

# ***CRT Reference Summary***

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**Space Shuttle Orbiter  
Displays and Controls**

**OI-7**

**DECEMBER 1985**

**STS 85-0260A**

**VOLUME 1**



**Rockwell International**

Space Transportation  
Systems Division

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This CRT Reference Summary is for information only. It provides all CRT displays documented in the Level C Functional Subsystem Software Requirements Display and Controls Specification, STS 83-0020A dated May 15, 1984. It also reflects the incorporation of approved CRs listed in the May 1985 CR Implementation Baselines. For detail information reference the above document. For information pertaining to distribution, contact P. Coleman or C. Thomas, (213) 922-5527.

### **DISPLAY LOCATION**

To aid in locating a display, two tables of contents are provided. Table A lists displays in alphabetical order. Table B lists the displays according to subsystems and in descending order of hierarchy OPS, SPEC and DISP. In addition, three IPL-related displays are listed separately under "Special Displays," and six HUD displays are listed under "Head Up Displays."

# Table of Contents — A

## ALPHABETICAL

Display	PFS	BFS	GNC					SM	PL	Page
			0	1	2	3	4			
ACTUATOR CONTROL	X						X			25D
ANTENNA	X							XX		10A
APU/ENVIRON THERMAL	X							X		14C
APU/HYDRAULIC	X							X		14A
BFS MEMORY		X	XX	X	X		X			28A
BFS OVERRIDE		X	X	X	X					30D
BUS/BTU STATUS	X						X	X	X	25A
COMM/RCDR	X							X		13A
CONTROLLERS (RM)	X					X				23B
CRYO SYSTEM	X							X		12C
DAP CONFIGURATION	X		X							5A
DEU STAND-ALONE S/T										26B
DPS UTILITY	X		X	X		XX	XX		X	18D
ELECTRIC	X						X			12B
ENTRY CONTROLS	X			X						7C
ENTRY TRAJ 1	X	X		X						2D.29A
ENTRY TRAJ 2	X	X		X						3A.29B
ENTRY TRAJ 3	X	X		X						3B.29C
ENTRY TRAJ 4	X	X		X						3C.29D
ENTRY TRAJ 5	X	X		X						3D.30A
ENVIRONMENT	X						X			12A
EVA/MMU/FSS	X							XX		13B
FAULT	X	X	XXXXXXXXXX				XXX	XX		19B.31A
FCS/DED DIS C/O	X					X				22A
FUEL CELLS	X						X			12D
GNC SYS SUMM 1	X	X	X*	X*						7D.31B
GNC SYS SUMM 2	X	X	X*	X*						8A
GND IMU CNTL/MONITOR	X					X				24C
GPC/BTU INTERFACE	X					X				25C
GPC/BUS STATUS	X		X	X		XX	XX		X	19C
GPC MEMORY	X		XXXXXXXXXX				XXX	XX		18C
GTS DISPLAY	X					X			X	23D
HORIZONTAL SIT	X	X	X	X	X					6D.30C
HUD	X	X								34A.35C
HYDRAULIC THERMAL	X						X			14B
IMU ALIGN	X			XX						5B
MANUAL CONTROLS	X					X				26A
MASS MEMORY R/W	X						X	X		22B
MENU NO. 1. XXXXIPL										18A
MENU NO. 2. GPCIPL										18B
ORBIT TARGETING	X			X						6C
OVERRIDE	X		X	X	X					7A
PCMMU/PL COMM	X				X	X	X			11A
PCS CONTROL	X						XX			11C
PDRS CONTROL	X						XX			11D
PDRS STATUS	X						X			15A
PL BAY DOORS	X	X					X**			10B
PL RETENTION	X						XX			15B
PRPLT THERMAL	X						X			14D
RCS	X			XX	X					5D
RCS/RGA/ADTA TEST (P/F)	X					X				24B
RCS/RGA/ADTA (ON-ORBIT)	X					X				22D
REL NAV	X		X							6B
RM ORBIT	X		X							6A

# Table of Contents — A

## ALPHABETICAL

Display	PFS	BFS	GNC						SM	PL	Page
			0	1	2	3	4	6			
RTLS TRAJ 2		X				X					30B
SENSOR SELF-TEST (ON-ORBIT)	X					X					22C
SENSOR SELF-TEST (P/F)	X						X				24A
SL MEMORY DUMP	X						X				25B
SM GROUND CHECKOUT	X							XX			11B
SM SYS SUMM 1	X	X						X *			13C
SM SYS SUMM 2	X	X						X *			13D,31C
SM TABLE MAINTENANCE	X							X			10C
STAR TRK/COAS CNTL	X				XX						5C
SWITCHES	X					X					23C
SWITCH/SURF FDBK (RM)	X					X					23A
SYS CHECK	X							X			10D
TCS CONTROL	X						X				24D
THERMAL		X						XXX			28B
TIME	X		X	X		XX		XX	X		19A
UNIV POINTING	X				X						2C
VERT SIT 1	X	X			X	X					4A,4C
VERT SIT 2	X	X			X	X					4B,4D
XXXXX MNVR YYYYY	X	X			X*	X					2B
XXXXXX TRAJ	X				X	X					2A
XXXXXX TRAJ 1 (ASCENT)		X			X						28C
XXXXXX TRAJ 2 (ASCENT)		X	X								28D

\* = INDICATES PFS ONLY AVAILABILITY

## Table of Contents — B

### "OPS DISPLAYS"

OPS No.	Display	PFS	BFS	GNC	SM	PL	Page
0001	GPC MEMORY	X		X			18C
0001	BFS MEMORY		X	X			28A
0001	THERMAL		X		X		28B
1011	XXXXXX TRAJ	X		X			2A
1011	XXXXXX TRAJ 1		X	X			28C
1021	XXXXXX TRAJ	X		X			2A
1021	XXXXXX TRAJ 1		X	X			28C
1031	XXXXXX TRAJ	X		X			2A
1031	XXXXXX TRAJ 2		X	X			28D
1041	XXXXX MNVR YYYYY	X	X	X			2B
1051	XXXXX MNVR YYYYY	X	X	X			2B
1061	XXXXX MNVR YYYYY	X	X	X			2B
2011	ANTENNA	X			X		10A
2011	UNIV PTG	X		X			2C
2021	PL BAY DOORS	X	X				10B
2021	XXXXX MNVR YYYYY	X		X			2B
3011	XXXXX MNVR YYYYY	X	X	X			2B
3021	XXXXX MNVR YYYYY	X	X	X			2B
3031	XXXXX MNVR YYYYY	X	X	X			2B
3041	ENTRY TRAJ 1	X		X			2D
3041	ENTRY TRAJ 1		X	X			29A
3041	ENTRY TRAJ 2	X		X			3A
3041	ENTRY TRAJ 2		X	X			29B
3041	ENTRY TRAJ 3	X		X			3B
3041	ENTRY TRAJ 3		X	X			29C
3041	ENTRY TRAJ 4	X		X			3C
3041	ENTRY TRAJ 4		X	X			29D
3041	ENTRY TRAJ 5	X		X			3D
3041	ENTRY TRAJ 5		X	X			30A
3051	VERT SIT 1	X	X	X			4A
3051	VERT SIT 2	X	X	X			4B
4011	ANTENNA	X			X		10A
6011	XXXXX TRAJ	X		X			2A
6011	RTLS TRAJ 2		X	X			30B
6021	VERT SIT 1	X	X	X			4A
6021	VERT SIT 1 (GRTLS)	X		X			4C
6031	VERT SIT 1	X	X	X			4A
6031	VERT SIT 2	X	X	X			4B
6031	VERT SIT 2 (GRTLS)	X		X			4D
8011	FCS/DED DIS C/O	X		X			22A
9011	MASS MEMORY R/W	X				X	22B
9011	GPC MEMORY	X		X			18C

### SPECIAL DISPLAYS

Display	Page
XXXXIPL MENU NO. 1	18A
GPCIPL MENU NO. 2	18B
DEU STAND-ALONE SELF-TEST	26B

### HEAD UP DISPLAYS

Display	Page
FORMAT 1 PRE-WOW (70,650 FT)	34A
FORMAT 1 PRE-WOW (100 FT)	34B
FORMAT 1 AFTER WOW	34C
FORMAT 2 PRE-WOW	35A
OPS 8 LOW	35B
OPS 9 LOW	35C

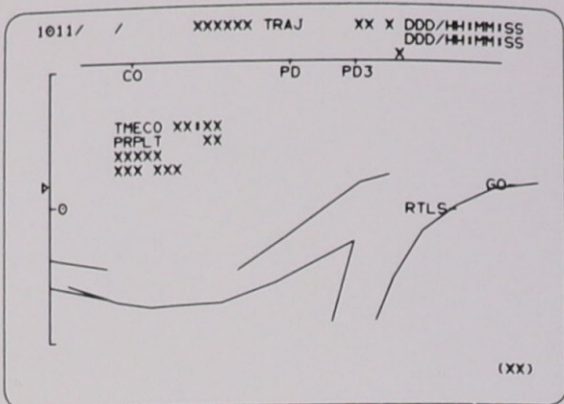
## Table of Contents — B

"SPEC" AND "DISP" DISPLAYS

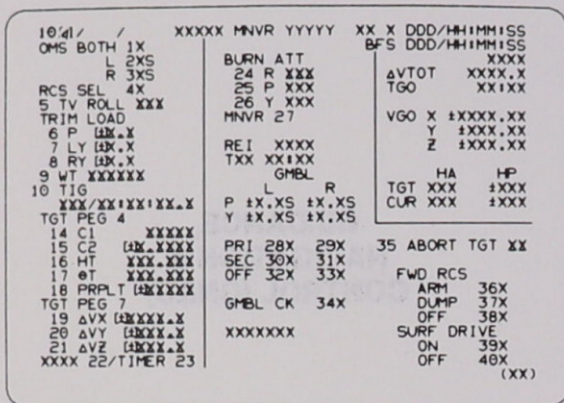
Spec No.	Display	PFS	BFS	GNC	SM	PL	Page
001	DPS UTILITY	X		X	X	X	18D
002	TIME	X		X	X	X	19A
006	GPC/BUS STATUS	X		X			19C
018	GNC SYS SUMM 1	X		X			7D
018	GNC SYS SUMM 1		X	X			31B
019	GNC SYS SUMM 2	X	X	X			8A
020	DAP CONFIG	X		X			5A
021	IMU ALIGN	X		X			5B
022	S TRK/COAS CNTL	X		X			5C
023	RCS	X		X			5D
025	RM ORBIT	X		X			6A
033	REL NAV	X		X			6B
034	ORBIT TGT	X		X			6C
040	SENSOR TEST	X		X			22C
041	RGA/ADTA/RCS	X		X			22D
042	SWITCH/SURF	X		X			23A
043	CONTROLLERS	X		X			23B
044	SWITCHES	X		X			23C
050	HORIZ SIT	X		X			6D
050	HORIZ SIT		X	X			30C
051	OVERRIDE	X		X			7A
051	BFS OVERRIDE		X	X			30D
053	ENTRY CONTROLS	X		X			7C
060	SM TABLE MAINT	X			X		10C
061	SYS CHECK	X			X		10D
062	PCMMU/PL COMM	X			X		11A
063	PL BAY DOORS		X		X		10B
064	SM GROUND CHECKOUT	X		X			11B
066	ENVIRONMENT	X			X		12A
067	ELECTRIC	X			X		12B
068	CRYO SYSTEM	X			X		12C
069	FUEL CELLS	X			X		12D
076	COMM/RCDR	X			X		13A
077	EVA-MMU/FSS	X		X	X		13B
078	SM SYS SUMM 1	X	X		X		13C
079	SM SYS SUMM 2	X			X		13D
079	SM SYS SUMM 2		X		X		31C
085	MASS MEMORY R/W	X				X	22B
086	APU/HYD	X			X		14A
087	HYD THERMAL	X			X		14B
088	APU/ENVIRON THERM	X			X		14C
089	PRPLT THERMAL	X			X		14D
090	PCS CONTROL	X				X	11C
094	PDRS CONTROL	X			X		11D
096	PDRS STATUS	X			X		15A
097	PL RETENTION	X		X		X	15B
099	FAULT	X		X	X	X	19B
099	FAULT		X	X	X	X	31A
100	GTS DISPLAY	X		X		X	23D
101	SENSOR SELF-TEST	X		X			24A
102	RCS/RGA/ADTA TEST	X		X			24B
104	GND IMU CNTL/MON	X		X			24C
105	TCS CONTROL	X		X			24D
106	MANUAL CONTROLS	X		X			26A
110	BUS/BTU STATUS	X		X		X	25A
111	SL MEMORY DUMP	X		X		X	25B
112	GPC/BTU I/F	X		X			25C
113	ACTUATOR CONTROL	X		X			25D

**GUIDANCE,  
NAVIGATION &  
CONTROL (GN&C)**

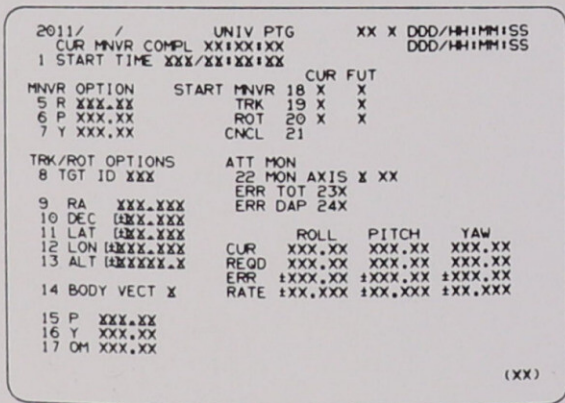




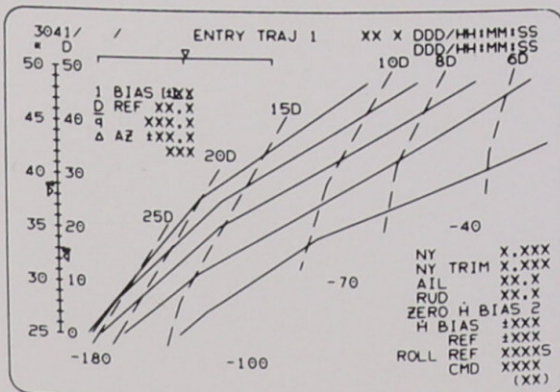
XXXXXX TRAJECTORY



XXXXX MANEUVER YYYYY (PFS/BFS)

