

CYL
EMU CRITICAL ITEMS LIST

12/24/91 SUPERSEDES 08/31/90

ANALYST:

Page: 1
Date: 12/02/91

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
CAUTION AND WARNING SYSTEM, ITEM 158 SU785970-13 (1)	2/1R	150VH14: EMU time line ("X" state memory changes to "X" - status). CAUSE: Electronic place part failure.	EMU ITEM: Program fixes "X" state value to one, indicating EMU is shut off. OFE INTERFACE: Loss of CMS fault message monitoring of CO2 level and O2 actuator position. MISSION: None. CREW/VEHICLE: None for single failure. Possible loss of crewman with loss of CO2, oxygen, or low vent flow.	A. Design - Established reliability capacitors and resistors are qualified to applicable military standards and thermal shocked per Condition B Test Method 787 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 JAN1KV level parts per the applicable methods, 103B, 1039, 1040 of MIL-STD-750. The electronic components are operating within the power dissipating requirements of SWHS 7804. The printed circuit (PC) boards are fiberglass/epoxy per MIL-P-13949 type G and manufactured in accordance with SM-P-0006. Parts mounting and soldering is per WSPC-S10-336 and RNS300.4 (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 boards 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 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 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 PMA to verify CMS operation. The CMS is also operational during

CIL
EMU CRITICAL ITEMS LIST

12/24/91 SUPERSEDES 08/31/90

ANALYST:

Page: 2
Date: 12/02/91

NAME P/N QTY	CAIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
	Z/1R	158FM14x		<p>other PLSS POA electrical tests such as sensor accuracy checks, Item 123 Fan Operation, Item 174 RTDS Checkout, and asteroid valve actuation.</p> <p>Certification Test - The item completed the 15 year structural vibration and shock certification requirement during 10/83. EC's 42006-264 (add jumper wires, add diode CR22), change resistor R388), 42806-345-3 (eliminate interferences with PLSS), 42806-718 (overstressed resistor R303 due to delta data logger, software change, diode UA201 rewiring), 42806-942 and 42806-942-1 (transistor Q201 lead stress relief) have been incorporated and certified by similarity and analysis since this configuration was tested.</p> <p>C. Inspection - Each circuit board, the flex 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 BCAS 94 per NHB5300.4 (3A-1).</p> <p>D. Failure History - None.</p> <p>E. Ground Turnaround - None.</p> <p>F. Operational Use - Crew Response - PreEVA: Trouble shoot problem, if no success, consider EMR 3 if available. If memory can be determined to be a-state failure, no constraint, continue with EVA. Otherwise EMU go for SCU ops. EVA: When CMS issues erroneous messages, trouble shoot problem using RTDS, continue EVA. Training - No training specifically covers this mode. Operational Considerations - Flight rules define operational CMS 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</p>

CR1
EMU CRITICAL ITEMS LIST

12/24/91 SUPERSEDES 80/31/90

ANALYST:

Page: 3
Date: 12/02/91

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
	2/1R	150JW74z		allows ground monitoring of EMU systems.