

36. STOP CNTR V92Q0103C FLOATING POINT  
(green)

The counter will start to count up to 125 once the Ku antenna line of sight has entered the Beta stop protected zone. It will reset once the line of site exits the zone or if it remains in the zone for more than 4 minutes. The 125 counts correspond to 4 minutes.

**EVA Protect**

The EVA protect zone is defined by uplink TMBU of two azimuth and two elevation angles.

37. AZ (roll) V92H0545C FLOATING POINT  
min (green)

Indicates the value of minimum azimuth angle (downlisted) 38. AZ (roll)  
V92H0546C FLOATING POINT  
max (green)

Indicates the value of maximum azimuth angle (downlisted).

38. EL (pitch) V92H0547C FLOATING POINT  
min (green)

Indicates the value of minimum elevation angle (downlisted).

39. EL (pitch) V92H0548C FLOATING POINT  
max (green)

Indicates the value of maximum elevation angle (downlisted).

40. Protect Mode V93X5606X 1 = ON 0 = OFF  
(green) (yellow)

This parameter indicates if the EVA protect mode has been enabled or disabled. When the discrete is set to one, the SM antenna management program will monitor the actual azimuth/elevation angles to determine whether the antenna line of sight is pointing into the EVA protect zone. If the TMBUs set of EVA angles is valid, the TWT will be turned off when the Ku-band antenna is pointing into the protect zone, and turned on when the antenna is pointing outside the protect zone. This is a downlisted parameter.

41. Angles V92X5601X 1 = GO 0 = NO-GO  
(green) (yellow)

A logic 1 indicates the Ku-Band EVA protect angles are valid. The parameter will be set to one when V92H0546C > V92H0545C and V92H0548C > V92H0547C. If the uplink angles are not valid, the last valid set of angles will be used to control the TWT.

Ku-BAND COMM(SM) v1.4		GMT XXX/XX:XX:XX	
Systems Status		TDRS Pointing	
Signal STRG	xxxx	AZ EL	
RF Power Out	xxxx	ACT	xxxx xxxx
COMM Power	xx	DESIG	xxxx xxxx
COMM STBY	xxxx	ACT TDRS SEL	xxxx xxxx
Fail Safe	xxxx	Ku Band PRI	xxxx xxxx
ACQ MODE	xxx	ALPHA GMBL	xxxx
System SEL	x	BETA GMBL	xxx
Link MOD	xxx	BETA FLAGS	xxxx xxxxx
SPRD Spectrum	xxx	STOP CNTR	x
Angle Track	xxxxx	EVA Protect	
Frame SYNC	xxxxx	Min Max	
Data Good	xxxx	AZ ( roll)	x x
Return MOD	xxxx	EL (pitch)	x x
MOD Command	xxx	Protect Mode	xxx
Antenna Mode		Angles	xxxxx
DESIG AUTO ACQ		Data Sources	
HDR (Ch 3)		LDR (Ch 2)	
ANLG DIGI TV MAX INTG		OPS P/L INTG DIGI	

Figure 5.111-1. KU-COMM display

**TITLE**

KU STOW/DPY V1.1

**GENERAL**

- A. The data displayed are real-time telemetry parameters that affect Ku-band mechanical system. A copy of the Ku stow/dpy display is shown in figure 5.112-1.
- B. Pathname of display: INCO/INCO Displays/COMM Systems/ku mechanical.
- C. Detailed display description.

1.	MECH PWR 1	V76S2875E	1 = ON (yellow)	0 = OFF (green)
----	------------	-----------	--------------------	--------------------

Indicates the status of payload bay mechanical power system no. 1.

2.	MECH PWR 2	V76S2878E	1 = ON (yellow)	0 = OFF (green)
----	------------	-----------	--------------------	--------------------

Indicates the status of payload bay mechanical power system no. 2.

3.	R13L DPY/GND/STO sw	V54S0003E	1 = DEPLOY (yellow)	0 = (blank)
----	---------------------	-----------	------------------------	-------------

Indicates switch on panel R13L is in the DEPLOY command position.

4.	R13L DPY/GND/STO sw	V54S0007E	1 = STOW (yellow)	0 = (blank)
----	---------------------	-----------	----------------------	-------------

Indicates switch on panel R13L is in the STOW command position.

5.	Ku MODE	V74X2583J	1 = RADAR (yellow)	0 = COMM
----	---------	-----------	-----------------------	----------

Indicates if the Ku-band system is in the radar or comm mode.

6.	COMM PWR	V74X4818E	1 = ON (green)	0 = OFF (darkslategray)
----	----------	-----------	-------------------	----------------------------

This parameter indicates the associated GCIL panel/command driver's status for this function.

7.	COMM STBY	V74X4807E	1 = YES (yellow)	0 = NO (darkslategray)
----	-----------	-----------	---------------------	---------------------------

This parameter indicates the associated GCIL panel/command driver's status for this function. A logic 1 indicates that the comm system is powered to STANDBY.

8.	ARM COMMAND	V76S0901E	1 = JETT (red)	0 = SAFE (green)
----	-------------	-----------	-------------------	---------------------

A logic 1 indicates the switch on panel A14 is in ARM. A logic 0 indicates it is in the SAFE position.

- |     |  |           |                                 |                                  |
|-----|--|-----------|---------------------------------|----------------------------------|
| 9.  | GMT  | V75W3504D | TIME<br>(green)                 |                                  |
|     | Greenwich mean time.   |           |                                 |                                  |
| 10. | MET  | V75W3514D | TIME<br>(green)                 |                                  |
|     | Mission elapsed time.  |           |                                 |                                  |
| 11. | PINS   | V54X0022E | 1 = LOCKED<br>(yellow)          | 0 = (blank)<br>(green)           |
|     | Indicates the gimbal lock pins are in the locked position.                             |           |                                 |                                  |
| 12. | WIGGLE TEST  | V54X0021E | 1 = PASS<br>(yellow)            | 0 = (blank)<br>(green)           |
|     | Indicates the wiggle test was defined as passed.                                       |           |                                 |                                  |
| 13. | DA fully STOWED<br>MMC2  | V54X0005E | 1 = YES<br>(red on ghostewhite) | 0 = (blank)<br>(green)           |
|     | Indicates the deployed assembly is fully stowed (indication no. 1).                    |           |                                 |                                  |
| 14. | DA fully STOWED<br>MMC4  | V54X0006E | 1 = YES<br>(red on ghostewhite) | 0 = (blank)<br>(green)           |
|     | Indicates the deployed assembly is fully stowed (indication no. 2).                    |           |                                 |                                  |
| 15. | DA fully DEPLOYD<br>MMC2   | V54X0009E | 1 = YES<br>(green)<br>black     | 0 = (blank)<br>(yellow)<br>black |
|     | Indicates the deployed assembly is fully deployed (indication no. 1).                  |           |                                 |                                  |
| 16. | DA fully DEPLOYD<br>MMC4   | V54X0010E | 1 = YES<br>(green)              | 0 = (blank)<br>(yellow)          |
|     | Indicates the deployed assembly is fully deployed (indication no. 2).                  |           |                                 |                                  |
| 17. | AZ (-125.0)<br>ACT   | V74H2618J | FLOATING POINT<br>(green)       |                                  |
|     | Actual azimuth pointing angle of the antenna.  |           |                                 |                                  |
| 18. | AZ (-125.0)<br>CMD   | V74H2648J | FLOATING POINT<br>(green)       |                                  |
|     | SM GPC antenna-management-designated (computed) azimuth pointing angle of the antenna. |           |                                 |                                  |



Ku STOW/DPY v1.1		GMT xxx/xx:xx:xx	
		MET xxx/xx:xx:xx	
<b>STOW / DEPLOY</b>			
MECH PWR1	xxx	PINS	xxxxxx
MECH PWR 2	xxx	WIGGLE TEST	xxx
		MMC2 MMC4	
R13L DPY/GND/STO sw		DA fully STOWED	xxx xxx
xxxxx	xxxx	DA fully DEPLOYD	xxx xxx
Ku MODE	xxxxx	ACT	CMD
COMM PWR	xxx	AZ(-125.0)	xxx xxx
COMM STBY	xxx	EL(-29.0)	xxx xxx
<b>JETTISON</b>			
ARM COMMAND		A	B
		GLTN VOLTS	xx xx
xxxx		BOLT VOLTS	xx xx

Figure 5.112-1. Ku-STOW/DPY display

**TITLE**

KU-BAND RADAR V1.1

**GENERAL**

A. The data displayed are real-time telemetry parameters that affect the management and operation of the Ku-band system. A copy of page 1 of the Ku-band radar system display is shown in figure 5.113-1.

B. Pathname of display: INCO/INCO Displays/COMM Systems/ku\_radar.

C. Detailed display description.

- |    |              |           |                           |
|----|--------------|-----------|---------------------------|
| 1. | SIGNAL STRGH | V74E2508A | FLOATING POINT<br>(green) |
|----|--------------|-----------|---------------------------|

Indicates the radar or comm received signal strength in dBm. Nominal is about -90 dBm in comm mode.

- |    |              |           |                           |
|----|--------------|-----------|---------------------------|
| 2. | RF POWER OUT | V74E2511A | FLOATING POINT<br>(green) |
|----|--------------|-----------|---------------------------|

Indicates the radar or comm RF output power in watts; nominal is about 25 watts.

- |    |      |           |                    |                      |
|----|------|-----------|--------------------|----------------------|
| 3. | MODE | V74X2583J | 1 = RDR<br>(green) | 0 = COMM<br>(yellow) |
|----|------|-----------|--------------------|----------------------|

Indicates if the Ku-band system is in the radar or comm mode.

- |    |          |           |                         |
|----|----------|-----------|-------------------------|
| 4. | ANT MODE | W01G3202R | SPECIAL COMP<br>(green) |
|----|----------|-----------|-------------------------|

Computation that indicates the antenna steering mode selected; i.e., GPC, GPC DESIG, AUTO TRACK, or MANUAL SLEW. This special comp is composed of the following MSIDs: V74X2584J, V74X2585J, and V74X2586J.

<u>V74X2585J</u>	<u>V74X2584J</u>	<u>V74X2586J</u>	
1	0	0	DESIG
0	1	0	AUTO
0	0	1	ACQ
0	0	0	(blank)

All other combination output INVL

- |    |            |           |                     |             |
|----|------------|-----------|---------------------|-------------|
| 5. | ANG & DATA | V74X2603J | 1 = TRCK<br>(green) | 0 = (blank) |
|----|------------|-----------|---------------------|-------------|

Indicates that antenna is angle-tracking the forward link signal in comm in GPC and AUTO TRACK antenna steering modes. In the radar mode, it is angle-, angle-rate-, range-, and range-rate-tracking in GPC and AUTO TRACK antenna steering modes, or range- and range-rate-tracking in GPC DESIG and MANUAL SLEW antenna steering modes.

- |    |           |           |                      |             |
|----|-----------|-----------|----------------------|-------------|
| 6. | MODE COOP | V74S2419E | 1 = COOP<br>(yellow) | 0 = (blank) |
|----|-----------|-----------|----------------------|-------------|

Indicates that the radar is in the cooperative (transponder) mode. This mode is not used.

- |    |      |           |                     |             |
|----|------|-----------|---------------------|-------------|
| 7. | PASS | V74S2420E | 1 = PASS<br>(green) | 0 = (blank) |
|----|------|-----------|---------------------|-------------|

Indicates that the radar is in the passive (skin track) mode. This is the normal radar mode. Indicates that the Ku-band MODE switch is in the RADAR PASSIVE position.

- |    |              |           |                   |             |
|----|--------------|-----------|-------------------|-------------|
| 8. | POWER OUTPUT | V74S2496E | 1 = HI<br>(green) | 0 = (blank) |
|----|--------------|-----------|-------------------|-------------|

Indicates that high radar output power; i.e., maximum output power, has been selected via the Ku-band radar output switch. If neither medium nor high power is selected, then low has been selected; i.e., 24 dB below high power.

- |    |              |           |                     |             |
|----|--------------|-----------|---------------------|-------------|
| 9. | POWER OUTPUT | V74S2495E | 1 = MED<br>(yellow) | 0 = (blank) |
|----|--------------|-----------|---------------------|-------------|

Indicates that medium radar output power; i.e., 12 dB below high power, has been selected via the Ku-band radar output switch.

- |     |       |           |                    |             |
|-----|-------|-----------|--------------------|-------------|
| 10. | RANGE | V93X5641X | 1 = MIN<br>(green) | 0 = (blank) |
|-----|-------|-----------|--------------------|-------------|

Indicates that the antenna management program in the SM GPC is outputting a fixed range of 2500 ft. This mode is used for close-in acquisition.

- |     |       |           |                     |             |
|-----|-------|-----------|---------------------|-------------|
| 11. | RANGE | V93X5642X | 1 = AUTO<br>(green) | 0 = (blank) |
|-----|-------|-----------|---------------------|-------------|

Indicates that the antenna management program in the SM GPC is computing the range to the selected radar target when in AUTO.

- |     |               |           |                    |                     |
|-----|---------------|-----------|--------------------|---------------------|
| 12. | AGC THRESHOLD | V74X2594J | 1 = VAR<br>(green) | 0 = FXD<br>(yellow) |
|-----|---------------|-----------|--------------------|---------------------|

FXD - Indicates that a fixed receiver threshold has been selected to aid in detection of a target in clutter (noise).

VAR - Indicates that the receiver threshold is variable; i.e., a function of the range and the constant false alarm ratio (CFAR), which is one false alarm per hour (normal operating mode).

- |     |           |           |                           |  |
|-----|-----------|-----------|---------------------------|--|
| 13. | ACT RANGE | V74U2623J | FLOATING POINT<br>(green) |  |
|-----|-----------|-----------|---------------------------|--|

Indicates measured target range in feet. Range is 0 to 2,621,440 ft (~440 n. mi.).

- |     |           |           |                           |  |
|-----|-----------|-----------|---------------------------|--|
| 14. | DES RANGE | V74U2651J | FLOATING POINT<br>(green) |  |
|-----|-----------|-----------|---------------------------|--|

Indicates designated target range in feet. Range is 10 to 2,621,440 ft (~440 n. mi.).





24.	RNG RATE DATA	V74X2616J	1 = GOOD (green)	0 = INVL (yellow)
-----	---------------	-----------	---------------------	----------------------

Indicates that the range rate tracking loop is locked up and outputting good data.

25.	ANGLE DATA	V74X2590J	1 = GOOD (green)	0 = INVL (yellow)
-----	------------	-----------	---------------------	----------------------

Indicates that the angle tracking loop is locked up and outputting good data.

26.	ANG RATE DATA	V74X2591J	1 = GOOD (green)	0 = INVL (yellow)
-----	---------------	-----------	---------------------	----------------------

Indicates that the angle-rate circuits are operating properly and outputting good data.

27.	SELF TEST	V74X2592J	1 = IN WORK (yellow)	0 = OFF (green)
-----	-----------	-----------	-------------------------	--------------------

Indicates that the radar is performing a system self-test (test runs about 3 min).

28.	EA-1	V74X2605J	1 = PASS (green)	0 = FAIL (yellow)
-----	------	-----------	---------------------	----------------------

Indicates the results of the radar self-test as regards the circuits tested in the interface and control unit (EA-1).

29.	EA-2	V74X2607J	1 = PASS (green)	0 = FAIL (yellow)
-----	------	-----------	---------------------	----------------------

Indicates the results of the radar self-test as regards the circuits tested in the radar signal processor (EA-2).

30.	DA	V74X2606J	1 = PASS (green)	0 = FAIL (yellow)
-----	----	-----------	---------------------	----------------------

Indicates the results of the radar self-test as regards the circuits tested in the deployed assembly (DEA and DMA).

31.	SYSTEM	V74X2608	1 = PASS (green)	0 = FAIL (yellow)
-----	--------	----------	---------------------	----------------------

This is an ANDing of the EA-1, EA-2, and the DA status signals.

Ku Band RADAR v1.1		GMT XXX/XX:XX:XX		
SIGNAL STRGH		XXX.X		
RF POWER OUT		XX.X		
MODE		XXXX		
ANT MODE		XXXXX		
ANG & DATA		XXXX		
MODE COOP		XXXX		
PASS		XXXX		
POWER OUTPUT		XX	XXX	
RANGE		XXX	XXXX	
AGC THRESHOLD		XXX		
		ACT	DESG	
RANGE		XXXXXXXX	XXXXXXXX	
RANGE RATE		XXXX.X		
AZ ANGLE		XXXX.X	XXXX.X	
EL ANGLE		XXXX.X	XXXX.X	
AZ ANG RATE		XX.X		
EL ANG RATE		XX.X		
S33 ITEM 2 (GNC PTG)		XXX		
RANGE DATA		XXXX		
RNG RATE DATA		XXXX		
ANGLE DATA		XXXX		
ANG RATE DATA		XXXX		
SELF TEST	EA-1	EA-2	DA	SYSTEM
XXXXXXXX	XXXX	XXXX	XXXX	XXXX

Figure 5.11-1. Ku Band RADAR display

**TITLE**

NSP CONFIGURATION

**GENERAL**

A. The data displayed are real-time telemetry parameters that affect the management and operation of the NSP configuration. A copy of the NSP CONFIG display is shown in figure 5.114-1. All parameters are OI.

B. Pathname of display: INCO/INCO Displays/COMM Systems/nsp config.

C. Detailed display description.

- |    |                    |           |                     |             |
|----|--------------------|-----------|---------------------|-------------|
| 1. | UPLINK DATA SOURCE | V74X4795E | 1 = S-BD<br>(green) | 0 = (blank) |
|----|--------------------|-----------|---------------------|-------------|

This parameter indicates the associated GCIL panel/command driver status for this function.

- |    |                    |           |                   |             |
|----|--------------------|-----------|-------------------|-------------|
| 2. | UPLINK DATA SOURCE | V74X4758E | 1 = KU<br>(green) | 0 = (blank) |
|----|--------------------|-----------|-------------------|-------------|

This parameter indicates the associated GCIL panel/command driver status for this function.

- |    |                  |           |                    |             |
|----|------------------|-----------|--------------------|-------------|
| 3. | UPLINK DATA RATE | V74X4794E | 1 = HDR<br>(green) | 0 = (blank) |
|----|------------------|-----------|--------------------|-------------|

This parameter indicates that the NSP is configured to receive high-data-rate uplink: two voice channels of 32 kbps each and command link of 8 kbps. This parameter indicates the associated GCIL panel/command driver's status for this function.

- |    |                  |           |                     |             |
|----|------------------|-----------|---------------------|-------------|
| 4. | UPLINK DATA RATE | V74X4756E | 1 = LDR<br>(yellow) | 0 = (blank) |
|----|------------------|-----------|---------------------|-------------|

This parameter indicates that the NSP is configured to receive low-data-rate uplink: one voice channel of 24 kbps and command link of 8 kbps. This parameter indicates the associated GCIL panel/command driver status for this function.

- |    |               |           |                   |             |
|----|---------------|-----------|-------------------|-------------|
| 5. | UPLINK CODING | V74X4796E | 1 = ON<br>(green) | 0 = (blank) |
|----|---------------|-----------|-------------------|-------------|

This parameter indicates that the NSP is configured for convolutional-coded uplink. The decoder is powered on. This parameter indicates the associated GCIL panel/command driver status for this function.

- |    |               |           |                     |             |
|----|---------------|-----------|---------------------|-------------|
| 6. | UPLINK CODING | V74X4752E | 1 = OFF<br>(yellow) | 0 = (blank) |
|----|---------------|-----------|---------------------|-------------|

This parameter indicates the associated GCIL panel/command driver status for this function.

- |    |                    |           |                    |             |
|----|--------------------|-----------|--------------------|-------------|
| 7. | DOWNLINK DATA RATE | V74X4753E | 1 = HDR<br>(green) | 0 = (blank) |
|----|--------------------|-----------|--------------------|-------------|

This parameter indicates that the NSP output is selected to the 192 kbps rate: 128 kbps of telemetry and two 32-kbps voice channels. This parameter indicates the associated GCIL panel/command driver status for this function.

- |    |                    |           |                     |             |
|----|--------------------|-----------|---------------------|-------------|
| 8. | DOWNLINK DATA RATE | V74X4754E | 1 = LDR<br>(yellow) | 0 = (blank) |
|----|--------------------|-----------|---------------------|-------------|

This parameter indicates that the NSP output is selected to the 96 kbps rate: 64 kbps of telemetry and one 32-kbps voice. This parameter indicates the associated GCIL panel/command driver status for this function.

- |    |                 |           |                   |             |
|----|-----------------|-----------|-------------------|-------------|
| 9. | DOWNLINK CODING | V74X4797E | 1 = ON<br>(green) | 0 = (blank) |
|----|-----------------|-----------|-------------------|-------------|

This parameter indicates that the NSP is configured to encode the downlink telemetry. This parameter indicates the associated GCIL panel/command driver status for this function.

- |     |                 |           |                    |             |
|-----|-----------------|-----------|--------------------|-------------|
| 10. | DOWNLINK CODING | V74X4751E | 1 = OFF<br>(green) | 0 = (blank) |
|-----|-----------------|-----------|--------------------|-------------|

This parameter indicates the associated GCIL panel/command driver status for this function.

- |     |                |           |                    |             |
|-----|----------------|-----------|--------------------|-------------|
| 11. | DATA VOICE 1/2 | V74X4798E | 1 = OFF<br>(green) | 0 = (blank) |
|-----|----------------|-----------|--------------------|-------------|

This parameter indicates that the NSP is configured to record 128-kbps telemetry data only. This parameter indicates the associated GCIL panel/command driver status for this function.

- |     |                |           |                    |             |
|-----|----------------|-----------|--------------------|-------------|
| 12. | DATA VOICE 1/2 | V74X4799E | 1 = ON<br>(yellow) | 0 = (blank) |
|-----|----------------|-----------|--------------------|-------------|

This parameter indicates that the NSP is configured to record 128-kbps telemetry data and two 32-kbps voice channels. This parameter indicates the associated GCIL panel/command driver status for this function.

- |     |           |           |                   |                     |
|-----|-----------|-----------|-------------------|---------------------|
| 13. | PSS VOICE | V74S5090E | 1 = ENBL<br>(red) | 0 = DSBL<br>(green) |
|-----|-----------|-----------|-------------------|---------------------|

ENBL indicates that payload station voice is enabled and the audio central control unit (ACCU) is disabled.

- |     |             |           |                     |                 |
|-----|-------------|-----------|---------------------|-----------------|
| 14. | NSP BIT (1) | V74X5188E | 1 = SYNC<br>(green) | 0 = --<br>(red) |
|-----|-------------|-----------|---------------------|-----------------|

SYNC indicates that the NSP's bit sync lock detector reached threshold after integrating for  $2^{14}$  symbol times. The bit lock detector threshold changes for each mode, DOD or NASA, decoding ON or OFF.

- |     |             |           |                     |                 |
|-----|-------------|-----------|---------------------|-----------------|
| 15. | NSP BIT (2) | V74X5189E | 1 = SYNC<br>(green) | 0 = --<br>(red) |
|-----|-------------|-----------|---------------------|-----------------|

SYNC indicates that the NSP's bit sync lock detector reached threshold after integrating for  $2^{14}$  symbol times. The bit lock detector threshold changes for each mode, DOD or NASA, decoding ON or OFF.

- |     |               |           |                     |                 |
|-----|---------------|-----------|---------------------|-----------------|
| 16. | NSP FRAME (1) | V74X5176E | 1 = SYNC<br>(green) | 0 = --<br>(red) |
|-----|---------------|-----------|---------------------|-----------------|

SYNC indicates that the NSP had two consecutive frame sync patterns pass the pattern check, and will remain locked until three consecutive frame sync patterns fail the pattern check.

- |     |               |           |                     |                 |
|-----|---------------|-----------|---------------------|-----------------|
| 17. | NSP FRAME (2) | V74X5177E | 1 = SYNC<br>(green) | 0 = --<br>(red) |
|-----|---------------|-----------|---------------------|-----------------|

SYNC indicates that the NSP had two consecutive frame sync patterns pass the pattern check, and will remain locked until two consecutive frame sync patterns fail the pattern check.

- |     |                |           |                     |                 |
|-----|----------------|-----------|---------------------|-----------------|
| 18. | COMSEC FRM (1) | V74X5019E | 1 = SYNC<br>(green) | 0 = --<br>(red) |
|-----|----------------|-----------|---------------------|-----------------|

This is the COMSEC 1 frame sync status indicator. Sync indicates that the data prior to authentication has been frame synchronized. The frame sync logic has detected two consecutive frame sync correlations with three or fewer frame sync errors.

- |     |                |           |                     |                 |
|-----|----------------|-----------|---------------------|-----------------|
| 19. | COMSEC FRM (2) | V74X5020E | 1 = SYNC<br>(green) | 0 = --<br>(red) |
|-----|----------------|-----------|---------------------|-----------------|

This is the COMSEC 2 frame sync status indicator. Sync indicates that the data prior to authentication has been frame synchronized. The frame sync logic has detected two consecutive frame sync correlations with three or fewer frame sync errors.

NSP CONFIG		
v1.0	GMT XXX/XX XX:XX	
UPLINK		
DATA SOURCE	XXXX	XX
DATA RATE	XXX	XXX
CODING	XX	XXX
DOWNLINK		
DATA RATE	XXX	XXX
CODING	XX	XXX
DATA VOICE ½	XXX	XX
PSS VOICE	XXXX	
	NSP	
	1	2
BIT	XXXX	XXXX
FRAME	XXXX	XXXX
COMSEC FRM	XXXX	XXXX

**Figure 5.114-1. NSP-CONFIG display**

**TITLE**

S-BAND PM PRE & PWR V1.0

**GENERAL**

A. The data displayed are real-time telemetry parameters that affect the management and operation of the S-band PM preamp and power amp. A copy of the S-BAND PM PRE & PWR display is shown in figure 5.115-1.

B. Pathname of display: INCO/INCO Displays/COMM Systems/power\_amp.

C. Detailed display description.

1.	PRE AMP (1)	V74X4776E	1 = ON (green)	0 = (blank)
----	-------------	-----------	-------------------	-------------

This parameter indicates the associated GCIL panel/command drivers status for this function. The S-band preamp no. 1 is selected.

2.	PREAMP (2)	V74X4777E	1 = ON (green)	0 = (blank)
----	------------	-----------	-------------------	-------------

This parameter indicates the associated GCIL panel/command drivers status for this function. S-band preamp no. 2 is selected.

3.	HTR PWR (1)	V74X4707E	1 = ON (green)	0 = (blank)
----	-------------	-----------	-------------------	-------------

This parameter indicates the associated GCIL panel/command driver's status for this function. The S-band preamp heater no. 1 is selected.

4.	HTR PWR (2)	V74X4708E	1 = ON (green)	0 = (blank)
----	-------------	-----------	-------------------	-------------

This parameter indicates the associated GCIL panel/command driver's status for this function. The S-band preamp heater no. 2 is selected.

5.	PWR AMP (1)	V74X4784E	1 = ON (green)	0 = (blank)
----	-------------	-----------	-------------------	-------------

This parameter indicates the associated GCIL panel/command driver status for this function.

6.	PWR AMP (2)	V74X4785E	1 = ON (green)	0 = (blank)
----	-------------	-----------	-------------------	-------------

This parameter indicates the associated GCIL panel/command driver status for this function.

7.	STBY (1)	V74X4747E	1 = ON (green)	0 = (blank)
----	----------	-----------	-------------------	-------------

This parameter indicates the associated GCIL panel/command driver status for this function.



- |    |          |           |                   |             |
|----|----------|-----------|-------------------|-------------|
| 8. | STBY (2) | V74X4749E | 1 = ON<br>(green) | 0 = (blank) |
|----|----------|-----------|-------------------|-------------|

This parameter indicates the associated GCIL panel/command driver status for this function.

- |    |            |           |                           |  |
|----|------------|-----------|---------------------------|--|
| 9. | RF OUT (1) | V74E4512A | FLOATING POINT<br>(green) |  |
|----|------------|-----------|---------------------------|--|

This is an analog parameter that indicates the power amplifier output in watts.

- |     |            |           |                           |  |
|-----|------------|-----------|---------------------------|--|
| 10. | RF OUT (2) | V74E4513A | FLOATING POINT<br>(green) |  |
|-----|------------|-----------|---------------------------|--|

This is an analog parameter that indicates the power amplifier output in watts.

- |     |            |           |                           |  |
|-----|------------|-----------|---------------------------|--|
| 11. | RF RFL (1) | V74E4540A | FLOATING POINT<br>(green) |  |
|-----|------------|-----------|---------------------------|--|

This is an analog parameter that indicates the reflected power of power amplifier no. 1 in watts.

- |     |            |           |                           |  |
|-----|------------|-----------|---------------------------|--|
| 12. | RF RFL (2) | V74E4541A | FLOATING POINT<br>(green) |  |
|-----|------------|-----------|---------------------------|--|

This is an analog parameter that indicates the reflected power of power amplifier no. 2 in watts.

- |     |          |           |                           |  |
|-----|----------|-----------|---------------------------|--|
| 13. | TEMP (1) | V74T4514A | FLOATING POINT<br>(green) |  |
|-----|----------|-----------|---------------------------|--|

This is an analog parameter that indicates the temperature of power amplifier no. 1 in degrees Fahrenheit.

- |     |          |           |                           |  |
|-----|----------|-----------|---------------------------|--|
| 14. | TEMP (2) | V74T4515A | FLOATING POINT<br>(green) |  |
|-----|----------|-----------|---------------------------|--|

This is an analog parameter that indicates the temperature of power amplifier no. 2 in degrees Fahrenheit.

S-BAND PM PRE & PWR v1.0		
	STRG 1	2
PRE AMP	XX	XX
HTR PWR	XX	XX
PWR AMP	XX	XX
STBY	XX	XX
RF OUT	XXX	XXX
RF RFL	XX	XX
TEMP	XXXX	XXXX

Figure 5.115-1. S-BAND PM PRE & PWR display

**TITLE**

KU RADAR/COMM STAT V1.2

**GENERAL**

- A. The data displayed are real-time telemetry parameters that affect the management and operation of the Ku-band system. A copy of the Ku RADAR/COMM STAT display is shown in figure 5.116-1.
- B. Pathname of display: INCO/INCO Displays/COMM Systems/radar\_comm.
- C. Detailed display description.

1.	GMT	V75W3504D	TIME (green)
----	-----	-----------	-----------------

Indicates Greenwich mean time.

2.	Control Switch	V74S2430E	1 = CMD (green)	0 = PNL (red)
----	----------------	-----------	--------------------	------------------

Indicates whether the Ku-band system is under ground or crew control. (MNA/C R11 and 15)

3.	MODE	V74X2583J	1 = RDR (yellow)	0 = COMM (green)
----	------	-----------	---------------------	---------------------

Indicates whether the Ku-band system is in the radar or comm mode.

4.	AGC	V74E2508A	FLOATING POINT (green)
----	-----	-----------	---------------------------

Indicates the radar or comm received signal strength in dBm. Nominal is about -90 dBm in comm mode.

5.	RF OUT	V74E2511A	DECIMAL (green)
----	--------	-----------	--------------------

Indicates the radar or comm RF output power in watts. Nominal is about 50 watts.

6.	TXT PWR OUT CMD	V74K2644J	1 = OFF (red)	0 = ON (green)
----	-----------------	-----------	------------------	-------------------

Indicates that the TWT has been turned off by command vice being inhibited by pointing the antenna into the obscuration zone.

7.	SCAN WARNING	V74X2614J	1 = LMT (yellow)	0 = (blank)
----	--------------	-----------	---------------------	-------------

Indicates that the antenna line of sight is pointing into the obscuration (protected) zone. This is the area enclosed by the dashed lines on the Antenna Management display.

- |    |               |           |                   |             |
|----|---------------|-----------|-------------------|-------------|
| 8. | OBSC Override | V74X2595J | 1 = OVRD<br>(red) | 0 = (blank) |
|----|---------------|-----------|-------------------|-------------|

Indicates that the Ku-band obscuration procedure has been overridden, and the TWT will remain on in accordance with the antenna steering mode and acquisition mode limitations.

- |    |                      |           |                     |                      |
|----|----------------------|-----------|---------------------|----------------------|
| 9. | INERT STAB GPC DESIG | V74K2640J | 1 = BODY<br>(green) | 0 = INRT<br>(yellow) |
|----|----------------------|-----------|---------------------|----------------------|

Indicates, in the GPC designate antenna steering mode, that antenna pointing is referenced to the body or to an inertial coordinate system.

- |     |             |           |                      |                     |
|-----|-------------|-----------|----------------------|---------------------|
| 10. | MASK SELECT | V74K2645J | 1 = BETA<br>(yellow) | 0 = BMSK<br>(green) |
|-----|-------------|-----------|----------------------|---------------------|

If BETA is selected, the TWT will be shut off only when the antenna beta angle is greater (positively) than the beta angle selected. If BMSK (beta mask) is selected, the TWT will be shut off only when the antenna beta angle is greater (positively) than the beta angle selected, and the antenna line of sight is pointing within the Ku-band obscuration zone. (The obscuration zone is displayed as a background plot on antenna displays MSK 901 and 902.)

- |     |            |           |                           |  |
|-----|------------|-----------|---------------------------|--|
| 11. | BETA ANGLE | V74H2655J | FLOATING POINT<br>(green) |  |
|-----|------------|-----------|---------------------------|--|

This angle is selectable via uplink command and has a range of  $-85^\circ < \text{BETA} < 75^\circ$ .

- |     |            |           |                     |                   |
|-----|------------|-----------|---------------------|-------------------|
| 12. | BETA LIMIT | V92X0992X | 1 = OUT<br>(yellow) | 0 = IN<br>(green) |
|-----|------------|-----------|---------------------|-------------------|

Indicates whether the uplinked or crew input beta angle is in or out of limits ( $-85^\circ < \text{BETA} < +75^\circ$ ).

- |     |                |           |                   |             |
|-----|----------------|-----------|-------------------|-------------|
| 13. | COMM BYPS PF-1 | V92X0324X | 1 = BYPS<br>(red) | 0 = (blank) |
|-----|----------------|-----------|-------------------|-------------|

Indicates that Ku-band data acquisition by the SM GPC via the PF-1 MDM SIO is bypassed.

- |     |                 |            |                   |             |
|-----|-----------------|------------|-------------------|-------------|
| 14. | RADAR BYPS FF-3 | V91X2256XX | 1 = BYPS<br>(red) | 0 = (blank) |
|-----|-----------------|------------|-------------------|-------------|

Indicates that Ku-band data acquisition by the G&N GPC via the FF-3 MDM SIO is bypassed.

- |     |               |           |                  |                   |
|-----|---------------|-----------|------------------|-------------------|
| 15. | SM SIO PARITY | V74X2587J | 1 = ERR<br>(red) | 0 = OK<br>(green) |
|-----|---------------|-----------|------------------|-------------------|

Indicates a parity error on the SM GPC SIO output to the Ku-band via the PF-1 MDM.

- |     |      |           |                  |                   |
|-----|------|-----------|------------------|-------------------|
| 16. | SYNC | V74X2588J | 1 = ERR<br>(red) | 0 = OK<br>(green) |
|-----|------|-----------|------------------|-------------------|

Indicates a sync error on the SM GPC SIO output to the Ku-band via the PF-1 MDM.

- |             |           |                  |                   |
|-------------|-----------|------------------|-------------------|
| 17. VALIDTY | V74X2589J | 1 = ERR<br>(red) | 0 = OK<br>(green) |
|-------------|-----------|------------------|-------------------|

Indicates that a nonvalid manchester code has been detected on the SM GPC SIO output to the Ku-band via the PF-1 MDM.

**ANTENNA MODE**

- |         |           |                    |             |
|---------|-----------|--------------------|-------------|
| 18. GPC | V74X4820E | 1 = GPC<br>(green) | 0 = (blank) |
|---------|-----------|--------------------|-------------|

Indicates that the GPC antenna steering mode has been selected in the comm mode or panel in the radar mode. This parameter indicates the associated GCIL panel/command driver's status for this function.

- |                  |           |                     |             |
|------------------|-----------|---------------------|-------------|
| 19. (GCIL) DESIG | V74X4822E | 1 = DESG<br>(green) | 0 = (blank) |
|------------------|-----------|---------------------|-------------|

Indicates that the GPC DESIGNATE antenna steering mode has been selected in the comm mode or panel in the radar mode. This parameter indicates the associated GCIL panel/command driver's status for this function.

- |                 |           |                     |             |
|-----------------|-----------|---------------------|-------------|
| 20. (GCIL) AUTO | V74X4824E | 1 = AUTO<br>(green) | 0 = (blank) |
|-----------------|-----------|---------------------|-------------|

Indicates that the AUTO TRACK antenna steering mode has been selected in the comm mode or panel in the radar mode. This parameter indicates the associated GCIL panel/command driver's status for this function.

- |            |           |                     |             |
|------------|-----------|---------------------|-------------|
| 21. MANUAL | V74X4810E | 1 = MAN<br>(yellow) | 0 = (blank) |
|------------|-----------|---------------------|-------------|

Indicates that the MANUAL SLEW antenna steering mode has been selected in the comm mode or panel in the radar mode. This parameter indicates the associated GCIL panel/command driver's status for this function.

**SYSTEM STATUS**

- |             |           |                     |             |
|-------------|-----------|---------------------|-------------|
| 22. OPERATE | V74X2604J | 1 = OPER<br>(green) | 0 = (blank) |
|-------------|-----------|---------------------|-------------|

Indicates that the TWT has warmed up (3.5-min timeout), no faults have been detected, COMM/RDR is on, and the TWT is outputting an RF signal.

- |            |           |                      |             |
|------------|-----------|----------------------|-------------|
| 23. SEARCH | V74X2601J | 1 = SRCH<br>(yellow) | 0 = (blank) |
|------------|-----------|----------------------|-------------|

Indicates that the antenna is in a programmed spiral search.

- |            |           |                    |             |
|------------|-----------|--------------------|-------------|
| 24. DETECT | V74X2602J | 1 = DET<br>(green) | 0 = (blank) |
|------------|-----------|--------------------|-------------|

Indicates costas lock (carrier lock) in the comm mode or when a target is detected, and the tracking sequence is initiated in the radar mode.

25. TRACK	V74X2603J	1 = TRCK (green)	0 = (blank)
-----------	-----------	---------------------	-------------

Indicates antenna is angle-tracking the forward link signal in GPC comm mode and AUTO TRACK antenna steering modes; in the radar mode it is angle-, angle-rate-, range-, and range-rate-tracking in GPC and AUTO TRACK antenna steering modes or range- and range-rate-tracking in GPC DESIG and MANUAL SLEW antenna steering modes.

**TEMPS**

26. TWT	V74T2497A	FLOATING POINT (green)
---------	-----------	---------------------------

Indicates temperature in the vicinity of the TWT (DEA). Minimum operating = 5° F; maximum operating = 171° F.

27. RECEIVER	V74T2961A	FLOATING POINT (green)
--------------	-----------	---------------------------

Indicates temperature in the vicinity of the receiver (DEA). Minimum operating = 5° F; maximum operating = 156° F.

28. ANT FEED	V74T2963A	FLOATING POINT (green)
--------------	-----------	---------------------------

Indicates temperature of the antenna feed (monopulse comparator (DMA)). Minimum operating = 5° F; maximum operating = 186° F.

29. ALPHA GIM	V74T2965A	FLOATING POINT (green)
---------------	-----------	---------------------------

Indicates temperature of the A-axis gimbal housing (DMA). Minimum operating = 5° F; maximum operating = 150° F.

30. BETA GIM	V74T2969A	FLOATING POINT (green)
--------------	-----------	---------------------------

Indicates temperature of the B-axis gimbal housing (DMA). Minimum operating = 5° F; maximum operating = 166° F.

31. GYRO	V74T2967A	FLOATING POINT (green)
----------	-----------	---------------------------

Indicates temperature of the gyro package (rate sensor assembly (DMA)). Minimum operating = 5° F; maximum operating = 155° F.

Ku RADAR/COMM STAT v1.2		GMT XXX/XX:XX:XX	
<b>Control Status</b>		<b>Antenna Mode</b>	
Control Switch	xxx	GPC	xxx
Mode	xxxx	(GCIL)DESIG	xxxx
AGC	xxxx	(GCIL)Auto	xxxx
RF Out	xx	Manual	xxx
TXT PWR Out CMD	xxx	<b>System Status</b>	
Scan Warning	xxx	Operate	xxxx
OBSC Override	xxxx	Search	xxxx
NERT STAB GPC DESIG	xxxx	Detect	xxx
Mask Select	xxxx	Track	xxxx
Beta Angle	xxx	<b>TEMPS</b>	
Beta Limit	xxx	TWT	xxxx
<b>Computer Interface</b>		RECEIVER	xxxx
COMM BYPS PF-1	xxxx	ANT FEED	xxxx
RADAR BYPS FF-3	xxxx	ALPHA GIM	xxxx
SM SIO Parity	xxx	BETA GIM	xxxx
SYNC	xxx	GYRO	xxxx
Validity	xxx		

Figure 5.116-1. Ku RADAR/COMM STAT display

**TITLE**

S-BAND ANTENNA V1.1

**GENERAL**

- A. The data displayed are real-time telemetry parameters that affect the management and operation of the COMM SM downlist. A copy of the S-Band Antenna display is shown in figure 5.117-1.
- B. Pathname of display: INCO/INCO Displays/COMM Systems/sb\_antenna.
- C. Detailed display description.

1. SEL ANTENNA W02I0603R SPECIAL COMP  
(green)

This is a special comp composed of two inputs. The S-BD ANT SEL (PM) comp and the switch beam selects FWD/AFT signals. The S-BD ANT SEL (PM) comp is composed of

- a. The transponder directs signals
- b. The preamp frequency (HI or LOW) signals
- c. The antenna select relays S1, S2, S3, and S4 signals

All of these inputs are used to determine the selected antenna (ULA, ULF, URA, URF, LLA, LLF, LRA, or LRF).

This special comp is composed of W05I0200R, V74X7090E, V74X7091E, V74X7092E, V74X7093E, V74X7094E, V74X7095E, V74X7096E, V74X7097E.

W0	V7	V7	V7	V7	V7	V7	V7	V7	
02	70	70	70	70	70	70	70	70	
50	49	49	49	49	49	49	49	49	
IO	XO	X1	X2	X3	X4	X5	X6	X7	
<u>-R</u>	<u>-E</u>	<u>-E</u>	<u>-E</u>	<u>-E</u>	<u>-E</u>	<u>-E</u>	<u>-E</u>	<u>-E</u>	
UL	1	0	X	X	X	X	X	X	ULF
UL	0	1	X	X	X	X	X	X	ULA
UR	X	X	1	0	X	X	X	X	URF
UR	X	X	0	1	X	X	X	X	URA
LL	X	X	X	X	1	0	X	X	LLF
LL	X	X	X	X	0	1	X	X	LLA
LR	X	X	X	X	X	X	1	0	LRF
LR	X	X	X	X	X	X	0	1	LRA
ER	X	X	X	X	X	X	X	X	ER1
All other combinations output									ER2

W05I0200R S-BD ANT SEL (PM)

This comp is composed of

- a. The transponder directs signal bits, V74X4780E, V74X4781E
- b. The preamp frequency (HI or LOW) signal bits, V74X4779E, V74X4778E



- c. the antenna select relays S1, S2, S3, and S4 signal bits, V74X7070E, V74X7072E, V74X7074E, V74X7076E, V74X7078E, V74X7080E, V74X7082E, V74X7084E.

V7	V7	V7	V7	V7	V7	V7	V7	V4	V4	V4	V4	
70	70	70	70	70	70	70	70	77	77	77	77	
47	47	47	47	47	48	48	48	48	48	47	47	
X0	X2	X4	X6	X8	X0	X2	X4	X0	X1	X9	X8	
<u>-E</u>	<u>-E</u>	<u>-E</u>	<u>-E</u>	<u>-E</u>	<u>-E</u>	<u>-E</u>	<u>-E</u>	<u>-E</u>	<u>-E</u>	<u>-E</u>	<u>-E</u>	
1	0	X	X	X	X	0	1	1	0	0	0	UR
0	1	0	1	X	X	X	X	0	1	0	0	UR
1	0	X	X	X	X	1	0	0	0	1	0	UR
0	1	1	0	X	X	X	X	0	0	0	1	UR
X	X	X	X	0	1	1	0	1	0	0	0	LR
X	X	1	0	1	0	X	X	0	1	0	0	LR
X	X	X	X	0	1	0	1	0	0	1	0	LR
X	X	0	1	1	0	X	X	0	0	0	1	LR
X	X	X	X	1	0	1	0	1	0	0	0	LL
X	X	1	0	0	1	X	X	0	1	0	0	LL
X	X	X	X	1	0	0	1	0	0	1	0	LL
X	X	0	1	0	1	X	X	0	0	0	1	LL
0	1	X	X	X	X	0	1	1	0	0	0	UL
1	0	0	1	X	X	X	X	0	1	0	0	UL
0	1	X	X	X	X	1	0	0	0	1	0	UL
1	0	1	0	X	X	X	X	0	0	0	1	UL
All other combinations output												
ER												

2. SM ACT QUAD                      W02G3210R      SPECIAL COMP  
(green)

This is a special comp of the three quad select bits from the SM antenna management, indicating which quad antenna the hardware has selected (UR, LR, UL, or LL).

This special comp is composed of the following MSID V92J1057C:

V92J1057C  
001 UR  
010 LR  
100 UL  
011 LL  
All other bit configurations blank

3. SM ACT BEAM                      W12I0603R      SPECIAL COMP  
(green)

This is a special comp of the two switch beam select bits from the SM antenna management, indicating which beam the hardware has selected (FWD or AFT).

This special comp is composed of the following MSID V92J1062C:

V92J1062C  
01 FWD  
10 AFT

4. SM CMD BEAM                      W03I0603R      SPECIAL COMP  
(green)

This is a special comp of the SM commanded S-band PM antenna (quad and beam) selected, using the SM downlist telemetry. This telemetry indicates the antenna commanded by the SM GPC antenna management program.

This special comp is composed of V74K7050Y, V74K7051Y, V74K7055Y, V74K7056Y, V74K7060Y, V74K7061Y, V74K7065Y, V74K7066Y, V74K7044Y, V74K7046Y, V74K7045Y, and V74K7047Y.

V7	V7	V7	V7	V7	V7	V7	V7	V4	V4	V4	V4	
70	70	70	70	70	70	70	70	70	70	70	70	
45	45	45	45	46	46	46	46	44	44	44	44	
K0	K1	K5	K6	K0	K1	K5	K6	K4	K6	K5	K7	
<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	
1	1	0	0	0	0	0	0	1	1	0	0	ULF
0	0	1	1	0	0	0	0	1	1	0	0	URF
0	0	0	0	1	1	0	0	1	1	0	0	LLF
0	0	0	0	0	0	1	1	1	1	0	0	LRF
1	1	0	0	0	0	0	0	0	0	1	1	ULA
0	0	1	1	0	0	0	0	0	0	1	1	URA
0	0	0	0	1	1	0	0	0	0	1	1	LLA
0	0	0	0	0	0	1	1	0	0	1	1	LRA
All other combinations												
ERR												

5. HEMI                                      W04I0603R      SPECIAL COMP  
(green)

This is a special comp of the SM commanded S-band FM antenna (hemi) selected, using the SM downlist telemetry. This telemetry indicates the hemi antenna commanded by the SM GPC antenna management program.

This special comp is composed of V74K6515Y, V74K6516Y, V74K6510Y, and V74K6511Y.

V6	V6	V6	V6	
75	75	75	75	
41	41	41	41	
K5	K6	K0	K1	
<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	
1	1	0	0	LOW
0	0	1	1	UP
All other combinations				ERR

6. ANT ELEC 1                              V74X4782E              1 = ON              0 = (blank)  
(green)

This parameter indicates the associated GCIL panel/command driver's status for this function.

7.	BEAM ASSY 1	V74X6491E	1 = ON (green)	0 = (blank)
----	-------------	-----------	-------------------	-------------

This parameter indicates that the switch-beam control assembly 1 is powered ON. (MNB FLC2)

8.	ANT ELEC 2	V74X4783E	1 = ON (green)	0 = (blank)
----	------------	-----------	-------------------	-------------

This parameter indicates the associated GCIL panel/command driver's status for this function.

9.	BEAM ASSY 2	V74X6492E	1 = ON (green)	0 = (blank)
----	-------------	-----------	-------------------	-------------

This parameter indicates that the switch-beam control assembly 2 is powered ON. (MNC FLC3)

10.	ANT ROTARY	V74S7214E	1 = GPC (green)	0 = MAN (red)
-----	------------	-----------	--------------------	------------------

This parameter indicates that the crew's antenna selector switch is in the GPC position.

11.	LLF	V74S7217E	1 = LLF (yellow)	0 = (blank)
-----	-----	-----------	---------------------	-------------

This parameter indicates that the crew's antenna selector switch is in the lower left forward position.

12.	LLA	V74S7317E	1 = LLA (yellow)	0 = (blank)
-----	-----	-----------	---------------------	-------------

This parameter indicates that the crew's antenna selector switch is in the lower left aft position.

13.	ULF	V74S7215E	1 = ULF (yellow)	0 = (blank)
-----	-----	-----------	---------------------	-------------

This parameter indicates that the crew's antenna selector switch is in the upper left forward position.

14.	ULA	V74S7315E	1 = ULA (yellow)	0 = (blank)
-----	-----	-----------	---------------------	-------------

This parameter indicates that the crew's antenna selector switch is in the upper left aft position.

15.	URF	V74S7216E	1 = URF (yellow)	0 = (blank)
-----	-----	-----------	---------------------	-------------

This parameter indicates that the crew's antenna selector switch is in the upper right forward position.



25. ANT SW POS S4B	V74X7084E	1 = ON (green)	0 = (blank)
--------------------	-----------	-------------------	-------------

This parameter indicates that antenna select relay S4 is in the B position. (MNB/C FLC 2/3)

26. FREQ LOW	V74X4778E	1 = LOW (green)	0 = (blank)
--------------	-----------	--------------------	-------------

This parameter indicates the antenna electronic switch GCIL panel/ command driver status for this function.

27. FREQ HIGH	V74X4779E	1 = HIGH (green)	0 = (blank)
---------------	-----------	---------------------	-------------

This parameter indicates the antenna electronic switch GCIL panel/ command driver status for this function.

28. BEAM SELECT UL FWD	V74X7090E	1 = ULF (green)	0 = (blank)
------------------------	-----------	--------------------	-------------

This parameter indicates that the forward beam has been selected in the upper left quad antenna. (CNTL BC1)

29. BEAM SELECT UR FWD	V74X7092E	1 = URF (green)	0 = (blank)
------------------------	-----------	--------------------	-------------

This parameter indicates that the forward beam has been selected in the upper right quad antenna. (CNTL BC1)

30. BEAM SELECT LL FWD	V74X7094E	1 = LLF (green)	0 = (blank)
------------------------	-----------	--------------------	-------------

This parameter indicates that the forward beam has been selected in the lower left quad antenna. (CNTL BC1)

31. BEAM SELECT LR FWD	V74X7096E	1 = LRF (green)	0 = (blank)
------------------------	-----------	--------------------	-------------

This parameter indicates that the forward beam has been selected in the lower right quad antenna. (CNTL BC1)

32. BEAM SELECT UL AFT	V74X7091E	1 = ULA (green)	0 = (blank)
------------------------	-----------	--------------------	-------------

This parameter indicates that the aft beam has been selected in the upper left quad antenna. (CNTL BC1)

33. BEAM SELECT UR AFT	V74X7093E	1 = URA (green)	0 = (blank)
------------------------	-----------	--------------------	-------------

This parameter indicates that the aft beam has been selected in the upper right quad antenna. (CNTL BC1)

- |     |                    |           |                    |             |
|-----|--------------------|-----------|--------------------|-------------|
| 34. | BEAM SELECT LL AFT | V74X7095E | 1 = LLA<br>(green) | 0 = (blank) |
|-----|--------------------|-----------|--------------------|-------------|

This parameter indicates that the aft beam has been selected in the lower left quad antenna.  
(CNTL BC1)

- |     |                    |           |                    |             |
|-----|--------------------|-----------|--------------------|-------------|
| 35. | BEAM SELECT LR AFT | V74X7097E | 1 = LRA<br>(green) | 0 = (blank) |
|-----|--------------------|-----------|--------------------|-------------|

This parameter indicates that the aft beam has been selected in the lower right quad antenna.  
(CNTL BC1)

S-Band Antenna v1.1 GMT XXX/XX:XX:XX			
SEL Antenna (OI)	XXX	ANT SW POS S1A	XX
SM ACT QUAD	XX	S1B	XX
SM ACT BEAM	XXX	S2A	XX
SM CMD BEAM	XXX	S2B	XX
HEMI	XXX	S3A	XX
		S3B	XX
ANT ELEC 1	XX	S4A	XX
BEAM ASSY 1	XX	S4B	XX
ANT ELEC 2	XX		
BEAM ASSY 2	XX	FREQ LOW HIGH	XXX XXXX
ANT ROTARY	XXX	BEAM SELECT	
LLF	XXX	UL FWD	XXX
LLA	XXX	UR FWD	XXX
ULF	XXX	LL FWD	XXX
ULA	XXX	LR FWD	XXX
URF	XXX	UL AFT	XXX
URA	XXX	UR AFT	XXX
LRF	XXX	LL AFT	XXX
		LR AFT	XXX

Figure 5.117-1. S-Band Antenna display

**TITLE**

SM STDN ANTENNA V1.0

**GENERAL**

- A. The data displayed are real-time telemetry parameters that affect the management and operation of the COMM SM downlist. A copy of the SM STDN ANTENNA display is shown in figure 5.118-1.
- B. Pathname of display: INCO/INCO Displays/COMM Systems/stdn\_antenna.
- C. Detailed display description.

- 1. GMT V75W3504D TIME (green)  
Displays Greenwich mean time.
- 2. QUAD SELECT W02G3210R SPECIAL COMP (green)

This is a special comp of the three quad select bits from the SM antenna management, indicating which quad antenna the hardware has selected (UR, LR, UL, or LL).

This special comp is composed of the following MSID V92J1057C:

V92J1057C  
001 UR  
010 LR  
100 UL  
011 LL  
All other bit configurations blank

- 3. QUAD FAIL V92X1049X 1 = FAIL 0 = (blank)  
(red)

This parameter indicates that the SM antenna management cannot compare the commanded quad to the actual selected quad antenna.

- 4. HEMI SELECT W03G3210R SPECIAL COMP (green)

This is a special comp of the two hemi select bits from the SM antenna management, indicating which hemi antenna the hardware has selected (upper or lower).

This special comp is composed of the following MSID V92J1056C:

V92J1056C  
01 UP  
10 LO

All other bit combinations blank



- |    |           |           |                   |             |
|----|-----------|-----------|-------------------|-------------|
| 5. | HEMI FAIL | V92X1050X | 1 = FAIL<br>(red) | 0 = (blank) |
|----|-----------|-----------|-------------------|-------------|

This parameter indicates that the SM antenna management cannot compare the commanded hemi to the actual selected hemi antenna.

- |    |             |           |                         |
|----|-------------|-----------|-------------------------|
| 6. | SITE SELECT | W01G3210R | SPECIAL COMP<br>(green) |
|----|-------------|-----------|-------------------------|

This is a special comp of the four site select bits to determine which site the SM antenna management program is using in computing the line-of-sight pitch and roll angles.

This special comp is composed of the following MSID V92J1054C (S-BD SEL SIT):

V92J1054C	
LSB	
XXXX XXXX XXXX 0001	IOS
0010	MAD
0011	NHS
0100	VAN
0101	BDA
0110	MIL
0111	HTS
1000	GTS
1001	VTS
1010	DGS
1011	CTS
1100	CAN
1101	DFR
1110	GDX
1111	OTS
XXXX XXXX XXXX 0000	DKR

- |    |               |           |                           |
|----|---------------|-----------|---------------------------|
| 7. | STDN ROLL ANG | V92H1069C | FLOATING POINT<br>(green) |
|----|---------------|-----------|---------------------------|

This is an analog parameter indicating the roll look angle to the STDN site computed by the onboard SM antenna management program.

- |    |                |           |                           |
|----|----------------|-----------|---------------------------|
| 8. | STDN PITCH ANG | V92H1068C | FLOATING POINT<br>(green) |
|----|----------------|-----------|---------------------------|

This is an analog parameter indicating the pitch look angle to the STDN site computed by the onboard SM antenna management program.

- 9. SM BYP PL 1                      V92X0323X                      1 = BYP (red)                      0 = (blank)

Indicates that the SM GPC has bypassed the payload MDM (PF 1) and that the SM will not send commands via PF 1.

- 10. SM BYP PL 2                      V92X0327X                      1 = BYP (red)                      0 = (blank)

Indicates that the SM GPC has bypassed the payload MDM 2 (PF 2) and that the SM will not send commands via PF 2.

- 11. SITE IN VIEW                      V92X1053XY                      1 = YES (green)                      0 = NO (yellow)

This parameter indicates that SM antenna management has found an STDN/SGLS site or TDRS in view and is providing an enable indication to uplink processing.

- 12. S-BD SEL SIT                      V92J1054C                      FLOATING POINT (green)

Displays the four site select bits in decimal to determine which site the SM antenna management program is using in computing the line-of-sight pitch and roll angles.

V92J1054C  
LSB

XXXX XXXX XXXX 0001	IOS
0010	MAD
0011	NHS
0100	VAN
0101	BDA
0110	MIL
0111	HTS
1000	GTS
1001	VTS
1010	DGS
1011	CTS
1100	CAN
1101	DFR
1110	GDX
1111	OTS
XXXX XXXX XXXX 0000	DKR

- 13. SEL FWD/AFT                      W12I0603R                      SPECIAL COMP (green)

This is a special comp of the two switch beam select bits from the SM antenna management, indicating which beam the hardware has selected (FWD or AFT).

This special comp is composed of the following MSID V92J1062C:

V92J1062C  
01 FWD  
10 AFT

- |     |               |           |                     |             |
|-----|---------------|-----------|---------------------|-------------|
| 14. | ANT MODE OVRD | V93X5647X | 1 = YES<br>(yellow) | 0 = (blank) |
|-----|---------------|-----------|---------------------|-------------|

In case of an override, the transponder is forced to TDRS mode.

15. SM ANTENNA PTG

ENA	V93X5625X	1 = ENA (green)	0 = (blank)
-----	-----------	--------------------	-------------

This parameter indicates that the SM antenna management program output to the antenna electronic switches is enabled and the onboard software is selecting antennas.

INH	V93X5626X	1 = INH (yellow)	0 = (blank)
-----	-----------	---------------------	-------------

This parameter indicates that the SM antenna management program output to the antenna electronic switches is inhibited and the antennas are being selected via uplink command.

16. SITE SELECT

AUTO	V93X5620X	1 = AUTO (green)	0 = (blank)
------	-----------	---------------------	-------------

This parameter indicates that SM antenna management is selecting STDN sites automatically.

NEXT	V93X5622X	1 = NEXT (green)	0 = (blank)
------	-----------	---------------------	-------------

This parameter indicates that SM antenna management has been requested to scan the STDN/SGLS site table for the next site in the table that is in view. If no site is found, it will revert to the auto state.

- |     |     |           |                     |             |
|-----|-----|-----------|---------------------|-------------|
| 17. | IOS | V92X0976X | 1 = INH<br>(yellow) | 0 = (blank) |
|-----|-----|-----------|---------------------|-------------|

This parameter indicates that the IOS inhibit flag is set and the SM antenna management program is inhibited from using it.

- |     |     |           |                     |             |
|-----|-----|-----------|---------------------|-------------|
| 18. | MAD | V92X0977X | 1 = INH<br>(yellow) | 0 = (blank) |
|-----|-----|-----------|---------------------|-------------|

This parameter indicates that the MAD inhibit flag is set and the SM antenna management program is inhibited from using it.

19.	NHS	V92X0978X	1 = INH (yellow)	0 = (blank)
-----	-----	-----------	---------------------	-------------

This parameter indicates that the GDS inhibit flag is set and the SM antenna management program is inhibited from using it.

20.	VAN	V92X0979X	1 = INH (yellow)	0 = (blank)
-----	-----	-----------	---------------------	-------------

This parameter indicates that the VAN inhibit flag is set and the SM antenna management program is inhibited from using it.

21.	BDA	V92X0980X	1 = INH (yellow)	0 = (blank)
-----	-----	-----------	---------------------	-------------

This parameter indicates that the BDA inhibit flag is set and the SM antenna management program is inhibited from using it.

22.	MIL	V92X0981X	1 = INH (yellow)	0 = (blank)
-----	-----	-----------	---------------------	-------------

This parameter indicates that the MIL inhibit flag is set and the SM antenna management program is inhibited from using it.

23.	HTS	V92X0982X	1 = INH (yellow)	0 = (blank)
-----	-----	-----------	---------------------	-------------

This parameter indicates that the HTS inhibit flag is set and the SM antenna management program is inhibited from using it.

24.	GTS	V92X0983X	1 = INH (yellow)	0 = (blank)
-----	-----	-----------	---------------------	-------------

This parameter indicates that the GTS inhibit flag is set and the SM antenna management program is inhibited from using it.

25.	VTS	V92X0984X	1 = INH (yellow)	0 = (blank)
-----	-----	-----------	---------------------	-------------

This parameter indicates that the VTS inhibit flag is set and the SM antenna management program is inhibited from using it.

26.	DGS	V92X0985X	1 = INH (yellow)	0 = (blank)
-----	-----	-----------	---------------------	-------------

This parameter indicates that the DGS inhibit flag is set and the SM antenna management program is inhibited from using it.

27.	CTS	V92X0986X	1 = INH (yellow)	0 = (blank)
-----	-----	-----------	---------------------	-------------

This parameter indicates that the CTS inhibit flag is set and the SM antenna management program is inhibited from using it.

28.	CAN	V92X0987X	1 = INH (yellow)	0 = (blank)
-----	-----	-----------	---------------------	-------------

This parameter indicates that the CAN inhibit flag is set and the SM antenna management program is inhibited from using it.

29.	DFR	V92X0988X	1 = INH (yellow)	0 = (blank)
-----	-----	-----------	---------------------	-------------

This parameter indicates that the DFR inhibit flag is set and the SM antenna management program is inhibited from using it.

30.	GDX	V92X0989X	1 = INH (yellow)	0 = (blank)
-----	-----	-----------	---------------------	-------------

This parameter indicates that the GDX inhibit flag is set and the SM antenna management program is inhibited from using it.

31.	OTS	V92X0990X	1 = INH (yellow)	0 = (blank)
-----	-----	-----------	---------------------	-------------

This parameter indicates that the OTS inhibit flag is set and the SM antenna management program is inhibited from using it.

32.	DKR	V92X0991X	1 = INH (yellow)	0 = (blank)
-----	-----	-----------	---------------------	-------------

This parameter indicates that the DKR inhibit flag is set and the SM antenna management program is inhibited from using it.

SM STDN ANTENNA		v1.0	
GMT XXX/XX:XX:XX			
QUAD SELECT			XX
QUAD FAIL			XXXX
HEMI SELECT			XX
HEMI FAIL			XXXX
SITE SELECT			XXX
STDN ROLL ANG			XXX
STDN PITCH ANG			XXX
SM BYP PL 1		XXX	
SM BYP PL 2		XXX	
SITE IN VIEW		XXX	
S-BD SEL SIT			XXX
SEL FWD/AFT			XXX
ANT MODE OVRD		XXX	
SM ANTENNA PTG		XXX	
SITE SELECT			XXXX
IOS	XXX	VTS	XXX
MAD	XXX	DGS	XXX
NHS	XXX	CTS	XXX
VAN	XXX	CAN	XXX
BDA	XXX	DFR	XXX
MIL	XXX	GDX	XXX
HTS	XXX	OTS	XXX
GTS	XXX	DKR	XXX

Figure 5.118-1. STDN ANTENNA display

**TITLE**

TDRS COMM V1.2

**GENERAL**

- A. The data displayed are real-time telemetry parameters that affect the management and operation of the COMM SM downlist through TDRS. A copy of the TDRSS COMM display is shown in figure 5.119-1.
- B. Pathname of display: INCO/INCO Displays/COMM Systems/tdrs\_comm.
- C. Detailed display description.

1. GMT V75W3504D TIME  
(green)  
black

Indicates Greenwich mean time.

**S-BAND**

2. ANT SELECTED W02G3210R SPECIAL COMP  
(green)

This is a special comp of the three quad select bits from the SM antenna management, indicating which quad antenna the hardware has selected (UR, LR, UL, or LL).

This special comp is composed of the following MSID V92J1057C:

<u>V92J1057C</u>	<u>Display</u>
001	"UR"
010	"LR"
100	"UL"
011	"LL"

All other bit configurations blank.

3. QUAD FAIL V92X1049X 1 = FAIL 0 = (blank)  
(red)

This parameter indicates that the SM antenna management cannot compare the commanded quad to the actual selected quad antenna.

4. SITE IN VIEW V92X1053XY 1 = YES 0 = (blank)  
(green)

This parameter indicates that SM antenna management has found an STDN/SGLS site or a TDRS in view and is providing an ENABLE indication to the uplink processing.

5. SM ANT PTG  
SM ANT POINTING - ENA V93X5625X 1 = ENA 0 = (blank)  
(green)

This parameter indicates that the SM antenna management program output to the antenna electronic switches is enabled and the onboard software is selecting antennas.

SM ANT POINTING - INH      V93X5626X      1 = INH      0 = (blank)  
(red)

This parameter indicates that the SM antenna management program output to the antenna electronic switches is inhibited and the antennas are being selected via uplink command.

6. TDRS OVRD (item 19)      V93X5647X      1 = YES      0 = (blank)  
(red)

In case of an override, the transponder is forced to TDRS mode.

7. ACT TDRS SEL      W04G3210R      SPECIAL COMP  
(green)

This is a special comp of the two satellite select bits to determine which satellite the SM antenna management program is using in computing the line-of-site pitch and roll angles for the S-band antenna.

This special comp is composed of the following MSID V92J1055C:

<u>V92J1055C</u>	<u>Display</u>
00	“ ”
01	“WEST”
10	“EAST”
11	“ ”

8. QUAD BEAM (PF1)

FWD      V74K7044Y      1 = FWD      0 = (blank)  
(green)

This parameter indicates that the quad beam is in the FWD position via MDM PF1.

AFT      V74K7045Y      1 = AFT      0 = (blank)  
(green)

This parameter indicates that the quad beam is in the AFT position via MDM PF1.

9. QUAD BEAM (PF2)

FWD      V74K7046Y      1 = FWD      0 = (blank)  
(green)

This parameter indicates that the quad beam is in the FWD position via MDM PF2.

AFT      V74K7047Y      1 = AFT      0 = (blank)  
(green)

This parameter indicates that the quad beam is in the AFT position via MDM PF2.



10. PRI MODE

WEST	V93X5613X	1 = WEST (green)	0 = (blank)
------	-----------	---------------------	-------------

This is a comp that indicates that the SM antenna management program is providing S-band look angles to the western satellite if it is in view.

EAST	V93X5615X	1 = EAST (yellow)	0 = (blank)
------	-----------	----------------------	-------------

This is a comp that indicates that the SM antenna management program is providing S-band look angles to the eastern satellite if it is in view.

**Ku-BAND**

11. ACT TDRS SEL	W05G3210R	SPECIAL COMP (green)
------------------	-----------	-------------------------

This is a special comp of the two satellite select bits to determine which satellite the SM antenna management program is using in computing the line-of-sight pitch and roll angles for the Ku-band antenna.

<u>V92J1052C</u>	<u>Display</u>
00	" "
01	"WEST"
10	"EAST"
11	" "

12. TDRS PRI MODE

WEST	V93X5603X	1 = WEST (green)	0 = (blank)
------	-----------	---------------------	-------------

This is a comp that indicates that the SM ANT MGMT program is providing Ku-band look angles to the western satellite.

EAST	V93X5605X	1 = EAST (yellow)	0 = (blank)
------	-----------	----------------------	-------------

This is a comp that indicates that the SM ANT MGMT program is providing Ku-band look angles to the eastern satellite.

**TDRS**

13. IN VIEW

EAST	V92X1060X	1 = YES (green)	0 = NO (yellow)
------	-----------	--------------------	--------------------

This analog parameter indicates that the SM antenna management program has computed that the eastern TDRSS satellite is in view from the orbiter.

WEST	V92X1061X	1 = YES (green)	0 = NO (yellow)
------	-----------	--------------------	--------------------



TDRS COMM v1.2		GMT XXX/XX:XX:XX	
<b>S-BAND</b>			
ANT SELECTED		XX	
QUAD FAIL	XXXX		
SITE IN VIEW	XXX		
SM ANT PTG	XXX		
TDRS OVRD (item 19)	XXX		
ACT TDRS SEL		XXXX	
QUAD BEAM ( PF1 )	XXX		XXX
QUAD BEAM ( PF2 )	XXX		XXX
PRI MODE	XXXX		XXXX
<b>Ku-BAND</b>			
ACT TDRS SEL		XXXX	
PRI MODE	XXXX		XXXX
<b>TDRS</b>			
	<b>E</b>		<b>W</b>
IN VIEW	XXX		XXX
PITCH (EL)	XXX.X		XXX.X
ROLL (AZ)	XXX.X		XXX.X

**Figure 5.119-1. TDRS COMM display**

**TITLE**

S BAND XPNDR V1.1

**GENERAL**

- A. The data displayed are real-time telemetry parameters that affect the management and operation of the S-band PM transponder. A copy of the S Band XPNDR display is shown in figure 5.120-1.
- B. Pathname of display: INCO/INCO Displays/COMM Systems/transponder.
- C. Detailed display description.

1.	GMT	V75W3504D	TIME (green)
----	-----	-----------	-----------------

Indicates Greenwich mean time.

**XPNDR 1**

2.	POWER	V74X4745E	1 = ON (green)	0 = (blank)
----	-------	-----------	-------------------	-------------

This parameter indicates the associated GCIL panel/command driver status for this function. (XPNDR 1 )

3.	DIRECT	V74X4780E	1 = DIR (green)	0 = (blank)
----	--------	-----------	--------------------	-------------

This parameter indicates the antenna switch GCIL panel/command driver status for this function. (XPNDR 1)

4.	AGC S/S	V74E4080A	FLOATING POINT (green)
----	---------	-----------	---------------------------

This parameter indicates the uplinked signal strength received by the S-band transponder 1 (-115 to -30 dBm).

5.	SPE	V74B4086A	FLOATING POINT (green)
----	-----	-----------	---------------------------

This is an analog parameter indicating the frequency offset of transponder 1 receiver VCO (-90 to +90 kHz).

6.	COHRENT	V74X4516E	1 = COH (green)	0 = (blank)
----	---------	-----------	--------------------	-------------

This parameter indicates that transponder 1 has switched to the coherent mode.

7.	PH LOCK	V74X4090E	1 = LOCK (green)	0 = (blank)
----	---------	-----------	---------------------	-------------

This parameter indicates that transponder 1 is phase locked.

8. RF OUT V74E4088A FLOATING POINT  
(green)

This is an analog parameter indicating that the RF output power in transponder 1 is in the SGLS or STDN LO mode (0 to 5 watts).

**Common Data**

9. AGC CAL SB\_AGC SPECIAL COMP  
(green)

This is a special comp that indicates which CAL CURVE the MOC is using to display the XPNDR AGC. There are five CAL CURVES.

All multical curve series numbers currently in use by the D/L FEP are contained within a multisample status data message (SDM) parameter: M21F1115F - Integer - 4 Bytes.

MSID	Sample	Nomenclature
V74E4080A	19	S-Bd XPNDR U/L AGC 1
V74E4081A	20	S-Bd XPNDR U/L AGC 2

The special comp uses the above two MSID to determine an output. The different outputs are as follows:

Sample 19	Sample 20	COMP OUTPUT
1	1	TDRS HI FREQ(green)
2	2	STDN LO (green)
3	3	STDN HI (green)
4	4	SGLS(green)
5	5	TDRS LO FREQ (green)
any other	any other	ERR (green)

10. TDRS V74X4786E 1 = TDRS 0 = (blank)  
(green)

This parameter indicates the associated GCIL panel/command driver status for this function. (XPNDR MODE)

11. STDN-HI V74X4788E 1 = HIGH 0 = (blank)  
(green)

This parameter indicates the associated GCIL panel/command driver status for this function. (XPNDR MODE)

12. STDN-LO V74X4787E 1 = LOW 0 = (blank)  
(green)

This parameter indicates the associated GCIL panel/command driver status for this function. (XPNDR MODE)

- |     |      |           |                     |             |
|-----|------|-----------|---------------------|-------------|
| 13. | SGLS | V74X4789E | 1 = SGLS<br>(green) | 0 = (blank) |
|-----|------|-----------|---------------------|-------------|

This parameter indicates the associated GCIL panel/command driver status for this function.  
 (XPNDR MODE)

- |     |           |           |                    |        |
|-----|-----------|-----------|--------------------|--------|
| 14. | SPRD SPEC | V74X4790E | 1 = OFF<br>(green) | 0 = ON |
|-----|-----------|-----------|--------------------|--------|

This parameter indicates the associated GCIL panel/command driver status for this function.

- |     |         |           |                    |        |
|-----|---------|-----------|--------------------|--------|
| 15. | RANGING | V74X4791E | 1 = OFF<br>(green) | 0 = ON |
|-----|---------|-----------|--------------------|--------|

This parameter indicates the associated GCIL panel/command driver status for this function.

- |     |          |           |                   |         |
|-----|----------|-----------|-------------------|---------|
| 16. | R/L DATA | V74X4735E | 1 = ON<br>(green) | 0 = OFF |
|-----|----------|-----------|-------------------|---------|

This parameter indicates the associated GCIL panel/command driver status for this function.

- |     |          |           |                    |             |
|-----|----------|-----------|--------------------|-------------|
| 17. | LOW FREQ | V74X4792E | 1 = LOW<br>(green) | 0 = (blank) |
|-----|----------|-----------|--------------------|-------------|

This parameter indicates the associated GCIL panel/command driver status for this function.

- |     |           |           |                     |             |
|-----|-----------|-----------|---------------------|-------------|
| 18. | HIGH FREQ | V74X4793E | 1 = HIGH<br>(green) | 0 = (blank) |
|-----|-----------|-----------|---------------------|-------------|

This parameter indicates the associated GCIL panel/command driver status for this function.

- |     |          |           |                    |             |
|-----|----------|-----------|--------------------|-------------|
| 19. | XMIT/RCV | V74X4741E | 1 = T/R<br>(green) | 0 = (blank) |
|-----|----------|-----------|--------------------|-------------|

This parameter indicates the associated GCIL panel/command driver status for this function.

- |     |          |           |                    |             |
|-----|----------|-----------|--------------------|-------------|
| 20. | RCV ONLY | V74X4743E | 1 = RCV<br>(green) | 0 = (blank) |
|-----|----------|-----------|--------------------|-------------|

This parameter indicates the associated GCIL panel/command driver status for this function.

**XPNDR 2**

- |     |       |           |                   |             |
|-----|-------|-----------|-------------------|-------------|
| 21. | POWER | V74X4746E | 1 = ON<br>(green) | 0 = (blank) |
|-----|-------|-----------|-------------------|-------------|

This parameter indicates the associated GCIL panel/command driver status for this function.  
 (XPNDR 2)

- |     |        |           |                    |             |
|-----|--------|-----------|--------------------|-------------|
| 22. | DIRECT | V74X4781E | 1 = DIR<br>(green) | 0 = (blank) |
|-----|--------|-----------|--------------------|-------------|

This parameter indicates the antenna switch GCIL panel/command driver status for this function.  
 (XPNDR 2)



S Band XPNDR v1.1	
GMT XXX/XX:XX:XX	
XPNDR 1	
POWER	XX
DIRECT	XXX
AGC S/S	XXXX
SPE	X
COHRENT	XXX
PH LOCK	XXXX
RF OUT	XX
Common Data	
AGC CAL	X
TDRS	XXXX
STDN-HI	XXXX
STDN-LO	XXX
SGLS	XXXX
SPRD SPEC	XXX
RANGING	XXX
R/L DATA	XXX
LOW FREQ	XXX
HIGH FREQ	XXXX
XMIT/RCV	XXX
RCV ONLY	XXX
XPNDR 2	
POWER	XX
DIRECT	XXX
AGC S/S	XXXX
SPE	X
COHRENT	XXX
PH LOCK	XXXX
RF OUT	XX

**Figure 5.120-1. S Band XPNDR display**



**TITLE**

A/E INST MGMT V1.4

**GENERAL**

- A. The data displayed are real-time telemetry parameters that affect the management and operation of the COMM and INST subsystem. A copy of the A/E INST MGMT display is shown in figure 5.121-1.
- B. Pathname of display: INCO/INCO Displays/ASC/ENT Inst Mgmt.
- C. Detailed display description.

- |    |        |           |                    |
|----|--------|-----------|--------------------|
| 1. | OI TFL | V75X4070D | DECIMAL<br>(green) |
|----|--------|-----------|--------------------|

The format will be displayed with unsuppressed data behind (B, D, or S).

- |    |     |            |                    |
|----|-----|------------|--------------------|
| 2. | GNC | V93Q0022CX | DECIMAL<br>(green) |
|----|-----|------------|--------------------|

The format will be displayed with unsuppressed data behind (B, D, or S).

- |    |     |           |                    |
|----|-----|-----------|--------------------|
| 3. | BFS | V98Q0009C | DECIMAL<br>(green) |
|----|-----|-----------|--------------------|

The format will be displayed with unsuppressed data behind (B, D, or S).

- |    |      |           |                          |
|----|------|-----------|--------------------------|
| 4. | SITE | W01G3211R | SPECIAL COMP<br>(yellow) |
|----|------|-----------|--------------------------|

This is a special comp of the four site select bits to determine which site the backup flight system (BFS) antenna management program is using in computing the line-of-sight pitch and roll angles.

V98U	DTE
1670C	TEXT
<hr/>	
0000	DKR
0001	IOS
0010	MAD
0011	NHS
0100	JDI
0101	BDA
0110	MIL
0111	HTS
1000	GTS
1001	WSM
1010	DGS
1011	GDY
1100	WLP
1101	PDL
1110	DFR
1111	OTS

5. SPC W01G5200L SPECIAL COMP  
(green)

This COMP indicates the number of SPCs in the BFS computer by computing the decimal number from V98J4296C.

**PCMMU BSR**

6. 1 V75X2121D 1 = PCM PWR 0 = PCM PWR  
(darkslategray) (red)

Indicates that the pulse-code modulation (PCM) unit power has dropped since the last bite status register (BSR).

7. 2 V75X2122D 1 = MTU BAD 0 = MTU BAD  
(darkslategray) (red)

Indicates that the PCM 4.608 MHz master timing unit (MTU) input has failed and the PCM is operating on internal clock.

8. 3 V75X2123D 1 = FETCH PRY0 = FETCH PRY  
(darkslategray) (red)

Indicates that one or more fetch programmable read-only memory (PROM) errors have been detected since last BSR reset.

