

CIL
EMU CRITICAL ITEMS LIST

12/24/91 SUPERSEDES 88/31/90

ANALYST:

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Date: 12/13/91

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
EMULIM AND WARNING SYSTEM, ITEM 150 ----- 59705970-13 (1)	2/2	150FKDS: Caution/warning tone discrete fails PCM. CAUSE: Electronic component failure.	END ITEM: Warning tone continues despite acknowledgement using CMS switch. GFE INTERFACE: BITE indicator is not on and no message displayed. No warning tone for next failure. MISSION: Terminate EVA, LOSS of use of one EMU. CREW/VEHICLE: None.	A. Design - Established reliability capacitors and resistors are qualified to the requirements of applicable military specification and thermal shocked per Condition B test Method 107 of MIL-910-202. Microcircuits are qualified to the requirements of MIL-H-30510 and receive the burn-in of Class B parts per Method 5004 of MIL-910-883. Transistors, diodes are qualified to the requirements of MIL-S-19580 and receive the burn-in of JANTRY level parts per the applicable methods, M3B, 1039, 1040 of MIL-910-750. The electronic components are operating within the power dissipating requirements of SVNS7884. The printed circuit (PC) boards are fiberglass/epoxy per MIL-P-13949 type GF and manufactured in accordance with R9FC-810-154. Parts mounting and soldering is per R9FC-810-136 and MGS380.4 (3A-1). The CMS is a mother/daughter board assembly. The daughter boards are held in place by metal card guides which also provide thermal transfer from the board heatinks to the CMS case. The top cover of the CMS exerts a downward force on the daughter boards to keep them properly seated in the mother board connectors. Flex Tape (Kapton insulated, flexible flat conductor) instead of conventional Teflon coated wires is used to provide connections between the mother board and the external connectors. This prevents pinching of the conductor during item assembly. The PC Board assemblies are conformal coated per MIL-A-46146 (New Corning RTV 3160) for environmental and humidity protection. Electrical connectors are environmentally sealed to prevent damage due to contamination and humidity. B. Test - Component Acceptance Test - Full functioning of the CMS is verified during Item AIP tests including continuity, logic flow, N-state sequencing, fault simulation, verification of status and fault messages, warning and alert tones activation, and BITE activation. These tests are conducted upon completion of random vibration testing.

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	2/2	150PHDS;		<p>PDA TEST - The above electrical tests are repeated during PLSS PDA to verify CMS operation. The CMS is also operational during other PLSS PDA electrical tests such as sensor accuracy checks, Item 123 fan operation, Item 174 RFDG checkout, and solenoid valve actuation.</p> <p>Certification Test - The item completed the 19 year structural vibration and shock certification requirement during 10/83. EC's 42806-244 (add jumper wires, and Diode CR221, change resistor R301), 42806-345-3 (eliminate interferences with PLSS), 42806-718 (overstressed resistor R303 due to delta data logger, software change, Diode VR201 rewiring), 42806-942 and 42806-942-1 (transistor Q201 lead stress relief) have been incorporated and certified by similarity or analysis since this configuration was tested.</p> <p>C. Inspection - Each circuit board, the item tape, and connectors are inspected for damage and contamination prior to being placed into finished stores. The CMS assembly is inspected internally and externally for damage and contamination during item assembly and externally during ATP. All soldering is inspected by HS QA and DCAS QA per MMS390.4(3A-1).</p> <p>D. Failure History - None.</p> <p>E. Ground Turnaround - Tested per FEMU-B-001, Para. 7.3.3.2.4.3, Tones Test.</p> <p>F. Operational Use - Crew Response - FREEVA: Trouble shoot problem, if no success, consider EMU 3 if available. EMU go for SCU OPS if tone is acceptable to EVA crewman. POSTEVA: Doff helmet and communication cap. EVA: If warning tone cannot be silenced, terminate EVA. EMU go for SCU OPS if noise is acceptable to EVA crewman. Training - No training specifically covers this mode.</p>

CTL
 EMU CRITICAL ITEMS LIST

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NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
	2/2	PSOPHDS		

Operational Use (Cont'd) -

Operational Consideration - EVA checklist procedures verify hardware integrity and system operational status prior to EVA. Real time data system allows ground monitoring of EMU systems.