

DIL
EMU CRITICAL ITEMS LIST

12/24/91 SUPERSEDES 88/31/90

ANALYST:

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Date: 12/02/91

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
CAUTION AND WARNING SYSTEM, ITEM 15B BY765976-13 [1]	2/2	1501M02: 3 volt reference power supply (VREF) failure at zero voltage. CAUSE: Electronic component failure.	END ITEM: Sensor outputs will be zero. The CMS A/B converter will cease to function. SFE INTERFACE: False warning and failure messages displayed. BITE indicator will turn on (see remarks). MISSION: Terminate EVA. CREW/VEHICLE: None.	A. Design - Established reliability capacitors and resistors are qualified to the applicable military specification thereof checked per Condition B Test Method 907 of MIL-STD-202. Microcircuits are qualified to the requirements of MIL-H-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-19508 and receive the burn-in of JANIXV level parts per the application methods, 1038, 1039, 1040 of MIL-STD-750. The electronic components are operating within the power dissipating requirements of 28VHS7804. The printed circuit (PC) boards are fiberglass/epoxy per MIL-P-13949 type 69 and manufactured in accordance with MSFC-STD-154. Parts mounting and soldering is per MSFC-STD-156 and MHS380.4 (3A-9). 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 heatsinks 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-46166 (Dow-Corning RIV 3340) 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 include continuity, logic flow, x-state sequencing, fault simulation, verification of status and limit 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	150FMU2:		

POA Test -

The above electrical tests are repeated during PLSS POA to verify DMS operation. The CMS is also operational during other PLSS POA electrical tests such as sensor accuracy checks, Item 123 fan operation, Item 174 RTDS checkout, and solenoid valve actuation.

Certification Test -

The item completed the 15 year structural vibration and shock certification requirements during 10/83. EC's 42806-264 (add Jumper wires, add diode CR221, change resistor R301), 42806-345-3 (eliminate interferences with PLSS), 42806-716 (overstressed resistor R303 due to delta data logger, software change, diode VR281 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.

C. Inspection -

Each circuit board, the flex tops, 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 MW85300.4 (SA-1).

D. Failure History -

None.

E. Ground Turnaround -

Failure would be detected per FEMU-R-001, during such tests as Transducer and DCM Calibration Check, and DCM Display.

F. Operational Use -

Crew Response - PreEVA: Insulate shoot problem, if no success, consider EMU 5 if available. EMU no go for EVA.
 EVA: When CMS issues RTE indication and RTDS confirms invalid EMU RTE data, terminate EVA.
 Training - Standard EMU training covers this failure mode.

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	3/2	150FN02:		Operational Considerations - Flight rules define operational Des 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 the EMU system.