9. 4 V75X2124D 1 = HDR D/L 0 = HDR D/L  
(darkslategray) (red)

This test consists of one or more fetch commands that initiate the RETURN RECEIVED WORD mode of a multiplexer/demultiplexer (MDM). The returned words will all be the same known pattern, which will then be stored in known locations in the PCMMU random access memory (RAM). The 128-kbps telemetry (TLM) format memory will then be programmed to access these words from the data RAM and will check the known pattern. The known pattern is 10101010. This parameter indicates if one or more pattern checks are bad since the last BSR reset.

10. 5 V75X2125D 1 = LDR D/L 0 = LDR D/L  
(darkslategray) (red)

Same as item 4, except check is performed by 64-kbps TLM formatter.

11. 6 V75X2126D 1 = HDR TLM 0 = HDR TLM  
(darkslategray) (red)

Indicates that one or more 128-kbps RAM or PROM parity errors have occurred since last BSR reset.

12. 7 V75X2127D 1 = HDR CNTR 0 = HDR CNTR  
(darkslategray) (red)

Indicates that an error has been detected in one of 128-kbps sample rate counters.

- |   |    |           |                                   |                          |
|---|----|-----------|-----------------------------------|--------------------------|
| 13.   | 8  | V75X2128D | 1 = LDR TLM<br>(darkslategray)    | 0 = LDR TLM<br>(red)     |
| Indicates that one or more 64-kbps TLM RAM parity errors or 64-kbps TLM sample rate counter errors have been detected since the last BSR reset. |    |           |                                   |                          |
| 14.   | 9  | V75X2129D | 1 = RCDR DATA<br>(darkslategray)  | 0 = RCDR DATA<br>(red)   |
| Indicates that the 128-kbps recorder data output has failed.  |    |           |                                   |                          |
| 15.   | 10 | V75X2130D | 1 = DATA INVL<br>(darkslategray)  | 0 = DATA INVL<br>(red)   |
| Indicates that one or more input invalid errors have been detected on any of seven data buses since last BSR reset.                             |    |           |                                   |                          |
| 16.   | 11 | V75X2131D | 1 = OI RAM<br>(darkslategray)     | 0 = OI RAM<br>(red)      |
| Indicates that one or more operational instrumentation (OI) data RAM parity errors have been detected since the last BSR reset.                 |    |           |                                   |                          |
| 17.   | 12 | V75X2132D | 1 = PL RAM<br>(darkslategray)     | 0 = PL RAM<br>(red)      |
| Indicates that one or more PDI RAM parity errors have been detected since the last BSR reset.   |    |           |                                   |                          |
| 18.   | 13 | V75X2133D | 1 = TOG BUFFER<br>(darkslategray) | 0 = TOG BUFFER<br>(red)  |
| Indicates that one or more toggle buffer parity errors have been detected since the last BSR reset.   |    |           |                                   |                          |
| 19.   | 14 | V75X2134D | 1 = NO GPC DAT<br>(darkslategray) | 0 = NO GPC DAT<br>(red)  |
| Indicates that one or more NO RESPONSE conditions have been detected on the five computer buses since the last BSR reset.                       |    |           |                                   |                          |
| 20.   | 15 | V75X2135D | 1 = OI/PL DATA<br>(darkslategray) | 0 = OI/PL DATA<br>(red)  |
| Indicates that one or more no response conditions have been detected on the OI or PDI data buses since the last BSR reset.                      |    |           |                                   |                          |
| 21.   | 16 | V75X2136D | 1 = HDR PROG<br>(green)           | 0 = HDR FIXD<br>(yellow) |
| Indicates that the PCM is in the fixed format mode.   |    |           |                                   |                          |



<u>V75X2755E</u>	<u>V75X2756E</u>	<u>V75X2757E</u>	
0	0	0	STBY
1	0	0	RCDA
0	1	0	PB
1	1	0	LOOP
0	0	1	RCDB
1	0	1	RCDP
0	1	1	PB-P
1	1	1	STOP

25. OPS 1 TRK                      W01I0302C              DECIMAL  
(green)

This is a special comp of the four recorder track bits to determine the active track (0 = parallel record mode; 15 = parallel playback mode; 1 through 14 = active track in other modes).

The special comp is composed of V75X2547E, V75X2548E, V75X2549E, and V75X2550E.

$$W01I0302C = V75X2547E(2^0) + V75X2548E(2^1) + V75X2549E(2^2) + V75X2550E(2^3)$$

26. OPS 2 TRK                      W02I0302C              DECIMAL  
(green)

This is a special comp of the four recorder track bits to determine the active track (0 = parallel record mode; 15 = parallel playback mode; 1 through 14 = active track in other modes).

The special comp is composed of V75X2647E, V75X2648E, V75X2649E, and V75X2650E.

$$W02I0302C = V75X2647E(2^0) + V75X2648E(2^1) + V75X2649E(2^2) + V75X2650E(2^3)$$

27. P/L TRK                      W03I0302C              DECIMAL  
(green)

This is a special comp of the four recorder track bits to determine the active track (0 = parallel record mode; 15 = parallel playback mode; 1 through 14 = active track in other modes).

The special comp is composed of V75X2747E, V75X2748E, V75X2749E, and V75X2750E.

$$V75X2747E(2^0) + V75X2748E(2^1) + V75X2749E(2^2) + \text{and } V75X2750E(2^3)$$

28. OPS 1 % TP                      W01I0306C              FLOATING POINT  
(green)

This is a special comp of the 5 percent tape bits to determine the tape position (beginning of tape (BOT) = 0 percent and end of tape (EOT) = 100 percent).

The special comp is composed of V75X2540E, V75X2541E, V75X2542E, V75X2543E, and V75X2544E.

$$W01I0306C = [ V75X2540E(2^0) + V75X2541E(2^1) + V75X2542E(2^2) + V75X2543E(2^3) + V75X2544E(2^4) ] * (100/31)$$

Percent tape output will be rounded up if the decimal fraction of the computed value is >0.5.









47. MODE V78X9604E 1 = RCD 0 = OFF  
(green) (yellow)

The record telemetry indicates that the record function is in progress, and is a 1 when

- a. The record amps have power present.
- b. The bias oscillator has power present.
- c. The servo indicates phase lock (up to speed).

48. MOTION V78X9605E 1 = RUN 0 = STOP  
(green) (green)

A 1 denotes that tape motion, in actuality a guide roller linked to a tachometer, is greater than or equal to 1-7/8 ips.

49. % TAPE V78Q9602A FLOATING POINT  
(green)

Analog representation is the percentage of tape used, referenced to BOT/EOT with 0% being BOT and 100% being EOT.

50. DIR V78X9612E 1 = FWD 0 = REV  
(green) (green)

1 equals motion from BOT to EOT. 0 equals motion from EOT to BOT.

51. SEQ 3 V78X9613E 1 = ON 0 = (blank)  
(yellow)

Denotes the status of the capability to record the third pass. 0 equals will not record; 1 equals will record.

52. MODE 1 V78X9309E 1 = DATA 0 = CAL  
(green) (yellow)

CAL denotes that a calibration sequence is taking place for the wideband multiplexer (MUX) modules and should last approximately 6 seconds. Data denotes that the FDM is processing normal data.

53. MODE 2 V78X9310E 1 = DATA 0 = CAL  
(green) (yellow)

Same as item 52 for mode 2.

54. TEMP 1 V78T9606A FLOATING POINT  
(green)

Shelf 8 temperature-monitoring sensor located in the proximity of the MADS PCM. Note that the shelf temperature will lead or lag the actual PCM temperature.

- |     |  |           |                           |                   |
|-----|--|-----------|---------------------------|-------------------|
| 55. | FDM 1  | V78X9380E | 1 = 1<br>(green)          | 0 = (blank)       |
|     | Wideband MUX 1 bite bit. A (blank) denotes FDM has failed or is powered off; 1 denotes FDM 1 is good.  |           |                           |                   |
| 56. | FDM 1  | V78X9381E | 1 = 2<br>(green)          | 0 = (blank)       |
|     | Same as item 55 for MUX 2.   |           |                           |                   |
| 57. | FDM 1  | V78X9382E | 1 = 3<br>(green)          | 0 = (blank)       |
|     | Same as item 55 for MUX 3.   |           |                           |                   |
| 58. | FDM 1  | V78X9383E | 1 = 4<br>(green)          | 0 = (blank)       |
|     | Same as item 55 for MUX 3.   |           |                           |                   |
| 59. | FDM 2  | V78X9390E | 1 = 1<br>(green)          | 0 = (blank)       |
|     | Wideband MUX 1 bite bit. A (blank) denotes FDM has failed or is powered off; 1 denotes FDM 2 is good.  |           |                           |                   |
| 60. | FDM 2  | V78X9391E | 1 = 2<br>(green)          | 0 = (blank)       |
|     | Same as item 59 for MUX 2.   |           |                           |                   |
| 61. | FDM 2  | V78X9392E | 1 = 3<br>(green)          | 0 = (blank)       |
|     | Same as item 59 for MUX 3.   |           |                           |                   |
| 62. | FDM 2  | V78X9393E | 1 = 4<br>(green)          | 0 = (blank)       |
|     | Same as item 59 for MUX 4.   |           |                           |                   |
| 63. | TEMP 2   | V78T9607A | FLOATING POINT<br>(green) |                   |
|     | Shelf 8 temperature-monitoring sensor located in the proximity of the FDM equipment. Note that the shelf temperature will lead or lag the actual equipment temperature.  |           |                           |                   |
| 64. | PCM 1  | V78X9611E | 1 = GOOD<br>(green)       | 0 = FAIL<br>(red) |
|     | MADS composite BITE BIT consisting of internal self-checks. The BITE circuitry verifies the correct operation of the low-level discrete (5 V dc) group module, the high-level analog group module, and each gain step in the low-level analog group module. Bipolar analogs and high-level discretes are not checked. If a fail is indicated, any or all of the above module groups may have failed. |           |                           |                   |

65. PCM 2 V78X9614E 1 = GOOD 0 = FAIL  
(green) (red)

Same as item 64 for PCM 2.

66. PCM 3 V78X9615E 1 = GOOD 0 = FAIL  
(green) (red)

Same as item 64 for PCM 3.

**PCMMU**

67. BITE V75M2120P HEX  
(green)

PCMMU bite status register in HEX.

Bit 1 PCM UNIT POWER STATUS GOOD  
2 MTU GOOD  
3 FETCH PROM PARITY GOOD  
4 128 KBPS TLM DOWNLINK GOOD  
5 64 KBPS TLM DOWNLINK GOOD  
6 128 KBPS TLM PARITY GOOD  
7 128 KBPS TLM COUNTERS GOOD  
8 64 KBPS TLM RAM PAR CNTR GOOD  
9 RECORDER DATA GOOD  
10 INPUT DATA VALID  
11 OI RAM PARITY  
12 PDI RAM PARITY  
13 TOGGLE BUFFER PARITY  
14 NO RESPONSE COMPUTER BUS  
15 NO RESPONSE MDM OR PDI  
16 128 KBPS PRGM/FIXED FORMAT

68. PWR (1) V75S2107E 1 = 1 0 = (blank)  
(green)

Switch setting for power to PCMMU 1.

69. PWR (2) V75S2109E 1 = 2 0 = (blank)  
(green)

Switch setting for power to PCMMU 2.

70. A (1) V76X4265E 1 = ON 0 = --  
(green) (tan)

Remote power controller (RPC) A power discrete.

71. A (2) V76X4272E 1 = ON 0 = --  
(green) (tan)

RPC A power discrete.



78. SWITCH	V75S5100E	1 = ON (green)	0 = OFF (yellow)
------------	-----------	-------------------	---------------------

PDI power. PDI may be powered on via GCIL command if the S-band PL control switch is in the CMD position or may be powered on by switch 17, panel A1 if in the PNL position. Either position will indicate according to the control switch.

79. A-	V76X4376E	1 = ON (green)	0 = OFF (yellow)
--------	-----------	-------------------	---------------------

PDI RPC A power. Indicates the status of RPC A.

80. C-	V76X4378E	1 = ON (green)	0 = OFF (yellow)
--------	-----------	-------------------	---------------------

PDI RPC C power. Indicates the status of RPC C.

81. DCM 1 FMT	V75J5132D	DECIMAL (green)
---------------	-----------	--------------------

Integer value of the DFL load in DECOM 1 loaded by SM 2 via Spec 62

82. DCM 2 FMT	V75J5152D	DECIMAL (green)
---------------	-----------	--------------------

Same as item 81 for DECOM 2.

83. DCM 3 FMT	V75J5172D	DECIMAL (green)
---------------	-----------	--------------------

Same as item 81 for DECOM 3.

84. DCM 4 FMT	V75J5192D	DECIMAL (green)
---------------	-----------	--------------------

Same as item 81 for DECOM 4.

85. DCM 1 SRC	V75J5111D	DECIMAL (green)
---------------	-----------	--------------------

Switch matrix connection for PDI payload input to DECOM 1.

0 = No connection	4 = Payload port 4
1 = Payload port 1	5 = Payload port 5
2 = Payload port 2	6 = PSP payload port 6
3 = Payload port 3	7 = TEST port (not used)

Note: This is an active read and reflects the true status of the switch matrix.

86. DCM 2 SRC	V75J5112D	DECIMAL (green)
---------------	-----------	--------------------

Same as item 85 for DECOM 2.

87.	DCM 3 SRC	V75J5113D	DECIMAL (green)	
	Same as item 85 for DECOM 3.			
88.	DCM 4 SRC	V75J5114D	DECIMAL (green)	
	Same as item 85 for DECOM 4.			
89.	DCM 1 LOCK	V75X6403D	1 = B (green)	0 = - (yellow)
	Bit sync locked on bit synchronizer for DECOM 1.			
90.	DCM 1 LOCK	V75X6402D	1 = W (green)	0 = - (yellow)
	Word sync locked on word synchronizer for DECOM 1.			
91.	DCM 1 LOCK	V75X6401D	1 = MF (green)	0 = -- (yellow)
	Master frame lock for DECOM 1.			
92.	DCM 2 LOCK	V75X6407D	1 = B (green)	0 = - (yellow)
	Same as item 89 for DECOM 2.			
93.	DCM 2 LOCK	V75X6406D	1 = W (green)	0 = - (yellow)
	Same as item 90 for DECOM 2.			
94.	DCM 2 LOCK	V75X6405D	1 = MF (green)	0 = -- (yellow)
	Same as item 91 for DECOM 2.			
95.	DCM 3 LOCK	V75X6411D	1 = B (green)	0 = - (yellow)
	Same as item 89 for DECOM 3.			
96.	DCM 3 LOCK	V75X6410D	1 = W (green)	0 = - (yellow)
	Same as item 90 for DECOM 3.			
97.	DCM 3 LOCK	V75X6409D	1 = MF (green)	0 = -- (yellow)
	Same as item 91 for DECOM 3.			

98. DCM 4 LOCK                      V75X6415D                      1 = B  
(green)                              0 = -  
(yellow)

Same as item 89 for DECOM 4.

99. DCM 4 LOCK                      V75X6414D                      1 = W  
(green)                              0 = -  
(yellow)

Same as item 90 for DECOM 4.

100. DCM 4 LOCK                      V75X6413D                      1 = MF  
(green)                              0 = --  
(yellow)

Same as item 91 for DECOM 4.

101. BITES                              V75M6400P                      HEX  
(green)

HEX parent word for word 1 of the bite status register. Bit definition is as follows:

Bit no.

1. MASTER FRAME LOCK 1
2. WORD LOCK 1
3. BIT LOCK 1
4. BR ACCURACY 1
5. MASTER FRAME LOCK 2
6. WORD LOCK 2
7. BIT LOCK 2
8. BR ACCURACY 2
9. MASTER FRAME LOCK 3
10. WORD LOCK 3
11. BIT LOCK 3
12. BR ACCURACY 3
13. MASTER FRAME LOCK 4
14. WORD LOCK 4
15. BIT LOCK 4
16. BR ACCURACY 4

102. BITES                              V75M6420P                      HEX  
(green)

HEX parent word for word 2 of the BSR. Bit definition is as follows:

Bit no.

1. NO RESPONSE 1
2. INPUT DATA INVALID 1
3. NO RESPONSE 2
4. INPUT DATA INVALID 2
5. NO RESPONSE 3
6. INPUT DATA INVALID 3
7. TB PARITY GOOD

8. DATA RAM PARITY GOOD
9. FPM PARITY GOOD
10. DCM 1 PARITY GOOD
11. DCM 2 PARITY GOOD
12. DCM 3 PARITY GOOD
13. DCM 4 PARITY GOOD
14. MTU IRIG GOOD
15. PCM 1.152 MHZ GOOD
16. POWER STATUS

**DSC BITE**

103. OF	V75X2171E	1 = 1 (darkslategray)	0 = 1 (red)
---------	-----------	--------------------------	----------------

This parameter indicates the state of the two OF1 DSC power supplies. If either supply fails or is out of tolerance (0.5 percent of 17 V) or if one of the 28 V power sources powering the DSC is lost, the parameter will indicate a logic 0. A logic 1 indicates good power supplies.

104. OF	V75X2172E	1 = 2 (darkslategray)	0 = 2 (red)
---------	-----------	--------------------------	----------------

Same as OF1 DSC BITE for OF2 DSC.

105. OF	V75X2173E	1 = 3 (darkslategray)	0 = 3 (red)
---------	-----------	--------------------------	----------------

Same as OF1 DSC BITE for OF3 DSC.

106. OA	V75X2174E	1 = 1 (darkslategray)	0 = 1 (red)
---------	-----------	--------------------------	----------------

Same as OF1 DSC BITE for OA1 DSC.

107. OA	V75X2175E	1 = 2 (darkslategray)	0 = 2 (red)
---------	-----------	--------------------------	----------------

Same as OF1 DSC BITE for OA2 DSC.

108. OA	V75X2176E	1 = 3 (darkslategray)	0 = 3 (red)
---------	-----------	--------------------------	----------------

Same as OF1 DSC BITE for OA3 DSC.

109. OM	V75X2181E	1 = 1 (darkslategray)	0 = 1 (red)
---------	-----------	--------------------------	----------------

Same as OF1 DSC BITE for OM1 DSC.

110. OM	V75X2182E	1 = 2 (darkslategray)	0 = 2 (red)
---------	-----------	--------------------------	----------------

Same as OF1 DSC BITE for OM2 DSC.



111. OM	V75X2183E	1 = 3 (darkslategray)	0 = 3 (red)
---------	-----------	--------------------------	----------------

Same as OF1 DSC BITE for OM3 DSC.

112. OP	V75X2184E	1 = 1 (darkslategray)	0 = 1 (red)
---------	-----------	--------------------------	----------------

Same as OF1 DSC BITE for OP1 DSC.

113. OP	V75X2185E	1 = 2 (darkslategray)	0 = 2 (red)
---------	-----------	--------------------------	----------------

Same as OF1 DSC BITE for OP2 DSC.

**MDM WRAP**

114. OF	OF1_MDM_WRAP	1 = 1 (darkslategray)	0 = 1 (red)
---------	--------------	--------------------------	----------------

This special comp evaluates the bus link between the PCMMU and the OF1 MDM. An 8-bit OI validation word from OF1 MDM is received at 10 samples/second to test the link. This comp checks to see whether two consecutive samples complement each other. A logic 0 indicates that two consecutive samples are not complements of each other and therefore failed. A logic 1 indicates they are complements and the link is good.

115. OF	OF2_MDM_WRAP	1 = 2 (darkslategray)	0 = 2 (red)
---------	--------------	--------------------------	----------------

Same as OF1 MDM WRAP for OF2.

116. OF	OF3_MDM_WRAP	1 = 3 (darkslategray)	0 = 3 (red)
---------	--------------	--------------------------	----------------

Same as OF1 MDM WRAP for OF3.

117. OF	OF4_MDM_WRAP	1 = 4 (darkslategray)	0 = 4 (red)
---------	--------------	--------------------------	----------------

Same as OF1 MDM WRAP for OF4.

118. OA	OA1_MDM_WRAP	1 = 1 (darkslategray)	0 = 1 (red)
---------	--------------	--------------------------	----------------

Same as OF1 MDM WRAP for OA1.

119. OA	OA2_MDM_WRAP	1 = 2 (darkslategray)	0 = 2 (red)
---------	--------------	--------------------------	----------------

Same as OF1 MDM WRAP for OA2.

120. OA	OA3_MDM_WRAP	1 = 3 (darkslategray)	0 = 3 (red)
---------	--------------	--------------------------	----------------

Same as OF1 MDM WRAP for OA3.



128. BITE (BFS)	V98X0246X	1 = BTE (red)	0 = (blank)
-----------------	-----------	------------------	-------------

This is bit 16 of the BFS NSP STATUS word. BLANK indicates the proper operation (bit 9) of the forward link voice buffers (bit 6), the return link voice buffers (bit 7), and also indicates that there has not been an NSP undervoltage condition. Failure of any one of these functions for 0.5 seconds or more will cause this parameter to go high.

129. BIT SYNC (OI)	V74X5188E	1 = BIT (green)	0 = (blank)
--------------------	-----------	--------------------	-------------

BIT indicates that NSP 1's bit sync lock detector reached threshold after integrating for - symbol times. The bit lock detector threshold changes for each mode, DOD or NASA, decoding ON or OFF.

130. BIT SYNC (OI)	V74X5189E	1 = BIT (green)	0 = (blank)
--------------------	-----------	--------------------	-------------

BIT indicates that the NSP 2's bit sync lock detector reached threshold after integrating for - symbol times. The bit lock detector threshold changes for each mode, DOD or NASA, decoding ON or OFF.

131. BIT SYNC (GN)	V92X6083XX	1 = (blank)	0 = BIT (green)
--------------------	------------	-------------	--------------------

BIT indicates that the selected NSP's bit sync lock detector reached threshold after integrating for - symbol times. The bit lock detector threshold changes for each mode, DOD or NASA, decoding ON or OFF.

132. BIT SYNC (BFS)	V98X0233X	1 = (blank)	0 = BIT (green)
---------------------	-----------	-------------	--------------------

BIT indicates that the selected NSP's bit sync lock detector reached threshold after integrating for - symbol times. The bit lock detector threshold changes for each mode, DOD or NASA, decoding ON or OFF.

133. FRM SYNC (OI)	V74X5176E	1 = FRM (green)	0 = (blank)
--------------------	-----------	--------------------	-------------

FRM indicates that the NSP 1 had two consecutive frame sync patterns pass the pattern check and will remain locked until two consecutive frame sync patterns fail the pattern check.

LOSS indicates the NSP frame sync lock logic has detected three consecutive frame sync correlation failures, and the NSP forward link data processing is inhibited.

134. FRM SYNC (OI)	V74X5177E	1 = FRM (green)	0 = (blank)
--------------------	-----------	--------------------	-------------

FRM indicates that the NSP 2 had two consecutive frame sync patterns pass the pattern check and will remain locked until two consecutive frame sync patterns fail the pattern check.

LOSS indicates the NSP frame sync lock logic has detected three consecutive frame sync correlation failures, and the NSP forward link data processing is inhibited.



OEX

145. V78X9511E 1 = (blank) 0 = BITE  
(red)

Same as ITEM 46 for OEX Recorder BITE.

146. MODE V78X9512E 1 = RCD 0 = STBY  
(green) (green)

Same as ITEM 47 for OEX Recorder Record.

147. MOTION V78X9513E 1 = RUN 0 = STOP  
(green) (green)

Same as ITEM 48 for OEX Recorder Motion.

148. DIR V78X9552E 1 = REV 0 = FWD  
(green) (green)

Same as ITEM 50 for OEX Recorder Direction.

149. % TAPE V78Q9551A FLOATING POINT  
(green)

Same as ITEM 49 for OEX Recorder Direction.

150. SPEED W01I0701R SPECIAL COMP  
(green)

This is a special comp made up of the three-speed bits.

<u>V78X9548E</u>	<u>V78X9549E</u>	<u>V78X9550E</u>	
0	0	0	STOP
0	1	1	1.87
0	1	0	3.75
0	1	1	7.50
1	0	0	15.00
1	0	1	30.00
1	1	0	60.00

151. TRACK W01I0702C FLOATING POINT  
(green)

This is a special comp made up of the five-track bits.

Inputs

V78X9553E - X1  
V78X9554E - X2  
V78X9555E - X3  
V78X9556E - X4  
V78X9557E - X5

$$W01I0702C = X1(2^{**4}) + X2(2^{**3}) + X3(2^{**2}) + X4(2^{**1}) + X5(2^{**0}) + 1$$

152. CMD ECHO W01I0703L SPECIAL COMP  
(green)

This is a special comp made up of the command echo bits.

Inputs

V78X9540E - X1  
V78X9541E - X2  
V78X9542E - X3  
V78X9543E - X4  
V78X9544E - X5  
V78X9545E - X6  
V78X9546E - X7  
V78X9547E - X8

X1 X2 X3 X4 | X5 X6 X7 X8  
HEX CHAR1 | HEX CHAR2

These two HEX characters combine to form a HEX word that will be output to DTE. It will be used by operators to confirm receipt of commands as well as for troubleshooting problems with the SCM.

The eight bits are converted directly into HEX.

Examples:

<u>X1</u>	<u>X2</u>	<u>X3</u>	<u>X4</u>	<u>X5</u>	<u>X6</u>	<u>X7</u>	<u>X8</u>	<u>HEX output</u>
1	1	0	0	0	0	0	0	C0
0	0	0	0	0	0	0	1	01
0	0	0	1	0	0	0	0	10

**FM**

153. SIG STRG WZZT0149A FLOATING POINT  
(green)

This is an analog parameter indicating the GSTDN-received signal strength for the S-band FM link in dBm.

154. ANT SEL W03I0200R SPECIAL COMP  
(green)

This is a special comp of both the crew's switch positions and the antenna sel relay S5 to determine the selected hemi antenna (UP or LO).

The special comp is composed of V74X6675E and V74X6676E.

<u>V74X6675E</u>	<u>V74X6676E</u>	
1	0	UP
0	1	LOW
All other combinations output		ER

155. ANT MODE W02I0200R SPECIAL COMP  
(green)

This is a special comp of both the crew's hemi switch positions to determine if the switch is in the manual or GPC position.

The special comp is composed of V74S6503E and V74S6504E.

<u>V74S6503E</u>	<u>V74S6504E</u>	
1	0	MAN
0	1	MAN
0	0	GPC
Other combinations output		INVL

156. MODE W01I0200R SPECIAL COMP  
(green)

This is a special comp of the FM mode switch parameters to determine the position selected (TV, PL ANLG, PL DGTL, PL RCD, ME, OPS RCD, DOD, or OFF).

The special comp is composed of V74X4800E, V74X4801E, V74X4802E, V74X4803E, V74X4804E, V74X4805E, and V74X4806E.

V4	V4	V4	V4	V4	V4	V4	
78	78	78	78	78	78	78	
40	40	40	40	40	40	40	
X0	X1	X2	X3	X4	X5	X6	
E	E	E	E	E	E	E	
1	0	0	0	0	0	0	OPS RCD
0	1	0	0	0	0	0	ME
0	0	1	0	0	0	0	PL RCD
0	0	0	1	0	0	0	PL DGTL
0	0	0	0	1	0	0	PL DGTL
0	0	0	0	0	1	0	DOD
0	0	0	0	0	0	1	TV
0	0	0	0	0	0	0	OFF
All other combinations output							INVL

157. PWR (1) V74X6120E 1 = ON 0 = (blank)  
(green)

This parameter indicates that the S-band FM transmitter 1 and signal processor 1 have 28 V dc applied.

158. PWR (2) V74X6121E 1 = ON 0 = (blank)  
(green)

This parameter indicates that the S-band FM transmitter 2 and signal processor 2 have 28 V dc applied.

159. RF (1) V74E6650A FLOATING POINT  
(green)

This is an analog parameter indicating the FM 1 transmitter RF power output in watts. The normal output is 15 watts.

160. RF (2) V74E6651A FLOATING POINT  
(green)

This is an analog parameter indicating the FM 2 transmitter RF power output in watts. The normal output is 15 watts.

**GN**

161. GPC 1 MASK DISB V91X7932XX 1 = -- 0 = PL1  
(GPC 1 has) (green) (yellow)

Indicates that GPC 1 does not have a mask on the PL 1 bus; i.e., GPC 1 communications on the PL 1 bus for uplink command purposes is possible if its transmitter is enabled.

162. GPC 1 MASK DISB V91X7933XX 1 = -- 0 = PL2  
(GPC 1 has) (green) (yellow)

Indicates that GPC 1 does not have a mask on the PL 2 bus; i.e., GPC 1 communications on the PL 2 bus for uplink command purposes is possible if its transmitter is enabled.

163. V98X0583X 1 = RUN 0 = (blank)  
(green)

Indicates when the BFS machine is in RUN mode.

164. V98X0582X 1 = STBY 0 = (blank)  
(yellow)

Indicates when the BFS machine is in STANDBY mode.

165. V98X0581X 1 = HALT 0 = (blank)  
(red)

Indicates when the BFS machine is in HALT mode.

166. V98X0643X 1 = ENGA 0 = (blank)  
(red)

Indicates when the BFS machine is engaged.

167. TRK V98X2752X 1 = 1 0 = -  
(green) (red)

Indicates that the BFS is tracking string 1.

168. TRK V98X2754X 1 = 3 0 = -  
(green) (red)

Indicates that the BFS is tracking string 3.



169. PL	V98X0961X	1 = BY1 (red)	0 = 1 (green)
---------	-----------	------------------	------------------

Indicates that the BFS has bypassed MDM PF1.

170. PL	V98X0965X	1 = BY2 (red)	0 = 2 (green)
---------	-----------	------------------	------------------

Indicates that the BFS has bypassed MDM PF2.

A/E INST MGMT v1.4		GMT xxx/xx:xx:xx		MET xx/xx:xx:xx		STS xxx/xxx						
		OI TFL xxx	GNC xx	BFS xx	SITE xxx	SPC xx						
PCMMU BSR	PCMMU	DSC BITE				NSP/COM	OI	GN	BFS			
1 PCM PWR	BITE xxxx	OF	1	2	3	SELECT		x	x	x	x	
2 MTU BAD	PWR x x	OA	1	2	3	BITE	xxx xxx	xxx	xxx			
3 FETCH PRY	A -- xx	OM	1	2	3	BIT SYNC	xxx xxx	xxx	xxx			
4 HDR D/L	B xx xx	OP	1	2		FRM SYNC	xxx xxx	xxx	xxx			
5 LDR D/L	C -- xx	MDM WRAP				COM SYNC	xxx xxx					
6 HDR TLM	MODE xxx	OF	1	2	3	4	COM BITE	x	x			
7 HDR CNTR	BFS TFL xxx	OA	1	2	3		BCE A BYP	xxx	xxx			
8 LDR TLM	PDI							GN				
9 RCDR DATA	WRAP TEST xx	PL CNTRL xxx				OEX	xxxx	GPC 1 has xx xx				
10 DATA INVL	SWITCH xx A- xx C- xx						MODE	xxxx	BFS			
11 OI RAM						MOTION	xxxx	x	x	x	x	
12 PL RAM	DCM	1	2	3	4	DIR	xxx	TRK x x PL x x				
13 TOG BUFFER	FMT xx xx xx xx						% TAPE	xxx	FM			
14 NO GPC DAT	SRC x x x x	BITE	xxxx						SPEED	xxxx	SIG STRG x	
15 OI/PL DATA	LOCK x x x x						TRACK	x	ANT SEL xxx			
16 HDR PROG	xx xx xx xx xxxx						CMD ECHO	x	ANT MODE xxx			
RECORDERS	MODE	TRK	%TP	DIR	SPD	MTN	TEMP	BITE	MODE xxxxxx			
OPS 1	xxxx	xx	xx	xxx	x	xxxx	xxx	xxxx	SYS 1 xx 2 xx			
2	xxxx	xx	xx	xxx	x	xxxx	xxx	xxxx	PWR			
P/L	xxxx	xx	xx	xxx	x	xxxx	xxx	xxxx	RF xx xx			
MADS												
BITE	xxxx	% TAPE	xxxx	MODE 1	xxxx	FDM	xxxx	PCM 1	xxxx			
MODE	xxx	DIR	xxx	MODE 2	xxxx	2	xxxx	2	xxxx			
MOTION	xxxx	SEQ 3	xx	TEMP 1	xxx	TEMP 2	xxx	3	xxxx			

Figure 5.121-1. A/E INST MGMT display

**TITLE**

BIOMED V 1.0

**GENERAL**

- A. The data displayed are real-time telemetry that affect the management and operation of the BIOMED system. A copy of the BIOMED system display is shown in figure 5.122-1.
- B. Pathname of display: INCO/INCO Displays/INST Systems/bio\_med.
- C. Detailed display description.

1.	CHAN 1 - MS	V67X0110E	1 = MS (green)	0 = (blank)
----	-------------	-----------	-------------------	-------------

This parameter indicates that the channel 1 biomedical instrumentation switch is in the MS position, enabling electrocardiogram (ECG) data to be obtained from the mission specialist.

2.	CHAN 2 - MS	V67X0210E	1 = MS (green)	0 = (blank)
----	-------------	-----------	-------------------	-------------

This parameter indicates that the channel 2 biomedical instrumentation switch is in the MS position, enabling ECG data to be obtained from the mission specialist.

3.	CHAN 1 - PS	V67X0112E	1 = PS (green)	0 = (blank)
----	-------------	-----------	-------------------	-------------

This parameter indicates that the channel 1 biomedical instrumentation switch is in the PS position, enabling ECG data to be obtained from the pilot.

4.	CHAN 2 - PS	V67X0212E	1 = PS (green)	0 = (blank)
----	-------------	-----------	-------------------	-------------

This parameter indicates that the channel 2 biomedical instrumentation switch is in the PS position, enabling ECG data to be obtained from the pilot.

5.	CHAN 1 - MD LEFT	V67X0114E	1 = MD-L (green)	0 = (blank)
----	------------------	-----------	---------------------	-------------

This parameter indicates that the channel 1 biomedical instrumentation switch is enabled to the MID DECK BIOMED panel, left connector.

6.	CHAN 2 - MD LEFT	V67X0214E	1 = MD-L (green)	0 = (blank)
----	------------------	-----------	---------------------	-------------

This parameter indicates that the channel 2 biomedical instrumentation switch is in the MID DECK BIOMED panel, left connector.

7. CHAN 1 - MD CENTER      V67X0116E      1 = MD-C  
(green)      0 = (blank)

This parameter indicates that the channel 1 biomedical instrumentation switch is enabled to the MID DECK BIOMED panel, center connector.

8. CHAN 2 - MD CENTER      V67X0216E      1 = MD-C  
(green)      0 = (blank)

This parameter indicates that the channel 2 biomedical instrumentation switch is in the MID DECK BIOMED panel, center connector.

9. CHAN 1 - MD RIGHT      V67X0118E      1 = MD-R  
(green)      0 = (blank)

This parameter indicates that the channel 1 biomedical instrumentation switch is enabled to the MID DECK BIOMED panel, right connector.

10. CHAN 2 - MD RIGHT      V67X0218E      1 = MD-R  
(green)      0 = (blank)

This parameter indicates that the channel 2 biomedical instrumentation switch is in the MID DECK BIOMED panel, right connector.

11. CHAN 1 - EVA 1      V67X0120E      1 = EVA  
(green)      0 = (blank)

This parameter indicates that the channel 1 biomedical instrumentation switch is enabled to the 259.7 MHz EVA/ATC XCVR.

12. CHAN 2 - EVA 1      V67X0220E      1 = EVA  
(green)      0 = (blank)

This parameter indicates that the channel 2 biomedical instrumentation switch is enabled to the 279.0 MHz EVA/ATC XCVR.

BIOMED v 1.0		XXX/XX:XX:XX	
	CHANNEL		
DATA SOURCE	1	2	
MS	XX	XX	
PS	XX	XX	
MD LEFT	XXXX	XXXX	
MD CENTER	XXXX	XXXX	
MD RIGHT	XXXX	XXXX	
EVA1	XXX	XXX	

Figure 5.122-1. BIOMED display

**TITLE**

COMM/INST BYPASS V 1.1

**GENERAL**

- A. The data displayed are real-time telemetry parameters affecting the COMM and DPS software systems. A copy of the COMM/INST BYPASS display is shown in figure 5.123-1. Refer to PCMMU Element Bypass and the flight-specific PMU element bypass list for further analysis of the PCMMU element bypass indications.
- B. Pathname of display: INCO/INCO Displays/INST Systems/comm\_bypass.
- C. Detailed display description.

1.	PMU RC1 TIO	V92X0585X	1 = BYP (red)	0 = (blank)
----	-------------	-----------	------------------	-------------

This is a discrete parameter that indicates that the SM GPC has encountered 2 consecutive errors on at least 1 of the 48 elements of SM/PCMMU TIMER READ CYCLE 1 and has bypassed that element(s). Refer to INCO/COMM Systems Brief 36 for definition of PCMMU TIO reads.

2.	PMU RC1 SVC	V92X0586X	1 = BYP (red)	0 = (blank)
----	-------------	-----------	------------------	-------------

This is a discrete parameter indicating that the SM GPC has encountered 2 consecutive errors on at least 1 of the 48 elements of SM/PCMMU supervisor call (SVC) read cycle 1 and has bypassed that element(s). Refer to INCO/COMM Systems Brief 36 for definition of PCMMU SVC reads.

3.	PMU RC2 TIO	V92X0587X	1 = BYP (red)	0 = (blank)
----	-------------	-----------	------------------	-------------

Same as V92X0585X, except PCMMU TIMER read cycle 2.

4.	PMU RC2 SVC	V92X0588X	1 = BYP (red)	0 = (blank)
----	-------------	-----------	------------------	-------------

Same as V92X0586X, except PCMMU SVC read cycle 2.

5.	PMU RC3 TIO	V92X0589X	1 = BYP (red)	0 = (blank)
----	-------------	-----------	------------------	-------------

Same as V92X0585X, except PCMMU TIMER read cycle 3.

6.	PMU RC3 SVC	V92X0590X	1 = BYP (red)	0 = (blank)
----	-------------	-----------	------------------	-------------

Same as V92X0586X, except PCMMU SVC read cycle 3.

7.	PMU RC4 TIO	V92X0591X	1 = BYP (red)	0 = (blank)
----	-------------	-----------	------------------	-------------

Same as V92X0585X, except PCMMU TIMER read cycle 4.

8. PMU RC4 SVC V92X0592X 1 = BYP (red) 0 = (blank)

Same as V92X0586X, except PCMMU SVC read cycle 4.

9. PMU RC5 TIO V92X0593X 1 = BYP (red) 0 = (blank)

Same as V92X0585X, except PCMMU TIMER read cycle 5.

10. PMU RC5 SVC V92X0594X 1 = BYP (red) 0 = (blank)

Same as V92X0586X, except PCMMU SVC read cycle 5.

11. PMU RC6 TIO V92X0595X 1 = BYP (red) 0 = (blank)

Same as V92X0585X, except PCMMU TIMER read cycle 6.

12. PMU RC6 SVC V92X0596X 1 = BYP (red) 0 = (blank)

Same as V92X0586X, except PCMMU SVC read cycle 6.

13. ID LAST ERROR V92U0597C BINARY (green)

This parameter is a binary readout, indicating the read cycle ID of the last error encountered by the SM GPC when reading PCMMU data. This parameter is used in conjunction with V92U0599C and V92U0600C to determine the current error processing status of the SM GPC on PCMMU reads.

14. ERROR COUNT V92U0600C DECIMAL (green)

This parameter is a decimal readout, indicating how many errors have occurred on SM GPC reads of PCMMU data since SM initialization. This integer counter will roll over after it reaches 999 error counts. This counter will enable the MCC to see how many errors have occurred since the last sight-in-view period.

15. ELEM NUMB V92U0599C DECIMAL (green)

This parameter is a decimal representation of the element number in the read cycle defined by V92U0597C where the SM GPC last encountered an error on PCMMU data reads.

16. PF1 PDI SW MATRIX V92X0908X 1 = BYP (red) 0 = (blank)

This is a discrete parameter indicating that the SM GPC has encountered two consecutive errors on the payload bus 1 (PF1) transaction read of the PDI switch matrix data and has bypassed that read.

- |     |         |           |                  |             |
|-----|---------|-----------|------------------|-------------|
| 17. | PF1 RTN | V92X0323X | 1 = BYP<br>(red) | 0 = (blank) |
|-----|---------|-----------|------------------|-------------|

This is a discrete parameter indicating that the SM GPC has encountered an error on some previous PL 1 MDM transaction plus a RETURN WORD echo check fail, and that SM has bypassed all elements (read transactions) for PL 1 MDM.

- |     |          |           |                  |             |
|-----|----------|-----------|------------------|-------------|
| 18. | PF1 KU-B | V92X0324X | 1 = BYP<br>(red) | 0 = (blank) |
|-----|----------|-----------|------------------|-------------|

This is a discrete parameter indicating that the SM GPC has encountered two consecutive read errors on its read transaction with the PL MDM1 serial I/O interface to the Ku-band signal processor and has bypassed that transaction.

- |     |           |           |                  |             |
|-----|-----------|-----------|------------------|-------------|
| 19. | PF1 PSP 1 | V92X0325X | 1 = BYP<br>(red) | 0 = (blank) |
|-----|-----------|-----------|------------------|-------------|

This is a discrete parameter indicating that the SM GPC has encountered two consecutive read element errors on the GPC's read transaction with the PL MDM 1 serial I/O interface to payload signal processor 1 and has bypassed that read element. SM applications reacts uniquely to this bypass by terminating the entire output, input, and process in response to the bypass by system software.

- |     |         |           |                  |             |
|-----|---------|-----------|------------------|-------------|
| 20. | PF2 RTN | V92X0327X | 1 = BYP<br>(red) | 0 = (blank) |
|-----|---------|-----------|------------------|-------------|

This is a discrete parameter indicating that an error and bypass of PL 2 MDM read elements have occurred. Same as V92X0323X, except PL2 MDM.

- |     |           |           |                  |             |
|-----|-----------|-----------|------------------|-------------|
| 21. | PF2 PSP 2 | V92X0329X | 1 = BYP<br>(red) | 0 = (blank) |
|-----|-----------|-----------|------------------|-------------|

Same as V92X0325X, except PSP 2 and PL MDM 2.

- |     |          |            |                    |  |
|-----|----------|------------|--------------------|--|
| 22. | 1 BCE EL | V92J4325CY | DECIMAL<br>(green) |  |
|-----|----------|------------|--------------------|--|

This parameter is a decimal number indicating the BCE element number (which uniquely identifies an LRU that may be bypassed by software action) of the LRU that was being accessed when the I/O error occurred as logged in I/O error log entry 1.

- |     |          |            |                    |  |
|-----|----------|------------|--------------------|--|
| 23. | 1 BCE ID | V92J4326CY | DECIMAL<br>(green) |  |
|-----|----------|------------|--------------------|--|

This parameter is a decimal number indicating the device ID/transaction ID (which identifies the unique device such as a PSP or NSP or identifies a transaction such as a PLBD data read) of the device function that was being accessed when the I/O error occurred as logged in I/O error log entry 1.

- |     |               |            |                    |  |
|-----|---------------|------------|--------------------|--|
| 24. | 1 BCE OP CODE | V92J4327CY | DECIMAL<br>(green) |  |
|-----|---------------|------------|--------------------|--|

This parameter is a decimal number that identifies the OP code (parameter used to further define/identify a device/transaction ID) of a device that was being accessed when I/O error log entry 1 occurred.



25. 2 BCE EL V92J4402CY DECIMAL  
(green)  
Same as V92J4325CY, except I/O error log entry 2.
26. 2 BCE ID V92J4403CY DECIMAL  
(green)  
Same as V92J4326CY, except I/O error log entry 2.
27. 2 BCE OP CODE V92J4404CY DECIMAL  
(green)  
Same as V92J4327CY, except I/O error log entry 2.
28. 3 BCE EL V92J4479CY DECIMAL  
(green)  
Same as V92J4325CY, except I/O error log entry 3.
29. 3 BCE ID V92J4480CY DECIMAL  
(green)  
Same as V92J4326CY, except I/O error log entry 3.
30. 3 BCE OP CODE V92J4481CY DECIMAL  
(green)  
Same as V92J4327CY, except I/O error log entry 3.
31. 4 BCE EL V92J4552CY DECIMAL  
(green)  
Same as V92J4325CY, except I/O error log entry 4.
32. 4 BCE ID V92J4553CY DECIMAL  
(green)  
Same as V92J4326CY, except I/O error log entry 4.
33. 4 BCE OP CODE V92J4554CY DECIMAL  
(green)  
Same as V92J4327CY, except I/O error log entry 4.
34. 5 BCE EL V92J4622CY DECIMAL  
(green)  
Same as V92J4325CY, except I/O error log entry 5.
35. 5 BCE ID V92J4623CY DECIMAL  
(green)  
Same as V92J4326CY, except I/O error log entry 5.

PCMMU			PF1			PF2	
RC	TIO	SVC	PSP 1	XX	PSP 2	XX	
1	XX	XX	PDI SW Matrix	XX	RTN	XX	
2	XX	XX	KU-B	XX			
3	XX	XX	RTN	XX			
4	XX	XX	BCE	ELEM	ID#	OP CODE	
5	XX	XX	1	X	X	X	
6	XX	XX	2	X	X	X	
ID Last Error		XX	3	X	X	X	
Error Count		XX	4	X	X	X	
Elem. Numb		XX	5	X	X	X	

Figure 5.123-1. COMM/INST BYPASS display

**TITLE**

DSC RAW DATA V1.1

**GENERAL**

- A. This MSKVIEW display is used to identify and troubleshoot any suspected OI dedicated signal conditioner failures. The display consists of 66 telemetry parameters that are all processed through OI DSCs. There are 3 to 5 parameters for each of the 16 OI DSCs. These parameters are the PCM counts and not the analog value of the relatively dynamic measurements. This display will allow the user to identify any suspected OI DSC failures (in which case the measurements from that DSC would go to zero), or any suspected OI MDM failures (in which case the measurements from that MDM would become static values). A copy of the DSC RAW DATA display is shown in figure 5.124-1.
- B. Pathname of display: INCO/INCO Displays/INST Systems/raw\_data.
- C. Detailed display description.

1. GMT V75W3504D TIME  
green

Indicates Greenwich mean time.

**OF1**

2. V76V1500A\_RAW FLOATING POINT  
V76V0121A\_RAW green  
V61P2115A\_RAW  
V61T2627A\_RAW  
V66T0752A\_RAW

Indicates the measurements in PCM counts of the given parameters that are processed through DSC OF1.

**OF2**

3. V76V1600A\_RAW FLOATING POINT  
V76V0221A\_RAW green  
V75T2517A\_RAW  
V75T2617A\_RAW  
V61T2631A\_RAW

Indicates the measurements in PCM counts of the given parameters that are processed through DSC OF2.

**OF3**

4. V76V1700A\_RAW FLOATING POINT  
V76V0321A\_RAW green  
V61P2700A\_RAW  
V45T0213A\_RAW

Indicates the measurements in PCM counts of the given parameters that are processed through DSC OF3.

**OF4**

- 5. V42T1304A\_RAW FLOATING POINT  
V42T1206A\_RAW green  
V09T1514A\_RAW  
V42T1308A\_RAW

Indicates the measurements in PCM counts of the given parameters that are processed through DSC OF4.

**OR1**

- 6. V43T5704A\_RAW FLOATING POINT  
V42T3204A\_RAW green  
V43T5708A\_RAW

Indicates the measurements in PCM counts of the given parameters that are processed through DSC OR1.

**OR2**

- 7. V43T5711A\_RAW FLOATING POINT  
V43T5706A\_RAW green  
V43T5642A\_RAW  
V43T5215A\_RAW

Indicates the measurements in PCM counts of the given parameters that are processed through DSC OR2.

**OP1**

- 8. V45P3100A\_RAW FLOATING POINT  
V45T3107A\_RAW green  
V45T3201A\_RAW  
V45T4307A\_RAW

Indicates the measurements in PCM counts of the given parameters that are processed through DSC OP1.

**OP2**

- 9. V45P3200A\_RAW FLOATING POINT  
V45T3207A\_RAW green  
V45T4207A\_RAW  
V45T3109A\_RAW

Indicates the measurements in PCM counts of the given parameters that are processed through DSC OP2.

**OM1**

10. V45V0100A\_RAW FLOATING POINT  
V45T1107A\_RAW green  
V45C0201A\_RAW  
V46T1172A\_RAW  
V46T1272A\_RAW

Indicates the measurements in PCM counts of the given parameters that are processed through DSC OM1.

**OM2**

11. V45V0200A\_RAW FLOATING POINT  
V45V0300A\_RAW green  
V45T0313A\_RAW  
V58T1700A\_RAW  
V78T9606A\_RAW

Indicates the measurements in PCM counts of the given parameters that are processed through DSC OM2.

**OM3**

12. V46T1274A\_RAW FLOATING POINT  
V46P0205A\_RAW green  
V46T1275A\_RAW  
V45T0113A\_RAW  
V61T2422A\_RAW

Indicates the measurements in PCM counts of the given parameters that are processed through DSC OM3.

**OA1**

13. V58Q0102A\_RAW FLOATING POINT  
V46T0174A\_RAW green  
V46T0108A\_RAW  
V63T1209A\_RAW

Indicates the measurements in PCM counts of the given parameters that are processed through DSC OA1.

**OA2**

14. V58T0222A\_RAW FLOATING POINT  
V46T0104A\_RAW green  
V63T1207A\_RAW  
V43T6219A\_RAW

Indicates the measurements in PCM counts of the given parameters that are processed through DSC OA2.

**OA3**

15. V76V3093A\_RAW FLOATING POINT  
V46T0308A\_RAW green  
V63T1760A\_RAW  
V43T6242A\_RAW

Indicates the measurements in PCM counts of the given parameters that are processed through DSC OA3.

**OL1**

16. V43T4704A\_RAW FLOATING POINT  
V42T2204A\_RAW green  
V43T4708A\_RAW

Indicates the measurements in PCM counts of the given parameters that are processed through DSC OL1.

**OL2**

17. V43T4711A\_RAW FLOATING POINT  
V43T4706A\_RAW green  
V43T4642A\_RAW

Indicates the measurements in PCM counts of the given parameters that are processed through DSC OL2.

DSC RAW DATA v1.1			GMT XXX/XX:XX:XX		
OF1	V76V1500A_RAW	XXX	OM1	V45V0100A_RAW	XXX
	V76V0121A_RAW	XXX		V45T1107A_RAW	XXX
	V61P2115A_RAW	XXX		V45C0201A_RAW	XXX
	V61T2627A_RAW	XXX		V46T1172A_RAW	XXX
	V66T0752A_RAW	XXX		V46T1272A_RAW	XXX
OF2	V76V1600A_RAW	XXX	OM2	V46T1272A_RAW	XXX
	V76V0221A_RAW	XXX		V45V0300A_RAW	XXX
	V75T2517A_RAW	XXX		V45T0313A_RAW	XXX
	V75T2617A_RAW	XXX		V58T1700A_RAW	XXX
	V61T2631A_RAW	XXX		V78T9606A_RAW	XXX
OF3	V76V1700A_RAW	XXX	OM3	V46T1274A_RAW	XXX
	V76V0321A_RAW	XXX		V46P0205A_RAW	XXX
	V61P2700A_RAW	XXX		V46T1275A_RAW	XXX
	V45T0213A_RAW	XXX		V45T0113A_RAW	XXX
				V61T2422A_RAW	XXX
OF4	V42T1304A_RAW	XXX	OA1	V58Q0102A_RAW	XXX
	V42T1206A_RAW	XXX		V46T0174A_RAW	XXX
	V09T1514A_RAW	XXX		V46T0108A_RAW	XXX
	V42T1308A_RAW	XXX		V63T1209A_RAW	XXX
OR1	V43T5704A_RAW	XXX	OA2	V58T0222A_RAW	XXX
	V42T3204A_RAW	XXX		V46T0104A_RAW	XXX
	V43T5708A_RAW	XXX		V63T1207A_RAW	XXX
				V43T6219A_RAW	XXX
OR2	V43T5711A_RAW	XXX	OA3	V76V3093A_RAW	XXX
	V43T5706A_RAW	XXX		V46T0308A_RAW	XXX
	V43T5642A_RAW	XXX		V63T1760A_RAW	XXX
	V43T5215A_RAW	XXX		V43T6242A_RAW	XXX
OP1	V45P3100A_RAW	XXX	OL1	V43T4704A_RAW	XXX
	V45T3107A_RAW	XXX		V42T2204A_RAW	XXX
	V45T3201A_RAW	XXX		V43T4708A_RAW	XXX
	V45T4307A_RAW	XXX			
OP2	V45P3200A_RAW	XXX	OL2	V43T4711A_RAW	XXX
	V45T3207A_RAW	XXX		V43T4706A_RAW	XXX
	V45T4207A_RAW	XXX		V43T4642A_RAW	XXX
	V45T3109A_RAW	XXX			

Figure 5.124-1. DSC RAW DATA display

**TITLE**

DSC/MDM PARAMETERS V 1.0

**GENERAL**

- A. This is a telemetry display that is used to identify and troubleshoot any suspected OI dedicated signal VOLTAGE conditioner (DSC) or MDM failures. The data displayed can be either real-time or playback telemetry parameters. A copy of the DSC/MDM parameters display is shown in figure 5.125-1.

DSC/MDM PARAMETERS consists of 66 analog telemetry parameters that are all processed through OI DSCs. There are 3 to 5 parameters for each of the 16 OI DSCs. All of the 66 parameters are analog measurements that read some value other than zero and are relatively dynamic (voltages, currents, and temperature measurements). This configuration will allow the user to identify any suspected OI DSC failures (in which case the measurements from that DSC would go to zero), or any suspected OI MDM failures (in which case the measurements from that MDM would become static values).

- B. Pathname of display: INCO/INCO Displays/INST Systems/dsc\_status.
- C. Detailed display description.

1.	GMT	V75W3504D	TIME
			green

Indicates Greenwich mean time.

**DSC**

The 16 different OI DSCs are listed in the two columns marked DSC. There are eight DSCs listed in the first column on the left side of the display (OF1, OF2, OF3, OF4, OR1, OR2, OP1, and OP2). The other eight are listed in the second column (OM1, OM2, OM3, OA1, OA2, OA3, OL1 and OL2). A BITE status indication is displayed for all DSCs except OF4, OR1, OR2, OL1 and OL2.

2.	OF1	V75X2171E	1 = OF1	0 = OF1
			wheat	black
			black	yellow

This parameter indicates the state of the two OF1 DSC power supplies (DSC OF1 BITE). If either supply fails or is out of tolerance (0.5 percent of 17 V) or if one of the 28-V power sources powering the DSC is lost, the parameter will indicate a logic 0. A logic 1 indicates good power supplies.

3.	OF2	V75X2172E	1 = OF2	0 = OF2
			wheat	black
			black	yellow

Same as OF1 DSC BITE for OF2 DSC.

4.	OF3	V75X2173E	1 = OF3	0 = OF3
			wheat	black
			black	yellow

Same as OF1 DSC BITE for OF3 DSC.



5.	OP1	V75X2184E	1 = OP1 wheat black	0 = OP1 black yellow
	Same as OF1 DSC BITE for OP1 DSC.			
6.	OP2	V75X2185E	1 = OP2 wheat black	0 = OP2 black yellow
	Same as OF1 DSC BITE for OP2 DSC.			
7.	OA1	V75X2174E	1 = OA1 wheat black	0 = OA1 black yellow
	Same as OF1 DSC BITE for OA1 DSC.			
8.	OA2	V75X2175E	1 = OA2 wheat black	0 = OA2 black yellow
	Same as OF1 DSC BITE for OA2 DSC.			
9.	OA3	V75X2176E	1 = OA3 wheat black	0 = OA3 black yellow
	Same as OF1 DSC BITE for OA3 DSC.			
10.	OM1	V75X2181E	1 = OM1 wheat black	0 = OM1 black yellow
	Same as OF1 DSC BITE for OM1 DSC.			
11.	OM2	V75X2182E	1 = OM2 wheat black	0 = OM2 black yellow
	Same as OF1 DSC BITE for OM2 DSC.			
12.	OM3	V75X2183E	1 = OM3 wheat black	0 = OM3 black yellow
	Same as OF1 DSC BITE for OM3 DSC.			

**MDM**

Next to each DSC column is a column marked MDM. This column identifies which MDM is processing the particular parameters that are listed for each DSC. All seven of the OI MDMs (OF1, OF2, OF3, OF4, OA1, OA2, and OA3) are represented on the display. The MDMs are represented by various parameters that may be scattered around in different locations on the display, depending

on which DSC the measurement is coming from. An MDM WRAP on a particular MDM will result in changing the corresponding text under the MDM column to red at every place it is represented. It will also affect the DSC column by changing the color of the text to purple for all the DSCs to which the particular MDM is linked.

**MDM WRAP Indications**

13. OF1	OF1_MDM_WRAP	1 = OF1 tan black	0 = OF1 black red
---------	--------------	-------------------------	-------------------------

This special comp evaluates the bus link between the PCMMU and the OF1 MDM. An 8-bit OI validation word from OF1 MDM is received at 10 samples/second to test the link. This comp checks to see whether two consecutive samples complement each other. A logic 0 indicates that two consecutive samples are not complements of each other and therefore failed. A logic 1 indicates they are complements and the link is good.

14. OF2	OF2_MDM_WRAP	1 = OF2 tan black	0 = OF2 black red
---------	--------------	-------------------------	-------------------------

Same as OF1\_MDM\_WRAP for OF2 MDM.

15. OF3	OF3_MDM_WRAP	1 = OF3 tan black	0 = OF3 black red
---------	--------------	-------------------------	-------------------------

Same as OF1\_MDM\_WRAP for OF3 MDM.

16. OF4	OF4_MDM_WRAP	1 = OF4 tan black	0 = OF4 black red
---------	--------------	-------------------------	-------------------------

Same as OF1\_MDM\_WRAP for OF4 MDM.

17. OA1	OA1_MDM_WRAP	1 = OA1 tan black	0 = OA1 black red
---------	--------------	-------------------------	-------------------------

Same as OF1\_MDM\_WRAP for OA1 MDM.

18. OA2	OA2_MDM_WRAP	1 = OA2 tan black	0 = OA2 black red
---------	--------------	-------------------------	-------------------------

Same as OF1\_MDM\_WRAP for OA2 MDM.

19. OA3	OA3_MDM_WRAP	1 = OA3 tan black	0 = OA3 black red
---------	--------------	-------------------------	-------------------------

Same as OF1\_MDM\_WRAP for OA3 MDM.

20. AC 1 Ph A CNTL AB2 O2 SYS 1 Reg	V76V1500A V76V0121A V61P2115A	FLOATING POINT green	
---	-------------------------------------	-------------------------	--

Loop1 AV 2                   V61T2627A  
MMU-FSS Toggle Vlv       V66T0752A

Indicates the analog measurements of the given parameters that are processed through DSC OF1.

- |     |             |           |                |
|-----|-------------|-----------|----------------|
| 21. | AC 2 Ph A   | V76V1600A | FLOATING POINT |
|     | CNTL BC2    | V76V0221A | green          |
|     | OPS 1       | V75T2517A |                |
|     | OPS 2       | V75T2617A |                |
|     | Loop2 AV 3A | V61T2631A |                |

Indicates the analog measurements of the given parameters that are processed through DSC OF2.

- |     |            |           |                |
|-----|------------|-----------|----------------|
| 22. | AC 3 Ph A  | V76V1700A | FLOATING POINT |
|     | CNTL CA2   | V76V0321A | green          |
|     | Loop2 Pump | V61P2700A |                |
|     | FC 2 Stack | V45T0213A |                |

Indicates the analog measurements of the given parameters that are processed through DSC OF3.

- |     |                  |           |                |
|-----|------------------|-----------|----------------|
| 23. | FRCS Fill Line   | V42T1304A | FLOATING POINT |
|     | FRCS Ox Line     | V42T1206A | green          |
|     | FWD Fus RCS Skin | V09T1514A |                |
|     | FRCS Bkup Line   | V42T1308A |                |

Indicates the analog measurements of the given parameters that are processed through DSC OF4.

- |     |                 |           |                |
|-----|-----------------|-----------|----------------|
| 24. | R-OMS Ox Drain  | V43T5704A | FLOATING POINT |
|     | R-RCS Ox Man    | V42T3204A | green          |
|     | R-OMS Ox/He FTG | V43T5708A |                |

Indicates the analog measurements of the given parameters that are processed through DSC OR1.

- |     |                 |           |                |
|-----|-----------------|-----------|----------------|
| 25. | R-RCS HSG Vrn   | V43T5711A | FLOATING POINT |
|     | R-OMS GSE Panel | V43T5706A | green          |
|     | R-OMS Feedline  | V43T5642A |                |
|     | R-OMS Ox Tack   | V43T5215A |                |

Indicates the analog measurements of the given parameters that are processed through DSC OR2.

- |     |                  |           |                |
|-----|------------------|-----------|----------------|
| 26. | PRSD O2 Tk 6     | V45P3100A | FLOATING POINT |
|     | PRSD O2 Tk 6 Htr | V45T3107A | green          |
|     | PRSD O2 Tk 7 Fld | V45T3201A |                |
|     | PRSD H2 Tk 8 Htr | V45T4307A |                |

Indicates the analog measurements of the given parameters that are processed through DSC OP1.

27.	PRSD O2 Tk 7	V45P3200A	FLOATING POINT
	PRSD O2 Tk Htr	V45T3207A	green
	PRSD H2 Tk 7 Htr	V45T4207A	
	PRSD O2 Tk 6 Htr	V45T3109A	

Indicates the analog measurements of the given parameters that are processed through DSC OP2.

28.	FC #1	V45V0100A	FLOATING POINT
	PRSD O2 Tk Htr	V45T1107A	green
	FC #2	V45C0201A	
	APU 1 Heat Sink	V46T1172A	
	APU 2 Heat Sink	V46T1272A	

Indicates the analog measurements of the given parameters that are processed through DSC OM1.

29.	FC #2	V45V0200A	FLOATING POINT
	FC #3	V45V0300A	green
	FC #3 Stack	V45T0313A	
	LMG Brake Line	V58T1700A	
	MADS Shelf	V78T9606A	

Indicates the analog measurements of the given parameters that are processed through DSC OM2.

30.	APU 2 ISO Valve B	V46T1274A	FLOATING POINT
	APU 2 Fuel Outlet	V46P0205A	green
	APU 2 ISO Valve A	V46T1275A	
	FC #1 Stack	V45T0113A	
	Sys 2 N2 Tk 3	V61T2422A	

Indicates the analog measurements of the given parameters that are processed through DSC OM3.

31.	Hyd Sys 1 Vol	V58Q0102A	FLOATING POINT
	APU 1 Inj Tube	V46T0174A	green
	APU 1 Fuel Line 1	V46T0108A	
	FCL 1 Rad Inlet	V63T1209A	

Indicates the analog measurements of the given parameters that are processed through DSC OA1.

32.	Hyd Sys 2 RTN	V58T0222A	FLOATING POINT
	APU 1 Fuel Line 2	V46T0104A	green
	FCL 1 Evap Out	V63T1207A	
	R-OMS Aft XFD	V43T6219A	

Indicates the analog measurements of the given parameters that are processed through DSC OA2.

- |     |                  |           |                |
|-----|------------------|-----------|----------------|
| 33. | Aft PCA-6        | V76V3093A | FLOATING POINT |
|     | APU 3 Fuel Line  | V46T0308A | green          |
|     | FES B H2O Supply | V63T1760A |                |
|     | OMS XFD Ox Line  | V43T6242A |                |

Indicates the analog measurements of the given parameters that are processed through DSC OA3.

- |     |                  |           |                |
|-----|------------------|-----------|----------------|
| 34. | L-OMS Ox Drain   | V43T4704A | FLOATING POINT |
|     | L-RCS AFT Ox Man | V42T2204A | green          |
|     | L-OMS Ox/He FTG  | V43T4708A |                |

Indicates the analog measurements of the given parameters that are processed through DSC OL1.

- |     |                 |           |                |
|-----|-----------------|-----------|----------------|
| 35. | L-OMS RCS Vrn   | V43T4711A | FLOATING POINT |
|     | L OMS GSE Panel | V43T4706A | green          |
|     | L-OMS Feedline  | V43T4642A |                |

Indicates the analog measurements of the given parameters that are processed through DSC OL2.

**DSC Power Switch Status**

- |     |           |               |                |
|-----|-----------|---------------|----------------|
| 36. | V75S2160E | 1 = ON<br>tan | 0 = OFF<br>red |
|-----|-----------|---------------|----------------|

This parameter indicates the power switch status for DSCs OL 1 and 2. In the ON position, an enable is provided to the OL 1 and 2 DSC RPC.

- |     |           |               |                |
|-----|-----------|---------------|----------------|
| 37. | V75S2165E | 1 = ON<br>tan | 0 = OFF<br>red |
|-----|-----------|---------------|----------------|

This parameter indicates the power switch status for DSCs OR 1 and 2. In the ON position, an enable is provided to the OR1 and 2 DSC RPCs.

DSC/MDM STATUS v 1.1				GMT XXX/XX:XX:XX			
DSC MDM				DSC MDM			
OF1	OF1	AC 1 Ph A	XXX V	OM1	OF1	FC #1	XXX V
		CNTL AB2	XXX V			PRSD O2 Tk Htr	XXX T
		O2 SYS 1 Reg	XXX P	OF3		FC #2	XXX A
		Loop1 AV2	XXX T	OF4		APU 1 Heat Sink	XXX T
		MMU-FSS Toggle Vlv	XXX T	OA1		APU 2 Heat Sink	XXX T
OF2	OF2	AC 2 Ph A	XXX V	OM2	OF2	FC #2	XXX V
		CNTL BC2	XXX V	OF3		FC #3	XXX V
		OPS 1	XXX T	OF1		FC #3 Stack	XXX T
		OPS 2	XXX T	OF4		LMG Brake Line	XXX T
		Loop2 AV 3A	XXX T	OA2		MADS Shelf	XXX T
OF3	OF3	AC 3 Ph A	XXX V	OM3	OA2	APU 2 ISO Valve B	XXX T
		CNTL CA2	XXX V			APU 2 Fuel Outlet	XXX T
		Loop2 Pump	XXX T	OF3		APU 2 ISO Valve A	XXX T
		FC 2 Stack	XXX T	OF2		FC #1 Stack	XXX T
				OF1		Sys 2 N2 Tk 3	XXX T
OF4	OF1	FRCS Fill Line	XXX T	OA1	OA1	Hyd Sys 1 Vol	
		FRCS Ox Line	XXX T			APU 1 Inj Tube	XXX T
		FWD Fus RCS Skin	XXX T			APU 1 Fuel Line 1	XXX T
		FRCS Bkup Line	XXX T			FCL 1 Rad Inlet	XXX T
OR1	OA2	R-OMS Ox Drain	XXX T	OA2	OA2	Hyd Sys 2 RTN	XXX T
		R-RCS Ox Man	XXX T			APU 1 Fuel Line 2	XXX T
		R-OMS Ox/He FTG	XXX T			FCL 1 Evap Out	XXX T
XX						R-OMS Aft XFD	XXX T
OR2	OA3	R-RCS HSG Vrn	XXX T	OA3	OA3	Aft PCA-6	XXX V
		R-OMS GSE Panel	XXX T			APU 3 Fuel Line	XXX V
		R-OMS Feedline	XXX T			FES B H2O Supply	XXX T
		R-OMS Ox Tack	XXX T			OMS XFD Ox Line	XXX T
OP1	OF2	PRSD O2 Tk 6	XXX P	OL1	OA1	L-OMS Ox Drain	XXX T
		PRSD O2 Tk 6 Htr	XXX T			L-RCS AFT Ox Man	XXX T
		PRSD O2 Tk 7 Fld	XXX T			L-OMS Ox/He FTG	XXX T
		PRSD H2 Tk 8 Htr	XXX T	XX			
OP2	OF4	PRSD O2 Tk 7	XXX P	OL2	OA3	L-OMS RCS Vrn	XXX T
		PRSD O2 Tk Htr	XXX T			L OMS GSE Panel	XXX T
		PRSD H2 Tk 7 Htr	XXX T			L-OMS Feedline	XXX T
		PRSD O2 Tk 6 Htr	XXX T				

Figure 5.125-1. DSC/MDM STATUS display

**TITLE**

S-BAND FM CONFIG V1.1 & V1.2

**GENERAL**

- A. The data displayed are real-time telemetry parameters that affect the management and operation of the S-band FM system. A copy of the FM CONFIG V1.1 display is shown in figure 5.126-1 and a copy of the FM CONFIG V1.2 is shown in figure 5.126-3.
- B. The difference between versions 1.1 and 1.2 is the incorporation of the Solid-State Recorder in the shuttle fleet. V1.2 displays data for a given flight using Ops Recorders, while V1.1 displays data for a given flight using Solid-State Recorders. It is necessary to have two separate versions because the in-depth installation process of these new recorders will require a mixed fleet until approximately 2003.
- C. Detailed display description.

- |    |                  |           |                  |             |
|----|------------------|-----------|------------------|-------------|
| 1. | FM SYSTEM ON (1) | V74X6120E | 1 = 1<br>(green) | 0 = (blank) |
|----|------------------|-----------|------------------|-------------|

This parameter indicates that the S-band FM transmitter 1 and signal processor 1 have 28 V dc applied.

- |    |                  |           |                  |             |
|----|------------------|-----------|------------------|-------------|
| 2. | FM SYSTEM ON (2) | V74X6121E | 1 = 2<br>(green) | 0 = (blank) |
|----|------------------|-----------|------------------|-------------|

This parameter indicates that the S-band FM transmitter 2 and signal processor 2 have 28 V dc applied.

- |    |            |           |                           |  |
|----|------------|-----------|---------------------------|--|
| 3. | RF OUT (1) | V74E6650A | FLOATING POINT<br>(green) |  |
|----|------------|-----------|---------------------------|--|

This is an analog parameter indicating the FM 1 transmitter RF power output in watts. The normal output is 15 watts.

- |    |            |           |                           |  |
|----|------------|-----------|---------------------------|--|
| 4. | RF OUT (2) | V74E6651A | FLOATING POINT<br>(green) |  |
|----|------------|-----------|---------------------------|--|

This is an analog parameter indicating the FM 2 transmitter RF power output in watts. The normal output is 15 watts.

- |    |             |           |                    |             |
|----|-------------|-----------|--------------------|-------------|
| 5. | ANTENNA SEL | V74S6505E | 1 = UP<br>(yellow) | 0 = (blank) |
|    |             | V74S6506E | 1 = LOW<br>(green) | 0 = (blank) |

These parameters indicate that the crew's hemi antenna selector switch is in the upper or lower position.

6. ANT MODE SEL W0210200R SPECIAL COMP  
(green)

This is a special comp of the crew's hemi switch positions to determine if the switch is in the manual or GPC position.

This special comp is composed of MSIDs V74S6505E and V74S6506E

V74S6505E	V74S6506E	
1	0	MAN
0	1	MAN
0	0	GPC
All other combinations output		INVL

7. ANT POS S5A V74X6675E 1 = UP 0 = (blank)  
(green)

This parameter indicates that the antenna SEL relay S5 is in the A position and that the upper hemi has been selected.

8. ANT POS S5B V74X6676E 1 = LOW 0 = (blank)  
(green)

This parameter indicates that the antenna SEL relay S5 is in the B position and that the lower hemi has been selected.

9. DATA MODE MULTI

This portion of the display incorporates a tool labeled a MULTI. A MULTI allows you to compact your data by assigning several different MSIDs and their associated outputs into one slot on the display. Shown in figure 5.126-2 is a display box that will pop up when the user right- or center-mouse-clicks on the output field of the MULTI. This box displays each possible output and the associated MSIDs. Notice that if all values are set to 0.0 then six dashed lines (-----) will be displayed to indicate that no mode is currently selected. If more than one value is set to 1.0, then six plus symbols (++++++) will appear, indicating an error.

The following are the possible modes for the FM system:

Ops Recorder Flight		Solid-State Recorder Flight	
PL ANLG	V74X4804E	PL ANLG	V74X4804E
PL DIGI	V74X4803E	PL DIGI	V74X4803E
PL RCDR	V74X4802E	SSR1	V74X3447E
OPS RCDR	V74X4800E	SSR2	V74X3446E
TV	V74X4806E	TV	V74X4806E
DOD	V74X4805E	DOD	V74X4805E
ME	V74X4801E	ME	V74X4801E

10. FM CONTROL V74S6550E 1 = CMD 0 = PNL  
(green) (red)



Indicates the position of the CMD control switch, which provides the command control 28 V dc transfer control from the panel drivers to the uplink command drivers of the S-band FM subsystem.

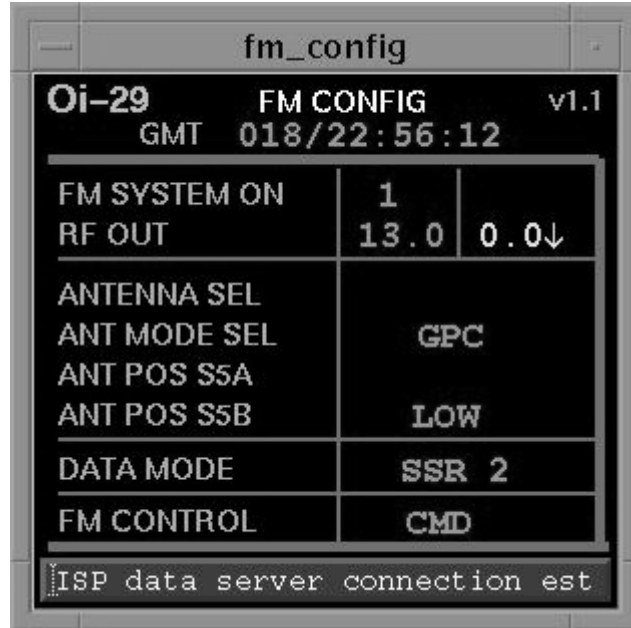


Figure 5.126-1: FM CONFIG v1.1

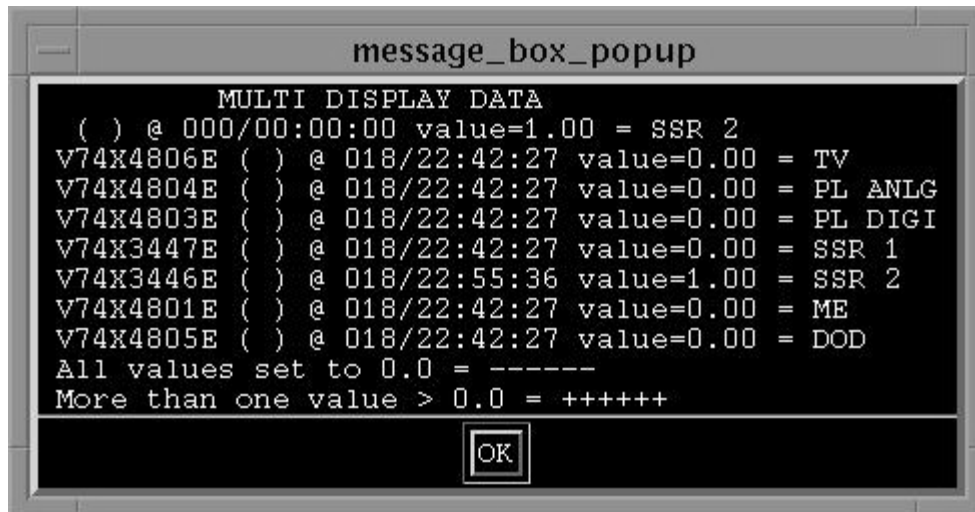


Figure 5.126-2: "MULTI" POPUP BOX

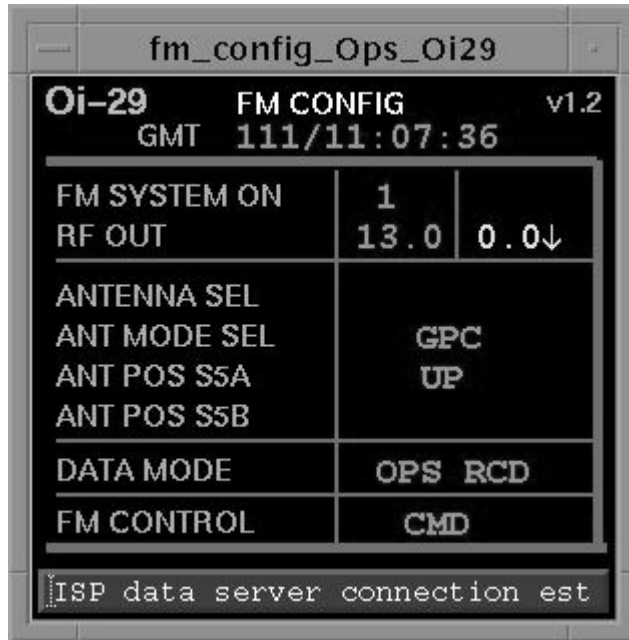


Figure 5.126-3: FM CONFIG version 1.2

**TITLE**

INST MGMT V1.3

**GENERAL**

A. The data displayed are real-time telemetry parameters that affect the instrumentation and payload communications subsystems. A copy of the INST MGMT display is shown in Figure 5.127-1.

B. Pathname of display: INCO/INCO Displays/INST Mgmt.

C. Detailed display description.

1.	OI TFL	V75X4070D	DECIMAL (green)
----	--------	-----------	--------------------

Format will be displayed with unsuppressed data behind (B, D, or S).

2.	SM	V93Q0022CY	DECIMAL (green)
----	----	------------	--------------------

Same as item 1.

3.	GNC	V93Q0022CX	DECIMAL (green)
----	-----	------------	--------------------

Same as item 1.

4.	GMT	M50Q0027HP	DECIMAL (green)
----	-----	------------	--------------------

Indicates Greenwich mean time.

5.	MET	M50Q0030HP	TIME (green)
----	-----	------------	-----------------

Indicates mission elapsed time.

6.	PL CNTRL	V74S5600E	1 = CMD (green)	0 = PNL (yellow)
----	----------	-----------	--------------------	---------------------

Indicates the position of the CMD control switch, which provides the command control 28 V dc to transfer control from the panel switch drivers to the uplink command drivers of the payload subsystem.

**PCMMU**

7. BITE V75M2120P HEX  
(green)

Indicates PCMMU bite status register in hex.

