

CRITICAL ITEMS LIST

PROJECT: SRMS (5 M INSTALLED)
 ASS'Y NOMENCLATURE:

SYSTEM: ELECTRICAL SUBSYSTEM
 ASS'Y P/N: 51557160-5

SHEET: 1

FMEA REF.	FMEA REV.	NAME, QTY, & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	HOW / FUNC. 2/1A CRITICALITY	RATIONALE FOR ACCEPTANCE SCREENS: A-PASS, B-PASS, C-PASS
1955	0	DIGITAL INTERFACE QTY 1 SCHEMATIC B12796	<p>MODE: CORRUPT DATA TRANSFER TO/FROM DAC</p> <p>CAUSE(S): 1) COMMAND BITS OF INPUT TO PARALLEL TO SERIAL CONVERSION CIRCUIT FAILS 2) LOSS OF CLOCK SIGNAL TO DAC PANEL 3) LOSS OF STROBE SIGNAL TO DAC PANEL 4) SERIAL INPUT CIRCUIT FAILS 5) SERIAL TO PARALLEL CONVERSION CIRCUIT FAILS 6) SERIAL OUTPUT CIRCUIT FAILS HIGH</p>	<p>LOSS OF COMMUNICATION WITH DAC INTERFACE WILL INITIATE DAC COMMUNICATION FAILURE DETECTION. AUTOGRABES. ARM COMES TO REST. OPC GOES INTO IDLE MODE. LOSS OF COMPUTER SUPPORTED MODES. ABE COMMUNICATION PATH REMAINS OPERABLE. LOSS OF TIMING DURING END EFFECTOR CAPTURE.</p> <p>FOR CAUSE 1): DAC COMMAND DATA BIT FAILS TO "0" OR "1".</p> <p>FOR CAUSE 2): DAC COMMAND DATA IS NOT UPDATED, AND DAC RESPONSE DATA FAILS TO ALL "1'S" OR "0'S".</p> <p>FOR CAUSE 3): DAC COMMAND DATA IS NOT UPDATED. DAC RESPONSE DATA IS ALL "0'S".</p> <p>FOR CAUSE 4): DAC RESPONSE DATA FAILS TO ALL ZERO'S.</p> <p>FOR CAUSE 5): DAC RESPONSE DATA FAILS TO ALL "1'S" OR ONE OR MORE "0'S".</p> <p>FOR CAUSE 6): DAC COMMAND</p>	<p>DESIGN FEATURES</p> <p>EEE PARTS HAVE BEEN SELECTED AND CONTROLLED IN ACCORDANCE WITH SPAR-RMS-PA.003. THIS DOCUMENT DEFINES THE PROGRAM REQUIREMENTS FOR MONITORING AND CONTROLLING EEE PARTS. THE REQUIREMENTS INCLUDE PART SELECTION TO AT LEAST "ESTABLISHED RELIABILITY" LEVELS AND ADEQUATE DERATING OF PART STRESS LEVELS. PROCEDURES AND ACTIVITIES ARE SPECIFIED TO ENSURE AT LEAST EQUIVALENT QUALITY FOR NONSTANDARD AND IRREGULAR PARTS. RELIABILITY ANALYSIS HAS CONFIRMED NO PARTS WITH GENERICALLY HIGH FAILURE RATES. AFOSPACE DESIGN STANDARDS FOR DETAILING ELECTRONIC PARTS PACKAGING, MOUNTING AND STRUCTURAL/MECHANICAL/INTEGRITY OF ASSEMBLIES ARE APPLIED. SUCH DESIGN HAS BEEN REVIEWED AND FOUND SATISFACTORY THROUGH THE DESIGN AND/IT PROCESS, INCLUDING THE USE OF RELIABILITY, MAINTAINABILITY AND SAFETY CHECKLISTS. MATERIAL SELECTION AND USAGE CONFORMS TO SPAR-SG.168 WHICH IS EQUIVALENT TO THE NASA MATERIALS USAGE REQUIREMENTS. WORST CASE ANALYSIS HAS BEEN CONDUCTED TO ENSURE THAT PERFORMANCE CAN BE MET UNDER WORST CASE TEMPERATURE AND AGING EFFECTS. EEE PARTS STRESS ANALYSIS HAS BEEN COMPLETED AND CONFIRMS THAT THE PARTS MEET THE DERATING REQUIREMENTS.</p> <p>PRINTED CIRCUIT BOARD DESIGNS HAVE BEEN REVIEWED TO ENSURE ADEQUATE CIRCUIT PAD WIDTH AND SEPARATION AND TO CONFIRM APPROPRIATE DIMENSIONS OF CIRCUIT SOLDER PADS AND OF COMPONENT HOLE PROVISIONS.</p> <p>PARTS MOUNTING METHODS ARE CONTROLLED IN ACCORDANCE WITH NSFC-S1D-136 WHICH DEFINES APPROVED MOUNTING METHODS, STRESS RELIEF, AND COMPONENT SECURITY.</p> <p>WHERE APPLICABLE, DESIGN DRAWINGS AND DOCUMENTATION GIVE CLEAR IDENTIFICATION OF HANDLING PRECAUTIONS FOR ESD SENSITIVE PARTS.</p> <p>BOARD ASS'Y DRAWINGS INCLUDE THE REQUIREMENTS FOR SOLDERING STANDARDS IN ACCORDANCE WITH WNG 5300.4(3) AND JSC 0680U.</p> <p>DISCRETE SEMICONDUCTOR DEVICES SPECIFIED TO AT LEAST THE TR LEVEL OF MIL-S-19500. ALL DEVICES ARE SUBJECTED TO RE-SCREENING BY AN INDEPENDANT TEST HOUSE. SAMPLES OF ALL PROCURED LOTS/DATE CODES ARE SUBJECTED TO DESTRUCTIVE PHYSICAL ANALYSIS (DPA) TO VERIFY THE INTEGRITY OF THE MANUFACTURING PROCESSES. DEVICE STRESS LEVELS ARE, DERATED IN ACCORDANCE WITH SPAR-RMS-PA.003 AND VERIFIED BY DESIGN REVIEW.</p> <p>THE DESIGN UTILIZES PROVEN CIRCUIT TECHNIQUES AND IS IMPLEMENTED USING TTL AND CMOS LOGIC DEVICES.</p> <p>CMOS DEVICES OPERATE AT LOW POWER AND REMCE 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.</p> <p>DESIGN, CONSTRUCTION, AND PHYSICAL DIMENSIONS ARE AS SPECIFIED</p>	

