

# Space Shuttle Systems Handbook

Volume I - Sections 1 through 11

Mission Operations Directorate  
Systems Division

Revision C, DCN-2  
April 15, 1984

**NASA**

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas

SPACE SHUTTLE SYSTEMS HANDBOOK

REVISION C  
DCN-2

DOCUMENT CHANGE INSTRUCTION SHEET

Update the Space Shuttle Systems Handbook, Revision C-1, in accordance with the following instructions.

Remove and replace the following pages.

Front cover, vol I		Front cover, vol II	
Preface page		Dwg 12.2 (Sheet 3 of 4)	12.2-3
vii to xii		Dwg 12.2 (Sheet 4 of 4)	12.2-4
Dwg 6.1 (Sheet 1 of 2)	6.1-1	Dwg 12.4	12.4-1
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Add the following new pages.

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Dwg 6.8	6.8-1	Dwg 11.11 (Sheet 2 of 2)	11.11-2
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Delete the following pages.

15.7 (Sheet 1 of 2)	15.7-1
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Delete all of sections 20A and 20B and replace with new section 20.

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## PREFACE

This document has been prepared by the Systems Division, NASA Lyndon B. Johnson Space Center, Houston, Texas, with technical support by Rockwell International, Ford Aerospace & Communications Corporation, McDonnell Douglas Corporation, and Omniplan Corporation.

This DCN reflects the Space Shuttle systems as of April 15, 1984, or as of the earlier signoff date of the individual drawings. This date is also shown on an item-by-item basis in the table of contents and item effectivity pages.

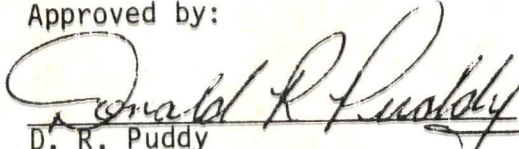
This is drawing change 2 of the Space Shuttle Systems Handbook. Updates (drawing changes) will be on a quarterly basis, with DCN-3 due for publication July 15, 1984. This document is now a universal handbook for OV-099, 102, and 103 with the drawings so identified. A letter on the drawing number (A = 099, B = 102, and C = 103) denotes the specific vehicle. No suffix letter means that that particular drawing is valid for all vehicles.

Major emphasis is on material for use by the flight crew and flight controllers during the STS operations. Caution should be exercised in using the systems drawings for other purposes.

Comments concerning the general contents of this document or requests for address changes should be addressed to DF6/Fred Frere, (713) 483-3421.

Requests for additional copies of this document and reproduction requests must be made in writing with SUFFICIENT JUSTIFICATION to the handbook manager, Fred Frere (code DF6), Lyndon B. Johnson Space Center, Houston, TX 77058.

Approved by:

  
D. R. Puddy  
Chief, Systems Division

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## Volume I - Sections 1 through 11

SECTION 1 STANDARDS

The Space Shuttle Drafting Standards document has been updated. It shows approved FOD formats and symbology with major emphasis on the Computer-Aided Design System (CADS). These standards, published under separate cover, have been automatically distributed to all recipients of this handbook. Updates will be published periodically. Drawings with no letter after the number apply to all vehicles. An "A" applies to OV-099, "B" to OV-102, and "C" to OV-103. An "\*" after the drawing defines drawings which are carried in the onboard Flight Data File.

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DWG 13.2	BRAKES	REV C-2	BASIC	4/4/84	13.2-1	
DWG 13.3	NOSE WHEEL STEERING	REV C-1	BASIC	12/12/83	13.3-1	
<u>SECTION 14 PAYLOAD BAY</u>						
DWG 14.1* (Sheet 1 of 3)	PAYLOAD BAY DOORS/ RADIATOR OVERVIEW	REV C-2	BASIC	4/4/84	14.1-1	
DWG 14.1* (Sheet 2 of 3)	PL BAY DOOR LATCH CLEAR TO OPEN/CLOSE INDICATIONS	REV C	BASIC	10/12/83	14.1-2	
DWG 14.1* (Sheet 3 of 3)	RADIATORS DEPLOY/STOW	REV C	BASIC	10/18/83	14.1-3	
DWG 14.2 (Sheet 1 of 2)	PLBD HARDWARE	REV C-2	BASIC	4/4/84	14.2-1	
DWG 14.2 (Sheet 2 of 2)	PLBD SOFTWARE OVERVIEW	REV C	BASIC	9/6/83	14.2-2	
DWG 14.3 (Sheet 1 of 2)	PAYLOAD RETENTION SYSTEM - ELECT	REV C	BASIC	10/19/83	14.3-1	
DWG 14.3 (Sheet 2 of 2)	PAYLOAD RETENTION SYSTEM - MECH	REV C	BASIC	11/2/83	14.3-2	
DWG 14.4 (Sheet 1 of 8)	RMS D&C PANEL	REV C	BASIC	9/30/83	14.4-1	
DWG 14.4 (Sheet 2 of 8)	RMS MCIU	REV C	BASIC	6/14/83	14.4-2	
DWG 14.4 (Sheet 3 of 8)	RMS CONTROL SYSTEM (SPA, AND MOTOR CONTROL)	REV C	BASIC	10/12/83	14.4-3	
DWG 14.4 (Sheet 4 of 8)	RMS CONTROL SYSTEM (BDA)	REV C	BASIC	9/22/83	14.4-4	
DWG 14.4 (Sheet 5 of 8)	RMS CONTROL SYSTEM (EEEU AND MOTOR CONTROL)	REV C	BASIC	9/15/83	14.4-5	
DWG 14.4 (Sheet 6 of 8)	RMS THERMOSTAT/HEATER ELEMENTS	REV C	BASIC	9/15/83	14.4-6	
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DWG 14.5 (Sheet 1 of 2)	RMS/SOFTWARE OVERVIEW	REV C	BASIC	10/5/83	14.5-1	
DWG 14.5 (Sheet 2 of 2)	RMS/SOFTWARE OVERVIEW	REV C	BASIC	10/5/83	14.5-2	
DWG 14.6 (Sheet 1 of 3)	PMPM - MANIPULATOR RETENTION LATCHES ELECTRICAL	REV C	BASIC	9/30/83	14.6-1	
DWG 14.6 (Sheet 2 of 3)	PMPM - MANIPULATOR RETENTION LATCHES MECHANICAL	REV C	BASIC	9/30/83	14.6-2	
DWG 14.6 (Sheet 3 of 3)	PMPM - MANIPULATOR RETENTION LATCHES JETTISON	REV C	BASIC	9/30/83	14.6-3	
DWG 14.7	(RESERVED)					
DWG 14.8 (Sheet 1 of 5)	MCIU SEQUENCING	REV C	BASIC	5/27/83	14.8-1	

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<u>SECTION 15 MECHANICAL SUPPORT SYSTEMS</u>						
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DWG 15.3 (Sheet 1 of 4)	SRB/ET SEPARATION	REV C	BASIC	10/4/83	15.3-1	
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DWG 15.3 (Sheet 4 of 4)	ORBITER ET SEPARATION MECHANICAL	REV C	BASIC	10/4/83	15.3-4	
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DWG 15.7A,C (Sheet 1 of 2)	KU-BAND ANTENNA DEPLOY/STOW/JETTISON	REV C-2	BASIC	3/6/84	15.7A-1	
DWG 15.7B (Sheet 1 of 2)	KU-BAND ANTENNA DEPLOY/STOW/JETTISON	REV C-1	BASIC	12/14/83	15.7B-1	
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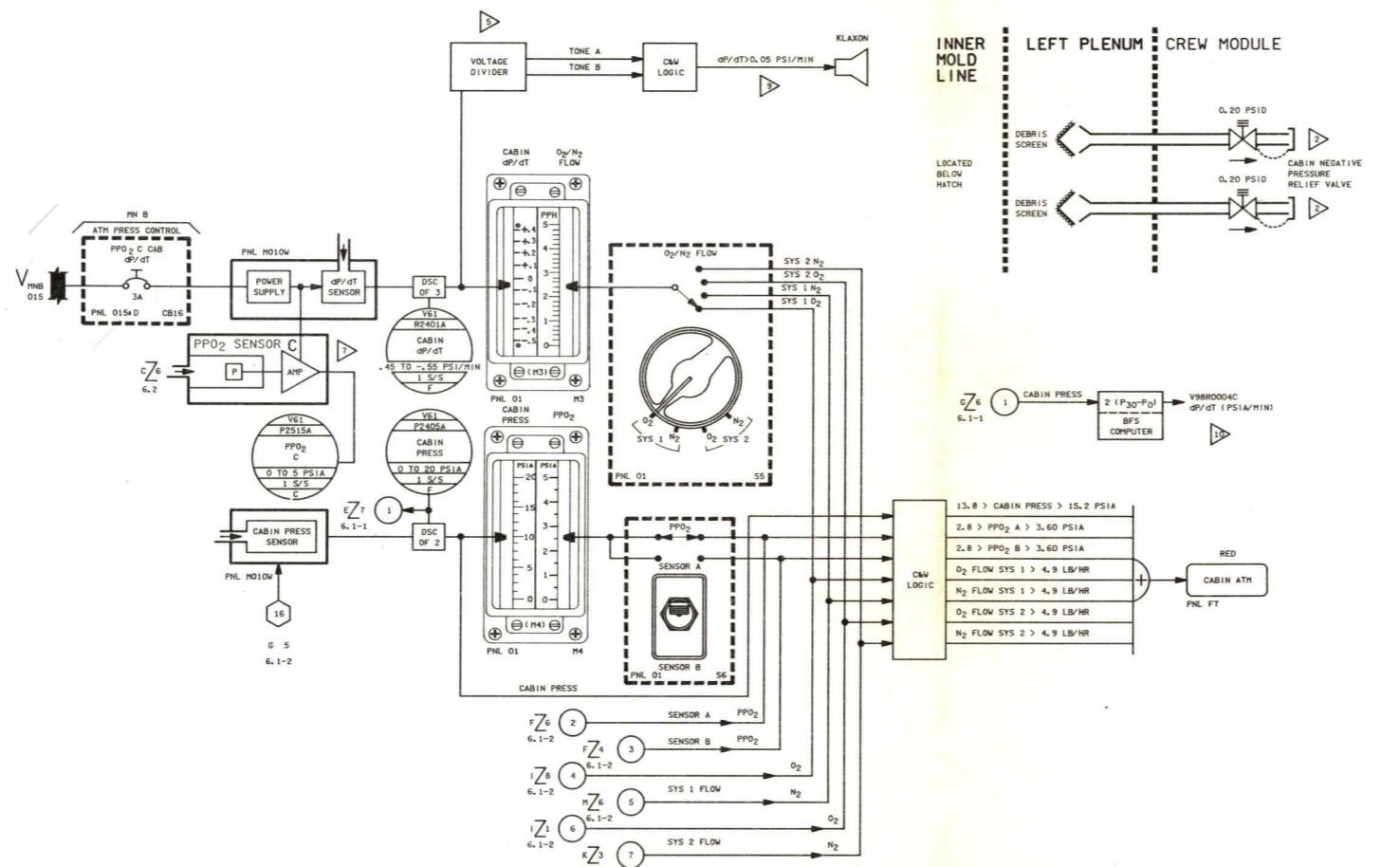
April 15, 1984

