

CRITICAL ITEMS LIST

SYSTEM: EXTRAVEHICULAR MOBILITY UNIT

SUBSYSTEM: SPACE TO SPACE COMMUNICATIONS SYSTEM

ASSEMBLY: SPACE TO SPACE EMU RADIO (SSER) ASSY P/N: SED16102580

APPROVAL DATE:
SUPERCEDES REV: N/A DATE: N/A
SHEET 1 OF 1

END ITEM EFFECTIVITY: OV102, OV103, OV104, OV105 AND SUBS.

PREPARED BY: Name: A. Olson

DATE: 12/06/96

APPROVAL:

SR&MA:

DESIGN

SSCS PROJECT MANAGER:

DATE:

DATE: 3-30-00

DATE: 6/30/00

CRITICALITY (H/F) 2/IR

INTACT ABORT MODE CRIT: N/A

REDUNDANCY SCREENS: A-PASS B-PASS C-PASS

FMEA REFERENCE: SSER-22A

NAME: SSER

DRAWING REFERENCE: SED16102580, SID16102601, SID16102639, SU216102561

QUANTITY: 1

CR #	REV	FUNCTION	FAILURE MODE AND CAUSE	FAILURE EFFECT	RATIONALE FOR ACCEPTABILITY
SSER-22A	BASIC	<p>1. Provides RF Duplex voice communications between the EMU and Orbiter, other EMUs, and the Space Station.</p> <p>2. Provides telemetry from EMU to Orbiter or Station.</p> <p>3. Provides caution and status tone to CCA on command from EMU, caution and warning system.</p> <p>4. Provides Handline voice communication between EMU and Orbiter or Station in Airlock.</p> <p>MISSION PHASES: Pre-EVA, EVA, Post-EVA</p>	<p>FAILURE MODE: Short of warning tone input</p> <p>CAUSE: Contamination, vibration, shock, EEE parts failure, or temperature cycle</p> <p>MISSION PHASES: Pre-EVA EVA Post-EVA</p>	<p>SUBSYSTEM: Continuous warning tone in received audio in all modes. No caution tones. Transmit audio, biased and telemetry not affected in any mode.</p> <p>INTERFACING SUBSYSTEMS: No effect.</p> <p>MISSION: Crew member not alerted to read DCM display because warning tone is continuous.</p> <p>CREW/VEHICLE: No effect for first failure, or second failure (CO2 sensor failure) crew member may not be alerted to potentially hazardous situation.</p> <p>SUCCESS PATHS REMAINING AFTER FIRST FAILURE: 1</p> <p>TIME TO EFFECT: 1 minute</p>	<p>DESIGN: The electrical design of the SSER is based upon JSC in-house engineering model hardware. Eaton is manufacturing the hardware in accordance with the appropriate NHB 5300.4 standards.</p> <p>Passive EEE parts are selected from the guidelines of MIL-STD-975. Active EEE parts are approved by the JSC Engineering Directorate Certified Parts Approval Process.</p> <p>The Warning Tone input line is brought into the SSER through a Bendix 10-550351-35P miniature guide disconnect, bayonet lock connector. M22759 wire is run from the Bendix Connector to an FMT filter connector (36-726-003 from Spectrum Control) and then to the PRI and AIT signal processors. Splices are made in accordance with Rockwell specification ME 16-0031-1004. The cables are laced to avoid strain. The Warning Tone signal is brought to the Modem/Signal Processor Power converter for the Handline mode through a SAMTEC SSQ-112-23-S-D stackable connector. The Warning Tone circuits on the PRI and AIT signal processors and the Modem/Signal Processor Power Converter are isolated through the use of QS3384 CMOS switches from Quality Semiconductor which are rated to operate from 55°C to 125°C. The PRI and AIT and Modem/Signal Processor Power Converter (Handline Mode) each have their own tone generator. The SSER is environmentally sealed to avoid contamination.</p>