PREPARED BY: MIMG SUPERSEDING DATE: NONE

DATE: 11 JUL 91 ETL REV: 0

5040237A
 ATTACHMENT
 PAGE 281 OF 471

CRITICAL ITEMS LIST

PROJECT: SRMS (-5 MCIU INSTALLED)
 ASS'Y NOMENCLATURE: RCTU

SYSTEM: ELECTRICAL SUBSYSTEM
 ASS'Y P/N: 51955F160-5

SHEET: 2

FMEA REF.	FMEA REV.	NAME, QTY, & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	MODE / FUNC. 2/1R CRITICALITY RATIONALE FOR ACCEPTANCE SCREENS: A-PASS, B-PASS, C-PASS
1955	0	DIGITAL INTERFACE QTY 1 SCHEMATIC B12796	MODE: CORRUPT DATA TRANSFER TO/FROM D&C CAUSE(S): 1) COMMAND BITS OF INPUT TO PARALLEL TO SERIAL CONVERSION CIRCUIT FAILS 2) LOSS OF CLOCK SIGNAL TO D&C PANEL 3) LOSS OF STROBE SIGNAL TO D&C PANEL. 4) SERIAL INPUT CIRCUIT FAILS. 5) SERIAL TO PARALLEL CONVERSION CIRCUIT FAILS 6) SERIAL OUTPUT CIRCUIT FAILS WHEN	DATA FAILS TO ALL "1'S" AND RESPONSE DATA IS ALL "0'S". IF D&C RESPONSE EE COMMAND BITS ARE ALL "1'S": AUTO EE CAPTURE COMMANDED WHEN EE MODE SWITCH SET TO AUTO. IF D&C RESPONSE EE COMMAND BITS ARE "0'S": LOSS OF EE AUTO COMMANDS, DURING AUTO CAPTURE LIMPING IS LOST. WORST CASE ----- UNEXPECTED MOTION. SIX JOINT RUNAWAY. AUTOBRAKES. REDUNDANT PATHS REMAINING ----- 1) AUTO BRAKES (FOR SAFING THE SYSTEM) 2) DIRECT DRIVE AND EE MANUAL MODES. (FOR CONTINUING OPERATIONS)	IN MIL-H-38510 B, SAMPLING INSPECTION AND SCREENING ARE CONDUCTED ACCORDING TO MIL-STD-883 METHODS 5005 AND 5004.

