

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :R/RADAR & COM ANT DEPLOY FMEA NO 05-6EH-56054 -1 REV:05/21/9

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

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

PREPARED BY: T BANHIDY  
DES J RESSIA  
REL *QAR 9-21-90*  
QE J COURSEN

APPROVED BY:  
DES *S. B. ... 5-21-90*  
REL *... 5-21-90*  
QE *... 5-21-90*

APPROVED BY (NASA):  
SSM  
REL  
QE

ITEM:  
DIODE, BLOCKING (1 AMP) - KU-BAND ANTENNA DEPLOYMENT INDICATION & TRANSMIT SCAN ENABLE CIRCUIT

FUNCTION:  
PROVIDES DC POWER/SIGNAL BLOCKING OF ANTENNA DEPLOYED POSITION TO COCKP. TALKBACK AND TO EA-1 FOR TRANSMIT SCAN ENABLE.  
M-MCA-2, 40V76A118A1CR38; M-MCA-4, 40V76A120A1CR23

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 REDUNDANT PATH FOR "DEPLOYED" PANEL INDICATION AND OF TRANSMIT SCAN ENABLE SIGNAL. AFTER TWO FAILURES, LOSS OF "DEPLOYED" PANEL INDICATION AND TRANSMIT SCAN ENABLE SIGNAL.

(B) NO EFFECT - FIRST FAILURE. AFTER TWO FAILURES, S-BAND OR UHF WILL BE REQUIRED FOR STATE VECTOR UPDATE.

(C) NO EFFECT - FIRST FAILURE. AFTER TWO FAILURES (DIODE OR FUSE IN REDUNDANT CIRCUIT FAILS OPEN), LOSS OF MISSION REQUIRING HIGH DATA RATE AND RENDEZVOUS RADAR OPERATIONS DUE TO LOSS OF ABILITY TO UNLOCK GIMBALS POSITION THE ANTENNA, AND ACTIVATE THE TRANSMITTER.

(D,E) NO EFFECT - FIRST FAILURE. POSSIBLE LOSS OF CREW/VEHICLE AFTER FIVE FAILURES (DIODE FAILS OPEN, DIODE OR FUSE IN REDUNDANT CIRCUIT OPENS, LOSS OF TWO S-BAND OPERATIONS, LOSS OF UHF OPERATIONS) DUE TO THE LOSS OF STATE VECTOR UPDATE CAPABILITY.

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FIRST FAILURE IS NOT DETECTABLE IN FLIGHT BECAUSE THIS KU-BAND ANTENNA "DEPLOYED" DISCRETE SIGNAL CIRCUIT IS PARALLEL REDUNDANT.

## DISPOSITION &amp; 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 KU-BAND ANTENNA DEPLOY LIMIT SWITCH AND THE TALKBACK FUNCTION CIRCUIT WHICH CONTAINS THE BLOCKING DIODE. THIS IS VERIFIED FOR FIRST FLIGHT; THEREAFTER, ON AN INTERVAL OF FIVE FLIGHTS, OR FOLLOWING LRU REPLACEMENT.

## (E) OPERATIONAL USE

NONE FOR REGAINING KU-BAND OPERATIONS. SECOND FAILURE RESULTS IN LOSS OF MISSION IF KU-BAND OPERATIONS ARE REQUIRED. S-BAND AND UHF ARE BACKUP PATHS FOR STATE VECTOR UPDATE.