CRITICAL ITEMS LIST

PROJECT: SRMS (-5 MEIU INSTALLED) SYSTEM: ELECTRICAL SUBSYSTEM
ASS'Y NOMENCLATURE: MCTU ASS'Y P/N: 511551160-5 SHEET: 1

FMEA REF.	FMEA REV.	NAME, QTY, & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	HDWR / FUNC. 2/IR CRITICALITY	RATIONALE FOR ACCEPTANCE SCREENS: A-PASS, B-PASS, C-PASS
1675	D	FAILURE DETECTOR QTY. 1. SCHEMATIC 812797	MODE: LOSS OF EXTERNAL FRAME SYNC MONITOR CIRCUIT CAUSE(S): 1) PARTS FAILURE IN EXT. F.S. MONITOR CIRCUIT. 2) STATUS BUFFER INPUT/OUTPUT FAILS	FAILURE OF EXTERNAL FRAME SYNC BITE CIRCUITRY. VERIFICATION TEST WILL FAIL. ARM WILL OPERATE CORRECTLY. ALL MODES STILL AVAILABLE. WORST CASE ---------- LOSS OF AUTOBRAKING. SYSTEM UNPROTECTED FROM RUNAWAY. ANNUNCIATED. REDUNDANT PATHS REMAINING ---------- 1) MANUAL BRAKES (FOR SAFING THE SYSTEM). 2) DIRECT DRIVE (FOR CONTINUING OPERATIONS).	DESIGN FEATURES ---------- THE DESIGN UTILIZES PROVEN CIRCUIT TECHNIQUES AND IS IMPLEMENTED USING CMOS LOGIC DEVICES. CMOS DEVICES OPERATE AT LOW POWER AND HENCE DO NOT EXPERIENCE SIGNIFICANT OPERATING STRESSES. THE TECHNOLOGY IS MATURE, AND DEVICE RELIABILITY HISTORY IS WELL DOCUMENTED. ALL STRESSES ARE ADDITIONALLY REDUCED BY DERATING THE APPROPRIATE PARAMETERS IN ACCORDANCE WITH SPAR-RMS-PA.003. SPECIAL HANDLING PRECAUTIONS ARE USED AT ALL STAGES OF MANUFACTURE TO PRECLUDE DAMAGE/STRESS DUE TO ELECTROSTATIC DISCHARGE.

PREPARED BY: MFMG SUPERCEDING DATE: NONE DATE: 11 JUL 91 CH REV: D

CRITICAL ITEMS LIST

PROJECT: SRMS (-5 MCIU INSTALLED) SYSTEM: ELECTRICAL SUBSYSTEM
ASS'Y NOMENCLATURE: MCIU ASS'Y P/N: 51155F160-5 SHEET: 2

FMEA REF.	FMEA REV.	NAME, QTY, & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	HDWR / FUNC. 2/1R CRITICALITY	RATIONALE FOR ACCEPTANCE SCREENS: A-PASS, B-PASS, C-PASS
1075	D	FAILURE DETECTOR QTY. 1. SCHEMATIC 812797	MODE: LOSS OF EXTERNAL FRAME SYNC MONITOR CIRCUIT CAUSE(S): 1) PARTS FAILURE IN EXT. F.S. MONITOR CIRCUIT. 2) STATUS BUFFER INPUT/OUTPUT FAILS	FAILURE OF EXTERNAL FRAME SYNC BITE CIRCUITRY. VERIFICATION TEST WILL FAIL. ARM WILL OPERATE CORRECTLY. ALL MODES STILL AVAILABLE. WORST CASE LOSS OF AUTOBRAKING. SYSTEM UNPROTECTED FROM RUNAWAY. ANNUNCIATED. REDUNDANT PATHS REMAINING 1) MANUAL BRAKES (FOR SAFING THE SYSTEM). 2) DIRECT DRIVE (FOR CONTINUING OPERATIONS).	ACCEPTANCE TESTS THE MCIU IS SUBJECTED TO THE FOLLOWING ACCEPTANCE ENVIRONMENTAL TESTING AS AN LRU. D VIBRATION: LEVEL AND DURATION - REFERENCE TABLE 3.2 D THERMAL: +40 DEGREES C TO -16 DEGREES C (2 CYCLES) QUALIFICATION TESTS THE MCIU IS SUBJECTED TO THE FOLLOWING LRU QUALIFICATION ENVIRONMENTS: D VIBRATION: LEVEL AND DURATION - REFERENCE TABLE 5.2 D SHOCK: BY SIMILARITY TO -3 MCIU D THERMAL: +51 DEGREES C TO -27 DEGREES C (10 CYCLES) D HUMIDITY: BY SIMILARITY TO -3 MCIU D EMC: MIL-STD-461 AS MODIFIED BY SL-E-0002 (TESTS CE01, CE03, CS01, CS02, CS06, RE02 (N/B), RS01, RS02 D LIFE: 630 OPERATING HOURS 1000 POWER ON/OFF CYCLES FLIGHT CHECKOUT PDRS OPS CHECKLIST (ALL VEHICLES) JSC 16987

