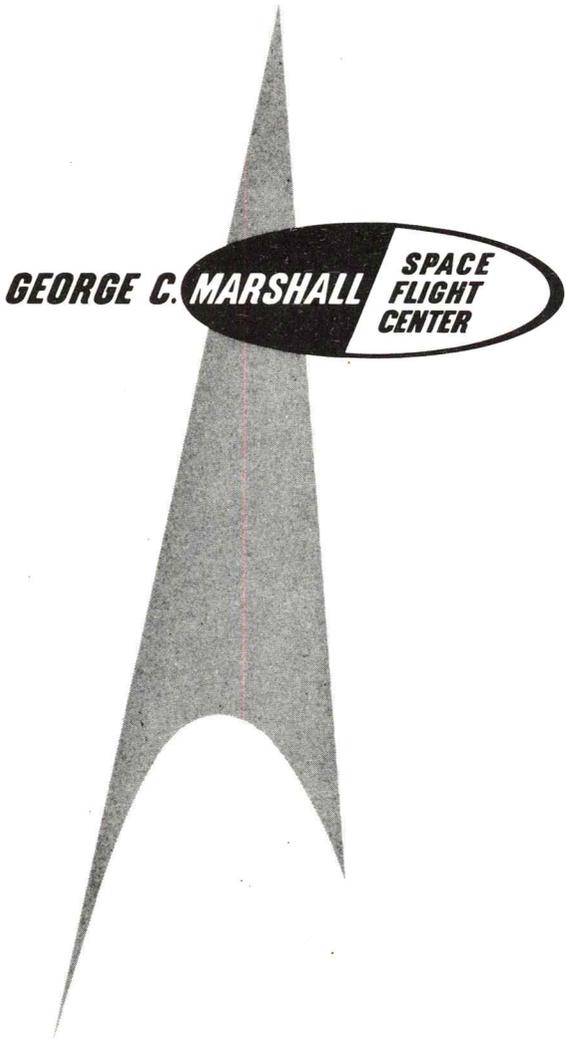


Park

REVISION 18
AUGUST 1, 1968



**SATURN IB MISSION PLAN
AND TECHNICAL CHECKLIST**

FINAL EDITION

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION



MARSHALL SPACE FLIGHT CENTER

SATURN IB

MISSION PLAN AND TECHNICAL CHECKLIST
REVISION 18

This document supersedes and replaces revision 17 of the Saturn IB Checklist, dated May 1, 1968.

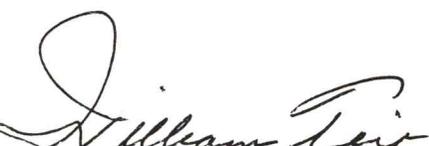
This document will be used as a program management tool to provide an insight on current launch vehicle data in the area of mission objectives and hardware configurations. It is not intended to replace or supersede any existing program documentation nor to be used as an instrument for program control.

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ABSTRACT

This document presents a brief definition of the Saturn IB configuration, objectives, and measuring program. This document is divided into six major sections. These sections cover the following areas in checklist form; A brief introduction, Vehicle Objectives, Mission Plan, Launch Vehicle Data, Payload Data, and Illustrations. The Launch Vehicle and Payload sections are broken down into functional systems and are further divided into configuration and measurements.

SATURN IB MISSION PLAN AND TECHNICAL CHECKLIST

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1.0 INTRODUCTION

The Saturn IB Mission Plan and Technical Checklist provides the branches of Marshall Space Flight Center and its prime contractors with pertinent information on the launch vehicle. The document is published every three months to provide an up-to-date reference to the Saturn IB configuration, measurements, flight objectives, and mission plan. The flight measurements are integrated with both the configuration and the flight objectives to give a comprehensive view of the flight program.

The document is divided into six sections. These sections cover the introduction, vehicle objectives, mission plan, launch vehicle, payload, and illustrations.

The vehicle objectives section indicates the flight objectives peculiar to a specific vehicle by the placement of "X's" in the column under the appropriate vehicle number. After the post flight evaluation of a vehicle, each "X" for that vehicle will be replaced by a letter indicating the degree of attainment of that objective, as follows:

"A" - Objective achieved

"P" - Objective partly achieved

"N" - Objective not achieved

This letter will be retained for a historical record of program progress.

The vehicle mission plan section presents launch and flight parameters and milestones, flight profiles, and trajectories for each vehicle.

The launch vehicle section gives the configuration and measurements connected with each vehicle stage. Both configuration and measurements are broken down by systems to aid in locating data and keeping abreast of changes. The component breakdown of each major stage system, showing vehicle effectivity, is presented through drawing numbers and applicable dash number. Where no dash number is applicable, an "X" is placed in the appropriate vehicle column. Sufficient items are listed to outline system configuration. Items of special interest are also listed. The measurements for each system are grouped by measurement parameter. Column A under each vehicle effectivity gives the number of measurements per parameter to be made per flight. Column B will be completed after the post flight evaluation of each vehicle and will show the number of usable measurements obtained per parameter during flight.

A bar () in the margin of a page indicates that a change, addition or deletion has been made to that specific line item since the previous issue of this document.

Although this document is launch vehicle oriented, payload information is included for reference.

Illustrations are included to support the major interest areas.

2.2 VEHICLE FLIGHT OBJECTIVES													
2.2.1 LAUNCH VEHICLE FLIGHT OBJECTIVES	D.M. Germany I-I/IB-E 876-0506	AS- 201	AS- 202	AS- 203	AS- 204	AS- 205	AS- 206	AS- 207	AS- 208	AS- 209	AS- 210	AS- 211	AS- 212
2.2.1.1 Confirm the following aerodynamic and dynamic characteristics:													
(a) Pitch, yaw, and roll rates and angle of attack as a function of flight time:		A	A	A	A								
(b) Longitudinal and lateral acceleration as a function of flight time;		A	A	A	A								
(c) Vehicle bending modes and frequencies for engine start and holddown, launch, and flight.		A	A	A	A								
2.2.1.2 Confirm the following structural and thermal characteristics;													
(a) Bending moment versus vehicle station for prelaunch, launch and flight;		A	A	A	A								
(b) Sound intensity for engine start and holddown, launch and flight;		A	A	A	A								
(c) Internal and external thermal environment as function of flight time.		A	A	A	A								
2.2.1.3 Demonstrate S-IB Stage, S-IVB Stage compatibility.		A	A	A	A								
2.2.1.4 Demonstrate S-IVB Stage, Instrument Unit compatibility.		A	A	A	A								

2.2 VEHICLE FLIGHT OBJECTIVES - Continued												
2.2.1 LAUNCH VEHICLE FLIGHT OBJECTIVES - Continued	AS-201	AS-202	AS-203	AS-204	AS-205	AS-206	AS-207	AS-208	AS-209	AS-210	AS-211	AS-212
2.2.1.5 Evaluate S-IB/S-IVB short coast separation mode.	A	A	A	A								
2.2.1.6 Demonstrate flight azimuth selection variables.						X						
2.2.1.7 Demonstrate capability to perform a dual launch.							X					
2.2.1.8 Determine the following LH ₂ experiment parameters:												
(a) Zero g environment effects on propellant sloshing;			A									
(b) Fluid damping transients and anti-vortex control;			A									
(c) Liquid/Vapor interface conditions;			A									
(d) Propulsive venting system effects;			A									
(e) Engine chilldown recirculation system characteristics;			A									
(f) Heat transfer mechanics at low g levels;			A									
(g) Tank thermodynamics and pressure rise conditions;			A									
(h) Ullage requirements for Simulated Saturn V S-IVB, J-2 engine restart in orbit.			A									

2.2 VEHICLE FLIGHT OBJECTIVES - Continued												
2.2.2 S-IB STAGE FLIGHT OBJECTIVES	AS-201	AS-202	AS-203	AS-204	AS-205	AS-206	AS-207	AS-208	AS-209	AS-210	AS-211	AS-212
2.2.2.1 Evaluate the following propulsion system characteristics:												
(a) Oxidizer and fuel flow rates as a function of engine burn time;	A	A	A	A		X						
(b) Oxidizer and fuel residual parameters;	A	A	A	A		X						
(c) Oxidizer and fuel turbopump speed as a function of engine burn time;	A	A	A	A		X						
(d) Gas pressure at the turbine inlet as a function of engine burn time;	A	A	A	A		X						
(e) Oxidizer and fuel pressure and temperature at pump inlets as a function of engine burn time;	A	A	A	A		X						
(f) Combustion chamber pressure as a function of engine burn time;	A	A	A	A		X						
(g) Engine cutoff transients;	A	A	A	A		X						
(h) Verify uprated H-1 engine performance.						X						
2.2.2.2 Evaluate the Propellant Depletion System cutoff capabilities.	A	A	A	A								
2.2.2.3 Evaluate the Hydraulic System capabilities.	A	A	A	A								

2.2 VEHICLE FLIGHT OBJECTIVES - Continued												
2.2.2 S-IB STAGE FLIGHT OBJECTIVES - Continued	AS-201	AS-202	AS-203	AS-204	AS-205	AS-206	AS-207	AS-208	AS-209	AS-210	AS-211	AS-212
2.2.2.4 Evaluate the Oxidizer and Fuel Container Pressurization System capability.	A	A	A	A								
2.2.2.5 Evaluate the following structural characteristics:												
(a) Vibration frequencies and amplitudes, and extent of thrust structure deformation resulting from engine thrust and gimbal action:	A	A	A	A								
(b) Fin bending modes;	A	A										
(c) Structural effects of heat load from engine exhaust;	A	A	A	A								
(d) Structural effects of heat load from aerodynamic heating;	A	A										
(e) Propellant Container structural integrity;	A	A										
(f) Thin-walled container structural integrity;			A	A								
(g) Fin redesign;	A	A										
(h) Spider beam redesign.	A	A	A									
(i) Structural Evaluation of tail section assembly.		A	A									

2.2 VEHICLE FLIGHT OBJECTIVES - Continued												
2.2.3 S-IVB STAGE FLIGHT OBJECTIVES	AS-201	AS-202	AS-203	AS-204	AS-205	AS-206	AS-207	AS-208	AS-209	AS-210	AS-211	AS-212
2.2.3.1 Evaluate the following propulsion system characteristics:												
(a) LOX and LH ₂ flow rates as a function of engine burn time;	A	A	A	A				X				
(b) LOX and LH ₂ residual requirements;	A	A	A	A				X				
(c) LOX and LH ₂ turbopump speed as a function of engine burn time;	A	A	A	A				X				
(d) Propellant pressure and temperature at the turbine inlets as a function of engine burn time;	A	A	A	A				X				
(e) Controlled venting effectiveness during flight;	A	A	A	A				X				
(f) LOX and LH ₂ pressures and temperatures at pump inlets as a function of engine burn time;	A	A	A	A				X				
(g) Combustion chamber pressure as a function of engine burn time;	A	A	A	A				X				
(h) Engine start and cutoff transients.	A	A	A	A				X				
2.2.3.2 Evaluate the Oxidizer and Fuel Container Pressurization Systems capability.	A	A	A	A								
2.2.3.3 Evaluate the Hydraulic System capability.	A	A	A	A								

2.2 VEHICLE FLIGHT OBJECTIVES - Continued												
2.2.3 S-IVB STAGE FLIGHT OBJECTIVES - Continued	AS-201	AS-202	AS-203	AS-204	AS-205	AS-206	AS-207	AS-208	AS-209	AS-210	AS-211	AS-212
2.2.3.4 Evaluate the Propellant Utilization System capabilities.	A	A	A	A								
2.2.3.5 Evaluate Retromotor performance.	A	A	A	A								
2.2.3.6 Evaluate Ullage Motor performance.	A	A	A	A								
2.2.3.7 Evaluate Auxiliary Propulsion System performance.	A	A	A	A								
2.2.3.8 Evaluate the following structural characteristics:												
(a) Vibration frequencies and amplitudes and extent of thrust structure deformation resulting from engine thrust and gimbal action;	A	A	A	A								
(b) Aerodynamic loads on S-IB/S-IVB interstage;			A	A								
(c) Structural effects of heat load from aerodynamics heating during ascent phase of flight;	A	A	A	A								
(d) Effectiveness of slosh baffles and vortex suppression devices:	A	A	A									
(e) Possible structural effects of heat loads from engine exhaust.	A	A										

2.2 VEHICLE FLIGHT OBJECTIVES - Continued												
2.2.3 S-IVB STAGE FLIGHT OBJECTIVES - Continued	AS-201	AS-202	AS-203	AS-204	AS-205	AS-206	AS-207	AS-208	AS-209	AS-210	AS-211	AS-212
2.2.3.9 Evaluate the following Astrionics Systems capability: - Continued												
(a) Instrumentation System;	A	A	A	A								
(b) Telemetry System;	A	A	A	A								
(c) Tracking System;	A	A	A	A								
(d) Guidance and Control System;	A	A	A	A								
(e) Electrical Power System.	A	A	A	A								
2.2.3.10 Evaluate S-IVB forward skirt in-flight panel flutter.				A								
2.2.3.11 Evaluate J-2 engine crossover duct temperature experiment.				A								
2.2.3.12 Evaluate S-IVB LH ₂ and LO ₂ propellant dump experiment.				A								
2.2.3.13 Evaluate the S-IVB/IU orbital coast lifetime capability.				A	X							
2.2.3.14 Demonstrate CSM/S-IVB attitude control system in closed loop operation.						X						
2.2.3.15 Evaluate S-IVB Orbital Safing Capability					X	X						
2.2.3.16 Evaluate J-2 Engine ASI Modifications					X							

2.2 VEHICLE FLIGHT OBJECTIVES - Continued												
2.2.4 INSTRUMENT UNIT FLIGHT OBJECTIVES	AS-201	AS-202	AS-203	AS-204	AS-205	AS-206	AS-207	AS-208	AS-209	AS-210	AS-211	AS-212
2.2.4.1 Evaluate the Thermal Conditioning System performance.	A	A	A	A								
2.2.4.2 Evaluate the following structural characteristics:												
(a) Vibration frequencies and amplitudes of the primary structure and components;	A	A	A	A								
(b) Sound intensity during engine burn.	A	A	A	A								
2.2.4.3 Evaluate Instrument and Cable Mounting Flight Reliability.	A	A	A	A								
2.2.4.4 Evaluate the following Astrionics Systems capabilities:												
(a) Instrumentation System;	A	A	A	A								
(b) Telemetry System;	A	A	A	A								
(c) Tracking System;	A	A	A	A								
(d) Guidance and Control System;	A	A	A	A								
(e) Electrical Power System.	A	A	A	A								
2.2.4.5 Evaluate the MSFC Thermal Control Coating Experiment.						X						

3.0 SATURN IB/APOLLO MISSION PLAN (For Information Only)													
3.1 MISSION ASSIGNMENT SUMMARY	D.M. Germany I-I/IB-E 876-0506	AS- 201	AS- 202	AS- 203	AS- 204	AS- 205	AS- 206	AS- 207	AS- 208	AS- 209	AS- 210	AS- 211	AS- 212
(Reference Apollo Flight Mission Assignments Document)													
(Reference Mission Directives)													
3.1.1 Launch Site, Kennedy Space Center, Latitude 28° 30'													
Launch Complex 34		X	X			X		X		X		X	X
Launch Complex 37B				X	X		X		X		X		
3.1.2 Tracking Network													
Eastern Test Range		X	X										
Manned Space Flight Network				X	X	X	X	X	X	X	X	X	X
3.1.3 Launch Azimuth (Approx)													
100° East of North		X	X			X		X		X		X	
90° East of North				X	X		X		X		X		X
3.1.4 Flight Azimuth													
105° East of North		X	X										
72° East of North				X	X	X	X						X
82.17° East of North								X		X		X	
82.17° East of North (Variable)									X		X		
3.1.5 Trajectory Type													
Super-circular Lob-Type, for re-entry test		X	X										
100 nautical mile (185.2 km) circular				X									
Elliptical Orbit (see section 3.2)					X	X	X						
115 nautical mile (209.3 km) circular									X		X		
105 nautical mile (194.2 km) circular								X		X		X	X

3.0

3.0 SATURN IB/APOLLO MISSION PLAN (For Information Only) - Continued

3.1 MISSION ASSIGNMENT SUMMARY - Continued	AS-201	AS-202	AS-203	AS-204	AS-205	AS-206	AS-207	AS-208	AS-209	AS-210	AS-211	AS-212
3.1.6 Mission Duration												
Approximately 4 revolutions or 6 hours				X		X						
Open Ended: 5 to 10 Days							X	X	X	X	X	X
Open Ended; Up to eleven days					X							
Less than one orbit (ballistic arc)	X	X										
Three orbits minimum			X									
3.1.7 Mission Type												
LV and CSM Development	X	X										
LH ₂ Experiment			X									
CSM Operations					X							
LM Development				X								
CSM-LM Operations						X	X	X	X	X	X	X
3.1.8 Launch Schedule												
Launch Scheduled by quarter and year					4/68	1/69	1/69	2/69	2/69	3/69	3/69	4/69
Launch Date, Actual	2/26	8/25	7/5	1/22								
	1966	1966	1966	1968								
3.1.9 Flight Type												
Unmanned Configuration	X	X	X	X		X		X		X		
Manned Configuration					X		X		X		X	X

3.0 SATURN IB/APOLLO MISSION PLAN (For Information Only) - Continued												
3.2 MISSION PROFILE SUMMARY	AS-201	AS-202	AS-203	AS-204	AS-205	AS-206	AS-207	AS-208	AS-209	AS-210	AS-211	AS-212
Powered flight of L/V on non-orbital super-circular entry												
"Lob-Type" trajectory. CSM/S-IVB separation. Use service propulsion system to achieve entry conditions for maximum heat load. CM Recovery.	X	X										
Insert into 100 nautical mile (185.2 km) circular orbit. No recovery.			X									
Insert into an elliptical orbit of 85 nautical mile (157.4 km) perigee altitude and 120 nautical mile (222.2 km) apogee. Jettison nose cone after orbital insertion. LM will separate from S-IVB using LM Reaction Control System after one-half orbit. Two Descent Propulsion System (DPS) burns. Second DPS burn followed by APS burn, staging the LM. Second APS burn places ascent stage in 165 nautical mile (305.6 km) by 380 nautical mile (703.8 km) orbit. S-IVB LOX and LH ₂ removal following LM/S-IVB separation				X		X						
Insert into an elliptical orbit of 120 nautical mile (222.2 km) perigee Altitude and 150 nautical mile (277.8 km) apogee. S-IVB/CSM separation during second orbit, using Service Module (SM) Reaction Control System. Transposition maneuver followed by station keeping period. Rendezvous with S-IVB stage. SM propulsion system performs de-orbit burn. CM Recovery.					X							
Insert CSM into a circular orbit of 105 nautical miles (194.5 km). Rendezvous and dock with LM/S-IVB. Extravehicular crew transfer to LM and staging. LM active rendezvous with CSM. SM propulsion system provides de-orbit burn.								X		X		X

3.0 SATURN IB/APOLLO MISSION PLAN (For Information Only) - Continued

3.2 MISSION PROFILE SUMMARY - Continued

AS-201	AS-202	AS-203	AS-204	AS-205	AS-206	AS-207	AS-208	AS-209	AS-210	AS-211	AS-212
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Insert LM into a circular orbit of 115 nautical miles (213.0 km).

Jettison nosecone after injection. No recovery.

X

X

4.0 SATURN IB LAUNCH VEHICLE																
4.1 EMERGENCY DETECTION SYSTEM - Configuration*	J. Sisson I-I/IB-E 876-0843	NEXT ASSY QTY	DRAWING NUMBER	SA- 201	SA- 202	SA- 203	SA- 204	SA- 205	SA- 206	SA- 207	SA- 208	SA- 209	SA- 210	SA- 211	SA- 212	
4.1.1 EDS SYSTEM		1	40M37530	X												
EDS SYSTEM		1	40M37532		X											
EDS SYSTEM		1	40M37565			X										
EDS SYSTEM		1	40M37549				X									
EDS SYSTEM		1	40M37551					X		X		X		X	X	
EDS SYSTEM		1	40M37572						X							
EDS SYSTEM		1	40M37552								X		X			
S-IB Thrust OK Switch (see section 4.2.2.6)				X	X	X	X	X	X	X	X	X	X	X	X	
Main Distributor (see section 4.2.5.2)				X	X	X	X	X	X	X	X	X	X	X	X	
Propulsion Distributor (see section 4.2.5.2)				X	X	X	X	X	X	X	X	X	X	X	X	
S-IVB Thrust OK Switch (see section 4.3.2.8)				X	X	X	X	X	X	X	X	X	X	X	X	
Aft Power Distributor, 28 vdc (see section 4.3.5.2)				X	X	X	X	X	X	X	X	X	X	X	X	
Sequencer Assembly (see section 4.3.5.2)				X	X	X	X	X	X	X	X	X	X	X	X	
Control EDS Rate Gyro Package (see section 4.4.2.1)				X	X	X	X	X	X	X	X	X	X	X	X	
Control Signal Processor (see section 4.4.2.1)				X	X	X	X	X	X	X	X	X	X	X	X	
Control Distributor (see section 4.4.4.2)				X	X	X	X	X	X	X	X	X	X	X	X	
EDS Distributor (see section 4.4.4.2)				X	X	X	X	X	X	X	X	X	X	X	X	
EDS 20 Second Timer (see section 4.4.4.2)							X		X							
EDS 40 Second Timer (see section 4.4.4.2)				X	X	X	X	X	X	X	X	X	X	X	X	
EDS 60 Second Timer (see section 4.4.4.2)					X				X		X		X			
Q-Ball (see section 4.4.7.1)				X	X	X		X		X		X		X	X	

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* All EDS components listed perform primary EDS function.

4.0 SATURN IB LAUNCH VEHICLE																									
4.1 EMERGENCY DETECTION SYSTEM - Measurements (1)		SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
		A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
FLIGHT MEASUREMENTS - TOTAL		89	86	100	100	125	125	94	94	87		85		91		85		85		85		92		91	
4.1.1 EDS SYSTEM (Functional)																									
Temperature - Total		1	1	1	1	1	1	0	0	1		0		1		0		0		0		1		1	
Q-Ball Internal		1	1	1	1	1	1	0	0	1		0		1		0		0		0		1		1	
Pressure - Total		7	7	7	7	9	9	5	5	7		4		7		4		4		4		7		7	
Fuel Tank Ullage		2	2	2	2	2	2	2	2	2		2		2		2		2		2		2		2	
Oxidizer Tank Ullage		2	2	2	2	2	2	2	2	2		2		2		2		2		2		2		2	
Control Signal Processor		1	1	1	1	1	1	1	1	0		0		0		0		0		0		0		0	
Q-Ball Vector Sum		0	0	0	0	2	2	0	0	1		0		1		0		0		0		1		1	
Q-Ball Delta P Pitch		1	1	1	1	1	1	0	0	1		0		1		0		0		0		1		1	
Q-Ball Delta P Yaw		1	1	1	1	1	1	0	0	1		0		1		0		0		0		1		1	
Vibration - Total		8	8	8	8	3	3	3	3	0		0		0		0		0		0		0		0	
Distributor, Vibration		5	5	5	5	3	3	3	3	0		0		0		0		0		0		0		0	
Sequence Assembly, Thrust		1	1	1	1	0	0	0	0	0		0		0		0		0		0		0		0	
Sequence Assembly, Radial		1	1	1	1	0	0	0	0	0		0		0		0		0		0		0		0	
Sequence Assembly, Tangential		1	1	1	1	0	0	0	0	0		0		0		0		0		0		0		0	
Signal - Total		35	35	43	43	71	71	48	48	48		50		52		52		50		50		52		52	
EDS Bus Energized +6D95		1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1	
Launch Vehicle Reference Failure		0	0	0	0	2	2	0	0	0		0		0		0		0		0		0		0	
Launch Vehicle Rate Excessive		0	0	0	0	2	2	0	0	0		0		0		0		0		0		0		0	
EDS Switch Point Monitor		0	0	0	0	3	3	0	0	0		3		3		3		3		3		3		3	

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(1) All measurements in this section are noted within the respective stages by: (1)

4.0 SATURN IB LAUNCH VEHICLE - Continued																									
4.1 EMERGENCY DETECTION SYSTEM - Measurements - Continued	SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212		
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	
4.1.1 EDS SYSTEM (Functional) - Continued																									
S-IB Burn	1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1		1
S-IB Thrust OK Switch	16	16	24	24	24	24	24	24	24		24		24		24		24		24		24		24		24
EDS Liftoff	0	0	0	0	2	2	0	0	0		0		0		0		0		0		0		0		0
LET Jettison Command	1	1	1	1	0	0	0	0	0		0		0		0		0		0		0		0		0
EDS Timer, Timed Out	1	1	0	0	0	0	1	1	0		1		0		0		0		0		0		0		0
S-IVB Thrust OK Switch	3	3	3	3	3	3	4	4	4		4		4		4		4		4		4		4		4
Control Signal Processor On	1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1		1
EDS S-IB One Engine Out	2	2	2	2	2	2	2	2	2		2		2		2		2		2		2		2		2
EDS S-IB Two Engines Out	2	2	2	2	2	2	2	2	2		2		2		2		2		2		2		2		2
S-IB or S-IVB Engine No. 1 Out	0	0	0	0	2	2	0	0	0		0		0		0		0		0		0		0		0
S-IB Engine No. 2 Out	0	0	0	0	2	2	0	0	0		0		0		0		0		0		0		0		0
S-IB Engine No. 3 Out	0	0	0	0	2	2	0	0	0		0		0		0		0		0		0		0		0
S-IB Engine No. 4 Out	0	0	0	0	2	2	0	0	0		0		0		0		0		0		0		0		0
S-IB Engine No. 5 Out	0	0	0	0	2	2	0	0	0		0		0		0		0		0		0		0		0
S-IB Engine No. 6 Out	0	0	0	0	2	2	0	0	0		0		0		0		0		0		0		0		0
S-IB Engine No. 7 Out	0	0	0	0	2	2	0	0	0		0		0		0		0		0		0		0		0
S-IB Engine No. 8 Out	0	0	0	0	2	2	0	0	0		0		0		0		0		0		0		0		0
Manual Cutoff Armed, S-IB or S-IVB	2	2	2	2	2	2	2	2	2		2		2		2		2		2		2		2		2
Auto-Abort 1, 2, and 3	0	0	0	0	3	3	0	0	0		0		0		0		0		0		0		0		0
Abort Request A	0	0	0	0	1	1	0	0	0		0		0		0		0		0		0		0		0
EDS S-IB or S-IVB Engine Cutoff from																									
Spacecraft	1	1	2	2	2	2	2	2	1		1		1		1		1		1		1		1		1
EDS or Manual Cutoff of S-IB or S-IVB	2	2	2	2	2	2	2	2	2		2		2		2		2		2		2		2		2
EDS Launch Vehicle Rate Excessive Auto																									
Abort Deactivate A	0	0	0	0	0	0	1	1	1		1		1		1		1		1		1		1		1

4.0 SATURN IB LAUNCH VEHICLE - Continued																									
4.1 EMERGENCY DETECTION SYSTEM - Measurements - Continued		SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
		A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
4.1.1 EDS SYSTEM (Functional) - Continued																									
EDS Launch Vehicle Rate Excessive Auto																									
Abort Deactive B		0	0	0	0	0	0	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1
Q-Ball on Indication		2	2	2	2	2	2	0	0	2		0	2	0	0	0	0	0	0	2	2				
EDS Launch Vehicle Rate Excessive Auto																									
Abort Deactivate C		0	0	0	0	0	0	0	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1
EDS S-IB 2 Engines Out Auto Abort																									
Deactive A		0	0	0	0	0	0	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1
EDS S-IB 2 Engines Out Auto Abort																									
Deactive B		0	0	0	0	0	0	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1
EDS S-IB 2 Engines Out Auto Abort																									
Deactive C		0	0	0	0	0	0	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1
Spacecraft/IU Mode Switch		0	0	0	0	0	0	0	0	0		0	1	1	1	1	1	1	1	1	1	1	1	1	1
Voltage - Total		6	3	6	6	6	6	6	6	5		5	5	5	5	5	5	5	5	5	5	5	5	5	5
EDS Bus Voltage +6D91, +6D92, +6D93		3	0	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	3	3	3	3	3
Bus Voltage Transients		1	1	1	1	1	1	1	1	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bus Voltage		2	2	2	2	2	2	2	2	2		2	2	2	2	2	2	2	2	2	2	2	2	2	2
Angular Velocity - Total		32	32	35	35	35	35	32	32	26		26	26	26	26	26	26	26	26	26	26	26	26	26	26
Pitch Rate Switch		3	3	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	3	3	3	3	3
Yaw Rate Switch		3	3	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	3	3	3	3	3
Roll Rate Switch		3	3	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	3	3	3	3	3
EDS Rate Gyro Pitch and Yaw Activate		1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1
EDS Rate Gyro Roll Activate		1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1
Pitch, Roll and Yaw Control		3	3	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	3	3	3	3	3

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4.2 S-IB STAGE

S-IB STAGE DATA SUMMARY (For Information Only)

Manufacturer - Chrysler Corporation

I DIMENSIONS - Length - 80.2 ft (24.5 m) Diameter - At Propellant Tanks, 21.4 ft (6.5m); At Tail Unit Assembly, 228 ft (6.9m)
Span Across Fins - 40.7 ft (12.4m) Fin Area (each) - 53.3 ft² (4.95m²)

II WEIGHT AND MEASUREMENTS

Vehicle	Drawing Number	Weight, Dry \approx	Weight at Ground Ignition	Weight, Separation	Stage Measurements		
					Type	Scheduled(A)	Successful(B)
S-IB-1	60C10002-1	93,000 lb (42,200kg)	1,009,900 lb (458,100kg)	106,000 lb (48,100kg)	R&D (2)	502	498
S-IB-2	60C10002-1	91,600 lb (41,550kg)	997,100 lb (452,300kg)	100,800 lb (45,700kg)	R&D (2)	511	498
S-IB-3	60C11002-1	86,200 lb (39,100kg)	997,400 lb (452,450kg)	96,000 lb (43,500kg)	R&D (2)	505	500
S-IB-4	60C11002-1	85,300 lb (38,700kg)	996,000 lb (451,800kg)	96,200 lb (43,600kg)	R&D (2)	396	393
S-IB-5	60C11002-1	84,500 lb (38,350kg)	994,200 lb (450,950kg)	95,400 lb (43,250kg)	Oper.	231	
S-IB-6	60C11002-1	84,500 lb (38,350kg)	995,000 lb (451,350kg)	95,500 lb (43,300kg)	Oper.	231	
S-IB-7	60C11002-1	84,100 lb (38,200kg)	997,200 lb (452,350kg)	94,800 lb (43,000kg)	Oper.	231	
S-IB-8	60C11002-1	83,900 lb (38,050kg)	997,200 lb (452,350kg)	94,600 lb (42,900kg)	Oper.	231	
S-IB-9	60C11002-1	83,800 lb (38,000kg)	994,800 lb (451,250kg)	94,200 lb (42,700kg)	Oper.	231	
S-IB-10	60C11002-1	83,800 lb (38,000kg)	997,200 lb (452,350kg)	94,500 lb (42,900kg)	Oper.	231	
S-IB-11	60C11002-1	84,000 lb (38,100kg)	997,300 lb (452,400kg)	94,700 lb (42,950kg)	Oper.	231	
S-IB-12	60C11002-1	84,000 lb (38,100kg)	997,300 lb (452,400kg)	94,700 lb (42,950kg)	Oper.	231	

NOTE: Quantities are given in both English and International System of Units.

(2) These measurements include measurements taken on the S-IVB Aft Interstage (see sections 4.2.1.5 and 4.2.3.2)

S-IB STAGE DATA SUMMARY - Continued

III MAIN PROPULSION SYSTEM

Engines - Rocketdyne H-1 (8 engines)

Dry Weight, Inboard - 1,790 lb (807kg)

Dry Weight, Outboard - 2,020 lb (916kg)

Burn Time - \approx 146 sec

Total Nominal Thrust at sea level - S-IB-1 thru S-IB-5 1,600,000 lb (7,116,000N); S-IB-6 and subs 1,640,000 lb (7,294,720N)

Propellants - LOX and RP-1

Nominal Mainstage Propellant Loading 884,000 lb (400,000kg)

Nominal Mixture Ratio (oxidizer to fuel) - 2.23:1

Expansion Ratio - 8:1

Chamber Pressure - 689 psia (475.6 N/cm²)

Oxidizer Net Positive Suction Head (NPSH) (Minimum Engine Requirement) - 35ft (10.7m) of LOX

Fuel Net Positive Suction Head (NPSH) (Minimum Engine Requirement) - 35ft (10.7m) of RP-1

Nominal Engine Pump Inlet Pressure - LOX 65 psia (44.8 N/cm²), RP-1 57 psia (39.3N/cm²)

Turbine Propellants - LOX and RP-1

Nominal Turbopump Speed - 6,700 RPM

Engine Mounting - Outboard (4 Engines) - 95in. (241 cm) Radius, 6 degree cant angle

Inboard (4 Engines) - 32in. (81 cm) Radius, 3 degree cant angle

Actuators (Outboard Engines Only) - Hydraulic, two per engine

Gimbal Angle - \pm 8.0 degree square pattern

Gimbal Rate, Nominal - 15 degrees/second in each plane

Gimbal Acceleration, Nominal - 31 rad/sec²

S-IB STAGE DATA SUMMARY - Continued

IV PRESSURIZATION SYSTEM

Oxidizer Pressure, Nominal

Preflight Pressurization - 60 psig (41.4N/cm²) of helium from ground source

Inflight Pressurization - 50 psig (34.5N/cm²) of GOX

Fuel Pressure, Nominal

Preflight Pressurization - 21 psig (14.5N/cm²) of helium

Inflight Pressurization - 17 psig (11.7N/cm²) of helium

Ullage	Oxidizer, Nominal	Fuel, Minimum
--------	-------------------	---------------

S-IB-1 & S-IB-2	1.7%	3.0%
-----------------	------	------

S-IB-3 thru S-IB-12	1.5%	2.0%
---------------------	------	------

V ENVIRONMENTAL CONTROL SYSTEM

Preflight Conditioning (Air) - Aft Compartment (Tail Unit), Instrument Canisters F1 & F2

Preflight Purge (GN₂) - Aft Compartment (Tail Unit), Instrument Canisters F1 & F2

Flight - Not Applicable

VI SEPARATION SYSTEM

Retrorockets - See S-IVB Stage

Severance System - See S-IVB Stage

VII RANGE SAFETY SYSTEM (two cross-connected systems)

S-IB-1 - AN/DRW - 13, with dual antennas for each system

S-IB-2 and Subs - Secure Range Safety Command System with dual antennas for each system

S-IB STAGE DATA SUMMARY - Continued

VIII ASTRIONICS SYSTEMS

Guidance - Pitch, Roll and Yaw program thru the IU during S-IB burn

Telemetry Links -

PAM/FM/FM - 2 systems on S-IB-1 thru S-IB-4; 1 system on S-IB-5 and subs

SS/FM - 1 system on S-IB-1 thru S-IB-4

PCM/FM - 1 system on all vehicles

Tracking - ODOP

Electrical -

Batteries - 28 vdc (2 Zinc - Silver Oxide)

450 VA Inverter - 28 vdc to 115 vac, 400 cps, 3 phase

Master Measuring Voltage Supply - 28 vdc to 5 vdc

Tape Recorder -

S-IB-1 thru S-IB-4 - Mod Air-940, PAM/FM/FM Systems; record time starts 39 seconds after liftoff and stops 26 seconds after S-IB/S-IVB separation.

