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Final Report D.R. Karl (Autonetics)
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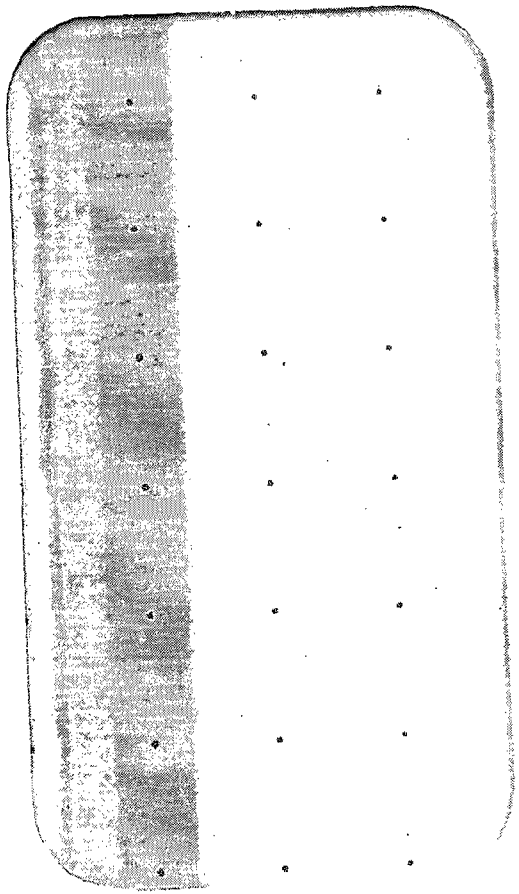

Autonetics
North American Rockwell

CR-128577

C71-999/401

ANALYSIS OF A DISPLAY AND CONTROL SYSTEM MAN-MACHINE INTERFACE CONCEPT

FINAL REPORT

VOLUME II

APPENDICES A & B

8 September 1972

Prepared under Contract No. NAS 9-12266 for
Manned Spacecraft Center
National Aeronautics & Space Administration

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FOREWORD

This final report covers the work performed by Autonetics Division of North American Rockwell Corporation under a study contract entitled Analysis of a Display and Control System Man-Machine Interface Concept. The report is submitted to the National Aeronautics and Space Administration Manned Spacecraft Center under the requirements of Contract NAS 9-12266. The study program covered the period from October 1, 1971 through August 31, 1972. The NASA technical monitor was Mr. G. K. Raines.

The final report consists of four (4) volumes:

Volume I.	Final Technical Report
➔Volume II.	Appendix A. Principal Subsystems of Phase B Orbital Vehicle used in the Analysis.
	Appendix B. Control and Display Data Required for Crew Operations.
Volume III.	Appendix C. Formats and Format Trees
	Appendix D. Coding of Sample Format
	Appendix E. Principal Subsystems of NR-SD Winning Proposal Orbital Vehicle
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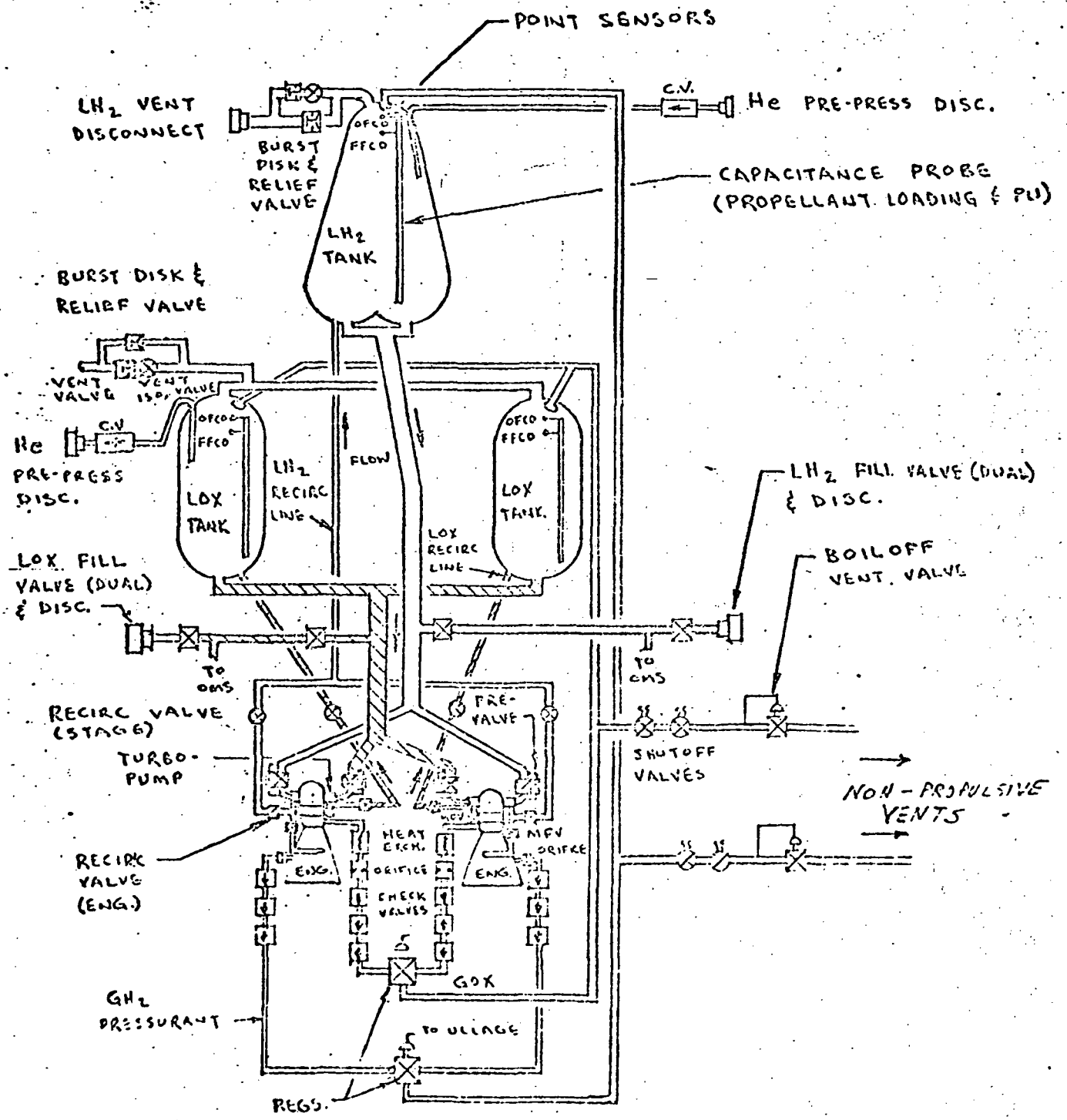
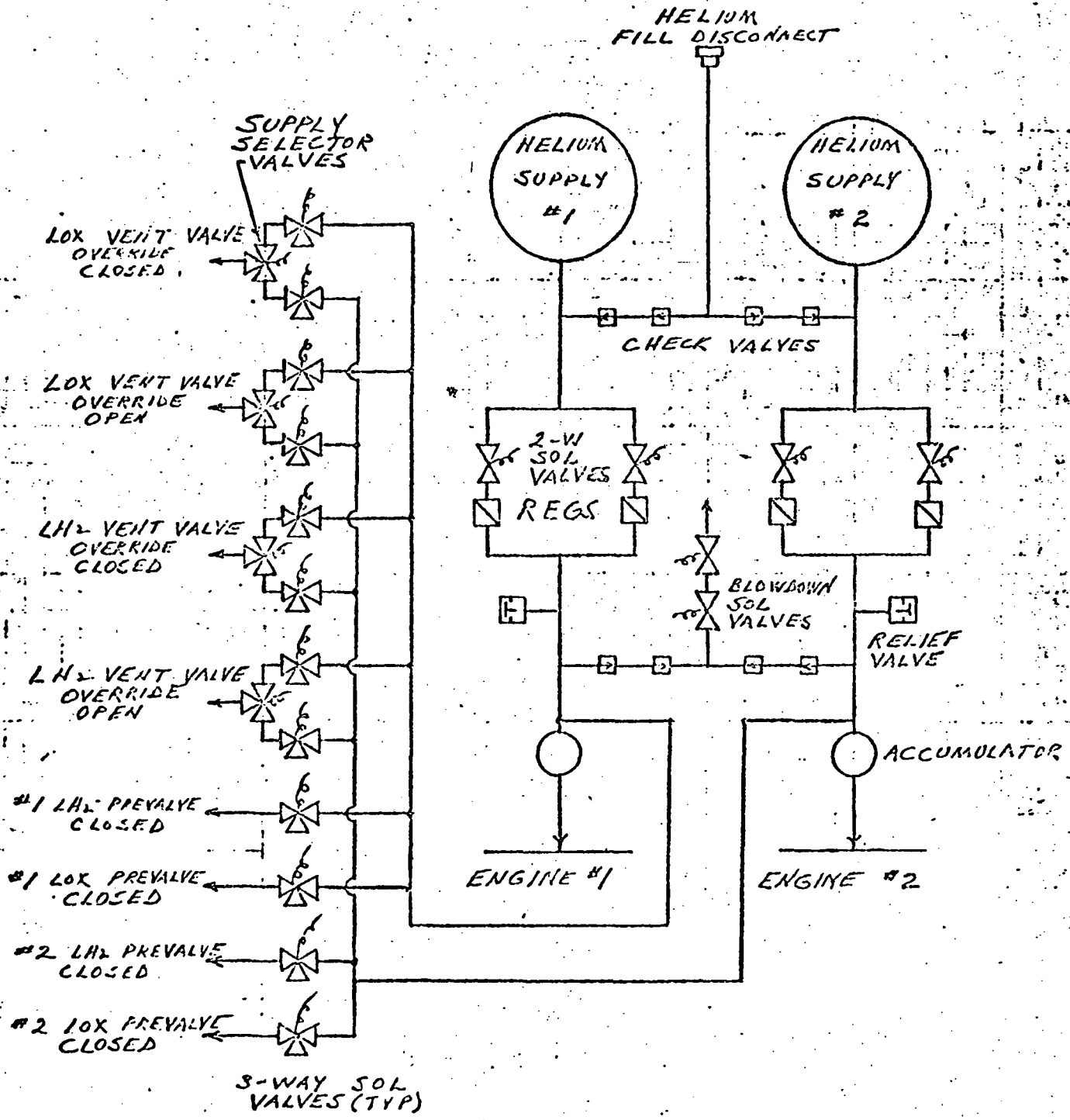
APPENDIX A

Principle subsystems of North American Rockwell Space Division Phase B Orbital Vehicle used in analysis

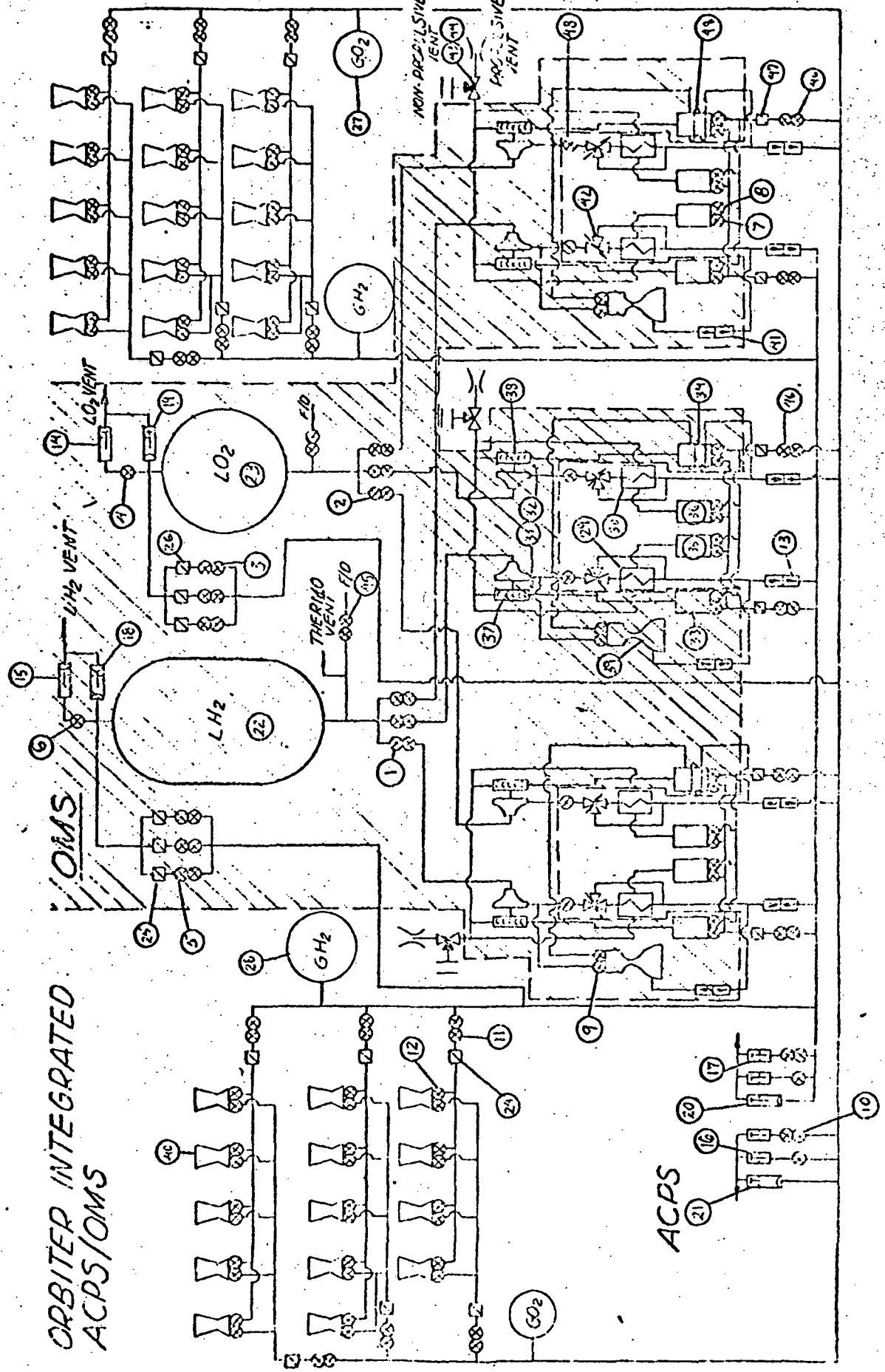
ORBITER MAIN PROPULSION SYSTEM

DELTA WING

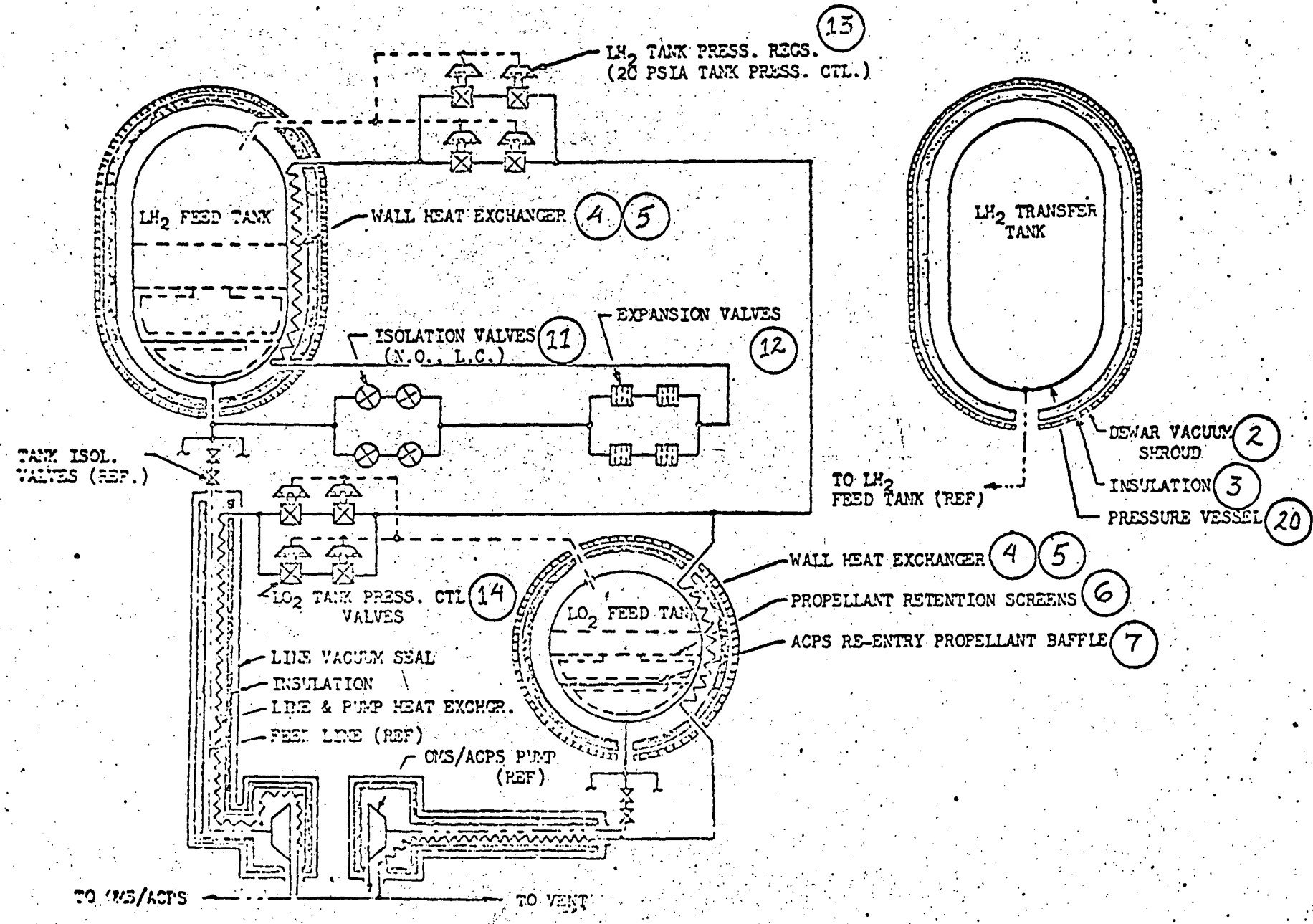


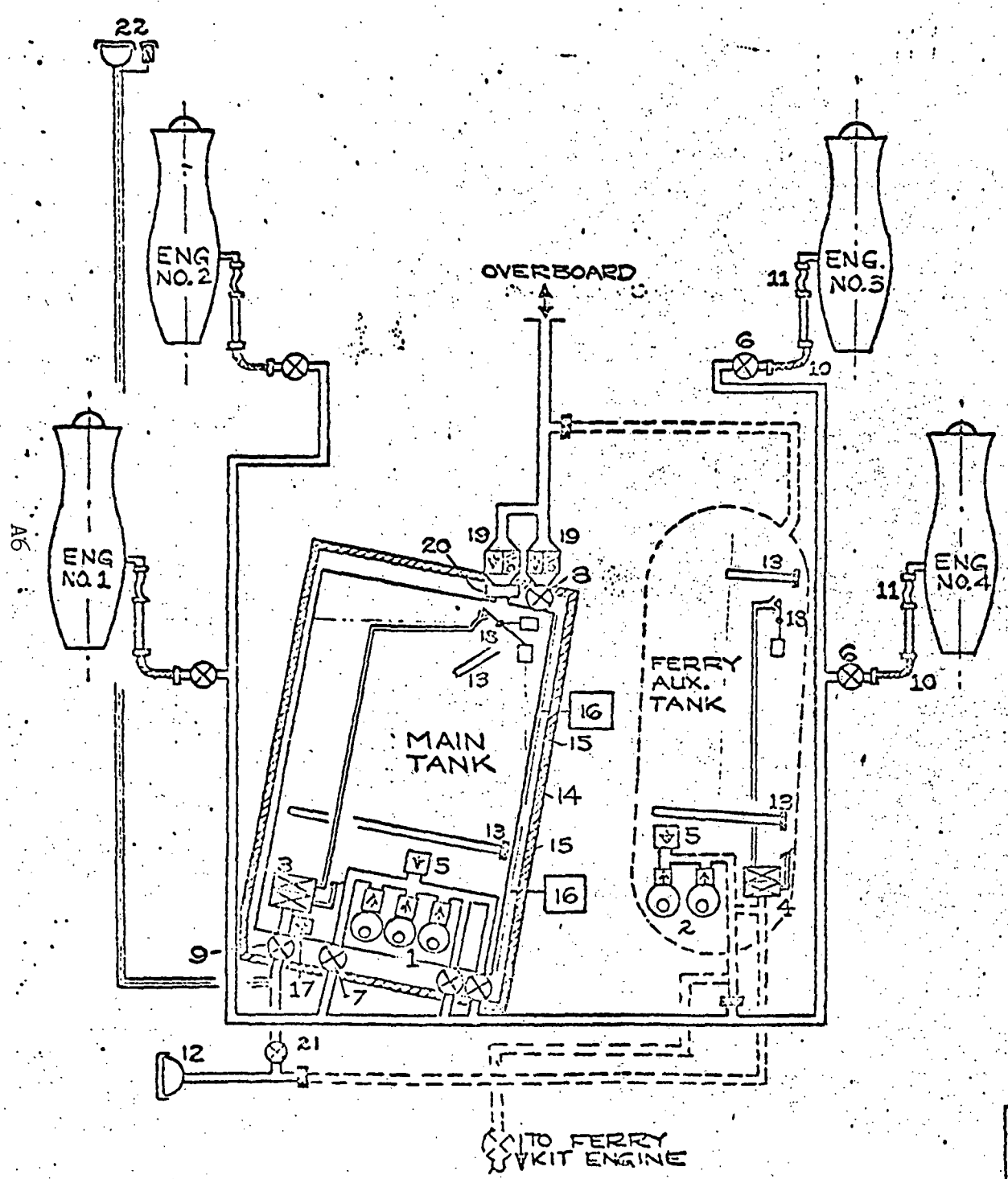


ORBITER PNEUMATIC SYSTEM


ORBITER INTEGRATED ACPS/OMS
OMS
ACPS
GO_2
GH_2
LO_2
LH_2
NON-PROPULSIVE VENT
PROPULSIVE VENT
LO_2 VENT
LH_2 VENT
THERMO VENT
FIO

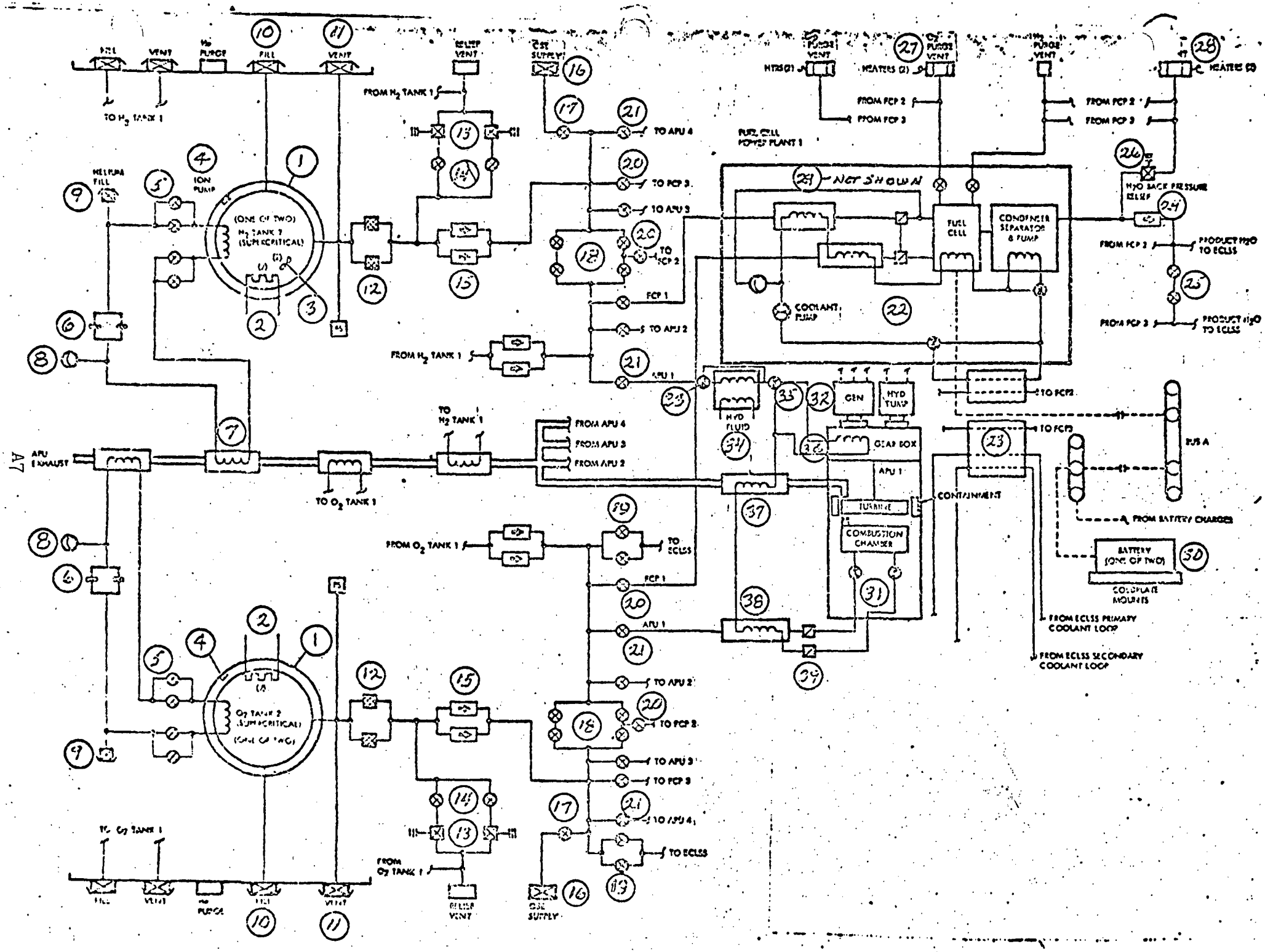
OMS AND ACPS TANKAGE SYSTEM SCHEMATIC

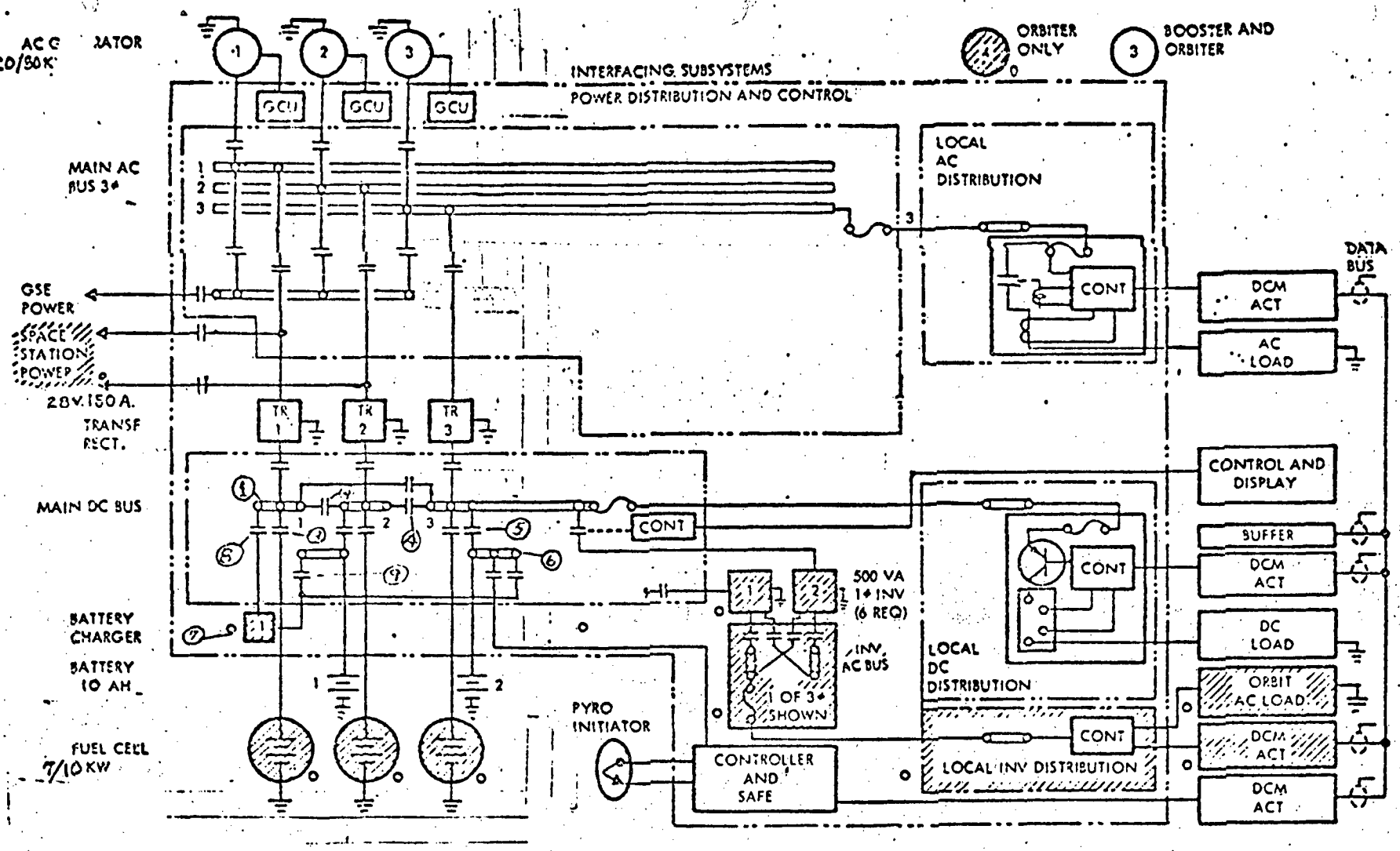




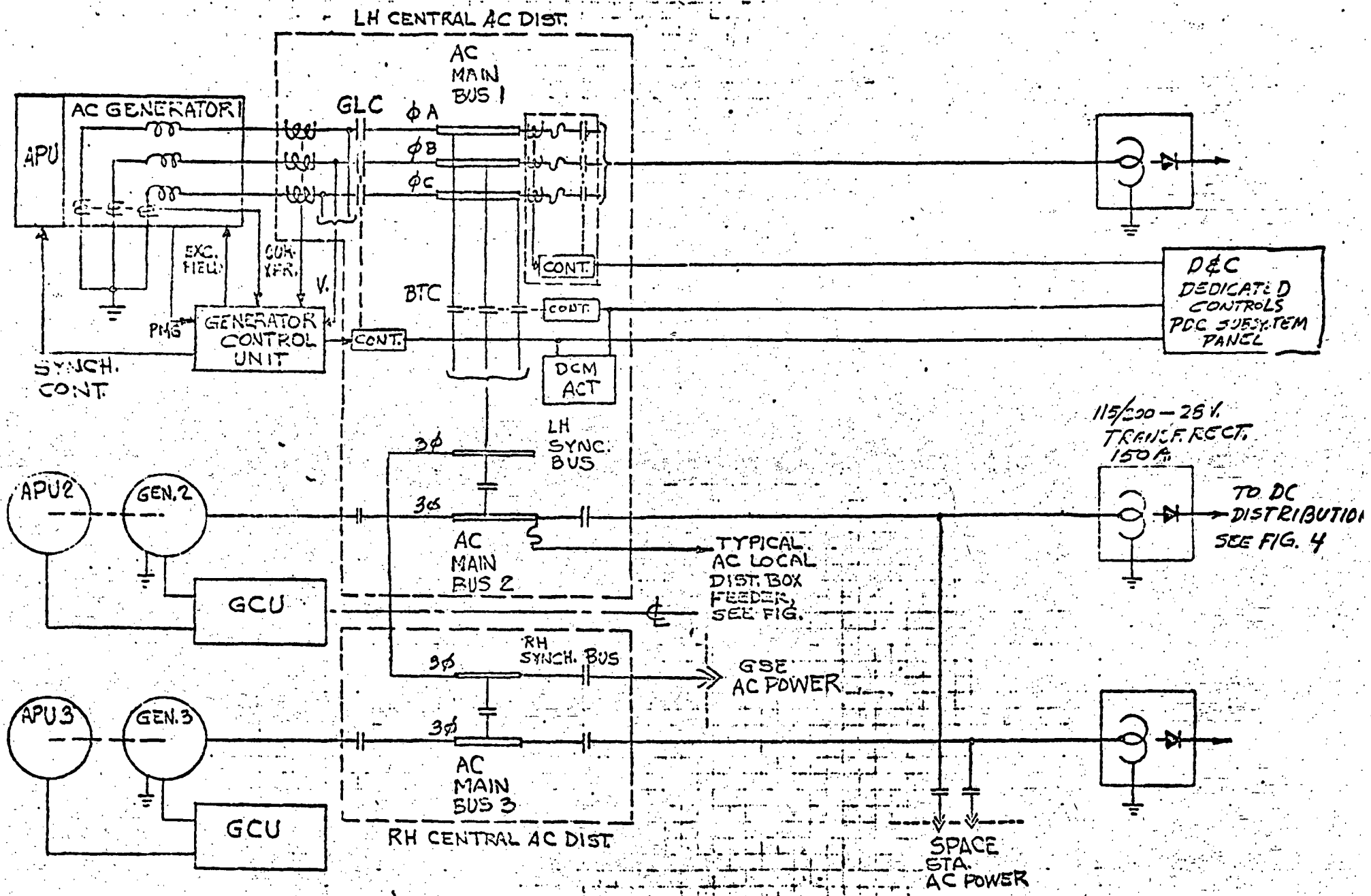
1. BOOSTER PUMP-MAIN TANK
2. BOOSTER PUMP-AUX. TANK
3. LEVEL CONTROL VALVE-MAIN TANK
4. LEVEL CONTROL VALVE-AUX. TANK (N.C.)
5. SUCTION FEED CHECK VALVE
6. ENGINE ISOLATION VALVE
7. TANK ISOLATION VALVE-FEED SYSTEM
8. TANK ISOLATION VALVE-VENT SYSTEM
9. TANK ISOLATION VALVE-FILL & DRAIN
10. ENGINE DEPLOYMENT COUPLING HOSE
11. ENGINE CONNECTOR HOSE
12. FILL & DRAIN ADAPTER & CAP (GROUND)
13. FUEL GAGING PROBE
14. BLANKET INSULATION
15. BLANKET HEATER
16. HEATER CONTROL UNIT
17. DRAIN CHECK VALVE
18. LEVEL CONTROL VALVE SENSOR
19. VENT VALVE
20. TANK VENT BURST DISC
21. HORIZONTAL SERVICING ISO VALVE
22. FILL & DRAIN ADAPTER & CAP (VERTICAL MODE)

