



815 BROADHOLLOW RD., FARMINGDALE, NY 11735 USA

SERVICE BULLETIN

MD-80/90 SERIES

COMMUNICATIONS, PASSENGER ADDRESS SERVICE INTERPHONE CALL SYSTEM (PASICS), ELECTRONIC SWITCHING UNIT P/N 686-3000-002; MODIFICATION FOR PA CH#1 GAIN ADJUSTMENT CAPABILITY AND POWER DELIVERY TO AFT/MID HANDSETS.

1. PLANNING INFORMATION:

- A. Effectivity: Electronic Switching Units P/N 686-3000-002 S/N's 0001 thru 0899, used in the PASICS equipment aboard MD-80/90 series aircraft are affected. In addition, the following **686-3000-003** serial numbered units are also affected by this revision: 0900, 0901, 0905-0909, 0911, 0912, 0915, 0917, 0919, 0923, 0931, 0934 - 0936.
- B. Reason: Allow external adjustment of Aft pedestal handset PA CH#1 audio level using a potentiometer mounted internal to unit, and improve power delivery to the mid and aft cabin attendant handsets.
- C. Description: Performance of this bulletin entails the installation of a internal, chassis mounted, trim board assembly (A3), removal of one capacitor, changing values of two resistors and one capacitor, and installation of two jumper wires on the Audio Card Assembly (A2), and the replacing of four resistors on the ESU Power Supply & Logic Circuit Card Assembly (A1). Handling procedures must be in accordance with requirements of DOD-STD-1686 for electrostatic sensitive devices (ESD).
- D. Compliance: The incorporation of this bulletin is recommended to be at the earliest convenience of the operator.
- E. Approval: FAA approval for installation of the modified equipment on MD-80 & MD-90 aircraft is provided by a FAA approved Douglas Service Bulletin number MD80-23-097 and MD90-23-012.
- F. Manpower: It is estimated that 2.0 man-hours will be required per unit, when performance is concurrent with repair.
- G. Material - Cost and Availability:
 - (1) Telephonics Performance: With customer's authorization, Telephonics will incorporate this bulletin at a charge based on the current Service Center labor rate, when unit is returned for repair and/or mod.



(2) Operator Performance: Kits, P/N SBK686-3000-3, for field accomplishment, will be supplied at the current price listed in Telephonics Spare Parts Catalog. For kit information, refer to Section 3 - MATERIAL INFORMATION.

H. Tooling - Cost and Availability: None required.

I. Weight and Balance: None

J. References:

(1) Component Maintenance Manual with Illustrated Parts List, Electronic Switching Unit P/N's 686-3000-001 & 686-3000-002 (ATA 23-44-32)

K. Publications Affected: Reference (1) at the next revision, to include information contained in this bulletin.



2. ACCOMPLISHMENT INSTRUCTIONS:

THIS UNIT CONTAINS ELECTROSTATIC SENSITIVE DEVICES, HANDLE IN ACCORDANCE WITH REQUIREMENTS OF DOD-STD-1686.

Note 1: Prior incorporation of Mods 1 & 2 is required before implementation of this bulletin.

Note 2: 686-3000-003 units, identified in "Effectivity" on page 1, will only require the change of resistors R44 and R45 on the A1 card assembly and marking of "3R1" above mod record plate to comply with this revision.

A. Disassembly: Item references are per Figure 1 of this bulletin.

- (1) Remove cover (2) by removing ten each pan head screws (9) and flat washers (11).
- (2) Remove three each pan head screws (8) and flat washers (11) which secure A2 card assembly (3) to side of chassis (1).
- (3) Release retainers and disconnect electrical harness (5) from connector receptacles of A2 and A1 circuit card assemblies (3 & 4).
- (4) Remove six each pan head screws (10), lock washers (12) and flat washers (11). Remove A2 card assembly and set aside in an ESD protective container.
- (5) Remove three each pan head screws (8), and flat washers (11), that secure A1 card bracket to chassis.
- (6) Remove A1 card assembly (4) from chassis (1). Ensure that isolator washers (13) remain adhered to bottom of card.

B. Modification:

- (1) Desolder and remove resistors R42, R43, R44 and R45 from A1 card assembly. Refer to Figure 2 of this bulletin for locations.
- (2) Install and solder a 3.16K Ω , 1.5W, 1% resistors (P/N RWR80S3161FS) in the R42 positions and a 2.0K Ω , 1.5W, 1% resistor (P/N RWR80S2001FS) in the R43 position. Since these components are longer in length than the original resistors, a service loop must be incorporated in each leg of the component (refer to Figure 2).
- (3) Install and solder a 4.32 Ω , 1W, 1% resistor (P/N RWR81S4R32FS) in R44 position and a 2.00 Ω , 1W, 1% resistor (P/N RWR81S2R00FS) in R45 position of the A1 card assembly. In the case of a -003 or -004 card assembly, these resistors will be mounted on turret terminals along with a diode, -005 card assembly resistor mounting is in plated thru holes. Clip excess lead length on DIP side of card.