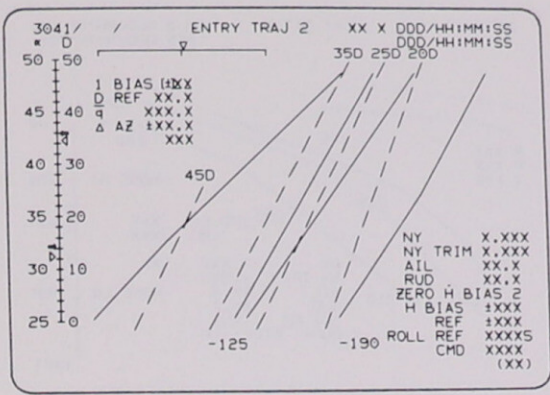


UNIVERSAL POINTING



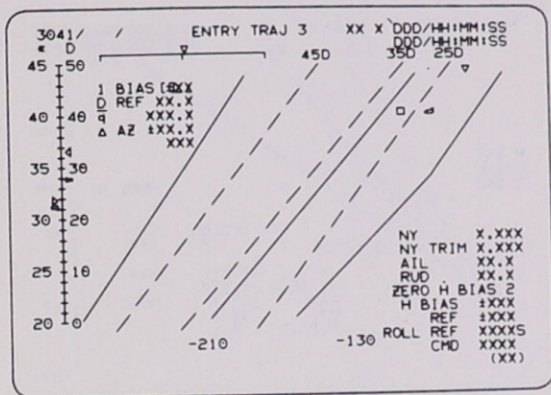
ENTRY TRAJECTORY 1

A



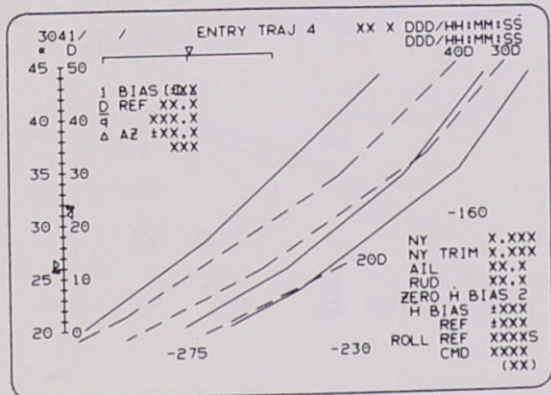
ENTRY TRAJECTORY 2

B



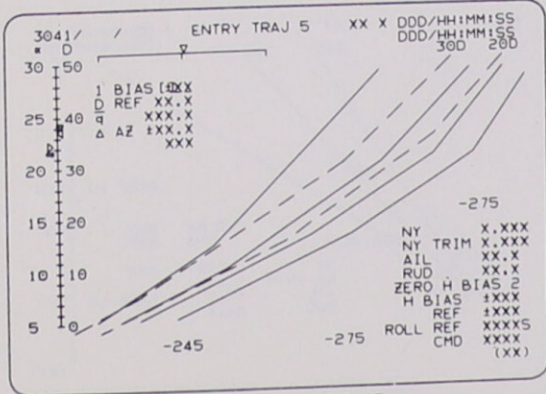
ENTRY TRAJECTORY 3

C

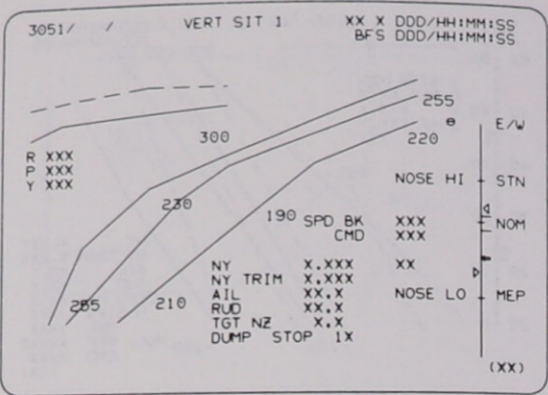


ENTRY TRAJECTORY 4

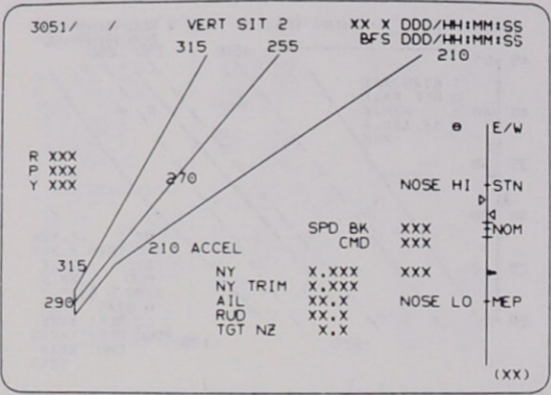
D



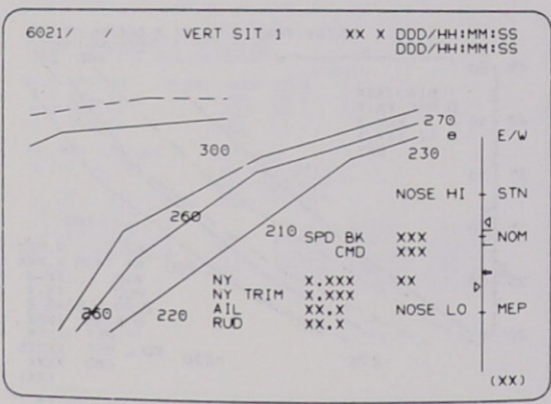
ENTRY TRAJECTORY 5



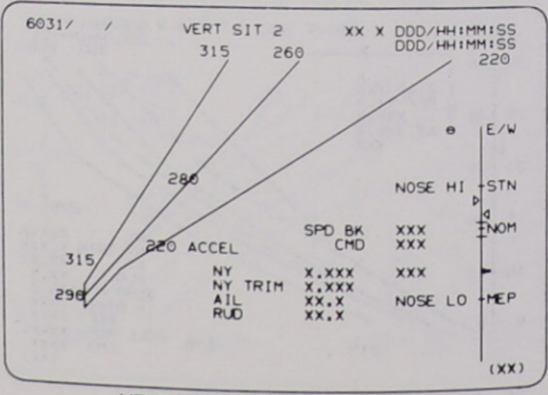
VERTICAL SITUATION 1 (PFS/BFS)



VERTICAL SITUATION 2 (PFS/BFS)



VERTICAL SITUATION 1 GRTLS



VERTICAL SITUATION 2 GRTLS

XXXX/020/		DAP CONFIG		XX X DDD/HH:MM:SS	
TRANSLATION PULSE		A	15	B	DDDD/HH:MM:SS
		1	X.XX	15	X.XX
ROTATION DISC RATE		NORM	2	X.XXX	16
		VERN	3	X.XXX	17
PULSE		NORM	4	X.XX	18
		VERN	5	X.XXX	19
COMP		NORM	6	.XX	20
		VERN	7	.XXX	21
					29 1X X.XXX
					30 1Y X.XXX
					31 1Z X.XXX
DEADBAND ATT		NORM	8	XX.XX	22
		VERN	9	XX.XXX	23
RATE		NORM	10	X.XX	24
		VERN	11	.XXX	25
JET OPT		P	12	X	26
		Y	13	X	27
CNTL ACCEL			14	X	28
(XX)					

DIGITAL AUTOPILOT CONFIGURATION

XXXX/021/		IMU ALIGN		XX X DDD/HH:MM:SS	
IMU				DDDD/HH:MM:SS	
STAT	1S	2S	3S	ALIGN	XXX
TEMP	XX	XX	XX	IMU	1 10X STAR ALIGN 13X
STBY	1X	2X	3X		2 11X 14 IMU/IMU X
OPER	4X	5X	6X		3 12X MATRIX 15X
DES	7X	8X	9X		
EXEC 16X					
TERM 17					
ACC					
	1	2	3		
X	±X.XX	±X.XX	±X.XX		
Y	±X.XX	±X.XX	±X.XX		
Z	±X.XX	±X.XX	±X.XX		
ANG					
	1	2	3		
X	XXX.XX	XXX.XX	XXX.XX		
Y	XXX.XX	XXX.XX	XXX.XX		
Z	XXX.XX	XXX.XX	XXX.XX		
ΔX	±XXX.XX	±XXX.XX	±XXX.XX	NAV ΔV THRESH	
ΔY	±XXX.XX	±XXX.XX	±XXX.XX	18 XXXXXXXX	
ΔZ	±XXX.XX	±XXX.XX	±XXX.XX	MM READ 19X	
(XX)					

IMU ALIGNMENT

XXXX/022/		S TRK/COAS CNTL		XX X DDD/HH:MM:SS	
				DDDD/HH:MM:SS	
S TRK CNTL	-Y	-Z	S TABLE	1	2
SELF-TEST	1X	2X	TRK ID	XXX	XXX
STAR TRK	3X	4X	, MIN	XXX	XXX
TGT TRK	5X	6X	ANG DIF	XXX.X	XXX.X
BREAK TRK	7	8	ERR	XX.XX	XX.XX
TERM/IDLE	9X	10X	SEL	17X	18X
			S TABLE CLR	20	19X
S TRK	-Y	-Z	COAS		
REQD ID	11	XXX	REQD ID	21	XXX
TRK ID	XXX	XXX	ΔDEG X		±X.X
S PRES	X	X	Y		±X.X
ΔANG	±X.XX	±X.XX	SIGHT MODE	22X	
THOLD	13	X	ACCEPT	23	
SHUTTER	XX	XX	CAL MODE	24X	
MAN OP	15X	16X	DES	25X	
STATUS	XXXXXXXXXX	XXXXXXXXXX	POS	+X 26X	-Z 27X
	XXXX	XXXX	ΔBIAS	X.XX	X.XX
			UPDATE	28	29
(XX)					

STAR TRACKER/COAS CONTROL

XXXX/023/		RCS		XX X DDD/HH:MM:SS																															
				DDDD/HH:MM:SS																															
RCS FWD	1X	PRI	JET	OMS PRESS	ENA																														
	L 2X	4	FAIL LIM X	L OMS	5X																														
	R 3X			R OMS	6X																														
				OFF	7X																														
					R XX.XXS																														
JET	FAIL	DES	JET	PTY																															
XXX	XXX	18X	9X	X																															
XX	XXX	10X	11X	X																															
Y XX	XXX	12X	13X	X																															
XX	XXX	14X	15X	X																															
XXU	XXX	16X	17X	X																															
XU	XXX	18X	19X	X																															
Z XU	XXX	20X	21X	X																															
xxx	xxx	22x	23x	x																															
x0	xxx	24x	25x	x																															
20	xxx	26x	27x	x																															
x0	xxx	28x	29x	x																															
xxx	xxx	30x	31x	x																															
x xx	xxx	32x	33x	x																															
xx	xxx	34x	35x	x																															
x5x	xxx	36x	37x	x																															
v 5x	xxx	38x	39x	x																															
<table border="1" style="width: 100%;"> <tr> <td colspan="2">OXIDIFU</td> </tr> <tr> <td>P</td> <td>XXXXX XXXXS</td> </tr> <tr> <td>PRPLT YK</td> <td>P XXXXS XXXXS</td> </tr> <tr> <td>T</td> <td>XXXXX XXXXS</td> </tr> <tr> <td>QTY</td> <td>XXXXX XXXXS</td> </tr> <tr> <td>MANF P</td> <td>1 XXXXS XXXXS</td> </tr> <tr> <td></td> <td>2 XXXXS XXXXS</td> </tr> <tr> <td></td> <td>3 XXXXS XXXXS</td> </tr> <tr> <td></td> <td>4 XXXXS XXXXS</td> </tr> <tr> <td>MANF VLVS</td> <td>STAT OVRD</td> </tr> <tr> <td>1</td> <td>XXS 40</td> </tr> <tr> <td>2</td> <td>XXS 41</td> </tr> <tr> <td>3</td> <td>XXS 42</td> </tr> <tr> <td>4</td> <td>XXS 43</td> </tr> <tr> <td>5</td> <td>XXS 44</td> </tr> </table>						OXIDIFU		P	XXXXX XXXXS	PRPLT YK	P XXXXS XXXXS	T	XXXXX XXXXS	QTY	XXXXX XXXXS	MANF P	1 XXXXS XXXXS		2 XXXXS XXXXS		3 XXXXS XXXXS		4 XXXXS XXXXS	MANF VLVS	STAT OVRD	1	XXS 40	2	XXS 41	3	XXS 42	4	XXS 43	5	XXS 44
OXIDIFU																																			
P	XXXXX XXXXS																																		
PRPLT YK	P XXXXS XXXXS																																		
T	XXXXX XXXXS																																		
QTY	XXXXX XXXXS																																		
MANF P	1 XXXXS XXXXS																																		
	2 XXXXS XXXXS																																		
	3 XXXXS XXXXS																																		
	4 XXXXS XXXXS																																		
MANF VLVS	STAT OVRD																																		
1	XXS 40																																		
2	XXS 41																																		
3	XXS 42																																		
4	XXS 43																																		
5	XXS 44																																		
JET RESET 45																																			
(XX)																																			

REACTION CONTROL SYSTEM

A

B

C

D

XXXX/025/ RM ORBIT XX X DDD/HH:MM:SS  
DDD/HH:MM:SS

THC	TX	TY	TZ	DES	RHC	R	P	Y	DES
L 1	XS	XS	XS	1X	L 1	XXXS	XXXS	XXXS	7X
2	XS	XS	XS	2X	2	XXXS	XXXS	XXXS	8X
3	XS	XS	XS	3X	3	XXXS	XXXS	XXXS	9X
A 1	XS	XS	XS	4X	R 1	XXXS	XXXS	XXXS	10X
2	XS	XS	XS	5X	2	XXXS	XXXS	XXXS	11X
3	XS	XS	XS	6X	3	XXXS	XXXS	XXXS	12X
					A 1	XXXS	XXXS	XXXS	13X
					2	XXXS	XXXS	XXXS	14X
					3	XXXS	XXXS	XXXS	15X

SW RM INH 16X

(XX)