ABES FUEL SYSTEM SCHEMATIC DIAGRAM

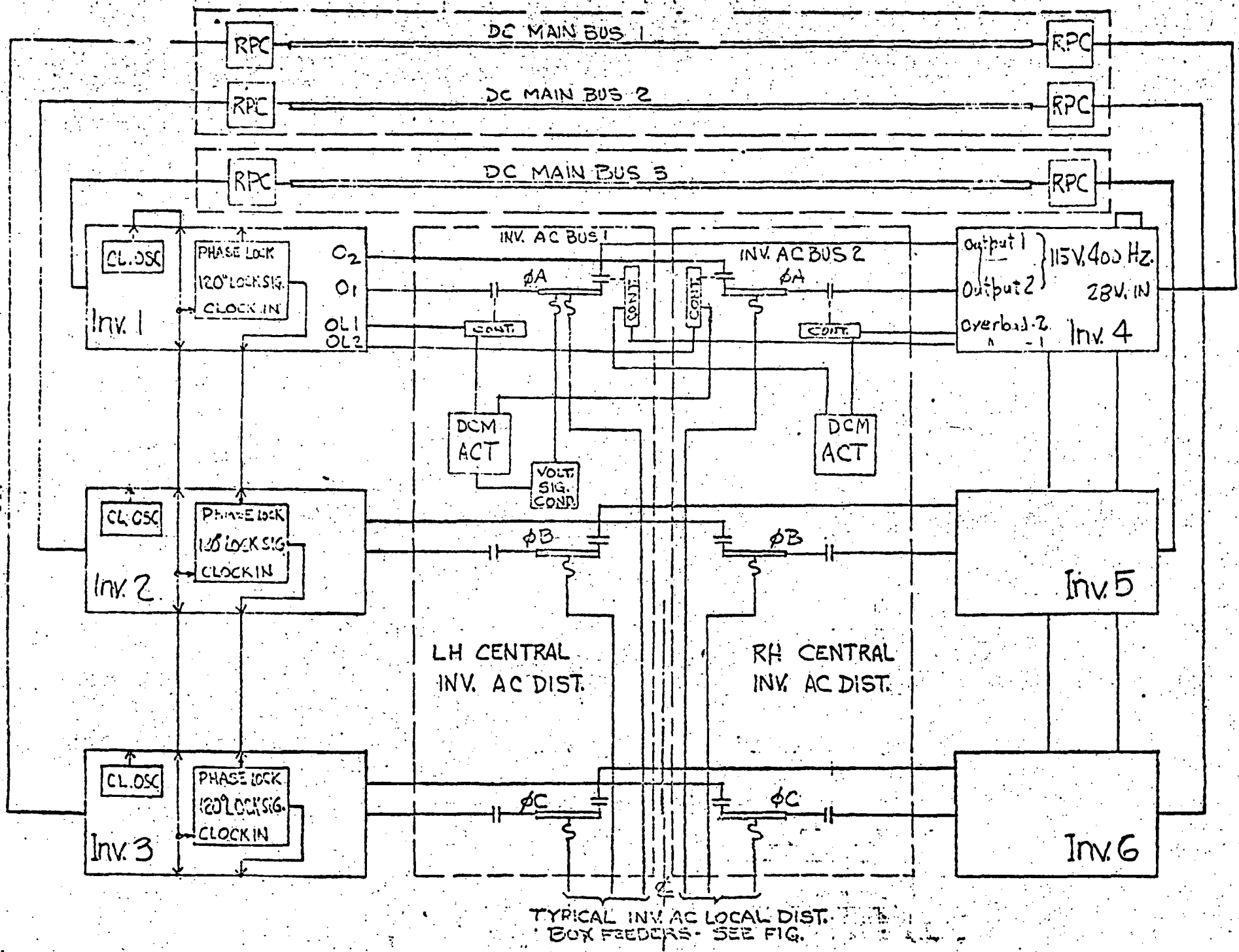

FUEL
VENT
H_2 PURGE
FILL
VENT
TO H_2 TANK 1
RELIEF VENT
FROM H_2 TANK 1
GSE SUPPLY
HEATERS (2)
O_2 PURGE VENT
H_2 PURGE VENT
HEATERS (2)
FROM FCP 2
FROM FCP 3
FUEL CELL POWER PLANT 1
NOT SHOWN
ION PUMP
HEATERS (2)
(ONE OF TWO)
H_2 TANK 2 (SUPERCRITICAL)
TO APU 4
TO FCP 3
TO APU 3
TO FCP 2
FCP 1
TO APU 2
FROM H_2 TANK 1
APU 1
H_2O BACK PRESSURE REGULATOR
FUEL CELL
CONDENSER SEPARATOR & PUMP
COOLANT PUMP
PRODUCT H_2O TO ECLSS
FROM FCP 2
FROM FCP 3
HYD FLUID
GEN
HYD PUMP
GEAR BOX
APU 1
TURBINE
COMBUSTION CHAMBER
CONTAINMENT
TO FCP3
TO FCP2
BUS A
FROM BATTERY CHARGER
BATTERY (ONE OF TWO)
COLDPLATE MOUNTS
FROM ECLSS PRIMARY COOLANT LOOP
FROM ECLSS SECONDARY COOLANT LOOP
APU EXHAUST
TO H_2 TANK 1
FROM APU 4
FROM APU 3
FROM APU 2
TO O_2 TANK 1
FROM O_2 TANK 1
TO ECLSS
TO APU 4
TO APU 3
TO FCP 3
TO APU 2
TO FCP 2
FCP 1
APU 1
TO O_2 TANK 1
FROM O_2 TANK 1
RELIEF VENT
GSE SUPPLY
FILL
VENT
O_2 PURGE
FILL
VENT
(ONE OF TWO)
O_2 TANK 2 (SUPERCRITICAL)
A7



SCHEMATIC - ORBITER BASELINE ELECTRICAL POWER DISTRIBUTION & CONTROL SUBSYSTEM

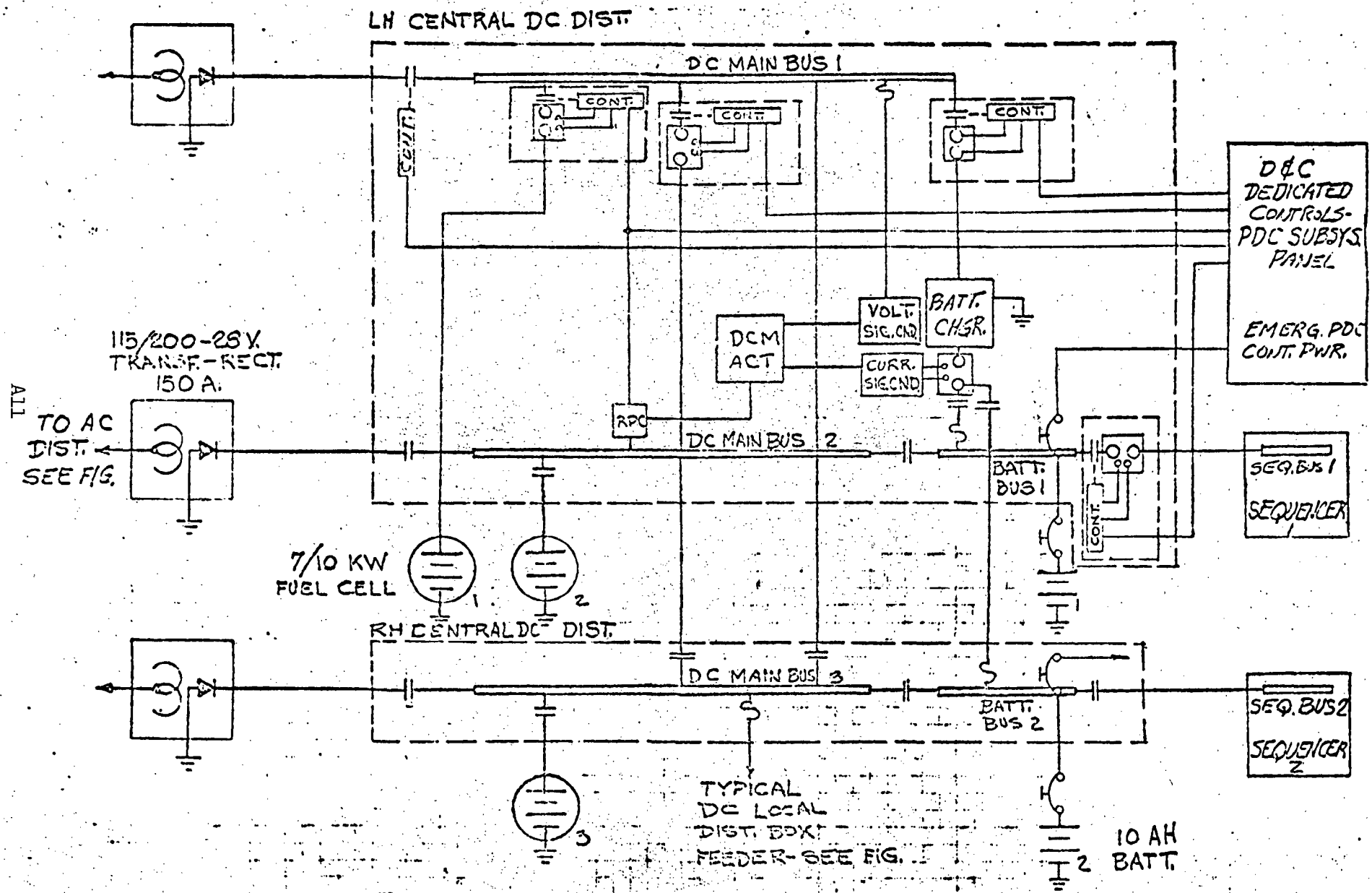


ORBITER MAIN AC POWER DISTRIBUTION & CONTROL SCHEMATIC

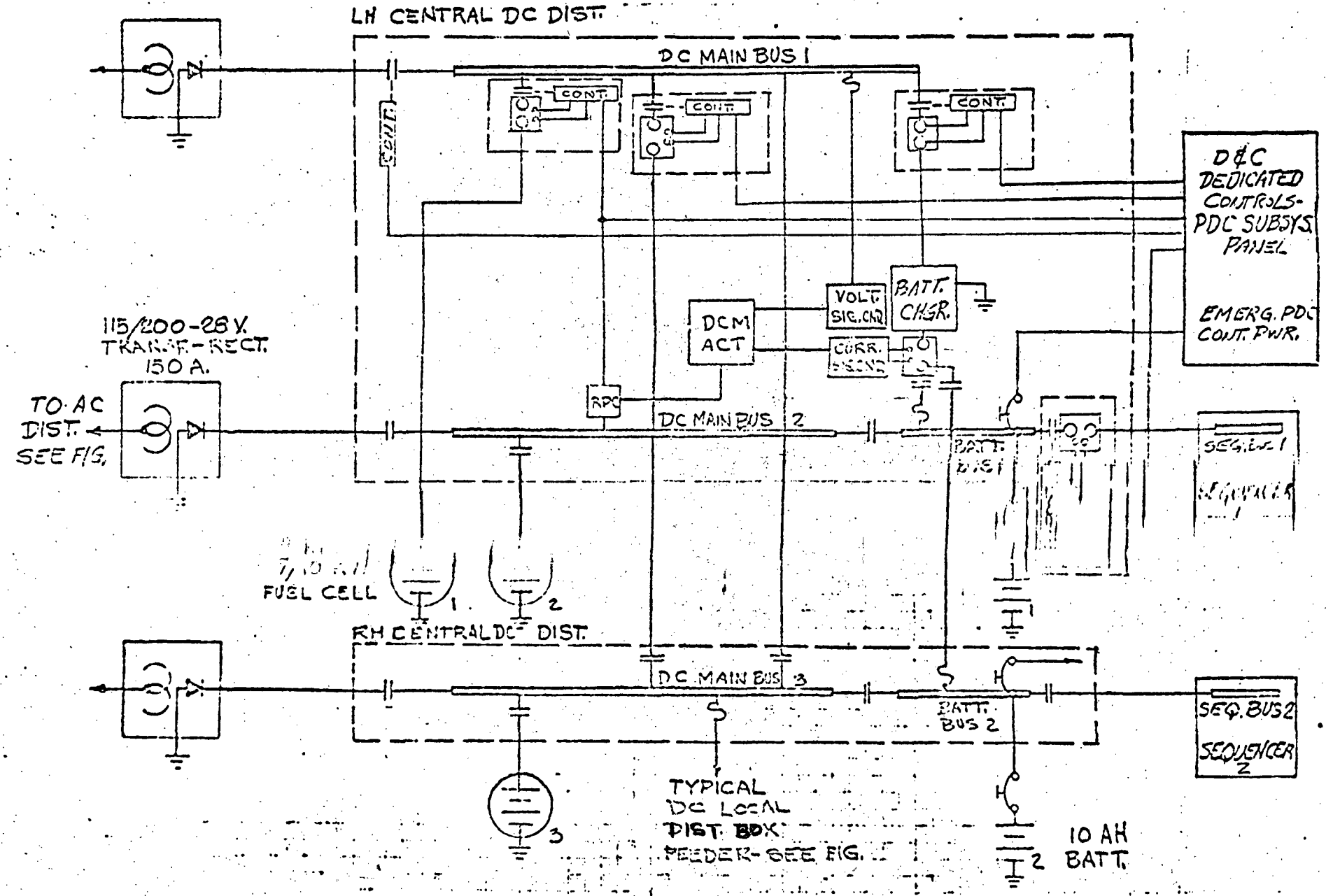


A10

ORBITER INVERTER AC POWER DISTRIBUTION & CONTROL SCHEM

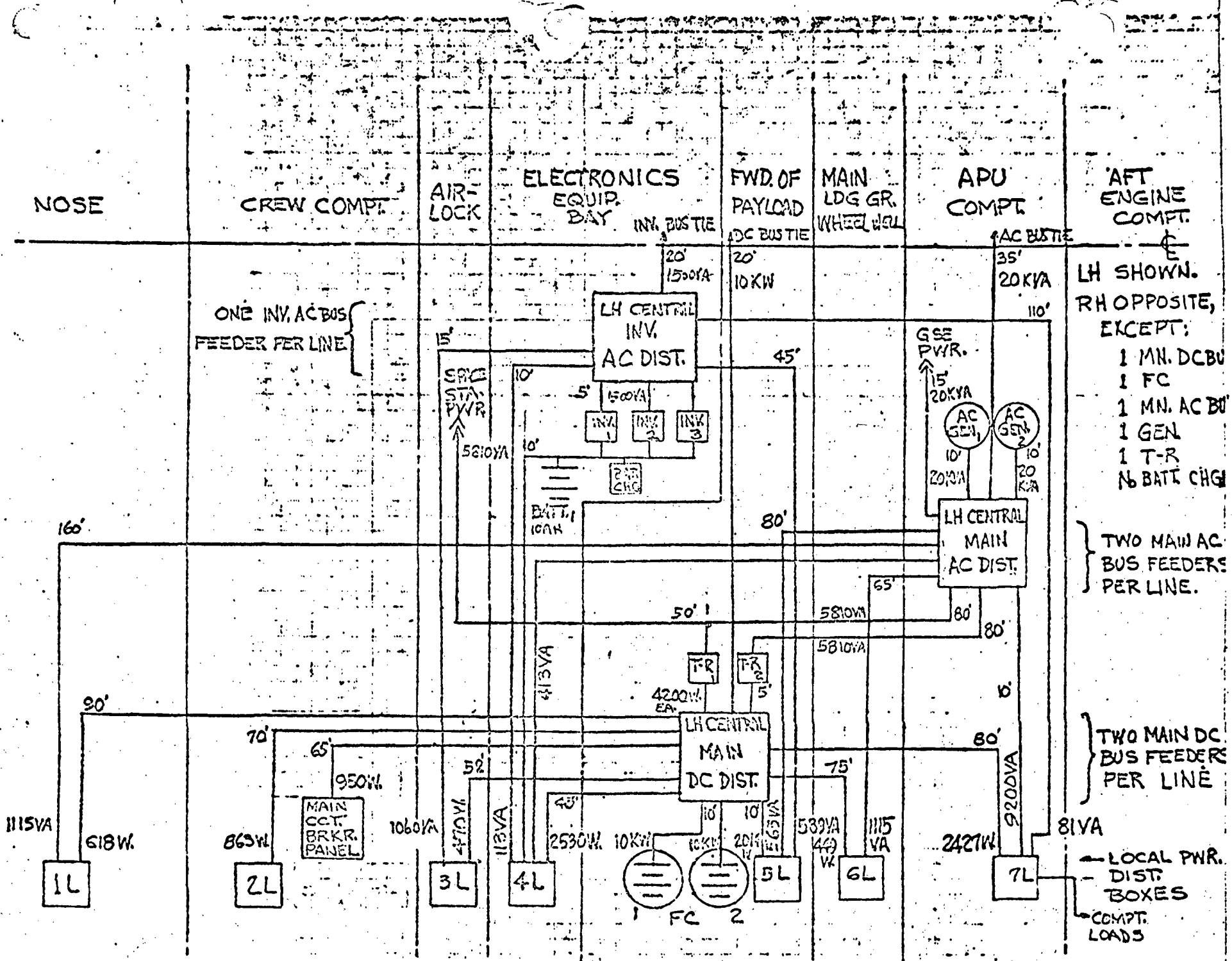


ORBITER DC POWER DISTRIBUTION & CONTROL SCHEMATIC



ORBITER DC POWER DISTRIBUTION & CONTROL SCHEMATIC

A12



ORBITER LOCAL BUS POWER FEEDER CONFIGURATION

COMMUNICATIONS

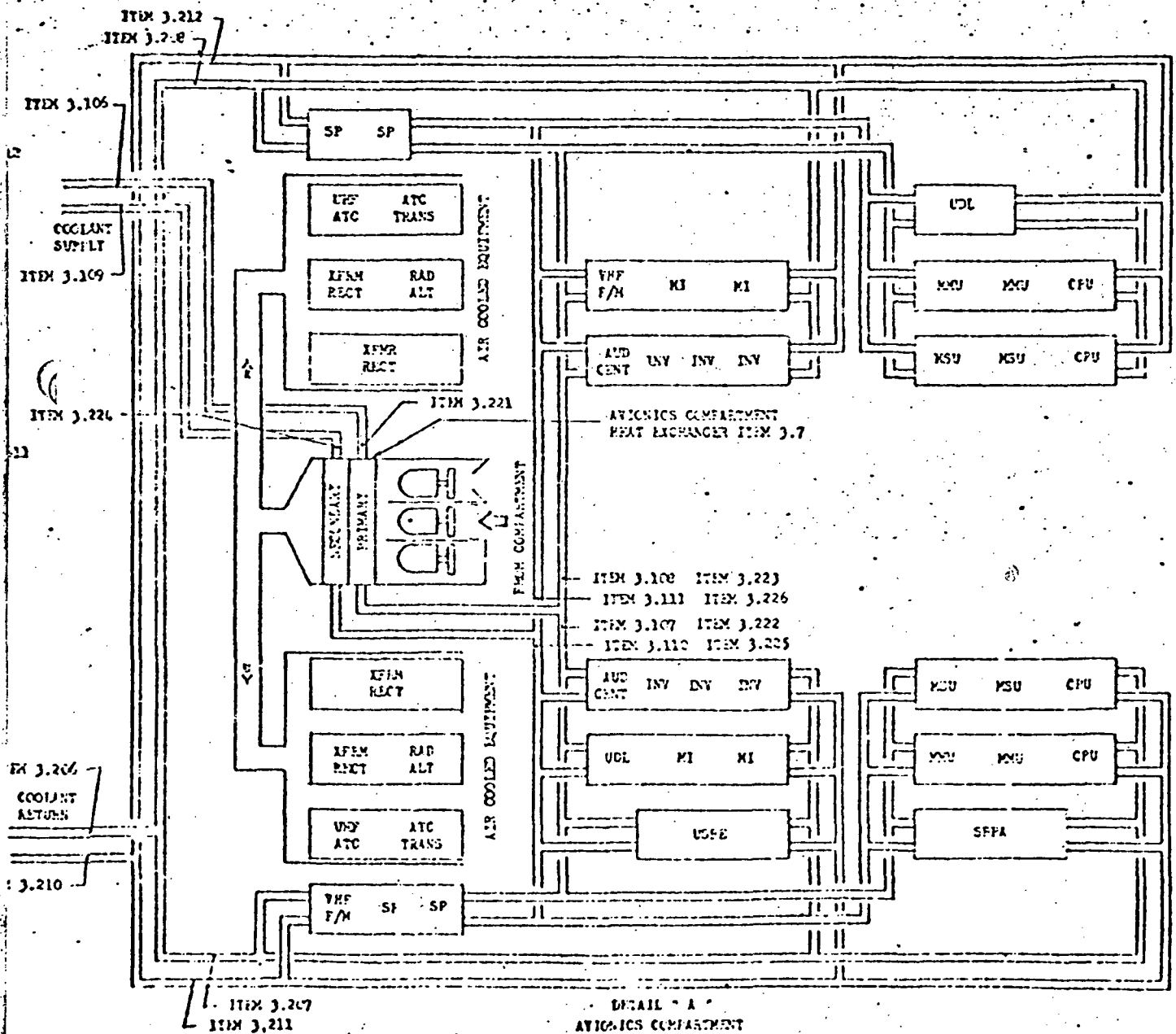
SP	SIGNAL PROCESSOR
UHF-ATC	ULTRA HIGH FREQUENCY-AIR TRAFFIC CONTROLLER
ATC XPNDR	AIR TRAFFIC CONTROLLER TRANSPONDER
VHF F/M	VERY HIGH FREQUENCY-FREQUENCY MODULATED
MI	MULTILATERATION INTERROGATOR
AC	AUDIO CENTER
RAD-ALT	RADAR ALTIMETER
UDL	UP-DATA LINK
SSPA	S-BAND POWER AMPLIFIER
USPE	UNIFIED S-BAND EQUIPMENT

POWER DISTRIBUTION

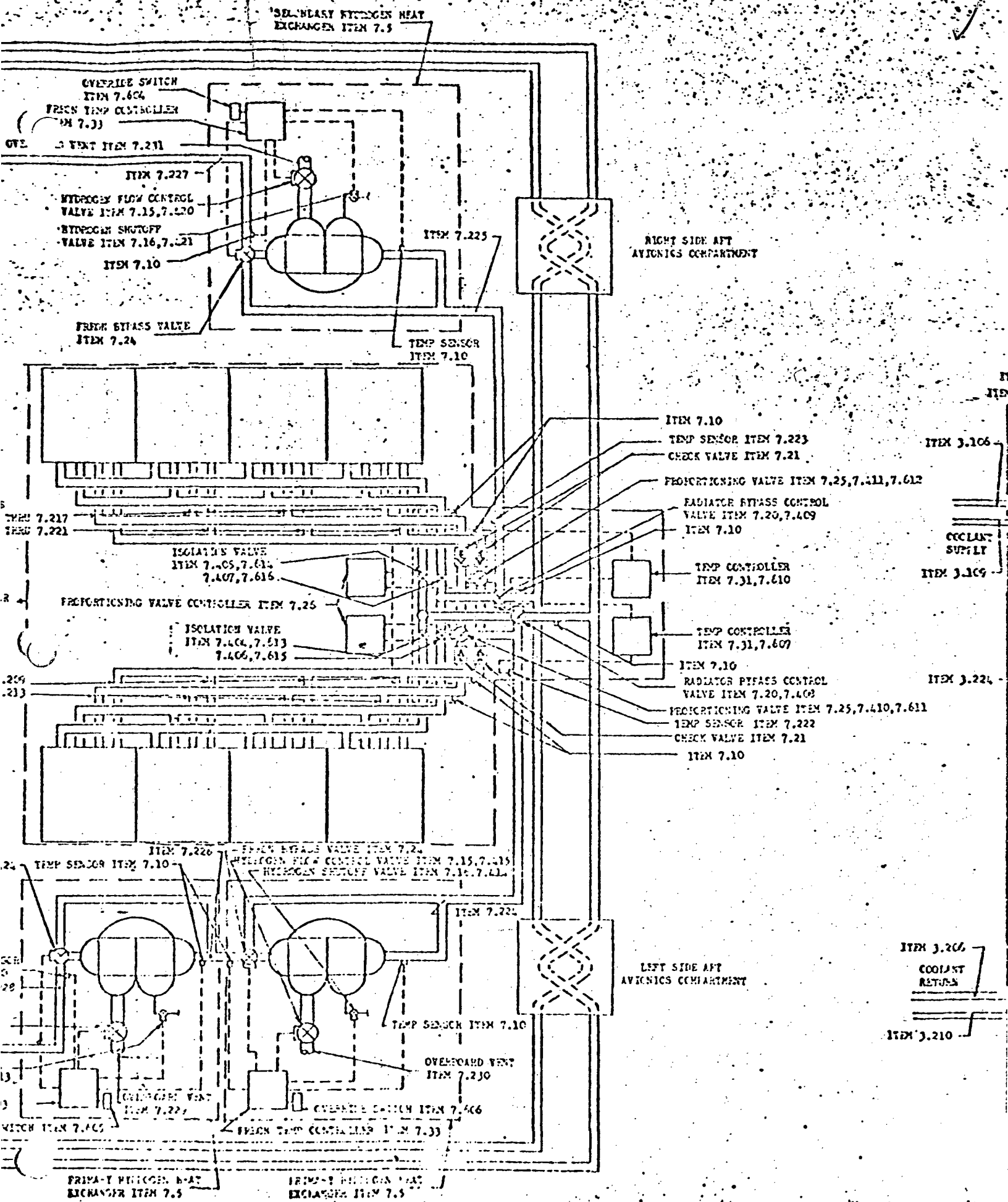
INV	INVERTER
XFRM RECT	TRANSFORMER-RECTIFIER