- |            |    |                               |
|------------|----|-------------------------------|
| <u>Bit</u> | 1  | PCM UNIT POWER STATUS GOOD    |
|            | 2  | MTU GOOD                      |
|            | 3  | FETCH PROM PARITY GOOD        |
|            | 4  | 128 KBPS TLM DOWNLINK GOOD    |
|            | 5  | 64 KBPS TLM DOWNLINK GOOD     |
|            | 6  | 128 KBPS TLM PARITY GOOD      |
|            | 7  | 128 KBPS TLM COUNTERS GOOD    |
|            | 8  | 64 KBPS TLM RAM PAR CNTR GOOD |
|            | 9  | RECORDER DATA GOOD            |
|            | 10 | INPUT DATA VALID              |
|            | 11 | OI RAM PARITY                 |
|            | 12 | PDI RAM PARITY                |
|            | 13 | TOGGLE BUFFER PARITY          |
|            | 14 | NO RESPONSE COMPUTER BUS      |
|            | 15 | NO RESPONSE MDM OR PDI        |
|            | 16 | 128 KBPS PRGM/FIXED FORMAT    |

8. PWR V75S2107E 1 = 1 0 = (blank)  
(green)

Switch setting for power to PCMMU 1.

9. PWR V75S2109E 1 = 2 0 = (blank)  
(green)

Switch setting for power to PCMMU 2.

10. A V76X4265E 1 = ON 0 = --  
(green) (tan)

Remote Power Controller (RPC) A power discrete for PCMMU 1.

11. A V76X4272E 1 = ON 0 = --  
(green) (tan)

RPC A power discrete for PCMMU 2.

12. B V76X4274E 1 = ON 0 = --  
(green) (tan)

RPC B power discrete for PCMMU 2.

13. C V76X4267E 1 = ON 0 = --  
(green) (tan)

RPC A power discrete for PCMMU 1.

14. MODE W01I0700R SPECIAL COMP  
(green)

Indicates the OI PCMMU format switch selection on panel C3.

<u>V75S1001E</u>	<u>V75S1002E</u>	<u>V75S1003E</u>	<u>V75S1004E</u>	
1	0	0	0	= GPC
0	1	0	0	= GPC
0	0	1	0	= PGM
0	0	0	1	= PGM
0	0	0	0	= FIXED

15. SM HDR V92J0050CY DECIMAL  
(green)

Format ID for the high-data-rate TFL sent to the programmable RAM in the active PCMMU by the SM 2 GPC.

16. SM LDR V92J0052CY DECIMAL  
(green)

Format ID of the low-data-rate TFL sent to the programmable RAM in the active PCMMU by the SM 2 GPC.

17. LOAD STAT V92J0053CY DECIMAL  
(green)

TFL load status for the SM machine.

00 = No previous TFL by SM  
01 = TFL load in progress  
02 = Last TFL good  
03 = Last TFL failed

18. ELEM V92U0599C DECIMAL  
(green)

Element number of last failed transaction. This number is mission unique and can be found in the console bypass tables.

19. ECNT V92U0600C DECIMAL  
(green)

The number of accumulated transactions errors encountered on the PCM Master Unit (PMU) bus and is reset when the PCMMU I/O reset is initiated.

**PCMMU BSR** (bite status register)

20. 1 V75X2121D 1 = PCM PWR 0 = PCM PWR  
(darkslategray) (red)

A logic 1 indicates that the +5 V Master Unit (MU) power has not dropped out during that major frame. A logic 0 indicates a power dropout.

- |   |    |           |                                   |                         |
|---|----|-----------|-----------------------------------|-------------------------|
| 21.   | 2  | V75X2122D | 1 = MTU BAD<br>(darkslategray)    | 0 = MTU BAD<br>(red)    |
| <p>A logic 1 indicates that the MU is operating from the shuttle MTU clock. A logic 0 indicates that the MU is using the MU internal oscillator.</p>  |    |           |                                   |                         |
| 22.   | 3  | V75X2123D | 1 = FETCH PRTY<br>(darkslategray) | 0 = FETCH PRTY<br>(red) |
| <p>A logic 1 indicates correct parity in the Fetch PROM and that the Fetch PROM parity checker is operating normally. A logic 0 indicates either a parity error or parity checker failure.</p>            |    |           |                                   |                         |
| 23.   | 4  | V75X2124D | 1 = HDR D/L<br>(darkslategray)    | 0 = HDR D/L<br>(red)    |
| <p>A logic 1 indicates that the 128-kbps TLM can access both the OI and PDI memories and that the data reach the NRZ to Bi0-L converter.</p>  |    |           |                                   |                         |
| 24.   | 5  | V75X2125D | 1 = LDR D/L<br>(darkslategray)    | 0 = LDR D/L<br>(red)    |
| <p>A logic 1 indicates that the 64-kbps TLM can access both the OI and PDI memories and that the data reach the NRZ-to-Bi0-L converter.</p>   |    |           |                                   |                         |
| 25.   | 6  | V75X2126D | 1 = HDR TLM<br>(darkslategray)    | 0 = HDR TLM<br>(red)    |
| <p>A logic 1 indicates correct parity in either RAM or ROM and indicates that the 128-kbps parity checker is operating normally. A logic 0 indicates either a parity error or parity checker failure.</p> |    |           |                                   |                         |
| 26.   | 7  | V75X2127D | 1 = HDR CNTR<br>(darkslategray)   | 0 = HDR CNTR<br>(red)   |
| <p>A logic 1 indicates that the 128-kbps TLM sample rate counters are operating correctly. A logic 0 indicates a sample rate counter failure.</p>   |    |           |                                   |                         |
| 27.   | 8  | V75X2128D | 1 = LDR TLM<br>(darkslategray)    | 0 = LDR TLM<br>(red)    |
| <p>A logic 1 indicates correct parity, correct parity checker operations, and correct sample rate counter operation for the 64-kbps TLM. A logic 0 indicates failure in one of the three areas.</p>       |    |           |                                   |                         |
| 28.   | 9  | V75X2129D | 1 = RCDR DATA<br>(darkslategray)  | 0 = RCDR DATA<br>(red)  |
| <p>A logic 1 indicates that the recorder data are changing states. A logic 0 indicates that the recorder data are not switching.</p>  |    |           |                                   |                         |
| 29.   | 10 | V75X2130D | 1 = DATA INVL<br>(darkslategray)  | 0 = DATA INVL<br>(red)  |
| <p>A logic 1 indicates no invalid input data received. A logic 0 indicates an "input data invalid" condition existed on one of seven input lines.</p>   |    |           |                                   |                         |

- |   |    |           |                                   |                          |
|---|----|-----------|-----------------------------------|--------------------------|
| 30.   | 11 | V75X2131D | 1 = OI RAM<br>(darkslategray)     | 0 = OI RAM<br>(red)      |
| A logic 1 indicates correct parity in OI RAM. A logic 0 indicates parity errors in RAM.   |    |           |                                   |                          |
| 31.   | 12 | V75X2132D | 1 = PL RAM<br>(darkslategray)     | 0 = PL RAM<br>(red)      |
| A logic 1 indicates correct parity in PDI RAM. A logic 0 indicates parity error in RAM.   |    |           |                                   |                          |
| 32.   | 13 | V75X2133D | 1 = TOG BUFFER<br>(darkslategray) | 0 = TOG BUFFER<br>(red)  |
| A logic 1 indicates correct parity in all of the five toggle buffers. A logic 0 indicates that a parity error existed in one of the five toggle buffers.        |    |           |                                   |                          |
| 33.   | 14 | V75X2134D | 1 = NO GPC DAT<br>(darkslategray) | 0 = NO GPC DAT<br>(red)  |
| A logic 1 indicates that all computers are transmitting properly. A logic 0 indicates that a "no response" condition existed on one of the five computer buses. |    |           |                                   |                          |
| 34.   | 15 | V75X2135D | 1 = OI/PL DATA<br>(darkslategray) | 0 = OI/PL DATA<br>(red)  |
| A logic 1 indicates that all MDMs and PDIs are responding properly. A logic 0 indicates that a "no response" condition existed on either the MDM or PDI bus.    |    |           |                                   |                          |
| 35.   | 16 | V75X2136D | 1 = HDR PROG<br>(green)           | 0 = HDR FIXD<br>(yellow) |
| A logic 1 indicates that the 128-kbps TLM is operating using its RAM. A logic 0 indicates use of PROM.  |    |           |                                   |                          |

**PI**

- |  |       |           |                   |             |
|--|-------|-----------|-------------------|-------------|
| 36.  | Power | V74X4323E | 1 = ON<br>(green) | 0 = (blank) |
| This parameter indicates the ON/OFF state of the payload interrogator no. 1 GCIL driver.         |       |           |                   |             |
| 37.  | Power | V74X4353E | 1 = ON<br>(green) | 0 = (blank) |
| This parameter indicates the ON/OFF state of the payload interrogator no. 2 GCIL driver.         |       |           |                   |             |
| 38.  | RCVR  | V74X5627E | 1 = ON<br>(green) | 0 = (blank) |
| This parameter indicates whether payload interrogator no. 1 has achieved a PHASE LOCK condition. |       |           |                   |             |
| 39.  | RCVR  | V74X5628E | 1 = ON<br>(green) | 0 = (blank) |
| This parameter indicates whether payload interrogator no. 2 has achieved a PHASE LOCK condition. |       |           |                   |             |

- |     |  |           |                           |                     |
|-----|--|-----------|---------------------------|---------------------|
| 40. | AGC  | V74E5658A | FLOATING POINT<br>(green) |                     |
|     | This parameter indicates the signal strength value of payload interrogator no. 1 in dBm (-120 to -30 dBm). |           |                           |                     |
| 41. | AGC  | V74E5659A | FLOATING POINT<br>(green) |                     |
|     | This parameter indicates the signal strength value of payload interrogator no. 2 in dBm (-120 to -30 dBm). |           |                           |                     |
| 42. | SPE  | V74B5655A | FLOATING POINT<br>(green) |                     |
|     | This parameter indicates the loop stress (phase error) for payload interrogator no. 1 (-87 to + 87 kHz).   |           |                           |                     |
| 43. | SPE  | V74B5656A | FLOATING POINT<br>(green) |                     |
|     | This parameter indicates the loop stress (phase error) for payload interrogator no. 2 (-87 to + 87 kHz).   |           |                           |                     |
| 44. | RF Out   | V74E5625A | FLOATING POINT<br>(green) |                     |
|     | This parameter indicates the RF power output level (0.0 to 10.0 watts) of payload interrogator no. 1.      |           |                           |                     |
| 45. | RF Out   | V74E5626A | FLOATING POINT<br>(green) |                     |
|     | This parameter indicates the RF power output level (0.0 to 10.0 watts) of payload interrogator no. 2.      |           |                           |                     |
| 46. | ANT  | V74X5603E | 1 = LHCP<br>(green)       | 0 = RHCP<br>(green) |
|     | This parameter indicates which payload interrogator is using which antenna polarization.                   |           |                           |                     |
| 47. | ANT  | V74X5604E | 1 = LHCP<br>(green)       | 0 = RHCP<br>(green) |
|     | This parameter indicates which payload interrogator is using which antenna polarization.                   |           |                           |                     |

**COMMON**

- |     |   |           |                           |  |
|-----|---|-----------|---------------------------|--|
| 48. | CHAN  | W01G3205C | FLOATING POINT<br>(green) |  |
|     | This parameter is a special comp that indicates the selected frequency of both payload interrogators. Note: This is an OR function and will read (channel no. for PI 1) + (channel no. for PI 2). |           |                           |  |
|     | This special comp is composed of the following parameters:  |           |                           |  |





- |     |   |           |                   |             |
|-----|---|-----------|-------------------|-------------|
| 52. | MOD   | V74X4320E | 1 = ON<br>(green) | 0 = (blank) |
|     | This parameter indicates that the selected payload interrogator S-band MOD is ON.   |           |                   |             |
| 53. | SWP   | V74X4300E | 1 = ON<br>(green) | 0 = (blank) |
|     | This parameter indicates the state of the selected payload interrogator frequency sweep.  |           |                   |             |
| 54. | WIDE  | V74X4301E | 1 = ON<br>(green) | 0 = (blank) |
|     | This parameter indicates that the selected payload interrogator is in the WIDE frequency sweep mode. This is the default sweep mode for the PI. |           |                   |             |
| 55. | NAR   | V74X4302E | 1 = ON<br>(green) | 0 = (blank) |
|     | This parameter indicates that the selected payload interrogator is in the NARROW frequency sweep mode.  |           |                   |             |

**MDM WRAP**

- |     |   |              |                          |                |
|-----|---|--------------|--------------------------|----------------|
| 56. | OF 1  | OF1_MDM_WRAP | 1 = 1<br>(darkslategray) | 0 = 1<br>(red) |
|     | This special comp evaluates the bus link between the PCMMU and the OF1 MDM. An 8-bit OI validation word from OF1 MDM is received at 10 samples/second to test the link. This comp checks to see whether two consecutive samples complement each other. A logic 0 indicates that two consecutive samples are not complements of each other and, therefore, failed. A logic 1 indicates that they are complements and the link is good. |              |                          |                |
| 57. | OF 2  | OF2_MDM_WRAP | 1 = 2<br>(darkslategray) | 0 = 2<br>(red) |
|     | Same as OF1_MDM_WRAP for OF2 MDM.   |              |                          |                |
| 58. | OF 3  | OF3_MDM_WRAP | 1 = 3<br>(darkslategray) | 0 = 3<br>(red) |
|     | Same as OF1_MDM_WRAP for OF3 MDM.   |              |                          |                |
| 59. | OF 4  | OF4_MDM_WRAP | 1 = 4<br>(darkslategray) | 0 = 4<br>(red) |
|     | Same as OF1_MDM_WRAP for OF4 MDM.   |              |                          |                |
| 60. | OA 1  | OA1_MDM_WRAP | 1 = 1<br>(darkslategray) | 0 = 1<br>(red) |
|     | Same as OF1_MDM_WRAP for OA1 MDM.   |              |                          |                |
| 61. | OA 2  | OA2_MDM_WRAP | 1 = 2<br>(darkslategray) | 0 = 2<br>(red) |
|     | Same as OF1_MDM_WRAP for OA2 MDM.   |              |                          |                |



$$W01I0302C = X1(2^0) + X2(2^1) + X3(2^2) + X4(2^3) = \text{OPS 1 active track}$$

$$W02I0302C = Y1(2^0) + Y2(2^1) + Y3(2^2) + Y4(2^3) = \text{OPS 2 active track}$$

$$W03I0302C = Z1(2^0) + Z2(2^1) + Z3(2^2) + Z4(2^3) = \text{P/L active track}$$

Bit 1	Bit 2	Bit 3	Bit 4	Track
0	0	0	0	0
1	0	0	0	1
0	1	0	0	2
1	1	0	0	3
0	0	1	0	4
1	0	1	0	5
0	1	1	0	6
1	1	1	0	7
0	0	0	1	8
1	0	0	1	9
0	1	0	1	10
1	1	0	1	11
0	0	1	1	12
1	0	1	1	13
0	1	1	1	14
1	1	1	1	15

65. % TP                      W01I0306C (OPS1)    FLOATING  
                                    W02I0306C (OPS2)    (green)  
                                    W03I0306C (P/L)

This is a special comp of the 5 percent tape bits to determine the tape position (BOT = 0 percent and EOT = 100 percent). These special comps are composed of the 5 percent tape bit MSIDs for each recorder.

<u>OPS 1</u>	<u>OPS 2</u>	<u>P/L</u>
V75X2540E = X1	V75X2640E = Y1	V75X2740E = Z1
V75X2541E = X2	V75X2641E = Y2	V75X2741E = Z2
V75X2542E = X3	V75X2642E = Y3	V75X2742E = Z3
V75X2543E = X4	V75X2643E = Y4	V75X2743E = Z4
V75X2544E = X5	V75X2644E = Y5	V75X2744E = Z5

$$W01I0306C = [X1(2^0) + X2(2^1) + X3(2^2) + X4(2^3) + X5(2^4)] [100/31] = \text{percent tape OPS 1}$$

$$W02I0306C = [Y1(2^0) + Y2(2^1) + Y3(2^2) + Y4(2^3) + Y5(2^4)] [100/31] = \text{percent tape OPS 2}$$

$$W03I0306C = [Z1(2^0) + Z2(2^1) + Z3(2^2) + Z4(2^3) + Z5(2^4)] [100/31] = \text{percent tape P/L}$$

66. DIR                      V75X2505E (OPS1)    1 = REV              0 = FWD  
                                    V75X2605E (OPS2)    (green)              (green)  
                                    V75X2705E (P/L)

This parameter indicates the direction the tape is moving, or was last moved, if there is no tape motion.



75. BIT V74X6002E 1 = BIT (green) 0 = (blank)

This parameter indicates whether PSP 1 has bit sync lock.

76. BIT V74X6003E 1 = BIT (green) 0 = (blank)

This parameter indicates whether PSP 2 has bit sync lock.

77. FRM V74X6000E 1 = FRM (green) 0 = (blank)

This parameter indicates whether PSP 1 has frame sync lock.

78. FRM V74X6001E 1 = FRM (green) 0 = (blank)

This parameter indicates whether PSP 2 has frame sync lock.

79. SM I/O V92X0325X 1 = BYP (red) 0 = (blank)

BYP indicates that PSP 1 is bypassed from the GPCs. (PSP and SM GPC are not communicating with each other.)

80. SM I/O V92X0329X 1 = BYP (red) 0 = (blank)

Same as item 79, except indication is for PSP 2.

**CMD**

81. RATE W01G3203R SPECIAL COMP (green)

This is a special comp indicating selected PSP command rate.

<u>V92J0807C</u>				<u>LSB</u>
0	1	0	0	125/16
0	1	0	1	125/8
0	1	1	0	125/4
0	1	1	1	125/2
1	0	0	0	125
1	0	0	1	250
1	0	1	0	500
1	0	1	1	1000
1	1	0	0	2000

Any other combinations output invalid.

82. TYPE W04G3203R SPECIAL COMP  
(green)

This is a special comp indicating the selected PSP command data type.

<u>V92J0808C</u>	<u>LSB</u>	
0	1	NRZ L
1	0	NRZ M
1	1	NRZ S
0	0	INVL

83. Idle Pattern V92X0809X 1 = ENA 0 = ---  
(green) (yellow)

This is a logic 1 when the idle pattern is enabled for transmission and when there are no command data being transmitted. This is a logic 0 for all other conditions, including initialization.

84. OUTPUT W05G3203R SPECIAL COMP  
(green)

This is a special comp indicating which PSP output has been selected.

COMM OUTPUT SELECT

V92X0810X Selected PSP PL INTGTR OUTPUT SELECT

V92X0811X Selected PSP PL UMB OUTPUT SELECT

V92X0812X Selected PSP GSE OUTPUT SELECT

<u>V92X0810X</u>	<u>V92X0811X</u>	<u>V92X0812X</u>	
0	0	0	BLANK
0	0	1	GSE UMB
0	1	0	P/S UMB
0	1	1	BTH UMB
1	0	0	INTEROG
1	0	1	INT UMB
1	1	0	INT P/L
1	1	1	ALL

85. UMB SEL W02G3202R SPECIAL COMP  
(green)

This is a special comp indicating the selected PSP umbilical.

<u>V92J0817C</u>		<u>LSB</u>	
0	0	0	(Blank)
0	0	1	UMB 1
0	1	0	UMB 2
0	1	1	UMB 3
1	0	0	UMB 4
1	0	1	UMB 5

Any other combination output invalid.

**TLM**

86. RATE W03G3203R SPECIAL COMP  
(green)

This is a special comp indicating selected PSP (software) TLM RATE.

V92J0815C selected PSP TLM RATE

			<u>LSB</u>	
0	0	1	1	kbps
0	1	0	2	kbps
0	1	1	4	kbps
1	0	0	8	kbps
1	0	1	16	kbps

Any other combinations invalid.

87. TYPE W11I0603R SPECIAL COMP  
(green)

This is a special comp indicating selected PSP (software) TLM data type.

V92J0816C selected PSP TLM data type

			<u>LSB</u>			
0	0	1	B1	PH	L	
0	1	0	B1	PH	M	
0	1	1	B1	PH	S	
1	0	0	NRZ	L		
1	0	1	NRZ	M		
1	1	0	NRZ	S		

Any other combinations output invalid.

88. FRM V92J0823C FLOATING POINT  
(green)

This parameter indicates the selected PSP (software) frame length.

89. SYNC W02G3203R SPECIAL COMP  
(green)

This is a special comp indicating the number of bits in the frame sync word. The inputs come from PSP Configuration Message word 3, bits 12-14.

<u>12</u>	<u>13</u>	<u>14</u>	
0	0	1	8 bits
0	1	0	16 bits
0	1	1	24 bits
1	0	0	32 bits

Any other combinations output invalid.

90. CONF V92J1103C DECIMAL  
(green)

This parameter indicates the last configuration message ID the selected PSP has received.



**REJECT FLAGS**

91.	V92X1115X	1 = MSG (yellow)	0 = MSG (darkslategray)
	PSP illegal status message.		
92.	V92X1116X	1 = CMD (yellow)	0 = CMD (darkslategray)
	PSP CMD load transfer incomplete.		
93.	V92X1120X	1 = TEC (yellow)	0 = TEC (darkslategray)
	PSP TEC reject flag.		
94.	V92X1102X	1 = LOAD (yellow)	0 = LOAD (darkslategray)
	PSP LOAD reject flag.		
95.	V92X1124X	1 = REQ (yellow)	0 = REQ (darkslategray)
	Uplink invalid request.		
96.	V92X1127X	1 = U/L (yellow)	0 = U/L (darkslategray)
	PSP uplink reject flag.		
97.	V92X1128X	1 = GNC (yellow)	0 = GNC (darkslategray)
	PSP GNC XFER reject flag.		
98.	V92X1129X	1 = CC (yellow)	0 = CC (darkslategray)
	PSP CC SPEC reject flag.		
99.	V92X1140X	1 = PORT (yellow)	0 = PORT (darkslategray)
	PSP PORT MODE reject flag.		
100.	V92X1121X	1 = PCS (yellow)	0 = PCS (darkslategray)
	PSP SEQUENCE reject flag.		
101.	RJT CTR V92J1104C	DECIMAL (green)	
	PSP load reject increment counter.		

102. Command Load Status (SM) V92J1119CY FLOATING POINT  
(green)

This indicates the status (via SM) of the PSP command load. The numerical value indicates the status as follows:

Value	Status of load
0	Configuration Message 0-5 has been successfully initiated
1	Reinitialization configuration message has completed successfully
2	Configuration message ID = 1-5 has completed successfully
3	Config msg ID = 0-5 did not complete successfully because of a PSP BCE bypass
4	A load was terminated while in progress because a config msg ID=0 was executed
5	Config Msg ID=0-5 did not complete because an Illegal Status error was received
6	OPS transition occurred during load; load did not complete
7	A load was terminated because the retry count was exceeded
8	A load was rejected because the PSP command output port reconfiguration failed

**DSC BITE**

103. OF 1 DSC BITE V75X2171E 1 = 1 (darkslategray) 0 = 1 (red)

This parameter indicates the state of the two OF1 DSC power supplies (DSC OF1 BITE). If either supply fails or is out of tolerance (0.5 percent of 17 V) or if one of the 28-V power sources powering the DSC is lost, the parameter indicates a logic 0. A logic 1 indicates good power supplies.

104. OF 2 DSC BITE V75X2172E 1 = 2 (darkslategray) 0 = 2 (red)

Same as OF1 DSC BITE for OF2 DSC.

105. OF 3 DSC BITE V75X2173E 1 = 3 (darkslategray) 0 = 3 (red)

Same as OF1 DSC BITE for OF3 DSC.

106. OA 1 DSC BITE V75X2174E 1 = 1 (darkslategray) 0 = 1 (red)

Same as OF1 DSC BITE for OA1 DSC.

107. OA 2 DSC BITE V75X2175E 1 = 2 (darkslategray) 0 = 2 (red)

Same as OF1 DSC BITE for OA2 DSC.

108. OA 3 DSC BITE V75X2176E 1 = 3 (darkslategray) 0 = 3 (red)

Same as OF1 DSC BITE for OA3 DSC.

- |      |                                   |           |                          |                |
|------|-----------------------------------|-----------|--------------------------|----------------|
| 109. | OM 1 DSC BITE                     | V75X2181E | 1 = 1<br>(darkslategray) | 0 = 1<br>(red) |
|      | Same as OF1 DSC BITE for OM1 DSC. |           |                          |                |
| 110. | OM 2 DSC BITE                     | V75X2182E | 1 = 2<br>(darkslategray) | 0 = 2<br>(red) |
|      | Same as OF1 DSC BITE for OM2 DSC. |           |                          |                |
| 111. | OM 3 DSC BITE                     | V75X2183E | 1 = 3<br>(darkslategray) | 0 = 3<br>(red) |
|      | Same as OF1 DSC BITE for OM3 DSC. |           |                          |                |
| 112. | OP 1 DSC BITE                     | V75X2184E | 1 = 1<br>(darkslategray) | 0 = 1<br>(red) |
|      | Same as OF1 DSC BITE for OP1 DSC. |           |                          |                |
| 113. | OP 2 DSC BITE                     | V75X2185E | 1 = 2<br>(darkslategray) | 0 = 2<br>(red) |
|      | Same as OF1 DSC BITE for OP2 DSC. |           |                          |                |

**PDI**

- |      |           |          |                   |                   |
|------|-----------|----------|-------------------|-------------------|
| 114. | WRAP TEST | PDI_WRAP | 1 = OK<br>(green) | 0 = FAIL<br>(red) |
|------|-----------|----------|-------------------|-------------------|

For OI validation, the ground processor stores and compares two sets of two 8-bit words. If the ground processing does not receive the complement of alternate 1's and 0's for the PDI, the PDI WRAP is set on the display. If PDI WRAP remains set on the display, it indicates loss of communication between the PDI and the PCMMU. Communication may be recovered with the PDI by selecting the alternate PCMMU, which, in effect, selects the alternate data bus.

- |      |         |           |                  |                   |
|------|---------|-----------|------------------|-------------------|
| 115. | SM LINK | V92X0908X | 1 = BYP<br>(red) | 0 = OK<br>(green) |
|------|---------|-----------|------------------|-------------------|

Indicates that the PDI switch matrix did not respond to two consecutive switch matrix READ commands from the SM GPC. Under these conditions, the switch matrix cannot be loaded and will remain at the last values selected.

- |      |             |           |                    |  |
|------|-------------|-----------|--------------------|--|
| 116. | DECOM 1 FMT | V75J5132D | DECIMAL<br>(green) |  |
|------|-------------|-----------|--------------------|--|

Integer value of the DFL load in DECOM 1 loaded by SM 2 via SPEC 62.

- |      |             |           |                    |  |
|------|-------------|-----------|--------------------|--|
| 117. | DECOM 2 FMT | V75J5152D | DECIMAL<br>(green) |  |
|------|-------------|-----------|--------------------|--|

Integer value of the DFL load in DECOM 2 loaded by SM 2 via SPEC 62.

118. DECOM 3 FMT V75J5172D DECIMAL  
(green)

Integer value of the DFL load in DECOM 3 loaded by SM 2 via SPEC 62.

119. DECOM 4 FMT V75J5192D DECIMAL  
(green)

Integer value of the DFL load in DECOM 4 loaded by SM 2 via SPEC 62.

120. DECOM 1 SRC V75J5111D DECIMAL  
(green)

Switch matrix connection for PDI payload input to DECOM 1.

0 = No connection	4 = Payload port 4
1 = Payload port 1	5 = Payload port 5
2 = Payload port 2	6 = PSP payload port 6
3 = Payload port 3	7 = TEST port (not used)

Note: This is an active read and reflects the true status of the switch matrix.

121. DECOM 2 SRC V75J5112D DECIMAL  
(green)

Same as DECOM 1 SRC for DECOM 2.

122. DECOM 3 SRC V75J5113D DECIMAL  
(green)

Same as DECOM 1 SRC for DECOM 3.

123. DECOM 4 SRC V75J5114D DECIMAL  
(green)

Same as DECOM 1 SRC for DECOM 4.

124. DECOM 1 FDA V93X5576X 1 = ENA (green) 0 = INH (yellow)

Denotes that the fault detection and annunciation for B/W/F for DECOM 1 is inhibited (INH) or enabled (ENA) on SPEC 62, item entry 14.

125. DECOM 2 FDA V93X5577X 1 = ENA (green) 0 = INH (yellow)

Same as item 117 for DECOM 2 and item entry 15.

126. DECOM 3 FDA V93X5578X 1 = ENA (green) 0 = INH (yellow)

Same as item 117 for DECOM 3 and item entry 16.

- |      |  |           |                    |                     |
|------|--|-----------|--------------------|---------------------|
| 127. | DECOM 4 FDA  | V93X5579X | 1 = ENA<br>(green) | 0 = INH<br>(yellow) |
|      | Same as item 117 for DECOM 4 and item entry 17.                                  |           |                    |                     |
| 128. | DECOM 1 LOCK (bit)   | V75X6403D | 1 = B<br>(green)   | 0 = -<br>(yellow)   |
|      | Bit sync locked on bit synchronizer for DECOM 1.                                 |           |                    |                     |
| 129. | DECOM 1 LOCK (word)  | V75X6402D | 1 = W<br>(green)   | 0 = -<br>(yellow)   |
|      | Word sync locked on word synchronizer for DECOM 1.                               |           |                    |                     |
| 130. | DECOM 1 LOCK (MF)  | V75X6401D | 1 = MF<br>(green)  | 0 = --<br>(yellow)  |
|      | Master frame lock for DECOM 1.   |           |                    |                     |
| 131. | DECOM 1 ACCURACY   | V75X6404D | 1 = A<br>(green)   | 0 = (blank)         |
|      | Bit rate accuracy is within $\pm 3.25$ percent of expected bit rate for DECOM 1. |           |                    |                     |
| 132. | DECOM 2 LOCK (bit)   | V75X6407D | 1 = B<br>(green)   | 0 = -<br>(yellow)   |
|      | Bit sync locked on bit synchronizer for DECOM 2.                                 |           |                    |                     |
| 133. | DECOM 2 LOCK (word)  | V75X6406D | 1 = W<br>(green)   | 0 = -<br>(yellow)   |
|      | Word sync locked on word synchronizer for DECOM 2.                               |           |                    |                     |
| 134. | DECOM 2 LOCK (MF)  | V75X6405D | 1 = MF<br>(green)  | 0 = --<br>(yellow)  |
|      | Master frame lock for DECOM 2.   |           |                    |                     |
| 135. | DECOM 2 ACCURACY   | V75X6408D | 1 = A<br>(green)   | 0 = (blank)         |
|      | Bit rate accuracy is within $\pm 3.25$ percent of expected bit rate for DECOM 2. |           |                    |                     |
| 136. | DECOM 3 LOCK (bit)   | V75X6411D | 1 = B<br>(green)   | 0 = -<br>(yellow)   |
|      | Bit sync locked on bit synchronizer for DECOM 3.                                 |           |                    |                     |
| 137. | DECOM 3 LOCK (word)  | V75X6410D | 1 = W<br>(green)   | 0 = -<br>(yellow)   |
|      | Word sync locked on word synchronizer for DECOM 3.                               |           |                    |                     |

138. DECOM 3 LOCK (MF) V75X6409D 1 = MF (green) 0 = -- (yellow)

Master frame lock for DECOM 3.

139. DECOM 3 ACCURACY V75X6412D 1 = A (green) 0 = (blank)

Bit rate accuracy is within  $\pm 3.25$  percent of expected bit rate for DECOM 3.

140. DECOM 4 LOCK (bit) V75X6415D 1 = B (green) 0 = - (yellow)

Bit sync locked on bit synchronizer for DECOM 4.

141. DECOM 4 LOCK (word) V75X6414D 1 = W (green) 0 = - (yellow)

Word sync locked on word synchronizer for DECOM 4.

142. DECOM 4 LOCK (MF) V75X6413D 1 = MF (green) 0 = -- (yellow)

Master frame lock for DECOM 4.

143. DECOM 4 ACCURACY V75X6416D 1 = A (green) 0 = (blank)

Bit rate accuracy is within  $\pm 3.25$  percent of expected bit rate for DECOM 4.

144. FPM V92J0078CY FLOATING POINT (green)

Integer value of the Fetch Pointer Memory (FPM) memory load sent to the PDI by SM2 GPC by SPEC 62. This value does not reflect what is loaded but is the last load sent by SM2.

145. BITES V75M6400P HEX (green)

Indicates PDI BITE WORD 1 in hex. The following table gives a detailed description of the word.



149.	C-	V76X4378E	1 = ON (green)	0 = OFF (yellow)
------	----	-----------	-------------------	---------------------

PDI RPC C power. Indicates the status of RPC C.

**MADS**

Clicking on this pushbutton will bring up separate a MADS/OEX display.

**VPs**

150.	4	V92U5506CY	FLOATING POINT (green)
------	---	------------	---------------------------

This parameter indicates variable parameter slot 4 in hex. This hex number gives insight on whether the crew has SPEC 60 on a CRT display. If the hex number is 2XXX, 3XXX, AXXX, or BXXX, it indicates that SPEC 60 is active. Note: X is a do not care.

151.	5	V92U5508CY	1 = S 62 (yellow)	0 = S 62 (darkslategray)
------	---	------------	----------------------	-----------------------------

Variable parameter slot 5 indicates whether the crew has SPEC 62 up on a CRT display. A logic 1 indicates SPEC 62 is active.

152.	CMD U/L	V93X5543XY	1 = A (green)	0 = (blank)
------	---------	------------	------------------	-------------

This parameter indicates that the uplink software automatically processes uplink data if a TDRS or STDN site is in view and inhibits uplink data processing if the vehicle is in LOS. The "in-view" information is provided to all active GPCs by the SM GPC via ICC data transfer. Control of this function and the ENA and INH (81 and 82) are from DPS utility SPEC 1.

153.	CMD U/L	V93X5544XY	1 = E (red)	0 = (blank)
------	---------	------------	----------------	-------------

This parameter indicates that the auto ENA/INHIBIT of uplink processing has been forced to the enable state and all uplink data will be processed, regardless of the state of the SM "site-in-view" indicator.

154.	CMD U/L	V93X5545XY	1 = I (red)	0 = (blank)
------	---------	------------	----------------	-------------

This parameter indicates the uplink process is inhibited and will not process uplink data.

155.	NSP 1-	V74X5188E	1 = B (green)	0 = (blank)
------	--------	-----------	------------------	-------------

This parameter indicates that NSP 1 has bit sync lock.

156.	NSP 1-	V74X5176E	1 = F (green)	0 = (blank)
------	--------	-----------	------------------	-------------

This parameter indicates that NSP 1 has frame sync lock.



- |   |          |            |                           |                  |
|---|----------|------------|---------------------------|------------------|
| 157.  | NSP 2-   | V74X5189E  | 1 = B<br>(green)          | 0 = (blank)      |
| This parameter indicates that NSP 2 has bit sync lock.  |          |            |                           |                  |
| 158.  | NSP 2-   | V74X5177E  | 1 = F<br>(green)          | 0 = (blank)      |
| This parameter indicates that NSP 2 has frame sync lock.  |          |            |                           |                  |
| 159.  | SM BYP   | V92X0323X  | 1 = PF1<br>(red)          | 0 = (blank)      |
| A logic 1 indicates that the SM GPC has bypassed the payload MDM (PF 1) and that the SM will not send commands via PF 1.        |          |            |                           |                  |
| 160.  | SM BYP`  | V92X0327X  | 1 = PF2<br>(red)          | 0 = (blank)      |
| This parameter indicates that the SM GPC has bypassed the payload MDM 2 (PF 2) and that the SM will not send commands via PF 2. |          |            |                           |                  |
| 161.  | FF 1 BYP | V91X2242XX | 1 = A<br>(red)            | 0 = -<br>(green) |
| This parameter indicates that MDM FF1 BCE A is bypassed.  |          |            |                           |                  |
| 162.  | FF 1 BYP | V91X2246XX | 1 = B<br>(red)            | 0 = -<br>(green) |
| This parameter indicates that MDM FF1 BCE B is bypassed.  |          |            |                           |                  |
| 163.  | FF 3 BYP | V91X2244XX | 1 = A<br>(red)            | 0 = -<br>(green) |
| This parameter indicates that MDM FF3 BCE A is bypassed.  |          |            |                           |                  |
| 164.  | FF 3 BYP | V91X2248XX | 1 = B<br>(red)            | 0 = -<br>(green) |
| This parameter indicates that MDM FF3 BCE B is bypassed.  |          |            |                           |                  |
| 165.  | SPC SM   | V92U6105C  | FLOATING POINT<br>(green) |                  |
| This parameter indicates the number of stored program commands in the SM GPC.   |          |            |                           |                  |
| 166.  | TEC SM   | V92J1126C  | DECIMAL<br>(green)        |                  |
| This parameter indicates the hex number of time executed commands in the SM GPC.  |          |            |                           |                  |

**PWR SW**

167. V75S2160E 1 = DSC OL 0 = DSC OL  
(darkslategray) (white)  
(black) (red)

This parameter indicates the power switch status for DSCs OL 1 and 2. In the ON position, an enable is provided to the OL 1 and 2 DSC RPC.

168. V75S2165E 1 = DSC OR 0 = DSC OR  
(darkslategray) (white)  
(black) (red)

This parameter indicates the power switch status for DSCs OR 1 and 2. In the ON position, an enable is provided to the OR1 and 2 DSC RPCs.

169. V75S2801E 1 = MDM OA 0 = MDM OA  
(darkslategray) (white)  
(black) (red)

This parameter indicates the power switch status for MDMs OA 1, 2, and 3. In the ON position, an enable is provided to the OA 1, 2, and 3 MDM RPCs.

170. V75S2157E 1 = DSC OA 0 = DSC OA  
(darkslategray) (white)  
(black) (red)

This parameter indicates the power switch status for DSCs OA 1, 2, and 3. In the ON position, an enable is provided to the OA 1, 2, and 3 DSC RPCs.

INST MGMT v1.3		GMT XXX/XX:XX:XX		MET XXX/XX:XX:XX		STS X/X						
OI TFL xxx		SM xx		GNC xx		PL CNTRL xxx						
PCMMU		PI		PSP		PDI						
BITE	xxxx	PI 1	x	PWR	x x	WRAP TEST		xxxx		SM LINK		xxx
PWR	x x	AGC	x	ITEM 6	x 7 x	SWITCH		xxx	A-	xxx	C- xxx	
A	x x	SPE	x	BIT	x x	DECOM	1	2	3	4	FPM	
B	x	LOCK	x	FRM	x x	FMT	xx	xx	xx	xx	x	
C	x	RF	x	CMD		SRC	x	x	x	x	BITES	
MODE	x	ANT	x	RATE	x	FDA	xxx	xxx	xxx	xxx	x	
SM HDR	x	PI 2	x	TYPE	x	LOCK	x x	x x	x x	x x	x	
LDR	x	AGC	x	IDLE	x	MADS		x		OEX		x
LOAD STAT	x	SPE	x	OUTPUT	x	MODE	x		MODE		x	
BFS TFL	x	LOCK	x	TLM		MOTION	x		MOTION		x	
ELEM	x	RF	x	RATE	x	DIR	x		DIR		x	
ECNT	x	ANT	x	TYPE	x	SEQ 3	x		% TAPE		x	
PCMMU BSR		COMMON		FRM	x	% TAPE	x		SPEED		x	
1	xxxxxx	XMIT	x x x	SYNC	x	MODE 1	x		TRACK		x	
2	xxxxxx	MOD	x	CONF	x	MODE 2	x		CMD ECHO		x	
3	xxxxxx	SWP	x	REJECT FLAGS		PCM 1	x		CMD U/L		x x x	
4	xxxxxx	WIDE	x	x	x x x	2	x		NSP 1-		x x 2-	x x
5	xxxxxx	NAR	x	x	x x x	3	x		SPC SM		x	
6	xxxxxx	CHAN	x	x	x	FDM 1	x x x x			BFS		x
7	xxxxxx	MDM WRAP		RJT CTR	x	2	x x x x			TEC SM		x
8	xxxxxx	OF	x x x x	DSC BITE		TEMP 1	x		SM BYP		xxx	xxx
9	xxxxxx	OA	x x x	OF	x x x	TEMP 2	x		FF1 BYP		x	x
10	xxxxxx			OA	x x x	VP's				FF3 BYP		x x
11	xxxxxx			OM	x x x	4	xxxx	5	xxxx			
12	xxxxxx	PWR SW		OP	x x	RECORDERS						
13	xxxxxx	x		MODE		TRK	%TP	DIR	SPD	MTN	TEMP	BITE
14	xxxxxx	x		OPS 1	x	x	x x	x x	x	x	x	x
15	xxxxxx	x		2	x	x	x x	x x	x	x	x	x
16	xxxxxx	x		P/L	x	x	x x	x x	x	x	x	x

Figure 5.127-1. INST MGMT display

**TITLE**

MADS/OEX SYSTEM V1.1

**GENERAL**

- A. The data displayed are real-time telemetry parameters that affect the management and operation of the MADS and OEX systems. A copy of the MADS/OEX SYSTEM display is shown in Figure 5.128-1.
- B. Pathname of display: INCO/INCO Displays/INST Systems/mads\_oex.
- C. Detailed display description.

1.	PCM BITE 1	V78X9611E	1 = GOOD (green)	0 = FAIL (yellow)
----	------------	-----------	---------------------	----------------------

MADS composite BITE BIT consisting of internal self-checks. The BITE circuitry verifies the correct operation of the low-level discrete (5 V dc) group module, the high-level analog group module, and each gain step in the low-level analog group module. Bipolar analogs and high-level discrettes are not checked. If a FAIL is indicated, any or all of the above module groups may have failed. GOOD indicates that the MADS PCMU is operating normally.

2.	PCM BITE 2	V78X9614E	1 = GOOD (green)	0 = FAIL (yellow)
----	------------	-----------	---------------------	----------------------

Same as item 1 for PCM 2.

3.	PCM BITE 3	V78X9615E	1 = GOOD (green)	0 = FAIL (yellow)
----	------------	-----------	---------------------	----------------------

Same as item 1 for PCM 3.

4.	MUX 1 BITE (FDM 1)	V8X9380E	1 = (blank)	0 = FAIL (yellow)
----	--------------------	----------	-------------	----------------------

This parameter indicates the status of the MADS FDM MUX 1. A blank indication implies that the composite output voltage has not varied more than  $3 \pm 1$  dB.

5.	MUX 1 BITE (FDM 2)	V78X9390E	1 = (blank)	0 = FAIL (yellow)
----	--------------------	-----------	-------------	----------------------

This parameter indicates the status of the MADS FDM 2 MUX1. A blank indication implies that the composite output voltage has not varied more than  $3 \pm 1$  dB.

6.	MUX 2 BITE (FDM 1)	V78X9381E	1 = (blank)	0 = FAIL (yellow)
----	--------------------	-----------	-------------	----------------------

This parameter indicates the status of the MADS FDM MUX 2. Status is the same as for MUX 1.

7.	MUX 2 BITE (FDM 2)	V78X9391E	1 = (blank)	0 = FAIL (yellow)
----	--------------------	-----------	-------------	----------------------

This parameter indicates the status of the MADS FDM 2 MUX 2 BITE. Status is the same as for MUX 1.

- |     |  |           |                           |                      |
|-----|--|-----------|---------------------------|----------------------|
| 8.  | MUX 3 BITE (FDM 1)   | V78X9382E | 1 = (blank)               | 0 = FAIL<br>(yellow) |
|     | This parameter indicates the status of the MADS FDM MUX 3. Status is the same as for MUX 1.  |           |                           |                      |
| 9.  | MUX 3 BITE (FDM 2)   | V78X9392E | 1 = (blank)               | 0 = FAIL<br>(yellow) |
|     | This parameter indicates the status of the MADS FDM 2 MUX 3 BITE. Status is the same as for MUX 1.   |           |                           |                      |
| 10. | MUX 4 BITE (FDM 1)   | V78X9383E | 1 = (blank)               | 0 = FAIL<br>(yellow) |
|     | This parameter indicates the status of the MADS FDM MUX 4. Status is the same as for MUX 1.  |           |                           |                      |
| 11. | MUX 4 BITE (FDM 2)   | V78X9393E | 1 = (blank)               | 0 = FAIL<br>(yellow) |
|     | This parameter indicates the status of the MADS FDM 2 MUX 4 BITE. Status is the same as for MUX1.  |           |                           |                      |
| 12. | MODE (FDM 1)   | V78X9309E | 1 = DATA<br>(green)       | 0 = CAL<br>(yellow)  |
|     | This parameter indicates the status of the FDM calibrate mode. DATA indicates normal data inputs. CAL denotes that a calibration sequence is taking place for the wideband MUX modules and should last approximately 6 seconds or that the FDM is powered off. |           |                           |                      |
| 13. | MODE (FDM 2)   | V78X9310E | 1 = DATA<br>(green)       | 0 = CAL<br>(yellow)  |
|     | Same as mode 1 for mode 2.   |           |                           |                      |
| 14. | SHLF 8 PCM TEMP  | V78T9606A | FLOATING POINT<br>(green) |                      |
|     | This parameter indicates the temperature of the MADS shelf heat sink adjacent to the MADS PCMU. Operating range: -45° to 140° F. Note that the shelf temperature will lead or lag the actual PCM temperature.  |           |                           |                      |
| 15. | SHLF 8 WB TEMP   | V78T9607A | FLOATING POINT<br>(green) |                      |
|     | This parameter indicates the temperature of the MADS shelf heat sink adjacent to the FDM and WBSC chassis. Operating range: 30° to 140° F. Note that the shelf temperature will lead or lag the actual equipment temperature.                                  |           |                           |                      |
| 16. | MADS RCDR BITE   | V78X9603E | 1 = (blank)               | 0 = FAIL<br>(yellow) |
|     | A logic 0 indicates the recorder internal bite circuitry has detected a failure or is off.   |           |                           |                      |

The BITE is set for any of the following reasons.

- a. Input voltage above  $37 \pm 2$  V. Reset at  $33 \pm 2$  V.  
Input voltage below  $22 \pm 2$  V. Reset at  $24 \pm 2$  V.
- b. Any of the sensor lights in the tension sensor arm burned out.

In the case of overvoltage or undervoltage, the BITE is reset when the problem is corrected (reset levels listed above), but for sensor lights out, power must be removed from the recorder and reapplied to reset the BITE circuit. (If the fault still exists, the recorder indicates the BITE again.)

A logic 1 indicates that the recorder is good.

- |     |                |           |                    |                    |
|-----|----------------|-----------|--------------------|--------------------|
| 17. | MADS RCDR MODE | V78X9604E | 1 = RCD<br>(green) | 0 = --<br>(yellow) |
|-----|----------------|-----------|--------------------|--------------------|

The record telemetry indicates that the record function is in progress and is a 1 when

- a. The record amps have power present.
- b. The bias oscillator has power present.
- c. The servo indicates phase lock (up to speed).

- |     |                  |           |                    |                      |
|-----|------------------|-----------|--------------------|----------------------|
| 18. | MADS RCDR MOTION | V78X9605E | 1 = RUN<br>(green) | 0 = STOP<br>(yellow) |
|-----|------------------|-----------|--------------------|----------------------|

A logic 1 denotes that tape motion, in actuality a guide roller linked to a tachometer, is greater than or equal to 1-7/8 ips.

- |     |             |           |                    |  |
|-----|-------------|-----------|--------------------|--|
| 19. | MADS RCDR % | V78Q9602A | DECIMAL<br>(green) |  |
|-----|-------------|-----------|--------------------|--|

Analog representation is percentage of tape used, referenced to BOT/EOT, with 0 percent being BOT and 100 percent being EOT.

- |     |                     |           |                    |                     |
|-----|---------------------|-----------|--------------------|---------------------|
| 20. | MADS RCDR DIRECTION | V78X9612E | 1 = FWD<br>(green) | 0 = REV<br>(yellow) |
|-----|---------------------|-----------|--------------------|---------------------|

This parameter indicates the status of direction relay in the MADS control module. A logic 1 equals motion from BOT to EOT. A logic 0 equals motion from EOT to BOT.

- |     |                 |           |                   |                         |
|-----|-----------------|-----------|-------------------|-------------------------|
| 21. | MADS RCDR SEQ 3 | V78X9613E | 1 = ON<br>(green) | 0 = (blank)<br>(yellow) |
|-----|-----------------|-----------|-------------------|-------------------------|

This parameter indicates the status of track sequence (PASS) number 3. This relay selects and deselects tracks required for sequence 3. A logic 0 indicates it will not record, and a logic 1 indicates it will record.

- |     |               |           |             |                      |
|-----|---------------|-----------|-------------|----------------------|
| 22. | OEX RCDR BITE | V78X9511E | 1 = (blank) | 0 = FAIL<br>(yellow) |
|-----|---------------|-----------|-------------|----------------------|

A logic 0 indicates the recorder internal bite circuitry has detected a failure or is off.

The BITE is set for any of the following reasons.

- a. Input voltage above  $37 \pm 2$  V. Reset at  $33 \pm 2$  V.  
Input voltage below  $22 \pm 2$  V. Reset at  $24 \pm 2$  V.
- b. Any of the sensor lights in the tension sensor arm burned out.

In the case of overvoltage or undervoltage, the BITE is reset when the problem is corrected (reset levels listed above), but for sensor lights out, power must be removed from the recorder and reapplied to reset the BITE circuit. (If the fault still exists, the recorder indicates the BITE again.)

A logic 1 indicates that the recorder is good.

- |     |               |           |                    |                    |
|-----|---------------|-----------|--------------------|--------------------|
| 23. | OEX RCDR MODE | V78X9512E | 1 = RCD<br>(green) | 0 = --<br>(yellow) |
|-----|---------------|-----------|--------------------|--------------------|

A logic 1 indicates that the recorder heads are energized, the bias oscillator power is on, and the capstans are up to speed.

- |     |                 |           |                    |                      |
|-----|-----------------|-----------|--------------------|----------------------|
| 24. | OEX RCDR MOTION | V78X9513E | 1 = RUN<br>(green) | 0 = STOP<br>(yellow) |
|-----|-----------------|-----------|--------------------|----------------------|

This parameter indicates tape motion. The recorder checks to see if the rotation frequency of a guide roller is above a 0.8-Hz reference. If it is above, the tape motion is set high.

- |     |            |           |                    |
|-----|------------|-----------|--------------------|
| 25. | OEX RCDR % | V78Q9551A | DECIMAL<br>(green) |
|-----|------------|-----------|--------------------|

This is an analog parameter that indicates percent tape.

0 V = 0% through 5 V = 100%.

- |     |                |           |                         |
|-----|----------------|-----------|-------------------------|
| 26. | OEX RCDR SPEED | W01I0701R | SPECIAL COMP<br>(green) |
|-----|----------------|-----------|-------------------------|

This is a special computation that monitors the tape speed the SCM has selected (this does not monitor the recorder itself). It looks at three parameters.

V78X9548E	V78X9549E	V78X9550E	TEXT
0	0	0	STOP
0	0	1	1.87
0	1	0	3.75
0	1	1	7.50
1	0	0	15.
1	0	1	30.
1	1	0	60.
1	1	1	---

- |     |                    |           |                    |                    |
|-----|--------------------|-----------|--------------------|--------------------|
| 27. | OEX RCDR DIRECTION | V78X9552E | 1 = REV<br>(green) | 0 = FWD<br>(green) |
|-----|--------------------|-----------|--------------------|--------------------|

This does not actually show which way the tape is going, but which direction the SCM is telling the recorder to go.

28. OEX RCDR HI TRACK W01I0702C FLOATING POINT  
(green)

This special computation is made up of the five-track bits and displays the highest track of any selected (0 to 31). Comp is

Inputs

V78X9553E - X1  
V78X9554E - X2  
V78X9555E - X3  
V78X9556E - X4  
V78X9557E - X5

$$W01I0702C = X1(2^{**4}) + X2(2^{**3}) + X3(2^{**2}) + X4(2^{**1}) + X5(2^{**0}) + 1$$

29. OEX RCDR CMD ECHO W01I0703L SPECIAL COMP  
(green)

This is a special comp made up of the command echo bits.

Inputs

V78X9540E - X1  
V78X9541E - X2  
V78X9542E - X3  
V78X9543E - X4  
V78X9544E - X5  
V78X9545E - X6  
V78X9546E - X7  
V78X9547E - X8

X1 X2 X3 X4 | X5 X6 X7 X8  
HEX CHAR1 | HEX CHAR2

These two HEX characters combine to form a HEX word that is output to DTE. It is used by operators to confirm receipt of commands as well as for troubleshooting problems with the SCM. If the command is not correct or not appropriate, the SCM downlinks an error code. Error codes are described in detail in the OEX System Brief.

The 8 bits are converted directly into HEX.

30. OEX RCDR SCM EVENT W05K0302E SPECIAL COMP  
(yellow)

This is a special computation, indicating that an error code has been returned by the SCM. The event is set equal to 1 if V78X9540E = 1, if V789541E = 1, and if V78X9542E = 1. The event equals 0 for any other combination (1 = ERR and 0 = (blank)).



<b>MADS/OEX SYSTEM</b>		<b>v 1.1</b>	
GMT XXX/XX:XX:XX			
<b>PCM BITE 1</b>		XXXX	
<b>BITE 2</b>		XXXX	
<b>BITE 3</b>		XXXX	
<b>FDM</b>	<b>1</b>	<b>2</b>	
<b>MUX 1 BITE</b>	XXXX	XXXX	
<b>MUX 2 BITE</b>	XXXX	XXXX	
<b>MUX 3 BITE</b>	XXXX	XXXX	
<b>MUX 4 BITE</b>	XXXX	XXXX	
<b>MODE</b>	XXXX	XXXX	
<b>SHLF 8 PCM TEMP</b>		XXXX.X	
<b>WB TEMP</b>		XXXX.X	
<b>MADS RCDR</b>		<b>(OV 103/104/105)</b>	
<b>BITE</b>		XXXX	
<b>MODE</b>		XXX	
<b>MOTION</b>		XXXX	
<b>% TAPE</b>		XXXX	
<b>DIRECTION</b>		XXX	
<b>SEQ 3</b>		XX	
<b>OEX RCDR</b>		<b>(OV 102)</b>	
<b>BITE</b>		XXXX	
<b>MODE</b>		XXX	
<b>MOTION</b>		XXXX	
<b>% TAPE</b>		XXXX	
<b>SPEED</b>		XXXX	
<b>DIRECTION</b>		XXX	
<b>HI TRACK</b>		XX	
<b>CMD ECHO</b>		XX	
<b>SCM EVENT</b>		XXX	

Figure 5.128-1. MADS/OEX SYSTEM display

**TITLE**

OI MDM/DSC V1.3

**GENERAL**

- A. This is a telemetry display that is used to identify and troubleshoot any suspected operational instrumentation (OI) dedicated signal conditioners (DSCs) that provide acquisition and conditioning of vehicle data and the OI MDMs, which receive these data and output serial digital data to the PCMMU upon request. A copy of the OI MDM/DSC system display is shown in figure 5.129-1.
- B. Pathname of display: INCO/INCO Displays/INST Systems/mdm\_dsc.
- C. Detailed display description.

- 1. GMT M50Q0027HP TIME  
green

Indicates Greenwich mean time.

**DSC FAIL**

The data displayed in this section are the OI monitor (Oimon) conclusions on the status of the DSCs. The Oimon is a real-time application that monitors the status of MDMs, DSCs, and the payload data interleaver (PDI). The application monitors the status by receiving data downlinked from the orbiter and deducing from them the states of the MDMs, DSCs, and PDI, based on a rule-based event detection scheme. The uncalibrated parameters received to monitor the status of the DSCs are displayed in the DSC RAW DATA display.

The Oimon receives 3 to 5 uncalibrated parameters that are processed through a DSC for each of the 16 OI DSCs. These parameters are the PCM counts, not the analog value of the relatively dynamic measurements. Oimon concludes that a particular DSC has failed if all the uncalibrated parameters received for that DSC have a value of zero. A particular DSC may also be considered a suspect for different reasons. First, if a subset of the uncalibrated parameters received for that DSC has a value of zero, it is considered a suspect. Second, if an MDM that is linked to a DSC has a wrap indication, the DSC is considered a suspect. On this display, the status of the DSCs is differentiated by color.

- 2. (OF1 DSC FAIL) OF1\_DSC

Indicates the status of OF1 DSC published by the Oimon application. The status of the DSC has the following three states:

<u>Oimon conclusion</u>	<u>Output</u>	<u>Color</u>
FAIL	"OF1"	white/red
SUSPECT	"OF1"	white/purple
OK	"OF1"	darkslategray/black

- 3. (OF2 DSC FAIL) OF2\_DSC

Same as OF1 DSC FAIL for OF2 DSC.

- 4. (OF3 DSC FAIL) OF3\_DSC

Same as OF1 DSC FAIL for OF3 DSC.

5. (OF4 DSC FAIL)                      OF4\_DSC  
Same as OF1 DSC FAIL for OF4 DSC.
6. (OP1 DSC FAIL)                      OP1\_DSC  
Same as OF1 DSC FAIL for OP1 DSC.
7. (OP2 DSC FAIL)                      OP2\_DSC  
Same as OF1 DSC FAIL for OP2 DSC.
8. (OL1 DSC FAIL)                      OL1\_DSC  
Same as OF1 DSC FAIL for OL1 DSC.
9. (OL2 DSC FAIL)                      OL2\_DSC  
Same as OF1 DSC FAIL for OL2 DSC.
10. (OA1 DSC FAIL)                      OA1\_DSC  
Same as OF1 DSC FAIL for OA1 DSC.
11. (OA2 DSC FAIL)                      OA2\_DSC  
Same as OF1 DSC FAIL for OA2 DSC.
12. (OA3 DSC FAIL)                      OA3\_DSC  
Same as OF1 DSC FAIL for OA3 DSC.
13. (OM1 DSC FAIL)                      OM1\_DSC  
Same as OF1 DSC FAIL for OM1 DSC.
14. (OM2 DSC FAIL)                      OM2\_DSC  
Same as OF1 DSC FAIL for OM2 DSC.
15. (OR1 DSC FAIL)                      OR1\_DSC  
Same as OF1 DSC FAIL for OR1 DSC.
16. (OR2 DSC FAIL)                      OR2\_DSC  
Same as OF1 DSC FAIL for OR2 DSC.

**DSC BITE**

17. V75X2171E	1 = OF1 darkslategray black	0 = OF1 white red
---------------	-----------------------------------	-------------------------

This parameter indicates the state of the two OF1 DSC power supplies. If either supply fails or is out of tolerance (0.5 percent of 17 V), or if one the 28 V-power sources powering the DSC is lost, the parameter will indicate a logic 0. A logic 1 indicates good power supplies.

18. V75X2172E	1 = OF2 darkslategray black	0 = OF2 white red
---------------	-----------------------------------	-------------------------

Same as OF1 DSC BITE for OF2 DSC.

19. V75X2173E	1 = OF3 darkslategray black	0 = OF3 white red
---------------	-----------------------------------	-------------------------

Same as OF1 DSC BITE for OF3 DSC.

20. V75X2184E	1 = OP1 darkslategray black	0 = OP1 white red
---------------	-----------------------------------	-------------------------

Same as OF1 DSC BITE for OP1 DSC.

21. V75X2185E	1 = OP2 darkslategray black	0 = OP2 white red
---------------	-----------------------------------	-------------------------

Same as OF1 DSC BITE for OP2 DSC.

22. V75X2174E	1 = OA1 darkslategray black	0 = OA1 white red
---------------	-----------------------------------	-------------------------

Same as OF1 DSC BITE for OA1 DSC.

23. V75X2175E	1 = OA2 darkslategray black	0 = OA2 white red
---------------	-----------------------------------	-------------------------

Same as OF1 DSC BITE for OA2 DSC.

24. V75X2176E	1 = OA3 darkslategray black	0 = OA3 white red
---------------	-----------------------------------	-------------------------

Same as OF1 DSC BITE for OA3 DSC.

25. V75X2181E	1 = OM1 darkslategray black	0 = OM1 white red
---------------	-----------------------------------	-------------------------

Same as OF1 DSC BITE for OM1 DSC.

26. V75X2182E	1 = OM2 darkslategray black	0 = OM2 white red
---------------	-----------------------------------	-------------------------

Same as OF1 DSC BITE for OM2 DSC.

27. V75X2183E	1 = OM3 darkslategray black	0 = OM3 white red
---------------	-----------------------------------	-------------------------

Same as OF1 DSC BITE for OM3 DSC.

**WRAP**

28. OF1_MDM_WRAP	1 = MDM OF1 darkslategray black	0 = MDM OF1 white red
------------------	---------------------------------------	-----------------------------

This special comp evaluates the bus link between the PCMMU and the OF1 MDM. An 8-bit OI validation word from OF1 MDM is received at 10 samples/second to test the link. This comp checks to see whether two consecutive samples complement each other. A logic 0 indicates that two consecutive samples are not complements of each other and, therefore, failed. A logic 1 indicates they are complements and the link is good.

29. OF2_MDM_WRAP	1 = MDM OF2 darkslategray black	0 = MDM OF2 white red
------------------	---------------------------------------	-----------------------------

Same as OF1\_MDM\_WRAP for OF2 MDM.

30. OF3_MDM_WRAP	1 = MDM OF3 darkslategray black	0 = MDM OF3 white red
------------------	---------------------------------------	-----------------------------

Same as OF1\_MDM\_WRAP for OF3 MDM.

31. OF4_MDM_WRAP	1 = MDM OF4 darkslategray black	0 = MDM OF4 white red
------------------	---------------------------------------	-----------------------------

Same as OF1\_MDM\_WRAP for OF4 MDM.

32. OA1_MDM_WRAP	1 = MDM OA1 darkslategray black	0 = MDM OA1 white red
------------------	---------------------------------------	-----------------------------

Same as OF1\_MDM\_WRAP for OA1 MDM.

33. OA2\_MDM\_WRAP  
1 = MDM OA2  
darkslategray  
black  
0 = MDM OA2  
white  
red
- Same as OF1\_MDM\_WRAP for OA2 MDM.

34. OA3\_MDM\_WRAP  
1 = MDM OA3  
darkslategray  
black  
0 = MDM OA3  
white  
red
- Same as OF1\_MDM\_WRAP for OA3 MDM.

**PWR SW**

35. V75S2801E  
1 = MDM OA  
darkslategray  
black  
0 = MDM OA  
white  
red

This parameter indicates the power switch status for MDMs OA 1, 2, and 3. In the ON position, an enable is provided to the OA 1, 2, and 3 MDM RPCs.

36. V75S2157E  
1 = DSC OA  
darkslategray  
black  
0 = DSC OA  
white  
red

This parameter indicates the power switch status for DSCs OA 1, 2, and 3. In the ON position, an enable is provided to the OA 1, 2, and 3 DSC RPCs.

37. V75S2160E  
1 = DSC OL  
darkslategray  
black  
0 = DSC OL  
white  
red

This parameter indicates the power switch status for DSCs OL 1 and 2. In the ON position, an enable is provided to the OL 1 and 2 DSC RPC.

38. V75S2165E  
1 = DSC OR  
darkslategray  
black  
0 = DSC OR  
white  
red

This parameter indicates the power switch status for DSCs OR 1 and 2. In the ON position, an enable is provided to the OR1 and 2 DSC RPCs.

OI MDM/DSC v1.3		XXX/XX:XX:XX	
DSC FAIL	DSC BITE	WRAP	PWR SW
OF1 OA1	OF1 OA1	MDM OF1	DSC OR
OF2 OA2	OF2 OA2	MDM OF2	DSC OL
OF3 OA3	OF3 OA3	MDM OF3	DSC OA
OF4 OM1	OM1	MDM OF4	MDM OA
OP1 OM2	OP1 OM2	MDM OA1	
OP2 OM3	OP2 OM3	MDM OA2	
OL1 OR1		MDM OA3	
OL2 OR2			

*Figure 5.129-1. MDM\_DSC display*

**TITLE**

PCMMU EVENTS V 1.1

**GENERAL**

- A. The data displayed are real-time telemetry parameters that affect the management and operation of the PCMMU. A copy of the PCMMU EVENTS display is shown in figure 5.130-1
- B. Pathname of display: INCO/INCO Displays/DDDs/PCMMU Events.
- C. Detailed display description.

1. V92X0585X 1 = TIO 1 BYPS 0 = TIO 1 BYPS  
(black on red) (darkslategray on black)

Indicates that two consecutive errors have occurred on the transaction indicated. Refer to read element table for the element or elements in error.

2. V92X0586X 1 = SVC 1 BYPS 0 = SVC 1 BYPS  
(black on red) (darkslategray on black)

Indicates that two consecutive errors have occurred on the transaction indicated. Refer to read element table for the element or elements in error.

3. V75X2136D 1 = TFL FMT PRGRM 0 = TFL FMT FIXED  
(darkslategray on black) (black on red)

Indicates that the PCM is either in the fixed or the program format mode, respectively.

4. V92X0587X 1 = TIO 2 BYPS 0 = TIO 2 BYPS  
(black on red) (darkslategray on black)

Indicates that two consecutive errors have occurred on the transaction indicated. Refer to read element table for the element or elements in error.

5. V92X0588X 1 = SVC 2 BYPS 0 = SVC 2 BYPS  
(black on red) (darkslategray on black)

Indicates that two consecutive errors have occurred on the transaction indicated. Refer to read element table for the element or elements in error.

6. V92J0054C 1=TFL LD REJECT 0=TFL LD REJECT  
(black on red) (darkslategray on black)

Indicates the TFL/DFL load has been rejected in the SM GPC.

7. V92X0589X 1 = TIO 3 BYPS 0 = TIO 3 BYPS  
(black on red) (darkslategray on black)

Indicates that two consecutive errors have occurred on the transaction indicated. Refer to read element table for the element or elements in error.





- 17. V92X0596X 1 = SVC 6 BYPS    0 = SVC 6 BYPS  
(black on red) (darkslategray on black)

Indicates that two consecutive errors have occurred on the transaction indicated. Refer to read element table for the element or elements in error.

- 18. V92X0077X 1=SM COM BFR BS    0=SM COM BFR BS  
(black on yellow)(darkslategray on black)

Indicates that the SM common buffer is busy.

<b>PCMMU EVENTS</b> v1.1		GMT XXX/XX:XX:XX
<i>TIO 1 BYPS</i>	<i>SVC 1 BYPS</i>	<i>TFL FMT xxxxx</i>
<i>TIO 2 BYPS</i>	<i>SVC 2 BYPS</i>	<i>TFL LD REJECT</i>
<i>TIO 3 BYPS</i>	<i>SVC 3 BYPS</i>	<i>TFL IN PRGRES</i>
<i>TIO 4 BYPS</i>	<i>SVC 4 BYPS</i>	<i>PCMMU 1    xxx</i>
<i>TIO 5 BYPS</i>	<i>SVC 5 BYPS</i>	<i>PCMMU 2    xxx</i>
<i>TIO 6 BYPS</i>	<i>SVC 6 BYPS</i>	<i>SM COM BFR BS</i>

**Figure 5.130-1. PCMMU EVENTS display**

**TITLE**

PDI V1.3

**GENERAL**

A. The data displayed are real-time telemetry parameters that affect the management and operation of the payload data interleaver (PDI). A copy of the PDI display is shown in figure 5.131-1.

B. DNAV LOCATION: INCO>INCO DISPLAYS>INST SYSTEMS>PDI

C. Detailed display description.

- |    |              |           |                   |                  |
|----|--------------|-----------|-------------------|------------------|
| 1. | POWER SWITCH | V75S5100E | 1 = ON<br>(green) | 0 = OFF<br>(red) |
|----|--------------|-----------|-------------------|------------------|

PDI power discrete on for CMD A to the PDI. Indicates PNL A1L PDI PWR switch position. Excitation for this parameter provided by CNTL BC1.

- |    |       |           |                   |                  |
|----|-------|-----------|-------------------|------------------|
| 2. | RPC A | V76X4376E | 1 = ON<br>(green) | 0 = OFF<br>(red) |
|----|-------|-----------|-------------------|------------------|

This parameter indicates that 28 V dc from main A (FPC1) via RPC A is applied to the PDI.

- |    |       |           |                   |                  |
|----|-------|-----------|-------------------|------------------|
| 3. | RPC C | V76X4378E | 1 = ON<br>(green) | 0 = OFF<br>(red) |
|----|-------|-----------|-------------------|------------------|

This parameter indicates that 28 V dc from main C (FPC3) via RPC C is applied to the PDI.

- |    |          |          |                     |                   |
|----|----------|----------|---------------------|-------------------|
| 4. | PDI WRAP | PDI_WRAP | 1 = PASS<br>(green) | 0 = FAIL<br>(red) |
|----|----------|----------|---------------------|-------------------|

This special COMP evaluates successive samples of V75X4007D. Each sample of V75X4007D should be the 1 complement of the previous sample. If this is the case, the special MOC COMP will output GOOD. If V75X4007D stops updating, the PDI WRAP parameter will indicate FAIL.

- |    |         |           |                   |                   |
|----|---------|-----------|-------------------|-------------------|
| 5. | SM LINK | V92X0908X | 1 = BYPS<br>(red) | 0 = OK<br>(green) |
|----|---------|-----------|-------------------|-------------------|

The PDI switch matrix read (PSMR) is performed cyclically by the (S2 or G9) SM GPC at a 1-Hz rate. The PSMR special SM process is initialized with the IPL. Once the PSMR is initialized, the SM GPC will bypass the process and issue an S62 BCE BYP PDI message if the switch matrix read cannot be accomplished. Such a response would most likely indicate a breakdown in the SM GPC-TO-PDI link. The PSMR process can be restarted with a PDI I/O RESET (SPEC 62, item 8).

- |    |        |           |                |  |
|----|--------|-----------|----------------|--|
| 6. | BITE 1 | V75M6400P | HEX<br>(green) |  |
|----|--------|-----------|----------------|--|

Hex parent word for word 1 of the bite status register. Bit definition is as follows:

Bit no.

1. MASTER FRAME LOCK 1
2. WORD LOCK 1
3. BIT LOCK 1
4. BR ACCURACY 1
5. MASTER FRAME LOCK 2
6. WORD LOCK 2
7. BIT LOCK 2
8. BR ACCURACY 2
9. MASTER FRAME LOCK 3
10. WORD LOCK 3
11. BIT LOCK 3
12. BR ACCURACY 3
13. MASTER FRAME LOCK 4
14. WORD LOCK 4
15. BIT LOCK 4
16. BR ACCURACY 4

- |    |        |           |                |
|----|--------|-----------|----------------|
| 7. | BITE 2 | V75M6420P | HEX<br>(green) |
|----|--------|-----------|----------------|

Hex parent word for word 2 of the BSR. Bit definition is as follows:

Bit no.

1. NO RESPONSE 1
2. INPUT DATA INVALID 1
3. NO RESPONSE 2
4. INPUT DATA INVALID 2
5. NO RESPONSE 3
6. INPUT DATA INVALID 3
7. TB PARITY GOOD
8. DATA RAM PARITY GOOD
9. FPM PARITY GOOD
10. DCM 1 PARITY GOOD
11. DCM 2 PARITY GOOD
12. DCM 3 PARITY GOOD
13. DCM 4 PARITY GOOD
14. MTU IRIG GOOD
15. PCM 1.152 MHZ GOOD
16. POWER STATUS

- |    |           |           |                |
|----|-----------|-----------|----------------|
| 8. | SW MATRIX | V75M5110P | HEX<br>(green) |
|----|-----------|-----------|----------------|

Hex parent word for the switch matrix connections for decom strings to input port. Word layout is as follows.

Bits 1 through 3 of the 12-bit code define the switch matrix input to which the bit sync 1 switch matrix output is connected, as follows.

Bits

1 2 3 Input function

000 No connection  
001 Payload input #1  
010 Payload input #2  
011 Payload input #3  
100 Payload input #4  
101 Payload input #5  
110 PSP input  
111 Special test input

Bits 4 through 6 of the 12-bit code define the switch matrix input to which the bit sync 2 switch matrix output is connected, as shown below.

Bits

4 5 6 Input function

000 No connection  
001 Payload input #1  
010 Payload input #2  
011 Payload input #3  
100 Payload input #4  
101 Payload input #5  
110 PSP input  
111 Special test input

Bits 7 through 9 of the 12-bit code define the switch matrix input to which the bit sync 3 switch matrix output is connected, as shown below.

Bits

7 8 9 Input function

000 No connection  
001 Payload input #1  
010 Payload input #2  
011 Payload input #3  
100 Payload input #4  
101 Payload input #5  
110 PSP input  
111 Special test input

Bits 10 through 12 of the 12-bit code define the switch matrix input to which the bit sync 4 switch matrix output is connected, as shown below.

Bits	Input function
000	No connection
001	Payload input #1
010	Payload input #2
011	Payload input #3
100	Payload input #4
101	Payload input #5
110	PSP input
111	Special test input

Bits 13 through 16 are unused.

9. PDI LOAD V92J0110CY FLOATING POINT  
(green)

This 2-bit parameter indicates the status of the current or last DFL or FPM load process.

00 = NO LOAD SINCE SM INITIALIZATION  
01 = LOAD IN PROGRESS  
10 = LAST LOAD COMPLETE  
11 = LAST LOAD FAILED

10. OI DECOM 1 FMT V75J5132D FLOATING POINT  
(green)

Integer value of the DFL currently loaded in decom 1.

11. OI DECOM 2 FMT V75J5152D FLOATING POINT  
(green)

Integer value of the DFL currently loaded in decom 2.

12. OI DECOM 3 FMT V75J5172D FLOATING POINT  
(green)

Integer value of the DFL currently loaded in decom 3.

13. OI DECOM 4 FMT V75J5192D FLOATING POINT  
(green)

Integer value of the DFL currently loaded in decom 4.



Shows enabled or inhibited status of SM GPC PDI decom fault detection and annunciation (FDA) software.

23.	SM DECOM 2 FDA	V93X5577X	1 = ENA (green)	0 = INH (yellow)
-----	----------------	-----------	--------------------	---------------------

Same as item 26 for decom 2.

24.	SM DECOM 3 FDA	V93X5578X	1 = ENA (green)	0 = INH (yellow)
-----	----------------	-----------	--------------------	---------------------

Same as item 26 for decom 3.

25.	SM DECOM 4 FDA	V93X5579X	1 = ENA (green)	0 = INH (yellow)
-----	----------------	-----------	--------------------	---------------------

Same as item 26 for decom 4.

26.	SM FPM ID	V92J0078CY	FLOATING POINT (green)	
-----	-----------	------------	---------------------------	--

Integer value of the last FPM loaded. If no load has been performed on the current SM GPC, this parameter will indicate zero. In this case, the PDI may be loaded and functioning, but SPEC 62 and SM downlist parameters will indicate zero.



The image shows a terminal window titled 'pdi' displaying the following information:

PDI v1.3  
GMT 022/06:48:21

Power Switch	ON
RPC A	ON
C	ON
PDI Wrap	PASS
SM Link	OK
BITE Word 1	0000
2	FFFF
SW Matrix	2400
PDI Load	2
SM FPM ID	501

DECOM	OI	SM
1 FMT	9	9
2 FMT	16	16
3 FMT	19	19
4 FMT	8	8

1 SRC	1	
2 SRC	1	
3 SRC	0	
4 SRC	0	

1 FDA	INH
2 FDA	INH
3 FDA	INH
4 FDA	INH

ISP data server conn

**Figure 5.131-1.**  
**PDI display**

**TITLE**

PI V1.0

**GENERAL**

- A. The data displayed are real-time telemetry parameters that affect the management and operation of the P/L INTRGTR. A copy of page 1 of the PI display is shown in figure 5.132-1.
- B. Pathname of display: INCO/INCO Displays/INST Systems/pi.
- C. Detailed display description.

1.	POWER (1)	V74X4323E	1 = ON green	0 = OFF dimgray
----	-----------	-----------	-----------------	--------------------

This parameter indicates the ON/OFF state of the payload interrogator no. 1 GCIL driver.

2.	POWER (2)	V74X4353E	1 = ON green	0 = OFF dimgray
----	-----------	-----------	-----------------	--------------------

Same as item 1, except for payload interrogator no. 2.

3.	RF POWER OUT (1)	V74E5625A	FLOATING POINT (green)	
----	------------------	-----------	---------------------------	--

This parameter indicates the RF power output level (0.0 to 10.0 watts) of payload interrogator no. 1.

4.	RF POWER OUT (2)	V74E5626A	FLOATING POINT (green)	
----	------------------	-----------	---------------------------	--

Same as item 3, except for payload interrogator no. 2.

5.	PHASE LOCK (1)	V74X5627E	1 = LOCK (green)	0 = NO LK (red)
----	----------------	-----------	---------------------	--------------------

This parameter indicates whether payload interrogator no. 1 has achieved a PHASE LOCK condition.

6.	PHASE LOCK (2)	V74X5628E	1 = LOCK (green)	0 = NO LK (red)
----	----------------	-----------	---------------------	--------------------

Same as item 3, except for payload interrogator no. 2.

7.	AGC SS (1)	V74E5658A	FLOATING POINT (green)	
----	------------	-----------	---------------------------	--

This parameter indicates the signal strength value of payload interrogator no. 1 in dBm (-120 to -30 dBm).

8.	AGC SS (2)	V74E5659A	FLOATING POINT (green)	
----	------------	-----------	---------------------------	--

Same as item 7, except for payload interrogator no. 2.

9. LOOP STRESS (1) V74B5655A FLOATING POINT  
(green)

This parameter indicates the loop stress (phase error) for payload interrogator no. 1 (-87 to + 87 kHz).

10. LOOP STRESS (2) V74B5656A FLOATING POINT  
(green)

Same as item 9, except payload interrogator no. 2.

11. CHANNEL SEL W01G3205C FLOATING POINT  
(green)

This parameter is a special comp that indicates the selected frequency of both payload interrogators. Note: This is an OR function and will read (channel no. for PI 1) + (channel no. for PI 2).

