

CRITICAL ITEM LIST

PROJECT: EMD

ASSEMBLY: CCEM

ITEM NOMENCLATURE: MICROPHONE BOOM, MICROPHONE MODULE

ASSEMBLY P/N: SED16102311-301

DATE: January 4, 1989

FEMA REF	REV	NAME, QTY, DRAWING REF. DESIGN	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	HOW/FUNC 3/2 HB CRITICALITY RATIONALE FOR ACCEPTANCE
01-	A	MICROPHONE AMPLIFIER MODULE, P/N SED16102311-301, QTY. 2	<p>MODE:</p> <p>Loss of output signal; Loss of one microphone function.</p> <p>CAUSES:</p> <p>1. EE parts and/or transducer fails</p>	<p>ITEM:</p> <p>Loss of redundancy</p> <p>WORSE CASE:</p> <p>Loss of communication if both microphones fail.</p>	<p>DESIGN FEATURES:</p> <p>The microphone amplifier and booms were designed and developed for the Shuttle program. They are manufactured with highly reliable EEE parts. The microphone assembly is designed with dual transducers for redundancy and noise canceling.</p>
02-		Microphone Boom, P/N SED16102311-301 QTY. 2	<p>2. Contamination, microphone ports clogged</p> <p>3. Mechanical shock</p> <p>4. Mishandling or abuse</p>	<p>INTERFACE: None</p> <p>MISSION: None</p> <p>CREW/VEHICLE: None</p>	<p>Each microphone assembly is powered through different leads. The loss of power to one microphone will not effect other microphones.</p> <p>The output of each (left and right) microphone is summed together to form the composite signal at the interface connector. The outputs are isolated from each other.</p> <p>The completed CCEM undergoes a 4H-hour burn-in test prior to the start of acceptance testing.</p> <p>The microphone boom consist of a twisted shielded 4-conductor cable with stainless steel wire coiled around this cable for stiffness. The cable is protected by two layers of viton shrink tubing.</p>

CRITICAL ITEM LIST

PROJECT: EMU

ASSEMBLY: CCLM

NOMENCLATURE: MICROPHONE

ASSEMBLY P/N:

DATE: January 4, 1969

TEMP REF	REV	NAME, QTY., DRAWING REF. DESIGN	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	ADMR/FUNC 3/2 NO CRITICALITY	RATIONALE FOR ACCEPTANCE
01-	A					<p><u>ACCEPTANCE TESTS:</u></p> <p>The acceptance testing verified that all measurable performance characteristics meet the requirements of the end item specifications. A thermal test was performed on the complete CCEM. The thermal test is a 24-hour test consisting of cycling from 25 F to 130 F.</p> <p>The acceptance testing was utilized as a production tool to detect material or workmanship defects.</p>
02-						

CRITICAL ITEM LIST

PROJECT: EMU

NOMENCLATURE: MICROPHONE ASSEMBLY

ASSEMBLY: CCEM

ASSEMBLY P/R:

DATE: January 4, 1989

ITEM REF	REV	NAME, DIV. DRAWING REF. DESIGN	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	HOWR/FURC CRITICALITY RATIONALE FOR ACCEPTANCE								
01-	A				<p><u>QUALIFICATION TESTS:</u></p> <p>The CCEM was subjected to a qualification test to demonstrate its capability to perform in or after being exposed to the environment it is required to operate as specified in EE-2-86-006; Certification Plan. The qualification testing consist of the following tests:</p> <p>Temperature: The thermal test shall be 5 degrees F to 145 degrees F for a period of 15 cycles. Figure 2 of the SP-T-002J0 (Specification Environmental Acceptance Testing) defines the temperature curve to be used in testing. The CCEM shall be operating during this test.</p> <p>Vibration: The CCEM shall be tested to the following levels for a period of 40 minutes per axis to satisfy the 100 mission flight requirements. The CCEM shall not be operating during this test.</p> <table border="0" data-bbox="1407 1282 1932 1404"> <tr> <td>FREQUENCY</td> <td>LEVEL</td> </tr> <tr> <td>20 to 150 HZ</td> <td>Inc. 1600/OCF</td> </tr> <tr> <td>150 to 1000 HZ</td> <td>Const. 0.03 G /112</td> </tr> <tr> <td>1000 to 2000 HZ</td> <td>Dec. -6DB/OCF</td> </tr> </table>	FREQUENCY	LEVEL	20 to 150 HZ	Inc. 1600/OCF	150 to 1000 HZ	Const. 0.03 G /112	1000 to 2000 HZ	Dec. -6DB/OCF
FREQUENCY	LEVEL												
20 to 150 HZ	Inc. 1600/OCF												
150 to 1000 HZ	Const. 0.03 G /112												
1000 to 2000 HZ	Dec. -6DB/OCF												
02-													