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- (4) Using an acid brush and isopropyl alcohol, clean soldering flux and debris from newly reworked areas. Allow to dry before proceeding.
- (5) Apply conformal coating (Humi Seal 1B31) over newly reworked areas, Allow to dry before continuing. Set aside in an ESD protective container.
- (6) On A2 card assembly, desolder and remove C10, C18, R5 and R12, refer to Figure 3 of this bulletin for locations.
- (7) Install and solder a 220pf, 100V, 10% capacitor (P/N M39014/22-0987) in C10 location, a 43.2K Ω , 1/8W, 1% resistor (P/N RLR05C4322FM) in R5 location and a 4.75K Ω , 1/8W, 1% resistor (P/N RLR05C4751FM) in R12 location.
- (8) Using #26 AWG insulated jumper wire, install two jumpers on the DIP side of the A2 card assembly as shown in Figure 3. One jumper from J1-30 to the open C18 pad designated E1 and the second from P1-31 to the other open C18 pad designated E2. Secure the jumpers, at their mid points, using small quantity of quick-setting epoxy.
- (9) Using an acid brush and isopropyl alcohol, clean soldering flux and debris from newly reworked areas. Allow to dry before proceeding.
- (10) Apply conformal coating (Humi Seal 1B31) over newly reworked areas. Allow to dry before continuing.
- (11) On A2 card assembly, obliterate the C18 marking and mark E1 and E2, using white epoxy ink, as shown in Figure 3.
- (12) Identify incorporation of modification on card assembly by marking new dash number, using white epoxy ink, of the A1 & A2 circuit cards Part Number as follows;
A1 card P/N 686-3023-003 remark as -006 Rev. T,
686-3023-004 remark as -007 Rev. T,
686-3023-005 remark as -008 Rev. T

A2 card P/N 686-3020-002 remark as -003 Rev. -
- (13) Set A1 and A2 card aside in ESD protective containers and proceed with chassis modifications.
- (14) On chassis side, to right of ID plate, locate and mark drilling holes as shown in Figure 4. Drill two (2) 0.125 in. (3.18mm) holes and one (1) 0.375 in. (9.5mm) hole, as shown in Figure 4. Debur holes and ensure loose metal shavings are cleaned from inside unit.



- (15) Mount Trim board assembly A3 (P/N 686-0015-001), using two each pan head screws, lock washer and flat washer, (supplied with assembly) as shown in Figure 4.
- (16) Route white and black wires from trim board assembly along inner edge of chassis proceeding towards the harness connector A2J1. At the A2J1 connector, carefully remove both cover halves, starting with the top half. Remove unused pins #30 & 31 by depressing small tang on pin, accessible thru opening in body of connector, with a dental pick, and pulling pin out rear of connector with needle-nosed pliers.
- (17) Insert white and black wire pins into A2J1 locations 31 & 30 respectively, making sure that pins are seated fully and locked in place. Reinstall both connector cover halves, bottom side first. Using lacing cord, secure white and black wires to wire harness and to E7 terminal on the A1 card as shown in Figure 4.

C. Assembly, Test and Identification:

- (1) Mix a sufficient amount of thermally conductive, silicone, potting-compound (Emerson & Cuming Inc. ECCOSIL 4952), to cover heat sink brackets of A1 & A2 cards. Mix thoroughly, and in proportions recommended by the manufacturer.
- (2) Apply a light, evenly spread coat of compound to surface of angle bracket of A1 card assembly. Without delay, seat A1 card in unit and secure by installing three each pan head screws (8) and flat washers (11). Ensure that six isolator washers (13) are in place on bottom of card. Do not tighten screws at this time.
- (3) Connect harness assembly (5) to J1 receptacle of A1 card assembly (4). Ensure it is fully seated.
- (4) Repeat the application of compound, as in (2) above, on angle bracket of A2 card assembly (3). Seat A2 card in unit and secure by installing three each pan head screws (8) and flat washers (11). Do not tighten screws at this time.
- (5) Install six each pan head screws (10), lock washers (12) and flat washers (11).
- (6) Tighten three screws (8) near ID plate, then three screws (8) at right side of unit, and finally, six screws (10), in that order.
- (7) Connect harness assembly (5) plugs to J1 receptacle of A2 (3) card assembly, ensuring it is fully seat.
- (8) Install cover (2) and secure with ten each pan head screws (9) and flat washers (11)