### REDUNDANCY MGMT ORBIT

XXXX/033/ REL NAV XX X DDD/HH:MM:SS  
DDD/HH:MM:SS

RNDZ	NAV	ENA	1X	SV	UPDATE	AVG	G	ON	5X
KU	ANT	ENA	2X	POS	XX.XX	ΔVX			±XX.XX
MEAS		ENA	3X	VEL	XX.XX	ΔVY			±XX.XX
	NAV					ΔVZ			±XX.XX
SV	SEL	4	XXXX	RR	XXXX	ΔVTOT			XXX.XX
RNG	XXXX	XXX		RNG	XXXX	RESET	COMPNT	6	
R	±XXXX	.XX		R	±XXXX	TOT	7		
θ	XXX	.XX		EL	±XXX	SV	TRANSFER		
Y	±XX	.XX		AZ	±XXX	FLTR	MINUS	PROP	
Y	±XXX	.X		ωP	±XX	POS		XX.XX	
NODE	XX:XX	:XX		ωR	±XX	VEL		XX.XX	
				FILTER		FLTR	TO	PROP	8X
S	TRK	12X		RR	13X	PROP	TO	FLTR	9X
STAT	XXXXXXX	XXXX		COAS	14X	ORB	TO	TGT	10X
				OFFSET	X ±X.X	TGT	TO	ORB	11X
					Y ±X.X				
SLOW	RATE		15X						
COVAR	REINIT		16X	MARK	HIST				
				RESID	RATIO	ACPT	REJ		
RNG	±XX	.XX		X.X	XXX	XXS			
R	±XX	.XX		X.X	XXX	XXS			
V/EL/Y	±X	.XX		X.X	XXX	XXS			
H/AZ/Y	±X	.XX		X.X	XXX	XXS			

(XX)

### RELATIVE NAVIGATION

XXXX/034/ ORBIT TGT XX X DDD/HH:MM:SS  
DDD/HH:MM:SS

MNVR	TIG	ΔVX	ΔVY	ΔVZ	ΔVT	
XX X	X/XX:XX:XX	±XXX.X	±XX.X	±XX.X	±XXX.X	
					PRED MATCH= XXXXXXX	
INPUTS					CONTROLS	
1 TGT NO		XX			T2 TO T1	25
2 T1 TIG	X/XX:XX:XX	XX.XX			XXXX	26
6 EL	XX.XX				COMPUTE T1	27X
7 ΔX/DNRNG	±XXX.XX				COMPUTE T2	28X
8 ΔY	±XXX.XX					
9 ΔZ/ΔH	±XXX.XX					
10 ΔX	±XXX.XX					
11 ΔY	±XXX.XX					
12 ΔZ	±XXX.XX					
13 T2 TIG	X/XX:XX:XX					
17 ΔT	±XXX.XX					
18 ΔX	±XXX.XX					
19 ΔY	±XXX.XX					
20 ΔZ	±XXX.XX					
21 BASE TIME	X/XX:XX:XX					

(XX)

### ORBIT TARGETING

XXXX/050/ PTI XXX 1 ALTH HORIZ SIT XX X DDD/HH:MM:SS  
INDEX XX 9 XX.XX DDD/HH:MM:SS  
XXX

XXXXXXX	XXXX	XX	XXXX	XX	XXXX	XX	XXXX	XX	XXXX	XX
41	XXXX	SITE	XX							
PRI	XXXXX		3X							
SEC	XXXXX		4X							
TAC	XXX		5							
TAEM	TGT									
GIN	X XXXX	6								
HSI	X									
XEP		7								
AIM	XXXX	8								
S/B	XXXX	39								
NAV	RESID	RATIO	ACPT	REJ						
TAC	±XX	.XX	X.X	XXX	XXS					
RNG	±XX	.XX	X.X	XXX	XXS					
DRAG	H:XXXXXX	X.S	22X	23X	24X					
ADTA	H:XXXXXX	X.S	25X	26X	27X					
ADTA	TO	GTC								

(XX)

### HORIZONTAL SITUATION

A

```

XXXX/851/   OVERRIDE   XX X DDD/HHMMISS
                               DDD/HHMMISS
ABORT MODE
AOA 1X      ADTA             H      #      M      DES
ATO 2X
ABORT 3X    L 15 XXXXXX XXX.X X,XX 11X
            3S XXXXXX XXX.X X,XX 12X
ET SEP      R 25 XXXXXX XXX.X X,XX 13X
AUTO 4X     45 XXXXXX XXX.X X,XX 14X
SEP 5X

ET LMB DR
CLOSE 6X

RCS RM
MANF CL
OVRD 7

IMU
STAT ATT DES
15 XXXX X 8X
25 XXXX XXX 9X
35 XXXX 10X

PRL
SYS 15 15X 18X  NOM  37X
    25 17X 18X  N POLE 38X
    35 19X 20X  S POLE 39X

ENTRY ROLL MODE SW-XXXXXXXX
AUTO SEL 21X

VENT DOOR CNTL   PRPLT DUMP
OPEN 22X        ARM 25X
CLOSE 23X       DUMP 26X
                   OFF 27X

XXX INCT 29   MAX THRGT 24X
                                                (XX)
  
```

B

```

                                OVERRIDE
6021/852/   CONT ABORT  XX X DDD/HHMMISS
                               DDD/HHMMISS

DUMP START 1X
STOP 2X

                                DELETED

                                PULL OUT NZ
                                                (XX)
  
```

C

```

XXXX/853/   ENTRY CONTROLS  XX X DDD/HHMMISS
                               DDD/HHMMISS

SEC ACT CK      PORT STAT      MOM PORT
                1 2 3 4      STRING ASSIGN
CH1 1X          L OB 1 5 5 5 5 5 5 5 1 22X 23X
    2 2X         IB 2 5 5 5 5 5 5 5 2 24X 25X
    3 3X         R IB 3 5 5 5 5 5 5 5 3 26X 27X
    4 4X         OB 4 5 5 5 5 5 5 5 4 28X 29X
START 5X        RUD 5 5 5 5 5 5 5 5  PL 30X 31X
STOP 6X        SPD BRK 6 5 5 5 5 5

NEG STIM
ENA 7X         8 BYPASS XX      ENTRY FCS
                    9 RESET XX     ELEVON
                                        NOM 32X
                                        ALT 33X

LRU AA  RGA  SURF FDBK      FILTER
DES  DES  DES  DES
1 10X S 14X S 18X S      NOM 34X
2 11X S 15X S 19X S      PL 35X
3 12X S 16X S 20X S
4 13X S 17X S 21X S
                                                (XX)
  
```

D

```

XXXX/XXX/818 GNC SYS SUMM 1 XX X DDD/HHMMISS
                               DDD/HHMMISS

RCS | JET | ISOL
MANF | FAIL | VL V
F 1XXX XXS L OB XXX,XS XXS DPS 1 2 3 4 S
2XXX XXS IB XXX,XS XXS MOM GF 5 6 7 8 S
3XXX XXS R IB XXX,XS XXS FA 9 10 11 12 S
4XXX XXS OB XXX,XS XXS
5XXX XXS AIL XXX,X FCS CH 1 2 3 4
L 1XXX XXS RUD XXX,X S 5 6 7 8 S
2XXX XXS SPD BRK XXX,X
3XXX XXS BOY FLP XXX,X X
4XXX XXS XXXXXX
5XXX XXS NAV 1 2 3 4
R 1XXX XXS IMU 5 6 7 8 S
2XXX XXS ACC 9 10 11 12 S
3XXX XXS RGA 13 14 15 16 S
4XXX XXS TAC 17 18 19 20 S
5XXX XXS MLS 21 22 23 24 S
ADTA 25 26 27 28 S

CNTLR 1 2 3 4
RHC L 5 6 7 8 S
R R 9 10 11 12 S
A A 13 14 15 16 S
THC L 17 18 19 20 S
A A 21 22 23 24 S
SBTC L 25 26 27 28 S
R R 29 30 31 32 S
                                                (XX)
  
```

XXXX/XXX/019 GNC SYS SUMM 2										XX X DDD/H#IMMISS			
										BFS DDD/H#IMMISS			
OMS AFT QTY L R					OMS L R								
OXID XX.XS XX.XS					TK P HE XXXXS XXXXS								
FU XX.XS XX.XS					OXID XXXS XXXS								
FU INJ T XXXS XXXS					FU XXXS XXXS								
					N2 TK P XXXXS XXXXS								
RCS					REG P XXXS XXXS								
OXID					FU					JET SOL			
FAIL					VLV								
FWD					P								
TK					P					ENG IN			
QTY					P					OXID XXXS XXXS			
MANF					1 P					FU XXXS XXXS			
					2 P					VLV 1 XXXS XXXS			
					3 P					2 XXXS XXXS			
					4 P								
					5								
					XXX								
					XXS								
AFT					HE P XXXXS XXXXS								
L					TK P XXXS XXXS								
QTY					P								
MANF					1 P								
					2 P								
					3 P								
					4 P								
					5								
					XXX								
					XXS								
										(XX)			

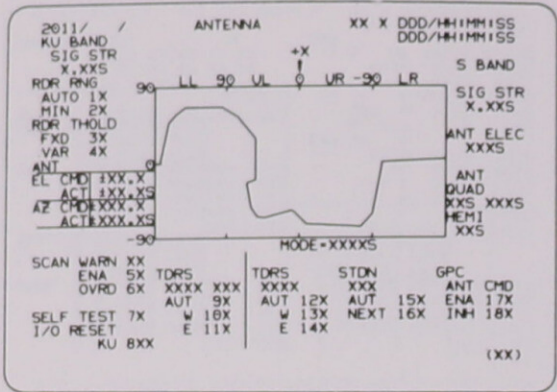
A

GNC SYSTEM SUMMARY 2

**SYSTEMS  
MANAGEMENT  
(SM)**



A



ANTENNA

B

2021/ / PL BAY DOORS XX X DDD/HH:MM:SS  
 BFS DDD/HH:MM:SS

AC POWER ON 1X							
AUTO MODE OFF 2X							
SEL 3X							
	MAN	OP/CL	AUTO	MICRO-SW STAT			
	SEL		SEQ	LATS	DOORS		
CENTER LATCHES 5-8 4X	XXS	X	XXXX	CCOO	CRRRO		
9-12 5X	XXS	X	XXXX	ABAB	ABC		
1-4 6X	XXS	X	XXXX				
13-16 7X	XXS	X	XXXX				
STBD							
FWD LATCHES 8X	XXS	X	XXXX	XXXXX	XXXXX		
AFT LATCHES 9X	XXS	X	XXXX	XXXXX	XXXXX		
DOOR 10X	XXXXS	X					
PORT							
FWD LATCHES 11X	XXS	X	XXXX	XXXXX	XXXXX		
AFT LATCHES 12X	XXS	X	XXXX	XXXXX	XXXXX		
DOOR 13X	XXXXS	X					
PBD SW BYPASS 14X			OPEN 15X				
			STOP 16X				
			CLOSE 17X				

(XX)

PAYLOAD BAY DOORS (PFS/BFS)

C

XXXX/060/ SM TABLE MAINT XX X DDD/HH:MM:SS  
 DDD/HH:MM:SS  
 SM COM BUFF XXX  
 PARAM XXXXXX  
 1 ID XXXXXXXX  
 VALUE= [XXXXXXXXXXS]

	ALERT		LIMITS		BACKUP C/W	
	LOW	HI		LOW	HI	
2	[XXXXXXXXXX]	3 [XXXXXXXXXX]	11	[XXXXXXXXXX]	12 [XXXXXXXXXX]	
4	[XXXXXXXXXX]	5 [XXXXXXXXXX]				
6	[XXXXXXXXXX]	7 [XXXXXXXXXX]				
	8 FILTER XX			13 FILTER XX		
	ENA 9X			ENA 14X		
	INH 10X			INH 15X		

CONSTANT  
 16 ID XXXXXXXX  
 17 VALUE= [XXXXXXXXXXXXXXXXXXS]

CHECKPT XXX/XX:XX:XX FDA  
 INITIATE 18 ENA 19X  
 STATUS XXXX XXXX INH 20X

(XX)

SM TABLE MAINTENANCE

D

XXXX/061/ SYS CHECK XX X DDD/HH:MM:SS  
 DDD/HH:MM:SS  
 SM COM BUFF XXX  
 LIST XXX  
 1 SEL XX  
 COMPARE 2

PARAM  
 3 ID XXXXXXXX

LIMIT/SW POS  
 4 LOW [XXXXXXXXXX] XXXX  
 5 HI [XXXXXXXXXX]

WRITE 6 XXXX

	DISCREPANCY				REQD
XXXX	XXXX	XXXX	XXXX	XXXX	XXXXS
XXXX	XXXX	XXXX	XXXX	XXXX	XXXXS
XXXX	XXXX	XXXX	XXXX	XXXX	XXXXS
XXXX	XXXX	XXXX	XXXX	XXXX	XXXXS
XXXX	XXXX	XXXX	XXXX	XXXX	XXXXS
XXXX	XXXX	XXXX	XXXX	XXXX	XXXXS
XXXX	XXXX	XXXX	XXXX	XXXX	XXXXS
XXXX	XXXX	XXXX	XXXX	XXXX	XXXXS
XXXX	XXXX	XXXX	XXXX	XXXX	XXXXS
XXXX	XXXX	XXXX	XXXX	XXXX	XXXXS

(XX)

SYSTEM CHECK

A

```

XXXX/862/          PCMMU/PL COMM  XX X DDD/HH:MM:SS
SM COM BUFF XXX   DDD/HH:MM:SS
PCMMU
BITE WORD XXXX
FMT
SEL FXD      1XS
PGM          2XS
PGM ID 64   XXX
          128 XXX
3 SEL ID    XXX
LOAD 4     XXXX

I/O RESET
PCM 5XX

PSP          PL INTRG
I/O RESET   1 CHANNEL XXXX
           PSP1 6XX 2 CHANNEL XXXX
           PSP2 7XX PHASE LOCK XXXX
SYNC        BIT XXXX ERR ±XXX
           FRAME XXXX XMIT PWR XX,XXX
LOAD        XXXX XXXX PL SIG STR X,XXX 18 TFL GPC SEL X

```

## PCMMU/PAYLOAD COMMUNICATION

B

```

XXXX/864/          SM GROUND CHECKOUT XX X DDD/HH:MM:SS
XXXXXXXXXXXXXXXXXX DDD/HH:MM:SS
           ENA INH   PROCESS INH/ENA
FDA        2X 3X   S P O/P 11 X
PL ANNUN   4X X
SM ANNUN   5X X

DOWNLIST
SEL FMT    6XX
LOAD       7X

RMS TOOLS
SOFT STOP/REACH
TURNAROUND 8X
REINSTALL   9X
SINGULARITY 10X

```

OPS ACTIVATE 1X

(XX)