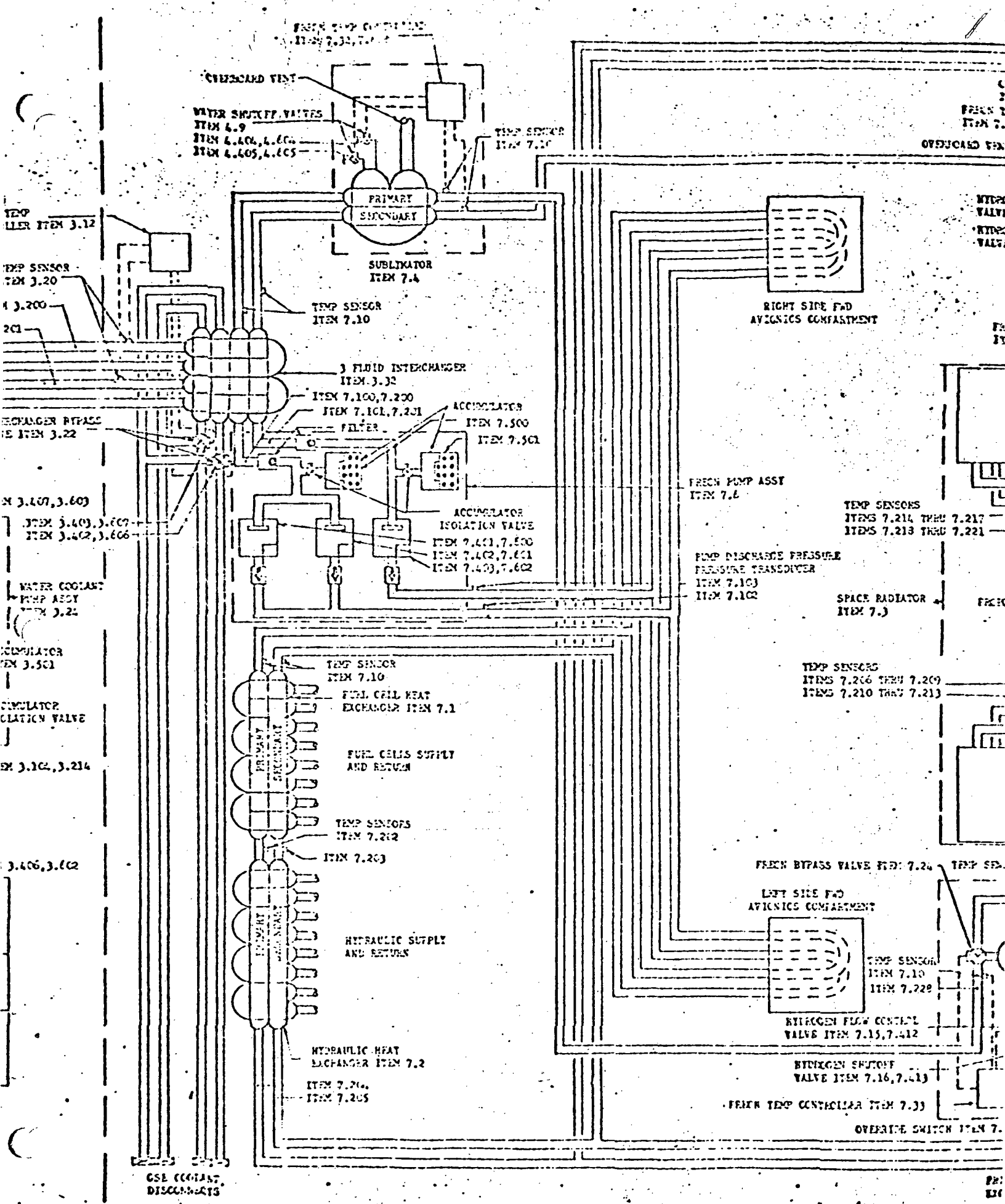
DATA AND CONTROL MANAGEMENT

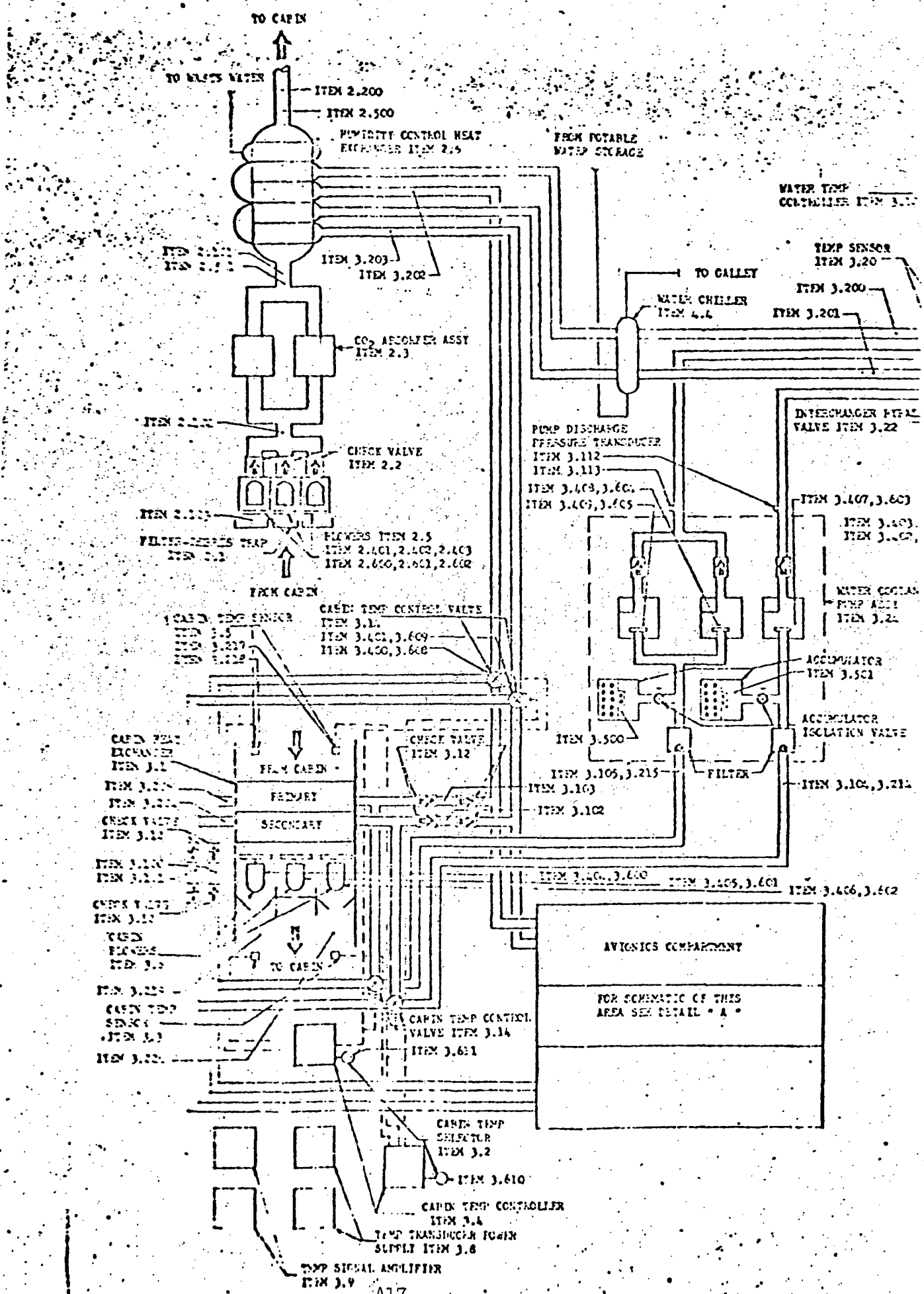
MMU	MASS MEMORY UNIT
MSU	MAIN STORAGE UNIT
CPU	CENTRAL PROCESSING UNIT

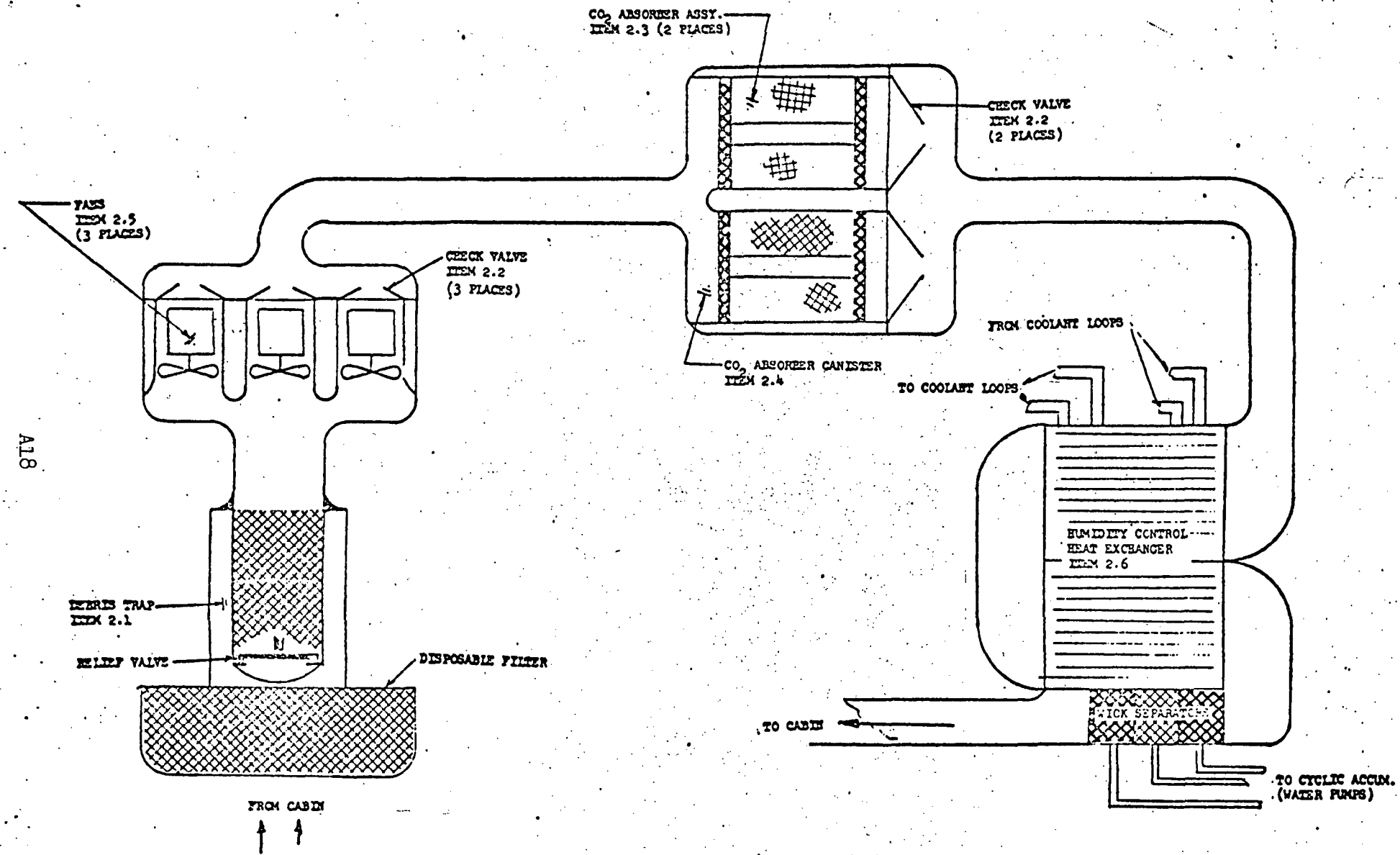


DETAIL "A"
AVIONICS COMPARTMENT

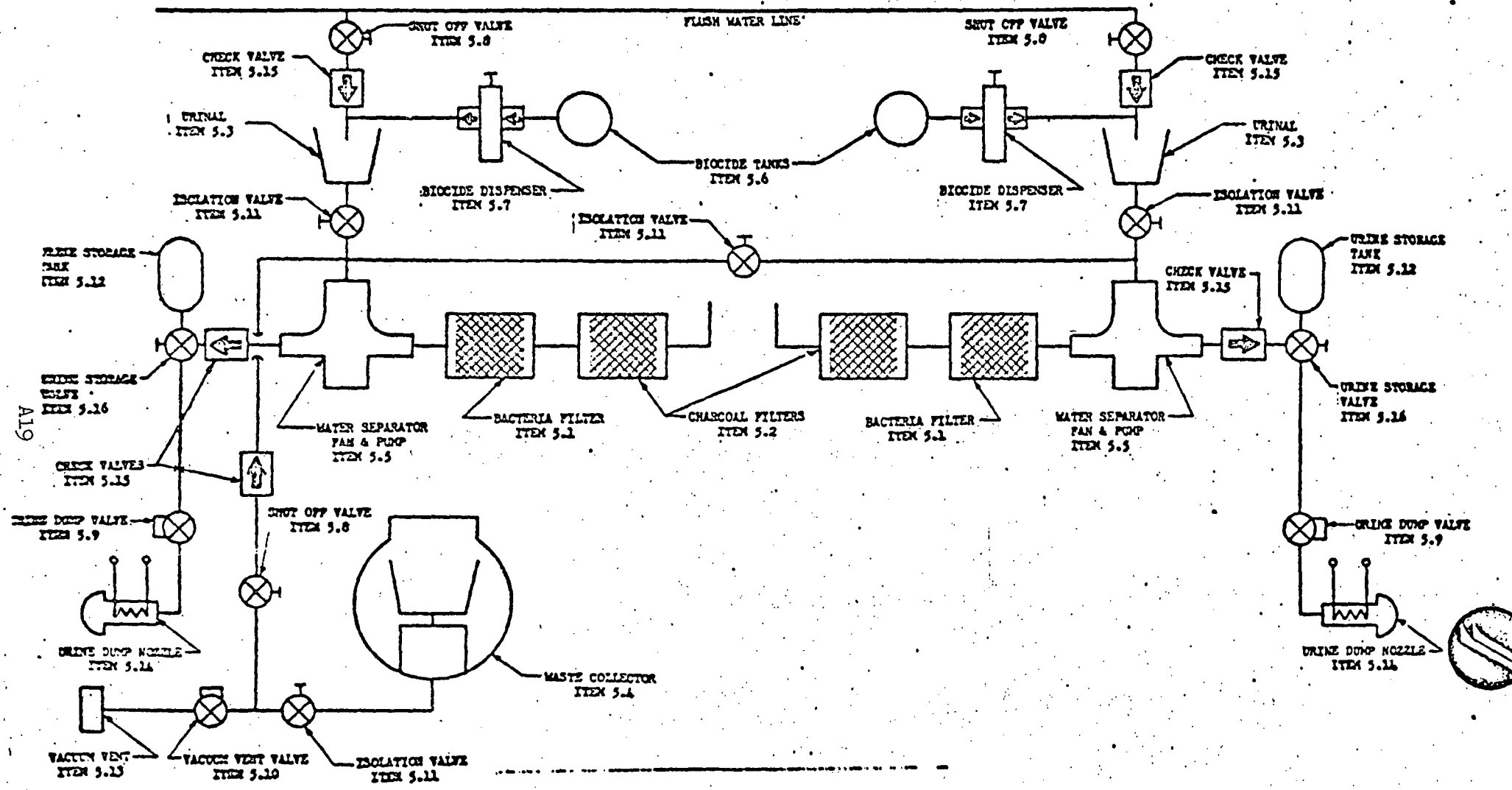

SEC. HEAT EXCHANGER ITEM 7.5
OVERRIDE SWITCH ITEM 7.604
FREON TEMP CONTROLLER ITEM 7.33
OVERBOARD VENT ITEM 7.231
ITEM 7.227
HYDROGEN FLOW CONTROL VALVE ITEM 7.15,7.420
HYDROGEN SHUTOFF VALVE ITEM 7.16,7.421
ITEM 7.10
ITEM 7.225
FREON BYPASS VALVE ITEM 7.24
TEMP SENSOR ITEM 7.10
RIGHT SIDE AFT AVIONICS COMPARTMENT
ITEM 7.10
TEMP SENSOR ITEM 7.223
CHECK VALVE ITEM 7.21
PROPORTIONING VALVE ITEM 7.25,7.411,7.612
RADIATOR BYPASS CONTROL VALVE ITEM 7.20,7.409
ITEM 7.10
ITEM 7.217
ITEM 7.221
ISOLATION VALVE ITEM 7.405,7.614 7.407,7.616
TEMP CONTROLLER ITEM 7.31,7.610
PROPORTIONING VALVE CONTROLLER ITEM 7.25
ISOLATION VALVE ITEM 7.404,7.613 7.406,7.615
TEMP CONTROLLER ITEM 7.31,7.607
ITEM 7.10
RADIATOR BYPASS CONTROL VALVE ITEM 7.20,7.408
PROPORTIONING VALVE ITEM 7.25,7.410,7.611
TEMP SENSOR ITEM 7.222
CHECK VALVE ITEM 7.21
ITEM 7.10
ITEM 7.226
FREON BYPASS VALVE ITEM 7.24
TEMP SENSOR ITEM 7.10
HYDROGEN FLOW CONTROL VALVE ITEM 7.15,7.415
HYDROGEN SHUTOFF VALVE ITEM 7.16,7.41
ITEM 7.224
LEFT SIDE AFT AVIONICS COMPARTMENT
TEMP SENSOR ITEM 7.10
OVERBOARD VENT ITEM 7.230
OVERRIDE SWITCH ITEM 7.406
FREON TEMP CONTROLLER ITEM 7.33
PRIMARY HYDROGEN HEAT EXCHANGER ITEM 7.5
PRIMARY HYDROGEN HEAT EXCHANGER ITEM 7.5
ITEM 3.106
COOLANT SUPPLY
ITEM 3.109
ITEM 3.224
ITEM 3.206
COOLANT RETURN
ITEM 3.210


OVERBOARD VENT
WATER SHUTOFF VALVES
ITEM 4.9
ITEM 4.404, 4.405
ITEM 4.405, 4.405
TEMP SENSOR
ITEM 7.20
PRIMARY
SECONDARY
SUBLIMATOR
ITEM 7.4
TEMP SENSOR
ITEM 7.10
3 FLUID INTERCHANGER
ITEM 3.32
ITEM 7.100, 7.200
ITEM 7.101, 7.201
FILTER
ACCUMULATOR
ITEM 7.500
ITEM 7.501
ACCUMULATOR
ISOLATION VALVE
ITEM 7.401, 7.500
ITEM 7.402, 7.401
ITEM 7.403, 7.402
RIGHT SIDE F&D
AVIONICS COMPARTMENT
FREON PUMP ASSY
ITEM 7.6
TEMP SENSORS
ITEMS 7.214 THRU 7.217
ITEMS 7.218 THRU 7.221
PUMP DISCHARGE PRESSURE
PRESSURE TRANSDUCER
ITEM 7.103
ITEM 7.102
SPACE RADIATOR
ITEM 7.3
TEMP SENSORS
ITEMS 7.206 THRU 7.209
ITEMS 7.210 THRU 7.213
TEMP SENSOR
ITEM 7.10
FUEL CELL HEAT
EXCHANGER ITEM 7.1
FUEL CELLS SUPPLY
AND RETURN
TEMP SENSORS
ITEM 7.202
ITEM 7.203
FREON BYPASS VALVE ITEM 7.24
LEFT SIDE F&D
AVIONICS COMPARTMENT
TEMP SENSOR
ITEM 7.10
ITEM 7.229
HYDRAULIC SUPPLY
AND RETURN
HYDROGEN FLOW CONTROL
VALVE ITEM 7.15, 7.412
HYDRAULIC HEAT
EXCHANGER ITEM 7.2
ITEM 7.204
ITEM 7.205
HYDROGEN SHUTOFF
VALVE ITEM 7.16, 7.413
FREON TEMP CONTROLLER ITEM 7.33
OVERRIDE SWITCH ITEM 7.
GSE COOLANT
DISCONNECTS

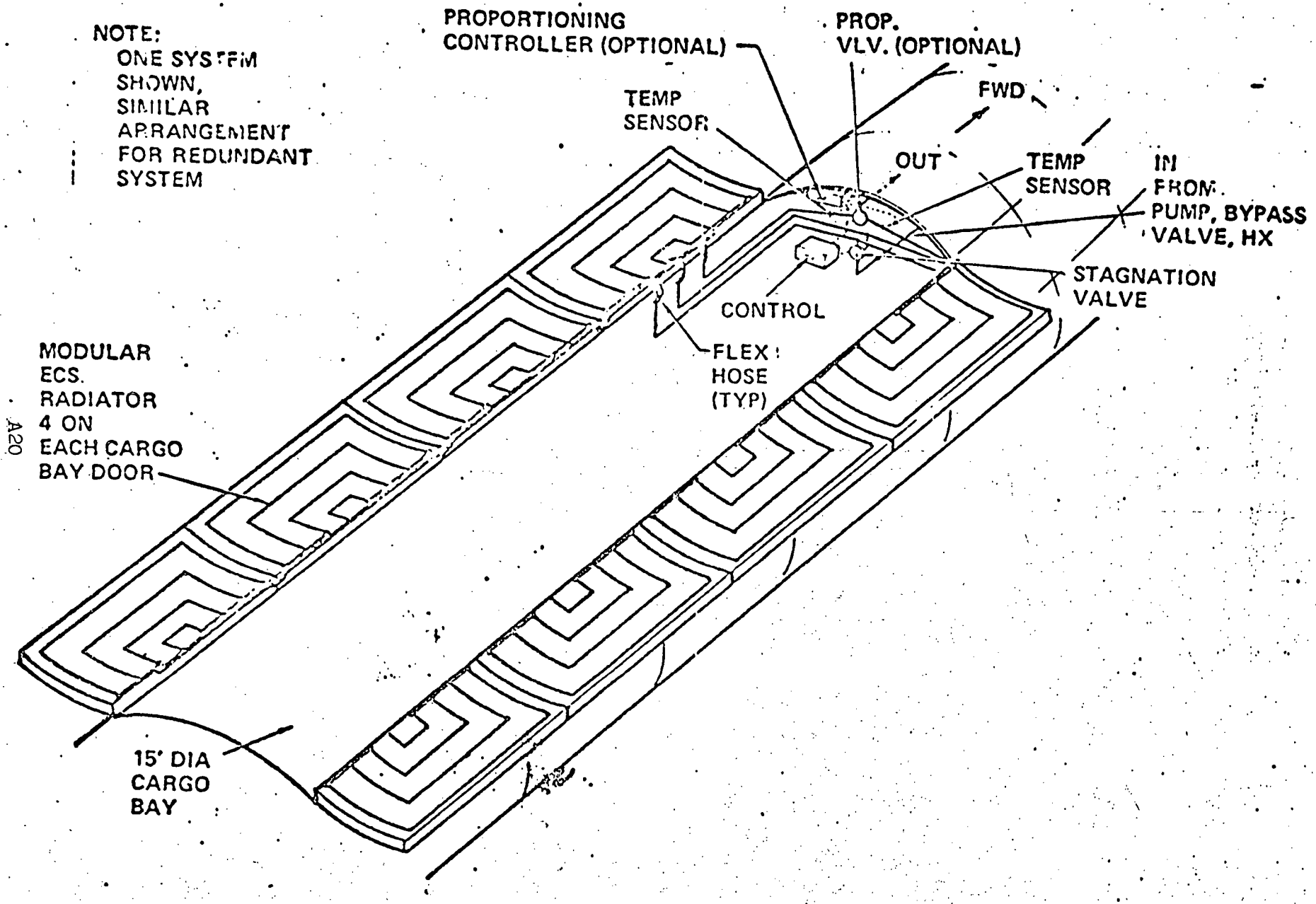

TO CABIN
TO WASTE WATER
ITEM 2.200
ITEM 2.500
PURITY CONTROL HEAT EXCHANGER ITEM 2.6
FROM POTABLE WATER STORAGE
WATER TEMP CONTROLLER ITEM 3.10
TEMP SENSOR ITEM 3.20
ITEM 3.203
ITEM 3.202
TO GALLEY
WATER CHILLER ITEM 4.4
ITEM 3.200
ITEM 3.201
CO2 ABSORBER ASSY ITEM 2.3
CHECK VALVE ITEM 2.2
PUMP DISCHARGE PRESSURE TRANSDUCER
ITEM 3.112
ITEM 3.113
INTERCHANGER BYPASS VALVE ITEM 3.22
ITEM 3.408,3.604
ITEM 3.409,3.605
ITEM 3.407,3.603
ITEM 3.403
ITEM 3.402
WATER COOLANT PUMP ASSY ITEM 3.21
FILTER-SEPARATOR TRAP ITEM 2.1
BLOWERS ITEM 2.5
ITEM 2.401,2.402,2.403
ITEM 2.600,2.601,2.602
FROM CABIN
CABIN TEMP CONTROL VALVE
ITEM 3.1
ITEM 3.401,3.609
ITEM 3.400,3.608
ACCUMULATOR ITEM 3.501
ACCUMULATOR ISOLATION VALVE
ITEM 3.500
CHECK VALVE ITEM 3.12
FROM CABIN
ITEM 3.105,3.215
FILTER
ITEM 3.104,3.214
ITEM 3.103
ITEM 3.102
PRIMARY
SECONDARY
CHECK VALVE ITEM 3.11
ITEM 3.406,3.602
ITEM 3.405,3.601
AVIONICS COMPARTMENT
FOR SCHEMATIC OF THIS AREA SEE DETAIL " A "
TO CABIN
CABIN TEMP CONTROL VALVE ITEM 3.14
ITEM 3.611
CABIN TEMP SELECTOR ITEM 3.2
ITEM 3.610
CABIN TEMP CONTROLLER ITEM 3.4
TEMP TRANSDUCER POWER SUPPLY ITEM 3.8
TEMP SIGNAL AMPLIFIER ITEM 3.9



Humidity Control System



Waste Management Subsystem



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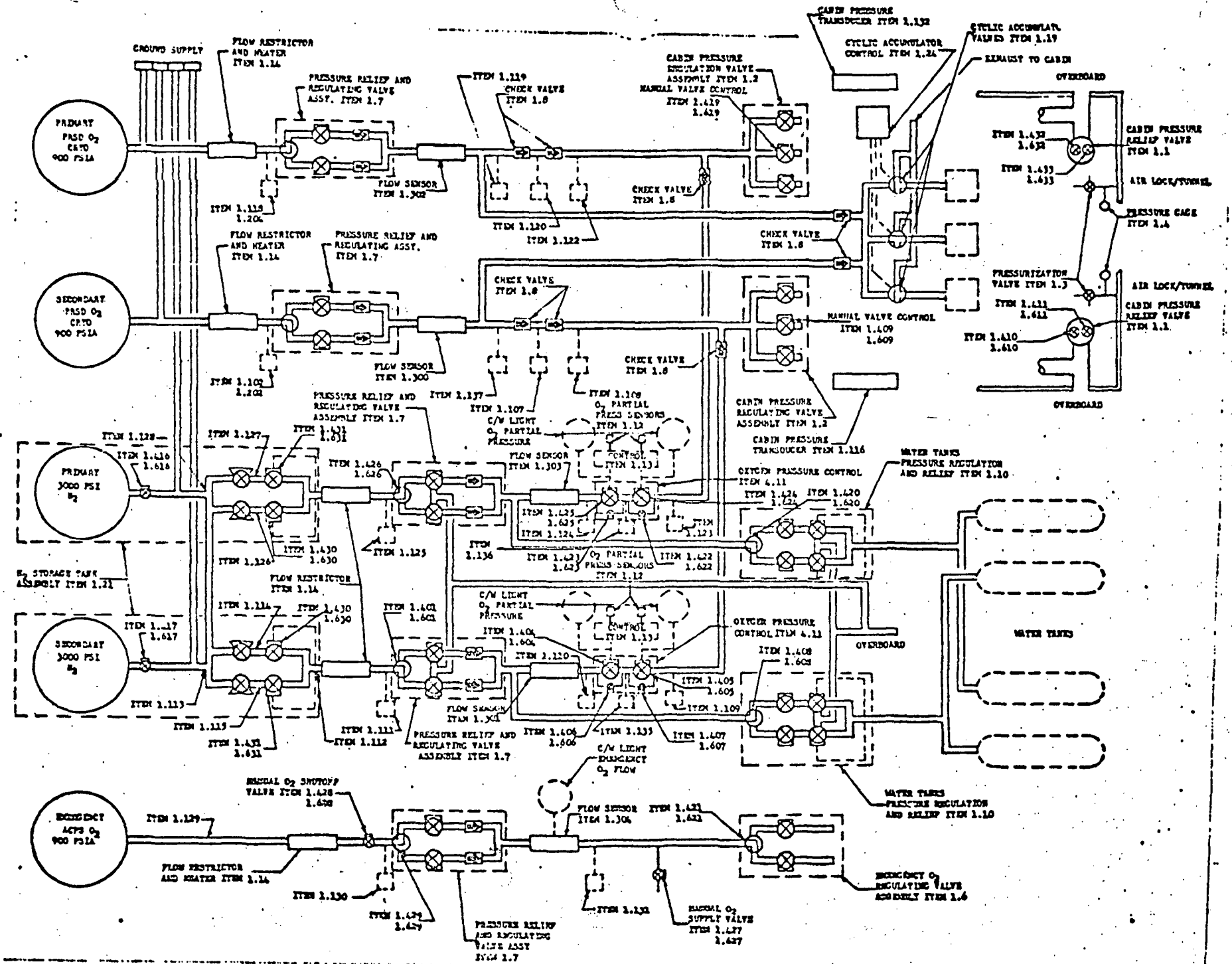
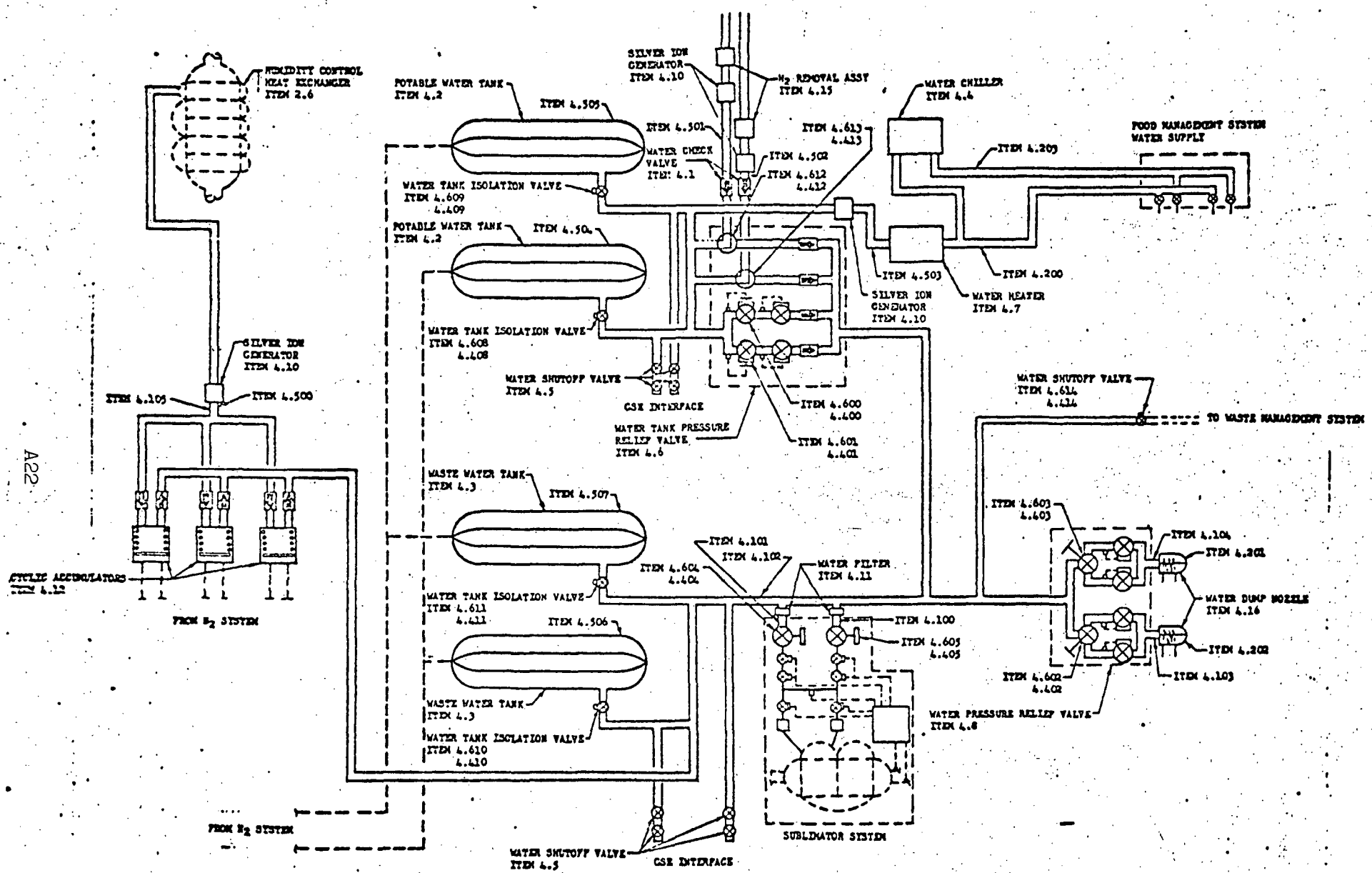
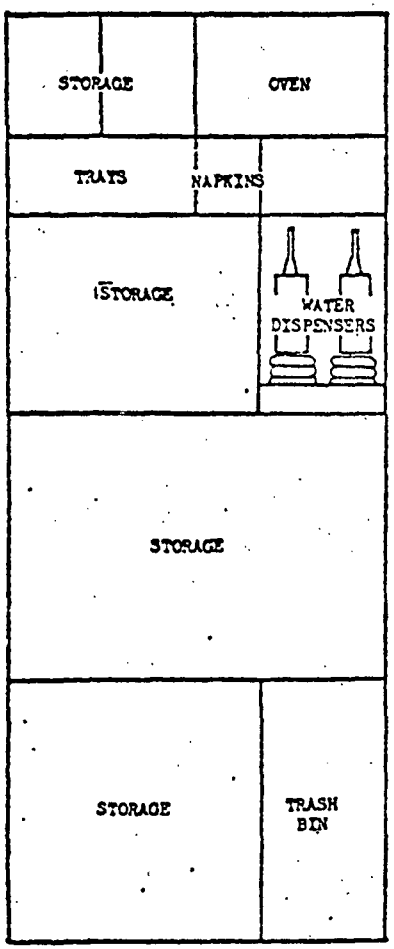
Space Radiator



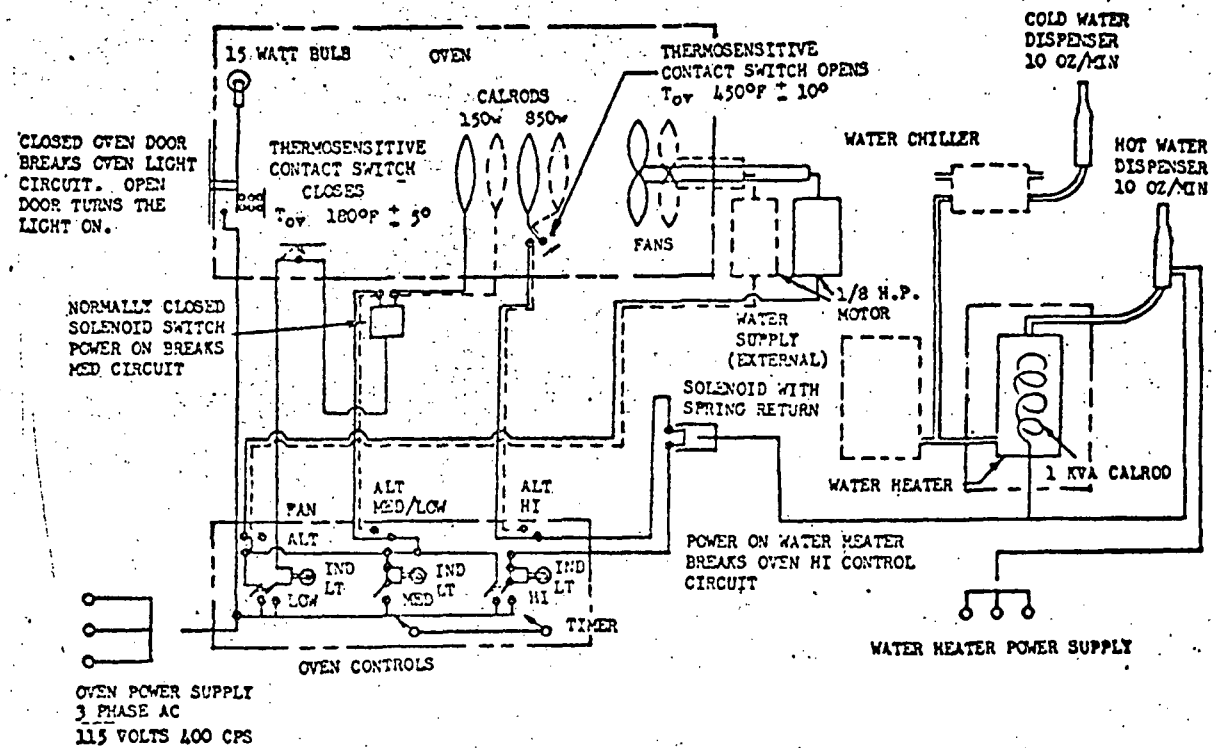
Atmospheric Pressure Control System



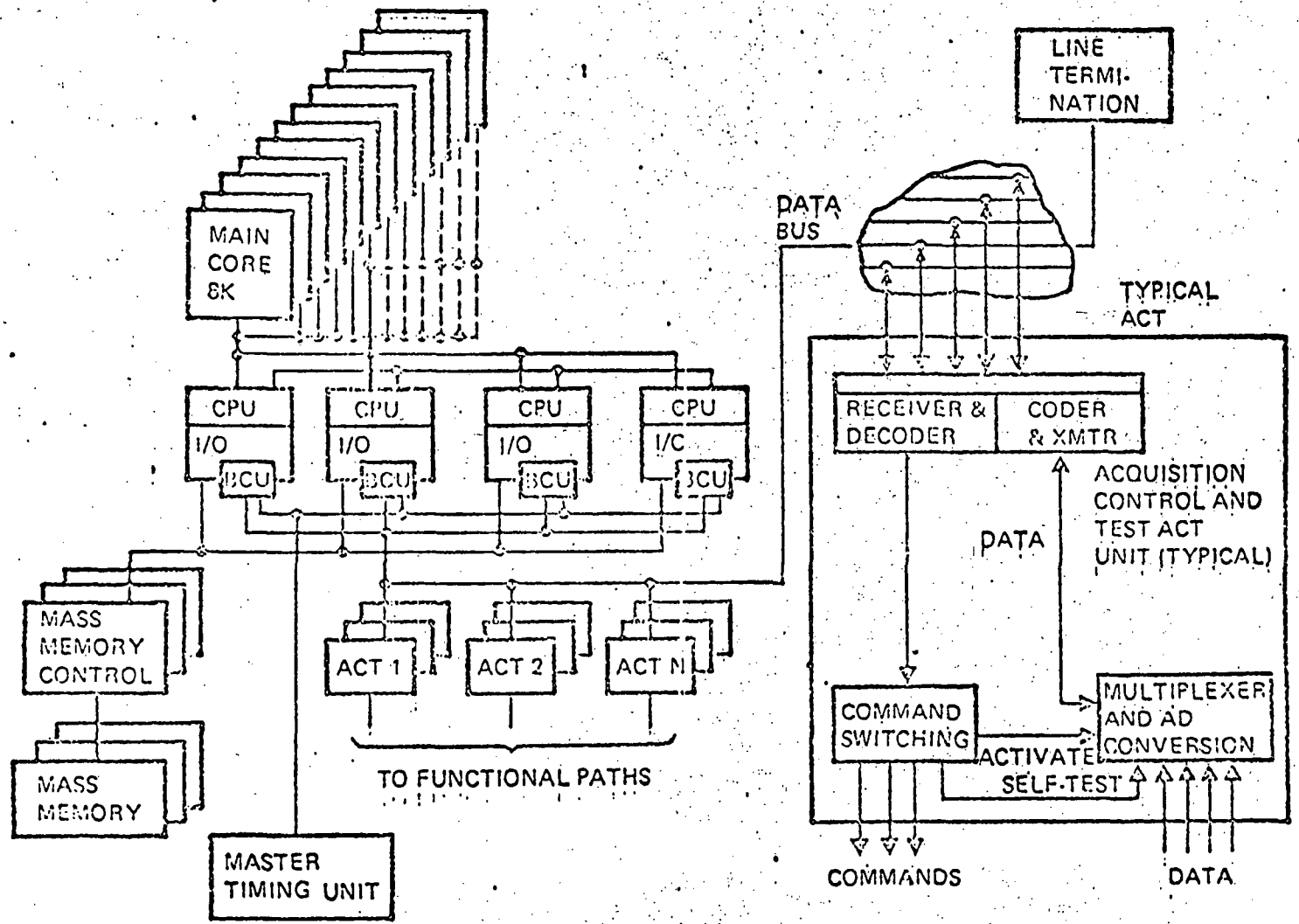
Water Management System



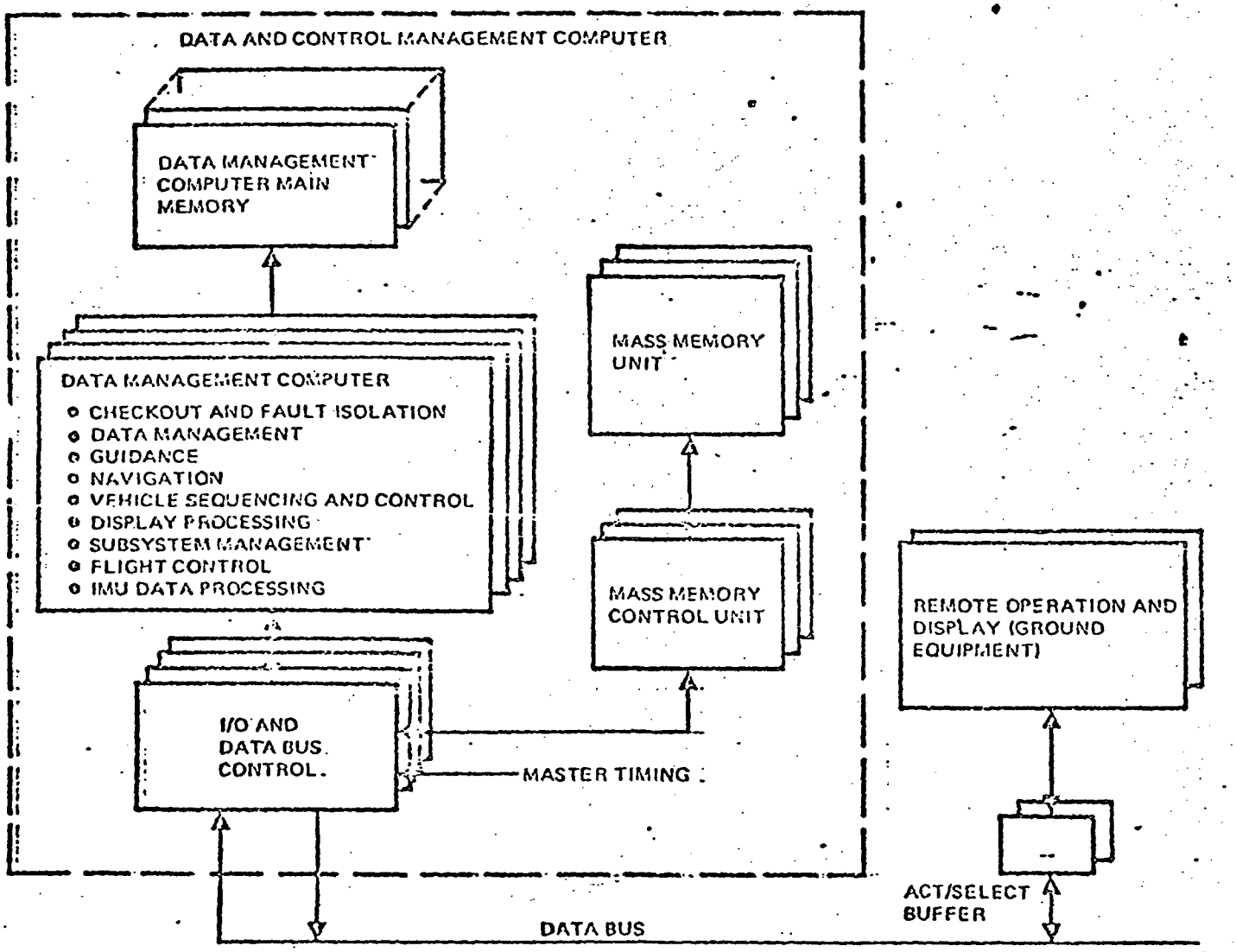
GALLEY CONFIGURATION



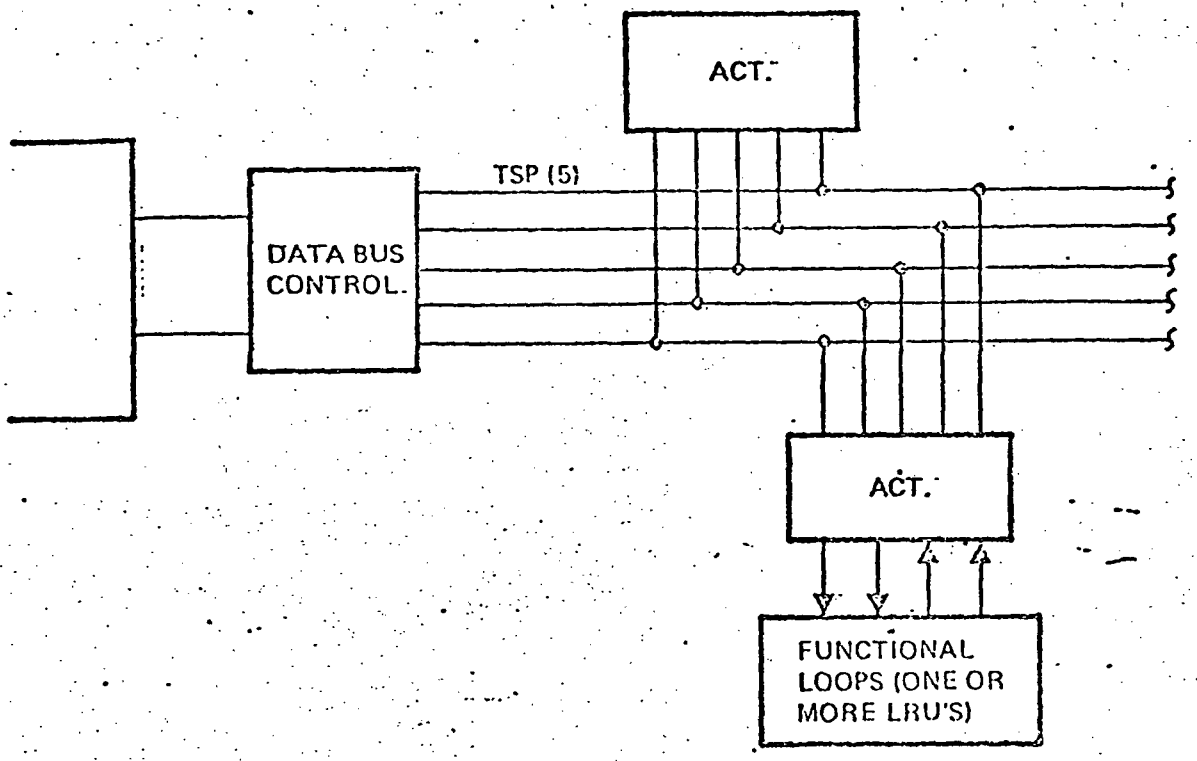
Food Management System



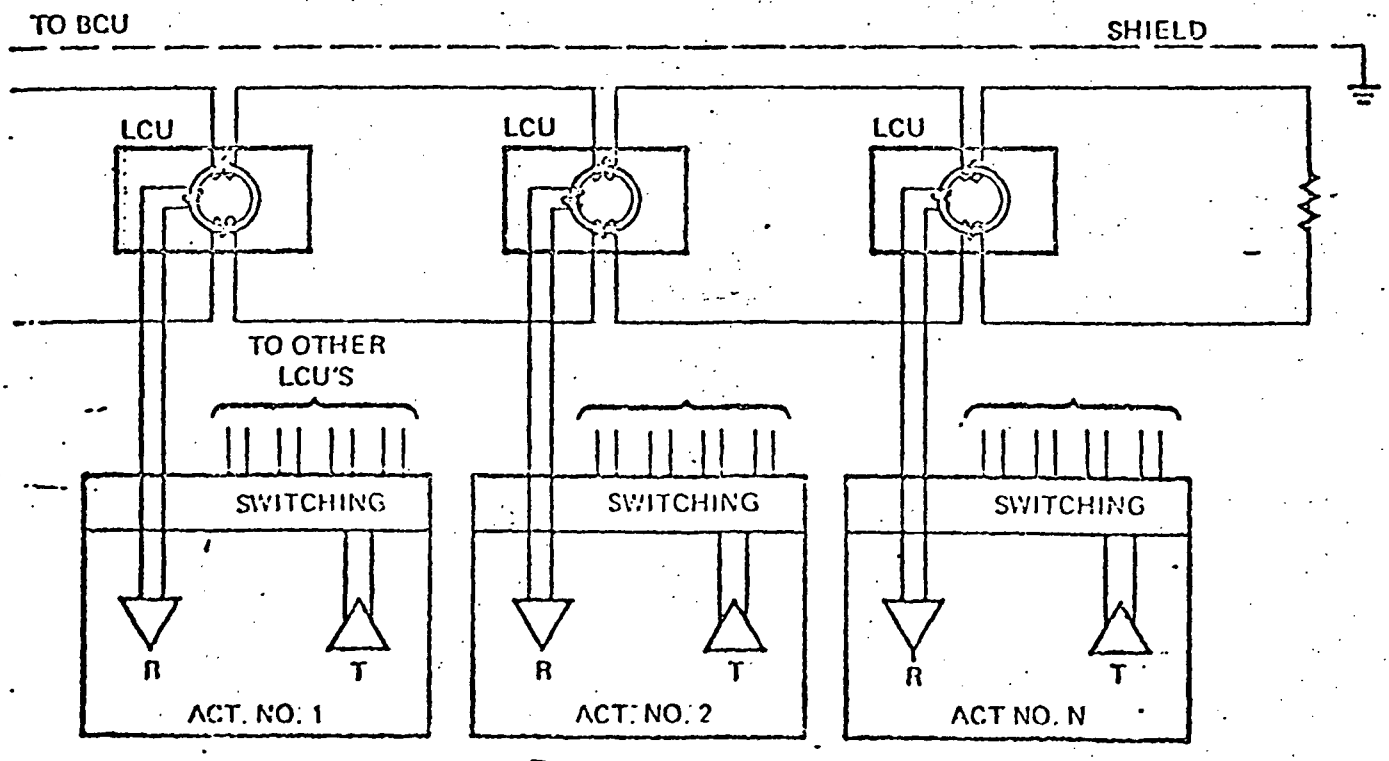
Central Computer System



DCM Computer Configuration (FO/FO/FS)