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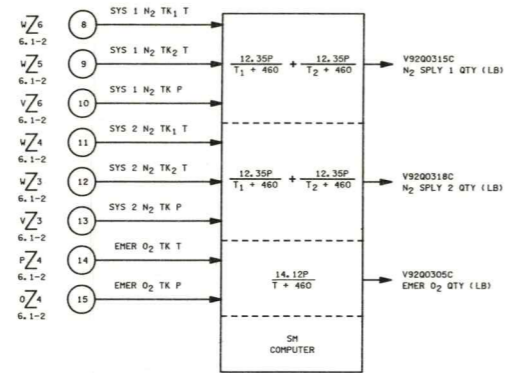
ITEM	TITLE	REV/PCN	DOC CHANGE	SIGNOFF DATE	PAGE	REMARKS
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DWG 20-4	DISPLAYS AND CONTROLS AIRLOCK	<sup>a</sup> /REV C-2	BASIC	4/16/84	20.4-1	

<sup>a</sup>All D&C drawings reference Rockwell Dwg VL70-73099, VL70-73102, and VL70-73103.<sup>b</sup>Displays and Controls "Flight Variable Panel Configurations" will be published in the Cargo Systems Manual, JSC-16086.

DATE: 1/19/83	NAME: T.J.L.	VERSION: BPT4.12
DATE: 1/26/84	NAME: J.N.	VERSION: BPT4.13
DATE: 4/1/84	NAME: L.G.H.	VERSION: BPT4.14
DATE: 4/5/84	NAME: L.H.B.	VERSION: INK4.1
DATE: 4/24/84	NAME: L.H.B.	VERSION: NIT4.1

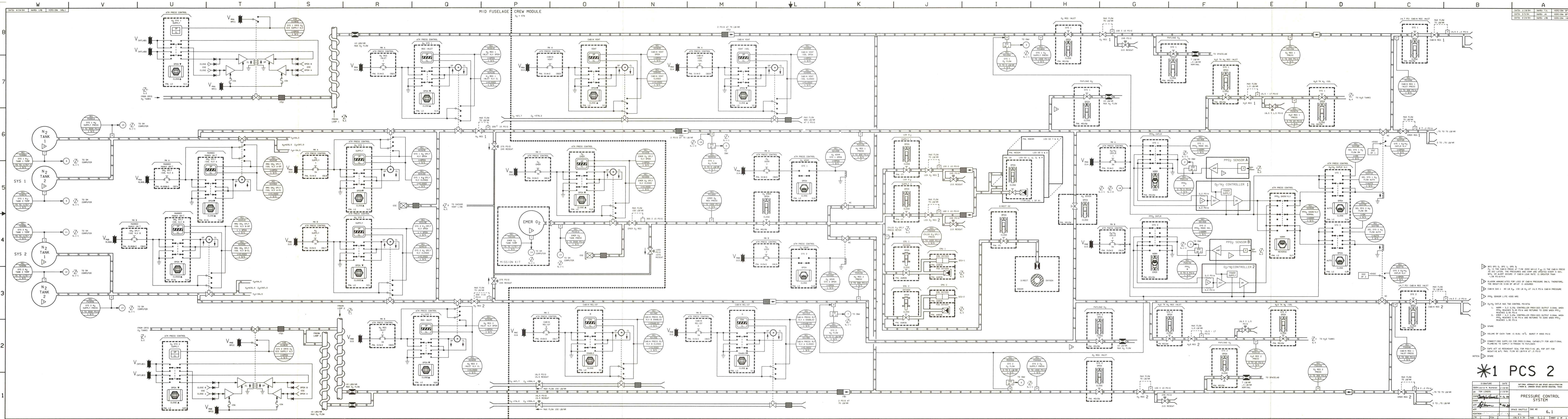


- ▽ BFS OPS 0, OPS 1, OPS 3  
P<sub>0</sub> IS THE CABIN PRESS AT TIME ZERO WHILE P<sub>30</sub> IS THE CABIN PRESS 30 SEC LATER. THE PRESSURES AND COMP ARE UPDATED EVERY 5 SEC. BFS, SH ALERT OCCURS IF CABIN LEAK RATE IS GREATER THAN -.08 PSIA/MIN
- ▽ KLAXON ANNUNCIATES FOR LOSS OF CABIN PRESSURE ONLY. THEREFORE, THE NEGATIVE SIGN OF dP/dT IS ASSUMED
- ▽ CABIN GAS = 40 LB O<sub>2</sub>, 130 LB N<sub>2</sub> AT 14.5 PSIA CABIN PRESSURE
- ▽ PPO<sub>2</sub> SENSOR LIFE 4300 HRS
- ▽ O<sub>2</sub>/N<sub>2</sub> CTRLR HAS TWO CONTROL POINTS  
1. NORM - 3.2 ± 25% CONTROLLER PROVIDES OUTPUT SIGNAL WHEN PPO<sub>2</sub> REACHES 3.45 PSIA AND RETURNS TO ZERO WHEN PPO<sub>2</sub> REACHES 2.95 PSIA  
2. EMER - 2.2 ± 25% CONTROLLER PROVIDES OUTPUT SIGNAL WHEN PPO<sub>2</sub> REACHES 2.45 PSIA AND RETURNS TO ZERO WHEN PPO<sub>2</sub> REACHES 1.95 PSIA
- ▽ VOLTAGE DIVIDER OUTPUTS 0.05 PSI/MIN dP/dT FOR ACTUAL CABIN dP/dT OF 0.08 PSI/MIN.
- ▽ VOLUME OF EACH TANK IS 8181 IN<sup>3</sup>, BURST P 4950 PSIG
- ▽ CONNECTIONS SUPPLIED FOR PROVISIONAL CAPABILITY FOR ADDITIONAL PLUMBING TO SUPPLY NITROGEN TO PAYLOADS
- ▽ CAPS ACT AS REDUNDANT SEAL FOR POSITIVE dP, POP OFF FOR NEGATIVE dP, MAX. FLOW 60 LB/MIN AT .5 PSID



1 PCS 1 \*

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION LYNN B. JOHNSON SPACE CENTER HOUSTON, TEXAS		SIGNATURE	DATE
PRESSURE CONTROL SYSTEM		DR TOM LEMERS	1/19/83
DWG NO 6.1		ENGR C. HUMPHRELL	
SPACE SHUTTLE		ENGR <i>[Signature]</i>	9.16.84
ALL		APP <i>[Signature]</i>	4.26.84
RETRON-2		KENTON-2	11.20.84
SHEET 1 OF 2		PCN 2	



