

**FAILURE MODES EFFECTS ANALYSIS (FMEA) – CIL HARDWARE**  
**NUMBER: 05-2G-21533 -X**

**SUBSYSTEM NAME: COMM & TRACK: S-BAND COMMUNICATIONS**

**REVISION: 0**

**01/05/88**

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**PART DATA**

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	<b>PART NAME</b>	<b>PART NUMBER</b>
	<b>VENDOR NAME</b>	<b>VENDOR NUMBER</b>
LRU	: PANEL A1A2	V070-730346
SRU	: SWITCH, TOGGLE	ME452-0102-7201

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**EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:**

SWITCH, NSP UPLINK DATA TOGGLE SWITCH, 2 POLE, 2 POSITION, NETWORK SIGNAL PROCESSOR (NSP) UPLINK DATA.

**REFERENCE DESIGNATORS: 36V73A1A2S20**

**QUANTITY OF LIKE ITEMS: 1**

ONE (TWO POLES FOR TWO REDUNDANT CIRCUITS)

**FUNCTION:**

SWITCHES THE NSP TO THE KU-BAND OR S-BAND MODE FOR UPLINK, WHEN THE GCIL IS IN THE PANEL MODE. ONE SWITCH POLE EACH IS DEDICATED TO THE "KU-BAND-S-BAND" CONTROL CIRCUIT OF THE 2 NSP'S.

## FAILURE MODES EFFECTS ANALYSIS FMEA -- CIL FAILURE MODE

NUMBER: 05-2G-21533-02

REVISION#: 1 09/15/97

SUBSYSTEM NAME: COMM &amp; 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-ORBITVEHICLE/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:

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.

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**(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.

**(E) OPERATIONAL USE:**

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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	: <u>J. Kemura 9/15/97</u>
EDITORIALLY APPROVED	: JSC	: <u>D. D'Amico 10/8/97</u>
TECHNICAL APPROVAL	: VIA APPROVAL FORM	: 96-CIL-019_05-2G