Film Cameras

S-IB-1 thru S-IB-3 - operate during S-IB/S-IVB separation

4.2 S-IB STAGE - Configuration and Measurements																
4.2.1	STRUCTURE - Configuration	C. R. Fitts I-I/IB-SIB 877-2496	NEXT ASSY QTY	DRAWING NUMBER	SA- 201	SA- 202	SA- 203	SA- 204	SA- 205	SA- 206	SA- 207	SA- 208	SA- 209	SA- 210	SA- 211	SA- 212
4.2.1.1	SPIDER BEAM UNIT ASSEMBLY		1	60C10015	-1	-1										
	SPIDER BEAM UNIT ASSEMBLY		1	60C11015			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	Spider Beam Assembly		1	60C30142	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	Seal Plate Assembly		8	60C30146	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	Seal Plate Assembly		8	60C30152	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	Seal Plate Assembly		8	60C30158	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
4.2.1.2	PROPELLANT CONTAINER ASSEMBLY		1	60C10003	-1	-1										
	PROPELLANT CONTAINER ASSEMBLY		1	60C11003			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	LOX Center Container Unit Assembly		1	60C10004	-1	-1										
	LOX Center Container Unit Assembly		1	60C11004			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	105" LOX Container Assembly (0-C)		1	60C10014	-1	-1										
	105" LOC Container Assembly (0-C)		1	60C11014			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	LOX Container Unit Assembly (0-1)		1	60C10005	-1	-1										
	LOX Container Unit Assembly (0-1)		1	60C11005			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	LOX Container Unit Assembly (0-2)		1	60C10006	-1	-1										
	LOX Container Unit Assembly (0-2)		1	60C11006			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	LOX Container Unit Assembly (0-3)		1	60C10007	-1	-1										
	LOX Container Unit Assembly (0-3)		1	60C11007			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	LOX Container Unit Assembly (0-4)		1	60C10008	-1	-1										
	LOX Container Unit Assembly (0-4)		1	60C11008			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	Fuel Container Unit Assembly (F-1)		1	60C10009	-1	-1										
	Fuel Container Unit Assembly (F-1)		1	60C11009			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	Fuel Container Unit Assembly (F-2)		1	60C10010	-1	-1										
	Fuel Container Unit Assembly (F-2)		1	60C11010			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	Fuel Container Unit Assembly (F-3)		1	60C10011	-1	-1										

4.2 S-IB STAGE														
4.2.1 STRUCTURE - Configuration - Continued	NEXT ASSY QTY	DRAWING NUMBER	SA- 201	SA- 202	SA- 203	SA- 204	SA- 205	SA- 206	SA- 207	SA- 208	SA- 209	SA- 210	SA- 211	SA- 212
4.2.1.2 PROPELLANT CONTAINER ASSEMBLY - Continued														
Fuel Container Unit Assembly (F-3)	1	60C11011			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Fuel Container Unit Assembly (F-4)	1	60C10012	-1	-1										
Fuel Container Unit Assembly (F-4)	1	60C11012			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Instrumentation Assembly No. 1	1	60C10233	-1	-1	-1	-1								
Instrumentation Assembly No. 1	1	60C11401					-1	-1	-1					
Instrumentation Assembly No. 1	1	60C11925								-1	-1	-1	-1	-1
Instrumentation Assembly No. 2	1	60C10234	-1	-1	-1	-1								
Instrumentation Assembly No. 2	1	60C11402					-1	-1	-1	-1	-1	-1	-1	-1
4.2.1.3 TAIL UNIT ASSEMBLY	1	60C10013	-1	-1										
TAIL UNIT ASSEMBLY	1	60C11013			-1	-1								
TAIL UNIT ASSEMBLY	1	60C12013					-1	-1	-1	-1	-1	-1	-1	-1
Tail Section Assembly	1	30C01000	X	X										
Tail Section Assembly	1	60C30500			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Thrust Structure Assembly	1	30C02000	X	X										
Thrust Structure Assembly	1	60C30258			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Barrel Assembly	1	30C02001	X	X										
Barrel Assembly	1	60C30064			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Outrigger Assembly, Thrust	4	30C02100	X	X										
Outrigger Assembly, Thrust	4	60C30300			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Outrigger Assembly, Fin	4	30C02050	X	X										
Outrigger Assembly, Fin	4	60C30250			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Ring Segment Assembly	6	30C02184	X	X	X									
Ring Segment Assembly	4	30C02184				X	X	X	X	X	X	X	X	X
Ring Segment Assembly	6	30C02180	X	X										

4.2 S-IB STAGE														
4.2.1 STRUCTURE - Configuration - Continued	NEXT ASSY QTY	DRAWING NUMBER	SA- 201	SA- 202	SA- 203	SA- 204	SA- 205	SA- 206	SA- 207	SA- 208	SA- 209	SA- 210	SA- 211	SA- 212
4.2.1.3 TAIL UNIT ASSEMBLY - Continued														
Ring Segment Assembly	6	60C30261			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Ring Segment Assembly	2	30C02173	X	X	X	X	X	X	X	X	X	X	X	X
Ring Segment Assembly	2	30C02174	X	X										
Ring Segment Assembly	2	60C30260			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Shroud Panel Assembly	4	30C03800	X	X										
Shroud Panel Assembly	4	30C03801	X	X										
Shroud Panel Assembly	4	30C03860	X	X										
Shroud Panel Assembly	1	30C03886	X	X										
Shroud Panel Assembly	1	30C03885	-1	-1										
Shroud Panel Assembly	2	30C03885	-3	-3										
Shroud Panel Assembly	4	30C03860	X	X										
Shroud Panel Assembly	1	60C30717			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Shroud Panel Assembly	4	60C30480			-1	-1	-1	-1	-1					
Shroud Panel Assembly	4	60C31061								-1	-1	-1	-1	-1
Shroud Panel Assembly	3	60C30715			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Shroud Panel Assembly	6	30C03850	X	X	X	X	X	X	X	X	X	X	X	X
Shroud Panel Assembly	2	30C03905	X	X	X	X	X	X	X	X	X	X	X	X
Shroud Panel Assembly	4	60C30473			-1	-1	-1	-1	-1					
Shroud Panel Assembly	4	60C31062								-1	-1	-1	-1	-1
Heat Shield Panel	4	30C03465	X	X										
Heat Shield Panel	4	30C03476	X	X										
Heat Shield Panel	7	30C03490	-1	-1										
Heat Shield Panel	1	30C03490	-7	-7										
Heat Shield Panel	4	30C03495	-3	-3										
Heat Shield Panel	4	30C03497	-6	-6										

4.2 S-IB STAGE

4.2.1 STRUCTURE - Configuration - Continued	NEXT ASSY QTY	DRAWING NUMBER	SA- 201	SA- 202	SA- 203	SA- 204	SA- 205	SA- 206	SA- 207	SA- 208	SA- 209	SA- 210	SA- 211	SA- 212
4.2.1.3 TAIL UNIT ASSEMBLY - Continued														
Heat Shield Panel	4	30C03562	X	X										
Heat Shield Panel	3	30C03565	-1	-1										
Heat Shield Panel	1	30C03565	-3	-3										
Heat Shield Panel	2	60C30555			-1	-1								
Heat Shield Panel	1	60C30555			-23	-23								
Heat Shield Panel	1	60C30555			-25	-25								
Heat Shield Panel	4	60C30555					-1	-1	-1	-1	-1	-1	-1	-1
Heat Shield Panel	4	60C30557			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Heat Shield Panel	3	60C30558			-1	-1								
Heat Shield Panel	1	60C30558			-25	-25								
Heat Shield Panel	4	60C30558					-1	-1	-1	-1	-1	-1	-1	-1
Heat Shield Panel	3	60C30559			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Heat Shield Panel	1	60C30559			-27	-27	-27	-27	-27	-27	-27	-27	-27	-27
Heat Shield Panel	1	60C30560			-1									
Heat Shield Panel	2	60C30560				-1								
Heat Shield Panel	3	60C30560					-1	-1	-1	-1	-1	-1	-1	-1
Heat Shield Panel	1	60C30560			-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
Heat Shield Panel	1	60C30560			-5	-5								
Heat Shield Panel	1	60C30560			-31									
Heat Shield Panel	4	60C30561			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Heat Shield Panel	4	60C30562			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Heat Shield Panel	4	60C30563			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Heat Shield Panel	4	60C30564			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1

4.2 S-IB STAGE																											
4.2.1 STRUCTURE - Measurements		SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212			
		A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B		
FLIGHT MEASUREMENTS - Total		219	218	220	218	212	208	109	109	24		24		24		24		24		24		24		24		24	
4.2.1.1 SPIDER BEAM UNIT ASSEMBLY																											
Measurements - Total		58	58	10	10	58	58	10	10	2		2		2		2		2		2		2		2		2	
Temperature - Total		2	2	2	2	2	2	2	2	2		2		2		2		2		2		2		2		2	
Interstage Ambient		2	2	2	2	2	2	2	2	2		2		2		2		2		2		2		2		2	
Pressure - Total		2	2	2	2	2	2	2	0	0		0		0		0		0		0		0		0		0	
Delta P, Seal Plate		1	1	1	1	1	1	1	0	0		0		0		0		0		0		0		0		0	
Interstage		1	1	1	1	1	1	1	0	0		0		0		0		0		0		0		0		0	
Vibration - Total		6	6	6	6	6	6	6	0	0		0		0		0		0		0		0		0		0	
Upper Structure, Longitudinal		1	1	1	1	1	1	1	0	0		0		0		0		0		0		0		0		0	
Upper Structure, Pitch		1	1	1	1	1	1	1	0	0		0		0		0		0		0		0		0		0	
Spider Beam, Longitudinal		2	2	2	2	2	2	2	0	0		0		0		0		0		0		0		0		0	
Spider Beam, Perpendicular		2	2	2	2	2	2	2	0	0		0		0		0		0		0		0		0		0	
Strain - Total		48	48	0	0	48	48	0	0	0		0		0		0		0		0		0		0		0	
Cross Beam		16	16	0	0	16	16	0	0	0		0		0		0		0		0		0		0		0	
Radial		32	32	0	0	32	32	0	0	0		0		0		0		0		0		0		0		0	
4.2.1.2 PROPELLANT CONTAINER ASSEMBLY																											
Measurements - Total		36	36	36	36	36	36	33	33	10		10		10		10		10		10		10		10		10	

4.2 S-IB STAGE																									
4.2.1 STRUCTURE - Measurements - Continued		SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
		A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
4.2.1.2 PROPELLANT CONTAINER ASSEMBLY - Continued																									
Acoustics - Total		1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Upper Container Area		1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Temperature - Total		3	3	3	3	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Instrument Compartment, F-1		1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Instrument Compartment, F-2		1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Center Container Manhole Cover		1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pressure - Total		2	2	2	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Instrument Compartment, F-2		1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0-3 Container Skirt		1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vibration - Total		6	6	6	6	6	6	6	6	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Instrument Panel Compartment F-2		3	3	3	3	3	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Center Container		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Support Container 0-2		1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Strain - Total		24	24	24	24	26	25	24	24	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
LOX Container Mounting Studs		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
LOX Container Tension Ties		16	16	16	16	16	16	16	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LOX Container Mounting Studs Flange		0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LOX Container Cross Beam		0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.2.1.3 TAIL UNIT ASSEMBLY																									
Measurements - Total		38	37	34	33	95	91	46	46	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12

4.2 S-IB STAGE																									
4.2.1 STRUCTURE - Measurements - Continued		SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
		A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
4.2.1.3 TAIL UNIT ASSEMBLY - Continued																									
Acoustics	- Total	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Engine Shroud Area		1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Temperature	- Total	18	18	16	16	22	22	21	21	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Tail Base Temperature		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Heat Shield		9	9	9	9	11	11	11	11	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Heat Shield Gas		0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Engine Shroud Skin		2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tail Skin		2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Flame Shield		3	3	3	3	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Flame Shield Support		0	0	0	0	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tail Base Gas		1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pressure	- Total	7	6	7	7	10	10	10	10	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Tail Base Pressure		3	2	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Delta P, Heat Shield		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Delta, P, Flame Shield		0	0	0	0	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delta P, 60° Fairing		1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Shear Panel Compartment		1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F-1 Container Skirt		1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Heat Shield Pressure		0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

4.2 S-IB STAGE																											
4.2.1 STRUCTURE - Measurements - Continued		SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212			
		A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B		
4.2.1.3 TAIL UNIT ASSEMBLY - Continued																											
Vibration	- Total	12	12	12	11	14	14	14	14	2		2		2		2		2		2		2		2		2	
Thrust Ring		2	2	2	2	2	2	2	2	2		2		2		2		2		2		2		2		2	
0-2 Container Support		1	1	1	0	1	1	1	1	0		0		0		0		0		0		0		0		0	
Engine Thrust Beam		4	4	4	4	4	4	4	4	0		0		0		0		0		0		0		0		0	
Lower Thrust Ring		1	1	1	1	1	1	1	1	0		0		0		0		0		0		0		0		0	
Lower "E" Beam		2	2	2	2	2	2	2	2	0		0		0		0		0		0		0		0		0	
Upper "E" Beam		2	2	2	2	2	2	2	2	0		0		0		0		0		0		0		0		0	
Engine Thrust Pad		0	0	0	0	2	2	2	2	0		0		0		0		0		0		0		0		0	
Strain	- Total	0	0	48	48	48	48	0	0	0		0		0		0		0		0		0		0		0	
Fin Outriggers		0	0	23	23	23	23	0	0	0		0		0		0		0		0		0		0		0	
Engine Outriggers		0	0	25	25	25	25	0	0	0		0		0		0		0		0		0		0		0	
4.2.1.4 FINS																											
Measurements	- Total	85	85	88	87	22	19	19	19	0		0		0		0		0		0		0		0		0	
Temperature	- Total	16	16	19	19	3	3	0	0	0		0		0		0		0		0		0		0		0	
Fin Skin, Fins 5 and 7		8	8	8	8	0	0	0	0	0		0		0		0		0		0		0		0		0	
Fin Base, Fins 1, 5 and 7		6	6	6	6	0	0	0	0	0		0		0		0		0		0		0		0		0	
Fin Base Gas, Fin 1		2	2	2	2	0	0	0	0	0		0		0		0		0		0		0		0		0	
Fin Trailing Edge		0	0	3	3	3	3	0	0	0		0		0		0		0		0		0		0		0	
Pressure	- Total	8	8	8	8	8	8	8	8	0		0		0		0		0		0		0		0		0	
Delta P, Fin Surface, Fins 5 and 7		8	8	8	8	8	8	8	8	0		0		0		0		0		0		0		0		0	

4.2 S-IB STAGE																
4.2.2 PROPULSION - Configuration	D.O. Toles I-I/IB-SIB 876-5511	NEXT ASSY QTY	DRAWING NUMBER	SA- 201	SA- 202	SA- 203	SA- 204	SA- 205	SA- 206	SA- 207	SA- 208	SA- 209	SA- 210	SA- 211	SA- 212	
4.2.2.1 FUEL SYSTEM																
Fuel Prevalve		8	60C20340	X	X	X	X	X	X	X	X	X	X	X	X	
Turbopump (see section 4.2.2.6)																
Main Fuel Valve		8	r409124	X	X	X	X	X	X	X	X	X	X	X	X	
Ignition Monitor Valve		8	r554838	X	X	X	X	X	X	X	X	X	X	X	X	
Fuel Igniter Valve		8	r407789	X	X	X	X	X	X	X	X	X	X	X	X	
Conax Valve		8	rNA526594	X	X	X										
Conax Valve		8	NA5260180				X	X	X	X	X	X	X	X	X	
Fuel Additive Blender Unit		8	r555232	X	X	X	X	X	X	X	X	X	X	X	X	
Fuel Sump Manifold Assembly		1	30C00147	X	X	X	X	X	X	X	X	X	X	X	X	
4.2.2.2 FUEL PRESSURIZATION SYSTEM																
Helium Spheres, 19.3 cu. ft.		2	20C00414	X	X											
Helium Spheres, 19.3 cu. ft.		2	60C20001			X	X	X	X	X	X	X	X	X	X	
Pressure Control Valve		2	60C20790	X	X	X	X									
Pressure Control Valve		2	60C21808					X	X	X	X	X	X	X	X	
Calibration Valve		2	60C20054	X	X	X	X	X	X	X	X	X	X	X	X	
Pressure Switch		1	60C20970	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
Fuel Vent Valve		2	60C20358	X	X											
Fuel Vent Valve		2	60C21490			X	X	-1	-1	-1	-1	-1	-1	-1	-1	
Fuel Container Unit Assemblies (see section 4.2.1.2)																
Fuel Pressurization Manifold Assembly		1	20C00048	X	X	X	X	X	X	X	X	X	X	X	X	

4.2 S-IB STAGE															
		NEXT ASSY QTY	DRAWING NUMBER	SA- 201	SA- 202	SA- 203	SA- 204	SA- 205	SA- 206	SA- 207	SA- 208	SA- 209	SA- 210	SA- 211	SA- 212
4.2.2 PROPULSION - Configuration - Continued															
4.2.2.2 FUEL PRESSURIZATION SYSTEM - Continued															
Fuel Pressurization Manifold Assembly	1	20C00049	X	X	X	X	X	X	X	X	X	X	X	X	X
Fuel Pressurization Manifold Assembly	1	20C00050	X	X	X	X	X	X	X	X	X	X	X	X	X
Fuel Pressurization Manifold Assembly	1	20C00054	X	X	X	X	X	X	X	X	X	X	X	X	X
Pressure Switch	2	60C20452	X	X	X	X	X	X	X	X	X	X	X	X	X
4.2.2.3 OXIDIZER SYSTEM															
LOX Prevalve	8	60C20339	X	X	X	X	X	X	X	X	X	X	X	X	X
Turbopump (see section 4.2.2.6)															
Main LOX Valve	8	r409849	X	X	X	X	X	X							
Main LOX Valve	8	r410611								X	X	X	X	X	X
LOX Sump Manifold Assembly (Center Container)	1	30C00305	X	X	X	X	X	X	X	X	X	X	X	X	X
LOX Sump Manifold Assembly (Outer Containers)	1	30C00151	X	X	X	X	X	X	X	X	X	X	X	X	X
4.2.2.4 OXIDIZER PRESSURIZATION SYSTEM															
GOX Flow Control Valve	1	60C20129	X	X	X	X	X	X	X	X	X	X	X	X	X
Pressure Switch	1	60C20057	X	X											
Pressure Switch	1	60C20890			-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
Overpressure Switch	1	60C20058	-1	-1	-1	-1	-1	-1							
Overpressure Switch	1	60C20890								-1	-1	-1	-1	-1	-1
Vent Valve	1	20C30122	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
GOX Vent Assembly	4	60C21263			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Relief Valve	2	20C30460	-1	-1											
Relief Valve Assembly	1	60C21404			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
LOX Pressurization Manifold Assembly	1	30C00310	X	X	X	X									

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4.2 S-IB STAGE															
4.2.2 PROPULSION - Configuration - Continued	NEXT ASSY QTY	DRAWING NUMBER	SA-201	SA-202	SA-203	SA-204	SA-205	SA-206	SA-207	SA-208	SA-209	SA-210	SA-211	SA-212	
4.2.2.4 OXIDIZER PRESSURIZATION SYSTEM - Continued															
LOX Pressurization Manifold Assembly	1	60C31011					-1	-1	-1	-1	-1	-1	-1	-1	
GOX Manifold Assembly	2	60C20111	X	X	X	X	X	X	X	X	X	X	X	X	
4.2.2.5 CONTROL PRESSURE SYSTEM															
Vent Valve	1	20C30131	X	X	X	X	X	X	X	X	X	X	X	X	
Pressure Regulator	1	20C30134	X												
Pressure Regulator	1	60C21506		X	X	X	X	X	X	X	X	X	X	X	
Pressure Relief Valve	1	20C30137	X	X	X	X	X	X	X	X	X	X	X	X	
Distribution Manifold	1	20C00879	X	X	X	X	X	X	X	X	X	X	X	X	
Control Valve, Solenoid	1	20C30160	X	X	X	X	X	X	X	X	X	X	X	X	
Control Valve	2	20C30128	X	X	X	X	X	X	X	X	X	X	X	X	
High Pressure Sphere, GN ₂ , 1 cu. ft.	1	60C21099	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
High Pressure Sphere, GN ₂ , 1 cu. ft.	1	60C21543		-1	-1										
4.2.2.6 H-1 ENGINE															
Outboard Engine Assembly	1	60C20411	-1												
Outboard Engine Assembly	1	60C20412	-1												
Outboard Engine Assembly	1	60C20413	-1												
Outboard Engine Assembly	1	60C20414	-1												
Outboard Engine Assembly	1	60C20811		-1											
Outboard Engine Assembly	1	60C20812		-1											
Outboard Engine Assembly	1	60C20813		-1											
Outboard Engine Assembly	1	60C20814		-1											

4.2 S-IB STAGE														
4.2.2 PROPULSION - Configuration - Continued	NEXT ASSY QTY	DRAWING NUMBER	SA-201	SA-202	SA-203	SA-204	SA-205	SA-206	SA-207	SA-208	SA-209	SA-210	SA-211	SA-212
4.2.2.6 H-1 ENGINE - Continued														
Outboard Engine Assembly	1	60C21011			-1									
Outboard Engine Assembly	1	60C21012			-1									
Outboard Engine Assembly	1	60C21013			-1									
Outboard Engine Assembly	1	60C21014			-1									
Outboard Engine Assembly	1	60C21111				-1								
Outboard Engine Assembly	1	60C21112				-1								
Outboard Engine Assembly	1	60C21113				-1								
Outboard Engine Assembly	1	60C21114				-1								
Outboard Engine Assembly	1	60C21211					-1							
Outboard Engine Assembly	1	60C21212					-1							
Outboard Engine Assembly	1	60C21213					-1							
Outboard Engine Assembly	1	60C21214					-1							
Outboard Engine Assembly	1	60C21711						-1						
Outboard Engine Assembly	1	60C21712						-1						
Outboard Engine Assembly	1	60C21713						-1						
Outboard Engine Assembly	1	60C21714						-1						
Outboard Engine Assembly	1	60C21811							-1	-1	-1	-1	-1	-1
Outboard Engine Assembly	1	60C21812							-1	-1	-1	-1	-1	-1
Outboard Engine Assembly	1	60C21813							-1	-1	-1	-1	-1	-1
Outboard Engine Assembly	1	60C21814							-1	-1	-1	-1	-1	-1
Inboard Engine Assembly	1	60C20415	-1											
Inboard Engine Assembly	1	60C20416	-1											
Inboard Engine Assembly	1	60C20417	-1											
Inboard Engine Assembly	1	60C20418	-1											
Inboard Engine Assembly	1	60C20815		-1										

4.2 S-IB STAGE															
4.2.2 PROPULSION - Configuration - Continued		NEXT ASSY QTY	DRAWING NUMBER	SA-201	SA-202	SA-203	SA-204	SA-205	SA-206	SA-207	SA-208	SA-209	SA-210	SA-211	SA-212
4.2.2.6 H-1 ENGINE - Continued															
	Inboard Engine Assembly	1	60C20816		-1										
	Inboard Engine Assembly	1	60C20817		-1										
	Inboard Engine Assembly	1	60C20818		-1										
	Inboard Engine Assembly	1	60C21015			-1									
	Inboard Engine Assembly	1	60C21016			-1									
	Inboard Engine Assembly	1	60C21017			-1									
	Inboard Engine Assembly	1	60C21018			-1									
	Inboard Engine Assembly	1	60C21115				-1								
	Inboard Engine Assembly	1	60C21116				-1								
	Inboard Engine Assembly	1	60C21117				-1								
	Inboard Engine Assembly	1	60C21118				-1								
	Inboard Engine Assembly	1	60C21215					-1							
	Inboard Engine Assembly	1	60C21216					-1							
	Inboard Engine Assembly	1	60C21217					-1							
	Inboard Engine Assembly	1	60C21218					-1							
	Inboard Engine Assembly	1	60C21715						-1						
	Inboard Engine Assembly	1	60C21716						-1						
	Inboard Engine Assembly	1	60C21717						-1						
	Inboard Engine Assembly	1	60C21718						-1						
	Inboard Engine Assembly	1	60C21815							-1	-1	-1	-1	-1	-1
	Inboard Engine Assembly	1	60C21816							-1	-1	-1	-1	-1	-1
	Inboard Engine Assembly	1	60C21817							-1	-1	-1	-1	-1	-1
	Inboard Engine Assembly	1	60C21818							-1	-1	-1	-1	-1	-1
9	(Typical Engine Component Breakdown)	1		X	X	X	X	X	X	X	X	X	X	X	X
	Thrust Chamber Assembly, Outboard Engine	1		X	X	X	X	X	X	X	X	X	X	X	X

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9 Specific drawing numbers determined by engine serial number assignment and latest engine configuration log.

4.2 S-IB STAGE																										
4.2.2 PROPULSION - Measurements		SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212		
		A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	
FLIGHT MEASUREMENTS - TOTAL		208	205	213	202	211	210	211	210	182		182		182		182		182		182		182		182		182
4.2.2.1 FUEL SYSTEM																										
Measurements - Total		19	18	24	24	20	19	20	20	14		14		14		14		14		14		14		14		14
Temperature - Total		4	4	4	4	4	4	4	4	4		4		4		4		4		4		4		4		4
③	Fuel in Container, F-1	1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1		1
③	Fuel in Container, F-2	1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1		1
③	Fuel in Container, F-3	1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1		1
③	Fuel in Container, F-4	1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1		1
Pressure - Total		4	4	4	4	5	5	5	5	4		4		4		4		4		4		4		4		4
Fuel Pump Inlets, Outboard Engines		4	4	4	4	4	4	4	4	4		4		4		4		4		4		4		4		4
Fuel Pump Inlets, Inboard Engines		0	0	0	0	1	1	1	1	0		0		0		0		0		0		0		0		0
Vibration - Total		0	0	4	4	1	0	1	1	0		0		0		0		0		0		0		0		0
Tank Fill and Drain Line		0	0	0	0	1	0	1	1	0		0		0		0		0		0		0		0		0
Fuel Pump Flange		0	0	3	3	0	0	0	0	0		0		0		0		0		0		0		0		0
Fuel Wrap-Around Line		0	0	1	1	0	0	0	0	0		0		0		0		0		0		0		0		0
Signal - Total		4	4	4	4	4	4	4	4	4		4		4		4		4		4		4		4		4
Fuel Level Cutoff, F-2 and F-4		2	2	2	2	2	2	2	2	2		2		2		2		2		2		2		2		2
Fuel Depletion, F-2 and F-4		2	2	2	2	2	2	2	2	2		2		2		2		2		2		2		2		2
Liquid Level - Total		7	6	8	8	6	6	6	6	2		2		2		2		2		2		2		2		2
④	Fuel Level Discrete, F-1	1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1		1

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③ Three temperature gauges in each container.

④ 15 probes in each container, SA-201 thru SA-206; 3 probes in each container, SA-207 and subs.

4.2 S-IB STAGE																									
4.2.2 PROPULSION - Measurements - Continued		SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
		A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
4.2.2.1 FUEL SYSTEM - Continued																									
④	Fuel Level Discrete, F-2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
④	Fuel Level Discrete, F-3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
④	Fuel Level Discrete, F-4	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Fuel Level Continuous, F-1	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Fuel Level Continuous, F-2	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Fuel Level Continuous, F-3	1	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Fuel Level Continuous, F-4	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.2.2.2 FUEL PRESSURIZATION SYSTEM																									
	Measurements - Total	4	4	4	4	4	4	4	4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Temperature - Total	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	F-3 Fuel Container Gas	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Helium Spheres	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pressure - Total	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	F-3 Fuel Container Gas	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Helium Spheres	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4.2.2.3 OXIDIZER SYSTEM																									
	Measurements - Total	24	24	24	24	24	24	24	24	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
	Temperature - Total	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	LOX Pump Inlets	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8

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④ 15 probes in each container, SA-201 thru SA-206; 3 probes in each container, SA-207 and subs.

4.2 S-IB STAGE																								
4.2.2 PROPULSION - Measurements - Continued	SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
4.2.2.3 OXIDIZER SYSTEMS - Continued																								
Pressure - Total	4	4	4	4	5	5	5	5	4		4	4	4	4	4	4	4	4	4	4	4	4	4	4
LOX Pump Inlets, Outboard Engines	4	4	4	4	4	4	4	4	4		4	4	4	4	4	4	4	4	4	4	4	4	4	4
LOX Pump Inlets, Inboard Engines	0	0	0	0	1	1	1	1	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vibration - Total	0	0	0	0	1	1	1	1	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tank Fill and Drain Line	0	0	0	0	1	1	1	1	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Signal - Total	2	2	2	2	2	2	2	2	2		2	2	2	2	2	2	2	2	2	2	2	2	2	2
LOX Level Cutoff, 0-2 and 0-4	2	2	2	2	2	2	2	2	2		2	2	2	2	2	2	2	2	2	2	2	2	2	2
Liquid Level - Total	10	10	10	10	8	8	8	8	3		3	3	3	3	3	3	3	3	3	3	3	3	3	3
④ LOX Level, Discrete, 0-C	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1
④ LOX Level, Discrete, 0-1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1
④ LOX Level, Discrete, 0-2	1	1	1	1	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0
④ LOX Level, Discrete, 0-3	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1
④ LOX Level, Discrete, 0-4	1	1	1	1	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0
LOX Level, Continuous, 0-C, 0-1 thru 0-4	5	5	5	5	5	5	5	5	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.2.2.4 OXIDIZER PRESSURIZATION SYSTEM																								
Measurements - Total	11	11	11	11	6	6	6	6	4		4	4	4	4	4	4	4	4	4	4	4	4	4	4
Temperature - Total	4	4	4	4	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1
0-C LOX Container Gas	1	1	1	1	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0
GOX Control Valve	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1
GOX Relief Valve	2	2	2	2	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0

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④ 15 probes in each container, SA-201 thru SA-204; 3 probes in each container, SA-205 and subs.

4.2 S-IB STAGE																								
4.2.2 PROPULSION - Measurements - Continued	SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
4.2.2.4 OXIDIZER PRESSURIZATION SYSTEM - Continued																								
Pressure - Total	4	4	4	4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
O-C LOX Container Gas	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Delta P, GOX Control Valve	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delta P, GOX, O-C to O-3	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GOX Control Valve Inlet	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Signal - Total	3	3	3	3	3	3	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
GOX Flow Control Valve Position	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
LOX Container Pressurization Switch Pos.	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LOX Relief Valve Closed Indication	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LOX Emergency Vent Pressure Switch	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.2.2.5 CONTROL PRESSURE SYSTEM																								
Measurements - Total	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Pressure - Total	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Control Equipment Supply	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Control Equipment Regulator	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4.2.2.6 H-1 ENGINE																								
Measurements - Total	148	147	148	146	155	155	155	154	143	143	143	143	143	143	143	143	143	143	143	143	143	143	143	143
Temperature - Total	35	35	35	35	40	40	40	40	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
LOX Pump Bearings	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Gas Generator Chamber	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8

4.2 S-IB STAGE																										
4.2.2 PROPULSION - Measurements - Continued		SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212		
		A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	
4.2.2.6 H-1 ENGINE - Continued																										
⑤	Engine Compartments 1, 2, 3, 4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	Engine Compartments 5, 6, 7, 8	4	4	4	4	4	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gear Case Lubricants	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Aspirator Surface, Engine 3	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	External, Nozzle, Engine 5	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Aspirator Inlet	0	0	0	0	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Turbine Exhaust Duct	0	0	0	0	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Infra-Red Flame Spectrum	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gas Aspirator Surface	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	LOX Seal Drainline									24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
	Pressure - Total	46	46	46	46	48	48	48	48	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
	Combustion Chamber	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Turbine Inlets	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Turbine Exhaust	2	2	2	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Turbine Exhaust Static Pressure	0	0	0	0	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Turbine Outlet to Aspirator Inlet	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gear Case Lubricants	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Gas Generator Fuel Injections	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Delta P Turbine Outlet to Exhaust Nozzle	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Partial Aspirator Nozzle Exit	0	0	0	0	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	LOX Heat Exchanger Inlet, Engine 2 & 6	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Delta P Heat Exchanger	0	0	0	0	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gas Generator LOX Injections	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8

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⑤ Four temperature gauges in parallel.

4.2 S-IB STAGE															
4.2.3 FLIGHT CONTROL - Configuration	D.O. Toles 1-1/IB-SIB 876-5511	NEXT ASSY QTY	DRAWING NUMBER	SA- 201	SA- 202	SA- 203	SA- 204	SA- 205	SA- 206	SA- 207	SA- 208	SA- 209	SA- 210	SA- 211	SA- 212
4.2.3.1 HYDRAULIC SYSTEM															
Hydraulic System Installation		4	60C20440	-1											
Hydraulic System Installation		4	60C20840		-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Accumulator, Manifold Assembly		1	20C85062	X	X	X	X	X	X	X	X	X	X	X	X
Pressure Relief Valve		1	20C85077	X	X	X	X	X	X	X	X	X	X	X	X
Pressure Relief Valve		1	20C85078	X	X	X	X	X	X	X	X	X	X	X	X
Pump, Auxiliary and Motor Assembly		1	20C85061	X	X	X	X		X						
Pump, Auxiliary and Motor Assembly		1	60C20722					-1		-1	-1	-1	-1	-1	-1
Pump, Main		1	20C85035	X	X	X	X	X	X	X	X	X	X	X	X
Hydraulic Actuators, Yaw and Pitch		2	60C60001	X	X	X	X	X	X	X	X	X	X	X	X
4.2.3.2 RETROMOTOR ASSEMBLY															
(Physically mounted on S-IVB Interstage but															
functionally part of S-IB Stage, see section															
4.3.3.5)															
4.2.3.3 CONTROL COMPONENTS															
Actuators (see section 4.2.3.1)															
Accelerometer, Longitudinal		1	50C10323	-1	-1	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
Accelerometer, Yaw		1	50C10324	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Accelerometer, Pitch		1	50C10324	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Rate Gyro Package		1	50C10676	X	X	X	X	X	X	X	X	X	X	X	X

4.2 S-IB STAGE																									
		SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
4.2.3 FLIGHT CONTROL - Measurements		A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
FLIGHT MEASUREMENTS - TOTAL		31	31	31	31	37	37	37	35	19		19		19		19		19		19		19		19	
4.2.3.1 HYDRAULIC SYSTEM																									
Measurements -Total		20	20	20	20	26	26	26	25	12		12		12		12		12		12		12		12	
Temperature - Total		4	4	4	4	4	4	4	4	4		4		4		4		4		4		4		4	
Hydraulic Oil		4	4	4	4	4	4	4	4	4		4		4		4		4		4		4		4	
Pressure - Total		12	12	12	12	12	12	12	12	4		4		4		4		4		4		4		4	
Hydraulic Sources		4	4	4	4	4	4	4	4	4		4		4		4		4		4		4		4	
Delta P, Yaw Actuators		4	4	4	4	4	4	4	4	0		0		0		0		0		0		0		0	
Delta P, Pitch Actuators		4	4	4	4	4	4	4	4	0		0		0		0		0		0		0		0	
Vibration - Total		0	0	0	0	6	6	6	5	0		0		0		0		0		0		0		0	
Pitch Actuator		0	0	0	0	3	3	3	3	0		0		0		0		0		0		0		0	
Yaw Actuator		0	0	0	0	3	3	3	2	0		0		0		0		0		0		0		0	
Liquid Level - Total		4	4	4	4	4	4	4	4	4		4		4		4		4		4		4		4	
Hydraulic Oil		4	4	4	4	4	4	4	4	4		4		4		4		4		4		4		4	
4.2.3.2 RETROMETER ASSEMBLY																									
② Measurements - Total		4	4	4	4	4	4	4	4	0		0		0		0		0		0		0		0	
② Pressure - Total		4	4	4	4	4	4	4	4	0		0		0		0		0		0		0		0	
② Retromotor Chamber		4	4	4	4	4	4	4	4	0		0		0		0		0		0		0		0	

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4-34 ② Measurements taken on S-IVB Aft Interstage, but telemetered through the S-IB Stage (see section 4.3.3.5).

4.2 S-IB STAGE															
4.2.4 INSTRUMENTATION AND RANGE SAFETY - Configuration	T.E. Kinser I-I/IB-SIB 876-5511	NEXT ASSY QTY	DRAWING NUMBER	SA- 201	SA- 202	SA- 203	SA- 204	SA- 205	SA- 206	SA- 207	SA- 208	SA- 209	SA- 210	SA- 211	SA- 212
4.2.4.1 TELEMETRY AND MEASURING															
Telemetry Antenna		2	50C10342	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Power Divider		1	50C10186	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
TM RF Coupler		1	60C50074	X	X	X	X								
TM RF Coupler		1	60C50145					X	X	X	X	X	X	X	X
PCM/RF Assembly, Mod CT 19B (P-1)		1	50C12187	-1	-1	-1	-1	-1							
PCM/RF Assembly, Mod II (P-1)		1	60C50177						-1	-1	-1	-1	-1	-1	-1
PCM/DDAS Assembly, Mod 301 (P-1)		1	60C50079	-1	-1	-1	-1	-3							
PCM/DDAS Assembly, Mod 301 (P-1)		1	60C50195						-1	-1	-1	-1	-1	-1	-1
Remote Digital Sub-Multiplexer (P-1)		1	50C12089	-3	-3	-3	-3								
Remote Digital Sub-Multiplexer (P-1)		1	50C12088	-5	-3	-3	-3	-3							
Remote Digital Sub-Multiplexer (P-1)		1	60C50198						-1	-1	-1	-1	-1	-1	-1
TM Multiplexer Assembly, Mod 270		1	60C50081	-7	-7	-13	-15								
TM Multiplexer Assembly, Mod 270		1	60C50087	-1	-1	-5	-9								
TM Multiplexer Assembly, Mod 270		1	60C50087	-3	-3	-7	-11								
TM Multiplexer Assembly, Mod 270 (PIA0)		1	60C50081					-19							
TM Multiplexer Assembly, Mod 270 (PIA0)		1	60C50196						-1	-1	-1	-1	-1	-1	-1
TM Multiplexer Assembly, Mod 270 (PIB0)		1	60C50081					-21							
TM Multiplexer Assembly, Mod 270 (PIB0)		1	60C50196						-3	-3	-3	-3	-3	-3	-3
SS/FM RF Assembly, Mod 1 (S-1)		1	50C12196	-5	-5	-5	-5								
SS/FM Assembly (S-1)		1	50C12195	-1	-3	-3	-3								
Vibration Multiplexer Assembly (S-1)		1	50C12192	-3	-9	-5	-7								
PAM/FM/FM RF Assembly, Mod 1 (F-1)		1	50C12196	-7	-7	-7	-7	-7							
PAM/FM/FM RF Assembly, Mod 1 (F-1)		1	60C50199						-1	-1	-1	-1	-1	-1	-1

4.2 S-IB STAGE															
4.2.4 INSTRUMENTATION AND RANGE SAFETY - Configuration- Continued		NEXT ASSY QTY	DRAWING NUMBER	SA-201	SA-202	SA-203	SA-204	SA-205	SA-206	SA-207	SA-208	SA-209	SA-210	SA-211	SA-212
4.2.4.1 TELEMETRY AND MEASURING - Continued															
	TM Assembly (F-1)	1	60C50087	-1	-1	-5	-9								
	TM Assembly (F-1)	1	60C50142					-1	-1	-1	-1	-1	-1	-1	-1
	Tape Recorder, Mod 101	1	50C10338	X	X	X	X								
	Timer Assembly, 26 Seconds	1	40C20614	-1	-1	-1	-1								
	PAM/FM/FM RF Assembly, Mod 1 (F-2)	1	50C12196	-9	-9	-9	-9								
	TM Assembly (F-2)	1	60C50087	-3	-3	-7	-11								
	Telemetry Calibrator, Mod II	1	50C12011	-3	-3	-3	-3	-3							
	Telemetry Calibrator, Mod II	1	60C50197						-1	-1	-1	-1	-1	-1	-1
4.2.4.2 RANGE SAFETY SYSTEM															
	SECURE RANGE SAFETY COMMAND SYSTEM	2		X											
	Command Antenna	4	50C12171	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	RF Power Divider	2	50C12173	X											
	RF Power Divider	3	50C12173		X	X	X	X	X	X	X	X	X	X	X
	Directional Coupler	2	50C12382		X	X	X	X	X	X	X	X	X	X	X
	AN/DRW - 13 Command Receiver and Decoder	2	50M12172	X											
	DRW-13 Voltage Regulator	2	50M10419	X											
	Secure Command Receiver	2	50M10697		X	X	X	X	X	X	X	X	X	X	X
	Range Safety Decoder	2	50M10698		X	X	X	X	X	X	X	X	X	X	X
	Range Safety System Controller	2	40C32016	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	Safe and Arming Device	1	10C11027	X	X	X	X	X	X	X	X	X	X	X	X
	Primary Battery (see section 4.2.5.1)														

4.2 S-IB STAGE																										
4.2.4 INSTRUMENTATION AND RANGE SAFETY - Measurements	SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212			
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B		
FLIGHT MEASUREMENTS - TOTAL	15	15	18	18	18	18	12	12	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10		
4.2.4.1 TELEMETRY AND MEASURING																										
Measurements - Total	4	4	4	4	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3		
Signal - Total	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Tape Recorder Ready to Record	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Voltage - Total	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3		
Measuring Voltage	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3		
4.2.4.2 RANGE SAFETY SYSTEM																										
Measurements - Total	4	4	7	7	7	7	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4		
Signal - Total	2	2	4	4	4	4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		
Cutoff and Destruct Indicators	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		
Decoder	0	0	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Voltage - Total	2	2	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		
AGC Voltage, Command Receiver	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Secure Command Receiver Field Strength	0	0	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		
4.2.4.3 TRACKING SYSTEM																										
Measurements - Total	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3		

4.2 S-IB STAGE																								
4.2.4 INSTRUMENTATION AND RANGE SAFETY - Measurements - Continued	SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
4.2.4.3 TRACKING SYSTEM - Continued																								
RF and Telemetry - Total	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Static Frame Error, ODOP	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Lock Indicator, ODOP	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Voltage - Total	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
AGC Voltage, ODOP	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4.2.4.4 FILM CAMERA SYSTEM																								
Measurements - Total	4	4	4	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pressure - Total	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Camera Eject System	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Signal - Total	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Camera Power Monitor	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous - Total	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Camera, Frame Rate	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

4.2 S-IB STAGE																
4.2.5 ELECTRICAL - Configuration	J.D. Alter I-I/IB-SIB 876-5218	NEXT ASSY QTY	DRAWING NUMBER	SA- 201	SA- 202	SA- 203	SA- 204	SA- 205	SA- 206	SA- 207	SA- 208	SA- 209	SA- 210	SA- 211	SA- 212	
4.2.5.1 POWER SUPPLY																
Primary Battery		2	60C40052	X	X	X	X	X	X	X	X	X	X	X	X	
Master Measuring Voltage Supply		3	40C20002	X	X	X	X	X	X	X	X	X	X	X	X	
4.2.5.2 POWER DISTRIBUTION																
① Main Distributor		1	60C40190	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
Power Distributor, 12A25		1	50C01138	X	X	X	X	X	X	X	X	X	X	X	X	
① Propulsion System Distributor, 9A1		1	60C41054	-1	-1	-1	-1	-1	-1	-1	-1	-1				
① Propulsion System Distributor, 9A1		1	60C41070										-1	-1	-1	
① Propulsion System Distributor, 9A2		1	60C41066		-1	-1	-1	-1	-1	-1	-1	-1				
① Propulsion System Distributor, 9A2		1	60C41071										-1	-1	-1	
Power Transfer Switching Assembly		2	50C01477	X	X	X	X	X	X	X	X	X	X	X	X	
Continous Liquid Level, Oxidizer and Fuel Racks		9	50C10699	X	X	X	X									
Switch Selector, Mod I		1	50C04008	-1												
Switch Selector, Mod II		1	50C67864		-5	-5	-5									
Switch Selector, Mod II		1	50M67864					-5	-5	-5	-5	-5	-5	-5	-5	
Measuring Distributor, 9A3		1	60C41025	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
Measuring Distributor, 9A4		1	60C41026	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
Measuring Distributor, 9A5		1	60C41057	-1	-1	-1	-1									
Main Measuring Distributor, 12A26		1	60C41000	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	

4.2 S-1B STAGE																									
4.2.5 ELECTRICAL - Measurements		SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
		A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
FLIGHT MEASUREMENTS - TOTAL		15	15	15	15	13	13	13	13	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
4.2.5.1 POWER SUPPLY																									
Measurements - Total		5	5	5	5	5	5	5	5	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Temperature - Total		1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Battery Surface		1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Voltage and Current - Total		4	4	4	4	4	4	4	4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Battery Current		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Battery Voltage		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
4.2.5.2 POWER DISTRIBUTION																									
Measurements - Total		10	10	10	10	8	8	8	8	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Vibration - Total		5	5	5	5	3	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
①	Distributor Vibration	5	5	5	5	3	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Signal - Total		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Switch Selector Output Pulse		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Switch Selector Register Test		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Voltage - Total		3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
①	Bus Voltage Transients	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
①	Bus Voltage	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

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4.2 S-IB STAGE																
4.2.6 ORDNANCE - Configuration	J. D. Alter I-I/IB-SIB 876-5218	NEXT ASSY QTY	DRAWING NUMBER	SA- 201	SA- 202	SA- 203	SA- 204	SA- 205	SA- 206	SA- 207	SA- 208	SA- 209	SA- 210	SA- 211	SA- 212	
4.2.6.1 ENGINE IGNITION AND CUTOFF																
Pyrotechnic Installation, Engine		8	60C20446	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
Solid Propellant Gas Generator		8	r651240	-31	-41	-41	-41									
Solid Propellant Gas Generator		8	r651049					X	X	X	X	X	X	X	X	
Liquid Propellant Gas Generator Igniter		16	r651175	X	X	X	X	X	X	X	X	X	X	X	X	
Conax Explosive Actuated Valve		8	NA5-26594	-1C	-1C	-1C										
Conax Explosive Actuated Valve		8	r411034				X	X								
Conax Explosive Actuated Valve		8	NA5-260180						X	X	X	X	X	X	X	
4.2.6.2 SEPARATION SYSTEM																
(Physically part of the S-IVB Aft Interstage but																
functionally part of S-IB Stage, see section																
4.3.6.1).																
4.2.6.3 PROPELLANT DISPERSION SYSTEM																
EBW Firing Unit		2	40C39515	X	X	X	X	X	X	X	X	X	X	X	X	
EBW Detonator		2	10C11028	X	X	X	X	X	X	X	X	X	X	X	X	
Primacord Ringline		1	d1A93803	X	X	X	X	X	X	X	X	X	X	X	X	
Primacord/LSC Spliceblock		9	10C10994	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
Primacord Assembly		18	60C11199	X	X	X	X	X	X	X	X	X	X	X	X	
Primacord Assembly		2	60C11209	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
Linear Shaped Charge 0-C		1	60C11215	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
Linear Shaped Charge F-1, F-2		2	60C11213	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
Linear Shaped Charge F-3, F-4		2	60C11214	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
Linear Shaped Charge 0-1, 0-2, 0-3, 0-4		4	60C11212	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	

4.2 S-1B STAGE																									
4.2.6 ORDNANCE - Measurements		SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
		A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
FLIGHT MEASUREMENTS - TOTAL		14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
4.2.6.1 ENGINE IGNITION AND CUTOFF																									
Measurements - Total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.2.6.2 SEPARATION SYSTEM																									
Measurements - Total		12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Signal - Total		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Retromotor		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Separation Trigger		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Voltage - Total		10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
EBW Retromotor Voltage		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
EBW Separation Voltage		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
4.2.6.3 PROPELLANT DISPERSION SYSTEM																									
Measurements - Total		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Voltage - Total		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Propellant Dispersion EBW Voltage		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

4.3 S-IVB STAGE

S-IVB STAGE DATA SUMMARY (For Information Only)

Manufacturer McDonnell Douglas Corporation

I DIMENSION Length 59.1 ft (18.0m)* Diameter 21.7 ft (6.6m)

*Includes approximately 8 inch protrusion of LH₂ container beyond S-IVB/IU mating surface.

