CRITICAL ITEMS LIST

DATE: 12/17/96

SYSTEM: COMMUNICATIONS AND TRACKING SUBSYSTEM: SPACE TO SPACE COMMUNICATIONS SYSTEM ASSEMBLY: SPACE TO SPACE ORBITER RADIO (SSOR) ASS'Y P/N: SEDIG102581

APPROVAL DATE:

SUPERCEDES REV: N/A DATE: N/A

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

SHEET LOF 4

PREPARED BY: Nanci A. Olson APPROVAL:

SR&MA:

DESIGN:

SSCS PROJECT MANAGER:

Most Leng Matt leske

DATE: <u>--</u> DATE: <u>6-2-07</u> DATE: <u>5-3-00</u>

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

REDUNDANCY SCREENS: A-N/A B-N/A C-N/A

FMEA REFERENCE: SSOR-07

NAME: SSOR

DRAWING REFERENCE: SED16102581, SID16102642, SID16102612

CIL#	REV	FUNCTION	FAILURE MODE AND CAUSE	FAILURE EFFECT	RATIONALE FOR ACCEPTABILITY
SSOR-07	BASIC	(1) Provides RF duplex voice comm between Orbiter and EMU's. (2) Receives biomed and telementy from EMU (3) Provides RF duplex voice comm between	FAILURE MODE: Audio output open/short CAUSE: Contamination, vibration, shock, EEE parts failure, or temperature cycle MISSION	SUBSYSTEM: Loss of Receive Voice Communications from Station and EMUs. No effect on blomed and telementy from EMUs or on command and telemetry to/from Station INTERFACING	DESIGN: The electrical design of the SSOI is based upon JSC in-house engineering model hardware. Litton is manufacturing the hardware in accordance with the appropriate NHB 5300.4 standards. Passive EEE parts are selected from the guidelines of MIL-STD-975. Active EEE are approved by the JSC Engineering Directorate Certified Parts Approval Process. The high, low, and shield audio output are on separate pins in a NB7H16-PW
		Orbiter and Station (4) Provides RF command to Space Station and telemetry from Space Station	PHASES: Pre EVA EVA Post EVA Station Rendezvous	SUBSYSTEMS: None MISSION: Terminate EVA. No effect on Station rendezvous CREW/VEHICLE: No effect.	connector. M22759 wire is run from the String I and String 2 signal processors to th NB7H16-PW connector. Splices are made in accordance with Rockwell specification ME416-0031-1004. Audio circuits on the String I and String 2 signal processors are isolated by solid state relays. Cables are laced to avoid strain. TEST:
	n N			SUCCESS PATHS REMAINING AFTER FIRST FAILURE: 0 TIME TO EFFECT: minutes	CERTIFICATION: One time test on Qual SSOR. Audio verified before, during, and after exposure to environments. QUALIFICATION THERMAL TEST - 7 cycles from 25F to 135F operating and 1 cycle to -65F non-operating. Audio verified before, during, and after thermal test.