## SM GROUND CHECKOUT

C

```

XXXX/890/          PCS CONTROL      XX X DDD/HH:MM:SS
                      DDD/HH:MM:SS
1 SET XX XXXXXX    SEQ STAT NAME      GMT
                      XXXX XXXX XXXXXX XXX/XX:XX:XX
2 SEQ XXXX XXXXXX  XXXX XXXX XXXXXX XXX/XX:XX:XX
3 GMT XX/XX:XX:XX  XXXX XXXX XXXXXX XXX/XX:XX:XX
7 FIRST STEP      XXXX XXXX XXXXXX XXX/XX:XX:XX
8 LAST STEP       XXXX XXXX XXXXXX XXX/XX:XX:XX
9 HOLD STEP       XXXX XXXX XXXXXX XXX/XX:XX:XX
ENA 10 HOLD       11X XXXX XXXX XXXXXX XXX/XX:XX:XX
TERM 12 RESUME    13 XXXX XXXX XXXXXX XXX/XX:XX:XX

SEQ UPDATE
14 STEP XXX       XXXX XXXX XXXXXX XXX/XX:XX:XX
15 MASK XXXX      XXXX XXXX XXXXXX XXX/XX:XX:XX
16 HI LIMIT XXXX  XXXX XXXX XXXXXX XXX/XX:XX:XX
17 LO LIMIT XXXX  XXXX XXXX XXXXXX XXX/XX:XX:XX
18 DELAY XX:XX    XXXX XXXX XXXXXX XXX/XX:XX:XX

CURRENT XXX
ERROR XXX/X
TERM ALL 20
CLEAR TEXT 21

```

(XX)

## PCS CONTROL

D

```

XXXX/894/          PDRS CONTROL     XX X DDD/HH:MM:SS
                      DDD/HH:MM:SS
RMS SEL1 XXXX    RMS PWR XXX          ENA INH
PORT 1X          I/O ON 5X          SOFT STOP 7X 8X
STBD 2X          OFF 6X           AUTO BRAKE 9X 10X
3 PL ID XX       POS ENC CK 11X 12X
4 END EFF X

          AUTO MODES
          1          2          3          4          17 START PT XXX
          13 XX     14 XX     15 XX     16 XX     LAST PT XXX

END POS          OPR CMD MODES
18 X (XXXX)     END ATT          24 PL INIT ID XX
19 Y (XXXX)     21 P (XXXX)
20 Z (XXXX)     22 Y (XXXX)     CMD CK 25 XXXX
                23 R (XXXX)

RMS STO/DPLY    26 WR RANGE X
SHLD X X X X

RMS LAT/REL/RDY
AFT X X X X X
MID X X X X X
FWD X X X X X

```

(XX)

## PDRS CONTROL

XXXX/XXX/066 ENVIRONMENT XX X DDD/HH:MM:SS  
DDD/HH:MM:SS

CABIN				AV BAY	1	2	3
dP/dT	±.XXS	CABIN P	XX.XS	TEMP	XXXXS	XXXXS	XXXXS
PP02		AJRLK P	XX.XS	FAN ΔP	X.XXS	X.XXS	X.XXS
A	X.XXS	FAN ΔP	X.XXS				
B	X.XXS	HX OUT T	XXXXS				
C	X.XXS	CABIN T	XXXXS				
PPC02	XX.XS						
02 FLOW		1	2	SUPPLY			
REG P		XXXS	XXXS	QTY A	XXXS	PRESS	XXXS
N2 FLOW		X.XS	X.XS	B	XXXS	DMP LN T	XXXS
REG P		XXXS	XXXS	C	XXXS	NOZ T A	XXXS
02/N2 CNTL VLV		XXXS	XXXS	D	XXXS	B	XXXS
H2O TK N2 P		XXXS	XXXS				
N2 QTY		XXXS	XXXS				
EMER 02 QTY		XXXS	XXXS	WASTE			
REG P		XXXS	XXXS	QTY 1	XXXS	PRESS	XXXS
		A	B	C	ΔP	DMP LN T	XXXS
IMU FAN		XS	XS	XS	X.XS	NOZ T A	XXXS
HUMID SEP		XS	XS				
				VAC VT NOZ T			
				XXXS			

(XX)

ENVIRONMENT

XXXX/XXX/067 ELECTRIC XX X DDD/HH:MM:SS  
DDD/HH:MM:SS

DC	1/A	2/B	3/C	AC	1	2	3
VOLT FC	XX.XS	XX.XS	XX.XS	V	●A	XXXS	XXXS
MN	XX.XS	XX.XS	XX.XS	●B	XXXS	XXXS	XXXS
PCA FWD	XX.XS	XX.XS	XX.XS	●C	XXXS	XXXS	XXXS
AFT	XX.XS	XX.XS	XX.XS	AMP	●A	XX.XS	XX.XS
CNTL AB	XX.XS	XX.XS	XX.XS	●B	XX.XS	XX.XS	XX.XS
BC	XX.XS	XX.XS	XX.XS	●C	XX.XS	XX.XS	XX.XS
CA	XX.XS	XX.XS	XX.XS	OVLD	XXS	XXS	XXS
ESS	XX.XS	XX.XS	XX.XS	O/U V	XXS	XXS	XXS
AMPS FC	XXXS	XXXS	XXXS	PAYLOAD DC AMPS			
FWD	XXXS	XXXS	XXXS	AFT B		XXX.XS	
MID	XXXS	XXXS	XXXS	C		XXX.XS	
AFT	±XXXS	±XXXS	±XXXS				
TOTAL AMPS		XXXXS					
KW		XXX.XS					

(XX)

ELECTRIC

XXXX/XXX/068 CRYO SYSTEM XX X DDD/HH:MM:SS  
DDD/HH:MM:SS

02	1	2	3	4	5
P	XXXXS	XXXXS	XXXXS	XXXXS	XXXXS
TK P	XXXXS	XXXXS	XXXXS	XXXXS	XXXXS
QTY	XXXXS	XXXXS	XXXXS	XXXXS	XXXXS
T	±XXXXS	±XXXXS	±XXXXS	±XXXXS	±XXXXS
HTR T 1	±XXXXS	±XXXXS	±XXXXS	±XXXXS	±XXXXS
HTR T 2	±XXXXS	±XXXXS	±XXXXS	±XXXXS	±XXXXS
HTR 1A					
CUR 1B				4/5	
SNSR 2A				4/5	
MANF P	XXXXS	XXXXS			
VLV	XXS	XXS			
H2					
TK P	XXXS	XXXS	XXXS	XXXS	XXXS
QTY	XXXS	XXXS	XXXS	XXXS	XXXS
T	±XXXS	±XXXS	±XXXS	±XXXS	±XXXS
HTR T	±XXXS	±XXXS	±XXXS	±XXXS	±XXXS
MANF P	XXXS	XXXS			
VLV	XXS	XXS			

(XX)

CRYOGENIC SYSTEM

XXXX/XXX/069 FUEL CELLS XX X DDD/HH:MM:SS  
DDD/HH:MM:SS

FC			H2O RLF LINE T		
VOLTS	1	2	3	NOZ T A	XXXS
AMPS	XX.XS	XX.XS	XX.XS	B	XXXS
FLOW 02	XX.XS	XX.XS	XX.XS	HTR SW	XXXS
H2	X.XS	X.XS	X.XS	02 T	XXXS
REAC 02	XXS	XXS	XXS	H2 T1	XXXS
H2	XXS	XXS	XXS	T2	XXXS
STACK T	±XXXS	±XXXS	±XXXS		
EXIT T	XXXS	XXXS	XXXS		
COOL T	XXXS	XXXS	XXXS		
P	XXXS	XXXS	XXXS		
PUMP	XXS	XXS	XXS		
H2O LN T	XXXS	XXXS	XXXS	PH	
VLV T	XXXS	XXXS	XXXS	ΔV	SS1
END HTR	AXXXXS	BXXXXS	CXXXXS	1	XXS
				2	XXS
				3	XXS
				SS2	XXXS
				SS3	XXXS
					XXXS

(XX)

FUEL CELLS

A

XXXX/XXX/076		COMM/RCDR	XX X	DDD/HH:MM:SS
S-BAND PM				DDD/HH:MM:SS
XPND		XXXXS	KU-BAND	
MODE		XXXXXS	PA TEMP	±XXXXS
SPD SPEC		XXXXS	GMBL TEMP	A ±XXXXS
RANGING		XXXXS		B ±XXXXS
PREAMP		XXXXS	SPD SPEC	XXX
FREQ		XXS	CCTV	
PWR AMPL			CNTL UNIT	XXXXS
OPER		XXXXS	CAM OVER TEMP	XXXXS
STBY		XXXXS		
		GCIL CONFIG		XXXXS
NSP		RECORDERS	OPS 1	OPS 2
FR SYNC	1	XXXXS	XXXXXS	XXXXXS
	2	XXXXS	XXS	XXS
FAIL SAFE		XXXXS	TRK	XXS
DATA XMIT		XXS	DIR	XXXXS
RCV		XXS	TAPE	XXXXS
UL DATA		XXS	TAPE	XXXXS
CODING XMIT		XXXXS	TEMP	XXXXS
RCV		XXXXS	BITE	XXS
RCDR INPUT		XXXXXS		XXS

(XX)

COMMUNICATION/RECORDER

B

XXXX/XXX/077		EVA-MMU/FSS	XX X	DDD/HH:MM:SS
				DDD/HH:MM:SS
MMU/FSS				
TEMPS		PORT	STBD	
TOGGLE VLV	FSS	L ±XXXXS	±XXXXS	
		R ±XXXXS	±XXXXS	
		MMU L ±XXXXS	±XXXXS	
		R ±XXXXS	±XXXXS	
GN2 TANK BARREL		L ±XXXXS	±XXXXS	
		R ±XXXXS	±XXXXS	
CNTL ELECT ASSY		±XXXXS	±XXXXS	

(XX)

EVA-MMU/FSS

C

XXXX/XXX/078		SM SYS SUMM 1	XX X	DDD/HH:MM:SS
				BFS DDD/HH:MM:SS
EMERGENCY				
	1/A	2/B	DC VOLTS	1/A 2/B 3/C
AV BAY	1	XX.XS	XX.XS	XX.XS
	2	XX.XS	XX.XS	XX.XS
	3	XX.XS	XX.XS	XX.XS
dP/dT		±.XXS	AB	XX.XS
			BC	XX.XS
			CA	XX.XS
			ESS	XX.XS
			AC	
			VOLT	0A XXXS
				0B XXXS
				0C XXXS
			AMPS	0A XX.XS
				0B XX.XS
				0C XX.XS
			FUEL CELL	PH XXS
				XXS
				XXS
			REAC VLV	XXS
			STACK T	±XXXXS
			EXIT T	XXXXS
			COOL P	XXXXS
			PUMP	XXS

(XX)

SM SYSTEM SUMMARY 1 (PFS/BFS)

D

XXXX/XXX/079		SM SYS SUMM 2	XX X	DDD/HH:MM:SS
				DDD/HH:MM:SS
CRYO TK		1	2	3
H2 PRESS		XXXXS	XXXXS	XXXXS
O2 PRESS		XXXXXS	XXXXXS	XXXXXS
HTR T1		±XXXXS	±XXXXS	±XXXXS
		±XXXXS	±XXXXS	±XXXXS
APU	1	2	3	HYD
TEMP EGT	XXXXXS	XXXXXS	XXXXXS	PRESS
B/U EGT	XXXXXS	XXXXXS	XXXXXS	XXXXXS
OIL IN	XXXXS	XXXXS	XXXXS	RSVR T
OUT	XXXXS	XXXXS	XXXXS	QTY
SPEED	XXXXS	XXXXS	XXXXS	W/B
FUEL QTY	XXXXS	XXXXS	XXXXS	H2O QTY
FMP LK P	XXS	XXS	XXS	BYP VLV
OIL OUT P	XXXXS	XXXXS	XXXXS	XXXXS
				THERM CNTL
AV BAY				H2O PUMP P
TEMP	XXXXS	XXXXS	XXXXS	XXXXS
FAN ΔP	X.XXS	X.XXS	X.XXS	FREON FLOW
				XXXXS
				EVAP OUT T
				XXXXS

(XX)

SM SYSTEM SUMMARY 2

XXXX/XXX/086			APU/HYD			XX X DDD/HHIMMISS DDD/HHIMMISS		
			HYD			1 2 3		
APU		1 2 3	B/U	P	XXXXS XXXXS XXXXS			
B/U	EGT	XXXXS XXXXS XXXXS	RSVR	T	XXXXS XXXXS XXXXS			
EGT		XXXXS XXXXS XXXXS		QTY	XXXXS XXXXS XXXXS			
SPEED	*	XXXXS XXXXS XXXXS	ACCUM	P	XXXXS XXXXS XXXXS			
FUEL	QTY	XXXXS XXXXS XXXXS	W/B					
TK	P	XXXXS XXXXS XXXXS	H2O	QTY	XXXXS XXXXS XXXXS			
OUT	P	XXXXS XXXXS XXXXS	N2	P	XXXXS XXXXS XXXXS			
TK	VLV	XXXXS XXXXS XXXXS		T	XXXXS XXXXS XXXXS			
VLV	A	XXS XXS XXS	REG	P	XXXXS XXXXS XXXXS			
	B	XXS XXS XXS	BYP	VLV	XXXXS XXXXS XXXXS			
	T	XXXXS XXXXS XXXXS	VENT	T	XXXXS XXXXS XXXXS			
OIL	OUT	XXXXS XXXXS XXXXS	TANK	T	XXXXS XXXXS XXXXS			
OUT	P	XXXXS XXXXS XXXXS	BLR	T	XXXXS XXXXS XXXXS			
GBX	P	XXXXS XXXXS XXXXS						
N2	P	XXXXS XXXXS XXXXS	SW	VLV	PR	S1	S2	
GG	BED	XXXXS XXXXS XXXXS	ELEV	L	OB	1XS	2XS	
					IB	1XS	3XS	
					R	IB	1XS	2XS
					OB	2XS	1XS	3XS
					RUD/SPDBK	1XS	2XS	3XS
								(XX)

APU HYDRAULIC

XXXX/XXX/087			HYD THERMAL			XX X DDD/HHIMMISS DDD/HHIMMISS		
			CIRC PUMP CONTROL			1 2 3		
HYD		1 2 3	LINE	TEMPS				
CIRC	PMP	XXXXS XXXXS XXXXS	ELEVON	LOB	XXXXS XXXXS XXXXS			
PMP	BOY	XXXXS XXXXS XXXXS		L	IB	XXXXS XXXXS XXXXS		
RSVR	T	XXXXS XXXXS XXXXS		R	IB	XXXXS XXXXS XXXXS		
ACCUM	P	XXXXS XXXXS XXXXS		ROB	XXXXS XXXXS XXXXS			
HX	IN	XXXXS XXXXS XXXXS	RD/SB	PDU	XXXXS XXXXS XXXXS			
OUT	T	XXXXS XXXXS XXXXS		FUS	XXXXS XXXXS XXXXS			
			BOYFLP	PDU	XXXXS XXXXS XXXXS			
				FUS	XXXXS XXXXS XXXXS			
			L BRAKE	WHL	XXXXS XXXXS XXXXS			
				FUS	XXXXS XXXXS XXXXS			
			R BRAKE	WHL	XXXXS XXXXS XXXXS			
				FUS	XXXXS XXXXS XXXXS			
			NLG	UPLK	XXXXS XXXXS XXXXS			
				MFUS	1 XXXS XXXS			
				MFUS	2 XXXS XXXS			
			LMG	UPLK	XXXXS XXXXS XXXXS			
			RMG	UPLK	XXXXS XXXXS XXXXS			
				FUS	XXXXS XXXXS XXXXS			
								(XX)