II WEIGHTS

Vehicle	Drawing Number	Stage Weights ≈			
		Dry	Ground Ignition	Injection	S-IB/S-IVB Interstage
S-IVB-201	1A74633-1	23,300 lb (10,569kg)	254,400 lb (115,396kg)	32,100 lb (14,561kg)	6,400 lb (2,093kg)
S-IVB-202	1A74633-501	23,300 lb (10,569kg)	265,800 lb (115,577kg)	30,100 lb (13,653kg)	6,400 lb (2,093kg)
S-IVB-203	1A74633-503	25,200 lb (11,431kg)	187,400 lb (85,080kg)	50,600 lb (22,970kg)	6,600 lb (2,994kg)
S-IVB-204	1A74633-505	23,600 lb (10,705kg)	255,000 lb (115,668kg)	29,500 lb (13,430kg)	6,600 lb (3,000kg)
S-IVB-205	1A74633-507	22,000 lb (10,000kg)	253,400 lb (115,000kg)	24,400 lb (11,100kg)	6,500 lb (2,950kg)
S-IVB-206	1A74633-509	22,000 lb (10,000kg)	253,800 lb (115,200kg)	24,200 lb (11,000kg)	6,700 lb (3,050kg)
S-IVB-207	1A74633-511	22,000 lb (10,000kg)	253,400 lb (115,000kg)	24,300 lb (11,000kg)	6,500 lb (2,950kg)
S-IVB-208	1A74633-513	21,900 lb (9,950kg)	255,600 lb (115,900kg)	24,200 lb (11,000kg)	6,500 lb (2,950kg)
S-IVB-209	1A74633-515	22,100 lb (10,050kg)	253,700 lb (115,100kg)	24,400 lb (11,050kg)	6,500 lb (2,950kg)
S-IVB-210	1A74633-517	22,250 lb (10,100kg)	253,550 lb (115,100kg)	24,500 lb (11,100kg)	6,500 lb (2,950kg)
S-IVB-211	1A74633-519	22,300 lb (10,100kg)	253,600 lb (115,050kg)	24,500 lb (11,100kg)	6,500 lb (2,950kg)
S-IVB-212	1A74633-521	22,200 lb (10,100kg)	253,500 lb (115,000kg)	24,500 lb (11,100kg)	6,500 lb (2,950kg)

III MAIN PROPULSION SYSTEM

Engine	Rocketdyne J-2		
Dry Weight	3,450 lb (1560kg)	Burn Time	450 seconds ≈
Nominal Thrust	200,000 lb (vac) (889,600N) S-IVB-201 thru S-IVB-207 205,000 lb (vac) (911,840N) S-IVB-208 and subsequent		

S-IVB STAGE DATA SUMMARY - Continued

III MAIN PROPULSION SYSTEM - Continued

Engine - Continued

Engine Mounting Stage Centerline

Actuators Hydraulic, two per engine

Gimbal Angle - ± 7.0 degree square pattern Gimbal Rate - 8 degree/sec in each plane Gimbal Acceleration - 30 rad/sec^2

Nominal Propellant Loading 228,500 lb (103,510kg) Nominal Mass Mixture Ratio - (oxidizer to fuel) 5:1

Programmed Mixture Ratio Relative Thrust Per Programmed Mixture Ratio

Vehicle	Programmed Mixture Ratio		Relative Thrust Per Programmed Mixture Ratio	
	Initial Step	Second Step	Initial Step	Second Step
S-IVB-201	5.5:1	5.236:1	225,000 lb (999,000N)	212,00 lb (942,976N)
S-IVB-202	5.5:1	4.702:1	225,000 lb (999,999N)	185,000 lb (821,400N)
S-IVB-203	Nominal	Nominal	200,000 lb (888,000N)	200,000 lb (888,000N)
S-IVB-204 thru S-IVB-207	5.5:1	4.702:1	225,000 lb (999,000N)	185,000 lb (821,400N)
S-IVB-208 thru S-IVB-212	5.5:1	4.702:1	230,000 lb (1,023,000N)	190,000 lb (843,640N)

Oxidizer NPSH

Fuel NPSH

Minimum Engine Ignition Requirements 26ft (7.9m) of LOX or 12.9 psia (8.9N/cm²) 150ft (45.7m) of LH₂ or 4.6 psia (1.9N/cm²)

Stage/Engine Interface Requirements 42.7 ft (12.9m) of LOX or 21.1 psia (14.5N/cm²) 211ft (64.3m) of LH₂ or 6.5 psia (4.5N/cm²)

Expansion Ratio - 27.5:1 Chamber Pressure - 680 psia (468.8N/cm²) Turbine Propellants - LOX and LH₂ Turbine Speed - 26,000rpm

IV PRESSURIZATION SYSTEM

	Initial	S-IVB Burn	Ullage
Oxidizer Container - Helium from ground source		Cold Helium	2.6%
Fuel Container - Helium from ground source		GH ₂	4.0%

S-IVB STAGE DATA SUMMARY - Continued

IV PRESSURIZATION SYSTEM - Continued

Preflight Pressurization

Oxidizer Pressure (Nominal) 37 to 40 psia (25.4 N/cm² to 27.6 N/cm² abs)

Fuel Pressure (Nominal) S-IVB-201 and S-IVB-202- 32 to 37 psia (22.0 N/cm² to 25.5 N/cm²)

S-IVB-203 and Subs - 31 to 34 psia (21.4 N/cm² to 23.4 N/cm²)

Inflight Pressurization

Oxidizer Pressure (Nominal) 37 to 40 psia (25.4 N/cm² to 27.6 N/cm² abs)

Fuel Pressure (Nominal) S-IVB-201 thru S-IVB-203 - 28 to 31 psia (19.2 N/cm² to 21.4 N/cm² abs)

Stepped to 39 psia (26.8 N/cm² abs) at 70% depletion

S-IVB-204 and subs - 26.5 to 29.5 psia (18.2 N/cm² to 20.3 N/cm²)

Stepped to 36 psia (24.8 N/cm² abs) at 70% depletion

V ENVIRONMENTAL CONTROL SYSTEM

Preflight Conditioning (Air) Aft compartment and forward skirt

Preflight Purge (GN₂) Aft compartment and forward skirt

Flight Cold Plates in forward skirt cooled and heated by IU Conditioning System

VI AUXILIARY PROPULSION SYSTEM

Engines - Six (6) TAPCO Mounted on the Aft skirt in modules, three engines per module

Nominal Thrust per Engine 150 lb (vacuum) (666N)

Propellants Each module contains 60 lb (27.0 kg) of hypergolic propellant (MMH and N₂O₄)

S-IVB STAGE DATA SUMMARY - Continued					
VII SEPARATION SYSTEM, S-IB/S-IVB - Short Coast, Single-Plane Mode					
Severance Method		Skin cutting at Aft interstage/Aft skirt interface by mild detonating fuse ring			
Type	Thrust Each	Burn Time	Propellant	Arrangement	
Retromotors Four (4) Thiokol TE-M-29-5	36,720 lb (163,774N)	1.52 sec	Solid	Equally spaced around S-IVB Aft interstage, canted 9.5°	
	3,400 lb (15,130N)	3.81 sec	Solid	Equally spaced around Aft skirt, canted 35°	
Ullage Rockets (3) Thiokol TX-280					
VIII ASTRIONICS SYSTEMS					
Guidance	Path adaptive guidance mode thru the IU during S-IVB burn				
Telemetry links	PAM/FM/FM, 3 systems on S-IVB-201 thru S-IVB-204; PCM/FM, system on all vehicles				
	SS/FM, 1 system on S-IVB-201 thru S-IVB-204				
Tracking	Not Applicable				
Electrical	Batteries - 28 vdc (Zinc-Silver Oxide) 3 on all stages except 4 on S-IVB-203; 56 vdc (Zinc-Silver Oxide) 1 on all stages				
	Static Inverter-Converter, input - 28 vdc - output 117.5 vdc, 115 vrms, 44 vdc, 21 vdc, 5 vdc, and 12 and 2.5 vpp, 400 Hz				
	Chilldown Inverter (2 each) input 56 vdc, output 56 vac 400 Hz				
	DC to DC converter - input 28 vdc, output 28 vdc regulated ± 0.56 vdc				
	5-Volt Excitation Module - input 28 vdc, output 5 vdc, - 20 vdc and 10 vpp, 2000 Hz				
	20 Volt Excitation Module - input 28 vdc, output 20 vdc				
Tape Recorder	Mod AIR 940 on PAM/FM/FM systems S-IVB-201 through S-IVB-204; PCM/DDAS on S-IVB-203 and S-IVB-204				
	Records during S-IB/S-IVB separation on S-IVB-201, during separation and over-the-horizon on S-IVB-202 thru S-IVB-204.				
IX RANGE SAFETY SYSTEM					
	S-IVB-201 - AN/DRW-13 with dual antennas for each system				
	S-IVB-202 and subsequent - Secure Range Safety Command System, with dual antennas.				

4.3 S-IVB Stage - Configuration and Measurements															
4.3.1 STRUCTURE - Configuration	G.A. Deuel I-V-S-IVB 876-5697	NEXT ASSY QTY	DRAWING NUMBER	SA- 201	SA- 202	SA- 203	SA- 204	SA- 205	SA- 206	SA- 207	SA- 208	SA- 209	SA- 210	SA- 211	SA- 212
4.3.1.1 FORWARD SKIRT ASSEMBLY		1	1B29835	-1	-1	-1	-1	-509	-505	-509	-505	-505	505	-503	-503
Modification, Forward Skirt		1	1B44307				-1								
Frame Segment		7	1A49629	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Frame Segment		4	1A49629	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501
Frame Segment		1	1A49629	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503
Closing Frame Segment		4	1A58328	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Aft Frame Segment		4	1A58875	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Aft Angle Segment		3	1A58608	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Aft Angle Segment		1	1A58608	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501
Forward Angle Segment		3	1A58609	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Forward Angle Segment		1	1A58609	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501
4.3.1.2 PROPELLANT CONTAINER ASSEMBLY		1	1A39303	-507	-507	-507	-511	-513	-527	-519	-531	-525	-529	-543	-537
Forward Dome Assembly		1	1A39304	-507	-507	-507	-503	-509	-509	-513	-513				
Forward Dome Assembly		1	1B64442									-1	-501	-1	-501
Duct, Insulated, External Fuel Tank Vent		1	1A94469	-503	-1	-505	-503	-503	-505	-503	-503	-503	-503	-503	-503
Duct, Insulated, External Fuel Tank Vent		1	1A94469		-503	-503									
Cylindrical Tank Assembly		1	1A39306	-503	-503	-503	-505	-505	-505	-505	-505	-509	-509	-509	-509
LOX Tank Assembly		1	1A39307	-505	-505	-505	-505	-507	-507	-509	-523	-523	-517	-523	-517
Common Bulkhead Dome Assembly		1	1A39309	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501
Common Bulkhead Foam Insulation Installation		1	1A72911	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Aft LOX Dome Assembly		1	1A39308	-503	-503	-503	-503	-505	-505	-507	-507	-507	-507	X	X
LOX Tank Components Modification		1	1B51213			-1									
LH ₂ Tank Components Modification		1	1B51216			-1									
LH ₂ Tank Manhole Cover Installation		1	1B51786			-1									

4.3 S-IVB STAGE														
4.3.1 STRUCTURE - Configuration - Continued	NEXT ASSY QTY	DRAWING NUMBER	SA-201	SA-202	SA-203	SA-204	SA-205	SA-206	SA-207	SA-208	SA-209	SA-210	SA-211	SA-212
4.3.1.3 THRUST STRUCTURE ASSEMBLY	1	1A39316	-501	-501	-501	-519	-523	-507	-525	-515	-515	-515	-521	-521
Forward Frame Assembly	1	1A67839	-501	-501	-501	-501	-501	-501	-501	-503	-503	-503	-503	-503
Intermediate Frame Assembly	1	1A67503	-501	-501	-501	-501	-503	-501	-503	-503	-503	-503	-503	-503
Aft Frame Assembly	1	1A68381	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Skin Panel Assembly	1	1A68314	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501
Skin Panel Assembly	2	1A68314	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Skin Panel Assembly	1	1A68349	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501
Skin Panel Assembly	1	1A68349	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Skin Panel Assembly	1	1A68549	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501
Skin Panel Assembly	1	1A68549	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Skin Panel Assembly	1	1A68666	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	1
Skin Panel Assembly	1	1A68951	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Intermediate Stringer Assembly	12	1A67502	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Intermediate Stringer Assembly	6	1A67502	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501
Intermediate Stringer Assembly	1	1A67502	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503
Intermediate Stringer Assembly	1	1A67502	-505	-505	-505	-505	-505	-505	-505	-505	-505	-505	-505	-505
Intermediate Stringer Assembly	1	1A67502	-507	-507	-507	-507	-507	-507	-507	-507	-507	-507	-507	-507
Intermediate Stringer Assembly	1	1A67502	-509	-509	-509	-509	-509	-509	-509	-509	-509	-509	-509	-509
Intermediate Stringer Assembly	1	1A67502	-511	-511	-511	-511	-511	-511	-511	-511	-511	-511	-511	-511
Intermediate Stringer Assembly	1	1A67502	-513	-513	-513	-513	-513							
Intermediate Stringer Assembly	1	1A67502	-515	-515	-515	-515	-515							
Intermediate Stringer Assembly	1	1A67502	-517	-517	-517	-517	-517							
Intermediate Stringer Assembly	1	1A67502	-519	-519	-519	-519	-519							
Intermediate Stringer Assembly	1	1A67502	-521	-521	-521	-521	-521	-521	-521	-521	-521	-521	-521	-521
Intermediate Stringer Assembly	1	1B58123						-1	-1	-1	-1	-1	-1	-1
Intermediate Stringer Assembly	1	1B58123						-501	-501	-501	-501	-501	-501	-501

4.3 S-IVB STAGE

4.3.1 STRUCTURE - Configuration - Continued	NEXT ASSY QTY	DRAWING NUMBER	SA- 201	SA- 202	SA- 203	SA- 204	SA- 205	SA- 206	SA- 207	SA- 208	SA- 209	SA- 210	SA- 211	SA- 212
Intermediate Stringer Assembly	1	1B58123						-503	-503	-503	-503	-503	-503	-503
Intermediate Stringer Assembly	1	1B58123						-505	-505	-505	-505	-505	-505	-505
Stringer Assembly	2	1B28969	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Thrust Structure, Support Installation	1	1A95637	-1	-507	-501	-503	-505	-509	-511	-511	-511	-511	-513	-513
Gimbal Mounting Engine Fitting Assembly	1	1A57487	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503
4.3.1.4 AFT SKIRT ASSEMBLY	1	1A58638	-501	-501										
AFT SKIRT ASSEMBLY	1	1B29825			-1	-503	-501	-501	-505	-507	-507	-507	-509	-509
Forward Interface Angle Segment	1	1A68136	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Forward Interface Angle Segment	1	1A68137	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Forward Interface Angle Segment	1	1A68138	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Forward Interface Angle Segment	1	1A68142	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Forward Interface Angle Segment	1	1A68144	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Forward Interface Angle Segment	1	1A68149			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Forward Intermediate Frame Assembly	1	1A68146	-1	-1										
Forward Intermediate Frame Assembly	1	1B29831			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Aft Intermediate Frame Assembly	1	1A68147	-1	-1										
Aft Intermediate Frame Assembly	1	1B29826			-1	-1	-501	-501	-501	-501	-501	-501	-501	-501
Aft Interface Frame Assembly	1	1A68152	-1	-1										
Aft Interface Frame Assembly	1	1B29827			-1	-1	-501	-501	-501	-501	-501	-501	-501	-501
Forward Interface Splice	2	1A86310	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Ullage Motor Support Installation	1	1A93268	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
APS Structure Support Installation	1	1A97480	-1	-1	-1	-1	-501	-501	-501	-501	-501	-501	-501	-501
4.3.1.5 AFT INTERSTAGE ASSEMBLY	1	1B29836	-1	-1	-507	-501	-503	-503	-505	-505	-505	-505	-505	-505
Reaction Beam Assembly	4	1B29837	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1

4.3 S-IVB STAGE														
4.3.1 STRUCTURE - Configuration - Continued	NEXT ASSY QTY	DRAWING NUMBER	SA-201	SA-202	SA-203	SA-204	SA-205	SA-206	SA-207	SA-208	SA-209	SA-210	SA-211	SA-212
4.3.1.5 AFT INTERSTAGE ASSEMBLY - Continued														
Reaction Beam Assembly	4	1B29837	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501
Skin Panel Assembly	7	1A79676	-1	-1	-1									
Skin Panel Assembly	7	1A79676	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501
Skin Panel Assembly	1	1A79676	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503
Skin Panel Assembly	1	1A79679	-505	-505	-505	-505	-505	-505	-505	-505	-505	-505	-505	-505
Skin Panel Assembly	6	1A79676				-1	-1	-1	-1	-1	-1	-1	-1	-1
Ring Segment	1	1B29841	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Ring Segment	2	1B29841	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501
Ring Segment	1	1B29841	-505	-505	-505	-505	-505	-505	-505	-505	-505	-505	-505	-505
Ring Segment	2	1B29841	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503
Ring Segment	1	1A65634	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Ring Segment	8	1A65634	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501
Ring Segment	8	1A65634	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503
Ring Segment	9	1B29843	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Ring Segment	3	1B29843	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501
Retromotor Nose Fairing Support	4	1B33091	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Retromotor Support Installation	2	1A84435	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501
4.3.1.6 STRUCTURE INSTALLATION, LH ₂ EXPERIMENT	1	1B51512			-1									
Support Installation, Battery, LH ₂ Experiment	1	1B51573			-1									
Support Installation, Instrumentation Probe	1	1B51642			-1									
Support Installation, He Repressurization System	1	1B51665			-1									

4.3 S-IVB STAGE																									
4.3.1 STRUCTURE - Measurements		SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
		A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
FLIGHT MEASUREMENTS - TOTAL		68	62	67	66	103	103	102	96	2		2		2		2		2		2		2		2	
4.3.1.1 FORWARD SKIRT ASSEMBLY																									
Measurements - Total		31	27	27	27	26	26	33	33	0		0		0		0		0		0		0		0	
Acceleration - Total		0	0	0	0	1	1	1	1	0		0		0		0		0		0		0		0	
Axial, Low Range		0	0	0	0	1	1	1	1	0		0		0		0		0		0		0		0	
Acoustics - Total		6	6	6	6	0	0	0	0	0		0		0		0		0		0		0		0	
Forward Skirt, External		3	3	3	3	0	0	0	0	0		0		0		0		0		0		0		0	
Forward Skirt, Internal		3	3	3	3	0	0	0	0	0		0		0		0		0		0		0		0	
Temperature - Total		10	8	10	10	4	4	1	1	0		0		0		0		0		0		0		0	
Forward Skirt, External		10	8	10	10	1	1	1	1	0		0		0		0		0		0		0		0	
Forward Skirt, Heat Flux		0	0	0	0	3	3	0	0	0		0		0		0		0		0		0		0	
Vibration - Total		8	8	5	5	3	3	3	3	0		0		0		0		0		0		0		0	
Upper Field Splice, Internal		5	5	5	5	3	3	3	3	0		0		0		0		0		0		0		0	
Natural Bending, Pitch		1	1	0	0	0	0	0	0	0		0		0		0		0		0		0		0	
Natural Bending, Yaw		1	1	0	0	0	0	0	0	0		0		0		0		0		0		0		0	
Natural Bending, Longitudinal		1	1	0	0	0	0	0	0	0		0		0		0		0		0		0		0	
Strain - Total		6	4	6	5	6	6	16	16	0		0		0		0		0		0		0		0	
Forward Skirt, Axial		6	4	6	5	6	6	16	16	0		0		0		0		0		0		0		0	

4.3 S-IVB STAGE																								
4.3.1 STRUCTURE - Measurements - Continued	SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
4.3.1.1 FORWARD SKIRT ASSEMBLY - Continued																								
Pressure - Total	1	1	1	1	12	12	12	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Forward Skirt, External	0	0	0	0	10	10	10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Forward Skirt, Internal	0	0	0	0	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Internal at Mike, Static	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.3.1.2 PROPELLANT CONTAINER ASSEMBLY																								
Measurements - Total	8	8	9	9	37	37	19	17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Temperature - Total	7	7	8	8	30	30	12	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LH ₂ Container, External	7	7	8	8	8	8	8	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LH ₂ Forward Bulkhead	0	0	0	0	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aft Dome	0	0	0	0	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Forward Dome	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Common Bulkhead	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pressure - Total	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Common Bulkhead, Internal	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Vibration - Total	0	0	0	0	6	6	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ring, Normal to Skin	0	0	0	0	6	6	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.3.1.3 THRUST STRUCTURE ASSEMBLY																								
Measurements - Total	12	12	12	12	6	6	6	6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

4.3 S-IVB STAGE																								
4.3.1 STRUCTURE - Measurements - Continued	SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
4.3.1.3 THRUST STRUCTURE ASSEMBLY - Continued																								
Temperature - Total	9	9	9	9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Thrust Structure Area	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Engine Area, Ambient	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Base Region, Gas	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Base Region Heat Flux	4	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pressure - Total	0	0	0	0	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thrust Structure Base	0	0	0	0	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vibration - Total	3	3	3	3	3	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gimbal Point, Yaw	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gimbal Point, Pitch	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gimbal Point, Thrust	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.3.1.4 AFT SKIRT ASSEMBLY																								
Measurements - Total	15	13	16	16	25	25	35	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acoustics - Total	0	0	0	0	6	6	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aft Skirt, Internal	0	0	0	0	3	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aft Skirt, External	0	0	0	0	3	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Temperature - Total	9	7	10	10	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aft Skirt Heat Flux	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aft Skirt, External	8	6	9	9	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

4.3 S-IVB STAGE																								
4.3.1 STRUCTURE - Measurements - Continued	SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
4.3.1.4 AFT SKIRT ASSEMBLY - Continued																								
Pressure - Total	0	0	0	0	12	12	12	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aft Skirt, Internal	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aft Skirt, External	0	0	0	0	3	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fuel Line Fairing	0	0	0	0	8	8	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Strain - Total	6	6	6	6	6	6	16	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aft Skirt, Axial	6	6	6	6	6	6	16	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.3.1.5 AFT INTERSTAGE ASSEMBLY																								
Measurements - Total	2	2	2	2	9	9	9	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Temperature - Total	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aft Interstage, External	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
② Aft Interstage, Skin Temperature	2	2	2	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pressure - Total	0	0	0	0	9	9	9	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aft Interstage, External	0	0	0	0	6	6	6	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aft Interstage, Internal	0	0	0	0	3	3	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.3.1.6 STRUCTURE, LH ₂ EXPERIMENT																								
Measurements - Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

② Measurements taken on S-IVB Aft Interstage, but telemetered through S-IB Stage (see section 4.2.1.5).

4.3 S-IVB STAGE

4.3.2 PROPULSION - Configuration	Pete LeBente I-V-S-IVB 876-5697	NEXT ASSY QTY	DRAWING NUMBER	SA- 201	SA- 202	SA- 203	SA- 204	SA- 205	SA- 206	SA- 207	SA- 208	SA- 209	SA- 210	SA- 211	SA- 212
4.3.2.1 FUEL SYSTEM															
Main Fuel Tank Components Installation	1	1A39322	-507	-513	-515	-511	-537	-529	-529	-529	-523	-527	-527	-527	-527
Main Fuel Valve Assembly	1	408474	X	X	X										
Main Fuel Valve Assembly	1	409120				X									
Main Fuel Valve Assembly	1	409920					X	X	X	X	X	X	X	X	X
Fuel Turbopump	1	459000	-61	-61	-31	-41	-101	-151	X	X	X	X	X	X	X
Fuel Prevalve	1	1A49968	-1	-503	-507	-507	-515	-515	-515	-515	-515	-507	-507	-507	-507
4.3.2.2 FUEL PRESSURIZATION SYSTEM															
Fuel Tank Pressurization System Installation	1	1A39326	-1	-513	-507	-509	-511	-511							
Fuel Tank Pressurization System Installation	1	1B58008							-1	-1	-505	-505	-505	-505	-505
Pressurization Control Module	1	1B55200	-1	-1	-503	-503	-505	-505	-505	-505	-505	-505	-505	-505	-505
Pressure Switch and Manifold Assembly	1	1B55000	-501	-501	-503	-509	-509	-509	-509	-509	-509	-509	-509	-509	-509
Prepressurization Pressure Switch	1	7851860	-511	-539	-539				-537	-537	-537	-537	-537	-537	-537
Prepressurization Pressure Switch	2	7851860				-537	-537	-537							
Flight Control Pressure Switch	1	781860							-537	-537	-537	-537	-537	-537	-537
Orbital Vent Initiation Pressure Switch	1	7851860							-543	-543	-543	-543	-543	-543	-543
Cold Gas Check Valve	1	1A66984	-1												
Cold Gas Check Valve	1	1B65673		-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Orbital Vent Termination Switch	1	1B39200			-1	-503	-503	-503	-503						
Propulsive Vent System Installation	1	1B55414			-1										
Helium Repressurization Sphere	1	1A49990			-1										
Propulsive Vent Regulator and Shutoff Valve	1	1B51753			-501										
Fuel Tank Relief Valve	1	1A49591	-513	-513	-513	-531	-533								
Fuel Tank Relief Valve	1	1A74535						-1	-1	-1	-1	-1	-1	-1	-1
Fuel Tank Directional Control Vent Valve	1	1A49988	-1	-1	-1	-1	-507	-509	-509	-509	-509	-509	-509	-509	-509

4.3 S-IVB STAGE															
4.3.2 PROPULSION - Configuration - Continued	NEXT ASSY QTY	DRAWING NUMBER	SA-201	SA-202	SA-203	SA-204	SA-205	SA-206	SA-207	SA-208	SA-209	SA-210	SA-211	SA-212	
4.3.2.2 FUEL PRESSURIZATION SYSTEM - Continued															
Fuel Tank Vent and Relief Valve	1	1A47257	-1	-1	-1	-501	-521	-509	-509	-509	-509	-509	-509	-509	
4.3.2.3 FUEL RECIRCULATION SYSTEM															
Recirculation Pump, Motor Driven	1	1A49421	-1	-503	-501	-501	-503	-503	-503	-503	-505	-505	-505	-505	
Pneumatic Recirculation Valve	1	1A49965	-511	-511	-511	-523	-523	-523	-523	-523	-523	-523	-523	-523	
Flowmeter	1	1A89104	-505	-504	-504	-509	-509	-509	-509	-509	-509	-509	-509	-509	
Checkvalve Assembly	1	1B53920	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
Swing Check Valve	1	1A49964	-1	-1	-1	-1	-501	-501	-501	-501	-501	-501	-501	-501	
Bleedvalve	1	r309036	X	X	X	X	X								
Bleedvalve	1	r309034						X	X	X	X	X	X	X	
4.3.2.4 OXIDIZER SYSTEM															
Oxidizer System Installation	1	1A39321	-507	-507	-509	-511	-513	-513	-517	-517	-521	-521	-521	-521	
Main LOX Valve Assembly	1	r409969	X	X	X	X	X	X	X	X	X	X	X	X	
LOX Bleed Valve	1	r308730	X	X	X										
LOX Bleed Valve	1	r309031				X	X								
LOX Bleed Valve	1	r309029						X	X	X	X	X	X	X	
LOX Turbopump	1	r458175	-41	-41	-11	-61	-61	-71	X	X	X	X	X	X	
LOX Prevalve	1	1A49968	-501	-501	-505	-509	-517	-517	-509	-509	-509	-509	-509	-509	
4.3.2.5 OXIDIZER PRESSURIZATION SYSTEM															
Oxidizer Pressurization Pneumatic Installation	1	1A39325	-507	-515	-509	-517	-511	-523							
Oxidizer Pressurization Pneumatic Installation	1	1B58006							-1	-1	-1	-1	-1	-1	
Pressurization Control Module	1	1B42290	-503	-503	-503	-505	-507	-507	-507	-507	-507	-507	-507	-507	
Cold Helium Dump Module	1	1B57781	-1	-1	-1	-505	-507	-507	-507	-507	-507	-507	-507	-507	

4.3 S-IVB STAGE															
4.3.2 PROPULSION - Configuration - Continued	NEXT ASSY QTY	DRAWING NUMBER	SA-201	SA-202	SA-203	SA-204	SA-205	SA-206	SA-207	SA-208	SA-209	SA-210	SA-211	SA-212	
4.3.2.5 OXIDIZER PRESSURIZATION SYSTEM - Continued															
Pressure Switch and Manifold Assembly	1	1B53756	-1	-1	-1										
Pressure Switch and Manifold Assembly	1	1B55000				-1	-1	-1							
Flight Control and Prepressurization Switch	1	7851847	-523	-533	-533	-533	-533	-533	-533	-533	-533	-533	-533	-533	
Helium Control Pressure Switch	1	7851830	-509	-509	-517	-517	-517	-517	-517	-517	-517	-517	-517	-517	
LOX Tank Relief Valve	1	1A49590	-513	-513	-513	-515	-515	-515	-515	-515	-515	-515	-515	-515	
Pressure Switch Assembly	1	1A95232	-505												
LOX Tank Vent and Relief Valve	1	1A48312	-503	-503	-503	-503	-507	-507	-505	-505	-505	-505	-505	-505	
Cold Gas Check Valve	2	1B40824	-1	-503		-507	-507	-507	-507	-507	-507	-507	-507	-507	
Cold Gas Check Valve	1	1B40824			-1										
Cold Gas Check Valve	1	1B40824			-503										
Helium Storage Spheres	8	1A48858	-1	-1	-1	-1	-1								
Helium Storage Spheres	6	1A48858						-1	-1	-1	-1	-1	-1	-1	
Helium Sphere Manifold Assembly	1	1A68668	-1	-1	-1	-1	-1	-1	-503	-503	-503	-503	-503	-503	
Helium Sphere Manifold Assembly	1	1A68668	-501	-501	-501	-501	-501	-511	-511	-511	-511	-511	-511	-511	
Plenum Chamber	1	1A49991	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
Heat Exchanger	1	1307725	-41	-41	-41	-41	-41	-41	X	X	X	X	X	X	
4.3.2.6 OXIDIZER RECIRCULATION SYSTEM															
Recirculation Pump, Motor Driven	1	1A49423	-1	-503	-501	-507	-507	-507	-507	-507	-507	-507	-507	-507	
Pneumatic Recirculation Valve	1	1A49965	-513	-513	-513	-525	-525	-525	-525	-525	-525	-525	-525	-525	
Flowmeter	1	1A89104	-501	-507	-507	-507	-507	-507	-507	-507	-507	-507	-507	-507	
Checkvalve Assembly	1	1A49964	-1	-1	-1	-1	-501	-501	-501	-501	-501	-501	-501	-501	
Pump Motor Purge Valve	1	1A67913	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
Recirculation Pump Purge Control Module	1	1A58347	-507	-505	-507	-507	-505	-513	-505	-505	-505	-505	-505	-505	
Recirculation Pump Purge Pressure Switch	1	7851847	-525	-525	-535	-535	-535	-535	-535	-535	-535	-535	-535	-535	

4.3 S-IVB STAGE															
4.3.2 PROPULSION - Configuration - Continued	NEXT ASSY QTY	DRAWING NUMBER	SA-201	SA-202	SA-203	SA-204	SA-205	SA-206	SA-207	SA-208	SA-209	SA-210	SA-211	SA-212	
4.3.2.7 CONTROL PRESSURE SYSTEM															
Pneumatic Power System Installation	1	1A39323	-507	-515	-511	-509	-517	-513							
Pneumatic Power System Installation	1	1B58002							-503	-1	-1	-1	-501	-501	
Pneumatic Power Control Module Assembly	1	1B43657	-507	-507	-507										
Pneumatic Power Control Module Assembly	1	1B67700				-1	-501	-1	-501	-501	-501	-501	-501	-501	
Actuation Control Module	1	1A49982	-503	-503	-509										
Actuation Control Module	3	1A49982	-505				-511								
Actuation Control Module	2	1A49982		-505											
Actuation Control Module	1	1A49982		-511											
Actuation Control Module	4	1A49982				-509									
Actuation Control Module	5	1B66692					-501	-501							
Actuation Control Module	4	1B66692							-501	-501	-501	-501	-501	-501	
Helium Storage Sphere	1	1A49963	-1	-1	-1					-1	-1	-1			
Helium Storage Sphere	1	1A49990				-505	-505	-505	-505						
Control Helium Tank	1	1A48857	-1	-1	-1	-501	-501	-501	-501	-501	-501	-501			
Control Helium Sphere	1	1B66865											-1	-1	
Helium Fill Module	1	1A57350	-503	-505	-505	-507	-507	-507	-507	-507	-507	-507	-507	-507	
Pressure Switch Assembly	1	1B53615	-1	-1											
Pneumatic Control Repress Modification	1	1B51215			-1										
4.3.2.8 J-2 ENGINE (9)															
Engine Installation	1	1A66894	-1	-503	-513	-509	-509	-509	-507	-507	-507	-507	-507	-507	
Thrust Chamber	1		X	X	X	X	X	X	X	X	X	X	X	X	
(1) S-IVB Thrust OK Switch	2		X	X	X	X	X	X	X	X	X	X	X	X	
Start Tank	1		X	X	X	X	X	X	X	X	X	X	X	X	
Start Tank Discharge Valve	1		X	X	X	X	X	X	X	X	X	X	X	X	

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(1) For EDS usage see section 4.1.1

(9) Specific Drawing numbers determined by engine serial number assignment and latest engine configuration log.

