

CIL
EMU CRITICAL ITEMS LIST

12/24/91 SUPERSEDES 08/31/90

ANALYST:

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NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
CAUTION AND WARNING SYSTEM, ITEM 150 6V785970-13 (1)	2/2	150FH01: 5 volt reference power supply (VREF) failure at maximum voltage (+13.5 VDC). CAUSE: Electronic component failure.	EMU ITEM: Data from sublimator temperature sensor, 50P pressure sensor, battery current and voltage sensor circuits will be erroneously low. OFF INTERFACE: False warning and failure messages displayed. MISSION: Terminate EVA. CREW/VEHICLE: None.	A. Design - Established reliable capacitors and resistors are qualified to applicable military standards and thermal shocked per condition B test method 807 of MIL-S10-202. Microcircuits are qualified to the requirements of MIL-M-38510 and receive the burn-in of Class B parts per method 5004 of MIL-S10-883. Transistors, diodes are qualified to the requirements of MIL-S-49500 and receive the burn in of JANSKY level parts per the applicable methods, 1038, 1039, 1040 of MIL-S10-750. The electronic components are operating within the power derating requirements of SVS1 TB84. The printed circuit (PC) boards are fiberglass/epoxy per MIL-P-13349 type OF and manufactured in accordance with MSFC-S10-156. Parts mounting and soldering is per MSFC-S10-136 and MHS300.4 (JA-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 heatlinks 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 (Dow-Corning RTV 3140) for environmental and humidity protection. Electrical connectors are environmentally sealed to prevent damage due to contamination and humidity. B. Test - Component Acceptance: Full functioning of the CMS is verified during item ATP. Tests include continuity, logic flow, x-state sequencing, fault stimulation, verification of status and fault messages.

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	2/2	150PMD4;		<p>warning and alert tones activation, and BITE activation. These tests are conducted upon completion of random vibration testing.</p> <p>PDA: 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 RTOS checkout, and solenoid valve actuation.</p> <p>Certification: The item completed the 15 year structural vibration and shock certification requirement during 10/81. Engineering changes 42806-244 (add jumper wires, add diode CR221, change resistor R381), 42806-345-3 (eliminate interferences with PLSS1, 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 flux 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 NS QA and DCAS QA per NHB5380.4 (3A-1).</p> <p>D. Failure History - None.</p> <p>E. Ground Turnaround - Failure would be detected per IERU-R-001, during such tests as Transducer and DEM Gauge Calibration Check, and DEM Display.</p> <p>F. Operational Use -</p>

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	2/2	YSDFK01:		<p>Crew Response - PreEVA: trouble shoot problem, if no success, consider EMU 3 if available, EMU no go for EVA. EVA: When CNS issues multiple unrelated failures, trouble shoot problem, terminate EVA. Training - No training specifically covers this failure mode. Operational Considerations - Flight rules define operational CNS as at least able to monitor a valid status list. EVA checklist procedures verify hardware integrity and system operational status prior to EVA. Real Time Data System allows ground monitoring of EMU systems.</p>