

## FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL HARDWARE

NUMBER: 05-2G-21801 -X

SUBSYSTEM NAME: COMM &amp; TRACK: S-BAND COMMUNICATIONS

REVISION: 0

01/05/88

## PART DATA

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	: PANEL A1A2	V070-730345
SRU	: SWITCH, TOGGLE	ME452-0102-7401

## EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:

SWITCH, S-BAND ENCRYPTION, MODE, TOGGLE SWITCH, 4 POLE, 2 POSITION, S-BAND COMMUNICATION ENCRYPTION MODES; TWO POSITIONS ARE - "SELECT" & "ALL".

REFERENCE DESIGNATORS: 36V73A1A2S25

QUANTITY OF LIKE ITEMS: 1

ONE TWO POLES DEDICATED TO EACH NSP

## FUNCTION:

PROVIDES PANEL SELECTION CAPABILITY FOR NSP ENCRYPTION MODE. THE "ALL" POSITION SELECTS A MODE IN WHICH ALL VOICE AND COMMANDS/DATA GOING THROUGH THE NSP ARE ENCRYPTED, INCLUDING VOICE AND DATA RECORDED. THE "SELECT" POSITION ACTIVATES THE ENCRYPTION SELECT SWITCH (SEE 05-2G, 21802)

## FAILURE MODES EFFECTS ANALYSIS FMEA - CIL FAILURE MODE

NUMBER: 05-2G-21801-02

REVISION#: 1 09/15/97

SUBSYSTEM NAME: COMM &amp; 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:

**FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL FAILURE MODE  
NUMBER: 05-2G-21801- 02**

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.

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CIL FAILURE MODE

NUMBER: 05-2G-21801-02

(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  
EDITORIALLY APPROVED  
TECHNICAL APPROVAL

: BNA  
: JSC  
: VIA APPROVAL FORM

: J. Kemura 9/15/97  
: D. O'Leary 10/18/97  
: 96-CIL-019/05-2G