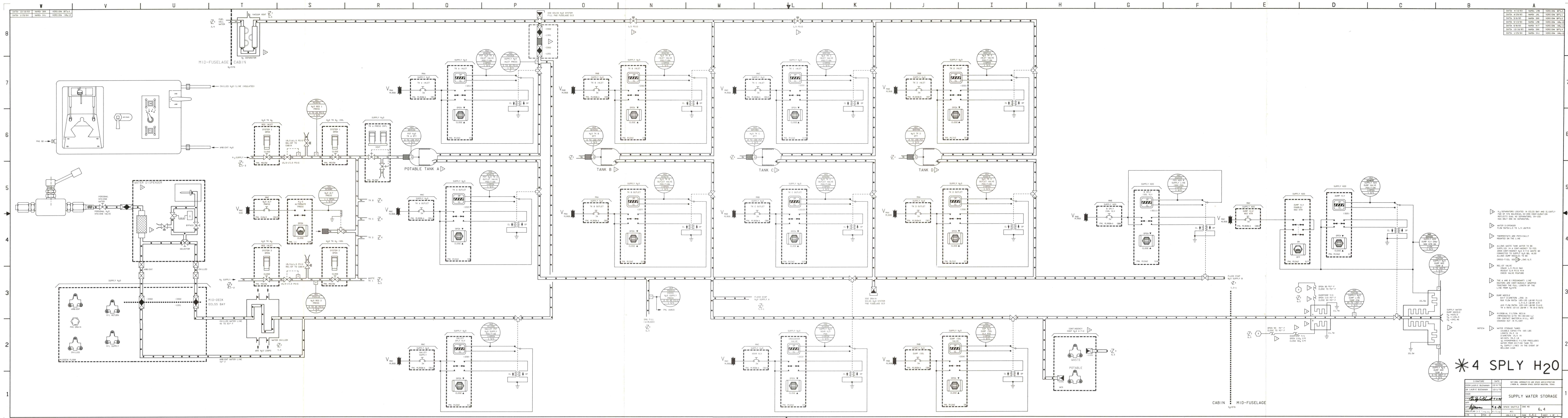
BASIC REV C-2

- PS1 OPN & PS2 CL OPN IS THE CABIN PRESS AT TIME ZERO WHILE PS2 IS THE CABIN PRESS TO SEC LATER. THE PRESSURE AND COMP ARE UPDATED EVERY 8 SEC. AN ALERT OCCURS IF CABIN LEAK RATE IS GREATER THAN 1.0 LB/HR.
- ALARM ANNUNCIATES FOR LOSS OF CABIN PRESSURE ONLY. THEREFORE, THE NEGATIVE SIGN OF PS1/2 IS ASSUMED.
- CABIN O2 = 40 LB O<sub>2</sub> / 100 LB H<sub>2</sub>O AT 14.7 PSIA CABIN PRESSURE.
- PP2<sub>2</sub> SENSOR LIFE 4500 HRS
- O<sub>2</sub>/N<sub>2</sub> OUTLET HAS TWO CONTROL POINTS
  1. NORM - SLS 2-25 CONTROLLER PROVIDES OUTPUT SIGNAL WHEN PPO<sub>2</sub> REACHES 14.7 PSIA AND RETURNS TO ZERO WHEN PPO<sub>2</sub> REACHES 2.0 PSIA.
  2. EMER - SLS 2-25 CONTROLLER PROVIDES OUTPUT SIGNAL WHEN PPO<sub>2</sub> REACHES 2.0 PSIA AND RETURNS TO ZERO WHEN PPO<sub>2</sub> REACHES 1.0 PSIA
- SPARE
- VOLUME OF EACH TANK IS 185 IN<sup>3</sup>. BURST P 4800 PSIG
- CONNECTING SUPPLY FOR PROVISIONAL CAPABILITY FOR ADDITIONAL PUMPING TO SUPPLY NITROGEN TO PAYLOADS
- GAUGES ACT AS REDUNDANT SEAL FOR POSITIVE O<sub>2</sub> POP OFF FOR WEATHER BY MAX FLOW 40 LB/HR AT 1.5 PSIG
- INTER: SPARE

**\*1 PCS 2**

SIGNATURE	DATE	MISSION AUTHORITY AND SPACE ADMINISTRATION
DESIGNER	1-26-84	LEWIS A. SIMMONS SPACE OPERATIONS DIVISION
CHKD BY	1-26-84	
APP	1-26-84	
REVISION	ALL	6.1
TR	REV	6.1

BASIC REV C-2



DATE	BY	NAME	VERSION
10/15/83	NAME	NAME	VERSION
10/15/83	NAME	NAME	VERSION
10/15/83	NAME	NAME	VERSION
10/15/83	NAME	NAME	VERSION
10/15/83	NAME	NAME	VERSION

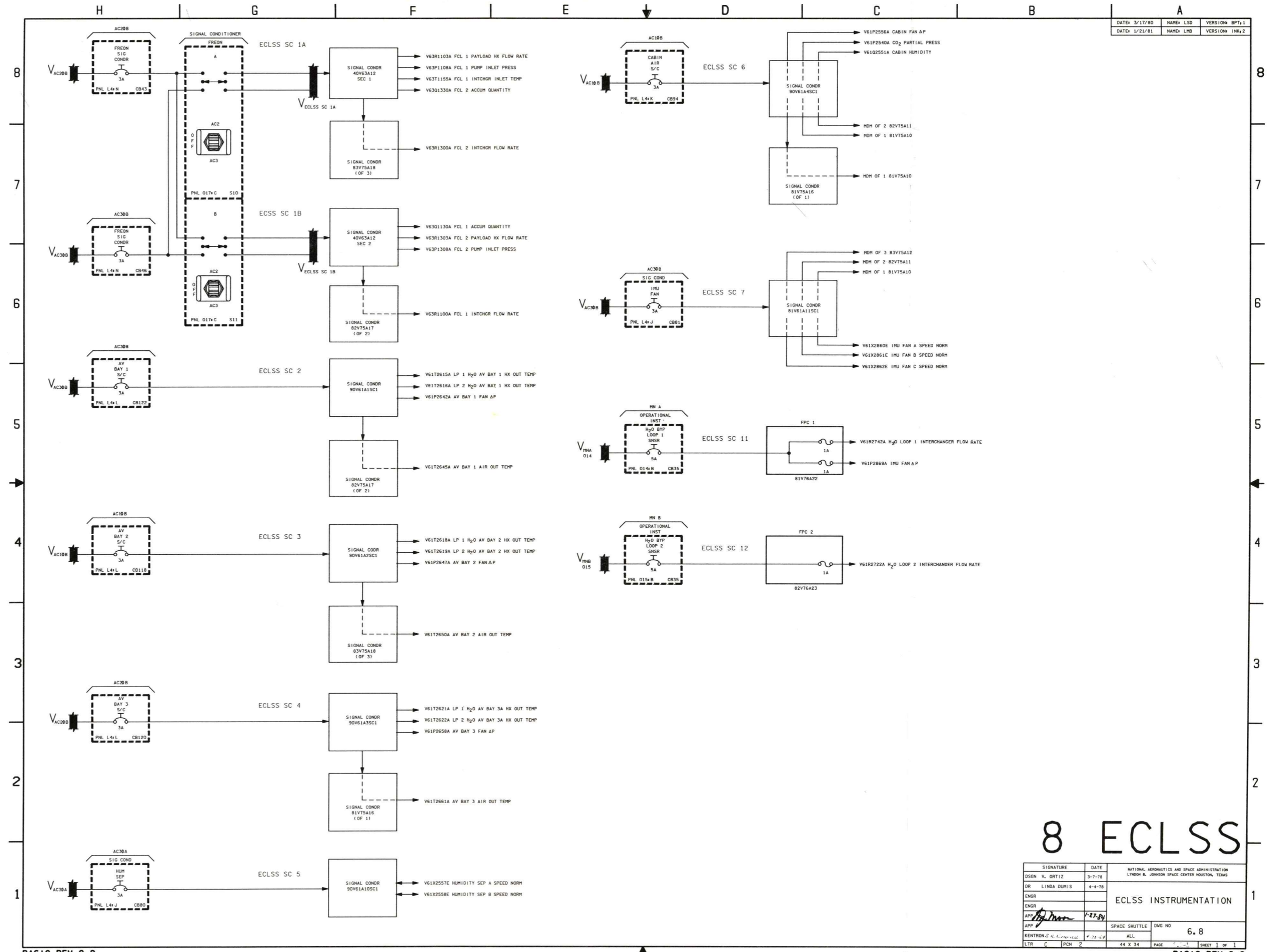
- ▽ H<sub>2</sub> SEPARATORS LOCATED IN ECDS BAY AND SLIGHTLY  
OFF OF THE RELIEF VALVE. ON-BOARD CONFIGURATION  
REFLECTS DUAL H<sub>2</sub> SEPARATORS. DV-100  
RELIEF VALVE ON THE SEPARATOR.
- ▽ WATER DISPENSER  
FLOW RATE 1.0 TO 1.5 LBS/MIN
- ▽ THERMOSTATS ARE PHYSICALLY  
MOUNTED ON THE LINE
- ▽ ALONG WATER TANK WATER TO BE  
SUPPLIED IN A CONTINGENCY TO BE  
WHEN CONTINGENCY H<sub>2</sub> O-TIE WASTE GO  
CONNECTED TO SUPPLY H<sub>2</sub> GO. ALSO  
ALONG DUMP NOZZLES TO BE  
CROSS-TIE. SEE LOW H<sub>2</sub>S
- ▽ RELIEF VALVE  
CRACK 1.5 PSIG MAX  
RESET TO PSIG MIN  
CHECK VALVE FEATURE
- ▽ THE A AND B (REDUNDANT) LINE  
HEATERS ARE CONTINUOUSLY WAPPED  
TOGETHER THE FULL LENGTH OF THE  
LINE FROM 90°/90°
- ▽ DUMP NOZZLE  
DEATH EXHAUST - 0.5 IN  
MAX FLOW RATE 100-150 LBS/MIN FLUID  
1.5-2.0 LBS/MIN FLUID  
IN A RATE 10-15 LBS/MIN @ 10-15 RATE
- ▽ MICROBIAL FILTER RESIN  
IMPROPERATED WITH 700 (0.1) MIC  
FOR CATCHING BACTERIA A WILL NOT  
CHECKED OUT IN FLIGHT

**\*4 SPLY H<sub>2</sub>O**

SIGNATURE	DATE	NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
DRON LAURIE BOCHANNAN	10/16/83	LINDON R. JOHNSON SPACE CENTER HOUSTON, TEXAS
DRON LAURIE BOCHANNAN	10/16/83	
DRON LAURIE BOCHANNAN	10/16/83	
DRON LAURIE BOCHANNAN	10/16/83	
DRON LAURIE BOCHANNAN	10/16/83	

