

SEATTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : R/RADAR & COM ANT DEPLOY FMEA NO 05-6EH-56011 -2 REV:05/21/90

ASSEMBLY : MID MCA 2 AND 4			CRIT. FUNC: 1R
P/N RI : JANTXVIN4246			CRIT: HDW: 3
P/N VENDOR:	VEHICLE	102	103
QUANTITY : 2	EFFECTIVITY:	X	X
: TWO (1 PER MCA)	PHASE(S):	PL	LO
:			OO X DO LS

PREPARED BY:	REDUNDANCY SCREEN:	A-PASS	B-FAIL	C-PASS
DES T BANHIDY	APPROVED BY:	APPROVED BY (NASA):		
REL <i>5-21-90</i> J RESSIA	DES <i>5-21-90</i> J RESSIA	SSM <i>[Signature]</i>	RELGE <i>[Signature]</i>	QE <i>[Signature]</i>
QE J COURSEN	QE <i>[Signature]</i>	EPD3C SSM <i>[Signature]</i>	EPD3C SSE <i>[Signature]</i>	

ITEM: DIODE, ISOLATION (1 AMP) - KU-BAND BOOM STOW ENABLE II EXCITATION

FUNCTION:
 PROVIDES REVERSE CURRENT PROTECTION AND CONDUCTS POWER TO THE BOOM STOW ENABLE II EXCITATION SIGNAL CIRCUIT.
 (102) - M-MCA-2, 40V76A118A1CR16; M-MCA-4, 40V76A120A1CR48
 (103,104) - M-MCA-2, 40V76A118A1CR46; M-MCA-4, 40V76A120A1CR48

FAILURE MODE:
 SHORT (END TO END)

CAUSE(S):
 STRUCTURAL FAILURE, MECHANICAL STRESS, VIBRATION, CONTAMINATION
 ELECTRICAL STRESS, THERMAL STRESS, PROCESSING ANOMALY

EFFECT(S) ON:
 (A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE (E) FUNCTIONAL CRITICALITY:

(A) FIRST FAILURE - LOSS OF DC BUS ISOLATION. AFTER TWO FAILURES, LOSS OF CURRENT LIMITING CAPABILITY ON AFFECTED PATH OF THE BOOM STOW ENABLE II EXCITATION CIRCUIT. AFTER THREE FAILURES, LOSS OF NORMAL STOW CAPABILITY.

(B) NO EFFECT - FIRST AND SECOND FAILURES. AFTER THREE FAILURES, IF THE GIMBALS ARE VERIFIED TO BE LOCKED, THE DIRECT STOW SWITCH CAN BE USED TO STOW THE DEPLOYED ASSEMBLY. IF GIMBALS CANNOT BE VERIFIED TO BE LOCKED JETTISON WILL BE REQUIRED.

(C,D,E) NO EFFECT - FIRST FAILURE. POSSIBLE LOSS OF CREW/VEHICLE AFTER FIVE FAILURES (DIODE FAILS SHORT, RESISTOR UPSTREAM OF AFFECTED DIODE FAILS SHORT, ASSOCIATED MAIN DC BUS OF AFFECTED DIODE SHORTS TO GROUND AND CAUSES LOSS OF VOLTAGE FOR THE BOOM STOW ENABLE II EXCITATION)

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CIRCUIT, DIRECT STOW SWITCH FAILS OPEN LOSING ALL CAPABILITY TO STOW THE DEPLOYED ASSEMBLY, AND LOSS OF DEPLOYED ASSEMBLY JETTISON CAPABILITY) DUE TO THE LOSS OF ABILITY TO CLOSE THE PAYLOAD BAY DOORS.

FAILURE IS NOT DETECTABLE DURING FLIGHT SINCE THE FAIL SHORT MODE OF THE DIODE DOES NOT AFFECT THE FUNCTIONAL OPERATION OF THE SUBSYSTEM UNLESS THERE ARE ADDITIONAL ASSOCIATED FAILURES.

DISPOSITION & RATIONALE:

(A) DESIGN (B) TEST (C) INSPECTION (D) FAILURE HISTORY (E) OPERATIONAL USE:

(A-D) DISPOSITION AND RATIONALE

REFER TO APPENDIX F, ITEM NO. 3 - DIODE

(B) GROUND TURNAROUND TEST

"KU-BAND DEPLOY LIMIT SWITCH AND TALKBACK" VERIFIES THE INTEGRITY OF THE DIODE BY ALTERNATELY SHUTTING POWER OFF BUS B AND BUS C; IF BUS B IS OFF AND ITS ASSOCIATED DIODE IS SHORTED, BUS C ON WILL ENERGIZE BUS B THROUGH THE SHORTED DIODE. A SIMILAR SITUATION EXISTS FOR SHUTTING BUS C OFF. THIS IS VERIFIED FOR FIRST FLIGHT; THEREAFTER, ON AN INTERVAL OF FIVE FLIGHTS, OR FOLLOWING LRU REPLACEMENT.

(E) OPERATIONAL USE

THIRD FAILURE RESULTS IN LOSS OF ABILITY TO DRIVE THE STOW MOTORS USING THE "DEPLOY/GND/STOW" SWITCH DUE TO LOSS OF THE BOOM STOW ENABLE SIGNAL. THE "DEPLOY/GND/STOW" SWITCH, HOWEVER, CAN STILL BE USED TO COMMAND THE GIMBAL LOCK SEQUENCE FOR LOCKING THE GIMBALS BUT THE DIRECT STOW SWITCH WILL BE USED FOR STOWING THE DEPLOYED ASSEMBLY. IF THE DEPLOYED ASSEMBLY CANNOT BE STOWED OR THE GIMBALS CANNOT BE LOCKED FOR ENTRY THE DEPLOYED ASSEMBLY WILL BE JETTISONED.