12/24/91 SUPERSEDES 08/31/90   ANALYST:

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
CAUTION AND WARNING SYSTEM, ITEM 15B ---------- SV785970-15 (1)	2/2	15BMM08: Failure of one or more read/write memory locations. CAUSE: Electronic component failure.	END ITEM: Erroneous processing of CWS data. GSE INTERFACE: Activation of BITE indicator on DCM and warning tone. All CWS data suspect. 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-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 recieve the burn-in of JANTXV level parts per the applicable methods, 1038, 1039, 1040 or MIL-STD-750. The electronic components are operating within the power derating requirements of SVHS 7804. The printed circuit (PC) boards are fiberglass/epoxy per MIL-P-13949 type GF and manufactured in accordance with NSFC-STD-154. Parts mounting and soldering is per NSFC-STD-156 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 board heatsinks 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.

B. Test - Component Acceptance Test - Full functioning of the CWS is verified during Item ATP 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.

PDA Test - The above electrical tests are repeated during PLSS PDA to |

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	2/2	ISOLATION:		

verify CWS operation. The CWS is also operational during other PLSS PDA electrical tests such as sensor accuracy checks, Item 123 fan operation, Item 174 RHDS checkout, and solenoid valve actuation.

Certification -
The item completed the 15 year structural vibration and shock certification requirement during 10/83. EC's 42806-244 (add jumper wires, add diode CR221, change resistor R301), 42806-345-3 (eliminate interferences with PLSS), 42806-718 (overstressed resistor R309 due to delta data logger, software change, diode VR201 rewiring), 42806-942 and 42806-942-1 (transistor Q208 lead stress relief), have been incorporated and certified by similarity or analysis since this configuration was tested.

C. Inspection -
Each circuit board, the flex tape, and connectors are inspected for damage and contamination prior to being placed into finished stores. The CWS assembly is inspected internally and externally for damage and contamination during item assembly and externally during AIP. All soldering is inspected by HS QA and DCAS QA per NHB5300.4 (3A-1).

D. Failure History -
R-EMU-150-0007 (8-2-83) WURAH was not retained after a 10 second power interruption during in-process testing. The cause was found to be inadvertent resetting and reactivation of the microprocessor during the power off state due to capacitor discharging. Change 42806-244-1 was issued to change one resistor and add a diode to keep the microprocessor off.

E. Ground Turnaround -
Tested per FEMU-R-001, DCM bite light verification.

F. Operational Use -
Crew Response - PreEVA: Trouble shoot problem using RHDS, if no success, consider EMU 3 if available. EMU no go for EVA.

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	2/2	150FM08:		

EVA: When CWS issues BITE indication and RTDS confirms
invalid EMU BITE data, terminate EVA.
Training - Standard EMU training covers this failure mode.
Operational Considerations - Flight rules define operational
CWS as at least able to monitor a valid status list. EVA
checklist procedures verify hardware integrity and systems
operational status prior to EVA. Real Time Data System
allows ground monitoring of EMU systems.