



PEGASUS LAUNCH VEHICLE  
AIM  
MISSION ANALYSIS  
CONTRACT NO. NAS10-99005  
CDRL C9

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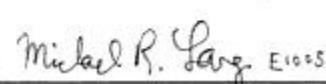
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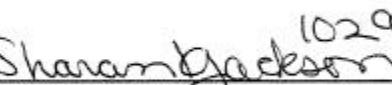
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**TABLE OF CONTENTS**

	<b>PAGE</b>
1. INTRODUCTION.....	1
1.1. Purpose .....	1
1.2. Scope.....	1
2. VEHICLE CONFIGURATION.....	2
2.1. General Description.....	2
2.2. Summary of Vehicle Systems.....	3
2.3. Vehicle Mass Summary.....	8
2.4. Vehicle Payload Performance .....	10
3. TRAJECTORY DESCRIPTION.....	10
3.1. Mission Requirements .....	10
3.2. Guidance System .....	11
3.2.1. Guidance Reserve .....	11
3.2.2. Energy Management Options .....	12
3.3. Control System Summary.....	13
4. TRAJECTORY INFORMATION.....	14
4.1. Sequence of Events.....	14
4.2. Definition of Drop Zone.....	15
4.3. Trajectory Plots.....	15
4.4. Trajectory Data .....	23
4.5. Dispersion Analysis .....	23
4.5.1. Dispersion Analysis Inputs.....	23
4.5.2. Matrix of 3-Sigma Singly Dispersed Trajectories .....	27
4.5.3. Dispersion Results .....	27
4.5.3.1. Insertion Parameter Distributions .....	27
4.5.3.2. Launch Window Analysis .....	37
4.5.3.3. Trajectory Environment Dispersions .....	40
4.5.3.4. Spent Stage/Fairing Impact Point Dispersions.....	52
4.5.3.5. Payload Separation Pointing and Tip-Off Rates .....	54
5. TRACKING AND TELEMETRY COVERAGE.....	57
5.1. Captive Carry Phase.....	57
5.2. Launch Phase.....	57
6. CONTAMINATION AND COLLISION AVOIDANCE ANALYSIS.....	62

**LIST OF FIGURES**

	<b>PAGE</b>
Figure 1-1. AIM Spacecraft.....	1
Figure 2-1. Pegasus XL AIM Mission Profile .....	2
Figure 2-2. Pegasus XL Configuration Expanded View .....	4
Figure 2-3. Pegasus XL Vehicle Coordinates and Dimensions .....	5
Figure 4-1. Nominal Trajectory: Angle of Attack vs. Time.....	17
Figure 4-2. Nominal Trajectory: Dynamic Pressure vs. Time.....	17
Figure 4-3. Nominal Trajectory: Q-Alpha vs. Time.....	18
Figure 4-4. Nominal Trajectory: Angle of Sideslip vs. Time .....	18
Figure 4-5. Nominal Trajectory: Q-Beta vs. Time.....	19
Figure 4-6. Nominal Trajectory: Altitude vs. Time .....	19
Figure 4-7. Nominal Trajectory: Inertial Velocity vs. Time.....	20
Figure 4-8. Nominal Trajectory: Axial Acceleration vs. Time .....	20
Figure 4-9. Nominal Trajectory: Normal Acceleration vs. Time.....	21
Figure 4-10. Nominal Trajectory: Inertial Flight Path Angle vs. Time.....	21
Figure 4-11. Nominal Trajectory: Aerodynamic Heating Rate vs. Time.....	22
Figure 4-12. Nominal Trajectory: Aerodynamic Heating Rate @ Fairing Deployment vs. Time.....	22
Figure 4-13. Monte Carlo Results: Time of Insertion Distribution .....	29
Figure 4-14. Monte Carlo Results: Insertion Apse Altitude Distribution .....	30
Figure 4-15. Monte Carlo Results: Non-Insertion Apse Altitude Distribution .....	30
Figure 4-16. Monte Carlo Results: Perigee Altitude Distribution.....	31
Figure 4-17. Monte Carlo Results: Apogee Altitude Distribution.....	31
Figure 4-18. Monte Carlo Results: Semi-major Axis Distribution .....	32
Figure 4-19. Monte Carlo Results: Eccentricity Distribution.....	32
Figure 4-20. Monte Carlo Results: Inclination Distribution .....	33
Figure 4-21. Monte Carlo Results: RAAN Distribution .....	33
Figure 4-22. Monte Carlo Results: ECI RAAN Distribution .....	34
Figure 4-23. Monte Carlo Results: Argument of Perigee Distribution .....	34
Figure 4-24. Monte Carlo Results: True Anomaly Distribution.....	35
Figure 4-25. Monte Carlo Results: Geodetic Latitude at Insertion Distribution .....	35
Figure 4-26. Monte Carlo Results: Longitude at Insertion Distribution.....	36
Figure 4-27. Monte Carlo Results: Time to 1 <sup>st</sup> Ascending Node Distribution.....	36
Figure 4-28. Monte Carlo Results: N <sub>2</sub> Consumption @ Insertion Distribution.....	37
Figure 4-29. Monte Carlo Results: MLT-AN Distribution .....	39
Figure 4-30. Monte Carlo Results: Drop Time Of Day Distribution .....	39

Figure 4-31. Right Ascension Definitions .....	40
Figure 4-32. Monte Carlo Results: Left Fin Hinge Moment Envelope.....	42
Figure 4-33. Monte Carlo Results: Right Fin Hinge Moment Envelope .....	42
Figure 4-34. Monte Carlo Results: Rudder Hinge Moment Envelope .....	43
Figure 4-35. Monte Carlo Results: Left Fin Bending Moment Envelope.....	43
Figure 4-36. Monte Carlo Results: Right Fin Bending Moment Envelope.....	44
Figure 4-37. Monte Carlo Results: Rudder Bending Moment Envelope .....	44
Figure 4-38. Monte Carlo Results: Left Fin Normal Force Envelope .....	45
Figure 4-39. Monte Carlo Results: Right Fin Normal Force Envelope .....	45
Figure 4-40. Monte Carlo Results: Rudder Normal Force Envelope.....	46
Figure 4-41. Monte Carlo Results: Left Wing Bending Moment Envelope.....	46
Figure 4-42. Monte Carlo Results: Right Wing Bending Moment Envelope .....	47
Figure 4-43. Monte Carlo Results: S1 Axial Acceleration Envelope .....	47
Figure 4-44. Monte Carlo Results: S1 Lateral Acceleration Envelope .....	48
Figure 4-45. Monte Carlo Results: S1 Normal Acceleration Envelope .....	48
Figure 4-46. Monte Carlo Results: Fairing Alpha Moment Envelope .....	49
Figure 4-47. Monte Carlo Results: Fairing Beta Moment Envelope.....	49
Figure 4-48. Monte Carlo Results: Fairing Line Load Envelope .....	50
Figure 4-49. Monte Carlo Results: Aerodynamic Heating Rate vs. Time Envelope .....	50
Figure 4-50. Monte Carlo Results: Integrated Aerodynamic Heating vs. Time Envelope.....	51
Figure 4-51. Monte Carlo Results: FM Heating Rate @ Fairing Deployment Dispersions .....	51
Figure 4-52. Monte Carlo Results: World Map Nominal IIP Trace and Vacuum IIP Dispersions .....	52
Figure 4-53. Monte Carlo Results: S1 Nominal IIP Trace and Vacuum IIP Dispersions .....	53
Figure 4-54. Monte Carlo Results: Fairing Nominal IIP Trace and Vacuum IIP Dispersions.....	53
Figure 4-55. Monte Carlo Results: S2 Nominal IIP Trace and Vacuum IIP Dispersions .....	54
Figure 4-56. Monte Carlo Results: Pegasus X-Axis to Velocity Vector Angle.....	56
Figure 4-57. Monte Carlo Results: Pegasus X-Axis to Orbit Normal Angle .....	56
Figure 5-1. AIM Mission Flight Plan (Western Range) .....	58
Figure 5-2. Monte Carlo Results: Elevation Angle Relative to SNIF at P/L Separation .....	60
Figure 5-3. Monte Carlo Results: Elevation Angle Relative to CALF at P/L Separation .....	61
Figure 5-4. Monte Carlo Results: Elevation Angle Relative to PPTQ at P/L Separation .....	61
Figure 6-1. Relative Motion Analysis: Separation Distance Relative to AIM.....	63
Figure 6-2. Relative Motion Analysis: Separation Distance Relative to AIM (Zoom) .....	64
Figure 6-3. Relative Motion Analysis: In-Plane Separation Distance (AIM-Centered Frame) .....	64
Figure 6-4. Relative Motion Analysis: Out-of-Plane Separation Distance (AIM-Centered Frame) .....	65
Figure 6-5. Relative Motion Analysis: In-Plane Trajectory of Bodies in AIM-Centered Frame .....	65

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Figure 6-6. Relative Motion Analysis: Out-of-Plane Trajectory of Bodies in AIM-Centered Frame .....	66
Figure 6-7. Relative Motion Analysis: Pegasus X-Axis Relative to Payload Separation Direction .....	66
Figure 6-8. Relative Motion Analysis: Separation Distance Relative to AIM.....	67
Figure 6-9. Relative Motion Analysis: Separation Distance Relative to AIM (Zoom) .....	67
Figure 6-10. Relative Motion Analysis: Mass Deposition Estimate .....	68

## LIST OF TABLES

TABLE 2-1. TYPICAL PEGASUS XL MOTOR CHARACTERISTICS .....	6
TABLE 2-2. TYPICAL ATTITUDE AND GUIDANCE MODES .....	7
TABLE 2-3. PEGASUS XL VEHICLE MASS SUMMARY FOR THE AIM MISSION .....	9
TABLE 3-1. PEGASUS GUIDANCE STRATEGY .....	11
TABLE 3-2. PEGASUS AUTOPILOT CONTROL MODES .....	13
TABLE 4-1. AIM MISSION NOMINAL TIMELINE AND RCS GAS USAGE.....	14
TABLE 4-2. MONTE CARLO SIMULATION DISPERSION PARAMETERS: 1-SIGMA VALUES .....	23
TABLE 4-3. SUMMARY OF INSERTION PARAMETER DISTRIBUTIONS .....	28
TABLE 4-4. LAUNCH WINDOW THAT SATISFIES MLT-AN CONSTRAINT .....	38
TABLE 4-5. DISPERSION RESULTS COMPARED WITH DESIGN LIMITS .....	41
TABLE 4-6. SUMMARY OF VACUUM IMPACT POINT DISPERSIONS .....	52
TABLE 4-7. MEAN AND DISPERSED POST-SEPARATION PAYLOAD BODY RATES .....	55
TABLE 4-8. MEAN AND DISPERSED PRE-SEPARATION BODY RATES.....	55
TABLE 5-1. TRACKING STATION LOCATIONS.....	57
TABLE 5-2. AIM MISSION FLIGHT PLAN SUMMARY (WESTERN RANGE) .....	59
TABLE 5-3. CALF CAPTIVE CARRY TRACKING DATA SUMMARY.....	59
TABLE 5-4. PPTQ CAPTIVE CARRY TRACKING DATA SUMMARY .....	59
TABLE 5-5. SNIF CAPTIVE CARRY TRACKING DATA SUMMARY.....	60

**LIST OF APPENDICES**

A. NOMINAL 6DOF TRAJECTORY OUTPUT DATA.....	A-1
B. GROUND STATION TRACKING DATA FOR NOMINAL 6DOF TRAJECTORY .....	B-1

**LIST OF ACRONYMS**

3DOF	Three Degrees-of-Freedom
6DOF	Six Degrees of Freedom
AIM	Aeronomy of Ice in the Mesosphere
AN	Ascending Node
C/CAM	Contamination And Collision Avoidance Maneuver
CA	Carrier Aircraft
CDRL	Contract Data Requirements List
DAP	Digital Autopilot
deg	degrees
DOF	Degrees of Freedom
DPAF	Dual Payload Attached Fitting
ECF	Earth-Centered-Fixed
ECI	Earth-Centered-Inertial
EEPROM	Electrically Erasable Programmable Read Only Memory
ER	Eastern Range
FA	Fin Actuator
FMA	Final Mission Analysis
FTS	Flight Termination System
GMT	Greenwich Mean Time
GN&C	Guidance, Navigation, and Control
GPS	Global Positioning System
GRAM	Global Reference Atmosphere Model
HAPS	Hydrazine Auxiliary Propulsion System
I/O	Input/Output
IA	Instrumented Aircraft
IE	Inertial Electronics
IIP	Instantaneous Impact Point
IMU	Inertial Measurement Unit
INS	Inertial Navigation System
ISA	Inertial Sensor Assembly
KSC	Kennedy Space Center
lbf	pound force
lbm	pound mass
LSG	Launch Systems Group

**LIST OF ACRONYMS (CONTINUED)**

MCD	Mission Constraints Document
MDL	Mission Data Load
MIWG	Mission Integration Working Group
MLT	Mean Local Time
MOI	Moment of Inertia
MSL	Mean Sea Level
nmi	nautical mile
NRTSIM	Non-Real Time Simulation
OLS	Orbital Launch Services (NASA)
Orbital	Orbital Sciences Corporation
PEG	Powered Explicit Guidance
PMC	Polar Mesospheric Cloud
POST	Program to Optimize Simulated Trajectories
ppm	parts per million
PPWR	Peg Power Up
PSF	Pounds per Square Foot
psia	pounds per square inch absolute
PVT	Position, Velocity, and Time
rad	radians
RAAN	Right Ascension of the Ascending Node
RAGM	Right Ascension of Greenwich Meridian
RA-MSUN	Right Ascension of the Mean Sun
RCS	Reaction Control System
RLG	Ring Laser Gyro
RSS	Root Sum of Squares
RTF	Return to Flight
S1	Stage One
S2	Stage Two
S3	Stage Three
SIGI	Space Integrated GPS/INS
SP	System Processor
SRS	Software Requirements Specification
TOF	Time of Flight
TVC	Thrust Vector Control

**LIST OF ACRONYMS (CONTINUED)**

USAF	United States Air Force
UT	Universal Time
UTC	Universal Time Coordinated
VAFB	Vandenberg Air Force Base
VME	VersaModule Eurocard
WFF	Wallops Flight Facility
WR	Western Range
WRT	With Respect To
XL	Enhanced Version of Pegasus

## 1. INTRODUCTION

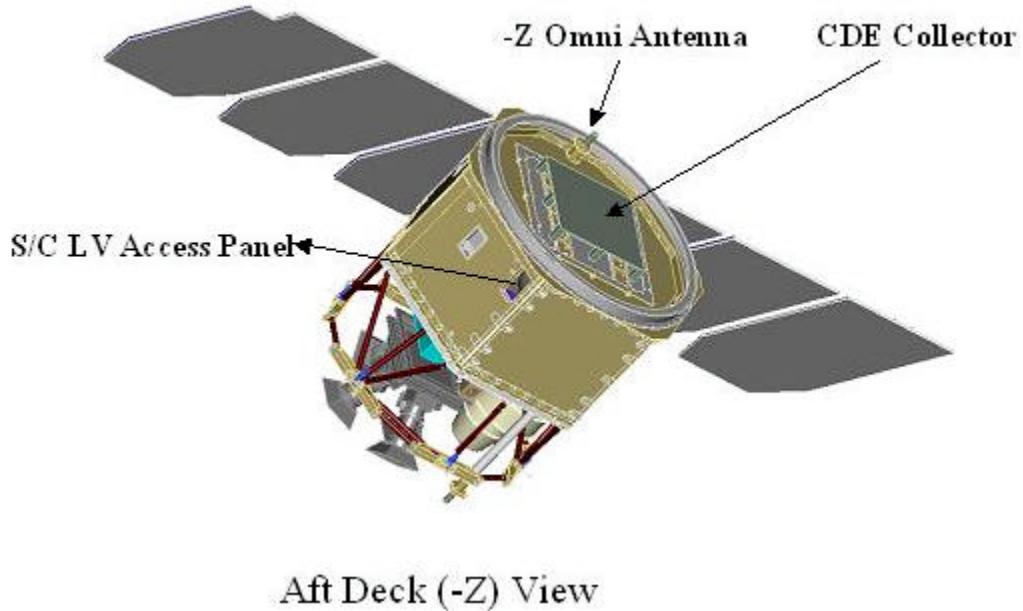
### 1.1. Purpose

The purpose of this document is to present the mission analysis for the Aeronomy of Ice in the Mesosphere (AIM) Pegasus mission. To meet the particular requirements of the AIM payload, Orbital Sciences Corporation, Launch Systems Group (Orbital/LSG) has developed a mission trajectory design using the industry-standard 3DOF Program to Optimize Simulated Trajectories (POST). This optimized 3DOF trajectory was then used as the basis for developing a nominal 6DOF simulation using the Orbital/LSG proprietary trajectory simulator, NRTSIM.

The primary goal of the AIM (Figure 1-1)<sup>1</sup> mission is to determine why polar mesospheric clouds (PMCs) form and why they vary.

### 1.2. Scope

This document includes general trajectory information, estimated trajectory dispersions, and tracking coverage information from the nominal 6DOF trajectory simulation.



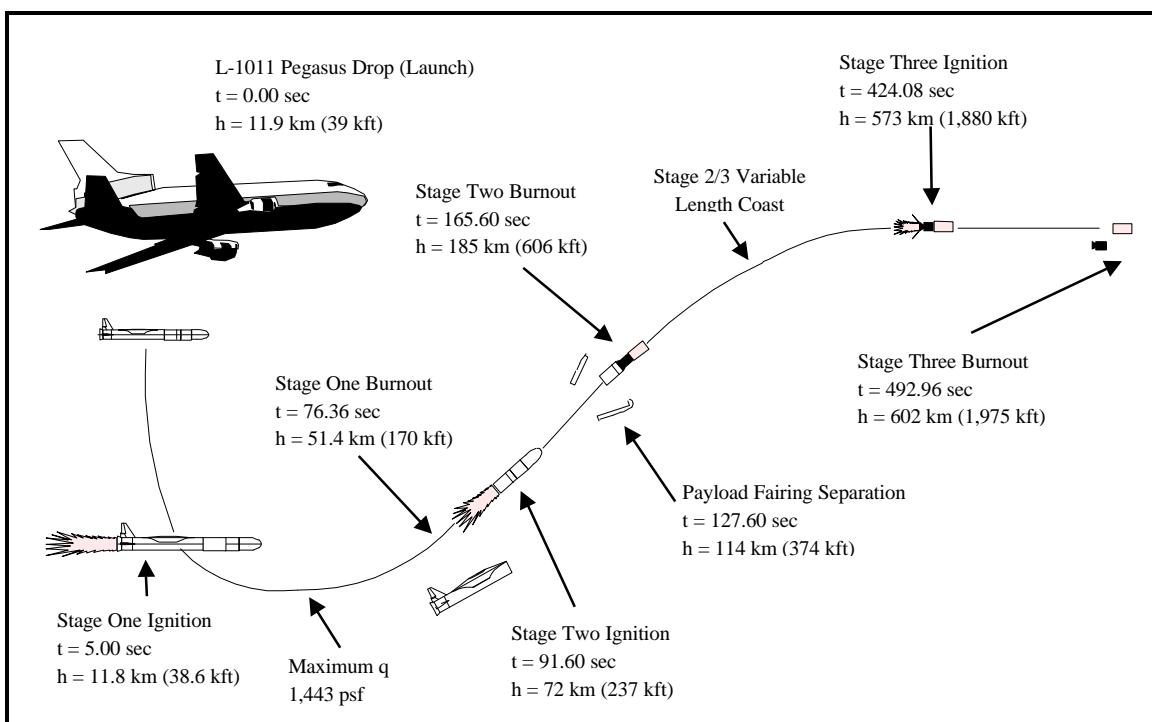
**Figure 1-1. AIM Spacecraft**

<sup>1</sup> AIM Interface Control Document, A70450 Rev.- Preliminary

## 2. VEHICLE CONFIGURATION

### 2.1. General Description

The launch vehicle to be used for the AIM mission will be the Pegasus XL. The Pegasus XL is a winged, three-stage, solid rocket booster weighing approximately 23,300 kg (51,300 lbm) and measuring 16.9 m (55.5 ft) in length and 1.27 m (50 in) in diameter. It is lifted by a carrier aircraft to a level flight condition of approximately 11,900 m (39,000 ft) and Mach 0.82. After release from the aircraft and Stage 1 (S1) motor ignition, the vehicle's autonomous guidance and flight control system provides all guidance necessary to insert payloads into a wide range of sub-orbital and orbital trajectories. The AIM mission profile is presented in Figure 2-1. The following sections give a summary description of the launch vehicle components, their design philosophy and heritage.



**Figure 2-1. Pegasus XL AIM Mission Profile**

## **2.2. Summary of Vehicle Systems**

Figure 2-2 shows an expanded view of the Pegasus XL configuration. The vehicle incorporates seven major elements: three solid rocket motors, a payload fairing, a lifting wing, an avionics assembly, and an aft skirt assembly including three movable control fins.

Figure 2-3 illustrates the Pegasus XL principal vehicle coordinates and dimensions.

The three solid rocket motors manufactured by Alliant Techsystems were designed and optimized specifically for the Pegasus XL vehicle and include features that emphasize reliability, ease in manufacturing and low cost. The designs were developed using previously flight-proven and qualified materials and components. To maximize savings, efficiency and reliability, common design features were applied to all three motors. Principal motor dimensions and nominal mass and performance characteristics for a typical Pegasus XL vehicle are listed in TABLE 2-1.

The payload fairing consists of five major components: Two composite halves, a nose-cap which is bonded to one of the halves, one or more payload access doors and a fairing separation mechanism. The fairing and mechanical interfaces may accommodate one or more payloads simultaneously, depending upon available space and vehicle performance.

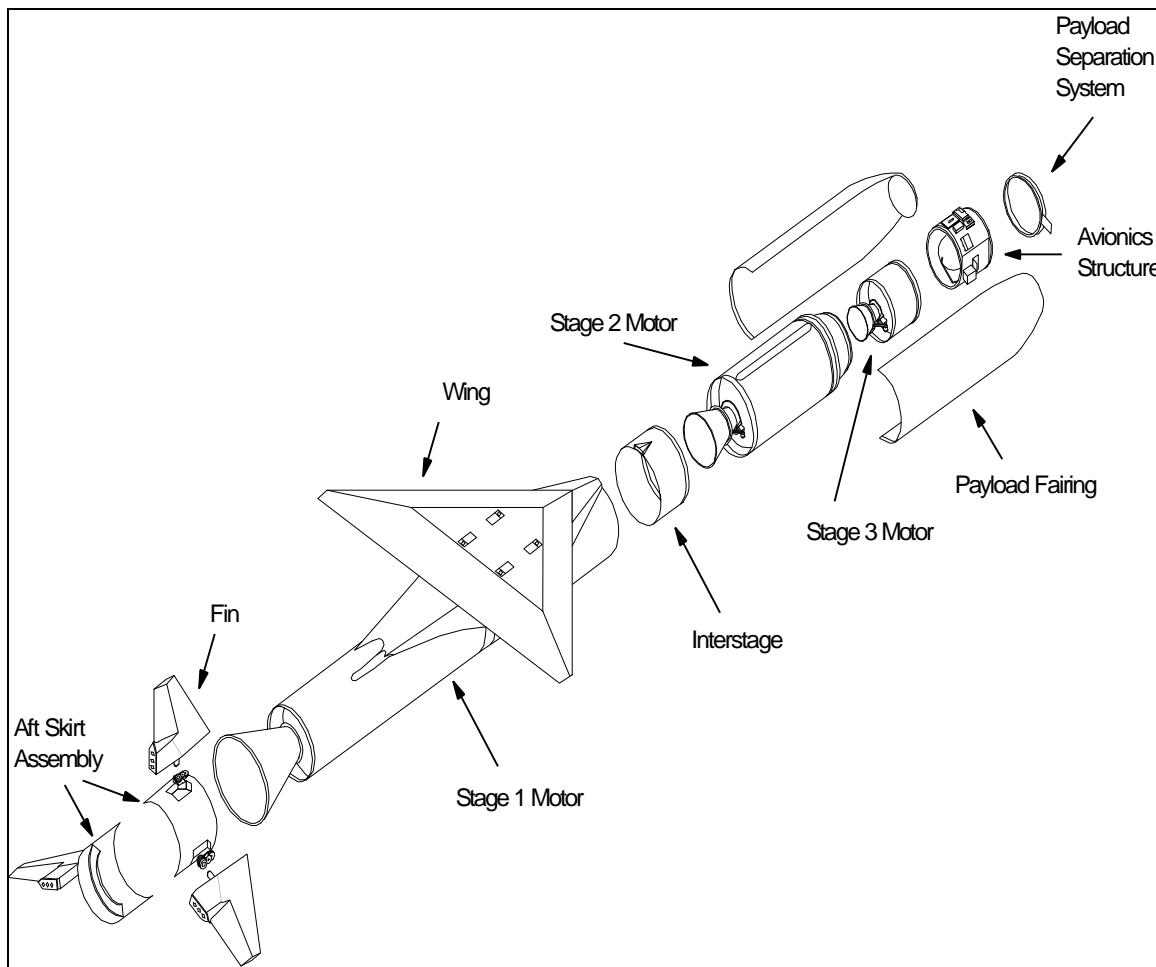
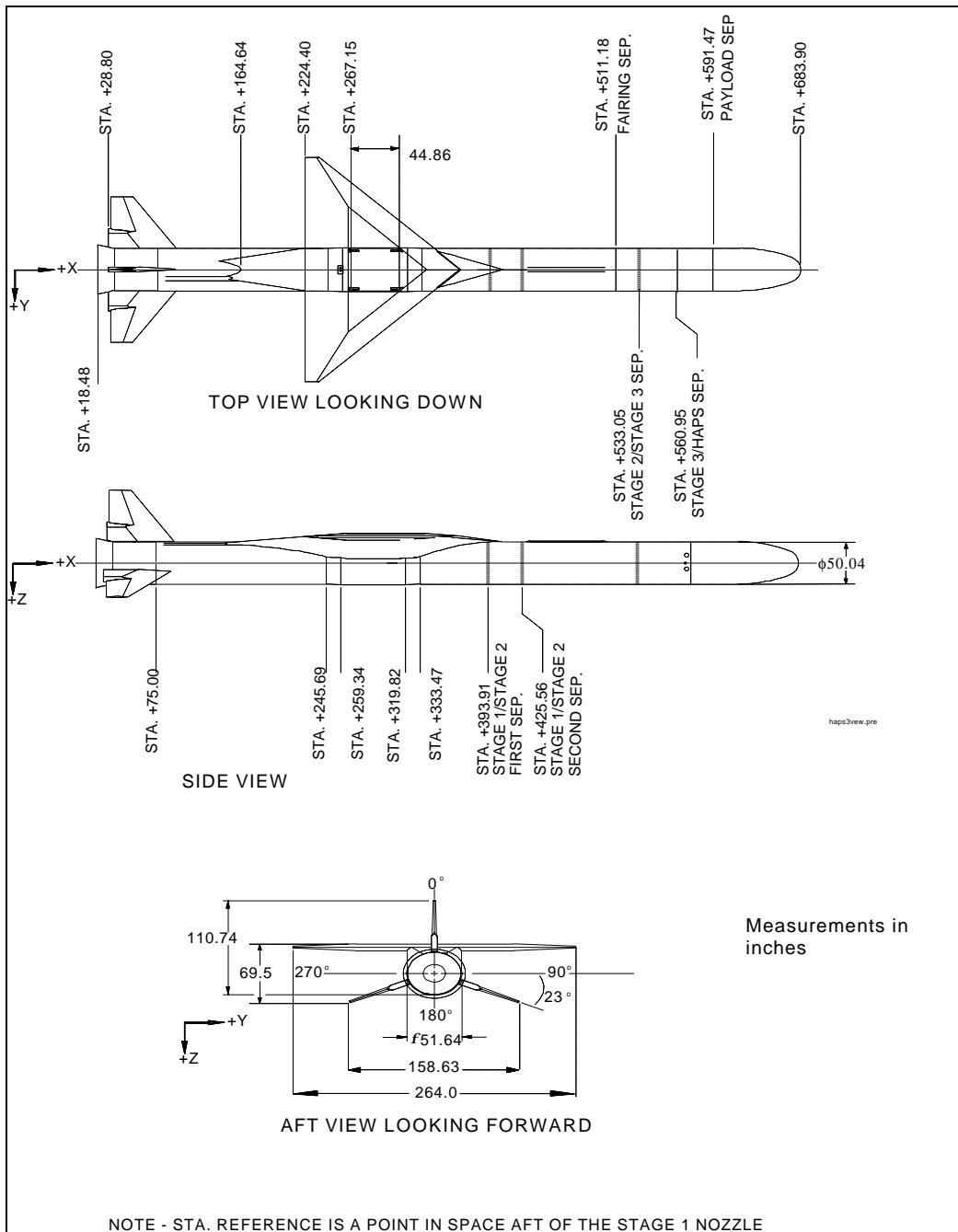


Figure 2-2. Pegasus XL Configuration Expanded View



**Figure 2-3. Pegasus XL Vehicle Coordinates and Dimensions**

TABLE 2-1. TYPICAL PEGASUS XL MOTOR CHARACTERISTICS

Description	Units	Stage 1	Stage 2	Stage 3
Overall Length	in	405.5	140.5	52.7
Diameter	in	50.2	50.2	38.0
Inert Weight	lbm	3073.6 (1)	926.0 (2)	237.8 (2)
Propellant Weight (3)	lbm	33,075	8636	1696.2
Expended Inert	lbm	137	78	13.6
Total Vacuum Impulse	lbf-sec	9,799,100	2,521,700	493,380
Max. Case Pressure (4)	psia	1266	1194	801
Avg. Pressure (4)	psia	1071	1009	655
Burn Time (4,5)	sec	68.7	68.1	64.4
Max. Vacuum Thrust (4)	lbf	161,198	40,891	8603
Specific Vacuum Impulse (4)	sec	293.59	290.25	290.22
Effective Specific Impulse (4,6)	sec	294.78	288.76	287.92
Initial Expansion Ratio	-	39.5	58.6	67.5
Initial Throat Diameter	in	8.890	4.424	2.515
Exit Diameter	in	55.9	33.86	20.66
TVC Deflection	deg	NA	±3	±3

- Notes:
- (1) Including Wing Saddle, Truss, and Associated Fasteners
  - (2) Does Not Includes TVC Hardware
  - (3) Includes Ignition Propellants
  - (4) At 70 deg F
  - (5) To 30 psia
  - (6) Delivered (Includes Expendet Inert)

The Pegasus XL avionics system is an all-digital design that exploits flight-proven hardware, software, communications systems. Most Pegasus subsystems are single-string and mission reliability is achieved by the use of simple designs and highly reliable components, combined with high design margins and extensive testing at the subsystem and system level. All Flight Termination System (FTS) and ordnance components are redundant.

A Motorola 68030-based VME bus flight computer provides central control of all vehicle functions. The flight computer communicates with the Inertial Navigation System (INS) for vehicle position and attitude, and generates commands for the fin control, Thrust Vector Control (TVC) and Reaction Control System (RCS). It generates all sequencing commands for pyrotechnic events. It also gathers telemetry from subsystems and data multiplexers, and formats the telemetry for transmission to the ground. The flight

computer consists of four boards; a dedicated 32 MHz 68030 CPU board used for autopilot functions, two six-channel intelligent 68302-based communications boards used for telemetry and vehicle communications, and a slave discrete I/O board. Communications with all sub-systems occur via asynchronous and synchronous RS-422 serial interfaces. The discrete I/O board provides all flight critical and payload discrete I/O.

After release from the carrier aircraft, Pegasus is fully autonomous except for range safety flight termination commands. A combination of open-loop steering and closed-loop guidance is employed during the flight. Stage 1 guidance utilizes steering attitude profiles optimized by ground simulations. Stages 2 and 3 (S2, S3) guidance uses an adaptation of an algorithm that was first developed for the Space Shuttle ascent guidance. All attitude control is closed-loop.

TABLE 2-2 summarizes the attitude and guidance modes during a typical flight. The exact sequence is controlled by the flight Mission Data Load (MDL) and is tailored to the specific mission requirements for the particular mission.

**TABLE 2-2. TYPICAL ATTITUDE AND GUIDANCE MODES**

Time (sec)	Event	Guidance Mode	Attitude Mode
0	Drop	Open-Loop	Inertial Euler Angles
5	S1 Ignition	Open-Loop	Inertial Euler Angles
16	Maximum Pitch Up	Open-Loop	Nz Limit
30	Pitch Down	Open-Loop	Inertial Euler Angles
65	Minimize Angle of Attack	Open-Loop	Gravity Turn
87	Begin S2 Powered Explicit Guidance (PEG)		Gravity Turn
90	Fins Zeroed		Gravity Turn
91	S2 Ignition	Closed-Loop PEG	Command Attitude
189	Begin S3 PEG Calculations		Attitude Hold
449	S3 Ignition	Closed-Loop PEG	Command Attitude
583	Payload Events as Required		Command Attitude

The Space Integrated GPS/INS (SIGI) is a self contained, all attitude inertial strapdown navigation system integrated with a tightly coupled GPS receiver within a single chassis. The Primary Nav SIGI consists of the following major components; Inertial Sensor Assembly (ISA) which contains the gyros and sensors, the Inertial Electronics (IE) Card, the System Processor (SP), and the GEM III GPS Module. The SIGI is

capable of providing three independent navigation solutions; Free Inertial, Blended GPS/INS, and GPS PVT (position, velocity, and time). The Free Inertial solution is completely unaided, including a lack of any vertical channel clamping. Therefore after approximately 15 minutes in navigate mode in a static environment, the vertical velocity will run off exponentially. To mitigate this affect, a handover capability has been enabled that allows the operator to update the free inertial solution with the blended parameters.

The Pegasus FTS supports ground-based command destruct and the capability to sense premature stage separation, which will automatically destruct the separating stage. Generally, no FTS support is required for the payload.

### **2.3. Vehicle Mass Summary**

TABLE 2-3 provides the vehicle mass summary. The summary is based on data from the Orbital/LSG document, "AIM Mission Mass Properties Data" (TM-18081, Rev A).

TABLE 2-3. PEGASUS XL VEHICLE MASS SUMMARY FOR THE AIM MISSION

Component	Inert Mass (lbm)	Expend Mass (lbm)
S1 Total Assembly	38196.26	
S1 Propellant	-33155.00	+33155.00
S1 Expended Inert	-137.00	+137.00
S1 Nozzle Baffle	-44.30	
S1/2 Sep Ring, S2 Nozzle Baffle	+13.00	
S1 Jettisoned Inert	4872.96	
S1 Expended		33292.00
Fairing	347.90	
Fairing Sep Ring (assumes frangible joint)	+20.34	
Fairing Jettisoned Inert	368.24	
S2 Total Assembly	9773.03	
S2 Propellant	-8646.45	+8646.45
S2 Expended Inert	-51.90	+51.90
S1/2 Sep Ring, S2 Nozzle Baffle	-13.00	
S2/3 Sep Ring, S3 Nozzle Baffle	+10.30	
S2 Jettisoned Inert	1071.98	
S2 Expended		8698.35
S3 Total Assembly	1973.41	
S3 Propellant	-1698.68	+1698.68
S3 Expended Inert	-15.10	+15.10
S3 Nozzle Baffle	-10.30	
Avionics Section and Adapter	+158.03	
RCS Gas	+12.40	
S3 Jettisoned Inert	419.76	
S3 Expended		1713.78
AIM Payload <sup>2</sup>	460.63	

<sup>2</sup> Includes payload mass plus Orbital-installed flyaway mass, if any.

## **2.4. Vehicle Payload Performance**

The maximum contractual payload mass Pegasus must provide to the AIM target orbit of 600 x 600 km, 97.79 degrees inclination, has been determined to be 235 kg (518 lbm) with all assumptions consistent with those used to provide performance estimates in the SELVS 2 contract. For example, auxiliary payload harness included, wide-band accel system included, fairing jettison criterion = 0.01 psf, etc.

In the AIM Mission Mass Properties (TM-18081, Rev A), the payload mass was assumed to be 205.0 kg (451.9 lbm) to which 3.94 kg of separation system hardware is added to provide a total separable payload mass of 208.9 kg (460.63 lbm, see TABLE 2-3). The maximum payload capability to the AIM target orbit for this mission specific Pegasus XL vehicle is 250.6 kg (552.6 lbm), which provides 15.6 kg (34.4 lbm) of margin relative to the maximum requirement. This estimate represents a snapshot of the maximum vehicle performance estimated using a minimum guidance reserve (220 ft/sec) and current vehicle modeling assumptions, with the exception that all S3 ballast has been removed. This maximum performance estimate is expected to fluctuate as the vehicle mass properties and other vehicle modeling assumptions change over the course of mission development, but the magnitude of the performance margin available should be more than adequate to cover those fluctuations.

## **3. TRAJECTORY DESCRIPTION**

The baseline Pegasus trajectory for the AIM mission is designed to place the 205.0 kg AIM payload into a 600 x 600 km orbit at 97.79° inclination. The L-1011 Pegasus carrier aircraft will stage out of Vandenberg Air Force Base (VAFB) with the Western Range (WR) acting as the lead range for the launch. The nominal drop will occur at a drop point of 36° N, 237° E. Nominal L-1011 drop conditions are approximately 11,887 m (39,000 ft) and Mach 0.82, with a nominal true heading of 197.0°.

### **3.1. Mission Requirements**

The requirements used as inputs to this analysis were taken from the AIM Mission Software Requirements Specification (A60450, Rev B).

The launch vehicle requirements for the AIM mission will be to deliver the payload to the target orbit while minimizing apogee, perigee, and inclination errors. In addition, the AIM mission has a mean local time of ascension node (MLT-AN) requirement described in Section 1.1.3 of the Mission Software Requirements Specification (A60450, Rev B). This requirement defines a target MLT-AN that must be satisfied to within a specified tolerance ( $\pm 4$  minutes). This requirement will be met for the AIM mission by appropriately selecting the launch window that satisfies the specified requirement (see Section 4.5.3.2 for details).

AIM payload separation will occur 60 seconds after stage 3 burnout, with the pre-separation attitude being unconstrained. Upon separation, the tip-off rates about each of the three Pegasus axes shall be less than 4 deg/sec. Finally, a Contamination and Collision Avoidance Maneuver (C/CAM) will be performed by the launch vehicle starting 3 seconds after AIM separation. Refer to Section 6 for details regarding the C/CAM analysis.

### **3.2. Guidance System**

The guidance strategies used in Pegasus trajectories are summarized in Table 3-1. The Powered Explicit Guidance algorithm, initiated after S1 burnout, allows the flight computer to manage the energy state of the vehicle such that excess energy may be scrubbed-off, if so desired. The mechanics of this energy management capability is discussed in greater detail in the next two sections.

**TABLE 3-1. PEGASUS GUIDANCE STRATEGY**

Trajectory Segment	Guidance Algorithm
Stage 1 Burn	Open Loop Inertial Euler Angle Tables
Stage 1/2 Coast	Energy Management Calculations
Stage 2 Burn	Powered Explicit Guidance
Stage 2/3 Coast	Energy Management Calculations
Stage 3 Burn	Powered Explicit Guidance

#### **3.2.1. Guidance Reserve**

In order to maximize the likelihood that even a minimum-performing Pegasus vehicle will achieve an acceptable orbit, Pegasus trajectories are nominally designed to include a 220 ft/sec guidance reserve. Since the AIM mission has additional performance reserve available beyond 220 ft/sec, the guidance reserve for this mission has been increased to approximately 500 ft/sec. The nominal (220 ft/sec) reserve represents the maximum velocity shortfall a Pegasus vehicle would experience over the first two motor burns given normal trajectory dispersions. Qualitatively, this means that a vehicle which under-performs by approximately 110 ft/sec on each of the first two motor burns will still achieve the targeted insertion state, given a nominal Stage 3 burn. This in turn implies that a nominally performing vehicle will have approximately 220 ft/sec surplus velocity at insertion, unless the excess energy is scrubbed-off by the guidance system.

For the AIM mission, the surplus velocity at insertion for a nominally performing vehicle will be 500 ft/sec. The increased guidance reserve will aid vehicle performance recovery in the event of unusually deficient vehicle motor performance on the first two stages. In the 3-DOF POST simulations, this 500 ft/sec guidance reserve is modeled by reducing the thrust profiles for the first two motors such that approximately 100 ft/sec ideal velocity is lost during the first burn, while the remaining 400 ft/sec is lost during the second burn. In this respect, the nominal 3-DOF trajectory actually simulates a less than minimum under-performing vehicle over the first two motor burns.

### **3.2.2. Energy Management Options**

Current Pegasus guidance software allows a variety of options to be used in conjunction with the guidance reserve. Several different guidance strategies may be employed depending on the particular mission requirements and constraints. These strategies fall into several basic categories:

- a. Use the guidance reserve to minimize insertion errors
- b. Use the guidance reserve to maximize insertion apse altitude
- c. Use the guidance reserve to maximize non-insertion apse altitude
- d. Use the guidance reserve to achieve some combination of 1), 2), and 3)

**Option 1:** Using this strategy, the guidance system will attempt to scrub-off all excess energy in an attempt to minimize insertion errors. Generally, the insertion errors of interest are perigee altitude, apogee altitude, and inclination. This strategy will result in the smallest achievable insertion errors and assumes that an orbit that is too high is just as undesirable as an orbit that is too low.

**Option 2:** Using this strategy, any excess velocity developed during the trajectory is conserved to maximize altitude at insertion. This option allows the customer to take advantage of the guidance reserve by increasing the mean expected insertion apse altitude. In this case, guidance may either adjust the non-insertion apse altitude target on the fly in an attempt to circularize the orbit at whatever insertion altitude is achieved, or guidance may continue to maintain the pre-launch, non-insertion apse altitude target. In either case, the insertion apse altitude dispersions will be significantly larger than those achieved using Option 1.

**Option 3:** Using this strategy, any excess velocity developed during the trajectory is conserved to maximize velocity at insertion. This option allows the customer to take advantage of the guidance reserve by increasing the mean expected non-insertion apse altitude. However, due to the fact that insertion velocity is effectively unconstrained, the resulting apogee dispersions may be significantly larger than those achieved using Option 1.

**Option 4:** The first three options may be combined in various ways to achieve specific guidance objectives. Options 2 and 3 are not mutually exclusive and could theoretically both be used for a particular mission. In addition, hybrid versions of either Option 2 or 3 may be employed where either insertion altitude or velocity is maximized up to a pre-determined limit, at which point Option 1 is invoked to minimize dispersions beyond that limit. However, all of these nonstandard guidance approaches have orbit dispersion implications (dispersions using these approaches will generally be much larger than those achieved using Option 1), and should not be selected without consultation with the Cognizant Pegasus Guidance, Navigation, and Control (GN&C) Engineer for the mission.

For the AIM mission, Option 1 has been identified (minimize apogee, perigee, and inclination errors) as the desired guidance strategy to be pursued. The MDL used in the dispersion analysis (Section 4.5) reflects this guidance strategy.

### **3.3. Control System Summary**

Pegasus Digital Auto Pilots (DAP) are responsible for producing actuator (fin or nozzle) and valve opening (cold gas) commands in response to attitude and attitude rate errors as well as other state variables. There are three DAPs: the Aerodynamic DAP, the TVC DAP, and the RCS DAP. The sequencing of these DAPs is summarized in TABLE 3-2.

**TABLE 3-2. PEGASUS AUTOPILOT CONTROL MODES**

Trajectory Segment	Pitch and Yaw	Roll
Stage 1 Burn	Aerodynamic Fins	Aerodynamic Fins
Stage 1/2 Coast	Cold Gas RCS	Cold Gas RCS
Stage 2 Burn	Thrust Vector Control	Cold Gas RCS
Stage 2/3 Coast	Cold Gas RCS	Cold Gas RCS
Stage 3 Burn	Thrust Vector Control	Cold Gas RCS
Post-Stage 3 Burnout	Cold Gas RCS	Cold Gas RCS

#### 4. TRAJECTORY INFORMATION

The simulation results contained in this section were generated using version 5.35 of the NRTSIM executable (Sun version), using the following input files: p45\_mdl.in, revision 1.3; p45\_vsf.in, revision 1.1; p45\_mnem.def, revision 1.0; and p45\_eb.in, revision 1.3.

##### 4.1. Sequence of Events

TABLE 4-1 outlines the sequence of events for the AIM mission based on the nominal 6DOF trajectory simulation. This table also provides the nominal estimated RCS gas consumption at each point in the trajectory. The total N<sub>2</sub> RCS gas load is nominally 12.40 lbm at drop. The RCS gas may be varied by two pounds to offset weight changes in the final weight to orbit from the nominal.

**TABLE 4-1. AIM MISSION NOMINAL TIMELINE AND RCS GAS USAGE**

Event	Time from Drop (sec)	RCS Gas Usage (lbm)
Drop From Aircraft	0.00	0.0
Stage 1 Motor Ignition	5.00	0.0
Stage 1 Motor Burnout	76.36	0.0
Stage 1 Separation	90.76	0.0
Stage 2 Motor Ignition	91.60	0.0
Fairing Separation	127.60	0.51
Stage 2 Motor Burnout	165.60	0.51
Stage 2 Separation	413.04	2.30
Stage 3 Motor Ignition	424.08	2.31
Stage 3 Motor Burnout	492.96	2.31
AIM Payload Separation	552.96	2.88
Initial C/CAM Attitude	555.96	3.19
Turn Off TLM Transmitter	612.96	3.30
Begin Crab Walk	852.96	3.50
End Crab Walk	1152.96	4.24
Nitrogen Venting	1157.96	4.24
End of Sequencer	1187.96	12.34

#### **4.2. Definition of Drop Zone**

The nominal drop zone for the AIM mission consists of a rectangular area oriented along the 197.0 deg drop azimuth. This rectangle extends 20 nmi uprange and downrange, and 5 nmi cross range (in both directions) from the nominal drop point of 36° North latitude and 237° East longitude.

The allowable altitude range at drop corresponds to a pressure-altitude range of  $39,000 \pm 500$  ft as determined by the L-1011 flight instruments. This typically corresponds to a geometric altitude range of no greater than  $40,000 \pm 4,000$  ft.

#### **4.3. Trajectory Plots**

This section contains plots corresponding to the nominal trajectory developed using established vehicle constraints and AIM payload specific requirements.

The angle of attack profile is shown in Figure 4-1. Immediately after drop, the vehicle pitches up to approximately a 19 degree angle of attack, followed by subsequent pitch-down maneuvers. During the second and third stage burns, alpha is non-zero due to attitude adjustments made by the guidance system to account for trajectory perturbations and to manage energy. The dynamic pressure and Q-Alpha time histories are provided in Figure 4-2 and Figure 4-3, respectively.

The angle of sideslip (beta) is shown in Figure 4-4. Nominally zero throughout the Stage 1 burn, beta is also adjusted by the guidance system during the second and third stage burns to correct trajectory errors and to manage energy. The time history for the Q-Beta plot is shown in Figure 4-5.

The altitude and inertial velocity profiles are provided in Figure 4-6 and Figure 4-7, respectively. The axial acceleration profile is shown in Figure 4-8. The normal acceleration is shown in Figure 4-9 and is a result of the pull-up performed early during the S1 motor burn. Normal acceleration remains nominally at zero after approximately 70 seconds from drop. The inertial flight path angle profile is provided in Figure 4-10.

Two methods of computing aerodynamic heating rates are presented: Chapman's Equation heating and free molecular heating. The calculations corresponding to these two methods are provided in the following equations.

Chapman's Equation:

$$\dot{Q} = \frac{17600}{\sqrt{R_N}} \sqrt{\frac{\mathbf{r}}{\mathbf{r}_{SL}}} \left( \frac{V_A}{26000} \right)^{3.15}$$

Free Molecular Heating Equation:

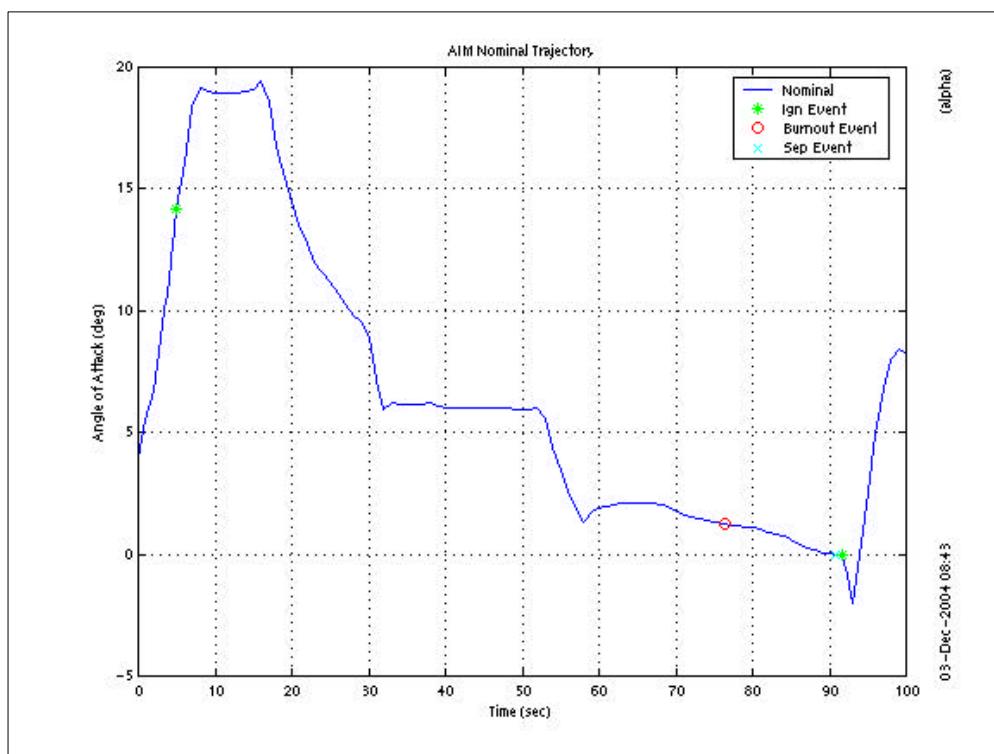
$$\dot{Q} = \left( \frac{2.3135}{3600} \right) \mathbf{r} V_A^3$$

where:

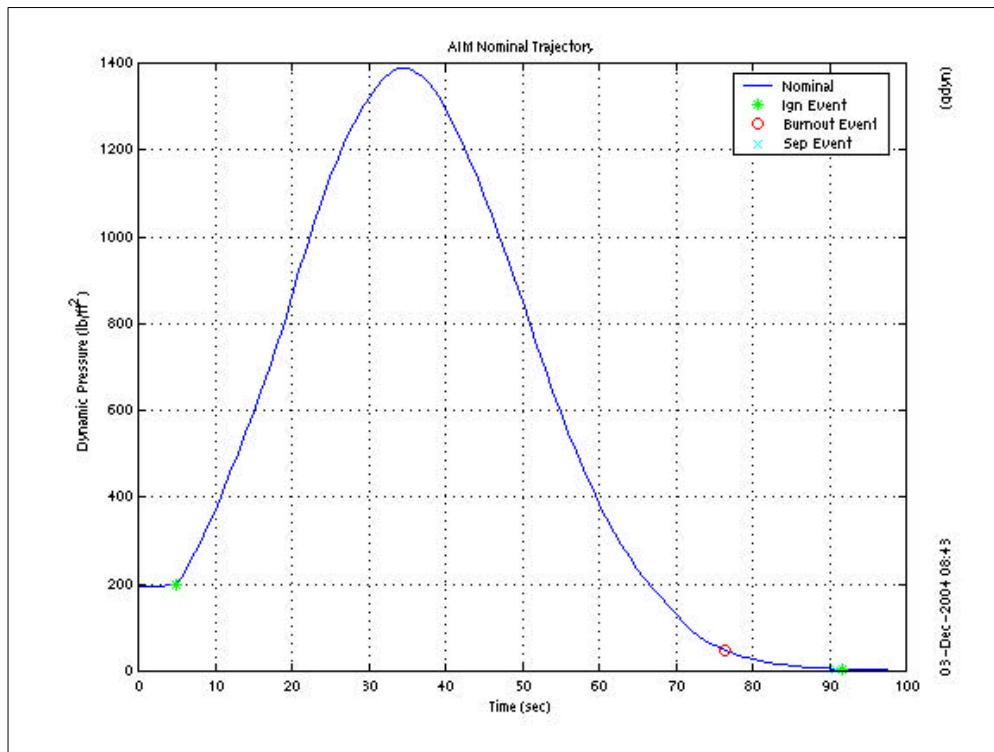
- $\dot{Q}$  = Aerodynamic heating rate (Btu/ft<sup>2</sup>/sec);  
 $R_N$  = nose-cap radius (1.33 ft);  
 $\mathbf{r}$  = atmospheric density (slugs/ft<sup>3</sup>);  
 $\mathbf{r}_{SL}$  = atmospheric density at sea level (slugs/ft<sup>3</sup>);  
 $V_A$  = atmosphere-relative velocity (ft/sec).

For the nominal 6DOF AIM trajectory, fairing deployment occurs at an altitude of approximately 114 km (62 nmi). This is within the altitude range over which the transition between Chapman's Equation heating and free molecular heating occurs, such that the former best describes heating at lower altitudes and the latter is more representative at higher altitudes.

The heating rate for the atmospheric portion of the launch phase as computed by Chapman's Equation is shown in Figure 4-11. The heating rate at the time of fairing deployment is shown Figure 4-12. In this figure, both Chapman's and free molecular heating estimates are shown to display the transition.



**Figure 4-1. Nominal Trajectory: Angle of Attack vs. Time**



**Figure 4-2. Nominal Trajectory: Dynamic Pressure vs. Time**

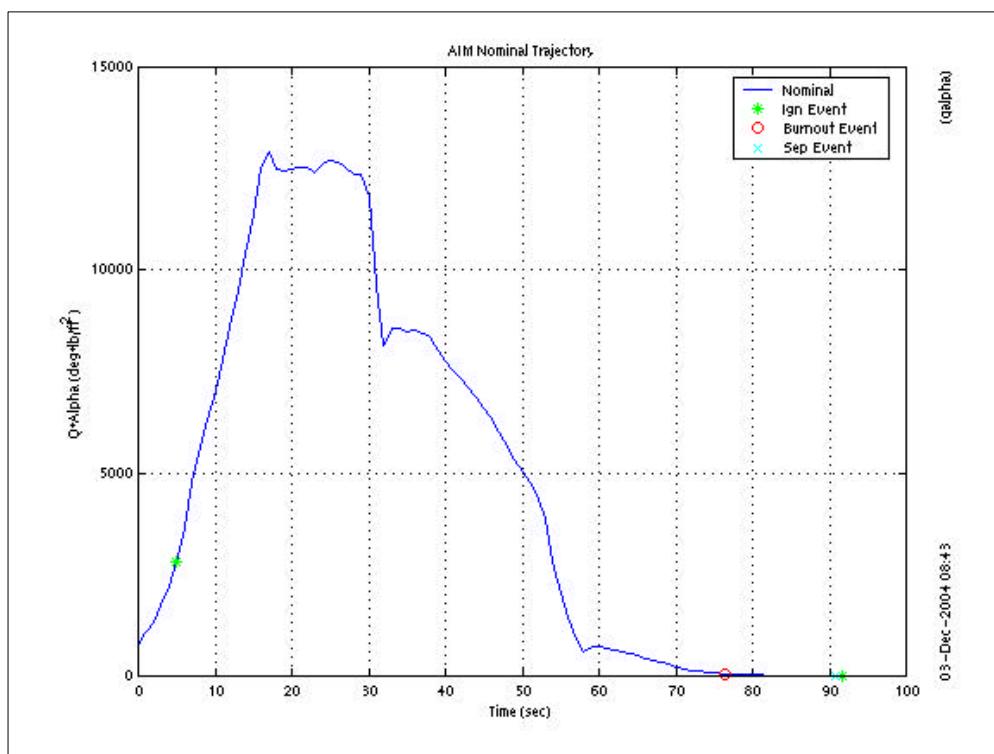


Figure 4-3. Nominal Trajectory: Q-Alpha vs. Time

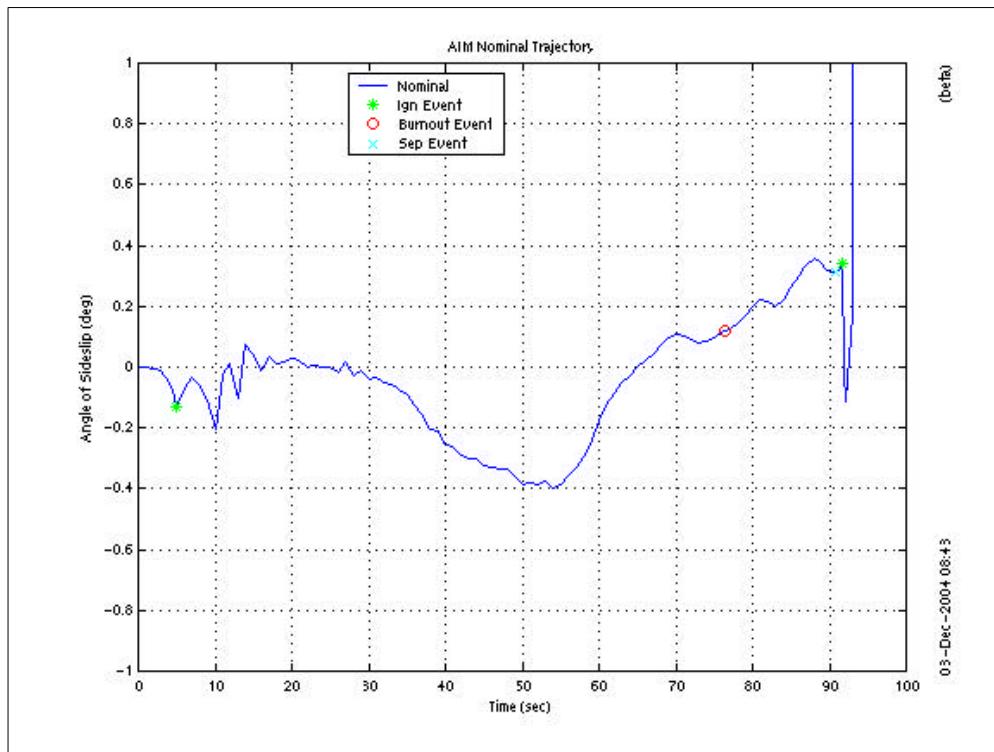
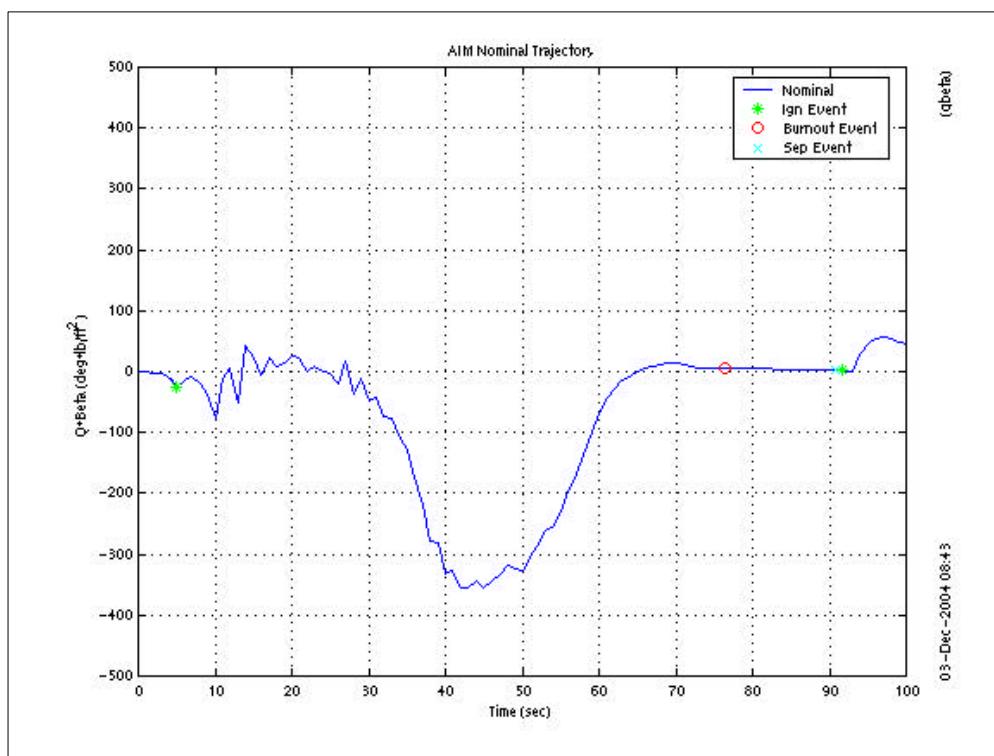
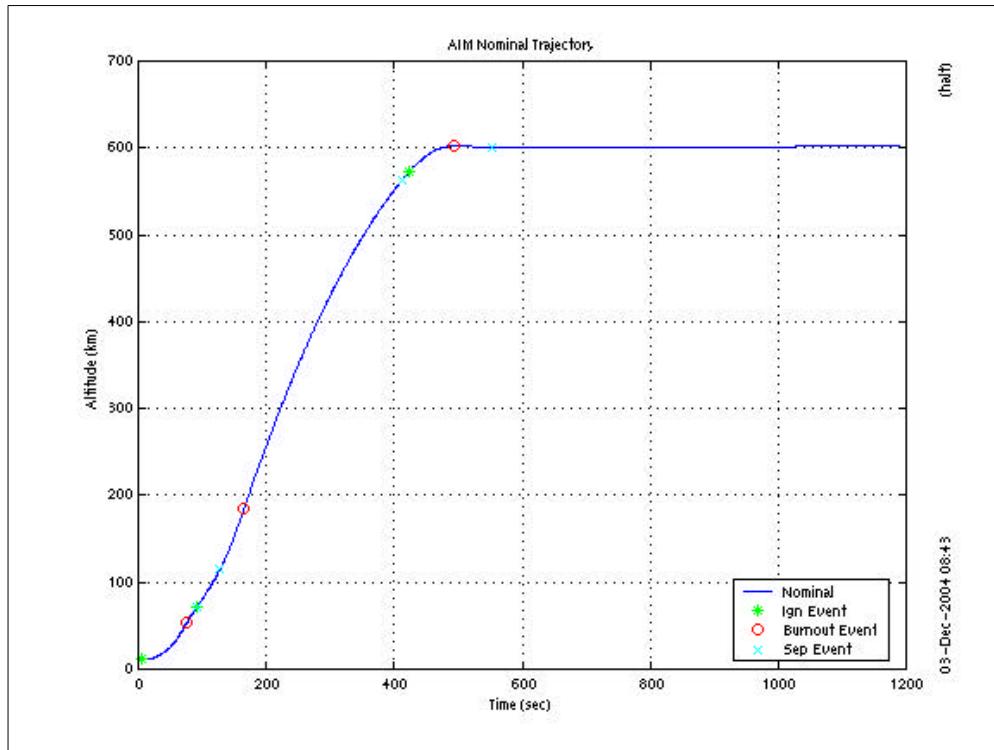


Figure 4-4. Nominal Trajectory: Angle of Sideslip vs. Time



**Figure 4-5. Nominal Trajectory: Q-Beta vs. Time**



**Figure 4-6. Nominal Trajectory: Altitude vs. Time**

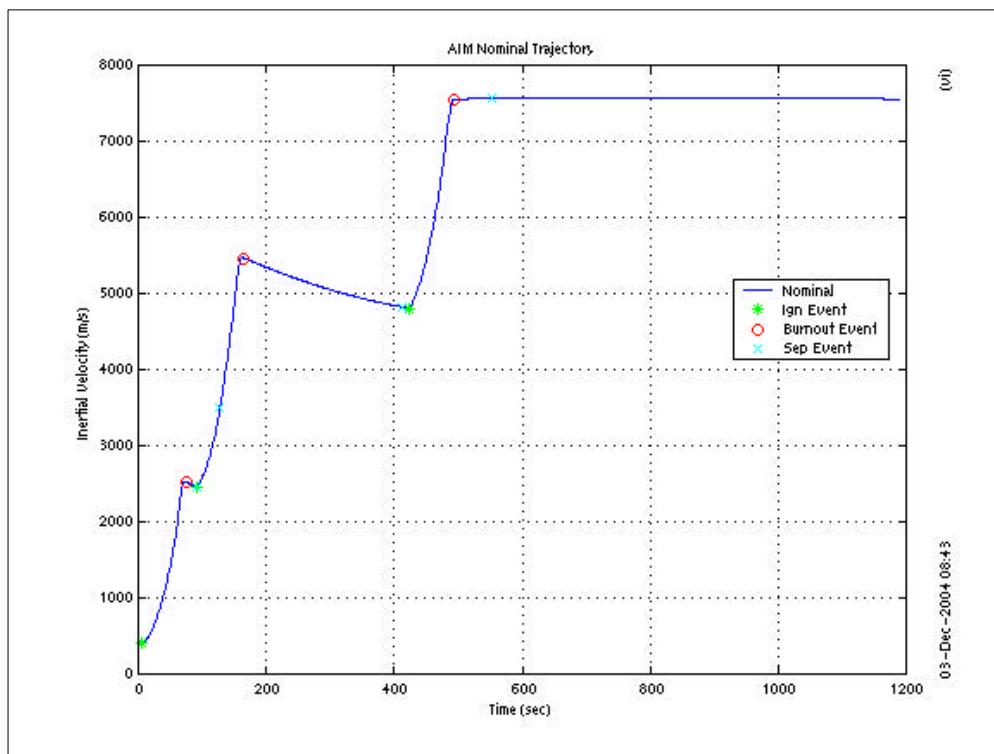


Figure 4-7. Nominal Trajectory: Inertial Velocity vs. Time

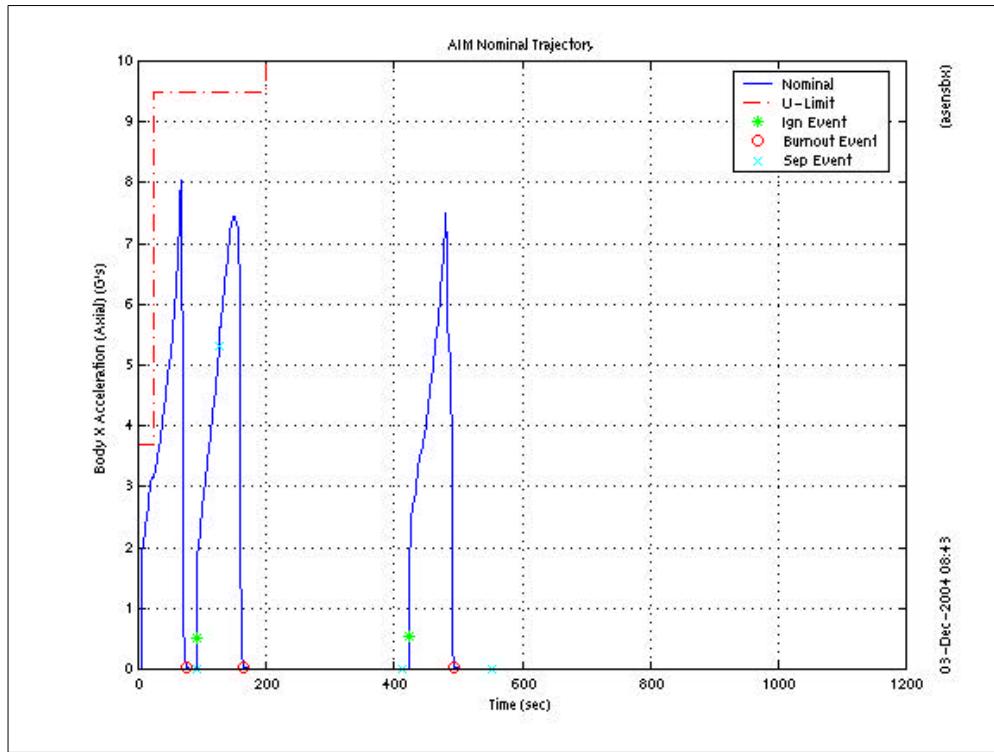
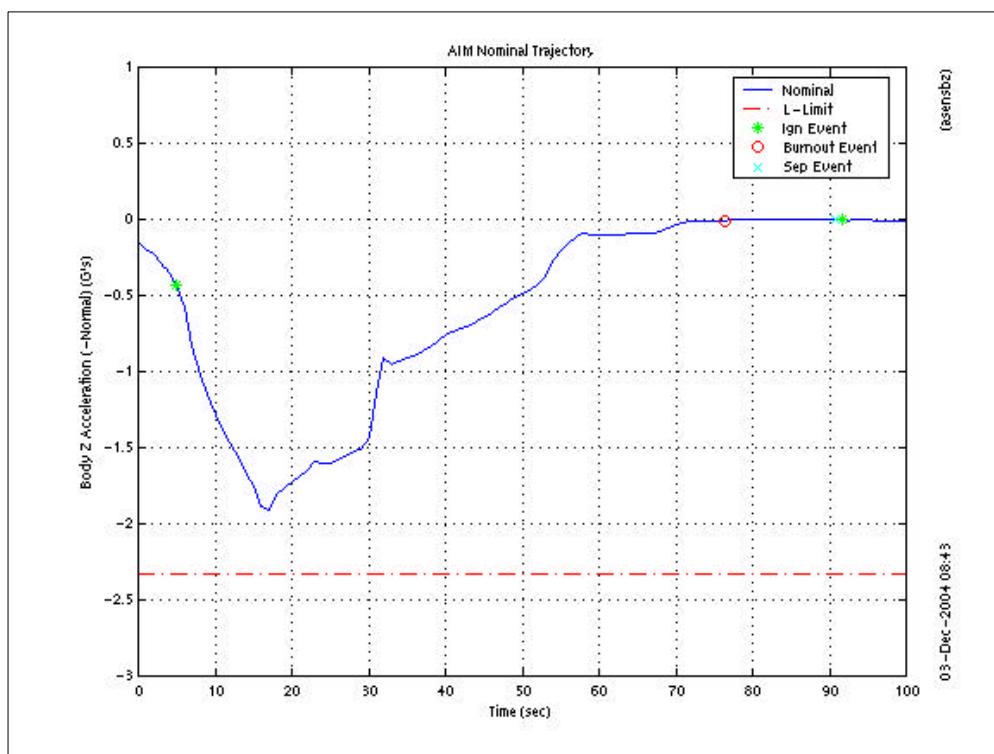
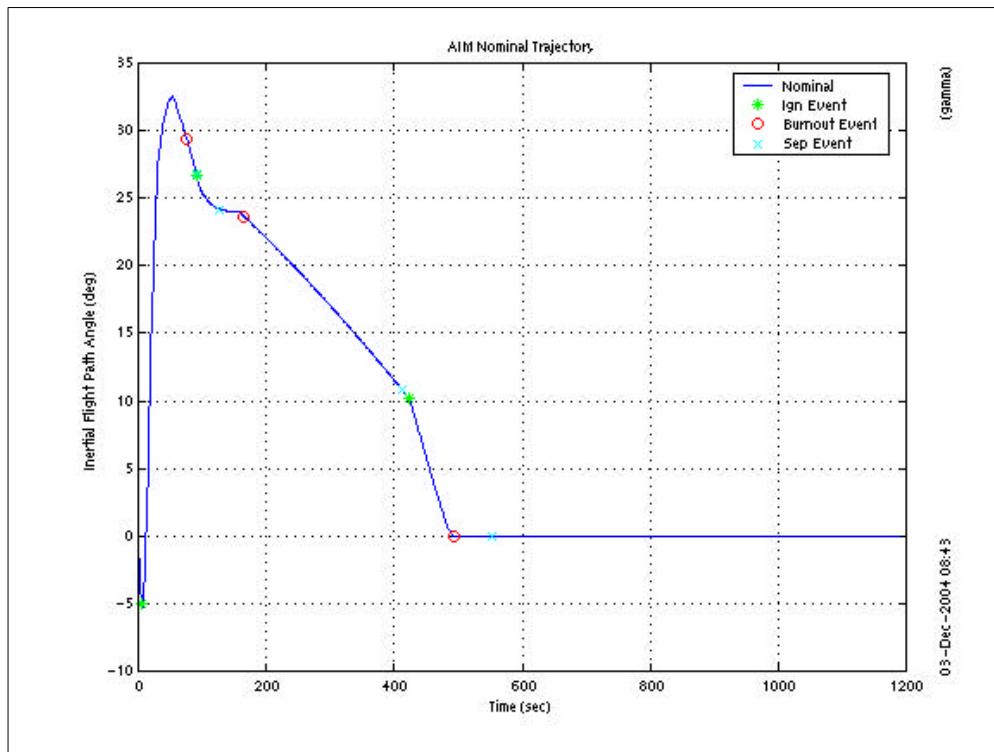


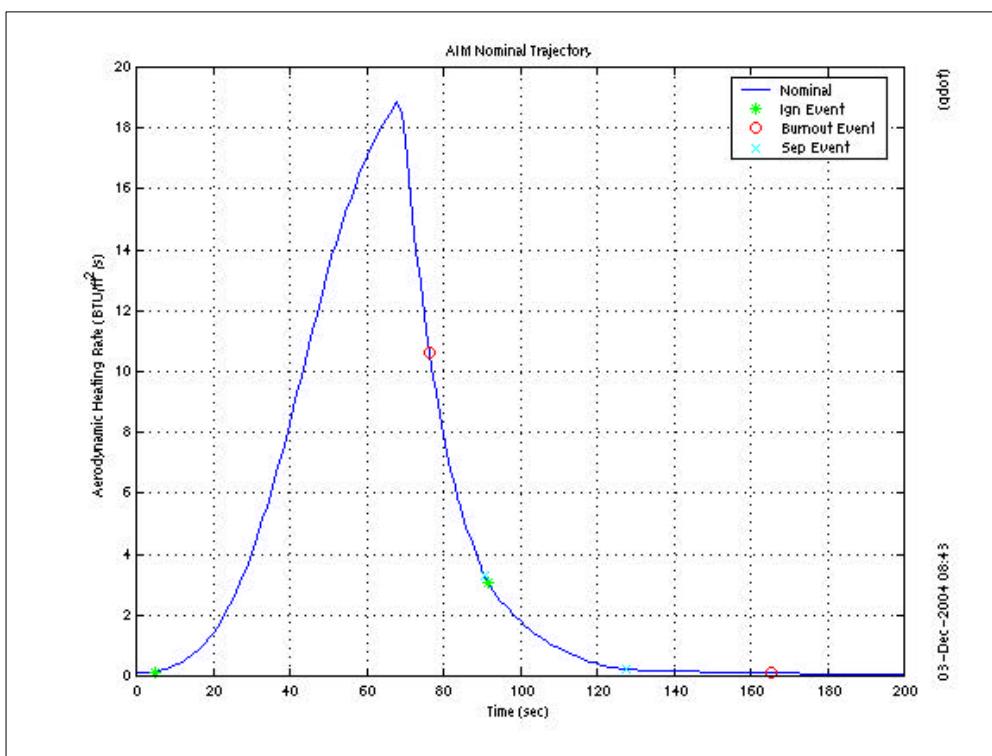
Figure 4-8. Nominal Trajectory: Axial Acceleration vs. Time



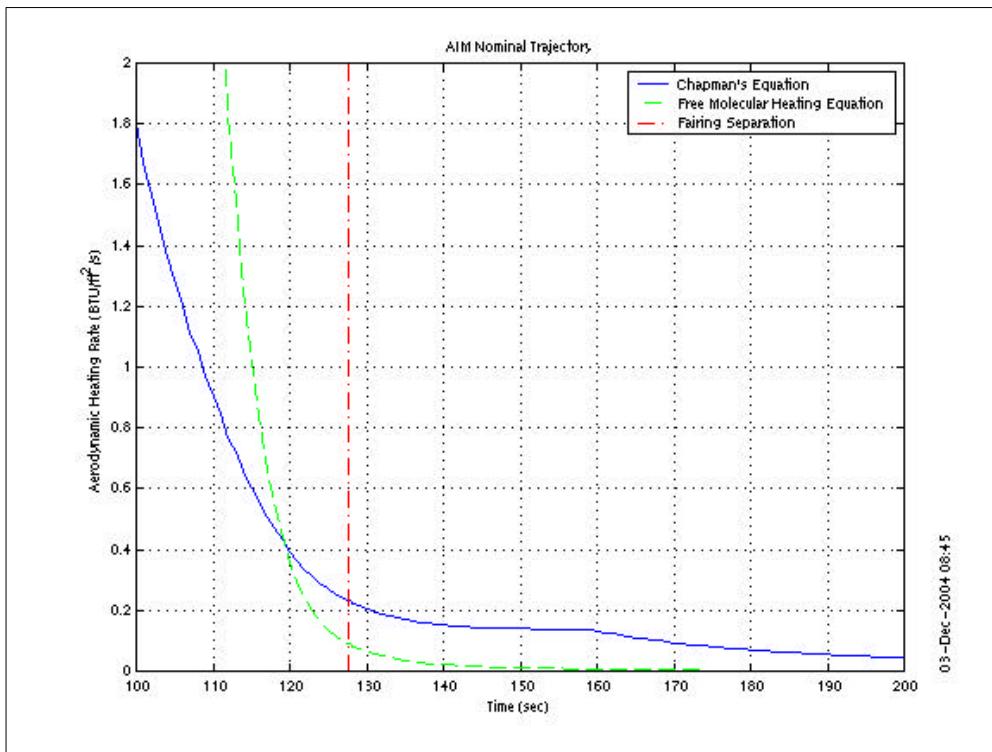
**Figure 4-9. Nominal Trajectory: Normal Acceleration vs. Time**



**Figure 4-10. Nominal Trajectory: Inertial Flight Path Angle vs. Time**



**Figure 4-11. Nominal Trajectory: Aerodynamic Heating Rate vs. Time**



**Figure 4-12. Nominal Trajectory: Aerodynamic Heating Rate @ Fairing Deployment vs. Time**

#### 4.4. Trajectory Data

A printout of the nominal AIM trajectory is provided in Appendix A. This trajectory is output from the Pegasus 6DOF simulation, NRTSIM. An electronic file containing the nominal trajectory data is also included as part of this mission analysis submittal.

#### 4.5. Dispersion Analysis

The 6DOF simulation input deck created as part of the mission analysis process consists of a vehicle model that includes mass properties, motor ballistics, and aerodynamic data, as well as a complete MDL for the mission. The MDL contains autopilot gains, attitude steering tables, and guidance system parameters. To evaluate Pegasus XL trajectory dispersions, Orbital/LSG has developed a Monte Carlo simulation based on NRTSIM. For any particular mission, the Monte Carlo simulation takes the nominal 6DOF trajectory input deck and performs a series of simulations for which it monitors parameters of interest. For each successive simulation, the Monte Carlo simulator randomly assigns a new value to each input variable that is subject to dispersions, according to a Gaussian distribution defined by the nominal value and the standard deviation.

##### 4.5.1. Dispersion Analysis Inputs

TABLE 4-2 lists the dispersion input variables currently used in the simulation, their nominal values, and their standard deviations. All other inputs to the simulation are fixed, with the exception of simulated winds. The wind data was obtained from actual measured wind profiles taken at the Western Range. The variation of wind conditions at drop leads to a ground speed dispersion range of 672 - 919 ft/s for the AIM mission. This range defines a ground speed constraint at drop and will be recorded in the Mission Constraints Document (MCD) published prior to launch.

Wind turbulence is modeled using the Dryden gust model.

**TABLE 4-2. MONTE CARLO SIMULATION DISPERSION PARAMETERS: 1-SIGMA VALUES**

Parameter	Standard Deviation
Cross-Range	$\pm 1.6667$ nmi
Down-Range	$\pm 6.6667$ nmi
Drop Altitude	$\pm 183.45$ ft
Drop Velocity (Air Relative)	$\pm 10$ ft/sec
Drop Azimuth	$\pm 1$ deg
Drop Tip-off Rates (roll, pitch, yaw)	$\pm 3, \pm 3, \pm 1$ deg/sec

TABLE 4-2. MONTE CARLO SIMULATION DISPERSION PARAMETERS: 1-SIGMA VALUES

Parameter	Standard Deviation
Atmospheric Profile Dispersions (pressure, temperature, density, and winds)	Taken from Range-specific database of GRAM99 atmosphere profiles.
IMU Initial Position Errors (Lat, Long)	$\pm 1.52\text{e-}4$ , $\pm 2.06\text{e-}4$ deg
IMU Initial Position Error (Altitude)	$\pm 71.23$ ft
IMU Initial Velocity Errors (North, East, Down)	$\pm 0.3714$ , $\pm 0.4587$ , $\pm 0.4432$ ft/sec
IMU Initial Tilt Errors (North, East, Heading)	$\pm 1.8609\text{e-}3$ , $\pm 1.7330\text{e-}3$ , $\pm 7.1881\text{e-}3$ deg
IMU Mounting Errors (x, y, z)	$\pm 0.167$ deg
IMU Gyro White Noise (x, y, z)	$\pm 0.0025$ deg/(rt-hr)
IMU Gyro Biases (x, y, z)	$\pm 0.0035$ deg/hr
IMU Gyro Scale Factor Errors (x, y, z)	$\pm 5$ ppm
IMU Gyro Misalignments	$\pm 2$ arc-sec
IMU Accel White Noise (x, y, z)	$\pm 0.096$ ft/s/(rt-hr)
IMU Accel Biases (x, y, z)	$\pm 32 \mu\text{g}$
IMU Accel Scale Factor Errors (x, y, z)	$\pm 100$ ppm
IMU Accel SF Asymmetry (x, y, z)	$\pm 20$ ppm
IMU Accel Misalignments	$\pm 9$ arc-sec
IMU Accel $\text{g}^2$ Sensitivities (x, y, z)	$\pm 20 \mu\text{g/g}^2$
IMU Latency Dispersions	$\pm 1$ msec
Drag dispersion	$\pm 5\%$
Lift dispersion	$\pm 3.3\%$
Lateral Aerodynamic Dispersions	Defined in documentation for version 9.4 of the Pegasus XL Aerodynamic Model
Asymmetric Wing Deformation Dispersions	$\pm 0.00022 C_1$ @ max. Q-alpha
Orbital S1 WT Variation	$\pm 22$ lbm
Orbital S2 WT Variation	$\pm 3$ lbm
Orbital S3 WT Variation	$\pm 0.2$ lbm
Fairing WT Variation	$\pm 4$ lbm
Avionics WT Variation	$\pm 0.8$ lbm

TABLE 4-2. MONTE CARLO SIMULATION DISPERSION PARAMETERS: 1-SIGMA VALUES

Parameter	Standard Deviation
Orbital S1 CG Variation (x, y, z)	$\pm 2, \pm 1, \pm 1$ inch
Orbital S2 CG Variation (x, y, z)	$\pm 1, \pm 0.5, \pm 0.5$ inch
Orbital S3 CG Variation (x, y, z)	$\pm 0.5, \pm 0.5, \pm 0.5$ inch
Fairing CG Variation (x, y, z)	$\pm 1.5, \pm 0.75, \pm 0.75$ inch
Avionics CG Variation (x, y, z)	$\pm 0.5, \pm 0.5, \pm 0.5$ inch
Orbital Component MOI Variations (Ix <sub>x</sub> , Iy <sub>y</sub> , I <sub>z</sub> <sub>z</sub> )	$\pm 3\%$
Orbital Component POI Variations	Variable <sup>3</sup>
Payload WT Variation	$\pm 1$ lbm
Payload CG Variation	$\pm 0.167, \pm 0.167, \pm 0.167$ inch
Payload MOI Variation (Ix <sub>x</sub> , Iy <sub>y</sub> , I <sub>z</sub> <sub>z</sub> )	$\pm 1.67\%, \pm 1.67\%, \pm 1.67\%$
Payload POI Variation (Ix <sub>y</sub> /Ix <sub>y</sub> , Ix <sub>z</sub> /Ix <sub>z</sub> , and Iy <sub>z</sub> /Iy <sub>z</sub> )	$\pm 33.3\%, \pm 33.3\%, \pm 33.3\%$
Motor(s) WT Variations (S1, S2, S3)	$\pm 25, \pm 7, \pm 1.5$ lbm
Motor(s) CG Variations (x, y, z)	$\pm 0.20, \pm 0.05, \pm 0.05$ inch
Motor(s) MOI Variations (Ix <sub>x</sub> , Iy <sub>y</sub> , I <sub>z</sub> <sub>z</sub> )	$\pm 0.2, \pm 0.2, \pm 0.2$ %
Motor(s) Total Impulse Variations	$\pm 0.2\%$
Motor(s) Prop Load Variations	$\pm 0.067\%$
Motor(s) Burn Time Variation	$\pm 2.0\%$
S1 Motor Residual Thrust Duration Dispersion Factor	-0.067/+0.067
S2 Motor Residual Thrust Duration Dispersion Factor	-0.1/+0.193
S3 Motor Residual Thrust Duration Dispersion Factor	-0.083/+0.160
Motor(s) Nozzle Offsets (y, z)	$\pm 0.03, \pm 0.03$ inch
S1 Motor Nozzle Misalignments (pitch, yaw)	$\pm 0.083, \pm 0.083$ deg
S2 Motor Nozzle Misalignments (pitch, yaw)	$\pm 0.100, \pm 0.100$ deg
S3 Motor Nozzle Misalignments (pitch, yaw)	$\pm 0.167, \pm 0.167$ deg
Motor(s) Nozzle Action Point Variations (x)	$\pm 0.167$ inch
RCS Mass Dispersion	$\pm 0.5$ lbm (uniform)
RCS Thrust Dispersion	$\pm 1$ lbf
RCS Thruster Orientation Dispersions (pitch, yaw)	$\pm 0.4^\circ$

<sup>3</sup> The source of this dispersion data is contained within PEG-0305-061 Rev A "Product of Inertia Dispersion for NRTSIM"

TABLE 4-2. MONTE CARLO SIMULATION DISPERSION PARAMETERS: 1-SIGMA VALUES

Parameter	Standard Deviation
FA Armature And Gear Train Rotational Inertia Disp.	$\pm 2.167 \times 10^{-5}$ lbm-in-sec <sup>2</sup>
FA Armature Resistance Dispersion	$\pm 0.028$ Ohms
FA Armature Inductance Dispersion	$\pm 2.1 \times 10^{-5}$ Henries
FA Armature Coulomb Friction Dispersion	$\pm 0.11$ lb-in
FA Armature Coulomb Stiction Dispersion	$\pm 0.11$ lb-in
FA Motor Torque Constant Dispersion	$\pm 0.021$ lb-in/Amp
FA Motor Cogging Torque Dispersion	$\pm 0.02$ lb-in/rad
FA Potentiometer Half Hysteresis Dispersion	$\pm 6.7 \times 10^{-6}$ rad
FA Gear Train Half Lash Amplitude Dispersion	$\pm 1.2 \times 10^{-4}$ rad
FA Fin-To-Potentiometer Stiffness Dispersion	-3.91e5, +4.77e5 lb-in/rad (uniform)
FA Gear Train And Shaft Stiffness Dispersion	-3.47e5, +4.37e5 lb-in/rad (uniform)
FA Power Supply Voltage Limit Dispersion	$\pm 2.4$ Volts
FA Current Limit Dispersion	$\pm 1.23$ Amp
FA Fin Shaft Bearing Friction Coefficient Dispersion	$\pm 0.002$
FA Fin Null Offset Dispersion	$\pm 0.33^\circ$
FA DC Motor Gain	$\pm 0.09$
FA EC Resistance #1	$\pm 133$ Ohms (uniform)
FA EC Resistance #2	$\pm 536$ Ohms (uniform)
FA EC Resistance #4	$\pm 2050$ Ohms (uniform)
FA EC Resistance #5	$\pm 4120$ Ohms (uniform)
FA EC Resistance #11	$\pm 20$ Ohms (uniform)
FA EC Resistance #21	$\pm 1500$ Ohms (uniform)
FA EC Capacitance #1	$\pm 1 \times 10^{-9}$ Henries (uniform)
FA EC Capacitance #2	$\pm 5.6 \times 10^{-8}$ Henries (uniform)
FA EC Capacitance #3	$\pm 1 \times 10^{-9}$ Henries (uniform)
FA Talkback Filter Resistance #12	$\pm 169$ Ohms (uniform)
FA Talkback Filter Capacitance #12	$\pm 1 \times 10^{-7}$ Henries (uniform)
S2 Roll Torque Disturbance Model	-2/+3.33 ft-lb (peak)
S2 Ignition OTA Variability	$\pm 0.08$ sec (uniform)
S3 Ignition OTA Variability	-0/+1.56 sec (uniform)

**TABLE 4-2. MONTE CARLO SIMULATION DISPERSION PARAMETERS: 1-SIGMA VALUES**

Parameter	Standard Deviation
Bending Mode Frequency Dispersion	$\pm 3.3\%$
Bending Mode Damping Ratio Dispersion	$\pm 17\%$
Launch Time Dispersions	-190, +190 sec (uniform)

#### **4.5.2. Matrix of 3-Sigma Singly Dispersed Trajectories**

A series of simulations have been performed in which each of the above dispersion input parameters have been separately and individually dispersed to their respective  $\pm 3$  sigma values. The insertion states resulting from these singly dispersed cases have been recorded and assembled into a matrix. Since dispersions due to wind and turbulence effects are not readily simulated in this manner, no singly dispersed wind/turbulence cases have been included in the dispersion matrix. Since there are so many singly dispersed cases (including the nominal trajectory), the actual matrix is not included within the text of this document, but is provided electronically.

#### **4.5.3. Dispersion Results**

For the AIM mission a total of 500 Monte Carlo simulations have been performed using the 6DOF, NRTSIM simulation. The results of these simulations are presented and discussed in the following sections.

##### **4.5.3.1. Insertion Parameter Distributions**

Histograms showing the distributions for the insertion parameters resulting from the Monte Carlo simulations are presented in Figure 4-13 through Figure 4-57. The mean and 3-sigma values resulting from all distributions are presented in TABLE 4-3. Insertion is defined as the time of the AIM payload separation. An electronic file containing the insertion summary of the 500 Monte Carlo simulations is also included as part of this mission analysis submittal.

The dispersion results presented in TABLE 4-3 represent Orbital/LSG's current understanding of the capability of the Pegasus XL launch vehicle. As was predicted, the non-insertion apse dispersions are much larger than the insertion apse dispersions. The larger non-insertion apse dispersions are due to the fact that the Stage 3 impulse and weight uncertainties are transformed into velocity errors at insertion. The tight insertion apse dispersions are consistent with the high-accuracy insertion guidance approach selected for the AIM mission. Also, the mean + 3-sigma non-insertion altitude appears to violates the +/-

85 km requirement however the min/max values are well within the +/- 85 km requirement. Therefore the 3-sigma violation isn't applicable due to the non-gaussian nature of the distribution.

