



## CRITICAL ITEMS LIST

PROJECT: EXTRAVEHICULAR MOBILITY UNIT

SYSTEM: EMI COMMUNICATIONS

ASS'Y IDENTIFICATION: EXTRAVEHICULAR COMMUNICATION (EUC)

ASS'Y P/N: B379400 (W/D)      SHEET: 2 of 6

FMEA REF.	REV.	NAME, DIV & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT BY END ITEM	IOWR / FUNC. 3/200 CRITICALITY      RATIONALE FOR ACCEPTANCE
EUC-09A (CONT'D)		EXTRAVEHICULAR COMMUNICATION  RCN P/N: B379400  DIV: 1	MODE: OPEN CIRCUIT DC POWER INPUT, PRIMARY OR SECONDARY  CAUSE: VIBRATION, SHOCK, TEMP. CYCLE, EEE PARTS FAILURE	LOSS OF REDUNDANT POWER INPUT PATH.  AFTER SECOND FAILURE, WORST CASE IS LOSS OF ONE EUC NODE.	<p>TEST:</p> <ul style="list-style-type: none"> <li>• (1) CERTIFICATION TEST: ONE-TIME TEST ON ORN MODEL EUC; ELECTRICAL PERFORMANCE VERIFIED SEPARATELY FOR PRIMARY AND SECONDARY POWER INPUTS BEFORE AND AFTER ENVIRONMENTAL EXPOSURE:             <ul style="list-style-type: none"> <li>◦ TEMPERATURE - 5 CYCLES FROM 15 F TO 155 F OPERATING AND 1 CYCLE TO -65 F NON-OPERATING. PRIMARY AND SECONDARY POWER INPUTS VERIFIED SEPARATELY DURING TEMPERATURE.</li> <li>◦ SHOCK - TERMINAL PEAK SAWTOOTH WITH 20g PEAK AND 10 msec DURATION OVER 180° 3 TIMES FOR EACH AXIS IN HORN + AND - DIRECTIONS. TOTAL OF 18 SHOCKS.</li> <li>◦ LANDING SHOCK &amp; ACCELERATION ENVIRONMENTS CERTIFIED BY ANALYSIS</li> <li>◦ VIBRATION - TEST-INDUCED (ORNI) - 5 MIN PER AXIS                 <ul style="list-style-type: none"> <li>20 TO 80 Hz - INCREASING 3 (M)/HZ</li> <li>80 TO 350 Hz - CONSTANT 0.067g/Hz</li> <li>350 TO 2000 Hz - INCREASING 3 (M)/HZ</li> </ul> </li> <li>FLIGHT-INDUCED - 40 MINUTES PER AXIS                 <ul style="list-style-type: none"> <li>20 TO 150 Hz - INCREASING 6 (M)/HZ</li> <li>150 TO 1000 Hz - CONSTANT 0.03 (g/Hz)</li> <li>1000 TO 2000 Hz - INCREASING 6 (M)/HZ</li> </ul> </li> </ul> </li> </ul> <p>PRIMARY AND SECONDARY POWER INPUTS VERIFIED SEPARATELY DURING FLIGHT-INDUCED VIBRATION.</p>

## CRITICAL ITEMS LIST

PROJECT: ENTREPRENEUR MOBILITY UNIT

SYSTEM: EMI COMMUNICATIONS

ASS'Y NAME: EXPIRATION OR  
CONTAMINATION TEST

ASS'Y P/N: 8379400 (R01) SHEET: 3 of 6

ITEM REF.	REV.	NAME, QTY & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	HWR / FUNC. CRITERIA / RATIONALE FOR ACCEPTANCE
EVC-09A (CONT'D)		ENTREPRENEUR COMMUNICATION  RCA P-N: 8379400  QTY: 1	MODE: OPEN CIRCUIT DC POWER INPUT, PATHWAY OR SECONDARY  CAUSE: VIBRATION, SHOCK, TEMP. CYCLE, EEE PAPER FAILURE	LOSS OF REDUNDANT POWER INPUT PATH.  AFTER SECOND FAILURE, WORST CASE IS LOSS OF ONE EVC MODE.	TEST: (CONT'D)  a VIBRATION - UNIT OPERATED IN CHAMBER EXCITED TO 10-5 FORR FOR SIX HOURS.  b SALT FOG, HUMIDITY, AND FUNGUS CERTIFIED BY ANALYSIS.  (2) MANUFACTURING ACCEPTANCE TEST: ENVIRONMENTAL SCREEN AND COMPLETE ELECTRICAL PERFORMANCE TEST.  c TEMPERATURE - ONE AND ONE-HALF CYCLES FROM 20 F TO 135 F, WITH PRIMARY AND SECONDARY POWER INPUTS VARIATED SEPA- RATELY.  d VIBRATION - 1 MINUTE PER AXIS MINIMUM 20 TO 80 Hz - INCREASING 3 dB/OCT 80 TO 150 Hz - CONSTANT 0.04g <sup>2</sup> /Hz 150 TO 2000 Hz - DECREASING 3 dB/OCT  (3) PREINSTALLATION ACCEPTANCE TEST (PIAT) PERFORMED PERIODICALLY AT 15C UNTIL TO DELIVERY OF END-ITEM FOR EMI INSTALLATION. INCLUDES COMPLETE ELECTRICAL PERFORMANCE WITH PRIMARY AND SECONDARY POWER INPUTS SEPARATELY VARIATED.

