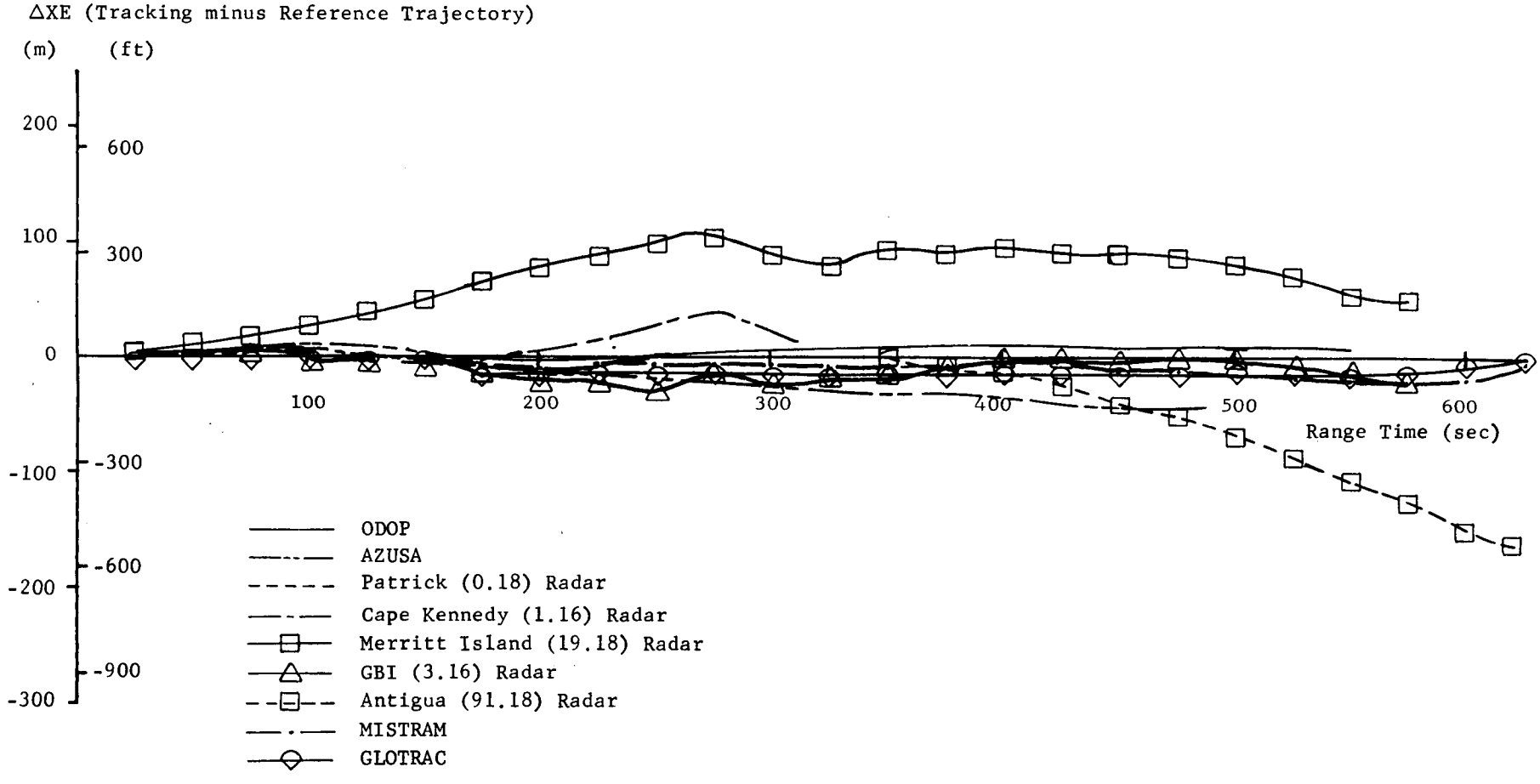



FIGURE 8 METRIC TRACKING COMPARISONS

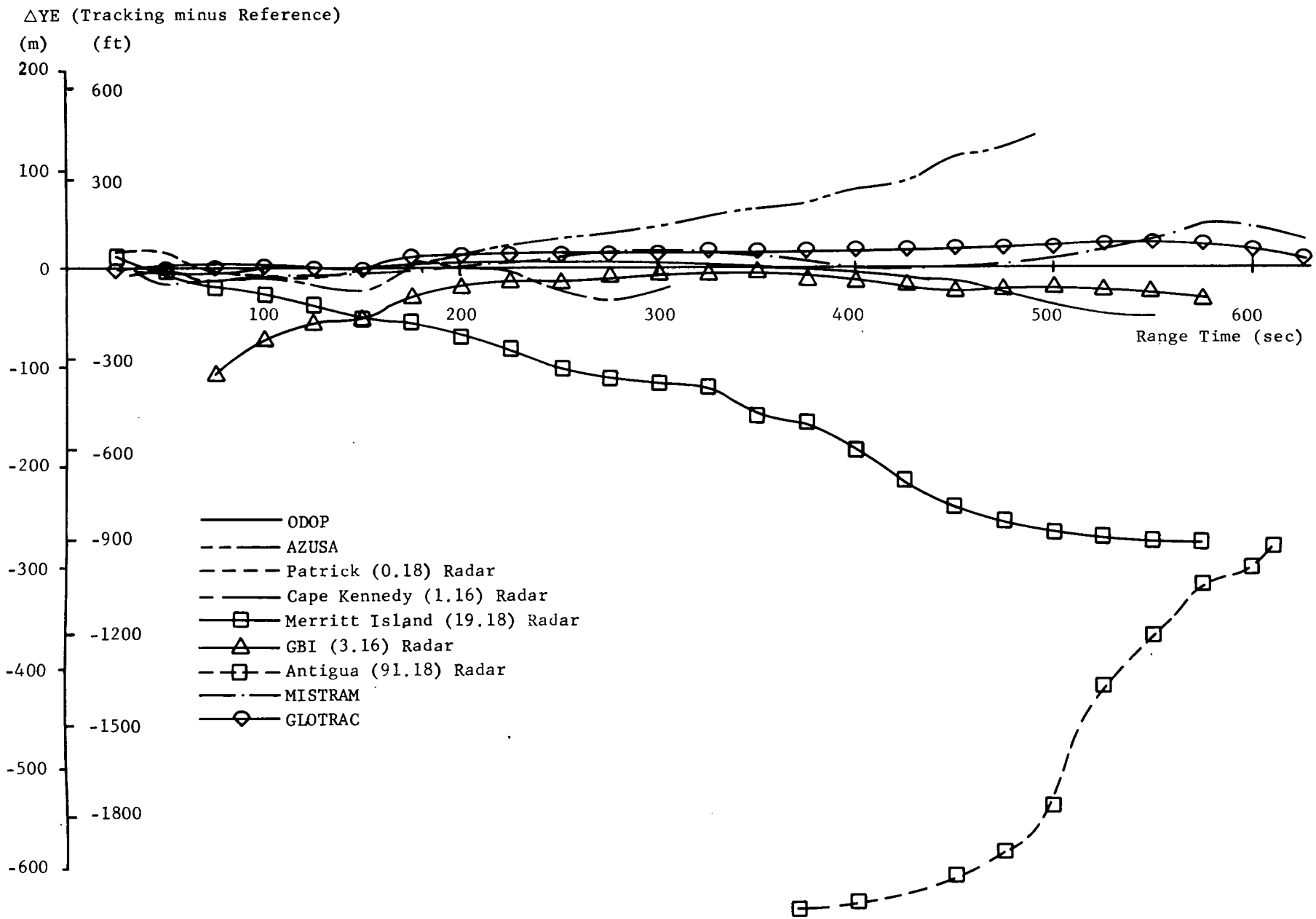



FIGURE 9 METRIC TRACKING COMPARISONS

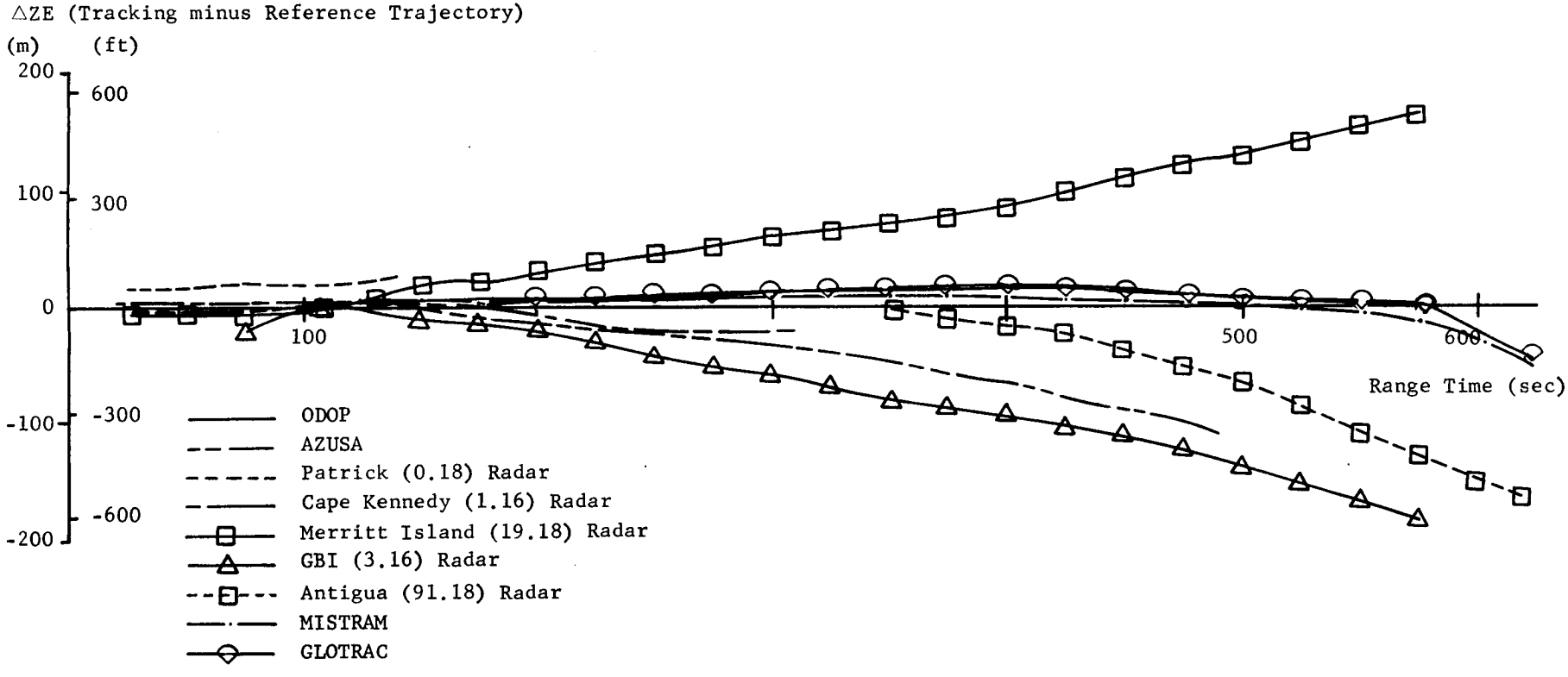



FIGURE 10 METRIC TRACKING COMPARISONS

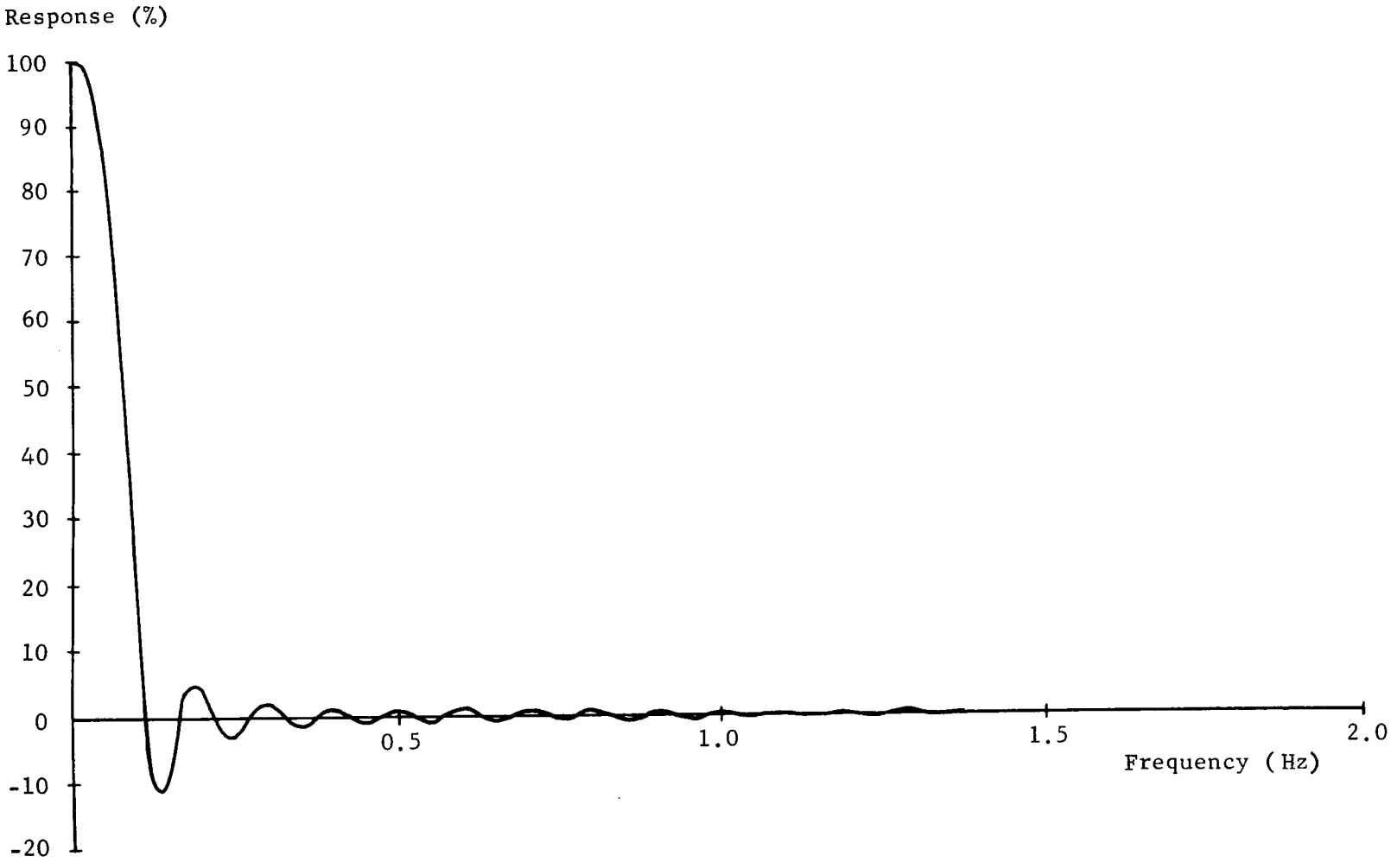



FIGURE 11 FREQUENCY RESPONSE OF SMOOTHING COEFFICIENTS

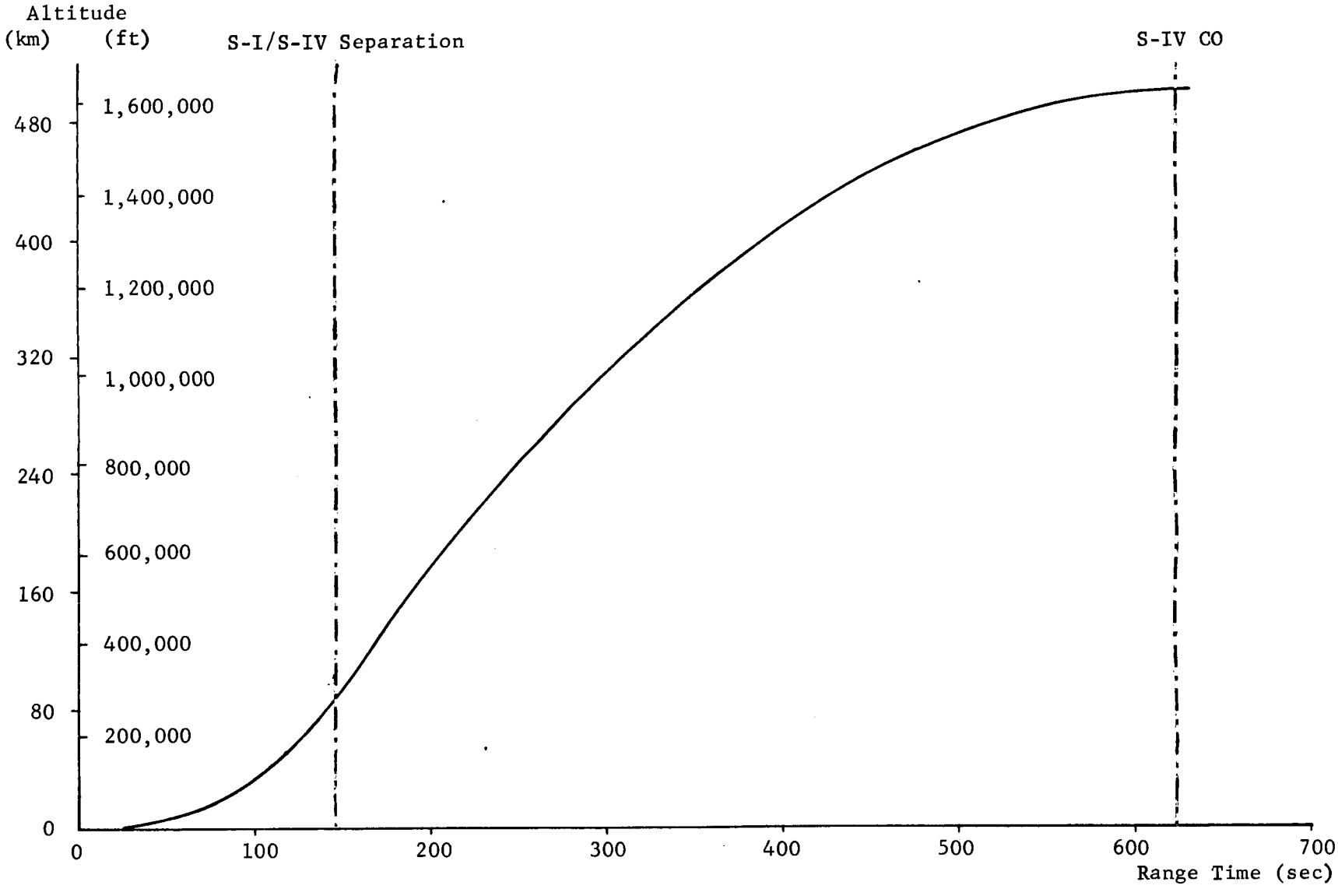



FIGURE 12 ALTITUDE

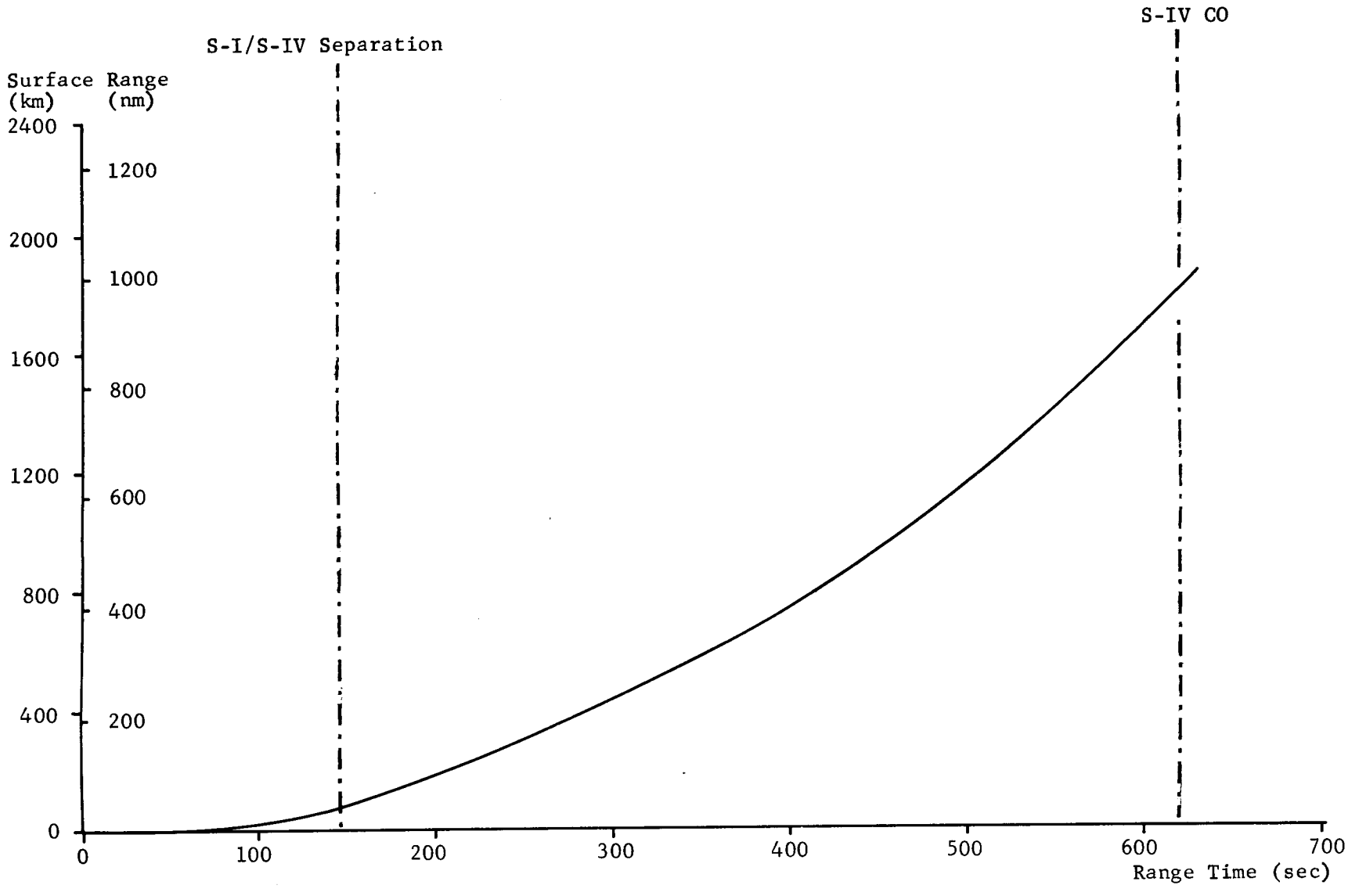
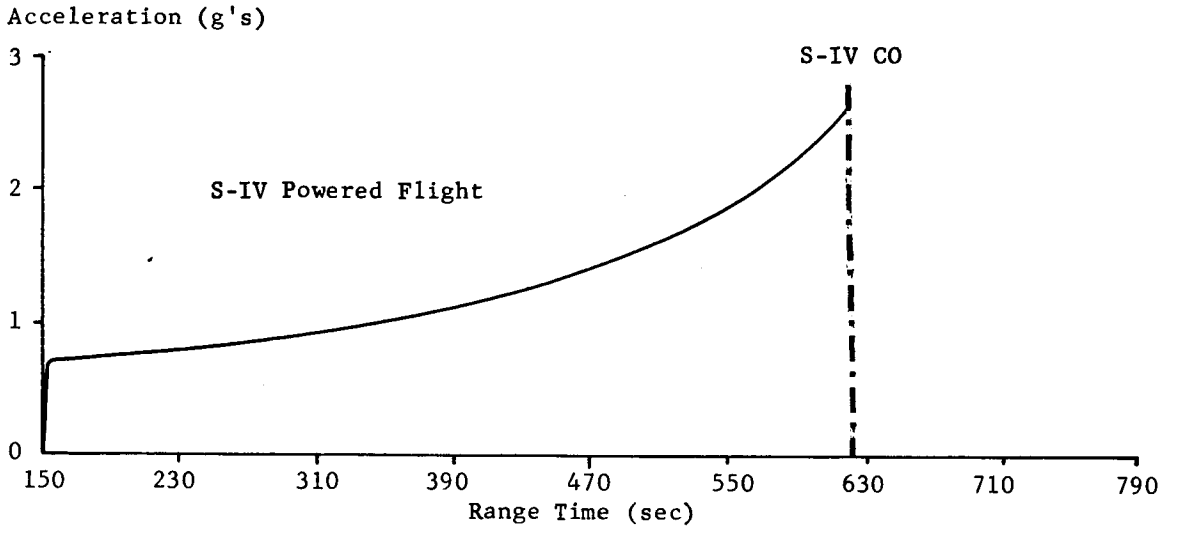



FIGURE 13 SURFACE RANGE



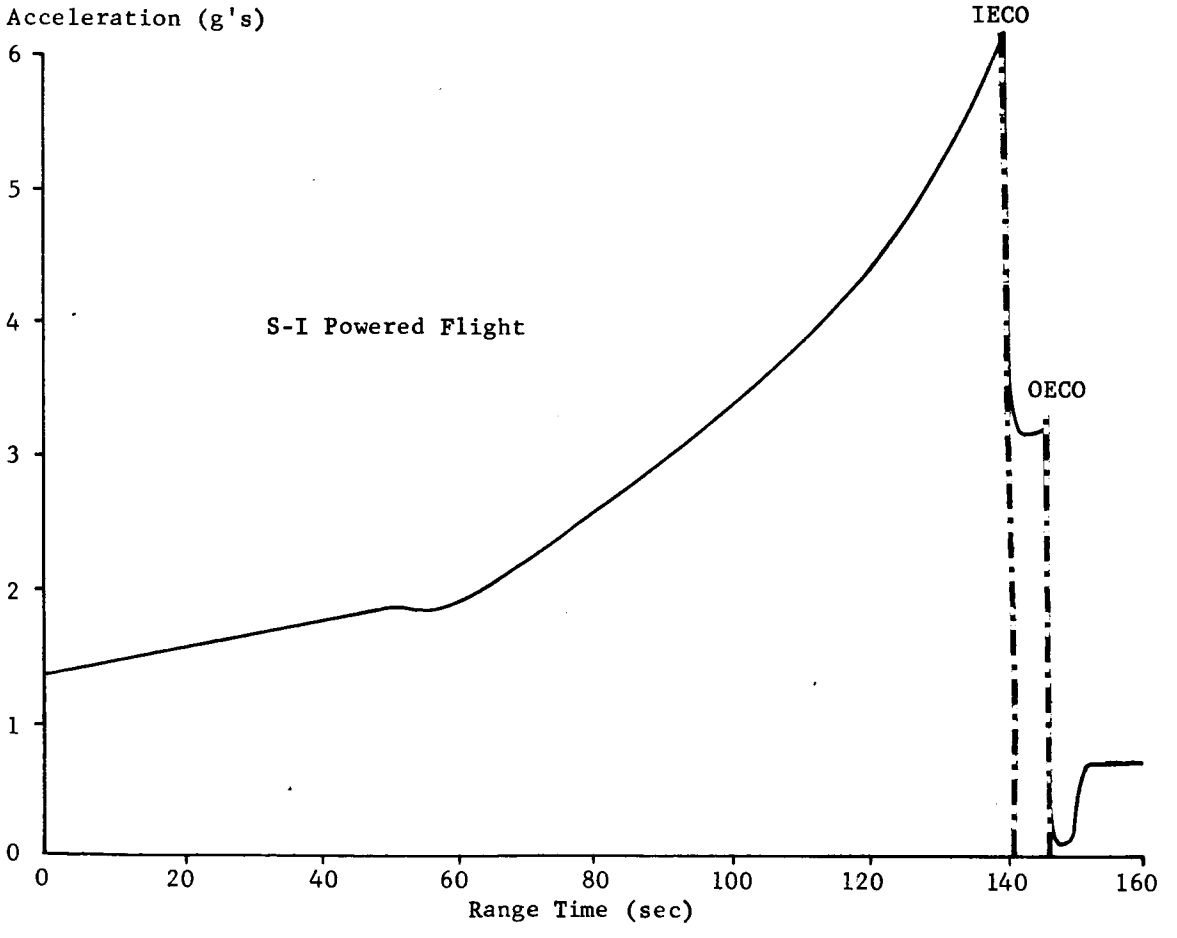
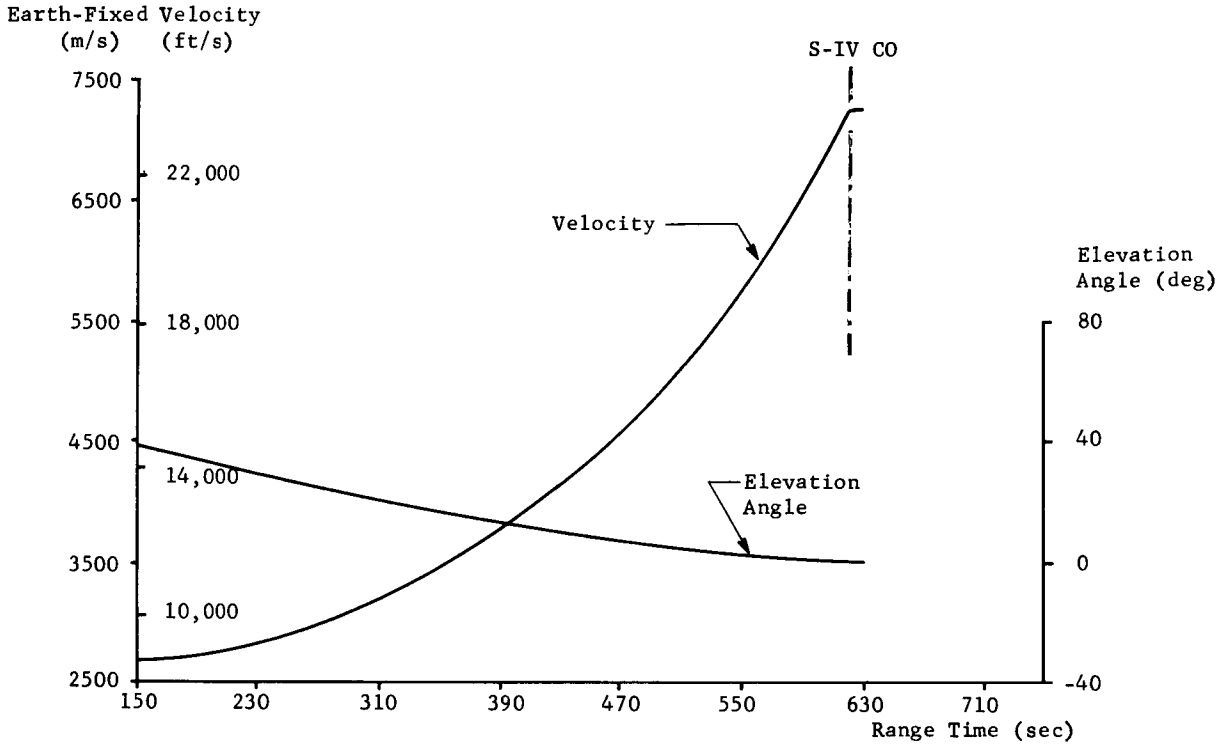




FIGURE 14 TOTAL INERTIAL ACCELERATION



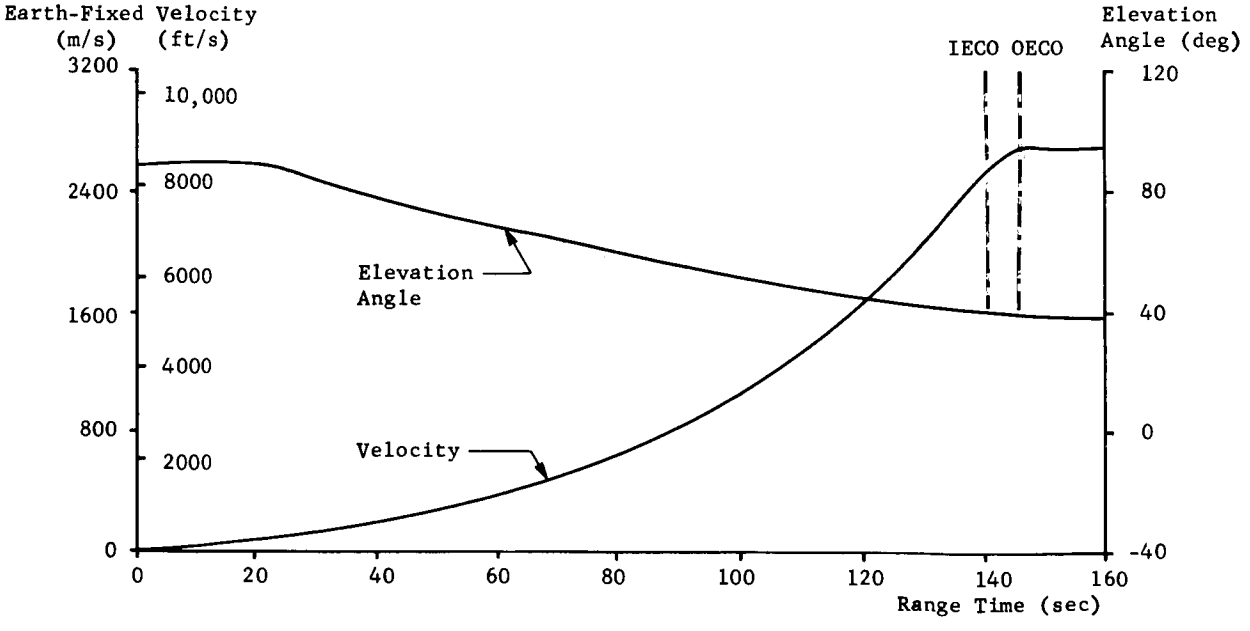
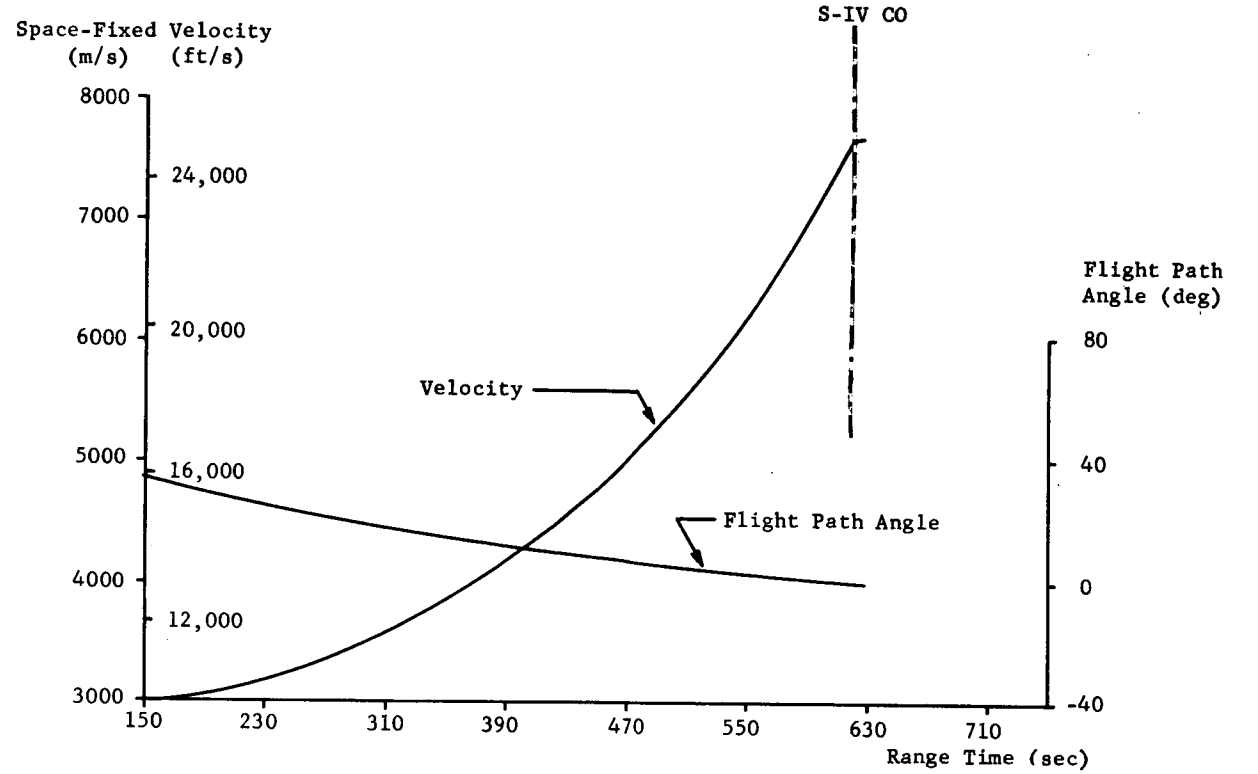




FIGURE 15 EARTH-FIXED VELOCITY AND ELEVATION ANGLE



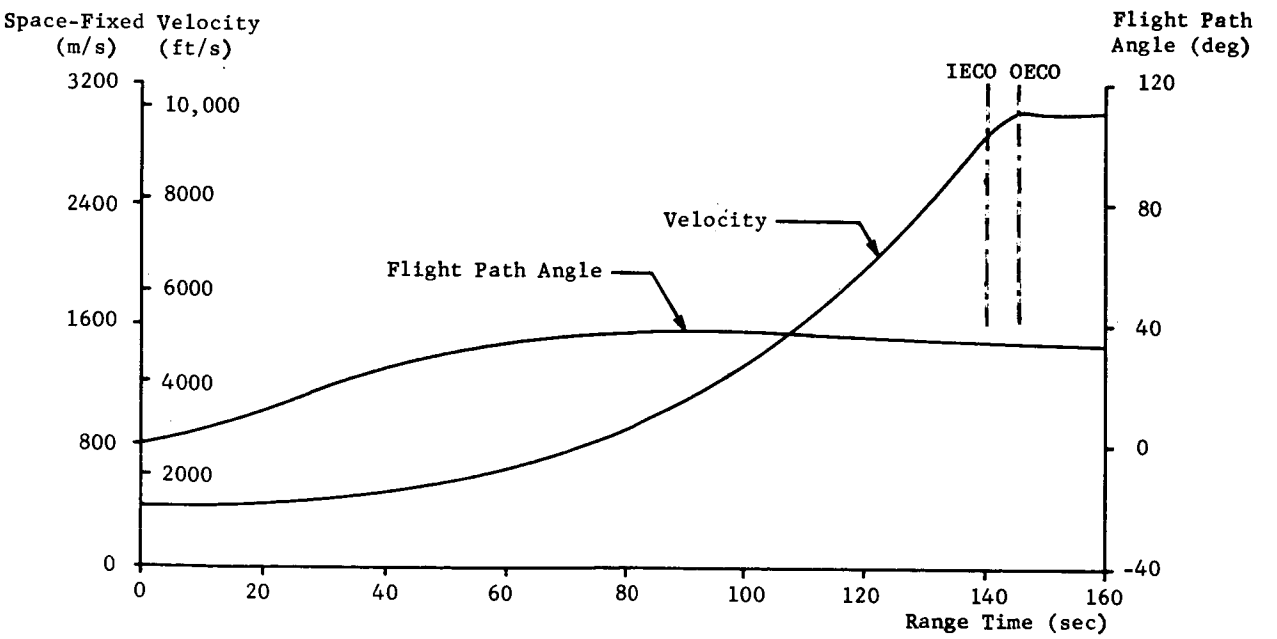




FIGURE 16 SPACE-FIXED VELOCITY AND FLIGHT PATH ANGLE

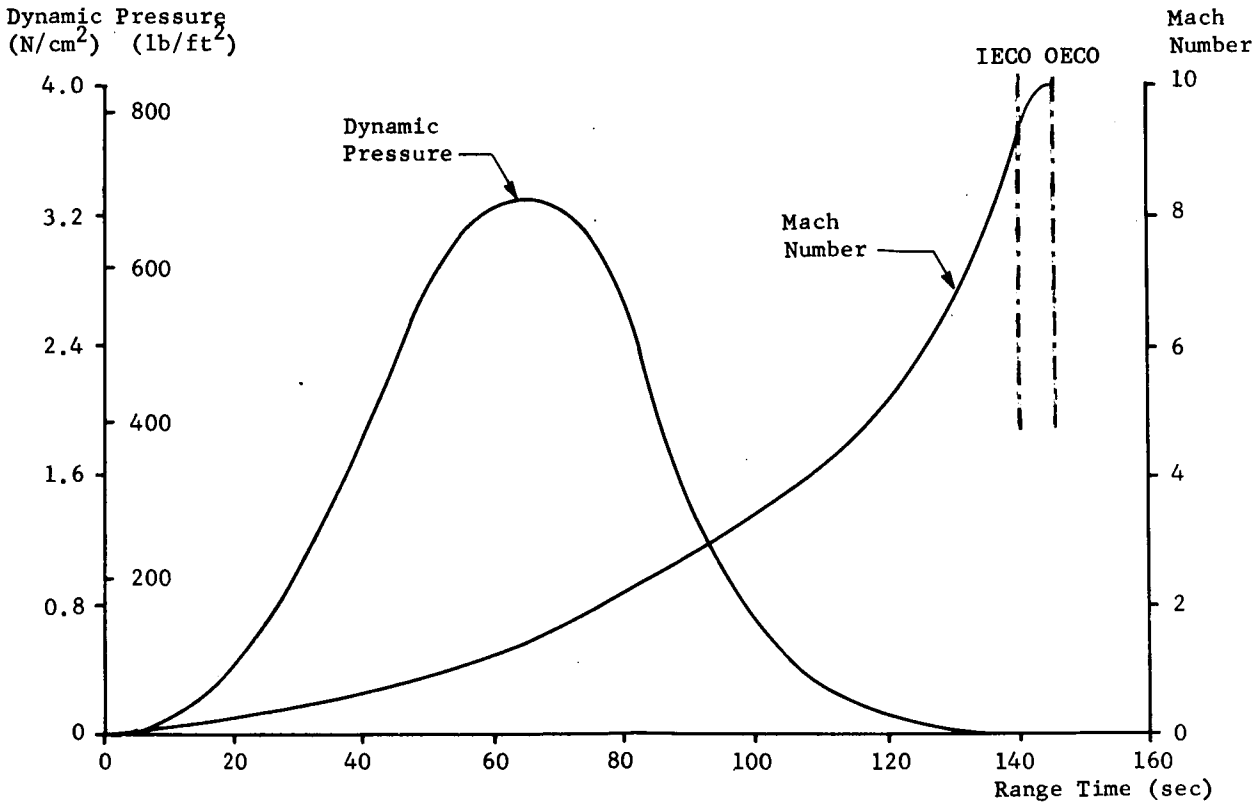
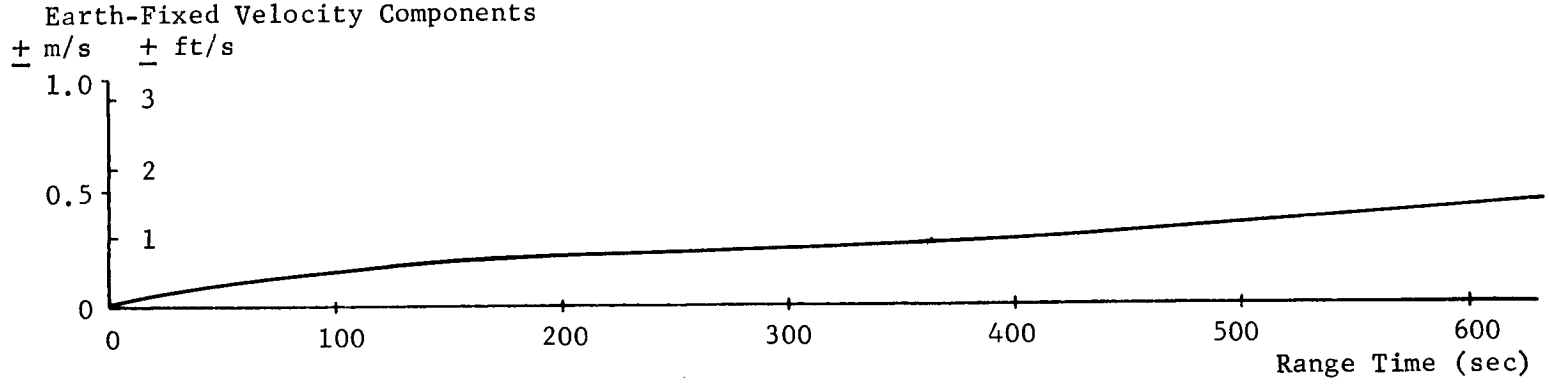