HYDRAULIC THERMAL

XXXX/XXX/088			APU/ENVIRON THERM			XX X DDD/HHIMMISS DDD/HHIMMISS		
FREON LOOP			H2O LOOP			1 2		
ACCUM	QTY	XXXXS XXXXS XXXXS	PUMP	OUT	P	XXXXS XXXXS XXXXS		
FREON	FLOW	XXXXS XXXXS XXXXS	OUT	T		XXXXS XXXXS XXXXS		
PL	HX	FLOW XXXXS XXXXS XXXXS			ΔP	XXXXS XXXXS XXXXS		
AFT	CP	FLOW XXXS XXXS	ICH	FLOW		XXXXS XXXXS XXXXS		
RAD	IN	T XXXS XXXS	OUT	T		XXXXS XXXXS XXXXS		
RAD	OUT	T XXXS XXXS	CAB	HX	IN T	XXXXS XXXXS XXXXS		
EVAP	OUT	T XXXS XXXS	ACCUM	QTY		XXXXS XXXXS XXXXS		
EVAP	TEMP	DUCT NOZ	APU	FUEL	T	1 2 3		
HI	LOAD	INBD XXXS	TK	SURF		XXXXS XXXXS XXXXS		
OUTBD	XXXXS XXXS		TK	HTR		XXXXS XXXXS XXXXS		
TOPPING	FWD	XXXXS XXXS	TEST	LN	1	XXXXS XXXXS XXXXS		
	AFT	XXXXS XXXS	TEST	LN	2	XXXXS XXXXS XXXXS		
	L	XXXXS XXXS	FEED	LN		XXXXS XXXXS XXXXS		
	R	XXXXS XXXS	PUMP	IN		XXXXS XXXXS XXXXS		
EVAP	FDLN	T A B	DRN	LN	1	XXXXS XXXXS XXXXS		
	FWD	XXXXS XXXS	DRN	LN	2	XXXXS XXXXS XXXXS		
	MID	1 XXXS XXXS	OUT			XXXXS XXXXS XXXXS		
	MID	2 XXXS XXXS	BYP	LN		XXXXS XXXXS XXXXS		
	AFT	XXXXS XXXS	H2O	LN	PRI	XXXXS XXXXS XXXXS		
TOPPING	XXXXS XXXS				SEC	XXXXS XXXXS XXXXS		
ACCUM	XXXXS XXXS				INJ	XXXXS XXXXS XXXXS		
HI	LOAD	XXXXS XXXS						(XX)

APU/ENVIRONMENT THERMAL

XXXX/XXX/089			PRPLT THERMAL			XX X DDD/HHIMMISS DDD/HHIMMISS		
POD			L R			L R C		
OMS	TK	OX XXXS XXXS	OMS	CRSFD				
	FU	XXXXS XXXXS	XFD	OX	XXXXS XXXXS XXXXS			
ENG	I/F	OX XXXS XXXS	GMBL	LN	XXXXS XXXS			
	FU	XXXXS XXXXS	DRN	OX	XXXXS XXXS			
	OX	VLV XXXS XXXS						
	FU	INJ XXXS XXXS						
WEB	KEEL	1 XXXS XXXS						
		2 XXXS XXXS						
	Y	OB XXXS XXXS						
		UP XXXS XXXS	BLD	AFT	FUS	XXXXS XXXS		
OX	DRN	PNL 1 XXXS XXXS	PL	BAY	XXXXS XXXS			
		2 XXXS XXXS						
ENG	COVER	XXXXS XXXS	FWD	RCS		FU	OX	
SERV	PNL	XXXXS XXXS	LINE	T1	XXXXS XXXS			
GSE	SERV	PNL XXXS XXXS		T2	XXXXS XXXS			
TEST	HE/OX	1 XXXS XXXS	AFT	RCS		L	R	
		2 XXXS XXXS	MANF	1	OX	XXXXS XXXS		
			DRN	PNL	1	XXXXS XXXS		
					2	XXXXS XXXS		
			VERN	PNL	1	XXXXS XXXS		
					2	XXXXS XXXS		
								(XX)

PROPELLANT THERMAL

XXXX/XXX/096 PDRS STATUS XX X DDD/HH:MM:SS  
DDD/HH:MM:SS

RMS SEL: XXXX

		X/P	Y/Y	Z/R
TRANS RATES	ACT	±XX.XXS	±XX.XXS	±XX.XXS
	CMD	±XX.XX	±XX.XX	±XX.XX
ROT RATES	ACT	±XX.XXS	±XX.XXS	±XX.XXS
	CMD	±XX.XX	±XX.XX	±XX.XX
POSITIONS	ACT	±XXXXXS	±XXXXXS	±XXXXXS
ATTITUDES	ACT	±XXX.XS	±XXX.XS	±XXX.XS

RMS FAULTS

JOINTS	SY	SP	EP	WP	WY	WR	MCIU	MADC	X
REACH LIMIT	X	X	X	X	X	X		MCPC	X
ABE - TACH	X	X	X	X	X	X		ICF	X
SPA	X	X	X	X	X	X		ABE/MCIU	X
MTR DR	X	X	X	X	X	X		CHECK CRT!	
MTR PWR	X	X	X	X	X	X		END EFF	X
CONTROL ERR	X	X	X	X	X	X		TEMP CKT	X
CK CRT- POS	X	X	X	X	X	X		DIC/MCIU	X

(XX)

PDRS STATUS

XXXX/XXX/097 PL RETENTION XX X DDD/HH:MM:SS  
DDD/HH:MM:SS

	LATCH 1	LATCH 2	LATCH 3	LATCH 4	LATCH 5
	AB/AB	AB/AB	AB/AB	AB/AB	AB/AB
PL SEL 1					
RDY-FOR-LAT	XX	XX	XX	XX	XX
LAT/REL	XX/XX	XX/XX	XX/XX	XX/XX	XX/XX
PL SEL 2					
RDY-FOR-LAT	XX	XX	XX	XX	XX
LAT/REL	XX/XX	XX/XX	XX/XX	XX/XX	XX/XX
PL SEL 3					
RDY-FOR-LAT	XX	XX	XX	XX	XX
LAT/RET	XX/XX	XX/XX	XX/XX	XX/XX	XX/XX

(XX)

PAYLOAD RETENTION

## SYSTEM LEVEL

A

```

XXXXXXXXPL MENU (1)XX X DDD/HH:MM:SS
DDE/HH:MM:SS
PASS1 1X PASS5 9X STP/PURGE CYC CNT XXXXX
BFS1 2X BFS5 10X ERROR/MSG CODE XXX
PASS2 3X PASS6 11X ERROR/MSG CODE CNT XXXX
BFS2 4X BFS6 12X TOTAL ERR MSG CNT XXXX
PASS3 5X PASS7 13X MSGS STILL IN LIST XXX
BFS3 6X BFS7 14X
PASS4 7X PASS8 15X
BFS4 8X BFS8 16X
MCDS BITE
MODE XXXX
BSR1 XXXX
BSR2 XXXX
SWSW XXXX
PCM BITE XXXX

17 DEU FORMAT LOAD X

START GPC SELF TEST 18X
STOP GPC SELF TEST 19X
START DEU SELF TEST 20X

START D/L OF TOGGLE BUFFER 1 21X
START D/L OF TOGGLE BUFFER 5 22X
STOP D/L 23X
STOP STP ON ERROR 24X
CONTINUE STP ON ERROR 25X
INHIBIT CKPT LOAD 26X
XXXXXXXXXXXXXXXXXX
27 OPTION X
START 28X
STOP 29X

```

(XX)

PL MENU NO. 1 (PFS/BFS)

B

```

GPCIPL MENU (2)XX X DDD/HH:MM:SS
DDE/HH:MM:SS
17 DEU FORMAT LOAD X STP/PURGE CYC CNT XXXXX
ERROR/MSG CODE XXX
START GPC SELF TEST 18X ERROR/MSG CODE CNT XXXX
STOP GPC SELF TEST 19X TOTAL ERR/MSG CNT XXXX
START DEU SELF TEST 20X MSGS STILL IN LIST XXX

START D/L OF TOGGLE BUFFER 1 21X MCDS BITE
START D/L OF TOGGLE BUFFER 5 22X MODE XXXX
STOP D/L 23X BSR1 XXXX
STOP STP ON ERROR 24X BSR2 XXXX
CONTINUE STP ON ERROR 25X SWSW XXXX
INHIBIT CKPT LOAD 26X PCM BITE XXXX

OLD PSW XXXX XXXX XXXX XXXX
REGISTER 0-3 XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX
SET 0 4-7 XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX

REGISTER 0-3 XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX
SET 1 4-7 XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX

FLOATING 0-3 XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX
PT REGS 4-7 XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX
MAJ=XXXXX MIN=XX SCHEDWRD=XXXXXXX CLOCK1=XXXXX
(XX)

```

GPCIPL MENU (2)

C

```

0001/ / GPC MEMORY XX X DDD/HH:MM:SS
DDE/HH:MM:SS
MEM/BUS CONFIG READ/WRITE XXX
1 CONFIG XX(XX) DATA 20X BIT SET 22X SEQ ID 24
2 GPC X X X X X CODE 21X BIT RST 23X WRITE 25
26 ENG UNITS XXX HEX 27X
STRING 1 7 X ADD ID DESIRED ACTUAL
2 8 X 28 XXXXX 29 XXXX +XXXXXXXXXXXX
3 9 X 30 XXXXX 31 XXXX +XXXXXXXXXXXX
4 10 X 32 XXXXX 33 XXXX +XXXXXXXXXXXX
PL 1/2 11 X 34 XXXXX 35 XXXX +XXXXXXXXXXXX
36 XXXXX 37 XXXX +XXXXXXXXXXXX
38 XXXXX 39 XXXX +XXXXXXXXXXXX
CRT 1 12 X
2 13 X
3 14 X
4 15 X
LAUNCH 1 16 X
2 17 X
MM 1 18 X
2 19 X
MEMORY DUMP
40 START ID XXXXX
41 NUMBER WDS XXXXXX
42 WDS/FRAME XXX
DUMP 43
44 DOWNLIST GPC X
OPS 0 ENA 49X
STORE MC=XX
45 CONFIG XX
46 GPC X
STORE 47
ERR LOG RESET 48
(XX)

```

GPC MEMORY

D

```

XXXX/001/ DPS UTILITY XX X DDD/HH:MM:SS
DDE/HH:MM:SS
MMU ASSIGN PORT ASSIGN
1 2 PRI SEC UL CNTL
GNC 1X 2X STRING 1 15X 18X AUTO 35X
SM 3X 4X 2 17X 18X ENA 36X
PL 5X 6X 3 19X 20X INH 37X
OPS 0 7X 8X 4 21X 22X
PL 1/2 23X 24X

MMU STATUS
1 XXX
2 XXX
VAR PARAM ID LIST
25 XXXX
26 XXXX
27 XXXX
28 XXXX
29 XXXX
30 XXXX
31 XXXX
32 XXXX
33 XXXX
34 XXXX
CKPT RETRV
ENA 12X
RTC
13 XXXX XXXX
CMD 14 X
GROUND OPS
GSE POLL ENA 50X
SM GSE INH 51X
SM C/O ENA 52X
GNC C/O ENA 53X
(XX)

```



XXXX/002/ TIME XX X DDD/HH:MM:SS  
DDD/HH:MM:SS

MISSION TIME

MTU

GMT 1X TONE 3 XX:XX:XX MSN T  
 MET 2X 6 XX:XX:XX  
 CRT TIMER  
 9 SET [#XX:XX:XX 20 [XX:XX:XX CRT T  
 START 12 STOP 13  
 14 START AT XX:XX:XX MSN T 23 DURATION XX  
 17 COUNT TO XX:XX:XX MSN T

MTU

24 GMT Δ [#XX:XX:XX,XX  
 28 MET Δ [#XX:XX:XX,XX  
 UPDATE 32 MET RESET 33

GPC TIME

	GMT	TRY	GPC
MTU ACCUM 1	XXX/XX:XX:XX,XXXS	34	1 XX
2	XXX/XX:XX:XX,XXXS	35	2 XX
3	XXX/XX:XX:XX,XXXS	36	3 XX
GPC	XXX/XX:XX:XX,XXXS	37	4 XX
			5 XX

TIME SYNC 38

(XX)

TIME

XXXX/099/ FAULT XX X DDD/HH:MM:SS  
DDD/HH:MM:SS

CRT ID FAULT C/W GPC TIME

XXX	XXXXXXXXXX	XXXX	X	XXXXX	XXX/XX:XX:XX
XXX	XXXXXXXXXX	XXXX	X	XXXXX	XXX/XX:XX:XX
XXX	XXXXXXXXXX	XXXX	X	XXXXX	XXX/XX:XX:XX
XXX	XXXXXXXXXX	XXXX	X	XXXXX	XXX/XX:XX:XX
XXX	XXXXXXXXXX	XXXX	X	XXXXX	XXX/XX:XX:XX
XXX	XXXXXXXXXX	XXXX	X	XXXXX	XXX/XX:XX:XX
XXX	XXXXXXXXXX	XXXX	X	XXXXX	XXX/XX:XX:XX
XXX	XXXXXXXXXX	XXXX	X	XXXXX	XXX/XX:XX:XX
XXX	XXXXXXXXXX	XXXX	X	XXXXX	XXX/XX:XX:XX
XXX	XXXXXXXXXX	XXXX	X	XXXXX	XXX/XX:XX:XX
XXX	XXXXXXXXXX	XXXX	X	XXXXX	XXX/XX:XX:XX
XXX	XXXXXXXXXX	XXXX	X	XXXXX	XXX/XX:XX:XX
XXX	XXXXXXXXXX	XXXX	X	XXXXX	XXX/XX:XX:XX
XXX	XXXXXXXXXX	XXXX	X	XXXXX	XXX/XX:XX:XX
XXX	XXXXXXXXXX	XXXX	X	XXXXX	XXX/XX:XX:XX
XXX	XXXXXXXXXX	XXXX	X	XXXXX	XXX/XX:XX:XX
XXX	XXXXXXXXXX	XXXX	X	XXXXX	XXX/XX:XX:XX
XXX	XXXXXXXXXX	XXXX	X	XXXXX	XXX/XX:XX:XX
XXX	XXXXXXXXXX	XXXX	X	XXXXX	XXX/XX:XX:XX
XXX	XXXXXXXXXX	XXXX	X	XXXXX	XXX/XX:XX:XX
XXX	XXXXXXXXXX	XXXX	X	XXXXX	XXX/XX:XX:XX
XXX	XXXXXXXXXX	XXXX	X	XXXXX	XXX/XX:XX:XX
XXX	XXXXXXXXXX	XXXX	X	XXXXX	XXX/XX:XX:XX

