

CRITICAL ITEMS LIST

PROJECT: SMS
 ASS'Y NOMENCLATURE: END EFFECTOR

SYSTEM: MECHANICAL ARM SUBSYSTEM
 ASS'Y P/N: 51140E1470-3 SHEET: 1

ITEM REF.	REV.	NAME, QTY, & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	MODE / FUNC. 3/2RAB CRITICALITY	RATIONALE FOR ACCEPTANCE
3900	1	END EFFECTOR SCHEMATIC 51140E729 FOR P/W 51140E1470-1 AND 51140E2221 FOR P/W 51140E1470-3 SPAR-SMS-66 459/011.	MODE: ONE OF THE SPEE RELAY CONTACTS FAILS O/C. CAUSE(S): (1) X1 CONTACT FAILS O/C.	NONE. WORST CASE ----- NO EFFECT ON CREW/VEHICLE OR MISSION. REDUNDANT PATHS REMAINING ----- OTHER SPEE RELAY CONTACT	DESIGN FEATURES -----	RELAYS ARE HERMETICALLY SEALED TYPES, CONFORMING TO MIL-R-39016 OR MIL-R-6106 AS DICTATED BY THE DESIGN APPLICATION. IN ADDITION, ALL DELAYS ARE SCREENED TO NASA ST-R-0001 REQUIREMENTS. CONTACT CURRENT AND VOLTAGE STRESSES ARE REDUCED IN ACCORDANCE WITH THE DEBATING REQUIREMENTS OF SPAR-SMS-PA.803. IN THE PACKAGING DESIGN, EMPHASIS HAS BEEN PLACED UPON RELAY MOUNTING TO ENSURE GOOD HEAT TRANSFER AND IMMUNITY FROM VIBRATION.

PREPARED BY: MWLG

SUPERSEDING DATE: 06 OCT 87

APPROVED BY: _____

ITEM REF.	REV.	NONE QTY & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	RDM / YUNC. 3/2008 CRITICALITY	RATIONALE FOR ACCEPTANCE
3980	1	END EFFECTOR SCHEMATIC 51140E729 FOR P/N 51140E1470-1 AND 51140E2221 FOR P/N 51140E1470-3 SPAR-DMS-86 459/011.	MODE: ONE OF THE SPEE RELAY CONTACTS FAILS O/C. CAUSE(S): (1) K1 CONTACT FAILS O/C.	NONE. WORST CASE ----- NO EFFECT ON CREW/VEHICLE OR MISSION. REDUNDANT PATHS REMAINING ----- OTHER SPEE RELAY CONTACT		<p>ACCEPTANCE TESTS</p> <p>-----</p> <p>THE EE ASSEMBLY IS TESTED TO THE FOLLOWING ACCEPTANCE ENVIRONMENTS:</p> <ul style="list-style-type: none"> O VIBRATION: LEVEL AND DURATION - REFERENCE TABLE 7 O THERMAL VACUUM: +70 DEGREES C TO -25 DEGREES C (1 1/2 CYCLES) 1 X 10⁻⁶ TORR <p>THE EE ASSEMBLY IS FURTHER TESTED IN THE IN THE RMS SYSTEM TEST (TP518 RMS STRONGBACK AND TP552 FLAT FLOOR TESTS) WHICH VERIFIES THE ABSENCE OF THE FAILURE MODE.</p> <p>QUALIFICATION TESTS</p> <p>-----</p> <p>THE EE ASSEMBLY QUALIFICATION TESTING CONSISTED OF THE FOLLOWING ENVIRONMENTS:</p> <ul style="list-style-type: none"> O VIBRATION: LEVEL AND DURATION - REFERENCE TABLE 7 O SHOCK: 200/11 MS - 3 AXES (6 DIRECTIONS) O THERMAL VACUUM: +81 DEGREES C TO -36 DEGREES C (6 CYCLES) 1 X 10⁻⁶ TORR O HUMIDITY: 95% RH (65 DEGREES C MAINTAINED FOR 6 HRS) (65 DEGREES C TO 30 DEGREES C IN 16 HRS) 10 CYCLES 240 HRS. O EMC: MIL-STD-461A AS MODIFIED BY SL-E-0002 (TEST CE01, CE03, CE01, CE02, CE06, RE02 (M/D)) O STRUCTURAL STIFFNESS AND LOAD TEST <p>FLIGHT CHECKOUT</p> <p>-----</p> <p>PDRS OPS CHECKLIST (ALL VEHICLES) JSC 16987</p>