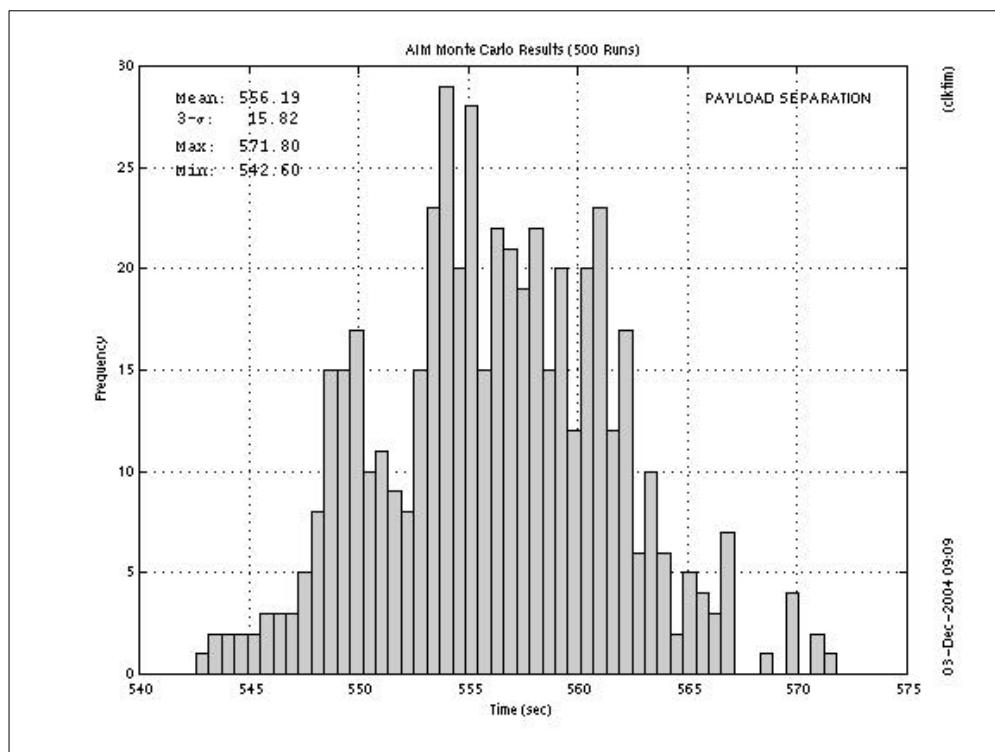
For circular orbits the argument of perigee and true anomaly Monte Carlo results are not particularly meaningful since dispersions about a nearly circular orbit result in their locations being almost anywhere along the orbit. The longitude and geodetic latitude Monte Carlo results make up for the shortcomings in argument of perigee and the true anomaly for circular orbits. For non-circular orbits, this information is provided in addition to the argument of perigee and true anomaly results.

**TABLE 4-3. SUMMARY OF INSERTION PARAMETER DISTRIBUTIONS**

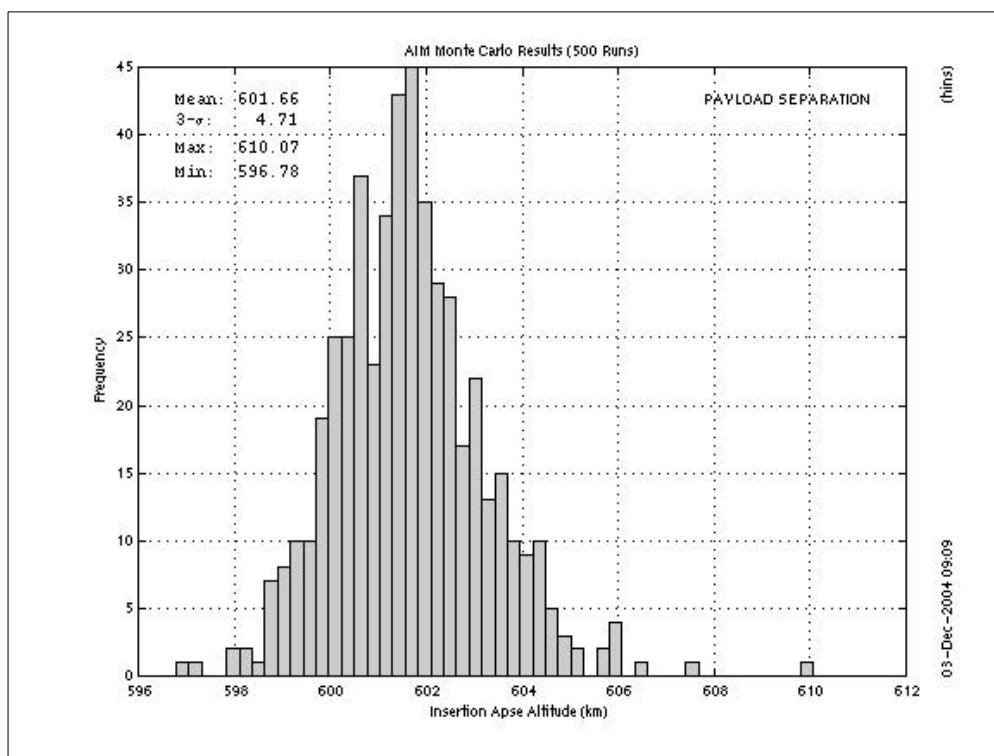
Insertion Parameter	Mean	3-Sigma $\pm$
Time (sec)	556.19	15.82
Insertion Apse Altitude (km)	601.66	4.71
Non-Insertion Apse Altitude (km)	606.41	88.09
Perigee Altitude (km)	591.43	46.07
Apogee Altitude (km)	616.64	53.82
Semimajor Axis (km)	6982.17	43.98
Eccentricity	0.0018	0.0034
Inclination (deg)	97.791	0.122
Vernal Equinox RAAN (deg)	8.47	1.43
ECI Right Ascension of Ascending Node (deg)	53.69	0.20
Argument of Perigee (deg)	163.80	335.81
True Anomaly (deg)	89.76	254.38
Geodetic Latitude (deg N)	14.95	0.66
Longitude (deg E)	-126.55	0.22
Time to 1st Ascending Node (sec)	3702.77	32.87
N2 Consumption (lbm)	3.77	1.21

In NRTSIM simulations, the ECI right ascension of ascending node is measured with respect to the Earth-Centered Inertial (ECI) frame, which is defined such that at drop, the z-axis lies along the Earth's axis of rotation, the X-axis lies in the equatorial plane and intersects the prime meridian, and the y-axis completes a right-handed system. Subsequent to drop, the ECI frame remains inertially fixed. This definition is convenient since it allows the ascending node information to be expressed in a form which is

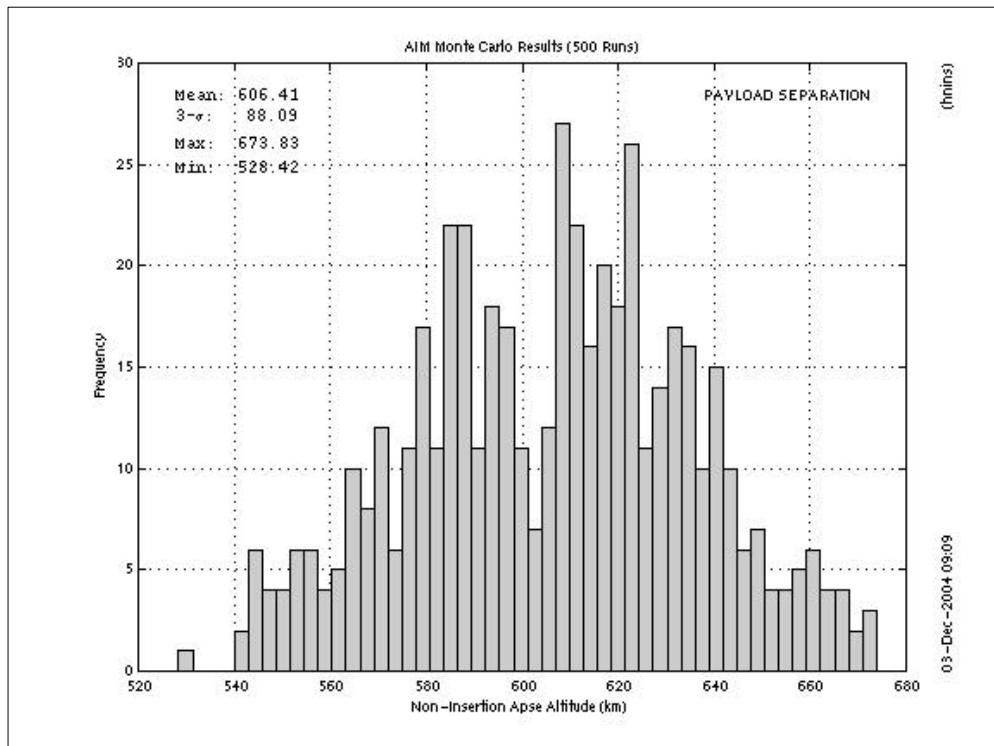
independent of launch time and day. These results can be converted to RAAN relative to the true-of-date vernal equinox frame by determining the right ascension of the Greenwich meridian at the time of drop.



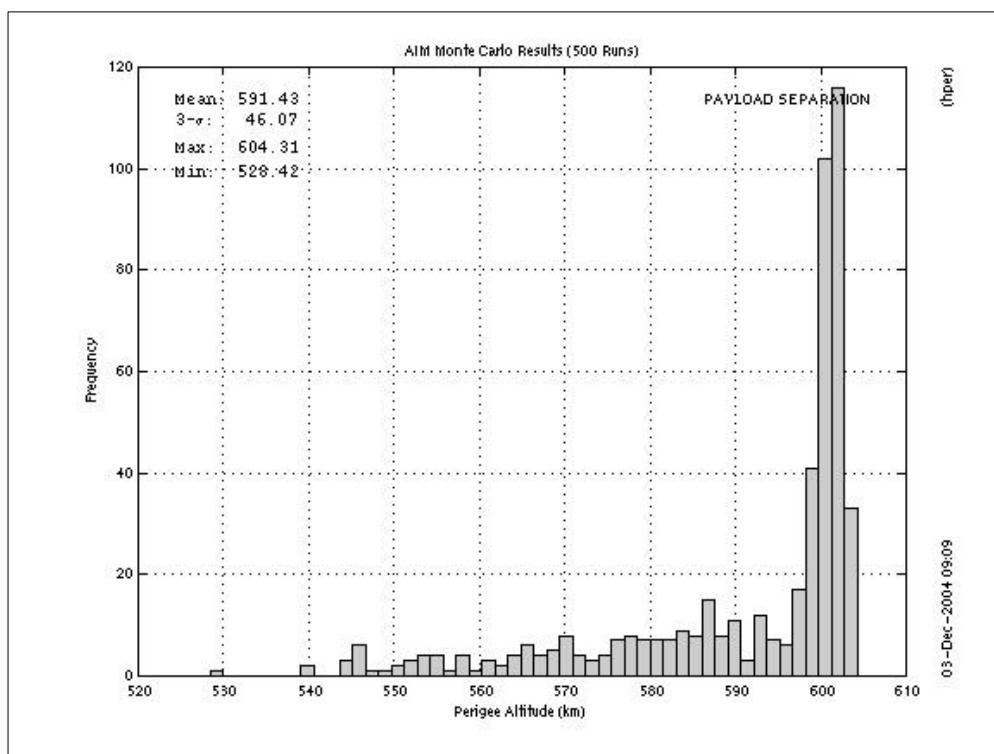
**Figure 4-13. Monte Carlo Results: Time of Insertion Distribution**



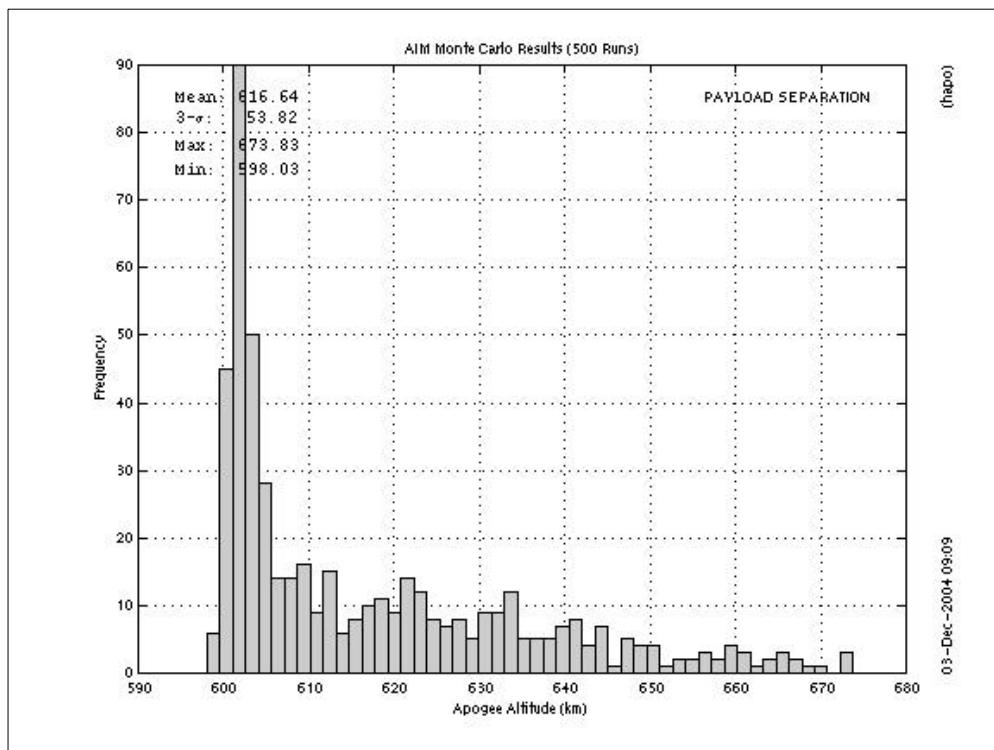
**Figure 4-14. Monte Carlo Results: Insertion Apse Altitude Distribution**



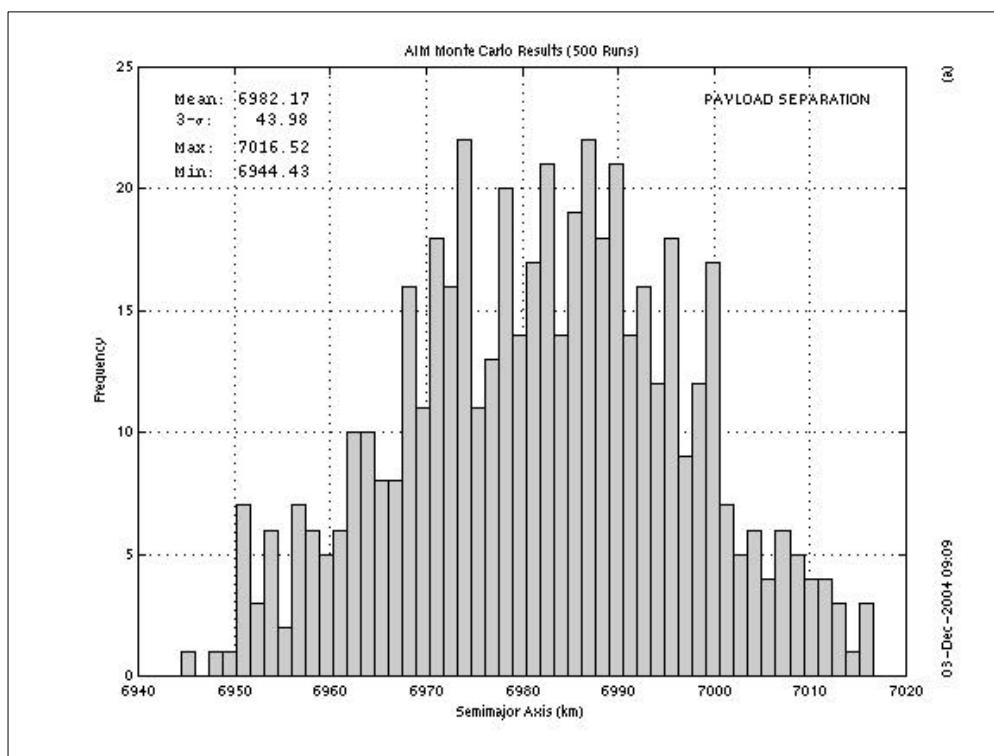
**Figure 4-15. Monte Carlo Results: Non-Insertion Apse Altitude Distribution**



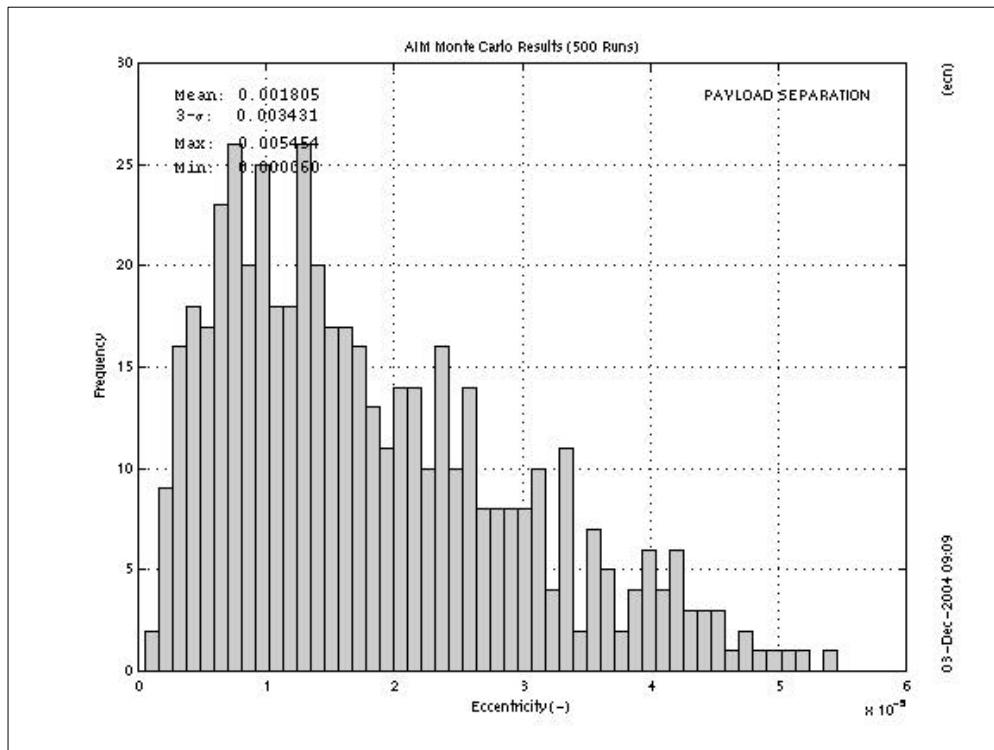
**Figure 4-16. Monte Carlo Results: Perigee Altitude Distribution**



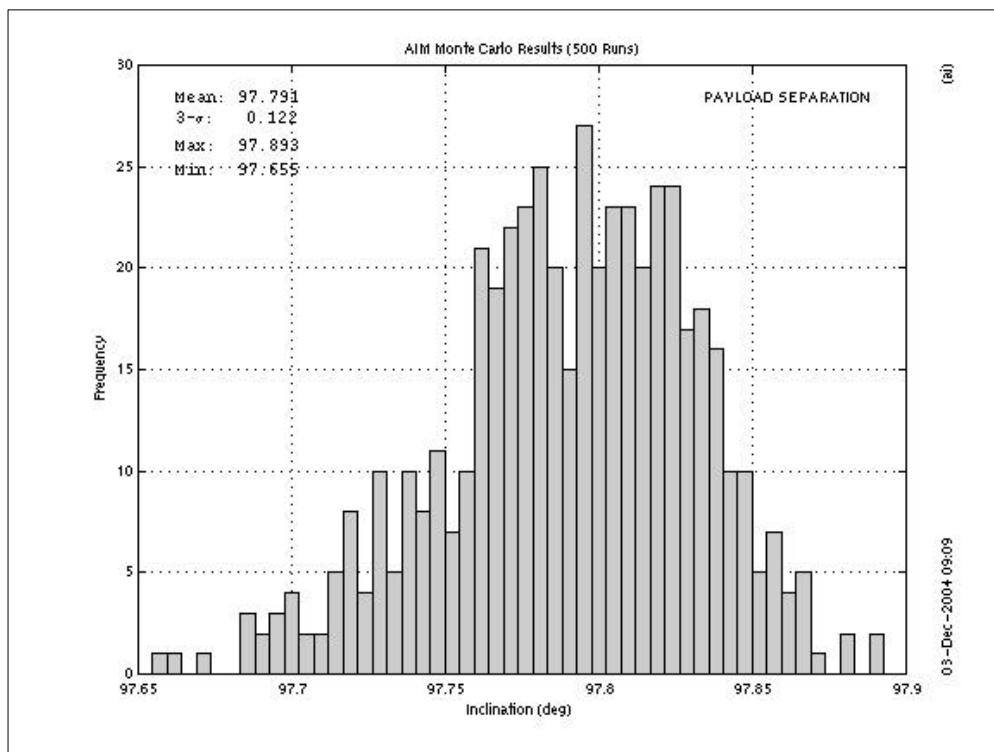
**Figure 4-17. Monte Carlo Results: Apogee Altitude Distribution**



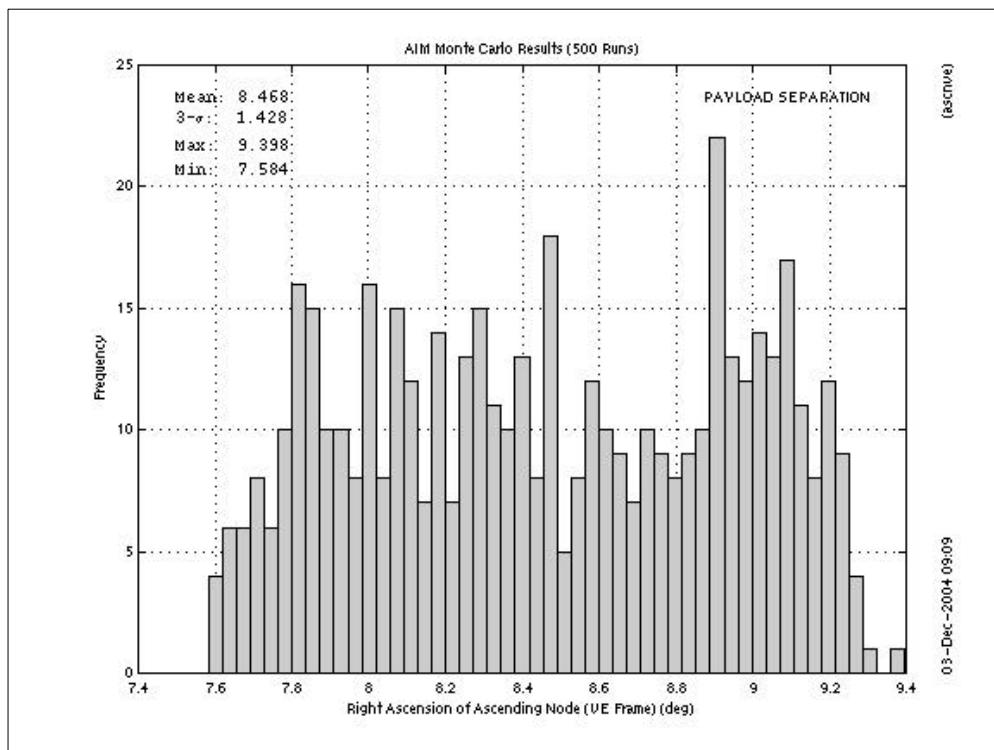
**Figure 4-18. Monte Carlo Results: Semi-major Axis Distribution**



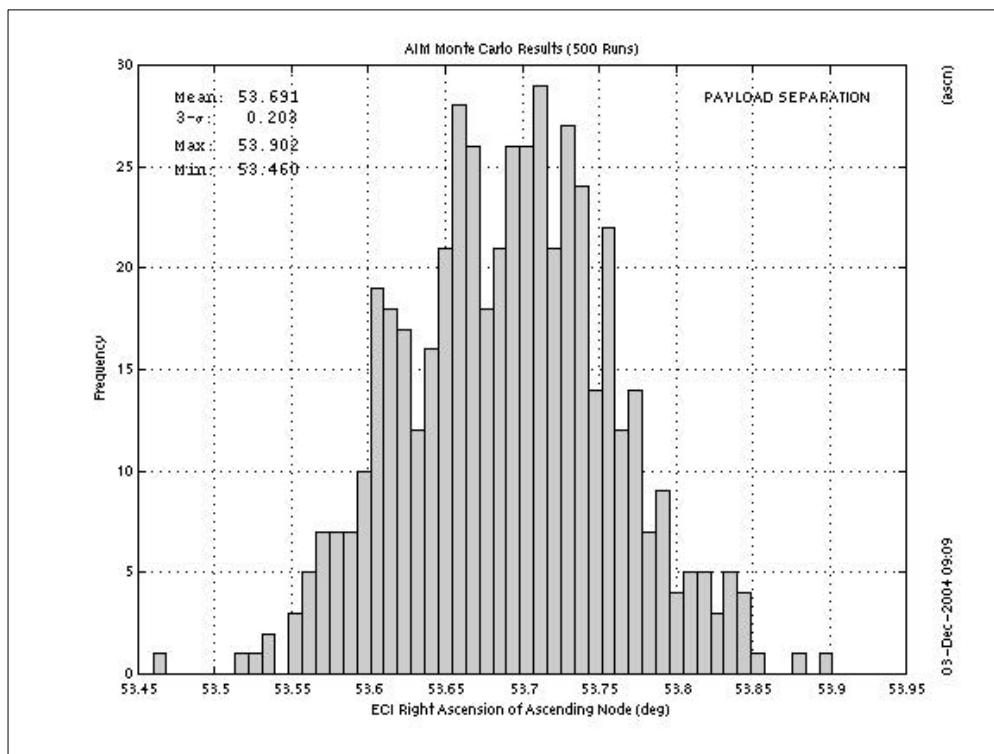
**Figure 4-19. Monte Carlo Results: Eccentricity Distribution**



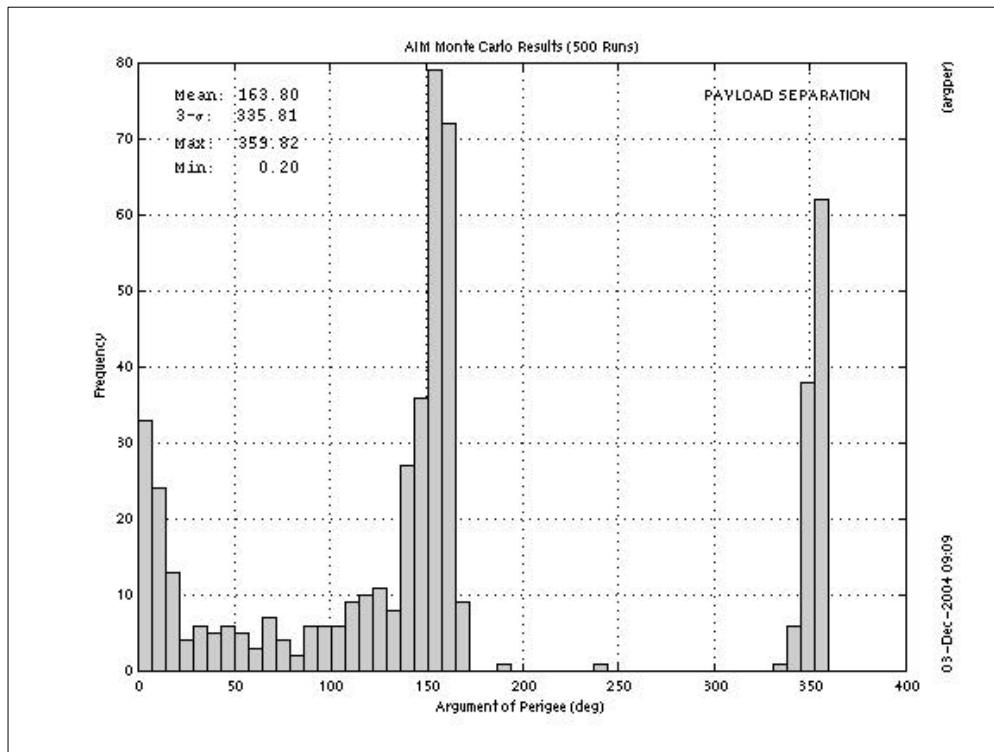
**Figure 4-20. Monte Carlo Results: Inclination Distribution**



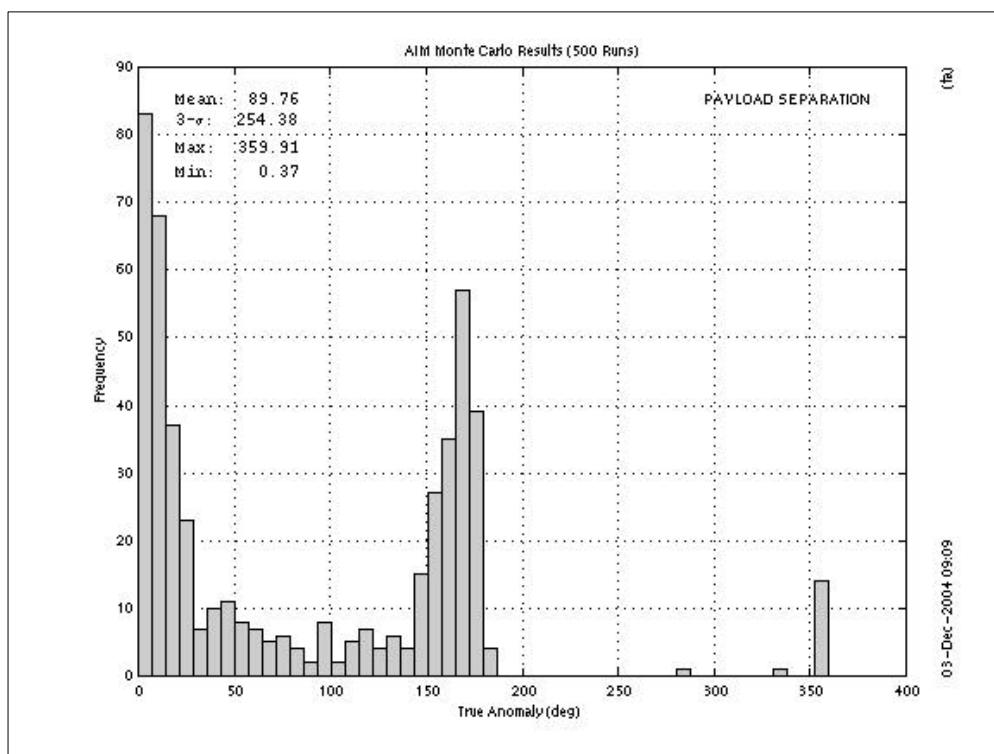
**Figure 4-21. Monte Carlo Results: RAAN Distribution**



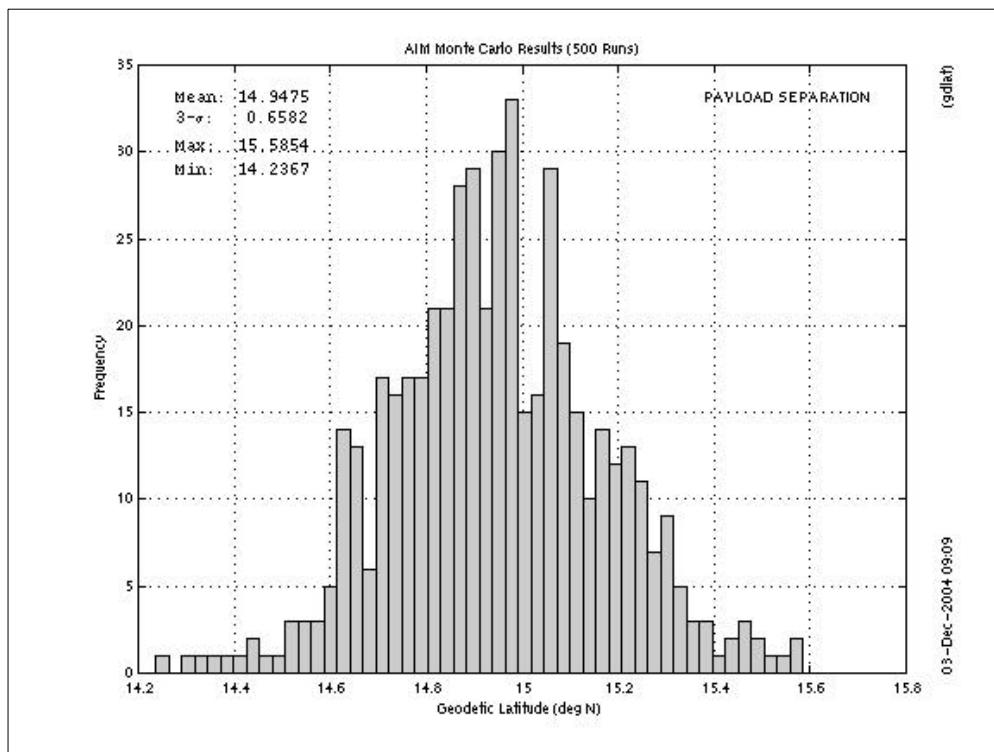
**Figure 4-22. Monte Carlo Results: ECI RAAN Distribution**



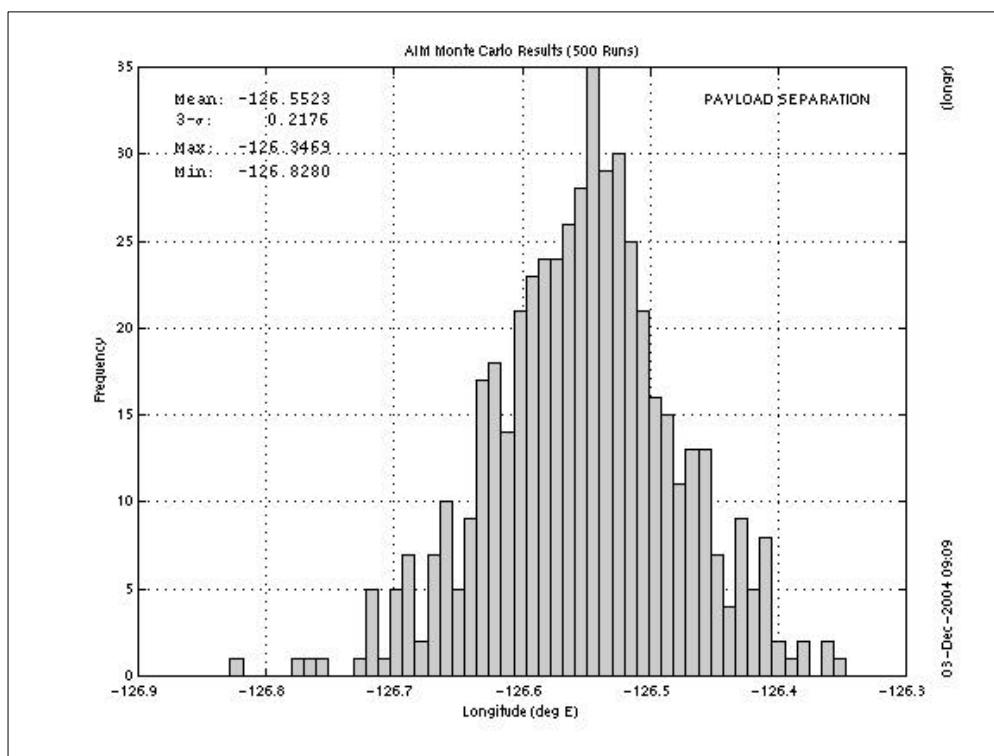
**Figure 4-23. Monte Carlo Results: Argument of Perigee Distribution**



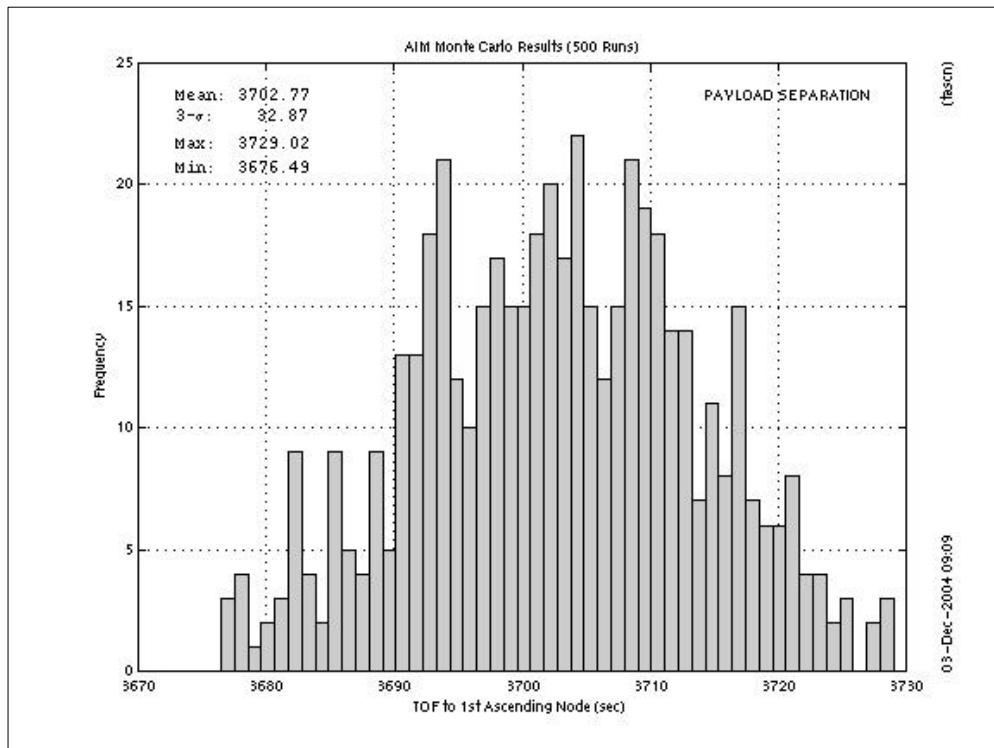
**Figure 4-24. Monte Carlo Results: True Anomaly Distribution**



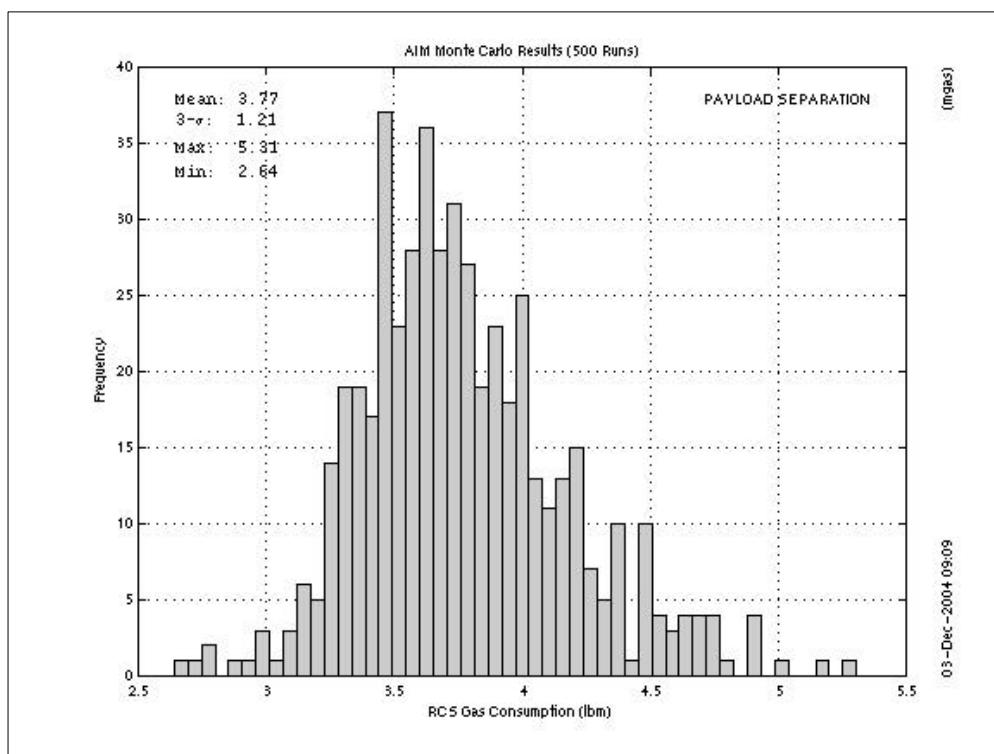
**Figure 4-25. Monte Carlo Results: Geodetic Latitude at Insertion Distribution**



**Figure 4-26. Monte Carlo Results: Longitude at Insertion Distribution**



**Figure 4-27. Monte Carlo Results: Time to 1<sup>st</sup> Ascending Node Distribution**



**Figure 4-28. Monte Carlo Results: N<sub>2</sub> Consumption @ Insertion Distribution**

#### 4.5.3.2. Launch Window Analysis

The AIM Mission System Requirements Specification (SRS) document specifies that the payload insertion shall occur at midnight MLT-AN  $\pm 4$  minutes. The launch window shall be chosen such that this constraint is satisfied. The launch window was derived using an iterative process in which different launch epochs were evaluated relative to the requirement until the window that satisfies the MLT-AN constraint is identified. A brief description of this process is provided below.

First the Right Ascension of Greenwich Meridian (RAGM) is calculated at the time of drop. Due to the fact that the ECI frame defined in the Pegasus simulation is fixed at the time of drop, this RAGM defines the angle between the Greenwich meridian and the Vernal Equinox direction at drop. Since the RAAN reported in the simulation is measured relative to the ECI frame (RAAN-ECI), the RAAN relative to the Vernal Equinox frame at payload insertion is the sum of RAGM and RAAN-ECI.

Next, the Right Ascension of the Mean Sun (RA-MSUN) is determined at the time of payload insertion. The difference between RAAN at payload insertion and RA-MSUN represents the angle between the RAAN and the projection of the Mean Sun direction in the equatorial plane. This angle can then be converted to an “hour angle” by multiplying by  $(1440/360)$  min/deg. For example, a 12:00 noon MLT-AN

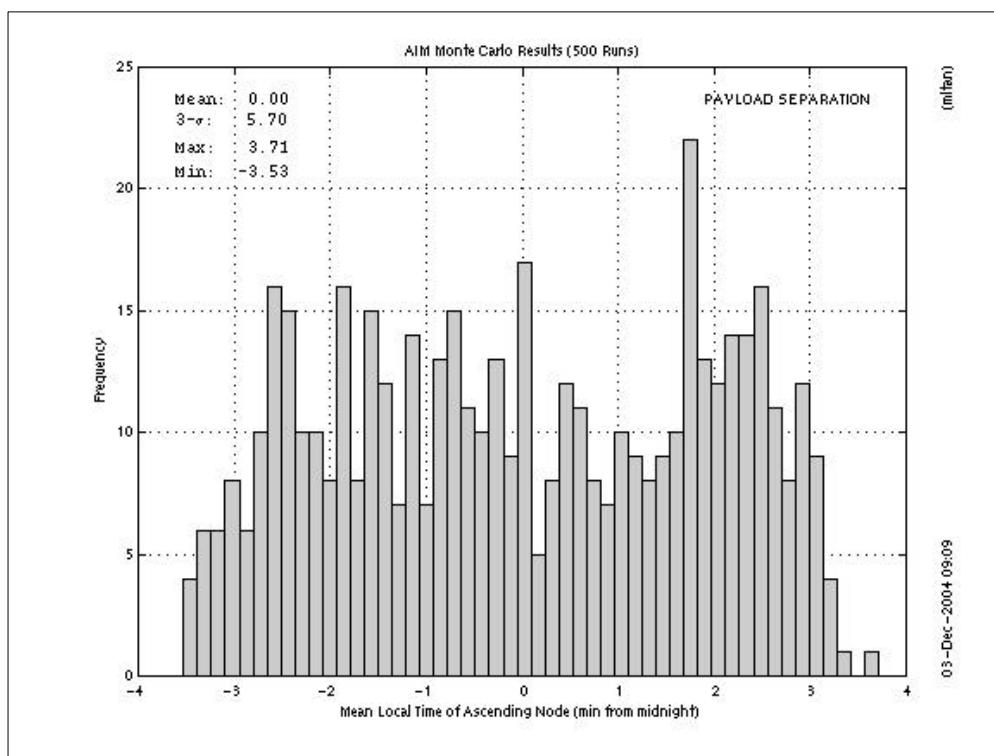
corresponds to an ascending node intersecting the projection of Mean Sun direction, and a 9:00 PM MLT-AN corresponds to an ascending node 135° East of the projection of Mean Sun direction.

The launch window has been determined using the approach described above. The Monte Carlo results indicate that the RAAN with respect to ECI frame is between 53.488 and 53.894 degrees ( $\pm 3\text{-sigma}$  range, see TABLE 4-3). Applying these RAAN dispersions to either end (open and close), of the MLT-AN defined 8 minute launch window, yields a window of 20:22:06 UTC to 20:28:27 UTC for September 29, 2006. TABLE 4-4 shows the intermediate steps that demonstrate that this launch window satisfies the MLT-AN constraint. The specific values of RAGM and RA-MSUN reported in TABLE 4-4 were generated for a September 29, 2006 launch date, however, the window itself does not change with launch date. This window may be adjusted to reflect final pre-launch analysis results.

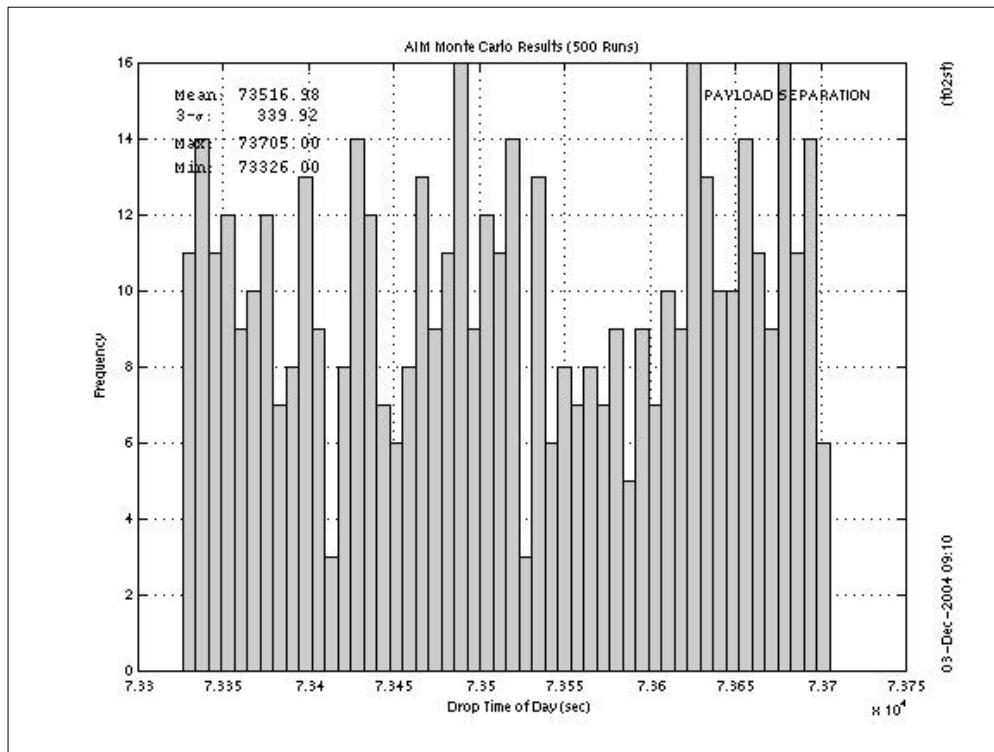
**TABLE 4-4. LAUNCH WINDOW THAT SATISFIES MLT-AN CONSTRAINT**

UTC Time at Drop	RAGM at Drop	RAAN-ECI 3S Extremum	RAAN at Insertion	RA-MSUN at Insertion	DIFF (RAAN) & (RA-MSUN)	MLT- AN <sup>4</sup>
20:22:06	313.979°	53.488°	367.467°	188.465°	179.002°	Midnight - 04:00 (mm:ss)
20:28:27	315.570°	53.894°	369.464°	188.470°	180.994°	Midnight + 03:59 (mm:ss)

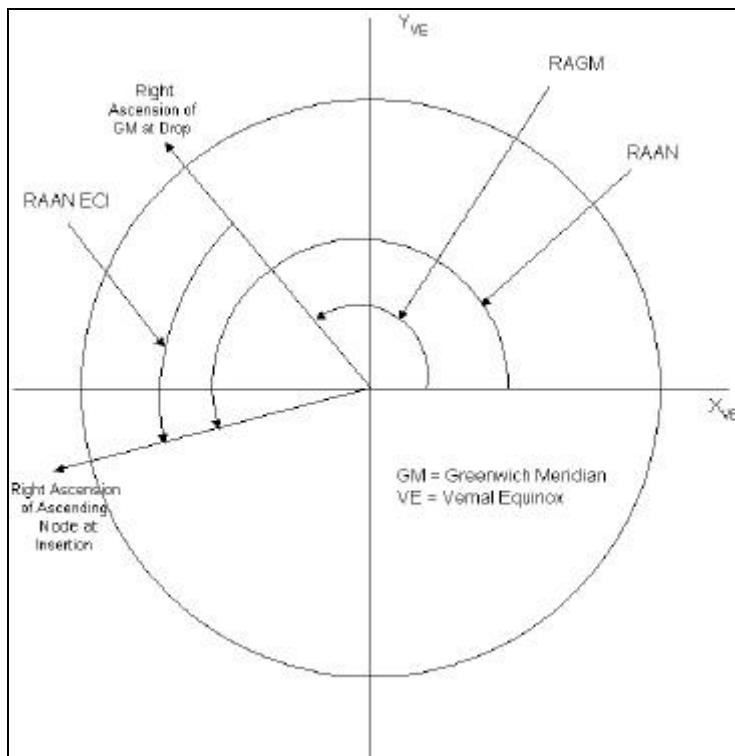
<sup>4</sup> An MLT-AN of midnight corresponds to an angular difference (RAAN to RA-MEAN SUN) of 180 degrees.



**Figure 4-29. Monte Carlo Results: MLT-AN Distribution**



**Figure 4-30. Monte Carlo Results: Drop Time Of Day Distribution**



**Figure 4-31. Right Ascension Definitions**

#### 4.5.3.3. Trajectory Environment Dispersions

In order to fully evaluate trajectory environment dispersions, an additional set of Monte Carlo simulations were performed. This set of simulations was run through the loads-critical flight regime (drop through 45 seconds) during which all loads-related parameters were monitored at 0.2 second intervals. The set was continued from 45 seconds through 100 seconds of flight, during which parameters were monitored at a 1 Hz rate to extract aero-heating data and provide additional S1 and S2 trajectory data. Because of the relatively high sampling rate used with these analyses, it is possible to generate trajectory envelopes which show the predicted mean and 3-sigma extreme values as functions of time for each parameter. These envelopes are then compared with the appropriate design limits<sup>5</sup>. The fin loads and wing bending moments are evaluated using the loading models developed during the Pegasus wind tunnel testing conducted in 1994, 1999, 2000, and 2001.

Figure 4-32 through Figure 4-48 show the results of these Monte Carlo simulations compared with limit and test levels. It is required that the 3-sigma envelopes be bounded by their respective design limits. However, it is not required that the worst case max/min envelopes fall within their boundaries. The

<sup>5</sup> Baumgartner, P., "Loads Analyses Associated With MDL Development", PEG-9504-2000, 1 April 1996.

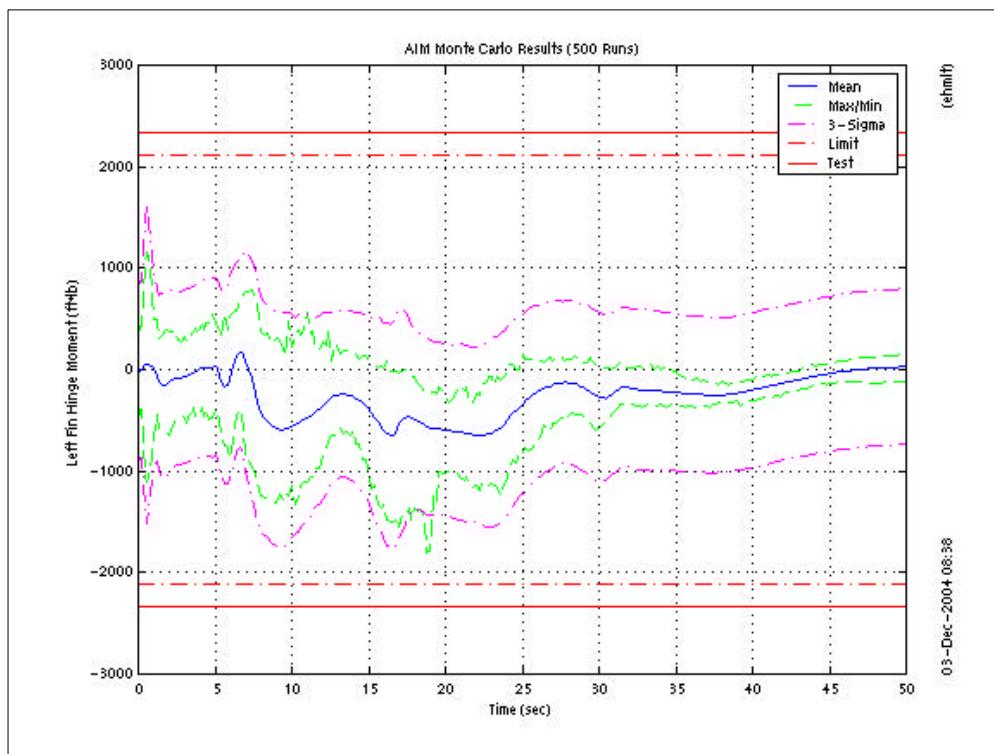
3-sigma results contained herein fall within their appropriate limits for all parameters, with one exception: Figure 4-44 shows a small violation in lateral acceleration. This behavior has been encountered in some previous Pegasus analyses and has become more common due to the additional level of conservatism associated with the current aerodynamics model (version 9.4) and atmospheric modeling assumptions (GRAM99). Pegasus Mechanical Engineering is currently in the process of revising the formal loading limit for static lateral accelerations from 0.2 G's to 0.3 G's. With this limit load revision, these occasion lateral acceleration loading violations should be eliminated.

The aero-heating plots (Figure 4-49 and Figure 4-50) cannot be evaluated directly although they do provide a qualitative indication that design limits are not being violated. TABLE 4-5 provides a summary of the results of these analyses compared with design limits.

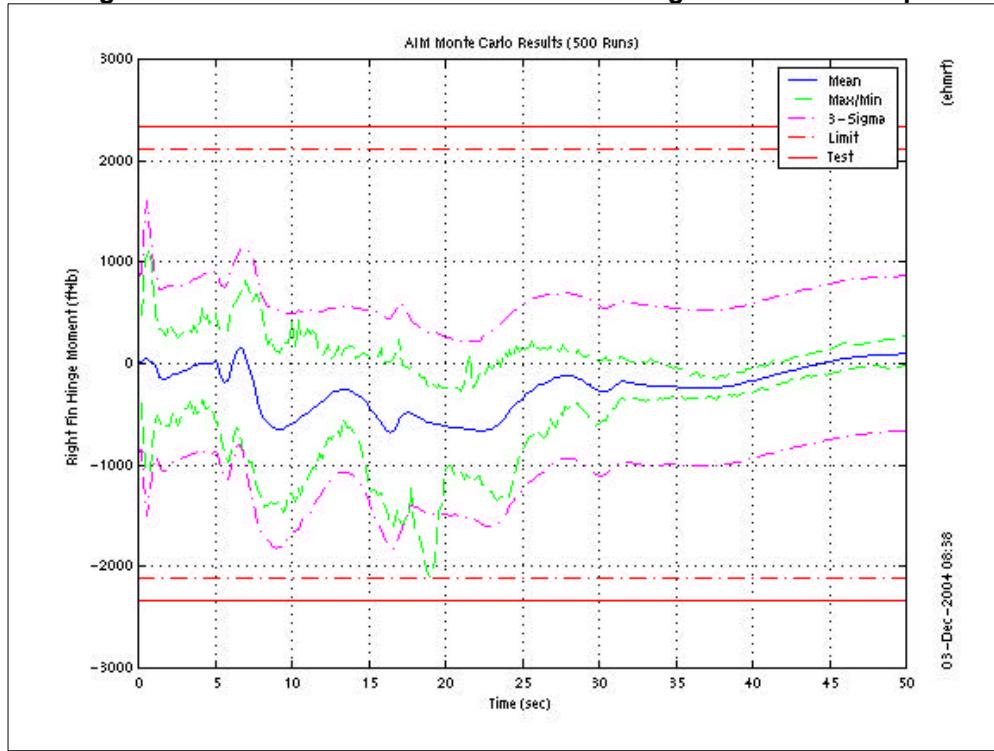
**TABLE 4-5. DISPERSION RESULTS COMPARED WITH DESIGN LIMITS**

Parameter	Design Limit	3-Sigma Extreme Dispersion
Elevon Hinge Moment (ft-lb.)	2119	1828
Elevon Bending Moment (ft-lb.)	13070	10195
Elevon Normal Force (lb.)	6289	5139
Wing Bending Moment (ft-lb.)	175351	111570
S1 Axial Acceleration (G's)	9.5	8.47
Lateral Acceleration (G's)	0.20	0.22
Normal Acceleration (G's)	2.33	2.21
Fairing Alpha Moment (lb-in) (1)	1731000	1659247
Fairing Beta Moment (lb-in) (1)	539700	118629
Line Load (ft-lb)	1003.92	860.68
Note (1) The indicated limits for the fairing alpha and beta moments are in reality simply the fairing test levels. The only formal fairing load limit applies to the line load only.		

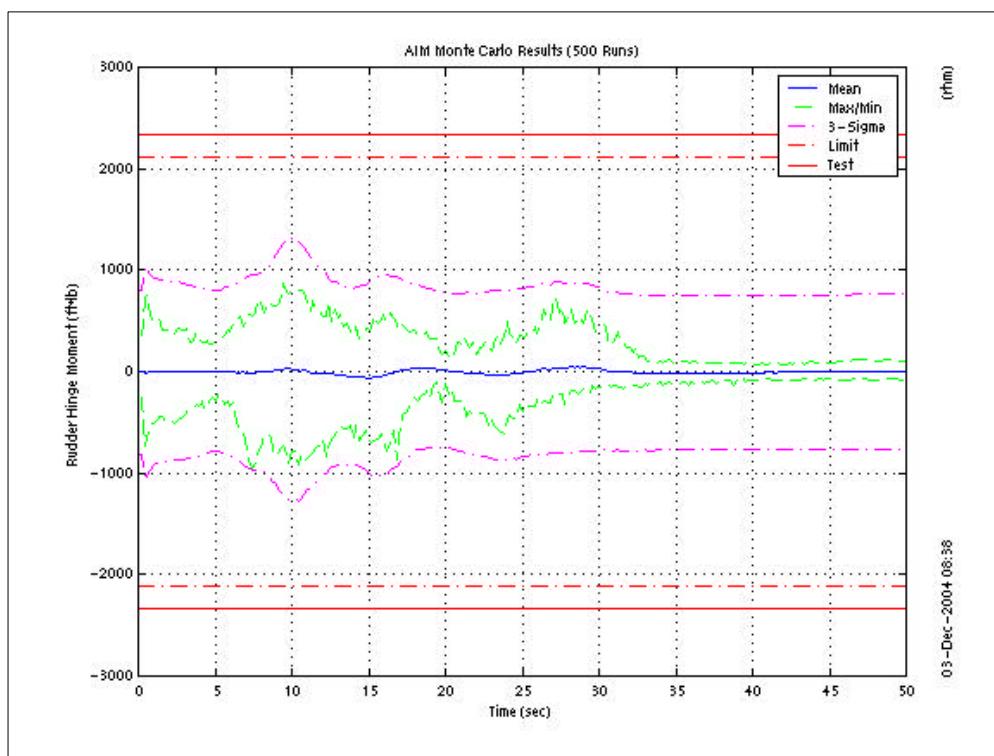
Figure 4-51 is provided to confirm the acceptability of the predicted heating environments at fairing separation. The AIM requirement is that the free molecular heating rate at fairing separation be less than 0.4 BTU/ft<sup>2</sup>/sec. The 3-Sigma high dispersions show that this requirement will be satisfied.



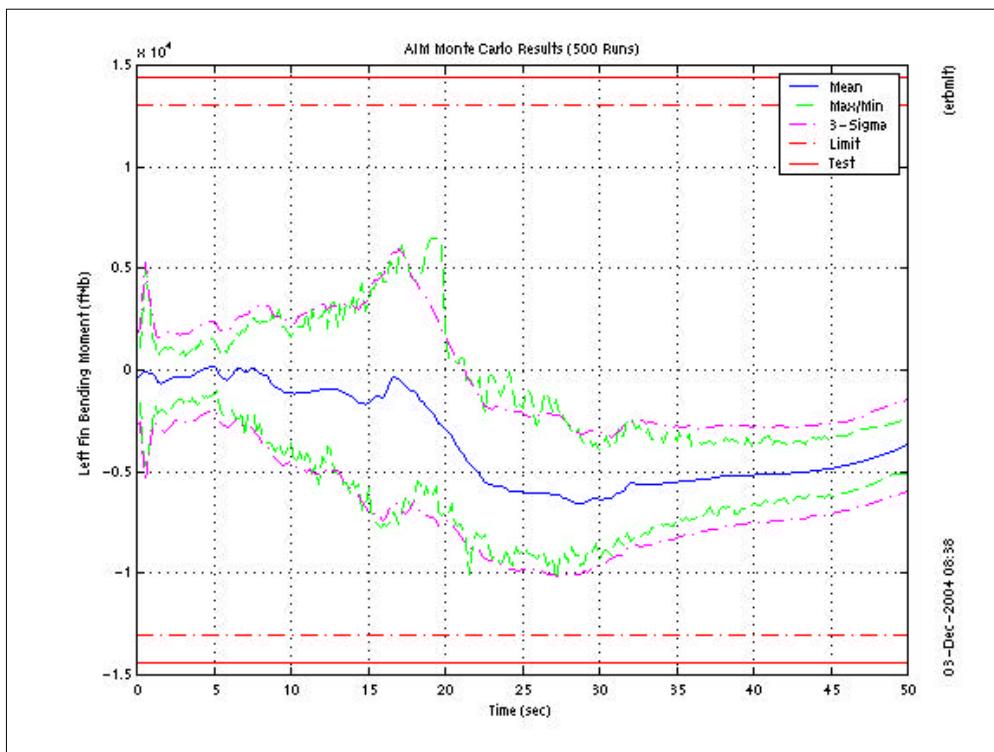
**Figure 4-32. Monte Carlo Results: Left Fin Hinge Moment Envelope**



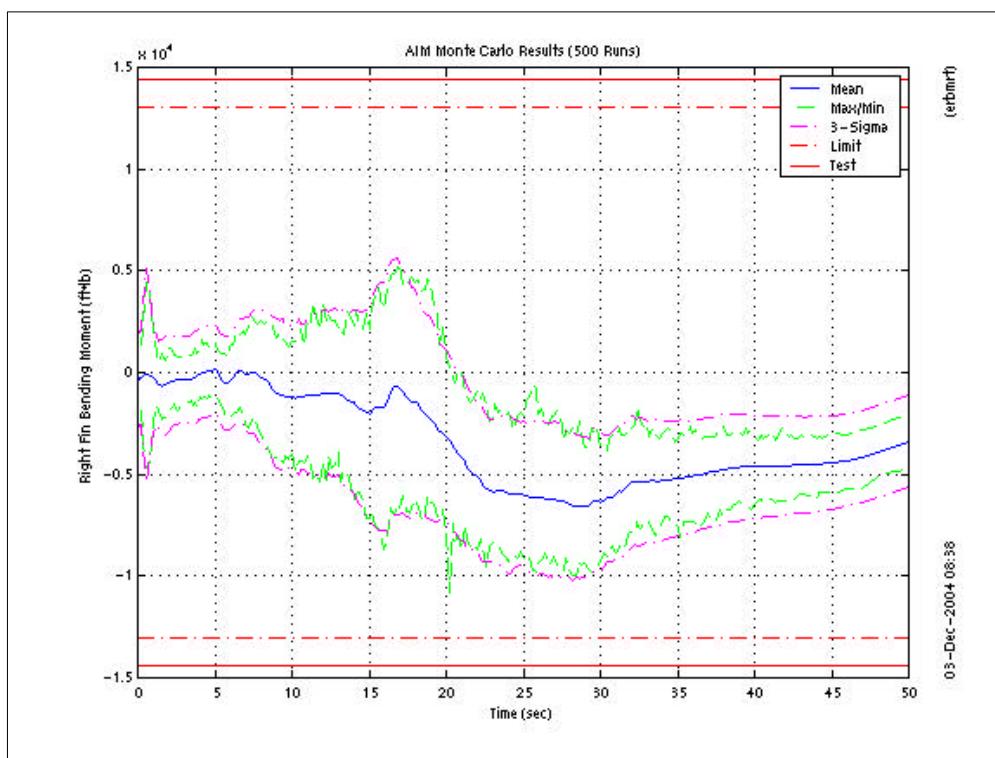
**Figure 4-33. Monte Carlo Results: Right Fin Hinge Moment Envelope**



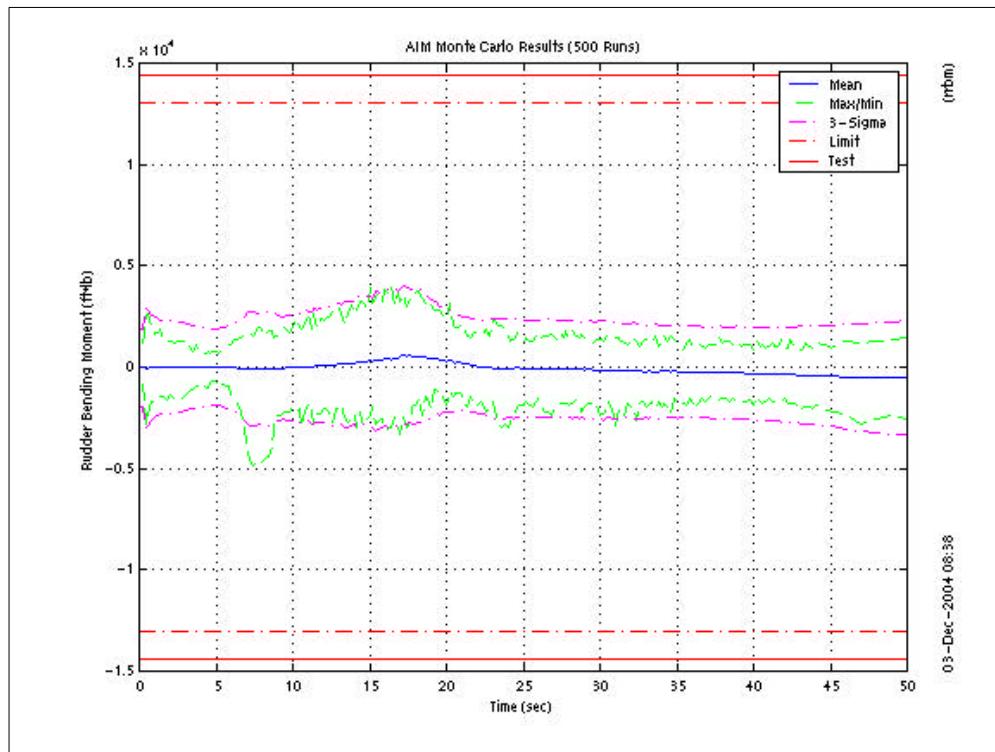
**Figure 4-34. Monte Carlo Results: Rudder Hinge Moment Envelope**



**Figure 4-35. Monte Carlo Results: Left Fin Bending Moment Envelope**



**Figure 4-36. Monte Carlo Results: Right Fin Bending Moment Envelope**



**Figure 4-37. Monte Carlo Results: Rudder Bending Moment Envelope**

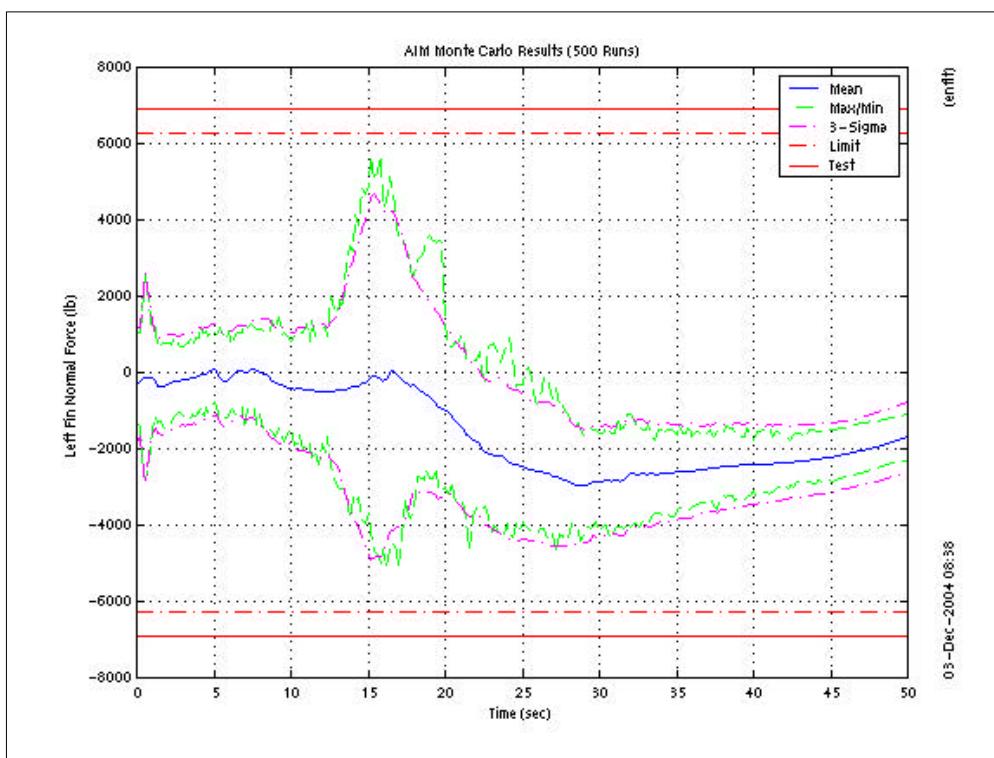


Figure 4-38. Monte Carlo Results: Left Fin Normal Force Envelope

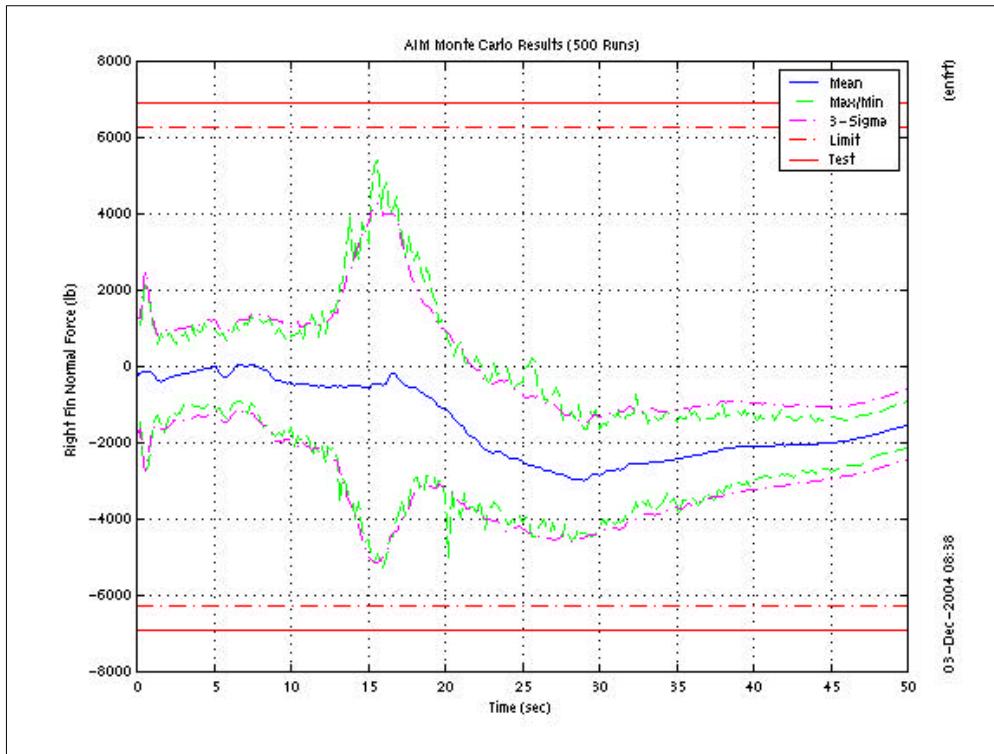
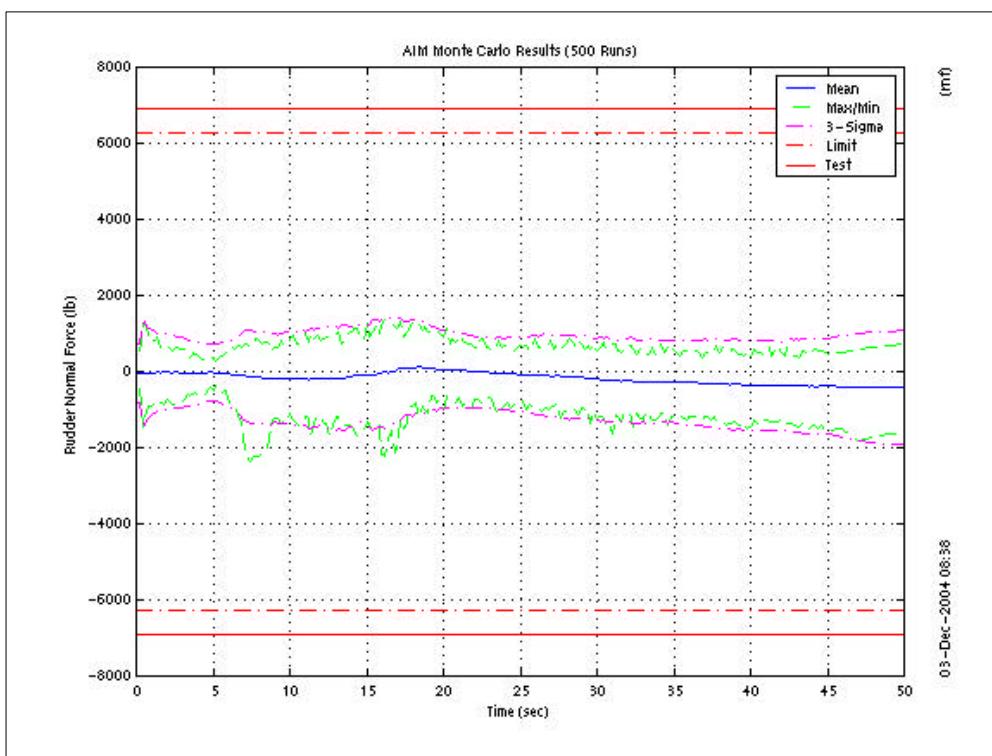
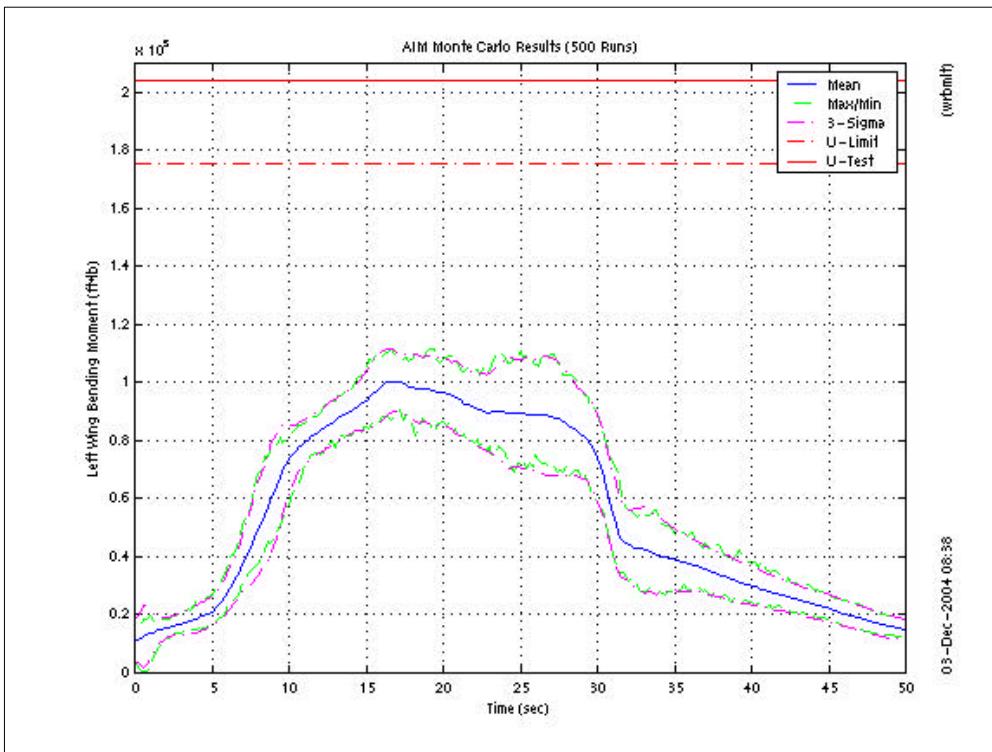


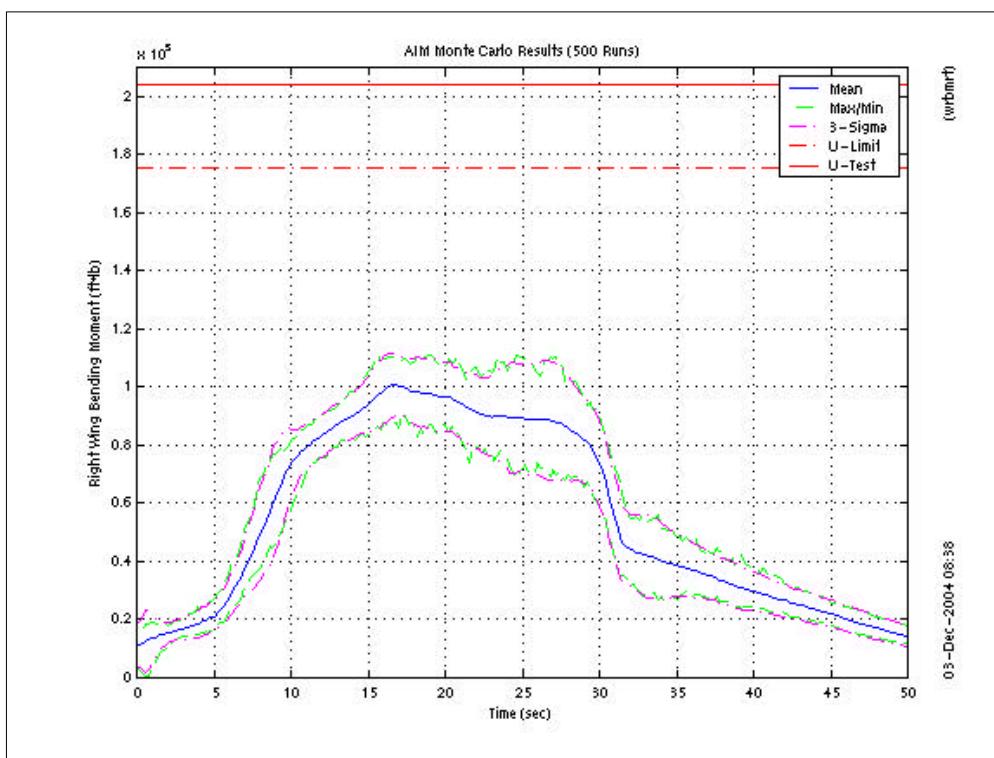
Figure 4-39. Monte Carlo Results: Right Fin Normal Force Envelope



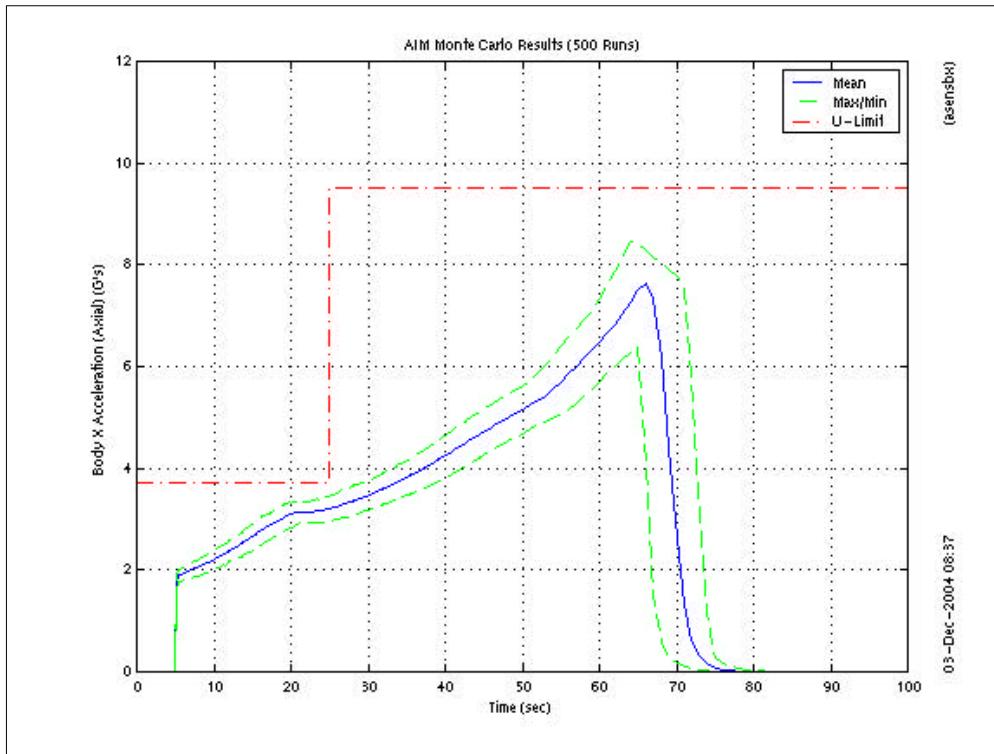
**Figure 4-40. Monte Carlo Results: Rudder Normal Force Envelope**



**Figure 4-41. Monte Carlo Results: Left Wing Bending Moment Envelope**



**Figure 4-42. Monte Carlo Results: Right Wing Bending Moment Envelope**



**Figure 4-43. Monte Carlo Results: S1 Axial Acceleration Envelope**

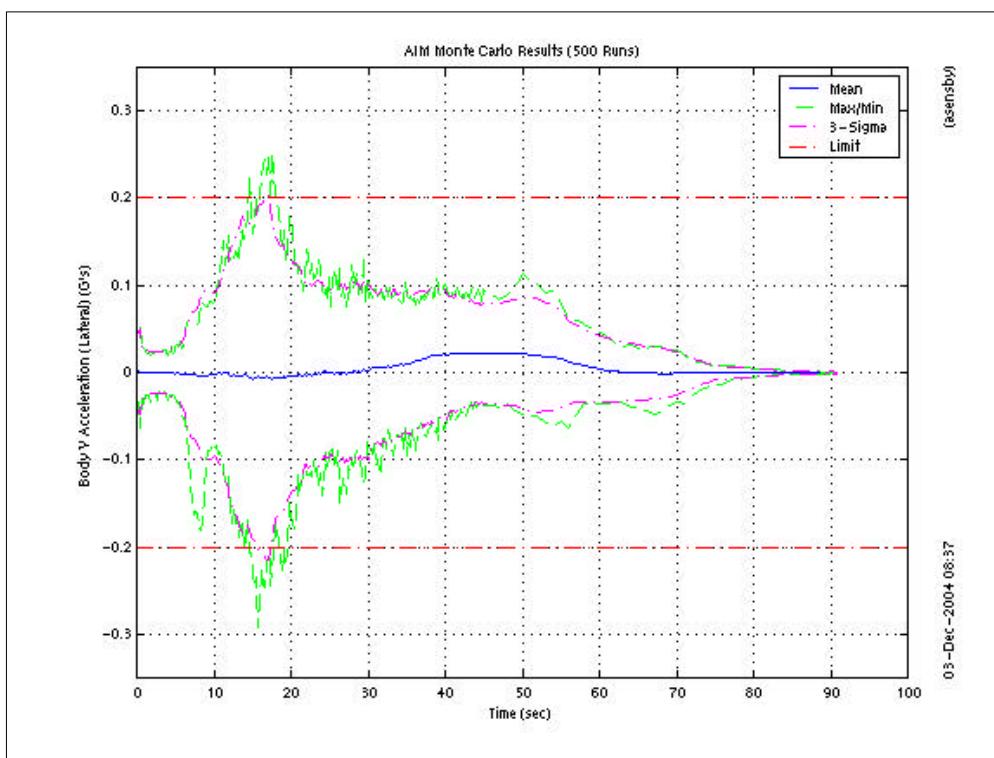


Figure 4-44. Monte Carlo Results: S1 Lateral Acceleration Envelope

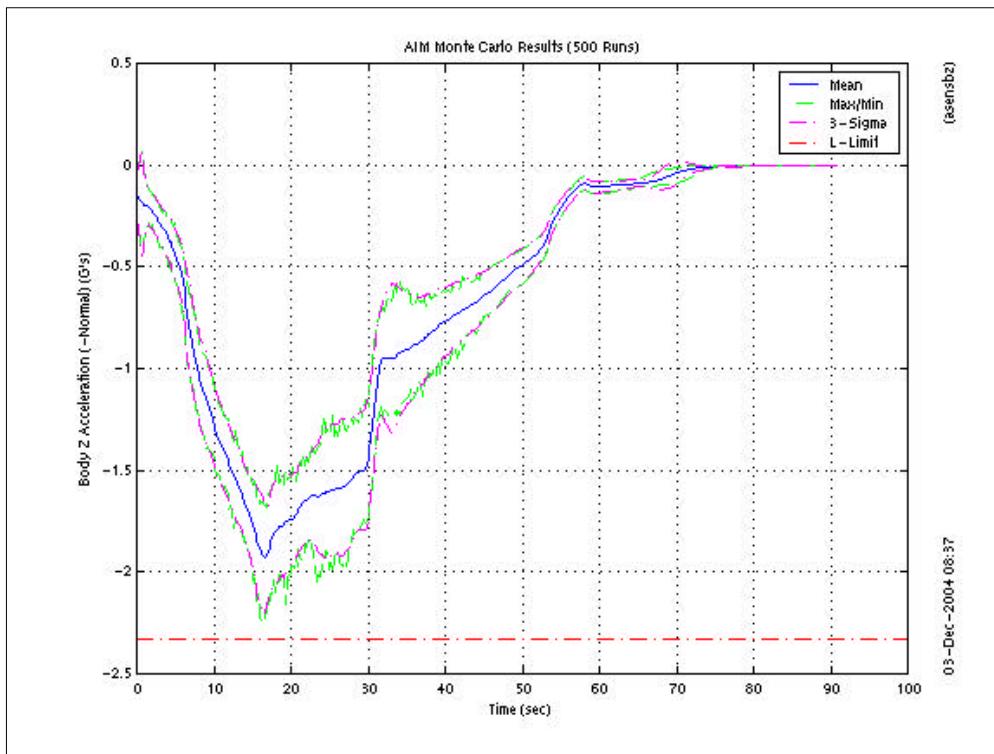
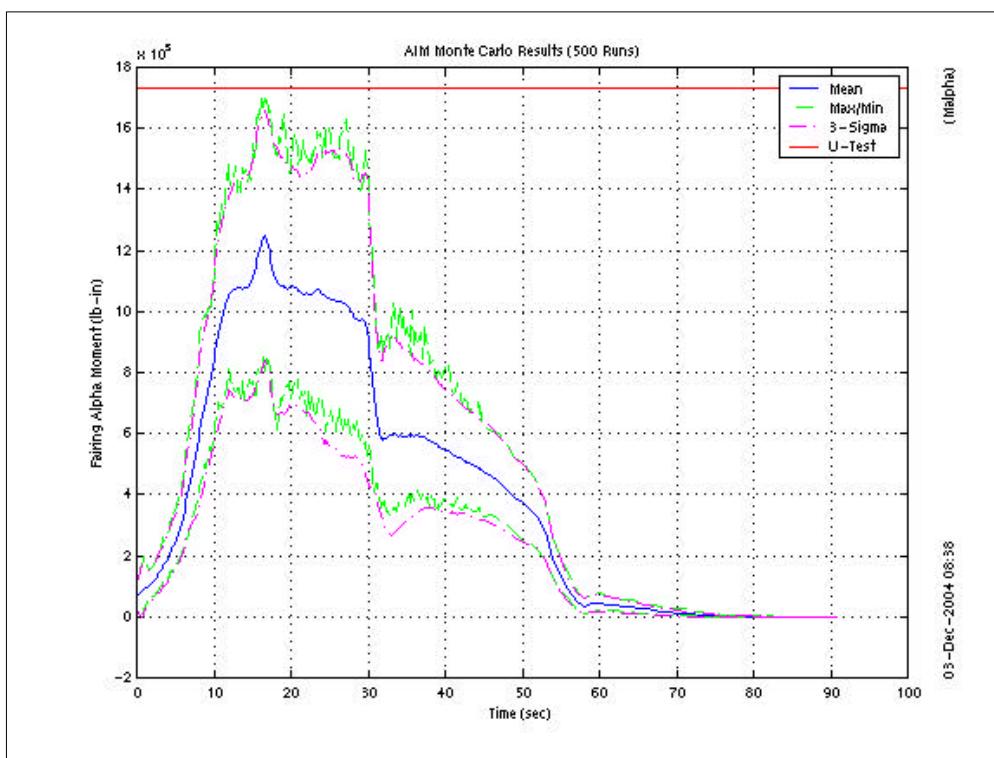
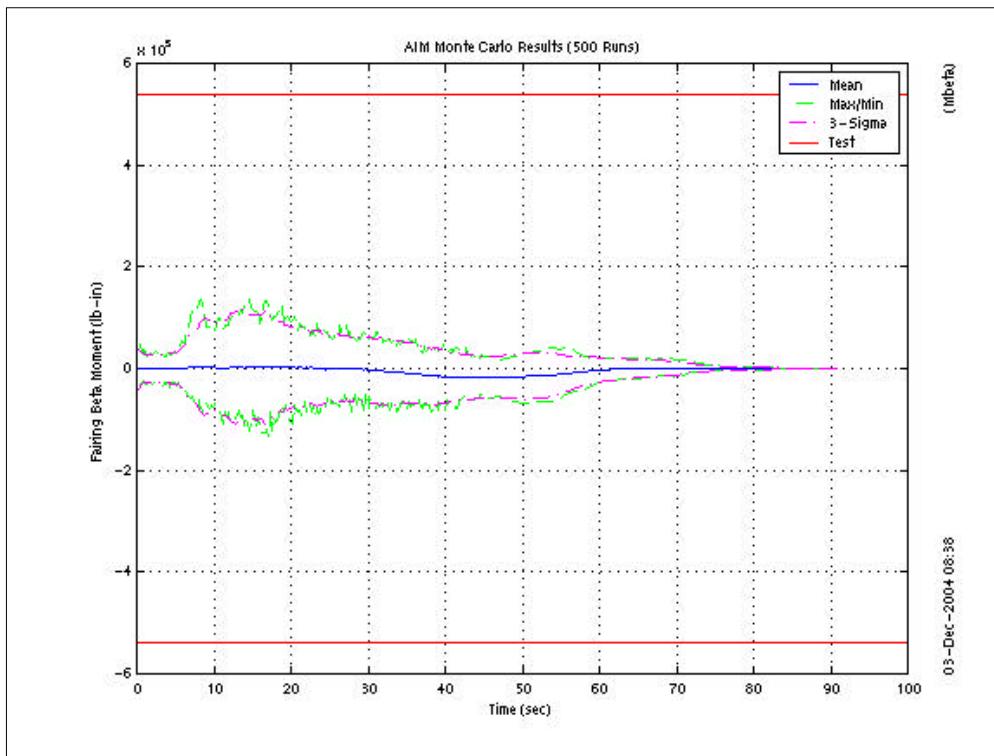