Interface Block Diagram

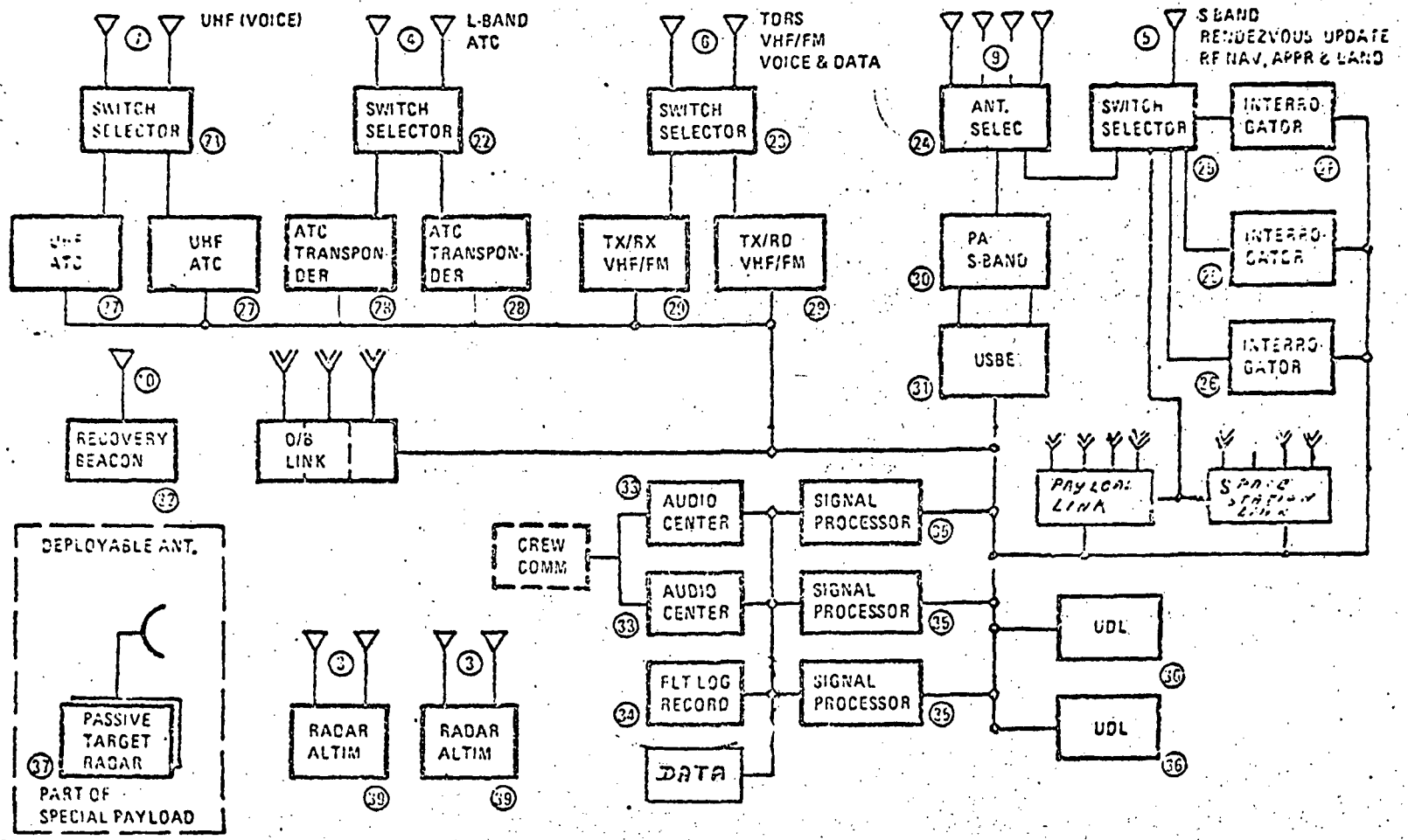


Data Bus Cable Harness Line Coupling Unit Connections

ORBITER

BASELINE COMMUNICATIONS SUBSYSTEM

HYBRID REDUNDANCY



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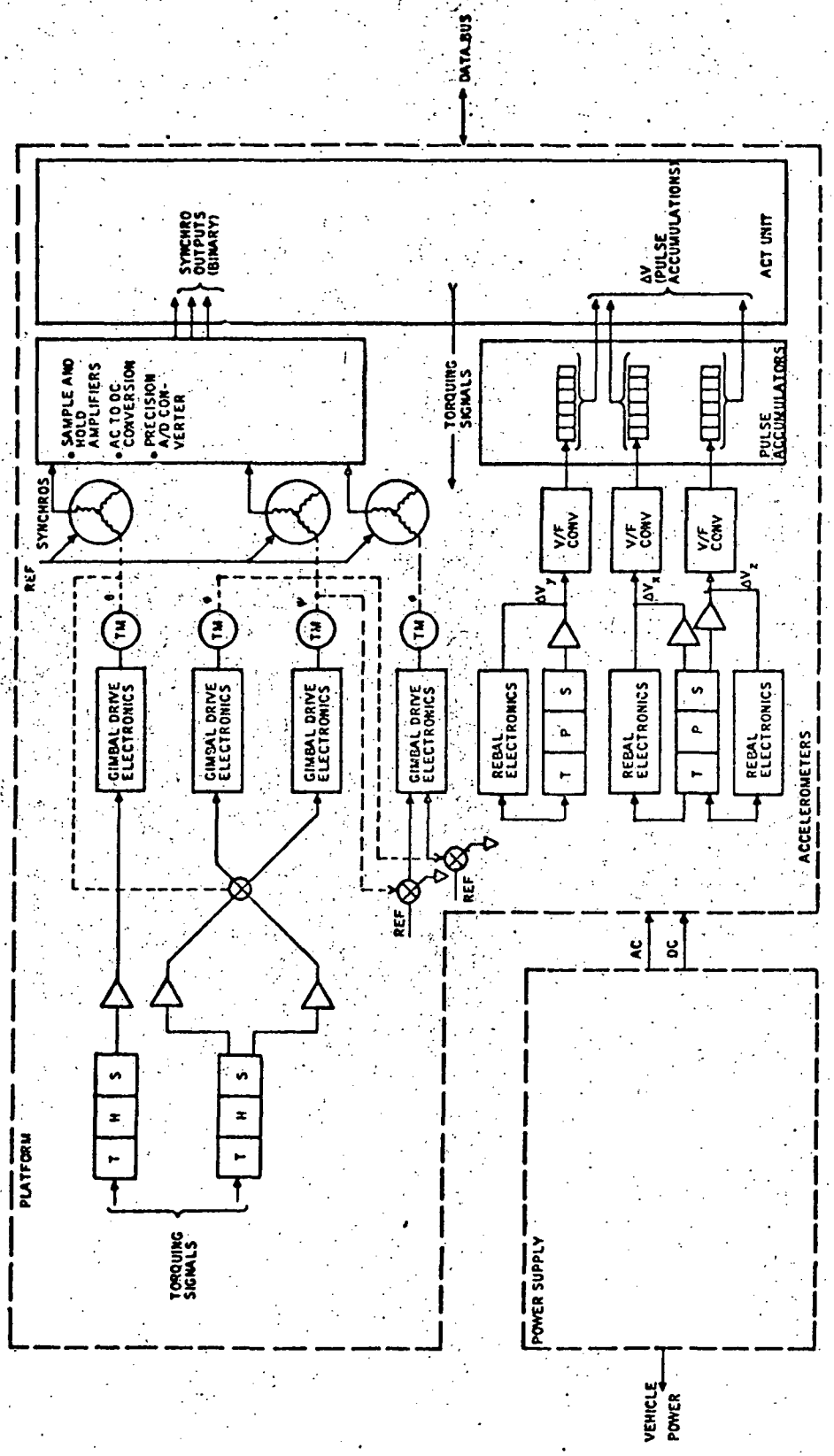
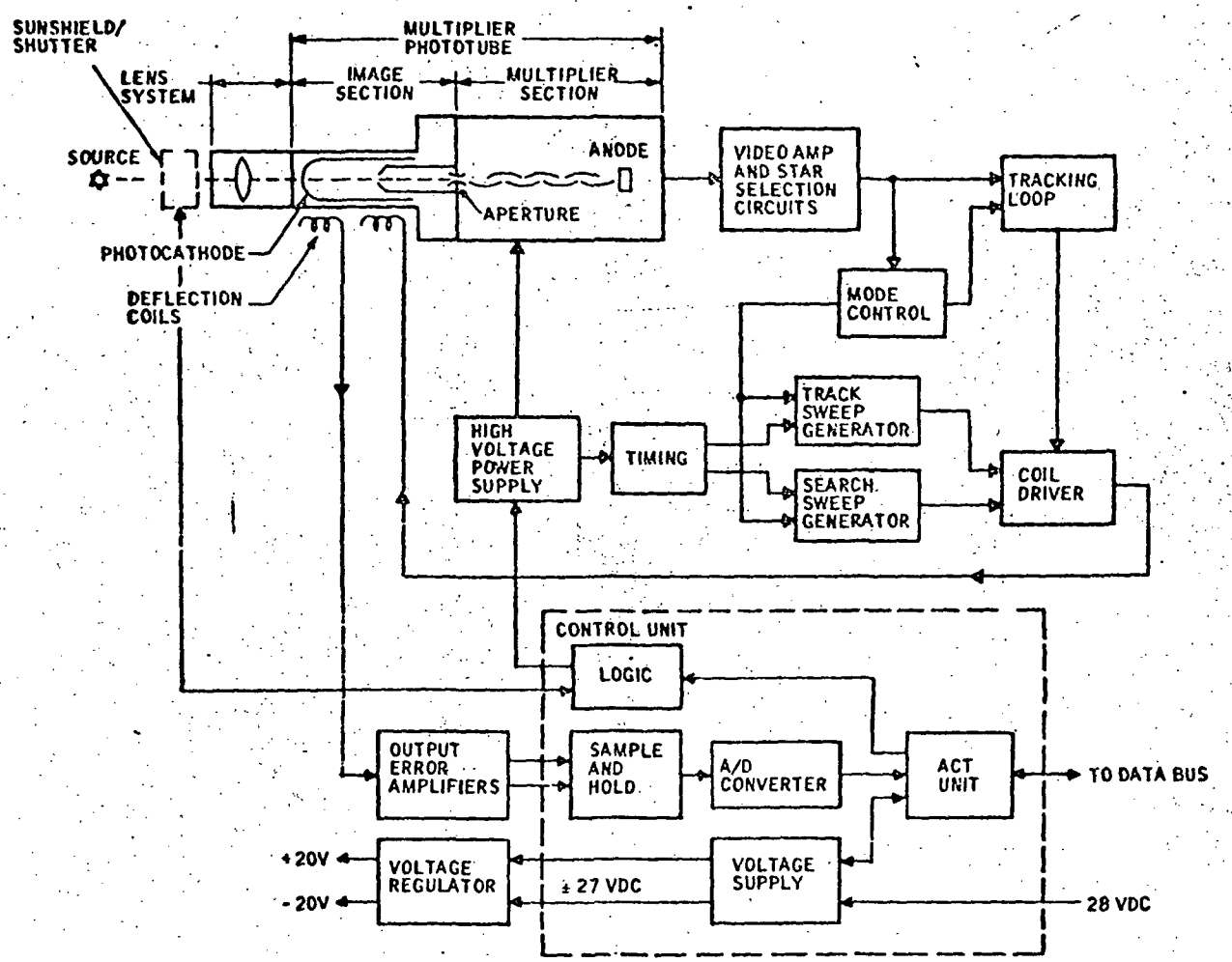
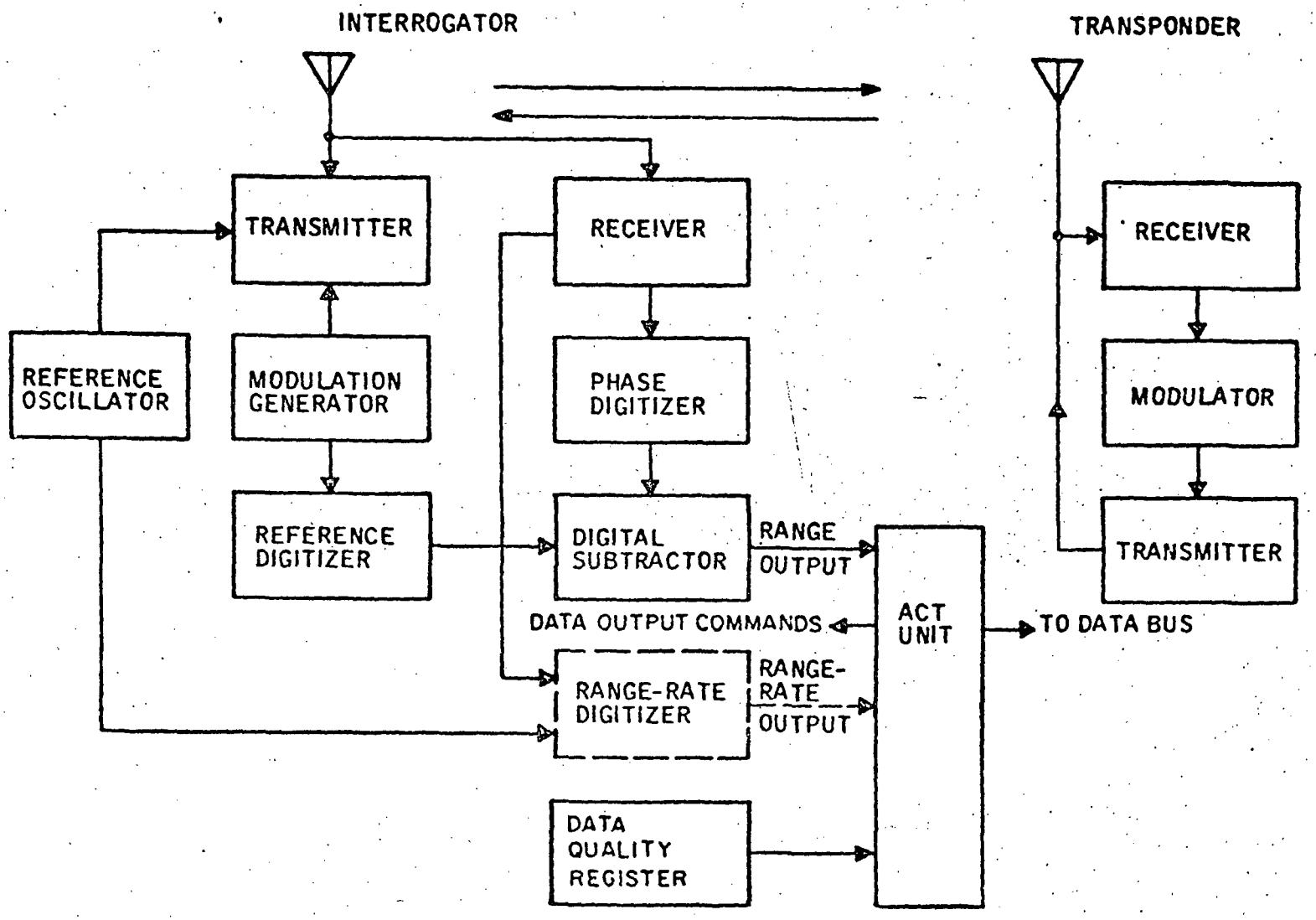


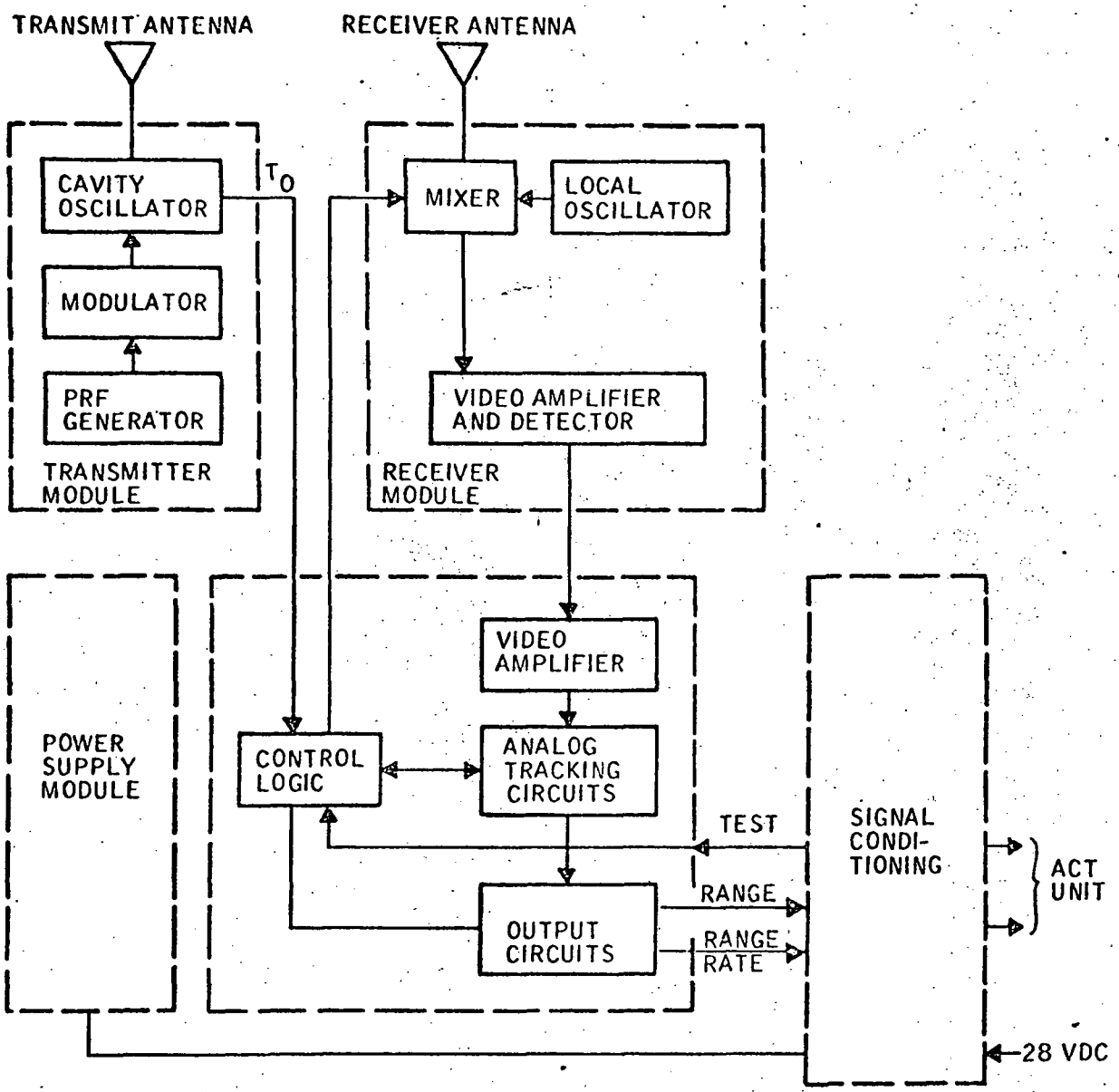
IMU Block Diagram



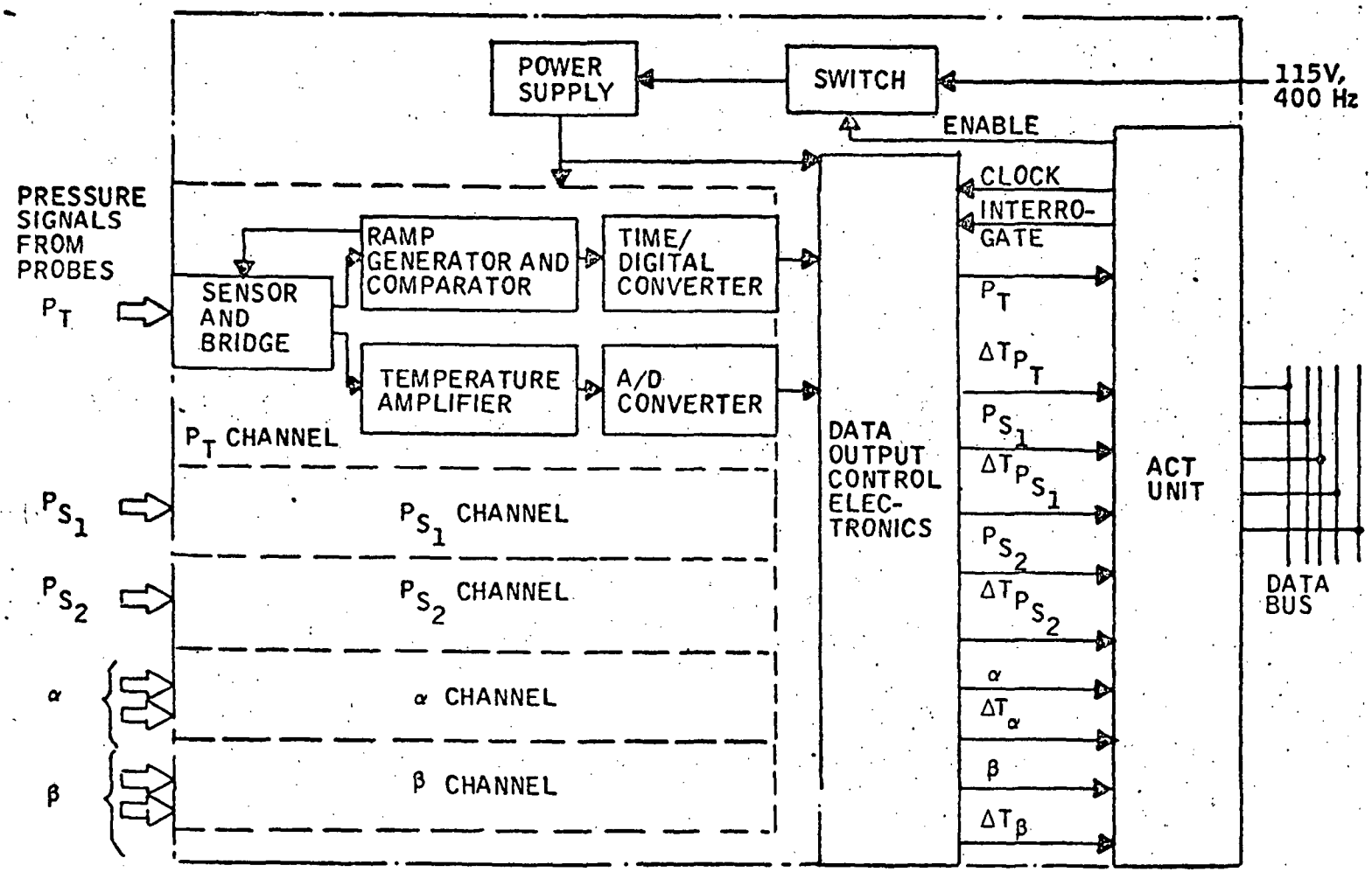
Star Tracker Block Diagram



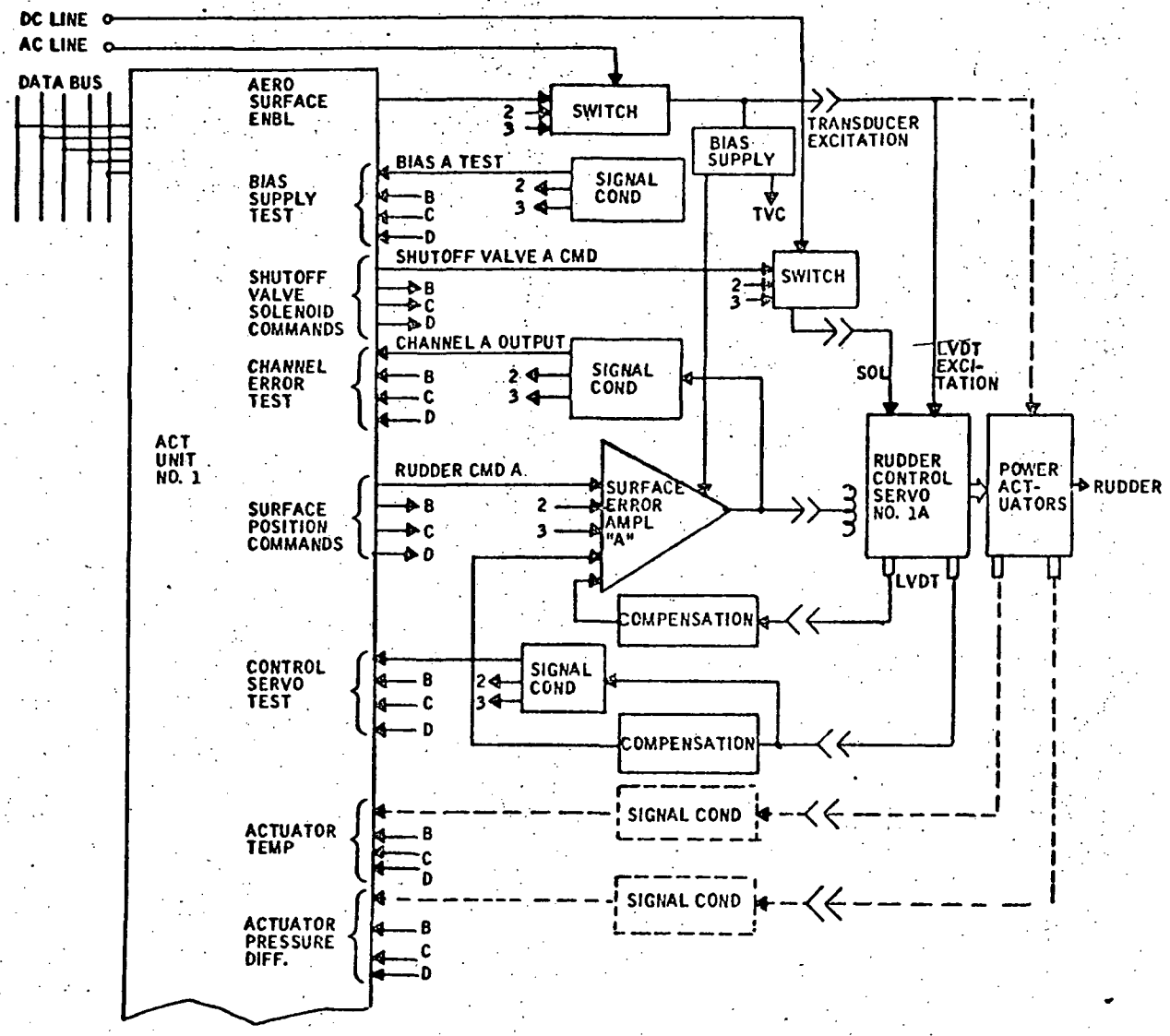
Multilateration Subsystem



Simplified Block Diagram and Module Division, Radar Altimeter



Air Data Package Block Diagram



Typical Aero Surface Control Channel

APPENDIX B

Control and display data necessary for crew operations during both nominal and non-nominal conditions

Categories:

Control	-	Man to machine
Display	-	Machine to man
Nominal	-	Required for crew management of a nominal mission (no unplanned internal or vehicle external events requiring crew participation)
Non-nominal	-	Required for crew management in the presence of non-nominal conditions, such as malfunctions and unplanned flight plan changes

CONTROL & DISPLAY DATA

SUBSYSTEM Main Propulsion

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	PRESS HE BOTTLE NO. 1		X		X		
2	PSIA						
3	PRESS HE BOTTLE NO. 2		X		X		
4	PSIA						
5	PRESS HE CONT VLV NO. 1		X		X		
6	PSIA						
7	PRESS HE CONT VLV NO. 2		X		X		
8	PSIA						
9	PRESS HE ENG INLET NO. 1		X		X		
10	PSIA						
11	PRESS HE ENG INLET NO. 2		X		X		
12	PSIA						
13	PRESS LOX ULLAGE TANK NO 1		X	X	X		
14	PSIA						
15	PRESS LOX ULLAGE TANK NO 2		X	X	X		
16	PSIA						
17	PRESS LH2 ULLAGE TANK		X	X	X		
18	PSIA						
19	ENG 1 PRESS LOX INLET		X	X	X		
20	PSIA						
21	ENG 1 PRESS LH2 INLET		X	X	X		
22	PSIA						
23	ENG 2 PRESS LOX INLET		X	X	X		
24	PSIA						
25	ENG 2 PRESS LH2 INLET		X	X	X		
26	PSIA						
27	LOX QUANTITY (CAPACITANCE)		X	X			
28	0 100 PCT 0.						
29	LH2 QUANTITY (CAPACITANCE)		X	X			
30	0 100 PCT 0.						

CONTROL & DISPLAY DATA

SUBSYSTEM Main Propulsion

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	LOX QUANTITY (PT SENSOR)		X		X		
2	0 100 PCT 0.						
3	LH2 QUANTITY (PT SENSOR)		X		X		
4	0 100 PCT 0.						
5	ENG 1 TEMP LOX INLET		X	X	X		
6	DEG F						
7	ENG 1 TEMP LH2 INLET		X	X	X		
8	DEG F						
9	LOX ENGINE CUTOFF 1 DRY		X	X			
10							
11	LOX ENGINE CUTOFF 2 DRY		X	X			
12							
13	LOX ENGINE CUTOFF 3 DRY		X	X			
14							
15	LOX ENGINE CUTOFF 4 DRY		X	X			
16							
17	LOX ENGINE CUTOFF 5 DRY		X	X			
18							
19	LH2 ENGINE CUTOFF 1 DRY		X	X			
20							
21	LH2 ENGINE CUTOFF 2 DRY		X	X			
22							
23	LH2 ENGINE CUTOFF 3 DRY		X	X			
24							
25	LH2 ENGINE CUTOFF 4 DRY		X	X			
26							
27	LH2 ENGINE CUTOFF 5 DRY		X	X			
28							
29	LOX PRE-VALVE 1 OPEN		X	X			
30		X		X			

SUBSYSTEM Main Propulsion

NO.	SIGNAL RANGE / UNITS / ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL	PURPOSE:	REMARKS
1	LOX PRE-VALVE 1 CLOSED		X	X			
2		X		X			
3	LOX PRE-VALVE 2 OPEN		X	X			
4		X		X			
5	LOX PRE-VALVE 2 CLOSED		X	X			
6		X		X			
7	LH2 PRE-VALVE 1 OPEN		X	X			
8		X		X			
9	LH2 PRE-VALVE 1 CLOSED		X	X			
10		X		X			
11	LH2 PRE-VALVE 2 OPEN		X	X			
12		X		X			
13	LH2 PRE-VALVE 2 CLOSED		X	X			
14		X		X			
15	LOX VENT ISOL VALVE OPEN		X	X	X		
16		X		X	X		
17	LOX VENT ISOL VALVE CLOSED		X	X	X		
18		X		X	X		
19	LOX VENT VALVE OPEN		X		X		
20		X			X		
21	LOX VENT VALVE CLOSED		X		X		
22		X			X		
23	LH2 VENT ISOL VALVE OPEN		X		X		
24		X					
25	LH2 VENT ISOL VALVE CLOSED		X		X		
26		X			X		
27	LH2 VENT VALVE OPEN		X		X		
28		X			X		
29	LH2 VENT VALVE CLOSED		X		X		
30		X			X		

CONTROL & DISPLAY DATA

SUBSYSTEM Main Propulsion

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	LOX BURST DISK OPEN		X		X		
2							
3	LOX BURST DISK CLOSED		X	X			
4							
5	LH2 BURST DISK OPEN		X		X		
6							
7	LH2 BURST DISK CLOSED		X	X			
8							
9	LOX FILL DRAIN NO 1 VALVE OPEN		X		X		
10		X			X		
11	LOX FILL DRAIN NO 1 VALVE CLOSED		X	X			
12		X			X		
13	LH2 FILL DRAIN NO 1 VALVE OPEN		X				
14		X			X		
15	LH2 FILL DRAIN NO 1 VALVE CLOSED		X	X			
16		X			X		
17	LH2 E1 RECIRC PUMP ON		X		X		
18	0 5 VDC	X			X		
19	LH2 E1 RECIRC PUMP OFF		X		X		
20	0 5 VDC	X			X		
21	LH2 E2 RECIRC PUMP ON		X		X		
22	0 5 VDC	X			X		
23	LH2 E2 RECIRC PUMP OFF		X		X		
24	0 5 VDC	X			X		
25	LOX FILL DRAIN NO. 2 VALVE OPEN		X		X		
26		X			X		
27	LOX FILL DRAIN NO. 2 VALVE CLOSE		X	X			
28		X			X		
29	LH2 FILL DRAIN NO. 2 VALVE OPEN		X		X		
30		X			X		

SUBSYSTEM Main Propulsion

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	LH2 FILL DRAIN NO. 2 VALVE CLOSE		X	X			
2		X			X		
3	ENG 1 NOZZLE EXTEND		X	X			
4		X		X			
5	ENG 1 NOZZLE RETRACT		X	X			
6		X		X			
7	ENG 2 NOZZLE EXTEND		X	X			
8		X		X			
9	ENG 2 NOZZLE RETRACT		X	X			
10		X		X			
11	LH2BOILOFF ISOL VLV OPN		X		X		
12		X			X		
13	LH2BOILOFF ISOL VLV CLS		X		X		
14		X			X		
15	LO2 BOILOFF ISOL VLV OPN		X		X		
16		X			X		
17	LO2 BOILOFF ISOL VLV CLS		X		X		
18		X			X		
19	LH2 BOILOFF VENT MODE PROP		X	X			
20		X		X			
21	LH2 BOILOFF VENT MODE NONPROP		X	X			
22		X		X			
23	LO2 BOILOFF VENT MODE PROP		X	X			
24		X		X			
25	LO2 BOILOFF VENT MODE NONPROP		X	X			
26		X		X			
27	HELIUM ISOL VLV 1 OPN		X	X	X		
28		X		X	X		
29	HELIUM ISOL VLV 1 CLS		X	X	X		
30		X		X	X		

CONTROL & DISPLAY DATA

SUBSYSTEM Main Propulsion

NO.	SIGNAL RANGE / UNITS / ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	HELIUM ISOL VLV 2 OPN		X	X	X		
2		X		X	X		
3	HELIUM ISOL VLV 2 CLS		X	X	X		
4		X		X	X		
5	PROP DUMP 1 FUEL		X	X			
6		X		X			
7	PROP DUMP 1 OFF		X	X			
8		X		X			
9	PROP DUMP 1 OXID		X	X			
10		X		X			
11	PROP DUMP 2 FUEL		X	X			
12		X		X			
13	PROP DUMP 2 OFF		X	X			
14		X		X			
15	PROP DUMP 2 OXID		X	X			
16		X		X			
17	LOX VENT VALVE AUTO		X	X			
18		X		X			
19	LH2 VENT VALVE AUTO		X	X			
20		X		X			
21	LH2 E1 RECIRC PUMP AUTO		X	X			
22		X		X			
23	LH2 E2 RECIRC PUMP AUTO		X	X			
24		X		X			
25							
26							
27							
28							
29							
30							

SUBSYSTEM Orbital Maneuvering Propulsion

NO.	SIGNAL RANGE	SIGNAL UNITS	SIGNAL ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL	PURPOSE:	REMARKS
1	LH2 ULLAGE PRESSURE A				X		X		
2	0 40	PSIA	2.						
3	LOX ULLAGE PRESSURE A				X		X		
4	0 40	PSIA	2.						
5	LH2 ULLAGE PRESSURE B				X		X		
6	0 40	PSIA	2.						
7	LOX ULLAGE PRESSURE B				X		X		
8	0 40	PSIA	2.						
9	LH2 PUMP INLET PRESSURE 1				X		X		
10	0 40	PSIA	2.						
11	LH2 PUMP INLET PRESSURE 2				X		X		
12	0 40	PSIA	2.						
13	LH2 PUMP INLET PRESSURE 3				X		X		
14	0 40	PSIA	2.						
15	THRUST CHAMBER PRESS 1				X	X	X		
16	0 1000	PSIA	0.						
17	THRUST CHAMBER PRESS 2				X	X	X		
18	0 1000	PSIA	0.						
19	THRUST CHAMBER PRESS 3				X	X	X		
20	0 1000	PSIA	0.						
21	LH2 PROPELLANT MASS 1				X	X			
22	0 2900	LBM	0.						
23	LH2 PROPELLANT MASS 2				X	X	X		
24	0 2900	LBM	0.						
25	LOX PROPELLANT MASS 1				X	X	X		
26	016000	LBM							
27	LOX PROPELLANT MASS 2				X	X	X		
28	016000	LBM							
29	LH2 PUMP SPEED 1				X		X		
30		RPM	2.						