PREPARED BY: MMG

SUPERSEDING DATE: NONE

DATE: 11 JUL 91

EXPLOSION PROOF

CRITICAL ITEMS LIST

PROJECT: SRMS (-5 MCIU INSTALL) /
 ASS'Y NOMENCLATURE: MCIU

SYSTEM: ELECTRICAL SUBSYSTEM
 ASS'Y P/N: 51955F100-5

SHEET: 3

FMEA REF.	THEA REV.	NAME, QTY, & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	HOUR / FINE. 2/1R CRITICALITY	RATIONALE FOR ACCEPTANCE SCREENS: A-PASS, B-PASS, C-PASS
1955	0	DIGITAL INTERFACE QTY 1 SCHEMATIC 812796	<p>MODE: CORRUPT DATA TRANSFER TO/FROM D&C</p> <p>CAUSE(S): 1) COMMAND BITS OF INPUT TO PARALLEL TO SERIAL CONVERSION CIRCUIT FAILS 2) LOSS OF CLOCK SIGNAL TO D&C PANEL 3) LOSS OF STROBE SIGNAL TO D&C PANEL. 4) SERIAL INPUT CIRCUIT FAILS. 5) SERIAL TO PARALLEL CONVERSION CIRCUIT FAILS 6) SERIAL OUTPUT CIRCUIT FAILS HIGH</p>	<p>LOSS OF COMMUNICATION WITH D&C INTERFACE WILL INITIATE D&C COMMUNICATION FAILURE DETECTION. AUTOBRAKES. ARM COMES TO REST. GPC GOES INTO IDLE MODE. LOSS OF COMPUTER SUPPORTED MODES. ARE COMMUNICATION PATH REMAINS OPERABLE. LOSS OF LIMPING DURING END EFFECTOR CAPTURE.</p> <p>FOR CAUSE 1): D&C COMMAND DATA BIT FAILS TO "0" OR "1".</p> <p>FOR CAUSE 2): D&C COMMAND DATA IS NOT UPDATED, AND D&C RESPONSE DATA FAILS TO ALL "1'S" OR "0'S".</p> <p>FOR CAUSE 3): D&C COMMAND DATA IS NOT UPDATED. D&C RESPONSE DATA IS ALL "0'S".</p> <p>FOR CAUSE 4): D&C RESPONSE DATA FAILS TO ALL ZERO'S.</p> <p>FOR CAUSE 5): D&C RESPONSE DATA FAILS TO ALL "1'S" OR ONE OR MORE "0'S".</p> <p>FOR CAUSE 6): D&C COMMAND</p>		<p>ACCEPTANCE TESTS ----- THE MCIU IS SUBJECTED TO THE FOLLOWING ACCEPTANCE ENVIRONMENTAL TESTING AS AN LRU.</p> <p>O VIBRATION: LEVEL AND DURATION - REFERENCE TABLE 3.2</p> <p>O THERMAL: +40 DEGREES C TO -16 DEGREES C (2 CYCLES)</p> <p>QUALIFICATION TESTS ----- THE MCIU IS SUBJECTED TO THE FOLLOWING LRU QUALIFICATION ENVIRONMENTS:</p> <p>O VIBRATION: LEVEL AND DURATION - REFERENCE TABLE 3.2</p> <p>O SHOCK: BY SIMILARITY TO -3 MCIU</p> <p>O THERMAL: +51 DEGREES C TO -27 DEGREES C (10 CYCLES)</p> <p>O HUMIDITY: BY SIMILARITY TO -3 MCIU</p> <p>O EMC: MIL-STD-461 AS MODIFIED BY SL E-0002 (TESTS CE01, CE03, CS01, CS02, CS06, RE02 (W/B), RS01, RS02)</p> <p>O LIFE: 630 OPERATING HOURS 1000 POWER ON/OFF CYCLES</p> <p>FLIGHT CHECKOUT ----- PDMS OPS CHECKLIST (ALL VEHICLES) JSC 76987</p>

