SH. TLE CRITICAL ITEMS LIST - ABITER

SUBSYSTEM :R/RADAR & COM ANT DEPLOY FMEA NO 05-6EH-56051 -2 REV:05/23/90

ASSEMBLY :MID MCA 4
P/N RI :JANTXV1N4246
P/N VENDOR:
QUANTITY :1
:ONE
:

CRIT. FUNC: 1R
CRIT. HDW: 3

VEHICLE EFFECTIVITY:	102	103	104
	X	X	X

PHASE(S): PL LO X OO X DO X LS

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

PREPARED BY:		APPROVED BY:		APPROVED BY (NASA):	
DES	T BANHIDY	DES	5.14.90	SSM	
REL QR 5-23-90	J RESSIA	REL	5-31-90	REL QE	
QE	J COURSEN	QE	5-29-90	QE	6/12/90

QPSC SSM
QPSC SSE & DC

ITEM:
DIODE, ISOLATION (1 AMP) - KU-BAND ANTENNA DEPLOYMENT POSITION INDICATIO CIRCUIT

FUNCTION:
PROVIDES ISOLATION BETWEEN THE DEPLOYED ASSEMBLY (DA) POSITION INDICATOR AND THE DEPLOYED ASSEMBLY DEPLOYED AND TRANSMIT SCAN ENABLE SIGNA CIRCUITS.
40V76A120A1CR49

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:

(A) FIRST FAILURE - LOSS OF ELECTRICAL ISOLATION BETWEEN THE "STOWED/DEPLOYED" PANEL INDICATOR "DEPLOYED" INPUT CIRCUIT AND THE "TRANSMIT SCAN ENABLE" INPUT CIRCUIT TO THE KU-BAND RADAR/COMMUNICATIONS EA-1. AFTER SECOND FAILURE, FAILURE (RESISTOR OPENS BETWEEN TERMINALS 2 & 3) OF "STOWED/DEPLOYED" PANEL INDICATOR, RESULTS IN A TRANSMIT SCAN ENABLE SIGNAL TO THE EA-1.

(B) NO EFFECT - FIRST FAILURE. AFTER SECOND FAILURE, FAILURE (RESISTOR OPENS BETWEEN TERMINALS 2 & 3) OF "STOWED/DEPLOYED" PANEL INDICATOR, RESULTS IN A TRANSMIT SCAN ENABLE SIGNAL TO THE EA-1. (NO EFFECT WITH KU-BAND SYSTEM OFF.)

(C,D,E) NO EFFECT - FIRST FAILURE POSSIBLE LOSS OF CREW/VEHICLE AFTER FIVE FAILURES (DIODE FAILS SHORT: "STOWED/DEPLOYED" PANEL INDICATOR FAILS (RESISTOR OPENS BETWEEN TERMINALS 2 & 3), RESULTING IN A TRANSMIT SCAN ENABLE SIGNAL TO EA-1; KU-BAND CB23 FAILS CLOSED: KU-BAND POWER

SWITCH S12 FAILS ON, RESULTING IN UNLOCKING THE GIMBALS AND STARTI ANTENNA INITIATION WHEN THE DEPLOYED ASSEMBLY IS IN THE STOWED POSITIO WHICH WILL DRIVE THE ANTENNA INTO THE RADIATOR, CAUSING POSSIBLE LOSS O ONE FREON COOLANT LOOP; SUBSEQUENT LOSS OF REDUNDANT FREON COOLANT LOOP CAUSES LOSS OF ALL VEHICLE COOLING CAPABILITY.

FIRST FAILURE IS NOT DETECTABLE IN FLIGHT SINCE THE FAIL SHORT MODE O THIS DIODE DOES NOT AFFECT THE FUNCTIONAL OPERATION OF THE SUBSYSTE 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
INVASIVE TESTING, REQUIRES MASTER VERIFICATION PLAN WAIVER. "TRANSMI SCAN ENABLE SNEAK PATH" VERIFIES THE INTEGRITY OF THE COMBINATION OF THI DIODE AND DEPLOY/STOW TALKBACK, BUT IS UNABLE TO VERIFY THE INTEGRITY O A SINGLE FAILURE OF THE DIODE OR THE DEPLOY/STOW TALKBACK. THIS I VERIFIED FOR FIRST FLIGHT; THEREAFTER, ON AN INTERVAL OF FIVE FLIGHTS, O FOLLOWING LRU REPLACEMENT.

(E) OPERATIONAL USE
THE FIRST THREE FAILURES ARE NOT DETECTABLE IN FLIGHT. DURING POWER FLIGHT, FOURTH FAILURE COULD CAUSE LOSS OF ONE FREON COOLANT LOO REQUIRING EQUIPMENT POWER-DOWN TO MINIMIZE HEAT GENERATION AND LANDING A NEXT PRIMARY LANDING SITE (PLS). THE FIFTH FAILURE (LOSS OF REDUNDAN FREON COOLANT LOOP) COULD CAUSE LOSS OF CREW/VEHICLE.