

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : COMMUNICATION & TRACKING FMEA NO 05-2R -5107 -1 REV:06/27/88

ASSEMBLY : PNL A1A1 CRIT. FUNC: 2
P/N RI : ME452-0093-5025 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 [Signature] 8/27/88 REDUNDANCY SCREEN: A- B- C-
REL 7-5-88 J Y HARADA REL [Signature] 8-30-88 SSMA [Signature] 9/1/88 APPROVED BY (NASA):
QE J T COURSEN QE [Signature] 8-27-88 QE [Signature] 9/7/88

ITEM:
A1S7, ROTARY SWITCH, DP4T, ANTENNA STEERING MODE

FUNCTION:
SELECTS KU-BAND A ANTENNA STEERING MODES - GPC, GPC DESIGNATE, AUTO, AND MANUAL, WHEN THE CONTROL SWITCH, A1S6, IS IN THE "PANEL" MODE. 36V73A1A1S7.

FAILURE MODE:
FAILS OPEN, PREMATURE OPEN, FAILS CLOSED, PREMATURE CLOSURE, CONTACT-TO-CONTACT SHORT

CAUSE(S):
VIBRATION, MECHANICAL SHOCK, CONTAMINATION, WRECK 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 - 3/3

(A,B,C,D) NO EFFECT ON LOCKING KU-BAND ANTENNA GIMBALS.

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

(A,B) LOSS OF ONE OR ALL ANTENNA STEERING MODES FROM PANEL MODE. WORST CASE, SYSTEM DEFAULTS TO MANUAL STEERING IN WHICH SEARCH AND TRACK ARE INHIBITED.

(C) LOSS OF ALL MISSION OBJECTIVES REQUIRING KU-BAND RENDEZVOUS RADAR.

(D) NO EFFECT.

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

(A,B,C,D) AFTER SECOND FAILURE (GCILF OR PNL/CMD SWITCH) POSSIBLE LOSS OF ONE OF THREE REDUNDANT PATHS TO SUPPLY DATA TO NSP FOR STATE VECTOR

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UPDATE. UHF PROVIDES AN INDEPENDENT PATH FOR STATE VECTOR UPDATE. AFTER FIVE 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 #2, ROTARY SWITCH

(B) TEST

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

(E) OPERATIONAL USE

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

NO EFFECT, NONE REQUIRED.

WORKAROUND TO REGAIN SUPPORT OF MISSION OBJECTIVES

COMM: USE GCILU CMD MODE. 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.