4.3 S-IVB STAGE																									
4.3.2 PROPULSION - Measurements		SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
		A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
FLIGHT MEASUREMENTS - TOTAL		178	174	176	176	266	263	204	191	134		132		131		131		130		133		132		132	
4.3.2.1 FUEL SYSTEM																									
Measurements - Total		29	29	27	27	71	70	47	45	18		18		18		18		18		18		18		18	
Temperature - Total		11	11	9	9	41	41	26	25	4		4		4		4		4		4		4		4	
Fuel Turbine Inlet		1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1	
Fuel Pump Inlet		1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1	
Fuel Tank, Internal		3	3	3	3	29	29	19	18	1		1		1		1		1		1		1		1	
Fuel Line Fairing		1	1	1	1	0	0	0	0	0		0		0		0		0		0		0		0	
Fuel Duct		0	0	0	0	2	2	2	2	0		0		0		0		0		0		0		0	
Fuel Tank Outlet		1	1	1	1	1	1	1	1	0		0		0		0		0		0		0		0	
Fuel Pump Discharge		1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1	
Fuel Pump Low Tie Rod Wall		1	1	1	1	1	1	0	0	0		0		0		0		0		0		0		0	
Fuel Pump Discharge Line Wall		1	1	0	0	1	1	0	0	0		0		0		0		0		0		0		0	
Fuel Pump Wall		1	1	0	0	1	1	0	0	0		0		0		0		0		0		0		0	
Fuel Pump Bearing		0	0	0	0	0	0	1	1	0		0		0		0		0		0		0		0	
Fuel Below Anti-Vortex Screen		0	0	0	0	1	1	0	0	0		0		0		0		0		0		0		0	
Fuel Feed Duct		0	0	0	0	2	2	0	0	0		0		0		0		0		0		0		0	
Pressure - Total		4	4	4	4	5	5	4	4	3		3		3		3		3		3		3		3	
Fuel Pump Inlet		1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1	
Fuel Pump Discharge		1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1	
Fuel Pump Balance Piston Sump		1	1	1	1	1	1	1	1	0		0		0		0		0		0		0		0	
Fuel Tank Inlet		1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1	
Fuel Pump Interstage Outlet		0	0	0	1	1	0	0	0	0		0		0		0		0		0		0		0	

4.3 S-IVB STAGE

4.3.2 PROPULSION - Measurements - Continued	SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212		
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	
	4.3.2.1 FUEL SYSTEM - Continued																								
Vibration - Total	2	2	2	2	5	5	5	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Turbopump	2	2	2	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fuel Lines	0	0	0	0	4	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Flow - Total	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Flowmeter	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Position - Total	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Main Fuel Valve	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Signal - Total	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Fuel Fill Valve Open and Closed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Fuel Prevalve Open and Closed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Main Fuel Valve Open and Closed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Liquid Level - Total	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Fuel Tank	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Miscellaneous - Total	1	1	1	1	9	8	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fuel, Liquid-Gas Differential	1	1	1	1	8	8	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quality GH ₂ Vapor, Cont. Vent System	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Speed - Total	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Turbopump	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

4.3 S-IVB STAGE																									
4.3.2 PROPULSION - Measurements - Continued		SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
		A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
4.3.2.2 FUEL PRESSURIZATION SYSTEM																									
Measurements	-Total	16	16	16	16	39	38	23	23	14		12		12		12		12		14		14		14	
Temperature	-Total	8	8	8	8	18	17	10	10	3		3		3		3		3		3		3		3	
GH ₂ Pressurization Control Module		1	1	1	1	1	1	1	0	0		0		0		0		0		0		0		0	
Fuel Tank Nonpropulsive Vent		0	0	0	0	2	2	2	2	2		2		2		2		2		2		2		2	
Fuel Tank Ullage		6	6	6	6	11	10	6	6	0		0		0		0		0		0		0		0	
Fuel Tank Continuous Vent		0	0	0	0	2	2	0	0	0		0		0		0		0		0		0		0	
Fuel Tank GH ₂ Inlet		1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1	
Helium Repressurization Sphere		0	0	0	0	1	1	0	0	0		0		0		0		0		0		0		0	
Pressure	-Total	5	5	5	5	12	12	6	6	5		5		5		5		5		5		5		5	
GH ₂ Tapoff Orifice		1	1	1	1	1	1	0	0	0		0		0		0		0		0		0		0	
Fuel Tank Ullage		1	1	1	1	1	1	1	1	0		0		0		0		0		0		0		0	
① Fuel Tank Ullage		2	2	2	2	2	2	2	2	2		2		2		2		2		2		2		2	
Differential Continuous Vent Exit		0	0	0	0	1	1	0	0	0		0		0		0		0		0		0		0	
Differential Nonpropulsive Vent Exit		0	0	0	0	1	1	0	0	0		0		0		0		0		0		0		0	
Fuel Tank Continuous Vent		0	0	0	0	2	2	0	0	0		0		0		0		0		0		0		0	
LH ₂ Pressurization Module Inlet		1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1	
Nonpropulsive Vent		0	0	0	0	2	2	2	2	2		2		2		2		2		2		2		2	
Helium Repressurization Sphere		0	0	0	0	1	1	0	0	0		0		0		0		0		0		0		0	
Vibration	- Total	0	0	0	0	0	0	0	0	0		0		0		0		0		0		0		0	
Tank Vent Valve		0	0	0	0	2	2	2	2	0		0		0		0		0		0		0		0	

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① For EDS usage see section 4.1.1.

4.3 S-IVB STAGE																									
4.3.2 PROCPULSION - Measurements - Continued		SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
		A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
4.3.2.2 FUEL PRESSURIZATION SYSTEM - Continued																									
Signal	-Total	3	3	3	3	7	7	5	5	6		4		4		4		4		6		6		6	
Tank Vent Valve Open and Closed		2	2	2	2	4	4	4	4	4		4		4		4		4		4		4		4	
Fuel Tank Flight Control Switch		1	1	1	1	1	1	1	1	0		0		0		0		0		0		0		0	
LH2 Pass Valve, Open and Closed, Talkback		0	0	0	0	0	0	0	0	0		2		0		0		0		0		0		0	
Relief Override Shutoff Valve		0	0	0	1	1	0	0	0	0		0		0		0		0		0		0		0	
Orifice Shutoff Valves Continuous Vent		0	0	0	0	1	0	0	0	0		0		0		0		0		0		0		0	
LH2 Latch Relief Valve, Open-Closed		0	0	0	0	0	0	0	0	0		0		0		0		0		2		2		2	
4.3.2.3 FUEL RECIRCULATION SYSTEM																									
Measurements	-Total	9	9	9	9	11	11	8	7	5		5		5		5		5		5		5		5	
Temperature	-Total	3	3	3	3	4	4	2	2	2		2		2		2		2		2		2		2	
Fuel Prevalve Bypass Line		1	1	1	1	1	1	0	0	0		0		0		0		0		0		0		0	
Fuel Recirculation Pump Outlet		1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1	
Fuel Recirculation Return Line Inlet		1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1	
Fuel Recirculation Return Connection		0	0	0	0	1	1	0	0	0		0		0		0		0		0		0		0	
Pressure	- Total	2	2	2	2	3	3	2	1	1		1		1		1		1		1		1		1	
Fuel Recirculation Pump Outlet		1	1	1	1	0	0	0	0	0		0		0		0		0		0		0		0	
Fuel Recirculation Return Line Inlet		1	1	1	1	1	1	1	0	0		0		0		0		0		0		0		0	
Fuel Recirculation Pump Differential		0	0	0	0	1	1	1	1	1		1		1		1		1		1		1		1	
Fuel Recirculation Return Connection		0	0	0	0	1	1	0	0	0		0		0		0		0		0		0		0	
Flow	-Total	1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1	
Fuel Recirculation Pump		1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1	

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4.3 S-IVB STAGE																									
4.3.2 PROPULSION - Measurements - Continued		SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
		A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
4.3.2.3 FUEL RECIRCULATION SYSTEM - Continued																									
	Signal - Total	3	3	3	3	3	3	3	3	1		1	1	1	1	1	1	1	1	1	1	1	1	1	
	Fuel Bleed Valve Closed	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	
	Recirculation System Shutoff Valve	2	2	2	2	2	2	2	2	0		0	0	0	0	0	0	0	0	0	0	0	0	0	
4.3.2.4 OXIDIZER SYSTEM																									
	Measurements - Total	37	33	38	38	42	42	34	29	23		23	22	22	22	22	22	22	22	22	22	22	22		
	Temperature - Total	15	11	17	17	17	17	10	6	6		6	5	5	5	5	5	5	5	5	5	5	5		
	LOX Turbine Inlet and Outlet	2	2	2	2	2	2	2	2	2		2	2	2	2	2	2	2	2	2	2	2	2		
	LOX Pump Inlet and Discharge	2	2	2	2	2	2	2	2	2		2	2	2	2	2	2	2	2	2	2	2	2		
	LOX Pump Wall	1	1	1	1	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0		
	LOX Pump Discharge Line Wall	1	1	0	0	1	1	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0		
	LOX Pump Bearing Coolant	1	1	1	1	1	1	1	1	0		0	0	0	0	0	0	0	0	0	0	0	0		
	LOX Lines	4	3	4	4	4	4	1	1	1		0	0	0	0	0	0	0	0	0	0	0	0		
	LOX Tank Internal	3	0	4	4	4	4	4	0	1		1	1	1	1	1	1	1	1	1	1	1	1		
	LOX Pump Low Tie Rod Wall	1	1	1	1	1	1	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0		
	LOX Valve Pneumatic Line Surface	0	0	1	1	1	1	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0		
	LOX Valve Actuator Skin	0	0	1	1	1	1	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0		
	Pressure - Total	8	8	8	8	8	8	7	7	6		6	6	6	6	6	6	6	6	6	6	6	6		
	LOX Turbine Inlet and Outlet	2	2	2	2	2	2	2	2	2		2	2	2	2	2	2	2	2	2	2	2	2		
	LOX Pump Inlet and Discharge	2	2	2	2	2	2	2	2	2		2	2	2	2	2	2	2	2	2	2	2	2		
	LOX Pump Bearing Coolant	1	1	1	1	1	1	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0		
	LOX Pump Primary Seal Cavity	1	1	1	1	1	1	1	1	0		0	0	0	0	0	0	0	0	0	0	0	0		
	LOX Tank Inlet	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1		

4.3 S-IVB STAGE		SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
4.3.2 PROPULSION - Measurements - Continued		A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
4.3.2.4 OXIDIZER SYSTEM - Continued																									
	Cold Helium Control Valve Inlet	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Vibration - Total	2	2	2	2	5	5	5	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Turbopump	2	2	2	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	LOX Lines	0	0	0	0	4	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Flow - Total	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Flowmeter	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Position - Total	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Main LOX Valve	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Signal - Total	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	LOX Fill Valve Open and Closed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	LOX Prevalve Open and Closed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Main LOX Valve Open and Closed	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Liquid Level - Total	3	3	2	2	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	LOX Tank	3	3	2	2	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Speed - Total	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Turbopump	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

4.3 S-IVB STAGE																									
4.3.2 PROPULSION - Measurements - Continued		SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
		A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
4.3.2.5 OXIDIZER PRESSURIZATION SYSTEM																									
Measurements	- Total	26	26	26	26	37	36	31	27	22		22	22	22	22	22	22	22	22	22	22	22	22	22	
Temperature	- Total	16	16	16	16	18	18	16	13	9		9	9	9	9	9	9	9	9	9	9	9	9	9	
Cold Helium Repressurization Spheres		5	5	5	5	5	5	5	5	4		4	4	4	4	4	4	4	4	4	4	4	4	4	
Helium Heat Exchanger, Inlet and Outlet		2	2	2	2	2	2	2	2	2		2	2	2	2	2	2	2	2	2	2	2	2	2	
Helium Pressure Module		1	1	1	1	1	1	1	1	0		0	0	0	0	0	0	0	0	0	0	0	0	0	
Oxidizer Tank Ullage		6	6	6	6	6	6	6	3	0		0	0	0	0	0	0	0	0	0	0	0	0	0	
GOX Ullage Thrust System		0	0	0	0	2	2	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	
LOX Tank Helium Inlet		2	2	2	2	2	2	2	2	1		1	1	1	1	1	1	1	1	1	1	1	1	1	
Non-Propulsive Vent Nozzles		0	0	0	0	0	0	0	0	2		2	2	2	2	2	2	2	2	2	2	2	2	2	
Pressure	- Total	6	6	6	6	9	8	6	5	7		7	7	7	7	7	7	7	7	7	7	7	7	7	
Cold Helium Sphere		1	1	1	1	1	1	1	1	2		2	2	2	2	2	2	2	2	2	2	2	2	2	
Heat Exchanger		1	1	1	1	1	1	1	1	0		0	0	0	0	0	0	0	0	0	0	0	0	0	
① Oxidizer Tank Ullage		2	2	2	2	2	2	2	2	2		2	2	2	2	2	2	2	2	2	2	2	2	2	
GOX Ullage Thrust System		0	0	0	0	3	3	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	
Oxidizer Tank Ullage		1	1	1	1	1	1	1	1	0		0	0	0	0	0	0	0	0	0	0	0	0	0	
LOX Tank Pressure Module		1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	
Non-Propulsive Vent Nozzles		0	0	0	0	0	0	0	0	2		2	2	2	2	2	2	2	2	2	2	2	2	2	
Vibration	- Total	0	0	0	0	4	4	4	4	0		0	0	0	0	0	0	0	0	0	0	0	0	0	
Helium Spheres		0	0	0	0	2	2	2	2	0		0	0	0	0	0	0	0	0	0	0	0	0	0	
Tank Vent Valve		0	0	0	0	2	2	2	2	0		0	0	0	0	0	0	0	0	0	0	0	0	0	

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① For EDS usage see section 4.1.1.

4.3 S-IVB STAGE																								
4.3.2 PROPULSION - Measurements - Continued	SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
4.3.2.5 OXIDIZER PRESSURIZATION SYSTEM - Continued																								
Signal - Total	4	4	4	4	6	6	5	5	6		6	6	6	6	6	6	6	6	6	6	6	6	6	6
Tank Vent Valve Open and Closed	2	2	2	2	2	2	2	2	2		2	2	2	2	2	2	2	2	2	2	2	2	2	2
LOX Prepressurization Flight Switch	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1
LOX Tank Regulator	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1
GOX Ullage Thrust System Shutoff Valve	0	0	0	0	2	2	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0
LOX Orbital Vent	0	0	0	0	0	0	1	1	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0
LOX NPV Valve Open and Closed, Talkback	0	0	0	0	0	0	0	0	2		2	2	2	2	2	2	2	2	2	2	2	2	2	2
4.3.2.6 OXIDIZER RECIRCULATION SYSTEM																								
Measurements - Total	9	9	9	9	9	9	9	9	5		5	5	5	5	5	5	5	5	5	5	5	5	5	5
Temperature - Total	2	2	2	2	2	2	2	2	2		2	2	2	2	2	2	2	2	2	2	2	2	2	2
LOX Recirculation Pump Outlet	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1
LOX Recirculation Return Line Inlet	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1
Pressure - Total	2	2	2	2	2	2	2	2	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1
LOX Recirculation Pump Outlet	1	1	1	1	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0
LOX Recirculation Return Line Inlet	1	1	1	1	1	1	1	1	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0
LOX Recirculation Pump Differential	0	0	0	0	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1
Flow - Total	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1
LOX Recirculation Pump	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1

4.3 S-IVB STAGE																								
4.3.2 PROPULSION - Measurements - Continued	SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
4.3.2.6 OXIDIZER RECIRCULATION SYSTEM - Continued																								
Signal	Total																							
	4	4	4	4	4	4	4	4	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
LOX Bleed Valve Closed	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Recirculation System Shutoff Valves	2	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LOX Recirculation Purge Switch	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.3.2.7 CONTROL PRESSURE SYSTEM																								
Measurements	- Total																							
	7	7	7	7	7	7	7	7	7	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Temperature	- Total																							
	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Helium Sphere, Ambient	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Control Helium Supply	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Pressure	- Total																							
	4	4	4	4	4	4	4	4	4	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Engine Pump Purge Regulator	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
LOX Motor Container, He Pressure	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Helium Sphere, Ambient	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Control Helium Regulator Discharge	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Signal	- Total																							
	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Pump Purge Regulator	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4.3.2.8 J-2 ENGINE																								
Measurements	- Total																							
	45	45	44	44	50	50	45	45	39	39	39	39	39	39	39	38	38	38	38	38	38	38	38	38

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4.3 S-IVB STAGE

4.3.2 PROPULSION - Measurements - Continued	SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
	4.3.2.8 J-2 ENGINE - Continued																							
Temperature - Total	11	11	10	10	15	15	6	6	4		4		4		4		4		4		4		4	
GH ₂ Start Bottle	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gas Generator Propellant Bleed Valve	3	3	2	2	3	3	2	2	0		0		0		0		0		0		0		0	
Gas Generator Propellant Inlet Lines	2	2	2	2	2	2	0	0	0		0		0		0		0		0		0		0	
Thrust Chamber Jacket	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
GN ₂ Accumulator	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Fuel Injection	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Engine Thrust Chamber, Exit Skin	2	2	2	2	2	2	0	0	0		0		0		0		0		0		0		0	
Thrust Chamber Tube, LH ₂ Inlet	0	0	0	0	3	3	0	0	0		0		0		0		0		0		0		0	
Heat Flux Engine Nozzle	0	0	0	0	1	1	0	0	0		0		0		0		0		0		0		0	
Pressure - Total	10	10	10	10	10	10	12	12	10		10		10		10		10		10		10		10	
Thrust Chamber	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Propellant Injection	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Gas Generator, Chamber	3	3	3	3	3	3	3	3	1		1		1		1		1		1		1		1	
GH ₂ Start Bottle	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Engine Regulator, Outlet	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
GN ₂ Accumulator	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Engine Control Helium Sphere	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Vibration - Total	0	0	0	0	1	1	1	1	0		0		0		0		0		0		0		0	
Combustion Chamber Dome	0	0	0	0	1	1	1	1	0		0		0		0		0		0		0		0	
(19) Combustion Chamber Dome - Thrust	0	0	0	0	0	0	0	0	1		0		0		0		0		0		0		0	
(19) LH ₂ and LOX Turbopump - Lateral	0	0	0	0	0	0	0	0	2		0		0		0		0		0		0		0	

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(19) - These measurements taken on S-IVB stage but telemetered through the IU

4.3 S-IVB STAGE																									
4.3.2 PROPULSION - Measurements - Continued	SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212		
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	
4.3.2.8 J-2 ENGINE - Continued																									
⑰ Main Fuel Valve	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
⑰ Main LOX Valve	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
⑰ ASI Connector Flange and Block	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Position - Total	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Gas Generator Valve	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Oxidizer Turbine Bypass Valve	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
GH2 Start Valve	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Signal - Total	21	21	21	21	21	21	23	23	22	22	22	22	22	22	22	22	21	21	21	21	21	21	21	21	21
Mainstage Control Solenoid Energized	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ignition Phase Control Solenoid Ener.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Helium Control Solenoid Energized	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ignition Detected	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sparks Systems On	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Engine Ready	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Cutoff	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
① Mainstage OK Pressure Switches	3	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
ASI LOX Valve	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Engine Start On	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Fuel Injector Temperature OK	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Start Tank Discharge	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Gas Generator Valve Open and Close	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
LOX Turbine Bypass Valve Open & Close	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Passivation Enable Indication	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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① For EDS usage see section 4.1.1.
 ⑰ These measurements taken on S-IVB stage but telemetered through the IU

4.3 S-IVB STAGE															
4.3.3 FLIGHT CONTROL - Configuration	Pete Lebente I-I/IB-SIVB 876-5697	NEXT ASSY QTY	DRAWING NUMBER	SA- 201	SA- 202	SA- 203	SA- 204	SA- 205	SA- 206	SA- 207	SA- 208	SA- 209	SA- 210	SA- 211	SA- 212
4.3.3.1 HYDRAULIC SYSTEM															
Hydraulic System Installation		1	1A39589	-515	-509	-513	-519	-517	-517						
Hydraulic System Installation		1	1B62563							-1	-503	-503	-503	-503	-503
Thermal Isolator Assembly, Hydraulic Pump		1	1A86847	-1	-1	-503	-509	-509	-509	-509	-513	-513	-513	-513	-513
Auxiliary Motor Driven Hydraulic Pump		1	1A66241	-501	-503	-503	-509	-509	-509	-509	-511	-511	-511	-511	-511
Actuator Assembly, Hydraulic		2	1A66248	-503	-503	-503	-507	-507	-507	-507	-507	-507	-507	-507	-507
Accumulator, Reservoir, Assembly		1	1B29319	-507	-509	-519	-519	-519	-519	-519	-519	-519	-519	-519	-519
Filter Element, Main System		1	1A66244	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
4.3.3.2 AUXILIARY PROPULSION SYSTEM															
APS Assembly		2	1A83785	-521	-523			-525	-525	-525	-531	-531	-531	-531	-531
APS Assembly		1	1A83785			-513	-527								
APS Assembly		1	1A83785			-515	-529								
Propulsion System Installation		1	1A82259	-513	-511	-511	-511	-515	-515	-515	-517	-517	-517	-517	-517
Propellant Control Module		1	1A49422	-506	-507	-507	-507	-509	-509	-509	-509	-509	-509	-509	-509
Propellant Control Module		1	1A49422	-505	-508	-508	-508	-510	-510	-510	-510	-510	-510	-510	-510
Tank Assembly		2	1A93231	-505	-505	-505	-505	-505	-505	-505	-507	-507	-507	-507	-507
Pressurization System Installation		1	1A79372	-513	-515	-517	-511	-511	-511	-511	-511	-511	-511	-511	-511
Helium Pressure Regulator Assembly		1	1B54601			-501	-503	-505	-505	-505	-505	-505	-505	-505	-505
Low Pressure Helium Module		1	1A49998	-507	-507	-507	-503	-503	-503	-503	-503	-503	-503	-503	-503
Low Pressure Helium Module		1	1A49998	-508	-508	-508	-506	-506	-506	-506	-506	-506	-506	-506	-506
Plenum Assembly		1	1A98296	-1	-1										
Engine Installation		1	1A65684	-1	-1	-1	-1	-505	-505	-505	-505	-505	-505	-505	-505
Attitude Control Engine, 150 lb		3	1A39597	-503	-503	-503	-503	-507	-507	-507	-507	-507	-507	-507	-507

4.3 S-IVB STAGE															
4.3.3 FLIGHT CONTROL - Configuration - Continued	NEXT ASSY QTY	DRAWING NUMBER	SA- 201	SA- 202	SA- 203	SA- 204	SA- 205	SA- 206	SA- 207	SA- 208	SA- 209	SA- 210	SA- 211	SA- 212	
4.3.3.3 ULLAGE MOTORS															
Ullage Motor	3	1A81960	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
Ullage Motor Igniters	3	^t FR42652	X	X	X	X	X	X	X	X	X	X	X	X	
Initiator (see section 4.3.6.1)															
Detonator Block Assembly (see section 4.3.6.1)															
Ullage Motor Fairing Kit (3 Fairing Units)	1	1A78894	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
4.3.3.4 PROPELLANT UTILIZATION SYSTEM															
Propellant Utilization Electronics Assembly	1	1A59358	-507	-511	-513	-523	-527	-527	-527	-527	-527	-527	-527	-527	
Propellant Utilization Valve	1	^r 251351	-11	-11	-11	-11	-11	-11	X	X	X	X	X	X	
LH ₂ Mass Sensor	1	1A49551	-1	-1	-1	-1	-1	-1	-1	-1	-501	-501	-501	-501	
LOX Mass Sensor	1	1A49553	-1	-1	-1	-501	-501	-501	-503	-503	-503	-503	-503	-503	
4.3.3.5 RETROMOTOR ASSEMBLIES															
Retromotors	4	1A59670	-1	-1	-501	-501	-505	-505	-505	-505	-505	-505	-505	-505	
Retromotor Igniters	4	^t FE16796	X	X	X	X	X	X	X	X	X	X	X	X	
Initiators (see section 4.3.6.1)															
Retromotor Fairing Kit	1	1B39973	-1	-1											
Retromotor Fairing Kit	1	1B64989			-1	-1	-501	-501	-501	-501	-501	-501	-501	-501	
Retromotor Nose Fairing	4	1B31604	-1	-1											
Retromotor Nose Fairing	4	1B64990			-1	-501	-501	-501	-501	-501	-501	-501	-501	-501	
Retromotor Center Fairing	4	1B31605	-1	-1	-501	-501	-503	-503	-503	-503	-503	-503	-503	-503	
Retromotor Aft Fairing	4	1B31606	-1	-1											
Retromotor Aft Fairing	4	1B64993			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	

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t - Thiokol part numbers

r - Rocketdyne part numbers

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4.3 S-IVB STAGE																									
4.3.3 FLIGHT CONTROL - Measurements		SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
		A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
FLIGHT MEASUREMENTS	- TOTAL	108	108	109	109	120	120	118	117	55		55		54		54		54		54		55		55	
4.3.3.1 HYDRAULIC SYSTEM																									
Measurements	- Total	20	20	20	20	15	15	15	14	7		7		7		7		7		7		7		7	
Temperature	- Total	4	4	4	4	4	4	4	4	2		2		2		2		2		2		2		2	
Pump Inlet Oil		1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1	
Reservoir Oil		1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1	
Actuator Cylinder Oil		2	2	2	2	2	2	2	2	0		0		0		0		0		0		0		0	
Pressure	- Total	5	5	5	5	6	6	6	5	2		2		2		2		2		2		2		2	
Hydraulic System		1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1	
Reservoir Oil		1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1	
Actuators		2	2	2	2	2	2	2	1	0		0		0		0		0		0		0		0	
Auxiliary Pump Air Tank		1	1	1	1	1	1	1	1	0		0		0		0		0		0		0		0	
Auxiliary Pump Motor, Gas		0	0	0	0	1	1	1	1	0		0		0		0		0		0		0		0	
Vibration	- Total	8	8	8	8	2	2	2	2	0		0		0		0		0		0		0		0	
Actuator Servo Valves		6	6	6	6	0	0	0	0	0		0		0		0		0		0		0		0	
Main Pump		0	0	0	0	1	1	1	1	0		0		0		0		0		0		0		0	
Auxiliary Pump		0	0	0	0	1	1	1	1	0		0		0		0		0		0		0		0	
Actuator Attachment Points		2	2	2	2	0	0	0	0	0		0		0		0		0		0		0		0	
Position	- Total	2	2	2	2	2	2	2	2	2		2		2		2		2		2		2		2	
Actuators		2	2	2	2	2	2	2	2	2		2		2		2		2		2		2		2	

4.3 S-IVB STAGE																								
4.3.3 FLIGHT CONTROL - Measurements - Continued	SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
4.3.3.1 HYDRAULIC SYSTEM - Continued																								
Liquid Level - Total	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Reservoir Oil	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4.3.3.2 AUXILIARY PROPULSION SYSTEM																								
Measurements - Total	62	62	62	62	78	78	80	80	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38
Temperature - Total	26	26	26	26	34	34	34	34	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
APS Fairing	2	2	2	2	3	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Helium Sphere	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oxidizer Container Outlet	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Fuel Container Outlet	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Injection Valve	6	6	6	6	6	6	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nozzle Skin	4	4	4	4	4	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aft of Nozzle, One Foot	4	4	4	4	4	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
APS Area	4	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Propellant Control Module	0	0	0	0	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Propellant Lines	0	0	0	0	6	6	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
APS Engine Enclosure	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LOX Tank	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fuel Tank	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pressure - Total	22	22	22	22	33	33	35	35	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
Fuel Supply Manifold	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Helium Regulator, Inlet and Outlet	4	4	4	4	4	4	4	4	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Oxidizer Supply Manifold	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

4.3 S-IVB STAGE																								
4.3.3 FLIGHT CONTROL - Measurements - Continued	SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
4.3.3.2 AUXILIARY PROPULSION SYSTEM - Continued																								
Attitude Control Chamber	6	6	6	6	4	4	6	6	6		6		6		6		6		6		6		6	
Fuel Container Ullage	2	2	2	2	2	2	2	6	2		2		2		2		2		2		2		2	
Oxidizer Container Ullage	2	2	2	2	2	2	2	2	2		2		2		2		2		2		2		2	
Fuel Container Outlet	2	2	2	2	2	2	2	2	2		2		2		2		2		2		2		2	
Oxidizer Container Outlet	2	2	2	2	2	2	2	2	2		2		2		2		2		2		2		2	
External	0	0	0	0	13	13	13	13	0		0		0		0		0		0		0		0	
Vibration - Total	0	0	0	0	3	3	3	3	0		0		0		0		0		0		0		0	
Module 1 Attachment Point	0	0	0	0	3	3	3	3	0		0		0		6		0		0		0		0	
Signal - Total	10	10	10	10	4	4	4	4	4		4		4		4		4		4		4		4	
Helium Backup Valve Open	2	2	2	2	0	0	0	0	0		0		0		0		0		0		0		0	
Feed Valve Open	4	4	4	4	4	4	4	4	4		4		4		4		4		4		4		4	
Helium Regulator Switch Closed	4	4	4	4	0	0	0	0	0		0		0		0		0		0		0		0	
Miscellaneous - Total	4	4	4	4	4	4	4	4	4		4		4		4		4		4		4		4	
Oxidizer Container Quantity	2	2	2	2	2	2	2	2	2		2		2		2		2		2		2		2	
Fuel Container Quantity	2	2	2	2	2	2	2	2	2		2		2		2		2		2		2		2	
4.3.3.3 ULLAGE MOTORS																								
Measurements - Total	11	11	11	11	11	11	8	8	0		0		0		0		0		0		0		0	
Pressure - Total	3	3	3	3	3	3	3	3	0		0		0		0		0		0		0		0	
Ullage Motor Chamber	3	3	3	3	3	3	3	3	0		0		0		0		0		0		0		0	

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4.3 S-IVB STAGE																								
4.3.3 FLIGHT CONTROL - Measurements - Continued	SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
4.3.3.3 ULLAGE MOTORS - Continued																								
Signal - Total	8	8	8	8	8	8	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ullage Rocket Ignition	6	6	6	6	6	6	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ullage Rocket Jettison	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.3.3.4 PROPELLANT UTILIZATION SYSTEM																								
Measurements - Total	14	14	15	15	12	12	12	12	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Temperature - Total	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
System, Internal	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Pressure - Total	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
PU Valve Inlet	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PU Valve Outlet	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Vibration - Total	3	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Propellant Utilization Electrical Panel	3	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Voltage - Total	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Propellant Utilization Valve	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Propellant Utilization Valve Feedback	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Position - Total	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Propellant Utilization Valve	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

4.3 S-IVB STAGE																									
4.3.3 FLIGHT CONTROL - Measurements - Continued		SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
		A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
4.3.3.4 PROPELLANT UTILIZATION SYSTEM - Continued																									
Miscellaneous - Total		5	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Propellant Mass		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Error Signal		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
P. U. Oven Stability Monitor		0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Signal - Total		1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oven On Indication		1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.3.3.5 RETROMOTOR ASSEMBLIES																									
Measurements - Total		0	0	0	0	3	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
② Pressure - Total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
② Retromotor Chamber Pressure		4	4	4	4	4	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vibration - Total		0	0	0	0	3	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Retromotor Attach Points		0	0	0	0	3	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.3.3.6 CONTROL COMPONENTS																									
Measurements - Total		1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1
Signal - Total		1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1
Rate Gyro Wheel Speed Indication		1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1

② Measurements taken on S-IVB Aft Interstage, but telemetered through S-IB Stage (see section 4.2.3.2).

4.3 S-IVB STAGE																
4.3.4 INSTRUMENTATION AND RANGE SAFETY - Configuration	A. L. Higgins I-V-S-IVB 876-5697	NEXT ASSY QTY	DRAWING NUMBER	SA- 201	SA- 202	SA- 203	SA- 204	SA- 205	SA- 206	SA- 207	SA- 208	SA- 209	SA- 210	SA- 211	SA- 212	
4.3.4.1 RANGE SAFETY SYSTEM		1		X												
SECURE RANGE SAFETY COMMAND SYSTEM		2			X	X	X	X	X	X	X	X	X	X	X	
Command Antenna		2	1A69207	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	
R. F. Power Divider		1	1A74778	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	
Command Power Divider		1	1B38999	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
AN/DRW-13 Command Receiver and Decoder		2	1B29348	-1												
AN/DRW-13 Voltage Regulator		2	50M10419	X												
Secure Command Receiver		2	50M10697		X	X	X	X	X	X	X	X	X	X	X	
Range Safety Receiver Decoder		2	50M10698		X	X	X	X	X	X	X	X	X	X	X	
Range Safety System Controller		2	1B33084	-1	-501	-501	-501	-501	-501	-501	-503	-503	-503	-503	-503	
EBW Firing Unit (see section 4.3.6.2)																
Safe and Arming Device		1	1A02446	-1	-1	-1	-505	-505	-505	-505	-505	-505	-505	-505	-505	
Primary Battery (see section 4.3.5.1)																
4.3.4.2 TELEMETRY AND MEASURING																
Telemetry Antenna		4	1A69206	-1	-1	-1	-1									
Telemetry Antenna		2	1A69206					-1	-1	-501	-501	-501	-501	-501	-501	
Coax Switch		4	1A69213	-1	-1	-1	-1									
Coax Switch		1	1A69213					-1	-1	-1	-1	-1	-1	-1	-1	
Bi-Directional Coupler		4	1A69214	-503	-503	-503	-503									
Bi-Directional Coupler		5	1A69214	-505	-505	-505	-505									
Bi-Directional Coupler		1	1A69214					-503	-503	-503	-503	-503	-503	-503	-503	
Power Divider		2	1A69215	-501	-501	-501	-501									
Power Divider		1	1A69215					-501	-501	-501	-501	-501	-501	-501	-501	

4.3 S-IVB STAGE															
4.3.4 INSTRUMENTATION AND RANGE SAFETY - Configuration - Continued	NEXT ASSY QTY	DRAWING NUMBER	SA- 201	SA- 202	SA- 203	SA- 204	SA- 205	SA- 206	SA- 207	SA- 208	SA- 209	SA- 210	SA- 211	SA- 212	
4.3.4.2 TELEMETRY AND MEASURING - Continued															
R. F. Multiplexer	1	1A69212	-1	-1	-1	-1									
R. F. Multiplexer	1	1A69212	-501	-501	-501	-501									
Power Amplifier, SS/FM (S-1)	1	1A77080	-507	-507	-507	-507									
SS/FM Transmitter (S-1)	1	1A58842	-507	-507	-507	-507									
Output Isolation Amplifier (S-1)	1	50M60036	-1	-1											
Output Isolation Amplifier (S-1)	1	1B39886			-1	-1									
Telemetry Assembly (S-1)	1	1B55252	-1	-1	-1	-501									
Vibration Multiplexer (S-1)	1	1B32686	-501	-501	-503	-511									
Power Amplifier, PCM/FM (P-1)	1	1A77080	-503	-503	-503	-503									
PCM/FM Transmitter (P-1)	1	1A58842	-503	-503	-503	-503									
PCM/FM RF Assembly (P-1)	1	1B52721					-521	-521	-521	-521	-521	-521	-521	-521	
Transmitter Switching Assembly, DDAS (P-1)	1	1B29476	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
Remote Analog Sub-Multiplexer (P-1)	1	1B54062					-505	-503	-503	-505	-505	-505	-505	-505	
PCM/DDAS Assembly (P-1)	1	1A74049	-507	-507	-505	-509	-511	-511	-511	-511	-511	-511	-511	-511	
Multiplexer, Mod 270 (P-1)	1	1B29741	-507	-507	-545	-545									
Multiplexer, Mod 270 (P-1 CP1B0)	1	1B62513					-531	-531	-531	-531	-531	-531	-531	-531	
Multiplexer, Mod 270 (P-1 DP1B0)	1	1B62513					-533	-533	-533	-533	-533	-533	-533	-533	
FM/DDAS Relay (P-1)	1	1A67921	-1	-1	-1	-1	-501	-501	-501	-501	-501	-501	-501	-501	
Remote Digital Sub-Multiplexer (P-1)	1	1B52894					-501	-1	-1	-501	-501	-501	-501	-501	
Power Amplifier (F-1)	1	1A77080	-501	-501	-501	-501									
PAM/FM/FM Transmitter (F-1)	1	1A58842	-501	-501	-501	-501									
Power Amplifier (F-2)	1	1A77080	-505	-505	-505	-505									
PAM/FM/FM Transmitter	1	1A58842	-505	-505	-505	-505									
Power Amplifier (F-3)	1	1A77080	-1	-1	-1	-1									
PAM/FM/FM Transmitter (F-3)	1	1A58842	-1	-1	-1	-1									

4.3 S-IVB STAGE														
4.3.4 INSTRUMENTATION AND RANGE SAFETY - Configuration - Continued	NEXT ASSY QTY	DRAWING NUMBER	SA- 201	SA- 202	SA- 203	SA- 204	SA- 205	SA- 206	SA- 207	SA- 208	SA- 209	SA- 210	SA- 211	SA- 212
4.3.4.2 TELEMETRY AND MEASURING - Continued														
Tape Recorder	1	1A66884	-1	-501	-501	-501								
Multiplexer Assembly, Time Division (F-1)	1	1B29741	-507	-507	-513	-531								
Multiplexer Assembly, Time Division (F-2)	1	1B29741	-509	-509	-537	-533								
Multiplexer Assembly, Time Division (F-3)	1	1B29741	-511	-511	-539	-535								
Oscillator Assembly (F-1)	1	1B33187	-523	-529	-535	-535								
Oscillator Assembly (F-2)	1	1B33187	-525	-531	-537	-537								
Oscillator Assembly (F-3)	1	1B33187	-527	-533	-539	-539								
TM Calibration Assembly, Model II	1	1B58798	-1	-1	-1	-1								
Central Calibration Decoder	1	1A74051	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501
Measuring Rack, Aft Skirt	1	1B28826	-519	-539	-559	-579								
Measuring Rack, Aft Skirt	1	1B28826	-521	-541	-561	-581								
Measuring Rack, Aft Skirt	1	1B22826	-523	-543	-563	-583								
Measuring Rack, Aft Skirt	1	1B28826	-525	-545	-565	-585								
Measuring Rack, Aft Skirt	1	1B28826	-527	-547	-567	-587								
Measuring Rack, Aft Skirt	1	1B28826	-529	-549	-569	-589								
Measuring Rack, Aft Skirt	1	1B28826	-531	-551	-571	-591								
Measuring Rack, Aft Skirt	1	1B28826	-533	-553	-573	-593								
Measuring Rack, Aft Skirt	1	1B28826	-535	-555	-575	-595								
Measuring Rack, Aft Skirt	1	1B28826	-537	-557	-577	-597								
Measuring Rack, Aft Skirt	1	1B55688					-1	-1	-1	-1	-1	-1	-521	-521
Measuring Rack, Aft Skirt	1	1B55688					-501	-501	-501	-501	-501	-501	-501	-501
Measuring Rack, Aft Skirt	1	1B55688					-503	-503	-503	-503	-503	-503	-503	-503
Measuring Rack, Forward Skirt	1	1B28827	-511	-525										
Measuring Rack, Forward Skirt	1	1B28827	-513	-527	-541	-555								

4.3 S-IVB STAGE																										
4.3.4 INSTRUMENTATION AND RANGE SAFETY- Measurements		SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212		
		A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	
FLIGHT MEASUREMENTS - TOTAL		38	38	41	41	41	41	37	37	12		12		13		13		13		13		13		13		13
4.3.4.1 RANGE SAFETY SYSTEM																										
Measurements - Total		9	9	12	12	12	12	8	8	6		6		7		7		7		7		7		7		7
Signal - Total		5	5	5	5	5	5	3	3	3		3		3		3		3		3		3		3		3
Range Safety Arm Cutoff Destruct Ind.		2	2	2	2	2	2	2	2	2		2		2		2		2		2		2		2		2
Engine Cutoff Command		1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1		1
Pulse Sensor		2	2	2	2	2	2	0	0	0		0		0		0		0		0		0		0		0
Voltage, Current, and Frequency - Total		2	2	2	2	2	2	2	2	2		2		2		2		2		2		2		2		2
EBW Range Safety		2	2	2	2	2	2	2	2	2		2		2		2		2		2		2		2		2
Miscellaneous - Total		2	2	5	5	5	5	3	3	1		1		2		2		2		2		2		2		2
Receiver Signal Strength		2	2	3	3	3	3	3	3	1		1		2		2		2		2		2		2		2
Secure Range Safety Decoder		0	0	2	2	2	2	0	0	0		0		0		0		0		0		0		0		0
4.3.4.2 TELEMETRY AND MEASURING																										
Measurements - Total		29	29	29	29	29	29	29	29	6		6		6		6		6		6		6		6		6
Temperature - Total		8	8	8	8	8	8	8	8	2		2		2		2		2		2		2		2		2
Instrument Package, Primary & Auxiliary		2	2	2	2	2	2	2	2	2		2		2		2		2		2		2		2		2
Forward Skirt Internal Bridge Module		3	3	3	3	3	3	3	3	0		0		0		0		0		0		0		0		0
Aft Skirt Internal Bridge Module		3	3	3	3	3	3	3	3	0		0		0		0		0		0		0		0		0
Vibration - Total		3	3	3	3	3	3	3	3	0		0		0		0		0		0		0		0		0