PREPARED BY: MFMG SUPERCEDING DATE: NONE DATE: 11 JUL 91 CIL REV: D

CRITICAL ITEMS LIST

PROJECT: SRMS (-5 MCIU INSTALLED) SYSTEM: ELECTRICAL SUBSYSTEM
ASS'T NOMENCLATURE: MCIU ASS'T P/N: SYSSE160-5 SHEET: 3

FMEA REF.	FMEA REV.	NAME, QTY, & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	NOWR / FUNC. 2/1R CRITICALITY	RATIONALE FOR ACCEPTABLE SCREENS: A-PASS, B-PASS, C-PASS
1075	A	FAILURE DETECTOR QTY. 1, SCHEMATIC 812797	MODE: LOSS OF EXTERNAL FRAME SYNC MONITOR CIRCUIT CAUSE(S): 1) PARTS FAILURE IN EXT. F.S. MONITOR CIRCUIT. 2) STATUS BUFFER INPUT/OUTPUT FAILS	FAILURE OF EXTERNAL FRAME SYNC BITE CIRCUITRY, VERIFICATION TEST WILL FAIL. ARM WILL OPERATE CORRECTLY. ALL MODES STILL AVAILABLE. WORST CASE --- LOSS OF AUTOBRAKING, SYSTEM UNPROTECTED FROM RUNAWAY. ANNUNCIATED. REDUNDANT PATHS REMAINING --- 1) MANUAL BRAKES (FOR SAFING THE SYSTEM). 2) DIRECT DRIVE (FOR CONTINUING OPERATIONS).	QA/INSPECTIONS --- DOCUMENTED QUALITY CONTROLS ARE EXERCISED THROUGHOUT DESIGN PROCUREMENT, PLANNING, RECEIVING, PROCESSING FABRICATION, ASSEMBLY, TESTING AND SHIPPING OF THE MCIU. GOVERNMENT SOURCE INSPECTION IS INVOKED AT VARIOUS LEVELS OF COMPONENT ASSEMBLY AND TEST OPERATIONS. MANDATORY INSPECTION POINTS ARE EMPLOYED AT VARIOUS LEVELS OF ASSEMBLY AND TEST. EEE PARTS INSPECTION IS PERFORMED AS REQUIRED BY SPAR-RMS-PA.003. EACH EEE PART IS QUALIFIED AT THE PART LEVEL TO THE REQUIREMENTS OF THE APPLICABLE SPECIFICATION. ALL EEE PARTS ARE 100% SCREENED AND BURNED IN, AS A MINIMUM, AS REQUIRED BY SPAR-RMS-PA.005, BY THE SUPPLIER. ADDITIONALLY, EEE PARTS ARE 100% RE-SCREENED IN ACCORDANCE WITH REQUIREMENTS, BY AN INDEPENDENT SPAR APPROVED TESTING FACILITY. DPA IS PERFORMED AS REQUIRED BY PA.003 ON A RANDOMLY SELECTED 5% OF PARTS, MAXIMUM 5 PIECES, MINIMUM 3 PIECES FOR EACH LOT NUMBER/DATE CODE OF PARTS RECEIVED. WIRE IS PROCURED, INSPECTED, AND TESTED TO SPAR RMS PA.003. 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. PARTS ARE INSPECTED THROUGHOUT MANUFACTURE AND ASSEMBLY AS APPROPRIATE TO THE MANUFACTURING STAGE COMPLETED. THESE INSPECTIONS INCLUDE, PRINTED CIRCUIT BOARD INSPECTION FOR TRACK SEPARATION, DAMAGE AND ADEQUACY OF PLATED THROUGH HOLES, COMPONENT MOUNTING INSPECTION FOR CORRECT SOLDERING, WIRE LOOPING, STRAPPING, ETC. OPERATORS AND INSPECTORS ARE TRAINED AND CERTIFIED TO NASA NHB 5300.4(3A-1) STANDARD. CONFORMAL COATING INSPECTION FOR ADEQUATE PROCESSING IS PERFORMED USING ULTRAVIOLET LIGHT TECHNIQUES. POST P.C. BD. INSTALLATION INSPECTION, CLEANLINESS AND WORKMANSHIP (SPAR/GOVERNMENT REP. MANDATORY INSPECTION POINT) P.C. BD. INSTALLATION INSPECTION, CHECK FOR CORRECT BOARD INSTALLATION, ALIGNMENT OF BOARDS, PROPER CONNECTOR CONTACT MATING, WIRE ROUTING, STRAPPING OF WIRES ETC., PRE-CLOSURE INSPECTION, WORKMANSHIP AND CLEANLINESS (SPAR/GOVERNMENT REP. - MANDATORY INSPECTION POINT) PRE-ACCEPTANCE TEST INSPECTION, WHICH INCLUDES AN AUDIT OF LOWER TIER INSPECTION COMPLETION, AS BUILT CONFIGURATION VERIFICATION TO AS DESIGN ETC., (MANDATORY INSPECTION POINT). A TEST READINESS REVIEW (TRR) WHICH INCLUDES VERIFICATION OF TEST PERSONNEL, TEST DOCUMENTS, TEST EQUIPMENT CALIBRATION/ VALIDATION STATUS AND HARDWARE CONFIGURATION IS CONVENED BY