FIGURE 17 MACH NUMBER AND DYNAMIC PRESSURE



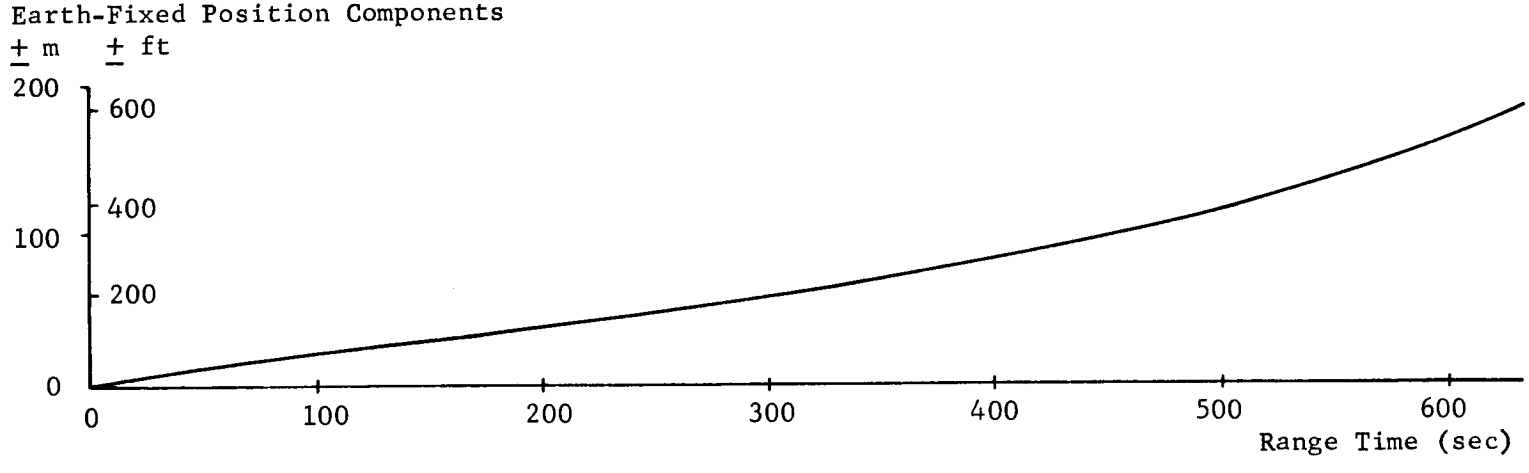




FIGURE 18 ESTIMATED UNCERTAINTY OF REFERENCE TRAJECTORY

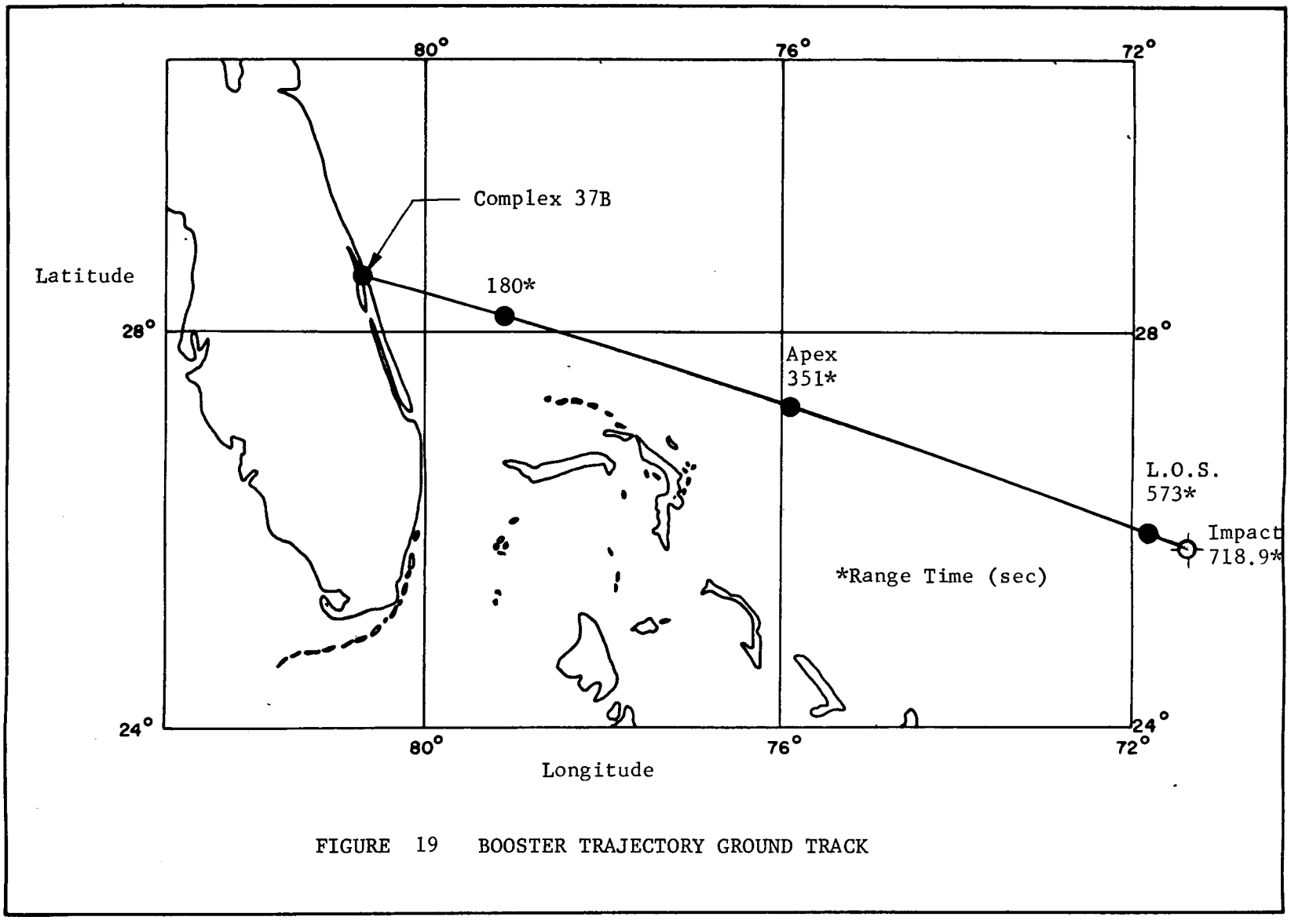



FIGURE 19 BOOSTER TRAJECTORY GROUND TRACK

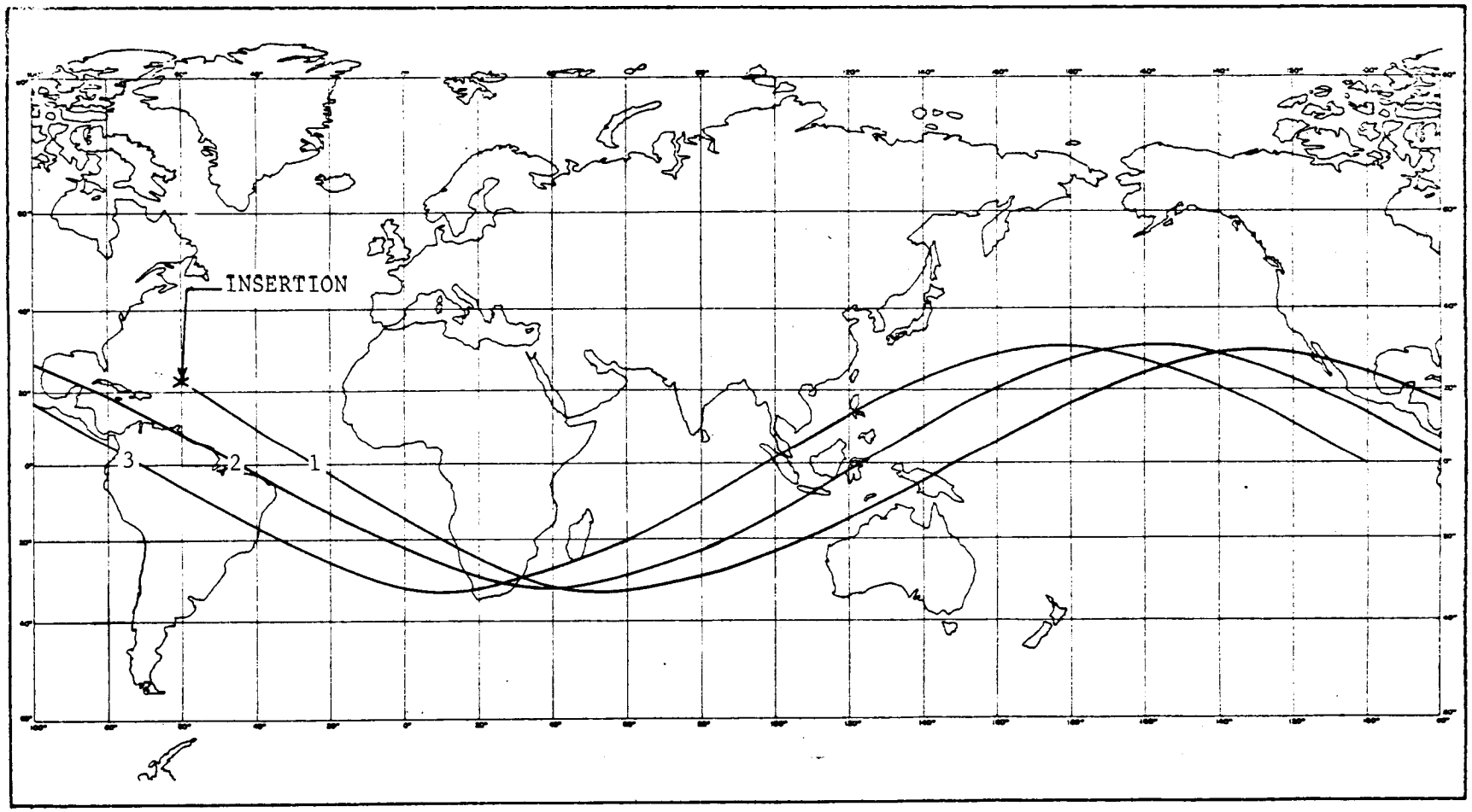



FIGURE 20 GROUND PROJECTION OF FIRST THREE EARTH REVOLUTIONS

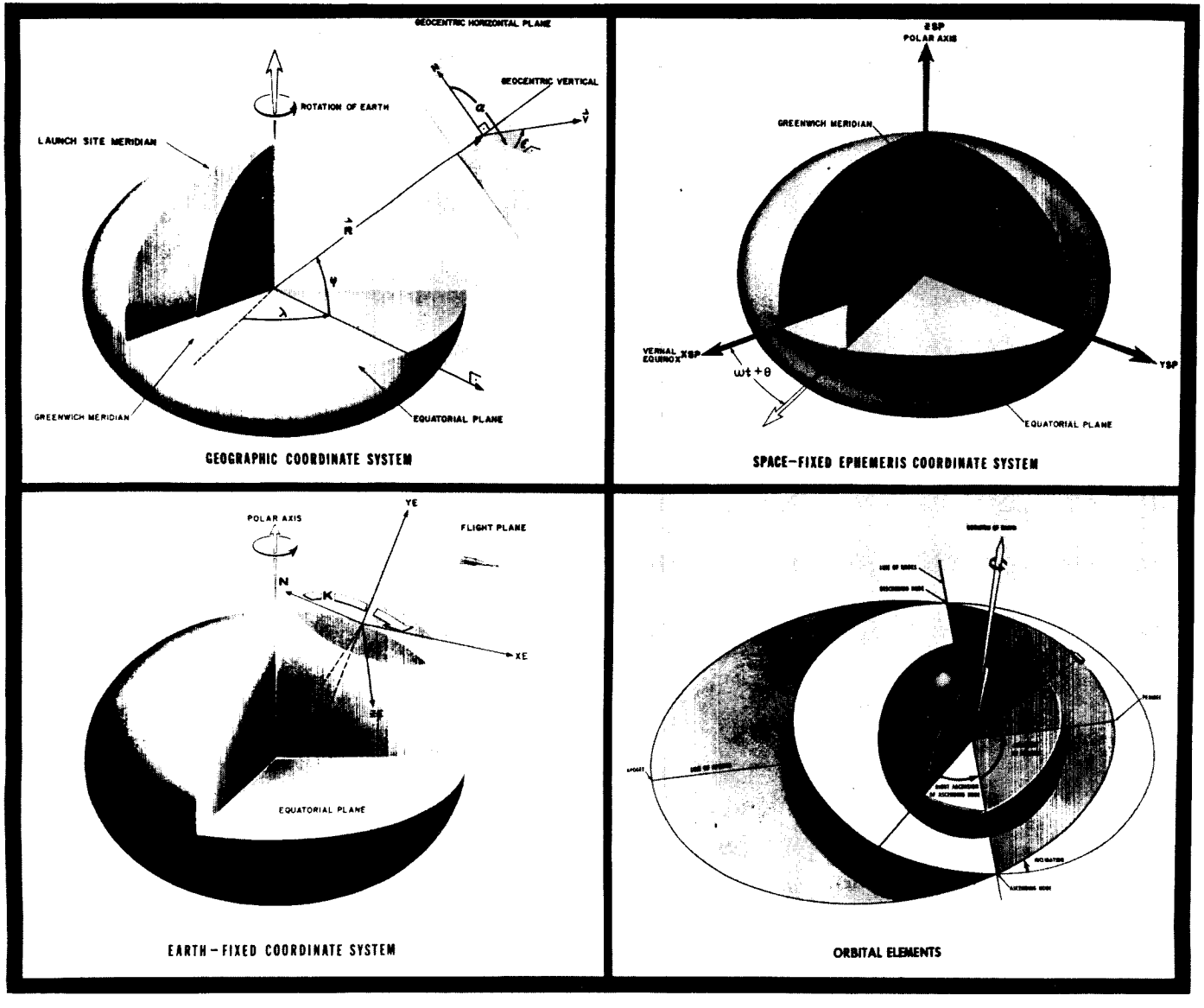



FIGURE 21 TRAJECTORY COORDINATE SYSTEMS

TABLE I TRACKING DATA SOURCES (POWERED FLIGHT)

| Data Source | Time Available (sec) |
|---|---|
| Fixed Camera | 0.00 - 18.196 |
| Theodolite | 1.4 - 64.0 |
| Azusa | 18.5 - 147.0<br>121.1 - 631.0 |
| ODOP | 2.1 - 113.5<br>121.1 - 146.3<br>155.1 - 586.0 |
| MISTRAM | 39.0 - 146.1<br>151.0 - 280.5<br>283.9 - 631.0 |
| GLOTRAC | 20.5 - 631.0 |
| Radar Altimeter | 175.0 - 240.0<br>420.0 - 490.0<br>520.0 - 631.0 |
| Cape Kennedy (1.16) Radar (FPS-16) | 10.0 - 315.0 |
| Merritt Island (19.18) Radar (TPQ-18) | 12.0 - 27.0<br>35.0 - 181.0<br>190.6 - 580.0 |
| GBI (3.16) Radar (FPS-16) | 66.0 - 580.0 |
| Grand Turk (7.18) Radar (TPQ-18) | 200.0 - 621.3 |
| Antiqua (91.18) Radar (FPQ-6) | 342.0 - 621.3 |
| Bermuda (BDA) Radar (FPS-16) | 287.0 - 631.0 |
| Patrick (0.18) Radar (FPQ-6)<br>(tracked S-I stage after separation) | 10.0 - 580.0 |

TABLE II TIMES OF EVENTS

| Event | Range Time | | |
|---|---|---|---|
| | Actual | Nominal | Act - Nom |
| First Motion | 0.08 | | |
| LO Signal (Umb Disc) | 0.28 | | |
| Guidance Detects LO | 0.30 | 0.30 | 0.00 |
| Pitch Command | 8.86 | 8.85 | 0.01 |
| Roll Command | 8.87 | 8.86 | 0.01 |
| Roll Completed | 23.90 | 23.86 | 0.04 |
| Lock Modules | 137.80 | 138.58 | -0.78 |
| IECO | 140.22 | 140.70 | -0.48 |
| OECO | 145.56 | 146.70 | -1.14 |
| Ullage Rockets Ignite | 146.32 | 147.41 | -1.09 |
| Separation | 146.42 | 147.51 | -1.09 |
| S-IV Ignition | 148.12 | 149.21 | -1.09 |
| Jettison Ullage Rockets & LES | 158.42 | 159.51 | -1.09 |
| Introduce Guidance | 163.86 | | |
| Guidance Cutoff Signal | 621.66 | 630.01 | -8.35 |
| Apollo Shroud Separation | 803.50 | 811.80 | -8.30 |
| Wing Deployment Complete | 902.25 | | |

TABLE III SIGNIFICANT TRAJECTORY PARAMETERS

| Event | Parameter | |
|---|---|---|
| First Motion | Range Time | 0.08 sec |
| | Total Inertial Acceleration | 13.18 m/s$^2$ (43.24 ft/s$^2$) |
| Mach One | Range Time | 53.208 sec |
| | Altitude | 7.10 km (23294 ft) |
| Maximum Dynamic Pressure | Range Time | 66.0 sec |
| | Dynamic Pressure | 3.313 N/cm$^2$ (691.9 lb/ft$^2$) |
| | Altitude | 11.64 km (38189 ft) |
| Maximum Total Inertial Acceleration (S-I Stage) | Range Time | 140.34 sec |
| | Acceleration | 60.66 m/s$^2$ (199.02 ft/s$^2$) |
| Maximum Earth-Fixed Velocity (S-I Stage) | Range Time | 145.70 sec |
| | Velocity | 2701.1 m/s (8861.9 ft/s) |
| Apex (S-I Stage) | Range Time | 351.0 sec |
| | Altitude | 263.29 km (142.17 nm) |
| | Range | 476.32 km (257.19 nm) |
| | Earth-Fixed Velocity | 1990.3 m/s (6529.9 ft/s) |
| Loss of Telemetry (S-I Stage) | Range Time | 573.0 sec |
| | Altitude | 59.72 km (195929 ft) |
| | Range | 911.42 km (492.13 nm) |
| | Total Inertial Acceleration | -3.91 m/s$^2$ (-12.83 ft/s$^2$) |
| | Elevation Angle from Pad | -0.368 deg |
| Impact (S-I Stage) | Range Time | 718.9 sec |
| | Range | 961.30 km (519.06 nm) |
| | Cross Range | 18.26 km (9.86 nm) |
| | Geodetic Latitude | 25.8155 deg |
| | Longitude | 71.3491 deg |
| Maximum Total Inertial Acceleration (S-IV Stage) | Range Time | 621.71 sec |
| | Acceleration | 25.68 m/s$^2$ (84.25 ft/s$^2$) |
| Maximum Earth-Fixed Velocity (S-IV Stage) | Range Time | 622.0 sec |
| | Velocity | 7257.6 m/s (23811.0 ft/s) |

TABLE IV CUTOFF CONDITIONS

| Parameters | IECO | | | OECO | | | S-IV CO (Guidance Signal) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Actual | Nominal | Act-Nom. | Actual | Nominal | Act-Nom. | Actual | Nominal | Act-Nominal |
| Range Time (sec) | 140.22 | 140.70* | -0.48 | 145.56 | 146.7* | -1.14 | 621.659 | 630.01* | -8.351 |
| Altitude (km) | 80.02 | 78.10 | 1.92 | 89.05 | 87.94 | 1.11 | 499.73 | 500.07 | -0.34 |
| Range (km) | 64.73 | 64.63 | 0.10 | 75.35 | 76.48 | -1.13 | 1837.69 | 1856.85 | -19.16 |
| Cross Range, $Z_e$ (km) | -0.22 | 0.01 | -0.23 | -0.18 | 0.06 | -0.24 | 50.63 | 51.10 | -0.47 |
| Cross Range Velocity, $\dot{Z}_e$ (m/s) | 7.7 | 7.8 | -0.1 | 9.5 | 9.5 | 0.0 | 225.6 | 226.5 | -0.9 |
| Earth-Fixed Velocity (m/s) | 2556.9 | 2506.7 | 50.2 | 2697.8 | 2662.4 | 35.4 | 7254.5 | 7255.0 | -0.5 |
| E.F. Velocity Vector Elevation (deg) | 40.42 | 39.82 | 0.60 | 39.65 | 38.97 | 0.68 | -0.04 | -0.02 | -0.02 |
| E.F. Velocity Vector Azimuth (deg) | 105.40 | 105.41 | -0.01 | 105.49 | 105.50 | -0.01 | 114.34 | 114.41 | -0.07 |
| Space-Fixed Velocity (m/s) | 2875.1 | 2837.4 | 47.7 | 3018.8 | 2986.2 | 32.6 | 7678.5 | 7679.0 | -0.5 |
| Total Inertial Acceleration ($m/s^2$) | 60.52 | 59.39 | 1.13 | 29.83 | 30.91 | -1.08 | 25.66 | 25.64 | 0.02 |

*Based on First Motion Time of 0.08 sec

Earth-Fixed Velocity Accuracy
OECO ± 0.2 m/s
S-IV CO ± 0.5 m/s

Altitude Accuracy
OECO ± 20 m
S-IV CO ± 100 m

TABLE V ORBITAL ELEMENTS AT INSERTION

| | |
|---|---|
| Time | 14:47:34.659 U. T. |
| Semi-Major Axis | 6998.91 km (3779.11 nm) |
| Eccentricity | 0.017754503 |
| Inclination | 31.7645 deg |
| Right Ascension of Ascending Node | 167.1532 deg |
| Argument of Perigee | 135.2553 deg |
| True Anomaly | -1.5580 deg |
| Mean Sidereal Time, 0 hr U. T. Feb 16, 1965 | 145.777137 deg |
| Space-Fixed Velocity | 7681.84 m/s (25,202.84 ft/s) |
| Azimuth of Space-Fixed Velocity (CW from North) | 113.1589 deg |
| Flight Path Angle | -0.02718 deg |
| Altitude from Earth Center | 499.62 km (269.77 nm) |
| Geocentric Latitude (North) | 22.3713 deg |
| Longitude (East) | 297.2119 deg |

TABLE VI ORBITAL INSERTION PARAMETERS

| | Actual | Nominal | Actual Minus Nominal |
|---|---|---|---|
| Time of Orbital Insertion (Range Time) | 631.659 sec | 640.01 sec | - 8.351 sec |
| Space-Fixed Velocity | 7681.8 m/s (25202.7 ft/s) | 7682.1 m/s (25203.7 ft/s) | - 0.3 m/s (-1.0 ft/s) |
| Flight Path Angle | -0.027 deg | -0.014 deg | - 0.013 deg |
| Altitude** | 499.6 km (269.8 nm) | 500.0 km (270.0 nm) | - 0.4 km (-0.2 nm) |
| Ground Range | 1905.0 km (1028.6 nm) | 1924.1 km) (1038.9 nm) | -19.1 km (-10.3 nm) |
| Apogee Altitude* | 745.0 km (402.3 nm) | 747.1 km (403.4 nm) | - 2.1 km (- 1.1 nm) |
| Perigee Altitude * | 496.5 km (268.1 nm) | 496.9 km (268.3 nm) | - 0.4 km (- 0.2 nm) |
| Period | 97.1 min | 97.1 min | 0.0 min |
| Inclination | 31.76 deg | 31.77 deg | - 0.01 deg |
| Excess Circular Velocity | 67.3 m/s (220.8 ft/s) | 67.7 m/s (222.1 ft/s) | - 0.4 m/s (- 1.3 ft/s) |
| Lifetime | 1188 days | 1250 days | -62 days |

*Apogee and perigee altitudes are defined assuming a spherical Earth of radius 6378.165 km (3443.9336 nm).
**Altitude is defined assuming an oblate Earth (Fischer Ellipsoid).

TABLE VII

INITIAL SA-9 ORBITAL TRACKING

| STATION | REVOLUTION NUMBER | | | | | |
|---|---|---|---|---|---|---|
| | INSERTION | 1 | 2 | 3 | 4 | 5 |
| RADAR | | | | | | |
| Wallops Island, Va. | S | | | | | |
| Merritt Island, Fla. | B | S | | | | |
| Bermuda | B | | | | | |
| Grand Bahamas | B | | | | | |
| Grand Turk | B | S | | | | |
| Antigua | B | | | | | |
| Ascension | | B | | | | |
| Pretoria, S. Africa | | B* | | | | |
| Carnarvon, Australia | | S | | | | |
| White Sands, N.M. | | S | | | | |
| Patrick AFB, Fla. | | S | | | | |
| MINITRACK | | | | | | |
| Johannesburg, S. Africa | | X | X | X | X | X |
| Woomera, Australia | | X | | | | |
| Fort Myers, Fla. | | X | | | | |
| Quito, Ecuador | | | X | | | |
| Mojave, Calif. | | X | X | | | |
| Rosman, N. C. | | X | | | | |
| Lima, Peru | | | | X | | |
| Santiago, Chile | | | | | X | X |

*Last C-Band beacon reception at approximately 15:19Z (42 min after liftoff)
B C-Band radar beacon track
S Radar Skin track

## TABLE VIII BOOSTER FREE FLIGHT TRAJECTORY

| Time (sec) | Earth-Fixed Position XE (m) | YE (m) | ZE (m) | Earth-Fixed Velocity DXE (m/s) | DYE (m/s) | DZE (m/s) | Altitude (m) | Range (m) |
|---|---|---|---|---|---|---|---|---|
| 160 | 106561 | 111973 | 2 | 2081 | 1551 | 13 | 112846 | 104628 |
| 180 | 148090 | 141189 | 299 | 2073 | 1369 | 17 | 142871 | 144753 |
| 200 | 189481 | 166763 | 672 | 2065 | 1188 | 20 | 169506 | 184477 |
| 220 | 230705 | 188725 | 1118 | 2057 | 1008 | 24 | 192776 | 223842 |
| 240 | 271749 | 207101 | 1634 | 2047 | 830 | 28 | 212705 | 262899 |
| 260 | 312600 | 221914 | 2219 | 2038 | 652 | 31 | 229312 | 301699 |
| 280 | 353246 | 233184 | 2867 | 2027 | 475 | 34 | 242613 | 340290 |
| 300 | 393674 | 240925 | 3578 | 2016 | 299 | 37 | 252620 | 378721 |
| 320 | 433871 | 245149 | 4347 | 2004 | 123 | 40 | 259343 | 417037 |
| 340 | 473825 | 245865 | 5171 | 1991 | -52 | 43 | 262788 | 455286 |
| 360 | 513523 | 243076 | 6048 | 1978 | -227 | 45 | 262958 | 493511 |
| 380 | 552952 | 236784 | 6975 | 1965 | -402 | 48 | 259853 | 531760 |
| 400 | 592099 | 226988 | 7947 | 1950 | -578 | 50 | 253471 | 570077 |
| 420 | 630950 | 213679 | 8961 | 1935 | -753 | 52 | 243806 | 608508 |
| 440 | 669491 | 196851 | 10015 | 1919 | -930 | 54 | 230848 | 647102 |
| 460 | 707708 | 176490 | 11105 | 1902 | -1107 | 55 | 214584 | 685903 |
| 480 | 745585 | 152578 | 12226 | 1885 | -1285 | 57 | 195001 | 724962 |
| 500 | 783106 | 125097 | 13377 | 1867 | -1464 | 58 | 172079 | 764328 |
| 520 | 820254 | 94021 | 14552 | 1848 | -1644 | 59 | 145795 | 804054 |
| 540 | 857011 | 59323 | 15748 | 1828 | -1826 | 60 | 116124 | 844193 |
| 560 | 893358 | 20972 | 16962 | 1807 | -2009 | 61 | 83038 | 884800 |
| 580 | 929058 | -20812 | 18181 | 1735 | -2135 | 60 | 46725 | 925683 |
| 600 | 953669 | -52583 | 19035 | 464 | -668 | 17 | 18914 | 954581 |
| 620 | 957298 | -58936 | 19021 | 70 | -201 | -12 | 13174 | 959112 |
| 640 | 958100 | -62610 | 18722 | 20 | -167 | -14 | 9661 | 960450 |
| 660 | 958242 | -65640 | 18531 | -2 | -138 | -8 | 6687 | 961043 |
| 680 | 958060 | -68193 | 18353 | -13 | -118 | -6 | 4134 | 961245 |
| 700 | 957784 | -70416 | 18281 | -14 | -105 | -2 | 1895 | 961307 |
| 718.9 | 957482 | -72287 | 18261 | -19 | -93 | -1 | 0 | 961290 |

TABLE IX

EARTH-FIXED PLUMBLINE PØSITIØNS AND VELØCITIES

| TIME SEC | XE M | YE M | ZE M | DXE M/S | DYE M/S | DZE M/S |
|---|---|---|---|---|---|---|
| | FIRST MØTIØN | | | | | |
| 0.080 | 0 | 32 | 0 | 0. | -0. | -0. |
| | LIFTØFF SIGNAL | | | | | |
| 0.280 | 0 | 32 | 0 | 0.0 | 0.7 | -0.0 |
| 1.0 | 0 | 33 | 0 | 0.0 | 3.2 | -0.1 |
| 2.0 | 0 | 38 | 0 | -0.0 | 6.8 | -0.1 |
| 3.0 | 0 | 47 | 0 | -0.1 | 10.5 | -0.1 |
| 4.0 | 0 | 59 | 0 | -0.2 | 14.3 | -0.1 |
| 5.0 | 0 | 75 | 0 | -0.2 | 18.1 | -0.0 |
| 6.0 | -0 | 95 | 0 | -0.3 | 22.1 | -0.0 |
| 7.0 | -0 | 120 | 0 | -0.4 | 26.1 | -0.1 |
| 8.0 | -0 | 148 | -0 | -0.5 | 30.2 | -0.1 |
| 9.0 | -1 | 180 | -0 | -0.5 | 34.4 | -0.1 |
| 10.0 | -1 | 216 | -0 | -0.6 | 38.6 | -0.2 |
| 11.0 | -2 | 257 | -0 | -0.6 | 43.0 | -0.2 |
| 12.0 | -3 | 302 | -0 | -0.6 | 47.4 | -0.2 |
| 13.0 | -4 | 352 | -0 | -0.6 | 51.9 | -0.2 |
| 14.0 | -4 | 406 | -1 | -0.5 | 56.6 | -0.2 |
| 15.0 | -5 | 465 | -1 | -0.4 | 61.3 | -0.2 |
| 16.0 | -6 | 529 | -1 | -0.3 | 66.2 | -0.1 |
| 17.0 | -6 | 597 | -1 | -0.1 | 71.1 | -0.1 |
| 18.0 | -6 | 671 | -1 | 0.3 | 76.1 | 0.0 |
| 19.0 | -6 | 750 | -1 | 0.7 | 81.2 | 0.1 |
| 20.0 | -5 | 833 | -1 | 1.3 | 86.4 | 0.1 |
| 21.0 | -3 | 922 | -1 | 1.9 | 91.6 | 0.2 |
| 22.0 | -1 | 1017 | -1 | 2.8 | 97.0 | 0.2 |
| 23.0 | 1 | 1116 | -0 | 3.8 | 102.4 | 0.2 |
| 24.0 | 6 | 1221 | -0 | 5.0 | 107.9 | 0.3 |
| 25.0 | 11 | 1332 | -0 | 6.4 | 113.4 | 0.3 |
| 26.0 | 18 | 1448 | -0 | 7.9 | 119.1 | 0.2 |
| 27.0 | 27 | 1570 | 0 | 9.6 | 124.8 | 0.2 |
| 28.0 | 37 | 1698 | 0 | 11.5 | 130.6 | 0.2 |
| 29.0 | 50 | 1831 | 0 | 13.6 | 136.5 | 0.2 |
| 30.0 | 64 | 1971 | 0 | 15.8 | 142.6 | 0.2 |

TABLE IX

EARTH-FIXED PLUMBLINE PØSITIØNS AND VELØCITIES

| TIME SEC | XE M | YE M | ZE M | DXE M/S | DYE M/S | DZE M/S |
|---|---|---|---|---|---|---|
| 31.0 | 81 | 2116 | 1 | 18.2 | 148.7 | 0.2 |
| 32.0 | 100 | 2268 | 1 | 20.7 | 154.9 | 0.2 |
| 33.0 | 122 | 2426 | 1 | 23.3 | 161.2 | 0.2 |
| 34.0 | 147 | 2591 | 1 | 26.0 | 167.5 | 0.1 |
| 35.0 | 174 | 2761 | 1 | 28.9 | 174.0 | -0.0 |
| 36.0 | 204 | 2939 | 1 | 31.8 | 180.5 | -0.1 |
| 37.0 | 237 | 3122 | 1 | 34.9 | 187.1 | -0.2 |
| 38.0 | 274 | 3313 | 1 | 38.3 | 193.8 | -0.2 |
| 39.0 | 314 | 3510 | 1 | 41.7 | 200.6 | -0.1 |
| 40.0 | 357 | 3714 | 1 | 45.2 | 207.5 | 0.0 |
| 41.0 | 404 | 3925 | 1 | 48.7 | 214.5 | 0.0 |
| 42.0 | 454 | 4143 | 1 | 52.3 | 221.7 | 0.0 |
| 43.0 | 508 | 4368 | 1 | 56.0 | 228.9 | -0.1 |
| 44.0 | 566 | 4601 | 1 | 59.7 | 236.2 | -0.2 |
| 45.0 | 627 | 4841 | 1 | 63.6 | 243.6 | -0.3 |
| 46.0 | 693 | 5088 | 0 | 67.7 | 251.1 | -0.5 |
| 47.0 | 763 | 5343 | 0 | 72.0 | 258.7 | -0.8 |
| 48.0 | 837 | 5606 | -0 | 76.3 | 266.3 | -1.2 |
| 49.0 | 915 | 5876 | -2 | 80.8 | 274.0 | -1.7 |
| 50.0 | 998 | 6154 | -4 | 85.3 | 281.8 | -2.2 |
| 51.0 | 1085 | 6440 | -6 | 90.0 | 289.6 | -2.6 |
| 52.0 | 1178 | 6733 | -9 | 94.9 | 297.4 | -2.9 |
| 53.0 | 1275 | 7034 | -12 | 100.1 | 305.0 | -3.0 |
| | MACH ØNE | | | | | |
| 53.208 | 1296 | 7098 | -12 | 101.2 | 306.5 | -3.0 |
| 54.0 | 1378 | 7343 | -15 | 105.4 | 312.4 | -3.1 |
| 55.0 | 1486 | 7659 | -18 | 110.8 | 319.8 | -3.1 |
| 56.0 | 1599 | 7983 | -21 | 116.4 | 327.0 | -3.0 |
| 57.0 | 1718 | 8313 | -24 | 122.0 | 334.3 | -3.0 |
| 58.0 | 1843 | 8651 | -27 | 127.8 | 341.7 | -3.0 |
| 59.0 | 1973 | 8997 | -30 | 133.7 | 349.3 | -2.9 |
| 60.0 | 2110 | 9350 | -32 | 139.9 | 357.1 | -2.7 |
| 61.0 | 2253 | 9711 | -35 | 146.5 | 365.0 | -2.6 |
| 62.0 | 2403 | 10080 | -38 | 153.3 | 373.1 | -2.7 |
| 63.0 | 2559 | 10458 | -40 | 160.5 | 381.4 | -3.1 |
| 64.0 | 2723 | 10843 | -44 | 168.0 | 389.9 | -3.8 |
| 65.0 | 2895 | 11238 | -48 | 175.6 | 398.6 | -4.5 |

TABLE IX

EARTH-FIXED PLUMBLINE POSITIONS AND VELOCITIES

| TIME SEC | XE M | YE M | ZE M | DXE M/S | DYE M/S | DZE M/S |
|---|---|---|---|---|---|---|
| | MAXIMUM DYNAMIC PRESSURE | | | | | |
| 66.000 | 3074 | 11641 | -53 | 183.4 | 407.6 | -5.2 |
| 67.0 | 3261 | 12053 | -58 | 191.3 | 416.8 | -5.7 |
| 68.0 | 3457 | 12475 | -64 | 199.4 | 426.2 | -6.1 |
| 69.0 | 3660 | 12906 | -70 | 207.8 | 435.9 | -6.6 |
| 70.0 | 3872 | 13347 | -77 | 216.6 | 445.7 | -7.1 |
| 71.0 | 4093 | 13797 | -85 | 225.6 | 455.6 | -7.6 |
| 72.0 | 4323 | 14258 | -92 | 235.0 | 465.8 | -7.9 |
| 73.0 | 4563 | 14729 | -100 | 244.8 | 476.2 | -8.0 |
| 74.0 | 4812 | 15211 | -108 | 254.8 | 486.8 | -7.9 |
| 75.0 | 5072 | 15703 | -116 | 265.1 | 497.6 | -7.9 |
| 76.0 | 5342 | 16206 | -124 | 275.8 | 508.6 | -7.8 |
| 77.0 | 5623 | 16721 | -132 | 286.7 | 519.9 | -7.7 |
| 78.0 | 5916 | 17246 | -139 | 297.9 | 531.4 | -7.6 |
| 79.0 | 6219 | 17784 | -147 | 309.5 | 543.2 | -7.4 |
| 80.0 | 6534 | 18333 | -154 | 321.4 | 555.2 | -7.2 |
| 81.0 | 6862 | 18894 | -161 | 333.8 | 567.4 | -7.0 |
| 82.0 | 7202 | 19468 | -168 | 346.6 | 579.8 | -6.7 |
| 83.0 | 7555 | 20054 | -174 | 359.9 | 592.3 | -6.5 |
| 84.0 | 7921 | 20653 | -181 | 373.6 | 605.1 | -6.2 |
| 85.0 | 8302 | 21265 | -187 | 387.8 | 618.0 | -6.0 |
| 86.0 | 8697 | 21889 | -193 | 402.5 | 631.0 | -5.7 |
| 87.0 | 9107 | 22527 | -198 | 417.6 | 644.2 | -5.5 |
| 88.0 | 9532 | 23178 | -204 | 433.2 | 657.6 | -5.3 |
| 89.0 | 9973 | 23842 | -209 | 449.3 | 671.0 | -5.2 |
| 90.0 | 10431 | 24520 | -214 | 465.9 | 684.6 | -5.1 |
| 91.0 | 10905 | 25212 | -219 | 483.1 | 698.2 | -4.9 |
| 92.0 | 11397 | 25917 | -224 | 500.7 | 712.0 | -4.8 |
| 93.0 | 11906 | 26636 | -229 | 518.9 | 725.8 | -4.7 |
| 94.0 | 12435 | 27368 | -234 | 537.6 | 739.8 | -4.5 |
| 95.0 | 12983 | 28113 | -239 | 556.8 | 753.8 | -4.3 |
| 96.0 | 13551 | 28872 | -244 | 576.4 | 768.0 | -4.1 |
| 97.0 | 14138 | 29645 | -249 | 596.6 | 782.3 | -4.0 |
| 98.0 | 14745 | 30435 | -253 | 617.1 | 796.7 | -3.8 |
| 99.0 | 15373 | 31239 | -256 | 638.2 | 811.2 | -3.7 |
| 100.0 | 16022 | 32058 | -260 | 659.7 | 825.8 | -3.6 |
| 101.0 | 16692 | 32891 | -264 | 681.7 | 840.6 | -3.5 |

TABLE IX

EARTH-FIXED PLUMBLINE PØSITIØNS AND VELØCITIES

| TIME SEC | XE M | YE M | ZE M | DXE M/S | DYE M/S | DZE M/S |
|---|---|---|---|---|---|---|
| 102.0 | 17385 | 33739 | -267 | 704.3 | 855.5 | -3.3 |
| 103.0 | 18101 | 34602 | -270 | 727.3 | 870.5 | -3.1 |
| 104.0 | 18840 | 35481 | -273 | 750.8 | 885.6 | -2.9 |
| 105.0 | 19602 | 36374 | -276 | 774.7 | 900.9 | -2.8 |
| 106.0 | 20389 | 37283 | -279 | 799.1 | 916.4 | -2.7 |
| 107.0 | 21201 | 38207 | -281 | 824.0 | 932.1 | -2.5 |
| 108.0 | 22037 | 39147 | -284 | 849.4 | 948.0 | -2.3 |
| 109.0 | 22900 | 40104 | -286 | 875.2 | 964.1 | -2.1 |
| 110.0 | 23788 | 41076 | -288 | 901.5 | 980.4 | -1.9 |
| 111.0 | 24703 | 42065 | -290 | 928.3 | 997.0 | -1.7 |
| 112.0 | 25645 | 43070 | -291 | 955.5 | 1013.8 | -1.5 |
| 113.0 | 26614 | 44093 | -293 | 983.2 | 1030.7 | -1.3 |
| 114.0 | 27611 | 45132 | -294 | 1011.5 | 1048.0 | -1.1 |
| 115.0 | 28637 | 46189 | -295 | 1040.2 | 1065.5 | -0.9 |
| 116.0 | 29692 | 47264 | -296 | 1069.4 | 1083.3 | -0.7 |
| 117.0 | 30776 | 48356 | -296 | 1099.2 | 1101.4 | -0.5 |
| 118.0 | 31890 | 49467 | -297 | 1129.4 | 1119.9 | -0.2 |
| 119.0 | 33035 | 50596 | -297 | 1160.1 | 1138.7 | 0.0 |
| 120.0 | 34211 | 51745 | -297 | 1191.3 | 1157.8 | 0.3 |
| 121.0 | 35418 | 52912 | -296 | 1223.0 | 1177.3 | 0.6 |
| 122.0 | 36657 | 54100 | -295 | 1255.3 | 1197.2 | 0.9 |
| 123.0 | 37929 | 55307 | -294 | 1288.2 | 1217.4 | 1.2 |
| 124.0 | 39234 | 56535 | -293 | 1321.6 | 1238.1 | 1.5 |
| 125.0 | 40572 | 57784 | -291 | 1355.6 | 1259.2 | 1.8 |
| 126.0 | 41945 | 59054 | -289 | 1390.1 | 1280.7 | 2.1 |
| 127.0 | 43353 | 60345 | -287 | 1425.4 | 1302.6 | 2.4 |
| 128.0 | 44796 | 61659 | -285 | 1461.2 | 1325.1 | 2.7 |
| 129.0 | 46276 | 62996 | -282 | 1497.7 | 1348.0 | 3.0 |
| 130.0 | 47792 | 64356 | -279 | 1534.9 | 1371.4 | 3.4 |
| 131.0 | 49346 | 65739 | -275 | 1572.8 | 1395.2 | 3.8 |
| 132.0 | 50938 | 67147 | -271 | 1611.5 | 1419.6 | 4.2 |
| 133.0 | 52569 | 68579 | -267 | 1650.9 | 1444.4 | 4.5 |
| 134.0 | 54241 | 70036 | -262 | 1691.3 | 1469.7 | 4.9 |
| 135.0 | 55954 | 71519 | -257 | 1732.6 | 1495.4 | 5.4 |
| 136.0 | 57708 | 73027 | -251 | 1774.7 | 1521.5 | 5.9 |
| 137.0 | 59506 | 74562 | -244 | 1818.0 | 1548.0 | 6.3 |
| 138.0 | 61347 | 76124 | -238 | 1862.3 | 1574.9 | 6.8 |
| 139.0 | 63233 | 77712 | -230 | 1907.8 | 1602.2 | 7.2 |
| 140.0 | 65165 | 79329 | -223 | 1954.2 | 1630.2 | 7.7 |
| | IECØ | | | | | |
| 140.220 | 65596 | 79690 | -222 | 1964.6 | 1636.5 | 7.7 |

TABLE IX

EARTH-FIXED PLUMBLINE PØSITIØNS AND VELØCITIES

| TIME SEC | XE M | YE M | ZE M | DXE M/S | DYE M/S | DZE M/S |
|---|---|---|---|---|---|---|
| 141.0 | 67141 | 80971 | -215 | 1989.7 | 1649.5 | 8.1 |
| 142.0 | 69143 | 82626 | -206 | 2014.1 | 1659.9 | 8.5 |
| 143.0 | 71170 | 84292 | -198 | 2037.8 | 1669.8 | 8.8 |
| 144.0 | 73220 | 85967 | -189 | 2061.5 | 1679.7 | 9.1 |
| 145.0 | 75294 | 87652 | -180 | 2085.3 | 1689.7 | 9.5 |
| | ØECØ | | | | | |
| 145.560 | 76462 | 88601 | -177 | 2098.5 | 1695.3 | 9.5 |
| 146.0 | 77391 | 89346 | -170 | 2102.9 | 1694.8 | 9.9 |
| 147.0 | 79495 | 91038 | -160 | 2104.2 | 1686.9 | 10.1 |
| 148.0 | 81599 | 92721 | -151 | 2104.8 | 1678.2 | 10.3 |
| | S-IV ENGINE START | | | | | |
| 148.120 | 81847 | 92923 | -152 | 2104.8 | 1677.4 | 10.1 |
| 149.0 | 83704 | 94395 | -140 | 2105.2 | 1669.7 | 10.5 |
| 150.0 | 85810 | 96061 | -130 | 2106.5 | 1661.7 | 10.7 |
| 155.0 | 96402 | 104308 | -76 | 2130.5 | 1636.1 | 11.8 |
| 160.0 | 107117 | 112424 | -14 | 2155.0 | 1611.2 | 12.9 |
| | GUIDANCE INITIATIØN | | | | | |
| 163.860 | 115473 | 118607 | 36 | 2174.3 | 1592.5 | 13.7 |
| 165.0 | 117955 | 120419 | 52 | 2180.0 | 1587.0 | 14.0 |
| 170.0 | 128917 | 128295 | 127 | 2204.7 | 1563.7 | 16.8 |
| 175.0 | 140001 | 136057 | 226 | 2228.8 | 1541.1 | 22.7 |
| 180.0 | 151206 | 143705 | 353 | 2253.5 | 1518.3 | 28.2 |
| 185.0 | 162537 | 151239 | 507 | 2279.0 | 1495.0 | 33.0 |
| 190.0 | 173996 | 158656 | 682 | 2304.9 | 1471.7 | 37.1 |
| 195.0 | 185587 | 165956 | 877 | 2331.3 | 1448.4 | 40.7 |
| 200.0 | 197310 | 173141 | 1088 | 2358.1 | 1425.3 | 43.8 |
| 205.0 | 209168 | 180209 | 1314 | 2385.4 | 1402.1 | 46.4 |
| 210.0 | 221164 | 187162 | 1552 | 2413.0 | 1378.9 | 48.8 |
| 215.0 | 233299 | 193998 | 1801 | 2441.1 | 1355.5 | 50.8 |
| 220.0 | 245576 | 200717 | 2059 | 2469.6 | 1332.2 | 52.5 |
| 225.0 | 257996 | 207320 | 2325 | 2498.6 | 1308.9 | 54.0 |

TABLE IX

EARTH-FIXED PLUMBLINE PØSITIØNS AND VELØCITIES

| TIME SEC | XE M | YE M | ZE M | DXE M/S | DYE M/S | DZE M/S |
|---|---|---|---|---|---|---|
| 230.0 | 270563 | 213806 | 2599 | 2528.2 | 1285.3 | 55.4 |
| 235.0 | 283279 | 220173 | 2878 | 2558.2 | 1261.7 | 56.5 |
| 240.0 | 296146 | 226422 | 3164 | 2588.7 | 1237.9 | 57.6 |
| 245.0 | 309166 | 232552 | 3454 | 2619.5 | 1214.0 | 58.6 |
| 250.0 | 322342 | 238563 | 3749 | 2650.7 | 1190.0 | 59.5 |
| 255.0 | 335674 | 244453 | 4049 | 2682.4 | 1165.9 | 60.4 |
| 260.0 | 349166 | 250221 | 4353 | 2714.6 | 1141.5 | 61.2 |
| 265.0 | 362820 | 255868 | 4661 | 2747.1 | 1117.0 | 62.1 |
| 270.0 | 376638 | 261392 | 4974 | 2780.2 | 1092.4 | 63.0 |
| 275.0 | 390623 | 266792 | 5291 | 2813.8 | 1067.5 | 63.9 |
| 280.0 | 404777 | 272067 | 5613 | 2847.7 | 1042.6 | 64.8 |
| 285.0 | 419101 | 277217 | 5940 | 2882.2 | 1017.4 | 65.8 |
| 290.0 | 433599 | 282241 | 6271 | 2917.2 | 992.0 | 66.8 |
| 295.0 | 448274 | 287137 | 6608 | 2952.6 | 966.4 | 67.9 |
| 300.0 | 463127 | 291904 | 6951 | 2988.7 | 940.6 | 69.1 |
| 305.0 | 478161 | 296543 | 7299 | 3025.2 | 914.7 | 70.3 |
| 310.0 | 493380 | 301050 | 7654 | 3062.3 | 888.4 | 71.5 |
| 315.0 | 508785 | 305426 | 8015 | 3099.9 | 861.9 | 72.8 |
| 320.0 | 524380 | 309669 | 8382 | 3138.2 | 835.3 | 74.2 |
| 325.0 | 540168 | 313778 | 8757 | 3177.1 | 808.4 | 75.7 |
| 330.0 | 556152 | 317752 | 9139 | 3216.4 | 781.1 | 77.2 |
| 335.0 | 572333 | 321589 | 9529 | 3256.4 | 753.6 | 78.8 |
| 340.0 | 588716 | 325287 | 9927 | 3296.9 | 725.7 | 80.4 |
| 345.0 | 605304 | 328846 | 10333 | 3338.0 | 697.6 | 82.0 |
| 350.0 | 622098 | 332262 | 10747 | 3379.7 | 669.1 | 83.7 |
| 355.0 | 639102 | 335536 | 11170 | 3422.1 | 640.1 | 85.5 |
| 360.0 | 656320 | 338663 | 11602 | 3465.1 | 610.9 | 87.2 |
| 365.0 | 673754 | 341644 | 12042 | 3508.5 | 581.3 | 89.0 |
| 370.0 | 691406 | 344476 | 12492 | 3552.6 | 551.3 | 90.9 |
| 375.0 | 709281 | 347156 | 12952 | 3597.4 | 520.8 | 92.8 |
| 380.0 | 727381 | 349683 | 13420 | 3642.8 | 489.8 | 94.7 |
| 385.0 | 745710 | 352053 | 13899 | 3688.8 | 458.4 | 96.8 |
| 390.0 | 764270 | 354266 | 14388 | 3735.6 | 426.6 | 98.7 |
| 395.0 | 783067 | 356319 | 14886 | 3783.0 | 394.3 | 100.8 |
| 400.0 | 802101 | 358209 | 15395 | 3831.1 | 361.6 | 102.8 |
| 405.0 | 821379 | 359934 | 15915 | 3880.0 | 328.4 | 104.9 |
| 410.0 | 840903 | 361491 | 16445 | 3929.5 | 294.6 | 107.0 |
| 415.0 | 860676 | 362879 | 16985 | 3979.9 | 260.3 | 109.2 |
| 420.0 | 880703 | 364092 | 17537 | 4030.9 | 225.2 | 111.4 |
| 425.0 | 900987 | 365130 | 18099 | 4082.8 | 189.7 | 113.6 |

TABLE IX

EARTH-FIXED PLUMBLINE PØSITIØNS AND VELØCITIES

| TIME SEC | XE M | YE M | ZE M | DXE M/S | DYE M/S | DZE M/S |
|---|---|---|---|---|---|---|
| 430.0 | 921532 | 365988 | 18673 | 4135.4 | 153.6 | 115.8 |
| 435.0 | 942343 | 366664 | 19257 | 4188.9 | 116.8 | 118.1 |
| 440.0 | 963423 | 367154 | 19854 | 4243.1 | 79.4 | 120.4 |
| 445.0 | 984775 | 367460 | 20462 | 4298.1 | 41.2 | 122.8 |
| 450.0 | 1006405 | 367569 | 21082 | 4353.8 | 2.4 | 125.2 |
| 455.0 | 1028315 | 367483 | 21714 | 4410.3 | -37.3 | 127.6 |
| 460.0 | 1050510 | 367195 | 22357 | 4467.6 | -77.8 | 130.0 |
| 465.0 | 1072993 | 366704 | 23014 | 4525.9 | -119.0 | 132.5 |
| 470.0 | 1095770 | 366003 | 23682 | 4584.9 | -161.2 | 134.9 |
| 475.0 | 1118844 | 365090 | 24363 | 4644.9 | -204.2 | 137.4 |
| 480.0 | 1142220 | 363960 | 25056 | 4705.8 | -248.0 | 139.9 |
| 485.0 | 1165904 | 362609 | 25762 | 4767.8 | -292.8 | 142.5 |
| 490.0 | 1189900 | 361031 | 26481 | 4830.7 | -338.5 | 145.1 |
| 495.0 | 1214213 | 359222 | 27213 | 4894.7 | -385.3 | 147.8 |
| 500.0 | 1238849 | 357177 | 27959 | 4959.6 | -433.0 | 150.4 |
| 505.0 | 1263812 | 354891 | 28718 | 5025.7 | -481.8 | 153.1 |
| 510.0 | 1289108 | 352358 | 29490 | 5092.8 | -531.6 | 155.9 |
| 515.0 | 1314742 | 349573 | 30276 | 5160.9 | -582.7 | 158.6 |
| 520.0 | 1340720 | 346529 | 31076 | 5230.3 | -635.0 | 161.4 |
| 525.0 | 1367047 | 343221 | 31890 | 5300.8 | -688.5 | 164.3 |
| 530.0 | 1393730 | 339642 | 32719 | 5372.5 | -743.3 | 167.1 |
| 535.0 | 1420775 | 335786 | 33562 | 5445.5 | -799.4 | 170.0 |
| 540.0 | 1448187 | 331645 | 34419 | 5519.7 | -857.1 | 173.0 |
| 545.0 | 1475974 | 327212 | 35291 | 5595.1 | -916.2 | 175.9 |
| 550.0 | 1504140 | 322480 | 36178 | 5671.8 | -976.9 | 178.9 |
| 555.0 | 1532694 | 317441 | 37080 | 5750.0 | -1039.2 | 182.0 |
| 560.0 | 1561642 | 312085 | 37998 | 5829.4 | -1103.4 | 185.0 |
| 565.0 | 1590992 | 306405 | 38931 | 5910.6 | -1169.1 | 188.1 |
| 570.0 | 1620751 | 300391 | 39879 | 5993.3 | -1236.7 | 191.2 |
| 575.0 | 1650927 | 294034 | 40843 | 6077.4 | -1306.4 | 194.3 |
| 580.0 | 1681529 | 287323 | 41822 | 6163.4 | -1378.1 | 197.5 |
| 585.0 | 1712564 | 280249 | 42818 | 6251.1 | -1452.1 | 200.7 |
| 590.0 | 1744042 | 272799 | 43830 | 6340.3 | -1528.3 | 204.0 |
| 595.0 | 1775971 | 264962 | 44858 | 6431.2 | -1607.1 | 207.4 |
| 600.0 | 1808358 | 256725 | 45904 | 6523.9 | -1688.1 | 210.7 |
| 605.0 | 1841213 | 248076 | 46966 | 6618.5 | -1771.7 | 214.1 |
| 610.0 | 1874546 | 239002 | 48045 | 6715.0 | -1858.4 | 217.6 |
| 615.0 | 1908366 | 229487 | 49141 | 6813.5 | -1948.1 | 221.0 |
| 620.0 | 1942682 | 219514 | 50255 | 6914.4 | -2040.9 | 224.5 |
| | S-IV CUTØFF | | | | | |
| 621.659 | 1954180 | 216102 | 50628 | 6948.5 | -2072.6 | 225.6 |

TABLE IX

EARTH-FIXED PLUMBLINE PØSITIØNS AND VELØCITIES

| TIME SEC | XE M | YE M | ZE M | DXE M/S | DYE M/S | DZE M/S |
|---|---|---|---|---|---|---|
| 625.0 | 1977393 | 209132 | 51384 | 6944.1 | -2098.1 | 226.7 |
| 630.0 | 2012087 | 198552 | 52523 | 6933.3 | -2134.1 | 228.5 |
| | INSERTIØN | | | | | |
| 631.659 | 2023586 | 195002 | 52902 | 6929.6 | -2146.0 | 229.1 |

