CIL
EMU CRITICAL ITEMS LIST

12/26/91 SUPERSEDES 08/31/90 ANALYST:

NAME P/N DTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
CAUTION AND WARNING SYSTEM, ITEM 150	2/1RB	150FM06: Caution/warning tone discrete fails "OFF".	END ITEM: Unable to provide warning tone with the issuance of a fault message.	A. Design - Established reliability capacitors and resistors are qualified to applicable military standards and thermal shocked per Condition B Test Method 107 of MIL-STD-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-STD-883. Transistors, diodes are qualified to the requirements of MIL-S-19500 and receive the burn-in of JANTXV level parts per the applicable methods, 1038, 1039, 1040 of MIL-STD-750. The electronic components are operating within the power derating requirements of SVHS7884 (derated to at least 75%). The printed circuit (PC) boards are fiberglass/epoxy per MIL-P-13949 type GF and manufactured in accordance with SN-P-0006. Parts mounting and soldering is per NSFC-STD-136 and NHB5300.4 (3A-1). The CWS is a mother/daughter board assembly. The daughter boards are held in place by metal card guides which also provide thermal transfer from the boards to the CWS case. The top cover of the CWS 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.
SV785970-13 (1)		CAUSE: Electronic component or wiring failure.	OFE INTERFACE: None for single failure. Fails to provide audible failure warning when warning message is displayed.	
			MISSION: None for single failure. Crew would not be alerted to subsequent failures and could not properly respond with corrective action. Loss of use of one EMU.	
			CREW/VEHICLE: None for single failure. Possible loss of crewman with loss of CCC, oxygen or fan vent flow.	B. Test - Component Acceptance Test - Full functioning of the CWS is verified during Item ATP. Tests include 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 (6.7 grms). PDR Test - The above electrical tests are repeated during PLSS PDA to verify CWS operation. The CWS is also operational during

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	2/1RB	150FM06;		other PLSS PDA electrical tests such as sensor accuracy checks, Item 123 fan operation, Item 174 RIPS checkout, and solenoid valve actuation.

Certification Test -
The item completed the 15 year structural vibration and shock certification requirements during 10/83. EC's 42806-244 (add jumper wires, add diode CR221, change resistor R301), 42806-345-3 (eliminate interferences with PLSS), 42806-748 (overstressed resistor R303 due to delta data logger (ground support equipment), 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 certified.

C. Inspection -
Each circuit board, the flex tape, and connectors are inspected for damage and contamination prior to being place into finished stores. The DMS 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 NHB5300.4 (3A-1).

D. Failure History -
None.

E. Ground Turnaround -
Proper operation of tones is verified by FEMU-R-001, Tones Test.

F. Operational Use -
Crew Response
Pre EVA: Trouble-shoot problem, if no success consider EMU 3 if available. EMU go for EVA. Rely on visual monitoring of displayed messages.
EVA : If detected during airlock depress, continue EVA. Rely on visual monitoring of displayed messages.
Training relies on visual displays.
Standard EMU training covers this failure mode.

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	2/1RB	150FM06:		Operational Considerations - EVA checklist procedures verify hardware integrity and systems operational status prior to EVA. Real Time Data System allows ground monitoring of EMU systems.