PREPARED BY: RF14G

SUPERSEDING DATE: 06 OCT 07

APPROVED BY: _____

CRITICAL ITEMS LIST

PROJECT: SRMS
ASS'Y NOMENCLATURE: END EFFECTOR

SYSTEM: MECHANICAL ARM SUBSYSTEM
ASS'Y P/N: 51140E1470-1E-3

SHEET: 3

FREA REF.	REV.	NAME, QTY, & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	MDM / FUNC. 3/2RAD CRITICALITY	RATIONALE FOR ACCEPTANCE
3980	1	END EFFECTOR SCHEMATIC 51140E729 FOR P/N 51140E1470-1 AND 51140E2221 FOR P/N 51140E1470-3 SPAR-RMS-SG 459/011.	MODE: ONE OF THE SPEE RELAY CONTACTS FAILS O/C. CAUSE(S): (1) KT CONTACT FAILS O/C.	NONE. WORST CASE ----- NO EFFECT ON CREW/VEHICLE OR MISSION. REDUNDANT PATHS REMAINING ----- OTHER SPEE RELAY CONTACT	QA/INSPECTIONS -----	<p>HERMETICALLY SEALED RELAYS ARE PROCURED TO SPAR SPECIFICATION SG.459/011 AS A QUALIFIED PRODUCT, IN ACCORDANCE WITH THE REQUIREMENTS OF MIL-R-61066, PART NO. MS27401-5, AS REQUIRED BY SPAR SPECIFICATION SG.459/011. SCREENING INSPECTION IS PERFORMED ON 100% OF THE RELAYS TO THE REQUIREMENTS OF SG.459/001. SCREENING INSPECTION CONSIST OF THE FOLLOWING EXAMINATION AND TESTS, CONTACT RESISTANCE, COIL CURRENT, DC COIL RESISTANCE, PICKUP AND DROPOUT VOLTAGE/CURRENT, OPERATE AND RELEASE TIME, CONTACT BOUNCE, DIELECTRIC WITHSTANDING VOLTAGE, INSULATION RESISTANCE, DELTA, HIGH, LOW ROOM TEMPERATURE RUN-IN, ELECTRICAL CHARACTERISTICS, PIND AND RADIOGRAPHIC INSPECTION IN ACCORDANCE WITH NSFC-STD-355.</p> <p>RECEIVING INSPECTION VERIFIES THAT ALL PARTS RECEIVED ARE AS IDENTIFIED IN THE PROCUREMENT DOCUMENTS, THAT NO PHYSICAL DAMAGE HAS OCCURRED TO PARTS DURING SHIPMENT, THAT THE RECEIVING DOCUMENTS PROVIDE ADEQUATE TRACEABILITY INFORMATION AND SCREENING DATA CLEARLY IDENTIFIES ACCEPTABLE PARTS.</p> <p>PARTS ARE INSPECTED THROUGHOUT MANUFACTURE AND ASSEMBLY AS APPROPRIATE TO THE MANUFACTURING STAGE COMPLETED. THESE INSPECTIONS INCLUDE,</p> <p>COMPONENT MOUNTING INSPECTION FOR CORRECT SOLDERING, WIRE LOOPING, STRAPPING, ETC. OPERATORS AND INSPECTORS ARE TRAINED AND CERTIFIED TO NASA MRB 5380.4(3A) STANDARD, AS MODIFIED BY JSC D0808A.</p> <p>RELAYS ARE OPERATIONAL TESTED AND INSPECTED AS PART OF THE END EFFECTOR POWER UP TESTS IN ACCORDANCE WITH THE REQUIREMENTS OF SPAR INSPECTION TEST PROCEDURE ITP.2510.</p> <p>PRIOR TO END EFFECTOR ACCEPTANCE TESTING RELAYS ARE FUNCTIONALLY TESTED TO THE END EFFECTOR SPEE POWER TRANSFER RELAY TEST PROCEDURE SPAR-RMS-IM.1056. TESTING INCLUDES, EYE TEST SET FLAG STATUS, EXTEND, RIGIDIZED, DERIGIDIZED, SNARE OPEN, SNARE CLOSED, PAYLOAD CAPTURE AND BITE FLAG (PRE-RUN CONDITION), (AFTER APPLYING CAPTURE COMMAND), (AFTER APPLYING POWER TRANSFER RELAY SWITCH) AND (AFTER APPLYING RELEASE COMMAND).</p> <p>PRE-ACCEPTANCE TEST INSPECTION, WHICH INCLUDES AN AUDIT OF LOWER TIER INSPECTION COMPLETION, AS BUILT CONFIGURATION VERIFICATION TO AS DESIGN ETC., (MANDATORY INSPECTION POINT).</p> <p>A TEST READINESS REVIEW (TRR) WHICH INCLUDES VERIFICATION OF TEST PERSONNEL, TEST DOCUMENTS, TEST EQUIPMENT CALIBRATION/ VALIDATION STATUS AND HARDWARE CONFIGURATION IS CONVENED BY QUALITY ASSURANCE IN CONJUNCTION WITH ENGINEERING, RELIABILITY, CONFIGURATION CONTROL, SUPPLIER AS APPLICABLE, AND THE GOVERNMENT REPRESENTATIVE, PRIOR TO THE START OF ANY FORMAL TESTING (ACCEPTANCE OR QUALIFICATION).</p> <p>ACCEPTANCE TESTING (ATP) INCLUDES, AMBIENT, VIBRATION AND THERMAL-VAC TESTING, (SPAR/GOVERNMENT REP. - MANDATORY INSPECTION POINT)</p>