TABLE X

SPACE-FIXED EPHEMERIS PØSITIØNS AND VELØCITIES

| TIME SEC | XSP KM | YSP KM | ZSP KM | DXSP M/S | DYSP M/S | DZSP M/S |
|---|---|---|---|---|---|---|
| | FIRST MØTIØN | | | | | |
| 0.080 | 1458.554 | -5414.860 | 3028.450 | 394.9 | 106.4 | 0. |
| | LIFTØFF SIGNAL | | | | | |
| 0.280 | 1458.632 | -5414.838 | 3028.450 | 395.0 | 105.8 | 0.3 |
| 1.0 | 1458.917 | -5414.763 | 3028.450 | 395.6 | 103.7 | 1.6 |
| 2.0 | 1459.313 | -5414.661 | 3028.453 | 396.4 | 100.7 | 3.3 |
| 3.0 | 1459.710 | -5414.561 | 3028.457 | 397.2 | 97.6 | 5.1 |
| 4.0 | 1460.107 | -5414.465 | 3028.463 | 397.9 | 94.4 | 6.9 |
| 5.0 | 1460.506 | -5414.373 | 3028.471 | 398.7 | 91.1 | 8.7 |
| 6.0 | 1460.905 | -5414.283 | 3028.480 | 399.6 | 87.8 | 10.6 |
| 7.0 | 1461.305 | -5414.197 | 3028.492 | 400.4 | 84.4 | 12.6 |
| 8.0 | 1461.706 | -5414.114 | 3028.506 | 401.3 | 81.0 | 14.6 |
| 9.0 | 1462.107 | -5414.035 | 3028.521 | 402.2 | 77.5 | 16.6 |
| 10.0 | 1462.510 | -5413.959 | 3028.539 | 403.1 | 73.9 | 18.7 |
| 11.0 | 1462.913 | -5413.887 | 3028.559 | 404.1 | 70.3 | 20.8 |
| 12.0 | 1463.318 | -5413.819 | 3028.581 | 405.1 | 66.5 | 23.0 |
| 13.0 | 1463.723 | -5413.754 | 3028.605 | 406.2 | 62.7 | 25.1 |
| 14.0 | 1464.130 | -5413.693 | 3028.631 | 407.3 | 58.8 | 27.3 |
| 15.0 | 1464.538 | -5413.636 | 3028.659 | 408.4 | 54.8 | 29.5 |
| 16.0 | 1464.947 | -5413.584 | 3028.690 | 409.7 | 50.7 | 31.8 |
| 17.0 | 1465.357 | -5413.535 | 3028.723 | 411.0 | 46.6 | 34.0 |
| 18.0 | 1465.768 | -5413.491 | 3028.758 | 412.5 | 42.4 | 36.3 |
| 19.0 | 1466.182 | -5413.450 | 3028.796 | 414.1 | 38.1 | 38.6 |
| 20.0 | 1466.596 | -5413.414 | 3028.835 | 415.8 | 33.8 | 40.9 |
| 21.0 | 1467.013 | -5413.383 | 3028.877 | 417.7 | 29.4 | 43.2 |
| 22.0 | 1467.432 | -5413.355 | 3028.922 | 419.7 | 25.0 | 45.5 |
| 23.0 | 1467.852 | -5413.333 | 3028.968 | 421.9 | 20.6 | 47.8 |
| 24.0 | 1468.275 | -5413.314 | 3029.017 | 424.3 | 16.1 | 50.2 |
| 25.0 | 1468.701 | -5413.300 | 3029.069 | 426.9 | 11.7 | 52.5 |
| 26.0 | 1469.129 | -5413.291 | 3029.122 | 429.7 | 7.1 | 54.9 |
| 27.0 | 1469.560 | -5413.286 | 3029.179 | 432.7 | 2.5 | 57.2 |
| 28.0 | 1469.994 | -5413.286 | 3029.237 | 435.9 | -2.1 | 59.6 |
| 29.0 | 1470.432 | -5413.290 | 3029.298 | 439.3 | -6.8 | 61.9 |
| 30.0 | 1470.873 | -5413.300 | 3029.361 | 442.8 | -11.6 | 64.3 |

TABLE X

SPACE-FIXED EPHEMERIS PØSITIØNS AND VELØCITIES

| TIME SEC | XSP KM | YSP KM | ZSP KM | DXSP M/S | DYSP M/S | DZSP M/S |
|---|---|---|---|---|---|---|
| 31.0 | 1471.317 | -5413.314 | 3029.426 | 446.5 | -16.5 | 66.7 |
| 32.0 | 1471.766 | -5413.333 | 3029.494 | 450.4 | -21.3 | 69.1 |
| 33.0 | 1472.218 | -5413.357 | 3029.565 | 454.4 | -26.2 | 71.5 |
| 34.0 | 1472.674 | -5413.385 | 3029.637 | 458.5 | -31.2 | 74.0 |
| 35.0 | 1473.134 | -5413.419 | 3029.713 | 462.7 | -36.2 | 76.5 |
| 36.0 | 1473.599 | -5413.458 | 3029.790 | 467.1 | -41.2 | 79.1 |
| 37.0 | 1474.068 | -5413.502 | 3029.871 | 471.7 | -46.3 | 81.6 |
| 38.0 | 1474.542 | -5413.551 | 3029.954 | 476.4 | -51.6 | 84.0 |
| 39.0 | 1475.021 | -5413.605 | 3030.039 | 481.3 | -56.8 | 86.4 |
| 40.0 | 1475.505 | -5413.664 | 3030.126 | 486.3 | -62.2 | 88.8 |
| 41.0 | 1475.994 | -5413.729 | 3030.217 | 491.3 | -67.7 | 91.3 |
| 42.0 | 1476.487 | -5413.800 | 3030.309 | 496.5 | -73.2 | 94.0 |
| 43.0 | 1476.986 | -5413.876 | 3030.405 | 501.7 | -78.7 | 96.7 |
| 44.0 | 1477.490 | -5413.957 | 3030.503 | 507.0 | -84.3 | 99.4 |
| 45.0 | 1478.000 | -5414.044 | 3030.603 | 512.6 | -89.9 | 102.2 |
| 46.0 | 1478.515 | -5414.137 | 3030.707 | 518.3 | -95.6 | 105.0 |
| 47.0 | 1479.036 | -5414.236 | 3030.813 | 524.2 | -101.2 | 107.8 |
| 48.0 | 1479.563 | -5414.340 | 3030.923 | 530.2 | -106.9 | 110.8 |
| 49.0 | 1480.096 | -5414.449 | 3031.035 | 536.4 | -112.5 | 113.9 |
| 50.0 | 1480.636 | -5414.565 | 3031.151 | 542.7 | -118.2 | 117.0 |
| 51.0 | 1481.182 | -5414.686 | 3031.269 | 549.1 | -123.9 | 120.1 |
| 52.0 | 1481.734 | -5414.813 | 3031.391 | 555.7 | -129.6 | 122.9 |
| 53.0 | 1482.293 | -5414.945 | 3031.515 | 562.4 | -135.2 | 125.5 |
| | MACH ØNE | | | | | |
| 53.208 | 1482.410 | -5414.974 | 3031.541 | 563.9 | -136.4 | 126.0 |
| 54.0 | 1482.858 | -5415.083 | 3031.642 | 569.3 | -140.8 | 127.9 |
| 55.0 | 1483.431 | -5415.227 | 3031.771 | 576.3 | -146.2 | 130.1 |
| 56.0 | 1484.011 | -5415.376 | 3031.902 | 583.4 | -151.5 | 132.3 |
| 57.0 | 1484.597 | -5415.530 | 3032.036 | 590.5 | -156.9 | 134.5 |
| 58.0 | 1485.192 | -5415.690 | 3032.171 | 597.8 | -162.4 | 136.7 |
| 59.0 | 1485.793 | -5415.855 | 3032.309 | 605.3 | -168.0 | 138.9 |
| 60.0 | 1486.402 | -5416.026 | 3032.449 | 613.1 | -173.7 | 141.0 |
| 61.0 | 1487.019 | -5416.203 | 3032.591 | 621.3 | -179.6 | 143.2 |
| 62.0 | 1487.644 | -5416.385 | 3032.736 | 629.9 | -185.4 | 145.6 |
| 63.0 | 1488.279 | -5416.574 | 3032.883 | 638.8 | -191.1 | 148.3 |
| 64.0 | 1488.922 | -5416.768 | 3033.032 | 648.1 | -196.9 | 151.3 |
| 65.0 | 1489.575 | -5416.968 | 3033.185 | 657.6 | -202.8 | 154.3 |

TABLE X

SPACE-FIXED EPHEMERIS PØSITIØNS AND VELØCITIES

| TIME SEC | XSP KM | YSP KM | ZSP KM | DXSP M/S | DYSP M/S | DZSP M/S |
|---|---|---|---|---|---|---|
| | MAXIMUM DYNAMIC PRESSURE | | | | | |
| 66.000 | 1490.237 | -5417.173 | 3033.341 | 667.3 | -208.9 | 157.4 |
| 67.0 | 1490.909 | -5417.386 | 3033.500 | 677.2 | -215.3 | 160.4 |
| 68.0 | 1491.591 | -5417.604 | 3033.662 | 687.3 | -221.9 | 163.4 |
| 69.0 | 1492.283 | -5417.830 | 3033.827 | 697.8 | -228.6 | 166.5 |
| 70.0 | 1492.986 | -5418.062 | 3033.995 | 708.5 | -235.4 | 169.6 |
| 71.0 | 1493.700 | -5418.301 | 3034.167 | 719.7 | -242.3 | 172.7 |
| 72.0 | 1494.425 | -5418.547 | 3034.341 | 731.2 | -249.4 | 175.7 |
| 73.0 | 1495.162 | -5418.800 | 3034.518 | 743.1 | -256.7 | 178.6 |
| 74.0 | 1495.911 | -5419.061 | 3034.698 | 755.3 | -264.2 | 181.3 |
| 75.0 | 1496.673 | -5419.329 | 3034.881 | 767.8 | -271.9 | 184.1 |
| 76.0 | 1497.447 | -5419.605 | 3035.066 | 780.7 | -279.8 | 186.9 |
| 77.0 | 1498.234 | -5419.889 | 3035.255 | 793.9 | -287.8 | 189.7 |
| 78.0 | 1499.034 | -5420.181 | 3035.446 | 807.4 | -296.0 | 192.5 |
| 79.0 | 1499.848 | -5420.481 | 3035.640 | 821.4 | -304.4 | 195.4 |
| 80.0 | 1500.677 | -5420.790 | 3035.837 | 835.7 | -312.9 | 198.2 |
| 81.0 | 1501.520 | -5421.107 | 3036.036 | 850.5 | -321.6 | 201.0 |
| 82.0 | 1502.378 | -5421.433 | 3036.239 | 865.7 | -330.3 | 203.8 |
| 83.0 | 1503.251 | -5421.768 | 3036.444 | 881.5 | -339.2 | 206.6 |
| 84.0 | 1504.141 | -5422.112 | 3036.652 | 897.7 | -348.1 | 209.3 |
| 85.0 | 1505.047 | -5422.465 | 3036.863 | 914.5 | -357.1 | 212.0 |
| 86.0 | 1505.970 | -5422.826 | 3037.076 | 931.7 | -366.1 | 214.7 |
| 87.0 | 1506.910 | -5423.197 | 3037.293 | 949.4 | -375.2 | 217.4 |
| 88.0 | 1507.868 | -5423.577 | 3037.511 | 967.6 | -384.4 | 220.1 |
| 89.0 | 1508.845 | -5423.966 | 3037.733 | 986.3 | -393.5 | 222.7 |
| 90.0 | 1509.841 | -5424.364 | 3037.957 | 1005.6 | -402.6 | 225.3 |
| 91.0 | 1510.856 | -5424.772 | 3038.184 | 1025.3 | -411.8 | 227.8 |
| 92.0 | 1511.892 | -5425.188 | 3038.413 | 1045.6 | -420.9 | 230.3 |
| 93.0 | 1512.948 | -5425.614 | 3038.644 | 1066.4 | -430.1 | 232.7 |
| 94.0 | 1514.025 | -5426.047 | 3038.878 | 1087.8 | -439.3 | 234.9 |
| 95.0 | 1515.124 | -5426.489 | 3039.114 | 1109.6 | -448.5 | 237.1 |
| 96.0 | 1516.246 | -5426.940 | 3039.351 | 1131.9 | -457.7 | 239.3 |
| 97.0 | 1517.390 | -5427.400 | 3039.591 | 1154.7 | -466.9 | 241.4 |
| 98.0 | 1518.556 | -5427.872 | 3039.834 | 1178.0 | -476.2 | 243.5 |
| 99.0 | 1519.746 | -5428.353 | 3040.078 | 1201.7 | -485.5 | 245.5 |
| 100.0 | 1520.960 | -5428.843 | 3040.325 | 1226.0 | -494.8 | 247.5 |
| 101.0 | 1522.198 | -5429.343 | 3040.574 | 1250.8 | -504.1 | 249.4 |

TABLE X

SPACE-FIXED EPHEMERIS PØSITIØNS AND VELØCITIES

| TIME SEC | XSP KM | YSP KM | ZSP KM | DXSP M/S | DYSP M/S | DZSP M/S |
|---|---|---|---|---|---|---|
| 102.0 | 1523.461 | -5429.852 | 3040.824 | 1276.0 | -513.5 | 251.3 |
| 103.0 | 1524.750 | -5430.370 | 3041.076 | 1301.8 | -523.0 | 253.1 |
| 104.0 | 1526.065 | -5430.898 | 3041.330 | 1328.1 | -532.5 | 254.8 |
| 105.0 | 1527.406 | -5431.435 | 3041.586 | 1354.8 | -542.0 | 256.5 |
| 106.0 | 1528.775 | -5431.982 | 3041.844 | 1382.1 | -551.6 | 258.3 |
| 107.0 | 1530.171 | -5432.539 | 3042.103 | 1409.8 | -561.3 | 260.0 |
| 108.0 | 1531.594 | -5433.105 | 3042.364 | 1438.0 | -571.2 | 261.7 |
| 109.0 | 1533.047 | -5433.681 | 3042.626 | 1466.7 | -581.1 | 263.3 |
| 110.0 | 1534.528 | -5434.268 | 3042.890 | 1496.0 | -591.2 | 264.9 |
| 111.0 | 1536.039 | -5434.864 | 3043.156 | 1525.8 | -601.4 | 266.5 |
| 112.0 | 1537.580 | -5435.471 | 3043.424 | 1556.1 | -611.7 | 268.2 |
| 113.0 | 1539.151 | -5436.088 | 3043.693 | 1586.9 | -622.1 | 269.9 |
| 114.0 | 1540.754 | -5436.715 | 3043.963 | 1618.2 | -632.6 | 271.5 |
| 115.0 | 1542.388 | -5437.353 | 3044.236 | 1650.1 | -643.3 | 273.2 |
| 116.0 | 1544.055 | -5438.002 | 3044.510 | 1682.5 | -654.2 | 274.9 |
| 117.0 | 1545.754 | -5438.662 | 3044.786 | 1715.5 | -665.2 | 276.6 |
| 118.0 | 1547.486 | -5439.333 | 3045.063 | 1749.1 | -676.5 | 278.3 |
| 119.0 | 1549.252 | -5440.015 | 3045.343 | 1783.2 | -688.0 | 280.1 |
| 120.0 | 1551.052 | -5440.709 | 3045.624 | 1817.8 | -699.8 | 281.9 |
| 121.0 | 1552.888 | -5441.415 | 3045.906 | 1853.1 | -711.7 | 283.7 |
| 122.0 | 1554.759 | -5442.133 | 3046.191 | 1889.0 | -723.9 | 285.6 |
| 123.0 | 1556.666 | -5442.863 | 3046.478 | 1925.5 | -736.4 | 287.5 |
| 124.0 | 1558.610 | -5443.606 | 3046.766 | 1962.6 | -749.1 | 289.6 |
| 125.0 | 1560.592 | -5444.362 | 3047.057 | 2000.4 | -762.0 | 291.7 |
| 126.0 | 1562.612 | -5445.130 | 3047.350 | 2038.9 | -775.2 | 293.8 |
| 127.0 | 1564.670 | -5445.912 | 3047.645 | 2078.1 | -788.7 | 296.1 |
| 128.0 | 1566.769 | -5446.708 | 3047.942 | 2118.0 | -802.5 | 298.4 |
| 129.0 | 1568.907 | -5447.518 | 3048.242 | 2158.7 | -816.7 | 300.8 |
| 130.0 | 1571.087 | -5448.342 | 3048.544 | 2200.1 | -831.1 | 303.2 |
| 131.0 | 1573.308 | -5449.180 | 3048.848 | 2242.4 | -845.9 | 305.6 |
| 132.0 | 1575.572 | -5450.034 | 3049.155 | 2285.5 | -860.9 | 308.1 |
| 133.0 | 1577.880 | -5450.902 | 3049.464 | 2329.5 | -876.2 | 310.7 |
| 134.0 | 1580.232 | -5451.786 | 3049.777 | 2374.5 | -891.7 | 313.2 |
| 135.0 | 1582.630 | -5452.686 | 3050.091 | 2420.4 | -907.6 | 315.8 |
| 136.0 | 1585.075 | -5453.602 | 3050.407 | 2467.3 | -923.6 | 318.2 |
| 137.0 | 1587.567 | -5454.534 | 3050.726 | 2515.4 | -939.8 | 320.7 |
| 138.0 | 1590.108 | -5455.482 | 3051.048 | 2564.6 | -956.2 | 323.0 |
| 139.0 | 1592.699 | -5456.446 | 3051.371 | 2614.9 | -972.7 | 325.4 |
| 140.0 | 1595.341 | -5457.428 | 3051.698 | 2666.4 | -989.8 | 327.8 |
| | IECØ | | | | | |
| 140.220 | 1595.929 | -5457.647 | 3051.772 | 2677.9 | -993.6 | 328.4 |

TABLE X

SPACE-FIXED EPHEMERIS PØSITIØNS AND VELØCITIES

| TIME SEC | XSP KM | YSP KM | ZSP KM | DXSP M/S | DYSP M/S | DZSP M/S |
|---|---|---|---|---|---|---|
| 141.0 | 1598.031 | -5458.425 | 3052.026 | 2705.2 | -1000.9 | 328.6 |
| 142.0 | 1600.750 | -5459.429 | 3052.354 | 2731.4 | -1006.1 | 327.7 |
| 143.0 | 1603.495 | -5460.437 | 3052.682 | 2756.6 | -1010.9 | 326.7 |
| 144.0 | 1606.264 | -5461.451 | 3053.008 | 2781.9 | -1015.7 | 325.8 |
| 145.0 | 1609.060 | -5462.469 | 3053.333 | 2807.3 | -1020.6 | 324.8 |
| | ØECØ | | | | | |
| 145.560 | 1610.633 | -5463.042 | 3053.519 | 2821.5 | -1023.2 | 324.5 |
| 146.0 | 1611.879 | -5463.492 | 3053.658 | 2825.7 | -1022.2 | 323.0 |
| 147.0 | 1614.705 | -5464.511 | 3053.979 | 2825.1 | -1015.1 | 318.7 |
| 148.0 | 1617.529 | -5465.522 | 3054.296 | 2823.7 | -1007.4 | 314.3 |
| | S-IV ENGINE START | | | | | |
| 148.120 | 1617.865 | -5465.643 | 3054.337 | 2823.6 | -1006.5 | 314.0 |
| 149.0 | 1620.352 | -5466.526 | 3054.609 | 2822.3 | -999.8 | 309.9 |
| 150.0 | 1623.174 | -5467.523 | 3054.917 | 2821.7 | -992.6 | 305.6 |
| 155.0 | 1637.328 | -5472.421 | 3056.402 | 2839.4 | -966.2 | 287.0 |
| 160.0 | 1651.571 | -5477.184 | 3057.789 | 2857.6 | -940.3 | 268.6 |
| | GUIDANCE INITIATIØN | | | | | |
| 163.860 | 1662.630 | -5480.775 | 3058.799 | 2872.2 | -920.6 | 254.6 |
| 165.0 | 1665.907 | -5481.821 | 3059.086 | 2876.6 | -914.8 | 250.5 |
| 170.0 | 1680.336 | -5486.334 | 3060.292 | 2895.1 | -891.0 | 231.4 |
| 175.0 | 1694.856 | -5490.736 | 3061.396 | 2912.9 | -869.5 | 210.1 |
| 180.0 | 1709.466 | -5495.029 | 3062.393 | 2931.2 | -847.5 | 188.8 |
| 185.0 | 1724.169 | -5499.209 | 3063.285 | 2950.2 | -824.7 | 167.9 |
| 190.0 | 1738.969 | -5503.275 | 3064.073 | 2969.8 | -801.3 | 147.4 |
| 195.0 | 1753.868 | -5507.222 | 3064.759 | 2989.8 | -777.6 | 127.2 |
| 200.0 | 1768.867 | -5511.050 | 3065.346 | 3010.2 | -753.7 | 107.4 |
| 205.0 | 1783.971 | -5514.759 | 3065.834 | 3031.1 | -729.4 | 87.9 |
| 210.0 | 1799.179 | -5518.345 | 3066.225 | 3052.4 | -704.9 | 68.6 |
| 215.0 | 1814.495 | -5521.807 | 3066.520 | 3074.1 | -680.0 | 49.3 |
| 220.0 | 1829.921 | -5525.144 | 3066.718 | 3096.3 | -654.9 | 30.3 |
| 225.0 | 1845.458 | -5528.355 | 3066.822 | 3118.9 | -629.6 | 11.2 |

TABLE X

SPACE-FIXED EPHEMERIS PØSITIØNS AND VELØCITIES

| TIME SEC | XSP KM | YSP KM | ZSP KM | DXSP M/S | DYSP M/S | DZSP M/S |
|---|---|---|---|---|---|---|
| 230.0 | 1861.110 | -5531.439 | 3066.830 | 3142.0 | -603.9 | -7.9 |
| 235.0 | 1876.879 | -5534.393 | 3066.743 | 3165.4 | -577.9 | -27.0 |
| 240.0 | 1892.765 | -5537.218 | 3066.560 | 3189.3 | -551.7 | -46.2 |
| 245.0 | 1908.772 | -5539.910 | 3066.281 | 3213.5 | -525.3 | -65.4 |
| 250.0 | 1924.901 | -5542.470 | 3065.906 | 3238.0 | -498.6 | -84.8 |
| 255.0 | 1941.153 | -5544.896 | 3065.433 | 3262.9 | -471.7 | -104.3 |
| 260.0 | 1957.530 | -5547.187 | 3064.863 | 3288.1 | -444.5 | -124.0 |
| 265.0 | 1974.035 | -5549.341 | 3064.193 | 3313.7 | -417.2 | -143.8 |
| 270.0 | 1990.668 | -5551.358 | 3063.424 | 3339.8 | -389.6 | -163.9 |
| 275.0 | 2007.433 | -5553.237 | 3062.554 | 3366.2 | -361.7 | -184.1 |
| 280.0 | 2024.331 | -5554.975 | 3061.582 | 3392.9 | -333.7 | -204.6 |
| 285.0 | 2041.363 | -5556.573 | 3060.508 | 3420.1 | -305.4 | -225.3 |
| 290.0 | 2058.532 | -5558.029 | 3059.329 | 3447.6 | -276.8 | -246.2 |
| 295.0 | 2075.839 | -5559.341 | 3058.045 | 3475.5 | -248.0 | -267.4 |
| 300.0 | 2093.288 | -5560.509 | 3056.654 | 3503.9 | -219.0 | -288.9 |
| 305.0 | 2110.879 | -5561.530 | 3055.156 | 3532.7 | -189.7 | -310.7 |
| 310.0 | 2128.615 | -5562.405 | 3053.548 | 3561.9 | -160.0 | -332.7 |
| 315.0 | 2146.499 | -5563.131 | 3051.828 | 3591.5 | -130.1 | -355.0 |
| 320.0 | 2164.531 | -5563.706 | 3049.997 | 3621.6 | -100.1 | -377.6 |
| 325.0 | 2182.716 | -5564.130 | 3048.052 | 3652.3 | -69.6 | -400.5 |
| 330.0 | 2201.055 | -5564.402 | 3045.991 | 3683.3 | -38.8 | -423.8 |
| 335.0 | 2219.550 | -5564.518 | 3043.813 | 3714.8 | -7.6 | -447.4 |
| 340.0 | 2238.203 | -5564.478 | 3041.517 | 3746.6 | 23.9 | -471.2 |
| 345.0 | 2257.017 | -5564.279 | 3039.100 | 3779.0 | 55.7 | -495.4 |
| 350.0 | 2275.993 | -5563.920 | 3036.562 | 3811.7 | 88.0 | -519.9 |
| 355.0 | 2295.135 | -5563.398 | 3033.900 | 3845.0 | 120.7 | -544.9 |
| 360.0 | 2314.444 | -5562.712 | 3031.113 | 3878.7 | 153.9 | -570.1 |
| 365.0 | 2333.922 | -5561.859 | 3028.198 | 3912.8 | 187.4 | -595.7 |
| 370.0 | 2353.572 | -5560.838 | 3025.155 | 3947.3 | 221.3 | -621.7 |
| 375.0 | 2373.396 | -5559.645 | 3021.981 | 3982.3 | 255.9 | -648.0 |
| 380.0 | 2393.396 | -5558.278 | 3018.674 | 4017.8 | 290.8 | -674.7 |
| 385.0 | 2413.575 | -5556.735 | 3015.233 | 4053.7 | 326.4 | -701.9 |
| 390.0 | 2433.934 | -5555.013 | 3011.655 | 4090.2 | 362.4 | -729.4 |
| 395.0 | 2454.477 | -5553.111 | 3007.938 | 4127.1 | 398.9 | -757.4 |
| 400.0 | 2475.207 | -5551.024 | 3004.080 | 4164.6 | 435.9 | -785.7 |
| 405.0 | 2496.125 | -5548.750 | 3000.080 | 4202.6 | 473.5 | -814.5 |
| 410.0 | 2517.234 | -5546.288 | 2995.935 | 4241.1 | 511.8 | -843.6 |
| 415.0 | 2538.537 | -5543.632 | 2991.643 | 4280.2 | 550.5 | -873.3 |
| 420.0 | 2560.036 | -5540.781 | 2987.201 | 4319.7 | 590.1 | -903.5 |
| 425.0 | 2581.735 | -5537.730 | 2982.607 | 4359.8 | 630.2 | -934.2 |

TABLE X

SPACE-FIXED EPHEMERIS PØSITIØNS AND VELØCITIES

| TIME SEC | XSP KM | YSP KM | ZSP KM | DXSP M/S | DYSP M/S | DZSP M/S |
|---|---|---|---|---|---|---|
| 430.0 | 2603.636 | -5534.477 | 2977.858 | 4400.5 | 671.0 | -965.3 |
| 435.0 | 2625.742 | -5531.018 | 2972.953 | 4441.8 | 712.5 | -997.0 |
| 440.0 | 2648.055 | -5527.350 | 2967.888 | 4483.6 | 754.7 | -1029.1 |
| 445.0 | 2670.579 | -5523.474 | 2962.662 | 4525.8 | 797.6 | -1061.8 |
| 450.0 | 2693.315 | -5519.377 | 2957.270 | 4568.6 | 841.3 | -1095.1 |
| 455.0 | 2716.266 | -5515.059 | 2951.711 | 4611.8 | 885.8 | -1128.9 |
| 460.0 | 2739.434 | -5510.517 | 2945.980 | 4655.6 | 931.2 | -1163.4 |
| 465.0 | 2762.823 | -5505.746 | 2940.076 | 4700.0 | 977.4 | -1198.4 |
| 470.0 | 2786.435 | -5500.741 | 2933.995 | 4744.8 | 1024.6 | -1234.1 |
| 475.0 | 2810.272 | -5495.498 | 2927.735 | 4790.4 | 1072.7 | -1270.3 |
| 480.0 | 2834.339 | -5490.013 | 2921.291 | 4836.6 | 1121.6 | -1307.2 |
| 485.0 | 2858.639 | -5484.281 | 2914.661 | 4883.4 | 1171.5 | -1344.9 |
| 490.0 | 2883.175 | -5478.296 | 2907.841 | 4930.9 | 1222.5 | -1383.3 |
| 495.0 | 2907.949 | -5472.054 | 2900.827 | 4979.1 | 1274.5 | -1422.4 |
| 500.0 | 2932.966 | -5465.550 | 2893.616 | 5027.8 | 1327.5 | -1462.2 |
| 505.0 | 2958.229 | -5458.778 | 2886.204 | 5077.3 | 1381.6 | -1502.8 |
| 510.0 | 2983.740 | -5451.732 | 2878.587 | 5127.5 | 1436.9 | -1544.2 |
| 515.0 | 3009.505 | -5444.407 | 2870.760 | 5178.2 | 1493.3 | -1586.5 |
| 520.0 | 3035.525 | -5436.797 | 2862.720 | 5229.9 | 1551.1 | -1629.6 |
| 525.0 | 3061.805 | -5428.894 | 2854.463 | 5282.2 | 1610.1 | -1673.6 |
| 530.0 | 3088.348 | -5420.694 | 2845.983 | 5335.2 | 1670.4 | -1718.5 |
| 535.0 | 3115.158 | -5412.188 | 2837.276 | 5389.0 | 1732.1 | -1764.4 |
| 540.0 | 3142.240 | -5403.370 | 2828.338 | 5443.6 | 1795.3 | -1811.3 |
| 545.0 | 3169.595 | -5394.233 | 2819.162 | 5498.8 | 1860.0 | -1859.2 |
| 550.0 | 3197.229 | -5384.767 | 2809.744 | 5554.8 | 1926.3 | -1908.1 |
| 555.0 | 3225.145 | -5374.967 | 2800.079 | 5611.8 | 1994.3 | -1958.3 |
| 560.0 | 3253.348 | -5364.822 | 2790.160 | 5669.3 | 2064.0 | -2009.5 |
| 565.0 | 3281.840 | -5354.324 | 2779.981 | 5728.0 | 2135.4 | -2062.0 |
| 570.0 | 3310.629 | -5343.464 | 2769.537 | 5787.7 | 2208.7 | -2115.7 |
| 575.0 | 3339.719 | -5332.233 | 2758.822 | 5848.1 | 2284.0 | -2170.8 |
| 580.0 | 3369.113 | -5320.620 | 2747.827 | 5909.6 | 2361.5 | -2227.4 |
| 585.0 | 3398.817 | -5308.615 | 2736.546 | 5972.1 | 2441.2 | -2285.3 |
| 590.0 | 3428.835 | -5296.205 | 2724.971 | 6035.3 | 2522.9 | -2344.8 |
| 595.0 | 3459.171 | -5283.381 | 2713.094 | 6099.4 | 2607.2 | -2406.0 |
| 600.0 | 3489.831 | -5270.129 | 2700.909 | 6164.6 | 2693.8 | -2468.6 |
| 605.0 | 3520.819 | -5256.438 | 2688.406 | 6230.7 | 2782.9 | -2532.9 |
| 610.0 | 3552.140 | -5242.295 | 2675.576 | 6297.7 | 2875.0 | -2599.2 |
| 615.0 | 3583.798 | -5227.683 | 2662.411 | 6365.8 | 2970.0 | -2667.3 |
| 620.0 | 3615.798 | -5212.589 | 2648.899 | 6435.3 | 3068.1 | -2737.5 |
| | S-IV CUTØFF | | | | | |
| 621.659 | 3626.492 | -5207.471 | 2644.338 | 6458.7 | 3101.5 | -2761.4 |

TABLE X

SPACE-FIXED EPHEMERIS PØSITIØNS AND VELØCITIES

| TIME SEC | XSP KM | YSP KM | ZSP KM | DXSP M/S | DYSP M/S | DZSP M/S |
|---|---|---|---|---|---|---|
| 625.0 | 3648.053 | -5197.067 | 2635.089 | 6446.1 | 3124.6 | -2773.6 |
| 630.0 | 3680.228 | -5181.365 | 2621.180 | 6423.7 | 3156.5 | -2789.8 |
| | INSERTIØN | | | | | |
| 631.659 | 3690.879 | -5176.120 | 2616.548 | 6416.2 | 3167.0 | -2795.1 |

TABLE XI

EARTH-FIXED PLUMBLINE AND SPACE-FIXED EPHEMERIS ACCELERATIØNS

| TIME SEC | DDXE M/S SQ | DDYE M/S SQ | DDZE M/S SQ | DDXSP M/S SQ | DDYSP M/S SQ | DDZSP M/S SQ |
|---|---|---|---|---|---|---|
| | FIRST MØTIØN | | | | | |
| 0.080 | 0.08 | 3.38 | -0.16 | 0.84 | -2.78 | 1.74 |
| | LIFTØFF SIGNAL | | | | | |
| 0.280 | 0.05 | 3.42 | -0.13 | 0.82 | -2.83 | 1.73 |
| 1.0 | -0.01 | 3.53 | -0.05 | 0.78 | -2.97 | 1.73 |
| 2.0 | -0.06 | 3.65 | 0.01 | 0.75 | -3.11 | 1.75 |
| 3.0 | -0.08 | 3.75 | 0.03 | 0.75 | -3.21 | 1.78 |
| 4.0 | -0.09 | 3.83 | 0.03 | 0.76 | -3.28 | 1.83 |
| 5.0 | -0.08 | 3.90 | 0.01 | 0.78 | -3.33 | 1.88 |
| 6.0 | -0.08 | 3.98 | -0.01 | 0.81 | -3.38 | 1.93 |
| 7.0 | -0.07 | 4.05 | -0.03 | 0.84 | -3.43 | 1.97 |
| 8.0 | -0.06 | 4.13 | -0.04 | 0.87 | -3.49 | 2.02 |
| 9.0 | -0.05 | 4.21 | -0.04 | 0.90 | -3.56 | 2.06 |
| 10.0 | -0.04 | 4.30 | -0.04 | 0.93 | -3.64 | 2.10 |
| 11.0 | -0.02 | 4.40 | -0.03 | 0.97 | -3.72 | 2.13 |
| 12.0 | -0.00 | 4.49 | -0.01 | 1.01 | -3.81 | 2.16 |
| 13.0 | 0.03 | 4.59 | 0.01 | 1.06 | -3.89 | 2.18 |
| 14.0 | 0.07 | 4.69 | 0.03 | 1.12 | -3.98 | 2.20 |
| 15.0 | 0.12 | 4.79 | 0.04 | 1.19 | -4.07 | 2.22 |
| 16.0 | 0.19 | 4.88 | 0.06 | 1.28 | -4.14 | 2.24 |
| 17.0 | 0.27 | 4.97 | 0.07 | 1.38 | -4.21 | 2.26 |
| 18.0 | 0.37 | 5.06 | 0.07 | 1.49 | -4.27 | 2.27 |
| 19.0 | 0.49 | 5.14 | 0.07 | 1.63 | -4.33 | 2.29 |
| 20.0 | 0.62 | 5.22 | 0.06 | 1.77 | -4.37 | 2.30 |
| 21.0 | 0.77 | 5.30 | 0.05 | 1.93 | -4.41 | 2.32 |
| 22.0 | 0.93 | 5.37 | 0.03 | 2.11 | -4.44 | 2.33 |
| 23.0 | 1.10 | 5.44 | 0.02 | 2.29 | -4.48 | 2.34 |
| 24.0 | 1.27 | 5.52 | 0.00 | 2.48 | -4.51 | 2.34 |
| 25.0 | 1.46 | 5.60 | -0.01 | 2.68 | -4.54 | 2.35 |
| 26.0 | 1.64 | 5.68 | -0.01 | 2.87 | -4.59 | 2.35 |
| 27.0 | 1.82 | 5.77 | -0.01 | 3.07 | -4.64 | 2.35 |
| 28.0 | 1.99 | 5.86 | -0.01 | 3.25 | -4.69 | 2.35 |
| 29.0 | 2.15 | 5.96 | 0.00 | 3.43 | -4.76 | 2.36 |
| 30.0 | 2.30 | 6.06 | 0.01 | 3.60 | -4.83 | 2.36 |

TABLE XI

EARTH-FIXED PLUMBLINE AND SPACE-FIXED EPHEMERIS ACCELERATIØNS

| TIME SEC | DDXE M/S SQ | DDYE M/S SQ | DDZE M/S SQ | DDXSP M/S SQ | DDYSP M/S SQ | DDZSP M/S SQ |
|---|---|---|---|---|---|---|
| 31.0 | 2.44 | 6.10 | 0.02 | 3.74 | -4.85 | 2.35 |
| 32.0 | 2.55 | 6.22 | -0.01 | 3.89 | -4.92 | 2.40 |
| 33.0 | 2.65 | 6.33 | -0.06 | 4.02 | -4.97 | 2.47 |
| 34.0 | 2.76 | 6.43 | -0.11 | 4.15 | -5.01 | 2.54 |
| 35.0 | 2.89 | 6.52 | -0.13 | 4.30 | -5.06 | 2.57 |
| 36.0 | 3.03 | 6.56 | -0.11 | 4.45 | -5.09 | 2.54 |
| 37.0 | 3.21 | 6.64 | -0.03 | 4.63 | -5.18 | 2.47 |
| 38.0 | 3.39 | 6.73 | 0.07 | 4.81 | -5.27 | 2.39 |
| 39.0 | 3.51 | 6.84 | 0.11 | 4.94 | -5.37 | 2.37 |
| 40.0 | 3.54 | 6.96 | 0.08 | 5.01 | -5.45 | 2.45 |
| 41.0 | 3.59 | 7.08 | 0.11 | 5.08 | -5.56 | 2.47 |
| 42.0 | 3.66 | 7.19 | 0.14 | 5.17 | -5.66 | 2.48 |
| 43.0 | 3.74 | 7.30 | 0.16 | 5.27 | -5.75 | 2.50 |
| 44.0 | 3.83 | 7.40 | 0.19 | 5.38 | -5.84 | 2.51 |
| 45.0 | 3.93 | 7.49 | 0.20 | 5.50 | -5.91 | 2.51 |
| 46.0 | 4.05 | 7.57 | 0.22 | 5.63 | -5.97 | 2.51 |
| 47.0 | 4.19 | 7.65 | 0.24 | 5.78 | -6.02 | 2.50 |
| 48.0 | 4.34 | 7.71 | 0.25 | 5.94 | -6.06 | 2.49 |
| 49.0 | 4.50 | 7.77 | 0.26 | 6.11 | -6.09 | 2.47 |
| 50.0 | 4.68 | 7.82 | 0.26 | 6.29 | -6.11 | 2.45 |
| 51.0 | 4.87 | 7.85 | 0.27 | 6.48 | -6.11 | 2.42 |
| 52.0 | 5.07 | 7.73 | 0.27 | 6.65 | -5.98 | 2.31 |
| 53.0 | 5.30 | 7.52 | 0.27 | 6.83 | -5.77 | 2.15 |
| | MACH ØNE | | | | | |
| 53.208 | 5.32 | 7.48 | 0.27 | 6.84 | -5.73 | 2.13 |
| 54.0 | 5.39 | 7.37 | 0.27 | 6.88 | -5.63 | 2.07 |
| 55.0 | 5.45 | 7.30 | 0.26 | 6.92 | -5.55 | 2.03 |
| 56.0 | 5.48 | 7.29 | 0.25 | 6.95 | -5.54 | 2.02 |
| 57.0 | 5.49 | 7.35 | 0.24 | 6.98 | -5.58 | 2.06 |
| 58.0 | 5.79 | 7.49 | 0.23 | 7.30 | -5.65 | 2.07 |
| 59.0 | 6.07 | 7.70 | 0.21 | 7.63 | -5.78 | 2.11 |
| 60.0 | 6.36 | 7.85 | 0.20 | 7.94 | -5.86 | 2.14 |
| 61.0 | 6.69 | 8.01 | 0.09 | 8.32 | -5.89 | 2.23 |
| 62.0 | 7.04 | 8.18 | -0.24 | 8.74 | -5.81 | 2.50 |
| 63.0 | 7.34 | 8.37 | -0.62 | 9.11 | -5.74 | 2.85 |
| 64.0 | 7.56 | 8.61 | -0.83 | 9.41 | -5.80 | 3.10 |
| 65.0 | 7.70 | 8.87 | -0.76 | 9.60 | -6.04 | 3.14 |

TABLE XI

EARTH-FIXED PLUMBLINE AND SPACE-FIXED EPHEMERIS ACCELERATIØNS

| TIME SEC | DDXE M/S SQ | DDYE M/S SQ | DDZE M/S SQ | DDXSP M/S SQ | DDYSP M/S SQ | DDZSP M/S SQ |
|---|---|---|---|---|---|---|
| | MAXIMUM DYNAMIC PRESSURE | | | | | |
| 66.000 | 7.84 | 9.11 | -0.54 | 9.76 | -6.34 | 3.03 |
| 67.0 | 8.02 | 9.33 | -0.36 | 9.97 | -6.59 | 2.94 |
| 68.0 | 8.26 | 9.52 | -0.40 | 10.25 | -6.69 | 3.01 |
| 69.0 | 8.54 | 9.71 | -0.52 | 10.58 | -6.75 | 3.14 |
| 70.0 | 8.87 | 9.89 | -0.56 | 10.95 | -6.83 | 3.19 |
| 71.0 | 9.23 | 10.08 | -0.42 | 11.32 | -7.02 | 3.07 |
| 72.0 | 9.60 | 10.27 | -0.18 | 11.69 | -7.24 | 2.87 |
| 73.0 | 9.91 | 10.48 | 0.01 | 12.02 | -7.48 | 2.74 |
| 74.0 | 10.19 | 10.70 | 0.07 | 12.34 | -7.65 | 2.74 |
| 75.0 | 10.46 | 10.94 | 0.06 | 12.66 | -7.81 | 2.79 |
| 76.0 | 10.76 | 11.17 | 0.05 | 13.00 | -7.95 | 2.85 |
| 77.0 | 11.08 | 11.40 | 0.09 | 13.36 | -8.12 | 2.85 |
| 78.0 | 11.43 | 11.63 | 0.16 | 13.74 | -8.30 | 2.82 |
| 79.0 | 11.75 | 11.87 | 0.23 | 14.10 | -8.50 | 2.81 |
| 80.0 | 12.12 | 12.10 | 0.22 | 14.51 | -8.63 | 2.83 |
| 81.0 | 12.54 | 12.30 | 0.22 | 14.97 | -8.74 | 2.84 |
| 82.0 | 13.03 | 12.47 | 0.23 | 15.48 | -8.82 | 2.80 |
| 83.0 | 13.52 | 12.65 | 0.26 | 15.99 | -8.91 | 2.74 |
| 84.0 | 14.01 | 12.81 | 0.27 | 16.50 | -8.98 | 2.70 |
| 85.0 | 14.45 | 12.98 | 0.27 | 16.97 | -9.07 | 2.68 |
| 86.0 | 14.89 | 13.14 | 0.23 | 17.43 | -9.12 | 2.69 |
| 87.0 | 15.35 | 13.28 | 0.19 | 17.92 | -9.15 | 2.69 |
| 88.0 | 15.84 | 13.40 | 0.15 | 18.43 | -9.16 | 2.67 |
| 89.0 | 16.35 | 13.51 | 0.14 | 18.95 | -9.17 | 2.62 |
| 90.0 | 16.87 | 13.60 | 0.13 | 19.48 | -9.16 | 2.55 |
| 91.0 | 17.40 | 13.70 | 0.13 | 20.01 | -9.17 | 2.47 |
| 92.0 | 17.92 | 13.79 | 0.14 | 20.53 | -9.18 | 2.40 |
| 93.0 | 18.42 | 13.91 | 0.15 | 21.05 | -9.21 | 2.32 |
| 94.0 | 18.91 | 14.03 | 0.16 | 21.55 | -9.24 | 2.27 |
| 95.0 | 19.38 | 14.15 | 0.16 | 22.02 | -9.27 | 2.22 |
| 96.0 | 19.82 | 14.24 | 0.19 | 22.48 | -9.30 | 2.13 |
| 97.0 | 20.29 | 14.34 | 0.15 | 22.95 | -9.30 | 2.11 |
| 98.0 | 20.81 | 14.44 | 0.10 | 23.49 | -9.28 | 2.08 |
| 99.0 | 21.28 | 14.57 | 0.11 | 23.97 | -9.32 | 2.03 |
| 100.0 | 21.78 | 14.70 | 0.13 | 24.49 | -9.37 | 1.96 |
| 101.0 | 22.29 | 14.83 | 0.15 | 25.01 | -9.41 | 1.89 |

TABLE XI

EARTH-FIXED PLUMBLINE AND SPACE-FIXED EPHEMERIS ACCELERATIØNS

| TIME SEC | DDXE M/S SQ | DDYE M/S SQ | DDZE M/S SQ | DDXSP M/S SQ | DDYSP M/S SQ | DDZSP M/S SQ |
|---|---|---|---|---|---|---|
| 102.0 | 22.79 | 14.95 | 0.17 | 25.51 | -9.44 | 1.82 |
| 103.0 | 23.28 | 15.08 | 0.20 | 26.01 | -9.50 | 1.74 |
| 104.0 | 23.72 | 15.23 | 0.20 | 26.48 | -9.56 | 1.71 |
| 105.0 | 24.16 | 15.39 | 0.14 | 26.95 | -9.59 | 1.74 |
| 106.0 | 24.63 | 15.58 | 0.12 | 27.45 | -9.67 | 1.74 |
| 107.0 | 25.10 | 15.79 | 0.14 | 27.95 | -9.79 | 1.72 |
| 108.0 | 25.58 | 16.01 | 0.19 | 28.46 | -9.93 | 1.67 |
| 109.0 | 26.06 | 16.23 | 0.25 | 28.97 | -10.07 | 1.62 |
| 110.0 | 26.55 | 16.44 | 0.26 | 29.49 | -10.18 | 1.60 |
| 111.0 | 27.01 | 16.65 | 0.20 | 30.00 | -10.26 | 1.64 |
| 112.0 | 27.49 | 16.87 | 0.15 | 30.52 | -10.35 | 1.68 |
| 113.0 | 28.00 | 17.11 | 0.17 | 31.07 | -10.49 | 1.66 |
| 114.0 | 28.49 | 17.38 | 0.21 | 31.60 | -10.65 | 1.65 |
| 115.0 | 28.97 | 17.65 | 0.21 | 32.13 | -10.82 | 1.67 |
| 116.0 | 29.47 | 17.96 | 0.21 | 32.69 | -11.00 | 1.70 |
| 117.0 | 29.96 | 18.29 | 0.23 | 33.24 | -11.20 | 1.73 |
| 118.0 | 30.45 | 18.62 | 0.24 | 33.79 | -11.43 | 1.76 |
| 119.0 | 30.96 | 18.97 | 0.29 | 34.36 | -11.66 | 1.78 |
| 120.0 | 31.49 | 19.31 | 0.32 | 34.95 | -11.89 | 1.79 |
| 121.0 | 32.01 | 19.68 | 0.31 | 35.54 | -12.11 | 1.86 |
| 122.0 | 32.55 | 20.07 | 0.30 | 36.16 | -12.35 | 1.93 |
| 123.0 | 33.12 | 20.46 | 0.30 | 36.80 | -12.59 | 1.99 |
| 124.0 | 33.70 | 20.87 | 0.30 | 37.46 | -12.85 | 2.05 |
| 125.0 | 34.27 | 21.29 | 0.28 | 38.12 | -13.11 | 2.14 |
| 126.0 | 34.90 | 21.73 | 0.29 | 38.83 | -13.39 | 2.20 |
| 127.0 | 35.52 | 22.18 | 0.28 | 39.54 | -13.67 | 2.28 |
| 128.0 | 36.16 | 22.66 | 0.30 | 40.27 | -13.98 | 2.35 |
| 129.0 | 36.82 | 23.16 | 0.35 | 41.02 | -14.33 | 2.39 |
| 130.0 | 37.53 | 23.64 | 0.39 | 41.81 | -14.65 | 2.43 |
| 131.0 | 38.29 | 24.11 | 0.39 | 42.66 | -14.93 | 2.48 |
| 132.0 | 39.09 | 24.57 | 0.39 | 43.55 | -15.20 | 2.51 |
| 133.0 | 39.92 | 25.04 | 0.38 | 44.46 | -15.46 | 2.56 |
| 134.0 | 40.79 | 25.48 | 0.35 | 45.41 | -15.69 | 2.60 |
| 135.0 | 41.85 | 25.80 | 0.37 | 46.50 | -15.81 | 2.49 |
| 136.0 | 42.89 | 26.18 | 0.40 | 47.60 | -15.99 | 2.41 |
| 137.0 | 43.93 | 26.62 | 0.42 | 48.71 | -16.21 | 2.37 |
| 138.0 | 44.97 | 27.11 | 0.44 | 49.82 | -16.48 | 2.35 |
| 139.0 | 45.99 | 27.65 | 0.47 | 50.94 | -16.80 | 2.35 |
| 140.0 | 47.01 | 28.26 | 0.49 | 52.07 | -17.17 | 2.39 |
| | IECØ | | | | | |
| 140.220 | 47.00 | 28.44 | 0.48 | 52.10 | -17.31 | 2.49 |