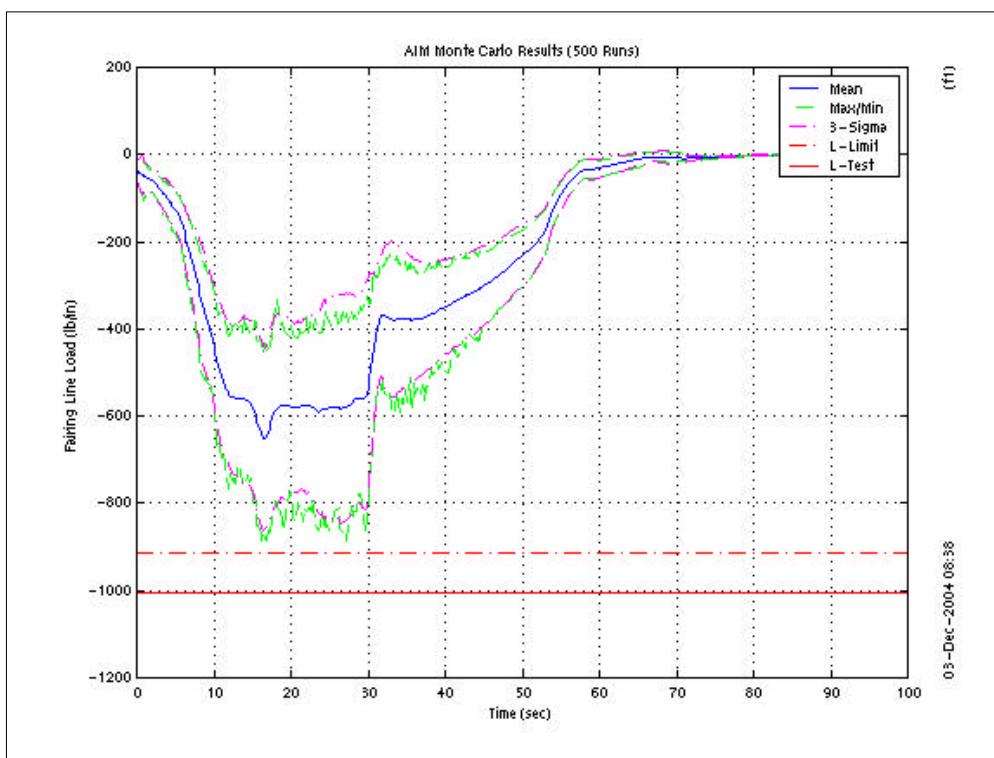
Figure 4-45. Monte Carlo Results: S1 Normal Acceleration Envelope



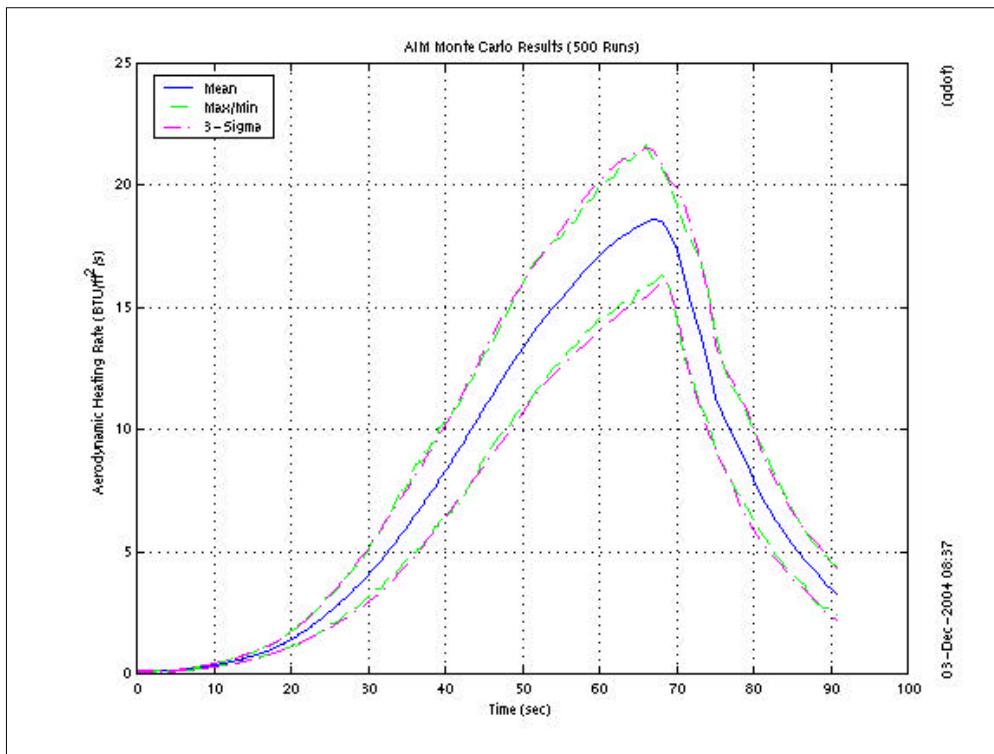
**Figure 4-46. Monte Carlo Results: Fairing Alpha Moment Envelope**



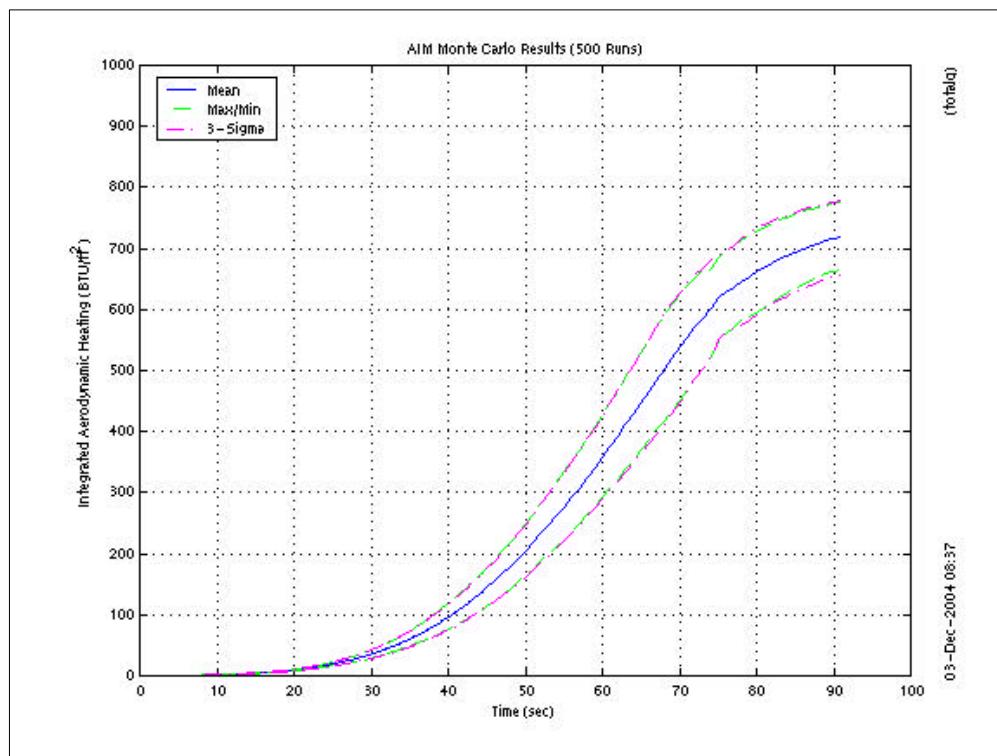
**Figure 4-47. Monte Carlo Results: Fairing Beta Moment Envelope**



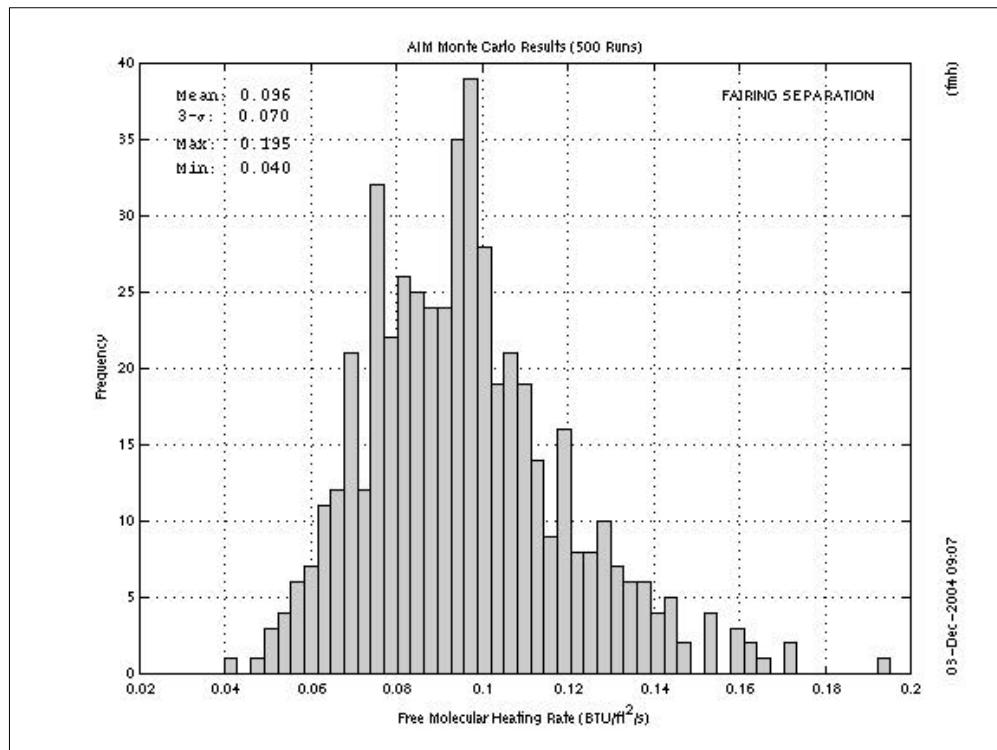
**Figure 4-48. Monte Carlo Results: Fairing Line Load Envelope**



**Figure 4-49. Monte Carlo Results: Aerodynamic Heating Rate vs. Time Envelope**



**Figure 4-50. Monte Carlo Results: Integrated Aerodynamic Heating vs. Time Envelope**



**Figure 4-51. Monte Carlo Results: FM Heating Rate @ Fairing Deployment Dispersions**

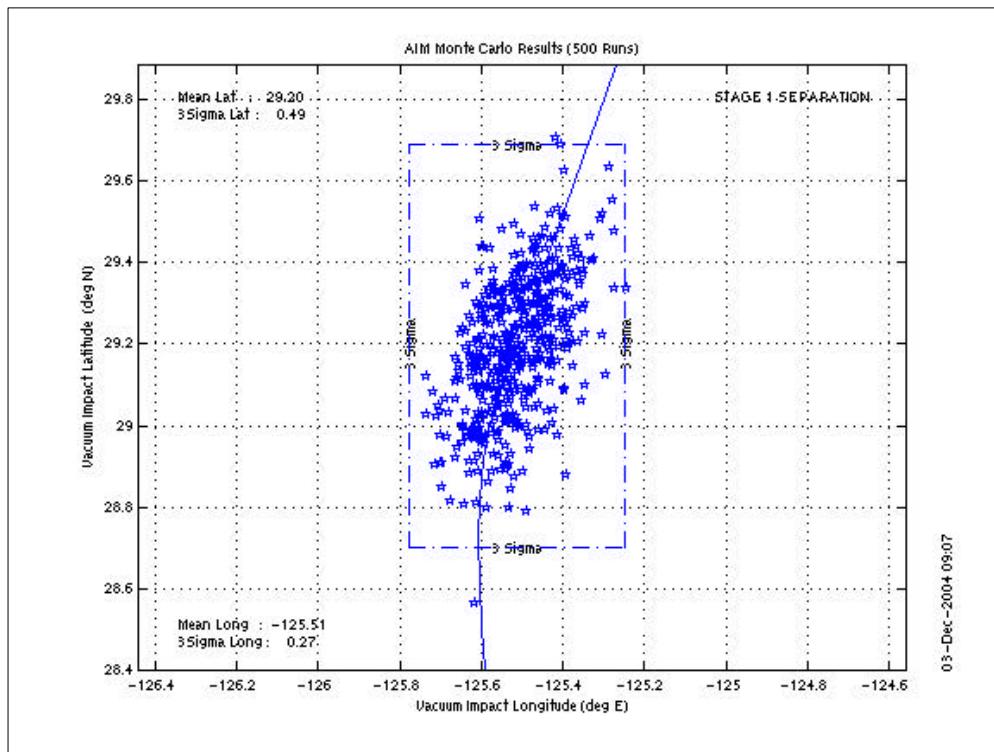
#### 4.5.3.4. Spent Stage/Fairing Impact Point Dispersions

Spent stages and fairing impact point dispersions have also been evaluated using the Monte Carlo simulation by monitoring the vacuum impact points for each impacting body. Plots of these impact point dispersions are presented in Figure 4-52 through Figure 4-55. The mean values and standard deviations corresponding to these distributions are shown in TABLE 4-6. Note that these impact point distributions are the result of trajectory dispersions including drop point variability.

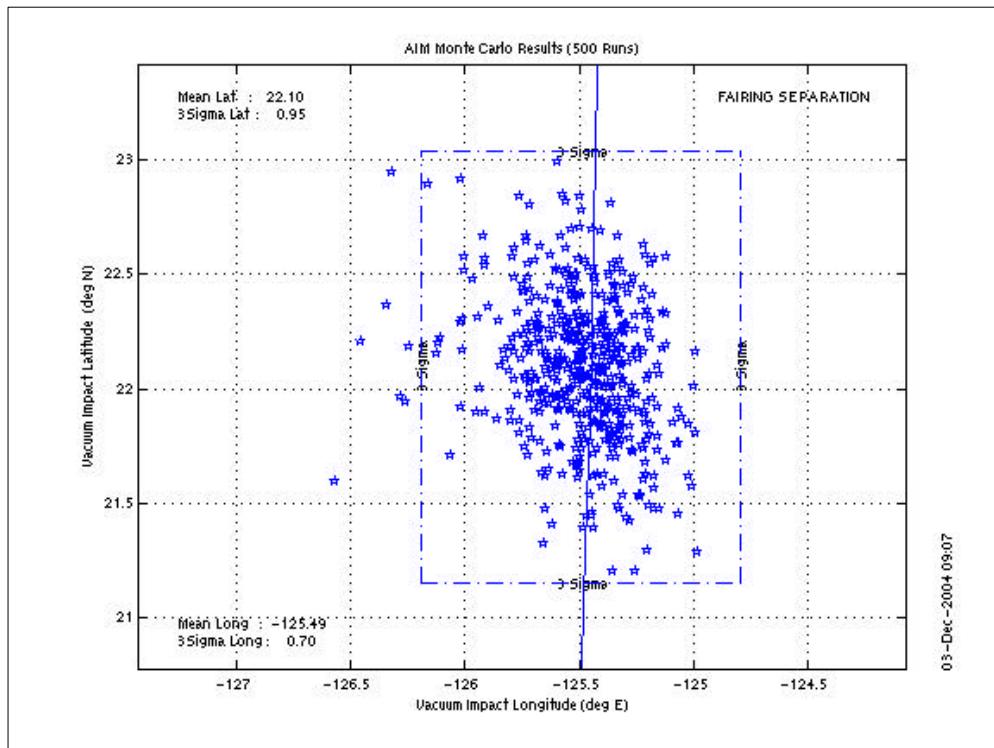
**TABLE 4-6. SUMMARY OF VACUUM IMPACT POINT DISPERSIONS**

Impact Parameter	Mean	3-Sigma ±
S1 Separation Time (sec)	90.76	0.00
S1 Latitude (deg N)	29.20	0.49
S1 Longitude (deg E)	-125.51	0.27
Fairing Separation Time (sec)	127.61	0.14
Fairing Latitude (deg N)	22.10	0.95
Fairing Longitude (deg E)	-125.49	0.70
S2 Separation Time (sec)	415.49	15.13
S2 Latitude (deg N)	-5.04	0.77
S2 Longitude (deg E)	-128.39	0.31

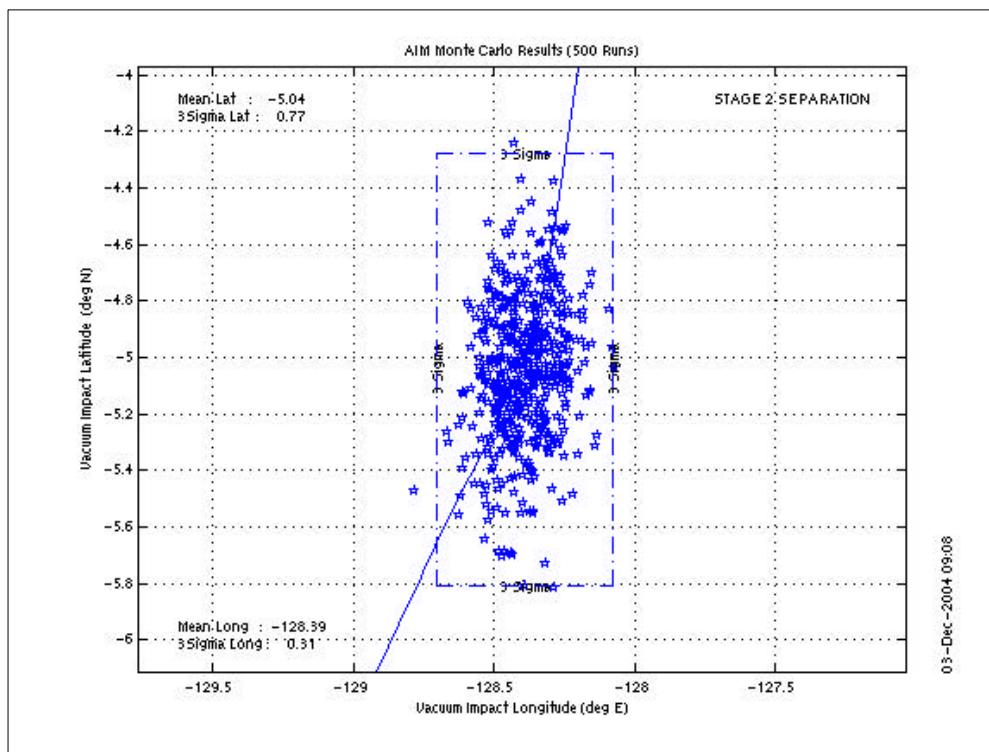
**Figure 4-52. Monte Carlo Results: World Map Nominal IIP Trace and Vacuum IIP Dispersion**



**Figure 4-53. Monte Carlo Results: S1 Nominal IIP Trace and Vacuum IIP Dispersions**



**Figure 4-54. Monte Carlo Results: Fairing Nominal IIP Trace and Vacuum IIP Dispersions**



**Figure 4-55. Monte Carlo Results: S2 Nominal IIP Trace and Vacuum IIP Dispersions**

#### 4.5.3.5. Payload Separation Pointing and Tip-Off Rates

The AIM payload separation will occur 60 seconds after Stage 3 burnout. Currently, there are no pointing requirements for the payload prior to payload separation. For purposes of this analysis, the separation direction was chosen to be in the inertial velocity direction. Separating along the velocity vector is optimal from a relative motion and contamination standpoint, since it maximizes the separation between the two bodies and minimizes contamination potential (from Stage 3 residual thrust).

TABLE 4-7 provides a summary of the results from the most recent payload tip-off analysis. All axes referenced are the Pegasus vehicle axes. The current requirement is for the absolute tip-off rate about each Pegasus axis introduced to the AIM payload following separation to be less than 4.0 deg/sec per axis. The results in TABLE 4-7 show that the tip-off attitude rate requirement has been satisfied in all three axes.

**TABLE 4-7. MEAN AND DISPERSED POST-SEPARATION PAYLOAD BODY RATES**

Body Rates	Mean (deg/s)	$\pm$ 3-Sigma (deg/s)	Minimum Occurrence (deg/s)	Maximum Occurrence (deg/s)
Roll Rate (X-axis)	0.00	2.12	-1.32	1.27
Pitch Rate (Y-axis)	-0.85	2.85	-3.49	1.62
Yaw Rate (Z-axis)	0.63	2.18	-1.40	3.27

In the tip-off analysis, assumptions were made about the body rate dispersions prior to the separation event. These uniformly distributed assumptions were  $\pm 1.25$  deg/sec and  $\pm 0.75$  deg/sec about the roll and pitch/yaw axes, respectively.<sup>6</sup> Dispersion results from the 6DOF Monte Carlo runs summarized in TABLE 4-8 show that the assumptions made in the tip-off analysis clearly encompass the expected pre-separation body rate trajectory dispersions.

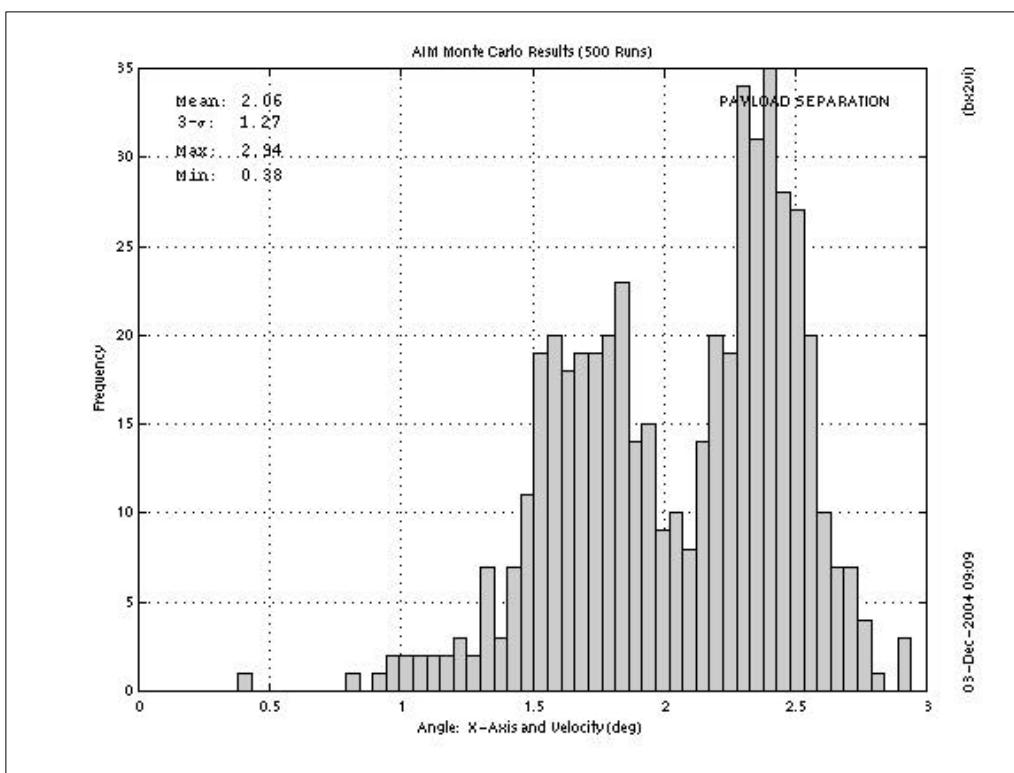
**TABLE 4-8. MEAN AND DISPERSED PRE-SEPARATION BODY RATES**

Body Rates	Mean (deg/s)	$\pm$ 3-Sigma (deg/s)	Minimum Occurrence (deg/s)	Maximum Occurrence (deg/s)
Roll Rate (X-axis)	0.00	0.48	-0.39	0.42
Pitch Rate (Y-axis)	-0.07	0.07	-0.18	-0.04
Yaw Rate (Z-axis)	-0.01	0.08	-0.12	0.03

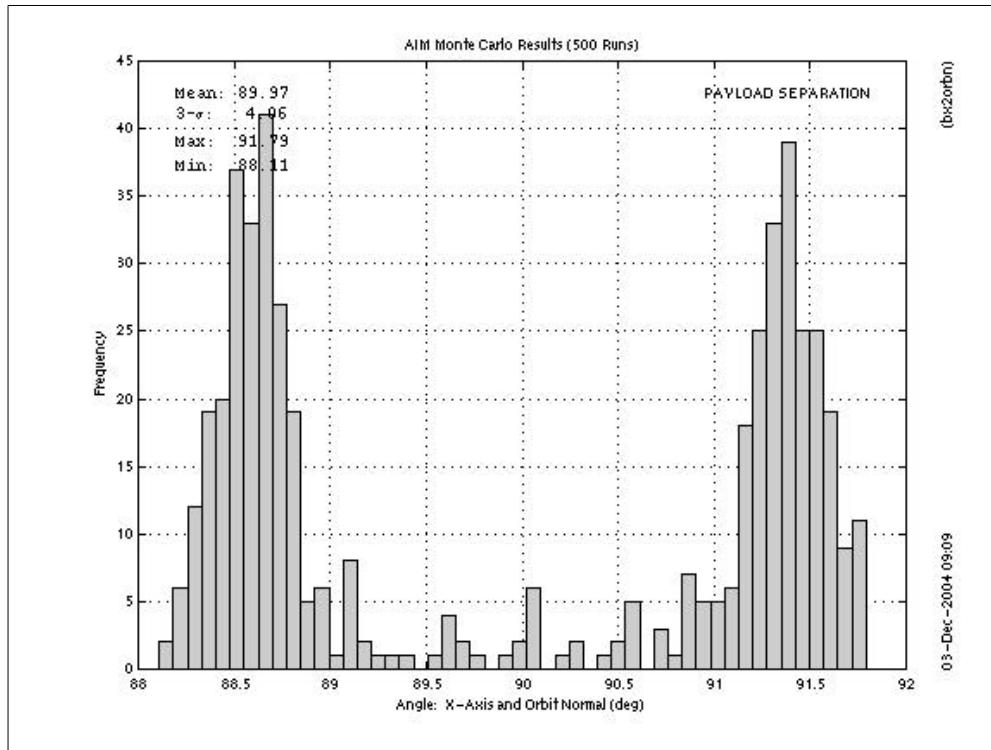
Figure 4-56 and Figure 4-57 are histograms that show the orientation of the Pegasus vehicle at the time of payload separation. There currently is not a pointing requirement for the AIM mission, therefore these histograms were simply added for information only.

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<sup>6</sup> The dispersion assumptions for the initial rates used in the tip-off analysis are contractually required to be equal to the rate deadband values used in the MDL +0.25 degrees.



**Figure 4-56. Monte Carlo Results: Pegasus X-Axis to Velocity Vector Angle**



**Figure 4-57. Monte Carlo Results: Pegasus X-Axis to Orbit Normal Angle**

## 5. TRACKING AND TELEMETRY COVERAGE

The following tracking stations have been identified for use in evaluating tracking and telemetry coverage during captive carry and powered flight. TABLE 5-1 provides the geodetic locations for each of the tracking stations.

TABLE 5-1. TRACKING STATION LOCATIONS

Tracking Station	Geodetic Latitude (deg n)	Longitude (deg e)	Altitude of Ref. Geoid (ft)
CALF	34.58	239.44	601.71
PPTQ	37.50	237.50	-6.17
SNIF	33.25	240.48	220.62

### 5.1. Captive Carry Phase

Figure 5-1 provides a preliminary L-1011 flight plan from takeoff through return-to-base for a typical mission out of the Western Range. The important points along the flight plan have been marked on the figure. TABLE 5-2 provides the position and flight characteristics at these points of interest. TABLE 5-3 through TABLE 5-5 show tracking station visibility data for the stations identified in TABLE 5-1 from Carrier Aircraft (CA) takeoff through Pegasus drop.

### 5.2. Launch Phase

Appendix B contains ground station visibility data of the launch phase for the nominal 6DOF AIM trajectory with respect to the tracking and telemetry stations identified in TABLE 5-1. For each station, data points are provided for elevation, azimuth, aspect angle, range, and range rate at 1 second time intervals.

Figure 5-2 through Figure 5-4 provide elevation angle dispersion data relative to selected tracking sites at selected mission events. These figures were included to supplement the nominal tracking data and to provide additional insight into the likelihood that these mission events would be visible from the selected tracking locations.

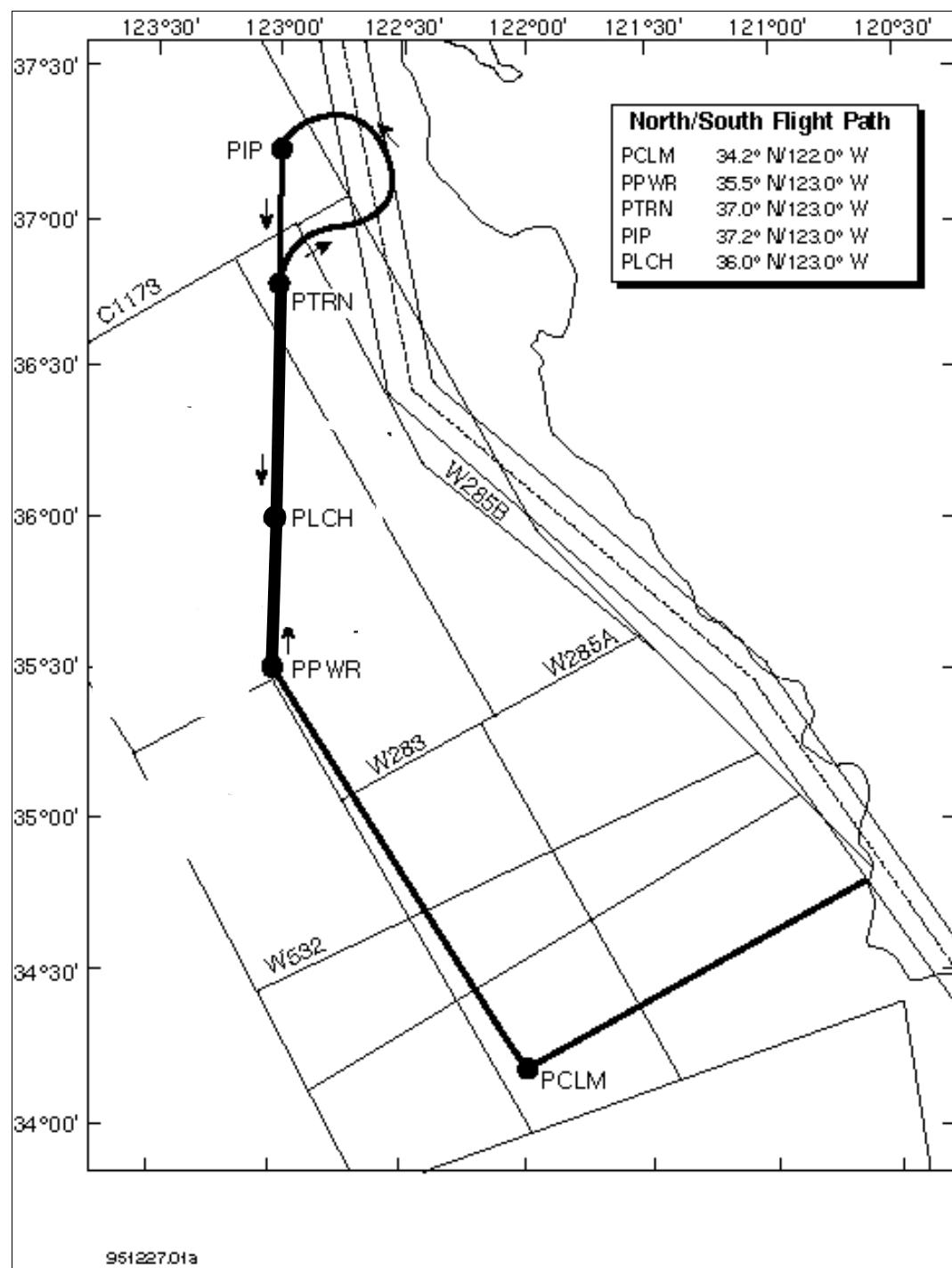


Figure 5-1. AIM Mission Flight Plan (Western Range)

TABLE 5-2. AIM MISSION FLIGHT PLAN SUMMARY (WESTERN RANGE)

Position	Lat. North (deg)	Long. West (deg)	Mag. Crs. (deg)	Dist. (nmi)	Enr. Time (min)	Total Time (min)	MSL alt. (ft)
VAFB (Takeoff Accel)	34-44	120-33	302	0	0	0	367
PCLM (Initial Climb)	34-10	122-00	225	85	17	17	28,000
PPWR (Peg Power-up)	35-30	123-00	320	105	13	30	37,000
PTRN (Begin Aided Nav)	36-45	123-00	345	78	10	40	39,000
PIP (Initial Point)	37-15	123-00	-	70	10	50	39,000
PLCH (Launch/Drop)	36-00	123-00	147	75	10	60	39,000
VAFB (Return to Base)	34-44	120-33	-	144	18	78	367

TABLE 5-3. CALF CAPTIVE CARRY TRACKING DATA SUMMARY

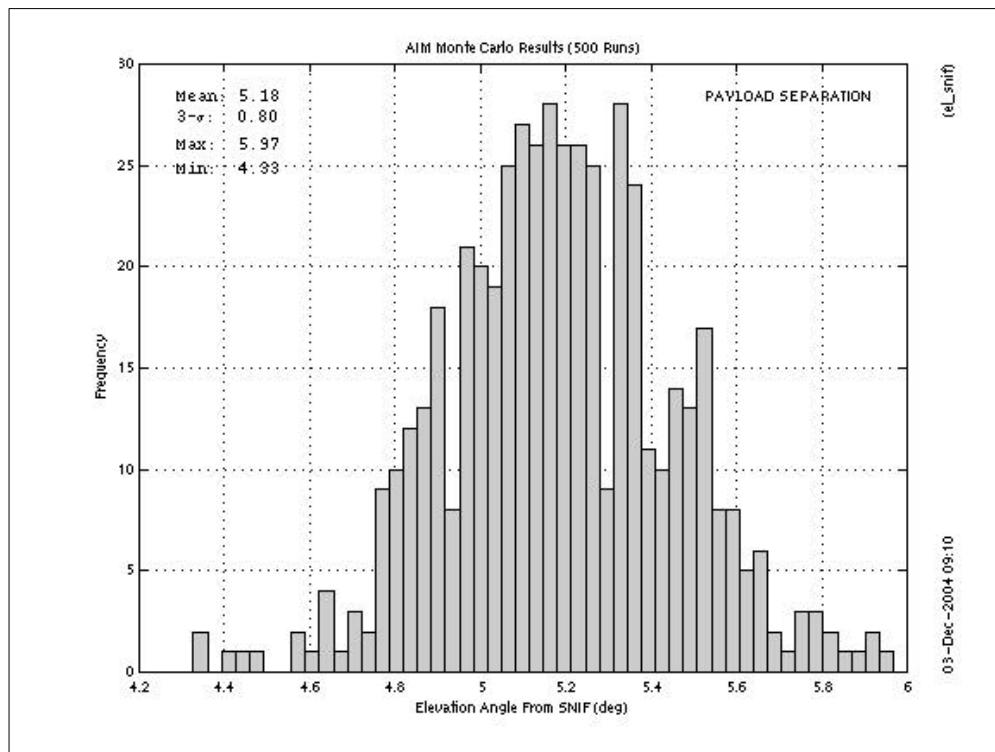
Position	Time from Takeoff (min)	Elevation (deg)	Azimuth (deg)	Range (ft)
VAFB	0	no coverage	no coverage	no coverage
PCLM	17	2.7788e+00	2.5117e+02	4.6088e+05
PPWR	30	1.4955e+00	2.9527e+02	8.0410e+05
PTRN	40	5.8329e-01	3.1814e+02	1.0724e+06
PIP	50	1.5645e-01	3.2407e+02	1.2114e+06
PLCH	60	1.2409e+00	3.0602e+02	8.9350e+05

TABLE 5-4. PPTQ CAPTIVE CARRY TRACKING DATA SUMMARY

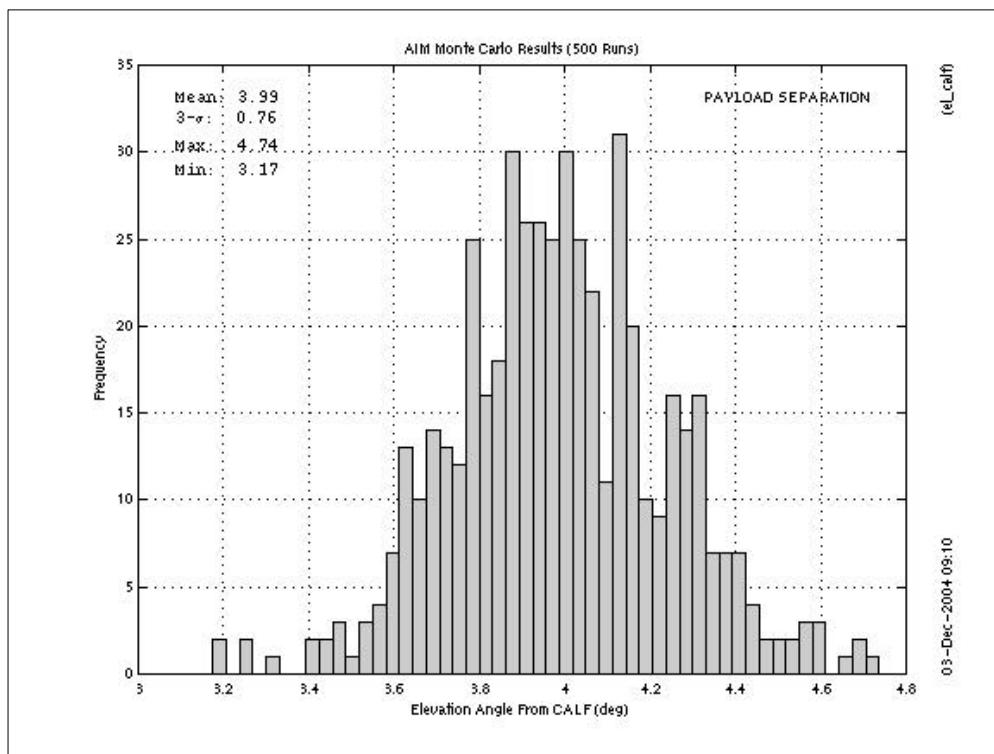
Position	Time from Takeoff (min)	Elevation (deg)	Azimuth (deg)	Range (ft)
VAFB	0	no coverage	no coverage	no coverage
PCLM	17	no coverage	no coverage	no coverage
PPWR	30	1.8326e+00	1.9158e+02	7.4371e+05
PTRN	40	6.7636e+00	2.0832e+02	3.1175e+05
PIP	50	1.2589e+01	2.3830e+02	1.7574e+05
PLCH	60	3.1713e+00	1.9520e+02	5.6666e+05

**TABLE 5-5. SNIF CAPTIVE CARRY TRACKING DATA SUMMARY**

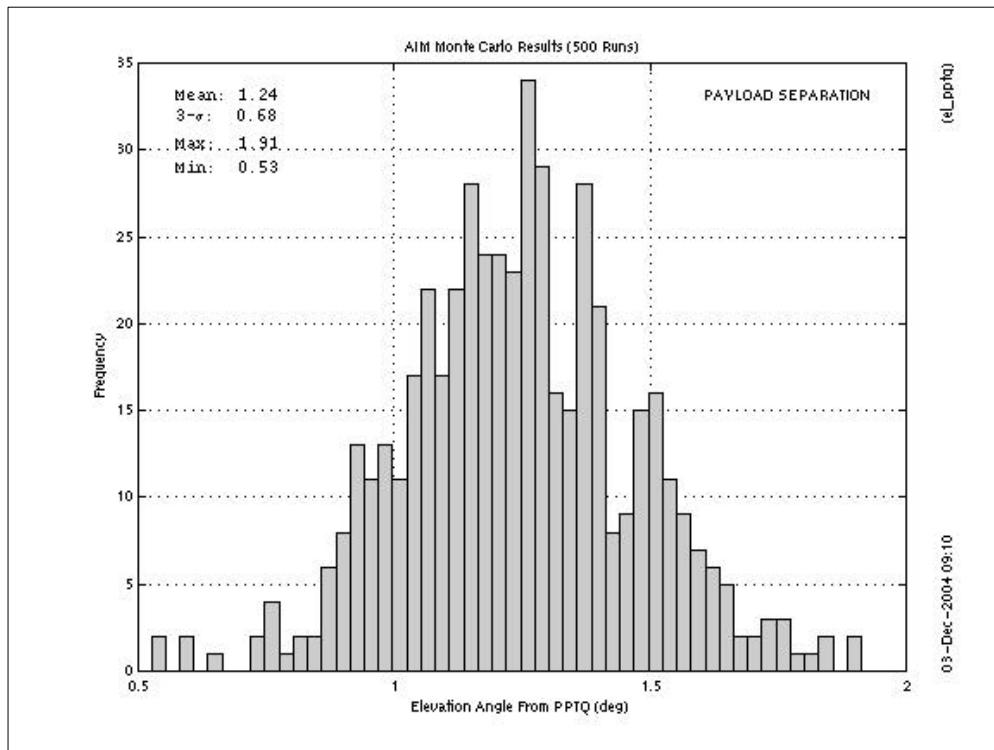
Position	Time from Takeoff (min)	Elevation (deg)	Azimuth (deg)	Range (ft)
VAFB	0	no coverage	no coverage	no coverage
PCLM	17	7.9739e-01	2.9461e+02	8.2608e+05
PPWR	30	no coverage	no coverage	no coverage
PTRN	40	no coverage	no coverage	no coverage
PIP	50	no coverage	no coverage	no coverage
PLCH	60	no coverage	no coverage	no coverage



**Figure 5-2. Monte Carlo Results: Elevation Angle Relative to SNIF at P/L Separation**



**Figure 5-3. Monte Carlo Results: Elevation Angle Relative to CALF at P/L Separation**



**Figure 5-4. Monte Carlo Results: Elevation Angle Relative to PPTQ at P/L Separation**

## **6. CONTAMINATION AND COLLISION AVOIDANCE ANALYSIS**

In order to reduce the probability of re-contact with the Pegasus third stage and to minimize the potential for contamination, a Contamination And Collision Avoidance Maneuver (C/CAM) will be performed following payload separation. The C/CAM logic has been designed to direct the Pegasus X-axis in a direction perpendicular to the separation direction and with a velocity vector component opposite in sign to that of the separation direction. In other words, if the separation direction is in right half of the velocity vector-orbit normal (V-H) plane, the C/CAM direction will be in the left half of that plane, 90 degrees from the separation direction. If on the other hand, the separation direction is in the left half of the V-H plane, the C/CAM direction will be in the right half plane, 90 degrees from the separation direction.

Following the C/CAM, Pegasus will perform a crab-walk maneuver. This maneuver, performed through a series of RCS thruster firings, is designed to impart a small amount of delta velocity in a direction that will increase the separation velocity between the spacecraft and Pegasus.

The relative timing of the post-insertion events is outlined as follows:

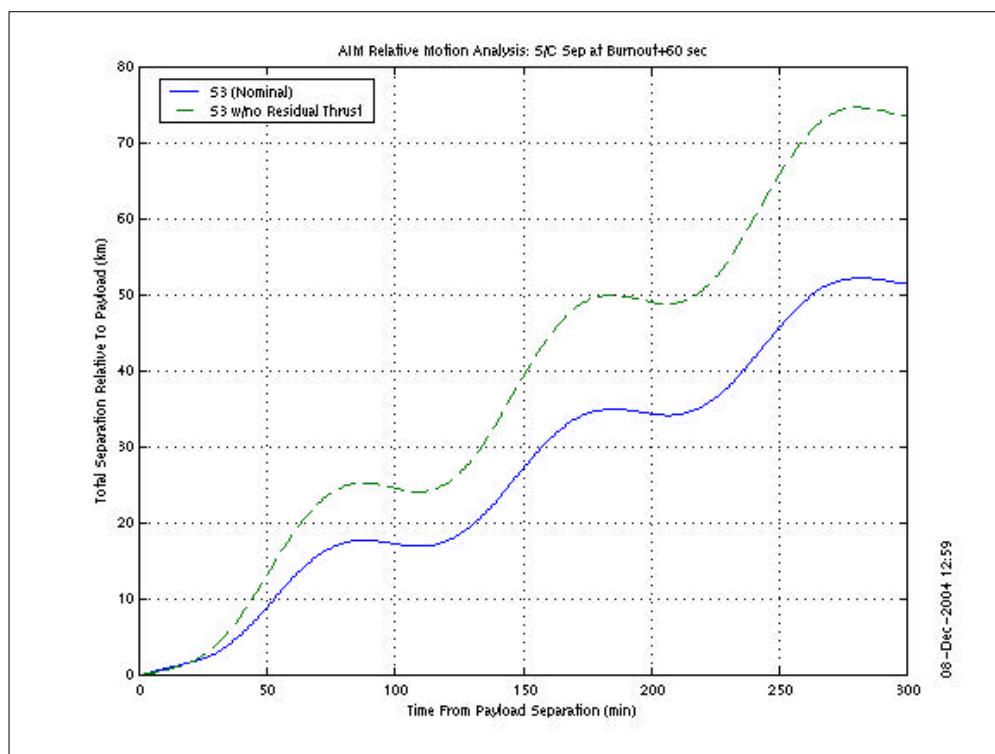
- a. At S3 burnout +60 seconds, the AIM spacecraft will be separated along the Pegasus +X-axis.  
The Pegasus -X-axis will be directed towards the inertial velocity vector.
- b. At AIM separation +3 seconds, Pegasus will begin a C/CAM as described above.
- c. At AIM separation +300 seconds, the Pegasus launch vehicle will begin the crab-walk maneuver.  
The maneuver is terminated 600 seconds after AIM separation.

Figure 6-1 through Figure 6-6 provide a summary description of the relative motion of the various separating bodies for the first 300 minutes after AIM separation. For the Pegasus S3, two cases have been considered. The first case assumes that a nominal residual thrust profile is experienced after Stage 3 motor burnout. Post-flight analysis of past Pegasus missions indicates low levels of residual thrust generally continue for several minutes following motor burnout. The magnitude of this residual thrust is extremely small (~1.25 lbf at payload separation), but is included to improve the fidelity of vehicle modeling. The second case assumes that no residual thrust is experienced after payload separation. Both cases simulate the crab-walk, in which approximately 1.5 ft/sec delta-v is imparted to the Pegasus Stage 3 through a series of RCS thruster firings.

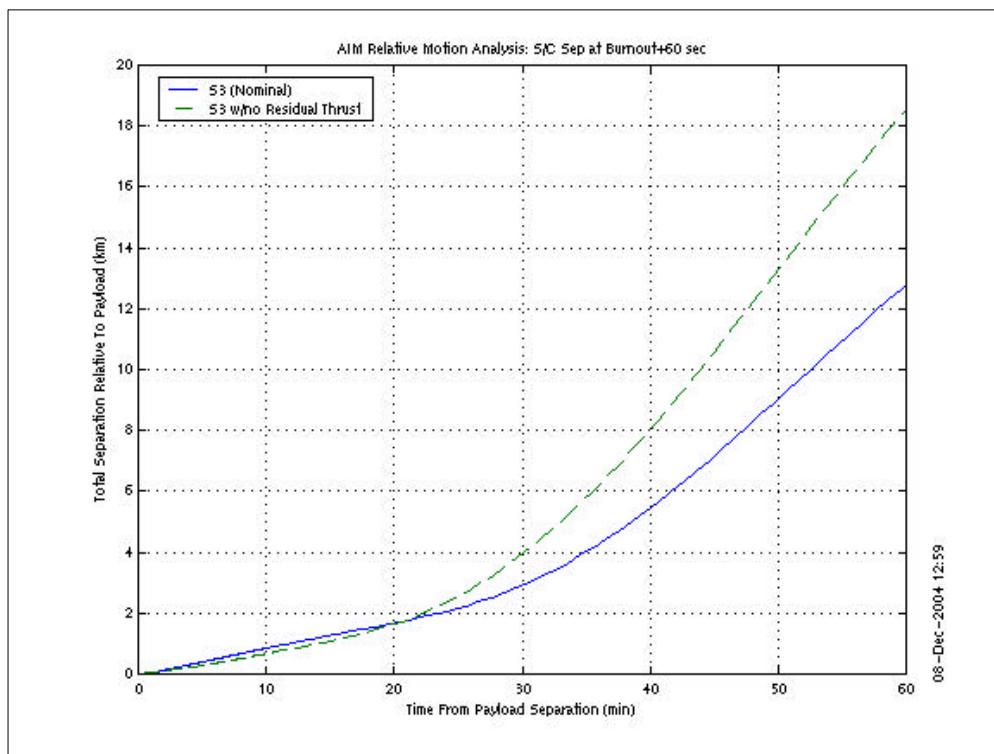
Figure 6-1 shows the magnitude of the separation distance relative to the AIM payload as a function of time from payload separation. Figure 6-3 and Figure 6-4 shows the in-plane and out-of-plane components of the total AIM-relative separation distance. In these two figures, the plane in question is

defined to be the instantaneous osculating orbital plane of the AIM spacecraft. Figure 6-5 shows the in-plane motion of each body in an AIM-centered frame. This coordinate system is centered on the AIM spacecraft and defined such that at each instant, the +X-axis is aligned along the velocity vector, the +Y-axis is aligned with the positive orbit normal, and the +Z-axis completes the right-handed frame.

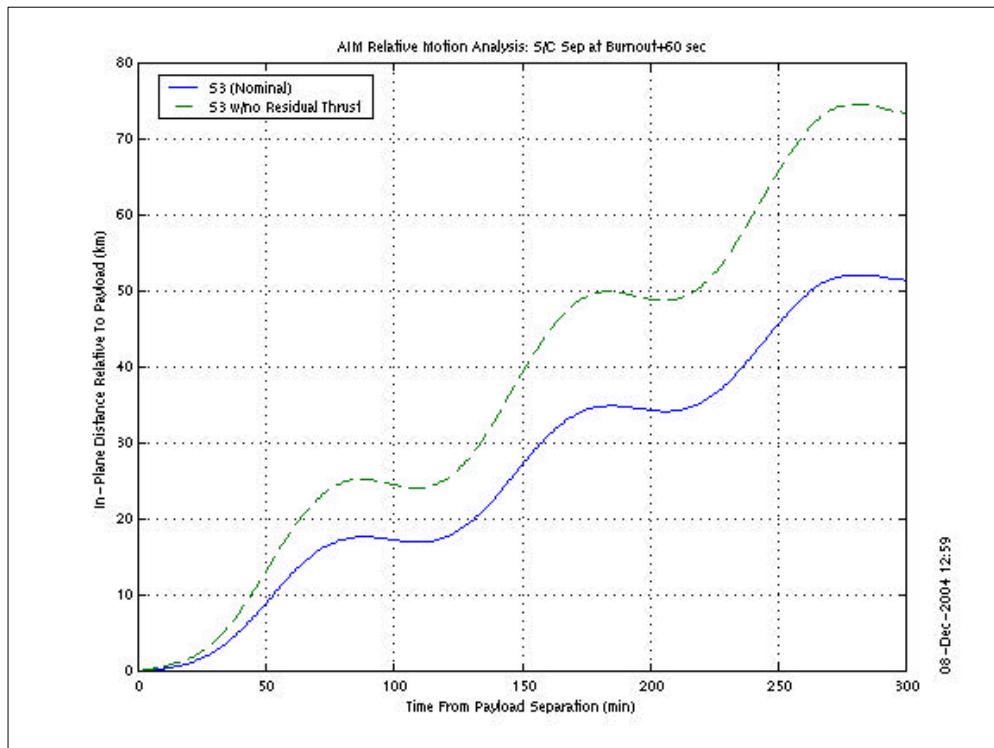
Figure 6-8 and Figure 6-9 provide the results of the relative motion analysis applied to the Monte Carlo results. The figures indicate that acceptable separation distances are maintained in all cases. The mass deposition estimates in Figure 6-10 were computed using the methodology described in the 8 August 2002 TIM between Orbital and KSC (peg0208\_005\_rev\_.pdf).



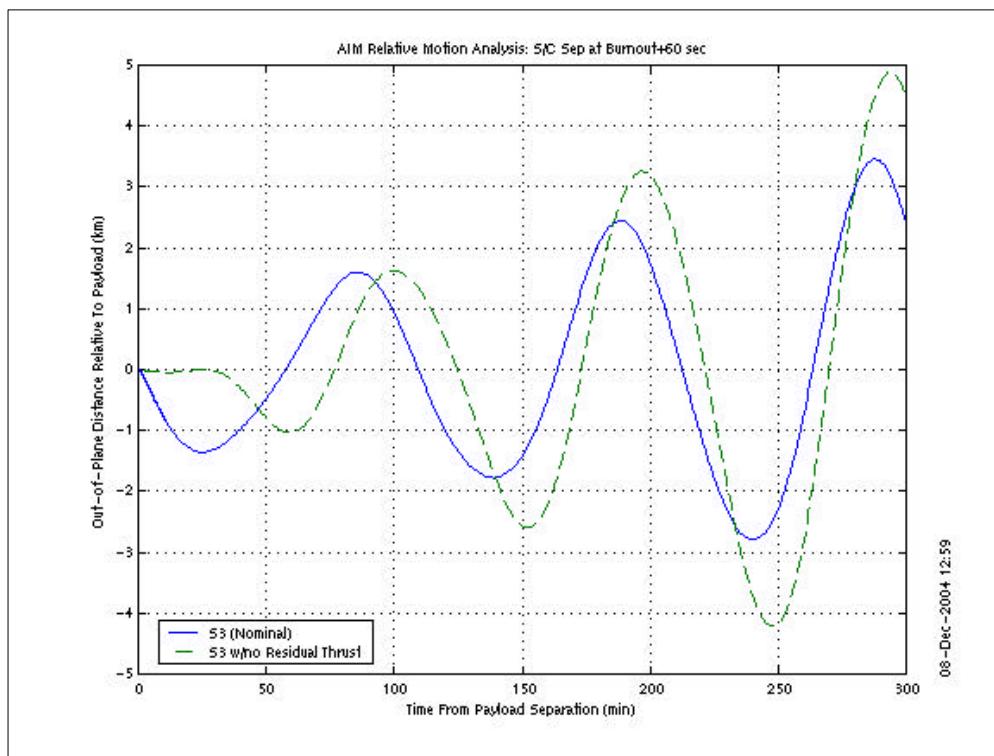
**Figure 6-1. Relative Motion Analysis: Separation Distance Relative to AIM**



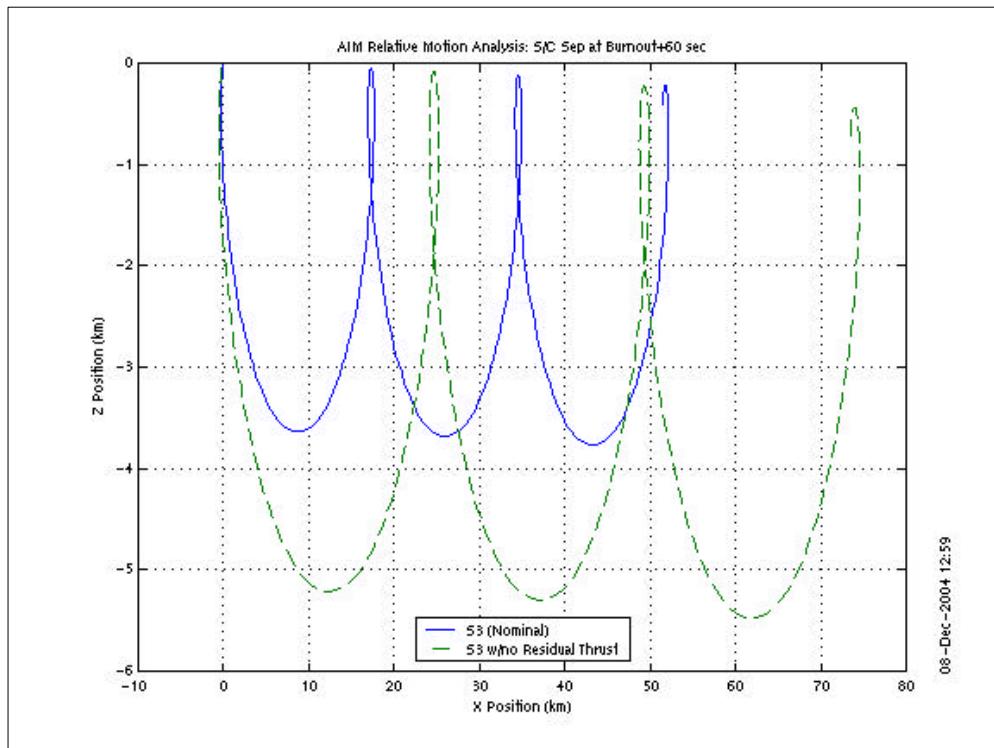
**Figure 6-2. Relative Motion Analysis: Separation Distance Relative to AIM (Zoom)**



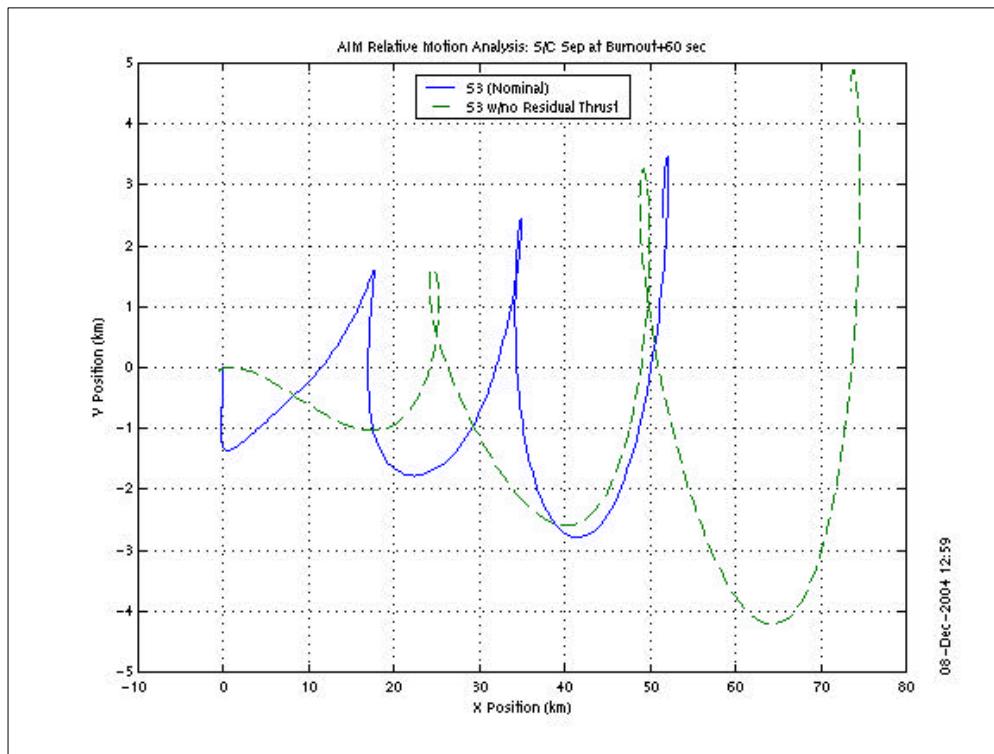
**Figure 6-3. Relative Motion Analysis: In-Plane Separation Distance (AIM-Centered Frame)**



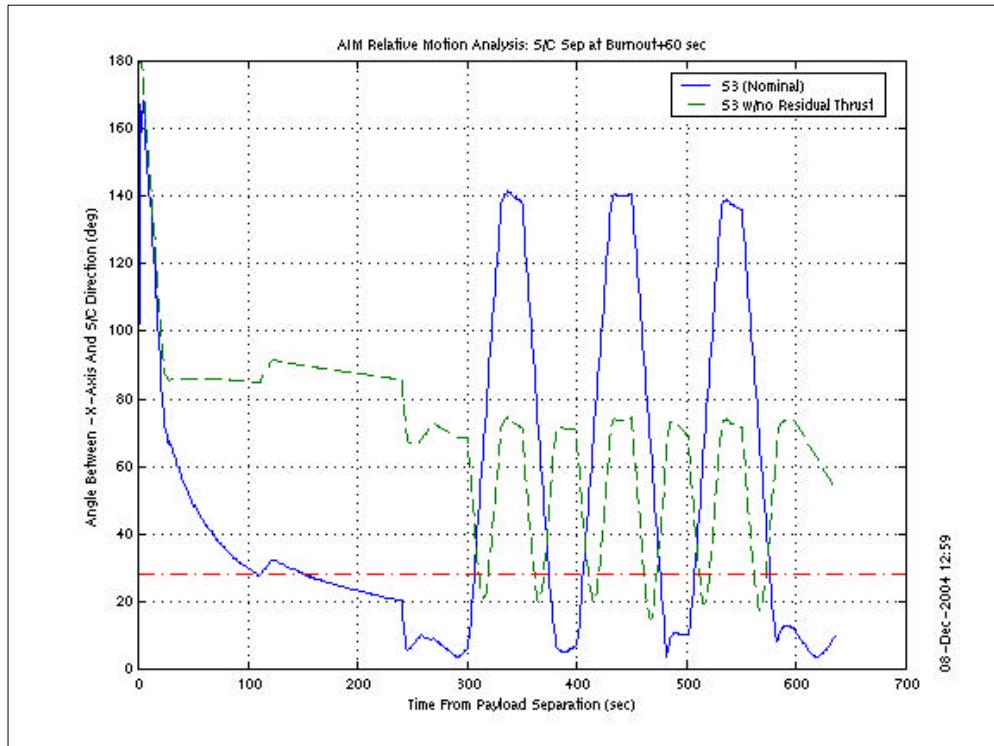
**Figure 6-4. Relative Motion Analysis: Out-of-Plane Separation Distance (AIM-Centered Frame)**



**Figure 6-5. Relative Motion Analysis: In-Plane Trajectory of Bodies in AIM-Centered Frame**



**Figure 6-6. Relative Motion Analysis: Out-of-Plane Trajectory of Bodies in AIM-Centered Frame**



**Figure 6-7. Relative Motion Analysis: Pegasus X-Axis Relative to Payload Separation Direction**

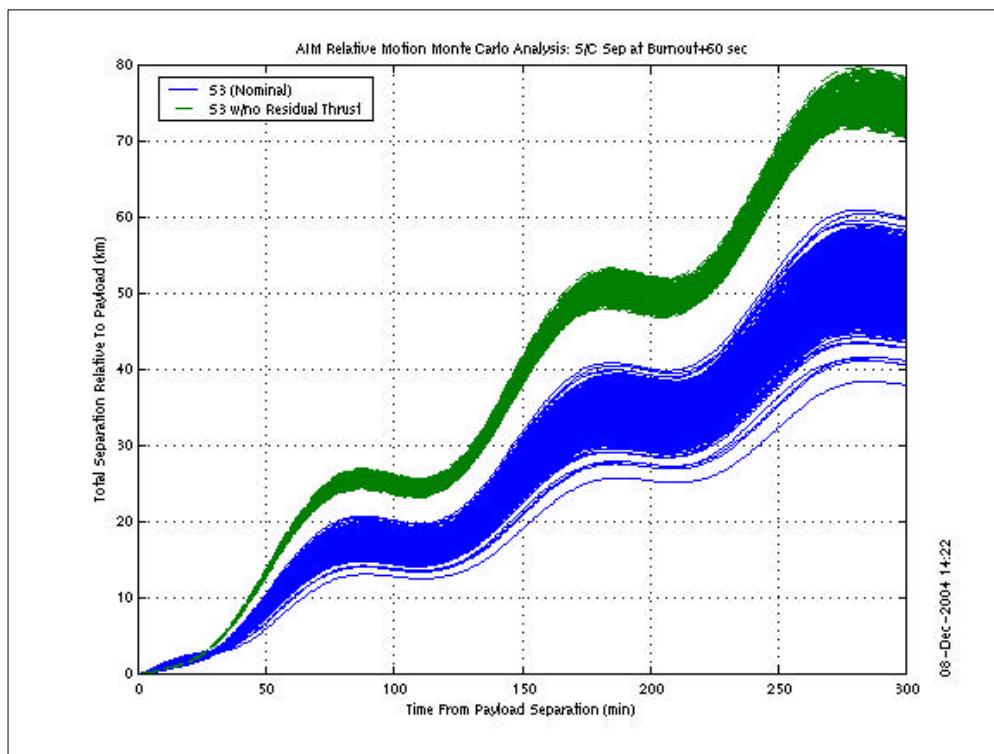


Figure 6-8. Relative Motion Analysis: Separation Distance Relative to AIM

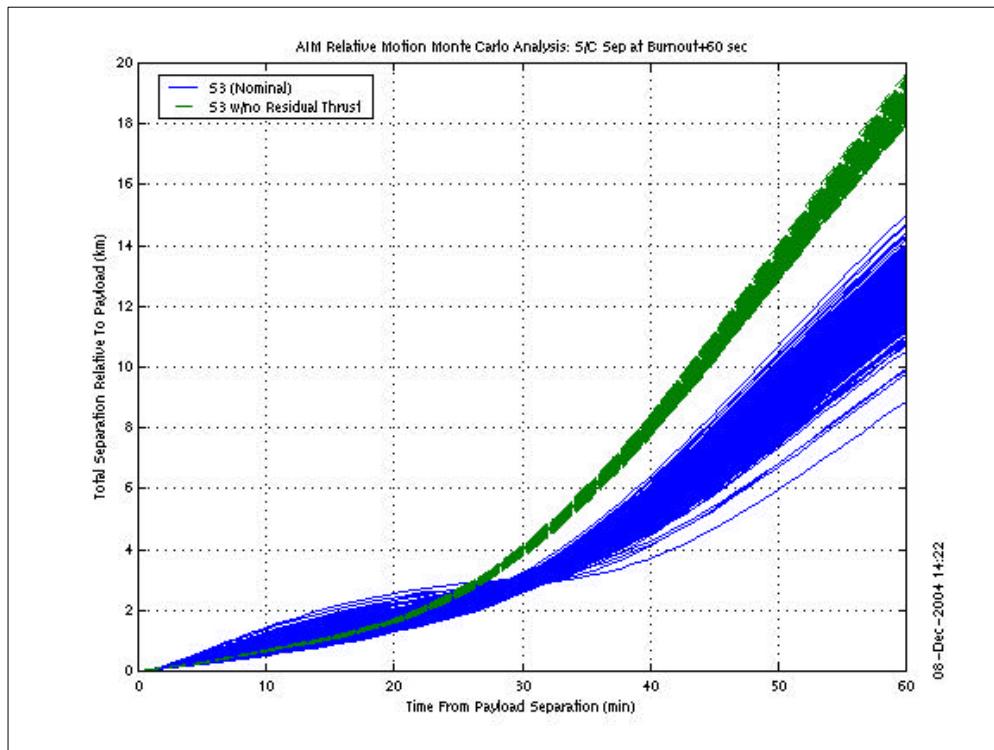
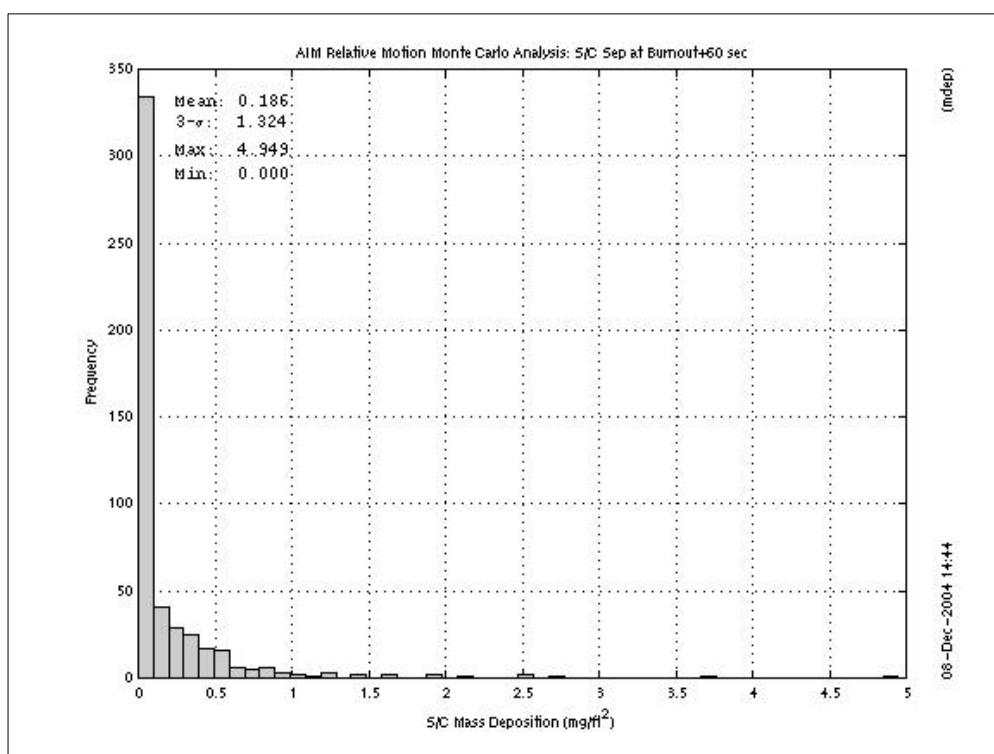


Figure 6-9. Relative Motion Analysis: Separation Distance Relative to AIM (Zoom)



**Figure 6-10. Relative Motion Analysis: Mass Deposition Estimate**

## APPENDIX A

### NOMINAL 6DOF TRAJECTORY OUTPUT DATA

**OUTPUT VARIABLE DEFINITION LIST**

TIME	Time From Drop (Sec)	MEAN	Mean Anomaly (Deg)
ALTITO	Altitude Above An Oblate Earth (Ft)	TIMIP	Time Of Vacuum Impact Point (Sec)
GCRAD	Geocentric Radius To The Vehicle (Ft)	GDLTIP	Geodetic Latitude Of Vacuum IIP (Deg N)
GAMMAI	Inertial Flight Path Angle (Deg)	LONGIP	Longitude Of Vacuum IIP (Deg E)
GAMMAR	Earth-Relative Flight Path Angle (Deg)	TLHEAT	Total Integrated Aerodynamic Heating
ALPHA	Angle Of Attack (Deg)		(Btu/Ft^2)
BETA	Sideslip Angle (Deg)	HEATRT	Aero Heating Rate (Btu/Ft^2/Sec)
BNKANG	Bank Angle (Deg)	ALTA	Altitude Of Apogee Above Mean Equatorial
PITI	Pitch Inertial Euler Angle, 1-3-2 Sequence, (Deg)	ALTP	Radius (Nmi)
YAWI	Yaw Inertial Euler Angle, 1-3-2 Sequence, (Deg)	INC	Altitude Of Perigee Above Mean Equatorial Radius (Nmi)
ROLI	Roll Inertial Euler Angle, 1-3-2 Sequence, (Deg)	TRUAN	Inclination (Deg)
ROLBD	Inertial Body-X Angular Rate (Deg/Sec)	APORAD	True Anomaly (Deg)
PITBD	Inertial Body-Y Angular Rate (Deg/Sec)	PGERAD	Radius Of Apogee (Ft)
YAWBD	Inertial Body-Z Angular Rate (Deg/Sec)	LAN	Radius Of Perigee (Ft)
VIDEAL	Ideal Velocity (Ft/Sec)	ARGP	ECI Longitude Of Ascending Node (Deg)
VELI	Ideal Velocity (Ft/Sec)	ANLON	Argument Of Perigee (Deg)
VELA	Earth-Relative Velocity (Ft/Sec)	FAXB	Earth-Relative Longitude Of The Nearest Ascending Node Crossing (Deg)
XI	ECI X-Position Vector (Ft)	FAYB	Aero Force Along The Body X-Axis (Lb.)
YI	ECI Y-Position Vector (Ft)	FAZB	Aero Force Along The Body Y-Axis (Lb.)
ZI	ECI Z-Position Vector (Ft)	AXB	Aero Force Along The Body Z-Axis (Lb.)
VXI	ECI Inertial X-Velocity (Ft/Sec)	AYB	Accel Along The Body X-Axis (Ft/Sec2)
YVI	ECI Inertial Y-Velocity (Ft/Sec)	AZB	Accel Along The Body Y-Axis (Ft/Sec2)
VZI	ECI Inertial Z-Velocity (Ft/Sec)	AZVELR	Accel Along The Body Z-Axis (Ft/Sec2)
AXI	ECI Inertial X-Acceleration (Ft/Sec2)	AZVELI	Earth-Relative Azimuth (Deg)
AYI	ECI Inertial Y-Acceleration (Ft/Sec2)	DWRNG	Inertial Azimuth (Deg)
AZI	ECI Inertial Z-Acceleration (Ft/Sec2)	CRRNG	Downrange Distance (Nmi)
MACH	Mach Number	ECCEN	Crossrange Distance (Nmi)
DYNP	Dynamic Pressure (Psf)	PERIOD	Eccentricity
QALPHA	Product Of Angle Of Attack And Dynamic Pressure (Deg-Psf)	SEMJAX	Orbital Period (Min.)
QBETA	Product Of Sideslip Angle And Dynamic Pressure (Deg-Psf)	LIFT	Semimajor Axis (Ft)
WPROP	Stage Propellant Weight (Lb.)	DRAG	Aerodynamic Lift (Lb.)
WEIGHT	Total Vehicle Weight (Lb.)	IB11	Aerodynamic Drag (Lb.)
THRUST	Net Thrust (Lb.)	IB12	Element (1,1) Of The ECI To Body Transformation Matrix
DENS	Atmospheric Density (Slugs/Ft3)	IB13	Element (1,2) Of The ECI To Body Transformation Matrix
PRES	Atmospheric Pressure (Lb./Ft2)		Element (1,3) Of The ECI To Body Transformation Matrix
GDLAT	Geodetic Latitude (Deg N)	IB21	Element (2,1) Of The ECI To Body Transformation Matrix
LONG	Longitude (Deg E)		Element (2,2) Of The ECI To Body Transformation Matrix

IB22	Element (2,2) Of The ECI To Body Transformation Matrix
IB23	Element (2,3) Of The ECI To Body Transformation Matrix
IB31	Element (3,1) Of The ECI To Body Transformation Matrix
IB32	Element (3,2) Of The ECI To Body Transformation Matrix
IB33	Element (3,3) Of The ECI To Body Transformation Matrix

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TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----

BEGIN DROP FROM AIRCRAFT

0.000000E+00	4.015045E+04	2.094169E+07	1.064828E-01	7.340431E-04	4.000000E+00
0.000000E+00	-5.337828E-02	-8.600000E+01	-5.337828E-02	-1.701000E+01	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	1.309894E+03	7.805505E+02	-9.248677E+06
-1.424171E+07	1.225520E+07	6.502708E+02	-9.558514E+02	-6.158885E+02	1.265678E+01
1.893005E+01	-1.524925E+01	8.228761E-01	1.948034E+02	7.792136E+02	0.000000E+00
3.329098E+04	5.089770E+04	0.000000E+00	6.133521E-04	4.109627E+02	3.600000E+01
-1.230000E+02	1.799847E+02	5.006626E+01	3.589558E+01	-1.230291E+02	0.000000E+00
1.316282E-01	2.640464E+00	-3.439514E+03	4.870947E+01	1.799997E+02	2.094169E+07
2.676246E+04	9.633157E+01	3.088450E+02	1.000868E+02	-1.140003E+03	1.503577E+01
-7.211023E+03	-7.205415E-01	9.503388E-03	-4.557743E+00	-1.672445E+02	1.255336E+02
0.000000E+00	4.773891E-14	9.974474E-01	2.996310E+01	1.048423E+07	7.112957E+03
1.640016E+03	-5.808167E-01	-3.586778E-01	-7.307545E-01	-7.087414E-01	6.643900E-01
2.372163E-01	4.004218E-01	6.556951E-01	-6.400986E-01	0.000000E+00	0.000000E+00

BEGIN STAGE 1 MOTOR IGNITION

5.000000E+00	3.983968E+04	2.094139E+07	-5.015891E+00	-8.604871E+00	1.415366E+01
-1.289852E-01	-3.923053E-01	-8.428301E+01	-4.239479E-01	-1.708348E+01	-2.411073E-01
1.467504E+00	4.313843E-02	0.000000E+00	1.313191E+03	7.834648E+02	-9.245281E+06
-1.424628E+07	1.225195E+07	7.054966E+02	-8.740812E+02	-6.802408E+02	9.514510E+00
1.358447E+01	-9.810748E+00	8.249129E-01	1.986940E+02	2.812247E+03	-2.562858E+01
3.329098E+04	5.089770E+04	0.000000E+00	6.216893E-04	4.171069E+02	3.598960E+01
-1.230029E+02	1.807180E+02	4.634426E+01	3.589365E+01	-1.230296E+02	6.608597E-01
1.338357E-01	2.625175E+00	-3.439526E+03	4.855715E+01	1.800128E+02	2.094160E+07
2.669098E+04	9.658425E+01	3.086828E+02	1.003338E+02	-1.035985E+03	7.379823E+01
-2.183895E+04	-6.547964E-01	4.664433E-02	-1.380336E+01	-1.672614E+02	1.253009E+02
6.390371E-01	7.111530E-05	9.974542E-01	2.996275E+01	1.048414E+07	2.091980E+04
6.343795E+03	-5.930000E-01	-3.777411E-01	-7.110996E-01	-7.108643E-01	6.603835E-01
2.420034E-01	3.781838E-01	6.490033E-01	-6.601301E-01	0.000000E+00	0.000000E+00
1.000000E+01	3.927078E+04	2.094084E+07	-2.920282E+00	-4.093616E+00	1.894127E+01
-2.036906E-01	-3.466852E-01	-7.510290E+01	-3.941211E-01	-1.718772E+01	-1.978963E-01
1.727918E+00	-8.089664E-03	3.265310E+02	1.426089E+03	1.063700E+03	-9.242150E+06
-1.425088E+07	1.224801E+07	5.294222E+02	-9.912142E+02	-8.780295E+02	-4.216370E+01
-3.366003E+01	-3.147241E+01	1.112838E+00	3.715508E+02	7.037643E+03	-7.568140E+01
3.141676E+04	4.902349E+04	1.131065E+05	6.370678E-04	4.285953E+02	3.597739E+01
-1.230065E+02	1.804546E+02	4.720865E+01	3.584412E+01	-1.230471E+02	1.809254E+00
3.493828E-01	2.513585E+00	-3.438710E+03	5.593529E+01	1.800089E+02	2.094092E+07
3.164356E+04	8.621607E+01	3.150776E+02	8.994040E+01	-4.722876E+03	2.771575E+02
-6.216856E+04	7.112146E+01	1.818752E-01	-4.128827E+01	-1.660895E+02	1.363250E+02
1.390813E+00	8.568831E-03	9.969824E-01	2.997191E+01	1.048628E+07	5.726133E+04
2.464359E+04	-6.470797E-01	-4.751862E-01	-5.962264E-01	-7.096314E-01	6.613042E-01
2.431047E-01	2.787671E-01	5.804092E-01	-7.651236E-01	0.000000E+00	0.000000E+00
2.000000E+01	4.073419E+04	2.094234E+07	1.419526E+01	1.523417E+01	1.449230E+01
3.064991E-02	1.359503E-01	-6.047380E+01	5.544251E-02	-1.697386E+01	-1.209559E-01
7.813016E-01	-1.473126E-02	1.292526E+03	1.822065E+03	1.681489E+03	-9.239389E+06
-1.426318E+07	1.223835E+07	-7.667711E+00	-1.517026E+03	-1.009205E+03	-6.117374E+01
-6.248621E+01	-7.373535E+00	1.755988E+00	8.627322E+02	1.250298E+04	2.644267E+01
2.664119E+04	4.424791E+04	1.512761E+05	5.978204E-04	3.996859E+02	3.594175E+01
-1.230179E+02	1.772037E+02	6.618241E+01	3.565768E+01	-1.231123E+02	9.622692E+00
1.409982E+00	3.261994E+00	-3.435900E+03	6.791789E+01	1.799324E+02	2.094547E+07

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TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----
4.872245E+04	7.405295E+01	3.209700E+02	7.767330E+01	-1.374304E+04	-1.963040E+02
-7.554897E+04	9.998960E+01	-1.427209E-01	-5.565656E+01	-1.649636E+02	1.524016E+02
3.596315E+00	7.919780E-02	9.953585E-01	3.001828E+01	1.049710E+07	6.969632E+04
3.220746E+04	-6.969477E-01	-6.059639E-01	-3.834991E-01	-7.082523E-01	6.654817E-01
2.356118E-01	1.124394E-01	4.358232E-01	-8.929813E-01	0.000000E+00	0.000000E+00
3.000000E+01	4.847422E+04	2.095014E+07	2.678179E+01	2.670551E+01	8.948855E+00
-3.724024E-02	9.017454E-01	-5.460646E+01	7.223145E-01	-1.655398E+01	3.319995E-01
-4.324891E-01	-5.001361E-02	2.524928E+03	2.496114E+03	2.487598E+03	-9.242576E+06
-1.428152E+07	1.222789E+07	-6.382513E+02	-2.159291E+03	-1.077350E+03	-6.644006E+01
-6.702710E+01	-6.477295E+00	2.620727E+00	1.320828E+03	1.181990E+04	-4.918794E+01
2.120553E+04	3.881225E+04	1.556143E+05	4.215831E-04	2.746328E+02	3.589100E+01
-1.230351E+02	1.729561E+02	1.006099E+02	3.530259E+01	-1.232411E+02	3.545059E+01
4.014262E+00	7.304259E+00	-3.431131E+03	7.657070E+01	1.797847E+02	2.097003E+07
7.770077E+04	6.697299E+01	3.233401E+02	7.047644E+01	-2.096161E+04	1.633278E+02
-5.459627E+04	1.116057E+02	1.353762E-01	-4.610821E+01	-1.642518E+02	1.633802E+02
6.746492E+00	2.265907E-01	9.926167E-01	3.013318E+01	1.052386E+07	5.066411E+04
2.919504E+04	-7.053316E-01	-6.468106E-01	-2.900749E-01	-7.070866E-01	6.710184E-01
2.230758E-01	5.035784E-02	3.624505E-01	-9.306416E-01	0.000000E+00	0.000000E+00
4.000000E+01	6.276243E+04	2.096451E+07	3.075695E+01	2.974426E+01	5.974093E+00
-2.568358E-01	1.559241E+00	-5.443286E+01	1.348454E+00	-1.598561E+01	-9.356241E-01
1.616456E-01	-8.258975E-02	3.966784E+03	3.441495E+03	3.528616E+03	-9.252567E+06
-1.430642E+07	1.221585E+07	-1.388556E+03	-2.840885E+03	-1.358372E+03	-8.313403E+01
-7.413647E+01	-3.447095E+01	3.694757E+00	1.296151E+03	7.743325E+03	-3.328979E+02
1.567636E+04	3.328308E+04	1.597705E+05	2.081000E-04	1.356386E+02	3.582199E+01
-1.230596E+02	1.689607E+02	1.396173E+02	3.470278E+01	-1.234687E+02	9.603037E+01
8.323623E+00	1.447819E+01	-3.421299E+03	8.405637E+01	1.795500E+02	2.101362E+07
1.374378E+05	6.138840E+01	3.245876E+02	6.479189E+01	-1.826547E+04	6.978633E+02
-2.428698E+04	1.367693E+02	6.745248E-01	-2.449895E+01	-1.635888E+02	1.726797E+02
1.104286E+01	4.807125E-01	9.870042E-01	3.035535E+01	1.057553E+07	2.225097E+04
2.069118E+04	-7.042607E-01	-6.489941E-01	-2.877907E-01	-7.075093E-01	6.751214E-01
2.089060E-01	5.871489E-02	3.507389E-01	-9.346308E-01	0.000000E+00	0.000000E+00
5.000000E+01	8.392148E+04	2.098578E+07	3.234032E+01	3.104505E+01	5.935658E+00
-3.845269E-01	2.098908E-01	-5.322343E+01	2.101758E-01	-1.685130E+01	5.415751E-02
6.478626E-02	2.315645E-02	5.655888E+03	4.702252E+03	4.853211E+03	-9.270991E+06
-1.433889E+07	1.220032E+07	-2.328871E+03	-3.681699E+03	-1.769924E+03	-1.027119E+02
-9.129761E+01	-4.753003E+01	4.960376E+00	8.497311E+02	5.043713E+03	-3.267445E+02
1.017738E+04	2.778410E+04	1.544858E+05	7.228126E-05	4.936312E+01	3.572785E+01
-1.230941E+02	1.641771E+02	1.898930E+02	3.367429E+01	-1.238607E+02	2.045138E+02
1.334100E+01	2.665921E+01	-3.402801E+03	8.949174E+01	1.791259E+02	2.108763E+07
2.498330E+05	5.747797E+01	3.253262E+02	6.078337E+01	-1.132321E+04	5.617780E+02
-1.255454E+04	1.657578E+02	6.504582E-01	-1.571215E+01	-1.631999E+02	1.793753E+02
1.691543E+01	8.839624E-01	9.765827E-01	3.075752E+01	1.066873E+07	1.130569E+04
1.255812E+04	-7.054970E-01	-6.561845E-01	-2.677610E-01	-7.082349E-01	6.666399E-01
2.323672E-01	2.602443E-02	3.535721E-01	-9.350452E-01	0.000000E+00	0.000000E+00
6.000000E+01	1.129974E+05	2.101500E+07	3.169273E+01	3.044602E+01	1.919358E+00
-1.742189E-01	6.319071E-02	-5.802704E+01	-6.044814E-02	-1.724845E+01	-1.139050E-01
-6.633072E-02	-7.624251E-03	7.605226E+03	6.325344E+03	6.524498E+03	-9.299858E+06
-1.438052E+07	1.217963E+07	-3.495843E+03	-4.668715E+03	-2.447886E+03	-1.316040E+02
-1.080376E+02	-8.645435E+01	6.421484E+00	3.875291E+02	7.438071E+02	-6.751492E+01
4.936386E+03	2.254311E+04	1.508725E+05	1.816632E-05	1.342263E+01	3.560119E+01

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Launch Systems Group**

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TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----
-1.231414E+02	1.589828E+02	2.493367E+02	3.197869E+01	-1.245000E+02	3.578709E+02
1.709582E+01	4.475730E+01	-3.367496E+03	9.347400E+01	1.784014E+02	2.119760E+07
4.643542E+05	5.463483E+01	3.261034E+02	5.786219E+01	-4.634452E+03	8.480996E+01
-1.406572E+03	2.086833E+02	1.210275E-01	-3.435163E+00	-1.629523E+02	-1.757357E+02
2.482574E+01	1.471751E+00	9.571272E-01	3.146180E+01	1.083098E+07	1.250390E+03
4.678319E+03	-7.032306E-01	-6.220242E-01	-3.443146E-01	-7.064945E-01	6.655992E-01
2.405062E-01	7.957479E-02	4.123877E-01	-9.075264E-01	0.000000E+00	0.000000E+00
7.000000E+01	1.506713E+05	2.105287E+07	3.039216E+01	2.930316E+01	1.752314E+00
1.083607E-01	2.193617E-01	-5.955383E+01	-9.674803E-02	-1.712846E+01	-7.379555E-03
-3.268521E-01	9.610514E-03	9.808223E+03	8.289586E+03	8.523184E+03	-9.342052E+06
-1.443318E+07	1.215042E+07	-4.872594E+03	-5.799074E+03	-3.368353E+03	-5.340967E+01
-3.798242E+01	-5.236426E+01	7.965332E+00	1.292687E+02	2.265193E+02	1.400765E+01
1.725278E+02	1.777925E+04	3.341327E+04	3.539990E-06	2.912730E+00	3.542982E+01
-1.232059E+02	1.532186E+02	3.222134E+02	2.929639E+01	-1.254780E+02	5.391174E+02
1.759736E+01	7.096650E+01	-3.306252E+03	9.615935E+01	1.772197E+02	2.135685E+07
8.364736E+05	5.271253E+01	3.272953E+02	5.588939E+01	-1.523800E+03	-2.418690E+01
-3.539735E+02	5.769987E+01	-4.376408E-02	-1.041456E+00	-1.628380E+02	-1.724504E+02
3.553539E+01	2.308041E+00	9.246193E-01	3.262651E+01	1.109666E+07	3.071697E+02
1.533701E+03	-6.993572E-01	-6.122310E-01	-3.688803E-01	-7.079325E-01	6.645196E-01
2.392599E-01	9.864582E-02	4.284705E-01	-8.981548E-01	0.000000E+00	0.000000E+00

