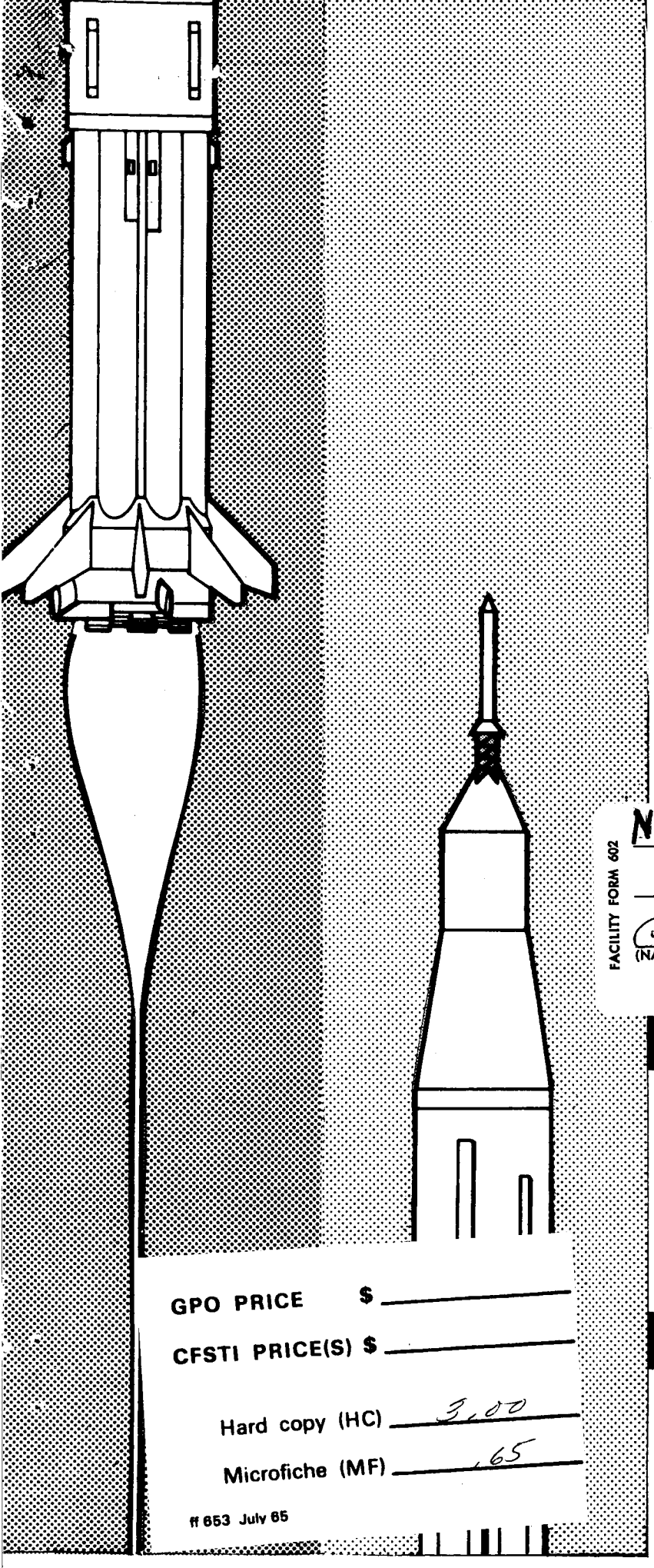

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AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

September 15, 1967

by

AEROSPACE PHYSICS BRANCH

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FOREWORD

This report documents the AS-206 S-IVB Restart Alternate Mission L/V Operational Flight Trajectory. The analysis and documentation were performed by the Aerospace Physics Branch, Chrysler Corporation Space Division, within the scope of NAS 8-4016, Modification MSFC 1, Amendment 38, MCRR No. 103, BB Item 3.1.3-10-M03, Part III.

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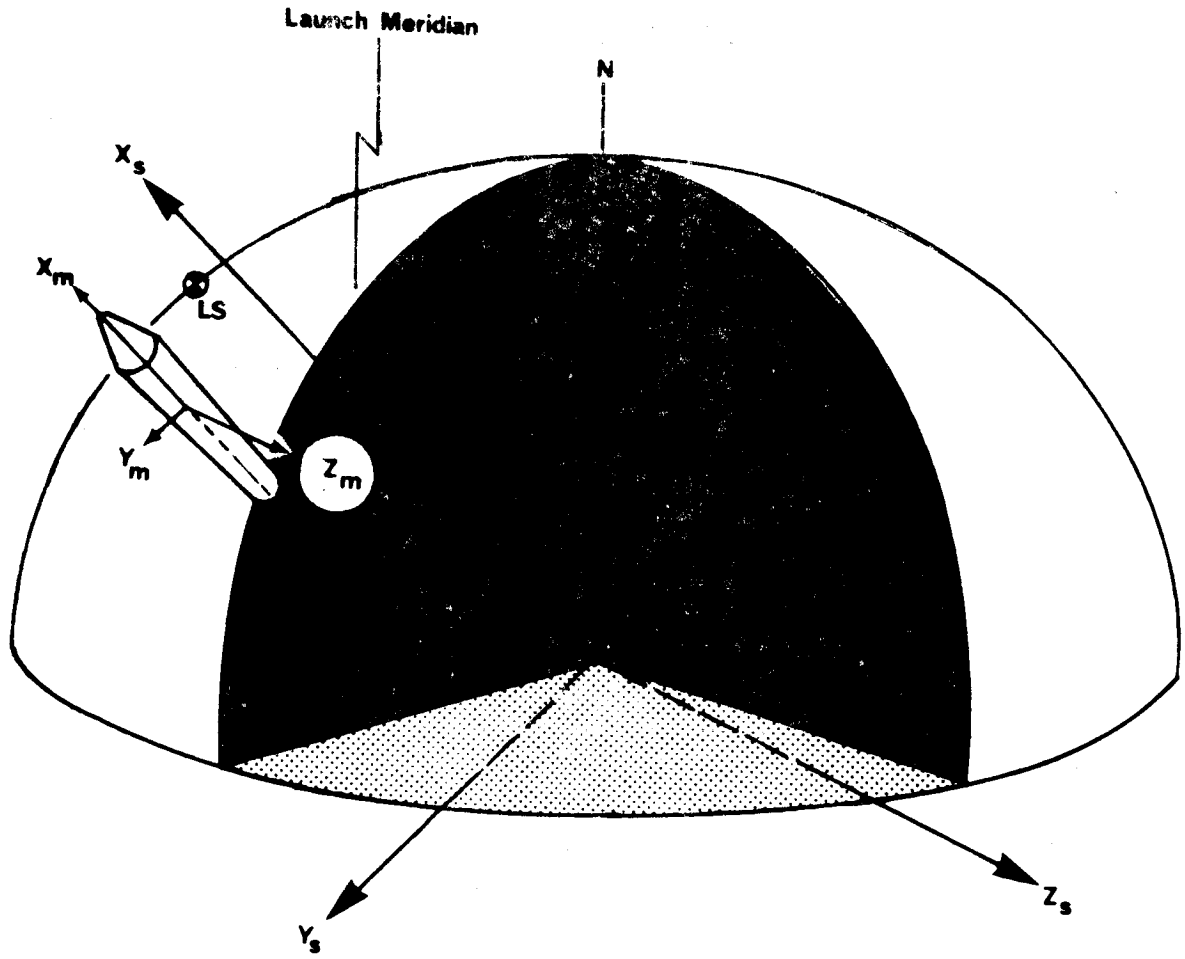
DEFINITIONS AND SYMBOLS

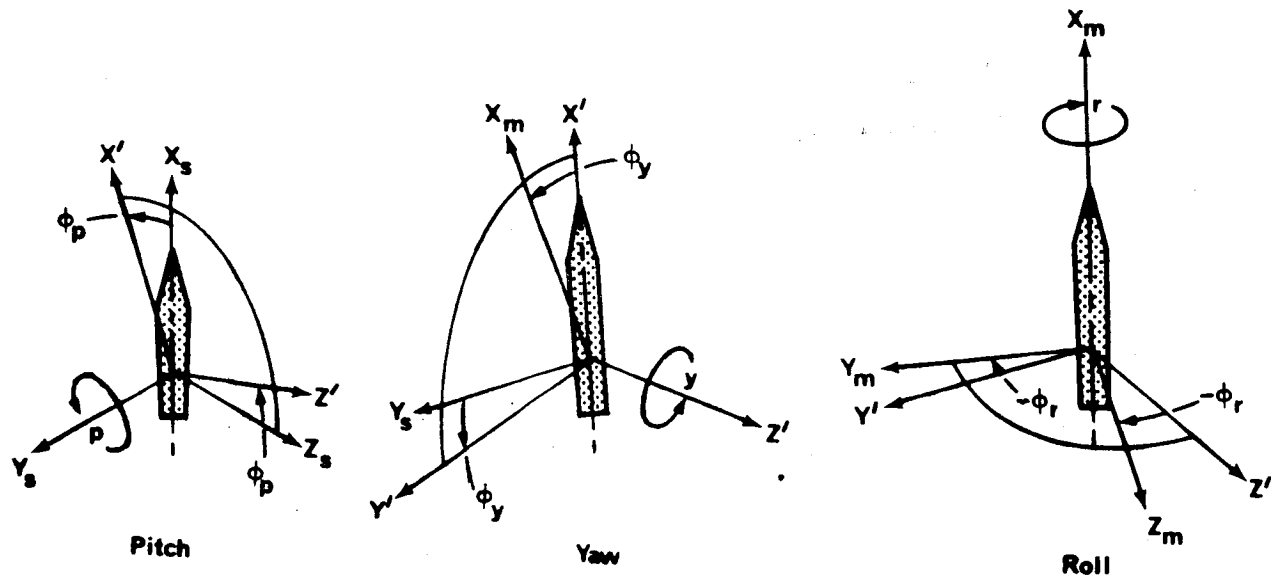
Aerodynamic Heating Indicator	$\int \frac{qV_r}{\pi/2 - \lvert\alpha_t\rvert} dt$ q = dynamic pressure, V_r = relative velocity, α_t = total angle of attack
Aerodynamic Load Indicator	Product of dynamic pressure and angle of attack.
Altitude	Vehicle altitude above the referenced ellipsoid measured along the geocentric position vector.
Angle of Attack, Pitch	Angle between the pitch plane component of the relative velocity vector and the longitudinal axis of the vehicle, measured positive nose up.
Attitude Error	Difference between the vehicle attitude (Pitch, Yaw and Roll Eulerian Angles) and the vehicle attitude command.
Axial Force	Component of the resultant aerodynamic force along the vehicle longitudinal axis (X axis of PASCS 8a), measured positive toward the tail of the vehicle.
Central Range Angle	Angle between instantaneous space fixed position vector and space fixed position vector at Guidance Reference Release.
Descending Node Argument	Angle measured in the equatorial plane between the orbit descending node and the space fixed launch meridian defined at Guidance Reference Release.
Drag	Component of the resultant aerodynamic force along the relative velocity vectory, measured positive opposite to the velocity vector.
Dynamic Pressure	$\frac{1}{2}$ x (Density) x (Relative Velocity)^2
Earth Fixed Position	Position vector components in an earth-fixed pad-centered plumbline coordinate system. The Xe axis is coincident with the reference ellipsoid normal, positive upward. The Ze axis is parallel to the earth-fixed aiming azimuth and is positive downrange. The Ye axis completes a right handed system. (PASCS 10)
Earth Fixed Cross Range	Ye component of PASCS 10 position vector.

DEFINITIONS AND SYMBOLS (Cont'd)

Earth Fixed Flight Path Angle	Angle between the earth fixed velocity vector and the earth fixed geocentric position vector (PASCS 11), measured positive downrange from the position vector.
Earth Fixed Velocity	Velocity vector components in PASCS 10.
Earth Fixed Velocity Magnitude	$\sqrt{\dot{X}e^2 + \dot{Y}e^2 + \dot{Z}e^2}$
Flight Azimuth	Angle defining orientation of the space fixed coordinate system downrange axis, Zs, at Guidance Reference Release, measured positive east of north in plane normal to the space fixed Xs axis at Guidance Reference Release.
Geocentric Declination	Angle between the geocentric radius vector and the true equatorial plane, measured positive north of the equator.
Geodetic Latitude	Angle between the reference ellipsoid normal through the point of interest and the true equatorial plane, measured positive north of the equator.
Ground Range	Surface distance from launch site to the sub vehicle point, positive east (0° - 180°).
Inclination	Angle between the instantaneous flight plane and the equatorial plane.
Longitude	Angle between the Greenwich meridian plane and the projection of the geocentric position vector in the equatorial plane, measured positive east of Greenwich.
Longitudinal Acceleration	That part of the total measurable acceleration directed along the longitudinal axis of the vehicle.
Mach Number	(Relative Velocity) ÷ (Local Speed of Sound)



$$\bar{X}_m = (-\phi_r)_1 (\phi_y)_3 (\phi_p)_2 \bar{X}_s$$



Mass	Mass of the vehicle.
Normal Force	Component of the resultant aerodynamic force normal to the vehicle X axis, and in the X-Z plane (PASCS 8a), measured positive toward Position I.
Pitch, Yaw, Roll	Eulerian angles of vehicle attitude measured with respect to the space fixed coordinate system. Vehicle attitude is defined by the ordered rotation of pitch, yaw, and roll, respectively. (See illustration)
Radius	$\sqrt{Xs^2 + Ys^2 + Zs^2}$
Range	Surface distance from launch site to the sub vehicle point, positive east (0° - 180°).
Relative Velocity	Velocity relative to the atmosphere (includes wind velocity).
Space Fixed Position	Position vector components in a spaced fixed, earth centered, plumbline coordinate system defined at Guidance Reference Release. The Xs axis is parallel to the reference ellipsoid normal which passes through the launch site. The Zs axis is parallel to, and positive in the same direction as the earth-fixed firing azimuth. The Ys axis completes the right handed system. This is Project Apollo Standard Coordinate System 13. (PASCS 13.)
Space Fixed Cross Range	Ys component of PASCS 13 position vector.
Space Fixed Flight Path Angle	Angle between the space fixed velocity vector and the radius vector (PASCS 13), measured positive downrange from radius vector.
Space Fixed Velocity	Velocity vector components in PASCS 13.
Space Fixed Velocity Magnitude	$\sqrt{\dot{Xs}^2 + \dot{Ys}^2 + \dot{Zs}^2}$
Time	Instantaneous flight time referenced to first motion.
Thrust	Total effective thrust magnitude. $\sqrt{FTX^2 + FTY^2 + FTZ^2}$
Weight	Weight of vehicle in pounds.

SUMMARY

This report documents the AS-206 S-IVB Restart Alternate Mission L/V Operational Flight Trajectory. Trajectory data are tabulated for all phases of flight for which the Saturn IB Launch Vehicle has a functional requirement. A comprehensive summary of the launch vehicle characteristics and flight environment is also presented.

The predicted S-IB, S-IVB stage first burn (Guidance Cutoff Signal) and S-IVB stage second burn (Depletion Cutoff Signal) end conditions are summarized below:

		S-IB/S-IVB Separation	Guidance Cutoff Signal	Depletion Cutoff Signal
Flight Time	(sec)	143.217	508.122	11,467.962
Altitude	(m)	67,566.	190,872.	216,168.
Space Fixed Velocity	(m/sec)	2,598.64	7,783.58	10,413.55
Space Fixed Path Angle	(deg)	63.820	90.007	89.189
Range	(m)	73,984.	1,485,602.	-315,701.

The nominal weight in orbit is predicted to be 67,675 pounds, of which 31,167 pounds is useable S-IVB stage propellant. Under nominal flowrate criteria, this propellant is depleted 74.962 seconds after the S-IVB stage restart signal is received. This includes a "full burn" period, 90% thrust level to propellant depletion, of 64.462 seconds.

S-IVB stage restart occurs after an orbital coast phase of approximately two revolutions (10,875 seconds). During this period a local horizontal vehicle attitude is maintained and the Constant Vent System (CVS) is open.

The S-IVB stage restart sequence is Time Base 5 (TB5) dependent. TB5 is established by navigational sighting of the Guaymas tracking station during the second revolution. The vehicle inertial attitude command is frozen 30 seconds prior to second ignition and held until 30 seconds after propellant depletion. For the balance of the lifetime of the batteries, a local horizontal attitude is maintained.

The S-IVB stage Flight Performance reserve for this mission is approximately 1,200 pounds. Therefore, the predicted useable propellant available at orbit insertion may deviate by 1,200 pounds. This corresponds to a second burn time deviation of approximately 2.5 seconds.

An H-1 engine out performance evaluation has been conducted for this mission. Analysis of the results reveals that the most severe case, engine failure at liftoff, would decrease S-IVB stage second burn time capability by approximately eight seconds. The controllability of this vehicle with H-1 engine failure will be determined at a later date.

SECTION 1

INTRODUCTION

The AS-206 S-IVB Restart Alternate Mission L/V Operational Flight Trajectory is presented in this document. By definition, the Launch Vehicle Operational Trajectory includes all phases of flight for which the S-IB stage and the S-IVB/IU stage have functional requirements.

In addition, comprehensive summaries of vehicle data, sub-systems characteristics, and the guidance and control modes are presented herein.

SECTION 2

MISSION DESCRIPTION

2.1 MISSION OBJECTIVES: The basic purpose of the Apollo Saturn 206 S-IVB Restart Alternate Mission is to place the S-IVB stage into orbit and test its restart capability, simulating the AS-501 mission profile. In the event S-IVB restart problems occur in the early Saturn V flights, this mission will be flown to help correct or solve the problems. The primary objective of the SA-206 Launch Vehicle is to insert the S-IVB/IU/Payload configuration into a near earth 100 nautical mile circular orbit. The payload consists of a Spacecraft LM Adapter (SLA) and a 25° Nose Cone (NC #2). (See Reference 1)

In the event of an S-IB engine premature shutdown, the desired orbit may be attained by using the remaining seven S-IB engines and S-IVB burn to orbit. The effects of S-IB engine premature shutdown on mission capability are shown in Figure 31.

2.2 MISSION GROUND RULES AND CONSTRAINTS: The following mission criteria, vehicle constraints, and trajectory constraints have been imposed on this trajectory:

1) Launch from AFETR Pad 37 B.

2) Pad oriented launch azimuth of 90 degrees east-of-north.

3) Flight azimuth of 72 degrees east-of-north.

4) S-IB stage tilt program defined in Table 1B.

5) S-IVB cutoff conditions for 100 nautical mile circular orbit insertion.

6) Commanded pitch and yaw attitude rate limit of one degree per second.

7) Average mean head/tailwind for December through April.

8) NC/SLA remains attached to the S-IVB/IU for restart.

9) First S-IVB burn Engine Mixture Ratio (EMR) 5.5:1.

10) Second S-IVB burn EMR 4.5:1 for 13 seconds, then closed loop Propellant Utilization (PU) to depletion.

11) Simulate as closely as possible the AS-501 profile, restart environment and restart sequence.

12) Open loop guidance during S-IVB second burn with propellant depletion cutoff.

SECTION 3

LAUNCH VEHICLE AND ENVIRONMENT DESCRIPTION

3.1 CONFIGURATION: The SA-206 Saturn IB Launch Vehicle consists of a S-IB first stage, a S-IVB second stage, an instrument unit, and a payload. For this mission the payload consists of a Spacecraft LM Adapter and a 25° Nose Cone. There will be no spacecraft or LM. An outboard profile of the complete configuration is shown in Figure 1A, Appendix A.

3.2 MASS CHARACTERISTICS: The SA-206 vehicle mass characteristics are defined in Reference 2. Table 1A presents a vehicle weight breakdown of the launch vehicle. These data are consistent with Reference 2 and the trajectory presented herein. Tables 3A, and 4A present a time history of the vehicle mass and the associated center of gravity and moment of inertia data for the S-IB stage and the two S-IVB burns, respectively.

3.3 AERODYNAMIC PROPERTIES: Powered Flight aerodynamic data for the S-IB stage and S-IVB stage first burn were obtained from Reference 3. Flight time histories of the S-IB stage aerodynamic data are presented in Table 5A. Orbital drag data was extracted from Reference 4 and was used for the orbital coast phases and the S-IVB stage second burn.

3.4 PROPULSION SYSTEMS: The S-IB stage is powered by eight H-1 engines which have a nominally rated sea level thrust of 205,000 pounds each. The predicted nominal thrust magnitude history for each H-1 engine, including thrust decay and the associated turbine engine thrust, were obtained from Reference 5. The thrust magnitude time history for each H-1 engine is delineated in Table 6A. Figure 2A depicts the thrust decay histories.

The S-IVB stage is powered by a single J-2 engine which has a rated vacuum thrust of 200,000 pounds at a nominal mixture ratio of 5:1. However, a 5.5:1 engine mixture ratio is maintained during the first S-IVB stage burn which results in a relatively high thrust level throughout this flight period. The predicted nominal first burn J-2 engine thrust history from the 90% thrust level time point to the time of the guidance cutoff signal was obtained from Reference 6. The thrust buildup and thrust decay histories were obtained from Reference 7. Table 7A presents a summary of the first burn J-2 engine thrust history. The J-2 thrust buildup and decay histories for the first burn are depicted in Figures 3A and 4A.

The predicted nominal J-2 engine second burn thrust history from the 90% thrust level to propellant depletion was obtained from Reference 8. The thrust buildup and thrust decay histories were obtained from Reference 7. Table 7A presents a summary of the J-2 engine thrust history. The J-2 thrust buildup and decay histories for the second burn are depicted in Figures 5A and 6A.

Four solid propellant retro-motors (TE-M-29) mounted on the S-IB/S-IVB interstage provide thrust to decelerate the S-IB stage after separation. The retro-motors are rated at a nominal thrust level of 36,720 pounds each (Reference 9).

Three solid propellant ullage motors mounted on the S-IVB stage aft skirt provide a positive acceleration for the S-IVB stage to settle propellants for J-2 engine start. The ullage motors rated thrust is 3,460 pounds each (Reference 10).

The S-IVB Stage Auxiliary Propulsion System (APS) consists of two modules. Each module contains three 150 pound thrust (vacuum) hypergolic rocket engines. This system provides roll control during both J-2 burn phases, and pitch, yaw and roll control during orbital coast phase.

3.5 ENVIRONMENT DESCRIPTION: The 1963 Patrick Reference Atmosphere model defines the atmospheric properties incorporated in the trajectory simulation. The earth model and potential function are those of the Fischer Earth Model. The wind profile is an average of the December through April mean headwind/tailwind profiles defined in Reference 11. It is depicted in Figure 7A.

SECTION 4

CONTROL AND GUIDANCE

The Saturn IB inertial guidance system performs navigation evaluations, issues discrete commands, initiates guidance and control functions, and issues steering commands to guide the launch vehicle to the prespecified targeting conditions. These functions are accomplished by the AS-206 Flight Program which is stored in the Launch Vehicle Digital Computer (LVDC). Inputs to the LVDC for navigation and steering command evaluations are the predetermined constants for the different guidance modes and the inertial velocity increments sensed by the stabilized platform accelerometers.

4.1 GUIDANCE: Guidance of the AS-206 Launch Vehicle into orbit and throughout the orbital phases of active attitude control is divided into three distinct phases: (1) Pre-IGM; (2) IGM; and (3) Orbital.

The Pre-IGM phase guidance provides pitch, yaw and roll vehicle attitude commands as a function of the time from liftoff to the time of IGM initiation. The S-IB stage pitch program polynomials for this mission are delineated in Appendix B, Table IB. Also included in Table IB is a time history of the yaw and roll attitude commands. A history of the pitch attitude steering command generated by the polynomials is given in Table 2B.

In the Iterative Guidance Mode (IGM) phase for this mission, a one-stage three-dimensional formulation of the IGM equations and logic provides active guiddance of the S-IVB stage in pitch and yaw from the time of IGM initiation, TB3 + 17.0 seconds, to J-2 cutoff. The commanded roll attitude is zero. The IGM equations and logic programmed for the LVDC Flight Program are defined in Reference 12. The IGM presettings for the mission are given in Appendix B, Table 3B.

The orbital guidance mode provides pitch, yaw and roll attitude commands for the planned maneuvers during the orbital coast phase and second J-2 burn phase of the mission. The planned maneuvers for this mission consist of :

1) At 10 to 20 seconds after insertion, maneuver into local horizontal plane, nose leading, fin 1 down and hold this local attitude until 30 seconds prior to second ignition;

2) At 30 seconds prior to second ignition, freeze the current vehicle inertial attitude for the entire second burn period;

3) 30 seconds after second J-2 cutoff, the local horizontal, nose leading, fin 1 down attitude is reattained and held throughout the mission lifetime. (See Reference 1)

4.2 CONTROL SYSTEMS: Pitch, yaw and roll attitude control are maintained by the four swivelable H-1 engines during the S-IB stage of powered flight. The control law, gains, and network characteristics for the S-IB stage control system are defined in Reference 13.

The J-2 engine provides pitch and yaw attitude control throughout both S-IVB stages of powered flight. Roll attitude control is maintained by the Auxiliary Propulsion System (APS). The control law, gains and network characteristics of the S-IVB stage control system are defined in Reference 13.

Pitch, yaw and roll attitude control are provided by the APS during orbital coast phases.

SECTION 5

LAUNCH VEHICLE TRAJECTORY

The nominal sequence of events for the AS-206 S-IVB Restart Alternate Mission L/V Operational Flight Trajectory is summarized in Table 1. It was derived from References 14 and 15.

Table 2 provides a summary of trajectory parameters at pertinent events from liftoff to loss of attitude control. Convenient summaries of the end conditions of flight for the S-IB, S-IVB first burn, first orbital coast and S-IVB second burn phases of flight are presented in Tables 3, 4, 5 and 6, respectively. Tabulated listings of the trajectory, in metric units, are presented in Tables 7 -10. Corresponding tabular listings, in English units, are given in Appendix C. Graphical displays of the ascent trajectory are shown in Figures 1 through 5.

The associated data tapes required for distribution by MSFC, R-AERO-F, are identified as follows:

Trajectory Listing (Printout Tape):
CCSD/Slidell Reel No. 8800
MSFC Copy Reel No. 10453

Data Tape (B-7 Tape):
CCSD/Slidell Reel No. 5441
MSFC Copy Reel No. 0153

5.1 BOOST PHASE: The trajectory boost phase consists of the S-IB stage powered flight and the S-IVB stage first burn. The phase begins at Guidance Reference Release (GRR) and ends at Orbit Insertion (OI).

5.1.1 S-IB Stage Powered Flight: Tabulated listings of trajectory parameters for this stage are presented in Table 7. It is initiated at Guidance Reference Release (GRR), which is assumed to be 5 seconds prior to launch (first motion). The time of umbilical disconnect and the corresponding establishment of Time Base One (TB1) is assumed to be 0.2 seconds after first motion. This stage ends at S-IB/S-IVB physical separation, which is assumed to be 1.379 seconds after Outboard Engine Cutoff signal (OECO).

A time history of the S-IB stage pitch attitude steering command is depicted in Figure 6. Figures 7 and 8 present summaries of the resulting vehicle pitch attitude rate and attitude error. A summary of the pitch plane angle of attack is presented in Figure 9. Figure 10 presents a summary of the dynamic pressure history. The longitudinal acceleration history is depicted in Figure 11.

In order to establish a more realistic nominal trajectory prediction, a constant thrust bias equal to + 0.7 per cent of the vehicle sea level longitudinal thrust has been included in the S-IB stage trajectory. This action is an attempt to minimize the effects of an apparent systematic shift in the ground to flight test performance level.

5.1.2 S-IVB Stage First Burn: Tabulated listings of this segment of the boost trajectory are presented in Table 8. The segment begins at S-IB/S-IVB stage separation and ends at orbit insertion. Orbit insertion is defined to be at Guidance Cutoff Signal (GCS) plus 10 seconds. GCS occurs when the space fixed velocity magnitude equals a prespecified value of 7783.58 m/sec. This phase of the trajectory includes the ullage rocket burns, J-2 engine thrust buildup, mainstage burn with ullage case jettisoning, J-2 thrust decay and ullage venting.

The pitch and yaw attitude angle steering commands during this S-IVB powered flight phase are depicted in Figures 12 and 13. The acceleration history is depicted in Figure 14. Trajectory parameters pertinent to an analysis of the trajectory from S-IB/S-IVB separation to the time of active control are depicted in Figures 15 - 18.

It should be noted that the vehicle pitch attitude error history, presented in Table 8, shows larger excursion than observed in previous flight predictions. This is primarily due to vehicle center of gravity misalignment caused by the S-IVB stage restart hardware installation. When misalignment is sensed, the attitude commands to the control system are biased by the LVDC steering misalignment control logic so that the desired vehicle attitude is maintained.

5.2 ORBITAL FLIGHT PHASE: The orbital flight phase is initiated at orbit insertion and terminates at loss of S-IVB/Payload attitude control. This phase consists of an orbit coast period of approximately two orbits, a second S-IVB stage burn and a final coast period.

5.2.1 First Orbital Coast Period: The first orbital coast period is initiated at orbit insertion and is terminated at Time Base Five (TB5) plus 450 seconds (J-2 engine start signal). TB5 is established by the LVDC as a result of navigational sighting of Guaymas on the second revolution. Guaymas sighting time is defined as the time at which the vehicle enters the cone described by a 5° elevation angle generated from Guaymas. Tabulated listings of the trajectory for this period are included in Table 8. Histories of altitude, velocity and pitch attitude for this period are displayed in Figures 19 through 21.

5.2.2 S-IVB Stage Second Burn: The S-IVB stage second burn is initiated at TB5 + 450 seconds with an eight second fuel lead through the thrust chamber prior to ignition. Ignition occurs at TB5 +458

seconds and the 90% thrust level is attained 2.5 seconds later. The Propellant Utilization (PU) valve is held in a hard over position providing a 4.5:1 engine mixture ratio until 13 seconds after engine start at which time closed loop PU control begins. This burn is terminated by depletion of useable propellants. The nominal amount of useable mainstage propellant on board for the second burn is 31,167 lbs. Under predicted flowrates, this amount is depleted 74.962 seconds after the restart signal is received or 64.462 seconds after the 90% thrust level is attained. The Flight Performance Reserve (FPR) for this mission is approximately 1,200 lbs. Therefore, the nominal useable propellant for the second J-2 burn may deviate by this amount producing a corresponding change in burn time of approximately 2.5 seconds. Tabulated listing of the trajectory from second burn engine start to 10 seconds after J-2 engine depletion shutdown are included in Table 8. Histories of altitude, velocity, flight path angle, and vehicle pitch attitude during this period of the trajectory are presented in Figures 22 through 25.

During this burn, open loop guidance is used. Therefore, the vehicle attitude commands are not biased by the LVDC steering misalignment logic to compensate for vehicle center of gravity displacements. Thus, the displacement caused by the S-IVB restart package installation produces vehicle attitude errors which are not corrected by the guidance scheme.

5.2.3 Second Orbital Coast Period: Table 9 presents tabulated listings of trajectory parameters for the second orbital coast period of the Launch Vehicle Trajectory. This period extends from J-2 engine depletion shutdown plus 10 seconds to loss of S-IVB/Payload attitude control. Histories of altitude, velocity and pitch attitude for this period are displayed in Figures 26 through 28.

5.3 SPENT S-IB STAGE TRAJECTORY: The re-entry trajectory for the spent S-IB stage is summarized in Table 10. This phase of the S-IB stage trajectory is initiated at S-IB/S-IVB separation and includes the retro-rocket burns.

5.4 TRACKING SUMMARY: Radar and telemetry coverage during ascent and orbit are provided by the stations listed in Tables 11 and 12. Summaries of the tracking and telemetry coverage for each station are presented in Figures 29 and 30.

5.5 LAUNCH VEHICLE PROPULSION PERFORMANCE CHARACTERISTICS: The predicted S-IB and S-IVB stage performance characteristics are presented in Table 2A. These data are time averages of the detailed vehicle performance data referenced herein.

5.6 S-IB STAGE ENGINE OUT PERFORMANCE CAPABILITY: From a performance standpoint, the effect of an S-IB stage engine failure may be offset by utilizing the seven remaining H-1 engines and the S-IVB stage engine to attain the specified orbit. The effect of an S-IB stage engine failure on available second burn propellants is depicted in Figure 31 as a function of engine failure time. These data indicate that for an otherwise nominal flight an engine out at liftoff would only reduce the nominal S-IVB stage second burn time by approximately 8 seconds.

SECTION 6

REFERENCES

1. "Minutes of Backup AS-206 S-IVB Restart Mission", I-I/IB-E-335-67, 6 June 1967; "AS-206 S-IVB Restart Alternate Mission Flight Program Definition", R-ASTR-NG-56-67, 17 July 1967.

2. "Preliminary Predicted Mass Characteristics, Saturn IB Vehicle AS-206, Part III, Depletion Cutoff", BB-3.8.0-1-M03, 31 July 1967.

3. "Summary of Saturn IB/LEM, AS-206 Static Aerodynamics", TN-AP-66-150 Volume 1, 20 December 1966.

4. "Study of Drag Coefficients For Unusual Vehicle Configurations" April Progress Report, LMSC/HREC A782759.

5. S-IB Stage Propulsion Prediction, CCSD B5 Reel No. 6755. (B6 Reel No. 9351/8249)

6. S-IVB Stage Propulsion Prediction, CCSD Reel No. 10028. (MSFC Reel No. 1254)

7. "Thrust Increase Envelope, Test No. 313-094, Engine SNJ-2046"; Saturn IB J-2 Engine Characteristics", R-P&VE-PPE-66-M-90, 11 May 1966.

8. S-IVB Stage Propulsion Prediction, CCSD Reel No. 2072. (MSFC Reel No. 9910)

9. "Data for use in S-IB-03 and Sub Vehicle Specifications and Future Separation Studies", MSFC, R-P&VE-PPE-66-M-82, 21 June 1966.

10. "S-IVB Ullage Rocket Typical Thrust Versus Time (Vacuum 70°F)", R-P&VE-PPS-65-M-65, Figure 16, 5 May 1965.

11. "Cape Kennedy Wind Component Statistics 0-60 km Altitude For 72 Degree Flight Azimuth For Monthly and Annual Reference Periods", R-AERO-Y-90-66, 23 March 1966; "Latest Wind Estimates From 80 km to 200 km Altitude Region at Mid-Latitudes", NASA TMX-53064, 16 June 1964.

12. "LVDC Equation Defining Document for the AS-207/AS-208 Flight Programs", MSFC No. III-4-423-9, November 1966.

REFERENCES (Cont'd)

13. "Control Gains and Shaping Networks for Saturn AS-206, S-IB and S-IVB Stages", R-ASTR-F-66-162, 6 September 1966 as revised by Reference 14.

14. R-AERO-FMR letter, "AS-206 S-IVB Restart Alternate Mission Operational Trajectory Data", 21 July 1967.

15. "Saturn IB Restart Mission Flight Sequence ", Drawing Number 10M30766, 26 June 1967.

TABLE 1

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
FLIGHT SEQUENCE OF EVENTS

NOMINAL FLIGHT TIME (HR: MIN: SEC)	TIME (SEC)	PROGRAM TIME (SEC)	EVENT
- 0:0:05.0	- 5.00	---	Guidance Reference Release (GRR).
- 0:0:03.1	- 3.10	---	Initiate S-IB Mainstage Ignition Sequence.
0:0:00.0	0.00	---	First Motion.
0:0:00.2	0.20	$(0.0)_1$	Lift-off Signal; Initiate Time Base 1.
0:0:10.2	10.20	$(10.0)_1$	Initiate Pitch and Roll Maneuvers.
0:1:00.2	60.20	$(60.0)_1$	Control Gain Switch Point.
0:1:11.0	71.00	---	Maximum Dynamic Pressure.
0:1:35.2	95.20	$(95.0)_1$	Control Gain Switch Point.
0:2:00.2	120.20	$(120.0)_1$	Control Gain Switch Point.
0:2:12.3	132.25	$(132.1)_1$	Tilt Arrest.
0:2:12.3	132.30	$(132.1)_1$	Enable S-IB Propellant Level Sensors.
0:2:15.8	135.84	$(0.0)_2$	Level Sensor Activation; Initiate Time Base 2.
0:2:18.8	138.84	$(3.0)_2$	Inboard Engine Cutoff (IECO).
0:2:21.8	141.84	$(0.0)_3$	Outboard Engine Cutoff (OECO); Initiate Time Base 3.
0:2:23.1	143.14	$(1.3)_3$	Separation Signal.
0:2:23.2	143.22	--- $(1.4)_3$	S-IB/S-IVB Physical Separation; Control Gain Switch Point.

TABLE 1 (Cont'd)

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
FLIGHT SEQUENCE OF EVENTS

NOMINAL FLIGHT (HR: MIN: SEC)	TIME (SEC)	PROGRAM TIME (SEC)	EVENT
0:2:24.5	144.54	$(2.7)_3$	J-2 Engine Start Command.
0:2:26.9	146.89	----	Ullage Burn Out.
0:2:27.9	147.94	----	90% J-2 Thrust Level.
0:2:30.5	150.54	$(8.7)_3$	Command PU System Activation.
0:2:35.1	155.14	$(13.3)_3$	Jettison Ullage Rocket Motors.
0:2:38.8	158.84	$(17.0)_3$	Command Active Guidance Initiation.
0:4:47.9	287.94	$(146.10)_3$	Control Gain Switch Point.
0:8:28.1	508.12	----	Guidance Cutoff Signal (GCS).
0:8:28.3	508.32	$(0.0)_4$	Initiate Time Base 4; Begin CVS LH_2 Vent. (Reflects an approximate 0.2 second systems delay)
0:8:38.1	518.12	----	Orbit Insertion.
0:8:50.0	530.00	$(21.88)_4$	Begin Local Horizontal Attitude Hold.
3:2:23.0	10943.00	$(0.00)_5$	Second Guaymas Sighting; Initiate Time Base 5.
3:8:53.0	11333.00	$(390.00)_5$	Begin Helium Ullage Vent Through CVS.
3:8:54.2	11334.20	$(391.20)_5$	End LH_2 Vent.
3:9:23.0	11363.00	$(420.00)_5$	Inertial Attitude Freeze.
3:9:53.0	11393.00	$(450.00)_5$	J-2 Start Command; Begin Fuel Lead.
3:9:56.0	11396.00	$(453.00)_5$	End Helium Vent.
3:10:01.0	11401.00	$(458.00)_5$	J-2 Ignition.
3:10:03.5	11403.50	----	90% Thrust Level.
3:10:06.0	11406.00	$(463.00)_5$	Command PU System Activation.

TABLE 1 (Cont'd)

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
FLIGHT SEQUENCE OF EVENTS

NOMINAL FLIGHT (HR: MIN: SEC)	TIME (SEC)	PROGRAM TIME (SEC)	EVENT
3:11:08.0	11467.96	$(0.00)_6$	Propellant Depletion Cutoff; Initiate Time Base 6.
3:11:08.2	11468.16	$(0.20)_6$	Begin LH_2 Vent.
3:11:08.4	11468.36	$(0.40)_6$	Begin LOX Vent.
3:11:18.0	11477.96	$(10.00)_6$	End LOX Vent.
3:11:38.0	11497.96	$(30.00)_6$	Begin Local Horizontal Attitude Hold.
3:13:08.0	11587.96	$(120.00)_6$	End LH_2 Vent.
7:38:38.0	27518.00	----	Loss of Attitude Control.

TABLE 2

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
LAUNCH VEHICLE TRAJECTORY SUMMARY

Event	Flight Time (sec)	Altitude (km)	Velocity (m/s)	Space Fixed Flight Path Angle (deg)	Azimuth (deg)	Geodetic Lat. (deg)	Longitude (Pos. East) (deg)
Guidance Ref. Release	-5.0	0.03	408.93	90.000	90.00	28.53	-80.57
First Motion	0.0	0.03	408.93	90.000	90.00	28.53	-80.57
Max. Dyn. Pressure	71.0	12.23	780.00	59.054	82.79	28.55	-80.52
Tilt Arrest	132.3	55.29	2265.22	62.303	75.80	28.68	-80.04
Inboard Engine Cutoff	138.8	62.52	2530.99	63.191	75.46	28.71	-79.93
Outboard Engine Cutoff	141.8	65.98	2596.95	63.598	75.39	28.73	-79.87
S-IB/S-IVB Physical Sep.	143.2	67.57	2598.64	63.820	75.40	28.74	-79.85
J-2 Eng. Start Command	144.5	69.07	2593.47	64.044	75.41	28.74	-79.82
Ullage Case Jettison	155.1	80.76	2614.97	65.741	75.44	28.80	-79.62
Initiate IGM	159.3	85.15	2634.54	66.361	75.44	28.82	-79.54
Guidance C/O Signal	508.1	190.87	7783.58	90.007	83.82	31.23	-65.49
Orbit Insertion	518.1	190.90	7793.03	89.999	84.22	31.30	-64.74
S-IB Stage Impact	585.8	0.00	414.09	102.554	89.97	30.12	-74.27
2nd Guaymas Sighting (TB5)	10943.0	215.20	7779.31	90.015	77.50	29.44	-122.53
S-IVB Restart Signal	11393.0	214.84	7780.88	90.015	95.74	31.31	-89.09
Depletion Cutoff	11468.0	216.17	10413.55	89.189	97.76	30.62	-82.77
Loss of S-IVB Att. Control	27518.0	43773.70	1913.47	45.738	93.39	-31.21	8.55

TABLE 3

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IB STAGE END CONDITIONS OF FLIGHT

Flight Time (t): OECO + 1.379 seconds	143.217	(sec)
Radius (R):	6440820.	(m)
Altitude:	67566.	(m)
Space Fixed Velocity (V):	2598.64	(m/s)
Space Fixed Path Angle (θ):	63.820	(deg)
Space Fixed Flight Azimuth (AZI):	75.401	(deg)
Earth Fixed Flight Azimuth (AZE):	72.322	(deg)
Geocentric Declination (δ):	28.576	(deg)
Geodetic Latitude (ϕ):	28.736	(deg)
Longitude (λ): (Pos. East)	-79.845	(deg)

SPACE FIXED POSITION AND VELOCITY COMPONENTS

X_s	=	6439461.	(m)
Y_s	=	35461.	(m)
Z_s	=	127461.	(m)
$\dot{X}_s$	=	1099.54	(m/s)
$\dot{Y}_s$	=	118.50	(m/s)
$\dot{Z}_s$	=	2351.58	(m/s)

VEHICLE ATTITUDE AND ATTITUDE RATE

Pitch Attitude Angle (ϕ_P):	-60.896	(deg)
Yaw Attitude Angle (ϕ_Y):	-0.069	(deg)
Roll Attitude Angle (ϕ_R):	-0.002	(deg)
Pitch Rate ($\dot{\phi}_P$):	-0.011	(deg/s)
Yaw Rate ($\dot{\phi}_Y$):	0.001	(deg/s)
Roll Rate ($\dot{\phi}_R$):	-0.002	(deg/s)

TABLE 4

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE END CONDITIONS OF FLIGHT, FIRST BURN

Flight Time (t): GCS	508.122	(sec)
Radius (R):	6563322.	(m)
Altitude:	190872.	(m)
Space Fixed Velocity (V):	7783.58	(m/s)
Space Fixed Flight Path Angle (θ):	90.007	(deg)
Space Fixed Flight Azimuth (AZI):	83.815	(deg)
Earth Fixed Flight Azimuth (AZE):	83.472	(deg)
Geocentric Declination (δ):	31.068	(deg)
Geodetic Latitude (ϕ):	31.233	(deg)
Longitude (λ): (Pos. East)	-65.489	(deg)
Inclination (i):	31.617	(deg)
Descending Node Argument (Θ):	119.079	(deg)

SPACE FIXED POSITION AND VELOCITY COMPONENTS

Xs	=	6335504.	(m)
Ys	=	123660.	(m)
Zs	=	1709766.	(m)
$\dot{X}s$	=	-2033.62	(m/s)
$\dot{Y}s$	=	415.91	(m/s)
$\dot{Z}s$	=	7501.70	(m/s)

VEHICLE ATTITUDE ANGLES

Pitch Attitude Angle (ϕ_P)	=	-97.136	(deg)
Yaw Attitude Angle (ϕ_Y)	=	2.813	(deg)
Roll Attitude Angle (ϕ_R)	=	-0.803	(deg)

OSCULATING CONIC PARAMETERS

*Perigee Altitude	=	153.31	(km)
*Apogee Altitude	=	185.18	(km)
Eccentricity	=	0.0024	
Semi-Major Axis	=	6547.41	(km)
True Anomaly	=	182.96	(deg)
Period	=	87.87	(min)

* Referenced to Equatorial Radius (6378.16 km)

TABLE 4 (Cont'd)

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE END CONDITIONS OF FLIGHT, FIRST BURN

Flight Time (t): Orbit Insertion	518.122	(sec)
Radius (R):	6563325.	(m)
Altitude:	190898.	(m)
Space Fixed Velocity (V):	7793.03	(m/s)
Space Fixed Flight Path Angle (θ):	89.999	(deg)
Space Fixed Flight Azimuth (AZI):	84.223	(deg)
Earth Fixed Flight Azimuth (AZE):	83.903	(deg)
Geocentric Declination (δ):	31.138	(deg)
Geodetic Latitude (ϕ):	31.304	(deg)
Longitude (λ): (Pos. East)	-64.741	(deg)
Inclination (i):	31.617	(deg)
Descending Node Argument (Θ):	119.080	(deg)

SPACE FIXED POSITION AND VELOCITY COMPONENTS

Xs	=	6314711.	(m)
Ys	=	127814.	(m)
Zs	=	1784747.	(m)
$\dot{X}s$	=	-2124.15	(m/s)
$\dot{Y}s$	=	414.59	(m/s)
$\dot{Z}s$	=	7486.48	(m/s)

VEHICLE ATTITUDE ANGLES

Pitch Attitude Angle (ϕ_P)	=	-97.320	(deg)
Yaw Attitude Angle (ϕ_Y)	=	2.660	(deg)
Roll Attitude Angle (ϕ_R)	=	-.692	(deg)

OSCULATING CONIC PARAMETERS

*Perigee Altitude	=	184.98	(km)
*Apogee Altitude	=	185.26	(km)
Eccentricity	=	0.0000	
Semi-Major Axis	=	6563.28	(km)
True Anomaly	=	108.33	(deg)
Period	=	88.19	(min)

* Referenced to Equatorial Radius (6378.16 km)

TABLE 5

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
FIRST ORBITAL COAST PHASE END CONDITIONS OF FLIGHT

Flight Time (t): Second J-2 Start Command	11393.0	(sec)
Radius (R):	6587268.	(m)
Altitude:	214843.	(m)
Space Fixed Velocity (V):	7780.88	(m/s)
Space Fixed Flight Path Angle (θ):	90.015	(deg)
Space Fixed Flight Azimuth (AZI):	95.743	(deg)
Earth Fixed Flight Azimuth (AZE):	96.062	(deg)
Geocentric Declination (δ):	31.144	(deg)
Geodetic Latitude (ϕ):	31.309	(deg)
Longitude (λ): (Pos. East)	-89.088	(deg)
Inclination (i):	31.617	(deg)
Descending Node Argument (Θ):	118.095	(deg)

SPACE FIXED POSITION AND VELOCITY COMPONENTS

Xs	=	5471231.	(m)
Ys	=	239640.	(m)
Zs	=	3660643.	(m)
$\dot{X}s$	=	-4334.85	(m/s)
$\dot{Y}s$	=	415.78	(m/s)
$\dot{Z}s$	=	6448.12	(m/s)

VEHICLE ATTITUDE ANGLES

Pitch Attitude Angle (ϕ_P)	=	-121.861	(deg)
Yaw Attitude Angle (ϕ_Y)	=	3.133	(deg)
Roll Attitude Angle (ϕ_R)	=	-1.978	(deg)

OSCULATING CONIC PARAMETERS

*Perigee Altitude	=	208.71	(km)
*Apogee Altitude	=	216.28	(km)
Eccentricity	=	0.0006	
Semi-Major Axis	=	6590.66	(km)
True Anomaly	=	333.587	(deg)
Period	=	88.75	(min)

* Referenced to Equatorial Radius (6378.16 km)

TABLE 6

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE END CONDITIONS OF FLIGHT, SECOND BURN

Flight Time (t): Depletion Cutoff	11467.962	(sec)
Radius (R):	6588818.	(m)
Altitude:	216168.	(m)
Space Fixed Velocity (V):	10413.55	(m/s)
Space Fixed Flight Path Angle (θ):	89.189	(deg)
Space Fixed Flight Azimuth (AZI):	97.762	(deg)
Earth Fixed Flight Azimuth (AZE):	98.083	(deg)
Geocentric Declination (δ):	30.460	(deg)
Geodetic Latitude (ϕ):	30.623	(deg)
Longitude (λ): (Pos. East)	-82.770	(deg)
Inclination (i):	31.341	(deg)
Descending Node Argument (Θ):	120.679	(deg)

SPACE FIXED POSITION AND VELOCITY COMPONENTS

X_s	=	5078442.	(m)
Y_s	=	266808.	(m)
Z_s	=	4189364.	(m)
$\dot{X}_s$	=	-6518.51	(m/s)
$\dot{Y}_s$	=	272.23	(m/s)
$\dot{Z}_s$	=	8116.46	(m/s)

VEHICLE ATTITUDE ANGLES

Pitch Attitude Angle (ϕ_P)	=	-127.583	(deg)
Yaw Attitude Angle (ϕ_Y)	=	-1.977	(deg)
Roll Attitude Angle (ϕ_R)	=	-2.431	(deg)

OSCULATING CONIC PARAMETERS

*Perigee Altitude	=	209.16	(km)
*Apogee Altitude	=	50550.12	(km)
Eccentricity	=	0.7926	
Semi-Major Axis	=	31757.80	(km)
True Anomaly	=	1.835	(deg)
Period	=	938.72	(min)

* Referenced to Equatorial Radius (6378.16 km)

TABLE 7

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

S-IB STAGE FLIGHT DATA

FLIGHT TIME (SEC)	----- SPACE FIXED ----- RADIUS (M)	VELOCITY (M/S)	PATH ANGLE (DEG)	--- SPACE FIXED POSITION AND VELOCITY VECTOR COMPONENTS --- X (M)	Y (M)	Z (M)	DX (M/S)	DY (M/S)	DZ (M/S)
1) -5.00	6373351.	408.93	90.000	6373326.	17051.	-5540.	0.00	126.37	388.92
2) 0.00	6373351.	408.93	90.000	6373326.	17683.	-3596.	-0.13	126.30	388.94
5.00	6373385.	409.23	87.841	6373362.	18314.	-1651.	15.16	126.19	388.99
10.00	6373509.	410.23	85.389	6373481.	18945.	294.	32.59	126.08	389.01
15.00	6373722.	413.13	82.677	6373692.	19575.	2240.	52.13	126.08	389.98
20.00	6374039.	420.14	79.758	6374006.	20205.	4199.	74.05	126.03	393.89
25.00	6374473.	431.66	76.746	6374436.	20835.	6185.	98.16	125.95	401.03
30.00	6375032.	448.11	73.763	6374991.	21465.	8215.	124.35	125.82	411.72
35.00	6375729.	469.86	70.905	6375683.	22093.	10308.	152.59	125.66	426.26
40.00	6376573.	497.12	68.261	6376520.	22721.	12484.	182.81	125.53	444.92
45.00	6377574.	530.12	65.900	6377514.	23349.	14765.	214.92	125.40	468.09
50.00	6378741.	568.52	63.835	6378673.	23975.	17172.	248.89	125.28	495.55
55.00	6380082.	611.51	62.136	6380004.	24602.	19727.	283.69	125.16	527.06
60.00	6381596.	657.24	60.906	6381506.	25227.	22448.	317.12	125.07	561.93
65.00	6383281.	708.73	59.948	6383178.	25852.	25356.	352.02	125.00	602.28
70.00	6385150.	767.34	59.185	6385031.	26477.	28482.	389.68	124.90	649.13
3) 71.00	6385547.	780.00	59.054	6385425.	26602.	29136.	397.58	124.87	659.34
75.00	6387217.	833.73	58.587	6387080.	27101.	31859.	430.52	124.76	702.99
80.00	6389501.	908.30	58.153	6389342.	27725.	35524.	474.49	124.64	764.42
85.00	6392013.	992.14	57.997	6391828.	28348.	39520.	520.09	124.50	835.67
90.00	6394758.	1085.87	58.175	6394542.	28970.	43901.	565.76	124.33	918.47
95.00	6397743.	1188.36	58.479	6397489.	29591.	48719.	613.04	124.10	1010.44
100.00	6400975.	1299.64	58.866	6400675.	30211.	54020.	662.02	123.77	1111.51
105.00	6404466.	1419.84	59.299	6404112.	30828.	59849.	712.94	123.40	1221.66
110.00	6408228.	1549.59	59.764	6407808.	31444.	66253.	765.90	122.99	1341.45
115.00	6412273.	1689.58	60.255	6411774.	32058.	73281.	820.89	122.55	1471.66
120.00	6416614.	1840.73	60.778	6416020.	32670.	80989.	877.72	122.08	1613.38
125.00	6421263.	2004.02	61.348	6420554.	33279.	89436.	935.76	121.36	1767.97
130.00	6426226.	2180.82	61.985	6425378.	33883.	98693.	994.07	120.52	1937.34
4) 132.25	6428562.	2265.22	62.303	6427644.	34154.	103143.	1019.98	120.13	2019.01
5) 138.84	6435787.	2530.99	63.191	6434619.	34942.	117279.	1099.60	118.90	2276.54
6) 141.84	6439232.	2596.95	63.598	6437937.	35298.	124221.	1109.11	118.57	2345.20
7) 143.14	6440729.	2598.88	63.807	6439374.	35452.	127276.	1100.25	118.50	2351.51
8) 143.22	6440820.	2598.64	63.820	6439461.	35461.	127461.	1099.54	118.50	2351.58

1) GRR;
2) First Motion;
3) Maximum Dynamic Pressure;
4) Tilt Arrest;
5) IECO;
6) OECO;
7) Separation Signal;
8) Physical Separation.

TABLE 7 (Cont'd)

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

S-IB STAGE FLIGHT DATA

FLIGHT TIME (SEC)	EARTH FIXED POSITION (M)	EARTH FIXED VELOCITY (M/S)	EARTH FIXED PATH ANGLE (DEG)	EARTH FIXED POSITION AND VELOCITY VECTOR COMPONENTS X (M)	Y (M)	Z (M)	DX (M/S)	DY (M/S)	DZ (M/S)
1) -5.00	33.	0.00	N/A	33.	-0.	0.	-0.00	0.00	-0.00
2) 0.00	33.	0.00	N/A	33.	-0.	-0.	-0.00	0.00	0.00
5.00	71.	15.42	0.334	71.	-0.	0.	15.42	-0.04	0.02
10.00	191.	32.98	0.328	191.	-0.	0.	32.98	-0.10	-0.01
15.00	404.	52.66	1.011	404.	-1.	1.	52.66	-0.05	0.86
20.00	722.	74.86	3.659	721.	-1.	14.	74.71	-0.04	4.11
25.00	1156.	99.67	6.815	1155.	-1.	53.	98.98	-0.08	11.74
30.00	1720.	127.29	10.132	1715.	-2.	137.	125.32	-0.16	22.28
35.00	2428.	158.05	13.456	2411.	-3.	282.	153.74	-0.27	36.65
40.00	3295.	192.24	16.705	3255.	-5.	510.	184.17	-0.35	55.11
45.00	4339.	230.16	19.864	4256.	-7.	841.	216.52	-0.42	78.04
50.00	5577.	271.95	22.805	5424.	-9.	1297.	250.77	-0.48	105.23
55.00	7027.	316.77	25.546	6766.	-11.	1900.	285.88	-0.51	136.43
60.00	8698.	362.51	28.166	8279.	-14.	2667.	319.66	-0.50	170.97
65.00	10602.	412.93	30.739	9965.	-16.	3619.	354.98	-0.46	210.95
70.00	12766.	469.88	33.221	11834.	-18.	4787.	393.12	-0.42	257.38
3) 71.00	13232.	482.14	33.703	12231.	-19.	5049.	401.13	-0.42	267.50
75.00	15223.	534.21	35.568	13902.	-21.	6205.	434.51	-0.39	310.77
80.00	18013.	606.39	37.781	16185.	-22.	7907.	479.13	-0.32	371.68
85.00	21173.	686.89	40.052	18696.	-24.	9938.	525.49	-0.20	442.36
90.00	24742.	776.13	42.458	21439.	-24.	12351.	572.05	-0.07	524.54
95.00	28763.	874.13	44.704	24420.	-24.	15198.	620.36	0.07	615.84
100.00	33278.	981.08	46.771	27646.	-24.	18524.	670.51	0.18	716.20
105.00	38335.	1097.23	48.648	31128.	-22.	22375.	722.75	0.30	825.56
110.00	43982.	1223.17	50.361	34877.	-21.	26796.	777.19	0.47	944.51
115.00	50270.	1359.56	51.934	38904.	-18.	31837.	833.87	0.70	1073.82
120.00	57255.	1507.26	53.402	43219.	-13.	37553.	892.57	0.98	1214.55
125.00	64994.	1667.16	54.804	47832.	-8.	44004.	952.73	1.14	1368.11
130.00	73551.	1840.52	56.183	52747.	-2.	51258.	1013.42	1.31	1536.38
4) 132.25	77686.	1923.31	56.810	55058.	1.	54806.	1040.50	1.42	1617.55
5) 138.84	90890.	2184.75	58.500	62180.	12.	66292.	1123.90	1.83	1873.50
6) 141.84	97402.	2248.94	59.104	65573.	18.	72024.	1134.79	2.12	1941.64
7) 143.14	100266.	2250.05	59.348	67044.	20.	74554.	1126.33	2.25	1947.84
8) 143.22	100440.	2249.76	59.362	67133.	21.	74708.	1125.64	2.26	1947.91

1) GRR;
2) First Motion;
3) Maximum Dynamic Pressure;
4) Tilt Arrest;
5) IECO;
6) OECO;
7) Separation Signal;
8) Physical Separation.

TABLE 7 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IB STAGE FLIGHT DATA

	FLIGHT TIME (SEC)	MASS (KG)	THRUST (TOTAL) (N)	DRAG (N)	LONGITUDINAL ACCELERATION (M/SEC2)	DYNAMIC PRESSURE (N/M2)	A.H.I. (KG-M/M2-RAD)	MACH NO.	PITCH ANGLE OF ATTACK (DEG)
1)	-5.00	574968.	0.	0.	0.000	0.	0.	0.00	0.000
2)	0.00	568578.	7064476.	5884.	12.522	0.	0.	0.00	0.000
	5.00	554557.	7224174.	14772.	13.110	140.	175.	0.04	0.559
	10.00	540456.	7271129.	32142.	13.506	633.	3239.	0.10	0.936
	15.00	526290.	7344550.	54367.	13.966	1583.	18739.	0.15	-1.133
	20.00	512040.	7410074.	59258.	14.473	3101.	67480.	0.22	-1.220
	25.00	497752.	7467544.	84332.	14.952	5260.	186530.	0.29	-0.948
	30.00	483441.	7530470.	111701.	15.466	8082.	432972.	0.37	-0.680
	35.00	469114.	7593411.	141216.	16.007	11549.	887491.	0.46	-0.398
	40.00	454783.	7661541.	175552.	16.584	15562.	1655267.	0.57	-0.198
	45.00	440448.	7735006.	215930.	17.196	19949.	2862637.	0.68	-0.099
	50.00	426110.	7809106.	291528.	17.769	24444.	4648700.	0.81	0.147
	55.00	411780.	7871277.	551252.	17.906	28540.	7138910.	0.96	0.204
	60.00	397409.	7935556.	761684.	18.184	31490.	10371656.	1.12	0.165
	65.00	382996.	8001897.	730006.	19.122	33513.	14338376.	1.30	-0.075
	70.00	368583.	8063246.	622347.	20.326	34455.	19032516.	1.51	-0.187
3)	71.00	365700.	8074436.	602297.	20.571	34490.	20054603.	1.56	-0.168
	75.00	354169.	8116962.	512581.	21.613	34063.	24406929.	1.78	0.156
	80.00	339765.	8162639.	404327.	22.982	31686.	30330020.	2.07	0.396
	85.00	325433.	8201020.	300060.	24.431	27045.	36399554.	2.36	0.275
	90.00	311109.	8223704.	214290.	25.904	21799.	42148700.	2.64	0.131
	95.00	296788.	8233978.	150229.	27.404	16849.	47278566.	2.93	0.007
	100.00	282477.	8234825.	107046.	28.948	12666.	51665183.	3.25	0.090
	105.00	268181.	8230292.	73529.	30.599	9156.	55294548.	3.57	0.117
	110.00	253904.	8222346.	46425.	32.395	6389.	58168686.	3.90	0.003
	115.00	239649.	8207799.	24319.	34.354	4348.	60370917.	4.24	-0.187
	120.00	225424.	8187050.	10967.	36.489	2907.	62011063.	4.60	-0.559
	125.00	211239.	8162347.	5356.	38.850	1918.	63215714.	5.01	-1.327
	130.00	197099.	8131279.	-725.	41.511	1284.	64100792.	5.58	-2.421
4)	132.25	190753.	8114355.	-2465.	42.813	1059.	64401058.	5.89	-3.084
5)	138.84	172263.	8043616.	-4208.	47.006	565.	65098731.	6.98	-1.730
6)	141.84	167154.	3544226.	-2934.	21.221	383.	65299737.	7.36	-0.957
7)	143.14	166408.	215436.	-2411.	1.309	314.	65365105.	7.44	-0.679
8)	143.22	166390.	199129.	-2381.	1.211	310.	65368668.	7.44	-0.662

1) GRR;
2) First Motion;
3) Maximum Dynamic Pressure;
4) Tilt Arrest;
5) IECO;
6) OECO;
7) Separation Signal;
8) Physical Separation.

TABLE 7 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IB STAGE FLIGHT DATA

	FLIGHT TIME (SEC)	ALTITUDE (KM)	RANGE (KM)	VELOCITY VECTOR AZIMUTH SPACE FIXED (DEG)	EARTH FIXED (DEG)	LONGITUDE (POS. EAST) (DEG)	GEOCENTRIC DECLINATION (DEG)	GEODETIC LATITUDE (DEG)
1)	-5.00	0.033	0.000	90.000	N/A	-80.565	28.371	28.532
2)	0.00	0.033	0.000	90.000	N/A	-80.565	28.371	28.532
	5.00	0.070	0.000	89.987	N/A	-80.565	28.371	28.532
	10.00	0.190	0.001	89.974	N/A	-80.565	28.371	28.532
	15.00	0.404	0.002	89.936	60.410	-80.565	28.371	28.532
	20.00	0.721	0.015	89.764	69.077	-80.565	28.371	28.532
	25.00	1.154	0.054	89.457	70.339	-80.564	28.371	28.532
	30.00	1.714	0.138	89.016	70.729	-80.564	28.371	28.532
	35.00	2.411	0.285	88.450	70.945	-80.562	28.372	28.533
	40.00	3.255	0.513	87.781	71.124	-80.560	28.372	28.533
	45.00	4.256	0.844	87.025	71.270	-80.557	28.373	28.534
	50.00	5.424	1.301	86.219	71.383	-80.552	28.374	28.536
	55.00	6.766	1.904	85.395	71.473	-80.547	28.376	28.537
	60.00	8.280	2.671	84.592	71.559	-80.539	28.378	28.539
	65.00	9.966	3.622	83.777	71.635	-80.530	28.381	28.542
	70.00	11.835	4.789	82.953	71.695	-80.519	28.384	28.545
3)	71.00	12.233	5.051	82.788	71.704	-80.516	28.385	28.546
	75.00	13.904	6.203	82.136	71.742	-80.505	28.388	28.549
	80.00	16.189	7.901	81.346	71.791	-80.488	28.393	28.554
	85.00	18.703	9.925	80.575	71.838	-80.469	28.399	28.560
	90.00	21.451	12.328	79.829	71.883	-80.445	28.406	28.566
	95.00	24.438	15.161	79.144	71.923	-80.418	28.413	28.574
	100.00	27.672	18.468	78.520	71.957	-80.386	28.423	28.583
	105.00	31.167	22.293	77.960	71.990	-80.349	28.433	28.594
	110.00	34.933	26.680	77.461	72.026	-80.306	28.446	28.606
	115.00	38.983	31.677	77.016	72.065	-80.257	28.459	28.620
	120.00	43.329	37.337	76.619	72.107	-80.202	28.475	28.635
	125.00	47.983	43.717	76.259	72.144	-80.140	28.493	28.653
	130.00	52.952	50.882	75.936	72.184	-80.070	28.512	28.673
4)	132.25	55.291	54.383	75.803	72.204	-80.036	28.522	28.682
5)	138.84	62.521	65.703	75.455	72.269	-79.926	28.553	28.713
6)	141.84	65.975	71.344	75.394	72.305	-79.871	28.568	28.729
7)	143.14	67.475	73.833	75.400	72.321	-79.847	28.575	28.735
8)	143.22	67.566	73.984	75.401	72.322	-79.845	28.576	28.736

1) GRR;
2) First Motion:
3) Maximum Dynamic Pressure;
4) Tilt Arrest;
5) IECO;
6) OECO;
7) Separation Signal;
8) Physical Separation.

TABLE 7 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IB STAGE FLIGHT DATA

	FLIGHT TIME (SEC)	VEHICLE ATTITUDE ANGLE PITCH (DEG)	YAW (DEG)	ROLL (DEG)	VEHICLE ATTITUDE RATE PITCH (DEG/S)	YAW (DEG/S)	ROLL (DEG/S)	VEHICLE ATTITUDE ERROR PITCH (DEG)	YAW (DEG)	ROLL (DEG)
1)	-5.00	0.000	0.000	18.000	-0.003	0.001	-0.002	0.000	0.000	0.000
2)	0.00	-0.017	0.006	17.990	-0.003	0.001	-0.002	-0.017	0.006	-0.010
	5.00	-0.023	-0.020	18.004	-0.004	-0.004	-0.003	-0.023	-0.020	0.004
	10.00	-0.019	-0.023	18.000	-0.001	-0.000	0.000	-0.019	-0.023	0.000
	15.00	-2.008	0.031	14.380	-0.365	-0.039	-1.078	0.270	0.031	1.180
	20.00	-4.260	0.034	9.385	-0.469	-0.006	-1.002	0.320	0.034	1.185
	25.00	-6.685	0.006	4.383	-0.498	-0.006	-1.000	0.335	0.006	1.183
	30.00	-9.229	-0.026	-0.003	-0.518	-0.005	-0.166	0.349	-0.026	-0.003
	35.00	-11.856	-0.026	-0.003	-0.531	0.001	-0.000	0.374	-0.026	-0.003
	40.00	-14.545	-0.024	-0.002	-0.545	0.000	0.000	0.409	-0.024	-0.002
	45.00	-17.262	-0.023	-0.003	-0.474	0.000	-0.000	0.343	-0.023	-0.003
	50.00	-19.657	-0.023	0.001	-0.485	0.000	0.000	0.370	-0.023	0.001
	55.00	-22.066	-0.021	0.003	-0.475	0.003	0.000	0.326	-0.021	0.003
	60.00	-24.489	-0.011	0.003	-0.495	0.000	-0.000	0.289	-0.011	0.003
	65.00	-27.065	-0.008	-0.003	-0.506	-0.000	-0.000	0.197	-0.008	-0.003
	70.00	-29.619	-0.016	-0.008	-0.529	-0.002	0.000	0.301	-0.016	-0.008
3)	71.00	-30.159	-0.017	-0.008	-0.542	0.000	-0.000	0.322	-0.017	-0.008
	75.00	-32.416	-0.012	0.002	-0.591	0.002	0.005	0.417	-0.012	0.002
	80.00	-35.723	-0.009	0.015	-0.721	-0.000	-0.001	0.351	-0.009	0.015
	85.00	-39.454	-0.011	0.012	-0.796	-0.001	-0.003	0.267	-0.011	0.012
	90.00	-42.605	-0.018	0.001	-0.501	-0.002	0.014	0.226	-0.018	0.001
	95.00	-45.062	-0.023	-0.000	-0.445	-0.001	-0.000	0.172	-0.023	-0.000
	100.00	-47.066	-0.048	0.001	-0.382	-0.000	-0.001	0.235	-0.048	0.001
	105.00	-48.921	-0.051	0.003	-0.365	-0.001	-0.000	0.229	-0.051	0.003
	110.00	-50.695	-0.053	0.000	-0.354	-0.001	-0.001	0.213	-0.053	0.000
	115.00	-52.481	-0.056	-0.001	-0.368	-0.000	-0.001	0.215	-0.056	-0.001
	120.00	-54.397	-0.058	-0.003	-0.404	-0.000	-0.000	0.242	-0.058	-0.003
	125.00	-56.572	-0.138	-0.004	-0.463	0.003	-0.001	0.286	-0.138	-0.004
	130.00	-59.107	-0.142	-0.005	-0.554	-0.000	-0.000	0.370	-0.142	-0.005
4)	132.25	-60.406	-0.142	-0.006	-0.602	-0.000	-0.000	0.412	-0.142	-0.006
5)	138.84	-60.961	-0.146	-0.003	0.002	-0.000	0.001	-0.143	-0.146	-0.003
6)	141.84	-60.891	-0.071	-0.001	0.003	0.002	0.000	-0.073	-0.071	-0.001
7)	143.14	-60.895	-0.069	-0.002	-0.010	0.001	-0.002	-0.078	-0.069	-0.002
8)	143.22	-60.896	-0.069	-0.002	-0.011	0.001	-0.002	-0.078	-0.069	-0.002

1) GRR;
2) First Motion;
3) Maximum Dynamic Pressure;
4) Tilt Arrest;
5) IECO;
6) OECO;
7) Separation Signal;
8) Physical Separation.

TABLE 8-1

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

S-IVB STAGE FIRST BURN, FIRST ORBIT COAST AND S-IVB STAGE SECOND BURN DATA

	FLIGHT TIME (SEC)	----- SPACE FIXED ----- RADIUS (M)	VELOCITY (M/S)	PATH ANGLE (DEG)	--- SPACE FIXED POSITION AND VELOCITY VECTOR COMPONENTS --- X (M)	Y (M)	Z (M)	DX (M/S)	DY (M/S)	DZ (M/S)
1)	143.22	6440820.	2598.64	63.820	6439461.	35461.	127461.	1099.54	118.50	2351.58
2)	144.54	6442327.	2593.47	64.044	6440905.	35618.	130568.	1087.04	118.44	2351.68
3)	146.89	6444971.	2585.57	64.442	6443434.	35896.	136095.	1065.38	118.34	2352.90
	147.94	6446139.	2587.39	64.613	6444548.	36020.	138568.	1058.18	118.22	2358.15
4)	147.94	6446139.	2587.39	64.613	6444548.	36020.	138568.	1058.18	118.22	2358.15
5)	150.54	6449005.	2596.11	65.028	6447279.	36327.	144721.	1042.36	117.80	2374.74
6)	155.14	6453996.	2614.97	65.741	6452012.	36867.	155716.	1015.97	116.97	2406.70
7)	159.25	6458377.	2634.54	66.361	6456143.	37346.	165675.	993.54	116.19	2437.25
	160.00	6459168.	2638.18	66.472	6456887.	37433.	167505.	989.47	116.04	2442.84
	180.00	6479232.	2745.62	69.809	6475443.	39819.	217942.	859.76	124.36	2604.57
	200.00	6497046.	2872.29	73.113	6491222.	42415.	271753.	717.93	135.44	2777.82
	220.00	6512648.	3017.89	76.067	6504170.	45262.	329102.	576.89	149.62	2958.46
	240.00	6526140.	3182.02	78.706	6514288.	48406.	390150.	434.56	164.85	3147.90
	260.00	6537602.	3364.74	81.047	6521537.	51858.	455085.	289.88	180.39	3347.37
	280.00	6547114.	3565.93	83.100	6525865.	55624.	524116.	142.41	196.24	3557.68
	300.00	6554761.	3786.40	84.901	6527202.	59700.	597475.	-10.01	210.91	3780.51
	320.00	6560633.	4026.58	86.415	6525458.	64080.	675424.	-164.83	227.41	4016.77
	340.00	6564878.	4287.62	87.676	6520579.	68801.	758248.	-323.86	244.76	4268.36
	360.00	6567638.	4571.33	88.704	6512468.	73874.	846275.	-488.34	262.58	4537.58
	380.00	6569071.	4880.02	89.513	6501002.	79308.	939886.	-659.41	280.92	4827.10
	400.00	6569366.	5216.30	90.112	6486041.	85115.	1039513.	-838.01	299.86	5139.81
	420.00	6568746.	5584.10	90.508	6467423.	91307.	1145659.	-1025.54	319.47	5479.81
	440.00	6567482.	5989.63	90.710	6444947.	97900.	1258927.	-1224.20	340.03	5853.32
	460.00	6565895.	6440.56	90.722	6418364.	104915.	1380064.	-1436.59	361.75	6267.86
	480.00	6564388.	6946.86	90.540	6387372.	112378.	1509979.	-1665.81	384.76	6733.19
	500.00	6563446.	7524.24	90.207	6351570.	120313.	1649819.	-1922.37	408.28	7263.06
8)	508.12	6563322.	7783.58	90.007	6335504.	123660.	1709766.	-2033.62	415.91	7501.70
9)	518.12	6563325.	7793.03	89.999	6314711.	127814.	1784747.	-2124.15	414.59	7486.48
	530.00	6563329.	7793.44	89.999	6288855.	132726.	1873491.	-2229.77	412.56	7456.24
10)	530.00	6563329.	7793.44	89.999	6288855.	132726.	1873491.	-2229.77	412.56	7456.24
	600.00	6563339.	7793.69	89.999	6111232.	161145.	2388366.	-2842.24	398.95	7245.97
	700.00	6563347.	7794.05	90.000	5784629.	199875.	3094453.	-3682.17	374.74	6859.19
	800.00	6563353.	7794.47	89.999	5376526.	235918.	3756982.	-4470.30	345.26	6375.81
	900.00	6563365.	7794.92	89.999	4892664.	268764.	4366620.	-5195.57	310.88	5802.60
	1000.00	6563388.	7795.38	89.998	4339849.	297947.	4914774.	-5847.76	272.08	5147.59

1) Separation Completed;
2) J-2 Start Command, First Burn;
3) Terminate Ullage Burn;
4) 90% Thrust Level, First Burn;
5) Command P. U. Activation, First Burn;
6) Ullage Case Jettison;
7) IGM Initiation;
8) Guidance Cutoff Signal;
9) Orbit Insertion;
10) Initiate Local Horizontal Attitude Hold.

