FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CIL HARDWARE
NUMBER:05-2B-22101M -X

SUBSYSTEM NAME: COMM & TRACK: UHF SPACE COMMUNICATION
REVISION: 0 11/14/95

PART DATA

	PART NAME / **VENDOR NAME**	**PART NUMBER** / **VENDOR NUMBER**
LRU	: PANEL O6	VO70-730389
SRU	: SWITCH, ROTARY	ME452-0093-5226

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
UHF MODE SELECT ROTARY SWITCH, 6P5P

REFERENCE DESIGNATORS: 33V73A6S6

QUANTITY OF LIKE ITEMS: 1
ONE

FUNCTION:
ACTIVATES UHF - ATC TRANSCEIVER OR SPACE-TO-SPACE ORBITER RADIO (SSOR). SELECTS OPERATING MODE BY PROVIDING CLOSURE TO COMMON OF ONE OF FOUR CONTROL CIRCUITS.

FAILURE MODES EFFECTS ANALYSIS FMEA – CIL FAILURE MODE
NUMBER: 05-2B-22101M-01

REVISION#: D 11/14/95
SUBSYSTEM NAME: COMM & TRACK: UHF SPACE COMMUNICATION
LRU: PANEL O5 CRITICALITY OF THIS
ITEM NAME: SWITCH, ROTARY FAILURE MODE: 2/2

FAILURE MODE:
FAILS OPEN

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, THERMAL STRESS

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

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

REDUNDANCY SCREEN
A) N/A
B) N/A
C) N/A

PASS/FAIL RATIONALE:
A)

B)

C)

- FAILURE EFFECTS -

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(A) SUBSYSTEM:
LOSS OF MISSION IF EVA IS REQUIRED DUE TO INABILITY TO ACTIVATE THE SSOR. INABILITY TO PERFORM STATION RENDEZVOUS DUE TO LOSS OF RF COMMAND AND VOICE COMMUNICATION TO SPACE STATION.

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

(B) INTERFACING SUBSYSTEM(S):
LOSS OF MISSION IF EVA IS REQUIRED DUE TO INABILITY TO ACTIVATE THE SSOR. INABILITY TO PERFORM STATION RENDEZVOUS DUE TO LOSS OF RF COMMAND AND VOICE COMMUNICATION TO SPACE STATION.

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

(C) MISSION:
LOSS OF MISSION IF EVA IS REQUIRED. LOSS OF MISSION DUE TO LOSS OF EVA COMMUNICATION AND TRANSMISSION TO THE EMU'S. WORSE CASE - EVA MUST BE TERMINATED.

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

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

(E) FUNCTIONAL CRITICALITY EFFECTS:
(REFER TO "ADDITIONAL DATA" FOR LESS CRITICAL EFFECTS SCENARIOS).

-ADDITIONAL DATA-

OTHER MISSION PHASES: 1R3, PPP

(A) SUBSYSTEM:
UNABLE TO ACTIVATE UHF - ATC TRANSCEIVER.

(B) INTERFACING SUBSYSTEM(S):
UNABLE TO ACTIVATE UHF - ATC TRANSCEIVER.

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CIL FAILURE MODE
NUMBER: 05-2B-22101M-01

(C) MISSION:
NO EFFECT- FIRST FAILURE

(D) CREW, VEHICLE, AND ELEMENT(S):
NO EFFECT - FIRST FAILURE

(E) FUNCTIONAL CRITICALITY EFFECTS:
AFTER THREE FAILURES (THIS SWITCH AND TWO S-BAND), POSSIBLE LOSS OF CREW/VEHICLE DUE TO LOSS OF STATE VECTOR UPDATE.

LOSS OF SWITCH SCAN MEASUREMENTS: 3/3, NNN

(A) SUBSYSTEM:
NO EFFECT

(B) INTERFACING SUBSYSTEM(S):
NO EFFECT

(C) MISSION:
NO EFFECT

(D) CREW, VEHICLE, AND ELEMENT(S):
NO EFFECT

(E) FUNCTIONAL CRITICALITY EFFECTS:
NO EFFECT

- TIME FRAME -

TIME FROM FAILURE TO CRITICAL EFFECT: MINUTES

-DISPOSITION RATIONALE-

(A) DESIGN:
REFER TO APPENDIX A, ITEM NO. 2 - ROTARY SWITCH

(B) TEST:
REFER TO APPENDIX A, ITEM NO. 2 - ROTARY SWITCH

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

(C) INSPECTION:

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REFER TO APPENDIX A, ITEM NO. 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 DATABASE.

(E) OPERATIONAL USE:
FOR EVA COMM - CREW IS TRAINED TO SAFELY TERMINATE EVA IF MINIMUM REQUIRED COMM IS LOST.

FOR STATION REDEZVOUS - ALTERNATE COMM LINKS WOULD BE USED IF AVAILABLE (E.G. RELAY VIA GROUND SITE OR A VHF RADIO LIKE USED FOR SHUTTLE MIR)

FOR ATC - USE ORBITER S-BAND SYSTEM FOR COMM.

- APPROVALS -

PAE MANAGER	: POLLY STENGER-NGUYEN	: Polly Stenger-Nguyen 8/21/98
PRODUCT ASSURANCE ENGR	: VAN D. NGUYEN	: Van Nguyen 8-20-98
DESIGN ENGINEERING	: G. J. SCHWARTZ	: [signature] 8-27-98
NASA SSMA	: Mike Penney	: Michael Penney 8-26-98
NASA EPD&C SSMA	: —	: NA to EPDC
NASA SUBSYSTEM MANAGER	: mark a. chavis	: Mark A Chavis 8-26-98
NASA EPD&C SUBSYS MGR	: —	: NA to EPDC
NASA MOD	:	: David E. Brown 8-26-98
USA/SAM	: Karen Blumenteit	: Karen V Blumenteit 8/26/98