BEGIN STAGE 1 MOTOR BURNOUT

7.636000E+01	1.768027E+05	2.107914E+07	2.933503E+01	2.826719E+01	1.231698E+00
1.172058E-01	1.783667E-01	-6.127300E+01	-1.555678E-01	-1.725211E+01	-2.649066E-02
-2.609793E-01	1.189114E-03	9.897148E+03	8.261521E+03	8.499080E+03	-9.373008E+06
-1.446984E+07	1.212851E+07	-4.834266E+03	-5.706535E+03	-3.509711E+03	1.309812E+01
2.080346E+01	-1.863943E+01	7.998837E+00	4.763717E+01	5.867461E+01	5.583352E+00
9.887825E+00	1.761661E+04	1.250657E+03	1.308228E-06	1.065641E+00	3.530600E+01
-1.232526E+02	1.541237E+02	3.188614E+02	2.919025E+01	-1.255157E+02	6.275048E+02
1.065008E+01	7.199338E+01	-3.303814E+03	9.622572E+01	1.772903E+02	2.136309E+07
8.512888E+05	5.266498E+01	3.273440E+02	5.584052E+01	-5.602834E+02	-7.130456E+00
-9.618723E+01	1.260653E+00	-1.302105E-02	-1.907961E-01	-1.628112E+02	-1.723806E+02
4.327504E+01	2.924271E+00	9.233570E-01	3.267295E+01	1.110719E+07	8.410985E+01
5.621443E+02	-6.970724E-01	-5.981692E-01	-3.953274E-01	-7.071883E-01	6.644905E-01
2.415307E-01	1.182150E-01	4.479353E-01	-8.862162E-01	0.000000E+00	0.000000E+00
8.000000E+01	1.912631E+05	2.109369E+07	2.870802E+01	2.765082E+01	1.078619E+00
2.004784E-01	2.012990E-01	-6.210252E+01	-1.839666E-01	-1.726393E+01	-2.011539E-02
-2.569107E-01	-9.157560E-04	9.901241E+03	8.206884E+03	8.446297E+03	-9.390514E+06
-1.449048E+07	1.211561E+07	-4.783862E+03	-5.628409E+03	-3.576118E+03	1.419824E+01
2.177002E+01	-1.805103E+01	8.037497E+00	2.720943E+01	2.934861E+01	5.454903E+00
2.223423E+00	1.760895E+04	1.740709E+02	7.569531E-07	6.022292E-01	3.523513E+01
-1.232794E+02	1.547859E+02	3.152906E+02	2.918821E+01	-1.255164E+02	6.611064E+02
7.937917E+00	7.201724E+01	-3.303778E+03	9.622611E+01	1.773605E+02	2.136323E+07
8.515111E+05	5.266470E+01	3.273450E+02	5.584018E+01	-3.196843E+02	-7.441605E+00
-4.907570E+01	-2.660299E-01	-1.359516E-02	-9.176613E-02	-1.627968E+02	-1.723867E+02
4.770494E+01	3.280512E+00	9.233382E-01	3.267376E+01	1.110737E+07	4.304324E+01
3.205074E+02	-6.952527E-01	-5.916542E-01	-4.081286E-01	-7.072913E-01	6.642170E-01
2.419811E-01	1.279168E-01	4.569038E-01	-8.802705E-01	0.000000E+00	0.000000E+00
9.000000E+01	2.290008E+05	2.113165E+07	2.693598E+01	2.591144E+01	1.519244E-02
3.100934E-01	2.273763E-01	-6.502120E+01	-2.336220E-01	-1.726331E+01	-3.070041E-02

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**Orbital Sciences Corporation**  
**Launch Systems Group**

TM-18187A

TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----
-2.178684E-01	-1.106955E-04	9.902440E+03	8.058032E+03	8.302443E+03	-9.437641E+06
-1.454567E+07	1.207895E+07	-4.641881E+03	-5.410580E+03	-3.756388E+03	1.411959E+01
2.171447E+01	-1.802282E+01	8.559137E+00	5.813533E+00	8.832173E-02	1.802738E+00
0.000000E+00	1.760670E+04	2.816074E+01	1.682115E-07	1.133983E-01	3.504094E+01
-1.233527E+02	1.566261E+02	3.052447E+02	2.919011E+01	-1.255155E+02	7.157166E+02
3.517391E+00	7.200269E+01	-3.303831E+03	9.622322E+01	1.775566E+02	2.136314E+07
8.511879E+05	5.266675E+01	3.273443E+02	5.584223E+01	-6.757507E+01	-2.283013E+00
-2.536441E+00	-7.201685E-02	-4.171398E-03	-4.975698E-03	-1.627584E+02	-1.724083E+02
5.984337E+01	4.267890E+00	9.233659E-01	3.267285E+01	1.110716E+07	2.518176E+00
6.756645E+01	-6.875716E-01	-5.678714E-01	-4.525123E-01	-7.076770E-01	6.636235E-01
2.424813E-01	1.625995E-01	4.869558E-01	-8.581582E-01	0.000000E+00	0.000000E+00

BEGIN STAGE 1 SEPARATION

9.076000E+01	2.317497E+05	2.113441E+07	2.679865E+01	2.577681E+01	-1.008658E-02
3.113993E-01	1.834974E-01	-6.519362E+01	-2.756967E-01	-1.728421E+01	-9.174413E-02
-2.355708E-01	3.244378E-03	9.902480E+03	8.047189E+03	8.291978E+03	-9.441165E+06
-1.454978E+07	1.207609E+07	-4.631156E+03	-5.394082E+03	-3.770083E+03	1.411129E+01
2.170790E+01	-1.801978E+01	8.583982E+00	5.124518E+00	-5.168887E-02	1.595772E+00
0.000000E+00	1.760662E+04	2.646489E+01	1.486717E-07	9.937226E-02	3.502621E+01
-1.233582E+02	1.567660E+02	3.044834E+02	2.919014E+01	-1.255155E+02	7.183026E+02
3.292915E+00	7.200227E+01	-3.303831E+03	9.622311E+01	1.775714E+02	2.136314E+07
8.511855E+05	5.266682E+01	3.273443E+02	5.584231E+01	-5.950934E+01	-2.124347E+00
-1.758686E+00	-6.037835E-02	-3.881508E-03	-3.534092E-03	-1.627556E+02	-1.724098E+02
6.076404E+01	4.343293E+00	9.233661E-01	3.267284E+01	1.110716E+07	1.768919E+00
5.950085E+01	-6.870951E-01	-5.663874E-01	-4.550885E-01	-7.077959E-01	6.632357E-01
2.431939E-01	1.640890E-01	4.892071E-01	-8.565928E-01	0.000000E+00	0.000000E+00

BEGIN STAGE 2 MOTOR IGNITION

9.160000E+01	2.347684E+05	2.113745E+07	2.664640E+01	2.562761E+01	-4.358521E-02
3.430837E-01	1.138321E-01	-6.539378E+01	-3.542870E-01	-1.729803E+01	-9.248692E-02
-2.235488E-01	-7.198812E-02	9.906186E+03	8.035574E+03	8.280781E+03	-9.445050E+06
-1.455430E+07	1.207291E+07	-4.619518E+03	-5.376021E+03	-3.785354E+03	1.360323E+01
2.129486E+01	-1.834516E+01	8.607088E+00	4.466705E+00	-1.946823E-01	1.532454E+00
8.697895E+03	1.273229E+04	6.652804E+03	1.299267E-07	8.614046E-02	3.500994E+01
-1.233644E+02	1.569195E+02	3.036517E+02	2.918977E+01	-1.255156E+02	7.209719E+02
3.065679E+00	7.200478E+01	-3.303821E+03	9.622334E+01	1.775876E+02	2.136316E+07
8.512510E+05	5.266667E+01	3.273445E+02	5.584215E+01	-3.572515E+01	-5.794086E-01
7.360781E-02	1.671899E+01	3.140946E-02	-1.085583E-03	-1.627524E+02	-1.724110E+02
6.178134E+01	4.426953E+00	9.233605E-01	3.267302E+01	1.110720E+07	1.541850E+00
5.186298E+01	-6.862685E-01	-5.649075E-01	-4.581649E-01	-7.082611E-01	6.623746E-01
2.441847E-01	1.655350E-01	4.920767E-01	-8.546688E-01	0.000000E+00	0.000000E+00
1.000000E+02	2.648471E+05	2.116772E+07	2.539245E+01	2.452117E+01	8.222879E+00
3.540766E+01	4.926688E+00	-5.998514E+01	-9.792714E+00	1.841554E+01	1.664645E+00
5.054740E-01	-9.967350E-01	1.049771E+04	8.481716E+03	8.706457E+03	-9.484512E+06
-1.460030E+07	1.203942E+07	-4.731221E+03	-5.655805E+03	-4.191291E+03	-1.082520E+00
-5.557080E+01	-4.790479E+01	9.292397E+00	1.243829E+00	1.022785E+01	4.404107E+01
7.922968E+03	1.195719E+04	3.194154E+04	3.273245E-08	2.062201E-02	3.484202E+01
-1.234260E+02	1.566129E+02	3.152219E+02	2.839122E+01	-1.255914E+02	7.409455E+02
1.801642E+00	7.824501E+01	-3.283110E+03	9.546066E+01	1.773682E+02	2.140107E+07
9.770882E+05	5.320151E+01	3.277870E+02	5.637182E+01	-9.948266E+00	-4.810788E+01
-8.581819E+00	8.590919E+01	-3.580579E-01	-2.396174E-01	-1.642051E+02	-1.733561E+02

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BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----
7.226003E+01	5.212871E+00	9.126748E-01	3.303495E+01	1.118908E+07	4.293539E-01
1.444211E+01	-1.744870E-01	-9.191453E-01	-3.531659E-01	-9.587292E-01	2.403575E-01
-1.518768E-01	2.244830E-01	3.120900E-01	-9.231507E-01	0.000000E+00	0.000000E+00
1.100000E+02	3.020354E+05	2.120516E+07	2.475722E+01	2.413075E+01	1.494263E+00
2.965417E+01	1.779399E+01	-6.023941E+01	2.845584E+00	2.110424E+01	1.759001E-01
-3.345139E-02	5.782760E-01	1.150534E+04	9.258699E+03	9.420624E+03	-9.531997E+06
-1.466018E+07	1.199495E+07	-4.789652E+03	-6.360352E+03	-4.725322E+03	-1.263525E+01
-8.113525E+01	-5.964941E+01	1.048147E+01	2.229569E-01	3.331561E-01	6.611602E+00
6.710048E+03	1.074401E+04	3.860354E+04	5.005128E-09	2.917970E-03	3.462544E+01
-1.234914E+02	1.549080E+02	3.435633E+02	2.690283E+01	-1.254887E+02	7.540068E+02
9.048969E-01	9.076269E+01	-3.247788E+03	9.308350E+01	1.768541E+02	2.147713E+07
1.191712E+06	5.485056E+01	3.286406E+02	5.800497E+01	-1.783232E+00	-7.123850E+00
-1.323737E-01	1.155822E+02	-7.521786E-02	-2.494628E-01	-1.677541E+02	-1.762599E+02
8.562559E+01	5.563026E+00	8.948591E-01	3.368070E+01	1.133442E+07	7.696190E-02
2.588756E+00	-2.376858E-01	-8.977070E-01	-3.709820E-01	-8.747052E-01	3.638870E-01
-3.201204E-01	4.223699E-01	2.484118E-01	-8.717197E-01	0.000000E+00	0.000000E+00
1.200000E+02	3.424080E+05	2.124580E+07	2.435855E+01	2.392045E+01	3.113658E+00
2.113212E+01	1.458915E+01	-6.093016E+01	4.413041E+00	1.543710E+01	-2.823747E-01
-1.953930E-02	5.667654E-01	1.281699E+04	1.037624E+04	1.048306E+04	-9.580873E+06
-1.472827E+07	1.194442E+07	-5.018740E+03	-7.295312E+03	-5.408971E+03	-3.224561E+01
-1.034868E+02	-7.598682E+01	1.095728E+01	2.678555E-02	8.340104E-02	5.660354E-01
5.307507E+03	9.341400E+03	4.276760E+04	4.862848E-10	3.282430E-04	3.438442E+01
-1.235457E+02	1.520249E+02	3.880272E+02	2.461519E+01	-1.254249E+02	7.602187E+02
3.940563E-01	1.093894E+02	-3.191388E+03	9.114752E+01	1.759631E+02	2.159031E+07
1.534407E+06	5.617542E+01	3.298210E+02	5.932068E+01	-2.142335E-01	-5.890092E-01
-3.773910E-02	1.472823E+02	-5.547790E-02	-3.301927E-01	-1.709328E+02	-1.786124E+02
1.003039E+02	5.080978E+00	8.672929E-01	3.470178E+01	1.156236E+07	9.246032E-03
3.110074E-01	-3.214551E-01	-8.559918E-01	-4.049008E-01	-8.570731E-01	4.448148E-01
-2.599336E-01	4.026069E-01	2.634726E-01	-8.766356E-01	0.000000E+00	0.000000E+00
<b>BEGIN FAIRING SEPARATION</b>					
1.276000E+02	3.762216E+05	2.127985E+07	2.417560E+01	2.383252E+01	4.147449E+00
1.478862E+01	1.122864E+01	-6.173458E+01	4.333420E+00	1.029768E+01	-3.732170E-01
-3.091928E-01	8.475919E-01	1.402863E+04	1.146427E+04	1.154014E+04	-9.620154E+06
-1.478688E+07	1.190096E+07	-5.341737E+03	-8.146137E+03	-6.044480E+03	-5.189090E+01
-1.186252E+02	-9.031165E+01	9.860614E+00	6.097465E-03	2.528892E-02	9.017310E-02
4.170210E+03	8.204091E+03	4.369765E+04	9.142734E-11	9.512134E-05	3.418008E+01
-1.235806E+02	1.489614E+02	4.363476E+02	2.209699E+01	-1.254471E+02	7.624932E+02
2.309276E-01	1.294891E+02	-3.128816E+03	9.015975E+01	1.749175E+02	2.171244E+07
1.914599E+06	5.684472E+01	3.310778E+02	5.999295E+01	-4.876813E-02	-8.886787E-02
-1.302132E-02	1.713469E+02	-1.330720E-01	-5.052962E-01	-1.728080E+02	-1.798073E+02
1.126291E+02	4.139814E+00	8.379315E-01	3.583860E+01	1.181352E+07	2.104768E-03
7.079775E-02	-3.850081E-01	-8.173057E-01	-4.286959E-01	-8.465727E-01	4.977314E-01
-1.886216E-01	3.675369E-01	2.903014E-01	-8.835393E-01	0.000000E+00	0.000000E+00
1.300000E+02	3.875991E+05	2.129131E+07	2.413433E+01	2.381322E+01	4.253136E+00
1.280643E+01	1.018221E+01	-6.212873E+01	4.237650E+00	8.524564E+00	-3.893942E-01
9.514750E-02	3.685530E-01	1.446707E+04	1.186900E+04	1.193744E+04	-9.633141E+06
-1.480679E+07	1.188618E+07	-5.483522E+03	-8.449850E+03	-6.277274E+03	-6.096729E+01
-1.278486E+02	-9.825977E+01	9.526947E+00	4.149146E-03	1.764688E-02	5.313577E-02
3.808319E+03	7.473961E+03	4.352324E+04	5.814350E-11	7.026146E-05	3.411106E+01

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**Orbital Sciences Corporation**  
**Launch Systems Group**

TM-18187A

TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----
-1.235907E+02	1.477677E+02	4.557526E+02	2.107422E+01	-1.254801E+02	7.630134E+02
2.048654E-01	1.375519E+02	-3.103453E+03	8.994902E+01	1.744789E+02	2.176143E+07
2.068711E+06	5.698671E+01	3.315852E+02	6.013898E+01	-3.318528E-02	-5.085807E-02
-9.373228E-03	1.873352E+02	-7.590005E-02	-5.342718E-01	-1.732877E+02	1.799386E+02
1.167748E+02	3.742585E+00	8.263786E-01	3.630170E+01	1.191507E+07	1.432233E-03
4.817580E-02	-4.056835E-01	-8.025693E-01	-4.373824E-01	-8.419030E-01	5.144131E-01
-1.630290E-01	3.558374E-01	3.020954E-01	-8.843744E-01	0.000000E+00	0.000000E+00
1.400000E+02	4.394437E+05	2.134351E+07	2.405636E+01	2.378958E+01	4.327613E+00
5.439254E+00	6.166160E+00	-6.358307E+01	3.519677E+00	1.585078E+00	-3.765093E-01
-1.460895E-01	6.576153E-01	1.650115E+04	1.376446E+04	1.381500E+04	-9.691555E+06
-1.489799E+07	1.181816E+07	-6.250239E+03	-9.810160E+03	-7.359052E+03	-9.082910E+01
-1.410811E+02	-1.173120E+02	8.577322E+00	1.206383E-03	5.220761E-03	6.561825E-03
2.336432E+03	6.002073E+03	4.095389E+04	1.263106E-11	2.639922E-05	3.379606E+01
-1.236300E+02	1.417578E+02	5.610643E+02	1.543943E+01	-1.258107E+02	7.647365E+02
1.511172E-01	1.820146E+02	-2.967990E+03	8.958144E+01	1.719960E+02	2.203159E+07
2.891795E+06	5.723321E+01	3.343810E+02	6.042114E+01	-9.648775E-03	-4.397979E-03
-2.830338E-03	2.195041E+02	-8.895428E-02	-7.069035E-01	-1.746177E+02	1.794974E+02
1.356217E+02	1.604596E+00	7.679452E-01	3.882823E+01	1.246169E+07	4.164283E-04
1.400733E-02	-4.846195E-01	-7.416040E-01	-4.638614E-01	-8.185565E-01	5.714475E-01
-5.842116E-02	3.083978E-01	3.513847E-01	-8.839794E-01	0.000000E+00	0.000000E+00
1.500000E+02	4.994804E+05	2.140395E+07	2.400593E+01	2.374710E+01	3.587367E+00
-9.554937E-01	2.688375E+00	-6.525362E+01	2.642286E+00	-5.396187E+00	-3.807418E-01
-1.292266E-01	5.760203E-01	1.882979E+04	1.595656E+04	1.601113E+04	-9.759229E+06
-1.500327E+07	1.173834E+07	-7.331941E+03	-1.124279E+04	-8.628675E+03	-1.195439E+02
-1.404941E+02	-1.318555E+02	8.385801E+00	5.448832E-04	1.954696E-03	-5.206325E-04
9.971528E+02	4.662794E+03	3.469411E+04	4.248659E-12	1.294655E-05	3.343121E+01
-1.236696E+02	1.339009E+02	7.223309E+02	6.645869E+00	-1.267156E+02	7.661745E+02
1.394215E-01	2.517003E+02	-2.771322E+03	9.005181E+01	1.680004E+02	2.245501E+07
4.086774E+06	5.692309E+01	3.387410E+02	6.019050E+01	-4.358030E-03	1.968470E-04
-9.291065E-04	2.393633E+02	-1.180292E-01	-8.810832E-01	-1.748289E+02	-1.799380E+02
1.573893E+02	-1.143870E+00	6.920498E-01	4.267094E+01	1.327089E+07	1.880868E-04
6.326646E-03	-5.608533E-01	-6.715510E-01	-4.842137E-01	-7.836795E-01	6.192373E-01
4.890369E-02	2.670019E-01	4.068961E-01	-8.735820E-01	0.000000E+00	0.000000E+00
1.600000E+02	5.682600E+05	2.147320E+07	2.390007E+01	2.362850E+01	1.549984E+00
-6.875191E+00	-3.743740E-01	-6.787234E+01	1.792912E+00	-1.270926E+01	-1.842914E-01
-1.515512E+00	2.008419E+00	2.094190E+04	1.792240E+04	1.799435E+04	-9.838635E+06
-1.512218E+07	1.164556E+07	-8.443993E+03	-1.238391E+04	-9.826007E+03	-3.790723E+01
-2.916602E+01	-5.761914E+01	8.461793E+00	2.930623E-04	4.542418E-04	-2.014859E-03
3.678480E+01	3.702426E+03	6.693451E+03	1.808339E-12	7.093522E-06	3.301334E+01
-1.237169E+02	1.256872E+02	9.263466E+02	-4.468974E+00	-1.282763E+02	7.675500E+02
1.314948E-01	3.421685E+02	-2.549164E+03	9.095280E+01	1.629126E+02	2.300470E+07
5.436629E+06	5.633649E+01	3.442399E+02	5.971316E+01	-2.343941E-03	1.560303E-03
-1.811207E-04	5.815847E+01	1.086996E-01	-1.155583E-01	-1.742912E+02	-1.788659E+02
1.823428E+02	-4.178175E+00	6.176952E-01	4.733278E+01	1.422066E+07	1.011614E-04
3.402750E-03	-6.349074E-01	-5.823712E-01	-5.076774E-01	-7.335405E-01	6.606626E-01
1.595096E-01	2.425097E-01	4.736758E-01	-8.466524E-01	0.000000E+00	0.000000E+00

BEGIN STAGE 2 MOTOR BURNOUT

1.656000E+02	6.085056E+05	2.151372E+07	2.365253E+01	2.338075E+01	9.397453E-01
-9.715957E+00	-2.361207E+00	-6.876086E+01	8.387059E-01	-1.626834E+01	-3.749141E-01

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TM-18187A

TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----
-3.005211E-01	6.524754E-01	2.102207E+04	1.792865E+04	1.800235E+04	-9.885917E+06
-1.519138E+07	1.159011E+07	-8.415549E+03	-1.230689E+04	-9.957688E+03	1.300280E+01
2.066548E+01	-1.716291E+01	8.131527E+00	1.971618E-04	1.852819E-04	-1.915616E-03
5.447805E+00	3.671089E+03	1.376001E+02	1.214936E-12	5.273906E-06	3.276725E+01
-1.237463E+02	1.260367E+02	9.296964E+02	-4.937030E+00	-1.283575E+02	7.682193E+02
1.080124E-01	3.459453E+02	-2.540170E+03	9.100208E+01	1.629265E+02	2.302765E+07
5.491278E+06	5.630474E+01	3.444706E+02	5.968647E+01	-1.576920E-03	1.704435E-03
-7.005361E-05	1.205769E+00	-1.712302E-03	-6.019084E-03	-1.742254E+02	-1.788105E+02
1.970558E+02	-5.877175E+00	6.149029E-01	4.752662E+01	1.425946E+07	6.805777E-05
2.289249E-03	-6.688200E-01	-5.411305E-01	-5.097623E-01	-7.088838E-01	6.707881E-01
2.180069E-01	2.239723E-01	5.071696E-01	-8.322352E-01	0.000000E+00	0.000000E+00
1.700000E+02	6.397706E+05	2.154520E+07	2.345273E+01	2.318155E+01	3.612538E-01
-1.217227E+01	-3.901364E+00	-6.945496E+01	1.668435E-01	-1.923519E+01	-3.946310E-01
-1.140119E-01	4.961023E-01	2.102564E+04	1.787883E+04	1.795315E+04	-9.922816E+06
-1.524533E+07	1.154613E+07	-8.356539E+03	-1.221436E+04	-0.003146E+04	1.351367E+01
2.111816E+01	-1.662598E+01	7.915618E+00	1.488609E-04	5.377656E-05	-1.811975E-03
4.051452E+00	3.669693E+03	6.851336E+01	9.219235E-13	4.267515E-06	3.257434E+01
-1.237694E+02	1.265757E+02	9.257114E+02	-4.959061E+00	-1.283616E+02	7.686611E+02
9.334796E-02	3.461167E+02	-2.539734E+03	9.100488E+01	1.631078E+02	2.302869E+07
5.493928E+06	5.630296E+01	3.444814E+02	5.968495E+01	-1.190604E-03	1.714307E-03
-2.033249E-05	6.005851E-01	2.963600E-05	-4.917721E-03	-1.742023E+02	-1.788098E+02
2.085912E+02	-7.199365E+00	6.147669E-01	4.753585E+01	1.426131E+07	5.138489E-05
1.728426E-03	-6.970926E-01	-5.052401E-01	-5.087184E-01	-6.850991E-01	6.786104E-01
2.648151E-01	2.114264E-01	5.331232E-01	-8.191938E-01	0.000000E+00	0.000000E+00
<b>BEGIN S-BAND ANTENNA TO STAGE 3</b>					
1.756000E+02	6.790716E+05	2.158477E+07	2.319671E+01	2.292634E+01	1.122836E-01
-1.471906E+01	-5.952916E+00	-6.968630E+01	-9.848137E-01	-2.248929E+01	-3.927908E-01
7.280187E-02	4.010332E-01	2.102834E+04	1.781448E+04	1.788959E+04	-9.969399E+06
-1.531340E+07	1.148970E+07	-8.280329E+03	-1.209566E+04	-0.012357E+04	1.367336E+01
2.123188E+01	-1.632633E+01	7.700728E+00	1.079321E-04	1.211900E-05	-1.588658E-03
2.986761E+00	3.668616E+03	4.294601E+01	6.727700E-13	3.330765E-06	3.232957E+01
-1.237988E+02	1.272701E+02	9.204255E+02	-4.975937E+00	-1.283650E+02	7.691418E+02
7.893648E-02	3.462441E+02	-2.539392E+03	9.100733E+01	1.633434E+02	2.302947E+07
5.496008E+06	5.630141E+01	3.444897E+02	5.968362E+01	-8.632513E-04	1.564285E-03
-4.582098E-06	3.765849E-01	2.947062E-05	3.972093E-05	-1.741739E+02	-1.788101E+02
2.232283E+02	-8.867117E+00	6.146596E-01	4.754299E+01	1.426274E+07	3.725678E-05
1.253201E-03	-7.272885E-01	-4.714089E-01	-4.988238E-01	-6.599139E-01	6.800178E-01
3.195144E-01	1.885871E-01	5.615599E-01	-8.056584E-01	0.000000E+00	0.000000E+00
1.800000E+02	7.095642E+05	2.161547E+07	2.299427E+01	2.272458E+01	8.725753E-01
-1.565744E+01	-6.956410E+00	-6.900894E+01	-1.709853E+00	-2.383815E+01	-2.068546E-01
2.120757E-01	1.381795E-01	2.102971E+04	1.776385E+04	1.783956E+04	-1.000570E+07
-1.536642E+07	1.144500E+07	-8.219976E+03	-1.200210E+04	-0.019490E+04	1.374609E+01
2.128516E+01	-1.613184E+01	7.566139E+00	8.566206E-05	7.474660E-05	-1.341249E-03
2.447288E+00	3.668023E+03	2.798601E+01	5.366388E-13	2.777796E-06	3.213786E+01
-1.238218E+02	1.278190E+02	9.161863E+02	-4.984668E+00	-1.283668E+02	7.694688E+02
6.994492E-02	3.463082E+02	-2.539211E+03	9.100864E+01	1.635301E+02	2.302986E+07
5.497108E+06	5.630058E+01	3.444940E+02	5.968291E+01	-6.851337E-04	1.335486E-03
-2.826109E-05	2.454423E-01	2.351446E-05	2.705500E-05	-1.741523E+02	-1.788110E+02
2.346943E+02	-1.016518E+01	6.146026E-01	4.754671E+01	1.426348E+07	2.956946E-05
9.946234E-04	-7.408001E-01	-4.658697E-01	-4.839222E-01	-6.506054E-01	6.768519E-01

**ORBITAL SCIENCES CORPORATION: PROPRIETARY DATA**  
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**Orbital Sciences Corporation**  
**Launch Systems Group**

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TM-18187A

TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----
3.443606E-01	1.671164E-01	5.699447E-01	-8.045092E-01	0.000000E+00	0.000000E+00
1.900000E+02	7.775992E+05	2.168398E+07	2.252992E+01	2.226190E+01	4.589945E+00
-1.598656E+01	-6.833704E+00	-6.616586E+01	-1.819448E+00	-2.440871E+01	-2.405349E-02
1.843092E-01	-4.423608E-03	2.103138E+04	1.764956E+04	1.772660E+04	-1.008721E+07
-1.548537E+07	1.134225E+07	-8.081933E+03	-1.178903E+04	-1.035414E+04	1.382812E+01
2.131445E+01	-1.577441E+01	7.337227E+00	5.353655E-05	2.457299E-04	-8.558654E-04
1.789486E+00	3.667294E+03	1.370300E+01	3.391570E-13	1.903827E-06	3.170408E+01
-1.238742E+02	1.290730E+02	9.063901E+02	-4.995953E+00	-1.283690E+02	7.700868E+02
5.463438E-02	3.463871E+02	-2.538968E+03	9.101034E+01	1.639566E+02	2.303033E+07
5.498583E+06	5.629953E+01	3.444995E+02	5.968203E+01	-4.281907E-04	8.552410E-04
-1.420212E-04	1.202008E-01	1.399937E-05	1.277438E-05	-1.741049E+02	-1.788145E+02
2.606401E+02	-1.307700E+01	6.145256E-01	4.755160E+01	1.426446E+07	1.848014E-05
6.216137E-04	-7.535357E-01	-4.877546E-01	-4.407713E-01	-6.450905E-01	6.777760E-01
3.528142E-01	1.266574E-01	5.501955E-01	-8.253744E-01	0.000000E+00	0.000000E+00
2.000000E+02	8.438770E+05	2.175073E+07	2.205966E+01	2.179344E+01	6.145255E+00
-1.573621E+01	-6.684767E+00	-6.551514E+01	-2.101422E+00	-2.441767E+01	-2.681487E-02
2.266909E-02	-1.624539E-02	2.103231E+04	1.753754E+04	1.761589E+04	-1.016734E+07
-1.560220E+07	1.123792E+07	-7.943534E+03	-1.157598E+04	-1.051011E+04	1.384473E+01
2.129590E+01	-1.545898E+01	7.179511E+00	3.541173E-05	2.176141E-04	-5.572464E-04
1.421428E+00	3.666873E+03	8.587001E+00	2.267279E-13	1.353915E-06	3.127294E+01
-1.239263E+02	1.303302E+02	8.965104E+02	-5.002856E+00	-1.283703E+02	7.705766E+02
4.393002E-02	3.464313E+02	-2.538810E+03	9.101130E+01	1.643828E+02	2.303060E+07
5.499543E+06	5.629894E+01	3.445028E+02	5.968156E+01	-2.832266E-04	5.553355E-04
-1.583213E-04	7.533250E-02	9.104948E-06	7.543515E-06	-1.740589E+02	-1.788188E+02
2.864321E+02	-1.593730E+01	6.144750E-01	4.755467E+01	1.426507E+07	1.222368E-05
4.111661E-04	-7.536990E-01	-4.952517E-01	-4.320457E-01	-6.470518E-01	6.743560E-01
3.557640E-01	1.151599E-01	5.476949E-01	-8.287150E-01	0.000000E+00	0.000000E+00
2.100000E+02	9.084032E+05	2.181572E+07	2.158355E+01	2.131927E+01	7.273882E+00
-1.536573E+01	-6.211369E+00	-6.539426E+01	-2.116783E+00	-2.420239E+01	1.540527E-01
3.771182E-03	-2.253475E-02	2.103295E+04	1.742819E+04	1.750783E+04	-1.024608E+07
-1.571689E+07	1.113206E+07	-7.805082E+03	-1.136314E+04	-1.066309E+04	1.384326E+01
2.127246E+01	-1.516895E+01	7.066494E+00	2.442923E-05	1.776954E-04	-3.753730E-04
1.170669E+00	3.666599E+03	6.293500E+00	1.579624E-13	9.906471E-07	3.084437E+01
-1.239783E+02	1.315888E+02	8.865958E+02	-5.007946E+00	-1.283712E+02	7.709749E+02
3.610232E-02	3.464609E+02	-2.538686E+03	9.101194E+01	1.648072E+02	2.303078E+07
5.500294E+06	5.629856E+01	3.445052E+02	5.968128E+01	-1.953875E-04	3.725256E-04
-1.414498E-04	5.521619E-02	6.423954E-06	5.354027E-06	-1.740138E+02	-1.788233E+02
3.120752E+02	-1.874720E+01	6.144349E-01	4.755699E+01	1.426554E+07	8.432662E-06
2.836482E-04	-7.516705E-01	-4.988572E-01	-4.314312E-01	-6.495554E-01	6.733224E-01
3.531499E-01	1.143209E-01	5.456908E-01	-8.301520E-01	0.000000E+00	0.000000E+00
2.200000E+02	9.711836E+05	2.187895E+07	2.110162E+01	2.083941E+01	8.466228E+00
-1.473549E+01	-4.266027E+00	-6.560884E+01	-8.246441E-01	-2.333228E+01	1.538683E-01
-3.092995E-03	-2.839683E-02	2.103344E+04	1.732163E+04	1.740256E+04	-1.032344E+07
-1.582946E+07	1.102467E+07	-7.666674E+03	-1.115055E+04	-1.081324E+04	1.383838E+01
2.124707E+01	-1.488770E+01	6.982202E+00	1.742004E-05	1.474820E-04	-2.566928E-04
9.790155E-01	3.666395E+03	4.793499E+00	1.136797E-13	7.420137E-07	3.041827E+01
-1.240302E+02	1.328481E+02	8.766623E+02	-5.012066E+00	-1.283719E+02	7.713050E+02
3.018671E-02	3.464823E+02	-2.538580E+03	9.101243E+01	1.652297E+02	2.303091E+07
5.500940E+06	5.629827E+01	3.445071E+02	5.968109E+01	-1.393272E-04	2.528075E-04
-1.251452E-04	4.205832E-02	4.648106E-06	3.949268E-06	-1.739696E+02	-1.788279E+02

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TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----
3.375743E+02	-2.150829E+01	6.144001E-01	4.755894E+01	1.426593E+07	6.013178E-06
2.022643E-04	-7.483540E-01	-5.000867E-01	-4.357517E-01	-6.495699E-01	6.855056E-01
3.288480E-01	1.342578E-01	5.291459E-01	-8.378421E-01	0.000000E+00	0.000000E+00
2.300000E+02	1.032224E+06	2.194044E+07	2.061395E+01	2.035394E+01	9.739010E+00
-1.400640E+01	-2.363849E+00	-6.569676E+01	4.482626E-01	-2.241623E+01	1.535020E-01
-2.268329E-02	-3.298746E-02	2.103380E+04	1.721787E+04	1.730008E+04	-1.039941E+07
-1.593990E+07	1.091580E+07	-7.528325E+03	-1.093822E+04	-1.096061E+04	1.383057E+01
2.122070E+01	-1.461426E+01	6.918114E+00	1.286236E-05	1.252666E-04	-1.801553E-04
8.347400E-01	3.666239E+03	3.843000E+00	8.464624E-14	5.703300E-07	2.999455E+01
-1.240819E+02	1.341081E+02	8.667132E+02	-5.015403E+00	-1.283724E+02	7.715834E+02
2.570539E-02	3.464972E+02	-2.538487E+03	9.101278E+01	1.656502E+02	2.303100E+07
5.501503E+06	5.629807E+01	3.445086E+02	5.968098E+01	-1.028744E-04	1.757021E-04
-1.115398E-04	3.372011E-02	3.503279E-06	3.080062E-06	-1.739261E+02	-1.788324E+02
3.629344E+02	-2.422170E+01	6.143695E-01	4.756057E+01	1.426625E+07	4.439923E-06
1.493450E-04	-7.446280E-01	-5.030532E-01	-4.387102E-01	-6.497555E-01	6.967530E-01
3.038963E-01	1.527967E-01	5.113440E-01	-8.456834E-01	0.000000E+00	0.000000E+00
2.400000E+02	1.091531E+06	2.200019E+07	2.012065E+01	1.986298E+01	1.100777E+01
-1.319232E+01	-5.077288E-01	-6.573724E+01	1.706294E+00	-2.146535E+01	1.539938E-01
1.046180E-02	-3.709511E-02	2.103412E+04	1.711698E+04	1.720046E+04	-1.047401E+07
-1.604822E+07	1.080547E+07	-7.390081E+03	-1.072616E+04	-1.110528E+04	1.381934E+01
2.119434E+01	-1.434863E+01	6.866150E+00	9.605900E-06	1.057395E-04	-1.267241E-04
7.076388E-01	3.666112E+03	3.509666E+00	6.370645E-14	4.420073E-07	2.957314E+01
-1.241335E+02	1.353683E+02	8.567576E+02	-5.018402E+00	-1.283728E+02	7.718214E+02
2.203042E-02	3.465093E+02	-2.538401E+03	9.101309E+01	1.660685E+02	2.303108E+07
5.502030E+06	5.629789E+01	3.445100E+02	5.968090E+01	-7.682895E-05	1.220771E-04
-9.754718E-05	3.079652E-02	2.866985E-06	2.854772E-06	-1.738835E+02	-1.788369E+02
3.881605E+02	-2.688896E+01	6.143406E-01	4.756207E+01	1.426655E+07	3.315835E-06
1.115342E-04	-7.405015E-01	-5.068210E-01	-4.413503E-01	-6.499373E-01	7.071530E-01
2.784172E-01	1.709945E-01	4.930184E-01	-8.530497E-01	0.000000E+00	0.000000E+00
2.500000E+02	1.149111E+06	2.205821E+07	1.962176E+01	1.936657E+01	1.235201E+01
-1.229382E+01	1.296878E+00	-6.564765E+01	2.947138E+00	-2.047358E+01	1.530535E-01
-4.562251E-02	-4.115058E-02	2.103442E+04	1.701896E+04	1.710369E+04	-1.054722E+07
-1.615443E+07	1.069370E+07	-7.251940E+03	-1.051435E+04	-1.124734E+04	1.381055E+01
2.117188E+01	-1.409277E+01	6.824159E+00	7.311016E-06	9.030572E-05	-8.988031E-05
5.920711E-01	3.665979E+03	3.176333E+00	4.882597E-14	3.475113E-07	2.915395E+01
-1.241850E+02	1.366287E+02	8.467964E+02	-5.021137E+00	-1.283732E+02	7.720266E+02
1.907602E-02	3.465188E+02	-2.538317E+03	9.101337E+01	1.664848E+02	2.303113E+07
5.502537E+06	5.629774E+01	3.445112E+02	5.968083E+01	-5.847424E-05	8.523369E-05
-8.573097E-05	2.787271E-02	2.377100E-06	2.609635E-06	-1.738417E+02	-1.788414E+02
4.132576E+02	-2.951117E+01	6.143127E-01	4.756348E+01	1.426684E+07	2.523670E-06
8.488831E-05	-7.362041E-01	-5.121124E-01	-4.424302E-01	-6.501754E-01	7.166426E-01
2.523792E-01	1.878178E-01	4.734598E-01	-8.605581E-01	0.000000E+00	0.000000E+00
2.600000E+02	1.204969E+06	2.211450E+07	1.911743E+01	1.886485E+01	1.315971E+01
-1.147778E+01	2.376770E+00	-6.592390E+01	3.556703E+00	-1.972318E+01	-2.714355E-02
-1.881560E-02	-4.603050E-02	2.103468E+04	1.692379E+04	1.700977E+04	-1.061905E+07
-1.625851E+07	1.058053E+07	-7.113896E+03	-1.030280E+04	-1.138681E+04	1.380029E+01
2.114453E+01	-1.383203E+01	6.790095E+00	5.694729E-06	7.494097E-05	-6.536285E-05
4.880366E-01	3.665869E+03	2.843000E+00	3.826830E-14	2.782177E-07	2.873690E+01
-1.242364E+02	1.378892E+02	8.368309E+02	-5.023630E+00	-1.283736E+02	7.722054E+02
1.672401E-02	3.465267E+02	-2.538238E+03	9.101360E+01	1.668990E+02	2.303118E+07

**Orbital Sciences Corporation  
Launch Systems Group**

TM-18187A

TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----
5.503016E+06	5.629761E+01	3.445123E+02	5.968079E+01	-4.554701E-05	6.095834E-05
-7.215470E-05	2.494847E-02	1.996644E-06	2.379173E-06	-1.738006E+02	-1.788457E+02
4.382304E+02	-3.208939E+01	6.142862E-01	4.756480E+01	1.426710E+07	1.965748E-06
6.612158E-05	-7.301937E-01	-5.149314E-01	-4.490688E-01	-6.527856E-01	7.198326E-01
2.360340E-01	2.017130E-01	4.654962E-01	-8.617570E-01	0.000000E+00	0.000000E+00
2.700000E+02	1.259110E+06	2.216906E+07	1.860771E+01	1.835788E+01	1.399557E+01
-1.089195E+01	2.292176E+00	-6.596561E+01	3.116330E+00	-1.939710E+01	-2.678799E-02
6.169012E-03	-4.922144E-02	2.103492E+04	1.683146E+04	1.691867E+04	-1.068950E+07
-1.636048E+07	1.046598E+07	-6.975936E+03	-1.009147E+04	-1.152374E+04	1.379248E+01
2.112402E+01	-1.358105E+01	6.761776E+00	4.503745E-06	6.303247E-05	-4.905456E-05
3.955355E-01	3.665777E+03	2.509666E+00	3.043189E-14	2.254244E-07	2.832190E+01
-1.242876E+02	1.391499E+02	8.268605E+02	-5.025880E+00	-1.283738E+02	7.723628E+02
1.478505E-02	3.465327E+02	-2.538163E+03	9.101381E+01	1.673114E+02	2.303122E+07
5.503472E+06	5.629750E+01	3.445132E+02	5.968077E+01	-3.602141E-05	4.512542E-05
-6.146495E-05	2.202393E-02	1.689431E-06	2.122619E-06	-1.737603E+02	-1.788499E+02
4.630837E+02	-3.462466E+01	6.142610E-01	4.756603E+01	1.426734E+07	1.554636E-06
5.229305E-05	-7.245203E-01	-5.203990E-01	-4.519460E-01	-6.597811E-01	7.133268E-01
2.363341E-01	1.993971E-01	4.694143E-01	-8.601692E-01	0.000000E+00	0.000000E+00
2.800000E+02	1.311542E+06	2.222191E+07	1.809269E+01	1.784575E+01	1.507044E+01
-1.031116E+01	2.178710E+00	-6.577398E+01	2.666465E+00	-1.904349E+01	-2.648681E-02
2.807798E-02	-5.192406E-02	2.103512E+04	1.674197E+04	1.683041E+04	-1.075856E+07
-1.646034E+07	1.035006E+07	-6.838050E+03	-9.880351E+03	-1.165819E+04	1.378564E+01
2.110352E+01	-1.333398E+01	6.737968E+00	3.609402E-06	5.439527E-05	-3.721713E-05
3.145677E-01	3.665696E+03	2.176333E+00	2.450783E-14	1.845935E-07	2.790888E+01
-1.243387E+02	1.404109E+02	8.168856E+02	-5.027894E+00	-1.283741E+02	7.725023E+02
1.316680E-02	3.465368E+02	-2.538092E+03	9.101398E+01	1.677218E+02	2.303124E+07
5.503904E+06	5.629740E+01	3.445141E+02	5.968076E+01	-2.886836E-05	3.371406E-05
-5.379450E-05	1.909916E-02	1.420187E-06	1.838811E-06	-1.737209E+02	-1.788541E+02
4.878219E+02	-3.711873E+01	6.142369E-01	4.756717E+01	1.426757E+07	1.245920E-06
4.190881E-05	-7.192556E-01	-5.280977E-01	-4.514246E-01	-6.670732E-01	7.065102E-01
2.363401E-01	1.941255E-01	4.711222E-01	-8.604413E-01	0.000000E+00	0.000000E+00
2.900000E+02	1.362268E+06	2.2227305E+07	1.757245E+01	1.732854E+01	1.614900E+01
-9.744593E+00	2.031419E+00	-6.558357E+01	2.204406E+00	-1.866925E+01	-2.715214E-02
-1.025086E-02	-5.426988E-02	2.103530E+04	1.665532E+04	1.674496E+04	-1.082626E+07
-1.655809E+07	1.023282E+07	-6.700227E+03	-9.669421E+03	-1.179020E+04	1.378027E+01
2.108594E+01	-1.309473E+01	6.717716E+00	2.928557E-06	4.729326E-05	-2.853760E-05
2.448120E-01	3.665614E+03	1.882250E+00	1.997104E-14	1.526789E-07	2.749777E+01
-1.243897E+02	1.416720E+02	8.069061E+02	-5.029677E+00	-1.283743E+02	7.726270E+02
1.180515E-02	3.465391E+02	-2.538025E+03	9.101413E+01	1.681305E+02	2.303126E+07
5.504314E+06	5.629733E+01	3.445148E+02	5.968077E+01	-2.342289E-05	2.541498E-05
-4.733947E-05	1.651871E-02	1.197485E-06	1.585064E-06	-1.736823E+02	-1.788582E+02
5.124496E+02	-3.957257E+01	6.142139E-01	4.756823E+01	1.426779E+07	1.010901E-06
3.400352E-05	-7.136214E-01	-5.360501E-01	-4.509932E-01	-6.746057E-01	6.993791E-01
2.361694E-01	1.888166E-01	4.727781E-01	-8.607143E-01	0.000000E+00	0.000000E+00
3.000000E+02	1.411293E+06	2.232248E+07	1.704712E+01	1.680640E+01	1.703681E+01
-9.196464E+00	1.848858E+00	-6.558812E+01	1.729562E+00	-1.827664E+01	-2.692092E-02
6.263000E-03	-5.637034E-02	2.103545E+04	1.657149E+04	1.666232E+04	-1.089257E+07
-1.665373E+07	1.011427E+07	-6.562462E+03	-9.458671E+03	-1.191981E+04	1.377441E+01
2.106738E+01	-1.285449E+01	6.700215E+00	2.403332E-06	4.094511E-05	-2.210216E-05
1.840990E-01	3.665554E+03	1.632250E+00	1.645310E-14	1.274760E-07	2.708848E+01

**ORBITAL SCIENCES CORPORATION: PROPRIETARY DATA**  
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TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----
-1.244406E+02	1.429332E+02	7.969232E+02	-5.031274E+00	-1.283745E+02	7.727391E+02
1.064971E-02	3.465403E+02	-2.537961E+03	9.101425E+01	1.685375E+02	2.303127E+07
5.504702E+06	5.629726E+01	3.445154E+02	5.968080E+01	-1.922209E-05	1.931700E-05
-4.134353E-05	1.432495E-02	1.016057E-06	1.373353E-06	-1.736445E+02	-1.788622E+02
5.369712E+02	-4.198666E+01	6.141920E-01	4.756922E+01	1.426798E+07	8.295998E-07
2.790512E-05	-7.070073E-01	-5.426219E-01	-4.535440E-01	-6.823519E-01	6.919306E-01
2.358559E-01	1.858404E-01	4.762285E-01	-8.594590E-01	0.000000E+00	0.000000E+00
3.100000E+02	1.458624E+06	2.237021E+07	1.651678E+01	1.627938E+01	1.774944E+01
-8.669870E+00	1.632678E+00	-6.577174E+01	1.243839E+00	-1.786723E+01	-2.763613E-02
-3.671439E-02	-5.827932E-02	2.103559E+04	1.649048E+04	1.658249E+04	-1.095750E+07
-1.674726E+07	9.994432E+06	-6.424744E+03	-9.248077E+03	-1.204706E+04	1.377002E+01
2.105273E+01	-1.262012E+01	6.684732E+00	1.992933E-06	3.537346E-05	-1.727847E-05
1.320235E-01	3.665490E+03	1.382250E+00	1.369226E-14	1.073711E-07	2.668095E+01
-1.244914E+02	1.441947E+02	7.869365E+02	-5.032684E+00	-1.283746E+02	7.728405E+02
9.660798E-03	3.465401E+02	-2.537900E+03	9.101435E+01	1.689428E+02	2.303126E+07
5.505073E+06	5.629721E+01	3.445158E+02	5.968084E+01	-1.593968E-05	1.479161E-05
-3.594379E-05	1.213111E-02	8.479662E-07	1.155988E-06	-1.736075E+02	-1.788662E+02
5.613909E+02	-4.436314E+01	6.141710E-01	4.757015E+01	1.426817E+07	6.879354E-07
2.313998E-05	-6.995152E-01	-5.478797E-01	-4.588096E-01	-6.902717E-01	6.841874E-01
2.353987E-01	1.849416E-01	4.813682E-01	-8.567854E-01	0.000000E+00	0.000000E+00
3.200000E+02	1.504263E+06	2.241625E+07	1.598156E+01	1.574763E+01	1.835130E+01
-8.162250E+00	1.387814E+00	-6.606998E+01	7.512124E-01	-1.743963E+01	-2.745674E-02
-2.480458E-02	-5.991874E-02	2.103570E+04	1.641229E+04	1.650546E+04	-1.102106E+07
-1.683869E+07	9.873334E+06	-6.287063E+03	-9.037627E+03	-1.217200E+04	1.376660E+01
2.103906E+01	-1.238965E+01	6.670692E+00	1.668206E-06	3.061376E-05	-1.361632E-05
8.858554E-02	3.665446E+03	1.132250E+00	1.149968E-14	9.117060E-08	2.627509E+01
-1.245421E+02	1.454562E+02	7.769468E+02	-5.033923E+00	-1.283747E+02	7.729328E+02
8.807011E-03	3.465389E+02	-2.537842E+03	9.101443E+01	1.693465E+02	2.303126E+07
5.505423E+06	5.629718E+01	3.445162E+02	5.968089E+01	-1.334248E-05	1.139159E-05
-3.126080E-05	9.937140E-03	6.892847E-07	9.319062E-07	-1.735714E+02	-1.788701E+02
5.857131E+02	-4.670205E+01	6.141511E-01	4.757100E+01	1.426834E+07	5.758437E-07
1.936957E-05	-6.913618E-01	-5.523150E-01	-4.657972E-01	-6.983388E-01	6.761820E-01
2.347358E-01	1.853155E-01	4.875716E-01	-8.531894E-01	0.000000E+00	0.000000E+00
3.300000E+02	1.548217E+06	2.246059E+07	1.544157E+01	1.521126E+01	1.906092E+01
-7.676530E+00	1.118526E+00	-6.626420E+01	2.559552E-01	-1.699593E+01	-2.731574E-02
-1.520219E-02	-6.121073E-02	2.103579E+04	1.633692E+04	1.643122E+04	-1.108325E+07
-1.692802E+07	9.750999E+06	-6.149408E+03	-8.827301E+03	-1.229465E+04	1.376416E+01
2.102734E+01	-1.216309E+01	6.657537E+00	1.410083E-06	2.687747E-05	-1.082454E-05
5.378505E-02	3.665412E+03	8.822501E-01	9.752016E-15	7.808138E-08	2.587086E+01
-1.245927E+02	1.467179E+02	7.669539E+02	-5.034988E+00	-1.283748E+02	7.730172E+02
8.068751E-03	3.465367E+02	-2.537788E+03	9.101448E+01	1.697487E+02	2.303124E+07
5.505754E+06	5.629715E+01	3.445165E+02	5.968096E+01	-1.127798E-05	8.828332E-06
-2.759345E-05	7.743093E-03	5.374839E-07	6.984881E-07	-1.735362E+02	-1.788738E+02
6.099416E+02	-4.900497E+01	6.141322E-01	4.757180E+01	1.426850E+07	4.867427E-07
1.637249E-05	-6.832937E-01	-5.577283E-01	-4.712206E-01	-7.064912E-01	6.679701E-01
2.338505E-01	1.843362E-01	4.927018E-01	-8.504499E-01	0.000000E+00	0.000000E+00
3.400000E+02	1.590489E+06	2.250325E+07	1.489692E+01	1.467037E+01	1.985367E+01
-7.218051E+00	8.249188E-01	-6.637778E+01	-2.415138E-01	-1.654016E+01	-2.721203E-02
-7.907760E-03	-6.216542E-02	2.103585E+04	1.626435E+04	1.635978E+04	-1.114405E+07
-1.701524E+07	9.627449E+06	-6.011768E+03	-8.617079E+03	-1.241506E+04	1.376367E+01

**ORBITAL SCIENCES CORPORATION: PROPRIETARY DATA**  
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**Orbital Sciences Corporation**  
**Launch Systems Group**

TM-18187A

TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----
2.101855E+01	-1.194043E+01	6.644471E+00	1.205702E-06	2.393761E-05	-8.702817E-06
2.762206E-02	3.665385E+03	6.322501E-01	8.366658E-15	6.757273E-08	2.546815E+01
-1.246432E+02	1.479798E+02	7.569579E+02	-5.035888E+00	-1.283748E+02	7.730947E+02
7.434160E-03	3.465335E+02	-2.537737E+03	9.101451E+01	1.701494E+02	2.303122E+07
5.506066E+06	5.629713E+01	3.445168E+02	5.968103E+01	-9.643323E-06	6.902546E-06
-2.471130E-05	5.548987E-03	3.908156E-07	4.577584E-07	-1.735018E+02	-1.788776E+02
6.340809E+02	-5.127277E+01	6.141143E-01	4.757253E+01	1.426864E+07	4.161930E-07
1.399942E-05	-6.752757E-01	-5.638971E-01	-4.754186E-01	-7.146805E-01	6.595752E-01
2.327925E-01	1.823033E-01	4.969715E-01	-8.484013E-01	0.000000E+00	0.000000E+00
3.500000E+02	1.631083E+06	2.254422E+07	1.434773E+01	1.412509E+01	2.070552E+01
-6.784384E+00	5.093973E-01	-6.643398E+01	-7.406967E-01	-1.607607E+01	-2.714443E-02
-2.921963E-03	-6.279280E-02	2.103590E+04	1.619459E+04	1.629112E+04	-1.120348E+07
-1.710036E+07	9.502705E+06	-5.874133E+03	-8.406945E+03	-1.253326E+04	1.376367E+01
2.100977E+01	-1.172168E+01	6.630911E+00	1.038315E-06	2.149884E-05	-7.044326E-06
1.009656E-02	3.665368E+03	3.822502E-01	7.231212E-15	5.887719E-08	2.506693E+01
-1.246936E+02	1.492418E+02	7.469589E+02	-5.036624E+00	-1.283749E+02	7.731662E+02
6.872089E-03	3.465295E+02	-2.537689E+03	9.101453E+01	1.705488E+02	2.303120E+07
5.506358E+06	5.629713E+01	3.445169E+02	5.968111E+01	-8.304545E-06	5.417910E-06
-2.231456E-05	3.354840E-03	2.475582E-07	2.123496E-07	-1.734684E+02	-1.788812E+02
6.581348E+02	-5.350617E+01	6.140975E-01	4.757320E+01	1.426878E+07	3.584131E-07
1.205589E-05	-6.672691E-01	-5.705916E-01	-4.787245E-01	-7.228618E-01	6.510213E-01
2.316074E-01	1.795067E-01	5.005961E-01	-8.468653E-01	0.000000E+00	0.000000E+00
3.600000E+02	1.670003E+06	2.258351E+07	1.379347E+01	1.357487E+01	1.335092E+01
-8.971091E+00	9.005540E-01	-7.475850E+01	-4.343576E-01	-1.817809E+01	-6.184374E-02
-2.032688E+00	5.007654E-01	2.103592E+04	1.612769E+04	1.622530E+04	-1.126154E+07
-1.718338E+07	9.376790E+06	-5.736495E+03	-8.196739E+03	-1.264944E+04	1.376465E+01
2.100391E+01	-1.150488E+01	6.616718E+00	8.997192E-07	1.201208E-05	-8.071463E-06
1.208568E-03	3.664836E+03	1.322502E-01	6.290394E-15	5.160967E-08	2.466711E+01
-1.247439E+02	1.505052E+02	7.369452E+02	-5.036984E+00	-1.283750E+02	7.732323E+02
6.370334E-03	3.465186E+02	-2.537629E+03	9.101479E+01	1.709470E+02	2.303113E+07
5.506718E+06	5.629701E+01	3.445166E+02	5.968112E+01	-7.196044E-06	6.994544E-06
-1.160094E-05	1.160832E-03	1.307275E-07	3.952489E-08	-1.734355E+02	-1.788845E+02
6.821071E+02	-5.570676E+01	6.140762E-01	4.757393E+01	1.426893E+07	3.105717E-07
1.044665E-05	-6.603360E-01	-4.676478E-01	-5.875899E-01	-7.002622E-01	6.660829E-01
2.568391E-01	2.712734E-01	5.810671E-01	-7.673146E-01	0.000000E+00	0.000000E+00
3.700000E+02	1.707252E+06	2.262112E+07	1.323560E+01	1.302120E+01	-6.120250E+00
-1.509895E+01	7.916201E-01	-9.507269E+01	-6.189092E-01	-2.422959E+01	-6.908458E-02
-2.038528E+00	7.407554E-01	2.103592E+04	1.606352E+04	1.616220E+04	-1.131821E+07
-1.726430E+07	9.249725E+06	-5.598854E+03	-7.986708E+03	-1.276331E+04	1.376270E+01
2.100293E+01	-1.129102E+01	6.601852E+00	7.838127E-07	-4.797130E-06	-1.183475E-05
0.000000E+00	3.664785E+03	0.000000E+00	5.502881E-15	4.547842E-08	2.426863E+01
-1.247941E+02	1.517675E+02	7.269402E+02	-5.037383E+00	-1.283750E+02	7.732937E+02
5.919328E-03	3.465132E+02	-2.537588E+03	9.101485E+01	1.713438E+02	2.303110E+07
5.506966E+06	5.629698E+01	3.445165E+02	5.968118E+01	-6.269012E-06	1.170806E-05
3.481416E-06	-5.503027E-08	1.027750E-07	3.056036E-08	-1.734038E+02	-1.788879E+02
7.060019E+02	-5.787525E+01	6.140617E-01	4.757447E+01	1.426903E+07	2.705622E-07
9.100859E-06	-5.952714E-01	-1.644742E-01	-7.865114E-01	-6.381335E-01	6.915982E-01
3.383455E-01	4.883007E-01	7.033066E-01	-5.166451E-01	0.000000E+00	0.000000E+00
3.800000E+02	1.742835E+06	2.265707E+07	1.267380E+01	1.246373E+01	-2.662365E+01
-2.539139E+01	-2.503290E+00	-1.149073E+02	-3.834576E+00	-3.448427E+01	9.267719E-01

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TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----
-1.516274E+00	1.241183E+00	2.103592E+04	1.600218E+04	1.610190E+04	-1.137351E+07
-1.734311E+07	9.121531E+06	-5.461246E+03	-7.776741E+03	-1.287505E+04	1.375293E+01
2.093359E+01	-1.108887E+01	6.586000E+00	6.890597E-07	-1.834528E-05	-1.749618E-05
0.000000E+00	3.664423E+03	0.000000E+00	4.859595E-15	4.042632E-08	2.387142E+01
-1.248443E+02	1.530295E+02	7.169386E+02	-5.037870E+00	-1.283751E+02	7.733509E+02
5.523087E-03	3.465093E+02	-2.537549E+03	9.101502E+01	1.717393E+02	2.303108E+07
5.507205E+06	5.629691E+01	3.445165E+02	5.968119E+01	-5.511168E-06	1.858304E-05
1.957560E-05	-4.838259E-08	1.631407E-07	1.718544E-07	-1.733728E+02	-1.788911E+02
7.298228E+02	-6.001191E+01	6.140479E-01	4.757501E+01	1.426914E+07	2.378547E-07
8.000681E-06	-4.992210E-01	2.167557E-01	-8.389251E-01	-5.383744E-01	6.810339E-01
4.963325E-01	6.789193E-01	6.994354E-01	-2.232907E-01	0.000000E+00	0.000000E+00
3.900000E+02	1.776757E+06	2.269134E+07	1.210829E+01	1.190270E+01	-2.550849E+01
-3.320864E+01	4.518251E+00	-1.179071E+02	1.764251E+00	-4.222568E+01	3.180513E-01
-1.044730E-01	3.887180E-02	2.103592E+04	1.594379E+04	1.604450E+04	-1.142744E+07
-1.741983E+07	8.992230E+06	-5.323581E+03	-7.566980E+03	-1.298479E+04	1.377148E+01
2.098828E+01	-1.087891E+01	6.569065E+00	6.108305E-07	-1.558136E-05	-2.028485E-05
0.000000E+00	3.663891E+03	0.000000E+00	4.329096E-15	3.622956E-08	2.347543E+01
-1.248944E+02	1.542907E+02	7.069496E+02	-5.039012E+00	-1.283750E+02	7.734043E+02
5.172740E-03	3.465093E+02	-2.537495E+03	9.101476E+01	1.721331E+02	2.303108E+07
5.507534E+06	5.629702E+01	3.445168E+02	5.968138E+01	-4.885483E-06	2.205507E-05
1.655691E-05	-4.289593E-08	1.936498E-07	1.453744E-07	-1.733432E+02	-1.788947E+02
7.535738E+02	-6.211868E+01	6.140292E-01	4.757583E+01	1.426931E+07	2.108509E-07
7.092361E-06	-4.955946E-01	3.077026E-01	-8.122224E-01	-3.921358E-01	7.551417E-01
5.253480E-01	7.749939E-01	5.788611E-01	-2.535829E-01	0.000000E+00	0.000000E+00
4.000000E+02	1.809020E+06	2.272395E+07	1.153858E+01	1.133762E+01	-2.374963E+01
-3.409733E+01	6.937129E+00	-1.182992E+02	3.170443E+00	-4.318544E+01	7.794437E-03
-5.568001E-03	-4.210680E-02	2.103592E+04	1.588808E+04	1.598978E+04	-1.147998E+07
-1.749445E+07	8.861842E+06	-5.185848E+03	-7.357060E+03	-1.309244E+04	1.377783E+01
2.098926E+01	-1.067676E+01	6.551782E+00	5.430713E-07	-1.289774E-05	-1.851728E-05
0.000000E+00	3.663845E+03	0.000000E+00	3.868392E-15	3.256847E-08	2.308058E+01
-1.249444E+02	1.555531E+02	6.969441E+02	-5.039361E+00	-1.283750E+02	7.734544E+02
4.850949E-03	3.465043E+02	-2.537454E+03	9.101473E+01	1.725263E+02	2.303105E+07
5.507781E+06	5.629703E+01	3.445167E+02	5.968149E+01	-4.343538E-06	2.017267E-05
1.360370E-05	-3.813797E-08	1.771240E-07	1.194458E-07	-1.733143E+02	-1.788980E+02
7.772583E+02	-6.419620E+01	6.140149E-01	4.757638E+01	1.426941E+07	1.874613E-07
6.305608E-06	-4.920226E-01	3.136147E-01	-8.121327E-01	-3.674553E-01	7.708824E-01
5.203046E-01	7.892340E-01	5.544241E-01	-2.640522E-01	0.000000E+00	0.000000E+00
4.100000E+02	1.839626E+06	2.275491E+07	1.096519E+01	1.076898E+01	-2.250847E+01
-3.372903E+01	7.890940E+00	-1.183360E+02	3.438745E+00	-4.285130E+01	7.795713E-03
-5.630413E-03	-4.208051E-02	2.103592E+04	1.583519E+04	1.593784E+04	-1.153115E+07
-1.756697E+07	8.730388E+06	-5.048061E+03	-7.147118E+03	-1.319807E+04	1.378125E+01
2.099512E+01	-1.047266E+01	6.533737E+00	4.869244E-07	-1.059992E-05	-1.642348E-05
0.000000E+00	3.663845E+03	0.000000E+00	3.487013E-15	2.951734E-08	2.268682E+01
-1.249943E+02	1.568155E+02	6.869368E+02	-5.039613E+00	-1.283749E+02	7.735015E+02
4.567060E-03	3.464990E+02	-2.537415E+03	9.101472E+01	1.729185E+02	2.303101E+07
5.508018E+06	5.629704E+01	3.445165E+02	5.968159E+01	-3.894470E-06	1.787743E-05
1.149078E-05	-3.419498E-08	1.569709E-07	1.008936E-07	-1.732863E+02	-1.789012E+02
8.008801E+02	-6.624468E+01	6.140011E-01	4.757688E+01	1.426952E+07	1.680801E-07
5.653685E-06	-4.885419E-01	3.084813E-01	-8.161900E-01	-3.699828E-01	7.739211E-01
5.139640E-01	7.902149E-01	5.530692E-01	-2.639601E-01	0.000000E+00	0.000000E+00

**Orbital Sciences Corporation  
Launch Systems Group**

TM-18187A

TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----

BEGIN STAGE 2 SEPARATION

4.130400E+02	1.848603E+06	2.276399E+07	1.079017E+01	1.059544E+01	-2.213366E+01
-3.361173E+01	8.177316E+00	-1.183469E+02	3.520327E+00	-4.274977E+01	7.796103E-03
-5.648963E-03	-4.207296E-02	2.103592E+04	1.581967E+04	1.592261E+04	-1.154644E+07
-1.758860E+07	8.690218E+06	-5.006163E+03	-7.083292E+03	-1.322978E+04	1.377879E+01
2.099161E+01	-1.039817E+01	6.528450E+00	4.705671E-07	-1.041537E-05	-1.581657E-05
0.000000E+00	3.663845E+03	0.000000E+00	3.375158E-15	2.862247E-08	2.256732E+01
-1.250095E+02	1.571994E+02	6.838944E+02	-5.039682E+00	-1.283749E+02	7.735153E+02
4.482138E-03	3.464974E+02	-2.537404E+03	9.101471E+01	1.730375E+02	2.303100E+07
5.508089E+06	5.629704E+01	3.445165E+02	5.968161E+01	-3.763643E-06	1.721235E-05
1.089860E-05	-3.304626E-08	1.511312E-07	9.569401E-08	-1.732780E+02	-1.789021E+02
8.080493E+02	-6.686212E+01	6.139969E-01	4.757704E+01	1.426955E+07	1.624338E-07
5.463761E-06	-4.874785E-01	3.069178E-01	-8.174143E-01	-3.707455E-01	7.748367E-01
5.120312E-01	7.905141E-01	5.526568E-01	-2.639278E-01	0.000000E+00	0.000000E+00
4.200000E+02	1.868580E+06	2.278420E+07	1.038829E+01	1.019697E+01	-2.128242E+01
-3.333551E+01	8.824952E+00	-1.183717E+02	3.707156E+00	-4.251741E+01	7.794601E-03
-5.675505E-03	-4.206952E-02	2.103592E+04	1.578511E+04	1.588869E+04	-1.158094E+07
-1.763739E+07	8.597888E+06	-4.910214E+03	-6.937149E+03	-1.330170E+04	1.378809E+01
2.099854E+01	-1.027441E+01	6.515270E+00	4.394884E-07	-9.353378E-06	-1.465057E-05
0.000000E+00	2.591865E+03	0.000000E+00	3.164693E-15	2.692590E-08	2.229408E+01
-1.250442E+02	1.580780E+02	6.769288E+02	-5.039827E+00	-1.283749E+02	7.735458E+02
4.313285E-03	3.464937E+02	-2.537377E+03	9.101470E+01	1.733097E+02	2.303098E+07
5.508250E+06	5.629705E+01	3.445163E+02	5.968169E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.732592E+02	-1.789043E+02
8.244428E+02	-6.826600E+01	6.139875E-01	4.757739E+01	1.426962E+07	1.517058E-07
5.102906E-06	-4.850354E-01	3.033325E-01	-8.202012E-01	-3.724816E-01	7.769189E-01
5.075968E-01	7.912004E-01	5.517122E-01	-2.638474E-01	0.000000E+00	0.000000E+00

BEGIN STAGE 3 MOTOR IGNITION

4.240800E+02	1.879919E+06	2.279567E+07	1.015155E+01	9.962250E+00	-2.078595E+01
-3.316714E+01	9.200646E+00	-1.183859E+02	3.816750E+00	-4.238115E+01	7.726341E-03
-7.314947E-03	-4.440919E-02	2.103662E+04	1.576567E+04	1.586964E+04	-1.160086E+07
-1.766552E+07	8.543532E+06	-4.854079E+03	-6.851391E+03	-1.334363E+04	1.220908E+01
2.199466E+01	-1.286837E+01	6.507812E+00	4.221824E-07	-8.775461E-06	-1.400258E-05
1.713707E+03	2.591792E+03	1.407112E+03	3.046874E-15	2.597551E-08	2.213412E+01
-1.250646E+02	1.585936E+02	6.728465E+02	-5.040318E+00	-1.283751E+02	7.735632E+02
4.217369E-03	3.464900E+02	-2.537332E+03	9.101519E+01	1.734690E+02	2.303096E+07
5.508524E+06	5.629684E+01	3.445162E+02	5.968158E+01	0.000000E+00	0.000000E+00
0.000000E+00	1.746544E+01	1.781732E-02	-7.522130E-03	-1.732480E+02	-1.789050E+02
8.340402E+02	-6.908278E+01	6.139717E-01	4.757802E+01	1.426974E+07	1.457320E-07
4.901965E-06	-4.835976E-01	3.012252E-01	-8.218253E-01	-3.734938E-01	7.781309E-01
5.049898E-01	7.916033E-01	5.511585E-01	-2.637965E-01	0.000000E+00	0.000000E+00
4.300000E+02	1.895558E+06	2.281151E+07	9.195431E+00	9.002186E+00	-1.530461E+01
-2.741273E+01	1.088124E+01	-1.141843E+02	5.345608E+00	-3.758629E+01	-2.038844E-01
-3.712684E-03	-6.998184E-01	2.150389E+04	1.609820E+04	1.622499E+04	-1.163002E+07
-1.770538E+07	8.463269E+06	-5.009662E+03	-6.617253E+03	-1.379374E+04	-3.000710E+01
3.864000E+01	-8.314990E+01	6.649643E+00	4.173096E-07	-6.386762E-06	-1.143959E-05
1.586274E+03	2.464355E+03	6.702681E+03	2.884378E-15	2.466473E-08	2.189966E+01
-1.250960E+02	1.598925E+02	6.722235E+02	-5.943551E+00	-1.288383E+02	7.735887E+02
4.392264E-03	3.446547E+02	-2.480321E+03	9.185577E+01	1.736014E+02	2.301981E+07

**ORBITAL SCIENCES CORPORATION: PROPRIETARY DATA**

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**Orbital Sciences Corporation**  
**Launch Systems Group**

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TM-18187A

TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----
5.854928E+06	5.595885E+01	3.446087E+02	5.944615E+01	0.000000E+00	0.000000E+00
0.000000E+00	8.749747E+01	1.527357E-01	7.108653E-02	-1.724741E+02	-1.780016E+02
8.481268E+02	-7.018319E+01	5.944601E-01	4.841882E+01	1.443737E+07	1.440500E-07
4.845387E-06	-5.004339E-01	1.955016E-01	-8.434127E-01	-4.262359E-01	7.923003E-01
4.365583E-01	7.535840E-01	5.779614E-01	-3.131641E-01	0.000000E+00	0.000000E+00
4.400000E+02	1.919168E+06	2.283546E+07	7.524360E+00	7.332030E+00	-1.482696E+01
-2.198569E+01	1.082704E+01	-1.148207E+02	5.057332E+00	-3.345188E+01	-1.999900E-01
1.904961E-02	-5.272841E-01	2.249964E+04	1.688151E+04	1.704798E+04	-1.168174E+07
-1.776964E+07	8.320774E+06	-5.348148E+03	-6.231548E+03	-1.474960E+04	-3.783838E+01
3.909912E+01	-1.077002E+02	6.974295E+00	4.252485E-07	-6.305143E-06	-9.349385E-06
1.336326E+03	2.214408E+03	7.777688E+03	2.671695E-15	2.293875E-08	2.148926E+01
-1.251592E+02	1.620702E+02	6.797087E+02	-8.218299E+00	-1.297851E+02	7.736349E+02
4.912912E-03	3.417346E+02	-2.341395E+03	9.333599E+01	1.737226E+02	2.300207E+07
6.699061E+06	5.537225E+01	3.448699E+02	5.910392E+01	0.000000E+00	0.000000E+00
0.000000E+00	1.129908E+02	2.200199E-01	1.124729E-01	-1.711666E+02	-1.764174E+02
8.728766E+02	-7.164894E+01	5.489019E-01	5.051223E+01	1.485056E+07	1.467904E-07
4.937567E-06	-4.584206E-01	1.560261E-01	-8.749322E-01	-4.823972E-01	7.831400E-01
3.924088E-01	7.464205E-01	6.019531E-01	-2.837410E-01	0.000000E+00	0.000000E+00
4.500000E+02	1.939012E+06	2.285566E+07	5.853604E+00	5.671775E+00	-1.443850E+01
-1.675461E+01	1.052941E+01	-1.156292E+02	4.777113E+00	-2.938506E+01	-1.966716E-01
-1.067006E-01	-3.436828E-01	2.370085E+04	1.790182E+04	1.810470E+04	-1.173712E+07
-1.783007E+07	8.167604E+06	-5.732973E+03	-5.857054E+03	-1.591550E+04	-3.979736E+01
3.707568E+01	-1.262500E+02	7.389153E+00	4.465809E-07	-6.447956E-06	-7.482289E-06
1.067446E+03	1.945528E+03	7.899752E+03	2.499299E-15	2.153737E-08	2.105569E+01
-1.252361E+02	1.643043E+02	6.992888E+02	-1.151488E+01	-1.309240E+02	7.736877E+02
5.701126E-03	3.386811E+02	-2.142129E+03	9.471742E+01	1.737886E+02	2.298351E+07
7.909822E+06	5.483464E+01	3.451989E+02	5.891806E+01	0.000000E+00	0.000000E+00
0.000000E+00	1.306249E+02	2.807400E-01	1.322032E-01	-1.700120E+02	-1.749482E+02
8.991393E+02	-7.261386E+01	4.879270E-01	5.358390E+01	1.544667E+07	1.541541E-07
5.185256E-06	-4.119335E-01	1.2023285E-01	-9.032341E-01	-5.350002E-01	7.704662E-01
3.466361E-01	7.376216E-01	6.260214E-01	-2.530051E-01	0.000000E+00	0.000000E+00
4.600000E+02	1.954826E+06	2.287185E+07	4.199322E+00	4.035155E+00	-1.400896E+01
-1.172659E+01	1.003553E+01	-1.165137E+02	4.560055E+00	-2.533362E+01	-1.977521E-01
-9.187976E-02	-3.829648E-01	2.514611E+04	1.919728E+04	1.943133E+04	-1.179653E+07
-1.788681E+07	8.0001594E+06	-6.153343E+03	-5.493907E+03	-1.733461E+04	-4.340820E+01
3.534814E+01	-1.548516E+02	7.908463E+00	4.848590E-07	-6.792371E-06	-5.685742E-06
7.858745E+02	1.663956E+03	8.188709E+03	2.368701E-15	2.047369E-08	2.059340E+01
-1.253272E+02	1.666654E+02	7.405665E+02	-1.654556E+01	-1.324020E+02	7.737502E+02
6.874933E-03	3.352635E+02	-1.850214E+03	9.593183E+01	1.738282E+02	2.296275E+07
9.683530E+06	5.437105E+01	3.455788E+02	5.897807E+01	0.000000E+00	0.000000E+00
0.000000E+00	1.583155E+02	3.554962E-01	1.724823E-01	-1.690721E+02	-1.736665E+02
9.272449E+02	-7.311171E+01	4.067605E-01	5.820866E+01	1.632314E+07	1.673672E-07
5.629705E-06	-3.619109E-01	8.681698E-02	-9.281613E-01	-5.840397E-01	7.549105E-01
2.983419E-01	7.265798E-01	6.500562E-01	-2.225058E-01	0.000000E+00	0.000000E+00
4.700000E+02	1.966238E+06	2.288366E+07	2.609654E+00	2.466803E+00	-1.360540E+01
-6.959692E+00	9.335533E+00	-1.175236E+02	4.409916E+00	-2.127080E+01	-2.000198E-01
-1.007678E-01	-4.419936E-01	2.688340E+04	2.081719E+04	2.107495E+04	-1.186026E+07
-1.794004E+07	7.819904E+06	-6.595899E+03	-5.156278E+03	-1.905944E+04	-4.484619E+01
3.256201E+01	-1.882793E+02	8.550614E+00	5.469360E-07	-7.441286E-06	-3.806506E-06
4.998629E+02	1.377944E+03	8.169988E+03	2.285610E-15	1.979338E-08	2.009519E+01

**ORBITAL SCIENCES CORPORATION: PROPRIETARY DATA**  
 USE, DUPLICATION AND DISCLOSURE OF THIS INFORMATION IS RESTRICTED ON TITLE PAGE

TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----
-1.254326E+02	1.691341E+02	8.337065E+02	-2.540470E+01	-1.347111E+02	7.738272E+02
8.636646E-03	3.315043E+02	-1.405144E+03	9.690063E+01	1.738415E+02	2.293990E+07
1.238783E+07	5.400890E+01	3.460244E+02	5.943239E+01	0.000000E+00	0.000000E+00
0.000000E+00	1.907388E+02	4.809065E-01	2.381915E-01	-1.684193E+02	-1.726550E+02
9.576189E+02	-7.320213E+01	2.986911E-01	6.552557E+01	1.766387E+07	1.887954E-07
6.350482E-06	-3.077152E-01	5.606264E-02	-9.498254E-01	-6.295511E-01	7.365086E-01
2.474277E-01	7.134260E-01	6.741009E-01	-1.913406E-01	0.000000E+00	0.000000E+00
4.800000E+02	1.972821E+06	2.289066E+07	1.112841E+00	9.914916E-01	-1.285480E+01
-2.325674E+00	8.468230E+00	-1.182721E+02	4.413656E+00	-1.700850E+01	-1.974070E-01
-1.472964E-01	-3.508484E-01	2.900591E+04	2.285165E+04	2.312384E+04	-1.192848E+07
-1.799010E+07	7.619070E+06	-7.049737E+03	-4.862948E+03	-2.118610E+04	-4.561328E+01
2.708838E+01	-2.345137E+02	9.350955E+00	6.404119E-07	-8.232370E-06	-1.489389E-06
2.152756E+02	1.093357E+03	8.019290E+03	2.237676E-15	1.940090E-08	1.955224E+01
-1.255522E+02	1.716452E+02	1.140158E+03	-4.895192E+01	-1.417106E+02	7.739260E+02
1.132828E-02	3.273847E+02	-6.680220E+02	9.756120E+01	1.737736E+02	2.291487E+07
1.686667E+07	5.376782E+01	3.466073E+02	6.058854E+01	0.000000E+00	0.000000E+00
0.000000E+00	2.359515E+02	6.690752E-01	3.304043E-01	-1.681135E+02	-1.719787E+02
9.907744E+02	-7.299309E+01	1.520355E-01	7.829960E+01	1.989077E+07	2.210621E-07
7.435832E-06	-2.517610E-01	2.133057E-02	-9.675543E-01	-6.723362E-01	7.152571E-01
1.907127E-01	6.961181E-01	6.985358E-01	-1.657325E-01	0.000000E+00	0.000000E+00
4.900000E+02	1.974625E+06	2.289292E+07	1.092547E-01	2.570126E-03	-1.280477E+01
1.397386E+00	7.291296E+00	-1.194773E+02	4.220328E+00	-1.319664E+01	-1.840827E-01
-4.595654E-01	1.070326E-02	3.083718E+04	2.463607E+04	2.491131E+04	-1.200064E+07
-1.803760E+07	7.396981E+06	-7.324436E+03	-4.642901E+03	-2.305931E+04	-1.286572E+01
2.117578E+01	-1.417324E+02	1.004905E+01	7.352639E-07	-9.414885E-06	1.027447E-06
1.627233E+01	8.943538E+02	3.459715E+03	2.224539E-15	1.929334E-08	1.895901E+01
-1.256836E+02	1.714979E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.740545E+02
1.417058E-02	3.242916E+02	2.271111E+02	9.778515E+01	1.717157E+02	2.289608E+07
2.230560E+07	5.368816E+01	3.492509E+02	6.227470E+01	0.000000E+00	0.000000E+00
0.000000E+00	1.244455E+02	4.061455E-01	1.916900E-01	-1.681721E+02	-1.717706E+02
1.027011E+03	-7.266163E+01	1.306322E-02	9.483507E+01	2.260084E+07	2.538038E-07
8.537160E-06	-1.948537E-01	1.219098E-04	-9.808323E-01	-7.089972E-01	6.909848E-01
1.409364E-01	6.777574E-01	7.228693E-01	-1.345545E-01	0.000000E+00	0.000000E+00

BEGIN STAGE 3 MOTOR BURNOUT

4.929600E+02	1.974555E+06	2.289298E+07	3.064414E-02	-7.431193E-02	-1.476909E+01
5.561512E-01	6.103272E+00	-1.217493E+02	2.825337E+00	-1.367298E+01	-6.493241E-01
-7.224500E-01	3.171005E-01	3.099177E+04	2.478328E+04	2.505858E+04	-1.202233E+07
-1.805124E+07	7.328362E+06	-7.311714E+03	-4.579229E+03	-2.323318E+04	1.332053E+01
2.136606E+01	-1.277681E+01	1.010658E+01	7.438774E-07	-1.098640E-05	4.137083E-07
1.470610E+00	8.795487E+02	2.887885E+01	2.225052E-15	1.929755E-08	1.877669E+01
-1.257237E+02	1.537963E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.740970E+02
1.442934E-02	3.242499E+02	3.151227E+02	9.779312E+01	1.538576E+02	2.289583E+07
2.284037E+07	5.368539E+01	7.292031E+00	6.245178E+01	0.000000E+00	0.000000E+00
0.000000E+00	1.054964E+00	3.966853E-02	3.411865E-02	-1.681898E+02	-1.717711E+02
1.038145E+03	-7.256429E+01	1.212561E-03	9.652219E+01	2.286810E+07	2.567771E-07
8.637171E-06	-1.823421E-01	4.201054E-02	-9.823372E-01	-7.166132E-01	6.783891E-01
1.620302E-01	6.732138E-01	7.335008E-01	-9.359359E-02	0.000000E+00	0.000000E+00
5.000000E+02	1.974322E+06	2.289307E+07	2.559644E-02	-7.723197E-02	-9.646953E+00
6.015542E+00	7.235736E-01	-1.172517E+02	-7.057628E-01	-6.898449E+00	-4.662933E-01

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TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----
2.287467E+00	9.165717E-02	3.099685E+04	2.478813E+04	2.506366E+04	-1.207346E+07
-1.808295E+07	7.164568E+06	-7.212479E+03	-4.429389E+03	-2.329833E+04	1.426611E+01
2.146240E+01	-9.035156E+00	1.010858E+01	7.447381E-07	-7.184452E-06	4.480003E-06
9.859043E-01	8.786446E+02	1.451750E+01	2.226746E-15	1.931141E-08	1.834234E+01
-1.258189E+02	1.471935E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.741987E+02
1.444382E-02	3.242909E+02	3.180776E+02	9.779282E+01	1.472447E+02	2.289608E+07
2.285832E+07	5.368549E+01	1.434166E+01	6.245860E+01	0.000000E+00	0.000000E+00
0.000000E+00	5.315252E-01	2.398878E-03	1.380153E-03	-1.682025E+02	-1.717923E+02
1.064668E+03	-7.232499E+01	8.251181E-04	9.657983E+01	2.287720E+07	2.570742E-07
8.647164E-06	-1.748218E-01	-6.286792E-02	-9.825910E-01	-7.995153E-01	5.915024E-01
1.044037E-01	5.746413E-01	8.038486E-01	-1.536714E-01	0.000000E+00	0.000000E+00
5.100000E+02	1.973991E+06	2.289318E+07	2.588845E-02	-7.395787E-02	1.400343E+00
5.704914E+00	-1.158052E+00	-1.070245E+02	-2.570588E+00	-6.630136E+00	1.868895E-02
8.979145E-02	-8.027153E-03	3.100040E+04	2.479177E+04	2.506764E+04	-1.214488E+07
-1.812619E+07	6.931149E+06	-7.071543E+03	-4.217918E+03	-2.338449E+04	1.418555E+01
2.122607E+01	-8.386719E+00	1.011016E+01	7.457763E-07	1.044343E-06	4.254589E-06
6.477920E-01	8.779068E+02	6.098092E+00	2.229155E-15	1.933114E-08	1.772518E+01
-1.259536E+02	1.311630E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.743432E+02
1.445873E-02	3.245866E+02	3.200640E+02	9.779256E+01	1.312148E+02	2.289787E+07
2.287039E+07	5.368558E+01	3.099202E+01	6.246274E+01	0.000000E+00	0.000000E+00
0.000000E+00	2.234553E-01	1.011700E-03	5.829964E-04	-1.682192E+02	-1.718211E+02
1.102349E+03	-7.196325E+01	6.004160E-04	9.662373E+01	2.288413E+07	2.574325E-07
8.659219E-06	-2.782228E-01	-2.017734E-01	-9.390844E-01	-8.150604E-01	5.668809E-01
1.196771E-01	5.082014E-01	7.987074E-01	-3.221767E-01	0.000000E+00	0.000000E+00
5.200000E+02	1.973673E+06	2.289329E+07	2.530418E-02	-7.150295E-02	1.785568E+00
5.818560E+00	-8.471907E-01	-1.072293E+02	-2.228454E+00	-6.628663E+00	3.695233E-02
-4.676956E-02	-7.116082E-03	3.100209E+04	2.479355E+04	2.506975E+04	-1.221488E+07
-1.816731E+07	6.696892E+06	-6.929027E+03	-4.005251E+03	-2.346629E+04	1.429980E+01
2.130151E+01	-8.023438E+00	1.011101E+01	7.466761E-07	1.333241E-06	4.344579E-06
4.860735E-01	8.777083E+02	3.549546E+00	2.231471E-15	1.935011E-08	1.710787E+01
-1.260877E+02	1.192106E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.744879E+02
1.447005E-02	3.248080E+02	3.209952E+02	9.779237E+01	1.192612E+02	2.289922E+07
2.287605E+07	5.368563E+01	4.356609E+01	6.246505E+01	0.000000E+00	0.000000E+00
0.000000E+00	1.300971E-01	5.895823E-04	3.399132E-04	-1.682348E+02	-1.718488E+02
1.140034E+03	-7.157718E+01	5.061117E-04	9.664591E+01	2.288763E+07	2.577431E-07
8.669667E-06	-2.749457E-01	-1.999385E-01	-9.404411E-01	-8.126413E-01	5.710674E-01
1.161730E-01	5.138278E-01	7.961825E-01	-3.194908E-01	0.000000E+00	0.000000E+00
5.300000E+02	1.973366E+06	2.289340E+07	2.463770E-02	-6.908348E-02	1.826995E+00
5.846685E+00	-4.735237E-01	-1.077673E+02	-1.856198E+00	-6.735535E+00	3.855876E-02
-4.501675E-02	-1.355942E-02	3.100313E+04	2.479466E+04	2.507118E+04	-1.228345E+07
-1.820630E+07	6.461835E+06	-6.785487E+03	-3.791927E+03	-2.354471E+04	1.439502E+01
2.135815E+01	-7.701172E+00	1.011160E+01	7.475115E-07	1.365700E-06	4.370464E-06
3.877142E-01	8.776008E+02	2.275273E+00	2.233711E-15	1.936844E-08	1.649044E+01
-1.262212E+02	1.095334E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.746326E+02
1.447994E-02	3.249941E+02	3.215559E+02	9.779224E+01	1.095826E+02	2.290035E+07
2.287946E+07	5.368568E+01	5.386519E+01	6.246664E+01	0.000000E+00	0.000000E+00
0.000000E+00	8.340299E-02	3.781517E-04	2.180692E-04	-1.682496E+02	-1.718753E+02
1.177721E+03	-7.116644E+01	4.563383E-04	9.666028E+01	2.288990E+07	2.580315E-07
8.679367E-06	-2.699059E-01	-1.925194E-01	-9.434443E-01	-8.091900E-01	5.764060E-01
1.138761E-01	5.218835E-01	7.941615E-01	-3.113601E-01	0.000000E+00	0.000000E+00

**Orbital Sciences Corporation**  
**Launch Systems Group**

TM-18187A

TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----
5.400000E+02	1.973069E+06	2.289350E+07	2.398705E-02	-6.660404E-02	1.812781E+00
5.830981E+00	-7.764263E-02	-1.083577E+02	-1.480519E+00	-6.898370E+00	4.072251E-02
-5.357667E-02	-7.313259E-03	3.100384E+04	2.479545E+04	2.507229E+04	-1.235059E+07
-1.824315E+07	6.226008E+06	-6.641055E+03	-3.578084E+03	-2.362008E+04	1.448047E+01
2.140674E+01	-7.404297E+00	1.011206E+01	7.483018E-07	1.356507E-06	4.363334E-06
3.198851E-01	8.775239E+02	1.729102E+00	2.235872E-15	1.938614E-08	1.587290E+01
-1.263541E+02	1.013900E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.747774E+02
1.448898E-02	3.2515185E+02	3.219403E+02	9.779213E+01	1.014380E+02	2.290135E+07
2.288179E+07	5.368571E+01	6.263041E+01	6.246788E+01	0.000000E+00	0.000000E+00
0.000000E+00	6.338798E-02	2.874619E-04	1.657881E-04	-1.682636E+02	-1.719007E+02
1.215410E+03	-7.073213E+01	4.270998E-04	9.667084E+01	2.289157E+07	2.583043E-07
8.688542E-06	-2.649799E-01	-1.838948E-01	-9.465561E-01	-8.052680E-01	5.821741E-01
1.123241E-01	5.304046E-01	7.919950E-01	-3.023490E-01	0.000000E+00	0.000000E+00
5.500000E+02	1.972783E+06	2.289361E+07	2.335254E-02	-6.406583E-02	1.857761E+00
5.814123E+00	3.226822E-01	-1.088893E+02	-1.104400E+00	-7.071083E+00	4.313751E-02
-6.685632E-02	4.677025E-03	3.100440E+04	2.479609E+04	2.507323E+04	-1.241627E+07
-1.827786E+07	5.989443E+06	-6.495798E+03	-3.363785E+03	-2.369252E+04	1.456201E+01
2.145093E+01	-7.113281E+00	1.011245E+01	7.490563E-07	1.391567E-06	4.355105E-06
2.660201E-01	8.774608E+02	1.353727E+00	2.237954E-15	1.940319E-08	1.525527E+01
-1.264865E+02	9.397130E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.749224E+02
1.449748E-02	3.253168E+02	3.222381E+02	9.779202E+01	9.401801E+01	2.290231E+07
2.288360E+07	5.368574E+01	7.067096E+01	6.246895E+01	0.000000E+00	0.000000E+00
0.000000E+00	4.963049E-02	2.251040E-04	1.298335E-04	-1.682770E+02	-1.719250E+02
1.253100E+03	-7.027456E+01	4.085713E-04	9.667962E+01	2.289296E+07	2.585647E-07
8.697302E-06	-2.605939E-01	-1.760595E-01	-9.492596E-01	-8.012289E-01	5.879909E-01
1.109011E-01	5.386308E-01	7.894744E-01	-2.942908E-01	0.000000E+00	0.000000E+00
<b>BEGIN PAYLOAD SEPARATION</b>					
5.529600E+02	1.972700E+06	2.289364E+07	2.316020E-02	-6.331100E-02	1.838043E+00
5.817358E+00	4.465181E-01	-1.090795E+02	-9.858255E-01	-7.117815E+00	4.289353E-02
-6.227120E-02	-8.072642E-04	3.100454E+04	2.479625E+04	2.507348E+04	-1.243544E+07
-1.828772E+07	5.919282E+06	-6.452647E+03	-3.300266E+03	-2.371341E+04	1.458429E+01
2.146148E+01	-7.005339E+00	1.011256E+01	7.492727E-07	1.377196E-06	4.358787E-06
2.525960E-01	8.774474E+02	1.248372E+00	2.238555E-15	1.940810E-08	1.507244E+01
-1.265256E+02	9.196893E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.749653E+02
1.449990E-02	3.253605E+02	3.223127E+02	9.779200E+01	9.201525E+01	2.290257E+07
2.288406E+07	5.368575E+01	7.285740E+01	6.246923E+01	0.000000E+00	0.000000E+00
0.000000E+00	4.576864E-02	2.075964E-04	1.197380E-04	-1.682808E+02	-1.719319E+02
1.264256E+03	-7.013472E+01	4.044661E-04	9.668190E+01	2.289331E+07	2.586395E-07
8.699816E-06	-2.588722E-01	-1.733712E-01	-9.502250E-01	-8.000035E-01	5.897616E-01
1.103433E-01	5.412758E-01	7.887482E-01	-2.913705E-01	0.000000E+00	0.000000E+00
<b>BEGIN CCAM ATTITUDE MANEUVER</b>					
5.559600E+02	1.972618E+06	2.289367E+07	2.297846E-02	-6.252927E-02	2.014927E+00
5.816760E+00	5.762585E-01	-1.090749E+02	-8.633777E-01	-7.170984E+00	4.582465E-02
6.412036E-02	7.501044E-03	3.100483E+04	2.479656E+04	2.507387E+04	-1.245473E+07
-1.829752E+07	5.848110E+06	-6.408883E+03	-3.235876E+03	-2.373446E+04	1.458537E+01
2.145122E+01	-6.926829E+00	1.011272E+01	7.494977E-07	1.510183E-06	4.359648E-06
2.397127E-01	4.168045E+02	1.210835E+00	2.239157E-15	1.941303E-08	1.488712E+01
-1.265651E+02	8.827217E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.750088E+02
1.450257E-02	3.254512E+02	3.224277E+02	9.779197E+01	8.831813E+01	2.290313E+07