TABLE 8 - 1 (Cont'd)

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

S-IVB STAGE FIRST BURN, FIRST ORBIT COAST AND S-IVB STAGE SECOND BURN DATA

FLIGHT TIME (SEC)	----- SPACE FIXED ----- RADIUS (M)	VELOCITY (M/S)	PATH ANGLE (DEG)	--- SPACE FIXED POSITION AND VELOCITY VECTOR COMPONENTS --- X (M)	Y (M)	Z (M)	DX (M/S)	DY (M/S)	DZ (M/S)
1100.00	6563424.	7795.85	89.997	3725856.	323050.	5393716.	-6417.68	229.38	4419.96
1200.00	6563473.	7796.34	89.996	3059325.	343712.	5796687.	-6897.29	183.37	3629.95
1300.00	6563536.	7796.83	89.995	2349636.	359634.	6117996.	-7279.82	134.67	2788.65
1400.00	6563610.	7797.31	89.994	1606781.	370579.	6353102.	-7559.82	83.96	1907.90
1500.00	6563694.	7797.76	89.993	841225.	376383.	6498674.	-7733.29	31.95	1000.09
1600.00	6563787.	7798.16	89.993	63759.	376949.	6552645.	-7797.74	-20.66	78.03
1700.00	6563889.	7798.50	89.992	-714655.	372256.	6514240.	-7752.22	-73.11	-845.24
1800.00	6563998.	7798.76	89.992	-1483036.	362357.	6383993.	-7597.32	-124.68	-1756.67
1900.00	6564114.	7798.92	89.991	-2230542.	347375.	6163734.	-7335.21	-174.64	-2643.35
2000.00	6564241.	7798.98	89.990	-2946626.	327507.	5856568.	-6969.61	-222.28	-3492.74
2100.00	6564378.	7798.93	89.989	-3621184.	303018.	5466833.	-6505.69	-266.94	-4292.79
2200.00	6564530.	7798.78	89.988	-4244704.	274240.	5000033.	-5950.04	-307.97	-5032.21
2300.00	6564701.	7798.52	89.987	-4808396.	241564.	4462765.	-5310.56	-344.81	-5700.53
2400.00	6564894.	7798.17	89.985	-5304322.	205437.	3862616.	-4596.33	-376.91	-6288.34
2500.00	6565116.	7797.73	89.983	-5725506.	166356.	3208061.	-3817.49	-403.82	-6787.37
2600.00	6565371.	7797.22	89.980	-6066032.	124858.	2508338.	-2985.08	-425.16	-7190.64
2700.00	6565664.	7796.66	89.977	-6321127.	81519.	1773317.	-2110.88	-440.62	-7492.52
2800.00	6566000.	7796.05	89.974	-6487226.	36938.	1013357.	-1207.26	-449.97	-7688.85
2900.00	6566382.	7795.42	89.970	-6562020.	-8267.	239160.	-286.94	-453.08	-7776.95
3000.00	6566814.	7794.79	89.966	-6544488.	-53467.	-538381.	637.11	-449.87	-7755.67
3100.00	6567295.	7794.16	89.963	-6434906.	-98032.	-1308334.	1551.91	-440.40	-7625.39
3200.00	6567827.	7793.56	89.959	-6234842.	-141342.	-2059883.	2444.63	-424.78	-7388.02
3300.00	6568405.	7792.98	89.956	-5947132.	-182790.	-2782475.	3302.78	-403.22	-7046.96
3400.00	6569028.	7792.44	89.953	-5575839.	-221797.	-3465972.	4114.33	-376.00	-6607.04
3500.00	6569689.	7791.94	89.950	-5126196.	-257814.	-4100788.	4867.96	-343.49	-6074.49
3600.00	6570380.	7791.49	89.948	-4604530.	-290333.	-4678025.	5553.11	-306.13	-5456.79
3700.00	6571095.	7791.08	89.947	-4018175.	-318895.	-5189592.	6160.22	-264.43	-4762.63
3800.00	6571821.	7790.70	89.946	-3375371.	-343093.	-5628321.	6680.80	-218.96	-4001.75
3900.00	6572550.	7790.35	89.947	-2685143.	-362581.	-5988068.	7107.57	-170.33	-3184.81
4000.00	6573266.	7790.03	89.948	-1957184.	-377076.	-6263790.	7434.56	-119.22	-2323.29
4100.00	6573961.	7789.72	89.950	-1201712.	-386366.	-6451633.	7657.18	-66.34	-1429.27
4200.00	6574623.	7789.41	89.952	-429332.	-390309.	-6548970.	7772.34	-12.41	-515.29
4300.00	6575242.	7789.10	89.956	349117.	-388837.	-6554444.	7778.41	41.82	405.81
4400.00	6575810.	7788.79	89.960	1122710.	-381959.	-6467991.	7675.34	95.60	1321.10
4500.00	6576319.	7788.47	89.965	1880593.	-369756.	-6290836.	7464.58	148.17	2217.73

TABLE 8- 1 (Cont'd)

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

S-IVB STAGE FIRST BURN, FIRST ORBIT COAST AND S-IVB STAGE SECOND BURN DATA

FLIGHT TIME (SEC)	----- SPACE FIXED ----- RADIUS (M)	VELOCITY (M/S)	PATH ANGLE (DEG)	--- SPACE FIXED POSITION AND VELOCITY VECTOR COMPONENTS --- X (M)	Y (M)	Z (M)	DX (M/S)	DY (M/S)	DZ (M/S)
4600.00	6576763.	7788.14	89.969	2612134.	-352388.	-6025479.	7149.13	198.81	3083.10
4700.00	6577139.	7787.79	89.975	3307075.	-330083.	-5675555.	6733.44	246.79	3905.07
4800.00	6577444.	7787.44	89.980	3955674.	-303140.	-5246286.	6223.38	291.46	4672.13
4900.00	6577679.	7787.09	89.985	4548843.	-271923.	-4743411.	5626.16	332.17	5373.52
5000.00	6577845.	7786.74	89.990	5078278.	-236856.	-4174091.	4950.19	368.36	5999.44
5100.00	6577947.	7786.41	89.994	5536571.	-198418.	-3546322.	4204.99	399.51	6541.15
5200.00	6577990.	7786.12	89.999	5917315.	-157135.	-2868911.	3401.04	425.19	6991.13
5300.00	6577982.	7785.87	90.002	6215192.	-113574.	-2151357.	2549.60	445.02	7343.11
5400.00	6577929.	7785.68	90.005	6426047.	-68334.	-1403710.	1662.62	458.73	7592.24
5500.00	6577840.	7785.55	90.007	6546941.	-22040.	-636444.	752.49	466.10	7735.07
5600.00	6577725.	7785.51	90.009	6576195.	24670.	139705.	-168.06	467.02	7769.67
5700.00	6577591.	7785.55	90.010	6513407.	71149.	913877.	-1086.20	461.47	7695.58
5800.00	6577446.	7785.67	90.011	6359460.	116751.	1675241.	-1989.12	449.51	7513.86
5900.00	6577299.	7785.89	90.011	6116509.	160842.	2413154.	-2864.23	431.29	7227.05
6000.00	6577154.	7786.20	90.011	5787945.	202808.	3117292.	-3699.35	407.04	6839.16
6100.00	6577017.	7786.59	90.010	5378359.	242061.	3777805.	-4482.81	377.09	6355.57
6200.00	6576892.	7787.06	90.009	4893469.	278049.	4385448.	-5203.68	341.83	5783.00
6300.00	6576782.	7787.58	90.008	4340045.	310267.	4931715.	-5851.87	301.74	5129.42
6400.00	6576689.	7788.14	90.006	3725820.	338256.	5408945.	-6418.29	257.36	4403.92
6500.00	6576613.	7788.73	90.005	3059377.	361617.	5810446.	-6894.98	209.29	3616.59
6600.00	6576554.	7789.33	90.004	2350037.	380014.	6130578.	-7275.22	158.19	2778.43
6700.00	6576513.	7789.90	90.003	1607726.	393178.	6364837.	-7553.62	104.76	1901.15
6800.00	6576488.	7790.44	90.002	842839.	400913.	6509923.	-7726.21	49.73	997.03
6900.00	6576480.	7790.92	90.001	66092.	403097.	6563782.	-7790.52	-6.14	78.75
7000.00	6576485.	7791.32	89.999	-711623.	399684.	6525642.	-7745.57	-62.06	-840.78
7100.00	6576507.	7791.63	89.998	-1479400.	390710.	6396027.	-7591.98	-117.26	-1748.63
7200.00	6576541.	7791.84	89.997	-2226467.	376284.	6176742.	-7331.85	-170.96	-2632.02
7300.00	6576591.	7791.94	89.996	-2942341.	356593.	5870862.	-6968.86	-222.42	-3478.50
7400.00	6576660.	7791.93	89.994	-3616979.	331900.	5482679.	-6508.09	-270.90	-4276.15
7500.00	6576752.	7791.80	89.993	-4240918.	302536.	5017645.	-5956.07	-315.73	-5013.75
7600.00	6576869.	7791.56	89.991	-4805411.	268899.	4482291.	-5320.59	-356.26	-5680.92
7700.00	6577014.	7791.22	89.988	-5302552.	231447.	3884132.	-4610.62	-391.93	-6268.31
7800.00	6577192.	7790.79	89.986	-5725386.	190692.	3231571.	-3836.18	-422.23	-6767.70
7900.00	6577410.	7790.28	89.983	-6068004.	147194.	2533768.	-3008.21	-446.73	-7172.14
8000.00	6577670.	7789.72	89.979	-6325631.	101551.	1800506.	-2138.34	-465.08	-7476.02

TABLE 8- 1 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE FIRST BURN, FIRST ORBIT COAST AND S-IVB STAGE SECOND BURN DATA

FLIGHT TIME (SEC)	----- SPACE FIXED ----- RADIUS (M)	VELOCITY (M/S)	PATH ANGLE (DEG)	--- SPACE FIXED POSITION AND VELOCITY VECTOR COMPONENTS --- X (M)	Y (M)	Z (M)	DX (M/S)	DY (M/S)	DZ (M/S)
8100.00	6577977.	7789.11	89.976	-6494684.	54393.	1042065.	-1238.81	-477.00	-7675.15
8200.00	6578334.	7788.47	89.972	-6572826.	6371.	269068.	-322.24	-482.34	-7766.84
8300.00	6578743.	7787.82	89.968	-6558992.	-41851.	-507669.	598.55	-480.99	-7749.87
8400.00	6579203.	7787.18	89.964	-6453405.	-89604.	-1277284.	1510.69	-472.97	-7624.58
8500.00	6579716.	7786.56	89.960	-6257568.	-136225.	-2029024.	2401.45	-458.38	-7392.79
8600.00	6580276.	7785.97	89.957	-5974244.	-181066.	-2752391.	3258.42	-437.41	-7057.81
8700.00	6580878.	7785.41	89.954	-5607410.	-223503.	-3437289.	4069.68	-410.33	-6624.35
8800.00	6581518.	7784.90	89.951	-5162209.	-262941.	-4074167.	4823.94	-377.52	-6098.50
8900.00	6582184.	7784.43	89.950	-4644873.	-298828.	-4654138.	5510.72	-339.40	-5487.63
9000.00	6582870.	7784.01	89.949	-4062635.	-330661.	-5169123.	6120.48	-296.51	-4800.28
9100.00	6583564.	7783.62	89.948	-3423632.	-357989.	-5611942.	6644.72	-249.41	-4048.02
9200.00	6584255.	7783.28	89.949	-2736789.	-380423.	-5976427.	7076.16	-198.75	-3235.40
9300.00	6584933.	7782.95	89.950	-2011697.	-397643.	-6257499.	7408.80	-145.23	-2379.71
9400.00	6585586.	7782.65	89.952	-1258482.	-409398.	-6451245.	7637.99	-89.58	-1490.89
9500.00	6586204.	7782.36	89.956	-487658.	-415512.	-6554969.	7760.55	-32.56	-581.35
9600.00	6586772.	7782.08	89.959	290013.	-415889.	-6567229.	7774.77	25.04	336.21
9700.00	6587286.	7781.80	89.964	1063675.	-410510.	-6487866.	7680.47	82.42	1248.98
9800.00	6587736.	7781.51	89.969	1822530.	-399438.	-6317998.	7478.97	138.78	2144.21
9900.00	6588117.	7781.23	89.974	2555987.	-382812.	-6060006.	7173.12	193.35	3009.40
10000.00	6588425.	7780.93	89.979	3253813.	-360851.	-5717502.	6767.20	245.36	3832.46
10100.00	6588659.	7780.64	89.985	3906275.	-333848.	-5295280.	6266.92	294.09	4601.92
10200.00	6588821.	7780.36	89.990	4504278.	-302166.	-4799244.	5679.29	338.84	5307.05
10300.00	6588913.	7780.08	89.995	5039489.	-266232.	-4236323.	5012.55	379.01	5938.05
10400.00	6588936.	7779.83	90.000	5504455.	-226535.	-3614379.	4276.03	414.01	6486.13
10500.00	6588900.	7779.61	90.004	5892705.	-183616.	-2942092.	3480.03	443.37	6943.71
10600.00	6588813.	7779.43	90.008	6198842.	-138062.	-2228844.	2635.65	466.65	7304.46
10700.00	6588681.	7779.31	90.011	6418611.	-90497.	-1484576.	1754.68	483.54	7563.40
10800.00	6588515.	7779.26	90.013	6548961.	-41575.	-719657.	849.36	493.78	7716.97
10900.00	6588322.	7779.28	90.015	6588085.	8032.	55256.	-67.71	497.21	7763.08
10943.00	6588233.	7779.31	90.015	6576681.	29404.	388860.	-462.50	496.58	7749.66
11) 10943.00	6588233.	7779.31	90.015	6576681.	29404.	388860.	-462.50	496.58	7749.66
11000.00	6588113.	7779.38	90.016	6535446.	57640.	829373.	-983.81	493.79	7701.11
11100.00	6587895.	7779.57	90.016	6391778.	106562.	1591911.	-1886.21	483.53	7531.94
11200.00	6587675.	7779.85	90.016	6159078.	154123.	2332266.	-2762.40	466.57	7257.93
11300.00	6587458.	7780.22	90.016	5840579.	199660.	3040128.	-3600.21	443.12	6882.87

11) Guaymas Acquisition, Start Time Base 5.

TABLE 8 - 1 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE FIRST BURN, FIRST ORBIT COAST AND S-IVB STAGE SECOND BURN DATA

	FLIGHT TIME (SEC)	----- SPACE FIXED ----- RADIUS (M)	VELOCITY (M/S)	PATH ANGLE (DEG)	--- SPACE FIXED POSITION AND VELOCITY VECTOR COMPONENTS --- X (M)	Y (M)	Z (M)	DX (M/S)	DY (M/S)	DZ (M/S)
12)	11333.00	6587389.	7780.36	90.015	5717366.	214135.	3264898.	-3866.27	434.01	6737.77
13)	11334.20	6587386.	7780.37	90.015	5712721.	214655.	3272979.	-3875.84	433.67	6732.31
14)	11363.00	6587327.	7780.67	90.015	5597813.	227024.	3464942.	-4103.15	425.17	6597.13
15)	11393.00	6587268.	7780.88	90.015	5471231.	239640.	3660643.	-4334.85	415.78	6448.12
	11395.00	6587263.	7781.08	90.015	5462546.	240470.	3673528.	-4350.21	415.15	6438.06
16)	11396.00	6587261.	7781.19	90.014	5458192.	240885.	3679963.	-4357.88	414.83	6433.02
	11400.00	6587254.	7781.60	90.014	5440699.	242542.	3705655.	-4388.50	413.55	6412.75
17)	11401.00	6587252.	7781.71	90.014	5436307.	242956.	3712066.	-4396.14	413.23	6407.66
	11403.50	6587248.	7803.79	90.008	5425286.	243988.	3728079.	-4426.96	413.36	6413.29
18)	11403.50	6587248.	7803.79	90.008	5425286.	243988.	3728079.	-4426.96	413.36	6413.29
	11405.00	6587246.	7841.91	90.018	5418620.	244607.	3737717.	-4461.15	411.92	6436.15
19)	11406.00	6587242.	7867.55	90.028	5414147.	245019.	3744160.	-4484.61	410.36	6451.22
	11410.00	6587215.	7991.38	90.065	5395997.	246647.	3770118.	-4590.93	404.20	6528.57
	11415.00	6587160.	8151.69	90.089	5372704.	248650.	3803012.	-4726.59	396.73	6629.63
	11420.00	6587093.	8318.49	90.095	5348724.	250614.	3836423.	-4866.30	388.72	6735.38
	11425.00	6587026.	8492.41	90.084	5324034.	252536.	3870374.	-5010.43	380.14	6846.33
	11430.00	6586974.	8674.20	90.054	5298612.	254414.	3904896.	-5159.47	370.94	6963.04
	11435.00	6586949.	8864.63	90.005	5272430.	256244.	3940015.	-5313.95	361.04	7086.13
	11440.00	6586970.	9064.61	89.938	5245462.	258023.	3975768.	-5474.45	350.36	7216.29
	11445.00	6587053.	9275.29	89.851	5217675.	259747.	4012191.	-5641.74	338.82	7354.39
	11450.00	6587218.	9497.82	89.745	5189032.	261410.	4049327.	-5816.55	326.33	7501.32
	11455.00	6587483.	9733.29	89.618	5159495.	263008.	4087220.	-5999.59	312.79	7657.94
	11460.00	6587874.	9983.01	89.471	5129021.	264536.	4125924.	-6191.72	298.07	7825.22
	11465.00	6588415.	10248.35	89.301	5097561.	265987.	4165494.	-6393.82	282.13	8004.26
20)	11467.96	6588818.	10413.55	89.189	5078442.	266808.	4189364.	-6518.51	272.23	8116.46
	11470.00	6589134.	10428.29	89.107	5065123.	267360.	4205917.	-6542.32	270.69	8116.28
	11475.00	6590038.	10428.02	88.906	5032323.	268709.	4246426.	-6577.83	268.86	8087.25
21)	11477.96	6590660.	10427.78	88.787	5012810.	269504.	4270352.	-6598.74	267.77	8069.91

12) Initiate Helium Ullage Control;
13) Terminate C.V.S. LH2 Venting;
14) Inertial Attitude Command Freeze;
15) J2 Start Command, Second Burn, Begin Fuel Lead;
16) Terminate Helium Ullage Control;
17) J-2 Ignition, Second Burn;
18) 90% Thrust Level, Second Burn;
19) Command P.U. Activation, Second Burn;
20) Depletion Cutoff;
21) End LOX Vent.

TABLE 8-2

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

S-IVB STAGE FIRST BURN, FIRST ORBIT COAST AND S-IVB STAGE SECOND BURN DATA

FLIGHT TIME (SEC)	----- EARTH FIXED ----- POSITION (M)	VELOCITY (M/S)	PATH ANGLE (DEG)	---- EARTH FIXED POSITION AND VELOCITY VECTOR COMPONENTS ---- X (M)	Y (M)	Z (M)	DX (M/S)	DY (M/S)	DZ (M/S)
1)143.22	100440.	2249.76	59.362	67133.	21.	74708.	1125.64	2.26	1947.91
2)144.54	103344.	2243.73	59.608	68612.	24.	77281.	1113.49	2.38	1947.94
3)146.89	108493.	2234.33	60.050	71203.	30.	81859.	1092.47	2.59	1949.03
147.94	110791.	2235.49	60.250	72347.	32.	83908.	1085.59	2.64	1954.20
4)147.94	110791.	2235.49	60.250	72347.	32.	83908.	1085.59	2.64	1954.20
5)150.54	116492.	2242.65	60.743	75150.	39.	89010.	1070.62	2.64	1970.60
6)155.14	126630.	2258.85	61.599	80016.	51.	98145.	1045.77	2.57	2002.19
7)159.25	135763.	2276.16	62.347	84273.	62.	106440.	1024.76	2.51	2032.44
160.00	137436.	2279.40	62.482	85040.	63.	107967.	1020.95	2.49	2037.97
180.00	182939.	2375.22	66.486	104299.	216.	150294.	898.70	14.71	2198.59
200.00	230292.	2491.86	70.437	120937.	663.	195979.	765.10	30.32	2371.30
220.00	279868.	2629.65	73.958	134918.	1458.	245196.	633.07	49.61	2551.83
240.00	332069.	2787.84	77.083	146256.	2658.	298114.	500.56	70.57	2741.62
260.00	387296.	2966.14	79.832	154931.	4287.	354931.	366.61	92.52	2941.94
280.00	445957.	3164.14	82.218	160909.	6366.	415867.	230.82	115.48	3153.60
300.00	508466.	3382.40	84.290	164139.	8904.	481162.	91.11	138.04	3378.35
320.00	575257.	3621.06	86.013	164554.	11913.	551091.	-49.87	163.25	3617.04
340.00	646788.	3881.13	87.432	162123.	15445.	625949.	-193.80	190.20	3871.61
360.00	723535.	4164.23	88.577	156775.	19530.	706076.	-341.83	218.59	4144.42
380.00	806017.	4472.60	89.469	148416.	24199.	791865.	-494.92	248.58	4438.17
400.00	894795.	4808.73	90.121	136940.	29486.	883762.	-653.84	280.37	4755.81
420.00	990491.	5176.49	90.548	122217.	35427.	982284.	-819.76	314.19	5101.50
440.00	1093827.	5582.05	90.762	104091.	42070.	1088050.	-994.57	350.49	5481.54
460.00	1205658.	6033.03	90.770	82360.	49467.	1201824.	-1180.49	389.78	5903.55
480.00	1327007.	6539.37	90.574	56781.	57684.	1324536.	-1380.09	432.50	6377.44
500.00	1459138.	7116.79	90.219	27021.	66792.	1457358.	-1603.20	478.40	6917.34
8) 508.12	1516228.	7376.14	90.008	13607.	70748.	1514515.	-1699.57	496.01	7160.51
9) 518.12	1587919.	7385.57	89.999	-3801.	75736.	1586108.	-1781.38	501.20	7149.98
530.00	1673081.	7385.96	89.998	-25526.	81722.	1670889.	-1877.06	506.71	7125.47
10) 530.00	1673081.	7385.96	89.998	-25526.	81722.	1670889.	-1877.06	506.71	7125.47
600.00	2174297.	7386.13	89.999	-176470.	118287.	2163893.	-2433.37	537.50	6953.04
700.00	2885834.	7386.49	90.000	-458486.	174019.	2843861.	-3200.98	575.97	6631.91
800.00	3589090.	7387.02	89.999	-815313.	233225.	3487468.	-3928.03	606.77	6226.60
900.00	4281422.	7387.71	89.999	-1242433.	295077.	4086547.	-4605.35	628.69	5742.28
1000.00	4960460.	7388.50	89.998	-1734429.	358630.	4633494.	-5224.39	640.62	5185.10

1) Separation Completed;
2) J-2 Start Command, First Burn;
3) Terminate Ullage Burn;
4) 90% Thrust level, First Burn;
5) Command P.U. Activation, First Burn;
6) Ullage Case Jettison;
7) I.G.M. Initiation;
8) Guidance Cutoff Signal;
9) Orbit Insertion;
10) Initiate Local Horizontal Attitude Hold.

TABLE 8 - 2 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE FIRST BURN, FIRST ORBIT COAST AND S-IVB STAGE SECOND BURN DATA

FLIGHT TIME (SEC)	----- EARTH FIXED ----- POSITION (M)	VELOCITY (M/S)	PATH ANGLE (DEG)	---- EARTH FIXED POSITION AND VELOCITY VECTOR COMPONENTS ---- X (M)	Y (M)	Z (M)	DX (M/S)	DY (M/S)	DZ (M/S)
1100.00	5623966.	7389.40	89.997	-2285107.	422837.	5121375.	-5777.36	641.64	4562.20
1200.00	6269789.	7390.36	89.996	-2887473.	486568.	5544007.	-6257.26	630.98	3881.50
1300.00	6895857.	7391.37	89.995	-3533919.	548625.	5896038.	-6658.03	608.08	3151.71
1400.00	7500167.	7392.27	89.994	-4216269.	607765.	6173022.	-6974.58	572.61	2382.13
1500.00	8080791.	7393.32	89.993	-4925891.	662723.	6371466.	-7202.88	524.43	1582.61
1600.00	8635880.	7394.16	89.992	-5653804.	712233.	6488887.	-7340.02	463.69	763.38
1700.00	9163668.	7394.87	89.992	-6390795.	755053.	6523836.	-7384.25	390.74	-65.06
1800.00	9662476.	7395.39	89.991	-7127536.	789993.	6475924.	-7335.00	306.20	-892.08
1900.00	10130719.	7395.70	89.991	-7854697.	815935.	6345822.	-7192.90	210.93	-1707.08
2000.00	10566915.	7395.79	89.990	-8563078.	831859.	6135258.	-6959.77	106.03	-2499.60
2100.00	10969682.	7395.64	89.989	-9243715.	836865.	5846992.	-6638.62	-7.18	-3259.48
2200.00	11337751.	7395.27	89.988	-9888003.	830196.	5484777.	-6233.57	-127.19	-3977.00
2300.00	11669966.	7394.68	89.986	-10487802.	811257.	5053313.	-5749.81	-252.29	-4643.00
2400.00	11965287.	7393.91	89.984	-11035545.	779630.	4558181.	-5193.55	-380.62	-5249.01
2500.00	12222795.	7392.99	89.982	-11524330.	735093.	4005769.	-4571.91	-510.17	-5787.37
2600.00	12441698.	7391.95	89.979	-11948011.	677624.	3403192.	-3892.83	-638.87	-6251.29
2700.00	12621322.	7390.84	89.976	-12301268.	607419.	2758190.	-3164.96	-764.56	-6634.98
2800.00	12761124.	7389.70	89.972	-12579683.	524886.	2079033.	-2397.56	-885.05	-6933.69
2900.00	12860689.	7388.59	89.968	-12779783.	430656.	1374410.	-1600.34	-998.16	-7143.80
3000.00	12919727.	7387.54	89.965	-12899090.	325572.	653316.	-783.38	-1101.76	-7262.79
3100.00	12938076.	7386.59	89.961	-12936142.	210691.	-75062.	43.02	-1193.78	-7289.36
3200.00	12915702.	7385.77	89.957	-12890516.	87267.	-801463.	868.46	-1272.30	-7223.33
3300.00	12852699.	7385.09	89.953	-12762825.	-43258.	-1516671.	1682.59	-1335.52	-7065.76
3400.00	12749285.	7384.58	89.950	-12554714.	-179272.	-2211628.	2475.19	-1381.82	-6818.80
3500.00	12605806.	7384.23	89.947	-12268833.	-319012.	-2877555.	3236.37	-1409.83	-6485.76
3600.00	12422727.	7384.03	89.945	-11908804.	-460588.	-3506052.	3956.58	-1418.38	-6071.04
3700.00	12200642.	7383.96	89.944	-11479181.	-602008.	-4089214.	4626.83	-1406.59	-5580.04
3800.00	11940261.	7384.00	89.943	-10985382.	-741207.	-4619723.	5238.74	-1373.88	-5019.11
3900.00	11642416.	7384.12	89.944	-10433631.	-876075.	-5090942.	5784.67	-1319.95	-4395.51
4000.00	11308053.	7384.27	89.945	-9830874.	-1004491.	-5496996.	6257.78	-1244.86	-3717.26
4100.00	10938236.	7384.44	89.947	-9184698.	-1124352.	-5832853.	6652.17	-1148.97	-2993.07
4200.00	10534142.	7384.57	89.950	-8503229.	-1233613.	-6094379.	6962.90	-1032.99	-2232.22
4300.00	10097054.	7384.63	89.953	-7795035.	-1330314.	-6278391.	7186.09	-897.97	-1444.47
4400.00	9628264.	7384.60	89.958	-7069020.	-1412616.	-6382701.	7318.98	-745.28	-639.88
4500.00	9129565.	7384.46	89.963	-6334304.	-1478834.	-6406139.	7359.92	-576.59	171.27

TABLE 8- 2 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE FIRST BURN, FIRST ORBIT COAST AND S-IVB STAGE SECOND BURN DATA

FLIGHT TIME (SEC)	----- EARTH FIXED ----- POSITION (M)	VELOCITY (M/S)	PATH ANGLE (DEG)	---- EARTH FIXED POSITION AND VELOCITY VECTOR COMPONENTS ---- X (M)	Y (M)	Z (M)	DX (M/S)	DY (M/S)	DZ (M/S)
4600.00	8602251.	7384.19	89.968	-5600116.	-1527465.	-6348565.	7308.44	-393.90	978.64
4700.00	8048107.	7383.79	89.973	-4875672.	-1557219.	-6210871.	7165.24	-199.45	1771.98
4800.00	7468913.	7383.26	89.979	-4170063.	-1567045.	-5994965.	6932.15	4.25	2541.21
4900.00	6866540.	7382.62	89.984	-3492138.	-1556149.	-5703749.	6612.18	214.51	3276.62
5000.00	6242946.	7381.90	89.989	-2850389.	-1524019.	-5341070.	6209.38	428.43	3968.94
5100.00	5600188.	7381.12	89.994	-2252853.	-1470438.	-4911677.	5728.86	643.01	4609.51
5200.00	4940431.	7380.32	89.999	-1707005.	-1395496.	-4421152.	5176.71	855.15	5190.33
5300.00	4265985.	7379.55	90.002	-1219667.	-1299592.	-3875836.	4559.88	1061.70	5704.21
5400.00	3579391.	7378.83	90.005	-798927.	-1183445.	-3282744.	3886.12	1259.51	6144.83
5500.00	2883647.	7378.23	90.008	-444059.	-1048082.	-2649482.	3163.88	1445.49	6506.81
5600.00	2182870.	7377.76	90.010	-165464.	-894838.	-1984139.	2402.20	1616.65	6785.81
5700.00	1484883.	7377.46	90.011	35384.	-725340.	-1295187.	1610.58	1770.11	6978.52
5800.00	816867.	7377.36	90.011	155984.	-541493.	-591376.	798.90	1903.21	7082.73
5900.00	413901.	7377.47	90.012	194833.	-345457.	118381.	-22.74	2013.49	7097.35
6000.00	850442.	7377.79	90.011	151447.	-139624.	825118.	-844.11	2098.79	7022.41
6100.00	1521926.	7378.31	90.010	26364.	73409.	1519926.	-1654.96	2157.24	6859.08
6200.00	2220482.	7379.03	90.009	-178858.	290879.	2194070.	-2445.22	2187.29	6609.59
6300.00	2921227.	7379.90	90.008	-461661.	509886.	2839094.	-3205.00	2187.80	6277.30
6400.00	3616686.	7380.90	90.007	-818523.	727432.	3446923.	-3924.82	2158.01	5866.56
6500.00	4302836.	7381.99	90.005	-1244990.	940468.	4009977.	-4595.66	2097.57	5382.73
6600.00	4976713.	7383.10	90.004	-1735740.	1145930.	4521252.	-5209.10	2006.57	4832.09
6700.00	5635785.	7384.21	90.003	-2284638.	1340785.	4974415.	-5757.43	1885.57	4221.75
6800.00	6277751.	7385.25	90.002	-2884821.	1522079.	5363884.	-6233.71	1735.55	3559.58
6900.00	6900448.	7386.17	90.001	-3528774.	1686978.	5684897.	-6631.93	1557.94	2854.09
7000.00	7501823.	7386.94	89.999	-4208431.	1832812.	5933571.	-6947.04	1354.61	2114.36
7100.00	8079922.	7387.52	89.998	-4915273.	1957123.	6106955.	-7175.04	1127.86	1349.88
7200.00	8632876.	7387.88	89.997	-5640424.	2057695.	6203059.	-7313.02	880.35	570.45
7300.00	9158913.	7388.00	89.996	-6374814.	2132604.	6220887.	-7359.24	615.13	-213.97
7400.00	9656356.	7387.89	89.994	-7109199.	2180245.	6160440.	-7313.10	335.55	-993.37
7500.00	10123621.	7387.54	89.992	-7834372.	2199360.	6022719.	-7175.21	45.25	-1757.86
7600.00	10559229.	7386.97	89.990	-8541235.	2189069.	5809699.	-6947.31	-251.91	-2497.75
7700.00	10961805.	7386.21	89.988	-9220926.	2148886.	5524308.	-6632.32	-551.90	-3203.73
7800.00	11330083.	7385.29	89.985	-9864925.	2078735.	5170387.	-6234.24	-850.58	-3866.95
7900.00	11662909.	7384.26	89.982	-10465167.	1978957.	4752627.	-5758.12	-1143.74	-4479.19
8000.00	11959246.	7383.15	89.978	-11014144.	1850314.	4276510.	-5210.00	-1427.18	-5032.88

TABLE 8- 2 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE FIRST BURN, FIRST ORBIT COAST AND S-IVB STAGE SECOND BURN DATA

FLIGHT TIME (SEC)	----- EARTH FIXED ----- POSITION (M)	VELOCITY (M/S)	PATH ANGLE (DEG)	---- EARTH FIXED POSITION AND VELOCITY VECTOR COMPONENTS ---- X (M)	Y (M)	Z (M)	DX (M/S)	DY (M/S)	DZ (M/S)
8100.00	12218173.	7382.01	89.974	-11504994.	1693985.	3748236.	-4596.80	-1696.78	-5521.27
8200.00	12438887.	7380.89	89.970	-11931587.	1511557.	3174638.	-3926.24	-1948.51	-5938.47
8300.00	12620711.	7379.83	89.966	-12288607.	1305009.	2563090.	-3206.76	-2178.57	-6279.52
8400.00	12763084.	7378.86	89.962	-12571604.	1076689.	1921414.	-2447.36	-2383.36	-6540.46
8500.00	12865575.	7378.03	89.958	-12777062.	829293.	1257775.	-1657.56	-2559.59	-6718.36
8600.00	12927871.	7377.34	89.955	-12902427.	565825.	580584.	-847.21	-2704.32	-6811.32
8700.00	12949786.	7376.81	89.951	-12946149.	289569.	-101618.	-26.41	-2814.98	-6818.55
8800.00	12931258.	7376.45	89.949	-12907696.	4040.	-780265.	794.60	-2889.44	-6740.31
8900.00	12872348.	7376.24	89.947	-12787554.	-287052.	-1446860.	1605.61	-2926.04	-6577.93
9000.00	12773247.	7376.16	89.946	-12587235.	-579860.	-2093109.	2396.52	-2923.59	-6333.80
9100.00	12634261.	7376.20	89.945	-12309241.	-870441.	-2710991.	3157.48	-2881.46	-6011.31
9200.00	12455826.	7376.32	89.946	-11957044.	-1154818.	-3292883.	3879.01	-2799.53	-5614.80
9300.00	12238498.	7376.48	89.947	-11535044.	-1429029.	-3831641.	4552.11	-2678.24	-5149.55
9400.00	11982957.	7376.66	89.950	-11048510.	-1689182.	-4320689.	5168.37	-2518.59	-4621.66
9500.00	11689997.	7376.81	89.953	-10503515.	-1931514.	-4754098.	5720.10	-2322.13	-4038.00
9600.00	11360530.	7376.90	89.957	-9906864.	-2152442.	-5126665.	6200.40	-2090.92	-3406.14
9700.00	10995589.	7376.91	89.962	-9266008.	-2348620.	-5433972.	6603.25	-1827.59	-2734.19
9800.00	10596316.	7376.81	89.967	-8588955.	-2516985.	-5672437.	6923.62	-1535.22	-2030.75
9900.00	10163957.	7376.59	89.972	-7884160.	-2654806.	-5839355.	7157.49	-1217.35	-1304.79
10000.00	9699873.	7376.25	89.978	-7160429.	-2759728.	-5932934.	7301.95	-877.93	-565.51
10100.00	9205519.	7375.79	89.984	-6426803.	-2829810.	-5952307.	7355.20	-521.29	177.75
10200.00	8682449.	7375.23	89.990	-5692445.	-2863558.	-5897544.	7316.58	-152.03	915.69
10300.00	8132306.	7374.58	89.995	-4966525.	-2859949.	-5769638.	7186.60	225.00	1639.07
10400.00	7556825.	7373.88	90.000	-4258108.	-2818459.	-5570496.	6966.90	604.76	2338.94
10500.00	6957823.	7373.16	90.004	-3576035.	-2739068.	-5302903.	6660.25	982.13	3006.67
10600.00	6337197.	7372.47	90.008	-2928820.	-2622276.	-4970488.	6270.48	1351.94	3634.08
10700.00	5696924.	7371.83	90.011	-2324539.	-2469095.	-4577667.	5802.48	1709.06	4213.58
10800.00	5039060.	7371.30	90.014	-1770730.	-2281046.	-4129585.	5262.07	2048.46	4738.19
10900.00	4365759.	7370.90	90.016	-1274305.	-2060147.	-3632051.	4655.99	2365.29	5201.66
10943.00	4072050.	7370.78	90.016	-1080053.	-1955662.	-3404476.	4377.04	2493.43	5380.77
11) 10943.00	4072050.	7370.78	90.016	-1080053.	-1955662.	-3404476.	4377.04	2493.43	5380.77
11000.00	3679299.	7370.66	90.017	-841461.	-1808887.	-3091458.	3991.78	2654.94	5598.55
11100.00	2982180.	7370.62	90.017	-477610.	-1530206.	-2514708.	3277.66	2913.11	5924.25
11200.00	2277363.	7370.79	90.017	-187297.	-1227446.	-1909104.	2522.52	3135.88	6175.09
11300.00	1569304.	7371.16	90.017	25838.	-904328.	-1282279.	1735.70	3319.72	6348.29

11) Guaymas Acquisition, Start Time Base 5.

TABLE 8 - 2 (Cont'd)

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

S-IVB STAGE FIRST BURN, FIRST ORBIT COAST AND S-IVB STAGE SECOND BURN DATA

	FLIGHT TIME (SEC)	----- EARTH FIXED ----- POSITION (M)	VELOCITY (M/S)	PATH ANGLE (DEG)	---- EARTH FIXED POSITION AND VELOCITY VECTOR COMPONENTS ---- X (M)	Y (M)	Z (M)	DX (M/S)	DY (M/S)	DZ (M/S)
12)	11333.00	1336379.	7371.33	90.016	78750.	-793913.	-1072105.	1470.75	3371.32	6388.08
13)	11334.20	1327930.	7371.34	90.016	80510.	-789866.	-1064438.	1461.08	3373.11	6389.37
14)	11363.00	1125908.	7371.68	90.016	119239.	-692119.	-880013.	1228.16	3414.26	6416.86
15)	11393.00	917861.	7371.94	90.015	152427.	-589097.	-687167.	984.14	3453.22	6438.33
	11395.00	904125.	7372.15	90.015	154379.	-582188.	-674289.	967.86	3455.77	6439.68
16)	11396.00	897265.	7372.26	90.015	155343.	-578732.	-667850.	959.72	3457.04	6440.34
	11400.00	869881.	7372.68	90.015	159116.	-564894.	-642083.	927.14	3462.06	6442.90
17)	11401.00	863049.	7372.78	90.015	160040.	-561431.	-635639.	918.99	3463.30	6443.52
	11403.50	845988.	7394.87	90.009	162314.	-552763.	-619518.	902.04	3476.26	6464.21
18)	11403.50	845988.	7394.87	90.009	162314.	-552763.	-619518.	902.04	3476.26	6464.21
	11405.00	835721.	7432.98	90.019	163661.	-547536.	-609795.	892.89	3493.29	6499.91
19)	11406.00	828857.	7458.60	90.030	164550.	-544037.	-603283.	886.14	3504.29	6524.21
	11410.00	801202.	7582.37	90.068	168044.	-529915.	-576955.	861.14	3557.28	6640.53
	11415.00	766185.	7742.61	90.094	172273.	-511958.	-543379.	830.88	3625.94	6790.45
	11420.00	730694.	7909.34	90.100	176353.	-493652.	-509040.	800.81	3696.85	6946.20
	11425.00	694766.	8083.19	90.088	180282.	-474985.	-473907.	771.00	3770.26	7108.35
	11430.00	658453.	8264.89	90.057	184063.	-455945.	-437944.	741.45	3846.44	7277.61
	11435.00	621829.	8455.24	90.006	187697.	-436516.	-401118.	712.20	3925.68	7454.72
	11440.00	584999.	8655.13	89.935	191185.	-416683.	-363384.	683.26	4008.30	7640.55
	11445.00	548109.	8865.71	89.845	194530.	-396426.	-324696.	654.66	4094.72	7836.16
	11450.00	511368.	9088.12	89.734	197733.	-375728.	-285003.	626.43	4185.38	8042.65
	11455.00	475072.	9323.48	89.602	200795.	-354565.	-244250.	598.62	4280.65	8261.05
	11460.00	439644.	9573.07	89.448	203720.	-332913.	-202371.	571.26	4381.00	8492.59
	11465.00	405691.	9838.28	89.272	206509.	-310745.	-159299.	544.41	4486.99	8738.55
20)	11467.96	386611.	10003.39	89.155	208098.	-297360.	-133194.	528.97	4552.80	8891.58
	11470.00	374121.	10018.12	89.070	209162.	-288067.	-115044.	513.62	4560.55	8905.07
	11475.00	346583.	10017.83	88.861	211632.	-265252.	-70521.	474.24	4565.69	8904.30
21)	11477.96	332693.	10017.57	88.737	213001.	-251725.	-44150.	450.91	4568.65	8903.70

12) Initiate Helium Ullage Control;
13) Terminate C.V.S. LH2 Venting;
14) Inertial Attitude Command Freeze;
15) J2 Start Command, Second Burn, Begin Fuel Lead;
16) Terminate Helium Ullage Control;
17) J-2 Ignition, Second Burn;
18) 90% Thrust Level, Second Burn;
19) Command P.U. Activation, Second Burn;
20) Depletion Cutoff;
21) End LOX Vent.

TABLE 8-3

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

S-IVB STAGE FIRST BURN, FIRST ORBIT COAST AND S-IVB STAGE SECOND BURN DATA

	FLIGHT TIME (SEC)	MASS (KG)	THRUST (TOTAL) (N)	LONGITUDINAL ACCELERATION (M/S2)	DYNAMIC PRESSURE (N/M2)	CENTRAL RANGE ANGLE (DEG)	PITCH ATT. COMMAND (DEG)	PITCH ANGLE OF ATTACK (DEG)
1)	143.22	120163.	39353.	0.310	310.	1.195	-60.818	-0.662
2)	144.54	120137.	38585.	0.307	251.	1.222	-60.818	-0.504
3)	146.89	119997.	437615.	3.637	172.	1.271	-60.818	-0.644
	147.94	119920.	902378.	7.517	145.	1.292	-60.818	-0.569
4)	147.94	119920.	902378.	7.517	145.	1.292	-60.818	-0.569
5)	150.54	119356.	895174.	7.495	95.	1.346	-60.818	0.227
6)	155.14	118291.	1025244.	8.665	44.	1.443	-60.818	1.263
7)	159.25	117175.	1023977.	8.738	21.	1.530	-60.818	2.016
	160.00	116986.	1023786.	8.750	18.	1.546	-61.568	2.089
	180.00	112031.	1024728.	9.147	1.	1.987	-73.568	-5.984
	200.00	107072.	1023621.	9.560	0.	2.457	-74.486	-2.300
	220.00	102115.	1024276.	10.030	0.	2.957	-75.464	0.771
	240.00	97160.	1023036.	10.529	0.	3.488	-76.825	3.084
	260.00	92203.	1024055.	11.106	0.	4.053	-78.291	4.891
	280.00	87249.	1023083.	11.725	0.	4.653	-79.666	6.381
	300.00	82294.	1024328.	12.446	0.	5.293	-80.208	7.252
	320.00	77339.	1024549.	13.247	0.	5.973	-81.262	8.511
	340.00	72385.	1023580.	14.140	0.	6.697	-82.554	9.174
	360.00	67430.	1024868.	15.198	0.	7.470	-83.937	9.519
	380.00	62475.	1023975.	16.389	0.	8.294	-85.210	9.768
	400.00	57524.	1022089.	17.766	0.	9.174	-86.452	9.834
	420.00	52578.	1021550.	19.427	0.	10.115	-87.729	9.704
	440.00	47631.	1023158.	21.478	0.	11.124	-89.027	9.384
	460.00	42681.	1022521.	23.953	0.	12.208	-90.204	8.987
	480.00	37735.	1021863.	27.075	0.	13.375	-91.442	8.438
	500.00	32792.	1021121.	31.133	0.	14.637	-93.613	6.451
8)	508.12	30786.	1020783.	33.150	0.	15.180	-92.558	8.016
9)	518.12	30697.	2042.	0.066	0.	15.860	-92.558	8.503
	530.00	30693.	311.	0.010	0.	16.668	-92.558	9.132
10)	530.00	30693.	311.	0.010	0.	16.668	-92.558	9.132
	600.00	30689.	125.	0.004	0.	21.430	-111.418	-0.001
	700.00	30684.	112.	0.004	0.	28.234	-118.228	-0.000
	800.00	30679.	98.	0.003	0.	35.038	-125.036	-0.001
	900.00	30673.	81.	0.003	0.	41.843	-131.842	-0.001
	1000.00	30668.	67.	0.002	0.	48.648	-138.646	-0.002

1) Separation Completed;
2) J-2 Start Command, First Burn;
3) Terminate Ullage Burn;
4) 90% Thrust Level, First Burn;
5) Command P.U. Activation, First Burn;
6) Ullage Case Jettison;
7) I.G.M. Initiation;
8) Guidance Cutoff Signal;
9) Orbit Insertion;
10) Initiate Local Horizontal Attitude Hold.

TABLE 8 - 3 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE FIRST BURN, FIRST ORBIT COAST AND S-IVB STAGE SECOND BURN DATA

FLIGHT TIME (SEC)	MASS (KG)	THRUST (TOTAL) (N)	LONGITUDINAL ACCELERATION (M/S2)	DYNAMIC PRESSURE (N/M2)	CENTRAL RANGE ANGLE (DEG)	PITCH ATT. COMMAND (DEG)	PITCH ANGLE OF ATTACK (DEG)
1100.00	30663.	59.	0.002	0.	55.453	-145.447	-0.003
1200.00	30658.	56.	0.002	0.	62.258	-152.247	-0.004
1300.00	30653.	56.	0.002	0.	69.064	-159.045	-0.005
1400.00	30647.	56.	0.002	0.	75.871	-165.842	-0.006
1500.00	30642.	57.	0.002	0.	82.677	-172.638	-0.007
1600.00	30637.	57.	0.002	0.	89.484	-179.434	-0.008
1700.00	30632.	58.	0.002	0.	96.292	173.770	-0.008
1800.00	30627.	58.	0.002	0.	103.099	166.973	-0.009
1900.00	30621.	57.	0.002	0.	109.906	160.174	-0.009
2000.00	30616.	57.	0.002	0.	116.714	153.373	-0.010
2100.00	30611.	57.	0.002	0.	123.521	146.571	-0.011
2200.00	30606.	57.	0.002	0.	130.328	139.766	-0.012
2300.00	30601.	57.	0.002	0.	137.134	132.958	-0.014
2400.00	30595.	56.	0.002	0.	143.941	126.149	-0.016
2500.00	30590.	55.	0.002	0.	150.746	119.338	-0.018
2600.00	30585.	54.	0.002	0.	157.551	112.525	-0.021
2700.00	30580.	54.	0.002	0.	164.355	105.711	-0.024
2800.00	30575.	53.	0.002	0.	171.159	98.897	-0.028
2900.00	30569.	52.	0.002	0.	177.961	92.083	-0.032
3000.00	30564.	51.	0.002	0.	175.237	85.270	-0.035
3100.00	30559.	51.	0.002	0.	168.437	78.459	-0.039
3200.00	30554.	50.	0.002	0.	161.637	71.650	-0.043
3300.00	30549.	49.	0.002	0.	154.839	64.844	-0.047
3400.00	30543.	48.	0.002	0.	148.042	58.041	-0.050
3500.00	30538.	48.	0.002	0.	141.246	51.242	-0.053
3600.00	30533.	47.	0.002	0.	134.451	44.447	-0.055
3700.00	30528.	46.	0.001	0.	127.657	37.655	-0.056
3800.00	30523.	45.	0.001	0.	120.864	30.868	-0.057
3900.00	30517.	45.	0.001	0.	114.073	24.083	-0.056
4000.00	30512.	44.	0.001	0.	107.282	17.302	-0.055
4100.00	30507.	43.	0.001	0.	100.492	10.523	-0.053
4200.00	30502.	43.	0.001	0.	93.704	3.746	-0.050
4300.00	30497.	42.	0.001	0.	86.916	-3.031	-0.047
4400.00	30491.	42.	0.001	0.	80.129	-9.806	-0.042
4500.00	30486.	42.	0.001	0.	73.343	-16.582	-0.037

TABLE 3 - 3 (Cont'd)

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

S-IVB STAGE FIRST BURN, FIRST ORBIT COAST AND S-IVB STAGE SECOND BURN DATA

FLIGHT TIME (SEC)	MASS (KG)	THRUST (TOTAL) (N)	LONGITUDINAL ACCELERATION (M/S2)	DYNAMIC PRESSURE (N/M2)	CENTRAL RANGE ANGLE (DEG)	PITCH ATT. COMMAND (DEG)	PITCH ANGLE OF ATTACK (DEG)
4600.00	30481.	41.	0.001	0.	66.558	-23.359	-0.032
4700.00	30476.	41.	0.001	0.	59.773	-30.137	-0.027
4800.00	30471.	41.	0.001	0.	52.989	-36.917	-0.021
4900.00	30465.	40.	0.001	0.	46.206	-43.699	-0.016
5000.00	30460.	40.	0.001	0.	39.423	-50.484	-0.011
5100.00	30455.	40.	0.001	0.	32.640	-57.271	-0.006
5200.00	30450.	40.	0.001	0.	25.858	-64.059	-0.001
5300.00	30445.	40.	0.001	0.	19.077	-70.850	0.002
5400.00	30439.	41.	0.001	0.	12.295	-77.643	0.005
5500.00	30434.	41.	0.001	0.	5.513	-84.436	0.008
5600.00	30429.	41.	0.001	0.	1.268	-91.230	0.010
5700.00	30424.	41.	0.001	0.	8.050	-98.024	0.011
5800.00	30419.	41.	0.001	0.	14.832	-104.817	0.011
5900.00	30413.	41.	0.001	0.	21.614	-111.609	0.012
6000.00	30408.	42.	0.001	0.	28.397	-118.399	0.011
6100.00	30403.	42.	0.001	0.	35.180	-125.187	0.010
6200.00	30398.	42.	0.001	0.	41.964	-131.973	0.009
6300.00	30393.	42.	0.001	0.	48.748	-138.756	0.008
6400.00	30387.	42.	0.001	0.	55.532	-145.538	0.007
6500.00	30382.	42.	0.001	0.	62.318	-152.317	0.005
6600.00	30377.	42.	0.001	0.	69.104	-159.094	0.004
6700.00	30372.	42.	0.001	0.	75.890	-165.870	0.003
6800.00	30367.	42.	0.001	0.	82.677	-172.645	0.002
6900.00	30361.	42.	0.001	0.	89.464	-179.420	0.001
7000.00	30356.	42.	0.001	0.	96.252	173.804	-0.001
7100.00	30351.	41.	0.001	0.	103.040	167.028	-0.002
7200.00	30346.	41.	0.001	0.	109.829	160.250	-0.003
7300.00	30341.	41.	0.001	0.	116.617	153.470	-0.004
7400.00	30336.	41.	0.001	0.	123.405	146.687	-0.006
7500.00	30330.	41.	0.001	0.	130.194	139.902	-0.008
7600.00	30325.	40.	0.001	0.	136.981	133.115	-0.010
7700.00	30320.	40.	0.001	0.	143.769	126.324	-0.012
7800.00	30315.	40.	0.001	0.	150.556	119.532	-0.015
7900.00	30310.	39.	0.001	0.	157.342	112.737	-0.018
8000.00	30304.	39.	0.001	0.	164.128	105.941	-0.022

TABLE 8-3 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE FIRST BURN, FIRST ORBIT COAST AND S-IVB STAGE SECOND BURN DATA

	FLIGHT TIME (SEC)	MASS (KG)	THRUST (TOTAL) (N)	LONGITUDINAL ACCELERATION (M/S2)	DYNAMIC PRESSURE (N/M2)	CENTRAL RANGE ANGLE (DEG)	PITCH ATT. COMMAND (DEG)	PITCH ANGLE OF ATTACK (DEG)
	8100.00	30299.	38.	0.001	0.	170.913	99.144	-0.026
	8200.00	30294.	38.	0.001	0.	177.696	92.348	-0.030
	8300.00	30289.	37.	0.001	0.	175.519	85.552	-0.034
	8400.00	30284.	37.	0.001	0.	168.738	78.757	-0.038
	8500.00	30278.	36.	0.001	0.	161.957	71.965	-0.042
	8600.00	30273.	36.	0.001	0.	155.177	65.175	-0.045
	8700.00	30268.	35.	0.001	0.	148.398	58.389	-0.049
	8800.00	30263.	35.	0.001	0.	141.620	51.607	-0.051
	8900.00	30258.	35.	0.001	0.	134.844	44.829	-0.053
	9000.00	30252.	34.	0.001	0.	128.068	38.056	-0.054
	9100.00	30247.	34.	0.001	0.	121.294	31.286	-0.055
	9200.00	30242.	33.	0.001	0.	114.521	24.520	-0.054
	9300.00	30237.	33.	0.001	0.	107.748	17.757	-0.053
	9400.00	30232.	32.	0.001	0.	100.977	10.997	-0.050
	9500.00	30226.	32.	0.001	0.	94.206	4.240	-0.047
	9600.00	30221.	32.	0.001	0.	87.436	-2.517	-0.043
	9700.00	30216.	33.	0.001	0.	80.668	-9.273	-0.038
	9800.00	30211.	33.	0.001	0.	73.899	-16.029	-0.033
	9900.00	30206.	33.	0.001	0.	67.132	-22.786	-0.028
	10000.00	30200.	34.	0.001	0.	60.365	-29.545	-0.022
	10100.00	30195.	34.	0.001	0.	53.599	-36.306	-0.016
	10200.00	30190.	34.	0.001	0.	46.833	-43.069	-0.010
	10300.00	30185.	34.	0.001	0.	40.067	-49.836	-0.005
	10400.00	30180.	34.	0.001	0.	33.302	-56.605	-0.000
	10500.00	30174.	34.	0.001	0.	26.537	-63.377	0.004
	10600.00	30169.	34.	0.001	0.	19.772	-70.151	0.008
	10700.00	30164.	34.	0.001	0.	13.007	-76.928	0.011
	10800.00	30159.	34.	0.001	0.	6.242	-83.706	0.014
	10900.00	30154.	34.	0.001	0.	0.537	-90.485	0.016
	10943.00	30151.	34.	0.001	0.	3.435	-93.400	0.016
11)	10943.00	30151.	34.	0.001	0.	3.435	-93.400	0.016
	11000.00	30148.	34.	0.001	0.	7.290	-97.264	0.017
	11100.00	30143.	35.	0.001	0.	14.056	-104.043	0.017
	11200.00	30138.	35.	0.001	0.	20.822	-110.821	0.017
	11300.00	30133.	35.	0.001	0.	27.588	-117.597	0.017

11) Guaymas Acquisition, Start Time Base 5.

TABLE 8 - 3 (Contd)

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

S-IVB STAGE FIRST BURN, FIRST ORBIT COAST AND S-IVB STAGE SECOND BURN DATA

	FLIGHT TIME (SEC)	MASS (KG)	THRUST (TOTAL) (N)	LONGITUDINAL ACCELERATION (M/S2)	DYNAMIC PRESSURE (N/M2)	CENTRAL RANGE ANGLE (DEG)	PITCH ATT. COMMAND (DEG)	PITCH ANGLE OF ATTACK (DEG)
12)	11333.00	30131.	35.	0.001	0.	29.822	-119.833	0.016
13)	11334.20	30131.	314.	0.010	0.	29.903	-119.914	0.016
14)	11363.00	30127.	145.	0.005	0.	31.852	-121.861	0.020
15)	11393.00	30123.	72.	0.002	0.	33.882	-121.861	2.050
	11395.00	30119.	3092.	0.103	0.	34.017	-121.861	2.185
16)	11396.00	30117.	3089.	0.103	0.	34.085	-121.861	2.253
	11400.00	30110.	3025.	0.100	0.	34.356	-121.861	2.523
17)	11401.00	30108.	3025.	0.100	0.	34.423	-121.861	2.591
	11403.50	29963.	763333.	25.476	0.	34.593	-121.861	0.961
18)	11403.50	29963.	763333.	25.476	0.	34.593	-121.861	0.961
	11405.00	29664.	759830.	25.603	0.	34.695	-121.861	-2.072
19)	11406.00	29466.	902071.	30.604	0.	34.763	-121.861	-2.497
	11410.00	28644.	904550.	31.572	0.	35.039	-121.861	-1.621
	11415.00	27560.	904521.	32.812	0.	35.390	-121.861	-1.357
	11420.00	26476.	904818.	34.166	0.	35.748	-121.861	-1.080
	11425.00	25390.	905729.	35.663	0.	36.114	-121.861	-0.821
	11430.00	24302.	907224.	37.321	0.	36.487	-121.861	-0.575
	11435.00	23211.	908790.	39.142	0.	36.868	-121.861	-0.341
	11440.00	22117.	910923.	41.173	0.	37.258	-121.861	-0.123
	11445.00	21021.	913595.	43.447	0.	37.657	-121.861	0.083
	11450.00	19923.	915689.	45.947	0.	38.065	-121.861	0.282
	11455.00	18824.	916873.	48.691	0.	38.483	-121.861	0.471
	11460.00	17727.	916734.	51.696	0.	38.912	-121.861	0.648
	11465.00	16632.	914960.	54.994	0.	39.351	-121.861	0.842
20)	11467.96	15983.	913788.	57.153	0.	39.617	-121.861	1.003
	11470.00	15901.	1741.	0.109	0.	39.802	-121.861	1.112
	11475.00	15898.	1674.	0.102	0.	40.255	-121.861	1.379
21)	11477.96	15897.	1555.	0.098	0.	40.524	-121.861	1.535

12) Initiate Helium Ullage Control;
13) Terminate C.V.S. LH2 Venting;
14) Inertial Attitude Command Freeze;
15) J2 Start Command, Second Burn, Begin Fuel Lead;
16) Terminate Helium Ullage Control;
17) J-2 Ignition, Second Burn;
18) 90% Thrust Level, Second Burn;
19) Command P.U. Activation, Second Burn;
20) Depletion Cutoff;
21) End LOX Vent.

TABLE 8 - 4

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

S-IVB STAGE FIRST BURN, FIRST ORBIT COAST AND S-IVB STAGE SECOND BURN DATA

	FLIGHT TIME (SEC)	ALTITUDE (KM)	RANGE (KM)	VELOCITY VECTOR AZIMUTH SPACE FIXED (DEG)	VELOCITY VECTOR AZIMUTH EARTH FIXED (DEG)	LONGITUDE (POS. EAST) (DEG)	GEOCENTRIC DECLINATION (DEG)	GEODETIC LATITUDE (DEG)
1)	143.22	67.566	73.984	75.401	72.322	-79.845	28.576	28.736
2)	144.54	69.075	76.514	75.415	72.338	-79.820	28.583	28.743
3)	146.89	71.723	81.012	75.439	72.367	-79.777	28.595	28.755
	147.94	72.892	83.024	75.442	72.379	-79.757	28.600	28.760
4)	147.94	72.892	83.024	75.442	72.379	-79.757	28.600	28.760
5)	150.54	75.763	88.032	75.443	72.403	-79.708	28.614	28.774
6)	155.14	80.761	96.990	75.441	72.445	-79.621	28.638	28.798
7)	159.25	85.149	105.115	75.437	72.483	-79.541	28.660	28.820
	160.00	85.942	106.609	75.436	72.490	-79.527	28.664	28.824
	180.00	106.041	147.938	75.705	73.014	-79.122	28.775	28.935
	200.00	123.891	192.377	76.033	73.590	-78.685	28.889	29.049
	220.00	139.531	240.120	76.424	74.213	-78.214	29.008	29.168
	240.00	153.062	291.362	76.829	74.831	-77.706	29.131	29.291
	260.00	164.564	346.327	77.237	75.434	-77.159	29.258	29.418
	280.00	174.118	405.268	77.651	76.025	-76.569	29.389	29.549
	300.00	181.808	468.462	78.050	76.584	-75.935	29.523	29.684
	320.00	187.724	536.227	78.484	77.168	-75.253	29.662	29.823
	340.00	192.015	608.900	78.940	77.762	-74.518	29.803	29.965
	360.00	194.822	686.870	79.412	78.363	-73.727	29.948	30.110
	380.00	196.303	770.583	79.905	78.975	-72.874	30.096	30.258
	400.00	196.646	860.541	80.423	79.603	-71.955	30.247	30.409
	420.00	196.077	957.318	80.969	80.251	-70.962	30.399	30.562
	440.00	194.863	1061.593	81.549	80.927	-69.888	30.552	30.716
	460.00	193.326	1174.186	82.167	81.634	-68.725	30.706	30.870
	480.00	191.869	1296.078	82.829	82.379	-67.462	30.858	31.023
	500.00	190.976	1428.484	83.532	83.160	-66.084	31.008	31.173
8)	508.12	190.872	1485.602	83.815	83.472	-65.489	31.068	31.233
9)	518.12	190.898	1557.286	84.223	83.903	-64.741	31.138	31.304
	530.00	190.928	1642.442	84.711	84.418	-63.850	31.216	31.382
10)	530.00	190.928	1642.442	84.711	84.418	-63.850	31.216	31.382
	600.00	191.045	2144.323	87.617	87.485	-58.576	31.535	31.702
	700.00	191.063	2861.322	91.810	91.910	-51.008	31.569	31.736
	800.00	190.916	3578.367	95.959	96.289	-43.476	31.108	31.273
	900.00	190.619	4295.480	99.964	100.520	-36.061	30.163	30.326
	1000.00	190.193	5012.679	103.741	104.513	-28.828	28.763	28.921

1) Separation completed;
2) J-2 Start Command, First Burn;
3) Terminate Ullage Burn;
4) 90% Thrust Level, First Burn;
5) Command P.U. Activation, First Burn;
6) Ullage Case Jettison;
7) IGM Initiation;
8) Guidance Cutoff Signal;
9) Orbit Insertion;
10) Initiate Local Horizontal Attitude Hold.

TABLE 8 - 4 (Cont'd)

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

S-IVB STAGE FIRST BURN, FIRST ORBIT COAST AND S-IVB STAGE SECOND BURN DATA

FLIGHT TIME (SEC)	ALTITUDE (KM)	RANGE (KM)	VELOCITY VECTOR AZIMUTH SPACE FIXED (DEG)	VELOCITY VECTOR AZIMUTH EARTH FIXED (DEG)	LONGITUDE (POS. EAST) (DEG)	GEOCENTRIC DECLINATION (DEG)	GEODETIC LATITUDE (DEG)
1100.00	189.667	5729.971	107.219	108.199	-21.827	26.944	27.096
1200.00	189.071	6447.359	110.352	111.524	-15.086	24.750	24.892
1300.00	188.443	7164.831	113.110	114.458	-8.610	22.226	22.358
1400.00	187.820	7882.367	115.479	116.984	-2.391	19.423	19.540
1500.00	187.239	8599.937	117.456	119.097	3.504	16.386	16.487
1600.00	186.736	9317.498	119.043	120.797	9.377	13.161	13.244
1700.00	186.345	10035.001	120.249	122.091	14.995	9.790	9.853
1800.00	186.093	10752.391	121.081	122.984	20.490	6.315	6.356
1900.00	186.000	11469.610	121.546	123.484	25.906	2.774	2.792
2000.00	186.080	12186.599	121.646	123.592	31.286	-0.795	-0.801
2100.00	186.337	12903.301	121.384	123.310	36.677	-4.357	-4.385
2200.00	186.768	13619.662	120.757	122.636	42.122	-7.872	-7.924
2300.00	187.362	14335.625	119.759	121.565	47.666	-11.306	-11.378
2400.00	188.097	15051.133	118.385	120.091	53.351	-14.616	-14.708
2500.00	188.950	15766.102	116.625	118.209	59.219	-17.762	-17.871
2600.00	189.889	16480.392	114.475	115.913	65.302	-20.701	-20.825
2700.00	190.882	17193.718	111.933	113.205	71.632	-23.385	-23.521
2800.00	191.892	17905.373	109.007	110.095	78.223	-25.767	-25.914
2900.00	192.886	18613.147	105.717	106.607	85.079	-27.800	-27.955
3000.00	193.833	19305.870	102.101	102.779	92.183	-29.438	-29.598
3100.00	194.704	-19768.817	98.216	98.673	99.499	-30.639	-30.803
3200.00	195.478	-19221.410	94.139	94.368	106.969	-31.372	-31.538
3300.00	196.138	-18524.724	89.961	89.959	114.521	-31.616	-31.783
3400.00	196.676	-17816.359	85.785	85.552	122.070	-31.363	-31.529
3500.00	197.092	-17105.080	81.713	81.252	129.535	-30.622	-30.786
3600.00	197.392	-16392.777	77.835	77.153	136.841	-29.414	-29.573
3700.00	197.590	-15680.066	74.228	73.334	143.933	-27.771	-27.925
3800.00	197.704	-14967.182	70.949	69.855	150.775	-25.735	-25.882
3900.00	197.759	-14254.218	68.032	66.755	157.350	-23.353	-23.489
4000.00	197.777	-13541.205	65.500	64.057	163.663	-20.670	-20.794
4100.00	197.789	-12828.148	63.359	61.770	169.730	-17.737	-17.845
4200.00	197.822	-12115.045	61.606	59.894	175.580	-14.597	-14.688
4300.00	197.901	-11401.894	60.237	58.426	-178.751	-11.295	-11.367
4400.00	198.048	-10688.702	59.242	57.358	-173.225	-7.872	-7.922
4500.00	198.278	-9975.482	58.617	56.685	-167.798	-4.366	-4.395

TABLE 8 - 4 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE FIRST BURN, FIRST ORBIT COAST AND S-IVB STAGE SECOND BURN DATA

FLIGHT TIME (SEC)	ALTITUDE (KM)	RANGE (KM)	VELOCITY VECTOR AZIMUTH SPACE FIXED (DEG)	VELOCITY VECTOR AZIMUTH EARTH FIXED (DEG)	LONGITUDE (POS. EAST) (DEG)	GEOCENTRIC DECLINATION (DEG)	GEODETIC LATITUDE (DEG)
4600.00	198.603	-9262.262	58.354	56.402	-162.426	-0.817	-0.822
4700.00	199.023	-8549.078	58.452	56.507	-157.065	2.741	2.759
4800.00	199.535	-7835.977	58.911	57.000	-151.670	6.271	6.311
4900.00	200.128	-7123.020	59.734	57.885	-146.198	9.734	9.797
5000.00	200.783	-6410.279	60.929	59.167	-140.604	13.095	13.178
5100.00	201.476	-5697.850	62.503	60.853	-134.847	16.312	16.413
5200.00	202.182	-4985.858	64.462	62.947	-128.891	19.343	19.460
5300.00	202.868	-4274.494	66.811	65.453	-122.703	22.144	22.275
5400.00	203.504	-3564.077	69.547	68.364	-116.260	24.668	24.810
5500.00	204.060	-2855.232	72.656	71.665	-109.553	26.868	27.019
5600.00	204.509	-2149.397	76.110	75.325	-102.588	28.696	28.854
5700.00	204.827	-1450.814	79.861	79.294	-95.390	30.110	30.272
5800.00	204.998	-779.011	83.845	83.503	-88.008	31.073	31.238
5900.00	205.011	354.534	87.975	87.863	-80.505	31.558	31.724
6000.00	204.864	813.243	92.156	92.275	-72.962	31.550	31.716
6100.00	204.561	1487.970	96.284	96.633	-65.461	31.050	31.215
6200.00	204.116	2187.268	100.262	100.836	-58.081	30.072	30.234
6300.00	203.550	2893.467	104.007	104.797	-50.888	28.644	28.801
6400.00	202.889	3602.596	107.451	108.448	-43.928	26.802	26.952
6500.00	202.166	4313.285	110.550	111.738	-37.225	24.589	24.731
6600.00	201.417	5024.929	113.275	114.628	-30.787	22.054	22.184
6700.00	200.681	5737.209	115.612	117.131	-24.603	19.242	19.359
6800.00	199.996	6449.931	117.559	119.212	-18.650	16.202	16.302
6900.00	199.398	7162.958	119.120	120.885	-12.895	12.976	13.058
7000.00	198.919	7876.178	120.303	122.153	-7.302	9.609	9.671
7100.00	198.587	8589.500	121.113	123.024	-1.829	6.139	6.179
7200.00	198.420	9302.841	121.558	123.503	3.568	2.606	2.623
7300.00	198.432	10016.125	121.642	123.593	8.931	-0.954	-0.960
7400.00	198.628	10729.284	121.365	123.295	14.307	-4.504	-4.534
7500.00	199.004	11442.259	120.725	122.607	19.739	-8.008	-8.060
7600.00	199.548	12154.996	119.716	121.524	25.271	-11.428	-11.500
7700.00	200.236	12867.453	118.332	120.040	30.946	-14.724	-14.816
7800.00	201.046	13579.584	116.565	118.149	36.802	-17.856	-17.965
7900.00	201.948	14291.340	114.409	115.847	42.876	-20.779	-20.903
8000.00	202.905	15002.656	111.864	113.135	49.193	-23.449	-23.585

TABLE 8 - 4 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE FIRST BURN, FIRST ORBIT COAST AND S-IVB STAGE SECOND BURN DATA

FLIGHT TIME (SEC)	ALTITUDE (KM)	RANGE (KM)	VELOCITY VECTOR AZIMUTH SPACE FIXED (DEG)	VELOCITY VECTOR AZIMUTH EARTH FIXED (DEG)	LONGITUDE (POS. EAST) (DEG)	GEOCENTRIC DECLINATION (DEG)	GEODETIC LATITUDE (DEG)
8100.00	203.883	15713.414	108.936	110.024	55.772	-25.817	-25.964
8200.00	204.849	16423.387	105.648	106.527	62.613	-27.837	-27.991
8300.00	205.770	17132.095	102.037	102.713	69.701	-29.462	-29.622
8400.00	206.617	17838.364	98.159	98.614	76.999	-30.653	-30.817
8500.00	207.369	18538.704	94.091	94.317	84.450	-31.378	-31.544
8600.00	208.008	19217.283	89.924	89.920	91.980	-31.615	-31.783
8700.00	208.525	-19688.266	85.760	85.524	99.508	-31.360	-31.526
8800.00	208.920	-19252.058	81.699	81.235	106.951	-30.619	-30.782
8900.00	209.195	-18576.754	77.832	77.147	114.236	-29.412	-29.572
9000.00	209.366	-17877.784	74.235	73.338	121.308	-27.775	-27.928
9100.00	209.449	-17172.627	70.963	69.867	128.130	-25.746	-25.892
9200.00	209.469	-16464.995	68.053	66.773	134.688	-23.371	-23.507
9300.00	209.451	-15756.109	65.524	64.078	140.985	-20.699	-20.822
9400.00	209.423	-15046.469	63.383	61.792	147.038	-17.775	-17.884
9500.00	209.412	-14336.306	61.630	59.915	152.874	-14.646	-14.738
9600.00	209.440	-13625.740	60.258	58.444	158.529	-11.355	-11.428
9700.00	209.531	-12914.841	59.260	57.371	164.042	-7.943	-7.994
9800.00	209.700	-12203.661	58.628	56.691	169.456	-4.449	-4.478
9900.00	209.958	-11492.240	58.357	56.399	174.813	-0.909	-0.915
10000.00	210.305	-10780.622	58.444	56.493	-179.842	2.640	2.657
10100.00	210.742	-10068.848	58.891	56.973	-174.464	6.161	6.201
10200.00	211.256	-9356.963	59.701	57.844	-169.009	9.619	9.681
10300.00	211.830	-8645.008	60.879	59.109	-163.435	12.976	13.057
10400.00	212.441	-7933.027	62.435	60.775	-157.701	16.191	16.291
10500.00	213.063	-7221.059	64.374	62.849	-151.769	19.223	19.339
10600.00	213.668	-6509.142	66.700	65.331	-145.608	22.027	22.157
10700.00	214.225	-5797.310	69.412	68.218	-139.194	24.559	24.700
10800.00	214.704	-5085.592	72.496	71.494	-132.517	26.769	26.919
10900.00	215.080	-4374.033	75.926	75.128	-125.582	28.613	28.770
10943.00	215.203	-4068.121	77.496	76.790	-122.526	29.282	29.441
11) 10943.00	215.203	-4068.121	77.496	76.790	-122.526	29.282	29.441
11000.00	215.329	-3662.697	79.654	79.074	-118.414	30.046	30.208
11100.00	215.434	-2951.722	83.618	83.262	-111.058	31.032	31.197
11200.00	215.383	-2241.412	87.722	87.607	-103.579	31.543	31.709
11300.00	215.173	-1532.714	91.903	92.009	-96.054	31.565	31.731

11) Guaymas Acquisition, Start Time Base 5.