CONTROL & DISPLAY DATA

SUBSYSTEM Orbital Maneuvering Propulsion

NO.	SIGNAL RANGE	UNITS	ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL	PURPOSE:	REMARKS
1	LH2 PUMP SPEED 2				X		X		
2		RPM	2.						
3	LH2 PUMP SPEED 3				X		X		
4		RPM	2.						
5	LOX PUMP SPEED 1				X		X		
6		RPM	2.						
7	LOX PUMP SPEED 2				X		X		
8		RPM	2.						
9	LOX PUMP SPEED 3				X		X		
10		RPM	2.						
11	LH2 VENT VLV OPEN				X		X		
12				X			X		
13	LH2 VENT VLV CLOSED				X		X		
14				X			X		
15	LH2 VENT ISO VLV OPEN				X		X		
16				X			X		
17	LH2 VENT ISO VLV CLOSED				X		X		
18				X			X		
19	LH2 BACKUP RELIEF VLV OPEN				X		X		
20									
21	LH2 BACKUP RELIEF VLV CLSD				X		X		
22									
23	LOX VENT VALVE OPEN				X		X		
24				X			X		
25	LOX VENT VALVE CLOSED				X		X		
26				X			X		
27	LOX VENT ISO VLV OPEN				X		X		
28				X			X		
29	LOX VENT ISO VLV CLOSED				X		X		
30				X			X		

CONTROL & DISPLAY DATA

SUBSYSTEM Orbital Maneuvering Propulsion

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	LOX BACKUP RLF VLV OPEN		X		X		
2							
3	LOX BACKUP RLF VLV CLOSED		X		X		
4							
5	LH2 PREVALVE 1A OPEN		X		X		
6		X			X		
7	LH2 PREVALVE 1A CLOSED		X		X		
8		X			X		
9	LH2 PREVALVE 2A OPEN		X		X		
10		X			X		
11	LH2 PREVALVE 2A CLOSED		X		X		
12		X			X		
13	LH2 PREVALVE 3A OPEN		X		X		
14		X			X		
15	LH2 PREVALVE 3A CLOSED		X		X		
16		X			X		
17	LOX PREVALVE 1A OPEN		X		X		
18		X			X		
19	LOX PREVALVE 1A CLOSED		X		X		
20		X			X		
21	LOX PREVALVE 2A OPEN		X		X		
22		X			X		
23	LOX PREVALVE 2A CLOSED		X		X		
24		X			X		
25	LOX PREVALVE 3A OPEN		X		X		
26		X			X		
27	LOX PREVALVE 3A CLOSED		X		X		
28		X			X		
29	MAIN FUEL VALVE 1 OPEN		X	X	X		
30		X		X	X		

SUBSYSTEM Orbital Maneuvering Propulsion

NO.	SIGNAL RANGE	SIGNAL UNITS	SIGNAL ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL	PURPOSE:	REMARKS
1	MAIN FUEL VALVE 1 CLSD				X	X	X		
2				X		X	X		
3	MAIN FUEL VALVE 2 OPEN				X	X	X		
4				X		X	X		
5	MAIN FUEL VALVE 2 CLSD				X	X	X		
6				X		X	X		
7	MAIN FUEL VALVE 3 OPEN				X	X	X		
8				X		X	X		
9	MAIN FUEL VALVE 3 CLSD				X	X	X		
10				X		X	X		
11	MAIN OXID VALVE 1 OPEN				X	X	X		
12				X		X	X		
13	MAIN OXID VALVE 1 CLSD				X	X	X		
14				X		X	X		
15	MAIN OXID VALVE 2 OPEN				X	X	X		
16				X		X	X		
17	MAIN OXID VALVE 2 CLSD				X	X	X		
18				X		X	X		
19	MAIN OXID VALVE 3 OPEN				X	X	X		
20				X		X	X		
21	MAIN OXID VALVE 3 CLSD				X	X	X		
22				X		X	X		
23	H2 PRESSN ISO VLV 1 OPEN				X		X		
24				X			X		
25	H2 PRESSN ISO VL 1 CLSD				X		X		
26				X			X		
27	H2 PRESSN ISO VL 2 OPEN				X		X		
28				X			X		
29	H2 PRESSN ISO VL 2 CLSD				X		X		
30				X			X		

SUBSYSTEM Orbital Maneuvering Propulsion

NO.	SIGNAL RANGE / UNITS / ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	H2 PRESSN ISO VLV 3 OPEN		X		X		
2		X			X		
3	H2 PRESSN ISO VLV 3 CLSD		X		X		
4		X			X		
5	02 PRESSN ISO VLV 1 OPEN		X		X		
6		X			X		
7	02 PRESSN ISO VLV 1 CLSD		X		X		
8		X			X		
9	02 PRESSN ISO VLV 2 OPEN		X		X		
10		X			X		
11	02 PRESSN ISO VLV 2 CLSD		X		X		
12		X			X		
13	LOW LEVEL WARNING A LH2		X		X		
14							
15	LOW LEVEL WARNING A LOX		X		X		
16							
17	LOW LEVEL WARNING B LOX		X		X		
18							
19	LOW LEVEL WARNING B LH2		X		X		
20							
21	LH2 F D VALVE OPEN/CLOSE		X		X		
22		X			X		
23	LOX F D VALVE OPEN/CLOSE		X		X		
24		X			X		
25	THERMO VENT FLOW VLV POS INCR		X		X		
26		X			X		
27	THERMO VENT FLOW VLV POS DECR		X		X		
28		X			X		
29	THERMO VENT FLOW RATE		X		X		
30							

SUBSYSTEM Orbital Maneuvering Propulsion

NO.	SIGNAL RANGE / UNITS / ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	THERMO VENT ISOL VLV POS OPN		X		X		
2		X			X		
3	THERMO VENT ISOL VLV POS CLS		X		X		
4		X			X		
5	LH2 TANK PRESS SEL LIQ		X		X		
6		X			X		
7	LH2 TANK PRESS SEL ULGE		X		X		
8		X			X		
9	VENT MODE SEL PROP		X	X			
10		X		X			
11	VENT MODE SEL NONPROP		X	X			
12		X		X			
13	HOT GAS DOORS OPEN		X	X			
14		X		X			
15	HOT GAS DOORS CLOSE		X	X			
16		X		X			
17	LH2 VENT VLV AUTO		X	X			
18		X		X			
19	LOX VENT VLV AUTO		X	X			
20		X		X			
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							

SUBSYSTEM Attitude Control Propulsion

NO.	SIGNAL: RANGE / UNITS / ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL	PURPOSE:	REMARKS
1	PRESSURE CHAMBER THRUSTER 1		X		X		
2	0 460 PSIA 2.						
3	PRESSURE CHAMBER THRUSTER 2		X		X		
4	0 460 PSIA 2.						
5	PRESSURE CHAMBER THRUSTER 3		X		X		
6	0 450 PSIA 2.						
7	PRESSURE CHAMBER THRUSTER 4		X		X		
8	0 450 PSIA 2.						
9	PRESSURE CHAMBER THRUSTER 5		X		X		
10	0 450 PSIA 2.						
11	PRESSURE CHAMBER THRUSTER 6		X		X		
2	0 460 PSIA 2.						
13	PRESSURE CHAMBER THRUSTER 7		X		X		
14	0 450 PSIA 2.						
15	PRESSURE CHAMBER THRUSTER 8		X		X		
16	0 450 PSIA 2.						
17	PRESSURE CHAMBER THRUSTER 9		X		X		
18	0 460 PSIA 2.						
19	PRESSURE CHAMBER THRUSTER 10		X		X		
20	0 460 PSIA 2.						
21	PRESSURE CHAMBER THRUSTER 11		X		X		
22	0 450 PSIA 2.						
23	PRESSURE CHAMBER THRUSTER 12		X		X		
24	0 460 PSIA 2.						
25	PRESSURE CHAMBER THRUSTER 13		X		X		
26	0 450 PSIA 2.						
27	PRESSURE CHAMBER THRUSTER 14		X		X		
28	0 460 PSIA 2.						
29	PRESSURE CHAMBER THRUSTER 15		X		X		
30	0 450 PSIA 2.						

SUBSYSTEM Attitude Control Propulsion

NO.	SIGNAL: RANGE / UNITS / ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL		REMARKS
1	PRESSURE CHAMBER THRUSTER 16		X		X		
2	0 450 PSIA 2.						
3	PRESSURE CHAMBER THRUSTER 17		X		X		
4	0 450 PSIA 2.						
5	PRESSURE CHAMBER THRUSTER 18		X		X		
6	0 450 PSIA 2.						
7	PRESSURE CHAMBER THRUSTER 19		X		X		
8	0 450 PSIA 2.						
9	PRESSURE CHAMBER THRUSTER 20		X		X		
10	0 450 PSIA 2.						
11	PRESSURE CHAMBER THRUSTER 21		X		X		
12	0 450 PSIA 2.						
13	PRESSURE CHAMBER THRUSTER 22		X		X		
14	0 450 PSIA 2.						
15	PRESSURE CHAMBER THRUSTER 23		X		X		
16	0 450 PSIA 2.						
17	PRESSURE CHAMBER THRUSTER 24		X		X		
18	0 450 PSIA 2.						
19	PRESSURE CHAMBER THRUSTER 25		X		X		
20	0 450 PSIA 2.						
21	PRESSURE CHAMBER THRUSTER 26		X		X		
22	0 450 PSIA 2.						
23	PRESSURE CHAMBER THRUSTER 27		X		X		
24	0 450 PSIA 2.						
25	PRESSURE CHAMBER THRUSTER 28		X		X		
26	0 450 PSIA 2.						
27	PRESSURE CHAMBER THRUSTER 29		X		X		
28	0 450 PSIA 2.						
29	PRESS FWD FUEL MANIFOLD		X	X	X		
30	0 1500 PSIA 2.						

SUBSYSTEM Attitude Control Propulsion

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	PRES AFT FUEL MANIFOLD		X	X	X		
2	0 1500 PSIA 2.						
3	PRES FWD OXID MANIFOLD		X	X	X		
4	0 1500 PSIA 2.						
5	PRES AFT OXID MANIFOLD		X	X	X		
6	0 1500 PSIA 2.						
7	TEMP THRUSTER FUEL INLET 1		X		X		
8	200 600 DEG R 2						
9	TEMP THRUSTER FUEL INLET 2		X		X		
10	200 600 DEG R 2						
11	TEMP THRUSTER FUEL INLET 3		X		X		
12	200 600 DEG R 2						
13	TEMP THRUSTER FUEL INLET 4		X		X		
14	200 600 DEG R 2						
15	TEMP THRUSTER FUEL INLET 5		X		X		
16	200 600 DEG R 2						
17	TEMP THRUSTER FUEL INLET 6		X		X		
18	200 600 DEG R 2						
19	TEMP THRUSTER OXID INLET 1		X		X		
20	200 600 DEG R 2						
21	TEMP THRUSTER OXID INLET 2		X		X		
22	300 600 DEG R 2						
23	TEMP THRUSTER OXID INLET 3		X		X		
24	300 600 DEG R 2						
25	TEMP THRUSTER OXID INLET 4		X		X		
26	300 600 DEG R 2						
27	TEMP THRUSTER OXID INLET 5		X		X		
28	300 600 DEG R 2						
29	TEMP THRUSTER OXID INLET 6		X		X		
30	300 600 DEG R 2						

SUBSYSTEM Attitude Control Propulsion

NO.	SIGNAL RANGE	UNITS	ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL		REMARKS
1	TEMP PROP FUEL ACCUM FWD				X		X		
2	200 600	DEG R	2						
3	TEMP PROP FUEL ACCUM AFT				X		X		
4	200 600	DEG R	2						
5	TEMP PROP OXID ACCUM FWD				X		X		
6	200 600	DEG R	2						
7	TEMP PROP OXID ACCUM AFT				X		X		
8	200 600	DEG R	2						
9	VLV FUEL RELIEF 1 CLOSED				X	X	X		
10				X			X		
11	VLV FUEL RELIEF 1 OPEN				X	X	X		
12				X			X		
13	VLV FUEL RELIEF 2 CLOSED				X	X	X		
14				X			X		
15	VLV FUEL RELIEF 2 OPEN				X	X	X		
16				X			X		
17	VLV OXID RELIEF 1 CLOSED				X	X	X		
18				X			X		
19	VLV OXID RELIEF 1 OPEN				X	X	X		
20				X			X		
21	VLV OXID RELIEF 2 CLOSED				X	X	X		
22				X			X		
23	VLV OXID RELIEF 2 OPEN				X	X	X		
24				X			X		
25	VLV FUEL MODE SEL 1 ACPS				X	X			
26				X		X			
27	VLV FUEL MODE SEL 2 ACPS				X	X			
28				X		X			
29	VLV FUEL MODE SEL 3 ACPS				X	X			
30				X		X			

SUBSYSTEM Attitude Control Propulsion

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	VLV FUEL MODE SEL 1 OMS		X	X			
2		X		X			
3	VLV FUEL MODE SEL 2 OMS		X	X			
4		X		X			
5	VLV FUEL MODE SEL 3 OMS		X	X			
6		X		X			
7	VLV OXID MODE SEL 1 ACPS		X	X			
8		X		X			
9	VLV OXID MODE SEL 2 ACPS		X	X			
10		X		X			
11	VLV OXID MODE SEL 3 ACPS		X	X			
12		X		X			
13	VLV OXID MODE SEL 1 OMS		X	X			
14		X		X			
15	VLV OXID MODE SEL 2 OMS		X	X			
16		X		X			
17	VLV OXID MODE SEL 3 OMS		X	X			
18		X		X			
19	VLV HOT GAS VENT 1 PROP		X	X	X		
20		X		X	X		
21	VLV HOT GAS VENT 2 PROP		X	X	X		
22		X		X	X		
23	VLV HOT GAS VENT 3 PROP		X	X	X		
24		X		X	X		
25	VLV HOT GAS VENT 1 NON-PROP		X	X			
26		X		X			
27	VLV HOT GAS VENT 2 NON-PROP		X	X			
28		X		X			
29	VLV HOT GAS VENT 3 NON-PROP		X	X			
30		X		X			

CONTROL & DISPLAY DATA

SUBSYSTEM Attitude Control Propulsion

NO.	SIGNAL RANGE	SIGNAL UNITS	SIGNAL ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL	PURPOSE:	REMARKS
1	VLV PROP OPEN THRUSTER 1				X		X		
2				X			X		
3	VLV PROP CLOSED THRUSTER 1				X		X		
4				X			X		
5	VLV PROP OPEN THRUSTER 2				X		X		
6				X			X		
7	VLV PROP CLOSED THRUSTER 2				X		X		
8				X			X		
9	VLV PROP OPEN THRUSTER 3				X		X		
10				X			X		
11	VLV PROP CLOSED THRUSTER 3				X		X		
12				X			X		
13	VLV PROP OPEN THRUSTER 4				X		X		
14				X			X		
15	VLV PROP CLOSED THRUSTER 4				X		X		
16				X			X		
17	VLV PROP OPEN THRUSTER 5				X		X		
18				X			X		
19	VLV PROP CLOSED THRUSTER 5				X		X		
20				X			X		
21	VLV PROP OPEN THRUSTER 6				X		X		
22				X			X		
23	VLV PROP CLOSED THRUSTER 6				X		X		
24				X			X		
25	VLV PROP OPEN THRUSTER 7				X		X		
26				X			X		
27	VLV PROP CLOSED THRUSTER 7				X		X		
				X			X		
29	VLV PROP OPEN THRUSTER 8				X		X		
30				X			X		

SUBSYSTEM Attitude Control Propulsion

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	VLV PROP CLOSED THRUSTER 8		X		X		
2		X			X		
3	VLV PROP OPEN THRUSTER 9		X		X		
4		X			X		
5	VLV PROP CLOSED THRUSTER 9		X		X		
6		X			X		
7	VLV PROP OPEN THRUSTER 10		X		X		
8		X			X		
9	VLV PROP CLOSED THRUSTER 10		X		X		
10		X			X		
11	VLV PROP OPEN THRUSTER 11		X		X		
12		X			X		
13	VLV PROP CLOSED THRUSTER 11		X		X		
14		X			X		
15	VLV PROP OPEN THRUSTER 12		X		X		
16		X			X		
17	VLV PROP CLOSED THRUSTER 12		X		X		
18		X			X		
19	VLV PROP OPEN THRUSTER 13		X		X		
20		X			X		
21	VLV PROP CLOSED THRUSTER 13		X		X		
22		X			X		
23	VLV PROP OPEN THRUSTER 14		X		X		
24		X			X		
25	VLV PROP CLOSED THRUSTER 14		X		X		
26		X			X		
27	VLV PROP OPEN THRUSTER 15		X		X		
28		X			X		
29	VLV PROP CLOSED THRUSTER 15		X		X		
30		X			X		

CONTROL & DISPLAY DATA

SUBSYSTEM Attitude Control Propulsion

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	VLV PROP OPEN THRUSTER 16		X		X		
2		X			X		
3	VLV PROP CLOSED THRUSTER 16		X		X		
4		X			X		
5	VLV PROP OPEN THRUSTER 17		X		X		
6		X			X		
7	VLV PROP CLOSED THRUSTER 17		X		X		
8		X			X		
9	VLV PROP OPEN THRUSTER 18		X		X		
10		X			X		
11	VLV PROP CLOSED THRUSTER 18		X		X		
12		X			X		
13	VLV PROP OPEN THRUSTER 19		X		X		
14		X			X		
15	VLV PROP CLOSED THRUSTER 19		X		X		
16		X			X		
17	VLV PROP OPEN THRUSTER 20		X		X		
18		X			X		
19	VLV PROP CLOSED THRUSTER 20		X		X		
20		X			X		
21	VLV PROP OPEN THRUSTER 21		X		X		
22		X			X		
23	VLV PROP CLOSED THRUSTER 21		X		X		
24		X			X		
25	VLV PROP OPEN THRUSTER 22		X		X		
26		X			X		
27	VLV PROP CLOSED THRUSTER 22		X		X		
28		X			X		
29	VLV PROP OPEN THRUSTER 23		X		X		
30		X			X		

CONTROL & DISPLAY DATA

SUBSYSTEM Attitude Control Propulsion

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	VLV PROP CLOSED THRUSTER 23		X		X		
2		X			X		
3	VLV PROP OPEN THRUSTER 24		X		X		
4		X			X		
5	VLV PROP CLOSED THRUSTER 24		X		X		
6		X			X		
7	VLV PROP OPEN THRUSTER 25		X		X		
8		X			X		
9	VLV PROP CLOSED THRUSTER 25		X		X		
10		X			X		
11	VLV PROP OPEN THRUSTER 26		X		X		
12		X			X		
13	VLV PROP CLOSED THRUSTER 26		X		X		
14		X			X		
15	VLV PROP OPEN THRUSTER 27		X		X		
16		X			X		
17	VLV PROP CLOSED THRUSTER 27		X		X		
18		X			X		
19	VLV PROP OPEN THRUSTER 28		X		X		
20		X			X		
21	VLV PROP CLOSED THRUSTER 28		X		X		
22		X			X		
23	VLV PROP OPEN THRUSTER 29		X		X		
24		X			X		
25	VLV PROP CLOSED THRUSTER 29		X		X		
26		X			X		
27	VLV THRUSTER OXID ISOL 1 OPEN		X		X		
28		X			X		
29	VLV THRUSTER OXID ISOL 1 CLOSED		X		X		
30		X			X		

SUBSYSTEM Attitude Control Propulsion

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	VLV THRUSTER OXID ISOL 2 OPEN		X		X		
2		X			X		
3	VLV THRUSTER OXID ISOL 2 CLOSED		X		X		
4		X			X		
5	VLV THRUSTER OXID ISOL 3 OPEN		X		X		
6		X			X		
7	VLV THRUSTER OXID ISOL 3 CLOSED		X		X		
8		X			X		
9	VLV THRUSTER OXID ISOL 4 OPEN		X		X		
10		X			X		
11	VLV THRUSTER OXID ISOL 4 CLOSED		X		X		
12		X			X		
13	VLV THRUSTER OXID ISOL 5 OPEN		X		X		
14		X			X		
15	VLV THRUSTER OXID ISOL 5 CLOSED		X		X		
16		X			X		
17	VLV THRUSTER OXID ISOL 6 OPEN		X		X		
18		X			X		
19	VLV THRUSTER OXID ISOL 6 CLOSED		X		X		
20		X			X		
21	VLV THRUST FUL ISO 1 CLOSE		X		X		
22		X			X		
23	VLV THRUST FUL ISO 1 OPEN		X		X		
24		X			X		
25	VLV THRUST FUL ISO 2 CLOSE		X		X		
26		X			X		
27	VLV THRUST FUL ISO 2 OPEN		X		X		
3		X			X		
29	VLV THRUST FUL ISO 3 CLOSE		X		X		
30		X			X		

CONTROL & DISPLAY DATA

SUBSYSTEM Attitude Control Propulsion

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	VLV THRUST FUL ISO 3 OPEN		X		X		
2		X			X		
3	VLV THRUST FUL ISO 4 CLOSE		X		X		
4		X			X		
5	VLV THRUST FUL ISO 4 OPEN		X		X		
6		X			X		
7	VLV THRUST FUL ISO 5 CLOSE		X		X		
8		X			X		
9	VLV THRUST FUL ISO 5 OPEN		X		X		
10		X			X		
11	VLV THRUST FUL ISO 6 CLOSE		X		X		
12		X			X		
13	VLV THRUST FUL ISO 6 OPEN		X		X		
14		X			X		
15	DOOR - Z THRUST REENTRY OPEN		X	X			
16		X		X			
17	DOOR - Z THRUST REENTRY CLOSED		X	X			
18		X		X			
19	DOOR - X THRUST RENTRY OPEN		X	X			
20		X		X			
21	DOOR - X THRUST REENTRY CLOSED		X	X			
22		X		X			
23							
24							
25							
26							
27							
28							
29							
30							

CONTROL & DISPLAY DATA

SUBSYSTEM Air Breathing Engines

NO.	SIGNAL RANGE	UNITS	ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL	PURPOSE:	REMARKS
1	ENG PRES RATO EPR PTG PTZ1				X	X			
2			0.						
3	ENG PRES RATO EPR PTG PTZ2				X	X			
4			0.						
5	ENG PRES RATO EPR PTG PTZ3				X	X			
6			0.						
7	ENG PRES RATO EPR PTG PTZ4				X	X			
8			0.						
9	ENG PRES RATO EPR PTG PTZAUX				X	X			
10			0.						
11	OIL DISCHARGE PRESS ENG 1				X	X	X		
12	0 300	PSIG	0.						
13	OIL DISCHARGE PRESS ENG 2				X	X	X		
14	0 300	PSIG	0.						
15	OIL DISCHARGE PRESS ENG 3				X	X	X		
16	0 300	PSIG	0.						
17	OIL DISCHARGE PRESS ENG 4				X	X	X		
18	0 300	PSIG	0.						
19	OIL DISCHARGE PRESS ENG AUX				X	X	X		
20	0 300	PSIG	0.						
21	OIL PRESSURE LOW ENG 1				X		X		
22	-35	PSIG	0.						
23	OIL PRESSURE LOW ENG 2				X		X		
24	-35	PSIG	0.						
25	OIL PRESSURE LOW ENG 3				X		X		
26	-35	PSIG	0.						
27	OIL PRESSURE LOW ENG 4				X		X		
28	-35	PSIG	0.						
29	OIL PRESSURE LOW ENG AUX				X		X		
30	-35	PSIG	0.						

CONTROL & DISPLAY DATA

SUBSYSTEM Air Breathing Engines

NO.	SIGNAL RANGE / UNITS / ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL	PURPOSE:	REMARKS
1	LUBE TK PRESS ISOL TK 1		X		X		
2	5 35 PSIA 0.						
3	LUBE TK PRESS ISOL TK 2		X		X		
4	5 35 PSIA 0.						
5	LUBE TK PRESS ISOL TK 3		X		X		
6	5 35 PSIA 0.						
7	LUBE TK PRESS ISOL TK 4		X		X		
8	5 35 PSIA 0.						
9	LUBE TK PRESS ISOL TK AUX		X		X		
10	5 35 PSIA 0.						
11	P0183 MAIN TK FUEL PRESS		X		X		
12	2.						
13	TK QUANTITY VERTICAL		X	X			
14	2.						
15	TK QUANTITY HORIZON		X	X			
16	2.						
17	FERRY TK QUANTITY		X	X			
18	2.						
19	HI PRESS ROTOR SPEED ENG 1		X	X	X		
20	12K 16K RPM 0.						
21	HI PRESS ROTOR SPEED ENG 2		X	X	X		
22	12K 15K RPM 0.						
23	HI PRESS ROTOR SPEED ENG 3		X	X	X		
24	12K 16K RPM 0.						
25	HI PRESS ROTOR SPEED ENG 4		X	X	X		
26	12K 16K RPM 0.						
27	HI PRESS ROTOR SPEED ENG AUX		X	X	X		
28	12K 15K RPM 0.						
29	HI PRES ROTR OVASPO ENG 1		X				
30	14K RPM 0.						

CONTROL & DISPLAY DATA

SUBSYSTEM Air Breathing Engines

NO.	SIGNAL RANGE	UNITS	ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL	PURPOSE:	REMARKS
1	HI PRES ROTR OVRSPD ENG 2				X		X		
2	14K	RPM	0.						
3	HI PRES ROTR OVRSPD ENG 3				X		X		
4	14K	RPM	0.						
5	HI PRES ROTR OVRSPD ENG 4				X		X		
6	14K	RPM	0.						
7	HI PRES ROTR OVRSPD ENG AUX				X		X		
8	14K	RPM	0.						
9	FAN ROTOR SPEED 1				X	X	X		
10	1400 12K	RPM	0.						
11	FAN ROTOR SPEED 2				X	X	X		
12	1400 12K	RPM	0.						
13	FAN ROTOR SPEED 3				X	X	X		
14	1400 12K	RPM	0.						
15	FAN ROTOR SPEED 4				X	X	X		
16	1400 12K	RPM	0.						
17	FAN ROTOR SPEED AUX				X	X	X		
18	1400 12K	RPM	0.						
19	ENG VIBRATION EXTERNAL 1				X		X		
20			0.						
21	ENG VIBRATION EXTERNAL 2				X		X		
22	0 10	MILS	0.						
23	ENG VIBRATION EXTERNAL 3				X		X		
24	0 10	MILS	0.						
25	ENG VIBRATION EXTERNAL 4				X		X		
26	0 10	MILS	0.						
27	OIL QUANITY LOW ENG 1				X		X		
28									
29	OIL QUANITY LOW ENG 2				X		X		
30									

SUBSYSTEM Air Breathing Engines

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	OIL QUANITY LOW ENG 3		X		X		
2							
3	OIL QUANITY LOW ENG 4		X		X		
4							
5	LUBE TK ISO VLV POS OPN 1		X		X		
6		X			X		
7	LUBE TK ISO VLV POS CLS 1		X		X		
8		X			X		
9	LUBE TK ISO VLV POS OPN 2		X		X		
10		X			X		
11	LUBE TK ISO VLV POS CLS 2		X		X		
12		X			X		
13	LUBE TK ISO VLV POS OPN 3		X		X		
14		X			X		
15	LUBE TK ISO VLV POS CLS 3		X		X		
16		X			X		
17	LUBE TK ISO VLV POS OPN 4		X		X		
18		X			X		
19	LUBE TK ISO VLV POS CLS 4		X		X		
20		X			X		
21	FUEL TK ISOL VLV VENT OP 8		X	X	X		
22		X		X	X		
23	FUEL TK ISOL VLV VENT CL 8		X	X	X		
24		X		X	X		
25	BOOST PMP ON		X		X		
26		X			X		
27	BOOST PMP OFF		X		X		
28		X			X		
29	BOOST PMP AUTO		X	X			
30		X		X			

CONTROL & DISPLAY DATA

SUBSYSTEM Air Breathing Engines

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	ENG NACELLE POS DEPLOY 1		X	X			
2		X		X			
3	ENG NACELLE POS DEPLOY 2		X	X			
4		X		X			
5	ENG NACELLE POS DEPLOY 3		X	X			
6		X		X			
7	ENG NACELLE POS DEPLOY 4		X	X			
8		X		X			
9	FIRE WARNING SIGNAL ENG 1		X		X		
10							
11	FIRE WARNING SIGNAL ENG 2		X		X		
12							
13	FIRE WARNING SIGNAL ENG 3		X		X		
14							
15	FIRE WARNING SIGNAL ENG 4		X		X		
16							
17	SYS A DETECTION INOP ENG 1		X		X		
18							
19	SYS A DETECTION INOP ENG 2		X		X		
20							
21	SYS A DETECTION INOP ENG 3		X		X		
22							
23	SYS A DETECTION INOP ENG 4		X		X		
24							
25	SYS B DETECTION INOP ENG 1		X		X		
26							
27	SYS B DETECTION INOP ENG 2		X		X		
28							
29	SYS B DETECTION INOP ENG 3		X		X		
30							

SUBSYSTEM Air Breathing Engines

NO.	SIGNAL RANGE UNITS ERR	USE CONTROL	USE DISPLAY	PURPOSE NOMINAL	PURPOSE NON-NOMINAL		REMARKS
1	SYS A DETECTION INOP ENG 4		X		X		
2							
3	SQUIB CKT TEST PRIM VLV 1		X	X			
4		X		X			
5	SQUIB CKT TEST PRIM VLV 2		X	X			
6		X		X			
7	SQUIB CKT TEST PRIM VLV 3		X	X			
8		X		X			
9	SQUIB CKT TEST PRIM VLV 4		X	X			
10		X		X			
11	SQUIB CKT TEST SECD VLV 1		X	X			
12		X		X			
13	SQUIB CKT TEST SECD VLV 2		X	X			
14		X		X			
15	SQUIB CKT TEST SECD VLV 3		X	X			
16		X		X			
17	SQUIB CKT TEST SECD VLV 4		X	X			
18		X		X			
19	TANK SELECT MAIN		X	X			
20		X		X			
21	TANK SELECT OFF		X	X			
22		X		X			
23	TANK SELECT AUX		X	X			
24		X		X			
25	FUEL TANK SHUTOFF POS 1 OPN		X	X	X		
26		X		X	X		
27	FUEL TANK SHUTOFF POS 1 CLS		X	X	X		
28		X		X	X		
29	FUEL TANK SHUTOFF POS 2 OPN		X	X	X		
30		X		X	X		

SUBSYSTEM Air Breathing Engines

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	FUEL TANK SHUTOFF POS 2 CLS		X	X	X		
2		X		X	X		
3	FUEL TANK SHUTOFF POS 3 OPN		X	X	X		
4		X		X	X		
5	FUEL TANK SHUTOFF POS 3 CLS		X	X	X		
6		X		X	X		
7	ANTI-ICE POS ON		X	X			
8		X		X			
9	ANTI-ICE POS OFF		X	X			
10		X		X			
11	START MODE POS 1 AIR		X	X			
12		X		X	X		
13	START MODE POS 1 OFF		X	X			
14		X		X	X		
15	START MODE POS 1 GND		X	X			
16		X		X	X		
17	START MODE POS 2 AIR		X	X			
18		X		X	X		
19	START MODE POS 2 OFF		X	X			
20		X		X	X		
21	START MODE POS 2 GND		X	X			
22		X		X	X		
23	START MODE POS 3 AIR		X	X			
24		X		X	X		
25	START MODE POS 3 OFF		X	X			
26		X		X	X		
27	START MODE POS 3 GND		X	X			
28		X		X	X		
29	START MODE POS 4 AIR		X	X			
30		X		X	X		

SUBSYSTEM Air Breathing Engines

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	START MODE POS 4 OFF		X	X			
2		X		X	X		
3	START MODE POS 4 GND		X	X			
4		X		X	X		
5	START MODE POS AUX AIR		X	X			
6		X		X	X		
7	START MODE POS AUX OFF		X	X			
8		X		X	X		
9	START MODE POS AUX GND		X	X			
10		X		X	X		
11	ENG 1 START POS CLS	X		X			
12							
13	ENG 2 START POS CLS	X		X			
14							
15	ENG 3 START POS CLS	X		X			
16							
17	ENG 4 START POS CLS	X		X			
18							
19	ENG AUX START POS CLS	X		X			
20							
21	FUEL SENS TEST FULL		X	X			
22		X		X			
23	FUEL SENS TEST OFF		X	X			
24		X		X			
25	FUEL SENS TEST EMPTY		X	X			
26		X		X			
27	FILL/DRAIN ISOL VLVE OPN		X		X		
28		X			X		
29	FILL/DRAIN ISOL VLVE CLS		X		X		
30		X			X		