(XX)

FAULT

XXXX/XXX/006 GPC/BUS STATUS XX X DDD/HH:MM:SS  
DDD/HH:MM:SS

	GPC	1S	2S	3S	4S	5S
MODE	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
OPS	XX	XX	XX	XX	XX	XX
STRING 1	FF	XS	XS	XS	XS	XS
	FA	XS	XS	XS	XS	XS
2	FF	XS	XS	XS	XS	XS
	FA	XS	XS	XS	XS	XS
3	FF	XS	XS	XS	XS	XS
	FA	XS	XS	XS	XS	XS
4	FF	XS	XS	XS	XS	XS
	FA	XS	XS	XS	XS	XS
PL	1	XS	XS	XS	XS	XS
	2	XS	XS	XS	XS	XS
LAUNCH	1	XS	XS	XS	XS	XS
	2	XS	XS	XS	XS	XS
CRT	1	XS	XS	XS	XS	XS
	2	XS	XS	XS	XS	XS
	3	XS	XS	XS	XS	XS
	4	XS	XS	XS	XS	XS

(XX)

GPC/BUS STATUS



## VEHICLE UTILITY

A

```

8011/ / FCS/DED DIS C/O XX X DDD/HHMMISS
          DDD/HHMMISS

DED DIS          MODE LT          AVG G ON 9X
FWD 1X HIGH 3X  ON 7X
AFT 2X LOW 4X   OFF 8X
          FLAG 5X
          OFF 6X

SURF DR START 10X STOP 11X

BODY FLP DES
VLV 1 XXX 12X
    2 XXX 13X
    3 XXX 14X

SEC ACT CK
CH 1 15X
CH 2 16X
CH 3 17X
CH 4 18X
STOP 19X
POS STIM
ENA 20X

SURF          CMD          POS 1 2 3 4
ELEV L 0B XXX,X XXX,XS S S S S
        1B XXX,X XXX,XS S S S S
        R 1B XXX,X XXX,XS S S S S
        0B XXX,X XXX,XS S S S S
RJD          XXX,X XXX,XS S S S S
SPD BRK     XXX,X XXX,XS S S S S
BDY FLP     XX XXX,X

SEC ACT
21 BYPASS XX
22 RESET  XX

          (XX)
  
```

FCS DEDICATED DISPLAY CHECKOUT

B

```

9011/ / MASS MEMORY R/W XX X DDD/HHMMISS
SM COM BUFF XXXX DDD/HHMMISS

DESIRED ACTUAL DESIRED ACTUAL
1 XXXX XXXX 21 XXXX XXXX
2 XXXX XXXX 22 XXXX XXXX
3 XXXX XXXX 23 XXXX XXXX
4 XXXX XXXX 24 XXXX XXXX
5 XXXX XXXX 25 XXXX XXXX
6 XXXX XXXX 26 XXXX XXXX
7 XXXX XXXX 27 XXXX XXXX
8 XXXX XXXX 28 XXXX XXXX
9 XXXX XXXX 29 XXXX XXXX
10 XXXX XXXX 30 XXXX XXXX
11 XXXX XXXX 31 XXXX XXXX
12 XXXX XXXX 32 XXXX XXXX
13 XXXX XXXX 33 XXXX XXXX
14 XXXX XXXX 34 XXXX XXXX
15 XXXX XXXX 35 XXXX XXXX
16 XXXX XXXX 36 XXXX XXXX
17 XXXX XXXX 37 XXXX XXXX
18 XXXX XXXX 38 XXXX XXXX
19 XXXX XXXX 39 XXXX XXXX
20 XXXX XXXX CHECKSUM XXXX

SELECT
MMU 1 40X
MMU 2 41X
42 S/W SYSTEM X
43 PHASE XXXX
44 LOAD BLK XXXX
45 OFFSET XXXXX
46 NUMBER XX
47 PATCH ID XXXX
VIOLATE XXXX
READ LOAD BLK 48X
MERGE 49X
WRITE LOAD BLK 50X
COMPARE 51X
STATUS XXXXX
ERROR CODE X
REGISTER A XXXX
          B XXXX
HM VERSION XX,XX
DUMP VIA DL 52X

          (XX)
  
```

MASS MEMORY READ/WRITE

C

```

XXXX/040/ SENSOR TEST XX X DDD/HHMMISS
          DDD/HHMMISS

MLS 1 1X XXXX XX,XS ±X,XXS X,XXS
    2 2X XXXX XX,XS ±X,XXS X,XXS
    3 3X XXXX XX,XS ±X,XXS X,XXS

TAC 1 DES STAT RNG AZ
    2 4X XXXX X,XS XXX,XXS
    3 5X XXXX X,XS XXX,XXS
    3 6X XXXX X,XS XXX,XXS

RA 1 DES STAT ALT
    2 7X XXXX XXXXS
    2 8X XXXX XXXXS

AA 1 DES Y Z
    2 9X ±XX,XS ±XX,XS
    3 10X ±XX,XS ±XX,XS
    3 11X ±XX,XS ±XX,XS
    4 12X ±XX,XS ±XX,XS

START 13X STOP 14X

          (XX)
  
```

SENSOR TEST

D

```

XXXX/041/ RGA/ADTA/RCS XX X DDD/HHMMISS
          DDD/HHMMISS

DES STAT R P Y
R1 1X XXXX ±XX,XS ±XX,XS ±XX,XS
G2 2X XXXX ±XX,XS ±XX,XS ±XX,XS
A3 3X XXXX ±XX,XS ±XX,XS ±XX,XS
4 4X XXXX ±XX,XS ±XX,XS ±XX,XS

DES STAT PS P=C P=U P=L T
A1 5X XXXX XX,XXXS XX,XXXS XX,XXXS XX,XXXS XXX,XXS
D3 6X XXXX XX,XXXS XX,XXXS XX,XXXS XX,XXXS XXX,XXS
T2 7X XXXX XX,XXXS XX,XXXS XX,XXXS XX,XXXS XXX,XXS
A4 8X XXXX XX,XXXS XX,XXXS XX,XXXS XX,XXXS XXX,XXS

TEST HI 9X LOW 10X STOP 11X

RCS DRIVERS
RJDF 12X TEST EXEC 15X TEST XXXX
RJDA-A 13X CONTINUE 16X JET XXX
-B 14X STOP 17

          (XX)
  
```

RGA/ADTA/RCS

XXXX/042/ SWITCH/SURF XX X DDD/HH:MM:SS  
DDD/HH:MM:SS

		DRIDE			DES					DRIDE			DES		
FCS CH	1	1	XS	1X	3	1	XS	7X							
		2	XS	2X		2	XS	8X							
		3	XS	3X		3	XS	9X							
	2	1	XS	4X	4	1	XS	10X							
		2	XS	5X		2	XS	11X							
		3	XS	6X		3	XS	12X							

FCS MODE	L	P			R/Y			SPD	BRK	BDY	FLP	DES
		AUT	CSS	GAIN	NAUT	CSS	GAIN	AUT	MAN	AUT		
	1	XS	XS	XS	XS	XS	XS	XS	XS	XS	13X	
	2	XS	XS	XS	XS	XS	XS	XS	XS	XS	14X	
	3	XS	XS	XS	XS	XS	XS	XS	XS	XS	15X	
	R 1	XS	XS	XS	XS	XS	XS	XS	XS	XS	16X	
	2	XS	XS	XS	XS	XS	XS	XS	XS	XS	17X	
	3	XS	XS	XS	XS	XS	XS	XS	XS	XS	18X	

SURF	L OB		L IB		R IB		R OB		RUD	SPD	BDY	DES
	1	2	1	2	1	2	1	2	BRK	FLP		
1	XXX	XS	XXX	XS	XXX	XS	XXX	XS	XXX	XS	XS	19X
2	XXX	XS	XXX	XS	XXX	XS	XXX	XS	XXX	XS	XS	20X
3	XXX	XS	XXX	XS	XXX	XS	XXX	XS	XXX	XS	XS	21X
4	XXX	XS	XXX	XS	XXX	XS	XXX	XS	XXX	XS	XS	22X

(XX)

RM SWITCHES/SURFACES FEEDBACK

XXXX/043/ CONTROLLERS XX X DDD/HH:MM:SS  
DDD/HH:MM:SS

		L			R			P			Y			DES		
THC	1	XS	XS	1X												
	2	XS	XS	2X												
	3	XS	XS	3X												
	1	XS	XS	4X												
	2	XS	XS	5X												
	3	XS	XS	6X												
SPD	1	XXXS	7X													
	2	XXXS	8X													
	3	XXXS	9X													
BK	1	XXXS	10X													
	2	XXXS	11X													
	3	XXXS	12X													
RUD	1	XXXS	13X													
	2	XXXS	14X													
	3	XXXS	15X													
PED	1	XXXS	16X													
	2	XXXS	17X													
	3	XXXS	18X													

(XX)

RM CONTROLLERS

XXXX/044/ SWITCHES XX X DDD/HH:MM:SS  
DDD/HH:MM:SS

		ENTRY		ROLL		MODE	
		LOW	NO	Y	J	DES	
		GAIN					
1		XS	XS			1X	
2		XS	XS			2X	
3		XS	XS			3X	
4		XS	XS			4X	

(XX)

SWITCHES

XXXX/100/ GTS DISPLAY XX X DDD/HH:MM:SS  
DDD/HH:MM:SS

HDA CONTROL	ENA 1X	INH 2X	DED DISP	FWD 18X	AFT 19X	DRIVE 24X
				HIGH 20X	LOW 21X	
				FLAG 22X	OFF 23X	
CSL/RML TEST	UF1 3X	UF4 6X	CRIT MEC CMDS	ENA 25X	ELEV LMT SEL	
	UF2 4X	UF5 7X		INH 26X	HORZ 27X	
	UF3 5X	IFA 8X			VERT 28X	
	9 FAIL GPC SEL X		SL COMM	SSC	EXC	
	TEST EXEC 10X		CH A ENA	29X	34X	
	RESET 11X		B ENA	30X	35X	
			DSBL	31X	36X	
DL FORMAT	12 SEL XX		MDM TESTS			
	LOAD 13X		RTRN CH	32 XXXX	37 XXXX	
GSE POLL ENA	14X		RTRN MSG	33 XXXX	38 XXXX	
PASS/BFS XFER	15		COUPLER			
			STATE	XXXX	XXXX	
RJD TOGGLER			ERR CD	XX	XX	
ON 16X	OFF 17X					

(XX)

GENERAL TEST SUPPORT

A

XXXX/101/ SENSOR SELF-TEST XX X DDD/HH:MM:SS  
DDD/HH:MM:SS

	ENA	STAT	RNG	AZ	EL
M1	1X	XXXX	XX,XS	±X,XXS	X,XXS
L2	2X	XXXX	XX,XS	±X,XXS	X,XXS
S3	3X	XXXX	XX,XS	±X,XXS	X,XXS

	ENA	STAT	RNG	AZ
T1	4X	XXXX	X,XS	XXX,XXS
A2	5X	XXXX	X,XS	XXX,XXS
C3	6X	XXXX	X,XS	XXX,XXS

TEST CONTROL:  
START 13X  
AUTO SEQ 14X  
TERM 15X

	ENA	STAT	ALT
R1	7X	XXXX	XXXXXS
A2	8X	XXXX	XXXXXS

INH ALL 16X

	ENA	Y	Z
A1	9X	±XX,XS	±XX,XS
A2	10X	±XX,XS	±XX,XS
3	11X	±XX,XS	±XX,XS
4	12X	±XX,XS	±XX,XS

(XX)

SENSOR SELF-TEST

B

XXXX/102/ RCS/RGA/ADTA TEST XX X DDD/HH:MM:SS  
DDD/HH:MM:SS

RCS DRIVERS

RJDF	1X	START TEST	4X	STAT	XXXX
RJDA-A	2X	CONT	5X	JET	XXX
-B	3X	TERM	6	STEP	X

SENSORS

TEST CONTROL:  
HIGH START 15X  
LOW START 16X  
AUTO SEQ 17X  
TERM 18X  
INH ALL 19X

R1	7X	XXXX	±XX,XS	±XX,XS	±XX,XS	±XX,XS
G2	8X	XXXX	±XX,XS	±XX,XS	±XX,XS	±XX,XS
A3	9X	XXXX	±XX,XS	±XX,XS	±XX,XS	±XX,XS
4	10X	XXXX	±XX,XS	±XX,XS	±XX,XS	±XX,XS

	ENA	STAT	P=C	PS	P=U	P=L	TT
A1	11X	XXXX	XX,XXXS	XX,XXXS	XX,XXXS	XX,XXXS	XXX,XXS
D3	12X	XXXX	XX,XXXS	XX,XXXS	XX,XXXS	XX,XXXS	XXX,XXS
T2	13X	XXXX	XX,XXXS	XX,XXXS	XX,XXXS	XX,XXXS	XXX,XXS
A4	14X	XXXX	XX,XXXS	XX,XXXS	XX,XXXS	XX,XXXS	XXX,XXS

(XX)

RCS/RGA/ADTA TEST

C

XXXX/104/ GND IMU CNTL/MON XX X DDD/HH:MM:SS  
DDD/HH:MM:SS

IMU	1	2	3	SEL IMU	1 16X
X	1	4	7		2 17X
Y	2	5	8		3 18X
Z	3	6	9		

O	XXX,XX	XXX,XX	XXX,XX	ATT DET	19X
M	XXX,XX	XXX,XX	XXX,XX	HNGR CAL A	20X
I	XXX,XX	XXX,XX	XXX,XX	B	21X
IR	XXX,XX	XXX,XX	XXX,XX	C	22X
V	X ±XX,XX	±XX,XX	±XX,XX	PREFLT CAL	23X
Y	±XX,XX	±XX,XX	±XX,XX	GYROCOMP	24X
Z	±XX,XX	±XX,XX	±XX,XX	XXXX	XXXX
VRSS	XX,XX	XX,XX	XX,XX	INERTIAL	25X
B HDW	XXXX	XXXX	XXXX	PLAT POS	26X
I S/W	XX	XX	XX	TERM/IDLE	27X
TSTAT	XX	XX	XX	28 MM WRITE	Y