TABLE 8 - 4 (Cont'd)

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

S-IVB STAGE FIRST BURN, FIRST ORBIT COAST AND S-IVB STAGE SECOND BURN DATA

	FLIGHT TIME (SEC)	ALTITUDE (KM)	RANGE (KM)	VELOCITY VECTOR AZIMUTH SPACE FIXED (DEG)	EARTH FIXED (DEG)	LONGITUDE (POS. EAST) (DEG)	GEOCENTRIC DECLINATION (DEG)	GEODETIC LATITUDE (DEG)
12)	11333.00	215.070	-1299.658	93.274	93.456	-93.575	31.464	31.630
13)	11334.20	215.066	-1291.198	93.324	93.509	-93.485	31.459	31.625
14)	11363.00	214.963	-1088.518	94.513	94.764	-91.328	31.326	31.491
	11390.00	214.856	-899.508	95.620	95.933	-89.312	31.164	31.330
15)	11393.00	214.843	-878.594	95.743	96.062	-89.088	31.144	31.309
	11395.00	214.834	-864.665	95.824	96.148	-88.939	31.131	31.296
16)	11396.00	214.830	-857.705	95.865	96.191	-88.865	31.124	31.289
	11400.00	214.813	-829.887	96.028	96.363	-88.567	31.096	31.261
17)	11401.00	214.809	-822.939	96.068	96.406	-88.492	31.089	31.253
	11403.50	214.799	-805.572	96.168	96.511	-88.306	31.071	31.235
18)	11403.50	214.799	-805.572	96.168	96.511	-88.306	31.071	31.235
	11405.00	214.793	-795.110	96.208	96.551	-88.194	31.060	31.224
19)	11406.00	214.787	-788.112	96.231	96.574	-88.119	31.052	31.217
	11410.00	214.750	-759.881	96.317	96.659	-87.816	31.022	31.187
	11415.00	214.683	-724.037	96.431	96.772	-87.430	30.983	31.148
	11420.00	214.602	-687.579	96.547	96.887	-87.036	30.943	31.107
	11425.00	214.521	-650.509	96.665	97.004	-86.633	30.901	31.065
	11430.00	214.454	-612.837	96.785	97.123	-86.222	30.857	31.021
	11435.00	214.415	-574.591	96.907	97.244	-85.802	30.811	30.975
	11440.00	214.420	-535.808	97.031	97.366	-85.372	30.764	30.928
	11445.00	214.487	-496.558	97.157	97.490	-84.933	30.715	30.879
	11450.00	214.635	-456.948	97.285	97.615	-84.483	30.663	30.827
	11455.00	214.882	-417.159	97.415	97.743	-84.022	30.610	30.773
	11460.00	215.255	-377.468	97.546	97.871	-83.549	30.554	30.717
	11465.00	215.778	-338.332	97.681	98.003	-83.064	30.496	30.659
20)	11467.96	216.168	-315.701	97.762	98.083	-82.770	30.460	30.623
	11470.00	216.476	-300.562	97.863	98.188	-82.567	30.435	30.598
	11475.00	217.360	-265.986	98.127	98.462	-82.067	30.372	30.535
21)	11477.96	217.969	-247.700	98.283	98.624	-81.771	30.334	30.496

12) Initiate Helium Ullage Control;
13) Terminate C.V.S. LH_2 Venting;
14) Inertial Attitude Command Freeze;
15) J-2 Start Command, Second Burn, Begin Fuel Lead;
16) Terminate Helium Ullage Control;
17) J-2 Ignition, Second Burn;
18) 90% Thrust Level, Second Burn;
19) Command P.U. Activation, Second Burn;
20) Depletion Cutoff;
21) End LOX Vent.

TABLE 8 - 5
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE FIRST BURN, FIRST ORBIT COAST AND S-IVB STAGE SECOND BURN DATA

	FLIGHT TIME (SEC)	VEHICLE ATTITUDE ANGLE PITCH (DEG)	YAW (DEG)	ROLL (DEG)	VEHICLE ATTITUDE RATE PITCH (DEG/S)	YAW (DEG/S)	ROLL (DEG/S)	VEHICLE ATTITUDE ERROR PITCH (DEG)	YAW (DEG)	ROLL (DEG)
1)	143.22	-60.896	-0.069	-0.002	-0.011	0.001	-0.002	-0.078	-0.069	-0.002
2)	144.54	-61.023	-0.089	-0.007	-0.172	-0.032	-0.005	-0.205	-0.089	-0.007
3)	146.89	-61.673	-0.264	-0.023	-0.300	-0.157	-0.016	-0.855	-0.264	-0.023
	147.94	-61.829	-0.466	-0.056	0.012	-0.189	-0.044	-1.011	-0.466	-0.056
4)	147.94	-61.829	-0.466	-0.056	0.012	-0.189	-0.044	-1.011	-0.466	-0.056
5)	150.54	-61.601	-0.699	-0.162	0.062	-0.014	-0.030	-0.784	-0.699	-0.162
6)	155.14	-61.537	-0.687	-0.226	-0.001	0.003	-0.002	-0.719	-0.687	-0.226
7)	159.25	-61.549	-0.687	-0.203	-0.004	-0.001	0.013	-0.731	-0.687	-0.203
	160.00	-61.615	-0.625	-0.183	-0.228	0.221	0.049	-0.047	-1.375	-0.183
	180.00	-74.264	3.940	-0.571	-0.066	0.002	-0.003	-0.695	-0.723	-0.571
	200.00	-75.347	4.319	-0.641	0.019	0.097	0.002	-0.861	-0.895	-0.641
	220.00	-76.257	4.920	-0.724	-0.063	0.001	-0.007	-0.793	-0.800	-0.724
	240.00	-77.655	4.846	-0.868	-0.071	-0.005	-0.007	-0.831	-0.835	-0.868
	260.00	-79.174	4.732	-0.673	-0.072	-0.005	0.114	-0.883	-0.883	-0.673
	280.00	-80.602	4.607	0.312	-0.073	-0.007	-0.009	-0.936	-0.930	0.312
	300.00	-82.393	4.285	0.130	-0.025	0.034	-0.005	-2.185	-2.023	0.130
	320.00	-83.504	4.466	-0.015	-0.081	-0.003	-0.008	-2.242	-2.103	-0.015
	340.00	-84.962	4.364	-0.183	-0.073	-0.007	-0.009	-2.408	-2.231	-0.183
	360.00	-86.518	4.235	-0.347	-0.076	-0.006	-0.008	-2.580	-2.387	-0.347
	380.00	-87.973	4.125	-0.508	-0.074	-0.005	-0.008	-2.763	-2.545	-0.508
	400.00	-89.432	4.002	-0.666	-0.067	-0.007	-0.008	-2.980	-2.721	-0.666
	420.00	-90.928	3.889	-0.815	-0.074	-0.004	-0.007	-3.199	-2.921	-0.815
	440.00	-92.470	3.784	-0.955	-0.078	-0.004	-0.007	-3.444	-3.135	-0.955
	460.00	-93.936	3.670	0.331	-0.073	-0.007	-0.029	-3.732	-3.371	0.331
	480.00	-95.470	3.545	-0.238	-0.080	-0.005	-0.028	-4.029	-3.638	-0.238
	500.00	-98.371	2.877	-0.734	0.182	-0.075	-0.036	-4.758	-3.831	-0.734
8)	508.12	-97.136	2.813	-0.803	-0.013	-0.013	0.011	-4.578	-4.037	-0.803
9)	518.12	-97.320	2.660	-0.692	-0.017	-0.014	0.011	-4.762	-4.191	-0.692
	530.00	-97.497	2.507	-0.556	-0.013	-0.012	0.012	-4.939	-4.344	-0.556
10)	530.00	-97.497	2.507	-0.556	-0.013	-0.012	0.012	-4.939	-4.344	-0.556
	600.00	-111.418	2.934	-1.409	0.000	0.000	0.000	0.000	-0.000	0.000
	700.00	-118.228	2.756	-1.747	0.000	0.000	0.000	0.000	-0.000	0.000
	800.00	-125.036	2.539	-2.062	0.000	0.000	0.000	0.000	-0.000	0.000
	900.00	-131.842	2.286	-2.349	0.000	0.000	0.000	0.000	-0.000	0.000
	1000.00	-138.646	2.000	-2.603	0.000	0.000	0.000	0.000	-0.000	0.000

1) Separation Completed;
2) J-2 Start Command, First Burn;
3) Terminate Ullage Burn;
4) 90% Thrust Level, First Burn;
5) Command P.U. Activation, First Burn;
6) Ullage Case Jettison;
7) I.G.M. Initiation;
8) Guidance Cutoff Signal;
9) Orbit Insertion;
10) Initiate Local Horizontal Attitude Hold.

TABLE 8 - 5 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE FIRST BURN, FIRST ORBIT COAST AND S-IVB STAGE SECOND BURN DATA

FLIGHT TIME (SEC)	VEHICLE ATTITUDE ANGLE PITCH (DEG)	YAW (DEG)	ROLL (DEG)	VEHICLE ATTITUDE RATE PITCH (DEG/S)	YAW (DEG/S)	ROLL (DEG/S)	VEHICLE ATTITUDE ERROR PITCH (DEG)	YAW (DEG)	ROLL (DEG)
1100.00	-145.447	1.686	-2.822	0.000	0.000	0.000	0.000	-0.000	0.000
1200.00	-152.247	1.347	-3.003	0.000	0.000	0.000	0.000	-0.000	0.000
1300.00	-159.045	0.989	-3.141	0.000	0.000	0.000	0.000	-0.000	0.000
1400.00	-165.842	0.617	-3.237	0.000	0.000	0.000	0.000	-0.000	0.000
1500.00	-172.638	0.234	-3.287	0.000	0.000	0.000	0.000	-0.000	0.000
1600.00	-179.434	-0.152	-3.292	0.000	0.000	0.000	0.000	0.000	0.000
1700.00	173.770	-0.538	-3.251	0.000	0.000	0.000	-0.000	0.000	0.000
1800.00	166.973	-0.916	-3.165	0.000	0.000	0.000	-0.000	0.000	0.000
1900.00	160.174	-1.284	-3.034	0.000	0.000	0.000	-0.000	0.000	0.000
2000.00	153.373	-1.634	-2.861	0.000	0.000	0.000	-0.000	0.000	0.000
2100.00	146.571	-1.962	-2.647	0.000	0.000	0.000	-0.000	0.000	0.000
2200.00	139.766	-2.264	-2.396	0.000	0.000	0.000	-0.000	0.000	0.000
2300.00	132.958	-2.535	-2.111	0.000	0.000	0.000	-0.000	0.000	0.000
2400.00	126.149	-2.771	-1.795	0.000	0.000	0.000	-0.000	0.000	0.000
2500.00	119.338	-2.969	-1.454	0.000	0.000	0.000	-0.000	0.000	0.000
2600.00	112.525	-3.126	-1.091	0.000	0.000	0.000	-0.000	0.000	0.000
2700.00	105.711	-3.240	-0.713	0.000	0.000	0.000	-0.000	0.000	0.000
2800.00	98.897	-3.309	-0.323	0.000	0.000	0.000	-0.000	0.000	0.000
2900.00	92.083	-3.332	0.072	0.000	0.000	0.000	-0.000	0.000	-0.000
3000.00	85.270	-3.308	0.467	0.000	0.000	0.000	-0.000	0.000	-0.000
3100.00	78.459	-3.239	0.857	0.000	0.000	0.000	-0.000	0.000	-0.000
3200.00	71.650	-3.124	1.235	0.000	0.000	0.000	-0.000	0.000	-0.000
3300.00	64.844	-2.965	1.597	0.000	0.000	0.000	-0.000	0.000	-0.000
3400.00	58.041	-2.764	1.937	0.000	0.000	0.000	-0.000	0.000	-0.000
3500.00	51.242	-2.525	2.251	0.000	0.000	0.000	-0.000	0.000	-0.000
3600.00	44.447	-2.249	2.535	0.000	0.000	0.000	-0.000	0.000	-0.000
3700.00	37.655	-1.942	2.783	0.000	0.000	0.000	-0.000	0.000	-0.000
3800.00	30.868	-1.608	2.994	0.000	0.000	0.000	-0.000	0.000	-0.000
3900.00	24.083	-1.250	3.163	0.000	0.000	0.000	-0.000	0.000	-0.000
4000.00	17.302	-0.874	3.289	0.000	0.000	0.000	-0.000	0.000	-0.000
4100.00	10.523	-0.485	3.369	0.000	0.000	0.000	-0.000	0.000	-0.000
4200.00	3.746	-0.088	3.403	0.000	0.000	0.000	-0.000	0.000	-0.000
4300.00	-3.031	0.310	3.390	0.000	0.000	0.000	0.000	-0.000	-0.000
4400.00	-9.806	0.706	3.330	0.000	0.000	0.000	0.000	-0.000	-0.000
4500.00	-16.582	1.092	3.224	0.000	0.000	0.000	0.000	-0.000	-0.000

TABLE 8- 5 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE FIRST BURN, FIRST ORBIT COAST AND S-IVB STAGE SECOND BURN DATA

FLIGHT TIME (SEC)	VEHICLE ATTITUDE ANGLE PITCH (DEG)	YAW (DEG)	ROLL (DEG)	VEHICLE ATTITUDE RATE PITCH (DEG/S)	YAW (DEG/S)	ROLL (DEG/S)	VEHICLE ATTITUDE ERROR PITCH (DEG)	YAW (DEG)	ROLL (DEG)
4600.00	-23.359	1.464	3.072	0.000	0.000	0.000	0.000	-0.000	-0.000
4700.00	-30.137	1.817	2.878	0.000	0.000	0.000	0.000	-0.000	-0.000
4800.00	-36.917	2.146	2.643	0.000	0.000	0.000	0.000	-0.000	-0.000
4900.00	-43.699	2.445	2.371	0.000	0.000	0.000	0.000	-0.000	-0.000
5000.00	-50.484	2.712	2.066	0.000	0.000	0.000	0.000	-0.000	-0.000
5100.00	-57.271	2.941	1.731	0.000	0.000	0.000	0.000	-0.000	-0.000
5200.00	-64.059	3.130	1.371	0.000	0.000	0.000	0.000	-0.000	-0.000
5300.00	-70.850	3.277	0.991	0.000	0.000	0.000	0.000	-0.000	-0.000
5400.00	-77.643	3.378	0.596	0.000	0.000	0.000	0.000	-0.000	-0.000
5500.00	-84.436	3.432	0.192	0.000	0.000	0.000	0.000	-0.000	-0.000
5600.00	-91.230	3.439	-0.215	0.000	0.000	0.000	0.000	-0.000	0.000
5700.00	-98.024	3.398	-0.621	0.000	0.000	0.000	0.000	-0.000	0.000
5800.00	-104.817	3.310	-1.019	0.000	0.000	0.000	0.000	-0.000	0.000
5900.00	-111.609	3.176	-1.403	0.000	0.000	0.000	0.000	-0.000	0.000
6000.00	-118.399	2.997	-1.769	0.000	0.000	0.000	0.000	-0.000	0.000
6100.00	-125.187	2.776	-2.112	0.000	0.000	0.000	0.000	-0.000	0.000
6200.00	-131.973	2.516	-2.425	0.000	0.000	0.000	0.000	-0.000	0.000
6300.00	-138.756	2.221	-2.706	0.000	0.000	0.000	0.000	-0.000	0.000
6400.00	-145.538	1.894	-2.950	0.000	0.000	0.000	0.000	-0.000	0.000
6500.00	-152.317	1.540	-3.153	0.000	0.000	0.000	0.000	-0.000	0.000
6600.00	-159.094	1.164	-3.313	0.000	0.000	0.000	0.000	-0.000	0.000
6700.00	-165.870	0.771	-3.428	0.000	0.000	0.000	0.000	-0.000	0.000
6800.00	-172.645	0.366	-3.495	0.000	0.000	0.000	0.000	-0.000	0.000
6900.00	-179.420	-0.045	-3.514	0.000	0.000	0.000	0.000	0.000	0.000
7000.00	173.804	-0.456	-3.484	0.000	0.000	0.000	-0.000	0.000	0.000
7100.00	167.028	-0.862	-3.406	0.000	0.000	0.000	-0.000	0.000	0.000
7200.00	160.250	-1.257	-3.281	0.000	0.000	0.000	-0.000	0.000	0.000
7300.00	153.470	-1.636	-3.109	0.000	0.000	0.000	-0.000	0.000	0.000
7400.00	146.687	-1.993	-2.894	0.000	0.000	0.000	-0.000	0.000	0.000
7500.00	139.902	-2.323	-2.639	0.000	0.000	0.000	-0.000	0.000	0.000
7600.00	133.115	-2.621	-2.346	0.000	0.000	0.000	-0.000	0.000	0.000
7700.00	126.324	-2.884	-2.019	0.000	0.000	0.000	-0.000	0.000	0.000
7800.00	119.532	-3.107	-1.664	0.000	0.000	0.000	-0.000	0.000	0.000
7900.00	112.737	-3.288	-1.284	0.000	0.000	0.000	-0.000	0.000	0.000
8000.00	105.941	-3.423	-0.886	0.000	0.000	0.000	-0.000	0.000	0.000

TABLE 8 - 5 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE FIRST BURN, FIRST ORBIT COAST AND S-IVB STAGE SECOND BURN DATA

FLIGHT TIME (SEC)	VEHICLE ATTITUDE ANGLE PITCH (DEG)	YAW (DEG)	ROLL (DEG)	VEHICLE ATTITUDE RATE PITCH (DEG/S)	YAW (DEG/S)	ROLL (DEG/S)	VEHICLE ATTITUDE ERROR PITCH (DEG)	YAW (DEG)	ROLL (DEG)
8100.00	99.144	-3.511	-0.475	0.000	0.000	0.000	-0.000	0.000	0.000
8200.00	92.348	-3.551	-0.056	0.000	0.000	0.000	-0.000	0.000	0.000
8300.00	85.552	-3.541	0.365	0.000	0.000	0.000	-0.000	0.000	-0.000
8400.00	78.757	-3.482	0.782	0.000	0.000	0.000	-0.000	0.000	-0.000
8500.00	71.965	-3.374	1.188	0.000	0.000	0.000	-0.000	0.000	-0.000
8600.00	65.175	-3.219	1.579	0.000	0.000	0.000	-0.000	0.000	-0.000
8700.00	58.389	-3.020	1.949	0.000	0.000	0.000	-0.000	0.000	-0.000
8800.00	51.607	-2.778	2.292	0.000	0.000	0.000	-0.000	0.000	-0.000
8900.00	44.829	-2.497	2.605	0.000	0.000	0.000	-0.000	0.000	-0.000
9000.00	38.056	-2.180	2.881	0.000	0.000	0.000	-0.000	0.000	-0.000
9100.00	31.286	-1.833	3.119	0.000	0.000	0.000	-0.000	0.000	-0.000
9200.00	24.520	-1.460	3.313	0.000	0.000	0.000	-0.000	0.000	-0.000
9300.00	17.757	-1.066	3.463	0.000	0.000	0.000	-0.000	0.000	-0.000
9400.00	10.997	-0.657	3.564	0.000	0.000	0.000	-0.000	0.000	-0.000
9500.00	4.240	-0.237	3.617	0.000	0.000	0.000	-0.000	0.000	-0.000
9600.00	-2.517	0.187	3.620	0.000	0.000	0.000	0.000	-0.000	-0.000
9700.00	-9.273	0.609	3.573	0.000	0.000	0.000	0.000	-0.000	-0.000
9800.00	-16.029	1.024	3.477	0.000	0.000	0.000	0.000	-0.000	-0.000
9900.00	-22.786	1.425	3.332	0.000	0.000	0.000	0.000	-0.000	-0.000
10000.00	-29.545	1.808	3.141	0.000	0.000	0.000	0.000	-0.000	-0.000
10100.00	-36.306	2.167	2.907	0.000	0.000	0.000	0.000	-0.000	-0.000
10200.00	-43.069	2.497	2.631	0.000	0.000	0.000	0.000	-0.000	-0.000
10300.00	-49.836	2.792	2.318	0.000	0.000	0.000	0.000	-0.000	-0.000
10400.00	-56.605	3.051	1.973	0.000	0.000	0.000	0.000	-0.000	-0.000
10500.00	-63.377	3.267	1.599	0.000	0.000	0.000	0.000	-0.000	-0.000
10600.00	-70.151	3.439	1.203	0.000	0.000	0.000	0.000	-0.000	-0.000
10700.00	-76.928	3.563	0.789	0.000	0.000	0.000	0.000	-0.000	-0.000
10800.00	-83.706	3.639	0.362	0.000	0.000	0.000	0.000	-0.000	-0.000
10900.00	-90.485	3.665	-0.070	0.000	0.000	0.000	0.000	-0.000	0.000
10943.00	-93.400	3.660	-0.256	0.000	0.000	0.000	0.000	-0.000	0.000
11) 10943.00	-93.400	3.660	-0.256	0.000	0.000	0.000	0.000	-0.000	0.000
11000.00	-97.264	3.639	-0.502	0.000	0.000	0.000	0.000	-0.000	0.000
11100.00	-104.043	3.564	-0.929	0.000	0.000	0.000	0.000	-0.000	0.000
11200.00	-110.821	3.439	-1.343	0.000	0.000	0.000	0.000	-0.000	0.000
11300.00	-117.597	3.266	-1.740	0.000	0.000	0.000	0.000	-0.000	0.000

11) Guaymas Acquisition, Start Time Base 5.

TABLE 8-5 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE FIRST BURN, FIRST ORBIT COAST AND S-IVB STAGE SECOND BURN DATA

	FLIGHT TIME (SEC)	VEHICLE ATTITUDE ANGLE PITCH (DEG)	YAW (DEG)	ROLL (DEG)	VEHICLE ATTITUDE RATE PITCH (DEG/S)	YAW (DEG/S)	ROLL (DEG/S)	VEHICLE ATTITUDE ERROR PITCH (DEG)	YAW (DEG)	ROLL (DEG)
12)	11333.00	-119.833	3.198	-1.866	0.000	0.000	0.000	0.000	-0.000	0.000
13)	11334.20	-119.914	3.196	-1.870	0.000	0.000	0.000	0.000	-0.000	0.000
14)	11363.00	-121.861	3.133	-1.978	0.000	0.000	0.000	0.000	-0.000	0.000
15)	11393.00	-121.861	3.133	-1.978	0.000	0.000	0.000	0.000	-0.000	0.000
	11395.00	-121.861	3.133	-1.978	0.000	0.000	0.000	0.000	-0.000	0.000
16)	11396.00	-121.861	3.133	-1.978	0.000	0.000	0.000	0.000	-0.000	0.000
	11400.00	-121.861	3.133	-1.978	0.000	0.000	0.000	0.000	-0.000	0.000
17)	11401.00	-121.861	3.133	-1.978	-0.001	-0.001	-0.000	-0.000	-0.000	-0.000
	11403.50	-123.599	1.495	-2.048	-3.057	-2.885	-0.080	-1.739	-1.638	-0.070
18)	11403.50	-123.599	1.495	-2.048	-3.057	-2.885	-0.080	-1.739	-1.638	-0.070
	11405.00	-126.646	-1.372	-2.052	-0.970	-0.862	0.029	-4.785	-4.505	-0.074
19)	11406.00	-127.139	-1.747	-2.028	-0.112	0.002	0.015	-5.279	-4.880	-0.051
	11410.00	-126.599	-1.103	-2.049	0.011	-0.004	-0.010	-4.738	-4.236	-0.071
	11415.00	-126.705	-1.216	-2.085	-0.017	-0.014	-0.006	-4.845	-4.349	-0.107
	11420.00	-126.788	-1.287	-2.118	-0.017	-0.015	-0.007	-4.927	-4.421	-0.141
	11425.00	-126.877	-1.367	-2.152	-0.018	-0.015	-0.007	-5.016	-4.500	-0.174
	11430.00	-126.968	-1.442	-2.184	-0.018	-0.016	-0.007	-5.107	-4.576	-0.206
	11435.00	-127.059	-1.528	-2.218	-0.019	-0.017	-0.007	-5.198	-4.661	-0.240
	11440.00	-127.155	-1.612	-2.250	-0.019	-0.016	-0.006	-5.294	-4.745	-0.272
	11445.00	-127.252	-1.691	-2.281	-0.019	-0.016	-0.006	-5.391	-4.824	-0.303
	11450.00	-127.345	-1.771	-2.313	-0.019	-0.017	-0.007	-5.484	-4.904	-0.335
	11455.00	-127.437	-1.859	-2.346	-0.019	-0.017	-0.006	-5.576	-4.992	-0.369
	11460.00	-127.529	-1.937	-2.378	-0.018	-0.015	-0.006	-5.669	-5.070	-0.400
	11465.00	-127.595	-1.988	-2.410	0.002	0.002	-0.007	-5.735	-5.122	-0.432
20)	11467.96	-127.583	-1.977	-2.432	0.005	0.005	-0.007	-5.723	-5.110	-0.454
	11470.00	-127.573	-1.967	-2.447	0.005	0.004	-0.007	-5.712	-5.100	-0.469
	11475.00	-127.549	-1.946	-2.485	0.005	0.004	-0.007	-5.689	-5.079	-0.507
21)	11477.96	-127.536	-1.934	-2.507	0.004	0.004	-0.007	-5.676	-5.067	-0.529

12) Initiate Helium Ullage Control;
13) Terminate C.V.S. LH2 Venting;
14) Inertial Attitude Command Freeze;
15) J2 Start Command, Second Burn, Begin Fuel Lead;
16) Terminate Helium Ullage Control;
17) J-2 Ignition, Second Burn;
18) 90% Thrust Level, Second Burn;
19) Command P.U. Activation, Second Burn
20) Depletion Cutoff;
21) End LOX Vent.

TABLE 9 - 1

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

SECOND ORBITAL COAST DATA

	FLIGHT TIME (SEC)	RADIUS (M)	SPACE FIXED VELOCITY (M/S)	PATH ANGLE * (DEG)	SPACE FIXED POSITION AND VELOCITY VECTORS X (M)	Y (M)	Z (M)	DX (M/S)	DY (M/S)	DZ (M/S)
1)	11477.96	6590660.	10427.78	1.213	5012810.	269504.	4270352.	-6598.74	267.77	8069.91
	11497.96	6596537.	10422.64	2.017	4879452.	274786.	4430546.	-6736.40	260.44	7948.88
2)	11497.96	6596537.	10422.64	2.017	4879452.	274786.	4430546.	-6736.40	260.44	7948.88
	11505.70	6599593.	10419.97	2.327	4827124.	276790.	4491869.	-6788.54	257.57	7900.96
3)	11505.70	6599593.	10419.97	2.327	4827124.	276790.	4491869.	-6788.54	257.57	7900.96
	11587.96	6658747.	10368.53	5.598	4247061.	296696.	5119898.	-7301.08	226.14	7358.63
4)	11587.96	6658747.	10368.53	5.598	4247061.	296696.	5119898.	-7301.08	226.14	7358.63
	11600.00	6671427.	10357.57	6.070	4158759.	299390.	5207978.	-7369.26	221.44	7274.91
	11800.00	7021207.	10066.51	13.534	2590490.	335818.	6517203.	-8226.19	143.25	5800.33
	12000.00	7592096.	9633.23	20.013	901113.	357211.	7529961.	-8595.26	72.63	4349.19
	12200.00	8318695.	9144.65	25.393	-823854.	365769.	8269713.	-8608.06	15.30	3086.38
	12400.00	9144214.	8658.41	29.773	-2528184.	364229.	8780220.	-8410.43	-28.62	2057.14
	12600.00	10027134.	8202.83	33.328	-4181135.	355067.	9106891.	-8108.00	-61.37	1242.18
	12800.00	10939576.	7787.88	36.230	-5768681.	340247.	9288749.	-7764.09	-85.60	602.18
	13000.00	11863555.	7414.32	38.620	-7286324.	321243.	9356827.	-7412.95	-103.54	98.42
	13200.00	12787686.	7079.10	40.610	-8734541.	299138.	9335053.	-7071.73	-116.86	-301.01
	13400.00	13704839.	6777.89	42.283	-10116206.	274724.	9241727.	-5748.23	-126.80	-620.63
	13600.00	14610608.	6506.33	43.704	-11435207.	248586.	9090881.	-6445.31	-134.22	-878.85
	13800.00	15502327.	6260.42	44.919	-12695725.	221160.	8893357.	-6163.32	-139.77	-1089.37
	14000.00	16378452.	6036.66	45.968	-13901875.	192774.	8657621.	-5901.42	-143.89	-1262.45
	14200.00	17238162.	5832.08	46.877	-15057537.	163676.	8390353.	-5658.20	-146.93	-1405.81
	14400.00	18081110.	5644.17	47.671	-16166294.	134059.	8096883.	-5432.11	-149.12	-1525.33
	14600.00	18907255.	5470.81	48.366	-17231414.	104073.	7781506.	-5221.57	-150.65	-1625.53
	14800.00	19716750.	5310.22	48.977	-18255854.	73835.	7447723.	-5025.09	-151.66	-1709.92
	15000.00	20509878.	5160.87	49.516	-19242293.	43438.	7098406.	-4841.33	-152.25	-1781.26
	15200.00	21286998.	5021.49	49.992	-20193148.	12956.	6735939.	-4669.06	-152.52	-1841.75
	15400.00	22048513.	4890.99	50.413	-21110604.	-17552.	6362313.	-4507.17	-152.52	-1893.12
	15600.00	22794853.	4768.42	50.786	-21996640.	-48037.	5979202.	-4354.70	-152.30	-1936.80
	15800.00	23526454.	4652.97	51.115	-22853049.	-78460.	5588025.	-4210.77	-151.91	-1973.95
	16000.00	24243751.	4543.95	51.406	-23681462.	-108791.	5189992.	-4074.62	-151.37	-2005.51
	16200.00	24947176.	4440.75	51.662	-24483365.	-139002.	4786141.	-3945.56	-150.72	-2032.25
	16400.00	25637146.	4342.83	51.887	-25260114.	-169072.	4377366.	-3822.99	-149.97	-2054.85
	16600.00	26314065.	4249.72	52.083	-26012952.	-198984.	3964441.	-3706.36	-149.14	-2073.84
	16800.00	26978323.	4161.03	52.254	-26743018.	-228724.	3548041.	-3595.20	-148.25	-2089.68
	17000.00	27630291.	4076.38	52.401	-27451361.	-258280.	3128754.	-3489.06	-147.30	-2102.76

1) End LOX Vent;
2) Command Local Horizontal Attitude Hold;
3) Local Horizontal Attitude Achieved;
4) End LH_2 Vent.

* Relative to local horizontal.

TABLE 9 - 1 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
SECOND ORBITAL COAST DATA

FLIGHT TIME (SEC)	RADIUS (M)	SPACE FIXED VELOCITY (M/S)	PATH ANGLE * (DEG)	SPACE FIXED POSITION AND VELOCITY VECTORS X (M)	Y (M)	Z (M)	DX (M/S)	DY (M/S)	DZ (M/S)
17200.00	28270328.	3995.45	52.527	-28138947.	-287642.	2707097.	-3387.57	-146.31	-2113.42
17400.00	28898773.	3917.95	52.632	-28806670.	-316803.	2283527.	-3290.37	-145.29	-2121.95
17600.00	29515952.	3843.63	52.719	-29455357.	-345755.	1858444.	-3197.16	-144.23	-2128.58
17800.00	30122172.	3772.25	52.788	-30085774.	-374494.	1432206.	-3107.64	-143.16	-2133.53
18000.00	30717730.	3703.61	52.841	-30698635.	-403016.	1005130.	-3021.56	-142.06	-2136.99
18200.00	31302905.	3637.52	52.878	-31294606.	-431317.	577500.	-2938.69	-140.95	-2139.11
18400.00	31877966.	3573.81	52.901	-31874305.	-459395.	149567.	-2858.81	-139.83	-2140.03
18600.00	32443167.	3512.32	52.911	-32438313.	-487247.	-278441.	-2781.74	-138.70	-2139.88
18800.00	32998749.	3452.92	52.908	-32987172.	-514873.	-706320.	-2707.30	-137.56	-2138.76
19000.00	33544945.	3395.48	52.892	-33521390.	-542271.	-1133887.	-2635.32	-136.42	-2136.77
19200.00	34081972.	3339.88	52.865	-34041444.	-569440.	-1560976.	-2565.65	-135.28	-2134.00
19400.00	34610042.	3286.02	52.827	-34547785.	-596381.	-1987437.	-2498.17	-134.13	-2130.51
19600.00	35129357.	3233.79	52.777	-35040838.	-623093.	-2413135.	-2432.74	-132.99	-2126.37
19800.00	35640109.	3183.10	52.718	-35521001.	-649577.	-2837945.	-2369.26	-131.85	-2121.65
20000.00	36142480.	3133.88	52.649	-35988652.	-675832.	-3261757.	-2307.60	-130.71	-2116.39
20200.00	36636645.	3086.05	52.570	-36444147.	-701859.	-3684468.	-2247.68	-129.57	-2110.64
20400.00	37122772.	3039.53	52.482	-36887825.	-727660.	-4105985.	-2189.41	-128.44	-2104.45
20600.00	37601021.	2994.26	52.385	-37320005.	-753234.	-4526222.	-2132.69	-127.31	-2097.86
20800.00	38071545.	2950.18	52.279	-37740990.	-778582.	-4945102.	-2077.45	-126.18	-2090.89
21000.00	38534491.	2907.23	52.164	-38151069.	-803707.	-5362554.	-2023.62	-125.06	-2083.58
21200.00	38989999.	2865.36	52.041	-38550516.	-828607.	-5778511.	-1971.12	-123.95	-2075.95
21400.00	39438206.	2824.52	51.910	-38939593.	-853285.	-6192914.	-1919.90	-122.84	-2068.04
21600.00	39879241.	2784.66	51.771	-39318546.	-877742.	-6605708.	-1869.89	-121.73	-2059.86
21800.00	40313228.	2745.74	51.624	-39687614.	-901978.	-7016841.	-1821.03	-120.63	-2051.44
22000.00	40740286.	2707.73	51.469	-40047022.	-925995.	-7426267.	-1773.28	-119.54	-2042.79
22200.00	41160531.	2670.58	51.307	-40396987.	-949794.	-7833942.	-1726.59	-118.45	-2033.93
22400.00	41574073.	2634.27	51.137	-40737714.	-973376.	-8239826.	-1680.90	-117.37	-2024.88
22600.00	41981020.	2598.74	50.959	-41069403.	-996743.	-8643882.	-1636.18	-116.30	-2015.65
22800.00	42381471.	2563.99	50.774	-41392240.	-1019895.	-9046074.	-1592.38	-115.23	-2006.26
23000.00	42775527.	2529.97	50.582	-41706406.	-1042834.	-9446372.	-1549.47	-114.16	-1996.71
23200.00	43163282.	2496.66	50.382	-42012075.	-1065560.	-9844745.	-1507.41	-113.10	-1987.02
23400.00	43544826.	2464.04	50.174	-42309414.	-1088076.	-10241167.	-1466.16	-112.05	-1977.19
23600.00	43920250.	2432.07	49.960	-42598583.	-1110381.	-10635611.	-1425.70	-111.01	-1967.24
23800.00	44289637.	2400.75	49.738	-42879733.	-1132478.	-11028054.	-1385.98	-109.97	-1957.18
24000.00	44653070.	2370.04	49.509	-43153014.	-1154367.	-11418473.	-1346.99	-108.93	-1947.01

* Relative to local horizontal.

TABLE 9 - 1 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
SECOND ORBITAL COAST DATA

FLIGHT TIME (SEC)	RADIUS (M)	SPACE FIXED VELOCITY (M/S)	PATH ANGLE* (DEG)	SPACE FIXED POSITION AND VELOCITY VECTORS X (M)	Y (M)	Z (M)	DX (M/S)	DY (M/S)	DZ (M/S)
24200.00	45010627.	2339.93	49.273	-43418566.	-1176050.	-11806847.	-1308.70	-107.90	-1936.73
24400.00	45362387.	2310.39	49.029	-43676527.	-1197527.	-12193157.	-1271.07	-106.88	-1926.36
24600.00	45708421.	2281.42	48.778	-43927027.	-1218800.	-12577384.	-1234.08	-105.86	-1915.91
24800.00	46048800.	2252.98	48.520	-44170192.	-1239870.	-12959511.	-1197.72	-104.84	-1905.36
25000.00	46383595.	2225.08	48.254	-44406144.	-1260737.	-13339522.	-1161.95	-103.83	-1894.75
25200.00	46712871.	2197.68	47.981	-44635000.	-1281404.	-13717402.	-1126.76	-102.83	-1884.05
25400.00	47036693.	2170.79	47.701	-44856875.	-1301870.	-14093135.	-1092.13	-101.83	-1873.29
25600.00	47355126.	2144.38	47.413	-45071878.	-1322136.	-14466710.	-1058.03	-100.84	-1862.46
25800.00	47668225.	2118.44	47.118	-45280112.	-1342205.	-14838113.	-1024.45	-99.85	-1851.57
26000.00	47976051.	2092.96	46.815	-45481681.	-1362076.	-15207331.	-991.37	-98.86	-1840.62
26200.00	48278660.	2067.92	46.504	-45676682.	-1381750.	-15574354.	-958.77	-97.88	-1829.61
26400.00	48576106.	2043.33	46.186	-45865210.	-1401229.	-15939170.	-926.65	-96.91	-1818.55
26600.00	48868444.	2019.16	45.860	-46047360.	-1420513.	-16301769.	-894.97	-95.94	-1807.44
26800.00	49155724.	1995.41	45.526	-46223218.	-1439603.	-16662140.	-863.73	-94.97	-1796.28
27000.00	49437996.	1972.07	45.184	-46392871.	-1458500.	-17020274.	-832.91	-94.00	-1785.07
27200.00	49715306.	1949.13	44.834	-46556402.	-1477205.	-17376162.	-802.51	-93.05	-1773.82
27400.00	49987703.	1926.59	44.477	-46713892.	-1495718.	-17729795.	-772.50	-92.09	-1762.53
5) 27518.00	50146131.	1913.47	44.262	-46804009.	-1506552.	-17937378.	-754.98	-91.53	-1755.84

5) Loss of Attitude Control.

* Relative to local horizontal.

TABLE 9 - 2
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
SECOND ORBITAL COAST DATA

	FLIGHT TIME (SEC)	*VEHICLE ATTITUDE PITCH (DEG)	YAW (DEG)	PITCH ATTITUDE (LOCAL HORIZONTAL) (DEG)	THRUST (N)	MASS (KG)	AXIAL FORCE (N)	NORMAL FORCE (N)
1)	11478.0	-37.54	-1.93	2.99	0.00	15896.83	-0.00	0.00
	11498.0	-39.13	-1.48	3.17	0.00	15893.20	-0.00	0.00
2)	11498.0	-39.13	-1.48	3.17	0.00	15893.20	-0.00	0.00
	11505.7	-43.00	-1.32	0.00	0.00	15891.79	-0.00	0.00
3)	11505.7	-43.00	-1.32	0.00	0.00	15891.79	-0.00	0.00
	11588.0	-50.37	-1.01	0.00	0.00	15876.87	-0.00	0.00
4)	11588.0	-50.37	-1.01	0.00	0.00	15876.87	-0.00	0.00
	11600.0	-51.43	-0.96	0.00	0.00	15876.77	-0.00	0.00
	11800.0	-68.33	-0.18	0.00	0.00	15876.77	-0.00	0.00
	12000.0	-83.15	0.52	0.00	0.00	15876.77	-0.00	0.00
	12200.0	-95.64	1.09	0.00	0.00	15876.77	-0.00	0.00
	12400.0	-106.00	1.52	-0.00	0.00	15876.77	-0.00	0.00
	12600.0	-114.60	1.85	0.00	0.00	15876.77	-0.00	0.00
	12800.0	-121.78	2.09	-0.00	0.00	15876.77	-0.00	0.00
	13000.0	-127.85	2.26	0.00	0.00	15876.77	-0.00	0.00
	13200.0	-133.04	2.40	-0.00	0.00	15876.77	-0.00	0.00
	13400.0	-137.54	2.49	-0.00	0.00	15876.77	-0.00	0.00
	13600.0	-141.47	2.57	-0.00	0.00	15876.77	-0.00	0.00
	13800.0	-144.95	2.62	-0.00	0.00	15876.77	-0.00	0.00
	14000.0	-148.06	2.66	0.00	0.00	15876.77	-0.00	0.00
	14200.0	-150.85	2.69	-0.00	0.00	15876.77	-0.00	0.00
	14400.0	-153.38	2.72	0.00	0.00	15876.77	-0.00	0.00
	14600.0	-155.68	2.73	0.00	0.00	15876.77	-0.00	0.00
	14800.0	-157.80	2.74	-0.00	0.00	15876.77	-0.00	0.00
	15000.0	-159.75	2.75	0.00	0.00	15876.77	-0.00	0.00
	15200.0	-161.55	2.75	0.00	0.00	15876.77	-0.00	0.00
	15400.0	-163.23	2.75	-0.00	0.00	15876.77	-0.00	0.00
	15600.0	-164.80	2.75	0.00	0.00	15876.77	-0.00	0.00
	15800.0	-166.27	2.74	0.00	0.00	15876.77	-0.00	0.00
	16000.0	-167.65	2.74	-0.00	0.00	15876.77	-0.00	0.00
	16200.0	-168.95	2.73	0.00	0.00	15876.77	-0.00	0.00
	16400.0	-170.19	2.73	-0.00	0.00	15876.77	-0.00	0.00
	16600.0	-171.36	2.72	0.00	0.00	15876.77	-0.00	0.00
	16800.0	-172.47	2.71	-0.00	0.00	15876.77	-0.00	0.00
	17000.0	-173.52	2.70	-0.00	0.00	15876.77	-0.00	0.00

1) End LOX Vent;
2) Command Local Horizontal Attitude Hold;
3) Local Horizontal Attitude Achieved;
4) End LH_2 Vent.

* Referenced to the Z_s axis (PASCS - 13) measured positive counter clockwise.

TABLE 9 - 2 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
SECOND ORBITAL COAST DATA

FLIGHT TIME (SEC)	*VEHICLE ATTITUDE PITCH (DEG)	YAW (DEG)	PITCH ATTITUDE (LOCAL HORIZONTAL) (DEG)	THRUST (N)	MASS (KG)	AXIAL FORCE (N)	NORMAL FORCE (N)
17200.0	-174.53	2.69	0.00	0.00	15876.77	-0.00	0.00
17400.0	-175.50	2.68	0.00	0.00	15876.77	-0.00	0.00
17600.0	-176.42	2.67	0.00	0.00	15876.77	-0.00	0.00
17800.0	-177.31	2.66	-0.00	0.00	15876.77	-0.00	0.00
18000.0	-178.16	2.65	0.00	0.00	15876.77	-0.00	0.00
18200.0	-178.98	2.64	-0.00	0.00	15876.77	-0.00	0.00
18400.0	-179.77	2.63	-0.00	0.00	15876.77	-0.00	0.00
18600.0	179.47	2.61	0.00	0.00	15876.77	-0.00	0.00
18800.0	178.73	2.60	0.00	0.00	15876.77	-0.00	0.00
19000.0	178.02	2.59	-0.00	0.00	15876.77	-0.00	0.00
19200.0	177.33	2.58	0.00	0.00	15876.77	-0.00	0.00
19400.0	176.66	2.57	-0.00	0.00	15876.77	-0.00	0.00
19600.0	176.02	2.56	-0.00	0.00	15876.77	-0.00	0.00
19800.0	175.39	2.55	-0.00	0.00	15876.77	-0.00	0.00
20000.0	174.77	2.54	0.00	0.00	15876.77	-0.00	0.00
20200.0	174.18	2.52	0.00	0.00	15876.77	-0.00	0.00
20400.0	173.60	2.51	-0.00	0.00	15876.77	-0.00	0.00
20600.0	173.03	2.50	0.00	0.00	15876.77	-0.00	0.00
20800.0	172.48	2.49	0.00	0.00	15876.77	-0.00	0.00
21000.0	171.95	2.48	-0.00	0.00	15876.77	-0.00	0.00
21200.0	171.42	2.47	-0.00	0.00	15876.77	-0.00	0.00
21400.0	170.91	2.46	0.00	0.00	15876.77	-0.00	0.00
21600.0	170.41	2.45	0.00	0.00	15876.77	-0.00	0.00
21800.0	169.92	2.44	-0.00	0.00	15876.77	-0.00	0.00
22000.0	169.44	2.43	0.00	0.00	15876.77	-0.00	0.00
22200.0	168.97	2.42	-0.00	0.00	15876.77	-0.00	0.00
22400.0	168.51	2.40	-0.00	0.00	15876.77	-0.00	0.00
22600.0	168.06	2.39	0.00	0.00	15876.77	-0.00	0.00
22800.0	167.61	2.38	-0.00	0.00	15876.77	-0.00	0.00
23000.0	167.18	2.37	-0.00	0.00	15876.77	-0.00	0.00
23200.0	166.75	2.36	0.00	0.00	15876.77	-0.00	0.00
23400.0	166.33	2.35	0.00	0.00	15876.77	-0.00	0.00
23600.0	165.92	2.34	0.00	0.00	15876.77	-0.00	0.00
23800.0	165.52	2.33	0.00	0.00	15876.77	-0.00	0.00
24000.0	165.12	2.32	-0.00	0.00	15876.77	-0.00	0.00

* Referenced to the Z_s axis (PASCS - 13) measured positive counter clockwise.

TABLE 9 - 2 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
SECOND ORBITAL COAST DATA

FLIGHT TIME (SEC)	*VEHICLE ATTITUDE PITCH (DEG)	YAW (DEG)	PITCH ATTITUDE (LOCAL HORIZONTAL) (DEG)	THRUST (N)	MASS (KG)	AXIAL FORCE (N)	NORMAL FORCE (N)
24200.0	164.73	2.31	0.00	0.00	15876.77	-0.00	0.00
24400.0	164.34	2.30	-0.00	0.00	15876.77	-0.00	0.00
24600.0	163.96	2.29	0.00	0.00	15876.77	-0.00	0.00
24800.0	163.59	2.28	-0.00	0.00	15876.77	-0.00	0.00
25000.0	163.22	2.27	-0.00	0.00	15876.77	-0.00	0.00
25200.0	162.85	2.26	0.00	0.00	15876.77	-0.00	0.00
25400.0	162.50	2.25	-0.00	0.00	15876.77	-0.00	0.00
25600.0	162.14	2.24	-0.00	0.00	15876.77	-0.00	0.00
25800.0	161.79	2.23	-0.00	0.00	15876.77	-0.00	0.00
26000.0	161.45	2.22	-0.00	0.00	15876.77	-0.00	0.00
26200.0	161.11	2.21	0.00	0.00	15876.77	-0.00	0.00
26400.0	160.77	2.20	-0.00	0.00	15876.77	-0.00	0.00
26600.0	160.44	2.19	-0.00	0.00	15876.77	-0.00	0.00
26800.0	160.11	2.18	0.00	0.00	15876.77	-0.00	0.00
27000.0	159.79	2.17	-0.00	0.00	15876.77	-0.00	0.00
27200.0	159.47	2.16	-0.00	0.00	15876.77	-0.00	0.00
27400.0	159.15	2.16	-0.00	0.00	15876.77	-0.00	0.00
5) 27518.0	158.97	2.15	-0.00	0.00	15876.77	-0.00	0.00

5) Loss of Attitude Control.

* Reference to the Z_s axis (PASCS - 13) measured positive counter clockwise.

TABLE 9 - 3

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

SECOND ORBITAL COAST DATA

	FLIGHT TIME (SEC)	ALTITUDE (KM)	CENTRAL RANGE ANGLE (DEG)	VELOCITY VECTOR AZIMUTH SPACE FIXED (DEG)	VELOCITY VECTOR AZIMUTH EARTH FIXED (DEG)	LONGITUDE (POS. EAST) (DEG)	GEOCENTRIC DECLINATION (DEG)	GEODETIC LATITUDE (DEG)
1)	11477.96	217.97	40.524	98.283	98.624	-81.771	30.334	30.496
	11497.96	223.76	42.335	99.326	99.712	-79.784	30.056	30.218
2)	11497.96	223.76	42.335	99.326	99.712	-79.784	30.056	30.218
	11505.70	226.77	43.034	99.724	100.128	-79.020	29.941	30.102
3)	11505.70	226.77	43.034	99.724	100.128	-79.020	29.941	30.102
	11587.96	285.45	50.412	103.771	104.359	-71.087	28.435	28.590
4)	11587.96	285.45	50.412	103.771	104.359	-71.087	28.435	28.590
	11600.00	298.05	51.479	104.330	104.945	-69.962	28.176	28.330
	11800.00	646.28	68.391	112.070	113.156	-52.987	22.847	22.972
	12000.00	1215.69	83.226	116.952	118.558	-39.482	16.657	16.746
	12200.00	1941.27	95.727	119.647	121.828	-28.993	10.710	10.764
	12400.00	2766.24	106.094	120.925	123.736	-20.789	5.471	5.496
	12600.00	3648.98	114.688	121.343	124.837	-14.257	1.021	1.025
	12800.00	4561.46	121.869	121.252	125.474	-8.957	-2.714	-2.724
	13000.00	5485.61	127.937	120.863	125.855	-4.580	-5.846	-5.867
	13200.00	6409.99	133.127	120.300	126.104	-0.912	-8.489	-8.517
	13400.00	7327.42	137.619	119.640	126.296	2.200	-10.734	-10.767
	13600.00	8233.47	141.551	118.929	126.479	4.866	-12.658	-12.694
	13800.00	9125.47	145.026	118.196	126.684	7.170	-14.321	-14.359
	14000.00	10001.87	148.126	117.458	126.932	9.174	-15.768	-15.808
	14200.00	10861.83	150.914	116.727	127.238	10.927	-17.039	-17.079
	14400.00	11705.02	153.440	116.008	127.614	12.466	-18.161	-18.201
	14600.00	12531.39	155.742	115.307	128.072	13.821	-19.158	-19.198
	14800.00	13341.10	157.853	114.624	128.621	15.018	-20.050	-20.090
	15000.00	14134.42	159.799	113.962	129.273	16.077	-20.851	-20.891
	15200.00	14911.72	161.601	113.320	130.038	17.013	-21.574	-21.614
	15400.00	15673.41	163.278	112.699	130.929	17.842	-22.230	-22.269
	15600.00	16419.91	164.843	112.098	131.963	18.574	-22.827	-22.865
	15800.00	17151.65	166.309	111.517	133.156	19.221	-23.372	-23.410
	16000.00	17869.09	167.688	110.954	134.529	19.790	-23.872	-23.910
	16200.00	18572.64	168.988	110.408	136.108	20.288	-24.332	-24.369
	16400.00	19262.73	170.216	109.880	137.920	20.723	-24.756	-24.793
	16600.00	19939.76	171.380	109.369	140.000	21.100	-25.148	-25.184
	16800.00	20604.12	172.485	108.872	142.387	21.424	-25.512	-25.547
	17000.00	21256.19	173.536	108.391	145.128	21.699	-25.849	-25.884

1) End LOX Vent;
2) Command Local Horizontal Attitude Hold;
3) Local Horizontal Attitude Achieved;
4) End LH_2 Vent.

TABLE 9 - 3 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
SECOND ORBITAL COAST DATA

FLIGHT TIME (SEC)	ALTITUDE (KM)	CENTRAL RANGE ANGLE (DEG)	VELOCITY VECTOR AZIMUTH SPACE FIXED (DEG)	VELOCITY VECTOR AZIMUTH EARTH FIXED (DEG)	LONGITUDE (POS. EAST) (DEG)	GEOCENTRIC DECLINATION (DEG)	GEODETIC LATITUDE (DEG)
17200.00	21896.32	174.538	107.923	148.271	21.929	-26.163	-26.198
17400.00	22524.85	175.492	107.469	151.872	22.118	-26.456	-26.490
17600.00	23142.11	176.402	107.028	155.982	22.268	-26.730	-26.763
17800.00	23748.41	177.267	106.598	160.646	22.383	-26.986	-27.019
18000.00	24344.04	178.079	106.180	165.890	22.465	-27.226	-27.259
18200.00	24929.28	178.809	105.773	171.705	22.515	-27.452	-27.484
18400.00	25504.41	179.293	105.376	178.029	22.537	-27.663	-27.695
18600.00	26069.67	179.109	104.989	184.744	22.532	-27.863	-27.894
18800.00	26625.31	178.524	104.612	191.672	22.501	-28.051	-28.082
19000.00	27171.56	177.868	104.243	198.632	22.447	-28.228	-28.259
19200.00	27708.64	177.207	103.883	205.321	22.370	-28.395	-28.426
19400.00	28236.76	176.555	103.532	211.657	22.272	-28.554	-28.583
19600.00	28756.12	175.919	103.187	217.491	22.155	-28.703	-28.733
19800.00	29266.92	175.297	102.851	222.756	22.018	-28.845	-28.874
20000.00	29769.33	174.692	102.521	227.476	21.864	-28.979	-29.008
20200.00	30263.54	174.102	102.199	231.646	21.693	-29.106	-29.135
20400.00	30749.70	173.526	101.883	235.324	21.505	-29.227	-29.255
20600.00	31227.99	172.965	101.573	238.562	21.303	-29.342	-29.370
20800.00	31698.55	172.417	101.269	241.413	21.086	-29.451	-29.478
21000.00	32161.53	171.883	100.971	243.930	20.856	-29.554	-29.582
21200.00	32617.07	171.360	100.678	246.156	20.612	-29.653	-29.680
21400.00	33065.30	170.850	100.391	248.132	20.356	-29.746	-29.773
21600.00	33506.37	170.350	100.109	249.893	20.088	-29.835	-29.862
21800.00	33940.38	169.862	99.832	251.468	19.809	-29.920	-29.947
22000.00	34367.46	169.383	99.559	252.881	19.519	-30.001	-30.027
22200.00	34787.73	168.915	99.291	254.154	19.218	-30.078	-30.104
22400.00	35201.30	168.455	99.028	255.305	18.908	-30.151	-30.177
22600.00	35608.27	168.005	98.769	256.350	18.588	-30.221	-30.246
22800.00	36008.74	167.563	98.513	257.300	18.259	-30.287	-30.313
23000.00	36402.82	167.129	98.262	258.168	17.921	-30.351	-30.376
23200.00	36790.59	166.704	98.014	258.963	17.575	-30.411	-30.436
23400.00	37172.16	166.285	97.771	259.693	17.221	-30.469	-30.493
23600.00	37547.60	165.874	97.530	260.365	16.859	-30.524	-30.548
23800.00	37917.00	165.470	97.293	260.986	16.489	-30.576	-30.600
24000.00	38280.45	165.072	97.059	261.560	16.112	-30.625	-30.650

TABLE 9 - 3 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
SECOND ORBITAL COAST DATA

FLIGHT TIME (SEC)	ALTITUDE (KM)	CENTRAL RANGE ANGLE (DEG)	VELOCITY VECTOR AZIMUTH SPACE FIXED (DEG)	VELOCITY VECTOR AZIMUTH EARTH FIXED (DEG)	LONGITUDE (POS. EAST) (DEG)	GEOCENTRIC DECLINATION (DEG)	GEODETIC LATITUDE (DEG)
24200.00	38638.02	164.680	96.829	262.093	15.729	-30.673	-30.697
24400.00	38989.80	164.295	96.602	262.589	15.339	-30.718	-30.742
24600.00	39335.85	163.916	96.377	263.051	14.942	-30.761	-30.784
24800.00	39676.24	163.542	96.156	263.482	14.539	-30.802	-30.825
25000.00	40011.05	163.174	95.937	263.886	14.131	-30.841	-30.864
25200.00	40340.33	162.811	95.721	264.264	13.716	-30.877	-30.901
25400.00	40664.17	162.452	95.507	264.619	13.296	-30.913	-30.936
25600.00	40982.61	162.099	95.296	264.953	12.871	-30.946	-30.969
25800.00	41295.72	161.751	95.088	265.268	12.440	-30.977	-31.000
26000.00	41603.56	161.407	94.882	265.564	12.005	-31.007	-31.030
26200.00	41906.17	161.067	94.678	265.845	11.565	-31.036	-31.058
26400.00	42203.63	160.731	94.477	266.110	11.120	-31.062	-31.085
26600.00	42495.98	160.400	94.277	266.362	10.670	-31.088	-31.110
26800.00	42783.26	160.072	94.080	266.601	10.216	-31.112	-31.134
27000.00	43065.54	159.748	93.885	266.828	9.758	-31.134	-31.156
27200.00	43342.86	159.428	93.692	267.043	9.296	-31.155	-31.177
27400.00	43615.26	159.111	93.500	267.249	8.830	-31.175	-31.197
5) 27518.00	43773.70	158.926	93.388	267.366	8.553	-31.186	-31.208

5) Loss of Attitude Control.

TABLE 10

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

S-IB STAGE RE-ENTRY DATA

	FLIGHT TIME (SEC)	----- SPACE FIXED ----- RADIUS (M)	VELOCITY (M/S)	PATH ANGLE (DEG)	--- SPACE FIXED POSITION AND VELOCITY VECTOR COMPONENTS --- X (M)	Y (M)	Z (M)	DX (M/S)	DY (M/S)	DZ (M/S)
1)	143.22	6440820.	2598.64	63.820	6439461.	35461.	127461.	1099.54	118.50	2351.58
	144.00	6441712.	2584.47	64.037	6440316.	35553.	129300.	1084.04	115.58	2343.29
2)	144.77	6442582.	2571.40	64.245	6441149.	35641.	131110.	1069.41	112.95	2335.75
	160.00	6458542.	2505.79	66.952	6456285.	37350.	166598.	920.64	111.93	2327.85
	180.00	6476416.	2436.49	70.667	6472789.	39580.	213096.	729.94	111.04	2321.93
	200.00	6490813.	2379.71	74.570	6485490.	41793.	259467.	540.36	110.09	2314.93
	220.00	6501747.	2335.82	78.633	6494408.	43984.	305685.	351.57	109.09	2306.64
	240.00	6509230.	2305.38	82.823	6499557.	46155.	351724.	163.38	108.02	2297.04
	260.00	6513270.	2288.78	87.096	6500946.	48304.	397558.	-24.41	106.89	2286.15
3)	274.00	6514051.	2285.53	90.110	6499685.	49795.	429506.	-155.72	106.07	2277.75
	280.00	6513870.	2286.25	91.402	6498582.	50430.	443161.	-211.97	105.71	2273.95
	300.00	6511031.	2297.84	95.693	6492467.	52532.	488507.	-399.51	104.46	2260.43
	320.00	6504751.	2323.38	99.917	6482601.	54608.	533569.	-587.22	103.16	2245.58
	340.00	6495023.	2362.51	104.031	6468977.	56658.	578321.	-775.27	101.78	2229.36
	360.00	6481837.	2414.74	107.994	6451586.	58679.	622735.	-963.86	100.35	2211.76
	380.00	6465180.	2479.39	111.778	6430418.	60671.	666782.	-1153.16	98.84	2192.67
	400.00	6445041.	2553.28	115.359	6405461.	62632.	710422.	-1341.91	97.27	2170.04
	420.00	6421593.	2580.48	118.644	6376925.	64562.	753338.	-1494.86	95.71	2101.22
	440.00	6398800.	1687.53	119.439	6349452.	66469.	790377.	-1005.17	95.62	1352.13
	460.00	6389926.	632.72	111.375	6338387.	68391.	807051.	-303.17	95.83	547.03
	480.00	6385982.	511.49	110.493	6333156.	70289.	816678.	-238.67	94.02	442.51
	500.00	6382683.	473.18	108.726	6328702.	72158.	825207.	-208.32	93.07	414.53
	520.00	6379872.	450.80	106.779	6324779.	74019.	833343.	-185.11	93.20	400.34
	540.00	6377438.	435.87	105.179	6321254.	75887.	841252.	-168.30	93.55	391.03
	560.00	6375283.	424.70	103.893	6318021.	77761.	848998.	-155.63	93.87	383.84
	580.00	6373344.	416.02	102.825	6315012.	79641.	856616.	-145.68	94.10	378.15
4)	585.82	6372814.	414.09	102.554	6314172.	80188.	858811.	-143.31	94.13	376.93

1) Physical Separation;
2) Retro-Rocket Burnout;
3) S-IB Stage Apogee;
4) S-IB Stage Impact.

TABLE 10 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IB STAGE RE-ENTRY DATA

	FLIGHT TIME (SEC)	----- EARTH FIXED ----- POSITION (M)	VELOCITY (M/S)	PATH ANGLE (DEG)	---- EARTH FIXED POSITION AND VELOCITY VECTOR COMPONENTS ---- X (M)	Y (M)	Z (M)	DX (M/S)	DY (M/S)	DZ (M/S)
1)	143.22	100440.	2249.76	59.362	67133.	21.	74708.	1125.64	2.26	1947.91
	144.00	102158.	2234.95	59.585	68008.	21.	76230.	1110.26	-0.57	1939.67
2)	144.77	103844.	2221.25	59.800	68862.	20.	77728.	1095.76	-3.12	1932.17
	160.00	136350.	2145.93	62.797	84429.	-23.	107066.	950.90	-2.07	1923.75
	180.00	177440.	2064.78	67.005	101589.	-44.	145480.	765.36	-0.06	1917.69
	200.00	216814.	1997.56	71.520	115050.	-24.	183771.	580.89	2.10	1911.23
	220.00	254624.	1945.14	76.310	124830.	41.	221926.	397.19	4.39	1904.15
	240.00	291051.	1908.50	81.320	130942.	153.	259933.	214.05	6.82	1896.44
	260.00	326792.	1888.39	86.479	133394.	314.	297779.	31.26	9.39	1888.10
3)	274.00	350369.	1884.40	90.133	132937.	459.	324170.	-96.58	11.26	1881.89
	280.00	360560.	1885.25	91.701	132193.	529.	335453.	-151.36	12.08	1879.13
	300.00	394082.	1899.17	96.893	127340.	798.	372940.	-334.00	14.89	1869.51
	320.00	427095.	1929.82	101.967	118832.	1126.	410229.	-516.87	17.83	1859.23
	340.00	459849.	1976.56	106.845	106663.	1513.	447305.	-700.16	20.90	1848.28
	360.00	492604.	2038.46	111.466	90822.	1962.	484155.	-884.07	24.07	1836.62
	380.00	525628.	2114.38	115.789	71295.	2476.	520765.	-1068.75	27.36	1824.18
	400.00	559185.	2200.69	119.795	48072.	3057.	557107.	-1253.03	30.73	1808.86
	420.00	593269.	2240.84	123.506	21351.	3701.	592873.	-1402.79	33.29	1747.12
	440.00	622831.	1356.70	127.687	-4370.	4300.	622801.	-929.16	20.88	988.36
	460.00	632147.	298.22	140.649	-14183.	4499.	631972.	-248.05	3.39	165.53
	480.00	634233.	195.21	156.535	-18342.	4525.	633951.	-195.85	-0.16	59.73
	500.00	635207.	158.86	162.990	-21743.	4507.	634819.	-155.75	-1.40	31.26
	520.00	635778.	133.48	167.151	-24614.	4478.	635286.	-132.43	-1.34	16.68
	540.00	636111.	115.61	170.805	-27083.	4455.	635519.	-115.39	-0.95	7.10
	560.00	636273.	102.45	174.481	-29255.	4440.	635585.	-102.44	-0.53	-0.27
	580.00	636299.	92.40	178.111	-31197.	4433.	635519.	-92.19	-0.18	-6.10
4)	585.82	636286.	90.02	178.999	-31726.	4432.	635479.	-89.72	-0.10	-7.35

1) Physical Separation;
2) Retro-Rocket Burnout;
3) S-IB Stage Apogee;
4) S-IB Stage Impact.

TABLE 10 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IB STAGE RE-ENTRY DATA

	FLIGHT TIME (SEC)	MASS (KG)	THRUST (TOTAL) (N)	DRAG (N)	LONGITUDINAL ACCELERATION (M/SEC2)	DYNAMIC PRESSURE (N/M2)	A.H.I. (KG-M/M2-RAD)	MACH NO.
1)	143.22	46222.	0.	41672.	-0.902	310.	65374288.	7.44
	144.00	45886.	686264.	36421.	-14.689	271.	65406772.	7.44
2)	144.77	45591.	487119.	31907.	-10.627	238.	65434675.	7.43
	160.00	45591.	0.	2370.	-0.052	18.	65620312.	7.89
	180.00	45591.	0.	84.	-0.002	1.	65633174.	6.75
	200.00	45591.	0.	10.	-0.000	0.	65633746.	5.48
	220.00	45591.	0.	3.	-0.000	0.	65633794.	4.24
	240.00	45591.	0.	1.	-0.000	0.	65633794.	3.68
	260.00	45591.	0.	1.	-0.000	0.	65633794.	3.44
3)	274.00	45591.	0.	1.	-0.000	0.	65633794.	3.40
	280.00	45591.	0.	1.	-0.000	0.	65633794.	3.41
	300.00	45591.	0.	1.	-0.000	0.	65633794.	3.56
	320.00	45591.	0.	2.	-0.000	0.	65633794.	3.97
	340.00	45591.	0.	5.	-0.000	0.	65633806.	4.98
	360.00	45591.	0.	34.	-0.001	0.	65634046.	6.35
	380.00	45591.	0.	619.	-0.014	5.	65637673.	7.60
	400.00	45591.	0.	20940.	-0.459	156.	65764950.	7.51
	420.00	45591.	0.	428434.	-9.397	3156.	68738291.	6.73
	440.00	45591.	0.	4593461.	-100.754	31670.	107548484.	4.52
	460.00	45591.	0.	977578.	-21.443	6348.	125845439.	1.00
	480.00	45591.	0.	522746.	-11.466	4807.	127283032.	0.63
	500.00	45591.	0.	501492.	-11.000	4997.	128346671.	0.50
	520.00	45591.	0.	488903.	-10.724	4946.	129258727.	0.41
	540.00	45591.	0.	477468.	-10.477	4891.	130036211.	0.35
	560.00	45591.	0.	470766.	-10.326	4863.	130718999.	0.30
	580.00	45591.	0.	465745.	-10.216	4814.	131328650.	0.27
4)	585.82	45591.	0.	463282.	-10.177	4796.	131492164.	0.26

1) Physical Separation;
2) Retro-Rocket Burnout;
3) S-IB Stage Apogee;
4) S-IB Stage Impact.

TABLE 10 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IB STAGE RE-ENTRY DATA

	FLIGHT TIME (SEC)	ALTITUDE (KM)	RANGE (KM)	VELOCITY VECTOR AZIMUTH SPACE FIXED (DEG)	EARTH FIXED (DEG)	LONGITUDE (POS. EAST) (DEG)	GEOCENTRIC DECLINATION (DEG)	GEODETIC LATITUDE (DEG)
1)	143.22	67.566	73.984	75.401	72.322	-79.845	28.576	28.736
	144.00	68.459	75.481	75.349	72.246	-79.831	28.580	28.740
2)	144.77	69.330	76.953	75.303	72.177	-79.816	28.584	28.744
	160.00	85.315	105.730	75.468	72.354	-79.535	28.663	28.823
	180.00	103.221	143.262	75.691	72.606	-79.159	28.764	28.924
	200.00	117.649	180.565	75.914	72.861	-78.803	28.864	29.024
	220.00	128.615	217.688	76.137	73.122	-78.439	28.961	29.121
	240.00	136.128	254.680	76.360	73.387	-78.074	29.057	29.217
	260.00	140.198	291.590	76.584	73.657	-77.710	29.151	29.312
3)	274.00	141.000	317.404	76.741	73.848	-77.455	29.216	29.377
	280.00	140.827	328.465	76.808	73.931	-77.345	29.244	29.405
	300.00	138.018	365.352	77.034	74.211	-76.980	29.335	29.496
	320.00	131.766	402.298	77.261	74.496	-76.613	29.424	29.586
	340.00	122.066	439.351	77.490	74.785	-76.244	29.513	29.675
	360.00	108.908	476.559	77.721	75.080	-75.872	29.600	29.762
	380.00	92.279	513.971	77.954	75.380	-75.498	29.685	29.849
	400.00	72.167	551.625	78.191	75.686	-75.121	29.770	29.934
	420.00	48.746	589.263	78.481	75.994	-74.743	29.853	30.018
	440.00	25.976	621.291	80.018	76.274	-74.420	29.922	30.088
	460.00	17.109	631.341	85.649	76.326	-74.319	29.943	30.109
	480.00	13.166	633.713	87.657	75.405	-74.295	29.948	30.115
	500.00	9.868	634.909	88.360	73.982	-74.283	29.951	30.118
	520.00	7.058	635.656	88.870	73.340	-74.275	29.953	30.120
	540.00	4.624	636.132	89.279	73.346	-74.271	29.954	30.121
	560.00	2.469	636.411	89.623	73.999	-74.268	29.955	30.122
	580.00	0.530	636.537	89.908	77.589	-74.267	29.955	30.122
4)	585.82	0.000	636.551	89.971	82.493	-74.267	29.955	30.122

1) Physical Separation;
2) Retro-Rocket Burnout;
3) S-IB Stage Apogee;
4) S-IB Stage Impact.

Table 11

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
TRACKING AND TELEMETRY STATION COORDINATES: LAUNCH PHASE

STATION	GEODETIC LATITUDE(1) (DEGREES NORTH)	LONGITUDE(1) (DEGREES EAST)	ALTITUDE ABOVE(1) ELLIPSOID (METERS)
Telemetry			
Cape Tel 4	28.463713	- 80.653029	0.00 (3)
MILA-CIF	28.542366	- 80.643533	0.00 (3)
Grand Bahama	26.628514	- 78.299444	0.00 (3)
Grand Turk	21.446016	- 71.147500	0.00 (3)
Bermuda	32.348102	- 64.653800	18.00
Antigua	17.137333	- 61.774955	41.20
Insertion Ship	22.0	- 44.0	0.00 (3)
C-Band Radar			
MILA	28.424862	- 80.664404	12.02
Patrick	28.226553	- 80.599293	15.51
Grand Bahama	26.615778	- 78.347833	13.98
Grand Turk	21.462890	- 71.132114	28.00
Bermuda	32.348103	- 64.653801	24.31
Antigua	17.144032	- 61.792859	49.37
Insertion Ship	22.0	- 44.0	0.00 (3)
GLOTRAC			
GLOTRAC I	28.413386	- 80.592263	10.95
Atlantic	34.881507	- 76.353404	2.92
Bassett Cove	26.614552	- 78.323580	16.15
Grand Turk	21.433765	- 71.145032	21.00
Bermuda	32.254488	- 64.838675	87.09
ODOP			
Transmitter (2) (1.3.1.7)	28.444373	- 80.579973	5.14

Notes:
1. All coordinates are referenced to Fischer Ellipsoid of 1960.
2. ODOP tracks the S-IB stage during powered flight and after separation from the S-IVB until loss of track at an elevation of zero degrees.
3. An altitude of zero meters is assumed whenever a value for the actual station altitude is not available.

Table 12

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY TRACKING AND TELEMETRY STATION COORDINATES: ORBITAL PHASE

STATION	GEODETIC LATITUDE(1) (DEGREES NORTH)	LONGITUDE(1) (DEGREES EAST)	ALTITUDE ABOVE(1) ELLIPSOID (METERS)
Telemetry			
Cape Tel 4	28.463713	- 80.653029	0.00 (2)
MILA-CIF	28.542366	- 80.643533	0.00 (2)
Grand Bahama	26.628514	- 78.299444	0.00 (2)
Grand Turk	21.446016	- 71.147500	0.00 (2)
Bermuda	32.348102	- 64.653800	18.00
Antigua	17.137333	- 61.774955	41.20
Insertion Ship	22.0	- 44.0	0.00 (2)
Canary	27.742797	- 15.598103	35.00
Ascension	- 7.974314	- 14.392221	29.98
Tananarive	-19.018056	47.304444	1375.00
Carnarvon	-24.897356	113.716067	64.00
Hawaii	22.125267	-159.667691	1142.00
Ship A	28.0	-138.0	0.00 (2)
Guaymas	27.958406	-110.720792	18.00
Corpus Christi	27.655400	- 97.380256	10.00
C-Band Radar			
MILA	28.424862	- 80.664404	12.02
Patrick	28.226553	- 80.599293	15.51
Grand Bahama	26.615778	- 78.347833	13.98
Grand Turk	21.462890	- 71.132114	28.00
Bermuda	32.348103	- 64.653801	24.31
Antigua	17.144032	- 61.792859	49.37
Insertion Ship	22.0	- 44.0	0.00 (2)
Canary	27.744861	- 15.602000	36.00
Ascension	- 7.951514	- 14.412606	152.43
Pretoria	-25.943731	28.358490	1622.40
Tananarive	-19.018056	47.304444	1375.00
Carnarvon	-24.897403	113.716078	62.00
Woomera	-30.819728	-136.836989	151.00
Hawaii	22.122092	-159.665383	1140.00
Ship A	28.0	-138.0	0.00 (2)
Point Arguello	34.582903	-120.561150	646.00
White Sands	32.358222	-106.369564	1232.00

Notes:
1. All coordinates are referenced to Fischer Ellipsoid of 1960.
2. A station altitude of zero is assumed when the actual value is unavailable.