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**Orbital Sciences Corporation**  
**Launch Systems Group**

TM-18187A

TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----
2.288475E+07	5.368576E+01	7.674069E+01	6.246969E+01	0.000000E+00	0.000000E+00
0.000000E+00	9.345391E-02	4.238922E-04	2.444955E-04	-1.682846E+02	-1.719389E+02
1.275563E+03	-6.999065E+01	4.012273E-04	9.668586E+01	2.289394E+07	2.587171E-07
8.702428E-06	-2.590501E-01	-1.733172E-01	-9.501864E-01	-7.986978E-01	5.916232E-01
1.098356E-01	5.431159E-01	7.873647E-01	-2.916881E-01	0.000000E+00	0.000000E+00
5.600000E+02	1.972508E+06	2.289371E+07	2.274256E-02	-6.146191E-02	3.274320E+00
-1.179107E+01	1.539140E+00	-1.070632E+02	-6.261241E+00	-2.400572E+01	9.125149E-03
3.324970E-01	4.517898E+00	3.100520E+04	2.479695E+04	2.507440E+04	-1.248050E+07
-1.831042E+07	5.752166E+06	-6.349997E+03	-3.148989E+03	-2.376237E+04	1.460889E+01
2.149707E+01	-6.867188E+00	1.011294E+01	7.497967E-07	2.455074E-06	-8.840909E-06
2.229840E-01	4.167559E+02	1.160284E+00	2.239955E-15	1.941956E-08	1.463755E+01
-1.266183E+02	8.341498E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.750674E+02
1.450612E-02	3.255786E+02	3.225676E+02	9.779238E+01	8.346046E+01	2.290390E+07
2.288560E+07	5.368565E+01	8.184907E+01	6.247016E+01	0.000000E+00	0.000000E+00
0.000000E+00	8.956280E-02	4.062504E-04	2.343222E-04	-1.682892E+02	-1.719477E+02
1.290790E+03	-6.979405E+01	3.995502E-04	9.669100E+01	2.289475E+07	2.588203E-07
8.705900E-06	-4.975741E-01	1.565752E-03	-8.674200E-01	-6.801535E-01	6.199171E-01
3.912723E-01	5.383411E-01	7.846658E-01	-3.073897E-01	0.000000E+00	0.000000E+00
5.700000E+02	1.972245E+06	2.289380E+07	2.225392E-02	-5.869798E-02	1.416114E+01
-5.665559E+01	9.255448E+00	-9.251552E+01	-1.514384E+01	-6.927651E+01	-9.436017E-02
7.407575E-01	4.537375E+00	3.100604E+04	2.479766E+04	2.507542E+04	-1.254327E+07
-1.834083E+07	5.514206E+06	-6.203688E+03	-2.933631E+03	-2.389239E+04	1.465527E+01
2.156372E+01	-6.535156E+00	1.011336E+01	7.505003E-07	1.062794E-05	-4.252004E-05
1.846419E-01	4.167175E+02	1.035159E+00	2.241870E-15	1.943524E-08	1.401973E+01
-1.267497E+02	7.457482E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.752125E+02
1.451423E-02	3.258384E+02	3.228022E+02	9.779348E+01	7.461933E+01	2.290548E+07
2.288703E+07	5.368536E+01	9.131075E+01	6.247098E+01	0.000000E+00	0.000000E+00
0.000000E+00	7.991171E-02	3.624908E-04	2.090869E-04	-1.683001E+02	-1.719686E+02
1.328482E+03	-6.929094E+01	4.028747E-04	9.670051E+01	2.289625E+07	2.590632E-07
8.714069E-06	-8.781260E-01	3.708816E-01	-3.022276E-01	-1.125541E-01	4.538312E-01
8.839507E-01	4.650014E-01	8.102371E-01	-3.567767E-01	0.000000E+00	0.000000E+00
5.800000E+02	1.971994E+06	2.289390E+07	2.166912E-02	-5.599081E-02	-9.380208E+00
-8.832450E+01	-6.981693E+00	-8.917962E+01	-2.267010E+01	-1.020858E+02	-1.178090E+00
-2.771446E-01	5.787668E-01	3.100679E+04	2.479796E+04	2.507604E+04	-1.260457E+07
-1.836909E+07	5.275592E+06	-6.056693E+03	-2.717705E+03	-2.389288E+04	1.473242E+01
2.159741E+01	-6.208984E+00	1.011363E+01	7.511519E-07	-7.045961E-06	-6.634511E-05
1.506665E-01	4.166201E+02	9.100341E-01	2.243698E-15	1.945022E-08	1.340184E+01
-1.268806E+02	7.027059E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.753577E+02
1.452135E-02	3.259571E+02	3.229293E+02	9.779508E+01	7.031393E+01	2.290620E+07
2.288780E+07	5.368496E+01	9.623671E+01	6.247125E+01	0.000000E+00	0.000000E+00
0.000000E+00	7.026880E-02	3.187642E-04	1.838694E-04	-1.683098E+02	-1.719879E+02
1.366175E+03	-6.876541E+01	4.017288E-04	9.670525E+01	2.289700E+07	2.592881E-07
8.721635E-06	-7.614947E-01	6.2427207E-01	1.727712E-01	2.810538E-01	7.805584E-02
9.565124E-01	5.840673E-01	7.769371E-01	-2.350192E-01	0.000000E+00	0.000000E+00
5.900000E+02	1.971754E+06	2.289399E+07	2.095191E-02	-5.337802E-02	2.733245E+01
-8.785062E+01	3.102304E+01	-9.050662E+01	-2.199002E+01	-1.018634E+02	6.810021E-01
2.567560E-02	-1.642972E-02	3.100745E+04	2.479801E+04	2.507639E+04	-1.266440E+07
-1.839519E+07	5.036358E+06	-5.908825E+03	-2.501430E+03	-2.395349E+04	1.482275E+01
2.163916E+01	-5.933594E+00	1.011379E+01	7.517589E-07	2.054742E-05	-6.604248E-05
1.210577E-01	4.165799E+02	7.849091E-01	2.245441E-15	1.946448E-08	1.278388E+01

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TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----
-1.270110E+02	6.858874E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.755029E+02
1.452770E-02	3.259676E+02	3.230077E+02	9.779650E+01	6.863065E+01	2.290626E+07
2.288828E+07	5.368463E+01	9.854057E+01	6.247130E+01	0.000000E+00	0.000000E+00
0.000000E+00	6.061304E-02	2.749751E-04	1.586148E-04	-1.683190E+02	-1.720065E+02
1.403868E+03	-6.821848E+01	3.927322E-04	9.670696E+01	2.289727E+07	2.594976E-07
8.728683E-06	-7.496950E-01	6.411121E-01	1.641121E-01	2.853811E-01	8.945088E-02
9.542307E-01	5.970888E-01	7.622164E-01	-2.500222E-01	0.000000E+00	0.000000E+00
6.000000E+02	1.971527E+06	2.289408E+07	2.024281E-02	-5.072224E-02	6.643327E+01
-8.500742E+01	6.873895E+01	-8.908085E+01	-1.906870E+01	-1.017312E+02	-2.395288E-01
2.597322E-01	-1.437124E-02	3.100801E+04	2.479804E+04	2.507671E+04	-1.272275E+07
-1.841912E+07	4.796532E+06	-5.760183E+03	-2.284918E+03	-2.401129E+04	1.489795E+01
2.166064E+01	-5.654297E+00	1.011394E+01	7.523356E-07	4.998011E-05	-6.395410E-05
9.581564E-02	4.165517E+02	6.597841E-01	2.247100E-15	1.947807E-08	1.216586E+01
-1.271411E+02	6.704904E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.756482E+02
1.453372E-02	3.259714E+02	3.230802E+02	9.779771E+01	6.708952E+01	2.290629E+07
2.288872E+07	5.368436E+01	1.007023E+02	6.247140E+01	0.000000E+00	0.000000E+00
0.000000E+00	5.095397E-02	2.311669E-04	1.333479E-04	-1.683279E+02	-1.720242E+02
1.441560E+03	-6.764993E+01	3.836184E-04	9.670842E+01	2.289750E+07	2.596967E-07
8.735378E-06	-7.651832E-01	6.211734E-01	1.692283E-01	3.134541E-01	1.298504E-01
9.406835E-01	5.623532E-01	7.728405E-01	-2.940687E-01	0.000000E+00	0.000000E+00
6.100000E+02	1.971311E+06	2.289417E+07	1.958613E-02	-4.798123E-02	5.849479E+01
-8.653834E+01	5.713948E+01	-8.539281E+01	-2.143367E+01	-1.018103E+02	-2.339488E-01
4.649423E-01	8.166415E-03	3.100847E+04	2.479807E+04	2.507701E+04	-1.277960E+07
-1.844088E+07	4.5556142E+06	-5.610801E+03	-2.068211E+03	-2.406628E+04	1.497070E+01
2.167871E+01	-5.371094E+00	1.011408E+01	7.528823E-07	4.403969E-05	-6.515318E-05
7.494021E-02	4.165308E+02	5.346590E-01	2.248673E-15	1.949095E-08	1.154778E+01
-1.272707E+02	6.550747E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.757936E+02
1.453941E-02	3.259785E+02	3.231477E+02	9.779871E+01	6.554665E+01	2.290633E+07
2.288913E+07	5.368415E+01	1.028657E+02	6.247153E+01	0.000000E+00	0.000000E+00
0.000000E+00	4.129285E-02	1.873454E-04	1.080721E-04	-1.683364E+02	-1.720411E+02
1.479252E+03	-6.706129E+01	3.755863E-04	9.670986E+01	2.289773E+07	2.598854E-07
8.741726E-06	-8.001344E-01	5.703340E-01	1.857528E-01	2.904503E-01	9.744884E-02
9.519151E-01	5.248082E-01	8.156119E-01	-2.436259E-01	0.000000E+00	0.000000E+00

BEGIN TELEMETRY XMTR OFF

6.129600E+02	1.971249E+06	2.289419E+07	1.940412E-02	-4.715150E-02	5.564779E+01
-8.698450E+01	5.283961E+01	-8.389863E+01	-2.211738E+01	-1.019164E+02	-2.322432E-01
5.174112E-01	1.509464E-02	3.100859E+04	2.479808E+04	2.507709E+04	-1.279614E+07
-1.8444691E+07	4.484882E+06	-5.566444E+03	-2.004033E+03	-2.408201E+04	1.499193E+01
2.168288E+01	-5.285524E+00	1.011412E+01	7.530383E-07	4.190491E-05	-6.550265E-05
6.959807E-02	4.165255E+02	4.990610E-01	2.249122E-15	1.949462E-08	1.136481E+01
-1.273090E+02	6.505855E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.758366E+02
1.454104E-02	3.259812E+02	3.231666E+02	9.779896E+01	6.509736E+01	2.290635E+07
2.288924E+07	5.368410E+01	1.034987E+02	6.247158E+01	0.000000E+00	0.000000E+00
0.000000E+00	3.854404E-02	1.748763E-04	1.008799E-04	-1.683389E+02	-1.720460E+02
1.490409E+03	-6.688315E+01	3.734397E-04	9.671028E+01	2.289779E+07	2.599393E-07
8.743537E-06	-8.130730E-01	5.494836E-01	1.923023E-01	2.847149E-01	8.719991E-02
9.546379E-01	5.077891E-01	8.309416E-01	-2.273461E-01	0.000000E+00	0.000000E+00
6.200000E+02	1.971107E+06	2.289425E+07	1.892941E-02	-4.520847E-02	3.466062E+01
-8.801942E+01	3.181066E+01	-8.374808E+01	-2.390184E+01	-1.021871E+02	-2.548187E-01

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TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----
5.533942E-02	1.1911838E-02	3.100885E+04	2.479810E+04	2.507729E+04	-1.283496E+07
-1.846048E+07	4.315216E+06	-5.460693E+03	-1.851309E+03	-2.411844E+04	1.504053E+01
2.169751E+01	-5.087891E+00	1.011421E+01	7.533985E-07	2.611326E-05	-6.631370E-05
5.785557E-02	4.165092E+02	4.550170E-01	2.250158E-15	1.950311E-08	1.092964E+01
-1.274000E+02	6.392555E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.759390E+02
1.454479E-02	3.259851E+02	3.232133E+02	9.779951E+01	6.396341E+01	2.290637E+07
2.288953E+07	5.368398E+01	1.050695E+02	6.247172E+01	0.000000E+00	0.000000E+00
0.000000E+00	3.514376E-02	1.594517E-04	9.198277E-05	-1.683446E+02	-1.720572E+02
1.516944E+03	-6.645320E+01	3.677561E-04	9.671125E+01	2.289795E+07	2.600636E-07
8.747720E-06	-8.132031E-01	5.489056E-01	1.933996E-01	2.694169E-01	6.050257E-02
9.611212E-01	5.158637E-01	8.336918E-01	-1.970853E-01	0.000000E+00	0.000000E+00
6.300000E+02	1.970915E+06	2.289433E+07	1.826707E-02	-4.241105E-02	7.601960E+01
-8.391055E+01	7.399295E+01	-8.456484E+01	-1.972063E+01	-1.019290E+02	6.493707E-01
-3.625908E-01	3.102334E-02	3.100917E+04	2.479812E+04	2.507755E+04	-1.288881E+07
-1.847791E+07	4.073782E+06	-5.309903E+03	-1.634216E+03	-2.416777E+04	1.510840E+01
2.171606E+01	-4.806641E+00	1.011433E+01	7.538836E-07	5.730993E-05	-6.325879E-05
4.303963E-02	4.164869E+02	3.924545E-01	2.251554E-15	1.951454E-08	1.031145E+01
-1.275289E+02	6.231157E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.760845E+02
1.454984E-02	3.259903E+02	3.232771E+02	9.780022E+01	6.234810E+01	2.290640E+07
2.288992E+07	5.368385E+01	1.073054E+02	6.247193E+01	0.000000E+00	0.000000E+00
0.000000E+00	3.031329E-02	1.375385E-04	7.934266E-05	-1.683523E+02	-1.720725E+02
1.554636E+03	-6.582585E+01	3.599907E-04	9.671258E+01	2.289816E+07	2.602311E-07
8.753353E-06	-8.058355E-01	5.596027E-01	1.935819E-01	3.093515E-01	1.191018E-01
9.434598E-01	5.049067E-01	8.201583E-01	-2.690904E-01	0.000000E+00	0.000000E+00
6.400000E+02	1.970736E+06	2.289441E+07	1.760952E-02	-3.958032E-02	7.578098E+01
-8.364646E+01	7.688804E+01	-8.755483E+01	-1.999159E+01	-1.022037E+02	-2.722162E-01
-2.515966E-01	2.644667E-02	3.100945E+04	2.479815E+04	2.507779E+04	-1.294116E+07
-1.849317E+07	3.831870E+06	-5.158451E+03	-1.416961E+03	-2.421427E+04	1.517480E+01
2.173279E+01	-4.521484E+00	1.011445E+01	7.543376E-07	5.716444E-05	-6.309766E-05
3.041120E-02	4.164712E+02	3.299820E-01	2.252861E-15	1.952523E-08	9.693214E+00
-1.276575E+02	6.068099E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.762300E+02
1.455456E-02	3.259947E+02	3.233383E+02	9.780081E+01	6.071621E+01	2.290643E+07
2.289029E+07	5.368375E+01	1.095579E+02	6.247217E+01	0.000000E+00	0.000000E+00
0.000000E+00	2.548191E-02	1.156201E-04	6.669923E-05	-1.683595E+02	-1.720869E+02
1.592327E+03	-6.518072E+01	3.524357E-04	9.671384E+01	2.289836E+07	2.603878E-07
8.758624E-06	-7.761773E-01	6.034061E-01	1.828930E-01	3.100035E-01	1.126261E-01
9.440409E-01	5.490415E-01	7.894406E-01	-2.744759E-01	0.000000E+00	0.000000E+00
6.500000E+02	1.970568E+06	2.289448E+07	1.692161E-02	-3.675267E-02	6.949648E+01
-8.571198E+01	7.261334E+01	-8.941550E+01	-2.269184E+01	-1.025645E+02	-2.694990E-01
-1.502986E-01	2.753271E-02	3.100968E+04	2.479817E+04	2.507802E+04	-1.299198E+07
-1.850625E+07	3.589507E+06	-5.006347E+03	-1.199557E+03	-2.425792E+04	1.523877E+01
2.174622E+01	-4.238281E+00	1.011455E+01	7.547602E-07	5.245318E-05	-6.469199E-05
1.997026E-02	4.164608E+02	2.673295E-01	2.254077E-15	1.953519E-08	9.074930E+00
-1.277858E+02	5.896858E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.763755E+02
1.455896E-02	3.259966E+02	3.233993E+02	9.780130E+01	5.900243E+01	2.290644E+07
2.289066E+07	5.368366E+01	1.118923E+02	6.247243E+01	0.000000E+00	0.000000E+00
0.000000E+00	2.064990E-02	9.369782E-05	5.405329E-05	-1.683664E+02	-1.721004E+02
1.630017E+03	-6.451842E+01	3.446034E-04	9.671506E+01	2.289855E+07	2.605337E-07
8.763531E-06	-7.550006E-01	6.309871E-01	1.784079E-01	2.866174E-01	7.285158E-02
9.552712E-01	5.897665E-01	7.723652E-01	-2.358549E-01	0.000000E+00	0.000000E+00

**Orbital Sciences Corporation**  
**Launch Systems Group**

TM-18187A

TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----
6.600000E+02	1.970414E+06	2.289455E+07	1.622121E-02	-3.391209E-02	7.528002E+01
-8.496139E+01	7.949567E+01	-9.030834E+01	-2.242644E+01	-1.029426E+02	6.571763E-01
-5.681828E-02	4.546534E-02	3.100987E+04	2.479819E+04	2.507823E+04	-1.304128E+07
-1.851716E+07	3.346721E+06	-4.853612E+03	-9.820344E+02	-2.429873E+04	1.530127E+01
2.175665E+01	-3.951172E+00	1.011465E+01	7.551515E-07	5.684782E-05	-6.415872E-05
1.171682E-02	4.164496E+02	2.047670E-01	2.255203E-15	1.954441E-08	8.456603E+00
-1.279138E+02	5.719776E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.765212E+02
1.456302E-02	3.259970E+02	3.234587E+02	9.780168E+01	5.723020E+01	2.290644E+07
2.289102E+07	5.368361E+01	1.142851E+02	6.247272E+01	0.000000E+00	0.000000E+00
0.000000E+00	1.581768E-02	7.177357E-05	4.140590E-05	-1.683728E+02	-1.721131E+02
1.667707E+03	-6.383952E+01	3.367598E-04	9.671620E+01	2.289873E+07	2.606687E-07
8.768074E-06	-7.424338E-01	6.453146E-01	1.798919E-01	2.939404E-01	7.249426E-02
9.530706E-01	6.019893E-01	7.604694E-01	-2.435062E-01	0.000000E+00	0.000000E+00
6.700000E+02	1.970272E+06	2.289462E+07	1.557282E-02	-3.099646E-02	6.219261E+01
-7.964272E+01	6.477111E+01	-9.015652E+01	-1.882752E+01	-9.899692E+01	-2.442364E-01
5.473635E-01	-5.812812E-01	3.101000E+04	2.479823E+04	2.507845E+04	-1.308905E+07
-1.852589E+07	3.103542E+06	-4.700289E+03	-7.644416E+02	-2.433670E+04	1.536084E+01
2.176385E+01	-3.667969E+00	1.011475E+01	7.555121E-07	4.698727E-05	-6.017105E-05
5.650888E-03	4.164315E+02	1.422045E-01	2.256238E-15	1.955288E-08	7.838234E+00
-1.280416E+02	5.524462E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.766668E+02
1.456679E-02	3.260087E+02	3.235157E+02	9.780196E+01	5.527576E+01	2.290651E+07
2.289137E+07	5.368356E+01	1.168601E+02	6.247303E+01	0.000000E+00	0.000000E+00
0.000000E+00	1.098538E-02	4.984791E-05	2.875741E-05	-1.683788E+02	-1.721249E+02
1.705397E+03	-6.314459E+01	3.307546E-04	9.671753E+01	2.289894E+07	2.607932E-07
8.772262E-06	-7.767532E-01	6.171338E-01	1.256994E-01	2.812113E-01	1.612621E-01
9.459993E-01	5.635376E-01	7.701561E-01	-2.988059E-01	0.000000E+00	0.000000E+00
6.800000E+02	1.970142E+06	2.289469E+07	1.484141E-02	-2.814099E-02	4.971729E+01
-7.965258E+01	4.694750E+01	-8.603948E+01	-2.132981E+01	-9.627765E+01	-2.687769E-01
2.852503E-02	5.810032E-02	3.101008E+04	2.479824E+04	2.507861E+04	-1.313528E+07
-1.853244E+07	2.859997E+06	-4.546348E+03	-5.467568E+02	-2.437179E+04	1.541846E+01
2.176837E+01	-3.382812E+00	1.011483E+01	7.558388E-07	3.757826E-05	-6.020451E-05
1.772452E-03	4.164186E+02	7.964202E-02	2.257180E-15	1.956059E-08	7.219828E+00
-1.281691E+02	5.344593E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.768125E+02
1.457018E-02	3.260012E+02	3.235711E+02	9.780213E+01	5.347562E+01	2.290647E+07
2.289170E+07	5.368354E+01	1.192809E+02	6.247334E+01	0.000000E+00	0.000000E+00
0.000000E+00	6.152580E-03	2.791897E-05	1.610673E-05	-1.683844E+02	-1.721359E+02
1.743086E+03	-6.243418E+01	3.223993E-04	9.671845E+01	2.289908E+07	2.609060E-07
8.776054E-06	-8.353763E-01	5.393875E-01	1.058659E-01	2.215683E-01	1.541687E-01
9.628808E-01	5.030447E-01	8.278243E-01	-2.483001E-01	0.000000E+00	0.000000E+00
6.900000E+02	1.970026E+06	2.289475E+07	1.416067E-02	-2.521516E-02	4.434512E+01
-8.158951E+01	4.109776E+01	-8.533045E+01	-2.396304E+01	-9.713673E+01	-2.683559E-01
4.348679E-02	6.035962E-02	3.101012E+04	2.479826E+04	2.507878E+04	-1.317998E+07
-1.853682E+07	2.616115E+06	-4.391848E+03	-3.290549E+02	-2.440403E+04	1.5475559E+01
2.177127E+01	-3.095703E+00	1.011490E+01	7.561343E-07	3.353087E-05	-6.169263E-05
8.151566E-05	4.164169E+02	1.707952E-02	2.258030E-15	1.956756E-08	6.601387E+00
-1.282963E+02	5.153063E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.769583E+02
1.457325E-02	3.260022E+02	3.236234E+02	9.780219E+01	5.155895E+01	2.290647E+07
2.289202E+07	5.368353E+01	1.218181E+02	6.247366E+01	0.000000E+00	0.000000E+00
0.000000E+00	1.319448E-03	5.987489E-06	3.454282E-06	-1.683897E+02	-1.721460E+02
1.780774E+03	-6.171018E+01	3.156073E-04	9.671947E+01	2.289925E+07	2.610080E-07
8.779486E-06	-8.364972E-01	5.352559E-01	1.173611E-01	2.065277E-01	1.095761E-01

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**Orbital Sciences Corporation**  
**Launch Systems Group**

TM-18187A

TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----
9.722857E-01	5.075617E-01	8.375525E-01	-2.022053E-01	0.000000E+00	0.000000E+00
7.000000E+02	1.969922E+06	2.289481E+07	1.347172E-02	-2.227891E-02	6.310527E+01
-7.840951E+01	5.956545E+01	-8.464351E+01	-2.011760E+01	-9.751297E+01	6.539549E-01
5.876292E-02	7.179417E-02	3.101012E+04	2.479827E+04	2.507892E+04	-1.322312E+07
-1.853903E+07	2.371926E+06	-4.236801E+03	-1.113318E+02	-2.443340E+04	1.552734E+01
2.177332E+01	-2.806641E+00	1.011497E+01	7.563973E-07	4.773265E-05	-5.930874E-05
0.000000E+00	4.164139E+02	0.000000E+00	2.258787E-15	1.957375E-08	5.982913E+00
-1.284233E+02	4.959556E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.771039E+02
1.457598E-02	3.260003E+02	3.236734E+02	9.780217E+01	4.962250E+01	2.290646E+07
2.289232E+07	5.368354E+01	1.243752E+02	6.247399E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.683945E+02	-1.721554E+02
1.818461E+03	-6.097177E+01	3.087098E-04	9.672040E+01	2.289939E+07	2.610988E-07
8.782539E-06	-8.385004E-01	5.288979E-01	1.310876E-01	2.494337E-01	1.586729E-01
9.553040E-01	4.844583E-01	8.337205E-01	-2.649723E-01	0.000000E+00	0.000000E+00
7.100000E+02	1.969830E+06	2.289487E+07	1.273499E-02	-1.937304E-02	6.205030E+01
-7.812630E+01	6.284426E+01	-8.875449E+01	-2.015469E+01	-9.799253E+01	-2.911866E-01
-5.286604E-01	4.050297E-02	3.101012E+04	2.479828E+04	2.507905E+04	-1.326471E+07
-1.853905E+07	2.127456E+06	-4.081245E+03	1.064214E+02	-2.445991E+04	1.557666E+01
2.177361E+01	-2.521484E+00	1.011503E+01	7.566283E-07	4.694902E-05	-5.911258E-05
0.000000E+00	4.164064E+02	0.000000E+00	2.259451E-15	1.957919E-08	5.364412E+00
-1.285502E+02	4.749133E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.772498E+02
1.457838E-02	3.259958E+02	3.237236E+02	9.780215E+01	4.751680E+01	2.290643E+07
2.289263E+07	5.368354E+01	1.271014E+02	6.247432E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.683988E+02	-1.721637E+02
1.856148E+03	-6.022083E+01	3.014510E-04	9.672128E+01	2.289953E+07	2.611785E-07
8.785222E-06	-7.980647E-01	5.908138E-01	1.184562E-01	2.552611E-01	1.534046E-01
9.546250E-01	5.458338E-01	7.920897E-01	-2.732386E-01	0.000000E+00	0.000000E+00
7.200000E+02	1.969752E+06	2.289492E+07	1.208368E-02	-1.636758E-02	5.545343E+01
-8.015255E+01	5.848098E+01	-9.092373E+01	-2.293210E+01	-9.839729E+01	-2.650068E-01
4.373917E-02	4.403711E-02	3.101012E+04	2.479829E+04	2.507916E+04	-1.330474E+07
-1.853690E+07	1.882737E+06	-3.925229E+03	3.241322E+02	-2.448352E+04	1.562378E+01
2.177133E+01	-2.232422E+00	1.011508E+01	7.568260E-07	4.196860E-05	-6.066154E-05
0.000000E+00	4.164019E+02	0.000000E+00	2.260021E-15	1.958386E-08	4.745884E+00
-1.286769E+02	4.563529E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.773956E+02
1.458043E-02	3.259898E+02	3.237666E+02	9.780213E+01	4.565946E+01	2.290640E+07
2.289289E+07	5.368354E+01	1.295794E+02	6.247462E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.684026E+02	-1.721712E+02
1.893834E+03	-5.945652E+01	2.949441E-04	9.672199E+01	2.289964E+07	2.612468E-07
8.787517E-06	-7.735262E-01	6.233481E-01	1.144309E-01	2.327818E-01	1.115098E-01
9.661150E-01	5.894657E-01	7.739527E-01	-2.313598E-01	0.000000E+00	0.000000E+00
7.300000E+02	1.969687E+06	2.289497E+07	1.138488E-02	-1.339567E-02	6.095877E+01
-7.955394E+01	6.358049E+01	-9.023875E+01	-2.257619E+01	-9.892031E+01	6.557255E-01
5.625096E-02	5.695266E-02	3.101012E+04	2.479829E+04	2.507925E+04	-1.334321E+07
-1.853257E+07	1.637796E+06	-3.768740E+03	5.418211E+02	-2.450425E+04	1.566919E+01
2.176648E+01	-1.943359E+00	1.011512E+01	7.569909E-07	4.614524E-05	-6.022161E-05
0.000000E+00	4.163989E+02	0.000000E+00	2.260495E-15	1.958774E-08	4.127334E+00
-1.288034E+02	4.361037E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.775414E+02
1.458215E-02	3.259807E+02	3.238097E+02	9.780211E+01	4.363314E+01	2.290634E+07
2.289315E+07	5.368354E+01	1.322263E+02	6.247492E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.684060E+02	-1.721777E+02

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TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----
1.931518E+03	-5.868158E+01	2.880205E-04	9.672265E+01	2.289975E+07	2.613037E-07
8.789431E-06	-7.764710E-01	6.177393E-01	1.244626E-01	2.429432E-01	1.112131E-01
9.636442E-01	5.814391E-01	7.784791E-01	-2.364294E-01	0.000000E+00	0.000000E+00
7.400000E+02	1.969635E+06	2.289502E+07	1.068342E-02	-1.041474E-02	7.145353E+01
-7.585974E+01	7.378155E+01	-8.951776E+01	-1.895367E+01	-9.947346E+01	-2.646217E-01
4.497711E-02	4.258664E-02	3.101012E+04	2.479828E+04	2.507933E+04	-1.338012E+07
-1.852606E+07	1.392662E+06	-3.611808E+03	7.594473E+02	-2.452209E+04	1.571265E+01
2.175909E+01	-1.654297E+00	1.011515E+01	7.571227E-07	5.409909E-05	-5.743513E-05
0.000000E+00	4.163959E+02	0.000000E+00	2.260874E-15	1.959085E-08	3.508765E+00
-1.289298E+02	4.154715E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.776872E+02
1.458352E-02	3.259693E+02	3.238507E+02	9.780209E+01	4.156852E+01	2.290627E+07
2.289340E+07	5.368354E+01	1.349115E+02	6.247521E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.684089E+02	-1.721833E+02
1.969202E+03	-5.789608E+01	2.810789E-04	9.672322E+01	2.289984E+07	2.613492E-07
8.790962E-06	-7.792627E-01	6.118405E-01	1.356495E-01	2.860822E-01	1.547112E-01
9.456328E-01	5.575900E-01	7.757033E-01	-2.955973E-01	0.000000E+00	0.000000E+00
7.500000E+02	1.969596E+06	2.289507E+07	9.979567E-03	-7.426240E-03	7.075494E+01
-7.790973E+01	7.261779E+01	-8.890046E+01	-2.159349E+01	-9.997358E+01	-2.645883E-01
4.378416E-02	4.393581E-02	3.101012E+04	2.479828E+04	2.507938E+04	-1.341545E+07
-1.851738E+07	1.147364E+06	-3.454451E+03	9.769849E+02	-2.453705E+04	1.575415E+01
2.174908E+01	-1.365234E+00	1.011518E+01	7.572216E-07	5.357718E-05	-5.899493E-05
0.000000E+00	4.163959E+02	0.000000E+00	2.261159E-15	1.959317E-08	2.890179E+00
-1.290561E+02	3.944044E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.778330E+02
1.458454E-02	3.259555E+02	3.238893E+02	9.780209E+01	3.946040E+01	2.290619E+07
2.289364E+07	5.368354E+01	1.376402E+02	6.247549E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.684113E+02	-1.721880E+02
2.006885E+03	-5.709916E+01	2.741163E-04	9.672369E+01	2.289991E+07	2.613833E-07
8.792110E-06	-7.815240E-01	6.068025E-01	1.449517E-01	2.660664E-01	1.140262E-01
9.571869E-01	5.642951E-01	7.866313E-01	-2.505639E-01	0.000000E+00	0.000000E+00
7.600000E+02	1.969570E+06	2.289511E+07	9.273600E-03	-4.431655E-03	6.975564E+01
-7.996137E+01	7.117289E+01	-8.825234E+01	-2.422731E+01	-1.005289E+02	-2.645549E-01
4.255617E-02	4.524922E-02	3.101012E+04	2.479826E+04	2.507943E+04	-1.344920E+07
-1.850652E+07	9.019305E+05	-3.296688E+03	1.194408E+03	-2.454912E+04	1.579395E+01
2.173645E+01	-1.076172E+00	1.011519E+01	7.572874E-07	5.282506E-05	-6.055374E-05
0.000000E+00	4.163959E+02	0.000000E+00	2.261348E-15	1.959472E-08	2.271580E+00
-1.291823E+02	3.728430E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.779789E+02
1.458523E-02	3.259392E+02	3.239257E+02	9.780207E+01	3.730285E+01	2.290609E+07
2.289386E+07	5.368354E+01	1.404184E+02	6.247577E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.684132E+02	-1.721918E+02
2.044567E+03	-5.629355E+01	2.671316E-04	9.672408E+01	2.289997E+07	2.614060E-07
8.792874E-06	-7.838065E-01	6.015670E-01	1.541574E-01	2.459613E-01	7.278700E-02
9.665429E-01	5.702197E-01	7.954993E-01	-2.050131E-01	0.000000E+00	0.000000E+00
7.700000E+02	1.969557E+06	2.289515E+07	8.565794E-03	-1.432457E-03	7.932964E+01
-7.459908E+01	8.043851E+01	-8.756482E+01	-1.913670E+01	-1.009191E+02	6.555502E-01
5.694292E-02	5.608975E-02	3.101012E+04	2.479825E+04	2.507945E+04	-1.348138E+07
-1.849349E+07	6.563910E+05	-3.138538E+03	1.411691E+03	-2.455829E+04	1.583203E+01
2.172119E+01	-7.871094E-01	1.011520E+01	7.573199E-07	6.007791E-05	-5.649537E-05
0.000000E+00	4.163929E+02	0.000000E+00	2.261441E-15	1.959549E-08	1.652971E+00
-1.293084E+02	3.507200E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.781247E+02
1.458557E-02	3.259205E+02	3.239598E+02	9.780206E+01	3.508913E+01	2.290598E+07

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**Orbital Sciences Corporation**  
**Launch Systems Group**

TM-18187A

TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----
2.289406E+07	5.368354E+01	1.432527E+02	6.247603E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.684147E+02	-1.721947E+02
2.082248E+03	-5.547840E+01	2.601254E-04	9.672437E+01	2.290002E+07	2.614173E-07
8.793252E-06	-7.864361E-01	5.950482E-01	1.656378E-01	3.026031E-01	1.373917E-01
9.431622E-01	5.384697E-01	7.918593E-01	-2.881133E-01	0.000000E+00	0.000000E+00
7.800000E+02	1.969557E+06	2.289518E+07	7.856429E-03	1.569876E-03	8.114304E+01
-7.513661E+01	8.186559E+01	-8.692237E+01	-2.020085E+01	-1.014620E+02	-2.641726E-01
4.383815E-02	4.383954E-02	3.101012E+04	2.479823E+04	2.507946E+04	-1.351197E+07
-1.847829E+07	4.107742E+05	-2.980019E+03	1.628808E+03	-2.456458E+04	1.586792E+01
2.170349E+01	-4.980469E-01	1.011520E+01	7.573192E-07	6.145119E-05	-5.690240E-05
0.000000E+00	4.163899E+02	0.000000E+00	2.261439E-15	1.959547E-08	1.034356E+00
-1.294345E+02	3.279587E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.782706E+02
1.458556E-02	3.258994E+02	3.239916E+02	9.780206E+01	3.281158E+01	2.290585E+07
2.289426E+07	5.368354E+01	1.461508E+02	6.247629E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.684157E+02	-1.721967E+02
2.119928E+03	-5.465553E+01	2.531007E-04	9.672458E+01	2.290005E+07	2.614170E-07
8.793244E-06	-7.883430E-01	5.896882E-01	1.754513E-01	2.987024E-01	1.175427E-01
9.470800E-01	5.378589E-01	7.990316E-01	-2.688053E-01	0.000000E+00	0.000000E+00
7.900000E+02	1.969571E+06	2.289521E+07	7.145780E-03	4.573862E-03	8.215636E+01
-7.720110E+01	8.249336E+01	-8.625289E+01	-2.281124E+01	-1.021084E+02	-2.641393E-01
4.261487E-02	4.515231E-02	3.101012E+04	2.479820E+04	2.507945E+04	-1.354098E+07
-1.846092E+07	1.651091E+05	-2.821151E+03	1.845734E+03	-2.456797E+04	1.590210E+01
2.168323E+01	-2.089844E-01	1.011519E+01	7.572853E-07	6.221580E-05	-5.846326E-05
0.000000E+00	4.163899E+02	0.000000E+00	2.261341E-15	1.959467E-08	4.157363E-01
-1.295605E+02	3.044722E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.784164E+02
1.458521E-02	3.258759E+02	3.240211E+02	9.780206E+01	3.046152E+01	2.290571E+07
2.289444E+07	5.368354E+01	1.491214E+02	6.247653E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.684162E+02	-1.721977E+02
2.157606E+03	-5.382499E+01	2.460627E-04	9.672470E+01	2.290007E+07	2.614053E-07
8.792850E-06	-7.901828E-01	5.843756E-01	1.847057E-01	2.798620E-01	7.593200E-02
9.570327E-01	5.452415E-01	8.079229E-01	-2.235447E-01	0.000000E+00	0.000000E+00
8.000000E+02	1.969597E+06	2.289524E+07	6.441568E-03	7.585366E-03	-1.770648E+02
-7.222990E+01	-1.758899E+02	-7.314580E+01	-3.350175E+01	-1.267712E+02	-1.195883E+00
3.679504E-01	7.498679E-01	3.101012E+04	2.479814E+04	2.507939E+04	-1.356840E+07
-1.844137E+07	-8.057488E+04	-2.661974E+03	2.062454E+03	-2.456844E+04	1.592896E+01
2.166443E+01	6.835938E-02	1.011517E+01	7.572168E-07	-1.340765E-04	-5.469369E-05
0.000000E+00	4.163008E+02	0.000000E+00	2.261148E-15	1.959309E-08	-2.028819E-01
-1.296865E+02	2.831260E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.785623E+02
1.458447E-02	3.258334E+02	3.240470E+02	9.780212E+01	2.832548E+01	2.290545E+07
2.289459E+07	5.368354E+01	1.518781E+02	3.822941E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.684162E+02	-1.721978E+02
2.195283E+03	-5.298767E+01	2.369965E-04	9.672438E+01	2.290002E+07	2.613816E-07
8.792054E-06	-6.874522E-01	5.248955E-01	5.018906E-01	3.892669E-01	-3.170997E-01
8.648232E-01	6.130911E-01	7.898940E-01	1.366646E-02	0.000000E+00	0.000000E+00
8.100000E+02	1.969637E+06	2.289527E+07	5.726941E-03	1.058599E-02	-1.782767E+02
-7.150431E+01	1.791600E+02	-6.913014E+01	-3.236321E+01	-1.272909E+02	6.210583E-01
3.643670E-01	-4.799624E-01	3.101012E+04	2.479815E+04	2.507939E+04	-1.359422E+07
-1.841967E+07	-3.262499E+05	-2.502479E+03	2.278932E+03	-2.456608E+04	1.596460E+01
2.163477E+01	3.691406E-01	1.011516E+01	7.571186E-07	-1.349766E-04	-5.413724E-05
0.000000E+00	4.162861E+02	0.000000E+00	2.260858E-15	1.959071E-08	-8.214988E-01

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TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----
-1.298126E+02	2.544006E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.787081E+02
1.458350E-02	3.258267E+02	3.240732E+02	9.780216E+01	2.545151E+01	2.290541E+07
2.289475E+07	5.368354E+01	1.553726E+02	3.822959E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.684158E+02	-1.721970E+02
2.232960E+03	-5.214366E+01	2.326367E-04	9.672476E+01	2.290008E+07	2.613478E-07
8.790914E-06	-7.202663E-01	4.679098E-01	5.121297E-01	4.084613E-01	-3.106453E-01
8.582883E-01	5.606922E-01	8.273813E-01	3.262427E-02	0.000000E+00	0.000000E+00
8.200000E+02	1.969690E+06	2.289529E+07	4.970059E-03	1.354248E-02	1.664618E+02
-7.610998E+01	1.650685E+02	-7.411214E+01	-3.122737E+01	-1.206763E+02	-3.117281E-01
-2.275955E-01	-5.015383E-01	3.101012E+04	2.479811E+04	2.507933E+04	-1.361844E+07
-1.839580E+07	-5.718866E+05	-2.342664E+03	2.495145E+03	-2.456079E+04	1.599316E+01
2.160693E+01	6.601562E-01	1.011513E+01	7.569853E-07	1.260092E-04	-5.761413E-05
0.000000E+00	4.162787E+02	0.000000E+00	2.260474E-15	1.958757E-08	-1.440110E+00
-1.299386E+02	2.263598E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.788539E+02
1.458212E-02	3.257951E+02	3.240966E+02	9.780217E+01	2.264593E+01	2.290521E+07
2.289489E+07	5.368354E+01	1.587988E+02	3.822985E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.684149E+02	-1.721954E+02
2.270635E+03	-5.129386E+01	2.253351E-04	9.672459E+01	2.290005E+07	2.613017E-07
8.789367E-06	-7.396179E-01	5.128553E-01	4.358266E-01	3.728935E-01	-2.268185E-01
8.997243E-01	5.602819E-01	8.279691E-01	-2.348139E-02	0.000000E+00	0.000000E+00
8.300000E+02	1.969756E+06	2.289531E+07	4.254226E-03	1.653546E-02	1.743683E+02
-7.663766E+01	1.756070E+02	-7.580554E+01	-3.427289E+01	-1.215107E+02	-3.100570E-01
-2.165228E-01	1.158907E-01	3.101012E+04	2.479804E+04	2.507923E+04	-1.364107E+07
-1.836977E+07	-8.174558E+05	-2.182578E+03	2.711042E+03	-2.455259E+04	1.601953E+01
2.157617E+01	9.472656E-01	1.011508E+01	7.568177E-07	1.319650E-04	-5.800074E-05
0.000000E+00	4.162743E+02	0.000000E+00	2.259995E-15	1.958365E-08	-2.058713E+00
-1.300647E+02	2.001325E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.789998E+02
1.458036E-02	3.257509E+02	3.241159E+02	9.780216E+01	2.002176E+01	2.290495E+07
2.289501E+07	5.368354E+01	1.620435E+02	3.823014E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.684136E+02	-1.721928E+02
2.308308E+03	-5.044010E+01	2.169111E-04	9.672412E+01	2.289998E+07	2.612439E-07
8.787421E-06	-7.184650E-01	5.437197E-01	4.337935E-01	3.396329E-01	-2.700250E-01
9.009639E-01	6.070070E-01	7.946416E-01	9.338401E-03	0.000000E+00	0.000000E+00
8.400000E+02	1.969835E+06	2.289533E+07	3.540788E-03	1.952495E-02	1.736177E+02
-7.550112E+01	1.772357E+02	-7.700222E+01	-3.482840E+01	-1.231632E+02	5.971704E-01
-2.054363E-01	1.267256E-01	3.101012E+04	2.479800E+04	2.507913E+04	-1.366209E+07
-1.834158E+07	-1.062929E+06	-2.022245E+03	2.926624E+03	-2.454152E+04	1.604431E+01
2.154297E+01	1.238281E+00	1.011503E+01	7.566182E-07	1.313623E-04	-5.712552E-05
0.000000E+00	4.162713E+02	0.000000E+00	2.259420E-15	1.957894E-08	-2.677303E+00
-1.301909E+02	1.710810E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.791456E+02
1.457829E-02	3.257162E+02	3.241330E+02	9.780217E+01	1.711518E+01	2.290474E+07
2.289512E+07	5.368354E+01	1.655706E+02	3.823041E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.684118E+02	-1.721894E+02
2.345980E+03	-4.958154E+01	2.100311E-04	9.672378E+01	2.289993E+07	2.611750E-07
8.785105E-06	-6.881468E-01	5.669920E-01	4.527406E-01	3.449254E-01	-2.933257E-01
8.916201E-01	6.383420E-01	7.697273E-01	6.281209E-03	0.000000E+00	0.000000E+00
8.500000E+02	1.969927E+06	2.289534E+07	2.871931E-03	2.255091E-02	1.576089E+02
-7.280831E+01	1.595841E+02	-7.564795E+01	-2.990149E+01	-1.234539E+02	-2.838649E-01
3.531309E-01	1.225297E-01	3.101012E+04	2.479795E+04	2.507902E+04	-1.368151E+07
-1.831123E+07	-1.308276E+06	-1.861687E+03	3.141845E+03	-2.452755E+04	1.606714E+01

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**Orbital Sciences Corporation**  
**Launch Systems Group**

TM-18187A

TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----
2.150732E+01	1.527344E+00	1.011497E+01	7.563853E-07	1.192131E-04	-5.507114E-05
0.000000E+00	4.162640E+02	0.000000E+00	2.258750E-15	1.957345E-08	-3.295878E+00
-1.303172E+02	1.427003E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.792913E+02
1.457587E-02	3.256792E+02	3.241467E+02	9.780219E+01	1.427577E+01	2.290451E+07
2.289520E+07	5.368354E+01	1.690306E+02	3.823067E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.684095E+02	-1.721850E+02
2.383651E+03	-4.872000E+01	2.033119E-04	9.672333E+01	2.289986E+07	2.610946E-07
8.782400E-06	-6.917375E-01	5.439770E-01	4.749612E-01	4.126722E-01	-2.419723E-01
8.781521E-01	5.926220E-01	8.034540E-01	-5.710286E-02	0.000000E+00	0.000000E+00
 BEGIN CRAB-WALK START					
8.529600E+02	1.969956E+06	2.289535E+07	2.660960E-03	2.343203E-02	1.610181E+02
-7.270047E+01	1.621291E+02	-7.426992E+01	-3.061706E+01	-1.241167E+02	-2.834634E-01
3.522668E-01	1.255684E-01	3.101012E+04	2.479793E+04	2.507898E+04	-1.368695E+07
-1.830184E+07	-1.380871E+06	-1.814116E+03	3.205485E+03	-2.452287E+04	1.607311E+01
2.149584E+01	1.611291E+00	1.011495E+01	7.563100E-07	1.217796E-04	-5.498410E-05
0.000000E+00	4.162640E+02	0.000000E+00	2.258533E-15	1.957167E-08	-3.478973E+00
-1.303546E+02	1.333532E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.793345E+02
1.457509E-02	3.256679E+02	3.241505E+02	9.780219E+01	1.334064E+01	2.290444E+07
2.289522E+07	5.368354E+01	1.701494E+02	3.823076E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.684088E+02	-1.721835E+02
2.394801E+03	-4.846474E+01	2.013158E-04	9.672319E+01	2.289983E+07	2.610687E-07
8.781526E-06	-6.998444E-01	5.276809E-01	4.814257E-01	4.084954E-01	-2.572258E-01
8.757662E-01	5.859602E-01	8.095602E-01	-3.553723E-02	0.000000E+00	0.000000E+00
8.600000E+02	1.970032E+06	2.289535E+07	2.124964E-03	2.549028E-02	1.763161E+02
-4.260567E+01	1.766125E+02	-5.740659E+01	-1.965623E+01	-1.561814E+02	-3.525992E-01
3.712816E-01	4.484223E+00	3.101012E+04	2.479776E+04	2.507875E+04	-1.369933E+07
-1.827874E+07	-1.553469E+06	-1.700841E+03	3.356673E+03	-2.451058E+04	1.608789E+01
2.146924E+01	1.814453E+00	1.011485E+01	7.561116E-07	1.333147E-04	-3.221464E-05
0.000000E+00	4.162331E+02	0.000000E+00	2.257984E-15	1.956718E-08	-3.914433E+00
-1.304435E+02	1.149900E+01	1.000000E+10	1.000000E+10	1.000000E+10	7.794371E+02
1.457288E-02	3.255601E+02	3.241581E+02	9.780208E+01	1.150325E+01	2.290379E+07
2.289527E+07	5.368354E+01	1.724237E+02	3.823115E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.684069E+02	-1.721798E+02
2.421320E+03	-4.785642E+01	1.860080E-04	9.672126E+01	2.289953E+07	2.610002E-07
8.779222E-06	-4.245768E-01	2.752779E-01	8.625292E-01	6.960652E-01	-5.099710E-01
5.053938E-01	5.789886E-01	8.149550E-01	2.491049E-02	0.000000E+00	0.000000E+00
8.700000E+02	1.970150E+06	2.289536E+07	1.406799E-03	2.844701E-02	-1.791943E+02
2.176215E+00	-1.781893E+02	-4.897891E+01	4.913218E+00	1.654340E+02	-4.760476E-01
2.412292E-01	4.484497E+00	3.101012E+04	2.479770E+04	2.507861E+04	-1.371553E+07
-1.824410E+07	-1.798479E+06	-1.539856E+03	3.571142E+03	-2.449084E+04	1.610693E+01
2.142822E+01	2.103516E+00	1.011478E+01	7.558132E-07	-1.354374E-04	1.644812E-06
0.000000E+00	4.162331E+02	0.000000E+00	2.257125E-15	1.956015E-08	-4.532966E+00
-1.305700E+02	7.863950E+00	1.000000E+10	1.000000E+10	1.000000E+10	7.795828E+02
1.456978E-02	3.255194E+02	3.241670E+02	9.780210E+01	7.866764E+00	2.290354E+07
2.289532E+07	5.368354E+01	1.766808E+02	3.823145E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.684037E+02	-1.721736E+02
2.458988E+03	-4.698995E+01	1.794232E-04	9.672065E+01	2.289943E+07	2.608971E-07
8.775757E-06	1.458686E-01	-2.236641E-01	9.636891E-01	7.662539E-01	-5.906067E-01
-2.530587E-01	6.257614E-01	7.753439E-01	8.523257E-02	0.000000E+00	0.000000E+00

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TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----
8.800000E+02	1.970281E+06	2.289537E+07	6.458604E-04	3.134862E-02	1.779951E+02
4.697742E+01	-1.719528E+02	-6.062044E+01	2.767743E+01	1.244081E+02	-6.394269E-01
-5.124758E-01	4.462992E+00	3.101012E+04	2.479763E+04	2.507844E+04	-1.373012E+07
-1.820732E+07	-2.043277E+06	-1.378680E+03	3.785202E+03	-2.446822E+04	1.612390E+01
2.138501E+01	2.390625E+00	1.011470E+01	7.554822E-07	1.344722E-04	3.549061E-05
0.000000E+00	4.162287E+02	0.000000E+00	2.256172E-15	1.955234E-08	-5.151474E+00
-1.306966E+02	3.733198E+00	1.000000E+10	1.000000E+10	1.000000E+10	7.797285E+02
1.456635E-02	3.254775E+02	3.241728E+02	9.780211E+01	3.734490E+00	2.290329E+07
2.289536E+07	5.368354E+01	1.814336E+02	3.823176E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.684000E+02	-1.721664E+02
2.496654E+03	-4.612156E+01	1.730971E-04	9.671995E+01	2.289932E+07	2.607829E-07
8.771915E-06	6.169531E-01	-6.064094E-01	5.016337E-01	3.904604E-01	-3.175632E-01
-8.641147E-01	6.833078E-01	7.289864E-01	4.085727E-02	0.000000E+00	0.000000E+00
8.900000E+02	1.970424E+06	2.289537E+07	-7.179865E-05	3.427844E-02	1.566679E+02
6.728458E+01	-1.597623E+02	-8.344629E+01	3.287804E+01	1.004944E+02	1.922029E-01
-1.267628E-01	3.120042E-01	3.101012E+04	2.479743E+04	2.507813E+04	-1.374310E+07
-1.816840E+07	-2.287833E+06	-1.217383E+03	3.998805E+03	-2.444259E+04	1.613892E+01
2.133911E+01	2.679688E+00	1.011456E+01	7.551122E-07	1.183019E-04	5.080742E-05
0.000000E+00	4.161659E+02	0.000000E+00	2.255128E-15	1.954379E-08	-5.769952E+00
-1.308234E+02	3.595416E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.798741E+02
1.456236E-02	3.253546E+02	3.241743E+02	9.780223E+01	3.595414E+02	2.290254E+07
2.289537E+07	5.368355E+01	1.862472E+02	3.823227E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.683957E+02	-1.721583E+02
2.534319E+03	-4.525311E+01	1.565932E-04	9.671761E+01	2.289895E+07	2.606552E-07
8.767619E-06	8.249068E-01	-5.440435E-01	1.534453E-01	1.031231E-01	-1.220613E-01
-9.871508E-01	5.557827E-01	8.301311E-01	-4.458569E-02	0.000000E+00	0.000000E+00
9.000000E+02	1.970581E+06	2.289537E+07	-7.558342E-04	3.722521E-02	1.623171E+02
6.530421E+01	-1.654215E+02	-8.083340E+01	3.452110E+01	1.040159E+02	2.147966E-01
4.156930E-01	-2.960670E-01	3.101012E+04	2.479734E+04	2.507791E+04	-1.375447E+07
-1.812735E+07	-2.532119E+06	-1.055931E+03	4.211918E+03	-2.441419E+04	1.615210E+01
2.129053E+01	2.966797E+00	1.011445E+01	7.547155E-07	1.225032E-04	4.928610E-05
0.000000E+00	4.161572E+02	0.000000E+00	2.253988E-15	1.953447E-08	-6.388397E+00
-1.309504E+02	3.549361E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.800197E+02
1.455821E-02	3.252981E+02	3.241718E+02	9.780226E+01	3.549346E+02	2.290220E+07
2.289535E+07	5.368356E+01	1.914746E+02	3.823261E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.683911E+02	-1.721493E+02
2.571982E+03	-4.438465E+01	1.494308E-04	9.671648E+01	2.289877E+07	2.605182E-07
8.763012E-06	8.123159E-01	-5.479552E-01	1.997198E-01	1.611484E-01	-1.182332E-01
-9.798225E-01	5.605123E-01	8.281099E-01	-7.740550E-03	0.000000E+00	0.000000E+00
9.100000E+02	1.970750E+06	2.289536E+07	-1.511239E-03	4.008337E-02	1.745708E+02
3.240895E+01	-1.766431E+02	-5.862883E+01	2.365671E+01	1.406938E+02	7.708980E-02
3.231975E-01	-4.609626E+00	3.101012E+04	2.479712E+04	2.507757E+04	-1.376422E+07
-1.808416E+07	-2.776106E+06	-8.943712E+02	4.424564E+03	-2.438280E+04	1.616351E+01
2.123975E+01	3.253906E+00	1.011430E+01	7.542805E-07	1.316753E-04	2.444544E-05
0.000000E+00	4.161268E+02	0.000000E+00	2.252757E-15	1.952438E-08	-7.006806E+00
-1.310775E+02	3.486820E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.801653E+02
1.455355E-02	3.251762E+02	3.241633E+02	9.780241E+01	3.486790E+02	2.290145E+07
2.289530E+07	5.368357E+01	1.983508E+02	3.823314E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.683858E+02	-1.721392E+02
2.609643E+03	-4.351718E+01	1.343800E-04	9.671396E+01	2.289838E+07	2.603681E-07
8.757961E-06	5.481904E-01	-4.456877E-01	7.077074E-01	5.854587E-01	-3.997908E-01

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TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----
-7.052698E-01	5.972650E-01	8.009556E-01	4.177028E-02	0.000000E+00	0.000000E+00
9.200000E+02	1.970932E+06	2.289535E+07	-2.234816E-03	4.295332E-02	1.781217E+02
-1.360425E+01	-1.792918E+02	-4.840849E+01	-4.843208E+00	1.778317E+02	-1.040759E-01
3.721709E-01	-4.606969E+00	3.101012E+04	2.479704E+04	2.507734E+04	-1.377236E+07
-1.803886E+07	-3.019766E+06	-7.326831E+02	4.636669E+03	-2.434867E+04	1.617291E+01
2.118604E+01	3.541016E+00	1.011419E+01	7.538212E-07	1.342719E-04	-1.025517E-05
0.000000E+00	4.161268E+02	0.000000E+00	2.251433E-15	1.951355E-08	-7.625177E+00
-1.312049E+02	3.426522E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.803108E+02
1.454878E-02	3.251353E+02	3.241494E+02	9.780243E+01	3.426478E+02	2.290121E+07
2.289522E+07	5.368357E+01	2.050025E+02	3.823348E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.683801E+02	-1.721284E+02
2.647302E+03	-4.265079E+01	1.307978E-04	9.671292E+01	2.289821E+07	2.602095E-07
8.752628E-06	-7.475369E-02	-6.423552E-02	9.951310E-01	7.858073E-01	-6.181755E-01
1.912630E-02	6.139371E-01	7.834110E-01	9.668765E-02	0.000000E+00	0.000000E+00
9.300000E+02	1.971126E+06	2.289534E+07	-2.955790E-03	4.580442E-02	-1.758311E+02
-5.956790E+01	-1.763017E+02	-5.747002E+01	-3.522907E+01	-1.446644E+02	-2.924747E-01
5.017893E-01	-4.590605E+00	3.101012E+04	2.479696E+04	2.507710E+04	-1.377888E+07
-1.799143E+07	-3.263070E+06	-5.709119E+02	4.848227E+03	-2.431168E+04	1.618030E+01
2.113037E+01	3.828125E+00	1.011407E+01	7.533303E-07	-1.324589E-04	-4.487430E-05
0.000000E+00	4.161268E+02	0.000000E+00	2.250019E-15	1.950197E-08	-8.243508E+00
-1.313326E+02	3.362917E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.804562E+02
1.454368E-02	3.250961E+02	3.241292E+02	9.780246E+01	3.362858E+02	2.290097E+07
2.289509E+07	5.368358E+01	2.119850E+02	3.823382E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.683739E+02	-1.721166E+02
2.684960E+03	-4.178652E+01	1.282885E-04	9.671177E+01	2.289803E+07	2.600401E-07
8.746928E-06	-6.519777E-01	3.559794E-01	6.694802E-01	4.559359E-01	-5.214287E-01
7.212729E-01	6.058444E-01	7.754939E-01	1.776561E-01	0.000000E+00	0.000000E+00
9.400000E+02	1.971332E+06	2.289533E+07	-3.739137E-03	4.857077E-02	1.328870E+02
-7.247796E+01	1.375437E+02	-7.944008E+01	-3.036916E+01	-1.195768E+02	-3.267162E-01
-2.232974E-01	1.156239E-01	3.101012E+04	2.479672E+04	2.507668E+04	-1.378378E+07
-1.794189E+07	-3.505989E+06	-4.090189E+02	5.059173E+03	-2.427169E+04	1.618585E+01
2.107178E+01	4.115234E+00	1.011388E+01	7.528000E-07	1.000373E-04	-5.456141E-05
0.000000E+00	4.160332E+02	0.000000E+00	2.248517E-15	1.948967E-08	-8.861794E+00
-1.314605E+02	3.262033E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.806017E+02
1.453799E-02	3.249770E+02	3.240929E+02	9.780238E+01	3.261959E+02	2.290024E+07
2.289487E+07	5.368357E+01	2.226956E+02	3.823437E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.683673E+02	-1.721039E+02
2.722616E+03	-4.092444E+01	1.173109E-04	9.670878E+01	2.289756E+07	2.598570E-07
8.740771E-06	-6.955179E-01	5.827486E-01	4.203080E-01	3.746063E-01	-2.050728E-01
9.042208E-01	6.131272E-01	7.863518E-01	-7.566950E-02	0.000000E+00	0.000000E+00
9.500000E+02	1.971551E+06	2.289531E+07	-4.419654E-03	5.141401E-02	1.441355E+02
-7.315661E+01	1.466193E+02	-7.549586E+01	-3.306667E+01	-1.218167E+02	-3.014934E-01
3.238920E-01	1.346467E-01	3.101012E+04	2.479662E+04	2.507640E+04	-1.378706E+07
-1.789025E+07	-3.748495E+06	-2.471504E+02	5.269544E+03	-2.422898E+04	1.618948E+01
2.101123E+01	4.398438E+00	1.011374E+01	7.522466E-07	1.084254E-04	-5.503181E-05
0.000000E+00	4.160289E+02	0.000000E+00	2.246923E-15	1.947662E-08	-9.480031E+00
-1.315887E+02	3.190374E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.807470E+02
1.453224E-02	3.249428E+02	3.240561E+02	9.780242E+01	3.190286E+02	2.290004E+07
2.289465E+07	5.368357E+01	2.304834E+02	3.823473E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.683601E+02	-1.720902E+02

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**Orbital Sciences Corporation**  
**Launch Systems Group**

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TM-18187A

TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----
2.760271E+03	-4.006650E+01	1.176550E-04	9.670741E+01	2.289734E+07	2.596660E-07
8.734346E-06	-7.166162E-01	5.392466E-01	4.423508E-01	3.580965E-01	-2.597868E-01
8.968153E-01	5.985216E-01	8.010767E-01	-6.934867E-03	0.000000E+00	0.000000E+00
9.600000E+02	1.971782E+06	2.289529E+07	-5.192773E-03	5.413924E-02	1.722273E+02
-4.010726E+01	1.748154E+02	-5.424693E+01	-2.019640E+01	-1.594006E+02	-3.820521E-01
3.225003E-01	4.381598E+00	3.101012E+04	2.479639E+04	2.507597E+04	-1.378872E+07
-1.783650E+07	-3.990558E+06	-8.519493E+01	5.479269E+03	-2.418329E+04	1.619118E+01
2.094727E+01	4.683594E+00	1.011355E+01	7.516554E-07	1.294556E-04	-3.014684E-05
0.000000E+00	4.159989E+02	0.000000E+00	2.245242E-15	1.946285E-08	-1.009822E+01
-1.317172E+02	3.075243E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.808923E+02
1.452594E-02	3.248541E+02	3.239929E+02	9.780236E+01	3.075139E+02	2.289950E+07
2.289426E+07	5.368356E+01	2.426186E+02	3.823526E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.683525E+02	-1.720756E+02
2.797923E+03	-3.921282E+01	1.142671E-04	9.670449E+01	2.289688E+07	2.594619E-07
8.727481E-06	-4.189779E-01	2.257749E-01	8.794790E-01	6.903666E-01	-5.499402E-01
4.700635E-01	5.897893E-01	8.041092E-01	7.454532E-02	0.000000E+00	0.000000E+00
9.700000E+02	1.972025E+06	2.289526E+07	-5.957805E-03	5.684438E-02	1.742827E+02
3.023474E+00	-1.759928E+02	-4.938897E+01	4.637450E+00	1.636592E+02	-5.446860E-01
-3.773128E-01	4.357498E+00	3.101012E+04	2.479629E+04	2.507566E+04	-1.378876E+07
-1.778067E+07	-4.232152E+06	7.672859E+01	5.688398E+03	-2.413488E+04	1.619096E+01
2.088184E+01	4.968750E+00	1.011340E+01	7.510418E-07	1.308936E-04	2.270756E-06
0.000000E+00	4.159946E+02	0.000000E+00	2.243473E-15	1.944837E-08	-1.071635E+01
-1.318460E+02	3.001961E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.810375E+02
1.451956E-02	3.248386E+02	3.239319E+02	9.780240E+01	3.001842E+02	2.289940E+07
2.289389E+07	5.368357E+01	2.505688E+02	3.823564E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.683442E+02	-1.720599E+02
2.835573E+03	-3.836360E+01	1.203007E-04	9.670302E+01	2.289665E+07	2.592501E-07
8.720357E-06	1.640803E-01	-2.322239E-01	9.587230E-01	7.480082E-01	-6.043105E-01
-2.743950E-01	6.430874E-01	7.621554E-01	7.454988E-02	0.000000E+00	0.000000E+00
9.800000E+02	1.972280E+06	2.289524E+07	-6.675856E-03	5.956626E-02	1.613803E+02
4.433594E+01	-1.595179E+02	-6.521622E+01	2.378186E+01	1.227276E+02	-7.077723E-01
-6.040055E-01	4.315236E+00	3.101012E+04	2.479619E+04	2.507533E+04	-1.378718E+07
-1.772274E+07	-4.473246E+06	2.386280E+02	5.896840E+03	-2.408363E+04	1.618883E+01
2.081299E+01	5.251953E+00	1.011324E+01	7.503982E-07	1.210995E-04	3.326961E-05
0.000000E+00	4.159946E+02	0.000000E+00	2.241619E-15	1.943319E-08	-1.133442E+01
-1.319752E+02	2.935836E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.811827E+02
1.451287E-02	3.248234E+02	3.238653E+02	9.780244E+01	2.935702E+02	2.289931E+07
2.289349E+07	5.368358E+01	2.578033E+02	3.823602E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.683354E+02	-1.720432E+02
2.873222E+03	-3.751902E+01	1.271278E-04	9.670144E+01	2.289640E+07	2.590280E-07
8.712884E-06	6.597863E-01	-5.541593E-01	5.075327E-01	3.461635E-01	-3.753332E-01
-8.598231E-01	6.669729E-01	7.429888E-01	-5.581001E-02	0.000000E+00	0.000000E+00
9.900000E+02	1.972546E+06	2.289521E+07	-7.453673E-03	6.219766E-02	1.516059E+02
6.660445E+01	-1.564570E+02	-8.299140E+01	3.726945E+01	1.016625E+02	1.074795E-01
-2.111094E-01	-3.714151E-03	3.101012E+04	2.479595E+04	2.507486E+04	-1.378399E+07
-1.766273E+07	-4.713814E+06	4.004758E+02	6.104598E+03	-2.402941E+04	1.618475E+01
2.074219E+01	5.535156E+00	1.011302E+01	7.497180E-07	1.136616E-04	4.993455E-05
0.000000E+00	4.159222E+02	0.000000E+00	2.239680E-15	1.941731E-08	-1.195244E+01
-1.321048E+02	2.830056E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.813278E+02
1.450564E-02	3.247640E+02	3.237578E+02	9.780258E+01	2.829907E+02	2.289895E+07

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TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----
2.289284E+07	5.368361E+01	2.690034E+02	3.823660E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.683259E+02	-1.720255E+02
2.910869E+03	-3.668194E+01	1.335121E-04	9.669823E+01	2.289589E+07	2.587932E-07
8.704986E-06	8.260246E-01	-5.401952E-01	1.608492E-01	1.522406E-01	-6.093588E-02
-9.864632E-01	5.426842E-01	8.393307E-01	3.190511E-02	0.000000E+00	0.000000E+00
1.000000E+03	1.972824E+06	2.289517E+07	-8.127934E-03	6.489853E-02	1.538384E+02
6.691166E+01	-1.575099E+02	-8.145937E+01	3.836747E+01	1.018022E+02	-7.379608E-01
3.206132E-01	-7.467016E-03	3.101012E+04	2.479583E+04	2.507450E+04	-1.377917E+07
-1.760065E+07	-4.953826E+06	5.622825E+02	6.311604E+03	-2.397250E+04	1.617883E+01
2.066895E+01	5.816406E+00	1.011285E+01	7.490152E-07	1.152273E-04	5.011785E-05
0.000000E+00	4.159151E+02	0.000000E+00	2.237654E-15	1.940073E-08	-1.257039E+01
-1.322347E+02	2.777285E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.814728E+02
1.449832E-02	3.247541E+02	3.236752E+02	9.780263E+01	2.777122E+02	2.289889E+07
2.289233E+07	5.368362E+01	2.749023E+02	3.823698E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.683159E+02	-1.720068E+02
2.948514E+03	-3.585081E+01	1.431569E-04	9.669645E+01	2.289561E+07	2.585506E-07
8.696826E-06	8.122089E-01	-5.612584E-01	1.590776E-01	1.622964E-01	-4.452521E-02
-9.857370E-01	5.603361E-01	8.264421E-01	5.492642E-02	0.000000E+00	0.000000E+00
1.010000E+03	1.973114E+06	2.289513E+07	-8.906466E-03	6.746171E-02	1.617784E+02
3.421902E+01	-1.638755E+02	-6.222325E+01	2.033057E+01	1.335587E+02	-8.759178E-01
5.175596E-01	-4.349518E+00	3.101012E+04	2.479558E+04	2.507400E+04	-1.377274E+07
-1.753650E+07	-5.193254E+06	7.240079E+02	6.517892E+03	-2.391263E+04	1.617096E+01
2.059326E+01	6.099609E+00	1.011262E+01	7.482762E-07	1.210550E-04	2.560528E-05
0.000000E+00	4.158841E+02	0.000000E+00	2.235546E-15	1.938347E-08	-1.318827E+01
-1.323651E+02	2.690517E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.816177E+02
1.449048E-02	3.247121E+02	3.235405E+02	9.780277E+01	2.690339E+02	2.289863E+07
2.289152E+07	5.368365E+01	2.842012E+02	3.823758E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.683052E+02	-1.719871E+02
2.986157E+03	-3.502762E+01	1.554688E-04	9.669305E+01	2.289508E+07	2.582955E-07
8.688246E-06	5.963701E-01	-4.637610E-01	6.551858E-01	4.774742E-01	-4.511713E-01
-7.539648E-01	6.452605E-01	7.624764E-01	-4.763115E-02	0.000000E+00	0.000000E+00
1.020000E+03	1.973414E+06	2.289509E+07	-9.619595E-03	7.005349E-02	1.693105E+02
-9.967768E+00	-1.653239E+02	-5.194632E+01	-1.174244E+01	1.642699E+02	-1.068667E+00
9.534068E-01	-4.246214E+00	3.101012E+04	2.479546E+04	2.507361E+04	-1.376469E+07
-1.747029E+07	-5.432070E+06	8.856647E+02	6.723397E+03	-2.385008E+04	1.616107E+01
2.051514E+01	6.380859E+00	1.011244E+01	7.475164E-07	1.265624E-04	-7.451069E-06
0.000000E+00	4.158841E+02	0.000000E+00	2.233355E-15	1.936553E-08	-1.380608E+01
-1.324959E+02	2.652538E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.817626E+02
1.448257E-02	3.247117E+02	3.234421E+02	9.780282E+01	2.652346E+02	2.289863E+07
2.289092E+07	5.368366E+01	2.886211E+02	3.823798E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.682941E+02	-1.719663E+02
3.023799E+03	-3.421178E+01	1.684736E-04	9.669115E+01	2.289477E+07	2.580332E-07
8.679423E-06	6.538420E-02	-6.957931E-02	9.954314E-01	6.157222E-01	-7.822012E-01
-9.511808E-02	7.852458E-01	6.191284E-01	-8.302072E-03	0.000000E+00	0.000000E+00
1.030000E+03	1.973727E+06	2.289505E+07	-1.032744E-02	7.261282E-02	-1.721420E+02
-5.218952E+01	-1.538329E+02	-5.484213E+01	-4.657524E+01	-1.656251E+02	-1.276871E+00
1.451651E+00	-4.062518E+00	3.101012E+04	2.479534E+04	2.507321E+04	-1.375503E+07
-1.740204E+07	-5.670246E+06	1.047213E+03	6.928107E+03	-2.378473E+04	1.614941E+01
2.043457E+01	6.660156E+00	1.011224E+01	7.467281E-07	-1.285433E-04	-3.897138E-05
0.000000E+00	4.158841E+02	0.000000E+00	2.231082E-15	1.934692E-08	-1.442382E+01

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TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----
-1.326272E+02	2.618770E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.819074E+02
1.447436E-02	3.247114E+02	3.233393E+02	9.780287E+01	2.618563E+02	2.289863E+07
2.289029E+07	5.368368E+01	2.926198E+02	3.823838E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.682823E+02	-1.719446E+02
3.061438E+03	-3.340535E+01	1.820793E-04	9.668916E+01	2.289446E+07	2.577611E-07
8.670270E-06	-4.641049E-01	4.018498E-01	7.893817E-01	2.930730E-01	-7.713155E-01
5.649607E-01	8.358916E-01	4.935475E-01	2.402000E-01	0.000000E+00	0.000000E+00
1.040000E+03	1.974050E+06	2.289501E+07	-1.103336E-02	7.513487E-02	1.524799E+02
-7.671478E+01	1.543214E+02	-7.250441E+01	-4.217700E+01	-1.224955E+02	5.470249E+00
7.140218E-01	-4.653286E-02	3.101012E+04	2.479508E+04	2.507266E+04	-1.374375E+07
-1.733174E+07	-5.907754E+06	1.208657E+03	7.131940E+03	-2.371647E+04	1.613574E+01
2.035156E+01	6.939453E+00	1.011199E+01	7.459038E-07	1.137354E-04	-5.722184E-05
0.000000E+00	4.158015E+02	0.000000E+00	2.228727E-15	1.932763E-08	-1.504149E+01
-1.327590E+02	2.558870E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.820521E+02
1.446561E-02	3.246804E+02	3.231841E+02	9.780285E+01	2.558649E+02	2.289844E+07
2.288935E+07	5.368367E+01	2.992318E+02	3.823892E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.682699E+02	-1.719218E+02
3.099075E+03	-3.260862E+01	1.985713E-04	9.668558E+01	2.289390E+07	2.574766E-07
8.660700E-06	-7.542267E-01	5.146716E-01	4.077440E-01	2.381524E-01	-3.642746E-01
9.003263E-01	6.119032E-01	7.761554E-01	1.521753E-01	0.000000E+00	0.000000E+00
1.050000E+03	1.974384E+06	2.289496E+07	-1.178864E-02	7.756735E-02	1.322004E+02
-6.632960E+01	1.320581E+02	-7.130014E+01	-3.036539E+01	-1.226024E+02	-5.448886E-01
1.095247E-01	4.299329E-01	3.101012E+04	2.479494E+04	2.507221E+04	-1.373086E+07
-1.725940E+07	-6.144566E+06	1.369948E+03	7.334997E+03	-2.364551E+04	1.612024E+01
2.026611E+01	7.218750E+00	1.011178E+01	7.450597E-07	9.849720E-05	-4.941951E-05
0.000000E+00	4.157737E+02	0.000000E+00	2.226295E-15	1.930772E-08	-1.565907E+01
-1.328913E+02	2.531630E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.821967E+02
1.445680E-02	3.246819E+02	3.230619E+02	9.780289E+01	2.531395E+02	2.289845E+07
2.288861E+07	5.368369E+01	3.025777E+02	3.823936E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.682569E+02	-1.718980E+02
3.136710E+03	-3.182193E+01	2.149790E-04	9.668326E+01	2.289353E+07	2.571852E-07
8.650899E-06	-7.446773E-01	4.787497E-01	4.650316E-01	3.998429E-01	-2.378741E-01
8.851788E-01	5.343981E-01	8.451122E-01	-1.428520E-02	0.000000E+00	0.000000E+00
1.060000E+03	1.974729E+06	2.289490E+07	-1.257195E-02	7.992993E-02	1.624650E+02
-4.421702E+01	1.664125E+02	-5.559484E+01	-2.237711E+01	-1.536669E+02	-6.153678E-01
5.447177E-02	4.548766E+00	3.101012E+04	2.479469E+04	2.507164E+04	-1.371635E+07
-1.718504E+07	-6.380654E+06	1.531110E+03	7.537138E+03	-2.357167E+04	1.610278E+01
2.017822E+01	7.496094E+00	1.011152E+01	7.441828E-07	1.209037E-04	-3.290555E-05
0.000000E+00	4.157446E+02	0.000000E+00	2.223786E-15	1.928718E-08	-1.627657E+01
-1.330241E+02	2.488356E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.823412E+02
1.444751E-02	3.246643E+02	3.228911E+02	9.780285E+01	2.488104E+02	2.289834E+07
2.288757E+07	5.368367E+01	3.075273E+02	3.823990E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.682433E+02	-1.718731E+02
3.174344E+03	-3.104567E+01	2.353128E-04	9.667963E+01	2.289296E+07	2.568825E-07
8.640717E-06	-4.926810E-01	2.672993E-01	8.281404E-01	6.586098E-01	-5.074659E-01
5.556181E-01	5.687693E-01	8.191639E-01	7.397281E-02	0.000000E+00	0.000000E+00
1.070000E+03	1.975084E+06	2.289485E+07	-1.326942E-02	8.233365E-02	1.688182E+02
-1.406450E+00	-1.749436E+02	-4.854184E+01	1.255830E+00	1.659301E+02	-7.657263E-01
-2.025621E-01	4.528401E+00	3.101012E+04	2.479455E+04	2.507119E+04	-1.370024E+07
-1.710866E+07	-6.615991E+06	1.692033E+03	7.738427E+03	-2.349518E+04	1.608337E+01

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**Orbital Sciences Corporation**  
**Launch Systems Group**

TM-18187A

TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----
2.008838E+01	7.773438E+00	1.011131E+01	7.432869E-07	1.254804E-04	-1.045395E-06
0.000000E+00	4.157446E+02	0.000000E+00	2.221201E-15	1.926601E-08	-1.689398E+01
-1.331575E+02	2.469944E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.824857E+02
1.443817E-02	3.246661E+02	3.227700E+02	9.780291E+01	2.469678E+02	2.289836E+07
2.288683E+07	5.368369E+01	3.099904E+02	3.824031E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.682289E+02	-1.718470E+02
3.211975E+03	-3.028107E+01	2.516309E-04	9.667734E+01	2.289259E+07	2.565732E-07
8.630314E-06	1.045419E-01	-1.993828E-01	9.743292E-01	7.451650E-01	-6.331146E-01
-2.095115E-01	6.586350E-01	7.479388E-01	8.238609E-02	0.000000E+00	0.000000E+00
1.080000E+03	1.975449E+06	2.289479E+07	-1.396034E-02	8.469869E-02	1.563808E+02
3.956390E+01	-1.525473E+02	-6.129099E+01	2.137020E+01	1.236315E+02	-9.307553E-01
-5.314023E-01	4.480162E+00	3.101012E+04	2.479441E+04	2.507071E+04	-1.368251E+07
-1.703027E+07	-6.850549E+06	1.852753E+03	7.938801E+03	-2.341593E+04	1.606226E+01
1.999561E+01	8.048828E+00	1.011108E+01	7.423647E-07	1.160916E-04	2.937084E-05
0.000000E+00	4.157446E+02	0.000000E+00	2.218540E-15	1.924422E-08	-1.751131E+01
-1.332915E+02	2.452932E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.826300E+02
1.442854E-02	3.246671E+02	3.226459E+02	9.780297E+01	2.452652E+02	2.289836E+07
2.288608E+07	5.368371E+01	3.123134E+02	3.824072E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.682139E+02	-1.718199E+02
3.249604E+03	-2.952863E+01	2.682360E-04	9.667497E+01	2.289222E+07	2.562549E-07
8.619607E-06	6.055030E-01	-5.864285E-01	5.380220E-01	3.449010E-01	-4.158939E-01
-8.414723E-01	7.172234E-01	6.950783E-01	-4.956521E-02	0.000000E+00	0.000000E+00
1.090000E+03	1.975824E+06	2.289473E+07	-1.475864E-02	8.691090E-02	1.390459E+02
6.385051E+01	-1.446048E+02	-8.296971E+01	3.755499E+01	1.016377E+02	6.897428E-01
-1.765117E-01	-2.308388E-01	3.101012E+04	2.479413E+04	2.507009E+04	-1.366318E+07
-1.694989E+07	-7.084300E+06	2.013234E+03	8.138251E+03	-2.333377E+04	1.603906E+01
1.990088E+01	8.324219E+00	1.011080E+01	7.414103E-07	1.030901E-04	4.733942E-05
0.000000E+00	4.156457E+02	0.000000E+00	2.215808E-15	1.922186E-08	-1.812854E+01
-1.334261E+02	2.418877E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.827742E+02
1.441842E-02	3.246505E+02	3.224497E+02	9.780313E+01	2.418582E+02	2.289826E+07
2.288489E+07	5.368376E+01	3.163410E+02	3.824136E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.681980E+02	-1.717914E+02
3.287231E+03	-2.878959E+01	2.920803E-04	9.667087E+01	2.2891157E+07	2.559255E-07
8.608525E-06	8.258220E-01	-5.407896E-01	1.598895E-01	1.541165E-01	-5.630604E-02
-9.864470E-01	5.424630E-01	8.392713E-01	3.684584E-02	0.000000E+00	0.000000E+00
1.100000E+03	1.976210E+06	2.289466E+07	-1.540368E-02	8.922670E-02	1.402244E+02
6.086009E+01	-1.447978E+02	-8.014678E+01	3.593824E+01	1.043438E+02	-1.290416E-01
3.412406E-01	-2.309349E-01	3.101012E+04	2.479398E+04	2.506958E+04	-1.364225E+07
-1.686751E+07	-7.317216E+06	2.173479E+03	8.336709E+03	-2.324901E+04	1.601416E+01
1.980371E+01	8.597656E+00	1.011057E+01	7.404379E-07	1.038274E-04	4.506312E-05
0.000000E+00	4.156388E+02	0.000000E+00	2.213002E-15	1.919888E-08	-1.874568E+01
-1.335614E+02	2.404275E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.829183E+02
1.440826E-02	3.246477E+02	3.223183E+02	9.780319E+01	2.403967E+02	2.289824E+07
2.288409E+07	5.368378E+01	3.184230E+02	3.824178E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.681814E+02	-1.717620E+02
3.324856E+03	-2.806278E+01	3.091598E-04	9.666829E+01	2.289117E+07	2.555898E-07
8.597234E-06	8.073492E-01	-5.550788E-01	2.001868E-01	1.757157E-01	-9.770713E-02
-9.795802E-01	5.633039E-01	8.260392E-01	1.865227E-02	0.000000E+00	0.000000E+00
1.110000E+03	1.976605E+06	2.289459E+07	-1.617352E-02	9.136963E-02	1.576390E+02
3.403122E+01	-1.640230E+02	-6.094625E+01	2.394404E+01	1.357084E+02	-2.451814E-01

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TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----
3.478786E-01	-4.277314E+00	3.101012E+04	2.479371E+04	2.506896E+04	-1.361971E+07
-1.678316E+07	-7.549270E+06	2.333448E+03	8.534212E+03	-2.316140E+04	1.598730E+01
1.970410E+01	8.873047E+00	1.011028E+01	7.394350E-07	1.165638E-04	2.516387E-05
0.000000E+00	4.156102E+02	0.000000E+00	2.210125E-15	1.917533E-08	-1.936271E+01
-1.336974E+02	2.379124E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.830624E+02
1.439765E-02	3.246351E+02	3.221242E+02	9.780337E+01	2.378801E+02	2.289817E+07
2.288291E+07	5.368384E+01	3.215601E+02	3.824239E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.681640E+02	-1.717312E+02
3.362479E+03	-2.735041E+01	3.332375E-04	9.666431E+01	2.289054E+07	2.552436E-07
8.585590E-06	5.909618E-01	-4.698385E-01	6.557560E-01	5.231654E-01	-3.955491E-01
-7.548767E-01	6.140538E-01	7.891722E-01	1.204891E-02	0.000000E+00	0.000000E+00
1.120000E+03	1.977009E+06	2.289452E+07	-1.684908E-02	9.355508E-02	1.642592E+02
-7.543698E+00	-1.748217E+02	-5.007538E+01	-3.626232E+00	1.693026E+02	-4.105087E-01
5.180695E-01	-4.252670E+00	3.101012E+04	2.479356E+04	2.506843E+04	-1.359558E+07
-1.669683E+07	-7.780436E+06	2.493162E+03	8.730690E+03	-2.307119E+04	1.595825E+01
1.960156E+01	9.144531E+00	1.011004E+01	7.384148E-07	1.212914E-04	-5.570379E-06
0.000000E+00	4.156102E+02	0.000000E+00	2.207180E-15	1.915121E-08	-1.997964E+01
-1.338340E+02	2.368305E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.832063E+02
1.438699E-02	3.246343E+02	3.219868E+02	9.780344E+01	2.367968E+02	2.289816E+07
2.288208E+07	5.368387E+01	3.232639E+02	3.824281E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.681460E+02	-1.716994E+02
3.400100E+03	-2.665306E+01	3.513847E-04	9.666165E+01	2.289012E+07	2.548914E-07
8.573745E-06	4.736999E-02	-1.151931E-01	9.922130E-01	7.352728E-01	-6.683366E-01
-1.126952E-01	6.761139E-01	7.348856E-01	5.303923E-02	0.000000E+00	0.000000E+00
1.130000E+03	1.977423E+06	2.289445E+07	-1.751690E-02	9.569608E-02	1.668669E+02
-4.976123E+01	1.783443E+02	-5.430373E+01	-3.420373E+01	-1.588338E+02	-5.868514E-01
7.542455E-01	-4.204242E+00	3.101012E+04	2.479341E+04	2.506789E+04	-1.356985E+07
-1.660854E+07	-8.010685E+06	2.652578E+03	8.926138E+03	-2.297827E+04	1.592773E+01
1.949805E+01	9.414062E+00	1.010979E+01	7.373710E-07	1.230428E-04	-3.669249E-05
0.000000E+00	4.156102E+02	0.000000E+00	2.204165E-15	1.912653E-08	-2.059647E+01
-1.339714E+02	2.357982E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.833501E+02
1.437608E-02	3.246324E+02	3.218467E+02	9.780351E+01	2.357632E+02	2.289815E+07
2.288122E+07	5.368390E+01	3.249180E+02	3.824323E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.681272E+02	-1.716663E+02
3.437718E+03	-2.597050E+01	3.697314E-04	9.665892E+01	2.288969E+07	2.545311E-07
8.561624E-06	-5.105546E-01	3.138259E-01	8.005294E-01	4.947327E-01	-6.542523E-01
5.720082E-01	7.032592E-01	6.880895E-01	1.787716E-01	0.000000E+00	0.000000E+00
1.140000E+03	1.977846E+06	2.289437E+07	-1.825762E-02	9.771161E-02	1.202878E+02
-6.456103E+01	1.215798E+02	-7.340791E+01	-3.249851E+01	-1.198088E+02	1.823807E+00
2.792372E-01	-3.125365E-02	3.101012E+04	2.479313E+04	2.506722E+04	-1.354253E+07
-1.651831E+07	-8.239992E+06	2.811719E+03	9.120481E+03	-2.288253E+04	1.590112E+01
1.938574E+01	9.699219E+00	1.010948E+01	7.362970E-07	8.856750E-05	-4.753609E-05
0.000000E+00	4.155411E+02	0.000000E+00	2.201084E-15	1.910130E-08	-2.121319E+01
-1.341096E+02	2.337384E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.834938E+02
1.436470E-02	3.246181E+02	3.216399E+02	9.780349E+01	2.337019E+02	2.289806E+07
2.287997E+07	5.368388E+01	3.275997E+02	3.824377E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.681076E+02	-1.716321E+02
3.475335E+03	-2.530424E+01	3.952874E-04	9.665466E+01	2.288902E+07	2.541604E-07
8.549154E-06	-7.575920E-01	5.002543E-01	4.192851E-01	3.491628E-01	-2.321352E-01
9.078538E-01	5.514886E-01	8.341816E-01	1.193587E-03	0.000000E+00	0.000000E+00

TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----

1.150000E+03	1.978278E+06	2.289429E+07	-1.895257E-02	9.971764E-02	1.152352E+02
-6.181324E+01	1.168505E+02	-7.491742E+01	-2.995715E+01	-1.181687E+02	1.406624E-01
-2.649322E-01	-6.732087E-02	3.101012E+04	2.479298E+04	2.506666E+04	-1.351362E+07
-1.642614E+07	-8.468327E+06	2.970491E+03	9.313811E-03	-2.278422E+04	1.586060E+01
1.928223E+01	9.951172E+00	1.010923E+01	7.352089E-07	8.472195E-05	-4.544565E-05
0.000000E+00	4.155317E+02	0.000000E+00	2.197939E-15	1.907555E-08	-2.182979E+01
-1.342486E+02	2.329831E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.836375E+02
1.435333E-02	3.246176E+02	3.214957E+02	9.780357E+01	2.329452E+02	2.289806E+07
2.287909E+07	5.368392E+01	3.289769E+02	3.824419E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.680871E+02	-1.715966E+02
3.512949E+03	-2.465491E+01	4.143830E-04	9.665188E+01	2.288858E+07	2.537848E-07
8.536521E-06	-7.554035E-01	5.122623E-01	4.085988E-01	3.675014E-01	-1.850534E-01
9.114263E-01	5.425019E-01	8.386552E-01	-4.846716E-02	0.000000E+00	0.000000E+00

BEGIN CRAB-WALK FINISH

1.152960E+03	1.978408E+06	2.289426E+07	-1.916406E-02	1.002950E-01	1.172127E+02
-6.255486E+01	1.200429E+02	-7.491461E+01	-3.114590E+01	-1.197388E+02	-6.879325E-01
-2.733822E-01	4.893881E-01	3.101012E+04	2.479291E+04	2.506648E+04	-1.350476E+07
-1.639849E+07	-8.535725E+06	3.017424E+03	9.370818E+03	-2.275459E+04	1.587768E+01
1.927829E+01	1.007951E+01	1.010914E+01	7.348817E-07	8.613744E-05	-4.597041E-05
0.000000E+00	4.155250E+02	0.000000E+00	2.196996E-15	1.906783E-08	-2.201229E+01
-1.342899E+02	2.326147E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.836799E+02
1.434988E-02	3.246155E+02	3.214433E+02	9.780358E+01	2.325764E+02	2.289805E+07
2.287877E+07	5.368392E+01	3.295294E+02	3.824434E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.680809E+02	-1.715858E+02
3.524083E+03	-2.446603E+01	4.210595E-04	9.665083E+01	2.288841E+07	2.536718E-07
8.532721E-06	-7.413551E-01	5.203333E-01	4.238466E-01	3.660537E-01	-2.158218E-01
9.052213E-01	5.624921E-01	8.262410E-01	-3.046931E-02	0.000000E+00	0.000000E+00