TABLE XI

EARTH-FIXED PLUMBLINE AND SPACE-FIXED EPHEMERIS ACCELERATIØNS

| TIME SEC | DDXE M/S SQ | DDYE M/S SQ | DDZE M/S SQ | DDXSP M/S SQ | DDYSP M/S SQ | DDZSP M/S SQ |
|---|---|---|---|---|---|---|
| 141.0 | 24.81 | 10.97 | 0.36 | 26.59 | -5.61 | -0.71 |
| 142.0 | 24.28 | 10.12 | 0.36 | 25.88 | -4.96 | -1.00 |
| 143.0 | 23.98 | 9.71 | 0.38 | 25.49 | -4.66 | -1.13 |
| 144.0 | 23.90 | 9.74 | 0.39 | 25.43 | -4.70 | -1.11 |
| 145.0 | 24.06 | 10.21 | 0.40 | 25.69 | -5.07 | -0.93 |
| | ØECØ | | | | | |
| 145.560 | 22.75 | 9.64 | 0.41 | 24.29 | -4.78 | -0.92 |
| 146.0 | 5.80 | -5.09 | 0.28 | 4.48 | 5.34 | -3.99 |
| 147.0 | 1.08 | -8.17 | 0.25 | -0.79 | 7.29 | -4.36 |
| 148.0 | 0.63 | -8.82 | 0.24 | -1.38 | 7.78 | -4.56 |
| | S-IV ENGINE START | | | | | |
| 148.120 | 0.38 | -8.83 | 0.26 | -1.63 | 7.74 | -4.52 |
| 149.0 | 0.86 | -8.60 | 0.24 | -1.12 | 7.62 | -4.51 |
| 150.0 | 3.88 | -6.19 | 0.26 | 2.37 | 6.00 | -4.06 |
| 155.0 | 4.86 | -5.03 | 0.26 | 3.58 | 5.16 | -3.73 |
| 160.0 | 5.02 | -4.94 | 0.22 | 3.75 | 5.13 | -3.69 |
| | GUIDANCE INITIATIØN | | | | | |
| 163.860 | 5.04 | -4.87 | 0.21 | 3.79 | 5.09 | -3.65 |
| 165.0 | 5.03 | -4.76 | 0.26 | 3.80 | 4.97 | -3.64 |
| 170.0 | 4.90 | -4.45 | 0.99 | 3.65 | 4.32 | -4.08 |
| 175.0 | 4.90 | -4.54 | 1.16 | 3.60 | 4.31 | -4.27 |
| 180.0 | 5.07 | -4.62 | 1.02 | 3.76 | 4.48 | -4.23 |
| 185.0 | 5.15 | -4.72 | 0.86 | 3.83 | 4.67 | -4.15 |
| 190.0 | 5.23 | -4.73 | 0.71 | 3.91 | 4.77 | -4.05 |
| 195.0 | 5.30 | -4.66 | 0.67 | 4.00 | 4.74 | -4.00 |
| 200.0 | 5.39 | -4.57 | 0.63 | 4.11 | 4.70 | -3.95 |
| 205.0 | 5.48 | -4.65 | 0.51 | 4.18 | 4.85 | -3.90 |
| 210.0 | 5.58 | -4.65 | 0.43 | 4.29 | 4.91 | -3.85 |
| 215.0 | 5.69 | -4.64 | 0.35 | 4.40 | 4.96 | -3.81 |
| 220.0 | 5.73 | -4.62 | 0.29 | 4.44 | 4.99 | -3.76 |
| 225.0 | 5.86 | -4.73 | 0.27 | 4.54 | 5.11 | -3.82 |

TABLE XI

EARTH-FIXED PLUMBLINE AND SPACE-FIXED EPHEMERIS ACCELERATIØNS

| TIME SEC | DDXE M/S SQ | DDYE M/S SQ | DDZE M/S SQ | DDXSP M/S SQ | DDYSP M/S SQ | DDZSP M/S SQ |
|---|---|---|---|---|---|---|
| 230.0 | 6.02 | -4.71 | 0.22 | 4.70 | 5.15 | -3.81 |
| 235.0 | 6.12 | -4.74 | 0.25 | 4.78 | 5.18 | -3.87 |
| 240.0 | 6.14 | -4.79 | 0.17 | 4.80 | 5.27 | -3.83 |
| 245.0 | 6.23 | -4.71 | 0.19 | 4.89 | 5.21 | -3.82 |
| 250.0 | 6.28 | -4.81 | 0.16 | 4.91 | 5.32 | -3.86 |
| 255.0 | 6.42 | -4.93 | 0.15 | 5.02 | 5.45 | -3.94 |
| 260.0 | 6.46 | -4.87 | 0.24 | 5.05 | 5.38 | -4.00 |
| 265.0 | 6.56 | -4.90 | 0.18 | 5.14 | 5.45 | -3.98 |
| 270.0 | 6.64 | -4.99 | 0.18 | 5.19 | 5.54 | -4.04 |
| 275.0 | 6.77 | -5.04 | 0.19 | 5.30 | 5.60 | -4.11 |
| 280.0 | 6.87 | -4.97 | 0.16 | 5.40 | 5.58 | -4.07 |
| 285.0 | 6.92 | -5.03 | 0.18 | 5.43 | 5.64 | -4.12 |
| 290.0 | 7.03 | -5.10 | 0.17 | 5.52 | 5.72 | -4.17 |
| 295.0 | 7.15 | -5.17 | 0.22 | 5.60 | 5.78 | -4.28 |
| 300.0 | 7.27 | -5.15 | 0.25 | 5.71 | 5.77 | -4.33 |
| 305.0 | 7.41 | -5.24 | 0.25 | 5.82 | 5.88 | -4.40 |
| 310.0 | 7.49 | -5.38 | 0.25 | 5.85 | 6.01 | -4.48 |
| 315.0 | 7.56 | -5.35 | 0.24 | 5.93 | 6.01 | -4.48 |
| 320.0 | 7.74 | -5.40 | 0.23 | 6.08 | 6.09 | -4.54 |
| 325.0 | 7.80 | -5.34 | 0.28 | 6.14 | 6.03 | -4.57 |
| 330.0 | 7.90 | -5.55 | 0.28 | 6.17 | 6.22 | -4.68 |
| 335.0 | 8.03 | -5.56 | 0.29 | 6.29 | 6.26 | -4.73 |
| 340.0 | 8.16 | -5.58 | 0.39 | 6.39 | 6.25 | -4.85 |
| 345.0 | 8.29 | -5.65 | 0.36 | 6.50 | 6.36 | -4.89 |
| 350.0 | 8.44 | -5.75 | 0.37 | 6.61 | 6.46 | -4.98 |
| 355.0 | 8.55 | -5.87 | 0.33 | 6.68 | 6.61 | -5.03 |
| 360.0 | 8.65 | -5.90 | 0.32 | 6.77 | 6.66 | -5.05 |
| 365.0 | 8.80 | -5.93 | 0.40 | 6.89 | 6.68 | -5.17 |
| 370.0 | 8.90 | -6.17 | 0.32 | 6.93 | 6.94 | -5.25 |
| 375.0 | 8.97 | -6.10 | 0.42 | 6.99 | 6.86 | -5.31 |
| 380.0 | 9.09 | -6.29 | 0.38 | 7.06 | 7.06 | -5.39 |
| 385.0 | 9.27 | -6.36 | 0.40 | 7.20 | 7.14 | -5.49 |
| 390.0 | 9.41 | -6.40 | 0.41 | 7.31 | 7.21 | -5.54 |
| 395.0 | 9.54 | -6.46 | 0.43 | 7.41 | 7.27 | -5.62 |
| 400.0 | 9.71 | -6.62 | 0.40 | 7.54 | 7.46 | -5.71 |
| 405.0 | 9.81 | -6.67 | 0.44 | 7.61 | 7.51 | -5.79 |
| 410.0 | 10.00 | -6.78 | 0.40 | 7.75 | 7.66 | -5.85 |
| 415.0 | 10.12 | -6.89 | 0.47 | 7.83 | 7.74 | -6.00 |
| 420.0 | 10.33 | -7.01 | 0.48 | 8.00 | 7.88 | -6.11 |
| 425.0 | 10.51 | -7.16 | 0.40 | 8.13 | 8.09 | -6.15 |

TABLE XI

EARTH-FIXED PLUMBLINE AND SPACE-FIXED EPHEMERIS ACCELERATIØNS

| TIME SEC | DDXE M/S SQ | DDYE M/S SQ | DDZE M/S SQ | DDXSP M/S SQ | DDYSP M/S SQ | DDZSP M/S SQ |
|---|---|---|---|---|---|---|
| 430.0 | 10.63 | -7.29 | 0.47 | 8.20 | 8.19 | -6.29 |
| 435.0 | 10.76 | -7.45 | 0.47 | 8.27 | 8.36 | -6.40 |
| 440.0 | 10.89 | -7.60 | 0.46 | 8.34 | 8.51 | -6.50 |
| 445.0 | 11.10 | -7.69 | 0.48 | 8.51 | 8.62 | -6.60 |
| 450.0 | 11.28 | -7.82 | 0.47 | 8.64 | 8.78 | -6.70 |
| 455.0 | 11.44 | -7.96 | 0.49 | 8.75 | 8.92 | -6.82 |
| 460.0 | 11.54 | -8.19 | 0.50 | 8.78 | 9.13 | -6.96 |
| 465.0 | 11.71 | -8.28 | 0.50 | 8.91 | 9.24 | -7.05 |
| 470.0 | 11.93 | -8.44 | 0.49 | 9.07 | 9.43 | -7.15 |
| 475.0 | 12.07 | -8.66 | 0.49 | 9.14 | 9.65 | -7.30 |
| 480.0 | 12.30 | -8.87 | 0.50 | 9.29 | 9.86 | -7.46 |
| 485.0 | 12.46 | -9.09 | 0.51 | 9.38 | 10.09 | -7.61 |
| 490.0 | 12.68 | -9.20 | 0.55 | 9.55 | 10.20 | -7.74 |
| 495.0 | 12.90 | -9.51 | 0.51 | 9.67 | 10.53 | -7.90 |
| 500.0 | 13.11 | -9.63 | 0.55 | 9.83 | 10.65 | -8.05 |
| 505.0 | 13.38 | -9.88 | 0.56 | 10.00 | 10.91 | -8.23 |
| 510.0 | 13.54 | -10.15 | 0.54 | 10.08 | 11.19 | -8.39 |
| 515.0 | 13.80 | -10.35 | 0.56 | 10.26 | 11.40 | -8.56 |
| 520.0 | 14.05 | -10.61 | 0.51 | 10.43 | 11.70 | -8.70 |
| 525.0 | 14.20 | -10.78 | 0.58 | 10.51 | 11.84 | -8.88 |
| 530.0 | 14.52 | -11.13 | 0.57 | 10.72 | 12.21 | -9.10 |
| 535.0 | 14.77 | -11.41 | 0.57 | 10.87 | 12.50 | -9.29 |
| 540.0 | 14.98 | -11.67 | 0.58 | 10.98 | 12.76 | -9.47 |
| 545.0 | 15.25 | -11.96 | 0.60 | 11.15 | 13.05 | -9.69 |
| 550.0 | 15.53 | -12.34 | 0.59 | 11.31 | 13.43 | -9.93 |
| 555.0 | 15.76 | -12.62 | 0.63 | 11.44 | 13.70 | -10.14 |
| 560.0 | 16.11 | -12.95 | 0.65 | 11.67 | 14.04 | -10.40 |
| 565.0 | 16.45 | -13.41 | 0.57 | 11.86 | 14.53 | -10.63 |
| 570.0 | 16.66 | -13.61 | 0.62 | 11.99 | 14.73 | -10.81 |
| 575.0 | 17.00 | -14.12 | 0.65 | 12.16 | 15.21 | -11.16 |
| 580.0 | 17.36 | -14.54 | 0.63 | 12.39 | 15.65 | -11.43 |
| 585.0 | 17.70 | -15.07 | 0.63 | 12.56 | 16.17 | -11.76 |
| 590.0 | 18.06 | -15.52 | 0.71 | 12.76 | 16.58 | -12.13 |
| 595.0 | 18.40 | -15.96 | 0.69 | 12.95 | 17.03 | -12.39 |
| 600.0 | 18.74 | -16.48 | 0.71 | 13.12 | 17.52 | -12.74 |
| 605.0 | 19.00 | -16.98 | 0.66 | 13.22 | 18.03 | -12.99 |
| 610.0 | 19.52 | -17.66 | 0.71 | 13.52 | 18.68 | -13.48 |
| 615.0 | 19.90 | -18.14 | 0.72 | 13.73 | 19.15 | -13.80 |
| 620.0 | 20.36 | -19.02 | 0.70 | 13.92 | 20.01 | -14.31 |
| | S-IV CUTØFF | | | | | |
| 621.659 | 20.48 | -19.31 | 0.70 | 13.95 | 20.27 | -14.47 |

TABLE XI

EARTH-FIXED PLUMBLINE AND SPACE-FIXED EPHEMERIS ACCELERATIØNS

| TIME SEC | DDXE M/S SQ | DDYE M/S SQ | DDZE M/S SQ | DDXSP M/S SQ | DDYSP M/S SQ | DDZSP M/S SQ |
|---|---|---|---|---|---|---|
| 625.0 | -2.17 | -7.20 | 0.35 | -4.49 | 6.34 | -3.24 |
| 630.0 | -2.21 | -7.19 | 0.35 | -4.53 | 6.32 | -3.23 |
| | INSERTIØN | | | | | |
| 631.659 | -2.22 | -7.19 | 0.34 | -4.54 | 6.31 | -3.22 |

TABLE XII
GEØGRAPHIC CØØRDINATES

| TIME SEC | EC DIST KM | LØNG DEG | GC LAT DEG | LAT DEG | VEL-AZ DEG | VEL-ELEV DEG | EF VEL M/S |
|---|---|---|---|---|---|---|---|
| | FIRST MØTIØN | | | | | | |
| 0.080 | 6373.350 | -80.56495 | 28.37067 | 28.53185 | 0. | 90.000 | 0. |
| | LIFTØFF SIGNAL | | | | | | |
| 0.280 | 6373.350 | -80.56495 | 28.37067 | 28.53185 | 37.018 | 87.192 | 0.7 |
| 1.0 | 6373.351 | -80.56495 | 28.37067 | 28.53185 | 30.052 | 88.135 | 3.2 |
| 2.0 | 6373.356 | -80.56495 | 28.37067 | 28.53185 | 10.756 | 88.951 | 6.8 |
| 3.0 | 6373.365 | -80.56495 | 28.37067 | 28.53185 | 338.303 | 89.255 | 10.5 |
| 4.0 | 6373.377 | -80.56495 | 28.37068 | 28.53186 | 312.912 | 89.235 | 14.3 |
| 5.0 | 6373.393 | -80.56495 | 28.37068 | 28.53186 | 302.598 | 89.147 | 18.1 |
| 6.0 | 6373.413 | -80.56496 | 28.37068 | 28.53186 | 300.340 | 89.081 | 22.1 |
| 7.0 | 6373.437 | -80.56496 | 28.37068 | 28.53186 | 301.674 | 89.043 | 26.1 |
| 8.0 | 6373.466 | -80.56496 | 28.37068 | 28.53186 | 304.430 | 89.024 | 30.2 |
| 9.0 | 6373.498 | -80.56497 | 28.37069 | 28.53186 | 307.461 | 89.020 | 34.4 |
| 10.0 | 6373.534 | -80.56497 | 28.37069 | 28.53187 | 310.173 | 89.033 | 38.6 |
| 11.0 | 6373.575 | -80.56498 | 28.37069 | 28.53187 | 312.341 | 89.065 | 43.0 |
| 12.0 | 6373.620 | -80.56499 | 28.37070 | 28.53188 | 314.001 | 89.119 | 47.4 |
| 13.0 | 6373.670 | -80.56499 | 28.37070 | 28.53188 | 315.391 | 89.198 | 52.0 |
| 14.0 | 6373.724 | -80.56500 | 28.37071 | 28.53189 | 317.007 | 89.306 | 56.6 |
| 15.0 | 6373.783 | -80.56501 | 28.37071 | 28.53189 | 319.899 | 89.443 | 61.3 |
| 16.0 | 6373.847 | -80.56501 | 28.37072 | 28.53190 | 327.083 | 89.607 | 66.2 |
| 17.0 | 6373.915 | -80.56501 | 28.37072 | 28.53190 | 351.986 | 89.776 | 71.1 |
| 18.0 | 6373.989 | -80.56501 | 28.37072 | 28.53190 | 61.138 | 89.780 | 76.1 |
| 19.0 | 6374.067 | -80.56501 | 28.37073 | 28.53190 | 91.840 | 89.538 | 81.2 |
| 20.0 | 6374.151 | -80.56500 | 28.37072 | 28.53190 | 100.119 | 89.208 | 86.4 |
| 21.0 | 6374.240 | -80.56499 | 28.37072 | 28.53190 | 103.042 | 88.824 | 91.7 |
| 22.0 | 6374.334 | -80.56497 | 28.37072 | 28.53190 | 104.146 | 88.391 | 97.0 |
| 23.0 | 6374.434 | -80.56493 | 28.37071 | 28.53189 | 104.509 | 87.912 | 102.5 |
| 24.0 | 6374.539 | -80.56489 | 28.37070 | 28.53188 | 104.556 | 87.392 | 108.0 |
| 25.0 | 6374.650 | -80.56484 | 28.37069 | 28.53187 | 104.486 | 86.833 | 113.6 |
| 26.0 | 6374.766 | -80.56477 | 28.37067 | 28.53185 | 104.395 | 86.243 | 119.3 |
| 27.0 | 6374.888 | -80.56469 | 28.37065 | 28.53183 | 104.330 | 85.628 | 125.1 |
| 28.0 | 6375.016 | -80.56458 | 28.37063 | 28.53181 | 104.312 | 84.994 | 131.1 |
| 29.0 | 6375.149 | -80.56446 | 28.37060 | 28.53178 | 104.336 | 84.351 | 137.2 |
| 30.0 | 6375.289 | -80.56432 | 28.37057 | 28.53175 | 104.417 | 83.707 | 143.5 |

TABLE XII
GEØGRAPHIC CØØRDINATES

| TIME SEC | EC DIST KM | LØNG DEG | GC LAT DEG | LAT DEG | VEL-AZ DEG | VEL-ELEV DEG | EF VEL M/S |
|---|---|---|---|---|---|---|---|
| 31.0 | 6375.434 | -80.56415 | 28.37053 | 28.53171 | 104.484 | 83.064 | 149.8 |
| 32.0 | 6375.586 | -80.56396 | 28.37049 | 28.53167 | 104.496 | 82.426 | 156.2 |
| 33.0 | 6375.744 | -80.56375 | 28.37044 | 28.53162 | 104.426 | 81.811 | 162.8 |
| 34.0 | 6375.909 | -80.56351 | 28.37039 | 28.53156 | 104.250 | 81.212 | 169.5 |
| 35.0 | 6376.079 | -80.56324 | 28.37033 | 28.53150 | 104.043 | 80.627 | 176.4 |
| 36.0 | 6376.257 | -80.56294 | 28.37026 | 28.53144 | 103.895 | 80.047 | 183.3 |
| 37.0 | 6376.440 | -80.56261 | 28.37019 | 28.53137 | 103.858 | 79.463 | 190.4 |
| 38.0 | 6376.631 | -80.56225 | 28.37011 | 28.53129 | 103.965 | 78.877 | 197.6 |
| 39.0 | 6376.828 | -80.56186 | 28.37002 | 28.53120 | 104.137 | 78.302 | 204.9 |
| 40.0 | 6377.032 | -80.56143 | 28.36993 | 28.53110 | 104.290 | 77.755 | 212.4 |
| 41.0 | 6377.243 | -80.56097 | 28.36983 | 28.53100 | 104.359 | 77.242 | 220.0 |
| 42.0 | 6377.462 | -80.56047 | 28.36971 | 28.53089 | 104.341 | 76.763 | 227.7 |
| 43.0 | 6377.687 | -80.55994 | 28.36959 | 28.53077 | 104.262 | 76.307 | 235.6 |
| 44.0 | 6377.919 | -80.55937 | 28.36946 | 28.53064 | 104.174 | 75.860 | 243.6 |
| 45.0 | 6378.159 | -80.55877 | 28.36933 | 28.53050 | 104.090 | 75.407 | 251.8 |
| 46.0 | 6378.407 | -80.55812 | 28.36919 | 28.53036 | 103.987 | 74.948 | 260.1 |
| 47.0 | 6378.662 | -80.55743 | 28.36904 | 28.53021 | 103.816 | 74.492 | 268.5 |
| 48.0 | 6378.924 | -80.55670 | 28.36888 | 28.53005 | 103.572 | 74.049 | 277.0 |
| 49.0 | 6379.195 | -80.55592 | 28.36872 | 28.52989 | 103.291 | 73.619 | 285.7 |
| 50.0 | 6379.473 | -80.55510 | 28.36855 | 28.52972 | 103.034 | 73.198 | 294.5 |
| 51.0 | 6379.758 | -80.55423 | 28.36837 | 28.52954 | 102.851 | 72.772 | 303.3 |
| 52.0 | 6380.052 | -80.55332 | 28.36819 | 28.52936 | 102.777 | 72.333 | 312.2 |
| 53.0 | 6380.353 | -80.55235 | 28.36800 | 28.52916 | 102.799 | 71.874 | 321.0 |
| | MACH ØNE | | | | | | |
| 53.208 | 6380.417 | -80.55214 | 28.36796 | 28.52912 | 102.812 | 71.776 | 322.8 |
| 54.0 | 6380.662 | -80.55133 | 28.36779 | 28.52896 | 102.877 | 71.401 | 329.8 |
| 55.0 | 6380.978 | -80.55026 | 28.36757 | 28.52874 | 102.975 | 70.924 | 338.4 |
| 56.0 | 6381.302 | -80.54913 | 28.36735 | 28.52851 | 103.069 | 70.455 | 347.1 |
| 57.0 | 6381.633 | -80.54795 | 28.36710 | 28.52827 | 103.158 | 69.997 | 355.9 |
| 58.0 | 6381.971 | -80.54672 | 28.36685 | 28.52801 | 103.254 | 69.549 | 364.9 |
| 59.0 | 6382.317 | -80.54542 | 28.36658 | 28.52774 | 103.371 | 69.103 | 374.0 |
| 60.0 | 6382.670 | -80.54407 | 28.36629 | 28.52746 | 103.509 | 68.653 | 383.5 |
| 61.0 | 6383.031 | -80.54266 | 28.36599 | 28.52715 | 103.614 | 68.191 | 393.3 |
| 62.0 | 6383.400 | -80.54118 | 28.36568 | 28.52684 | 103.625 | 67.713 | 403.4 |
| 63.0 | 6383.778 | -80.53963 | 28.36535 | 28.52651 | 103.524 | 67.230 | 413.8 |
| 64.0 | 6384.164 | -80.53800 | 28.36501 | 28.52616 | 103.352 | 66.750 | 424.5 |
| 65.0 | 6384.558 | -80.53630 | 28.36465 | 28.52581 | 103.174 | 66.282 | 435.6 |

TABLE XII
GEØGRAPHIC CØØRDINATES

| TIME SEC | EC DIST KM | LØNG DEG | GC LAT DEG | LAT DEG | VEL-AZ DEG | VEL-ELEV DEG | EF VEL M/S |
|---|---|---|---|---|---|---|---|
| | MAXIMUM DYNAMIC PRESSURE | | | | | | |
| 66.000 | 6384.961 | -80.53453 | 28.36429 | 28.52544 | 103.040 | 65.833 | 447.0 |
| 67.0 | 6385.374 | -80.53267 | 28.36391 | 28.52507 | 102.964 | 65.402 | 458.6 |
| 68.0 | 6385.796 | -80.53074 | 28.36352 | 28.52467 | 102.921 | 64.982 | 470.6 |
| 69.0 | 6386.227 | -80.52872 | 28.36311 | 28.52426 | 102.875 | 64.564 | 482.9 |
| 70.0 | 6386.668 | -80.52661 | 28.36269 | 28.52384 | 102.820 | 64.143 | 495.5 |
| 71.0 | 6387.119 | -80.52442 | 28.36225 | 28.52340 | 102.783 | 63.718 | 508.5 |
| 72.0 | 6387.580 | -80.52214 | 28.36180 | 28.52294 | 102.795 | 63.289 | 521.8 |
| 73.0 | 6388.052 | -80.51976 | 28.36132 | 28.52246 | 102.852 | 62.862 | 535.5 |
| 74.0 | 6388.534 | -80.51729 | 28.36082 | 28.52197 | 102.935 | 62.438 | 549.5 |
| 75.0 | 6389.026 | -80.51471 | 28.36030 | 28.52144 | 103.027 | 62.021 | 563.9 |
| 76.0 | 6389.530 | -80.51204 | 28.35975 | 28.52089 | 103.114 | 61.610 | 578.6 |
| 77.0 | 6390.045 | -80.50926 | 28.35918 | 28.52032 | 103.198 | 61.206 | 593.8 |
| 78.0 | 6390.571 | -80.50637 | 28.35858 | 28.51972 | 103.287 | 60.807 | 609.3 |
| 79.0 | 6391.109 | -80.50336 | 28.35796 | 28.51909 | 103.381 | 60.412 | 625.2 |
| 80.0 | 6391.659 | -80.50025 | 28.35730 | 28.51843 | 103.478 | 60.020 | 641.6 |
| 81.0 | 6392.221 | -80.49701 | 28.35662 | 28.51774 | 103.570 | 59.626 | 658.3 |
| 82.0 | 6392.795 | -80.49366 | 28.35590 | 28.51702 | 103.658 | 59.228 | 675.5 |
| 83.0 | 6393.382 | -80.49018 | 28.35515 | 28.51628 | 103.745 | 58.822 | 693.1 |
| 84.0 | 6393.981 | -80.48656 | 28.35437 | 28.51549 | 103.830 | 58.412 | 711.1 |
| 85.0 | 6394.593 | -80.48281 | 28.35356 | 28.51467 | 103.909 | 57.998 | 729.6 |
| 86.0 | 6395.219 | -80.47892 | 28.35271 | 28.51382 | 103.983 | 57.582 | 748.5 |
| 87.0 | 6395.858 | -80.47488 | 28.35182 | 28.51293 | 104.049 | 57.165 | 767.8 |
| 88.0 | 6396.509 | -80.47070 | 28.35090 | 28.51200 | 104.104 | 56.745 | 787.5 |
| 89.0 | 6397.175 | -80.46636 | 28.34993 | 28.51104 | 104.154 | 56.321 | 807.6 |
| 90.0 | 6397.854 | -80.46186 | 28.34894 | 28.51003 | 104.199 | 55.893 | 828.1 |
| 91.0 | 6398.546 | -80.45720 | 28.34789 | 28.50899 | 104.243 | 55.460 | 849.1 |
| 92.0 | 6399.253 | -80.45237 | 28.34681 | 28.50791 | 104.285 | 55.023 | 870.4 |
| 93.0 | 6399.973 | -80.44736 | 28.34569 | 28.50678 | 104.326 | 54.585 | 892.2 |
| 94.0 | 6400.706 | -80.44217 | 28.34453 | 28.50561 | 104.367 | 54.146 | 914.5 |
| 95.0 | 6401.452 | -80.43678 | 28.34332 | 28.50440 | 104.407 | 53.707 | 937.2 |
| 96.0 | 6402.213 | -80.43121 | 28.34206 | 28.50314 | 104.445 | 53.271 | 960.3 |
| 97.0 | 6402.988 | -80.42545 | 28.34076 | 28.50183 | 104.481 | 52.837 | 983.8 |
| 98.0 | 6403.780 | -80.41950 | 28.33941 | 28.50047 | 104.513 | 52.410 | 1007.7 |
| 99.0 | 6404.586 | -80.41335 | 28.33800 | 28.49906 | 104.541 | 51.985 | 1032.1 |
| 100.0 | 6405.406 | -80.40699 | 28.33655 | 28.49760 | 104.568 | 51.564 | 1057.0 |
| 101.0 | 6406.242 | -80.40042 | 28.33505 | 28.49610 | 104.596 | 51.146 | 1082.3 |

TABLE XII
GEØGRAPHIC CØØRDINATES

| TIME SEC | EC DIST KM | LØNG DEG | GC LAT DEG | LAT DEG | VEL-AZ DEG | VEL-ELEV DEG | EF VEL M/S |
|---|---|---|---|---|---|---|---|
| 102.0 | 6407.093 | -80.39364 | 28.33349 | 28.49453 | 104.624 | 50.732 | 1108.1 |
| 103.0 | 6407.958 | -80.38663 | 28.33188 | 28.49292 | 104.654 | 50.323 | 1134.3 |
| 104.0 | 6408.839 | -80.37940 | 28.33021 | 28.49124 | 104.683 | 49.919 | 1161.1 |
| 105.0 | 6409.735 | -80.37194 | 28.32849 | 28.48951 | 104.707 | 49.523 | 1188.3 |
| 106.0 | 6410.647 | -80.36425 | 28.32671 | 28.48773 | 104.728 | 49.133 | 1215.9 |
| 107.0 | 6411.575 | -80.35632 | 28.32488 | 28.48589 | 104.752 | 48.752 | 1244.1 |
| 108.0 | 6412.518 | -80.34814 | 28.32298 | 28.48398 | 104.774 | 48.379 | 1272.8 |
| 109.0 | 6413.478 | -80.33972 | 28.32102 | 28.48202 | 104.799 | 48.014 | 1302.1 |
| 110.0 | 6414.454 | -80.33105 | 28.31900 | 28.47999 | 104.824 | 47.656 | 1331.9 |
| 111.0 | 6415.447 | -80.32212 | 28.31692 | 28.47790 | 104.848 | 47.306 | 1362.2 |
| 112.0 | 6416.457 | -80.31293 | 28.31478 | 28.47575 | 104.869 | 46.964 | 1393.1 |
| 113.0 | 6417.484 | -80.30348 | 28.31257 | 28.47353 | 104.888 | 46.629 | 1424.5 |
| 114.0 | 6418.529 | -80.29376 | 28.31029 | 28.47124 | 104.906 | 46.302 | 1456.5 |
| 115.0 | 6419.591 | -80.28376 | 28.30794 | 28.46889 | 104.926 | 45.984 | 1489.1 |
| 116.0 | 6420.671 | -80.27348 | 28.30553 | 28.46647 | 104.946 | 45.675 | 1522.2 |
| 117.0 | 6421.769 | -80.26293 | 28.30305 | 28.46398 | 104.965 | 45.375 | 1556.0 |
| 118.0 | 6422.886 | -80.25208 | 28.30049 | 28.46141 | 104.985 | 45.084 | 1590.5 |
| 119.0 | 6424.022 | -80.24094 | 28.29787 | 28.45878 | 105.005 | 44.802 | 1625.5 |
| 120.0 | 6425.177 | -80.22951 | 28.29517 | 28.45607 | 105.026 | 44.529 | 1661.2 |
| 121.0 | 6426.352 | -80.21777 | 28.29239 | 28.45328 | 105.047 | 44.265 | 1697.6 |
| 122.0 | 6427.548 | -80.20573 | 28.28954 | 28.45042 | 105.068 | 44.010 | 1734.7 |
| 123.0 | 6428.763 | -80.19338 | 28.28661 | 28.44748 | 105.087 | 43.762 | 1772.4 |
| 124.0 | 6430.000 | -80.18071 | 28.28360 | 28.44445 | 105.106 | 43.523 | 1810.9 |
| 125.0 | 6431.258 | -80.16772 | 28.28051 | 28.44135 | 105.124 | 43.292 | 1850.2 |
| 126.0 | 6432.538 | -80.15440 | 28.27734 | 28.43817 | 105.141 | 43.068 | 1890.2 |
| 127.0 | 6433.840 | -80.14075 | 28.27408 | 28.43490 | 105.158 | 42.852 | 1930.9 |
| 128.0 | 6435.165 | -80.12677 | 28.27074 | 28.43155 | 105.175 | 42.643 | 1972.5 |
| 129.0 | 6436.513 | -80.11244 | 28.26732 | 28.42811 | 105.193 | 42.442 | 2015.0 |
| 130.0 | 6437.885 | -80.09776 | 28.26380 | 28.42459 | 105.212 | 42.247 | 2058.3 |
| 131.0 | 6439.281 | -80.08272 | 28.26020 | 28.42097 | 105.231 | 42.058 | 2102.5 |
| 132.0 | 6440.702 | -80.06732 | 28.25651 | 28.41726 | 105.250 | 41.873 | 2147.6 |
| 133.0 | 6442.148 | -80.05155 | 28.25272 | 28.41346 | 105.268 | 41.692 | 2193.6 |
| 134.0 | 6443.620 | -80.03541 | 28.24883 | 28.40956 | 105.286 | 41.513 | 2240.6 |
| 135.0 | 6445.119 | -80.01886 | 28.24484 | 28.40556 | 105.306 | 41.337 | 2288.7 |
| 136.0 | 6446.644 | -80.00193 | 28.24076 | 28.40145 | 105.327 | 41.161 | 2337.6 |
| 137.0 | 6448.196 | -79.98459 | 28.23656 | 28.39725 | 105.344 | 40.983 | 2387.8 |
| 138.0 | 6449.777 | -79.96684 | 28.23227 | 28.39294 | 105.364 | 40.805 | 2439.0 |
| 139.0 | 6451.385 | -79.94867 | 28.22786 | 28.38851 | 105.381 | 40.628 | 2491.3 |
| 140.0 | 6453.022 | -79.93007 | 28.22335 | 28.38398 | 105.402 | 40.455 | 2545.0 |
| | IECØ | | | | | | |
| 140.220 | 6453.388 | -79.92592 | 28.22235 | 28.38299 | 105.402 | 40.419 | 2556.9 |

TABLE XII
GEØGRAPHIC CØØRDINATES

| TIME SEC | EC DIST KM | LØNG DEG | GC LAT DEG | LAT DEG | VEL-AZ DEG | VEL-ELEV DEG | EF VEL M/S |
|---|---|---|---|---|---|---|---|
| 141.0 | 6454.686 | -79.91105 | 28.21873 | 28.37935 | 105.418 | 40.297 | 2584.5 |
| 142.0 | 6456.363 | -79.89179 | 28.21405 | 28.37465 | 105.436 | 40.148 | 2610.0 |
| 143.0 | 6458.052 | -79.87231 | 28.20930 | 28.36989 | 105.454 | 40.005 | 2634.5 |
| 144.0 | 6459.751 | -79.85261 | 28.20450 | 28.36507 | 105.469 | 39.864 | 2659.2 |
| 145.0 | 6461.462 | -79.83270 | 28.19964 | 28.36019 | 105.487 | 39.726 | 2683.9 |
| | ØECØ | | | | | | |
| 145.560 | 6462.425 | -79.82148 | 28.19693 | 28.35747 | 105.490 | 39.652 | 2697.8 |
| 146.0 | 6463.182 | -79.81258 | 28.19473 | 28.35526 | 105.504 | 39.594 | 2700.9 |
| 147.0 | 6464.901 | -79.79240 | 28.18980 | 28.35031 | 105.520 | 39.464 | 2696.9 |
| 148.0 | 6466.611 | -79.77223 | 28.18486 | 28.34535 | 105.536 | 39.332 | 2692.0 |
| | S-IV ENGINE START | | | | | | |
| 148.120 | 6466.816 | -79.76985 | 28.18430 | 28.34479 | 105.532 | 39.318 | 2691.5 |
| 149.0 | 6468.314 | -79.75207 | 28.17992 | 28.34039 | 105.552 | 39.201 | 2687.0 |
| 150.0 | 6470.009 | -79.73192 | 28.17497 | 28.33543 | 105.569 | 39.069 | 2683.0 |
| 155.0 | 6478.412 | -79.63070 | 28.15006 | 28.31043 | 105.645 | 38.416 | 2686.3 |
| 160.0 | 6486.702 | -79.52859 | 28.12478 | 28.28505 | 105.723 | 37.772 | 2690.7 |
| | GUIDANCE INITIATIØN | | | | | | |
| 163.860 | 6493.034 | -79.44917 | 28.10503 | 28.26522 | 105.781 | 37.280 | 2695.1 |
| 165.0 | 6494.892 | -79.42561 | 28.09915 | 28.25932 | 105.798 | 37.135 | 2696.5 |
| 170.0 | 6502.983 | -79.32174 | 28.07313 | 28.23321 | 105.919 | 36.523 | 2703.0 |
| 175.0 | 6510.980 | -79.21706 | 28.04661 | 28.20659 | 106.121 | 35.934 | 2709.8 |
| 180.0 | 6518.885 | -79.11157 | 28.01953 | 28.17941 | 106.309 | 35.339 | 2717.4 |
| 185.0 | 6526.697 | -79.00523 | 27.99191 | 28.15168 | 106.477 | 34.733 | 2725.8 |
| 190.0 | 6534.416 | -78.89800 | 27.96376 | 28.12343 | 106.623 | 34.124 | 2735.0 |
| 195.0 | 6542.041 | -78.78985 | 27.93512 | 28.09468 | 106.755 | 33.517 | 2744.9 |
| 200.0 | 6549.574 | -78.68076 | 27.90599 | 28.06544 | 106.874 | 32.916 | 2755.7 |
| 205.0 | 6557.015 | -78.57070 | 27.87638 | 28.03572 | 106.980 | 32.312 | 2767.3 |
| 210.0 | 6564.367 | -78.45964 | 27.84631 | 28.00553 | 107.077 | 31.714 | 2779.6 |
| 215.0 | 6571.627 | -78.34757 | 27.81578 | 27.97488 | 107.166 | 31.115 | 2792.6 |
| 220.0 | 6578.799 | -78.23445 | 27.78479 | 27.94378 | 107.247 | 30.522 | 2806.5 |
| 225.0 | 6585.881 | -78.12026 | 27.75334 | 27.91222 | 107.323 | 29.931 | 2821.2 |

TABLE XII
GEØGRAPHIC CØØRDINATES

| TIME SEC | EC DIST KM | LØNG DEG | GC LAT DEG | LAT DEG | VEL-AZ DEG | VEL-ELEV DEG | EF VEL M/S |
|---|---|---|---|---|---|---|---|
| 230.0 | 6592.875 | -78.00498 | 27.72145 | 27.88020 | 107.396 | 29.338 | 2836.7 |
| 235.0 | 6599.780 | -77.88859 | 27.68909 | 27.84772 | 107.464 | 28.750 | 2852.9 |
| 240.0 | 6606.598 | -77.77105 | 27.65628 | 27.81478 | 107.529 | 28.165 | 2870.0 |
| 245.0 | 6613.327 | -77.65235 | 27.62300 | 27.78138 | 107.592 | 27.584 | 2887.7 |
| 250.0 | 6619.969 | -77.53247 | 27.58926 | 27.74750 | 107.654 | 27.006 | 2906.2 |
| 255.0 | 6626.525 | -77.41140 | 27.55503 | 27.71315 | 107.716 | 26.434 | 2925.4 |
| 260.0 | 6632.992 | -77.28910 | 27.52033 | 27.67831 | 107.777 | 25.863 | 2945.4 |
| 265.0 | 6639.374 | -77.16557 | 27.48513 | 27.64298 | 107.840 | 25.299 | 2966.2 |
| 270.0 | 6645.668 | -77.04077 | 27.44943 | 27.60714 | 107.902 | 24.738 | 2987.8 |
| 275.0 | 6651.877 | -76.91469 | 27.41321 | 27.57078 | 107.964 | 24.182 | 3010.2 |
| 280.0 | 6657.999 | -76.78731 | 27.37647 | 27.53390 | 108.028 | 23.633 | 3033.3 |
| 285.0 | 6664.036 | -76.65860 | 27.33920 | 27.49648 | 108.093 | 23.087 | 3057.2 |
| 290.0 | 6669.988 | -76.52856 | 27.30138 | 27.45851 | 108.159 | 22.547 | 3082.0 |
| 295.0 | 6675.854 | -76.39715 | 27.26299 | 27.41998 | 108.226 | 22.013 | 3107.5 |
| 300.0 | 6681.635 | -76.26434 | 27.22404 | 27.38088 | 108.294 | 21.484 | 3134.0 |
| 305.0 | 6687.332 | -76.13013 | 27.18449 | 27.34117 | 108.364 | 20.962 | 3161.3 |
| 310.0 | 6692.944 | -75.99448 | 27.14435 | 27.30087 | 108.435 | 20.444 | 3189.4 |
| 315.0 | 6698.473 | -75.85738 | 27.10359 | 27.25995 | 108.507 | 19.934 | 3218.4 |
| 320.0 | 6703.917 | -75.71879 | 27.06220 | 27.21840 | 108.581 | 19.431 | 3248.3 |
| 325.0 | 6709.278 | -75.57870 | 27.02016 | 27.17620 | 108.656 | 18.933 | 3279.2 |
| 330.0 | 6714.557 | -75.43707 | 26.97746 | 27.13333 | 108.732 | 18.441 | 3310.8 |
| 335.0 | 6719.751 | -75.29389 | 26.93408 | 27.08978 | 108.809 | 17.955 | 3343.4 |
| 340.0 | 6724.863 | -75.14913 | 26.89002 | 27.04554 | 108.887 | 17.476 | 3376.8 |
| 345.0 | 6729.893 | -75.00275 | 26.84525 | 27.00060 | 108.966 | 17.005 | 3411.1 |
| 350.0 | 6734.839 | -74.85475 | 26.79976 | 26.95492 | 109.045 | 16.539 | 3446.4 |
| 355.0 | 6739.703 | -74.70509 | 26.75353 | 26.90851 | 109.126 | 16.077 | 3482.5 |
| 360.0 | 6744.484 | -74.55375 | 26.70654 | 26.86134 | 109.207 | 15.624 | 3519.6 |
| 365.0 | 6749.182 | -74.40070 | 26.65879 | 26.81339 | 109.289 | 15.178 | 3557.5 |
| 370.0 | 6753.798 | -74.24591 | 26.61025 | 26.76466 | 109.372 | 14.738 | 3596.3 |
| 375.0 | 6758.330 | -74.08936 | 26.56092 | 26.71513 | 109.455 | 14.303 | 3636.1 |
| 380.0 | 6762.780 | -73.93102 | 26.51076 | 26.66477 | 109.539 | 13.875 | 3676.8 |
| 385.0 | 6767.147 | -73.77086 | 26.45977 | 26.61357 | 109.625 | 13.452 | 3718.4 |
| 390.0 | 6771.431 | -73.60885 | 26.40792 | 26.56151 | 109.709 | 13.038 | 3761.2 |
| 395.0 | 6775.632 | -73.44497 | 26.35520 | 26.50858 | 109.795 | 12.630 | 3804.8 |
| 400.0 | 6779.750 | -73.27917 | 26.30159 | 26.45475 | 109.882 | 12.229 | 3849.5 |
| 405.0 | 6783.786 | -73.11144 | 26.24707 | 26.40000 | 109.969 | 11.835 | 3895.3 |
| 410.0 | 6787.739 | -72.94173 | 26.19161 | 26.34433 | 110.056 | 11.446 | 3942.0 |
| 415.0 | 6791.609 | -72.77002 | 26.13522 | 26.28770 | 110.144 | 11.065 | 3989.9 |
| 420.0 | 6795.396 | -72.59626 | 26.07784 | 26.23009 | 110.233 | 10.688 | 4038.8 |
| 425.0 | 6799.099 | -72.42044 | 26.01948 | 26.17149 | 110.322 | 10.319 | 4088.8 |

TABLE XII
GEØGRAPHIC CØØRDINATES

| TIME SEC | EC DIST KM | LØNG DEG | GC LAT DEG | LAT DEG | VEL-AZ DEG | VEL-ELEV DEG | EF VEL M/S |
|---|---|---|---|---|---|---|---|
| 430.0 | 6802.720 | -72.24251 | 25.96011 | 26.11187 | 110.411 | 9.956 | 4139.9 |
| 435.0 | 6806.257 | -72.06244 | 25.89970 | 26.05121 | 110.502 | 9.599 | 4192.2 |
| 440.0 | 6809.710 | -71.88018 | 25.83823 | 25.98948 | 110.593 | 9.250 | 4245.6 |
| 445.0 | 6813.084 | -71.69573 | 25.77568 | 25.92667 | 110.685 | 8.905 | 4300.1 |
| 450.0 | 6816.371 | -71.50902 | 25.71202 | 25.86275 | 110.777 | 8.567 | 4355.6 |
| 455.0 | 6819.573 | -71.32003 | 25.64724 | 25.79770 | 110.870 | 8.234 | 4412.3 |
| 460.0 | 6822.690 | -71.12872 | 25.58131 | 25.73149 | 110.964 | 7.905 | 4470.2 |
| 465.0 | 6825.721 | -70.93506 | 25.51420 | 25.66410 | 111.058 | 7.584 | 4529.4 |
| 470.0 | 6828.667 | -70.73900 | 25.44589 | 25.59550 | 111.152 | 7.267 | 4589.7 |
| 475.0 | 6831.527 | -70.54050 | 25.37635 | 25.52566 | 111.246 | 6.956 | 4651.4 |
| 480.0 | 6834.301 | -70.33952 | 25.30556 | 25.45457 | 111.342 | 6.651 | 4714.5 |
| 485.0 | 6836.988 | -70.13601 | 25.23347 | 25.38217 | 111.438 | 6.352 | 4778.9 |
| 490.0 | 6839.588 | -69.92993 | 25.16007 | 25.30846 | 111.535 | 6.058 | 4844.8 |
| 495.0 | 6842.101 | -69.72124 | 25.08532 | 25.23338 | 111.633 | 5.770 | 4912.1 |
| 500.0 | 6844.526 | -69.50987 | 25.00918 | 25.15693 | 111.731 | 5.487 | 4980.8 |
| 505.0 | 6846.864 | -69.29579 | 24.93164 | 25.07905 | 111.830 | 5.210 | 5051.0 |
| 510.0 | 6849.113 | -69.07895 | 24.85265 | 24.99971 | 111.930 | 4.938 | 5122.8 |
| 515.0 | 6851.274 | -68.85929 | 24.77217 | 24.91889 | 112.030 | 4.672 | 5196.1 |
| 520.0 | 6853.345 | -68.63676 | 24.69018 | 24.83654 | 112.130 | 4.409 | 5271.2 |
| 525.0 | 6855.327 | -68.41130 | 24.60664 | 24.75263 | 112.232 | 4.153 | 5347.9 |
| 530.0 | 6857.218 | -68.18287 | 24.52150 | 24.66711 | 112.334 | 3.901 | 5426.3 |
| 535.0 | 6859.018 | -67.95139 | 24.43473 | 24.57996 | 112.437 | 3.654 | 5506.5 |
| 540.0 | 6860.727 | -67.71681 | 24.34628 | 24.49113 | 112.541 | 3.411 | 5588.5 |
| 545.0 | 6862.343 | -67.47908 | 24.25612 | 24.40056 | 112.645 | 3.173 | 5672.4 |
| 550.0 | 6863.866 | -67.23811 | 24.16420 | 24.30823 | 112.750 | 2.939 | 5758.1 |
| 555.0 | 6865.295 | -66.99386 | 24.07047 | 24.21409 | 112.856 | 2.708 | 5846.0 |
| 560.0 | 6866.628 | -66.74625 | 23.97489 | 24.11808 | 112.962 | 2.481 | 5935.8 |
| 565.0 | 6867.864 | -66.49520 | 23.87741 | 24.02015 | 113.070 | 2.260 | 6028.0 |
| 570.0 | 6869.004 | -66.24063 | 23.77797 | 23.92027 | 113.177 | 2.043 | 6122.6 |
| 575.0 | 6870.046 | -65.98247 | 23.67652 | 23.81836 | 113.286 | 1.828 | 6219.3 |
| 580.0 | 6870.988 | -65.72063 | 23.57301 | 23.71437 | 113.395 | 1.617 | 6318.7 |
| 585.0 | 6871.828 | -65.45503 | 23.46737 | 23.60825 | 113.504 | 1.409 | 6420.7 |
| 590.0 | 6872.566 | -65.18558 | 23.35954 | 23.49993 | 113.616 | 1.204 | 6525.0 |
| 595.0 | 6873.199 | -64.91218 | 23.24947 | 23.38935 | 113.728 | 1.001 | 6632.2 |
| 600.0 | 6873.725 | -64.63476 | 23.13708 | 23.27644 | 113.841 | 0.803 | 6742.1 |
| 605.0 | 6874.142 | -64.35321 | 23.02231 | 23.16114 | 113.955 | 0.607 | 6854.8 |
| 610.0 | 6874.450 | -64.06743 | 22.90509 | 23.04337 | 114.069 | 0.412 | 6970.8 |
| 615.0 | 6874.643 | -63.77731 | 22.78535 | 22.92306 | 114.184 | 0.219 | 7089.9 |
| 620.0 | 6874.717 | -63.48274 | 22.66300 | 22.80014 | 114.299 | 0.028 | 7212.8 |
| | S-IV CUTØFF | | | | | | |
| 621.659 | 6874.716 | -63.38399 | 22.62182 | 22.75876 | 114.338 | -0.035 | 7254.5 |

TABLE XII
GEØGRAPHIC CØØRDINATES

| TIME SEC | EC DIST KM | LØNG DEG | GC LAT DEG | LAT DEG | VEL-AZ DEG | VEL-ELEV DEG | EF VEL M/S |
|---|---|---|---|---|---|---|---|
| 625.0 | 6874.699 | -63.18465 | 22.53839 | 22.67494 | 114.424 | -0.036 | 7257.7 |
| 630.0 | 6874.679 | -62.88679 | 22.41302 | 22.54897 | 114.555 | -0.030 | 7257.9 |
| | INSERTIØN | | | | | | |
| 631.659 | 6874.673 | -62.78809 | 22.37128 | 22.50703 | 114.598 | -0.029 | 7257.9 |