CRITICAL ITEM LIST

PROJECT: EMU

ASSEMBLY: CCEM

ASSEMBLY NOMENCLATURE: MICROPHONE ASSEMBLY

ASSEMBLY P/N: 5E016102311-301

DATE: January 4, 1989

FEMA REF	REV	NAME, QTY., DRAWING REF. DESIGN	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	IDWR/FUNC 3/2 RB RATIONALE FOR ACCEPTANCE CRITICALITY QUALIFICATION TESTS:
01-	A				<p>Humidity: The CCEM shall be tested at a 100 percent relative humidity at 35 degrees Fahrenheit dry bulb, and 8 percent relative humidity at 90 degrees Fahrenheit for 9 bulk (24 hours), and 90 percent relative humidity at 90 degrees Fahrenheit for 9 hours. Refer to MIL-STD-8100 (Environmental Test Methods for Aerospace and Ground Equipment). The certification of the CCEM for humidity shall be accomplished by test and analysis. The 100 percent humidity test condition shall be performed to the extent allowed by the test chamber and supplemented by an analysis for the delta between the test conditions and test requirements. The CCEM shall be operating during the humidity test.</p> <p>Pressure: The pressure test shall be from 20 psia for 8 hours using dry air. (Oxygen atmosphere will be used in the EMU manned tests.) The CCEM shall be operating during this test.</p>
02-					

CRITIC. ITEM LIST

PROJECT: EMU

NOMENCLATURE: MICROPHONE ASSEMBLY

ASSEMBLY: CCEM

ASSEMBLY P/N: 5E01G102J11-301

DATE: January 4, 1989

FEM REF	REV	NAME, QTY., DRAWING REF. DESIGN	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	HOW/FUNC 3/2RH CRITICALITY	RATIONALE FOR ACCEPTANCE
01-	A				EMI:	
02-					The EMI test, per NSTS-SL-E-0002B (Specification, Electromagnetic Interference Characteristics, requirements for equipment in the Space Shuttle program), shall be performed for power line conducted susceptibility and RF radiated susceptibility. (Power-line interference and RF interference tests are not required since the CCEM design cannot, by analysis, generate spurious EMI signals.) The following tests (Class I equipment) shall apply:	
					A. Conducted susceptibility (CS01) - Limit to be 1.2 VRMS per Figure 2 of ICD-1150-4-000B-0C (Space Shuttle Extravehicular Mobility Unit/Extravehicular Communicator Interface Document).	
					B. Conducted susceptibility (CS12) - Limit to be 0.22 VRMS.	
					C. Conducted susceptibility (CS06) - Limit to be 51V per Figures 3 and 4 of ICD-1150-4-000B-0C.	
					D. Radiated susceptibility (RS03).	

CRITIC ITEM LIST

PROJECT: EMU

NOMENCLATURE MICROPHONE ASSEMBLY

ASSEMBLY P/N: SLD16102311-301

DATE: January 4, 1989

FEMA REF	REV	NAME, QTY., DRAWING REF. DESIGN	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	IDDR/FUNC D/2RB CRITICALITY RATIONALE FOR ACCEPTANCE
01-	A				<p><u>QA INSPECTION:</u></p> <p>The CCEM is manufactured, assembled, and tested to flight-approved JSC drawings and procedures. The drawings have been approved by Quality Engineering, Materials, and Structures, and they are maintained by the JSC drawings control center. Quality controls are exercised throughout design, procurement, planning, processing, fabrication, assembly, qualification and acceptance testing. Mandatory inspection points are employed as appropriate at various levels of assembly and tests.</p> <p>Receiving inspection verifies that the parts and components received are as identified in the procurement documents, that no damage has occurred during shipment, and that appropriate data has been received which provides adequate traceability information and identifies acceptable parts.</p> <p>Parts are inspected through manufacture and assembly as appropriate to the manufacturing stage completed.</p>
02-					

CRITIC ITEM LIST

PROJECT: EMU

NOMENCLATURE: MICROPHONE ASSEMBLY

ASSEMBLY P/N: SC016102311-301

DATE: January 4 1989

FCMA REF	REV	NAME, QTY., DRAWING REF. DESIGN	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	RDMR/FORC 3/2HB RATIONALE FOR ACCEPTANCE CRITICALITY QA INSPECTION (Continued):
01-	A				<p>Pre-acceptance test inspection, which includes an inspection of the lower assembly on completion, a verification of the design etc. (mandatory inspection points).</p> <p>A performance test, EE-2-86-02J, will be performed on each CCEM prior to flying on a mission. The performance test will check parameter of the CCEM. A visual inspection will also be performed on the CCEM prior to each flight. The visual inspection will detect clogged microphone ports and defects in the boom.</p> <p>The performance test and visual inspection will detect any failure or out of spec condition in the CCEM.</p>
02-					

CRITICAL ITEM LIST

PROJECT: EMO

NOMENCLATURE: MICROPHONE ASSEMBLY

ASSEMBLY P/N: SED16102311-301

DATE: January 4, 1989

FEMA REF	REV	NAME, QTY., DRAWING REF. DESIGN	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	NDMR/FONC 3/2HB RATIONALE FOR ACCEPTANCE CRITICALITY FAILURE HISTORY: None
01-	A				
02-					<p>EMU/ORBITER INTERFACE TEST The CCEM shall be interfaced and tested with the extravehicular Mobility Unit (EMU) in the environments under which it is required to operate. Tests shall be performed in the altitude chamber during a manned test. It shall also be interfaced with the Space Shuttle Orbiter and tested to insure proper operation in that environment.</p>