CONTROL & DISPLAY DATA

SUBSYSTEM Air Breathing Engines

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	LUBE TK ISO VLV POS AUTO 1		X	X			
2		X		X			
3	LUBE TK ISO VLV POS AUTO 2		X	X			
4		X		X			
5	LUBE TK ISO VLV POS AUTO 3		X	X			
6		X		X			
7	LUBE TK ISO VLV POS AUTO 4		X	X			
8		X		X			
9	ENG NACELLE POS RETRACT 1		X	X			
10		X		X			
11	ENG NACELLE POS RETRACT 2		X	X			
12		X		X			
13	ENG NACELLE POS RETRACT 3		X	X			
14		X		X			
15	ENG NACELLE POS RETRACT 4		X	X			
16		X		X			
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							

SUBSYSTEM Electrical Power

NO.	SIGNAL RANGE / UNITS / ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL	PURPOSE:	REMARKS
1	VOLT MAIN AC BUS 1 PH A		X	X	X		
2	VAC						
3	VOLT MAIN AC BUS 1 PH B		X	X	X		
4	VAC						
5	VOLT MAIN AC BUS 1 PH C		X	X	X		
6	VAC						
7	VOLT MAIN AC BUS 2 PH A		X	X	X		
8	VAC						
9	VOLT MAIN AC BUS 2 PH B		X	X	X		
10	VAC						
11	VOLT MAIN AC BUS 2 PH C		X	X	X		
12	VAC						
13	VOLT MAIN AC BUS 3 PH A		X	X	X		
14	VAC						
15	VOLT MAIN AC BUS 3 PH B		X	X	X		
16	VAC						
17	VOLT MAIN AC BUS 3 PH C		X	X	X		
18	VAC						
19	CURRENT CHG BATT 1	X	X	X	X		
20	AMP						
21	CURRENT CHG BATT 2	X	X	X	X		
22	AMP						
23	CURRENT TRANSF-RECT 1		X	X	X		
24	AMP						
25	CURRENT TRANSF-RECT 2		X	X	X		
26	AMP						
27	CURRENT TRANSF-RECT 3		X	X	X		
28	AMP						
29	VOLTAGE MAIN DC BUS 1		X	X	X		
30	VDC						

SUBSYSTEM Electrical Power

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	VOLTAGE MAIN DC BUS 2 VDC		X	X	X		
2							
3	VOLTAGE MAIN DC BUS 3 VDC		X	X	X		
4							
5	VOLTAGE SEQ BUS 1 VDC		X	X	X		
6							
7	VOLTAGE SEQ BUS 2 VDC		X	X	X		
8							
9	VOLTAGE INV BUS 1 PH A		X	X	X		
10							
11	VOLTAGE INV BUS 1 PH B		X	X	X		
12							
13	VOLTAGE INV BUS 1 PH C		X	X	X		
14							
15	VOLTAGE INV BUS 2 PH A		X	X	X		
16							
17	VOLTAGE INV BUS 2 PH B		X	X	X		
18							
19	VOLTAGE INV BUS 2 PH C		X	X	X		
20							
21	AC BUS 1 FREQ HZ		X	X	X		
22							
23	AC BUS 2 FREQ HZ		X	X	X		
24							
25	AC BUS 3 FREQ HZ		X	X	X		
26							
27	KVA AC GEN APU 1 0 30 KVA		X	X	X		
28							
29	KVA AC GEN APU 2 0 30 KVA		X	X	X		
30							

SUBSYSTEM Electrical Power

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	KVA AC GEN APU 3		X	X	X		
2	0 30 KVA						
3	PRESS LUBE OIL APU 1		X		X		
4	0 500 PSI						
5	PRESS LUBE OIL APU 2		X		X		
6	0 500 PSI						
7	PRESS LUBE OIL APU 3		X		X		
8	0 500 PSI						
9	PRESS LUBE OIL APU 4		X		X		
10	0 500 PSI						
11	PRESS O2 REG APU 1		X		X		
12							
13	PRESS O2 REG APU 2		X		X		
14	0 350 PSIA						
15	PRESS O2 REG APU 3		X		X		
16	0 350 PSIA						
17	PRESS O2 REG APU 4		X		X		
18	0 350 PSIA						
19	PRESS EXIT APU 1		X		X		
20	0 20 PSIA						
21	PRESS EXIT APU 2		X		X		
22	0 20 PSIA						
23	PRESS EXIT APU 3		X		X		
24	0 20 PSIA						
25	PRESS EXIT APU 4		X		X		
26	0 20 PSIA						
27	PRESS H2 REG APU 1		X		X		
28	0 350 PSIA						
9	PRESS H2 REG APU 2		X		X		
30	0 350 PSIA						

SUBSYSTEM Electrical Power

NO.	SIGNAL RANGE / UNITS / ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL	PURPOSE:	REMARKS
1	PRESS H2 REG APU 3		X		X		
2	0 350 PSIA						
3	PRESS H2 REG APU 4		X		X		
4	0 350 PSIA						
5	RPM TURB APU 1		X	X	X		
6	RPM						
7	RPM TURB APU 2		X	X	X		
8	RPM						
9	RPM TURB APU 3		X	X	X		
10	RPM						
11	RPM TURB APU 4		X	X	X		
12	RPM						
13	FLOW H2 APU 1		X		X		
14	PPH						
15	FLOW H2 APU 2		X		X		
16	PPH						
17	FLOW H2 APU 3		X		X		
18	PPH						
19	FLOW H2 APU 4		X		X		
20	PPH						
21	FLOW O2 APU 1		X		X		
22	PPH						
23	FLOW O2 APU 2		X		X		
24	PPH						
25	FLOW O2 APU 3		X		X		
26	PPH						
27	FLOW O2 APU 4		X		X		
28	PPH						
29	TEMP TURBINE INLET APU 1		X	X	X		
30	1200 2000 DEG F						

SUBSYSTEM Electrical Power

NO.	SIGNAL RANGE	SIGNAL UNITS	SIGNAL ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL	PURPOSE:	REMARKS
1	TEMP TURBINE INLET APU 2				X	X	X		
2	1200 2000	DEG F							
3	TEMP TURBINE INLET APU 3				X	X	X		
4	1200 2000	DEG F							
5	TEMP TURBINE INLET APU 4				X	X	X		
6	1200 2000	DEG F							
7	TEMP LUBE OIL APU 1				X		X		
8	M65 350	DEG F							
9	TEMP LUBE OIL APU 2				X		X		
10	M65 350	DEG F							
11	TEMP LUBE OIL APU 3				X		X		
12	M65 350	DEG F							
13	TEMP LUBE OIL APU 4				X		X		
14	M65 350	DEG F							
15	TEMP O2 INLET APU 1				X		X		
16		DEG F							
17	TEMP O2 INLET APU 2				X		X		
18		DEG F							
19	TEMP O2 INLET APU 3				X		X		
20		DEG F							
21	TEMP O2 INLET APU 4				X		X		
22		DEG F							
23	TEMP H2 INLET APU 1				X		X		
24		DEG F							
25	TEMP H2 INLET APU 2				X		X		
26		DEG F							
27	TEMP H2 INLET APU 3				X		X		
28		DEG F							
29	TEMP H2 INLET APU 4				X		X		
30		DEG F							

SUBSYSTEM Electrical Power

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	TEMP H2 EX LUB OIL HX APU1		X		X		
2	DEG F						
3	TEMP H2 EX LUB OIL HX APU2		X		X		
4	DEG F						
5	TEMP H2 EX LUB OIL HX APU3		X		X		
6	DEG F						
7	TEMP H2 EX LUB OIL HX APU4		X		X		
8	DEG F						
9	TEMP H2 EX HYD OIL HX APU1		X		X		
10	DEG F						
11	TEMP H2 EX HYD OIL HX APU2		X		X		
12	DEG F						
13	TEMP H2 EX HYD OIL HX APU3		X		X		
14	DEG F						
15	TEMP H2 EX HYD OIL HX APU4		X		X		
16	DEG F						
17	TEMP CONTROLLER APU 1		X		X		
18	-65 350 DEG F						
19	TEMP CONTROLLER APU 2		X		X		
20	-65 350 DEG F						
21	TEMP CONTROLLER APU 3		X		X		
22	-65 350 DEG F						
23	TEMP CONTROLLER APU 4		X		X		
24	-65 350 DEG F						
25	FAIL IND POWER CONT UNIT		X		X		
26							
27	CONTACTOR GEN 1 BUS CLOSED		X	X	X		
28							
29	CONTACTOR GEN 2 BUS CLOSED		X	X	X		
30							

SUBSYSTEM Electrical Power

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	CONTACTOR GEN 3 BUS CLOSED		X	X	X		
2							
3	CONTACTOR GSE PWR CLOSED		X		X		
4							
5	CONTACTOR SPACE STA CLOSED		X	X	X		
6							
7	CONTACTOR AC TIE BUS 1 CLS		X	X	X		
8							
9	CONTACTOR AC TIE BUS 2 CLS		X	X	X		
10							
11	CONTACTOR AC TIE BUS 3 CLS		X	X	X		
12							
13	CONTACTOR TRANF RECT 1 CLS		X	X	X		
14							
15	CONTACTOR TRANF RECT 2 CLS		X	X	X		
16							
17	CONTACTOR TRANF RECT 3 CLS		X	X	X		
18							
19	CONTACTOR FC 1 CLOSED		X	X	X		
20							
21	CONTACTOR FC 2 CLOSED		X	X	X		
22							
23	CONTACTOR FC 3 CLOSED		X	X	X		
24							
25	CONTACTOR MAIN DC 1 TIE CL		X	X	X		
26							
27	CONTACTOR MAIN DC 2 TIE CL		X	X	X		
28							
29	CONTACTOR MAIN DC 3 TIE CL		X	X	X		
30							

SUBSYSTEM Electrical Power

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	CONTACTOR BATT 1 CLOSED		X	X	X		
2							
3	CONTACTOR BATT 2 CLOSED		X	X	X		
4							
5	CONTACTOR INV 1 CLOSED		X	X	X		
6							
7	CONTACTOR INV 2 CLOSED		X	X	X		
8							
9	CONTACTOR INV 3 CLOSED		X	X	X		
10							
11	CONTACTOR INV 4 CLOSED		X	X	X		
12							
13	CONTACTOR INV 5 CLOSED		X	X	X		
14							
15	CONTACTOR INV 6 CLOSED		X	X	X		
16							
17	CONTACTOR INV BUS A TIE CL		X	X	X		
18							
19	CONTACTOR INV BUS B TIE CL		X	X	X		
20							
21	CONTACTOR INV BUS C TIE CL		X	X	X		
22							
23	SSPC TRIP INDICATION 1		X		X		
24							
25	THRU						
26							
27	SSPC TRIP INDICATION 900		X		X		
28							
29	VLV SUPPLY H2 FCP 2 OPEN		X	X	X		
30							

SUBSYSTEM Electrical Power

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	VLV SUPPLY H2 FCP 3 OPEN		X	X	X		
2							
3	VLV MANF ISOL 1 H2 OPEN		X	X	X		
4							
5	VLV MANF ISOL 2 H2 OPEN		X	X	X		
6							
7	VLV MANF ISOL 3 H2 OPEN		X	X	X		
8							
9	VLV MANF ISOL 4 H2 OPEN		X	X	X		
10							
11							
12							
13	VALVE SUPPLY 02 FCP 1 OPEN		X	X	X		
14							
15	VALVE SUPPLY 02 FCP 2 OPEN		X	X	X		
16							
17	VALVE SUPPLY 02 ECS 1 OPEN		X	X	X		
18							
19	VALVE SUPPLY 02 ECS 2 OPEN		X	X	X		
20							
21	VALVE MANF ISO 1 02 OPEN		X	X	X		
22							
23	VALVE MANF ISO 2 02 OPEN		X	X	X		
24							
25	VALVE MANF ISO 3 02 OPEN		X	X	X		
26							
27	VALVE MANF ISO 4 02 OPEN		X	X	X		
28							
29	VALVE H2 PURGE FCP1 CLOSE		X	X	X		
30							

SUBSYSTEM Electrical Power

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	VALVE H2 PURGE FCP2 CLOSE		X	X	X		
2							
3	VALVE H2 PURGE FCP3 CLOSE		X	X	X		
4							
5	VALVE O2 PURGE FCP1 CLOSE		X	X	X		
6							
7	VALVE O2 PURGE FCP2 CLOSE		X	X	X		
8							
9	VALVE O2 PURGE FCP3 CLOSE		X	X	X		
10							
11	VALVE H2O DISCH FCP1 OPEN		X	X	X		
12							
13	VALVE H2O DISCH FCP2 OPEN		X	X	X		
14							
15	VALVE H2O DISCH FCP3 OPEN		X	X	X		
16							
17	VALVE H2O MANF ISOL 1 OPEN		X	X	X		
18							
19	VALVE H2O MANF ISOL 2 OPEN		X	X	X		
20							
21	VALVE H2O SUPPLY ISO 1 OP		X	X	X		
22							
23	VALVE H2O SUPPLY ISO 2 OP		X	X	X		
24							
25	SELF CHECK OK APU 1		X	X	X		
26							
27	SELF CHECK OK APU 2		X	X	X		
28							
49	SELF CHECK OK APU 3		X	X	X		
30							

CONTROL & DISPLAY DATA

SUBSYSTEM Electrical Power

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	SELF CHECK OK APU 4		X	X	X		
2							
3	H2 TK 1 HTR MODE AUTO	X	X	X	X		
4							
5	H2 TK 1 HTR MODE ON	X	X	X	X		
6							
7	H2 TK 2 HTR MODE AUTO	X	X	X	X		
8							
9	H2 TK 2 HTR MODE ON	X	X	X	X		
10							
11	O2 TK 1 HTR MODE AUTO	X	X	X	X		
12							
13	O2 TK 1 HTR MODE ON	X	X	X	X		
14							
15	O2 TK 2 HTR MODE AUTO	X	X	X	X		
16							
17	O2 TK 2 HTR MODE ON	X	X	X	X		
18							
19	AC GEN 1 BUS CONT ON	X	X	X	X		
20							
21	AC GEN 1 BUS CONOFF	X	X	X	X		
22							
23	AC GEN 2 BUS CONT ON	X	X	X	X		
24							
25	AC GEN 2 BUS CONT OFF	X	X	X	X		
26							
27	AC GEN 3 BUS CONT ON	X	X	X	X		
28							
29	AC GEN 3 BUS CONT OFF	X	X	X	X		
30							

SUBSYSTEM Electrical Power

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	GSE PWR BUS CONT ON	X	X	X	X		
2							
3	GSE PWR BUS CONTR OFF	X	X	X	X		
4							
5	SPACE STA BUS CONT ON	X	X	X	X		
6							
7	SPACE STA BUS CONT OFF	X	X	X	X		
8							
9	AC BUS 1 BUS TIE CONT ON	X	X	X	X		
10							
11	AC BUS 1 BUS TIE CONT OFF	X	X	X	X		
12							
13	AC BUS 2 BUS TIE CONT ON	X	X	X	X		
14							
15	AC BUS 2 BUS TIE CONT OFF	X	X	X	X		
16							
17	AC BUS 3 BUS TIE CONT ON	X	X	X	X		
18							
19	AC BUS 3 BUS TIE CONT OFF	X	X	X	X		
20							
21	TRANS RECTIFIER 1 CONT ON	X	X	X	X		
22							
23	TRANS RECTIFIER 1 CONT OFF	X	X	X	X		
24							
25	TRANS RECTIFIER 2 CONT ON	X	X	X	X		
26							
27	TRANS RECTIFIER 2 CONT OFF	X	X	X	X		
28							
29	TRANS RECTIFIER 3 CONT ON	X	X	X	X		
30							

SUBSYSTEM Electrical Power

NO.	SIGNAL RANGE	SIGNAL UNITS	SIGNAL ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL		REMARKS
1	TRANS RECTIFIER 3 CONT OFF			X	X	X	X		
2									
3	BAT CGR TO BAT 1 ON OFF			X	X	X	X		
4									
5	BAT CGR TO BAT 2 ON OFF			X	X	X	X		
6									
7	FUEL CELL NO 1 BUS CONT ON			X	X	X	X		
8									
9	FUEL CELL NO 1 BUS CON OFF			X	X	X	X		
10									
11	FUEL CELL NO 2 BUS CONT ON			X	X	X	X		
12									
13	FUEL CELL NO 2 BUS CON OFF			X	X	X	X		
14									
15	FUEL CELL NO 3 BUS CON ON			X	X	X	X		
16									
17	FUEL CELL NO 3 BUS CON OFF			X	X	X	X		
18									
19	DC BUS 1 TIE CONT		ON	X	X	X	X		
20									
21	DC BUS 1 TIE CONT		OFF	X	X	X	X		
22									
23	DC BUS 2 TIE CONT		ON	X	X	X	X		
24									
25	DC BUS 2 TIE CONT		OFF	X	X	X	X		
26									
27	DC BUS 3 BUS TIE CONT		ON	X	X	X	X		
28									
29	DC BUS 3 BUS TIE CONT		OFF	X	X	X	X		
30									

CONTROL & DISPLAY DATA

SUBSYSTEM Electrical Power

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	BATT 1 BUS CONT ON	X	X	X	X		
2							
3	BATT 1 BUS CONT OFF	X	X	X	X		
4							
5	BATT 2 BUS CONT ON	X	X	X	X		
6							
7	BATT 2 BUS CONT OFF	X	X	X	X		
8							
9	INVERTER 1 CONTACTOR ON	X	X	X	X		
10							
11	INVERTER 1 CONTACTOR OFF	X	X	X	X		
12							
13	INVERTER 2 CONTACTOR ON	X	X	X	X		
14							
15	INVERTER 2 CONTACTOR OFF	X	X	X	X		
16							
17	INVERTOR 3 CONTACTOR ON	X	X	X	X		
18							
19	INVERTOR 3 CONTACTOR OFF	X	X	X	X		
20							
21	INVERTOR 4 CONTACTOR ON	X	X	X	X		
22							
23	INVERTOR 4 CONTACTOR OFF	X	X	X	X		
24							
25	INVERTER BUS A TIE CONT ON	X	X	X	X		
26							
27	INVERTER BUS A TIE CONTOFF	X	X	X	X		
28							
29	INVERTER BUS H TIL CONT ON	X	X	X	X		
30							

SUBSYSTEM Electrical Power

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	INVERTER BUS B TIE CONTOFF	X	X	X	X		
2							
3	INVERTER BUS C TIE CONT ON	X	X	X	X		
4							
5	INVERTER BUS C TIE CONTOFF	X	X	X	X		
6							
7	SEQUENCER BUS 1 CONT ON	X	X	X	X		
8							
9	SEQUENCER BUS 1 CONT OFF	X	X	X	X		
10							
11	SEQUENCER BUS 2 CONT ON	X	X	X	X		
2							
13	SEQUENCER BUS 2 CONT OFF	X	X	X	X		
14							
15	H2 TK 1 FAN 1 ON	X	X	X	X		
16							
17	H2 TK 1 FAN 2 ON	X	X	X	X		
18							
19	H2 TK 2 FAN 1 ON	X	X	X	X		
20							
21	H2 TK 2 FAN 2 ON	X	X	X	X		
22							
23	H2 TK 1 HTR OFF	X	X	X	X		
24							
25	H2 TK 2 HTR OFF	X	X	X	X		
26							
27	O2 TK 1 HTR OFF	X	X	X	X		
28							
3	O2 TK 2 HTR OFF	X	X	X	X		
30							

CONTROL & DISPLAY DATA

SUBSYSTEM Electrical Power

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	O2 TK 2 HTR 2 ON	X	X	X	X		
2							
3							
4							
5							
6							
7							
8							
9							
10							
11	H2 TK 1 FAN MODE AUTO	X	X	X	X		
12							
13	H2 TK 1 FAN MODE ON	X	X	X	X		
14							
15	H2 TK 2 FAN MODE AUTO	X	X	X	X		
16							
17	H2 TK 2 FAN MODE ON	X	X	X	X		
18							
19							
20							
21							
22							
23							
24							
25							
26							
27	H2 MANF ISOL VLV 1 OPEN	X	X	X	X		
28							
29	H2 MANF ISOL VLV 1 CLOSE	X	X	X	X		
30							

CONTROL & DISPLAY DATA

SUBSYSTEM Electrical Power

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	H2 MANF ISOL VLV 2 OPEN	X	X	X	X		
2							
3	H2 MANF ISOL VLV 2 CLOSE	X	X	X	X		
4							
5	H2 MANF ISOL VLV 3 OPEN	X	X	X	X		
6							
7	H2 MANF ISOL VLV 3 CLOSE	X	X	X	X		
8							
9	H2 MANF ISOL VLV 4 OPEN	X	X	X	X		
10							
11	H2 MANF ISOL VLV 4 CLOSE	X	X	X	X		
12							
13	O2 MANF ISOL VLV 1 OPEN	X	X	X	X		
14							
15	O2 MANF ISOL VLV 1 CLOSE	X	X	X	X		
16							
17	O2 MANF ISOL VLV 2 OPEN	X	X	X	X		
18							
19	O2 MANF ISOL VLV 2 CLOSE	X	X	X	X		
20							
21	O2 MANF ISOL VLV 3 OPEN	X	X	X	X		
22							
23	O2 MANF ISOL VLV 3 CLOSE	X	X	X	X		
24							
25	O2 MANF ISOL VLV 4 OPEN	X	X	X	X		
26							
27	O2 MANF ISOL VLV 4 CLOSE	X	X	X	X		
28							
29	FCP 1 H2 SUPLY VLV OPEN	X	X	X	X		
30							

SUBSYSTEM Electrical Power

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	FCP 1 H2 SUPLY VLV CLOSE	X	X	X	X		
2							
3	FCP 2 H2 SUPLY VLV OPEN	X	X	X	X		
4							
5	FCP 2 H2 SUPLY VLV CLOSE	X	X	X	X		
6							
7	FCP 3 H2 SUPLY VLV OPEN	X	X	X	X		
8							
9	FCP 3 H2 SUPLY VLV CLOSE	X	X	X	X		
10							
11	FCP 1 02 SUPLY VLV OPEN	X	X	X	X		
12							
13	FCP 1 02 SUPLY VLV CLOSE	X	X	X	X		
14							
15	FCP 2 02 SUPLY VLV OPEN	X	X	X	X		
16							
17	FCP 2 02 SUPLY VLV CLOSE	X	X	X	X		
18							
19	FCP 3 02 SUPLY VLV OPEN	X	X	X	X		
20							
21	FCP 3 02 SUPLY VLV CLOSE	X	X	X	X		
22							
23	H20 MANF ISOL VLV 1 OPEN	X	X	X	X		
24							
25	H20 MANF ISOL VLV 1 CLOSE	X	X	X	X		
26							
27	H20 MANF ISOL VLV 2 OPEN	X	X	X	X		
28							
29	H20 MANF ISOL VLV 2 CLOSE	X	X	X	X		
30							

SUBSYSTEM Electrical Power

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	H2O RELIEF VENT HTR ON	X	X	X	X		
2							
3							
4							
5	FCP 1 H2 PURGE VLV OPEN	X	X	X	X		
6							
7	FCP 1 H2 PURGE VLV AUTO	X	X	X	X		
8							
9	FCP 2 H2 PURGE VLV OPEN	X	X	X	X		
10							
11	FCP 2 H2 PURGE VLV AUTO	X	X	X	X		
12							
13	FCP 3 H2 PURGE VLV OPEN	X	X	X	X		
14							
15	FCP 3 H2 PURGE VLV AUTO	X	X	X	X		
16							
17	FCP 1 O2 PURGE VLV OPEN	X	X	X	X		
18							
19	FCP 1 O2 PURGE VLV AUTO	X	X	X	X		
20							
21	FCP 2 O2 PURGE VLV OPEN	X	X	X	X		
22							
23	FCP 2 O2 PURGE VLV AUTO	X	X	X	X		
24							
25	FCP 3 O2 PURGE VLV OPEN	X	X	X	X		
26							
27	FCP 3 O2 PURGE VLV AUTO	X	X	X	X		
28							
29	FCP H2 VENT HTR AUTO	X	X	X	X		
30							

SUBSYSTEM Electrical Power

NO.	SIGNAL RANGE	SIGNAL UNITS	SIGNAL ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL		REMARKS
1	FCP H2 VENT HTR ON			X	X	X	X		
2									
3	FCP H2 VENT HTR OFF			X	X	X	X		
4									
5	FCP O2 VENT HTR AUTO			X	X	X	X		
6									
7									
8									
9	FCP O2 VENT HTR ON			X	X	X	X		
10									
11	FCP O2 VENT HTR OFF			X	X	X	X		
12									
13	FCP COOL H20 VLV 1 OPEN				X		X		
14									
15	FCP COOL H20 VLV 1 CLOSE				X		X		
16									
17	FCP COOL H20 VLV 2 OPEN				X		X		
18									
19	FCP COOL H20 VLV 2 CLOSE				X		X		
20									
21	FCP 1 H2 INLET VLV OPEN				X		X		
22									
23	FCP 1 H2 INLET VLV CLOSE				X		X		
24									
25	FCP 2 H2 INLET VLV OPEN				X		X		
26									
27	FCP 2 H2 INLET VLV CLOSE				X		X		
28									
29	FCP 3 H2 INLET VLV OPEN				X		X		
30									

SUBSYSTEM Electrical Power

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	FCP 3 H2 INLET VLV CLOSE		X		X		
2							
3	FCP 1 O2 INLET VLV OPEN		X		X		
4							
5	FCP 1 O2 INLET VLV CLOSE		X		X		
6							
7	FCP 2 O2 INLET VLV OPEN		X		X		
8							
9	FCP 2 O2 INLET VLV CLOSE		X		X		
10							
11	FCP 3 O2 INLET VLV OPEN		X		X		
12							
13	FCP 3 O2 INLET VLV CLOSE		X		X		
14							
15	FCP 1 LINE CONTACT CLOSE-OPEN	X	X	X	X		
16							
17	FCP 2 LINE CONTACT CLOSE-OPEN	X	X	X	X		
18							
19	FCP 3 LINE CONTACT CLOSE-OPEN	X	X	X	X		
20							
21	FCP 1 PROD H2O VLV OPEN	X	X	X	X		
22							
23	FCP 1 PROD H2O VLV CLOSE	X	X	X	X		
24							
25	FCP 2 PROD H2O VLV OPEN	X	X	X	X		
26							
27	FCP 2 PROD H2O VLV CLOSE	X	X	X	X		
28							
29	FCP 3 PROD H2O VLV OPEN	X	X	X	X		
30							

SUBSYSTEM Electrical Power

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	ECP 3 PROD H2O VLV CLOSE	X	X	X	X		
2							
3	ECLS O2 SUPLY VLV 1 OPEN	X	X	X	X		
4							
5	ECLS O2 SUPLY VLV 1 CLOSE	X	X	X	X		
6							
7	ECLS O2 SUPLY VLV 2 OPEN	X	X	X	X		
8							
9	ECLS O2 SUPLY VLV 2 CLOSE	X	X	X	X		
10							
11	ECLS O2 SUPLY VLV 3 OPEN	X	X	X	X		
12							
13	ECLS O2 SUPLY VLV 3 CLOSE	X	X	X	X		
14							
15	ECLS O2 SUPLY VLV 4 OPEN	X	X	X	X		
16							
17	ECLS O2 SUPLY VLV 4 CLOSE	X	X	X	X		
18							
19	APV 1 START	X	X	X	X		
20							
21	APV 2 START	X	X	X	X		
22							
23	APV 3 START	X	X	X	X		
24							
25	APV 4 START	X	X	X	X		
26							
27	APV 1 STOP	X	X	X	X		
28							
29	APV 2 STOP	X	X	X	X		
30							

CONTROL & DISPLAY DATA

SUBSYSTEM Electrical Power

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	APV 3 STOP	X	X	X	X		
2							
3	APV 4 STOP	X	X	X	X		
4							
5	H2 SUPLY VLV APU 1 OPEN	X	X	X	X		
6							
7	H2 SUPLY VLV APU 2 OPEN	X	X	X	X		
8							
9	H2 SUPLY VLV APU 3 OPEN	X	X	X	X		
10							
11	H2 SUPLY VLV APU 4 OPEN	X	X	X	X		
12							
13	H2 SUPLY VLV APU 1 CLOSE	X	X	X	X		
14							
15	H2 SUPLY VLV APU 2 CLOSE	X	X	X	X		
16							
17	H2 SUPLY VLV APU 3 CLOSE	X	X	X	X		
18							
19	H2 SUPLY VLV APU 4 CLOSE	X	X	X	X		
20							
21	O2 SUPPLY VLV APU 1 OPEN	X	X	X	X		
22							
23	O2 SUPLY VLV APU 2 OPEN	X	X	X	X		
24							
25	O2 SUPLY VLV APU 3 OPEN	X	X	X	X		
26							
27	O2 SUPLY VLV APU 4 OPEN	X	X	X	X		
28							
29	O2 SUPLY VLV APU 1 CLOSE	X	X	X	X		
30							

SUBSYSTEM Electrical Power

NO.	SIGNAL RANGE UNITS ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL		REMARKS
1	O2 SUPLY VLV APU 2 CLOSE	X	X	X	X		
2							
3	O2 SUPLY VLV APU 3 CLOSE	X	X	X	X		
4							
5	O2 SUPLY VLV APU 4 CLOSE	X	X	X	X		
6							
7	H2 TK 1 HE FAN 1 ON	X	X	X	X		
8							
9	H2 TK 1 HE FAN 2 ON	X	X	X	X		
10							
11	H2 TK 2 HE FAN 1 ON	X	X	X	X		
12							
13	H2 TK 2 HE FAN 2 ON	X	X	X	X		
14							
15	O2 TK 1 HE FAN 1 ON	X	X	X	X		
16							
17	O2 TK 1 HE FAN 2 ON	X	X	X	X		
18							
19	O2 TK 2 HE FAN 1 ON	X	X	X	X		
20							
21	O2 TK 2 HE FAN 2 ON	X	X	X	X		
22							
23	H2 TK 1 HE CIRC MODE ON	X	X	X	X		
24							
25	H2 TK 1 HE CIRC MODE AUTO	X	X	X	X		
26							
27	H2 TK 2 HE CIRC MODE ON	X	X	X	X		
28							
29	H2 TK 2 HE CIRC MODE AUTO	X	X	X	X		
30							

SUBSYSTEM Electrical Power

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	O2 TK 1 HE CIRC MODE ON	X	X	X	X		
2							
3	O2 TK 1 HE CIRC MODE AUTO	X	X	X	X		
4							
5	O2 TK 2 HE CIRC MODE ON	X	X	X	X		
6							
7	O2 TK 2 HE CIRC MODE AUTO	X	X	X	X		
8							
9	H2 TK 1 HE ISOL VLV 1 OPN	X	X	X	X		
10							
11	H2 TK 1 HE ISOL VLV 1 CLO	X	X	X	X		
12							
13	H2 TK 1 HE ISOL VLV 2 OPN	X	X	X	X		
14							
15	H2 TK 1 HE ISOL VLV 2 CLO	X	X	X	X		
16							
17	H2 TK 1 HE ISOL VLV 3 OPN	X	X	X	X		
18							
19	H2 TK 1 HE ISOL VLV 3 CLO	X	X	X	X		
20							
21	H2 TK 1 HE ISOL VLV 4 OPN	X	X	X	X		
22							
23	H2 TK 1 HE ISOL VLV 4 CLO	X	X	X	X		
24							
25	HE TK 2 HE ISOL VLV 1 OPN	X	X	X	X		
26							
27	H2 TK 2 HE ISOL VLV 1 CLO	X	X	X	X		
28							
29	H2 TK 2 HE ISOL VLV 2 OPN	X	X	X	X		
30							

SUBSYSTEM Electrical Power

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	H2 TK 2 HE ISOL VLV 2 CLO	X	X	X	X		
2							
3	H2 TK 2 HE ISOL VLV 3 OPN	X	X	X	X		
4							
5	H2 TK 2 HE ISOL VLV 3 CLO	X	X	X	X		
6							
7	H2 TK 2 HE ISOL VLV 4 OPN	X	X	X	X		
8							
9	H2 TK 2 HE ISOL VLV 4 CLO	X	X	X	X		
10							
11	O2 TK 1 HE ISOL VLV 1 OPN	X	X	X	X		
2							
13	O2 TK 1 HE ISOL VLV 1 CLO	X	X	X	X		
14							
15	O2 TK 1 HE ISOL VLV 2 OPN	X	X	X	X		
16							
17	O2 TK 1 HE ISOL VLV 2 CLO	X	X	X	X		
18							
19	O2 TK 1 HE ISOL VLV 3 OPN	X	X	X	X		
20							
21	O2 TK 1 HE ISOL VLV 3 CLO	X	X	X	X		
22							
23	O2 TK 1 HE ISOL VLV 4 OPN	X	X	X	X		
24							
25	O2 TK 1 HE ISOL VLV 4 CLO	X	X	X	X		
26							
27	O2 TK 2 HE ISOL VLV 1 OPN	X	X	X	X		
28							
29	O2 TK 2 HE ISOL VLV 1 CLO	X	X	X	X		
30							

SUBSYSTEM Electrical Power

NO.	SIGNAL RANGE / UNITS / ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL		REMARKS
1	O2 TK 2 HE ISOL VLV 2 OPN	X	X	X	X		
2							
3	O2 TK 2 HE ISOL VLV 2 CLO	X	X	X	X		
4							
5	O2 TK 2 HE ISOL VLV 3 OPN	X	X	X	X		
6							
7	O2 TK 2 HE ISOL VLV 3 CLO	X	X	X	X		
8							
9	O2 TK 2 HE ISOL VLV 4 OPN	X	X	X	X		
10							
11	O2 TK 2 HE ISOL VLV 4 CLO	X	X	X	X		
2							
13	SELF CHECK APU 1		X		X		
14							
15	SELF CHECK APU 2		X		X		
16							
17	SELF CHECK APU 3		X		X		
18							
19	SELF CHECK APU 4		X		X		
20							
21	VLV VENT H2 TANK 1 OPN	X	X	X	X		
22							
23	VLV VENT H2 TANK 2 OPN	X	X	X	X		
24							
25	VLV VENT O2 TANK 1 OPN	X	X	X	X		
26							
27	VLV VENT O2 TANK 2 OPN	X	X	X	X		
28							
29	LH2 TK 1 PRESSURE		X	X	X		
30							

CONTROL & DISPLAY DATA

SUBSYSTEM Electrical Power

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	LH2 TK 2 PRESSURE		X	X	X		
2							
3	LH2 TK 1 QUANTITY		X	X	X		
4							
5	LH2 TK 2 QUANTITY		X	X	X		
6							
7	LO2 TK 1 PRESSURE		X	X	X		
8							
9	LO2 TK 2 PRESSURE		X	X	X		
10							
11	LO2 TK 1 QUANTITY		X	X	X		
12							
13	Lo2 TK 2 QUANTITY		X	X	X		
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							

CONTROL & DISPLAY DATA

SUBSYSTEM Hydraulic Power

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	ELEVON SURFACE NO 1 POSITION		X	X	X		
2	M45 15 DEG 5.						
3	ELEVON SURFACE NO 5 POSITION		X	X	X		
4	M45 15 DEG 5.						
5	RUDDER POSITION	X	X	X	X		
6	M20 20 DEG						
7	DRAG BRAKE POSITION	X	X	X	X		
8	M20 20 DEG						
9	ME 1 YAW ACTUATOR POSITION		X		X		
10	M12 12 DEG 5.						
11	ME 1 PITCH ACTUATOR POSITION		X		X		
12	M12 12 DEG 5.						
13	ME 2 YAW ACTUATOR POSITION		X		X		
14	M12 12 DEG 5.						
15	ME 2 PITCH ACTUATOR POSITION		X		X		
16	M12 12 DEG 5.						
17	NOSE GEAR POSITION	X	X	X	X		
18							
19	NOSE GEAR LOCK POSITION	X	X	X	X		
20							
21	LEFT M GEAR POSITION	X	X	X	X		
22							
23	LEFT M GEAR LOCK POSITION	X	X	X	X		
24							
25	RIGHT M GEAR POSITION	X	X	X	X		
26							
27	RIGHT M GEAR LOCK POSITION	X	X	X	X		
28							
29	ABES NO 1 DOOR POSITION	X	X	X	X		
30							

SUBSYSTEM Hydraulic Power

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	ABES NO 2 DOOR POSITION	X	X	X	X		
2							
3	ABES NO 3 DOOR POSITION	X	X	X	X		
4							
5	ABES NO 4 DOOR POSITION	X	X	X	X		
6							
7	CARGO BAY DOOR POSITION	X	X	X	X		
8							
9	NLG ACCUM PRESS		X		X		
10	1000 5000 PSIA 5.						
11	MLG ACCUM PRESS		X		X		
12	0 5000 PSIA 5.						
13	BRAKE ACTUATOR NO 1 PRESS		X		X		
14	1000 5000 PSIA 5.						
15	BRAKE ACTUATOR NO 2 PRESS		X		X		
16	1000 5000 PSIA 5.						
17	BRAKE ACCUM NO 1 PRESS		X		X		
18	0 5000 PSIA 5.						
19	BRAKE ACCUM NO 2 PRESS		X		X		
20	0 5000 PSIA 5.						
21	HYDRAULIC SYS NO 1 PRESS	X	X	X	X		
22	0 5000 PSIA 5.						
23	HYDRAULIC SYS NO 2 PRESS	X	X	X	X		
24	0 5000 PSIA 5.						
25	HYDRAULIC SYS NO 3 PRESS	X	X	X	X		
26	0 5000 PSIA 5.						
27	HYDRAULIC SYS NO 4 PRESS	X	X	X	X		
28	0 5000 PSIA 5.						
29	RESERVOIR NO 1 FLUID PRESS		X		X		
30	0 200 PSIA 5.						