PREPARED BY: MWG SUPERCEDING DATE: NONE

DATE: 11 JUL 91 CIL REV: D

SDAC237A
ATTACHMENT -
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CRITICAL ITEMS LIST

PROJECT: SHMS I-S MCIU INSTALLED
ASS'Y NOMENCLATURE: MCIU
SYSTEM: ELECTRICAL SUBSYSTEM
ASS'Y P/N: 21155F160-5
SHEET: 4

FMEA REF.	FMEA REV.	NAME, QTY, & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	HDWR / FUNC. Z/IR CRITICALITY	RATIONALE FOR ACCEPTANCE SCREENS: A-PASS, B-PASS, C-PASS
1075	0	FAILURE DETECTOR QTY. 1. SCHEMATIC 812797	MODE: LOSS OF EXTERNAL FRAME SYNC MONITOR CIRCUIT CAUSE(S): 1) PARTS FAILURE IN EXT. F.S. MONITOR CIRCUIT. 2) STATUS BUFFER INPUT/OUTPUT FAILS	FAILURE OF EXTERNAL FRAME SYNC BITE CIRCUITRY. VERIFICATION TEST WILL FAIL. ARM WILL OPERATE CORRECTLY. ALL MODES STILL AVAILABLE. WORST CASE --------- LOSS OF AUTOBRAKING. SYSTEM UNPROTECTED FROM RUNAWAY. ANNUNCIATED. REDUNDANT PATHS REMAINING ---------- 1) MANUAL BRAKES (FOR SAFING THE SYSTEM). 2) DIRECT DRIVE (FOR CONTINUING OPERATIONS).	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). ACCEPTANCE TESTING (ATP) INCLUDES AMBIENT, VIBRATION, AND THERMAL TESTING (SPAR/GOVERNMENT REP. - MANDITORY INSPECTION POINT).