CRITICAL ITEMS LIST SYSTEM: COMMUNICATIONS AND TRACKING SUBSYSTEM: SPACE TO SPACE COMMUNICATIONS SYSTEM. ASSEMBLY: SPACE TO SPACE ORBITER RADIO (SSOR) ASS'Y P/N: SED16102581 APPROVAL DATE: SUPERCEDES REV: N/A DATE: N/A END ITEM EFFECTIVITY: OV102, OV103, OV104, OV105, AND SUBS. SHEET 2 OF 4 PREPARED BY: Nanci A. Olson DATE: 12/17/96 APPROVAL: SR&MA: DATE: DESIGN: DATE: SSCS PROJECT MANAGER: DATE: CRITICALITY(H/F): 2/2 INTACT ABORT MODE CRIT: N/A REDUNDANCY SCREENS: A-N/A B-N/A C-N/A FMEA REFERENCE: SSOR-07 NAME: SSOR DRAWING REFERENCE: SED16102581, SID16102642, SID16102612 QUANTITY: 1 CIL# REV FUNCTION FAILURE MODE FAILURE EFFECT RATIONALE FOR ACCEPTABILITY AND CAUSE SSOR-07 BASIC (1) Provides RF FAILURE MODE: SUBSYSTEM: TEST: (CONTINUED) duplex voice Audio output Loss of Receive comm between open/short Voice PRESSURE TEST - 8 to 15.23 psia at Orbiter and Communications 2psi/minute repress/depress rate. Non-EMU's. CAUSE: from Station and operating excursion to 30 psia. Audio Contamination. EMUs. No effect verified before, during and after pressure (2) Receives vibration, shock, on biomed and biomed and EEE parts failure. telementy from telemetry from or temperature EMLis or on SHOCK - Beach handling 4 meh drop test EMU cycle command and on each corner. telemetry to/from Landing shock and acceleration (3) Provides RF Station environments certified by analysis. duplex voice comm between MISSION INTERFACING VIBRATION -Orbiter and PHASES: SUBSYSTEMS: Test-induced (QAVT) - 5 minutes per axis. Station None 20 to 80 Hz - increasing 3 dB/oct Pre EVA 80 to 350 Hz - construt 0,067 g /Hz (4) Provides RF MISSION: 350 to 2000 Hz - decreasing 3 dB/oct command to EVA. Terminate EVA. Flight-induced - 16 min, 40 sec per axis Space Station No effect on Station 20 to 150 Hz - increasing 6 dB/oct and telemetry Post EVA rendezvous 150 to 1000 Hz - constant 0.03 g²/Hz from Space 1000 to 2000 Hz - decreasing 6 dB/oct Station Station CREW/VEHICLE: Audio verified before and after each Rendezvous Na effect. vibration test SUCCESS PATHS REMAINING Salt-fog, humidity, and fungus certified by AFTER FIRST analysis to requirements of ISC 26799 FAILURE: 0 (SSOR Specification) TIME TO EFFECT: ACCEPTANCE: minutes TEMPERATURE - One and one-half evoles. from 30F to 130F, with audio verified at remperature extremes.

