

FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL HARDWARE
NUMBER: 05-2G-21534 -X

SUBSYSTEM NAME: COMM & TRACK: S-BAND COMMUNICATIONS

REVISION: 0

01/05/88

PART DATA

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

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:

SWITCH, NSP CODING, XMIT TOGGLE SWITCH, 2 POLE, 2 POSITION, NETWORK SIGNAL PROCESSOR (NSP) CODING, DOWNLINK FUNCTION

REFERENCE DESIGNATORS: 36V73A1A2S21

QUANTITY OF LIKE ITEMS: 1

ONE TWO SWITCH POLES FOR TWO REDUNDANT CIRCUITS

FUNCTION:

SWITCHES THE S-BAND PM TO THE CODING MODE ("ON" POSITION) FOR DOWNLINK, WHEN THE GCIL IS IN THE PANEL MODE. ONE SWITCH POLE EACH IS DEDICATED TO THE CONVOLUTIONAL ENCODING CONTROL CIRCUIT OF THE 2 NSP'S. NOTE - CONVOLUTIONAL ENCODING IS PROVIDED TO INCREASE LINK MARGIN. IT IS REQUIRED FOR TDRSS.

FAILURE MODES EFFECTS ANALYSIS FMEA - CIL FAILURE MODE

NUMBER: 05-2G-21534-02

REVISION#: 1 09/15/97

SUBSYSTEM NAME: COMM & TRACK; S-BAND COMMUNICATIONS

LRU: PANEL A1A2

CRITICALITY OF THIS

ITEM NAME: SWITCH, TOGGLE

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.

-DISPOSITION RATIONALE-

(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.

- APPROVALS -

EDITORIALLY APPROVED	: BNA	: <u><i>H. Herrera</i> 7/15/97</u>
EDITORIALLY APPROVED	: JSC	: <u><i>W. Cheney</i> 10/8/97</u>
TECHNICAL APPROVAL	: VIA APPROVAL FORM	: 96-CIL-019_05-2G