CONTROL & DISPLAY DATA

SUBSYSTEM Hydraulic Power

NO.	SIGNAL RANGE	SIGNAL UNITS	ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL	PURPOSE:	REMARKS
1	RESERVOIR NO 2 FLUID PRESS				X		X		
2	0	200 PSIA	5.						
3	RESERVOIR NO 3 FLUID PRESS				X		X		
4	0	200 PSIA	5.						
5	RESERVOIR NO 4 FLUID PRESS				X		X		
6	0	200 PSIA	5.						
7	AUX PUMP NO 1 PRESS			X	X	X	X		
8	0	5000 PSIA	5.						
9	AUX PUMP NO 2 PRESS			X	X	X	X		
10	0	5000 PSIA	5.						
11	AUX PUMP NO 3 PRESS			X	X	X	X		
12	0	5000 PSIA	5.						
13	AUX PUMP NO 4 PRESS			X	X	X	X		
14	0	5000 PSIA	5.						
15	RESERVOIR NO 1 FLUID LEVEL				X		X		
16	0	14 GAL	5.						
17	RESERVOIR NO 2 FLUID LEVEL				X		X		
18	0	14 GAL	5.						
19	RESERVOIR NO 3 FLUID LEVEL				X		X		
20	0	14 GAL	5.						
21	RESERVOIR NO 4 FLUID LEVEL				X		X		
22	0	14 GAL	5.						
23	ELEVON SURFACE POSITION			X		X	X		
24									
25									
26									
27									
28									
29									
30									

CONTROL & DISPLAY DATA

SUBSYSTEM ECLSS

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	SECONDARY 02 SUPPLY PRESS		X		X		
2	0 1100 PSIG 5.						
3	RESTRICTOR OUTLET PRESS		X		X		
4	0 1100 PSIG 5.						
5	CYCLIC ACCUM SUPLY IN PRES		X		X		
6	0 150 PSIG 5.						
7	CYCLIC ACCUM SUP VLV OT PR		X		X		
8	0 150 PSIG 5.						
9	CYCLIC ACCUM SUP VLV OT PRS		X		X		
10	0 150 PSIG 5.						
11	SEC CAB PRES REG VLV IN PR		X		X		
12	0 200 PSIG 3						
13	SEC N2 PRES DSTM 02 PP CONTL PR		X		X		
14	0 200 PSIG 3						
15	SEC N2 FLO SENS OUT PRESS		X		X		
16	0 200 PSIG 3						
17	SEC N2 FLO REST OUT PRESS		X		X		
18	0 1000 PSIG 5.						
19	SEC N2 FLO REST IN PRESS		X		X		
20	0 1000 PSIG 5.						
21	SEC N2 STORAGE PRESS		X	X	X		
22	0 3100 PSIG 5.						
23	SEC N2 STORAGE REG PRESS		X		X		
24	0 1000 PSIG 5.						
25	CABIN PRESS		X	X	X		
26	0 30 PSIA 2						
27	PRIM 02 SUPPLY PRESS		X		X		
28	0 1100 PSIG 5.						
29	PRIM 02 FLO REST DSTM PRES		X		X		
30	0 1100 PSIG 5.						

CONTROL & DISPLAY DATA

SUBSYSTEM ECLSS

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	PRIM 02 FLO SENS DSTM PRES		X		X		
2	0 150 PSIG 3						
3	PRIM 02 PRES BTWN CK VLV		X		X		
4	0 150 PSIG 3						
5	PRIM SYS CAB PRES REG IN		X		X		
6	0 260 PSIG 3						
7	PRIM N2 PRES PP CONT/CKVLV		X		X		
8	0 200 PSIG 3						
9	PRIM N2 PRES FLO SENS/PP CONT		X		X		
10	0 200 PSIG 3						
11	PRIM N2 PRES FLO REST OUT		X		X		
12	0 1000 PSIG 5.						
13	PRIM N2 STORAGE REG PRESS		X		X		
14	0 1000 PSIG 5.						
15	PRIM N2 STORAGE TK PRESS		X	X	X		
16	0 1000 PSIG 5.						
17	EMERG 02 FLO REST IN PRESS		X		X		
18	0 1000 PSIG 5.						
19	EMERG 02 PRES IN 900 REG		X		X		
20	0 1000 PSIG 5.						
21	EMERG 02 FLO SENS OUT PRES		X		X		
22	0 150 PSIG 3						
23	CABIN PRESS		X	X	X		
24	0 2$_0$ PSIA 3						
25	PRIM N2 PRES H20 TK REG OT		X		X		
26	0 50 PSIG 3						
27	SEC N2 PRES H20 TK REG OT		X		X		
28	0 50 PSIG 3						
29	SEC N2 PRES PP CONTROL		X		X		
30	0 200 PSIG 3						

CONTROL & DISPLAY DATA

SUBSYSTEM ECLSS

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	SEC O2 PRESS DSTM FLO SENS		X		X		
2	0 150 PSIG 3						
3	SEC N2 STOR N2 REG PRESS		X		X		
4	0 1000 PSIG 5						
5	PRIM N2 STORABLE REG PRESS		X		X		
6	0 3100 PSIG 5						
7	CO2 ABSORBER ASSY OUT PRES		X		X		
8	0 30 PSIA 3						
9	CO2 ABSORBER ASSY IN PRESS		X		X		
10	0 30 PSIA 3						
11	HUM CO2 CONT FAN IN PRESS		X		X		
12	0 30 PSIA 3						
13	CO2 ABSOR OUT CO2 CONTENT		X		X		
14	0 15 MM HG 2.						
15	PRIM COOL LOP PRES CAB HEX IN VL		X		X		
16	0 50 PSIG 3						
17	SEC COOL LOP PRES CAB HEX IN VLV		X		X		
18	0 50 PSIG 3						
19	PRIM COOL LOP PRES CAB HEX OUT V		X		X		
20	0 50 PSIG 3						
21	SEC COOL LOP PRES CAB HEX OUT VL		X		X		
22	0 50 PSIG 3						
23	PRIM COOL LOP PMP SUCT PRE		X		X		
24	0 50 PSIG 3						
25	SEC COOL LOP PMP SUCT PRE		X		X		
26	0 50 PSIG 3						
27	PRIM COOL LOOP COLDPLT IN PRES1		X		X		
28	0 50 PSIG 3						
29	PRIM COOL LOOP COLDPLT IN PRES2		X		X		
30	0 50 PSIG 3						

CONTROL & DISPLAY DATA

SUBSYSTEM ECLSS

NO.	SIGNAL: RANGE / UNITS / ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL	PURPOSE:	REMARKS
1	PRIM COOL LOOP COLDPLT IN PRESS		X		X		
2	0 50 PSIG 3						
3	SEC COOL LOOP COLDPLT IN PRES 1		X		X		
4	0 50 PSIG						
5	SEC LOOP COLDPLT IN PRES 2		X		X		
6	0 50 PSIG 3						
7	SEC LOOP COLDPLT IN PRES 3		X		X		
8	0 50 PSIG 3						
9	PRIM COOL LOOP PMP OUT PRE		X		X		
10	0 50 PSIG 3						
11	SUBLIMATOR SUPPLY PRESS 1		X		X		
12	0 50 PSIG 3						
13	SUBLIMATOR SUPPLY PRESS 2		X		X		
14	0 50 PSIG 3						
15	WASTE WATER TK PRESS		X		X		
16	0 50 PSIG 3						
17	WASTE DUMP NOZZLE PRESS		X		X		
18	0 50 PSIG 3						
19	WASTE DUMP NOZZLE PRESS		X		X		
20	0 50 PSIG 3						
21	CYCLIC ACCM INLET PRESS		X		X		
22	0 50 PSIG 3						
23	POTABLE WATER LINE PRESS		X		X		
24	0 50 PSIG 3						
25	FLUSH WATER PRESS		X		X		
26	0 50 PSIG 5						
27	WASTE COLLECT VAC VENT PRE		X		X		
8	0 -0.25 PSIA 3						
29	WASTE COLLECT PRESS		X		X		
30	0 1.0 PSIA 3						

SUBSYSTEM ECLSS

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1 2	NOZ DUMP UPSTRM PRESS 0 0.25 PSIA 3		X		X		
3 4	SEP OUTLET PRESSURE 0 20 PSIA 3		X		X		
5 6	SEP OUTLET PRESSURE 0 20 PSIA 3		X		X		
7 8	COLLECT TO SEP LINE PRESS 0 20 PSIA 5		X		X		
9 10	NOZ DUMP UPSTRM PRESS 0 0.25 PSIA 3		X		X		
11 12	SEP INLET PRESS 0 20 PSIA 3		X		X		
13 14	SEP INLET PRESS 0 20 PSIA 3		X		X		
15 16	NOZ DUMP UPSTRM PRESS 0 1.0 PSIA 3		X		X		
17 18	NOZ DUMP UPSTRM PRESS 0 1.0 PSIA 3		X		X		
19 20	PRIM FREON LOOP SUCT PRESS 0 300 PSIG 3		X		X		
21 22	SEC FREON LOOP SUCT PRESS 0 300 PSIA 3		X		X		
23 24	PRIM FREON LOOP DISC PRESS 0 300 PSIA 3		X		X		
25 26	SEC FREON LOOP DISC PRESS 0 300 PSIA 3		X		X		
27 28	SUBLIMATOR SUPPLY PRESS 3 0 50 PSIG 3.0		X		X		
29 30	SUBLIMATOR SUPPLY PRESS 4 0 50 PSIG 3.0		X		X		

SUBSYSTEM ECLSS

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	SEC COOL LOOP PMP OUT PRESS		X		X		
2	3.						
3	CYCLIC ACCM SUPPLY VLV OUT PRESS		X		X		
4	0. 150 PSIG 5.						
5	PRIM H20 LOOP ACCM QUANITY		X		X		
6	0 100 PCT 3						
7	SEC H20 LOOP ACCM QUANITY		X		X		
8	0 100 PCT 3						
9	POTABLE WATER QUANITY TANK 1		X	X	X		
10	0 100 PCT 3						
11	POTABLE WATER QUANITY TANK 2		X	X	X		
12	0 100 PCT 3						
13	WASTE WATER TANK1QUANITY		X	X	X		
14	0 100 PCT 3						
15	WASTE WATER TANK2QUANITY		X	X	X		
16	0 100 PCT 3						
17	BIOCIDE TK1 QUANITY		X	X	X		
18	0 100 PCT 5						
19	BIOCIDE TK2 QUANITY		X	X	X		
20	0 100 PCT 5						
21	PRIM FREON LOOP ACCUM QUAN		X		X		
22	0 100 PCT 5						
23	SEC FREON LOOP ACCUM QUAN		X		X		
24	0 100 PCT 5						
25	URINE STR TK QUANTITY 1		X	X	X		
26	0 100 PCT 5.0						
27	URINE STR TK QUANTITY 2		X	X	X		
28	0 100 PCT 5.0						
29	SECONDARY 02 FLOW		X		X		
30	0 10 LB/HR 2						

SUBSYSTEM ECLSS

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	SECONDARY N2 FLOW		X		X		
2	0 10 LB/HR 2.						
3	PRIMARY O2 FLOW		X		X		
4	0 10 LB/HR 2.						
5	PRIMARY N2 FLOW		X		X		
6	0 10 LB/HR 2.						
7	EMERG O2 FLOW		X		X		
8	0 75 LB/HR 2.						
9	POT H_2O TK SILVER ION DETE		X		X		
10	0 5 PPM 3						
11	POT H_2O TK SILVER ION DETE		X		X		
12	0 5 PPM 3						
13	DRINK H2O SUPLY SVR ION DE		X		X		
14	0 5 PPM 3						
15	CONDENSATE SVR ION DET		X		X		
16	0 5 PPM 3.						
17	SEC COOL LOOP INTRCH OUT TEMP		X		X		
18	30 80 DEG F 3						
19	PRIM COL LOP HUM HX OT TEM		X		X		
20	30 80 DEG F 3						
21	SEC COL LOP HUM HX OT TEM		X		X		
22	30 80 DEG F 3						
23	PRIM COL LOP CAB HX IN TEM		X		X		
24	30 95 DEG F 3						
25	SEC COL COP CAB HX IN TEM		X		X		
26	30 95 DEG F 3						
27	PRIM H20 LOOP PLT OUT TMP1		X		X		
28	30 120 DEG F 3						
29	PRIM H20 LOOP PLT OUT TMP2		X		X		
30	30 120 DEG F 3						

CONTROL & DISPLAY DATA

SUBSYSTEM ECLSS

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	PRIM H2O LOOP PLT OUT TMP3		X		X		
2	30 120 DEG F 3						
3	PRIM H2O COLDWAL OUT TEMP		X		X		
4	30 120 DEG F 3						
5	SEC H_2O COLDPLT OUT TEMP 1		X		X		
6	30 120 DEG F 3						
7	SEC H_2O COLDPLT OUT TEMP 2		X		X		
8	30 120 DEG F 3						
9	SEC H_2O COLDPLT OUT TEMP 3		X		X		
10	30 120 DEG F 3						
11	SEC H_2O COLDWAL OUT TEMP		X		X		
12	30 120 DEG F 3						
13	PRIM H2O LOOP PMP IN TEMP		X		X		
14	30 120 DEG F 3						
15	SEC H2O LOOP PMP IN TEMP		X		X		
16	30 120 DEG F 3						
17	HOT WATER TEMP		X	X	X		
18	100 175 DEG F 3						
19	WATERDUMP NOZZLE TEMP		X	X	X		
20	0 150 DEG F 3						
21	WATERDUMP NOZZLE TEMP		X	X	X		
22	0 150 DEG F 3						
23	COLD WATER TEMP		X	X	X		
24	30 60 DEG F 3						
25	DUMP NOZ TEMP		X	X	X		
26	0 150 DEG F 5						
27	DUMP NOZ TEMP		X	X	X		
28	0 150 DEG F 5						
29	PRIM FREON COOL SUCT TEMP		X		X		
30	30 130 DEG F 3						

CONTROL & DISPLAY DATA

SUBSYSTEM ECLSS

NO.	SIGNAL RANGE	UNITS	ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL	PURPOSE:	REMARKS
1	SEC FREON COOL SUCT TEMP				X		X		
2	30	130	DEG F 3						
3	FUEL CEL HX PRIM OUT TEMP				X		X		
4	50	210	DEG F 3						
5	FUEL CEL HX SEC OUT TEMP				X		X		
6	50	210	DEG F 3						
7	HYD HX PRIM OUT TEMP				X		X		
8	50	210	DEG F 3						
9	HYD HX SEC OUT TEMP				X		X		
10	50	210	DEG F 3						
11	RAD PNL 1 PRIM OUT TEMP				X		X		
12	-100	200	DEG F 3						
13	RAD PNL 2 PRIM OUT TEMP				X		X		
14	-100	200	DEG F 3						
15	RAD PNL 3 PRIM OUT TEMP				X		X		
16	-100	200	DEG F 3						
17	RAD PNL 4 PRIM OUT TEMP				X		X		
18	-100	200	DEG F 3						
19	RAD PNL 1 SEC OUT TEMP				X		X		
20	-100	200	DEG F 3						
21	RAD PNL 2 SEC OUT TEMP				X		X		
22	-100	200	DEG F 3						
23	RAD PNL 3 SEC OUT TEMP				X		X		
24	-100	200	DEG F 3						
25	RAD PNL 4 SEC OUT TEMP				X		X		
26	-100	200	DEG F 3						
27	RAD PNL 5 PRIM OUT TEMP				X		X		
28	-100	200	DEG F 3						
29	RAD PNL 6 PRIM OUT TEMP				X		X		
30	-100	200	DEG F 3						

CONTROL & DISPLAY DATA

SUBSYSTEM ECLSS

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	RAD PNL 7 PRIM OUT TEMP		X		X		
2	-100 200 DEG F 3						
3	RAD PNL 8 PRIM OUT TEMP		X		X		
4	-100 200 DEG F 3						
5	RAD PNL 5 SEC OUT TEMP		X		X		
6	-100 200 DEG F 3						
7	RAD PNL 6 SEC OUT TEMP		X		X		
8	-100 200 DEG F 3						
9	RAD PNL 7 SEC OUT TEMP		X		X		
10	-100 200 DEG F 3						
11	RAD PNL 8 SEC OUT TEMP		X		X		
12	-100 200 DEG F 3						
13	PRIM RAD OUT MIX TEMP		X		X		
14	0 210 DEG F 3						
15	SEC RAD OUT MIX TEMP		X		X		
16	0 210 DEG F 3						
17	PRIM H2 HX 1 COOL IN TEMP		X		X		
18	0 210 DEG F 3						
19	SEC H2 HX 1 COOL IN TEMP		X		X		
20	0 210 DEG F 3						
21	PRIM H2 HX 2 COOL IN TEMP		X		X		
22	0 210 DEG F 3						
23	SEC H2 HX COOL OUT TEMP		X		X		
24	0 210 DEG F 3						
25	PRIM H2 HX COOL OUT TEMP		X		X		
26	0 210 DEG F 3						
27	H2 HX OVRBRD VENT 1 TEMP		X	X	X		
28	0 100 DEG F 3						
29	H2 HX OVRBRD VENT 2 TEMP		X	X	X		
30	0 100 DEG F 3						

CONTROL & DISPLAY DATA

SUBSYSTEM ECLSS

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	CAB AIR SEC HT EXCH IN TEMP		X		X		
2	30 120 DEG F 3.0						
3	AVION BAY HT EXCH PRI COOL IN T		X		X		
4	30 120 DEG F 3.0						
5	AVION BAY CLDPLT PRI COOL IN 1 T		X		X		
6	30 120 DEG F 3.0						
7	AVION BAY CLDPLT PRI COOL IN 2 T		X		X		
8	30 120 DEG F 3.0						
9	AVION BAYHT EXCH SEC COOL IN T		X		X		
10	30 120 DEG F 3.0						
11	AVION BAYCLDPLT SEC COOL IN 1 T		X		X		
12	30 120 DEG F 3.0						
13	AVION BAYCLDPLT SEC COOL IN 2 T		X		X		
14	30 120 DEG F 3.0						
15	H2HX OVRBD VT SEC TEMP		X		X		
16	0 100 DEG F 3.0						
17	HUM CONT HEAT EXCH GAS OUT TEMP		X		X		
18	30 90 DEG F 3.						
19	PRIM COOL LOOP INTRCH OUT TEMP		X		X		
20	30 80 DEG F 3.						
21	CAB AIR PRIM HT EXCH OUT TEMP		X		X		
22	30 120 DEG F 3.						
23	CAB AIR SEC HT EXCH OUT TEMP		X		X		
24	30 120 DEG F 3.						
25	CAB AIR PRIM HT EXCH IN TEMP		X		X		
26	30 120 DEG F 3.						
27	HUM C02 CONTFAN 1 OPERATIO	X	X	X	X		
28	5						
29	HUM C02 CONTFAN 2 OPERATIO	X	X	X	X		
30	5						

CONTROL & DISPLAY DATA

SUBSYSTEM ECLSS

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	HUM C02 CONTFAN 3	X	X	X	X		
2	5						
3	PRIM 02 PP		X	X	X		
4	2.5 4.0 PSIA 5.						
5	SEC 02 PP		X	X	X		
6	2.5 4.0 PSIA 5.						
7	PRIM INTCGE BYPASS VLV POS	X	X	X			
8	OPN CLS						
9	SEC INTCGE BYPASS VLV POS	X	X	X			
10	OPN CLS						
11	CABIN FAN 1	X	X	X	X		
12	ON OFF						
13	CABIN FAN 2	X	X	X	X		
14	ON OFF						
15	CABIN FAN 3	X	X	X	X		
16	ON OFF						
17	PRI H20 COOL PMP 1	X	X	X	X		
18	ON OFF						
19	PRIM H20 COOL PMP 2	X	X	X	X		
20	ON OFF						
21	SEC H20 COOL PMP	X	X	X	X		
22	ON OFF						
23	PRIM FREON PMP 1	X	X	X	X		
24	ON OFF						
25	PRIM FREON PMP 2	X	X	X	X		
26	ON OFF						
27	SEC FREON PMP	X	X	X	X		
28	ON OFF						
29	PRIM RAD PNL 1 ISO VLV	X	X	X	X		
30	OPN CLS						

CONTROL & DISPLAY DATA

SUBSYSTEM ECLSS

NO.	SIGNAL RANGE / UNITS / ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL		REMARKS
1	PRIM RAD PNL 2 ISO VLV	X	X	X	X		
2	OPN CLS						
3	SEC RAD PNL 1 ISO VLV	X	X	X	X		
4	OPN CLS						
5	SEC RAD PNL 2 ISO VLV	X	X	X	X		
6	OPN CLS						
7	PRIM RAD CONT VLV	X	X	X	X		
8	OPN CLS						
9	SEC RAD CONT VLV	X	X	X	X		
10	OPN CLS						
11	PRI RAD PROPTION VLV	X	X	X	X		
12	OPN CLS						
13	SEC RAD PROPTION VLV	X	X	X	X		
14	OPN CLS						
15	PRI H2 FLO CONT VLV 2	X	X	X	X		
16	OPN CLS						
17	PRI H2 SHUT OFF VLV 2	X	X	X	X		
18	OPN CLS						
19	PRIM H2 SHUT OFF VLV 1	X	X	X	X		
20	OPN CLS						
21	SEC H2 SHUTOFF VLV	X	X	X	X		
22	OPN CLS PCT						
23	POT H2O TK ISO VLV 1 POS	X	X	X	X		
24	OPN CLS						
25	POT H2O TK ISO VLV 2 POS	X	X	X	X		
26	OPN CLS						
27	WASTE H2O TK ISO VLV 1 POS	X	X	X	X		
28	OPN CLS						
29	WASTE H2O TK ISO VLV 2 POS	X	X	X	X		
30	OPN CLS						

SUBSYSTEM ECLSS

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	FUEL CELL DIVERTER VLV 1 POS	X	X	X	X		
2	OPN CLS						
3	FUEL CELL DIVERTER VLV 2 POS	X	X	X	X		
4	OPN CLS						
5	FLUSH H2O S/O VLV POS	X		X	X		
6	OPN CLS		X		X		
7	URINE DUMP VLV POS	X		X	X		
8	OPN CLS		X		X		
9	ISOLATION VLV POS	X		X	X		
10	OPN CLS		X		X		
11	URINE STR VLV 1 POS	X		X	X		
12	OPN CLS		X		X		
13	URINE STR VLV 2 POS	X		X	X		
14	OPN CLS		X		X		
15	FLUSH VLV 1 POS	X		X	X		
16	OPN CLS		X		X		
17	FLUSH VLV 2 POS	X		X	X		
18	OPN CLS		X		X		
19	ISOLATION VLV POS	X		X	X		
20	OPN CLS		X		X		
21	VENT VLV POS	X		X	X		
22	OPN CLS		X		X		
23	SEC N2 SYS PP CONT VLV 1 POS	X		X	X		
24	OPN CLS		X	X	X		
25	SEC N2 SYS PP CONT VLV 2 POS	X		X	X		
26	OPN CLS		X	X	X		
27	SEC N2 SYS PP CONT BYPAS VLV 1 P	X		X	X		
28	OPN CLS		X	X	X		
29	SEC N2 SYS PP CONT BYPAS VLV 2 P	X		X	X		
30	OPN CLS		X	X	X		

SUBSYSTEM ECLSS

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	PRIM N2 SYS PP CONT VLV 1 POS	X		X	X		
2	OPN CLS		X	X	X		
3	PRIM N2 SYS PP CONT VLV 2 POS	X		X	X		
4	OPN CLS		X	X	X		
5	PRIM N2 SYS PP BYPAS VLV 1 POS	X	X	X	X		
6	OPN CLS						
7	PRIM N2 SYS PP BYPAS VLV 2 POS	X	X	X	X		
8	OPN CLS						
9	WASTE COLCT TO SEP ISO VLV POS	X	X	X	X		
10	OPN CLS						
11	PRIM H2 FLOW CONT VLV 1 POS	X	X	X	X		
12	OPN CLS						
13	PRIM H2 HX BYPAS VLV 1 POS	X	X	X	X		
14	OPN CLS						
15	PRIM H2 HX BYPAS VLV 2 POS	X	X	X	X		
16	OPN CLS						
17	SEC H2 HX BYPAS VLV POS	X	X	X	X		
18	OPN CLS						
19	SEC H2 FLOW CONT VLV POS	X	X	X	X		
20	OPN CLS						
21	SEC O2 100 PSI REG SEL VLV POS	X	X	X	X		
22	OPN CLS						
23	SEC N2 140 PSI REG SEL VLV POS	X	X	X	X		
24	OPN CLS						
25	SEC N2 150 VLV 1 POS	X	X	X	X		
26	OPN CLS						
27	SEC N2 150 VLV 2 POS	X	X	X	X		
28	OPN CLS						
29	SEC CAB REG MAN VLV POS	X	X	X	X		
30	OPN CLS						

CONTROL & DISPLAY DATA

SUBSYSTEM ECLSS

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	CAB PRES RELIEF VLV 1 POS	X	X	X	X		
2	OPN CLS						
3	CAB PRES RELIEF VLV 2 POS	X	X	X	X		
4	OPN CLS						
5	CYCLIC ACCM CONT VLV 1 POS	X	X	X	X		
6	OPN CLS						
7	CYCLIC ACCM CONT VLV 2 POS	X	X	X	X		
8	OPN CLS						
9	CYCLIC ACCM CONT VLV 3 POS	X	X	X	X		
10	OPN CLS						
11	PRIM 02 100 PSI REG SEL VLV POS	X	X	X	X		
12	OPN CLS						
13	PRIM CAB REG MAN VLV POS	X	X	X	X		
14	OPN CLS						
15	EMERG 02 CAB REG MAN VLV POS	X	X	X	X		
16	OPN CLS						
17	PRIM N2 140 PSI REG SEL VLV POS	X	X	X	X		
18	OPN CLS						
19	EMERG MAN 02 SUPPLY VLV POS	X	X	X	X		
20	OPN CLS						
21	EMERG 02 S'S STOFF VLV POS	X	X	X	X		
22	OPN CLS						
23	EMRG 02 SYS 100PSI RG SL VLV POS	X	X	X	X		
24	OPN CLS						
25	PRIM N2 STOR 150 VLV 1 POS	X	X	X	X		
26	OPN CLS						
27	PRIM N2 STOR 150 VLV 2 POS	X	X	X	X		
28	OPN CLS						
29	CAB PRES RELIEF VLV 3 POS	X	X	X	X		
30	OPN CLS						

CONTROL & DISPLAY DATA

SUBSYSTEM ECLSS

NO.	SIGNAL RANGE / UNITS / ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL		REMARKS
1	CAB PRES RELIEF VLV 4 POS	X	X	X	X		
2	OPN CLS						
3	PRIM CAB TEMP CONT VLV POS	X	X	X	X		
4	OPN CLS						
5	SEC CAB TEMP CONT VLV POS	X	X	X	X		
6	OPN CLS						
7	H2O TK PRESS RELIEF VLV POS	X	X	X	X		
8	OPN CLS						
9	H2O TK PRESS RELIEF VLV POS	X	X	X	X		
10	OPN CLS						
11	H2O PRESS RELIEF VLV POS	X	X	X	X		
12	OPN CLS						
13	H2O PRESS RELIEF VLV POS	X	X	X	X		
14	OPN CLS						
15	SUBLIMATOR H2O SUPPLY VLV POS	X	X	X	X		
16	OPN CLS						
17	SUBLIMATOR H2O SUPPLY VLV POS	X	X	X	X		
18	OPN CLS						
19	SUBLIMATOR H2O SUPPLY VLV POS	X	X	X	X		
20	OPN CLS						
21	SUBLIMATOR H2O SUPPLY VLV POS	X	X	X	X		
22	OPN CLS						
23	URINAL ISO VLV POS	X	X	X	X		
24	OPN CLS						
25	URINAL ISO VLV POS	X	X	X	X		
26	OPN CLS						
27	URINE DUMP VLV POS	X	X	X	X		
28	OPN CLS						
29	WASTE COLLECT SEAT POS	X		X			
30	OPN CLS						

CONTROL & DISPLAY DATA

SUBSYSTEM ECLSS

NO.	SIGNAL RANGE / UNITS / ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL		REMARKS
1	EMERG MAN O2 SUPPLY VLV POS	X	X	X	X		
2	OPN CLS						
3	PRM N2 H2O TK PRES RG SL VLV POS	X	X	X	X		
4	OPN CLS						
5	SEC N2/H2O TK PR REG SEL VLV POS	X	X	X	X		
6	OPN CLS						
7	PRIM N2 SHUTOFF POS	X	X	X	X		
8	OPN CLS						
9	SEC N2 SHUTOFF OS	X	X	X	X		
10	OPN CLS						
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							

CONTROL & DISPLAY DATA

SUBSYSTEM GN&C

NO.	SIGNAL RANGE / UNITS / ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL	PURPOSE:	REMARKS
1	ADP3 ANGLE SIDESLIP		X	X			
2	2.						
3	GSD 1A RUDDER POS FDBK		X	X			
4	2.						
5	GSD 1A SP BRKE POS FDBK		X	X			
6	2.						
7	GSD 1A RT ELVN POS FDBK		X	X			
8	2.						
9	GSD 1A LT ELVN POS FDBK		X	X			
10	2.						
11	GSD 1A MAIN E I P POS FDBK		X	X			
12	2.						
13	GSD 1A MAIN E I Y POS FDBK		X	X			
14	2.						
15	GSD 1A OMS E I P POS FDBK		X	X			
16	2.						
17	GSD 1A OMS E I Y POS FDBK		X	X			
18	2.						
19	GSD 1A OMS E I P POS FDBK		X	X			
20	2.						
21	GSD 1A OMS C I P POS FDBK		X	X			
22	2.						
23	GSD 1B RUDDER POS FDBK		X	X			
24	2.						
25	GSD 1B SP BRKE POS FDBK		X	X			
26	2.						
27	GSD 1B RT ELVN POS FDBK		X	X			
28	2.						
29	GSD 1B LT ELVN POS FDBK		X	X			
30	2.						

CONTROL & DISPLAY DATA

SUBSYSTEM GNGC

NO.	SIGNAL RANGE / UNITS / ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL	PURPOSE:	REMARKS
1	GSD 1S MAIN E 1 P POS FDBK		X	X			
2	2.						
3	GSD 1S OMS E 1 Y POS FDBK		X	X			
4	2.						
5	GSD 1C RUDDER POS FDBK		X	X			
6	2.						
7	GSD 1C SP BRKE POS FDBK		X	X			
8	2.						
9	GSD 1C RT ELVN POS FDBK		X	X			
10	2.						
11	GSD 1C LT ELVN POS FDBK		X	X			
2	2.						
13	GSD 1C MAIN E 1 P POS FDBK		X	X			
14	2.						
15	GSD 1C MAIN E 1 Y POS FDBK		X	X			
16	2.						
17	GSD 1C OMS E 1 P POS FDBK		X	X			
18	2.						
19	GSD 1C OMS E 1 Y POS FDBK		X	X			
20	2.						
21	STAR TRKR 1 SUN SHLD POS		X		X		
22	2.						
23	STAR TRKR 1 X SCAN ANGLE		X	X			
24	2.						
25	STAR TRKR 1 Y SCAN ANGLE		X	X			
26	2.						
27	STAR TRKR 1 TARGET AZIMUTH		X	X			
28	2.						
29	STAR TRKR 1 TARGET ELEV		X	X			
30	2.						

CONTROL & DISPLAY DATA

SUBSYSTEM GN&C

NO.	SIGNAL RANGE / UNITS / ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL	PURPOSE:	REMARKS
1	STAR TRKR 2 SUN SHLD POS		X		X		
2	2.						
3	STAR TRKR 2 X SCAN ANGLE		X	X			
4	2.						
5	STAR TRKR 2 Y SCAN ANGLE		X	X			
6	2.						
7	STAR TRKR 2 TARGET AZIMUTH		X	X			
8	2.						
9	STAR TRKR 2 TARGET ELEV		X	X			
10	2.						
11	ADP1 ANGLE/ATTACK PRESS		X		X		
2	2.						
13	ADP1 ANGLE SIDESLIP PRESS		X		X		
14	2.						
15	ADP1 TOTAL PRESS		X	X			
16	2.						
17	ADP1 STATIC PRESS 1		X	X			
18	2.						
19	ADP1 STATIC PRESS 2		X	X			
20	2.						
21	ADP2 ANGLE/ATTACK PRESS		X		X		
22	2.						
23	ADP2 ANGLE SIDESLIP PRESS		X		X		
24	2.						
25	ADP2 TOTAL PRESS		X	X			
26	2.						
27	ADP2 STATIC PRESS 1		X	X			
28	2.						
29	ADP2 STATIC PRESS 2		X	X			
30	2.						

CONTROL & DISPLAY DATA

SUBSYSTEM GN&C

NO.	SIGNAL RANGE / UNITS / ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL	PURPOSE:	REMARKS
1	ADP2 TOTAL PRESS XDCR T		X		X		
2	2.						
3	ADP2 STATIC PRESS 1DCR T		X		X		
4	2.						
5	ADP2 STATIC PRESS 2DCR T		X		X		
6	2.						
7	ADP3 ANGLE/ATTACK PRESS		X	X			
8	2.						
9	ADP3 TOTAL PRESS		X	X			
10	2.						
11	ADP3 STATIC PRESS 1		X	X			
12	2.						
13	ADP3 STATIC PRESS 2		X	X			
14	2.						
15	ADP3 TOTAL PRESS XDCR T		X		X		
16	2.						
17	ADP3 STATIC PRESS 1DCR T		X		X		
18	2.						
19	ADP3 STATIC PRESS 2DCR T		X		X		
20	2.						
21	ADP3 ANGLE/ATTACK PRESS		X		X		
22	2.						
23	ADP3 ANGLE SIDESLIP PRESS		X		X		
24	2.						
25	ADP3 TOTAL PRESS		X	X			
26	2.						
27	ADP3 STATIC PRESS 1		X	X			
28	2.						
29	ADP3 STATIC PRESS 2		X	X			
30	2.						