TABLE XIII

SPECIAL TRAJECTØRY DEPENDENT PARAMETERS

| TIME SEC | SF VEL M/S | FLT-PATH DEG | HEAD DEG | MACH | DYN-PRES N/CM SQ | RANGE M | ALTITUDE M |
|---|---|---|---|---|---|---|---|
| | FIRST MØTIØN | | | | | | |
| 0.080 | 408.9 | 0. | 90.000 | 0.014 | 0.001 | 0 | 32 |
| | LIFTØFF SIGNAL | | | | | | |
| 0.280 | 409.0 | 0.095 | 89.996 | 0.014 | 0.001 | 0 | 32 |
| 1.0 | 409.0 | 0.446 | 89.987 | 0.017 | 0.002 | 0 | 33 |
| 2.0 | 409.0 | 0.950 | 89.983 | 0.024 | 0.004 | 0 | 38 |
| 3.0 | 409.0 | 1.469 | 89.982 | 0.034 | 0.008 | 0 | 47 |
| 4.0 | 409.0 | 2.000 | 89.982 | 0.044 | 0.014 | 0 | 59 |
| 5.0 | 409.1 | 2.541 | 89.980 | 0.055 | 0.021 | -0 | 75 |
| 6.0 | 409.2 | 3.093 | 89.975 | 0.066 | 0.031 | -0 | 95 |
| 7.0 | 409.4 | 3.654 | 89.968 | 0.078 | 0.043 | -0 | 119 |
| 8.0 | 409.6 | 4.226 | 89.959 | 0.090 | 0.057 | -1 | 148 |
| 9.0 | 409.9 | 4.807 | 89.950 | 0.102 | 0.073 | -1 | 180 |
| 10.0 | 410.3 | 5.400 | 89.941 | 0.115 | 0.092 | -2 | 216 |
| 11.0 | 410.7 | 6.005 | 89.934 | 0.128 | 0.114 | -3 | 257 |
| 12.0 | 411.2 | 6.621 | 89.929 | 0.140 | 0.137 | -4 | 302 |
| 13.0 | 411.7 | 7.248 | 89.927 | 0.153 | 0.162 | -4 | 352 |
| 14.0 | 412.4 | 7.887 | 89.930 | 0.167 | 0.190 | -5 | 406 |
| 15.0 | 413.2 | 8.536 | 89.936 | 0.180 | 0.221 | -6 | 465 |
| 16.0 | 414.0 | 9.195 | 89.947 | 0.195 | 0.255 | -7 | 529 |
| 17.0 | 415.1 | 9.862 | 89.961 | 0.209 | 0.292 | -7 | 597 |
| 18.0 | 416.2 | 10.535 | 89.980 | 0.224 | 0.332 | -7 | 671 |
| 19.0 | 417.6 | 11.213 | 90.003 | 0.239 | 0.375 | -7 | 749 |
| 20.0 | 419.2 | 11.893 | 90.029 | 0.254 | 0.420 | -7 | 833 |
| 21.0 | 420.9 | 12.575 | 90.059 | 0.269 | 0.468 | -5 | 922 |
| 22.0 | 422.9 | 13.257 | 90.093 | 0.285 | 0.519 | -4 | 1016 |
| 23.0 | 425.1 | 13.936 | 90.130 | 0.301 | 0.572 | 5 | 1116 |
| 24.0 | 427.6 | 14.611 | 90.171 | 0.318 | 0.628 | 7 | 1221 |
| 25.0 | 430.3 | 15.283 | 90.217 | 0.335 | 0.687 | 11 | 1332 |
| 26.0 | 433.3 | 15.950 | 90.267 | 0.352 | 0.748 | 18 | 1448 |
| 27.0 | 436.5 | 16.611 | 90.323 | 0.369 | 0.811 | 26 | 1570 |
| 28.0 | 440.0 | 17.268 | 90.386 | 0.386 | 0.877 | 36 | 1698 |
| 29.0 | 443.7 | 17.920 | 90.454 | 0.404 | 0.944 | 49 | 1831 |
| 30.0 | 447.6 | 18.575 | 90.529 | 0.423 | 1.016 | 63 | 1971 |

TABLE XIII

SPECIAL TRAJECTØRY DEPENDENT PARAMETERS

| TIME SEC | SF VEL M/S | FLT-PATH DEG | HEAD DEG | MACH | DYN-PRES N/CM SQ | RANGE M | ALTITUDE M |
|---|---|---|---|---|---|---|---|
| 31.0 | 451.8 | 19.221 | 90.608 | 0.442 | 1.090 | 80 | 2116 |
| 32.0 | 456.1 | 19.850 | 90.688 | 0.461 | 1.166 | 99 | 2268 |
| 33.0 | 460.7 | 20.477 | 90.767 | 0.481 | 1.245 | 121 | 2426 |
| 34.0 | 465.4 | 21.098 | 90.841 | 0.502 | 1.329 | 145 | 2591 |
| 35.0 | 470.4 | 21.710 | 90.914 | 0.523 | 1.417 | 172 | 2761 |
| 36.0 | 475.6 | 22.314 | 90.991 | 0.545 | 1.503 | 202 | 2938 |
| 37.0 | 480.9 | 22.902 | 91.078 | 0.567 | 1.590 | 235 | 3122 |
| 38.0 | 486.5 | 23.482 | 91.181 | 0.589 | 1.679 | 272 | 3313 |
| 39.0 | 492.3 | 24.052 | 91.293 | 0.612 | 1.770 | 311 | 3510 |
| 40.0 | 498.2 | 24.617 | 91.407 | 0.637 | 1.870 | 354 | 3714 |
| 41.0 | 504.3 | 25.178 | 91.513 | 0.662 | 1.965 | 401 | 3925 |
| 42.0 | 510.5 | 25.736 | 91.609 | 0.686 | 2.056 | 451 | 4143 |
| 43.0 | 516.9 | 26.287 | 91.699 | 0.711 | 2.146 | 505 | 4368 |
| 44.0 | 523.5 | 26.828 | 91.788 | 0.737 | 2.238 | 562 | 4601 |
| 45.0 | 530.3 | 27.353 | 91.879 | 0.764 | 2.333 | 624 | 4841 |
| 46.0 | 537.4 | 27.864 | 91.969 | 0.791 | 2.427 | 689 | 5088 |
| 47.0 | 544.7 | 28.359 | 92.050 | 0.819 | 2.515 | 758 | 5343 |
| 48.0 | 552.1 | 28.843 | 92.117 | 0.847 | 2.602 | 832 | 5606 |
| 49.0 | 559.8 | 29.317 | 92.175 | 0.877 | 2.696 | 910 | 5876 |
| 50.0 | 567.6 | 29.778 | 92.233 | 0.907 | 2.780 | 993 | 6154 |
| 51.0 | 575.6 | 30.221 | 92.302 | 0.936 | 2.857 | 1080 | 6440 |
| 52.0 | 583.7 | 30.638 | 92.391 | 0.965 | 2.921 | 1172 | 6733 |
| 53.0 | 591.9 | 31.023 | 92.500 | 0.994 | 2.977 | 1269 | 7034 |
| | MACH ØNE | | | | | | |
| 53.208 | 593.7 | 31.099 | 92.524 | 1.000 | 2.986 | 1290 | 7098 |
| 54.0 | 600.3 | 31.377 | 92.622 | 1.023 | 3.022 | 1371 | 7343 |
| 55.0 | 608.6 | 31.704 | 92.749 | 1.055 | 3.080 | 1479 | 7659 |
| 56.0 | 617.1 | 32.014 | 92.877 | 1.088 | 3.137 | 1592 | 7983 |
| 57.0 | 625.6 | 32.313 | 93.004 | 1.124 | 3.194 | 1711 | 8314 |
| 58.0 | 634.4 | 32.608 | 93.135 | 1.159 | 3.241 | 1835 | 8652 |
| 59.0 | 643.4 | 32.898 | 93.274 | 1.191 | 3.257 | 1965 | 8997 |
| 60.0 | 652.7 | 33.181 | 93.423 | 1.227 | 3.289 | 2101 | 9351 |
| 61.0 | 662.4 | 33.453 | 93.568 | 1.262 | 3.304 | 2243 | 9712 |
| 62.0 | 672.5 | 33.711 | 93.693 | 1.297 | 3.306 | 2393 | 10081 |
| 63.0 | 683.1 | 33.957 | 93.790 | 1.323 | 3.255 | 2549 | 10458 |
| 64.0 | 694.0 | 34.197 | 93.866 | 1.353 | 3.218 | 2712 | 10844 |
| 65.0 | 705.2 | 34.436 | 93.936 | 1.400 | 3.252 | 2883 | 11238 |

TABLE XIII
SPECIAL TRAJECTØRY DEPENDENT PARAMETERS

| TIME SEC | SF VEL M/S | FLT-PATH DEG | HEAD DEG | MACH | DYN-PRES N/CM SQ | RANGE M | ALTITUDE M |
|---|---|---|---|---|---|---|---|
| | MAXIMUM DYNAMIC PRESSURE | | | | | | |
| 66.000 | 716.7 | 34.678 | 94.017 | 1.447 | 3.270 | 3062 | 11641 |
| 67.0 | 728.5 | 34.922 | 94.112 | 1.494 | 3.278 | 3248 | 12054 |
| 68.0 | 740.5 | 35.163 | 94.216 | 1.547 | 3.295 | 3442 | 12476 |
| 69.0 | 752.9 | 35.397 | 94.319 | 1.601 | 3.300 | 3645 | 12907 |
| 70.0 | 765.7 | 35.620 | 94.419 | 1.658 | 3.304 | 3856 | 13348 |
| 71.0 | 778.8 | 35.833 | 94.525 | 1.715 | 3.286 | 4076 | 13798 |
| 72.0 | 792.3 | 36.036 | 94.650 | 1.773 | 3.260 | 4305 | 14259 |
| 73.0 | 806.2 | 36.232 | 94.792 | 1.833 | 3.223 | 4544 | 14731 |
| 74.0 | 820.5 | 36.422 | 94.945 | 1.890 | 3.162 | 4792 | 15212 |
| 75.0 | 835.1 | 36.606 | 95.103 | 1.961 | 3.132 | 5051 | 15705 |
| 76.0 | 850.1 | 36.785 | 95.261 | 2.020 | 3.049 | 5320 | 16208 |
| 77.0 | 865.5 | 36.959 | 95.418 | 2.096 | 3.006 | 5599 | 16723 |
| 78.0 | 881.3 | 37.126 | 95.578 | 2.145 | 2.873 | 5890 | 17249 |
| 79.0 | 897.5 | 37.287 | 95.743 | 2.221 | 2.808 | 6192 | 17787 |
| 80.0 | 914.1 | 37.441 | 95.909 | 2.268 | 2.663 | 6506 | 18336 |
| 81.0 | 931.2 | 37.585 | 96.076 | 2.336 | 2.565 | 6831 | 18898 |
| 82.0 | 948.7 | 37.715 | 96.242 | 2.368 | 2.391 | 7169 | 19472 |
| 83.0 | 966.8 | 37.833 | 96.410 | 2.409 | 2.244 | 7520 | 20059 |
| 84.0 | 985.3 | 37.936 | 96.579 | 2.453 | 2.110 | 7884 | 20658 |
| 85.0 | 1004.4 | 38.027 | 96.747 | 2.504 | 1.993 | 8263 | 21270 |
| 86.0 | 1023.8 | 38.107 | 96.912 | 2.555 | 1.880 | 8655 | 21895 |
| 87.0 | 1043.8 | 38.174 | 97.074 | 2.617 | 1.782 | 9062 | 22534 |
| 88.0 | 1064.2 | 38.229 | 97.232 | 2.673 | 1.679 | 9484 | 23185 |
| 89.0 | 1085.0 | 38.271 | 97.386 | 2.728 | 1.576 | 9922 | 23850 |
| 90.0 | 1106.4 | 38.298 | 97.538 | 2.771 | 1.464 | 10377 | 24529 |
| 91.0 | 1128.2 | 38.312 | 97.689 | 2.836 | 1.379 | 10847 | 25221 |
| 92.0 | 1150.4 | 38.313 | 97.839 | 2.896 | 1.292 | 11335 | 25927 |
| 93.0 | 1173.2 | 38.303 | 97.988 | 2.978 | 1.223 | 11841 | 26647 |
| 94.0 | 1196.4 | 38.282 | 98.136 | 3.058 | 1.153 | 12366 | 27380 |
| 95.0 | 1220.0 | 38.252 | 98.283 | 3.124 | 1.074 | 12910 | 28126 |
| 96.0 | 1244.2 | 38.213 | 98.427 | 3.154 | 0.977 | 13473 | 28886 |
| 97.0 | 1268.7 | 38.167 | 98.568 | 3.210 | 0.902 | 14055 | 29661 |
| 98.0 | 1293.7 | 38.115 | 98.705 | 3.299 | 0.847 | 14657 | 30452 |
| 99.0 | 1319.1 | 38.056 | 98.839 | 3.382 | 0.790 | 15279 | 31257 |
| 100.0 | 1345.0 | 37.992 | 98.970 | 3.439 | 0.723 | 15922 | 32078 |
| 101.0 | 1371.4 | 37.921 | 99.100 | 3.474 | 0.654 | 16586 | 32913 |

TABLE XIII
SPECIAL TRAJECTØRY DEPENDENT PARAMETERS

| TIME SEC | SF VEL M/S | FLT-PATH DEG | HEAD DEG | MACH | DYN-PRES N/CM SQ | RANGE M | ALTITUDE M |
|---|---|---|---|---|---|---|---|
| 102.0 | 1398.3 | 37.845 | 99.228 | 3.564 | 0.608 | 17273 | 33763 |
| 103.0 | 1425.6 | 37.764 | 99.356 | 3.680 | 0.578 | 17982 | 34628 |
| 104.0 | 1453.4 | 37.680 | 99.482 | 3.741 | 0.533 | 18713 | 35508 |
| 105.0 | 1481.6 | 37.594 | 99.603 | 3.802 | 0.490 | 19468 | 36404 |
| 106.0 | 1510.3 | 37.505 | 99.719 | 3.863 | 0.449 | 20247 | 37315 |
| 107.0 | 1539.5 | 37.416 | 99.835 | 3.925 | 0.411 | 21050 | 38242 |
| 108.0 | 1569.3 | 37.326 | 99.949 | 3.990 | 0.375 | 21878 | 39185 |
| 109.0 | 1599.5 | 37.236 | 100.062 | 4.062 | 0.342 | 22731 | 40145 |
| 110.0 | 1630.2 | 37.146 | 100.174 | 4.135 | 0.312 | 23609 | 41120 |
| 111.0 | 1661.5 | 37.055 | 100.283 | 4.210 | 0.284 | 24513 | 42112 |
| 112.0 | 1693.3 | 36.965 | 100.388 | 4.286 | 0.259 | 25444 | 43122 |
| 113.0 | 1725.7 | 36.874 | 100.490 | 4.364 | 0.236 | 26402 | 44148 |
| 114.0 | 1758.6 | 36.785 | 100.590 | 4.445 | 0.214 | 27387 | 45192 |
| 115.0 | 1792.0 | 36.696 | 100.689 | 4.529 | 0.195 | 28400 | 46253 |
| 116.0 | 1826.0 | 36.610 | 100.786 | 4.617 | 0.177 | 29442 | 47332 |
| 117.0 | 1860.7 | 36.527 | 100.882 | 4.710 | 0.161 | 30512 | 48430 |
| 118.0 | 1895.9 | 36.446 | 100.976 | 4.817 | 0.146 | 31612 | 49546 |
| 119.0 | 1931.7 | 36.368 | 101.068 | 4.938 | 0.134 | 32741 | 50681 |
| 120.0 | 1968.2 | 36.293 | 101.160 | 5.066 | 0.122 | 33900 | 51836 |
| 121.0 | 2005.2 | 36.221 | 101.250 | 5.199 | 0.111 | 35090 | 53010 |
| 122.0 | 2043.0 | 36.152 | 101.339 | 5.339 | 0.100 | 36312 | 54204 |
| 123.0 | 2081.4 | 36.085 | 101.425 | 5.486 | 0.091 | 37565 | 55419 |
| 124.0 | 2120.6 | 36.022 | 101.509 | 5.640 | 0.081 | 38850 | 56655 |
| 125.0 | 2160.4 | 35.961 | 101.591 | 5.801 | 0.073 | 40168 | 57912 |
| 126.0 | 2201.0 | 35.903 | 101.672 | 5.970 | 0.065 | 41519 | 59191 |
| 127.0 | 2242.4 | 35.848 | 101.751 | 6.146 | 0.058 | 42905 | 60491 |
| 128.0 | 2284.6 | 35.797 | 101.828 | 6.330 | 0.051 | 44324 | 61815 |
| 129.0 | 2327.5 | 35.748 | 101.905 | 6.521 | 0.045 | 45779 | 63162 |
| 130.0 | 2371.3 | 35.702 | 101.982 | 6.721 | 0.039 | 47269 | 64533 |
| 131.0 | 2416.0 | 35.657 | 102.058 | 6.929 | 0.034 | 48796 | 65928 |
| 132.0 | 2461.6 | 35.613 | 102.133 | 7.145 | 0.030 | 50360 | 67348 |
| 133.0 | 2508.2 | 35.570 | 102.206 | 7.370 | 0.025 | 51961 | 68793 |
| 134.0 | 2555.7 | 35.527 | 102.278 | 7.603 | 0.022 | 53601 | 70264 |
| 135.0 | 2604.2 | 35.483 | 102.352 | 7.844 | 0.018 | 55281 | 71761 |
| 136.0 | 2653.6 | 35.436 | 102.425 | 8.095 | 0.015 | 57002 | 73285 |
| 137.0 | 2704.3 | 35.385 | 102.494 | 8.356 | 0.013 | 58764 | 74836 |
| 138.0 | 2756.0 | 35.332 | 102.565 | 8.627 | 0.010 | 60568 | 76415 |
| 139.0 | 2808.9 | 35.277 | 102.633 | 8.910 | 0.008 | 62415 | 78022 |
| 140.0 | 2863.0 | 35.224 | 102.703 | 9.208 | 0.007 | 64306 | 79658 |
| | IECØ | | | | | | |
| 140.220 | 2875.1 | 35.213 | 102.714 | 9.276 | 0.006 | 64727 | 80024 |

TABLE XIII

SPECIAL TRAJECTØRY DEPENDENT PARAMETERS

| TIME SEC | SF VEL M/S | FLT-PATH DEG | HEAD DEG | MACH | DYN-PRES N/CM SQ | RANGE M | ALTITUDE M |
|---|---|---|---|---|---|---|---|
| 141.0 | 2903.1 | 35.154 | 102.755 | 9.466 | 0.005 | 66239 | 81320 |
| 142.0 | 2929.1 | 35.065 | 102.796 | 9.686 | 0.004 | 68198 | 82996 |
| 143.0 | 2954.2 | 34.980 | 102.835 | 9.778 | 0.003 | 70179 | 84684 |
| 144.0 | 2979.4 | 34.895 | 102.872 | 9.869 | 0.002 | 72182 | 86382 |
| 145.0 | 3004.7 | 34.813 | 102.911 | 9.961 | 0.002 | 74208 | 88090 |
| | ØECØ | | | | | | |
| 145.560 | 3018.8 | 34.769 | 102.926 | 10.013 | 0.001 | 75347 | 89053 |
| 146.0 | 3022.2 | 34.722 | 102.942 | 10.024 | 0.001 | 76254 | 89809 |
| 147.0 | 3018.8 | 34.599 | 102.956 | 9.885 | 0.001 | 78307 | 91526 |
| 148.0 | 3014.5 | 34.472 | 102.969 | 9.733 | 0.001 | 80359 | 93235 |
| | S-IV ENGINE START | | | | | | |
| 148.120 | 3014.1 | 34.459 | 102.965 | 9.715 | 0.001 | 80601 | 93440 |
| 149.0 | 3010.1 | 34.347 | 102.982 | 9.587 | 0.000 | 82411 | 94936 |
| 150.0 | 3006.8 | 34.221 | 102.995 | 9.451 | 0.000 | 84462 | 96630 |
| 155.0 | 3013.0 | 33.642 | 103.078 | 8.727 | 0.000 | 94768 | 105025 |
| 160.0 | 3020.3 | 33.072 | 103.163 | 7.832 | 0.000 | 105170 | 113308 |
| | GUIDANCE INITIATIØN | | | | | | |
| 163.860 | 3026.8 | 32.638 | 103.227 | 7.116 | 0.000 | 113266 | 119633 |
| 165.0 | 3028.9 | 32.511 | 103.246 | 6.807 | 0.000 | 115668 | 121489 |
| 170.0 | 3038.0 | 31.974 | 103.367 | 5.739 | 0.000 | 126264 | 129572 |
| 175.0 | 3047.1 | 31.459 | 103.555 | 5.066 | 0.000 | 136955 | 137561 |
| 180.0 | 3057.1 | 30.940 | 103.733 | 4.596 | 0.000 | 147742 | 145458 |
| 185.0 | 3067.9 | 30.412 | 103.895 | 4.279 | 0.000 | 158627 | 153261 |
| 190.0 | 3079.5 | 29.883 | 104.039 | 4.076 | 0.000 | 169616 | 160971 |
| 195.0 | 3091.8 | 29.355 | 104.171 | 3.958 | 0.000 | 180709 | 168587 |
| 200.0 | 3105.0 | 28.835 | 104.293 | 3.883 | 0.000 | 191910 | 176111 |
| 205.0 | 3118.9 | 28.313 | 104.404 | 3.821 | 0.000 | 203220 | 183544 |
| 210.0 | 3133.5 | 27.795 | 104.507 | 3.767 | 0.000 | 214641 | 190885 |
| 215.0 | 3148.8 | 27.278 | 104.604 | 3.735 | 0.000 | 226176 | 198137 |
| 220.0 | 3164.9 | 26.767 | 104.695 | 3.706 | 0.000 | 237827 | 205298 |
| 225.0 | 3181.8 | 26.258 | 104.781 | 3.680 | 0.000 | 249596 | 212371 |

TABLE XIII
SPECIAL TRAJECTØRY DEPENDENT PARAMETERS

| TIME SEC | SF VEL M/S | FLT-PATH DEG | HEAD DEG | MACH | DYN-PRES N/CM SQ | RANGE M | ALTITUDE M |
|---|---|---|---|---|---|---|---|
| 230.0 | 3199.5 | 25.748 | 104.865 | 3.657 | 0.000 | 261487 | 219355 |
| 235.0 | 3217.8 | 25.242 | 104.945 | 3.636 | 0.000 | 273501 | 226250 |
| 240.0 | 3237.0 | 24.740 | 105.023 | 3.621 | 0.000 | 285641 | 233058 |
| 245.0 | 3256.8 | 24.241 | 105.100 | 3.613 | 0.000 | 297909 | 239777 |
| 250.0 | 3277.3 | 23.746 | 105.175 | 3.606 | 0.000 | 310307 | 246409 |
| 255.0 | 3298.4 | 23.255 | 105.251 | 3.601 | 0.000 | 322837 | 252954 |
| 260.0 | 3320.4 | 22.766 | 105.326 | 3.597 | 0.000 | 335502 | 259411 |
| 265.0 | 3343.0 | 22.283 | 105.402 | 3.595 | 0.000 | 348304 | 265781 |
| 270.0 | 3366.4 | 21.802 | 105.478 | 3.595 | 0.000 | 361245 | 272065 |
| 275.0 | 3390.6 | 21.326 | 105.554 | 3.596 | 0.000 | 374328 | 278262 |
| 280.0 | 3415.4 | 20.856 | 105.632 | 3.598 | 0.000 | 387556 | 284374 |
| 285.0 | 3441.0 | 20.389 | 105.711 | 3.602 | 0.000 | 400930 | 290399 |
| 290.0 | 3467.4 | 19.927 | 105.791 | 3.608 | 0.000 | 414453 | 296339 |
| 295.0 | 3494.6 | 19.469 | 105.872 | 3.616 | 0.000 | 428129 | 302194 |
| 300.0 | 3522.6 | 19.016 | 105.954 | 3.628 | 0.000 | 441959 | 307963 |
| 305.0 | 3551.4 | 18.569 | 106.038 | 3.641 | 0.000 | 455946 | 313648 |
| 310.0 | 3581.0 | 18.126 | 106.122 | 3.656 | 0.000 | 470094 | 319248 |
| 315.0 | 3611.4 | 17.688 | 106.208 | 3.671 | 0.000 | 484406 | 324764 |
| 320.0 | 3642.6 | 17.256 | 106.296 | 3.688 | 0.000 | 498883 | 330196 |
| 325.0 | 3674.9 | 16.830 | 106.384 | 3.706 | 0.000 | 513530 | 335544 |
| 330.0 | 3707.8 | 16.407 | 106.474 | 3.725 | 0.000 | 528349 | 340810 |
| 335.0 | 3741.6 | 15.990 | 106.565 | 3.746 | 0.000 | 543344 | 345991 |
| 340.0 | 3776.2 | 15.578 | 106.656 | 3.767 | 0.000 | 558517 | 351090 |
| 345.0 | 3811.7 | 15.172 | 106.749 | 3.790 | 0.000 | 573872 | 356106 |
| 350.0 | 3848.0 | 14.771 | 106.842 | 3.814 | 0.000 | 589411 | 361039 |
| 355.0 | 3885.3 | 14.373 | 106.937 | 3.839 | 0.000 | 605138 | 365888 |
| 360.0 | 3923.4 | 13.981 | 107.031 | 3.865 | 0.000 | 621057 | 370655 |
| 365.0 | 3962.3 | 13.595 | 107.127 | 3.892 | 0.000 | 637171 | 375339 |
| 370.0 | 4002.1 | 13.215 | 107.224 | 3.920 | 0.000 | 653482 | 379940 |
| 375.0 | 4042.8 | 12.838 | 107.320 | 3.949 | 0.000 | 669994 | 384458 |
| 380.0 | 4084.4 | 12.466 | 107.418 | 3.980 | 0.000 | 686711 | 388893 |
| 385.0 | 4126.9 | 12.100 | 107.518 | 4.011 | 0.000 | 703636 | 393244 |
| 390.0 | 4170.5 | 11.739 | 107.616 | 4.044 | 0.000 | 720774 | 397513 |
| 395.0 | 4215.0 | 11.383 | 107.716 | 4.079 | 0.000 | 738127 | 401698 |
| 400.0 | 4260.4 | 11.034 | 107.816 | 4.117 | 0.000 | 755700 | 405801 |
| 405.0 | 4306.9 | 10.690 | 107.917 | 4.156 | 0.000 | 773497 | 409820 |
| 410.0 | 4354.4 | 10.350 | 108.018 | 4.196 | 0.000 | 791522 | 413757 |
| 415.0 | 4402.9 | 10.016 | 108.121 | 4.237 | 0.000 | 809779 | 417610 |
| 420.0 | 4452.5 | 9.685 | 108.223 | 4.280 | 0.000 | 828272 | 421380 |
| 425.0 | 4503.1 | 9.360 | 108.326 | 4.323 | 0.000 | 847005 | 425066 |

TABLE XIII

SPECIAL TRAJECTØRY DEPENDENT PARAMETERS

| TIME SEC | SF VEL M/S | FLT-PATH DEG | HEAD DEG | MACH | DYN-PRES N/CM SQ | RANGE M | ALTITUDE M |
|---|---|---|---|---|---|---|---|
| 430.0 | 4554.8 | 9.041 | 108.430 | 4.368 | 0.000 | 865984 | 428669 |
| 435.0 | 4607.7 | 8.727 | 108.534 | 4.414 | 0.000 | 885212 | 432188 |
| 440.0 | 4661.7 | 8.418 | 108.640 | 4.462 | 0.000 | 904695 | 435624 |
| 445.0 | 4716.7 | 8.113 | 108.746 | 4.510 | 0.000 | 924435 | 438979 |
| 450.0 | 4772.7 | 7.813 | 108.852 | 4.560 | 0.000 | 944439 | 442247 |
| 455.0 | 4829.9 | 7.518 | 108.959 | 4.611 | 0.000 | 964711 | 445430 |
| 460.0 | 4888.3 | 7.225 | 109.066 | 4.663 | 0.000 | 985256 | 448528 |
| 465.0 | 4947.8 | 6.939 | 109.175 | 4.717 | 0.000 | 1006078 | 451540 |
| 470.0 | 5008.6 | 6.656 | 109.283 | 4.772 | 0.000 | 1027183 | 454466 |
| 475.0 | 5070.7 | 6.379 | 109.391 | 4.828 | 0.000 | 1048577 | 457306 |
| 480.0 | 5134.1 | 6.105 | 109.501 | 4.886 | 0.000 | 1070265 | 460059 |
| 485.0 | 5198.9 | 5.837 | 109.612 | 4.945 | 0.000 | 1092252 | 462725 |
| 490.0 | 5265.1 | 5.573 | 109.723 | 5.006 | 0.000 | 1114546 | 465304 |
| 495.0 | 5332.8 | 5.313 | 109.835 | 5.069 | 0.000 | 1137153 | 467796 |
| 500.0 | 5401.8 | 5.059 | 109.947 | 5.133 | 0.000 | 1160078 | 470199 |
| 505.0 | 5472.3 | 4.808 | 110.061 | 5.198 | 0.000 | 1183327 | 472514 |
| 510.0 | 5544.4 | 4.562 | 110.175 | 5.266 | 0.000 | 1206909 | 474741 |
| 515.0 | 5617.9 | 4.320 | 110.289 | 5.335 | 0.000 | 1230829 | 476879 |
| 520.0 | 5693.3 | 4.082 | 110.404 | 5.406 | 0.000 | 1255095 | 478927 |
| 525.0 | 5770.1 | 3.848 | 110.520 | 5.479 | 0.000 | 1279714 | 480884 |
| 530.0 | 5848.7 | 3.619 | 110.637 | 5.553 | 0.000 | 1304693 | 482752 |
| 535.0 | 5929.1 | 3.393 | 110.755 | 5.630 | 0.000 | 1330041 | 484527 |
| 540.0 | 6011.3 | 3.171 | 110.873 | 5.709 | 0.000 | 1355765 | 486211 |
| 545.0 | 6095.4 | 2.952 | 110.992 | 5.789 | 0.000 | 1381875 | 487802 |
| 550.0 | 6181.2 | 2.737 | 111.111 | 5.872 | 0.000 | 1408377 | 489300 |
| 555.0 | 6269.3 | 2.525 | 111.232 | 5.957 | 0.000 | 1435283 | 490702 |
| 560.0 | 6359.2 | 2.316 | 111.353 | 6.044 | 0.000 | 1462599 | 492008 |
| 565.0 | 6451.5 | 2.111 | 111.475 | 6.134 | 0.000 | 1490338 | 493218 |
| 570.0 | 6546.2 | 1.911 | 111.597 | 6.227 | 0.000 | 1518509 | 494330 |
| 575.0 | 6643.0 | 1.711 | 111.721 | 6.321 | 0.000 | 1547124 | 495344 |
| 580.0 | 6742.5 | 1.515 | 111.845 | 6.419 | 0.000 | 1576192 | 496257 |
| 585.0 | 6844.5 | 1.322 | 111.969 | 6.520 | 0.000 | 1605727 | 497069 |
| 590.0 | 6949.0 | 1.131 | 112.096 | 6.624 | 0.000 | 1635739 | 497777 |
| 595.0 | 7056.1 | 0.941 | 112.223 | 6.730 | 0.000 | 1666241 | 498380 |
| 600.0 | 7166.0 | 0.755 | 112.351 | 6.840 | 0.000 | 1697246 | 498875 |
| 605.0 | 7278.8 | 0.572 | 112.480 | 6.953 | 0.000 | 1728766 | 499262 |
| 610.0 | 7394.8 | 0.389 | 112.609 | 7.069 | 0.000 | 1760816 | 499538 |
| 615.0 | 7513.9 | 0.207 | 112.740 | 7.190 | 0.000 | 1793411 | 499699 |
| 620.0 | 7636.8 | 0.027 | 112.871 | 7.314 | 0.000 | 1826565 | 499741 |
| | S-IV CUTØFF | | | | | | |
| 621.659 | 7678.5 | -0.033 | 112.915 | 7.356 | 0.000 | 1837692 | 499728 |

TABLE XIII
SPECIAL TRAJECTØRY DEPENDENT PARAMETERS

| TIME SEC | SF VEL M/S | FLT-PATH DEG | HEAD DEG | MACH | DYN-PRES N/CM SQ | RANGE M | ALTITUDE M |
|---|---|---|---|---|---|---|---|
| 625.0 | 7681.7 | -0.034 | 112.996 | 7.360 | 0.000 | 1860177 | 499690 |
| 630.0 | 7681.8 | -0.029 | 113.118 | 7.360 | 0.000 | 1893828 | 499636 |
| | INSERTIØN | | | | | | |
| 631.659 | 7681.8 | -0.027 | 113.159 | 7.360 | 0.000 | 1904994 | 499619 |

TABLE XIV BOOSTER FREE FLIGHT TRAJECTORY

| Time (sec) | Earth-Fixed Position XE (ft) | YE (ft) | ZE (ft) | Earth-Fixed Velocity DXE (ft/s) | DYE (ft/s) | DZE (ft/s) | Altitude (ft) | Range (nm) |
|---|---|---|---|---|---|---|---|---|
| 160 | 349605 | 367361 | 7 | 6827 | 5089 | 43 | 370225 | 56 |
| 180 | 485854 | 463213 | 981 | 6801 | 4491 | 56 | 468731 | 78 |
| 200 | 621649 | 547116 | 2205 | 6775 | 3897 | 66 | 556115 | 100 |
| 220 | 756897 | 619169 | 3668 | 6748 | 3307 | 79 | 632460 | 121 |
| 240 | 891554 | 679457 | 5361 | 6716 | 2723 | 92 | 697843 | 142 |
| 260 | 1025578 | 728055 | 7280 | 6686 | 2139 | 102 | 752327 | 163 |
| 280 | 1158929 | 765030 | 9406 | 6650 | 1558 | 112 | 795965 | 184 |
| 300 | 1291566 | 790427 | 11739 | 6614 | 981 | 121 | 828796 | 204 |
| 320 | 1423444 | 804285 | 14262 | 6575 | 404 | 131 | 850853 | 225 |
| 340 | 1554525 | 806634 | 16965 | 6532 | -171 | 141 | 862155 | 245 |
| 360 | 1684766 | 797484 | 19842 | 6489 | -745 | 148 | 862712 | 266 |
| 380 | 1814125 | 776841 | 22884 | 6447 | -1319 | 157 | 852526 | 287 |
| 400 | 1942558 | 744702 | 26073 | 6398 | -1896 | 164 | 831588 | 307 |
| 420 | 2070021 | 701038 | 29399 | 6348 | -2470 | 171 | 799879 | 328 |
| 440 | 2196466 | 645829 | 32857 | 6296 | -3051 | 177 | 757366 | 349 |
| 460 | 2321848 | 579028 | 36433 | 6240 | -3632 | 180 | 704007 | 370 |
| 480 | 2446115 | 500578 | 40111 | 6184 | -4216 | 187 | 639759 | 391 |
| 500 | 2569214 | 410418 | 43887 | 6125 | -4803 | 190 | 564557 | 412 |
| 520 | 2691089 | 308464 | 47742 | 6063 | -5394 | 194 | 478324 | 434 |
| 540 | 2811682 | 194627 | 51666 | 5997 | -5991 | 197 | 380980 | 456 |
| 560 | 2930929 | 68805 | 55649 | 5928 | -6591 | 200 | 272431 | 478 |
| 580 | 3048053 | -68280 | 59648 | 5692 | -7005 | 197 | 153295 | 500 |
| 600 | 3128797 | -172514 | 62450 | 1522 | -2192 | 56 | 62053 | 515 |
| 620 | 3140703 | -193357 | 62404 | 230 | -659 | -39 | 43221 | 518 |
| 640 | 3143334 | -205411 | 61423 | 66 | -548 | -46 | 31696 | 519 |
| 660 | 3143800 | -215352 | 60797 | -7 | -453 | -26 | 21939 | 519 |
| 680 | 3143203 | -223728 | 60212 | -43 | -387 | -20 | 13563 | 519 |
| 700 | 3142298 | -231021 | 59976 | -46 | -344 | -7 | 6217 | 519 |
| 718.9 | 3141307 | -237159 | 59911 | -62 | -305 | -3 | 0 | 519 |

TABLE XV

EARTH-FIXED PLUMBLINE PØSITIØNS AND VELØCITIES

| TIME SEC | XE FT | YE FT | ZE FT | DXE FT/S | DYE FT/S | DZE FT/S |
|---|---|---|---|---|---|---|
| | FIRST MØTIØN | | | | | |
| 0.080 | 0 | 105 | 0 | 0. | -0. | -0. |
| | LIFTØFF SIGNAL | | | | | |
| 0.280 | 0 | 105 | 0 | 0.0 | 2.2 | -0.1 |
| 1.0 | 0 | 109 | 0 | 0.1 | 10.4 | -0.3 |
| 2.0 | 0 | 126 | -0 | -0.0 | 22.2 | -0.3 |
| 3.0 | 0 | 154 | -0 | -0.2 | 34.4 | -0.3 |
| 4.0 | 0 | 194 | -0 | -0.5 | 46.8 | -0.2 |
| 5.0 | -0 | 247 | -0 | -0.8 | 59.5 | -0.1 |
| 6.0 | -1 | 313 | -0 | -1.1 | 72.4 | -0.1 |
| 7.0 | -2 | 392 | -0 | -1.3 | 85.6 | -0.2 |
| 8.0 | -4 | 484 | -1 | -1.5 | 99.0 | -0.3 |
| 9.0 | -5 | 590 | -1 | -1.7 | 112.7 | -0.4 |
| 10.0 | -7 | 710 | -2 | -1.8 | 126.7 | -0.6 |
| 11.0 | -10 | 843 | -2 | -1.9 | 140.9 | -0.7 |
| 12.0 | -12 | 991 | -3 | -2.0 | 155.5 | -0.7 |
| 13.0 | -14 | 1154 | -4 | -1.9 | 170.4 | -0.7 |
| 14.0 | -17 | 1332 | -4 | -1.8 | 185.7 | -0.7 |
| 15.0 | -19 | 1526 | -5 | -1.5 | 201.2 | -0.6 |
| 16.0 | -20 | 1735 | -6 | -0.9 | 217.1 | -0.4 |
| 17.0 | -21 | 1960 | -6 | -0.2 | 233.2 | -0.2 |
| 18.0 | -22 | 2201 | -6 | 0.9 | 249.7 | 0.0 |
| 19.0 | -20 | 2459 | -6 | 2.3 | 266.4 | 0.2 |
| 20.0 | -18 | 2734 | -6 | 4.1 | 283.4 | 0.4 |
| 21.0 | -12 | 3026 | -5 | 6.4 | 300.7 | 0.6 |
| 22.0 | -5 | 3335 | -5 | 9.2 | 318.2 | 0.7 |
| 23.0 | 4 | 3662 | -4 | 12.5 | 335.9 | 0.8 |
| 24.0 | 18 | 4007 | -3 | 16.4 | 353.9 | 0.8 |
| 25.0 | 36 | 4370 | -2 | 20.9 | 372.1 | 0.8 |
| 26.0 | 59 | 4751 | -1 | 25.9 | 390.6 | 0.8 |
| 27.0 | 88 | 5151 | -0 | 31.6 | 409.4 | 0.7 |
| 28.0 | 122 | 5570 | -0 | 37.8 | 428.4 | 0.7 |
| 29.0 | 163 | 6008 | 0 | 44.6 | 447.8 | 0.7 |
| 30.0 | 210 | 6466 | 1 | 51.9 | 467.8 | 0.7 |

TABLE XV

EARTH-FIXED PLUMBLINE PØSITIØNS AND VELØCITIES

| TIME SEC | XE FT | YE FT | ZE FT | DXE FT/S | DYE FT/S | DZE FT/S |
|---|---|---|---|---|---|---|
| 31.0 | 266 | 6944 | 2 | 59.7 | 487.9 | 0.8 |
| 32.0 | 329 | 7442 | 3 | 67.9 | 508.1 | 0.8 |
| 33.0 | 401 | 7960 | 4 | 76.5 | 528.7 | 0.7 |
| 34.0 | 481 | 8499 | 4 | 85.4 | 549.6 | 0.4 |
| 35.0 | 571 | 9059 | 4 | 94.7 | 570.8 | -0.0 |
| 36.0 | 670 | 9641 | 4 | 104.4 | 592.3 | -0.4 |
| 37.0 | 779 | 10244 | 4 | 114.7 | 613.9 | -0.6 |
| 38.0 | 899 | 10869 | 3 | 125.5 | 635.9 | -0.5 |
| 39.0 | 1029 | 11516 | 3 | 136.8 | 658.2 | -0.3 |
| 40.0 | 1171 | 12185 | 3 | 148.3 | 680.8 | 0.0 |
| 41.0 | 1325 | 12878 | 3 | 159.9 | 703.8 | 0.1 |
| 42.0 | 1490 | 13593 | 3 | 171.7 | 727.2 | 0.0 |
| 43.0 | 1668 | 14332 | 3 | 183.6 | 750.9 | -0.3 |
| 44.0 | 1857 | 15095 | 3 | 195.9 | 775.0 | -0.7 |
| 45.0 | 2059 | 15882 | 2 | 208.8 | 799.3 | -1.1 |
| 46.0 | 2274 | 16694 | 0 | 222.2 | 823.8 | -1.7 |
| 47.0 | 2502 | 17530 | -1 | 236.2 | 848.6 | -2.6 |
| 48.0 | 2745 | 18391 | -4 | 250.4 | 873.7 | -3.9 |
| 49.0 | 3002 | 19278 | -8 | 265.0 | 899.0 | -5.5 |
| 50.0 | 3274 | 20190 | -14 | 279.9 | 924.6 | -7.1 |
| 51.0 | 3561 | 21127 | -22 | 295.4 | 950.2 | -8.5 |
| 52.0 | 3864 | 22090 | -31 | 311.5 | 975.6 | -9.4 |
| 53.0 | 4183 | 23078 | -41 | 328.3 | 1000.6 | -9.9 |
| | MACH ØNE | | | | | |
| 53.208 | 4252 | 23287 | -43 | 331.9 | 1005.7 | -10.0 |
| 54.0 | 4520 | 24091 | -51 | 345.8 | 1025.1 | -10.0 |
| 55.0 | 4874 | 25129 | -61 | 363.7 | 1049.1 | -10.0 |
| 56.0 | 5246 | 26190 | -70 | 381.8 | 1072.9 | -10.0 |
| 57.0 | 5637 | 27275 | -80 | 400.3 | 1096.9 | -9.9 |
| 58.0 | 6046 | 28384 | -90 | 419.2 | 1121.2 | -9.8 |
| 59.0 | 6474 | 29518 | -100 | 438.7 | 1146.0 | -9.4 |
| 60.0 | 6922 | 30677 | -109 | 459.1 | 1171.5 | -8.8 |
| 61.0 | 7392 | 31861 | -117 | 480.5 | 1197.5 | -8.4 |
| 62.0 | 7883 | 33072 | -126 | 503.1 | 1224.0 | -8.8 |
| 63.0 | 8397 | 34310 | -135 | 526.7 | 1251.2 | -10.3 |
| 64.0 | 8935 | 35575 | -146 | 551.0 | 1279.1 | -12.5 |
| 65.0 | 9498 | 36869 | -160 | 576.1 | 1307.7 | -14.9 |

TABLE XV

EARTH-FIXED PLUMBLINE PØSITIØNS AND VELØCITIES

| TIME SEC | XE FT | YE FT | ZE FT | DXE FT/S | DYE FT/S | DZE FT/S |
|---|---|---|---|---|---|---|
| | MAXIMUM DYNAMIC PRESSURE | | | | | |
| 66.000 | 10086 | 38191 | -176 | 601.6 | 1337.2 | -17.1 |
| 67.0 | 10700 | 39544 | -194 | 627.6 | 1367.5 | -18.7 |
| 68.0 | 11341 | 40927 | -213 | 654.3 | 1398.4 | -20.1 |
| 69.0 | 12008 | 42341 | -234 | 681.9 | 1430.0 | -21.6 |
| 70.0 | 12704 | 43788 | -256 | 710.5 | 1462.1 | -23.2 |
| 71.0 | 13428 | 45267 | -280 | 740.2 | 1494.9 | -24.8 |
| 72.0 | 14183 | 46778 | -305 | 771.1 | 1528.3 | -25.8 |
| 73.0 | 14970 | 48324 | -331 | 803.0 | 1562.3 | -26.1 |
| 74.0 | 15789 | 49904 | -357 | 836.0 | 1597.1 | -26.1 |
| 75.0 | 16641 | 51519 | -383 | 869.9 | 1632.5 | -25.8 |
| 76.0 | 17528 | 53170 | -409 | 904.7 | 1668.8 | -25.6 |
| 77.0 | 18450 | 54857 | -434 | 940.6 | 1705.8 | -25.3 |
| 78.0 | 19408 | 56582 | -459 | 977.5 | 1743.6 | -24.9 |
| 79.0 | 20404 | 58346 | -484 | 1015.5 | 1782.2 | -24.3 |
| 80.0 | 21438 | 60148 | -507 | 1054.6 | 1821.5 | -23.6 |
| 81.0 | 22512 | 61990 | -531 | 1095.1 | 1861.5 | -22.9 |
| 82.0 | 23628 | 63872 | -553 | 1137.1 | 1902.1 | -22.1 |
| 83.0 | 24786 | 65795 | -575 | 1180.6 | 1943.3 | -21.3 |
| 84.0 | 25989 | 67759 | -595 | 1225.7 | 1985.1 | -20.4 |
| 85.0 | 27237 | 69766 | -615 | 1272.4 | 2027.4 | -19.6 |
| 86.0 | 28533 | 71815 | -634 | 1320.5 | 2070.3 | -18.8 |
| 87.0 | 29878 | 73908 | -653 | 1370.2 | 2113.6 | -18.0 |
| 88.0 | 31273 | 76043 | -670 | 1421.3 | 2157.4 | -17.5 |
| 89.0 | 32720 | 78223 | -688 | 1474.1 | 2201.5 | -17.0 |
| 90.0 | 34221 | 80448 | -704 | 1528.6 | 2246.0 | -16.6 |
| 91.0 | 35777 | 82716 | -721 | 1584.8 | 2290.8 | -16.2 |
| 92.0 | 37390 | 85030 | -736 | 1642.8 | 2335.9 | -15.7 |
| 93.0 | 39062 | 87389 | -752 | 1702.4 | 2381.3 | -15.3 |
| 94.0 | 40798 | 89789 | -769 | 1763.7 | 2427.1 | -14.7 |
| 95.0 | 42597 | 92233 | -786 | 1826.6 | 2473.2 | -14.2 |
| 96.0 | 44459 | 94723 | -803 | 1891.1 | 2519.7 | -13.6 |
| 97.0 | 46386 | 97262 | -818 | 1957.2 | 2566.5 | -13.1 |
| 98.0 | 48377 | 99852 | -831 | 2024.7 | 2613.8 | -12.6 |
| 99.0 | 50435 | 102490 | -844 | 2093.7 | 2661.4 | -12.2 |
| 100.0 | 52564 | 105176 | -856 | 2164.4 | 2709.4 | -11.9 |
| 101.0 | 54764 | 107910 | -867 | 2236.7 | 2757.8 | -11.4 |

TABLE XV

EARTH-FIXED PLUMBLINE PØSITIØNS AND VELØCITIES

| TIME SEC | XE FT | YE FT | ZE FT | DXE FT/S | DYE FT/S | DZE FT/S |
|---|---|---|---|---|---|---|
| 102.0 | 57038 | 110693 | -878 | 2310.6 | 2806.6 | -10.9 |
| 103.0 | 59386 | 113525 | -889 | 2386.2 | 2855.9 | -10.3 |
| 104.0 | 61810 | 116406 | -899 | 2463.3 | 2905.6 | -9.6 |
| 105.0 | 64312 | 119337 | -908 | 2541.8 | 2955.9 | -9.1 |
| 106.0 | 66894 | 122319 | -917 | 2621.9 | 3006.6 | -8.7 |
| 107.0 | 69556 | 125352 | -925 | 2703.5 | 3058.1 | -8.2 |
| 108.0 | 72301 | 128436 | -933 | 2786.6 | 3110.3 | -7.6 |
| 109.0 | 75130 | 131573 | -941 | 2871.3 | 3163.1 | -7.0 |
| 110.0 | 78044 | 134764 | -947 | 2957.6 | 3216.7 | -6.2 |
| 111.0 | 81045 | 138008 | -953 | 3045.5 | 3271.0 | -5.5 |
| 112.0 | 84136 | 141307 | -958 | 3134.9 | 3326.0 | -4.8 |
| 113.0 | 87316 | 144661 | -963 | 3225.9 | 3381.7 | -4.3 |
| 114.0 | 90588 | 148072 | -967 | 3318.5 | 3438.2 | -3.7 |
| 115.0 | 93953 | 151539 | -970 | 3412.8 | 3495.7 | -3.0 |
| 116.0 | 97414 | 155064 | -973 | 3508.7 | 3554.1 | -2.3 |
| 117.0 | 100971 | 158648 | -975 | 3606.2 | 3613.6 | -1.6 |
| 118.0 | 104627 | 162293 | -976 | 3705.3 | 3674.1 | -0.8 |
| 119.0 | 108383 | 165998 | -976 | 3806.0 | 3735.8 | 0.1 |
| 120.0 | 112240 | 169766 | -976 | 3908.5 | 3798.6 | 1.1 |
| 121.0 | 116201 | 173597 | -974 | 4012.6 | 3862.6 | 2.1 |
| 122.0 | 120266 | 177492 | -972 | 4118.5 | 3927.8 | 3.1 |
| 123.0 | 124439 | 181453 | -968 | 4226.3 | 3994.2 | 4.1 |
| 124.0 | 128720 | 185482 | -963 | 4335.9 | 4062.0 | 5.0 |
| 125.0 | 133111 | 189579 | -958 | 4447.4 | 4131.2 | 6.0 |
| 126.0 | 137616 | 193746 | -952 | 4560.8 | 4201.7 | 6.9 |
| 127.0 | 142234 | 197984 | -944 | 4676.4 | 4273.8 | 7.8 |
| 128.0 | 146970 | 202294 | -936 | 4793.9 | 4347.3 | 8.8 |
| 129.0 | 151824 | 206680 | -927 | 4913.6 | 4422.5 | 9.9 |
| 130.0 | 156798 | 211141 | -916 | 5035.6 | 4499.3 | 11.1 |
| 131.0 | 161896 | 215680 | -905 | 5160.0 | 4577.6 | 12.3 |
| 132.0 | 167120 | 220297 | -892 | 5286.9 | 4657.5 | 13.7 |
| 133.0 | 172472 | 224996 | -878 | 5416.5 | 4738.9 | 14.9 |
| 134.0 | 177955 | 229777 | -862 | 5548.9 | 4821.7 | 16.1 |
| 135.0 | 183574 | 234641 | -844 | 5684.2 | 4906.2 | 17.6 |
| 136.0 | 189331 | 239590 | -825 | 5822.5 | 4991.7 | 19.2 |
| 137.0 | 195229 | 244626 | -804 | 5964.7 | 5078.6 | 20.5 |
| 138.0 | 201269 | 249749 | -782 | 6110.1 | 5166.9 | 22.2 |
| 139.0 | 207457 | 254962 | -758 | 6259.0 | 5256.5 | 23.6 |
| 140.0 | 213796 | 260265 | -733 | 6411.6 | 5348.6 | 25.3 |
| | IECØ | | | | | |
| 140.220 | 215209 | 261451 | -732 | 6445.5 | 5369.2 | 25.2 |