This special comp is composed of the following parameters:

<u>MSID</u>		<u>MSID</u>		<u>MSID</u>	
V74X5629E (A1)	PI #1 CH 1	V74X5637E (B1)	PI #1 CH 10	V74X5645E (C1)	PI #1 CH 100
V74X5630E (A2)	PI #2 CH 1	V74X5638E (B2)	PI #2 CH 10	V74X5646E (C2)	PI #2 CH 100
V74X5631E (A3)	PI #1 CH 2	V74X5639E (B3)	PI #1 CH 20	V74X5647E (C3)	PI #1 CH 200
V74X5632E (A4)	PI #2 CH 2	V74X5640E (B4)	PI #2 CH 20	V74X5648E (C4)	PI #2 CH 200
V74X5633E (A5)	PI #1 CH 4	V74X5641E (B5)	PI #1 CH 40	V74X5649E (C5)	PI #1 CH 400
V74X5634E (A6)	PI #2 CH 4	V74X5642E (B6)	PI #2 CH 40	V74X5650E (C6)	PI #2 CH 400
V74X5635E (A7)	PI #1 CH 8	V74X5643E (B7)	PI #1 CH 80	V74X5651E (C7)	PI #1 CH 800
V74X5636E (A8)	PI #2 CH 8	V74X5644E (B8)	PI #2 CH 80	V74X5652E (C8)	PI #2 CH 800

If A1 = 1 or A2 = 1 then X1 = 1, else X1 = 0  
 If A3 = 1 or A4 = 1 then X2 = 1, else X2 = 0  
 If A5 = 1 or A6 = 1 then X3 = 1, else X3 = 0  
 If A7 = 1 or A8 = 1 then X4 = 1, else X4 = 0

Units =  $X1(2^0) + X2(2^1) + X3(2^2) + X4(2^3)$ ,  
 if U>9, U = blank

If B1 = 1 or B2 = 1 then Y1 = 1, else Y1 = 0  
 If B3 = 1 or B4 = 1 then Y2 = 1, else Y2 = 0  
 If B5 = 1 or B6 = 1 then Y3 = 1, else Y3 = 0  
 If B7 = 1 or B8 = 1 then Y4 = 1, else Y4 = 0

Tens =  $Y1(2^0) + Y2(2^1) + Y3(2^2) + Y4(2^3)$ ,  
 if T>9, T = blank

If C1 = 1 or C2 = 1 then Z1 = 1, else Z1 = 0  
 If C3 = 1 or C4 = 1 then Z2 = 1, else Z2 = 0  
 If C5 = 1 or C6 = 1 then Z3 = 1, else Z3 = 0  
 If C7 = 1 or C8 = 1 then Z4 = 1, else Z4 = 0

Hundreds  
 =  $Z1(2^0) + Z2(2^1) + Z3(2^2) + Z4(2^3)$ ,  
 if H>9, H = blank

W01G3205C = H\*100 + T\*10 + U

Example: Ch 581 =>  $(1*2^0 + 1*2^2)*100 + (1*2^3)*10 + (1*2^0)$

- |     |            |           |                   |                     |
|-----|------------|-----------|-------------------|---------------------|
| 12. | FREQ Sweep | V74X4300E | 1 = ON<br>(green) | 0 = OFF<br>(yellow) |
|-----|------------|-----------|-------------------|---------------------|

This parameter indicates the state of the selected payload interrogator frequency sweep.

- |     |                   |           |                   |                     |
|-----|-------------------|-----------|-------------------|---------------------|
| 13. | GCIL (FREQ Sweep) | V74X4901E | 1 = ON<br>(green) | 0 = OFF<br>(yellow) |
|-----|-------------------|-----------|-------------------|---------------------|

This parameter indicates the state of the selected payload interrogator frequency sweep as commanded by the GCIL.

- |     |            |           |                     |                       |
|-----|------------|-----------|---------------------|-----------------------|
| 14. | Band Width | V74X4301E | 1 = WIDE<br>(green) | 0 = WIDE<br>(dimgray) |
|-----|------------|-----------|---------------------|-----------------------|

This parameter indicates that the selected payload interrogator is in the WIDE frequency sweep mode. This is the default sweep mode for the PI.

- |     |            |           |                      |                       |
|-----|------------|-----------|----------------------|-----------------------|
| 15. | Band Width | V74X4302E | 1 = NARR<br>(yellow) | 0 = NARR<br>(dimgray) |
|-----|------------|-----------|----------------------|-----------------------|

Same as item 15, except in the NARROW frequency sweep mode.

- |     |          |           |                   |                     |
|-----|----------|-----------|-------------------|---------------------|
| 16. | RF POWER | V74X4313E | 1 = HI<br>(green) | 0 = HI<br>(dimgray) |
|-----|----------|-----------|-------------------|---------------------|

This parameter indicates that the selected payload interrogator is in the high power mode.

- |     |          |           |                     |                      |
|-----|----------|-----------|---------------------|----------------------|
| 17. | RF POWER | V74X4314E | 1 = MED<br>(yellow) | 0 = MED<br>(dimgray) |
|-----|----------|-----------|---------------------|----------------------|

Same as item 17, except in the MED power mode.

- |     |          |           |                     |                      |
|-----|----------|-----------|---------------------|----------------------|
| 18. | RF POWER | V74X4315E | 1 = LOW<br>(yellow) | 0 = LOW<br>(dimgray) |
|-----|----------|-----------|---------------------|----------------------|

Same as item 17, except in the LO power mode.

- |     |            |           |                   |                     |
|-----|------------|-----------|-------------------|---------------------|
| 19. | MODULATION | V74X4320E | 1 = ON<br>(green) | 0 = OFF<br>(yellow) |
|-----|------------|-----------|-------------------|---------------------|

This parameter indicates that the selected payload interrogator S-band MOD IS ON.

- |     |                   |           |                   |                     |
|-----|-------------------|-----------|-------------------|---------------------|
| 20. | GCIL (Modulation) | V74X4903E | 1 = ON<br>(green) | 0 = OFF<br>(yellow) |
|-----|-------------------|-----------|-------------------|---------------------|

This parameter indicates that the selected payload interrogator MOD has been commanded OFF by the GCIL.

- |     |          |           |                    |                  |
|-----|----------|-----------|--------------------|------------------|
| 21. | Panel Sw | V74S5600E | 1 = CMD<br>(green) | 0 = PNL<br>(red) |
|-----|----------|-----------|--------------------|------------------|

This parameter indicates the position of the payload control switch.

**Antenna Switch**

22. V74X5603E 1 = 1 LHCP/ 2 RHCP 0 = 1 LHCP/ 2 RHCP  
(green) (dimgray)

This parameter indicates which payload interrogator is using which antenna polarization.

23. V74X5604E 1 = 2 LHCP/ 1 RHCP 0 = 2 LHCP/ 1 RHCP  
(green) (dimgray)

Same as item 23, except reversed.

24. SW SEL INTR V74S3207E 1 = ON 0 = OFF  
(green) (yellow)

This is the panel A1L S-BD PAYLOAD POWER SELECT switch selected to the PI position. If BOTH or PSP is selected, this will be 0.

<b>PI</b> v1.1 GMT XXX/XX:XX:XX			
PI			
Panel Sw	XXX	1	2
Power	XXX	XXX	XXX
RF Power Out	XX	XX	XX
Phase Lock	XXXX	XXXX	XXXX
AGC SS	XX	XX	XX
Loop Stress	XX	XX	XX
Channel SEL	XXX		
FREQ Sweep	ON XXX	GCIL	XXX
Modulation	ON XXX	GCIL	XXX
Band Width	XXXX	XXXX	
RF Power	XX XXX	XXX	
SW SEL INTR	XXX		
Antenna Switch			
XXXXXXXXXXXXX XXXXXXXXXXXXX			

**Figure 5.132-1. PI display**

**TITLE**

PSP V1.2

**GENERAL**

- A. The data displayed are real-time telemetry parameters that affect the management and operation of the INST PSP. A copy of the PSP display is shown in figure 5.133-1.
- B. Pathname of display: INCO/INCO Displays/INST Systems/psp.
- C. Detailed display description.

**TELEMETRY**

1. POWER (1) V74X4890E 1 = ON 0 = (blank)  
(green)

This parameter indicates whether PSP 1 is powered or is OFF.

2. POWER (2) V74X4891E 1 = ON 0 = (blank)  
(green)

Same as item 1, except indication is for PSP 2.

3. FRAME SYNC (1) V74X6000E 1 = LOCK 0 = (blank)  
(green)

This parameter indicates whether PSP 1 has frame sync lock.

4. FRAME SYNC (2) V74X6001E 1 = LOCK 0 = (blank)  
(green)

Same as item 3, except indication is for PSP 2.

5. BIT SYNC (1) V74X6002E 1 = LOCK 0 = (blank)  
(green)

This parameter indicates whether PSP 1 has bit sync lock.

6. BIT SYNC (2) V74X6003E 1 = LOCK 0 = (blank)  
(green)

Same as item 5, except indication is for PSP 2.

7. BYPASS (1) V92X0325X 1 = BYP 0 = (blank)  
(red)

This parameter indicates that PSP 1 is bypassed from the GPCs. (PSP and GPC are not communicating with each other.)

8. BYPASS (2) V92X0329X 1 = BYP 0 = (blank)  
(red)

Same as item 7, except indication is for PSP 2.

9. DATA TYPE W11I0603R SPECIAL COMP  
(green)

This is a special comp indicating selected PSP (software) TLM data type.

V92J0816C selected PSP TLM data type

LSB					
0	0	1	B1	PH	L
0	1	0	B1	PH	M
0	1	1	B1	PH	S
1	0	0	NRZ	L	
1	0	1	NRZ	M	
1	1	0	NRZ	S	

Any other combination output invalid.

10. DATA RATE W03G3203R SPECIAL COMP  
(green)

This is a special comp indicating selected PSP (software) TLM RATE.

V92J0815C selected PSP TLM RATE

LSB				
0	0	1	1	kbps
0	1	0	2	kbps
0	1	1	4	kbps
1	0	0	8	kbps
1	0	1	16	kbps

Any other combination invalid.

11. FRAME LENGTH V92J0823C FLOATING POINT  
(green)

This parameter indicates the selected PSP (software) frame length.

12. BIT SYNC SW V92X0819X 1 = LOCK 0 = (blank)  
(green)

This parameter indicates that the selected PSP has bit sync lock.

13. FRAME SYNC SW V92X0820X 1 = LOCK 0 = (blank)  
(green)

This parameter indicates that the selected PSP has frame sync lock. It is part of the SM downlist.



14. FRAME WORD W02G3203R SPECIAL COMP  
(green)

This is a special comp indicating the number of bits in the frame sync word. The inputs come from PSP configuration message word 3, bits 12-14.

12	13	14	
0	0	1	8 bits
0	1	0	16 bits
0	1	1	24 bits
1	0	0	32 bits

Any other combination output invalid.

15. DATA SRC PI V92X0813X 1 = YES 0 = (blank)  
(green)

This parameter indicates that the TLM signal from the payload interrogator has been selected.

16. GSE V92X0814X 1 = YES 0 = (blank)  
(green)

This parameter indicates that the TLM input from the Ground Support Equipment (GSE) has been selected.

17. PI/UMB SEL W05G3203R SPECIAL COMP  
(green)

This is a special comp indicating which PSP output has been selected.

COMM OUTPUT SELECT

V92X0810X Selected PSP PL INTGTR OUTPUT SELECT

V92X0811X Selected PSP PL UMB OUTPUT SELECT

V92X0812X Selected PSP GSE OUTPUT SELECT

V92X0810	V92X0810	V92X0810	
0	0	0	BLANK
0	0	1	GSE UMB
0	1	0	P/S UMB
0	1	1	BTH UMB
1	0	0	INTEROG
1	0	1	INT UMB
1	1	0	INT P/L
1	1	1	ALL



22. FRAME SYNC 2                                  V92J0822C                                  HEX  
(green)

This is the indication of the second 16 bits of the 32-bit TLM frame sync word. If the frame sync word is less than 32 bits, the remaining bits will be filled with zeros.

**GPC INTERFACE**

23. Command Load Status (SM)    V92J1119CY    FLOATING POINT  
(green)

This indicates the status (via SM) of the PSP Command Load. The numerical value indicates the status as follows:

Value	Status of load
0	Configuration Message 0 - 5 has been successfully initiated
1	Reinitialization configuration message has completed successfully
2	Configuration message ID = 1-5 has completed successfully
3	Config msg ID = 0-5 did not complete successfully because of a PSP BCE bypass
4	A load was terminated while in progress because a config msg ID=0 was executed
5	Config Msg ID=0-5 did not complete because an Illegal Status error was received
6	OPS transition occurred during load; load did not complete
7	A load was terminated because the retry count was exceeded
8	A load was rejected because the PSP command output port reconfiguration failed

24. Item 6    V93X5584X    1 = \*    0 = (blank)  
(green)

This indicates if an I/O reset has been established between the SM GPC and PSP 1.

25. Item 7    V93X5585X    1 = \*    0 = (blank)  
(green)

This indicates if an I/O reset has been established between the SM GPC and PSP 2.

**COMMAND**

26. COMMAND RATE                                  W01G3203R                                  SPECIAL COMP  
(green)

This is a special comp indicating selected PSP command rate.

V92J0807C

				LSB
0	1	0	0	125/16
0	1	0	1	125/8
0	1	1	0	125/4
0	1	1	1	125/2
1	0	0	0	125
1	0	0	1	250
1	0	1	0	500
1	0	1	1	1000
1	1	0	0	2000

Any other combination output invalid.





38. ILL STAT MSG V92X1115X 1 = ILL STAT MSG (yellow) 0 = ILL STAT MSG (darkslategray)

PSP ILLEGAL STATUS MSG. This is set to a logic 1 if, after three retries, the SM continues to receive an illegal status message from the PSP. When the status message is valid, it is reset to a logic 0. Illegal status messages are status messages with:

NEW DATA	BUSY	REPEAT
0	0	0
0	0	1
0	1	1

39. CONF MSG INV V92X1124X 1 = CONF MSG INV (yellow) 0 = CONF MSG INV (darkslategray)

UPLINK INVALID REQUEST. This shall be set to a logic 1 if a new configuration message is received (to update the configuration message in the SM) and the reinitialize bit is set to 1 or if the configuration message to be changed is configuration message 0. The configuration message load will be rejected. This parameter will be reset to zero when a configuration message load is accepted. This is set to a logic 1 when any uplinked command field is invalid or if an output to an interface cannot be processed because the specified interface is busy with a previous request of this type. It is reset to a logic 0 when a subsequent PL data uplink is successfully processed.

40. TEC V92X1120X 1 = TEC (yellow) 0 = TE (darkslategray)

PSP TEC REJECT FLAG. If a PSP load is rejected (V92X1102X) or a PSP command load transfer is incomplete (V92X1116X) and the load was from a Time-Executed Command (TEC), this bit is set to a logic 1. It is reset to 0 when any subsequent PSP command (that does not contain config msg ID = 0) is initiated.

41. U/L V92X1127X 1 = U/L (yellow) 0 = U/L (darkslategray)

PSP UPLINK REJECT FLAG. If a PSP load is rejected (V92X1102X) or a PSP command load transfer is incomplete (V92X1116X) and the load was from ground uplink, this bit is set to a logic 1. It is reset to 0 when any subsequent PSP command (that does not contain config msg ID = 0) is initiated.

42. GNC V92X1128X 1 = GNC (yellow) 0 = GNC (darkslategray)

PSP GN&C XFER REJECT FLAG. If a PSP load is rejected (V92X1102X) or a PSP command load transfer is incomplete (V92X1116X) and the load was from a IUS GNC or standard GNC transfer, this bit is set to a logic 1. It is reset to 0 when any subsequent PSP command (that does not contain config msg ID = 0) is initiated.

43. CC V92X1129X 1 = CC (yellow) 0 = CC (darkslategray)

PSP CC SPEC REJECT FLAG. If a PSP load is rejected (V92X1102X) or a PSP command load transfer is incomplete (V92X1116X) and the load was from a CC SPEC, this bit is set to

a logic 1. It is reset to 0 when any subsequent PSP command (that does not contain config msg ID = 0) is initiated.

- |     |     |           |                     |                            |
|-----|-----|-----------|---------------------|----------------------------|
| 44. | PCS | V92X1121X | 1 = PCS<br>(yellow) | 0 = PCS<br>(darkslategray) |
|-----|-----|-----------|---------------------|----------------------------|

PSP SEQUENCE REJECT FLAG. If a PSP load is rejected (V92X1102X) or a PSP command load transfer is incomplete (V92X1116X) and the load was from the Payload Control Supervisor, this bit is set to a logic 1. It is reset to 0 when any subsequent PSP command (that does not contain config msg ID = 0) is initiated.

- |     |      |           |                      |                             |
|-----|------|-----------|----------------------|-----------------------------|
| 45. | PORT | V92X1140X | 1 = PORT<br>(yellow) | 0 = PORT<br>(darkslategray) |
|-----|------|-----------|----------------------|-----------------------------|

PSP PORT MODE REJECT FLAG. This shall be set to a 1 if the SM has issued a GCIL command for the PSP Port Mode and the GCIL command bits that are acquired from the PCMMU do not match the configuration message (for example, the configuration message specifies PI, but the GCIL command bits select PL UMB). The Load Reject flag will also be set (V92X1102X). The command will be rejected. This parameter will be reset to a zero after any subsequent PSP command load (that does not have config msg ID = 0) is initiated.

- |     |         |           |                           |  |
|-----|---------|-----------|---------------------------|--|
| 46. | COUNTER | V92J1104C | FLOATING POINT<br>(green) |  |
|-----|---------|-----------|---------------------------|--|

PSP LOAD REJECT/INC COUNTER. This indicates a total count of the number of PSP loads that were rejected or output incompletely and maintained by the PSP software.

**CONFIG MSG**

- |     |            |           |                      |             |
|-----|------------|-----------|----------------------|-------------|
| 47. | INITIALIZE | V92X0804X | 1 = READY<br>(green) | 0 = (blank) |
|-----|------------|-----------|----------------------|-------------|

This parameter indicates the status of the selected PSP initial configuration state.

- |     |         |           |                           |  |
|-----|---------|-----------|---------------------------|--|
| 48. | LAST ID | V92J1103C | FLOATING POINT<br>(green) |  |
|-----|---------|-----------|---------------------------|--|

This parameter indicates the last configuration message ID the selected PSP has received.

- |     |        |           |                    |             |
|-----|--------|-----------|--------------------|-------------|
| 49. | NEW ID | V92X0806X | 1 = NEW<br>(green) | 0 = (blank) |
|-----|--------|-----------|--------------------|-------------|

This is a logic 1 only when the configuration message received is different from the present configuration while the PSP is still processing payload commands. It is a logic 0 for all other conditions.

- |     |                |           |                  |        |
|-----|----------------|-----------|------------------|--------|
| 50. | CONFIG MESSAGE | V92X0803X | 1 = ERR<br>(red) | 0 = OK |
|-----|----------------|-----------|------------------|--------|

This is a logic 1 only when the configuration message received from the PL MDM failed to meet the following data validation.

- The bit orientation in the received waveform reflects a valid biphasic code, such that only 10 or 01 patterns occur and that only the proper number of received threshold transitions occur within each bit time.

- Each word has exactly 20 bits: 3 sync, 16 data, and 1 odd parity bit.
- Standard parity bit verification.
- Legal "payload umbilical select" bit even when PI is selected.

PSP v1.2			GMT XXX/XX:XX:XX	
TELEMETRY			COMMAND	
PSP	1	2		
Power	XX	XX	Command Rate	XXXX
Frame SYNC	XXXX	XXXX	Data Type	XXXX
BIT SYNC	XXXX	XXXX	Buff Available	XXX
Bypass	XXX	XXX	Buff Busy	XXXX
			Idle Pattern	XXX
			P/L CMD ERR	XXX
			REPEAT MSG	XXX
Data Type	XXXXX		GCIL CMD OUT	XXXX
Data Rate	XXXXXX		UMB Select	XXXX
Frame Length	XXXX		-----SM REJECT FLAGS-----	
Bit SYNC SW	XXXX		PSP LOAD REJ	
Frame SYNC SW	XXXX		PSP XFER INC	
Frame Word	XX		ILL STAT MSG	
Data SRC PI	XXX		CONF MSG INV	
GSE	XXX		Source	
PI/UMB SEL	XXXXX		TEC U/L GNC CC PCS	
STAT Word 1	XXXX		PORT	
STAT Word 2	XXXX		Counter	XXX
STAT Word 3	XXXX		CONFIG MSG	
Frame SYNC 1	XXXX		Initialize	XXXXX
Frame SYNC 2	XXXX		Last ID	X
-----GPC INTERFACE-----			New ID	XXX
SM Load Status	XX		Config Message	XXX
Item 6 *		Item 7 *		

Figure 5.133-1. PSP display





3. TAPE MOTION      V75X2523E                      1 = RUN              0 = STOP  
                                 V75X2623E                      (green)              (yellow)  
                                 V75X2723E

This parameter indicates tape motion and recorder tach/speed lock.

4. ACTIVE TRACK      W01I0302C                      DECIMAL  
                                 W02I0302C                      (green)  
                                 W03I0302C

This is a special comp of the four recorder-track bits to determine the active track (0 = parallel record mode, 15 = parallel playback mode, 1 through 14 = active track in other modes).

These special comps are composed of the four track bits MSIDs for each recorder.

OPS 1	OPS 2	P/L
V75X2547E = X1	V75X2647E = Y1	V75X2747E = Z1
V75X2548E = X2	V75X2648E = Y2	V75X2748E = Z2
V75X2549E = X3	V75X2649E = Y3	V75X2749E = Z3
V75X2550E = X4	V75X2650E = Y4	V75X2750E = Z4

$$W01I0302C = X1(2^0) + X2(2^1) + X3(2^2) + X4(2^3) = \text{OPS 1 active track}$$

$$W02I0302C = Y1(2^0) + Y2(2^1) + Y3(2^2) + Y4(2^3) = \text{OPS 2 active track}$$

$$W03I0302C = Z1(2^0) + Z2(2^1) + Z3(2^2) + Z4(2^3) = \text{P/L active track}$$

Bit 1	Bit 2	Bit 3	Bit 4	Track
0	0	0	0	0
1	0	0	0	1
0	1	0	0	2
1	1	0	0	3
0	0	1	0	4
1	0	1	0	5
0	1	1	0	6
1	1	1	0	7
0	0	0	1	8
1	0	0	1	9
0	1	0	1	10
1	1	0	1	11
0	0	1	1	12
1	0	1	1	13
0	1	1	1	14
1	1	1	1	15

- |    |              |                                     |                    |
|----|--------------|-------------------------------------|--------------------|
| 5. | PERCENT TAPE | W01I0306C<br>W02I0306C<br>W03I0306C | DECIMAL<br>(green) |
|----|--------------|-------------------------------------|--------------------|

This is a special comp of the 5-percent tape bits to determine the tape position (BOT = 0 percent and EOT = 100 percent). These special comps are composed of the 5-percent tape bits MSIDs for each recorder.

OPS 1	OPS 2	P/L
V75X2540E = X1	V75X2640E = Y1	V75X2740E = Z1
V75X2541E = X2	V75X2641E = Y2	V75X2741E = Z2
V75X2542E = X3	V75X2642E = Y3	V75X2742E = Z3
V75X2543E = X4	V75X2643E = Y4	V75X2743E = Z4
V75X2544E = X5	V75X2644E = Y5	V75X2744E = Z5

$$W01I0306C = [X1(2^0) + X2(2^1) + X3(2^2) + X4(2^3) + X5(2^4)] [100/31] = \text{percent tape OPS 1}$$

$$W02I0306C = [Y1(2^0) + Y2(2^1) + Y3(2^2) + Y4(2^3) + Y5(2^4)] [100/31] = \text{percent tape OPS 2}$$

$$W03I0306C = [Z1(2^0) + Z2(2^1) + Z3(2^2) + Z4(2^3) + Z5(2^4)] [100/31] = \text{percent tape P/L}$$

- |    |           |                                     |                    |                    |
|----|-----------|-------------------------------------|--------------------|--------------------|
| 6. | DIRECTION | V75X2505E<br>V75X2605E<br>V75X2705E | 1 = REV<br>(green) | 0 = FWD<br>(green) |
|----|-----------|-------------------------------------|--------------------|--------------------|

This parameter indicates the direction the tape is moving, or was last moved, if there is no tape motion.

- |    |            |                                     |                         |
|----|------------|-------------------------------------|-------------------------|
| 7. | RCDR SPEED | W01I0301R<br>W02I0301R<br>W03I0301R | SPECIAL COMP<br>(green) |
|----|------------|-------------------------------------|-------------------------|

This is a special comp of the two recorder-speed bits to determine the selected recorder speed (1, 2, 3, or 4). These special comps are composed of the two speed bits MSIDs for each recorder.

W01I0301R OPS 1 RCDR		W02I0301R OPS 2 RCDR		W03I0301R P/L RCDR		Speed
V75X <u>2533E</u>	V75X <u>2534E</u>	V75X <u>2633E</u>	V75X <u>2634E</u>	V75X <u>2733E</u>	V75X <u>2734E</u>	
0	0	0	0	0	0	1
1	0	1	0	1	0	2
0	1	0	1	0	1	3
1	1	1	1	1	1	4

- |    |                   |                                     |                    |             |
|----|-------------------|-------------------------------------|--------------------|-------------|
| 8. | BEGINNING OF TAPE | V75X2522E<br>V75X2622E<br>V75X2722E | 1 = BOT<br>(green) | 0 = (blank) |
|----|-------------------|-------------------------------------|--------------------|-------------|

This parameter indicates that the recorder is at BOT.

- |    |             |                                     |                    |             |
|----|-------------|-------------------------------------|--------------------|-------------|
| 9. | END OF TAPE | V75X2521E<br>V75X2621E<br>V75X2721E | 1 = EOT<br>(green) | 0 = (blank) |
|----|-------------|-------------------------------------|--------------------|-------------|

This parameter indicates that the tape is positioned at EOT.

- |     |                |                                     |                     |             |
|-----|----------------|-------------------------------------|---------------------|-------------|
| 10. | RCDING INPUT B | V75X2513E<br>V75X2613E<br>V75X2713E | 1 = YES<br>(yellow) | 0 = (blank) |
|-----|----------------|-------------------------------------|---------------------|-------------|

This parameter indicates that the delay interval timer has timed out and the recorder is recording input B.

- |     |           |                                     |                   |             |
|-----|-----------|-------------------------------------|-------------------|-------------|
| 11. | RCDR FULL | V75X2527E<br>V75X2627E<br>V75X2727E | 1 = FULL<br>(red) | 0 = (blank) |
|-----|-----------|-------------------------------------|-------------------|-------------|

This parameter indicates the end of a serial recording pass on track 11.

- |     |            |                                     |                     |             |
|-----|------------|-------------------------------------|---------------------|-------------|
| 12. | RCDR RESET | V75X2531E<br>V75X2631E<br>V75X2731E | 1 = RST<br>(yellow) | 0 = (blank) |
|-----|------------|-------------------------------------|---------------------|-------------|

This parameter indicates that the record track sequence has been reset to track 1 after a reset command or the completion of an erase/reset cycle.

- |     |           |                                     |                   |                   |
|-----|-----------|-------------------------------------|-------------------|-------------------|
| 13. | RCDR BITE | V75X2529E<br>V75X2629E<br>V75X2729E | 1 = OK<br>(green) | 0 = FAIL<br>(red) |
|-----|-----------|-------------------------------------|-------------------|-------------------|

This parameter is a composite of the bite parameters in the recorder.

- |     |               |                                     |                    |                    |
|-----|---------------|-------------------------------------|--------------------|--------------------|
| 14. | WRITE PROTECT | V75X2509E<br>V75X2609E<br>V75X2709E | 1 = ON<br>(yellow) | 0 = OFF<br>(green) |
|-----|---------------|-------------------------------------|--------------------|--------------------|

This parameter indicates that the write lockout serial or parallel is set and a command to record over those tracks has been received.

- |     |           |                                     |                           |  |
|-----|-----------|-------------------------------------|---------------------------|--|
| 15. | HEAD TEMP | V75T2517A<br>V75T2617A<br>V75T2717A | FLOATING POINT<br>(green) |  |
|-----|-----------|-------------------------------------|---------------------------|--|

This parameter is an analog that indicates the recorder head temp (0 to +140° F).

- |     |      |                                |                   |                  |
|-----|------|--------------------------------|-------------------|------------------|
| 16. | MN A | (1) V76X4383E<br>(PL)V76X4380E | 1 = ON<br>(green) | 0 = OFF<br>(red) |
|-----|------|--------------------------------|-------------------|------------------|

These parameters indicate that power is being applied to the recorder via main A.

- |          |               |         |         |
|----------|---------------|---------|---------|
| 17. MN B | (1) V76X4384E | 1 = ON  | 0 = OFF |
|          | (2) V76X4386E | (green) | (red)   |

These parameters indicate that power is being applied to the recorder via main B.

- |          |                |         |         |
|----------|----------------|---------|---------|
| 18. MN C | (2) V76X4387E  | 1 = ON  | 0 = OFF |
|          | (PL) V76X4382E | (green) | (red)   |

These parameters indicate that power is being applied to the recorder via main C.

- |              |           |         |         |
|--------------|-----------|---------|---------|
| 19. CNTL AB1 | V75S2501E | 1 = ON  | 0 = OFF |
|              |           | (green) | (red)   |

Indicates if power is being applied by the CNTL AB1 bus to the OPS 1 recorder power switch on panel A1R.

- |              |           |         |         |
|--------------|-----------|---------|---------|
| 20. CNTL BC1 | V75S2601E | 1 = ON  | 0 = OFF |
|              |           | (green) | (red)   |

Indicates if power is being applied by the CNTL BC1 bus to the OPS 2 recorder power switch on panel A1R.

- |              |           |         |         |
|--------------|-----------|---------|---------|
| 21. CNTL CA2 | V75S2702E | 1 = ON  | 0 = OFF |
|              |           | (green) | (red)   |

Indicates if power is being applied by the CNTL CA2 bus to the PL recorder power switch on panel A1R.

RECORDERS v1.2		GMT ### / ## : ## : ##		
	OPS1	OPS2	PLR	
RCDR Mode	XXXX	XXXX	XXXX	
Tape Motion	XXXX	XXXX	XXXX	
Active Track	XX	XX	XX	
Percent Tape	XX	XX	XX	
Direction	XXX	XXX	XXX	
RCDR Speed	X	X	X	
Beginning of Tape	XXX	XXX	XXX	
End of Tape	XXX	XXX	XXX	
RCDING Input B	XXX	XXX	XXX	
RCDR Full	XXXX	XXXX	XXXX	
RCDR Reset	XXX	XXX	XXX	
RCDR BITE	XXXX	XXXX	XXXX	
Write Prottext	XXX	XXX	XXX	
Head Temp	XXX	XXX	XXX	
Power Supplies				
MNA A RPC	XXX		XXX	
MNB B RPC	XXX	XXX		
MNC C RPC		XXX	XXX	
Switch Scans				
CNTL AB1	XXX			
CNTL BC1		XXX		
CNTL CA2			XXX	

Figure 5.134-1. RECORDERS display

TITLE

ORBITER INTERFACE UNIT (OIU) DISPLAY

GENERAL

- A. This display's primary purpose is to enable the monitoring of the OIU configuration and status. The display is made up of one main and two lower level displays. One of the lower level displays is the OIU status display and the other is the OIU error display. The primary users of this display will be the INCO and PAYLOADS positions. A copy of the main OIU display is shown Figure 5.135-1. A copy of the Status subdisplay is shown in Figure 5.135-2. A copy of the Errors subdisplay is shown in Figure 5.135-3.
- B. Pathname of display: INCO/INCO Systems/OIU
- C. Detailed display description of the main OIU display:

**TOP SECTION** - The top eighth of the display contains the following:

1.	TEMP 1	P50T4000V	FLOATING POINT (green)
----	--------	-----------	---------------------------

The power supply temperature of OIU 1. A value of 140° F indicates a PCM value of zero, which indicates no power to the OIU represented by a temperature of 140° F.

Indicates the power supply temperature for OIU 1. This signal is an analog differential signal with a voltage range of +5 V dc to -5 V dc.

The calibration curve is:  $OIU\ TEMP = V(32.0929) + 140.60854$

Note that the zero-voltage (OIU "OFF") temperature reading is 140.6° F.

2.	TEMP 2	P50T4001V	FLOATING POINT (green)
----	--------	-----------	---------------------------

Same as TEMP (1) for OIU 2.

3.	STS	M50Q0003HP	DECIMAL (green)
----	-----	------------	--------------------

The flight number.

4.		M50Q0005HP	DECIMAL (green)
----	--	------------	--------------------

The vehicle ID.

5.	MET	M50Q0030HP	TIME (green)
----	-----	------------	-----------------

The current downlisted mission elapsed time.

6.	GMT	M50Q0027HP	TIME (green)
----	-----	------------	-----------------

The current downlisted Greenwich mean time.

7. OIU P50U4100D mm/dd/yy hh:mm:ss  
(green if incrementing)  
(red if not incrementing)

Indicates the timer being kept in the OIU, synchronized with but independent from the orbiter time, converted to mm/dd/yy hh:mm:ss.

8. BC P50U4110D mm/dd/yy hh:mm:ss  
(green if incrementing)  
(red if not incrementing)

Time data received by the OIU from a Bus Controller (BC) when the OIU is a remote terminal.

9. GMT - OIU SPECIAL COMP hh:mm:ss  
(green)

This is the computed value of the difference between the downlinked OIU time P50U4100D and the downlisted orbiter GMT M50Q0027HP.

**PCMMU/PDI/OCC SECTION** - The next fourth of the display (to the left of the BIC section) contains the following:

10. TFL (HDR) V75X4070D DECIMAL  
(green)

The high data rate Telemetry Format Load (TFL) in the Pulse Code Modulation Master Unit (PCMMU).

11. (LDR TFL) V92J0052CY DECIMAL  
(green)

The low data rate TFL in the PCMMU.

12. PDI 1 (DECOM FMT) V75J5132D FLOATING POINT  
(green)

Integer value of the decom format currently loaded in decom 1.

13. PDI 2 (DECOM FMT) V75J5152D FLOATING POINT  
(green)

Same as item 12 for decom 2.

14. PDI 3 (DECOM FMT) V75J5172D FLOATING POINT  
(green)

Same as item 12 for decom 3.

15. PDI 4 (DECOM FMT) V75J5192D FLOATING POINT  
(green)

Same as item 12 for decom 4.



16. PDI 1 (SOURCE) V75J5111D FLOATING POINT  
(green)
- Integer value of decom 1 switch matrix input source.
- 0 = No connection
- 1 = Port 1  
2 = Port 2  
3 = Port 3  
4 = Port 4  
5 = Port 5  
6 = Port 6 (PSP ports 1 and 2)  
7 = Test port
17. PDI 2 (SOURCE) V75J5112D FLOATING POINT  
(green)
- Same as item 16 for decom 2.
18. PDI 3 (SOURCE) V75J5113D FLOATING POINT  
(green)
- Same as item 16 for decom 3.
19. PDI 4 (SOURCE) V75J5114D FLOATING POINT  
(green)
- Same as item 16 for decom 4.
20. (DECOM 1 BIT LOCK) V75X6403D 1 = B 0 = (blank)  
(green)
- Bit sync locked for decom 1.
21. (DECOM 1 WORD LOCK) V75X6402D 1 = W 0 = (blank)  
(green)
- Word sync locked for decom 1.
22. (DECOM 1 MF LOCK) V75X6401D 1 = F 0 = (blank)  
(green)
- Master frame lock for decom 1.
23. (DECOM 1 ACCURACY) V75X6404D 1 = A 0 = (blank)  
(green)
- Bit rate accuracy is within  $\pm 3.25$  percent of expected bit rate for decom 1.
24. (DECOM 2 BIT LOCK) V75X6407D 1 = B 0 = (blank)  
(green)
- Bit sync locked for decom 2.

- |     |  |                  |             |
|-----|--|------------------|-------------|
| 25. | (DECOM 2 WORD LOCK) V75X6406D  | 1 = W<br>(green) | 0 = (blank) |
|     | Word sync locked for decom 2.  |                  |             |
| 26. | (DECOM 2 MF LOCK) V75X6405D  | 1 = F<br>(green) | 0 = (blank) |
|     | Master frame lock for decom 2.   |                  |             |
| 27. | (DECOM 2 ACCURACY) V75X6408D   | 1 = A<br>(green) | 0 = (blank) |
|     | Bit rate accuracy is within $\pm 3.25$ percent of expected bit rate for decom 2. |                  |             |
| 28. | (DECOM 3 BIT LOCK) V75X6411D   | 1 = B<br>(green) | 0 = (blank) |
|     | Bit sync locked for decom 3.   |                  |             |
| 29. | (DECOM 3 WORD LOCK) V75X6410D  | 1 = W<br>(green) | 0 = (blank) |
|     | Word sync locked for decom 3.  |                  |             |
| 30. | (DECOM 3 MF LOCK) V75X6409D  | 1 = F<br>(green) | 0 = (blank) |
|     | Master frame lock for decom 3.   |                  |             |
| 31. | (DECOM 3 ACCURACY) V75X6412D   | 1 = A<br>(green) | 0 = (blank) |
|     | Bit rate accuracy is within $\pm 3.25$ percent of expected bit rate for decom 3. |                  |             |
| 32. | (DECOM 4 BIT LOCK) V75X6415D   | 1 = B<br>(green) | 0 = (blank) |
|     | Bit sync locked for decom 4.   |                  |             |
| 33. | (DECOM 4 WORD LOCK) V75X6414D  | 1 = W<br>(green) | 0 = (blank) |
|     | Word sync locked for decom 4.  |                  |             |
| 34. | (DECOM 4 MF LOCK) V75X6413D  | 1 = F<br>(green) | 0 = (blank) |
|     | Master frame lock for decom 4.   |                  |             |
| 35. | (DECOM 4 ACCURACY) V75X6416D   | 1 = A<br>(green) | 0 = (blank) |
|     | Bit rate accuracy is within $\pm 3.25$ percent of expected bit rate for decom 4. |                  |             |

36. FPM V92J0078CY FLOATING POINT  
(green)

Integer value of the Fetch Pointer Memory (FPM) memory load sent to the PDI by SM2 GPC by SPEC 62. This value does not reflect what is loaded, but it is the last load sent by SM2.

37. (SM LINK BYPASS) V92X0908X 1 = BYPASS 0 = BYPASS  
(red) (gray)

Indicates that the PDI switch matrix did not respond to two consecutive switch matrix READ commands from the SM GPC. Under these conditions, the switch matrix cannot be loaded and will remain at the last values selected.

38. (PDI WRAP TEST) PDI\_WRAP 1 = WRAP 0 = WRAP  
(gray) (red)

For OI validation, the ground processor stores and compares two sets of two 8-bit words. If the ground processing does not receive the complement of alternate ones and zeros for the PDI, the PDI WRAP will be set on the display. If PDI WRAP remains set on the display, it indicates loss of communication between the PDI and the PCMMU. Communication may be recovered with the PDI by selecting the alternate PCMMU, which in effect selects the alternate data bus.

- 38a. (OIU S/N) SPECIAL COMP STRING  
(tan)

This is a special comp, displayed under the PDI block, that uses the ID number (P50U4011D) of the OIU generating the telemetry data stream and the OIU input file to determine which OIU is being used. The OIU input file for STS-91 is displayed in Figure 5.135-4.

If P50U4011D = the OIU 1 ID number specified in the file, OIU 1 is displayed.  
If P50U4011D = the OIU 2 ID number specified in the file, OIU 2 is displayed.  
If P50U4011D does not match either number specified in the file, it displays a blank.

**OCC** - The OIU Controller Card (OCC) block displays the status of the OCC as follows:

39. FORMAT P50U4010A DECIMAL  
(green)

The currently loaded OIU format.

40. ERR LOG LAST ENT P50U4170D DECIMAL  
(green)

Displays the OIU error log counter (0-255).

41. MULTI RT P50X4254E 1 = MULTI RT 0 = MULTI RT  
(red) (gray)

RECON data indicate that the OIU is assigned as an RT on more than one bus.

42. FL POINT                      P50X4288E              1 = FL POINT (red)              0 = FL POINT (gray)

A floating point conversion error was detected.

43. CFG CMD                      P50X4287E              1 = CFG CMD (red)              0 = CFG CMD (gray)

An invalid configuration command was detected.

44. ERROR                      OCC\_ERR              1 = ERROR (red)              0 = ERROR (gray)

Indicates an error exists in the OCC.

OCC\_ERR = MSID no. 1+2+3+4+5+6+7+8+9+10+11+12+13  
              +14+15+16+17+18+19+20+21+22+23+24+25

No.	MSID	Description
1	P50X4211E	Illegal instruction error (does not match a valid instruction)
2	P50X4212E	Fame overrun error (unable to process instruction in allocated time)
3	P50X4213E	Check instruction error (fails while "check register against bounds")*
4	P50X4214E	Bus error (read/write time-out)
5	P50X4218E	Address error (attempted to access an odd address)
5	P50X4221E	Max Error Log Write Wait Err (EEPROM write time is excessive)
6	P50X4222E	Line 1111 error (processor recognizes 1111 pattern in instruction)*
7	P50X4223E	Line 1010 error (processor recognizes 1010 pattern in instruction)*
8	P50X4224E	Level 7 autovector error (there is no level 7 autovector in OIU)*
9	P50X4225E	Invalid GSE error (fails to detect valid handshake in GSE mode)
10	P50X4226E	Invalid DUART interrupt error (associated with level 2 autovector)*
11	P50X4227E	Invalid BIC2 interrupt error (there is no BIC2 in OIU)*
12	P50X4234E	OCC SRAM error (Power-On Self-Test (POST) read from/write to SRAM)
13	P50X4235E	OCC register error (POST read from/write to OCC CPU register)
14	P50X4237E	OCC EEPROM error (POST read from/write to EEPROM)
15	P50X4261E	Trace error (trace bit enabled in status register)*
16	P50X4262E	Spurious interrupt error (bus error while processing an interrupt)
17	P50X4263E	Transaction subframe error (too many 1553 transaction in a subframe)
18	P50X4264E	RECON EEPROM faulty (bad table tag or checksum)
19	P50X4268E	Privilege violation (privileged instruction attempted in user mode)*
20	P50X4274E	Divide by zero attempted
21	P50X4275E	Unused exception error (unused or unassigned interrupt detected)
22	P50X4276E	Uninitialized interrupt vector (must be initialized to register number)
23	P50X4277E	Trap X error (trap 0 to 15 instruction exception)*
24	P50X4278E	Trap V error (overflow occurs during TRAPV execution)*
25	P50X4288E	Floating point conversion error (same as FL POINT, above)

\*Indicates error is unexpected because this function is not being implemented in OIU.

**PSP** - The PSP block displays the status of the PSP as follows:

45. PSP (PWR) SPECIAL COMP STRING

Displays which PSP is currently powered up. V92J1103C is tested against the variable OIU\_PSP\_CFG, which is defined in a flight-specific file to define the background color of this box.

V92J1103C	V74X4890E	V74X4891E	COLOR	STRING
= OIU_PSP_CFG	0	0	Green on black	(blank)
= OIU_PSP_CFG	0	1	Green on black	2
= OIU_PSP_CFG	1	0	Green on black	1
= OIU_PSP_CFG	1	1	Red on black	ERR
≠ OIU_PSP_CFG	0	0	Black on yellow	(blank)
≠ OIU_PSP_CFG	0	1	Black on yellow	2
≠ OIU_PSP_CFG	1	0	Black on yellow	1
≠ OIU_PSP_CFG	1	1	Red on yellow	ERR

46. CFG V92J1103C DECIMAL  
(green)

This parameter indicates the last configuration message ID the selected PSP has received.

47. UMB V92J0817C DECIMAL  
(green)

Indicates in decimal form which PSP umbilical is selected.

48. CMD SPECIAL COMP STRING

SM parameter indicating which PSP output has been selected, Payload Umbilical or Payload Interrogator.

V92X0810X	V92X0811X	COLOR	STRING
0	0		(Blank)
0	1	Green	UMB
1	0	Green	INT
1	1	Red	ERR

49. I/O SPECIAL COMP STRING

Indicates the state of I/O between the PSP and the SM GPC.

Let PSP 1 BYP = V92X0325X  
 PSP 2 BYP = V92X0329X  
 ITEM 6 = V93X5584X  
 ITEM 7 = V93X5585X

If (ITEM 7 • NOT(PSP 2 BYP)) + (ITEM 6 • NOT(PSP 1 BYP)) = 1  
 Then STRING = OK (green)  
 Else STRING = NO (red)



- |     |            |           |                         |                          |
|-----|------------|-----------|-------------------------|--------------------------|
| 55. | CMD PARITY | P50X4281E | 1 = CMD PARITY<br>(red) | 0 = CMD PARITY<br>(gray) |
|-----|------------|-----------|-------------------------|--------------------------|

This error flag, also known as OIC PSP Parity Err, is set when the parity check fails on the command received by the OIU. The command failing the parity check is rejected. The OIU uses odd byte parity. This error flag remains high until the next command is received and processed.

- |     |            |           |                         |                          |
|-----|------------|-----------|-------------------------|--------------------------|
| 56. | PTB SIGNAL | P50X4296E | 1 = PTB SIGNAL<br>(red) | 0 = PTB SIGNAL<br>(gray) |
|-----|------------|-----------|-------------------------|--------------------------|

This error flag, also known as OIC PTB LOS Err, occurs when OIC does not receive a valid PTB signal transition from the PTB interface within 16 ms. This bit remains set until the condition is cleared.

- |     |          |           |                       |                        |
|-----|----------|-----------|-----------------------|------------------------|
| 57. | PTB SYNC | P50X4295E | 1 = PTB SYNC<br>(red) | 0 = PTB SYNC<br>(gray) |
|-----|----------|-----------|-----------------------|------------------------|

This error is caused by OIC not receiving a valid PTB pulse width within 11 ms. This bit remains set until the condition is cleared.

- |     |       |             |                    |                     |
|-----|-------|-------------|--------------------|---------------------|
| 58. | ERROR | OIC_PSP_ERR | 1 = ERROR<br>(red) | 0 = ERROR<br>(gray) |
|-----|-------|-------------|--------------------|---------------------|

Indicates an error in the OIC's interface to the PSP. Clicking on ERROR brings up the OIU Error subdisplay.

OIC\_PSP\_ERR = MSID no. 1+2+3+4+5+6+7+8+9+10+11+12

No.	MSID	Description
1	P50X4238E	NO PSP CMD (OCC received interrupt, but OIC does not see the cmd)
2	P50X4241E	OIC PSP EEPROM error (SRAM/EEPROM POST checksum mismatch)
3	P50X4242E	OIC PSP C51 error (POST C51 register read/write mismatch)
4	P50X4243E	OIC PSP arbitration error (PSP SRAM access denied for >30 ms)
5	P50X4255E	OIC PSP SRAM error (POST mismatch written to/read from SRAM)
6	P50X4256E	OIC PSP POST incomplete (POST did not complete)
7	P50X4257E	OIC PSP POST error (when any OIC PSP POST error occurs)
8	P50X4258E	OIC PSP interrupt error (unused or invalid interrupt message)
9	P50X4265E	PSP SRAM read/write error (during POST)
10	P50X4266E	PSP PTB SRAM access error (Not granted SRAM access during POST)
11	P50X4267E	PSP in Wrong Buffer (Expected cmd in Buffer 1(2) but in buffer 2(1))
12	P50X4298E	OIC PSP PTB Health error (Has failed three consecutive checks)

**BLOCK STATUS WORDS** - This section can display up to six Block Status Words (BSW). BSWs indicate the success or failure of individual MS1553B transactions. See the Systems Brief or Block Status Word section in part D (the OIU Status subdisplay description) of this SCP for a more detailed description of the BSWs.

59. Title (1-6) SPECIAL PROC STRING

This is a special process that uses the OIU input file to determine the title of the BSWs. The OIU input file for STS-91 is described in Figure 5.135-4.

Title	STRING
1	BSW1_NAME from input file
2	BSW2_NAME from input file
3	BSW3_NAME from input file
4	BSW4_NAME from input file
5	BSW5_NAME from input file
6	BSW6_NAME from input file

Note that the title will be blank if BSW name is not defined in the file.

60. HEX (1-6) SPECIAL PROC HEX  
(green)

This is a special process that uses the real-time data value of the corresponding BSW MSID (from the flight-specific input file) and displays it as a four-character hex value.

Example: if BSW1\_MSID= P50U4493D, P50U4493D is displayed in hex for BSW1.

MSID	BSW MSID
1	BSW1_MSID from input file
2	BSW2_MSID from input file
3	BSW3_MSID from input file
4	BSW4_MSID from input file
5	BSW5_MSID from input file
6	BSW6_MSID from input file

Note that the HEX column for a given BSW will be blank if that BSW MSID is not defined in the file.

61. CHANNEL (1-6) SPECIAL PROC STRING  
(green)

This is a special process that uses bit 13 of the real-time BSW (1-6) to determine the channel on which the last message was processed. It finds BSW (1-6) using the BSW MSID (1-6) from the OIU input file.

BSW (1-6) bit 13	STRING
0	A
1	B

Note that the channel will be blank if BSW MSID is not defined in the file.



62. ERROR (1-6) SPECIAL PROC STRING

This is a special process that uses bits from the real-time BSW (1-6), defined by the BSW MSID (1-6) in the OIU input file, to determine if there is an error in the MS1553B transaction.

If Bit 0 (LSB) + Bit 1 + Bit 2 + Bit 3 + Bit 5 + Bit 8 + Bit 9 + Bit 10 + Bit 11 + Bit 12 = 1  
(for any real-time BSW (1-6))

Then STRING = ERROR (red)  
Else STRING = ERROR (gray)

**SSOR** - The Space-to-Space Orbiter Radio (SSOR) block displays the state of the OIU's interface with the SSOR as follows:

63. SYNC P50X4293E 1 = SYNC 0 = SYNC  
(red) (gray)

This flag is set high when two consecutive frame counts are not received from the SSOR. The OIU checks the frame count in each minor frame received from the SSOR. When the frame count does not increment correctly in two or more consecutive frames, the OIU will set this bit high and resume operations under internal timing control.

64. FRM SEQ P50X4305E 1 = FRM SEQ 0 = FRM SEQ  
(red) (gray)

This flag is set high when one frame count is not received from the SSOR. The OIU checks the frame count in each minor frame received from the SSOR. When the frame count does not increment correctly and only one frame count is "skipped," the OIU will set this bit high and will continue program execution.

**ISS** - The ISS block displays the status of the OIU-to-ISS interface as follows:

65. INT TIME P50X4286E 1 = INT TIME 0 = INT TIME  
(red) (gray)

This error flag, also known as ISS BC No Comm Status, indicates that the OIU was communicating with an ISS BC MDM and the OIU BIA no longer "sees" ISS BC transmissions on that bus. This error can be caused either by the ISS BC MDM's stopping transmission or by the BIA's being reconfigured such that it stops receiving the ISS BC MDM transmissions. Following this error, the OIU will reinitialize and resume operation under internal timing control.

66. CMD FAIL P50X4291E 1 = CMD FAIL 0 = CMD FAIL  
(red) (gray)

This flag, also known as PSP RETRIES FAILED, is set high when the OIU made three attempts to transmit a command to a RT and all three attempts failed. The OIU rejects the command.

- |     |           |           |                        |                         |
|-----|-----------|-----------|------------------------|-------------------------|
| 67. | SYNC FAIL | P50X4294E | 1 = SYNC FAIL<br>(red) | 0 = SYNC FAIL<br>(gray) |
|-----|-----------|-----------|------------------------|-------------------------|

This flag, also known as ISS LOST SYNC, is set high when the OIU loses frame sync with the ISS BC MDM. The OIU checks the frame count in each minor frame received from the ISS BC MDM. When the frame count does not increment correctly in two or more consecutive frames, the OIU will set this bit high. It will also set this bit high if it cannot obtain 3 consecutive frame counts within 10 frames. Following this error, the OIU will reinitialize and resume operation under internal timing control.

- |     |           |           |                        |                         |
|-----|-----------|-----------|------------------------|-------------------------|
| 68. | FRAME SEQ | P50X4304E | 1 = FRAME SEQ<br>(red) | 0 = FRAME SEQ<br>(gray) |
|-----|-----------|-----------|------------------------|-------------------------|

This flag, also known as ISS FRAME COUNT OUT OF ORDER, is set high when one frame count is not received from the ISS BC MDM. The OIU checks the frame count in each minor frame received from the ISS BC MDM. When the frame count does not increment correctly and only one frame count is "skipped," the OIU will set this bit high and will continue program execution.

**BIC Section** - The Bus Interface Controller (BIC) block displays the status of the four Bus Interface Adapters (BIAs) as follows:

- |     |                   |           |                   |  |
|-----|-------------------|-----------|-------------------|--|
| 69. | BC/RT (BIA no. 1) | P50X4021E | 1 = BC<br>(green) | 0 = RT<br>(yellow if RT on all BIAs)<br>(else green) |
|-----|-------------------|-----------|-------------------|--|

This is a discrete parameter indicating the BC/RT status for bus no. 1. A value of 1 indicates that the OIU is in Bus Controller (BC) mode on that bus, and a value of 0 indicates that the OIU is in Remote Terminal (RT) mode on that bus.

- |     |                   |           |                   |  |
|-----|-------------------|-----------|-------------------|--|
| 70. | BC/RT (BIA no. 2) | P50X4022E | 1 = BC<br>(green) | 0 = RT<br>(yellow if RT on all BIAs)<br>(else green) |
|-----|-------------------|-----------|-------------------|--|

Same as BC/RT (BIA no. 1) for bus no. 2.

- |     |                   |           |                   |  |
|-----|-------------------|-----------|-------------------|--|
| 71. | BC/RT (BIA no. 3) | P50X4023E | 1 = BC<br>(green) | 0 = RT<br>(yellow if RT on all BIAs)<br>(else green) |
|-----|-------------------|-----------|-------------------|--|

Same as BC/RT (BIA no. 1) for BIA no. 3.

- |     |                   |           |                   |  |
|-----|-------------------|-----------|-------------------|--|
| 72. | BC/RT (BIA no. 4) | P50X4024E | 1 = BC<br>(green) | 0 = RT<br>(yellow if RT on all BIAs)<br>(else green) |
|-----|-------------------|-----------|-------------------|--|

Same as BC/RT (BIA no.1) for BIA no. 4.

- |     |                     |           |                  |                  |
|-----|---------------------|-----------|------------------|------------------|
| 73. | Channel (BIA no. 1) | P50X4041E | 1 = B<br>(green) | 0 = A<br>(green) |
|-----|---------------------|-----------|------------------|------------------|

This is a discrete parameter indicating the primary channel selected for bus no. 1. A value of 1 indicates that channel B is selected as the prime channel on that bus, and a value of 0 indicates that channel A is selected as the prime channel on that bus. Note that the primary channel displayed is not necessarily the channel actually in use.

74. Channel (BIA no. 2) P50X4042E 1 = B (green) 0 = A (green)  
 Same as channel (BIA no. 1) for bus no. 2.
75. Channel (BIA no. 3) P50X4043E 1 = B (green) 0 = A (green)  
 Same as channel (BIA no. 1) for bus no. 3.
76. Channel (BIA no. 4) P50X4044E 1 = B (green) 0 = A (green)  
 Same as channel (BIA no. 1) for bus no. 4.
77. LOCK (BIA no. 1) SPECIAL COMP STRING

This special comp indicates the sync status of BIA no. 1. This computation uses a value extracted from the H&S DEV1 (Phys) Code/Sync Status Byte (MSID P50M4050P). This particular H&S field consists of eight bits. The last two bits indicate the sync status:

P50M4050P	AD1 LOCK COMP
XXXXXXnn	NONE
XXXXXX01	YES
XXXXXX10	NO
XXXXXX11	N/A

Where X is "Don't Care."

Use the same table to create AD2\_LOCK\_COMP except using P50M4060P.  
 Use the same table to create AD3\_LOCK\_COMP except using P50M4070P.  
 Use the same table to create AD4\_LOCK\_COMP except using P50M4080P.

If P50U4055D = 1, then let STRING = AD1\_LOCK\_COMP  
 If P50U4065D = 1, then let STRING = AD2\_LOCK\_COMP  
 If P50U4075D = 1, then let STRING = AD3\_LOCK\_COMP  
 If P50U4085D = 1, then let STRING = AD4\_LOCK\_COMP  
 Else, let STRING be blank.

If STRING = NO, then let the color be red.  
 Else, let the color be green.

If the OIU is BC on a bus, then LOCK will show N/A.

If the OIU is RT on a bus and achieves sync with the BC, the indication will be YES and application initialization ends. YES indicates the OIU is in sync with the device and is using its frame count to drive telemetry processing and MS1553B traffic on other buses.

If the OIU cannot achieve sync within ten 100-ms frames, the OIU ISS LOST SYNC error (P50X4283E) is set, this LOCK indication will be NO, interrupts are disabled on the BIA OIU for the bus, and if during application initialization, application initialization ends. The OIU will internally generate the frame count to drive telemetry and MS1553B traffic. Subsequent broadcast messages from the Command and Control MDM will be ignored. The OIU will not try to get in sync with the BC until application initialization is run again. Note that an OIU format reload will cause application initialization to run.

78. LOCK (BIA no. 2) SPECIAL COMP STRING

Same LOCK (BIA no. 1) except for the STRING is set as follows:

If P50U4055D = 2, then let STRING = AD1\_LOCK\_COMP  
If P50U4065D = 2, then let STRING = AD2\_LOCK\_COMP  
If P50U4075D = 2, then let STRING = AD3\_LOCK\_COMP  
If P50U4085D = 2, then let STRING = AD4\_LOCK\_COMP  
Else, let STRING be blank.

79. LOCK (BIA no. 3)

Same LOCK (BIA no. 1) except for the STRING is set as follows.

If P50U4055D = 3, then let STRING = AD1\_LOCK\_COMP  
If P50U4065D = 3, then let STRING = AD2\_LOCK\_COMP  
If P50U4075D = 3, then let STRING = AD3\_LOCK\_COMP  
If P50U4085D = 3, then let STRING = AD4\_LOCK\_COMP  
Else, let STRING be blank.

If STRING = NO, let the color be red.  
Else, let the color be green.

80. LOCK (BIA no. 4)

Same LOCK (BIA no. 1) except for the STRING is set as follows:

If P50U4055D = 4, then let STRING = AD1\_LOCK\_COMP  
If P50U4065D = 4, then let STRING = AD2\_LOCK\_COMP  
If P50U4075D = 4, then let STRING = AD3\_LOCK\_COMP  
If P50U4085D = 4, then let STRING = AD4\_LOCK\_COMP  
Else, let STRING be blank.

If STRING = NO, then let the color be red.  
Else, let the color be green.

81. PD (BIA no. 1) SPECIAL COMP STRING  
(green)

This special comp indicates the Physical Device Code assigned to the Logical Device for BIA no. 1. This computation uses a value extracted from the H&S DEV(1-4) (Phys) Code/ Sync Status Byte (MSID P50M4050P, 60P, 70P, 80P). This particular H&S field consists of eight bits. Bits 5, 4, 3, and 2 of the field are used to indicate the Physical Device Code:

P50M4050P	AD1_PD_COMP
XX0000XX	(blank)
XX0001XX	GNC-1
XX0010XX	GNC-2
XX0011XX	SSOR-1
XX0100XX	SSOR-2
XX0101XX	MPLM-1
XX0110XX	MPLM-2
XX0111XX	N1-1
XX1000XX	N1-2
XX1001XX	FGB-1
XX1010XX	FGB-2
XX1011XX	AMS-1
XX1100XX	AMS-2

Where X is "Don't Care."

Use the same table to create AD2\_PD\_COMP except using P50M4060P.  
Use the same table to create AD3\_PD\_COMP except using P50M4070P.  
Use the same table to create AD4\_PD\_COMP except using P50M4080P.

If P50U4055D = 1, then let STRING = AD1\_PD\_COMP  
If P50U4065D = 1, then let STRING = AD2\_PD\_COMP  
If P50U4075D = 1, then let STRING = AD3\_PD\_COMP  
If P50U4085D = 1, then let STRING = AD4\_PD\_COMP  
Else, let STRING be blank.

82. PD (BIA no. 2)      SPECIAL COMP      STRING  
(green)

Same as PD (BIA no. 1) except for BIA no. 2/bus no. 2 and the STRING is set as follows:

If P50U4055D = 2, then let STRING = AD1\_PD\_COMP  
If P50U4065D = 2, then let STRING = AD2\_PD\_COMP  
If P50U4075D = 2, then let STRING = AD3\_PD\_COMP  
If P50U4085D = 2, then let STRING = AD4\_PD\_COMP  
Else, let STRING be blank.

83. PD (BIA no. 3)      SPECIAL COMP      STRING  
(green)

Same as PD (BIA no. 1) except for BIA no. 3/bus no. 3 and the STRING is set as follows:

If P50U4055D = 3, then let STRING = AD1\_PD\_COMP  
If P50U4065D = 3, then let STRING = AD2\_PD\_COMP  
If P50U4075D = 3, then let STRING = AD3\_PD\_COMP  
If P50U4085D = 3, then let STRING = AD4\_PD\_COMP  
Else, let STRING be blank.

84. PD (BIA no. 4) SPECIAL COMP STRING  
(green)

Same as PD (BIA no. 1) except for BIA no. 4/bus no. 4 and the STRING is set as follows:

If P50U4055D = 4, then let STRING = AD1\_PD\_COMP  
If P50U4065D = 4, then let STRING = AD2\_PD\_COMP  
If P50U4075D = 4, then let STRING = AD3\_PD\_COMP  
If P50U4085D = 4, then let STRING = AD4\_PD\_COMP  
Else, let STRING be blank.

85. ERROR BIC\_ERR 1 = ERROR 0 = ERROR  
(red) (gray)

Indicates an error exists in the BIC.

BIC\_ERR = MSID no. 1+2+3+4

No.	MSID	Description
1	P50X4215E	POST SRAM (BIC SRAM initialization values are different from expected)
2	P50X4216E	POST SELF TEST (POST self-test failure for one of the four BIAs)
3	P50X4217E	POST REGISTER (BIC register initialization values different from expected)
4	P50X4228E	INVAL BIC 1 INTR (Autovector w/ BIC 1 generated for invalid reason)

86. BUS NAME (1-4) SPECIAL PROC STRING  
(tan)

The buses graphically coming out of the BIC block of the display have names displayed directly beneath the bus. These names are defined by the flight-specific OIU data file, as follows:

Bus no.	STRING
1	BUS1_NAME from input file
2	BUS2_NAME from input file
3	BUS3_NAME from input file
4	BUS4_NAME from input file

**DISPLAY CONTROLS** - The ERROR LATCH buttons (ALL/OIC/OCC/BIC/BSW/ISS/SSOR), when selected, latch errors in the associated blocks of this display. The LATCH CLEAR buttons, when pressed, clear any errors which have been latched in the past. Some of the Latch Controls (ISS and SSOR) do not necessarily latch the errors in their blocks because of the definition of these errors inside other blocks of the Errors subdisplay. To avoid confusion, the best practice is to LATCH ALL.

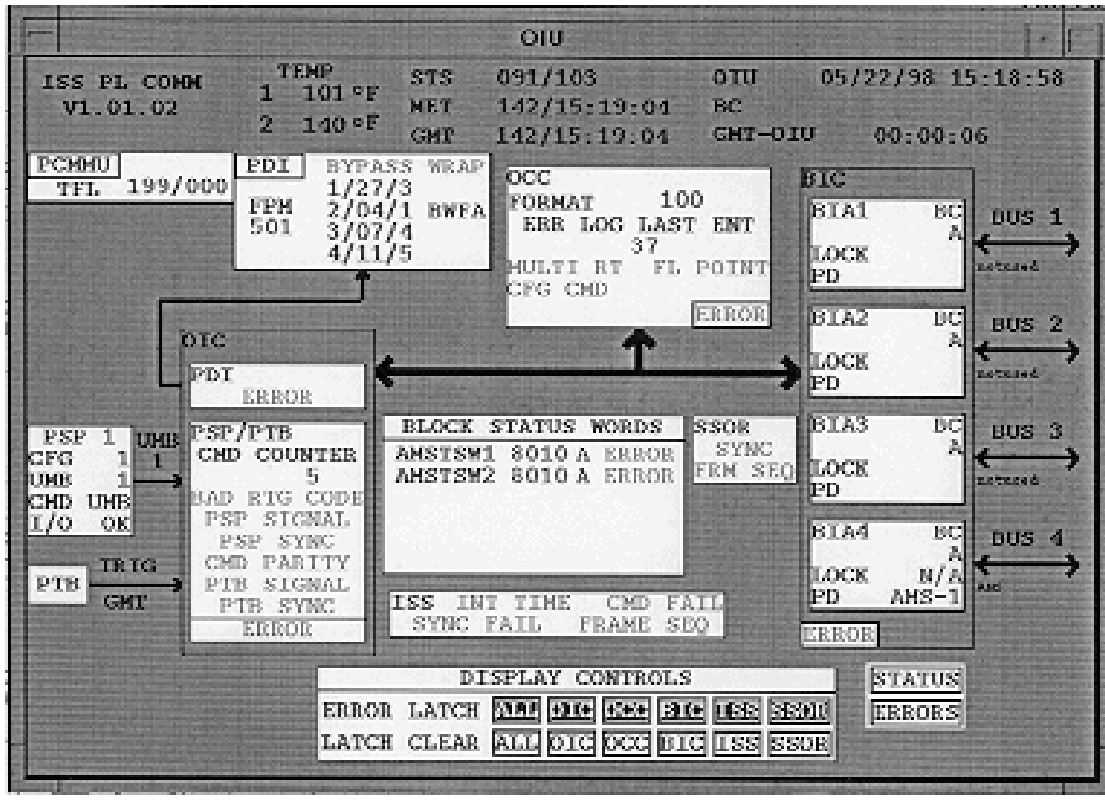


Figure 5.135-1. OIU main display

D. Detailed display description of the OIU Status display:

**FORMAT SECTION** - The upper left corner of the display contains the following:

- Format P50U4010A DECIMAL (green)

Indicates the current OIU format.

**ACTIVE DEVICE SECTION** -

- PD (AD1) SPECIAL COMP STRING (green)

This special comp indicates the Physical Device Code assigned to the Logical Device for Active Device 1. This computation uses a value extracted from the H&S DEV1 (Phys) Code/Sync Status Byte (MSID P50M4050P). This particular H&S field consists of eight bits. Bits 5, 4, 3, and 2 of the field are used to indicate the Physical Device Code as follows:

P50M4050P	STRING
XX0000XX	(blank)
XX0001XX	GNC-1
XX0010XX	GNC-2
XX0011XX	SSOR-1
XX0100XX	SSOR-2
XX0101XX	MPLM-1
XX0110XX	MPLM-2
XX0111XX	N1-1
XX1000XX	N1-2
XX1001XX	FGB-1
XX1010XX	FGB-2
XX1011XX	AMS-1
XX1100XX	AMS-2

Where X is "Don't Care."

3. PD (AD2) SPECIAL COMP STRING  
(green)

Same as PD (AD1) except for AD no. 2 and using the H&S DEV2 (Phys) Code/Sync Status Byte (MSID P50M4060P).

4. PD (AD3) SPECIAL COMP STRING  
(green)

Same as PD (AD1) except for AD no. 3 and using the H&S DEV3 (Phys) Code/Sync Status Byte (MSID P50M4070P).

5. PD (AD4) SPECIAL COMP STRING  
(green)

Same as PD (AD1) except for AD no. 4 and using the H&S DEV4 (Phys) Code/Sync Status Byte (MSID P50M4080P).

6. PD no. (AD1) SPECIAL COMP HEX  
(green)

This special comp indicates the Physical Device number assigned to the Logical Device for Active Device 1. This computation uses a value extracted from the H&S DEV1 (Phys) Code/Sync Status Byte (MSID P50M4050P). This particular H&S field consists of eight bits. Bits 5, 4, 3, and 2 of the field are used to indicate the Physical Device number in hex as follows:



P50M4050P	HEX
XX0000XX	00
XX0001XX	01
XX0010XX	02
XX0011XX	03
XX0100XX	04
XX0101XX	05
XX0110XX	06
XX0111XX	07
XX1000XX	08
XX1001XX	09
XX1010XX	0A
XX1011XX	0B
XX1100XX	0C

Where X is "Don't Care."

7. PD no. (AD2) SPECIAL COMP HEX  
(green)

Same as PD no. (AD1) except for AD no. 2 and using the H&S DEV2 (Phys) Code/Sync Status Byte (MSID P50M4060P).

8. PD no. (AD3) SPECIAL COMP HEX  
(green)

Same as PD no. (AD1) except for AD no. 3 and using the H&S DEV3 (Phys) Code/Sync Status Byte (MSID P50M4070P).

9. PD no. (AD4) SPECIAL COMP HEX  
(green)

Same as PD no. (AD1) except for AD no. 4 and using the H&S DEV4 (Phys) Code/Sync Status Byte (MSID P50M4080P).

10. BUS no. (AD1) P50U4055D HEX  
(green)

Indicates the number of the bus that the AD 1 is on. This value is extracted from the H&S DEV1 Bus/RT Number Byte. This particular H&S field consists of eight bits. The first three bits of the field indicate the bus number.

11. BUS no. (AD2) P50U4065D HEX  
(green)

Same as bus no. (AD1) for Active Device 2.

12. BUS no. (AD3) P50U4075D HEX  
(green)

Same as BUS no. (AD1) for Active Device 3.

13. BUS no. (AD4) P50U4085D HEX  
green)

Same as BUS number (AD1) for Active Device 4.

14. LOCK (AD1) SPECIAL COMP STRING

This special comp indicates the sync status of AD no. 1. This computation uses a value extracted from the H&S DEV1 (Phys) Code/Sync Status Byte (MSID P50M4050P). This particular H&S field consists of eight bits. The last two bits are used indicate the sync status as follows:

<b>P50M4050P</b>	<b>STRING</b>
XXXXXX00	NONE
XXXXXX01	YES
XXXXXX10	NO
XXXXXX11	N/A

Where X is "Don't Care."

If STRING = NO, then let the color be red.  
Else, let the color be green.

If the OIU is BC on a bus, then LOCK will show N/A.

If the OIU is RT on a bus and achieves sync with the BC, this indication will be YES and application initialization ends. YES indicates the OIU is in sync to the device and is using the frame count from this device to drive telemetry processing and MS1553B traffic on other buses.

If the OIU cannot achieve sync within ten 100 ms frames, the OIU ISS LOST SYNC error (P50X4283E) is set, this LOCK indication will be NO, interrupts are disabled on the BIA OIU for the bus, and, if during application initialization, application initialization ends. The OIU will internally generate the frame count to drive telemetry and MS1553B traffic. Subsequent broadcast messages from the Command and Control MDM will be ignored. The OIU will not try to get in sync with the BC until application initialization is run again. Note that an OIU format reload will cause application initialization to run.

15. LOCK (AD2) SPECIAL PROC STRING

Same as LOCK (AD1) except for AD no. 2 and using the H&S DEV2 (Phys) Code/Sync Status Byte (MSID P50M4060P).

16. LOCK (AD3) SPECIAL PROC STRING

Same as LOCK (AD1) except for AD no. 3 and using the H&S DEV3 (Phys) Code/Sync Status Byte (MSID P50M4070P).

17. LOCK (AD4) SPECIAL PROC STRING

Same as LOCK (AD1) except for AD no. 3 and using the H&S DEV4 (Phys) Code/Sync Status Byte (MSID P50M4080P).

18. AD RT (AD1) P50U4056D DECIMAL  
(green)

Indicates the RT number for active device 1. This value is extracted from the H&S DEV1 Bus/RT number byte. This particular H&S field consists of eight bits. The last five bits of the field indicate the RT number.

19. AD RT (AD2) P50U4066D DECIMAL  
(green)

Same as AD RT (AD1) for Active Device 2.

20. AD RT (AD3) P50U4076D DECIMAL  
(green)

Same as AD RT (AD1) for Active Device 3.

21. AD RT (AD4) P50U4086D DECIMAL  
(green)

Same as AD RT (AD1) for Active Device 4.

22. OIU RT (BUS1) P50U4059D DECIMAL  
(green)

Indicates the OIU RT address if the OIU is an RT on bus no. 1. This value is extracted from the H&S Dev Data Start Byte/OIU RT number bus no. 1 bytes. This particular H&S field consists of 16 bits. The last six bits of the field indicate the OIU RT number.

23. OIU RT (BUS2) P50U4069D DECIMAL  
(green)

Same as OIU RT (BUS1) for bus no. 2.

24. OIU RT (BUS3) P50U4079D DECIMAL  
(green)

Same as OIU RT (BU1) for bus no. 3.

25. OIU RT (BUS4) P50U4089D DECIMAL  
(green)

Same as OIU RT (BUS1) for bus no. 4.

26. START WORD (AD1) P50U4058D HEX  
(green)

Indicates the byte number in the PDI minor frame where the device no. 1 format ID data start. This value is extracted from the H&S Dev Data Start Byte/OIU RT number bus no. 1 bytes. This particular H&S field consists of 16 bits. The first 10 bits of the field indicate the byte number.

27. START WORD (AD2) P50U4068D HEX  
(green)

Same as START WORD (AD1) for active device no. 2.

28. START WORD (AD3) P50U4078D HEX  
(green)

Same as START WORD (AD1) for active device no. 3.

29. START WORD (AD4) P50U4088D HEX  
(green)

Same as START WORD (AD1) for active device no. 4.

**BUS CONFIGURATION SECTION** - This section displays whether the OIU is functioning as a BC or an RT on each of the four MS1553B buses currently used. It also indicates the prime selected channel of each of the four OIU BIAs.

30. BC/RT (bus no. 1) P50X4021E 1 = BC 0 = RT  
(green) (green)

This is a discrete parameter indicating the BC/RT status for bus no. 1. A value of 1 indicates that the OIU is in BC mode on that bus, and a value of 0 indicates the OIU is in RT mode on that bus.

31. BC/RT (bus no. 2) P50X4022E 1 = BC 0 = RT  
(green) (green)

Same as BC/RT (bus no. 1) for bus no. 2.

32. BC/RT (bus no. 3) P50X4023E 1 = BC 0 = RT  
(green) (green)

Same as BC/RT (bus no. 1) for bus no. 3.

33. BC/RT (bus no. 4) P50X4024E 1 = BC 0 = RT  
(green) (green)

Same as BC/RT (bus no. 1) for bus no. 4.

34. A/B (bus no. 1) P50X4041E 1 = B 0 = A  
(green) (green)

This is a discrete parameter indicating the primary channel selected for bus no. 1. A value of 1 indicates that channel B is selected as the prime channel on that bus, and a value of 0 indicates that channel A is selected as the prime channel on that bus. Note that the primary channel displayed is not the channel actually in use.

35. A/B (bus no. 2) P50X4042E 1 = B 0 = A  
(green) (green)

Same as A/B (bus no. 1) for bus no. 3.

36.	A/B (BUS no. 3)	P50X4043E	1 = B (green)	0 = A (green)
-----	-----------------	-----------	------------------	------------------

Same as A/B (bus no. 1) for bus no. 3.

37.	A/B (BUS no. 4)	P50X4044E	1 = B (green)	0 = A (green)
-----	-----------------	-----------	------------------	------------------

Same as A/B (bus no. 1) for bus no. 4.

**TEMPERATURE AND S/N SECTION**

38.	TEMP (1)	P50T4000V	FLOATING POINT (green)
-----	----------	-----------	---------------------------

Indicates the power supply temperature for OIU 1. This signal is an analog differential signal with a voltage range of +5 V dc to -5 V dc.

The calibration curve is:  $OIU\ TEMP = V(32.0929) + 140.60854$

Note that the zero-voltage (OIU "OFF") temperature reading is 140.6° F.

39.	TEMP (2)	P50T4001V	FLOATING POINT (green)
-----	----------	-----------	---------------------------

Same as TEMP (1) for OIU 2.

40.	OIU S/N	SPECIAL COMP	STRING (green)
-----	---------	--------------	-------------------

This is a special comp that uses the ID number (P50U4011D) of the OIU generating the telemetry data stream and the OIU input file to determine which OIU is being used. The OIU input file for STS-91 is displayed in Figure 5.135-4.

If P50U4011D = the OIU 1 ID number specified in the file, OIU 1 is displayed.

If P50U4011D = the OIU 2 ID number specified in the file, OIU 2 is displayed.

If P50U4011D does not match either number specified in the file, it displays a blank.

**HEALTH AND STATUS SECTION** - This section displays the 10 OIU status bytes in binary form. Each parent MSID is composed of eight bits, and each bit represents the occurrence of an error. Whenever a particular bit is set to one, it indicates that a corresponding error occurred at some time in the 10 frames prior to the beginning of this 10-frame cycle. The OIU Generated Error Table in Appendix 38.B of the INCO Systems Brief gives a detailed description of the individual errors. All status errors are displayed individually in the OIU Errors display.

41. WORD 1 P50M4210P BINARY  
(green)

Displays status byte 1 in binary.

The eight bits represent the following errors:

(MSB) BIT 7 - (P50X4211E) - Illegal Instruction  
BIT 6 - (P50X4212E) - Frame Overrun  
BIT 5 - (P50X4213E) - Check Instruction  
BIT 4 - (P50X4214E) - Bus  
BIT 3 - (P50X4215E) - BIC Post SRAM  
BIT 2 - (P50X4216E) - BIC Post Self Test  
BIT 1 - (P50X4217E) - BIC Post Register  
(LSB) BIT 0 - (P50X4218E) - Address

42. WORD 2 P50M4220P BINARY  
(green)

Displays status byte 2 in binary.

The eight bits represent the following errors:

(MSB) BIT 7 - (P50X4221E) - Max Error Log Write Wait  
BIT 6 - (P50X4222E) - Line 1111  
BIT 5 - (P50X4223E) - Line 1010  
BIT 4 - (P50X4224E) - Level 7 Autovector  
BIT 3 - (P50X4225E) - Invalid GSE  
BIT 2 - (P50X4226E) - Invalid DUART Interrupt  
BIT 1 - (P50X4227E) - Invalid BIC2 Interrupt  
(LSB) BIT 0 - (P50X4228E) - Invalid BIC1 Interrupt

43. WORD 3 P50M4230P BINARY  
(green)

Displays status byte 3 in binary.

The eight bits represent the following errors:

(MSB) BIT 7 - (P50X4231E) - OIC PDI EEPROM  
BIT 6 - (P50X4232E) - OIC PDI C51  
BIT 5 - (P50X4233E) - OIC PDI ARB  
BIT 4 - (P50X4234E) - OCC SRAM  
BIT 3 - (P50X4235E) - OCC Register  
BIT 2 - (P50X4236E) - Reserved  
BIT 1 - (P50X4237E) - OCC EEPROM  
(LSB) BIT 0 - (P50X4238E) - No PSP Command

44. WORD 4 P50M4240P BINARY  
(green)

Displays status byte 4 in binary.

The eight bits represent the following errors:

(MSB) BIT 7 - (P50X4241E) - OIC PSP EEPROM  
BIT 6 - (P50X4242E) - OIC PSP C51  
BIT 5 - (P50X4243E) - OIC PSP ARB  
BIT 4 - (P50X4244E) - OIC PDI WRAP  
BIT 3 - (P50X4245E) - OIC PDI SRAM  
BIT 2 - (P50X4246E) - OIC PDI POST Incomplete  
BIT 1 - (P50X4247E) - OIC PDI POST  
(LSB) BIT 0 - (P50X4248E) - OIC PDI Interrupt

45. WORD 5 P50M4250P BINARY  
(green)

Displays status byte 5 in binary.

The eight bits represent the following errors:

(MSB) BIT 7 - (P50X4251E) - PDI SRAM R/W  
BIT 6 - (P50X4252E) - PDI SRAM Access  
BIT 5 - (P50X4253E) - Reserved  
BIT 4 - (P50X4254E) - OIU RT on Multiple Bus  
BIT 3 - (P50X4255E) - OIC PSP SRAM  
BIT 2 - (P50X4256E) - OIC PSP Post Incomplete  
BIT 1 - (P50X4257E) - OIC PSP Post  
(LSB) BIT 0 - (P50X4258E) - OIC PSP Interrupt

46. WORD 6 P50M4260P BINARY  
(green)

Displays status byte 6 in binary.

