

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CIL HARDWARE  
 NUMBER: 05-2G-21802 -X

SUBSYSTEM NAME: COMMUNICATION & TRACKING

REVISION: D 01/05/88

PART DATA

	PART NAME	PART NUMBER
	VENDOR NAME	VENDOR NUMBER
LRU	: PANEL A1A2	V070-730346
SRU	: SWITCH, TOGGLE	ME452-0102-7406

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:  
 SWITCH, ENCRYPTION SEL TOGGLE SWITCH, 4P3T, S-BAND NSP ENCRYPTION  
 SELECT.

REFERENCE DESIGNATORS: 36V73A1A2S26

QUANTITY OF LIKE ITEMS: 1  
 ONE TWO POLES PER NSP

FUNCTION:  
 PROVIDES PANEL ENCRYPTION SELECT CAPABILITY. THE 3 SWITCH POSITIONS ARE  
 "BYPASS" (NO ENCRYPTION), "RCV" (DECRYPTION OF UPLINK), AND "T/R"  
 (ENCRYPTION OF DOWNLINK, DECRYPTION OF UPLINK).

FAILURE MODES EFFECTS ANALYSIS FMEA - CIL FAILURE MODE

NUMBER: 05-2G-21802-02

REVISION#: 1 09/15/97

SUBSYSTEM NAME: COMM & TRACK: S-BAND COMMUNICATIONS

LRU: PANEL A1A2

ITEM NAME: SWITCH, TOGGLE

CRITICALITY OF THIS  
FAILURE MODE: 2/2

FAILURE MODE:

SHORT TO GROUND (INPUT) WORST CASE - CONTAMINANT OR LOOSE PART MOVES  
AND SEQUENTIALLY SHORTS SEVERAL INPUT TERMINALS TO CASE (GROUND).

MISSION PHASE: LO LIFT-OFF  
OO ON-ORBIT  
DO DE-ORBIT

VEHICLE/PAYLOAD/KIT EFFECTIVITY: 102 COLUMBIA  
103 DISCOVERY  
104 ATLANTIS  
105 ENDEAVOUR

CAUSE:

PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, VIBRATION, MECHANICAL  
SHOCK, PROCESSING ANOMALY

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

REDUNDANCY SCREEN A) N/A  
B) N/A  
C) N/A

PASS/FAIL RATIONALE:

A)

B)

C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:

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DUE TO THE LOSS OF THE NSP SWITCH BUFFER DRIVERS (REF. FMEA 05- 6PG-21503-1), LOSS OF ALL S-BAND PM DOWNLINK IN GCIL "PANEL" MODE DUE TO LOSS OF THE "NSP ON" SIGNAL TO THE TRANSPONDERS.

**(B) INTERFACING SUBSYSTEM(S):**

LOSS OF PANEL MODE OPERATION, AND LOSS OF ENCRYPTION PROTECTION OF COMMANDS AND DATA.

**(C) MISSION:**

POSSIBLE LOSS OF MISSION DUE TO MDF DECISION AFTER LOSS OF "PANEL" "NSP ON" TO TRANSPONDERS. LOSS OF ENCRYPTION PROTECTION OF COMMANDS AND DATA.

**(D) CREW, VEHICLE, AND ELEMENT(S):**

NO EFFECT

**(E) FUNCTIONAL CRITICALITY EFFECTS:**

LOSS OF "PANEL" "NSP ON" WOULD REDUCE THE MISSION TO MDF. AFTER TWO FAILURES (THIS SWITCH, AND 1 GCIL PNL/CMD SWITCH) LOSS OF BOTH NSP, A NEXT PLS WOULD BE DECLARED.

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**-DISPOSITION RATIONALE-**

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**(A) DESIGN:**

REFER TO APPENDIX A, ITEM #1, TOGGLE SWITCH.

**(B) TEST:**

REFER TO APPENDIX A, ITEM #1, TOGGLE SWITCH.

**GROUND TURNAROUND TEST**

ANY TURNAROUND CHECKOUT TESTING IS ACCOMPLISHED IN ACCORDANCE WITH OMRSD.

**(C) INSPECTION:**

REFER TO APPENDIX A, ITEM #1, TOGGLE SWITCH.

**(D) FAILURE HISTORY:**

CURRENT DATA ON TEST FAILURES, FLIGHT FAILURES, UNEXPLAINED ANOMALIES, AND OTHER FAILURES EXPERIENCED DURING GROUND PROCESSING ACTIVITY CAN BE FOUND IN THE PRACA DATA BASE.

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(E) OPERATIONAL USE:

NO CREW CORRECTIVE ACTION IS AVAILABLE TO RECOVER ENCRYPTION CAPABILITY.  
CREW ACTION IS REQUIRED TO REGAIN S-BAND IN GCIL COMMAND MODE OR TO USE  
THE UHF SYSTEM FOR VOICE COMMUNICATIONS.

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- APPROVALS -

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EDITORIALLY APPROVED	: BNA	: <i>JK Amura 9/15/97</i>
EDITORIALLY APPROVED	: JSC	: <i>AJ O'Harney 10/2/97</i>
TECHNICAL APPROVAL	: VIA APPROVAL FORM	: 86-CIL-019_05-2G