1.160000E+03	1.978719E+06	2.289421E+07	-1.962071E-02	1.016942E-01	1.255782E+02
-6.457296E+01	1.317757E+02	-7.395169E+01	-3.490721E+01	-1.251897E+02	-6.893564E-01
-2.971288E-01	4.744140E-01	3.101012E+04	2.479280E+04	2.506607E+04	-1.348312E+07
-1.633204E+07	-8.695667E+06	3.128906E+03	9.506021E+03	-2.268322E+04	1.582422E+01
1.917090E+01	1.021875E+01	1.010896E+01	7.340979E-07	9.218671E-05	-4.740287E-05
0.000000E+00	4.136072E+02	0.000000E+00	2.194731E-15	1.904929E-08	-2.244628E+01
-1.343884E+02	2.320278E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.837809E+02
1.434168E-02	3.246124E+02	3.213888E+02	9.780363E+01	2.319886E+02	2.289803E+07
2.287814E+07	5.368394E+01	3.305540E+02	3.824463E+01	0.000000E+00	0.000000E+00
0.000000E+00	-2.684365E-31	8.980624E-16	-8.289808E-16	-1.680657E+02	-1.715598E+02
3.550561E+03	-2.402244E+01	4.345215E-04	9.664876E+01	2.288808E+07	2.534013E-07
8.523620E-06	-6.991346E-01	5.328710E-01	4.767171E-01	3.587648E-01	-3.152817E-01
8.785700E-01	6.184647E-01	7.852680E-01	2.924903E-02	0.000000E+00	0.000000E+00

1.170000E+03	1.979168E+06	2.289412E+07	-2.026196E-02	1.036402E-01	1.389960E+02
-6.617477E+01	1.502234E+02	-7.213347E+01	-4.016544E+01	-1.333151E+02	-6.912124E-01
-3.295728E-01	4.512508E-01	3.101012E+04	2.479264E+04	2.506549E+04	-1.345104E+07
-1.623602E+07	-8.921983E+06	3.286939E+03	9.697111E+03	-2.257957E+04	1.578613E+01
1.905762E+01	1.048438E+01	1.010869E+01	7.329663E-07	1.018794E-04	-4.850388E-05
0.000000E+00	4.086336E+02	0.000000E+00	2.191461E-15	1.902251E-08	-2.306265E+01
-1.345290E+02	2.312171E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.839243E+02
1.432983E-02	3.246071E+02	3.211885E+02	9.780372E+01	2.311766E+02	2.289800E+07
2.287722E+07	5.368398E+01	3.319864E+02	3.824505E+01	0.000000E+00	0.000000E+00
0.000000E+00	-4.851851E-32	1.616959E-16	-1.748064E-16	-1.680434E+02	-1.715216E+02

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**Orbital Sciences Corporation**  
**Launch Systems Group**

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TM-18187A

TIME	ALTITO	GCRAD	GAMMAI	GAMMAR	ALPHA
BETA	BNKANG	PITI	YAWI	ROLI	ROLBD
PITBD	YAWBD	VIDEAL	VELI	VELA	XI
YI	ZI	VXI	VYI	VZI	AXI
AYI	AZI	MACH	DYNP	QALPHA	QBETA
WPROP	WEIGHT	THRUST	DENS	PRES	GDLAT
LONG	MEAAN	TIMIP	GDLTIP	LONGIP	TLHEAT
HEATRT	ALTA	ALTP	INC	TRUAN	APORAD
PGERAD	LAN	ARGP	ANLON	FAXB	FAYB
FAZB	AXB	AYB	AZB	AZVELR	AZVELI
DWNRNG	CRRNG	ECCEN	PERIOD	SEMJAX	LIFT
DRAG	IB11	IB12	IB13	IB21	IB22
IB23	IB31	IB32	IB33	-----	-----
3.588172E+03	-2.340766E+01	4.537870E-04	9.664576E+01	2.288761E+07	2.530107E-07
8.510482E-06	-6.350076E-01	5.429134E-01	5.495547E-01	3.334615E-01	-4.490587E-01
8.289449E-01	6.968277E-01	7.096416E-01	1.041150E-01	0.000000E+00	0.000000E+00
1.180000E+03	1.979626E+06	2.289403E+07	-2.089436E-02	1.055365E-01	1.527542E+02
-6.618913E+01	1.693139E+02	-6.965994E+01	-4.527613E+01	-1.420435E+02	-6.928310E-01
-3.604921E-01	4.259137E-01	3.101012E+04	2.479247E+04	2.506489E+04	-1.341738E+07
-1.613810E+07	-9.147249E+06	3.444581E+03	9.887056E+03	-2.247327E+04	1.574609E+01
1.894238E+01	1.074805E+01	1.010842E+01	7.318138E-07	1.117876E-04	-4.843812E-05
0.000000E+00	4.074194E+02	0.000000E+00	2.188129E-15	1.899523E-08	-2.367890E+01
-1.346706E+02	2.304315E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.840675E+02
1.431776E-02	3.246008E+02	3.210358E+02	9.780380E+01	2.303897E+02	2.289796E+07
2.287630E+07	5.368402E+01	3.333938E+02	3.824548E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.680202E+02	-1.714821E+02
3.625780E+03	-2.281131E+01	4.732163E-04	9.664271E+01	2.288713E+07	2.526129E-07
8.497100E-06	-5.667082E-01	5.437674E-01	6.189983E-01	2.908241E-01	-5.709087E-01
7.677790E-01	7.708847E-01	6.151263E-01	1.653979E-01	0.000000E+00	0.000000E+00
<b>BEGIN SEQUENCER END</b>					
1.187960E+03	1.979996E+06	2.289396E+07	-2.139127E-02	1.070098E-01	1.627017E+02
-6.516865E+01	-1.762678E+02	-6.709962E+01	-4.919425E+01	-1.495650E+02	-6.939224E-01
-3.840318E-01	4.041789E-01	3.101012E+04	2.479234E+04	2.506441E+04	-1.338946E+07
-1.605880E+07	-9.325793E+06	3.569771E+03	1.003742E+04	-2.238676E+04	1.571338E+01
1.884944E+01	1.096033E+01	1.010820E+01	7.308819E-07	1.189157E-04	-4.763059E-05
0.000000E+00	4.074194E+02	0.000000E+00	2.185435E-15	1.897317E-08	-2.416934E+01
-1.347840E+02	2.298228E+02	1.000000E+10	1.000000E+10	1.000000E+10	7.841814E+02
1.430799E-02	3.245951E+02	3.209128E+02	9.780387E+01	2.297800E+02	2.289792E+07
2.287555E+07	5.368405E+01	3.344974E+02	3.824581E+01	0.000000E+00	0.000000E+00
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	-1.680011E+02	-1.714498E+02
3.655714E+03	-2.235026E+01	4.887956E-04	9.664023E+01	2.288674E+07	2.522912E-07
8.486280E-06	-5.098896E-01	5.379031E-01	6.713218E-01	2.450016E-01	-6.572643E-01
7.127257E-01	8.246131E-01	5.278863E-01	2.033451E-01	0.000000E+00	0.000000E+00

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**APPENDIX B**

GROUND STATION TRACKING DATA FOR NOMINAL 6DOF TRAJECTORY

**CALF TRACKING DATA**

Time (sec)	Elevation (deg)	Azimuth (deg)	Aspect Angle (deg)	Range (ft)	Range Rate (fps)
0.0000000e+00	1.3139158e+00	-5.3978362e+01	7.2751916e+01	8.9372649e+05	-2.8996123e+02
1.6000000e-01	1.3140924e+00	-5.3985813e+01	7.2759334e+01	8.9367936e+05	-2.9009370e+02
2.0000000e-01	1.3141263e+00	-5.3987602e+01	7.2761121e+01	8.9366836e+05	-2.9012775e+02
1.0000000e+00	1.3142869e+00	-5.4024804e+01	7.2766880e+01	8.9343567e+05	-2.9073552e+02
2.0000000e+00	1.3129987e+00	-5.4071203e+01	7.2771717e+01	8.9314453e+05	-2.9146704e+02
3.0000000e+00	1.3101224e+00	-5.4117559e+01	7.2857124e+01	8.9285316e+05	-2.9208727e+02
3.4800000e+00	1.3082091e+00	-5.4139892e+01	7.2922137e+01	8.9271363e+05	-2.9232909e+02
3.7200000e+00	1.3071333e+00	-5.4151021e+01	7.2959768e+01	8.9264286e+05	-2.9243363e+02
3.9600000e+00	1.3059745e+00	-5.4162077e+01	7.2998970e+01	8.9257283e+05	-2.9252324e+02
4.0000000e+00	1.3057751e+00	-5.4163945e+01	7.3005566e+01	8.9256089e+05	-2.9253621e+02
4.1999998e+00	1.3047417e+00	-5.4173209e+01	7.3038888e+01	8.9250197e+05	-2.9259558e+02
4.3200002e+00	1.3040948e+00	-5.4178739e+01	7.3059450e+01	8.9246691e+05	-2.9262599e+02
4.4400001e+00	1.3034296e+00	-5.4184269e+01	7.3079789e+01	8.9243185e+05	-2.9265105e+02
5.0000000e+00	1.3000833e+00	-5.4210287e+01	7.3191203e+01	8.9226864e+05	-2.9270701e+02
6.0000000e+00	1.2934410e+00	-5.4257931e+01	7.3397053e+01	8.9196799e+05	-3.0857092e+02
7.0000000e+00	1.2865368e+00	-5.4309372e+01	7.3759533e+01	8.9165236e+05	-3.2531551e+02
8.0000000e+00	1.2800776e+00	-5.4364373e+01	7.4094367e+01	8.9131703e+05	-3.4097922e+02
9.0000000e+00	1.2745722e+00	-5.4423038e+01	7.4332273e+01	8.9096986e+05	-3.5592570e+02
1.0000000e+01	1.2704198e+00	-5.4485284e+01	7.4625063e+01	8.9060688e+05	-3.7034726e+02
1.1000000e+01	1.2680137e+00	-5.4551194e+01	7.4863173e+01	8.9022789e+05	-3.8421874e+02
1.2000000e+01	1.2676865e+00	-5.4620791e+01	7.5187169e+01	8.8983873e+05	-3.9757467e+02
1.3000000e+01	1.2698143e+00	-5.4693913e+01	7.5597970e+01	8.8943356e+05	-4.1016806e+02
1.4000000e+01	1.2747415e+00	-5.4770657e+01	7.5958869e+01	8.8901748e+05	-4.2189242e+02
1.5000000e+01	1.2828511e+00	-5.4851033e+01	7.6425676e+01	8.8859111e+05	-4.3269393e+02
1.6000000e+01	1.2945690e+00	-5.4934738e+01	7.6973960e+01	8.8815290e+05	-4.4219315e+02
1.7000000e+01	1.3103598e+00	-5.5021788e+01	7.7339543e+01	8.8770622e+05	-4.5040998e+02
1.8000000e+01	1.3304159e+00	-5.5112347e+01	7.7461016e+01	8.8725269e+05	-4.5913154e+02
1.9000000e+01	1.3546970e+00	-5.5206339e+01	7.7675799e+01	8.8678801e+05	-4.6825051e+02
2.0000000e+01	1.3832326e+00	-5.5304087e+01	7.7918846e+01	8.8631482e+05	-4.7737746e+02
2.1000000e+01	1.4160948e+00	-5.5405600e+01	7.8150299e+01	8.8583357e+05	-4.8630063e+02
2.2000000e+01	1.4533037e+00	-5.5511042e+01	7.8404918e+01	8.8534317e+05	-4.9471564e+02
2.3000000e+01	1.4948218e+00	-5.5620274e+01	7.8658339e+01	8.8484555e+05	-5.0253031e+02
2.4000000e+01	1.5406363e+00	-5.5733378e+01	7.8921893e+01	8.8433775e+05	-5.0980524e+02
2.5000000e+01	1.5908092e+00	-5.5850377e+01	7.9200042e+01	8.8382564e+05	-5.1627470e+02
2.6000000e+01	1.6454581e+00	-5.5971123e+01	7.9470401e+01	8.8330607e+05	-5.2203868e+02
2.7000000e+01	1.7046422e+00	-5.6095709e+01	7.9695490e+01	8.8278156e+05	-5.2728718e+02
2.8000000e+01	1.7684291e+00	-5.6224300e+01	8.0009777e+01	8.8225128e+05	-5.3191267e+02
2.9000000e+01	1.8368642e+00	-5.6356913e+01	8.0286340e+01	8.8171857e+05	-5.3574543e+02
3.0000000e+01	1.9100487e+00	-5.6493480e+01	8.0506525e+01	8.8117962e+05	-5.3891348e+02
3.1000000e+01	1.9878979e+00	-5.6634481e+01	8.0393995e+01	8.8063860e+05	-5.4311087e+02
3.2000000e+01	2.0699672e+00	-5.6780240e+01	8.0382102e+01	8.8009279e+05	-5.4963346e+02
3.3000000e+01	2.1559355e+00	-5.6931237e+01	8.0657131e+01	8.7954090e+05	-5.5598494e+02
3.4000000e+01	2.2459556e+00	-5.7087570e+01	8.0880945e+01	8.7898059e+05	-5.6134360e+02
3.5000000e+01	2.3401121e+00	-5.7249414e+01	8.1127765e+01	8.7841680e+05	-5.6605939e+02
3.6000000e+01	2.4384907e+00	-5.7416866e+01	8.1388393e+01	8.7784992e+05	-5.6993521e+02
3.7000000e+01	2.5412150e+00	-5.7590106e+01	8.1639168e+01	8.7727706e+05	-5.7301842e+02
3.8000000e+01	2.6483548e+00	-5.7769230e+01	8.1910031e+01	8.7670407e+05	-5.7530359e+02
3.9000000e+01	2.7600232e+00	-5.7954500e+01	8.2143894e+01	8.7612749e+05	-5.7679977e+02
4.0000000e+01	2.8762593e+00	-5.8146015e+01	8.2383906e+01	8.7555063e+05	-5.7752964e+02
4.1000000e+01	2.9971546e+00	-5.8344116e+01	8.2620699e+01	8.7497215e+05	-5.7755775e+02
4.2000000e+01	3.1227995e+00	-5.8548824e+01	8.2918804e+01	8.7439630e+05	-5.7638450e+02
4.3000000e+01	3.2533305e+00	-5.8760409e+01	8.3193969e+01	8.7382006e+05	-5.7409499e+02
4.4000000e+01	3.3888272e+00	-5.8979128e+01	8.3484619e+01	8.7324846e+05	-5.7054681e+02
4.5000000e+01	3.5294052e+00	-5.9205013e+01	8.3784433e+01	8.7268074e+05	-5.6565072e+02
4.6000000e+01	3.6751768e+00	-5.9438337e+01	8.4084423e+01	8.7211686e+05	-5.5941186e+02
4.7000000e+01	3.8262026e+00	-5.9679434e+01	8.4396860e+01	8.7156150e+05	-5.5157060e+02
4.8000000e+01	3.9825696e+00	-5.9928264e+01	8.4716236e+01	8.7101489e+05	-5.4209112e+02
4.9000000e+01	4.1443495e+00	-6.0185101e+01	8.5053057e+01	8.7047731e+05	-5.3081537e+02
5.0000000e+01	4.3115651e+00	-6.0450199e+01	8.5421982e+01	8.6995445e+05	-5.1750483e+02
5.1000000e+01	4.4843134e+00	-6.0723764e+01	8.5773900e+01	8.6944492e+05	-5.0204349e+02
5.2000000e+01	4.6626653e+00	-6.1005911e+01	8.6159224e+01	8.6895077e+05	-4.8427447e+02
5.3000000e+01	4.8466799e+00	-6.1296905e+01	8.6459145e+01	8.6847552e+05	-4.6413902e+02
5.4000000e+01	5.0362977e+00	-6.1597095e+01	8.6631094e+01	8.6802203e+05	-4.4233264e+02
5.5000000e+01	5.2313233e+00	-6.1906910e+01	8.6838795e+01	8.6759242e+05	-4.1880664e+02

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**CALF TRACKING DATA (CONTINUED)**

Time (sec)	Elevation (deg)	Azimuth (deg)	Aspect Angle (deg)	Range (ft)	Range Rate (fps)
5.6000000e+01	5.4316728e+00	-6.2226730e+01	8.7022318e+01	8.6718452e+05	-3.9328622e+02
5.7000000e+01	5.6372138e+00	-6.2557272e+01	8.7214874e+01	8.6680659e+05	-3.6554842e+02
5.8000000e+01	5.8479163e+00	-6.2898771e+01	8.7487681e+01	8.6645560e+05	-3.3528064e+02
5.9000000e+01	6.0637915e+00	-6.3251894e+01	8.7935691e+01	8.6613594e+05	-3.0148600e+02
6.0000000e+01	6.2850109e+00	-6.3616825e+01	8.8351631e+01	8.6585364e+05	-2.6362782e+02
6.1000000e+01	6.5117165e+00	-6.3993845e+01	8.8767005e+01	8.6561162e+05	-2.2162511e+02
6.2000000e+01	6.7440261e+00	-6.4383322e+01	8.9195389e+01	8.6541249e+05	-1.7521678e+02
6.3000000e+01	6.9820394e+00	-6.4785429e+01	8.9635553e+01	8.6526292e+05	-1.2412494e+02
6.4000000e+01	7.2259344e+00	-6.5200700e+01	9.0094294e+01	8.6516517e+05	-6.7962708e+01
6.5000000e+01	7.4758322e+00	-6.5629531e+01	9.0556153e+01	8.6512771e+05	-6.3582884e+00
6.6000000e+01	7.7319180e+00	-6.6072365e+01	9.1023370e+01	8.6515423e+05	6.1075221e+01
6.7000000e+01	7.9943363e+00	-6.6529757e+01	9.1500417e+01	8.6525307e+05	1.3478893e+02
6.8000000e+01	8.2632297e+00	-6.7002084e+01	9.1984597e+01	8.6542664e+05	2.1489034e+02
6.9000000e+01	8.5374568e+00	-6.7487746e+01	9.2480446e+01	8.6568314e+05	2.9852795e+02
7.0000000e+01	8.8138363e+00	-6.7982025e+01	9.2975217e+01	8.6602393e+05	3.8135965e+02
7.1000000e+01	9.0894472e+00	-6.8480211e+01	9.3503354e+01	8.6644515e+05	4.6235250e+02
7.2000000e+01	9.3628892e+00	-6.8979913e+01	9.4042049e+01	8.6694662e+05	5.4215878e+02
7.3000000e+01	9.6335955e+00	-6.9480527e+01	9.4573442e+01	8.6752964e+05	6.2114909e+02
7.4000000e+01	9.9013640e+00	-6.9981606e+01	9.5094902e+01	8.6819045e+05	6.9943840e+02
7.5000000e+01	1.0166046e+01	-7.0482984e+01	9.5612078e+01	8.6892876e+05	7.7704503e+02
7.6000000e+01	1.0427551e+01	-7.0984360e+01	9.6123441e+01	8.6974259e+05	8.5393173e+02
7.6360001e+01	1.0520875e+01	-7.1164809e+01	9.6306951e+01	8.7005537e+05	8.8142902e+02
7.7000000e+01	1.0685718e+01	-7.1485658e+01	9.6634152e+01	8.7063586e+05	9.3009349e+02
7.8000000e+01	1.0940544e+01	-7.1986797e+01	9.7152149e+01	8.7160319e+05	1.0055266e+03
7.9000000e+01	1.1191925e+01	-7.2487743e+01	9.7662825e+01	8.7264600e+05	1.0802227e+03
8.0000000e+01	1.1439792e+01	-7.2988237e+01	9.8165001e+01	8.7376430e+05	1.1541591e+03
8.1000000e+01	1.1684141e+01	-7.3488341e+01	9.8664367e+01	8.7495447e+05	1.2273647e+03
8.2000000e+01	1.1924883e+01	-7.3987838e+01	9.9160375e+01	8.7621865e+05	1.2998218e+03
8.3000000e+01	1.2162022e+01	-7.4486702e+01	9.9650461e+01	8.7755357e+05	1.3715349e+03
8.3760002e+01	1.2339771e+01	-7.4865429e+01	1.0001862e+02	8.7861775e+05	1.4255392e+03
8.4000000e+01	1.2395488e+01	-7.49484895e+01	1.0013399e+02	8.7896065e+05	1.4424979e+03
8.5000000e+01	1.2625253e+01	-7.5482431e+01	1.0060001e+02	8.8043882e+05	1.5127142e+03
8.6000000e+01	1.2851315e+01	-7.5979019e+01	1.0105707e+02	8.8198577e+05	1.5821469e+03
8.6760002e+01	1.3020590e+01	-7.6355816e+01	1.0140869e+02	8.8320917e+05	1.6343952e+03
8.7000000e+01	1.3073614e+01	-7.6474710e+01	1.0152084e+02	8.8360258e+05	1.6508046e+03
8.8000000e+01	1.3292132e+01	-7.6969521e+01	1.0199252e+02	8.8528821e+05	1.7186918e+03
8.9000000e+01	1.3506874e+01	-7.7463165e+01	1.0246759e+02	8.8704021e+05	1.7857771e+03
8.9760002e+01	1.3667521e+01	-7.7837711e+01	1.0283174e+02	8.8841696e+05	1.8362478e+03
9.0000000e+01	1.3717795e+01	-7.7955784e+01	1.0294707e+02	8.8885947e+05	1.8520824e+03
9.0760002e+01	1.3875559e+01	-7.8329363e+01	1.0331102e+02	8.9028492e+05	1.9019399e+03
9.1000000e+01	1.3924912e+01	-7.8447189e+01	1.0342367e+02	8.9074325e+05	1.9175860e+03
9.1160004e+01	1.3957665e+01	-7.8525753e+01	1.0349666e+02	8.9105228e+05	1.9279969e+03
9.1599998e+01	1.4047323e+01	-7.8741435e+01	1.0368814e+02	8.9190565e+05	1.9565796e+03
9.1639999e+01	1.4055453e+01	-7.8761108e+01	1.0370417e+02	8.9198306e+05	1.9594122e+03
9.1680000e+01	1.4063532e+01	-7.8780713e+01	1.0372179e+02	8.9206299e+05	1.9623756e+03
9.2000000e+01	1.4128244e+01	-7.8937637e+01	1.0415456e+02	8.9269492e+05	1.9871752e+03
9.2040001e+01	1.4136331e+01	-7.8957201e+01	1.0425487e+02	8.9277370e+05	1.9903056e+03
9.3000000e+01	1.4328793e+01	-7.9429443e+01	1.0414436e+02	8.9472238e+05	2.0678401e+03
9.4000000e+01	1.4526827e+01	-7.9923549e+01	9.6531924e+01	8.9682750e+05	2.1442995e+03
9.5000000e+01	1.4722550e+01	-8.0419911e+01	8.9245903e+01	8.9900732e+05	2.2124738e+03
9.6000000e+01	1.4916328e+01	-8.0918799e+01	8.3748397e+01	9.0125175e+05	2.2733441e+03
9.7000000e+01	1.5108517e+01	-8.1419869e+01	7.9941024e+01	9.0355213e+05	2.3284928e+03
9.8000000e+01	1.5299353e+01	-8.1923218e+01	7.7527541e+01	9.0590566e+05	2.3794855e+03
9.9000000e+01	1.5489054e+01	-8.2428952e+01	7.6189589e+01	9.0830957e+05	2.4277252e+03
1.0000000e+02	1.56777820e+01	-8.2936912e+01	7.5617167e+01	9.1076154e+05	2.4743458e+03
1.0100000e+02	1.5865833e+01	-8.3447220e+01	7.5593553e+01	9.1325876e+05	2.5203181e+03
1.0160000e+02	1.5978318e+01	-8.3754567e+01	7.5775875e+01	9.1477936e+05	2.5479245e+03
1.0200000e+02	1.6053175e+01	-8.3959941e+01	7.6093230e+01	9.1580299e+05	2.5664001e+03
1.0300000e+02	1.6239993e+01	-8.4475207e+01	7.7461769e+01	9.1839144e+05	2.6141512e+03
1.0400000e+02	1.6426247e+01	-8.4993194e+01	7.8472144e+01	9.2103025e+05	2.6639170e+03
1.0500000e+02	1.6611977e+01	-8.5513958e+01	7.9388595e+01	9.2372126e+05	2.7154230e+03
1.0600000e+02	1.6797313e+01	-8.6037631e+01	8.0344794e+01	9.2646200e+05	2.7687720e+03
1.0700000e+02	1.6982200e+01	-8.6564461e+01	8.1332253e+01	9.2925880e+05	2.8242008e+03
1.0800000e+02	1.7166713e+01	-8.7094400e+01	8.2317048e+01	9.3211172e+05	2.8818461e+03

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**CALF TRACKING DATA (CONTINUED)**

Time (sec)	Elevation (deg)	Azimuth (deg)	Aspect Angle (deg)	Range (ft)	Range Rate (fps)
1.0900000e+02	1.7350883e+01	-8.7627676e+01	8.3309343e+01	9.3502293e+05	2.9418678e+03
1.1000000e+02	1.7534684e+01	-8.8164512e+01	8.4306982e+01	9.3799699e+05	3.0044862e+03
1.1100000e+02	1.7718179e+01	-8.8704853e+01	8.5314182e+01	9.4103419e+05	3.0698346e+03
1.1200000e+02	1.7901380e+01	-8.9248912e+01	8.6328473e+01	9.4413708e+05	3.1380669e+03
1.1300000e+02	1.8084245e+01	-8.9796804e+01	8.7331449e+01	9.4731054e+05	3.2093559e+03
1.1400000e+02	1.8266782e+01	-9.0348638e+01	8.8357153e+01	9.5055740e+05	3.2838646e+03
1.1500000e+02	1.8449040e+01	-9.0904524e+01	8.9382530e+01	9.5387841e+05	3.3617651e+03
1.1600000e+02	1.8630919e+01	-9.1464548e+01	9.0412088e+01	9.5728102e+05	3.4432213e+03
1.1700000e+02	1.8812458e+01	-9.2028806e+01	9.1448721e+01	9.6076618e+05	3.5284148e+03
1.1800000e+02	1.8993595e+01	-9.2597373e+01	9.2495535e+01	9.6433934e+05	3.6175178e+03
1.1900000e+02	1.9174307e+01	-9.3170412e+01	9.3547073e+01	9.6800400e+05	3.7107129e+03
1.2000000e+02	1.9354579e+01	-9.3747900e+01	9.4606460e+01	9.7176357e+05	3.8081791e+03
1.2100000e+02	1.9534379e+01	-9.4329898e+01	9.5679276e+01	9.7562166e+05	3.9100899e+03
1.2200000e+02	1.9713619e+01	-9.4916616e+01	9.6744408e+01	9.7958441e+05	4.0166021e+03
1.2300000e+02	1.9892264e+01	-9.5507918e+01	9.7815296e+01	9.8365535e+05	4.1278643e+03
1.2400000e+02	2.0070217e+01	-9.6103905e+01	9.8897161e+01	9.8784072e+05	4.2440073e+03
1.2500000e+02	2.0247372e+01	-9.6704658e+01	9.9993287e+01	9.9214683e+05	4.3652672e+03
1.2600000e+02	2.0423777e+01	-9.7310143e+01	1.0108931e+02	9.9657331e+05	4.4917107e+03
1.2700000e+02	2.0599217e+01	-9.7920293e+01	1.0218457e+02	1.0011307e+06	4.6235118e+03
1.2736000e+02	2.0662133e+01	-9.8141045e+01	1.0257531e+02	1.0028040e+06	4.6722718e+03
1.2744000e+02	2.0676107e+01	-9.8190180e+01	1.0266510e+02	1.0031779e+06	4.6832026e+03
1.2752000e+02	2.0690068e+01	-9.8239374e+01	1.0275797e+02	1.0035528e+06	4.6941734e+03
1.2760000e+02	2.0704016e+01	-9.8288627e+01	1.0285488e+02	1.0039288e+06	4.7051847e+03
1.2800000e+02	2.0773641e+01	-9.8353090e+01	1.0343674e+02	1.0058235e+06	4.7615560e+03
1.2808000e+02	2.0787589e+01	-9.8584549e+01	1.0356351e+02	1.0062035e+06	4.7729843e+03
1.2816000e+02	2.0801478e+01	-9.8633955e+01	1.0368853e+02	1.0065865e+06	4.7844462e+03
1.2900000e+02	2.0947122e+01	-9.9155042e+01	1.0465672e+02	1.0106561e+06	4.9074283e+03
1.3000000e+02	2.1119449e+01	-9.9779940e+01	1.0557722e+02	1.0156396e+06	5.0590063e+03
1.3100000e+02	2.1290614e+01	-1.0040984e+02	1.0660083e+02	1.0207771e+06	5.2163351e+03
1.3200000e+02	2.1460499e+01	-1.0104455e+02	1.0770042e+02	1.0260752e+06	5.3797805e+03
1.3300000e+02	2.1629001e+01	-1.0168416e+02	1.0880140e+02	1.0315394e+06	5.5495441e+03
1.3400000e+02	2.1795988e+01	-1.0232837e+02	1.0992660e+02	1.0371762e+06	5.7257744e+03
1.3500000e+02	2.1961298e+01	-1.0297713e+02	1.1106342e+02	1.0429928e+06	5.9085290e+03
1.3600000e+02	2.2124838e+01	-1.0363023e+02	1.1220817e+02	1.0489938e+06	6.0979675e+03
1.3700000e+02	2.2286329e+01	-1.0428758e+02	1.1337219e+02	1.0551912e+06	6.2941884e+03
1.3800000e+02	2.2445773e+01	-1.0494902e+02	1.1453541e+02	1.0615854e+06	6.4972481e+03
1.3900000e+02	2.2602914e+01	-1.0561421e+02	1.1570451e+02	1.0681871e+06	6.7072197e+03
1.4000000e+02	2.2757627e+01	-1.0628310e+02	1.1687319e+02	1.0750021e+06	6.9241640e+03
1.4100000e+02	2.2909762e+01	-1.0695540e+02	1.1803831e+02	1.0820371e+06	7.1481402e+03
1.4200000e+02	2.3059116e+01	-1.0763081e+02	1.1921935e+02	1.0893012e+06	7.3792136e+03
1.4300000e+02	2.3205591e+01	-1.0830911e+02	1.2036326e+02	1.0967992e+06	7.6173150e+03
1.4400000e+02	2.3349030e+01	-1.0899010e+02	1.2153087e+02	1.1045387e+06	7.8623652e+03
1.4500000e+02	2.3489305e+01	-1.0967335e+02	1.2269350e+02	1.1125256e+06	8.1140417e+03
1.4600000e+02	2.3626244e+01	-1.1035864e+02	1.2386617e+02	1.1207671e+06	8.3718593e+03
1.4700000e+02	2.3759650e+01	-1.1104545e+02	1.2506676e+02	1.1292706e+06	8.6356611e+03
1.4800000e+02	2.3889365e+01	-1.1173341e+02	1.2621372e+02	1.1380419e+06	8.9050174e+03
1.4900000e+02	2.4015339e+01	-1.1242222e+02	1.2735669e+02	1.1470825e+06	9.1794395e+03
1.5000000e+02	2.4137314e+01	-1.1311112e+02	1.2849607e+02	1.1564022e+06	9.4583100e+03
1.5100000e+02	2.4255275e+01	-1.1379996e+02	1.2963134e+02	1.1660006e+06	9.7413370e+03
1.5160001e+02	2.4324036e+01	-1.1421294e+02	1.3031683e+02	1.1718965e+06	9.9129095e+03
1.5200000e+02	2.4369004e+01	-1.1448808e+02	1.3076761e+02	1.1758852e+06	1.0027936e+04
1.5300000e+02	2.4478436e+01	-1.1517502e+02	1.3188563e+02	1.1860575e+06	1.0317464e+04
1.5400000e+02	2.4583462e+01	-1.1586027e+02	1.3302912e+02	1.1965206e+06	1.0609567e+04
1.5500000e+02	2.4683956e+01	-1.1654319e+02	1.3417032e+02	1.2072784e+06	1.0904083e+04
1.5600000e+02	2.4779896e+01	-1.1722354e+02	1.3532166e+02	1.2183309e+06	1.1200702e+04
1.5700000e+02	2.4871239e+01	-1.1790071e+02	1.3647457e+02	1.2296792e+06	1.1499426e+04
1.5800000e+02	2.4957824e+01	-1.1857417e+02	1.3734277e+02	1.2413262e+06	1.1791093e+04
1.5900000e+02	2.5039523e+01	-1.1924218e+02	1.3814676e+02	1.2532460e+06	1.2035357e+04
1.6000000e+02	2.5116141e+01	-1.1990227e+02	1.4017758e+02	1.2653784e+06	1.2224634e+04
1.6100000e+02	2.5187370e+01	-1.2055227e+02	1.4186465e+02	1.2776834e+06	1.2379823e+04
1.6200000e+02	2.5253315e+01	-1.2119136e+02	1.4293396e+02	1.2901311e+06	1.2514101e+04
1.6300000e+02	2.5314060e+01	-1.2181913e+02	1.4355581e+02	1.3027088e+06	1.2636794e+04
1.6400000e+02	2.5369938e+01	-1.2243557e+02	1.4432452e+02	1.3154021e+06	1.2752420e+04
1.6500000e+02	2.5421012e+01	-1.2304072e+02	1.4531020e+02	1.3282102e+06	1.2862879e+04

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**CALF TRACKING DATA (CONTINUED)**

Time (sec)	Elevation (deg)	Azimuth (deg)	Aspect Angle (deg)	Range (ft)	Range Rate (fps)
1.6560001e+02	2.5449422e+01	-1.2339844e+02	1.4594911e+02	1.3359487e+06	1.2926839e+04
1.6600000e+02	2.5467514e+01	-1.2363475e+02	1.4637727e+02	1.3411268e+06	1.2968684e+04
1.6700000e+02	2.5509627e+01	-1.2421779e+02	1.4744074e+02	1.3541474e+06	1.3070712e+04
1.6800000e+02	2.5547550e+01	-1.2478995e+02	1.4847873e+02	1.3672678e+06	1.3169258e+04
1.6900000e+02	2.5581462e+01	-1.2535161e+02	1.4947409e+02	1.3804845e+06	1.3264511e+04
1.7000000e+02	2.5611485e+01	-1.2590270e+02	1.5042298e+02	1.3937960e+06	1.3356533e+04
1.7056000e+02	2.5626689e+01	-1.2620691e+02	1.5093693e+02	1.4012895e+06	1.3406719e+04
1.7060001e+02	2.5627749e+01	-1.2622855e+02	1.5097326e+02	1.4018250e+06	1.3410274e+04
1.7100000e+02	2.5637822e+01	-1.2644365e+02	1.5133548e+02	1.4071975e+06	1.3445476e+04
1.7200000e+02	2.5660630e+01	-1.2697447e+02	1.5224042e+02	1.4206860e+06	1.3531428e+04
1.7300000e+02	2.5680039e+01	-1.2749540e+02	1.5314479e+02	1.4342594e+06	1.3614495e+04
1.7400000e+02	2.5696230e+01	-1.2800670e+02	1.5404884e+02	1.4479132e+06	1.3694782e+04
1.7500000e+02	2.5709289e+01	-1.2850837e+02	1.5495244e+02	1.4616471e+06	1.3772348e+04
1.7560001e+02	2.5715707e+01	-1.2880495e+02	1.5546329e+02	1.4699234e+06	1.3817636e+04
1.7600000e+02	2.5719385e+01	-1.2900082e+02	1.5578394e+02	1.4754569e+06	1.3847313e+04
1.7700000e+02	2.5726610e+01	-1.2948400e+02	1.5654000e+02	1.4893415e+06	1.3919739e+04
1.7800000e+02	2.5731124e+01	-1.2995833e+02	1.5723345e+02	1.5032969e+06	1.3989744e+04
1.7900000e+02	2.5733043e+01	-1.3042384e+02	1.5788315e+02	1.5173207e+06	1.4057377e+04
1.8000000e+02	2.5732500e+01	-1.3088080e+02	1.5848879e+02	1.5314099e+06	1.4122739e+04
1.8100000e+02	2.5729537e+01	-1.3132926e+02	1.5906593e+02	1.5455652e+06	1.4185878e+04
1.8200000e+02	2.5724321e+01	-1.3176954e+02	1.5960747e+02	1.5597814e+06	1.4246902e+04
1.8300000e+02	2.5716939e+01	-1.3220169e+02	1.6014421e+02	1.5740570e+06	1.4305862e+04
1.8400000e+02	2.5707452e+01	-1.3262596e+02	1.6067531e+02	1.5883919e+06	1.4362836e+04
1.8500000e+02	2.5695970e+01	-1.3304249e+02	1.6118085e+02	1.6027831e+06	1.4417883e+04
1.8600000e+02	2.5682618e+01	-1.3345148e+02	1.6166727e+02	1.6172267e+06	1.4471077e+04
1.8700000e+02	2.5667412e+01	-1.3385298e+02	1.6214451e+02	1.6317245e+06	1.4522469e+04
1.8800000e+02	2.5650494e+01	-1.3424728e+02	1.6260796e+02	1.6462716e+06	1.4572137e+04
1.8900000e+02	2.5631901e+01	-1.3463450e+02	1.6303925e+02	1.6608682e+06	1.4620130e+04
1.9000000e+02	2.5611727e+01	-1.3501474e+02	1.6342299e+02	1.6755118e+06	1.4666499e+04
1.9060001e+02	2.5598912e+01	-1.3523968e+02	1.6364266e+02	1.6843187e+06	1.4693575e+04
1.9100000e+02	2.5590050e+01	-1.3538826e+02	1.6378765e+02	1.6902001e+06	1.4711312e+04
1.9200000e+02	2.5566900e+01	-1.3575504e+02	1.6413610e+02	1.7049337e+06	1.4754594e+04
1.9300000e+02	2.5542383e+01	-1.3611539e+02	1.6447228e+02	1.7197091e+06	1.4796418e+04
1.9400000e+02	2.5516529e+01	-1.3646939e+02	1.6479857e+02	1.7345262e+06	1.4836824e+04
1.9500000e+02	2.5489418e+01	-1.3681713e+02	1.6511378e+02	1.7493827e+06	1.4875850e+04
1.9600000e+02	2.5461114e+01	-1.3715886e+02	1.6542024e+02	1.7642766e+06	1.4913558e+04
1.9700000e+02	2.5431628e+01	-1.3749456e+02	1.6572125e+02	1.7792092e+06	1.4949969e+04
1.9800000e+02	2.5401053e+01	-1.3782450e+02	1.6601130e+02	1.7941766e+06	1.4985148e+04
1.9900000e+02	2.5369427e+01	-1.3814873e+02	1.6629420e+02	1.8091787e+06	1.5019121e+04
2.0000000e+02	2.5336782e+01	-1.3846739e+02	1.6657214e+02	1.8242147e+06	1.5051929e+04
2.0100000e+02	2.5303179e+01	-1.3878058e+02	1.6684509e+02	1.8392828e+06	1.5083607e+04
2.0200000e+02	2.5268671e+01	-1.3908851e+02	1.6711261e+02	1.8543812e+06	1.5114202e+04
2.0300000e+02	2.5233278e+01	-1.3939122e+02	1.6737244e+02	1.8695101e+06	1.5143738e+04
2.0400000e+02	2.5197051e+01	-1.3968881e+02	1.6762747e+02	1.8846679e+06	1.5172247e+04
2.0500000e+02	2.5160144e+01	-1.3998141e+02	1.6787613e+02	1.8989541e+06	1.5199764e+04
2.0600000e+02	2.5122207e+01	-1.4026913e+02	1.6811886e+02	1.9150677e+06	1.5226318e+04
2.0700000e+02	2.5083687e+01	-1.4055213e+02	1.6835712e+02	1.9303064e+06	1.5251950e+04
2.0800000e+02	2.5044441e+01	-1.4083038e+02	1.6859079e+02	1.9455719e+06	1.5276672e+04
2.0900000e+02	2.5004554e+01	-1.4110411e+02	1.6881932e+02	1.9608600e+06	1.5300524e+04
2.1000000e+02	2.4964021e+01	-1.4137337e+02	1.6904373e+02	1.9761725e+06	1.5323531e+04
2.1100000e+02	2.4922905e+01	-1.4163830e+02	1.6926390e+02	1.9915059e+06	1.5345721e+04
2.1200000e+02	2.4881176e+01	-1.4189888e+02	1.6947703e+02	2.0068631e+06	1.5367109e+04
2.1300000e+02	2.4838911e+01	-1.4215533e+02	1.6968448e+02	2.0222402e+06	1.5387732e+04
2.1400000e+02	2.4796095e+01	-1.4240760e+02	1.6988807e+02	2.0376390e+06	1.5407597e+04
2.1500000e+02	2.4752792e+01	-1.4265590e+02	1.7008799e+02	2.0530561e+06	1.5426743e+04
2.1600000e+02	2.4709019e+01	-1.4290035e+02	1.7028428e+02	2.0684914e+06	1.5445192e+04
2.1700000e+02	2.4664773e+01	-1.4314085e+02	1.7047690e+02	2.0839456e+06	1.5462947e+04
2.1800000e+02	2.4620080e+01	-1.4337759e+02	1.7066592e+02	2.0994178e+06	1.5480041e+04
2.1860001e+02	2.4593078e+01	-1.4351793e+02	1.7077769e+02	2.1087082e+06	1.5489994e+04
2.1900000e+02	2.4574980e+01	-1.4361071e+02	1.7085145e+02	2.1149061e+06	1.5496498e+04
2.2000000e+02	2.4529480e+01	-1.4384020e+02	1.7103341e+02	2.1304105e+06	1.5512329e+04
2.2060001e+02	2.4502009e+01	-1.4397620e+02	1.7114090e+02	2.1397198e+06	1.5521536e+04
2.2100000e+02	2.4483601e+01	-1.4406614e+02	1.7121183e+02	2.1459304e+06	1.5527552e+04
2.2200000e+02	2.4437369e+01	-1.4428868e+02	1.7138673e+02	2.1614645e+06	1.5542194e+04

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**CALF TRACKING DATA (CONTINUED)**

Time (sec)	Elevation (deg)	Azimuth (deg)	Aspect Angle (deg)	Range (ft)	Range Rate (fps)
2.2300000e+02	2.4390766e+01	-1.4450777e+02	1.7155798e+02	2.1770146e+06	1.5556259e+04
2.2400000e+02	2.4343853e+01	-1.4472358e+02	1.7172566e+02	2.1925771e+06	1.5569773e+04
2.2500000e+02	2.4296610e+01	-1.4493606e+02	1.7188959e+02	2.2081540e+06	1.5582741e+04
2.2600000e+02	2.4249071e+01	-1.4514542e+02	1.7204882e+02	2.2237433e+06	1.5595193e+04
2.2700000e+02	2.4201267e+01	-1.4535170e+02	1.7220307e+02	2.2393435e+06	1.5607143e+04
2.2800000e+02	2.4153168e+01	-1.4555487e+02	1.7235426e+02	2.2549568e+06	1.5618593e+04
2.2900000e+02	2.4104823e+01	-1.4575508e+02	1.7250248e+02	2.2705804e+06	1.5629571e+04
2.3000000e+02	2.4056211e+01	-1.4595230e+02	1.7264764e+02	2.2862163e+06	1.5640077e+04
2.3060001e+02	2.4026943e+01	-1.4606929e+02	1.7273334e+02	2.2956018e+06	1.5646166e+04
2.3100000e+02	2.4007385e+01	-1.4614668e+02	1.7278985e+02	2.3018609e+06	1.5650135e+04
2.3200000e+02	2.3958325e+01	-1.4633825e+02	1.7292906e+02	2.3175162e+06	1.5659754e+04
2.3300000e+02	2.3909050e+01	-1.4652704e+02	1.7306523e+02	2.3331811e+06	1.5668946e+04
2.3400000e+02	2.3859593e+01	-1.4671316e+02	1.7319837e+02	2.3488534e+06	1.5677726e+04
2.3500000e+02	2.3809918e+01	-1.4689657e+02	1.7332835e+02	2.3645361e+06	1.5686098e+04
2.3600000e+02	2.3760078e+01	-1.4707743e+02	1.7345522e+02	2.3802260e+06	1.5694081e+04
2.3700000e+02	2.3710061e+01	-1.4725572e+02	1.7357883e+02	2.3959238e+06	1.5701683e+04
2.3800000e+02	2.3659878e+01	-1.4743150e+02	1.7369912e+02	2.4116290e+06	1.5708912e+04
2.3900000e+02	2.3609531e+01	-1.4760483e+02	1.7381600e+02	2.4273419e+06	1.5715781e+04
2.4000000e+02	2.3559051e+01	-1.4777579e+02	1.7392941e+02	2.4430603e+06	1.5722302e+04
2.4100000e+02	2.3508431e+01	-1.4794438e+02	1.7403915e+02	2.4587851e+06	1.5728481e+04
2.4200000e+02	2.3457658e+01	-1.4811060e+02	1.7414507e+02	2.4745176e+06	1.5734322e+04
2.4300000e+02	2.3406771e+01	-1.4827459e+02	1.7424711e+02	2.4902545e+06	1.5739845e+04
2.4400000e+02	2.3355762e+01	-1.4843635e+02	1.7434614e+02	2.5059973e+06	1.5745052e+04
2.4500000e+02	2.3304654e+01	-1.4859597e+02	1.7444268e+02	2.5217439e+06	1.5749956e+04
2.4600000e+02	2.3253419e+01	-1.4875338e+02	1.7453568e+02	2.5374968e+06	1.5754556e+04
2.4700000e+02	2.3202102e+01	-1.4890872e+02	1.7462512e+02	2.5532529e+06	1.5758870e+04
2.4800000e+02	2.3150678e+01	-1.4906201e+02	1.7471083e+02	2.5690141e+06	1.5762902e+04
2.4900000e+02	2.3099158e+01	-1.4921319e+02	1.7479260e+02	2.5847794e+06	1.5766653e+04
2.5000000e+02	2.3047572e+01	-1.4936249e+02	1.7487361e+02	2.6005471e+06	1.5770144e+04
2.5100000e+02	2.2995898e+01	-1.4950977e+02	1.7495682e+02	2.6163190e+06	1.5773368e+04
2.5200000e+02	2.2944137e+01	-1.4965513e+02	1.7503732e+02	2.6320948e+06	1.5776339e+04
2.5300000e+02	2.2892324e+01	-1.4979865e+02	1.7511511e+02	2.6478720e+06	1.5779065e+04
2.5400000e+02	2.2840445e+01	-1.4994032e+02	1.7519012e+02	2.6636521e+06	1.5781549e+04
2.5500000e+02	2.2788499e+01	-1.5008016e+02	1.7526229e+02	2.6794347e+06	1.5783797e+04
2.5600000e+02	2.2736497e+01	-1.5021821e+02	1.7533158e+02	2.6952197e+06	1.5785816e+04
2.5700000e+02	2.2684439e+01	-1.5035450e+02	1.7539671e+02	2.7110067e+06	1.5787612e+04
2.5800000e+02	2.2632329e+01	-1.5048906e+02	1.7545835e+02	2.7267954e+06	1.5789189e+04
2.5900000e+02	2.2580184e+01	-1.5062198e+02	1.7551696e+02	2.7425847e+06	1.5790558e+04
2.6000000e+02	2.2527997e+01	-1.5075323e+02	1.7557245e+02	2.7583754e+06	1.5791718e+04
2.6100000e+02	2.2475750e+01	-1.5088279e+02	1.7562469e+02	2.7741687e+06	1.5792674e+04
2.6200000e+02	2.2423479e+01	-1.5101080e+02	1.7567365e+02	2.7899618e+06	1.5793437e+04
2.6300000e+02	2.2371187e+01	-1.5113727e+02	1.7571927e+02	2.8057546e+06	1.5794012e+04
2.6400000e+02	2.2318853e+01	-1.5126214e+02	1.7576135e+02	2.8215489e+06	1.5794395e+04
2.6500000e+02	2.2266487e+01	-1.5138548e+02	1.7579984e+02	2.8373440e+06	1.5794596e+04
2.6600000e+02	2.2214101e+01	-1.5150738e+02	1.7583471e+02	2.8531387e+06	1.5794623e+04
2.6700000e+02	2.2161700e+01	-1.5162779e+02	1.7586580e+02	2.8689326e+06	1.5794475e+04
2.6800000e+02	2.2109266e+01	-1.5174676e+02	1.7589303e+02	2.8847273e+06	1.5794160e+04
2.6900000e+02	2.2056817e+01	-1.5186430e+02	1.7591630e+02	2.9005214e+06	1.5793679e+04
2.7000000e+02	2.2004355e+01	-1.5198043e+02	1.7593554e+02	2.9163148e+06	1.5793036e+04
2.7100000e+02	2.1951885e+01	-1.5209524e+02	1.7595068e+02	2.9321069e+06	1.5792240e+04
2.7200000e+02	2.1899389e+01	-1.5220865e+02	1.7596162e+02	2.9478994e+06	1.5791288e+04
2.7300000e+02	2.1846898e+01	-1.5232076e+02	1.7596834e+02	2.9636897e+06	1.5790188e+04
2.7400000e+02	2.1794396e+01	-1.5243157e+02	1.7597076e+02	2.9794790e+06	1.5788943e+04
2.7500000e+02	2.1741884e+01	-1.5254109e+02	1.7596882e+02	2.9952673e+06	1.5787556e+04
2.7600000e+02	2.1689364e+01	-1.5264934e+02	1.7596249e+02	3.0110544e+06	1.5786030e+04
2.7700000e+02	2.1636841e+01	-1.5275634e+02	1.7595177e+02	3.0268402e+06	1.5784368e+04
2.7800000e+02	2.1584329e+01	-1.5286216e+02	1.7593666e+02	3.0426228e+06	1.5782577e+04
2.7900000e+02	2.1531801e+01	-1.5296673e+02	1.7591709e+02	3.0584053e+06	1.5780653e+04
2.8000000e+02	2.1479289e+01	-1.5307015e+02	1.7589317e+02	3.0741845e+06	1.5778607e+04
2.8100000e+02	2.1426773e+01	-1.5317240e+02	1.7586486e+02	3.0899622e+06	1.5776438e+04
2.8200000e+02	2.1374263e+01	-1.5327350e+02	1.7583220e+02	3.1057372e+06	1.5774148e+04
2.8300000e+02	2.1321754e+01	-1.5337348e+02	1.7579525e+02	3.1215105e+06	1.5771741e+04
2.8400000e+02	2.1269260e+01	-1.5347238e+02	1.7576490e+02	3.1372805e+06	1.5769223e+04
2.8500000e+02	2.1216765e+01	-1.5357014e+02	1.7573991e+02	3.1530489e+06	1.5766590e+04

**CALF TRACKING DATA (CONTINUED)**

Time (sec)	Elevation (deg)	Azimuth (deg)	Aspect Angle (deg)	Range (ft)	Range Rate (fps)
2.8600000e+02	2.1164289e+01	-1.5366687e+02	1.7571164e+02	3.1688137e+06	1.5763850e+04
2.8700000e+02	2.1111821e+01	-1.5376252e+02	1.7568009e+02	3.1845756e+06	1.5761004e+04
2.8800000e+02	2.1059349e+01	-1.5385709e+02	1.7564527e+02	3.2003361e+06	1.5758052e+04
2.8900000e+02	2.1006908e+01	-1.5395072e+02	1.7560731e+02	3.2160917e+06	1.5755003e+04
2.9000000e+02	2.0954465e+01	-1.5404330e+02	1.7557808e+02	3.2318456e+06	1.5751852e+04
2.9100000e+02	2.0902037e+01	-1.5413487e+02	1.7555601e+02	3.2475962e+06	1.5748605e+04
2.9200000e+02	2.0849634e+01	-1.5422550e+02	1.7553143e+02	3.2633424e+06	1.5745266e+04
2.9300000e+02	2.0797232e+01	-1.5431512e+02	1.7550430e+02	3.2790866e+06	1.5741832e+04
2.9400000e+02	2.0744856e+01	-1.5440382e+02	1.7547472e+02	3.2948262e+06	1.5738310e+04
2.9500000e+02	2.0692492e+01	-1.5449159e+02	1.7544269e+02	3.3105626e+06	1.5734700e+04
2.9600000e+02	2.0640144e+01	-1.5457843e+02	1.7540824e+02	3.3262957e+06	1.5731004e+04
2.9700000e+02	2.0587815e+01	-1.5466436e+02	1.7537143e+02	3.3420249e+06	1.5727224e+04
2.9800000e+02	2.0535498e+01	-1.5474939e+02	1.7533227e+02	3.3577504e+06	1.5723363e+04
2.9900000e+02	2.0483210e+01	-1.5483359e+02	1.7529084e+02	3.3734716e+06	1.5719423e+04
3.0000000e+02	2.0430932e+01	-1.5491686e+02	1.7524713e+02	3.3891892e+06	1.5715402e+04
3.0100000e+02	2.0378676e+01	-1.5499932e+02	1.7520122e+02	3.4049028e+06	1.5711309e+04
3.0200000e+02	2.0326445e+01	-1.5508093e+02	1.7515314e+02	3.4206118e+06	1.5707140e+04
3.0300000e+02	2.0274231e+01	-1.5516170e+02	1.7510293e+02	3.4363169e+06	1.5702898e+04
3.0400000e+02	2.0222036e+01	-1.5524166e+02	1.7505062e+02	3.4520178e+06	1.5698585e+04
3.0500000e+02	2.0169867e+01	-1.5532080e+02	1.7503408e+02	3.4677139e+06	1.5694202e+04
3.0600000e+02	2.0117720e+01	-1.5539918e+02	1.7502735e+02	3.4834054e+06	1.5689754e+04
3.0700000e+02	2.0065587e+01	-1.5547674e+02	1.7501903e+02	3.4990934e+06	1.5685238e+04
3.0800000e+02	2.0013485e+01	-1.5555356e+02	1.7500918e+02	3.5147761e+06	1.5680657e+04
3.0900000e+02	1.9961403e+01	-1.5562962e+02	1.7499780e+02	3.5304542e+06	1.5676015e+04
3.1000000e+02	1.9909344e+01	-1.5570492e+02	1.7498492e+02	3.5461277e+06	1.5671310e+04
3.1100000e+02	1.9857303e+01	-1.5577948e+02	1.7497056e+02	3.5617970e+06	1.5666544e+04
3.1200000e+02	1.9805290e+01	-1.5585331e+02	1.7495475e+02	3.5774609e+06	1.5661720e+04
3.1300000e+02	1.9753297e+01	-1.5592641e+02	1.7493753e+02	3.5931206e+06	1.5656838e+04
3.1400000e+02	1.9701327e+01	-1.5599879e+02	1.7491890e+02	3.6087752e+06	1.5651899e+04
3.1500000e+02	1.9649385e+01	-1.5607052e+02	1.7489893e+02	3.6244245e+06	1.5646909e+04
3.1600000e+02	1.9597467e+01	-1.5614156e+02	1.7487762e+02	3.6400687e+06	1.5641864e+04
3.1700000e+02	1.9545575e+01	-1.5621190e+02	1.7485499e+02	3.6557077e+06	1.5636766e+04
3.1800000e+02	1.9493704e+01	-1.5628158e+02	1.7483107e+02	3.6713420e+06	1.5631617e+04
3.1900000e+02	1.9441861e+01	-1.5635059e+02	1.7480589e+02	3.6869711e+06	1.5626418e+04
3.2000000e+02	1.9390036e+01	-1.5641894e+02	1.7477947e+02	3.7025952e+06	1.5621170e+04
3.2100000e+02	1.9338239e+01	-1.5648664e+02	1.7475184e+02	3.7182138e+06	1.5615874e+04
3.2200000e+02	1.9286472e+01	-1.5655375e+02	1.7472305e+02	3.7338267e+06	1.5610535e+04
3.2300000e+02	1.9234722e+01	-1.5662018e+02	1.7469309e+02	3.7494347e+06	1.5605147e+04
3.2400000e+02	1.9182999e+01	-1.5668603e+02	1.7466200e+02	3.7650374e+06	1.5599717e+04
3.2500000e+02	1.9131308e+01	-1.5675127e+02	1.7462982e+02	3.7806337e+06	1.5594243e+04
3.2600000e+02	1.9079636e+01	-1.5681590e+02	1.7459656e+02	3.7962254e+06	1.5588727e+04
3.2700000e+02	1.9027990e+01	-1.5687994e+02	1.7456225e+02	3.8118111e+06	1.5583170e+04
3.2800000e+02	1.8976369e+01	-1.5694338e+02	1.7452691e+02	3.8273916e+06	1.5577571e+04
3.2900000e+02	1.8924767e+01	-1.5700625e+02	1.7449058e+02	3.8429672e+06	1.5571934e+04
3.3000000e+02	1.8873205e+01	-1.5706857e+02	1.7445329e+02	3.8585353e+06	1.5566260e+04
3.3100000e+02	1.8821655e+01	-1.5713029e+02	1.7441504e+02	3.8740993e+06	1.5560547e+04
3.3200000e+02	1.8770136e+01	-1.5719150e+02	1.7437589e+02	3.8896568e+06	1.5554798e+04
3.3300000e+02	1.8718642e+01	-1.5725215e+02	1.7433584e+02	3.9052088e+06	1.5549014e+04
3.3400000e+02	1.8667171e+01	-1.5731225e+02	1.7429492e+02	3.9207549e+06	1.5543195e+04
3.3500000e+02	1.8615731e+01	-1.5737181e+02	1.7425316e+02	3.9362947e+06	1.5537342e+04
3.3600000e+02	1.8564310e+01	-1.5743084e+02	1.7421059e+02	3.9518292e+06	1.5531455e+04
3.3700000e+02	1.8512915e+01	-1.5748935e+02	1.7416722e+02	3.9673579e+06	1.5525536e+04
3.3800000e+02	1.8461540e+01	-1.5754735e+02	1.7412309e+02	3.9828813e+06	1.5519585e+04
3.3900000e+02	1.8410201e+01	-1.5760486e+02	1.7407824e+02	3.9983972e+06	1.5513606e+04
3.4000000e+02	1.8358882e+01	-1.5766187e+02	1.7403267e+02	4.0139077e+06	1.5507596e+04
3.4100000e+02	1.8307583e+01	-1.5771835e+02	1.7398640e+02	4.0294129e+06	1.5501555e+04
3.4200000e+02	1.8256315e+01	-1.5777437e+02	1.7393948e+02	4.0449111e+06	1.5495486e+04
3.4300000e+02	1.8205069e+01	-1.5782990e+02	1.7389192e+02	4.0604038e+06	1.5489391e+04
3.4400000e+02	1.8153848e+01	-1.5788495e+02	1.7384376e+02	4.0758902e+06	1.5483268e+04
3.4500000e+02	1.8102660e+01	-1.5793957e+02	1.7379501e+02	4.0913695e+06	1.5477119e+04
3.4600000e+02	1.8051486e+01	-1.5799368e+02	1.7374570e+02	4.1068439e+06	1.5470943e+04
3.4700000e+02	1.8000337e+01	-1.5804732e+02	1.7369584e+02	4.1223118e+06	1.5464742e+04
3.4800000e+02	1.7949216e+01	-1.5810055e+02	1.7364548e+02	4.1377732e+06	1.5458518e+04
3.4900000e+02	1.7898118e+01	-1.5815332e+02	1.7359464e+02	4.1532287e+06	1.5452270e+04

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**CALF TRACKING DATA (CONTINUED)**

Time (sec)	Elevation (deg)	Azimuth (deg)	Aspect Angle (deg)	Range (ft)	Range Rate (fps)
3.5000000e+02	1.7847039e+01	-1.5820561e+02	1.7354332e+02	4.1686784e+06	1.5445997e+04
3.5100000e+02	1.7795993e+01	-1.5825750e+02	1.7349157e+02	4.1841208e+06	1.5439703e+04
3.5200000e+02	1.7744963e+01	-1.5830895e+02	1.7343941e+02	4.1995577e+06	1.5433387e+04
3.5300000e+02	1.7693959e+01	-1.5835997e+02	1.7338686e+02	4.2149880e+06	1.5427050e+04
3.5400000e+02	1.7642984e+01	-1.5841060e+02	1.7334785e+02	4.2304115e+06	1.5420693e+04
3.5404001e+02	1.7640945e+01	-1.5841259e+02	1.7334663e+02	4.2310283e+06	1.5420437e+04
3.5500000e+02	1.7592028e+01	-1.5846077e+02	1.7331700e+02	4.2458289e+06	1.5414313e+04
3.5504001e+02	1.7589996e+01	-1.5846279e+02	1.7331575e+02	4.2464449e+06	1.5414058e+04
3.5600000e+02	1.7541094e+01	-1.5851053e+02	1.7387446e+02	4.2612402e+06	1.5407929e+04
3.5700000e+02	1.7490182e+01	-1.5855992e+02	1.7562889e+02	4.2766450e+06	1.5401520e+04
3.5800000e+02	1.7439297e+01	-1.5860890e+02	1.7766503e+02	4.2920429e+06	1.5395085e+04
3.5900000e+02	1.7388427e+01	-1.5865744e+02	1.7954264e+02	4.3074354e+06	1.5388631e+04
3.6000000e+02	1.7337585e+01	-1.5870562e+02	1.7815325e+02	4.3228206e+06	1.5382159e+04
3.6100000e+02	1.7286765e+01	-1.5875341e+02	1.7612005e+02	4.3381995e+06	1.5375670e+04
3.6200000e+02	1.7235968e+01	-1.5880082e+02	1.7407226e+02	4.3535721e+06	1.5369165e+04
3.6300000e+02	1.7185192e+01	-1.5884784e+02	1.7200366e+02	4.3689381e+06	1.5362643e+04
3.6400000e+02	1.7134444e+01	-1.5889452e+02	1.6992996e+02	4.3842969e+06	1.5356106e+04
3.6500000e+02	1.7083712e+01	-1.5894078e+02	1.6785458e+02	4.3996499e+06	1.534954e+04
3.6600000e+02	1.7033009e+01	-1.5898672e+02	1.6577806e+02	4.4149956e+06	1.5342987e+04
3.6700000e+02	1.6982317e+01	-1.5903225e+02	1.6367878e+02	4.4303360e+06	1.5336405e+04
3.6800000e+02	1.6931653e+01	-1.5907746e+02	1.6157761e+02	4.4456691e+06	1.5329810e+04
3.6900000e+02	1.6881012e+01	-1.5912231e+02	1.5946849e+02	4.4609955e+06	1.5323203e+04
3.7000000e+02	1.6830391e+01	-1.5916681e+02	1.5734271e+02	4.4763151e+06	1.5316582e+04
3.7100000e+02	1.6779794e+01	-1.5921095e+02	1.5521288e+02	4.4916281e+06	1.5309947e+04
3.7200000e+02	1.6729214e+01	-1.5925476e+02	1.5305704e+02	4.5069349e+06	1.5303301e+04
3.7300000e+02	1.6678656e+01	-1.5929822e+02	1.5089638e+02	4.5222348e+06	1.5296643e+04
3.7400000e+02	1.6628117e+01	-1.5934134e+02	1.4870976e+02	4.5375286e+06	1.5289973e+04
3.7500000e+02	1.6577605e+01	-1.5938417e+02	1.4649404e+02	4.5528147e+06	1.5283294e+04
3.7600000e+02	1.6527106e+01	-1.5942663e+02	1.4424888e+02	4.5680954e+06	1.5276603e+04
3.7700000e+02	1.6476633e+01	-1.5946880e+02	1.4196987e+02	4.5833682e+06	1.5269901e+04
3.7800000e+02	1.6426178e+01	-1.5951064e+02	1.3964541e+02	4.5986348e+06	1.5263190e+04
3.7900000e+02	1.6375740e+01	-1.5955213e+02	1.3724291e+02	4.6138951e+06	1.5256464e+04
3.8000000e+02	1.6325327e+01	-1.5959334e+02	1.3502384e+02	4.6291483e+06	1.5249779e+04
3.8100000e+02	1.6274935e+01	-1.5963424e+02	1.3366653e+02	4.6443944e+06	1.5243109e+04
3.8200000e+02	1.6224562e+01	-1.5967482e+02	1.3287853e+02	4.6596340e+06	1.5236381e+04
3.8300000e+02	1.6174212e+01	-1.5971514e+02	1.3226087e+02	4.6748665e+06	1.5229641e+04
3.8400000e+02	1.6123874e+01	-1.5975512e+02	1.3177518e+02	4.6900931e+06	1.5222890e+04
3.8500000e+02	1.6073556e+01	-1.5979480e+02	1.3140370e+02	4.7053133e+06	1.5216128e+04
3.8600000e+02	1.6023263e+01	-1.5983422e+02	1.3110908e+02	4.7205254e+06	1.5209360e+04
3.8700000e+02	1.5972989e+01	-1.5987335e+02	1.3087595e+02	4.7357310e+06	1.5202585e+04
3.8800000e+02	1.5922728e+01	-1.5991215e+02	1.3070652e+02	4.7509307e+06	1.5195796e+04
3.8900000e+02	1.5872484e+01	-1.5995070e+02	1.3056753e+02	4.7661235e+06	1.5189005e+04
3.9000000e+02	1.5822264e+01	-1.5998896e+02	1.3045470e+02	4.7813091e+06	1.5182209e+04
3.9100000e+02	1.5772060e+01	-1.6002695e+02	1.3039701e+02	4.7964879e+06	1.5175406e+04
3.9200000e+02	1.5721879e+01	-1.6006465e+02	1.3035710e+02	4.8116594e+06	1.5168595e+04
3.9300000e+02	1.5671707e+01	-1.6010209e+02	1.3031721e+02	4.8268253e+06	1.5161780e+04
3.9400000e+02	1.5621561e+01	-1.6013928e+02	1.3028975e+02	4.8419831e+06	1.5154960e+04
3.9500000e+02	1.5571430e+01	-1.6017617e+02	1.3026580e+02	4.8571348e+06	1.5148135e+04
3.9600000e+02	1.5521320e+01	-1.6021283e+02	1.3025829e+02	4.8722790e+06	1.5141309e+04
3.9700000e+02	1.5471218e+01	-1.6024919e+02	1.3027464e+02	4.8874176e+06	1.5134475e+04
3.9800000e+02	1.5421140e+01	-1.6028532e+02	1.3029155e+02	4.9025485e+06	1.5127638e+04
3.9900000e+02	1.5371078e+01	-1.6032120e+02	1.3030854e+02	4.9176726e+06	1.5120798e+04
4.0000000e+02	1.5321035e+01	-1.6035681e+02	1.3033827e+02	4.9327897e+06	1.5113956e+04
4.0100000e+02	1.5271004e+01	-1.6039218e+02	1.3038656e+02	4.9479004e+06	1.5107111e+04
4.0200000e+02	1.5220996e+01	-1.6042729e+02	1.3043495e+02	4.9630036e+06	1.5100260e+04
4.0300000e+02	1.5170996e+01	-1.6046216e+02	1.3048346e+02	4.9781010e+06	1.5093409e+04
4.0400000e+02	1.5121018e+01	-1.6049678e+02	1.3053207e+02	4.9931907e+06	1.5086554e+04
4.0404001e+02	1.5119019e+01	-1.6049817e+02	1.3053401e+02	4.9937939e+06	1.5086280e+04
4.0500000e+02	1.5071049e+01	-1.6053117e+02	1.3058079e+02	5.0082745e+06	1.5079698e+04
4.0504001e+02	1.5069056e+01	-1.6053254e+02	1.3058274e+02	5.0088771e+06	1.5079424e+04
4.0600000e+02	1.5021107e+01	-1.6056533e+02	1.3062960e+02	5.0233500e+06	1.5072841e+04
4.0700000e+02	1.4971173e+01	-1.6059924e+02	1.3067853e+02	5.0384197e+06	1.5065981e+04
4.0800000e+02	1.4921258e+01	-1.6063293e+02	1.3072756e+02	5.0534822e+06	1.5059120e+04
4.0900000e+02	1.4871360e+01	-1.6066640e+02	1.3077669e+02	5.0685375e+06	1.5052258e+04

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**CALF TRACKING DATA (CONTINUED)**

Time (sec)	Elevation (deg)	Azimuth (deg)	Aspect Angle (deg)	Range (ft)	Range Rate (fps)
4.1000000e+02	1.4821471e+01	-1.6069960e+02	1.3082592e+02	5.0835870e+06	1.5045395e+04
4.1100000e+02	1.4771599e+01	-1.6073260e+02	1.3087526e+02	5.0986292e+06	1.5038531e+04
4.1200000e+02	1.4721744e+01	-1.6076538e+02	1.3092469e+02	5.1136642e+06	1.5031667e+04
4.1204001e+02	1.4719752e+01	-1.6076669e+02	1.3092667e+02	5.1142651e+06	1.5031392e+04
4.1295999e+02	1.4673896e+01	-1.6079663e+02	1.3097225e+02	5.1280917e+06	1.5025077e+04
4.1300000e+02	1.4671903e+01	-1.6079794e+02	1.3097422e+02	5.1286925e+06	1.5024803e+04
4.1304001e+02	1.4669911e+01	-1.6079924e+02	1.3097621e+02	5.1292934e+06	1.5024528e+04
4.1400000e+02	1.4622079e+01	-1.6083027e+02	1.3102386e+02	5.1437137e+06	1.5017937e+04
4.1500000e+02	1.4572273e+01	-1.6086241e+02	1.3107359e+02	5.1587274e+06	1.5011073e+04
4.1504001e+02	1.4570276e+01	-1.6086366e+02	1.3107559e+02	5.1593287e+06	1.5010798e+04
4.1600000e+02	1.4522472e+01	-1.6089431e+02	1.3112343e+02	5.1737358e+06	1.5004209e+04
4.1700000e+02	1.4472692e+01	-1.6092598e+02	1.3117337e+02	5.1887363e+06	1.4997344e+04
4.1800000e+02	1.4422926e+01	-1.6095748e+02	1.3122340e+02	5.2037300e+06	1.4990481e+04
4.1804001e+02	1.4420935e+01	-1.6095874e+02	1.3122540e+02	5.2043295e+06	1.4990207e+04
4.1900000e+02	1.4373167e+01	-1.6098873e+02	1.3127354e+02	5.2187177e+06	1.4983618e+04
4.2000000e+02	1.4323428e+01	-1.6101981e+02	1.3132377e+02	5.2336979e+06	1.4976756e+04
4.2100000e+02	1.4273703e+01	-1.6105068e+02	1.3137410e+02	5.2486706e+06	1.4969896e+04
4.2200000e+02	1.4223990e+01	-1.6108134e+02	1.3142452e+02	5.2636373e+06	1.4963036e+04
4.2300000e+02	1.4174288e+01	-1.6111177e+02	1.3147506e+02	5.2785972e+06	1.4956177e+04
4.2400000e+02	1.4124601e+01	-1.6114203e+02	1.3152568e+02	5.2935502e+06	1.4949321e+04
4.2407999e+02	1.4120630e+01	-1.6114444e+02	1.3152979e+02	5.2947456e+06	1.4948946e+04
4.2412000e+02	1.4118642e+01	-1.6114565e+02	1.3152963e+02	5.2953436e+06	1.4949447e+04
4.2416000e+02	1.4116654e+01	-1.6114686e+02	1.3151440e+02	5.2959416e+06	1.4950559e+04
4.2500000e+02	1.4074737e+01	-1.6117200e+02	1.3321863e+02	5.3085131e+06	1.4982611e+04
4.2600000e+02	1.4024389e+01	-1.6120153e+02	1.33561027e+02	5.3235175e+06	1.5028165e+04
4.2700000e+02	1.3973531e+01	-1.6123058e+02	1.3625959e+02	5.3385710e+06	1.5078604e+04
4.2800000e+02	1.3922153e+01	-1.6125920e+02	1.3676993e+02	5.3536762e+06	1.5132325e+04
4.2900000e+02	1.3870240e+01	-1.6128734e+02	1.3724062e+02	5.3688363e+06	1.5188019e+04
4.2907999e+02	1.3866067e+01	-1.6128958e+02	1.3727502e+02	5.3700512e+06	1.5192559e+04
4.3000000e+02	1.3817793e+01	-1.6131503e+02	1.3773668e+02	5.3840527e+06	1.5245489e+04
4.3100000e+02	1.3764806e+01	-1.6134229e+02	1.3807547e+02	5.3993274e+06	1.5304275e+04
4.3200000e+02	1.3711275e+01	-1.6136909e+02	1.3823868e+02	5.4146624e+06	1.5364729e+04
4.3300000e+02	1.3657203e+01	-1.6139550e+02	1.3831961e+02	5.4300575e+06	1.5427204e+04
4.3400000e+02	1.3602564e+01	-1.6142144e+02	1.3840297e+02	5.4455171e+06	1.5491818e+04
4.3500000e+02	1.3547355e+01	-1.6144699e+02	1.3851544e+02	5.4610424e+06	1.5558726e+04
4.3600000e+02	1.3491560e+01	-1.6147208e+02	1.3863845e+02	5.4766358e+06	1.5628097e+04
4.3700000e+02	1.3435166e+01	-1.6149676e+02	1.3876373e+02	5.4922995e+06	1.5699965e+04
4.3800000e+02	1.3378161e+01	-1.6152102e+02	1.3887374e+02	5.5080361e+06	1.5774403e+04
4.3900000e+02	1.3320531e+01	-1.6154487e+02	1.3901062e+02	5.5238487e+06	1.5851284e+04
4.4000000e+02	1.3262261e+01	-1.6156827e+02	1.3924781e+02	5.5397397e+06	1.5930309e+04
4.4100000e+02	1.3203357e+01	-1.6159128e+02	1.3955637e+02	5.5557097e+06	1.6011017e+04
4.4200000e+02	1.3143807e+01	-1.6161388e+02	1.3979372e+02	5.5717622e+06	1.6092888e+04
4.4300000e+02	1.3083626e+01	-1.6163611e+02	1.3992533e+02	5.5878959e+06	1.6175903e+04
4.4400000e+02	1.3022806e+01	-1.6165794e+02	1.4002900e+02	5.6041142e+06	1.6260040e+04
4.4500000e+02	1.2961352e+01	-1.6167939e+02	1.4006439e+02	5.6204163e+06	1.6345477e+04
4.4600000e+02	1.2899254e+01	-1.6170047e+02	1.4009049e+02	5.6368055e+06	1.6432511e+04
4.4700000e+02	1.2836510e+01	-1.6172120e+02	1.4013513e+02	5.6532823e+06	1.6521356e+04
4.4800000e+02	1.2773110e+01	-1.6174154e+02	1.4020067e+02	5.6698493e+06	1.6612194e+04
4.4900000e+02	1.2709054e+01	-1.6176157e+02	1.4028527e+02	5.6865069e+06	1.6705011e+04
4.5000000e+02	1.2644323e+01	-1.6178124e+02	1.4034870e+02	5.7032596e+06	1.6800156e+04
4.5100000e+02	1.2578911e+01	-1.6180055e+02	1.4042084e+02	5.7201085e+06	1.6897567e+04
4.5200000e+02	1.2512815e+01	-1.6181954e+02	1.4049867e+02	5.7370557e+06	1.6997423e+04
4.5300000e+02	1.2446020e+01	-1.6183820e+02	1.4058460e+02	5.7541041e+06	1.7099695e+04
4.5400000e+02	1.2378519e+01	-1.6185654e+02	1.4065190e+02	5.7712557e+06	1.7204460e+04
4.5500000e+02	1.2310302e+01	-1.6187458e+02	1.4072594e+02	5.7885136e+06	1.7311733e+04
4.5600000e+02	1.2241359e+01	-1.6189229e+02	1.4082946e+02	5.8058804e+06	1.7421514e+04
4.5700000e+02	1.2171683e+01	-1.6190973e+02	1.4090796e+02	5.8233577e+06	1.7533771e+04
4.5800000e+02	1.2101271e+01	-1.6192686e+02	1.4097162e+02	5.8409485e+06	1.7648416e+04
4.5900000e+02	1.2030110e+01	-1.6194373e+02	1.4103285e+02	5.8586551e+06	1.7765451e+04
4.6000000e+02	1.1958192e+01	-1.6196030e+02	1.4111909e+02	5.8764808e+06	1.7884992e+04
4.6100000e+02	1.1885520e+01	-1.6197663e+02	1.4122199e+02	5.8944261e+06	1.8007088e+04
4.6200000e+02	1.1812079e+01	-1.6199271e+02	1.4127952e+02	5.9124950e+06	1.8131808e+04
4.6300000e+02	1.1737862e+01	-1.6200854e+02	1.4131480e+02	5.9306900e+06	1.8259192e+04
4.6400000e+02	1.1662856e+01	-1.6202411e+02	1.4133330e+02	5.9490151e+06	1.8389224e+04

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**CALF TRACKING DATA (CONTINUED)**

Time (sec)	Elevation (deg)	Azimuth (deg)	Aspect Angle (deg)	Range (ft)	Range Rate (fps)
4.6500000e+02	1.1587065e+01	-1.6203951e+02	1.4136705e+02	5.9674699e+06	1.8521952e+04
4.6600000e+02	1.1510473e+01	-1.6205466e+02	1.4137675e+02	5.9860592e+06	1.8657415e+04
4.6700000e+02	1.1433070e+01	-1.6206960e+02	1.4138909e+02	6.0047861e+06	1.8795739e+04
4.6800000e+02	1.1354851e+01	-1.6208437e+02	1.4140210e+02	6.0236516e+06	1.8937054e+04
4.6900000e+02	1.1275801e+01	-1.6209895e+02	1.4142520e+02	6.0426611e+06	1.9081429e+04
4.7000000e+02	1.1195917e+01	-1.6211334e+02	1.4148852e+02	6.0618158e+06	1.9228996e+04
4.7064001e+02	1.1144346e+01	-1.6212248e+02	1.4152819e+02	6.0741530e+06	1.9325282e+04
4.7100000e+02	1.1115183e+01	-1.6212759e+02	1.4158098e+02	6.0811200e+06	1.9380045e+04
4.7200000e+02	1.1033593e+01	-1.6214168e+02	1.4171994e+02	6.1005772e+06	1.9534750e+04
4.7300000e+02	1.0951140e+01	-1.6215564e+02	1.4179273e+02	6.1201907e+06	1.9693118e+04
4.7400000e+02	1.0867813e+01	-1.6216949e+02	1.4182399e+02	6.1399643e+06	1.9855198e+04
4.7500000e+02	1.0783596e+01	-1.6218322e+02	1.4181185e+02	6.1599027e+06	2.0021206e+04
4.7600000e+02	1.0698486e+01	-1.6219687e+02	1.4183238e+02	6.1800082e+06	2.0191163e+04
4.7700000e+02	1.0612462e+01	-1.6221042e+02	1.4180498e+02	6.2002861e+06	2.0365301e+04
4.7800000e+02	1.0525511e+01	-1.6222393e+02	1.4181383e+02	6.2207401e+06	2.0543657e+04
4.7900000e+02	1.0437616e+01	-1.6223735e+02	1.4182604e+02	6.2413753e+06	2.0725953e+04
4.8000000e+02	1.0348777e+01	-1.6225075e+02	1.4182381e+02	6.2621937e+06	2.0912585e+04
4.8100000e+02	1.0258974e+01	-1.6226414e+02	1.4180313e+02	6.2832009e+06	2.1103724e+04
4.8200000e+02	1.0168197e+01	-1.6227750e+02	1.4215731e+02	6.3044012e+06	2.1293997e+04
4.8300000e+02	1.0076582e+01	-1.6229086e+02	1.4315845e+02	6.3257806e+06	2.1460658e+04
4.8400000e+02	9.9843221e+00	-1.6230424e+02	1.4253417e+02	6.3473182e+06	2.1613153e+04
4.8500000e+02	9.8914783e+00	-1.6231766e+02	1.4195693e+02	6.3690048e+06	2.1758646e+04
4.8600000e+02	9.7980834e+00	-1.6233108e+02	1.4176155e+02	6.3908343e+06	2.1899999e+04
4.8700000e+02	9.7041652e+00	-1.6234451e+02	1.4173754e+02	6.4128033e+06	2.2037504e+04
4.8800000e+02	9.6097642e+00	-1.6235793e+02	1.4173531e+02	6.4349078e+06	2.2170127e+04
4.8900000e+02	9.5149372e+00	-1.6237137e+02	1.4171343e+02	6.4571409e+06	2.2295385e+04
4.9000000e+02	9.4197566e+00	-1.6238481e+02	1.4138921e+02	6.4794940e+06	2.2407942e+04
4.9100000e+02	9.3243429e+00	-1.6239825e+02	1.4116444e+02	6.5019499e+06	2.2496717e+04
4.9200000e+02	9.2289610e+00	-1.6241166e+02	1.4046912e+02	6.5244701e+06	2.2535475e+04
4.9295999e+02	9.1377132e+00	-1.6242444e+02	1.3944107e+02	6.5461093e+06	2.2544816e+04
4.9300000e+02	9.1339211e+00	-1.6242497e+02	1.3941683e+02	6.5470106e+06	2.2545106e+04
4.9400000e+02	9.0393036e+00	-1.6243817e+02	1.3930882e+02	6.5695596e+06	2.2552240e+04
4.9500000e+02	8.9451146e+00	-1.6245125e+02	1.3989639e+02	6.5921151e+06	2.2559200e+04
4.9600000e+02	8.8513471e+00	-1.6246423e+02	1.4068348e+02	6.6146778e+06	2.2566029e+04
4.9700000e+02	8.7579970e+00	-1.6247711e+02	1.4127716e+02	6.6372475e+06	2.2572735e+04
4.9795999e+02	8.6687732e+00	-1.6248938e+02	1.4149712e+02	6.6589202e+06	2.2579051e+04
4.9800000e+02	8.6650629e+00	-1.6248989e+02	1.4149835e+02	6.6598235e+06	2.2579312e+04
4.9900000e+02	8.5725408e+00	-1.6250257e+02	1.4216184e+02	6.6824056e+06	2.2585529e+04
5.0000000e+02	8.4804219e+00	-1.6251515e+02	1.4397092e+02	6.7049945e+06	2.2591677e+04
5.0100000e+02	8.3887058e+00	-1.6252762e+02	1.4651583e+02	6.7275892e+06	2.2597871e+04
5.0200000e+02	8.2973918e+00	-1.6254001e+02	1.4899785e+02	6.7501901e+06	2.2604047e+04
5.0300000e+02	8.2064758e+00	-1.6255228e+02	1.5090734e+02	6.7727968e+06	2.2610167e+04
5.0400000e+02	8.1159532e+00	-1.6256447e+02	1.5221603e+02	6.7954102e+06	2.2616149e+04
5.0500000e+02	8.0258209e+00	-1.6257656e+02	1.5306961e+02	6.8180294e+06	2.2622002e+04
5.0600000e+02	7.9360762e+00	-1.6258853e+02	1.5367164e+02	6.8406543e+06	2.2627720e+04
5.0700000e+02	7.8467135e+00	-1.6260045e+02	1.5411026e+02	6.8632848e+06	2.2633327e+04
5.0800000e+02	7.7577309e+00	-1.6261224e+02	1.5443045e+02	6.8859209e+06	2.2638815e+04
5.0900000e+02	7.6691214e+00	-1.6262396e+02	1.5466942e+02	6.9085631e+06	2.2644210e+04
5.1000000e+02	7.5808891e+00	-1.6263558e+02	1.5484820e+02	6.9312093e+06	2.2649507e+04
5.1100000e+02	7.4930217e+00	-1.6264712e+02	1.5498114e+02	6.9538614e+06	2.2654717e+04
5.1200000e+02	7.4055203e+00	-1.6265858e+02	1.5508060e+02	6.9765189e+06	2.2659836e+04
5.1300000e+02	7.3183795e+00	-1.6266993e+02	1.5515642e+02	6.9991814e+06	2.2664867e+04
5.1400000e+02	7.2315994e+00	-1.6268122e+02	1.5522422e+02	7.0218483e+06	2.2669812e+04
5.1500000e+02	7.1451750e+00	-1.6269240e+02	1.5527696e+02	7.0445202e+06	2.2674681e+04
5.1600000e+02	7.0590960e+00	-1.6270349e+02	1.5532223e+02	7.0671983e+06	2.2679466e+04
5.1700000e+02	6.9733694e+00	-1.6271452e+02	1.5537065e+02	7.0898799e+06	2.2684177e+04
5.1800000e+02	6.8879911e+00	-1.6272546e+02	1.5540183e+02	7.1125657e+06	2.2688810e+04
5.1900000e+02	6.8029510e+00	-1.6273631e+02	1.5543524e+02	7.1352568e+06	2.2693364e+04
5.2000000e+02	6.7182505e+00	-1.6274708e+02	1.5547076e+02	7.1579525e+06	2.2697843e+04
5.2100000e+02	6.6338844e+00	-1.6275778e+02	1.5550826e+02	7.1806528e+06	2.2702250e+04
5.2200000e+02	6.5498506e+00	-1.6276838e+02	1.5554927e+02	7.2033575e+06	2.2706578e+04
5.2300000e+02	6.4661486e+00	-1.6277893e+02	1.5557173e+02	7.2260661e+06	2.2710839e+04
5.2400000e+02	6.3827719e+00	-1.6278938e+02	1.5559542e+02	7.2487789e+06	2.2715026e+04
5.2500000e+02	6.2997193e+00	-1.6279976e+02	1.5562068e+02	7.2714960e+06	2.2719144e+04

**CALF TRACKING DATA (CONTINUED)**

Time (sec)	Elevation (deg)	Azimuth (deg)	Aspect Angle (deg)	Range (ft)	Range Rate (fps)
5.2600000e+02	6.2169886e+00	-1.6281007e+02	1.5564746e+02	7.2942167e+06	2.2723195e+04
5.2700000e+02	6.1345704e+00	-1.6282029e+02	1.5567569e+02	7.3169428e+06	2.2727178e+04
5.2800000e+02	6.0524715e+00	-1.6283043e+02	1.5570531e+02	7.3396717e+06	2.2731094e+04
5.2900000e+02	5.9706842e+00	-1.6284051e+02	1.5573626e+02	7.3624046e+06	2.2734945e+04
5.3000000e+02	5.8892058e+00	-1.6285052e+02	1.5576849e+02	7.3851415e+06	2.2738732e+04
5.3100000e+02	5.8080358e+00	-1.6286047e+02	1.5580574e+02	7.4078816e+06	2.2742451e+04
5.3200000e+02	5.7271658e+00	-1.6287032e+02	1.5583958e+02	7.4306262e+06	2.2746112e+04
5.3300000e+02	5.6465972e+00	-1.6288012e+02	1.5585594e+02	7.4533746e+06	2.2749707e+04
5.3400000e+02	5.5663304e+00	-1.6288984e+02	1.5587334e+02	7.4761253e+06	2.2753239e+04
5.3500000e+02	5.4863541e+00	-1.6289948e+02	1.5589174e+02	7.4988810e+06	2.2756713e+04
5.3600000e+02	5.4066751e+00	-1.6290908e+02	1.5591114e+02	7.5216390e+06	2.2760126e+04
5.3700000e+02	5.3272861e+00	-1.6291860e+02	1.5593152e+02	7.5444005e+06	2.2763481e+04
5.3800000e+02	5.2481813e+00	-1.6292803e+02	1.5595286e+02	7.5671661e+06	2.2766779e+04
5.3900000e+02	5.1693658e+00	-1.6293742e+02	1.5597514e+02	7.5899342e+06	2.2770019e+04
5.4000000e+02	5.0908306e+00	-1.6294674e+02	1.5599834e+02	7.6127059e+06	2.2773201e+04
5.4100000e+02	5.0125773e+00	-1.6295599e+02	1.5602244e+02	7.6354807e+06	2.2776328e+04
5.4200000e+02	4.9345995e+00	-1.6296516e+02	1.5604741e+02	7.6582590e+06	2.2779398e+04
5.4300000e+02	4.8569002e+00	-1.6297430e+02	1.5607324e+02	7.6810394e+06	2.2782414e+04
5.4400000e+02	4.7794723e+00	-1.6298335e+02	1.5610829e+02	7.7038234e+06	2.2785373e+04
5.4500000e+02	4.7023128e+00	-1.6299233e+02	1.5614641e+02	7.7266107e+06	2.2788280e+04
5.4600000e+02	4.6254253e+00	-1.6300128e+02	1.5618533e+02	7.7494001e+06	2.2791132e+04
5.4700000e+02	4.5488035e+00	-1.6301015e+02	1.5622416e+02	7.7721925e+06	2.2793934e+04
5.4800000e+02	4.4724442e+00	-1.6301896e+02	1.5623418e+02	7.7949877e+06	2.2796683e+04
5.4900000e+02	4.3963447e+00	-1.6302770e+02	1.5624492e+02	7.8177862e+06	2.2799377e+04
5.5000000e+02	4.3205083e+00	-1.6303641e+02	1.5625636e+02	7.8405865e+06	2.2802022e+04
5.5100000e+02	4.2449276e+00	-1.6304504e+02	1.5626847e+02	7.8633896e+06	2.2804614e+04
5.5200000e+02	4.1695991e+00	-1.6305360e+02	1.5628125e+02	7.8861960e+06	2.2807156e+04
5.5288000e+02	4.1035206e+00	-1.6306110e+02	1.5629303e+02	7.9062671e+06	2.2809351e+04
5.5296002e+02	4.0975252e+00	-1.6306179e+02	1.5629412e+02	7.9080915e+06	2.2809549e+04
5.5300000e+02	4.0945250e+00	-1.6306211e+02	1.5629470e+02	7.9090045e+06	2.2809649e+04
5.5400000e+02	4.0197010e+00	-1.6307057e+02	1.5633071e+02	7.9318155e+06	2.2812138e+04
5.5496002e+02	3.9481047e+00	-1.6307864e+02	1.5640385e+02	7.9537159e+06	2.2814481e+04
5.5500000e+02	3.9451264e+00	-1.6307898e+02	1.5640771e+02	7.9546284e+06	2.2814578e+04
5.5520001e+02	3.9302396e+00	-1.6308064e+02	1.5642799e+02	7.9591918e+06	2.2815061e+04
5.5591998e+02	3.8767337e+00	-1.6308664e+02	1.5651439e+02	7.9756194e+06	2.2816780e+04
5.5596002e+02	3.8737648e+00	-1.6308698e+02	1.5651981e+02	7.9765320e+06	2.2816875e+04
5.5600000e+02	3.8707963e+00	-1.6308731e+02	1.5652529e+02	7.9774446e+06	2.2816970e+04
5.5700000e+02	3.7967121e+00	-1.6309560e+02	1.5764607e+02	8.0002625e+06	2.2819331e+04
5.5800000e+02	3.7228689e+00	-1.6310384e+02	1.5811088e+02	8.0230829e+06	2.2821629e+04
5.5900000e+02	3.6492662e+00	-1.6311202e+02	1.5773415e+02	8.0459056e+06	2.2823879e+04
5.6000000e+02	3.5759004e+00	-1.6312014e+02	1.5655277e+02	8.0687307e+06	2.2826083e+04
5.6100000e+02	3.5027704e+00	-1.6312820e+02	1.5467602e+02	8.0915580e+06	2.2828239e+04
5.6200000e+02	3.4298741e+00	-1.6313621e+02	1.5224201e+02	8.1143876e+06	2.2830349e+04
5.6300000e+02	3.3572126e+00	-1.6314418e+02	1.4938123e+02	8.1372187e+06	2.2832411e+04
5.6400000e+02	3.2847813e+00	-1.6315210e+02	1.4620025e+02	8.1600516e+06	2.2834426e+04
5.6500000e+02	3.2125758e+00	-1.6315996e+02	1.4277985e+02	8.1828873e+06	2.2836394e+04
5.6600000e+02	3.1405965e+00	-1.6316776e+02	1.3917930e+02	8.2057250e+06	2.2838313e+04
5.6700000e+02	3.0688447e+00	-1.6317553e+02	1.3544173e+02	8.2285637e+06	2.2840189e+04
5.6800000e+02	2.9973121e+00	-1.6318321e+02	1.3159875e+02	8.2514054e+06	2.2842015e+04
5.6900000e+02	2.9260032e+00	-1.6319088e+02	1.2767375e+02	8.2742481e+06	2.2843795e+04
5.7000000e+02	2.8549132e+00	-1.6319848e+02	1.2368444e+02	8.2970926e+06	2.2845529e+04
5.7100000e+02	2.7840402e+00	-1.6320604e+02	1.1963969e+02	8.3199390e+06	2.2847209e+04
5.7200000e+02	2.7133825e+00	-1.6321355e+02	1.1539641e+02	8.3427871e+06	2.2848849e+04
5.7300000e+02	2.6429393e+00	-1.6322101e+02	1.1113983e+02	8.3656367e+06	2.2850443e+04
5.7400000e+02	2.5727062e+00	-1.6322841e+02	1.0677642e+02	8.3884883e+06	2.2851987e+04
5.7500000e+02	2.5026859e+00	-1.6323577e+02	1.0226466e+02	8.4113409e+06	2.2853483e+04
5.7600000e+02	2.4328743e+00	-1.6324309e+02	9.7559952e+01	8.4341948e+06	2.2854935e+04
5.7700000e+02	2.3632691e+00	-1.6325036e+02	9.5305130e+01	8.4570507e+06	2.2856448e+04
5.7800000e+02	2.2938693e+00	-1.6325759e+02	9.3771594e+01	8.4799077e+06	2.2857839e+04
5.7900000e+02	2.2246719e+00	-1.6326476e+02	9.2813166e+01	8.5027666e+06	2.2859179e+04
5.8000000e+02	2.1556791e+00	-1.6327189e+02	9.2024760e+01	8.5256263e+06	2.2860478e+04
5.8100000e+02	2.0868868e+00	-1.6327899e+02	9.1854634e+01	8.5484871e+06	2.2861753e+04
5.8200000e+02	2.0182920e+00	-1.6328603e+02	9.1792138e+01	8.5713496e+06	2.2862970e+04
5.8300000e+02	1.9498971e+00	-1.6329303e+02	9.1740890e+01	8.5942129e+06	2.2864149e+04