The eight bits represent the following errors:

(MSB) BIT 7 - (P50X4261E) - Trace  
BIT 6 - (P50X4262E) - Spurious Interrupt  
BIT 5 - (P50X4263E) - Recon No. Trans Subframe  
BIT 4 - (P50X4264E) - Recon EEPROM Faulty  
BIT 3 - (P50X4265E) - PSP SRAM R/W  
BIT 2 - (P50X4266E) - PSP/PTB SRAM access  
BIT 1 - (P50X4267E) - CMD in Wrong Buffer  
(LSB) BIT 0 - (P50X4268E) - Privilege Violation

47. WORD 7 P50M4270P BINARY  
(green)

Displays status byte 7 in binary.

The eight bits represent the following errors:

(MSB) BIT 7 - (P50X4271E) - Reserved  
BIT 6 - (P50X4272E) - Reserved  
BIT 5 - (P50X4273E) - Reserved  
BIT 4 - (P50X4274E) - Zero Divide  
BIT 3 - (P50X4275E) - Unused Exception  
BIT 2 - (P50X4276E) - Uninit Interrupt vector  
BIT 1 - (P50X4277E) - TRAP X  
(LSB) BIT 0 - (P50X4278E) - TRAP V

48. WORD 8 P50M4280P BINARY  
(green)

Displays status byte 8 in binary.

The eight bits represent the following errors:

(MSB) BIT 7 - (P50X4281E) - OIC PSP Parity Error  
BIT 6 - (P50X4282E) - OIC PTB Time  
BIT 5 - (P50X4283E) - OIC PSP LOS Err  
BIT 4 - (P50X4284E) - OIC PDI Sync  
BIT 3 - (P50X4285E) - Reserved  
BIT 2 - (P50X4286E) - ISS BC No Comm Status  
BIT 1 - (P50X4287E) - Invalid config cmd  
(LSB) BIT 0 - (P50X4288E) - Floating point conversion

49. WORD 9 P50M4290P BINARY  
(green)

Displays status byte 9 in binary.

The eight bits represent the following errors:

(MSB) BIT 7 - (P50X4291E) - PSP Retries Failed Err  
BIT 6 - (P50X4292E) - PSP Cmd Count Out of Bound Err  
BIT 5 - (P50X4293E) - OIU SSOR Lost Sync Err  
BIT 4 - (P50X4294E) - OIU ISS Lost Sync Err  
BIT 3 - (P50X4295E) - OIC PTB Sync Err  
BIT 2 - (P50X4296E) - OIC PTB LOS Err  
BIT 1 - (P50X4297E) - OIC PSP Sync Err  
(LSB) BIT 0 - (P50X4298E) - OIC PSP PTB Health Err



50. WORD 10 P50M4300P BINARY  
(green)

Displays status byte 10 in binary.

The eight bits represent the following errors:

- (MSB) BIT 7 - (P50X4301E) - Reserved
- BIT 6 - (P50X4302E) - PDI Buffer not clear Err
- BIT 5 - (P50X4303E) - OIC PSP byte count Err
- BIT 4 - (P50X4304E) - ISS frame nonconsecutive Err
- BIT 3 - (P50X4305E) - SSOR frame nonconsecutive Err
- BIT 2 - (P50X4306E) - Unimplemented RC Err
- BIT 1 - (P50X4307E) - Unfinished BC Frame Err
- (LSB) BIT 0 - (P50X4308E) - PTB not available Err

**BLOCK STATUS WORD SECTION** - This section displays up to six BSWs. BSWs indicate the success or failure of individual MS1553B transactions. Each BSW is composed of 16 bits, and each bit represents a given status. Bit 15 is defined as the MSB and bit 0 is defined as the LSB.

51. Title (1-6) SPECIAL PROC STRING

This is a special process that uses the OIU input file to determine the title of the BSWs. The OIU input file for STS-91 is described in Figure 5.135-4.

Title	STRING
Row 1	BSW1_NAME from input file
Row 2	BSW2_NAME from input file
Row 3	BSW3_NAME from input file
Row 4	BSW4_NAME from input file
Row 5	BSW5_NAME from input file
Row 6	BSW6_NAME from input file

Note that the title will be blank if BSW name is not defined in the file.

52. MSID (1-6) SPECIAL PROC STRING

This is a special process that uses the OIU input file to determine the MSIDs that correspond to the BSWs.

MSID	STRING
Row 1	BSW1_MSID from input file
Row 2	BSW2_MSID from input file
Row 3	BSW3_MSID from input file
Row 4	BSW4_MSID from input file
Row 5	BSW5_MSID from input file
Row 6	BSW6_MSID from input file

Note that the MSID column for a given BSW will be blank if that BSW MSID is not defined in the file.

53. HEX (rows 1-6) SPECIAL PROC HEX

This is a special process that uses the real-time data value of the corresponding BSW MSID and displays it as a four-character hex value.

Example: If BSW1\_MSID = P50U4493D, P50U4493D is displayed in hex for BSW1.

Note that the HEX column for a given BSW will be blank if that BSW MSID is not defined in the file.

54. EOM (rows 1-6) SPECIAL PROC STRING

This is a special process that uses bit 15 of each of the BSWs.

EOM	STRING
Row 1	"X" if Bit 15 of BSW1_MSID = 1, else blank
Row 2	"X" if Bit 15 of BSW2_MSID = 1, else blank
Row 3	"X" if Bit 15 of BSW3_MSID = 1, else blank
Row 4	"X" if Bit 15 of BSW4_MSID = 1, else blank
Row 5	"X" if Bit 15 of BSW5_MSID = 1, else blank
Row 6	"X" if Bit 15 of BSW6_MSID = 1, else blank

In both BC and RT mode, Bit 15 is set (logic 1) at the completion of the message, regardless of whether there were any errors in the message.

Bit 15 set (logic 1) is an expected nonerror BC or RT mode status.

55. SOM (rows 1-6) SPECIAL PROC STRING

This is a special process that uses bit 14 of each of the BSWs.

SOM	STRING
Row 1	"X" if Bit 14 of BSW1_MSID = 1, else blank
Row 2	"X" if Bit 14 of BSW2_MSID = 1, else blank
Row 3	"X" if Bit 14 of BSW3_MSID = 1, else blank
Row 4	"X" if Bit 14 of BSW4_MSID = 1, else blank
Row 5	"X" if Bit 14 of BSW5_MSID = 1, else blank
Row 6	"X" if Bit 14 of BSW6_MSID = 1, else blank

In both BC and RT mode, bit 15 is set (logic 1) at the start of the message and cleared at the end of the message.

56. CH B (rows 1-6) SPECIAL PROC STRING

This is a special process that uses bit 13 of each of the BSWs.

CH B	STRING
Row 1	"X" if Bit 13 of BSW1_MSID = 1, else blank
Row 2	"X" if Bit 13 of BSW2_MSID = 1, else blank
Row 3	"X" if Bit 13 of BSW3_MSID = 1, else blank
Row 4	"X" if Bit 13 of BSW4_MSID = 1, else blank
Row 5	"X" if Bit 13 of BSW5_MSID = 1, else blank
Row 6	"X" if Bit 13 of BSW6_MSID = 1, else blank

In both BC and RT mode, bit 13 will be a logic 0 if the message was processed on channel A or a logic 1 if processed on channel B.

57. ERR (rows 1-6) SPECIAL PROC STRING

This is a special process that uses bit 12 of each of the BSWs.

ERR	STRING
Row 1	"X" if Bit 12 of BSW1_MSID = 1, else blank
Row 2	"X" if Bit 12 of BSW2_MSID = 1, else blank
Row 3	"X" if Bit 12 of BSW3_MSID = 1, else blank
Row 4	"X" if Bit 12 of BSW4_MSID = 1, else blank
Row 5	"X" if Bit 12 of BSW5_MSID = 1, else blank
Row 6	"X" if Bit 12 of BSW6_MSID = 1, else blank

In both BC and RT mode, bit 12 will be set (logic 1) if there was an error in the message. The exact error is specified in the remaining bits.

58. BC STAT (rows 1-6) SPECIAL PROC STRING

This is a special process that uses bit 11 of each of the BSWs.

BC STAT	STRING
Row 1	"X" if Bit 11 of BSW1_MSID = 1, else blank
Row 2	"X" if Bit 11 of BSW2_MSID = 1, else blank
Row 3	"X" if Bit 11 of BSW3_MSID = 1, else blank
Row 4	"X" if Bit 11 of BSW4_MSID = 1, else blank
Row 5	"X" if Bit 11 of BSW5_MSID = 1, else blank
Row 6	"X" if Bit 11 of BSW6_MSID = 1, else blank

In RT mode, bit 11 is not applicable.

In BC mode, bit 11 is set (logic 1) if an RT MS1553B Status Word received from a responding RT contained an incorrect RT address field or one of the lower 11 bits contained an unexpected value. Detailed information on MS1553B status words is located in Section 38.8.2 of the INCO Systems Brief.

59. FMT ERR (rows 1-6) SPECIAL PROC STRING

This is a special process that uses bit 10 of each of the BSWs.

FMT ERR	STRING
Row 1	"X" if Bit 10 of BSW1_MSID = 1, else blank
Row 2	"X" if Bit 10 of BSW2_MSID = 1, else blank
Row 3	"X" if Bit 10 of BSW3_MSID = 1, else blank
Row 4	"X" if Bit 10 of BSW4_MSID = 1, else blank
Row 5	"X" if Bit 10 of BSW5_MSID = 1, else blank
Row 6	"X" if Bit 10 of BSW6_MSID = 1, else blank

In both BC and RT mode, bit 10 will be set (logic 1) if message contained one or more violations of the MS1553B message validation criteria (sync, encoding, parity, bit count, word count, etc.).

60. BC NO RESP (rows 1-6) SPECIAL PROC STRING

This is a special process that uses bit 9 of each of the BSWs.

BC NO RESP	STRING
Row 1	"X" if Bit 9 of BSW1_MSID = 1, else blank
Row 2	"X" if Bit 9 of BSW2_MSID = 1, else blank
Row 3	"X" if Bit 9 of BSW3_MSID = 1, else blank
Row 4	"X" if Bit 9 of BSW4_MSID = 1, else blank
Row 5	"X" if Bit 9 of BSW5_MSID = 1, else blank
Row 6	"X" if Bit 9 of BSW6_MSID = 1, else blank

In RT mode, bit 9 is not applicable.

In BC mode, bit 9 is set (logic 1) if the RT either has not responded or has responded later than the BC No Response Timeout time (50.5 ms).

61. LOOP FAIL (rows 1-6) SPECIAL PROC STRING

This is a special process that uses bit 8 of each of the BSWs.

LOOP FAIL	STRING
Row 1	"X" if Bit 8 of BSW1_MSID = 1, else blank
Row 2	"X" if Bit 8 of BSW2_MSID = 1, else blank
Row 3	"X" if Bit 8 of BSW3_MSID = 1, else blank
Row 4	"X" if Bit 8 of BSW4_MSID = 1, else blank
Row 5	"X" if Bit 8 of BSW5_MSID = 1, else blank
Row 6	"X" if Bit 8 of BSW6_MSID = 1, else blank

In BC mode, bit 8 set (logic 1) indicates that the BC loop test has failed.

In RT mode, bit 8 set (logic 1) indicates that the RT loop test has failed.

62. RT WD CNT (rows 1-6) SPECIAL PROC STRING

This is a special process that uses bit 5 of each of the BSWs.

RT WD CNT	STRING
Row 1	"X" if Bit 5 of BSW1_MSID = 1, else blank
Row 2	"X" if Bit 5 of BSW2_MSID = 1, else blank
Row 3	"X" if Bit 5 of BSW3_MSID = 1, else blank
Row 4	"X" if Bit 5 of BSW4_MSID = 1, else blank
Row 5	"X" if Bit 5 of BSW5_MSID = 1, else blank
Row 6	"X" if Bit 5 of BSW6_MSID = 1, else blank

In BC mode, bit 5 is not applicable.

In RT mode, bit 5 is set (logic 1) if the BC did not transmit the correct number of data words, as specified in the MS1553B command word.

63. RT BAD SYNC (rows 1-6) SPECIAL PROC STRING

This is a special process that uses bit 4 of each of the BSWs.

RT BAD SYNC	STRING
row 1	"X" if Bit 4 of BSW1_MSID = 1, else blank
row 2	"X" if Bit 4 of BSW2_MSID = 1, else blank
row 3	"X" if Bit 4 of BSW3_MSID = 1, else blank
row 4	"X" if Bit 4 of BSW4_MSID = 1, else blank
row 5	"X" if Bit 4 of BSW5_MSID = 1, else blank
row 6	"X" if Bit 4 of BSW6_MSID = 1, else blank

In RT mode, bit 4 set (logic 1) indicates that the BC transmitted a Command Sync in a data word. **If not in RT mode**, disregard this column of the status display.

64. BC GOOD BLOCK (rows 1-6) SPECIAL PROC STRING

This is a special process that uses bit 4 of each of the BSWs.

BC GOOD BLOCK	STRING
Row 1	"X" if Bit 4 of BSW1_MSID = 1, else blank
Row 2	"X" if Bit 4 of BSW2_MSID = 1, else blank
Row 3	"X" if Bit 4 of BSW3_MSID = 1, else blank
Row 4	"X" if Bit 4 of BSW4_MSID = 1, else blank
Row 5	"X" if Bit 4 of BSW5_MSID = 1, else blank
Row 6	"X" if Bit 4 of BSW6_MSID = 1, else blank

In BC mode, bit 4 set (logic 1) indicates that a valid (error free) RT-to-BC transfer or a "receive mode code with data" message has been completed. Bit 4 is set to 0 for a BC-to-RT transfer, or a "receive mode code without data" message. **If not in BC mode**, disregard this column of the status display. Bit 4 set is an expected nonerror BC mode transmit status.

65. BC NO GAP (rows 1-6) SPECIAL PROC STRING

This is a special process that uses bit 3 of each of the BSWs.

BC NO GAP	STRING
Row 1	"X" if Bit 3 of BSW1_MSID = 1, else blank
Row 2	"X" if Bit 3 of BSW2_MSID = 1, else blank
Row 3	"X" if Bit 3 of BSW3_MSID = 1, else blank
Row 4	"X" if Bit 3 of BSW4_MSID = 1, else blank
Row 5	"X" if Bit 3 of BSW5_MSID = 1, else blank
Row 6	"X" if Bit 3 of BSW6_MSID = 1, else blank

In RT mode, bit 3 is not applicable.

In BC mode, bit 3 is set (logic 1) if either or both of the following occur:

- a. The RT address field of a responding RT does not match the RT address in the MS1553B command word.

- b. An RT responds with a response time less than 4 ms (minimum intermessage time gap).

66. BC BAD CNT (rows 1-6) SPECIAL PROC STRING

This is a special process that uses bit 2 of each of the BSWs.

BC BAD CNT	STRING
Row 1	"X" if Bit 2 of BSW1_MSID = 1, else blank
Row 2	"X" if Bit 2 of BSW2_MSID = 1, else blank
Row 3	"X" if Bit 2 of BSW3_MSID = 1, else blank
Row 4	"X" if Bit 2 of BSW4_MSID = 1, else blank
Row 5	"X" if Bit 2 of BSW5_MSID = 1, else blank
Row 6	"X" if Bit 2 of BSW6_MSID = 1, else blank

In RT mode, bit 2 is not applicable.

In BC mode, bit 2 is set (logic 1) if a responding RT did not transmit the correct number of data words. Bit 2 is set to a logic 0 for BC-to-RT and "receive mode code" transfers.

67. BC SYNC TYPE (rows 1-6) SPECIAL PROC STRING

This is a special process that uses bit 1 of each of the BSWs.

BC SYNC TYPE	STRING
Row 1	"X" if Bit 1 of BSW1_MSID = 1, else blank
Row 2	"X" if Bit 1 of BSW2_MSID = 1, else blank
Row 3	"X" if Bit 1 of BSW3_MSID = 1, else blank
Row 4	"X" if Bit 1 of BSW4_MSID = 1, else blank
Row 5	"X" if Bit 1 of BSW5_MSID = 1, else blank
Row 6	"X" if Bit 1 of BSW6_MSID = 1, else blank

In RT mode, bit 1 is not applicable.

In BC mode, bit 1 is set (logic 1) if an RT responds with a Data Sync in a Status Word and/or a Command/Status Sync in a Data Word.

68. RT CW CNT (rows 1-6) SPECIAL PROC STRING

This is a special process that uses bit 0 of each of the BSWs.

RT CW CNT	STRING
Row 1	"X" if Bit 0 of BSW1_MSID = 1, else blank
Row 2	"X" if Bit 0 of BSW2_MSID = 1, else blank
Row 3	"X" if Bit 0 of BSW3_MSID = 1, else blank
Row 4	"X" if Bit 0 of BSW4_MSID = 1, else blank
Row 5	"X" if Bit 0 of BSW5_MSID = 1, else blank
Row 6	"X" if Bit 0 of BSW6_MSID = 1, else blank

In RT mode, bit 0 set (logic 1) indicates that a received Command Word is not defined in accordance with MIL-STD-1553. **If not in RT mode**, disregard this column of the status display.

69. BC INV IND (rows 1-6) SPECIAL PROC STRING

This is a special process that uses bit 0 of each of the BSWs.

BC INV IND	STRING
1	"X" if Bit 0 of BSW1_MSID = 1, else blank
2	"X" if Bit 0 of BSW2_MSID = 1, else blank
3	"X" if Bit 0 of BSW3_MSID = 1, else blank
4	"X" if Bit 0 of BSW4_MSID = 1, else blank
5	"X" if Bit 0 of BSW5_MSID = 1, else blank
6	"X" if Bit 0 of BSW6_MSID = 1, else blank

In BC mode, bit 0 set (logic 1) indicates that an RT responded with one or more words containing one or more of the following error types: sync field error, Manchester encoding error, and/or bit count error. **If not in BC mode**, disregard this column of the status display.

**TIME AND COMMAND COUNTER SECTION**

70. OIU TIME P50U4100D mm/dd/yy hh:mm:ss  
green if incrementing  
(red if not incrementing)

Indicates the timer being kept in the OIU, synchronized with, but independent from, the orbiter time converted to mm/dd/yy hh:mm:ss.

71. BC TIME P50U4110D mm/dd/yy hh:mm:ss  
(green if incrementing)  
(red if not incrementing)

Indicates the broadcast time received by the OIU from a BC, when the OIU is a remote terminal.

72. CMD CNT P50U4130D DECIMAL  
(green)

Indicates the total number of PSP commands received by the OCC since poweron.

OIU STATUS																																
OIU STATUS	AD	PD	PD #	BUS #	LOCK #	AD RT	OIU RT	START WORD	BUS #	BC RT	A B	TEMP	H & S				RT WD CNT	RT BAD SYNC	BC GOOD BLOCK	BC NO GAP	BC BAD CNT	BC SYNC TYPE	RT CW CNT	BC INV IND								
													MSB	LSB	MSB	LSB																
V1.01.02	1	AMS-1	0B	4	N/A	4	8	0000	1	BC	A	1	101 °F	1	0000	0000	6	0000	0000	W	2	0000	0000	W	7	0000	0000					
FORMAT 100	2		00	0	NONE	0	8	0000	2	BC	A	OIU S/N																				
	3		00	0	NONE	0	8	0000	3	BC	A																					
	4		00	0	NONE	0	8	0000	4	BC	A																					
BLOCK STATUS WORDS																																
TITLE	MSID	HEX	EOM	SOM	CH B	ERR	BC STAT	FMT ERR	BC NO RESP	LOOP FAIL	RT WD CNT	RT BAD SYNC	BC GOOD BLOCK	BC NO GAP	BC BAD CNT	BC SYNC TYPE	RT CW CNT	BC INV IND														
AMSTSM1	P50U4493D	8010	X									X	X																			
AMSTSM2	P50U4494D	8010	X									X	X																			
OIU TIME		05/22/98 15:18:58		CMD CNT		5																										
BC TIME		00/00/00 00:00:00																														

Figure 5.135-2. Example of OIU STATUS display

E. Detailed display description of the OIU Errors display:

**DISPLAY CONTROLS** - The ERROR LATCH buttons (ALL/OIC/OCC/BIC/CMD), when selected, latch errors in the associated blocks of this display. The LATCH CLEAR buttons, when pressed, clear any errors that have been latched in the past.

**COMMAND** - The Command block displays OIU command errors as follows:

- |    |            |           |                         |                          |
|----|------------|-----------|-------------------------|--------------------------|
| 1. | PSP SIGNAL | P50X4283E | 1 = PSP SIGNAL<br>(red) | 0 = PSP SIGNAL<br>(gray) |
|----|------------|-----------|-------------------------|--------------------------|

This parameter, also known as OIC PSP Command LOS Err, is set if a loss of the PSP carrier signal is detected by the OIU. This flag is cleared when the PSP carrier signal is detected at the interface.

- |    |          |           |                       |                        |
|----|----------|-----------|-----------------------|------------------------|
| 2. | PSP SYNC | P50X4297E | 1 = PSP SYNC<br>(red) | 0 = PSP SYNC<br>(gray) |
|----|----------|-----------|-----------------------|------------------------|

This error flag is set if both OIC command buffers are full when the OIU attempts to store a new command. Because of the lack of buffer space, the command is lost.

- |    |        |           |                     |                      |
|----|--------|-----------|---------------------|----------------------|
| 3. | PARITY | P50X4281E | 1 = PARITY<br>(red) | 0 = PARITY<br>(gray) |
|----|--------|-----------|---------------------|----------------------|

This error flag, also known as OIC PSP Parity Err and CMD PARITY, is set when the parity check fails on the command received by the OIU. The command failing the parity check is rejected. The OIU uses odd byte parity. This error flag remains high until the next command is received and processed.

- |    |            |           |                         |                          |
|----|------------|-----------|-------------------------|--------------------------|
| 4. | BYTE COUNT | P50X4303E | 1 = BYTE COUNT<br>(red) | 0 = BYTE COUNT<br>(gray) |
|----|------------|-----------|-------------------------|--------------------------|

This error flag, also known as OIC PSP Byte Count Err, is set when the byte count in a received command is invalid. A valid byte count number is greater than 4 (04h) and less than 126 (7Eh). This flag remains set until the next valid command is received and processed. The command is rejected.

- |    |            |           |                         |                          |
|----|------------|-----------|-------------------------|--------------------------|
| 5. | 1553 RETRY | P50X4291E | 1 = 1553 RETRY<br>(red) | 0 = 1553 RETRY<br>(gray) |
|----|------------|-----------|-------------------------|--------------------------|

This flag, also known as PSP RETRIES FAILED and CMD FAIL, is set high when the OIU has made three attempts to transmit a command to an RT and all three attempts have failed. The OIU rejects the command.

- |    |              |           |                              |                               |
|----|--------------|-----------|------------------------------|-------------------------------|
| 6. | ROUTING CODE | P50X4306E | 1 = ROUTING<br>CODE<br>(red) | 0 = ROUTING<br>CODE<br>(gray) |
|----|--------------|-----------|------------------------------|-------------------------------|

This parameter is set high if the OIU receives a routing code that does not match a valid code in the Reconfiguration Table. This parameter is also known as an UNIMPLEMENTED RC ERR. This flag remains high until the next command with a valid routing code is processed.



- |    |           |           |                        |                         |
|----|-----------|-----------|------------------------|-------------------------|
| 7. | WRONG BFR | P50X4267E | 1 = WRONG BFR<br>(red) | 0 = WRONG BFR<br>(gray) |
|----|-----------|-----------|------------------------|-------------------------|

This parameter is set high if the OIC expects the command to be in buffer 1, but it is in buffer 2 (or vice versa). This error is also known as PSP in Wrong Buffer Err.

- |    |            |           |                         |                          |
|----|------------|-----------|-------------------------|--------------------------|
| 8. | COUNTER OB | P50X4292E | 1 = COUNTER OB<br>(red) | 0 = COUNTER OB<br>(gray) |
|----|------------|-----------|-------------------------|--------------------------|

This error flag (Command Count Out of Bounds) is set if the OIU receives three or more commands before one is processed. The first two commands will be processed and the third (or more) command(s) will be lost.

**ERROR LOG COUNTERS** - The Error Log Counters section of the display keeps a status of the number of errors that have occurred as follows:

- |    |          |           |                    |
|----|----------|-----------|--------------------|
| 9. | PDI WRAP | P50U4160D | DECIMAL<br>(green) |
|----|----------|-----------|--------------------|

This field represents the number of PDI error log wrap cycles. The PDI error log can hold 100 entries. When the PDI error log wraps around, this parameter is incremented by one. This parameter has a range of 0-65535. When the error log wraps around, it wraps from entry no. 100 to entry no. 11 so that the first 10 entries and last 90 entries are saved. The PDI error log can be dumped on the ground at KSC. Endurance for the EEPROM holding the error log is specified as a minimum of 10,000 writes for each byte.

- |     |          |           |                    |
|-----|----------|-----------|--------------------|
| 10. | PSP WRAP | P50U4150D | DECIMAL<br>(green) |
|-----|----------|-----------|--------------------|

This field represents the number of PSP/PTB error log wrap cycles. The PSP/PTB error log can hold 100 entries. When the PSP/PTB error log wraps around, this parameter is incremented by one. This parameter has a range of 0-65535. When the error log wraps around, it wraps from entry no. 100 to entry no. 11, so that the first 10 entries and last 90 entries are saved. The PSP/PTB error log can be dumped on the ground at KSC. Endurance for the EEPROM holding the error log is specified as a minimum of 10,000 writes for each byte.

- |     |          |           |                    |
|-----|----------|-----------|--------------------|
| 11. | OCC WRAP | P50U4140D | DECIMAL<br>(green) |
|-----|----------|-----------|--------------------|

This field represents the number of OCC error log wrap cycles. The OCC error log can hold 100 entries. When the OCC error log wraps around, this parameter is incremented by one. This parameter has a range of 0-65535. When the error log wraps around it wraps from entry no. 100 to entry no. 11 so that the first 10 entries and last 90 entries are saved. The OCC error log can be dumped on orbit (OIU FMT 254). Endurance for the EEPROM holding the error log is specified as a minimum of 10,000 writes for each byte.

- |     |                  |           |                    |
|-----|------------------|-----------|--------------------|
| 12. | OCC LATEST ENTRY | P50U4170D | DECIMAL<br>(green) |
|-----|------------------|-----------|--------------------|

This is the OCC error log entry number that was last written by OCC firmware. OCC error log entry numbers range from 1 to 100. A value of 0 indicates that the error log is empty.

**OIC HARDWARE** - This block displays errors in the OIC hardware as follows:

- |     |            |           |                         |                          |
|-----|------------|-----------|-------------------------|--------------------------|
| 13. | PSP EEPROM | P50X4241E | 1 = PSP EEPROM<br>(red) | 0 = PSP EEPROM<br>(gray) |
|-----|------------|-----------|-------------------------|--------------------------|

This flag indicates that an error was detected with the OIC PSP EEPROM. This can be identified when the SRAM checksum does not match the OIC PSP EEPROM checksum. This comparison is completed during the PSP POST.

- |     |         |           |                      |                       |
|-----|---------|-----------|----------------------|-----------------------|
| 14. | PSP C51 | P50X4242E | 1 = PSP C51<br>(red) | 0 = PSP C51<br>(gray) |
|-----|---------|-----------|----------------------|-----------------------|

This error flag is set during PSP POST when data are unsuccessfully written or read from one of the internal registers on the PSP/PTB 80C51FC microcontroller. A specified value is written to an internal C51 register. A read is done to verify that the value is set. If the read back fails, this error condition is flagged.

- |     |           |           |                        |                         |
|-----|-----------|-----------|------------------------|-------------------------|
| 15. | PSP ARBIT | P50X4243E | 1 = PSP ARBIT<br>(red) | 0 = PSP ARBIT<br>(gray) |
|-----|-----------|-----------|------------------------|-------------------------|

This error flag is set by the OIC if the arbitration of the shared SRAM is found to be in error. SRAM is shared between the OIU Flight Software in the OCC and the firmware that controls the PSP/PTB interface. The memory arbitration is controlled by a programmable logic device on the OIC. If a request for shared SRAM is not granted within 30 ms, this flag is set high. This flag is also set high if memory is not immediately available during POST.

- |     |               |           |                               |                                |
|-----|---------------|-----------|-------------------------------|--------------------------------|
| 16. | PSP INTERRUPT | P50X4258E | 1 = PSP<br>INTERRUPT<br>(red) | 0 = PSP<br>INTERRUPT<br>(gray) |
|-----|---------------|-----------|-------------------------------|--------------------------------|

This flag is set by the OIC when an unused PSP interrupt location is accessed and cleared by the OCC.

- |     |          |           |                       |                        |
|-----|----------|-----------|-----------------------|------------------------|
| 17. | PSP POST | P50X4257E | 1 = PSP POST<br>(red) | 0 = PSP POST<br>(gray) |
|-----|----------|-----------|-----------------------|------------------------|

This flag is set if OIC PSP/PTB errors occurred during the OIC PSP/PTB POST.

- |     |              |           |                           |                            |
|-----|--------------|-----------|---------------------------|----------------------------|
| 18. | PSP POST INC | P50X4256E | 1 = PSP POST INC<br>(red) | 0 = PSP POST INC<br>(gray) |
|-----|--------------|-----------|---------------------------|----------------------------|

This flag is set if the OIC did not complete the OIC PSP/PTB POST.

- |     |          |           |                       |                        |
|-----|----------|-----------|-----------------------|------------------------|
| 19. | PSP SRAM | P50X4255E | 1 = PSP SRAM<br>(red) | 0 = PSP SRAM<br>(gray) |
|-----|----------|-----------|-----------------------|------------------------|

This flag is set by the OIC during POST when data written to SRAM do not match data read from SRAM.

- |     |              |           |                           |                            |
|-----|--------------|-----------|---------------------------|----------------------------|
| 20. | PSP SRAM R/W | P50X4265E | 1 = PSP SRAM R/W<br>(red) | 0 = PSP SRAM R/W<br>(gray) |
|-----|--------------|-----------|---------------------------|----------------------------|

This flag is set high during OIC PSP/PTB POST if the OIC is unsuccessful in reading from or writing to the shared SRAM.

- |     |                 |           |                                 |                                  |
|-----|-----------------|-----------|---------------------------------|----------------------------------|
| 21. | PSP SRAM ACCESS | P50X4266E | 1 = PSP SRAM<br>ACCESS<br>(red) | 0 = PSP SRAM<br>ACCESS<br>(gray) |
|-----|-----------------|-----------|---------------------------------|----------------------------------|

This flag is set if the OCC is not granted a memory request during POST or if the OIC cannot read a PSP command from the SRAM.

- |     |                 |           |                                 |                                  |
|-----|-----------------|-----------|---------------------------------|----------------------------------|
| 22. | PTB LOST SIGNAL | P50X4296E | 1 = PTB LOST<br>SIGNAL<br>(red) | 0 = PTB LOST<br>SIGNAL<br>(gray) |
|-----|-----------------|-----------|---------------------------------|----------------------------------|

This error flag occurs when OIC does not receive a valid PTB signal transition from the PTB interface within 16 ms. This bit remains set until the condition is cleared. This bit is displayed as PTB SIGNAL on the main OIU display.

- |     |          |           |                       |                        |
|-----|----------|-----------|-----------------------|------------------------|
| 23. | PTB SYNC | P50X4295E | 1 = PTB SYNC<br>(red) | 0 = PTB SYNC<br>(gray) |
|-----|----------|-----------|-----------------------|------------------------|

This error is caused by OIC not receiving a valid PTB pulse width within 11 ms. This bit remains set until the condition is cleared.

- |     |          |           |                       |                        |
|-----|----------|-----------|-----------------------|------------------------|
| 24. | PTB TIME | P50X4282E | 1 = PTB TIME<br>(red) | 0 = PTB TIME<br>(gray) |
|-----|----------|-----------|-----------------------|------------------------|

This error is set high when the OIC detects at least one value in the PTB time field that is not valid. This bit remains set until the condition is cleared.

- |     |               |           |                            |                             |
|-----|---------------|-----------|----------------------------|-----------------------------|
| 25. | PTB NOT AVAIL | P50X4308E | 1 = PTB NOT AVAIL<br>(red) | 0 = PTB NOT AVAIL<br>(gray) |
|-----|---------------|-----------|----------------------------|-----------------------------|

This flag is set high if PTB time is still not available 2.5 seconds after it was requested.

- |     |            |           |                         |                          |
|-----|------------|-----------|-------------------------|--------------------------|
| 26. | PDI EEPROM | P50X4231E | 1 = PDI EEPROM<br>(red) | 0 = PDI EEPROM<br>(gray) |
|-----|------------|-----------|-------------------------|--------------------------|

This flag indicates that an error was detected with the OIC PDI EEPROM. This can be identified when the SRAM checksum does not match the OIC PDI EEPROM checksum. This comparison is completed during the PDI POST.

- |     |         |           |                      |                       |
|-----|---------|-----------|----------------------|-----------------------|
| 27. | PDI C51 | P50X4232E | 1 = PDI C51<br>(red) | 0 = PDI C51<br>(gray) |
|-----|---------|-----------|----------------------|-----------------------|

This error flag is set during PDI POST when data are unsuccessfully written or read from one of the internal registers on the PDI 80C51FC microcontroller. A specified value is written to an internal C51 register. A read is done to verify the value is set. If the read back fails, this error condition is flagged.

- |     |           |           |                        |                         |
|-----|-----------|-----------|------------------------|-------------------------|
| 28. | PDI ARBIT | P50X4233E | 1 = PDI ARBIT<br>(red) | 0 = PDI ARBIT<br>(gray) |
|-----|-----------|-----------|------------------------|-------------------------|

This error flag is set by the OIC if the arbitration of the shared SRAM is found to be in error. SRAM is shared between the OIU Flight Software in the OCC and the firmware that controls the PSP/PTB interface. The memory arbitration is controlled by a programmable logic device on the OIC. If a request for shared SRAM is not granted within 30 ms, this flag is set high. This flag is also set high if memory is not immediately available during POST.

- |     |               |           |                               |                                |
|-----|---------------|-----------|-------------------------------|--------------------------------|
| 29. | PDI INTERRUPT | P50X4248E | 1 = PDI<br>INTERRUPT<br>(red) | 0 = PDI<br>INTERRUPT<br>(gray) |
|-----|---------------|-----------|-------------------------------|--------------------------------|

This flag is set by the OIC when an unused PDI interrupt location is accessed and cleared by the OCC.

- |     |          |           |                       |                        |
|-----|----------|-----------|-----------------------|------------------------|
| 30. | PDI POST | P50X4247E | 1 = PDI POST<br>(red) | 0 = PDI POST<br>(gray) |
|-----|----------|-----------|-----------------------|------------------------|

This flag is set if OIC PDI errors occurred during the OIC PDI POST.

- |     |              |           |                  |                  |
|-----|--------------|-----------|------------------|------------------|
| 31. | PDI POST INC | P50X4231E | 1 = PDI POST INC | 0 = PDI POST INC |
|-----|--------------|-----------|------------------|------------------|

This flag is set if the OIC did not complete the OIC PDI POST.

- |     |          |           |                       |                        |
|-----|----------|-----------|-----------------------|------------------------|
| 32. | PDI SRAM | P50X4245E | 1 = PDI SRAM<br>(red) | 0 = PDI SRAM<br>(gray) |
|-----|----------|-----------|-----------------------|------------------------|

This flag is set by the OIC during POST when data written to SRAM do not match data read from SRAM.

- |     |              |           |                           |                            |
|-----|--------------|-----------|---------------------------|----------------------------|
| 33. | PDI SRAM R/W | P50X4251E | 1 = PDI SRAM R/W<br>(red) | 0 = PDI SRAM R/W<br>(gray) |
|-----|--------------|-----------|---------------------------|----------------------------|

This flag is set high during OIC PDI POST if the OIC is unsuccessful in reading from or writing to the shared SRAM.

- |     |                 |           |                                 |                                  |
|-----|-----------------|-----------|---------------------------------|----------------------------------|
| 34. | PDI SRAM ACCESS | P50X4252E | 1 = PDI SRAM<br>ACCESS<br>(red) | 0 = PDI SRAM<br>ACCESS<br>(gray) |
|-----|-----------------|-----------|---------------------------------|----------------------------------|

This flag is set if the OCC is not granted a memory request for SRAM during POST or if the OIC is not granted memory to the shared SRAM when constructing the PDI frame.

- |     |               |           |                               |                                |
|-----|---------------|-----------|-------------------------------|--------------------------------|
| 35. | PDI CARD SYNC | P50X4284E | 1 = PDI CARD<br>SYNC<br>(red) | 0 = PDI CARD<br>SYNC<br>(gray) |
|-----|---------------|-----------|-------------------------------|--------------------------------|

It is the responsibility of the OIU Flight Software in the OCC to make sure one SRAM PDI buffer is full before it is transmitted to the PDI by the OIC. If the buffer is not full before it is transmitted, this flag is set high by the OIC. This will result in a loss of sync at PDI decom.

- |     |               |           |                               |                                |
|-----|---------------|-----------|-------------------------------|--------------------------------|
| 36. | PDI CARD WRAP | P50X4244E | 1 = PDI CARD<br>WRAP<br>(red) | 0 = PDI CARD<br>WRAP<br>(gray) |
|-----|---------------|-----------|-------------------------------|--------------------------------|

This flag indicates the status of the OIC's interface to the PDI. The OIC compares data read from the shared SRAM and data read back from the PDI data stream. If they do not compare, this flag is set high.

- |     |                |           |                                 |                                  |
|-----|----------------|-----------|---------------------------------|----------------------------------|
| 37. | PDI BFR NOTCLR | P50X4302E | 1 = PDI BFR<br>NOT CLR<br>(red) | 0 = PDI BFR<br>NOT CLR<br>(gray) |
|-----|----------------|-----------|---------------------------------|----------------------------------|

This bit is set high if the OIC determines that the buffer that is to be written to is still full.

- |     |            |           |                         |                          |
|-----|------------|-----------|-------------------------|--------------------------|
| 38. | OIC HEALTH | P50X4298E | 1 = OIC HEALTH<br>(red) | 0 = OIC HEALTH<br>(gray) |
|-----|------------|-----------|-------------------------|--------------------------|

A failure is detected from the PSP/PTB Health and Status bit. It is expected to toggle and has failed to do so on three consecutive checks.

**OCC HARDWARE** - The status of the OCC Hardware errors is displayed as follows:

- |     |                  |           |                                  |                                   |
|-----|------------------|-----------|----------------------------------|-----------------------------------|
| 39. | R/T ON MULTI BUS | P50X4254E | 1 = R/T ON MULTI<br>BUS<br>(red) | 0 = R/T ON MULTI<br>BUS<br>(gray) |
|-----|------------------|-----------|----------------------------------|-----------------------------------|

Recon data indicate that the OIU is assigned as an RT on more than one bus.

- |     |             |           |                          |                           |
|-----|-------------|-----------|--------------------------|---------------------------|
| 40. | TRACE ERROR | P50X4261E | 1 = TRACE ERROR<br>(red) | 0 = TRACE ERROR<br>(gray) |
|-----|-------------|-----------|--------------------------|---------------------------|

This bit is set high when tracing is enabled via the trace bit in the OCC status register. However, tracing is not used in the current design. Therefore, this flag is unexpected.

- |     |               |           |                            |                             |
|-----|---------------|-----------|----------------------------|-----------------------------|
| 41. | SPURIOUS INTR | P50X4262E | 1 = SPURIOUS INTR<br>(red) | 0 = SPURIOUS INTR<br>(gray) |
|-----|---------------|-----------|----------------------------|-----------------------------|

This bit is set high when a bus error occurs while processing an interrupt.

- |     |              |           |                           |                            |
|-----|--------------|-----------|---------------------------|----------------------------|
| 42. | 80 HZ SUBFRM | P50X4263E | 1 = 80 HZ SUBFRM<br>(red) | 0 = 80 HZ SUBFRM<br>(gray) |
|-----|--------------|-----------|---------------------------|----------------------------|

This flag is set high when more than 15 MS1553B transactions are detected in a subframe for a given bus.

- |     |              |           |                              |                               |
|-----|--------------|-----------|------------------------------|-------------------------------|
| 43. | RECON EEPROM | P50X4264E | 1 = RECON<br>EEPROM<br>(red) | 0 = RECON<br>EEPROM<br>(gray) |
|-----|--------------|-----------|------------------------------|-------------------------------|

This flag is set high when the subroutine loading the flight-specific RECON data into the RECON data tables detects a bad table or checksum.

- |     |                |           |                                |                                 |
|-----|----------------|-----------|--------------------------------|---------------------------------|
| 44. | PRIV VIOLATION | P50X4268E | 1 = PRIV<br>VIOLATION<br>(red) | 0 = PRIV<br>VIOLATION<br>(gray) |
|-----|----------------|-----------|--------------------------------|---------------------------------|

This flag is generated when attempting to execute a privileged instruction when in the user mode. However, user mode is not used by OIU FSW. OIU FSW is always in supervisor mode. Therefore, this flag is unexpected.

- |     |                |           |                                |                                 |
|-----|----------------|-----------|--------------------------------|---------------------------------|
| 45. | DIVIDE BY ZERO | P50X4274E | 1 = DIVIDE BY<br>ZERO<br>(red) | 0 = DIVIDE BY<br>ZERO<br>(gray) |
|-----|----------------|-----------|--------------------------------|---------------------------------|

This flag is generated when the processor attempts to divide by zero.

- |   |                  |           |                                  |                                  |
|---|------------------|-----------|----------------------------------|----------------------------------|
| 46.   | UNUSED EXCEPT    | P50X4275E | 1 = UNUSED<br>EXCEPT<br>(red)    | 0 = UNUSED<br>EXCEPT<br>(gray)   |
| <p>This flag is set high when an unused, reserved, unassigned, or user interrupt vector is generated.</p>   |                  |           |                                  |                                  |
| 47.   | UNINIT INTR VECT | P50X4276E | 1 = UNINIT INTR<br>VECT<br>(red) | 0 = UNINIT ITR<br>VECT<br>(gray) |
| <p>This flag is set high when an interrupt occurs and the interrupting device has not initialized its appropriate vector register number.</p>   |                  |           |                                  |                                  |
| 48.   | TRAP X           | P50X4277E | 1 = TRAP X<br>(red)              | 0 = TRAP X<br>(gray)             |
| <p>This flag is generated when a TRAP instruction (numbered 0 to 15) is executed. TRAP instructions, however, are not used in the current design; therefore, this flag is unexpected.</p>                           |                  |           |                                  |                                  |
| 49.   | INVAL CFG CMD    | P50X4287E | 1 = INVAL CFG<br>CMD<br>(red)    | 0 = INVAL CFG<br>CMD<br>(gray)   |
| <p>This flag is set high when an invalid configuration command is received.</p>   |                  |           |                                  |                                  |
| 50.   | FLT PT CONV      | P50X4288E | 1 = FLT PT CONV<br>(red)         | 0 = FLT PT CONV<br>(gray)        |
| <p>This flag is set high when a floating point conversion error is detected.</p>  |                  |           |                                  |                                  |
| 51.   | ADDRESS          | P50X4218E | 1 = ADDRESS<br>(red)             | 0 = ADDRESS<br>(gray)            |
| <p>This flag is generated when the processor attempts to access a word, operand, or instruction at an odd address.</p>  |                  |           |                                  |                                  |
| 52.   | TRAP OVERFLOW    | P50X4278E | 1 = TRAP<br>OVERFLOW<br>(red)    | 0 = TRAP<br>OVERFLOW<br>(gray)   |
| <p>This flag is generated when a runtime overflow condition occurs and the TRAPV instruction has been executed; however, the TRAPV instruction is not used by the OIU FSW. Therefore, this error is unexpected.</p> |                  |           |                                  |                                  |
| 53.   | LINE 1010        | P50X4223E | 1 = LINE 1010<br>(red)           | 0 = LINE 1010<br>(gray)          |
| <p>This flag is set high when the processor recognizes the 1010 bit pattern within the instruction. This instruction (1010) is not used by the OIU FSW; therefore, this flag is unexpected.</p>                     |                  |           |                                  |                                  |
| 54.   | LINE 1111        | P50X4222E | 1 = LINE 1111<br>(red)           | 0 = LINE 1111<br>(gray)          |

This flag is set high when the processor recognizes the 1111 bit pattern within the instruction. However, this instruction (1111) is not used by the OIU FSW. Therefore, this flag is unexpected.

- |     |                    |           |                                    |                                     |
|-----|--------------------|-----------|------------------------------------|-------------------------------------|
| 55. | LEVEL 7 AUTOVECTOR | P50X4224E | 1 = LEVEL 7<br>AUTOVECTOR<br>(red) | 0 = LEVEL 7<br>AUTOVECTOR<br>(gray) |
|-----|--------------------|-----------|------------------------------------|-------------------------------------|

This flag is set high when the Level 7 Autovector interrupt is invoked. However, the Level 7 Autovector interrupt is not used by the OIU FSW (or even implemented in hardware).

- |     |           |           |                        |                         |
|-----|-----------|-----------|------------------------|-------------------------|
| 56. | INVAL GSE | P50X4225E | 1 = INVAL GSE<br>(red) | 0 = INVAL GSE<br>(gray) |
|-----|-----------|-----------|------------------------|-------------------------|

This flag is set high when the OIU detects invalid handshake, or no handshake, when GSE connection has been detected during system startup.

- |     |            |           |                         |                          |
|-----|------------|-----------|-------------------------|--------------------------|
| 57. | DUART INTR | P50X4226E | 1 = DUART INTR<br>(red) | 0 = DUART INTR<br>(gray) |
|-----|------------|-----------|-------------------------|--------------------------|

This flag is set high if the OCC processor detects a DUART interrupt. The DUART interrupt is associated with the Level 2 Autovector. However, DUART interrupts are not used in current design. Therefore, this flag is not expected.

- |     |      |           |                   |                    |
|-----|------|-----------|-------------------|--------------------|
| 58. | SRAM | P50X4234E | 1 = SRAM<br>(red) | 0 = SRAM<br>(gray) |
|-----|------|-----------|-------------------|--------------------|

This flag is set high if the OCC encounters problem reading/writing to/from OCC SRAM during POST.

- |     |          |           |                       |                        |
|-----|----------|-----------|-----------------------|------------------------|
| 59. | REGISTER | P50X4235E | 1 = REGISTER<br>(red) | 0 = REGISTER<br>(gray) |
|-----|----------|-----------|-----------------------|------------------------|

This flag is set high if the OCC encounters problem reading/writing to/from OCC CPU Register(s) during POST.

- |     |        |           |                     |                      |
|-----|--------|-----------|---------------------|----------------------|
| 60. | EEPROM | P50X4237E | 1 = EEPROM<br>(red) | 0 = EEPROM<br>(gray) |
|-----|--------|-----------|---------------------|----------------------|

This flag is set high if the OCC reads an invalid value from any one of three EEPROM banks in OCC during POST.

- |     |               |           |                            |                             |
|-----|---------------|-----------|----------------------------|-----------------------------|
| 61. | ILLEGAL INSTR | P50X4211E | 1 = ILLEGAL INSTR<br>(red) | 0 = ILLEGAL INSTR<br>(gray) |
|-----|---------------|-----------|----------------------------|-----------------------------|

This flag is set high if the OCC processor fetches an instruction that does not match any legal instruction patterns.

- |     |             |           |                          |                           |
|-----|-------------|-----------|--------------------------|---------------------------|
| 62. | FRM OVERRUN | P50X4212E | 1 = FRM OVERRUN<br>(red) | 0 = FRM OVERRUN<br>(gray) |
|-----|-------------|-----------|--------------------------|---------------------------|

This flag is set high when the OIU firmware has detected a 100 ms processing frame overrun. In other words, the OIU has taken longer than 100 ms to get all of its work done.

- |     |             |           |                          |                           |
|-----|-------------|-----------|--------------------------|---------------------------|
| 63. | CHECK INSTR | P50X4213E | 1 = CHECK INSTR<br>(red) | 0 = CHECK INSTR<br>(gray) |
|-----|-------------|-----------|--------------------------|---------------------------|

This flag is set high when the Check Register Against Bounds instruction fails. However, this Check Instruction is not used in the current design.

- |     |     |           |                  |                   |
|-----|-----|-----------|------------------|-------------------|
| 64. | BUS | P50X4214E | 1 = BUS<br>(red) | 0 = BUS<br>(gray) |
|-----|-----|-----------|------------------|-------------------|

This flag is set high when an external read/write times out.

- |     |                 |           |                                 |                                  |
|-----|-----------------|-----------|---------------------------------|----------------------------------|
| 65. | ERROR LOG WRITE | P50X4221E | 1 = ERROR LOG<br>WRITE<br>(red) | 0 = ERROR LOG<br>WRITE<br>(gray) |
|-----|-----------------|-----------|---------------------------------|----------------------------------|

This flag is set high when the maximum time to complete an EEPROM write has been exceeded.

- |     |             |           |                          |                           |
|-----|-------------|-----------|--------------------------|---------------------------|
| 66. | NO CMD RCVD | P50X4238E | 1 = NO CMD RCVD<br>(red) | 0 = NO CMD RCVD<br>(gray) |
|-----|-------------|-----------|--------------------------|---------------------------|

This flag is set high if the OCC receives an interrupt indicating a command is being sent, but both OIC PSP/PTB register data received bits are 0, indicating there is no PSP command.

**BIC HARDWARE** - The BIC Hardware errors are displayed as follows:

- |     |          |           |                       |                        |
|-----|----------|-----------|-----------------------|------------------------|
| 67. | INT TIME | P50X4286E | 1 = INT TIME<br>(red) | 0 = INT TIME<br>(gray) |
|-----|----------|-----------|-----------------------|------------------------|

This error flag, also known as ISS BC No Comm Status, indicates the OIU was communicating with an ISS BC MDM and the OIU BIA no longer “sees” ISS BC transmissions on that bus. This error can be caused by ISS BC MDM’s stopping transmission or by BIA’s being reconfigured such that it stops receiving the ISS BC MDM transmissions. Following this error, the OIU will reinitialize and resume operation under internal timing control.

- |     |                |           |                                |                                 |
|-----|----------------|-----------|--------------------------------|---------------------------------|
| 68. | SSOR LOST SYNC | P50X4293E | 1 = SSOR LOST<br>SYNC<br>(red) | 0 = SSOR LOST<br>SYNC<br>(gray) |
|-----|----------------|-----------|--------------------------------|---------------------------------|

This flag is set high when two consecutive frame counts are not received from the SSOR. The OIU checks the frame count in each minor frame received from the SSOR. When the frame count does not increment correctly in two or more consecutive frames, the OIU will set this bit high and resumes operation under internal timing control.

- |     |               |           |                               |                                |
|-----|---------------|-----------|-------------------------------|--------------------------------|
| 69. | ISS LOST SYNC | P50X4294E | 1 = ISS LOST<br>SYNC<br>(red) | 0 = ISS LOST<br>SYNC<br>(gray) |
|-----|---------------|-----------|-------------------------------|--------------------------------|

This flag is set high when the OIU loses frame sync with the ISS BC MDM. The OIU checks the frame count in each minor frame received from the ISS BC MDM. When the frame count does not increment correctly in two or more consecutive frames, the OIU will set this bit high. It will also set this bit high if it cannot obtain 3 consecutive frame counts within 10 frames. Following this error, the OIU will reinitialize and resume operation under internal timing control.



70.	ISS FRAME SEQ	P50X4304E	1 = ISS FRAME SEQ (red)	0 = ISS FRAME SEQ (gray)
-----	---------------	-----------	-------------------------------	--------------------------------

This flag, also known as ISS FRAME COUNT OUT OF ORDER, is set high when one frame count is not received from the ISS BC MDM. The OIU checks the frame count in each minor frame received from the ISS BC MDM. When the frame count does not increment correctly and only one frame count is "skipped," the OIU will set this bit high and continue program execution.

71.	SSOR FRAME SEQ	P50X4305E	1 = SSOR FRAME SEQ (red)	0 = SSOR FRAME SEQ (gray)
-----	----------------	-----------	--------------------------------	---------------------------------

This flag is set high when one frame count is not received from the SSOR. The OIU checks the frame count in each minor frame received from the SSOR. When the frame count does not increment correctly and only one frame count is "skipped," the OIU will set this bit high and continue program execution.

72.	UNFINISHED BC FR	P50X4307E	1 = UNFINISHED BC FR (red)	0 = UNFINISHED BC FR (gray)
-----	------------------	-----------	----------------------------------	-----------------------------------

This flag is set high when the BC frame on a bus that the OIU is BC on did not finish before the BIA was told to send another.

73.	POST SRAM	P50X4215E	1 = POST SRAM (red)	0 = POST SRAM (gray)
-----	-----------	-----------	------------------------	-------------------------

This flag is set high during POST when the OIU firmware determines that BIC SRAM contents do not equal expected values (i.e., what they should be after initialization).

74.	POST SELF TEST	P50X4216E	1 = POST SELF TEST (red)	0 = POST SELF TEST (gray)
-----	----------------	-----------	--------------------------------	---------------------------------

This flag is set high during POST if the OIU firmware detects a self-test failure for any one of the four BIAs.

75.	POST REGISTER	P50X4217E	1 = POST REGISTER (red)	0 = POST REGISTER (gray)
-----	---------------	-----------	-------------------------------	--------------------------------

This flag is set high during POST if the OIU firmware determines that BIC register contents do not equal expected values (i.e., what they should be after initialization).

76.	INVAL BIC 1 INTR	P50X4228E	1 = INVAL BIC 1 INTR (red)	0 = INVAL BIC 1 INTR (gray)
-----	------------------	-----------	----------------------------------	-----------------------------------

This flag is set high if the autovector associated with the BIC1 interrupt has been generated for an invalid reason (i.e., NOT a "Broadcast Sync With Data" 100 ms interrupt).



**TITLE**

SSOR V1.0

**GENERAL**

- A. The data displayed are real-time telemetry parameters that affect the management and operation of the Space-to-Space Orbiter Radio (SSOR). Figure 5.136-1 shows a copy of the SSOR display.
- B. Pathname of display: INCO/INCO Displays/COMM Systems/ssor.
- C. Detailed display description.

TELEMETRY

- |    |                  |           |                   |                     |
|----|------------------|-----------|-------------------|---------------------|
| 1. | Power (EVA Mode) | V74S2032E | 1 = ON<br>(green) | 0 = OFF<br>(yellow) |
|----|------------------|-----------|-------------------|---------------------|

When this parameter is high, it indicates that the UHF mode switch is in the EVA position. This switch activates the SSOR.

- |    |      |           |                      |                     |
|----|------|-----------|----------------------|---------------------|
| 2. | Freq | V74S2040E | 1 = 417.1<br>(green) | 0 = 414.<br>(green) |
|----|------|-----------|----------------------|---------------------|

This parameter indicates the position of the frequency select switch on the O6 panel.

- |    |           |           |                    |                   |
|----|-----------|-----------|--------------------|-------------------|
| 3. | Power Amp | V74S2016E | 1 = OFF<br>(green) | 0 = ON<br>(green) |
|----|-----------|-----------|--------------------|-------------------|

This parameter indicates the position of the UHF SPLY PWR AMP switch on the O6 panel.

- |    |         |                                    |  |  |
|----|---------|------------------------------------|--|--|
| 4. | Current | V74C2047AFLOATING POINT<br>(green) |  |  |
|----|---------|------------------------------------|--|--|

This parameter indicates the current consumption of the SSOR on the power distribution board. This provides a status on either string 1 or string 2 of the SSOR. It is expected to be between 0 and 5 amps. The measurement is capable of measuring from 0 to 7 amps.

- |    |        |           |                           |  |
|----|--------|-----------|---------------------------|--|
| 5. | RF Out | V74E2045A | FLOATING POINT<br>(green) |  |
|----|--------|-----------|---------------------------|--|

This parameter indicates the RF power output at the duplexer. This measurement ranges from 15 to 45 dBm.

- |    |         |           |                   |                    |
|----|---------|-----------|-------------------|--------------------|
| 6. | Encrypt | V74S2048E | 1 = ON<br>(green) | 0 = OFF<br>(green) |
|----|---------|-----------|-------------------|--------------------|

When this parameter is high, the ENCRYPT switch on panel O6 is in the ON position. When this parameter is low, the ENCRYPT switch on panel O6 is in the OFF position.

- |    |                |           |                  |                 |
|----|----------------|-----------|------------------|-----------------|
| 7. | String Sel (1) | V74S2049E | 1 = 1<br>(green) | 0 = 1<br>(gray) |
|----|----------------|-----------|------------------|-----------------|

When this parameter is high, the STRING SELECT switch on panel O6 is in the position to select string 1. When this parameter is low, the STRING SELECT switch on panel O6 is in the position to select string 2.

- |    |                |           |                  |                 |
|----|----------------|-----------|------------------|-----------------|
| 8. | String Sel (2) | V74S2049E | 1 = 2<br>(green) | 0 = 2<br>(gray) |
|----|----------------|-----------|------------------|-----------------|

When this parameter is high, the STRING SELECT switch on panel O6 is in the position to select string 1. When this parameter is low, the STRING SELECT switch on panel O6 is in the position to select string 2.

- |    |              |           |                   |                   |
|----|--------------|-----------|-------------------|-------------------|
| 9. | Sig Proc (1) | V74X2051E | 1 = ON<br>(green) | 0 = OFF<br>(gray) |
|----|--------------|-----------|-------------------|-------------------|

When this parameter is high, the signal processor on string 1 has a good status.

- |     |              |           |                   |                   |
|-----|--------------|-----------|-------------------|-------------------|
| 10. | Sig Proc (2) | V74X2052E | 1 = ON<br>(green) | 0 = OFF<br>(gray) |
|-----|--------------|-----------|-------------------|-------------------|

When this parameter is high, the signal processor on string 2 has a good status.

- |     |           |           |                   |                  |
|-----|-----------|-----------|-------------------|------------------|
| 11. | Frame (1) | V74X2050E | 1 = LK<br>(green) | 0 = No<br>(gray) |
|-----|-----------|-----------|-------------------|------------------|

When this parameter is high, the SSOR has acquired frame synchronization with at least one other user on string 1.

- |     |           |           |                   |                  |
|-----|-----------|-----------|-------------------|------------------|
| 12. | Frame (2) | V74X2053E | 1 = LK<br>(green) | 0 = No<br>(gray) |
|-----|-----------|-----------|-------------------|------------------|

When this parameter is high, the SSOR has acquired frame synchronization with at least one other user on string 2.

<b>SSOR v1.1</b>		
GMT XXX/XX:XX:XX		
POWER (EVA Mode)	XXX	
Freq	XXX.X	
Power Amp	XXX	
Current	XX.X	
RF Out	XX.X	
Encrypt	XXX	
String Sel	1	2
Sig Proc	XXX	XXX
Frame	XX	XX

**Figure 5.136-1. SSOR display**

**TITLE**

SSR1(2) MANAGEMENT

**GENERAL**

- A. These applications are used to monitor the Modular Memory Unit (MMU) Solid State Recorders (SSR) and manage the data stored on them. There are three versions of each display: one for DATACOMM only that writes to the details database and log file (described herein), and two versions that do not write: one for an INCO user connected to the command server that is able to read commands to update the display, and another version for public DNAV that does not connect to the server.
- B. DNAV location: INCO> Displays> SSR> DATACOMM (other options)> SSR1(2)
- C. Detailed display description (see figure 5.137-1).

## 1. MODE

SPECIAL COMP  
(green on black)

These are special computations of the SSR1(2) MODE telemetry, found in INCO computation recorder\_COMP.

SSR1 MODE is decoded from the six discrete bits: V75X2966E (MSB), V75X2965E, V75X2957E, V75X2956E, V75X2955E, V75X2944E (LSB).

SSR2 MODE is decoded from the six discrete bits: V75X2866E (MSB), V75X2865E, V75X2857E, V75X2856E, V75X2855E, V75X2844E (LSB).

The following table indicates the mode for each decimal equivalent value:

VAL	MODE	DESCRIPTION
0	NONE	MMU pre-POST (NONE = yellow on black)
1	STBY	Standby, no record or playback or maintenance operation in process
2	RCDA	Recording Serial A, NSP1(NSP2) data or data and voice
3	RCDB	Recording Serial B, payload input
4	RCDE	Recording main engine or payload data at the EIU1(2)(3) inputs
5	RCDP	Recording three EIU inputs and Serial A input
6	PB2048	Dumping at 2048 Kbps
7	PB1024	Dumping at 1024 Kbps
8	PB960	Dumping at 960 Kbps
9	PB192	Dumping at 192 Kbps
10	PB128	Dumping at 128 Kbps
11	PB64	Dumping at 64 Kbps
12	PB32	Dumping at 32 Kbps
13	PBME	Dumping all EIU data in 1,2,3 order at 960 Kbps
14	PB E1	Dumping EIU1 data at 60 Kbps
15	PB E2	Dumping EIU2 data at 60 Kbps
16	PB E3	Dumping EIU3 data at 60 Kbps
17	PBQ2048	Dumping all data slots queued at 2048 Kbps in order defined
18	PBQ1024	Dumping all data slots queued at 1024 Kbps in order defined
19	PBQ960	Dumping all data slots queued at 960 Kbps in order defined
20	PBQ192	Dumping all data slots queued at 192 Kbps in order defined
21	PBQ128	Dumping all data slots queued at 128 Kbps in order defined
22	A/PB2048	Simultaneously recording Serial A data and dumping per mode 17

23	A/PB1024	Simultaneously recording Serial A data and dumping per mode 18
24	A/PB960	Simultaneously recording Serial A data and dumping per mode 19
25	A/PB192	Simultaneously recording Serial A data and dumping per mode 20
26	A/PB128	Simultaneously recording Serial A data and dumping per mode 21
27	B/PB2048	Simultaneously recording Serial B data and dumping per mode 17
28	B/PB1024	Simultaneously recording Serial B data and dumping per mode 18
29	B/PB960	Simultaneously recording Serial B data and dumping per mode 19
30	B/PB192	Simultaneously recording Serial B data and dumping per mode 20
31	B/PB128	Simultaneously recording Serial B data and dumping per mode 21
32	P/PB2048	Simultaneously recording per mode 5 and dumping per mode 17
33	P/PB1024	Simultaneously recording per mode 5 and dumping per mode 18
34	P/PB960	Simultaneously recording per mode 5 and dumping per mode 19
35	P/PB192	Simultaneously recording per mode 5 and dumping per mode 20
36	P/PB128	Simultaneously recording per mode 5 and dumping per mode 21
37	E/PB2048	Simultaneously recording per mode 4 and dumping per mode 17
38	E/PB1024	Simultaneously recording per mode 4 and dumping per mode 18
39	E/PB960	Simultaneously recording per mode 4 and dumping per mode 19
40	E/PB192	Simultaneously recording per mode 4 and dumping per mode 20
41	E/PB128	Simultaneously recording per mode 4 and dumping per mode 21
42	ERASE	Erasing all non-volatile memory (NVM) (maintenance function)
43	REMAP	Destructive remapping of physical NVM to exclude bad segments (maintenance)
44	TEST	Non-destructive in-depth self-testing (maintenance function)
45	POST	Power-on self-test mode
>45	INVAL	Values of 46 through 63 are invalid (INVAL = yellow on black)

2. POSN POSITIVE INTEGER = 0 - 810  
green on black

POSITION is the value of the functional address or location of the recording operation, while recording, or the PB operation while dumping without recording. The maximum valid value of POSITION is 810.

SSR1 POSN is the decimal equivalent of the ten discrete bits V75X2949E (MSB), V75X2948E, V75X2947E, V75X2934E, V75X2933E, V75X2921E, V75X2913E, V75X2911E, V75X2909E, V75X2905E (LSB).

SSR2 POSN is the decimal equivalent of the ten discrete bits V75X2849E (MSB), V75X2848E, V75X2847E, V75X2834E, V75X2833E, V75X2821E, V75X2813E, V75X2811E, V75X2809E, V75X2805E (LSB).

3. SLOTS HEXADECIMAL = 0 -F  
(green on black)

SLOTS is the total number of PB queue definition slots currently held in the SSR.

SSR1 SLOTS is the hexadecimal equivalent of the four discrete bits: V75X2941E (MSB), V75X2940E, V75X2931E, V75X2929E (LSB).

SSR2 SLOTS is the hexadecimal equivalent of the four discrete bits: V75X2841E (MSB), V75X2840E, V75X2831E, V75X2829E (LSB).

4. AUTO-STOP 1 = ENA                      0 = CLR  
(yellow on black)    (darkslategray on black)

AUTO-STOP indicates whether or not an auto-stop position has been defined (which enables it) or cleared for the applicable SSR.

V75X2959E indicates status of auto-stop function for SSR1.

V75X2859E indicates status of auto-stop function for SSR2.

5. BITE SPECIAL COMP GOOD  
(yellow on black) (darkslategray on black)

Operational Self Test (OST) results are continuously displayed in this field. Power On Self Test (POST) and Comprehensive Self Test (CST) results are not normally used operationally during a flight. The following table defines the OST BITE:

SSR1	SSR2	DISPLAYED CONDITIONS			
V75X2943E	V75X2843E	0	1	1	1
V75X2942E	V75X2842E	X	0	1	1
V75X2960E	V75X2860E	X	X	0	1
		CBF	NCBF	REJ	GOOD

CBF = Critical BITE Failure

NCBF = Non-Critical BITE Failure

REJ = Command Rejected

X = either state, don't care

## 6. GRAPHICAL DATA MANAGEMENT DISPLAY AREA, GENERAL DESCRIPTION

This area is used to display the current status of each segment of the memory area, per figure 5.137-1.

When first started, the display defaults to the smallest possible size: all the telemetry on the upper part of the display is visible, and there is a partial row (or "slice") of data positions displayed on the data management area. When the display is expanded horizontally, up to 102 positions appear. 102 positions make up a "slice" of memory for the purpose of describing this display. When the display is expanded vertically, a new slice is displayed below the current slice, with each position exactly 102 positions beyond the position above it. More slices (up to 8) can be viewed as the display is expanded vertically, until all of the memory codes can be seen in one window. Since the total memory (811 positions) cannot be divided evenly by the slice size, there are blank segment areas at the bottom right of the fully expanded display.

At the top of each slice is a code for the input data recorded at that position, and below that are two lines of status. Different types of status indicators will have a different background color as noted later. Where there is no status indicator, the background of the status line will be white, to match the surrounding non-status area.

There is a field on the display (white number on black background) for the position number of the mouse pointer location. When the mouse pointer is situated over a particular position's input or status code, the number of that position is displayed in the mouse pointer location field. Each position will contain detailed information, to be described later, which can be accessed in a daughter window when the input data or status code for a position is left mouse-clicked. When the current position indicator increments (leaves a position) in record mode, the details in that position are updated to the new information relevant to the new data

## 7. DATA SOURCE CODE

D, V, A, B, E, >  
(black on specified backgrounds)

**D** indicates data recorded from the Serial A input when NSP RCD Voice V74X4799E = 0 and V74X4798E = 1, indicating OFF. Default background is white, and when new data is recorded on a segment, the background turns or stays white. If a segment is recorded with over four total seconds of LOS data, the background will turn red for that segment. See section 9 for more LOS requirement definition. After the application determines that the LOS segment was dumped, the red background will turn orange. The application determines that the data was dumped when (1) that segment is included in a non-queued PB (verified by that segment number appearing in the telemetry while in the PB mode) and (2) when a slot is cleared while in a PB Q mode. If the "D or V" code field is right-mouse clicked or swiped, a dialog box will pop up, and the clicked or swiped segment(s) will be highlighted in pink. Three options will be presented: **verify data**, **build commands**, and **delete slot**. If **verify data** is clicked, the red or orange background will change to light gray for the selected (swiped) segments. The **build commands** operation is explained in SCP 3.30. The **delete slot** option will delete all slots within the selected area to allow the flight controller to get the display back in sync with the SSR after an SPC initiated dump.

**V** indicates data recorded from the Serial A input when NSP RCD Voice V74X4799E = 1 and V74X4798E = 0, indicating ON. Background color and mousing behavior for "D" code also apply to "V, A, and B" codes.

**A** indicates data recorded from the Serial A input when V74X4799E equals V74X4798E, indicating an error condition. Serial A (D or V) data is also being recorded in all the "P" record modes. Background color and mousing behavior for "D" code also apply to "V, A, and B" codes.

**B** indicates data recorded from the Serial B input. Background color and mousing behavior for "D" code also apply to "V, A, and B" codes.

**E** indicates data recorded from the parallel E inputs. When parallel recording is started via the RCD PAR command, confirmed by mode telemetry, the total E area (0-161) will be indicated as E, except that queued data slots will be skipped. The exact positions of each Engine data area and duration of each segment recording are listed in the Systems Brief. LOS and dumped status are not indicated for E data; however, after recording in parallel mode, when the Parallel Protect bit (see next section) goes low, each E segment background will turn light gray and remain that way until the segment is overwritten. Since the "E" modes cannot be commanded directly, without going through a "P" mode, the E data source codes will only be initiated by the application when in any P mode; the E codes will persist until overwritten by a new data source code, one segment at a time.

> indicates the current value of the position indicator. The > indicator moves to the next position when the position number increments.

## 8. DATA STATUS CODE

s/r, S, **1**, **2**, P  
(black on light backgrounds or reverse)

**s/r** is the number of the defined dump queue **slot** and dump **rate** for that defined segment. Since there is no telemetry to indicate which slot is being dumped (although there is an indication of number of slots), individual slot numbers are tracked by the application. There are zero defined slots following a maintenance mode operation. There are four ways to modify slot numbers. These rules apply to all dump rates.

1. When the operator sends a set of commands to define the start and end of a playback queue slot, and the slot count telemetry subsequently increments, the updated slot count equals the number of the latest slot defined. This application will read the slot definitions from the queue start, queue end, and rate values in the uplinked command's title.



2. When the operator sends a command to dump queued data at a particular rate and the SSR subsequently signifies successful completion of a playback by decrementing the slot count, the slot definition of the played back segment is deleted, and the slot numbers greater than the deleted slot are decreased by one (e.g., if slot 5 is dumped and deleted, slot 6 is renumbered to 5, slot 7 becomes slot 6, etc.). Note that the PB QUE 1024 command causes the eventual dumping and undefining of all the predefined 1024 queues (lowest slot number first) unless a STOP PB is commanded. If the dump sequence is stopped, any partially dumped slot (and definition) will remain in the queue.
3. When the operator sends a command to clear slot N, that slot will be deleted, and the higher slot numbers will be decremented. Also note that the slot can be cleared by the mousing operation previously described in section 7.
4. When the operator sends a command to clear all slots, all slot definitions will be deleted.

Slot values are 0 through  $F_H$ . Rate codes are marked below the slot values. Each of the five rate codes has a different background color, and accordingly, all the slots of a certain rate will show the same background color for the rate code. The following rate codes apply:

- 0 = 960 (light blue)
- 1 = 128 (pink)
- 2 = 192 (yellow-green)
- 4 = 1024 (light green)
- 8 = 2048 (light blue-green)

**S** (black on yellow) indicates that an auto-stop has been enabled at that position. When the auto-stop is cleared, the S will disappear (the S will show only when the enable telemetry bit = 1). This application will get the position of the auto-stop from the uplink real-time command (RTC) title. If the auto-stop position is commanded to a protected area (or defined queue), the auto-stop will revert to the last unprotected segment before the protected area. This status indicator will be shown in the foreground, superceding any other status designator.

**1** (white on black) indicates that position register 1 is storing the indicated position. The application will get the position from the current position indicator when uplinked. This position will remain stored until another position is defined for position register 1. This status indicator will be shown in the foreground, superceding any other status designator except for S. The command to store position will be accepted by the SSR only when in the standby mode.

**2** (white on black) indicates that position register 2 is storing the indicated position in the same manner described for position register 1. This status indicator will be shown in the foreground, superceding all status designators except the S and **1**.

**P** (black on white) indicates that the E data region protect telemetry bit = 1. The segment numbers covered by this protection are always positions 0 through 161. This status indicator is in the background and superceded by all other status. V75X2950E indicates status of main engine data region protection for SSR1. V75X2850E indicates status of main engine data region protection for SSR2.

## 9. DATA SEGMENT DETAILED DATA

When the position (input or status code area) is clicked, a "details" window will appear with the following information:

1. Functional position number (e.g., Position 555)
2. Start time of recording in this segment position (e.g., Start OGMT DDD:HH:MM:SS)
3. Number of seconds of AOS data in this segment (e.g., 12 sec AOS data)

4. Number of seconds of LOS data in this segment (if applicable)

This application will project LOS data and fill in the LOS details for D or V data source codes only. When NSP RCD Voice is ON (**V** code), segment time is 21.8 seconds; when NSP RCD Voice is OFF (**D** code), segment time is 32.8 seconds. Positions with A or B data source codes will show AOS times but not LOS times. If AOS appears at an advanced position, the application will also fill in any non-projected LOS gaps with a continuation of the same data source codes with a red background, deleting previously stored details at these filled-in LOS positions.

Positions with E data will not contain these details, other than position number.

## 10. LOG

## BUTTON

There is a log button on the display, which can be clicked to bring up a daughter window. The window can be expanded and scrolled. The log data (displayed in English) is automatically updated, and the log file is saved after each entry; the log file is not deleted when the application is closed normally or abnormally and can be deleted or appended (optionally) when the application is restarted. The log window has a print menu with start/stop time limits for printing log entries. The log adds an OGMT time entry, current mode, and current position indicator on most line items, per the following list:

1. (OGMT/MODE/POSN LOS) Start of any LOS period of 4 or more seconds
2. (OGMT/MODE/POSN AOS) End of any LOS period of 4 or more seconds
3. (OGMT/MODE/POSN Mode change) Any mode change
4. (OGMT/MODE/POSN BITE = XXXX) Any change in OST BITE status
5. (OGMT/MODE/POSN Power = XXX) Any change in MMU power telemetry status
6. deleted
7. (OGMT/MODE/POSN Uplinked SSR1 Q START @555) Uplink of any queue definition command
8. (OGMT/MODE/POSN Uplinked SSR2 STOP PB) Uplink of any STOP, HALT, RCD or PB command
9. (OGMT/MODE/POSN Uplinked SSR1 CLR AUTO STOP) Uplink of an auto-stop define or clear command
10. (OGMT/MODE/POSN Uplinked SSR2 STORE POS1) Uplink of a position storage or recall command
11. (OGMT/MODE/POSN Uplinked SSR1 CLR PBQ 4) Uplink of any slot clear command
12. (OGMT/MODE/POSN Uplinked SSR2 UNPROT PAR) Uplink of a parallel unprotect command
13. (OGMT/MODE/POSN Uplinked SSR1 RESET ENA) Uplink of any maintenance command (ERASE, RESET, SELF TEST, REMAP)
14. (OGMT/MODE/POSN Restarted SSR2 MGMT APP) Start/restart of the SSR management application
15. (OGMT/MODE/POSN Time discontinuity) OGMT discontinuity, adding >1 hour or subtracting >1 minute, signifying start of another SIM run
16. (OGMT/MODE/POSN NSP Voice OFF(ON)) Change in D/V codes

The user can edit a log entry, using the mouse or the cursor keys to move the cursor prior to inserting, and using the mouse swipe to overwrite and backspace to delete. The edited log will not be saved but can be printed.

11. POWER 1 = ON 0 = OFF  
(green on black) (yellow on black)

V72S7185E indicates switch status of the input power to MMU1.

V72S7186E indicates switch status of the input power to MMU2.

12. CLR BUTTON

When the CLEAR button is clicked, a box will pop up to offer three options: **clear data status** only, **clear all data codes**, and **cancel**. **Clear data status** clears the data status lines below the data source codes. **Clear all data codes** clears all detailed data (not the log file). The purpose of **clear all data codes** is to allow the application to remain open while turning the SMS around between SIM runs. **Clear data status** allows the display to be cleared of status codes following a reset command or if the display gets out of sync with the onboard equipment.

13. CMDS BUTTON

When this button is clicked, the command build window will pop up. This window is described in SCP 3.30. Whenever a command is uplinked, the application will check the title of the command to see if it applies to the display.

14. COLD PLATE TEMP LOOP 1 LOOP 2  
(green on black) (green on black)

These are analog temperature measurements for cold plates in AV BAY 1 (SSR1) and 2 (SSR2). LOOP 1 uses V61T2624A for SSR1 and V61T2627A for SSR2. LOOP 2 uses V61T2625A for SSR1 and V61T2628A for SSR2.

15. LOS TIME INTEGER SEC  
(green on black)

The application totals and displays the D and V combined times of non-dumped LOS data.

16. PBQ TIME INTEGER SEC  
(green on black)

The application totals and displays the D and V combined queued PB times. PB queues are identified with a PB rate: 960 takes 4.4 seconds per position, and 1024 is 4.1 seconds per position. PBQ TIME decrements during a PB as each queue is deleted.