PREPARED BY: HMG

SUPERSEDING DATE: NONE

DATE: 31 JUL 91

CHL REV: 0

504237A
 ATTACHMENT
 PAGE 203 OF 471

CRITICAL ITEMS LIST

PROJECT: SRMS (-5 MCIM INSTALLED)
 ASS'Y NOMENCLATURE: ACIU

SYSTEM: ELECTRICAL SUBSYSTEM
 ASS'Y P/N: 5155PT80-2

SHEET: 4

FMEA REF.	FMEA REV.	NAME, QTY, & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	HOWR / FUNC. 2/19 CRITICALITY	RATIONALE FOR ACCEPTANCE SCREENS: A-PASS, B-PASS, C-PASS
1955	0	DIGITAL INTERFACE QTY 1 SCHEMATIC 812796	<p>MODE: CORRUPT DATA TRANSFER TO/FROM DAC</p> <p>CAUSE(S): 1) COMMAND BITS OF INPUT TO PARALLEL TO SERIAL CONVERSION CIRCUIT FAILS 2) LOSS OF CLCK SIGNAL TO DAC PANEL 3) LOSS OF STROBE SIGNAL TO DAC PANEL. 4) SERIAL INPUT CIRCUIT FAILS. 5) SERIAL TO PARALLEL CONVERSION CIRCUIT FAILS 6) SERIAL OUTPUT CIRCUIT FAILS HIGH</p>	<p>DATA FAILS TO ALL "1'S" AND RESPONSE DATA IS ALL "0'S".</p> <p>IF DAC RESPONSE EE COMMAND BITS ARE ALL "1'S": AUTO EE CAPTURE COMMAND WHEN EE MODE SWITCH SET TO AUTO. IF DAC RESPONSE EE COMMAND BITS ARE "0'S": LOSS OF EE AUTO COMMANDS DURING AUTO CAPTURE LIMPING IS LOST.</p> <p>WORST CASE UNEXPECTED MOTION, SIX JOINT RUNAWAY, AUTOBRAKES.</p> <p>REDUANT PATHS REMAINING ----- 1) AUTO BRAKES (FOR SAFING THE SYSTEM) 2) DIRECT DRIVE AND EE MANUAL MODES. (FOR CONTINUING OPERATIONS)</p>	<p>DA/INSPECTIONS ----- DOCUMENTED QUALITY CONTROLS ARE EXERCISED THROUGHOUT DESIGN, PROCUREMENT, PLANNING, RECEIVING, PROCESSING, FABRICATION, ASSEMBLY, TESTING AND SHIPPING OF THE MCIM. 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.</p> <p>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.003, 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.</p> <p>WIRE IS PROCURED, INSPECTED, AND TESTED TO SPAR-RMS-PA.003.</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>PRINTED CIRCUIT BOARD INSPECTION FOR TRACK SEPARATION, DAMAGE AND ADEQUACY OF PLATED THROUGH HOLES,</p> <p>COMPONENT MOUNTING INSPECTION FOR CORRECT SOLDERING, WIRE LOOPING, STRAPPING, ETC. OPERATORS AND INSPECTORS ARE TRAINED AND CERTIFIED TO WASH AND 5300.4(3A-1) STANDARD.</p> <p>CONFORMAL COATING INSPECTION FOR ADEQUATE PROCESSING IS PERFORMED USING ULTRAVIOLET LIGHT TECHNIQUES.</p> <p>POST P.C. BD. INSTALLATION INSPECTION, CLEANLINESS AND WORKMANSHIP (SPAR/GOVERNMENT REP. MANDATORY INSPECTION POINT)</p> <p>P.C. BD. INSTALLATION INSPECTION, CHECK FOR CORRECT BOARD INSTALLATION, ALIGNMENT OF BOARDS, PROPER CONNECTOR CONTACT MATING, WIRE ROUTING, STRAPPING OF WIRES ETC.,</p> <p>PIE-CLOSURE INSPECTION, WORKMANSHIP AND CLEANLINESS (SPAR/GOVERNMENT REP. - MANDATORY INSPECTION POINT)</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 CONVEYED BY</p>	<p>DA/INSPECTIONS ----- DOCUMENTED QUALITY CONTROLS ARE EXERCISED THROUGHOUT DESIGN, PROCUREMENT, PLANNING, RECEIVING, PROCESSING, FABRICATION, ASSEMBLY, TESTING AND SHIPPING OF THE MCIM. 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.</p> <p>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.003, 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.</p> <p>WIRE IS PROCURED, INSPECTED, AND TESTED TO SPAR-RMS-PA.003.</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>PRINTED CIRCUIT BOARD INSPECTION FOR TRACK SEPARATION, DAMAGE AND ADEQUACY OF PLATED THROUGH HOLES,</p> <p>COMPONENT MOUNTING INSPECTION FOR CORRECT SOLDERING, WIRE LOOPING, STRAPPING, ETC. OPERATORS AND INSPECTORS ARE TRAINED AND CERTIFIED TO WASH AND 5300.4(3A-1) STANDARD.</p> <p>CONFORMAL COATING INSPECTION FOR ADEQUATE PROCESSING IS PERFORMED USING ULTRAVIOLET LIGHT TECHNIQUES.</p> <p>POST P.C. BD. INSTALLATION INSPECTION, CLEANLINESS AND WORKMANSHIP (SPAR/GOVERNMENT REP. MANDATORY INSPECTION POINT)</p> <p>P.C. BD. INSTALLATION INSPECTION, CHECK FOR CORRECT BOARD INSTALLATION, ALIGNMENT OF BOARDS, PROPER CONNECTOR CONTACT MATING, WIRE ROUTING, STRAPPING OF WIRES ETC.,</p> <p>PIE-CLOSURE INSPECTION, WORKMANSHIP AND CLEANLINESS (SPAR/GOVERNMENT REP. - MANDATORY INSPECTION POINT)</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 CONVEYED BY</p>

