

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :R/RADAR & COM ANT DEPLOY FMEA NO 05-6EH-56056 -2 REV:05/21/90

ASSEMBLY :MID MCA 2 AND 4  
P/N RI :JANTXVIN4246  
P/N VENDOR:  
QUANTITY :2  
:TWO (1 PER MCA)  
:

VEHICLE	102	103	104
EFFECTIVITY:	X	X	X
PHASE(S):	PL	LO	OO X DO LS

CRIT. FUNC: 1R  
CRIT. HDW: 3

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

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

APPROVED BY:  
DES *S. A. J. [Signature]*  
REL *[Signature]*  
QE *[Signature]*

APPROVED BY (NASA):  
SSM *[Signature]*  
REIG *[Signature]*  
QE *[Signature]*

EPDIL SSM *[Signature]*  
EPDIL SSE *[Signature]*

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, 40V76A118A1CR35; M-MCA-4, 40V76A120A1CR9

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 ISOLATION BETWEEN REDUNDANT NORMAL STOW CIRCUITS INTERFACING WITH THE BOOM STOW INITIATE CIRCUIT TO EA-1.

(B) NO EFFECT - FIRST FAILURE. AFTER TWO 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 THREE FAILURES (DIODE FAILS SHORT, "DEPLOY/GND/STOW" SWITCH SHORTS TO CASE (I.E., CONTACT 12) CAUSING FOUR FUSES TO OPEN, WHEN THE "DEPLOY/GND/STOW" SWITCH IS IN THE STOW POSITION, LOSING THE ABILITY TO INITIATE THE GIMBAL LOCK OPERATION REQUIRED FOR THE PROPER STOWING OF THE DEPLOYED ASSEMBLY AND LOSS OF DEPLOYED ASSEMBLY JETTISON CAPABILITY) DUE TO THE LOSS OF ABILITY TO CLOSE THE PAYLOAD BAY DOORS.

SHU-FILE CRITICAL ITEMS LIST - LABITER

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FAILURE IS NOT DETECTABLE DURING FLIGHT SINCE THE FAIL SHORT MODE OF THE DIODE DOES NOT AFFECT THE FUNCTIONAL OPERATION TO STOW 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-BD CRT REDUNDANCY - CA1 OR BC1 OFF" TESTS THE INTEGRITY OF THE KU BAND CIRCUIT REDUNDANCY AND THE BOOM STOW INITIATE CIRCUIT CONTAINING THE ISOLATION DIODE PRIOR TO EACH FLIGHT OR AFTER LRU REPLACEMENT USING CONTROL BUS DROPS. 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.