**SUPPLY WATER STORAGE**

6.4

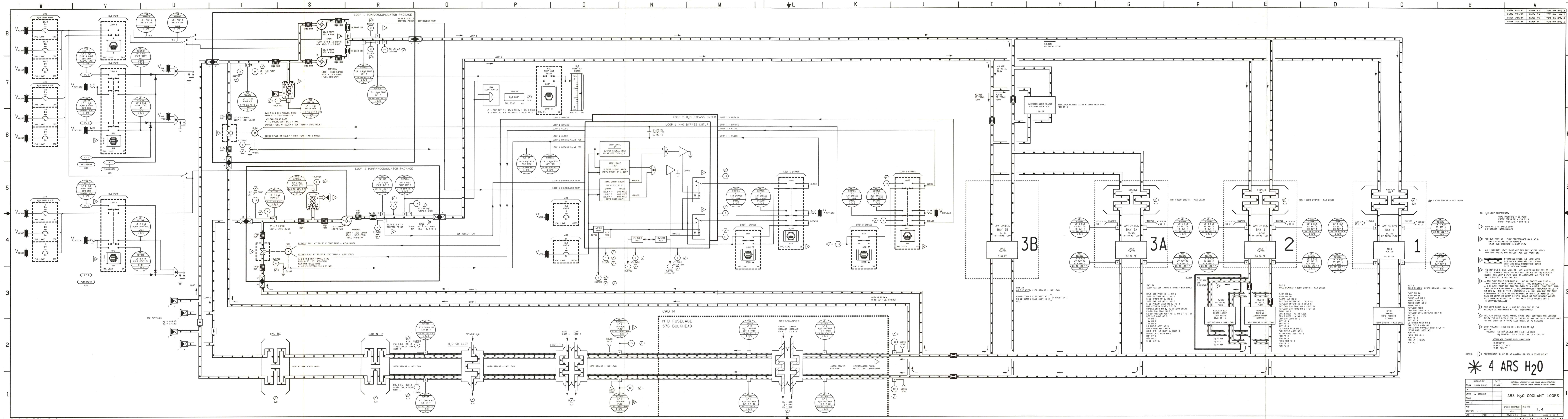


# 8 ECLSS

SIGNATURE	DATE	NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
DR V. ORTIZ	3-7-78	LINDON B. JOHNSON SPACE CENTER HOUSTON, TEXAS
ENGR LINDA DUMIS	4-4-78	
ECLSS INSTRUMENTATION		
APP <i>[Signature]</i>	1-27-84	
KENTRON	4-1-80	SPACE SHUTTLE
LTR C PCN 2	44 X 34	DWG NO 6.8
		PAGE 1 OF 1







DATE	BY	NAME	VERSION
1/15/84	DM	DM	1.0
1/15/84	DM	DM	1.1
1/15/84	DM	DM	1.2

- 12. H<sub>2</sub>O LOOP COMPONENTS
  - ▷ BAY 1: 1200 BTU/Hr - MAX LOAD
  - ▷ BAY 2: 1200 BTU/Hr - MAX LOAD
  - ▷ BAY 3A: 1200 BTU/Hr - MAX LOAD
  - ▷ BAY 3B: 1200 BTU/Hr - MAX LOAD
- 13. H<sub>2</sub>O LOOP COMPONENTS
  - ▷ BAY 1: 1200 BTU/Hr - MAX LOAD
  - ▷ BAY 2: 1200 BTU/Hr - MAX LOAD
  - ▷ BAY 3A: 1200 BTU/Hr - MAX LOAD
  - ▷ BAY 3B: 1200 BTU/Hr - MAX LOAD
- 14. H<sub>2</sub>O LOOP COMPONENTS
  - ▷ BAY 1: 1200 BTU/Hr - MAX LOAD
  - ▷ BAY 2: 1200 BTU/Hr - MAX LOAD
  - ▷ BAY 3A: 1200 BTU/Hr - MAX LOAD
  - ▷ BAY 3B: 1200 BTU/Hr - MAX LOAD

**\* 4 ARS H<sub>2</sub>O**

SIGNATURE	DATE	NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
DM	1/15/84	1.0
DM	1/15/84	1.1
DM	1/15/84	1.2



**TABLE 10-I-MASTER EVENTS CONTROLLER COMMANDS**

FOR USE WITH DWG 10.1, SHEET 1, 2 AND 3

1 MEC 1 LOAD CONTROLLER COMMANDS

COMMAND WORD CONTROL FIELD					
MODE CONTROL	MODULE ADDRESS	CHANNEL ADDRESS	MEAS		NAME
9 10 11 12 13	14 15 16 17	18 19 20 21 22			
1 1 0 0 0	0 0 0 0 0	X 0 0 0 0 0	NONE		RCV CRITICAL WORD
X 1 0 0 0	0 1 1 1 1	X 0 0 0 0 0	V76M7019P		RESET NON CRITICAL CMD
X 1 0 0 0	1 0 1 1 1	X 0 0 0 0 0	V76M7000P		SET NON CRITICAL CMD
X 1 0 0 0	0 0 0 0 0	X 0 0 0 0 0	V76K8371B		RCV NON CRITICAL WORD
X 1 0 1 1	0 0 0 0 0	X 0 0 0 0 0	V76K7098B		MASTER RESET
X 0 1 0 0	0 0 0 1 1	X 0 0 0 0 0	V76K8400B		PIC CAPACITOR VOLTAGE SIMULATION
X 1 0 0 1	1 1 1 1 1	X 1 0 0 0 0	V76K7059B		PIC LOAD/RESISTANCE TEST STATUS
X 1 0 0 1	1 1 1 1 0	X 0 0 0 0 0	V76K7099B		OPER PIC CAP VOLT READ CMD
X 1 0 1 0	0 0 0 0 0	X 1 0 1 1 0	V76K7097B		OPER BITE TEST STATUS CMD
X 1 0 1 0	0 0 0 0 0	X 1 1 0 1 0	V76K8351B		PREFLIGHT DIAGNOSTIC BITE
X 1 0 1 0	0 0 0 0 0	X 1 1 1 1 0	V76K8372B		NON CRITICAL VERIFICATION

MEC 2 LOAD CONTROLLER COMMANDS

COMMAND WORD CONTROL FIELD					
MODE CONTROL	MODULE ADDRESS	CHANNEL ADDRESS	MEAS		NAME
9 10 11 12 13	14 15 16 17	18 19 20 21 22			
1 1 0 0 0	0 0 0 0 0	X 0 0 0 0 0	NONE		RCV CRITICAL WORD
X 1 0 0 0	0 1 1 1 1	X 0 0 0 0 0	V76M7119P		RESET NON CRITICAL CMD
X 1 0 0 0	1 0 1 1 1	X 0 0 0 0 0	V76M7100P		SET NON CRITICAL CMD
X 1 0 0 0	0 0 0 0 0	X 0 0 0 0 0	V76K8871B		RCV NON CRITICAL WORD
X 1 0 1 1	0 0 0 0 0	X 0 0 0 0 0	V76K7198B		MASTER RESET
X 0 1 0 0	0 0 0 1 1	X 0 0 0 0 0	V76K8900B		PIC CAPACITOR VOLTAGE SIMULATION
X 1 0 0 1	1 1 1 1 1	X 1 0 0 0 0	V76K7159B		PIC LOAD/RESISTANCE TEST STATUS
X 1 0 0 1	1 1 1 1 0	X 0 0 0 0 0	V76K7199B		OPER PIC CAP VOLT READ CMD
X 1 0 1 0	0 0 0 0 0	X 1 0 1 1 0	V76K7197B		OPERATIONAL BITE TEST STATUS CMD
X 1 0 1 0	0 0 0 0 0	X 1 1 0 1 0	V76K8851B		PREFLIGHT DIAGNOSTIC BITE
X 1 0 1 0	0 0 0 0 0	X 1 1 1 1 0	V76K8872B		NON CRITICAL VERIFICATION

X = Doesn't Matter

2 MEC 1 CRITICAL COMMANDS

HEX CODE	HEX DECODING LOGIC												MEASUREMENT	NAME
	COMMAND DATA WORD													
	9 10 11 12	13 14 15 16	17 18 19 20	21 22 23 24										
3EAC	0 0 1 1	1 1 1 0	1 0 1 0	1 1 0 0	V76K6951B	SRB IGNITION ARM								
3E6A	0 0 1 1	1 1 1 0	0 1 1 0	1 0 1 0	V76K6953B	SRB IGNITION FIRE 1								
3E42	0 0 1 1	1 1 1 0	0 1 0 0	0 0 1 0	V76K6954B	SRB IGNITION FIRE 2								
3154	0 0 1 1	0 0 0 1	0 1 0 1	0 1 0 0	V76K6956B	SRB SEPARATION ARM								
316A	0 0 1 1	0 0 0 1	0 1 1 0	1 0 1 0	V76K6958B	SRB SEPARATION FIRE 1								
3198	0 0 1 1	0 0 0 1	1 0 0 1	1 0 1 1	V76K6959B	SRB SEPARATION FIRE 2								
C121	1 1 0 0	0 0 0 1	1 0 1 0	0 0 0 1	V76K4617B	ET/UMB UNLATCH ARM								
C162	1 1 0 0	0 0 0 1	0 1 1 0	0 0 1 0	V76K4619B	ET/UMB UNLATCH FIRE 1								
C193	1 1 0 0	0 0 0 1	1 0 0 1	0 0 1 1	V76K4623B	ET/UMB UNLATCH FIRE 2								
7463	0 1 1 1	0 1 0 0	0 1 1 0	0 0 1 1	V76K4655B	ET/UMB RETRACT 1								
7498	0 1 1 1	0 1 0 0	1 0 0 1	1 0 0 0	V76K4656B	ET/UMB RETRACT 2								
E117	1 1 1 0	0 0 0 1	0 0 0 1	0 1 1 1	V76K6909B	ET/UMB STRUCT SEP ARM								
E168	1 1 1 0	0 0 0 1	0 1 1 0	1 0 0 0	V76K6913B	ET/UMB STRUCT SEP FIRE 1								
E199	1 1 1 0	0 0 0 1	1 0 0 1	1 0 0 1	V76K6914B	ET/ORB STRUCT SEP FIRE 2								
CEDC	1 1 0 0	1 1 1 0	1 1 0 1	1 1 0 0	V76K4609B	T-0 UMB RELEASE ARM								
CE6A	1 1 0 0	1 1 1 0	0 1 1 0	1 0 1 0	V76K4610B	T-0 UMB RELEASE FIRE 1								
CE9A	1 1 0 0	1 1 1 0	1 0 0 1	1 0 1 0	V76K4611B	T-0 UMB RELEASE FIRE 2								
EBC2	1 1 1 0	1 0 1 1	1 1 0 0	0 0 1 0	V76K7104B	ET TUMBLE ARM								
EB68	1 1 1 0	1 0 1 1	0 1 1 0	1 0 0 0	V76K7008B	L SRB RSS SAFE 1								
EB95	1 1 1 0	1 0 1 1	1 0 0 1	0 1 0 1	V76K7009B	R SRB RSS SAFE 2								
ECB6	1 1 1 0	1 1 0 0	1 0 1 1	0 1 1 0	NOT ASSIGNED									
EC68	1 1 1 0	1 1 0 0	0 1 1 0	1 0 0 0	V76K7015B	ATVC 2 26 V DEAD FACE								
EC9D	1 1 1 0	1 1 0 0	1 0 0 1	1 1 0 1	V76K7016B	ATVC 4 26 V DEAD FACE								

