

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :R/RADAR & COM ANT DEPLOY FMEA NO 05-6EH-56056 -1 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	104
QUANTITY :2		EFFECTIVITY:	X	X	X
:TWO (1 PER MCA)		PHASE(S):	PL	LO	OO X DO LS

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS

PREPARED BY: DES T BANHIDY REL 5-21-90 J RESSIA J COURSEN

APPROVED BY: DES [Signature] REL [Signature] QE [Signature]

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ITEM: DIODE, ISOLATION (1 AMP) - KU-BAND ANTENNA BOOM STOW INITIATE CIRCUIT

FUNCTION: PROVIDES ISOLATION FOR THE "DEPLOY/GND/STOW" SWITCH FROM THE BOOM STOW INITIATE COMMAND CIRCUIT TO EA-1. M-MCA-2, 40V76A118A1CR15; M-MCA-4, 40V76A120A1CR9

FAILURE MODE: OPEN, FAILS TO CONDUCT

CAUSE(S): STRUCTURAL FAILURE, MECHANICAL STRESS, VIBRATION, 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 ONE OF TWO PATHS FROM THE NORMAL STOW SWITCH FOR THE BOOM STOW INITIATE SIGNAL TO THE KU-BAND RADAR/COMMUNICATIONS EA-1. AFTER TWO FAILURES, LOSS OF BOOM STOW INITIATE SIGNAL.

(B) NO EFFECT - FIRST FAILURE. AFTER TWO FAILURES, LOSS OF BOOM STOW INITIATE RESULTS IN THE LOSS OF CAPABILITY TO LOCK THE GIMBALS AND SAFELY STOW THE DEPLOYED ASSEMBLY, REQUIRING DEPLOYED ASSEMBLY JETTISON FOR PAYLOAD BAY DOOR CLOSURE. IF GIMBALS ARE VERIFIED TO BE LOCKED, THE DIRECT STOW SWITCH CAN BE USED TO STOW THE DEPLOYED ASSEMBLY.

(C,D,E) NO EFFECT - FIRST FAILURE. POSSIBLE LOSS OF CREW/VEHICLE AFTER THREE FAILURES (DIODE FAILS OPEN, DIODE OR FUSE IN REDUNDANT CIRCUIT FAILS OPEN, LOSS OF DEPLOYED ASSEMBLY JETTISON CAPABILITY, DUE TO LOSS OF ABILITY TO CLOSE THE PAYLOAD BAY DOORS.

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FIRST FAILURE IS NOT DETECTABLE IN FLIGHT BECAUSE OF PARALLEL REDUNDANCY OF THE CIRCUIT THAT CONTAINS THIS DIODE.

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 STOW - BOOM STOW INITIATE" TESTS THE INTEGRITY OF THE BOOM STOW INITIATE CIRCUIT CONTAINING THE ISOLATION DIODE. THIS IS VERIFIED FOR FIRST FLIGHT; THEREAFTER, ON AN INTERVAL OF FIVE FLIGHTS, OR FOLLOWING LRU REPLACEMENT.

(E) OPERATIONAL USE

SECOND FAILURE RESULTS IN LOSS OF GIMBAL LOCK OPERATION. ALL PROCEDURES WHICH DO NOT JEOPARDIZE FLIGHT SAFETY WILL BE CONSIDERED. IF TIME IS AVAILABLE, AN EXTRAVEHICULAR ACTIVITY (EVA) WILL BE CONSIDERED TO ALIGN ANTENNA GIMBALS. AN IN-FLIGHT MAINTENANCE PROCEDURE IS AVAILABLE ON BOARD TO DRIVE THE LOCK PINS ONCE THE ANTENNA IS ALIGNED (VIA EVA CREW IN ORDER TO LOCK THE GIMBALS. IF THE DEPLOYED ASSEMBLY CANNOT BE STOWED OR THE GIMBALS CANNOT BE LOCKED FOR ENTRY, THE DEPLOYED ASSEMBLY WILL BE JETTISONED.