

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

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

SHEET 1 OF 4

PREPARED BY: Nancy A. Olson

DATE: 12/06/95

APPROVAL:

SR&MA

DESIGN

SSCS PROJECT MANAGER.

DATE:

DATE: 6/30/97

DATE: 6/20/97

CRITICALITY(H/F): 2/1R

INTACT ABORT MODE CRIT: N/A

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

Screen B is failed when the warning tone input is open because if it opens after the Pre-EVA check on-orbit, during the EVA, there is no indication from the EMU or the SSER

FMEA REFERENCE: SSER-22

NAME: SSER

DRAWING REFERENCE: SED16102580, SH216102601, SID16102639, SID16102561

QUANTITY: 1

CI #	REV	FUNCTION	FAILURE MODE AND CAUSE	FAILURE EFFECT	RATIONALE FOR ACCEPTABILITY
SSER-22	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: Open 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: Loss of warning tones when CWS displays message. No effect on caution tones, transmit or received audio or biomed and telemetry in any modes.</p> <p>INTERFACING SUBSYSTEMS: Warning tone inputs from the EMU are not received</p> <p>MISSION: Crew member not alerted to read DCM display</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: The electrical design of the SSER is based upon JSC in-house engineering model hardware. Litton 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 10-550354-35P miniature guide disconnect, bayonet lock connector. M22759 wire is run from the Bendix Connector to an FMD filter connector (56-726-303 from Spectrum Control) and then to the PRI and ALT signal processors. Splices are made in accordance with Rockwell specification: MF416-0031-1004. The cables are faced to avoid strain. The Warning Tone signal is brought to the Modem/Signal Processor Power converter for the Hardline mode through a SAMTEC SSC-112-23-S-D stackable connector. The Warning Tone circuits on the PRI and ALT signal processors and the Modem/Signal Processor Power Converter are isolated through the use of QS3384 CMOS switches from Qualis Semiconductor which are rated to operate from -55°C to 125°C. The PRI and ALT and Modem/Signal Processor Power Converter (Hardline Mode) each have their own tone generator. The SSER is environmentally sealed to avoid contamination.</p>

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SYSTEM: EXTRAVEHICULAR MOBILITY UNIT SUBSYSTEM: SPACE TO SPACE COMMUNICATIONS SYSTEM

ASSEMBLY: SPACE TO SPACE EMU RADIO (SSER) ASS'Y P/N: SED16102580

APPROVAL DATE:
SUPERCEDES REV: N/A DATE: N/A
SHEET 2 OF 4

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

PREPARED BY: Nanci A. Olson DATE: 12/06/96

APPROVAL:

SR&MA: _____

DATE: _____

DESIGN: _____

DATE: _____

SSCS PROJECT MANAGER: _____

DATE: _____

CRITICALITY(H/F): 2/IR

INTACT ABORT MODE CRIT: N/A

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

Screen B is failed when the warning tone input is open because if it opens after the Pre-EVA check on-orbit, during the EVA, there is no indication from the EMU or the SSER.

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SSER-22	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: Open of warning tone input</p> <p>CAUSE: Contamination, vibration, shock, EFE parts failure, or temperature cycle</p> <p>MISSION PHASES: Pre EVA EVA Post EVA</p>	<p>SUBSYSTEM: Loss of warning tones when CWS displays message. No effect on caution tones, transmit or received audio or biomed and telemetry in any modes.</p> <p>INTERFACING SUBSYSTEMS: Warning tone inputs from the EMU are not received.</p> <p>MISSION: Crew member not alerted to read DCM display</p> <p>CREW/VEHICLE: No effect for first failure. 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 1×10^{-6} torr throughout test. Warning tones are verified before and after test.</p> <p>SHOCK: Terminal peak sawtooth with 20g peak and 11 msec duration applied 3 times for each axis in both + and - directions. Total of 18 shocks. Warning tone verified before and after test.</p> <p>Landing shock and acceleration environments certified by analysis.</p>

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SYSTEM: EXTRAVEHICULAR MOBILITY UNIT SUBSYSTEM: SPACE TO SPACE COMMUNICATIONS SYSTEM

ASSEMBLY: SPACE TO SPACE EMU RADIO (SSER) ASSY P/N: SEDI6102580

APPROVAL DATE:
SUPERCEDES REV: N/A DATE: N/A
SHEET 3 OF 4

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

PREPARED BY: Nancy A. Olson DATE: 12/06/96

APPROVAL:

SR&MA: _____ DATE: _____
DESIGN: _____ DATE: _____
SSCS PROJECT MANAGER: _____ DATE: _____

CRITICALITY(H/F): 2/IR INTACT ABORT MODE CRIT: N/A

REDUNDANCY SCREENS: A-PASS B FAIL C-PASS

Screen B is failed when the warning tone input is open because if it opens after the Pre-EVA check on-orbit, during the EVA, there is no indication from the EMU or the SSER.

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PREPARED BY: Nanci A. Olson		DATE: 12/06/96			
APPROVAL:					
SR&MA: _____		DATE: _____			
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