## CRITICAL ITEMS LIST

PROJECT: EXTRAVEHICULAR MOBILITY UNIT

SYSTEM: EVD COMMUNICATIONS

ASS'Y NOMENCLATURE: EXTRAVEHICULAR COMMUNICATOR (EVC)

ASS'Y P/N: 8379400 (RCU) SHEET: 4 of 6

ITEM REF.	REV.	NAME, QTY & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	REQD / FUNC. 3/200 CRITICALITY	NOTICE FOR ACCEPTANCE
EVC-09A (CONT'D)		EXTRAVEHICULAR COMMUNICATOR  RCR P/N: 8379400  QTY: 1	MODE: OPEN CIRCUIT DC POWER INPUT, PRIMARY OR SECONDARY  CAUSE: VIBRATION, SHOCK, TEMP. CYCLE, EEC PARTS FAILURE	LOSS OF REDUNDANT POWER INPUT PATH.  AFTER SECOND FAILURE, WORST CASE IS LOSS OF ONE EVC NODE.	TEST: (CONT'D)	<p>(4) GROUND TERNAROUND TEST -</p> <ul style="list-style-type: none"> <li>o EVC/EMU INTEGRATION TEST PERFORMED FIRST TIME EVC IS INSTALLED IN EMU. POWER INPUT CIRCUITS ARE NOT SEPARATELY VERIFIED.</li> <li>o CONDITIONED CHECKOUT PROGRAMME IS PERFORMED PRIOR TO FIRST GROUND TERNAROUND TEST SEQUENCE AND PRIOR TO DELIVERY FOR FLIGHT. POWER INPUT CIRCUITS ARE NOT SEPARATELY VERIFIED.</li> <li>o DROTTER/EMI FUNCTIONAL CHECKOUT IS PERFORMED AT VEHICLE INSTALLATION. POWER INPUT CIRCUITS ARE NOT SEPARATELY VERIFIED.</li> </ul>

## CRITICAL ITEMS LIST

PROJECT: EXTRAVEHICULAR MOBILITY UNIT

SYSTEM: EVA COMMUNICATIONS

ASS'Y NOMENCLATURE: EXTRAVEHICULAR COMMUNICATOR (EVC)

ASS'Y P/N: 0379400 (RCA) SHEET: 5 of 6

ITEM REF.	REV.	NAME, QTY & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	HWR / FUNC. 3/200 CRITICALITY RATIONALE FOR ACCEPTANCE
EVC-03A (CONT'D)		EXTRAVEHICULAR COMMUNICATOR RCA P/N: 0379400 QTY: 1	MODE: OPEN CIRCUIT DC POWER INPUT, PRIMARY OR SECONDARY  CAUSE: VIBRATION, SHOCK, TEMP. CYCLE, EEE POPS FAILURE	LOSS OF REDUNDANT POWER INPUT PATH.  AFTER SECOND FAILURE, WORST CASE IS LOSS OF ONE EVC MODE.	<p><b>INSPECTION:</b> THE EVC WAS MANUFACTURED IN ACCORDANCE WITH AN APPROVED QUALITY ASSURANCE PLAN USING RCA STANDARD WORKSHOPS (CATERED). MANDATORY INSPECTION POINTS WERE ESTABLISHED AT LEVELS OF SUBASSEMBLY FABRICATION, TEST, INTEGRATION, AND FINAL ASSEMBLY. SUBASSEMBLIES ARE INSPECTED FOR CONFORMANCE WITH RELEASED DRAWINGS AND STANDARDS FOR PARTS PLACEMENT, SOLDERING, AND CLEANLINESS. FINAL QUALITY INSPECTION INCLUDES VISUAL CLEANING OF DEBRIS.</p> <p><b>FAILURE HISTORY:</b> THE RECENT PROBLEMS ARE COMPLETELY OPEN. NO OPEN CIRCUIT OR POWER INPUT LEAKS FAILURES HAVE OCCURRED SINCE HQ.</p>

## CRITICAL ITEMS LIST

PROJECT: EXTRAVEHICULAR MOBILITY UNIT

SYSTEM: EVN COMMUNICATIONS

ASS'Y NOMENCLATURE: EXTRAVEHICULAR COMMUNICATOR (EVC)

ASS'Y P/N: 0379400 (DCN)      SHEET: 6 of 6

ITEM REF.	REV.	NAME, QTY & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	HOLD / FINC. 3/208 RATIONALE FOR ACCEPTANCE CRITICALITY
EVC-03A (CONT'D)		EXTRAVEHICULAR COMMUNICATOR  DCN P/N: 0379400  QTY: 1	NOTE: (OPEN CIRCUIT DC POWER INPUT, PRIMARY OR SECONDARY  CAUSE: VIBRATION, SHOCK, TEMP. CYCLE, ETC PARTS FAILURE	LOSS OF REDUNDANT POWER INPUT PATH.  AFTER SECOND FAILURE, WORST CASE IS LOSS OF ONE EVC MODE.	CREW RESPONSE:  - SINGLE FAILURE UNDETECTABLE BY GROUND OR CREW; NO RESPONSE.  - FOR SUBSEQUENT FAILURES, LOSS OF SELECTED EVC MODE WOULD REQUIRE CREW TO SWITCH MODES.  TRAINING:  - CREW IS TRAINED IN ALTERNATE MODE SELECTION AND USAGE FOR EVC FAILURES.  - CREW IS TRAINED TO IDENTIFY EVM FOR LOSS OF MINIMUM REQUIRED COMMUNICATION.  OPERATIONAL CONSIDERATIONS:  - LOSS/FAILURE FLIGHT RULES DEFINE EVM GO/NO GO CRITERIA FOR MINIMUM OF COMMUNICATIONS.  - FLIGHT RULES DEFINE MINIMUM EVM COMM.