

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : COMMUNICATION & TRACKING FMEA NO 05-2J -23600 -1 REV:01/05/88

ASSEMBLY : AV BAY 2					CRIT. FUNC: 2
P/N RI : ME452-0152-0001					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 <i>1-5-88</i> M ZELON	APPROVED BY:	DES <i>1/7/88</i>	REDUNDANCY SCREEN: A-	B-	C-	APPROVED BY (NASA):
REL <i>1/5/88</i> M ALVAREZ	REL <i>1-12-88</i>	SSM <i>1/6/88</i>	REL <i>1/17/88</i>				
QE <i>1/11/88</i> J COURSEN	QE <i>1/17/88</i>	QE <i>1/17/88</i>	QE <i>1/17/88</i>				

ITEM:
SWITCH, PAYLOAD RF S-BAND COAX TRANSFER SWITCH.

FUNCTION:
SELECTS EITHER LEFT HCP OR RIGHT HCP DEDICATED PORT (ANTENNA) FOR PAYLOAD INTERROGATOR'S NO. 1 OR NO. 2. EITHER PORT (ANTENNA) MAY BE DEDICATED TO EITHER PAYLOAD INTERROGATOR UPON SELECTION. 82V74A89.

FAILURE MODE:
RF TRANSFER SWITCH OPENS OR SHORTS TO GROUND.

CAUSE(S):
VIBRATION, TEMPERATURE, MECHANICAL SHOCK, CONTAMINATION, MISHANDLING, PIECE-PART STRUCTURAL FAILURE.

EFFECT(S) ON:
(A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE

(A, B) LOSS OF ONE OR BOTH (WORST CASE) PAYLOAD INTERROGATORS AND/OR ONE OR BOTH (WORST CASE) ANTENNA POLARITIES (NOT REDUNDANT BECAUSE THEY ARE RIGHT AND LEFT HAND POLARITY - ONE EACH). LOSS OF PAYLOAD COMMUNICATIONS IF BOTH PAYLOAD INTERROGATORS AND/OR BOTH ANTENNA POLARITIES ARE LOST OR IF COMMUNICATION WITH A PAYLOAD REQUIRES THE POLARITY THAT HAS BEEN LOST.

(C) POSSIBLE LOSS OF PRIME MISSION OBJECTIVE FOR THOSE MISSIONS WHICH REQUIRE RF COMMUNICATION WITH A PAYLOAD.

(D) NO EFFECT.

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DISPOSITION & RATIONALE:

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

(A) DESIGN

SUPPRESSION DIODES ARE SELECTED FROM MF004-400 (OPPL) WHICH CALLS FOR JANIXV LEVEL, AND HAVE ADEQUATE DERATING FACTORS OF AT LEAST 50 PERCENT. ALL NON-OPPL PARTS ARE EVALUATED FOR COMPLIANCE WITH OPPL DERATING REQUIREMENTS. THE RF COAX SWITCH IS QUALIFIED BY TESTS. THE QUALIFICATION TESTS WERE PERFORMED ON OTHER SPACE PROGRAMS (E.G., TELEFUNKEN-SYMPHONY SATELLITE AND INTELSAT IV).

(B) TEST

ACCEPTANCE TESTING OF ALL UNITS INCLUDES EXAMINATION OF PRODUCT, AVT AND FUNCTIONAL TEST. QUAL TEST INCLUDES QAVT - RANDOM VIBRATION 9 G RMS, 5 MIN/AXIS IN 3 AXES. QVT - RANDOM VIBRATION 11 G RMS, 48 MIN/AXES IN 3 AXIS. QTT 5 CYCLES + 120 TO -20 DEG F. LIFE CYCLING, 100,000 CYCLES OR 200,000 ACTUATIONS. THE QUAL PROCEDURES ARE 78-14 BY TRANSCO INC., AND THE QUAL TEST REPORT IS 2109, DATED 1978, BY TRANSCO INC. (THE "SYMPHONY" QUAL WAS COMPLETED IN 1970). GROUND TURN AROUND TEST - CONFIRM VALID FRAME SYNC LOCK ON PAYLOAD INTERROGATORS (PI) 1 AND 2 FOR LHC AND RCH POLARIZATION USING MISSION SPECIFIC CHANNEL. MEASURE PI 1 AND 2 RF POWER OUTPUT USING MISSION SPECIFIC POLARIZATION - PERFORMED TO SUPPORT FLIGHT MANIFEST.

(C) INSPECTION

RECEIVING INSPECTION

RECEIVING INSPECTION PERFORMS VISUAL AND DIMENSIONAL EXAMINATION OF ALL INCOMING PARTS. CERTIFICATION RECORDS AND TEST REPORTS ARE MAINTAINED CERTIFYING MATERIALS AND PHYSICAL PROPERTIES.

CONTAMINATION CONTROL

QUALITY CONTROL (QC) VERIFIES THAT REQUIRED PROCEDURES AND SHOP PRACTICES ARE UTILIZED FOR CONTAMINATION CONTROL. ASSEMBLY IS ACCOMPLISHED ON A CLASS 100 LAMINAR FLOW BENCH WITHIN A CLASS 100,000 CLEAN ROOM.

ASSEMBLY/INSTALLATION

DETAILED INSPECTION IS PERFORMED ON ALL PARTS PRIOR TO NEXT ASSEMBLY.

CRITICAL PROCESSES

ALL CRITICAL PROCESSES (SOLDERING, RESISTANCE WELDING, NICKEL PLATING, GOLD PLATING AND PASSIVATION) ARE MONITORED AND VERIFIED BY QC. ALSO, CERTIFICATION FOR SOLDERING IS MONITORED AND VERIFIED BY QC.

TESTING

ALL PARTS OF THE ATP ARE OBSERVED AND VERIFIED BY QC. QUALITY ASSURANCE TEST PERSONNEL PERFORM THE ATP.

HANDLING/PACKAGING

IN-PROCESS OPERATIONS ARE VERIFIED BY QC TO PROTECT PARTS AND PRECLUDE MISHANDLING. PARTS ARE PACKAGED, PROTECTED, AND VERIFIED BY INSPECTION TO APPLICABLE REQUIREMENTS AT THE SUPPLIER.

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(D) FAILURE HISTORY

NO RECORDED FAILURES FOR THIS FAILURE MODE.

(E) OPERATIONAL USE

NO CREW CORRECTIVE ACTION AVAILABLE.