SUBSYSTEM GN&C

NO.	SIGNAL RANGE / UNITS / ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL		REMARKS
1	ADP3 TOTAL PRESS XDCR T		X		X		
2	2.						
3	ADP3 STATIC PRESS IDCR T		X		X		
4	2.						
5	ADP1 ANGLE/ATTACK XDCR TEMP		X		X		
6	2.						
7	ADP1 SIDESLIP XDCR TEMP		X		X		
8	2.						
9	ADP1 TOTAL PRESS XDCR TEMP		X		X		
10	2.						
11	ADP1 STATIC PRESS 1 XDCR TEMP		X		X		
12	2.						
13	ADP1 STATIC PRESS 2 XDCR TEMP		X		X		
14	2.						
15	ADP2 ANGLE/ATTACK XDCR TEMP		X		X		
16	2.						
17	ADP2 SIDESLIP XDCR TEMP		X		X		
18	2.						
19	ADP3 ANGLE/ATTACK XDCR TEMP		X		X		
20	2.						
21	ADP3 SIDESLIP XDCR TEMP		X		X		
22	2.						
23	ADP3 ANGLE/ATTACK XDCR TEMP		X		X		
24	2.						
25	ADP3 SIDESLIP XDCR TEMP		X		X		
26	2.						
27	ROT CONT 1 CHNL 1 ENABLE	X	X	X			
28							
29	ROT CONT 1 CHNL 2 ENABLE	X	X	X			
30							

CONTROL & DISPLAY DATA

SUBSYSTEM GN&C

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	ROT CONT 1 CHNL 3 ENABLE	X	X	X			
2							
3	ROT CONT 2 CHNL 1 ENABLE	X	X	X			
4							
5	ROT CONT 2 CHNL 2 ENABLE	X	X	X			
6							
7	ROT CONT 2 CHNL 3 ENABLE	X	X	X			
8							
9	POWER ON	X	X	X			
10							
11	ATT DEADBAND AUTO ENGAGED	X	X	X			
12							
13	ATT DEADBAND 5-0 ENGAGED	X	X	X			
14							
15	ATT DEADBAND 1-0 ENGAGED	X	X	X			
16							
17	ATT DEADBAND 0-5 ENGAGED	X	X	X			
18							
19	ATT DEADBAND 0-2 ENGAGED	X	X	X			
20							
21	ASCENT ENGAGED	X	X	X			
22							
23	ORBIT ATT ENGAGED	X	X	X			
24							
25	DELTA V ENGAGED	X	X	X			
26							
27	ENTRY ENGAGED	X	X	X			
28							
29	PITCH ATT HOLD ENGAGED	X	X	X			
30							

CONTROL & DISPLAY DATA

SUBSYSTEM GN&C

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	ROLL ATT HOLD ENGAGED	X	X	X			
2							
3	YAW ATT HOLD ENGAGED	X	X	X			
4							
5	PITCH RATE COND ENGAGED	X	X	X			
6							
7	ROLL RATE COND ENGAGED	X	X	X			
8							
9	YAW RATE COND ENGAGED	X	X	X			
10							
11	PITCH ACCELCOND ENGAGED	X	X	X			
2							
13	ROLL ACCELCOND ENGAGED	X	X	X			
14							
15	YAW ACCELCOND ENGAGED	X	X	X			
16							
17	INERT ATT REF ENGAGED	X	X	X			
18							
19	LOCAL VERT REF ENGAGED	X	X	X			
20							
21	AUTO GUIDANCE ENGAGED	X	X	X			
22							
23	AUTO/PILOT CSS ENGAGED	X	X	X			
24							
25	HEADING HOLD ENGAGED	X	X	X			
26							
27	AUTO GUIDANCE ENGAGED	X	X	X			
49	AUTO/PILOT CSS ENGAGED	X	X	X			
30							

CONTROL & DISPLAY DATA

SUBSYSTEM GN&C

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	HEADING HOLD ENGAGED	X	X	X			
2							
3	ALTITUDE HOLD ENGAGED	X	X	X			
4							
5	MACH HOLD ENGAGED	X	X	X			
6							
7	LANDING ENGAGED	X	X	X			
8							
9	PITCH ACCEL ENGAGED	X	X	X			
10							
11	ROLL ACCEL ENGAGED	X	X	X			
12							
13	YAW ACCEL ENGAGED	X	X	X			
14							
15	PITCH MIN IMP ENGAGED	X	X	X			
16							
17	ROLL MIN IMP ENGAGED	X	X	X			
18							
19	YAW MIN IMP ENGAGED	X	X	X			
20							
21	MACH HOLD ENGAGED	X	X	X			
22							
23	AUTO DEADBAND 1-0 ENGAGED	X	X	X			
24							
25	AUTO DEADBAND 0-5 ENGAGED	X	X	X			
26							
27	AUTO DEADBAND 0-2 ENGAGED	X	X	X			
28							
29	LANDING HOLD ENGAGED	X	X	X			
30							

CONTROL & DISPLAY DATA

SUBSYSTEM GN&C

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	ROLL RT SEN NO 3 ENABLE	X	X	X			
2							
3	IMU NO 1 AZIMUTH LOW GAIN		X		X		
4							
5	IMU NO 1 COARSE ALIGN		X		X		
6							
7	IMU NO 1 VERTICAL CAGE		X		X		
8							
9	IMU NO 1 AZIMUTH CAGE		X		X		
10							
11	IMU NO 1 VERTICAL ERECT		X		X		
12							
13	IMU NO 1 VERT GYR WHEEL IN		X		X		
14							
15	IMU NO 1 DISABLE		X		X		
16							
17	IMU NO 2 VERTICAL LOW GAIN		X		X		
18							
19	IMU NO 2 AZIMUTH LOW GAIN		X		X		
20							
21	IMU NO 2 COARSE ALIGN		X		X		
22							
23	IMU NO 2 VERTICAL CAGE		X		X		
24							
25	IMU NO 2 AZIMUTH CAGE		X		X		
26							
27	IMU NO 2 VERTICAL ERECT		X		X		
28							
29	IMU NO 2 VERT GYR WHEEL IN		X		X		
30							

SYSTEM GN&C

SIGNAL RANGE	SIGNAL UNITS	SIGNAL ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL	PURPOSE:	REMARKS
IMU NO 2 DISABLE				X		X		
IMU NO 3 VERTICAL LOW GAIN				X		X		
IMU NO 3 AZIMUTH LOW GAIN				X		X		
IMU NO 3 COARSE ALIGN				X		X		
IMU NO 3 VERTICAL CAGE				X		X		
IMU NO 3 AZIMUTH CAGE				X		X		
IMU NO 3 VERTICAL ERECT				X		X		
IMU NO 3 VERT GYR WHEEL IN				X		X		
IMU NO 3 DISABLE				X		X		
PITCH RT SEN NO 1 RATE OUT				X		X		
PITCH RT SEN NO 2 RATE OUT				X		X		
PITCH RT SEN NO 3 RATE OUT				X		X		
PITCH RT SEN NO 1 RATE OUT				X		X		
PITCH RT SEN NO 2 RATE OUT				X		X		
PITCH RT SEN NO 3 RATE OUT				X		X		

SUBSYSTEM GN&C

NO.	SIGNAL RANGE / UNITS / ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL	PURPOSE:	REMARKS
1	IMU NO 1 THETA		X	X			
2							
3	IMU NO 1 PHI		X	X			
4							
5	IMU NO 1 PSI		X	X			
6							
7	IMU NO 1 ACCEL X		X	X			
8							
9	IMU NO 1 ACCEL Y		X	X			
10							
11	IMU NO 1 ACCEL Z		X	X			
12							
13	IMU NO 1 PLATFORM FAILURE		X		X		
14							
15	IMU NO 1 PWR SUPP FAILURE		X		X		
16							
17	IMU NO 2 THETA		X	X			
18							
19	IMU NO 2 PHI		X	X			
20							
21	IMU NO. 2 PSI		X	X			
22							
23	IMU NO 2 ACCEL X		X	X			
24							
25	IMU NO 2 ACCEL Y		X	X			
26							
27	IMU NO 2 ACCEL Z		X	X			
28							
29	IMU NO 2 PLATFORM FAILURE		X		X		
30							

SUBSYSTEM GN&C

NO.	SIGNAL RANGE / UNITS / ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	IMU NO 2 PWR SUPP FAILURE		X		X		
2							
3	IMU NO 3 THETA		X	X			
4							
5	IMU NO 3 PHI		X	X			
6							
7	IMU NO 3 PSI		X	X			
8							
9	IMU NO 3 ACCEL X		X	X			
10							
11	IMU NO 3 ACCEL Y		X	X			
12							
13	IMU NO 3 ACCEL Z		X	X			
14							
15	IMU NO 3 PLATFORM FAILURE		X		X		
16							
17	IMU NO 3 PWR SUPP FAILURE		X		X		
18							
19	ASCENT MODE		X	X			
20							
21	ORBIT ATTITUDE MODE		X	X			
22							
23	DELTA V MODE		X	X			
24							
25	ENTRY MODE		X	X			
26							
27	PITCH ATT HOLD MODE		X	X			
28							
29	ROLL ATT HOLD MODE		X	X			
30							

CONTROL & DISPLAY DATA

SUBSYSTEM GN&C

NO.	SIGNAL RANGE	UNITS	ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL	PURPOSE:	REMARKS
1	YAW ATT HOLD MODE			X	X	X			
2									
3	PITCH RATE COND MODE			X	X	X			
4									
5	ROLL RATE COND MODE			X	X	X			
6									
7	YAW RATE COND MODE			X	X	X			
8									
9	PITCH ACCEL COND			X	X	X			
10									
11	ROLL ACCEL COND			X	X	X			
12									
13	YAW ACCEL COND			X	X	X			
14									
15	PITCH MIN IMP MODE			X	X	X			
16									
17	ROLL MIN IMP MODE			X	X	X			
18									
19	YAW MIN IMP MODE			X	X	X			
20									
21	INERTIAL ATT REF			X	X	X			
22									
23	LOCAL VERT ATT REF			X	X	X			
24									
25	AUTO GUIDANCE MODE			X	X	X			
26									
27	AUTOPILOT CSS MODE			X	X	X			
28									
29	HEADING HOLD MODE			X	X	X			
30									

CONTROL & DISPLAY DATA

SUBSYSTEM GN&C

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	ALTITUDE HOLD MODE	X	X	X			
2							
3	MACH HOLD MODE	X	X	X			
4							
5	LANDING HOLD MODE	X	X	X			
6							
7	TVC MODE PITCH AUTO	X	X	X			
8							
9	TVC MODE PITCH RCMD	X	X	X			
10							
11	TVC MODE YAW AUTO	X	X	X			
12							
13	TVC MODE YAW RCMD	X	X	X			
14							
15	GIMBAL TRIM ENG 1	X	X	X			
16							
17	GIMBAL TRIM ENG 2	X	X	X			
18							
19	GIMBAL TRIM ENG 3	X	X	X			
20							
21	GIMBAL TRIM PITCH +V	X	X	X			
22							
23	GIMBAL TRIM PITCH -V	X	X	X			
24							
25	GIMBAL TRIM YAW +V	X	X	X			
26							
27	GIMBAL TRIM YAW -V	X	X	X			
28							
29	DELTA V INCREASE	X	X	X			
30							

SUBSYSTEM GN&C

NO.	SIGNAL / RANGE / UNITS / ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL	PURPOSE:	REMARKS
1	DELTA V DECREASE	X	X	X			
2							
3	DELTA V THRUST 1 EN	X	X	X			
4							
5	DELTA V THRUST 2 EN	X	X	X			
6							
7	DELTA V THRUST 3 EN	X	X	X			
8							
9	YAW TRIM RIGHT	X	X	X			
10							
11	YAW TRIM LEFT	X	X	X			
12							
13	APCS ENABLE	X	X	X			
14							
15	TVC ENABLE	X	X	X			
16							
17	AERO ENABLE	X	X	X			
18							
19	STAR TRKR 1 EXCESS LIGHT		X		X		
20							
21	STAR TRKR 1 TRACK MODE		X	X			
22							
23	STAR TRKR 2 EXCESS LIGHT		X		X		
24							
25	STAR TRKR 2 TRACK MODE		X	X			
26							
27	GSO 1A MAIN ENG 1 ON		X	X			
28							
29	GSO 1A OMS ENG 1 ON		X	X			
30							

CONTROL & DISPLAY DATA

SUBSYSTEM GNSC

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1							
2	GSD 1A MAIN ENG 1 PTCH POS		X	X			
3	GSD 1A MAIN ENG 1 YAW POS		X	X			
4							
5	GSD 1A OMS ENG 1 PTCH POS		X	X			
6							
7	GSD 1A OMS ENG 1 YAW POS		X	X			
8							
9	GSD 1B MAIN ENG 1 ON		X	X			
10							
11	GSD 1B OMS ENG 1 ON		X	X			
12							
13	GSD 1B MAIN ENG 1 PTCH POS		X	X			
14							
15	GSD 1B MAIN ENG 1 YAW POS		X	X			
16							
17	GSD 1B OMS ENG 1 PTCH POS		X	X			
18							
19	GSD 1B OMS ENG 1 YAW POS		X	X			
20							
21	GSD 1C MAIN ENG 1 ON		X	X			
22							
23	GSD 1C MAIN ENG 1 PTCH POS		X	X			
24							
25	GSD 1C MAIN ENG 1 YAW POS		X	X			
26							
27	GSD 1C OMS ENG 1 PTCH POS		X	X			
28							
29	GSD 1C OMS ENG 1 YAW POS		X	X			
30							

CONTROL & DISPLAY DATA

SUBSYSTEM GN&C

NO.	SIGNAL / RANGE / UNITS / ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL	PURPOSE:	REMARKS
1	STAR TRACKER 1 SRCH MODE	X	X	X			
2							
3	STAR TRACKER 2 ENABLE	X	X	X			
4							
5	STAR TRACKER 2 SRCH MODE	X	X	X			
6							
7	STAR TRACKER 1 ENABLE	X	X	X			
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							

CONTROL & DISPLAY DATA

SUBSYSTEM Data Control & Management

NO.	SIGNAL RANGE	SIGNAL UNITS	SIGNAL ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL		REMARKS
1	CENTRAL PROC UNIT 1 FUNCTION			X			X		
2	MASTER SLAVE STANDBY OFF				X	X	X		
3	CENTRAL PROC UNIT 2 FUNCTION			X			X		
4	MASTER SLAVE STANDBY OFF				X	X	X		
5	CENTRAL PROC UNIT 3 FUNCTION			X			X		
6	MASTER SLAVE STANDBY OFF				X	X	X		
7	CENTRAL PROC UNIT 4 FUNCTION			X			X		
8	MASTER SLAVE STANDBY OFF				X	X	X		
9	MAIN STORAGE UNIT 1 FUNCTION			X			X		
10	MASTER SLAVE STANDBY OFF				X	X	X		
11	MAIN STORAGE UNIT 2 FUNCTION			X			X		
12	MASTER SLAVE STANDBY OFF				X	X	X		
13	MAIN STORAGE UNIT 3 FUNCTION			X			X		
14	MASTER SLAVE STANDBY OFF				X	X	X		
15	MAIN STORAGE UNIT 4 FUNCTION			X			X		
16	MASTER SLAVE STANDBY OFF				X	X	X		
17	MAIN STORAGE UNIT 5 FUNCTION			X			X		
18	MASTER SLAVE STANDBY OFF				X	X	X		
19	MAIN STORAGE UNIT 6 FUNCTION			X			X		
20	MASTER SLAVE STANDBY OFF				X	X	X		
21	MAIN STORAGE UNIT 7 FUNCTION			X			X		
22	MASTER SLAVE STANDBY OFF				X	X	X		
23	MAIN STORAGE UNIT 8 FUNCTION			X			X		
24	MASTER SLAVE STANDBY OFF				X	X	X		
25	MAIN STORAGE UNIT 9 FUNCTION			X			X		
26	MASTER SLAVE STANDBY OFF				X	X	X		
27	MAIN STORAGE UNIT 10 FUNCTION			X			X		
28	MASTER SLAVE STANDBY OFF				X	X	X		
29	MAIN STORAGE UNIT 11 FUNCTION			X			X		
30	MASTER SLAVE STANDBY OFF				X	X	X		

CONTROL & DISPLAY DATA

SUBSYSTEM Data Control & Management

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	MAIN STORAGE UNIT 12 FUNCTION	X					
2	MASTER SLAVE STANDBY OFF		X	X	X X		
3	MASS MEMORY 1 FUNCTION						
4	ACTIVE STANDBY OFF	X	X	X	X X		
5	MASS MEMORY 2 FUNCTION						
6	ACTIVE STANDBY OFF	X	X	X	X X		
7	MASS MEMORY 3 FUNCTION						
8	ACTIVE STANDBY OFF	X	X	X	X X		
9	DATA BUS 1 FUNCTION						
10	ACTIVE STANDBY OFF	X	X	X	X X		
11	DATA BUS 2 FUNCTION						
12	ACTIVE STANDBY OFF	X	X	X	X X		
13	DATA BUS 3 FUNCTION						
14	ACTIVE STANDBY OFF	X	X	X	X X		
15	DATA BUS 4 FUNCTION						
16	ACTIVE STANDBY OFF	X	X	X	X X		
17	DATA BUS 5 FUNCTION						
18	ACTIVE STANDBY OFF	X	X	X	X X		
19	ACT 1 FUNCTION						
20	AUTO OFF ON	X	X		X X		
21	THRU						
22							
23	ACT 150 FUNCTION						
24	AUTO OFF ON	X	X		X X		
25	SLAVE COMPUTER STORAGE SOFTWARE MODULES						
26	INDICATE LOAD CLEAR	X	X	X	X X		
27	MASTER COMPUTER STORAGE SOFTWARE MODULES						
28	INDICATE LOAD CLEAR	X	X	X	X X		
29	MASS MEMORY 1 SOFTWARE MODULES						
30	INDICATE		X	X	X		

CONTROL & DISPLAY DATA

SUBSYSTEM Data Control & Management

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	MASS MEMORY 2 SOFTWARE MODULES		X	X	X		
2	INDICATE						
3	MASS MEMORY 3 SOFTWARE MODULES		X	X	X		
4	INDICATE						
5	MISSION PHASE PRELAUNCH SOFTWARE MODULES		X	X	X		
6	INDICATE						
7	MISSION PHASE MATED BOOST SOFTWARE MODULES		X	X	X		
8	INDICATE						
9	MISSION PHASE INSERTION SOFTWARE MODULES		X	X	X		
10	INDICATE						
11	MISSION PHASE RENDEZVOUS SOFTWARE MODULES		X	X	X		
12	INDICATE						
13	MISSION PHASE DOCKING SOFTWARE MODULES		X	X	X		
14	INDICATE						
15	MISSION PHASE DEORBIT SOFTWARE MODULES		X	X	X		
16	INDICATE						
17	MISSION PHASE REENTRY SOFTWARE MODULES		X	X	X		
18	INDICATE						
19	MISSION PHASE AERO SOFTWARE MODULES		X	X	X		
20	INDICATE						
21	MISSION PHASE APPROACH SOFTWARE MODULES		X	X	X		
22	INDICATE						
23	CENTRAL PROC UNIT 1 POWER	X		X	X		
24	OFF ON		X		X		
25	CENTRAL PROC UNIT 2 POWER	X		X	X		
26	OFF ON		X	X	X		
27	CENTRAL PROC UNIT 3 POWER	X		X	X		
28	OFF ON		X	X	X		
29	CENTRAL PROC UNIT 4 POWER	X		X	X		
30	OFF ON		X	X	X		

CONTROL & DISPLAY DATA

SUBSYSTEM Data Control & Management

NO.	SIGNAL RANGE / UNITS / ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	MAIN STORAGE UNIT 1 POWER	X	X	X	X		
2	OFF ON						
3	MAIN STORAGE UNIT 2 POWER	X	X	X	X		
4	OFF ON						
5	MAIN STORAGE UNIT 3 POWER	X	X	X	X		
6	OFF ON						
7	MAIN STORAGE UNIT 4 POWER	X	X	X	X		
8	OFF ON						
9	MAIN STORAGE UNIT 5 POWER	X	X	X	X		
10	OFF ON						
11	MAIN STORAGE UNIT 6 POWER	X	X	X	X		
12	OFF ON						
13	MAIN STORAGE UNIT 7 POWER	X	X	X	X		
14	OFF ON						
15	MAIN STORAGE UNIT 8 POWER	X	X	X	X		
16	OFF ON						
17	MAIN STORAGE UNIT 9 POWER	X	X	X	X		
18	OFF ON						
19	MAIN STORAGE UNIT 10 POWER	X	X	X	X		
20	OFF ON						
21	MAIN STORAGE UNIT 11 POWER	X	X	X	X		
22	OFF ON						
23	MAIN STORAGE UNIT 12 POWER	X	X	X	X		
24	OFF ON						
25	MASS MEMORY 1 POWER	X	X	X	X		
26	OFF ON						
27	MASS MEMORY 2 POWER	X	X	X	X		
28	OFF ON						
29	MASS MEMORY 3 POWER	X	X	X	X		
30	OFF ON						

CONTROL & DISPLAY DATA

SUBSYSTEM Data Control & Management

NO.	SIGNAL RANGE / UNITS / ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL	PURPOSE:	REMARKS
1	ACT 1 POWER	X		X	X		
2	OFF ON		X		X		
3	THRU						
4							
5	ACT 150 POWER	X		X	X		
6	OFF ON		X		X		
7	MASS MEMORY 1 PRESSURE	X		X	X		
8	OFF ON						
9	MASS MEMORY 2 PRESSURE	X		X	X		
10	OFF ON						
11	MASS MEMORY 3 PRESSURE	X		X	X		
12	OFF ON						
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							

CONTROL & DISPLAY DATA

SUBSYSTEM Communications

NO.	SIGNAL RANGE	SIGNAL UNITS	SIGNAL ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL	PURPOSE:	REMARKS
1	PWR FWD RADAR ALT A				X	X			
2			4.	X		X	X		
3	PWR FWD RADAR ALT B				X	X			
4			4.	X		X	X		
5	PWR REL RADAR ALT A				X	X			
6			4.	X		X	X		
7	PWR REL RADAR ALT B				X	X			
8			4.	X		X	X		
9	FREQ SEL UHF/AM 1A				X	X			
10				X		X			
11	FREQ SEL UHF/AM 1B				X	X			
12				X		X			
13	FREQ SEL UHF/AM 1C				X	X			
14				X		X			
15	FREQ SEL UHF/AM 1D				X	X			
16				X		X			
17	FREQ SEL UHF/AM 1E				X	X			
18				X		X			
19	FREQ SEL UHF/AM 2A				X	X			
20				X		X			
21	FREQ SEL UHF/AM 2B				X	X			
22				X		X			
23	FREQ SEL UHF/AM 2C				X	X			
24				X		X			
25	FREQ SEL UHF/AM 2D				X	X			
26				X		X			
27	INTERROGATOR A SELF TEST				X	X	X		
28				X		X			
29	INTERROGATOR B SELF TEST				X	X	X		
30				X		X			

CONTROL & DISPLAY DATA

SUBSYSTEM Communications

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	INTERROGATOR C SELF TEST		X	X	X		
2		X		X			
3	AUDIO CENTER A ON		X	X			
4		X		X			
5	AUDIO CENTER A OFF		X	X			
6		X			X		
7	AUDIO CENTER B ON		X	X			
8		X		X			
9	AUDIO CENTER B OFF		X	X			
10		X			X		
11	MOTION TAPE REC FLT LOG		X	X	X		
12		X			X		
13	STATUS CH 1 REC FLT LOG		X	X			
14							
15	STATUS CH 2 REC FLT LOG		X	X			
16							
17	STATUS CH 3 REC FLT LOG		X	X			
18							
19	STATUS CH 4 REC FLT LOG		X	X			
20							
21	STATUS CH 5 REC FLT LOG		X	X			
22							
23	ALT MIN RADAR ALT A		X	X	X		
24							
25	ALT MIN RADAR ALT B		X	X	X		
26							
27	SELF TEST RADAR ALT A		X	X	X		
28		X		X			
29	SELF TEST RADAR ALT B		X	X	X		
30		X		X			

CONTROL & DISPLAY DATA

SUBSYSTEM Communications

NO.	SIGNAL RANGE / UNITS / ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL		REMARKS
1	ORBITER BOOSTER DL A ON		X	X			
2		X		X			
3	ORBITER BOOSTER DL A OFF		X		X		
4		X			X		
5	ORBITER BOOSTER DL B ON		X	X			
6		X		X			
7	ORBITER BOOSTER DL B OFF		X		X		
8		X			X		
9	ORBITER BOOSTER DL C ON		X	X			
10		X		X			
11	ORBITER BOOSTER DL C OFF		X		X		
12		X			X		
13	ORBITER BOOSTER DL D ON		X	X			
14		X		X			
15	ORBITER BOOSTER DL D OFF		X		X		
16		X			X		
17	ANT SEL UHF/AM 1A ON		X	X			
18		X			X		
19	ANT SEL UHF/AM 1A OFF		X	X			
20		X			X		
21	ANT SEL UHF/AM 2A ON		X	X			
22		X			X		
23	ANT SEL UHF/AM 2A OFF		X	X			
24		X			X		
25	ANT SEL UHF/AM 1B ON		X	X			
26		X			X		
27	ANT SEL UHF/AM 1B OFF		X	X			
28		X			X		
29	ANT SEL UHF/AM 2B ON		X	X			
30		X			X		

CONTROL & DISPLAY DATA

SUBSYSTEM Communications

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	ANT SEL UHF/AM 26 OFF	X	X	X	X		
2			X	X			
3	ANT TRANS A POS 1 ON	X			X		
4			X	X			
5	ANT TRANS A POS 1 OFF	X			X		
6			X	X			
7	ANT TRANS A POS 2 ON	X			X		
8			X	X			
9	ANT TRANS A POS 2 OFF	X			X		
10			X	X			
11	ANT TRANS B POS 1 ON	X			X		
12			X	X			
13	ANT TRANS B POS 1 OFF	X			X		
14			X	X			
15	ANT TRANS B POS 2 ON	X			X		
16			X	X			
17	ANT TRANS B POS 2 OFF	X			X		
18			X	X			
19	ANT VHF/FM A POS 1 ON	X			X		
20			X	X			
21	ANT VHF/FM A POS 1 OFF	X			X		
22			X	X			
23	ANT VHF/FM A POS 2 ON	X			X		
24			X	X			
25	ANT VHF/FM A POS 2 OFF	X			X		
26			X	X			
27	ANT VHF/FM B POS 1 ON	X			X		
28			X	X			
29	ANT VHF/FM B POS 1 OFF	X			X		
30							

CONTROL & DISPLAY DATA

SUBSYSTEM Communications

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	ANT VHF/FM B POS 2 ON		X	X			
2		X			X		
3	ANT VHF/FM B POS 2 OFF		X	X			
4		X			X		
5	ANT SEL USBE 1A ON		X	X			
6		X			X		
7	ANT SEL USBE 1A OFF		X	X			
8		X			X		
9	ANT SEL USBE 1B ON		X	X			
10		X			X		
11	ANT SEL USBE 1B OFF		X	X			
12		X			X		
13	ANT SEL USBE 1C ON		X	X			
14		X			X		
15	ANT SEL USBE 1C OFF		X	X			
16		X			X		
17	ANT SEL USBE 1D ON		X	X			
18		X			X		
19	ANT SEL USBE 1D OFF		X	X			
20		X			X		
21	ANT SEL USBE 2A ON		X	X			
22		X			X		
23	ANT SEL USBE 2A OFF		X	X			
24		X			X		
25	ANT SEL USBE 2B ON		X	X			
26		X			X		
27	ANT SEL USBE 2B OFF		X	X			
8		X			X		
29	ANT SEL USBE 2C ON		X	X			
30		X			X		

CONTROL & DISPLAY DATA

SUBSYSTEM Communications

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	ANT SEL USBE 2C OFF	X	X	X	X		
2							
3	ANT SEL USBE 2D ON	X	X	X	X		
4							
5	ANT SEL USBE 2D OFF	X	X	X	X		
6							
7	ANT SEL USBE A TO PRS ON	X	X	X	X		
8							
9	ANT SEL USBE A TO PRS OFF	X	X	X	X		
10							
11	ANT SEL USBE B TO PRS ON	X	X	X	X		
12							
13	ANT SEL USBE B TO PRS OFF	X	X	X	X		
14							
15	ANT SEL PRS A ON	X	X	X	X		
16							
17	ANT SEL PRS A OFF	X	X	X	X		
18							
19	ANT SEL PRS B ON	X	X	X	X		
20							
21	ANT SEL PRS B OFF	X	X	X	X		
22							
23	PRS A TO USBE ON	X	X	X	X		
24							
25	PRS A TO USBE OFF	X	X	X	X		
26							
27	PRS B TO USBE ON	X	X	X	X		
28							
29	PRS B TO USBE OFF	X	X	X	X		
30							

CONTROL & DISPLAY DATA

SUBSYSTEM Communications

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	INTERROGATOR A ON	X	X	X	X		
2				X	X		
3	INTERROGATOR A OFF	X	X	X	X		
4				X	X		
5	INTERROGATOR A RANGE MODE		X	X			
6		X		X			
7	INTERROGATOR A APR LO MODE		X	X			
8		X		X			
9	INTERROGATOR B ON		X	X	X		
10		X		X	X		
11	INTERROGATOR B OFF		X	X	X		
12		X		X	X		
13	INTERROGATOR B RANGE MODE		X	X			
14		X		X			
15	INTERROGATOR B APR LO MODE		X	X			
16		X		X			
17	INTERROGATOR C ON		X	X	X		
18		X		X	X		
19	INTERROGATOR C OFF		X	X	X		
20		X		X	X		
21	INTERROGATOR C RANGE MODE		X	X			
22		X		X			
23	INTERROGATOR C APR LO MODE		X	X			
24		X		X			
25	TRANSCIEVER UHF/AM 2 OFF		X	X	X		
26		X		X	X		
27	TRANSCIEVER UHF/AM 1 ON		X	X	X		
28		X		X	X		
29	TRANSCIEVER UHF/AM 1 OFF		X	X	X		
30		X		X	X		

CONTROL & DISPLAY DATA

SUBSYSTEM Communications

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	TRANSCIEVER UHF/AM 2 ON	X	X	X	X		
2							
3	HI PWR UHF/AM 1 ON	X	X	X	X		
4							
5	HI PWR UHF/AM 1 OFF	X	X	X	X		
6							
7	HI PWR UHF/AM 2 ON	X	X	X	X		
8							
9	HI PWR UHF/AM 2 OFF	X	X	X	X		
10							
11	ATC A ON	X	X	X	X		
12							
13	ATC A OFF	X	X	X	X		
14							
15	ATC B ON	X	X	X	X		
16							
17	ATC B OFF	X	X	X	X		
18							
19	TRANSCIEVER VHF-FM 1 ON	X	X	X	X		
20							
21	TRANSCIEVER VHF-FM 1 OFF	X	X	X	X		
22							
23	TRANSCIEVER VHF-FM2 ON	X	X	X	X		
24							
25	TRANSCIEVER VHF-FM 2 OFF	X	X	X	X		
26							
27	AMP POWER USBE 1 ON	X	X	X	X		
28							
29	AMP POWER USBE 1 OFF	X	X	X	X		
30							

CONTROL & DISPLAY DATA

SUBSYSTEM Communications

NO.	SIGNAL / RANGE / UNITS / ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	AMP POWER USBE 2 ON		X	X	X		
2		X		X	X		
3	AMP POWER USBE 2 OFF		X	X	X		
4		X		X	X		
5	USBE 1 ON		X	X	X		
6		X		X	X		
7	USBE 1 OFF		X	X	X		
8		X		X	X		
9	USBE 2 ON		X	X	X		
10		X		X	X		
11	USBE 2 OFF		X	X	X		
12		X		X	X		
13	USBE 3 ON		X	X	X		
14		X		X	X		
15	USBE 3 OFF		X	X	X		
16		X		X	X		
17	AUDIO CENTER 1 CHANNEL 1		X	X			
18		X		X			
19	AUDIO CENTER 1 CHANNEL 2		X	X			
20		X		X			
21	AUDIO CENTER 1 CHANNEL 3		X	X			
22		X		X			
23	AUDIO CENTER 2 CHANNEL 1		X	X			
24		X		X			
25	AUDIO CENTER 2 CHANNEL 2		X	X			
26		X		X			
27	AUDIO CENTER 2 CHANNEL 3		X	X			
28		X		X			
29	FLIGHT LOG RECORDER ON		X	X	X		
30		X		X	X		

CONTROL & DISPLAY DATA

SUBSYSTEM Communications

NO.	SIGNAL RANGE UNITS ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	FLIGHT LOG RECORDER OFF	X	X	X	X		
2		X		X	X		
3	PROCESSOR SIGNAL 1 ON		X	X	X		
4		X		X	X		
5	PROCESSOR SIGNAL 1 OFF		X	X	X		
6		X		X	X		
7	PROCESSOR SIGNAL 2 ON		X	X	X		
8		X		X	X		
9	PROCESSOR SIGNAL 2 OFF		X	X	X		
10		X		X	X		
11	PROCESSOR SIGNAL 3 ON		X	X	X		
12		X		X	X		
13	PROCESSOR SIGNAL 3 OFF		X	X	X		
14		X		X	X		
15	PROCESSOR CONFIG SEL 1		X	X	X		
16		X		X	X		
17	PROCESSOR CONFIG SEL 2		X	X	X		
18		X		X	X		
19	PROCESSOR CONFIG SEL 3		X	X	X		
20		X		X	X		
21	PROCESSOR CONFIG SEL 4		X	X	X		
22		X		X	X		
23	PROCESSOR CONFIG SEL 5		X	X	X		
24		X		X	X		
25	UDL 1 ON		X	X	X		
26		X		X	X		
27	UDL 1 OFF		X	X	X		
28		X		X	X		
29	UDL 2 ON		X	X	X		
30		X		X	X		

SUBSYSTEM Communications

NO.	SIGNAL RANGE / UNITS / ERR	USE: CONTROL	USE: DISPLAY	PURPOSE: NOMINAL	PURPOSE: NON-NOMINAL		REMARKS
1	UDL 2 OFF	X	X	X	X		
2		X		X	X		
3	UDL 1 RESET						
4		X		X	X		
5	UDL 2 RESET						
6		X		X	X		
7	ALT RADAR A ON		X	X	X		
8		X		X	X		
9	ALT RADAR A OFF		X	X	X		
10		X		X	X		
11	ALT RADAR A SLF TST ON		X	X	X		
12		X		X	X		
13	ALT RADAR A SLF TST OFF		X	X	X		
14		X		X	X		
15	ALT RADAR B ON		X	X	X		
16		X		X	X		
17	ALT RADAR B OFF		X	X	X		
18		X		X	X		
19	ALT RADAR B SLF TST ON		X	X	X		
20		X		X	X		
21	ALT RADAR B SLF TST OFF		X	X	X		
22		X		X	X		
23	ORBITER/BOOSTER LINK A ON		X	X			
24		X			X		
25	ORBITER/BOOSTER LINK A OFF		X	X			
26		X			X		
27	ORBITER/BOOSTER LINK B ON		X	X			
28		X			X		
29	ORBITER/BOOSTER LINK B OFF		X	X			
30		X			X		

SUBSYSTEM Communications

NO.	SIGNAL RANGE / UNITS / ERR	USE		PURPOSE			REMARKS
		CONTROL	DISPLAY	NOMINAL	NON-NOMINAL		
1	ORBITER/BOOSTER LINK C ON		X	X			
2		X			X		
3	ORBITER/BOOSTER LINK C OFF		X	X			
4		X			X		
5	FREQ SEL UHF/AM 2E		X		X		
6		X			X		
7	ANT SEL UHF/AM 1 AUTO		X	X			
8		X		X			
9	ANT SEL UHF/AM 2 AUTO		X	X			
10		X		X			
11	ANT TRANS A AUTO		X	X			
12		X		X			
13	ANT TRANS B AUTO		X	X			
14		X		X			
15	ANT VHF/FM A AUTO		X	X			
16		X		X			
17	ANT VHF/FM B AUTO		X	X			
18		X		X			
19	ANT SEL USGE A AUTO		X	X			
20		X		X			
21	ANT SEL USBE B AUTO		X	X			
22		X		X			
23	ANT SEL USBE C AUTO		X	X			
24		X		X			
25	ANT SEL USBE D AUTO		X	X			
26		X		X			
27	ANT SEL PRS A AUTO		X	X			
28		X		X			
29	ANT SEL PRS B AUTO		X	X			
30		X		X			