MEC 2 CRITICAL COMMANDS

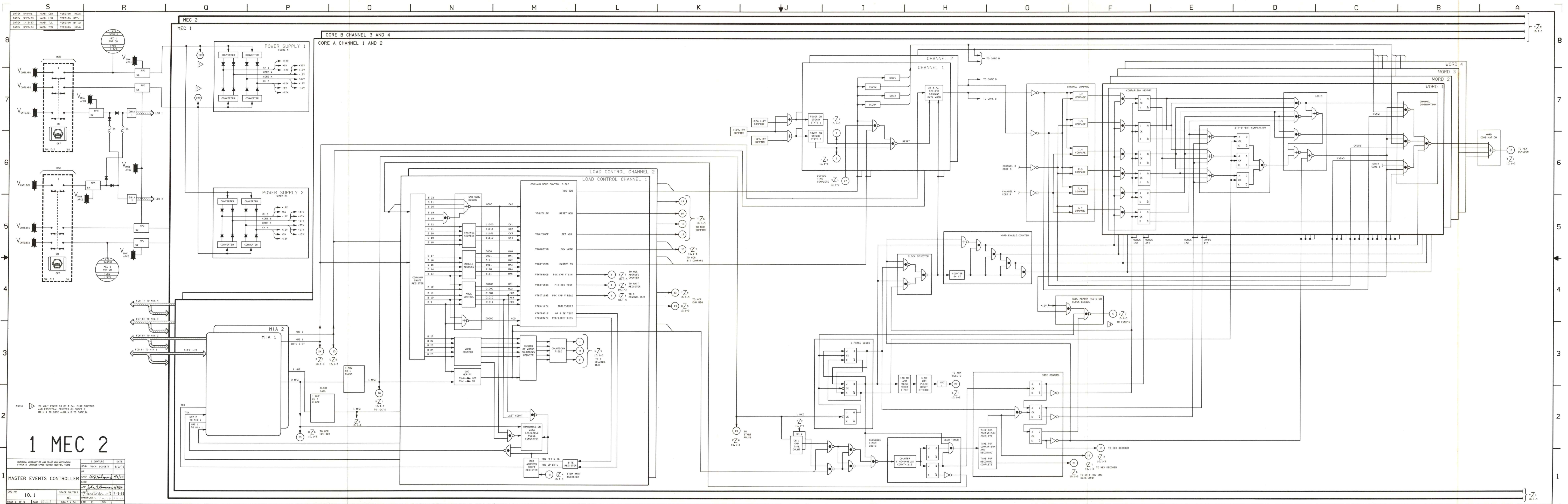
HEX CODE	HEX DECODING LOGIC												MEASUREMENT	NAME
	COMMAND DATA WORD													
	9 10 11 12	13 14 15 16	17 18 19 20	21 22 23 24										
3EAC	0 0 1 1	1 1 1 0	1 0 1 0	1 1 0 0	V76K6961B	SRB IGNITION ARM								
3E6A	0 0 1 1	1 1 1 0	0 1 1 0	1 0 1 0	V76K6963B	SRB IGNITION FIRE 1								
3E42	0 0 1 1	1 1 1 0	0 1 0 0	0 0 1 0	V76K6964B	SRB IGNITION FIRE 2								
3154	0 0 1 1	0 0 0 1	0 1 0 1	0 1 0 0	V76K6966B	SRB SEPARATION ARM								
316A	0 0 1 1	0 0 0 1	0 1 1 0	1 0 1 0	V76K6968B	SRB SEPARATION FIRE 1								
3198	0 0 1 1	0 0 0 1	1 0 0 1	1 0 1 1	V76K6969B	SRB SEPARATION FIRE 2								
C121	1 1 0 0	0 0 0 1	0 0 1 0	0 0 0 1	V76K4618B	ET/UMB UNLATCH ARM								
C162	1 1 0 0	0 0 0 1	0 1 1 0	0 0 1 0	V76K4620B	ET/UMB UNLATCH FIRE 1								
C193	1 1 0 0	0 0 0 1	1 0 0 1	0 0 1 1	V76K4624B	ET/UMB UNLATCH FIRE 2								
7463	0 1 1 1	0 1 0 0	0 1 1 0	0 0 1 1	V76K4659B	ET/UMB RETRACT 1								
7498	0 1 1 1	0 1 0 0	1 0 0 1	1 0 0 0	V76K4660B	ET/UMB RETRACT 2								
E117	1 1 1 0	0 0 0 1	0 0 0 1	0 1 1 1	V76K6911B	ET/ORB STRUCT SEP ARM								
E168	1 1 1 0	0 0 0 1	0 1 1 0	1 0 0 0	V76K6915B	ET/ORB STRUCT SEP FIRE 1								
E199	1 1 1 0	0 0 0 1	1 0 0 1	1 0 0 1	V76K6916B	ET/ORB STRUCT SEP FIRE 2								
CEDL	1 1 0 0	1 1 1 0	1 1 0 1	1 1 0 0	V76K4613B	T-0 UMB RELEASE ARM								
CE6A	1 1 0 0	1 1 1 0	0 1 1 0	1 0 1 0	V76K4614B	T-0 UMB RELEASE FIRE 1								
CE9A	1 1 0 0	1 1 1 0	1 0 0 1	1 0 1 0	V76K4615B	T-0 UMB RELEASE FIRE 2								
EBC2	1 1 1 0	1 0 1 1	1 1 0 0	0 0 1 0	NOT ASSIGNED									
EB68	1 1 1 0	1 0 1 1	0 1 1 0	1 0 0 0	V76K7108B	R SRB RSS SAFE 1								
EB95	1 1 1 0	1 0 1 1	1 0 0 1	0 1 0 1	V76K7109B	L SRB RSS SAFE 2								
ECB6	1 1 1 0	1 1 0 0	1 0 1 1	0 1 1 0	V76K7105B	ET TUMBLE FIRE								
EC68	1 1 1 0	1 1 0 0	0 1 1 0	1 0 0 0	V76K7113B	ATVC 1 26 V DEAD FACE								
EC9D	1 1 1 0	1 1 0 0	1 0 0 1	1 1 0 1	V76K7114B	ATVC 3 26 V DEAD FACE								

3 MEC 1 NON CRITICAL COMMAND MEMORY REGISTER

COMMAND WORD																								COMMAND	MEASUREMENT	NAME
9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24											
0	1	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	RES TEST	V76K7001B	PIC RESISTANCE TEST						
0	1	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	RES TEST	V76K7002B	LSRB PWR A						
0	1	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	A	V76K7003B	RSRB PWR A						
0	1	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	B	V76K7003B	RSRB PWR A						
0	1	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	C	V76K6955B	SRB IGN FIRE 3						
0	1	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	D	V76K4612B	TO UMB SEP FIRE 3						
0	1	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	E	V76K7006B	LSRB RSS PWR OFF						
0	1	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	F	V76K7007B	RSRB RSS PWR OFF						
0	1	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	G	V76K6960B	SRB SEP FIRE 3						
0	1	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	H	V76K4625B	ET UMB FIRE 3 SET						
0	1	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	I	NOT ASSIGNED							
0	1	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	J	V76K7011B	LSRB PWR C						
0	1	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	K	V76K7012B	RSRB PWR C						
0	1	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	L	V76K7013B	ATVC 2 SRB IVD PWR ON						
0	1	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	M	V76K7014B	ATVC 4 SRB IVD PWR ON						
0	1	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	N	V76K4657B	ET UMB RETR SOL						
0	1	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	O	V76K6921B	ET/ORB SEP FIRE 3						

MEC 2 NON CRITICAL COMMAND MEMORY REGISTER

COMMAND WORD																								COMMAND	MEASUREMENT	NAME
9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24											
0	1	1	0	1	1	1	0	1	1	0	1	0	1	0	1	0	1	RES TEST	V76K7101B	PIC RESISTANCE TEST						
0	1	1	0	1	1	1	0	1	1	0	1	0	1	0	1	0	1	RES TEST	V76K7101B	PIC RESISTANCE TEST						
0	1	1	0	1	1	1	0	1	1	0	1	0	1	0	1	0	1	A	V76K7102B	LSRB PWR B						
0	1	1	0	1	1	1	0	1	1	0	1	0	1	0	1	0	1	A	V76K7102B	LSRB PWR B						
0	1	1	0	1	1	1	0	1	1	0	1	0	1	0	1	0	1	B	V76K7103B	RSRB PWR B						
0	1	1	0	1	1	1	0	1	1	0	1	0	1	0	1	0	1	B	V76K7103B	RSRB PWR B						
0	1	1	0	1	1	1	0	1	1	0	1	0	1	0	1	0	1	C	V76K6985B	LSRB IGN FIRE 3						
0	1	1	0	1	1	1	0	1	1	0	1	0	1	0	1	0	1	C	V76K6985B	LSRB IGN FIRE 3						
0	1	1	0	1	1	1	0	1	1	0	1	0	1	0	1	0	1	D	V76K4616B	TO UMB SEP REL						
0	1	1	0	1	1	1	0	1	1	0	1	0	1	0	1	0	1	D	V76K4616B	TO UMB SEP REL						
0	1	1	0	1	1	1	0	1	1	0	1	0	1	0	1	0	1	E	V76K7106B	LSRB RSS PWR OFF						
0	1	1	0	1	1	1	0	1	1	0	1	0	1	0	1	0	1	E	V76K7106B	LSRB RSS PWR OFF						
0	1	1	0	1	1	1	0	1	1	0	1	0	1	0	1	0	1	F	V76K7107B	RSRB RSS PWR OFF						
0	1	1	0	1	1	1	0	1	1	0	1</															



# 1 MEC 2

DATE: 5/20/64		NAME: TLM	VERSION: 10K1.2
DATE: 5/20/64		NAME: TLM	VERSION: 10K1.2
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DATE: 5/20/64		NAME: TLM	VERSION: 10K1.2

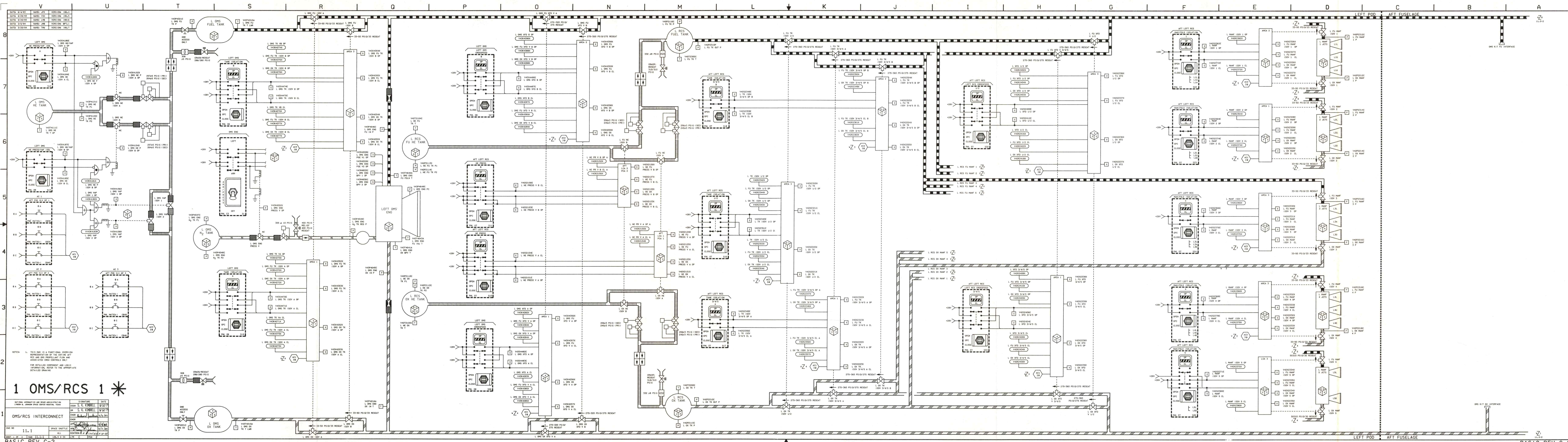
  

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DATE: 5/20/64		NAME: TLM	VERSION: 10K1.2

DATE: 5/20/64		NAME: TLM	VERSION: 10K1.2
DATE: 5/20/64		NAME: TLM	VERSION: 10K1.2
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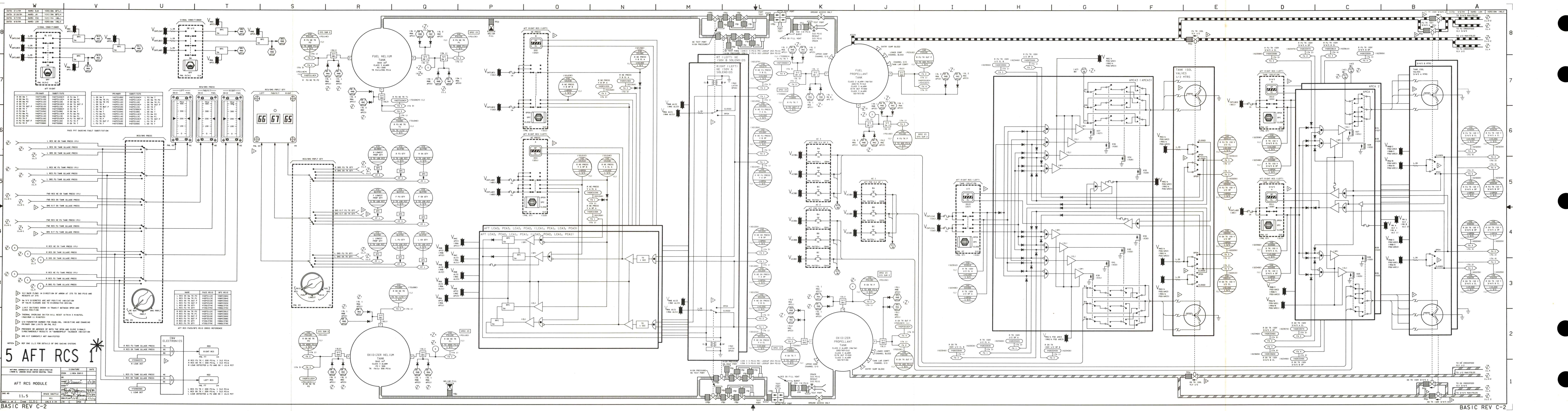
# 1 OMS/RCS 1 \*

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION WASHINGTON, D. C. 20546-0001	
TITLE <b>OMS/RCS INTERCONNECT</b>	DATE <b>9/27/79</b>
AUTHOR <b>S. E. KIMMEL</b>	DRAWN <b>S. E. KIMMEL</b>
CHECKED <b>S. E. KIMMEL</b>	DESIGNED <b>S. E. KIMMEL</b>
APPROVED <b>S. E. KIMMEL</b>	SPECIAL INSTRUCTIONS <b>11.1</b>