TABLE XV

EARTH-FIXED PLUMBLINE PØSITIØNS AND VELØCITIES

| TIME SEC | XE FT | YE FT | ZE FT | DXE FT/S | DYE FT/S | DZE FT/S |
|---|---|---|---|---|---|---|
| 141.0 | 220278 | 265654 | -707 | 6527.9 | 5411.8 | 26.5 |
| 142.0 | 226849 | 271084 | -679 | 6608.0 | 5445.8 | 27.8 |
| 143.0 | 233498 | 276547 | -651 | 6685.6 | 5478.3 | 29.0 |
| 144.0 | 240224 | 282043 | -622 | 6763.4 | 5510.7 | 29.9 |
| 145.0 | 247029 | 287572 | -591 | 6841.5 | 5543.6 | 31.2 |
| | ØECØ | | | | | |
| 145.560 | 250860 | 290685 | -582 | 6885.0 | 5562.0 | 31.2 |
| 146.0 | 253907 | 293131 | -560 | 6899.4 | 5560.5 | 32.3 |
| 147.0 | 260809 | 298680 | -528 | 6903.6 | 5534.4 | 33.1 |
| 148.0 | 267714 | 304202 | -496 | 6905.4 | 5506.1 | 33.8 |
| | S-IV ENGINE START | | | | | |
| 148.120 | 268528 | 304864 | -501 | 6905.6 | 5503.2 | 33.1 |
| 149.0 | 274619 | 309696 | -463 | 6907.0 | 5478.0 | 34.5 |
| 150.0 | 281527 | 315161 | -429 | 6911.1 | 5451.6 | 35.2 |
| 155.0 | 316278 | 342219 | -251 | 6989.9 | 5367.9 | 38.7 |
| 160.0 | 351435 | 368844 | -48 | 7070.1 | 5286.2 | 42.4 |
| | GUIDANCE INITIATIØN | | | | | |
| 163.860 | 378848 | 389129 | 120 | 7133.4 | 5224.6 | 45.0 |
| 165.0 | 386991 | 395075 | 171 | 7152.3 | 5206.7 | 45.8 |
| 170.0 | 422956 | 420915 | 418 | 7233.3 | 5130.3 | 55.0 |
| 175.0 | 459319 | 446381 | 740 | 7312.3 | 5056.0 | 74.4 |
| 180.0 | 496082 | 471474 | 1158 | 7393.4 | 4981.2 | 92.6 |
| 185.0 | 533257 | 496190 | 1662 | 7476.9 | 4905.0 | 108.3 |
| 190.0 | 570854 | 520524 | 2238 | 7562.1 | 4828.5 | 121.7 |
| 195.0 | 608880 | 544476 | 2876 | 7648.7 | 4752.0 | 133.4 |
| 200.0 | 647343 | 568047 | 3570 | 7736.5 | 4676.3 | 143.7 |
| 205.0 | 686248 | 591238 | 4311 | 7826.1 | 4600.0 | 152.4 |
| 210.0 | 725604 | 614048 | 5092 | 7916.6 | 4523.8 | 160.0 |
| 215.0 | 765417 | 636476 | 5909 | 8008.8 | 4447.2 | 166.5 |
| 220.0 | 805695 | 658521 | 6756 | 8102.4 | 4370.8 | 172.2 |
| 225.0 | 846444 | 680184 | 7629 | 8197.7 | 4294.3 | 177.1 |

TABLE XV

EARTH-FIXED PLUMBLINE PØSITIØNS AND VELØCITIES

| TIME SEC | XE FT | YE FT | ZE FT | DXE FT/S | DYE FT/S | DZE FT/S |
|---|---|---|---|---|---|---|
| 230.0 | 887674 | 701462 | 8526 | 8294.7 | 4217.0 | 181.6 |
| 235.0 | 929393 | 722353 | 9444 | 8393.0 | 4139.3 | 185.4 |
| 240.0 | 971608 | 742855 | 10380 | 8492.9 | 4061.4 | 188.9 |
| 245.0 | 1014325 | 762967 | 11333 | 8594.1 | 3983.1 | 192.1 |
| 250.0 | 1057551 | 782686 | 12301 | 8696.6 | 3904.3 | 195.1 |
| 255.0 | 1101293 | 802010 | 13284 | 8800.5 | 3825.1 | 198.0 |
| 260.0 | 1145559 | 820936 | 14281 | 8906.0 | 3745.1 | 200.8 |
| 265.0 | 1190355 | 839462 | 15293 | 9012.8 | 3664.9 | 203.8 |
| 270.0 | 1235690 | 857584 | 16319 | 9121.5 | 3584.0 | 206.8 |
| 275.0 | 1281572 | 875301 | 17360 | 9231.6 | 3502.4 | 209.6 |
| 280.0 | 1328007 | 892608 | 18416 | 9342.9 | 3420.6 | 212.7 |
| 285.0 | 1375004 | 909504 | 19488 | 9456.0 | 3337.9 | 216.0 |
| 290.0 | 1422570 | 925986 | 20576 | 9570.8 | 3254.6 | 219.3 |
| 295.0 | 1470714 | 942049 | 21681 | 9687.2 | 3170.6 | 222.9 |
| 300.0 | 1519445 | 957691 | 22805 | 9805.4 | 3086.0 | 226.6 |
| 305.0 | 1568770 | 972909 | 23948 | 9925.3 | 3000.8 | 230.6 |
| 310.0 | 1618700 | 987698 | 25111 | 10047.0 | 2914.6 | 234.6 |
| 315.0 | 1669243 | 1002054 | 26295 | 10170.4 | 2827.7 | 238.9 |
| 320.0 | 1720407 | 1015975 | 27501 | 10295.8 | 2740.4 | 243.5 |
| 325.0 | 1772205 | 1029456 | 28731 | 10423.4 | 2652.1 | 248.3 |
| 330.0 | 1824645 | 1042494 | 29985 | 10552.6 | 2562.7 | 253.3 |
| 335.0 | 1877735 | 1055082 | 31264 | 10683.8 | 2472.3 | 258.4 |
| 340.0 | 1931485 | 1067215 | 32568 | 10816.7 | 2381.0 | 263.6 |
| 345.0 | 1985905 | 1078890 | 33900 | 10951.6 | 2288.7 | 269.0 |
| 350.0 | 2041004 | 1090100 | 35259 | 11088.4 | 2195.2 | 274.6 |
| 355.0 | 2096793 | 1100839 | 36647 | 11227.4 | 2100.2 | 280.4 |
| 360.0 | 2153281 | 1111100 | 38063 | 11368.3 | 2004.2 | 286.1 |
| 365.0 | 2210478 | 1120879 | 39509 | 11510.9 | 1907.2 | 292.1 |
| 370.0 | 2268393 | 1130169 | 40985 | 11655.6 | 1808.7 | 298.3 |
| 375.0 | 2327037 | 1138962 | 42492 | 11802.4 | 1708.6 | 304.4 |
| 380.0 | 2386421 | 1147253 | 44030 | 11951.4 | 1607.1 | 310.8 |
| 385.0 | 2446554 | 1155030 | 45600 | 12102.3 | 1504.0 | 317.5 |
| 390.0 | 2507449 | 1162290 | 47203 | 12255.9 | 1399.7 | 323.8 |
| 395.0 | 2569116 | 1169024 | 48839 | 12411.4 | 1293.7 | 330.6 |
| 400.0 | 2631567 | 1175225 | 50510 | 12569.2 | 1186.4 | 337.3 |
| 405.0 | 2694813 | 1180885 | 52213 | 12729.6 | 1077.4 | 344.3 |
| 410.0 | 2758867 | 1185996 | 53952 | 12892.1 | 966.4 | 351.1 |
| 415.0 | 2823740 | 1190547 | 55725 | 13057.4 | 853.9 | 358.3 |
| 420.0 | 2889445 | 1194529 | 57535 | 13224.9 | 738.9 | 365.5 |
| 425.0 | 2955994 | 1197932 | 59380 | 13395.0 | 622.3 | 372.7 |

TABLE XV

EARTH-FIXED PLUMBLINE PØSITIØNS AND VELØCITIES

| TIME SEC | XE FT | YE FT | ZE FT | DXE FT/S | DYE FT/S | DZE FT/S |
|---|---|---|---|---|---|---|
| 430.0 | 3023400 | 1200747 | 61262 | 13567.6 | 503.8 | 379.9 |
| 435.0 | 3091677 | 1202965 | 63180 | 13743.2 | 383.1 | 387.5 |
| 440.0 | 3160837 | 1204574 | 65137 | 13921.1 | 260.4 | 395.1 |
| 445.0 | 3230891 | 1205578 | 67132 | 14101.4 | 135.3 | 402.9 |
| 450.0 | 3301854 | 1205937 | 69166 | 14284.2 | 7.8 | 410.7 |
| 455.0 | 3373738 | 1205652 | 71239 | 14469.6 | -122.3 | 418.5 |
| 460.0 | 3446555 | 1204709 | 73351 | 14657.6 | -255.3 | 426.5 |
| 465.0 | 3520319 | 1203096 | 75504 | 14848.6 | -390.5 | 434.6 |
| 470.0 | 3595045 | 1200799 | 77697 | 15042.2 | -528.9 | 442.7 |
| 475.0 | 3670748 | 1197803 | 79931 | 15239.1 | -669.8 | 450.7 |
| 480.0 | 3747442 | 1194096 | 82205 | 15439.1 | -813.7 | 459.0 |
| 485.0 | 3825144 | 1189662 | 84522 | 15642.3 | -960.5 | 467.5 |
| 490.0 | 3903871 | 1184486 | 86880 | 15848.9 | -1110.7 | 476.0 |
| 495.0 | 3983640 | 1178551 | 89282 | 16058.9 | -1264.0 | 484.8 |
| 500.0 | 4064465 | 1171842 | 91728 | 16271.8 | -1420.5 | 493.5 |
| 505.0 | 4146364 | 1164341 | 94218 | 16488.4 | -1580.6 | 502.4 |
| 510.0 | 4229356 | 1156031 | 96752 | 16708.6 | -1744.2 | 511.4 |
| 515.0 | 4313457 | 1146892 | 99331 | 16932.1 | -1911.7 | 520.5 |
| 520.0 | 4398686 | 1136906 | 101956 | 17159.9 | -2083.4 | 529.6 |
| 525.0 | 4485063 | 1126052 | 104627 | 17391.2 | -2258.8 | 538.9 |
| 530.0 | 4572605 | 1114311 | 107345 | 17626.4 | -2438.7 | 548.3 |
| 535.0 | 4661335 | 1101659 | 110111 | 17865.7 | -2622.8 | 557.9 |
| 540.0 | 4751270 | 1088074 | 112924 | 18109.2 | -2812.0 | 567.4 |
| 545.0 | 4842433 | 1073531 | 115785 | 18356.7 | -3006.0 | 577.1 |
| 550.0 | 4934844 | 1058007 | 118695 | 18608.3 | -3205.0 | 587.0 |
| 555.0 | 5028525 | 1041472 | 121655 | 18864.8 | -3409.6 | 597.0 |
| 560.0 | 5123498 | 1023901 | 124665 | 19125.3 | -3619.9 | 607.0 |
| 565.0 | 5219789 | 1005265 | 127725 | 19391.6 | -3835.7 | 617.1 |
| 570.0 | 5317423 | 985534 | 130836 | 19663.1 | -4057.4 | 627.2 |
| 575.0 | 5416427 | 964678 | 133998 | 19939.0 | -4286.0 | 637.6 |
| 580.0 | 5516826 | 942662 | 137212 | 20221.3 | -4521.5 | 648.1 |
| 585.0 | 5618650 | 919452 | 140479 | 20508.9 | -4764.1 | 658.5 |
| 590.0 | 5721924 | 895010 | 143798 | 20801.4 | -5014.0 | 669.4 |
| 595.0 | 5826675 | 869297 | 147173 | 21099.7 | -5272.5 | 680.4 |
| 600.0 | 5932932 | 842273 | 150602 | 21403.9 | -5538.3 | 691.4 |
| 605.0 | 6040726 | 813899 | 154087 | 21714.1 | -5812.6 | 702.6 |
| 610.0 | 6150085 | 784129 | 157628 | 22030.7 | -6097.0 | 713.8 |
| 615.0 | 6261044 | 752911 | 161225 | 22353.9 | -6391.3 | 725.1 |
| 620.0 | 6373630 | 720191 | 164878 | 22684.9 | -6695.8 | 736.5 |
| | S-IV CUTØFF | | | | | |
| 621.659 | 6411353 | 708995 | 166103 | 22796.9 | -6799.8 | 740.2 |

TABLE XV

EARTH-FIXED PLUMBLINE PØSITIØNS AND VELØCITIES

| TIME SEC | XE FT | YE FT | ZE FT | DXE FT/S | DYE FT/S | DZE FT/S |
|---|---|---|---|---|---|---|
| 625.0 | 6487509 | 686129 | 168583 | 22782.5 | -6883.6 | 743.9 |
| 630.0 | 6601334 | 651418 | 172319 | 22746.9 | -7001.6 | 749.6 |
| | INSERTIØN | | | | | |
| 631.659 | 6639062 | 639770 | 173564 | 22734.8 | -7040.8 | 751.5 |

TABLE XVI

SPACE-FIXED EPHEMERIS PØSITIØNS AND VELØCITIES

| TIME SEC | XSP NM | YSP NM | ZSP NM | DXSP FT/S | DYSP FT/S | DZSP FT/S |
|---|---|---|---|---|---|---|
| | FIRST MØTIØN | | | | | |
| 0.080 | 787.556 | -2923.790 | 1635.232 | 1295.5 | 348.9 | 0. |
| | LIFTØFF SIGNAL | | | | | |
| 0.280 | 787.599 | -2923.779 | 1635.232 | 1296.0 | 347.1 | 1.1 |
| 1.0 | 787.752 | -2923.738 | 1635.232 | 1298.0 | 340.3 | 5.2 |
| 2.0 | 787.966 | -2923.683 | 1635.234 | 1300.5 | 330.4 | 10.9 |
| 3.0 | 788.180 | -2923.629 | 1635.236 | 1303.1 | 320.2 | 16.7 |
| 4.0 | 788.395 | -2923.577 | 1635.239 | 1305.6 | 309.6 | 22.6 |
| 5.0 | 788.610 | -2923.527 | 1635.243 | 1308.2 | 298.9 | 28.7 |
| 6.0 | 788.826 | -2923.479 | 1635.249 | 1310.9 | 288.0 | 34.9 |
| 7.0 | 789.042 | -2923.433 | 1635.255 | 1313.7 | 276.9 | 41.3 |
| 8.0 | 789.258 | -2923.388 | 1635.262 | 1316.5 | 265.7 | 47.9 |
| 9.0 | 789.475 | -2923.345 | 1635.271 | 1319.5 | 254.2 | 54.6 |
| 10.0 | 789.692 | -2923.304 | 1635.280 | 1322.6 | 242.5 | 61.4 |
| 11.0 | 789.910 | -2923.265 | 1635.291 | 1325.8 | 230.5 | 68.3 |
| 12.0 | 790.129 | -2923.228 | 1635.303 | 1329.1 | 218.3 | 75.4 |
| 13.0 | 790.347 | -2923.193 | 1635.316 | 1332.5 | 205.8 | 82.5 |
| 14.0 | 790.567 | -2923.161 | 1635.330 | 1336.1 | 192.9 | 89.7 |
| 15.0 | 790.787 | -2923.130 | 1635.345 | 1340.0 | 179.8 | 96.9 |
| 16.0 | 791.008 | -2923.101 | 1635.362 | 1344.1 | 166.5 | 104.2 |
| 17.0 | 791.229 | -2923.075 | 1635.380 | 1348.5 | 152.9 | 111.6 |
| 18.0 | 791.452 | -2923.051 | 1635.399 | 1353.3 | 139.0 | 119.0 |
| 19.0 | 791.675 | -2923.029 | 1635.419 | 1358.5 | 125.0 | 126.5 |
| 20.0 | 791.899 | -2923.010 | 1635.440 | 1364.1 | 110.9 | 134.1 |
| 21.0 | 792.124 | -2922.993 | 1635.463 | 1370.3 | 96.6 | 141.6 |
| 22.0 | 792.350 | -2922.978 | 1635.487 | 1377.0 | 82.1 | 149.3 |
| 23.0 | 792.577 | -2922.966 | 1635.512 | 1384.3 | 67.6 | 156.9 |
| 24.0 | 792.805 | -2922.956 | 1635.539 | 1392.2 | 53.0 | 164.6 |
| 25.0 | 793.035 | -2922.948 | 1635.566 | 1400.7 | 38.2 | 172.3 |
| 26.0 | 793.266 | -2922.943 | 1635.595 | 1409.9 | 23.4 | 180.0 |
| 27.0 | 793.499 | -2922.941 | 1635.626 | 1419.7 | 8.3 | 187.7 |
| 28.0 | 793.733 | -2922.941 | 1635.657 | 1430.1 | -6.9 | 195.4 |
| 29.0 | 793.970 | -2922.943 | 1635.690 | 1441.2 | -22.3 | 203.2 |
| 30.0 | 794.208 | -2922.948 | 1635.724 | 1452.8 | -38.1 | 211.0 |

TABLE XVI

SPACE-FIXED EPHEMERIS PØSITIØNS AND VELØCITIES

| TIME SEC | XSP NM | YSP NM | ZSP NM | DXSP FT/S | DYSP FT/S | DZSP FT/S |
|---|---|---|---|---|---|---|
| 31.0 | 794.448 | -2922.956 | 1635.759 | 1465.0 | -54.1 | 218.8 |
| 32.0 | 794.690 | -2922.966 | 1635.796 | 1477.6 | -69.9 | 226.6 |
| 33.0 | 794.934 | -2922.979 | 1635.834 | 1490.7 | -86.1 | 234.6 |
| 34.0 | 795.180 | -2922.994 | 1635.873 | 1504.2 | -102.3 | 242.8 |
| 35.0 | 795.429 | -2923.012 | 1635.914 | 1518.1 | -118.7 | 251.1 |
| 36.0 | 795.680 | -2923.033 | 1635.956 | 1532.5 | -135.3 | 259.5 |
| 37.0 | 795.933 | -2923.057 | 1635.999 | 1547.5 | -152.1 | 267.7 |
| 38.0 | 796.189 | -2923.083 | 1636.044 | 1563.1 | -169.1 | 275.7 |
| 39.0 | 796.448 | -2923.113 | 1636.090 | 1579.1 | -186.5 | 283.5 |
| 40.0 | 796.709 | -2923.145 | 1636.137 | 1595.5 | -204.1 | 291.4 |
| 41.0 | 796.973 | -2923.180 | 1636.186 | 1612.0 | -222.0 | 299.7 |
| 42.0 | 797.239 | -2923.218 | 1636.236 | 1628.8 | -240.0 | 308.3 |
| 43.0 | 797.509 | -2923.259 | 1636.288 | 1645.9 | -258.2 | 317.2 |
| 44.0 | 797.781 | -2923.303 | 1636.341 | 1663.5 | -276.6 | 326.2 |
| 45.0 | 798.056 | -2923.350 | 1636.395 | 1681.6 | -295.1 | 335.3 |
| 46.0 | 798.334 | -2923.400 | 1636.451 | 1700.4 | -313.6 | 344.4 |
| 47.0 | 798.616 | -2923.453 | 1636.508 | 1719.8 | -332.1 | 353.8 |
| 48.0 | 798.900 | -2923.510 | 1636.567 | 1739.6 | -350.6 | 363.6 |
| 49.0 | 799.188 | -2923.569 | 1636.628 | 1759.8 | -369.2 | 373.8 |
| 50.0 | 799.479 | -2923.631 | 1636.690 | 1780.4 | -387.8 | 384.0 |
| 51.0 | 799.774 | -2923.697 | 1636.755 | 1801.5 | -406.5 | 393.9 |
| 52.0 | 800.072 | -2923.765 | 1636.820 | 1823.1 | -425.2 | 403.2 |
| 53.0 | 800.374 | -2923.837 | 1636.887 | 1845.3 | -443.7 | 411.7 |
| | MACH ØNE | | | | | |
| 53.208 | 800.437 | -2923.852 | 1636.901 | 1850.0 | -447.5 | 413.4 |
| 54.0 | 800.679 | -2923.911 | 1636.956 | 1867.9 | -461.8 | 419.5 |
| 55.0 | 800.989 | -2923.989 | 1637.025 | 1890.8 | -479.6 | 426.9 |
| 56.0 | 801.302 | -2924.069 | 1637.096 | 1913.9 | -497.2 | 434.1 |
| 57.0 | 801.618 | -2924.152 | 1637.168 | 1937.4 | -514.8 | 441.3 |
| 58.0 | 801.939 | -2924.239 | 1637.242 | 1961.3 | -532.7 | 448.5 |
| 59.0 | 802.264 | -2924.328 | 1637.316 | 1986.0 | -551.1 | 455.6 |
| 60.0 | 802.593 | -2924.420 | 1637.392 | 2011.6 | -570.0 | 462.7 |
| 61.0 | 802.926 | -2924.516 | 1637.468 | 2038.3 | -589.1 | 469.9 |
| 62.0 | 803.264 | -2924.614 | 1637.546 | 2066.4 | -608.1 | 477.8 |
| 63.0 | 803.606 | -2924.716 | 1637.626 | 2095.8 | -627.0 | 486.6 |
| 64.0 | 803.953 | -2924.821 | 1637.707 | 2126.2 | -645.9 | 496.2 |
| 65.0 | 804.306 | -2924.928 | 1637.789 | 2157.4 | -665.3 | 506.3 |

TABLE XVI

SPACE-FIXED EPHEMERIS PØSITIØNS AND VELØCITIES

| TIME SEC | XSP NM | YSP NM | ZSP NM | DXSP FT/S | DYSP FT/S | DZSP FT/S |
|---|---|---|---|---|---|---|
| | MAXIMUM DYNAMIC PRESSURE | | | | | |
| 66.000 | 804.663 | -2925.040 | 1637.873 | 2189.3 | -685.5 | 516.4 |
| 67.0 | 805.026 | -2925.154 | 1637.959 | 2221.7 | -706.5 | 526.3 |
| 68.0 | 805.395 | -2925.272 | 1638.047 | 2255.0 | -728.1 | 536.2 |
| 69.0 | 805.768 | -2925.394 | 1638.136 | 2289.2 | -750.1 | 546.3 |
| 70.0 | 806.148 | -2925.519 | 1638.226 | 2324.6 | -772.3 | 556.6 |
| 71.0 | 806.533 | -2925.648 | 1638.319 | 2361.2 | -795.0 | 566.8 |
| 72.0 | 806.925 | -2925.781 | 1638.413 | 2399.0 | -818.3 | 576.5 |
| 73.0 | 807.323 | -2925.918 | 1638.509 | 2438.0 | -842.3 | 585.8 |
| 74.0 | 807.727 | -2926.059 | 1638.606 | 2478.0 | -867.0 | 594.9 |
| 75.0 | 808.139 | -2926.204 | 1638.705 | 2519.1 | -892.2 | 603.9 |
| 76.0 | 808.557 | -2926.353 | 1638.805 | 2561.3 | -918.0 | 613.1 |
| 77.0 | 808.982 | -2926.506 | 1638.906 | 2604.6 | -944.3 | 622.4 |
| 78.0 | 809.414 | -2926.664 | 1639.010 | 2649.1 | -971.1 | 631.7 |
| 79.0 | 809.853 | -2926.826 | 1639.114 | 2694.8 | -998.6 | 641.0 |
| 80.0 | 810.301 | -2926.992 | 1639.221 | 2741.8 | -1026.6 | 650.2 |
| 81.0 | 810.756 | -2927.164 | 1639.329 | 2790.3 | -1055.0 | 659.5 |
| 82.0 | 811.219 | -2927.340 | 1639.438 | 2840.3 | -1083.7 | 668.8 |
| 83.0 | 811.691 | -2927.521 | 1639.549 | 2892.0 | -1112.7 | 677.8 |
| 84.0 | 812.171 | -2927.706 | 1639.661 | 2945.3 | -1142.0 | 686.8 |
| 85.0 | 812.660 | -2927.897 | 1639.775 | 3000.3 | -1171.5 | 695.7 |
| 86.0 | 813.159 | -2928.092 | 1639.890 | 3056.8 | -1201.2 | 704.5 |
| 87.0 | 813.666 | -2928.292 | 1640.007 | 3114.9 | -1231.1 | 713.3 |
| 88.0 | 814.184 | -2928.497 | 1640.125 | 3174.6 | -1261.0 | 722.1 |
| 89.0 | 814.711 | -2928.707 | 1640.245 | 3235.9 | -1291.0 | 730.8 |
| 90.0 | 815.249 | -2928.922 | 1640.366 | 3299.1 | -1321.0 | 739.3 |
| 91.0 | 815.797 | -2929.142 | 1640.488 | 3363.9 | -1350.9 | 747.5 |
| 92.0 | 816.356 | -2929.367 | 1640.612 | 3430.5 | -1380.9 | 755.5 |
| 93.0 | 816.926 | -2929.597 | 1640.737 | 3498.8 | -1411.0 | 763.3 |
| 94.0 | 817.508 | -2929.831 | 1640.863 | 3568.7 | -1441.1 | 770.8 |
| 95.0 | 818.102 | -2930.069 | 1640.990 | 3640.4 | -1471.3 | 778.0 |
| 96.0 | 818.707 | -2930.313 | 1641.118 | 3713.6 | -1501.5 | 785.0 |
| 97.0 | 819.325 | -2930.562 | 1641.248 | 3788.5 | -1531.9 | 791.9 |
| 98.0 | 819.955 | -2930.816 | 1641.379 | 3864.8 | -1562.3 | 798.8 |
| 99.0 | 820.597 | -2931.076 | 1641.511 | 3942.7 | -1592.7 | 805.5 |
| 100.0 | 821.253 | -2931.341 | 1641.644 | 4022.3 | -1623.3 | 812.0 |
| 101.0 | 821.921 | -2931.611 | 1641.778 | 4103.5 | -1654.0 | 818.3 |

TABLE XVI

SPACE-FIXED EPHEMERIS PØSITIØNS AND VELØCITIES

| TIME SEC | XSP NM | YSP NM | ZSP NM | DXSP FT/S | DYSP FT/S | DZSP FT/S |
|---|---|---|---|---|---|---|
| 102.0 | 822.603 | -2931.885 | 1641.914 | 4186.5 | -1684.8 | 824.4 |
| 103.0 | 823.299 | -2932.165 | 1642.050 | 4271.1 | -1715.8 | 830.3 |
| 104.0 | 824.009 | -2932.450 | 1642.187 | 4357.3 | -1746.9 | 835.9 |
| 105.0 | 824.734 | -2932.740 | 1642.325 | 4445.0 | -1778.2 | 841.6 |
| 106.0 | 825.472 | -2933.036 | 1642.464 | 4534.3 | -1809.7 | 847.3 |
| 107.0 | 826.226 | -2933.336 | 1642.604 | 4625.3 | -1841.6 | 852.9 |
| 108.0 | 826.995 | -2933.642 | 1642.745 | 4717.9 | -1873.9 | 858.5 |
| 109.0 | 827.779 | -2933.953 | 1642.887 | 4812.2 | -1906.6 | 863.9 |
| 110.0 | 828.579 | -2934.270 | 1643.029 | 4908.1 | -1939.6 | 869.2 |
| 111.0 | 829.395 | -2934.592 | 1643.173 | 5005.8 | -1973.1 | 874.5 |
| 112.0 | 830.227 | -2934.919 | 1643.317 | 5105.2 | -2006.8 | 879.9 |
| 113.0 | 831.075 | -2935.253 | 1643.463 | 5206.2 | -2040.9 | 885.4 |
| 114.0 | 831.941 | -2935.591 | 1643.609 | 5309.1 | -2075.4 | 890.8 |
| 115.0 | 832.823 | -2935.936 | 1643.756 | 5413.7 | -2110.5 | 896.2 |
| 116.0 | 833.723 | -2936.286 | 1643.904 | 5520.1 | -2146.2 | 901.8 |
| 117.0 | 834.640 | -2936.643 | 1644.053 | 5628.4 | -2182.5 | 907.4 |
| 118.0 | 835.576 | -2937.005 | 1644.203 | 5738.4 | -2219.5 | 913.1 |
| 119.0 | 836.529 | -2937.373 | 1644.353 | 5850.2 | -2257.3 | 918.9 |
| 120.0 | 837.501 | -2937.748 | 1644.505 | 5964.0 | -2295.8 | 924.7 |
| 121.0 | 838.493 | -2938.129 | 1644.658 | 6079.7 | -2335.1 | 930.8 |
| 122.0 | 839.503 | -2938.517 | 1644.812 | 6197.4 | -2375.1 | 937.0 |
| 123.0 | 840.533 | -2938.911 | 1644.966 | 6317.2 | -2415.9 | 943.4 |
| 124.0 | 841.582 | -2939.312 | 1645.122 | 6439.0 | -2457.5 | 950.0 |
| 125.0 | 842.652 | -2939.720 | 1645.279 | 6563.1 | -2500.0 | 956.9 |
| 126.0 | 843.743 | -2940.135 | 1645.437 | 6689.4 | -2543.4 | 964.0 |
| 127.0 | 844.854 | -2940.557 | 1645.597 | 6818.0 | -2587.7 | 971.4 |
| 128.0 | 845.987 | -2940.987 | 1645.757 | 6949.0 | -2632.9 | 978.9 |
| 129.0 | 847.142 | -2941.424 | 1645.919 | 7082.4 | -2679.3 | 986.7 |
| 130.0 | 848.319 | -2941.869 | 1646.082 | 7218.3 | -2726.7 | 994.7 |
| 131.0 | 849.518 | -2942.322 | 1646.246 | 7357.0 | -2775.1 | 1002.7 |
| 132.0 | 850.741 | -2942.783 | 1646.412 | 7498.4 | -2824.5 | 1010.9 |
| 133.0 | 851.987 | -2943.252 | 1646.579 | 7642.8 | -2874.7 | 1019.3 |
| 134.0 | 853.257 | -2943.729 | 1646.748 | 7790.3 | -2925.7 | 1027.7 |
| 135.0 | 854.552 | -2944.215 | 1646.917 | 7941.0 | -2977.8 | 1035.9 |
| 136.0 | 855.872 | -2944.709 | 1647.088 | 8094.7 | -3030.3 | 1044.0 |
| 137.0 | 857.218 | -2945.213 | 1647.260 | 8252.6 | -3083.3 | 1052.1 |
| 138.0 | 858.590 | -2945.725 | 1647.434 | 8413.9 | -3137.1 | 1059.8 |
| 139.0 | 859.989 | -2946.245 | 1647.609 | 8579.0 | -3191.4 | 1067.5 |
| 140.0 | 861.415 | -2946.775 | 1647.785 | 8748.0 | -3247.4 | 1075.3 |
| | IECØ | | | | | |
| 140.220 | 861.733 | -2946.894 | 1647.825 | 8785.8 | -3259.7 | 1077.6 |

TABLE XVI

SPACE-FIXED EPHEMERIS PØSITIØNS AND VELØCITIES

| TIME SEC | XSP NM | YSP NM | ZSP NM | DXSP FT/S | DYSP FT/S | DZSP FT/S |
|---|---|---|---|---|---|---|
| 141.0 | 862.868 | -2947.314 | 1647.962 | 8875.5 | -3283.8 | 1078.1 |
| 142.0 | 864.336 | -2947.856 | 1648.140 | 8961.1 | -3300.7 | 1075.1 |
| 143.0 | 865.818 | -2948.400 | 1648.316 | 9043.9 | -3316.6 | 1071.9 |
| 144.0 | 867.313 | -2948.948 | 1648.492 | 9126.9 | -3332.2 | 1068.9 |
| 145.0 | 868.823 | -2949.497 | 1648.668 | 9210.4 | -3348.3 | 1065.7 |
| | ØECØ | | | | | |
| 145.560 | 869.672 | -2949.806 | 1648.768 | 9256.9 | -3357.0 | 1064.7 |
| 146.0 | 870.345 | -2950.050 | 1648.843 | 9270.6 | -3353.8 | 1059.7 |
| 147.0 | 871.871 | -2950.600 | 1649.017 | 9268.8 | -3330.2 | 1045.7 |
| 148.0 | 873.396 | -2951.146 | 1649.188 | 9264.2 | -3305.1 | 1031.1 |
| | S-IV ENGINE START | | | | | |
| 148.120 | 873.577 | -2951.211 | 1649.210 | 9263.9 | -3302.1 | 1030.3 |
| 149.0 | 874.920 | -2951.688 | 1649.357 | 9259.5 | -3280.2 | 1016.7 |
| 150.0 | 876.444 | -2952.226 | 1649.523 | 9257.6 | -3256.5 | 1002.6 |
| 155.0 | 884.086 | -2954.871 | 1650.325 | 9315.6 | -3169.9 | 941.7 |
| 160.0 | 891.777 | -2957.443 | 1651.074 | 9375.3 | -3084.9 | 881.3 |
| | GUIDANCE INITIATIØN | | | | | |
| 163.860 | 897.748 | -2959.382 | 1651.619 | 9423.2 | -3020.2 | 835.3 |
| 165.0 | 899.518 | -2959.947 | 1651.775 | 9437.5 | -3001.3 | 821.7 |
| 170.0 | 907.309 | -2962.384 | 1652.425 | 9498.5 | -2923.4 | 759.0 |
| 175.0 | 915.149 | -2964.760 | 1653.022 | 9556.6 | -2852.7 | 689.2 |
| 180.0 | 923.038 | -2967.078 | 1653.560 | 9616.8 | -2780.6 | 619.6 |
| 185.0 | 930.977 | -2969.336 | 1654.041 | 9679.2 | -2705.6 | 550.8 |
| 190.0 | 938.968 | -2971.531 | 1654.467 | 9743.3 | -2629.0 | 483.5 |
| 195.0 | 947.013 | -2973.662 | 1654.838 | 9808.9 | -2551.1 | 417.3 |
| 200.0 | 955.112 | -2975.729 | 1655.154 | 9875.9 | -2472.9 | 352.5 |
| 205.0 | 963.267 | -2977.731 | 1655.418 | 9944.7 | -2393.0 | 288.3 |
| 210.0 | 971.479 | -2979.668 | 1655.629 | 10014.4 | -2312.6 | 224.9 |
| 215.0 | 979.749 | -2981.537 | 1655.788 | 10085.7 | -2230.8 | 161.7 |
| 220.0 | 988.078 | -2983.339 | 1655.896 | 10158.3 | -2148.6 | 99.3 |
| 225.0 | 996.468 | -2985.073 | 1655.952 | 10232.6 | -2065.5 | 36.8 |

TABLE XVI

SPACE-FIXED EPHEMERIS PØSITIØNS AND VELØCITIES

| TIME SEC | XSP NM | YSP NM | ZSP NM | DXSP FT/S | DYSP FT/S | DZSP FT/S |
|---|---|---|---|---|---|---|
| 230.0 | 1004.919 | -2986.738 | 1655.956 | 10308.4 | -1981.2 | -26.0 |
| 235.0 | 1013.433 | -2988.333 | 1655.909 | 10385.2 | -1896.0 | -88.7 |
| 240.0 | 1022.012 | -2989.858 | 1655.810 | 10463.5 | -1810.0 | -151.6 |
| 245.0 | 1030.655 | -2991.312 | 1655.659 | 10542.9 | -1723.3 | -214.7 |
| 250.0 | 1039.363 | -2992.695 | 1655.457 | 10623.4 | -1635.8 | -278.2 |
| 255.0 | 1048.139 | -2994.004 | 1655.201 | 10705.0 | -1547.7 | -342.1 |
| 260.0 | 1056.982 | -2995.241 | 1654.893 | 10787.9 | -1458.4 | -406.7 |
| 265.0 | 1065.894 | -2996.405 | 1654.532 | 10871.8 | -1368.8 | -471.8 |
| 270.0 | 1074.875 | -2997.494 | 1654.117 | 10957.4 | -1278.2 | -537.7 |
| 275.0 | 1083.927 | -2998.508 | 1653.647 | 11044.0 | -1186.6 | -604.1 |
| 280.0 | 1093.051 | -2999.447 | 1653.122 | 11131.6 | -1094.9 | -671.1 |
| 285.0 | 1102.248 | -3000.309 | 1652.542 | 11220.7 | -1001.9 | -739.1 |
| 290.0 | 1111.518 | -3001.096 | 1651.906 | 11311.0 | -908.2 | -807.8 |
| 295.0 | 1120.864 | -3001.804 | 1651.212 | 11402.6 | -813.7 | -877.4 |
| 300.0 | 1130.285 | -3002.434 | 1650.461 | 11495.7 | -718.4 | -947.9 |
| 305.0 | 1139.783 | -3002.986 | 1649.652 | 11590.2 | -622.3 | -1019.2 |
| 310.0 | 1149.360 | -3003.458 | 1648.784 | 11686.0 | -525.1 | -1091.5 |
| 315.0 | 1159.016 | -3003.850 | 1647.855 | 11783.2 | -427.0 | -1164.7 |
| 320.0 | 1168.753 | -3004.161 | 1646.867 | 11882.0 | -328.3 | -1238.9 |
| 325.0 | 1178.572 | -3004.390 | 1645.816 | 11982.6 | -228.4 | -1314.1 |
| 330.0 | 1188.474 | -3004.537 | 1644.704 | 12084.3 | -127.3 | -1390.4 |
| 335.0 | 1198.461 | -3004.599 | 1643.528 | 12187.5 | -25.1 | -1467.7 |
| 340.0 | 1208.533 | -3004.578 | 1642.288 | 12292.1 | 78.3 | -1546.0 |
| 345.0 | 1218.692 | -3004.470 | 1640.983 | 12398.2 | 182.8 | -1625.4 |
| 350.0 | 1228.938 | -3004.276 | 1639.612 | 12505.7 | 288.6 | -1705.8 |
| 355.0 | 1239.274 | -3003.995 | 1638.175 | 12614.8 | 396.1 | -1787.8 |
| 360.0 | 1249.700 | -3003.624 | 1636.670 | 12725.4 | 504.8 | -1870.5 |
| 365.0 | 1260.217 | -3003.164 | 1635.096 | 12837.2 | 614.7 | -1954.4 |
| 370.0 | 1270.827 | -3002.612 | 1633.453 | 12950.5 | 726.1 | -2039.5 |
| 375.0 | 1281.531 | -3001.968 | 1631.739 | 13065.3 | 839.5 | -2125.9 |
| 380.0 | 1292.331 | -3001.230 | 1629.954 | 13181.7 | 954.2 | -2213.7 |
| 385.0 | 1303.226 | -3000.397 | 1628.096 | 13299.4 | 1070.7 | -2302.9 |
| 390.0 | 1314.219 | -2999.467 | 1626.163 | 13419.4 | 1188.8 | -2393.1 |
| 395.0 | 1325.312 | -2998.440 | 1624.157 | 13540.4 | 1308.7 | -2484.8 |
| 400.0 | 1336.505 | -2997.313 | 1622.074 | 13663.3 | 1430.1 | -2577.6 |
| 405.0 | 1347.799 | -2996.086 | 1619.914 | 13788.1 | 1553.5 | -2672.1 |
| 410.0 | 1359.197 | -2994.756 | 1617.676 | 13914.4 | 1679.0 | -2767.8 |
| 415.0 | 1370.700 | -2993.322 | 1615.358 | 14042.7 | 1806.2 | -2865.3 |
| 420.0 | 1382.309 | -2991.782 | 1612.959 | 14172.3 | 1936.0 | -2964.4 |
| 425.0 | 1394.025 | -2990.135 | 1610.479 | 14303.9 | 2067.6 | -3064.9 |

TABLE XVI

SPACE-FIXED EPHEMERIS PØSITIØNS AND VELØCITIES

| TIME SEC | XSP NM | YSP NM | ZSP NM | DXSP FT/S | DYSP FT/S | DZSP FT/S |
|---|---|---|---|---|---|---|
| 430.0 | 1405.851 | -2988.378 | 1607.915 | 14437.4 | 2201.5 | -3166.9 |
| 435.0 | 1417.787 | -2986.511 | 1605.266 | 14572.8 | 2337.7 | -3270.9 |
| 440.0 | 1429.835 | -2984.530 | 1602.531 | 14709.9 | 2476.0 | -3376.4 |
| 445.0 | 1441.997 | -2982.437 | 1599.710 | 14848.6 | 2616.8 | -3483.7 |
| 450.0 | 1454.274 | -2980.225 | 1596.798 | 14988.8 | 2760.2 | -3592.8 |
| 455.0 | 1466.666 | -2977.894 | 1593.796 | 15130.7 | 2906.2 | -3703.8 |
| 460.0 | 1479.176 | -2975.441 | 1590.702 | 15274.2 | 3055.3 | -3816.8 |
| 465.0 | 1491.805 | -2972.865 | 1587.514 | 15419.8 | 3206.8 | -3931.7 |
| 470.0 | 1504.554 | -2970.163 | 1584.231 | 15567.0 | 3361.5 | -4048.7 |
| 475.0 | 1517.426 | -2967.332 | 1580.850 | 15716.4 | 3519.2 | -4167.6 |
| 480.0 | 1530.421 | -2964.370 | 1577.371 | 15868.0 | 3679.9 | -4288.9 |
| 485.0 | 1543.542 | -2961.275 | 1573.791 | 16021.6 | 3843.5 | -4412.4 |
| 490.0 | 1556.790 | -2958.043 | 1570.109 | 16177.4 | 4010.8 | -4538.3 |
| 495.0 | 1570.167 | -2954.673 | 1566.321 | 16335.5 | 4181.4 | -4666.7 |
| 500.0 | 1583.675 | -2951.161 | 1562.428 | 16495.4 | 4355.2 | -4797.2 |
| 505.0 | 1597.316 | -2947.504 | 1558.425 | 16657.8 | 4532.8 | -4930.5 |
| 510.0 | 1611.091 | -2943.700 | 1554.312 | 16822.4 | 4714.1 | -5066.4 |
| 515.0 | 1625.003 | -2939.745 | 1550.087 | 16989.0 | 4899.3 | -5204.9 |
| 520.0 | 1639.052 | -2935.635 | 1545.745 | 17158.4 | 5088.9 | -5346.5 |
| 525.0 | 1653.242 | -2931.368 | 1541.287 | 17329.9 | 5282.4 | -5490.7 |
| 530.0 | 1667.574 | -2926.941 | 1536.708 | 17503.9 | 5480.4 | -5638.1 |
| 535.0 | 1682.051 | -2922.348 | 1532.007 | 17680.4 | 5682.7 | -5788.6 |
| 540.0 | 1696.674 | -2917.586 | 1527.180 | 17859.5 | 5890.1 | -5942.4 |
| 545.0 | 1711.445 | -2912.653 | 1522.226 | 18040.8 | 6102.5 | -6099.6 |
| 550.0 | 1726.366 | -2907.542 | 1517.141 | 18224.5 | 6319.9 | -6260.2 |
| 555.0 | 1741.439 | -2902.250 | 1511.922 | 18411.3 | 6542.9 | -6424.8 |
| 560.0 | 1756.667 | -2896.772 | 1506.566 | 18600.1 | 6771.6 | -6593.0 |
| 565.0 | 1772.052 | -2891.104 | 1501.070 | 18792.7 | 7006.0 | -6765.2 |
| 570.0 | 1787.597 | -2885.240 | 1495.431 | 18988.5 | 7246.5 | -6941.4 |
| 575.0 | 1803.304 | -2879.176 | 1489.645 | 19186.5 | 7493.6 | -7122.1 |
| 580.0 | 1819.175 | -2872.905 | 1483.708 | 19388.5 | 7747.7 | -7307.7 |
| 585.0 | 1835.214 | -2866.423 | 1477.616 | 19593.5 | 8009.1 | -7497.8 |
| 590.0 | 1851.423 | -2859.722 | 1471.367 | 19800.8 | 8277.3 | -7693.0 |
| 595.0 | 1867.803 | -2852.798 | 1464.954 | 20011.2 | 8553.9 | -7893.6 |
| 600.0 | 1884.358 | -2845.642 | 1458.374 | 20224.9 | 8837.8 | -8099.0 |
| 605.0 | 1901.090 | -2838.250 | 1451.623 | 20441.8 | 9130.2 | -8310.1 |
| 610.0 | 1918.002 | -2830.613 | 1444.696 | 20661.9 | 9432.3 | -8527.4 |
| 615.0 | 1935.096 | -2822.723 | 1437.587 | 20885.2 | 9744.0 | -8751.1 |
| 620.0 | 1952.374 | -2814.573 | 1430.291 | 21113.1 | 10065.9 | -8981.4 |
| | S-IV CUTØFF | | | | | |
| 621.659 | 1958.149 | -2811.809 | 1427.828 | 21189.9 | 10175.6 | -9059.8 |

TABLE XVI

SPACE-FIXED EPHEMERIS PØSITIØNS AND VELØCITIES

| TIME SEC | XSP NM | YSP NM | ZSP NM | DXSP FT/S | DYSP FT/S | DZSP FT/S |
|---|---|---|---|---|---|---|
| 625.0 | 1969.791 | -2806.192 | 1422.834 | 21148.6 | 10251.3 | -9099.6 |
| 630.0 | 1987.164 | -2797.713 | 1415.324 | 21075.2 | 10355.8 | -9152.8 |
| | INSERTIØN | | | | | |
| 631.659 | 1992.915 | -2794.881 | 1412.823 | 21050.6 | 10390.4 | -9170.3 |

TABLE XVII

EARTH-FIXED PLUMBLINE AND SPACE-FIXED EPHEMERIS ACCELERATIØNS

| TIME SEC | DDXE FT/S SQ | DDYE FT/S SQ | DDZE FT/S SQ | DDXSP FT/S SQ | DDYSP FT/S SQ | DDZSP FT/S SQ |
|---|---|---|---|---|---|---|
| | FIRST MØTIØN | | | | | |
| 0.080 | 0.25 | 11.11 | -0.53 | 2.75 | -9.12 | 5.70 |
| | LIFTØFF SIGNAL | | | | | |
| 0.280 | 0.18 | 11.22 | -0.43 | 2.70 | -9.28 | 5.68 |
| 1.0 | -0.02 | 11.59 | -0.16 | 2.56 | -9.76 | 5.67 |
| 2.0 | -0.18 | 11.99 | 0.04 | 2.46 | -10.22 | 5.73 |
| 3.0 | -0.26 | 12.30 | 0.10 | 2.45 | -10.53 | 5.85 |
| 4.0 | -0.28 | 12.57 | 0.09 | 2.50 | -10.75 | 5.99 |
| 5.0 | -0.28 | 12.81 | 0.03 | 2.57 | -10.92 | 6.16 |
| 6.0 | -0.25 | 13.04 | -0.04 | 2.66 | -11.08 | 6.32 |
| 7.0 | -0.23 | 13.29 | -0.09 | 2.75 | -11.26 | 6.48 |
| 8.0 | -0.20 | 13.55 | -0.13 | 2.84 | -11.45 | 6.63 |
| 9.0 | -0.16 | 13.82 | -0.14 | 2.94 | -11.68 | 6.76 |
| 10.0 | -0.12 | 14.12 | -0.13 | 3.05 | -11.93 | 6.88 |
| 11.0 | -0.07 | 14.42 | -0.09 | 3.17 | -12.20 | 6.98 |
| 12.0 | -0.00 | 14.74 | -0.04 | 3.31 | -12.49 | 7.07 |
| 13.0 | 0.10 | 15.06 | 0.02 | 3.47 | -12.78 | 7.15 |
| 14.0 | 0.23 | 15.39 | 0.09 | 3.67 | -13.06 | 7.22 |
| 15.0 | 0.41 | 15.70 | 0.14 | 3.90 | -13.34 | 7.29 |
| 16.0 | 0.63 | 16.01 | 0.19 | 4.18 | -13.59 | 7.35 |
| 17.0 | 0.90 | 16.31 | 0.21 | 4.52 | -13.82 | 7.40 |
| 18.0 | 1.23 | 16.60 | 0.22 | 4.90 | -14.02 | 7.46 |
| 19.0 | 1.61 | 16.87 | 0.21 | 5.33 | -14.20 | 7.51 |
| 20.0 | 2.04 | 17.13 | 0.19 | 5.82 | -14.34 | 7.56 |
| 21.0 | 2.52 | 17.37 | 0.15 | 6.35 | -14.47 | 7.60 |
| 22.0 | 3.05 | 17.62 | 0.10 | 6.92 | -14.58 | 7.64 |
| 23.0 | 3.60 | 17.86 | 0.05 | 7.52 | -14.68 | 7.67 |
| 24.0 | 4.18 | 18.11 | 0.01 | 8.14 | -14.79 | 7.69 |
| 25.0 | 4.78 | 18.36 | -0.03 | 8.78 | -14.91 | 7.71 |
| 26.0 | 5.37 | 18.63 | -0.04 | 9.42 | -15.04 | 7.71 |
| 27.0 | 5.96 | 18.92 | -0.04 | 10.06 | -15.21 | 7.72 |
| 28.0 | 6.52 | 19.22 | -0.02 | 10.67 | -15.40 | 7.72 |
| 29.0 | 7.05 | 19.55 | 0.01 | 11.26 | -15.62 | 7.73 |
| 30.0 | 7.55 | 19.89 | 0.04 | 11.82 | -15.85 | 7.75 |