Figure 1

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
ALTITUDE VS FLIGHT TIME: BOOST FLIGHT DATA

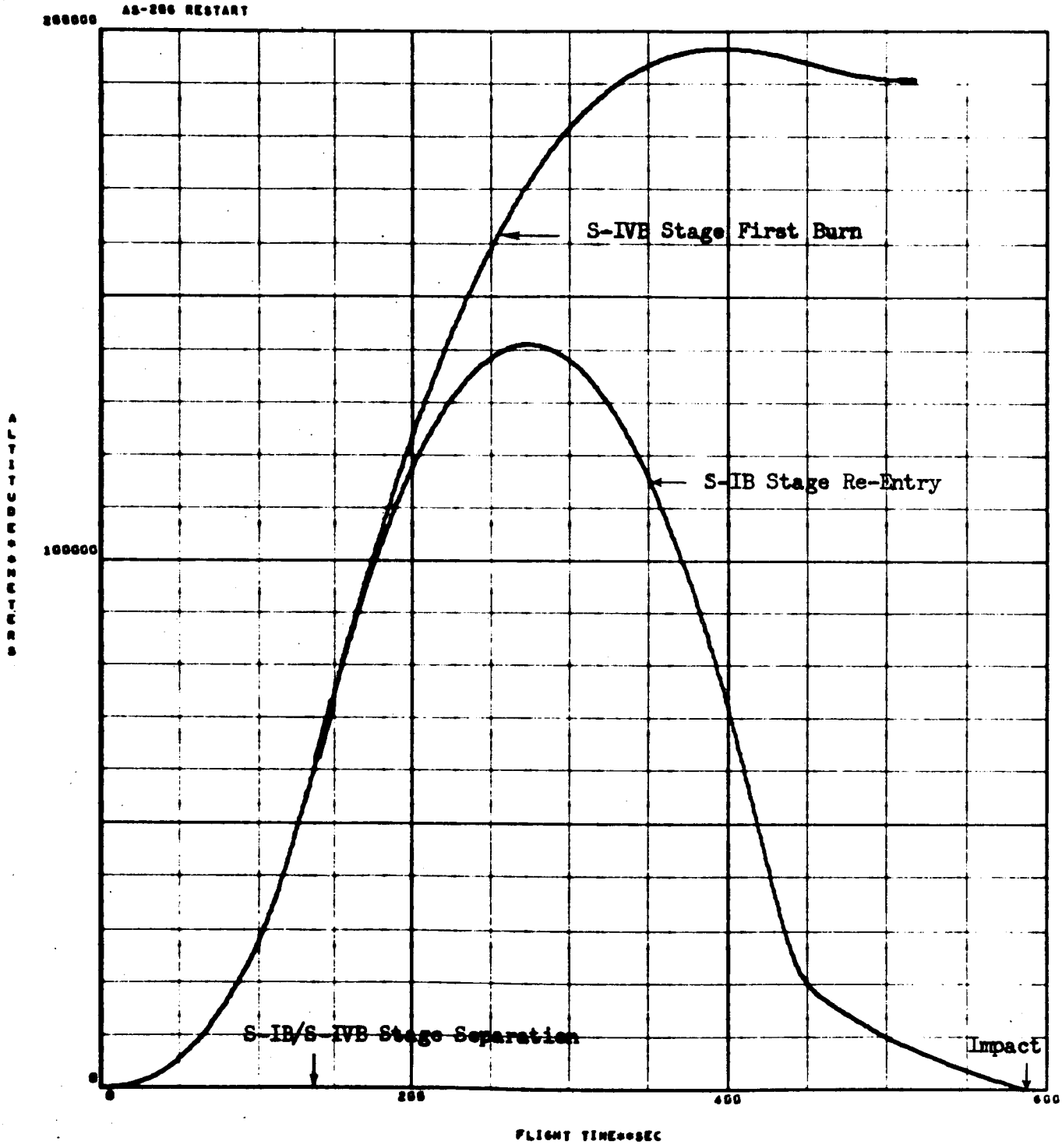


Figure 2

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
ALTITUDE VS GROUND RANGE: BOOST FLIGHT DATA

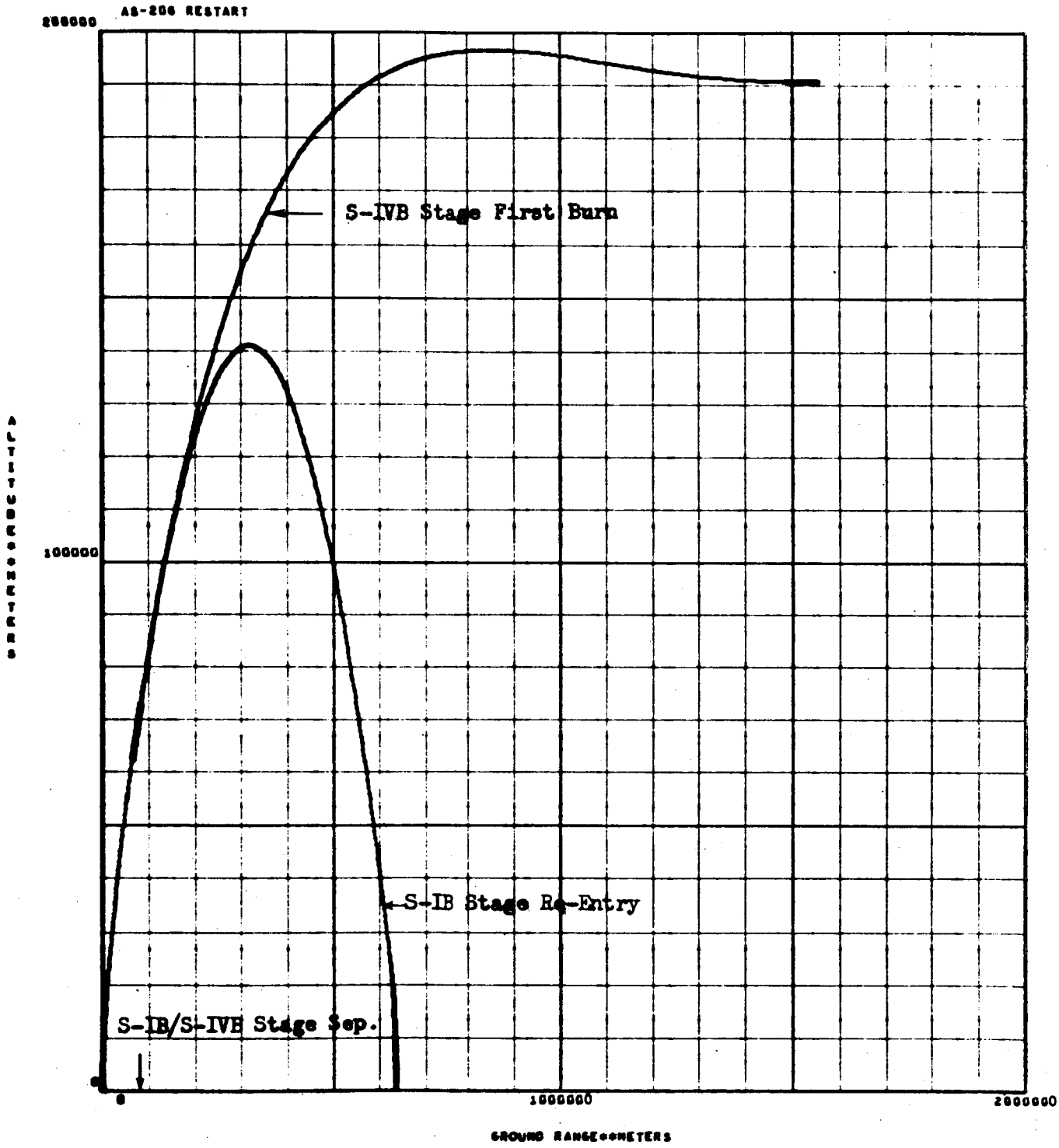


Figure 3

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
VELOCITY VS FLIGHT TIME: BOOST FLIGHT DATA

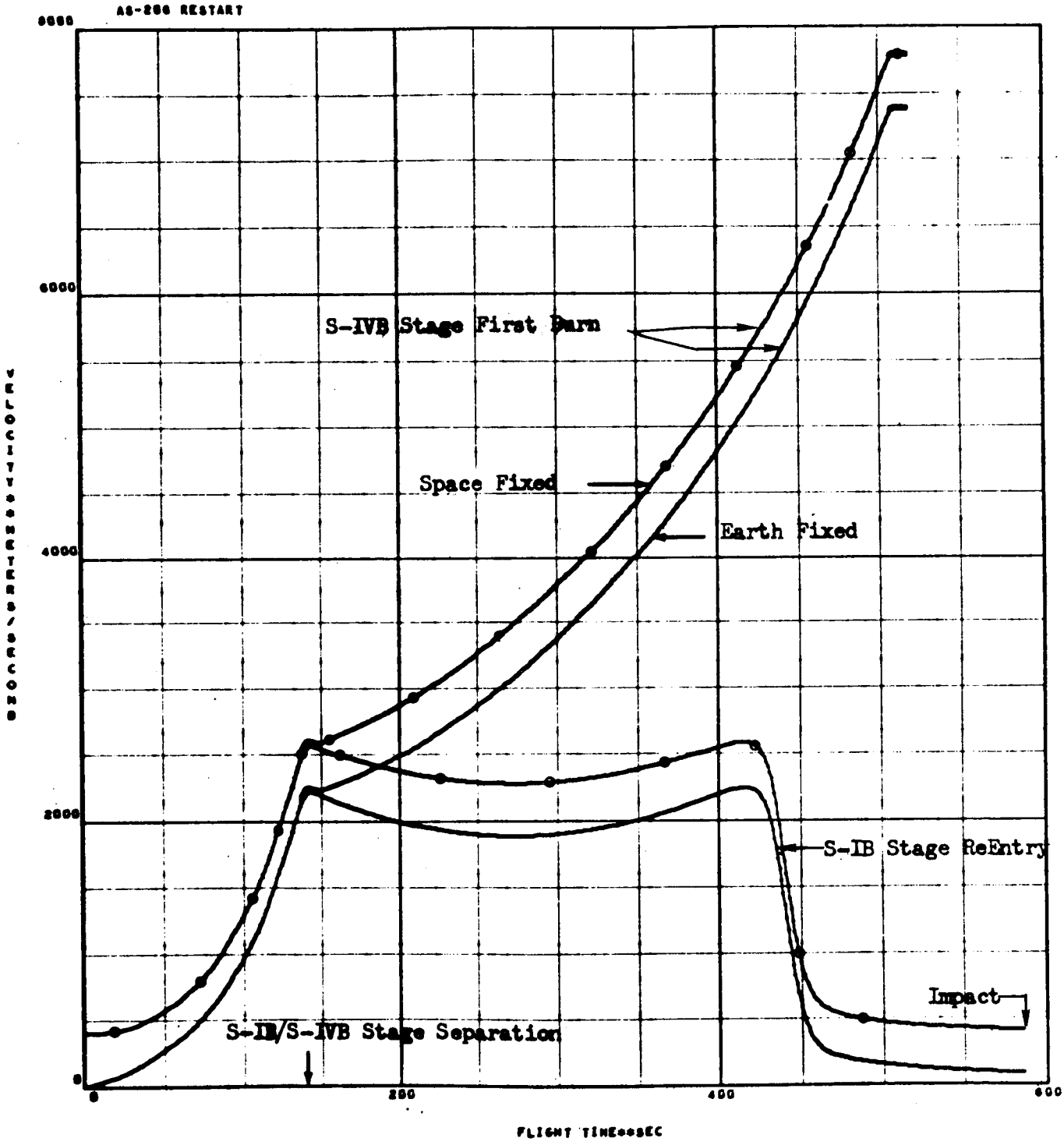


Figure 4

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
SPACE FIXED FLIGHT PATH ANGLE VS FLIGHT TIME: BOOST FLIGHT DATA

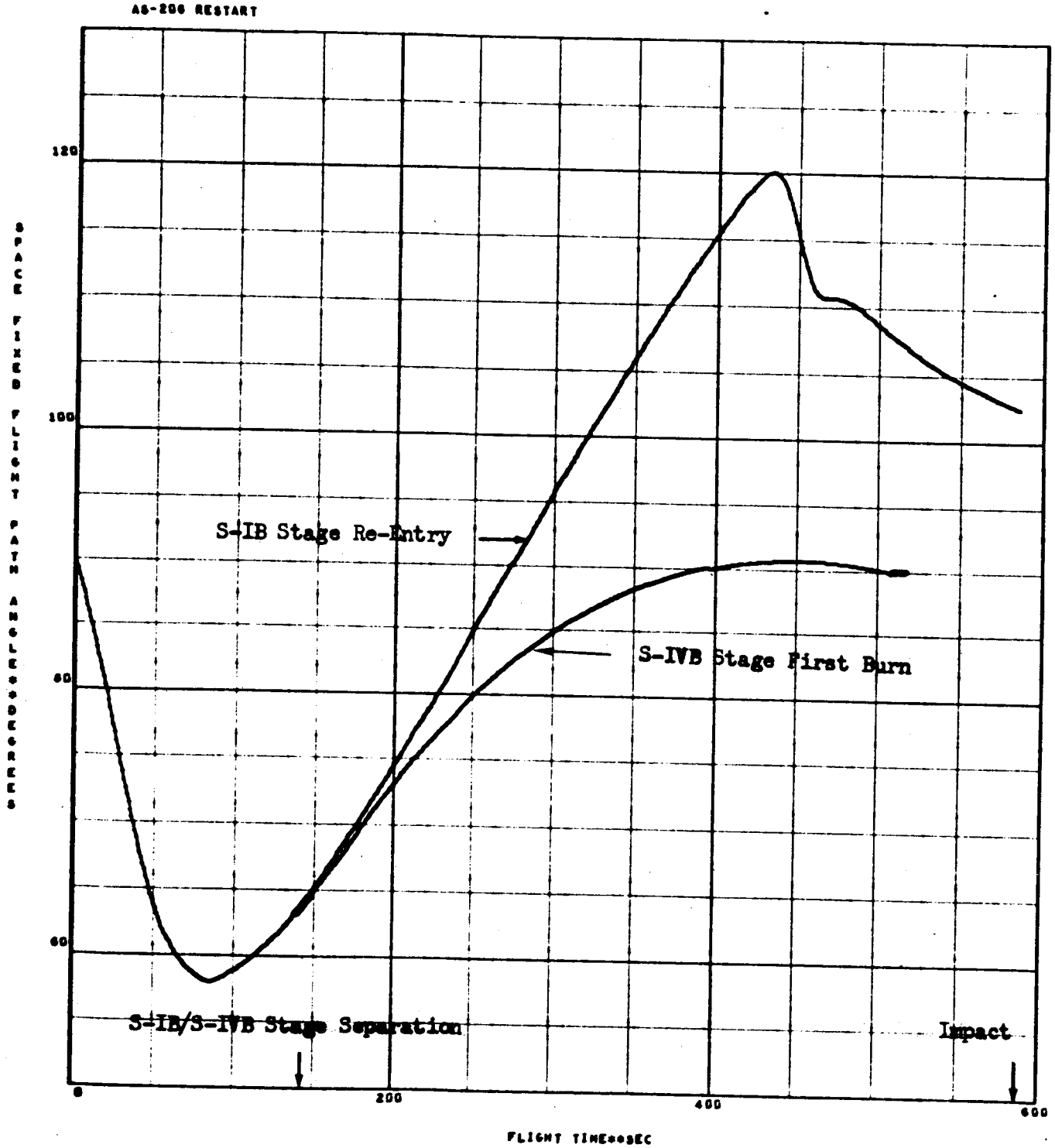


Figure 5

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
EARTH FIXED FLIGHT PATH ANGLE VS FLIGHT TIME: BOOST FLIGHT DATA

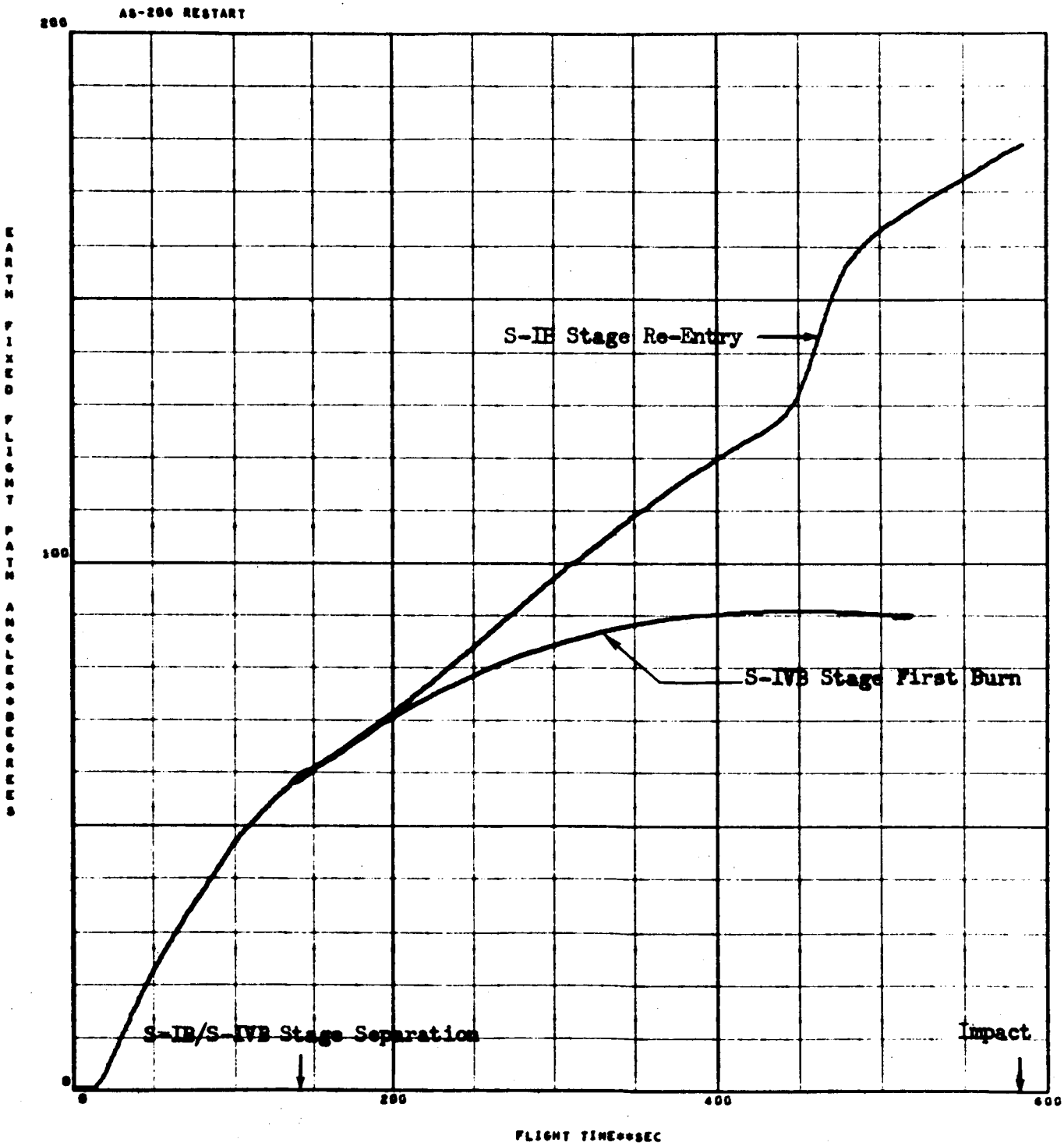


Figure 6

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
PITCH ATTITUDE STEERING COMMAND HISTORY: S-IB STAGE FLIGHT DATA

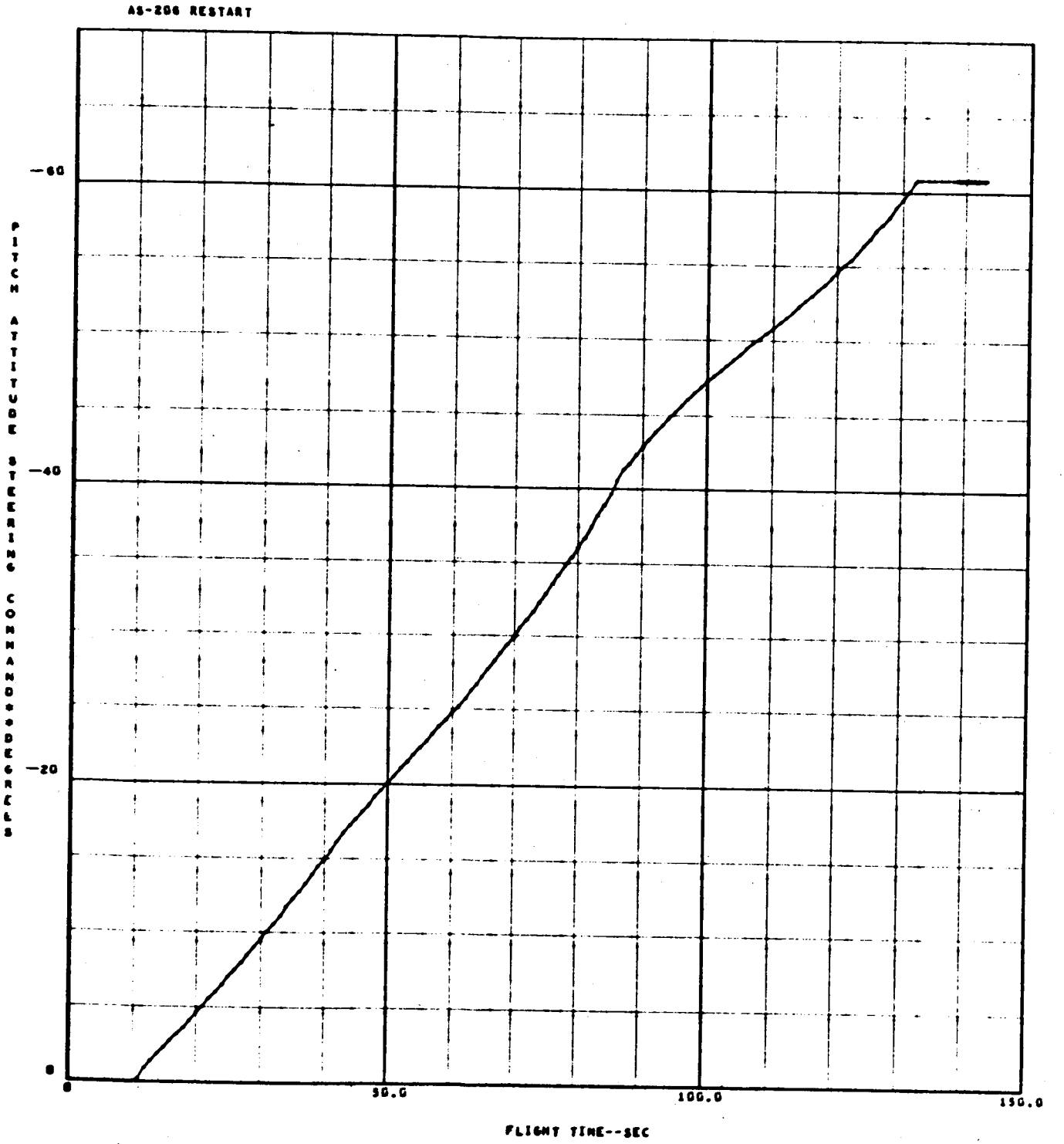


Figure 7

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
VEHICLE PITCH ATTITUDE RATE HISTORY: S-IB STAGE FLIGHT DATA

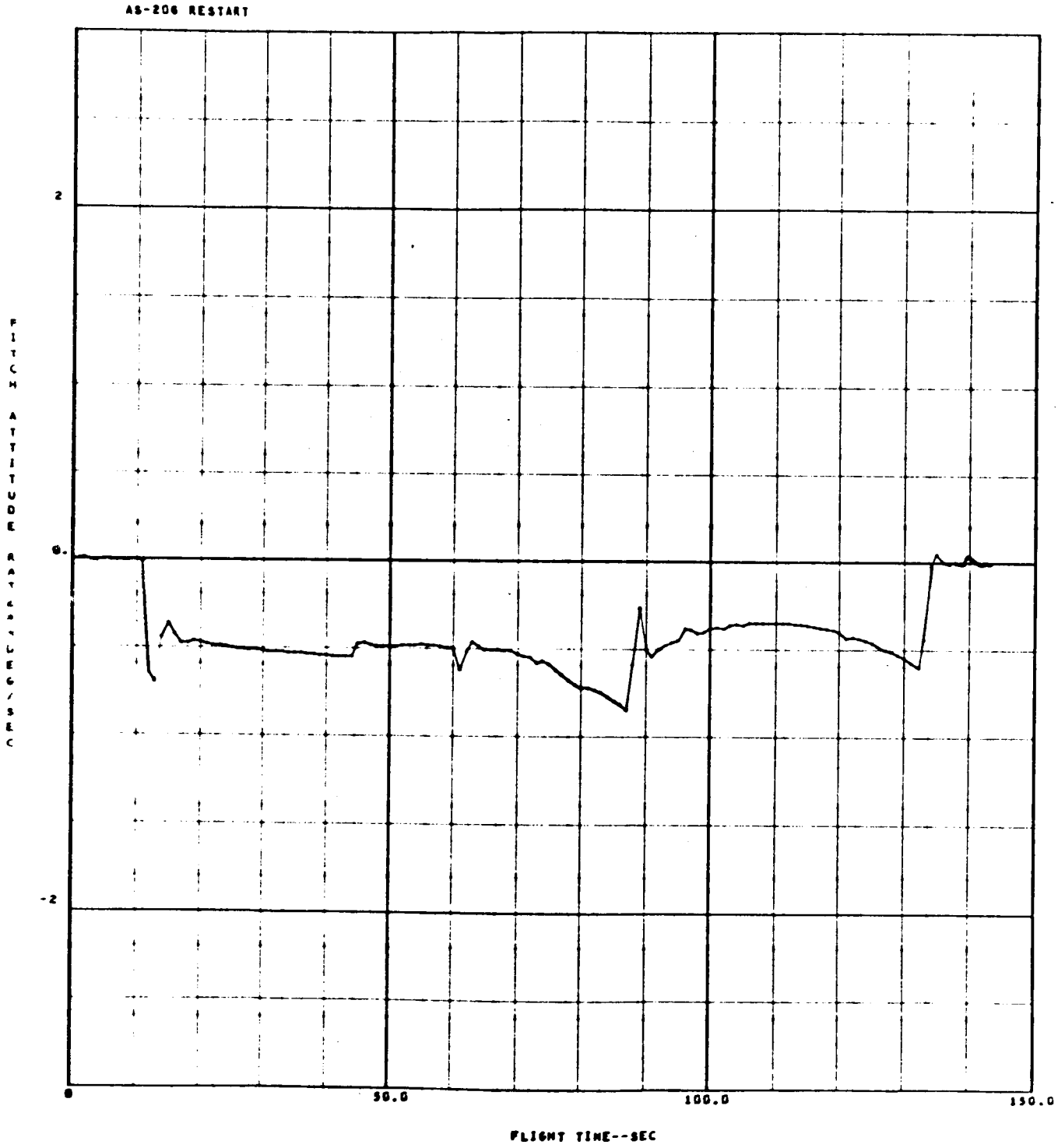


Figure 8

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
PITCH ATTITUDE ERROR HISTORY: S-IB STAGE FLIGHT DATA

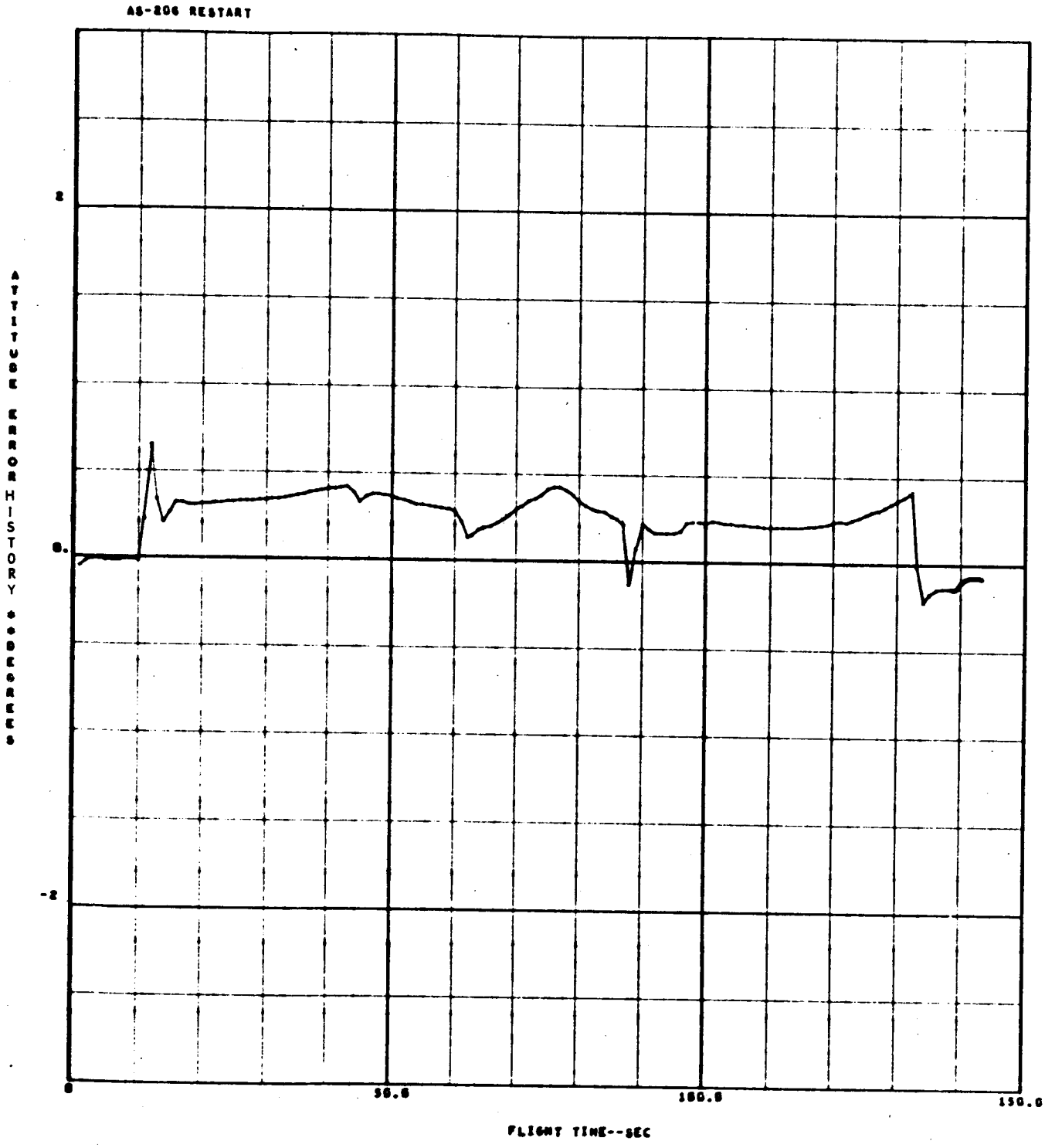


Figure 9

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
PITCH ANGLE OF ATTACK HISTORY: S-IB STAGE FLIGHT DATA

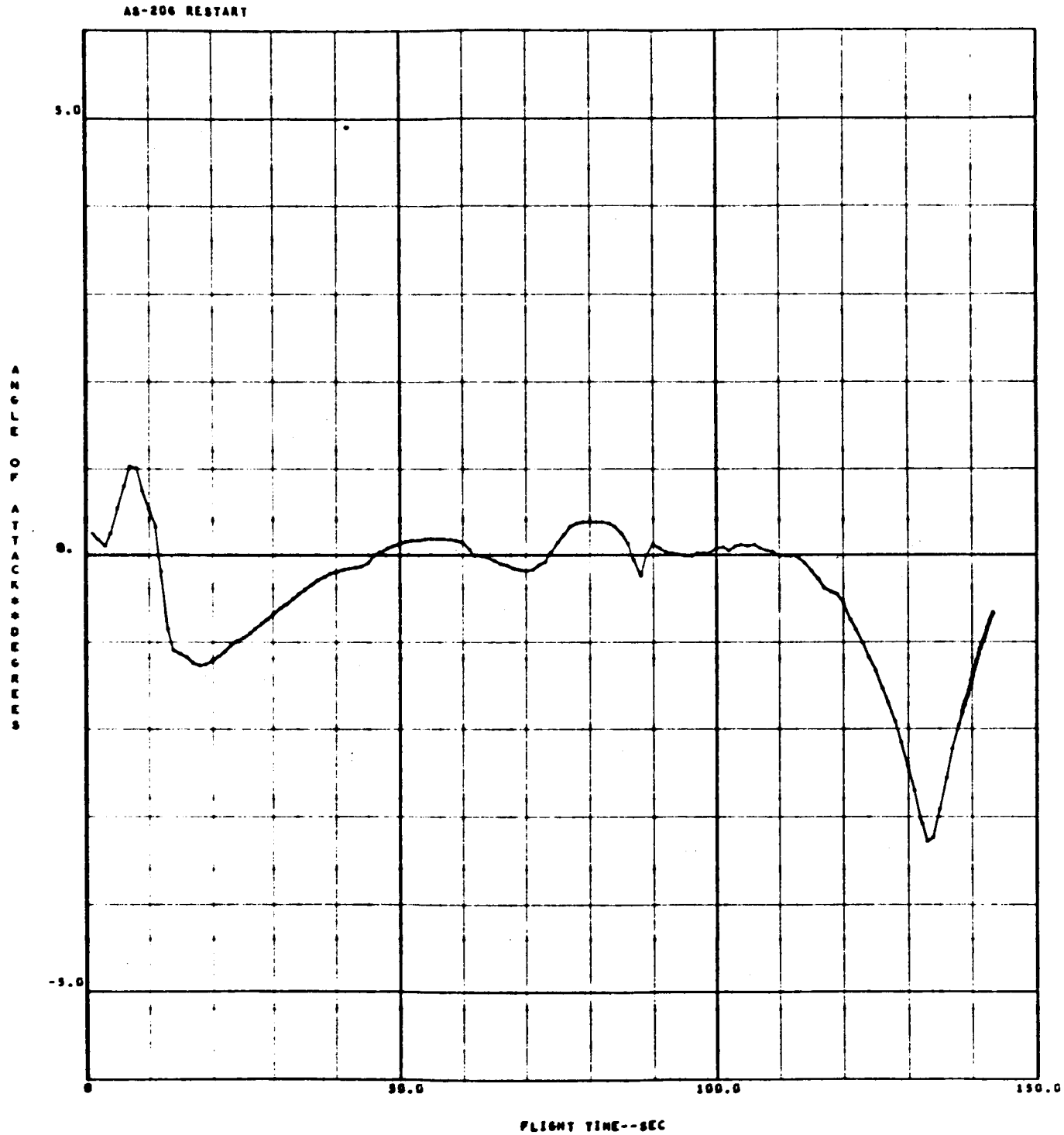


Figure 10

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
DYNAMIC PRESSURE HISTORY: S-IB STAGE FLIGHT DATA

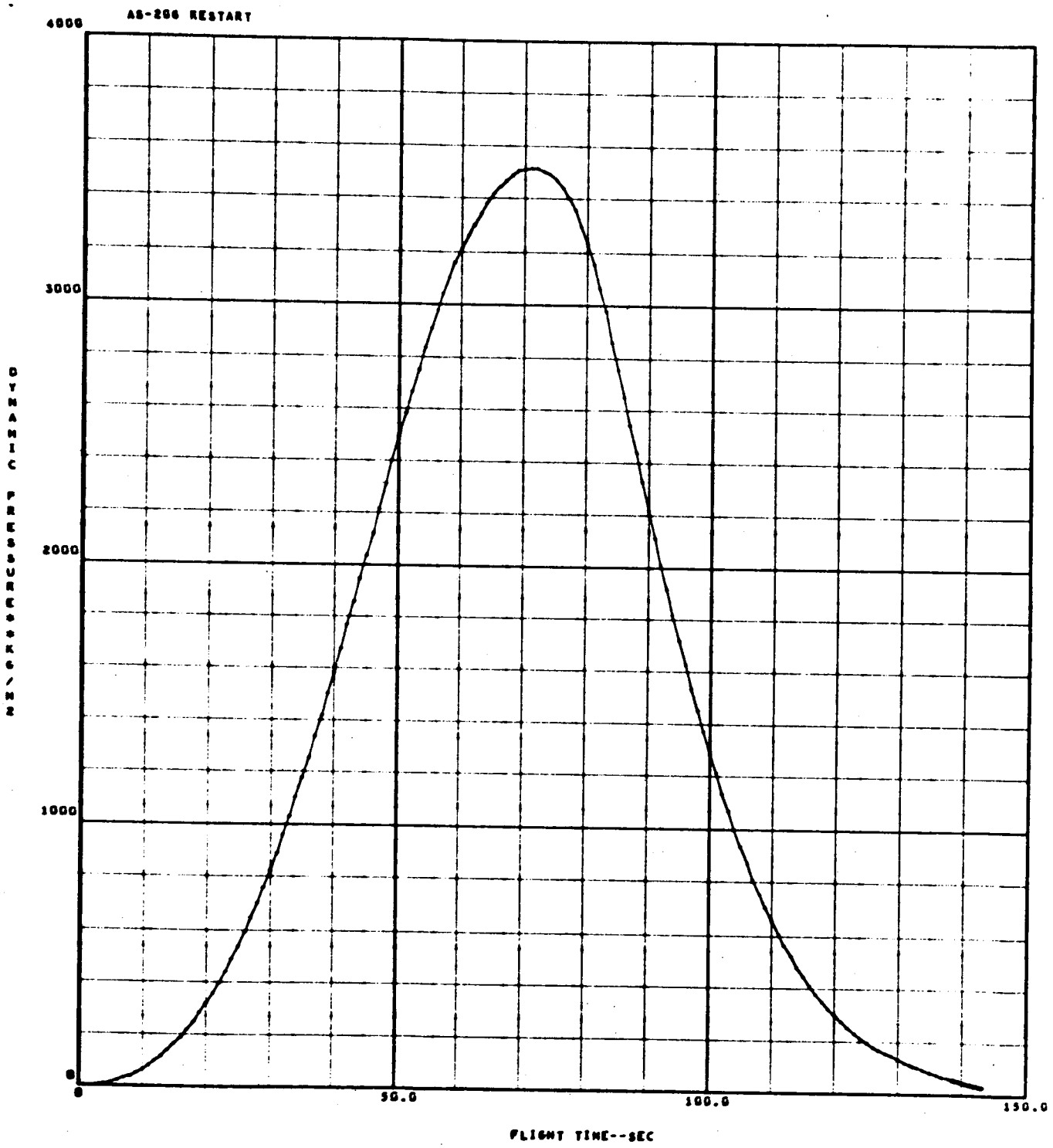


Figure 11

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
LONGITUDINAL ACCELERATION HISTORY: S-IB STAGE FLIGHT DATA

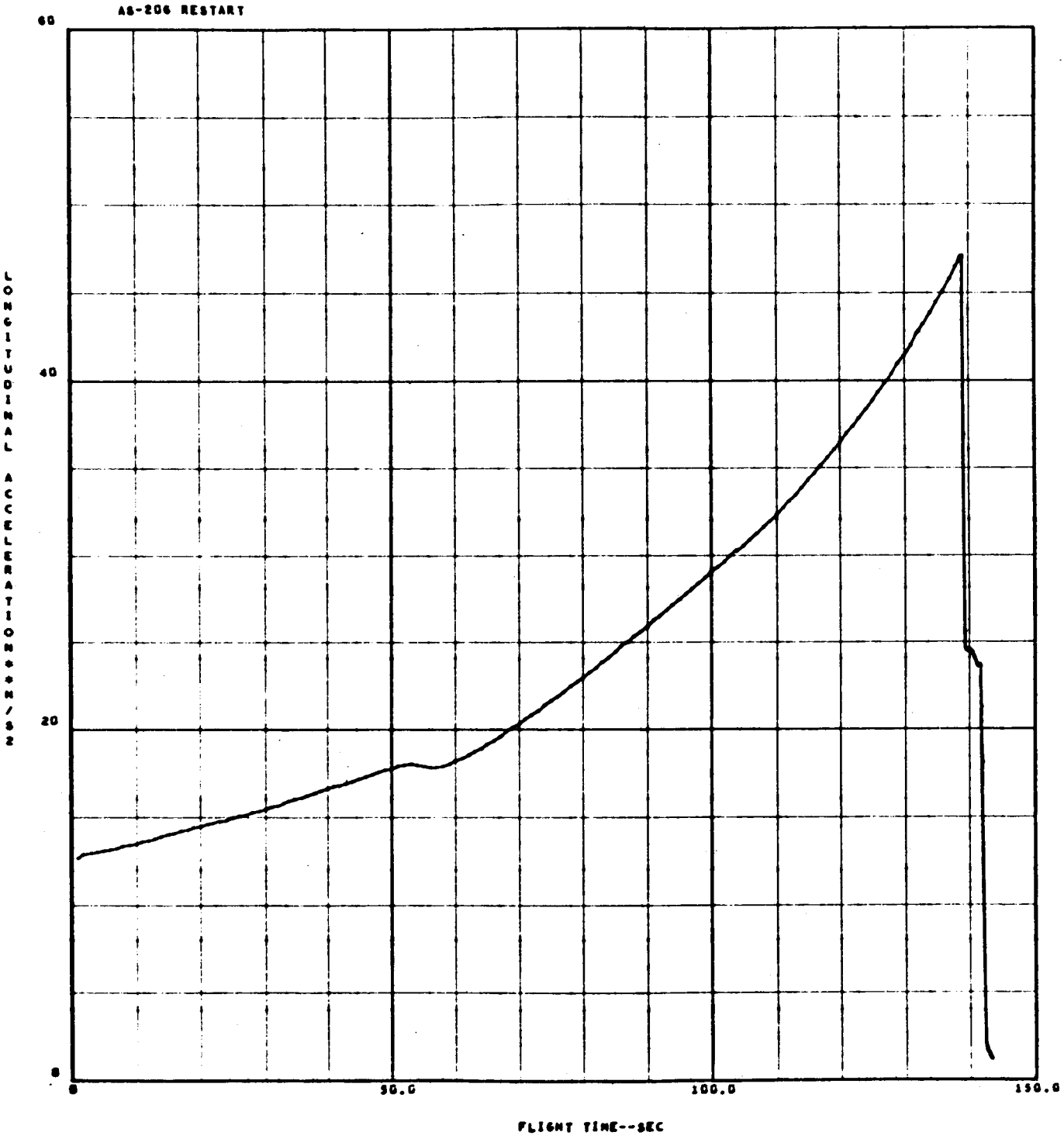


Figure 12

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
PITCH ATTITUDE STEERING COMMAND HISTORY: S-IVB STAGE FLIGHT DATA, FIRST BURN

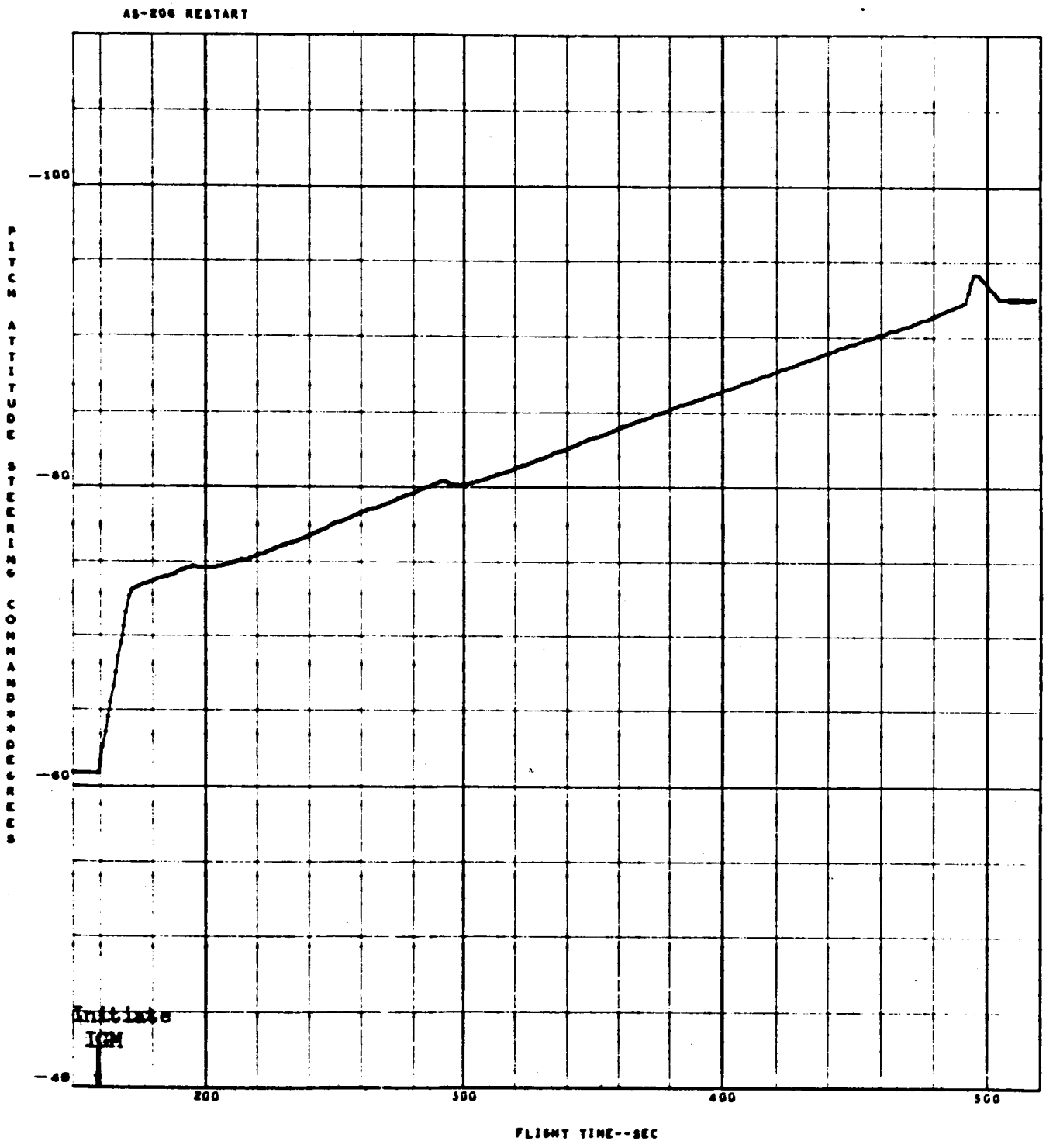


Figure 13

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
YAW ATTITUDE STEERING COMMAND HISTORY: S-IVB STAGE FLIGHT DATA, FIRST BURN

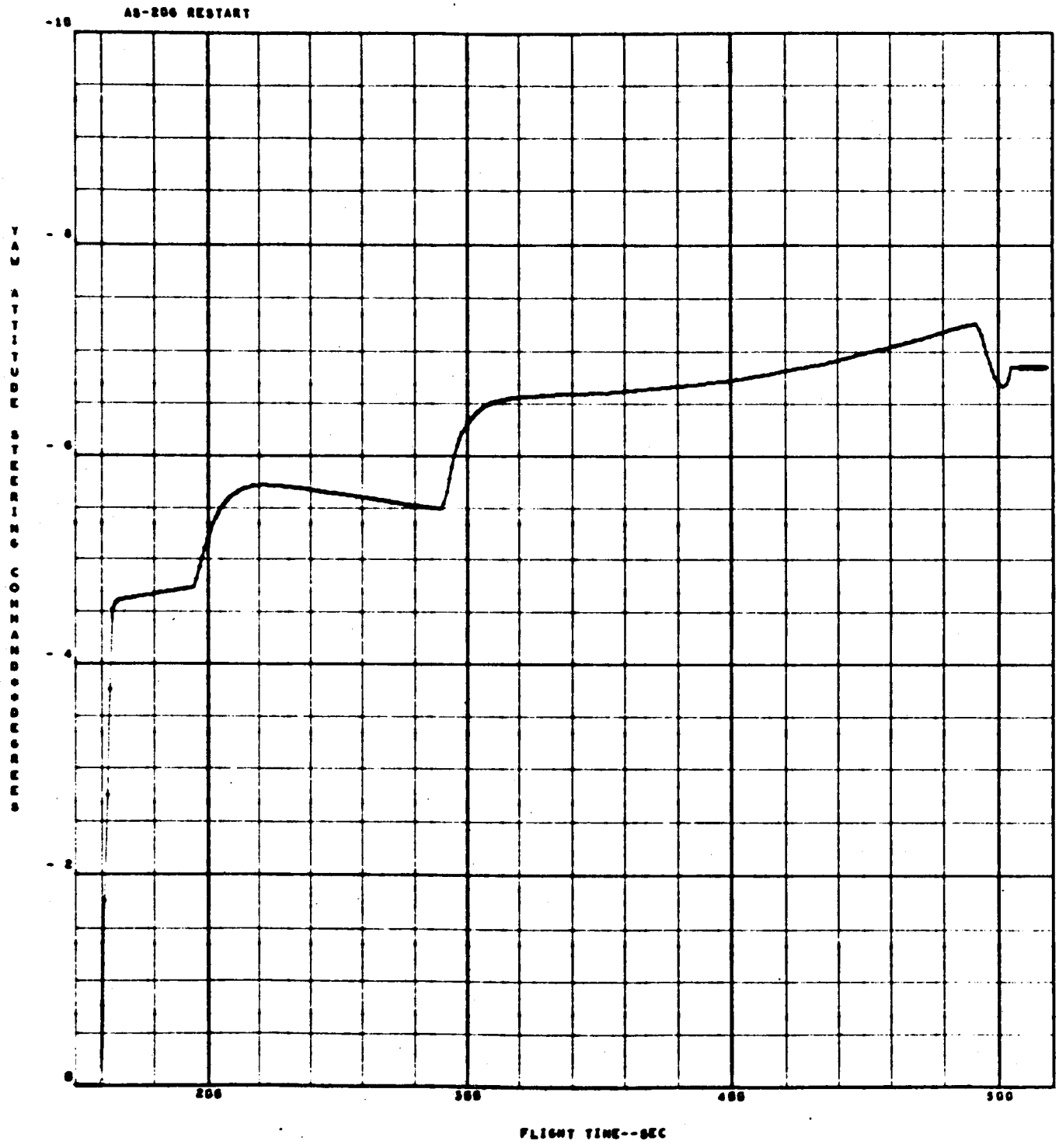


Figure 14

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
LONGITUDINAL ACCELERATION HISTORY: S-IVB STAGE FLIGHT DATA, FIRST BURN

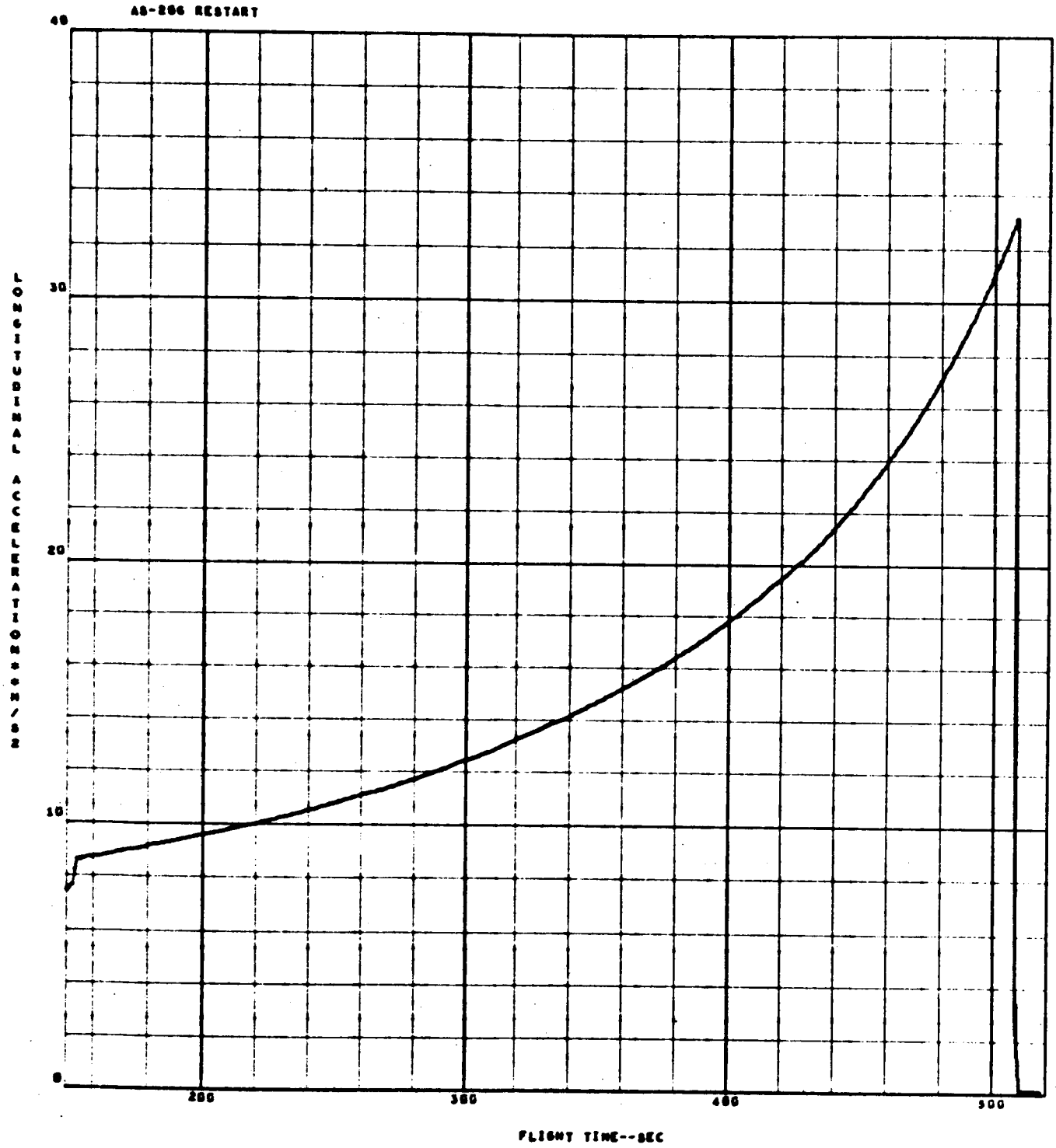


Figure 15

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
VEHICLE ATTITUDE RATE HISTORY: S-IVB STAGE FLIGHT DATA, FIRST BURN

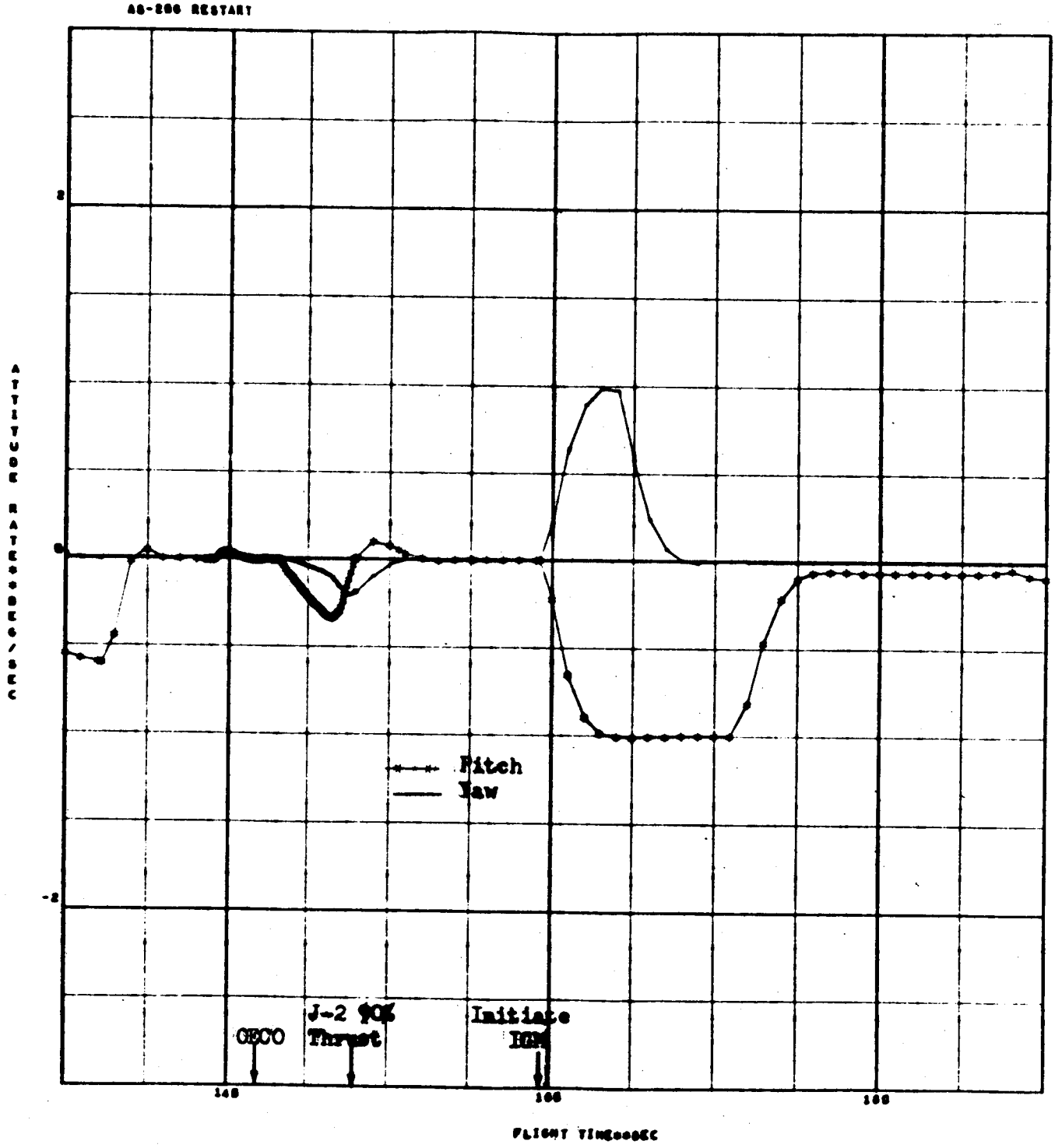


Figure 16

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
ATTITUDE ERROR HISTORY: S-IVB STAGE FLIGHT DATA, FIRST BURN

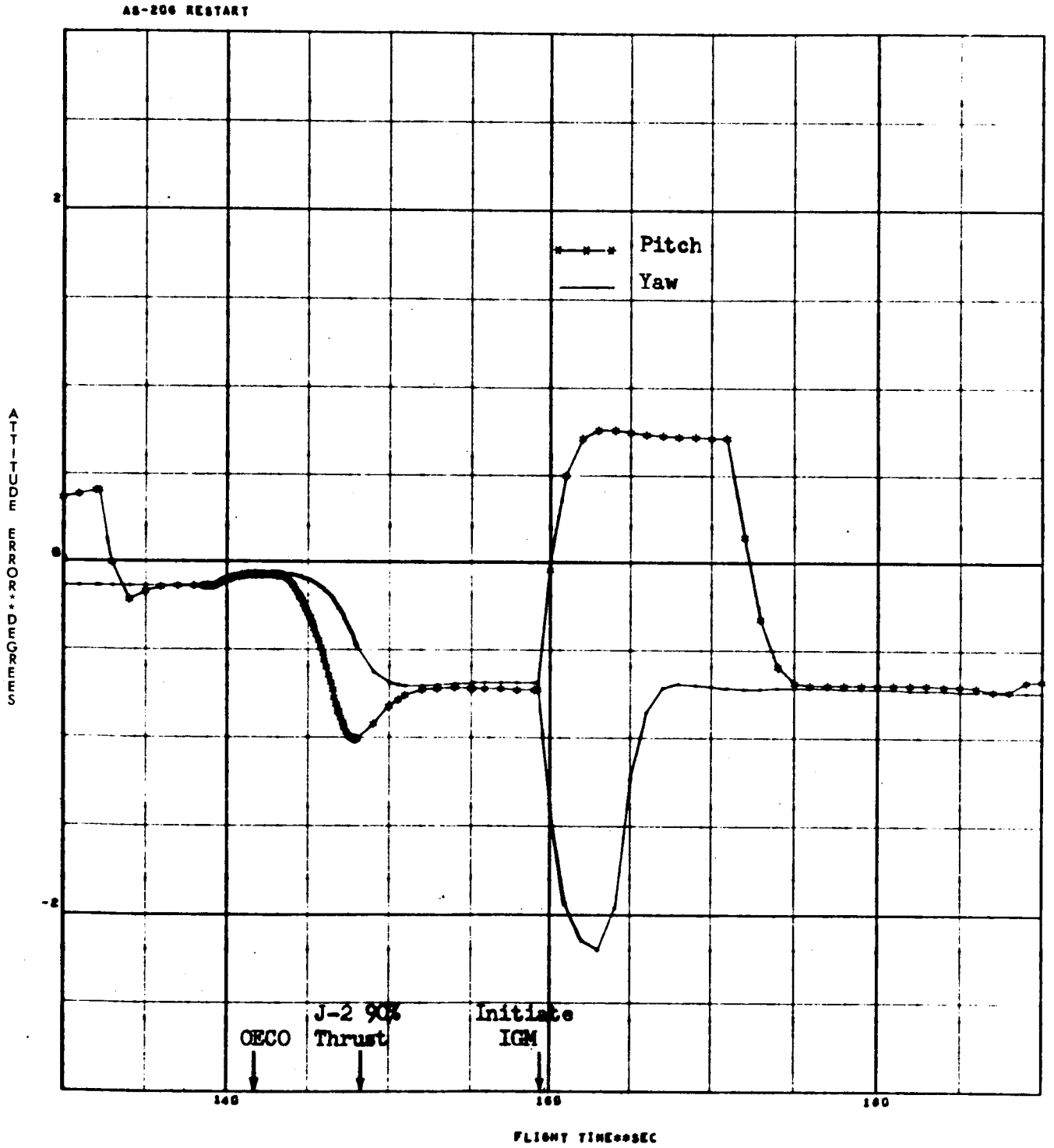


Figure 17

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
ANGLE OF ATTACK HISTORY: S-IVB STAGE FLIGHT DATA, FIRST BURN

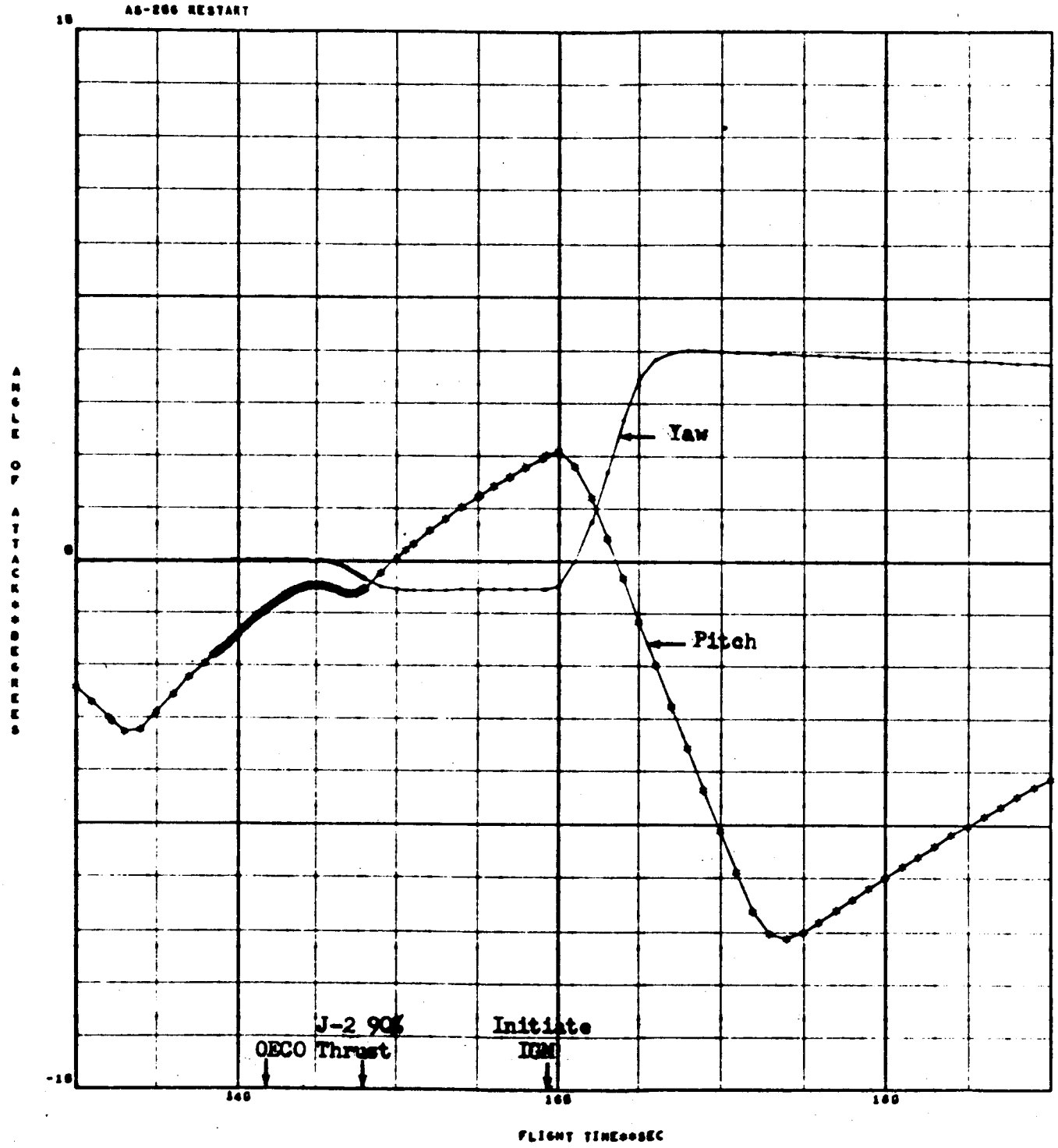


Figure 18

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
DYNAMIC PRESSURE HISTORY: S-IVB STAGE FLIGHT DATA, FIRST BURN

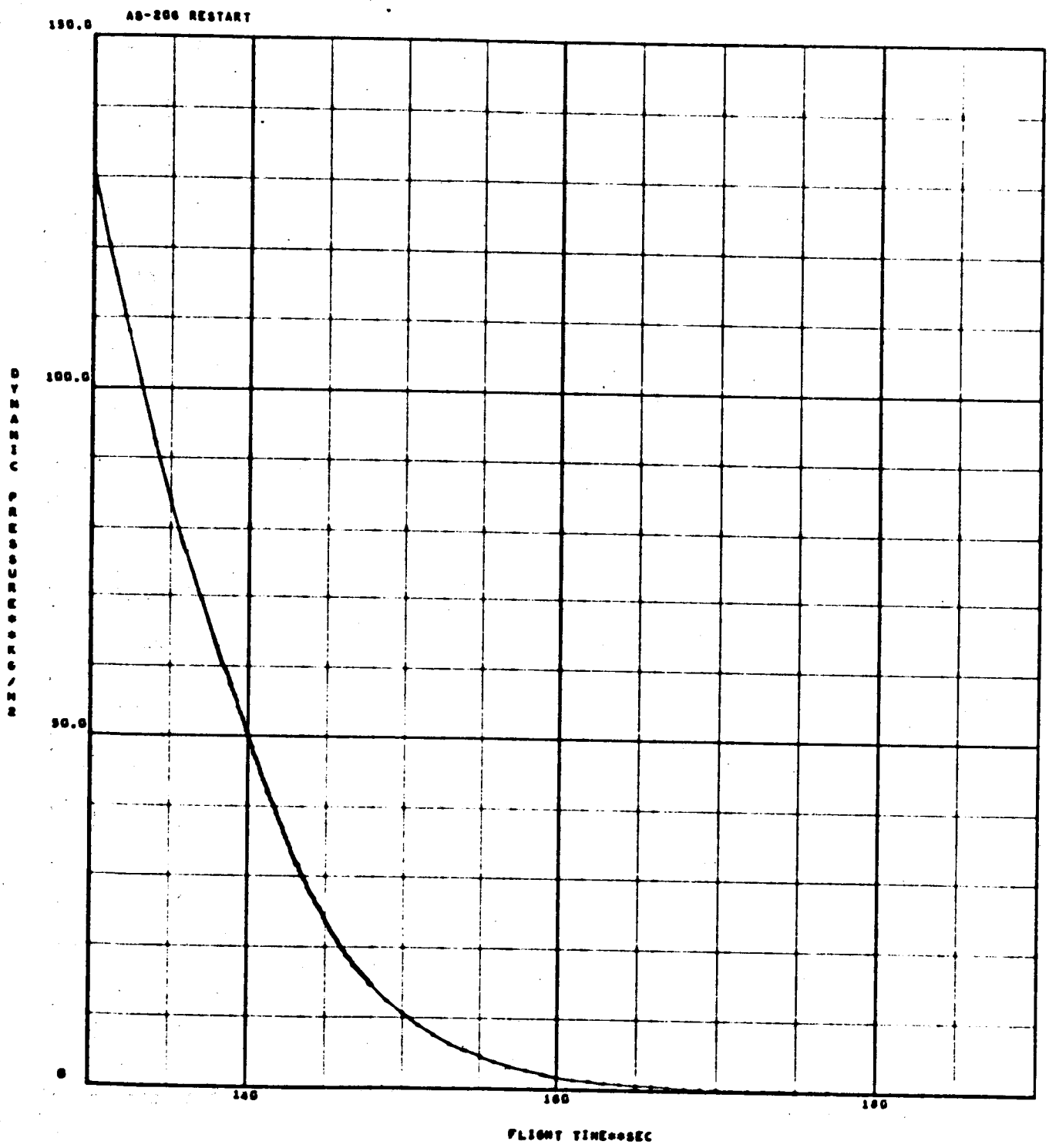


Figure 19

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
ALTITUDE HISTORY: FIRST ORBITAL COAST PHASE

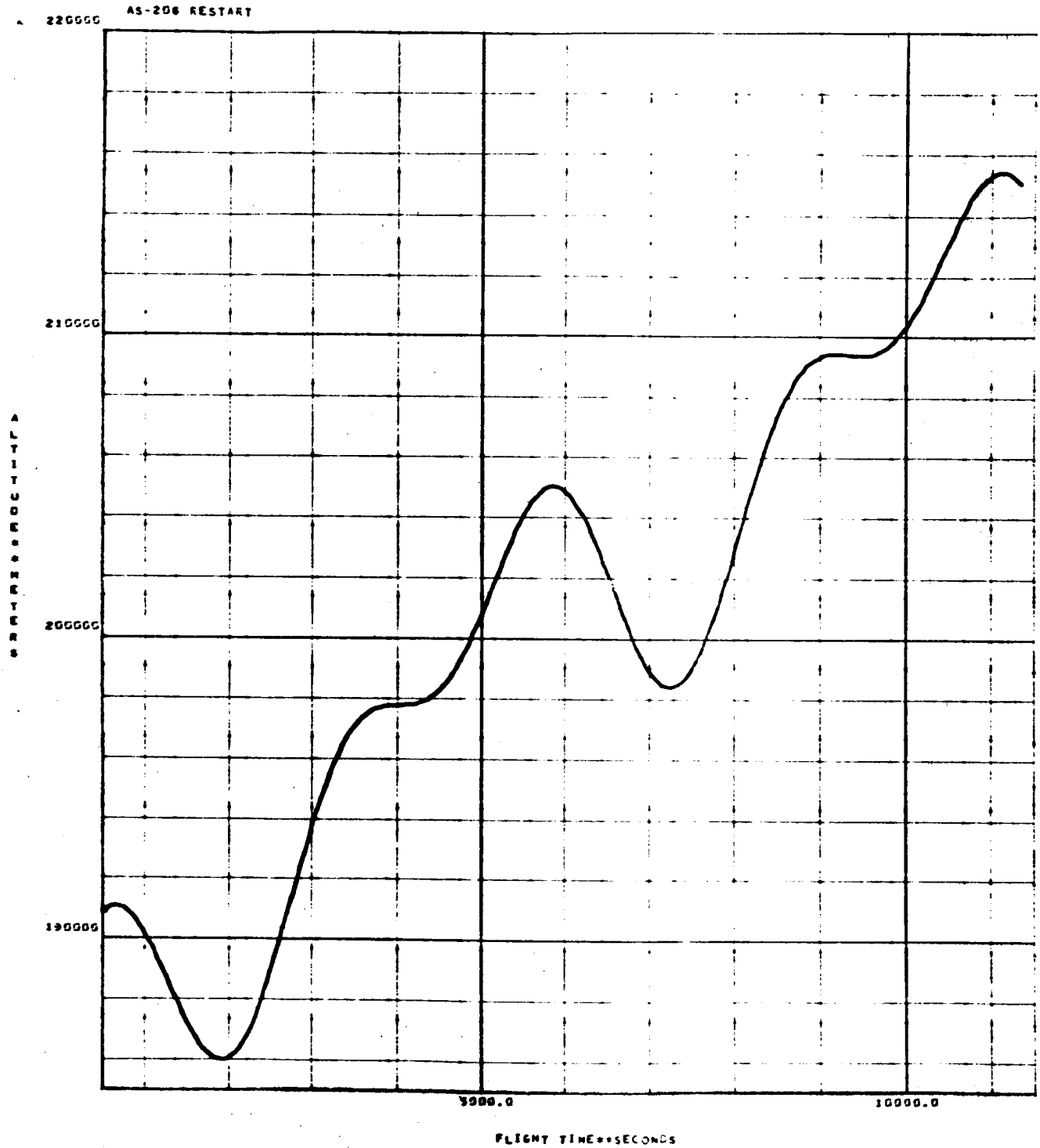


Figure 20

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
SPACE FIXED VELOCITY: FIRST ORBITAL COAST PHASE

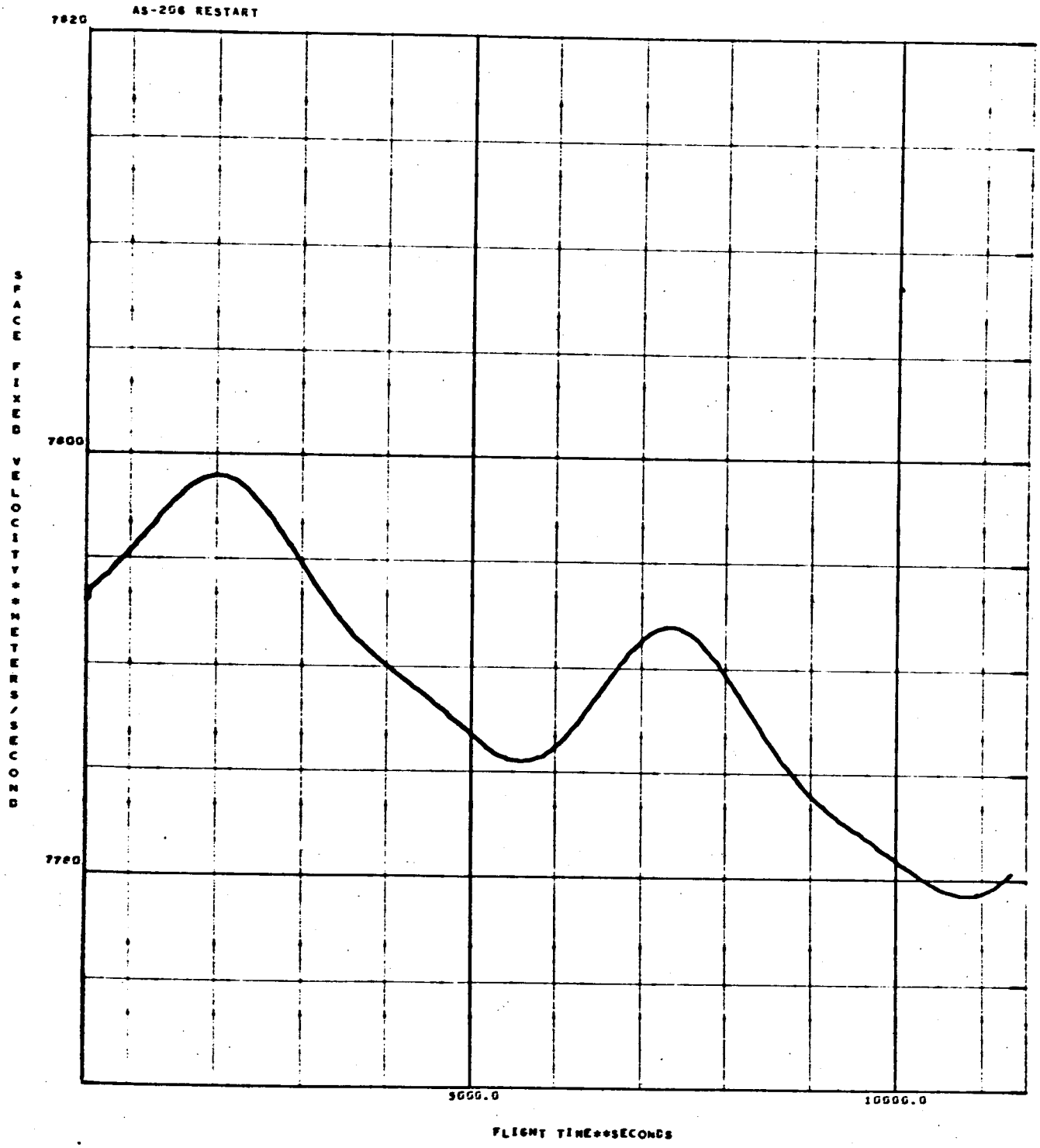
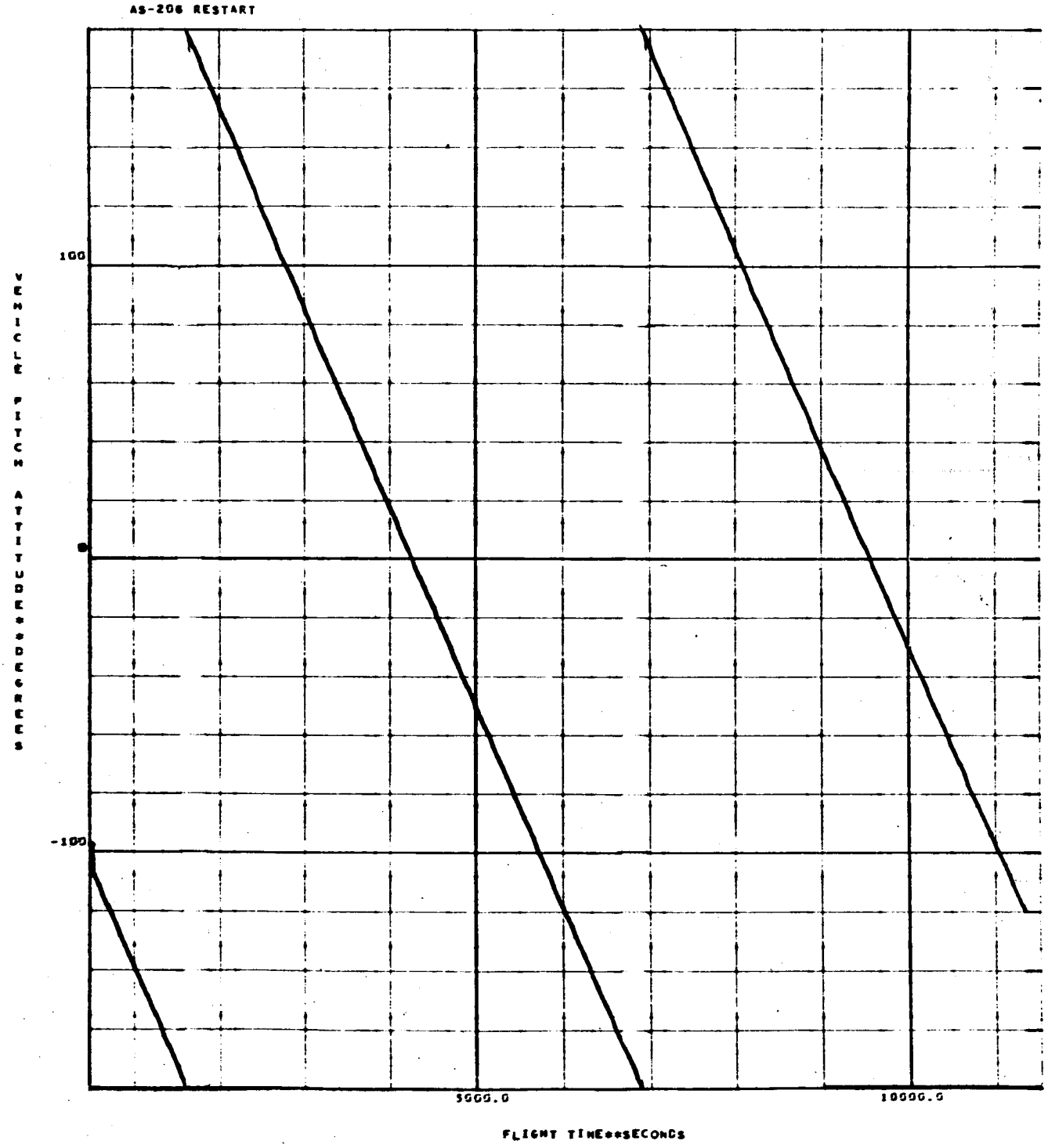


Figure 21

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
* PITCH ATTITUDE HISTORY: FIRST ORBITAL COAST PHASE



* Referenced to the X_g axis measured positive counter clockwise (0 - 180°).