**5 AFT RCS**

**AFT RCS MODULE**

**BASIC REV C-2**

DATE	BY	REVISION
11/5	SPACE SHUTTLE	
ALL	ORIGINATOR	

DATE: 11/5/84  
 NAME: JIM  
 VERSION: 001.4

DATE: 11/5/84  
 NAME: JIM  
 VERSION: 001.4

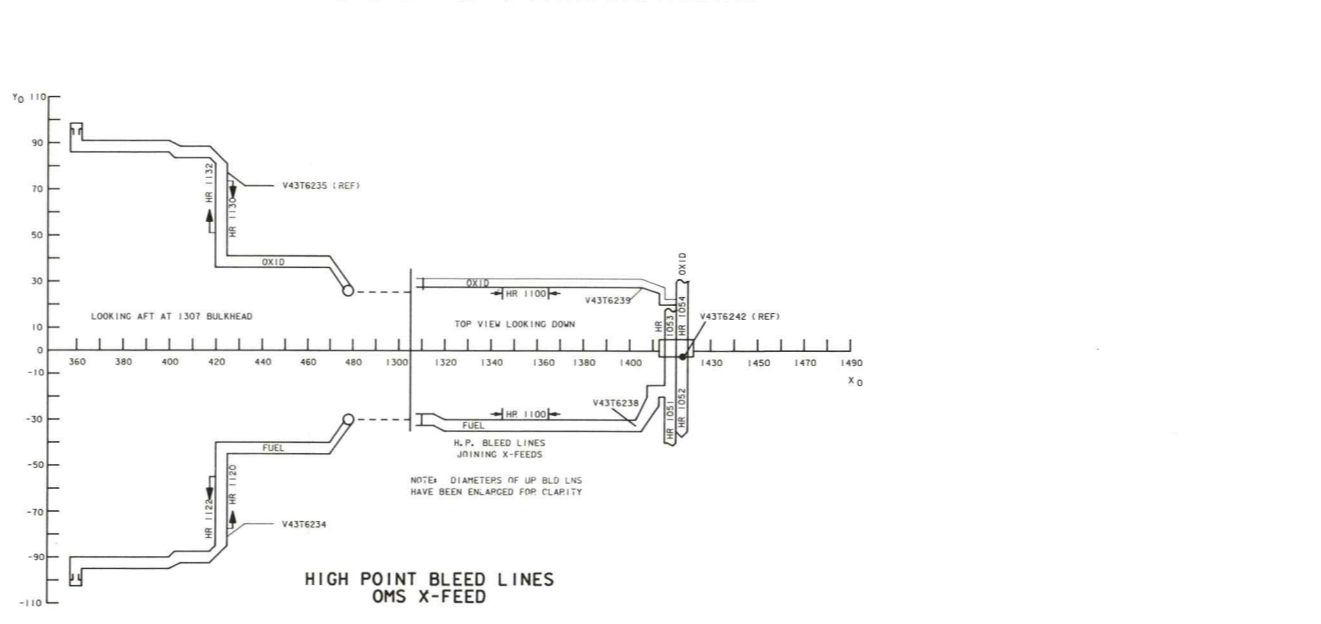
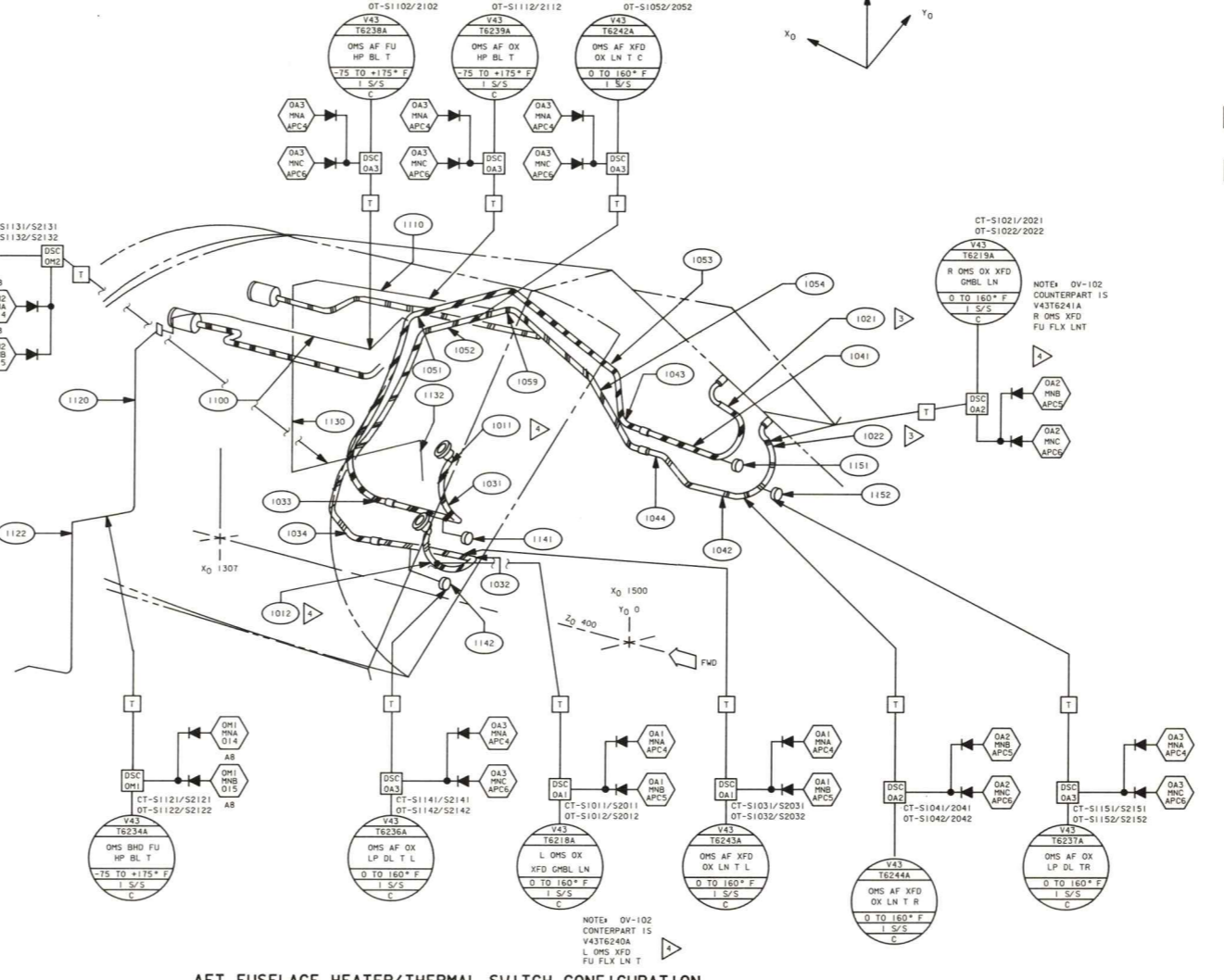
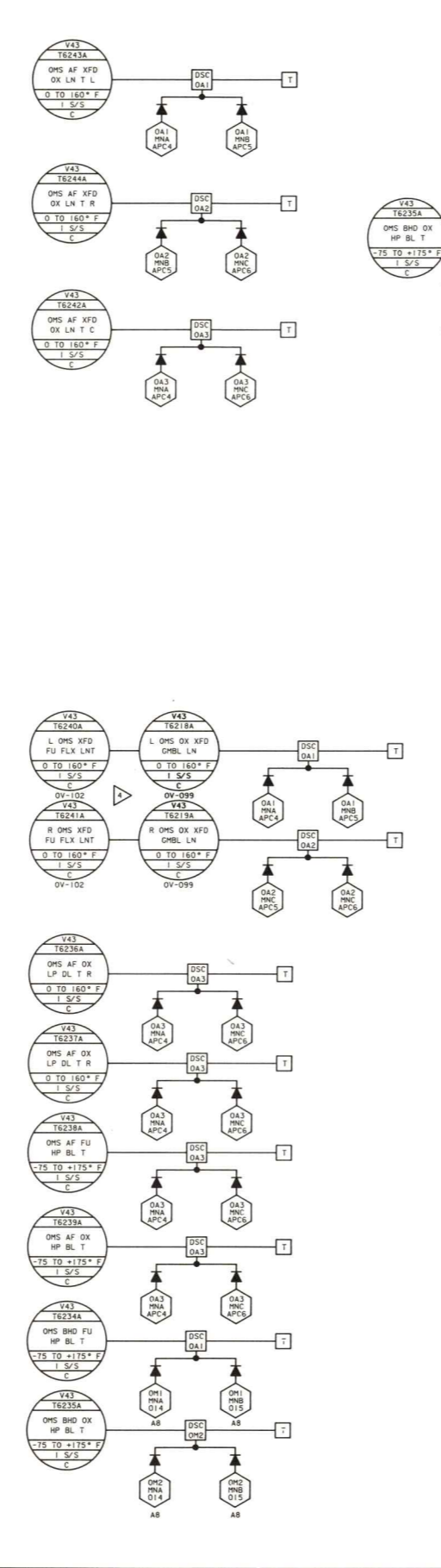
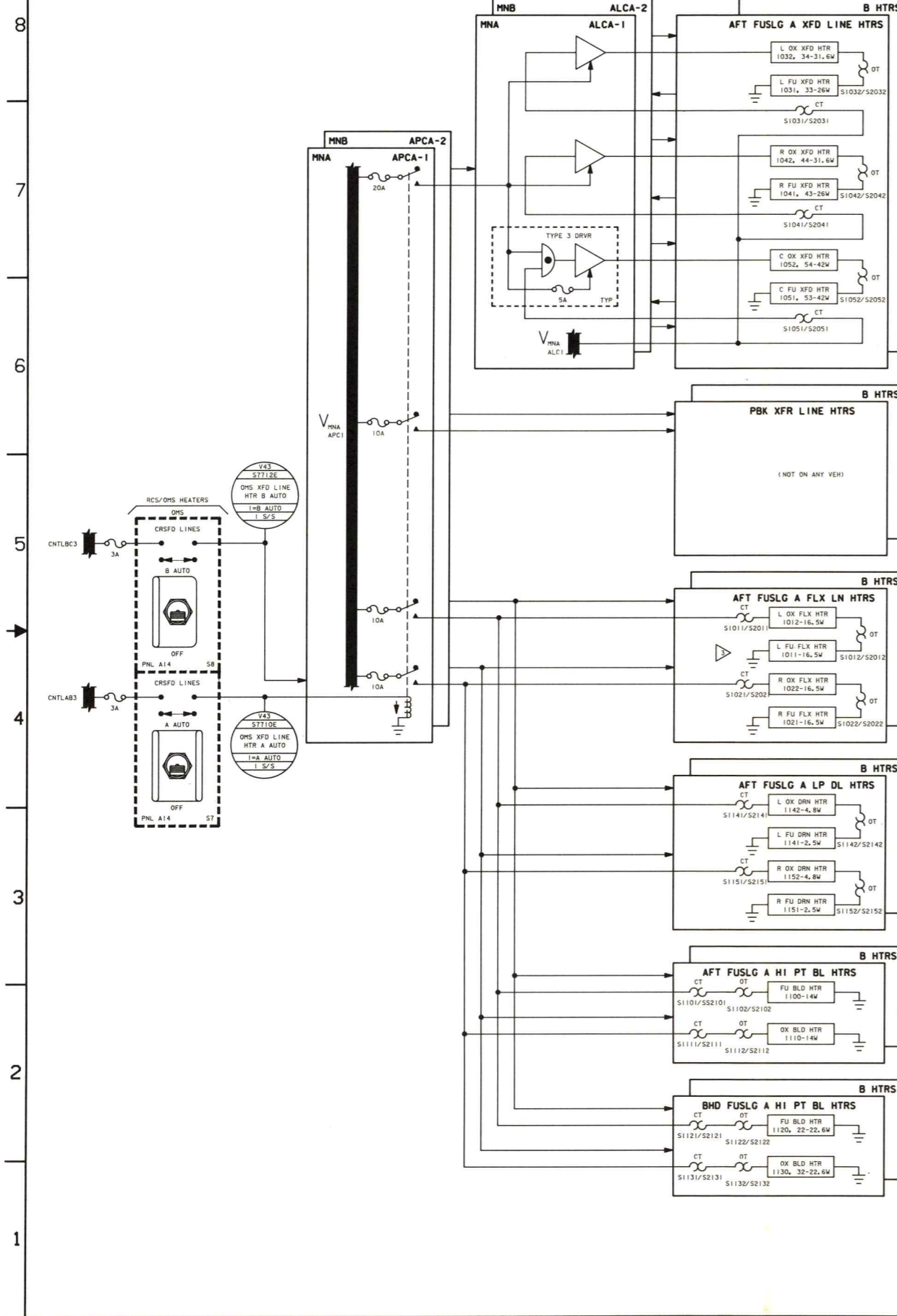




