PRINT DATE: 09/15/97

FAILURE MODES EFFECTS ANALYSIS (FMEA) – CIL HARDWARE
NUMBER: 05-2G-21204 -X

SUBSYSTEM NAME: COMM & TRACK: S-BAND COMMUNICATIONS
REVISION: 0 01/05/88

PART DATA

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	: PANEL A1A2	V070-730346
SRU	: SWITCH, ROTARY	ME452-0093-5031

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
SWITCH S-BAND PM MODE ROTARY SWITCH, 10 POLE (6 USED), 5 POSITION, S-BAND PM MODE SWITCH - THE 5 POSITIONS ARE SGLS, STDN LO, STDN HI, TDRS DATA & TDRS RANGING.

REFERENCE DESIGNATORS: 36V73A1A2S6

QUANTITY OF LIKE ITEMS: 1

FUNCTION:
IN THE GCIL "PANEL" MODE, SELECTS THE OPERATION MODE OF THE S-BAND TRANSPONDER TO SGLS, STDN LO, AND STDN-HI FOR DIRECT COMMUNICATIONS WITH GROUND STATIONS, OR TO TDRS FOR COMMUNICATIONS VIA THE TDRS RELAY SATELLITE. IN ALL SWITCH POSITIONS EXCEPT TDRS RANGING, THIS SWITCH ALSO PROVIDES THE "NSP 1 ON" OR "NSP 2 ON" INDICATION TO BOTH TRANSPONDERS. THIS INDICATION ENABLES THE DOWNLINK FUNCTION BY KEEPING THE TRANSPONDERS SWITCHED TO THE NSP IN OPERATION.

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FAILURE MODES EFFECTS ANALYSIS FMEA -- CIL FAILURE MODE
NUMBER: 05-2G-21204- 03

REVISION#: 1 09/15/97

SUBSYSTEM NAME: COMM & TRACK: S-BAND COMMUNICATIONS
LRU: PANEL A1A2
ITEM NAME: SWITCH, ROTARY

CRITICALITY OF THIS FAILURE MODE: 2/2

FAILURE MODE:
SHORT TO GROUND INPUT OR OUTPUT OF ONE OF SIX ROTORS SHORTS 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 #2, ROTARY SWITCH.

(B) TEST:
REFER TO APPENDIX A, ITEM #2, ROTARY SWITCH

GROUND TURNAROUND TEST
ANY TURNAROUND CHECKOUT TESTING IS ACCOMPLISHED IN ACCORDANCE WITH OMRSD.

(C) INSPECTION:
REFER TO APPENDIX A, ITEM # 2, ROTARY 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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NUMBER: 05-2G-21204- 03

(E) OPERATIONAL USE:
NO CREW CORRECTIVE ACTION 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	: J. Kimura 9/15/97
EDITORIALLY APPROVED	: JSC	: [illegible] 10/8/97
TECHNICAL APPROVAL	: VIA APPROVAL FORM	: B6-CIL-019_05-2G