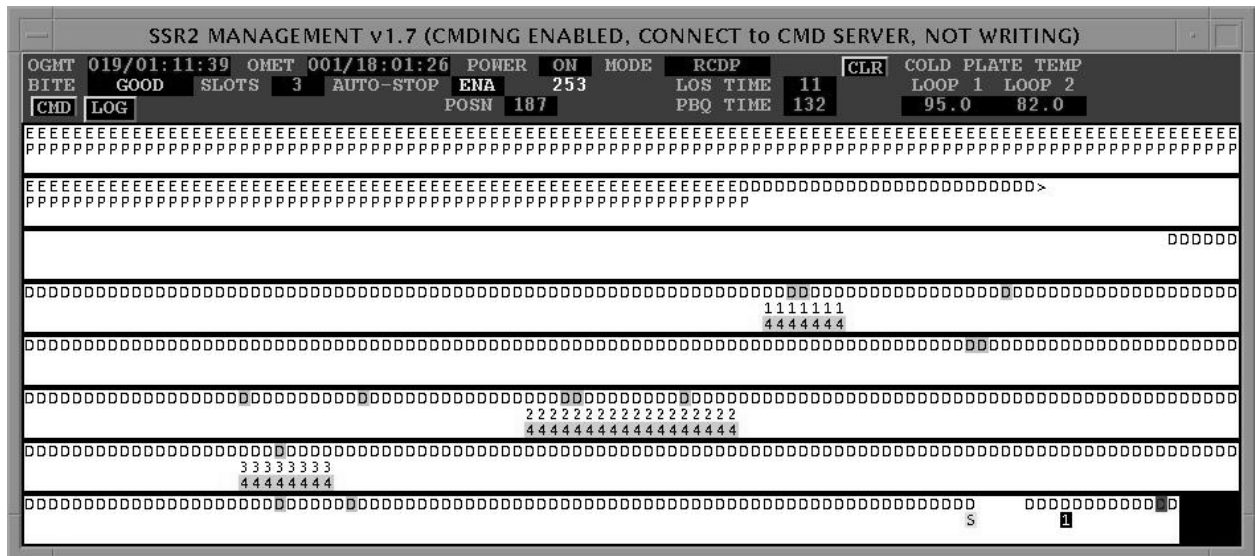


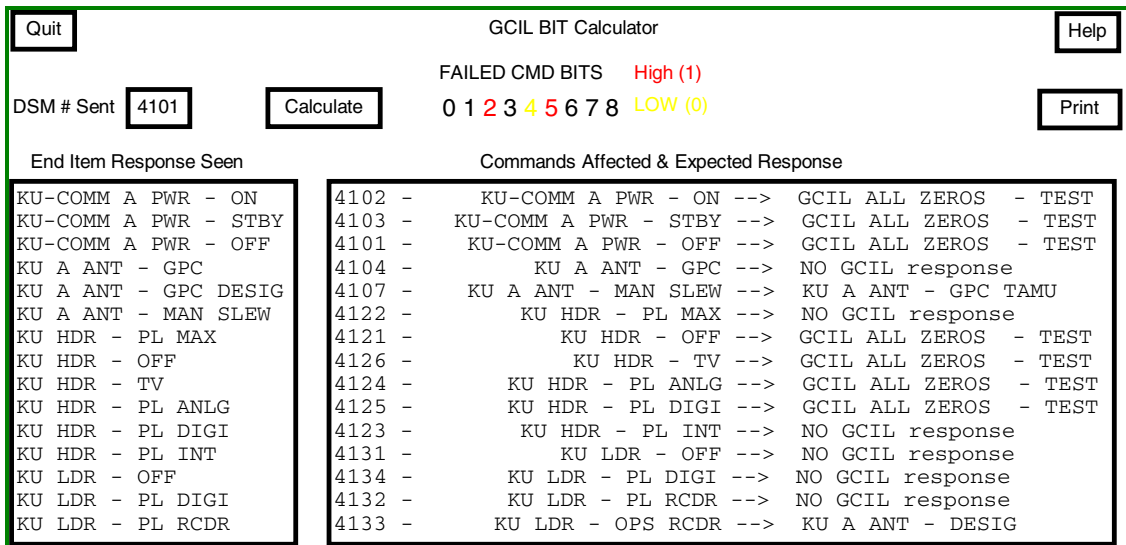
Figure 5.137-1. SSR1 management display

**TITLE**

GCIL BIT DISPLAY

**GENERAL**

The GCIL BIT display is a tool to calculate which of nine GCIL command bits have failed and to determine the affect of uplinking any other GCIL commands. Figure is a description of the display and how it works.



**Figure Error! No text of specified style in document.-1. GCIL BIT calculator**

**DISPLAY DESCRIPTION**

The buttons and scrolled lists on this display are described as follows. A series of lights is used to show which bits have failed. These lights are described also.

- A. **Quit** - The Quit button is used to terminate the execution of the program and to clean up the workstation memory used by the program upon termination.
- B. **Help** - The Help button is used to open a small window that gives the user information about how to use the program.
- C. **Calculate** - This button is used to start the process of determining which command bits have failed (high or low). Once this button is pressed, the application compares the command bits from the DSM that was typed in against the command bits of the end item response selected from the list. When the comparison is completed, the rest of the GCIL commands are laid against those bits to determine if they are affected or not. If they are affected, the end item response for those commands is determined and displayed.
- D. **Print** - When this button is pressed, a printout of the report just created by the Calculate button is generated. If there was a problem with the calculation in step C, the printout may be an old report or no report at all. If there is not a "gcilbit\_output" file, there is no report at all.
- E. **End Item Response** - This scrolling list contains all the possible responses to the commands that can be sent to the GCIL. These data are read from the data file. It is the command title field in the

file. The user selects from the list by pressing the left mouse button when pointing to the desired response.

- F. **Failed Cmd Bits** - These nine digits are activated after a failure has been determined. If the bit is failed high, the digit for that bit turns red. If the bit is failed low, the digit is yellow. If the bit did not fail either direction, the digit is gray.
- G. **Commands Affected & Expected Response** - This scrolled list shows the report generated by the program. The part of each line farthest left is the DSM, followed by the command title and the expected response to the command being uplinked. If the GCIL does not execute the command because the bit failure combination would cause an invalid command, the report displays "NO GCIL response."
- H. **Error Messages** - There are several error messages that can be generated by this display. Only one of them is caused by a fatal problem with the program. A listing of those messages and where they can be seen follows.

**"gcilbit - NO data file found"** - This message can be seen on the dxconsole window when attempting to start the display. The reason for this message is that no data file was supplied to the display at run start. The display will never run as long as there is no data file supplied.

The following messages appear in the Commands Affected & Expected Response scrolled list.

**"No DSM was entered!"** - The user did not type in a DSM number.

**"DSM xxxx not found in the GCIL database!"** - The user types in a DSM number "xxxx" that is not a valid GCIL command DSM number or is not in the data file read at run start.

**"No End Item was Selected!"** - The user did not select an end item response from the list.

**"No Calculations Done"** - The user has not attempted to calculate a command bit failure pattern.

**"The correct end item response for the CMD was seen"** - The user selected the normally expected end item response for the DSM entered.

**TITLE**

COMMAND CONFIGURATION DISPLAY

**GENERAL**

This command display is the tool for uplinking commands once the command system has been configured. The display (Figure 5.140-1) is made up of two lower level displays. One of the lower level displays is the command configuration display, and the other is the Multiple Command Matrix (MCM). The primary users of this display are the INCO, COMMAND, and PAYLOADS positions.



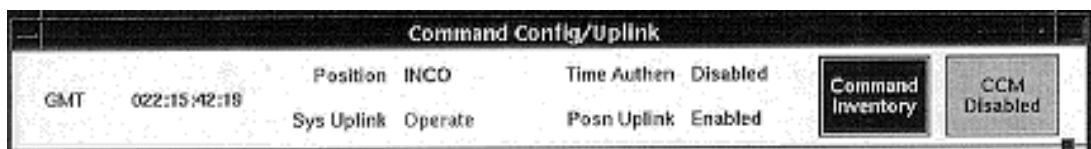
**Figure 5.140-1. Example of the Command Config DSM display**

**DISPLAY DESCRIPTION**

The following discussion is divided into three major sections. The first section discusses the parts of the display that are common to both of the lower level displays. The second section discusses the command configuration display in detail. The third section details the parts of the MCM display.

**A. Top Section**

The top section (Figure 5.140-2) contains some general information about the users of the display and their ability to uplink commands.



**Figure 5.140-2. Example of the top section**

**GMT** - The current GMT is displayed here. The update rate is every 5 seconds.

**Position** - The position that was selected at the startup of the command manager on the workstation. The available positions are INCO, RF COMM, INST, DATACOMM, INCO01, and INCO02.

**Sys Uplink** - The uplink state of the command system. Operate (green) indicates that commands are being uplinked to the orbiter. Safe (red) indicates that commands are not leaving the MCC.

**Time Authen** - This indicator displays whether time authentication is enabled (green) or disabled (yellow).

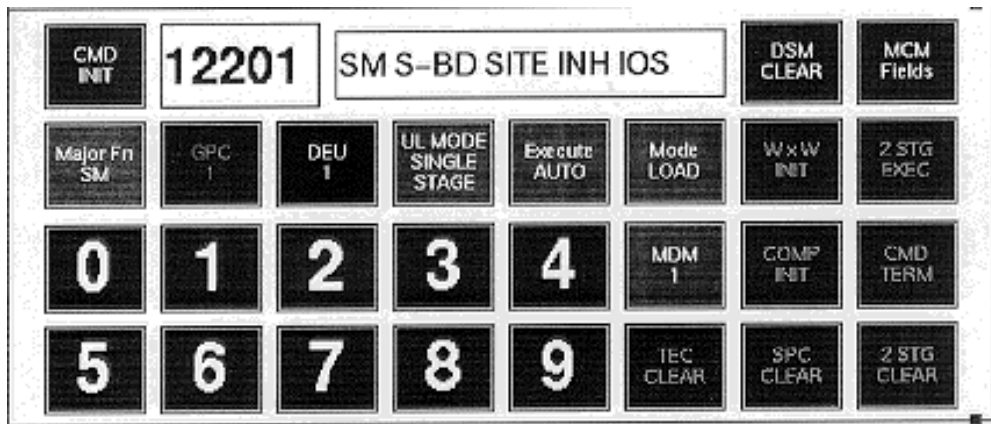
**Posn Uplink** - This indicator displays the uplink state of the workstation. Enabled (green) means the workstation has permission to send commands or command configuration changes to the server to be uplinked. Disabled (red) means the workstation does not have permission to send commands or command configuration changes to the server. See SCP 3.110 for the procedure to initialize the workstations for command.

**Command Inventory** - This button pops up a display that lists commands by Digital Select Matrix (DSM) number. There is more discussion on the command inventory later in this briefing.

**CCM Disable** - This button toggles between allowing the workstation to send commands (enabled - green) and not allowing the workstation to send commands (disabled - red).

A. Command Config

The bottom of the display is the command config or MCM. This section discusses the command config part of the display (see Figure 5.140-3).



**Figure 5.140-3. Command config display**

There are several parts to the command config section of the display. Just under the top common section is the first row of buttons that are unique to the command config section.

The first row of buttons has five selection choices.

**CMD INIT** - This button is used to request the uplink of the DSM located in the DSM number box to the right. The button is orange when a DSM is selected and uplink is enabled. The button is gray with black text when no DSM is selected or uplink is disabled.

**DSM Number box** - The blue box to the right of the CMD INIT button is where the DSM selected for uplink is displayed. The user can select from the Command Inventory popup



window or “dial in” the DSM number from the keypad provided on the display. If the command number entered is safed, the DSM number, as well as the command title, is displayed in red characters. If the command load is nonexistent, the DSM is displayed in red characters, but no title is displayed.

**DSM Title box** - Once a valid DSM number has been entered, the title for the command is displayed in the label box to the right of the DSM box.

**DSM CLEAR** - This button clears the DSM number and title selected. If the command is safed, nonexistent, if the command server is safed, or if the server has a System Error (SYSE), this button turns red.

**MCM Fields** - This button changes the middle part of the display to the MCM section. At startup, the command config section is displayed in the middle. If the user does not want to have to switch back and forth with the MCM/DSM button in the upper right-hand side of the display, he/she needs to start a second copy of the display.

The second row of buttons has eight selections.

**Major Fn** - This button is used to select the orbiter software major function to which the commands are to be sent. The following is a list of the possible major functions.

SM	-	green
BFS	-	yellow
P/L	-	gray
GNC	-	red

**GPC** - This button is used to select a particular General Purpose Computer (GPC) to which to send a command. When this button is pressed, the Major function button is grayed out. When the Major function button is pressed again, the GPC button is grayed out. The list of possible labels displayed on the button are GPC 1, GPC 2, GPC 3, GPC 4, GPC 5, and GPC ALL. When this button is active, the background is blue-gray with black text.

**DEU** - This button is used to select the Display Electronics Unit (DEU) to which a DEU equivalent command will be sent. For a DEU equivalent command to execute correctly, the user must select the correct major function for that DEU. The list of DEUs is as follows: DEU 1, DEU 2, DEU 3, and DEU 4. When this button is active, the background is yellow with black text. This button is always yellow, but does not affect any uplinked commands, except DEU equivalents, because other command types do not affect what state this button is in.

**UL MODE** - This button is used to select the mode of the uplink (single or two stage). Single-stage commands do not require a comparison by the command server, while two-stage commands do. When single stage is selected, the button label is green and shows UL MODE SINGLE STAGE. When two stage is selected, the button is yellow and shows UL MODE TWO STAGE.

**Execution Mode** - This button is used to select between auto execution or manual execution of two-stage commands. When AUTO is selected, the button is green. When MANUAL is selected, the button is red.

**CMD Type** - This button is used to select between RTC and LOAD type commands. When RTC is selected, the “Command Inventory” popup display shows only the RTC commands in the command server, and the button is yellow. When LOAD is selected, the “Command Inventory” automatically changes to display the load type commands and the button is green.

If a DSM is displayed and the CMD Type button is pressed, the DSM number and title disappear. The user is not be allowed to enter a DSM number larger than four characters while in RTC mode or five characters while in LOAD mode.

**WxW INIT** - This button is not active (red) until a DATA REJECT is detected on a two-stage command on the GNC, SM, or GPC 1 - ALL. For the BFS major function, the button does not light up. The button is grayed out the rest of the time.

**2 STG EXEC** - This button is not active (red) until a two-stage command is uplinked in manual execute mode or a two-stage command is uplinked with some reject indicated. The button is grayed out the rest of the time.

**0 - 4** - These buttons are used for “dialing” in a command DSM number.

**MDM 1** - This button is used to select the payload MDM to which the uplinked commands are passed. The options are MDM 1 (green) and MDM 2 (yellow).

**COMP INIT** - This button becomes active (red) when a TLM REJECT is detected on a two-stage command. The button is grayed out the rest of the time.

**CMD TERM** - This button allows the user to terminate a two-stage command while it is being uplinked. It is red-colored as long as the panel is enabled for uplink, otherwise it is grayed out.

**5 - 9** - These buttons are used for “dialing” in a command DSM number.

**TEC CLEAR** - This button is active (green) once the user is enabled for uplink by the COMMAND position and they CCM Enable themselves. The button is grayed out otherwise. The button sends the command to clear the time-executed command buffer.

**SPC CLEAR** - This button is active (green) once the user is enabled for uplink by the COMMAND position and they CCM Enable themselves. The button is grayed out otherwise. The button sends the command to clear the stored program command buffer in the major mode that is selected on button row 2.

**2 STG CLEAR** - This button is active (green) once the user is enabled for uplink by the COMMAND position and they CCM Enable themselves. The button is grayed out otherwise. The button sends the command to clear the two-stage button in the major mode that is selected on button row 2.

## B. MCM

The top of the MCM display (Figure 5.140-4) is the same as the command config display. The bottom section contains four rows of buttons. The topmost row is used to select a set or field of commands. The bottom three rows are command buttons. The button configuration file is the same as the hardware command panel. When a change is needed to the configuration of the fields, the user should refer to the Hardware Command Panel User’s Guide located in the INCO Console Handbook.



Figure 5.140-4. Example of an MCM panel section

**Field Select Row** - The top row of buttons is used to select the field of commands that are displayed in the bottom three rows of buttons. The rightmost button in this row is used to switch back to the command config display, which is also called the Digital Select Matrix, or DSM. Each button on this row represents two fields of commands, as noted by the two rows of field names on each button. When a field select button is pressed, the top field name is highlighted and the field of commands is displayed in the three rows below. If the same button is pressed again, the bottom field name is highlighted and its field of commands is displayed in the three rows below.

**Command Field** - The bottom three rows contain the commands that can be sent from the selected field of commands. The button images are taken straight from the hardware command panel database. The difference between the hardware panel database and the images shown on these buttons is that the DSM number is added to the bottom of each command button. When a command is safed, the button associated with the command turns red, but when the command is unsafe, the button returns to the default gray color.

**Command Inventory** - This subdisplay (Figure 5.140-5) is used to select from the command inventory in the command server. There are several features of this small popup display that are discussed in the following section.

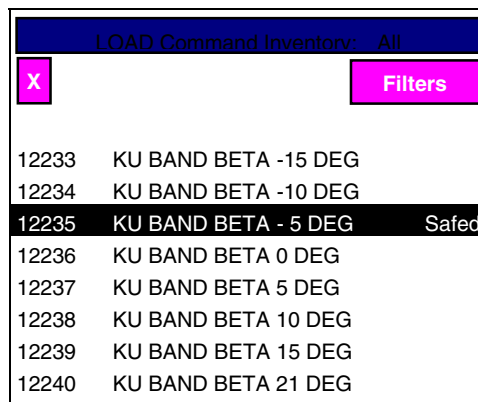


Figure 5.140-5. Load Command Inventory display

**Inventory Label** - At the top of the command inventory display is the command type and filter applied. The command types are LOAD or RTC. There are several types of filters that can be applied to the command inventory (see the discussion later in this SCP), but the name of the filter is added to the label at the top of the display.

**Exit** - The button to close this popup display is located on the left-hand top of the display. The little "X" is the exit button.

**Filters** - This button opens a menu of filters that can be used to filter out commands that the user is not interested in viewing. There are several filters on various INCO systems, but there is one specialized filter available to filter partial DSM numbers. See Table 5.140-1 for the list of filters.

The DSM filter can be used by pressing the DSM filter button in the Filters menu. A type-in box appears between the filter button and the exit button. Type in the partial DSM number to search for, followed by an "\*" character, and the display shows all commands in the server that start with the partial DSM number. See Figure 5.140-6

Once the user has selected from the command inventory popup display by pressing the left mouse button when the mouse cursor is located over the command desired, the display disappears. The next time the display is called up, the same filter setting appears.

**Table 5.140-1. Filter list**

Filter types	
DSM	
All	All DSM numbers
<b>For LOAD mode</b>	
MSPCs	12101 - 50
SPCs	10101 - 12050
TFL/DFLs	12501 - 99
TECs	13401 - 50
Prestored TMBUs	12201 - 50
<b>For RTC mode</b>	
S Band	4470 - 4475 4709 - 4756
Antenna	4676 - 4707
NSP	4758 - 4779
Ku Band	4101 - 4154
FM	4780 - 4794
OPS 1	4300 - 4359
OPS 2	4400 - 4458
PLR	4500 - 4574
MADS	4600 - 4632 5701 - 5767
PL Comm	4800 - 4845
CCTV	4185 - 4293
GCIL	4370 - 4376
HRM	6101 - 6186
HDRR	6201 - 6241
VAS	6001 - 6054
VCR	6250 - 6277

RTC Command Inventory: DSM	
X	DSM Filter 455* Filters
4550	P/L RCD SER A SPD 1
4551	P/L STOP
4552	P/L RCD SER A SPD 2
4553	P/L PB SERIAL REV
4554	P/L PB SERIAL FWD
4556	P/L REWIND EOT
4557	P/L REWIND BOT
4558	P/L STBY/CREW RST
4559	P/L RCD SER A SPD 3

**Figure 5.140-6. Example of command inventory**

Note: A server restart or synchronization notification may appear in the form of a popup box that states, "Please wait while the command inventory is obtained from the Command Manager after this Server Restart or Server Synchronization." The position is not able to uplink commands from the software panel while the popup message is displayed. However, DSMs dialed into the Software Panel while the message is up are displayed on the command config display after the server notification disappears.

**TITLE**

UPLINK VERIFY DISPLAY

**GENERAL**

The Uplink Verify display (Figure 5.141-1) includes all possible two-stage command buffer information for all the major functions available in the orbiter software. This display replaces the MOC command displays for uplink verification (MSK 1320, 1321 and 1322).

**DISPLAY DESCRIPTION**

This display is divided into several sections. The main sections of the display are the header and the GNC, SM, Ops 0, and BFS data sections. Each part will be discussed separately, but there are some generic parts that are common to each section.

The header area of the display includes a menu (Options) for selecting the major function sections that can be viewed. The current GMT time is displayed in this area along with the display title, version number, STS number, and vehicle number. The header is the only thing that is displayed when the display is started up. The user will have to select the major functions to view (maximum of two).



Each section contains a button in the upper left-hand corner that is used to close the section. There is a title that describes the major function that is being displayed. The command number (DSM no.) that is being uplinked to that major function is displayed with the number of command words that are being uplinked.

In the lower right-hand corner of the section is a button that calls up a small display with indications as to what errors were detected during uplink. All the command words uplinked are displayed in the middle of the section with the downlinked command words from that major function. The following is a table of the MSIDs that are downlinked for each major function:

Command words	GNC	SM	Ops 0	BFS
1	V92U6140CX	V92U6140CY	V92U6140CZ	V98U0021C
2	V92U6141CX	V92U6141CY	V92U6141CZ	V98U0022C
...				
66	V92U6205CX	V92U6205CY	V92U6205CZ	V98U0086C
67	V92U6206CX	V92U6206CY	V92U6206CZ	V98U0087C

When there is no active uplink taking place or there are no data in the downlink telemetry, there is nothing displayed in the middle part of the section. If for some reason the uplink and downlinked command words do not match, the GCS will set a flag on the command words with the problem. The uplink\_verify display will indicate which command words had a miscompare by changing the background color to red and the foreground color to white. The most common causes of miscompares are

- A. **Telemetry reject** - Caused by missing downlinked command words. This is seen as all the command words turning red on the display. The reason for this rejection is that the major function being commanded to is not being downlinked at the current time or the orbiter is in a loss-of-signal period.
- B. **Data reject** - Caused by some of the words miscomparing. This is seen as some, but not usually all, command words turning red. The reason for this reject is usually a weaker than normal radio communications link that causes some of the bits in the command words to be garbled.

Each section contains a small display that will pop up when a command error occurs for the major function being commanded to. The description of these displays follows.

### GN Major Function Command Errors Display

The GN major function can transmit several indicators to help the user determine the cause of a command uplink problem. At the top of the GNC Command Errors table is the GPC number (V93Q0018CX) and the format (V93Q0022CX) currently downlinking the data on the major function. There are several boxes in the table that light up to show the user the problem. The following list provides the boxes and their associated MSIDs and meanings:

<b>GPC/MF Check</b>	V92X6125XX - A 1 (red) value indicates that the uplinked command did not pass the major function check.
<b>Illegal Op</b>	V92X6132XX - A 1 (red) value indicates that the uplinked command did not pass the operation code check for that major function.
<b>Veh Add Error</b>	V92X5997XX - A 1 (red) value indicates that the major function found that the vehicle address in the command was not correct.
<b>EX PAR BUF</b>	V92X5998XX - A 1 (red) value indicates that a two-stage buffer execute was attempted without a valid last command word flag.
<b>U/L Act</b>	V92X5032XX - A 1 (green) value indicates that the GPC is currently processing an uplinked command.
<b>MDM Add Error</b>	V92X5996XX - A 1 (red) value indicates that the MDM address in the command is out of the bounds of the valid address table.
<b>TSC Error</b>	V92X6134XX - A 1 (red) value indicates that a two-stage error was detected.
<b>U/L Skip</b>	V92X6126XX - A 1 (red) value indicates that the previous cycle of the uplink process was skipped or not completed and a previously uplinked command may not have been processed.
<b>FW/LW Error</b>	V92X5995XX - A 1 (red) value indicates that a first or last command word error was detected.

### SM Major Function Command Errors Display

The SM major function can transmit several indicators to help the user determine the cause of a command uplink problem. At the top of the SM Command Errors table is the GPC number (V93Q0018CY) and format (V93Q0022CY) currently downlinking the data on the major function. There are several boxes in the table that light up to show the user the problem. The following is a list of the boxes and their associated MSIDs and meanings:

<b>GPC/MF Check</b>	V92X6125XY - A 1 (red) value indicates that the uplinked command did not pass the major function check.
<b>Illegal Op</b>	V92X6132XY - A 1 (red) value indicates that the uplinked command did not pass the operation code check for that major function.
<b>Veh Add Error</b>	V92X5997XY - A 1 (red) value indicates that the major function found that the vehicle address in the command was not correct.
<b>EX PAR BUF</b>	V92X5998XY - A 1 (red) value indicates that a two-stage buffer execute was attempted without a valid last command word flag.
<b>SPC Full</b>	V92X6128XY - A 1 (red) value indicates that an attempt was made to put a stored command into a full SPC buffer (10 command maximum for OI-25 and 25 command maximum for OI-26).
<b>MDM Add Error</b>	V92X5996XY - A 1 (red) value indicates that the MDM address in the command is out of the bounds of the valid address table.
<b>TSC Error</b>	V92X6134XY - A 1 (red) value indicates that a two-stage error was detected.
<b>TEC Full</b>	V92X1125X - A 1 (red) value indicates that an attempt was made to put a time executed command in a full TEC buffer (25 commands maximum).
<b>FW/LW Error</b>	V92X5995XY - A 1 (red) value indicates that a first or last command word error was detected.
<b>TMBU REJ</b>	<p>V92J0660C - Indicates (red) that the uplinked TMBU has some error in it. If the MSID value is between 1 and 10, the possible problems are</p> <ol style="list-style-type: none"><li>1. If class 2 limit change is requested and no class 2 limit set is defined for FDA parameter</li><li>2. If class 0, 3, 4 limit change is requested and no class 0, 3, 4 limits are defined for FDA parameter</li><li>3. If class 0, 3, 4 limit change is requested and specified limit set does not exist</li><li>4. If requested change is a high limit and changed parameter is a discrete</li><li>5. If parameter of a limit change is not processed by FDA</li><li>6. If analog or EU limit value exceeds allowable range</li><li>7. If parameter of a constant change is not a constant parameter. If the MSID value is equal to 11, the possible problems are<ol style="list-style-type: none"><li>a. If TM SPEC is active when the load reaches the application</li><li>b. If the number of data sets is less than 1 or greater than 10</li></ol></li></ol>
<b>PL UL INV</b>	V92X1124X - A 1 (red) value indicates that either the contents of a payload command were in error or the destination interface (PSP, SSI, SCOS, or ECOS) was busy.
<b>U/L Act</b>	V92X5032XY - A 1 (green) value indicates that the GPC is currently processing an uplinked command.



## BFS Major Function Command Errors Display

The BFS major function can transmit several indicators to help the user determine the cause of a command uplink problem. At the top of the display is the GPC number (V98Q0012C) and format (V98Q0009C) currently downlinking the data on the major function. There are several boxes in the display that light up to show the problem to the user. The following is a list of the boxes and their associated MSIDs and meanings:

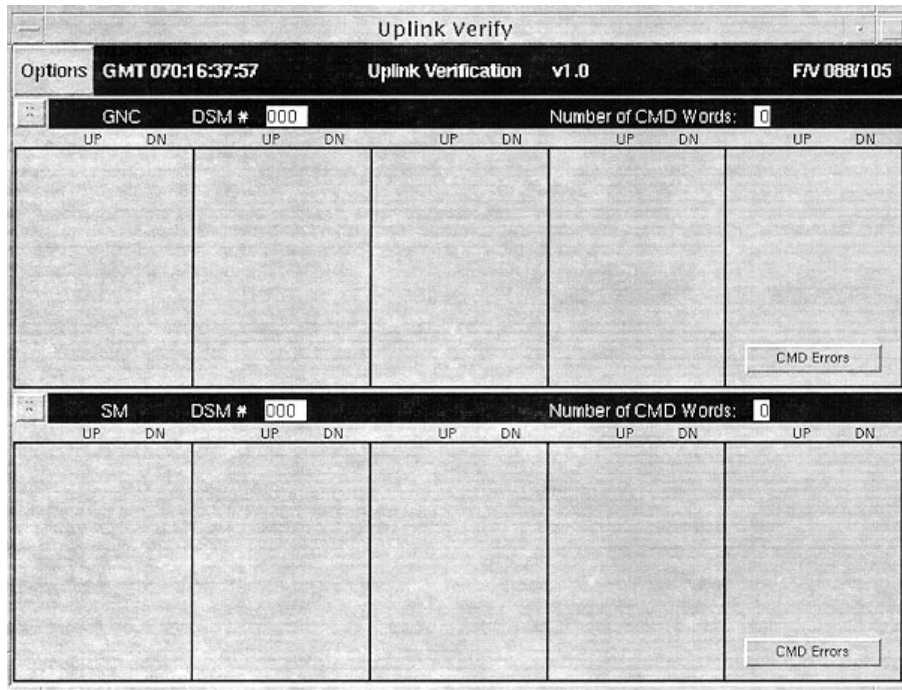
<b>GPC/MF Check</b>	V98X0211X - A 1 (red) value indicates that the uplinked command did not pass the major function check.
<b>Illegal Op</b>	V98X0214X - A 1 (red) value indicates that the uplinked command did not pass the operation code check for that major function.
<b>Veh Add Error</b>	V98X4272X - A 1 (red) value indicates that the major function found that the vehicle address in the command was not correct.
<b>NR OUT BD</b>	<p>V98X4273X - Indicates (red) that a number in the command was out of bounds. The following is a list of the reasons for this error flag:</p> <ol style="list-style-type: none"><li>1. An MDM Single, MDM Multiple, or SPC Multiple command load contains an MDM number that is 0 or greater than 14.</li><li>2. The number of command groups in an MDM Multiple or SPC Multiple command load is 0 or greater than 10.</li><li>3. The number of words to be written in a G-MEM Contiguous command load is 0 or greater than 64.</li><li>4. The starting address of a G-MEM Contiguous command load, plus the number of words to be written, minus 1, is greater than 33FFF (hex).</li><li>5. The number of address and word pairs in a G-MEM Scatter command load is 0 or greater than 32.</li><li>6. A G-MEM Scatter command load contains a memory address that is greater than 33FFF (hex).</li><li>7. The number of data sets in a TMBU command load is 0 or greater than 10.</li><li>8. There is an illegal data set type in a TMBU command load.</li><li>9. There is an illegal parameter interpretation in a TMBU command load.</li><li>10. A displacement in a TMBU command load exceeds the length of the table for which its data set is intended or causes a full work parameter to be written to an odd address.</li><li>11. A parameter value in a TMBU command load exceeds the limits specified for its interpretation.</li><li>12. The landing site table slot in a "deorbit landing site parameters" command load is less than 19 or greater than 21.</li><li>13. The Tactical Air Navigation (TACAN) table slot ID in 01 Deorbit TACAN Parameters command load is less than 51 or greater than 60.</li></ol>
<b>SPC Lost</b>	V98X4272X - A 1 (red) value indicates that an attempt was made to put a stored command into a full SPC buffer (10 command maximum for OI-25, 25 command maximum for OI-26).

<b>MDM Add Error</b>	V98X4271X - A 1 (red) value indicates that the MDM address in the command is out of the bounds of the valid address table.
<b>TSC Error</b>	V98X0215X - A 1 (red) value indicates that a two-stage error was detected.
<b>U/L Skip</b>	V98X0212X - A 1 (red) value indicates that the previous cycle of the uplink process was skipped and a previously uplinked command may not have been processed.
<b>FW/LW Error</b>	V98X4270X - A 1 (red) value indicates that a first word/last word error was detected and an RTC or a command load was rejected (ref. Comm Systems Brief 1, paragraph 1.4.8).
<b>GPC Block</b>	V98X4275X - A 1 (red) value indicates that all uplink commands (both single and two stage) are blocked.
<b>TK STR 3</b>	V98X2754X - A 1 (green) value indicates that the BFS major function is tracking the transactions on flight-critical bus number 3. If the BFS is not tracking string 3, the color is red.

### Ops 0 Major Function Command Errors Display

The Ops 0 major function can transmit several indicators to help the user determine the cause of a command uplink problem. At the top of the display is the GPC number (V93Q0018CZ) and format (V93Q0022CZ) currently downlinking the data on the major function. There are several boxes in the display that light up to show the user the problem. The following paragraphs list the boxes and their associated MSIDs and meanings:

<b>Data Ready</b>	V92X6081XZ - A 1 (green) value indicates that at least 1 command word in the 10-word command buffer is valid.
<b>GPC/MF Check</b>	V92X6125XZ - A 1 (red) value indicates the uplinked command did not pass the major function check.
<b>Illegal Op</b>	V92X6132XZ - A 1 (red) value indicates that the uplinked command did not pass the operation code check for that major function.
<b>GPC BLK</b>	V92X6000XZ - A 1 (red) value indicates that the panel C3 Uplink Block switch is in the GPC block position. These data are gathered by the GPC by reading the NSP status word. If both this and the NSP BLK lights are not red, the panel C3 Uplink Block switch is in the Enable position.
<b>NSP BLK</b>	V92X60082XZ - A 1 (red) value indicates that the panel C3 Uplink Block switch is in the NSP block position.
<b>SS Error</b>	V92X6126XZ - A 1 (red) value indicates a single-stage command error has been detected
<b>SPC Full</b>	V92X6128XZ - A 1 (red) value indicates that the stored program command buffer is full and that any attempt to put more commands into the buffer will be rejected (10 command maximum for OI-25, 25 command maximum for OI-26).
<b>U/L Act</b>	V92X5032XZ - A 1 (green) value indicates that there is currently activity on the command buffer processor and that the new command uplinked is rejected.
<b>TSC Error</b>	V92X6134XZ - A 1 (red) value indicates that a two-stage error was detected.



**Figure 5.141-1. Example of the Uplink Verification display with the GNC and SM major functions shown**

## TITLE

INST COMMAND BUILD DISPLAY

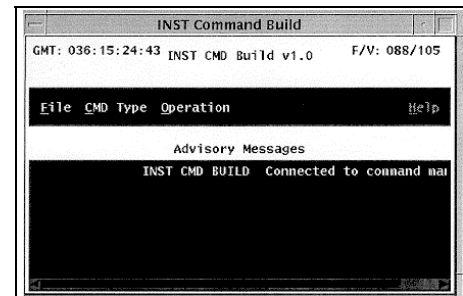
## GENERAL

The command build display is used to build the command loads that are generally controlled by the Instrumentation Officer. This display replaces the TFL/DFL Build (MSK 913), PSP Config Message (MSK 981), and General Payload Command Load (MSK 980) displays.

This display is divided into several sections. The top of the display is the title, version number, current time (GMT), and the flight /vehicle number for the command server to which the display is attached. Below the title information is the menu bar that contains all the pulldown menus available to manipulate the parts of the display. The middle of the display changes, depending on the type of command to be built. The bottom of the display shows any advisories from the command server itself.

## DISPLAY DESCRIPTION

The top of this display contains general information about the display itself. The data displayed here are the current time (GMT), the title of the display, the version number, the flight number, and the vehicle number of the command server to which the display is attached. At initial startup of the display, the only parts of the display that are visible are the title information section, the menu bar, and the Advisory Messages section.



**Example of the initial display**

The menu bar, located just below the title information, is used to manipulate the rest of the display. There are four menus on the menu bar. The File menu contains all the options to manipulate the storage file structure of the application and to exit the display. The CMD Type menu changes the middle of the display to allow the user to build different commands. This menu contains all the possible command types that can be built from this application. The Operation menu is used to interface with the command server to submit or delete command loads. The last option on the menu bar is the Help option. This option creates a window with helpful information on how to use the display.

**File** - This menu contains the commands for saving or recalling commands from files on the workstation.

**Save (Ctrl + s)** - This option is used to save the currently displayed command load to a file on the workstation. A standard popup file selection box is displayed for the user to enter a file name. Once the command data have been saved to a file, the user can recall it at any time.

**Recall (Ctrl + r)** - This option is used to recall a command data file from the workstation. A standard popup file selection box is displayed from which the user can request a file. Once the user has requested the file, it fills in the middle of the display. The user can then edit the data and submit it to the command server for later uplink to the orbiter.

**Clear (Ctrl + c)** - This option is used to clear the contents of a currently displayed command build type. It is used once a command type is selected or a file is recalled from the workstation.

**Batch Submit** - This option is used to select several command files that are submitted to the command server at the same time. This option will save the INST time because all of the commands needed can be submitted in one lump.

**Exit (Ctrl + x)** - This option is used to terminate the display and close any open files associated with the application.

**CMD Type** - This menu contains all the types of orbiter commands that can be created, viewed, or edited from this display. The following sections describe these options.

**TFL/DFL** - This option is used to build, view, edit, or delete TFL and DFL commands. When this option is selected, the middle of the display changes to reflect the data that must be entered to create a TFL/DFL load. The title of the display changes to show that the TFL/DFL option has been selected. If the user did not recall TFL/DFL from the workstation, the display will not have anything selected on the left side, but the right side should initialize with the first command in the 125 DSM class (generally 12538).



**Example of Batch Submit**

The display is divided into four major sections. Below the menu bar are the type-in boxes used to enter the DSM sequence number for a command and the title for that command load. The TFL/DFL selection menus are located below the TFL/DFL DSM type-in box. The command data in the command server for the DSM in the TFL/DFL type-in box is located below the GMT GEN text box. A button to delete the last Data Set entered is placed under the command data box. At the bottom of the display is the Advisory Messages section. Below is a detailed description of each part of the TFL/DFL display and an example of the filled out display.

**TFL/DFL type-in box** - This type-in box is located just after the TFL/DFL label. It starts out with "125" displayed in the box. This information cannot be changed. If there are any TFL/DFLs stored in the command server or if the user recalled a TFL/DFL file from the workstation, the last two digits will be filled in with the sequence number for this type of command. The valid range is 01 to 99. DSM numbers 12538 through 12550 are prestored and cannot be edited or deleted. If the user presses the right mouse button while the mouse cursor is located in the type-in box, a list of the TFL/DFLs stored in the command server will be displayed from which the user can select.

**Up/down arrowheads** - These two buttons are used to access the TFL/DFLs that are stored in the command server (one at a time). When a user pushes the up arrow, the next higher TFL/DFL DSM number will be displayed, if there is one stored in the command server. If the user pushes the down arrow, the next lower TFL/DFL DSM number will be displayed, if there is one stored in the server.

**Title** - This type-in box is used to enter a title for the command load. It can be any combination of characters (except ; [ ] and | ) up to 21 characters long.

**GMT GEN** - This box contains the last time the displayed TFL/DFL was updated in the command server. If the load has not been submitted to the command server or has been edited, this box will be blank. The user cannot type into this box.

**EDITED** - This box will display the word EDITED (on a green background) when the currently displayed command load is changed in any way. If the command has been submitted to the command server previously, the GMT GEN box will be blank and the EDITED box will light up.

Once the command displayed is submitted to the command server, the EDITED box disappears.

**TFL selection box** - These two selection boxes are located under the TFL label below the TFL/DFL DSM type-in box. The High Data Rate (HDR) format numbers are in the selection column on the left. A scroll bar is available to allow the user to see all the format numbers that are listed in the GCS. The Low Data Rate (LDR) format numbers are in the selection column to the right. To build a TFL, all the user needs to do is select the format number to put into the command load. The right side of the display will change to display the data that will be stored in the load.

TFL	
HDR	LDR
188	102
189	103
190	
191	
192	
193	
194	

**I/O RESET/DCM FDA box** - This area of the display contains several buttons used for special purposes. There are four buttons for selecting I/O resets and four buttons for decommutator fault detection enables and disables.

I/O RESET		DCM FDA ENABLE/DISABLE	
PCMMU	PSP1	1	2
PDI	PSP2	3	4

**DFL selection box** - These three selection boxes are located under the DFL label below the Title type-in box. The DCM numbers are in the selection column to the left. The next selection column to the right is the DFL, labeled as FMT (Format). There is a scroll bar available to allow the user to see all the format numbers that are listed in the GCS. To the right of the FMT selection column is the Source (SRC) selection column. To build a DFL, the user needs to select a DCM number, an FMT number, and an SRC number (if needed). Fetch Pointer Memory (FPM) formats can be selected from this section of the display. To create an FPM command, select FPM from the DCM column. The FMT column will change to show only the valid FPM format numbers. Select an FPM format number.

DFL		
DCM	FMT	SRC
1	17	0
2	18	1
3	19	2
4	20	3
FPM	21	4
	22	5
	23	6

**Data Set display box** - This section of the display shows the command data that are stored in a command load. There are 10 rows of command data that can be stored into a TFL/DFL. There are three columns in this section. The first column is the data set number and the second is the function ID, which means the item entry that occurs when the command is executed onboard the orbiter. The function IDs are automatically added to the display when the user selects from one of the selection columns to the left of this section. A description of the function ID is placed just to the right of the number. Example: 02 (program). The following is a listing of the function ID descriptions.

Function ID	Description
01	Selects the fixed HDR formatter (TFL = 129)
02	Selects the programmable HDR formatter
03	Selects a TFL number
04	Actually loads the selected TFL
05	PCMMU I/O reset
06	PSP 1 I/O reset
07	PSP 2 I/O reset
08	PDI I/O reset
09	Selects the PDI decom

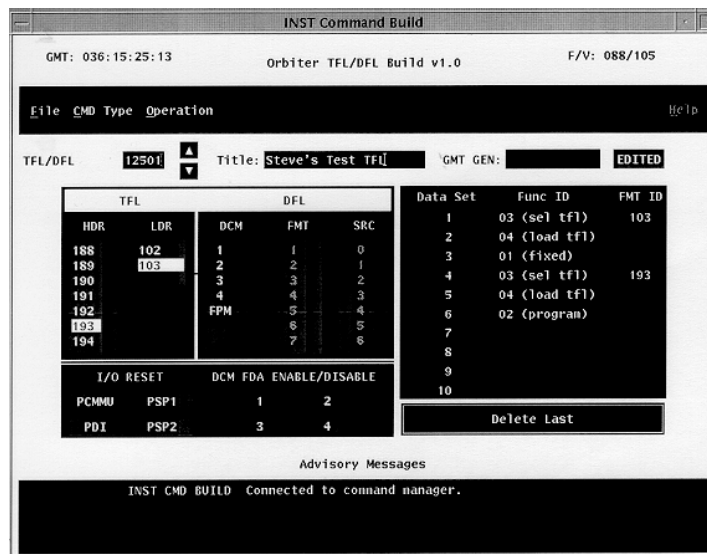
Data Set	Func ID	FMT ID
1	03 (sel tfl)	103
2	04 (load tfl)	
3	01 (fixed)	
4	03 (sel tfl)	193
5	04 (load tfl)	
6	02 (program)	
7		
8		
9		
10		

- 10 Selects the PDI decom format
- 11 Actually loads the selected DFL
- 12 Selects the input source
- 13 Actually loads the source
- 14-17 Toggles the FDA enable/disable bit for decoms 1-4, respectively.

**Delete Last** - This button is used to delete the last Data Set function entry. When a user selects a TFL, there are at least three Data Set rows filled. The Delete Last button deletes the whole TFL command data set of functions. An example of a DFL source select would be:

- 09 (select) 003
- 12 (sel src) 000
- 13 (load src)

When the user presses the delete button, all three of the lines above are deleted from the Data Set area of the display.



**Example of the TFL/DFL display**

**PSP Config** - This option is used to build, view, edit, or delete payload signal processor configuration commands. When this option is selected, the middle of the display changes to reflect the data that must be entered to create a PSP Config load. The title of the display changes to show that the PSP Config option has been selected. If the user did not recall a PSP Config from a workstation file, the display will not have anything selected (highlighted with a black background).

The display is divided into four major sections. Below the menu bar are the type-in boxes used to enter the DSM sequence number for a command and the title for that command load. The Payload command selection menus are located below the PSP config DSM type-in box. The telemetry selection menus are located to the right of the command selection menus. A set of type-in boxes is included in the telemetry section. At the bottom of the display is the Advisory Messages section. A detailed description of each part of the PSP Config display and an example of the filled out display follow.

**PSP Config type-in box** - This type-in box is located just after the PSP Config label. It starts out with "132" displayed in the box. This information cannot be changed. If there are any PSP Configs stored in the command server or if the user recalled an PSP Config file from the workstation, the last two digits will be filled in with the sequence number for this type of command. The valid range is 01 to 50. If the user presses the right mouse button while the mouse cursor is located in the type-in box, then a list of the PSP Configs stored in the command server is displayed from which the user can select.

**Up/down arrowheads** - These two buttons are used to access the PSP Configs that are stored in the command server (one at a time). When a user pushes the up arrow, the next higher PSP Config DSM number will be displayed if there is one stored in the command server. If the user pushes the down arrow, the next lower PSP Config DSM number will be displayed, if there is one stored in the server.

**Title** - This type-in box is used to enter a title for the command load. It can be any combination of characters (except ; [ ] and |) up to 21 characters long.

**GMT GEN** - This box contains the last time the displayed PSP Config was updated in the command server. If the load has not been submitted to the command server or has been edited, this box will be blank. The user cannot type into this box.

**EDITED** - This box will display the word EDITED (on a green background) when the currently displayed command load is changed in any way. If the command has been submitted to the command server previously, the GMT GEN box will be blank and the EDITED box will light up. Once the command displayed is submitted to the command server, the EDITED box will be blank again.

**Command Config Section** - The section below the PSP config DSM type-in box is the Command configuration section. It is used to set up the required data for sending commands through the PSP. There are five selection boxes in this section of the display. Each selection box contains the actual values used by the PSP and the Payload Management Flight Software Requirements (PM FSR) values in parenthesis for ease of translation.

**ID#** - This selection box is used to select the PSP configuration identification number that will be used with this command. Once a configuration is uplinked and stored in the SM major function on an orbiter GPC, it can be used to configure the PSP. The configuration is attached to a payload command at the time it is passed through the SM major function so that the PSP will know where and how to route the command data to a payload. This config ID also includes the telemetry configuration of the PSP. These data will tell the PSP how to format the payload data that are coming in and where the data are coming from.

ID#	CMD Rate	CMD Type
1	7.81 (4)	NRZ-L (1)
2	15.62 (5)	NRZ-M (2)
3	31.25 (6)	NRZ-S (3)
4	62.5 (7)	
5	125 (8)	
	250 (9)	
	500 (10)	
Idle Pattern	1000 (11)	UMB #
	2000 (12)	1
Off (0)		2
On (1)		3
		4
		5

**CMD Rate** - This selection box is used to select the rate at which commands can be clocked out of the PSP and sent to the payload.

**CMD Type** - This selection box is used to select the structure of the payload command words that are to be transmitted to the payload.

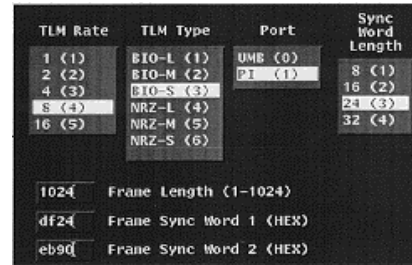
**Idle Pattern** - This selection box is used to turn on and off the idle pattern. Some payloads require that it receive a constantly modulated link so that it can process incoming commands, and some do not.



**UMB #** - This selection box is used to determine which umbilical port to send the payload commands out on if the umbilical is selected.

**Telemetry Config Section** - The section below the GMT GEN label is the telemetry configuration section. This section contains the command data required to configure the PSP to handle the incoming payload telemetry data. There are four selection boxes and three type-in boxes.

**TLM Rate** - This selection box is used to select the rate at which data will be transmitted to the PSP so that the PSP can know how to process the incoming stream of data.



**TLM Type** - This selection box is used to determine what type of data is being shipped from the payload to the PSP.

**Port** - This selection box is used to select the path the payload data will take to the PSP. There are two possible selections. The UMB selection must be associated with an umbilical number in the command config section. PI stands for payload interrogator.

**Sync Word Length** - This selection box is used to determine which of four different data word lengths the PSP must use to be able to bit sync to the payload data coming in.

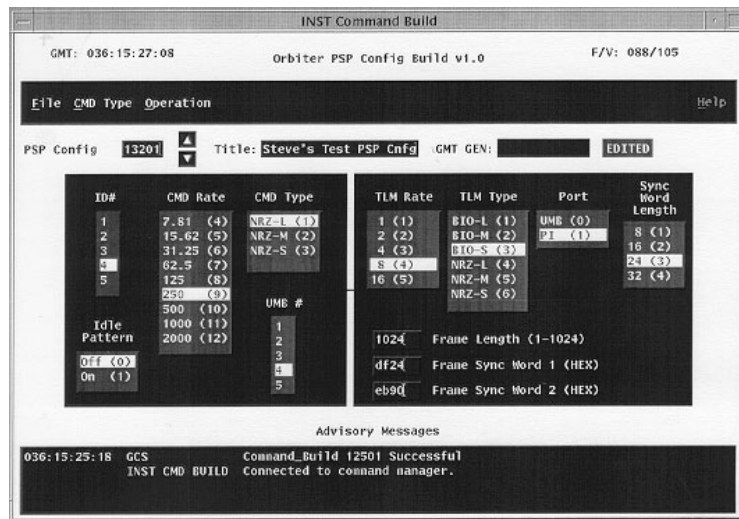
**Frame Length** - This type-in box is used to set the size of a frame of payload data coming into the PSP. This will tell the frame sync module in the PSP where to look for a new frame of data once it has bit synched on the data stream.

**Frame Sync Word 1** - This type-in box is used to set the pattern of the data in the first frame sync word. The frame sync module will look for this pattern of 0's and 1's to be able to frame sync lock on the payload data.

**Frame Sync Word 2** - This type-in box is used to set the pattern of the data in the second frame sync word (if required).

**GEN Payload** - This option is used to build, view, edit, or delete general payload command loads. INCO's primary use of this display is to build general payload load commands to push the PSP configuration in the SM major function into the PSP. When this option is selected, the middle of the display changes to reflect the data that must be entered to create a general payload load command. The title of the display changes to show that the general payload option has been selected. If the user did not recall a general payload command file from the workstation, the display will be mostly blank.

The display is divided into three major sections. Below the menu bar are the type-in boxes used to enter the DSM sequence number for a command and the title for that command load. The command data selection is located below the row of type-in boxes. It contains three option menus for determining the destination of the command and in what mode the command will go up (default is two stage). Below the selection boxes are the type-in boxes for entering the hexadecimal command data words. At the bottom of the display is the Advisory Messages section. A detailed description of each part of the general payload load display and an example of the display filled out follow.



Example of PSP Config display

**Gen Payload type-in box** - This type-in box is located just after the Gen Payload label. It starts out with "133" displayed in the box. This information cannot be changed. If there are any general payload load commands stored in the command server or if the user recalled a general payload load file from the workstation, the last two digits will be filled in with the sequence number for this type of command. The valid range is 01 to 50. If the user presses the right mouse button while the mouse cursor is located in the type-in box, a list of the general payload loads stored in the command server will be displayed from which the user can select.

**Up/down arrowheads** - These two buttons are used to access the general payload loads that are stored in the command server (one at a time). When a user pushes the up arrow, the next higher general payload load DSM number will be displayed, if there is one stored in the command server. If the user pushes the down arrow, the next lower general payload load DSM number will be displayed, if there is one stored in the server.

**Title** - This type-in box is used to enter a title for the command load. It can be any combination of characters (except ; [ ] and | ), up to 21 characters long.

**GMT GEN** - This box contains the last time the displayed general payload load was updated in the command server. If the load has not been submitted to the command server or has been edited, this box will be blank. The user cannot type into this box.

**EDITED** - This box will display the word EDITED (on a green background) when the currently displayed command load is changed in any way. If the command has been submitted to the command server previously, the GMT GEN box will be blank and the EDITED box will light up. Once the command displayed is submitted to the command server, the EDITED box will be blank again.

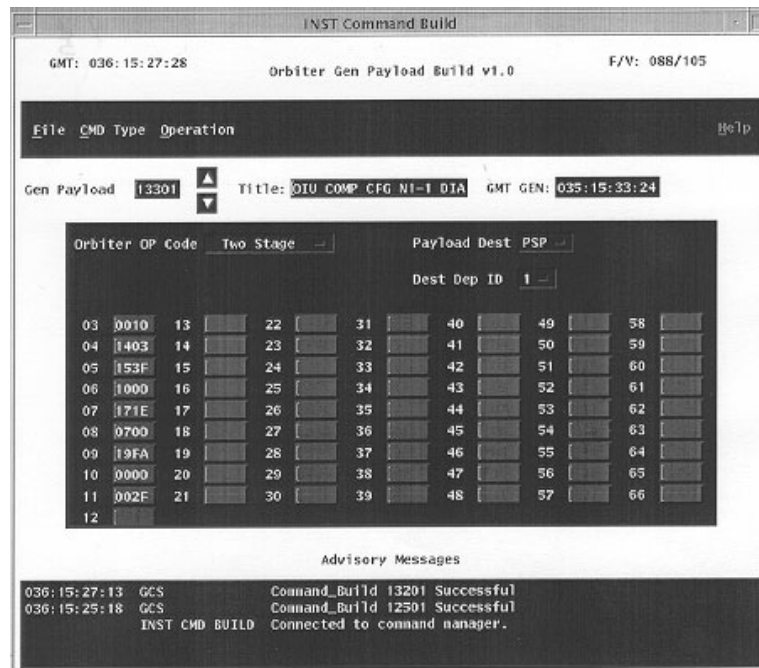
**Command data selection** - This section of the display contains all the information that is required to build a general payload load command. There are four major components of this part of the display. They are discussed in detail in the following paragraphs.

**Orbiter Op Code** - This is a selection menu used to choose in which mode the command will be uplinked. The default is two stage, but the other option is single stage (which means the command will go through the payload throughput buffer).

**Payload Dest** - This is a selection menu used to choose the system to which the command will be sent. The default is PSP, but the other options are SSI (Standard Serial Interface).

**Dest Dep ID** - This is a selection menu used to choose the identification number of the destination for the command. The options are 0 to 5 for the PSP and 1 to 8 for SSI.

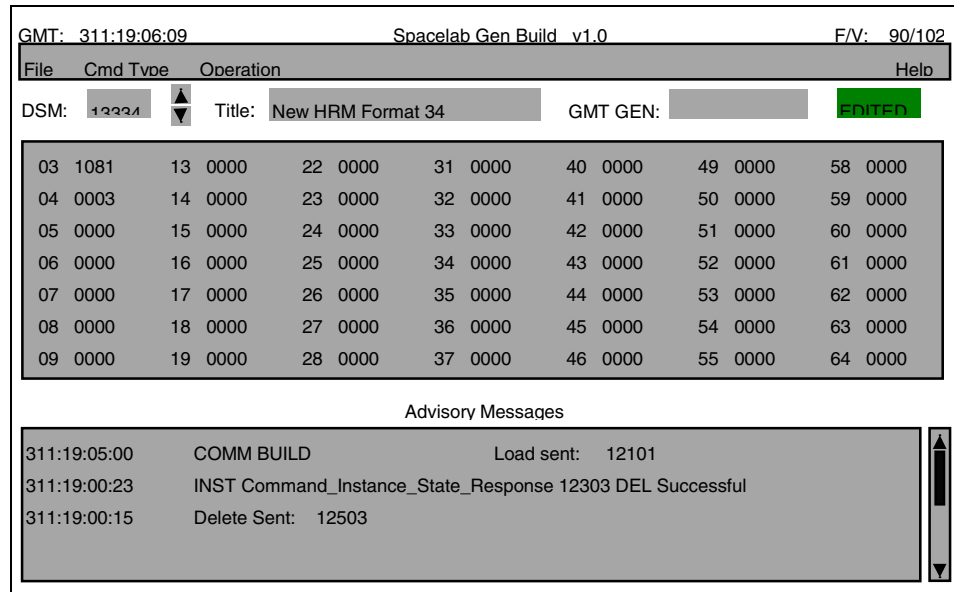
**03-66 command data words** - These type-in boxes are used to enter the command data words in four hexadecimal characters. The display will take either upper- or lowercase characters as inputs. It will convert all the characters to uppercase. The number of command data words available depends on the payload destination selected above. For PSP, the available command words are 3 to 66. For SSI, the available command words are 3 to 34. The display will limit the user to the correct number of command data words.



Example of General Payload Build display

### Spacelab Gen Payload

The Spacelab General Payload load display is a specialized version of the Orbiter General Payload Load display. The prime difference is that the three option menus are not available in this version of the display because they are not required. The rest of the display is described in the preceding section.



**None** - This CMD Type menu option will cause the display to close the middle part and only show the header, menu bar, and advisory messages sections.

**Operation** - This menu contains all the commands that can cause a change to the command server itself. The options available on this menu are Submit and Delete. The following paragraphs discuss each of these options.

**Submit** - This option is used to submit the currently displayed command to the command server for storage and possible future uplink to the orbiter. Submit will send all the information entered or edited by the user to the server and generate a message in the Advisory Messages area of the display. If a command being edited exists in the server, the user does not need to delete it before submitting the new version. A "worry box" will pop up asking if the command can be overwritten or not. If YES is selected a response message is generated by the command server acknowledging the submittal and any error messages for an invalid command structure. The newly submitted command should also show up on the display from which it was built.

**Delete** - This option is used to delete a command from the command server. The user will call up the type of command he wants to delete from the server and enter or select the DSM to delete. He will select the Delete option and the display updates to show that the command was deleted from the server. A message is displayed in the Advisory Messages section of the application.

## TITLE

RF COMMAND BUILD DISPLAY

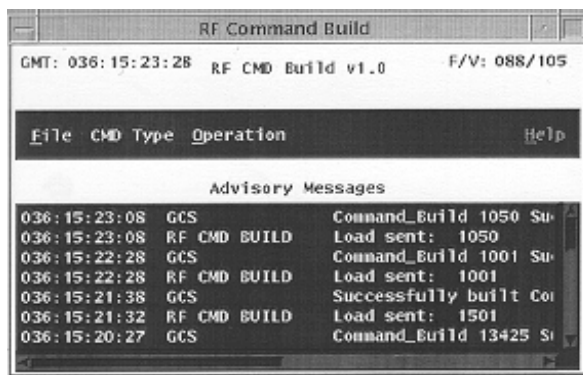
## GENERAL

The Command Build display is used to build the command loads that generally are used by the RF Communications Officer. This display is divided into several sections. The top of the display is the title, version number, current time (GMT), and the flight /vehicle number for the command server to which the display is attached. Below the title information is the menu bar that contains all the "pull down" menus available to manipulate the parts of the display. The middle of the display changes, depending on the type of command to be built. The bottom of the display will show any advisories from the command server itself.

## DISPLAY DESCRIPTION

The top of this display contains general information about the display itself. The data displayed here are the current time (GMT), the title of the display, the version number, the flight number, and the vehicle number of the command server to which the display is attached. At initial startup of the display, the only parts of the display that are visible are the title information section, the menu bar, and the advisory messages section.

The menu bar, located just below the title information, is used to manipulate the rest of the display. There are four menus on the menu bar. The "FILE" menu contains all the options to manipulate the storage file structure of the application and to exit the display. The "CMD Type" menu changes the middle of the display to allow the user to build different commands. This menu contains all the possible command types that can be built from this application. The "Operation" menu is used to interface with the command server for submitting or deleting of command loads and to change phase elapsed time (PET). The last option on the menu bar is the "Help" option. This will create a window with helpful information on how to use the display.



*Example of the initial display*

**File** - This menu contains the commands for saving or recalling commands from files on the workstation.

**Save (Ctrl + s)** - This option is used to save the currently displayed command load to a file on the workstation. A standard popup file selection box will be displayed for the user to enter a file name. Once the command data have been saved to a file, the user can recall it at any time.

**Recall (Ctrl + r)** - This option is used to recall a command data file from the workstation. A standard popup file selection box will be displayed for the user to request a file. Once the user has requested the file, it will fill in the middle of the display. The user can then edit the data and submit the information to the command server for later uplink to the orbiter.

**Clear (Ctrl + c)** - This option is used to clear the contents of a currently displayed command build type. It is used once a command type is selected or a file is recalled from the workstation.

**Exit (Ctrl + x)** - This option is used to terminate the display and close any open files associated with the application.

**CMD Type** - This menu contains all the types of orbiter commands that can be created, viewed, or edited from this display. The following are detailed descriptions of these options.

**MSPC** - This option is used to build, view, edit, or delete multiple stored program commands (MSPCs). When this option is selected or a file from the workstation is selected that contains MSPC build information, the middle of the display changes to reflect the data that must be entered to create an MSPC load. The title of the display changes to show that the MSPC option has been selected. If there are not any MSPCs already in the command server and the user did not recall an MSPC from the workstation, the display will be mostly blank. Below is a detailed description of each part of the MSPC display and an example of the display filled out.

**NOTE:**

MSPCs are made up of two or more RTCs. For a single stored program command (SPC), use the SPC single menu option.

**MSPC type-in box** - This type-in box is located just after the MSPC label. It starts out with “121” displayed in the box. This information cannot be changed. If there are any MSPCs stored in the command server or if the user recalled an MSPC file from the workstation, the last two digits will be filled in with the sequence number for this type of command. The valid range is 01 to 50. Example: 12105. If the user presses the right mouse button while the mouse cursor is located in the type-in box, then a list of the MSPCs stored in the command server will be displayed from which the user can select.

**Up/Down Arrows** - These two buttons are used to access the MSPCs that are stored in the command server (one at a time). When a user pushes the up arrow, the next higher MSPC DSM number will be displayed if there is one stored in the command server (example 12102 to 12103). If the user pushes the down arrow, the next lower MSPC DSM number will be displayed if there is one stored in the server (example 12103 to 12102). The MSPCs are in a circular list, so continuing to press the arrow buttons will eventually end up at the DSM number with which you started.

**Title** - This type-in box is used to enter a title for the command load. It can be any combination of characters (*except ; [ ] and |*), up to 21 characters long. A title longer than 21 characters will generate an error message.

**GMT GEN** - This box contains the last time the displayed MSPC was updated in the command server. If the load has not been “submit”ed to the command server or has been edited, this box will be blank. The user cannot type into this box.

**EDITED** - This light will turn on (green) whenever the command being viewed has been changed from the values that are in the command server. It is an indication to the user that if anyone else is looking at the same command, they will be seeing the values that are in the command server and not what the edited version is. As soon as the user editing the command “Submits” the command to the server, the “EDITED” light will disappear.

**Load Information** - This section of the display is used to type in the command information that will be contained in the MSPC. The user must supply the DSM number, a title, the MDM to send the command through, and an execution time. Although 25 commands can be stored in the SPC buffer of both the BFS and the

SM, only 10 commands can be built in one MSPC at a time because of NSP command buffer size limitations. Each of the 10 rows is exactly the same. The following is a detailed description of the parts to this section of the display.

**DSM** - This type-in box is used to enter the real-time command (RTC) ID number. The user can press the right mouse button while the mouse cursor is located over the DSM type-in box to display the available DSM numbers. They can scroll through the list and select the DSM number to put in the type-in box by pressing the left mouse button while the mouse cursor is located over the desired command. See the **DSM Popup** discussion later in this brief for more details. Pressing the Tab key will send the cursor to the next DSM box.

**Title** - This box will be filled in automatically by the command server once the user has selected the DSM number.

**Safed** - This box will display the safe status of the command requested for this row. If the command is safed (cannot be uplinked) in the command server, the word "Safed" will appear in that column. The DSM, title, and safed fields will turn red if the command is safed.

**MDM** - This type-in box is used to determine which of the two payload MDMs the command data are going to pass through. The default is MDM 1, but it can be changed by typing a 2 in the box. The MDM selection must be there. The display will not allow deletion of the values in the MDM boxes. A 1 will be displayed if an attempt to delete the value is made.

**GMT** - This is a menu selection. The options are GMT, PET1, or PET2. Once the user has selected which option they want to build with, it will affect all the rows on the display. See the discussion about **PET Set** later in this brief for more details on how PET works.

**Exec Time** - This type-in box displays the time that the command in the load will execute onboard the orbiter. The time must be entered with the following format:

DDD:HH:MM:SS

but the ":" can be replaced with a space, and leading zeros are not required (example: 23 12 4 9 would display as 023:12:04:09). The space key is used to delimit the time sections. If 0 days is the input, simply press the space key and 000 days will be displayed.

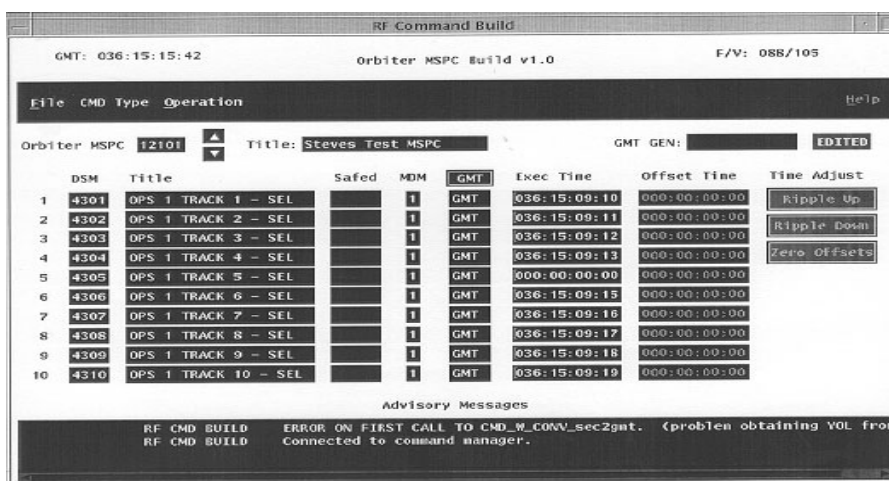
This box can be typed into only if the GMT option was selected from the previous discussion. If the user has selected one of the PET options, this time box will reflect the addition of the PET time, plus the offset time. The default time is 000:00:00:00. Each of the rows will be defaulted to increment the execution time by 1 second.

**Offset Time** - This type-in box displays the time that the command's execution time will be offset from some other time reference (PET1 or PET2). This will allow the user to update one time (PET1 or PET2) and have it reflected in the all the execution times of the commands in the MSPC. See the discussion about the use of **PET Set** later in this brief. The default offset time is 000:00:00:00.

**Ripple Up Button** - This button will “ripple up” or decrement the “Exec Time” or “Offset Time” (depending on which time is selected from the GMT/PET button). The ripple process will be from the selected command row up when the button is pressed.

**Ripple Down Button** - This button will “ripple down” or increment the “Exec Time” or “Offset Time” (depending on which time is selected from the GMT/PET button). The ripple process will be from the selected command row down when the button is pressed.

**Zero Offsets Button** - When the reference time button (GMT/PET) is selected to PET1 or PET2, the “Zero Offsets” button is pressed and the Offset time column will go to 000:00:00:00.



*Example of the MSPC Build display*

**SPC** - This option is used to build, view, edit, or delete single SPCs. When this option is selected, the middle of the display changes to reflect the data that are currently in the command server. Below the SPCs that are in the command server is the area for editing or creating a new SPC. The title of the display changes to show that the SPC option has been selected. If there are not any SPCs already in the command server, the display will be mostly blank. The following discussion is a detailed description of each part of the SPC display and an example of the display filled out.

**Current Command Server SPCs** - This middle section of the display shows the SPCs that are currently in the command server. Each must have a valid DSM number, a title, an RTC number, a payload MDM selected, RTC title, a reference time, an execution time or an offset time, and a safe status. If there are more SPCs than can be displayed at one time, a scroll bar will appear on the right side of the display. Press the left mouse button when the mouse cursor is located over the SPC that is to be edited, and the data will appear in the type-in boxes below this section.

**SPC** - This type-in box is used to enter a valid DSM number for a single SPC. The valid DSMs are 101 to 120, with valid sequence numbers of 01 to 50.

Example: 10124



### 12003

The user can select the SPC by either pressing the left mouse button while the mouse cursor is located over the SPC in the current command server SPCs or by typing a valid SPC DSM number in the edit area.

**Title** - This type-in box is used to edit the title of the SPC. The title can be any character (*except ; [ ] and /*), up to 21 characters long.

**Safed** - This will display a red SAFED if the DSM selected is safed in the server. Once the command is unsafe, the SAFED flag will disappear.

**DSM** - This type-in box is for the selection of the real-time command to be stored in the command load. The number can be typed in or selected from a list by pressing the right mouse button while the mouse cursor is located over the DSM edit box. See **DSM Pop up** for a discussion on this feature.

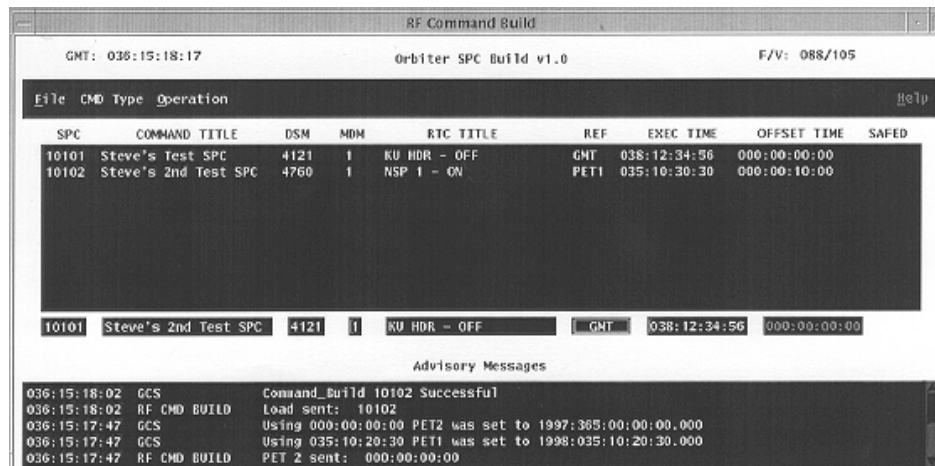
**MDM** - This type-in box contains the payload MDM that the command will pass through. The valid numbers are 1 and 2. The default is 1.

**RTC Title** - This field contains the title of the RTC selected in the DSM type-in box above. The title is taken from the command server and cannot be edited by the user.

**GMT** - This selection box is used to determine if an offset time is to be used. The valid options are GMT, PET1, or PET2. The default value is GMT. See the discussion on **PET Set** for more information on offset times.

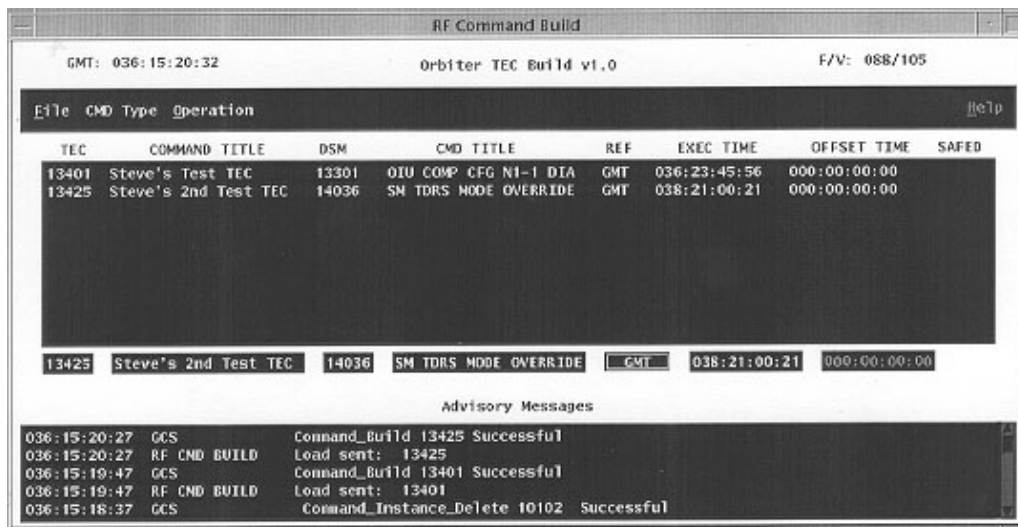
**Exec Time** - This type-in box indicates the time that the RTC will execute onboard the orbiter. If the GMT option was selected above, the execution time must be edited here. If one of the PET options was selected, this box will reflect the PET time, plus the offset time entered in the next type-in box.

**Offset Time** - This type-in box is used to enter an offset execution time from some event. A time can be entered in this box only if one of the PET options was selected earlier.



**Example of the SPC Build display**

**TEC** - This option is very much like the SPC option. The primary difference is that the time executed command (TEC) load type uses other command loads as the command to be executed onboard the orbiter. The valid TEC DSM numbers are 13401 to 13450. The display will prohibit the user from entering a load class that cannot be built into a TEC command load.



**Example of the TEC Build display**

**MRTC** - This option is used to build, view, edit, or delete multiple real-time commands (MRTCs). When this option is selected, or a file from the workstation is selected that contains MRTC build information, the middle of the display changes to reflect the data that must be entered to create an MRTC load. The title of the display changes to show that the MRTC option has been selected. If there are not any MRTCs already in the command server, the display will be mostly blank. Below is a detailed description of each part of the MRTC display and an example of the display filled out.

**MRTC Type-in Box** - This type-in box is located just after the MRTC label. It starts out with "15" displayed in the box. This information cannot be changed. If there are any MRTCs stored in the command server, the last two digits will be filled in with the sequence number of this type of command. The valid range is 00 to 50. Example: 1501. If the user presses the right mouse button while the mouse cursor is located in the type-in box, a list of the buildable MRTCs stored in the command server will be displayed from which the user can select.

**Up/Down Arrow** - These two buttons are used to access the MRTCs that are stored in the command server (one at a time). When a user pushes the up arrow, the next higher MRTC DSM number will be displayed if there is one stored in the command server. If the user pushes the down arrow, the next lower MRTC DSM number will be displayed if there is one stored in the server.

**Title** - This type-in box is used to type in a title for the command load. It can be any combination of characters (*except ; [ ] and |*), up to 21 characters long.

**Safed** - This will display a red SAFED if the DSM selected is safed in the server. Once the command is unsafed, the SAFED flag will disappear.

**Stage** - This type-in box is defaulted to 2. The 2 means that the command will be uplinked via the two-stage process. The value can be changed to 1 but cannot be deleted. It will reset to 2 if an attempt to delete the value is made.

**GMT GEN** - This box contains the last time the displayed MRTC was updated in the command server. If the load has not been submitted to the command server or has been edited, this will be blank. The user cannot type into this box.

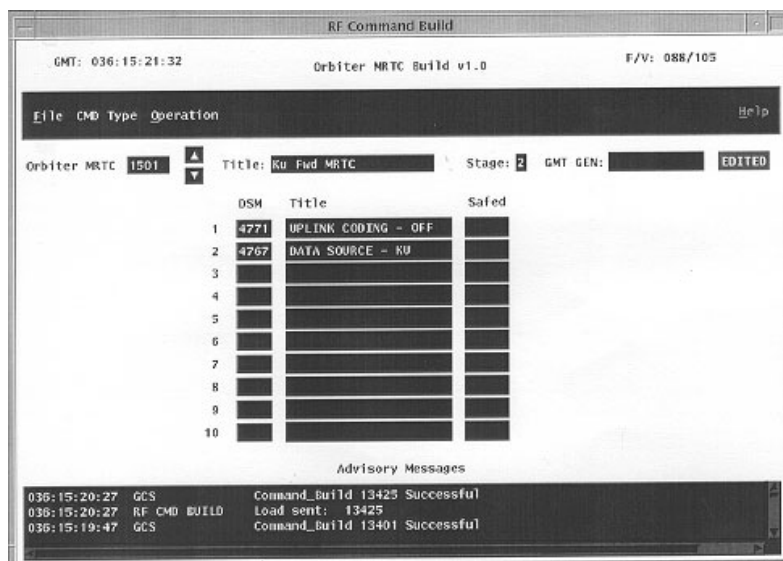
**EDITED** - This light will turn on (green) whenever the command being viewed has been changed from the values that are in the command server. It is an indication to the user that if anyone else is looking at the same command, they will be seeing the values that are in the command server and not what the edited version is. As soon as the user editing the command “Submits” the command to the server, the “EDITED” light will disappear.

**MRTC Contents** - The middle of the display contains the RTCs that are included in the MRTC command “chain.” These commands are combined into one command structure and uplinked as a unit. The required command data to build an MRTC are described below.

**DSM** - These are the RTC numbers to be contained in the MRTC. The number can be typed into the box, or the right mouse button can be pressed when the mouse cursor is located over the DSM type-in box, and a list of possible RTC DSM numbers will pop up.

**Title** - This box displays the title of the RTC selected in the DSM box. These data come from the command server and cannot be edited.

**Safed** - This box displays the safe status of the RTC. It will display the word “Safed” if the command has been inhibited from uplink. The whole line will turn red when the RTC is safed.



**Example of MRTC Build display**

**RTC** - This option is used to build, view, edit, or delete RTCs . When this option is selected, the middle of the display changes to reflect the data that must be entered to create an RTC load. The title of the display changes to show that the RTC option has been selected. If there are not any user-built RTCs already in the command server, the display will be mostly blank. Below is a detailed description of each part of the RTC display and an example of the filled out display.

**Current Command Server RTCs** - This middle section of the display shows the RTCs that are currently in the command server. If there are more RTCs than can be displayed at one time, a scroll bar will appear on the right side of the display. Press the left mouse button when the mouse cursor is located over the RTC that is to be edited, and the data will appear in the type-in boxes below this section.

**DSM** - This type-in box contains the DSM number for the command to be built or edited. If a command that is currently stored in the command server is to be edited, the user can select the command by pressing the left mouse button while the mouse cursor is located over the command DSM number in the middle section of the display, or they can type in the DSM number. The valid range for buildable RTCs is 1000 to 1099. The default value in the type-in box is 10. The last two digits of the DSM must be entered in the box, but the first two are fixed and cannot be edited. If a currently stored command is selected for editing and is safed from uplink, the type-in boxes will turn red.

**COMMAND TITLE** - This type-in box contains the title of the command being built or modified. The title can be any characters (*except ; [ ] and |*) in any combination up to 21 characters long.

**ADDR** - This type-in box contains the payload MDM address to which the command will be sent for execution. This hex number must contain a module, channel, and MDM address values.

**WARNING**

Some error checking is done by the system to verify that the hex information is reasonable, but the system will not prevent the user from typing a valid but wrong address.

**RESET** - This type-in box contains the command bits to reset the previously defined address in preparation of the new bit information that will cause a change to some line replaceable unit (LRU) on the orbiter. The values allowable for this hex information are 0000 to FFFF.

**ADDR** - This type-in box contains the payload MDM address to which the set command bits will be sent. See the previous ADDR discussion.

**SET** - This type-in box contains the command bits that will cause the change to the LRU. The values allowable for this hex information are 0000 to FFFF.

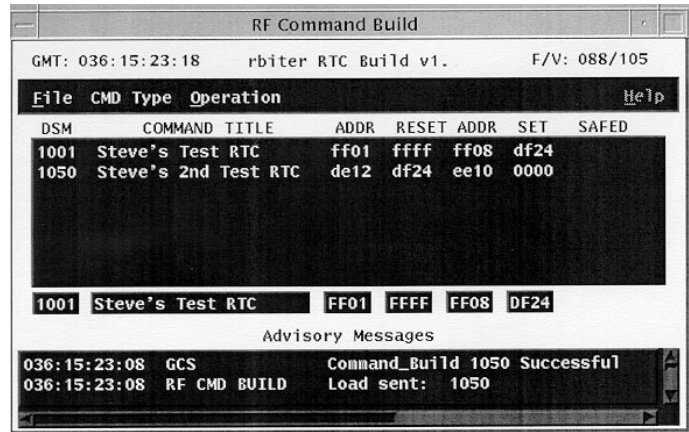
**SAFED** - This will display a red SAFED if the DSM selected is safed in the server. Once the command is unsafed, the SAFED flag will disappear.

**TDRS** - This option is used to build, view, edit, or delete TDRS state vector commands. When this option is selected, the top of the display changes to reflect commands that have already been stored in the command server. The middle of the display is the location for editing or building new TDRS state vector commands. If there are not any TDRS commands built the display will be mostly blank.

**Current Command Server TDRS Commands** - This middle section of the display shows the TDRS state vector commands that are currently in the command server. Each must have a valid DSM number, a title, State vector slot number, a Longitude, inclination, GMT of ascending node, position vector of magnitude, a GMT of command generation and a safe status. If there are more TDRS commands than can be displayed at one time, a scroll bar will appear on the right side of the display. Press the left mouse button when the mouse cursor is located over the command that is to be edited, and the data will appear in the type-in boxes below this section.

**DSM type-in box** - This type-in box is located just after the DSM label. It starts out with "403" displayed in the box. This information cannot be changed. If there are any TDRS state vectors stored in the command server or if the user recalled an TDRS file from the workstation, the last two digits will be filled in with the sequence number for this type of command. The valid range is 01 to 50. Example: 40305.