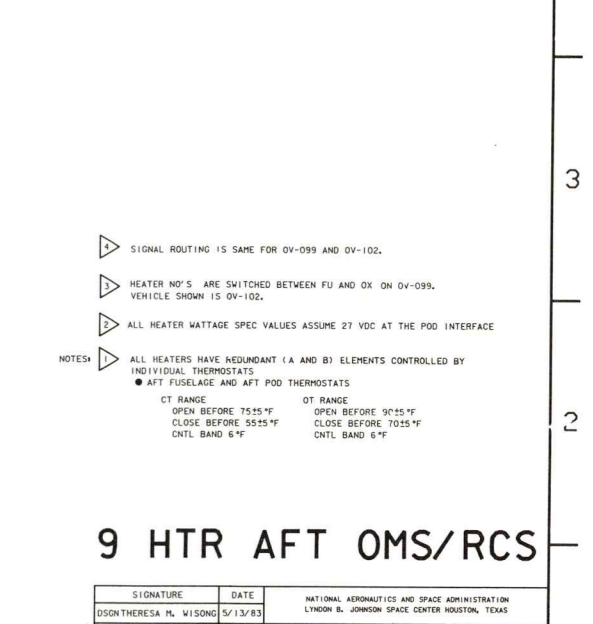
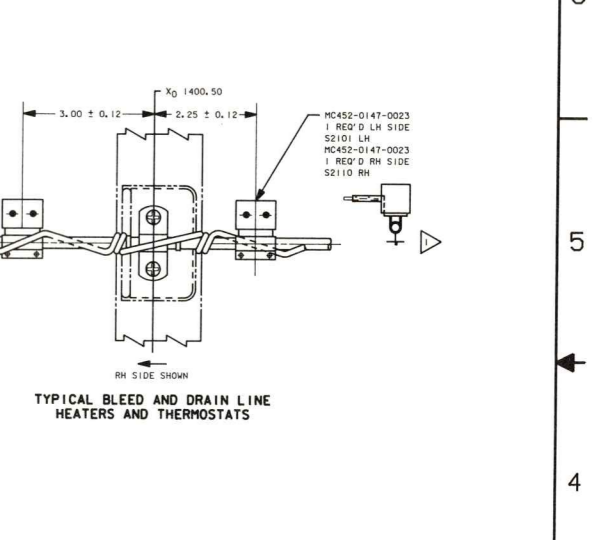
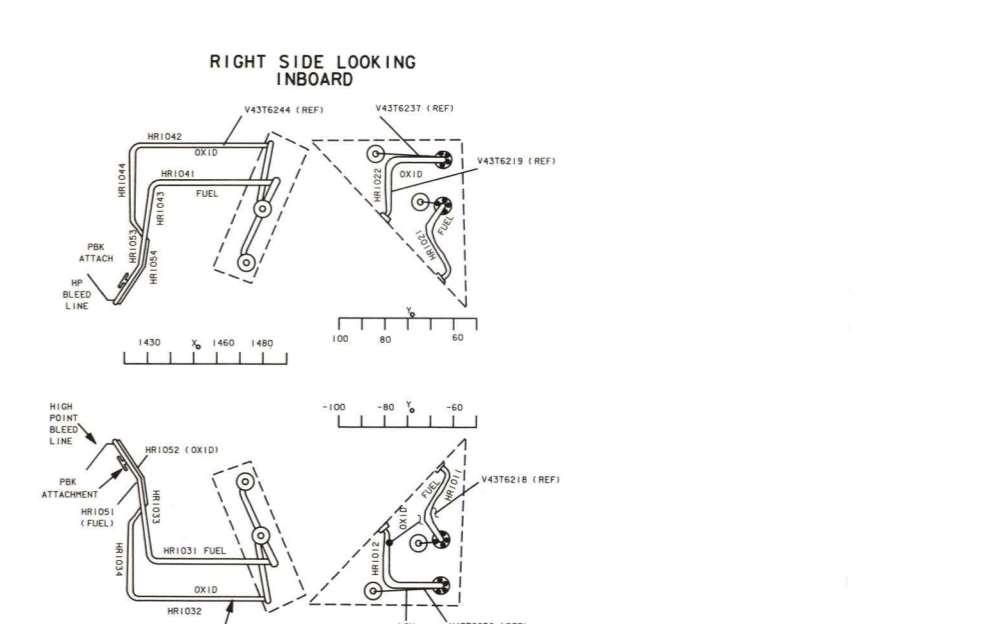
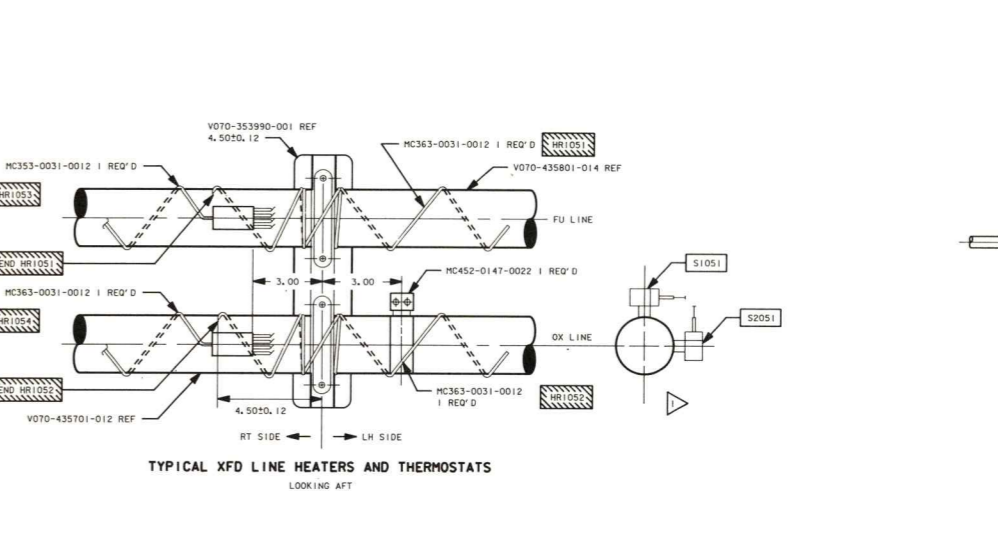


DATE: 7/27/83	NAME: JML	VERSION: BPT1.3
DATE: 7/27/83	NAME: TMW	VERSION: INM.1
DATE: 8/20/83	NAME: JFX	VERSION: INM.3
DATE: 3/8/84	NAME: VSH	VERSION: INM.5

DATE: 7/27/83	NAME: JML	VERSION: BPT1.3
DATE: 7/27/83	NAME: TMW	VERSION: INM.1
DATE: 8/20/83	NAME: JFX	VERSION: INM.3
DATE: 3/8/84	NAME: VSH	VERSION: INM.5
DATE: 4/17/84	NAME: LKH	VERSION: INM.6



LOCATION	HTR NO	THERMAL SW HTR CNTL THERMOSTAT (OVER T, THERMOSTAT)	OV-102		OV-099		LENGTH INCHES	RADIUS INCHES	ELEC SPEC WATTS	VOLTS	FDA LIMITS °F	SPEC NO
			RESET POINT CT A/B (OT A/B °F)	CT A/B (OT A/B °F)	RESET POINT CT A/B (OT A/B °F)	CT A/B (OT A/B °F)						
LH FLEX LINES	1011	S1011/S2011	58.6-71.5/57.1-71.7	60.3-72.7/58.8-72.6			1800	1.00	146.5	13.5	50-100	89
LH LO PT DRAIN LINES	1141	S1141/S2141	58.6-71.5/57.1-71.7	60.3-72.7/58.8-72.6			3000	0.125	2.5	3.2	50-100	89
RH FLEX LINES	1021	S1021/S2021	58.6-71.5/57.1-71.7	60.3-72.7/58.8-72.6			1800	1.00	146.5	13.5	50-100	89
RH LO PT DRAIN LINES	1121	S1121/S2121	58.6-71.5/57.1-71.7	60.3-72.7/58.8-72.6			3000	0.125	2.5	3.2	50-100	89
CENTER XFD LINES	1051	S1051/S2051	58.6-71.5/57.1-71.7	60.3-72.7/58.8-72.6			2250	0.125	21.0	6.75	50-100	89
HP BLD LINES	1100	S1100/S2100	58.6-71.5/57.1-71.7	60.3-72.7/58.8-72.6			2250	0.125	14.0	21.0	50-100	---
BHD BLD LINES	1120	S1120/S2120	58.6-71.5/57.1-71.7	60.3-72.7/58.8-72.6			2250	0.125	11.3	13.5	45-100	---
LH XFD LINES	1031	S1031/S2031	58.6-71.5/57.1-71.7	60.3-72.7/58.8-72.6			2000	0.125	15.8	7.35	50-100	89
RH XFD LINES	1041	S1041/S2041	58.6-71.5/57.1-71.7	60.3-72.7/58.8-72.6			2000	0.125	15.8	7.35	50-100	89



SIGNATURE	DATE	NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
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