TABLE XVII

EARTH-FIXED PLUMBLINE AND SPACE-FIXED EPHEMERIS ACCELERATIØNS

| TIME SEC | DDXE FT/S SQ | DDYE FT/S SQ | DDZE FT/S SQ | DDXSP FT/S SQ | DDYSP FT/S SQ | DDZSP FT/S SQ |
|---|---|---|---|---|---|---|
| 31.0 | 7.99 | 20.02 | 0.06 | 12.28 | -15.91 | 7.70 |
| 32.0 | 8.38 | 20.41 | -0.02 | 12.75 | -16.15 | 7.86 |
| 33.0 | 8.71 | 20.77 | -0.20 | 13.18 | -16.32 | 8.11 |
| 34.0 | 9.07 | 21.09 | -0.37 | 13.63 | -16.45 | 8.33 |
| 35.0 | 9.48 | 21.38 | -0.44 | 14.11 | -16.60 | 8.43 |
| 36.0 | 9.96 | 21.54 | -0.36 | 14.59 | -16.71 | 8.33 |
| 37.0 | 10.55 | 21.80 | -0.10 | 15.19 | -16.98 | 8.10 |
| 38.0 | 11.12 | 22.08 | 0.22 | 15.77 | -17.30 | 7.83 |
| 39.0 | 11.51 | 22.44 | 0.37 | 16.21 | -17.63 | 7.78 |
| 40.0 | 11.63 | 22.82 | 0.27 | 16.44 | -17.88 | 8.02 |
| 41.0 | 11.79 | 23.22 | 0.37 | 16.68 | -18.24 | 8.09 |
| 42.0 | 12.00 | 23.60 | 0.46 | 16.96 | -18.58 | 8.15 |
| 43.0 | 12.26 | 23.95 | 0.54 | 17.28 | -18.87 | 8.19 |
| 44.0 | 12.56 | 24.27 | 0.61 | 17.64 | -19.15 | 8.22 |
| 45.0 | 12.91 | 24.58 | 0.67 | 18.05 | -19.38 | 8.23 |
| 46.0 | 13.30 | 24.85 | 0.73 | 18.49 | -19.59 | 8.23 |
| 47.0 | 13.74 | 25.10 | 0.77 | 18.96 | -19.76 | 8.21 |
| 48.0 | 14.23 | 25.31 | 0.81 | 19.48 | -19.89 | 8.16 |
| 49.0 | 14.76 | 25.50 | 0.85 | 20.04 | -19.98 | 8.10 |
| 50.0 | 15.34 | 25.64 | 0.87 | 20.63 | -20.04 | 8.02 |
| 51.0 | 15.96 | 25.76 | 0.88 | 21.26 | -20.05 | 7.92 |
| 52.0 | 16.64 | 25.35 | 0.89 | 21.82 | -19.61 | 7.57 |
| 53.0 | 17.40 | 24.66 | 0.89 | 22.40 | -18.92 | 7.07 |
| | MACH ØNE | | | | | |
| 53.208 | 17.47 | 24.55 | 0.88 | 22.44 | -18.81 | 7.00 |
| 54.0 | 17.68 | 24.19 | 0.88 | 22.57 | -18.47 | 6.79 |
| 55.0 | 17.87 | 23.94 | 0.86 | 22.70 | -18.22 | 6.65 |
| 56.0 | 17.97 | 23.92 | 0.83 | 22.79 | -18.17 | 6.64 |
| 57.0 | 18.03 | 24.13 | 0.79 | 22.91 | -18.32 | 6.75 |
| 58.0 | 18.99 | 24.58 | 0.75 | 23.95 | -18.54 | 6.78 |
| 59.0 | 19.93 | 25.26 | 0.70 | 25.03 | -18.96 | 6.94 |
| 60.0 | 20.87 | 25.75 | 0.64 | 26.06 | -19.21 | 7.01 |
| 61.0 | 21.96 | 26.29 | 0.29 | 27.28 | -19.33 | 7.32 |
| 62.0 | 23.11 | 26.83 | -0.78 | 28.66 | -19.08 | 8.22 |
| 63.0 | 24.07 | 27.47 | -2.03 | 29.90 | -18.84 | 9.36 |
| 64.0 | 24.79 | 28.24 | -2.73 | 30.86 | -19.03 | 10.17 |
| 65.0 | 25.27 | 29.11 | -2.51 | 31.51 | -19.81 | 10.29 |

TABLE XVII

EARTH-FIXED PLUMBLINE AND SPACE-FIXED EPHEMERIS ACCELERATIØNS

| TIME SEC | DDXE FT/S SQ | DDYE FT/S SQ | DDZE FT/S SQ | DDXSP FT/S SQ | DDYSP FT/S SQ | DDZSP FT/S SQ |
|---|---|---|---|---|---|---|
| | MAXIMUM DYNAMIC PRESSURE | | | | | |
| 66.000 | 25.72 | 29.90 | -1.76 | 32.04 | -20.79 | 9.93 |
| 67.0 | 26.31 | 30.61 | -1.19 | 32.69 | -21.61 | 9.65 |
| 68.0 | 27.11 | 31.24 | -1.31 | 33.64 | -21.96 | 9.87 |
| 69.0 | 28.03 | 31.86 | -1.72 | 34.72 | -22.14 | 10.30 |
| 70.0 | 29.10 | 32.45 | -1.85 | 35.92 | -22.42 | 10.45 |
| 71.0 | 30.29 | 33.07 | -1.37 | 37.15 | -23.02 | 10.07 |
| 72.0 | 31.49 | 33.69 | -0.59 | 38.35 | -23.77 | 9.43 |
| 73.0 | 32.52 | 34.38 | 0.04 | 39.43 | -24.53 | 8.99 |
| 74.0 | 33.45 | 35.10 | 0.22 | 40.48 | -25.09 | 8.98 |
| 75.0 | 34.33 | 35.88 | 0.20 | 41.52 | -25.61 | 9.17 |
| 76.0 | 35.31 | 36.63 | 0.15 | 42.66 | -26.09 | 9.34 |
| 77.0 | 36.37 | 37.40 | 0.31 | 43.84 | -26.66 | 9.33 |
| 78.0 | 37.48 | 38.15 | 0.52 | 45.07 | -27.24 | 9.26 |
| 79.0 | 38.54 | 38.96 | 0.75 | 46.26 | -27.89 | 9.21 |
| 80.0 | 39.75 | 39.69 | 0.74 | 47.60 | -28.32 | 9.29 |
| 81.0 | 41.15 | 40.35 | 0.72 | 49.11 | -28.67 | 9.31 |
| 82.0 | 42.76 | 40.92 | 0.74 | 50.80 | -28.94 | 9.19 |
| 83.0 | 44.37 | 41.49 | 0.86 | 52.47 | -29.25 | 9.00 |
| 84.0 | 45.95 | 42.02 | 0.88 | 54.13 | -29.47 | 8.87 |
| 85.0 | 47.40 | 42.59 | 0.89 | 55.66 | -29.75 | 8.81 |
| 86.0 | 48.85 | 43.11 | 0.77 | 57.20 | -29.92 | 8.83 |
| 87.0 | 50.36 | 43.59 | 0.62 | 58.80 | -30.02 | 8.84 |
| 88.0 | 51.97 | 43.98 | 0.49 | 60.47 | -30.05 | 8.78 |
| 89.0 | 53.64 | 44.33 | 0.46 | 62.16 | -30.09 | 8.59 |
| 90.0 | 55.35 | 44.63 | 0.41 | 63.90 | -30.07 | 8.38 |
| 91.0 | 57.08 | 44.93 | 0.43 | 65.64 | -30.08 | 8.12 |
| 92.0 | 58.78 | 45.25 | 0.45 | 67.36 | -30.11 | 7.87 |
| 93.0 | 60.45 | 45.63 | 0.50 | 69.05 | -30.21 | 7.62 |
| 94.0 | 62.04 | 46.02 | 0.51 | 70.69 | -30.32 | 7.44 |
| 95.0 | 63.57 | 46.41 | 0.52 | 72.26 | -30.42 | 7.27 |
| 96.0 | 65.04 | 46.71 | 0.62 | 73.74 | -30.50 | 7.00 |
| 97.0 | 66.55 | 47.04 | 0.50 | 75.29 | -30.50 | 6.91 |
| 98.0 | 68.26 | 47.39 | 0.34 | 77.05 | -30.46 | 6.83 |
| 99.0 | 69.81 | 47.80 | 0.35 | 78.65 | -30.58 | 6.66 |
| 100.0 | 71.46 | 48.23 | 0.41 | 80.34 | -30.73 | 6.44 |
| 101.0 | 73.14 | 48.65 | 0.49 | 82.05 | -30.88 | 6.19 |

TABLE XVII

EARTH-FIXED PLUMBLINE AND SPACE-FIXED EPHEMERIS ACCELERATIØNS

| TIME SEC | DDXE FT/S SQ | DDYE FT/S SQ | DDZE FT/S SQ | DDXSP FT/S SQ | DDYSP FT/S SQ | DDZSP FT/S SQ |
|---|---|---|---|---|---|---|
| 102.0 | 74.76 | 49.04 | 0.55 | 83.71 | -30.99 | 5.96 |
| 103.0 | 76.36 | 49.47 | 0.67 | 85.34 | -31.17 | 5.70 |
| 104.0 | 77.84 | 49.96 | 0.64 | 86.89 | -31.35 | 5.62 |
| 105.0 | 79.27 | 50.49 | 0.44 | 88.43 | -31.48 | 5.71 |
| 106.0 | 80.81 | 51.10 | 0.39 | 90.07 | -31.74 | 5.71 |
| 107.0 | 82.34 | 51.80 | 0.46 | 91.70 | -32.13 | 5.63 |
| 108.0 | 83.92 | 52.52 | 0.63 | 93.38 | -32.59 | 5.47 |
| 109.0 | 85.50 | 53.24 | 0.81 | 95.05 | -33.04 | 5.30 |
| 110.0 | 87.10 | 53.93 | 0.85 | 96.76 | -33.41 | 5.23 |
| 111.0 | 88.63 | 54.61 | 0.65 | 98.43 | -33.65 | 5.38 |
| 112.0 | 90.18 | 55.34 | 0.49 | 100.12 | -33.94 | 5.51 |
| 113.0 | 91.85 | 56.14 | 0.57 | 101.92 | -34.40 | 5.44 |
| 114.0 | 93.46 | 57.02 | 0.68 | 103.67 | -34.95 | 5.41 |
| 115.0 | 95.06 | 57.92 | 0.69 | 105.43 | -35.48 | 5.46 |
| 116.0 | 96.69 | 58.92 | 0.70 | 107.25 | -36.08 | 5.56 |
| 117.0 | 98.31 | 59.99 | 0.74 | 109.06 | -36.76 | 5.67 |
| 118.0 | 99.89 | 61.10 | 0.80 | 110.85 | -37.49 | 5.79 |
| 119.0 | 101.57 | 62.23 | 0.95 | 112.72 | -38.25 | 5.83 |
| 120.0 | 103.31 | 63.37 | 1.06 | 114.66 | -39.00 | 5.88 |
| 121.0 | 105.02 | 64.58 | 1.00 | 116.61 | -39.74 | 6.11 |
| 122.0 | 106.80 | 65.84 | 0.98 | 118.64 | -40.51 | 6.33 |
| 123.0 | 108.67 | 67.13 | 0.99 | 120.75 | -41.32 | 6.52 |
| 124.0 | 110.56 | 68.46 | 0.99 | 122.90 | -42.16 | 6.72 |
| 125.0 | 112.45 | 69.86 | 0.93 | 125.06 | -43.02 | 7.02 |
| 126.0 | 114.50 | 71.29 | 0.94 | 127.38 | -43.92 | 7.22 |
| 127.0 | 116.55 | 72.78 | 0.92 | 129.72 | -44.85 | 7.48 |
| 128.0 | 118.63 | 74.35 | 0.97 | 132.10 | -45.88 | 7.71 |
| 129.0 | 120.80 | 75.97 | 1.16 | 134.57 | -47.02 | 7.83 |
| 130.0 | 123.13 | 77.56 | 1.28 | 137.18 | -48.07 | 7.97 |
| 131.0 | 125.63 | 79.10 | 1.27 | 139.96 | -48.98 | 8.13 |
| 132.0 | 128.26 | 80.63 | 1.29 | 142.87 | -49.88 | 8.25 |
| 133.0 | 130.98 | 82.14 | 1.25 | 145.86 | -50.72 | 8.38 |
| 134.0 | 133.84 | 83.60 | 1.15 | 148.99 | -51.47 | 8.52 |
| 135.0 | 137.29 | 84.66 | 1.23 | 152.57 | -51.88 | 8.18 |
| 136.0 | 140.73 | 85.90 | 1.30 | 156.17 | -52.45 | 7.92 |
| 137.0 | 144.14 | 87.32 | 1.38 | 159.80 | -53.18 | 7.76 |
| 138.0 | 147.53 | 88.93 | 1.46 | 163.45 | -54.07 | 7.70 |
| 139.0 | 150.90 | 90.73 | 1.54 | 167.13 | -55.11 | 7.72 |
| 140.0 | 154.25 | 92.70 | 1.61 | 170.82 | -56.32 | 7.84 |
| | IECØ | | | | | |
| 140.220 | 154.21 | 93.30 | 1.57 | 170.93 | -56.80 | 8.17 |

TABLE XVII

EARTH-FIXED PLUMBLINE AND SPACE-FIXED EPHEMERIS ACCELERATIØNS

| TIME SEC | DDXE FT/S SQ | DDYE FT/S SQ | DDZE FT/S SQ | DDXSP FT/S SQ | DDYSP FT/S SQ | DDZSP FT/S SQ |
|---|---|---|---|---|---|---|
| 141.0 | 81.40 | 35.98 | 1.17 | 87.25 | -18.40 | -2.32 |
| 142.0 | 79.66 | 33.19 | 1.20 | 84.91 | -16.28 | -3.28 |
| 143.0 | 78.66 | 31.85 | 1.23 | 83.63 | -15.29 | -3.72 |
| 144.0 | 78.43 | 31.95 | 1.27 | 83.42 | -15.41 | -3.65 |
| 145.0 | 78.95 | 33.50 | 1.31 | 84.30 | -16.65 | -3.07 |
| | ØECØ | | | | | |
| 145.560 | 74.64 | 31.63 | 1.36 | 79.69 | -15.69 | -3.02 |
| 146.0 | 19.03 | -16.72 | 0.92 | 14.69 | 17.53 | -13.09 |
| 147.0 | 3.56 | -26.80 | 0.81 | -2.60 | 23.91 | -14.30 |
| 148.0 | 2.07 | -28.95 | 0.79 | -4.54 | 25.53 | -14.97 |
| | S-IV ENGINE START | | | | | |
| 148.120 | 1.25 | -28.96 | 0.84 | -5.35 | 25.39 | -14.83 |
| 149.0 | 2.81 | -28.22 | 0.80 | -3.66 | 25.01 | -14.79 |
| 150.0 | 12.74 | -20.31 | 0.86 | 7.77 | 19.70 | -13.33 |
| 155.0 | 15.96 | -16.50 | 0.86 | 11.76 | 16.95 | -12.24 |
| 160.0 | 16.47 | -16.20 | 0.74 | 12.32 | 16.85 | -12.11 |
| | GUIDANCE INITIATIØN | | | | | |
| 163.860 | 16.53 | -15.97 | 0.68 | 12.42 | 16.69 | -11.96 |
| 165.0 | 16.52 | -15.61 | 0.86 | 12.47 | 16.31 | -11.94 |
| 170.0 | 16.07 | -14.61 | 3.26 | 11.97 | 14.17 | -13.40 |
| 175.0 | 16.06 | -14.89 | 3.81 | 11.81 | 14.14 | -14.00 |
| 180.0 | 16.63 | -15.16 | 3.36 | 12.34 | 14.69 | -13.87 |
| 185.0 | 16.91 | -15.50 | 2.81 | 12.57 | 15.31 | -13.63 |
| 190.0 | 17.15 | -15.53 | 2.33 | 12.84 | 15.64 | -13.30 |
| 195.0 | 17.39 | -15.29 | 2.21 | 13.12 | 15.54 | -13.13 |
| 200.0 | 17.69 | -15.00 | 2.07 | 13.49 | 15.43 | -12.95 |
| 205.0 | 17.96 | -15.27 | 1.66 | 13.72 | 15.92 | -12.79 |
| 210.0 | 18.30 | -15.25 | 1.41 | 14.06 | 16.10 | -12.64 |
| 215.0 | 18.66 | -15.22 | 1.15 | 14.43 | 16.27 | -12.49 |
| 220.0 | 18.79 | -15.16 | 0.96 | 14.58 | 16.36 | -12.33 |
| 225.0 | 19.23 | -15.51 | 0.88 | 14.91 | 16.78 | -12.52 |

TABLE XVII

EARTH-FIXED PLUMBLINE AND SPACE-FIXED EPHEMERIS ACCELERATIØNS

| TIME SEC | DDXE FT/S SQ | DDYE FT/S SQ | DDZE FT/S SQ | DDXSP FT/S SQ | DDYSP FT/S SQ | DDZSP FT/S SQ |
|---|---|---|---|---|---|---|
| 230.0 | 19.74 | -15.47 | 0.72 | 15.41 | 16.91 | -12.49 |
| 235.0 | 20.07 | -15.55 | 0.82 | 15.68 | 17.00 | -12.69 |
| 240.0 | 20.15 | -15.70 | 0.56 | 15.74 | 17.29 | -12.56 |
| 245.0 | 20.43 | -15.45 | 0.62 | 16.04 | 17.10 | -12.55 |
| 250.0 | 20.59 | -15.78 | 0.53 | 16.11 | 17.47 | -12.67 |
| 255.0 | 21.07 | -16.16 | 0.50 | 16.45 | 17.89 | -12.93 |
| 260.0 | 21.20 | -15.99 | 0.78 | 16.57 | 17.64 | -13.12 |
| 265.0 | 21.52 | -16.06 | 0.59 | 16.87 | 17.87 | -13.07 |
| 270.0 | 21.77 | -16.36 | 0.59 | 17.02 | 18.17 | -13.26 |
| 275.0 | 22.22 | -16.52 | 0.64 | 17.38 | 18.37 | -13.48 |
| 280.0 | 22.52 | -16.30 | 0.53 | 17.72 | 18.31 | -13.36 |
| 285.0 | 22.69 | -16.51 | 0.57 | 17.81 | 18.51 | -13.53 |
| 290.0 | 23.07 | -16.72 | 0.55 | 18.10 | 18.77 | -13.70 |
| 295.0 | 23.46 | -16.97 | 0.71 | 18.38 | 18.98 | -14.04 |
| 300.0 | 23.84 | -16.90 | 0.83 | 18.73 | 18.94 | -14.19 |
| 305.0 | 24.32 | -17.21 | 0.83 | 19.10 | 19.29 | -14.45 |
| 310.0 | 24.57 | -17.64 | 0.81 | 19.21 | 19.73 | -14.70 |
| 315.0 | 24.81 | -17.55 | 0.80 | 19.45 | 19.72 | -14.71 |
| 320.0 | 25.39 | -17.73 | 0.77 | 19.95 | 19.99 | -14.90 |
| 325.0 | 25.60 | -17.53 | 0.93 | 20.16 | 19.79 | -14.98 |
| 330.0 | 25.90 | -18.20 | 0.93 | 20.26 | 20.42 | -15.37 |
| 335.0 | 26.33 | -18.25 | 0.96 | 20.63 | 20.54 | -15.52 |
| 340.0 | 26.76 | -18.30 | 1.27 | 20.98 | 20.51 | -15.90 |
| 345.0 | 27.20 | -18.54 | 1.17 | 21.33 | 20.86 | -16.03 |
| 350.0 | 27.68 | -18.85 | 1.21 | 21.68 | 21.19 | -16.33 |
| 355.0 | 28.05 | -19.27 | 1.07 | 21.93 | 21.70 | -16.49 |
| 360.0 | 28.37 | -19.35 | 1.04 | 22.20 | 21.86 | -16.58 |
| 365.0 | 28.87 | -19.46 | 1.30 | 22.59 | 21.92 | -16.96 |
| 370.0 | 29.21 | -20.24 | 1.07 | 22.73 | 22.77 | -17.21 |
| 375.0 | 29.43 | -20.02 | 1.37 | 22.93 | 22.50 | -17.42 |
| 380.0 | 29.84 | -20.63 | 1.23 | 23.17 | 23.17 | -17.69 |
| 385.0 | 30.41 | -20.87 | 1.33 | 23.62 | 23.44 | -18.01 |
| 390.0 | 30.86 | -21.01 | 1.33 | 24.00 | 23.65 | -18.18 |
| 395.0 | 31.29 | -21.20 | 1.42 | 24.32 | 23.86 | -18.45 |
| 400.0 | 31.87 | -21.72 | 1.33 | 24.73 | 24.47 | -18.75 |
| 405.0 | 32.19 | -21.89 | 1.44 | 24.97 | 24.63 | -18.99 |
| 410.0 | 32.80 | -22.25 | 1.30 | 25.44 | 25.14 | -19.19 |
| 415.0 | 33.21 | -22.62 | 1.55 | 25.69 | 25.41 | -19.67 |
| 420.0 | 33.90 | -22.99 | 1.58 | 26.23 | 25.84 | -20.03 |
| 425.0 | 34.49 | -23.49 | 1.30 | 26.67 | 26.53 | -20.16 |

TABLE XVII

EARTH-FIXED PLUMBLINE AND SPACE-FIXED EPHEMERIS ACCELERATIØNS

| TIME SEC | DDXE FT/S SQ | DDYE FT/S SQ | DDZE FT/S SQ | DDXSP FT/S SQ | DDYSP FT/S SQ | DDZSP FT/S SQ |
|---|---|---|---|---|---|---|
| 430.0 | 34.89 | -23.90 | 1.53 | 26.90 | 26.85 | -20.65 |
| 435.0 | 35.31 | -24.46 | 1.53 | 27.13 | 27.41 | -21.01 |
| 440.0 | 35.72 | -24.94 | 1.52 | 27.37 | 27.92 | -21.33 |
| 445.0 | 36.40 | -25.23 | 1.56 | 27.92 | 28.29 | -21.65 |
| 450.0 | 37.01 | -25.67 | 1.55 | 28.36 | 28.79 | -21.99 |
| 455.0 | 37.54 | -26.12 | 1.62 | 28.72 | 29.25 | -22.38 |
| 460.0 | 37.86 | -26.88 | 1.65 | 28.80 | 29.96 | -22.85 |
| 465.0 | 38.43 | -27.16 | 1.66 | 29.24 | 30.32 | -23.12 |
| 470.0 | 39.13 | -27.68 | 1.60 | 29.76 | 30.93 | -23.47 |
| 475.0 | 39.59 | -28.41 | 1.61 | 29.97 | 31.65 | -23.94 |
| 480.0 | 40.35 | -29.10 | 1.65 | 30.49 | 32.36 | -24.48 |
| 485.0 | 40.88 | -29.84 | 1.68 | 30.77 | 33.09 | -24.97 |
| 490.0 | 41.60 | -30.19 | 1.80 | 31.32 | 33.48 | -25.41 |
| 495.0 | 42.32 | -31.20 | 1.66 | 31.73 | 34.55 | -25.93 |
| 500.0 | 43.02 | -31.58 | 1.82 | 32.25 | 34.95 | -26.41 |
| 505.0 | 43.88 | -32.40 | 1.83 | 32.82 | 35.81 | -27.01 |
| 510.0 | 44.43 | -33.31 | 1.79 | 33.08 | 36.72 | -27.53 |
| 515.0 | 45.28 | -33.96 | 1.85 | 33.68 | 37.41 | -28.08 |
| 520.0 | 46.10 | -34.80 | 1.69 | 34.22 | 38.38 | -28.54 |
| 525.0 | 46.60 | -35.37 | 1.92 | 34.49 | 38.86 | -29.12 |
| 530.0 | 47.65 | -36.51 | 1.87 | 35.16 | 40.05 | -29.86 |
| 535.0 | 48.47 | -37.44 | 1.86 | 35.66 | 41.02 | -30.48 |
| 540.0 | 49.14 | -38.30 | 1.89 | 36.03 | 41.87 | -31.07 |
| 545.0 | 50.03 | -39.24 | 1.95 | 36.59 | 42.82 | -31.78 |
| 550.0 | 50.96 | -40.48 | 1.94 | 37.11 | 44.07 | -32.56 |
| 555.0 | 51.71 | -41.40 | 2.05 | 37.53 | 44.95 | -33.28 |
| 560.0 | 52.85 | -42.49 | 2.13 | 38.28 | 46.06 | -34.12 |
| 565.0 | 53.95 | -44.00 | 1.88 | 38.92 | 47.69 | -34.88 |
| 570.0 | 54.65 | -44.65 | 2.02 | 39.35 | 48.32 | -35.47 |
| 575.0 | 55.76 | -46.33 | 2.13 | 39.91 | 49.90 | -36.61 |
| 580.0 | 56.95 | -47.71 | 2.06 | 40.64 | 51.34 | -37.49 |
| 585.0 | 58.08 | -49.45 | 2.06 | 41.21 | 53.04 | -38.57 |
| 590.0 | 59.26 | -50.92 | 2.34 | 41.86 | 54.38 | -39.79 |
| 595.0 | 60.36 | -52.37 | 2.26 | 42.48 | 55.88 | -40.65 |
| 600.0 | 61.48 | -54.06 | 2.35 | 43.03 | 57.48 | -41.79 |
| 605.0 | 62.34 | -55.71 | 2.15 | 43.38 | 59.17 | -42.61 |
| 610.0 | 64.05 | -57.93 | 2.33 | 44.35 | 61.28 | -44.22 |
| 615.0 | 65.28 | -59.50 | 2.36 | 45.04 | 62.84 | -45.27 |
| 620.0 | 66.81 | -62.41 | 2.28 | 45.66 | 65.64 | -46.94 |
| | S-IV CUTØFF | | | | | |
| 621.659 | 67.20 | -63.35 | 2.29 | 45.77 | 66.51 | -47.48 |

TABLE XVII

EARTH-FIXED PLUMBLINE AND SPACE-FIXED EPHEMERIS ACCELERATIØNS

| TIME SEC | DDXE FT/S SQ | DDYE FT/S SQ | DDZE FT/S SQ | DDXSP FT/S SQ | DDYSP FT/S SQ | DDZSP FT/S SQ |
|---|---|---|---|---|---|---|
| 625.0 | -7.13 | -23.63 | 1.15 | -14.73 | 20.80 | -10.64 |
| 630.0 | -7.25 | -23.59 | 1.14 | -14.86 | 20.74 | -10.58 |
| | INSERTIØN | | | | | |
| 631.659 | -7.30 | -23.58 | 1.13 | -14.90 | 20.72 | -10.57 |

TABLE XVIII
GEØGRAPHIC CØØRDINATES

| TIME SEC | EC DIST NM | LØNG DEG | GC LAT DEG | LAT DEG | VEL-AZ DEG | VEL-ELEV DEG | EF VEL FT/S |
|---|---|---|---|---|---|---|---|
| | FIRST MØTIØN | | | | | | |
| 0.080 | 3441.334 | -80.56495 | 28.37067 | 28.53185 | 0. | 90.000 | 0. |
| | LIFTØFF SIGNAL | | | | | | |
| 0.280 | 3441.334 | -80.56495 | 28.37067 | 28.53185 | 37.018 | 87.192 | 2.2 |
| 1.0 | 3441.334 | -80.56495 | 28.37067 | 28.53185 | 30.052 | 88.135 | 10.5 |
| 2.0 | 3441.337 | -80.56495 | 28.37067 | 28.53185 | 10.756 | 88.951 | 22.2 |
| 3.0 | 3441.342 | -80.56495 | 28.37067 | 28.53185 | 338.303 | 89.255 | 34.4 |
| 4.0 | 3441.348 | -80.56495 | 28.37068 | 28.53186 | 312.912 | 89.235 | 46.8 |
| 5.0 | 3441.357 | -80.56495 | 28.37068 | 28.53186 | 302.598 | 89.147 | 59.5 |
| 6.0 | 3441.368 | -80.56496 | 28.37068 | 28.53186 | 300.340 | 89.081 | 72.5 |
| 7.0 | 3441.381 | -80.56496 | 28.37068 | 28.53186 | 301.674 | 89.043 | 85.6 |
| 8.0 | 3441.396 | -80.56496 | 28.37068 | 28.53186 | 304.430 | 89.024 | 99.0 |
| 9.0 | 3441.414 | -80.56497 | 28.37069 | 28.53186 | 307.461 | 89.020 | 112.7 |
| 10.0 | 3441.433 | -80.56497 | 28.37069 | 28.53187 | 310.173 | 89.033 | 126.7 |
| 11.0 | 3441.455 | -80.56498 | 28.37069 | 28.53187 | 312.341 | 89.065 | 141.0 |
| 12.0 | 3441.480 | -80.56499 | 28.37070 | 28.53188 | 314.001 | 89.119 | 155.5 |
| 13.0 | 3441.506 | -80.56499 | 28.37070 | 28.53188 | 315.391 | 89.198 | 170.4 |
| 14.0 | 3441.536 | -80.56500 | 28.37071 | 28.53189 | 317.007 | 89.306 | 185.7 |
| 15.0 | 3441.567 | -80.56501 | 28.37071 | 28.53189 | 319.899 | 89.443 | 201.2 |
| 16.0 | 3441.602 | -80.56501 | 28.37072 | 28.53190 | 327.083 | 89.607 | 217.1 |
| 17.0 | 3441.639 | -80.56501 | 28.37072 | 28.53190 | 351.986 | 89.776 | 233.2 |
| 18.0 | 3441.679 | -80.56501 | 28.37072 | 28.53190 | 61.138 | 89.780 | 249.7 |
| 19.0 | 3441.721 | -80.56501 | 28.37073 | 28.53190 | 91.840 | 89.538 | 266.4 |
| 20.0 | 3441.766 | -80.56500 | 28.37072 | 28.53190 | 100.119 | 89.208 | 283.4 |
| 21.0 | 3441.814 | -80.56499 | 28.37072 | 28.53190 | 103.042 | 88.824 | 300.7 |
| 22.0 | 3441.865 | -80.56497 | 28.37072 | 28.53190 | 104.146 | 88.391 | 318.3 |
| 23.0 | 3441.919 | -80.56493 | 28.37071 | 28.53189 | 104.509 | 87.912 | 336.1 |
| 24.0 | 3441.976 | -80.56489 | 28.37070 | 28.53188 | 104.556 | 87.392 | 354.3 |
| 25.0 | 3442.036 | -80.56484 | 28.37069 | 28.53187 | 104.486 | 86.833 | 372.7 |
| 26.0 | 3442.098 | -80.56477 | 28.37067 | 28.53185 | 104.395 | 86.243 | 391.5 |
| 27.0 | 3442.164 | -80.56469 | 28.37065 | 28.53183 | 104.330 | 85.628 | 410.6 |
| 28.0 | 3442.233 | -80.56458 | 28.37063 | 28.53181 | 104.312 | 84.994 | 430.1 |
| 29.0 | 3442.305 | -80.56446 | 28.37060 | 28.53178 | 104.336 | 84.351 | 450.0 |
| 30.0 | 3442.381 | -80.56432 | 28.37057 | 28.53175 | 104.417 | 83.707 | 470.6 |

TABLE XVIII
GEØGRAPHIC CØØRDINATES

| TIME SEC | EC DIST NM | LØNG DEG | GC LAT DEG | LAT DEG | VEL-AZ DEG | VEL-ELEV DEG | EF VEL FT/S |
|---|---|---|---|---|---|---|---|
| 31.0 | 3442.459 | -80.56415 | 28.37053 | 28.53171 | 104.484 | 83.064 | 491.6 |
| 32.0 | 3442.541 | -80.56396 | 28.37049 | 28.53167 | 104.496 | 82.426 | 512.6 |
| 33.0 | 3442.626 | -80.56375 | 28.37044 | 28.53162 | 104.426 | 81.811 | 534.2 |
| 34.0 | 3442.715 | -80.56351 | 28.37039 | 28.53156 | 104.250 | 81.212 | 556.2 |
| 35.0 | 3442.807 | -80.56324 | 28.37033 | 28.53150 | 104.043 | 80.627 | 578.6 |
| 36.0 | 3442.903 | -80.56294 | 28.37026 | 28.53144 | 103.895 | 80.047 | 601.4 |
| 37.0 | 3443.002 | -80.56261 | 28.37019 | 28.53137 | 103.858 | 79.463 | 624.6 |
| 38.0 | 3443.105 | -80.56225 | 28.37011 | 28.53129 | 103.965 | 78.877 | 648.2 |
| 39.0 | 3443.212 | -80.56186 | 28.37002 | 28.53120 | 104.137 | 78.302 | 672.2 |
| 40.0 | 3443.322 | -80.56143 | 28.36993 | 28.53110 | 104.290 | 77.755 | 696.8 |
| 41.0 | 3443.436 | -80.56097 | 28.36983 | 28.53100 | 104.359 | 77.242 | 721.7 |
| 42.0 | 3443.554 | -80.56047 | 28.36971 | 28.53089 | 104.341 | 76.763 | 747.2 |
| 43.0 | 3443.675 | -80.55994 | 28.36959 | 28.53077 | 104.262 | 76.307 | 773.1 |
| 44.0 | 3443.801 | -80.55937 | 28.36946 | 28.53064 | 104.174 | 75.860 | 799.4 |
| 45.0 | 3443.931 | -80.55877 | 28.36933 | 28.53050 | 104.090 | 75.407 | 826.1 |
| 46.0 | 3444.064 | -80.55812 | 28.36919 | 28.53036 | 103.987 | 74.948 | 853.3 |
| 47.0 | 3444.202 | -80.55743 | 28.36904 | 28.53021 | 103.816 | 74.492 | 880.9 |
| 48.0 | 3444.344 | -80.55670 | 28.36888 | 28.53005 | 103.572 | 74.049 | 908.9 |
| 49.0 | 3444.490 | -80.55592 | 28.36872 | 28.52989 | 103.291 | 73.619 | 937.3 |
| 50.0 | 3444.640 | -80.55510 | 28.36855 | 28.52972 | 103.034 | 73.198 | 966.1 |
| 51.0 | 3444.794 | -80.55423 | 28.36837 | 28.52954 | 102.851 | 72.772 | 995.1 |
| 52.0 | 3444.953 | -80.55332 | 28.36819 | 28.52936 | 102.777 | 72.333 | 1024.2 |
| 53.0 | 3445.115 | -80.55235 | 28.36800 | 28.52916 | 102.799 | 71.874 | 1053.1 |
| | MACH ØNE | | | | | | |
| 53.208 | 3445.150 | -80.55214 | 28.36796 | 28.52912 | 102.812 | 71.776 | 1059.1 |
| 54.0 | 3445.282 | -80.55133 | 28.36779 | 28.52896 | 102.877 | 71.401 | 1081.9 |
| 55.0 | 3445.453 | -80.55026 | 28.36757 | 28.52874 | 102.975 | 70.924 | 1110.4 |
| 56.0 | 3445.627 | -80.54913 | 28.36735 | 28.52851 | 103.069 | 70.455 | 1138.9 |
| 57.0 | 3445.806 | -80.54795 | 28.36710 | 28.52827 | 103.158 | 69.997 | 1167.7 |
| 58.0 | 3445.989 | -80.54672 | 28.36685 | 28.52801 | 103.254 | 69.549 | 1197.0 |
| 59.0 | 3446.175 | -80.54542 | 28.36658 | 28.52774 | 103.371 | 69.103 | 1227.2 |
| 60.0 | 3446.366 | -80.54407 | 28.36629 | 28.52746 | 103.509 | 68.653 | 1258.3 |
| 61.0 | 3446.561 | -80.54266 | 28.36599 | 28.52715 | 103.614 | 68.191 | 1290.3 |
| 62.0 | 3446.761 | -80.54118 | 28.36568 | 28.52684 | 103.625 | 67.713 | 1323.4 |
| 63.0 | 3446.964 | -80.53963 | 28.36535 | 28.52651 | 103.524 | 67.230 | 1357.6 |
| 64.0 | 3447.173 | -80.53800 | 28.36501 | 28.52616 | 103.352 | 66.750 | 1392.8 |
| 65.0 | 3447.386 | -80.53630 | 28.36465 | 28.52581 | 103.174 | 66.282 | 1429.1 |

TABLE XVIII
GEØGRAPHIC CØØRDINATES

| TIME SEC | EC DIST NM | LØNG DEG | GC LAT DEG | LAT DEG | VEL-AZ DEG | VEL-ELEV DEG | EF VEL FT/S |
|---|---|---|---|---|---|---|---|
| | MAXIMUM DYNAMIC PRESSURE | | | | | | |
| 66.000 | 3447.603 | -80.53453 | 28.36429 | 28.52544 | 103.040 | 65.833 | 1466.4 |
| 67.0 | 3447.826 | -80.53267 | 28.36391 | 28.52507 | 102.964 | 65.402 | 1504.8 |
| 68.0 | 3448.054 | -80.53074 | 28.36352 | 28.52467 | 102.921 | 64.982 | 1544.1 |
| 69.0 | 3448.287 | -80.52872 | 28.36311 | 28.52426 | 102.875 | 64.564 | 1584.4 |
| 70.0 | 3448.525 | -80.52661 | 28.36269 | 28.52384 | 102.820 | 64.143 | 1625.8 |
| 71.0 | 3448.768 | -80.52442 | 28.36225 | 28.52340 | 102.783 | 63.718 | 1668.3 |
| 72.0 | 3449.017 | -80.52214 | 28.36180 | 28.52294 | 102.795 | 63.289 | 1712.0 |
| 73.0 | 3449.272 | -80.51976 | 28.36132 | 28.52246 | 102.852 | 62.862 | 1756.8 |
| 74.0 | 3449.532 | -80.51729 | 28.36082 | 28.52197 | 102.935 | 62.438 | 1802.8 |
| 75.0 | 3449.798 | -80.51471 | 28.36030 | 28.52144 | 103.027 | 62.021 | 1850.0 |
| 76.0 | 3450.070 | -80.51204 | 28.35975 | 28.52089 | 103.114 | 61.610 | 1898.4 |
| 77.0 | 3450.348 | -80.50926 | 28.35918 | 28.52032 | 103.198 | 61.206 | 1948.1 |
| 78.0 | 3450.632 | -80.50637 | 28.35858 | 28.51972 | 103.287 | 60.807 | 1999.0 |
| 79.0 | 3450.923 | -80.50336 | 28.35796 | 28.51909 | 103.381 | 60.412 | 2051.3 |
| 80.0 | 3451.220 | -80.50025 | 28.35730 | 28.51843 | 103.478 | 60.020 | 2104.9 |
| 81.0 | 3451.523 | -80.49701 | 28.35662 | 28.51774 | 103.570 | 59.626 | 2159.8 |
| 82.0 | 3451.833 | -80.49366 | 28.35590 | 28.51702 | 103.658 | 59.228 | 2216.2 |
| 83.0 | 3452.150 | -80.49018 | 28.35515 | 28.51628 | 103.745 | 58.822 | 2274.0 |
| 84.0 | 3452.474 | -80.48656 | 28.35437 | 28.51549 | 103.830 | 58.412 | 2333.1 |
| 85.0 | 3452.804 | -80.48281 | 28.35356 | 28.51467 | 103.909 | 57.998 | 2393.7 |
| 86.0 | 3453.142 | -80.47892 | 28.35271 | 28.51382 | 103.983 | 57.582 | 2455.6 |
| 87.0 | 3453.487 | -80.47488 | 28.35182 | 28.51293 | 104.049 | 57.165 | 2518.9 |
| 88.0 | 3453.839 | -80.47070 | 28.35090 | 28.51200 | 104.104 | 56.745 | 2583.6 |
| 89.0 | 3454.198 | -80.46636 | 28.34993 | 28.51104 | 104.154 | 56.321 | 2649.5 |
| 90.0 | 3454.565 | -80.46186 | 28.34894 | 28.51003 | 104.199 | 55.893 | 2716.9 |
| 91.0 | 3454.939 | -80.45720 | 28.34789 | 28.50899 | 104.243 | 55.460 | 2785.6 |
| 92.0 | 3455.320 | -80.45237 | 28.34681 | 28.50791 | 104.285 | 55.023 | 2855.7 |
| 93.0 | 3455.709 | -80.44736 | 28.34569 | 28.50678 | 104.326 | 54.585 | 2927.3 |
| 94.0 | 3456.105 | -80.44217 | 28.34453 | 28.50561 | 104.367 | 54.146 | 3000.3 |
| 95.0 | 3456.508 | -80.43678 | 28.34332 | 28.50440 | 104.407 | 53.707 | 3074.7 |
| 96.0 | 3456.918 | -80.43121 | 28.34206 | 28.50314 | 104.445 | 53.271 | 3150.5 |
| 97.0 | 3457.337 | -80.42545 | 28.34076 | 28.50183 | 104.481 | 52.837 | 3227.7 |
| 98.0 | 3457.765 | -80.41950 | 28.33941 | 28.50047 | 104.513 | 52.410 | 3306.2 |
| 99.0 | 3458.200 | -80.41335 | 28.33800 | 28.49906 | 104.541 | 51.985 | 3386.3 |
| 100.0 | 3458.643 | -80.40699 | 28.33655 | 28.49760 | 104.568 | 51.564 | 3467.8 |
| 101.0 | 3459.094 | -80.40042 | 28.33505 | 28.49610 | 104.596 | 51.146 | 3550.8 |

TABLE XVIII
GEØGRAPHIC CØØRDINATES

| TIME SEC | EC DIST NM | LØNG DEG | GC LAT DEG | LAT DEG | VEL-AZ DEG | VEL-ELEV DEG | EF VEL FT/S |
|---|---|---|---|---|---|---|---|
| 102.0 | 3459.553 | -80.39364 | 28.33349 | 28.49453 | 104.624 | 50.732 | 3635.4 |
| 103.0 | 3460.021 | -80.38663 | 28.33188 | 28.49292 | 104.654 | 50.323 | 3721.6 |
| 104.0 | 3460.496 | -80.37940 | 28.33021 | 28.49124 | 104.683 | 49.919 | 3809.3 |
| 105.0 | 3460.980 | -80.37194 | 28.32849 | 28.48951 | 104.707 | 49.523 | 3898.5 |
| 106.0 | 3461.473 | -80.36425 | 28.32671 | 28.48773 | 104.728 | 49.133 | 3989.3 |
| 107.0 | 3461.973 | -80.35632 | 28.32488 | 28.48589 | 104.752 | 48.752 | 4081.8 |
| 108.0 | 3462.483 | -80.34814 | 28.32298 | 28.48398 | 104.774 | 48.379 | 4176.0 |
| 109.0 | 3463.001 | -80.33972 | 28.32102 | 28.48202 | 104.799 | 48.014 | 4272.0 |
| 110.0 | 3463.528 | -80.33105 | 28.31900 | 28.47999 | 104.824 | 47.656 | 4369.7 |
| 111.0 | 3464.064 | -80.32212 | 28.31692 | 28.47790 | 104.848 | 47.306 | 4469.2 |
| 112.0 | 3464.610 | -80.31293 | 28.31478 | 28.47575 | 104.869 | 46.964 | 4570.5 |
| 113.0 | 3465.164 | -80.30348 | 28.31257 | 28.47353 | 104.888 | 46.629 | 4673.6 |
| 114.0 | 3465.728 | -80.29376 | 28.31029 | 28.47124 | 104.906 | 46.302 | 4778.5 |
| 115.0 | 3466.302 | -80.28376 | 28.30794 | 28.46889 | 104.926 | 45.984 | 4885.4 |
| 116.0 | 3466.885 | -80.27348 | 28.30553 | 28.46647 | 104.946 | 45.675 | 4994.3 |
| 117.0 | 3467.478 | -80.26293 | 28.30305 | 28.46398 | 104.965 | 45.375 | 5105.1 |
| 118.0 | 3468.081 | -80.25208 | 28.30049 | 28.46141 | 104.985 | 45.084 | 5218.1 |
| 119.0 | 3468.694 | -80.24094 | 28.29787 | 28.45878 | 105.005 | 44.802 | 5333.1 |
| 120.0 | 3469.318 | -80.22951 | 28.29517 | 28.45607 | 105.026 | 44.529 | 5450.2 |
| 121.0 | 3469.953 | -80.21777 | 28.29239 | 28.45328 | 105.047 | 44.265 | 5569.6 |
| 122.0 | 3470.598 | -80.20573 | 28.28954 | 28.45042 | 105.068 | 44.010 | 5691.2 |
| 123.0 | 3471.254 | -80.19338 | 28.28661 | 28.44748 | 105.087 | 43.762 | 5815.1 |
| 124.0 | 3471.922 | -80.18071 | 28.28360 | 28.44445 | 105.106 | 43.523 | 5941.3 |
| 125.0 | 3472.601 | -80.16772 | 28.28051 | 28.44135 | 105.124 | 43.292 | 6070.1 |
| 126.0 | 3473.293 | -80.15440 | 28.27734 | 28.43817 | 105.141 | 43.068 | 6201.3 |
| 127.0 | 3473.996 | -80.14075 | 28.27408 | 28.43490 | 105.158 | 42.852 | 6335.1 |
| 128.0 | 3474.711 | -80.12677 | 28.27074 | 28.43155 | 105.175 | 42.643 | 6471.6 |
| 129.0 | 3475.439 | -80.11244 | 28.26732 | 28.42811 | 105.193 | 42.442 | 6610.8 |
| 130.0 | 3476.180 | -80.09776 | 28.26380 | 28.42459 | 105.212 | 42.247 | 6752.8 |
| 131.0 | 3476.934 | -80.08272 | 28.26020 | 28.42097 | 105.231 | 42.058 | 6897.8 |
| 132.0 | 3477.701 | -80.06732 | 28.25651 | 28.41726 | 105.250 | 41.873 | 7045.8 |
| 133.0 | 3478.482 | -80.05155 | 28.25272 | 28.41346 | 105.268 | 41.692 | 7196.9 |
| 134.0 | 3479.277 | -80.03541 | 28.24883 | 28.40956 | 105.286 | 41.513 | 7351.2 |
| 135.0 | 3480.086 | -80.01886 | 28.24484 | 28.40556 | 105.306 | 41.337 | 7508.8 |
| 136.0 | 3480.909 | -80.00193 | 28.24076 | 28.40145 | 105.327 | 41.161 | 7669.3 |
| 137.0 | 3481.748 | -79.98459 | 28.23656 | 28.39725 | 105.344 | 40.983 | 7833.9 |
| 138.0 | 3482.601 | -79.96684 | 28.23227 | 28.39294 | 105.364 | 40.805 | 8001.9 |
| 139.0 | 3483.469 | -79.94867 | 28.22786 | 28.38851 | 105.381 | 40.628 | 8173.6 |
| 140.0 | 3484.353 | -79.93007 | 28.22335 | 28.38398 | 105.402 | 40.455 | 8349.6 |
| | IECØ | | | | | | |
| 140.220 | 3484.551 | -79.92592 | 28.22235 | 28.38299 | 105.402 | 40.419 | 8388.9 |

TABLE XVIII
GEØGRAPHIC CØØRDINATES

| TIME SEC | EC DIST NM | LØNG DEG | GC LAT DEG | LAT DEG | VEL-AZ DEG | VEL-ELEV DEG | EF VEL FT/S |
|---|---|---|---|---|---|---|---|
| 141.0 | 3485.252 | -79.91105 | 28.21873 | 28.37935 | 105.418 | 40.297 | 8479.5 |
| 142.0 | 3486.157 | -79.89179 | 28.21405 | 28.37465 | 105.436 | 40.148 | 8563.0 |
| 143.0 | 3487.069 | -79.87231 | 28.20930 | 28.36989 | 105.454 | 40.005 | 8643.4 |
| 144.0 | 3487.987 | -79.85261 | 28.20450 | 28.36507 | 105.469 | 39.864 | 8724.3 |
| 145.0 | 3488.910 | -79.83270 | 28.19964 | 28.36019 | 105.487 | 39.726 | 8805.6 |
| | ØECØ | | | | | | |
| 145.560 | 3489.430 | -79.82148 | 28.19693 | 28.35747 | 105.490 | 39.652 | 8851.0 |
| 146.0 | 3489.839 | -79.81258 | 28.19473 | 28.35526 | 105.504 | 39.594 | 8861.3 |
| 147.0 | 3490.767 | -79.79240 | 28.18980 | 28.35031 | 105.520 | 39.464 | 8848.2 |
| 148.0 | 3491.691 | -79.77223 | 28.18486 | 28.34535 | 105.536 | 39.332 | 8831.9 |
| | S-IV ENGINE START | | | | | | |
| 148.120 | 3491.802 | -79.76985 | 28.18430 | 28.34479 | 105.532 | 39.318 | 8830.3 |
| 149.0 | 3492.610 | -79.75207 | 28.17992 | 28.34039 | 105.552 | 39.201 | 8815.7 |
| 150.0 | 3493.525 | -79.73192 | 28.17497 | 28.33543 | 105.569 | 39.069 | 8802.5 |
| 155.0 | 3498.063 | -79.63070 | 28.15006 | 28.31043 | 105.645 | 38.416 | 8813.3 |
| 160.0 | 3502.539 | -79.52859 | 28.12478 | 28.28505 | 105.723 | 37.772 | 8827.8 |
| | GUIDANCE INITIATIØN | | | | | | |
| 163.860 | 3505.958 | -79.44917 | 28.10503 | 28.26522 | 105.781 | 37.280 | 8842.2 |
| 165.0 | 3506.961 | -79.42561 | 28.09915 | 28.25932 | 105.798 | 37.135 | 8846.8 |
| 170.0 | 3511.330 | -79.32174 | 28.07313 | 28.23321 | 105.919 | 36.523 | 8868.1 |
| 175.0 | 3515.648 | -79.21706 | 28.04661 | 28.20659 | 106.121 | 35.934 | 8890.3 |
| 180.0 | 3519.917 | -79.11157 | 28.01953 | 28.17941 | 106.309 | 35.339 | 8915.3 |
| 185.0 | 3524.135 | -79.00523 | 27.99191 | 28.15168 | 106.477 | 34.733 | 8942.8 |
| 190.0 | 3528.302 | -78.89800 | 27.96376 | 28.12343 | 106.623 | 34.124 | 8973.0 |
| 195.0 | 3532.419 | -78.78985 | 27.93512 | 28.09468 | 106.755 | 33.517 | 9005.7 |
| 200.0 | 3536.487 | -78.68076 | 27.90599 | 28.06544 | 106.874 | 32.916 | 9041.1 |
| 205.0 | 3540.505 | -78.57070 | 27.87638 | 28.03572 | 106.980 | 32.312 | 9079.1 |
| 210.0 | 3544.474 | -78.45964 | 27.84631 | 28.00553 | 107.077 | 31.714 | 9119.4 |
| 215.0 | 3548.395 | -78.34757 | 27.81578 | 27.97488 | 107.166 | 31.115 | 9162.2 |
| 220.0 | 3552.267 | -78.23445 | 27.78479 | 27.94378 | 107.247 | 30.522 | 9207.7 |
| 225.0 | 3556.091 | -78.12026 | 27.75334 | 27.91222 | 107.323 | 29.931 | 9256.0 |