**Up/Down Arrows** - These two buttons are used to access the TDRS vectors that are stored in the command server (one at a time). When a user pushes



*Example of RTC Build display*

the up arrow, the next higher DSM number will be displayed if there is one stored in the command server (example 40301 to 40302). If the user pushes the down arrow, the next lower DSM number will be displayed if there is one stored in the server (example 40303 to 40302). The TDRS vectors are in a circular list, so continuing to press the arrow buttons will eventually end up at the DSM number with which you started.

**Title** - This type-in box is used to enter a title for the command load. It can be any combination of characters (*except ; [ ] and /*), up to 21 characters long. A title longer than 21 characters will generate an error message.

**GMT GEN** - This box contains the last time the displayed TDRS vector was updated in the command server. If the load has not been “submit”ed to the command server or has been edited, this box will be blank. The user cannot type into this box.

**EDITED** - This light will turn on (green) whenever the command being viewed has been changed from the values that are in the command server. It is an indication to the user that if anyone else is looking at the same command, they will be seeing the values that are in the command server and not what the edited version is. As soon as the user editing the command “Submits” the command to the server, the “EDITED” light will disappear.

**SLOT NUMBER Buttons**—This area of the display is located just below the DSM/Title part of the display. It is used to select which of the 4 available slots to put the new TDRS state vector data into. The SM major function allows all 4 slots to be used but the BFS only contains 3 slots. This means that the user must be careful when building TDRS state vectors for the BFS. The BFS will reject, without a warning, any command that attempts to modify the forth slot.

**TDRS Longitude Buttons**—This area of the display is located just to the right of the Slot number area. It is used to select between the different TDRS satellites, referenced by their longitude (41, 47, 171, 174 and 275). The user selects the satellite that will be placed in the slot. Once the button for that satellite is selected, a request is transferred to the FDO workstation for the vector data at the current SGMT time. If the FDO ephemeris for that TDRS satellite contains the SGMT time requested, it will return the current location (state vector) data to the display. This data is discussed in the next sub-sections.

**State Vector Data** –This area of the display is located just below the Slot number and longitude buttons. Once the slot number and longitude are selected the display will request the data for this area from the FDO workstation files. There are four elements to the TDRS state vector displayed in this area.

**Longitude of Ascending Node**—This element of the TDRS state vector represents the location of the satellite in the East/West directions (angle in degrees from 0 located in England). i.e. -174 West is over the Pacific ocean.

**Inclination of Orbital Plane**—This element of the TDRS state vector represents the location of the satellite in the North/South directions (angle above or below the equator).

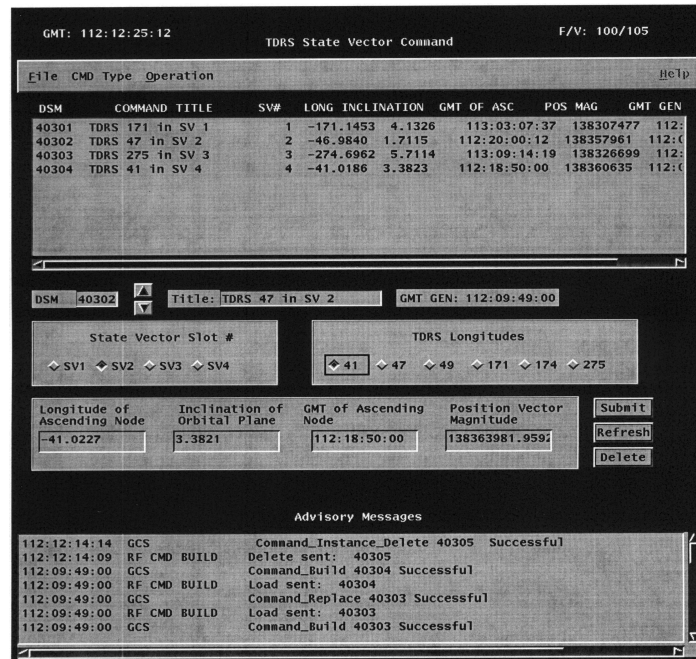
**GMT of Ascending Node** –This element of the TDRS state vector represents the closest time in GMT when the satellite will cross or will cross the equator on a Northern track (ascending node).

**Position Vector of Magnitude** – This element of the TDRS state vector represents the altitude of the satellite at the GMT of Ascending Node.

**Submit** –This button is used to submit the command that is displayed to the command server.

**Refresh** –This button is used to request fresh data at the current SGMT for the command displayed in the build area of the display.

**Delete** –This button is used to delete the command that is displayed in the build area.



*Example of TDRS Build display*

**PET SET Popup** - This option is used to set a PET so that MSPCs, SPCs, and TECs can be built with an offset time instead of the actual GMT of execution. The primary reason for this capability is to support commands that are tied to an activity and the activity time is not tied to GMT. The user will enter the GMT of the PET to reference and press the “submit” button on the popup window. There are two PETs that can be set. A future capability will be to allow the user to select the launch time as one of the PETs without knowing the actual launch time. Any commands that are tied to a PET will be automatically updated to reflect the time reference change.



Example of how PET works:  
 PET1 = 123:12:13:00  
 Offset = 000:00:05:00  
 123:12:18:00

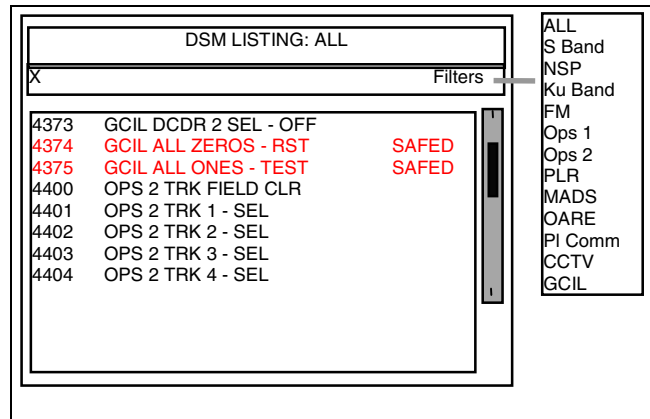
**DSM Popup** - This popup window will appear whenever the user presses the right mouse button when the mouse cursor is located over a DSM type-in box. There are two forms of this popup window dependent on the DSM type-in box that is used. The following are descriptions of the two forms.

**Loads** - If the popup window is called because the right mouse button was pressed for an MSPC, SPC, or TEC command load, the only DSMs in the popup window are those types of commands. The user will not be able to view any command load DSM outside of the ones that would normally be available for that command type.

**RTCs** - If the popup window is called because the right mouse button was pressed for an RTC, a listing of all the RTC DSMs will be in the popup window. With this form of the popup window comes a menu to filter out unwanted DSM numbers. The filter menu is based on the orbiter LRUs and will filter out all commands that do not manipulate the selected LRU. The following is a listing of the filters and the associated DSM numbers that are available from those filters.

<u>Filter</u>	<u>DSM Range</u>
ALL	All DSM numbers
S-band	4470 - 4475, 4709 - 4766
NSP	4758 - 4764, 4767 - 4779
Ku-band	4101 - 4141
FM	4780 - 4794
OPS 1	4300 - 4395
OPS 2	4400 - 4458
PLR	4500 - 4574
MADS	4600 - 4632, 5701 - 5767
OARE	7001 - 7006
PL comm	4800 - 4845
CCTV	4185 - 4293
GCIL	4370 - 4376





*Example of the DSM Listing popup window*

## TITLE

COMMAND BUFFERS DISPLAY

## GENERAL

The command buffers display can display all the command buffers that are available in any of the software major functions of the orbiter. This display replaces MOC MSKs 911, 978, and 3603.

This display is divided into several sections. The top of the display is the menu bar that contains all the pull-down menus available to manipulate the parts of the display. There are five window panes that display the stored commands. The lower part of the display allows the user to manually delete commands from the command server. The bottom of the display shows any advisories from the command server itself.

## DISPLAY DESCRIPTION

The top of this display (Figure 5.144-1) has the menus for manipulating the contents of the display. The following is a description of each of these menus and the options available on them.

- A. **File** - This menu currently contains only the EXIT button for terminating the display.
- B. **Sort** - This menu contains the options for sorting a buffer window. The following list is the descriptions of the available options.
  - 1. **Execution Time** - This option will sort the buffer window by the time the commands in the buffer will execute. The first command to execute will be located at the top of the list, and the last will be at the bottom. This is the default sort type.
  - 2. **Load Number** - This option will sort by the type of commands in the buffers. Example: 12101 will be displayed before 12102, etc.
  - 3. **Title** - This option will sort the buffers window alphabetically by the name of the commands in the buffer. Example: Ku-band before S-band commands.
  - 4. **Entry Number** - This option will sort the list of commands by their entry index number, which is related to the position in the loads that were uplinked.
- C. **Help** - This menu option will display a help file to assist the user with the operation of the display.
- D. **Window Panes** - The primary purpose of the display is to show the commands that are stored in buffers on the orbiter. There are four command buffers available on the orbiter. This display includes a fifth buffer that will display a sorted version of all the commands that are stored onboard. The following is a description of the five windows that contain the command data for each of the onboard buffers.
  - 1. **All Commands** - This window pane will display all the commands that the command server "thinks" are awaiting execution onboard the orbiter. Any command buffer that has a command in it will be displayed with this option. The default sorting used is execution time (see the earlier discussion).
  - 2. **SM SPCs** - This window displays only the SM stored program commands that are awaiting execution.

com\_buff

<u>F</u> ile	<u>S</u> ort			<u>H</u> elp
--------------	--------------	--	--	--------------

GMT: 340:18:29:06 F/V: 080/103

All Commands				
Buff	Load	DSM	Title	Time
SPC	12101	4351	Ops 1 Stop	342:12:18:34
SPC	12101	4451	Ops 2 Stop	342:12:18:35
TEC	13401	14005	Sband W Pri	342:18:20:00
TEC	13402	14004	Ku Band W Pri	342:18:20:01
SPC	12102	4567	Fuel Cell 1 Off	342:20:34:00

---

SM Commands

---

TEC Commands

TEC	13401	14005	Sband W Pri	342:18:20:00
TEC	13402	14004	Ku Band W Pri	342:18:20:01

---

SpaceLab Commands

---

BFS Commands

---

Update Buffer

Buff: <input style="width: 50px;" type="text"/>	Load: <input style="width: 50px;" type="text"/>	DSM: <input style="width: 50px;" type="text"/>	Entry: <input style="width: 50px;" type="text"/>	<input type="button" value="Delete"/>
---	---	--	--	---------------------------------------

Command Advisories

**Figure 5.144-1. Com\_buff display**

3. **SM TECs** - This window displays only the time executed commands that are awaiting execution.
4. **Spacelab SPC** - This window displays only the SpaceLab stored program commands that are awaiting execution.
5. **BFS SPC** - This window displays only the BFS stored program commands that are awaiting execution.
6. **Window Configuration** - Each of the windows is built the same way. The following discussion explains the components of each window pane.
  - a. **Buffer Title** - The type of command displayed. Example: SPC, TEC, SL SPC, or BFS.
  - b. **Load** - The DSM of the command load used to put the command onboard the orbiter. Example: 12101 or 13401.
  - c. **DSM** - The title of the command in the buffer. Example: 4351 for Ops 1 Stop.
  - d. **Time** - The DSM of the command in the command load uplinked. Example: 4351 for Ops 1 Stop.

- e. **Title** - The time (in GMT) that the command will execute onboard.
- f. **Entry** - This is the index number of the commands in the loads.
- g. **Sizing Button** - Each buffer has a small square located in the lower right-hand side of the window. This square is used to resize the window. The window can be resized to take up almost all of the displays space, but at least a small visible area will be there for the other buffer windows. If the buffer window is made too small to display all the commands that need to be displayed, a scroll bar appears on the right side of the window. This scroll bar can be used to see the commands that are not currently visible.

#### E. Update Buffer

Since this display is driven by what is uplinked and does not reflect what is actually in the command buffers onboard, a way was needed to delete any commands from the display that were not onboard for a reason. This section of the display is used for that purpose. The following list is a description of data displayed when a command is selected for deletion from a buffer.

1. **Buff** - This box displays the command buffer from which a command is to be deleted. Example: SM SPC, BFS SPC, TEC, or SSPC.
2. **Load** - This box displays the DSM number of the command load to be deleted from the command buffers.
3. **DSM** - This box displays the DSM number of the command to be deleted from the command buffer.
4. **Entry** - This box displays the Entry number for the command to be deleted from the buffers display.

The only way the user can select a command to be deleted from the buffer is by pressing the left mouse button while the mouse cursor is located over a command line in one of the buffer window panes. The command information will appear in the Update Buffer area. Once the command data is filled in, the DELETE button will be active so that the delete operation can take place. The commands to be deleted will not be deleted until this button is pressed. The only personnel who have the capability to delete commands from the buffers display are INCO and Command groups.

At the bottom of the display is the Command Advisories section. This part of the display will inform the user of any messages from the command server of the display itself. It contains a scrolled list of messages so that the user can look back for old messages.

All copies of the display will be kept up to date by the command server. When a command is uplinked, the display will update as the buffer compare happens on the command and before the buffer execute command is uplinked. As command execution times pass, the displays will be refreshed. If a user deletes a command from one of the buffers, the other copies of the display will be updated to reflect the change.

**TITLE**

SHUTTLE AND STATION FREQUENCY AND POWER SPECIFICATIONS AND ANTENNA LOCATIONS

**PURPOSE**

To provide tabulated specifications for all transmitters and receivers onboard the shuttle and station; also, to show the locations of all antennas. The transmitters and receivers are not only for Comm, but also for GNC systems.

**FREQUENCY AND POWER SPECIFICATIONS**

**A. Shuttle**

System: **Ku-BAND**

Effective: In use

Mode	XMIT FREQ. (GHz)	RCV FREQ. (GHz)	PWR OUT (W)	Modulation
COMM	15.0034	13.7750	50.0	PSK
RADAR	13.779-13.879	13.779-13.879	50.0 max. <sup>①</sup>	N/A

<sup>①</sup> Power is much less during rendezvous operations.

System: **RADAR ALTIMETER**

Effective: In use

Mode	XMIT FREQ. (MHz)	RCV FREQ. (MHz)	PWR OUT (W)	Modulation
N/A	4290-4310	4290-4310	200	PTM

System: **S-BAND FM**

Effective: In use

Mode	XMIT FREQ. (MHz)	RCV FREQ. (MHz)	PWR OUT (W)	Modulation
ALL	2250.0	2250.0 <sup>②</sup>	15.0	FM

<sup>②</sup> EMU camera signal.

System: **S-BAND PI**

Effective: In use

Mode	XMIT FREQ. (MHz)	RCV FREQ. (MHz)	PWR OUT (W)	Modulation
N/A	1759.7-2120.1	1197.5-2302.4	10.6 max.	PM

System: **S-BAND PM**

Effective: In use

Mode	XMIT FREQ. (MHz)	RCV FREQ. (MHz)	PWR OUT (W)	Modulation
SGLS (LOW FREQ.)	2217.5	1775.733	8.4	PSK
SGLS (HIGH FREQ.)	2287.5	1831.787	8.4	PSK
STDN LO (LOW FREQ.)	2217.5	2041.947	8.4	PM/PSK
STDN LO (HIGH FREQ.)	2287.5	2106.406	8.4	PM/PSK
TDRS/STDN HI (LOW FREQ.)	2217.5	2041.947	144-151 <sup>®</sup>	PM/PSK
TDRS/STDN HI (HIGH FREQ.)	2287.5	2106.406	144-151 <sup>®</sup>	PM/PSK

<sup>®</sup> Varies with transmit frequencies.

System: **SHUCS**

Effective: In use

Mode	XMIT FREQ. (MHz)	RCV FREQ. (MHz)	PWR OUT (W)	Modulation
N/A	1626.5-1646.5	1525.0-1545.0	15.0 max.	QPSK

System: **SSOR<sup>®</sup>**

Effective: 6A

Mode	XMIT FREQ. (MHz)	RCV FREQ. (MHz)	PWR OUT (W)	Modulation
LOW	414.2	414.2	0.25	FSK
HI	417.1	417.1	5.00	FSK

<sup>®</sup> EVA can also use UHF frequencies (see UHF system below).

System: **TACAN**

Effective: In use

Mode	XMIT FREQ. (MHz)	RCV FREQ. (MHz)	PWR OUT (W)	Modulation
X Channels-RCV	N/A	962-1024 <sup>®</sup> 1151-1213 <sup>®</sup>	800 max.	PCM
X Channels-XMIT/RCV	1025-1087 <sup>®</sup> 1088-1150 <sup>®</sup>	962-1024 <sup>®</sup> 1151-1213 <sup>®</sup>	650 max.	PCM
X Channels-AIR/AIR	1025-1087 <sup>®</sup> 1088-1150 <sup>®</sup>	1088-1150 <sup>®</sup> 1025-1087 <sup>®</sup>	500 max.	PCM
Y Channels-XMIT/RCV	1025-1087 <sup>®</sup> 1088-1150 <sup>®</sup>	1088-1150 <sup>®</sup> 1025-1087 <sup>®</sup>	650 max.	PCM
Y Channels-AIR/AIR	1025-1087 <sup>®</sup> 1088-1150 <sup>®</sup>	1088-1150 <sup>®</sup> 1025-1087 <sup>®</sup>	500 max.	PCM

<sup>®</sup> Channels 1 through 63.

<sup>®</sup> Channels 64 through 128.

System: **UHF**

Effective: In use

Mode	XMIT FREQ. (MHz)	RCV FREQ. (MHz)	PWR OUT (W)	Modulation
EVA	296.8  259.7	296.8 (V <sup>Ⓣ</sup> ) 259.7(V+D <sup>Ⓢ</sup> ) 279.0 (V+D) 259.7(V) 296.8 (V)	0.25	AM
SIMPLEX	296.8 259.7	296.8 (V) 259.7 (V)	0.25 or 10.0	AM
SIMPLEX + G <sup>Ⓢ</sup>	296.8  259.7	296.8 (V) 243.0 (V) 259.7 (V) 243.0 (V)	0.25 or 10.0	AM
G T/R	243.0	243.0 (V)	0.25 or 10.0	AM

<sup>Ⓣ</sup> Voice.

<sup>Ⓢ</sup> Data.

<sup>Ⓢ</sup> Guard.

System: **VHF<sup>⋄</sup>**

Effective: In use

	XMIT FREQ. (MHz)	RCV FREQ. (MHz)	PWR OUT (W)	Modulation
VHF 2 <sup>†</sup>	121.750	130.167	0.1 or 5.0 or 10.0 <sup>⋄</sup>	FM
VHF 1 <sup>⋄</sup>	139.208	143.625	0.1 or 5.0 or 10.0 <sup>⋄</sup>	FM

<sup>⋄</sup> Operation frequency range is 115MHz-174MHz, tunable in increments of 25KHz OR 12.5KHz.

<sup>†</sup> Contingency frequencies; antenna designed to radiate at 139.208MHz.

<sup>⋄</sup> Nominal frequencies and modulation.

<sup>⋄</sup> Low, medium, and high power settings.

## B. Station

System: **EARLY COMM (ECS)**

Effective: 2A

Mode	XMIT FREQ. (MHz)	RCV FREQ. (MHz)	PWR OUT (W)	Modulation
LOW/HI	2287.5	2106.4	10.0	BPSK

System: **INTERIM CONTROL MODULE (ICM)** Effective: 2A.1<sup>Ⓢ</sup>

Mode	XMIT FREQ. (MHz)	RCV FREQ. (MHz)	PWR OUT (W)	Modulation
MA	2287.5	2106.4	15.8	BPSK
S-BAND SA	N/A	2106.4	15.8	BPSK

<sup>Ⓢ</sup> May be 7A.1.

System: **Ku-BAND**

Effective: 6A

Mode	XMIT FREQ. (GHz)	RCV FREQ. (GHz)	PWR OUT (W)	Modulation
N/A	15.003	13.775	10.0	BPSK <sup>2</sup>

<sup>2</sup> For return link, UQPSK for forward link.

System: **S-BAND**

Effective: 4A<sup>3</sup>

Mode	XMIT FREQ. (MHz)	RCV FREQ. (MHz)	PWR OUT (W)	Modulation
LOW/HI	2265.00	2085.70	21.0	BPSK

<sup>3</sup> Low data rate is operational at 4A while high data rate is operational at 5A.

System: **UHF (or SSSR)**

Effective: 6A

Mode	XMIT FREQ. (MHz)	RCV FREQ. (MHz)	PWR OUT (W)	Modulation
LOW	414.2	414.2	0.25	CPFSK
HI	417.1	417.1	5.00	CPFSK

System: **WIRELESS VIDEO SYSTEM (WVS)** Effective: 4A

Mode	XMIT FREQ. (MHz)	RCV FREQ. (MHz)	PWR OUT (W)	Modulation
N/A	N/A	400.2 <sup>4</sup>	min 0.250	GMSK
N/A	2410 <sup>5</sup> 2470 <sup>6</sup>	N/A	0.125-0.250	GMSK

<sup>4</sup> Commands and UHF to EMUs.

<sup>5</sup> Video signals from EMUs.

<sup>6</sup> S-band, center frequency.



ANTENNA LOCATIONS

A. Shuttle (see Figure 6.3-1 and Figure 6.3-2)

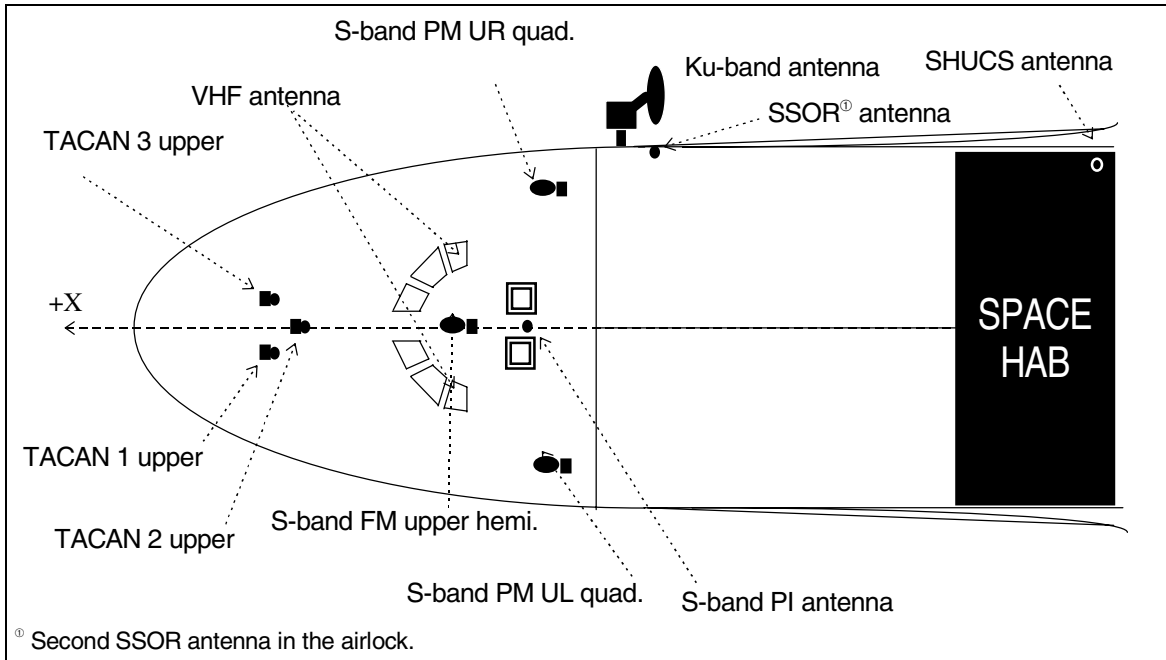


Figure 6.3-1. Top view of the shuttle vehicle/antenna locations

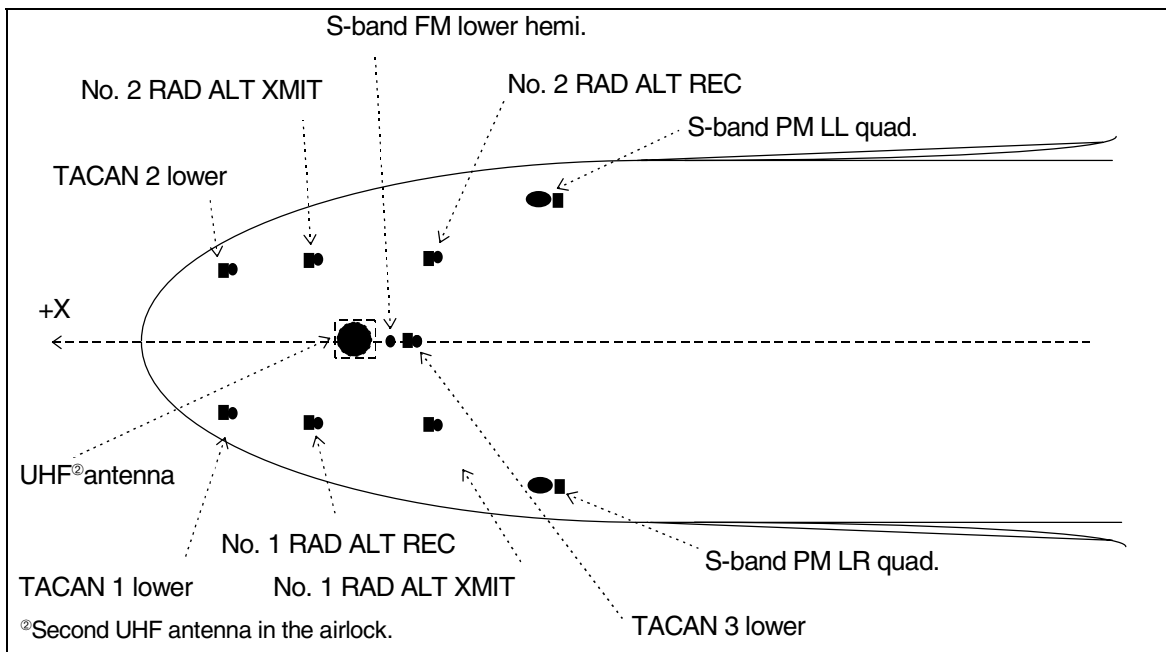


Figure 6.3-2. Bottom view of the shuttle vehicle/antenna locations

B. Station (See Figure 6.3-3 through Figure 6.3-7)

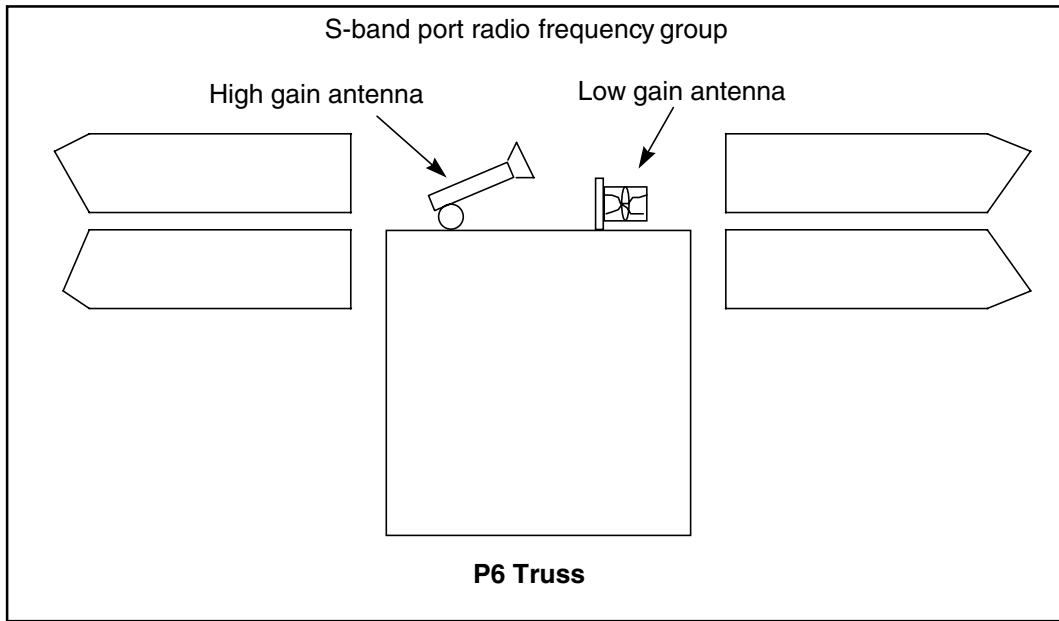


Figure 6.3-3. S-band antenna locations

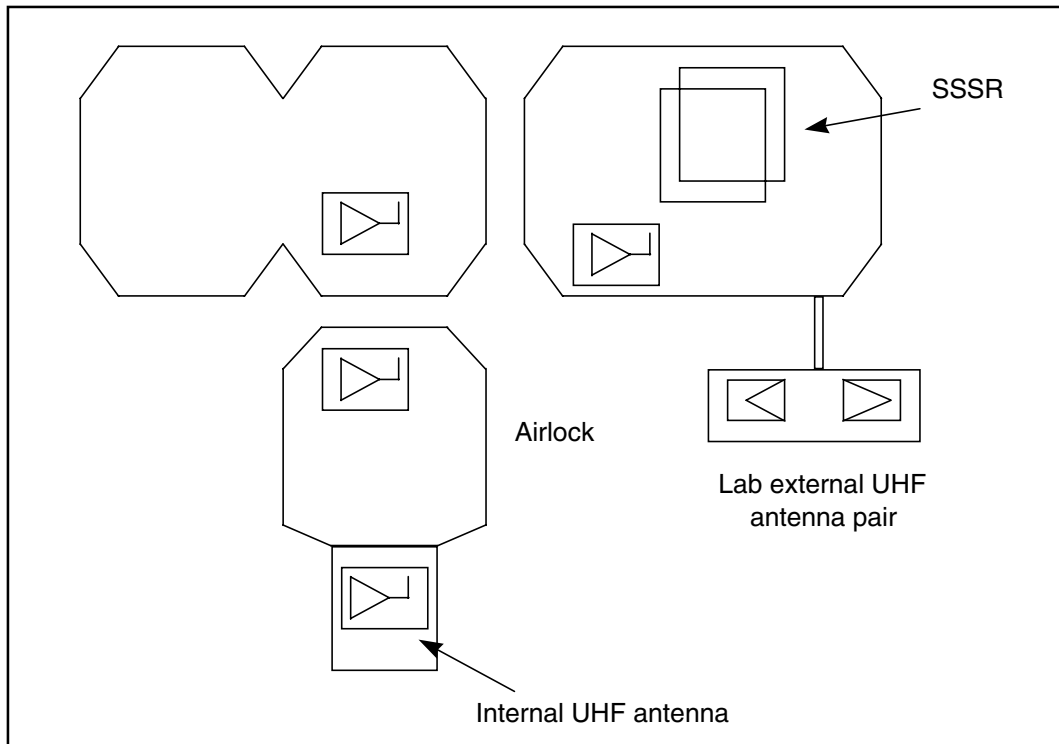
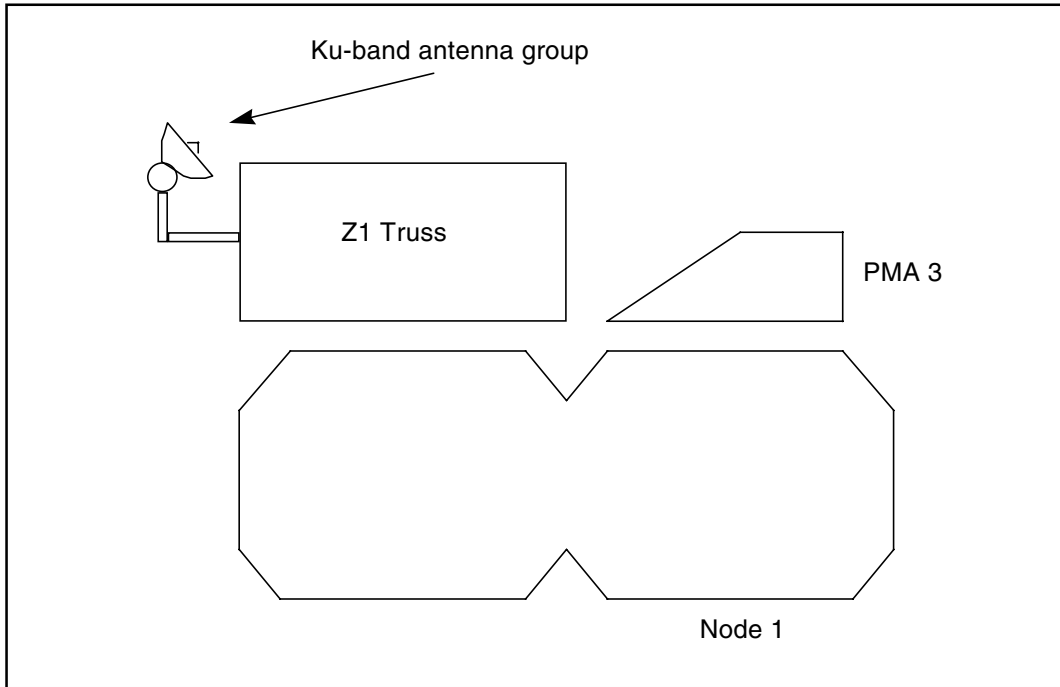
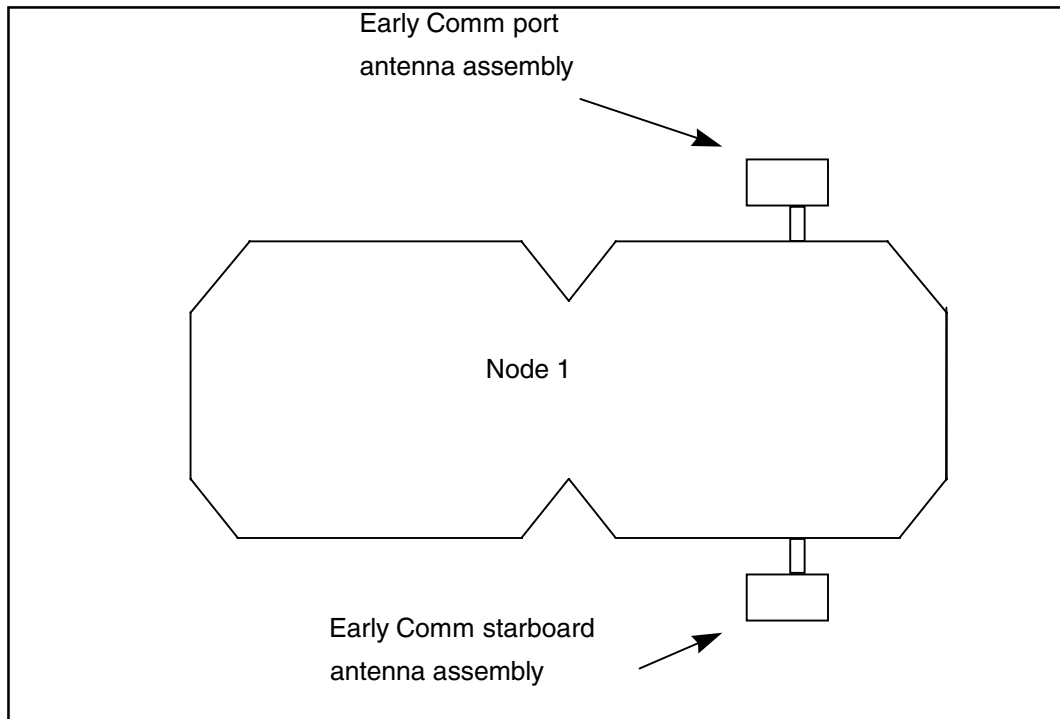


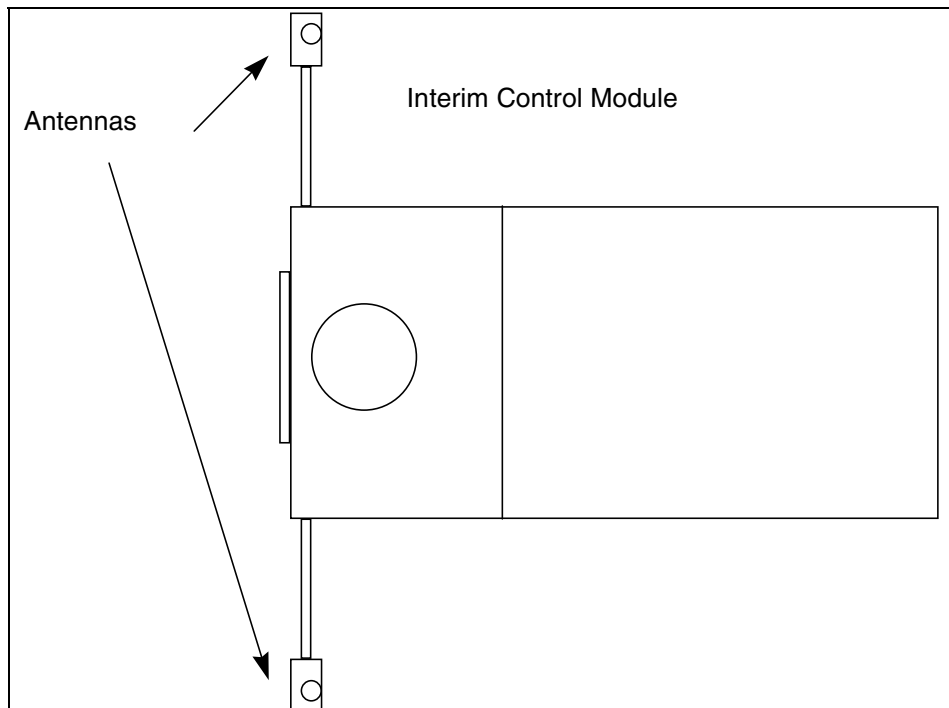
Figure 6.3-4. UHF antenna locations



**Figure 6.3-5. Ku-band antenna location**



**Figure 6.3-6. ECS antenna locations**



*Figure 6.3-7. ICM antenna location*

## TITLE

GENERAL PROCEDURE FOR CERTIFICATION OF DISPLAYS AND APPLICATIONS IN THE MCC

## PURPOSE

This procedure documents some basic standard information that is required in the documentation used to certify MCC displays and applications.

## GENERAL

A standard for what is required for the documentation of verification tests of applications and displays in the MCC. This SCP is divided into the primary types of application and display certification (first time cert, no change recert, and minor change recert). The suggestions in this SCP are general. The user should try to include as much data as possible when certifying applications and displays.

## FIRST TIME/MAJOR CHANGE CERTIFICATION

First time certification means the application or display has never been certified before in the MCC. Every possible combination of states that the display or application can have must be tested and documented. The following are some suggested data to collect and how to prove that the states of the application or display were tested.

- A. Start the display or application without any data flowing (if it uses data at all). This will verify that the program does not die when there is no data for it to process. Hard copy all applicable displays and mark up the printouts to indicate this condition.
- B. Systematically proceed through each state of each part of the application or display. Document via hard copies each state possible. Mark the hard copies with the state tested. A good way to document the states in the verification report is to use a matrix or table that was prebuilt by the developer of the primary tester and simply check off each state as it is seen.
- C. Write up a verification report using the example in Figure 7.1-1.
- D. Sign the verification report and the application notebook cover sheet and return the application notebook to the Discipline Technical Representative (DTR).
- E. The DTR will review the documentation and inform the tester of any missing data that is required before the application or display can be certified.
- F. The DTR will review the application notebook and forward it to the Software Management Board (SMB) chairman for final approval before the application or display is transferred to the certification directories in the MCC.

## Verification Test

**Application Name:** General Payload Load      **Version #:** 1.0

**Tester's Name:** Steve Sides

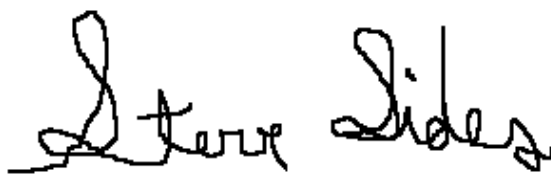
**Test Date:** 06/21/95

**Comments:**

I have tested the General Payload Load display during an Ops comp run. The following are the steps that I used to test this display.

1. I made hard copies of the display and the EDTE display (MSK980) with no data in them. I tried go to the next page. ERROR - general payload load display lets the user change pages when there are not any more pages. An Ops note explaining this problem must be supplied.
2. I built 5 PSP dummy commands using the MED emulator application and sent them to the MOC.
3. I made hard copies of the Xbuilder display and MSK 980 for all the commands built. I included the printouts with this report.
4. I verified that the display returned to page 1 after the last command in the list.

I recommend this application for recertification and promotion to mission support.



*Figure 7.1-1. Verification Test*

### NO CHANGE CERTIFICATION

No change certification will be done when there is a change to the MCC baseline services and the application or display has been recompiled/relinked to support those changes to the baseline. The tests for this level of certification are not as detailed as a first time certification. Only the major modules of the displays or applications need to be verified.

- A. Start the display with data flowing, if needed.
- B. Systematically check each major part of the display or application to verify that the application or display still works the same as it did before the baseline change.
- C. Write up a verification report like example 7.1-1 but with less data required.
- D. Sign the verification report and the applications notebook cover sheet and return it to the DTR.
- E. The DTR will review the document and inform the tester of any missing data that is required before the application or display can be certified.
- F. The DTR will review the application notebook and forward it to the SMB chairman for final approval before the application or display is transferred to the certification directories in the MCC.

### MINOR CHANGE CERTIFICATION

Minor change certification will be done when there is a small change to application or display. Small change means a change that does not greatly affect the operation of the display or application. The tests for this level of certification are not as detailed as a first time certification but are more detailed than the no change certification. Major modules of the displays or applications need to be verified, as well as the documented changes to the display or application.

- A. Start the display with data flowing, if needed, unless the change was to the data acquisition interface.
- B. Systematically check each major part of the display or application to verify that the application or display still works the same as it did before the baseline change.
- C. Write up a verification report like example 7.1-1 but with less data required.
- D. Sign the verification report and the applications notebook cover sheet and return it to the MCC lead.
- E. The DTR lead will review the document and inform the tester of any missing data that is required before the application or display can be certified.
- F. The DTR will review the application notebook and forward it to the SMB chairman for final approval before the application or display is transferred to the certification directories in the MCC.

## TITLE

COMMAND SYSTEM: HARDWARE PANEL CONFIGURATION MANAGEMENT PROCESS

## PURPOSE

To define a standard procedure required for modification of the hardware panel database.

## GENERAL

Whenever there is a change required to the hardware panel database, the user will need to follow some very carefully constructed steps so that there cannot be any chance of an error in the database.

## PROCEDURE

- A. Log on to a workstation in the Consolidated Development Environment (CDE).
- B. Open an xterm and start the hardware panel cm tool. See the hardware panel certification notebook for the procedure to start the cm tool.
- C. Edit the database per the cm tool users guide.
- D. Run the verification report per the cm tool users guide.
- E. Manually verify all the warning messages generated by the cm tool verification task. There will be some warning messages associated with buildable loads and MRTCs. The cm tool will ask the user to verify or not verify the report, since there are some warnings. If the user accepts the verification report, the cm tool will set the checksum so that any more changes will be rejected by the hardware panel background process.
- F. Contact an INCO Group Administrator (GA) for transfer of the new database to the ops side. The GAs are  

Tim Craft	713-760-7886
Laura Hoppe	281-483-1969
- G. Once the GA has moved the database to the ops side, the user will need to verify that the changed database is in the correct place. During a comp run, set up the new database and press all the commands that were changed during the editing process.
- H. Repeat step G by having two independent testers verify that the changes were made.
- I. Generate the test reports and the application cover sheet for signoff by management.
- J. Fill out the application notebook cover sheet and the Joint Evaluation Team (JET) form. When both of these forms have been signed off by the Discipline Technical Representative (DTR), the DTR should get the software management board chairman's signature before submitting the forms to the JET.
- K. Inform an INCO GA that the database needs to be promoted to the certification directories for flight support. See step F for the list of GAs.



## TITLE

DATA ACQUISITION IN THE MCC

## PURPOSE

To define a standard procedure for initialization and operation of the data acquisition system in the MCC.

## GENERAL

This procedure explains how the DATA ACQ function works on the INCO workstations in the MCC and how to manually start and stop data flow to the workstations.

## PROCEDURE

How to Start DATA ACQ.

The data source that is used by the INCO displays is called Information Sharing Protocol (ISP). The process that collects the data for display is named "ispdacq." The ispdacq server automatically starts on the normal INCO workstations in the white-fcr. These workstations are white-fcr5 and white-fcr24. The best way to make sure that the ispdacq application is running on the most efficient workstation (white-fcr24 is to log onto this workstation before logging on to the other INCO workstation. If the normal INCO workstations are not being used for the activity, data acq will have to be started manually. The following steps explain the procedure for manually starting data acq so that INCO displays have telemetry and computational data.

- A. From the INCO DNAV, select DATA ACQ/START DATA.
- B. Repeat step 1 on the workstation to be used as the backup to the prime workstation that is running the ispdacq program.
- B. Start up some of the real-time displays to verify that DATA ACQ has started. The user can also note the DATA ACQ-related messages that will be generated in the advisory services window.

How To Tell If DATA ACQ Is Working.

Generally, the times at the top of each of the displays will increment as long as DATA ACQ is working (exception is LOS periods).

What To Do If DATA ACQ Quits

When there is a workstation problem that causes the ispdacq program to terminate, another application will automatically move the ispdacq program to the backup workstation.

- A. When DATA ACQ quits on both the prime and backup workstations, it has been a very bad day for INCO. DATA ACQ will have to be started on a third workstation. If the normal workstations are being used, the backup to both of the FCR workstations is the INST workstation (white-mpsr5). The How to Start DATA ACQ procedure should be followed to recover data to the displays. All the displays should automatically reconnect to the new DATA ACQ server. The reconnection might take a minute, so be patient.
- B. If the workstation displays are not changing (GMT and MET not updating), that workstation may have fallen off the LAN. Verify that the DATA ACQ workstations are processing data by asking INCO or looking at another INCO workstation. If none of the INCO workstations is processing any data updates, there is a very serious problem with the MCC LAN network that will have to be

worked by the workstation systems supervisor (WSS) on the WSS call loop. They will tell you what should be done to recover data flow.

#### How to Stop DATA ACQ

Normally, there is no need to stop data flow on the INCO workstations, but if it is started on one of the other workstations as a backup to the INCO workstations, the following procedure should be used when that backup is not needed any longer.

- A. From the INCO DNAV, select DATA ACQ/STOP DATA. This will start the automatic process to gracefully shut down all the DATA ACQ-related processes on the workstation.

Some of the displays that are used by the INCO group start their own data flowing when they are started from the DNAV menu. If these displays do not show good data, they must be dropped so that the DATA ACQ background processes will quit. If there is more than one copy of a display of this type running, all of the copies will have to be dropped before the background process will quit.

#### What to Do When a Comp Does Not Work

Sometimes comps will stop processing data to the displays. An "M" will be displayed for the parameter that is computed in the comp. The following procedure can be used to restart individual comps on the workstation where they are running.

- A. From the INCO DNAV, select DATA ACQ/SHOW CONNECTIONS. Look for the computation that is failed and determine on which workstation it is running. This is usually white-fcr5 or white-fcr24.
- B. From the MASTER DNAV, on the workstation on which the comp is running, select GLOBAL/AUTOPANEL. The autopanel display will appear.
- C. Locate the comp name on the display. Press the left mouse button when the cursor is located over the comp name. This will select the comp.
- D. Press the right mouse button to view a small menu. Select Restart. A worry box will pop up. Select the YES option to restart the comp. Once the comp is restarted, the M's on the displays should be replaced by valid data, if there are data flowing to the workstations.

#### To Restart All the Comps on a Workstation

Sometimes none of the comps on a workstation are running correctly. Use the following procedure to restart all the comps that are running on the workstation.

- A. From the INCO DNAV on the workstation with the failed comps, select DATA ACQ/RESTART COMPS. All the M's on the displays should be replaced by valid data, if there are data flowing to the workstations.

#### How to Start Oimon

Oimon is a special process that is used to determine the health and status of the OI MDMs and DSCs. Normally, it will start automatically on the INST workstation (white-mpsr5). The way to tell if it started automatically on the workstation is to call up one of its displays. The best one to call up is the "raw data" display. This display is located on the INCO DNAV under the DISPLAYS/INST SYSTEMS/raw data menu option. If oimon is not running, the following procedure should be used to start it.

- A. From the INCO DNAV, select DATA ACQ/Start oimon. A small display will pop up on the lower right hand side of the monitor of the workstation on which it is started. This display will tell when

the program is running and where. It will beep in the headset of the DVIS that is plugged into the workstation when oimon quits.

#### How To Stop Oimon

Oimon should not have to be stopped, but if there is some reason to, the following step should be taken.

- A. From the INCO DNAV, on the workstation that oimon is running on, select DATA ACQ/Stop oimon. There will be a beep in the headset that is connected to the workstation that oimon was running on and all the MDM wrap parameters will change to "M".

#### When All Else Fails!

- A. Contact WSS on the WSS call loop for help and write a DR. Do not let them try to troubleshoot too long. Tell them to reboot the workstation so that INCO can get back to work.
- B. Contact an INCO Group Administrator (GA). The GAs are

Laura Hoppe	(281) 483-1969
Tim Craft	(713) 760-7866
Steve Sides	(713) 891-8821

**TITLE**

DUMP REPORT PROGRAM USER'S GUIDE

**PURPOSE**

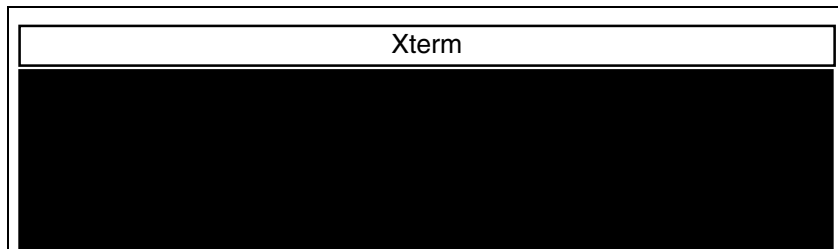
This procedure documents how the user will execute the dmp\_rpt program to process a dump Front End Processor (FEP) report.

**GENERAL**

The dump FEP generates a report that details each second that is dumped to the ground from the orbiter operational recorders. The workstation file generated can be very large and difficult to review for data segments. This program will read the dump FEP report and generate a smaller report that includes the start and stop times of the data segments that contain at least the user defined number of minor frames per major frames.

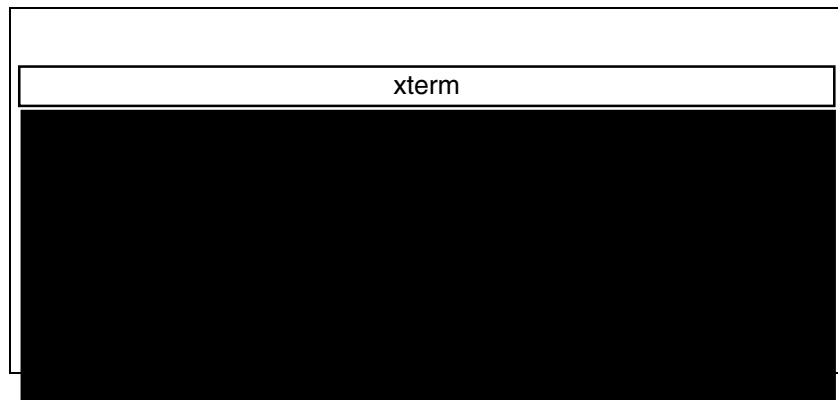
**PROCEDURES**

- A. From the INCO DNAV select Ground Displays/Dump Report.
- B. A small window will open that lists the files available to process. Ask DFE which report file is from the dump that you want to process (Figure 7.7-1). The format of the file name should be <site><rev #>



**Figure 7.7-1. Report to process screen**

- C. The program will ask you for a report filename to process, followed by the number of minor frames per major frame that are considered to be a valid dump (Figure 7.7-2).



**Figure 7.7-2. Frame count screen**

- D. Once the operation is complete, the user can close the window by pressing the Return key. To process another report, simply start at step 1 again.

To delete files from the dump directory

The directory on the workstation that contains the files that the dump report processes periodically will get full and should be cleaned out. Use the following procedure to delete the files from this directory:

- From the INCO DNAV, select Ground Displays/Delete Dump Files
- The files in the dump directory will be deleted

Error messages

There are several possible messages that the program can generate. These messages are displayed in the window. The following is a list of the messages and the meaning of each:

- A. dmp\_rpt can't find the <report name> TERMINATING - This message means that the program could not locate the report name that was entered. The file either does not exist or is located in another directory. Contact DFE to find out in what directory they stored the report.
- B. Using 99 for frame count - This message means that the user did not enter a frame count number. The normal number is between 0 and 100.

## TITLE

X WORLD MAP USERS GUIDE (VERSION 1.0)

## GENERAL

The x world map suite is a set of applications used in the Consolidated Control Center (CCC). There are four modules in the x world map suite. The first is the world map display, which shows the position of the orbiter and other satellites over the Earth. The second is the world map daemon (xmadsd), which is a background process used for collecting statistical data on telemetry drop outs. This module collects the data and makes it available to the real-time display (xvwm) statistics (xskaps) and S-band quad antenna (xsqad) modules. The scope of this users guide is for the world map display only. The other modules are discussed in SCP **TBD**.

## OVERALL DISPLAY

There are several parts to the world map display but the general look and feel of the display is in the following figure.

**TBD**

### ***Figure 7.8-1. x world map***

The top part of the display contains all the controls for the application. The options button will list all the actions that the user can take to modify the world map. The quit button will terminate the execution of the application. The help button opens a window with the help file in it. The following sections will explain the use of each of these buttons in more detail.

The map part of the display is where all the work is done. The position of the orbiter is generated by processing the Systems Management (SM) telemetry from the orbiter for the data. If the orbiter data is lost, the program will continue to update by propagating the position from the last good data. All data losses are marked on the display with a red line along the path the orbiter followed. This gives a graphical representation of where there were data drop outs.

## THE OPTIONS MENU

The options menu has 10 options. The options are explained as follows:

- A. Resize Map - This option will allow the user to select from three different sizes. The choices are
  - Small size
  - Medium size
  - Large size
- B. Clear Data Point - This option clears all the LOS data points for the world map display.
- C. Orbit Number - This option allows the user to set the orbit number.
- D. Color Key - This option displays the color key for all the possible combinations of lines over backgrounds.
- E. Statistics - If the world map daemon is running, this option will display a window with the statistics on the S-band antennas and how and where data drop outs occurred.
- F. Ground Stations - This option opens a display with the list of available sites that can be displayed on the world map. These sites will be displayed with their associated masking for the altitude of the orbiter. The user selects all the sites they want to display and presses the Apply button. If they do not want to make any changes, then they press the Cancel button.
- G. Satellites - This option opens a display with the list of available satellites to display. The user selects all the satellites they want to display and presses the Apply button. If they do not want to make any changes, then they press the Cancel button.
- H. TDRS Footprints - This option allows the user to select which TDRSS satellite will show its "footprint" on the world map. The footprint is used to determine when a TDRS satellite is in view of the orbiter. There are three choices
  - TDRSS East
  - TDRSS Spare
  - TDRSS West

The user selects all the satellites they want to display and presses the Apply button. If they do not want to make any changes, then they press the Cancel button.
- I. Show SAA - This option allows the user to show the South Atlantic Anomaly (SAA) on the world map display.
- J. Show Sun Terminator - This option allows the user to show the locations over the world where the Sun will be shining. There are two sets of terminator lines displayed. One is for ground Sun raise and set, and the other is for orbiter Sun raise and set.

## QUIT BUTTON

This button is used to terminate the execution of the display.

## HELP BUTTON

This button will open a display with a help file in it.

## TITLE

MEWS USERS GUIDE FOR INCO USERS

## PURPOSE

To provide a procedure for using the Mission Evaluation Workstation System (MEWS) program for collecting and displaying Operational Data Reduction Complex (ODRC) data on the MCC INCO team member's workstation.

## GENERAL

This users guide is designed to assist the user in operating some of the more simple functions that are available in the MEWS suite of programs. See the MEWS Users Guide for assistance on the other functions for MEWS or call the ODRC help desk at 483-ODRC for assistance on any problem in pulling ODRC data.

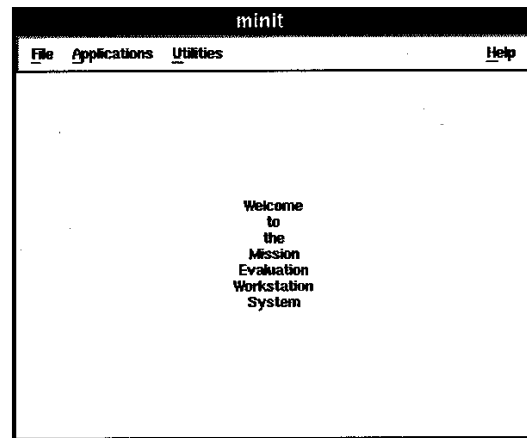
## COMMON PROCEDURES

To select a box or button - Move the mouse cursor over the box or button, then press and release the left mouse button.

To type text in a "type-in box" - Move the mouse cursor into the box, select the box but leave the mouse cursor in the box, then type in the text.

## TO START MEWS

- A. Select Master Display Navigation (DNAV) and Global APPS.
- B. Slide the mouse cursor down to the MEWS/ODRC option and release the left mouse button.
- C. The following window should appear (Figure 7.9-1).

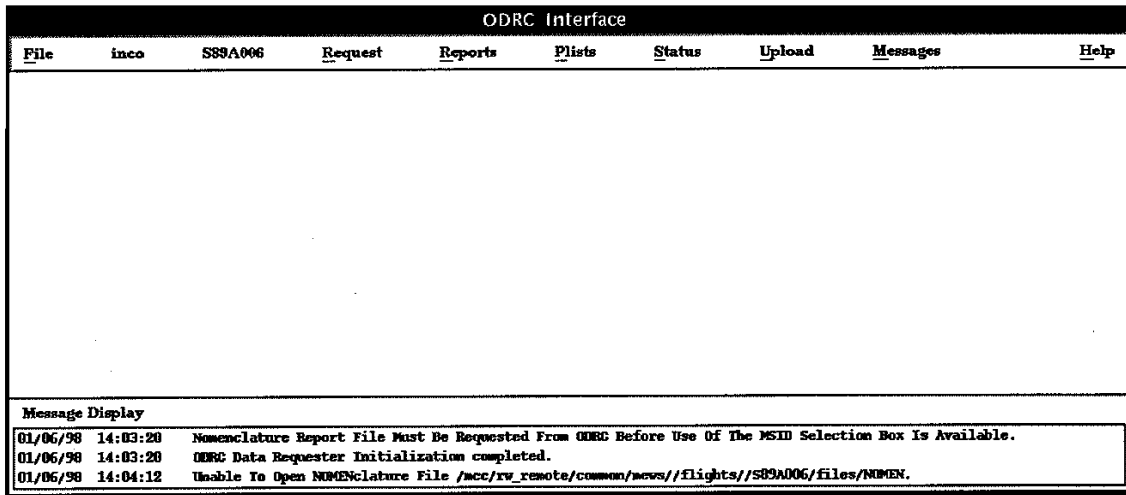


*Figure 7.9-1. Welcome window*



### TO GET ODRC DATA

- A. Follow the procedure, TO START MEWS, then select Applications.
- B. Select ODRC Interface. Wait a few seconds and a window will open (Figure 7.9-2).



**Figure 7.9-2. ODRC interface**

- C. Verify that the correct flight ID is at the top of the window.

If the flight ID is not the correct one from which the data will be requested, follow the procedure TO CHANGE THE FLIGHT ID. Note that in ODRC, simulations are numbered with S for sim, two digits for flight, day of the year (local time), and run number is alphabetic; e.g., S89A006. On a flight, MEWS will default to the flight number, but a sim number must be selected when supporting a sim.

- D. Select Request and Operational Downlink to request data from the ODRC host.
  - 1. For a format that is already built for INCO.
    - a. Select Tab format (Figure 7.9-3).
    - b. Select the box for the List Files.
    - c. Click on the format name (one or more) and Done.

Request Operational Downlink Data			
<b>Options</b>			
<b>Build Request Items List</b>			
<b>Add Item</b> <input type="text"/>	<b>Item Type</b> <input type="checkbox"/> Plot Format <input type="checkbox"/> Tab Format <input type="checkbox"/> Plot Family <input type="checkbox"/> Tab Family <input type="checkbox"/> Verif Format <input type="checkbox"/> MSID <input type="checkbox"/> Local Plist <input type="checkbox"/> DPS Format	<b>Items List</b> RCDRS	<b>Type</b> T
<b>ODRC Plist</b> <input type="text"/>			
<b>MED Override</b> <input type="text"/>			
<input type="button" value="List Files"/>	<input type="button" value="List MSIDs"/>	<input type="button" value="Item Delete"/>	<input type="button" value="Recall List"/>
<b>Data Request Times And Rate</b>			
<b>Start</b>	DDD: <input type="text" value="017"/> : HH: <input type="text" value="00"/> : MM: <input type="text" value="00"/> : SS: <input type="text" value="00"/>	<b>Time Reference</b>	<input type="text" value="GMT"/>
<b>Stop</b>	DDD: <input type="text" value="017"/> : HH: <input type="text" value="01"/> : MM: <input type="text" value="00"/> : SS: <input type="text" value="00"/>	<b>Update Rate</b>	<input type="text" value="0"/>
(secs between samples 0=full)			
<b>Select Product Options</b>			
<b>Calibration</b> <input type="text" value="MCC CALIBRATIONS"/>	<b>Data Type</b> <input type="text" value="BEST"/>	<b>Product Type</b> <input type="text" value="COD"/>	
<b>Product Destination</b>			
<b>Node Address</b> <input type="text" value="white-mps9"/>	<b>Run Number</b> <input type="text" value="1"/>	<b>Filename</b> <input type="text" value="TEST1"/>	
<b>Select Action</b>			
<input type="button" value="Request"/>	<input type="button" value="Validate List"/>	<input type="button" value="Cancel"/>	

Figure 7.9-3. Parameter tab request

- d. Type in the start and stop times for the request by selecting each box and entering the appropriate values.
- e. In the Update Rate box, type in a sample rate:
  - “0” will request full rate data
  - “1” will request 1 second/sample
  - “2” will request 2 seconds/sample
- f. In the Filename box, type in a file name for the data to be written into.
- g. Select the Request button.

- h. Messages will scroll across the bottom of the window. Verify that the request completed without errors. If there are error messages, the request can be canceled and/or resubmitted.
2. There is a way to create a parameter list and send that list to the ODRC host computer. This procedure is not covered in this SCP, but the MEWS Users Guide contains a way to build a parameter list and send it to the ODRC host. These formats can be used by MEWS to request data. "Format."
- E. Once the data file is on the workstation, exit or minimize the ODRC Interface window.
- E. To view Tab format data, select Applications and Tab on the MEWS Welcome (minit) window.
1. Verify or change flight number.
  2. Select Format.
  3. Select Select Format.
  4. Select the tab format used above in step D. The selected tab format will change to white.
  5. Select Done. The window will disappear.
  6. Select Data.
  7. Select Select Data Source.
  8. Select the filename you used in step D. The selected filename will change to white.
  9. Select Done. The window will disappear.
  10. Select Tab.
  11. Select Tab to Screen.

## **TO PLOT DATA**

- A. Make the ODRC request as above, but request a Plot format instead of a Tab format (Figure 7.9-4).
- B. From the MEWS Welcome window, select Applications and Plot.
- C. Verify that the correct flight is shown at the top of the window. If it is not, follow the procedure, TO CHANGE THE FLIGHT ID.
- D. Select Data to pick the data file to plot.
- E. Select a data file from the list displayed. The data file name will change to white letters when it is selected.

**Request Operational Downlink Data**

---

**Options**

**Build Request Items List**

Add Item	Item Type	Items List	Type														
<input type="text"/>	<input checked="" type="checkbox"/> Plot Format	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">KU-TEMPS</td> <td style="width: 20%;">P</td> </tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </table>	KU-TEMPS	P													
KU-TEMPS	P																
	<input type="checkbox"/> Tab Format																
	<input type="checkbox"/> Plot Family																
	<input type="checkbox"/> Tab Family																
	<input type="checkbox"/> Verif Format																
	<input type="checkbox"/> MSID																
	<input type="checkbox"/> Local Plist																
	<input type="checkbox"/> DPS Format																

**ODRC Plist**

**MED Override**

---

**Data Request Times And Rate**

<b>Start</b>	DDD	HH	MM	SS	<b>Time Reference</b>	<input type="text" value="GMT"/>
	<input type="text" value="017"/>	<input type="text" value="00"/>	<input type="text" value="00"/>	<input type="text" value="00"/>		
<b>Stop</b>	DDD	HH	MM	SS	<b>Update Rate</b>	<input type="text" value="0"/>
	<input type="text" value="017"/>	<input type="text" value="01"/>	<input type="text" value="00"/>	<input type="text" value="00"/>		(secs between samples 0=full)

---

**Select Product Options**

<b>Calibration</b>	<b>Data Type</b>	<b>Product Type</b>
<input type="text" value="MCC CALIBRATIONS"/>	<input type="text" value="BEST"/>	<input type="text" value="COD"/>

---

**Product Destination**

<b>Node Address</b>	<b>Run Number</b>	<b>Filename</b>
<input type="text" value="white-wpsr9"/>	<input type="text" value="1"/>	<input type="text" value="TEST1"/>

---

**Select Action**

<input type="button" value="Request"/>	<input type="button" value="Validate List"/>	<input type="button" value="Cancel"/>
--	--	---------------------------------------

Figure 7.9-4. Parameter plot request

- F. Select Done. The window will disappear.
- G. Select Format.
- H. Select Select Format.
- I. Select a plot format from the list displayed. The selected plot format will change to white.
- J. Select Done. The window will disappear.
- K. Select Plot.
- L. Select View Plot. The plot will display in the window (Figure 7.9-5).

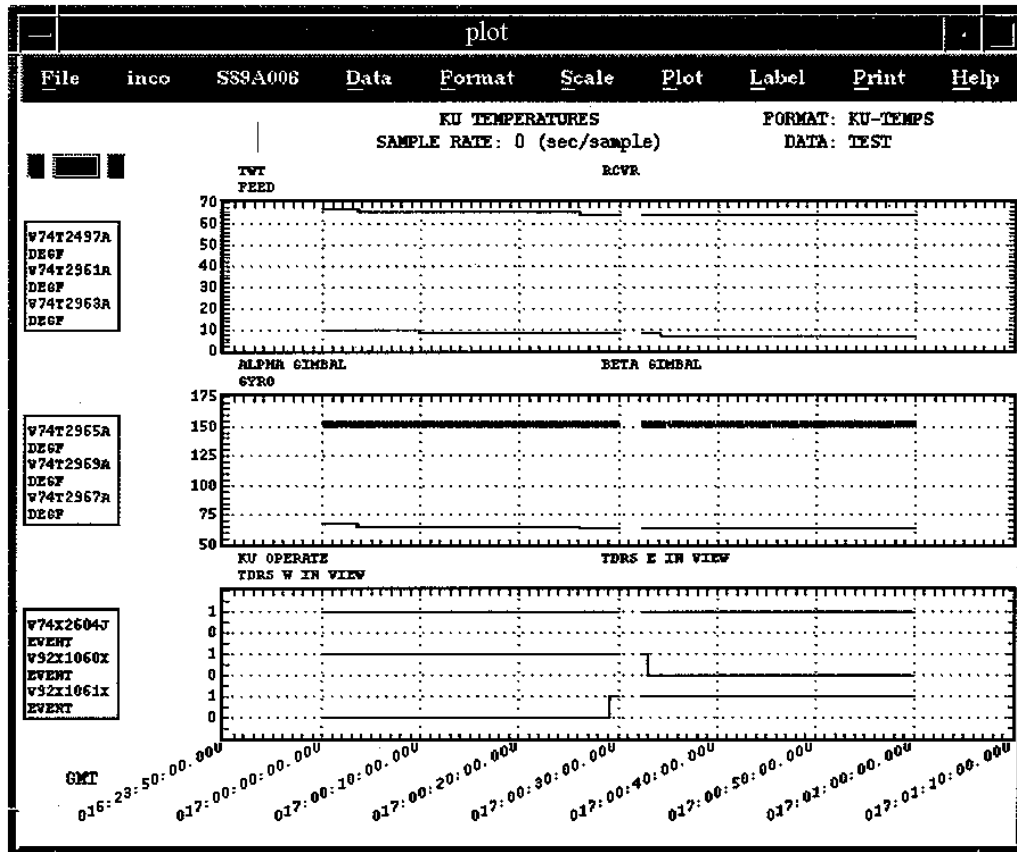
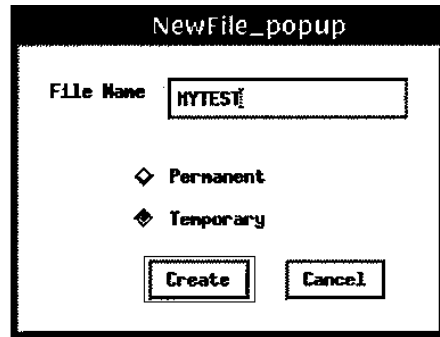


Figure 7.9-5. Plotted data

**TO CREATE A NEW PLOT FORMAT**

- A. Follow the procedure, TO START MEWS, then select Application.
- B. Select Plot.
- C. Select Format.
- D. Select Create Format.
- E. Type in a unique file name for the new plot format file and select Create (Figure 7.9-6).



**Figure 7.9-6. Assign name**

- F. Wait a few seconds and a new window will open (Figure 7.9-7).
- G. Type in a title in the TITLE box.
- H. Select the GRID box and type in a grid number (1 to 3). This will determine where the data for an MSID will be placed.
- I. Select the MSID box and type in the MSID to display data.
- J. Select the NOMENCLATURE box and type a short description of the MSID.
- K. Select Apply. The MSID and the nomenclature will show up in the box for the plot grid selected.
- L. If the MSID to be plotted is a discrete, then press the GRID x - ANALOG button to toggle to the GRID x - DISCRETE condition.  
  
Note: Analog and discrete data cannot be plotted in the same grid.
- M. If the MSID is analog, enter the Low and High scale limits.
- N. Enter a Low and High value for limit lines (optional). This will display a line on the plot grid at the requested level.
- O. Repeat steps H through K for all the MSIDs to be plotted in the same grid.
- P. Repeat steps H through O for each grid to be plotted.
- Q. Select SAVE to save all the work to a file. The window will disappear.

The screenshot shows the 'MEWS Format Editor' window. At the top, there is a 'Help' button. Below it, a 'MYTEST' label is on the left and a 'TITLE MY TEST' field is on the right. A central section contains 'GRID', 'MSID', and 'NOMENCLATURE' labels with corresponding input fields: '3', 'V75T2717A', and 'PLR TEMP'. To the right of these are 'APPLY' and 'MODIFY' buttons. The main area is divided into three columns for 'GRID 1 - ANALOG', 'GRID 2 - ANALOG', and 'GRID 3 - ANALOG'. Each column has a 'Major Divisions' field (set to '1'), a 'Y Low' field (set to '0'), a 'Y High' field (set to '150'), a 'Limit 1' field (set to '120'), and a 'Limit 2' field (set to '140'). The 'MSID' for each grid is 'V75T2517A', 'V75T2617A', and 'V75T2717A' respectively. At the bottom, there are buttons for 'SAVE', 'CANCEL', 'X-PLOT INACTIVE', 'EVENTS DISABLED', and 'DELETE'.

Figure 7.9-7. Build plot template

**TO CHANGE A PLOTS SCALE**

- A. Follow the procedure, TO PLOT DATA.
- B. Once the data is displayed, select Scaling.
- C. Select Y-Axis Zoom (mouse). A small circle will replace the shuttle as the mouse cursor.
- D. Select the upper and lower bounds to plot by moving the mouse cursor to a spot and pressing the left mouse button.

Note: The current value of the position of the mouse cursor is displayed in a small box in the upper left-hand corner of the window.

- E. Select Plot.
- F. Select View Plot.
- G. Verify that the Y-scale had changed for the plot grid requested (note changes in Figure 7.9-8).
- H. This same procedure can be followed for changing the X-axis scale (time).

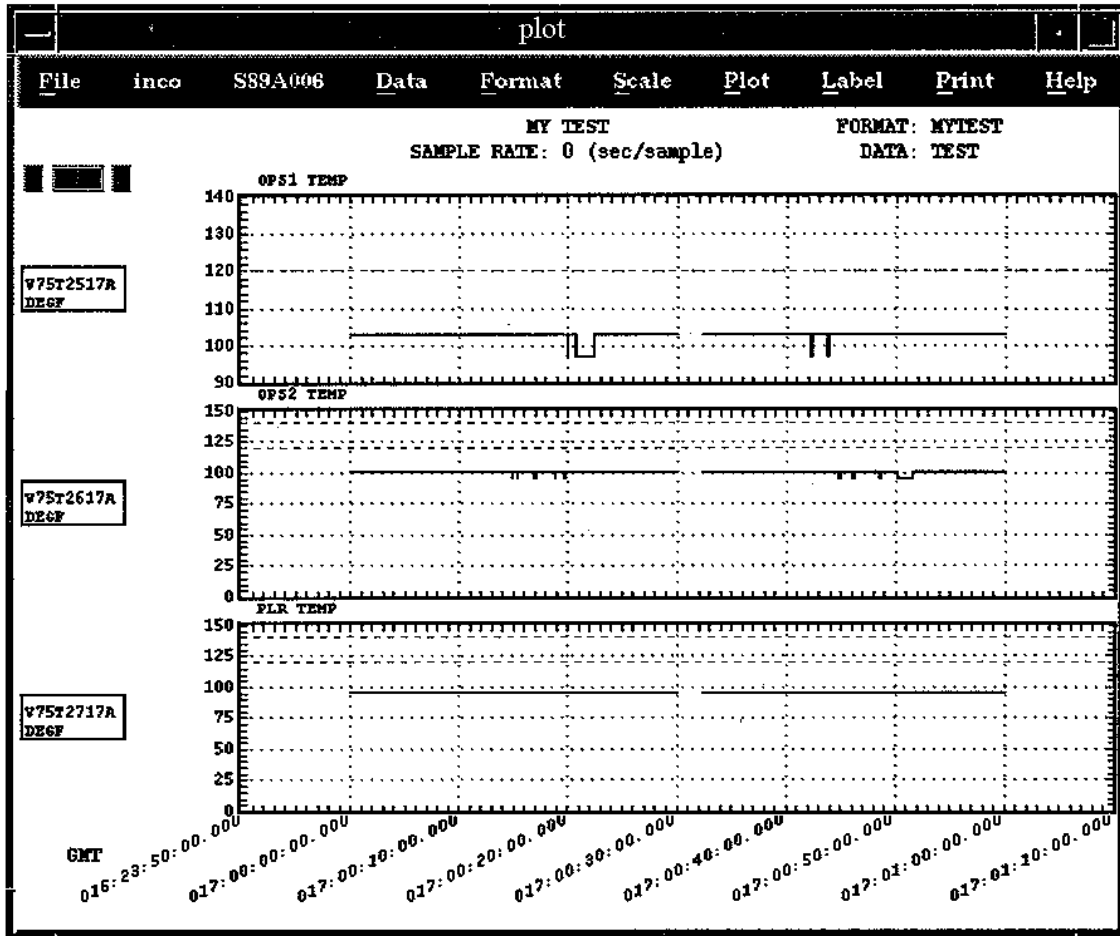


Figure 7.9-8. Plot with modified Y-axis

**TO PRINT A PLOT**

- A. Follow the procedure, TO PLOT DATA.
- B. Select Print.
- C. Select Hardcopy.
- D. An hourglass will replace the shuttle cursor while the plot's printer data is being collected.
- E. Wait a few minutes, and the plot should print on the laser printer behind the COMM SUPPORT console.

**TO CHANGE THE FLIGHT ID**

- A. Select the STS-0xx number or Flight if supporting a sim.
- B. Select Change Flight.
- C. Select a flight from the list of flights (Figure 7.9-9).
- D. Select OK. The window will disappear.



E. Verify that the flight ID has changed at the top of the window.

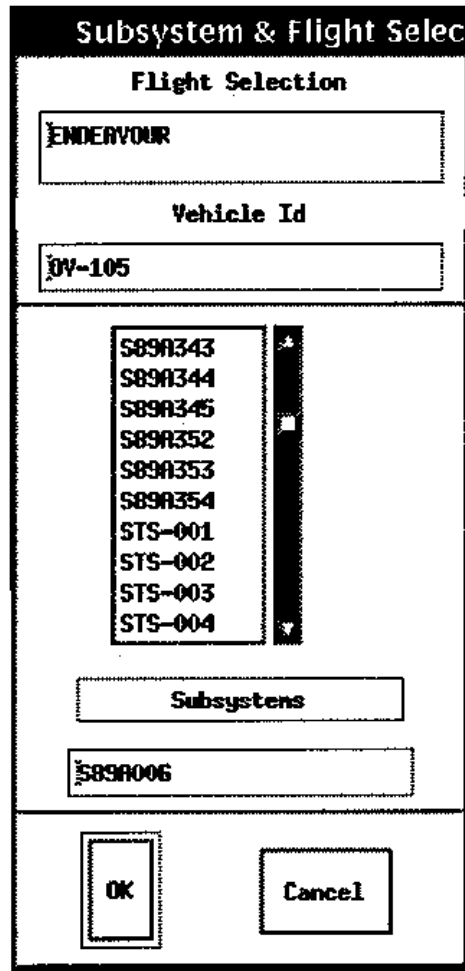


Figure 7.9-9. Select flight

## TITLE

elog - EVENT LOGGER

## DESCRIPTION

The program provides a means of logging telemetry events in real time. An event is defined as the comparison (greater than, equal to, etc.) of an MSID value to a constant. When the comparison is true, the event, time tagged by GMT and MET, is logged to a file and to the program window. A text message (color and content defined by the user) represents the logged event. Events are assigned to a class group or groups for easier manipulation. These classes define the display windows for the events. The program allows for acknowledging an event; counters are displayed showing the number of unacknowledged events and total events by class to aid in event tracking. An information mode provides the user with a means of examining and changing event parameters from within the program.

## PROCEDURES

The program can log events only while real-time data are available; previously logged events can be checked even if real-time data is not active. The program uses three data files: (1) event, (2) log, and (3) configuration. The event file describes the events; i.e., the comparisons, update rates, filter values, messages, and colors for each event. The log file is generated by the program at startup if not already existing. If present, this file is checked for previously logged events, and the program display is updated accordingly. The configuration file contains class window position information and is generated by the program via user request. This information is used to restore the class configuration for subsequent sessions. The event file is required; the configuration file is optional. Additionally, the program writes a temporary file, **elog.temp**, to the current directory when a print command is issued. This file is erased when the program exits.

