

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - COMM. & TRACK. FMEA NO 05-6PR-53066 -1 REV:06/28/88

ASSEMBLY : MID PCA -2
P/N RI : ME455-0131-0002,-1002
P/N VENDOR:
QUANTITY : 2
 :TWO

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

REDUNDANCY SCREEN: A- B- C-
PREPARED BY: APPROVED BY: APPROVED BY (NASA):
DES H D HADDAD DES *[Signature]* SSM *[Signature]*
REL *[Signature]* REL *[Signature]*
QE *[Signature]* QE *[Signature]*

ITEM: K6, K7, RELAYS, DA TELEMETRY EXCITATION

FUNCTION:
PROVIDES DA TELEMETRY EXCITATION FOR THE FOLLOWING - KU-BAND TEMPERATURES: TRANSMITTER HEATER, RECEIVER HEATER, BETA AXIS GIMBAL, ALPHA AXIS GIMBAL, GYRO, AND ANTENNA FEED. 40V76A26K6, K7.

FAILURE MODE:
OPEN, FAILS TO CONDUCT, INADVERTENTLY OPENS, FAILS TO TRANSFER, SHORT TO STRUCTURE (GROUND)

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/3

(A) NO EFFECT ON EPD&C.

(B) POSSIBLE LOSS OF ABILITY TO LOCK GIMBALS IF TEMPERATURES EXCEED OPERATIONAL LIMITS.

(C,D) POSSIBLE LOSS OF CREW/VEHICLE AFTER THREE FAILURES (RELAY, HEATER FAILURE, JETTISON) IF DA CANNOT BE SECURED FOR REENTRY OR JETTISONED. REENTRY WITH GIMBALS UNLOCKED MAY CAUSE DAMAGE TO THE RADIATOR.

EFFECTS ON MISSIONS REQUIRING KU-BAND SYSTEM SUPPORT - 2/2

(A) NO EFFECT ON EPD&C.

(B) LOSS OF ABILITY TO MONITOR KU-BAND TEMPERATURES.

(C) POSSIBLE LOSS OF MISSION OBJECTIVES REQUIRING KU-BAND.

(D) NO EFFECT.

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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 # 4, RELAY MODULE

(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

IF THE TEMPERATURE MEASUREMENTS ARE LOST, THE ANTENNA GIMBALS WILL BE LOCKED AND THE DA WILL BE STOWED IN ACCORDANCE WITH THE FLIGHT RULE ANNEX.

WORKAROUND TO REGAIN SUPPORT OF MISSION OBJECTIVES

IF THE TEMPERATURE MEASUREMENTS ARE LOST, THE ANTENNA GIMBALS WILL BE LOCKED AND THE DA WILL BE STOWED IN ACCORDANCE WITH THE FLIGHT RULE ANNEX. 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

IF THE TEMPERATURE MEASUREMENTS ARE LOST, THE ANTENNA GIMBALS WILL BE LOCKED AND THE DA WILL BE STOWED IN ACCORDANCE WITH THE FLIGHT RULE ANNEX. IF THE GIMBALS MUST BE LOCKED, THE STATE VECTOR CAN BE UPDATED VIA THE NORMAL S-BAND COMMUNICATIONS LINK OR VIA UHF/AUDIO.