

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : R/RADAR & COM ANT DEPLOY FMEA NO 05-6EH-56021 -3 REV:05/21/90

ASSEMBLY : MID MCA 2 AND 4	CRIT. FUNC: 1R
P/N RI : MC455-0135-0002	CRIT. MDW: 3
P/N VENDOR:	VEHICLE 102 103 104
QUANTITY : 4	EFFECTIVITY: X X X
: FOUR (2 PER MCA)	PHASE(S): FL LO OO X DO X LS

PREPARED BY:	REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS	APPROVED BY (NASA):
DES T BANHIDY	DES <i>S.B.T. [Signature]</i>	SSM <i>[Signature]</i>
REL <i>AK 5-21-90</i> J RESSIA	REL <i>[Signature] 5-2-90</i>	RELGE <i>[Signature]</i>
QE J COURSEN	QE <i>[Signature] 5-21-90</i>	QE <i>[Signature]</i>

EPDSC SSM *[Signature]*
 EPDSC SSE *[Signature]*
 L.D.C. no for I.I. no. 7-1-90

ITEM:

RELAY, HYBRID - BOOM STOW, MOTOR POWER

FUNCTION:

SWITCHES POWER FROM AC BUSES TO THE KU-BAND ANTENNA DEPLOYMENT ACTUATOR. STOW MOTOR ACTIVATION IS CONTROLLED BY THE PANEL SWITCH. 40V76A120K25, K2; 40V76A118K68, K14

FAILURE MODE:

SHORTS CONTACT-TO-CONTACT

CAUSE(S):

PIECE-PART FAILURE, CONTAMINATION, VIBRATION, MECHANICAL SHOCK, PROCESSING ANOMALY, THERMAL STRESS

EFFECT(S) ON:

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

(A) FIRST FAILURE - LOSS OF CONTROL CAPABILITY FOR ONE POLE OF THE AFFECTED 3-PHASE POWER "STOW" HYBRID RELAY. AFTER TWO FAILURES, LOSS OF CONTROL CAPABILITY FOR TWO POLES OF THE AFFECTED 3-PHASE POWER "STOW" HYBRID RELAY. AFTER THREE FAILURES, LOSS OF ABILITY TO ACTIVATE ONE OF THE TWO DEPLOYMENT ACTUATORS DUE TO A PHASE-TO-PHASE FAULT ON THE 3-PHASE AC POWER SOURCE CIRCUIT.

(B) NO EFFECT - FIRST, SECOND, AND THIRD FAILURES. AFTER FOUR FAILURES, JETTISON WILL BE REQUIRED.

(C,D,E) NO EFFECT - FIRST FAILURE. POSSIBLE LOSS OF CREW/VEHICLE AFTER FIVE FAILURES (CONTACT-TO-CONTACT SHORT ON UPSTREAM "STOW" HYBRID RELAY, CONTACT-TO-CONTACT SHORT ON SECOND CONTACT SET OF SAME UPSTREAM "STOW" HYBRID RELAY, POLE-TO-POLE SHORT ON ASSOCIATED DOWNSTREAM SERIES "STOW" HYBRID RELAY LOSING ABILITY TO ACTIVATE ONE OF THE TWO DEPLOYMENT ACTUATORS DUE TO A PHASE-TO-PHASE FAULT ON THE 3-PHASE AC POWER SOURCE CIRCUIT, FAIL OPEN OF ONE OF THE TWO SERIES "STOW" HYBRID RELAYS IN THE

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REDUNDANT ACTUATOR CIRCUIT CAUSING THE LOSS OF ALL "STOW" CAPABILITY (LOSS OF DEPLOYED ASSEMBLY JETTISON CAPABILITY) DUE TO THE LOSS OF ABILITY TO CLOSE THE PAYLOAD BAY DOORS.

FAILURE IS NOT DETECTABLE DURING GROUND TURNAROUND OR DURING FLIGHT SINCE THE CONTACT-TO-CONTACT FAILURE MODE OF THIS HYBRID RELAY 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 C, ITEM NO. 1 - HYBRID RELAY

(B) GROUND TURNAROUND TEST

"KU-BAND STOW RELAY CHECK" VERIFIES THE INTEGRITY OF THE STOW RELAYS BY ENERGIZING ONE OF THE TWO RELAYS CONNECTED IN SERIES AND MONITORING THE AC CURRENT. IF ANY OF THE CONTACTS OF THE DE-ENERGIZED RELAYS ARE SHORTED, CURRENT DRAWN ON THAT PHASE WILL BE DETECTED. THIS IS VERIFIED FOR FIRST FLIGHT; THEREAFTER, ON AN INTERVAL OF FIVE FLIGHTS, FOLLOWING LRU REPLACEMENT.

(E) OPERATIONAL USE

NONE