

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- NON-CIL HARDWARE
 NUMBER:05-2B-22103M -X

SUBSYSTEM NAME: COMM & TRACK: UHF SPACE COMMUNICATION
 REVISION: 0 10/03/96

PART DATA

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	: PANEL 06	VO70-730389
SRU	: SWITCH, TOGGLE	ME452-0102-8301

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
 TOGGLE SWITCH, UHF TRANSMIT FREQUENCY, 3P2P

REFERENCE DESIGNATORS: 33V73A6S7

QUANTITY OF LIKE ITEMS: 1
 ONE POLE FOR ATC, ONE POLE FOR EVA, ONE POLE SW SCAN

FUNCTION:
 SELECTS 259.7 MHZ OR 295.8 MHZ TRANSMIT FREQUENCY ON THE UHF - ATC
 TRANCEIVER FOR AIR-TO-GROUND OR AIR-TO-AIR COMMUNICATION. SELECTS
 FREQUENCY (414.2 MHZ OR 417.1 MHZ) ON THE SPACE-TO-SPACE ORBITER RADIO
 (SSOR) FOR EVA OR STATION RENDEZVOUS COMMUNICATIONS.

FAILURE MODES EFFECTS ANALYSIS FMEA - NON-CIL FAILURE MODE

NUMBER: 05-2B-22103M-03

REVISION#: 0 10/03/96

SUBSYSTEM NAME: COMM & TRACK: UHF SPACE COMMUNICATION

LRU: PANEL 06

CRITICALITY OF THIS

ITEM NAME: SWITCH, TOGGLE

FAILURE MODE: 1R3

FUNCTIONAL CRITICALITY/

REQUIRED FAULT TOLERANCE/ACHIEVED FAULT TOLERANCE:1R/2/3

FAILURE MODE:

CONTACT-TO-CONTACT SHORT, SHORT TO CASE (COMMON)

MISSION PHASE: PL PRE-LAUNCH
 LO LIFT-OFF
 OO ON-ORBIT
 DO DE-ORBIT
 LS LANDING/SAFING

VEHICLE/PAYLOAD/KIT EFFECTIVITY: 102 COLUMBIA
 103 DISCOVERY
 104 ATLANTIS
 105 ENDEAVOUR
 AFTER SPACE COMM MODIFICATION

CAUSE:

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

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

CRITICALITY 1R2 DURING INTACT ABORT ONLY (AVIONICS ONLY)? NO

REDUNDANCY SCREEN A) PASS
 B) PASS
 C) PASS

PASS/FAIL RATIONALE:

A)

B)

C)

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CORRECTING ACTION: MANUAL

CORRECTING ACTION DESCRIPTION:

FOR SSOR - HAVE ALL USERS CONFIGURE FOR THE FUNCTIONAL FREQUENCY.

FOR ATC - CREW MUST MANUALLY SELECT GUARD T/R. ASCENT POCKET CHECKLIST AND ENTRY POCKET CHECKLIST DIRECT CREW TO SELECT GUARD T/R IF OTHER COMM IS LOST.

- FAILURE EFFECTS -

(A) SUBSYSTEM:

NO EFFECT ON DOWNLINK, BOTH GROUND RECEIVERS ACTIVE SIMULTANEOUSLY. LOSS OF UPLINK ON 296.8 OR 259.7 MHZ. GUARD T/R MODE NOT AFFECTED.

(REFER TO "ADDITIONAL DATA" FOR LESS CRITICAL EFFECTS SCENARIOS).

(B) INTERFACING SUBSYSTEM(S):

NO EFFECT ON DOWNLINK, BOTH GROUND RECEIVERS ACTIVE SIMULTANEOUSLY. LOSS OF UPLINK ON 296.8 OR 259.7 MHZ. GUARD T/R MODE NOT AFFECTED.

(REFER TO "ADDITIONAL DATA" FOR LESS CRITICAL EFFECTS SCENARIOS).

(C) MISSION:

NO EFFECT - FIRST FAILURE

LOSS OF MISSION IF STATION RENDEZVOUS IS REQUIRED. LOSS OF MISSION DUE TO LOSS OF RF COMMAND AND/OR VOICE COMMUNICATION TO SPACE STATION. WORST CASE - STATION RENDEZVOUS MUST BE TERMINATED.

(REFER TO "ADDITIONAL DATA" FOR LESS CRITICAL EFFECTS SCENARIOS).

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

NO EFFECT - FIRST FAILURE

(REFER TO "ADDITIONAL DATA" FOR LESS CRITICAL EFFECTS SCENARIOS).

(E) FUNCTIONAL CRITICALITY EFFECTS:

POSSIBLE LOSS OF CREW/VEHICLE AFTER 4 FAILURES (THIS SWITCH FAILS, LOSS OF GUARD FREQUENCY, AND LOSS OF 2 S-BAND) DUE TO LOSS OF STATE VECTOR UPDATE.

(REFER TO "ADDITIONAL DATA" FOR LESS CRITICAL EFFECTS SCENARIOS).

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-ADDITIONAL DATA-

FOR OTHER MISSION PHASES: 2R3, PPP

(A) SUBSYSTEM:

IF THE XMIT FREQ HI AND THE XMIT FREQ LO LINES ARE BOTH ACTIVE SIMULTANEOUSLY, THE SSOR WILL DEFAULT TO TRANSMIT/RECEIVE ON 414.2 MHZ.

(B) INTERFACING SUBSYSTEM(S):

NO EFFECT - FIRST FAILURE

(C) MISSION:

NO EFFECT - FIRST FAILURE

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

NO EFFECT

(E) FUNCTIONAL CRITICALITY EFFECTS:

POSSIBLE LOSS OF MISSION AFTER TWO FAILURES (THIS SWITCH FAILS AND LOSS OF THE DEFAULT FREQUENCY) DUE TO LOSS OF SPACE-TO-SPACE COMMUNICATIONS.

1

- TIME FRAME -

TIME FROM FAILURE TO CRITICAL EFFECT: MINUTES

- APPROVALS -

PRODUCT ASSURANCE ENGR : VAN D. NGUYEN
DESIGN ENGINEERING : G. J. SCHWARTZ

: Van Nguyen 8-20-98
: G. J. Schwartz 8-21-98