(9) Identify unit as follows:

- (a) If not already installed, mount adhesive-backed modification record plate P/N 255B012 (7) one quarter inch to left of ID plate (6).
- (b) Using black epoxy ink, obliterate circled numeral ③ of the plate (7), and hand stamp “3R1” on the chassis metal above the modification record plate, as shown in Figure 4.
- (c) Remove existing ID plate (6), clean any remaining adhesive residue and install new adhesive backed ID Plate in same location.

(10) Test unit in accordance with test procedure in CMM ATA 23-44-32 with the following test steps added or changed as noted;

NOTE: ESU Test Fixture P/N 686-7100-001 must be modified in order to accomplish the following test steps. Refer to Appendix A for test fixture modification.

ADD to; 3. Equipment Setup

B. Verify the following conditions (* for 686-3000-003 unit).

* (8) Set S13 to “OFF”.

ADD to; 4. Test Procedure

F. Logic Check - Forward PA Mode (* for 686-3000-003 unit)

* (4) Set S13 to “OFF”.

* (5) Adjust Power Supply to $+22.0 \pm 0.2$ VDC.

* (6) Set S13 to “NORM” and measure $+20.5$ VDC Min. at TP1.

* (7) Set S13 to “LIMIT”, connect a DVM, set to DC Amps, at DBP6 and measure $135 \text{ mA} \pm 27 \text{ mA}$.

* (8) Set S13 to “OFF”.

* (9) Adjust Power Supply to $+28.0 \pm 0.5$ VDC.

(10) Set S7 to “OFF” (down) position.

(11) Verify LEDs DS1 thru DS3, DS6 and DS7 are “ON”.

(12) Verify LEDs DS4, DS5 and DS8 are “OFF”.



ADD to; G. Logic Check - Mid/Aft Mode (* for 686-3000-003 unit)

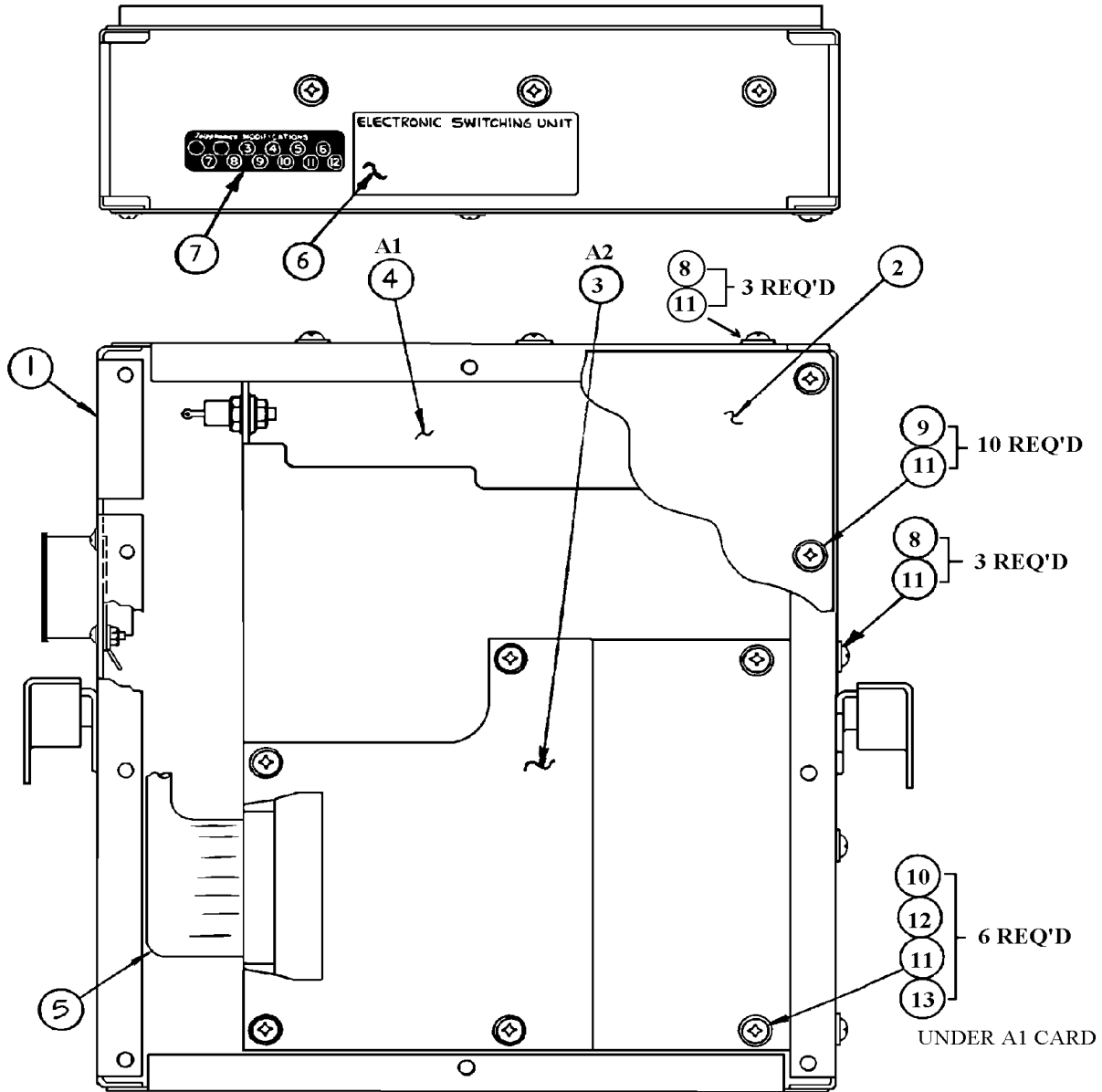
- * (4) Set S13 to "OFF".
- * (5) Adjust Power Supply to $+22.0 \pm 0.2\text{VDC}$.
- * (6) Set S13 to "NORM" and measure $+20.5\text{ VDC Min.}$ at TP2.
- * (7) Set S13 to "LIMIT" , connect a DVM, set to DC Amps, at DBP7 and measure $290\text{ mA} \pm 58\text{ mA}$.
- * (8) Set S13 to "OFF".
- * (9) Adjust Power Supply to $+28.0 \pm 0.5\text{VDC}$.
- (10) Set S8 to "OFF" (down) position.
- (11) Verify LEDs DS1 thru DS3, DS6, and DS7 are "ON".
- (12) Verify LEDs DS4, DS5, and DS8 are "OFF".

CHANGE L. Audio Test - Pilot PA Audio (* for 686-3000-003 unit)

- * (6) Adjust A3R1 through its range from minimum to maximum, verify an output level at DBP2 of less than 240mVp-p at the minimum setting and more than 1.0Vp-p at the maximum setting with no visible distortion. Finally, adjust A3R1 for an output signal of 275mVp-p (97mVrms) $\pm 13.75\text{mVp-p}$ at DBP2.

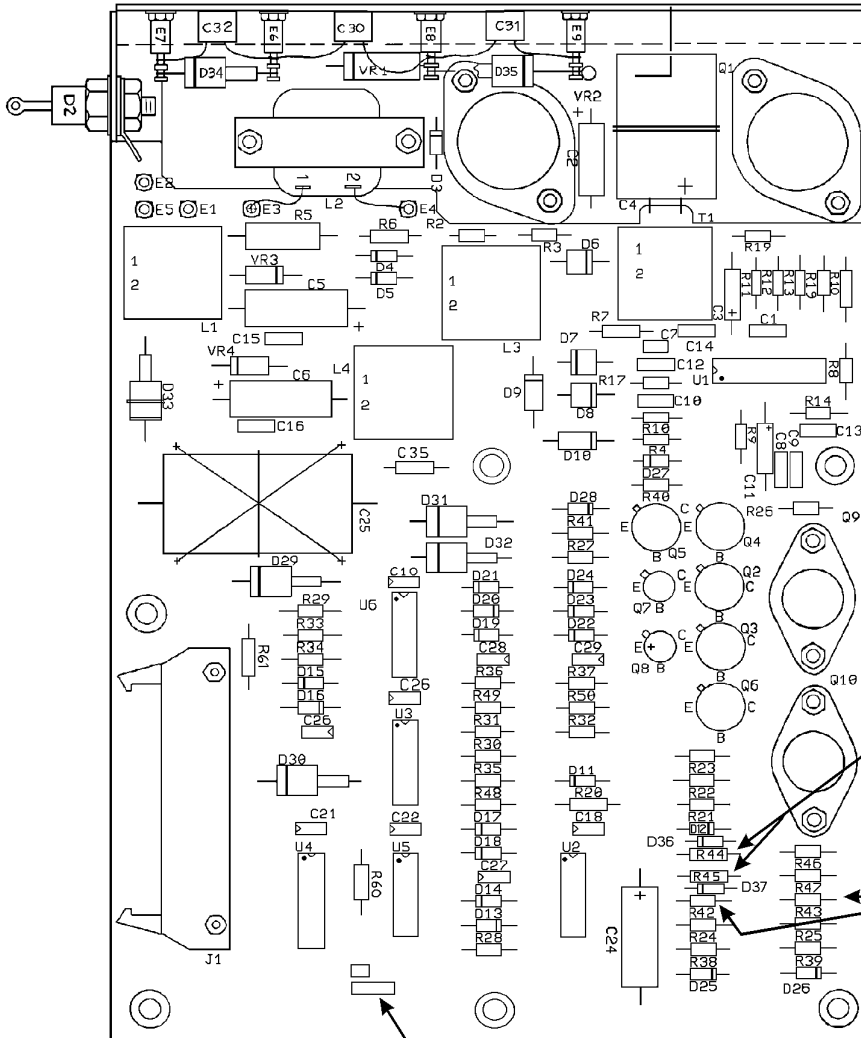


ITEM	DESCRIPTION	ITEM	DESCRIPTION
1	Chassis	8	Screw, Pan Hd. 8-32 x .38
2	Cover	9	Screw, Pan Hd. 8-32 x .50
3	ESU Audio Card (A2)	10	Screw, Pan Hd. 8-32 x 1.0
4	ESU Pwr Supply & Logic Card (A1)	11	Washer, Flat #8
5	Harness Assembly	12	Washer, Lock #8
6	Plate, Identification	13	Washer, Isolator
7	Plate, Mod. Record		



ESU ASSEMBLY, BASIC P/N 686-3000
FIGURE 1

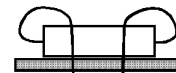
686-3000-23-3



Replace R44 & R45
R44 = 4.32 Ohm, 1W
R45 = 2.0 Ohm, 1W

Replace R42 & R43
R42 = 3.16K, 1.5W
R43 = 2.0K, 1.5W

Mounting Method
for R42 & R43



Mark New Dash Number

From -003 to -006

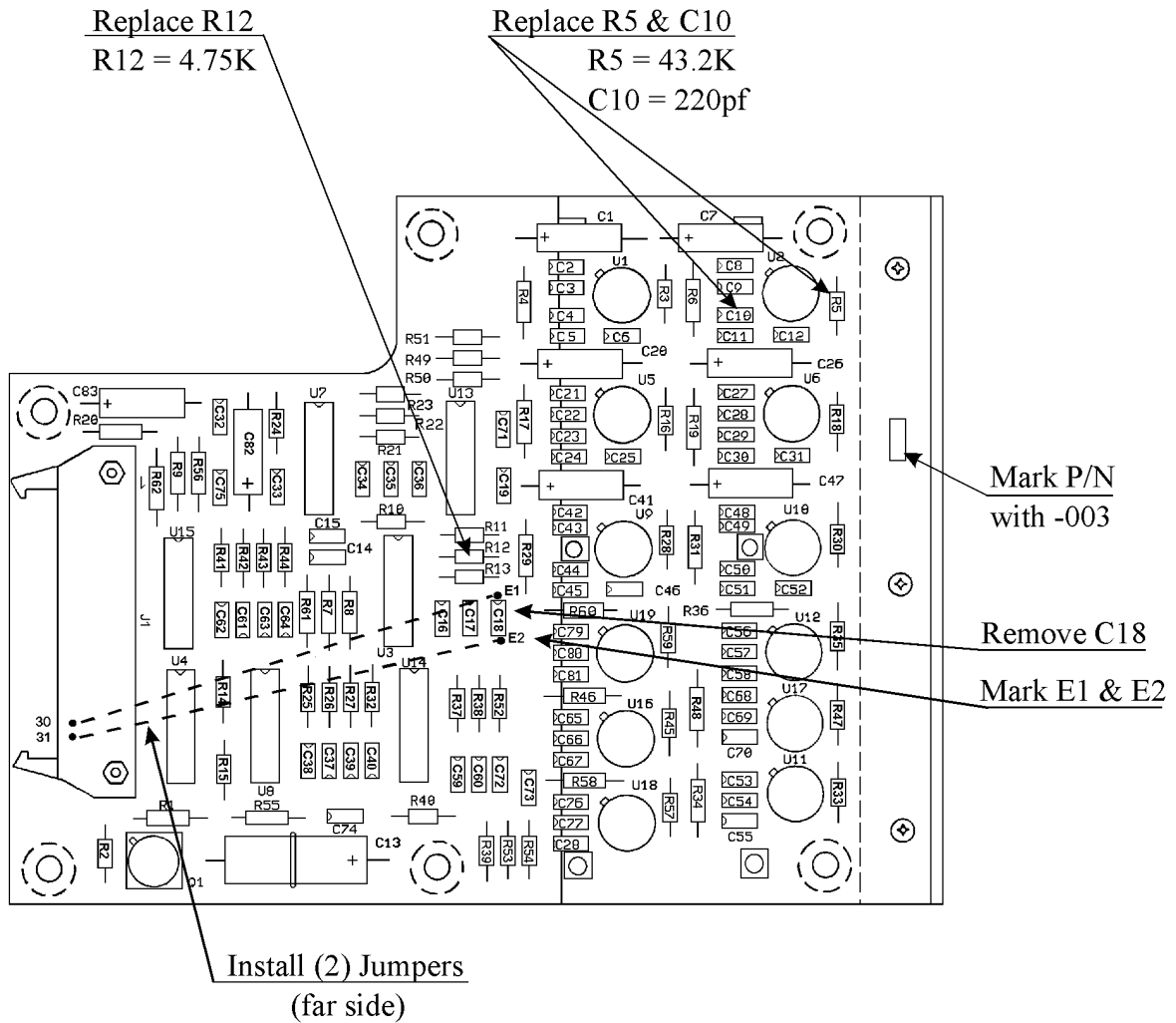
-004 to -007

-005 to -008

POWER SUPPLY & LOGIC CARD ASSEMBLY (A1) - P/N 686-3023-xxx

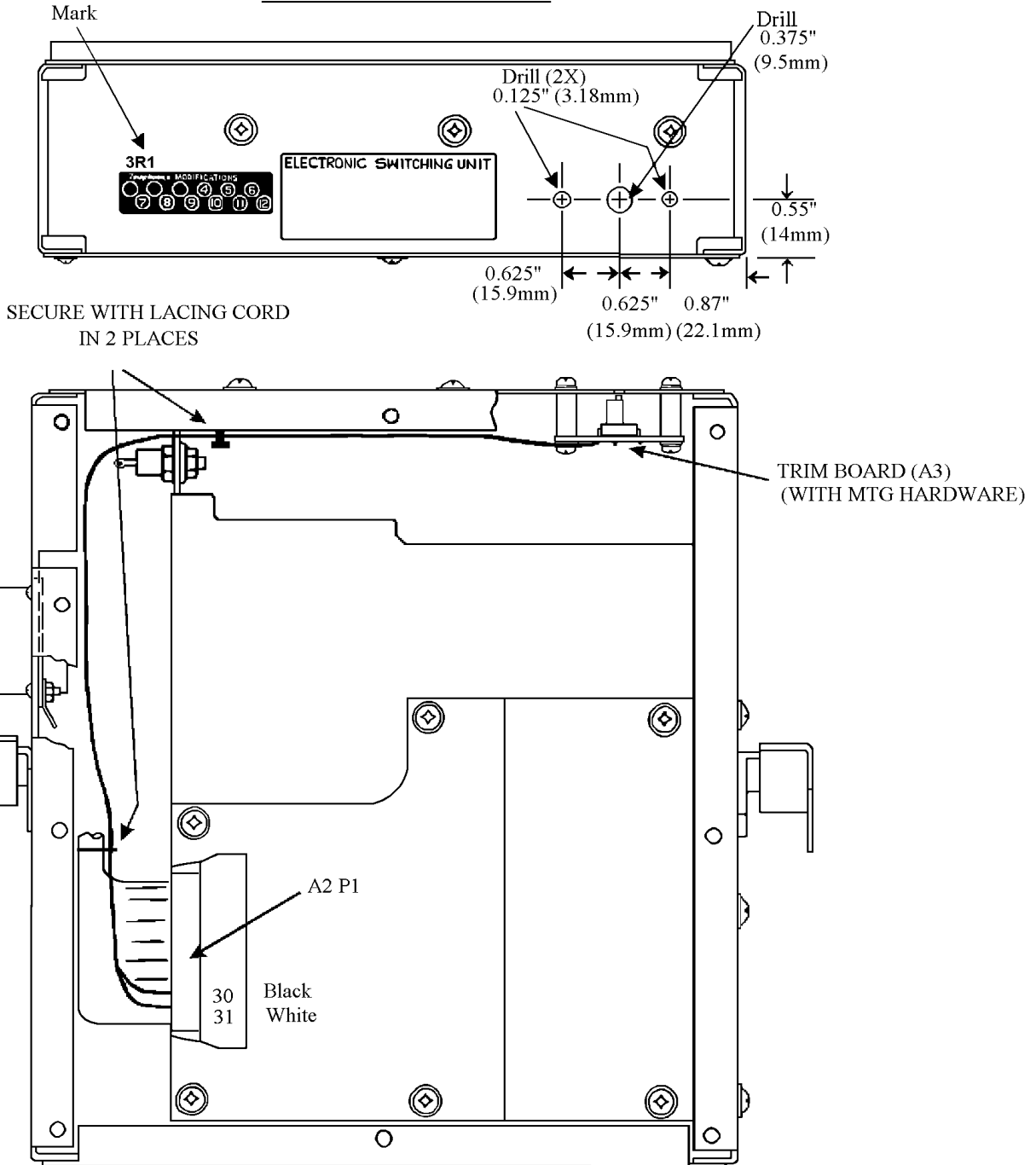
COMPONENT LOCATION & MODIFICATION

FIGURE 2



AUDIO CARD ASSEMBLY (A2) - P/N 686-3020-002
COMPONENT LOCATION & MODIFICATION
FIGURE 3

DRILLING LOCATIONS



MODIFIED ESU CHASSIS ASSEMBLY
FIGURE 4



3. MATERIAL INFORMATION: Material information is furnished on a unit basis.

A. KITS: Each kit, P/N SBK686-3000-3 consists of the following components;

<u>Qty</u>	<u>New P/N</u>	<u>Key Word</u>	<u>Old P/N</u>	<u>Disposition</u>
1	686-0015-001 *	Assy, Trim board, A3	N/A	N/A
1	RWR80S3161FS	Res., 3.16K, 1.5W, 1%	RLR05C1822FM	Scrap
1	RWR80S2001FS	Res., 2.00K, 1.5W, 1%	RLR05C1822FM	Scrap
1	RWR81S4R32FS	Res., 4.32Ω, 1W, 1%	RLR07C11R0GM	Scrap
1	RWR81S2R00FS	Res., 2.00Ω, 1W, 1%	RWR81S5R62FR	Scrap
1	RLR05C4322FM	Res., 43.2K, 1/8W, 1%	RLR05C3302GM	Scrap
1	RLR05C4751FM	Res., 4.75K, 1/8W, 1%	RLR05C4752FM	Scrap
1	M39014/22-0987	Cap., 220pf, 100V, 10%	M39014/22-0978	Scrap
1	255B012	Plate, Mod. Record	N/A	N/A
1	686-3014-003	Plate, Identification	686-3014-002	Scrap

* Note: Trim Board Assy, A3, P/N 686-0015-001 consists of the following components;

<u>P/N</u>	<u>Desc.</u>	<u>Qty</u>
686-3040-001	Trim Board	1
S235A111-106	Spacer	2
MS35338-135	Washer, Lock, #4	4
MS51957-13	Screw, Pan Head, 4-40	4
MS15795-803	Washer, Flat, #4	4
102399-3	Pins (AMP)	2

B. Material - Not Supplied: The following thermally conductive, silicone potting-compound is not supplied in kits:

<u>Qty</u>	<u>Part Number</u>	<u>Description</u>	<u>Source</u>
2cc	STYCAST 4952 Emerson & Cuming, Inc. Billirica, MA	Compound, Potting Silicone	*

* Find an Emerson & Cuming distributor on the Internet at: www.emersoncuming.com

Additionally, the following materials will be required; lacing cord, jumper wire, white and black epoxy ink, quick setting epoxy and conformal coating.

C. Identification: Incorporation of this bulletin is identified by the obliteration of circled numeral ③ of a modification record plate affixed to the chassis next to manufacturer's ID plate, marking of the revision that applies and by changing the Part Number on the ID plate from 686-3000-002 to 686-3000-003

D. Interchangeability: Modified and unmodified units are not interchangeable.

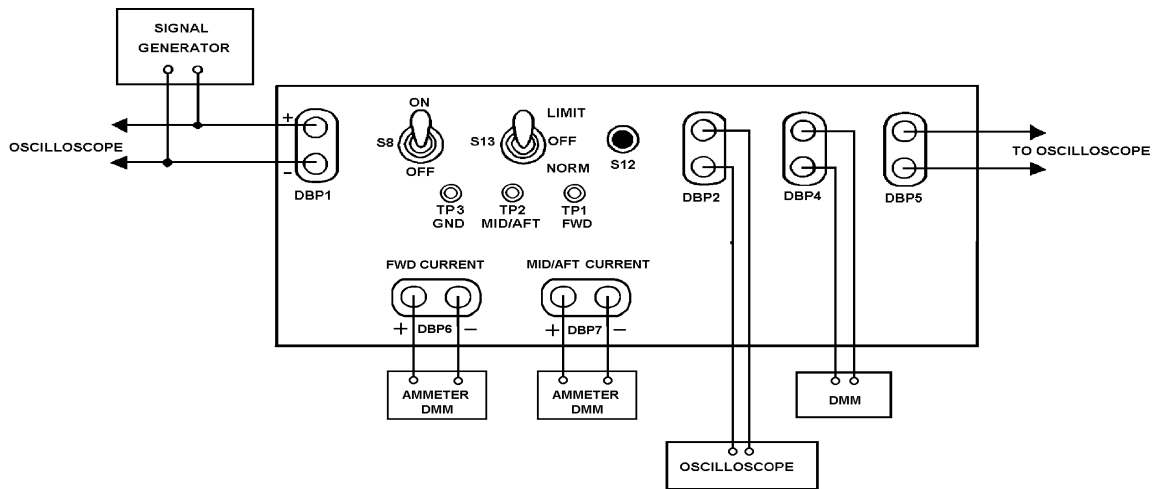
686-3000-23-3



Appendix A

The following information is provided to allow modification of the ESU Test Fixture P/N 686-7100-001. This modification is necessary to perform verification testing of the ESU after incorporation of Service Bulletin 686-3000-23-3. This document contains only that information relative to the modification, refer to the Component Maintenance Manual ATA 23-44-32 for the basic data on the test fixture.

Modification to the test fixture includes the addition of one toggle switch, three resistors, three test point terminals and two binding posts. Depicted below is the lower section of the tester front panel showing switch S13, terminals TP1, TP2 & TP3 and DBP6 & DBP7 binding posts. A parts list and a revised schematic are also provided.



FRONT PANEL CHANGES

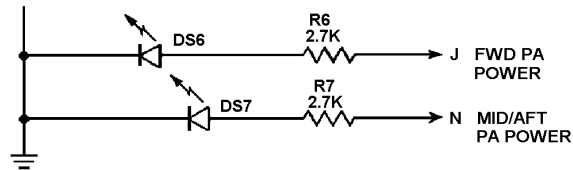
REF DES	DESCRIPTION	PART NO.	MFG
R23	Resistor, 820Ω, 2W, ±5%	RCR42G821JM	
R24	Resistor, 1KΩ, 2W, ±5%	RCR42G102JM	
R25	Resistor, 150Ω, 12W, ADJ.	D12K150	Ohmite
S13	Switch, Toggle, DPDT, Center Off	7103P3Y2Q	C&K
TP1- TP3	Terminal	105-1041-001	E. F. Johnson
DBP6 & 7	Dual Banana Plug	4243-0	Pomona

NEW PARTS REQUIREMENT LIST

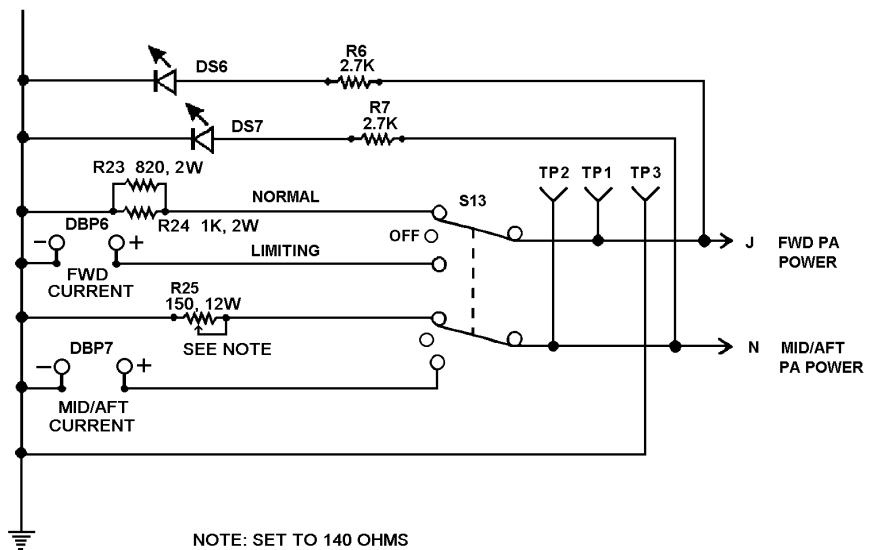


Change drawing area

From:



To:



SCHEMATIC DIAGRAM CHANGES