PREPARED BY: HEWG
SUPERCEDING DATE: NONE
DATE: 11 JUL 91
CIL REV: 0

CRITICAL ITEMS LIST

PROJECT: SRMS (-5 MCIU INSTALLED) SYSTEM: ELECTRICAL SUBSYSTEM
ASS'Y NOMENCLATURE: MCTU ASS'Y P/N: 51155F160-5 SHEET: 5

FMEA REF.	FMEA REV.	NAME, QTY, & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	HDWR / FUNC. Z/IR CRITICALITY	RATIONALE FOR ACCEPTANCE SCREENS: A-PASS, B-PASS, C-PASS
1075	0	FAILURE DETECTOR QTY. 1. SCHEMATIC 812797	MODE: LOSS OF EXTERNAL FRAME SYNC MONITOR CIRCUIT CAUSE(S): 1) PARTS FAILURE IN EXT. F.S. MONITOR CIRCUIT. 2) STATUS BUFFER INPUT/OUTPUT FAILS	FAILURE OF EXTERNAL FRAME SYNC BITE CIRCUITRY. VERIFICATION TEST WILL FAIL. ARM WILL OPERATE CORRECTLY. ALL MODES STILL AVAILABLE. WORST CASE --- LOSS OF AUTOBRAKING. SYSTEM UNPREDICTED FROM RUNAWAY. ANNUNCIATED. REDUNDANT PATHS REMAINING --- 1) MANUAL BRAKES (FOR SAFING THE SYSTEM). 2) DIRECT DRIVE (FOR CONTINUING OPERATIONS).	FAILURE HISTORY --- THERE HAVE BEEN NO FAILURES ASSOCIATED WITH THIS FAILURE MODE ON THE SRMS PROGRAM.

PREPARED BY: MFWG SUPERCEDING DATE: NONE DATE: 11 JUL 91 ECL REV: 0

CRITICAL ITEMS LIST

PROJECT: SRMS (-5 MCIU INSTALLED) SYSTEM: ELECTRICAL SUBSYSTEM
ASS'Y NOMENCLATURE: MCIU ASS'Y P/N: 5T15ST180-5 SHEET: 6

FMEA REF.	FMEA REV.	NAME, QTY, & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	HDWR / FUNC. 2/1R CRITICALITY: RATIONALE FOR ACCEPTANCE: SCREENS: A-PASS, B-PASS, C-PASS
1875	0	FAILURE DETECTOR QTY. 1. SCHEMATIC 812797	MODE: LOSS OF EXTERNAL FRAME SYNC MONITOR CIRCUIT CAUSE(S): 1) PARTS FAILURE IN EXT. F.S. MONITOR CIRCUIT. 2) STATUS BUFFER INPUT/OUTPUT FAILS	FAILURE OF EXTERNAL FRAME SYNC BITE CIRCUITRY. VERIFICATION TEST WILL FAIL. ARM WILL OPERATE CORRECTLY. ALL MODES STILL AVAILABLE. WORST CASE LOSS OF AUTOBRAKING. SYSTEM UNPROTECTED FROM RUNAWAY. ANNUNCIATED. REDUNDANT PATHS REMAINING 1) MANUAL BRAKES (FOR SAFING THE SYSTEM). 2) DIRECT DRIVE (FOR CONTINUING OPERATIONS).	OPERATIONAL EFFECT NO EFFECT BUT LOSS OF AUTOBRAKES FOR A SUBSEQUENT FAILURE. CREW ACTION SELECT DIRECT DRIVE IF WITHIN 10 FEET OF STRUCTURE. SINGLE/DIRECT DRIVE SWITCH SHOULD BE PULSED TO MAINTAIN PROPER RATES. CREW TRAINING CREW IS TRAINED TO ALWAYS OBSERVE WHETHER THE ARM IS RESPONDING PROPERLY TO COMMANDS. IF IT ISN'T, APPLY BRAKES. MISSION CONSTRAINT NONE SCREEN FAILURES N/A ONRSD OFFLINE VERIFY NO BITE BITS SET DURING TEST. ONRSD ONLINE INSTALLATION NONE ONRSD ONLINE TURNAROUND VERIFY NO BITE ANNUNCIATIONS.

PREPARED BY: MTMB SUPERCEDING DATE: NONE DATE: 11 JUL 91 CH. REV. B