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**CALF TRACKING DATA (CONTINUED)**

Time (sec)	Elevation (deg)	Azimuth (deg)	Aspect Angle (deg)	Range (ft)	Range Rate (fps)
5.8400000e+02	1.8816959e+00	-1.6329998e+02	9.1700816e+01	8.6170778e+06	2.2865292e+04
5.8500000e+02	1.8136907e+00	-1.6330690e+02	9.1671836e+01	8.6399432e+06	2.2866397e+04
5.8600000e+02	1.7458759e+00	-1.6331376e+02	9.1653858e+01	8.6628106e+06	2.2867467e+04
5.8700000e+02	1.6782540e+00	-1.6332059e+02	9.1641781e+01	8.6856786e+06	2.2868501e+04
5.8800000e+02	1.6108216e+00	-1.6332736e+02	9.1639402e+01	8.7085477e+06	2.2869499e+04
5.8900000e+02	1.5435773e+00	-1.6333411e+02	9.1647090e+01	8.7314175e+06	2.2870461e+04
5.9000000e+02	1.4765213e+00	-1.6334082e+02	9.1664166e+01	8.7542882e+06	2.2871390e+04
5.9100000e+02	1.4096493e+00	-1.6334747e+02	9.1689975e+01	8.7771603e+06	2.2872282e+04
5.9200000e+02	1.3429602e+00	-1.6335408e+02	9.1723869e+01	8.8000333e+06	2.2873141e+04
5.9300000e+02	1.2764553e+00	-1.6336066e+02	9.1765197e+01	8.8229067e+06	2.2873966e+04
5.9400000e+02	1.2101318e+00	-1.6336720e+02	9.1813323e+01	8.8457811e+06	2.2874756e+04
5.9500000e+02	1.1439871e+00	-1.6337370e+02	9.1867641e+01	8.8686563e+06	2.2875513e+04
5.9600000e+02	1.0780223e+00	-1.6338016e+02	9.1929456e+01	8.8915318e+06	2.2876237e+04
5.9700000e+02	1.0122322e+00	-1.6338658e+02	9.2003570e+01	8.9144088e+06	2.2876928e+04
5.9800000e+02	9.4661934e-01	-1.6339296e+02	9.2083887e+01	8.9372859e+06	2.2877585e+04
5.9900000e+02	8.8118050e-01	-1.6339930e+02	9.2170356e+01	8.9601639e+06	2.2878210e+04
6.0000000e+02	8.1591524e-01	-1.6340561e+02	9.2262892e+01	8.9830422e+06	2.2878804e+04
6.0100000e+02	7.5082041e-01	-1.6341187e+02	9.2361438e+01	9.0059216e+06	2.2879366e+04
6.0200000e+02	6.8589750e-01	-1.6341811e+02	9.2465914e+01	9.0288010e+06	2.2879896e+04
6.0300000e+02	6.2114244e-01	-1.6342429e+02	9.2576258e+01	9.0516814e+06	2.2880394e+04
6.0400000e+02	5.5655580e-01	-1.6343046e+02	9.2692368e+01	9.0745622e+06	2.2880861e+04
6.0500000e+02	4.9213654e-01	-1.6343659e+02	9.2814168e+01	9.0974427e+06	2.2881297e+04
6.0600000e+02	4.2788119e-01	-1.6344266e+02	9.2941593e+01	9.1203246e+06	2.2881703e+04
6.0700000e+02	3.6379068e-01	-1.6344872e+02	9.3074509e+01	9.1432062e+06	2.2882077e+04
6.0800000e+02	2.9986345e-01	-1.6345474e+02	9.3212844e+01	9.1660885e+06	2.2882422e+04
6.0900000e+02	2.3609758e-01	-1.6346071e+02	9.3356497e+01	9.1889711e+06	2.2882736e+04
6.1000000e+02	1.7249203e-01	-1.6346666e+02	9.3505357e+01	9.2118538e+06	2.2883021e+04
6.1100000e+02	1.0904524e-01	-1.6347256e+02	9.3659323e+01	9.2347374e+06	2.2883276e+04
6.1200000e+02	4.5757333e-02	-1.6347844e+02	9.3818269e+01	9.2576205e+06	2.2883503e+04
6.1296002e+02	-1.4851641e-02	-1.6348405e+02	9.3975438e+01	9.2795888e+06	2.2883691e+04

**PPTQ TRACKING DATA**

Time (sec)	Elevation (deg)	Azimuth (deg)	Aspect Angle (deg)	Range (ft)	Range Rate (fps)
0.0000000e+00	3.2879098e+00	-1.6481515e+02	1.7772561e+02	5.6667783e+05	7.7723226e+02
1.6000000e-01	3.2868059e+00	-1.6481568e+02	1.7772574e+02	5.6680266e+05	7.7669983e+02
2.0000000e-01	3.2865307e+00	-1.6481577e+02	1.7772540e+02	5.6683252e+05	7.7656748e+02
1.0000000e+00	3.2799250e+00	-1.6481812e+02	1.7754921e+02	5.6745362e+05	7.7398210e+02
2.0000000e+00	3.2693754e+00	-1.6482105e+02	1.7717547e+02	5.6822590e+05	7.7088983e+02
3.0000000e+00	3.2563850e+00	-1.6482394e+02	1.7744430e+02	5.6899479e+05	7.6791070e+02
3.4800000e+00	3.2493269e+00	-1.6482522e+02	1.7763352e+02	5.6936401e+05	7.6649138e+02
3.7200000e+00	3.2456115e+00	-1.6482597e+02	1.7772464e+02	5.6954817e+05	7.6577735e+02
3.9600000e+00	3.2417857e+00	-1.6482669e+02	1.7779476e+02	5.6973089e+05	7.6504811e+02
4.0000000e+00	3.2411330e+00	-1.6482682e+02	1.7780348e+02	5.6976178e+05	7.6492446e+02
4.1999998e+00	3.2378303e+00	-1.6482743e+02	1.7783265e+02	5.6991486e+05	7.6429704e+02
4.3200002e+00	3.2358143e+00	-1.6482779e+02	1.7783708e+02	5.7000613e+05	7.6391319e+02
4.4400001e+00	3.2337704e+00	-1.6482815e+02	1.7783130e+02	5.7009738e+05	7.6352403e+02
5.0000000e+00	3.2238444e+00	-1.6482965e+02	1.7763204e+02	5.7052573e+05	7.6163347e+02
6.0000000e+00	3.2048968e+00	-1.6483257e+02	1.7651633e+02	5.7130972e+05	8.1411522e+02
7.0000000e+00	3.1850012e+00	-1.6483498e+02	1.7401265e+02	5.7215349e+05	8.7290716e+02
8.0000000e+00	3.1652459e+00	-1.6483753e+02	1.7218389e+02	5.7305621e+05	9.3188986e+02
9.0000000e+00	3.1464790e+00	-1.6483949e+02	1.7101618e+02	5.7401762e+05	9.9119544e+02
1.0000000e+01	3.1292872e+00	-1.6484135e+02	1.6955439e+02	5.7503838e+05	1.0510437e+03
1.1000000e+01	3.1142568e+00	-1.6484313e+02	1.6794010e+02	5.7612031e+05	1.1113772e+03
1.2000000e+01	3.1019360e+00	-1.6484432e+02	1.6620311e+02	5.7726232e+05	1.1721076e+03
1.3000000e+01	3.0928485e+00	-1.6484562e+02	1.6434512e+02	5.7846445e+05	1.2326845e+03
1.4000000e+01	3.0875301e+00	-1.6484656e+02	1.6235118e+02	5.7972696e+05	1.2929189e+03
1.5000000e+01	3.0865371e+00	-1.6484714e+02	1.6025582e+02	5.8105033e+05	1.3525485e+03
1.6000000e+01	3.0904986e+00	-1.6484772e+02	1.5778169e+02	5.8243125e+05	1.4106626e+03
1.7000000e+01	3.1000986e+00	-1.6484805e+02	1.5642487e+02	5.8386958e+05	1.4674230e+03
1.8000000e+01	3.1155660e+00	-1.6484796e+02	1.5633853e+02	5.8536753e+05	1.5269841e+03
1.9000000e+01	3.1367495e+00	-1.6484790e+02	1.5580092e+02	5.8692526e+05	1.5893001e+03
2.0000000e+01	3.1636142e+00	-1.6484752e+02	1.5511767e+02	5.8854673e+05	1.6535369e+03
2.1000000e+01	3.1962015e+00	-1.6484683e+02	1.5452295e+02	5.9023213e+05	1.7188260e+03
2.2000000e+01	3.2344388e+00	-1.6484589e+02	1.5394479e+02	5.9198426e+05	1.7839938e+03
2.3000000e+01	3.2782278e+00	-1.6484463e+02	1.5351732e+02	5.9380054e+05	1.8491750e+03
2.4000000e+01	3.3274327e+00	-1.6484335e+02	1.5278868e+02	5.9568317e+05	1.9147041e+03
2.5000000e+01	3.3821135e+00	-1.6484154e+02	1.5209902e+02	5.9763092e+05	1.9797132e+03
2.6000000e+01	3.4423443e+00	-1.6483964e+02	1.5153187e+02	5.9964293e+05	2.0450653e+03
2.7000000e+01	3.5081323e+00	-1.6483744e+02	1.5104442e+02	6.0172009e+05	2.1112553e+03
2.8000000e+01	3.5794514e+00	-1.6483500e+02	1.5059720e+02	6.0386539e+05	2.1786870e+03
2.9000000e+01	3.6562971e+00	-1.6483209e+02	1.5003330e+02	6.0607838e+05	2.2472683e+03
3.0000000e+01	3.7386839e+00	-1.6482917e+02	1.4985171e+02	6.0835963e+05	2.3173461e+03
3.1000000e+01	3.8263599e+00	-1.6482570e+02	1.5107111e+02	6.1071509e+05	2.3929100e+03
3.2000000e+01	3.9185130e+00	-1.6482184e+02	1.5199456e+02	6.1314970e+05	2.4775529e+03
3.3000000e+01	4.0145050e+00	-1.6481755e+02	1.5154812e+02	6.1567050e+05	2.5653078e+03
3.4000000e+01	4.1144093e+00	-1.6481311e+02	1.5137817e+02	6.1828007e+05	2.6542584e+03
3.5000000e+01	4.2182590e+00	-1.6480811e+02	1.5123541e+02	6.2097998e+05	2.7457113e+03
3.6000000e+01	4.3260492e+00	-1.6480259e+02	1.5101744e+02	6.2377200e+05	2.8395669e+03
3.7000000e+01	4.4377761e+00	-1.6479687e+02	1.5086902e+02	6.2666001e+05	2.9357862e+03
3.8000000e+01	4.5534581e+00	-1.6479051e+02	1.5071972e+02	6.2964433e+05	3.0347276e+03
3.9000000e+01	4.6730464e+00	-1.6478385e+02	1.5074289e+02	6.3273019e+05	3.1365649e+03
4.0000000e+01	4.7964799e+00	-1.6477670e+02	1.5075992e+02	6.3591861e+05	3.2418937e+03
4.1000000e+01	4.9236783e+00	-1.6476919e+02	1.5070623e+02	6.3921543e+05	3.3501937e+03
4.2000000e+01	5.0546637e+00	-1.6476111e+02	1.5065540e+02	6.4262046e+05	3.4616848e+03
4.3000000e+01	5.1893952e+00	-1.6475279e+02	1.5061968e+02	6.4613904e+05	3.5761402e+03
4.4000000e+01	5.3278413e+00	-1.6474387e+02	1.5062107e+02	6.4977428e+05	3.6937336e+03
4.5000000e+01	5.4699832e+00	-1.6473460e+02	1.5060539e+02	6.5352753e+05	3.8145038e+03
4.6000000e+01	5.6157606e+00	-1.6472507e+02	1.5063110e+02	6.5740345e+05	3.9384085e+03
4.7000000e+01	5.7650849e+00	-1.6471498e+02	1.5068016e+02	6.6140648e+05	4.0654507e+03
4.8000000e+01	5.9179080e+00	-1.6470453e+02	1.5077873e+02	6.6553666e+05	4.1957003e+03
4.9000000e+01	6.0741053e+00	-1.6469381e+02	1.5091636e+02	6.6979861e+05	4.3293114e+03
5.0000000e+01	6.2335559e+00	-1.6468250e+02	1.5098639e+02	6.7419543e+05	4.4660094e+03
5.1000000e+01	6.3961517e+00	-1.6467088e+02	1.5107203e+02	6.7873120e+05	4.6058305e+03
5.2000000e+01	6.5618059e+00	-1.6465899e+02	1.5116146e+02	6.8340793e+05	4.7487630e+03
5.3000000e+01	6.7304069e+00	-1.6464673e+02	1.5169744e+02	6.8822957e+05	4.8951386e+03
5.4000000e+01	6.9016717e+00	-1.6463400e+02	1.5306139e+02	6.9320111e+05	5.0475869e+03
5.5000000e+01	7.0751304e+00	-1.6462076e+02	1.5424732e+02	6.9832856e+05	5.2073557e+03

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**PPTQ TRACKING DATA (CONTINUED)**

Time (sec)	Elevation (deg)	Azimuth (deg)	Aspect Angle (deg)	Range (ft)	Range Rate (fps)
5.6000000e+01	7.2504055e+00	-1.6460736e+02	1.5539005e+02	7.0361821e+05	5.3742393e+03
5.7000000e+01	7.4271394e+00	-1.6459323e+02	1.5655627e+02	7.0907935e+05	5.5483064e+03
5.8000000e+01	7.6050415e+00	-1.6457887e+02	1.5739278e+02	7.1471642e+05	5.7293330e+03
5.9000000e+01	7.7838868e+00	-1.6456410e+02	1.5735144e+02	7.2053910e+05	5.9161320e+03
6.0000000e+01	7.9637750e+00	-1.6454880e+02	1.5749845e+02	7.2655031e+05	6.1073463e+03
6.1000000e+01	8.1446260e+00	-1.6453307e+02	1.5776419e+02	7.3275493e+05	6.3030288e+03
6.2000000e+01	8.3264269e+00	-1.6451705e+02	1.5804070e+02	7.3915912e+05	6.5039778e+03
6.3000000e+01	8.5091609e+00	-1.6450060e+02	1.5831766e+02	7.4576574e+05	6.7112436e+03
6.4000000e+01	8.6927794e+00	-1.6448391e+02	1.5860375e+02	7.5258382e+05	6.9255664e+03
6.5000000e+01	8.8772848e+00	-1.6446674e+02	1.5889947e+02	7.5961965e+05	7.1473702e+03
6.6000000e+01	9.0626690e+00	-1.6444924e+02	1.5921450e+02	7.6688109e+05	7.3774875e+03
6.7000000e+01	9.2489195e+00	-1.6443125e+02	1.5955673e+02	7.7437725e+05	7.6165318e+03
6.8000000e+01	9.4359704e+00	-1.6441308e+02	1.5991099e+02	7.8211534e+05	7.8561873e+03
6.9000000e+01	9.6229263e+00	-1.6439461e+02	1.6033792e+02	7.9006928e+05	8.0388586e+03
7.0000000e+01	9.8074369e+00	-1.6437602e+02	1.6088711e+02	7.9816127e+05	8.1310971e+03
7.1000000e+01	9.9875233e+00	-1.6435768e+02	1.6136929e+02	8.0631440e+05	8.1678242e+03
7.2000000e+01	1.0162443e+01	-1.6433957e+02	1.6181974e+02	8.1449012e+05	8.1839427e+03
7.3000000e+01	1.0331978e+01	-1.6432154e+02	1.6225304e+02	8.2267855e+05	8.1921932e+03
7.4000000e+01	1.0496178e+01	-1.6430381e+02	1.6267613e+02	8.3087348e+05	8.1969241e+03
7.5000000e+01	1.0655134e+01	-1.6428636e+02	1.6309304e+02	8.3907283e+05	8.1995002e+03
7.6000000e+01	1.0808995e+01	-1.6426927e+02	1.6350418e+02	8.4727274e+05	8.2004488e+03
7.6360001e+01	1.0863167e+01	-1.6426311e+02	1.6365189e+02	8.5022422e+05	8.2004733e+03
7.7000000e+01	1.0957874e+01	-1.6425222e+02	1.6390640e+02	8.5547248e+05	8.2001880e+03
7.8000000e+01	1.1101890e+01	-1.6423551e+02	1.6425479e+02	8.6367168e+05	8.1989489e+03
7.9000000e+01	1.1241153e+01	-1.6421900e+02	1.6461146e+02	8.7187044e+05	8.1968640e+03
8.0000000e+01	1.1375829e+01	-1.6420264e+02	1.6499328e+02	8.8006568e+05	8.1941521e+03
8.1000000e+01	1.1506007e+01	-1.6418660e+02	1.6538396e+02	8.8825903e+05	8.1909985e+03
8.2000000e+01	1.1631846e+01	-1.6417070e+02	1.6577538e+02	8.9644807e+05	8.1875062e+03
8.3000000e+01	1.1753454e+01	-1.6415509e+02	1.6616552e+02	9.0463318e+05	8.1837192e+03
8.3760002e+01	1.1843105e+01	-1.6414324e+02	1.6646129e+02	9.1085197e+05	8.1806537e+03
8.4000000e+01	1.1870940e+01	-1.6413963e+02	1.6655607e+02	9.1281460e+05	8.1796523e+03
8.5000000e+01	1.1984397e+01	-1.6412433e+02	1.6701619e+02	9.2099333e+05	8.1753203e+03
8.6000000e+01	1.2093984e+01	-1.6410929e+02	1.6750494e+02	9.2916585e+05	8.1707424e+03
8.6760002e+01	1.21747430e+01	-1.6409788e+02	1.6784674e+02	9.3537373e+05	8.1671023e+03
8.7000000e+01	1.2199778e+01	-1.6409438e+02	1.6794773e+02	9.3733375e+05	8.1659234e+03
8.8000000e+01	1.2301858e+01	-1.6407962e+02	1.6833941e+02	9.4549808e+05	8.1608645e+03
8.9000000e+01	1.2400374e+01	-1.6406510e+02	1.6869920e+02	9.5365533e+05	8.1555790e+03
8.9760002e+01	1.2472874e+01	-1.6405415e+02	1.6894472e+02	9.5985297e+05	8.1514182e+03
9.0000000e+01	1.2495370e+01	-1.6405072e+02	1.6901830e+02	9.6180847e+05	8.1500795e+03
9.0760002e+01	1.2565291e+01	-1.6403999e+02	1.6925923e+02	9.6800060e+05	8.1457612e+03
9.1000000e+01	1.2586968e+01	-1.6403660e+02	1.6933735e+02	9.6995535e+05	8.1443631e+03
9.1160004e+01	1.2601299e+01	-1.6403426e+02	1.6938989e+02	9.7125924e+05	8.1434248e+03
9.1599998e+01	1.2640328e+01	-1.6402815e+02	1.6953627e+02	9.7484072e+05	8.1411490e+03
9.1639999e+01	1.2643828e+01	-1.6402765e+02	1.6954903e+02	9.7516731e+05	8.1419007e+03
9.1680000e+01	1.2647336e+01	-1.6402700e+02	1.6956357e+02	9.7549318e+05	8.1432560e+03
9.2000000e+01	1.2675268e+01	-1.6402252e+02	1.6994484e+02	9.7810126e+05	8.1586086e+03
9.2040001e+01	1.2678758e+01	-1.6402200e+02	1.7003105e+02	9.7842659e+05	8.1606365e+03
9.3000000e+01	1.2760786e+01	-1.6400851e+02	1.7180679e+02	9.8628569e+05	8.2112312e+03
9.4000000e+01	1.2843622e+01	-1.6399469e+02	1.6830436e+02	9.9452478e+05	8.2669501e+03
9.5000000e+01	1.2923977e+01	-1.6398133e+02	1.6070649e+02	1.0028192e+06	8.3240116e+03
9.6000000e+01	1.3002006e+01	-1.6396918e+02	1.5387230e+02	1.0111733e+06	8.3812022e+03
9.7000000e+01	1.3078010e+01	-1.6395882e+02	1.4858102e+02	1.0195822e+06	8.4382170e+03
9.8000000e+01	1.3152166e+01	-1.6395050e+02	1.4483194e+02	1.0280480e+06	8.4952207e+03
9.9000000e+01	1.3224632e+01	-1.6394448e+02	1.4238056e+02	1.0365729e+06	8.5528089e+03
1.0000000e+02	1.3295611e+01	-1.6394093e+02	1.4090455e+02	1.0451550e+06	8.6114844e+03
1.0100000e+02	1.3365218e+01	-1.6394009e+02	1.4014161e+02	1.0537963e+06	8.6716392e+03
1.0160000e+02	1.3406367e+01	-1.6394088e+02	1.3994710e+02	1.0590104e+06	8.7085924e+03
1.0200000e+02	1.3433559e+01	-1.6394192e+02	1.4011119e+02	1.0624987e+06	8.7336078e+03
1.0300000e+02	1.3500716e+01	-1.6394664e+02	1.4107563e+02	1.0712641e+06	8.7985164e+03
1.0400000e+02	1.3566726e+01	-1.6395399e+02	1.4163774e+02	1.0800966e+06	8.8662192e+03
1.0500000e+02	1.3631661e+01	-1.6396392e+02	1.4215449e+02	1.0889982e+06	8.9366588e+03
1.0600000e+02	1.3695585e+01	-1.6397666e+02	1.4272428e+02	1.0979706e+06	9.0099761e+03
1.0700000e+02	1.3758508e+01	-1.6399196e+02	1.4333013e+02	1.1070195e+06	9.0863032e+03
1.0800000e+02	1.3820523e+01	-1.6400987e+02	1.4392687e+02	1.1161448e+06	9.1657379e+03

**PPTQ TRACKING DATA (CONTINUED)**

Time (sec)	Elevation (deg)	Azimuth (deg)	Aspect Angle (deg)	Range (ft)	Range Rate (fps)
1.0900000e+02	1.3881654e+01	-1.6403040e+02	1.4452864e+02	1.1253509e+06	9.2483633e+03
1.1000000e+02	1.3941912e+01	-1.6405342e+02	1.4513089e+02	1.1346428e+06	9.3340282e+03
1.1100000e+02	1.4001381e+01	-1.6407898e+02	1.4574180e+02	1.1440206e+06	9.4227764e+03
1.1200000e+02	1.4060075e+01	-1.6410708e+02	1.4636395e+02	1.1534885e+06	9.5147382e+03
1.1300000e+02	1.4118018e+01	-1.6413758e+02	1.4695687e+02	1.1630505e+06	9.6099957e+03
1.1400000e+02	1.4175246e+01	-1.6417046e+02	1.4756355e+02	1.1727098e+06	9.7085719e+03
1.1500000e+02	1.4231799e+01	-1.6420580e+02	1.4819597e+02	1.1824688e+06	9.8105681e+03
1.1600000e+02	1.4287691e+01	-1.6424335e+02	1.4881816e+02	1.1923321e+06	9.9160362e+03
1.1700000e+02	1.4342959e+01	-1.6428319e+02	1.4944827e+02	1.2023023e+06	1.0024989e+04
1.1800000e+02	1.4397621e+01	-1.6432520e+02	1.5007798e+02	1.2123832e+06	1.0137534e+04
1.1900000e+02	1.4451685e+01	-1.6436936e+02	1.5071291e+02	1.2225794e+06	1.0253696e+04
1.2000000e+02	1.4505195e+01	-1.6441562e+02	1.5135940e+02	1.2328929e+06	1.0373544e+04
1.2100000e+02	1.4558174e+01	-1.6446397e+02	1.5200604e+02	1.2433270e+06	1.0497110e+04
1.2200000e+02	1.4610597e+01	-1.6451430e+02	1.5264462e+02	1.2538880e+06	1.0624328e+04
1.2300000e+02	1.4662520e+01	-1.6456656e+02	1.5327090e+02	1.2645768e+06	1.0755195e+04
1.2400000e+02	1.4713934e+01	-1.6462062e+02	1.5390994e+02	1.2753984e+06	1.0889721e+04
1.2500000e+02	1.4764828e+01	-1.6467637e+02	1.5457304e+02	1.2863581e+06	1.1028009e+04
1.2600000e+02	1.4815250e+01	-1.6473398e+02	1.5523267e+02	1.2974568e+06	1.1169925e+04
1.2700000e+02	1.4865186e+01	-1.6479312e+02	1.5589223e+02	1.3086993e+06	1.1315529e+04
1.2736000e+02	1.4883056e+01	-1.6481477e+02	1.5611719e+02	1.3127818e+06	1.1368831e+04
1.2744000e+02	1.4887022e+01	-1.6481963e+02	1.5617177e+02	1.3136914e+06	1.1380739e+04
1.2752000e+02	1.4890978e+01	-1.6482449e+02	1.5623376e+02	1.3146025e+06	1.1392670e+04
1.2760000e+02	1.4894923e+01	-1.6482937e+02	1.5630624e+02	1.3155150e+06	1.1404625e+04
1.2800000e+02	1.4914658e+01	-1.6485375e+02	1.5682088e+02	1.3200892e+06	1.1467771e+04
1.2808000e+02	1.4918594e+01	-1.6485875e+02	1.5694168e+02	1.3210073e+06	1.1480494e+04
1.2816000e+02	1.4922530e+01	-1.6486364e+02	1.5706409e+02	1.3219262e+06	1.1493246e+04
1.2900000e+02	1.4963670e+01	-1.6491606e+02	1.5772054e+02	1.3316377e+06	1.1628901e+04
1.3000000e+02	1.5012240e+01	-1.6497969e+02	1.5801094e+02	1.3433487e+06	1.1793723e+04
1.3100000e+02	1.5060386e+01	-1.6504473e+02	1.5849789e+02	1.3552264e+06	1.1962052e+04
1.3200000e+02	1.5108135e+01	-1.6511106e+02	1.5912590e+02	1.3672735e+06	1.2134109e+04
1.3300000e+02	1.5155455e+01	-1.6517866e+02	1.5974193e+02	1.3794961e+06	1.2309930e+04
1.3400000e+02	1.5202378e+01	-1.6524739e+02	1.6040197e+02	1.3918953e+06	1.2489591e+04
1.3500000e+02	1.5248874e+01	-1.6531715e+02	1.6106982e+02	1.4044765e+06	1.2673010e+04
1.3600000e+02	1.5294958e+01	-1.6538789e+02	1.6175618e+02	1.4172415e+06	1.2860286e+04
1.3700000e+02	1.5340567e+01	-1.6545933e+02	1.6246552e+02	1.4301980e+06	1.3051437e+04
1.3800000e+02	1.5385725e+01	-1.6553164e+02	1.6315621e+02	1.4433469e+06	1.3246391e+04
1.3900000e+02	1.5430419e+01	-1.6560450e+02	1.6386198e+02	1.4566916e+06	1.3445239e+04
1.4000000e+02	1.5474607e+01	-1.6567792e+02	1.6454930e+02	1.4702383e+06	1.3647960e+04
1.4100000e+02	1.5518291e+01	-1.6575178e+02	1.6522848e+02	1.4839892e+06	1.3854576e+04
1.4200000e+02	1.5561452e+01	-1.6582588e+02	1.6591262e+02	1.4979489e+06	1.4065171e+04
1.4300000e+02	1.5604084e+01	-1.6590021e+02	1.6653132e+02	1.5121207e+06	1.4279642e+04
1.4400000e+02	1.5646158e+01	-1.6597469e+02	1.6717351e+02	1.5265096e+06	1.4497795e+04
1.4500000e+02	1.5687691e+01	-1.6604919e+02	1.6781069e+02	1.5411168e+06	1.4719062e+04
1.4600000e+02	1.5728634e+01	-1.6612362e+02	1.6845452e+02	1.5559474e+06	1.4942613e+04
1.4700000e+02	1.5768975e+01	-1.6619780e+02	1.6913920e+02	1.5710027e+06	1.5168276e+04
1.4800000e+02	1.5808682e+01	-1.6627160e+02	1.6971911e+02	1.5862848e+06	1.5395549e+04
1.4900000e+02	1.5847741e+01	-1.6634513e+02	1.7027261e+02	1.6017950e+06	1.5623946e+04
1.5000000e+02	1.5886146e+01	-1.6641797e+02	1.7083294e+02	1.6175327e+06	1.5852844e+04
1.5100000e+02	1.5923858e+01	-1.6649033e+02	1.7139142e+02	1.6334999e+06	1.6081981e+04
1.5160001e+02	1.5946145e+01	-1.6653338e+02	1.7171928e+02	1.6431902e+06	1.6219380e+04
1.5200000e+02	1.5960848e+01	-1.6656191e+02	1.7192439e+02	1.6496968e+06	1.6310845e+04
1.5300000e+02	1.5997103e+01	-1.6663270e+02	1.7239720e+02	1.6661220e+06	1.6538832e+04
1.5400000e+02	1.6032601e+01	-1.6670259e+02	1.7289157e+02	1.6827746e+06	1.6765747e+04
1.5500000e+02	1.6067328e+01	-1.6677140e+02	1.7339067e+02	1.6996530e+06	1.6991707e+04
1.5600000e+02	1.6101240e+01	-1.6683923e+02	1.7385989e+02	1.7167578e+06	1.7216549e+04
1.5700000e+02	1.6134346e+01	-1.6690595e+02	1.7428610e+02	1.7340855e+06	1.7440585e+04
1.5800000e+02	1.6166576e+01	-1.6697141e+02	1.7424632e+02	1.7516349e+06	1.7652051e+04
1.5900000e+02	1.6197865e+01	-1.6703552e+02	1.7416593e+02	1.7693673e+06	1.7799155e+04
1.6000000e+02	1.6227982e+01	-1.6709847e+02	1.7557159e+02	1.7872084e+06	1.7873972e+04
1.6100000e+02	1.6256729e+01	-1.6716001e+02	1.7575476e+02	1.8051014e+06	1.7906844e+04
1.6200000e+02	1.6284050e+01	-1.6722028e+02	1.7543361e+02	1.8230144e+06	1.7917075e+04
1.6300000e+02	1.6309932e+01	-1.6727924e+02	1.7515894e+02	1.8409332e+06	1.7917291e+04
1.6400000e+02	1.6334457e+01	-1.6733710e+02	1.7488671e+02	1.8588475e+06	1.7913221e+04
1.6500000e+02	1.6357618e+01	-1.6739372e+02	1.7458664e+02	1.8767578e+06	1.7907153e+04

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**PPTQ TRACKING DATA (CONTINUED)**

Time (sec)	Elevation (deg)	Azimuth (deg)	Aspect Angle (deg)	Range (ft)	Range Rate (fps)
1.6560001e+02	1.6370872e+01	-1.6742712e+02	1.7436404e+02	1.8875016e+06	1.7902725e+04
1.6600000e+02	1.6379459e+01	-1.6744922e+02	1.7419700e+02	1.8946618e+06	1.7899628e+04
1.6700000e+02	1.6400022e+01	-1.6750362e+02	1.7371748e+02	1.9125579e+06	1.7891612e+04
1.6800000e+02	1.6419358e+01	-1.6755693e+02	1.7319238e+02	1.9304447e+06	1.7883351e+04
1.6900000e+02	1.6437479e+01	-1.6760927e+02	1.7267376e+02	1.9483243e+06	1.7874913e+04
1.7000000e+02	1.6454433e+01	-1.6766051e+02	1.7217855e+02	1.9661946e+06	1.7866306e+04
1.7056000e+02	1.6463422e+01	-1.6768884e+02	1.7190842e+02	1.9761989e+06	1.7861416e+04
1.7060001e+02	1.6464052e+01	-1.6769089e+02	1.7188919e+02	1.9769132e+06	1.7861067e+04
1.7100000e+02	1.6470236e+01	-1.6771085e+02	1.7169596e+02	1.9840574e+06	1.7857546e+04
1.7200000e+02	1.6484946e+01	-1.6776020e+02	1.7120216e+02	2.0019104e+06	1.7848661e+04
1.7300000e+02	1.6498577e+01	-1.6780862e+02	1.7069843e+02	2.0197546e+06	1.7839656e+04
1.7400000e+02	1.6511163e+01	-1.6785619e+02	1.7018930e+02	2.0375896e+06	1.7830537e+04
1.7500000e+02	1.6522738e+01	-1.6790279e+02	1.6967764e+02	2.0554148e+06	1.7821304e+04
1.7560001e+02	1.6529204e+01	-1.6793039e+02	1.6940264e+02	2.0661058e+06	1.7815714e+04
1.7600000e+02	1.6533311e+01	-1.6794860e+02	1.6923998e+02	2.0732319e+06	1.7811967e+04
1.7700000e+02	1.6542925e+01	-1.6799348e+02	1.6888040e+02	2.0910389e+06	1.7802530e+04
1.7800000e+02	1.6551588e+01	-1.6803761e+02	1.6858512e+02	2.1088376e+06	1.7793002e+04
1.7900000e+02	1.6559349e+01	-1.6808093e+02	1.6833304e+02	2.1266256e+06	1.7783381e+04
1.8000000e+02	1.6566223e+01	-1.6812353e+02	1.6812272e+02	2.1444038e+06	1.7773673e+04
1.8100000e+02	1.6572223e+01	-1.6816529e+02	1.6793596e+02	2.1621728e+06	1.7763881e+04
1.8200000e+02	1.6577380e+01	-1.6820637e+02	1.6777793e+02	2.1799318e+06	1.7754019e+04
1.8300000e+02	1.6581725e+01	-1.6824671e+02	1.6761479e+02	2.1976798e+06	1.7744089e+04
1.8400000e+02	1.6585252e+01	-1.6828634e+02	1.6744560e+02	2.2154193e+06	1.7734091e+04
1.8500000e+02	1.6587996e+01	-1.6832528e+02	1.6728848e+02	2.2331489e+06	1.7724030e+04
1.8600000e+02	1.6589986e+01	-1.6836360e+02	1.6713472e+02	2.2508675e+06	1.7713911e+04
1.8700000e+02	1.6591225e+01	-1.6840118e+02	1.6697245e+02	2.2685764e+06	1.7703741e+04
1.8800000e+02	1.6591742e+01	-1.6843818e+02	1.6680609e+02	2.2862748e+06	1.7693526e+04
1.8900000e+02	1.6591543e+01	-1.6847455e+02	1.6666230e+02	2.3039636e+06	1.7683266e+04
1.9000000e+02	1.6590660e+01	-1.6851030e+02	1.6656041e+02	2.3216416e+06	1.7672963e+04
1.9060001e+02	1.6589805e+01	-1.6853152e+02	1.6650989e+02	2.3322432e+06	1.7666762e+04
1.9100000e+02	1.6589097e+01	-1.6854550e+02	1.6647553e+02	2.3393094e+06	1.7662619e+04
1.9200000e+02	1.6586878e+01	-1.6858005e+02	1.6640600e+02	2.3569666e+06	1.7652235e+04
1.9300000e+02	1.6584015e+01	-1.6861407e+02	1.6634653e+02	2.3746136e+06	1.7641813e+04
1.9400000e+02	1.6580516e+01	-1.6864754e+02	1.6629329e+02	2.3922507e+06	1.7631355e+04
1.9500000e+02	1.6576411e+01	-1.6868045e+02	1.6625032e+02	2.4098765e+06	1.7620862e+04
1.9600000e+02	1.6571704e+01	-1.6871287e+02	1.6621334e+02	2.4274919e+06	1.7610337e+04
1.9700000e+02	1.6566408e+01	-1.6874471e+02	1.6617416e+02	2.4450970e+06	1.7599781e+04
1.9800000e+02	1.6560538e+01	-1.6877608e+02	1.6614839e+02	2.4626916e+06	1.7589200e+04
1.9900000e+02	1.6554111e+01	-1.6880695e+02	1.6612643e+02	2.4802753e+06	1.7578591e+04
2.0000000e+02	1.6547130e+01	-1.6883732e+02	1.6610251e+02	2.4978488e+06	1.7567958e+04
2.0100000e+02	1.6539617e+01	-1.6886721e+02	1.6607668e+02	2.5154114e+06	1.7557300e+04
2.0200000e+02	1.6531580e+01	-1.6889667e+02	1.6605050e+02	2.5329632e+06	1.7546621e+04
2.0300000e+02	1.6523028e+01	-1.6892567e+02	1.6603171e+02	2.5505046e+06	1.7535919e+04
2.0400000e+02	1.6513978e+01	-1.6895421e+02	1.6601121e+02	2.5680349e+06	1.7525197e+04
2.0500000e+02	1.6504434e+01	-1.6898231e+02	1.6599496e+02	2.5855547e+06	1.7514456e+04
2.0600000e+02	1.6494408e+01	-1.6900997e+02	1.6598203e+02	2.6030640e+06	1.7503696e+04
2.0700000e+02	1.6483913e+01	-1.6903725e+02	1.6596750e+02	2.6205622e+06	1.7492920e+04
2.0800000e+02	1.6472951e+01	-1.6906406e+02	1.6595148e+02	2.6380503e+06	1.7482128e+04
2.0900000e+02	1.6461547e+01	-1.6909050e+02	1.6594293e+02	2.6555266e+06	1.7471322e+04
2.1000000e+02	1.6449696e+01	-1.6911655e+02	1.6593287e+02	2.6729928e+06	1.7460502e+04
2.1100000e+02	1.6437421e+01	-1.6914225e+02	1.6592132e+02	2.6904472e+06	1.7449669e+04
2.1200000e+02	1.6424712e+01	-1.6916751e+02	1.6592186e+02	2.7078918e+06	1.7438824e+04
2.1300000e+02	1.6411590e+01	-1.6919245e+02	1.6592962e+02	2.7253252e+06	1.7427968e+04
2.1400000e+02	1.6398060e+01	-1.6921695e+02	1.6593603e+02	2.7427481e+06	1.7417100e+04
2.1500000e+02	1.6384133e+01	-1.6924115e+02	1.6594103e+02	2.7601596e+06	1.7406223e+04
2.1600000e+02	1.6369815e+01	-1.6926503e+02	1.6594469e+02	2.7775605e+06	1.7395338e+04
2.1700000e+02	1.6355117e+01	-1.6928851e+02	1.6594710e+02	2.7949500e+06	1.7384442e+04
2.1800000e+02	1.6340039e+01	-1.6931165e+02	1.6594827e+02	2.8123292e+06	1.7373539e+04
2.1860001e+02	1.6330817e+01	-1.6932542e+02	1.6594834e+02	2.8227512e+06	1.7366994e+04
2.1900000e+02	1.6324592e+01	-1.6933450e+02	1.6594818e+02	2.8296975e+06	1.7362629e+04
2.2000000e+02	1.6308785e+01	-1.6935702e+02	1.6594690e+02	2.8470547e+06	1.7351711e+04
2.2060001e+02	1.6299137e+01	-1.6937039e+02	1.6594554e+02	2.8574631e+06	1.7345158e+04
2.2100000e+02	1.6292627e+01	-1.6937920e+02	1.6594442e+02	2.8644007e+06	1.7340788e+04
2.2200000e+02	1.6276120e+01	-1.6940112e+02	1.6594074e+02	2.8817358e+06	1.7329859e+04

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**PPTQ TRACKING DATA (CONTINUED)**

Time (sec)	Elevation (deg)	Azimuth (deg)	Aspect Angle (deg)	Range (ft)	Range Rate (fps)
2.2300000e+02	1.6259265e+01	-1.6942268e+02	1.6593595e+02	2.8990607e+06	1.7318925e+04
2.2400000e+02	1.6242082e+01	-1.6944397e+02	1.6592997e+02	2.9163740e+06	1.7307987e+04
2.2500000e+02	1.6224571e+01	-1.6946491e+02	1.6592289e+02	2.9336763e+06	1.7297043e+04
2.2600000e+02	1.6206733e+01	-1.6948560e+02	1.6592356e+02	2.9509682e+06	1.7286098e+04
2.2700000e+02	1.6188585e+01	-1.6950605e+02	1.6593850e+02	2.9682484e+06	1.7275151e+04
2.2800000e+02	1.6170121e+01	-1.6952616e+02	1.6595240e+02	2.9855182e+06	1.7264200e+04
2.2900000e+02	1.6151355e+01	-1.6954604e+02	1.6596522e+02	3.0027769e+06	1.7253249e+04
2.3000000e+02	1.6132284e+01	-1.6956559e+02	1.6597703e+02	3.0200251e+06	1.7242297e+04
2.3060001e+02	1.6120703e+01	-1.6957723e+02	1.6598358e+02	3.0303684e+06	1.7235726e+04
2.3100000e+02	1.6112927e+01	-1.6958492e+02	1.6598775e+02	3.0372614e+06	1.7231345e+04
2.3200000e+02	1.6093275e+01	-1.6960398e+02	1.6599742e+02	3.0544876e+06	1.7220392e+04
2.3300000e+02	1.6073340e+01	-1.6962277e+02	1.6600604e+02	3.0717029e+06	1.7209440e+04
2.3400000e+02	1.6053133e+01	-1.6964136e+02	1.6601356e+02	3.0889061e+06	1.7198490e+04
2.3500000e+02	1.6032642e+01	-1.6965964e+02	1.6602004e+02	3.1060995e+06	1.7187540e+04
2.3600000e+02	1.6011889e+01	-1.6967772e+02	1.6602541e+02	3.1232815e+06	1.7176591e+04
2.3700000e+02	1.5990871e+01	-1.6969555e+02	1.6602968e+02	3.1404525e+06	1.7165645e+04
2.3800000e+02	1.5969592e+01	-1.6971315e+02	1.6603284e+02	3.1576125e+06	1.7154701e+04
2.3900000e+02	1.5948054e+01	-1.6973050e+02	1.6603485e+02	3.1747620e+06	1.7143760e+04
2.4000000e+02	1.5926270e+01	-1.6974767e+02	1.6603568e+02	3.1919001e+06	1.7132821e+04
2.4100000e+02	1.5904241e+01	-1.6976461e+02	1.6603533e+02	3.2090271e+06	1.7121886e+04
2.4200000e+02	1.5881963e+01	-1.6978127e+02	1.6603380e+02	3.2261440e+06	1.7110953e+04
2.4300000e+02	1.5859449e+01	-1.6979776e+02	1.6603101e+02	3.2432494e+06	1.7100025e+04
2.4400000e+02	1.5836699e+01	-1.6981403e+02	1.6603403e+02	3.2603442e+06	1.7089101e+04
2.4500000e+02	1.5813722e+01	-1.6983013e+02	1.6604268e+02	3.2774274e+06	1.7078181e+04
2.4600000e+02	1.5790513e+01	-1.6984598e+02	1.6605019e+02	3.2945004e+06	1.7067265e+04
2.4700000e+02	1.5767087e+01	-1.6986165e+02	1.6605649e+02	3.3115618e+06	1.7056355e+04
2.4800000e+02	1.5743434e+01	-1.6987713e+02	1.6606158e+02	3.3286132e+06	1.7045449e+04
2.4900000e+02	1.5719568e+01	-1.6989236e+02	1.6606549e+02	3.3456530e+06	1.7034549e+04
2.5000000e+02	1.5695489e+01	-1.6990748e+02	1.6607883e+02	3.3626821e+06	1.7023655e+04
2.5100000e+02	1.5671204e+01	-1.6992235e+02	1.6610956e+02	3.3797002e+06	1.7012766e+04
2.5200000e+02	1.5646703e+01	-1.6993704e+02	1.6613916e+02	3.3967082e+06	1.7001883e+04
2.5300000e+02	1.5622008e+01	-1.6995158e+02	1.6616762e+02	3.4137044e+06	1.6991006e+04
2.5400000e+02	1.5597113e+01	-1.6996594e+02	1.6619497e+02	3.4306899e+06	1.6980135e+04
2.5500000e+02	1.5572018e+01	-1.6998011e+02	1.6622122e+02	3.4476646e+06	1.6969272e+04
2.5600000e+02	1.5546733e+01	-1.6999410e+02	1.6624636e+02	3.4646285e+06	1.6958415e+04
2.5700000e+02	1.5521255e+01	-1.7000791e+02	1.6627169e+02	3.4815816e+06	1.6947565e+04
2.5800000e+02	1.5495589e+01	-1.7002154e+02	1.6629644e+02	3.4985238e+06	1.6936722e+04
2.5900000e+02	1.5469741e+01	-1.7003505e+02	1.6632009e+02	3.5154548e+06	1.6925887e+04
2.6000000e+02	1.5443713e+01	-1.7004839e+02	1.6634262e+02	3.5323749e+06	1.6915059e+04
2.6100000e+02	1.5417497e+01	-1.7006151e+02	1.6636408e+02	3.5492851e+06	1.6904239e+04
2.6200000e+02	1.5391108e+01	-1.7007451e+02	1.6638443e+02	3.5661840e+06	1.6893427e+04
2.6300000e+02	1.5364549e+01	-1.7008740e+02	1.6640364e+02	3.5830716e+06	1.6882624e+04
2.6400000e+02	1.5337818e+01	-1.7010008e+02	1.6642179e+02	3.5999486e+06	1.6871828e+04
2.6500000e+02	1.5310915e+01	-1.7011260e+02	1.6643884e+02	3.6168153e+06	1.6861040e+04
2.6600000e+02	1.5283845e+01	-1.7012501e+02	1.6645474e+02	3.6336713e+06	1.6850261e+04
2.6700000e+02	1.5256617e+01	-1.7013726e+02	1.6646954e+02	3.6505156e+06	1.6839491e+04
2.6800000e+02	1.5229218e+01	-1.7014937e+02	1.6648320e+02	3.6673501e+06	1.6828730e+04
2.6900000e+02	1.5201664e+01	-1.7016132e+02	1.6649574e+02	3.6841736e+06	1.6817977e+04
2.7000000e+02	1.5173955e+01	-1.7017313e+02	1.6650715e+02	3.7009861e+06	1.6807234e+04
2.7100000e+02	1.5146091e+01	-1.7018483e+02	1.6651738e+02	3.7177877e+06	1.6796499e+04
2.7200000e+02	1.5118069e+01	-1.7019635e+02	1.6652647e+02	3.7345792e+06	1.6785775e+04
2.7300000e+02	1.5089904e+01	-1.7020777e+02	1.6653438e+02	3.7513593e+06	1.6775060e+04
2.7400000e+02	1.5061588e+01	-1.7021905e+02	1.6654110e+02	3.7681289e+06	1.6764354e+04
2.7500000e+02	1.5033124e+01	-1.7023202e+02	1.6655663e+02	3.7848879e+06	1.6753658e+04
2.7600000e+02	1.5004514e+01	-1.7024121e+02	1.6655096e+02	3.8016364e+06	1.6742971e+04
2.7700000e+02	1.4975762e+01	-1.7025209e+02	1.6655406e+02	3.8183744e+06	1.6732296e+04
2.7800000e+02	1.4946874e+01	-1.7026287e+02	1.6655590e+02	3.8351008e+06	1.6721630e+04
2.7900000e+02	1.4917841e+01	-1.7027349e+02	1.6655653e+02	3.8518177e+06	1.6710973e+04
2.8000000e+02	1.4888679e+01	-1.7028402e+02	1.6655586e+02	3.8685230e+06	1.6700327e+04
2.8100000e+02	1.4859376e+01	-1.7029442e+02	1.6655392e+02	3.8852183e+06	1.6689692e+04
2.8200000e+02	1.4829944e+01	-1.7030470e+02	1.6655069e+02	3.9019023e+06	1.6679067e+04
2.8300000e+02	1.4800376e+01	-1.7031486e+02	1.6654615e+02	3.9185763e+06	1.6668452e+04
2.8400000e+02	1.4770682e+01	-1.7032493e+02	1.6654956e+02	3.9352393e+06	1.6657849e+04
2.8500000e+02	1.4740859e+01	-1.7033485e+02	1.6655952e+02	3.9518921e+06	1.6647255e+04

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**PPTQ TRACKING DATA (CONTINUED)**

Time (sec)	Elevation (deg)	Azimuth (deg)	Aspect Angle (deg)	Range (ft)	Range Rate (fps)
2.8600000e+02	1.4710913e+01	-1.7034469e+02	1.6656833e+02	3.9685338e+06	1.6636674e+04
2.8700000e+02	1.4680842e+01	-1.7035441e+02	1.6657601e+02	3.9851648e+06	1.6626102e+04
2.8800000e+02	1.4650643e+01	-1.7036398e+02	1.6658257e+02	4.0017861e+06	1.6615542e+04
2.8900000e+02	1.4620328e+01	-1.7037351e+02	1.6658792e+02	4.0183959e+06	1.660492e+04
2.9000000e+02	1.4589888e+01	-1.7038289e+02	1.6660170e+02	4.0349960e+06	1.6594455e+04
2.9100000e+02	1.4559331e+01	-1.7039217e+02	1.6662235e+02	4.0515854e+06	1.6583929e+04
2.9200000e+02	1.4528661e+01	-1.7040137e+02	1.6664197e+02	4.0681636e+06	1.6573413e+04
2.9300000e+02	1.4497871e+01	-1.7041043e+02	1.6666062e+02	4.0847321e+06	1.6562910e+04
2.9400000e+02	1.4466972e+01	-1.7041942e+02	1.6667823e+02	4.1012893e+06	1.6552417e+04
2.9500000e+02	1.4435957e+01	-1.7042830e+02	1.6669482e+02	4.1178365e+06	1.6541936e+04
2.9600000e+02	1.4404831e+01	-1.7043708e+02	1.6671040e+02	4.1343735e+06	1.6531467e+04
2.9700000e+02	1.4373597e+01	-1.7044576e+02	1.6672495e+02	4.1508996e+06	1.6521010e+04
2.9800000e+02	1.4342251e+01	-1.7045434e+02	1.6673846e+02	4.1674155e+06	1.6510565e+04
2.9900000e+02	1.4310801e+01	-1.7046286e+02	1.6675092e+02	4.1839209e+06	1.6500131e+04
3.0000000e+02	1.4279245e+01	-1.7047125e+02	1.6676235e+02	4.2004157e+06	1.6489709e+04
3.0100000e+02	1.4247581e+01	-1.7047957e+02	1.6677273e+02	4.2169006e+06	1.6479299e+04
3.0200000e+02	1.4215819e+01	-1.7048780e+02	1.6678204e+02	4.2333746e+06	1.6468901e+04
3.0300000e+02	1.4183953e+01	-1.7049593e+02	1.6679030e+02	4.2498383e+06	1.6458516e+04
3.0400000e+02	1.4151985e+01	-1.7050397e+02	1.6679749e+02	4.2662917e+06	1.6448142e+04
3.0500000e+02	1.4119921e+01	-1.7051192e+02	1.6683213e+02	4.2827342e+06	1.6437781e+04
3.0600000e+02	1.4087756e+01	-1.7051981e+02	1.6687455e+02	4.2991667e+06	1.6427432e+04
3.0700000e+02	1.4055492e+01	-1.7052758e+02	1.6691620e+02	4.3155892e+06	1.6417096e+04
3.0800000e+02	1.4023135e+01	-1.7053530e+02	1.6695705e+02	4.3320011e+06	1.6406771e+04
3.0900000e+02	1.3990681e+01	-1.7054293e+02	1.6699711e+02	4.3484026e+06	1.6396459e+04
3.1000000e+02	1.3958135e+01	-1.7055047e+02	1.6703640e+02	4.3647937e+06	1.6386159e+04
3.1100000e+02	1.3925492e+01	-1.7055793e+02	1.6707493e+02	4.3811751e+06	1.6375872e+04
3.1200000e+02	1.3892760e+01	-1.7056530e+02	1.6711269e+02	4.3975455e+06	1.6365597e+04
3.1300000e+02	1.3859937e+01	-1.7057259e+02	1.6714970e+02	4.4139062e+06	1.6355335e+04
3.1400000e+02	1.3827023e+01	-1.7057979e+02	1.6718595e+02	4.4302564e+06	1.6345085e+04
3.1500000e+02	1.3794020e+01	-1.7058695e+02	1.6722143e+02	4.4465966e+06	1.6334849e+04
3.1600000e+02	1.3760930e+01	-1.7059403e+02	1.6725616e+02	4.4629263e+06	1.6324625e+04
3.1700000e+02	1.3727754e+01	-1.7060103e+02	1.6729017e+02	4.4792455e+06	1.6314413e+04
3.1800000e+02	1.3694491e+01	-1.7060796e+02	1.6732343e+02	4.4955550e+06	1.6304215e+04
3.1900000e+02	1.3661145e+01	-1.7061480e+02	1.6735596e+02	4.5118541e+06	1.6294029e+04
3.2000000e+02	1.3627711e+01	-1.7062157e+02	1.6738776e+02	4.5281433e+06	1.6283856e+04
3.2100000e+02	1.3594197e+01	-1.7062826e+02	1.6741885e+02	4.5444220e+06	1.6273696e+04
3.2200000e+02	1.3560601e+01	-1.7063492e+02	1.6744918e+02	4.5606905e+06	1.6263549e+04
3.2300000e+02	1.3526922e+01	-1.7064146e+02	1.6747882e+02	4.5769488e+06	1.6253415e+04
3.2400000e+02	1.3493161e+01	-1.7064797e+02	1.6750774e+02	4.5931977e+06	1.6243294e+04
3.2500000e+02	1.3459326e+01	-1.7065440e+02	1.6753594e+02	4.6094353e+06	1.6233186e+04
3.2600000e+02	1.3425408e+01	-1.7066076e+02	1.6756343e+02	4.6256637e+06	1.6223091e+04
3.2700000e+02	1.3391413e+01	-1.7066705e+02	1.6759023e+02	4.6418815e+06	1.6213009e+04
3.2800000e+02	1.3357340e+01	-1.7067327e+02	1.6761632e+02	4.6580894e+06	1.6202940e+04
3.2900000e+02	1.3323188e+01	-1.7067943e+02	1.6764173e+02	4.6742881e+06	1.6192884e+04
3.3000000e+02	1.3288968e+01	-1.7068554e+02	1.6766643e+02	4.6904752e+06	1.6182842e+04
3.3100000e+02	1.3254666e+01	-1.7069156e+02	1.6769046e+02	4.7066533e+06	1.6172812e+04
3.3200000e+02	1.3220293e+01	-1.7069754e+02	1.6771378e+02	4.7228211e+06	1.6162796e+04
3.3300000e+02	1.3185846e+01	-1.7070346e+02	1.6773644e+02	4.7389791e+06	1.6152794e+04
3.3400000e+02	1.3151325e+01	-1.7070932e+02	1.6775841e+02	4.7551269e+06	1.6142804e+04
3.3500000e+02	1.3116737e+01	-1.7071510e+02	1.6777973e+02	4.7712642e+06	1.6132828e+04
3.3600000e+02	1.3082074e+01	-1.7072083e+02	1.6780038e+02	4.7873921e+06	1.6122865e+04
3.3700000e+02	1.3047342e+01	-1.7072649e+02	1.6782037e+02	4.8035101e+06	1.6112916e+04
3.3800000e+02	1.3012536e+01	-1.7073209e+02	1.6783970e+02	4.8196187e+06	1.6102979e+04
3.3900000e+02	1.2977667e+01	-1.7073766e+02	1.6785838e+02	4.8357162e+06	1.6093057e+04
3.4000000e+02	1.2942727e+01	-1.7074317e+02	1.6787641e+02	4.8518044e+06	1.6083147e+04
3.4100000e+02	1.2907718e+01	-1.7074859e+02	1.6789383e+02	4.8678829e+06	1.6073252e+04
3.4200000e+02	1.2872644e+01	-1.7075398e+02	1.6791060e+02	4.8839509e+06	1.6063369e+04
3.4300000e+02	1.2837502e+01	-1.7075931e+02	1.6792674e+02	4.9000966e+06	1.6053500e+04
3.4400000e+02	1.2802294e+01	-1.7076458e+02	1.6794227e+02	4.9160582e+06	1.6043645e+04
3.4500000e+02	1.2767026e+01	-1.7076983e+02	1.6795718e+02	4.9320964e+06	1.6033803e+04
3.4600000e+02	1.2731688e+01	-1.7077499e+02	1.6797150e+02	4.9481255e+06	1.6023975e+04
3.4700000e+02	1.2696288e+01	-1.7078009e+02	1.6798523e+02	4.9641444e+06	1.6014159e+04
3.4800000e+02	1.2660824e+01	-1.7078517e+02	1.6799836e+02	4.9801536e+06	1.6004359e+04
3.4900000e+02	1.2625297e+01	-1.7079019e+02	1.6801091e+02	4.9961533e+06	1.5994571e+04

**PPTQ TRACKING DATA (CONTINUED)**

Time (sec)	Elevation (deg)	Azimuth (deg)	Aspect Angle (deg)	Range (ft)	Range Rate (fps)
3.5000000e+02	1.2589706e+01	-1.7079513e+02	1.6802291e+02	5.0121433e+06	1.5984797e+04
3.5100000e+02	1.2554059e+01	-1.708004e+02	1.6803433e+02	5.0281227e+06	1.5975037e+04
3.5200000e+02	1.2518344e+01	-1.7080490e+02	1.6804522e+02	5.0440933e+06	1.5965290e+04
3.5300000e+02	1.2482572e+01	-1.7080971e+02	1.6805556e+02	5.0600538e+06	1.5955558e+04
3.5400000e+02	1.2446741e+01	-1.7081450e+02	1.6804123e+02	5.0760044e+06	1.5945838e+04
3.5404001e+02	1.2445309e+01	-1.7081467e+02	1.6804004e+02	5.0766419e+06	1.5945449e+04
3.5500000e+02	1.2410851e+01	-1.7081920e+02	1.6801107e+02	5.0919451e+06	1.5936132e+04
3.5504001e+02	1.2409417e+01	-1.7081940e+02	1.6800986e+02	5.0925821e+06	1.5935744e+04
3.5600000e+02	1.2374900e+01	-1.7082386e+02	1.6819028e+02	5.1078763e+06	1.5926452e+04
3.5700000e+02	1.2338888e+01	-1.7082849e+02	1.6895782e+02	5.1237983e+06	1.5916785e+04
3.5800000e+02	1.2302821e+01	-1.7083307e+02	1.6963877e+02	5.1397100e+06	1.5907121e+04
3.5900000e+02	1.2266694e+01	-1.7083758e+02	1.6994340e+02	5.1556125e+06	1.5897471e+04
3.6000000e+02	1.2230511e+01	-1.7084206e+02	1.6983502e+02	5.1715051e+06	1.5887835e+04
3.6100000e+02	1.2194272e+01	-1.7084650e+02	1.6932637e+02	5.1873882e+06	1.5878212e+04
3.6200000e+02	1.2157978e+01	-1.7085089e+02	1.6847047e+02	5.2032617e+06	1.5868602e+04
3.6300000e+02	1.2121626e+01	-1.7085523e+02	1.6726485e+02	5.2191255e+06	1.5859006e+04
3.6400000e+02	1.2085223e+01	-1.7085955e+02	1.6585042e+02	5.2349794e+06	1.5849424e+04
3.6500000e+02	1.2048763e+01	-1.7086380e+02	1.6428927e+02	5.2508240e+06	1.5839857e+04
3.6600000e+02	1.2012252e+01	-1.7086803e+02	1.6262028e+02	5.2666588e+06	1.5830303e+04
3.6700000e+02	1.1975682e+01	-1.7087219e+02	1.6080998e+02	5.2824848e+06	1.5820762e+04
3.6800000e+02	1.1939061e+01	-1.7087633e+02	1.5894480e+02	5.2983009e+06	1.5811236e+04
3.6900000e+02	1.1902389e+01	-1.7088043e+02	1.5702227e+02	5.3141074e+06	1.5801724e+04
3.7000000e+02	1.1865664e+01	-1.7088448e+02	1.5503382e+02	5.3299041e+06	1.5792225e+04
3.7100000e+02	1.1828890e+01	-1.7088848e+02	1.5301851e+02	5.3456913e+06	1.5782740e+04
3.7200000e+02	1.1792061e+01	-1.7089245e+02	1.5093533e+02	5.3614694e+06	1.5773270e+04
3.7300000e+02	1.1755183e+01	-1.7089637e+02	1.4883569e+02	5.3772378e+06	1.5763812e+04
3.7400000e+02	1.1718252e+01	-1.7090025e+02	1.4668147e+02	5.3929972e+06	1.5754370e+04
3.7500000e+02	1.1681274e+01	-1.7090412e+02	1.4447308e+02	5.4087466e+06	1.5744941e+04
3.7600000e+02	1.1644243e+01	-1.7090792e+02	1.4221532e+02	5.4244873e+06	1.5735527e+04
3.7700000e+02	1.1607165e+01	-1.7091170e+02	1.3990497e+02	5.4402179e+06	1.5726122e+04
3.7800000e+02	1.1570037e+01	-1.7091544e+02	1.3752706e+02	5.4559395e+06	1.5716734e+04
3.7900000e+02	1.1532860e+01	-1.7091912e+02	1.3503489e+02	5.4716516e+06	1.5707354e+04
3.8000000e+02	1.1495637e+01	-1.7092278e+02	1.3271804e+02	5.4873544e+06	1.5698044e+04
3.8100000e+02	1.1458367e+01	-1.7092640e+02	1.3125403e+02	5.5030475e+06	1.5688768e+04
3.8200000e+02	1.1421049e+01	-1.7092999e+02	1.3036052e+02	5.5187314e+06	1.5679460e+04
3.8300000e+02	1.1383686e+01	-1.7093356e+02	1.2966578e+02	5.5344060e+06	1.5670161e+04
3.8400000e+02	1.1346272e+01	-1.7093707e+02	1.2912583e+02	5.5500718e+06	1.5660874e+04
3.8500000e+02	1.1308812e+01	-1.7094054e+02	1.2871840e+02	5.5657285e+06	1.5651596e+04
3.8600000e+02	1.1271310e+01	-1.7094400e+02	1.2839713e+02	5.5813750e+06	1.5642332e+04
3.8700000e+02	1.1233762e+01	-1.7094743e+02	1.2815007e+02	5.5970124e+06	1.5633083e+04
3.8800000e+02	1.1196167e+01	-1.7095079e+02	1.2796944e+02	5.6126411e+06	1.5623841e+04
3.8900000e+02	1.1158523e+01	-1.7095414e+02	1.2782859e+02	5.6282609e+06	1.5614616e+04
3.9000000e+02	1.1120839e+01	-1.7095745e+02	1.2771451e+02	5.6438709e+06	1.5605407e+04
3.9100000e+02	1.1083110e+01	-1.7096073e+02	1.2765906e+02	5.6594717e+06	1.5596210e+04
3.9200000e+02	1.1045341e+01	-1.7096397e+02	1.2761869e+02	5.6750627e+06	1.5587024e+04
3.9300000e+02	1.1007520e+01	-1.7096718e+02	1.2757837e+02	5.6906459e+06	1.5577854e+04
3.9400000e+02	1.0969662e+01	-1.7097038e+02	1.2755380e+02	5.7062188e+06	1.5568698e+04
3.9500000e+02	1.0931760e+01	-1.7097352e+02	1.2753366e+02	5.7217829e+06	1.5559556e+04
3.9600000e+02	1.0893816e+01	-1.7097665e+02	1.2752735e+02	5.7373375e+06	1.5550430e+04
3.9700000e+02	1.0855825e+01	-1.7097972e+02	1.2754113e+02	5.7528839e+06	1.5541316e+04
3.9800000e+02	1.0817795e+01	-1.7098279e+02	1.2755576e+02	5.7684207e+06	1.5532216e+04
3.9900000e+02	1.0779724e+01	-1.7098582e+02	1.2757052e+02	5.7839483e+06	1.5523131e+04
4.0000000e+02	1.0741611e+01	-1.7098882e+02	1.2760109e+02	5.7994667e+06	1.5514062e+04
4.0100000e+02	1.0703455e+01	-1.7099179e+02	1.2765469e+02	5.8149764e+06	1.5505006e+04
4.0200000e+02	1.06665263e+01	-1.7099472e+02	1.2770835e+02	5.8304763e+06	1.5495963e+04
4.0300000e+02	1.0627023e+01	-1.7099762e+02	1.2776208e+02	5.8459683e+06	1.5486934e+04
4.0400000e+02	1.0588748e+01	-1.7100049e+02	1.2781588e+02	5.8614503e+06	1.5477920e+04
4.0404001e+02	1.0587216e+01	-1.7100061e+02	1.2781803e+02	5.8620693e+06	1.5477560e+04
4.0500000e+02	1.0550427e+01	-1.7100333e+02	1.2786974e+02	5.8769244e+06	1.5468921e+04
4.0504001e+02	1.0548897e+01	-1.7100345e+02	1.2787189e+02	5.8775426e+06	1.546851e+04
4.0600000e+02	1.0512073e+01	-1.7100617e+02	1.2792365e+02	5.8923882e+06	1.5459936e+04
4.0700000e+02	1.0473676e+01	-1.7100895e+02	1.2797764e+02	5.9078437e+06	1.5450965e+04
4.0800000e+02	1.0435240e+01	-1.7101172e+02	1.2803168e+02	5.9232903e+06	1.5442007e+04
4.0900000e+02	1.0396766e+01	-1.7101447e+02	1.2808579e+02	5.9387276e+06	1.5433065e+04

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**PPTQ TRACKING DATA (CONTINUED)**

Time (sec)	Elevation (deg)	Azimuth (deg)	Aspect Angle (deg)	Range (ft)	Range Rate (fps)
4.100000e+02	1.0358251e+01	-1.7101715e+02	1.2813996e+02	5.9541565e+06	1.5424136e+04
4.110000e+02	1.0319697e+01	-1.7101984e+02	1.2819420e+02	5.9695765e+06	1.5415223e+04
4.120000e+02	1.0281106e+01	-1.7102250e+02	1.2824850e+02	5.9849872e+06	1.5406323e+04
4.1204001e+02	1.0279562e+01	-1.7102261e+02	1.2825067e+02	5.9856032e+06	1.5405967e+04
4.1295999e+02	1.0244022e+01	-1.7102501e+02	1.2830068e+02	5.9997734e+06	1.5397793e+04
4.1300000e+02	1.0242476e+01	-1.7102512e+02	1.2830285e+02	6.0003892e+06	1.5397438e+04
4.1304001e+02	1.0240931e+01	-1.7102523e+02	1.2830503e+02	6.0010050e+06	1.5397083e+04
4.1400000e+02	1.0203811e+01	-1.7102772e+02	1.2835728e+02	6.0157819e+06	1.5388567e+04
4.1500000e+02	1.0165108e+01	-1.7103032e+02	1.2841175e+02	6.0311655e+06	1.5379711e+04
4.1504001e+02	1.0163558e+01	-1.7103040e+02	1.2841394e+02	6.0317813e+06	1.5379356e+04
4.1600000e+02	1.0126363e+01	-1.7103286e+02	1.2846630e+02	6.0465415e+06	1.5370869e+04
4.1700000e+02	1.0087587e+01	-1.7103537e+02	1.2852092e+02	6.0619075e+06	1.5362041e+04
4.1800000e+02	1.0048772e+01	-1.7103789e+02	1.2857558e+02	6.0772651e+06	1.5353227e+04
4.1804001e+02	1.0047218e+01	-1.7103799e+02	1.2857777e+02	6.0778792e+06	1.5352875e+04
4.1900000e+02	1.0009916e+01	-1.7104035e+02	1.2863033e+02	6.0926143e+06	1.5344428e+04
4.2000000e+02	9.9710270e+00	-1.7104280e+02	1.2868512e+02	6.1079546e+06	1.5335642e+04
4.2100000e+02	9.9321031e+00	-1.7104523e+02	1.2873998e+02	6.1232853e+06	1.5326872e+04
4.2200000e+02	9.8931410e+00	-1.7104764e+02	1.2879490e+02	6.1386081e+06	1.5318115e+04
4.2300000e+02	9.8541435e+00	-1.7104999e+02	1.2884989e+02	6.1539218e+06	1.5309374e+04
4.2400000e+02	9.8151098e+00	-1.7105234e+02	1.2890493e+02	6.1692271e+06	1.5300647e+04
4.2407999e+02	9.8119883e+00	-1.7105254e+02	1.2890941e+02	6.1704506e+06	1.5300112e+04
4.2412000e+02	9.8104252e+00	-1.7105263e+02	1.2890944e+02	6.1710627e+06	1.5300498e+04
4.2416000e+02	9.8088622e+00	-1.7105273e+02	1.2889419e+02	6.1716748e+06	1.5301464e+04
4.2500000e+02	9.7758893e+00	-1.7105456e+02	1.3055108e+02	6.1845395e+06	1.5329948e+04
4.2600000e+02	9.7362377e+00	-1.7105646e+02	1.3291578e+02	6.1998892e+06	1.5371097e+04
4.2700000e+02	9.6961370e+00	-1.7105799e+02	1.3360326e+02	6.2152833e+06	1.5417035e+04
4.2800000e+02	9.6555762e+00	-1.7105919e+02	1.3417738e+02	6.2307248e+06	1.5466221e+04
4.2900000e+02	9.6145459e+00	-1.7106001e+02	1.3471378e+02	6.2462164e+06	1.5517421e+04
4.2907999e+02	9.6112452e+00	-1.7106007e+02	1.3475353e+02	6.2474578e+06	1.5521603e+04
4.3000000e+02	9.5730442e+00	-1.7106049e+02	1.3531844e+02	6.2617600e+06	1.5570465e+04
4.3100000e+02	9.5310657e+00	-1.7106062e+02	1.3573937e+02	6.2773576e+06	1.5624930e+04
4.3200000e+02	9.4886077e+00	-1.7106038e+02	1.3596570e+02	6.2930108e+06	1.5681109e+04
4.3300000e+02	9.4456688e+00	-1.7105984e+02	1.3610520e+02	6.3087204e+06	1.5739318e+04
4.3400000e+02	9.4022315e+00	-1.7105892e+02	1.3624794e+02	6.3244899e+06	1.5799671e+04
4.3500000e+02	9.3582886e+00	-1.7105767e+02	1.3642273e+02	6.3403211e+06	1.5862326e+04
4.3600000e+02	9.3138291e+00	-1.7105606e+02	1.3660785e+02	6.3562157e+06	1.5927452e+04
4.3700000e+02	9.2688399e+00	-1.7105410e+02	1.3679526e+02	6.3721768e+06	1.5995089e+04
4.3800000e+02	9.2233119e+00	-1.7105179e+02	1.3696731e+02	6.3882064e+06	1.6065307e+04
4.3900000e+02	9.1772306e+00	-1.7104913e+02	1.3716565e+02	6.4043079e+06	1.6137990e+04
4.4000000e+02	9.1305862e+00	-1.7104609e+02	1.3747280e+02	6.4204834e+06	1.6212855e+04
4.4100000e+02	9.0833798e+00	-1.7104272e+02	1.3785765e+02	6.4367340e+06	1.6289483e+04
4.4200000e+02	9.0356028e+00	-1.7103898e+02	1.3816543e+02	6.4530628e+06	1.6367367e+04
4.4300000e+02	8.9872634e+00	-1.7103493e+02	1.3836421e+02	6.4694692e+06	1.6446470e+04
4.4400000e+02	8.9383566e+00	-1.7103053e+02	1.3853483e+02	6.4859561e+06	1.6526768e+04
4.4500000e+02	8.8888852e+00	-1.7102580e+02	1.3862921e+02	6.5025230e+06	1.6608427e+04
4.4600000e+02	8.8388386e+00	-1.7102075e+02	1.3872034e+02	6.5191734e+06	1.6691733e+04
4.4700000e+02	8.7882144e+00	-1.7101539e+02	1.3882645e+02	6.5359076e+06	1.6776900e+04
4.4800000e+02	8.7370056e+00	-1.7100968e+02	1.3895468e+02	6.5527281e+06	1.6864110e+04
4.4900000e+02	8.6852070e+00	-1.7100370e+02	1.3910461e+02	6.5696360e+06	1.6953352e+04
4.5000000e+02	8.6328048e+00	-1.7099739e+02	1.3923299e+02	6.5866353e+06	1.7044976e+04
4.5100000e+02	8.5797934e+00	-1.7099076e+02	1.3937114e+02	6.6037272e+06	1.7138925e+04
4.5200000e+02	8.5261669e+00	-1.7098384e+02	1.3951180e+02	6.6209141e+06	1.7235377e+04
4.5300000e+02	8.4719130e+00	-1.7097661e+02	1.3966529e+02	6.6381988e+06	1.7334302e+04
4.5400000e+02	8.4170258e+00	-1.7096907e+02	1.3979871e+02	6.6555832e+06	1.7435791e+04
4.5500000e+02	8.3614922e+00	-1.7096126e+02	1.3994164e+02	6.6730710e+06	1.7539847e+04
4.5600000e+02	8.3053067e+00	-1.7095314e+02	1.4010744e+02	6.6906641e+06	1.7646486e+04
4.5700000e+02	8.2484598e+00	-1.7094475e+02	1.4025344e+02	6.7083651e+06	1.7755669e+04
4.5800000e+02	8.1909488e+00	-1.7093606e+02	1.4038441e+02	6.7261761e+06	1.7867324e+04
4.5900000e+02	8.1327611e+00	-1.7092711e+02	1.4051260e+02	6.7441002e+06	1.7981443e+04
4.6000000e+02	8.0738897e+00	-1.7091787e+02	1.4066539e+02	6.7621403e+06	1.8098149e+04
4.6100000e+02	8.0143330e+00	-1.7090839e+02	1.4083953e+02	6.7802975e+06	1.8217499e+04
4.6200000e+02	7.9540794e+00	-1.7089865e+02	1.4096460e+02	6.7985756e+06	1.8339566e+04
4.6300000e+02	7.8931214e+00	-1.7088865e+02	1.4106501e+02	6.8169771e+06	1.8464383e+04
4.6400000e+02	7.8314484e+00	-1.7087839e+02	1.4115290e+02	6.8355058e+06	1.8591944e+04

**PPTQ TRACKING DATA (CONTINUED)**

Time (sec)	Elevation (deg)	Azimuth (deg)	Aspect Angle (deg)	Range (ft)	Range Rate (fps)
4.6500000e+02	7.7690573e+00	-1.7086793e+02	1.4124798e+02	6.8541625e+06	1.8722288e+04
4.6600000e+02	7.7059378e+00	-1.7085721e+02	1.4132112e+02	6.8729509e+06	1.8855452e+04
4.6700000e+02	7.6420782e+00	-1.7084626e+02	1.4139751e+02	6.8918745e+06	1.8991569e+04
4.6800000e+02	7.5774730e+00	-1.7083510e+02	1.4147112e+02	6.9109349e+06	1.9130772e+04
4.6900000e+02	7.5121073e+00	-1.7082374e+02	1.4155658e+02	6.9301371e+06	1.9273130e+04
4.7000000e+02	7.4459783e+00	-1.7081215e+02	1.4168987e+02	6.9494824e+06	1.9418785e+04
4.7064001e+02	7.4032475e+00	-1.7080465e+02	1.4177102e+02	6.9619408e+06	1.9513909e+04
4.7100000e+02	7.3790697e+00	-1.7080039e+02	1.4185125e+02	6.9689756e+06	1.9568040e+04
4.7200000e+02	7.3113762e+00	-1.7078843e+02	1.4207220e+02	6.9886199e+06	1.9721086e+04
4.7300000e+02	7.2428881e+00	-1.7077629e+02	1.4221961e+02	7.0084189e+06	1.9877945e+04
4.7400000e+02	7.1735957e+00	-1.7076400e+02	1.4231325e+02	7.0283768e+06	2.0038638e+04
4.7500000e+02	7.1034852e+00	-1.7075152e+02	1.4236287e+02	7.0484978e+06	2.0203381e+04
4.7600000e+02	7.0325483e+00	-1.7073893e+02	1.4244442e+02	7.0687852e+06	2.0372189e+04
4.7700000e+02	6.9607695e+00	-1.7072616e+02	1.4247333e+02	7.0892434e+06	2.0545307e+04
4.7800000e+02	6.8881329e+00	-1.7071329e+02	1.4254432e+02	7.1098771e+06	2.0722772e+04
4.7900000e+02	6.8146256e+00	-1.7070026e+02	1.4261701e+02	7.1306908e+06	2.0904309e+04
4.8000000e+02	6.7402418e+00	-1.7068714e+02	1.4267316e+02	7.1516872e+06	2.1090320e+04
4.8100000e+02	6.6649632e+00	-1.7067392e+02	1.4270791e+02	7.1728722e+06	2.1280977e+04
4.8200000e+02	6.5887822e+00	-1.7066060e+02	1.4318693e+02	7.1942494e+06	2.1470865e+04
4.8300000e+02	6.5118098e+00	-1.7064722e+02	1.4443457e+02	7.2158055e+06	2.1637197e+04
4.8400000e+02	6.4342111e+00	-1.7063383e+02	1.4375907e+02	7.2375193e+06	2.1789280e+04
4.8500000e+02	6.3560348e+00	-1.7062046e+02	1.4312835e+02	7.2593818e+06	2.1934127e+04
4.8600000e+02	6.2773100e+00	-1.7060708e+02	1.4295569e+02	7.2813866e+06	2.2074742e+04
4.8700000e+02	6.1980589e+00	-1.7059370e+02	1.4298895e+02	7.3035300e+06	2.2211499e+04
4.8800000e+02	6.1183160e+00	-1.7058033e+02	1.4304745e+02	7.3258080e+06	2.2343365e+04
4.8900000e+02	6.0381281e+00	-1.7056700e+02	1.4308038e+02	7.3482139e+06	2.2467807e+04
4.9000000e+02	5.9575581e+00	-1.7055369e+02	1.4274704e+02	7.3707389e+06	2.2579345e+04
4.9100000e+02	5.8767084e+00	-1.7054043e+02	1.4253535e+02	7.3933655e+06	2.2666663e+04
4.9200000e+02	5.7958074e+00	-1.7052724e+02	1.4175494e+02	7.4160545e+06	2.2703062e+04
4.9295999e+02	5.7183445e+00	-1.7051465e+02	1.4058427e+02	7.4378533e+06	2.2709636e+04
4.9300000e+02	5.7151239e+00	-1.7051413e+02	1.4055776e+02	7.4387612e+06	2.2709810e+04
4.9400000e+02	5.6347282e+00	-1.7050109e+02	1.4049026e+02	7.4614736e+06	2.2714052e+04
4.9500000e+02	5.5546278e+00	-1.7048811e+02	1.4124339e+02	7.4841894e+06	2.2718155e+04
4.9600000e+02	5.4748166e+00	-1.7047520e+02	1.4223510e+02	7.5069096e+06	2.2722163e+04
4.9700000e+02	5.3952921e+00	-1.7046237e+02	1.4299853e+02	7.5296340e+06	2.2726082e+04
4.9795999e+02	5.3192187e+00	-1.7045013e+02	1.4330911e+02	7.5514527e+06	2.2729752e+04
4.9800000e+02	5.3160541e+00	-1.7044962e+02	1.4331247e+02	7.5523620e+06	2.2729903e+04
4.9900000e+02	5.2371000e+00	-1.7043694e+02	1.4397673e+02	7.5750934e+06	2.2733414e+04
5.0000000e+02	5.1584233e+00	-1.7042433e+02	1.4579306e+02	7.5978289e+06	2.2736869e+04
5.0100000e+02	5.0800259e+00	-1.7041178e+02	1.4837142e+02	7.6205674e+06	2.2740398e+04
5.0200000e+02	5.0019056e+00	-1.7039931e+02	1.5089742e+02	7.6433096e+06	2.2743935e+04
5.0300000e+02	4.9240622e+00	-1.7038690e+02	1.5284351e+02	7.6660549e+06	2.2747444e+04
5.0400000e+02	4.8464916e+00	-1.7037456e+02	1.5417425e+02	7.6888042e+06	2.2750845e+04
5.0500000e+02	4.7691921e+00	-1.7036230e+02	1.5503650e+02	7.7115569e+06	2.2754146e+04
5.0600000e+02	4.6921632e+00	-1.7035008e+02	1.5564019e+02	7.7343125e+06	2.2757340e+04
5.0700000e+02	4.6153988e+00	-1.7033795e+02	1.5607643e+02	7.7570715e+06	2.2760451e+04
5.0800000e+02	4.5389003e+00	-1.7032587e+02	1.5639168e+02	7.7798333e+06	2.2763471e+04
5.0900000e+02	4.4626614e+00	-1.7031385e+02	1.5662457e+02	7.8025989e+06	2.2766424e+04
5.1000000e+02	4.3866865e+00	-1.7030191e+02	1.5679692e+02	7.8253661e+06	2.2769307e+04
5.1100000e+02	4.3109659e+00	-1.7029003e+02	1.5692361e+02	7.8481369e+06	2.2772128e+04
5.1200000e+02	4.2355013e+00	-1.7027822e+02	1.5701745e+02	7.8709107e+06	2.2774885e+04
5.1300000e+02	4.1602898e+00	-1.7026646e+02	1.5708862e+02	7.8936869e+06	2.2777579e+04
5.1400000e+02	4.0853303e+00	-1.7025478e+02	1.5714617e+02	7.9164656e+06	2.2780213e+04
5.1500000e+02	4.0106214e+00	-1.7024315e+02	1.5718788e+02	7.9392468e+06	2.2782796e+04
5.1600000e+02	3.9361547e+00	-1.7023156e+02	1.5722363e+02	7.9620316e+06	2.2785320e+04
5.1700000e+02	3.8619352e+00	-1.7022005e+02	1.5726133e+02	7.9848181e+06	2.2787794e+04
5.1800000e+02	3.7879611e+00	-1.7020861e+02	1.5727663e+02	8.0076065e+06	2.2790212e+04
5.1900000e+02	3.7142254e+00	-1.7019721e+02	1.5729594e+02	8.0303978e+06	2.2792576e+04
5.2000000e+02	3.6407289e+00	-1.7018588e+02	1.5731905e+02	8.0531917e+06	2.2794888e+04
5.2100000e+02	3.5674679e+00	-1.7017461e+02	1.5734573e+02	8.0759879e+06	2.2797150e+04
5.2200000e+02	3.4944424e+00	-1.7016338e+02	1.5737618e+02	8.0987863e+06	2.2799357e+04
5.2300000e+02	3.4216505e+00	-1.7015223e+02	1.5738071e+02	8.1215868e+06	2.2801519e+04
5.2400000e+02	3.3490893e+00	-1.7014112e+02	1.5738783e+02	8.1443892e+06	2.2803628e+04
5.2500000e+02	3.2767575e+00	-1.7013008e+02	1.5739782e+02	8.1671939e+06	2.2805690e+04

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**PPTQ TRACKING DATA (CONTINUED)**

Time (sec)	Elevation (deg)	Azimuth (deg)	Aspect Angle (deg)	Range (ft)	Range Rate (fps)
5.2600000e+02	3.2046538e+00	-1.7011909e+02	1.5741060e+02	8.1900001e+06	2.2807706e+04
5.2700000e+02	3.1327717e+00	-1.7010815e+02	1.5742604e+02	8.2128096e+06	2.2809675e+04
5.2800000e+02	3.0611169e+00	-1.7009726e+02	1.5744404e+02	8.2356200e+06	2.2811598e+04
5.2900000e+02	2.9896832e+00	-1.7008643e+02	1.5746449e+02	8.2584324e+06	2.2813476e+04
5.3000000e+02	2.9184689e+00	-1.7007566e+02	1.5748728e+02	8.2812469e+06	2.2815310e+04
5.3100000e+02	2.8474744e+00	-1.7006495e+02	1.5751322e+02	8.3040628e+06	2.2817098e+04
5.3200000e+02	2.7766936e+00	-1.7005428e+02	1.5753071e+02	8.3268809e+06	2.2818845e+04
5.3300000e+02	2.7061278e+00	-1.7004367e+02	1.5753076e+02	8.3497011e+06	2.2820545e+04
5.3400000e+02	2.6357777e+00	-1.7003311e+02	1.5753277e+02	8.3725218e+06	2.2822202e+04
5.3500000e+02	2.5656349e+00	-1.7002259e+02	1.5753669e+02	8.3953454e+06	2.2823820e+04
5.3600000e+02	2.4957043e+00	-1.7001214e+02	1.5754249e+02	8.4181698e+06	2.2825395e+04
5.3700000e+02	2.4259819e+00	-1.7000173e+02	1.5755012e+02	8.4409957e+06	2.2826930e+04
5.3800000e+02	2.3564631e+00	-1.6999136e+02	1.5755956e+02	8.4638236e+06	2.2828427e+04
5.3900000e+02	2.2871511e+00	-1.6998106e+02	1.5757075e+02	8.4866526e+06	2.2829883e+04
5.4000000e+02	2.2180406e+00	-1.6997080e+02	1.5758367e+02	8.5094833e+06	2.2831299e+04
5.4100000e+02	2.1491326e+00	-1.6996059e+02	1.5759826e+02	8.5323153e+06	2.2832676e+04
5.4200000e+02	2.0804227e+00	-1.6995042e+02	1.5761448e+02	8.5551489e+06	2.2834015e+04
5.4300000e+02	2.0119126e+00	-1.6994032e+02	1.5763229e+02	8.5779833e+06	2.2835315e+04
5.4400000e+02	1.9435982e+00	-1.6993026e+02	1.5765363e+02	8.6008193e+06	2.2836576e+04
5.4500000e+02	1.8754774e+00	-1.6992023e+02	1.5767703e+02	8.6236568e+06	2.2837801e+04
5.4600000e+02	1.8075523e+00	-1.6991027e+02	1.5770192e+02	8.6464950e+06	2.2838986e+04
5.4700000e+02	1.7398195e+00	-1.6990034e+02	1.5772739e+02	8.6693344e+06	2.2840138e+04
5.4800000e+02	1.6722758e+00	-1.6989047e+02	1.5772336e+02	8.6921750e+06	2.2841251e+04
5.4900000e+02	1.6049203e+00	-1.6988063e+02	1.5772070e+02	8.7150171e+06	2.2842327e+04
5.5000000e+02	1.5377546e+00	-1.6987086e+02	1.5771939e+02	8.7378598e+06	2.2843367e+04
5.5100000e+02	1.4707745e+00	-1.6986112e+02	1.5771938e+02	8.7607034e+06	2.2844370e+04
5.5200000e+02	1.4039772e+00	-1.6985141e+02	1.5772063e+02	8.7835487e+06	2.2845338e+04
5.5288000e+02	1.3453481e+00	-1.6984292e+02	1.5772274e+02	8.8036529e+06	2.2846160e+04
5.5296002e+02	1.3400268e+00	-1.6984216e+02	1.5772298e+02	8.8054802e+06	2.2846233e+04
5.5300000e+02	1.3373646e+00	-1.6984176e+02	1.5772313e+02	8.8063944e+06	2.2846272e+04
5.5400000e+02	1.2709330e+00	-1.6983215e+02	1.5774913e+02	8.8292414e+06	2.2847216e+04
5.5496002e+02	1.2073292e+00	-1.6982298e+02	1.5781382e+02	8.8511748e+06	2.2848090e+04
5.5500000e+02	1.2046825e+00	-1.6982260e+02	1.5781735e+02	8.8520887e+06	2.2848125e+04
5.5520001e+02	1.1914530e+00	-1.6982069e+02	1.5783603e+02	8.8566586e+06	2.2848304e+04
5.5591998e+02	1.1438894e+00	-1.6981383e+02	1.5791706e+02	8.8731097e+06	2.2848932e+04
5.5596002e+02	1.1412496e+00	-1.6981345e+02	1.5792219e+02	8.8740236e+06	2.2848966e+04
5.5600000e+02	1.1386100e+00	-1.6981308e+02	1.5792739e+02	8.8749376e+06	2.2849001e+04
5.5700000e+02	1.0727165e+00	-1.6980360e+02	1.5803750e+02	8.8977868e+06	2.2849845e+04
5.5800000e+02	1.0069979e+00	-1.6979418e+02	1.5735670e+02	8.9206370e+06	2.2850654e+04
5.5900000e+02	9.4145522e-01	-1.6978478e+02	1.5591612e+02	8.9434880e+06	2.2851426e+04
5.6000000e+02	8.7608479e-01	-1.6977544e+02	1.5383833e+02	8.9663399e+06	2.2852166e+04
5.6100000e+02	8.1088688e-01	-1.6976612e+02	1.5125904e+02	8.9891924e+06	2.2852871e+04
5.6200000e+02	7.4585935e-01	-1.6975685e+02	1.4829867e+02	9.0120459e+06	2.2853541e+04
5.6300000e+02	6.8100357e-01	-1.6974763e+02	1.4505257e+02	9.0348995e+06	2.2854177e+04
5.6400000e+02	6.1631584e-01	-1.6973846e+02	1.4159217e+02	9.0577537e+06	2.2854777e+04
5.6500000e+02	5.5179355e-01	-1.6972932e+02	1.3796975e+02	9.0806090e+06	2.2855342e+04
5.6600000e+02	4.8743738e-01	-1.6972020e+02	1.3422346e+02	9.1034648e+06	2.2855871e+04
5.6700000e+02	4.2324732e-01	-1.6971115e+02	1.3038136e+02	9.1263206e+06	2.2856367e+04
5.6800000e+02	3.5921885e-01	-1.6970211e+02	1.2646449e+02	9.1491775e+06	2.2856827e+04
5.6900000e+02	2.9535405e-01	-1.6969314e+02	1.2248879e+02	9.1720344e+06	2.2857250e+04
5.7000000e+02	2.3165046e-01	-1.6968419e+02	1.1846677e+02	9.1948917e+06	2.2857640e+04
5.7100000e+02	1.6810608e-01	-1.6967529e+02	1.1440380e+02	9.2177496e+06	2.2857988e+04
5.7200000e+02	1.0472055e-01	-1.6966642e+02	1.1015792e+02	9.2406078e+06	2.2858306e+04
5.7300000e+02	4.1492815e-02	-1.6965759e+02	1.0590453e+02	9.2634662e+06	2.2858590e+04
5.7400000e+02	-2.1580060e-02	-1.6964879e+02	1.0155014e+02	9.2863252e+06	2.2858834e+04

