

SUBSYSTEM : R/RADAR &amp; COM ANT DEPLOY FMEA NO 05-6EH-56020 -3 REV: 05/21/90

ASSEMBLY : MID MCA 2 AND 4  
 P/N RI : MC455-0135-0002  
 P/N VENDOR:  
 QUANTITY : 4  
 : FOUR/2 PER MCA  
 :

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

CRIT. FUNC: 1R

CRIT. HDW: 3

PREPARED BY:

DES T BANHIDY

REL *GR* 9-21-90 J RESSIA

QE J COURSEN

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

APPROVED BY:

DES *L.D. Curran 5-21-90*REL *L.D. Curran 5-21-90*QE *L.D. Curran 5-21-90*

APPROVED BY (NASA):

SSM *L.D. Curran 5-21-90*REL *L.D. Curran 5-21-90*QE *L.D. Curran 5-21-90*

EPDIC SSM: *L.D. Curran 5-21-90*  
 EPDIC SSE: *L.D. Curran 5-21-90*  
 7-12-90

ITEM:

RELAY, HYBRID - BOOM DEPLOY, MOTOR POWER

FUNCTION:

SWITCHES POWER FROM AC BUSES TO THE KU-BAND ANTENNA DEPLOYMENT ACTUATOR.  
 DEPLOY MOTOR ACTIVATION IS CONTROLLED BY THE PANEL SWITCH.

40V76A118K70, K72; 40V76A120K27, K37

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 "DEPLOY" HYBRID RELAY. AFTER TWO FAILURES, LOSS  
 OF ABILITY TO ACTIVATE ONE OF THE TWO DEPLOYMENT ACTUATORS DUE TO  
 PHASE-TO-PHASE FAULT ON THE 3-PHASE AC POWER SOURCE CIRCUIT WHEN THE  
 STOW FUNCTION FOR THE DEPLOYED ASSEMBLY IS INITIATED. AFTER THREE  
 FAILURES, LOSS OF STOW CAPABILITY.

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

(C,D,E) NO EFFECT - FIRST FAILURE. POSSIBLE LOSS OF CREW/VEHICLE AFTER  
 FOUR FAILURES (CONTACT-TO-CONTACT SHORT ON "DEPLOY" HYBRID RELAY,  
 CONTACT-TO-CONTACT SHORT ON ASSOCIATED CONTACT SET OF SECOND SERIES  
 "DEPLOY" 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 WHEN THE STOW FUNCTION FOR THE DEPLOYED ASSEMBLY IS  
 INITIATED), FAIL OPFN OF ONE OF THE TWO SERIES "STOW" HYBRID RELAYS IN

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THE 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 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 ASSOCIATE 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 DEPLOY RELAY CHECK" VERIFIES THE INTEGRITY OF THE DEPLOY RELAY 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 IS SHORTED, CURRENT DRAWN ON THAT PHASE WILL BE DETECTED. THIS IS VERIFIED FOR FIRST FLIGHT; THEREAFTER, ON AN INTERVAL OF FIVE FLIGHTS, CHECK FOLLOWING LRU REPLACEMENT.

**(E) OPERATIONAL USE**

NONE