PWR ON	X	X	X	MM READ	29X
I/O	S	S	S	MM STATUS	XXXX
STBY	10X	11X	12X	30 SITE SEL	Y
OPER	13X	14X	15X	ACTUAL	XXX

(XX)

GROUND IMU CONTROL/MONITOR

D

XXXX/105/ TCS CONTROL XX X DDD/HH:MM:SS  
DDD/HH:MM:SS

1 SELECT ID	XX	NAME	XXXXXXXXXX	ECP ERROR	XXX
MM READ	2 XXXX	STATUS	XXXX	ERROR CODE	XXX
STEP	XXXXX	TIME	XX:XX:XX	BITE	XXXX
STOP	3	4 STOP AT	XXXXXX	CANCEL	5
RESUME	6	7 RSM AT	XXXXXX	CLEAR MSGS	8

TIME	TEXT
XX:XX:XX	XX
XX:XX:XX	XX
XX:XX:XX	XX
XX:XX:XX	XX
XX:XX:XX	XX
XX:XX:XX	XX
XX:XX:XX	XX
XX:XX:XX	XX
XX:XX:XX	XX
XX:XX:XX	XX
XX:XX:XX	XX
XX:XX:XX	XX
XX:XX:XX	XX
XX:XX:XX	XX
XX:XX:XX	XX
XX:XX:XX	XX
XX:XX:XX	XX
XX:XX:XX	XX
XX:XX:XX	XX
XX:XX:XX	XX
XX:XX:XX	XX
XX:XX:XX	XX
XX:XX:XX	XX
XX:XX:XX	XX

(XX)

TCS CONTROL

```

XXXX/110/      BUS/BTU STATUS      XX X DDD/HH:MM:SS
                B T O P      B T O P      DDD/HH:MM:SS
MODE X      FF1P X X X X LF1P X X X X      B T O P
MC X        1S X X X X      1S X X X X      PMU X X X X
MF XX       2P X X X X LA1P X X X X      EIUIA X X X X
XX          2S X X X X      1S X X X X      1B X X X X
CPU XX      3P X X X X PM1P X X X X      1C X X X X
           4P X X X X LL1P X X X X      1D X X X X
           FF4S X X X X      1S X X X X      2A X X X X
PRI/SEC     FA1P X X X X      2P X X X X      2B X X X X
PORTS       1S X X X X      2S X X X X      2C X X X X
           2P X X X X LR1P X X X X      2D X X X X
           2S X X X X      1S X X X X      3A X X X X
PRI 1X      3P X X X X      2P X X X X      3B X X X X
SEC 2X      3S X X X X      2S X X X X      3C X X X X
           4P X X X X MCIU X X X X      EIUI3D X X X X
           FA4S X X X X      LDIUP X X X X      MEC1A X X X X
MMU1        2 X X X X      S X X X X      1B X X X X
           2 X X X X      S X X X X      1C X X X X
           DEU1 X X X X PF1P X X X X      1D X X X X
           2 X X X X      1S X X X X      2A X X X X
           3 X X X X      2S X X X X      2B X X X X
           4 X X X X      2P X X X X      2C X X X X
                                           MEC2D X X X X
                                           (XX)

```

A

BUS/BTU STATUS

```

XXXX/111/      SL MEMORY DUMP      XX X DDD/HH:MM:SS
SM COM BUFF XXX      DDD/HH:MM:SS

SL COMP SEL
SS 1X
EXP 2X
SL COUPLER
SEL A 3X
    B 4X
5 START ADD XXXX
6 LENGTH XXXXX
DUMP 7 XXXX

WORDS ACQ XXXXX
FAIL RHW XXXX
AW XXXXX
LAST ADD XXXX

```

B

(XX)

SPACELAB MEMORY DUMP

```

XXXX/112/      GPC/BTU I/F      XX X DDD/HH:MM:SS
                DDD/HH:MM:SS

BTU SELECTION      TEST STATUS
FF1 1X PCMMU 12X XXXX      MDM OUTPUT TEST
2 2X MMU1 13X BTU ITEM XX      MODULE XX
3 3X 2 14X STEP XXXXXX
4 4X MEC1 15X RDW XXXX
FA1 5X 2 16X BCE STAT RG      ANALOG OUTPUTS
2 6X EIUI 17X XXXXXXXX      0 +X.XX 1 +X.XX
3 7X 2 18X      2 +X.XX 3 +X.XX
4 8X 3 19X PORT SEL 1 31X 6 +X.XX 7 +X.XX
PF1 9X DDU 20X      2 32X 8 +X.XX 9 +X.XX
2 10X MCIU 21X      10 +X.XX 11 +X.XX
        CMD 22X      12 +X.XX 13 +X.XX
        SRB 23X      14 +X.XX 15 +X.XX

ALL DES
MDMS 11X ALL 24X      DISCRETE OUTPUTS
                        CHANNEL 0 XXXXXX
                        CHANNEL 1 XXXXXX
                        CHANNEL 2 XXXXXX

TEST      LEVEL 1 25X
          LEVEL 2 26X
          MDM OUTPUT 27X
CONTROL   TERMINATE 28
          CONTINUE 29      BTU CYCLIC BITE 30X

```

C

(XX)

GPC/BTU INTERFACE

```

XXXX/113/      ACTUATOR CONTROL      XX X DDD/HH:MM:SS
MONITOR        FAIL      DDD/HH:MM:SS
CMD            POS ACT      A B C D      ACTUATOR GIMBALING
+XX.XX +XX.XX SB 1X S S S S S RATE 29 XX.XX DEG/SEC
+XX.XX +XX.XX RUD 2X S S S S S FIN POS 30 +XX.XX DEG
+XX.XX +XX.XX LIE 3X S S S S S START 31XXX STOP 32X
+XX.XX +XX.XX RIE 4X S S S S S STATUS XXXX
+XX.XX +XX.XX LOE 5X S S S S S HYD PR ECP ERR XXX
+XX.XX +XX.XX ROE 6X S S S S S 1 XXXX BF MON 33X
+XX.XX +XX.XX 1P 7X S S S S S 2 XXXX
+XX.XX +XX.XX 1Y 8X S S S S S 3 XXXX
+XX.XX +XX.XX 2P 9X S S S S S AI SRB/NW 34X
+XX.XX +XX.XX 2Y 10X S S S S S ME ISO V
+XX.XX +XX.XX 3P 11X S S S S S 1X 2X 3X FC LIM CHNG
+XX.XX +XX.XX 3Y 12X S S S S S R/SB MAT 35X
+XX.XX +XX.XX RPA 13X R/SB RFG/FRT 36X
+XX.XX +XX.XX RPS 14X MAT P 40MS 37X
+XX.XX +XX.XX RYA 15X 0 SAFE 22 X NOP CA RFG 38X
+XX.XX +XX.XX RYS 16X 1 MDM 23 X NOP CA FRT 39X
+XX.XX +XX.XX LPA 17X 2 FERY 24 X NOP OMS 40X
+XX.XX +XX.XX LPS 18X 3 RAIN 25 X SRB S/S LIM 41X
+XX.XX +XX.XX LYA 19X 4 GRAV 26 X EL POS LIM 42X
+XX.XX +XX.XX LYS 20X 5 NULL 27 X S/B POS LIM 43X
XX +XX.XX BF 21X 6 TURN 28 X R RATE .5 PCM 44X
                                           (XX)

```

D

ACTUATOR CONTROL

XXXX/XXX/106 MANUAL CONTROLS XX X DDD/HH:MM:SS  
 DDD/HH:MM:SS

RHC	R	P	Y										
L	1	±XXX	±XXX	±XXX									
	2	±XXX	±XXX	±XXX									
	3	±XXX	±XXX	±XXX									
R	1	±XXX	±XXX	±XXX									
	2	±XXX	±XXX	±XXX									
	3	±XXX	±XXX	±XXX									
A	1	±XXX	±XXX	±XXX									
	2	±XXX	±XXX	±XXX									
	3	±XXX	±XXX	±XXX									

TRIM	SW	R	P	Y	BDY	FLP							
PNL	L	1	X	X	L	1X							
		2	X	X	L	2X							
	R	1	X	X	R	1X							
		2	X	X		2X							
RHC	L	1	X	X									
		2	X	X									
	R	1	X	X									
		2	X	X									

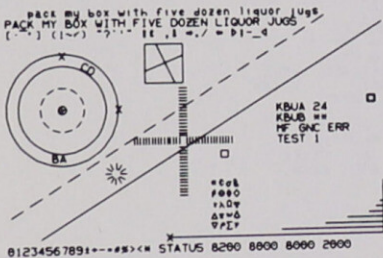
THC													
L	1	X	X	X									
	2	X	X	X									
	3	X	X	X									
A	1	X	X	X									
	2	X	X	X									
	3	X	X	X									

(XX)

A

MANUAL CONTROLS

B



DEU STAND-ALONE SELF TEST



**BACK-UP FLIGHT SYSTEM  
(BFS)**

A

0001/ /		BFS MEMORY		XX X DDD/HH:MM:SS	
				BFS DDD/HH:MM:SS	
READ/WRITE					
DATA	1X	BIT SET	3X	SEQ ID	5
CODE	2X	BIT RST	4X	WRITE	6
7 ENG UNITS XXXX HEX BX					
ADD ID	DESIRED		ACTUAL		
9	XXXXX	10	XXXXX	+XXXXXXXXXXXXX	
11	XXXXX	12	XXXXX	+XXXXXXXXXXXXX	
13	XXXXX	14	XXXXX	+XXXXXXXXXXXXX	
15	XXXXX	16	XXXXX	+XXXXXXXXXXXXX	
17	XXXXX	18	XXXXX	+XXXXXXXXXXXXX	
19	XXXXX	20	XXXXX	+XXXXXXXXXXXXX	

MEMORY DUMP	LAUNCH BUS		1	26X
21 START ID	XXXXX		2	27X
22 NUMBER WDS	XXXXXX		OFF	28X
23 WDS/FRAME	XXX			
DUMP 24				
PASS/BFS XFER ENA	25X	TFL ENA	29X	

(XX)

BFS MEMORY

B

0001/ /		THERMAL		XX X DDD/HH:MM:SS	
				BFS DDD/HH:MM:SS	
HYD SYS TEMP	BDYFLP	RD/SB	L OB	L IB	R IB R OB
ACTR	+XXXS	+XXXS	+XXXS	+XXXS	+XXXS +XXXS
PRIME	+XXXS	+XXXS	+XXXS	+XXXS	+XXXS +XXXS
STBY 1	+XXXS	+XXXS	+XXXS	+XXXS	+XXXS +XXXS
STBY 2	+XXXS	+XXXS	+XXXS	+XXXS	+XXXS +XXXS

HTR TEMP	L/A	R/B	FREON LOOP	1	2
PRPLT			ACCUM QTY	XXXS	XXXS
POD	SSSSSSS	SSSSSSS	RAD IN T	XXXS	XXXS
OMS CRSFD	SSSSSSS				
EVAP			H2O		
HI LOAD	SSS		SUPPLY P	XXXS	
TOP DUCT	SS				
NOZ	S	S			
FDLN	SSSS	SSSS			

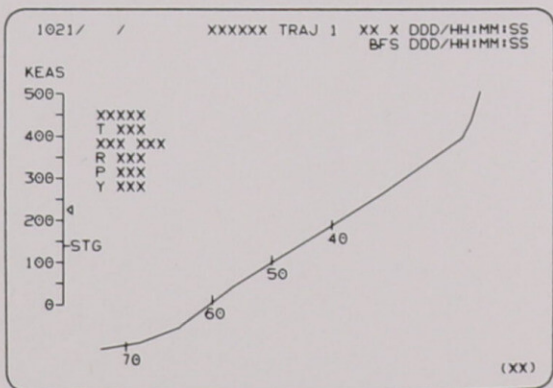
  

HYD BLR/HTR	1	2	3
APU	S	S	S
GG/FU PMP HTR	SSSS	SSSS	SSSS
TK/FU LN HTR	SSSSSSSSS	SSSSSSSSS	SSSSSSSSS
PUMP/VLV COOL	SS	SS	SS
FC END HTR A/B	XXXX/XXXXS	XXXX/XXXXS	XXXX/XXXXS

(XX)

THERMAL

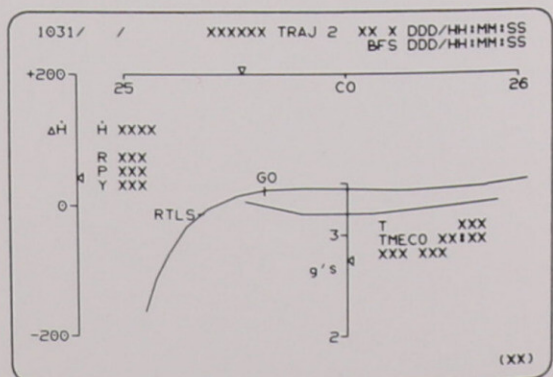
C



(XX)

ASCENT TRAJECTORY 1

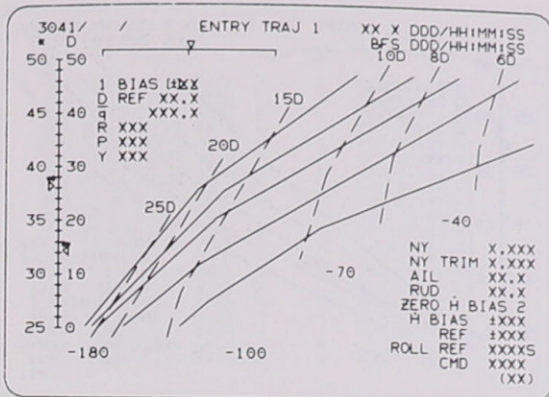
D



(XX)