4.3 S-IVB STAGE																									
4.3.4 INSTRUMENTATION AND RANGE SAFETY - Measurements - Continued	SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212		
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	
4.3.4.2 TELEMETRY AND MEASURING - Continued																									
Telemetry Antenna	0	0	0	0	3	3	3	3	0		0		0		0		0		0		0		0		0
Racks	3	3	3	3	0	0	0	0	0		0		0		0		0		0		0		0		0
Signal - Total	1	1	1	1	1	1	1	1	0		0		0		0		0		0		0		0		0
Recorder Ready	1	1	1	1	1	1	1	1	0		0		0		0		0		0		0		0		0
Voltage - Total	4	4	4	4	4	4	4	4	2		2		2		2		2		2		2		2		2
Aft Telemetry	2	2	2	2	2	2	2	2	2		2		2		2		2		2		2		2		2
Forward Telemetry	2	2	2	2	2	2	2	2	0		0		0		0		0		0		0		0		0
Miscellaneous - Total	13	13	13	13	13	13	13	13	2		2		2		2		2		2		2		2		2
Antenna Power	8	8	8	8	8	8	8	8	1		1		1		1		1		1		1		1		1
PAM/FM/FM Transmitter Power Output	3	3	3	3	3	3	3	3	0		0		0		0		0		0		0		0		0
PCM/FM Transmitter Power Output	1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1		1
SS/FM Transmitter Power Output	1	1	1	1	1	1	1	1	0		0		0		0		0		0		0		0		0
4.3.4.3 T.V. CAMERA SYSTEM, LH ₂ EXPERIMENT																									
(See Instrument Unit, section 4.4.3.4, for the LH ₂ Experiment Measurements)																									

4.3 S-IVB STAGE														
4.3.5 ELECTRICAL - Configuration	NEXT ASSY QTY	DRAWING NUMBER	SA-201	SA-202	SA-203	SA-204	SA-205	SA-206	SA-207	SA-208	SA-209	SA-210	SA-211	SA-212
4.3.5.1 POWER SUPPLY														
Primary Batter, Aft Number 1	1	1A83468			-503									
Primary Battery, Forward Number 3	1	1A83468			-503									
Primary Battery, Forward Number 1, 28 vdc	1	1A83468	-503	-505										
Primary Battery, Forward Number 1, 28 vdc	1	1A59741			-507	-507	-507	-507	-507	-507	-507	-507	-507	-507
Primary Battery, Forward Number 1, 28 vdc	1	1A83469	-501	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503
Primary Battery, Aft Number 1, 28 vdc	1	1A83470	-503	-505		-505	-505	-505	-505	-505	-505	-505	-505	-505
Primary Battery, Aft Number 2, 56 vdc	1	1A83471	-501	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503
Static Inverter Converter	1	1A79392	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Excitation Module, Aft, 5 vdc	1	1A77310	-501	-501	-501	-501	-503	-503	-503	-503	-503	-503	-503	-503
Excitation Module, Forward, 5 vdc	2	1A77310				-501	-503	-503	-503	-503	-503	-503	-503	-503
Excitation Module, Aft, 20 vdc	9	1A74036	-1	-1	-1	-1								
Excitation Module, Aft, 20 vdc	3	1A74036					-1	-1	-1	-1	-1	-1	-1	-1
Excitation Module, Aft, 20 vdc	1	1B62732					-1	-1	-1	-1	-1	-1	-1	-1
Excitation Module, Forward, 20 vdc	6	1A74036	-1	-1	-1	-1								
Excitation Module, Forward, 20 vdc	1	1A74036					-1	-1	-1	-1	-1	-1	-1	-1
Excitation Module, Forward, 5 vdc	1	1A77310	-501	-501	-501									
Excitation Module, LH2 Experiment, 20 vdc	4	1A74036			-1									
Electronic Chilldown Inverter Assembly	2	1A74039	-505	-505	-507	-519	-521	-521	-521	-521	-521	-521	-521	-521
4.3.5.2 POWER DISTRIBUTION														
Electrical Equipment Installation, Forward Skirt	1	1A49602	-505	-507	-509	-517								
Electrical Equipment Installation, Forward Skirt	1	1B58470					-1	-513	-1	-503	-503	-503	-503	-503
Electrical Equipment Installation, Panel Mounted	1	1A78949	-501	-503	-505	-509								
Electrical Equipment Installation, Panel Mounted	1	1B55394					-1	-513	-1	-501	-501	-501	-501	-501

4.3 S-IVB STAGE														
4.3.5 ELECTRICAL - Configuration - Continued	NEXT ASSY QTY	DRAWING NUMBER	SA- 201	SA- 202	SA- 203	SA- 204	SA- 205	SA- 206	SA- 207	SA- 208	SA- 209	SA- 210	SA- 211	SA- 212
4.3.5.2 POWER DISTRIBUTION - Continued														
Power Distribution Assembly, Forward	1	1A74917	-505	-505										
Power Distribution Assembly, Forward	1	1B51379			-1	-509	-505	-517	-505	-513	-513	-513	-513	-513
Transfer Switch, 50 Amp	2	1A88061	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Transfer Switch, 300 Amp	1	1A68085	-501	-501	-505	-505	-505	-505	-505	-505	-505	-505	-505	-505
Electrical Equipment Installation, Aft Skirt	1	1A49609	-505	-513	-507	-511								
Electrical Equipment Installation, Aft Skirt	1	1B58471					-1	-517	-505	-503	-513	-513	-511	-511
Electrical Equipment Installation, Panel Mounted	1	1A49562	-501	-509	-503	-505								
Electrical Equipment Installation, Panel Mounted	1	1B55396					-501	-509	-501	-507	-507	-507	-505	-505
1 Power Distribution Assembly, Aft, 28 vdc	1	1A74975	-503	-507										
1 Power Distribution Assembly, Aft, 28 vdc	1	1B51354			-1	-505	-503	-515	-503	-509	-509	-509	-509	-509
Transfer Switch, 50 Amp	2	1A88061	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Transfer Switch, 300 Amp	1	1A68065	-501	-501	-505	-505	-505	-505	-505	-505	-505	-505	-505	-505
1 Sequencer Assembly	1	1A67840	-1	-503										
1 Sequencer Assembly	1	1B39550			-1	-505	-503	-521	-503	-509	-509	-509	-517	-517
Power Distribution Assembly, Aft, 56 vdc	1	1A93590	-509	-503										
Power Distribution Assembly, Aft, 56 vdc	1	1B51211			-1	-509	-503	-511	-503	-507	-507	-507	-507	-507
Transfer Switch, 50 Amp	2	1A88061	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Transfer Switch, 300 Amp	1	1A68085	-501	-501	-505	-505	-505	-505	-505	-505	-505	-505	-505	-505
Switch Selector Assembly	1	1B65319			-503	-503	-503	-503	-503	-503	-503	-503	-503	-503

4.3 S-IVB STAGE																								
4.3.5 ELECTRICAL - Measurements	SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
FLIGHT MEASUREMENTS - TOTAL	49	47	49	49	42	42	40	40	25		25		24		24		24		24		25		25	
4.3.5.1 POWER SUPPLY																								
Measurements - Total	34	34	34	34	38	38	36	36	21		21		21		21		21		21		21		21	
Temperature - Total	8	8	8	8	10	10	9	9	6		6		6		6		6		6		6		6	
Power Control Assembly	1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1	
Static Inverter - Converter	1	1	1	1	1	1	1	1	0		0		0		0		0		0		0		0	
Batteries	4	4	4	4	6	6	5	5	5		5		5		5		5		5		5		5	
Chilldown Inverter	2	2	2	2	2	2	2	2	0		0		0		0		0		0		0		0	
Voltage, Current & Frequency - Total	26	26	26	26	28	28	27	27	15		15		15		15		15		15		15		15	
Static Inverter - Converter, Volts	3	3	3	3	3	3	3	3	3		3		3		3		3		3		3		3	
Static Inverter - Converter, Frequency	1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1	
Battery Output, Volts	4	4	4	4	4	4	4	4	4		4		4		4		4		4		4		4	
Battery Current Load	4	4	4	4	4	4	4	4	4		4		4		4		4		4		4		4	
5 vdc Excitation Module, Volts & Freq.	4	4	4	4	4	4	4	4	3		3		2		2		2		2		2		2	
Fuel Chilldown Inverter Phase Voltage	4	4	4	4	4	4	4	4	0		0		0		0		0		0		0		0	
LOX Chilldown Inverter Phase Voltage	4	4	4	4	4	4	4	4	0		0		0		0		0		0		0		0	
Fuel Chilldown Inverter Phase Frequency	1	1	1	1	1	1	1	1	0		0		0		0		0		0		0		0	
LOX Chilldown Inverter Phase Frequency	1	1	1	1	1	1	1	1	0		0		0		0		0		0		0		0	
Forward Battery No. 3	0	0	0	0	2	2	0	0	0		0		0		0		0		0		0		0	
5 vdc Excitation Module - Forward No. 2	0	0	0	0	0	0	1	1	1		1		1		1		1		1		1		1	

4.3 S-IVB STAGE

4.3.5 ELECTRICAL - Measurements - Continued	SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212		
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	
4.3.5.2 POWER DISTRIBUTION																									
Measurements - Total	15	13	15	15	4	4	4	4	4	4	4	3	3	3	3	3	4	4							
Temperature - Total	5	3	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
Electrical Tunnels	5	3	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
Voltage, Current & Frequency - Total	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2							
Engine Bus	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2							
Vibration - Total	6	6	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
① Sequence Assembly, Thrust	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
① Sequence Assembly, Radial	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
① Sequence Assembly, Tangential	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
Switch Selector, Thrust	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
Switch Selector, Radial	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
Signal - Total	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2							
Switch Selector Output Monitor	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1							
Switch Selector Register Test	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	1	1							

① For EDS usage see section 4.1.1.

4.3 S-IVB STAGE														
4.3.6 ORDNANCE - Configuration	NEXT ASSY QTY	DRAWING NUMBER	SA- 201	SA- 202	SA- 203	SA- 204	SA- 205	SA- 206	SA- 207	SA- 208	SA- 209	SA- 210	SA- 211	SA- 212
4.3.6.1 SEPARATION SYSTEM														
Stage Separation Harness	1	1A87336	-501	-503	-505	-507	-509	-509	-513	-529	-525	-517	-521	-531
EBW Firing Units, Separation	2	40M39515	-107	-107	-107	-107	-107	-107	-107	-107	-119	-119	-119	-119
Detonator Block Assembly, Separation	1	1B55619	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503
EBW Detonators, Separation	2	7865742	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Mild Detonating Fuse Assembly	2	1A93438	-507	-509	-509	-509	-509	-509	-509	-509	-509	-509	-509	-509
EBW Firing Units, Retromotors	8	40M39515	-105	-105	-119	-119	-119	-119	-119	-119	-119	-119	-119	-119
Retromotor Initiators	8	1B34838	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
EBW Firing Units, Ullage Motor Ignition	6	40M39515	X	X	X	-107	-107	-107	-107	-119	-119	-119	-119	-119
Initiators Ullage Motor Ignition	6	^t TX-346	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
EBW Firing Units, Ullage Motor Jettison	2	40M39515	X	X	X	-101	-101	-101	-101	-113	-113	-113	-113	-113
Detonator Block, Ullage Motor Jettison	2	1A48223	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503
EBW Detonators, Ullage Motor Jettison	2	7865742	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Frangible Nuts, Ullage Motor Jettison	6	1A72620	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Frangible Nut Charge Assembly	12	1A66320	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Frangible Nut Tee	12	1A39399	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
CDF Assemblies, Ullage Motor Jettison	2	1A84225	-507	-507	-511	-515	-515	-515	-515	-515	-515	-515	-515	-515
CDF End Fitting	2	1A86316	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503
4.3.6.2 PROPELLANT DISPERSION SYSTEM														
Explosive Kit	1	1B32652	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501	-501
EBW Firing Unit	2	40M39515	X	X	X	-107	-107	-107	-107	-119	-119	-119	-119	-119
EBW Detonator	2	7865742	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Primacord Assembly, Forward Skirt	1	1A92992	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503
Primacord Assembly, Aft Dome	1	1A92993	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503	-503
Primacord to LSC Fitting, Nut	6	1A93706	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1

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t - Thiokol part number.

4.3 S-IVB STAGE															
4.3.7 ENVIRONMENTAL CONTROL - Configuration	G. A. Deuel I-V-S-IVB 876-5697	NEXT ASSY QTY	DRAWING NUMBER	SA- 201	SA- 202	SA- 203	SA- 204	SA- 205	SA- 206	SA- 207	SA- 208	SA- 209	SA- 210	SA- 211	SA- 212
4.3.7.1 THERMAL CONDITIONING SYSTEM															
Thermo-Conditioning System Installation		1	1A69491	-507	-509										
Thermo-Conditioning System Installation		1	1B38426			-509	-505	-501	-517	-519	-521	-523	-525	-527	-529
Cold Panel, Forward Skirt, No. 1		1	1A98132	-501	-503	-511	-509								
Cold Panel, Forward Skirt, No. 2		1	1A98133	-1	-1	-1	-1								
Cold Panel, Forward Skirt, No. 3		1	1A98134	-1	-1	-503	-507								
Cold Panel, Forward Skirt, No. 4		1	1A98135	-1	-1	-507	-505								
Cold Panel, Forward Skirt, No. 5		1	1A98136	-1	-1	-501	-1								
Cold Panel, Forward Skirt, No. 6		1	1A98137	-1	-1	-501	-1								
Cold Panel, Forward Skirt, No. 7		1	1A98138	-1	-503	-505	-505								
Cold Panel, Forward Skirt, No. 8		1	1A98139	-1	-1	-1	-1								
Cold Panel, Forward Interstage, No. 9		1	1A98140	-503	-503	-501	-501								
Cold Panel, Forward Interstage, No. 10		1	1A98141	-503	-503	-507	-509								
Cold Panel, Forward Skirt, No. 11		1	1A98142	-1	-1	-1	-1	-501	-501	-501	-501	-501	-501	-501	-501
Cold Panel, Forward Skirt, No. 12		1	1A98143	-1	-1	-505	-501								
Cold Panel, Forward Skirt, No. 13		1	1A98144	-1	-1	-503	-501	-507	-507	-507	-507	-507	-507	-507	-507
Cold Panel, Forward Skirt, No. 14		1	1A98145	-1	-1	-503	-507	-513	-513	-515	-515	-515	-515	-515	-515
Cold Panel, Forward Skirt, No. 15		1	1A98146	-1	-513	-509	-509	-511	-511	-511	-511	-511	-511	-511	-511
Cold Panel, Forward Skirt, No. 16		1	1A98147	-1	-1	-503	-505	-505	-505	-505	-505	-505	-505	-505	-505
(Thermal Conditioning System components															
shown above are supplied by coolant from the															
Thermal Conditioning System in the IU (see															
section 4.4.5.1).															

4.4 INSTRUMENT UNIT

IU DATA SUMMARY (For Information Only)

Manufacturer - - - MSFC, IU-201 thru IU-203; IBM, IU-204 and subsequent.

I DIMENSIONS - - - Length 3.0 ft (0.9m), Diameter 21.7 ft (6.6m)

II WEIGHTS AND MEASUREMENTS

Vehicle	Drawing Number	Weight at Ground Ignition \approx	Measurements		
			Type	Scheduled (A)	Successful (B)
IU-201	10M22201	4,370 lb (1,984kg)	R&D	298	290
IU-202	10M22201	4,490 lb (2,038kg)	R&D	298	297
IU-203	10M22201	4,650 lb (2,111kg)	R&D	366	365
IU-204	10Z22201	4,600 lb (2,084kg)	R&D	315	315
IU-205	10Z22201	4,300 lb (1,952kg)	Operational	204	
IU-206	10Z22201	4,260 lb (1,930kg)	Operational	236	
IU-207	10Z22201	4,300 lb (1,948kg)	Operational	194	
IU-208	10Z22201	4,160 lb (1,884kg)	Operational	195	
IU-209	10Z22201	4,060 lb (1,839kg)	Operational	191	
IU-210	10Z22201	4,040 lb (1,830kg)	Operational	192	
IU-211	10Z22201	4,080 lb (1,848kg)	Operational	191	
IU-212	10Z22201	4,080 lb (1,848kg)	Operational	198	

III PRESSURIZATION SYSTEMS

Gas Bearing GN₂ Supply and Environmental Control System GN₂ Supply

INSTRUMENT UNIT DATA SUMMARY - Continued

IV ENVIRONMENTAL CONDITIONING SYSTEM - Continued

Preflight Conditioning - IU and S-IVB forward skirt conditioned by air from 19.5 to 4 hours prior to launch.

Methanol/water (60/40 mixture) from ground, conditions electronic equipment during checkout.

Preflight Purge (GN₂) - IU and S-IVB forward skirt purged from 200 minutes prior to hydrogen loading to umbilical separation.

Flight - Methanol/water in a closed-loop system conditions IU and S-IVB electronic equipment.

V ASTRIONICS SYSTEMS

Guidance - S-IB stage; pitch, yaw and roll program; S-IVB stage, Iterative Guidance Mode.

ST-124M Stabilized Platform System, Launch Vehicle Digital Computer (LVDC) and Launch Vehicle Data Adapter (LVDA).

Telemetry Links - PAM/FM/FM, 2 systems IU-201 through IU-204; 1 system IU-205 and subsequent.

SS/FM, 1 system IU-201 through IU-204;

PCM/FM, 1 system including transmitter and oscillator units, on all vehicles.

Flight Control - Flight Control Computer, Control Signal Processor, Control Accelerometers and Control/EDS Rate Gyro.

Tracking - C-Band Radar, 5400 mc to 5900 mc at 400 watts.

AZUSA-C, 5000 mc at 135 watts. (IU-201 through IU-204)

Electrical - Batteries, 28 vdc, Zinc-Silver Oxide:

4 each on IU-201 through IU-205 and IU-207,

3 each on IU-206 and IU-208 through IU-212

Master Measuring Voltage Supply, 28 vdc to 5 vdc.

Tape Recorder - Model Air-940, PAM/FM/FM systems on IU-201 through IU-204. Starts recording 39 seconds after liftoff and stops 26 seconds after S-IB/S-IVB separation.

Digital Command System - IU-203 and Subsequent.

Q-Ball - IU-201, IU-203, IU-205, IU-207, IU-209, IU-211 and IU-212

4.4 INSTRUMENT UNIT - Configuration and Measurements															
4.4.1 STRUCTURE - Configuration	W. E. Wilkinson I-V-IU 876-3372	NEXT ASSY QTY	DRAWING NUMBER	SA- 201	SA- 202	SA- 203	SA- 204	SA- 205	SA- 206	SA- 207	SA- 208	SA- 209	SA- 210	SA- 211	SA- 212
4.4.1.1 INSTRUMENT UNIT ASSEMBLY		1	30M13100	-1	-1										
INSTRUMENT UNIT ASSEMBLY		1	30Z13100			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Segment Assembly, Unit 601		1	30Z13101	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Battery Support Bracket		4	10M22244	-1	-1	-1									
Battery Support Bracket		4	10Z22244				-1			-5					
Battery Support Bracket		3	10Z22244						-5		-5	-5	-5	-5	-5
Battery Support Bracket		5	10Z22244					-5							
Battery Angle Brace		4	10M22245	-1	-1	-1									
Battery Angle Brace		4	10M22245	-2	-2	-2									
Battery Angle Brace		4	10Z22245				-1			-1					
Battery Angle Brace		4	10Z22245				-2			-2					
Battery Angle Brace		3	10Z22245						-1		-1	-1	-1	-1	-1
Battery Angle Brace		3	10Z22245						-2		-2	-2	-2	-2	-2
Battery Angle Brace		5	10Z22245					-1							
Battery Angle Brace		5	10Z22245					-2							
Umbilical Plate Assembly		1	11M00055	-1	-1	-1									
Umbilical Plate Assembly		1	11Z00055				-1	-1	-1	-1	-1	-1	-1	-1	-1
Segment Assembly, Unit 603		1	30Z13102	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Mounting Bracket, LVDC/LVDA		1	10M22470	-3	-3	-3									
Mounting Bracket, LVDC/LVDA		1	10Z22470				-3	-3	-5	-5	-5	-5	-5	-5	-5
Mounting Bracket, LVDC/LVDA		1	10M22470	-4	-4	-4									
Mounting Bracket, LVDC/LVDA		1	10Z22470				-4	-4	-6	-6	-6	-6	-6	-6	-6
Segment Assembly, Unit 602		1	30Z13103	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
4.4.1.2 RING SEGMENT, CABLE SUPPORT		3	10M22257	-1	-1	-1									
RING SEGMENT, CABLE SUPPORT		3	10Z22257				-1	-1	-1	-1	-1	-1	-1	-1	-1

4.4 INSTRUMENT UNIT																								
4.4.1 STRUCTURE - Measurements	SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
FLIGHT MEASUREMENTS - TOTAL	24	23	26	26	29	29	22	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.4.1.1 INSTRUMENT UNIT ASSEMBLY																								
Measurements - Total	18	17	20	20	23	23	19	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acoustic - Total	1	1	1	1	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Instrument Unit, Internal	1	1	1	1	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Temperature - Total	9	9	10	10	10	10	10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Instrument Unit, Ambient	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Internal Panel, Skin	7	7	8	8	8	8	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ST-124M Mounting Frame	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vibration - Total	8	7	8	8	8	8	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lower Mounting Ring	4	4	4	4	4	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Upper Mounting Ring	4	3	4	4	4	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pressure - Total	0	0	1	1	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Static, Instrument Unit	0	0	1	1	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.4.1.2 RING SEGMENT, CABLE SUPPORT																								
Measurements - Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.4.1.3 ST-124 MOUNTING FRAME																								
Measurements - Total	6	6	6	6	6	6	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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4.4 INSTRUMENT UNIT																									
4.4.2 FLIGHT CONTROL - Measurements		SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
		A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
FLIGHT MEASUREMENTS - TOTAL		74	71	76	75	80	80	74	74	63		63		63		63		63		63		63		63	
4.4.2.1 CONTROL COMPONENTS																									
Measurements - Total		74	71	76	75	80	80	74	74	63		63		63		63		63		63		63		63	
Acceleration - Total		4	4	4	4	7	7	4	4	4		4		4		4		4		4		4		4	
Longitudinal		2	2	2	2	3	3	2	2	2		2		2		2		2		2		2		2	
Pitch		1	1	1	1	2	2	1	1	1		1		1		1		1		1		1		1	
Yaw		1	1	1	1	2	2	1	1	1		1		1		1		1		1		1		1	
Angular Velocity - Total		32	32	35	35	35	35	32	32	26		26		26		26		26		26		26		26	
①	Pitch Rate Switch	3	3	3	3	3	3	3	3	3		3		3		3		3		3		3		3	
①	Yaw Rate Switch	3	3	3	3	3	3	3	3	3		3		3		3		3		3		3		3	
①	Roll Rate Switch	3	3	3	3	3	3	3	3	3		3		3		3		3		3		3		3	
①	EDS Rate Gyro Pitch and Yaw Activate	1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1	
①	EDS Rate Gyro Roll Activate	1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1	
①	Pitch, Roll and Yaw Control	3	3	3	3	3	3	3	3	3		3		3		3		3		3		3		3	
①	Roll, EDS	3	3	4	4	4	4	3	3	1		1		1		1		1		1		1		1	
①	Pitch, EDS	3	3	4	4	4	4	3	3	1		1		1		1		1		1		1		1	
①	Yaw, EDS	3	3	4	4	4	4	3	3	1		1		1		1		1		1		1		1	
①	EDS Locking or Comparitor Relay	3	3	3	3	3	3	3	3	3		3		3		3		3		3		3		3	
①	Rate Gyro Wheel Speed	3	3	3	3	3	3	3	3	3		3		3		3		3		3		3		3	
①	EDS Monitor Angular Velocity, Roll	3	3	3	3	3	3	3	3	3		3		3		3		3		3		3		3	
Temperature - Total		2	2	2	2	2	2	2	2	1		1		1		1		1		1		1		1	
Flight Control Computer		2	2	2	2	2	2	2	2	1		1		1		1		1		1		1		1	

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4.4 INSTRUMENT UNIT																								
4.4.2 FLIGHT CONTROL - Measurements - Continued	SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
4.4.2.1 CONTROL COMPONENTS - Continued																								
Pressure - Total	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Flight Control Computer	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
① Control Signal Processor	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vibration - Total	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Flight Control Computer	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Position - Total	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Pitch Actuator	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Yaw Actuator	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Control - Total	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
Valve Current Pitch Actuator	1	1	1	1	1	1	1	1	1	1	5	1	1	5	1	1	5	1	1	5	1	1	1	1
Delta I Pitch Actuator	4	4	4	4	4	4	4	4	4	4	0	4	4	0	4	4	0	4	4	0	4	4	4	4
Valve Current, Yaw Actuator	1	1	1	1	1	1	1	1	1	1	5	1	1	5	1	1	5	1	1	5	1	1	1	1
Delta I Yaw Actuator	4	4	4	4	4	4	4	4	4	4	0	4	4	0	4	4	0	4	4	0	4	4	4	4
Attitude Control Engine, Relay		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Signal - Total	8	5	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Spatial Amplifier, Pitch	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Spatial Amplifier, Roll-Yaw	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Control Accelerometers On	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Flight Control Computer On	3	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
① Control Signal Processor On	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

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① For EDS usage see section 4.1.1.

4.4 INSTRUMENT UNIT																
4.4.3 INSTRUMENTATION AND RANGE SAFETY - Configuration	N. Poarch I-V-IU 876-3372	NEXT ASSY QTY	DRAWING NUMBER	SA- 201	SA- 202	SA- 203	SA- 204	SA- 205	SA- 206	SA- 207	SA- 208	SA- 209	SA- 210	SA- 211	SA- 212	
4.4.3.1 TELEMETRY AND MEASURING																
Telemetry Antenna, Mod 219	2	50M12284	X	X												
Telemetry Antenna, Mod 223	2	50M12500			X											
Telemetry Antenna, Mod 223	2	50Z12500				-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
Telemetry Power Divider, Mod 221	1	50M12495	X	X	X											
Telemetry Power Divider, Mod 221	1	50Z12495				-1	-3	-3	-3	-3	-3	-3	-3	-3	-3	
SS/FM Assembly, (S-1)	1	50M12209	-1	-1	-1											
SS/FM Assembly, (S-1)	1	50M13004				-1										
RF Assembly, Mod I (S-1)	1	50M12205	-5	-5	-5	-5										
Slow Speed Multiplexer, Mod 245	1	50M12208	-1	-5	-7	-9										
PCM/RF Assembly, Mod I (P-1)	1	50M12211	-1	-1												
PCM/RF Assembly, Mod II (P-1)	1	50M12421			-1	-1										
PCM/RF Assembly, Mod II (P-1)	1	50Z13012					-1	-1	-1	-1	-1	-1	-1	-1	-1	
PCM/DDAS Assembly, Mod 301 (P-1)	1	50M12210	-1	-5	-7	-9										
PCM/DDAS Assembly, Mod 301 (P-1)	1	50Z13005					-5	-5	-5	-7	-7	-7	-7	-7	-7	
TM Multiplexer Assembly, MOD 270 (P-1)	1	50M12212	-1	-9	-13	-17										
TM Multiplexer Assembly, Mod 270 (P-1)	1	50Z12212					-3									
TM Multiplexer Assembly, Mod 270 (P-1)	1	50Z13002						-19	-13	-13	-13	-13	-13	-13	-13	
Remote Digital Multiplexer, Mod 410	1	50M12214	-1	-5	-7	-9										
Remote Digital Multiplexer (J), Mod 410	1	50Z13006					-5	-5	-5	-7	-7	-7	-7	-7	-7	
Remote Digital Multiplexer (K), Mod 410	1	50Z13006					-3	-3	-3	-3	-3	-3	-3	-3	-3	
Remote Digital Submultiplexer, Mod RDSM-1D	1	50M12213	-1	-1	-1	-1										
DDAS/Computer Interface Unit	1	50M12216			-1	-1										
DDAS/Computer Interface Unit	1	50Z13007					-1	-1	-1	-1	-1	-1	-1	-1	-1	
RF Assembly, Mod I (F-1)	1	50M12205	-1	-1	-1	-1										
RF Assembly, Analog, Mod II (F-1)	1	50Z13011					-7	-7	-7	-7	-7	-7	-7	-7	-7	

4.4 INSTRUMENT UNIT															
4.4.3 INSTRUMENTATION AND RANGE SAFETY Configuration - Continued	NEXT ASSY QTY	DRAWING NUMBER	SA- 201	SA- 202	SA- 203	SA- 204	SA- 205	SA- 206	SA- 207	SA- 208	SA- 209	SA- 210	SA- 211	SA- 212	
4.4.3.1 TELEMETRY AND MEASURING - Continued															
Telemetry Assembly, Mod B-1 (F-1)	1	50M12206	-1	-5	-7	-9									
Telemetry Assembly, Mod B-1 (F-1)	1	50Z13000					-15	-5	-5	-5	-5	-5	-5	-5	
Airborne Tape Recorder, Mod 101	1	50M12410	-1	-1	-1	-1									
RF Assembly, Mod 1 (F-2)	1	50M12205	-3	-3	-3	-3									
Telemetry Assembly, Mod A3 (F-2)	1	50M12207	-1	-5	-7	-9									
TM Multiplexer Assembly, Mod 270 (F-2)	1	50M12212	-3	-11	-15	-19									
TM Multiplexer Assembly, Mod 270 (F-2)	1	50Z12212					-1								
TM Multiplexer Assembly, Mod 270 (F-2)	1	50Z13002						-9	-15	-15	-15	-15	-15	-15	
PCM Coax Switch	1	50M12357	-1	-1	-1										
PCM Coax Switch	1	50Z12357				-1	-1	-1	-1	-1	-1	-1	-1	-1	
Telemetry Calibrator, Mod II	1	50M12416	-1	-1	-1	-1									
Telemetry Calibrator, Mod II	1	50Z13008					-3	-3	-3	-3	-3	-3	-3	-3	
TM Calibrator Power Control Unit	1	50M12404	-1	-1	-1	-1									
TM Calibrator Power Control Unit	1	50Z13009					-1	-1	-1	-1	-1	-1	-1	-1	
Coax Terminal, RF Dummy Load	1	50M12358	X	X	X										
Coax Terminal, RF Dummy Load	1	50Z12358				-1	-1	-1	-1	-1	-1	-1	-1	-1	
Measuring Rack Selector	1	50M12270	-1	-1	-1										
Measuring Rack Selector	1	50Z12270				-1	-1	-1	-1	-1	-1	-1	-1	-1	
TM RF Coupler, Mod 433	1	50M12497	-1	-1	-1										
TM RF Coupler, Mod 433	1	50Z12497				-1	-1	-1	-1	-1	-1	-1	-1	-1	
VSWR Measuring Assembly, Mod 220	1	50M10683	X	X											
VSWR Measuring Assembly, Mod 225	1	50Z12555			-1	-1									
TM Directional Coupler, Mod 226	1	50M12586					-1								
TM Directional Coupler, Mod 226	1	50Z12586						-1	-1	-1	-1	-1	-1	-1	
Measuring Rack (A401)	1	50M12271	-1	-7	-9										

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4.4 INSTRUMENT UNIT														
4.4.3 INSTRUMENTATION AND RANGE SAFETY Configuration - Continued	NEXT ASSY QTY	DRAWING NUMBER	SA- 201	SA- 202	SA- 203	SA- 204	SA- 205	SA- 206	SA- 207	SA- 208	SA- 209	SA- 210	SA- 211	SA- 212
4.4.3.1 TELEMETRY AND MEASURING - Continued														
Measuring Rack (A401)	1	50Z12271				-11	-13	-15	-17	-19	-21	-23	-25	-27
Measuring Rack (A402)	1	50M12525	-3											
Measuring Rack (A402)	1	50M12272		-7	-9									
Measuring Rack (A402)	1	50Z12272				-11	-13	-15	-17	-19	-21	-23	-25	-27
Measuring Rack (A403)	1	50M12273	-1	-7	-9									
Measuring Rack (A403)	1	50Z12273				-11	-13	-15	-17	-19	-21	-23	-25	-27
Measuring Rack (A404)	1	50M12274	-1	-7	-9									
Measuring Rack (A404)	1	50Z12274				-11	-13	-15	-17	-19	-21	-23	-25	-27
Measuring Rack (A405)	1	50M12275	-1	-7	-9									
Measuring Rack (A405)	1	50Z12275				-11		-15						
Measuring Rack (A406)	1	50M12276	-1	-7	-9									
Measuring Rack (A406)	1	50Z12276				-11		-15						
Measuring Rack (A407)	1	50M12277	-1	-7	-9									
Measuring Rack (A407)	1	50Z12277				-11								
Measuring Rack (A408)	1	50M12278	-1	-7	-9									
Measuring Rack (A408)	1	50Z12278				-11								
Measuring Rack (A409)	1	50M12279	-1	-7	-9									
Measuring Rack (A409)	1	50Z12279				-11								
4.4.3.2 RF COMMAND AND TRACKING														
Digital Command														
Command Receiver, MCR 503	1	50M10697	X		X	X	X	X	X	X	X	X		
Command Receiver, MCR 503	1	50Z10697											-1	-1
Secure Range Safety Decoder	1	50M10698	X											
Command Directional Coupler, Mod 314	1	50M12382	X		X									

4.4 INSTRUMENT UNIT														
4.4.3 INSTRUMENTATION AND RANGE SAFETY Configuration - Continued	NEXT ASSY QTY	DRAWING NUMBER	SA- 201	SA- 202	SA- 203	SA- 204	SA- 205	SA- 206	SA- 207	SA- 208	SA- 209	SA- 210	SA- 211	SA- 212
4.4.3.2 RF COMMAND AND TRACKING - Continued														
Command Directional Coupler, Mod 314	1	50Z12382				-1	-3	-3	-3	-3	-3	-3	-3	-3
Command Power Divider	1	50M10485	X											
Command Power Divider, Mod 312	1	50M12173			-1									
Command Power Divider, Mod 312	1	50Z12173			-1	-3	-3	-3	-3	-3	-3	-3	-3	-3
Command Antenna, Mod 309	2	50M10484	X											
Command Antenna, Mod 313	2	50M12321			X									
Command Antenna, Mod 313	2	50Z12321				-1	-1	-1	-1	-1	-1	-1	-1	-3
Command Decoder	1	50M12264			X	X	X							
Command Decoder	1	50Z12705						-1	-1	-3	-3	-3	-3	-3
AZUSA Antenna, Mod 711	1	50Z12333	-1	-1	-1	-1								
AZUSA Transponder, Type "C"	1	50M12266	-1	-1	-1	-1								
AZUSA RI Filter	1	50M12267	-1	-1	-1	-1	-1	-1	-1	-1				
C-Band Radar Antenna, Mod 708	1	50M10347	X	X										
C-Band Radar Antenna, Mod 713	1	50M12504			X									
C-BAND Radar Antenna, Mod 713	2	50Z12504				-1	-1	-1	-1	-1	-1	-1	-1	-1
C-BAND Radar Transponder	1	50M12261	-1	-1										
C-Band Radar Transponder	1	50Z12261			X									
C-Band Radar Transponder No. 1 and No. 2	2	50Z12574				-1	-1	-3	-3	-5	-5	-5	-5	-5
4.4.3.3 RANGE SAFETY (Not Applicable)														
4.4.3.4 LH2 EXPERIMENT														
TV Antenna, Mod 606	2	50M12502			X									
TV Power Amplifier	2	50M12676			X									
Exciter Unit, TV S-Band	2	50M12675			X									

4.4 INSTRUMENT UNIT																									
4.4.3 INSTRUMENTATION AND RANGE SAFETY - Measurements		SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
		A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
FLIGHT MEASUREMENTS - Total		64	64	59	59	109	109	78	78	46		57		37		44		35		42		35		42	
4.4.3.1 TELEMETRY AND MEASURING																									
Measurements - Total		43	43	45	45	69	69	62	62	32		44		24		31		24		31		24		31	
Temperature - Total		5	5	5	5	6	6	17	17	0		12		0		0		0		0		0		0	
Telemetry Assembly Surface (F-1 & F-2)		2	2	2	2	2	2	2	2	0		0		0		0		0		0		0		0	
Tape Recorder Assembly		1	1	1	1	1	1	1	1	0		0		0		0		0		0		0		0	
PCM/RF Assembly Surface (P-1)		1	1	1	1	2	2	1	1	0		0		0		0		0		0		0		0	
7	SLA Skin	0	0	0	0	0	0	12	12	0		12		0		0		0		0		0		0	
RF Assembly Surface (F-1)		1	1	1	1	1	1	1	1	0		0		0		0		0		0		0		0	
Vibration - Total		2	2	2	2	2	2	2	2	8		0		0		0		0		0		0		0	
RF Assembly Panel (F-2)		2	2	2	2	2	2	2	2	0		0		0		0		0		0		0		0	
19	Combustion Chamber Dome-Thrust	0	0	0	0	0	0	0	0	1		0		0		0		0		0		0		0	
19	LH ₂ and LOX Turbopump - Lateral	0	0	0	0	0	0	0	0	2		0		0		0		0		0		0		0	
19	Main Fuel Valve	0	0	0	0	0	0	0	0	2		0		0		0		0		0		0		0	
19	Main LOX Valve	0	0	0	0	0	0	0	0	1		0		0		0		0		0		0		0	
19	ASI Connector Flange and Block	0	0	0	0	0	0	0	0	2		0		0		0		0		0		0		0	
RF and Telemetry - Total		8	8	8	8	8	8	8	8	1		1		1		1		1		1		1		1	
RF Power Output		4	4	4	4	4	4	4	4	1		1		1		1		1		1		1		1	
RF Reflector Power		4	4	4	4	4	4	4	4	0		0		0		0		0		0		0		0	
Signal - Total		28	28	30	30	53	53	35	35	23		31		23		30		23		30		23		30	
RF and TM Assembly On		4	4	5	5	4	4	4	4	2		2		2		2		2		2		2		2	

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7 These measurements taken on Payload components but telemetered through IU.

19 These measurements taken on S-IVB stage but telemetered through IU.

4.4 INSTRUMENT UNIT																										
4.4.3 INSTRUMENTATION AND RANGE SAFETY - Measurements - Continued		SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212		
		A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	
4.4.3.1 TELEMETRY AND MEASURING - Continued																										
	PCM/DDAS TM On	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	SS/FM On	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Tape Recorder Record On	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Tape Recorder Power On	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Measuring Racks On	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Measurement Transferred to DDAS On	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Telemeter Calibrator On	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	RF Assembly (P-1), On Indication	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
①	EDS Switch Point Monitor	0	0	0	0	3	3	0	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
①	S-IB Burn	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
①	EDS Liftoff	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
①	LET Jettison Command	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
①	EDS S-IB One Engine Out	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
①	EDS S-IB Two Engines Out	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
①	S-IB or S-IVB Engine No. 1 Out	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
①	S-IB Engine No. 2 Out	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
①	S-IB Engine No. 3 Out	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
①	S-IB Engine No. 4 Out	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
①	S-IB Engine No. 5 Out	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
①	S-IB Engine No. 6 Out	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
①	S-IB Engine No. 7 Out	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
①	S-IB Engine No. 8 Out	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
①	Spacecraft/IU Mode Switch	0	0	0	0	0	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	S-IB Stage Separation	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	S-IVB Burn	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

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① For EDS usage see section 4.1.1.

4.4 INSTRUMENT UNIT

4.4.3 INSTRUMENTATION AND RANGE SAFETY - Measurements - Continued	SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212		
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	
4.4.3.1 TELEMETRY AND MEASURING - Continued																									
① Manual Cutoff Armed, S-IB or S-IVB	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
① Auto-Abort 1, 2, and 3	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
① Abort Request A	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
① EDS S-IB or S-IVB Engine Cutoff from Spacecraft	1	1	2	2	2	2	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
① EDS or Manual Cutoff of S-IB or S-IVB	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
⑦ Nosecone SLA Physical Monitor	0	0	0	0	0	0	2	2	0	2	0	2	0	2	0	2	0	2	0	2	0	2	0	2	
⑦ Nosecone Jettison A and B	0	0	0	0	0	0	2	2	0	2	0	2	0	2	0	2	0	2	0	2	0	2	0	2	
⑦ SLA Panels Deploy Relay	0	0	0	0	0	0	2	2	0	2	0	2	0	2	0	2	0	2	0	2	0	2	0	2	
⑦ SLA Deployment Physical Monitor	0	0	0	0	0	0	1	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	
⑦ LM-SLA Separation Relay	0	0	0	0	0	0	2	2	0	2	0	2	0	2	0	2	0	2	0	2	0	2	0	2	
4.4.3.2 RF COMMAND AND TRACKING																									
Measurements - Total	20	20	11	11	14	14	16	16	14	13	13	13	13	11	11	11	11	11	11	11	11	11	11	11	
Temperature - Total	1	1	2	2	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AZUSA Internal	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
C-Band Internal	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
RF and Telemetry - Total	12	12	7	7	9	9	8	8	7	7	7	7	7	7	7	7	5	5	5	5	5	5	5	5	
AZUSA Power and AGC Voltage	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	
C-Band Receiver Input Signal	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
C-Band Interrogation PRF	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
C-Band Incident and Reflected Power	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

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⑦ These measurements taken on Payload components but telemetered through the IU. ① For EDS usage see section 4.1.1.

4.4 INSTRUMENT																								
4.4.3 INSTRUMENTATION AND RANGE SAFETY - Measurements - Continued	SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
4.4.3.2 RF COMMAND AND TRACKING - Continued																								
Command Receiver Limiter Test	2	2	0	0	2	2	2	2	1		1		1		1		1		1		1		1	
Range Safety Decoder	3	3	0	0	0	0	0	0	0		0		0		0		0		0		0		0	
Signal - Total	7	7	2	2	3	3	7	7	7		6		6		6		6		6		6		6	
AZUSA Transponder On	1	1	1	1	1	1	1	1	1		X		X		X		0		0		0		0	
C-Band Inhibit	0	0	0	0	0	0	2	2	2		2		2		2		2		2		2		2	
Inverter Detector Monitor	0	0	0	0	0	0	1	1	1		1		1		1		1		1		1		1	
Radar Transponder On	1	1	1	1	1	1	2	2	2		2		2		2		2		2		2		2	
Command Receiver and Decoder On	0	0	0	0	1	1	1	1	1		1		1		1		1		1		1		1	
Range Safety Decoder	5	5	0	0	0	0	0	0	0		0		0		0		0		0		0		0	
4.4.3.3 RANGE SAFETY (Not applicable)																								
4.4.3.4 LH ₂ EXPERIMENT																								
Measurements - Total					23	23																		
Acceleration - Total					4	4																		
Lateral Orbital Slosh, Pitch					1	1																		
Lateral Orbital Slosh, Yaw					1	1																		
Longitudinal Orbital LH ₂ Venting					2	2																		
Acoustics - Total					3	3																		
Nose Cone Assy., Internal and External					3	3																		

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4.4 INSTRUMENT UNIT																									
4.4.3 INSTRUMENTATION AND RANGE SAFETY - Measurements - Continued		SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
		A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
4.4.3.4 LH2 EXPERIMENT - Continued																									
Temperature	- Total			6	6																				
Low G Acceleration				1	1																				
Supply				1	1																				
Upper Tank				1	1																				
Lower Tank				1	1																				
Heat Exchanger, Inlet and Outlet				2	2																				
Pressure	- Total			5	5																				
Supply				1	1																				
Static (Nose Shroud)				2	2																				
Tank				1	1																				
Tank Outlet				1	1																				
Voltage, Current and Frequency	- Total			1	1																				
Longitudinal Position, LH2 Venting				1	1																				
Flow Rate	- Total			1	1																				
Supply				1	1																				
Signal	- Total			3	3																				
TV System Power On				1	1																				
Transmitter On				2	2																				
4.4.3.5 MSC CRYOGENIC STORAGE EXPERIMENT																									
Measurements	- Total			3	3																				

4.4 INSTRUMENT UNIT															
4.4.4 ELECTRICAL - Configuration	J. Rountree I-I/IB-U 876-3372	NEXT ASSY QTY	DRAWING NUMBER	SA- 201	SA- 202	SA- 203	SA- 204	SA- 205	SA- 206	SA- 207	SA- 208	SA- 209	SA- 210	SA- 211	SA- 212
4.4.4.1 POWER SUPPLY															
Primary Battery D10	1	40M20780	-1	-1	-1										
Primary Battery D10	1	40Z20780				-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Primary Battery D20	1	40Z20780				-1	-1								
Primary Battery D20	1	40M20780	-1	-1	-1										
Primary Battery D30	1	40M20780	-1	-1	-1										
Primary Battery D30	1	40Z20780				-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Primary Battery D40	1	40M20780	-1	-1	-1										
Primary Battery D40	1	40Z20780				-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
5 Volt Master Measuring Voltage Supply	1	40Z20964	X	X	X	X	X	X	X	X	X	X	X	X	X
56 Volt Power Supply	1	40Z20807	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
4.4.4.2 POWER DISTRIBUTION															
Power Distributor Assembly	1	40M37212	-1												
Power Distributor Assembly	1	40M37219		-1											
Power Distributor Assembly	1	40M37226			-1										
Power Distributor Assembly	1	40Z37233				-1									
Power Distributor Assembly	1	7910419					-1	-3	-5	-7	-9	-11	-13	-15	
Auxiliary Power Distributor	1	40M37213	-1												
Auxiliary Power Distributor	1	40M37214	-1												
Auxiliary Power Distributor	1	40M37220		-1											
Auxiliary Power Distributor	1	40M37221		-1											
Auxiliary Power Distributor	1	40M37227			-1										
Auxiliary Power Distributor	1	40M37228			-1										
Auxiliary Power Distributor	1	40Z37234				-1									

4.4 INSTRUMENT UNIT															
4.4.4 ELECTRICAL - Configuration - Continued		NEXT ASSY QTY	DRAWING NUMBER	SA- 201	SA- 202	SA- 203	SA- 204	SA- 205	SA- 206	SA- 207	SA- 208	SA- 209	SA- 210	SA- 211	SA- 212
4.4.4.2 POWER DISTRIBUTION - Continued															
	Auxiliary Power Distributor	1	40Z37235				-1								
	Auxiliary Power Distributor	1	7910420					-1	-3	-5	-7	-9	-11	-13	-15
	Auxiliary Power Distributor	1	7910421					-1	-3	-5	-7	-9	-11	-13	-15
①	Control Distributor Assembly	1	40M37210	-1											
①	Control Distributor Assembly	1	40M37217		-1										
①	Control Distributor Assembly	1	40M37224			-1									
①	Control Distributor Assembly	1	40Z37231				-1								
①	Control Distributor Assembly	1	7910417					-1	-3	-5	-7	-9	-11	-13	-15
	Measuring Distributor	1	40M37208	-1											
	Measuring Distributor	1	40M37209	-1											
	Measuring Distributor	1	40M37215		-1										
	Measuring Distributor	1	40M37216		-1										
	Measuring Distributor	1	40M37222			-1									
	Measuring Distributor	1	40M37223			-1									
	Measuring Distributor	1	40Z37229				-1								
	Measuring Distributor	1	40Z37230				-1								
	Measuring Distributor	1	7910416					-1	-3	-5	-7	-9	-11	-13	-15
	Measuring Distributor	1	7910415						-3						
①	EDS 20-Second Timer	1	40Z37575				-1		-1						
①	EDS 40-Second Timer	1	40M37452	-1		-1									
①	EDS 40-Second Timer	1	40Z37452				-1								
①	EDS 40-Second Timer	1	7914540					-1		-1		-1	-1	-1	-1
①	EDS 60-Second Timer	1	40Z37615		-1				-1		-1		-1		
	J-Box Assembly	1	40M33012	-1											
	J-Box Assembly	1	40M33032		-1										

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① For EDS usage see section 4.1.1

4.4 INSTRUMENT UNIT																									
4.4.4 ELECTRICAL - Measurements		SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
		A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
FLIGHT MEASUREMENTS - Total		31	28	30	30	30	30	31	31	25		23		23		23		23		23		23		23	
4.4.4.1 POWER SUPPLY																									
Measurements - Total		15	15	15	15	15	15	15	15	10		9		9		9		9		9		9		9	
Temperature - Total		5	5	5	5	5	5	5	5	1		1		1		1		1		1		1		1	
Batteries		4	4	4	4	4	4	4	4	0		0		0		0		0		0		0		0	
250 VA Inverter		1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1	
Voltage, Current and Frequency - Total		10	10	10	10	10	10	10	10	9		8		8		8		8		8		8		8	
Measuring Voltage		1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1	
250 VA Inverter		4	4	4	4	4	4	4	4	4		4		4		4		4		4		4		4	
Battery Current		4	4	4	4	4	4	4	4	4		3		3		3		3		3		3		3	
56 vdc Supply		1	1	1	1	1	1	1	1	0		0		0		0		0		0		0		0	
4.4.4.2 POWER DISTRIBUTION																									
Measurements - Total		16	13	15	15	15	15	16	16	15		14		14		14		14		14		14		14	
Voltage, Current and Frequency - Total		7	4	7	7	7	7	7	7	7		6		6		6		6		6		6		6	
Bus Voltage		4	4	4	4	4	4	4	4	4		3		3		3		3		3		3		3	
①	EDS Bus Voltage, +6D91, +6D92, +6D93	3	0	3	3	3	3	3	3	3		3		3		3		3		3		3		3	
Signal - Total		9	9	8	8	8	8	9	9	8		8		8		8		8		8		8		8	
①	EDS Timer, Timed Out	1	1	0	0	0	0	1	1	0		0		0		0		0		0		0		0	
Switch Selector		7	7	7	7	7	7	7	7	7		7		7		7		7		7		7		7	
①	EDS Bus Energized +6D95	1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1	

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① For EDS usage see section 4.1.1.

4.4 INSTRUMENT UNIT																
4.4.5 ENVIRONMENTAL CONTROL SYSTEM - Configuration		W. E. Wilkinson I-V-IU 876-3372	NEXT ASSY QTY	DRAWING NUMBER	SA- 201	SA- 202	SA- 203	SA- 204	SA- 205	SA- 206	SA- 207	SA- 208	SA- 209	SA- 210	SA- 211	SA- 212
4.4.5.1 THERMAL CONDITIONING SYSTEM																
Coolant Pump			1	20M42001	X	X	X	-1								
Coolant Pump			1	20Z42001					-1						-3	-3
Coolant Pump			2	20Z42001						-1	-1	-1	-1	-1		
Coolant Pump			1	7914878											-3	-3
Methanol/Water Accumulator			1	20Z42040	-1	-1	-1									
Methanol/Water Accumulator			1	7914398				-1	-1	-2	-1	-1	-1	-1	-1	-1
Water Accumulator			1	20Z42196	-1	-1	-1	-1			-2	-2	-2	-2	-2	-2
Water Accumulator			1	7915984					-1	-1	-1	-1	-1	-1	-1	-1
GN ₂ Storage Sphere, 50 cu. in.			2	20M42014	-1	-1	-1									
GN ₂ Storage Sphere, 50 cu. in.			1	20Z42039				-1	-1							
GN ₂ Storage Sphere, 165 cu. in.			1	7910120						-3	-3	-3	-3	-3	-3	-3
Thermal Conditioned Mounting Panel			16	20Z42000	-1	-1	-1	X	X	-1	-1	-1	-1	-1	-1	-1
Thermal Conditioned Mounting Panel Heaters			12	40M37641					-1		-1					
Heat Exchanger Assembly (Sublimator)			1	20Z42159	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Heat Exchanger, Preflight			1	20Z42159	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
Heat Exchanger, Flight			1	20Z42159	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5
Heat Exchanger, Gas Bearing			1	20M42048	X	X	-1	-1								
Heat Exchanger, Gas Bearing			1	20Z42048					-1							
Heat Exchanger, Gas Bearing			1	7912296						-1	-1	-1	-1	-1	-1	-1
Valve, Flow Control, Modulating			1	20Z42007	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Electronic Controller Assembly			1	20Z42007	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
Thermistor			1	20Z42007	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5
Bleeder Assembly			1	20M42098	-1	-1	-1									
Bleeder Assembly			1	20Z42098				-1	-1	-1	-1	-1	-1	-1	-1	-1
Valve, Check, Coolant			2	7912474						-1	-1	-1	-1	-1	-1	-1

4.4 INSTRUMENT UNIT															
4.4.5 ENVIRONMENTAL CONTROL SYSTEM - Configuration - Continued		NEXT ASSY QTY	DRAWING NUMBER	SA-201	SA-202	SA-203	SA-204	SA-205	SA-206	SA-207	SA-208	SA-209	SA-210	SA-211	SA-212
4.4.5.1 THERMAL CONDITIONING SYSTEM - Continued															
	Switch, Pressure (Methanol/Water)	1	7912340						-3	-3	-3	-3	-3	-3	-3
	Switch, Thermal (Methanol/Water)	2	7915392				-3	-1	-1	-1	-1	-1	-1	-1	-1
	Valve, Shut-Off, Water Accumulator	1	20Z42034	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	Filter Assembly, 20 Micron	1	20M30414	-1	-1	-1									
	Filter Assembly, 20 Micron	1	20Z42119				-3	-3	-3	-3	-3	-3	-3	-3	-3
	Pressure Regulator	1	20Z42013	-1	-1	-1	-3	-3	-3	-3	-3	-3	-3	-3	-3
	Orifice Regulator	2	20M42116	-1	-1										
	Orifice Regulator	1	20Z42122			-1	-1	-5	-5	-5	-5	-5	-5	-5	-5
	Orifice Assembly, Union	1	20Z42037	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	Orifice Assembly, Union	1	20Z42176				-1	-1	-3	-3	-3	-3	-3	-3	-3
	Hose Assembly, Flex IU	1	7904307	X											
	Hose Assembly, Flex IU	1	20Z42133		X	X									
	Hose Assembly, Flex IU	47	20Z43133					X							
	Hose Assembly, Flex IU	53	20Z43133						X						
	Hose Assembly, Flex IU	50	20Z43133							X					
	Hose Assembly, Flex IU	52	20Z43133				X								
	Hose Assembly, Flex IU	57	20Z42133								X	X	X	X	X
⑩	Manifold, Coolant Supply	5		X	X	X	X	X							
⑩	Manifold, Coolant Supply	4							X	X	X	X	X	X	X
⑩	Manifold, Coolant Return	7		X	X	X	X	X	X						
⑩	Manifold, Coolant Return	6								X	X	X	X	X	X
	Coupling, Quick Disconnect	10	20M42006	-1	-1	-1									
	Coupling, Quick Disconnect	1	20M42006	-5	-5	-5									
	Coupling, Quick Disconnect	1	20M42006	-7	-7	-7									

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⑩ These parts are grouped for brevity and individual drawing numbers are omitted.

4.4 INSTRUMENT UNIT														
4.4.5 ENVIRONMENTAL CONTROL SYSTEM - Configuration - Continued	NEXT ASSY QTY	DRAWING NUMBER	SA- 201	SA- 202	SA- 203	SA- 204	SA- 205	SA- 206	SA- 207	SA- 208	SA- 209	SA- 210	SA- 211	SA- 212
4.4.5.1 THERMAL CONDITIONING SYSTEM - Continued														
Coupling, Quick Disconnect	10	20Z42006				-1	-1	-1	-1	-1	-1	-1	-1	-1
Coupling, Quick Disconnect	1	20Z42006				-5	-5	-5	-5	-5	-5	-5	-5	-5
4.4.5.2 ST-124M GAS BEARING SUPPLY														
Valve Assembly, Solenoid	1	20M30380	-1	-1	-1									
Valve Assembly, Solenoid	1	20Z42079				-3	-3							
Valve Assembly, Solenoid	1	20Z42079						-5	-5	-5	-5	-5	-5	-5
GN ₂ Storage Sphere, 2 cu. ft.	1	20Z32013	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Switch, Low Pressure	1	20M42131	X	X	X									
Switch, Low Pressure	1	20Z42016				-5	-5	-5	-5	-5	-5	-5	-5	-5
Switch, Pressure	1	20M42130	-1											
Filter Assembly, 20 Micron	2	20M30414	-1	-1	-1									
Filter Assembly, 20 Micron	2	20Z42119				-3	-3	-3	-3	-3	-3	-3	-3	-3
Pressure Regulator	1	20Z42013	X	X	X	X	-3	-3	-3	-3	-3	-3	-3	-5
Panel Assembly, Gas Supply	1	20Z42023	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
4.4.5.3 PURGE (Preflight)														
Purge Duct Assembly	6	20M42101	X	X	X									
Purge Duct Assembly	10	20Z42101				X	X	X	X	X	X	X	X	X
Purge Duct Assembly	1	20M42102	-1	-1	-1									
Purge Duct Assembly	1	20Z42197				-1	-1	-1	-1	-1	-1	-1	-1	-1
Purge Y Duct Assembly	1	20Z42100	X	X	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Flexible Coupler Assembly	8	20M42103	-1	-1	-1									
Flexible Coupler Assembly	8	20Z42103				-1	-1	-1	-1	-1	-1	-1	-1	-1
Cap, End	2	20Z42104	X	X	X	-1	-1	-1	-1	-1	-1	-1	-1	-1

4.4 INSTRUMENT UNIT																											
4.4.5 ENVIRONMENTAL CONTROL SYSTEM - Measurements		SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212			
		A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B		
FLIGHT MEASUREMENTS - TOTAL		47	46	49	49	49	49	49	49	18		18		18		18		18		18		18		18		18	
4.4.5.1 THERMAL CONDITIONING SYSTEM																											
Measurements - Total		39	38	41	41	41	41	41	41	16		16		16		16		16		16		16		16		16	
Temperature - Total		20	20	22	22	22	22	21	21	4		4		4		4		4		4		4		4		4	
Sublimator Inlet, Water		1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1		1	
IU Inlet and Exit, Coolant		2	2	2	2	2	2	3	3	0		0		0		0		0		0		0		0		0	
Sublimator Inlet/Exit, Coolant		2	2	2	2	2	2	2	2	1		1		1		1		1		1		1		1		1	
Accumulator Inlet, Coolant		1	1	1	1	1	1	1	1	0		0		0		0		0		0		0		0		0	
Coolant Control		1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1		1	
ST-124M Shroud Inlet, Coolant		1	1	2	2	1	1	1	1	0		0		0		0		0		0		0		0		0	
ST-124M Coolant Exit		1	1	1	1	1	1	1	1	0		0		0		0		0		0		0		0		0	
ST-124M Shroud Exit, Coolant		1	1	1	1	2	2	1	1	0		0		0		0		0		0		0		0		0	
Cold Plates, Inlet and Exits, Coolant		4	4	4	4	4	4	4	4	0		0		0		0		0		0		0		0		0	
Flight Control Computer Exit, Coolant		1	1	1	1	1	1	1	1	0		0		0		0		0		0		0		0		0	
S-IVB Coolant Loop, Inlet/Exit		2	2	2	2	2	2	1	1	1		1		1		1		1		1		1		1		1	
Heat Exchanger Inlet, Coolant		1	1	1	1	1	1	1	1	0		0		0		0		0		0		0		0		0	
GN ₂ Bottle Outlet		0	0	1	1	1	1	1	1	0		0		0		0		0		0		0		0		0	
IU Inlet Air/GN ₂		1	1	1	1	1	1	1	1	0		0		0		0		0		0		0		0		0	
Adapter/Computer Exit, Coolant		1	1	1	1	1	1	1	1	0		0		0		0		0		0		0		0		0	
Pressure - Total		4	4	4	4	4	4	5	5	4		4		4		4		4		4		4		4		4	
Sublimator Inlet, Water		0	0	0	0	0	0	1	1	1		1		1		1		1		1		1		1		1	
Coolant Manifold, Inlet		1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1		1	
S-IVB Coolant Loop, Exit		1	1	1	1	1	1	1	1	0		0		0		0		0		0		0		0		0	

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4.4 INSTRUMENT UNIT																								
4.4.5 ENVIRONMENTAL CONTROL SYSTEM - Measurements - Continued	SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
4.4.5.1 THERMAL CONDITIONING SYSTEM - Continued																								
Coolant Pump, Inlet	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
GN ₂ Regulator Inlet	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Signal - Total	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Cooling System Electronic On	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Flow Rate - Total	11	10	11	11	11	11	11	11	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Sublimator Inlet, Water	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sublimator Bypass, Coolant	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Cold Plate Inlets, Coolant	3	3	3	3	3	3	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ST-124M Shroud Inlet, Coolant	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Flight Control Computer Inlet, Coolant	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Adapter/Computer Inlet, Coolant	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S-IVB Coolant Loop, Inlet	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
IU/Coolant, Exit	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Position - Total	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Coolant Control Valve	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Water Control Valve, Open	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Water Control Valve, Closed	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4.4.5.2 GAS BEARING SUPPLY SYSTEM																								
Measurements - Total	8	8	8	8	8	8	8	8	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

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4.4 INSTRUMENT UNIT																								
4.4.5 ENVIRONMENTAL CONTROL SYSTEM - Measurements - Continued	SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
4.4.5.2 GAS BEARING SUPPLY SYSTEM - Continued																								
Temperature - Total	4	4	4	4	4	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GN ₂ Regulator, Inlet	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Heat Exchanger, Inlet and Exit, GN ₂	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ST-124M Air Bearing, Inlet	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pressure - Total	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
GN ₂ Regulator, Inlet	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ST-124M Air Bearing, Inlet	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Vibration - Total	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Air Bearing Supply Panel	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.4.5.3 PURGE																								
Measurements - Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

4.4 INSTRUMENT UNIT																											
4.4.6 GUIDANCE - Measurements		SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212			
		A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B		
FLIGHT MEASUREMENTS	- TOTAL	54	54	54	54	62	61	61	61	46		46		46		46		46		46		46		46		46	
4.4.6.1 GUIDANCE SYSTEM																											
Measurements	- Total	54	54	54	54	62	61	61	61	46		46		46		46		46		46		46		46		46	
Temperature	- Total	7	7	7	7	7	7	7	7	7		7		7		7		7		7		7		7		7	
ST-124M Inertial Gimbal		1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1		1	
Launch Vehicle Digital Computer		2	2	2	2	2	2	2	2	2		2		2		2		2		2		2		2		2	
Launch Vehicle Data Adapter		2	2	2	2	2	2	2	2	2		2		2		2		2		2		2		2		2	
Accelerometer Signal Conditioner		1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1		1	
ST-124M Platform Electronics Assembly		1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1		1	
Pressure	- Total	1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1		1	
ST-124M Internal Ambient		1	1	1	1	1	1	1	1	1		1		1		1		1		1		1		1		1	
Vibration	- Total	6	6	6	6	6	5	6	6	0		0		0		0		0		0		0		0		0	
ST-124M Inertial Gimbal (X, Y, Z Axes)		3	3	3	3	3	2	3	3	0		0		0		0		0		0		0		0		0	
LVDC/LVDA		3	3	3	3	3	3	3	3	0		0		0		0		0		0		0		0		0	
Guidance	- Total	27	27	27	27	27	27	30	30	21		21		21		21		21		21		21		21		21	
Accelerometer Pickup ST-124M		2	2	2	2	2	2	3	3	3		3		3		3		3		3		3		3		3	
Accelerometer Servo		1	1	1	1	1	1	3	3	0		0		0		0		0		0		0		0		0	
Accelerometers		12	12	12	12	12	12	12	12	6		6		6		6		6		6		6		6		6	
Gyro Pickup, ST-124M (X, Y, and Z)		3	3	3	3	3	3	3	3	3		3		3		3		3		3		3		3		3	
Gyro Servo Output (X, Y, Z)		3	3	3	3	3	3	3	3	3		3		3		3		3		3		3		3		3	
Attitude Ladder, Pitch, Yaw and Roll		3	3	3	3	3	3	3	3	3		3		3		3		3		3		3		3		3	

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4.4 INSTRUMENT UNIT																									
4.4.6 GUIDANCE - Measurements - Continued	SA-201		SA-202		SA-203		SA-204		SA-205		SA-206		SA-207		SA-208		SA-209		SA-210		SA-211		SA-212		
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	
4.4.6.1 GUIDANCE SYSTEM - Continued																									
4.8 kc Voltage	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
LVDC Operation	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Control - Total	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Attitude Error Signal	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
RF and Telemetry - Total	0	0	0	0	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
LVDC Reset Pulse	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Verification Pulse	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Signal - Total	4	4	4	4	8	8	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
① Launch Vehicle Reference Failure	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
① Launch Vehicle Rate Excessive	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Summation Gyro Currents	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Summation Accelerometer Currents	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Servo Amplifier, Pitch	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Servo Amplifier, Yaw	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Voltage, Current and Frequency - Total	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Launch Vehicle Data Adapter	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6

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① For EDS usage see section 4.1.1.

4.4 INSTRUMENT UNIT														
4.4.8 SPECIAL EXPERIMENTS - Configuration	NEXT ASSY QTY	DRAWING NUMBER	SA-201	SA-202	SA-203	SA-204	SA-205	SA-206	SA-207	SA-208	SA-209	SA-210	SA-211	SA-212
4.4.8.1 MSFC THERMAL CONTROL COATING EXPERIMENT														
Thermal Sensor Experiment Installation	1	10M22600						-1						
Sensor Package Assembly #1	1	10M22601						-1						
Base Panel	1	30M13162						-1						
Forward Fairing	1	30M13159						-1						
Aft Fairing	1	30M12742						-1						
Cover Assy, Thermal Sensor	3	30M13163						-1						
Explosive Bolt	6	10M22600						-1						
Electrical Connector	2	10M23232						X						
Thermal Sensor Assy, Type A	4	50M12666						-1						
Thermal Sensor Assy, Type B	4	50M12666						-1						
Thermal Sensor Assy, Type C	3	50M12666						-1						
Thermal Sensor Assy, Type E	1	50M12666						-1						
Resistance Thermometer	1	^d 20200						X						
Microswitch	3	10M22601						-3						
Sensor Package Assembly #2	1	10M22601						-1						
Base Panel	1	30M13162						-1						
Forward Fairing	1	30M13159						-1						
Aft Fairing	1	30M12742						-1						
Cover Assembly, Thermal Sensor	3	30M13163						-1						
Explosive Bolt	6	10M22600						-1						
Electrical Connector	2	10M23232						X						
Thermal Sensor Assy, Type A	2	50M12666						-1						
Thermal Sensor Assy, Type B	1	50M12666						-1						
Thermal Sensor Assy, Type C	2	50M12666						-1						
Thermal Sensor Assy, Type D	4	50M12666						-1						

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d - RDF Corp. part number

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5.0 PAYLOAD						
PAYLOAD DATA SUMMARY (For Information Only)						
	MANUFACTURER	LENGTH	DIAMETER		PROPULSION SYSTEM	FUNCTIONAL STATUS
LAUNCH ESCAPE SYSTEM	North American	400 in.	26 in.	Tower Jettison Motor	33,000 lb (146,520N) thrust	LES Jettisoned 30 seconds
	Aviation	(1016 cm)	(66 cm)	Launch Escape Motor	155,000 lb (688,200N) thrust	after S-IYB ignition
	(S&I Division)			Pitch Control Motor	3400 lb (15,096 N) thrust	
COMMAND MODULE	North American	134 in.	154 in.	Reaction Control	95 lb (423 N) thrust for	Live on AS-205, AS-207,
	Aviation	(340 cm)	(391 cm)	Engines, (4)	230 seconds. Operates pulsed	AS-209, AS-211, AS-212
	(S&I Division)				or continuous. Propellants, N ₂ O ₄ and MMH	
SERVICE MODULE	North American	265 in.	154 in.	Gimbaled engine (1)	21,330 lb (94,876 N) thrust	Live on AS-201, AS-202,
	Aviation	(673 cm)	(391 cm)		Propellants, N ₂ O ₄ and 50/50	AS-205, AS-207, AS-209,
	(S&I Division)				blend of UDMH and N ₂ H ₄	AS-211, AS-212
					(30 restarts)	
				Reaction Control Engines,	96 lb (427N) thrust, 1000	
				(4 clusters, 4 chambers	seconds	
				per cluster)		
LUNAR MODULE	Grumman Air-	232 in.	177 in.	Ascent Stage		Live on AS-204,
	Craft Corp.	(589 cm)	(449 cm)	Main Engine	3500 lb (15,568 N) thrust	AS-206, AS-208, AS-210,
				Reaction Control Engine	96 lb (427 N) thrust	AS-212
				(4 Clusters, 4 chambers		
				per cluster)		

5.0 PAYLOAD														
5.1 PAYLOAD - Configuration	NEXT ASSY QTY	DRAWING NUMBER	SA- 201	SA- 202	SA- 203	SA- 204	SA- 205	SA- 206	SA- 207	SA- 208	SA- 209	SA- 210	SA- 211	SA- 212
5.1.1 APOLLO LAUNCH ESCAPE SYSTEM (LES)	1		X	X			X		X		X		X	X
Launch Escape Motor	1		X	X			X		X		X		X	X
Tower Jettison Motor	1		X	X			X		X		X		X	X
Pitch Control Motor	1		X	X			X		X		X		X	X
Canard Surfaces	2		X	X			X		X		X		X	X
Q-Ball (see section 4.4.7.1)														
5.1.2 COMMAND MODULE	1		X	X			X		X		X		X	X
5.1.3 SERVICE MODULE	1		X	X			X		X		X		X	X
5.1.4 SPACECRAFT LUNAR MODULE ADAPTER	1		X	X		X	X	X	X	X	X	X	X	X
5.1.5 LUNAR MODULE (LM)	1					X		X		X		X		X
LM Lunar Descent Stage	1					X		X		X		X		X
LM Lunar Ascent Stage	1					X		X		X		X		X
5.1.6 NOSE CONE	1	30M03619			X									
NOSE CONE	1	30M03940				X		X		X		X		

SECTION 6.0
ILLUSTRATIONS

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SECTION 6.0

ILLUSTRATIONS (Continued)

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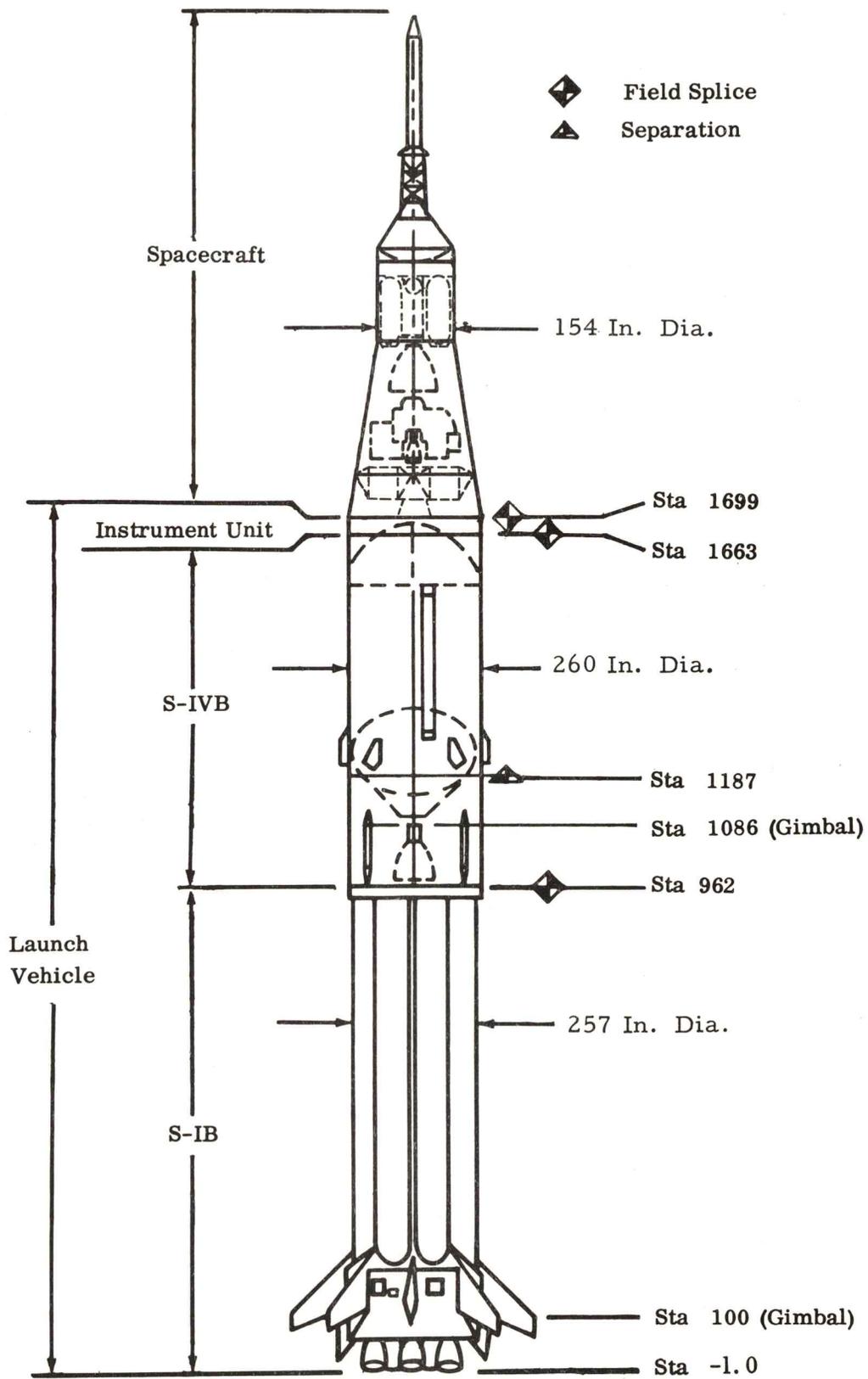


Figure 1. Saturn IB General Operational Configuration.

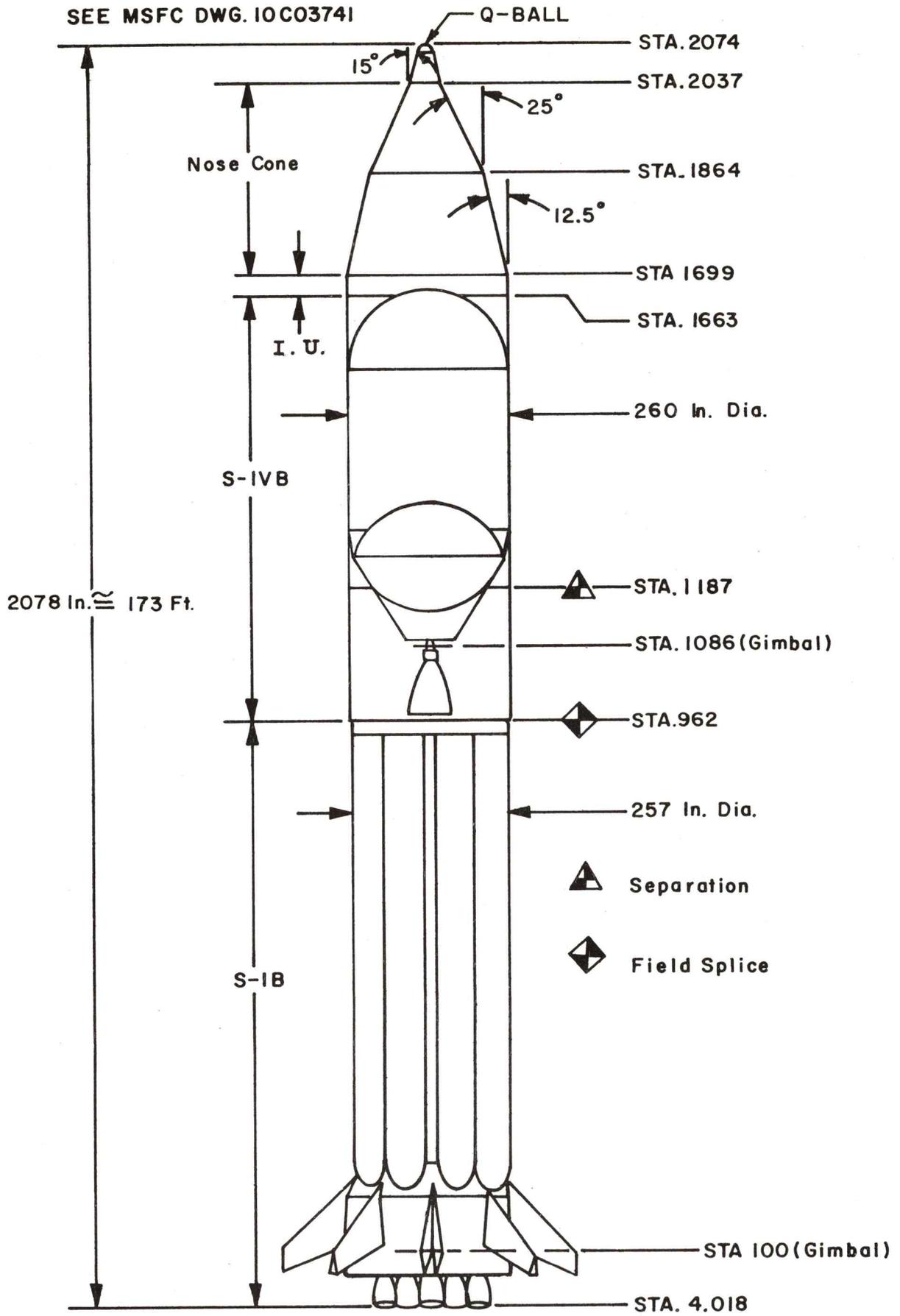


Figure 2. Saturn IB LH₂ Experiment Configuration (SA-203).