PREPARED BY:

MTWG

SUPERSEDING DATE: NONE

DATE: 11 JUL 91

CTL REV: 0

5040237A
 ATTACHMENT
 PAGE 284 OF 471

CRITICAL ITEMS LIST

PROJECT: SRMS (-5 MC1U INSTALLED)
 ASSY NAME (INTORE: MC1U)

SYSTEM: ELECTRICAL SUBSYSTEM
 ASSY P/R: 51155F160-5

SHEET: 5

JREA REF.	FMEA REV.	NAME, QTY, & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	ADWR / FUNC. 2/1R CRITICALITY	RATIONALE FOR ACCEPTANCE SCREENS: A-PASS, B-PASS, C-PASS
1955	0	DIGITAL INTERFACE QTY 1 SCHEMATIC 812796	MODE: CORRUPT DATA TRANSFER TO/FROM D&C CAUSE(S): 1) COMMAND BITS OF INPUT TO PARALLEL TO SERIAL CONVERSION CIRCUIT FAILS 2) LOSS OF CLOCK SIGNAL TO D&C PANEL 3) LOSS OF STROBE SIGNAL TO D&C PANEL. 4) SERIAL INPUT CIRCUIT FAILS. 5) SERIAL TO PARALLEL CONVERSION CIRCUIT FAILS 6) SERIAL OUTPUT CIRCUIT FAILS HIGH	LOSS OF COMMUNICATION WITH D&C INTERFACE WILL INITIATE D&C COMMUNICATION FAILURE DETECTION. AUTOBRAKES. ARM COMES TO REST. GPC GOES INTO IDLE MODE. LOSS OF COMPUTER SUPPORTED MODES. ABE COMMUNICATION PATH REMAINS OPERABLE. LOSS OF CLIPPING DURING END EFFECTOR CAPTURE. FOR CAUSE 1: D&C COMMAND DATA BIT FAILS TO "0" OR "1". FOR CAUSE 2): D&C COMMAND DATA IS NOT UPDATED, AND D&C RESPONSE DATA FAILS TO ALL "1'S" OR "0'S". FOR CAUSE 3: D&C COMMAND DATA IS NOT UPDATED. D&C RESPONSE DATA IS ALL "0'S". FOR CAUSE 4: D&C RESPONSE DATA FAILS TO ALL ZERO'S. FOR CAUSE 5): D&C RESPONSE DATA FAILS TO ALL "1'S" OR ONE OR MORE "0'S". FOR CAUSE 6: D&C COMMAND		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. - MANDATORY INSPECTION POINT).