TABLE XVIII
GEØGRAPHIC CØØRDINATES

| TIME SEC | EC DIST NM | LØNG DEG | GC LAT DEG | LAT DEG | VEL-AZ DEG | VEL-ELEV DEG | EF VEL FT/S |
|---|---|---|---|---|---|---|---|
| 230.0 | 3559.868 | -78.00498 | 27.72145 | 27.88020 | 107.396 | 29.338 | 9306.9 |
| 235.0 | 3563.596 | -77.88859 | 27.68909 | 27.84772 | 107.464 | 28.750 | 9360.1 |
| 240.0 | 3567.277 | -77.77105 | 27.65628 | 27.81478 | 107.529 | 28.165 | 9416.0 |
| 245.0 | 3570.911 | -77.65235 | 27.62300 | 27.78138 | 107.592 | 27.584 | 9474.2 |
| 250.0 | 3574.498 | -77.53247 | 27.58926 | 27.74750 | 107.654 | 27.006 | 9534.8 |
| 255.0 | 3578.037 | -77.41140 | 27.55503 | 27.71315 | 107.716 | 26.434 | 9597.9 |
| 260.0 | 3581.529 | -77.28910 | 27.52033 | 27.67831 | 107.777 | 25.863 | 9663.5 |
| 265.0 | 3584.975 | -77.16557 | 27.48513 | 27.64298 | 107.840 | 25.299 | 9731.5 |
| 270.0 | 3588.374 | -77.04077 | 27.44943 | 27.60714 | 107.902 | 24.738 | 9802.5 |
| 275.0 | 3591.726 | -76.91469 | 27.41321 | 27.57078 | 107.964 | 24.182 | 9875.9 |
| 280.0 | 3595.032 | -76.78731 | 27.37647 | 27.53390 | 108.028 | 23.633 | 9951.7 |
| 285.0 | 3598.292 | -76.65860 | 27.33920 | 27.49648 | 108.093 | 23.087 | 10030.2 |
| 290.0 | 3601.505 | -76.52856 | 27.30138 | 27.45851 | 108.159 | 22.547 | 10111.4 |
| 295.0 | 3604.673 | -76.39715 | 27.26299 | 27.41998 | 108.226 | 22.013 | 10195.3 |
| 300.0 | 3607.794 | -76.26434 | 27.22404 | 27.38088 | 108.294 | 21.484 | 10282.1 |
| 305.0 | 3610.870 | -76.13013 | 27.18449 | 27.34117 | 108.364 | 20.962 | 10371.6 |
| 310.0 | 3613.901 | -75.99448 | 27.14435 | 27.30087 | 108.435 | 20.444 | 10463.8 |
| 315.0 | 3616.886 | -75.85738 | 27.10359 | 27.25995 | 108.507 | 19.934 | 10558.9 |
| 320.0 | 3619.826 | -75.71879 | 27.06220 | 27.21840 | 108.581 | 19.431 | 10657.1 |
| 325.0 | 3622.720 | -75.57870 | 27.02016 | 27.17620 | 108.656 | 18.933 | 10758.4 |
| 330.0 | 3625.571 | -75.43707 | 26.97746 | 27.13333 | 108.732 | 18.441 | 10862.3 |
| 335.0 | 3628.376 | -75.29389 | 26.93408 | 27.08978 | 108.809 | 17.955 | 10969.1 |
| 340.0 | 3631.136 | -75.14913 | 26.89002 | 27.04554 | 108.887 | 17.476 | 11078.8 |
| 345.0 | 3633.851 | -75.00275 | 26.84525 | 27.00060 | 108.966 | 17.005 | 11191.4 |
| 350.0 | 3636.522 | -74.85475 | 26.79976 | 26.95492 | 109.045 | 16.539 | 11306.9 |
| 355.0 | 3639.148 | -74.70509 | 26.75353 | 26.90851 | 109.126 | 16.077 | 11425.5 |
| 360.0 | 3641.730 | -74.55375 | 26.70654 | 26.86134 | 109.207 | 15.624 | 11547.2 |
| 365.0 | 3644.267 | -74.40070 | 26.65879 | 26.81339 | 109.289 | 15.178 | 11671.5 |
| 370.0 | 3646.759 | -74.24591 | 26.61025 | 26.76466 | 109.372 | 14.738 | 11798.8 |
| 375.0 | 3649.206 | -74.08936 | 26.56092 | 26.71513 | 109.455 | 14.303 | 11929.3 |
| 380.0 | 3651.609 | -73.93102 | 26.51076 | 26.66477 | 109.539 | 13.875 | 12062.9 |
| 385.0 | 3653.967 | -73.77086 | 26.45977 | 26.61357 | 109.625 | 13.452 | 12199.5 |
| 390.0 | 3656.280 | -73.60885 | 26.40792 | 26.56151 | 109.709 | 13.038 | 12339.9 |
| 395.0 | 3658.549 | -73.44497 | 26.35520 | 26.50858 | 109.795 | 12.630 | 12483.0 |
| 400.0 | 3660.772 | -73.27917 | 26.30159 | 26.45475 | 109.882 | 12.229 | 12629.5 |
| 405.0 | 3662.951 | -73.11144 | 26.24707 | 26.40000 | 109.969 | 11.835 | 12779.8 |
| 410.0 | 3665.086 | -72.94173 | 26.19161 | 26.34433 | 110.056 | 11.446 | 12933.1 |
| 415.0 | 3667.176 | -72.77002 | 26.13522 | 26.28770 | 110.144 | 11.065 | 13090.2 |
| 420.0 | 3669.220 | -72.59626 | 26.07784 | 26.23009 | 110.233 | 10.688 | 13250.5 |
| 425.0 | 3671.220 | -72.42044 | 26.01948 | 26.17149 | 110.322 | 10.319 | 13414.6 |

TABLE XVIII
GEØGRAPHIC CØØRDINATES

| TIME SEC | EC DIST NM | LØNG DEG | GC LAT DEG | LAT DEG | VEL-AZ DEG | VEL-ELEV DEG | EF VEL FT/S |
|---|---|---|---|---|---|---|---|
| 430.0 | 3673.175 | -72.24251 | 25.96011 | 26.11187 | 110.411 | 9.956 | 13582.3 |
| 435.0 | 3675.085 | -72.06244 | 25.89970 | 26.05121 | 110.502 | 9.599 | 13754.0 |
| 440.0 | 3676.949 | -71.88018 | 25.83823 | 25.98948 | 110.593 | 9.250 | 13929.1 |
| 445.0 | 3678.771 | -71.69573 | 25.77568 | 25.92667 | 110.685 | 8.905 | 14107.8 |
| 450.0 | 3680.546 | -71.50902 | 25.71202 | 25.86275 | 110.777 | 8.567 | 14290.1 |
| 455.0 | 3682.275 | -71.32003 | 25.64724 | 25.79770 | 110.870 | 8.234 | 14476.2 |
| 460.0 | 3683.958 | -71.12872 | 25.58131 | 25.73149 | 110.964 | 7.905 | 14666.1 |
| 465.0 | 3685.595 | -70.93506 | 25.51420 | 25.66410 | 111.058 | 7.584 | 14860.1 |
| 470.0 | 3687.185 | -70.73900 | 25.44589 | 25.59550 | 111.152 | 7.267 | 15058.0 |
| 475.0 | 3688.730 | -70.54050 | 25.37635 | 25.52566 | 111.246 | 6.956 | 15260.4 |
| 480.0 | 3690.227 | -70.33952 | 25.30556 | 25.45457 | 111.342 | 6.651 | 15467.4 |
| 485.0 | 3691.678 | -70.13601 | 25.23347 | 25.38217 | 111.438 | 6.352 | 15678.8 |
| 490.0 | 3693.082 | -69.92993 | 25.16007 | 25.30846 | 111.535 | 6.058 | 15894.9 |
| 495.0 | 3694.439 | -69.72124 | 25.08532 | 25.23338 | 111.633 | 5.770 | 16115.8 |
| 500.0 | 3695.749 | -69.50987 | 25.00918 | 25.15693 | 111.731 | 5.487 | 16341.1 |
| 505.0 | 3697.011 | -69.29579 | 24.93164 | 25.07905 | 111.830 | 5.210 | 16571.6 |
| 510.0 | 3698.225 | -69.07895 | 24.85265 | 24.99971 | 111.930 | 4.938 | 16807.2 |
| 515.0 | 3699.392 | -68.85929 | 24.77217 | 24.91889 | 112.030 | 4.672 | 17047.7 |
| 520.0 | 3700.510 | -68.63676 | 24.69018 | 24.83654 | 112.130 | 4.409 | 17294.1 |
| 525.0 | 3701.580 | -68.41130 | 24.60664 | 24.75263 | 112.232 | 4.153 | 17545.5 |
| 530.0 | 3702.601 | -68.18287 | 24.52150 | 24.66711 | 112.334 | 3.901 | 17802.7 |
| 535.0 | 3703.574 | -67.95139 | 24.43473 | 24.57996 | 112.437 | 3.654 | 18065.8 |
| 540.0 | 3704.496 | -67.71681 | 24.34628 | 24.49113 | 112.541 | 3.411 | 18335.0 |
| 545.0 | 3705.369 | -67.47908 | 24.25612 | 24.40056 | 112.645 | 3.173 | 18610.1 |
| 550.0 | 3706.191 | -67.23811 | 24.16420 | 24.30823 | 112.750 | 2.939 | 18891.4 |
| 555.0 | 3706.963 | -66.99386 | 24.07047 | 24.21409 | 112.856 | 2.708 | 19179.8 |
| 560.0 | 3707.682 | -66.74625 | 23.97489 | 24.11808 | 112.962 | 2.481 | 19474.4 |
| 565.0 | 3708.350 | -66.49520 | 23.87741 | 24.02015 | 113.070 | 2.260 | 19776.9 |
| 570.0 | 3708.966 | -66.24063 | 23.77797 | 23.92027 | 113.177 | 2.043 | 20087.1 |
| 575.0 | 3709.528 | -65.98247 | 23.67652 | 23.81836 | 113.286 | 1.828 | 20404.4 |
| 580.0 | 3710.037 | -65.72063 | 23.57301 | 23.71437 | 113.395 | 1.617 | 20730.8 |
| 585.0 | 3710.491 | -65.45503 | 23.46737 | 23.60825 | 113.504 | 1.409 | 21065.3 |
| 590.0 | 3710.889 | -65.18558 | 23.35954 | 23.49993 | 113.616 | 1.204 | 21407.6 |
| 595.0 | 3711.231 | -64.91218 | 23.24947 | 23.38935 | 113.728 | 1.001 | 21759.2 |
| 600.0 | 3711.514 | -64.63476 | 23.13708 | 23.27644 | 113.841 | 0.803 | 22119.6 |
| 605.0 | 3711.740 | -64.35321 | 23.02231 | 23.16114 | 113.955 | 0.607 | 22489.6 |
| 610.0 | 3711.906 | -64.06743 | 22.90509 | 23.04337 | 114.069 | 0.412 | 22870.0 |
| 615.0 | 3712.010 | -63.77731 | 22.78535 | 22.92306 | 114.184 | 0.219 | 23260.9 |
| 620.0 | 3712.050 | -63.48274 | 22.66300 | 22.80014 | 114.299 | 0.028 | 23663.9 |
| | S-IV CUTØFF | | | | | | |
| 621.659 | 3712.050 | -63.38399 | 22.62182 | 22.75876 | 114.338 | -0.035 | 23800.9 |

TABLE XVIII
GEØGRAPHIC CØØRDINATES

| TIME SEC | EC DIST NM | LØNG DEG | GC LAT DEG | LAT DEG | VEL-AZ DEG | VEL-ELEV DEG | EF VEL FT/S |
|---|---|---|---|---|---|---|---|
| 625.0 | 3712.041 | -63.18465 | 22.53839 | 22.67494 | 114.424 | -0.036 | 23811.3 |
| 630.0 | 3712.030 | -62.88679 | 22.41302 | 22.54897 | 114.555 | -0.030 | 23811.9 |
| | INSERTIØN | | | | | | |
| 631.659 | 3712.026 | -62.78809 | 22.37128 | 22.50703 | 114.598 | -0.029 | 23812.0 |

TABLE XIX
SPECIAL TRAJECTØRY DEPENDENT PARAMETERS

| TIME SEC | SF VEL FT/S | FLT-PATH DEG | HEAD DEG | MACH | DYN-PRES LB/FT SQ | RANGE NM | ALTITUDE FT |
|---|---|---|---|---|---|---|---|
| | FIRST MØTIØN | | | | | | |
| 0.080 | 1341.6 | 0. | 90.000 | 0.014 | 0.293 | -0. | 105 |
| | LIFTØFF SIGNAL | | | | | | |
| 0.280 | 1341.7 | 0.095 | 89.996 | 0.014 | 0.299 | -0.000 | 105 |
| 1.0 | 1341.9 | 0.446 | 89.987 | 0.017 | 0.422 | 0.000 | 109 |
| 2.0 | 1341.9 | 0.950 | 89.983 | 0.024 | 0.877 | 0.000 | 126 |
| 3.0 | 1341.9 | 1.469 | 89.982 | 0.034 | 1.688 | 0.000 | 154 |
| 4.0 | 1342.0 | 2.000 | 89.982 | 0.044 | 2.880 | -0.000 | 194 |
| 5.0 | 1342.2 | 2.541 | 89.980 | 0.055 | 4.474 | -0.000 | 247 |
| 6.0 | 1342.6 | 3.093 | 89.975 | 0.066 | 6.490 | -0.000 | 313 |
| 7.0 | 1343.2 | 3.654 | 89.968 | 0.078 | 8.951 | -0.001 | 392 |
| 8.0 | 1343.9 | 4.226 | 89.959 | 0.090 | 11.882 | -0.001 | 484 |
| 9.0 | 1344.9 | 4.807 | 89.950 | 0.102 | 15.314 | -0.001 | 590 |
| 10.0 | 1346.0 | 5.400 | 89.941 | 0.115 | 19.277 | -0.002 | 709 |
| 11.0 | 1347.4 | 6.005 | 89.934 | 0.128 | 23.753 | -0.002 | 843 |
| 12.0 | 1349.0 | 6.621 | 89.929 | 0.140 | 28.515 | -0.002 | 991 |
| 13.0 | 1350.8 | 7.248 | 89.927 | 0.153 | 33.834 | -0.003 | 1154 |
| 14.0 | 1353.0 | 7.887 | 89.930 | 0.167 | 39.730 | -0.003 | 1332 |
| 15.0 | 1355.5 | 8.536 | 89.936 | 0.180 | 46.223 | -0.004 | 1525 |
| 16.0 | 1358.4 | 9.195 | 89.947 | 0.195 | 53.310 | -0.004 | 1735 |
| 17.0 | 1361.8 | 9.862 | 89.961 | 0.209 | 60.998 | -0.004 | 1959 |
| 18.0 | 1365.6 | 10.535 | 89.980 | 0.224 | 69.300 | -0.004 | 2201 |
| 19.0 | 1370.1 | 11.213 | 90.003 | 0.239 | 78.219 | -0.004 | 2459 |
| 20.0 | 1375.2 | 11.893 | 90.029 | 0.254 | 87.663 | -0.004 | 2734 |
| 21.0 | 1381.0 | 12.575 | 90.059 | 0.269 | 97.697 | -0.003 | 3026 |
| 22.0 | 1387.5 | 13.257 | 90.093 | 0.285 | 108.304 | -0.003 | 3335 |
| 23.0 | 1394.8 | 13.936 | 90.130 | 0.301 | 119.454 | 0.003 | 3662 |
| 24.0 | 1402.9 | 14.611 | 90.171 | 0.318 | 131.145 | 0.004 | 4006 |
| 25.0 | 1411.8 | 15.283 | 90.217 | 0.335 | 143.414 | 0.006 | 4370 |
| 26.0 | 1421.5 | 15.950 | 90.267 | 0.352 | 156.226 | 0.010 | 4751 |
| 27.0 | 1432.1 | 16.611 | 90.323 | 0.369 | 169.455 | 0.014 | 5151 |
| 28.0 | 1443.4 | 17.268 | 90.386 | 0.386 | 183.082 | 0.020 | 5570 |
| 29.0 | 1455.6 | 17.920 | 90.454 | 0.404 | 197.261 | 0.026 | 6008 |
| 30.0 | 1468.6 | 18.575 | 90.529 | 0.423 | 212.191 | 0.034 | 6466 |

TABLE XIX

SPECIAL TRAJECTØRY DEPENDENT PARAMETERS

| TIME SEC | SF VEL FT/S | FLT-PATH DEG | HEAD DEG | MACH | DYN-PRES LB/FT SQ | RANGE NM | ALTITUDE FT |
|---|---|---|---|---|---|---|---|
| 31.0 | 1482.3 | 19.221 | 90.608 | 0.442 | 227.727 | 0.043 | 6943 |
| 32.0 | 1496.5 | 19.850 | 90.688 | 0.461 | 243.464 | 0.053 | 7442 |
| 33.0 | 1511.5 | 20.477 | 90.767 | 0.481 | 259.964 | 0.065 | 7960 |
| 34.0 | 1527.1 | 21.098 | 90.841 | 0.502 | 277.475 | 0.078 | 8499 |
| 35.0 | 1543.3 | 21.710 | 90.914 | 0.523 | 295.939 | 0.093 | 9059 |
| 36.0 | 1560.2 | 22.314 | 90.991 | 0.545 | 313.941 | 0.109 | 9641 |
| 37.0 | 1577.8 | 22.902 | 91.078 | 0.567 | 332.137 | 0.127 | 10244 |
| 38.0 | 1596.2 | 23.482 | 91.181 | 0.589 | 350.723 | 0.147 | 10869 |
| 39.0 | 1615.2 | 24.052 | 91.293 | 0.612 | 369.638 | 0.168 | 11516 |
| 40.0 | 1634.7 | 24.617 | 91.407 | 0.637 | 390.459 | 0.191 | 12186 |
| 41.0 | 1654.6 | 25.178 | 91.513 | 0.662 | 410.341 | 0.217 | 12877 |
| 42.0 | 1675.0 | 25.736 | 91.609 | 0.686 | 429.413 | 0.244 | 13593 |
| 43.0 | 1696.0 | 26.287 | 91.699 | 0.711 | 448.112 | 0.273 | 14332 |
| 44.0 | 1717.6 | 26.828 | 91.788 | 0.737 | 467.371 | 0.304 | 15095 |
| 45.0 | 1739.9 | 27.353 | 91.879 | 0.764 | 487.245 | 0.337 | 15882 |
| 46.0 | 1763.1 | 27.864 | 91.969 | 0.791 | 506.949 | 0.372 | 16694 |
| 47.0 | 1786.9 | 28.359 | 92.050 | 0.819 | 525.364 | 0.409 | 17530 |
| 48.0 | 1811.4 | 28.843 | 92.117 | 0.847 | 543.350 | 0.449 | 18392 |
| 49.0 | 1836.5 | 29.317 | 92.175 | 0.877 | 563.007 | 0.491 | 19278 |
| 50.0 | 1862.1 | 29.778 | 92.233 | 0.907 | 580.611 | 0.536 | 20190 |
| 51.0 | 1888.3 | 30.221 | 92.302 | 0.936 | 596.633 | 0.583 | 21128 |
| 52.0 | 1915.0 | 30.638 | 92.391 | 0.965 | 610.013 | 0.633 | 22090 |
| 53.0 | 1942.0 | 31.023 | 92.500 | 0.994 | 621.701 | 0.685 | 23079 |
| | MACH ØNE | | | | | | |
| 53.208 | 1947.7 | 31.099 | 92.524 | 1.000 | 623.617 | 0.696 | 23288 |
| 54.0 | 1969.4 | 31.377 | 92.622 | 1.023 | 631.126 | 0.740 | 24092 |
| 55.0 | 1996.9 | 31.704 | 92.749 | 1.055 | 643.206 | 0.799 | 25130 |
| 56.0 | 2024.6 | 32.014 | 92.877 | 1.088 | 655.255 | 0.860 | 26190 |
| 57.0 | 2052.6 | 32.313 | 93.004 | 1.124 | 667.054 | 0.924 | 27276 |
| 58.0 | 2081.3 | 32.608 | 93.135 | 1.159 | 676.822 | 0.991 | 28385 |
| 59.0 | 2110.8 | 32.898 | 93.274 | 1.191 | 680.153 | 1.061 | 29519 |
| 60.0 | 2141.4 | 33.181 | 93.423 | 1.227 | 686.944 | 1.134 | 30678 |
| 61.0 | 2173.2 | 33.453 | 93.568 | 1.262 | 690.005 | 1.211 | 31862 |
| 62.0 | 2206.4 | 33.711 | 93.693 | 1.297 | 690.479 | 1.292 | 33074 |
| 63.0 | 2241.0 | 33.957 | 93.790 | 1.323 | 679.784 | 1.376 | 34312 |
| 64.0 | 2276.8 | 34.197 | 93.866 | 1.353 | 672.097 | 1.464 | 35577 |
| 65.0 | 2313.7 | 34.436 | 93.936 | 1.400 | 679.188 | 1.557 | 36871 |

TABLE XIX
SPECIAL TRAJECTØRY DEPENDENT PARAMETERS

| TIME SEC | SF VEL FT/S | FLT-PATH DEG | HEAD DEG | MACH | DYN-PRES LB/FT SQ | RANGE NM | ALTITUDE FT |
|---|---|---|---|---|---|---|---|
| | MAXIMUM DYNAMIC PRESSURE | | | | | | |
| 66.000 | 2351.5 | 34.678 | 94.017 | 1.447 | 683.022 | 1.653 | 38194 |
| 67.0 | 2390.1 | 34.922 | 94.112 | 1.494 | 684.564 | 1.754 | 39547 |
| 68.0 | 2429.5 | 35.163 | 94.216 | 1.547 | 688.168 | 1.859 | 40930 |
| 69.0 | 2470.1 | 35.397 | 94.319 | 1.601 | 689.273 | 1.968 | 42345 |
| 70.0 | 2512.0 | 35.620 | 94.419 | 1.658 | 689.975 | 2.082 | 43792 |
| 71.0 | 2555.1 | 35.833 | 94.525 | 1.715 | 686.210 | 2.201 | 45270 |
| 72.0 | 2599.5 | 36.036 | 94.650 | 1.773 | 680.881 | 2.325 | 46783 |
| 73.0 | 2645.1 | 36.232 | 94.792 | 1.833 | 673.113 | 2.453 | 48329 |
| 74.0 | 2691.8 | 36.422 | 94.945 | 1.890 | 660.327 | 2.588 | 49910 |
| 75.0 | 2739.8 | 36.606 | 95.103 | 1.961 | 654.094 | 2.727 | 51526 |
| 76.0 | 2789.0 | 36.785 | 95.261 | 2.020 | 636.895 | 2.872 | 53177 |
| 77.0 | 2839.5 | 36.959 | 95.418 | 2.096 | 627.735 | 3.023 | 54865 |
| 78.0 | 2891.3 | 37.126 | 95.578 | 2.145 | 599.997 | 3.180 | 56591 |
| 79.0 | 2944.5 | 37.287 | 95.743 | 2.221 | 586.364 | 3.343 | 58355 |
| 80.0 | 2999.0 | 37.441 | 95.909 | 2.268 | 556.150 | 3.513 | 60159 |
| 81.0 | 3055.1 | 37.585 | 96.076 | 2.336 | 535.796 | 3.689 | 62002 |
| 82.0 | 3112.7 | 37.715 | 96.242 | 2.368 | 499.366 | 3.871 | 63885 |
| 83.0 | 3171.9 | 37.833 | 96.410 | 2.409 | 468.670 | 4.061 | 65809 |
| 84.0 | 3232.8 | 37.936 | 96.579 | 2.453 | 440.672 | 4.257 | 67776 |
| 85.0 | 3295.1 | 38.027 | 96.747 | 2.504 | 416.254 | 4.461 | 69784 |
| 86.0 | 3359.0 | 38.107 | 96.912 | 2.555 | 392.595 | 4.673 | 71835 |
| 87.0 | 3424.4 | 38.174 | 97.074 | 2.617 | 372.206 | 4.893 | 73929 |
| 88.0 | 3491.4 | 38.229 | 97.232 | 2.673 | 350.671 | 5.121 | 76067 |
| 89.0 | 3559.8 | 38.271 | 97.386 | 2.728 | 329.200 | 5.358 | 78249 |
| 90.0 | 3629.8 | 38.298 | 97.538 | 2.771 | 305.736 | 5.603 | 80475 |
| 91.0 | 3701.3 | 38.312 | 97.689 | 2.836 | 288.104 | 5.857 | 82747 |
| 92.0 | 3774.4 | 38.313 | 97.839 | 2.896 | 269.782 | 6.121 | 85064 |
| 93.0 | 3849.0 | 38.303 | 97.988 | 2.978 | 255.491 | 6.394 | 87426 |
| 94.0 | 3925.1 | 38.282 | 98.136 | 3.058 | 240.899 | 6.677 | 89828 |
| 95.0 | 4002.8 | 38.252 | 98.283 | 3.124 | 224.296 | 6.971 | 92276 |
| 96.0 | 4081.9 | 38.213 | 98.427 | 3.154 | 204.024 | 7.275 | 94770 |
| 97.0 | 4162.5 | 38.167 | 98.568 | 3.210 | 188.336 | 7.589 | 97313 |
| 98.0 | 4244.4 | 38.115 | 98.705 | 3.299 | 176.916 | 7.914 | 99908 |
| 99.0 | 4327.9 | 38.056 | 98.839 | 3.382 | 164.992 | 8.250 | 102551 |
| 100.0 | 4412.8 | 37.992 | 98.970 | 3.439 | 151.103 | 8.597 | 105242 |
| 101.0 | 4499.4 | 37.921 | 99.100 | 3.474 | 136.543 | 8.956 | 107982 |

TABLE XIX

SPECIAL TRAJECTØRY DEPENDENT PARAMETERS

| TIME SEC | SF VEL FT/S | FLT-PATH DEG | HEAD DEG | MACH | DYN-PRES LB/FT SQ | RANGE NM | ALTITUDE FT |
|---|---|---|---|---|---|---|---|
| 102.0 | 4587.4 | 37.845 | 99.228 | 3.564 | 127.047 | 9.327 | 110771 |
| 103.0 | 4677.1 | 37.764 | 99.356 | 3.680 | 120.788 | 9.709 | 113609 |
| 104.0 | 4768.3 | 37.680 | 99.482 | 3.741 | 111.258 | 10.104 | 116497 |
| 105.0 | 4860.9 | 37.594 | 99.603 | 3.802 | 102.271 | 10.512 | 119436 |
| 106.0 | 4955.1 | 37.505 | 99.719 | 3.863 | 93.778 | 10.933 | 122426 |
| 107.0 | 5051.0 | 37.416 | 99.835 | 3.925 | 85.786 | 11.366 | 125467 |
| 108.0 | 5148.5 | 37.326 | 99.949 | 3.990 | 78.344 | 11.813 | 128561 |
| 109.0 | 5247.7 | 37.236 | 100.062 | 4.062 | 71.512 | 12.274 | 131708 |
| 110.0 | 5348.6 | 37.146 | 100.174 | 4.135 | 65.209 | 12.748 | 134909 |
| 111.0 | 5451.2 | 37.055 | 100.283 | 4.210 | 59.410 | 13.236 | 138164 |
| 112.0 | 5555.6 | 36.965 | 100.388 | 4.286 | 54.085 | 13.739 | 141475 |
| 113.0 | 5661.6 | 36.874 | 100.490 | 4.364 | 49.204 | 14.256 | 144843 |
| 114.0 | 5769.5 | 36.785 | 100.590 | 4.445 | 44.740 | 14.788 | 148267 |
| 115.0 | 5879.3 | 36.696 | 100.689 | 4.529 | 40.661 | 15.335 | 151749 |
| 116.0 | 5990.9 | 36.610 | 100.786 | 4.617 | 36.948 | 15.897 | 155290 |
| 117.0 | 6104.5 | 36.527 | 100.882 | 4.710 | 33.559 | 16.475 | 158891 |
| 118.0 | 6220.1 | 36.446 | 100.976 | 4.817 | 30.571 | 17.069 | 162553 |
| 119.0 | 6337.6 | 36.368 | 101.068 | 4.938 | 27.913 | 17.679 | 166277 |
| 120.0 | 6457.2 | 36.293 | 101.160 | 5.066 | 25.428 | 18.305 | 170065 |
| 121.0 | 6578.9 | 36.221 | 101.250 | 5.199 | 23.103 | 18.947 | 173917 |
| 122.0 | 6702.8 | 36.152 | 101.339 | 5.339 | 20.934 | 19.607 | 177835 |
| 123.0 | 6828.9 | 36.085 | 101.425 | 5.486 | 18.908 | 20.283 | 181821 |
| 124.0 | 6957.3 | 36.022 | 101.509 | 5.640 | 17.018 | 20.977 | 185875 |
| 125.0 | 7088.0 | 35.961 | 101.591 | 5.801 | 15.259 | 21.689 | 189999 |
| 126.0 | 7221.2 | 35.903 | 101.672 | 5.970 | 13.624 | 22.419 | 194195 |
| 127.0 | 7357.0 | 35.848 | 101.751 | 6.146 | 12.108 | 23.167 | 198463 |
| 128.0 | 7495.3 | 35.797 | 101.828 | 6.330 | 10.708 | 23.933 | 202806 |
| 129.0 | 7636.2 | 35.748 | 101.905 | 6.521 | 9.418 | 24.719 | 207226 |
| 130.0 | 7780.0 | 35.702 | 101.982 | 6.721 | 8.235 | 25.523 | 211723 |
| 131.0 | 7926.7 | 35.657 | 102.058 | 6.929 | 7.155 | 26.348 | 216300 |
| 132.0 | 8076.3 | 35.613 | 102.133 | 7.145 | 6.175 | 27.192 | 220958 |
| 133.0 | 8229.0 | 35.570 | 102.206 | 7.370 | 5.289 | 28.057 | 225700 |
| 134.0 | 8384.8 | 35.527 | 102.278 | 7.603 | 4.496 | 28.942 | 230526 |
| 135.0 | 8544.0 | 35.483 | 102.352 | 7.844 | 3.790 | 29.850 | 235438 |
| 136.0 | 8706.2 | 35.436 | 102.425 | 8.095 | 3.168 | 30.779 | 240438 |
| 137.0 | 8872.4 | 35.385 | 102.494 | 8.356 | 2.624 | 31.730 | 245527 |
| 138.0 | 9042.0 | 35.332 | 102.565 | 8.627 | 2.152 | 32.704 | 250706 |
| 139.0 | 9215.4 | 35.277 | 102.633 | 8.910 | 1.748 | 33.701 | 255978 |
| 140.0 | 9393.1 | 35.224 | 102.703 | 9.208 | 1.407 | 34.722 | 261345 |
| | IECØ | | | | | | |
| 140.220 | 9432.7 | 35.213 | 102.714 | 9.276 | 1.338 | 34.950 | 262545 |

TABLE XIX

SPECIAL TRAJECTØRY DEPENDENT PARAMETERS

| TIME SEC | SF VEL FT/S | FLT-PATH DEG | HEAD DEG | MACH | DYN-PRES LB/FT SQ | RANGE NM | ALTITUDE FT |
|---|---|---|---|---|---|---|---|
| 141.0 | 9524.7 | 35.154 | 102.755 | 9.466 | 1.107 | 35.766 | 266799 |
| 142.0 | 9610.0 | 35.065 | 102.796 | 9.686 | 0.856 | 36.824 | 272298 |
| 143.0 | 9692.3 | 34.980 | 102.835 | 9.778 | 0.640 | 37.893 | 277833 |
| 144.0 | 9774.8 | 34.895 | 102.872 | 9.869 | 0.477 | 38.975 | 283404 |
| 145.0 | 9857.9 | 34.813 | 102.911 | 9.961 | 0.355 | 40.069 | 289010 |
| | ØECØ | | | | | | |
| 145.560 | 9904.2 | 34.769 | 102.926 | 10.013 | 0.300 | 40.684 | 292168 |
| 146.0 | 9915.3 | 34.722 | 102.942 | 10.024 | 0.262 | 41.174 | 294650 |
| 147.0 | 9904.2 | 34.599 | 102.956 | 9.885 | 0.187 | 42.282 | 300283 |
| 148.0 | 9890.0 | 34.472 | 102.969 | 9.733 | 0.134 | 43.390 | 305890 |
| | S-IV ENGINE START | | | | | | |
| 148.120 | 9888.6 | 34.459 | 102.965 | 9.715 | 0.129 | 43.521 | 306562 |
| 149.0 | 9875.8 | 34.347 | 102.982 | 9.587 | 0.097 | 44.498 | 311471 |
| 150.0 | 9864.7 | 34.221 | 102.995 | 9.451 | 0.071 | 45.606 | 317028 |
| 155.0 | 9885.1 | 33.642 | 103.078 | 8.727 | 0.017 | 51.170 | 344571 |
| 160.0 | 9909.1 | 33.072 | 103.163 | 7.832 | 0.005 | 56.788 | 371744 |
| | GUIDANCE INITIATIØN | | | | | | |
| 163.860 | 9930.6 | 32.638 | 103.227 | 7.116 | 0.002 | 61.159 | 392496 |
| 165.0 | 9937.3 | 32.511 | 103.246 | 6.807 | 0.002 | 62.456 | 398586 |
| 170.0 | 9967.1 | 31.974 | 103.367 | 5.739 | 0.001 | 68.177 | 425104 |
| 175.0 | 9997.1 | 31.459 | 103.555 | 5.066 | 0.000 | 73.950 | 451316 |
| 180.0 | 10029.9 | 30.940 | 103.733 | 4.596 | 0.000 | 79.774 | 477224 |
| 185.0 | 10065.3 | 30.412 | 103.895 | 4.279 | 0.000 | 85.652 | 502826 |
| 190.0 | 10103.4 | 29.883 | 104.039 | 4.076 | 0.000 | 91.585 | 528120 |
| 195.0 | 10143.8 | 29.355 | 104.171 | 3.958 | 0.000 | 97.575 | 553107 |
| 200.0 | 10186.9 | 28.835 | 104.293 | 3.883 | 0.000 | 103.623 | 577792 |
| 205.0 | 10232.6 | 28.313 | 104.404 | 3.821 | 0.000 | 109.730 | 602177 |
| 210.0 | 10280.4 | 27.795 | 104.507 | 3.767 | 0.000 | 115.897 | 626265 |
| 215.0 | 10330.7 | 27.278 | 104.604 | 3.735 | 0.000 | 122.125 | 650055 |
| 220.0 | 10383.5 | 26.767 | 104.695 | 3.706 | 0.000 | 128.416 | 673551 |
| 225.0 | 10439.0 | 26.258 | 104.781 | 3.680 | 0.000 | 134.771 | 696756 |

TABLE XIX
SPECIAL TRAJECTØRY DEPENDENT PARAMETERS

| TIME SEC | SF VEL FT/S | FLT-PATH DEG | HEAD DEG | MACH | DYN-PRES LB/FT SQ | RANGE NM | ALTITUDE FT |
|---|---|---|---|---|---|---|---|
| 230.0 | 10497.0 | 25.748 | 104.865 | 3.657 | 0.000 | 141.192 | 719669 |
| 235.0 | 10557.2 | 25.242 | 104.945 | 3.636 | 0.000 | 147.679 | 742292 |
| 240.0 | 10620.0 | 24.740 | 105.023 | 3.621 | 0.000 | 154.234 | 764625 |
| 245.0 | 10684.9 | 24.241 | 105.100 | 3.613 | 0.000 | 160.858 | 786671 |
| 250.0 | 10752.2 | 23.746 | 105.175 | 3.606 | 0.000 | 167.552 | 808429 |
| 255.0 | 10821.7 | 23.255 | 105.251 | 3.601 | 0.000 | 174.318 | 829900 |
| 260.0 | 10893.6 | 22.766 | 105.326 | 3.597 | 0.000 | 181.157 | 851086 |
| 265.0 | 10967.7 | 22.283 | 105.402 | 3.595 | 0.000 | 188.069 | 871986 |
| 270.0 | 11044.8 | 21.802 | 105.478 | 3.595 | 0.000 | 195.057 | 892602 |
| 275.0 | 11124.0 | 21.326 | 105.554 | 3.596 | 0.000 | 202.121 | 912935 |
| 280.0 | 11205.5 | 20.856 | 105.632 | 3.598 | 0.000 | 209.263 | 932985 |
| 285.0 | 11289.5 | 20.389 | 105.711 | 3.602 | 0.000 | 216.485 | 952753 |
| 290.0 | 11376.1 | 19.927 | 105.791 | 3.608 | 0.000 | 223.787 | 972241 |
| 295.0 | 11465.2 | 19.469 | 105.872 | 3.616 | 0.000 | 231.171 | 991449 |
| 300.0 | 11557.1 | 19.016 | 105.954 | 3.628 | 0.000 | 238.639 | 1010377 |
| 305.0 | 11651.5 | 18.569 | 106.038 | 3.641 | 0.000 | 246.191 | 1029028 |
| 310.0 | 11748.6 | 18.126 | 106.122 | 3.656 | 0.000 | 253.831 | 1047402 |
| 315.0 | 11848.3 | 17.688 | 106.208 | 3.671 | 0.000 | 261.558 | 1065498 |
| 320.0 | 11950.9 | 17.256 | 106.296 | 3.688 | 0.000 | 269.375 | 1083320 |
| 325.0 | 12056.6 | 16.830 | 106.384 | 3.706 | 0.000 | 277.284 | 1100867 |
| 330.0 | 12164.7 | 16.407 | 106.474 | 3.725 | 0.000 | 285.286 | 1118142 |
| 335.0 | 12275.6 | 15.990 | 106.565 | 3.746 | 0.000 | 293.382 | 1135142 |
| 340.0 | 12389.2 | 15.578 | 106.656 | 3.767 | 0.000 | 301.575 | 1151870 |
| 345.0 | 12505.6 | 15.172 | 106.749 | 3.790 | 0.000 | 309.866 | 1168326 |
| 350.0 | 12624.8 | 14.771 | 106.842 | 3.814 | 0.000 | 318.256 | 1184510 |
| 355.0 | 12747.0 | 14.373 | 106.937 | 3.839 | 0.000 | 326.749 | 1200421 |
| 360.0 | 12872.1 | 13.981 | 107.031 | 3.865 | 0.000 | 335.344 | 1216059 |
| 365.0 | 12999.7 | 13.595 | 107.127 | 3.892 | 0.000 | 344.045 | 1231427 |
| 370.0 | 13130.2 | 13.215 | 107.224 | 3.920 | 0.000 | 352.852 | 1246522 |
| 375.0 | 13263.8 | 12.838 | 107.320 | 3.949 | 0.000 | 361.768 | 1261345 |
| 380.0 | 13400.3 | 12.466 | 107.418 | 3.980 | 0.000 | 370.794 | 1275896 |
| 385.0 | 13539.7 | 12.100 | 107.518 | 4.011 | 0.000 | 379.933 | 1290172 |
| 390.0 | 13682.8 | 11.739 | 107.616 | 4.044 | 0.000 | 389.187 | 1304176 |
| 395.0 | 13828.6 | 11.383 | 107.716 | 4.079 | 0.000 | 398.557 | 1317907 |
| 400.0 | 13977.7 | 11.034 | 107.816 | 4.117 | 0.000 | 408.046 | 1331367 |
| 405.0 | 14130.3 | 10.690 | 107.917 | 4.156 | 0.000 | 417.655 | 1344555 |
| 410.0 | 14286.0 | 10.350 | 108.018 | 4.196 | 0.000 | 427.388 | 1357469 |
| 415.0 | 14445.4 | 10.016 | 108.121 | 4.237 | 0.000 | 437.246 | 1370112 |
| 420.0 | 14607.9 | 9.685 | 108.223 | 4.280 | 0.000 | 447.231 | 1382480 |
| 425.0 | 14774.0 | 9.360 | 108.326 | 4.323 | 0.000 | 457.346 | 1394574 |

TABLE XIX

SPECIAL TRAJECTØRY DEPENDENT PARAMETERS

| TIME SEC | SF VEL FT/S | FLT-PATH DEG | HEAD DEG | MACH | DYN-PRES LB/FT SQ | RANGE NM | ALTITUDE FT |
|---|---|---|---|---|---|---|---|
| 430.0 | 14943.7 | 9.041 | 108.430 | 4.368 | 0.000 | 467.594 | 1406394 |
| 435.0 | 15117.2 | 8.727 | 108.534 | 4.414 | 0.000 | 477.976 | 1417940 |
| 440.0 | 15294.2 | 8.418 | 108.640 | 4.462 | 0.000 | 488.496 | 1429212 |
| 445.0 | 15474.6 | 8.113 | 108.746 | 4.510 | 0.000 | 499.155 | 1440221 |
| 450.0 | 15658.6 | 7.813 | 108.852 | 4.560 | 0.000 | 509.956 | 1450942 |
| 455.0 | 15846.2 | 7.518 | 108.959 | 4.611 | 0.000 | 520.902 | 1461386 |
| 460.0 | 16037.6 | 7.225 | 109.066 | 4.663 | 0.000 | 531.995 | 1471549 |
| 465.0 | 16233.1 | 6.939 | 109.175 | 4.717 | 0.000 | 543.239 | 1481431 |
| 470.0 | 16432.4 | 6.656 | 109.283 | 4.772 | 0.000 | 554.635 | 1491031 |
| 475.0 | 16636.1 | 6.379 | 109.391 | 4.828 | 0.000 | 566.186 | 1500347 |
| 480.0 | 16844.3 | 6.105 | 109.501 | 4.886 | 0.000 | 577.897 | 1509379 |
| 485.0 | 17056.8 | 5.837 | 109.612 | 4.945 | 0.000 | 589.769 | 1518127 |
| 490.0 | 17274.0 | 5.573 | 109.723 | 5.006 | 0.000 | 601.807 | 1526589 |
| 495.0 | 17496.0 | 5.313 | 109.835 | 5.069 | 0.000 | 614.013 | 1534763 |
| 500.0 | 17722.3 | 5.059 | 109.947 | 5.133 | 0.000 | 626.392 | 1542648 |
| 505.0 | 17953.8 | 4.808 | 110.061 | 5.198 | 0.000 | 638.946 | 1550244 |
| 510.0 | 18190.2 | 4.562 | 110.175 | 5.266 | 0.000 | 651.679 | 1557550 |
| 515.0 | 18431.5 | 4.320 | 110.289 | 5.335 | 0.000 | 664.594 | 1564563 |
| 520.0 | 18678.7 | 4.082 | 110.404 | 5.406 | 0.000 | 677.697 | 1571282 |
| 525.0 | 18930.9 | 3.848 | 110.520 | 5.479 | 0.000 | 690.990 | 1577705 |
| 530.0 | 19188.8 | 3.619 | 110.637 | 5.553 | 0.000 | 704.478 | 1583831 |
| 535.0 | 19452.4 | 3.393 | 110.755 | 5.630 | 0.000 | 718.165 | 1589657 |
| 540.0 | 19722.2 | 3.171 | 110.873 | 5.709 | 0.000 | 732.055 | 1595181 |
| 545.0 | 19997.9 | 2.952 | 110.992 | 5.789 | 0.000 | 746.153 | 1600401 |
| 550.0 | 20279.7 | 2.737 | 111.111 | 5.872 | 0.000 | 760.463 | 1605314 |
| 555.0 | 20568.5 | 2.525 | 111.232 | 5.957 | 0.000 | 774.991 | 1609915 |
| 560.0 | 20863.5 | 2.316 | 111.353 | 6.044 | 0.000 | 789.741 | 1614200 |
| 565.0 | 21166.4 | 2.111 | 111.475 | 6.134 | 0.000 | 804.718 | 1618169 |
| 570.0 | 21476.9 | 1.911 | 111.597 | 6.227 | 0.000 | 819.930 | 1621818 |
| 575.0 | 21794.5 | 1.711 | 111.721 | 6.321 | 0.000 | 835.380 | 1625144 |
| 580.0 | 22121.1 | 1.515 | 111.845 | 6.419 | 0.000 | 851.076 | 1628140 |
| 585.0 | 22455.9 | 1.322 | 111.969 | 6.520 | 0.000 | 867.023 | 1630804 |
| 590.0 | 22798.4 | 1.131 | 112.096 | 6.624 | 0.000 | 883.229 | 1633128 |
| 595.0 | 23150.1 | 0.941 | 112.223 | 6.730 | 0.000 | 899.698 | 1635105 |
| 600.0 | 23510.6 | 0.755 | 112.351 | 6.840 | 0.000 | 916.440 | 1636730 |
| 605.0 | 23880.7 | 0.572 | 112.480 | 6.953 | 0.000 | 933.459 | 1637999 |
| 610.0 | 24261.1 | 0.389 | 112.609 | 7.069 | 0.000 | 950.765 | 1638904 |
| 615.0 | 24652.0 | 0.207 | 112.740 | 7.190 | 0.000 | 968.365 | 1639432 |
| 620.0 | 25055.0 | 0.027 | 112.871 | 7.314 | 0.000 | 986.266 | 1639569 |
| | S-IV CUTØFF | | | | | | |
| 621.659 | 25191.9 | -0.033 | 112.915 | 7.356 | 0.000 | 992.274 | 1639528 |

TABLE XIX
SPECIAL TRAJECTØRY DEPENDENT PARAMETERS

| TIME SEC | SF VEL FT/S | FLT-PATH DEG | HEAD DEG | MACH | DYN-PRES LB/FT SQ | RANGE NM | ALTITUDE FT |
|---|---|---|---|---|---|---|---|
| 625.0 | 25202.3 | -0.034 | 112.996 | 7.360 | 0.000 | 1004.415 | 1639402 |
| 630.0 | 25202.8 | -0.029 | 113.118 | 7.360 | 0.000 | 1022.585 | 1639226 |
| | INSERTIØN | | | | | | |
| 631.659 | 25202.8 | -0.027 | 113.159 | 7.360 | 0.000 | 1028.614 | 1639170 |

# APPENDIX

## DEFINITION OF SYMBOLS

| Symbol | Definition |
|---|---|
| XE, YE, ZE<br>DXE, DYE, DZE<br>DDXE, DDYE, DDZE | Position, velocity and acceleration components in the Earth-Fixed Cartesian Coordinate System. The origin of this system is the projection of the center of gravity of the complete vehicle at first motion onto the Fischer Ellipsoid of 1960. The X-Z plane is tangent to the reference ellipsoid at the origin of the coordinate system. The positive X-axis is oriented in the flight azimuth direction, 105 deg E of N. The Y-axis is normal to the X-Z plane and is positive above the origin. The Z-axis is normal to the X-Y plane and is in a right hand relation to the X-Y axes with the positive direction 195 deg E of N. The origin of this earth-fixed system rotates with an angular velocity identical to that of the earth. The earth-fixed coordinate system is shown in Figure 21. |
| XSP, YSP, ZSP<br>DXSP, DYSP, DZSP<br>DDXSP, DDYSP, DDZSP | Position, velocity and acceleration components in the Space-Fixed Ephemeris Coordinate System. The origin of this system is located at the geocentric center of the earth. The Z-axis points north along the earth's axis of rotation (through the north pole). The X-Y plane is coincident with the equatorial plane. The X-axis points through the vernal equinox. The reference equinox and equator are the mean equinox and equator of date of the epoch of midnight or zero hours on the day of launch . The Y-axis is normal to the X-Z plane and in a right hand relation to the X-, Z- axes. The direction of the coordinate axes remain fixed in space although the origin continues to move with the center of the earth. The space-fixed ephemeris coordinate system is shown is Figure 21. |

## DEFINITION OF SYMBOLS (CONT'D)

| Symbol | Definition |
|---|---|
| E. C. DIST<br>LONG<br>G. C. LAT | Position of vehicle in the Geographic Coordinate System. Position in this system is defined by the radius vector from the vehicle to the geocentric center of the earth (E. C. DIST), geocentric latitude (G. C. LAT) and longitude (LONG). A subvehicle point is defined as the intersection of the reference ellipsoid and the radius vector from the vehicle to the center of the earth. The geocentric latitude and longitude refer to the subvehicle point. Geocentric latitude is the angle between the radius vector and the equatorial plane, positive north of the equator. Longitude is the angle between the projection of the radius vector into the equatorial plane and the Greenwich meridian, measured positive east of the Greenwich meridian. |
| E. F. VEL<br>VEL-AZ<br>VEL-ELEV | Earth-fixed velocity of vehicle in the Geographic Coordinate System. Velocity in this system is given in terms of azimuth (VEL-AZ) elevation (VEL-ELEV), and magnitude of the velocity vector (E. F. VEL). Azimuth is the angle between the projection of the velocity vector into the local horizontal plane and the north direction in this plane. Elevation is the angle between the velocity vector and the local horizontal plane. The local horizontal plane is defined as the plane perpendicular to the radius vector from the vehicle to the geocentric center of the earth. The geographic coordinate system is shown in Figure 21. |

## DEFINITION OF SYMBOLS (CONT'D)

| Symbol | Definition |
|---|---|
| S.F. VEL<br>FLT-PATH<br>HEAD | Space-fixed velocity of vehicle in the Geographic Coordinate System. Velocity is given in terms of flight-path angle (FLT-PATH), heading angle (HEAD), and magnitude of the velocity vector (S.F. VEL). The flight-path angle is the angle between the space-fixed velocity vector and the plane normal to the radius vector from the vehicle to the geocentric center of the earth, measured positive upward from this plane. The heading angle is measured positive clockwise from north to the projection of the space-fixed velocity vector in the plane normal to the radius vector. |
| LAT | Geodetic latitude of vehicle |
| MACH | Mach number |
| DYN PRES | Dynamic Pressure |
| ALTITUDE | Distance from the subvehicle point to the center of gravity of the vehicle measured along the radius vector from the vehicle to the geocentric center of the earth. |
| RANGE | Surface range measured along a spherical earth from the launch site to the subvehicle point. |
| Mean Sidereal Time ($\theta$) | The mean sidereal time is the angle between the mean vernal equinox and the Greenwich meridian for the epoch of midnight on the day of launch. |

## DEFINITION OF SYMBOLS (CONT'D)

| Symbol | Definition |
|---|---|
| Orbital Element | The Orbital Element System is defined by six osculating elements of the two body ellipse with the reference body being determined by the body constants used, normally those of the earth. The elements are the semi-major axis of the ellipse; the eccentricity; the right ascension of the ascending node (Point of intersection of the orbital plane and earth equatorial plane); the inclination of the orbital plane to the earth equatorial plane; the argument of perigee or the angle between the ascending node and the perigee; the true anomaly or the angle between the perigee point and the satellite point. The various orbital elements are shown in Figure 21. |

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# SATURN SA-9/PEGASUS A POSTFLIGHT TRAJECTORY

By Jonathan B. Haussler and Robert H. Benson

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