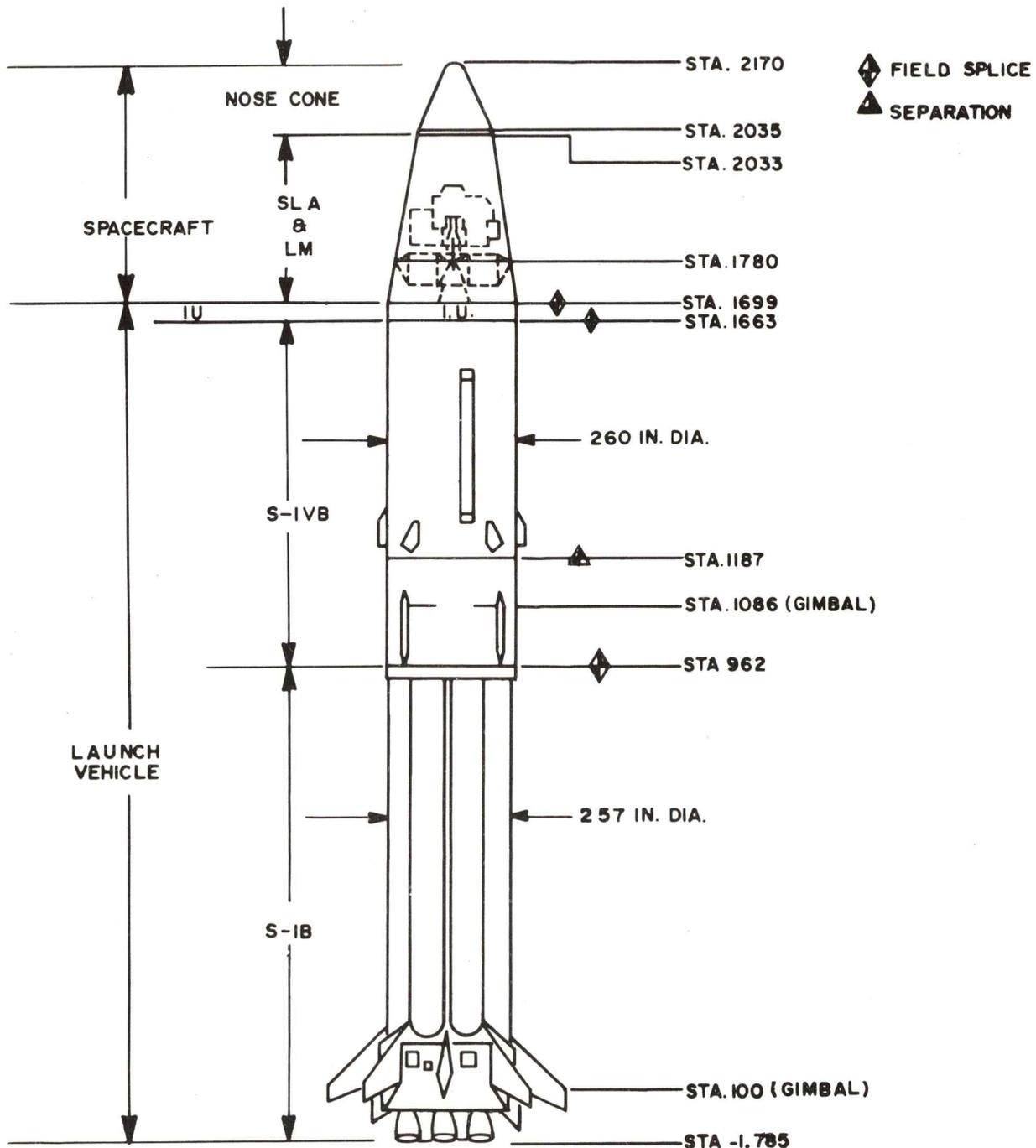


Figure 3. Saturn IB Configuration (SA-204, SA-206, SA-208, SA-210)

Figure 4. S-IB Saturn Inboard Profile (SA-201 and SA-202).

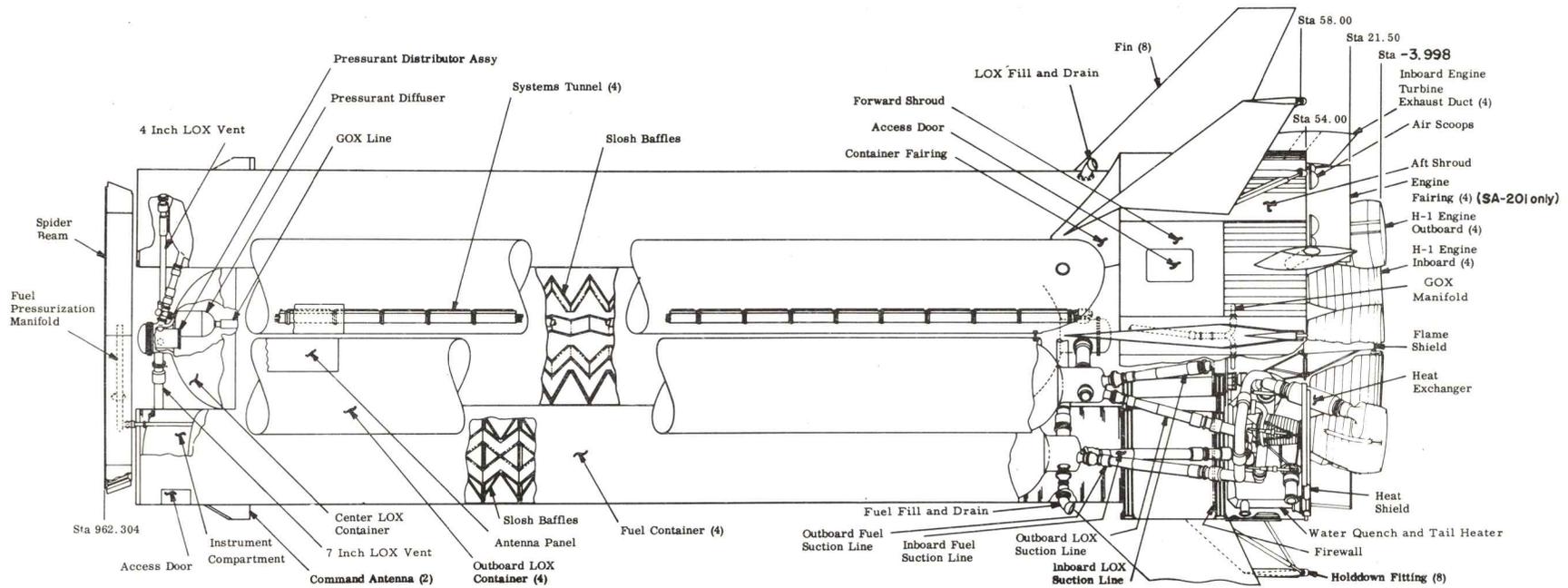


Figure 6. S-IVB Stage Inboard Profile.

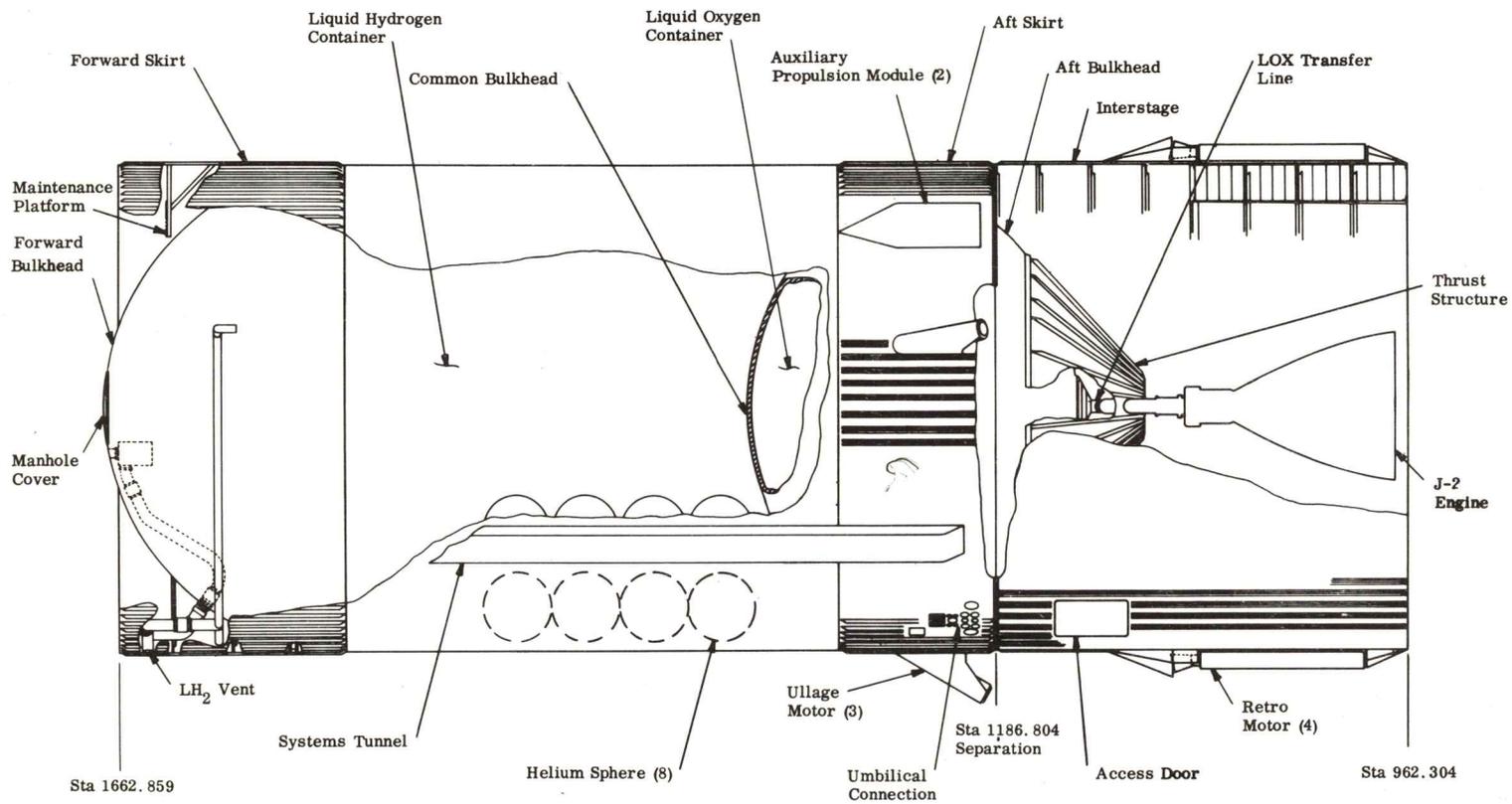
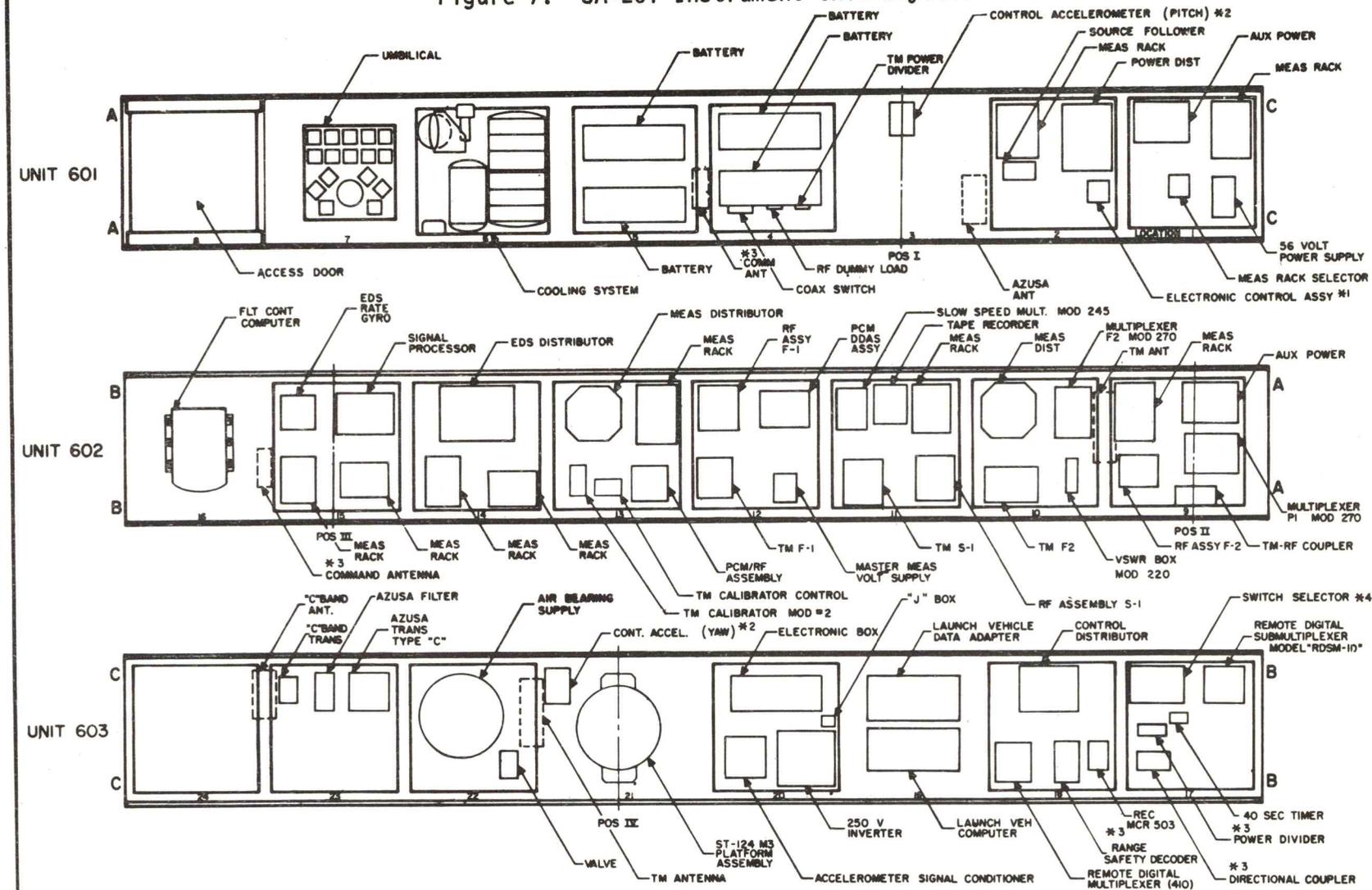


Figure 7. SA-201 Instrument Unit Layout.



*NOTES:

1. P&VE ENVR. CONT. COMP. (601A40), P&VE SUPPLIED.
2. TO BE FLOWN ON SATURN IB ONLY.
3. RANGE SAFETY DECODER AND RECEIVER *MCR 503 TO BE FLOWN ON SA-201 ONLY AS A PASSENGER.
4. SA-201-MOD 1

B	LAYOUT UPDATED	3 MAY 65
A	LAYOUT UPDATED TO REFLECT LATEST CHANGES.	15 DEC 64
LET	REVISION	DATE

ASTRONICS LAB
SYSTEMS ENG OFFICE

APPROVAL: *[Signature]*

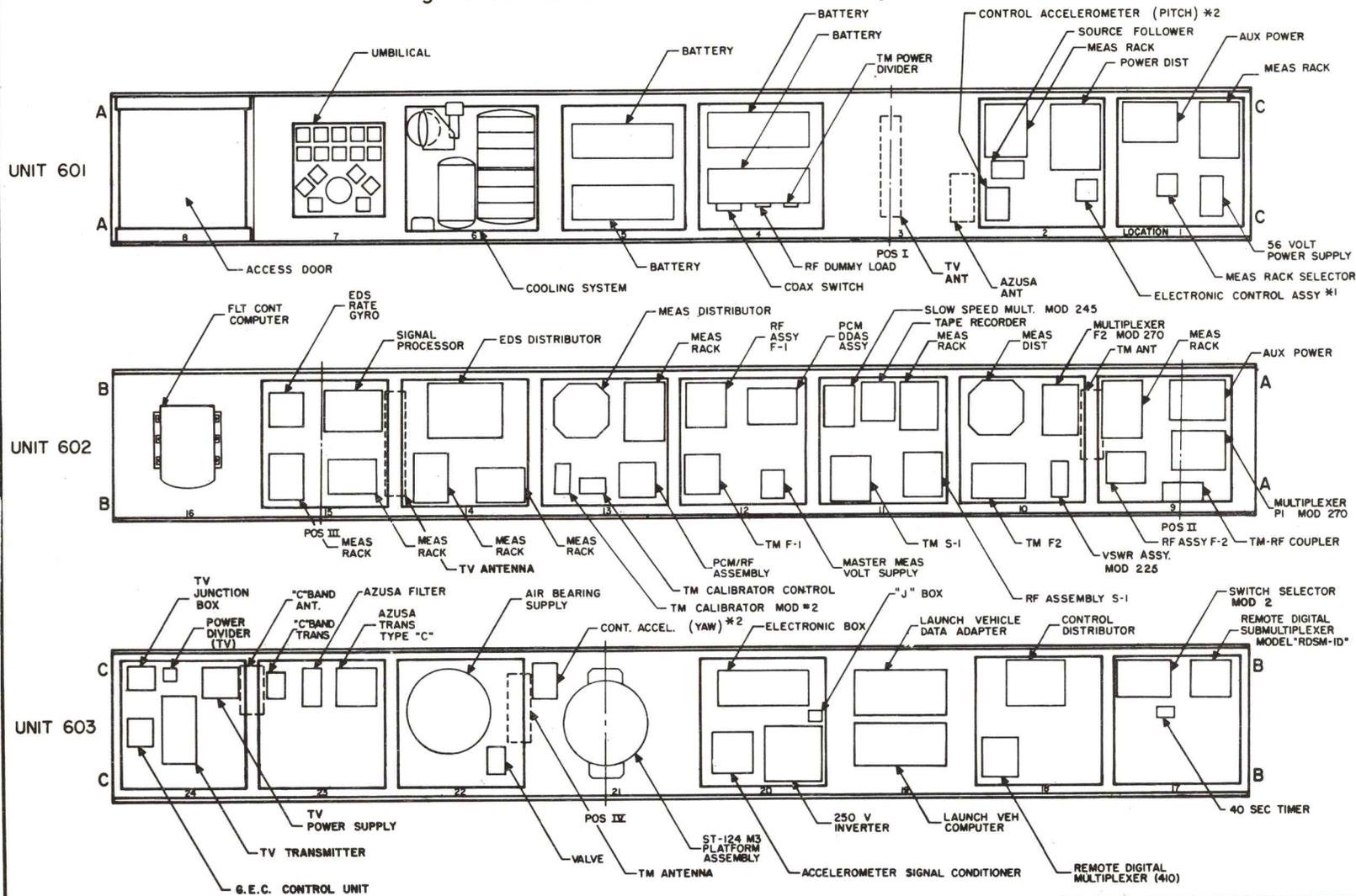
SATURN IB INSTRUMENT UNIT
EQUIPMENT LAYOUT
NON-ORBITAL R & D

DRAWN BY: *[Signature]*

SK-323B

SA-201

Figure 8. SA-202 Instrument Unit Layout.



*NOTES:

1. P & VE ENVR. CONT. COMP. (601A40), P & VE SUPPLIED.
2. TO BE FLOWN ON SATURN IB ONLY.

B	LAYOUT ADDED	7.1.64	31-AUG-66
A	LAYOUT ADDED	9/1	1-20-65
LET	REVISION		DATE

ASTRONICS LAB
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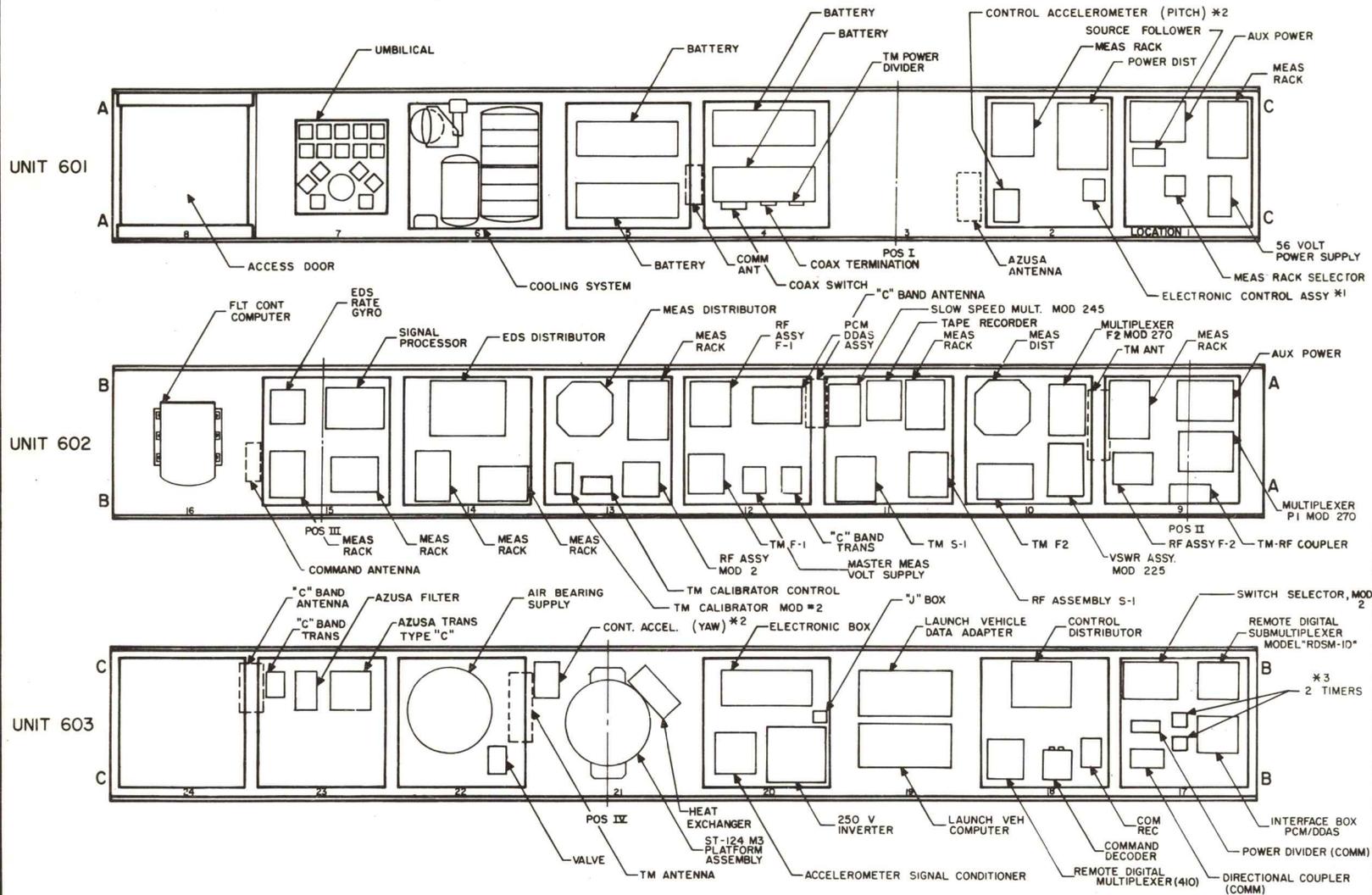
APPROVAL: *Ludie S. Richard*

SATURN IB INSTRUMENT UNIT
EQUIPMENT LAYOUT
NON-ORBITAL R & D
"PANEL DEPLOYMENT"
VEHICLE LAUNCHED

DRAWN BY: *[Signature]* SK-334 B

SA-202

Figure 10. SA-204 Instrument Unit Layout.



*NOTES:

1. P & VE ENVR. CONT COMP. (601A40), P & VE SUPPLIED.
2. TO BE FLOWN ON SATURN IB ONLY.
3. TIMER SETTING SUBJECT TO CHANGE

D	LAYOUT UPDATED	V.G.	31-AUG-66
C	LAYOUT UPDATED	H.H.W.	22-NOV-65
B	LAYOUT UPDATED	V.S.R.	3-MAY-65
A	LAYOUT ADDED		TO REFLECT LATEST CHANGES.
LET	REVISION		DATE

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APPROVAL: *Judith S. Richard*

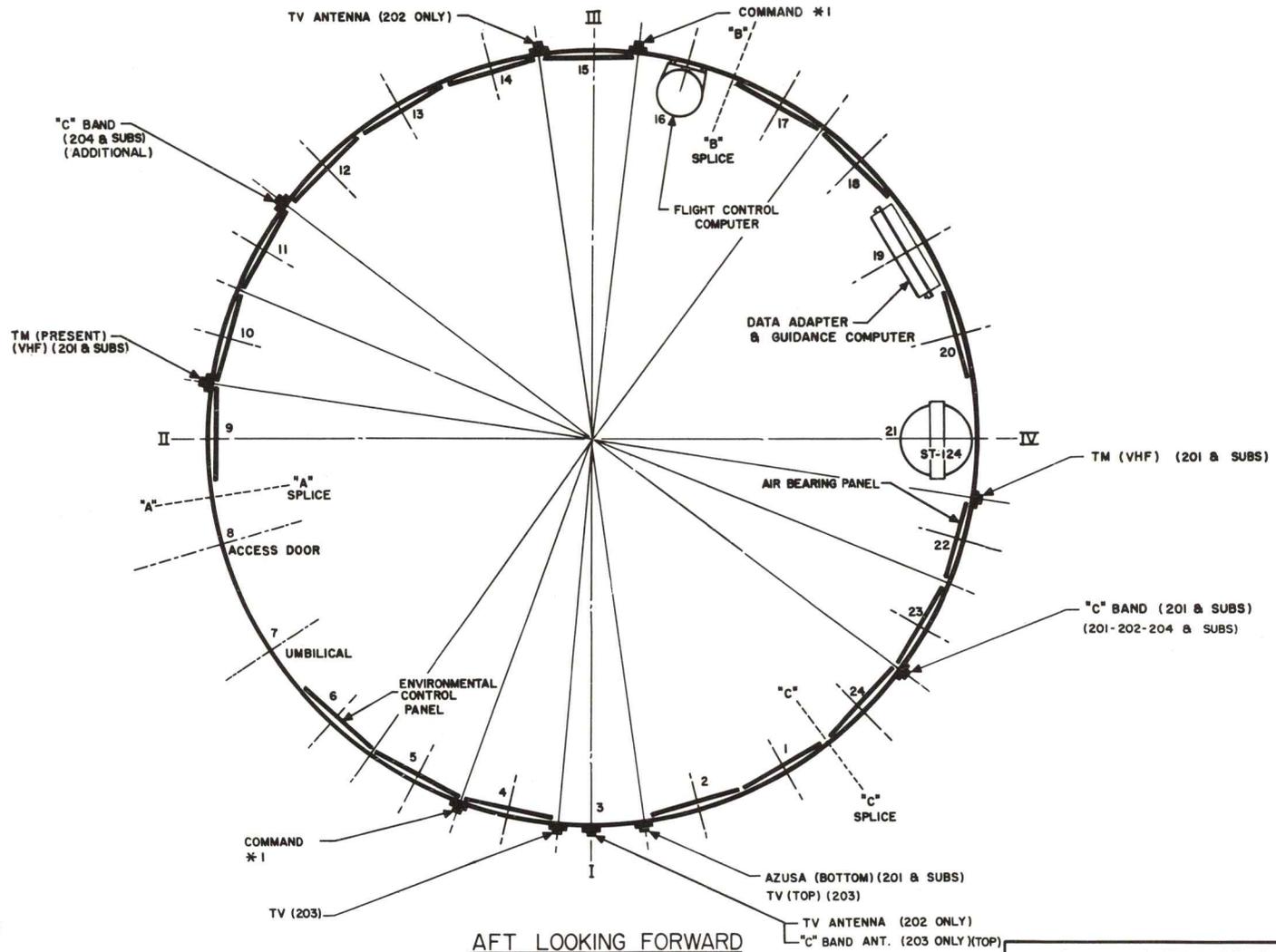
SATURN IB INSTRUMENT UNIT
EQUIPMENT LAYOUT
ORBITAL R & D

DRAWN BY: *James Traeger*
R. J. Lannon

SK 324 D

SA-204

Figure 12. Saturn IB Instrument Unit Layout Antenna Orientation.



NOTES:

- * 1 - COMMAND (ON 201, 203 & SUBS) (OFF 202)
- * 2 - ALL ANTENNAS SUBJECT TO CHANGE IN ORIENTATION AND ANTENNA TYPES DUE TO REQUIREMENTS ESTABLISHED BY THE VEHICLE TRAJECTORIES AND MISSION REQUIREMENTS.

AFT LOOKING FORWARD

LET	REVISION	DATE
D	LAYOUT UPDATED	31-AUG-66
C	LAYOUT UPDATED	22-MAY-66
B	LAYOUT UPDATED	1-JULY-65
A	LAYOUT ADDED	3-MAY-65

ASTRONICS LAB
SYSTEMS ENG OFFICE

APPROVAL: *James W. Harker*
Paul S. Richard

SATURN IB INSTRUMENT UNIT
EQUIPMENT LAYOUT
ANTENNA ORIENTATION

DRAWN BY: *[Signature]* SK 331 D

ALL VEHICLES-I-B

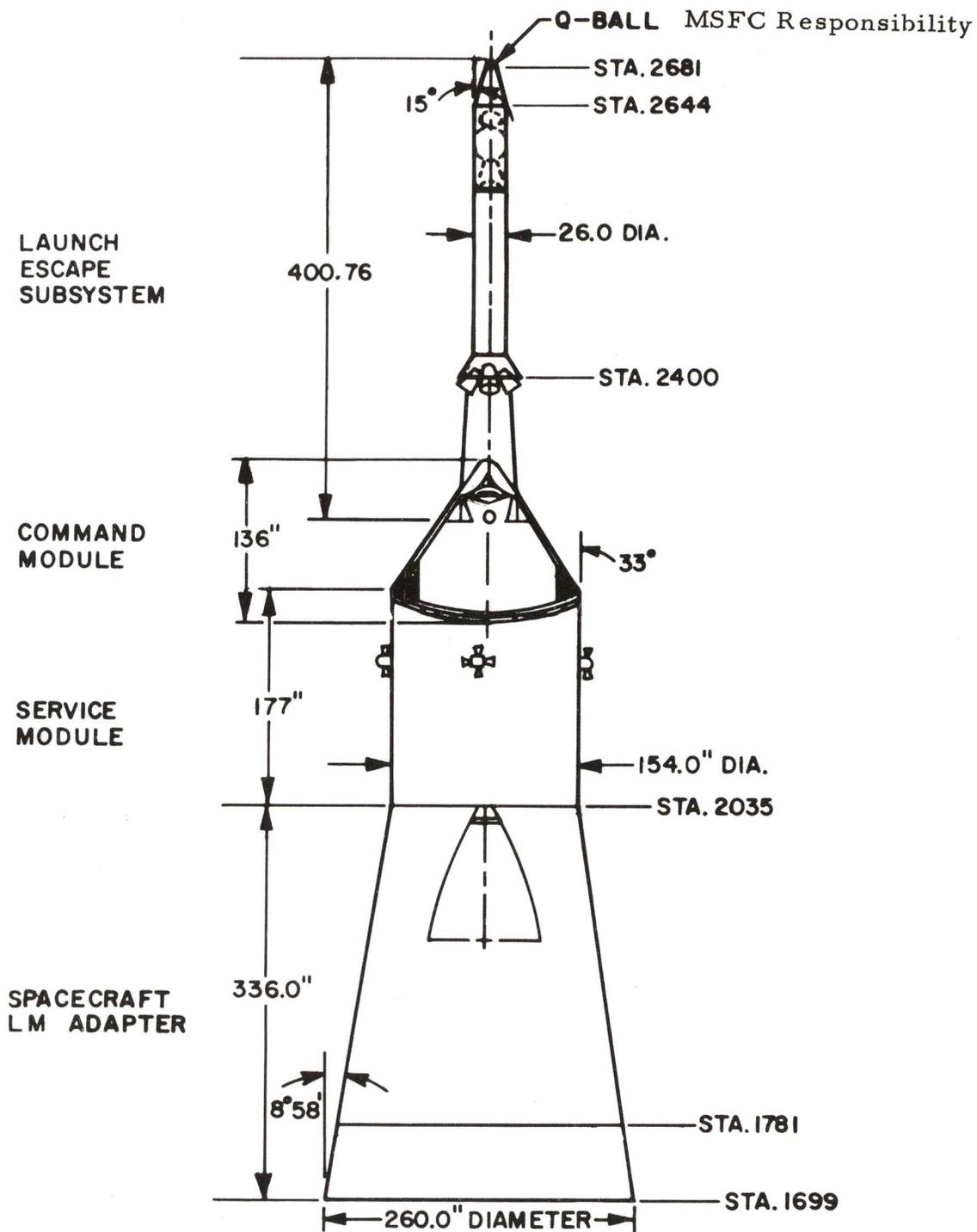


Figure 13. Typical Apollo Spacecraft with CSM Reference Dimensions.

Figure 14. AS-201 Trajectory Performance Profile.

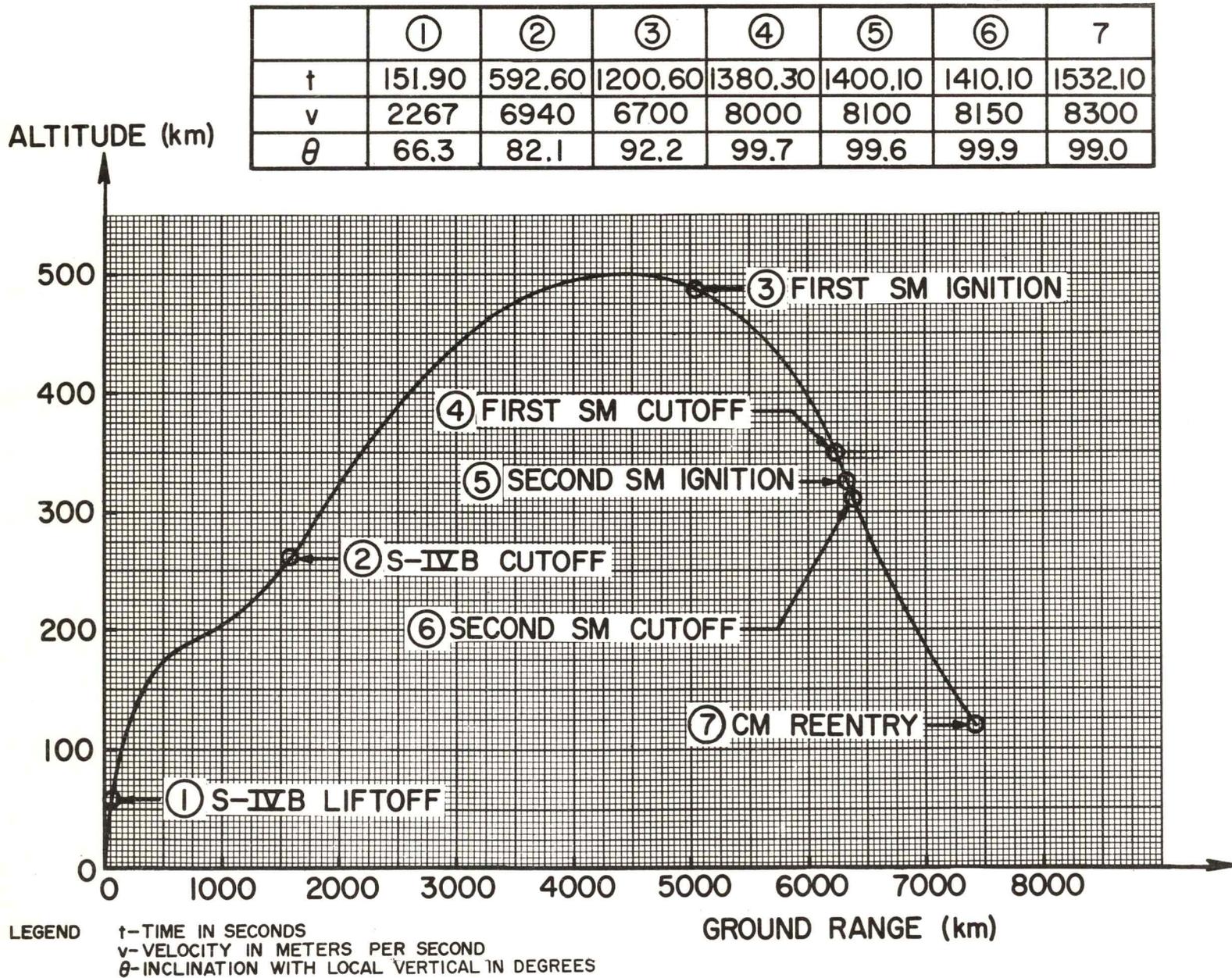
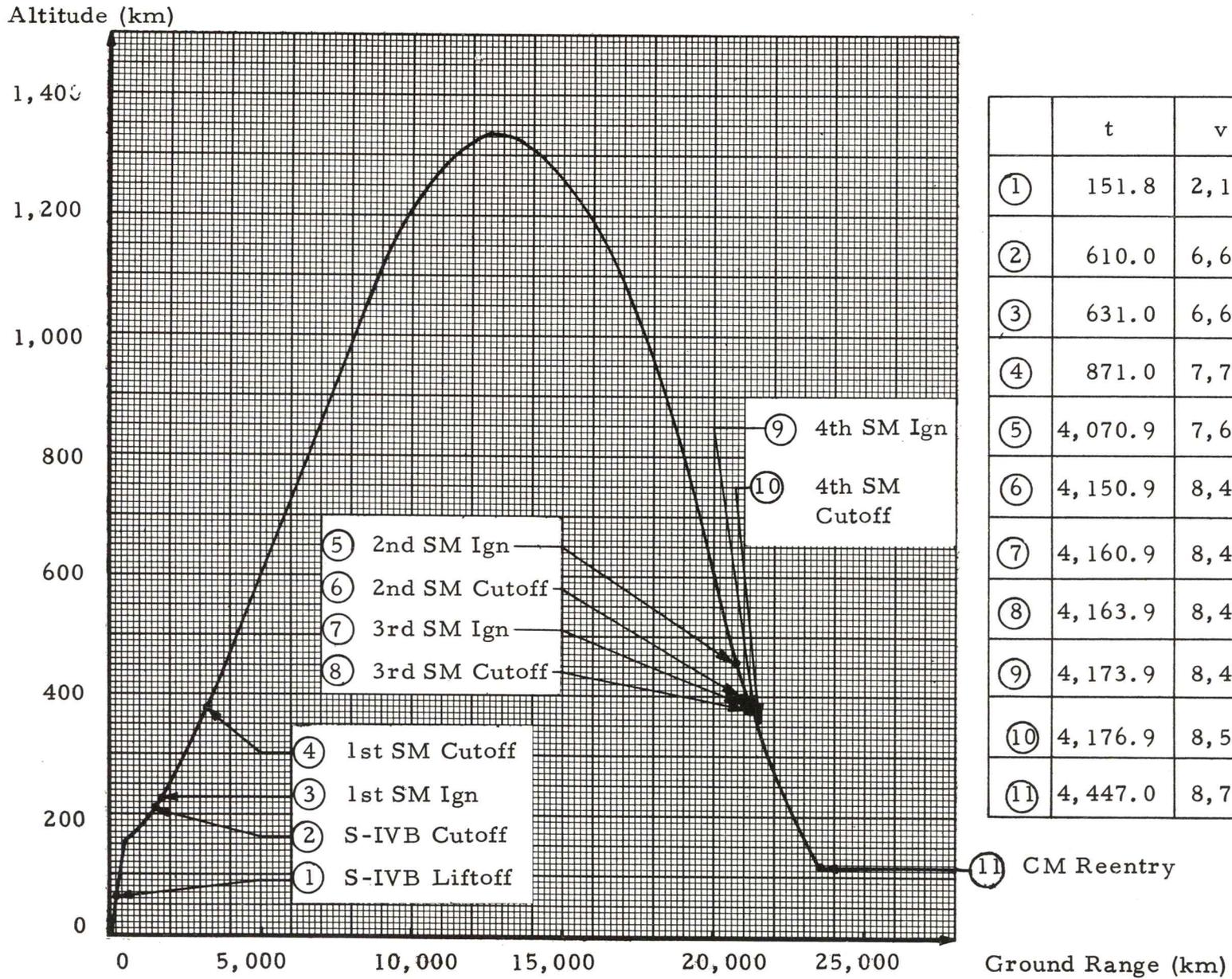


Figure 15. AS-202 Trajectory Performance Profile.