The user is allowed to change a number of the program parameters. These parameters, and their default values, are as follows:

<u>Parameter</u>	<u>Default</u>
Event file name	DATA/elog.event
Log file name	DATA/elog.log
Configuration file name	DATA/elog.config
Title bar name	Event Logger
Class window width	80 columns
Class window rows	5 rows
Move class/icon outlines	TRUE
Start iconified	FALSE
Alert tone volume	100%
Font name	9x15
Icon font name	8x13
Background color	Black
Border color	White
Border width	2 pixels
Window size and position	9/10 screen size
Display name/ID	NULL
Log initial events	FALSE

Two methods are available for changing the parameter default values, command line inputs and entries in the **.Xdefaults** file.

The **.Xdefaults** file, found in the user's home directory, can contain parameter values for a number of programs. The syntax for a parameter setting in this file for the **elog** program is as follows:

**elog\**<parameter name>*: *<value>***

*<parameter name>* is one of the valid parameter names and *<value>* is the new value of the parameter. The parameter names are the same as the command line options (without the preceding character; see below); however, the abbreviated forms cannot be used in the **.Xdefaults** file. The following is an example entry to set the background color:

**elog\*background: midnightblue**

The command line options to change the parameter defaults can appear in any order on the command line. The syntax for these commands is as follows:

**-event (or -e) *<event file name>***

Instructs the program to use the file, *<event file name>*, as the event file.

**-log (or -l) *<log file name>***

Instructs the program to use the file, *<log file name>*, as the log file.

**-config (or -c) *<configuration file name>***

Instructs the program to use the file, *<configuration file name>*, as the configuration file.

**-name (or -n) "*<name>*"**

Causes the main title bar to display *<name>*. If the name contains any spaces, it must appear in quotes as shown.

**-classwidth (or -cw) *<number of columns>***

Changes the initial character width of the class windows. A configuration file overrides this command.

**-classrows (or -cr) *<number of rows>***

Changes the initial number of rows of the class windows. A configuration file overrides this command.

**-moveoutline (or -mo) *<FALSE>***

Instructs the program to move the classes/icons instead of their outlines when (re)positioning the classes/icons with the mouse.

**-snapshot (or -s) *<TRUE or FALSE>***

If TRUE, the program logs any events that evaluate TRUE at program startup (rate and filter applies). If FALSE, the program ignores the initial state and begins logging only when changes occur.

**-iconic (or -i) *<x,y>***

Instructs the window manager to iconify the program window initially; the x-y coordinates specify the location of the icon.

**-volume (or -v) *<volume>***

Sets the volume of the alert tone given whenever a dialog box is generated. The volume should be from 0 (no tone) to 100 (full volume) percent; values outside this range are adjusted to the nearest valid value.

**-font (or -fn) *<font name>***

The program uses the font specified for drawing the main title bar, command menu, and help, commonality, and reference mode displays.

**-iconfont** (or **-ifn**) **<icon font name>**

The program uses the font specified to draw the icon window text.

**-background** (or **-bg**) **<background color>**

Specifies the background color of the main window. RGB values are accepted.

**-bordercolor** (or **-bd**) **<border color>**

Specifies the color of the main window border. RGB values are accepted.

**-borderwidth** (or **-bw**) **<border width>**

Specifies the width, in pixels, of the main window border.

**-geometry** (or **-gm**) **<widthxheight+x+y>**

Instructs the program to set the initial main window size (in pixels) and/or position. The entire set of values need not be specified (e.g., just the size could be set). For initial main window size the precedence is (lowest to highest): the default size, the **-geometry**-specified size, the mouse-selected size (using the middle mouse button), then the size saved in the configuration file. The window can be resized as desired using the mouse once the program is running. The window manager will prevent sizing the window smaller than the area required to display the main title bar and all the classes in an iconified state.

**-display** (or **-ds**) **<display name/ID>**

Sets the display on which the program window is shown. The display name is in the X-windows format (e.g., local:1.0 or ursa:0.0). This command is valid only on the command line (i.e., ignored in the .Xdefaults file).

## EVENT FILE FORMAT

Each event defined is placed on a single line in the event file. The format for an event definition is as follows:

```
<class {:class 2 {... :class n}},<MSID><operator><constant>,<update  
rate>,<filter>,{''}<text message>{''},<text color>,  
<background color>
```

The individual parameters in the event definition are described below.

- A. **Class** - An event must be assigned to at least one class and can belong to as many classes as desired. The program uses these class names to define the class windows for receiving events. Only those events of a particular class can be displayed in that class window. If an event is assigned to multiple classes, it is shown in each class window to which it belongs. If more than one class is defined in the event file, the program automatically generates a class named 'All,' to which all events are assigned. The class designations are used in the program for manipulating event display, rates, filters, acknowledgement, and enabled status of event groups.
- B. **MSID** - This is the MSID whose value is checked in the event. An MSID can be used in as many events as required. Text characters in MSID's must be capitalized.
- C. **Operator** - The operator defines the comparison between the MSID and the constant. The valid operators are > (greater than), < (less than), = (equal to), and % (bit mask). Certain operators may be combined: >= (greater than or equal to) and <= (less than or equal to). The NOT operator (~) may precede any of these operators (not greater than, not equal to, etc.). The bit mask operator allows testing of individual bits within parent word and natural unsigned parameters. Constants following this operator are assumed to be in hexadecimal (one or two words of up to eight digits each; if less than eight digits are in a word, leading zeros are assumed). For example, V72M7919P

% 10a evaluates TRUE if the second, fourth, and ninth bits of the MSID are ON (hex 10a = binary 100001010). The ~% operator evaluates TRUE if none of the bits specified by the constant are ON in the MSID. For text comparisons the character/string must be bounded by double quotes (= "text"). Only the = operator can be used in text comparisons. The text string can be from one to eight characters in length.

- D. **Constant** - The constant is the value (or bit mask or text) to which the MSID is compared. The constant is read as a floating point number except when following a bit mask operator, in which case a hexadecimal number is assumed (see above for format), or if a double quote follows an equal operator, in which case a text string is assumed.
- E. **Update rate** - The update rate is the rate at which the MSID value is obtained from the real-time data stream in seconds per sample. The update rate cannot be less than 1. The program allows for changing the rate of individual events, or classes of events, while the program is running.
- F. **Filter** - The filter value specifies the number of sequential times that the event must evaluate as TRUE before being annunciated. This can be used to eliminate or reduce spurious events caused by data hits. The filter must be 1 or greater. When an event is logged, the GMT/MET time at which it occurred (based on the event update rate) is displayed versus the actual display time (i.e., the filter will not cause the time to be offset). The filter value is also used to reset an event: The event must evaluate FALSE sequentially a number of times equal to the filter value before it can be annunciated again.
- G. **Text message** - The text message, along with the GMT and MET times, is displayed in the appropriate class window(s) when the event occurs. If the text message contains a comma, it must be single or double quoted. Also, a message beginning with a quote must be bounded by the alternate quote mark.
- H. **Text color** - The text color specifies the color in which the text and times of an unacknowledged event are displayed. The valid color format is described below.
- I. **Background color** - The background color specifies the color of the background box on which the message and times of an unacknowledged event are displayed. When an event is acknowledged, the text is displayed in this background color and the background is changed to black. The valid color format is described below.

The text and background colors must either be a name from the standard X-Windows color database or be an RGB value. For a listing of the standard color database look in the file `/usr/lib/X11/rgb/rgb.txt` on the machine being used; color names from this database are case insensitive. An RGB value is used to set the actual red/green/blue intensities. The RGB format (signified by a leading # character) must be `#RGB`, `#RRGGBB`, `#RRRGGBBB`, or `#RRRRGGGBBBB`, where **R**, **G**, and **B** are single-digit hexadecimal values representing the red, green, and blue intensities (the higher the number, the stronger the color). Values are automatically filled out to 12 digits by adding trailing zeros so that `#RGB` becomes `#ROOOGOOOBOOO`, etc.

Spaces can be inserted in the event definition between parameters. Blank lines can be used to separate event definitions for clarity. Lines with the @ character in the first column are ignored and are used to denote comment lines. Maximum line length in the event file is limited to 300 characters. A sample event file is shown in Figure 7.11-1.

## EXAMPLES

The following is an example of an event file.

@ Example event file

@ First event belongs to 2 classes, APU and APU 1 APU:APU 1, V46P0100A<107, 5, 1, APU 1 low tank press, black, yellow

@ This event belongs only to class APU 1  
APU 1, V46R0135A >= 129, 1, 1, "APU 1 overspeed", white, red

@ Example bit mask comparisons  
PLBD; V72M7919P%8000000,1,1,STBD DR open cmd 1 ON,black,#00d000  
PLBD,V72M7894P%8000000,1,1,PLBD sw close A ON,black,coral

*Figure 7.11-1. Example event file*

## CONFIGURATION FILE FORMAT

The configuration file is created/updated by the program when the user selects the Save Config option from the command menu (described below). The program saves the total number of classes, the main window width and height, and for each class it saves the iconification state, class/icon x-y coordinates, and class window size. When the program is executed, it looks for the configuration file (either the default or the user-specified file name). If found, the file is read, and the saved window size and class/icon size/positions are restored; otherwise, the classes are initially iconified and placed along the right side of the main window.

## PROGRAM OPERATION

When the program is executed, the user is allowed to position/size the main program window using the mouse (unless the **-iconic** option is used; the program icon appears in this case). There is a brief delay while the program reads the event, log, and configuration file contents and checks for errors. If no errors are detected, then the main window header is displayed containing the program name, title, and the command menu title. The classes are positioned as described above in 'Configuration File Format'. The class icons show the number of unacknowledged events/total events for that class and the class name. The mouse pointer turns into an orbiter while within the main program window.

Error and warning messages are displayed in a dialog box that appears, as required, centered over the program window. When a dialog box is displayed, no further processing is possible until the message is acknowledged. See Dialog box OKAY/NO button descriptions below.

The mouse button and keyboard now perform the following functions (other pointer/button/keyboard combinations are ignored by the program).

---

Location	: Class logged event
Button	: Left or middle button
Action	: The "acknowledge" status of the logged event indicated is toggled. If the event is acknowledged, the background color is changed to black, the text color assumes the previous background color, and the unacknowledged event count is decremented. If the event is unacknowledged, then the original colors are restored and the counter is incremented.

---

Location : Class logged event area

Button : Right button

Action : If the button is held, then the pointer turns into a lower/ right-hand corner arrow, and a full-sized dashed outline of the class appears. The mouse can then be used to resize the class. The class outline cannot be moved such that any portion of the class extends outside the main program window or is smaller than the minimum class size. Releasing the button returns the pointer to its previous shape and the class is drawn. The class window is raised to the top of the class stack if it is overlapped by another class.

If the main program window is sized smaller than a deiconified class then that class is automatically resized to fit within the window. If the new main window size is too small (insufficient to contain the class at size 3 rows plus header by 50 columns), then the class is iconified and a warning message issued.

---

Location : Class logged event

Button : Left and middle button

Action : The selected event is deleted from each class to which it belongs (regardless of the class from which it was selected) if the user verifies the deletion via the dialog box that appears. The event total and unacknowledged counters are updated for the relevant classes. The event is not removed from the event file, but is instead flagged as deleted. The program will also ignore these flagged events when restarted. The events can be restored by editing the file and changing the 2 in the first column to a 0 or 1.

---

Location : Class icon

Button : Any button

Action : This "deiconifies" a class; the icon is removed and the class it represents is displayed. If the button is held, then the pointer turns into a four-pointed arrow, and a full-sized dashed outline of the class appears. The mouse can then be used to position the deiconified class. The class outline cannot be moved such that any portion of the class extends outside the main program window or over the main window header. Releasing the button returns the pointer to its previous shape and the class is drawn. The class window is raised to the top of the class stack if it is overlapped by another class. If insufficient window space is available, then a dialog box to this effect is displayed and the class remains in icon form.

If the control key was pressed in unison with the button, then instead of deiconifying the class, the icon itself enters the "move" mode. The icon's outline is displayed and can be repositioned as described above for the class. The icon window is placed at the bottom of the stack of classes/icons (if applicable).

Location : Class iconify box

Button : Any button

Action : When the pointer is positioned over the iconify box (located at the right side of the class header), then the box is highlighted. Pressing a button at this point causes the class to be reiconified. (It returns to its former icon position.) The icon window is placed at the bottom of the stack of classes/icons (if applicable).

---

Location : Class header

Button : Any button

Action : If the button is pressed and held, then the pointer turns into a four-pointed arrow, and a full-sized outline of the class appears. The mouse can then be used to reposition the class. The class outline cannot be moved such that any portion of the class extends outside the main program window or over the main window header. Releasing the button returns the pointer to its previous shape and moves the class to the outline's position.

The class window is raised to the top of the class stack if it is overlapped by another class.

If the control key was pressed in unison with the button, then the pointer can be anywhere within the class window for repositioning to take place as described.

---

Location : Command menu title (Commands) in main window header

Button : Any button

Action : When the pointer is positioned over Commands (located at the right side of the main window header), then the text is highlighted. If a button is then pressed, the command pulldown menu appears and the pointer turns into a hand. (The button must be held down.) Position the pointer over one of the commands (only those commands that highlight can be executed) and release the button pressed to initiate the command. See below for descriptions of the various commands. Releasing the button elsewhere performs no action. The pull-down menu is erased and pointer restored in either case.

---



Location : Command menu item "Event Info"

Button : Any button

Action : The Commands menu is removed, and the pointer changes into a diamond/cross hair. A class is selected by positioning the pointer over the class/class icon desired and pressing any button. The classes are removed and the information for each event belonging to the class selected is displayed. This information includes MSID, operator, constant, active rate and filter, default rate and filter, text message, event disabled status, and all the classes to which the event belongs. The colors in which this information is displayed reflect the event text and background colors. The information header displays the class name, the total number of events definitions in the class, and whether the class is enabled or disabled. A scroll bar appears at the right-hand side of the information window and is used to display any events that will not fit in the window. (See the scroll bar descriptions below.)

The main header changes to reflect that the information mode is in effect. The command menu item Event Info changes to Info Off (see below).

---

Location : Command menu item "Info Off"

Button : Any button

Action : Information mode is turned off and the normal mode is resumed (the classes/icons reappear). Pressing the control key and any button simultaneously while the pointer is in the information display area also terminates information mode.

The main header changes to reflect that the main mode is in effect. The command menu item Info Off changes to Event Info.

---

Location : Command menu item "Enable" - main mode

Button : Any button

Action : The "Commands" menu is removed, and the pointer changes into a diamond/cross hair. A class is selected by positioning the pointer over the class/class icon desired and pressing any button. The class selected has all events which belong to it enabled for real-time data processing. If the "All" class is selected, then all classes/events are enabled. The disable status shown in the class header is removed, and the color of the class icon name is changed from red to green.

---

Location : Command menu item "Enable" - information mode

Button : Any button

Action : The Commands menu is removed, and the pointer changes into a diamond/cross hair. An event is selected by positioning the pointer over the event desired and pressing any button. The event selected is enabled for real-time data processing. The disable status shown in the event description is removed. Any changes made do not take effect until the information mode is exited; the program then pauses to incorporate these changes.

---

Location : Command menu item "Disable" - main mode

Button : Any button

Action : The Commands menu is removed, and the pointer changes into a diamond/cross hair. A class is selected by positioning the pointer over the class/class icon desired and pressing any button. The class selected has all events which belong to it and are not enabled by another class disabled for real-time data processing. If the All class is selected, then all classes/ events are disabled. The disable status is displayed in the class header and the color of the class icon name is changed from green to red.

---

Location : Command menu item "Disable" - information mode

Button : Any button

Action : The Commands menu is removed, and the pointer changes into a diamond/cross hair. An event is selected by positioning the pointer over the event desired and pressing any button. The event selected is disabled for real-time data processing in every class to which it belongs. The disable status is displayed in the event description. Any changes made do not take effect until the information mode is exited; the program then pauses to incorporate these changes.

---

Location : Command menu item "Update Rate" - main mode

Button : Any button

Action : The Commands menu is removed, and the pointer changes into a diamond/cross hair. A class is selected by positioning the pointer over the class/class icon desired and pressing any button. A dialog box is generated with an input window showing the current real-time data acquisition rate in seconds per sample for the class selected (the input box is blank if the class has no rate). To change the class rate, a value is entered and the "OKAY" box selected. The update rate for all the events belonging to that class is changed to the new value. If the All class has been assigned a rate then changes to other classes are ignored. If the DEFAULT box is selected, then the default update rates are restored for all the events belonging to that class.

---

Location : Command menu item "Update Rate" - information mode

Button : Any button

Action : The Commands menu is removed, and the pointer changes into a diamond/cross hair. An event is selected by positioning the pointer over the event desired and pressing any button. A dialog box is generated with an input window showing the current real-time data acquisition rate in seconds per sample for the event selected. To change the event rate, a value is entered and the OKAY box selected. The update rate is changed to the new value. If the DEFAULT box is selected, then the default rate is resorted for the event selected. Any changes made do not take effect until the information mode is exited; the program then pauses to incorporate these changes.

---

Location : Command menu item "Filter" - main mode

Button : Any button

Action : The Commands menu is removed, and the pointer changes into a diamond/cross hair. A class is selected by positioning the pointer over the class/class icon desired and pressing any button. A dialog box is generated with an input window showing the current filter value for the class selected (the input box is blank if the class has no filter). To change the class filter, a value is entered and the OKAY box selected. The filter value for all the events belonging to that class is changed to the new value. If the All class has been assigned, a filter then changes to other classes are ignored. If the DEFAULT box is selected, then the default filter values are restored for all the events belonging to that class.

---

Location : Command menu item "Filter" - information mode

Button : Any button

Action : The Commands menu is removed, and the pointer changes into a diamond/cross hair. An event is selected by positioning the pointer over the event desired and pressing any button. A dialog box is generated with an input window showing the current filter value for the event selected. To change the event filter, a value is entered and the OKAY box selected. The filter is changed to the new value. If the DEFAULT box is selected, then the default filter value is restored for the event selected.

---

Location : Command menu item "Acknowledge" - main mode

Button : Any button

Action : The Commands menu is removed, and the pointer changes into a diamond/cross hair. A class is selected by positioning the pointer over the class/class icon desired and pressing any button. A dialog box is generated requesting the user to verify the command. If verified, all events in the class selected are acknowledged. If any of the events belong to other classes then they are acknowledged in these classes also. The unacknowledge counters of all relevant classes are updated.

---

Location : Command menu item "Acknowledge" - information mode

Button : Any button

Action : The Commands menu is removed, and the pointer changes into a diamond/cross hair. An event is selected by positioning the pointer over the event desired and pressing any button.

A dialog box is generated requesting the user to verify the command. If verified, the event selected is acknowledged in all classes to which it belongs. The unacknowledge counters of all relevant classes are updated.

---

Location : Command menu item "Print Log"

Button : Any button

Action : The Commands menu is removed, and the pointer changes into a diamond/cross hair. A class is selected by positioning the pointer over the class/class icon desired and pressing any button. All the events logged for the class selected are output to the printer in the same format shown in the class window.

---

Location : Command menu item "Print Info"

Button : Any button

Action : The contents of the information display are output to the printer. (Items truncated due to the size of the program window will be printed.)

---

Location : Command menu item "Save Config"

Button : Any button

Action : The user is asked to verify this command via a dialog box before continuing. If verified, the current main window size and class state/position information is saved to the configuration file (either the file name specified with the command line option, the **.Xdefaults** file, or the default file name, **DATA/eelog.config**).

---

Location : Command menu item "Clear Log"

Button : Any button

Action : This command, available only while in the information mode, cannot be selected if no events have been logged. The user is asked to verify this command via a dialog box before continuing. If verified, the program then asks if a backup of the log file is desired (**.sav** is appended to the log file name); otherwise, the program deletes the log file. The log is then cleared (all event counters are zeroed) and processing continues.

---

Location : Command menu item "Exit ELOG"

Button : Any button

Action : The user is asked to verify this command via a dialog box before continuing. If verified, the program window is erased and the program exits.

---

Location : Dialog box "OKAY" button

Button : Any button

Action : Acknowledging a dialog box message is done by placing the pointer (which now resembles a hand) over the OKAY button (which highlights to show its selection) and pressing any button. For rate/filter value changes, selecting OKAY indicates that the value shown in the input box is to be used. The dialog box disappears and the program continues (or exits, depending on the circumstances). See ERROR MESSAGES below for a description of the dialog box error and warning messages. Pressing the RETURN or ENTER key is equivalent to selecting the OKAY button.

---

Location : Dialog box "NO" button

Button : Any button

Action : The NO button is displayed when the dialog box requires a yes-or-no answer to the dialog box message. Selecting the NO box indicates a negative response to the message (for rate/filter values the input box is ignored and no changes are made) and is done by placing the pointer (which now resembles a hand) over the NO button (which highlights to show its selection) and pressing any button. The dialog box disappears, and the program continues (or exits, depending on the circumstances).

---

Location : Dialog box "DEFAULT" button

Button : Any button

Action : The DEFAULT button is displayed when the dialog box requires a rate or filter value. Selecting the DEFAULT box indicates that the initial, default rate/filter value for the event(s) selected should be used. This is done by placing the pointer (which now resembles a hand) over the DEFAULT button (which highlights to show its selection) and pressing any button. The dialog box disappears and the program continues.

---

Location : Dialog box input box

Button : Any button

Action : The input box is displayed when the dialog box requires a rate or filter value. Placing the pointer within the input box and pressing any button causes the text cursor to jump to the pointer position. The following keys are valid for the input box: 0-9 (including the keypad), space, left and right arrows, backspace and delete, and escape and tab (these cause the input box to be cleared). The pointer may be anywhere on the screen during text input.

---

Location : Scroll bar up button

Button : Any button

Action : Pressing a button will cause the list displayed (logged events for class windows or events descriptions for the information mode) to scroll up one list item unless the last item has been reached. The scroll bar slide box position is updated accordingly (see below). The scroll bar up button highlights briefly when the mouse button is pressed.

---

Location : Scroll bar down button

Button : Any button

Action : Pressing a button will cause the list displayed (logged events for class windows or events descriptions for the information mode) to scroll down one list item unless the first item has been reached. The scroll bar slide box position is updated accordingly (see below). The scroll bar down button highlights briefly when the mouse button is pressed.

---

Location : Scroll bar slide box

Button : Any button

Action : When a button is pressed and held, the pointer changes to the shape of a hand and the slide box can be moved. Moving the slide box causes the items displayed to be scrolled accordingly. Releasing the button stops slide box movement. The scroll bar slide box highlights while the mouse button is pressed.

---

Location : Scroll bar slide area

Button : Any button

Action : If the pointer is positioned outside the scroll bar slide box but within the area that the box can move and a button is pressed, then the scroll area pages (forward if the pointer was below the slide box, backward if the pointer was above the slide box). The slide box is repositioned, as required.

---

Each class window possesses a scroll bar for reviewing logged events that will not fit in the class window. If the log file contains events at program startup, then the classes display the latest events logged. As events are logged, the class will automatically scroll only if the last event in that class is displayed (or would be displayed if the class was deiconified). The slide size/position is updated as events are logged.

The timetags associated with each logged event represent GMT and MET. Prior to launch, MET is equivalent to GMT. After lift-off, any events logged previously will display a negative MET (time before lift-off).

The X-Windows window manager can be used to move, resize, and (de)iconify the entire **elog** program window. Depending on the window manager, the window cannot be sized smaller than is allowed to contain the main header information and the "Commands" menu. When a resize occurs, the classes and icons are moved an amount proportional to the window size change. If the control key is pressed and held during resizing, the icons are positioned along the right side of the window. If the window is sized too small to contain a class at minimum size, then a dialog box message is issued and the class is automatically reiconified. When the entire program is iconified, the main window disappears and is replaced by the **elog** icon with the program name underneath. When deiconified, the main window returns with all the classes unchanged.

## ERROR MESSAGES

The following error and warning messages can be generated within the program. Causes and corrective actions are given. The error messages are listed below in alphabetical order.

**ERROR: <MSID name> is not a valid MSID**

Cause: The MSID specified is not recognized by the MOC. Program terminates.

Resolution: Correct or delete the MSID in the event file.

**ERROR: Bad color <color name> RGB format in event definition**

Cause: The RGB color definition specified is in the wrong format (too many/few R, G, and/or B values). Program terminates.

Resolution: Correct the RGB format.

**ERROR: Bad rate or filter in event definition (<line number>)**

Cause: The event defined on line <line number> contains an update rate less than 0 or a filter value less than 1. Program terminates.

Resolution: Correct the bad event definition.

**ERROR: Cannot access MSID keys**

Cause: The ds\_getkeys() call to obtain MSID information for real-time data access was unsuccessful. Program terminates.

Resolution: Check real-time data source status and MSID names.

**ERROR: Cannot connect to X server**

Cause: Program executed outside of the X-Windows environment, or server error. Program terminates. Since the program window is never displayed, this message does not appear in a dialog box but in the standard output window (if it exists).

Resolution: Execute the program while in X-Windows.

**ERROR: Cannot open event file <file name>**

Cause: Event file cannot be opened. Program terminates.

Resolution: Check for correct file name spelling and path.

**ERROR: Cannot open log file <file name>**

Cause: Log file cannot be opened. Program terminates.

Resolution: Check for correct file name spelling and path.

**ERROR: Cannot open <font name> font**

Cause: The font listed cannot be found. Program terminates.

Resolution: Check current font path (to make sure all available font directories are included) and font name spelling.

**ERROR: Character string missing in event definition (<line number>)**

Cause: The event defined on line <line number> is missing the character string. Program terminates.

Resolution: Correct the bad event definition.

**ERROR: Character string too long in event definition (<line number>)**

Cause: The event defined on line <line number> has a character string longer than 8 characters. Program terminates.

Resolution: Correct the bad event definition.

**ERROR: Class name missing in event definition (<line number>)**

Cause: The event defined on line <line number> is missing the class designation(s). Program terminates.

Resolution: Correct the bad event definition.

**ERROR: Color <color name> undefined in event definition**

Cause: The color name shown cannot be found in the standard color database or the '#' character was left off the RGB format. Program terminates.

Resolution: Check spelling/syntax (add '#' to RGB format).

**ERROR: Color(s) missing in event definition (<line number>)**

Cause: The event defined on line <line number> is missing the text and/or background colors. Program terminates.

Resolution: Correct the bad event definition.

**ERROR: Configuration file <configuration file name> data missing**

Cause: The number of class data sets in the configuration file does not match the total number of classes. Program terminates.

Resolution: Remove the configuration file or save the current configuration.

**ERROR: Constant missing in event definition (<line number>)**

Cause: The event defined on line <line number> is missing the comparison constant. Program terminates.

Resolution: Correct the bad event definition.

**ERROR: Event message ending quote missing in event definition (<line number>)**

Cause: The event defined on line <line number> is preceded by a quote (single or double) but has no ending quote. Program terminates.

Resolution: Correct the bad event definition.

**ERROR: Excess characters in event definition (<line number>)**

Cause: The event defined on line <line number> contains characters after the event definition. Program terminates.

Resolution: Correct the bad event definition.

**ERROR: Illegal command line option/syntax**

Cause: Excess character(s) or no value listed after option on command line, or illegal command line option. Program terminates.

Resolution: Correct the command line syntax.

**ERROR: Insufficient memory space available**

Cause: Insufficient memory could be allocated for program variables. Program terminates.

Resolution: Terminate other processes and/or clear some disk space.

**ERROR: Mask value missing in event definition (<line number>)**

Cause: The event defined on line <line number> is missing the mask value. Program terminates.

Resolution: Correct the bad event definition.

**ERROR: Mask value too large in event definition (<line number>)**

Cause: The event defined on line <line number> has a mask word value larger than eight digits. Program terminates.

Resolution: Correct the bad event definition.

**ERROR: MSID <MSID name> has invalid type**

Cause: An MSID does not return with a binary, integer, floating point, or parent word value. Program terminates.

Resolution: Remove the MSID specified from the files.

**ERROR: MSID name missing in event definition (<line number>)**

Cause: The event defined on line <line number> is missing the MSID. Program terminates.

Resolution: Correct the bad event definition.

**ERROR: MSID name too long in event definition (<line number>)**

Cause: The MSID on line <line number> of the event file contains too many characters (10 characters maximum). Program terminates.

Resolution: Correct the MSID specified.

**ERROR: No events in event file <file name>**

Cause: The event file specified contains no event definitions.

Resolution: Check file and path name(s), or select a file containing event definitions.



**ERROR: No room in color map**

Cause: The color map is full and no new colors can be defined (text or background). Program terminates.

Resolution: Reduce the number of colors defined. Try to use names from the standard color database, if possible, to increase the chance of interclient color sharing.

**ERROR: Operator missing in event definition (<line number>)**

Cause: The event defined on line <line number> is missing the operator. Program terminates.

Resolution: Correct the bad event definition.

**ERROR: Rate or filter missing in event definition (<line number>)**

Cause: The event defined on line <line number> is missing the update rate or filter value. Program terminates.

Resolution: Correct the bad event definition.

**WARNING: Bad input value; ignored**

Cause: A number entered in the input dialog box is incorrectly formatted (embedded spaces or no value entered) or is less than 1. The bad value is ignored and the dialog box is removed.

Resolution: Reenter the constant value correctly.

**WARNING: Cannot connect to data source; continue (no real-time)?**

Cause: The ds\_connect() call to connect to the real-time data source was unsuccessful. If the dialog OKAY box is selected, then the program continues operation, but no real-time data is processed. If NO is selected then the program terminates.

Resolution: Check real-time data source status.

**WARNING: Cannot initialize WEX; continue (no real-time)?**

Cause: The EXwexinit() call to initialize WEX was unsuccessful. If the dialog OKAY box is selected, then the program continues operation, but no real-time data is processed. If NO is selected, then the program terminates.

Resolution: Execute program in the WEX environment.

**WARNING: Cannot obtain flight number; continue (no real-time)?**

Cause: The EXflight() call to obtain the current flight number was unsuccessful. If the dialog OKAY box is selected, then the program continues operation, but no real-time data is processed. If NO is selected, then the program terminates.

Resolution: Select a flight number for real-time data access.

**WARNING: Cannot open configuration file <file name>**

Cause: Configuration file cannot be opened. Program continues operation (configuration is not saved).

Resolution: Bad subdirectory; check file path name.

**WARNING: Cannot open output file "elog.temp"**

Cause: The temporary output file used for print requests could not be opened. No output is generated. Program continues operation.

Resolution: Reattempt request. Possible Unix problem.

**WARNING: Configuration file <file name> data mismatch**

Cause: The number of classes saved in the configuration file does not match the number of class definitions in the event file. Program continues operation (the configuration file is ignored).

Resolution: Remove the configuration file, save the current configuration, or specify another configuration file name on the command line.

**WARNING: Insufficient window size for class <class name>**

Cause: The size of the main window is too small to contain the class (at minimum size of 3 rows plus header by 50 columns) when deiconified. Program continues operation (the class iconifies/remains iconified).

Resolution: Resize the main window larger.

**WARNING: Main window too small**

Cause: The program window is too small to contain the main window header or the largest icon. The program continues operation.

Resolution: The window manager should prevent resizing the window too small to contain the header or largest icon. Start the program with a larger window size, or shorten the main title or class name(s).

**WARNING: No log entries for class <class name>**

Cause: The class selected for the Print Log option has no events logged. No output is generated. Program continues operation.

Resolution: Select a class containing logged events.

**USAGE NOTES**

Except for error checking noted above, the program expects to find correct file syntax. Incorrect syntax could produce unexpected results (program hangs, error messages, etc.).

## TITLE

BFSANT

## GENERAL

To provide a standard procedure for operating the bfs\_ant program on the console workstation.

## BACKGROUND

The bfs\_ant program is designed to provide the user the information necessary to build a backup flight system command load to inhibit antenna pointing. This program will allow the user to create any combination of site inhibits in one command load. The user will enter the information that is created by this program into the TMBU program and review the results that are in the Mission Operations Computer (MOC).

## PROCEDURE

- A. To start bfs\_ant
  1. Press and hold the right mouse button while the mouse cursor is over the background.
  2. Drag the mouse cursor down to the option labeled "bfs\_ant."
  3. Release the mouse button.
  4. Place the window on the screen by pressing then releasing the left mouse button when the window outline is in the desired location.
- B. To stop bfs\_ant
  1. Press then release the left mouse button when the mouse cursor is over the menu option labeled "Quit." The window will disappear.
- C. To calculate an inhibit command load
  1. Press then release the left mouse button while over each of the ground sites that are to be inhibited in the BFS site table.
  2. Press then release the Build Command button located at the bottom of the site table. The text boxes above the site table will be filled with data, and an output file will be created.
- D. To print a command load
  1. After calculating a command load, press and hold the left mouse button when the mouse cursor is over the Utilities option.
  2. Drag the mouse cursor down to the Print option.
  3. Release the left mouse cursor.
- E. Possible error messages and their meanings
  1. **"Cannot find lp"** - There is not a printer driver or printer connected to the workstation when a print was attempted. To print the command data, the user will have to move to a workstation with a printer and recalculate the command load.

2. **'bfs\_ant cannot connect to X server'** - The program is being run on a remote workstation, and it does not know where to display the window. The user can set the environment variable DISPLAY to tell X windows where to display bfs\_ant.
3. **'bfs\_ant ERROR : Cannot open helvetica-18 font'** - The workstation that bfs\_ant is trying to run on does not have the correct font to display the text. The user will need to call the systems administrator to correct this problem.
4. **'bfs\_ant cannot find the site list TERMINATING!'** - The file that contains the site list is missing from the directory that the program is running from. The user can look for the site list file or create it from scratch or tell the systems administrator to fix the problem.
5. **'ERROR - bfs\_ant not able to write command output to a file'** - The output file "bfs\_ant.prt" is write protected. Ask the systems administrator to correct the problem.

**TITLE**

GCILBIT

**PURPOSE**

This procedure gives an outline of the GCILBIT program format and provides a simple user's guide to do a GCIL failure analysis.

- A. Once the command "gcilbit" is entered, an introduction to the program is displayed - to continue the user must enter any key and press <cr>.
  - B. A menu selection of DSM or BIT will appear - enter dsm or bit for the appropriate analysis.
    1. For DSM
      - a. Enter the valid DSM# that was sent.
      - b. Enter the valid DSM# that was executed.
      - c. The program will respond with a message.
    2. For BIT
      - a. The user is asked to input how many bits have failed (1-9).
      - b. Then enter the failed bit number reading from R to L.
      - c. Finally enter the status of the failed bit.
      - d. The steps in boldface are repeated for an analysis of more than one bit failure.
  - C. A printout selection will appear and the user must choose one of the following:
    1. 's'creen for output to the crt with directions for screen output control (i.e., control C for exit, space bar for page advance, and <cr> for one space advance).
    2. 'p'rint for output to line printer.
    3. 'f'ile for output to file with a cursor response to input a new filename to print to.
    4. 'x' for exit.
- Note: The output lists the number of bad commands, the failed bits and their respective status, and a list of bad commands with a list of their executed commands.
- D. Would you like to go back to printout screen? yes or no
  - E. Do you care to do another analysis? yes or no

## TITLE

CONFIGURABLE REAL-TIME ANALYSIS SYSTEM (CRANS) USER'S GUIDE

## PURPOSE

To provide a ready reference for the console operator.

## OVERVIEW

The Configurable Real-Time Analysis System (CRANS) provides a means of representing logically interconnected items in a matrix format. A matrix consists of rows and columns of item names with colored backgrounds that show the item's logic status (failed/on or not-failed/off). CRANS allows for toggling of an item's logic status by selection of the item within a matrix via the mouse device. Upon selection of an item, the entire logic framework is tested for further status changes, and results of these changes are displayed in the matrix or matrices as appropriate. A "help" mode and a reference check provide the user with a means of exploring an item's underlying logic from within the program. A commonality check determines single-point failures for an item or group of items. In WEX 2.5, real-time telemetry can be accessed by the program for use in the logic (i.e., MSID's can be logic items). Examples of CRANS applications include orbiter system failure analysis, runway selection, and flight rule location.

The CRANS program uses four data files: (1) logic, (2) matrix, (3) help, and (4) configuration. The logic file describes the logic tree; i.e., how all the logic items are interconnected. The matrix file defines the placement of the logic items in the matrices. The help file contains text messages associated with a logic item that are displayed in the program's help mode. The configuration file contains matrix position information and is generated by the program via user request. This information is used to restore the matrix configuration for subsequent sessions. The logic and matrix files are required; the help and configuration files are optional. Additionally, the program writes a temporary file, crans.temp, to the current directory when a print command is issued. The temporary file is erased when the program exits.

## PROGRAM OPERATION

CRANS is an executable WEX program. The following procedure will execute CRANS:

- A. Depress and hold the right mouse button and move the cursor down the WEX Applications pulldown menu to the CRANS entry. Release the right mouse button when the cursor is on the CRANS selection. The cursor will change into the upper left corner of the CRANS program window.
- B. Position the program window left corner near the screen's upper left edge and depress the left mouse button. A blank window will appear, and there is a brief delay while the program reads the logic, matrix, and configuration file contents and checks for errors. If no errors are detected, the main window header is displayed, containing the program name, the user-specified title (from the matrix file), and the command menu. The matrices and/or icons are positioned as described in the configuration file. The matrix icons show the matrix group name (if any) and the matrix name (from the matrix definition). The mouse pointer turns into an orbiter while within the main program window.

If there are errors in the data files, error and warning messages are displayed in a dialog box that appears, as required, centered over the program window. When a dialog box is displayed, no further processing is possible until the message is acknowledged. See dialog box "OKAY:/:NO" button descriptions in Mouse Button and Keyboard Functions, paragraphs A.4.b (23) and (24).

- C. CRANS is now ready for user inputs. Inputs are made using the mouse device. CRANS features, mouse button, and keyboard functions are described below.

### MOUSE BUTTON AND KEYBOARD FUNCTIONS

Pointer/button/keyboard combinations not described in this SCP have no impact on CRANS operation. Note that these actions must take place inside the CRANS application window, unless stated otherwise. WEX actions can and will be executed if you attempt the following functions outside the CRANS program window (i.e., in the root window).

The X-Windows window manager can be used to move, resize, and (de)iconify the entire CRANS application window. Depending on the window manager, the window cannot be sized smaller than is allowed to contain the main header information and all the matrices in icon form. When a resize occurs, the icons are repositioned along the right side of the window, and the matrices are moved an amount proportional to the window size change. If the window is sized too small to contain a matrix, then a dialog box message is issued, and the matrix is automatically reiconified. When the entire program is iconified, the main window disappears and is replaced by the CRANS icon with the icon name (defined in the matrix file) underneath. When deiconified, the main window returns with all the matrices unchanged.

Except for error checking noted below, the program expects to find correct data file syntax. Incorrect syntax could produce unexpected results (program hangs, error messages, etc.).

#### A. Mouse device operation

##### 1. Left mouse button

###### a. Location: Matrix logic item box

Action: If the box is multilevel, see matrix multilevel pop up menu on logic item selection. In either case (multilevel or single-item box), the logic item selected has its fail state toggled (off → on or on → off) if the item has not been hard-fail protected in the matrix box definition. The box color changes, depending on the box definition in the matrix file, to reflect the new logic state (not-failed or failed). An "\*" character is displayed in the first column of the box if the item displayed is hard-failed in this manner. (The "\*" is removed when the fail state is toggled off.) A logic check is performed to reflect changes in the logic states of other items. Failed items that are tagged (see matrix logic item box - Right button paragraph A.3) have the tag removed. The results are reflected immediately in the matrices and the matrix icons. (The icon name color is green if no items in the matrix are failed, and red otherwise.)

###### b. Location: Help mode logic item

Action: The logic item selected has its fail state toggled (off → on or on → off). An item that is hard-fail protected in a matrix can be hard-failed in this mode. A logic check is performed to reflect changes in the logic states of other items, and the results are reflected immediately in the help display.

##### 2. Middle button

###### a. Location: Matrix logic item box

Action: If the box is a multilevel, see matrix multilevel pop up menu on logic item selection. In either case (multilevel or single-item box), the help mode is initiated for the item selected. A box that does not contain an item name cannot be selected. The main header changes to reflect that the help mode is in effect. The command menu item Save Config changes to Help Off (see below). The matrices are erased, and the

display shows the logic item with its associated logic (or sub-items) underneath, similar to its arrangement in the logic file ("or" is used in place of |, etc., to improve readability). The color of the item names reflects the item's fail state: green = not-failed, red = failed. Hard-fail and tag status is shown as in the matrices (\* and ~ characters). Constant values are shown in white. If real-time data are active, then MSID items are displayed with their current values beside them. If the help file exists and contains a reference for the logic item selected, then the text message is displayed to the right side of the logic. To review a item's logic tree, see paragraph A.2.b, help mode logic item, middle button.

- b. Location: Help mode logic item

Action: To travel forward through a logic item's logic tree, position the pointer over one of the subitems displayed (an outline surrounds the subitem name), and press a button. The program window is cleared, and the subitem selected has its logic displayed as previously described. Repeat this procedure to continue down the logic tree. Selecting the item name itself has no effect. To travel back through the tree, see paragraph A.4.b (2), help mode BACK box. An item's entire logic tree can be examined in this way.

- c. Location: Commonality mode logic item

Action: The help mode (as described above) is initiated for the item selected (an outline surrounds the item name). The BACK box, if present, is removed. To return to the commonality mode, see Command menu item Commonality.

- d. Location: Reference mode logic item

Action: The help mode (as described above) is initiated for the item selected (an outline surrounds the item name). The BACK box, if present, is removed. To return to the reference mode, see Command menu item Reference.

### 3. Right button

- a. Location: Matrix logic item box

Action: If the box is multilevel, see matrix multilevel pop up menu on logic item selection. In either case (multilevel or single-item box), the selected logic item's tagged state is toggled on/off if the item is not failed. A box that does not contain a name cannot be tagged. A character is displayed in the last column of the box when it is tagged (the character is removed when the fail status it toggled on). The tag determines which item(s) is used for a commonality or reference check. See Command menu item Commonality and Command menu item Reference for instructions to perform these checks.

- b. Location: Help mode logic item

Action: The selected logic item's tagged state is toggled on/off if the item is not failed. A character is displayed at the end of the item name when it is tagged. The tag determines which item(s) is used for a commonality or reference check. See Command menu item Commonality and Command menu item Reference for instructions to perform these checks.



- c. Location: Commonality mode logic item

Action: The selected logic item's tagged state is toggled on/off. A ~ character is displayed at the end of the item name when it is tagged. The tag determines which item(s) is used for a commonality or reference check. See Command menu item Commonality and Command menu item Reference for instructions to perform these checks.

- d. Location: Reference mode logic item

Action: The selected logic item's tagged state is toggled on/off. A ~ character is displayed at the end of the item name when it is tagged. The tag determines which item(s) is used for a commonality or reference check. See Command menu item Commonality and Command menu item Reference for instructions to perform these checks.

#### 4. Miscellaneous

- a. Two or more buttons simultaneously

Location: Matrix logic item box

Action: The box suppression state is toggled on/off. When a box is "suppressed," the text color is changed to the background color, and the background color is changed to black. Reselecting the box restores the normal color configuration. If a box is suppressed and the item or items (if the box is a multilevel) driving that box change logic state, then the normal color mode takes effect. The box can then be resuppressed, if desired. Box suppression is a means of acknowledging a failure and helps to unclutter a "busy" matrix.

- b. Any button

- (1) Location: Matrix multilevel pop up menu

Action: If a multilevel box is selected, then a pop up menu showing all the items represented by the box is displayed. The pointer is used to indicate the item desired (the item is highlighted), and the mouse button is released to select the item. Some items may not be selectable, depending on which button is pressed. Items that are hard-fail protected cannot be selected if the left button is pressed, and failed items are not taggable with the right button. Empty (no item name) positions specified in the multilevel are not selectable.

- (2) Location: Help mode BACK box

Action: When a subitem is selected, the BACK box appears to the left of the logic information. When this box is selected, the preceding logic item from which the current item was chosen is redisplayed. Repeat this procedure to continue back up the logic tree. When the original item is reached, the BACK box will disappear. This box is also removed if either the reference or commonality mode is entered.

- (3) Location: Help mode constant value

Action: Constant values (not including filter numbers used in fractional AND statements) can be changed while the program is operating. Select a constant by placing the pointer over the number (an outline surrounds it), and press a

button. A dialog box appears that displays the current value. The keyboard is then used to change the constant. Using the pointer, select the dialog box OKAY button to accept the change or the NO button to ignore it. The logic is then reevaluated, and the help display is updated to reflect the change.

- (4) Location: Commonality mode BACK box

Action: When a commonality check is performed from within the commonality mode (and the item(s) tagged have changed), the BACK box appears to the left of the commonality information. When this box is selected, the preceding commonality check is reinstated (the former tags are restored). Repeat this procedure to continue back up the commonality tree. When the originally performed check is reached, the BACK box will disappear. This box is also removed if either the reference or help mode is entered.

- (5) Location: Reference mode BACK box

Action: When a reference check is performed from within the reference mode (and the item(s) tagged have changed), the BACK box appears to the left of the reference information. When this box is selected, the preceding reference check is reinstated (the former tags are restored). Repeat this procedure to continue back up the reference tree. When the originally performed check is reached, the BACK box will disappear. This box is also removed if either the commonality or help mode is entered.

- (6) Location: Matrix icon

Action: This “deiconifies” a matrix; the icon is removed and the matrix it represents is displayed. If the button is held, the pointer turns into a four-pointed arrow, and a full-sized, dashed outline of the matrix appears. The mouse can then be used to position the deiconified matrix. The matrix outline cannot be moved such that any portion of the matrix extends outside of the main program window or over the main window header. Releasing the button returns the pointer to its previous shape, and the matrix is drawn. The matrix window is raised to the top of the matrix stack if it is overlapped by another matrix. If insufficient window space is available, a dialog box to this effect is displayed, and the matrix remains in icon form.

If the control key was pressed in unison with the button, instead of deiconifying the matrix, the icon itself enters the “move” mode. The icon outline is displayed and can be repositioned as previously describe for the matrix. The icon window is placed at the bottom of the stack of matrices/icons, if applicable.

- (7) Location: Matrix iconify box

Action: When the pointer is positioned over the iconify box (located at the right side of the matrix header), the box is highlighted. Pressing a button at this point causes the matrix to be iconified (it returns to its former, or original, icon position). The icon window is placed at the bottom of the stack of matrices/icons, if applicable.

- (8) Location: Matrix header

Action: If the button is pressed and held, the pointer turns into a four-pointed arrow, and a full-sized outline of the matrix appears. The mouse can then be used to reposition the matrix. The matrix outline cannot be moved such that any portion of the matrix extends outside of the main program window or over the main window header. Releasing the button returns the pointer to its previous shape and moves the matrix to the outline's position. The matrix window is raised to the top of the matrix stack if it is overlapped by another matrix.

If the control key was pressed in unison with the button, the pointer can be anywhere within the matrix window for repositioning to take place as previously described.

- (9) Location: Command menu tile (Commands) in main window header

Action: When the pointer is positioned over Commands (located at the right side of the main window header), the text is highlighted. If a button is then pressed, the command pull-down menu appears, and the pointer turns into a hand (the button must be held down). Position the pointer over one of the commands (only the commands that are highlighted can be executed) and release the button pressed to initiate the command. See the following for descriptions of the various commands. Releasing the button elsewhere performs no action. The pull-down menu is erased, and pointer restored in either case.

- (10) Location: Command menu item Commonality

Action: If at least one item is tagged, a check is performed to determine if any single-point failures exist for the tagged item or common to the tagged items (see matrix logic item box - right button, paragraph A.3.a. The program takes into account the current failure state of all the logic items when searching for single-point failures (i.e., an item that normally is not a single-point failure for the item(s) tagged could become so if other failures are input). The matrices are replaced (if the normal mode is active) by a window showing the item(s) tagged and the single-point failures. ("None" is displayed if there are no single-point failures.) Only the lowest common items are shown; common items further up the logic tree are not displayed (see previous Commonality mode logic item - right button on how to tag items and continue down a commonality tree). If a commonality check is performed from within the commonality mode (and the item(s) tagged have changed), the BACK box appears to the left of the commonality information (see commonality mode BACK box, paragraph A.4.b (4)).

The main header changes to reflect that commonality mode is in effect. The command menu item Save Config changes to Common Off (see the following paragraphs).

- (11) Location: Command menu item Common Off

Action: Commonality mode is turned off, and the normal mode is resumed (the matrices/ icons reappear). Pressing the control key and any button simultaneously while the pointer is in the commonality display area also terminates commonality mode.

- (12) Location: Command menu item Reference

Action: If a least one item is tagged, then all logic items that directly reference all the tagged items are displayed ("None" is displayed if the tagged item(s) is not referenced by any of the logic items in the logic file). Note that the tagged item is not necessarily a single point failure for the items displayed. (See paragraph A.3.d, reference mode logic item - right button, on how to tag items and continue down a reference tree.)

If a reference check is performed from within the reference mode (and the item(s) tagged have changed), the BACK box appears to the left of the reference information (see paragraph A.4.b (5), reference mode BACK box).

The color of the item name reflects the item's fail state: green = not-failed, red = failed (by definition the tagged item(s) cannot be in a failed state). The main header changes to reflect that reference mode is in effect. The command menu item Save Config changes to Refer Off (see paragraph below).

- (13) Location: Command menu item Refer Off

Action: Reference mode is turned off, and the normal mode is resumed (the matrices/icons reappear). Pressing the control key and any button simultaneously while the pointer is in the commonality display area also terminates reference mode.

- (14) Location: Command menu item Help Off

Action: Help mode is turned off, and the normal mode is resumed (the matrices/icons reappear). Pressing the control key and any button simultaneously while the pointer is in the help display area also terminates help mode.

- (15) Location: Command menu item Clear Fails

Action: The user is asked to verify this command via a dialog box before continuing. If verified, all failure statuses are set to "not-failed," and a logic test is performed to reset the logic states. The results are reflected immediately in the matrices, the matrix icons, and the help or reference modes (if active).

- (16) Location: Command menu item Clear Tags

Action: All tagged statuses are reset (to untagged). The results are reflected immediately in the matrices. If the help mode is active, then any tags shown are removed. If the commonality or reference mode is in effect, then the normal mode is resumed (the matrices/icons reappear).

- (17) Location: Command menu item Print Data - Main mode

Action: A summary of input and resultant failed item names is output to the printer. If real-time data are active, then the current MSID values are also output.

- (18) Location: Command menu item Print Data - Help mode

Action: The contents of the help display are output to the printer. (Items truncated due to the size of the program window will be printed.)

- (19) Location: Command menu item Print Data - Commonality mode
- Action: The contents of the commonality display are output to the printer. (Items truncated due to the size of the program window will be printed.)
- (20) Location: Command menu item Print Data - Reference mode
- Action: The contents of the reference display are output to the printer. (Items truncated due to the size of the program window will be printed.)
- (21) Location: Command menu item Save Config
- Action: The user is asked to verify this command via a dialog box before continuing. If verified, the current main window size and matrix state/position information is saved to the configuration file (either the file name specified with the command line option or the default file name, DATA/crans.config).
- (22) Location: Command menu item Exit CRANS
- Action: The user is asked to verify this command via a dialog box before continuing. If verified, the program window is erased and the program exits.
- (23) Location: Dialog box OKAY button
- Action: A dialog box message is acknowledged by placing the pointer (which now resembles a hand) over the OKAY button (which highlights to show its selection) and pressing any button. The dialog box disappears, and the program continues (or exits, depending on the circumstances). See section A.5, error messages, for a description of the dialog box error and warning messages.
- (24) Location: Dialog box NO button
- Action: The NO button is displayed when the dialog box requires a yes or no answer to the dialog box message. Selecting the NO box indicates a negative response to the message and is done by placing the pointer (which now resembles a hand) over the NO button (which highlights to show its selection) and pressing any button. The dialog box disappears, and the program continues (or exits, depending on the circumstances).
- (25) Location: Command menu item Update Rate
- Action: If real-time data are being taken by the program, a dialog box is generated with an input window showing the current real-time data acquisition rate in seconds per sample. The user types in the new rate and selects the OKAY box to accept it or selects the OKAY box to keep the current acquisition rate.

5. Error messages

The following error and warning messages can be generated within the program. Causes and corrective actions are given. The error messages are listed below in alphabetical order.

- a. Bad color <color name> RGB format in matrix file <file name>  
Cause: The RGB color definition shown is in the wrong format (too many/few R's, G's, and/or B's). Program terminates.  
Resolution: Correct the RGB format.
- b. Cannot access MSID keys  
Cause: The ds\_getkeys() call to obtain MSID information for real-time data access was unsuccessful. Program terminates.  
Resolution: Check real-time data source status and MSID names.
- c. Cannot connect to X server  
Cause: Program executed outside of the X-Windows environment, or server error. Program terminates. Since the program window is never displayed, this message does not appear in a dialog box, but in the standard output window (if it exists).  
Resolution: Execute the program while in X-Windows.
- d. Cannot open file <file name>  
Cause: The logic or matrix file specified could not be opened. Program terminates.  
Resolution: Check for correct file name spelling and path.
- e. Cannot open <font name> font  
Cause: The font listed cannot be found. Program terminates.  
Resolution: Check current font path (to make sure all available font directories are included) and font name spelling.
- f. Color <color name> undefined in matrix file <file name>  
Cause: The color name shown cannot be found in the standard color database or the “#” character was left off the RGB format. Program terminates.  
Resolution: Check spelling/syntax (add “#” to RGB format).
- g. Color map syntax error in matrix file <file name>  
Cause: The matrix file color map has incorrect syntax (too few or too many color names). Program terminates.  
Resolution: Correct the color map syntax.
- h. Configuration file <file name> data missing  
Cause: The number of matrix data sets in the configuration file does not match the total number of matrices. Program terminates.  
Resolution: Remove the configuration file or save the current configuration.
- i. Illegal command line option/syntax  
Cause: Excess character(s) or no file name listed after option on command line, or illegal command line option. Program terminates.  
Resolution: Correct the command line syntax.
- j. Infinite loop found  
Cause: Logic that would result in an infinite loop (e.g., A is failed by NOT A) has been detected. This is determined in the program by the logic routine

- being unable to converge within a specified number of loops. This can occur only with the use of inverse (NOT) logic.  
Resolution: Remove the logic causing the infinite loop from the logic file.
- k. Insufficient memory space available  
Cause: Insufficient memory could be allocated for program variables. Program terminates.  
Resolution: Terminate other processes and/or clear some disk space.
- l. Item <name> mask value too large in logic file <file name>  
Cause: The logic statement of the item indicated contains a mask word value larger than eight digits. Program terminates.  
Resolution: Correct the bad logic statement.
- m. Item <name> filter value < 2 in logic file <file name>  
Cause: The filter value for the item named is less than 2. Program terminates.  
Resolution: Increase the filter value.
- n. Item <name> has illegal <operator> in logic file <file name>  
Cause: The logic statement for the item named contains the operator shown in an illegal context. Program terminates.  
Resolution: Correct the logic syntax.
- o. Item <name> has illegal ending operator in logic file <file name>  
Cause: The logic string for the item referenced is terminated with an operator that is illegal in that context. Program terminates.  
Resolution: Correct the logic syntax.
- p. Item <name> has illegal item name in logic file <file name>  
Cause: A logic item name is placed illegally in the logic for the item named. Program terminates.  
Resolution: Correct the logic syntax.
- q. Item <name> has illegal MSID item in logic file <file name>  
Cause: An MSID item name is placed illegally in the logic for the item named. Program terminates.  
Resolution: Correct the logic syntax.
- r. Item <name> has illegal constant in logic file <file name>  
Cause: A filter number or constant value is placed illegally in the logic item named. Program terminates.  
Resolution: Correct the logic syntax.
- s. Item <name> has no name following quote in logic file <file name>  
Cause: An item name was expected following a single or double quote in the logic file. Program terminates.  
Resolution: Delete the quote or put an item name after it.
- t. Item <name> has too few ( 's in logic file <file name>  
Cause: The number of right parentheses exceeds the number of left parentheses at some point in the logic string for the item named (reading left to right). Program terminates.  
Resolution: Add/subtract parentheses as required to correct syntax.

- u. Item <name> has too few )'s in logic file <file name>  
Cause: The number of left parentheses exceeds the number of right parentheses at some point in the logic string for the item named (reading left to right). Program terminates.  
Resolution: Add/subtract parentheses as required to correct syntax.
- v. Item <name> undefined in logic file <file name>  
Cause: A subitem is not listed as separate item in the logic file. Program terminates.  
Resolution: Put an entry for the item in the logic file or check spelling.
- w. Item <name> is not a valid MSID in logic file <file name>  
Cause: An MSID logic item name (an item beginning with a "#") is not a valid MSID. Program terminates.  
Resolution: Correct the item name indicated.
- x. Item <name> mask value missing in logic file <file name>  
Cause: The logic statement of the item indicated is missing the required mask value. Program terminates.  
Resolution: Correct the bad logic statement.
- y. Matrix <matrix name> box definition color name missing in matrix file <file name>  
Cause: Insufficient color names are given in a box definition in the matrix indicated.  
Resolution: Provide a fail color for each item represented in the matrix box in addition to a single not-fail color.
- aa. Matrix <matrix name> box definition syntax error in matrix file <file name>  
Cause: A box definition in the matrix indicted contains too many color names or has excess characters.  
Resolution: Remove the excess characters.
- bb. Matrix <matrix name> color <color name> undefined in matrix file <file name>  
Cause: The color name in the specified matrix has not been defined in the matrix file color map. Program terminates.  
Resolution: Add an entry for the color or check spelling.
- cc. Matrix <matrix name> font name missing in matrix file <file name>  
Cause: The matrix indicated does not have a font name specified.  
Resolution: Provide the missing font name.
- dd. Matrix <matrix name> has no boxes defined in matrix file <file name>  
Cause: No box definitions exist in the matrix file for the matrix specified. Program terminates.  
Resolution: Define boxes for the matrix or remove the matrix command.
- ee. Matrix <matrix name> item <item name> in matrix file <file name> undefined in logic file  
Cause: Matrix item specified in matrix file could not be found in the logic file. Program terminates.  
Resolution: Add entry in logic file for matrix item, delete matrix item, or check spelling.



- ff. Matrix <matrix name> rows have unequal number of columns in matrix file <file name>
    - Cause: Number of columns in one row of a matrix does not equal the number of columns in the preceding rows of that matrix. Matrices must be symmetrical. Program terminates.
    - Resolution: Fill out columns with empty boxes (no name, and not-fail/fail colors set to black).
  - gg. Matrix definition name missing in matrix file <file name>
    - Cause: A matrix definition does not include a matrix name.
    - Resolution: Provide the missing matrix name.
  - hh. MSID <MSID name> has invalid type
    - Cause: An MSID logic item does not return with an binary, integer, floating point, or parent word value. Program terminates.
    - Resolution: Remove the MSID specified from the files.
  - ii. MSID item name <MSID name> too long in logic file <file name>
    - Cause: The MSID portion of the MSID logic item (items beginning with a “#” character are assumed to be MSID’s) indicated contains too many characters (10 characters maximum). Program terminates.
    - Resolution: Correct the MSID logic item name specified.
  - jj. No color map defined before matrix definition
    - Cause: A matrix definition precedes the color map, or no color map is present in the matrix file. Program terminates.
    - Resolution: Place the color map ahead of any matrix definitions in the file.
  - kk. No logic items defined in logic file(s)
    - Cause: The logic file(s) does not contain any logic item definitions (item names beginning in the first column). Program terminates.
    - Resolution: Supply correctly formatted logic file.
  - ll. No matrices defined in matrix file(s)
    - Cause: No matrix definitions were found in the matrix file. Program terminates.
    - Resolution: Add at least one matrix definition to the matrix file.
  - mm. No room in color map
    - Cause: The color map is full and no new colors can be defined (box or text). Program terminates.
    - Resolution: Reduce the number of colors defined. Try to use names from the standard color database, if possible, to increase the chance of interclient color sharing.
  - nn. Syntax error in matrix file <file name>
    - Cause: A line in the matrix file that is not an identifier or a comment line was found. Program terminates.
    - Resolution: Delete excess lines.
6. Warning messages
- a. Bad input value; ignored
    - Cause: A number entered in the input dialog box is incorrectly formatted (embedded spaces, improperly placed decimal points, or minus signs). The bad value is ignored, and the dialog box is removed.
    - Resolution: Reenter the constant value correctly.

- b. Cannot connect to data source; continue (no real-time)?  
Cause: The ds\_connect () call to connect to the real-time data source was unsuccessful. If the dialog OKAY box is selected, then the program continues operation, but no real-time data are processed. (All MSID logic items are initialized to not-failed.) If NO is selected, then the program terminates.  
Resolution: Check real-time source status.
- c. Cannot initialize WEX; continue (no real-time)?  
Cause: The EXwexinit () call to initialize WEX was unsuccessful. If the dialog OKAY box is selected, then the program continues operation, but no real-time data are processed. (All MSID logic items are initialized to not-failed.) If NO is selected, then the program terminates.  
Resolution: Execute program in the WEX 2.5 environment.
- d. Cannot obtain flight number; continue (no real-time)?  
Cause: The EXflight () call to obtain the current flight number was unsuccessful. If the dialog OKAY box is selected, then the program continues operation, but no real-time data are processed. (All MSID logic items are initialized to not-failed.) If NO is selected, then the program terminates.  
Resolution: Select a flight number for real-time data access.
- e. Cannot open output file crans.temp  
Cause: The temporary output file used for print requests could not be opened. No output is generated. Program continues operation.  
Resolution: Reattempt request. Possible Unix problem.
- f. Configuration file <file name> data mismatch  
Cause: The number of matrices saved in the configuration file does not match the number of matrix definitions in the matrix file. Program continues operation (the configuration file is ignored).  
Resolution: Remove the configuration file, save the current configuration, or specify another configuration file name on the command line.
- g. Insufficient window size to display all information  
Cause: The program window size is too small to contain all the help, commonality, or reference display information (which is truncated). The program continues operation.  
Resolution: Resize the program window larger.
- h. Item <name> in logic file <file name> already defined; continue (ignore)?  
Cause: A logic item has two (or more) definitions in the logic file(s). If the dialog OKAY box is selected, then the program continues operation and the duplicate entry is ignored. If NO is selected, then the program terminates.  
Resolution: Remove duplicate logic item entries from the logic file(s). The option “-shadowduplicates FALSE” will inhibit this warning message.
- i. Main window too small  
Cause: The program window is too small to contain the main window header or the largest icon. Program continues operation.  
Resolution: The window manager should prevent resizing the window too small to contain the header or largest icon. Start the program with a larger window size or shorten the main title or matrix name(s).

- j. Insufficient window size for matrix <matrix name>  
Cause: The size of the main window is too small to contain the matrix when deiconified. Program continues operation (the matrix remains iconified).  
Resolution: Resize the main window with a larger window size.
  
- k. Cannot open configuration file <file name>  
Cause: Configuration file cannot be opened. Program continues operation (configuration is not saved).  
Resolution: Bad subdirectory; check file pathname.

**A ACRONYMS AND ABBREVIATIONS**

A/D	Analog to Digital
A/G	Air to Ground
ACCU	Audio Central Control Unit
ACIP	Aerodynamic Coefficient Instrumentation Package
ADI	Attitude Display Indicator
ADPE	Automatic Data Processing Equipment
AED	Analog Event Distribution
AES	Analog Event System
AGC	Automatic Gain Control
ALC	Automatic Level Control
AM	Antenna Management
AOA	Abort-Once-Around
AOS	Acquisition of Signal
ATL	Attitude Timeline
ATU	Audio Terminal Unit
AZ	Azimuth
BCE	Bus Control Element
BCH	Binary Coded Hexadecimal
BFS	Backup Flight System
BOT	Beginning of Tape
BSR	Bite Status Register
BSU	Bit String Unsigned
BTU	Bus Terminal Unit
BUC	Buckhorn Stdn Tracking Station
C&D	Control and Display
CAP	Crew Activity Plan
CCM	Configuration Control Module
CCTV	Closed Circuit Television
CDAT	Communication and Data Activity Timeline
CDMS	Command and Data Management Subsystem
CFAR	Constant False Alarm Ratio
CMD	Command
CMOS	Complementary Metal-Oxide Semiconductor
COMM	Communication
CRP	Configuration Requirements Processor
CSG	Cover Sequence Generator
CVM	Crypto Variable Memory
DCC	Data Computation Complex
DDD	Digital Display Driver
DDH	Dump Data Handler
DEU	Display Electronics Unit
DFE	Data Flow Engineer
DFI	Development Flight Instrumentation
DFL	Decom Format Load
DFRC	Dryden Flight Research Center
DI	Data Interrogator
DMC	Data Management Checklist
DOD	Department of Defense
DPS	Data Processing System

DQM	Data Quality Monitor
DR	Discrepancy Report
DRK	Display Request Keyboard
DRM	Direct Readout Module
DSC	Dedicated Signal Conditioner
DSM	Digital Select Matrix
DSN	Deep Space Network
DTE	Digital Television Equipment
DTO	Detailed Test Objective
DVS	Digital Voice System
DYN	Dynamics
E&D	Engineering and Development
ECG	Electrocardiogram
ECIO	Experiment Computer Input/Output Processor
ECOS	Experiment Computer Operating System
ED	Engineering Directorate
EDE	EMCC Documentation Engineer
EECOM	Electrical, Environmental, Consumables, and Mechanical Systems
EGIL	Electrical, General Instrumentation, and Lighting Engineer
EI	Entry Interface
EL	Elevation
EMCC	Emergency Mission Control Center
EMU	Extravehicular Mobility Unit
EOT	End of Tape
EPSAT	Entry Predicted Site Acquisition Table
ERAU	Experiment Remote Acquisition Unit
ESTL	Electronic Systems Test Laboratory
ET	External Tank
ETF	Even Track Forward
EU	Engineering Unit
EVA	Extravehicular Activity
EXC	Experiment Computer
FAO	Flight Activities Officer
FC	Fuel Cell
FCOH	Flight Controllers Operational Handbook
FCR	Flight Control Room
FD	Flight Director
FDA	Fault Detection and Annunciation
DFD	Flight Data File
FDM	Frequency Division Multiplexer
FDO	Flight Dynamics Officer
FES	Flash Evaporator System
FIFO	First In - First Out
FIMS	Fault Isolation Monitoring System
FM	Frequency Modulated
FMT	Format
FOD	Flight Operations Directorate
FPM	Fetch Pointer Memory
FRR	Flight Readiness Review

G&C	Guidance and Control
G&N	Guidance and Navigation
GC	Ground Control
GCIL	Ground Control Interface Logic
GCMR	Ground Control Message Request
GDSD	Ground Data Systems Division
GLS	Ground Launch Sequence (Sequencer)
GMT	Greenwich Mean Time
GNC	Guidance, Navigation, and Control
GND	Ground
GPC	General Purpose Computer
GSE	Ground Support Equipment
GSFC	Goddard Space Flight Center
GSTDN	Ground Spaceflight Tracking and Data Network
HAL	High Order Assembly Language
HDR	High Data Rate
HDRR	High-Data-Rate Recorder
HOSC	Huntsville Operations Support Center
HRM	High-Rate Multiplexer
I/O	Input/Output
ICC	Intercomputer Communication
ICD	Interface Control Document
ICM	Interface Control Module
ICMS	Intercom Master Station
IDSD	Institutional Data Systems Division
IF	Intermediate Frequency
IFM	In-Flight Maintenance
ILC	Initial Launch Capabilities
IMU	Inertial Measurement Unit
INCO	Integrated Communications Officer
INST	Instrumentation
IOM	Input/Output Module
IOS	Instructor Operator Station
IPCL	Instrumentation Program and Component List
IPS	Inches Per Second
IRIG	Interrange Instrumentation Group
IUS	Inertial Upper Stage
IVT	Integrated Verification Test
JSC	Lyndon B. Johnson Space Center
KSC	John F. Kennedy Space Center
LAN	Local Area Network
LCA	Launch Control Amplifier
LDR	Low Data Rate
LHCP	Left-Hand Circular Polarization
LO	Lock-On
LOS	Loss of Signal
LRU	Line Replaceable Unit
LW	Last Word

MAD	Mission Assignment Description (NASCOM)
MADS	Modular Auxiliary Data System
MAL	Malfunction
MAR	Mission Action Request
MCC	Mission Control Center
MCIU	Master Controller Interface Unit
MCM	Multiple Command Module
MDM	Multiplexer/Demultiplexer
MDRF	Mission Data Request Form
MECO	Main Engine Cutoff
MED	Manual Entry Device
MER	Mission Evaluation Room
MET	Mission Elapsed Time
MF	Medium Frequency
MIA	Multiplexer Interface Adapter
MITS	Master Instrumentation and Timing Subsystem
MM	Mass Memory
MMDB	Master Measurement Database
MML	Master Measurement List
MMU	Mass Memory Unit
MOC	Mission Operations Computer
MOCR	Mission Operations Control Room
MPAD	Mission Planning and Analysis Division
MPSR	Multipurpose Support Room
MPT	Maneuver Planning Table
MRD	Medium Rate Data
MRL	Material Requirements List
MRTC	Multiple Real-Time Commands
MSFC	Marshall Space Flight Center
MSID	Measurement Stimulation Identification
MSK	Manual Select Keyboard
MSPC	Multiple Stored Program Command
MTU	Master Timing Unit
MUX	Multiplexer
NASCOM	Nasa Communications Network
NCC	Network Control Center
NCIU	Network Communications Interface Unit
NGT	Nasa Ground Terminal
NOM	Network Output Multiplexer
NSC	Next Station Contacts
NSP	Network Signal Processor
OA	Operations Analyst
ODDS	Operational Data Delivery Services
ODM	Operational Data Message
OEX	Orbiter Experiments
OI	Operational Instrumentation
OMI	Operation and Maintenance Instructions
OPS	Operations Sequence
OST	Operations Support Team
OTF	Odd Track Forward

P/L	Payload
PA	Power Amplifier
PAD	Preliminary Advisory Data
PAM	Payload Assist Module
PAO	Public Affairs Office
PASS	Primary Avionics Software System
PBI	Pushbutton Indicator
PCA	Point of Closest Approach
PCAP	Premission Crew Activity Plan
PCL	Pocket Checklist
PCM	Pulse-Code Modulation
PCMMU	Pulse-Code Modulation Master Unit
PCMU	Pulse-Code Modulation Unit
PDI	Payload Data Interleaver
PDL	Payload Data Load
PET	Phase Elapsed Time
PGM	Program
PI	Payload Interrogator
PIP	Payload Integration Plan
PLB	Payload Bay
PLR	Payload Recorder
PLT	Pilot
PM	Phase Modulated
PMU	Pulse-Code Modulation CM Master Unit
PNL	Panel
POCC	Payload Operations Control Center
POR	Point of Resolution
POWG	Payload Operations Working Group
PRM	Parameter
PROM	Programmable Read-Only Memory
PSAT	Predicted Site Acquisition Table
PSP	Payload Signal Processor
PTL	Payload Throughput Load
R/T	Real Time
RAAB	Remote Amplification and Advisory Box
RAM	Random Access Memory
RAU	Remote Acquisition Unit
RCDR	Recorder
RCU	Remote Control Unit
RELMAT	Relative Matrix
RF	Radio Frequency
RHCP	Right-Hand Circular Polarization
RI	Record Identification
RMS	Redundancy Management System
RMU	Remote Multiplex Unit
RPC	Remote Power Controller
RSA	RTC Storage Area
RSS	Range Safety System
RTC	Real-Time Command
RTLS	Return to Launch Site



S/W	Software
SAIL	Shuttle Avionics Integration Laboratory
SAT	Satellite Acquisition Table
SCAP	Shuttle Configuration Analysis Processor
SCOS	Subsystem Computer Operating System
SCR	Strip Chart Recorder
SCT	Site Contacts Table
SCU	Service and Cooling Umbilical
SDD	Systems Development Division
SDL	Software Development Laboratory
SDP	Shuttle Data Processor
SDPC	Shuttle Data Processing Complex
SEADS	Shuttle Entry Air Data System
SGLS	Space/Ground Link System
SGSC	Strain Gauge Signal Conditioner
SHO	Scheduling Order
SILTS	Shuttle Infrared Leeside Temperature Sensor
SIO	Serial Input/Output
SIPS	Spacelab Input Processing System
SL	Spacelab
SLPDF	Spacelab Payload Data Formatter
SLS	Spacelab Serial I/O
SM	Systems Management
SMEK	Summary Message Enable Keyboard
SMS	Shuttle Mission Simulator
SPAN	Spacecraft Analysis
SPAS	Shuttle Pallet Satellite
SPC	Stored Program Command
SRB	Solid Rocket Booster
SRU	Shop Replaceable Unit
SSA	S-Band Signal Access
SSC	Subsystem Computer
SSI	Standard Serial Interface
SSME	Space Shuttle Main Engine
SSPC	Spacelab Stored Program Command
SSR	Staff Support Room
STDN	Space Tracking and Data Network
STS	Space Transportation System
SUMS	Shuttle Upper Atmosphere Mass Spectrometer
SVC	Supervisor Call
SW	Status Word
T&G	Text and Graphics
TACAN	Tactical Air Navigation
TAGS	Test and Graphics Subsystem
TAL	Transatlantic Abort Landing
TCDT	Terminal Count Demonstration Test
TDM	Tracking Data Messages
TDRS	Tracking and Data Relay Satellite
TDRSS	Tracking and Data Relay Satellite System
TEC	Time Execute Command
TFL	Telemetry Format Load
TLM	Telemetry

TMBU	Table Maintenance Block Update
TN	TDRS Network
TOCC	Test Operations Control Center
TPC	Telemetry Processing Computer
TPE	Telemetry Processor Engineer
TPR	Teleprinter
TSB	Two-Stage Buffer
TV	Television
TVC	Television Camera
TWT	Traveling Wave Tube
UHF	Ultrahigh Frequency
UPF	Universal Patch Format
USAF	United States Air Force
VAS	Video Analog Switch
VCU	Video Control Unit
VDB	Vandenberg Air Force Base
VED	Video Editor
VFI	Verification Flight Instrumentation
VITR	Video/Instrumentation Tape Recorder
VLVS	Valves
VSU	Video Switching Unit
VTR	Video Tape Recorder
WBSC	Wide-Band Signal Conditioner
WSGT	White Sands Ground Terminal
WSTF	White Sands Test Facility
WTR	Western Test Range
XMTR	Transmitter

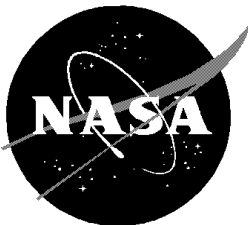
# Instrumentation and Communications Officer (INCO) Console Handbook

---

Systems Division  
Communications and Data  
Systems Branch

Rev F, PCN-15  
November 4, 2002

DUTIES AND RESPONSIBILITIES	<b>1</b>
CONSOLE DATA BASE	<b>2</b>
PROCEDURES	<b>3</b>
COMMUNICATIONS MALSOPs	<b>4</b>
DISPLAY BRIEFS	<b>5</b>
MISCELLANEOUS DATA	<b>6</b>
WORKSTATION PROCEDURES	<b>7</b>
ACRONYMS	<b>A</b>



National Aeronautics and  
Space Administration

Lyndon B. Johnson Space Center  
Houston, Texas

MISSION OPERATIONS DIRECTORATE

INSTRUMENTATION AND COMMUNICATIONS OFFICER (INCO)  
CONSOLE HANDBOOK

REV F, PCN-15

November 4, 2002

Prepared by

Original approval obtained

---

David N. Miller  
Communications Group

Approved by

Original approval obtained

---

Sarah L. Murray  
Lead, Communications Group

Original approval obtained

---

Ray B. Lachney  
Chief, Communications and Data Systems Branch

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
LYNDON B. JOHNSON SPACE CENTER  
HOUSTON, TEXAS

## CONTENTS

Section		Page
<b>1.0</b>	<b>DUTIES AND RESPONSIBILITIES</b>	
1.1	INSTRUMENTATION AND COMMUNICATIONS OFFICER (INCO) .....	1.1-1
1.2	RF COMMUNICATIONS OFFICER .....	1.2-1
1.3	INSTRUMENTATION OFFICER (INST) .....	1.3-1
1.4	LEAD INCO DUTIES AND RESPONSIBILITIES .....	1.4-1
1.5	LEAD RF COMMUNICATION OFFICER DUTIES AND RESPONSIBILITIES.....	1.5-1
1.6	LEAD INSTRUMENTATION OFFICER DUTIES AND RESPONSIBILITIES.....	1.6-1
1.7	DATA COMMUNICATIONS OFFICER .....	1.7-1
1.8	COMMUNICATIONS PLANNING MEMORANDUM DEVELOPMENT AND DISTRIBUTION.....	1.8-1
1.9	CONSOLE CUE CARDS.....	1.9-1
1.10	FLIGHT SOFTWARE CR REVIEW PROCESS.....	1.10-1
<b>2.0</b>	<b>CONSOLE DATA BASE</b>	
2.1	CONSOLE DOCUMENTATION AND LOG KEEPING .....	2.1-1
2.2	PARAMETER DEFINITION AND RELATED SOURCE MATERIAL.....	2.2-1
<b>3.0</b>	<b>PROCEDURES</b>	
3.1	COMMAND .....	3.1-1
3.2	INCO OMI/PRELAUNCH PROCEDURES.....	3.2-1
3.3	GENERAL INCO ASCENT/ENTRY PROCEDURES .....	3.3-1
3.4	ASCENT/ENTRY COMM MALFUNCTION ACTIONS .....	3.4-1
3.5	INCO A/E INCLINATION-SPECIFIC PROCEDURES.....	3.5-1
3.6	ON-ORBIT TDRSS/GROUND OPERATION PROCEDURES .....	3.6-1
3.7	ANTENNA MANAGEMENT: COMM LINK HANDOVER COMMAND PROCEDURES.....	3.7-1
3.8	LOSS OF S-BD U/L DUE TO TDRS CARRIER ONLY DOPPLER TRACKING.....	3.8-1
3.9	COMMAND SYSTEM: TFL/DFL BUILD & UPLINK.....	3.9-1
3.10	TBS	
3.11	CREW ALERT.....	3.11-1
3.12	TIME EXECUTE COMMAND BUILD PROCEDURES .....	3.12-1
3.13	CONTINGENCY RTC'S FOR EECOM/THERMAL .....	3.13-1
3.14	COMMAND SYSTEM: SPARE RTC BUILD .....	3.14-1
3.15	COMMAND SYSTEM: (MRTC'S/SPC'S/MSPC'S).....	3.15-1
3.16	COMMAND SYSTEM: TABLE MAINTENANCE BLOCK UPLINK COMMAND PROCEDURE .....	3.16-1
3.17	TBS	
3.18	USE OF THE GENERIC COMMAND BUILD TOOL .....	3.18-1
3.19	COMMAND SYSTEM: COMMAND APPLICATION INITIALIZATION IN THE MCC .....	3.19-1