Figure 22

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
ALTITUDE HISTORY: S-IVB STAGE FLIGHT DATA, SECOND BURN

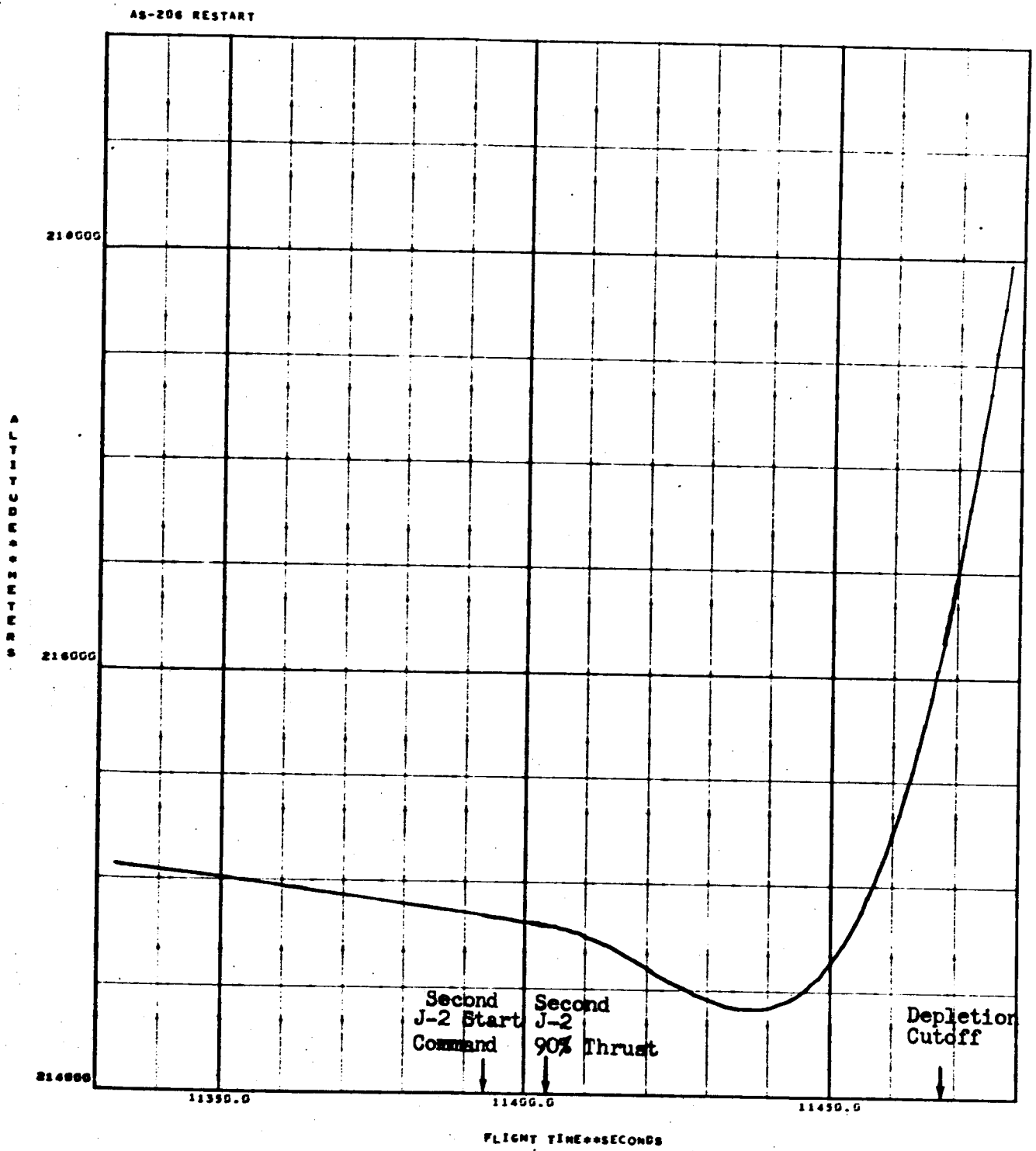


Figure 23

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
SPACE FIXED VELOCITY HISTORY: S-IVB STAGE FLIGHT DATA, SECOND BURN

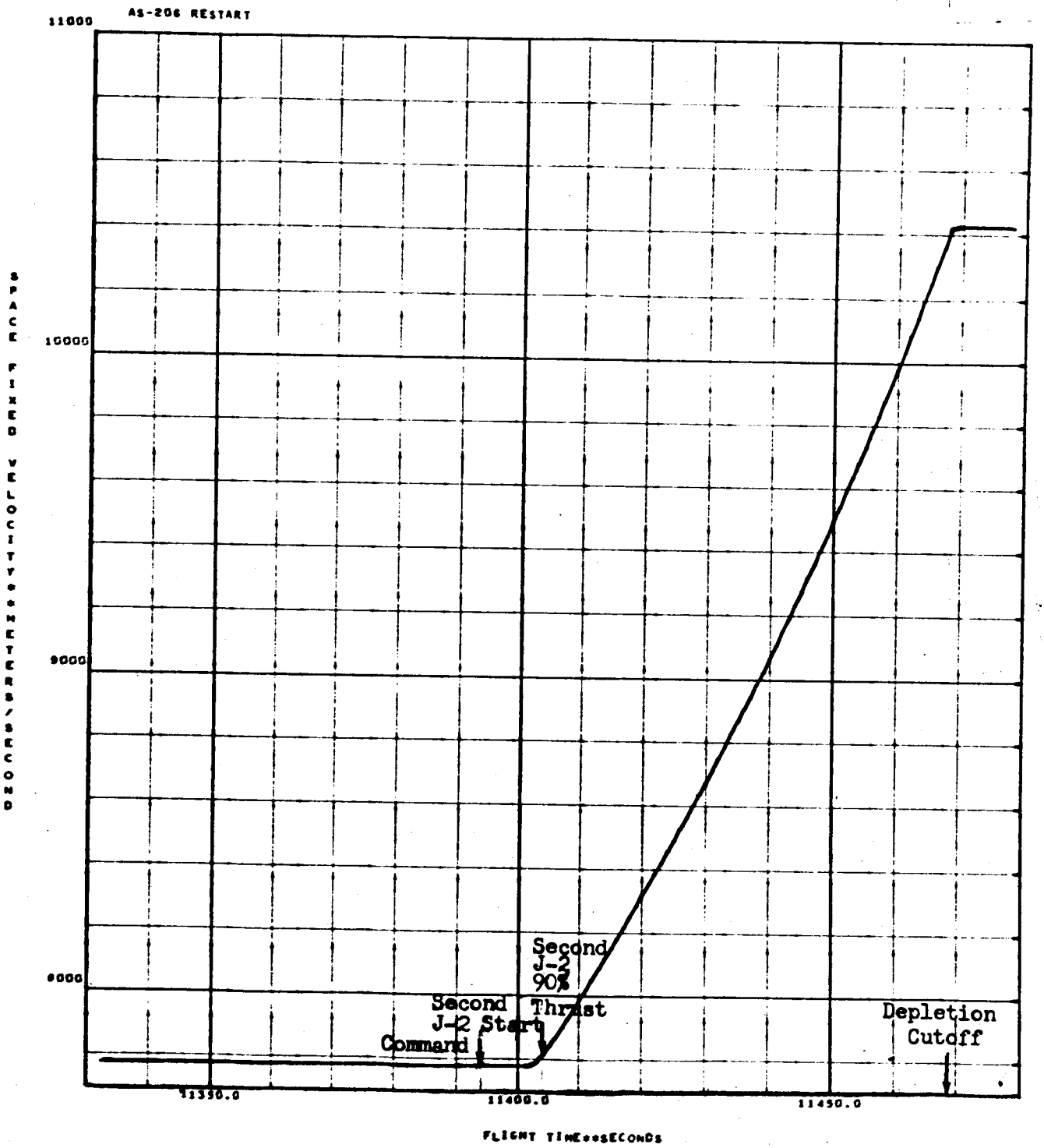


Figure 24

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
SPACE FIXED PATH ANGLE HISTORY: S-IVB STAGE FLIGHT DATA, SECOND BURN

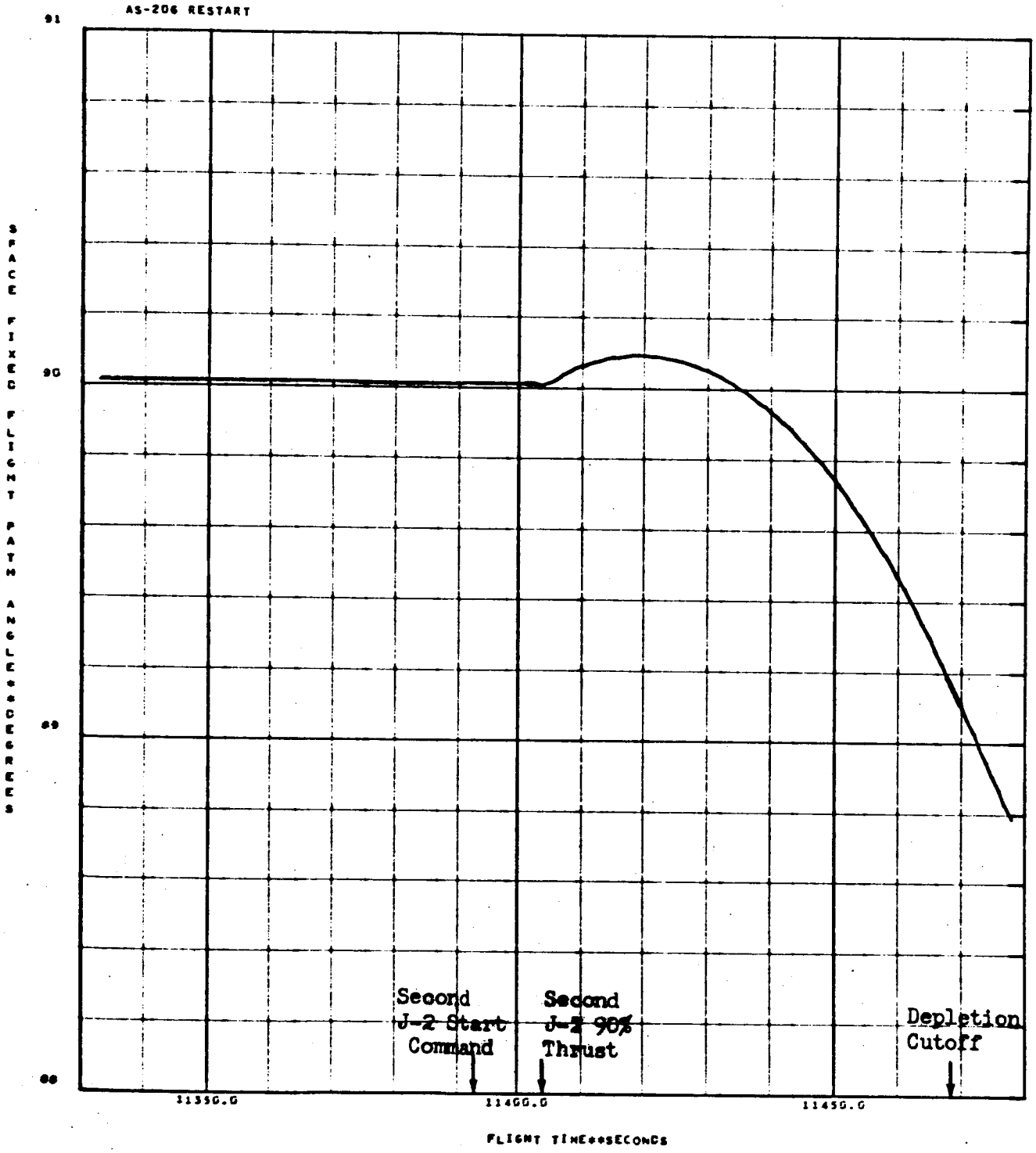


Figure 25

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
PITCH ATTITUDE HISTORY: S-IVB STAGE FLIGHT DATA, SECOND BURN

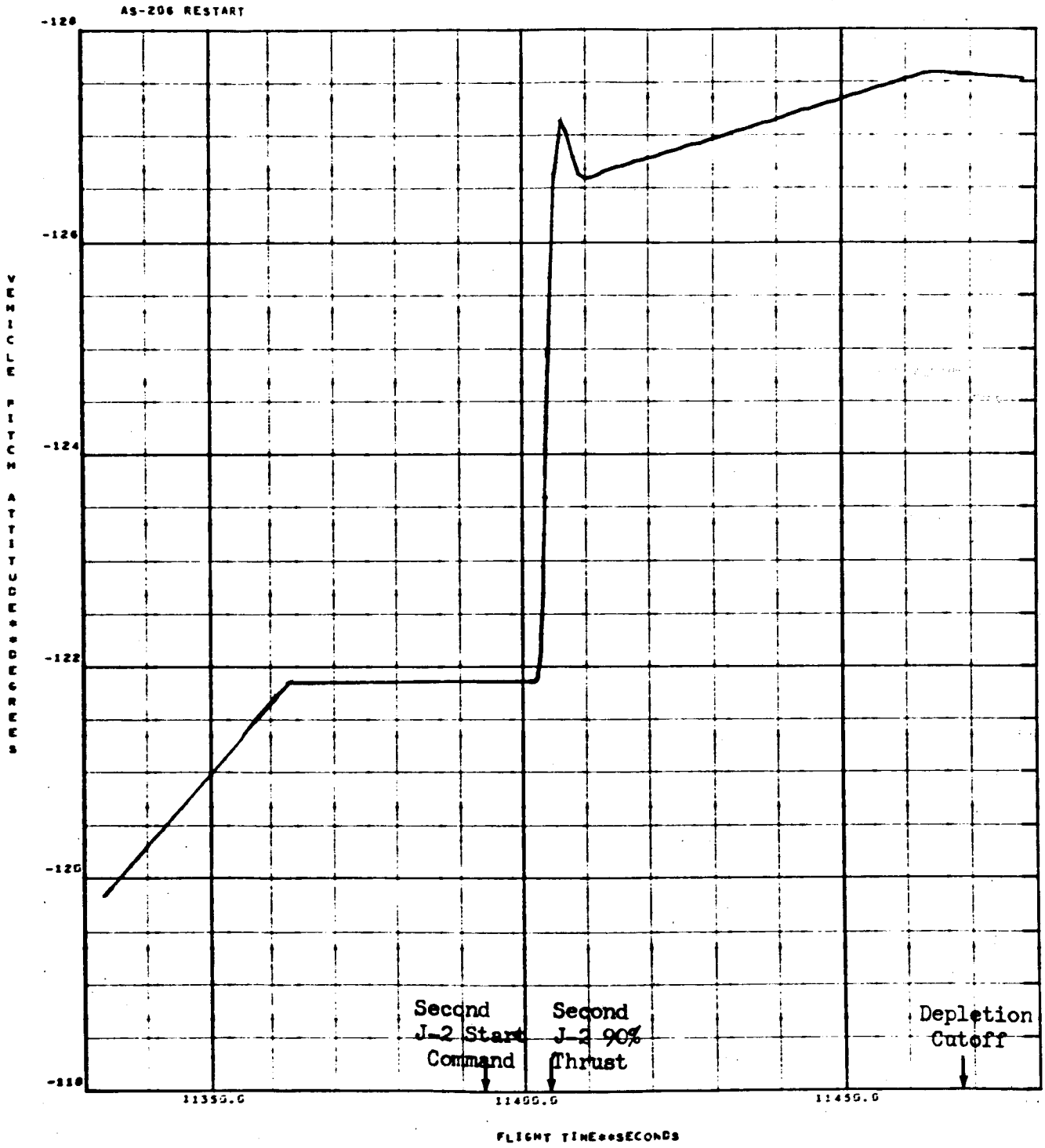


Figure 26

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
ALTITUDE HISTORY: SECOND ORBITAL COAST PHASE

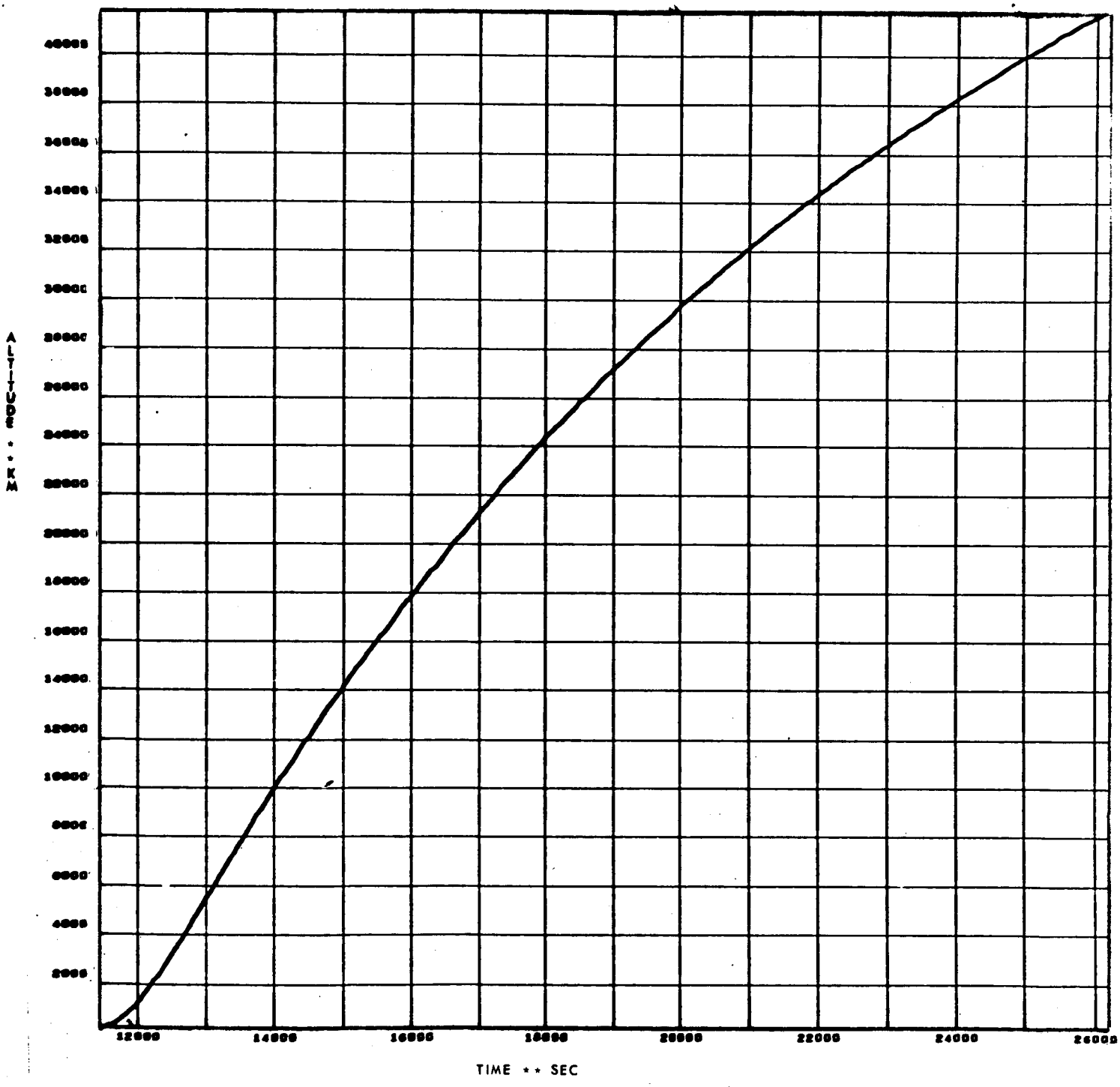


Figure 27

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
SPACE FIXED VELOCITY HISTORY: SECOND ORBITAL COAST DATA

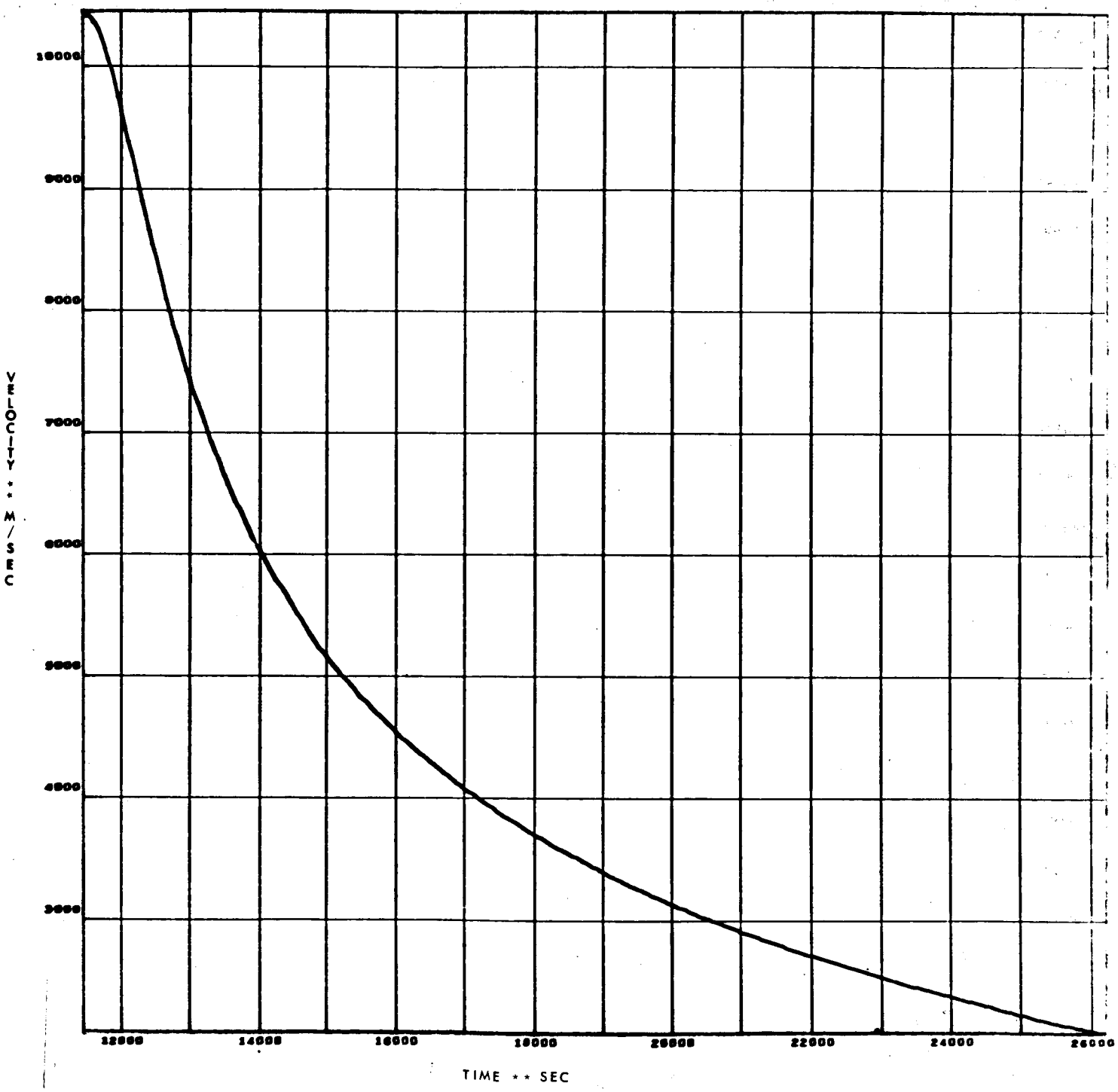
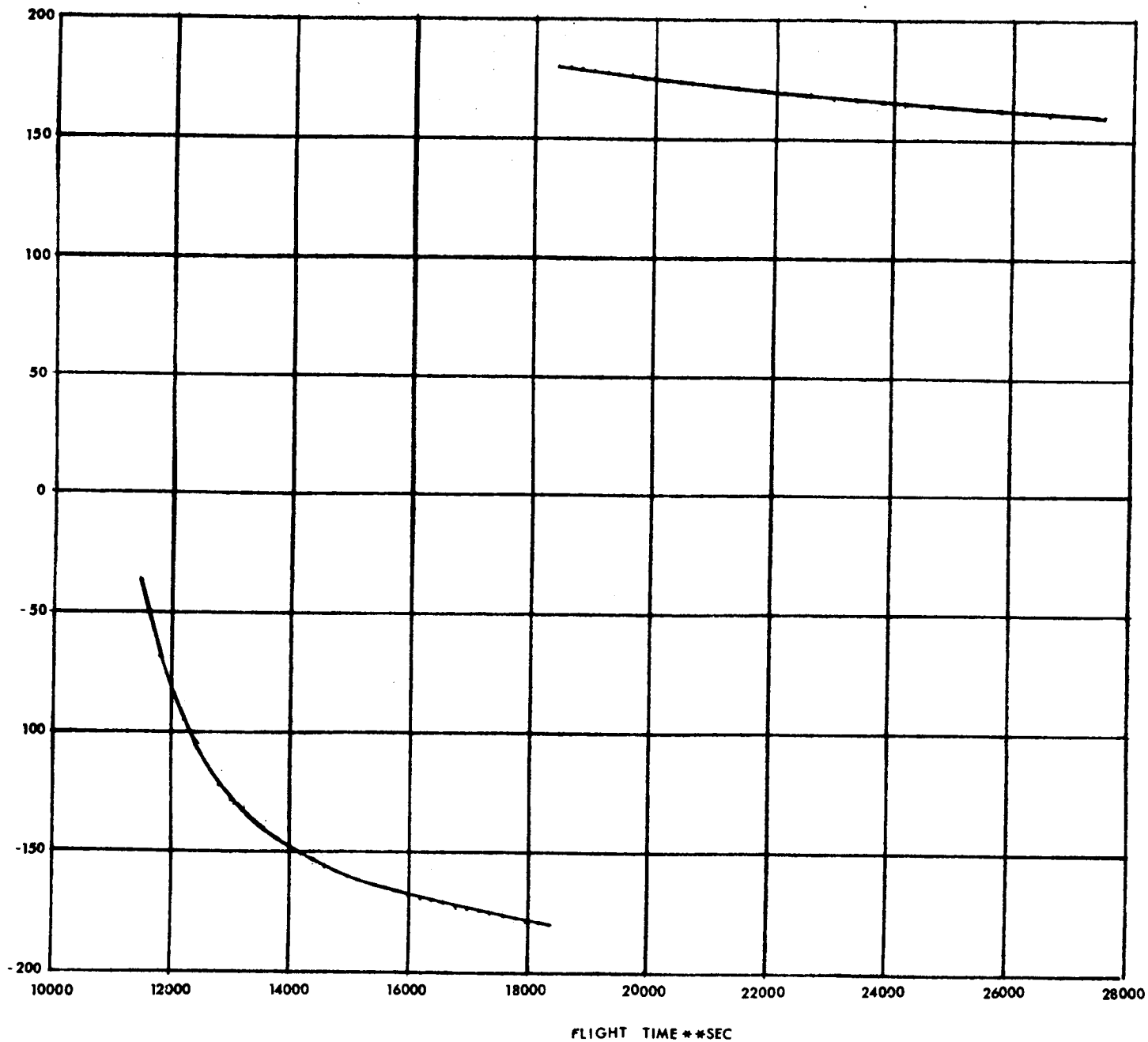


Figure 28

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
PITCH ATTITUDE* HISTORY: SECOND ORBITAL COAST DATA



* Reference to the Z_S axis (PASCS - 13) measured positive counter clockwise (0 - 180°).

Figure 29

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
GROUND PROJECTION WITH C-BAND RADAR COVERAGE ABOVE 5 DEGREE ELEVATION ANGLE - LAUNCH PHASE

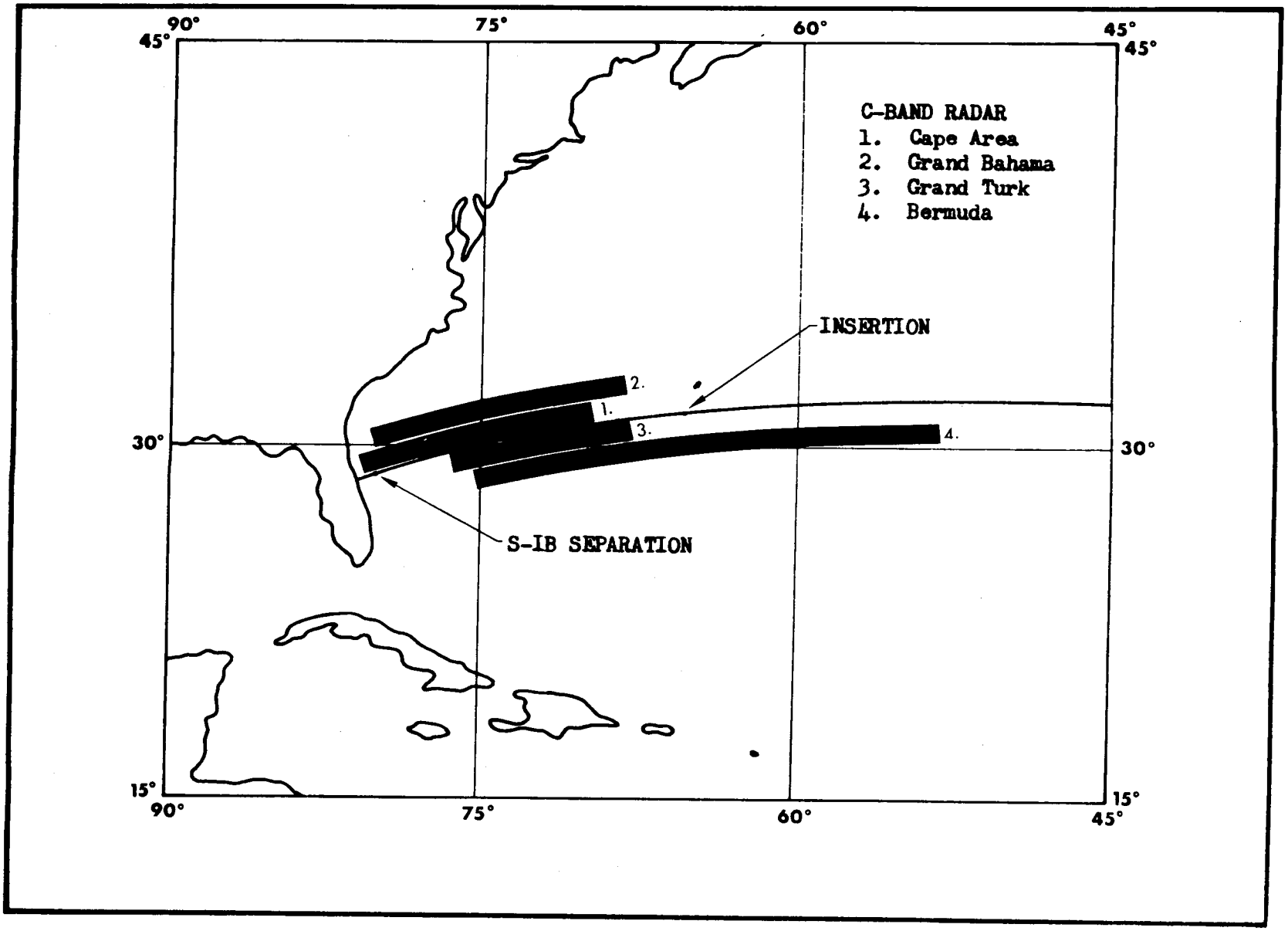
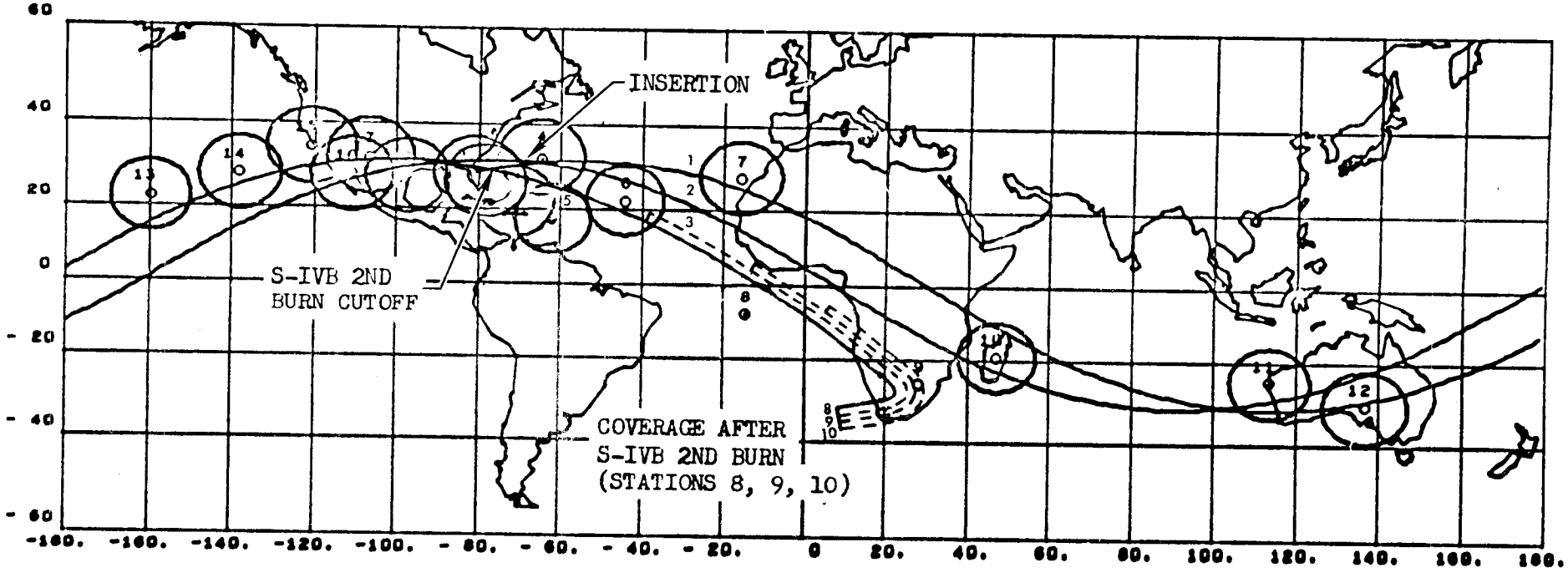


Figure 30

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
GROUND PROJECTION WITH TRACKING AND TELEMETRY COVERAGE ABOVE 5 DEGREE ELEVATION ANGLE - ORBITAL PHASE



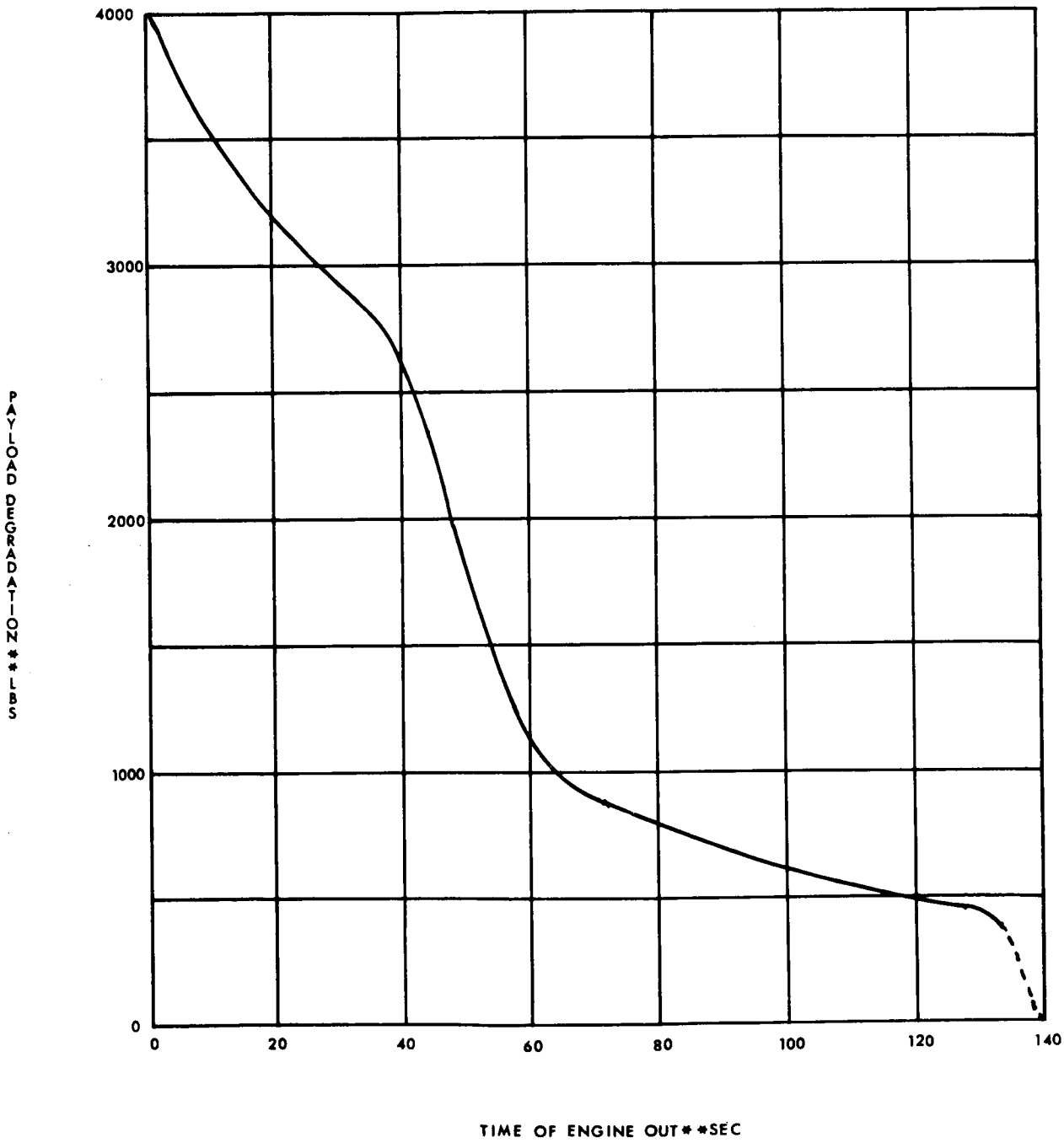
STATION *

1. CAPE AREA-R/T
2. GRAND BAHAMA-R/T
3. GRAND TURK-R/T
4. BERMUDA-R/T
5. ANTIGUA-R/T
6. INSERT. SHIP-R/T
7. CANARY ISLAND-R/T
8. ASCENSION ISLAND-R/T
9. PRETORIA-R
10. TANANARIVE-R/T
11. CARNARVON-R/T
12. WOOMERA-R
13. HAWAII-R/T
14. SHIP A-R/T
15. POINT ARGUELLO-R
16. GUAYMAS-T
17. WHITE SANDS-R
18. CORPUS CHRISTI-T

* R denotes C-band radar stations: T denotes telemetry stations.

Figure 31

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
H-1 ENGINE OUT PERFORMANCE CAPABILITY



APPENDIX A: "LAUNCH VEHICLE CHARACTERISTICS AND FLIGHT ENVIRONMENT"

TABLE 1A

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
VEHICLE WEIGHT BREAKDOWN
(POUNDS)

Nose Cone	1,055	
SLA Ring	91	
Spacecraft LM Adapter	5,222	
Instrument Unit	4,214	
S-IVB Stage, Dry	21,910	
S-IVB Stage Residuals	2,554	
Vehicle at End of LOX Vent, Second Burn		35,046
LOX Venting	54	
S-IVB Thrust Decay Propellant	136	
Vehicle at Propellant Depletion Cutoff		35,236
S-IVB Propellant Consumed	30,818	
APS Propellant Consumed	2	
Vehicle at "90% Thrust", Second Burn		66,056
S-IVB GN2 Start Tank	4	
S-IVB Buildup Propellant Consumed	317	
Propellant Lead	32	
Ullage Control Helium Expended	1	
Vehicle at J-2 Restart Command		66,410
Ullage Control Helium Expended	17	
LOX Vented	160	
Fuel Vented	1,088	
Vehicle at Orbit Insertion		67,675
S-IVB Thrust Decay Propellant Consumed	196	
Vehicle at S-IVB Cutoff, First Burn		67,871
S-IVB Propellant Consumed	196,287	
S-IVB APS Propellant Consumed	6	
Ullage Cases	215	
S-IVB "90% Thrust" Weight		264,379
S-IVB GH2 Start Tank	4	
S-IVB Buildup Propellant Consumed	369	
Ullage Propellant Consumed	163	
S-IVB Stage Weight at Separation		264,915

TABLE 1A (Cont'd)

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
VEHICLE WEIGHT BREAKDOWN
(POUNDS)

S-IVB Detonation Package	5	
Ullage Propellant Consumed	13	
S-IVB Aft Frame Hardware	31	
S-IB/S-IVB Interstage	6,667	
S-IB Dry Weight	84,365	
S-IB Residuals and Reserves	10,844	
S-IVB Frost Consumed	100	
S-IB Frost Consumed	1,000	
S-IB Seal Purge Consumed	6	
S-IB Fuel Additive Consumed	27	
S-IB Gearbox Lubricant Consumed	712	
Inboard Engine Thrust Decay Prpt Consumed	2,183	
Outboard Engine Thrust Decay Prpt Consumed To Separation	1,670	
S-IB Mainstage Propellant Consumed	880,961	
Vehicle Liftoff Weight		1,253,499

TABLE 2A

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
LAUNCH VEHICLE PROPULSION PERFORMANCE CHARACTERISTICS

S-IB STAGE

Average Longitudinal Sea Level Thrust (lbs)

	H-1 Engine	Turbine	Total
Engine #1	203914.	646.	204560.
Engine #2	203148.	651.	203799.
Engine #3	203232.	640.	203872.
Engine #4	203367.	688.	204055.
Engine #5	205745.	648.	206393.
Engine #6	207935.	644.	208579.
Engine #7	205058.	649.	205707.
Engine #8	204431.	641.	205072.

Total Average Sea Level Thrust (F): 1,642,037.

Flight Time Interval: 0.0 - 138.838 seconds (IECO)

$\dot{W}$ = [Wt (t = 0) - Wt (t = 138.838) - * Waux] / 138.838

= 6284.97 (lb/sec)

Isp = F/$\dot{W}$

= 261.26 (sec)

* Waux:	
Frost	1100 lbs
Seal Purge	6 lbs
Fuel Additive	27 lbs
Total	1133 lbs

S-IVB STAGE

First Burn Flight Time Interval: 150.54 - 508.12 seconds
Second Burn Flight Time Interval: 11403.50 - 11467.96 seconds

AVERAGE VALUES

	First Burn Thrust Level	Second Burn Thrust Level
Vacuum Thrust (lbs)	229,916.	204,604.
Flowrate (lb/sec)	545.46	479.85
Specific Impulse (sec)	421.51	426.39

NOTE: The 0.7% S-IB stage bias, previously mentioned, is not included in these data.

TABLE 3A
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IB STAGE MASS CHARACTERISTICS

	FLIGHT TIME (SEC)	MASS (KG)	--- CENTER OF GRAVITY --- X-AXIS (M)	Y-AXIS (M)	Z-AXIS (M)	---- MOMENT OF INERTIA ---- X-AXIS (KG-M-S2)	Y-AXIS (KG-M-S2)	Z-AXIS (KG-M-S2)
1)	-5.00	574968.	-------	-------	-------	-------	---------	----------
2)	0.00	568578.	15.1765	0.0058	-0.0053	213913.	5065617.	5065617.
	5.00	554557.	15.0729	0.0060	-0.0056	207884.	5037101.	5037101.
	10.00	540456.	14.9776	0.0062	-0.0057	201805.	5013369.	5013369.
	15.00	526290.	14.8912	0.0063	-0.0058	195722.	4993702.	4993702.
	20.00	512040.	14.8155	0.0065	-0.0060	189593.	4978752.	4978752.
	25.00	497752.	14.7504	0.0067	-0.0062	183432.	4967237.	4967237.
	30.00	483441.	14.6980	0.0069	-0.0063	177252.	4958634.	4958634.
	35.00	469114.	14.6601	0.0071	-0.0066	171045.	4952393.	4952393.
	40.00	454783.	14.6373	0.0074	-0.0067	164850.	4947611.	4947611.
	45.00	440448.	14.6314	0.0076	-0.0071	158670.	4943479.	4943479.
	50.00	426110.	14.6449	0.0079	-0.0073	152493.	4939072.	4939072.
	55.00	411780.	14.6784	0.0081	-0.0075	146316.	4933762.	4933762.
	60.00	397409.	14.7345	0.0084	-0.0079	140121.	4925549.	4925549.
	65.00	382996.	14.8183	0.0088	-0.0080	133921.	4913103.	4913103.
	70.00	368583.	14.9291	0.0090	-0.0085	127731.	4896157.	4896157.
3)	71.00	365700.	14.9552	0.0091	-0.0086	126493.	4892015.	4892015.
	75.00	354169.	15.0714	0.0094	-0.0086	121544.	4872603.	4872603.
	80.00	339765.	15.2520	0.0098	-0.0091	115362.	4840226.	4840226.
	85.00	325433.	15.4700	0.0102	-0.0095	109204.	4799004.	4799004.
	90.00	311109.	15.7313	0.0109	-0.0099	103047.	4745905.	4745905.
	95.00	296788.	16.0488	0.0113	-0.0105	96889.	4675997.	4675997.
	100.00	282477.	16.4257	0.0119	-0.0110	90733.	4587577.	4587577.
	105.00	268181.	16.8685	0.0127	-0.0117	84589.	4477263.	4477263.
	110.00	253904.	17.4001	0.0133	-0.0123	78444.	4336878.	4336878.
	115.00	239649.	18.0237	0.0141	-0.0130	72301.	4163845.	4163845.
	120.00	225424.	18.7544	0.0150	-0.0137	66168.	3952086.	3952086.
	125.00	211239.	19.6315	0.0160	-0.0148	60044.	3686560.	3686560.
	130.00	197099.	20.6657	0.0172	-0.0157	53944.	3362002.	3362002.
4)	132.25	190753.	21.1877	0.0176	-0.0163	51208.	3194498.	3194498.
5)	138.84	172263.	22.9955	0.0196	-0.0180	43200.	2596281.	2596281.
6)	141.84	167154.	23.6111	0.0203	-0.0188	40772.	2376457.	2376457.
7)	143.14	166408.	23.7070	0.0203	-0.0188	40324.	2340287.	2340287.
8)	143.22	166390.	23.7070	0.0203	-0.0188	40324.	2340287.	2340287.

1) GRR;
2) First Motion;
3) Maximum Dynamic Pressure;
4) Tilt Arrest;
5) IECO;
6) OECO;
7) Separation Signal;
8) Physical Separation.

TABLE 4A

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

S-IVB STAGE FIRST BURN, FIRST ORBITAL COAST AND S-IVB STAGE SECOND BURN MASS CHARACTERISTICS

	FLIGHT TIME (SEC)	MASS (KG)	--- CENTER OF GRAVITY --- X-AXIS (M)	Y-AXIS (M)	Z-AXIS (M)	---- MOMENT OF INERTIA ---- X-AXIS (KG-M-S2)	Y-AXIS (KG-M-S2)	Z-AXIS (KG-M-S2)
1)	143.22	120163.	5.0507	0.0234	-0.0259	11679.	165551.	165551.
2)	144.54	120137.	5.0507	0.0234	-0.0259	11679.	165551.	165551.
3)	146.89	119997.	5.0482	0.0234	-0.0259	11639.	165392.	165392.
	147.94	119920.	5.0468	0.0234	-0.0259	11616.	165301.	165301.
4)	147.94	119920.	5.0468	0.0234	-0.0259	11616.	165301.	165301.
5)	150.54	119356.	5.0406	0.0235	-0.0260	11616.	164955.	164955.
6)	155.14	118291.	5.0289	0.0236	-0.0262	11615.	164337.	164337.
7)	159.25	117175.	5.0197	0.0239	-0.0265	11497.	163717.	163717.
	160.00	116989.	5.0178	0.0240	-0.0265	11497.	163617.	163617.
	180.00	112031.	4.9711	0.0250	-0.0275	11494.	160950.	160950.
	200.00	107072.	4.9307	0.0260	-0.0288	11492.	158704.	158704.
	220.00	102115.	4.8955	0.0273	-0.0303	11489.	156751.	156751.
	240.00	97160.	4.8673	0.0286	-0.0319	11486.	154922.	154922.
	260.00	92203.	4.8452	0.0301	-0.0335	11483.	153210.	153210.
	280.00	87249.	4.8307	0.0317	-0.0353	11480.	151592.	151592.
	300.00	82294.	4.8246	0.0335	-0.0375	11477.	150019.	150019.
	320.00	77339.	4.8277	0.0355	-0.0398	11474.	148517.	148517.
	340.00	72385.	4.8423	0.0379	-0.0425	11470.	147014.	147014.
	360.00	67430.	4.8683	0.0407	-0.0456	11466.	145548.	145548.
	380.00	62475.	4.9122	0.0437	-0.0492	11462.	144019.	144019.
	400.00	57524.	4.9778	0.0474	-0.0535	11458.	142374.	142374.
	420.00	52578.	5.0694	0.0517	-0.0584	11454.	140575.	140575.
	440.00	47631.	5.1986	0.0569	-0.0645	11448.	138461.	138461.
	460.00	42681.	5.3770	0.0635	-0.0720	11442.	135905.	135905.
	480.00	37735.	5.6254	0.0716	-0.0813	11435.	132659.	132659.
	500.00	32792.	5.9786	0.0820	-0.0934	11426.	128294.	128294.
8)	508.12	30786.	6.1616	0.0875	-0.0995	11422.	126083.	126083.
9)	518.12	30697.	6.1709	0.0878	-0.0998	11422.	125973.	125973.
	520.00	30693.	6.1714	0.0878	-0.0998	11422.	125968.	125968.
10)	530.00	30693.	6.1714	0.0878	-0.0998	11422.	125968.	125968.
	600.00	30689.	6.1718	0.0876	-0.0998	11422.	125964.	125964.
	700.00	30684.	6.1723	0.0876	-0.0998	11422.	125958.	125958.
	800.00	30679.	6.1729	0.0876	-0.0998	11422.	125952.	125952.
	900.00	30673.	6.1734	0.0877	-0.0999	11422.	125945.	125945.
	1000.00	30668.	6.1739	0.0877	-0.0999	11422.	125939.	125939.

1) Separation Completed;
2) J-2 Start Command, First Burn;
3) Terminate Ullage Burn;
4) 90% Thrust Level, First Burn;
5) Command P.U. Activation, First Burn;
6) Ullage Case Jettison;
7) I.G.M. Initiation;
8) Guidance Cutoff Signal;
9) Orbit Insertion;
10) Initiate Local Horizontal Attitude Hold.

TABLE 4A (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE FIRST BURN, FIRST ORBITAL COAST AND S-IVB STAGE SECOND BURN MASS CHARACTERISTICS

FLIGHT TIME (SEC)	MASS (KG)	--- CENTER OF GRAVITY --- X-AXIS (M)	Y-AXIS (M)	Z-AXIS (M)	---- MOMENT OF INERTIA ---- X-AXIS (KG-M-S2)	Y-AXIS (KG-M-S2)	Z-AXIS (KG-M-S2)
1100.00	30663.	6.1745	0.0877	-0.0999	11422.	125932.	125932.
1200.00	30658.	6.1750	0.0877	-0.0999	11422.	125926.	125926.
1300.00	30653.	6.1756	0.0877	-0.0999	11422.	125919.	125919.
1400.00	30647.	6.1761	0.0877	-0.1000	11422.	125913.	125913.
1500.00	30642.	6.1766	0.0877	-0.1000	11422.	125906.	125906.
1600.00	30637.	6.1772	0.0878	-0.1000	11422.	125900.	125900.
1700.00	30632.	6.1777	0.0878	-0.1000	11422.	125893.	125893.
1800.00	30627.	6.1783	0.0878	-0.1000	11422.	125887.	125887.
1900.00	30621.	6.1788	0.0878	-0.1000	11422.	125880.	125880.
2000.00	30616.	6.1793	0.0878	-0.1001	11422.	125874.	125874.
2100.00	30611.	6.1799	0.0878	-0.1001	11422.	125868.	125868.
2200.00	30606.	6.1804	0.0879	-0.1001	11422.	125861.	125861.
2300.00	30601.	6.1810	0.0879	-0.1001	11422.	125855.	125855.
2400.00	30595.	6.1815	0.0879	-0.1001	11422.	125848.	125848.
2500.00	30590.	6.1820	0.0879	-0.1001	11422.	125842.	125842.
2600.00	30585.	6.1826	0.0879	-0.1002	11422.	125835.	125835.
2700.00	30580.	6.1831	0.0879	-0.1002	11422.	125829.	125829.
2800.00	30575.	6.1837	0.0879	-0.1002	11422.	125822.	125822.
2900.00	30569.	6.1842	0.0880	-0.1002	11422.	125816.	125816.
3000.00	30564.	6.1847	0.0880	-0.1002	11422.	125809.	125809.
3100.00	30559.	6.1853	0.0880	-0.1002	11422.	125803.	125803.
3200.00	30554.	6.1858	0.0880	-0.1003	11422.	125796.	125796.
3300.00	30549.	6.1864	0.0880	-0.1003	11422.	125790.	125790.
3400.00	30543.	6.1869	0.0880	-0.1003	11422.	125783.	125783.
3500.00	30538.	6.1874	0.0880	-0.1003	11422.	125777.	125777.
3600.00	30533.	6.1880	0.0881	-0.1003	11422.	125771.	125771.
3700.00	30528.	6.1885	0.0881	-0.1004	11422.	125764.	125764.
3800.00	30523.	6.1891	0.0881	-0.1004	11422.	125758.	125758.
3900.00	30517.	6.1896	0.0881	-0.1004	11422.	125751.	125751.
4000.00	30512.	6.1901	0.0881	-0.1004	11422.	125745.	125745.
4100.00	30507.	6.1907	0.0881	-0.1004	11422.	125738.	125738.
4200.00	30502.	6.1912	0.0882	-0.1004	11421.	125732.	125732.
4300.00	30497.	6.1918	0.0882	-0.1005	11421.	125725.	125725.
4400.00	30491.	6.1923	0.0882	-0.1005	11421.	125719.	125719.
4500.00	30486.	6.1928	0.0882	-0.1005	11421.	125712.	125712.

TABLE 4A (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE FIRST BURN, FIRST ORBITAL COAST AND S-IVB STAGE SECOND BURN MASS CHARACTERISTICS

FLIGHT TIME (SEC)	MASS (KG)	--- CENTER OF GRAVITY --- X-AXIS (M)	Y-AXIS (M)	Z-AXIS (M)	---- MOMENT OF INERTIA ---- X-AXIS (KG-M-S2)	Y-AXIS (KG-M-S2)	Z-AXIS (KG-M-S2)
4600.00	30481.	6.1934	0.0882	-0.1005	11421.	125706.	125706.
4700.00	30476.	6.1939	0.0882	-0.1005	11421.	125699.	125699.
4800.00	30471.	6.1945	0.0882	-0.1005	11421.	125693.	125693.
4900.00	30465.	6.1950	0.0883	-0.1006	11421.	125687.	125687.
5000.00	30460.	6.1955	0.0883	-0.1006	11421.	125680.	125680.
5100.00	30455.	6.1961	0.0883	-0.1006	11421.	125674.	125674.
5200.00	30450.	6.1966	0.0883	-0.1006	11421.	125667.	125667.
5300.00	30445.	6.1972	0.0883	-0.1006	11421.	125661.	125661.
5400.00	30439.	6.1977	0.0883	-0.1007	11421.	125654.	125654.
5500.00	30434.	6.1982	0.0883	-0.1007	11421.	125648.	125648.
5600.00	30429.	6.1988	0.0884	-0.1007	11421.	125641.	125641.
5700.00	30424.	6.1993	0.0884	-0.1007	11421.	125635.	125635.
5800.00	30419.	6.1999	0.0884	-0.1007	11421.	125628.	125628.
5900.00	30413.	6.2004	0.0884	-0.1007	11421.	125622.	125622.
6000.00	30408.	6.2009	0.0884	-0.1008	11421.	125615.	125615.
6100.00	30403.	6.2015	0.0884	-0.1008	11421.	125609.	125609.
6200.00	30398.	6.2020	0.0885	-0.1008	11421.	125603.	125603.
6300.00	30393.	6.2026	0.0885	-0.1008	11421.	125596.	125596.
6400.00	30387.	6.2031	0.0885	-0.1008	11421.	125590.	125590.
6500.00	30382.	6.2036	0.0885	-0.1008	11421.	125583.	125583.
6600.00	30377.	6.2042	0.0885	-0.1009	11421.	125577.	125577.
6700.00	30372.	6.2047	0.0885	-0.1009	11421.	125570.	125570.
6800.00	30367.	6.2053	0.0885	-0.1009	11421.	125564.	125564.
6900.00	30361.	6.2058	0.0886	-0.1009	11421.	125557.	125557.
7000.00	30356.	6.2063	0.0886	-0.1009	11421.	125551.	125551.
7100.00	30351.	6.2069	0.0886	-0.1009	11421.	125544.	125544.
7200.00	30346.	6.2074	0.0886	-0.1010	11421.	125538.	125538.
7300.00	30341.	6.2080	0.0886	-0.1010	11421.	125531.	125531.
7400.00	30336.	6.2085	0.0886	-0.1010	11421.	125525.	125525.
7500.00	30330.	6.2090	0.0886	-0.1010	11421.	125518.	125518.
7600.00	30325.	6.2096	0.0887	-0.1010	11421.	125512.	125512.
7700.00	30320.	6.2101	0.0887	-0.1011	11421.	125506.	125506.
7800.00	30315.	6.2107	0.0887	-0.1011	11421.	125499.	125499.
7900.00	30310.	6.2112	0.0887	-0.1011	11421.	125493.	125493.
8000.00	30304.	6.2117	0.0887	-0.1011	11421.	125486.	125486.

TABLE 4A (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION I/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE FIRST BURN, FIRST ORBITAL COAST AND S-IVB STAGE SECOND BURN MASS CHARACTERISTICS

FLIGHT TIME (SEC)	MASS (KG)	--- CENTER OF GRAVITY --- X-AXIS (M)	Y-AXIS (M)	Z-AXIS (M)	---- MOMENT OF INERTIA ---- X-AXIS (KG-M-S2)	Y-AXIS (KG-M-S2)	Z-AXIS (KG-M-S2)
8100.00	30299.	6.2123	0.0887	-0.1011	11421.	125480.	125480.
8200.00	30294.	6.2128	0.0888	-0.1011	11421.	125473.	125473.
8300.00	30289.	6.2134	0.0888	-0.1012	11421.	125467.	125467.
8400.00	30284.	6.2139	0.0888	-0.1012	11421.	125460.	125460.
8500.00	30278.	6.2144	0.0888	-0.1012	11421.	125454.	125454.
8600.00	30273.	6.2150	0.0888	-0.1012	11421.	125447.	125447.
8700.00	30268.	6.2155	0.0888	-0.1012	11421.	125441.	125441.
8800.00	30263.	6.2161	0.0888	-0.1012	11421.	125434.	125434.
8900.00	30258.	6.2166	0.0889	-0.1013	11421.	125428.	125428.
9000.00	30252.	6.2171	0.0889	-0.1013	11421.	125422.	125422.
9100.00	30247.	6.2177	0.0889	-0.1013	11421.	125415.	125415.
9200.00	30242.	6.2182	0.0889	-0.1013	11421.	125409.	125409.
9300.00	30237.	6.2188	0.0889	-0.1013	11421.	125402.	125402.
9400.00	30232.	6.2193	0.0889	-0.1014	11421.	125396.	125396.
9500.00	30226.	6.2198	0.0889	-0.1014	11421.	125389.	125389.
9600.00	30221.	6.2204	0.0890	-0.1014	11421.	125383.	125383.
9700.00	30216.	6.2209	0.0890	-0.1014	11421.	125376.	125376.
9800.00	30211.	6.2215	0.0890	-0.1014	11421.	125370.	125370.
9900.00	30206.	6.2220	0.0890	-0.1014	11421.	125363.	125363.
10000.00	30200.	6.2225	0.0890	-0.1015	11421.	125357.	125357.
10100.00	30195.	6.2231	0.0890	-0.1015	11421.	125350.	125350.
10200.00	30190.	6.2236	0.0891	-0.1015	11421.	125344.	125344.
10300.00	30185.	6.2242	0.0891	-0.1015	11421.	125338.	125338.
10400.00	30180.	6.2247	0.0891	-0.1015	11421.	125331.	125331.
10500.00	30174.	6.2252	0.0891	-0.1015	11421.	125325.	125325.
10600.00	30169.	6.2258	0.0891	-0.1016	11421.	125318.	125318.
10700.00	30164.	6.2263	0.0891	-0.1016	11421.	125312.	125312.
10800.00	30159.	6.2269	0.0891	-0.1016	11421.	125305.	125305.
10900.00	30154.	6.2274	0.0892	-0.1016	11421.	125299.	125299.
10943.00	30151.	6.2282	0.0892	-0.1016	11420.	125291.	125296.
11) 10943.00	30151.	6.2282	0.0892	-0.1016	11420.	125291.	125291.
11000.00	30148.	6.2285	0.0892	-0.1016	11420.	125287.	125287.
11100.00	30143.	6.2290	0.0892	-0.1016	11420.	125280.	125280.
11200.00	30138.	6.2296	0.0892	-0.1016	11420.	125274.	125274.
11300.00	30133.	6.2301	0.0892	-0.1016	11420.	125267.	125267.

11) Guaymas Acquisition, Start Time Base 5.

TABLE 4A (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE FIRST BURN, FIRST ORBITAL COAST AND S-IVB STAGE SECOND BURN MASS CHARACTERISTICS

	FLIGHT TIME (SEC)	MASS (KG)	--- CENTER OF GRAVITY --- X-AXIS (M)	Y-AXIS (M)	Z-AXIS (M)	---- MOMENT OF INERTIA ---- X-AXIS (KG-M-S2)	Y-AXIS (KG-M-S2)	Z-AXIS (KG-M-S2)
12)	11333.00	30131.	6.2303	0.0893	-0.1017	11420.	125265.	125265.
13)	11334.20	30131.	6.2303	0.0893	-0.1017	11420.	125265.	125265.
14)	11363.00	30127.	6.2307	0.0893	-0.1017	11420.	125260.	125260.
15)	11393.00	30123.	6.2311	0.0893	-0.1017	11420.	125256.	125256.
	11395.00	30119.	6.2315	0.0893	-0.1017	11420.	125251.	125251.
16)	11396.00	30117.	6.2317	0.0893	-0.1017	11420.	125248.	125248.
	11400.00	30110.	6.2324	0.0893	-0.1017	11420.	125240.	125240.
17)	11401.00	30108.	6.2326	0.0893	-0.1017	11420.	125237.	125237.
	11403.50	29963.	6.3240	0.0927	-0.1031	11388.	123773.	123773.
18)	11403.50	29963.	6.3240	0.0927	-0.1031	11388.	123773.	123773.
	11405.00	29664.	6.3591	0.0937	-0.1043	11387.	123379.	123379.
19)	11406.00	29466.	6.3824	0.0944	-0.1050	11387.	123115.	123115.
	11410.00	28644.	6.4829	0.0972	-0.1082	11384.	121985.	121985.
	11415.00	27560.	6.6272	0.1010	-0.1126	11381.	120361.	120361.
	11420.00	26476.	6.7867	0.1053	-0.1173	11378.	118557.	118557.
	11425.00	25390.	6.9635	0.1099	-0.1226	11375.	116519.	116519.
	11430.00	24302.	7.1603	0.1150	-0.1283	11371.	114201.	114201.
	11435.00	23211.	7.3802	0.1207	-0.1346	11367.	111613.	111613.
	11440.00	22117.	7.6277	0.1269	-0.1417	11363.	108700.	108700.
	11445.00	21021.	7.9074	0.1338	-0.1496	11358.	105399.	105399.
	11450.00	19923.	8.2255	0.1415	-0.1583	11353.	101633.	101633.
	11455.00	18824.	8.5901	0.1504	-0.1680	11347.	97290.	97290.
	11460.00	17727.	9.0094	0.1601	-0.1791	11340.	92245.	92245.
	11465.00	16632.	9.2777	0.1658	-0.1856	11298.	89182.	89182.
20)	11467.96	15983.	9.3133	0.1660	-0.1858	11250.	88993.	88993.
	11470.00	15901.	9.3178	0.1660	-0.1859	11244.	88969.	88969.
	11475.00	15898.	9.3179	0.1660	-0.1859	11244.	88968.	88968.
21)	11477.96	15897.	9.3180	0.1660	-0.1859	11244.	88968.	88968.

12) Initiate Helium Ullage Control;
13) Terminate C.V.S. LH2 Venting;
14) Inertial Attitude Command Freeze;
15) J2 Start Command, Second Burn, Begin Fuel Lead;
16) Terminate Helium Ullage Control;
17) J-2 Ignition, Second Burn;
18) 90% Thrust Level, Second Burn;
19) Command P.U. Activation, Second Burn;
20) Depletion Cutoff;
21) End LOX Vent.

TABLE 5A
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IB STAGE AERODYNAMIC CHARACTERISTICS

	FLIGHT TIME (SEC)	MACH NO.	CENTER OF PRESSURE (M)	AXIAL FORCE COEFFICIENT	NORMAL FORCE COEFFICIENT (1/RAD)
1)	-5.00	0.00	19.3900	1.0000	5.7300
2)	0.00	0.00	19.3900	1.0000	5.7300
	5.00	0.04	19.3588	1.0000	5.7478
	10.00	0.10	19.3233	1.0000	5.7681
	15.00	0.15	19.2533	0.9793	5.8021
	20.00	0.22	19.1054	0.5684	5.8435
	25.00	0.29	18.9545	0.4775	5.8662
	30.00	0.37	18.8360	0.4122	5.8917
	35.00	0.46	18.6722	0.3651	5.9383
	40.00	0.57	18.4265	0.3370	5.9867
	45.00	0.68	18.2905	0.3234	6.0413
	50.00	0.81	17.9074	0.3563	6.0973
	55.00	0.96	18.9533	0.5771	6.0208
	60.00	1.12	21.0476	0.7227	5.8534
	65.00	1.30	21.8780	0.6508	5.8703
	70.00	1.51	19.6466	0.5396	6.0780
3)	71.00	1.56	19.8693	0.5217	5.9376
	75.00	1.78	23.8211	0.4496	5.4612
	80.00	2.07	28.1031	0.3810	4.8825
	85.00	2.36	30.4007	0.3314	4.7266
	90.00	2.64	30.9216	0.2937	4.6698
	95.00	2.93	29.6735	0.2664	4.7104
	100.00	3.25	28.3359	0.2525	4.9048
	105.00	3.57	27.1858	0.2399	5.0828
	110.00	3.90	26.7162	0.2171	5.0502
	115.00	4.24	25.7923	0.1671	4.9875
	120.00	4.60	24.6868	0.1122	4.9116
	125.00	5.01	23.7033	0.0808	4.8390
	130.00	5.58	24.0976	-0.0254	4.7519
4)	132.25	5.89	24.6160	-0.0833	4.7214
5)	138.84	6.98	27.3619	-0.2268	4.6120
6)	141.84	7.36	30.7594	-0.2300	4.6100
7)	143.14	7.44	31.5105	-0.2300	4.6100
8)	143.22	7.44	31.5452	-0.2300	4.6100

1) GRR;
2) First Motion;
3) Maximum Dynamic Pressure;
4) Tilt Arrest;
5) IECO;
6) OECO;
7) Separation Signal;
8) Physical Separation.

TABLE 6A
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IB STAGE PROPULSION CHARACTERISTICS

	FLIGHT TIME (SEC)	ALTITUDE (KM)	LONG. ACCEL (M/S2)	H-1 ENGINE THRUST MAGNITUDES ENGINE 1 (N)	ENGINE 2 (N)	ENGINE 3 (N)	ENGINE 4 (N)	ENGINE 5 (N)	ENGINE 6 (N)	ENGINE 7 (N)	ENGINE 8 (N)
1)	-5.00	0.03	0.000	0.	0.	0.	0.	0.	0.	0.	0.
2)	0.00	0.03	12.522	883785.	880451.	881024.	881477.	884529.	894148.	881445.	878619.
	5.00	0.07	13.110	903683.	900342.	900897.	901361.	904421.	914145.	901361.	898560.
	10.00	0.19	13.506	909518.	906168.	906716.	907185.	910252.	919990.	907190.	904390.
	15.00	0.40	13.966	918597.	915279.	915778.	916293.	919350.	929131.	916290.	913508.
	20.00	0.72	14.473	926684.	923352.	923850.	924364.	927441.	937223.	924378.	921584.
	25.00	1.15	14.952	933716.	930387.	930875.	931398.	934474.	944265.	931411.	928620.
	30.00	1.71	15.466	941371.	938072.	938526.	939083.	942103.	951928.	939040.	936278.
	35.00	2.41	16.007	948965.	945637.	946114.	946647.	949670.	959524.	946603.	943871.
	40.00	3.25	16.584	957138.	953783.	954284.	954792.	957874.	967641.	954805.	951987.
	45.00	4.26	17.196	966034.	962650.	963180.	963660.	966742.	976539.	963675.	960884.
	50.00	5.42	17.769	974982.	971659.	972124.	972667.	975633.	985488.	972562.	969832.
	55.00	6.77	17.906	982427.	979103.	979569.	980111.	983139.	992925.	980065.	977274.
	60.00	8.28	18.184	990137.	986816.	987283.	987826.	990851.	1000693.	987778.	985046.
	65.00	9.97	19.122	998170.	994788.	995314.	995797.	998885.	1008664.	995811.	993017.
	70.00	11.84	20.326	1005620.	1002178.	1002763.	1003186.	1006216.	1016117.	1003140.	1000469.
3)	71.00	12.23	20.571	1006923.	1003605.	1004067.	1004612.	1007643.	1017359.	1004567.	1001713.
	75.00	13.90	21.613	1012071.	1008692.	1009218.	1009701.	1012794.	1022509.	1009722.	1006864.
	80.00	16.19	22.982	1017581.	1014266.	1014727.	1015274.	1018246.	1028086.	1015174.	1012439.
	85.00	18.70	24.431	1022246.	1018870.	1019392.	1019877.	1022979.	1032697.	1019909.	1017048.
	90.00	21.45	25.904	1025133.	1021448.	1022285.	1022457.	1025684.	1035466.	1022619.	1019817.
	95.00	24.44	27.404	1026133.	1022822.	1023286.	1023831.	1026939.	1036716.	1023873.	1021068.
	100.00	27.67	28.948	1026288.	1022856.	1023447.	1023865.	1026974.	1036745.	1023911.	1021103.
	105.00	31.17	30.599	1025663.	1022357.	1022827.	1023367.	1026354.	1036117.	1023293.	1020481.
	110.00	34.93	32.395	1024653.	1021225.	1021822.	1022234.	1025475.	1035105.	1022412.	1019472.
	115.00	38.98	34.354	1022731.	1019430.	1019910.	1020442.	1023684.	1033303.	1020625.	1017679.
	120.00	43.33	36.489	1020228.	1016805.	1017415.	1017817.	1020938.	1030791.	1017879.	1015176.
	125.00	47.98	38.850	1017012.	1013842.	1014216.	1014857.	1017854.	1027692.	1014802.	1012091.
	130.00	52.95	41.511	1013254.	1009717.	1010471.	1010731.	1014105.	1023798.	1011053.	1008210.
4)	132.25	55.29	42.813	1011108.	1007759.	1008334.	1008774.	1011933.	1021615.	1008884.	1006036.
5)	138.84	62.52	47.006	1002090.	998928.	999389.	999930.	1003149.	1012863.	1000129.	997347.
6)	141.84	65.98	21.221	801253.	968508.	798674.	969633.	-0.	-0.	-0.	-0.
7)	143.14	67.47	1.309	65856.	41747.	65672.	41792.	-0.	-0.	-0.	-0.
8)	143.22	67.57	1.211	59358.	40097.	59193.	40140.	-0.	-0.	-0.	-0.

1) GRR;
2) First Motion;
3) Maximum Dynamic Pressure;
4) Tilt Arrest;
5) IECO;
6) OECO;
7) Separation Signal;
8) Physical Separation.

TABLE 7A

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

S-IVB STAGE FIRST BURN, FIRST ORBITAL COAST AND S-IVB STAGE SECOND BURN PROPULSION CHARACTERISTICS

	FLIGHT TIME (SEC)	ALTITUDE (KM)	LONGITUDINAL ACCELERATION (M/S2)	THRUST MAGNITUDE (TOTAL) (N)
1)	143.22	67.57	0.310	0.
2)	144.54	69.07	0.307	0.
3)	146.89	71.72	3.637	403126.
	147.94	72.89	7.517	902379.
4)	147.94	72.89	7.517	902379.
5)	150.54	75.76	7.495	895174.
6)	155.14	80.76	8.665	1025244.
7)	159.25	85.15	8.738	1023977.
	160.00	85.94	8.750	1023786.
	180.00	106.04	9.147	1024728.
	200.00	123.89	9.560	1023621.
	220.00	139.53	10.030	1024277.
	240.00	153.06	10.529	1023036.
	260.00	164.56	11.106	1024055.
	280.00	174.12	11.725	1023083.
	300.00	181.81	12.446	1024328.
	320.00	187.72	13.247	1024549.
	340.00	192.01	14.140	1023580.
	360.00	194.82	15.198	1024868.
	380.00	196.30	16.389	1023975.
	400.00	196.65	17.766	1022089.
	420.00	196.08	19.427	1021550.
	440.00	194.86	21.478	1023159.
	460.00	193.33	23.953	1022521.
	480.00	191.87	27.075	1021864.
	500.00	190.98	31.133	1021121.
8)	508.12	190.87	33.150	1020784.
9)	518.12	190.90	0.066	2042.
	530.00	190.93	0.010	311.
10)	530.00	190.93	0.010	311.
	600.00	191.04	0.004	125.
	700.00	191.06	0.004	112.
	800.00	190.92	0.003	98.
	900.00	190.62	0.003	81.
	1000.00	190.19	0.002	67.

1) Separation Completed;
2) J-2 Start Command, First Burn;
3) Terminate Ullage Burn;
4) 90% Thrust Level, First Burn;
5) Command P.U. Activation, First Burn;
6) Ullage Case Jettison;
7) I.G.M. Initiation;
8) Guidance Cutoff Signal;
9) Orbit Insertion;
10) Initiate Local Horizontal Attitude Hold.

TABLE 7A (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE FIRST BURN, FIRST ORBITAL COAST AND S-IVB STAGE SECOND BURN PROPULSION CHARACTERISTICS

FLIGHT TIME (SEC)	ALTITUDE (KM)	LONGITUDINAL ACCELERATION (M/S2)	THRUST MAGNITUDE (TOTAL) (N)
1100.00	189.67	0.002	59.
1200.00	189.07	0.002	56.
1300.00	188.44	0.002	56.
1400.00	187.82	0.002	56.
1500.00	187.24	0.002	57.
1600.00	186.74	0.002	57.
1700.00	186.34	0.002	58.
1800.00	186.09	0.002	58.
1900.00	186.00	0.002	57.
2000.00	186.08	0.002	57.
2100.00	186.34	0.002	57.
2200.00	186.77	0.002	57.
2300.00	187.36	0.002	57.
2400.00	188.10	0.002	56.
2500.00	188.95	0.002	55.
2600.00	189.89	0.002	54.
2700.00	190.88	0.002	54.
2800.00	191.89	0.002	53.
2900.00	192.89	0.002	52.
3000.00	193.83	0.002	51.
3100.00	194.70	0.002	51.
3200.00	195.48	0.002	50.
3300.00	196.14	0.002	49.
3400.00	196.68	0.002	48.
3500.00	197.09	0.002	48.
3600.00	197.39	0.002	47.
3700.00	197.59	0.001	46.
3800.00	197.70	0.001	45.
3900.00	197.76	0.001	45.
4000.00	197.78	0.001	44.
4100.00	197.79	0.001	43.
4200.00	197.82	0.001	43.
4300.00	197.90	0.001	42.
4400.00	198.05	0.001	42.
4500.00	198.28	0.001	42.

TABLE 7A (Cont'd)

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

S-IVB STAGE FIRST BURN, FIRST ORBITAL COAST AND S-IVB STAGE SECOND BURN PROPULSION CHARACTERISTICS

FLIGHT TIME (SEC)	ALTITUDE (KM)	LONGITUDINAL ACCELERATION (M/S2)	THRUST MAGNITUDE (TOTAL) (N)
4600.00	198.60	0.001	41.
4700.00	199.02	0.001	41.
4800.00	199.54	0.001	41.
4900.00	200.13	0.001	40.
5000.00	200.78	0.001	40.
5100.00	201.48	0.001	40.
5200.00	202.18	0.001	40.
5300.00	202.87	0.001	40.
5400.00	203.50	0.001	41.
5500.00	204.06	0.001	41.
5600.00	204.51	0.001	41.
5700.00	204.83	0.001	41.
5800.00	205.00	0.001	41.
5900.00	205.01	0.001	41.
6000.00	204.86	0.001	42.
6100.00	204.56	0.001	42.
6200.00	204.12	0.001	42.
6300.00	203.55	0.001	42.
6400.00	202.89	0.001	42.
6500.00	202.17	0.001	42.
6600.00	201.42	0.001	42.
6700.00	200.68	0.001	42.
6800.00	200.00	0.001	42.
6900.00	199.40	0.001	42.
7000.00	198.92	0.001	42.
7100.00	198.59	0.001	41.
7200.00	198.42	0.001	41.
7300.00	198.43	0.001	41.
7400.00	198.63	0.001	41.
7500.00	199.00	0.001	41.
7600.00	199.55	0.001	40.
7700.00	200.24	0.001	40.
7800.00	201.05	0.001	40.
7900.00	201.95	0.001	39.
8000.00	202.91	0.001	39.

TABLE 7A (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE FIRST BURN, FIRST ORBITAL COAST AND S-IVB STAGE SECOND BURN PROPULSION CHARACTERISTICS

	FLIGHT TIME (SEC)	ALTITUDE (KM)	LONGITUDINAL ACCELERATION (M/S2)	THRUST MAGNITUDE (TOTAL) (N)
	8100.00	203.88	0.001	38.
	8200.00	204.85	0.001	38.
	8300.00	205.77	0.001	37.
	8400.00	206.62	0.001	37.
	8500.00	207.37	0.001	36.
	8600.00	208.01	0.001	36.
	8700.00	208.53	0.001	35.
	8800.00	208.92	0.001	35.
	8900.00	209.20	0.001	35.
	9000.00	209.37	0.001	34.
	9100.00	209.45	0.001	34.
	9200.00	209.47	0.001	33.
	9300.00	209.45	0.001	33.
	9400.00	209.42	0.001	32.
	9500.00	209.41	0.001	32.
	9600.00	209.44	0.001	32.
	9700.00	209.53	0.001	33.
	9800.00	209.70	0.001	33.
	9900.00	209.96	0.001	33.
	10000.00	210.31	0.001	34.
	10100.00	210.74	0.001	34.
	10200.00	211.26	0.001	34.
	10300.00	211.83	0.001	34.
	10400.00	212.44	0.001	34.
	10500.00	213.06	0.001	34.
	10600.00	213.67	0.001	34.
	10700.00	214.22	0.001	34.
	10800.00	214.70	0.001	34.
	10900.00	215.08	0.001	34.
	10943.00	215.20	0.001	34.
11)	10943.00	215.20	0.001	34.
	11000.00	215.33	0.001	34.
	11100.00	215.43	0.001	35.
	11200.00	215.38	0.001	35.
	11300.00	215.17	0.001	35.

11) Guaymas Acquisition, Start Time Base 5.

TABLE 7A (Cont'd)

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

S-IVB STAGE FIRST BURN, FIRST ORBITAL COAST AND S-IVB STAGE SECOND BURN PROPULSION CHARACTERISTICS

	FLIGHT TIME (SEC)	ALTITUDE (KM)	LONGITUDINAL ACCELERATION (M/S2)	THRUST MAGNITUDE (TOTAL) (N)
12)	11333.00	215.07	0.001	35.
13)	11334.20	215.07	0.010	314.
14)	11363.00	214.96	0.005	145.
15)	11393.00	214.84	0.002	72.
	11395.00	214.83	0.103	3092.
16)	11396.00	214.83	0.103	3089.
	11400.00	214.81	0.100	3025.
17)	11401.00	214.81	0.100	3025.
	11403.50	214.80	25.476	763333.
18)	11403.50	214.80	25.476	763333.
	11405.00	214.79	25.603	759830.
19)	11406.00	214.79	30.604	902072.
	11410.00	214.75	31.572	904550.
	11415.00	214.68	32.812	904521.
	11420.00	214.60	34.166	904818.
	11425.00	214.52	35.663	905729.
	11430.00	214.45	37.321	907225.
	11435.00	214.41	39.142	908791.
	11440.00	214.42	41.173	910923.
	11445.00	214.49	43.447	913595.
	11450.00	214.63	45.947	915689.
	11455.00	214.88	48.691	916874.
	11460.00	215.26	51.696	916734.
	11465.00	215.78	54.994	914960.
20)	11467.96	216.17	57.153	913788.
	11470.00	216.48	0.109	1741.
	11475.00	217.36	0.102	1624.
21)	11477.96	217.97	0.098	1555.

12) Initiate Helium Ullage Control;
13) Terminate C.V.S. LH2 Venting;
14) Inertial Attitude Command Freeze;
15) J2 Start Command, Second Burn, Begin Fuel Lead;
16) Terminate Helium Ullage Control;
17) J-2 Ignition, Second Burn;
18) 90% Thrust Level, Second Burn;
19) Command P.U. Activation, Second Burn;
20) Depletion Cutoff;
21) End LOX Vent.

Table 8A

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
ORBITAL VENT SEQUENCE AND IMPULSE HISTORY

FLIGHT TIME (HR: MIN: SEC) Start	End		EFFECTIVE IMPULSE (lb - sec)
0:8:28	3:8:54	LH_2 Vent (CVS)	120000.
3:8:53	3:9:56	Helium Ullage Vent Through CVS	2250.
3:11:08	3:13:08	LH_2 Vent	0.
3:11:08	3:11:18	LOX Vent	3600.

Figure 1A

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY VEHICLE PROFILE

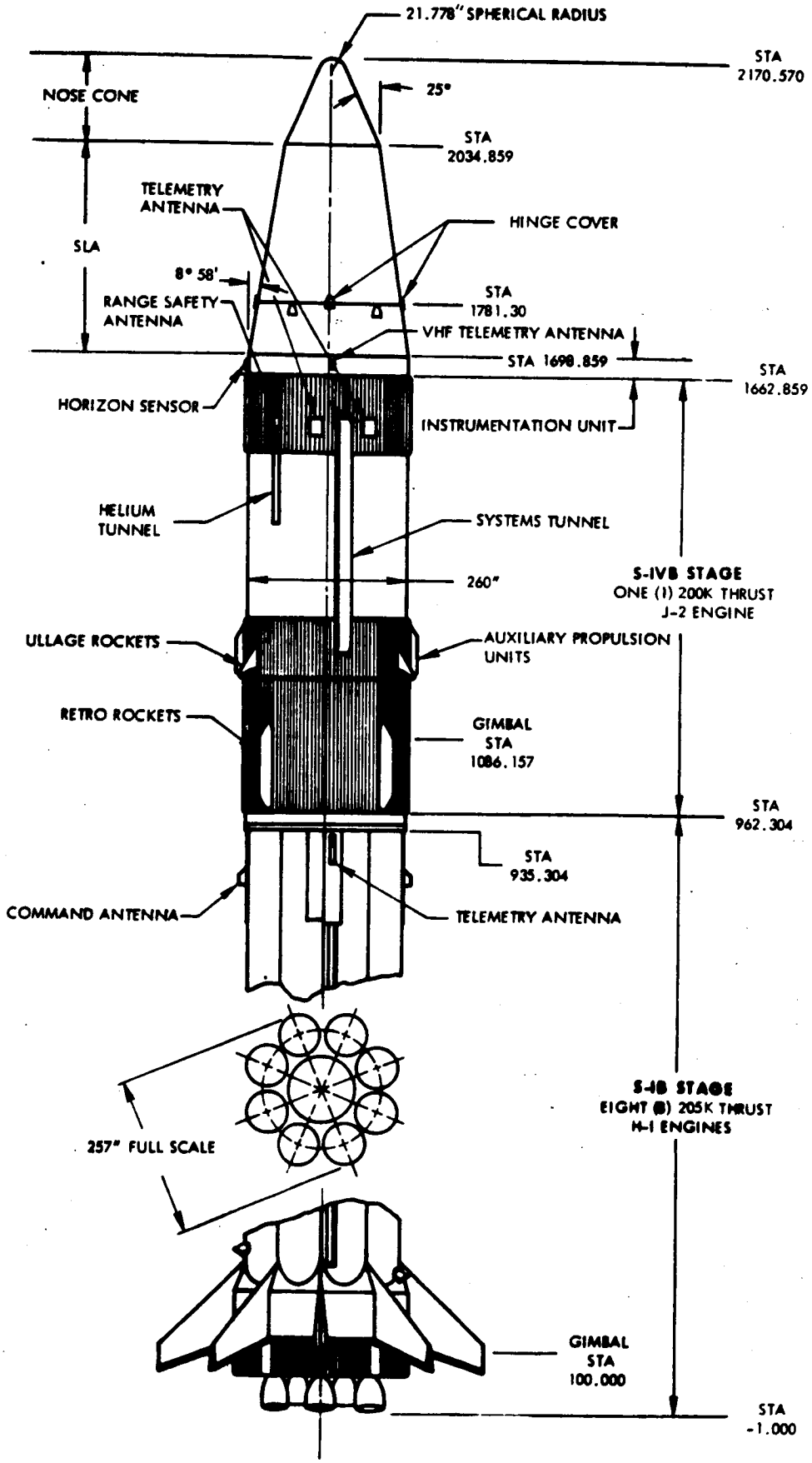


Figure 2A

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
H-1 ENGINE THRUST DECAY

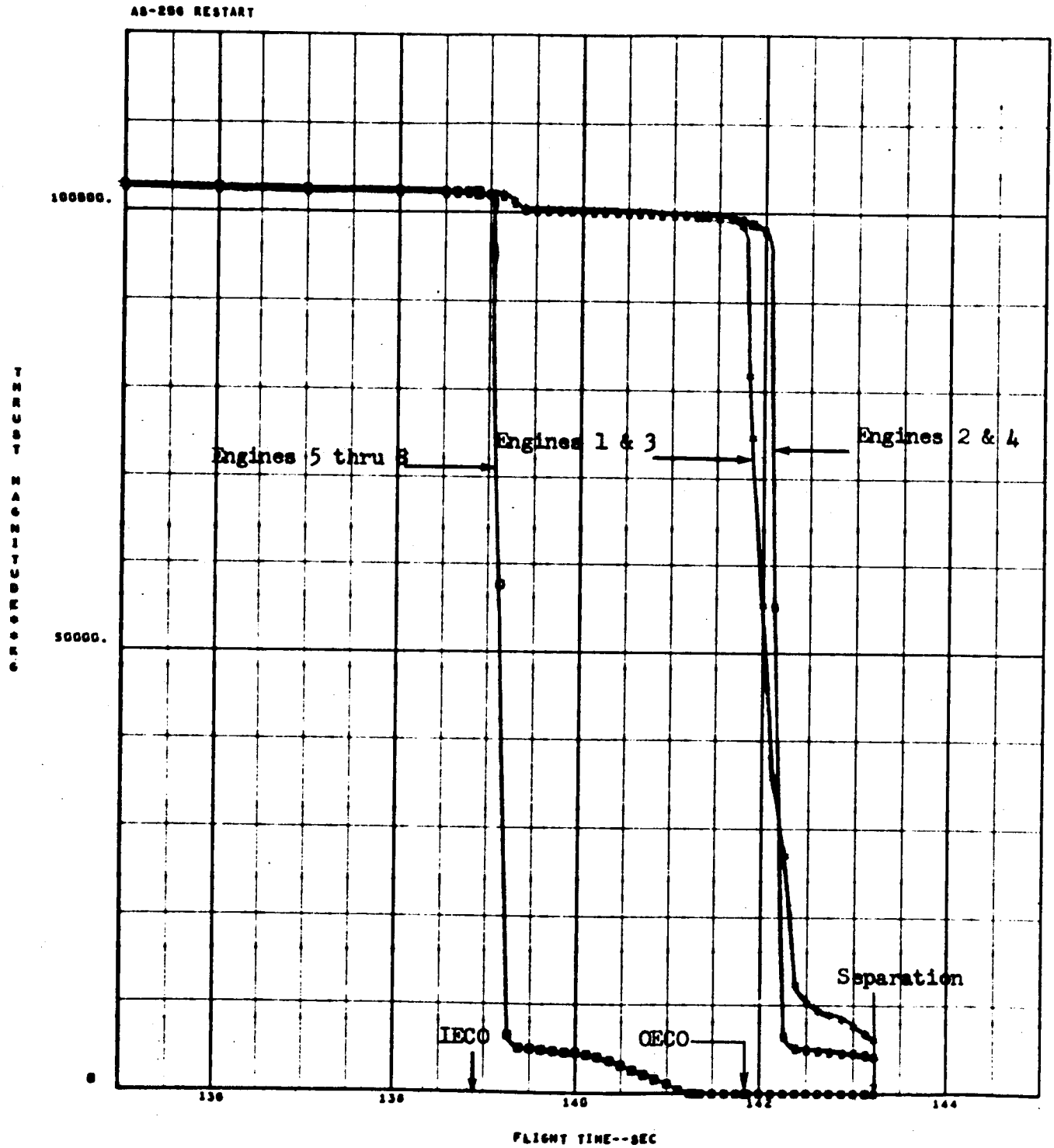


Figure 3A

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
J-2 ENGINE THRUST BUILDUP, FIRST BURN

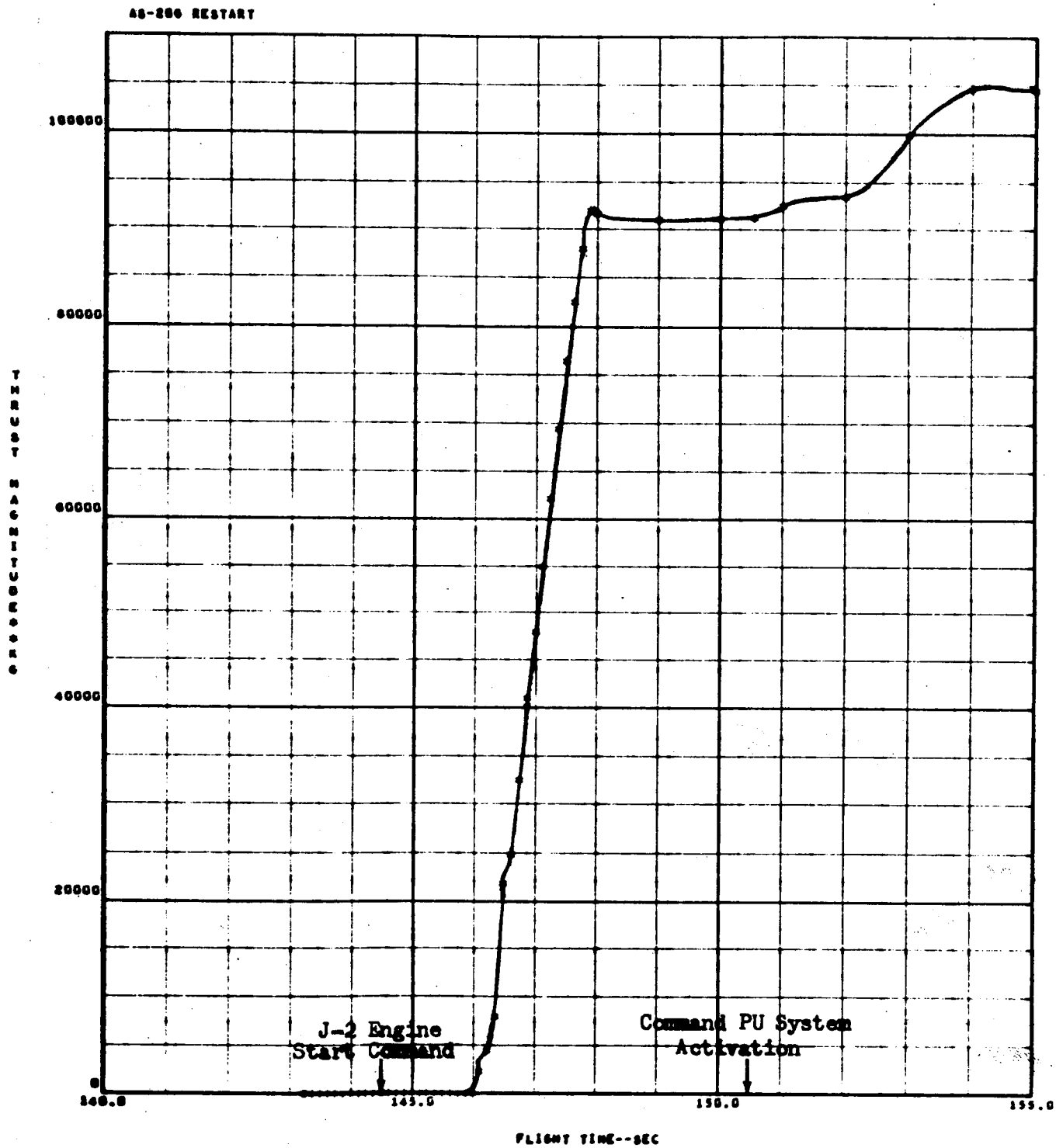


Figure 4A

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
J-2 ENGINE THRUST DECAY, FIRST BURN

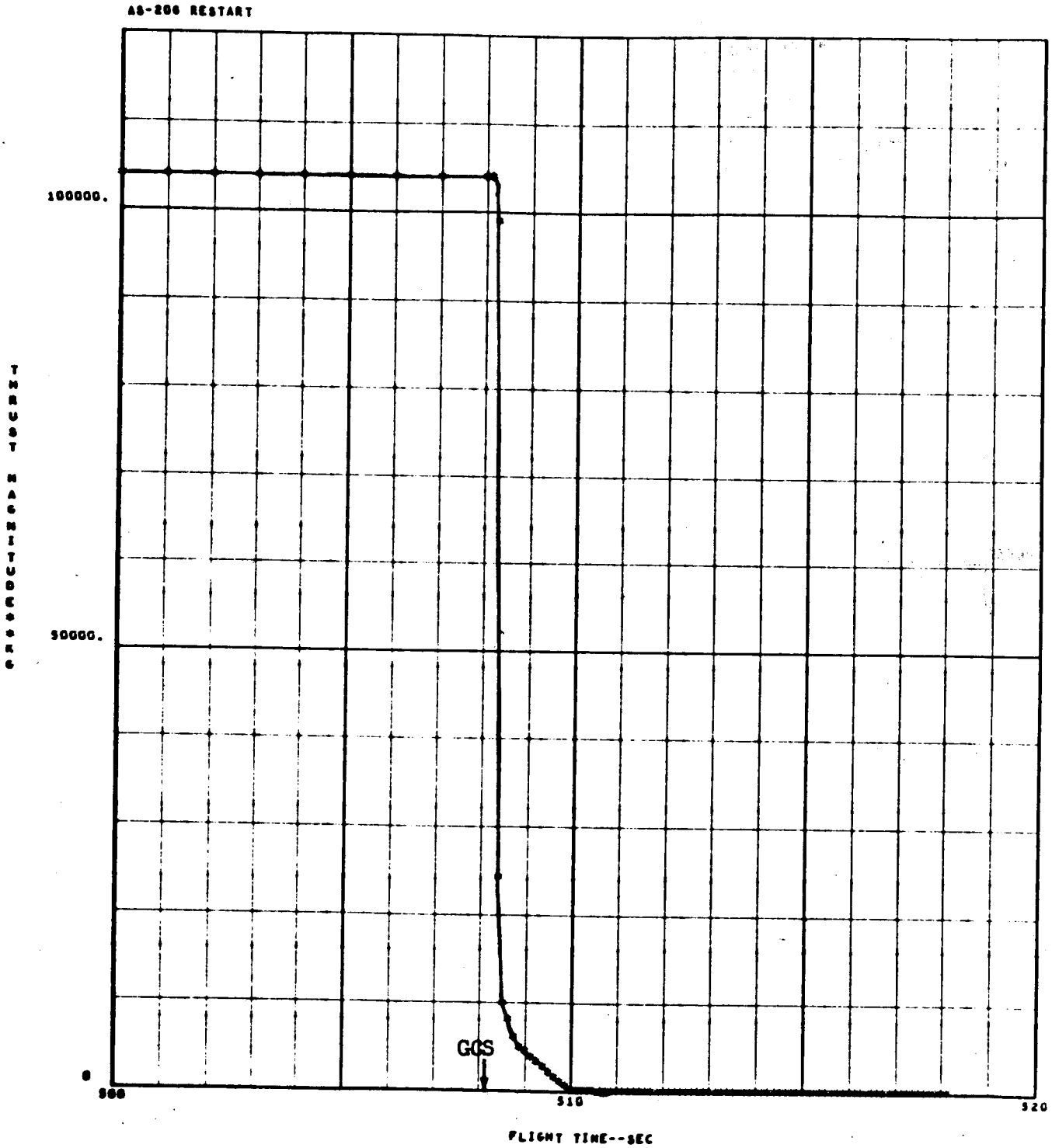


Figure 5A

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
J-2 ENGINE THRUST BUILDUP, SECOND BURN

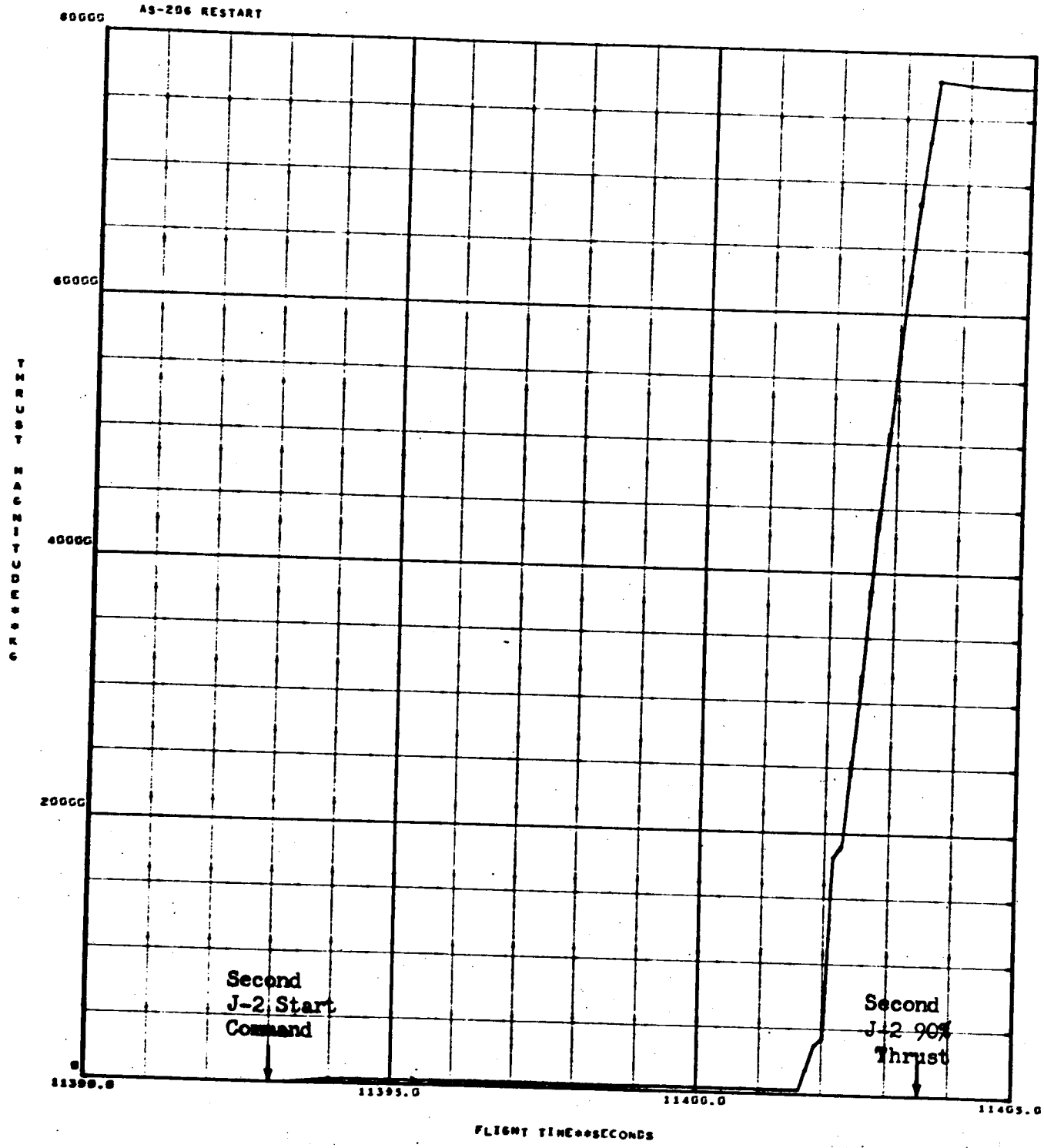


Figure 6A

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
J-2 ENGINE THRUST DECAY, SECOND BURN

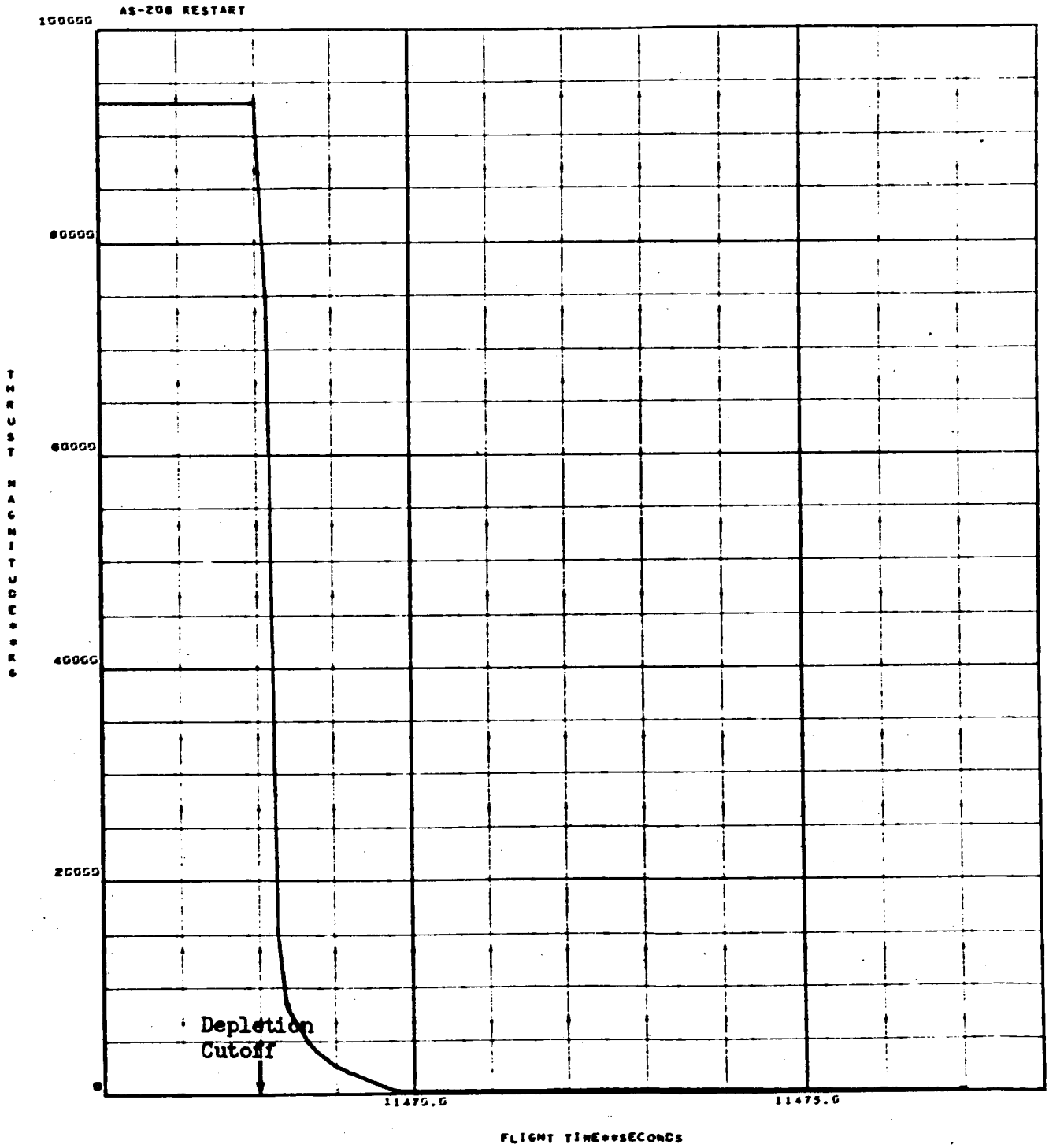
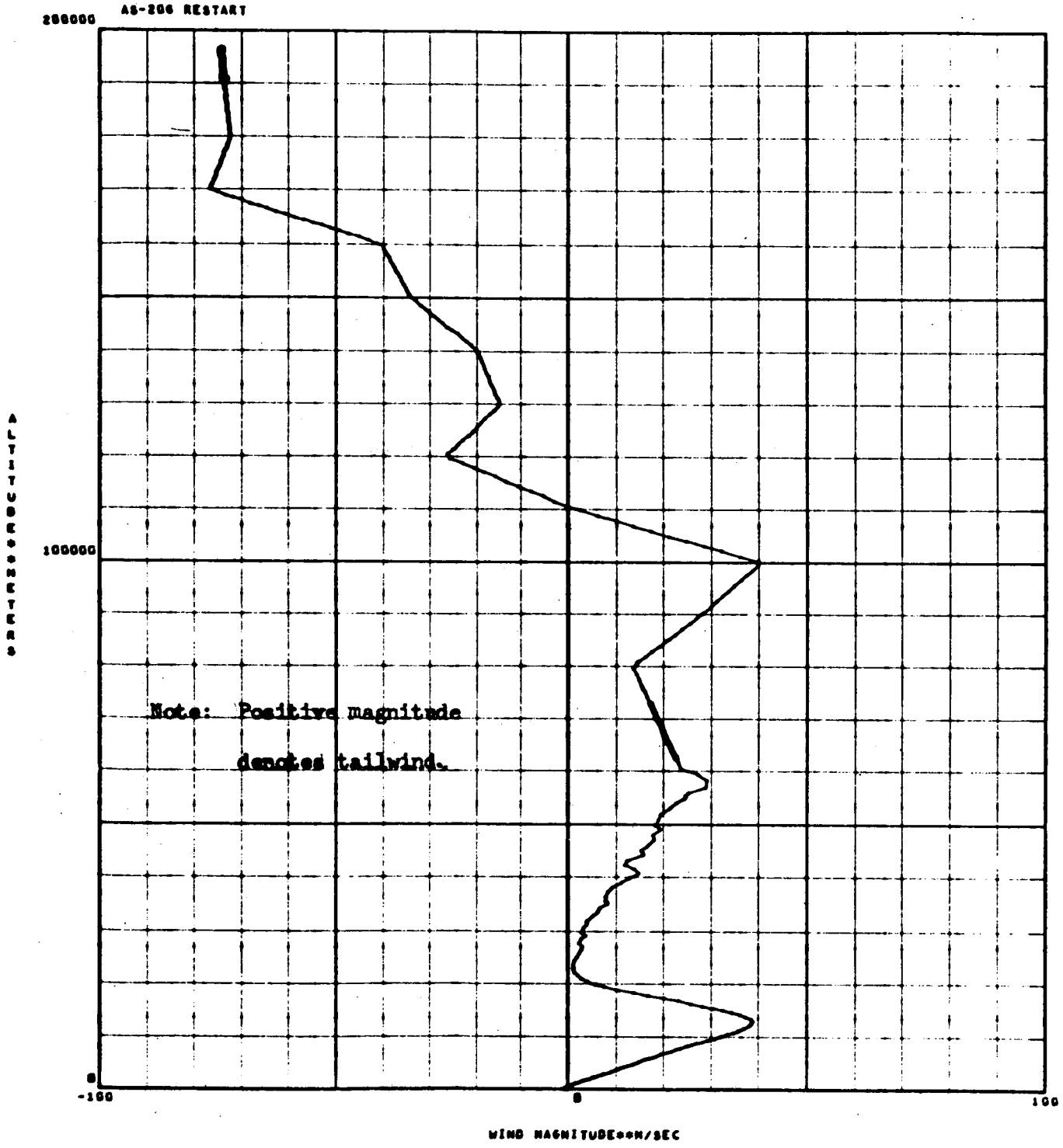


Figure 7A

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
MEAN HEADWIND/TAILWIND PROFILE
DECEMBER - APRIL AVERAGE



APPENDIX B: "GUIDANCE PRESETTINGS"

Table 1B

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IB STAGE STEERING PROGRAM

For the time segment $t - T1 \leq 10$:

$X_y = 0.$
$X_z = 0.$
$X_x = -0.314159$ rad. (-18. degrees)

For the time segment $10 < t - T1 \leq 43.$:

$X_y = A0 + A1xT + A2xT^2 + A3xT^3$

$A0 = .646496 \times 10^{-1}$ radians
$A1 = -.566646 \times 10^{-2}$ radians/second
$A2 = -.801710 \times 10^{-4}$ radians/second^2
$A3 = .518111 \times 10^{-6}$ radians/second^3

$X_x = X_z = 0.$

For the time segment $43. < t - T1 \leq 87.$:

$X_y = B0 + B1xT + B2xT^2 + B3xT^3$

$B0 = .349258 \times 10^{0}$ radians
$B1 = -.239848 \times 10^{-1}$ radians/second
$B2 = .291350 \times 10^{-3}$ radians/seconds^2
$B3 = -.179669 \times 10^{-5}$ radians/second^3

$X_x = X_z = 0.$

For the time segment $87. < t - T1 \leq 132.$:

$X_y = C0 + C1xT + C2xT^2 + C3xT^3$

$C0 = .350808 \times 10^{1}$ radians
$C1 = -.108421 \times 10^{0}$ radians/second
$C2 = .937385 \times 10^{-3}$ radians/second^2
$C3 = -.286264 \times 10^{-5}$ radians/second^3

$X_x = X_z = 0.$

For the time segment $t - T1 > 132.$:

$X_y = -1.0614721$ radians
$X_x = X_z = 0.$

NOTE:

X_y:	Pitch attitude angle measured negative downrange from inertial vertical
T =	t - T1 + 1.803 GMDT
t:	time from GRR
T1:	time of liftoff (Time Base 1), approximately 0.2 seconds after first motion

1.803 GMDT: Bias to account for system delays.

Table 2B

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IB STAGE PITCH ATTITUDE COMMAND

FLIGHT TIME (SEC)	*PITCH ATTITUDE COMMAND, χ_c (DEG)	FLIGHT TIME (SEC)	* PITCH ATTITUDE COMMAND, χ_c (DEG)
0	0.0000	82	-37.4792
10	0.0000	84	-38.9564
12	-0.9692	86	-40.5076
14	-1.8363	88	-41.7484
16	-2.7259	90	-42.8309
18	-3.6413	92	-43.8408
20	-4.5800	94	-44.7857
22	-5.5406	96	-45.6708
24	-6.5226	98	-46.5065
26	-7.5236	100	-47.3005
28	-8.5424	102	-48.0590
30	-9.5781	104	-48.7914
32	-10.6287	106	-49.5053
34	-11.6928	108	-50.2081
36	-12.7695	110	-50.9081
38	-13.8568	112	-51.6128
40	-14.9533	114	-52.3306
42	-16.0581	116	-53.0690
44	-17.1393	118	-53.8353
46	-18.0985	120	-54.6392
48	-19.0697	122	-55.4868
50	-20.0272	124	-56.3856
52	-20.9757	126	-57.3464
54	-21.9200	128	-58.3741
56	-22.8653	130	-59.4762
58	-23.8161	132	-60.6646
60	-24.7781	132.25	-60.8179
62	-25.7556	↓	↓
64	-26.7533		
66	-27.7774		
68	-28.8316		
70	-29.9206		
72	-31.0512		
74	-32.2266		
76	-33.4514		
78	-34.7331	IGM Initiation	-60.8179
80	-36.0742		

* χ_c is related to the χ_y of Table 1B by the following equation:

$$\chi_c = (t - TTTD) \frac{\chi_{yi} - \chi_{y(i-1)}}{GMDT} + \chi_y (i - 1), \text{ where}$$

t = time from GRR (FLIGHT TIME +5 seconds)
TTTD = t of last χ_y evaluation
χ_{yi} = χ_y evaluated at T
$\chi_y (i - 1)$ = χ_y evaluated at (T - 1 GMDT)
GMDT = LVDC computation cycle = 0.75 seconds

Table 3B

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
IGM PRESETTINGS

LVDC SYMBOL	INITIAL VALUE	UNITS	DESCRIPTION
---	17.	sec	Time from time base 3 to initiate IGM guidance
T1i	0.0	sec	Time to g_o for first IGM stage
T3i	349.5	sec	Time to g_o for second IGM stage
τ_3	473.0	sec	Average value of $m/\dot{m}$ at initiation of second IGM stage
Vex1	0.00	m/sec	Average exhaust velocity (g_o x Isp) for 1st IGM stage phase of flight
Vex3	4132.00	m/sec	Average exhaust velocity (g_o x Isp) for 2nd IGM stage phase of flight
VT	7783.577	m/sec	Guidance Cutoff Signal (GCS) criteria. Terminal velocity for IGM equations
XVT	6563365.	m	Desired terminal position vector components in IGM coordinate system
YVT	0.	m	
ZVT	0.	m	
$\dot{X}VT$	0.	m/sec	Desired cutoff velocity components in IGM coordinate system
$\dot{Y}VT$	0.	m/sec	
$\dot{Z}VT$	7783.577	m/sec	
$\ddot{X}VGT$	-9.256	m/sec^2	Terminal gravitation vector components in IGM coordinate system
$\ddot{Y}VGT$	0.	m/sec^2	
$\ddot{Z}VGT$	0.	m/sec^2	

Table 3B(Cont'd)

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
IGM PRESETTINGS

LVDC SYMBOL	INITIAL VALUE	UNITS	DESCRIPTIONS
ϵ	15.	sec	Value of T3i to initiate IGM ΔV guidance
---	3.	sec	Value of T3i to freeze IGM (ϵ')
TR1	1.8	N/D	Mission dependent constant multiplier for terminal range angle equation
TR2	0.	N/D	Mission dependent constants for N3 and N4 equations
TR3	0.	N/D	
---	200.	sec	Time to initiate thrust misalignment correction
T2	0.	sec	Terminal steering time argument
ΔTNOM	R-ASTR	sec	Nominal computation cycle length
$\tilde{T}$LD	1.	N/D	IGM staging flag (Burn switch)
AP1	-.42666501	E+00	Transformation matrix from navigation coordinate system to the (X4, Y4, Z4) coordinate system Az = 72. ϕL = 28.531856 θN = 119.0548 i = 31.6143
AP2	+.49514778	E-01	
AP3	+.90305328	E+00	
AP4	-.41829534	E-02	
AP5	+.99838143	E+00	
AP6	-.56717968	E-01	
AP7	-.90440002	E+00	
AP8	-.27976999	E-01	
AP9	-.42576733	E+00	
---	N/A	sec	Time from time base 3 to sample F/M for IGM staging (Approximately 70 sec. prior to nominal IGM staging)
FLAG	0.	N/D	Number of F/M decreases required for IGM staging criteria

Table 3B(Cont'd)

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
IGM PRESETTINGS

LVDC SYMBOL	INITIAL VALUE	UNITS	DESCRIPTION
ACC	N/A	m/sec^2	F/M comparison tolerance for IGM staging
τ10	N/A	sec	Constants for updating second stage time-to-go for perturbed EMR shift time
A0	N/A	sec	
A1	N/A	N/D	
PCO	N/A	sec	Backup time for IGM staging
τ10	N/A	sec	Constants for artificial τ_3 mode
CO	N/A	sec	
MO2	N/A	kg	
M1	N/A	kg/sec	
$\dot{M}3$	N/A	kg/sec	
ARTAU3	1.0	N/D	Artificial τ_3 mode flag
MO3	120039.4	kg	Mass at J-2 start command minus mass to be jettisoned
M1	568577.7	kg	Mass at first motion
F1	1642037.	lbs.	S-IB average sea level longitudinal thrust, from first motion to IECO
F2	229708.	lbs.	S-IVB average first burn thrust, from 90% thrust to T1
F3	204604.	lbs.	S-IVB average second burn thrust from T1 to cutoff
$\dot{M}_2$	2850.81	kg/sec	Average S-IB flow rate, from first motion to IECO

APPENDIX C: "TRAJECTORY LISTINGS, ENGLISH UNITS"

TABLE 1C

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

S-IB STAGE FLIGHT DATA

	FLIGHT TIME (SEC)	----- SPACE FIXED ----- RADIUS (FT)	VELOCITY (FT/S)	PATH ANGLE (DEG)	--- SPACE FIXED POSITION AND VELOCITY VECTOR COMPONENTS --- X (FT)	Y (FT)	Z (FT)	DX (FT/S)	DY (FT/S)	DZ (FT/S)
1)	-5.00	20909945.	1341.64	90.000	20909863.	55942.	-18177.	0.00	414.59	1275.97
2)	0.00	20909945.	1341.64	90.000	20909862.	58015.	-11797.	-0.43	414.37	1276.05
	5.00	20910068.	1342.62	87.841	20909981.	60086.	-5416.	49.73	414.02	1276.23
	10.00	20910462.	1345.90	85.389	20910370.	62155.	965.	106.91	413.64	1276.29
	15.00	20911161.	1355.42	82.677	20911062.	64223.	7350.	171.04	413.64	1279.38
	20.00	20912203.	1378.40	79.758	20912093.	66291.	13775.	242.93	413.48	1292.29
	25.00	20913624.	1416.20	76.746	20913503.	68357.	20290.	322.06	413.22	1315.73
	30.00	20915461.	1470.19	73.763	20915325.	70422.	26952.	407.96	412.79	1350.79
	35.00	20917746.	1541.54	70.905	20917594.	72485.	33819.	500.62	412.29	1398.48
	40.00	20920515.	1630.97	68.261	20920342.	74545.	40959.	599.76	411.83	1459.71
	45.00	20923798.	1739.23	65.900	20923602.	76604.	48441.	705.13	411.41	1535.72
	50.00	20927627.	1865.22	63.835	20927404.	78660.	56339.	816.57	411.01	1625.84
	55.00	20932028.	2006.25	62.136	20931773.	80714.	64722.	930.75	410.62	1729.21
	60.00	20936993.	2156.32	60.906	20936700.	82766.	73648.	1040.41	410.35	1843.60
	65.00	20942523.	2325.22	59.948	20942186.	84817.	83189.	1154.93	410.11	1976.00
	70.00	20948653.	2517.53	59.185	20948265.	86867.	93444.	1278.47	409.78	2129.69
3)	71.00	20949956.	2559.05	59.054	20949556.	87277.	95590.	1304.41	409.68	2163.20
	75.00	20955437.	2735.34	58.587	20954988.	88915.	104524.	1412.45	409.32	2306.41
	80.00	20962928.	2979.98	58.153	20962407.	90960.	116548.	1556.72	408.92	2507.93
	85.00	20971170.	3255.05	57.997	20970564.	93004.	129658.	1706.33	408.47	2741.70
	90.00	20980178.	3562.57	58.175	20979469.	95045.	144031.	1856.16	407.91	3013.34
	95.00	20989969.	3898.82	58.479	20989136.	97083.	159839.	2011.30	407.16	3315.08
	100.00	21000573.	4263.89	58.866	20999591.	99116.	177231.	2171.99	406.08	3646.69
	105.00	21012027.	4658.28	59.299	21010866.	101143.	196355.	2339.06	404.84	4008.06
	110.00	21024370.	5083.95	59.764	21022993.	103164.	217365.	2512.79	403.51	4401.09
	115.00	21037642.	5543.24	60.255	21036005.	105178.	240423.	2693.22	402.07	4828.30
	120.00	21051885.	6039.13	60.778	21049935.	107185.	265710.	2879.64	400.51	5293.23
	125.00	21067135.	6574.86	61.348	21064808.	109182.	293426.	3070.09	398.15	5800.42
	130.00	21083417.	7154.93	61.985	21080638.	111166.	323795.	3261.39	395.42	6356.10
4)	132.25	21091084.	7431.81	62.303	21088072.	112054.	338396.	3346.39	394.13	6624.06
5)	138.84	21114771.	8303.77	63.191	21110954.	114638.	384774.	3607.62	390.09	7468.97
6)	141.84	21126088.	8520.18	63.598	21121839.	115806.	407548.	3638.82	389.00	7694.22
7)	143.14	21131001.	8526.51	63.807	21126555.	116311.	417571.	3609.75	388.78	7714.91
8)	143.22	21131298.	8525.73	63.820	21126840.	116342.	418181.	3607.42	388.77	7715.15

1) GRR;
2) First Motion;
3) Maximum Dynamic Pressure;
4) Tilt Arrest;
5) IECO;
6) OECO;
7) Separation Signal;
8) Physical Separation.

TABLE 1f (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IB STAGE FLIGHT DATA

	FLIGHT TIME (SEC)	----- EARTH FIXED ----- POSITION (FT)	VELOCITY (FT/S)	PATH ANGLE (DEG)	---- EARTH FIXED POSITION AND VELOCITY VECTOR COMPONENTS ---- X (FT)	Y (FT)	Z (FT)	DX (FT/S)	DY (FT/S)	DZ (FT/S)
1)	-5.00	109.	0.00	N/A	109.	-0.	0.	-0.00	0.00	-0.00
2)	0.00	109.	0.00	N/A	109.	-0.	-0.	-0.00	0.00	0.00
	5.00	232.	50.59	0.334	232.	-0.	0.	50.59	-0.14	0.07
	10.00	626.	108.20	0.328	626.	-1.	0.	108.20	-0.33	-0.03
	15.00	1325.	172.78	1.011	1325.	-3.	3.	172.76	-0.15	2.84
	20.00	2367.	245.59	3.659	2367.	-4.	45.	245.11	-0.14	15.44
	25.00	3793.	327.00	6.815	3789.	-5.	175.	324.72	-0.26	38.51
	30.00	5643.	417.61	10.132	5625.	-7.	449.	411.16	-0.53	73.10
	35.00	7966.	518.54	13.456	7912.	-10.	927.	504.41	-0.88	120.23
	40.00	10811.	630.70	16.705	10680.	-15.	1674.	604.23	-1.16	180.80
	45.00	14234.	755.11	19.864	13964.	-22.	2759.	710.38	-1.39	256.03
	50.00	18297.	892.23	22.805	17795.	-29.	4257.	822.72	-1.56	345.25
	55.00	23056.	1039.26	25.546	22197.	-37.	6234.	937.93	-1.69	447.61
	60.00	28538.	1189.34	28.166	27164.	-46.	8750.	1048.76	-1.65	560.91
	65.00	34783.	1354.76	30.739	32694.	-53.	11874.	1164.64	-1.51	692.09
	70.00	41882.	1541.59	33.221	38825.	-61.	15706.	1289.75	-1.38	844.42
3)	71.00	43414.	1581.83	33.703	40128.	-62.	16567.	1316.03	-1.38	877.63
	75.00	49946.	1752.66	35.568	45609.	-67.	20356.	1425.57	-1.29	1015.60
	80.00	59098.	1989.48	37.781	53099.	-73.	25942.	1571.95	-1.04	1219.42
	85.00	69465.	2253.59	40.052	61338.	-78.	32604.	1724.05	-0.67	1451.31
	90.00	81176.	2546.37	42.458	70339.	-80.	40520.	1876.81	-0.22	1720.93
	95.00	94366.	2867.89	44.704	80117.	-80.	49861.	2035.30	0.24	2020.48
	100.00	109181.	3218.76	46.771	90702.	-78.	60774.	2199.82	0.58	2345.73
	105.00	125772.	3599.84	48.648	102127.	-74.	73407.	2371.23	0.99	2708.53
	110.00	144298.	4013.01	50.361	114427.	-67.	87912.	2549.85	1.55	3098.80
	115.00	164929.	4460.51	51.934	127638.	-58.	104452.	2735.78	2.29	3523.02
	120.00	187844.	4945.07	53.402	141795.	-44.	123205.	2928.38	3.22	3984.76
	125.00	213235.	5469.69	54.804	156929.	-26.	144369.	3125.77	3.73	4488.54
	130.00	241308.	6038.44	56.183	173056.	-6.	168171.	3324.88	4.30	5040.63
4)	132.25	254875.	6310.07	56.810	180637.	4.	179809.	3413.71	4.65	5306.93
5)	138.84	298196.	7167.82	58.500	204003.	39.	217494.	3687.33	6.01	6146.64
6)	141.84	319561.	7378.41	59.104	215134.	58.	236298.	3723.08	6.97	6370.21
7)	143.14	328955.	7382.05	59.348	219961.	67.	244600.	3695.31	7.38	6390.56
8)	143.22	329526.	7381.11	59.362	220253.	68.	245105.	3693.05	7.41	6390.78

1) GRR;
2) First Motion;
3) Maximum Dynamic Pressure;
4) Tilt Arrest;
5) IECO;
6) OECO;
7) Separation Signal;
8) Physical Separation.

TABLE 10 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IB STAGE FLIGHT DATA

	FLIGHT TIME (SEC)	MASS (LB)	THRUST (TOTAL) (LB)	DRAG (LB)	LONGITUDINAL ACCELERATION (FT/SEC2)	DYNAMIC PRESSURE (LB/FT2)	A.H.I. (LB-FT/FT2-RAD)	MACH NO.	PITCH ANGLE OF ATTACK (DEG)
1)	-5.00	1267587.	0.	0.	0.000	0.	0.	0.00	0.000
2)	0.00	1253499.	1588157.	1323.	41.084	0.	0.	0.00	0.000
	5.00	1222588.	1624059.	3321.	43.012	3.	118.	0.04	0.559
	10.00	1191502.	1634615.	7226.	44.312	13.	2177.	0.10	0.536
	15.00	1160271.	1651121.	12222.	45.822	33.	12592.	0.15	-1.133
	20.00	1128854.	1665851.	13322.	47.482	65.	45345.	0.22	-1.220
	25.00	1097356.	1678771.	18959.	49.054	110.	125342.	0.29	-0.948
	30.00	1065806.	1692917.	25111.	50.741	169.	290944.	0.37	-0.680
	35.00	1034219.	1707067.	31747.	52.518	241.	596366.	0.46	-0.398
	40.00	1002625.	1722383.	39466.	54.408	325.	1112288.	0.57	-0.198
	45.00	971022.	1738899.	48543.	56.418	417.	1923603.	0.68	-0.095
	50.00	939413.	1755557.	65538.	58.297	511.	3123782.	0.81	0.147
	55.00	907819.	1769533.	123926.	58.746	596.	4797126.	0.96	0.204
	60.00	876137.	1783984.	171233.	59.658	658.	6969431.	1.12	0.165
	65.00	844361.	1798898.	164112.	62.735	700.	9634944.	1.30	-0.075
	70.00	812586.	1812690.	139909.	66.686	720.	12789260.	1.51	-0.187
3)	71.00	806231.	1815205.	135402.	67.491	720.	13476071.	1.56	-0.168
	75.00	780809.	1824766.	115233.	70.909	711.	16400699.	1.78	0.156
	80.00	749053.	1835034.	90896.	75.399	662.	20380832.	2.07	0.396
	85.00	717456.	1843663.	67456.	80.153	565.	24459370.	2.36	0.275
	90.00	685878.	1848762.	48174.	84.985	455.	28322618.	2.64	0.131
	95.00	654306.	1851072.	33773.	89.907	352.	31769729.	2.93	0.007
	100.00	622756.	1851262.	24065.	94.974	265.	34717400.	3.25	0.090
	105.00	591237.	1850243.	16530.	100.392	191.	37156220.	3.57	0.117
	110.00	559762.	1848457.	10437.	106.284	133.	39087551.	3.90	0.003
	115.00	528336.	1845187.	5467.	112.710	91.	40567383.	4.24	-0.187
	120.00	496975.	1840522.	2465.	119.715	61.	41669510.	4.60	-0.559
	125.00	465703.	1834969.	1204.	127.460	40.	42478998.	5.01	-1.327
	130.00	434530.	1827984.	-163.	136.191	27.	43073743.	5.58	-2.421
4)	132.25	420538.	1824180.	-554.	140.464	22.	43275512.	5.89	-3.084
5)	138.84	379774.	1808277.	-946.	154.219	12.	43744327.	6.98	-1.730
6)	141.84	368512.	796774.	-660.	69.623	8.	43879396.	7.36	-0.957
7)	143.14	366866.	48432.	-542.	4.295	7.	43922322.	7.44	-0.679
8)	143.22	366827.	44766.	-535.	3.973	6.	43925716.	7.44	-0.662

1) GRR;
2) First Motion;
3) Maximum Dynamic Pressure;
4) Tilt Arrest;
5) IECO;
6) OECO;
7) Separation Signal;
8) Physical Separation.

TABLE 1C (Cont'd)

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

S-IB STAGE FLIGHT DATA

	FLIGHT TIME (SEC)	ALTITUDE (FT)	RANGE (NM)	VELOCITY VECTOR AZIMUTH SPACE FIXED (DEG)	VELOCITY VECTOR AZIMUTH EARTH FIXED (DEG)	LONGITUDE (POS. EAST) (DEG)	GEOCENTRIC DECLINATION (DEG)	GEODETIC LATITUDE (DEG)
1)	-5.00	108.	0.000	90.000	N/A	-80.565	28.371	28.532
2)	0.00	108.	0.000	90.000	N/A	-80.565	28.371	28.532
	5.00	230.	0.000	89.987	N/A	-80.565	28.371	28.532
	10.00	625.	0.001	89.974	N/A	-80.565	28.371	28.532
	15.00	1324.	0.001	89.936	60.410	-80.565	28.371	28.532
	20.00	2365.	0.008	89.764	69.077	-80.565	28.371	28.532
	25.00	3787.	0.029	89.457	70.339	-80.564	28.371	28.532
	30.00	5624.	0.075	89.016	70.729	-80.564	28.371	28.532
	35.00	7910.	0.154	88.450	70.945	-80.562	28.372	28.533
	40.00	10679.	0.277	87.781	71.124	-80.560	28.372	28.533
	45.00	13963.	0.456	87.025	71.270	-80.557	28.373	28.534
	50.00	17794.	0.703	86.219	71.383	-80.552	28.374	28.536
	55.00	22197.	1.028	85.395	71.473	-80.547	28.376	28.537
	60.00	27164.	1.442	84.592	71.559	-80.539	28.378	28.539
	65.00	32696.	1.956	83.777	71.635	-80.530	28.381	28.542
	70.00	38830.	2.586	82.953	71.695	-80.519	28.384	28.545
3)	71.00	40134.	2.727	82.788	71.704	-80.516	28.385	28.546
	75.00	45618.	3.350	82.136	71.742	-80.505	28.388	28.549
	80.00	53114.	4.266	81.346	71.791	-80.488	28.393	28.554
	85.00	61362.	5.359	80.575	71.838	-80.469	28.399	28.560
	90.00	70377.	6.657	79.829	71.883	-80.445	28.406	28.566
	95.00	80176.	8.186	79.144	71.923	-80.418	28.413	28.574
	100.00	90789.	9.972	78.520	71.957	-80.386	28.423	28.583
	105.00	102254.	12.037	77.960	71.990	-80.349	28.433	28.594
	110.00	114609.	14.406	77.461	72.026	-80.306	28.446	28.606
	115.00	127896.	17.104	77.016	72.065	-80.257	28.459	28.620
	120.00	142155.	20.160	76.619	72.107	-80.202	28.475	28.635
	125.00	157423.	23.605	76.259	72.144	-80.140	28.493	28.653
	130.00	173726.	27.474	75.936	72.184	-80.070	28.512	28.673
4)	132.25	181402.	29.364	75.803	72.204	-80.036	28.522	28.682
5)	138.84	205122.	35.477	75.455	72.269	-79.926	28.553	28.713
6)	141.84	216454.	38.523	75.394	72.305	-79.871	28.568	28.729
7)	143.14	221375.	39.866	75.400	72.321	-79.847	28.575	28.735
8)	143.22	221672.	39.948	75.401	72.322	-79.845	28.576	28.736

1) GRR;
2) First Motion;
3) Maximum Dynamic Pressure;
4) Tilt Arrest;
5) IECO;
6) OECO;
7) Separation Signal;
8) Physical Separation.

TABLE 1C (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IB STAGE FLIGHT DATA

	FLIGHT TIME (SEC)	VEHICLE ATTITUDE ANGLE PITCH (DEG)	YAW (DEG)	ROLL (DEG)	VEHICLE ATTITUDE RATE PITCH (DEG/S)	YAW (DEG/S)	ROLL (DEG/S)	VEHICLE ATTITUDE ERROR PITCH (DEG)	YAW (DEG)	ROLL (DEG)
1)	-5.00	0.000	0.000	18.000	-0.003	0.001	-0.002	0.000	0.000	0.000
2)	0.00	-0.017	0.006	17.990	-0.003	0.001	-0.002	-0.017	0.006	-0.010
	5.00	-0.023	-0.020	18.004	-0.004	-0.004	-0.003	-0.023	-0.020	0.004
	10.00	-0.019	-0.023	18.000	-0.001	-0.000	0.000	-0.019	-0.023	0.000
	15.00	-2.008	0.031	14.380	-0.365	-0.039	-1.078	0.270	0.031	1.180
	20.00	-4.260	0.034	9.385	-0.469	-0.006	-1.002	0.320	0.034	1.185
	25.00	-6.685	0.006	4.383	-0.498	-0.006	-1.000	0.335	0.006	1.183
	30.00	-9.229	-0.026	-0.003	-0.518	-0.005	-0.166	0.349	-0.026	-0.003
	35.00	-11.856	-0.026	-0.003	-0.531	0.001	-0.000	0.374	-0.026	-0.003
	40.00	-14.545	-0.024	-0.002	-0.545	0.000	0.000	0.409	-0.024	-0.002
	45.00	-17.262	-0.023	-0.003	-0.474	0.000	-0.000	0.343	-0.023	-0.003
	50.00	-19.657	-0.023	0.001	-0.485	0.000	0.000	0.370	-0.023	0.001
	55.00	-22.066	-0.021	0.003	-0.475	0.003	0.000	0.326	-0.021	0.003
	60.00	-24.489	-0.011	0.003	-0.495	0.000	-0.000	0.289	-0.011	0.003
	65.00	-27.065	-0.008	-0.003	-0.506	-0.000	-0.000	0.197	-0.008	-0.003
	70.00	-29.619	-0.016	-0.009	-0.529	-0.002	0.000	0.301	-0.016	-0.008
3)	71.00	-30.159	-0.017	-0.008	-0.542	0.000	-0.000	0.322	-0.017	-0.008
	75.00	-32.416	-0.012	0.002	-0.591	0.002	0.005	0.417	-0.012	0.002
	80.00	-35.723	-0.009	0.015	-0.721	-0.000	-0.001	0.351	-0.009	0.015
	85.00	-39.454	-0.011	0.012	-0.796	-0.001	-0.003	0.267	-0.011	0.012
	90.00	-42.605	-0.018	0.001	-0.501	-0.002	0.014	0.226	-0.018	0.001
	95.00	-45.062	-0.023	-0.000	-0.445	-0.001	-0.000	0.172	-0.023	-0.000
	100.00	-47.066	-0.048	0.001	-0.382	-0.000	-0.001	0.235	-0.048	0.001
	105.00	-48.921	-0.051	0.003	-0.365	-0.001	-0.000	0.229	-0.051	0.003
	110.00	-50.695	-0.053	0.000	-0.354	-0.001	-0.001	0.213	-0.053	0.000
	115.00	-52.481	-0.056	-0.001	-0.368	-0.000	-0.001	0.215	-0.056	-0.001
	120.00	-54.397	-0.058	-0.003	-0.404	-0.000	-0.000	0.242	-0.058	-0.003
	125.00	-56.572	-0.138	-0.004	-0.463	0.003	-0.001	0.286	-0.138	-0.004
	130.00	-59.107	-0.142	-0.005	-0.554	-0.000	-0.000	0.370	-0.142	-0.005
4)	132.25	-60.406	-0.142	-0.006	-0.602	-0.000	-0.000	0.412	-0.142	-0.006
5)	138.84	-60.961	-0.146	-0.003	0.002	-0.000	0.001	-0.143	-0.146	-0.003
6)	141.84	-60.891	-0.071	-0.001	0.003	0.002	0.000	-0.073	-0.071	-0.001
7)	143.14	-60.995	-0.069	-0.002	-0.010	0.001	-0.002	-0.078	-0.069	-0.002
8)	143.22	-60.896	-0.069	-0.002	-0.011	0.001	-0.002	-0.078	-0.069	-0.002

1) GRR;
2) First Motion;
3) Maximum Dynamic Pressure;
4) Tilt Arrest;
5) IECO;
6) OECO;
7) Separation Signal;
8) Physical Separation.

TABLE 2C - 1

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

S-IVB STAGE FIRST BURN, FIRST ORBITAL COAST AND S-IVB STAGE SECOND BURN DATA

	FLIGHT TIME (SEC)	----- SPACE FIXED ----- RADIUS (FT)	VELOCITY (FT/S)	PATH ANGLE (DEG)	--- SPACE FIXED POSITION AND VELOCITY VECTOR COMPONENTS --- X (FT)	Y (FT)	Z (FT)	DX (FT/S)	DY (FT/S)	DZ (FT/S)
1)	143.22	21131298.	8525.73	63.820	21126840.	116342.	418181.	3607.42	388.77	7715.15
2)	144.54	21136243.	8508.75	64.044	21131578.	116856.	428373.	3566.41	388.59	7715.47
3)	146.89	21144917.	8482.84	64.442	21139874.	117768.	446505.	3495.35	388.24	7719.48
	147.94	21148748.	8488.81	64.613	21143531.	118176.	454619.	3471.73	387.87	7736.71
4)	147.94	21148748.	8488.81	64.613	21143531.	118176.	454619.	3471.73	387.87	7736.71
5)	150.54	21158154.	8517.43	65.028	21152490.	119183.	474805.	3419.82	386.48	7791.16
6)	155.14	21174527.	8579.29	65.741	21168018.	120954.	510878.	3333.23	383.75	7895.98
7)	159.25	21188900.	8643.50	66.361	21181573.	122527.	543552.	3259.63	381.20	7996.23
	160.00	21191495.	8655.44	66.472	21184012.	122813.	549556.	3246.30	380.71	8014.56
	180.00	21257324.	9007.94	69.809	21244893.	130640.	715032.	2820.74	408.00	8545.17
	200.00	21315768.	9423.53	73.113	21296659.	139157.	891578.	2355.42	444.35	9113.58
	220.00	21366956.	9901.22	76.067	21339141.	148497.	1079730.	1892.70	490.89	9706.22
	240.00	21411222.	10439.70	78.706	21372336.	158812.	1280020.	1425.71	540.84	10327.74
	260.00	21448825.	11039.16	81.047	21396119.	170138.	1493060.	951.06	591.84	10982.18
	280.00	21480034.	11699.24	83.100	21410318.	182493.	1719542.	467.24	643.83	11672.17
	300.00	21505123.	12422.57	84.901	21414703.	195865.	1960219.	-32.85	691.95	12403.24
	320.00	21524385.	13210.55	86.415	21408982.	210237.	2215957.	-540.80	746.10	13178.37
	340.00	21538313.	14067.00	87.676	21392976.	225726.	2487690.	-1062.52	803.02	14003.81
	360.00	21547370.	14997.79	88.704	21366364.	242368.	2776492.	-1602.16	861.49	14887.07
	380.00	21552071.	16010.56	89.513	21328746.	260196.	3083614.	-2163.42	921.65	15836.93
	400.00	21553037.	17113.85	90.112	21279663.	279247.	3410476.	-2749.38	983.79	16862.88
	420.00	21551005.	18320.52	90.508	21218579.	299562.	3758723.	-3364.62	1048.14	17978.39
	440.00	21546857.	19651.02	90.710	21144839.	321194.	4130340.	-4016.40	1115.58	19203.82
	460.00	21541650.	21130.44	90.722	21057624.	344211.	4527769.	-4713.23	1186.85	20563.86
	480.00	21536705.	22791.53	90.540	20955945.	368695.	4953999.	-5465.27	1262.33	22090.53
	500.00	21533614.	24685.83	90.207	20838484.	394729.	5412793.	-6306.97	1339.51	23828.94
8)	508.12	21533209.	25536.67	90.007	20785773.	405708.	5609468.	-6671.98	1364.52	24611.87
9)	518.12	21533217.	25567.67	89.999	20717555.	419337.	5855469.	-6969.00	1360.19	24561.93
	530.00	21533230.	25569.01	89.999	20632726.	435453.	6146625.	-7315.50	1353.56	24462.74
10)	530.00	21533230.	25569.01	89.999	20632726.	435453.	6146625.	-7315.50	1353.56	24462.74
	600.00	21533265.	25569.84	89.999	20049975.	528692.	7835846.	-9324.94	1308.88	23772.86
	700.00	21533289.	25571.04	90.000	18978440.	655759.	10152406.	-12080.61	1229.48	22503.90
	800.00	21533310.	25572.41	89.999	17639521.	774009.	12326057.	-14666.35	1132.74	20918.01
	900.00	21533350.	25573.89	89.999	16052047.	881772.	14326180.	-17045.85	1019.96	19037.41
	1000.00	21533425.	25575.39	89.998	14238349.	977516.	16124587.	-19185.55	892.65	16888.40

1) Separation Completed;
2) J-2 Start Command, First Burn;
3) Terminate Ullage Burn;
4) 90% Thrust Level, First Burn;
5) Command P.U. Activation, First Burn;
6) Ullage Case Jettison;
7) I.G.M. Initiation;
8) Guidance Cutoff Signal;
9) Orbit Insertion;
10) Initiate Local Horizontal Attitude Hold.

TABLE 2C-1 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE FIRST BURN, FIRST ORBITAL COAST AND S-IVB STAGE SECOND BURN DATA

FLIGHT TIME (SEC)	----- SPACE FIXED ----- RADIUS (FT)	VELOCITY (FT/S)	PATH ANGLE (DEG)	--- SPACE FIXED POSITION AND VELOCITY VECTOR COMPONENTS --- X (FT)	Y (FT)	Z (FT)	DX (FT/S)	DY (FT/S)	DZ (FT/S)
1100.00	21533543.	25576.94	89.997	12223938.	1059875.	17695918.	-21055.38	752.56	14501.20
1200.00	21533705.	25578.53	89.996	10037155.	1127665.	19018001.	-22628.92	601.59	11909.30
1300.00	21533909.	25580.14	89.995	7708778.	1179901.	20072166.	-23883.92	441.83	9149.12
1400.00	21534153.	25581.71	89.994	5271590.	1215811.	20843509.	-24802.56	275.47	6259.50
1500.00	21534429.	25583.20	89.993	2759925.	1234851.	21321107.	-25371.70	104.81	3281.13
1600.00	21534735.	25584.52	89.993	209182.	1236709.	21498177.	-25583.15	-67.77	256.02
1700.00	21535068.	25585.63	89.992	-2344670.	1221314.	21372180.	-25433.78	-239.86	-2773.09
1800.00	21535425.	25586.48	89.992	-4865604.	1188835.	20944859.	-24925.58	-409.04	-5763.34
1900.00	21535808.	25587.01	89.991	-7318051.	1139681.	20222223.	-24065.66	-572.95	-8672.41
2000.00	21536222.	25587.21	89.990	-9667408.	1074498.	19214463.	-22866.18	-729.27	-11459.11
2100.00	21536673.	25587.05	89.989	-11880526.	994155.	17935804.	-21344.13	-875.78	-14083.97
2200.00	21537172.	25586.55	89.988	-13926195.	899738.	16404309.	-19521.14	-1010.41	-16509.86
2300.00	21537732.	25585.70	89.987	-15775578.	792533.	14641618.	-17423.10	-1131.25	-18702.52
2400.00	21538368.	25584.55	89.985	-17402632.	674006.	12672624.	-15079.82	-1236.58	-20631.02
2500.00	21539094.	25583.11	89.983	-18784468.	545786.	10525134.	-12524.56	-1324.88	-22268.27
2600.00	21539930.	25581.44	89.980	-19901680.	409641.	8229456.	-9793.56	-1394.90	-23591.33
2700.00	21540897.	25579.59	89.977	-20738605.	267451.	5817970.	-6925.47	-1445.61	-24581.77
2800.00	21541994.	25577.60	89.974	-21283549.	121187.	3324663.	-3960.82	-1476.29	-25225.90
2900.00	21543249.	25575.54	89.970	-21528938.	-27123.	784645.	-941.41	-1486.47	-25514.94
3000.00	21544664.	25573.45	89.966	-21471419.	-175416.	-1766342.	2090.24	-1475.96	-25445.12
3100.00	21546244.	25571.40	89.963	-21111898.	-321628.	-4292434.	5091.56	-1444.89	-25017.69
3200.00	21547987.	25569.41	89.959	-20455518.	-463721.	-6758145.	8020.45	-1393.65	-24238.91
3300.00	21549886.	25567.52	89.956	-19511586.	-599706.	-9128853.	10835.89	-1322.90	-23119.94
3400.00	21551930.	25565.75	89.953	-18293434.	-727681.	-11371298.	13498.47	-1233.60	-21676.65
3500.00	21554097.	25564.12	89.950	-16818227.	-845846.	-13454030.	15970.98	-1126.94	-19929.43
3600.00	21556366.	25562.63	89.948	-15106724.	-952536.	-15347849.	18218.86	-1004.37	-17902.86
3700.00	21558710.	25561.28	89.947	-13182990.	-1046243.	-17026219.	20210.70	-867.55	-15625.43.
3800.00	21561093.	25560.04	89.946	-11074051.	-1125633.	-18465619.	21918.64	-718.36	-13129.09
3900.00	21563484.	25558.90	89.947	-8809526.	-1189570.	-19645891.	23318.80	-558.83	-10448.86
4000.00	21565833.	25557.83	89.948	-6421208.	-1237127.	-20550493.	24391.59	-391.16	-7622.35
4100.00	21568112.	25556.81	89.950	-3942626.	-1267605.	-21166775.	25121.99	-217.65	-4689.20
4200.00	21570285.	25555.81	89.952	-1408569.	-1280541.	-21486120.	25499.80	-40.70	-1690.58
4300.00	21572316.	25554.80	89.956	1145398.	-1275712.	-21504080.	25519.73	137.22	1331.40
4400.00	21574179.	25553.78	89.960	3683433.	-1253145.	-21220442.	25181.56	313.65	4334.32
4500.00	21575848.	25552.73	89.965	6169926.	-1213112.	-20639225.	24490.10	486.13	7276.01

TABLE 2C - 1 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE FIRST BURN, FIRST ORBITAL COAST AND S-IVB STAGE SECOND BURN DATA

FLIGHT TIME (SEC)	----- SPACE FIXED ----- RADIUS (FT)	VELOCITY (FT/S)	PATH ANGLE (DEG)	--- SPACE FIXED POSITION AND VELOCITY VECTOR COMPONENTS --- X (FT)	Y (FT)	Z (FT)	DX (FT/S)	DY (FT/S)	DZ (FT/S)
4600.00	21577308.	25551.63	89.969	8569995.	-1156128.	-19768631.	23455.15	652.25	10115.16
4700.00	21578539.	25550.50	89.975	10849983.	-1082948.	-18620915.	22091.33	809.69	12811.92
4800.00	21579540.	25549.34	89.980	12977932.	-994552.	-17212225.	20417.92	956.22	15328.50
4900.00	21580312.	25548.18	89.985	14924027.	-892134.	-15562371.	18458.53	1089.79	17629.64
5000.00	21580857.	25547.05	89.990	16661018.	-777086.	-13694525.	16240.79	1208.53	19683.19
5100.00	21581191.	25545.98	89.994	18164602.	-650978.	-11634916.	13795.91	1310.74	21460.47
5200.00	21581333.	25545.02	89.999	19413762.	-515536.	-9412439.	11158.26	1394.98	22936.77
5300.00	21581306.	25544.20	90.002	20391050.	-372619.	-7058257.	8364.83	1460.05	24091.57
5400.00	21581131.	25543.56	90.005	21082831.	-224194.	-4605349.	5454.78	1505.01	24908.91
5500.00	21580841.	25543.16	90.007	21479465.	-72308.	-2088070.	2468.81	1529.19	25377.54
5600.00	21580462.	25543.00	90.009	21575443.	80940.	458349.	-551.38	1532.22	25491.04
5700.00	21580023.	25543.13	90.010	21369446.	233429.	2998283.	-3563.64	1514.01	25247.97
5800.00	21579548.	25543.55	90.011	20864371.	383042.	5496198.	-6525.98	1474.76	24651.77
5900.00	21579063.	25544.27	90.011	20067285.	527698.	7917171.	-9397.09	1414.98	23710.81
6000.00	21578589.	25545.28	90.011	18989322.	665381.	10227337.	-12136.97	1335.43	22438.19
6100.00	21578139.	25546.56	90.010	17645536.	794163.	12394372.	-14707.38	1237.17	20851.61
6200.00	21577729.	25548.08	90.009	16054688.	912236.	14387953.	-17072.43	1121.50	18973.11
6300.00	21577370.	25549.80	90.008	14238993.	1017935.	16180166.	-19199.04	989.97	16828.82
6400.00	21577064.	25551.65	90.006	12223819.	1109763.	17745883.	-21057.38	844.37	14448.55
6500.00	21576814.	25553.58	90.005	10037327.	1186407.	19063144.	-22621.34	686.66	11865.46
6600.00	21576621.	25555.53	90.004	7710094.	1246764.	20113444.	-23868.84	519.00	9115.59
6700.00	21576486.	25557.42	90.003	5274691.	1289954.	20882012.	-24782.23	343.69	6237.36
6800.00	21576406.	25559.18	90.002	2765219.	1315331.	21358014.	-25348.47	163.15	3271.09
6900.00	21576378.	25560.75	90.001	216839.	1322495.	21534718.	-25559.44	-20.13	258.36
7000.00	21576395.	25562.08	89.999	-2334721.	1311301.	21409587.	-25411.99	-203.60	-2758.47
7100.00	21576466.	25563.10	89.998	-4853675.	1281857.	20984341.	-24908.05	-384.70	-5736.98
7200.00	21576577.	25563.79	89.997	-7304681.	1234527.	20264902.	-24054.64	-560.89	-8635.24
7300.00	21576742.	25564.12	89.996	-9653348.	1169926.	19261359.	-22863.70	-729.71	-11412.40
7400.00	21576970.	25564.07	89.994	-11866728.	1088912.	17987793.	-21352.01	-888.78	-14029.37
7500.00	21577271.	25563.64	89.993	-13913772.	992573.	16462089.	-19540.92	-1035.84	-16449.30
7600.00	21577655.	25562.86	89.991	-15765783.	882214.	14705678.	-17456.00	-1168.84	-18638.18
7700.00	21578128.	25561.74	89.988	-17396825.	759340.	12743214.	-15126.70	-1285.87	-20565.32
7800.00	21578714.	25560.33	89.986	-18784073.	625629.	10602268.	-12585.91	-1385.28	-22203.75
7900.00	21579428.	25558.67	89.983	-19908150.	482920.	8312886.	-9869.45	-1465.66	-23530.65
8000.00	21580283.	25556.81	89.979	-20753384.	333173.	5907173.	-7015.56	-1525.85	-24527.63

TABLE 2C- 1 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE FIRST BURN, FIRST ORBITAL COAST AND S-IVB STAGE SECOND BURN DATA

FLIGHT TIME (SEC)	----- SPACE FIXED ----- RADIUS (FT)	VELOCITY (FT/S)	PATH ANGLE (DEG)	--- SPACE FIXED POSITION AND VELOCITY VECTOR COMPONENTS --- X (FT)	Y (FT)	Z (FT)	DX (FT/S)	DY (FT/S)	DZ (FT/S)
8100.00	21581288.	25554.81	89.976	-21308018.	178455.	3418849.	-4064.35	-1564.98	-25180.95
8200.00	21582459.	25552.72	89.972	-21564388.	20902.	882770.	-1057.21	-1582.47	-25481.75
8300.00	21583801.	25550.60	89.968	-21519003.	-137306.	-1665582.	1963.76	-1578.05	-25426.10
8400.00	21585313.	25548.49	89.964	-21172588.	-293976.	-4190565.	4956.33	-1551.74	-25015.04
8500.00	21586993.	25546.45	89.960	-20530080.	-446933.	-6656904.	7878.77	-1503.87	-24254.57
8600.00	21588830.	25544.51	89.957	-19600537.	-594050.	-9030153.	10690.36	-1435.06	-23155.53
8700.00	21590807.	25542.69	89.954	-18397014.	-733276.	-11277196.	13351.97	-1346.24	-21733.42
8800.00	21592907.	25541.01	89.951	-16936382.	-862667.	-13366691.	15826.58	-1238.57	-20008.21
8900.00	21595092.	25539.47	89.950	-15239085.	-980408.	-15269482.	18079.80	-1113.53	-18004.05
9000.00	21597341.	25538.08	89.949	-13328854.	-1084846.	-16959066.	20080.30	-972.79	-15748.94
9100.00	21599618.	25536.83	89.948	-11232389.	-1174504.	-18411884.	21800.26	-818.27	-13274.36
9200.00	21601887.	25535.68	89.949	-8978966.	-1248108.	-19607701.	23215.75	-652.07	-10614.83
9300.00	21604110.	25534.63	89.950	-6600056.	-1304603.	-20529853.	24307.08	-476.48	-7807.44
9400.00	21606254.	25533.64	89.952	-4128877.	-1343168.	-21165503.	25059.03	-293.89	-4891.27
9500.00	21608280.	25532.69	89.956	-1599928.	-1363229.	-21505805.	25461.13	-106.82	-1907.31
9600.00	21610145.	25531.76	89.959	951485.	-1364465.	-21546028.	25507.79	82.15	1103.06
9700.00	21611829.	25530.84	89.964	3489748.	-1346818.	-21285650.	25198.40	270.40	4097.71
9800.00	21613307.	25529.90	89.969	5979429.	-1310491.	-20728341.	24537.32	455.33	7034.82
9900.00	21614558.	25528.96	89.974	8385784.	-1255945.	-19881910.	23533.85	634.35	9873.36
10000.00	21615567.	25528.00	89.979	10675238.	-1183896.	-18758209.	22202.09	804.99	12573.70
10100.00	21616336.	25527.04	89.985	12815863.	-1095302.	-17372967.	20560.75	964.85	15098.17
10200.00	21616868.	25526.10	89.990	14777814.	-991357.	-15745552.	18632.83	1111.69	17411.59
10300.00	21617165.	25525.20	89.995	16533756.	-873463.	-13898698.	16445.37	1243.47	19481.78
10400.00	21617245.	25524.37	90.000	18059236.	-743224.	-11858200.	14028.97	1358.32	21279.96
10500.00	21617125.	25523.65	90.004	19333023.	-602414.	-9652534.	11417.41	1454.62	22781.21
10600.00	21616839.	25523.07	90.008	20337409.	-452960.	-7312481.	8647.16	1531.02	23964.76
10700.00	21616408.	25522.68	90.011	21058434.	-296907.	-4870657.	5756.82	1586.41	24814.30
10800.00	21615861.	25522.50	90.013	21486092.	-136400.	-2361080.	2786.61	1620.00	25318.14
10900.00	21615230.	25522.57	90.015	21614454.	26353.	181285.	-222.16	1631.27	25469.42
10943.00	21614938.	25522.68	90.015	21577039.	96470.	1275786.	-1517.39	1629.20	25425.39
11) 10943.00	21614938.	25522.68	90.015	21577039.	96470.	1275786.	-1517.39	1629.20	25425.39
11000.00	21614544.	25522.91	90.016	21441752.	189108.	2721039.	-3227.72	1620.03	25266.11
11100.00	21613830.	25523.54	90.016	20970407.	349614.	5222804.	-6188.35	1586.39	24711.10
11200.00	21613107.	25524.46	90.016	20206950.	505652.	7651790.	-9062.98	1530.74	23812.12
11300.00	21612395.	25525.66	90.016	19162004.	655053.	9974172.	-11811.71	1453.82	22581.61

11) Guaymas Acquisition, Start Time Base 5.

TABLE 2C- 1 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE FIRST BURN, FIRST ORBITAL COAST AND S-IVB STAGE SECOND BURN DATA

	FLIGHT TIME (SEC)	----- SPACE FIXED ----- RADIUS (FT)	VELOCITY (FT/S)	PATH ANGLE (DEG)	--- SPACE FIXED POSITION AND VELOCITY VECTOR COMPONENTS --- X (FT)	Y (FT)	Z (FT)	DX (FT/S)	DY (FT/S)	DZ (FT/S)
12)	11333.00	21612167.	25526.11	90.015	18757764.	702542.	10711607.	-12684.60	1423.93	22105.56
13)	11334.20	21612158.	25526.15	90.015	18742524.	704250.	10738119.	-12716.00	1422.80	22087.63
14)	11363.00	21611965.	25527.12	90.015	18365530.	744829.	11367919.	-13461.79	1394.91	21644.13
15)	11393.00	21611771.	25527.81	90.015	17950233.	786219.	12009983.	-14221.95	1364.11	21155.24
	11395.00	21611756.	25528.49	90.015	17921739.	788945.	12052256.	-14272.34	1362.03	21122.23
16)	11396.00	21611750.	25528.83	90.014	17907455.	790307.	12073368.	-14297.51	1360.98	21105.69
	11400.00	21611724.	25530.20	90.014	17850063.	795742.	12157660.	-14397.97	1356.79	21039.21
17)	11401.00	21611720.	25530.54	90.014	17835653.	797098.	12178693.	-14423.04	1355.74	21022.52
	11403.50	21611705.	25602.98	90.008	17799495.	800487.	12231229.	-14524.14	1356.18	21040.98
18)	11403.50	21611705.	25602.98	90.008	17799495.	800487.	12231229.	-14524.14	1356.18	21040.98
	11405.00	21611698.	25728.06	90.018	17777626.	802518.	12262850.	-14636.32	1351.44	21115.98
19)	11406.00	21611686.	25812.16	90.028	17762951.	803867.	12283988.	-14713.27	1346.34	21165.42
	11410.00	21611598.	26218.45	90.065	17703401.	809210.	12369153.	-15062.09	1326.11	21419.19
	11415.00	21611417.	26744.39	90.089	17626983.	815780.	12477072.	-15507.18	1301.62	21750.76
	11420.00	21611198.	27291.64	90.095	17548308.	822223.	12586689.	-15965.54	1275.34	22097.71
	11425.00	21610976.	27862.25	90.084	17467304.	828530.	12698076.	-16438.40	1247.19	22461.71
	11430.00	21610806.	28458.66	90.054	17383897.	834692.	12811338.	-16927.41	1217.01	22844.63
	11435.00	21610725.	29083.44	90.005	17298000.	840697.	12926557.	-17434.22	1184.53	23248.47
	11440.00	21610794.	29739.55	89.938	17209521.	846533.	13043857.	-17960.81	1149.47	23675.49
	11445.00	21611067.	30430.75	89.851	17118355.	852187.	13163355.	-18509.64	1111.60	24128.57
	11450.00	21611606.	31160.82	89.745	17024384.	857644.	13285193.	-19083.16	1070.65	24610.64
	11455.00	21612477.	31933.38	89.618	16927478.	862888.	13409513.	-19683.71	1026.20	25124.47
	11460.00	21613759.	32752.64	89.471	16827497.	867899.	13536495.	-20314.04	977.92	25673.31
	11465.00	21615536.	33623.19	89.301	16724283.	872660.	13666318.	-20977.09	925.63	26260.69
20)	11467.96	21616857.	34165.20	89.189	16661554.	875353.	13744632.	-21386.18	893.13	26628.82
	11470.00	21617894.	34213.54	89.107	16617858.	877167.	13798939.	-21464.30	888.10	26628.20
	11475.00	21620861.	34212.68	88.906	16510245.	881592.	13931843.	-21580.82	882.08	26532.96
21)	11477.96	21622901.	34211.87	88.787	16446228.	884199.	14010340.	-21649.42	878.50	26476.08

12) Initiate Helium Ullage Control;
13) Terminate C.V.S. LH2 Venting;
14) Inertial Attitude Command Freeze;
15) J2 Start Command, Second Burn, Begin Fuel Lead;
16) Terminate Helium Ullage Control;
17) J-2 Ignition, Second Burn;
18) 90% Thrust Level, Second Burn;
19) Command P.U. Activation, Second Burn;
20) Depletion Cutoff;
21) End LOX Vent.

TABLE 2C - 2

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

S-IVB STAGE FIRST BURN, FIRST ORBITAL COAST AND S-IVB STAGE SECOND BURN DATA

	FLIGHT TIME (SEC)	----- EARTH FIXED ----- POSITION (FT)	VELOCITY (FT/S)	PATH ANGLE (DEG)	---- EARTH FIXED POSITION AND VELOCITY VECTOR COMPONENTS ---- X (FT)	Y (FT)	Z (FT)	DX (FT/S)	DY (FT/S)	DZ (FT/S)
1)	143.22	329526.	7381.11	59.362	220253.	68.	245105.	3693.05	7.41	6390.78
2)	144.54	339055.	7361.32	59.608	225105.	78.	253547.	3653.20	7.81	6390.86
3)	146.89	355950.	7330.47	60.050	233607.	97.	268566.	3584.21	8.51	6394.46
	147.94	363487.	7334.30	60.250	237358.	106.	275288.	3561.66	8.67	6411.43
4)	147.94	363487.	7334.30	60.250	237358.	106.	275288.	3561.66	8.67	6411.43
5)	150.54	382190.	7357.78	60.743	246554.	129.	292028.	3512.52	8.65	6465.22
6)	155.14	415451.	7410.93	61.599	262520.	168.	321999.	3431.00	8.43	6568.88
7)	159.25	445415.	7467.73	62.347	276486.	202.	349214.	3362.06	8.22	6668.10
	160.00	450905.	7478.35	62.482	279003.	208.	354221.	3349.58	8.15	6686.25
	180.00	600194.	7792.71	66.486	342189.	708.	493091.	2948.49	48.25	7213.21
	200.00	755550.	8175.39	70.437	396777.	2176.	642977.	2510.19	99.47	7779.85
	220.00	918202.	8627.46	73.958	442645.	4783.	804449.	2077.00	162.73	8372.13
	240.00	1089467.	9146.44	77.083	479843.	8720.	978065.	1642.27	231.54	8994.82
	260.00	1270656.	9731.42	79.832	508304.	14066.	1164473.	1202.79	303.55	9652.03
	280.00	1463113.	10381.04	82.218	527916.	20885.	1364393.	757.28	378.88	10346.45
	300.00	1668195.	11097.10	84.290	538512.	29213.	1578615.	298.91	452.89	11083.82
	320.00	1887328.	11880.13	86.013	539874.	39084.	1808041.	-163.61	535.60	11856.92
	340.00	2122009.	12733.35	87.432	531900.	50673.	2053640.	-635.83	624.01	12702.15
	360.00	2373804.	13662.18	88.577	514353.	64076.	2316523.	-1121.48	717.16	13597.18
	380.00	2644413.	14673.88	89.469	486930.	79394.	2597983.	-1623.75	815.56	14560.94
	400.00	2935678.	15776.68	90.121	449277.	96738.	2899482.	-2145.16	919.86	15603.07
	420.00	3249644.	16983.24	90.548	400974.	116232.	3222716.	-2689.50	1030.80	16737.22
	440.00	3588671.	18313.81	90.762	341505.	138024.	3569718.	-3263.04	1149.92	17984.05
	460.00	3955570.	19793.40	90.770	270211.	162293.	3942991.	-3872.99	1278.82	19368.61
	480.00	4353697.	21454.64	90.574	186290.	189251.	4345590.	-4527.86	1418.97	20923.35
	500.00	4787198.	23349.04	90.219	88651.	219134.	4781358.	-5259.85	1569.56	22694.67
8)	508.12	4974500.	24199.94	90.008	44641.	232114.	4968881.	-5576.03	1627.32	23492.48
9)	518.12	5209709.	24230.88	89.999	-12470.	248479.	5203765.	-5844.41	1644.35	23457.93
	530.00	5489110.	24232.16	89.998	-83747.	268118.	5481918.	-6158.34	1662.45	23377.53
10)	530.00	5489110.	24232.16	89.998	-83747.	268118.	5481918.	-6158.34	1662.45	23377.53
	600.00	7133520.	24232.72	89.999	-578969.	388080.	7099388.	-7983.49	1763.46	22811.81
	700.00	9467959.	24233.90	90.000	-1504218.	570928.	9330253.	-10501.90	1889.67	21758.24
	800.00	11775229.	24235.64	89.999	-2674911.	765175.	11441825.	-12887.23	1990.73	20428.48
	900.00	14046659.	24237.89	89.999	-4076222.	968101.	13407305.	-15109.41	2062.62	18839.50
	1000.00	16274475.	24240.49	89.998	-5690416.	1176608.	15201753.	-17140.39	2101.77	17011.49

1) Separation Completed;
2) J-2 Start Command, First Burn;
3) Terminate Ullage Burn;
4) 90% Thrust Level, First Burn;
5) Command P.U. Activation, First Burn;
6) Ullage Case Jettison;
7) I.G.M. Initiation;
8) Guidance Cutoff Signal;
9) Orbit Insertion;
10) Initiate Local Horizontal Attitude Hold.

TABLE 2C - 2 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE FIRST BURN, FIRST ORBITAL COAST AND S-IVB STAGE SECOND BURN DATA

FLIGHT TIME (SEC)	----- EARTH FIXED ----- POSITION (FT)	VELOCITY (FT/S)	PATH ANGLE (DEG)	---- EARTH FIXED POSITION AND VELOCITY VECTOR COMPONENTS ---- X (FT)	Y (FT)	Z (FT)	DX (FT/S)	DY (FT/S)	DZ (FT/S)
1100.00	18451331.	24243.42	89.997	-7497070.	1387261.	16802412.	-18954.58	2105.11	14967.83
1200.00	20570175.	24246.59	89.996	-9473337.	1596352.	18188998.	-20529.06	2070.14	12734.58
1300.00	22624202.	24249.90	89.995	-11594223.	1799950.	19343958.	-21843.92	1995.02	10340.24
1400.00	24606846.	24253.18	89.994	-13832904.	1993980.	20252696.	-22882.47	1878.63	7815.39
1500.00	26511781.	24256.29	89.993	-16161059.	2174288.	20903761.	-23631.49	1720.58	5192.29
1600.00	28332940.	24259.07	89.992	-18549226.	2336721.	21288999.	-24081.43	1521.28	2504.54
1700.00	30064527.	24261.37	89.992	-20967176.	2477209.	21403662.	-24226.54	1281.95	-213.44
1800.00	31701035.	24263.09	89.991	-23384303.	2591842.	21246469.	-24064.96	1004.59	-2926.78
1900.00	33237268.	24264.11	89.991	-25770004.	2676953.	20819626.	-23598.75	692.04	-5600.66
2000.00	34668355.	24264.40	89.990	-28094088.	2729195.	20128800.	-22833.90	347.88	-8200.78
2100.00	35989770.	24263.92	89.989	-30327149.	2745619.	19183045.	-21780.25	-23.56	-10693.82
2200.00	37197347.	24262.69	89.988	-32440955.	2723740.	17994675.	-20451.33	-417.30	-13047.89
2300.00	38287289.	24260.78	89.986	-34408799.	2661603.	16579111.	-18864.20	-827.73	-15232.93
2400.00	39256190.	24258.25	89.984	-36205857.	2557842.	14954661.	-17039.21	-1248.74	-17221.17
2500.00	40101035.	24255.21	89.982	-37809482.	2411721.	13142287.	-14999.71	-1673.80	-18987.42
2600.00	40819217.	24251.80	89.979	-39199509.	2223177.	11165327.	-12771.76	-2096.04	-20509.47
2700.00	41408536.	24248.15	89.976	-40358492.	1992843.	9049179.	-10383.74	-2508.40	-21768.30
2800.00	41867206.	24244.43	89.972	-41271925.	1722067.	6820975.	-7866.00	-2903.70	-22748.34
2900.00	42193862.	24240.78	89.968	-41928423.	1412912.	4509218.	-5250.45	-3274.80	-23437.66
3000.00	42387554.	24237.33	89.965	-42319849.	1068150.	2143424.	-2570.14	-3614.68	-23828.07
3100.00	42447755.	24234.21	89.961	-42441412.	691243.	-246265.	141.13	-3916.61	-23915.21
3200.00	42374350.	24231.52	89.957	-42291719.	286309.	-2629472.	2849.28	-4174.22	-23698.61
3300.00	42167647.	24229.31	89.953	-41872787.	-141923.	-4975953.	5520.30	-4381.62	-23181.61
3400.00	41828364.	24227.62	89.950	-41190007.	-588162.	-7255998.	8120.72	-4533.54	-22371.38
3500.00	41357630.	24226.47	89.947	-40252075.	-1046627.	-9440796.	10618.00	-4625.42	-21278.75
3600.00	40756979.	24225.81	89.945	-39070880.	-1511115.	-11502794.	12980.90	-4653.47	-19918.11
3700.00	40028353.	24225.59	89.944	-37661354.	-1975093.	-13416056.	15179.89	-4614.80	-18307.20
3800.00	39174085.	24225.72	89.943	-36041279.	-2431782.	-15156570.	17187.48	-4507.47	-16466.90
3900.00	38196904.	24226.10	89.944	-34231074.	-2874263.	-16702567.	18978.57	-4330.55	-14420.96
4000.00	37099910.	24226.62	89.945	-32253525.	-3295573.	-18034764.	20530.78	-4084.18	-12195.73
4100.00	35886601.	24227.15	89.947	-30133523.	-3688819.	-19136656.	21824.69	-3769.59	-9819.77
4200.00	34560834.	24227.58	89.950	-27897732.	-4047287.	-19994681.	22844.15	-3389.08	-7323.56
4300.00	33126818.	24227.79	89.953	-25574263.	-4364547.	-20598395.	23576.42	-2946.10	-4739.08
4400.00	31589121.	24227.70	89.958	-23192322.	-4634567.	-20940621.	24012.40	-2445.13	-2099.36
4500.00	29952642.	24227.23	89.963	-20781836.	-4851817.	-21017516.	24146.73	-1891.70	561.90

TABLE 2C - 2 (Cont'd)

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

S-IVB STAGE FIRST BURN, FIRST ORBITAL COAST AND S-IVB STAGE SECOND BURN DATA

FLIGHT TIME (SEC)	----- EARTH FIXED ----- POSITION (FT)	VELOCITY (FT/S)	PATH ANGLE (DEG)	---- EARTH FIXED POSITION AND VELOCITY VECTOR COMPONENTS ---- X (FT)	Y (FT)	Z (FT)	DX (FT/S)	DY (FT/S)	DZ (FT/S)
4600.00	28222609.	24226.34	89.968	-18373083.	-5011368.	-20828626.	23977.83	-1292.32	3210.77
4700.00	26404550.	24225.02	89.973	-15996300.	-5108988.	-20376872.	23508.00	-654.37	5813.57
4800.00	24504308.	24223.29	89.979	-13681311.	-5141222.	-19668520.	22743.29	13.95	8337.30
4900.00	22528018.	24221.20	89.984	-11457145.	-5105474.	-18713086.	21693.49	703.76	10750.05
5000.00	20482107.	24218.82	89.989	-9351670.	-5000062.	-17523196.	20371.97	1405.61	13021.46
5100.00	18373321.	24216.27	89.994	-7391251.	-4824272.	-16114426.	18795.49	2109.62	15123.05
5200.00	16208763.	24213.65	89.999	-5600410.	-4578398.	-14505092.	16983.96	2805.61	17028.63
5300.00	13996014.	24211.11	90.002	-4001534.	-4263755.	-12715996.	14960.24	3483.26	18714.59
5400.00	11743409.	24208.78	90.005	-2614588.	-3882693.	-10770157.	12749.74	4132.25	20160.19
5500.00	9460785.	24206.78	90.008	-1456886.	-3438590.	-8692527.	10380.20	4742.43	21347.82
5600.00	7161646.	24205.25	90.010	-542862.	-2935820.	-6509642.	7881.23	5303.96	22263.16
5700.00	4871665.	24204.28	90.011	116090.	-2379724.	-4249300.	5284.06	5807.44	22895.40
5800.00	2680009.	24203.95	90.011	511758.	-1776551.	-1940210.	2621.05	6244.11	23237.30
5900.00	1357944.	24204.30	90.012	639216.	-1133388.	388391.	-74.61	6605.95	23285.27
6000.00	2790163.	24205.34	90.011	496872.	-458085.	2707081.	-2769.37	6885.81	23039.42
6100.00	4993197.	24207.06	90.010	86496.	240845.	4986635.	-5429.67	7077.55	22503.53
6200.00	7285047.	24209.40	90.009	-586803.	954328.	7198391.	-8022.36	7176.16	21685.01
6300.00	9584078.	24212.27	90.008	-1514637.	1672854.	9314612.	-10515.09	7177.83	20594.80
6400.00	11865768.	24215.56	90.007	-2685443.	2386589.	11308804.	-12876.70	7080.08	19247.24
6500.00	14116917.	24219.11	90.005	-4084614.	3085525.	13156094.	-15077.63	6881.78	17659.89
6600.00	16327798.	24222.78	90.004	-5694685.	3759612.	14833505.	-17090.23	6583.25	15853.33
6700.00	18490109.	24226.40	90.003	-7495532.	4398901.	16320258.	-18889.19	6186.26	13850.89
6800.00	20596297.	24229.81	90.002	-9464634.	4993698.	17598044.	-20451.80	5694.06	11678.40
6900.00	22639266.	24232.84	90.001	-11577342.	5534705.	18651236.	-21758.30	5111.35	9363.82
7000.00	24612281.	24235.36	89.999	-13807190.	6013164.	19467095.	-22792.13	4444.27	6936.88
7100.00	26508929.	24237.26	89.998	-16126224.	6421006.	20035941.	-23540.15	3700.32	4428.76
7200.00	28323082.	24238.44	89.997	-18505361.	6750968.	20351242.	-23992.86	2888.29	1871.56
7300.00	30048927.	24238.85	89.996	-20914744.	6996734.	20409733.	-24144.49	2018.14	-701.99
7400.00	31680956.	24238.48	89.994	-23324144.	7153034.	20211418.	-23993.13	1100.89	-3259.10
7500.00	33213980.	24237.33	89.992	-25703320.	7215749.	19759576.	-23540.71	148.46	-5767.25
7600.00	34643140.	24235.47	89.990	-28022424.	7181986.	19060694.	-22793.01	-826.48	-8194.72
7700.00	35963927.	24232.97	89.988	-30252382.	7050152.	18124370.	-21759.57	-1810.71	-10510.91
7800.00	37172187.	24229.96	89.985	-32365239.	6819996.	16963211.	-20453.53	-2790.62	-12686.86
7900.00	38264138.	24226.56	89.982	-34334538.	6492640.	15592607.	-18891.48	-3752.43	-14695.49
8000.00	39236372.	24222.92	89.978	-36135644.	6070583.	14030544.	-17093.18	-4682.36	-16512.07

TABLE 2C-2 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE FIRST BURN, FIRST ORBITAL COAST AND S-IVB STAGE SECOND BURN DATA

FLIGHT TIME (SEC)	----- EARTH FIXED ----- POSITION (FT)	VELOCITY (FT/S)	PATH ANGLE (DEG)	---- EARTH FIXED POSITION AND VELOCITY VECTOR COMPONENTS ---- X (FT)	Y (FT)	Z (FT)	DX (FT/S)	DY (FT/S)	DZ (FT/S)
8100.00	40085868.	24219.19	89.974	-37746043.	5557692.	12297361.	-15081.37	-5566.85	-18114.40
8200.00	40809996.	24215.51	89.970	-39145628.	4959176.	10415479.	-12881.38	-6392.75	-19483.17
8300.00	41406531.	24212.03	89.966	-40316953.	4281524.	8409086.	-10520.86	-7147.53	-20602.11
8400.00	41873636.	24208.87	89.962	-41245421.	3532445.	6303851.	-8029.40	-7819.41	-21458.22
8500.00	42209892.	24206.13	89.958	-41919493.	2720776.	4126560.	-5438.18	-8397.61	-22041.85
8600.00	42414274.	24203.88	89.955	-42330796.	1856382.	1904803.	-2779.55	-8872.44	-22346.85
8700.00	42486173.	24202.15	89.951	-42474242.	950028.	-333394.	-86.65	-9235.50	-22370.56
8800.00	42425388.	24200.95	89.949	-42348084.	13254.	-2559925.	2606.96	-9479.80	-22113.86
8900.00	42232113.	24200.25	89.947	-41953918.	-941772.	-4746918.	5267.75	-9599.86	-21581.14
9000.00	41906977.	24200.01	89.946	-41296703.	-1902428.	-6867156.	7862.60	-9591.84	-20780.19
9100.00	41450986.	24200.13	89.945	-40384648.	-2855778.	-8894326.	10359.19	-9453.62	-19722.13
9200.00	40865570.	24200.52	89.946	-39229148.	-3788774.	-10803423.	12726.41	-9184.82	-18421.26
9300.00	40152552.	24201.06	89.947	-37844633.	-4688415.	-12571000.	14934.74	-8786.89	-16894.83
9400.00	39314164.	24201.64	89.950	-36248393.	-5541937.	-14175487.	16956.60	-8263.10	-15162.91
9500.00	38353008.	24202.13	89.953	-34460351.	-6336989.	-15597435.	18766.74	-7618.52	-13248.04
9600.00	37272081.	24202.43	89.957	-32502834.	-7061818.	-16819767.	20342.51	-6859.98	-11174.99
9700.00	36074767.	24202.46	89.962	-30400289.	-7705447.	-17827992.	21664.21	-5996.03	-8970.42
9800.00	34764815.	24202.13	89.967	-28178987.	-8257825.	-18610359.	22715.28	-5036.80	-6662.56
9900.00	33346316.	24201.42	89.972	-25866665.	-8709993.	-19157988.	23482.59	-3993.92	-4280.81
10000.00	31823730.	24200.30	89.978	-23492220.	-9054225.	-19465005.	23956.54	-2880.36	-1855.36
10100.00	30201833.	24198.79	89.984	-21085310.	-9284154.	-19528567.	24131.23	-1710.27	583.19
10200.00	28485726.	24196.94	89.990	-18676002.	-9394875.	-19348899.	24004.54	-498.78	3004.22
10300.00	26680794.	24194.82	89.995	-16294373.	-9383035.	-18929258.	23578.09	738.18	5377.54
10400.00	24792734.	24192.52	90.000	-13970169.	-9246913.	-18275904.	22857.30	1984.13	7673.69
10500.00	22827502.	24190.17	90.004	-11732398.	-8986444.	-17397975.	21851.21	3222.22	9864.39
10600.00	20791329.	24187.88	90.008	-9608989.	-8603267.	-16307375.	20572.45	4435.51	11922.85
10700.00	18690696.	24185.80	90.011	-7626440.	-8100704.	-15018593.	19037.00	5607.15	13824.08
10800.00	16532349.	24184.04	90.014	-5809480.	-7483747.	-13548507.	17264.02	6720.66	15545.23
10900.00	14322357.	24182.73	90.016	-4180791.	-6759013.	-11916178.	15275.57	7760.13	17065.81
10943.00	13359743.	24182.33	90.016	-3543480.	-6416215.	-11169541.	14360.37	8180.53	17653.44
11) 10943.00	13359743.	24182.33	90.016	-3543480.	-6416215.	-11169541.	14360.37	8180.53	17653.44
11000.00	12071190.	24181.97	90.017	-2760698.	-5934669.	-10142578.	13096.38	8710.43	18367.94
11100.00	9784055.	24181.84	90.017	-1566961.	-5020360.	-8250355.	10753.49	9557.46	19436.53
11200.00	7471662.	24182.38	90.017	-614490.	-4027053.	-6263464.	8275.97	10288.31	20259.48
11300.00	5148636.	24183.60	90.017	84770.	-2966955.	-4206952.	5694.54	10891.49	20827.73

11) Guaymas Acquisition, Start Time Base 5.

TABLE 2C- 2 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE FIRST BURN, FIRST ORBITAL COAST AND S-IVB STAGE SECOND BURN DATA

	FLIGHT TIME (SEC)	----- EARTH FIXED ----- POSITION (FT)	VELOCITY (FT/S)	PATH ANGLE (DEG)	---- EARTH FIXED POSITION AND VELOCITY VECTOR COMPONENTS ---- X (FT)	Y (FT)	Z (FT)	DX (FT/S)	DY (FT/S)	DZ (FT/S)
12)	11333.00	4384445.	24184.16	90.016	258367.	-2604701.	-3517404.	4825.30	11060.77	20958.28
13)	11334.20	4356727.	24184.20	90.016	264139.	-2591424.	-3492251.	4793.56	11066.65	20962.50
14)	11363.00	3653925.	24185.29	90.016	391203.	-2270733.	-2887181.	4029.39	11201.64	21052.69
15)	11393.00	3011354.	24186.14	90.015	500089.	-1932734.	-2254485.	3228.80	11329.48	21123.14
	11395.00	2966288.	24186.83	90.015	506494.	-1910066.	-2212233.	3175.39	11337.83	21127.55
16)	11396.00	2943784.	24187.19	90.015	509655.	-1898728.	-2191107.	3148.68	11341.99	21129.72
	11400.00	2853941.	24188.58	90.015	522035.	-1853326.	-2106571.	3041.80	11358.46	21138.12
17)	11401.00	2831526.	24188.92	90.015	525067.	-1841965.	-2085429.	3015.08	11362.54	21140.15
	11403.50	2775551.	24261.38	90.009	532525.	-1813529.	-2032540.	2959.45	11405.04	21208.04
18)	11403.50	2775551.	24261.38	90.009	532525.	-1813529.	-2032540.	2959.45	11405.04	21208.04
	11405.00	2741868.	24386.40	90.019	536944.	-1796378.	-2000639.	2929.42	11460.94	21325.15
19)	11406.00	2719346.	24470.47	90.030	539862.	-1784899.	-1979274.	2907.28	11497.02	21404.90
	11410.00	2628617.	24876.55	90.068	551324.	-1738567.	-1892896.	2825.27	11670.85	21786.51
	11415.00	2513731.	25402.26	90.094	565202.	-1679652.	-1782740.	2725.98	11896.12	22278.38
	11420.00	2397290.	25949.28	90.100	578587.	-1619592.	-1670077.	2627.33	12128.77	22789.37
	11425.00	2279417.	26519.64	90.088	591476.	-1558351.	-1554812.	2529.52	12369.61	23321.35
	11430.00	2160279.	27115.79	90.057	603883.	-1495881.	-1436826.	2432.59	12619.56	23876.66
	11435.00	2040123.	27740.28	90.006	615803.	-1432139.	-1316003.	2336.63	12879.54	24457.74
	11440.00	1919288.	28396.09	89.935	627248.	-1367069.	-1192204.	2241.68	13150.58	25037.41
	11445.00	1798258.	29086.96	89.845	638223.	-1300612.	-1065275.	2147.83	13434.12	25709.20
	11450.00	1677715.	29816.68	89.734	648731.	-1232703.	-935050.	2055.23	13731.56	26386.64
	11455.00	1558634.	30588.85	89.602	658777.	-1163271.	-801344.	1963.98	14044.13	27103.20
	11460.00	1442402.	31407.70	89.448	668373.	-1092234.	-663946.	1874.20	14373.36	27862.84
	11465.00	1331006.	32277.81	89.272	677524.	-1019506.	-522633.	1786.12	14721.09	28669.78
20)	11467.96	1268410.	32819.53	89.155	682736.	-975590.	-436988.	1735.46	14937.00	29171.84
	11470.00	1227432.	32867.83	89.070	686228.	-945102.	-377442.	1685.12	14962.43	29216.10
	11475.00	1137082.	32866.91	88.861	694329.	-870248.	-231369.	1555.91	14979.28	29213.60
21)	11477.96	1091511.	32866.05	88.737	698823.	-825870.	-144850.	1479.37	14989.01	29211.62

12) Initiate Helium Ullage Control;
13) Terminate C.V.S. LH2 Venting;
14) Inertial Attitude Command Freeze;
15) J2 Start Command, Second Burn, Begin Fuel Lead;
16) Terminate Helium Ullage Control;
17) J-2 Ignition, Second Burn;
18) 90% Thrust Level, Second Burn;
19) Command P.U. Activation, Second Burn;
20) Depletion Cutoff;
21) End LOX Vent.

TABLE 2C - 3

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

S-IVB STAGE FIRST BURN, FIRST ORBITAL COAST AND S-IVB STAGE SECOND BURN DATA

	FLIGHT TIME (SEC)	MASS (LB)	THRUST (TOTAL) (LB)	LONGITUDINAL ACCELERATION (FT/S2)	DYNAMIC PRESSURE (LB/FT2)	CENTRAL RANGE ANGLE (DEG)	PITCH ATT. COMMAND (DEG)	PITCH ANGLE OF ATTACK (DEG)
1)	143.22	264915.	8847.	1.018	6.	1.195	-60.818	-0.662
2)	144.54	264856.	8674.	1.008	5.	1.222	-60.818	-0.504
3)	146.89	264548.	98380.	11.934	4.	1.271	-60.818	-0.644
	147.94	264379.	202863.	24.662	3.	1.292	-60.818	-0.569
4)	147.94	264379.	202863.	24.662	3.	1.292	-60.818	-0.569
5)	150.54	263134.	201243.	24.589	2.	1.346	-60.818	0.227
6)	155.14	260788.	230484.	28.427	1.	1.443	-60.818	1.263
7)	159.25	258326.	230199.	28.667	0.	1.530	-60.818	2.016
	160.00	257916.	230156.	28.707	0.	1.546	-61.568	2.089
	180.00	246985.	230368.	30.008	0.	1.987	-73.568	-5.984
	200.00	236054.	230119.	31.364	0.	2.457	-74.486	-2.300
	220.00	225126.	230267.	32.908	0.	2.957	-75.464	0.771
	240.00	214201.	229988.	34.544	0.	3.488	-76.825	3.084
	260.00	203272.	230217.	36.437	0.	4.053	-78.291	4.891
	280.00	192350.	229998.	38.469	0.	4.653	-79.666	6.381
	300.00	181428.	230278.	40.835	0.	5.293	-80.208	7.252
	320.00	170503.	230328.	43.460	0.	5.973	-81.262	8.511
	340.00	159582.	230110.	46.390	0.	6.697	-82.554	9.174
	360.00	148658.	230399.	49.861	0.	7.470	-83.937	9.519
	380.00	137733.	230199.	53.769	0.	8.294	-85.210	9.768
	400.00	126818.	229775.	58.288	0.	9.174	-86.452	9.834
	420.00	115916.	229653.	63.736	0.	10.115	-87.729	9.704
	440.00	105008.	230015.	70.466	0.	11.124	-89.027	9.384
	460.00	94096.	229872.	78.587	0.	12.208	-90.204	8.987
	480.00	83191.	229724.	88.830	0.	13.375	-91.442	8.438
	500.00	72294.	229557.	102.141	0.	14.637	-93.613	6.451
8)	508.12	67871.	229481.	108.760	0.	15.180	-92.558	8.016
9)	518.12	67675.	459.	0.218	0.	15.860	-92.558	8.503
	530.00	67666.	70.	0.033	0.	16.668	-92.558	9.132
10)	530.00	67666.	70.	0.033	0.	16.668	-92.558	9.132
	600.00	67658.	28.	0.013	0.	21.430	-111.418	-0.001
	700.00	67646.	25.	0.012	0.	28.234	-118.228	-0.000
	800.00	67635.	22.	0.010	0.	35.038	-125.036	-0.001
	900.00	67623.	18.	0.009	0.	41.843	-131.842	-0.001
	1000.00	67612.	15.	0.007	0.	48.648	-138.646	-0.002

1) Separation Completed;
2) J-2 Start Command, First Burn;
3) Terminate Ullage Burn;
4) 90% Thrust Level, First Burn;
5) Command P.U. Activation, First Burn;
6) Ullage Case Jettison;
7) I.G.M. Initiation;
8) Guidance Cutoff Signal;
9) Orbit Insertion;
10) Initiate Local Horizontal Attitude Hold.

TABLE 2C - 3 (Cont'd)

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

S-IVB STAGE FIRST BURN, FIRST ORBITAL COAST AND S-IVB STAGE SECOND BURN DATA

FLIGHT TIME (SEC)	MASS (LB)	THRUST (TOTAL) (LB)	LONGITUDINAL ACCELERATION (FT/S2)	DYNAMIC PRESSURE (LB/FT2)	CENTRAL RANGE ANGLE (DEG)	PITCH ATT. COMMAND (DEG)	PITCH ANGLE OF ATTACK (DEG)
1100.00	67600.	13.	0.006	0.	55.453	-145.447	-0.003
1200.00	67589.	13.	0.006	0.	62.258	-152.247	-0.004
1300.00	67577.	13.	0.006	0.	69.064	-159.045	-0.005
1400.00	67566.	13.	0.006	0.	75.871	-165.842	-0.006
1500.00	67555.	13.	0.006	0.	82.677	-172.638	-0.007
1600.00	67543.	13.	0.006	0.	89.484	-179.434	-0.008
1700.00	67532.	13.	0.006	0.	96.292	173.770	-0.008
1800.00	67520.	13.	0.006	0.	103.099	166.973	-0.009
1900.00	67509.	13.	0.006	0.	109.906	160.174	-0.009
2000.00	67497.	13.	0.006	0.	116.714	153.373	-0.010
2100.00	67486.	13.	0.006	0.	123.521	146.571	-0.011
2200.00	67474.	13.	0.006	0.	130.328	139.766	-0.012
2300.00	67463.	13.	0.006	0.	137.134	132.958	-0.014
2400.00	67451.	13.	0.006	0.	143.941	126.149	-0.016
2500.00	67440.	12.	0.006	0.	150.746	119.338	-0.018
2600.00	67428.	12.	0.006	0.	157.551	112.525	-0.021
2700.00	67417.	12.	0.006	0.	164.355	105.711	-0.024
2800.00	67406.	12.	0.006	0.	171.159	98.897	-0.028
2900.00	67394.	12.	0.005	0.	177.961	92.083	-0.032
3000.00	67383.	12.	0.005	0.	175.237	85.270	-0.035
3100.00	67371.	11.	0.005	0.	168.437	78.459	-0.039
3200.00	67360.	11.	0.005	0.	161.637	71.650	-0.043
3300.00	67348.	11.	0.005	0.	154.839	64.844	-0.047
3400.00	67337.	11.	0.005	0.	148.042	58.041	-0.050
3500.00	67325.	11.	0.005	0.	141.246	51.242	-0.053
3600.00	67314.	11.	0.005	0.	134.451	44.447	-0.055
3700.00	67302.	10.	0.005	0.	127.657	37.655	-0.056
3800.00	67291.	10.	0.005	0.	120.864	30.868	-0.057
3900.00	67279.	10.	0.005	0.	114.073	24.083	-0.056
4000.00	67268.	10.	0.005	0.	107.282	17.302	-0.055
4100.00	67257.	10.	0.005	0.	100.492	10.523	-0.053
4200.00	67245.	10.	0.005	0.	93.704	3.746	-0.050
4300.00	67234.	10.	0.004	0.	86.916	-3.031	-0.047
4400.00	67222.	9.	0.004	0.	80.129	-9.806	-0.042
4500.00	67211.	9.	0.004	0.	73.343	-16.582	-0.037

TABLE 2C- 3 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE FIRST BURN, FIRST ORBITAL COAST AND S-IVB STAGE SECOND BURN DATA

FLIGHT TIME (SEC)	MASS (LB)	THRUST (TOTAL) (LB)	LONGITUDINAL ACCELERATION (FT/S2)	DYNAMIC PRESSURE (LB/FT2)	CENTRAL RANGE ANGLE (DEG)	PITCH ATT. COMMAND (DEG)	PITCH ANGLE OF ATTACK (DEG)
4600.00	67199.	9.	0.004	0.	66.558	-23.359	-0.032
4700.00	67188.	9.	0.004	0.	59.773	-30.137	-0.027
4800.00	67176.	9.	0.004	0.	52.989	-36.917	-0.021
4900.00	67165.	9.	0.004	0.	46.206	-43.699	-0.016
5000.00	67153.	9.	0.004	0.	39.423	-50.484	-0.011
5100.00	67142.	9.	0.004	0.	32.640	-57.271	-0.006
5200.00	67130.	9.	0.004	0.	25.858	-64.059	-0.001
5300.00	67119.	9.	0.004	0.	19.077	-70.850	0.002
5400.00	67108.	9.	0.004	0.	12.295	-77.643	0.005
5500.00	67096.	9.	0.004	0.	5.513	-84.436	0.008
5600.00	67085.	9.	0.004	0.	1.268	-91.230	0.010
5700.00	67073.	9.	0.004	0.	8.050	-98.024	0.011
5800.00	67062.	9.	0.004	0.	14.832	-104.817	0.011
5900.00	67050.	9.	0.004	0.	21.614	-111.609	0.012
6000.00	67039.	9.	0.004	0.	28.397	-118.399	0.011
6100.00	67027.	9.	0.004	0.	35.180	-125.187	0.010
6200.00	67016.	9.	0.004	0.	41.964	-131.973	0.009
6300.00	67004.	9.	0.004	0.	48.748	-138.756	0.008
6400.00	66993.	9.	0.004	0.	55.532	-145.538	0.007
6500.00	66981.	9.	0.004	0.	62.318	-152.317	0.005
6600.00	66970.	9.	0.004	0.	69.104	-159.094	0.004
6700.00	66959.	9.	0.004	0.	75.890	-165.870	0.003
6800.00	66947.	9.	0.004	0.	82.677	-172.645	0.002
6900.00	66936.	9.	0.004	0.	89.464	-179.420	0.001
7000.00	66924.	9.	0.004	0.	96.252	173.804	-0.001
7100.00	66913.	9.	0.004	0.	103.040	167.028	-0.002
7200.00	66901.	9.	0.004	0.	109.829	160.250	-0.003
7300.00	66890.	9.	0.004	0.	116.617	153.470	-0.004
7400.00	66878.	9.	0.004	0.	123.405	146.687	-0.006
7500.00	66867.	9.	0.004	0.	130.194	139.902	-0.008
7600.00	66855.	9.	0.004	0.	136.981	133.115	-0.010
7700.00	66844.	9.	0.004	0.	143.769	126.324	-0.012
7800.00	66832.	9.	0.004	0.	150.556	119.532	-0.015
7900.00	66821.	9.	0.004	0.	157.342	112.737	-0.018
8000.00	66810.	9.	0.004	0.	164.128	105.941	-0.022

TABLE 2C - 3 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE FIRST BURN, FIRST ORBITAL COAST AND S-IVB STAGE SECOND BURN DATA

FLIGHT TIME (SEC)	MASS (LB)	THRUST (TOTAL) (LB)	LONGITUDINAL ACCELERATION (FT/S2)	DYNAMIC PRESSURE (LB/FT2)	CENTRAL RANGE ANGLE (DEG)	PITCH ATT. COMMAND (DEG)	PITCH ANGLE OF ATTACK (DEG)
8100.00	66798.	9.	0.004	0.	170.913	99.144	-0.026
8200.00	66787.	8.	0.004	0.	177.696	92.348	-0.030
8300.00	66775.	8.	0.004	0.	175.519	85.552	-0.034
8400.00	66764.	8.	0.004	0.	168.738	78.757	-0.038
8500.00	66752.	8.	0.004	0.	161.957	71.965	-0.042
8600.00	66741.	8.	0.004	0.	155.177	65.175	-0.045
8700.00	66729.	8.	0.004	0.	148.398	58.389	-0.049
8800.00	66718.	8.	0.004	0.	141.620	51.607	-0.051
8900.00	66706.	8.	0.004	0.	134.844	44.829	-0.053
9000.00	66695.	8.	0.004	0.	128.068	38.056	-0.054
9100.00	66683.	8.	0.004	0.	121.294	31.286	-0.055
9200.00	66672.	7.	0.004	0.	114.521	24.520	-0.054
9300.00	66661.	7.	0.003	0.	107.748	17.757	-0.053
9400.00	66649.	7.	0.003	0.	100.977	10.997	-0.050
9500.00	66638.	7.	0.003	0.	94.206	4.240	-0.047
9600.00	66626.	7.	0.003	0.	87.436	-2.517	-0.043
9700.00	66615.	7.	0.003	0.	80.668	-9.273	-0.038
9800.00	66603.	7.	0.004	0.	73.899	-16.029	-0.033
9900.00	66592.	8.	0.004	0.	67.132	-22.786	-0.028
10000.00	66580.	8.	0.004	0.	60.365	-29.545	-0.022
10100.00	66569.	8.	0.004	0.	53.599	-36.306	-0.016
10200.00	66557.	8.	0.004	0.	46.833	-43.069	-0.010
10300.00	66546.	8.	0.004	0.	40.067	-49.836	-0.005
10400.00	66534.	8.	0.004	0.	33.302	-56.605	-0.000
10500.00	66523.	8.	0.004	0.	26.537	-63.377	0.004
10600.00	66512.	8.	0.004	0.	19.772	-70.151	0.008
10700.00	66500.	8.	0.004	0.	13.007	-76.928	0.011
10800.00	66489.	8.	0.004	0.	6.242	-83.706	0.014
10900.00	66477.	8.	0.004	0.	0.537	-90.485	0.016
10943.00	66472.	8.	0.004	0.	3.435	-93.400	0.016
11) 10943.00	66472.	8.	0.004	0.	3.435	-93.400	0.016
11000.00	66466.	8.	0.004	0.	7.290	-97.264	0.017
11100.00	66454.	8.	0.004	0.	14.056	-104.043	0.017
11200.00	66443.	8.	0.004	0.	20.822	-110.821	0.017
11300.00	66431.	8.	0.004	0.	27.588	-117.597	0.017

11) Guaymas Acquisition, Start Time Base 5.

TABLE 2C - 3 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE FIRST BURN, FIRST ORBITAL COAST AND S-IVB STAGE SECOND BURN DATA

	FLIGHT TIME (SEC)	MASS (LB)	THRUST (TOTAL) (LB)	LONGITUDINAL ACCELERATION (FT/S2)	DYNAMIC PRESSURE (LB/FT2)	CENTRAL RANGE ANGLE (DEG)	PITCH ATT. COMMAND (DEG)	PITCH ANGLE OF ATTACK (DEG)
12)	11333.00	66428.	8.	0.004	0.	29.822	-119.833	0.016
13)	11334.20	66427.	71.	0.034	0.	29.903	-119.914	0.016
14)	11363.00	66419.	33.	0.016	0.	31.852	-121.861	0.020
16)	11393.00	66410.	16.	0.008	0.	33.882	-121.861	2.050
	11395.00	66402.	695.	0.337	0.	34.017	-121.861	2.185
16)	11396.00	66397.	694.	0.336	0.	34.085	-121.861	2.253
	11400.00	66382.	680.	0.330	0.	34.356	-121.861	2.523
17)	11401.00	66377.	680.	0.330	0.	34.423	-121.861	2.591
	11403.50	66056.	171604.	83.583	0.	34.593	-121.861	0.961
18)	11403.50	66056.	171604.	83.583	0.	34.593	-121.861	0.961
	11405.00	65399.	170817.	84.000	0.	34.695	-121.861	-2.072
19)	11406.00	64961.	202794.	100.408	0.	34.763	-121.861	-2.497
	11410.00	63148.	203351.	103.582	0.	35.039	-121.861	-1.621
	11415.00	60759.	203344.	107.649	0.	35.390	-121.861	-1.357
	11420.00	58368.	203411.	112.094	0.	35.748	-121.861	-1.080
	11425.00	55974.	203616.	117.005	0.	36.114	-121.861	-0.821
	11430.00	53576.	203952.	122.445	0.	36.487	-121.861	-0.575
	11435.00	51172.	204304.	128.417	0.	36.868	-121.861	-0.341
	11440.00	48761.	204784.	135.082	0.	37.258	-121.861	-0.123
	11445.00	46343.	205384.	142.543	0.	37.657	-121.861	0.083
	11450.00	43927.	205855.	150.744	0.	38.065	-121.861	0.282
	11455.00	41500.	206121.	159.746	0.	38.483	-121.861	0.471
	11460.00	39081.	206090.	169.607	0.	38.912	-121.861	0.648
	11465.00	36666.	205691.	180.425	0.	39.351	-121.861	0.842
20)	11467.96	35236.	205428.	187.509	0.	39.617	-121.861	1.003
	11470.00	35056.	391.	0.359	0.	39.802	-121.861	1.112
	11475.00	35050.	365.	0.335	0.	40.255	-121.861	1.379
21)	11477.96	35046.	350.	0.321	0.	40.524	-121.861	1.535

12) Initiate Helium Ullage Control;
13) Terminate C.V.S. LH2 Venting;
14) Inertial Attitude Command Freeze;
15) J2 Start Command, Second Burn, Begin Fuel Lead;
16) Terminate Helium Ullage Control;
17) J-2 Ignition, Second Burn;
18) 90% Thrust Level, Second Burn;
19) Command P.U. Activation, Second Burn;
20) Depletion Cutoff;
21) End LOX Vent.

TABLE 2C - 4

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

S-IVB STAGE FIRST BURN, FIRST ORBIT COAST AND S-IVB STAGE SECOND BURN DATA

	FLIGHT TIME (SEC)	ALTITUDE (FT)	RANGE (NM)	VELOCITY VECTOR AZIMUTH SPACE FIXED (DEG)	EARTH FIXED (DEG)	LONGITUDE (POS. EAST) (DEG)	GEOCENTRIC DECLINATION (DEG)	GEODETIC LATITUDE (DEG)
1)	143.22	221672.	39.948	75.401	72.322	-79.845	28.576	28.736
2)	144.54	226623.	41.314	75.415	72.338	-79.820	28.583	28.743
3)	146.89	235310.	43.743	75.439	72.367	-79.777	28.595	28.755
	147.94	239147.	44.829	75.442	72.379	-79.757	28.600	28.760
4)	147.94	239147.	44.829	75.442	72.379	-79.757	28.600	28.760
5)	150.54	248567.	47.534	75.443	72.403	-79.708	28.614	28.774
6)	155.14	264966.	52.371	75.441	72.445	-79.621	28.638	28.798
7)	159.25	279361.	56.757	75.437	72.483	-79.541	28.660	28.820
	160.00	281961.	57.564	75.436	72.490	-79.527	28.664	28.824
	180.00	347903.	79.880	75.705	73.014	-79.122	28.775	28.935
	200.00	406466.	103.875	76.033	73.590	-78.685	28.889	29.049
	220.00	457778.	129.655	76.424	74.213	-78.214	29.008	29.168
	240.00	502172.	157.323	76.829	74.831	-77.706	29.131	29.291
	260.00	539907.	187.001	77.237	75.434	-77.159	29.258	29.418
	280.00	571253.	218.827	77.651	76.025	-76.569	29.389	29.549
	300.00	596484.	252.949	78.050	76.584	-75.935	29.523	29.684
	320.00	615892.	289.539	78.484	77.168	-75.253	29.662	29.823
	340.00	629970.	328.780	78.940	77.762	-74.518	29.803	29.965
	360.00	639180.	370.880	79.412	78.363	-73.727	29.948	30.110
	380.00	644039.	416.082	79.905	78.975	-72.874	30.096	30.258
	400.00	645165.	464.655	80.423	79.603	-71.955	30.247	30.409
	420.00	643296.	516.910	80.969	80.251	-70.962	30.399	30.562
	440.00	639313.	573.214	81.549	80.927	-69.888	30.552	30.716
	460.00	634271.	634.010	82.167	81.634	-68.725	30.706	30.870
	480.00	629490.	699.826	82.829	82.379	-67.462	30.858	31.023
	500.00	626561.	771.320	83.532	83.160	-66.084	31.008	31.173
8)	508.12	626221.	802.161	83.815	83.472	-65.489	31.068	31.233
9)	518.12	626307.	840.867	84.223	83.903	-64.741	31.138	31.304
	530.00	626404.	886.848	84.711	84.418	-63.850	31.216	31.382
10)	530.00	626404.	886.848	84.711	84.418	-63.850	31.216	31.382
	600.00	626787.	1157.842	87.617	87.485	-58.576	31.535	31.702
	700.00	626848.	1544.990	91.810	91.910	-51.008	31.569	31.736
	800.00	626366.	1932.163	95.959	96.289	-43.476	31.108	31.273
	900.00	625390.	2319.374	99.964	100.520	-36.061	30.163	30.326
	1000.00	623993.	2706.630	103.741	104.513	-28.828	28.763	28.921

1) Separation Completed;
2) J-2 Start Command, First Burn;
3) Terminate Ullage Burn;
4) 90% Thrust Level, First Burn;
5) Command P.U. Activation, First Burn;
6) Ullage Case Jettison;
7) IGM Initiation;
8) Guidance Cutoff Signal;
9) Orbit Insertion;
10) Initiate Local Horizontal Attitude Hold.

TABLE 2C - 4 (Cont'd)

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

S-IVB STAGE FIRST BURN, FIRST ORBIT COAST AND S-IVB STAGE SECOND BURN DATA

FLIGHT TIME (SEC)	ALTITUDE (FT)	RANGE (NM)	VELOCITY VECTOR AZIMUTH SPACE FIXED (DEG)	VELOCITY VECTOR AZIMUTH EARTH FIXED (DEG)	LONGITUDE (POS. EAST) (DEG)	GEOCENTRIC DECLINATION (DEG)	GEODETIC LATITUDE (DEG)
1100.00	622266.	3093.937	107.219	108.199	-21.827	26.944	27.096
1200.00	620313.	3481.295	110.352	111.524	-15.086	24.750	24.892
1300.00	618252.	3868.699	113.110	114.458	-8.610	22.226	22.358
1400.00	616206.	4256.138	115.479	116.984	-2.391	19.423	19.540
1500.00	614300.	4643.594	117.456	119.097	3.594	16.386	16.487
1600.00	612651.	5031.046	119.042	120.797	9.377	13.161	13.244
1700.00	611368.	5418.467	120.249	122.091	14.995	9.790	9.853
1800.00	610540.	5805.827	121.081	122.984	20.490	6.315	6.356
1900.00	610235.	6193.094	121.546	123.484	25.906	2.774	2.792
2000.00	610498.	6580.237	121.646	123.592	31.286	-0.795	-0.801
2100.00	611342.	6967.225	121.384	123.310	36.677	-4.357	-4.385
2200.00	612757.	7354.029	120.757	122.636	42.122	-7.873	-7.924
2300.00	614703.	7740.618	119.759	121.565	47.656	-11.306	-11.378
2400.00	617117.	8126.961	118.385	120.091	53.351	-14.616	-14.708
2500.00	619914.	8513.014	116.625	118.209	59.219	-17.762	-17.871
2600.00	622996.	8898.700	114.475	115.913	65.303	-20.701	-20.825
2700.00	626252.	9283.865	111.933	113.205	71.632	-23.385	-23.521
2800.00	629567.	9668.128	109.007	110.095	78.223	-25.767	-25.914
2900.00	632830.	10050.295	105.717	106.607	85.079	-27.800	-27.955
3000.00	635935.	10424.336	102.101	102.779	92.183	-29.438	-29.598
3100.00	638794.	-10674.307	98.216	98.673	99.499	-30.639	-30.803
3200.00	641331.	-10378.731	94.139	94.368	106.969	-31.372	-31.538
3300.00	643497.	-10002.551	89.961	89.959	114.521	-31.616	-31.783
3400.00	645264.	-9620.064	85.785	85.552	122.070	-31.363	-31.529
3500.00	646628.	-9236.004	81.713	81.252	129.535	-30.622	-30.786
3600.00	647612.	-8851.391	77.835	77.153	136.841	-29.414	-29.573
3700.00	648261.	-8466.558	74.228	73.334	143.933	-27.771	-27.925
3800.00	648635.	-8081.632	70.949	69.855	150.775	-25.735	-25.882
3900.00	648815.	-7696.662	68.023	66.755	157.350	-23.353	-23.489
4000.00	648874.	-7311.666	65.500	64.057	163.663	-20.670	-20.794
4100.00	648914.	-6926.646	63.359	61.770	169.730	-17.737	-17.845
4200.00	649024.	-6541.601	61.606	59.894	175.580	-14.597	-14.688
4300.00	649282.	-6156.530	60.237	58.426	-178.751	-11.295	-11.367
4400.00	649763.	-5771.437	59.243	57.358	-173.225	-7.872	-7.922
4500.00	650519.	-5386.329	58.617	56.685	-167.798	-4.366	-4.395

TABLE 2C - 4 (Cont'd)

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

S-IVB STAGE FIRST BURN, FIRST ORBIT COAST AND S-IVB STAGE SECOND BURN DATA

FLIGHT TIME (SEC)	ALTITUDE (FT)	RANGE (NM)	VELOCITY VECTOR AZIMUTH SPACE FIXED (DEG)	EARTH FIXED (DEG)	LONGITUDE (POS. EAST) (DEG)	GEOCENTRIC DECLINATION (DEG)	GEODETIC LATITUDE (DEG)
4600.00	651584.	-5001.221	58.354	56.402	-162.426	-0.817	-0.822
4700.00	652962.	-4616.133	58.452	56.507	-157.065	2.741	2.759
4800.00	654643.	-4231.089	58.911	57.000	-151.670	6.271	6.311
4900.00	656589.	-3846.123	59.734	57.885	-146.198	9.734	9.797
5000.00	658737.	-3461.274	60.929	59.167	-140.604	13.095	13.178
5100.00	661012.	-3076.593	62.503	60.853	-134.847	16.312	16.413
5200.00	663325.	-2692.148	64.462	62.947	-128.891	19.343	19.460
5300.00	665578.	-2308.042	66.811	65.453	-122.703	22.144	22.275
5400.00	667664.	-1924.447	69.547	68.364	-116.260	24.668	24.810
5500.00	669488.	-1541.702	72.656	71.665	-109.553	26.868	27.019
5600.00	670961.	-1160.582	76.110	75.325	-102.588	28.696	28.854
5700.00	672006.	-783.377	79.861	79.294	-95.390	30.110	30.272
5800.00	672566.	-420.632	83.845	83.503	-88.008	31.073	31.238
5900.00	672610.	191.433	87.975	87.863	-80.505	31.558	31.724
6000.00	672127.	439.116	92.156	92.275	-72.962	31.550	31.716
6100.00	671132.	803.440	96.284	96.633	-65.461	31.050	31.235
6200.00	669671.	1181.030	100.262	100.836	-58.081	30.072	30.234
6300.00	667814.	1562.347	104.007	104.797	-50.888	28.644	28.801
6400.00	665645.	1945.246	107.451	108.448	-43.928	26.802	26.952
6500.00	663273.	2328.987	110.550	111.738	-37.225	24.589	24.731
6600.00	660816.	2713.244	113.275	114.638	-30.787	22.054	22.184
6700.00	658401.	3097.845	115.612	117.131	-24.603	19.242	19.359
6800.00	656154.	3482.684	117.550	119.212	-18.650	16.202	16.302
6900.00	654194.	3867.688	119.120	120.885	-12.895	12.976	13.058
7000.00	652621.	4252.796	120.303	122.153	-7.302	9.609	9.671
7100.00	651534.	4637.959	121.113	123.024	-1.829	6.139	6.179
7200.00	650984.	5023.132	121.558	123.503	3.568	2.606	2.623
7300.00	651023.	5408.275	121.642	123.593	8.931	-0.954	-0.960
7400.00	651666.	5793.350	121.365	123.295	14.307	-4.504	-4.534
7500.00	652900.	6178.326	120.725	122.607	19.739	-8.008	-8.060
7600.00	654684.	6563.173	119.716	121.524	25.271	-11.428	-11.500
7700.00	656943.	6947.869	118.332	120.040	30.946	-14.724	-14.816
7800.00	659601.	7332.389	116.565	118.149	36.802	-17.856	-17.965
7900.00	662558.	7716.706	114.409	115.847	42.876	-20.779	-20.903
8000.00	665700.	8100.786	111.864	113.135	49.193	-23.449	-23.585

TABLE 2C - 4 (Cont'd)

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

S-IVB STAGE FIRST BURN, FIRST ORBIT COAST AND S-IVB STAGE SECOND BURN DATA

FLIGHT TIME (SEC)	ALTITUDE (FT)	RANGE (NM)	VELOCITY VECTOR AZIMUTH SPACE FIXED (DEG)	VELOCITY VECTOR AZIMUTH EARTH FIXED (DEG)	LONGITUDE (POS. EAST) (DEG)	GEOCENTRIC DECLINATION (DEG)	GEODETIC LATITUDE (DEG)
8100.00	668909.	8484.565	108.936	110.024	55.772	-25.817	-25.964
8200.00	672077.	8867.920	105.648	106.537	62.613	-27.837	-27.991
8300.00	675098.	9250.591	102.037	102.713	69.701	-29.462	-29.622
8400.00	677877.	9631.946	98.159	98.614	76.999	-30.653	-30.817
8500.00	680343.	10010.099	94.091	94.317	84.450	-31.378	-31.544
8600.00	682441.	10376.503	89.924	89.920	91.980	-31.616	-31.783
8700.00	684138.	-10630.813	85.760	85.524	99.508	-31.360	-31.526
8800.00	685434.	-10395.280	81.699	81.235	106.951	-30.619	-30.782
8900.00	686327.	-10030.645	77.832	77.147	114.236	-29.412	-29.572
9000.00	686896.	-9653.231	74.235	73.338	121.308	-27.775	-27.928
9100.00	687170.	-9272.477	70.963	69.867	128.130	-25.746	-25.892
9200.00	687235.	-8890.386	68.053	66.773	134.688	-23.371	-23.507
9300.00	687175.	-8507.618	65.524	64.078	140.985	-20.699	-20.822
9400.00	687084.	-8124.443	63.383	61.792	147.038	-17.775	-17.884
9500.00	687048.	-7740.986	61.630	59.915	152.874	-14.646	-14.738
9600.00	687140.	-7357.311	60.258	58.444	158.529	-11.355	-11.428
9700.00	687427.	-6973.456	59.260	57.371	164.042	-7.943	-7.994
9800.00	687993.	-6589.449	58.628	56.691	169.456	-4.449	-4.478
9900.00	688837.	-6205.313	58.357	56.399	174.813	-0.909	-0.915
10000.00	689978.	-5821.070	58.444	56.493	-179.842	2.640	2.657
10100.00	691410.	-5436.743	58.891	56.973	-174.464	6.161	6.201
10200.00	693098.	-5052.356	59.701	57.844	-169.009	9.619	9.681
10300.00	694980.	-4667.931	60.879	59.109	-163.435	12.976	13.057
10400.00	696986.	-4283.492	62.435	60.775	-157.701	16.191	16.291
10500.00	699025.	-3899.060	64.374	62.849	-151.769	19.223	19.339
10600.00	701011.	-3514.656	66.700	65.331	-145.608	22.027	22.157
10700.00	702838.	-3130.297	69.412	68.218	-139.194	24.559	24.700
10800.00	704411.	-2746.000	72.496	71.494	-132.517	26.769	26.919
10900.00	705642.	-2361.789	75.926	75.128	-125.582	28.613	28.770
10943.00	706045.	-2196.610	77.496	76.790	-122.526	29.282	29.441
11) 10943.00	706045.	-2196.610	77.496	76.790	-122.526	29.282	29.441
11000.00	706459.	-1977.638	79.654	79.074	-118.414	30.046	30.208
11100.00	706804.	-1593.802	83.618	83.262	-111.058	31.032	31.197
11200.00	706637.	-1210.266	87.733	87.607	-103.579	31.543	31.709
11300.00	705949.	-827.593	91.903	92.009	-96.054	31.565	31.731

11) Guaymas Acquisition, Start Time Base 5.