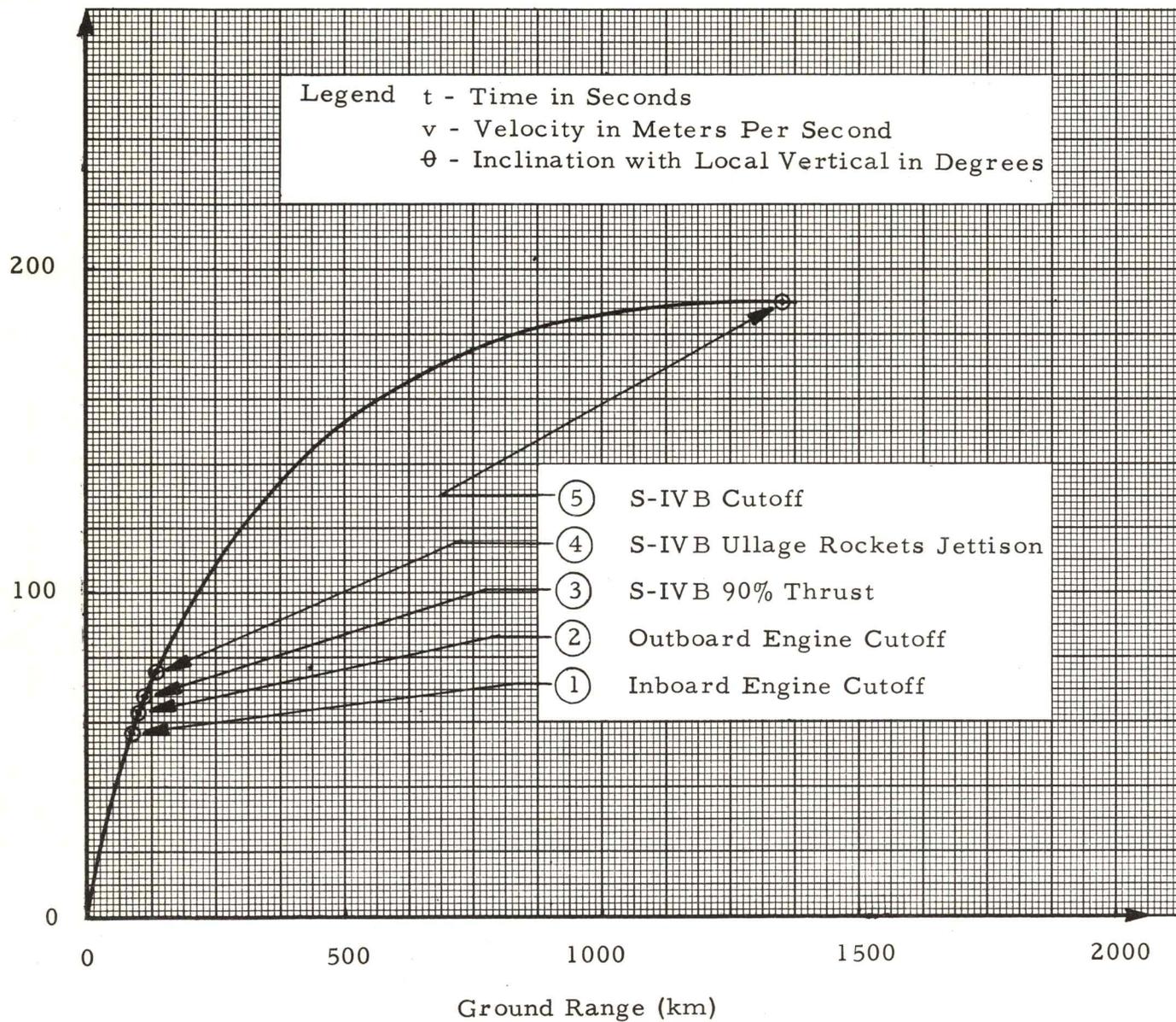


	t	v	θ
①	151.8	2,113	63.5
②	610.0	6,645	85.1
③	631.0	6,629	85.5
④	871.0	7,744	82.8
⑤	4,070.9	7,658	97.0
⑥	4,150.9	8,413	97.6
⑦	4,160.9	8,424	97.5
⑧	4,163.9	8,456	97.5
⑨	4,173.9	8,468	97.3
⑩	4,176.9	8,500	97.3
⑪	4,447.0	8,737	93.5

t = Time (sec), v = Velocity (m/sec), θ = Inclination with Local Vertical (deg)

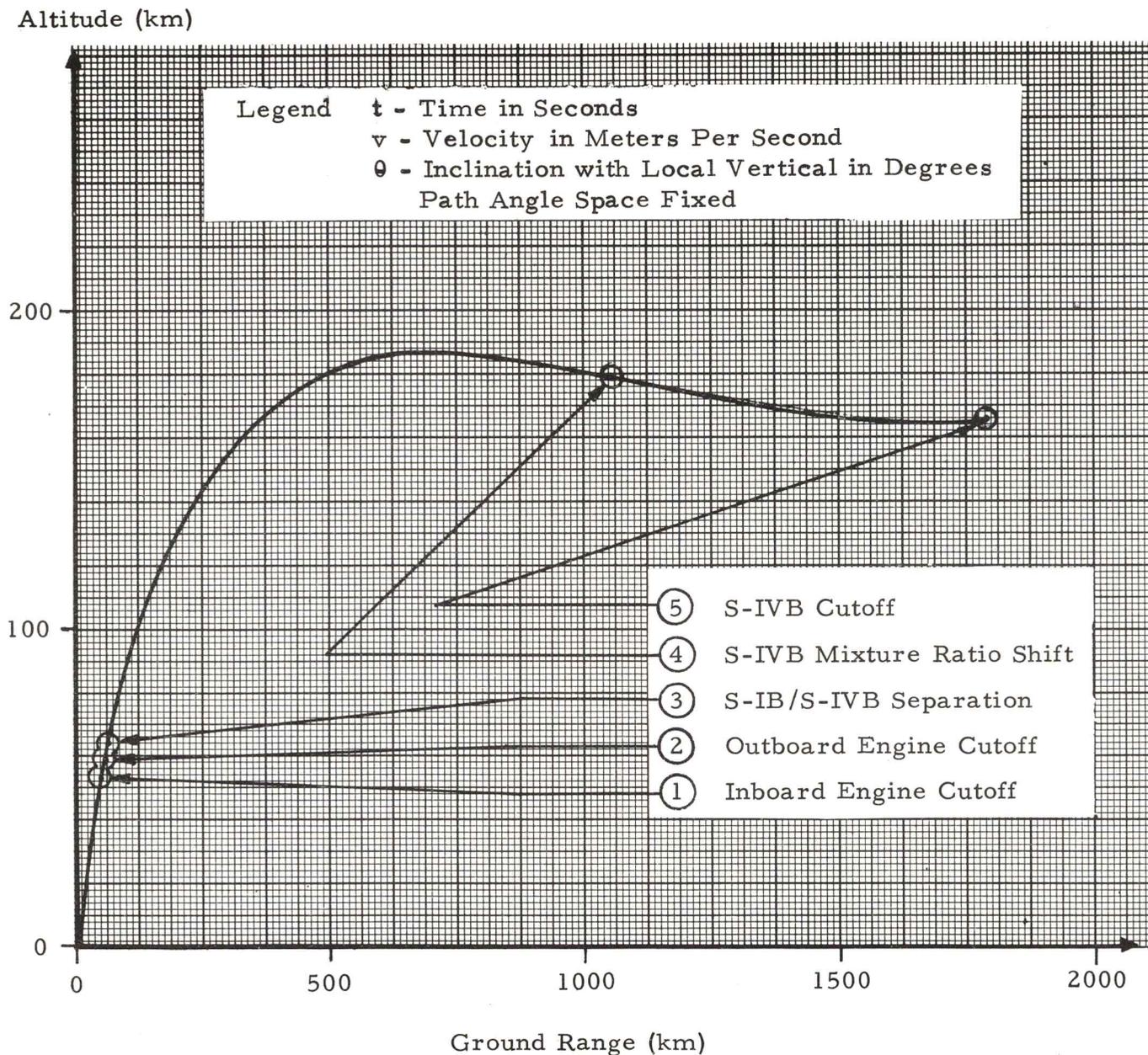
Figure 16. AS-203 Trajectory Performance Profile.

Altitude (km)



	t	v	θ
①	141.2	2887	71.4
②	147.2	3044	72.1
③	152.7	3039	72.9
④	162.7	3112	74.2
⑤	446.5	7793	90.0

Figure 17. AS-204 Trajectory Performance Profile



	t	v	θ
①	139.14	2309.91	62.15
②	142.14	2368.73	62.61
③	143.52	2369.58	62.85
④	475.75	5483.43	91.47
⑤	598.15	7821.49	90.00

Figure 18. AS-205 Trajectory Performance Profile.

Altitude (km)

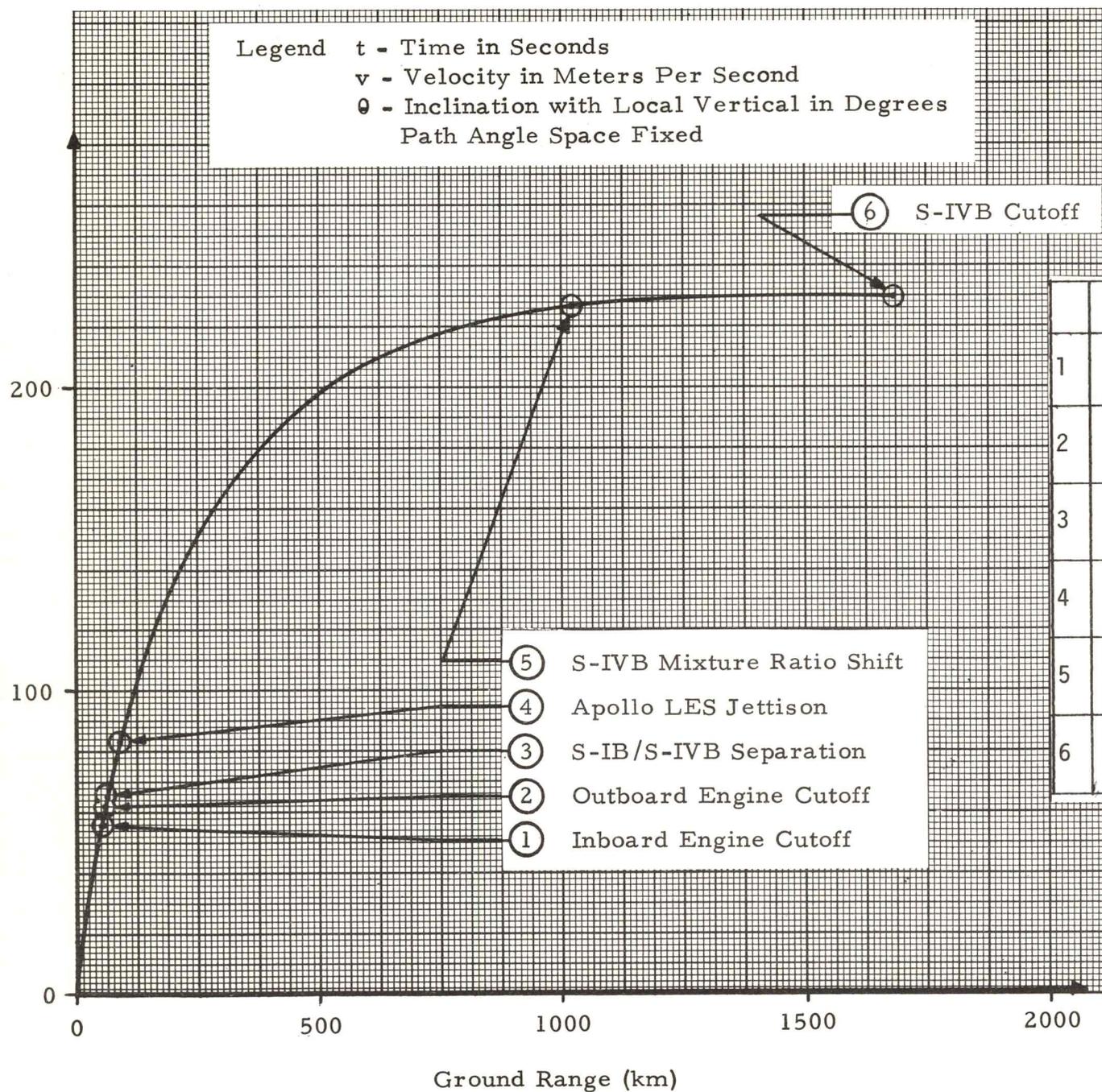


Figure 19. AS-207/AS-206 Trajectory Performance Profile.

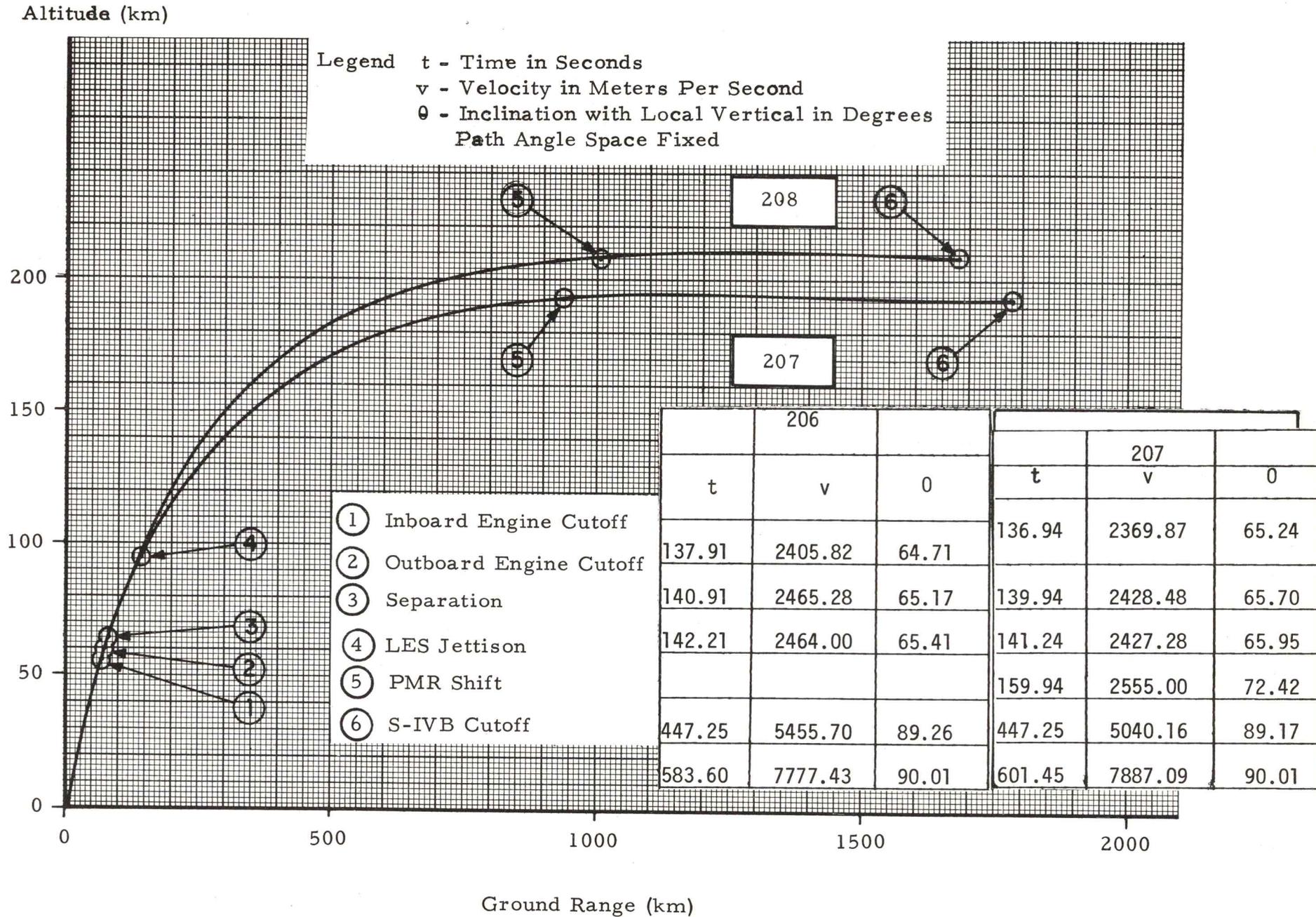


Figure 20. Saturn IB Delivery Schedule
AS-201 Thru AS-206

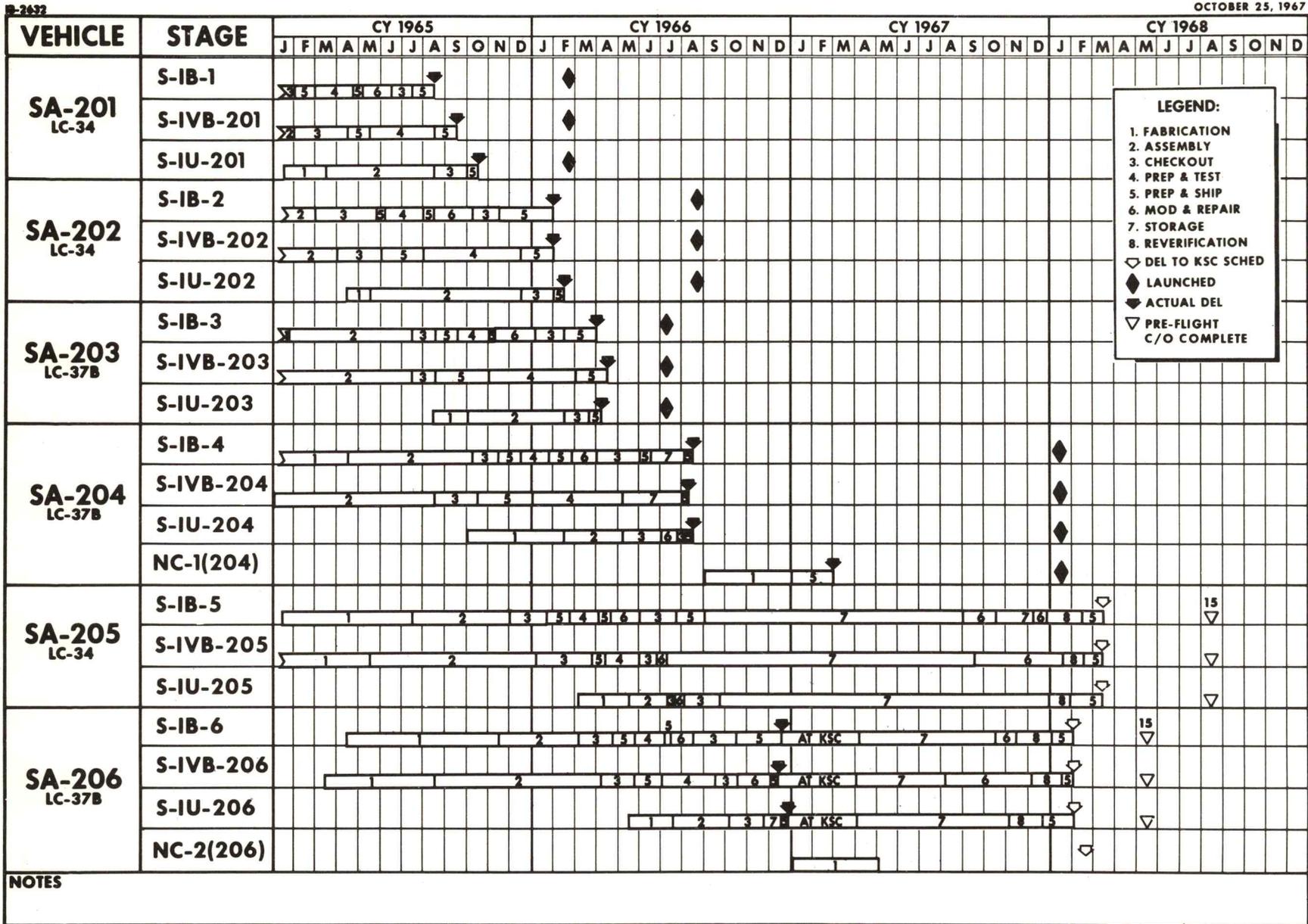


Figure 20. Saturn IB Delivery Schedule (AS-207 thru AS-212).

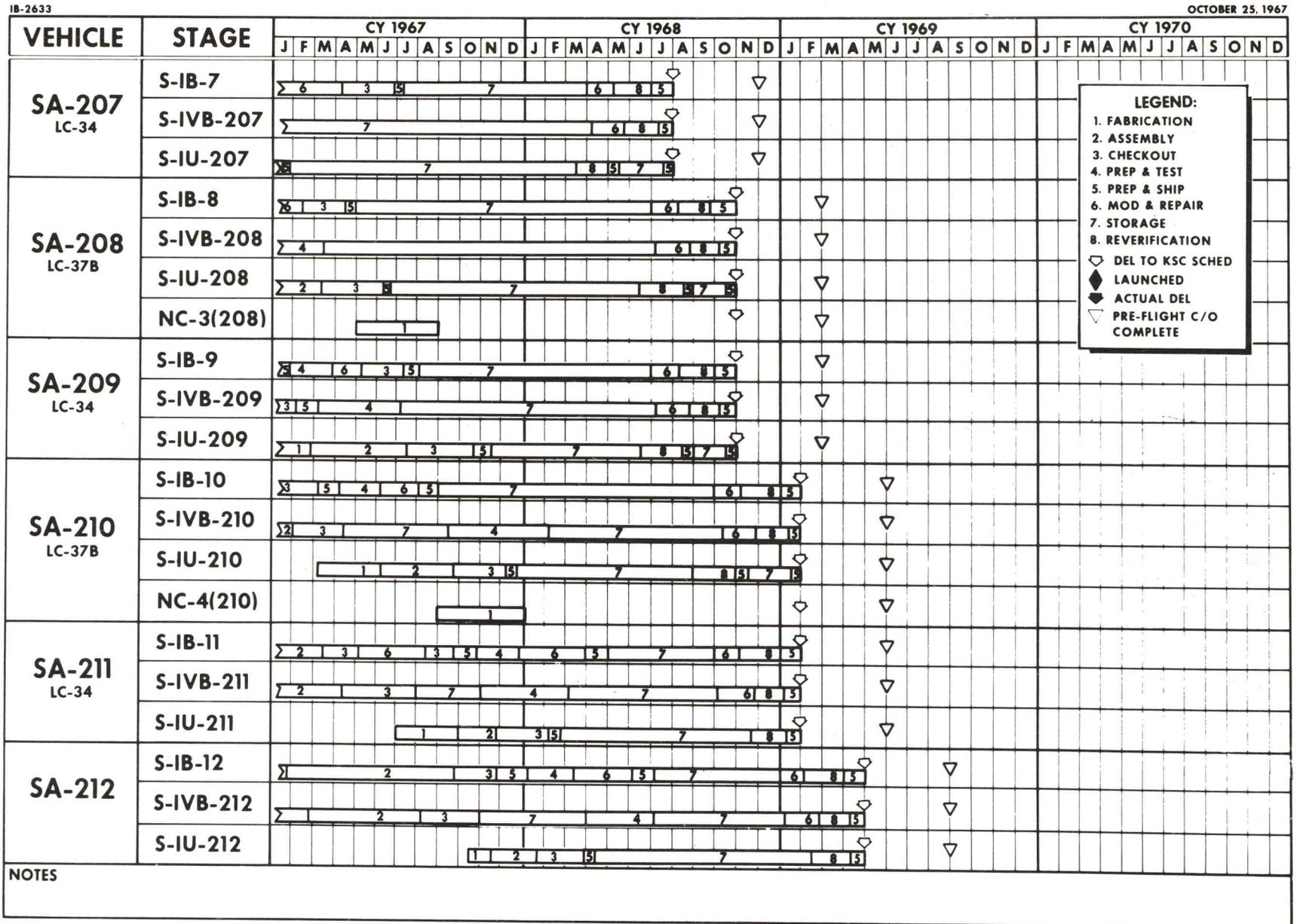


Figure 21. Saturn IB Operational Sequence (AS-205).

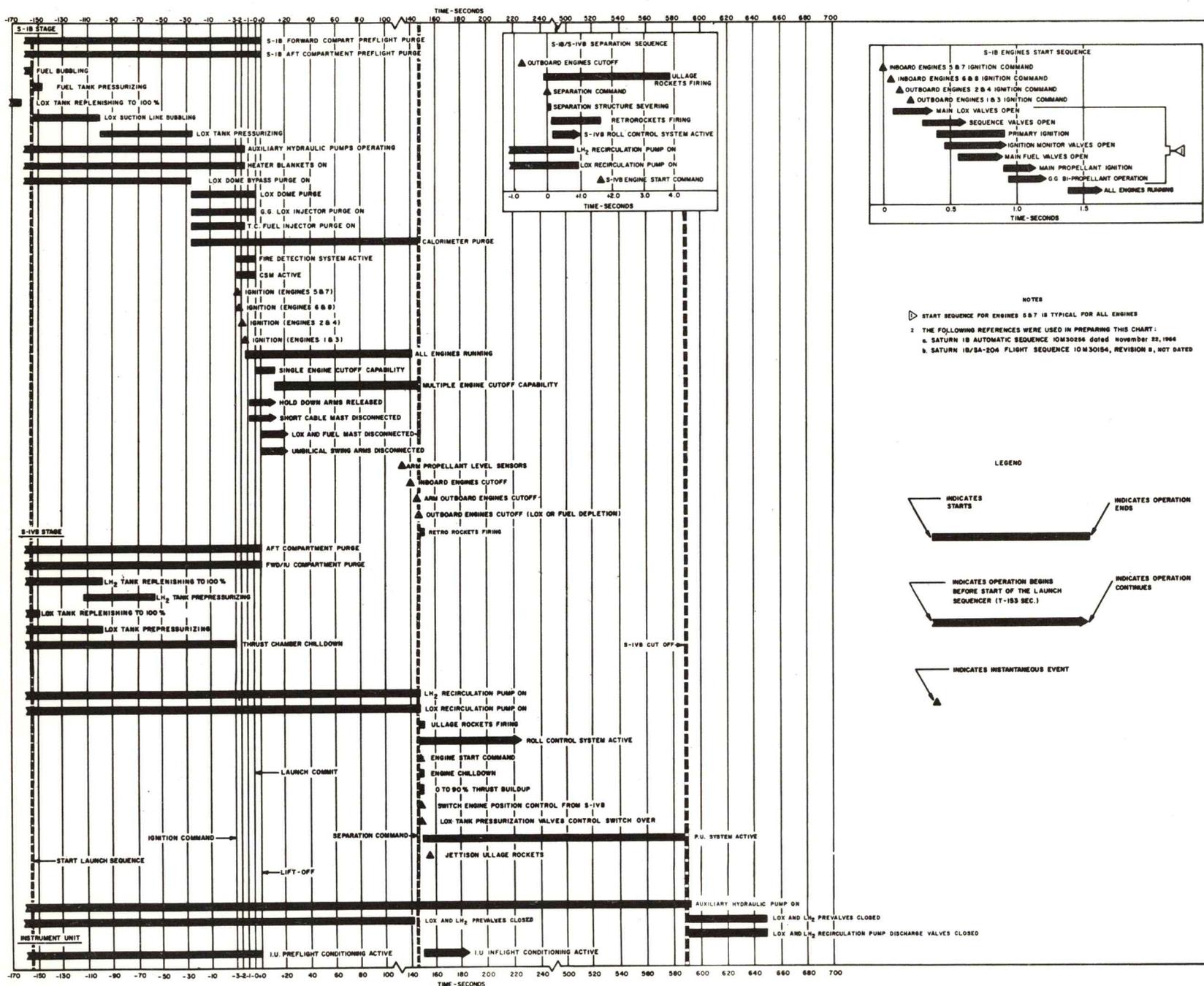
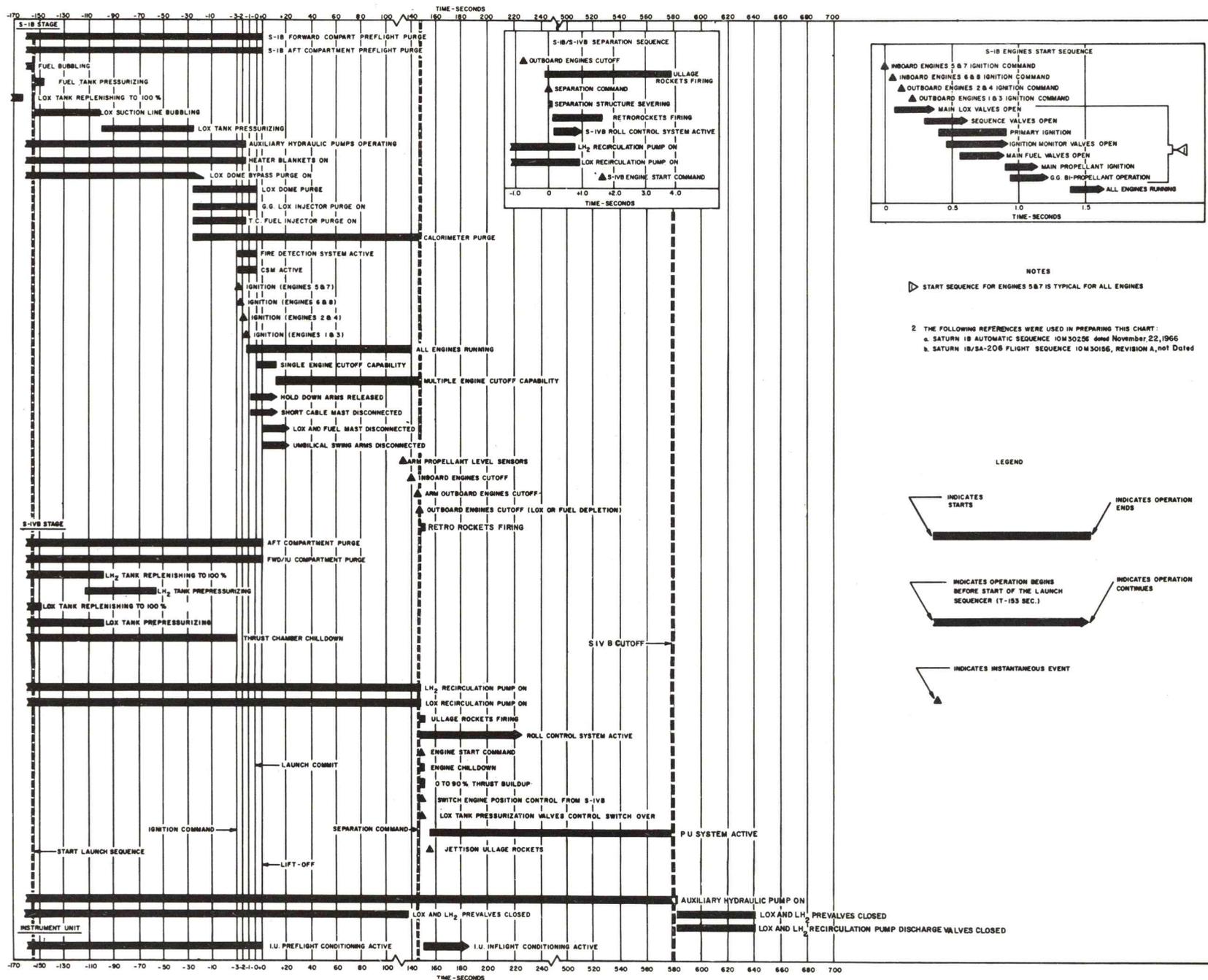


Figure 22. Saturn IB Operational Sequence (SA-206).



NOTE: UPDATED FIGURE WILL BE INCORPORATED WHEN AVAILABLE.

Figure 23. Launch Complex 37.

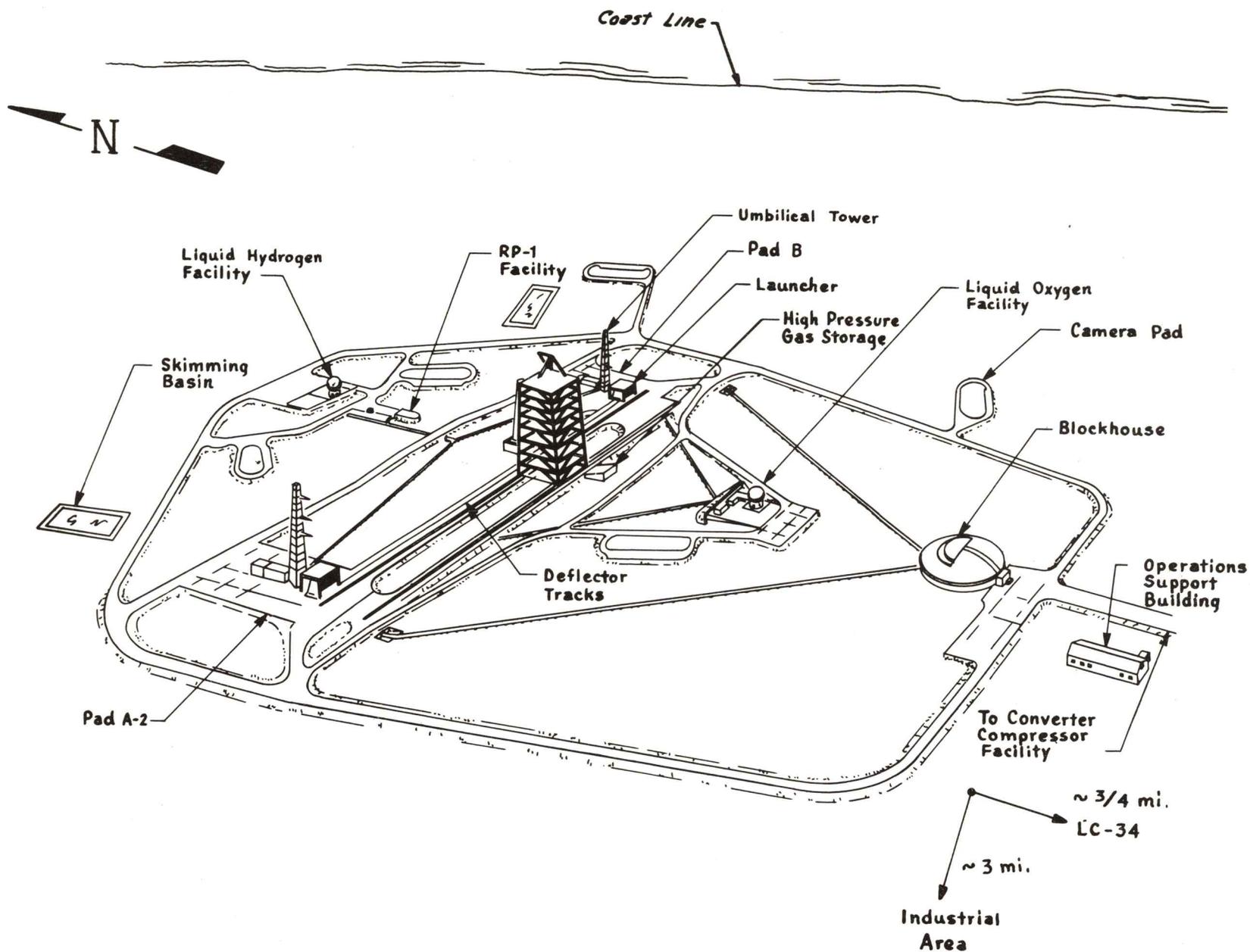


Figure 24. Launch Complex 34.

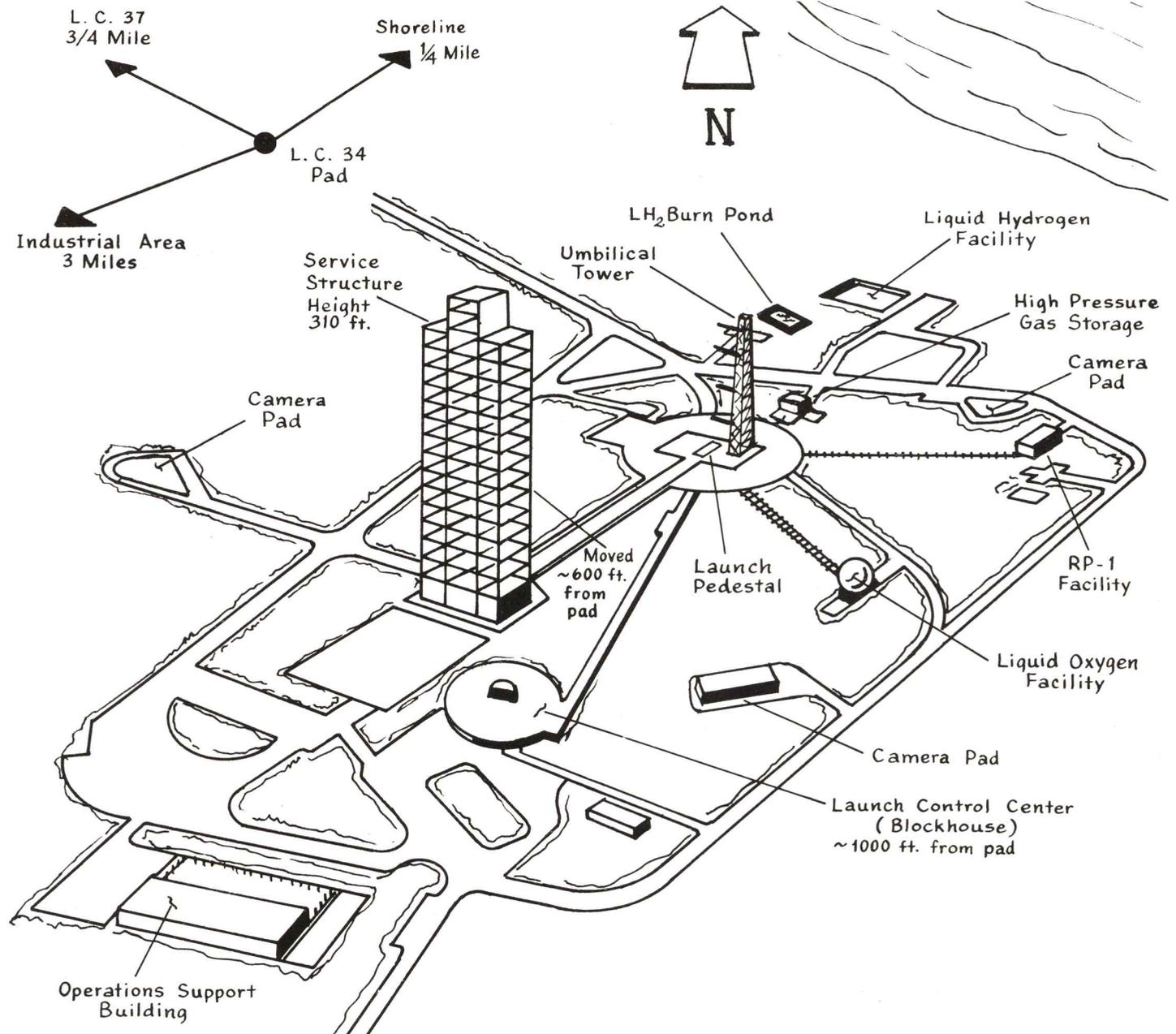


Figure 25. Saturn IB and Umbilical Tower (LC 34) Orientation.

