

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - COMM. & TRACK. FMEA NO 05-6PR-53065 -1 REV:06/23/83

ASSEMBLY : MID PCA -2 CRIT. FUNC: 1R  
P/N RI : MC455-0129-0002 CRIT. HDW: 2  
P/N VENDOR: VEHICLE 102 103 104  
QUANTITY : 1 EFFECTIVITY: X X X  
: ONE PHASE(S): PL LO OO X DO LS

PREPARED BY: DES H D HADDAD APPROVED BY: DES *H D Haddad 9/27/88* APPROVED BY (NASA): DES *M B...*  
REL *7-5-88 J Y HARADA* REL *...* REL *...*  
QE *...* QE *...* QE *...*

ITEM: K1, RELAY, DA HEATER CIRCUIT AND TELEMETRY ACTIVATION.

FUNCTION: PROVIDES 28 VDC POWER TO DMA AND DEA HEATERS, PROVIDES INITIAL ACTIVATION OF TELEMETRY RELAYS 40V76A26K6 AND K7. (FMEA # 05-6PR-53065-1). RECEIVES CONTROL POWER FROM CB24. HEATER POWER RECEIVED FROM F45, F50, F54. 40V76A26A2K1.

FAILURE MODE: OPEN, FAILS TO CONDUCT, INADVERTENTLY OPENS, FAILS TO TRANSFER

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

- EFFECTS ON ABILITY TO CONTROL POSITION, OR LOCK ANTENNA GIMBALS - 1R/2
  - (A) NO EFFECT ON EPDC.
  - (B) POSSIBLE LOSS OF ABILITY TO LOCK GIMBALS IF TEMPERATURES EXCEED OPERATIONAL LIMITS.
  - (C,D) POSSIBLE LOSS OF CREW/VEHICLE AFTER TWO FAILURES IF DA CANNOT BE SECURED FOR REENTRY OR JETTISONED. REENTRY WITH GIMBALS UNLOCKED MAY RESULT IN DAMAGE TO THE RADIATOR.

- EFFECTS ON MISSIONS REQUIRING KU-BAND SYSTEM SUPPORT - 2/2
  - (A) NO EFFECT ON EPDC.
  - (B) LOSS OF POWER TO DA (DMA/DEA) HEATERS.
  - (C) POSSIBLE LOSS OF ALL MISSION OBJECTIVES REQUIRING KU-BAND COMM DATA PROCESSING OR RENDEZVOUS RADAR IF TEMPERATURES EXCEED OPERATIONAL LIMITS.

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPDC - COMM. & TRACK. FMEA NO 05-6PR-53065 -1 REV:06/28/88

(D) NO EFFECT.

EFFECTS ON PROVIDING DATA TO NSP FOR STATE VECTOR UPDATE - 1R/3

(A) NO EFFECT ON EPDC.

(B,C,D) LOSS OF ONE OF THREE REDUNDANT PATHS TO SUPPLY DATA TO NSP FOR STATE VECTOR UPDATE. UHF PROVIDES AN INDEPENDENT PATH FOR STATE VECTOR UPDATE. AFTER FOUR FAILURES POSSIBLE LOSS OF CREW/VEHICLE DUE TO LOSS OF STATE VECTOR UPDATE. NOTE- A SINGLE FAILURE OF A KU-BAND SPA DASH NUMBER -4001 CAN CAUSE THE LOSS OF POWER TO BOTH NSP'S, RESULTING IN ONLY ONE REMAINING PATH (UHF) TO UPDATE THE STATE VECTOR. THIS FAILURE CAN OCCUR DURING ANY MISSION PHASE. (KU-BAND POWERED ON OR OFF.)

DISPOSITION & RATIONALE:

(A) DESIGN (B) TEST (C) INSPECTION (D) FAILURE HISTORY (E) OPERATIONAL USE

(A,B,C,D) REFER TO APPENDIX C, ITEM # 2, GENERAL PURPOSE RELAY

(B) TEST

GROUND TURNAROUND TEST - VERIFY CORRECT HEATER ELEMENT OPERATION - PERFORMED EVERY FLIGHT.

(E) OPERATIONAL USE

WORKAROUND TO REGAIN ABILITY TO CONTROL, POSITION, OR LOCK ANTENNA GIMBALS

TEMPERATURES WILL BE MONITORED AND THE ANTENNA GIMBALS WILL BE LOCKED BEFORE THE TEMPERATURES EXCEED THE OPERATIONAL LIMITS. IF TEMPERATURE MONITORING IS NOT POSSIBLE, THE ANTENNA GIMBALS WILL BE LOCKED.

WORKAROUND TO REGAIN SUPPORT OF MISSION OBJECTIVES

TEMPERATURES WILL BE MONITORED AND THE ANTENNA GIMBALS WILL BE LOCKED BEFORE THE TEMPERATURES EXCEED THE OPERATIONAL LIMITS. IF TEMPERATURE MONITORING IS NOT POSSIBLE, THE ANTENNA GIMBALS WILL BE LOCKED. COMM: IF THE GIMBALS MUST BE LOCKED, NONE. RADAR: IF THE GIMBALS MUST BE LOCKED, ATTEMPT RENDEZVOUS WITH ALTERNATE SENSORS. USE BACK-UP RENDEZVOUS PROCEDURES.

WORKAROUND TO PROVIDE THE STATE VECTOR UPDATE

TEMPERATURES WILL BE MONITORED AND THE ANTENNA GIMBALS WILL BE LOCKED BEFORE THE TEMPERATURES EXCEED THE OPERATIONAL LIMITS. IF TEMPERATURE MONITORING IS NOT POSSIBLE, THE ANTENNA GIMBALS WILL BE LOCKED. IF THE GIMBALS ARE LOCKED, THE STATE VECTOR CAN BE UPDATED VIA THE NORMAL S-BAND COMMUNICATIONS LINK OR VIA UHF/AUDIO.