TABLE 2C - 4 (Cont'd)

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

S-IVB STAGE FIRST BURN, FIRST ORBIT COAST AND S-IVB STAGE SECOND BURN DATA

	FLIGHT TIME (SEC)	ALTITUDE (FT)	RANGE (NM)	VELOCITY VECTOR AZIMUTH SPACE FIXED (DEG)	VELOCITY VECTOR AZIMUTH EARTH FIXED (DEG)	LONGITUDE (POS. EAST) (DEG)	GEOCENTRIC DECLINATION (DEG)	GEODETIC LATITUDE (DEG)
12)	11333.00	705611.	-701.759	93.274	93.456	-93.575	31.464	31.630
13)	11334.20	705596.	-697.191	93.324	93.509	-93.485	31.459	31.625
14)	11363.00	705258.	-587.753	94.513	94.764	-91.328	31.326	31.491
	11390.00	704907.	-485.695	95.620	95.933	-89.312	31.164	31.330
15)	11393.00	704867.	-474.403	95.743	96.062	-89.088	31.144	31.309
	11395.00	704837.	-466.882	95.824	96.148	-88.939	31.131	31.296
16)	11396.00	704823.	-463.124	95.865	96.191	-88.865	31.124	31.289
	11400.00	704767.	-448.103	96.028	96.363	-88.567	31.096	31.261
17)	11401.00	704755.	-444.351	96.068	96.406	-88.492	31.089	31.253
	11403.50	704720.	-434.974	96.168	96.511	-88.306	31.071	31.235
18)	11403.50	704720.	-434.974	96.168	96.511	-88.306	31.071	31.235
	11405.00	704702.	-429.325	96.208	96.551	-88.194	31.060	31.224
19)	11406.00	704682.	-425.546	96.231	96.574	-88.119	31.052	31.217
	11410.00	704561.	-410.303	96.317	96.659	-87.816	31.022	31.187
	11415.00	704340.	-390.949	96.431	96.772	-87.430	30.983	31.148
	11420.00	704075.	-371.263	96.547	96.887	-87.036	30.943	31.107
	11425.00	703808.	-351.247	96.665	97.004	-86.633	30.901	31.065
	11430.00	703590.	-330.906	96.785	97.123	-86.222	30.857	31.021
	11435.00	703460.	-310.254	96.907	97.244	-85.802	30.811	30.975
	11440.00	703479.	-289.313	97.031	97.366	-85.372	30.764	30.928
	11445.00	703698.	-268.120	97.157	97.490	-84.933	30.715	30.879
	11450.00	704184.	-246.732	97.285	97.615	-84.483	30.663	30.827
	11455.00	704995.	-225.248	97.415	97.743	-84.022	30.610	30.773
	11460.00	706217.	-203.816	97.546	97.871	-83.549	30.554	30.717
	11465.00	707932.	-182.685	97.681	98.003	-83.064	30.496	30.659
20)	11467.96	709214.	-170.465	97.762	98.083	-82.770	30.460	30.623
	11470.00	710224.	-162.291	97.863	98.188	-82.567	30.435	30.598
	11475.00	713124.	-143.621	98.127	98.463	-82.067	30.372	30.535
21)	11477.96	715122.	-133.747	98.283	98.624	-81.771	30.334	30.496

12) Initiate Helium Ullage Control;
13) Terminate C.V.S. LH_2 Venting;
14) Inertial Attitude Command Freeze;
15) J-2 Start Command, Second Burn, Begin Fuel Lead;
16) Terminate Helium Ullage Control;
17) J-2 Ignition, Second Burn;
18) 90% Thrust Level, Second Burn;
19) Command P.U. Activation, Second Burn;
20) Depletion Cutoff;
21) End LOX Vent.

TABLE 2C-5

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

S-IVB STAGE FIRST BURN, FIRST ORBITAL COAST AND S-IVB STAGE SECOND BURN DATA

	FLIGHT TIME (SEC)	VEHICLE ATTITUDE ANGLE PITCH (DEG)	YAW (DEG)	ROLL (DEG)	VEHICLE ATTITUDE RATE PITCH (DEG/S)	YAW (DEG/S)	ROLL (DEG/S)	VEHICLE ATTITUDE ERROR PITCH (DEG)	YAW (DEG)	ROLL (DEG)
1)	143.22	-60.896	-0.069	-0.002	-0.011	0.001	-0.002	-0.078	-0.069	-0.002
2)	144.54	-61.023	-0.089	-0.007	-0.172	-0.032	-0.005	-0.205	-0.089	-0.007
3)	146.89	-61.673	-0.264	-0.023	-0.300	-0.157	-0.016	-0.855	-0.264	-0.023
	147.94	-61.829	-0.466	-0.056	0.012	-0.189	-0.044	-1.011	-0.466	-0.056
4)	147.94	-61.829	-0.466	-0.056	0.012	-0.189	-0.044	-1.011	-0.466	-0.056
5)	150.54	-61.601	-0.699	-0.162	0.062	-0.014	-0.030	-0.784	-0.699	-0.162
6)	155.14	-61.537	-0.687	-0.226	-0.001	0.003	-0.002	-0.719	-0.687	-0.226
7)	159.25	-61.549	-0.687	-0.203	-0.004	-0.001	0.013	-0.731	-0.687	-0.203
	160.00	-61.615	-0.625	-0.183	-0.228	0.221	0.049	-0.047	-1.375	-0.183
	180.00	-74.264	3.940	-0.571	-0.066	0.002	-0.003	-0.695	-0.723	-0.571
	200.00	-75.347	4.319	-0.641	0.019	0.097	0.002	-0.861	-0.895	-0.641
	220.00	-76.257	4.920	-0.724	-0.063	0.001	-0.007	-0.793	-0.800	-0.724
	240.00	-77.655	4.846	-0.868	-0.071	-0.005	-0.007	-0.831	-0.835	-0.868
	260.00	-79.174	4.732	-0.673	-0.072	-0.005	0.114	-0.883	-0.883	-0.673
	280.00	-80.602	4.607	0.312	-0.073	-0.007	-0.009	-0.936	-0.930	0.312
	300.00	-82.393	4.285	0.130	-0.025	0.034	-0.005	-2.185	-2.023	0.130
	320.00	-83.504	4.466	-0.015	-0.081	-0.003	-0.008	-2.242	-2.103	-0.015
	340.00	-84.962	4.364	-0.183	-0.073	-0.007	-0.009	-2.408	-2.231	-0.183
	360.00	-86.518	4.235	-0.347	-0.076	-0.006	-0.008	-2.580	-2.387	-0.347
	380.00	-87.973	4.125	-0.508	-0.074	-0.005	-0.008	-2.763	-2.545	-0.508
	400.00	-89.432	4.002	-0.666	-0.067	-0.007	-0.008	-2.980	-2.721	-0.666
	420.00	-90.928	3.889	-0.815	-0.074	-0.004	-0.007	-3.199	-2.921	-0.815
	440.00	-92.470	3.784	-0.955	-0.078	-0.004	-0.007	-3.444	-3.135	-0.955
	460.00	-93.936	3.670	0.331	-0.073	-0.007	-0.029	-3.732	-3.371	0.331
	480.00	-95.470	3.545	-0.238	-0.080	-0.005	-0.028	-4.029	-3.638	-0.238
	500.00	-98.371	2.877	-0.734	0.182	-0.075	-0.036	-4.758	-3.831	-0.734
8)	508.12	-97.136	2.813	-0.803	-0.013	-0.013	0.011	-4.578	-4.037	-0.803
9)	518.12	-97.320	2.660	-0.692	-0.017	-0.014	0.011	-4.762	-4.191	-0.692
	530.00	-97.497	2.507	-0.556	-0.013	-0.012	0.012	-4.939	-4.344	-0.556
10)	530.00	-97.497	2.507	-0.556	-0.013	-0.012	0.012	-4.939	-4.344	-0.556
	600.00	-111.418	2.934	-1.409	0.000	0.000	0.000	0.000	-0.000	0.000
	700.00	-118.228	2.756	-1.747	0.000	0.000	0.000	0.000	-0.000	0.000
	800.00	-125.036	2.539	-2.062	0.000	0.000	0.000	0.000	-0.000	0.000
	900.00	-131.842	2.286	-2.349	0.000	0.000	0.000	0.000	-0.000	0.000
	1000.00	-138.646	2.000	-2.603	0.000	0.000	0.000	0.000	-0.000	0.000

1) Separation Completed;
2) J-2 Start Command, First Burn;
3) Terminate Ullage Burn;
4) 90% Thrust Level, First Burn;
5) Command P.U. Activation, First Burn;
6) Ullage Case Jettison;
7) I.G.M. Initiation;
8) Guidance Cutoff Signal;
9) Orbit Insertion;
10) Initiate Local Horizontal Attitude Hold.

TABLE 2C - 5 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE FIRST BURN, FIRST ORBITAL COAST AND S-IVB STAGE SECOND BURN DATA

FLIGHT TIME (SEC)	VEHICLE ATTITUDE ANGLE PITCH (DEG)	YAW (DEG)	ROLL (DEG)	VEHICLE ATTITUDE RATE PITCH (DEG/S)	YAW (DEG/S)	ROLL (DEG/S)	VEHICLE ATTITUDE ERROR PITCH (DEG)	YAW (DEG)	ROLL (DEG)
1100.00	-145.447	1.686	-2.822	0.000	0.000	0.000	0.000	-0.000	0.000
1200.00	-152.247	1.347	-3.003	0.000	0.000	0.000	0.000	-0.000	0.000
1300.00	-159.045	0.989	-3.141	0.000	0.000	0.000	0.000	-0.000	0.000
1400.00	-165.842	0.617	-3.237	0.000	0.000	0.000	0.000	-0.000	0.000
1500.00	-172.638	0.234	-3.287	0.000	0.000	0.000	0.000	-0.000	0.000
1600.00	-179.434	-0.152	-3.292	0.000	0.000	0.000	0.000	0.000	0.000
1700.00	173.770	-0.538	-3.251	0.000	0.000	0.000	-0.000	0.000	0.000
1800.00	166.973	-0.916	-3.165	0.000	0.000	0.000	-0.000	0.000	0.000
1900.00	160.174	-1.284	-3.034	0.000	0.000	0.000	-0.000	0.000	0.000
2000.00	153.373	-1.634	-2.861	0.000	0.000	0.000	-0.000	0.000	0.000
2100.00	146.571	-1.962	-2.647	0.000	0.000	0.000	-0.000	0.000	0.000
2200.00	139.766	-2.264	-2.396	0.000	0.000	0.000	-0.000	0.000	0.000
2300.00	132.958	-2.535	-2.111	0.000	0.000	0.000	-0.000	0.000	0.000
2400.00	126.149	-2.771	-1.795	0.000	0.000	0.000	-0.000	0.000	0.000
2500.00	119.338	-2.969	-1.454	0.000	0.000	0.000	-0.000	0.000	0.000
2600.00	112.525	-3.126	-1.091	0.000	0.000	0.000	-0.000	0.000	0.000
2700.00	105.711	-3.240	-0.713	0.000	0.000	0.000	-0.000	0.000	0.000
2800.00	98.897	-3.309	-0.323	0.000	0.000	0.000	-0.000	0.000	0.000
2900.00	92.083	-3.332	0.072	0.000	0.000	0.000	-0.000	0.000	-0.000
3000.00	85.270	-3.308	0.467	0.000	0.000	0.000	-0.000	0.000	-0.000
3100.00	78.459	-3.239	0.857	0.000	0.000	0.000	-0.000	0.000	-0.000
3200.00	71.650	-3.124	1.235	0.000	0.000	0.000	-0.000	0.000	-0.000
3300.00	64.844	-2.965	1.597	0.000	0.000	0.000	-0.000	0.000	-0.000
3400.00	58.041	-2.764	1.937	0.000	0.000	0.000	-0.000	0.000	-0.000
3500.00	51.242	-2.525	2.251	0.000	0.000	0.000	-0.000	0.000	-0.000
3600.00	44.447	-2.249	2.535	0.000	0.000	0.000	-0.000	0.000	-0.000
3700.00	37.655	-1.942	2.783	0.000	0.000	0.000	-0.000	0.000	-0.000
3800.00	30.868	-1.608	2.994	0.000	0.000	0.000	-0.000	0.000	-0.000
3900.00	24.082	-1.250	3.163	0.000	0.000	0.000	-0.000	0.000	-0.000
4000.00	17.302	-0.874	3.289	0.000	0.000	0.000	-0.000	0.000	-0.000
4100.00	10.523	-0.485	3.369	0.000	0.000	0.000	-0.000	0.000	-0.000
4200.00	3.746	-0.088	3.403	0.000	0.000	0.000	-0.000	0.000	-0.000
4300.00	-3.031	0.310	3.390	0.000	0.000	0.000	0.000	-0.000	-0.000
4400.00	-9.806	0.706	3.330	0.000	0.000	0.000	0.000	-0.000	-0.000
4500.00	-16.582	1.092	3.224	0.000	0.000	0.000	0.000	-0.000	-0.000

TABLE 2C-5 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE FIRST BURN, FIRST ORBITAL COAST AND S-IVB STAGE SECOND BURN DATA

FLIGHT TIME (SEC)	VEHICLE ATTITUDE ANGLE PITCH (DEG)	YAW (DEG)	ROLL (DEG)	VEHICLE ATTITUDE RATE PITCH (DEG/S)	YAW (DEG/S)	ROLL (DEG/S)	VEHICLE ATTITUDE ERROR PITCH (DEG)	YAW (DEG)	ROLL (DEG)
4600.00	-23.359	1.464	3.072	0.000	0.000	0.000	0.000	-0.000	-0.000
4700.00	-30.137	1.817	2.878	0.000	0.000	0.000	0.000	-0.000	-0.000
4800.00	-36.917	2.146	2.643	0.000	0.000	0.000	0.000	-0.000	-0.000
4900.00	-43.699	2.445	2.371	0.000	0.000	0.000	0.000	-0.000	-0.000
5000.00	-50.484	2.712	2.066	0.000	0.000	0.000	0.000	-0.000	-0.000
5100.00	-57.271	2.941	1.731	0.000	0.000	0.000	0.000	-0.000	-0.000
5200.00	-64.059	3.130	1.371	0.000	0.000	0.000	0.000	-0.000	-0.000
5300.00	-70.850	3.277	0.991	0.000	0.000	0.000	0.000	-0.000	-0.000
5400.00	-77.643	3.378	0.596	0.000	0.000	0.000	0.000	-0.000	-0.000
5500.00	-84.436	3.432	0.192	0.000	0.000	0.000	0.000	-0.000	-0.000
5600.00	-91.230	3.439	-0.215	0.000	0.000	0.000	0.000	-0.000	0.000
5700.00	-98.024	3.398	-0.621	0.000	0.000	0.000	0.000	-0.000	0.000
5800.00	-104.817	3.310	-1.019	0.000	0.000	0.000	0.000	-0.000	0.000
5900.00	-111.609	3.176	-1.403	0.000	0.000	0.000	0.000	-0.000	0.000
6000.00	-118.399	2.997	-1.769	0.000	0.000	0.000	0.000	-0.000	0.000
6100.00	-125.187	2.776	-2.112	0.000	0.000	0.000	0.000	-0.000	0.000
6200.00	-131.973	2.516	-2.425	0.000	0.000	0.000	0.000	-0.000	0.000
6300.00	-138.756	2.221	-2.706	0.000	0.000	0.000	0.000	-0.000	0.000
6400.00	-145.538	1.894	-2.950	0.000	0.000	0.000	0.000	-0.000	0.000
6500.00	-152.317	1.540	-3.153	0.000	0.000	0.000	0.000	-0.000	0.000
6600.00	-159.094	1.164	-3.313	0.000	0.000	0.000	0.000	-0.000	0.000
6700.00	-165.870	0.771	-3.428	0.000	0.000	0.000	0.000	-0.000	0.000
6800.00	-172.645	0.366	-3.495	0.000	0.000	0.000	0.000	-0.000	0.000
6900.00	-179.420	-0.045	-3.514	0.000	0.000	0.000	0.000	0.000	0.000
7000.00	173.804	-0.456	-3.484	0.000	0.000	0.000	-0.000	0.000	0.000
7100.00	167.028	-0.862	-3.406	0.000	0.000	0.000	-0.000	0.000	0.000
7200.00	160.250	-1.257	-3.281	0.000	0.000	0.000	-0.000	0.000	0.000
7300.00	153.470	-1.636	-3.109	0.000	0.000	0.000	-0.000	0.000	0.000
7400.00	146.687	-1.993	-2.894	0.000	0.000	0.000	-0.000	0.000	0.000
7500.00	139.902	-2.323	-2.639	0.000	0.000	0.000	-0.000	0.000	0.000
7600.00	133.115	-2.621	-2.346	0.000	0.000	0.000	-0.000	0.000	0.000
7700.00	126.324	-2.884	-2.019	0.000	0.000	0.000	-0.000	0.000	0.000
7800.00	119.532	-3.107	-1.664	0.000	0.000	0.000	-0.000	0.000	0.000
7900.00	112.737	-3.288	-1.284	0.000	0.000	0.000	-0.000	0.000	0.000
8000.00	105.941	-3.423	-0.886	0.000	0.000	0.000	-0.000	0.000	0.000

TABLE 2C- 5 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE FIRST BURN, FIRST ORBITAL COAST AND S-IVB STAGE SECOND BURN DATA

FLIGHT TIME (SEC)	VEHICLE ATTITUDE ANGLE PITCH (DEG)	YAW (DEG)	ROLL (DEG)	VEHICLE ATTITUDE RATE PITCH (DEG/S)	YAW (DEG/S)	ROLL (DEG/S)	VEHICLE ATTITUDE ERROR PITCH (DEG)	YAW (DEG)	ROLL (DEG)
8100.00	99.144	-3.511	-0.475	0.000	0.000	0.000	-0.000	0.000	0.000
8200.00	92.348	-3.551	-0.056	0.000	0.000	0.000	-0.000	0.000	0.000
8300.00	85.552	-3.541	0.365	0.000	0.000	0.000	-0.000	0.000	-0.000
8400.00	78.757	-3.482	0.782	0.000	0.000	0.000	-0.000	0.000	-0.000
8500.00	71.965	-3.374	1.188	0.000	0.000	0.000	-0.000	0.000	-0.000
8600.00	65.175	-3.219	1.579	0.000	0.000	0.000	-0.000	0.000	-0.000
8700.00	58.389	-3.020	1.949	0.000	0.000	0.000	-0.000	0.000	-0.000
8800.00	51.607	-2.778	2.292	0.000	0.000	0.000	-0.000	0.000	-0.000
8900.00	44.829	-2.497	2.605	0.000	0.000	0.000	-0.000	0.000	-0.000
9000.00	38.056	-2.180	2.881	0.000	0.000	0.000	-0.000	0.000	-0.000
9100.00	31.286	-1.833	3.119	0.000	0.000	0.000	-0.000	0.000	-0.000
9200.00	24.520	-1.460	3.313	0.000	0.000	0.000	-0.000	0.000	-0.000
9300.00	17.757	-1.066	3.463	0.000	0.000	0.000	-0.000	0.000	-0.000
9400.00	10.997	-0.657	3.564	0.000	0.000	0.000	-0.000	0.000	-0.000
9500.00	4.240	-0.237	3.617	0.000	0.000	0.000	-0.000	0.000	-0.000
9600.00	-2.517	0.187	3.620	0.000	0.000	0.000	0.000	-0.000	-0.000
9700.00	-9.273	0.609	3.573	0.000	0.000	0.000	0.000	-0.000	-0.000
9800.00	-16.029	1.024	3.477	0.000	0.000	0.000	0.000	-0.000	-0.000
9900.00	-22.786	1.425	3.332	0.000	0.000	0.000	0.000	-0.000	-0.000
10000.00	-29.545	1.808	3.141	0.000	0.000	0.000	0.000	-0.000	-0.000
10100.00	-36.306	2.167	2.907	0.000	0.000	0.000	0.000	-0.000	-0.000
10200.00	-43.069	2.497	2.631	0.000	0.000	0.000	0.000	-0.000	-0.000
10300.00	-49.836	2.792	2.318	0.000	0.000	0.000	0.000	-0.000	-0.000
10400.00	-56.605	3.051	1.973	0.000	0.000	0.000	0.000	-0.000	-0.000
10500.00	-63.377	3.267	1.599	0.000	0.000	0.000	0.000	-0.000	-0.000
10600.00	-70.151	3.439	1.203	0.000	0.000	0.000	0.000	-0.000	-0.000
10700.00	-76.928	3.563	0.789	0.000	0.000	0.000	0.000	-0.000	-0.000
10800.00	-83.706	3.639	0.362	0.000	0.000	0.000	0.000	-0.000	-0.000
10900.00	-90.485	3.665	-0.070	0.000	0.000	0.000	0.000	-0.000	0.000
10943.00	-93.400	3.660	-0.256	0.000	0.000	0.000	0.000	-0.000	0.000
11) 10943.00	-93.400	3.660	-0.256	0.000	0.000	0.000	0.000	0.000	-0.000
11000.00	-97.264	3.639	-0.502	0.000	0.000	0.000	0.000	-0.000	0.000
11100.00	-104.043	3.564	-0.929	0.000	0.000	0.000	0.000	-0.000	0.000
11200.00	-110.821	3.439	-1.343	0.000	0.000	0.000	0.000	-0.000	0.000
11300.00	-117.597	3.266	-1.740	0.000	0.000	0.000	0.000	-0.000	0.000

11) Guaymas Acquisition, Start Time Base 5.

TABLE 2C-5 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IVB STAGE FIRST BURN, FIRST ORBITAL COAST AND S-IVB STAGE SECOND BURN DATA

	FLIGHT TIME (SEC)	VEHICLE ATTITUDE ANGLE PITCH (DEG)	YAW (DEG)	ROLL (DEG)	VEHICLE ATTITUDE RATE PITCH (DEG/S)	YAW (DEG/S)	ROLL (DEG/S)	VEHICLE ATTITUDE ERROR PITCH (DEG)	YAW (DEG)	ROLL (DEG)
12)	11333.00	-119.833	3.198	-1.866	0.000	0.000	0.000	0.000	-0.000	0.000
13)	11334.20	-119.914	3.196	-1.870	0.000	0.000	0.000	0.000	-0.000	0.000
14)	11363.00	-121.861	3.133	-1.978	0.000	0.000	0.000	0.000	-0.000	0.000
15)	11393.00	-121.861	3.133	-1.978	0.000	0.000	0.000	0.000	-0.000	0.000
	11395.00	-121.861	3.133	-1.978	0.000	0.000	0.000	0.000	-0.000	0.000
16)	11396.00	-121.861	3.133	-1.978	0.000	0.000	0.000	0.000	-0.000	0.000
	11400.00	-121.861	3.133	-1.978	0.000	0.000	0.000	0.000	-0.000	0.000
17)	11401.00	-121.861	3.133	-1.978	-0.001	-0.001	-0.000	-0.000	-0.000	-0.000
	11403.50	-123.599	1.495	-2.048	-3.057	-2.885	-0.080	-1.739	-1.638	-0.070
18)	11403.50	-123.599	1.495	-2.048	-3.057	-2.885	-0.080	-1.739	-1.638	-0.070
	11405.00	-126.646	-1.372	-2.052	-0.970	-0.862	0.029	-4.785	-4.505	-0.074
19)	11406.00	-127.139	-1.747	-2.028	-0.112	0.002	0.015	-5.279	-4.880	-0.051
	11410.00	-126.599	-1.103	-2.049	0.011	-0.004	-0.010	-4.738	-4.236	-0.071
	11415.00	-126.705	-1.216	-2.085	-0.017	-0.014	-0.006	-4.845	-4.349	-0.107
	11420.00	-126.788	-1.287	-2.118	-0.017	-0.015	-0.007	-4.927	-4.421	-0.141
	11425.00	-126.877	-1.367	-2.152	-0.018	-0.015	-0.007	-5.016	-4.500	-0.174
	11430.00	-126.968	-1.442	-2.184	-0.018	-0.016	-0.007	-5.107	-4.576	-0.206
	11435.00	-127.059	-1.528	-2.218	-0.019	-0.017	-0.007	-5.198	-4.661	-0.240
	11440.00	-127.155	-1.612	-2.250	-0.019	-0.016	-0.006	-5.294	-4.745	-0.272
	11445.00	-127.252	-1.691	-2.281	-0.019	-0.016	-0.006	-5.391	-4.824	-0.303
	11450.00	-127.345	-1.771	-2.313	-0.019	-0.017	-0.007	-5.484	-4.904	-0.335
	11455.00	-127.437	-1.859	-2.346	-0.019	-0.017	-0.006	-5.576	-4.992	-0.369
	11460.00	-127.529	-1.937	-2.378	-0.018	-0.015	-0.006	-5.669	-5.070	-0.400
	11465.00	-127.595	-1.988	-2.410	0.002	0.002	-0.007	-5.735	-5.122	-0.432
20)	11467.96	-127.583	-1.977	-2.432	0.005	0.005	-0.007	-5.723	-5.110	-0.454
	11470.00	-127.573	-1.967	-2.447	0.005	0.004	-0.007	-5.712	-5.100	-0.469
	11475.00	-127.549	-1.946	-2.485	0.005	0.004	-0.007	-5.689	-5.079	-0.507
21)	11477.96	-127.536	-1.934	-2.507	0.004	0.004	-0.007	-5.676	-5.067	-0.529

12) Initiate Helium Ullage Control;
13) Terminate C.V.S. LH2 Venting;
14) Inertial Attitude Command Freeze;
15) J-2 Start Command, Second Burn, Begin Fuel Lead;
16) Terminate Helium Ullage Control;
17) J-2 Ignition, Second Burn;
18) 90% Thrust Level, Second Burn;
19) Command P.U. Activation, Second Burn;
20) Depletion Cutoff;
21) End LOX Vent.

TABLE 3C - 1

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

SECOND ORBITAL COAST DATA

FLIGHT TIME (SEC)	RADIUS (FT)	SPACE FIXED VELOCITY (FT/S)	PATH ANGLE * (DEG)	SPACE FIXED POSITION AND VELOCITY VECTORS X (FT)	Y (FT)	Z (FT)	DX (FT/S)	DY (FT/S)	DZ (FT/S)
1) 11477.96	21622901.	34211.87	1.213	16446228.	884199.	14010340.	-21649.42	878.50	26476.08
11497.96	21642182.	34195.03	2.017	16008701.	901530.	14535913.	-22101.03	854.45	26079.00
2) 11497.96	21642182.	34195.03	2.017	16008701.	901530.	14535913.	-22101.03	854.45	26079.00
11505.70	21652208.	34186.26	2.327	15837021.	908105.	14737103.	-22272.12	845.03	25921.79
3) 11505.70	21652208.	34186.26	2.327	15837021.	908105.	14737103.	-22272.12	845.03	25921.79
11587.96	21846282.	34017.47	5.598	13933928.	973411.	16797565.	-23953.68	741.93	24142.48
4) 11587.96	21846282.	34017.47	5.598	13933928.	973411.	16797565.	-23953.68	741.93	24142.48
11600.00	21887884.	33981.54	6.070	13644222.	982249.	17086541.	-24177.35	726.50	23867.82
11800.00	23035455.	33026.60	13.534	8498983.	1101766.	21381898.	-25988.81	469.98	19029.96
12000.00	24908451.	31605.09	20.013	2956407.	1171951.	24704598.	-28199.66	238.20	14268.98
12200.00	27292305.	30002.13	25.393	-2702933.	1200029.	27131605.	-28241.65	50.18	10125.93
12400.00	30000701.	28406.84	29.773	-8294568.	1194976.	28806497.	-27593.27	-93.88	6749.16
12600.00	32897421.	26912.17	33.328	-13717635.	1164917.	29878250.	-26601.05	-201.35	4075.39
12800.00	35890996.	25550.78	36.230	-18936120.	1115297.	30474899.	-25472.73	-280.85	1975.67
13000.00	38922423.	24325.21	38.620	-23905263.	1053948.	30698252.	-24320.70	-339.70	322.90
13200.00	41954349.	23225.39	40.610	-28656630.	981424.	30626815.	-23201.22	-383.40	-987.57
13400.00	44963382.	22237.19	42.283	-33189652.	901325.	30320627.	-22139.86	-416.00	-2036.20
13600.00	47935066.	21346.24	43.704	-37517084.	815572.	29825724.	-21146.02	-440.36	-2883.36
13800.00	50860653.	20539.42	44.919	-41652642.	725591.	29177680.	-20220.88	-458.56	-3574.05
14000.00	53735077.	19805.30	45.968	-45609824.	632459.	28404268.	-19361.61	-472.09	-4141.89
14200.00	56555649.	19134.12	46.877	-49401367.	536994.	27527404.	-18563.66	-482.04	-4612.23
14400.00	59321228.	18517.62	47.671	-53039023.	439827.	26564576.	-17821.88	-489.23	-5004.35
14600.00	62031676.	17948.86	48.366	-56533510.	341448.	25529877.	-17131.12	-494.25	-5333.09
14800.00	64687499.	17421.97	48.977	-59894534.	242242.	24434786.	-16486.53	-497.56	-5609.97
15000.00	67289625.	16931.99	49.516	-63130883.	142514.	23288734.	-15883.64	-499.52	-5844.04
15200.00	69839231.	16474.72	49.992	-66250486.	42507.	22099538.	-15318.44	-500.39	-6042.47
15400.00	72337641.	16046.55	50.413	-69260512.	-57584.	20873729.	-14787.31	-500.39	-6211.03
15600.00	74786263.	15644.42	50.786	-72167454.	-157601.	19616803.	-14287.07	-499.68	-6354.35
15800.00	77186527.	15265.66	51.115	-74977194.	-257416.	18333415.	-13814.87	-498.39	-6476.22
16000.00	79539866.	14907.97	51.406	-77695085.	-356925.	17027534.	-13368.17	-496.63	-6579.74
16200.00	81847690.	14569.38	51.662	-80325999.	-456042.	15702563.	-12944.75	-494.49	-6667.50
16400.00	84111371.	14248.12	51.887	-82874388.	-554698.	14361437.	-12542.61	-492.03	-6741.63
16600.00	86332234.	13942.66	52.083	-85344328.	-652836.	13006696.	-12159.98	-489.31	-6803.92
16800.00	88511558.	13651.67	52.254	-87739560.	-750408.	11640553.	-11795.26	-486.38	-6855.89
17000.00	90650560.	13373.94	52.401	-90063518.	-847376.	10264940.	-11447.05	-483.28	-6898.82

1) End LOX Vent;
2) Command Local Horizontal Attitude Hold;
3) Local Horizontal Attitude Achieved;
4) End LH_2 Vent.

* Relative to local horizontal.

TABLE 3 C- 1 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
SECOND ORBITAL COAST DATA

FLIGHT TIME (SEC)	RADIUS (FT)	SPACE FIXED VELOCITY (FT/S)	PATH ANGLE* (DEG)	SPACE FIXED POSITION AND VELOCITY VECTORS X (FT)	Y (FT)	Z (FT)	DX (FT/S)	DY (FT/S)	DZ (FT/S)
17200.00	92750419.	13108.42	52.527	-92319379.	-943709.	8881553.	-11114.07	-480.03	-6933.80
17400.00	94812248.	12854.16	52.632	-94510072.	-1039379.	7491885.	-10795.18	-476.66	-6961.77
17600.00	96837111.	12610.32	52.719	-96638309.	-1134368.	6097257.	-10489.36	-473.21	-6983.53
17800.00	98826022.	12376.14	52.788	-98706606.	-1228656.	4698839.	-10195.66	-469.67	-6999.78
18000.00	100779952.	12150.94	52.841	-100717307.	-1322231.	3297672.	-9913.25	-466.07	-7011.12
18200.00	102699820.	11934.11	52.878	-102672590.	-1415082.	1894684.	-9641.36	-462.43	-7018.07
18400.00	104586502.	11725.09	52.901	-104574491.	-1507201.	490705.	-9379.31	-458.75	-7021.10
18600.00	106440836.	11523.36	52.911	-106424911.	-1598580.	-913520.	-9126.45	-455.04	-7020.60
18800.00	108263612.	11328.48	52.908	-108225628.	-1689215.	-2317323.	-8882.20	-451.31	-7016.93
19000.00	110055594.	11140.03	52.892	-109978314.	-1779103.	-3720102.	-8646.05	-447.57	-7010.41
19200.00	111817491.	10957.61	52.865	-111684525.	-1868242.	-5121312.	-8417.49	-443.82	-7001.30
19400.00	113550004.	10780.89	52.827	-113345751.	-1956631.	-6520463.	-8196.09	-440.07	-6989.85
19600.00	115253795.	10609.53	52.777	-114963377.	-2044269.	-7917109.	-7981.44	-436.32	-6976.28
19800.00	116929491.	10443.25	52.718	-116538717.	-2131157.	-9310845.	-7773.15	-432.57	-6960.78
20000.00	118577690.	10281.77	52.649	-118073005.	-2217296.	-10701303.	-7570.88	-428.83	-6943.53
20200.00	120198964.	10124.83	52.570	-119567411.	-2302688.	-12088150.	-7374.29	-425.10	-6924.69
20400.00	121793869.	9972.21	52.482	-121023046.	-2387335.	-13471078.	-7183.10	-421.38	-6904.38
20600.00	123362929.	9823.68	52.385	-122440959.	-2471240.	-14849810.	-6997.02	-417.67	-6882.74
20800.00	124906641.	9679.06	52.279	-123822143.	-2554404.	-16224088.	-6815.79	-413.98	-6859.87
21000.00	126425493.	9538.15	52.164	-125167549.	-2636832.	-17593679.	-6639.17	-410.31	-6835.89
21200.00	127919944.	9400.77	52.041	-126478070.	-2718527.	-18958369.	-6466.93	-406.65	-6810.87
21400.00	129390439.	9266.78	51.910	-127754568.	-2799492.	-20317960.	-6298.88	-403.01	-6784.91
21600.00	130837404.	9136.02	51.771	-128997854.	-2879730.	-21672270.	-6134.80	-399.38	-6758.08
21800.00	132261244.	9008.35	51.624	-130208707.	-2959245.	-23021133.	-5974.52	-395.78	-6730.44
22000.00	133662353.	8883.64	51.469	-131387867.	-3038042.	-24364394.	-5817.86	-392.19	-6702.07
22200.00	135041112.	8761.76	51.307	-132536046.	-3116123.	-25701911.	-5664.66	-388.62	-6673.01
22400.00	136397874.	8642.60	51.137	-133653917.	-3193492.	-27033551.	-5514.77	-385.08	-6643.31
22600.00	137733002.	8526.06	50.959	-134742132.	-3270154.	-28359192.	-5368.05	-381.55	-6613.03
22800.00	139046820.	8412.03	50.774	-135801310.	-3346112.	-29678720.	-5224.36	-378.04	-6582.21
23000.00	140339654.	8300.43	50.582	-136832038.	-3421370.	-30992033.	-5083.57	-374.55	-6550.88
23200.00	141611814.	8191.15	50.382	-137834890.	-3495932.	-32299032.	-4945.57	-371.08	-6519.09
23400.00	142863602.	8084.11	50.174	-138810410.	-3569802.	-33599629.	-4810.25	-367.63	-6486.85
23600.00	144095308.	7979.24	49.960	-139759128.	-3642983.	-34893738.	-4677.49	-364.19	-6454.21
23800.00	145307206.	7876.47	49.738	-140681538.	-3715479.	-36181280.	-4547.19	-360.78	-6421.19
24000.00	146499570.	7775.72	49.509	-141578128.	-3787294.	-37462182.	-4419.27	-357.38	-6387.81

*Relative to local horizontal.

TABLE 3 C - 1 (Cont'd)

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

SECOND ORBITAL COAST DATA

FLIGHT TIME (SEC)	RADIUS (FT)	SPACE FIXED VELOCITY (FT/S)	PATH ANGLE* (DEG)	SPACE FIXED POSITION AND VELOCITY VECTORS X (FT)	Y (FT)	Z (FT)	DX (FT/S)	DY (FT/S)	DZ (FT/S)
24200.00	147672660.	7676.93	49.273	-142449360.	-3858432.	-38736376.	-4293.62	-354.00	-6354.11
24400.00	148826726.	7580.03	49.029	-143295692.	-3928895.	-40003795.	-4170.17	-350.64	-6320.09
24600.00	149962010.	7484.96	48.778	-144117542.	-3998689.	-41264383.	-4048.83	-347.30	-6285.78
24800.00	151078738.	7391.68	48.520	-144915326.	-4067815.	-42518081.	-3929.52	-343.97	-6251.20
25000.00	152177148.	7300.13	48.254	-145689446.	-4136278.	-43764836.	-3812.18	-340.66	-6216.36
25200.00	153257448.	7210.25	47.981	-146440288.	-4204080.	-45004599.	-3696.73	-337.37	-6181.27
25400.00	154319858.	7122.01	47.701	-147168222.	-4271226.	-46237320.	-3583.09	-334.09	-6145.96
25600.00	155364584.	7035.36	47.413	-147873614.	-4337717.	-47462959.	-3471.22	-330.83	-6110.43
25800.00	156391812.	6950.25	47.118	-148556796.	-4403558.	-48681473.	-3361.05	-327.59	-6074.70
26000.00	157401740.	6866.65	46.815	-149218112.	-4468752.	-49892819.	-3252.52	-324.36	-6038.78
26200.00	158394550.	6784.53	46.504	-149857880.	-4533301.	-51096961.	-3145.58	-321.14	-6002.66
26400.00	159370426.	6703.84	46.186	-150476410.	-4597208.	-52293864.	-3040.17	-317.94	-5966.38
26600.00	160329538.	6624.55	45.860	-151074012.	-4660476.	-53483493.	-2936.25	-314.75	-5929.92
26800.00	161272060.	6546.63	45.526	-151650976.	-4723107.	-54665814.	-2833.76	-311.58	-5893.31
27000.00	162198146.	6470.05	45.184	-152207580.	-4785106.	-55840795.	-2732.66	-308.41	-5856.54
27200.00	163107956.	6394.79	44.834	-152744098.	-4846473.	-57008405.	-2632.90	-305.27	-5819.63
27400.00	164001650.	6320.82	44.477	-153260800.	-4907212.	-58168619.	-2534.45	-302.13	-5782.57
5) 27518.00	164521426.	6277.77	44.262	-153556458.	-4942754.	-58849664.	-2476.95	-300.29	-5760.64

5) Loss of Attitude Control.

* Relative to local horizontal.

TABLE 3C - 2

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

SECOND ORBITAL COAST DATA

	FLIGHT TIME (SEC)	*VEHICLE ATTITUDE PITCH (DEG)	YAW (DEG)	PITCH ATTITUDE (LOCAL HORIZONTAL) (DEG)	THRUST (POUNDS)	WEIGHT (POUNDS)	AXIAL FORCE (POUNDS)	NORMAL FORCE (POUNDS)
1)	11478.0	-37.54	-1.93	2.99	0.00	35046.50	-0.00	0.00
	11498.0	-39.13	-1.48	3.17	0.00	35038.50	-0.00	0.00
2)	11498.0	-39.13	-1.48	3.17	0.00	35038.50	-0.00	0.00
	11505.7	-43.00	-1.32	0.00	0.00	35035.40	-0.00	0.00
3)	11505.7	-43.00	-1.32	0.00	0.00	35035.40	-0.00	0.00
	11588.0	-50.37	-1.01	0.00	0.00	35002.49	-0.00	0.00
4)	11588.0	-50.37	-1.01	0.00	0.00	35002.49	-0.00	0.00
	11600.0	-51.43	-0.96	0.00	0.00	35002.29	-0.00	0.00
	11800.0	-68.33	-0.18	0.00	0.00	35002.29	-0.00	0.00
	12000.0	-83.15	0.52	0.00	0.00	35002.29	-0.00	0.00
	12200.0	-95.64	1.09	0.00	0.00	35002.29	-0.00	0.00
	12400.0	-106.00	1.52	-0.00	0.00	35002.29	-0.00	0.00
	12600.0	-114.60	1.85	0.00	0.00	35002.29	-0.00	0.00
	12800.0	-121.78	2.09	-0.00	0.00	35002.29	-0.00	0.00
	13000.0	-127.85	2.26	0.00	0.00	35002.29	-0.00	0.00
	13200.0	-133.04	2.40	-0.00	0.00	35002.29	-0.00	0.00
	13400.0	-137.54	2.49	-0.00	0.00	35002.29	-0.00	0.00
	13600.0	-141.47	2.57	-0.00	0.00	35002.29	-0.00	0.00
	13800.0	-144.95	2.62	-0.00	0.00	35002.29	-0.00	0.00
	14000.0	-148.06	2.66	0.00	0.00	35002.29	-0.00	0.00
	14200.0	-150.85	2.69	-0.00	0.00	35002.29	-0.00	0.00
	14400.0	-153.38	2.72	0.00	0.00	35002.29	-0.00	0.00
	14600.0	-155.68	2.73	0.00	0.00	35002.29	-0.00	0.00
	14800.0	-157.80	2.74	-0.00	0.00	35002.29	-0.00	0.00
	15000.0	-159.75	2.75	0.00	0.00	35002.29	-0.00	0.00
	15200.0	-161.55	2.75	0.00	0.00	35002.29	-0.00	0.00
	15400.0	-163.23	2.75	-0.00	0.00	35002.29	-0.00	0.00
	15600.0	-164.80	2.75	0.00	0.00	35002.29	-0.00	0.00
	15800.0	-166.27	2.74	0.00	0.00	35002.29	-0.00	0.00
	16000.0	-167.65	2.74	-0.00	0.00	35002.29	-0.00	0.00
	16200.0	-168.95	2.73	0.00	0.00	35002.29	-0.00	0.00
	16400.0	-170.19	2.73	-0.00	0.00	35002.29	-0.00	0.00
	16600.0	-171.36	2.72	0.00	0.00	35002.29	-0.00	0.00
	16800.0	-172.47	2.71	-0.00	0.00	35002.29	-0.00	0.00
	17000.0	-173.52	2.70	-0.00	0.00	35002.29	-0.00	0.00

1) End LOX Vent;
2) Command Local Horizontal Attitude Hold;
3) Local Horizontal Attitude Achieved;
4) End LH_2 Vent.

* Referenced to the Z_s axis (PASCS - 13) measured positive counter clockwise.

TABLE 3C - 2 (Cont'd)

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

SECOND ORBITAL COAST DATA

FLIGHT TIME (SEC)	*VEHICLE ATTITUDE PITCH (DEG)	YAW (DEG)	PITCH ATTITUDE (LOCAL HORIZONTAL) (DEG)	THRUST (POUNDS)	WEIGHT (POUNDS)	AXIAL FORCE (POUNDS)	NORMAL FORCE (POUNDS)
17200.0	-174.53	2.69	0.00	0.00	35002.29	-0.00	0.00
17400.0	-175.50	2.68	0.00	0.00	35002.29	-0.00	0.00
17600.0	-176.42	2.67	0.00	0.00	35002.29	-0.00	0.00
17800.0	-177.31	2.66	-0.00	0.00	35002.29	-0.00	0.00
18000.0	-178.16	2.65	0.00	0.00	35002.29	-0.00	0.00
18200.0	-178.98	2.64	-0.00	0.00	35002.29	-0.00	0.00
18400.0	-179.77	2.63	-0.00	0.00	35002.29	-0.00	0.00
18600.0	179.47	2.61	0.00	0.00	35002.29	-0.00	0.00
18800.0	178.73	2.60	0.00	0.00	35002.29	-0.00	0.00
19000.0	178.02	2.59	-0.00	0.00	35002.29	-0.00	0.00
19200.0	177.33	2.58	0.00	0.00	35002.29	-0.00	0.00
19400.0	176.66	2.57	-0.00	0.00	35002.29	-0.00	0.00
19600.0	176.02	2.56	-0.00	0.00	35002.29	-0.00	0.00
19800.0	175.39	2.55	-0.00	0.00	35002.29	-0.00	0.00
20000.0	174.77	2.54	0.00	0.00	35002.29	-0.00	0.00
20200.0	174.18	2.52	0.00	0.00	35002.29	-0.00	0.00
20400.0	173.60	2.51	-0.00	0.00	35002.29	-0.00	0.00
20600.0	173.03	2.50	0.00	0.00	35002.29	-0.00	0.00
20800.0	172.48	2.49	0.00	0.00	35002.29	-0.00	0.00
21000.0	171.95	2.48	-0.00	0.00	35002.29	-0.00	0.00
21200.0	171.42	2.47	-0.00	0.00	35002.29	-0.00	0.00
21400.0	170.91	2.46	0.00	0.00	35002.29	-0.00	0.00
21600.0	170.41	2.45	0.00	0.00	35002.29	-0.00	0.00
21800.0	169.92	2.44	-0.00	0.00	35002.29	-0.00	0.00
22000.0	169.44	2.43	0.00	0.00	35002.29	-0.00	0.00
22200.0	168.97	2.42	-0.00	0.00	35002.29	-0.00	0.00
22400.0	168.51	2.40	-0.00	0.00	35002.29	-0.00	0.00
22600.0	168.06	2.39	0.00	0.00	35002.29	-0.00	0.00
22800.0	167.61	2.38	-0.00	0.00	35002.29	-0.00	0.00
23000.0	167.18	2.37	-0.00	0.00	35002.29	-0.00	0.00
23200.0	166.75	2.36	0.00	0.00	35002.29	-0.00	0.00
23400.0	166.33	2.35	0.00	0.00	35002.29	-0.00	0.00
23600.0	165.92	2.34	0.00	0.00	35002.29	-0.00	0.00
23800.0	165.52	2.33	0.00	0.00	35002.29	-0.00	0.00
24000.0	165.12	2.32	-0.00	0.00	35002.29	-0.00	0.00

* Referenced to the Z_B axis (PASCS - 13) measured positive counter clockwise.

TABLE 3C - 2 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
SECOND ORBITAL COAST DATA

FLIGHT TIME (SEC)	* VEHICLE ATTITUDE PITCH (DEG)	YAW (DEG)	PITCH ATTITUDE (LOCAL HORIZONTAL) (DEG)	THRUST (POUNDS)	WEIGHT (POUNDS)	AXIAL FORCE (POUNDS)	NORMAL FORCE (POUNDS)
24200.0	164.73	2.31	0.00	0.00	35002.29	-0.00	0.00
24400.0	164.34	2.30	-0.00	0.00	35002.29	-0.00	0.00
24600.0	163.96	2.29	0.00	0.00	35002.29	-0.00	0.00
24800.0	163.59	2.28	-0.00	0.00	35002.29	-0.00	0.00
25000.0	163.22	2.27	-0.00	0.00	35002.29	-0.00	0.00
25200.0	162.85	2.26	0.00	0.00	35002.29	-0.00	0.00
25400.0	162.50	2.25	-0.00	0.00	35002.29	-0.00	0.00
25600.0	162.14	2.24	-0.00	0.00	35002.29	-0.00	0.00
25800.0	161.79	2.23	-0.00	0.00	35002.29	-0.00	0.00
26000.0	161.45	2.22	-0.00	0.00	35002.29	-0.00	0.00
26200.0	161.11	2.21	0.00	0.00	35002.29	-0.00	0.00
26400.0	160.77	2.20	-0.00	0.00	35002.29	-0.00	0.00
26600.0	160.44	2.19	-0.00	0.00	35002.29	-0.00	0.00
26800.0	160.11	2.18	0.00	0.00	35002.29	-0.00	0.00
27000.0	159.79	2.17	-0.00	0.00	35002.29	-0.00	0.00
27200.0	159.47	2.16	-0.00	0.00	35002.29	-0.00	0.00
27400.0	159.15	2.16	-0.00	0.00	35002.29	-0.00	0.00
5) 27518.0	158.97	2.15	-0.00	0.00	35002.29	-0.00	0.00

5) Loss of Attitude Control.

* Reference to the Z_s axis (PASCS - 13) measured positive counter clockwise.

TABLE 3C - 3

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

SECOND ORBITAL COAST DATA

	FLIGHT TIME (SEC)	ALTITUDE (FT)	CENTRAL RANGE ANGLE (DEG)	VELOCITY VECTOR AZIMUTH SPACE FIXED (DEG)	VELOCITY VECTOR AZIMUTH EARTH FIXED (DEG)	LONGITUDE (POS. EAST) (DEG)	GEOCENTRIC DECLINATION (DEG)	GEODETIC LATITUDE (DEG)
1)	11477.96	715121.	40.524	98.283	98.624	-81.771	30.334	30.496
	11497.96	734106.	42.335	99.326	99.712	-79.784	30.056	30.218
2)	11497.96	734106.	42.335	99.326	99.712	-79.784	30.056	30.218
	11505.70	744009.	43.034	99.724	100.128	-79.020	29.941	30.102
3)	11505.70	744009.	43.034	99.724	100.128	-79.020	29.941	30.102
	11587.96	936509.	50.412	103.771	104.359	-71.087	28.435	28.590
4)	11587.96	936509.	50.412	103.771	104.359	-71.087	28.435	28.590
	11600.00	977846.	51.479	104.330	104.945	-69.962	28.176	28.330
	11800.00	2120333.	68.391	112.070	113.156	-52.987	22.847	22.972
	12000.00	3988500.	83.226	116.952	118.558	-39.482	16.657	16.746
	12200.00	6369000.	95.727	119.647	121.828	-28.993	10.710	10.764
	12400.00	9075604.	106.094	120.925	123.736	-20.789	5.471	5.496
	12600.00	11971708.	114.688	121.343	124.837	-14.257	1.021	1.025
	12800.00	14965418.	121.869	121.252	125.474	-8.957	-2.714	-2.724
	13000.00	17997416.	127.937	120.863	125.855	-4.580	-5.846	-5.867
	13200.00	21030144.	133.127	120.300	126.104	-0.912	-8.489	-8.517
	13400.00	24040083.	137.619	119.640	126.296	2.200	-10.734	-10.767
	13600.00	27012702.	141.551	118.929	126.479	4.866	-12.658	-12.694
	13800.00	29939212.	145.026	118.196	126.684	7.170	-14.321	-14.359
	14000.00	32814525.	148.126	117.458	126.932	9.174	-15.768	-15.808
	14200.00	35635939.	150.914	116.727	127.238	10.927	-17.039	-17.079
	14400.00	38402310.	153.440	116.008	127.614	12.466	-18.161	-18.201
	14600.00	41113499.	155.742	115.307	128.072	13.821	-19.158	-19.198
	14800.00	43770011.	157.853	114.624	128.621	15.018	-20.050	-20.090
	15000.00	46372779.	159.799	113.962	129.273	16.077	-20.851	-20.891
	15200.00	48922981.	161.601	113.320	130.038	17.013	-21.574	-21.614
	15400.00	51421948.	163.278	112.699	130.929	17.842	-22.230	-22.269
	15600.00	53871086.	164.843	112.098	131.963	18.574	-22.827	-22.865
	15800.00	56271830.	166.309	111.517	133.156	19.221	-23.372	-23.410
	16000.00	58625618.	167.688	110.954	134.529	19.790	-23.872	-23.910
	16200.00	60933863.	168.988	110.408	136.108	20.288	-24.332	-24.369
	16400.00	63197935.	170.216	109.880	137.920	20.723	-24.756	-24.793
	16600.00	65419164.	171.380	109.369	140.000	21.100	-25.148	-25.184
	16800.00	67598832.	172.485	108.872	142.387	21.424	-25.512	-25.547
	17000.00	69738156.	173.536	108.391	145.128	21.699	-25.849	-25.884

1) End LOX Vent;
2) Command Local Horizontal Attitude Hold;
3) Local Horizontal Attitude Achieved;
4) End LH_2 Vent.

TABLE 3C - 3 (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
SECOND ORBITAL COAST DATA

FLIGHT TIME (SEC)	ALTITUDE (FT)	CENTRAL RANGE ANGLE (DEG)	VELOCITY VECTOR AZIMUTH SPACE FIXED (DEG)	VELOCITY VECTOR AZIMUTH EARTH FIXED (DEG)	LONGITUDE (POS. EAST) (DEG)	GEOCENTRIC DECLINATION (DEG)	GEODETIC LATITUDE (DEG)
17200.00	71838318.	174.538	107.923	148.271	21.929	-26.163	-26.198
17400.00	73900431.	175.492	107.469	151.872	22.118	-26.456	-26.490
17600.00	75925561.	176.402	107.028	155.982	22.268	-26.730	-26.763
17800.00	77914725.	177.267	106.598	160.646	22.383	-26.986	-27.019
18000.00	79868893.	178.079	106.180	165.890	22.465	-27.226	-27.259
18200.00	81788986.	178.809	105.773	171.705	22.515	-27.452	-27.484
18400.00	83675881.	179.293	105.376	178.029	22.537	-27.663	-27.695
18600.00	85530416.	179.109	104.989	184.744	22.532	-27.863	-27.894
18800.00	87353383.	178.524	104.612	191.672	22.501	-28.051	-28.082
19000.00	89145544.	177.868	104.243	198.602	22.447	-28.228	-28.259
19200.00	90907613.	177.207	103.883	205.321	22.370	-28.395	-28.426
19400.00	92640287.	176.555	103.532	211.657	22.272	-28.554	-28.583
19600.00	94344232.	175.919	103.187	217.491	22.155	-28.703	-28.733
19800.00	96020073.	175.297	102.851	222.766	22.018	-28.845	-28.874
20000.00	97668411.	174.692	102.521	227.476	21.864	-28.979	-29.008
20200.00	99289818.	174.102	102.199	231.646	21.693	-29.106	-29.135
20400.00	100884848.	173.526	101.883	235.324	21.505	-29.227	-29.255
20600.00	102454028.	172.965	101.573	238.562	21.303	-29.342	-29.370
20800.00	103997854.	172.417	101.269	241.413	21.086	-29.451	-29.478
21000.00	105516814.	171.883	100.971	243.930	20.856	-29.554	-29.582
21200.00	107011368.	171.360	100.678	246.156	20.612	-29.653	-29.680
21400.00	108481962.	170.850	100.391	248.132	20.356	-29.746	-29.773
21600.00	109929022.	170.350	100.109	249.893	20.088	-29.835	-29.862
21800.00	111352950.	169.862	99.832	251.468	19.809	-29.920	-29.947
22000.00	112754143.	169.383	99.559	252.881	19.519	-30.001	-30.027
22200.00	114132983.	168.915	99.291	254.154	19.218	-30.078	-30.104
22400.00	115489825.	168.455	99.028	255.305	18.908	-30.151	-30.177
22600.00	116825027.	168.005	98.769	256.350	18.588	-30.221	-30.246
22800.00	118138915.	167.563	98.513	257.300	18.259	-30.287	-30.313
23000.00	119431817.	167.129	98.262	258.168	17.921	-30.351	-30.376
23200.00	120704041.	166.704	98.014	258.963	17.575	-30.411	-30.436
23400.00	121955890.	166.285	97.771	259.693	17.221	-30.469	-30.493
23600.00	123187655.	165.874	97.530	260.365	16.859	-30.524	-30.548
23800.00	124399611.	165.470	97.293	260.986	16.489	-30.576	-30.600
24000.00	125592027.	165.072	97.059	261.560	16.112	-30.625	-30.650

TABLE 3 C - 3 (Cont'd)

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

SECOND ORBITAL COAST DATA

FLIGHT TIME (SEC)	ALTITUDE (FT)	CENTRAL RANGE ANGLE (DEG)	VELOCITY VECTOR AZIMUTH SPACE FIXED (DEG)	VELOCITY VECTOR AZIMUTH EARTH FIXED (DEG)	LONGITUDE (POS. EAST) (DEG)	GEOCENTRIC DECLINATION (DEG)	GEODETIC LATITUDE (DEG)
24200.00	126765167.	164.680	96.829	262.093	15.729	-30.673	-30.697
24400.00	127919281.	164.295	96.602	262.589	15.339	-30.718	-30.742
24600.00	129054611.	163.916	96.377	263.051	14.942	-30.761	-30.784
24800.00	130171384.	163.542	96.156	263.482	14.539	-30.802	-30.825
25000.00	131269835.	163.174	95.937	263.886	14.131	-30.841	-30.864
25200.00	132350175.	162.811	95.721	264.264	13.716	-30.877	-30.901
25400.00	133412622.	162.452	95.507	264.619	13.296	-30.913	-30.936
25600.00	134457384.	162.099	95.296	264.953	12.871	-30.946	-30.969
25800.00	135484644.	161.751	95.088	265.268	12.440	-30.977	-31.000
26000.00	136494606.	161.407	94.882	265.564	12.005	-31.007	-31.030
26200.00	137487448.	161.067	94.678	265.845	11.565	-31.036	-31.058
26400.00	138463350.	160.731	94.477	266.110	11.120	-31.062	-31.085
26600.00	139422490.	160.400	94.277	266.362	10.670	-31.088	-31.110
26800.00	140365038.	160.072	94.080	266.601	10.216	-31.112	-31.134
27000.00	141291150.	159.748	93.885	266.828	9.758	-31.134	-31.156
27200.00	142200984.	159.428	93.692	267.043	9.296	-31.155	-31.177
27400.00	143094696.	159.111	93.500	267.249	8.830	-31.175	-31.197
5) 27518.00	143614486.	158.926	93.388	267.366	8.553	-31.186	-31.208

5) Loss of Attitude Control.

TABLE 4C

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

S-IB STAGE RE-ENTRY DATA

	FLIGHT TIME (SEC)	----- SPACE FIXED ----- RADIUS (FT)	VELOCITY (FT/S)	PATH ANGLE (DEG)	--- SPACE FIXED POSITION AND VELOCITY VECTOR COMPONENTS --- X (FT)	Y (FT)	Z (FT)	DX (FT/S)	DY (FT/S)	DZ (FT/S)
1)	143.22	21121298.	8525.73	63.820	21126840.	116342.	418181.	3607.42	388.77	7715.15
	144.00	21124225.	8479.24	64.037	21129645.	116643.	424211.	3556.55	379.20	7687.96
2)	144.77	21137080.	8436.36	64.245	21132379.	116933.	430152.	3508.55	370.56	7663.22
	160.00	21185442.	8221.11	66.952	21182038.	122541.	546580.	3020.47	367.23	7637.31
	180.00	21248085.	7993.74	70.667	21236183.	129856.	699135.	2394.83	364.31	7617.87
	200.00	21295317.	7807.43	74.570	21277854.	137112.	851270.	1772.82	361.20	7594.91
	220.00	21331191.	7663.46	78.633	21307113.	144303.	1002903.	1153.43	357.89	7567.70
	240.00	21355742.	7563.57	82.823	21324005.	151426.	1153949.	536.01	354.39	7536.23
	260.00	21368995.	7509.11	87.096	21328563.	158477.	1304324.	-80.08	350.70	7500.49
3)	274.00	21371558.	7498.45	90.110	21324426.	163368.	1409140.	-510.88	348.00	7472.93
	280.00	21370964.	7500.83	91.402	21320807.	165453.	1453940.	-695.46	346.82	7460.47
	300.00	21361651.	7538.85	95.693	21300746.	172349.	1602714.	-1310.74	342.73	7416.12
	320.00	21341047.	7622.63	99.917	21268374.	179161.	1750556.	-1926.56	338.44	7367.38
	340.00	21309130.	7751.03	104.031	21223676.	185885.	1897379.	-2543.53	333.94	7314.19
	360.00	21265869.	7922.39	107.994	21166622.	192517.	2043093.	-3162.28	329.22	7256.43
	380.00	21211219.	8134.47	111.778	21097170.	199052.	2187604.	-3783.33	324.29	7193.80
	400.00	21145148.	8376.92	115.359	21015293.	205487.	2330780.	-4402.61	319.13	7119.55
	420.00	21068218.	8466.16	118.644	20921670.	211817.	2471580.	-4904.41	314.00	6893.77
	440.00	20993440.	5536.52	119.439	20831534.	218075.	2593100.	-3297.81	313.72	4436.11
	460.00	20964325.	2075.85	111.375	20795233.	224379.	2647807.	-994.66	314.41	1794.70
	480.00	20951386.	1678.11	110.493	20778072.	230607.	2679391.	-783.03	308.47	1451.81
	500.00	20940560.	1552.41	108.726	20763458.	236737.	2707371.	-683.46	305.36	1360.01
	520.00	20931339.	1479.02	106.779	20750587.	242846.	2734065.	-607.32	305.77	1313.45
	540.00	20923354.	1430.02	105.179	20739023.	248973.	2760014.	-552.18	306.93	1282.91
	560.00	20916282.	1393.36	103.993	20728415.	255122.	2785428.	-510.60	307.98	1259.32
	580.00	20909921.	1364.90	102.825	20718544.	261290.	2810421.	-477.95	308.71	1240.65
4)	585.82	20908182.	1358.58	102.554	20715788.	263085.	2817623.	-470.17	308.81	1236.65

1) Physical Separation;
2) Retro-Rocket Burnout;
3) S-IB Stage Apogee;
4) S-IB Stage Impact.

TABLE 4C (Cont'd)

AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY

S-IB STAGE RE-ENTRY DATA

	FLIGHT TIME (SEC)	----- EARTH FIXED ----- POSITION (FT)	VELOCITY (FT/S)	PATH ANGLE (DEG)	---- EARTH FIXED POSITION AND VELOCITY VECTOR COMPONENTS ---- X (FT)	Y (FT)	Z (FT)	DX (FT/S)	DY (FT/S)	DZ (FT/S)
1)	143.22	329526.	7381.11	59.362	220253.	68.	245105.	3693.05	7.41	6390.78
	144.00	335163.	7332.50	59.585	223125.	70.	250098.	3642.59	-1.88	6383.74
2)	144.77	340697.	7287.58	59.800	225925.	65.	255014.	3595.00	-10.24	6339.14
	160.00	447343.	7040.45	62.797	276997.	-74.	351267.	3119.75	-6.80	6311.50
	180.00	582152.	6774.21	67.005	333297.	-145.	477298.	2511.02	-0.19	6291.64
	200.00	711331.	6553.69	71.520	377461.	-79.	602922.	1905.82	6.89	6270.45
	220.00	835381.	6381.70	76.310	409547.	133.	728103.	1303.13	14.42	6247.22
	240.00	954892.	6261.47	81.320	429598.	501.	852798.	702.26	22.39	6221.93
	260.00	1070512.	6195.49	86.479	437645.	1032.	976966.	102.57	30.79	6194.56
3)	274.00	1149504.	6182.41	90.133	436145.	1506.	1063548.	-316.85	36.93	6174.17
	280.00	1182941.	6185.21	91.701	433705.	1735.	1100566.	-496.57	39.62	6165.12
	300.00	1292919.	6230.87	96.893	417782.	2619.	1223557.	-1095.81	48.87	6133.56
	320.00	1401229.	6331.44	101.967	389869.	3693.	1345894.	-1695.78	58.51	6099.84
	340.00	1508690.	6484.78	106.845	349943.	4963.	1467535.	-2297.13	68.55	6063.90
	360.00	1616154.	6687.88	111.466	297971.	6437.	1588435.	-2900.49	78.98	6025.66
	380.00	1724501.	6936.95	115.789	233907.	8124.	1708545.	-3506.40	89.78	5984.84
	400.00	1834598.	7220.10	119.795	157716.	10030.	1827778.	-4111.00	100.82	5934.59
	420.00	1946421.	7351.85	123.506	70048.	12144.	1945122.	-4602.34	109.21	5732.03
	440.00	2043409.	4451.11	127.687	-14336.	14108.	2043310.	-3048.44	68.50	3242.64
	460.00	2073974.	978.43	140.649	-46532.	14760.	2073399.	-813.80	11.12	543.07
	480.00	2080816.	640.46	156.535	-60176.	14847.	2079893.	-609.74	-0.51	195.97
	500.00	2084013.	521.20	162.990	-71336.	14785.	2082739.	-510.99	-4.61	102.56
	520.00	2085887.	437.93	167.151	-80754.	14691.	2084271.	-434.48	-4.41	54.72
	540.00	2086980.	379.30	170.805	-88854.	14616.	2085036.	-378.58	-3.10	23.30
	560.00	2087510.	336.11	174.481	-95981.	14568.	2085251.	-336.10	-1.74	-0.90
	580.00	2087596.	303.14	178.111	-102353.	14545.	2085035.	-302.47	-0.59	-20.02
4)	585.82	2087553.	295.35	178.999	-104087.	14542.	2084906.	-294.36	-0.33	-24.10

1) Physical Separation;
2) Retro-Rocket Burnout;
3) S-IB Stage Apogee;
4) S-IB Stage Impact.

TABLE 4C (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IB STAGE RE-ENTRY DATA

	FLIGHT TIME (SEC)	MASS (LB)	THRUST (TOTAL) (LB)	DRAG (LB)	LONGITUDINAL ACCELERATION (FT/SEC2)	DYNAMIC PRESSURE (LB/FT2)	A.H.I. (LB-FT/FT2-RAD)	MACH NO.
1)	143.22	101902.	0.	9368.	-2.958	6.	43929492.	7.44
	144.00	101160.	154278.	8188.	-48.191	6.	43951321.	7.44
2)	144.77	100510.	109509.	7173.	-34.864	5.	43970071.	7.43
	160.00	100510.	0.	533.	-0.171	0.	44094813.	7.89
	180.00	100510.	0.	19.	-0.006	0.	44103456.	6.75
	200.00	100510.	0.	2.	-0.001	0.	44103840.	5.48
	220.00	100510.	0.	1.	-0.000	0.	44103872.	4.24
	240.00	100510.	0.	0.	-0.000	0.	44103872.	3.68
	260.00	100510.	0.	0.	-0.000	0.	44103872.	3.44
3)	274.00	100510.	0.	0.	-0.000	0.	44103872.	3.40
	280.00	100510.	0.	0.	-0.000	0.	44103872.	3.41
	300.00	100510.	0.	0.	-0.000	0.	44103872.	3.56
	320.00	100510.	0.	0.	-0.000	0.	44103872.	3.97
	340.00	100510.	0.	1.	-0.000	0.	44103880.	4.98
	360.00	100510.	0.	8.	-0.002	0.	44104042.	6.35
	380.00	100510.	0.	139.	-0.045	0.	44106479.	7.60
	400.00	100510.	0.	4708.	-1.507	3.	44192005.	7.51
	420.00	100510.	0.	96316.	-30.831	66.	46189998.	6.73
	440.00	100510.	0.	1032651.	-330.559	661.	72269243.	4.52
	460.00	100510.	0.	219768.	-70.349	133.	84564229.	1.00
	480.00	100510.	0.	117518.	-37.618	100.	85530247.	0.63
	500.00	100510.	0.	112740.	-36.089	104.	86244979.	0.50
	520.00	100510.	0.	109910.	-35.183	103.	86857853.	0.41
	540.00	100510.	0.	107384.	-34.374	102.	87380298.	0.35
	560.00	100510.	0.	105832.	-33.878	102.	87839110.	0.30
	580.00	100510.	0.	104704.	-33.516	101.	88248777.	0.27
4)	585.82	100510.	0.	104307.	-33.389	100.	88358653.	0.26

1) Physical Separation;
2) Retro-Rocket Burnout;
3) S-IB Stage Apogee;
4) S-IB Stage Impact.

TABLE 4C (Cont'd)
AS-206 S-IVB RESTART ALTERNATE MISSION L/V OPERATIONAL FLIGHT TRAJECTORY
S-IB STAGE RE-ENTRY DATA

	FLIGHT TIME (SEC)	ALTITUDE (FT)	RANGE (NM)	VELOCITY VECTOR AZIMUTH SPACE FIXED (DEG)	EARTH FIXED (DEG)	LONGITUDE (POS. EAST) (DEG)	GEOCENTRIC DECLINATION (DEG)	GEODETIC LATITUDE (DEG)
1)	143.22	221672.	39.948	75.401	72.322	-79.845	28.576	28.736
	144.00	224603.	40.756	75.349	72.246	-79.831	28.580	28.740
2)	144.77	227462.	41.552	75.303	72.177	-79.816	28.584	28.744
	160.00	279906.	57.090	75.468	72.354	-79.535	28.663	28.823
	180.00	338653.	77.355	75.691	72.606	-79.169	28.764	28.924
	200.00	385989.	97.497	75.914	72.861	-78.803	28.864	29.024
	220.00	421964.	117.542	76.137	73.122	-78.439	28.961	29.121
	240.00	446615.	137.516	76.360	73.387	-78.074	29.057	29.217
	260.00	459966.	157.446	76.584	73.657	-77.710	29.151	29.312
3)	274.00	462597.	171.384	76.741	73.848	-77.455	29.216	29.377
	280.00	462032.	177.357	76.808	73.931	-77.345	29.244	29.405
	300.00	452815.	197.274	77.034	74.211	-76.980	29.335	29.496
	320.00	432304.	217.224	77.261	74.496	-76.613	29.424	29.586
	340.00	400480.	237.231	77.490	74.785	-76.244	29.513	29.675
	360.00	357311.	257.321	77.721	75.080	-75.872	29.600	29.762
	380.00	302751.	277.522	77.954	75.380	-75.498	29.685	29.849
	400.00	236770.	297.854	78.191	75.686	-75.121	29.770	29.934
	420.00	159928.	318.177	78.481	75.994	-74.743	29.853	30.018
	440.00	85222.	335.470	80.018	76.274	-74.420	29.922	30.088
	460.00	56130.	340.897	85.649	76.326	-74.319	29.943	30.109
	480.00	43196.	342.178	87.657	75.405	-74.295	29.948	30.115
	500.00	32374.	342.824	88.360	73.982	-74.283	29.951	30.118
	520.00	22155.	343.227	88.870	73.340	-74.275	29.953	30.120
	540.00	15171.	343.484	89.279	73.346	-74.271	29.954	30.121
	560.00	8100.	343.635	89.623	73.999	-74.268	29.955	30.122
	580.00	1739.	343.703	89.908	77.589	-74.267	29.955	30.122
4)	585.82	0.	343.710	89.971	82.493	-74.267	29.955	30.122

1) Physical Separation;
2) Retro-Rocket Burnout;
3) S-IB Stage Apogee;
4) S-IB Stage Impact.

DISTRIBUTION

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