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ASSEMBI	LY: SPAC	NICATIONS AND LE TO SPACE ORB) TRACKING — SU SITER RADIO (SSOR	JBSYSTEM: SPACE :) ASS'Y PAN: SEDI	TO SPACE COMMUNICATIONS SYSTEM 16102581						
END IT	'EM EFFE	CTIVITY: OV102	. OV103. OV104. OV1	105 AND SURS	APPROVAL DATE: SUPERCEDES REV: N/A DATE: N/A SHEET 3 OF 4						
END ITEM EFFECTIVITY: OV102, OV103, OV104, OV105, AND SUBS. PREPARED BY: Nanci A. Olson DATE, 12/17/96 SHEET 3 OF 4											
APPROVAL:											
DESIGN:		_	··		DATE:						
SSCS PRO					DATE:						
CRITICAL	.TTY(H/F)	: 2/2	ĪNī	ACT ABORT MODE							
		REENS: A-N/A B	-N/A C-N/A								
		2: SSOR-07			<u> </u>						
NAME: S											
DRAWING QUANTIT	G REFERI Y: 1	ENCE: SED161025	81, SID16102642, SII	016102612							
CIL#	REV	FUNCTION	FAILURE MODE AND CAUSE	FAILURE EFFECT	RATIONALE FOR ACCEPTABILITY						
SSOR-07	BASIC	(1) Provides RF	FAILURE MODE:	SUBSYSTEM:	TEST: (CONTINUED)						
	Ì	duplex voice	Audio output	Loss of Receive	, , , , , , , , , , , , , , , , , , , ,						
		comm between	open/short	Voice	VIBRATION - 30 sec per axis minimum						
	ļ	Orbiter and	ĺ	Communications	20 to 80 Hz - increasing 3 dB/oct						
		EMU's.	CAUSE:	from Station and	80 to 350 Hz - constant 0.04 g ² /Hz						
			Contamination,	EMUs. No effect	350 to 2000 Hz -decreasing 3 dB/oct						
		(2) Receives	vibration, shock,	on biomed and	Audio verified before and after each axis.						
		biomed and	EEE parts failure,	telemetry from							
		telemetry from	or temperature	EMUs or on	PREINSTALLATION ACCEPTANCE						
i	'	1340	cycle	command and	TEST - Performed periodically at ISC prior						
	J	(3) Provides RF		telemetry to/from Station	to delivery of SSOR for Orbiter installation.						
		duplex voice		Station	Includes complete electrical performance with Audio output measured. Unit operated						
		comm between	MISSION	INTERFACING	approximately 40 hours during acceptance						
		Orbiter and	PHASES:	SUBSYSTEMS:	testing.						
		Station		None	1 14 5 14 5						
			Pre EVA		GROUND INTERVAL (OMDP) TEST:						
		(4) Provides RF]	MISSION:	Interval (OMDP) checkout testing is						
		command to	EVA	Terminate EVA.	accomplished in accordance with the						
l	· [Space Station		No effect on Station	OMRSD (V74). Tests in the OPF verify						
		and telemetry	Póst EVA	rendezvous	audio. On the pad, functional verification of						
٠.		from Space	·		audio in V1103 (EMU checkout)						
		Station .	Station	CREW/VEHICLE:							
		•	Rendezvous	No offect.							
				CI IOCHURC B + TITA	INSPECTION: The SSOR is manufactured						
. }				SUCCESS PATHS REMAINING	in accordance with an approved Quality						
	- i - i			AFTER FIRST	Assurance Plan. Subassemblies are						
	· .	ì	1	FAILURE: 0	inspected for conformance with released drawings and standards for parts placement,						
	7			TIME ONLY	soldering, and cleanliness.						
				TIME TO EFFECT:	Tarana, and Grantiness.						
				minutes	İ						
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SYSTEM:	СОММ	UNICATIONS AND			TO SPACE COMMUNICATIONS SYSTEM	
ASSEMB!	LY. SPAC	CE TO SPACE OR	HER RADIO (SSOR) ASS'Y P/N; SED.	10 SPACE COMMUNICATIONS SYSTEM	
				, I TILL	APPROVAL DATE:	
					SUPERCEDES REV: N/A, DATE: N/A	
END I	TEM EFF	ECTIVITY: OV 107	<u>2, OV103, OV104, A</u> N	D SUBS.	SHEET 4 OF 4	
<u>PREPA</u> RE	DBY: N	anci A. Olson		ATE: 12/17/96	534 <u>LL</u> 1+0F4	
APPROVA	AL:			<u>-</u>	······································	
SR&MA:		_			DATE:	
DESIGN:					DATE:	
		NAGER:	<u> </u>	DATE:		
KITICAL	JTY(II/F)): 2/2	IN7	TACT ABORT MODE	CRIT: N/A	
CEDUNI)	ANCY SC	REFNS: A-N/A B	-N/A C-N/A			
		E: SSOR-07				
NAME: S		F3100F 0===4.44				
DAAWIIN TTTNAUG	J KEFEK 37. j	ENCE: SED161025	81, SID16102642, SII	016102612	•	
CIL#	REV	FUNCTION		·	· · ·	
CIL #	REV	FUNCTION	FAILURE MODE	FAILURE EFFECT	RATIONALE FOR ACCEPTABILITY	
SOR-07	BASIC	(1) Provides RF	AND CAUSE	<u> </u>		
DOIC-07	DAGIC	duplex voice	FAILURE MODE:	SUBSYSTEM:	FAILURE HISTORY: Current data can be	
		comm between	Audio output open/short	Loss of Receive	found in PRACA database.	
	Į	Orbiter and	open short	Voice Communications		
	[EMU's.	CAUSE:	from Station and	Office ATTONIAL HOT	
			Contamination,	EMUs. No effect	OPERATIONAL USE: Crew is trained to	
		(2) Receives	vibration, shock,	on biomed and	terminate EVA upon loss of all communications with the Orbiter.	
		biomed and	EEE parts failure.	telemetry from	communications with the Othitel.	
		telemetry from	or temperature	EMUs or on	,	
		EMU:	cycle	command and		
				telemetry to/from		
		(3) Provides RF		Station	!	
		duplex voice	l		·	
i		comm between	MISSION	INTERFACING		
i		Orbiter and	PHASES:	SUBSYSTEMS:		
	i	Station		None -		
		(4) Provides RF	Pre EVA		Ï	
		command to	EVA	MISSION:	•	
		Space Station	L T Y AL	Terminate EVA.		
		and telemetry	Post EVA	No effect on Station rendezvous	i	
		from Space	1031.617	rendezvous		
		Station	Station	CREW/VEHICLE:		
			Rendezvous	No effect.		
				. TO CITCE!.		
	- 1			SUCCESS PATHS		
	.		ļ	REMAINING	İ	
	: I		i	AFTER FIRST		
	- A	i		FAILURE: 0		
	!			TIME TO EFFECT:	ļ	
			j	minutes		
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