FMEA REF.	REV.	NAME, QTY & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	WDM / FUNC. 3/2RAB CRITICALITY	RATIONALE FOR ACCEPTANCE
3900	1	END EFFECTOR SCHEMATIC 51140E729 FOR P/N 51140E1470-1 AND 51140E2221 FOR P/N 51140E1470-3 SPAR-RMS-SQ 459/011.	MODE: ONE OF THE SPEE RELAY CONTACTS FAILS O/C. CAUSE(S): (1) RT CONTACT FAILS O/C.	NONE. WORST CASE NO EFFECT ON CREW/VEHICLE OR MISSION. REDUNDANT PATHS REMAINING OTHER SPEE RELAY CONTACT		SRMS SYSTEMS INTEGRATION, THE INTEGRATION OF MECHANICAL ARM SUBASSEMBLIES AND THE FLIGHT CABIN EQUIPMENT TO FORM THE SRMS. INSPECTIONS ARE PERFORMED AT EACH PHASE OF INTEGRATION WHICH INCLUDES GROUNDING CHECKS, TURNS WIRING CHECKS, WIRING ROUTING, INTERFACE CONNECTORS FOR BENT OR PUSH BACK CONTACTS ETC. SRMS SYSTEMS TESTING - STRONGBACK AND FLAT FLOOR AMBIENT PERFORMANCE TEST. (SPAR/GOVERNMENT REP. - MANDATORY INSPECTION POINT)

PREPARED BY: MEMGSUPERSEDING DATE: 06 OCT 07

APPROVED BY: _____

DATE: _____

CRITICAL ITEMS LIST

PROJECT: SMB
 ASS'Y NOMENCLATURE: END EFFECTOR

SYSTEM: MECHANICAL ARM SUBSYSTEM
 ASS'Y P/N: 51140E1470-1-3

SHEET: 2

AREA REF.	REV.	NODE, QTY, & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	MODE / FUNC. 3/2RAB CRITICALITY	RATIONALE FOR ACCEPTANCE
3900	1	END EFFECTOR SCHEMATIC 51140E729 FOR P/N 51140E1470-1 AND 51140E2221 FOR P/N 51140E1470-3 SPAR-SMB-56 459/011.	MODE: ONE OF THE SPEE RELAY CONTACTS FAILS O/C. CAUSE(S): (1) R1 CONTACT FAILS O/C.	NONE. WORST CASE ----- NO EFFECT ON CREW/VEHICLE OR MISSION. REDUNDANT PATHS REMAINING ----- OTHER SPEE RELAY CONTACT	FAILURE HISTORY -----	THERE HAVE BEEN NO FAILURES ASSOCIATED WITH THIS FAILURE MODE ON THE SMB PROGRAM.

PREPARED BY: MMG

SUPERSEDING DATE: 06 OCT 87

APPROVED BY: _____

P/N REF.	REV.	NODE, QTY, & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	NOUN / FUNC. 3/2RAB CRITICALITY	RATIONALE FOR ACCEPTANCE
3980	1	END EFFECTOR SCHEMATIC 51140E729 FOR P/N 51140E1470-1 AND 51140E2221 FOR P/N 51140E1470-3 SPAR-BNS-BQ 459/011.	MODE: ONE OF THE SPEE RELAY CONTACTS FAILS O/C. CAUSE(S): (1) K1 CONTACT FAILS O/C.	NONE. WORST CASE NO EFFECT ON CREW/VEHICLE ON MISSION. REDUNDANT PATHS REMAINING OTHER SPEE RELAY CONTACT	OPERATIONAL EFFECTS	<p>.....</p> <p>NONE. SUBSEQUENT FAILURE WILL RESULT IN NO SPEE POWER TO PAYLOAD.</p> <p>CREW ACTION</p> <p>.....</p> <p>NONE</p> <p>CREW TRAINING</p> <p>.....</p> <p>NONE</p> <p>MISSION CONSTRAINT</p> <p>.....</p> <p>NONE</p> <p>SCREEN FAILURES</p> <p>.....</p> <p>A AND B: INDEPENDENT PATHS NOT INSTRUMENTED.</p> <p>.....</p> <p>ONRSD OFFLINE</p> <p>.....</p> <p>NONE</p> <p>ONRSD ONLINE INSTALLATION</p> <p>.....</p> <p>NONE</p> <p>ONRSD ONLINE TURNAROUND</p> <p>.....</p> <p>NONE</p>

PREPARED BY: MFUG

SUPERSEDING DATE: 06 OCT 87

APPROVED BY: _____

DATE: _____