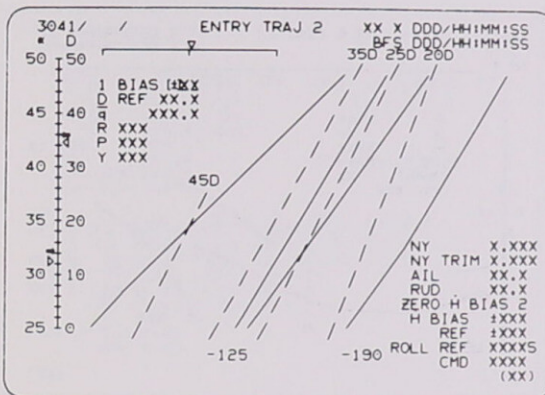
ASCENT TRAJECTORY 2

A



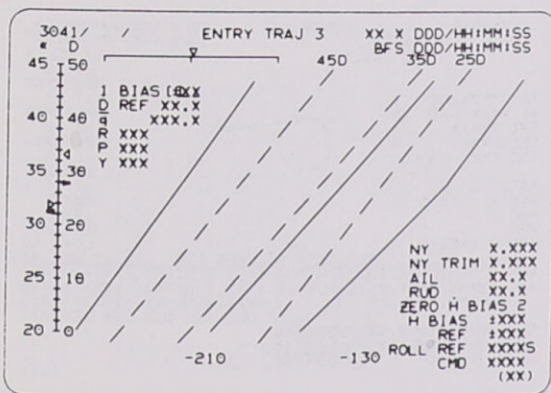
ENTRY TRAJECTORY 1

B



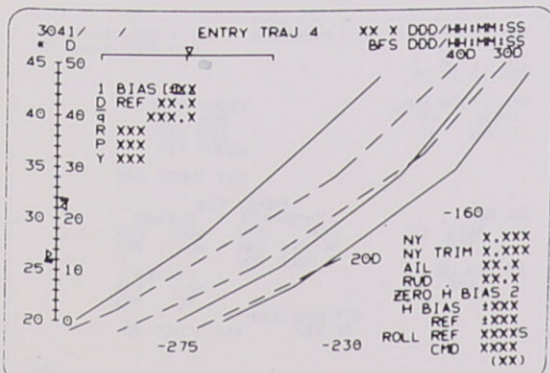
ENTRY TRAJECTORY 2

C



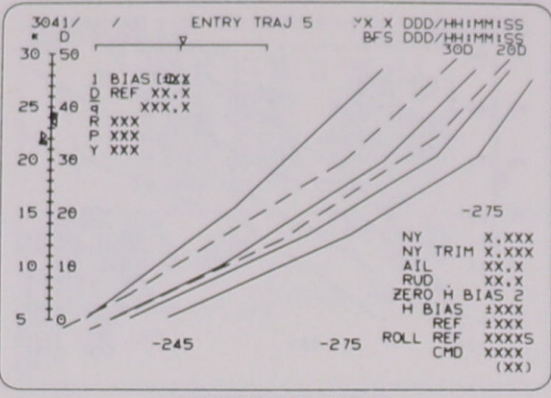
ENTRY TRAJECTORY 3

D



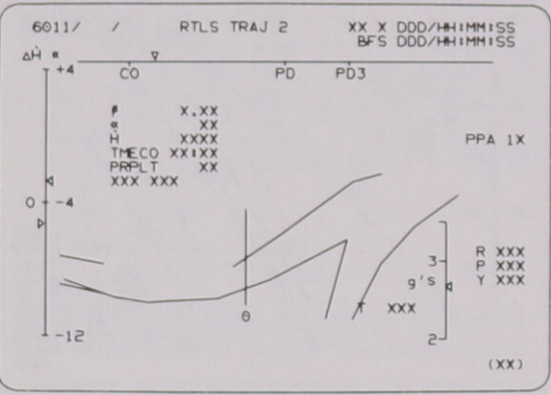
ENTRY TRAJECTORY 4

A



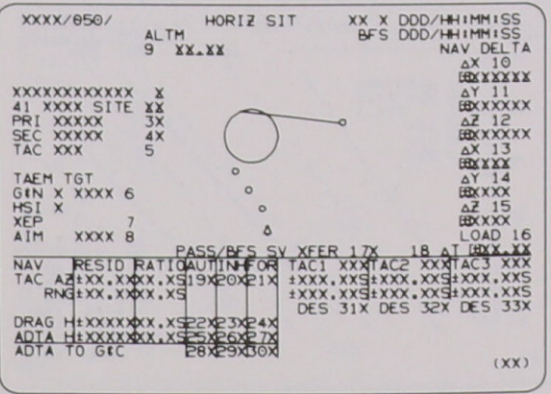
ENTRY TRAJECTORY 5

B



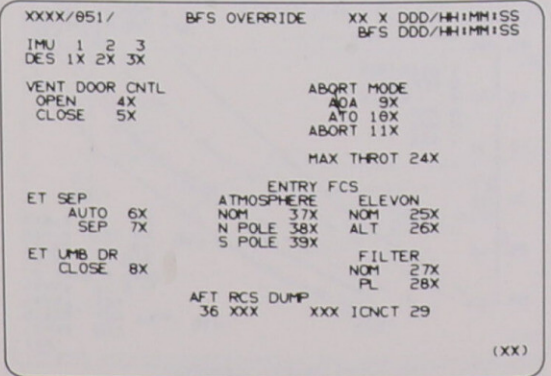
RTLS TRAJECTORY 2

C



HORIZONTAL SITUATION

D



BFS OVERRIDE

XXXX/099/ FAULT XX X DDD/HHMMSS  
BFS DDD/HHMMSS

CRT ID	FAULT	C/W	GPC	TIME
XXX	XXXXXXXXXX	XXXX	X	XXX/XX1XX1XX
XXX	XXXXXXXXXX	XXXX	X	XXX/XX1XX1XX
XXX	XXXXXXXXXX	XXXX	X	XXX/XX1XX1XX
XXX	XXXXXXXXXX	XXXX	X	XXX/XX1XX1XX
XXX	XXXXXXXXXX	XXXX	X	XXX/XX1XX1XX
XXX	XXXXXXXXXX	XXXX	X	XXX/XX1XX1XX
XXX	XXXXXXXXXX	XXXX	X	XXX/XX1XX1XX
XXX	XXXXXXXXXX	XXXX	X	XXX/XX1XX1XX
XXX	XXXXXXXXXX	XXXX	X	XXX/XX1XX1XX
XXX	XXXXXXXXXX	XXXX	X	XXX/XX1XX1XX
XXX	XXXXXXXXXX	XXXX	X	XXX/XX1XX1XX
XXX	XXXXXXXXXX	XXXX	X	XXX/XX1XX1XX
XXX	XXXXXXXXXX	XXXX	X	XXX/XX1XX1XX
XXX	XXXXXXXXXX	XXXX	X	XXX/XX1XX1XX
XXX	XXXXXXXXXX	XXXX	X	XXX/XX1XX1XX
XXX	XXXXXXXXXX	XXXX	X	XXX/XX1XX1XX
XXX	XXXXXXXXXX	XXXX	X	XXX/XX1XX1XX
XXX	XXXXXXXXXX	XXXX	X	XXX/XX1XX1XX
XXX	XXXXXXXXXX	XXXX	X	XXX/XX1XX1XX
XXX	XXXXXXXXXX	XXXX	X	XXX/XX1XX1XX
XXX	XXXXXXXXXX	XXXX	X	XXX/XX1XX1XX
XXX	XXXXXXXXXX	XXXX	X	XXX/XX1XX1XX

(XX)

A

FAULT

XXXX/XXX/018 GNC SYS SUMM 1 XX X DDD/HHMMSS  
BFS DDD/HHMMSS

SURF	POS	MOI	DPS	1	2	3	4
L OB	XXX.XS	XXS	MOH	FF	5	5	5
IB	XXX.XS	XXS	FA	5	5	5	5
R IB	XXX.XS	XXS	PL	5	5		
OB	XXX.XS	XXS					
AIL	XXX.X						
RUD	XXX.X		FCS	CH	1	2	3
SPD BRK	XXX.X				5	5	5
BDY FLP	XXX.X						
MPS							
HE Tk P	XXXX5	XXXX5	XXXX5	IMU	5	5	5
REG P A	XXXX5	XXXX5	XXXX5	TAC	5	5	5
B	XXXX5	XXXX5	XXXX5	ADTA	5	5	5
dP/dT	XXX5	XXX5	XXX5				
ULL P LH2	XX.XS	XX.XS	XX.XS				
L02	XX.XS	XX.XS	XX.XS				
MANF P LH2	XXX5						
L02	XXX5						

(XX)

B

GNC SYSTEM SUMMARY 1

XXXX/XXX/079 SM SYS SUMM 2 XX X DDD/HHMMSS  
BFS DDD/HHMMSS

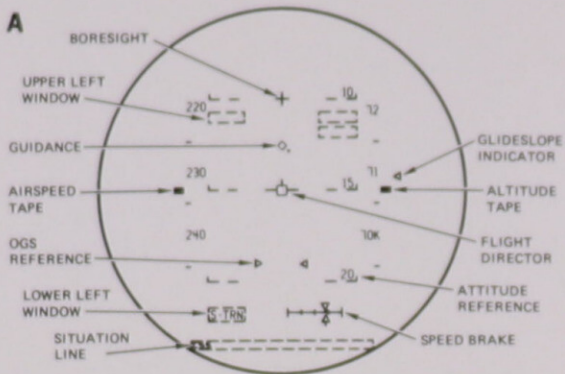
CRYO Tk	1	2	3	4	5		
H2 PRESS	XXXX5	XXXX5	XXXX5	XXXX5	XXXX5		
O2 PRESS	XXXX5	XXXX5	XXXX5	XXXX5	XXXX5		
HTR T1	XXXX5	XXXX5	XXXX5	XXXX5	XXXX5		
T2	XXXX5	XXXX5	XXXX5	XXXX5	XXXX5		
APU	1	2	3	HYD	1	2	3
TEMP EGT	XXXX5	XXXX5	XXXX5	PRESS	XXXX5	XXXX5	XXXX5
B/U EGT	XXXX5	XXXX5	XXXX5	ACUM P	XXXX5	XXXX5	XXXX5
OIL IN	XXXX5	XXXX5	XXXX5	RSVR T	XXXX5	XXXX5	XXXX5
OUT	XXXX5	XXXX5	XXXX5	QTY	XXXX5	XXXX5	XXXX5
GG BED	XXXX5	XXXX5	XXXX5				
INJ	XXXX5	XXXX5	XXXX5	W/B			
SPEED *	XXXX5	XXXX5	XXXX5	H2O QTY	XXXX5	XXXX5	XXXX5
FUEL QTY	XXXX5	XXXX5	XXXX5	BYP VLV	XXXX5	XXXX5	XXXX5
PMP LK P	XXS	XXS	XXS				
OIL OUT P	XXXX5	XXXX5	XXXX5	Therm Cntl		1	2
FU Tk VLV	XXXX5	XXXX5	XXXX5	H2O PUMP P	XXXX5	XXXX5	XXXX5
AV BAY				FREON FLOW	XXXX5	XXXX5	XXXX5
TEMP	XXXX5	XXXX5	XXXX5	EVAP OUT T	XXXX5	XXXX5	XXXX5
FAN ΔP	X.XXS	X.XXS	X.XXS				

(XX)

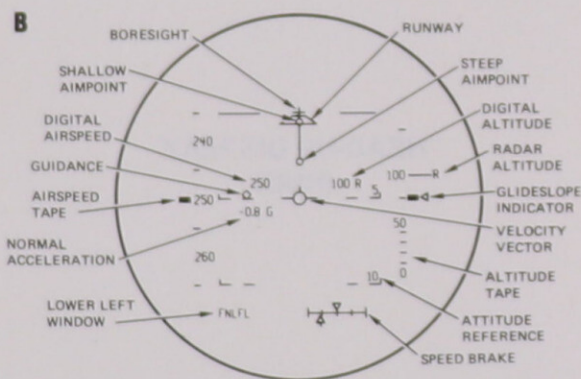
C

SM SYSTEM SUMMARY 2

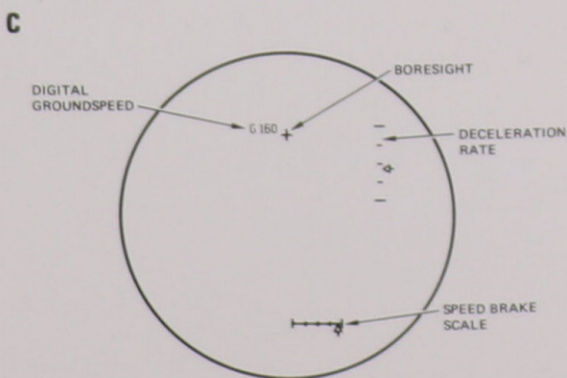
**HEAD-UP DISPLAY  
(HUD)**



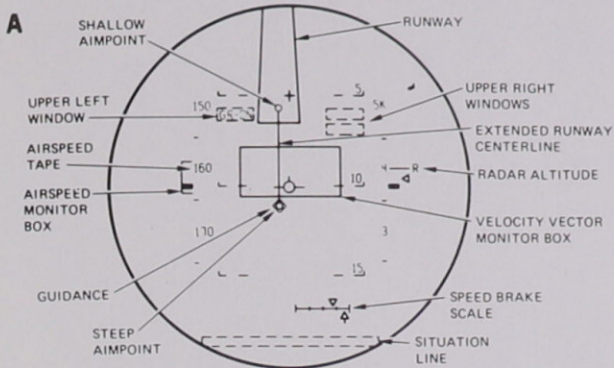
FORMAT 1 PRE-WOW (70,650 FT)



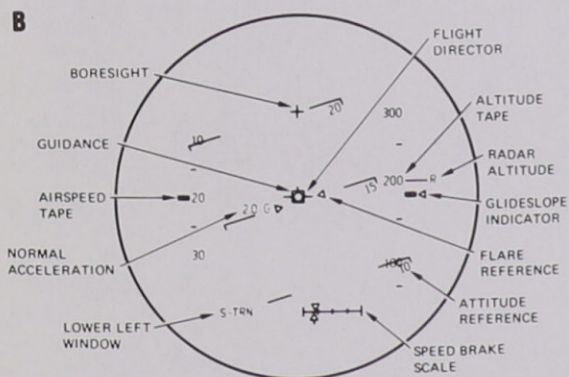
FORMAT 2 PRE-WOW (100 FT)



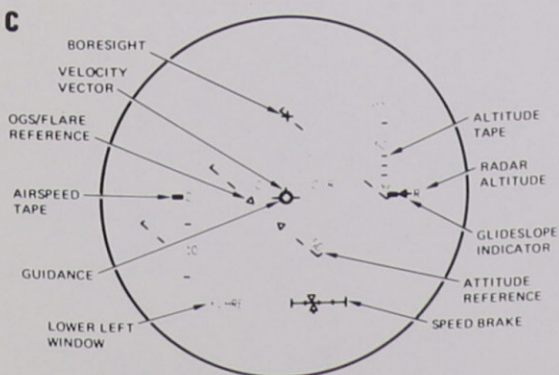
FORMAT 1 AFTER WOW



FORMAT 2 PRE-WOW



OPS 8 LOW



OPS 9 LOW



NOTES:

