NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT
ELECTRICAL SIGNALS ITEM 152 SV789152-2 (1) 0145-1 1	2/2	152FM06: ELECTRICAL SHORT IN WARNING TONE OR STATUS TONE LINES. CAUSE: CABLE CHAFING AGAINST CONNECTOR SHELL OR SHIELD. IMPROPER CONNECTOR STRAIN RELIEF.	END ITEM: SHORT FROM WARNING TONE OR STATUS TONE LINES TO GROUND. GFE INTERFACE: TONES WILL BE CONTINUOUSLY ACTIVATED. MISSION: TERMINATE EVA DUE TO CREW DISCOMFORT FROM CONTINUOUS TONES. CREW/VEHICLE: NONE.

RATIONALE FOR ACCEPTANCE

A. DESIGN -

EACH CONNECTOR/CABLE INTERFACE IS STRAIN RELIEVED BY POTTING THE CONDUCTORS IN PLACE. A RUBBER BACKSHELL IS THEN MOLDED OVER THE CONNECTOR/CABLE INTERFACE. EACH CONNECTOR/ADAPTER RING INTERFACE IS LOCKED IN PLACE TO PREVENT ROTATION BY MECHANICAL LOCK AND AN ADHESIVE LOCK.

#26 AWG, TEFLON COATED WIRE PROVIDES THE REQUIRED INSULATION RESISTANCE.

■ THE CONDUCTORS ARE BUNDLED WITHIN A WOVEN COPPER STRANDED SHEATH OVER BRAIDED WITH A WOVEN NOMEX OUTER SHEATH. THESE COVER THE CABLES TO ACT TOGETHER AND SHARE ANY LOADING AND RESIST ANY DAMAGE FROM ABRASION AND IMPACT.

WIRE CRIMPING IS PER SVHS4909 (BASED ON MSFC-SPEC-Q-1A).

B. TEST -

COMPONENT ACCEPTANCE TEST -

THE 152 HARNESS IS SUBJECTED TO ACCEPTANCE TESTING PER AT-EMU-152 PRIOR TO FINAL ACCEPTANCE TESTING. THIS TESTING INCLUDES THE FOLLOWING TESTS WHICH INSURE THERE ARE NO WORKMANSHIP PROBLEMS WHICH WOULD CAUSE AN ELECTRICAL SHORT IN THE WARNING TONE OR STATUS TONE LINES TO GROUND.

THE INSULATION RESISTANCE AND DIELECTRIC STRENGTH BETWEEN EACH CONDUCTOR AND THE SHIELD GROUND IS MEASURED TO INSURE THERE ARE NO SHORTS.

EACH CONNECTOR/CABLE INTERFACE IS PULL TESTED (10 POUNDS) TO DETECT ANY WORKMANSHIP PROBLEMS WHICH COULD CAUSE A SHORT CIRCUIT.

PDA TEST -

THE WARNING TONE AND STATUS TONE LINES ARE FUNCTIONALLY CHECKED DURING PLSS PDA PER SEMU-60-010, TEST 4.0 TO INSURE THERE ARE NO SHORTS TO SHIELD GROUND WHICH AFFECT THE PERFORMANCE OF THE PLSS.

CERTIFICATION TEST -

THIS ITEM HAS COMPLETED THE STRUCTURAL VIBRATION AND SHOCK CERTIFICATION REQUIREMENTS DURING 10/83. ENGINEERING CHANGE 42001-527-2 (ADDED CONNECTOR PULL TEST) HAS BEEN INCORPORATED AND CERTIFIED SINCE THIS CONFIGURATION WAS CERTIFIED.

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
ELECTRICAL SIGNALS ITEM 152 SV789152-2 (1) 0145-2 [illegible]	2/2	152FM04: ELECTRICAL SHORT IN WARNING TONE OR STATUS TONE LINES.		(see below)

C. INSPECTION -
TO INSURE THERE ARE NO WORKMANSHIP PROBLEMS WHICH WOULD CAUSE A SHORT CIRCUIT IN THE HARNESS CONDUCTORS, THE FOLLOWING INSPECTIONS ARE PERFORMED:
HARNESS CABLES AND CONDUCTORS ARE VISUALLY INSPECTED PRIOR TO ASSEMBLY TO INSURE THERE ARE NO DEFECTS WHICH COULD CAUSE A SHORT TO GROUND DUE TO DEFECTS IN THE CABLE INSULATION.
CONNECTOR WIRING IS INSPECTED BEFORE AND AFTER POTTING TO INSURE THERE IS NO CONDUCTOR DAMAGE AND THAT THE CONDUCTORS ARE PROPERLY STRAIN RELIEVED AND PROPERLY DRESSED TO PREVENT CONDUCTOR SHORTING TO THE ADAPTER RING.
INSULATION RESISTANCE AND DIELECTRIC STRENGTH ARE MEASURED BETWEEN EACH CONDUCTOR AND SHIELD GROUND TO INSURE THERE ARE NO SHORT PRIOR TO AND AFTER POTTING OF THE CONNECTORS.
IN-PROCESS, ELECTRICAL CHECKOUT OF HARNESS BEFORE AND AFTER POTTING AND MOLDING TO INSURE THERE ARE NO SHORT CIRCUITS.

D. FAILURE HISTORY -
NONE FOR THIS FAILURE MODE. RELATED FAILURE:
H-EMU-152-A001 (3/9/84)
DURING PDSS ACCEPTANCE TESTING, ALL SENSOR OUTPUTS READ FULL SCALE. A SHORT CIRCUIT IN THE HARNESS WAS FOUND BETWEEN VREF AND GROUND. THE SHORT WAS DUE TO IMPROPER ASSEMBLY AND TESTING BY THE VENDOR. THE VENDOR'S ASSEMBLY AND TEST PROCEDURES WERE REVISED.
J-EMU-152-003 (4-22-86)
DURING A PRE-FLIGHT COMMUNICATIONS CHECK, IT WAS NOT POSSIBLE TO TRANSMIT THROUGH THE RIGHT MICROPHONE ON THE CCA. THE FAILURE WAS CAUSED BY A SHORT CIRCUIT BETWEEN THE RIGHT MICROPHONE POWER LINE AND THE CABLE GROUNDING SHIELD. THE INSULATION ON THE POWER LINE WAS BEEN DAMAGED PRIOR TO THE CABLE ASSEMBLY. EC 42006-527-2 WAS ISSUED TO CHANGE THE SV789152-2 HARNESS CONFIGURATION BY ADDING A CONNECTOR PULL TEST TO THE ACCEPTANCE TESTING REQUIREMENTS.

E. GROUND TURNAROUND -
GROUND TURNAROUND TESTED PER FEMU-R-001, TONES TEST.

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
ELECTRICAL SIGNALS EFEM 352 SV78T852-2 (1)	2/2	352FM06: ELECTRICAL SHORT IN HARNESS TONE OR STATUS TONE LINES.		F. OPERATIONAL USE - CREW RESPONSE - PREEVA: ENABLE SHORT PROBLEM. CONSIDER THIRD EMU IF AVAILABLE. TERMINATE EVA PREP DUE TO CREW DISCOMFOR CAUSED BY CONTINUOUS TONE AND LOSS OF EMU ANNUNCIATION CAPABILITY. EVA: TERMINATE EVA. EMU IS OK FOR SCU IF NOISE LEVEL IS REASONABLE. TRAINING - STANDARD TRAINING COVERS THIS FAILURE MODE. OPERATIONAL CONSIDERATIONS - EVA CHECKLIST PROCEDURES VERIFY HARDWARE INTEGRITY AND SYSTEMS OPERATIONAL STATUS PRIOR TO EVA. FLIGHT RULES DEFINE GO/NO GO CRITERIA RELATED TO EMU EMS. REAL TIME DATA SYSTEM ALLOWS GROUND MONITORING OF EMU SYSTEMS.

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