PREPARED BY: MFNG SUPERSEDING DATE: NONE

DATE: 11 JUL 91 CIL REV: 0

504-227A
 ATTACHMENT -
 PAGE 285 OF 471

CRITICAL ITEMS LIST

PROJECT: SMS (-5 MCU INSTALLED)
 ASS'Y NOMENCLATURE: MCTD

SYSTEM: ELECTRICAL SUBSYSTEM
 ASS'Y P/N: 5115F160-5

SHEET: 6

FMEA REF.	FMEA REV.	NAME, QTY, & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	HWR / FUNC. 2/1R CRITICALITY	RATIONALE FOR ACCEPTANCE SCREENS: A-PASS, B-PASS, C PASS
1955	0	DIGITAL INTERFACE QTY 1 SCHEMATIC B12796	MODE: CORRUPT DATA TRANSFER TO/FROM DAC CAUSE(S): 1) COMMAND BITS OF INPUT TO PARALLEL TO SERIAL CONVERSION CIRCUIT FAILS 2) LOSS OF CLOCK SIGNAL TO DAC PANEL 3) LOSS OF STROBE SIGNAL TO DAC PANEL. 4) SERIAL INPUT CIRCUIT FAILS. 5) SERIAL TO PARALLEL CONVERSION CIRCUIT FAILS 6) SERIAL OUTPUT CIRCUIT FAILS HIGH	DATA FAILS TO ALL "1'S" AND RESPONSE DATA IS ALL "0'S". IF DAC RESPONSE EE COMMAND BITS ARE ALL "1'S": AUTO EE CAPTURE COMMANDED WHEN EE MODE SWITCH SET TO AUTO. IF DAC RESPONSE EE COMMAND BITS ARE "0'S": LOSS OF EE AUTO COMMANDS. DURING AUTO CAPTURE LIMPING IS LOST. WORST CASE ----- UNEXPECTED MOTION. SEN JOINT RUNAWAY. AUTOBRAKES. REDUNDANT PATHS REMAINING ----- 1) AUTO BRAKES (FOR SAFING THE SYSTEM) 2) DIRECT DRIVE AND EE MANUAL MODES. (FOR CONTINUING OPERATIONS)		FAILURE HISTORY ----- THERE HAVE BEEN NO FAILURES ASSOCIATED WITH THIS FAILURE MODE ON THE SMS PROGRAM.

PREPARED BY: MPMG

SUPERSEDING DATE: NONE

DATE: 11 JUL 91

CIL REV: 0

5040237A
 ATTACHMENT
 PAGE 296 OF 471

CRITICAL ITEMS LIST

PROJECT: SWS (5 MCIU INSTALLED)
 ASSY NOMENCLATURE: MCIU

SYSTEM: ELECTRICAL SUBSYSTEM
 ASSY P/N: S155180-5

SHEET: 2

FMEA REF.	FMEA REV.	NAME, QTY, & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	HOWR / FUNC. 2/IR CRITICALITY	RATIONALE FOR ACCEPTANCE SCREENS: A-PASS, B-PASS, C-PASS
1955	0	DIGITAL INTERFACE QTY 1 SCHEMATIC 612796	<p>MODE: CORRUPT DATA TRANSFER TO/FROM DBC</p> <p>CAUSE(S): 1) COMMAND BITS OF INPUT TO PARALLEL TO SERIAL CONVERSION CIRCUIT FAILS 2) LOSS OF CLOCK SIGNAL TO DBC PANEL 3) LOSS OF STROBE SIGNAL TO DBC PANEL. 4) SERIAL INPUT CIRCUIT FAILS. 5) SERIAL TO PARALLEL CONVERSION CIRCUIT FAILS 6) SERIAL OUTPUT CIRCUIT FAILS HIGH</p>	<p>LOSS OF COMMUNICATION WITH DBC INTERFACE WILL INITIATE DBC COMMUNICATION FAILURE DETECTION. AUTOBRAKES. ARM COMES TO REST. GPC GOES INTO IDLE MODE. LOSS OF COMPUTER SUPPORTED MODES. ABE COMMUNICATION PATH REMAINS OPERABLE. LOSS OF LIMPING DURING END EFFECTOR CAPTURE.</p> <p>FOR CAUSE 1): DBC COMMAND DATA BIT FAILS TO "0" OR "1".</p> <p>FOR CAUSE 2): DBC COMMAND DATA IS NOT UPDATED, AND DBC RESPONSE DATA FAILS TO ALL "1'S" OR "0'S".</p> <p>FOR CAUSE 3): DBC COMMAND DATA IS NOT UPDATED. DBC RESPONSE DATA IS ALL "0'S".</p> <p>FOR CAUSE 4): DBC RESPONSE DATA FAILS TO ALL ZERO'S.</p> <p>FOR CAUSE 5): DBC RESPONSE DATA FAILS TO ALL "1'S" OR ONE OR MORE "0'S".</p> <p>FOR CAUSE 6): DBC COMMAND</p>	<p>OPERATIONAL EFFECTS</p> <p>LOSS OF DATA. AUTOBRAKES. LOSS OF COMPUTER SUPPORTED MODES. LOSS OF LIMPING. POSSIBLE LOSS OF EE AUTO MODES. DBC DATA MAY BE INVALID. DIRECT DRIVE AND BACKUP AVAILABLE. EE MODE MANUAL AVAILABLE POSSIBLY WITHOUT TALKBACKS.</p> <p>CREW ACTION</p> <p>SELECT DIRECT DRIVE. USE EE MODE MANUAL. SINGLE/DIRECT DRIVE SWITCH SHOULD BE PULSED TO MAINTAIN PROPER RATES.</p> <p>CREW TRAINING</p> <p>CREW IS TRAINED: TO ALWAYS OBSERVE WHETHER THE ARM IS RESPONDING PROPERLY TO COMMANDS. IF IT ISN'T, APPLY BRAKES. TO RECOGNIZE AND RESPOND TO ALL OFF NOMINAL OPERATIONS OF THE END EFFECTOR.</p> <p>MISSION CONSTRAINT</p> <p>OPERATE UNDER VERNIER RATES WITHIN 10 FT OF STRUCTURE. THE OPERATOR MUST BE ABLE TO DETECT THAT THE ARM/PAYLOAD IS RESPONDING PROPERLY TO COMMANDS VIA WINDOW AND/OR CCTN VIEWS DURING ALL ARM OPERATIONS.</p> <p>SCREEN FAILURES</p> <p>N/A</p> <p>OMRSD OFFLINE</p> <p>EXERCISE THE MCIU/DAC DATA BUS. VERIFY CLOCK AND STROBE CHARACTERISTICS AT OUTPUT OF MCIU, AND VERIFY NO DBC COMM ERRORS.</p> <p>OMRSD ONLINE INSTALLATION</p> <p>NONE</p> <p>OMRSD ONLINE FURNAROUND</p> <p>EXERCISE THE MCIU/DAC DATA BUS. VERIFY NO DBC COMM ERRORS.</p>	