**SNIF TRACKING DATA**

Time (sec)	Elevation (deg)	Azimuth (deg)	Aspect Angle (deg)	Range (ft)	Range Rate (fps)
3.0000000e+01	-3.0563755e-02	-4.6732969e+01	7.3014053e+01	1.4323510e+06	-8.7947845e+02
3.1000000e+01	1.8091261e-02	-4.6814496e+01	7.2734020e+01	1.4314624e+06	-8.9760427e+02
3.2000000e+01	6.9378733e-02	-4.6898790e+01	7.2580004e+01	1.4305544e+06	-9.1980576e+02
3.3000000e+01	1.2310586e-01	-4.6986132e+01	7.2832892e+01	1.4296241e+06	-9.4266053e+02
3.4000000e+01	1.7936832e-01	-4.7076557e+01	7.3007974e+01	1.4286688e+06	-9.6505582e+02
3.5000000e+01	2.3822373e-01	-4.7170199e+01	7.3200751e+01	1.4276924e+06	-9.8757794e+02
3.6000000e+01	2.9972857e-01	-4.7267113e+01	7.3412321e+01	1.4266948e+06	-1.0100455e+03
3.7000000e+01	3.6396182e-01	-4.7367379e+01	7.3605491e+01	1.4256722e+06	-1.0325184e+03
3.8000000e+01	4.3097357e-01	-4.7471090e+01	7.3816120e+01	1.4246297e+06	-1.0550772e+03
3.9000000e+01	5.0083756e-01	-4.7578372e+01	7.3971410e+01	1.4235627e+06	-1.0777968e+03
4.0000000e+01	5.7358483e-01	-4.7689300e+01	7.4130892e+01	1.4224739e+06	-1.1008359e+03
4.1000000e+01	6.4927862e-01	-4.7804063e+01	7.4291965e+01	1.4213604e+06	-1.1241867e+03
4.2000000e+01	7.2798312e-01	-4.7922696e+01	7.4509567e+01	1.4202258e+06	-1.1474473e+03
4.3000000e+01	8.0978876e-01	-4.8045330e+01	7.4700913e+01	1.4190659e+06	-1.1706942e+03
4.4000000e+01	8.9475721e-01	-4.8172148e+01	7.4900760e+01	1.4178843e+06	-1.1938613e+03
4.5000000e+01	9.8296741e-01	-4.8303155e+01	7.5108555e+01	1.4166795e+06	-1.2169059e+03
4.6000000e+01	1.0744993e+00	-4.8438505e+01	7.5309425e+01	1.4154500e+06	-1.2398683e+03
4.7000000e+01	1.1694070e+00	-4.8578424e+01	7.5516977e+01	1.4141987e+06	-1.2625484e+03
4.8000000e+01	1.2677546e+00	-4.8722880e+01	7.5723098e+01	1.4129253e+06	-1.2849626e+03
4.9000000e+01	1.3696009e+00	-4.8872030e+01	7.5938881e+01	1.4116284e+06	-1.3070422e+03
5.0000000e+01	1.4749813e+00	-4.9026061e+01	7.6189705e+01	1.4103121e+06	-1.3285490e+03
5.1000000e+01	1.5839707e+00	-4.9185077e+01	7.6419307e+01	1.4089734e+06	-1.3494271e+03
5.2000000e+01	1.6966321e+00	-4.9349151e+01	7.6677532e+01	1.4076132e+06	-1.3695701e+03
5.3000000e+01	1.8130261e+00	-4.9518462e+01	7.6802440e+01	1.4062330e+06	-1.3890410e+03
5.4000000e+01	1.9331425e+00	-4.9693234e+01	7.6714506e+01	1.4048338e+06	-1.4091126e+03
5.5000000e+01	2.0568898e+00	-4.9873737e+01	7.6679011e+01	1.4034152e+06	-1.4300678e+03
5.6000000e+01	2.1842407e+00	-5.0060176e+01	7.6623371e+01	1.4019729e+06	-1.4516805e+03
5.7000000e+01	2.3151590e+00	-5.0253045e+01	7.6572957e+01	1.4005116e+06	-1.4738444e+03
5.8000000e+01	2.4496523e+00	-5.0452453e+01	7.6629243e+01	1.3990265e+06	-1.4963078e+03
5.9000000e+01	2.5877734e+00	-5.0658832e+01	7.6932465e+01	1.3975183e+06	-1.5179472e+03
6.0000000e+01	2.7296732e+00	-5.0872334e+01	7.7183094e+01	1.3959080e+06	-1.5380361e+03
6.1000000e+01	2.8754850e+00	-5.1093146e+01	7.7417919e+01	1.3944443e+06	-1.5565986e+03
6.2000000e+01	3.0253315e+00	-5.1321503e+01	7.7660023e+01	1.3928784e+06	-1.5736456e+03
6.3000000e+01	3.1793324e+00	-5.1557565e+01	7.7909191e+01	1.3912975e+06	-1.5892235e+03
6.4000000e+01	3.3376586e+00	-5.1801666e+01	7.8171063e+01	1.3896998e+06	-1.6032395e+03
6.5000000e+01	3.5004603e+00	-5.2054119e+01	7.8430593e+01	1.3880905e+06	-1.6155422e+03
6.6000000e+01	3.6679254e+00	-5.2315220e+01	7.8688980e+01	1.3864692e+06	-1.6260736e+03
6.7000000e+01	3.8402346e+00	-5.2585382e+01	7.88949784e+01	1.3848401e+06	-1.6346755e+03
6.8000000e+01	4.0175584e+00	-5.2864855e+01	7.9211730e+01	1.3832016e+06	-1.6394341e+03
6.9000000e+01	4.1992437e+00	-5.3152794e+01	7.9474547e+01	1.3815656e+06	-1.6293107e+03
7.0000000e+01	4.3832750e+00	-5.3446471e+01	7.9723563e+01	1.3799504e+06	-1.5995557e+03
7.1000000e+01	4.5677645e+00	-5.3743117e+01	8.0010950e+01	1.3783699e+06	-1.5585100e+03
7.2000000e+01	4.7518156e+00	-5.4041363e+01	8.0312322e+01	1.3768331e+06	-1.5134955e+03
7.3000000e+01	4.9350885e+00	-5.4340910e+01	8.0609359e+01	1.3753440e+06	-1.4671013e+03
7.4000000e+01	5.1174598e+00	-5.4641495e+01	8.0899069e+01	1.3739008e+06	-1.4202177e+03
7.5000000e+01	5.2988518e+00	-5.4943058e+01	8.1186709e+01	1.3725038e+06	-1.3731249e+03
7.6000000e+01	5.4792139e+00	-5.5245435e+01	8.1470899e+01	1.3711527e+06	-1.3259538e+03
7.6360001e+01	5.5438727e+00	-5.5354486e+01	8.1573136e+01	1.3706790e+06	-1.3089701e+03
7.7000000e+01	5.6584707e+00	-5.5548667e+01	8.1757049e+01	1.3698516e+06	-1.2787826e+03
7.8000000e+01	5.8366191e+00	-5.5852685e+01	8.2056472e+01	1.3685960e+06	-1.2316625e+03
7.9000000e+01	6.0136120e+00	-5.6157526e+01	8.2350010e+01	1.3673875e+06	-1.1846154e+03
8.0000000e+01	6.1894119e+00	-5.6463075e+01	8.2635371e+01	1.3662275e+06	-1.1376946e+03
8.1000000e+01	6.3640181e+00	-5.6769365e+01	8.2919414e+01	1.3651124e+06	-1.0909210e+03
8.2000000e+01	6.5373860e+00	-5.7076331e+01	8.3202423e+01	1.3640454e+06	-1.0443152e+03
8.3000000e+01	6.7095151e+00	-5.7383957e+01	8.3482081e+01	1.3630236e+06	-9.9788178e+02
8.3760002e+01	6.8394750e+00	-5.7618256e+01	8.3692099e+01	1.3622797e+06	-9.6270099e+02
8.4000000e+01	6.8803725e+00	-5.7692277e+01	8.3757730e+01	1.3620490e+06	-9.5161763e+02
8.5000000e+01	7.0499448e+00	-5.8001325e+01	8.4013793e+01	1.3611205e+06	-9.0551906e+02
8.6000000e+01	7.2182175e+00	-5.8310934e+01	8.4261901e+01	1.3602376e+06	-8.5961192e+02
8.6760002e+01	7.3452102e+00	-5.8546670e+01	8.4458611e+01	1.3595988e+06	-8.2484172e+02
8.7000000e+01	7.3851631e+00	-5.8621185e+01	8.4522606e+01	1.3594013e+06	-8.1388317e+02
8.8000000e+01	7.5507688e+00	-5.8932114e+01	8.4797256e+01	1.3586107e+06	-7.6832580e+02
8.9000000e+01	7.7150212e+00	-5.9243552e+01	8.5080064e+01	1.3578651e+06	-7.2296169e+02
8.9760002e+01	7.8389357e+00	-5.9480715e+01	8.5301609e+01	1.3573288e+06	-6.8859733e+02

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**SNIF TRACKING DATA (CONTINUED)**

Time (sec)	Elevation (deg)	Azimuth (deg)	Aspect Angle (deg)	Range (ft)	Range Rate (fps)
9.0000000e+01	7.87778988e+00	-5.9555634e+01	8.5372487e+01	1.3571649e+06	-6.7777315e+02
9.0760002e+01	8.0007666e+00	-5.9793162e+01	8.5596175e+01	1.3566618e+06	-6.4355794e+02
9.1000000e+01	8.0393960e+00	-5.9868242e+01	8.5564791e+01	1.3565087e+06	-6.3277405e+02
9.1160004e+01	8.0650942e+00	-5.9918365e+01	8.5708531e+01	1.3564091e+06	-6.2558442e+02
9.1599998e+01	8.1356129e+00	-6.0056081e+01	8.5820062e+01	1.3561373e+06	-6.0588520e+02
9.1639999e+01	8.1420207e+00	-6.0068643e+01	8.5828873e+01	1.3561119e+06	-6.0416220e+02
9.1680000e+01	8.1484035e+00	-6.0081198e+01	8.5839200e+01	1.3560892e+06	-6.0248931e+02
9.2000000e+01	8.1995460e+00	-6.0181610e+01	8.6190001e+01	1.3558986e+06	-5.8945194e+02
9.2040001e+01	8.2059409e+00	-6.0194129e+01	8.6276558e+01	1.3558746e+06	-5.8782394e+02
9.3000000e+01	8.3591323e+00	-6.0497235e+01	8.5928143e+01	1.3553305e+06	-5.4693909e+02
9.4000000e+01	8.5183899e+00	-6.0815741e+01	7.8357118e+01	1.3548012e+06	-5.0955991e+02
9.5000000e+01	8.6774536e+00	-6.1137090e+01	7.1253531e+01	1.3543078e+06	-4.8092208e+02
9.6000000e+01	8.8365527e+00	-6.1461330e+01	6.6026052e+01	1.3538385e+06	-4.5974354e+02
9.7000000e+01	8.9958871e+00	-6.1788143e+01	6.2509291e+01	1.3533862e+06	-4.4437938e+02
9.8000000e+01	9.1556213e+00	-6.2117565e+01	6.0332692e+01	1.3529472e+06	-4.3334805e+02
9.9000000e+01	9.3159119e+00	-6.2449636e+01	5.9137798e+01	1.3525178e+06	-4.2546750e+02
1.0000000e+02	9.4768906e+00	-6.2784239e+01	5.8610782e+01	1.3520962e+06	-4.1977819e+02
1.0100000e+02	9.6386922e+00	-6.3121421e+01	5.8548760e+01	1.3516785e+06	-4.1545809e+02
1.0160000e+02	9.7362062e+00	-6.3325004e+01	5.8673838e+01	1.3514300e+06	-4.1324121e+02
1.0200000e+02	9.8014011e+00	-6.3461264e+01	5.8908845e+01	1.3512659e+06	-4.1186385e+02
1.0300000e+02	9.9651312e+00	-6.3803824e+01	6.0026228e+01	1.3508544e+06	-4.0781396e+02
1.0400000e+02	1.0129913e+01	-6.4149324e+01	6.0832425e+01	1.3504488e+06	-4.0290474e+02
1.0500000e+02	1.0295804e+01	-6.4497848e+01	6.1542565e+01	1.3500500e+06	-3.9740938e+02
1.0600000e+02	1.0462916e+01	-6.4849458e+01	6.2287717e+01	1.3496546e+06	-3.9129675e+02
1.0700000e+02	1.0631273e+01	-6.5204432e+01	6.3062485e+01	1.3492668e+06	-3.8437542e+02
1.0800000e+02	1.0800954e+01	-6.5562765e+01	6.3838759e+01	1.3488865e+06	-3.7654613e+02
1.0900000e+02	1.0972025e+01	-6.5924658e+01	6.4624764e+01	1.3485141e+06	-3.6768737e+02
1.1000000e+02	1.1144534e+01	-6.6290353e+01	6.5419063e+01	1.3481522e+06	-3.5751698e+02
1.1100000e+02	1.1318548e+01	-6.6659846e+01	6.6224616e+01	1.3478008e+06	-3.4591076e+02
1.1200000e+02	1.1494131e+01	-6.7033343e+01	6.7037934e+01	1.3474606e+06	-3.3276211e+02
1.1300000e+02	1.1671313e+01	-6.7411032e+01	6.7847249e+01	1.3471352e+06	-3.1791284e+02
1.1400000e+02	1.1850153e+01	-6.7793062e+01	6.8681836e+01	1.3468260e+06	-3.0119493e+02
1.1500000e+02	1.2030728e+01	-6.8179550e+01	6.9512306e+01	1.3465324e+06	-2.8246494e+02
1.1600000e+02	1.2213041e+01	-6.8570716e+01	7.0352282e+01	1.3462606e+06	-2.6154579e+02
1.1700000e+02	1.2397167e+01	-6.8966678e+01	7.1200970e+01	1.3460101e+06	-2.3824109e+02
1.1800000e+02	1.2583125e+01	-6.9367622e+01	7.2063871e+01	1.3457851e+06	-2.1238540e+02
1.1900000e+02	1.2770966e+01	-6.9773757e+01	7.2933471e+01	1.3455874e+06	-1.8377516e+02
1.2000000e+02	1.2960727e+01	-7.0185179e+01	7.3812124e+01	1.3454197e+06	-1.5221544e+02
1.2100000e+02	1.3152446e+01	-7.0602039e+01	7.4708741e+01	1.3452842e+06	-1.1750167e+02
1.2200000e+02	1.3346141e+01	-7.1024637e+01	7.5600885e+01	1.3451850e+06	-7.9402042e+01
1.2300000e+02	1.3541830e+01	-7.1453007e+01	7.6504861e+01	1.3451254e+06	-3.7702722e+01
1.2400000e+02	1.3739518e+01	-7.1887387e+01	7.7421550e+01	1.3451102e+06	7.7843753e+00
1.2500000e+02	1.3939201e+01	-7.2328010e+01	7.8352627e+01	1.3451440e+06	5.7331029e+01
1.2600000e+02	1.4140494e+01	-7.2774911e+01	7.9287382e+01	1.3452261e+06	1.1111451e+02
1.2700000e+02	1.4344676e+01	-7.3228314e+01	8.0224634e+01	1.3453662e+06	1.6939065e+02
1.2736000e+02	1.4418506e+01	-7.3393127e+01	8.0561235e+01	1.3454315e+06	1.9149259e+02
1.2744000e+02	1.4434953e+01	-7.3429860e+01	8.0638557e+01	1.3454468e+06	1.9648556e+02
1.2752000e+02	1.4451412e+01	-7.3466660e+01	8.0717987e+01	1.3454625e+06	2.0151335e+02
1.2760000e+02	1.4467884e+01	-7.3503525e+01	8.0800038e+01	1.3454785e+06	2.0657650e+02
1.2800000e+02	1.4550407e+01	-7.3688362e+01	8.1292277e+01	1.3455679e+06	2.3190016e+02
1.2808000e+02	1.45666981e+01	-7.3725478e+01	8.1399260e+01	1.3455850e+06	2.3709058e+02
1.2816000e+02	1.4583533e+01	-7.3762626e+01	8.1504114e+01	1.3456051e+06	2.4231887e+02
1.2900000e+02	1.4758293e+01	-7.4155530e+01	8.2333921e+01	1.3458314e+06	2.9943835e+02
1.3000000e+02	1.4968247e+01	-7.4629973e+01	8.3152317e+01	1.3461676e+06	3.7204354e+02
1.3100000e+02	1.5180314e+01	-7.5111860e+01	8.4054441e+01	1.3465783e+06	4.4992863e+02
1.3200000e+02	1.5394452e+01	-7.5601286e+01	8.5020467e+01	1.3470705e+06	5.3352291e+02
1.3300000e+02	1.5610645e+01	-7.6098499e+01	8.5994084e+01	1.3476480e+06	6.2313966e+02
1.3400000e+02	1.5828820e+01	-7.6603521e+01	8.6991563e+01	1.3483183e+06	7.1904537e+02
1.3500000e+02	1.6048905e+01	-7.7116550e+01	8.8005234e+01	1.3490879e+06	8.2147259e+02
1.3600000e+02	1.6270845e+01	-7.7637634e+01	8.9029607e+01	1.3499621e+06	9.3069301e+02
1.3700000e+02	1.6494487e+01	-7.8167053e+01	9.0076852e+01	1.3509521e+06	1.0469700e+03
1.3800000e+02	1.6719823e+01	-7.8704804e+01	9.1131388e+01	1.3520590e+06	1.1705320e+03
1.3900000e+02	1.6946670e+01	-7.9250963e+01	9.2195822e+01	1.3532949e+06	1.3016043e+03
1.4000000e+02	1.7174949e+01	-7.9805729e+01	9.3268218e+01	1.3546649e+06	1.4404163e+03

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**SNIF TRACKING DATA (CONTINUED)**

Time (sec)	Elevation (deg)	Azimuth (deg)	Aspect Angle (deg)	Range (ft)	Range Rate (fps)
1.4100000e+02	1.7404527e+01	-8.0369121e+01	9.4343852e+01	1.3561774e+06	1.5872042e+03
1.4200000e+02	1.7635235e+01	-8.0941222e+01	9.5442203e+01	1.3578424e+06	1.7421912e+03
1.4300000e+02	1.7866963e+01	-8.1522073e+01	9.6515222e+01	1.3596662e+06	1.9055172e+03
1.4400000e+02	1.8099565e+01	-8.2111782e+01	9.7616982e+01	1.3616569e+06	2.0773689e+03
1.4500000e+02	1.8332869e+01	-8.2710253e+01	9.8720546e+01	1.3638234e+06	2.2578439e+03
1.4600000e+02	1.8566689e+01	-8.3317563e+01	9.9840671e+01	1.3661740e+06	2.4469722e+03
1.4700000e+02	1.8800775e+01	-8.3933592e+01	1.0099277e+02	1.3687195e+06	2.6448636e+03
1.4800000e+02	1.9034900e+01	-8.4558258e+01	1.0210643e+02	1.3714684e+06	2.8514486e+03
1.4900000e+02	1.9268910e+01	-8.5191451e+01	1.0322527e+02	1.3744249e+06	3.0665467e+03
1.5000000e+02	1.9502441e+01	-8.5832883e+01	1.0434660e+02	1.3776043e+06	3.2899467e+03
1.5100000e+02	1.9735353e+01	-8.6482471e+01	1.0547075e+02	1.3810081e+06	3.5215638e+03
1.5160001e+02	1.9874657e+01	-8.6876015e+01	1.0615368e+02	1.3831634e+06	3.6643671e+03
1.5200000e+02	1.9967296e+01	-8.7139947e+01	1.0660510e+02	1.3846489e+06	3.7611344e+03
1.5300000e+02	2.0198029e+01	-8.7805014e+01	1.0773240e+02	1.3885327e+06	4.0083200e+03
1.5400000e+02	2.0427268e+01	-8.8477363e+01	1.0889037e+02	1.3926672e+06	4.2629223e+03
1.5500000e+02	2.0654686e+01	-8.9156601e+01	1.1005205e+02	1.3970623e+06	4.5248137e+03
1.5600000e+02	2.0880075e+01	-8.9842513e+01	1.1123206e+02	1.4017210e+06	4.7937778e+03
1.5700000e+02	2.1103151e+01	-9.0534617e+01	1.1242201e+02	1.4066506e+06	5.0697466e+03
1.5800000e+02	2.1323541e+01	-9.1232533e+01	1.1336407e+02	1.4118595e+06	5.3475136e+03
1.5900000e+02	2.1540594e+01	-9.1934410e+01	1.1425176e+02	1.4173394e+06	5.6035508e+03
1.6000000e+02	2.1753358e+01	-9.2637237e+01	1.1625702e+02	1.4230575e+06	5.8319146e+03
1.6100000e+02	2.1960898e+01	-9.3338559e+01	1.1798548e+02	1.4289965e+06	6.0422840e+03
1.6200000e+02	2.2162889e+01	-9.4037030e+01	1.1914386e+02	1.4351382e+06	6.2405543e+03
1.6300000e+02	2.2359121e+01	-9.4731906e+01	1.1987885e+02	1.4414761e+06	6.4315377e+03
1.6400000e+02	2.2549671e+01	-9.5422680e+01	1.2075777e+02	1.4479993e+06	6.6176914e+03
1.6500000e+02	2.2734442e+01	-9.6109159e+01	1.2184628e+02	1.4547086e+06	6.8000584e+03
1.6560001e+02	2.2842536e+01	-9.6518904e+01	1.2254745e+02	1.4588225e+06	6.9077109e+03
1.6600000e+02	2.2913501e+01	-9.6791139e+01	1.2301842e+02	1.4615986e+06	6.9788291e+03
1.6700000e+02	2.3086878e+01	-9.7468408e+01	1.2419504e+02	1.4686661e+06	7.1544573e+03
1.6800000e+02	2.3254631e+01	-9.8140765e+01	1.2535367e+02	1.4759077e+06	7.3270435e+03
1.6900000e+02	2.3416849e+01	-9.8808214e+01	1.2647497e+02	1.4833188e+06	7.4966524e+03
1.7000000e+02	2.3573516e+01	-9.9470470e+01	1.2755427e+02	1.4909003e+06	7.6632425e+03
1.7056000e+02	2.3658897e+01	-9.9839114e+01	1.2814326e+02	1.4952167e+06	7.7552397e+03
1.7060001e+02	2.3664950e+01	-9.9865393e+01	1.2818500e+02	1.4955260e+06	7.7617787e+03
1.7100000e+02	2.3724770e+01	-1.0012757e+02	1.2860186e+02	1.4986453e+06	7.8268615e+03
1.7200000e+02	2.3870652e+01	-1.0077927e+02	1.2964608e+02	1.5065526e+06	7.9874978e+03
1.7300000e+02	2.4011229e+01	-1.0142552e+02	1.3069287e+02	1.5146194e+06	8.1451761e+03
1.7400000e+02	2.4146617e+01	-1.0206625e+02	1.3174165e+02	1.5228407e+06	8.2999162e+03
1.7500000e+02	2.4276819e+01	-1.0270126e+02	1.3279170e+02	1.5312174e+06	8.4517060e+03
1.7560001e+02	2.4352534e+01	-1.0307956e+02	1.3339063e+02	1.5363145e+06	8.5413871e+03
1.7600000e+02	2.4401988e+01	-1.0333063e+02	1.3376995e+02	1.5397431e+06	8.6005961e+03
1.7700000e+02	2.4522137e+01	-1.0395412e+02	1.3467249e+02	1.5484184e+06	8.7465833e+03
1.7800000e+02	2.4637422e+01	-1.0457183e+02	1.3551187e+02	1.5572370e+06	8.8897266e+03
1.7900000e+02	2.4747902e+01	-1.0518355e+02	1.3630707e+02	1.5661973e+06	9.0300169e+03
1.8000000e+02	2.4853703e+01	-1.0578933e+02	1.3705786e+02	1.5752948e+06	9.1675055e+03
1.8100000e+02	2.4954934e+01	-1.0638904e+02	1.3778023e+02	1.5845309e+06	9.3021988e+03
1.8200000e+02	2.5051466e+01	-1.0698271e+02	1.3846729e+02	1.5938988e+06	9.4341574e+03
1.8300000e+02	2.5143661e+01	-1.0757022e+02	1.3915046e+02	1.6033971e+06	9.5633892e+03
1.8400000e+02	2.5231495e+01	-1.0815164e+02	1.3982929e+02	1.6130243e+06	9.6899503e+03
1.8500000e+02	2.5315073e+01	-1.0872689e+02	1.4048426e+02	1.6227771e+06	9.8138610e+03
1.8600000e+02	2.5394528e+01	-1.0929597e+02	1.4112240e+02	1.6326506e+06	9.9351649e+03
1.8700000e+02	2.5469873e+01	-1.0985881e+02	1.4175429e+02	1.6426466e+06	1.0053892e+04
1.8800000e+02	2.5541282e+01	-1.1041548e+02	1.4237552e+02	1.6527584e+06	1.0170094e+04
1.8900000e+02	2.5608802e+01	-1.1096596e+02	1.4296584e+02	1.6629857e+06	1.0283806e+04
1.9000000e+02	2.5672539e+01	-1.1151021e+02	1.4350873e+02	1.6733257e+06	1.0395059e+04
1.9060001e+02	2.5709034e+01	-1.1183382e+02	1.4382316e+02	1.6795809e+06	1.0460657e+04
1.9100000e+02	2.5732609e+01	-1.1204831e+02	1.4403161e+02	1.6837743e+06	1.0503908e+04
1.9200000e+02	2.5789041e+01	-1.1258016e+02	1.4453691e+02	1.6943327e+06	1.0610365e+04
1.9300000e+02	2.5841993e+01	-1.1310588e+02	1.4502882e+02	1.7049949e+06	1.0714496e+04
1.9400000e+02	2.5891513e+01	-1.1362546e+02	1.4551002e+02	1.7157607e+06	1.0816334e+04
1.9500000e+02	2.5937704e+01	-1.1413888e+02	1.4597845e+02	1.7266272e+06	1.0915905e+04
1.9600000e+02	2.5980678e+01	-1.1464624e+02	1.4643692e+02	1.7375909e+06	1.1013272e+04
1.9700000e+02	2.6020453e+01	-1.1514747e+02	1.4689014e+02	1.7486529e+06	1.1108452e+04
1.9800000e+02	2.6057183e+01	-1.1564270e+02	1.4732953e+02	1.7598077e+06	1.1201507e+04

**ORBITAL SCIENCES CORPORATION: PROPRIETARY DATA**  
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**SNIF TRACKING DATA (CONTINUED)**

Time (sec)	Elevation (deg)	Azimuth (deg)	Aspect Angle (deg)	Range (ft)	Range Rate (fps)
1.9900000e+02	2.6090923e+01	-1.1613190e+02	1.4776060e+02	1.7710547e+06	1.1292464e+04
2.0000000e+02	2.6121746e+01	-1.1661514e+02	1.4818660e+02	1.7823922e+06	1.1381368e+04
2.0100000e+02	2.6149743e+01	-1.1709243e+02	1.4860754e+02	1.7938177e+06	1.1468252e+04
2.0200000e+02	2.6175021e+01	-1.1756387e+02	1.4902263e+02	1.8053277e+06	1.1553168e+04
2.0300000e+02	2.6197622e+01	-1.1802947e+02	1.4942784e+02	1.8169222e+06	1.1636146e+04
2.0400000e+02	2.6217633e+01	-1.1848925e+02	1.4982807e+02	1.8285988e+06	1.1717222e+04
2.0500000e+02	2.6235117e+01	-1.1894328e+02	1.5022031e+02	1.8403560e+06	1.1796436e+04
2.0600000e+02	2.6250154e+01	-1.1939161e+02	1.5060515e+02	1.8521918e+06	1.1873827e+04
2.0700000e+02	2.6262845e+01	-1.1983433e+02	1.5098520e+02	1.8641028e+06	1.1949441e+04
2.0800000e+02	2.6273195e+01	-1.2027141e+02	1.5136043e+02	1.8760907e+06	1.2023298e+04
2.0900000e+02	2.6281344e+01	-1.2070297e+02	1.5172732e+02	1.8881497e+06	1.2095446e+04
2.1000000e+02	2.6287318e+01	-1.2112906e+02	1.5208970e+02	1.9002809e+06	1.2165923e+04
2.1100000e+02	2.6291224e+01	-1.2154974e+02	1.5244751e+02	1.9124798e+06	1.2234762e+04
2.1200000e+02	2.6293050e+01	-1.2196502e+02	1.5279402e+02	1.9247492e+06	1.2301989e+04
2.1300000e+02	2.6292928e+01	-1.2237503e+02	1.5313179e+02	1.9370835e+06	1.2367652e+04
2.1400000e+02	2.6290858e+01	-1.2277972e+02	1.5346518e+02	1.9494848e+06	1.2431768e+04
2.1500000e+02	2.6286958e+01	-1.2317926e+02	1.5379433e+02	1.9619479e+06	1.2494387e+04
2.1600000e+02	2.6281284e+01	-1.2357373e+02	1.5411932e+02	1.9744718e+06	1.2555544e+04
2.1700000e+02	2.6273841e+01	-1.2396304e+02	1.5444011e+02	1.9870577e+06	1.2615248e+04
2.1800000e+02	2.6264703e+01	-1.2434735e+02	1.5475681e+02	1.9997031e+06	1.2673546e+04
2.1860001e+02	2.6258458e+01	-1.2457561e+02	1.5494495e+02	2.0073167e+06	1.2707870e+04
2.1900000e+02	2.6253952e+01	-1.2472677e+02	1.5506953e+02	2.0124050e+06	1.2730475e+04
2.2000000e+02	2.6241617e+01	-1.2510128e+02	1.5537825e+02	2.0251632e+06	1.2786056e+04
2.2060001e+02	2.6233493e+01	-1.2532367e+02	1.5556160e+02	2.0328439e+06	1.2818770e+04
2.2100000e+02	2.6227750e+01	-1.2547096e+02	1.5568303e+02	2.0379766e+06	1.2840317e+04
2.2200000e+02	2.6212420e+01	-1.2583592e+02	1.5598395e+02	2.0508423e+06	1.2893300e+04
2.2300000e+02	2.6195617e+01	-1.2619613e+02	1.5628096e+02	2.0637625e+06	1.2945017e+04
2.2400000e+02	2.6177455e+01	-1.2655173e+02	1.5657417e+02	2.0767323e+06	1.2995507e+04
2.2500000e+02	2.6157920e+01	-1.2690269e+02	1.5686352e+02	2.0897536e+06	1.3044784e+04
2.2600000e+02	2.6137099e+01	-1.2724919e+02	1.5714465e+02	2.1028227e+06	1.3092895e+04
2.2700000e+02	2.6115047e+01	-1.2759127e+02	1.5741445e+02	2.1159378e+06	1.3139862e+04
2.2800000e+02	2.6091743e+01	-1.2792890e+02	1.5768072e+02	2.1291012e+06	1.3185697e+04
2.2900000e+02	2.6067284e+01	-1.2826225e+02	1.5794357e+02	2.1423087e+06	1.3230443e+04
2.3000000e+02	2.6041654e+01	-1.2859126e+02	1.5820296e+02	2.1555623e+06	1.3274107e+04
2.3060001e+02	2.6025765e+01	-1.2878667e+02	1.5835702e+02	2.1635340e+06	1.3299805e+04
2.3100000e+02	2.6014951e+01	-1.2891609e+02	1.5845904e+02	2.1688574e+06	1.3316726e+04
2.3200000e+02	2.5987171e+01	-1.2923677e+02	1.5871183e+02	2.1821953e+06	1.3358322e+04
2.3300000e+02	2.5958358e+01	-1.2955335e+02	1.5896136e+02	2.1955745e+06	1.3398915e+04
2.3400000e+02	2.5928576e+01	-1.2986591e+02	1.5920770e+02	2.2089921e+06	1.3438533e+04
2.3500000e+02	2.5897795e+01	-1.3017446e+02	1.5945083e+02	2.2224510e+06	1.3477188e+04
2.3600000e+02	2.5866109e+01	-1.3047912e+02	1.5969086e+02	2.2359468e+06	1.3514912e+04
2.3700000e+02	2.5833519e+01	-1.3077991e+02	1.5992776e+02	2.2494800e+06	1.3551722e+04
2.3800000e+02	2.5800055e+01	-1.3107688e+02	1.6016157e+02	2.2630498e+06	1.3587636e+04
2.3900000e+02	2.5765744e+01	-1.3137010e+02	1.6039233e+02	2.2766556e+06	1.3622678e+04
2.4000000e+02	2.5730643e+01	-1.3165966e+02	1.6062009e+02	2.2902945e+06	1.3656871e+04
2.4100000e+02	2.5694758e+01	-1.3194557e+02	1.6084481e+02	2.3039674e+06	1.3690228e+04
2.4200000e+02	2.5658084e+01	-1.3222784e+02	1.6106649e+02	2.3176753e+06	1.3722763e+04
2.4300000e+02	2.5620698e+01	-1.3250660e+02	1.6128519e+02	2.3314139e+06	1.3754506e+04
2.4400000e+02	2.5582601e+01	-1.3278189e+02	1.6149770e+02	2.3451843e+06	1.3785470e+04
2.4500000e+02	2.5543842e+01	-1.3305377e+02	1.6170430e+02	2.3589837e+06	1.3815677e+04
2.4600000e+02	2.5504394e+01	-1.3332223e+02	1.6190808e+02	2.3728149e+06	1.3845132e+04
2.4700000e+02	2.5464334e+01	-1.3358739e+02	1.6210914e+02	2.3866737e+06	1.3873865e+04
2.4800000e+02	2.5423647e+01	-1.3384928e+02	1.6230746e+02	2.4005617e+06	1.3901888e+04
2.4900000e+02	2.53822349e+01	-1.3410787e+02	1.6250296e+02	2.4144783e+06	1.3929205e+04
2.5000000e+02	2.5340511e+01	-1.3436338e+02	1.6269130e+02	2.4284198e+06	1.3955855e+04
2.5100000e+02	2.5298103e+01	-1.3461569e+02	1.6286927e+02	2.4423890e+06	1.3981833e+04
2.5200000e+02	2.5255147e+01	-1.3486492e+02	1.6304487e+02	2.4563845e+06	1.4007163e+04
2.5300000e+02	2.5211700e+01	-1.3511114e+02	1.6321813e+02	2.4704034e+06	1.4031861e+04
2.5400000e+02	2.5167754e+01	-1.3535436e+02	1.6338905e+02	2.4844471e+06	1.4055937e+04
2.5500000e+02	2.5123321e+01	-1.3559463e+02	1.6355766e+02	2.4985147e+06	1.4079404e+04
2.5600000e+02	2.5078425e+01	-1.3583199e+02	1.6372400e+02	2.5126057e+06	1.4102278e+04
2.5700000e+02	2.5033079e+01	-1.3606648e+02	1.6388670e+02	2.5267196e+06	1.4124570e+04
2.5800000e+02	2.4987299e+01	-1.3629815e+02	1.6404661e+02	2.5408555e+06	1.4146293e+04
2.5900000e+02	2.4941121e+01	-1.3652708e+02	1.6420429e+02	2.5550117e+06	1.4167466e+04

**SNIF TRACKING DATA (CONTINUED)**

Time (sec)	Elevation (deg)	Azimuth (deg)	Aspect Angle (deg)	Range (ft)	Range Rate (fps)
2.6000000e+02	2.4894542e+01	-1.3675327e+02	1.6435976e+02	2.5691889e+06	1.4188093e+04
2.6100000e+02	2.4847547e+01	-1.3697673e+02	1.6451297e+02	2.5833885e+06	1.4208185e+04
2.6200000e+02	2.4800199e+01	-1.3719757e+02	1.6466398e+02	2.5976066e+06	1.4227763e+04
2.6300000e+02	2.4752510e+01	-1.3741585e+02	1.6481280e+02	2.6118427e+06	1.4246836e+04
2.6400000e+02	2.4704456e+01	-1.3763149e+02	1.6495935e+02	2.6260991e+06	1.4265406e+04
2.6500000e+02	2.4656062e+01	-1.3784461e+02	1.6510365e+02	2.6403744e+06	1.4283490e+04
2.6600000e+02	2.4607359e+01	-1.3805528e+02	1.6524576e+02	2.6546666e+06	1.4301104e+04
2.6700000e+02	2.4558353e+01	-1.3826347e+02	1.6538559e+02	2.6689757e+06	1.4318250e+04
2.6800000e+02	2.4509035e+01	-1.3846925e+02	1.6552316e+02	2.6833026e+06	1.4334942e+04
2.6900000e+02	2.4459432e+01	-1.3867264e+02	1.6565844e+02	2.6976459e+06	1.4351188e+04
2.7000000e+02	2.4409554e+01	-1.3887366e+02	1.6579141e+02	2.7120052e+06	1.4366997e+04
2.7100000e+02	2.4359422e+01	-1.3907243e+02	1.6592207e+02	2.7263791e+06	1.4382383e+04
2.7200000e+02	2.4309011e+01	-1.3926886e+02	1.6605037e+02	2.7407699e+06	1.4397349e+04
2.7300000e+02	2.4258375e+01	-1.3946309e+02	1.6617632e+02	2.7551740e+06	1.4411909e+04
2.7400000e+02	2.4207496e+01	-1.3965510e+02	1.6629987e+02	2.7695928e+06	1.4426070e+04
2.7500000e+02	2.4156385e+01	-1.3984494e+02	1.6642098e+02	2.7840259e+06	1.4439839e+04
2.7600000e+02	2.4105050e+01	-1.4003263e+02	1.6653963e+02	2.7984727e+06	1.4453226e+04
2.7700000e+02	2.4053503e+01	-1.4021820e+02	1.6665580e+02	2.8129331e+06	1.4466238e+04
2.7800000e+02	2.4001771e+01	-1.4040172e+02	1.6676947e+02	2.8274047e+06	1.447887e+04
2.7900000e+02	2.3949820e+01	-1.4058315e+02	1.6688052e+02	2.8418908e+06	1.4491172e+04
2.8000000e+02	2.3897703e+01	-1.4076259e+02	1.6698903e+02	2.8563875e+06	1.4503110e+04
2.8100000e+02	2.3845397e+01	-1.4094005e+02	1.6709489e+02	2.8708966e+06	1.4514705e+04
2.8200000e+02	2.3792921e+01	-1.4111553e+02	1.6711980e+02	2.8854167e+06	1.4525962e+04
2.8300000e+02	2.3740272e+01	-1.4128908e+02	1.6729850e+02	2.8999485e+06	1.4536889e+04
2.8400000e+02	2.3687479e+01	-1.4146077e+02	1.6739542e+02	2.9144900e+06	1.4547498e+04
2.8500000e+02	2.3634517e+01	-1.4163053e+02	1.6748920e+02	2.9290433e+06	1.4557786e+04
2.8600000e+02	2.3581424e+01	-1.4179847e+02	1.6758066e+02	2.9436055e+06	1.4567769e+04
2.8700000e+02	2.3528188e+01	-1.4196460e+02	1.6766973e+02	2.9581776e+06	1.4577447e+04
2.8800000e+02	2.3474796e+01	-1.4212888e+02	1.6775635e+02	2.9727610e+06	1.4586826e+04
2.8900000e+02	2.3421306e+01	-1.4229147e+02	1.6784061e+02	2.9873511e+06	1.4595922e+04
2.9000000e+02	2.3367672e+01	-1.4245228e+02	1.6792233e+02	3.0019520e+06	1.4604730e+04
2.9100000e+02	2.3313921e+01	-1.4261136e+02	1.6800185e+02	3.0165615e+06	1.4613258e+04
2.9200000e+02	2.3260072e+01	-1.4276879e+02	1.6807932e+02	3.0311780e+06	1.4621517e+04
2.9300000e+02	2.3206095e+01	-1.4292450e+02	1.6815464e+02	3.0458044e+06	1.4629506e+04
2.9400000e+02	2.3152030e+01	-1.4307860e+02	1.6822789e+02	3.0604373e+06	1.4637235e+04
2.9500000e+02	2.3097863e+01	-1.4323108e+02	1.6829900e+02	3.0750781e+06	1.4644708e+04
2.9600000e+02	2.3043598e+01	-1.4338196e+02	1.6836797e+02	3.0897267e+06	1.4651930e+04
2.9700000e+02	2.2989245e+01	-1.4353125e+02	1.6843478e+02	3.1043822e+06	1.4658905e+04
2.9800000e+02	2.2934801e+01	-1.4367899e+02	1.6849941e+02	3.1190449e+06	1.4665639e+04
2.9900000e+02	2.2880289e+01	-1.4382523e+02	1.6856190e+02	3.1337133e+06	1.4672141e+04
3.0000000e+02	2.2825686e+01	-1.4396992e+02	1.6862214e+02	3.1483891e+06	1.4678406e+04
3.0100000e+02	2.2771014e+01	-1.4411316e+02	1.6868018e+02	3.1630706e+06	1.4684449e+04
3.0200000e+02	2.2716277e+01	-1.4425493e+02	1.6873599e+02	3.1777577e+06	1.4690270e+04
3.0300000e+02	2.2661470e+01	-1.4439524e+02	1.6878953e+02	3.1924508e+06	1.4695872e+04
3.0400000e+02	2.2606597e+01	-1.4453413e+02	1.6884081e+02	3.2071496e+06	1.4701261e+04
3.0500000e+02	2.2551668e+01	-1.4467159e+02	1.6889484e+02	3.2218533e+06	1.4706439e+04
3.0600000e+02	2.2496687e+01	-1.4480772e+02	1.6894877e+02	3.2365616e+06	1.4711417e+04
3.0700000e+02	2.2441639e+01	-1.4494243e+02	1.6900111e+02	3.2512761e+06	1.4716191e+04
3.0800000e+02	2.2386552e+01	-1.4507583e+02	1.6905190e+02	3.2659942e+06	1.4720770e+04
3.0900000e+02	2.2331416e+01	-1.4520789e+02	1.6910114e+02	3.2807169e+06	1.4725156e+04
3.1000000e+02	2.2276234e+01	-1.4533864e+02	1.6914882e+02	3.2954439e+06	1.4729353e+04
3.1100000e+02	2.2221004e+01	-1.4546809e+02	1.6919495e+02	3.3101757e+06	1.4733364e+04
3.1200000e+02	2.2165738e+01	-1.4559625e+02	1.6923953e+02	3.3249108e+06	1.4737193e+04
3.1300000e+02	2.2110432e+01	-1.4572316e+02	1.6928257e+02	3.3396503e+06	1.4740844e+04
3.1400000e+02	2.2055089e+01	-1.4584882e+02	1.6932409e+02	3.3543934e+06	1.4744320e+04
3.1500000e+02	2.1999721e+01	-1.4597329e+02	1.6936411e+02	3.3691391e+06	1.4747629e+04
3.1600000e+02	2.1944324e+01	-1.4609655e+02	1.6940262e+02	3.3838880e+06	1.4750769e+04
3.1700000e+02	2.1888899e+01	-1.4621861e+02	1.6943960e+02	3.3986399e+06	1.4753743e+04
3.1800000e+02	2.1833445e+01	-1.4633949e+02	1.6947508e+02	3.4133951e+06	1.4756556e+04
3.1900000e+02	2.1777969e+01	-1.4645921e+02	1.6950905e+02	3.4281531e+06	1.4759211e+04
3.2000000e+02	2.1722466e+01	-1.4657778e+02	1.6954153e+02	3.4429139e+06	1.4761711e+04
3.2100000e+02	2.1666944e+01	-1.4669521e+02	1.6957250e+02	3.4576770e+06	1.4764057e+04
3.2200000e+02	2.1611413e+01	-1.4681156e+02	1.6960203e+02	3.4724417e+06	1.4766258e+04
3.2300000e+02	2.1555855e+01	-1.4692677e+02	1.6963005e+02	3.4872093e+06	1.4768309e+04

**SNIF TRACKING DATA (CONTINUED)**

Time (sec)	Elevation (deg)	Azimuth (deg)	Aspect Angle (deg)	Range (ft)	Range Rate (fps)
3.2400000e+02	2.1500286e+01	-1.4704094e+02	1.6965663e+02	3.5019787e+06	1.4770220e+04
3.2500000e+02	2.1444712e+01	-1.4715402e+02	1.6968173e+02	3.5167492e+06	1.4771989e+04
3.2600000e+02	2.1389120e+01	-1.4726604e+02	1.6970540e+02	3.5315222e+06	1.4773620e+04
3.2700000e+02	2.1333518e+01	-1.4737702e+02	1.6972759e+02	3.5462964e+06	1.4775116e+04
3.2800000e+02	2.1277907e+01	-1.4748696e+02	1.6974835e+02	3.5610723e+06	1.4776478e+04
3.2900000e+02	2.1222283e+01	-1.4759589e+02	1.6976768e+02	3.5758504e+06	1.4777710e+04
3.3000000e+02	2.1166672e+01	-1.4770384e+02	1.6978561e+02	3.5906275e+06	1.4778817e+04
3.3100000e+02	2.1111038e+01	-1.4781076e+02	1.6980209e+02	3.6054076e+06	1.4779795e+04
3.3200000e+02	2.1055412e+01	-1.4791674e+02	1.6981720e+02	3.6201876e+06	1.4780654e+04
3.3300000e+02	2.0999783e+01	-1.4802175e+02	1.6983090e+02	3.6349685e+06	1.4781392e+04
3.3400000e+02	2.0944151e+01	-1.4812580e+02	1.6984323e+02	3.6497502e+06	1.4782011e+04
3.3500000e+02	2.0888526e+01	-1.4822891e+02	1.6985417e+02	3.6645321e+06	1.4782513e+04
3.3600000e+02	2.0832896e+01	-1.4833108e+02	1.6986375e+02	3.6793150e+06	1.4782901e+04
3.3700000e+02	2.0777269e+01	-1.4843234e+02	1.6987198e+02	3.6940983e+06	1.4783178e+04
3.3800000e+02	2.0721641e+01	-1.4853269e+02	1.6987888e+02	3.7088825e+06	1.4783345e+04
3.3900000e+02	2.0666032e+01	-1.4863218e+02	1.6988448e+02	3.7236651e+06	1.4783407e+04
3.4000000e+02	2.0610425e+01	-1.4873078e+02	1.6988777e+02	3.7384482e+06	1.4783364e+04
3.4100000e+02	2.0554815e+01	-1.4882847e+02	1.6989172e+02	3.7532324e+06	1.4783214e+04
3.4200000e+02	2.0499221e+01	-1.4892533e+02	1.6989343e+02	3.7680151e+06	1.4782964e+04
3.4300000e+02	2.0443634e+01	-1.4902134e+02	1.6989387e+02	3.7827982e+06	1.4782616e+04
3.4400000e+02	2.0388056e+01	-1.4911650e+02	1.6989306e+02	3.7975806e+06	1.4782169e+04
3.4500000e+02	2.0332500e+01	-1.4921087e+02	1.6989104e+02	3.8123615e+06	1.4781628e+04
3.4600000e+02	2.0276940e+01	-1.4930438e+02	1.6988778e+02	3.8271432e+06	1.4780991e+04
3.4700000e+02	2.0221394e+01	-1.4939707e+02	1.6988332e+02	3.8419241e+06	1.4780260e+04
3.4800000e+02	2.0165866e+01	-1.4948901e+02	1.6987770e+02	3.8567035e+06	1.4779443e+04
3.4900000e+02	2.0110349e+01	-1.4958015e+02	1.6987093e+02	3.8714825e+06	1.4778535e+04
3.5000000e+02	2.0054837e+01	-1.4967047e+02	1.6986299e+02	3.8862614e+06	1.4777538e+04
3.5100000e+02	1.9999352e+01	-1.4976005e+02	1.6985396e+02	3.9010379e+06	1.4776457e+04
3.5200000e+02	1.9943872e+01	-1.4984887e+02	1.6984381e+02	3.9158142e+06	1.4775292e+04
3.5300000e+02	1.9888412e+01	-1.4993693e+02	1.6983259e+02	3.9305890e+06	1.4774045e+04
3.5400000e+02	1.9832974e+01	-1.5002429e+02	1.6985423e+02	3.9453616e+06	1.4772720e+04
3.5404010e+02	1.9830756e+01	-1.5002774e+02	1.6985594e+02	3.9459528e+06	1.4772663e+04
3.5500000e+02	1.9777547e+01	-1.5011086e+02	1.6989641e+02	3.9601337e+06	1.4771311e+04
3.5504001e+02	1.9775337e+01	-1.5011432e+02	1.6989807e+02	3.9607239e+06	1.4771254e+04
3.5600000e+02	1.9722134e+01	-1.5019671e+02	1.7040121e+02	3.9749046e+06	1.4769842e+04
3.5700000e+02	1.9666740e+01	-1.5028189e+02	1.7148402e+02	3.9896736e+06	1.4768286e+04
3.5800000e+02	1.9611368e+01	-1.5036634e+02	1.7232881e+02	4.0044406e+06	1.4766651e+04
3.5900000e+02	1.9556003e+01	-1.5045006e+02	1.7268336e+02	4.0192072e+06	1.4764939e+04
3.6000000e+02	1.9500664e+01	-1.5053312e+02	1.7247682e+02	4.0339711e+06	1.4763157e+04
3.6100000e+02	1.9445344e+01	-1.5061550e+02	1.7175113e+02	4.0487333e+06	1.4761305e+04
3.6200000e+02	1.9390044e+01	-1.5069719e+02	1.7062601e+02	4.0634938e+06	1.4759381e+04
3.6300000e+02	1.9334761e+01	-1.5077822e+02	1.6926122e+02	4.0782523e+06	1.4757392e+04
3.6400000e+02	1.9279509e+01	-1.5085862e+02	1.6770048e+02	4.0930079e+06	1.4755335e+04
3.6500000e+02	1.9224266e+01	-1.5093833e+02	1.6600600e+02	4.1077625e+06	1.4753211e+04
3.6600000e+02	1.9169055e+01	-1.5101742e+02	1.6422090e+02	4.1225139e+06	1.4751024e+04
3.6700000e+02	1.9113851e+01	-1.5109584e+02	1.6238329e+02	4.1372647e+06	1.4748772e+04
3.6800000e+02	1.9058676e+01	-1.5117367e+02	1.6049257e+02	4.1520122e+06	1.4746459e+04
3.6900000e+02	1.9003526e+01	-1.5125087e+02	1.5856349e+02	4.1667573e+06	1.4744086e+04
3.7000000e+02	1.8948396e+01	-1.5132745e+02	1.5660338e+02	4.1814999e+06	1.4741653e+04
3.7100000e+02	1.8893290e+01	-1.5140342e+02	1.5461565e+02	4.1962401e+06	1.4739160e+04
3.7200000e+02	1.8838203e+01	-1.5147878e+02	1.5260166e+02	4.2109781e+06	1.4736610e+04
3.7300000e+02	1.8783139e+01	-1.5155355e+02	1.5056550e+02	4.2257135e+06	1.4734004e+04
3.7400000e+02	1.8728096e+01	-1.5162773e+02	1.4850392e+02	4.2404467e+06	1.4731342e+04
3.7500000e+02	1.8673085e+01	-1.5170136e+02	1.4641464e+02	4.2551761e+06	1.4728627e+04
3.7600000e+02	1.8618087e+01	-1.5177437e+02	1.4429627e+02	4.2699041e+06	1.4725858e+04
3.7700000e+02	1.8563121e+01	-1.5184685e+02	1.4214575e+02	4.2846281e+06	1.4723036e+04
3.7800000e+02	1.8508175e+01	-1.5191877e+02	1.3995582e+02	4.2993496e+06	1.4720164e+04
3.7900000e+02	1.8453248e+01	-1.5199009e+02	1.3770594e+02	4.3140690e+06	1.4717236e+04
3.8000000e+02	1.8398352e+01	-1.5206090e+02	1.3563089e+02	4.3287848e+06	1.4714305e+04
3.8100000e+02	1.8343482e+01	-1.5213115e+02	1.3439308e+02	4.3434973e+06	1.4711350e+04
3.8200000e+02	1.8288634e+01	-1.5220087e+02	1.3370581e+02	4.3582071e+06	1.4708297e+04
3.8300000e+02	1.8233817e+01	-1.5227009e+02	1.3316356e+02	4.3729131e+06	1.4705196e+04
3.8400000e+02	1.8179015e+01	-1.5233875e+02	1.3273330e+02	4.3876172e+06	1.4702044e+04
3.8500000e+02	1.8124236e+01	-1.5240688e+02	1.3240108e+02	4.4023184e+06	1.4698843e+04

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**SNIF TRACKING DATA (CONTINUED)**

Time (sec)	Elevation (deg)	Azimuth (deg)	Aspect Angle (deg)	Range (ft)	Range Rate (fps)
3.8600000e+02	1.8069492e+01	-1.5247453e+02	1.3213698e+02	4.4170149e+06	1.4695601e+04
3.8700000e+02	1.8014771e+01	-1.5254167e+02	1.3192374e+02	4.4317083e+06	1.4692316e+04
3.8800000e+02	1.7960068e+01	-1.5260827e+02	1.3177056e+02	4.4463997e+06	1.4688981e+04
3.8900000e+02	1.7905390e+01	-1.5267441e+02	1.3164044e+02	4.4610874e+06	1.4685608e+04
3.9000000e+02	1.7850741e+01	-1.5274005e+02	1.3153531e+02	4.4757712e+06	1.4682195e+04
3.9100000e+02	1.7796116e+01	-1.5280520e+02	1.3148149e+02	4.4904517e+06	1.4678742e+04
3.9200000e+02	1.7741521e+01	-1.5286986e+02	1.3144686e+02	4.5051283e+06	1.4675246e+04
3.9300000e+02	1.7686940e+01	-1.5293405e+02	1.3141215e+02	4.5198025e+06	1.4671713e+04
3.9400000e+02	1.7632396e+01	-1.5299780e+02	1.3138721e+02	4.5344717e+06	1.4668143e+04
3.9500000e+02	1.7577787e+01	-1.5306104e+02	1.3136500e+02	4.5491383e+06	1.4664533e+04
3.9600000e+02	1.7523376e+01	-1.5312385e+02	1.3136063e+02	4.5638003e+06	1.4660892e+04
3.9700000e+02	1.7468896e+01	-1.5318617e+02	1.3138214e+02	4.5784602e+06	1.4657211e+04
3.9800000e+02	1.7414448e+01	-1.5324807e+02	1.3140398e+02	4.5931154e+06	1.4653497e+04
3.9900000e+02	1.7360026e+01	-1.5330952e+02	1.3142583e+02	4.6077668e+06	1.4649748e+04
4.0000000e+02	1.7305629e+01	-1.5337052e+02	1.3145793e+02	4.6224144e+06	1.4645967e+04
4.0100000e+02	1.7251254e+01	-1.5343109e+02	1.3150507e+02	4.6370586e+06	1.4642152e+04
4.0200000e+02	1.7196909e+01	-1.5349121e+02	1.3155231e+02	4.6516984e+06	1.4638304e+04
4.0300000e+02	1.7142581e+01	-1.5355091e+02	1.3159966e+02	4.6663353e+06	1.4634424e+04
4.0400000e+02	1.7088284e+01	-1.5361018e+02	1.3164712e+02	4.6809675e+06	1.4630513e+04
4.0404001e+02	1.7086113e+01	-1.5361254e+02	1.3164902e+02	4.6815525e+06	1.4630357e+04
4.0500000e+02	1.7034004e+01	-1.5366903e+02	1.3169468e+02	4.6955969e+06	1.4626573e+04
4.0504001e+02	1.7031839e+01	-1.5367137e+02	1.3169658e+02	4.6961814e+06	1.4626414e+04
4.0600000e+02	1.6979761e+01	-1.5372749e+02	1.3174234e+02	4.7102205e+06	1.4622604e+04
4.0700000e+02	1.6925534e+01	-1.5378550e+02	1.3179011e+02	4.7248416e+06	1.4618604e+04
4.0800000e+02	1.6871337e+01	-1.5384314e+02	1.3183797e+02	4.7394580e+06	1.4614576e+04
4.0900000e+02	1.6817165e+01	-1.5390037e+02	1.3188594e+02	4.7540701e+06	1.4610521e+04
4.1000000e+02	1.6763010e+01	-1.5395717e+02	1.3193402e+02	4.7686794e+06	1.4606436e+04
4.1100000e+02	1.6708884e+01	-1.5401361e+02	1.3198220e+02	4.7832840e+06	1.4602327e+04
4.1200000e+02	1.6654784e+01	-1.5406965e+02	1.3203047e+02	4.7978842e+06	1.4598191e+04
4.1204001e+02	1.6652622e+01	-1.5407189e+02	1.3203240e+02	4.7984678e+06	1.4598025e+04
4.1295999e+02	1.6602868e+01	-1.5412308e+02	1.3207691e+02	4.8118968e+06	1.4594196e+04
4.1300000e+02	1.6600706e+01	-1.5412530e+02	1.3207884e+02	4.8124804e+06	1.4594029e+04
4.1304001e+02	1.6598545e+01	-1.5412752e+02	1.3208078e+02	4.8130640e+06	1.4593862e+04
4.1400000e+02	1.65466656e+01	-1.5418056e+02	1.3212732e+02	4.8270721e+06	1.4589841e+04
4.1500000e+02	1.6492635e+01	-1.5423548e+02	1.3217589e+02	4.8416589e+06	1.4585631e+04
4.1504001e+02	1.6490468e+01	-1.5423764e+02	1.3217784e+02	4.8422434e+06	1.4585460e+04
4.1600000e+02	1.6438627e+01	-1.5428999e+02	1.3222457e+02	4.8562433e+06	1.4581395e+04
4.1700000e+02	1.6384650e+01	-1.5434412e+02	1.3227335e+02	4.8708224e+06	1.4577135e+04
4.1800000e+02	1.6330698e+01	-1.5439792e+02	1.3232222e+02	4.8853970e+06	1.4572853e+04
4.1804001e+02	1.6328541e+01	-1.5440006e+02	1.3232418e+02	4.8859798e+06	1.4572681e+04
4.1900000e+02	1.6276762e+01	-1.5445131e+02	1.3237121e+02	4.8999685e+06	1.4568546e+04
4.2000000e+02	1.6222857e+01	-1.5450438e+02	1.3242028e+02	4.9145348e+06	1.4564219e+04
4.2100000e+02	1.6168977e+01	-1.5455708e+02	1.3246945e+02	4.9290962e+06	1.4559870e+04
4.2200000e+02	1.6115118e+01	-1.5460943e+02	1.3251872e+02	4.9436541e+06	1.4555500e+04
4.2300000e+02	1.6061279e+01	-1.5466140e+02	1.3256810e+02	4.9582079e+06	1.4551107e+04
4.2400000e+02	1.6007466e+01	-1.5471305e+02	1.3261757e+02	4.9727571e+06	1.4546696e+04
4.2407999e+02	1.6003167e+01	-1.5471717e+02	1.3262158e+02	4.9739202e+06	1.4546519e+04
4.2412000e+02	1.6001014e+01	-1.5471923e+02	1.3262141e+02	4.9745020e+06	1.4547134e+04
4.2416000e+02	1.5998862e+01	-1.5472129e+02	1.3260659e+02	4.9750839e+06	1.4548372e+04
4.2500000e+02	1.5953468e+01	-1.5476429e+02	1.3431303e+02	4.9873188e+06	1.4583278e+04
4.2600000e+02	1.5898945e+01	-1.5481500e+02	1.3667738e+02	5.0019255e+06	1.4632242e+04
4.2700000e+02	1.5843866e+01	-1.5486516e+02	1.3729012e+02	5.0165848e+06	1.4686090e+04
4.2800000e+02	1.5788224e+01	-1.5491482e+02	1.3774773e+02	5.0312991e+06	1.4743200e+04
4.2900000e+02	1.5731999e+01	-1.5496393e+02	1.3816581e+02	5.0460718e+06	1.4802231e+04
4.2907999e+02	1.57272480e+01	-1.5496785e+02	1.3819600e+02	5.0472558e+06	1.4807036e+04
4.3000000e+02	1.5675196e+01	-1.5501253e+02	1.3857891e+02	5.0609041e+06	1.4862971e+04
4.3100000e+02	1.5617808e+01	-1.5506064e+02	1.3885675e+02	5.0757978e+06	1.4924940e+04
4.3200000e+02	1.5559829e+01	-1.5510822e+02	1.3897626e+02	5.0907552e+06	1.4988527e+04
4.3300000e+02	1.5501268e+01	-1.5515536e+02	1.3901861e+02	5.1057755e+06	1.5054105e+04
4.3400000e+02	1.5442093e+01	-1.5520197e+02	1.3906283e+02	5.1208637e+06	1.5121789e+04
4.3500000e+02	1.5382304e+01	-1.5524813e+02	1.3913358e+02	5.1360204e+06	1.5191736e+04
4.3600000e+02	1.5321882e+01	-1.5529379e+02	1.3921485e+02	5.1512484e+06	1.5264111e+04
4.3700000e+02	1.5260815e+01	-1.5533899e+02	1.3929838e+02	5.1665496e+06	1.5338945e+04
4.3800000e+02	1.5199090e+01	-1.5538373e+02	1.3936717e+02	5.1819266e+06	1.5416312e+04

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**SNIF TRACKING DATA (CONTINUED)**

Time (sec)	Elevation (deg)	Azimuth (deg)	Aspect Angle (deg)	Range (ft)	Range Rate (fps)
4.3900000e+02	1.5136692e+01	-1.5542800e+02	1.3946269e+02	5.1973825e+06	1.5496080e+04
4.4000000e+02	1.5073606e+01	-1.5547180e+02	1.3965053e+02	5.2129197e+06	1.5577945e+04
4.4100000e+02	1.5009839e+01	-1.5551516e+02	1.3990390e+02	5.2285388e+06	1.5661423e+04
4.4200000e+02	1.4945378e+01	-1.5555807e+02	1.4009180e+02	5.2442431e+06	1.574594e+04
4.4300000e+02	1.4880243e+01	-1.5560059e+02	1.4017876e+02	5.2600310e+06	1.5831649e+04
4.4400000e+02	1.4814423e+01	-1.5564266e+02	1.4023867e+02	5.2759064e+06	1.5918369e+04
4.4500000e+02	1.4747925e+01	-1.5568432e+02	1.4023737e+02	5.2918682e+06	1.6006337e+04
4.4600000e+02	1.4680739e+01	-1.5572559e+02	1.4022303e+02	5.3079195e+06	1.6095855e+04
4.4700000e+02	1.4612864e+01	-1.5576646e+02	1.4022928e+02	5.3240608e+06	1.6187132e+04
4.4800000e+02	1.4544289e+01	-1.5580692e+02	1.4025521e+02	5.3402949e+06	1.6280352e+04
4.4900000e+02	1.4475018e+01	-1.5584704e+02	1.4029814e+02	5.3566217e+06	1.6375496e+04
4.5000000e+02	1.4405027e+01	-1.5588677e+02	1.4032075e+02	5.3730460e+06	1.6472913e+04
4.5100000e+02	1.4334312e+01	-1.5592612e+02	1.4035128e+02	5.3895689e+06	1.6572538e+04
4.5200000e+02	1.4262871e+01	-1.5596513e+02	1.4038958e+02	5.4061921e+06	1.6674546e+04
4.5300000e+02	1.4190688e+01	-1.5600379e+02	1.4043281e+02	5.4229187e+06	1.6778912e+04
4.5400000e+02	1.4117757e+01	-1.5604210e+02	1.4045890e+02	5.4397506e+06	1.6885705e+04
4.5500000e+02	1.4044067e+01	-1.5608012e+02	1.4048990e+02	5.4566906e+06	1.6994944e+04
4.5600000e+02	1.3969608e+01	-1.5611778e+02	1.4055414e+02	5.4737416e+06	1.7106624e+04
4.5700000e+02	1.3894375e+01	-1.5615516e+02	1.4059066e+02	5.4909049e+06	1.7220714e+04
4.5800000e+02	1.3818362e+01	-1.5619221e+02	1.4061292e+02	5.5081837e+06	1.7337121e+04
4.5900000e+02	1.3741562e+01	-1.5622900e+02	1.4063318e+02	5.5255797e+06	1.7455852e+04
4.6000000e+02	1.3663961e+01	-1.5626548e+02	1.4067828e+02	5.5430967e+06	1.7577016e+04
4.6100000e+02	1.3585567e+01	-1.5630173e+02	1.4073683e+02	5.5607348e+06	1.7700661e+04
4.6200000e+02	1.3506364e+01	-1.5633771e+02	1.4075351e+02	5.5784979e+06	1.7826850e+04
4.6300000e+02	1.3426344e+01	-1.5637345e+02	1.4075009e+02	5.5963886e+06	1.7955628e+04
4.6400000e+02	1.3345495e+01	-1.5640893e+02	1.4072768e+02	5.6144110e+06	1.8086974e+04
4.6500000e+02	1.3263824e+01	-1.5644424e+02	1.4072541e+02	5.6325640e+06	1.8220943e+04
4.6600000e+02	1.3181311e+01	-1.5647930e+02	1.4069839e+02	5.6508530e+06	1.8357572e+04
4.6700000e+02	1.3097947e+01	-1.5651417e+02	1.4067368e+02	5.6692807e+06	1.8496985e+04
4.6800000e+02	1.3013732e+01	-1.5654886e+02	1.4065191e+02	5.6878479e+06	1.8639307e+04
4.6900000e+02	1.2928646e+01	-1.5658338e+02	1.4063902e+02	5.7065601e+06	1.8784608e+04
4.7000000e+02	1.2842688e+01	-1.5661772e+02	1.4066091e+02	5.7254185e+06	1.8933014e+04
4.7064001e+02	1.2787211e+01	-1.5663964e+02	1.4067621e+02	5.7375663e+06	1.9029785e+04
4.7100000e+02	1.2755843e+01	-1.5665194e+02	1.4071213e+02	5.7444270e+06	1.9084804e+04
4.7200000e+02	1.2668106e+01	-1.5668600e+02	1.4080100e+02	5.7635894e+06	1.9240140e+04
4.7300000e+02	1.2579468e+01	-1.5671997e+02	1.4082983e+02	5.7829084e+06	1.9399019e+04
4.7400000e+02	1.2489921e+01	-1.5675384e+02	1.4082563e+02	5.8023881e+06	1.9561513e+04
4.7500000e+02	1.2399448e+01	-1.5678761e+02	1.4077942e+02	5.8220330e+06	1.9727830e+04
4.7600000e+02	1.2308046e+01	-1.5682133e+02	1.4076579e+02	5.8418452e+06	1.9897998e+04
4.7700000e+02	1.2215694e+01	-1.5685498e+02	1.4070815e+02	5.8618301e+06	2.0072241e+04
4.7800000e+02	1.2122381e+01	-1.5688861e+02	1.4068260e+02	5.8819909e+06	2.0250594e+04
4.7900000e+02	1.2028088e+01	-1.5692220e+02	1.4066148e+02	5.9023332e+06	2.0432781e+04
4.8000000e+02	1.1932816e+01	-1.5695579e+02	1.4062757e+02	5.9228582e+06	2.0619193e+04
4.8100000e+02	1.1836546e+01	-1.5698941e+02	1.4057742e+02	5.9435719e+06	2.0809999e+04
4.8200000e+02	1.1739268e+01	-1.5702305e+02	1.4085374e+02	5.9644782e+06	2.0999900e+04
4.8300000e+02	1.1641128e+01	-1.5705671e+02	1.4169346e+02	5.9855634e+06	2.1166399e+04
4.8400000e+02	1.1542333e+01	-1.5709038e+02	1.4111481e+02	6.0068069e+06	2.1318928e+04
4.8500000e+02	1.1442951e+01	-1.5712409e+02	1.4058334e+02	6.0281992e+06	2.1464669e+04
4.8600000e+02	1.1343013e+01	-1.5715776e+02	1.4038148e+02	6.0497350e+06	2.1606370e+04
4.8700000e+02	1.1242553e+01	-1.5719142e+02	1.4032752e+02	6.0714104e+06	2.1744274e+04
4.8800000e+02	1.1141611e+01	-1.5722505e+02	1.4029301e+02	6.0932220e+06	2.1877350e+04
4.8900000e+02	1.1040251e+01	-1.5725866e+02	1.4024276e+02	6.1151626e+06	2.2003173e+04
4.9000000e+02	1.0938548e+01	-1.5729223e+02	1.3993281e+02	6.1372239e+06	2.2116538e+04
4.9100000e+02	1.0836632e+01	-1.5732572e+02	1.3970746e+02	6.1593891e+06	2.2206609e+04
4.9200000e+02	1.0734783e+01	-1.5735907e+02	1.3907674e+02	6.1816202e+06	2.2247669e+04
4.9295999e+02	1.0637377e+01	-1.5739087e+02	1.3815220e+02	6.2029844e+06	2.2259771e+04
4.9300000e+02	1.0633330e+01	-1.5739218e+02	1.3812981e+02	6.2038743e+06	2.2260177e+04
4.9400000e+02	1.0532357e+01	-1.5742504e+02	1.3800240e+02	6.2261397e+06	2.2270203e+04
4.9500000e+02	1.0431871e+01	-1.5745760e+02	1.3848631e+02	6.2484147e+06	2.2280020e+04
4.9600000e+02	1.0331863e+01	-1.5748990e+02	1.3914488e+02	6.2706997e+06	2.2289674e+04
4.9700000e+02	1.0232330e+01	-1.5752196e+02	1.3963447e+02	6.2929944e+06	2.2299172e+04
4.9795999e+02	1.0137223e+01	-1.5755249e+02	1.3980218e+02	6.3144058e+06	2.2308138e+04
4.9800000e+02	1.0133269e+01	-1.5755376e+02	1.3980231e+02	6.3152982e+06	2.2308508e+04
4.9900000e+02	1.0034676e+01	-1.5758531e+02	1.4045895e+02	6.3376109e+06	2.2317445e+04

**SNIF TRACKING DATA (CONTINUED)**

Time (sec)	Elevation (deg)	Azimuth (deg)	Aspect Angle (deg)	Range (ft)	Range Rate (fps)
5.0000000e+02	9.9365404e+00	-1.5761661e+02	1.4223944e+02	6.3599329e+06	2.2326291e+04
5.0100000e+02	9.8388617e+00	-1.5764765e+02	1.4472618e+02	6.3822637e+06	2.2335155e+04
5.0200000e+02	9.7416400e+00	-1.5767847e+02	1.4714096e+02	6.4046030e+06	2.2343974e+04
5.0300000e+02	9.6448687e+00	-1.5770903e+02	1.4899483e+02	6.4269511e+06	2.2352707e+04
5.0400000e+02	9.5485438e+00	-1.5773935e+02	1.5026660e+02	6.4493083e+06	2.2361274e+04
5.0500000e+02	9.4526615e+00	-1.5776945e+02	1.5109997e+02	6.4716738e+06	2.2369684e+04
5.0600000e+02	9.3572176e+00	-1.5779929e+02	1.5169117e+02	6.4940479e+06	2.2377929e+04
5.0700000e+02	9.2622077e+00	-1.5782892e+02	1.5212495e+02	6.5164297e+06	2.2386036e+04
5.0800000e+02	9.1676277e+00	-1.5785831e+02	1.5244456e+02	6.5388198e+06	2.2393998e+04
5.0900000e+02	9.0734708e+00	-1.5788748e+02	1.5268559e+02	6.5612184e+06	2.2401838e+04
5.1000000e+02	8.9797408e+00	-1.5791643e+02	1.5286815e+02	6.5836235e+06	2.2409555e+04
5.1100000e+02	8.8864245e+00	-1.5794516e+02	1.5300594e+02	6.6060369e+06	2.2417158e+04
5.1200000e+02	8.7935228e+00	-1.5797368e+02	1.5311077e+02	6.6284578e+06	2.2424645e+04
5.1300000e+02	8.7010287e+00	-1.5800196e+02	1.5319205e+02	6.6508864e+06	2.2432017e+04
5.1400000e+02	8.6089437e+00	-1.5803006e+02	1.5326845e+02	6.6733215e+06	2.2439278e+04
5.1500000e+02	8.5172604e+00	-1.5805793e+02	1.5333057e+02	6.6957640e+06	2.2446438e+04
5.1600000e+02	8.4259680e+00	-1.5808557e+02	1.5338458e+02	6.7182152e+06	2.2453490e+04
5.1700000e+02	8.3350748e+00	-1.5811304e+02	1.5344226e+02	6.7406719e+06	2.2460443e+04
5.1800000e+02	8.2445754e+00	-1.5814030e+02	1.5348585e+02	6.7631350e+06	2.2467294e+04
5.1900000e+02	8.1544584e+00	-1.5816734e+02	1.5353062e+02	6.7856057e+06	2.2474043e+04
5.2000000e+02	8.0647252e+00	-1.5819419e+02	1.5357652e+02	6.8080832e+06	2.2480694e+04
5.2100000e+02	7.9753705e+00	-1.5822085e+02	1.5362348e+02	6.8305674e+06	2.2487249e+04
5.2200000e+02	7.8863909e+00	-1.5824729e+02	1.5367368e+02	6.8530583e+06	2.2493702e+04
5.2300000e+02	7.7977869e+00	-1.5827357e+02	1.5370967e+02	6.8755549e+06	2.2500067e+04
5.2400000e+02	7.7095500e+00	-1.5829964e+02	1.5374613e+02	6.8980580e+06	2.2506336e+04
5.2500000e+02	7.6216794e+00	-1.5832552e+02	1.5378337e+02	6.9205675e+06	2.2512514e+04
5.2600000e+02	7.5341723e+00	-1.5835123e+02	1.5382139e+02	6.9430825e+06	2.2518604e+04
5.2700000e+02	7.4470181e+00	-1.5837673e+02	1.5386015e+02	6.9656051e+06	2.2524604e+04
5.2800000e+02	7.3602242e+00	-1.5840205e+02	1.5389961e+02	6.9881325e+06	2.2530517e+04
5.2900000e+02	7.2737824e+00	-1.5842720e+02	1.5393974e+02	7.0106658e+06	2.2536344e+04
5.3000000e+02	7.1876893e+00	-1.5845217e+02	1.5398052e+02	7.0332050e+06	2.2542086e+04
5.3100000e+02	7.1019442e+00	-1.5847698e+02	1.5402716e+02	7.0557494e+06	2.2547741e+04
5.3200000e+02	7.0165375e+00	-1.5850159e+02	1.5407312e+02	7.0783002e+06	2.2553318e+04
5.3300000e+02	6.9314709e+00	-1.5852603e+02	1.5410199e+02	7.1008568e+06	2.2558809e+04
5.3400000e+02	6.8467445e+00	-1.5855030e+02	1.5413134e+02	7.1234175e+06	2.2564218e+04
5.3500000e+02	6.7623456e+00	-1.5857440e+02	1.5416116e+02	7.1459852e+06	2.2569550e+04
5.3600000e+02	6.6782824e+00	-1.5859835e+02	1.5419146e+02	7.1685568e+06	2.2574803e+04
5.3700000e+02	6.5945455e+00	-1.5862211e+02	1.5422222e+02	7.1911340e+06	2.2579979e+04
5.3800000e+02	6.5111289e+00	-1.5864570e+02	1.5425344e+02	7.2137171e+06	2.2585080e+04
5.3900000e+02	6.4280386e+00	-1.5866915e+02	1.5428512e+02	7.2363043e+06	2.2590104e+04
5.4000000e+02	6.3452639e+00	-1.5869242e+02	1.5431724e+02	7.2588970e+06	2.2595054e+04
5.4100000e+02	6.2628068e+00	-1.5871554e+02	1.5434978e+02	7.2814944e+06	2.2599930e+04
5.4200000e+02	6.1806597e+00	-1.5873849e+02	1.5438275e+02	7.3040973e+06	2.2604733e+04
5.4300000e+02	6.0988266e+00	-1.5876131e+02	1.5441612e+02	7.3267039e+06	2.2609464e+04
5.4400000e+02	6.0172988e+00	-1.5878396e+02	1.5446152e+02	7.3493157e+06	2.2614120e+04
5.4500000e+02	5.9360727e+00	-1.5880643e+02	1.5451042e+02	7.3719327e+06	2.2618709e+04
5.4600000e+02	5.8551534e+00	-1.5882879e+02	1.5455970e+02	7.3945533e+06	2.2623227e+04
5.4700000e+02	5.7745324e+00	-1.5885098e+02	1.5460852e+02	7.4171786e+06	2.2627678e+04
5.4800000e+02	5.6942070e+00	-1.5887303e+02	1.5462955e+02	7.4398084e+06	2.2632060e+04
5.4900000e+02	5.6141736e+00	-1.5889491e+02	1.5465090e+02	7.4624431e+06	2.2636372e+04
5.5000000e+02	5.5344364e+00	-1.5891668e+02	1.5467258e+02	7.4850811e+06	2.2640619e+04
5.5100000e+02	5.4549864e+00	-1.5893829e+02	1.5469455e+02	7.5077236e+06	2.2644797e+04
5.5200000e+02	5.3758196e+00	-1.5895974e+02	1.5471682e+02	7.5303711e+06	2.2648910e+04
5.5288000e+02	5.3063898e+00	-1.5897852e+02	1.5473666e+02	7.5503035e+06	2.2652476e+04
5.5296002e+02	5.3000913e+00	-1.5898022e+02	1.5473848e+02	7.5521152e+06	2.2652798e+04
5.5300000e+02	5.2969388e+00	-1.5898106e+02	1.5473941e+02	7.5530221e+06	2.2652960e+04
5.5400000e+02	5.2183392e+00	-1.5900224e+02	1.5478350e+02	7.5756772e+06	2.2656990e+04
5.5496002e+02	5.1431472e+00	-1.5902245e+02	1.5486287e+02	7.5974293e+06	2.2660799e+04
5.5500000e+02	5.1400198e+00	-1.5902329e+02	1.5486696e+02	7.5983357e+06	2.2660957e+04
5.5520001e+02	5.1243873e+00	-1.5902748e+02	1.5488833e+02	7.6028684e+06	2.2661743e+04
5.5591998e+02	5.0682081e+00	-1.5904252e+02	1.5497814e+02	7.6191860e+06	2.2664550e+04
5.5596002e+02	5.0650912e+00	-1.5904336e+02	1.5498371e+02	7.6200925e+06	2.2664705e+04
5.5600000e+02	5.0619747e+00	-1.5904419e+02	1.5498936e+02	7.6209990e+06	2.2664860e+04
5.5700000e+02	4.9842059e+00	-1.5906497e+02	1.5664301e+02	7.6436656e+06	2.2668728e+04

**SNIF TRACKING DATA (CONTINUED)**

Time (sec)	Elevation (deg)	Azimuth (deg)	Aspect Angle (deg)	Range (ft)	Range Rate (fps)
5.5800000e+02	4.9067079e+00	-1.5908561e+02	1.5778142e+02	7.6663360e+06	2.2672511e+04
5.5900000e+02	4.8294794e+00	-1.5910611e+02	1.5811091e+02	7.6890104e+06	2.2676231e+04
5.6000000e+02	4.7525171e+00	-1.5912648e+02	1.5759155e+02	7.7116885e+06	2.2679894e+04
5.6100000e+02	4.6758190e+00	-1.5914671e+02	1.5627533e+02	7.7343705e+06	2.2683494e+04
5.6200000e+02	4.5993833e+00	-1.5916681e+02	1.5428116e+02	7.7570560e+06	2.2687035e+04
5.6300000e+02	4.5232109e+00	-1.5918680e+02	1.5174965e+02	7.7797445e+06	2.2690516e+04
5.6400000e+02	4.4472968e+00	-1.5920666e+02	1.4880927e+02	7.8024362e+06	2.2693938e+04
5.6500000e+02	4.3716359e+00	-1.5922639e+02	1.4556297e+02	7.8251320e+06	2.2697299e+04
5.6600000e+02	4.2962281e+00	-1.5924597e+02	1.4208804e+02	7.8478315e+06	2.2700600e+04
5.6700000e+02	4.2210756e+00	-1.5926547e+02	1.3844092e+02	7.8705331e+06	2.2703844e+04
5.6800000e+02	4.1461683e+00	-1.5928480e+02	1.3466274e+02	7.8932392e+06	2.2707027e+04
5.6900000e+02	4.0715122e+00	-1.5930405e+02	1.3078352e+02	7.9159475e+06	2.2710152e+04
5.7000000e+02	3.9971008e+00	-1.5932316e+02	1.2682564e+02	7.9386590e+06	2.2713218e+04
5.7100000e+02	3.9229327e+00	-1.5934216e+02	1.2280108e+02	7.9613737e+06	2.2716220e+04
5.7200000e+02	3.8490053e+00	-1.5936103e+02	1.1856490e+02	7.9840916e+06	2.2719169e+04
5.7300000e+02	3.7753182e+00	-1.5937979e+02	1.1431111e+02	8.0068121e+06	2.2722061e+04
5.7400000e+02	3.7018660e+00	-1.5939842e+02	1.0994531e+02	8.0295360e+06	2.2724891e+04
5.7500000e+02	3.6286521e+00	-1.5941695e+02	1.0542734e+02	8.0522622e+06	2.2727662e+04
5.7600000e+02	3.5556717e+00	-1.5943537e+02	1.0071357e+02	8.0749909e+06	2.2730378e+04
5.7700000e+02	3.4829221e+00	-1.5945366e+02	9.8446458e+01	8.0977228e+06	2.2733143e+04
5.7800000e+02	3.4104023e+00	-1.5947185e+02	9.6899140e+01	8.1204571e+06	2.2735775e+04
5.7900000e+02	3.3381086e+00	-1.5948992e+02	9.5927211e+01	8.1431946e+06	2.2738346e+04
5.8000000e+02	3.2660436e+00	-1.5950789e+02	9.5127854e+01	8.1659341e+06	2.2740866e+04
5.8100000e+02	3.1942029e+00	-1.5952576e+02	9.4947647e+01	8.1886758e+06	2.2743350e+04
5.8200000e+02	3.1225828e+00	-1.5954351e+02	9.4875027e+01	8.2114206e+06	2.2745765e+04
5.8300000e+02	3.0511860e+00	-1.5956116e+02	9.4813871e+01	8.2341672e+06	2.2748133e+04
5.8400000e+02	2.9800054e+00	-1.5957870e+02	9.4764112e+01	8.2569166e+06	2.2750454e+04
5.8500000e+02	2.9090438e+00	-1.5959613e+02	9.4725672e+01	8.2796678e+06	2.2752727e+04
5.8600000e+02	2.8382947e+00	-1.5961346e+02	9.4698463e+01	8.3024222e+06	2.2754955e+04
5.8700000e+02	2.7677710e+00	-1.5963069e+02	9.4677478e+01	8.3251782e+06	2.2757137e+04
5.8800000e+02	2.6974385e+00	-1.5964780e+02	9.4666436e+01	8.3479365e+06	2.2759273e+04
5.8900000e+02	2.6273263e+00	-1.5966483e+02	9.4656583e+01	8.3706967e+06	2.2761364e+04
5.9000000e+02	2.5574241e+00	-1.5968176e+02	9.4674535e+01	8.3934588e+06	2.2763412e+04
5.9100000e+02	2.4877271e+00	-1.5969858e+02	9.4692330e+01	8.4162234e+06	2.2765414e+04
5.9200000e+02	2.4182339e+00	-1.5971530e+02	9.4718408e+01	8.4389902e+06	2.2767373e+04
5.9300000e+02	2.3489461e+00	-1.5973192e+02	9.4752112e+01	8.4617584e+06	2.2769289e+04
5.9400000e+02	2.2798608e+00	-1.5974846e+02	9.4792788e+01	8.4845286e+06	2.2771161e+04
5.9500000e+02	2.2109745e+00	-1.5976489e+02	9.4839820e+01	8.5073008e+06	2.2772990e+04
5.9600000e+02	2.1422889e+00	-1.5978123e+02	9.4894477e+01	8.5300743e+06	2.2774778e+04
5.9700000e+02	2.0737979e+00	-1.5979748e+02	9.4961498e+01	8.5528504e+06	2.2776525e+04
5.9800000e+02	2.0055044e+00	-1.5981363e+02	9.5034840e+01	8.5756276e+06	2.2778229e+04
5.9900000e+02	1.9374044e+00	-1.5982969e+02	9.5114437e+01	8.5984067e+06	2.2779892e+04
6.0000000e+02	1.8694980e+00	-1.5984566e+02	9.5200185e+01	8.6211873e+06	2.2781515e+04
6.0100000e+02	1.8017811e+00	-1.5986153e+02	9.5292006e+01	8.6439699e+06	2.2783098e+04
6.0200000e+02	1.7342558e+00	-1.5987732e+02	9.5389800e+01	8.6667536e+06	2.2784641e+04
6.0300000e+02	1.6669171e+00	-1.5989301e+02	9.5493486e+01	8.6895393e+06	2.2786143e+04
6.0400000e+02	1.5997660e+00	-1.5990862e+02	9.5602939e+01	8.7123262e+06	2.2787607e+04
6.0500000e+02	1.5328012e+00	-1.5992416e+02	9.5718062e+01	8.7351139e+06	2.2789030e+04
6.0600000e+02	1.4660182e+00	-1.5993958e+02	9.5838771e+01	8.7579041e+06	2.2790416e+04
6.0700000e+02	1.3994191e+00	-1.5995494e+02	9.5964906e+01	8.7806949e+06	2.2791764e+04
6.0800000e+02	1.3330013e+00	-1.5997020e+02	9.6096375e+01	8.8034873e+06	2.2793074e+04
6.0900000e+02	1.2667627e+00	-1.5998537e+02	9.6233054e+01	8.8262811e+06	2.2794344e+04
6.1000000e+02	1.2007025e+00	-1.6000047e+02	9.6374811e+01	8.8490759e+06	2.2795579e+04
6.1100000e+02	1.1348186e+00	-1.6001548e+02	9.6521521e+01	8.8718725e+06	2.2796776e+04
6.1200000e+02	1.0691114e+00	-1.6003041e+02	9.6673037e+01	8.8946696e+06	2.2797937e+04
6.1296002e+02	1.0061961e+00	-1.6004466e+02	9.6822888e+01	8.9165561e+06	2.2799015e+04
6.1300000e+02	1.0035770e+00	-1.6004525e+02	9.6829224e+01	8.9174683e+06	2.2799061e+04
6.1400000e+02	9.3821814e-01	-1.6006002e+02	9.6799530e+01	8.9402677e+06	2.2800141e+04
6.1500000e+02	8.7302880e-01	-1.6007470e+02	9.6764553e+01	8.9630685e+06	2.2801192e+04
6.1600000e+02	8.0801164e-01	-1.6008931e+02	9.6734835e+01	8.9858698e+06	2.2802209e+04
6.1700000e+02	7.4316124e-01	-1.6010383e+02	9.6710366e+01	9.0086730e+06	2.2803189e+04
6.1800000e+02	6.7848214e-01	-1.6011828e+02	9.6691112e+01	9.0314762e+06	2.2804136e+04
6.1900000e+02	6.1396752e-01	-1.6013265e+02	9.6677061e+01	9.0542808e+06	2.2805047e+04
6.2000000e+02	5.4961910e-01	-1.6014695e+02	9.6668174e+01	9.0770861e+06	2.2805923e+04

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**SNIF TRACKING DATA (CONTINUED)**

Time (sec)	Elevation (deg)	Azimuth (deg)	Aspect Angle (deg)	Range (ft)	Range Rate (fps)
6.2100000e+02	4.8543436e-01	-1.6016116e+02	9.6664433e+01	9.0998924e+06	2.2806765e+04
6.2200000e+02	4.2141189e-01	-1.6017529e+02	9.6665803e+01	9.1227000e+06	2.2807572e+04
6.2300000e+02	3.5755126e-01	-1.6018935e+02	9.6669753e+01	9.1455082e+06	2.2808347e+04
6.2400000e+02	2.9385165e-01	-1.6020333e+02	9.6673418e+01	9.1683169e+06	2.2809089e+04
6.2500000e+02	2.3031129e-01	-1.6021725e+02	9.6680774e+01	9.1911264e+06	2.2809797e+04
6.2600000e+02	1.6693085e-01	-1.6023111e+02	9.6691468e+01	9.2139360e+06	2.2810473e+04
6.2700000e+02	1.0370483e-01	-1.6024486e+02	9.6577662e+01	9.2367472e+06	2.2811108e+04
6.2800000e+02	4.0637678e-02	-1.6025857e+02	9.6405907e+01	9.2595580e+06	2.2811717e+04
6.2900000e+02	-2.2278232e-02	-1.6027218e+02	9.6240059e+01	9.2823706e+06	2.2812295e+04