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END ITEM EFFECTIVITY: OV102, OV103, OV104, OV105 AND SUBS.		APPROVAL DATE: SUPERCEDES REV: N/A DATE: N/A SHEET 2 OF 4			
PREPARED BY: Nanci A. Olson		DATE: 12/06/96			
APPROVAL:					
SR&MA:		DATE: _____			
DESIGN:		DATE: _____			
SSCS PROJECT MANAGER:		DATE: _____			
CRITICALITY(H/F): 2/1R		INTACT ABORT MODE CRIT: N/A			
REDUNDANCY SCREENS. A-PASS B-PASS C-PASS					
FMEA REFERENCE: SSER-22A					
NAME: SSER					
DRAWING REFERENCE: SED16102580, SID16102601, SID16102639, SID16102561					
QUANTITY: 1					
CIL #	REV	FUNCTION	FAILURE MODE AND CAUSE	FAILURE EFFECT	RATIONALE FOR ACCEPTABILITY
SSER-22A	BASIC	<p>1. Provides RF Duplex voice communications between the EMU and Orbiter, other EMUs, and the Space Station</p> <p>2. Provides telemetry from EMU to Orbiter or Station</p> <p>3. Provides caution and status tone to CCA on command from EMU caution and warning system.</p> <p>4. Provides Hardline voice communication between EMU and Orbiter or Station in Airlock</p> <p>MISSION PHASE: Pre-EVA, EVA, Post-EVA</p>	<p>FAILURE MODE: Short of warning tone input</p> <p>CAUSE: Contamination, vibration, shock, EEE parts failure, or temperature cycle</p> <p>MISSION PHASES: Pre EVA EVA Post EVA</p>	<p>SUBSYSTEM: Continuous warning tone in received audio in all modes. No caution tones. Transmit audio, biomed and telemetry not affected in any mode.</p> <p>INTERFACING SUBSYSTEMS: No effect</p> <p>MISSION: Crew member not alerted to read DCM display because warning tone is continuous.</p> <p>CREW/VEHICLE: No effect for first failure. For second failure (CO2 sensor failure) crew member may not be alerted to potentially hazardous situation.</p> <p>SUCCESS PATHS REMAINING AFTER FIRST FAILURE: 1</p> <p>TIME TO EFFECT: minutes</p>	<p>DESIGN: (continued) The signal processor and modem/signal processor power converter boards are conformably coated to avoid contamination.</p> <p>TEST:</p> <p>CERTIFICATION: One time test on Qual SSER. Warning Tones are verified before and after exposure to environments in all modes.</p> <p>QUALIFICATION THERMAL VACUUM TEST: 7 cycles from 15F to 140F operating and 1 cycle to -65F non-operating. Chamber evacuated to 1X10⁻⁶ torr throughout test. Warning tones are verified before and after test.</p> <p>SHOCK: Bench handling 4 inch drop test on each corner.</p> <p>Landing shock and acceleration environments certified by analysis.</p>

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END ITEM EFFECTIVITY: OV102, OV103, OV104, OV105 AND SUBS		APPROVAL DATE: SUPERCEDES REV: N/A DATE: N/A SHEET 3 OF 4			
PREPARED BY: Nanci A. Olson		DATE: 12/06/96			
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SR&MA: _____		DATE: _____			
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PREPARED BY: Nanci A Olson		DATE: 12/06/96			
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QUANTITY: 1					
CIL #	REV	FUNCTION	FAILURE MODE AND CAUSE	FAILURE EFFECT	RATIONALE FOR ACCEPTABILITY
SSER-22A	BASIC	<p>1. Provides RP Duplex voice communications between the EMU and Orbiter, other EMUs, and the Space Station</p> <p>2. Provides telemetry from EMU to Orbiter or Station</p> <p>3. Provides caution and status tone to CCA on command from EMU caution and warning system.</p> <p>4. Provides Hardline voice communication between EMU and Orbiter or Station in Airlock</p> <p>MISSION PHASE: Pre-EVA, EVA, Post-EVA</p>	<p>FAILURE MODE: Short of warning tone input</p> <p>CAUSE: Contamination, vibration, shock, EEE parts failure, or temperature cycle</p> <p>MISSION PHASES: Pre EVA EVA Post EVA</p>	<p>SUBSYSTEM: Continuous warning tone in received audio in all modes. No caution tones. Transmit audio, biomed and telemetry nor affected in any mode.</p> <p>INTERFACING SUBSYSTEMS: No effect</p> <p>MISSION: Crew member not alerted to read DCM display because warning tone is continuous.</p> <p>CREW/VEHICLE: No effect for first failure. For second failure (CO2 sensor failure) crew member may not be alerted to potentially hazardous situation.</p> <p>SUCCESS PATHS REMAINING AFTER FIRST FAILURE: 1</p> <p>TIME TO EFFECT: minutes</p>	<p>TEST: (continued)</p> <p>PREINSTALLATION ACCEPTANCE TEST - Performed periodically at JSC prior to delivery of SSER for EMU installation. Includes complete electrical performance with warning tone outputs verified</p> <p>GROUND TURNAROUND TEST: Turnaround checkout testing is accomplished in accordance with the OMRSD (V66). Functional verification of tone generators when suit is powered up, but no verification of warning tone input.</p> <p>INSPECTION: The SSER is manufactured in accordance with an approved Quality Assurance Plan. Subassemblies are inspected for conformance with released drawings and standards for parts placement, soldering, and cleanliness.</p> <p>FAILURE HISTORY: NONE. There have been no failures of this type through qualification and initial flight unit production. Current data on test failures, flight failures, unexplained anomalies, and other failures experienced during ground processing activity can be found in the PRACA database</p> <p>OPERATIONAL USE: Real Time Data System allows ground monitoring of EMU Status. EVA timeline procedures require periodic EMU systems status checks by viewing DCM. Since failure of warning tone is known, checks of status data are made more frequently. Flight rules define operational caution and warning system.</p>