PREPARED BY:

MFW

SUPERSEDING DATE: NONE

DATE: 11 JUL 91

CIL REV: 0

5040257A
 ATTACHMENT
 PAGE 287 OF 473

CRITICAL ITEMS LIST

PROJECT: SMS (-S MCIU INSTALLED)
 ASS'T NOMENCLATURE: MCIU

SYSTEM: ELECTRICAL SUBSYSTEM
 ASS'T P/N: 51152720-5

SHEET: 8

FMEA REF.	FMEA REV.	NAME, QTY, & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	HOWR / FUNC. 2/1P CRITICALITY	RATIONALE FOR ACCEPTANCE SCREENS: A-PASS, B-PASS, C-PASS
1955	0	DIGITAL INTERFACE QTY 1 SCHEMATIC 812796	MODE: CORRUPT DATA TRANSFER TO/FROM DEC CAUSE(S): 1) COMMAND BITS OF INPUT TO PARALLEL TO SERIAL CONVERSION CIRCUIT FAILS 2) LOSS OF CLOCK SIGNAL TO DEC PANEL 3) LOSS OF STROBE SIGNAL TO DEC PANEL. 4) SERIAL INPUT CIRCUIT FAILS. 5) SERIAL TO PARALLEL CONVERSION CIRCUIT FAILS 6) SERIAL OUTPUT CIRCUIT FAILS HIGH	DATA FAILS TO ALL "1'S" AND RESPONSE DATA IS ALL "0'S". IF DEC RESPONSE EE COMMAND BITS ARE ALL "1'S": AUTO EE CAPTURE COMMANDED WHEN EE MODE SWITCH SET TO AUTO. IF DEC RESPONSE EE COMMAND BITS ARE "0'S": LOSS OF EE AUTO COMMANDS. DURING AUTO CAPTURE LUMPING IS LOST. WORST CASE ----- UNEXPECTED MOTION. SIR JOINT BURWAY. AJIDBRKES. REDUNDANT PATHS REMAINING ----- 1) AUTO BRAKES (FOR SAFING THE SYSTEM) 2) DIRECT DRIVE AND EE MANUAL MODES. (FOR CONTINUING OPERATIONS)		

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 ATTACHMENT
 PAGE 208 OF 471

EXPEDITED
 RECORDS

PREPARED BY: MEVG SUPERSEDING DATE: NONE

DATE: 11 JUL 91 CIL REV: 0