

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : COMMUNICATION & TRACKING FMEA NO 05-2R -5112 -2 REV:06/27/88

ASSEMBLY : PNL ALA1 CRIT. FUNC: 1R
P/N RI : ME452-0102-7306 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
REL 7-5-88 J Y HARADA
QE J T COURSEN

REDUNDANCY SCREEN: A-PASS B-PASS C-PASS
APPROVED BY: DES *Haddad 8/27/88*
REL *Harada 8-30-88*
QE *J. Courson 8/27/88*

APPROVED BY (NASA): SSM *John V. Hoff 9/8/88*
REL *William J. ... 9/7/88*
QE *B. ... 9/18/88*

ITEM:
ALS12, TOGGLE SWITCH, 3P3T, "OFF"- "STANDBY" - "ON", KU-BAND A POWER

FUNCTION:
SELECTS KU-BAND A "POWER ON", "POWER STANDBY", OR "POWER OFF".
MECHANIZATION IS TO PROVIDE A 28 VDC "POWER ON" OR "POWER STANDBY"
DISCRETE TO THE MODE SWITCH WHICH THEN PROVIDES SPECIFIC OPERATE COMMAND
DISCRETES TO EA-1A. 36V73A1A1S12.

FAILURE MODE:
SHORT-TO-CASE (GROUND)

CAUSE(S):
VIBRATION, MECHANICAL SHOCK, CONTAMINATION, PIECE PART STRUCTURAL
FAILURE, PROCESSING ANOMALY.

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,B) LOSS OF ABILITY TO LOCK GIMBALS, REAL-TIME DECISION REQUIRED TO
PERFORM IN-FLIGHT MAINTENANCE PROCEDURE WITH EVA OR JETTISON THE
DEPLOYED ASSEMBLY.
(C,D) POSSIBLE LOSS OF CREW/VEHICLE AFTER TWO FAILURES 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,B,C) LOSS OF ALL MISSION OBJECTIVES REQUIRING KU-BAND COMM DATA
PROCESSING OR RENDEZVOUS RADAR.
(D) NO EFFECT.

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

(A,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 A, ITEM # 1, TOGGLE SWITCH

(B) TEST

GROUND TURNAROUND TEST- ALL SWITCH POSITIONS ARE SELECTED AND CORRECT TELEMETRY RESPONSES VERIFIED - PERFORMED EVERY FLIGHT.

(E) OPERATIONAL USE

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

REAL-TIME DECISION REQUIRED TO PERFORM THE GIMBAL LOCK IN-FLIGHT MAINTENANCE PROCEDURE WITH EVA OR TO JETTISON THE DA.

WORKAROUND TO REGAIN SUPPORT OF MISSION OBJECTIVES

COMM: NONE. RADAR: ATTEMPT RENDEZVOUS WITH ALTERNATE SENSORS. USE BACK-UP RENDEZVOUS PROCEDURES.

WORKAROUND TO PROVIDE THE STATE VECTOR UPDATE

THE STATE VECTOR CAN BE UPDATED VIA THE NORMAL S-BAND COMMUNICATIONS LINK OR VIA UHF/AUDIO.