TO: ALL HOLDERS OF AUDIO ACCESSORY UNIT ASSEMBLY M69 OVERHAUL MANUAL, 23-56-02

REVISION NO. 12, DATED NOV 1/08

HIGHLIGHTS

DESCRIPTION OF CHANGE	TOPICS AFFECTED												
	D&O	D/Assy	Cleaning	Insp/Chk	Repair	Assy	F/C	Test	T/Shooting	S/Tools	Storage	IPL	L/Overhaul
Removed BAE Systems assemblies from manual	X							X	X			X	

AUDIO ACCESSORY UNIT ASSEMBLY M69

23-56-02

BOEING P/N 69-64953-1

AIRLINE P/N

THE FOLLOWING DIRECTIVES APPLY TO THIS SUBJECT:

BOEING SERVICE BULLETIN	BOEING TEMPORARY REVISION	OTHER DIRECTIVES	DATE DIRECTIVE INCORPORATED INTO TEXT
		PRR 31054	Feb 15/69
23-1005		PRR 31777	Feb 10/70
23-1007			Dec 25/73
		MR 39118-3	Dec 25/73
23-33			Nov 10/76
23-39			Nov 10/77
23-1021			Nov 10/77

LIST OF EFFECTIVE PAGES

* Indicates pages revised, added or deleted in latest revision
F Indicates foldout pages - print one side only

PAGE	DATE	PAGE	DATE	PAGE	DATE
23-56-02		* 1106	Nov 1/08		
* T-1	Nov 1/08	* 1107	DELETED		
T-2	BLANK	* 1108	DELETED		
* LEP-1	Nov 1/08	* 1109	DELETED		
LEP-2	BLANK	* 1110	DELETED		
* T/C-1	Nov 1/08				
T/C-2	BLANK				
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* F 813	DELETED				
* 814	DELETED				
* 1101	Nov 1/08				
* 1102	Nov 1/08				
* 1103	Nov 1/08				
* 1104	Nov 1/08				
* 1105	Nov 1/08				

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*[1] Use applicable procedures in SOPM 20-11-04 and standard industry practices.

*[2] Special instructions not required.

AUDIO ACCESSORY UNIT ASSEMBLY (M69)

DESCRIPTION AND OPERATION

NOTE: For coverage of 65-52804-1, -15, -34, -47, -51, -59, -65, refer to BAE Systems Controls Inc., (V89954 BAE Systems Controls Inc., 600 Main St., Johnson City, NY 13790-1806) CMM 23-56-02.

1. Description

   A. The audio accessory unit assembly consists of printed circuit assemblies, filters, potentiometers, a terminal block, and a wire bundle mounted in a chassis assembly.

2. Operation

   A. The audio accessory unit assembly contains components and circuitry used with various communications systems. Amplifiers with associated potentiometers control volume level of the flight, service and attendant interphone systems. Another potentiometer provides control for passenger address sidetone level. Filtering is provided for the reception of voice and range signals.

3. Function Description (See Schematic Diagram.)

   A. Audio System Loads

      (1) Impedance matching resistors on printed circuit assembly A1 provide audio system loads.

   B. Interphone Signal Isolation

      (1) Printed circuit assembly A2 contains interphone signal isolation diodes.

   C. Sensitivity and Output Control

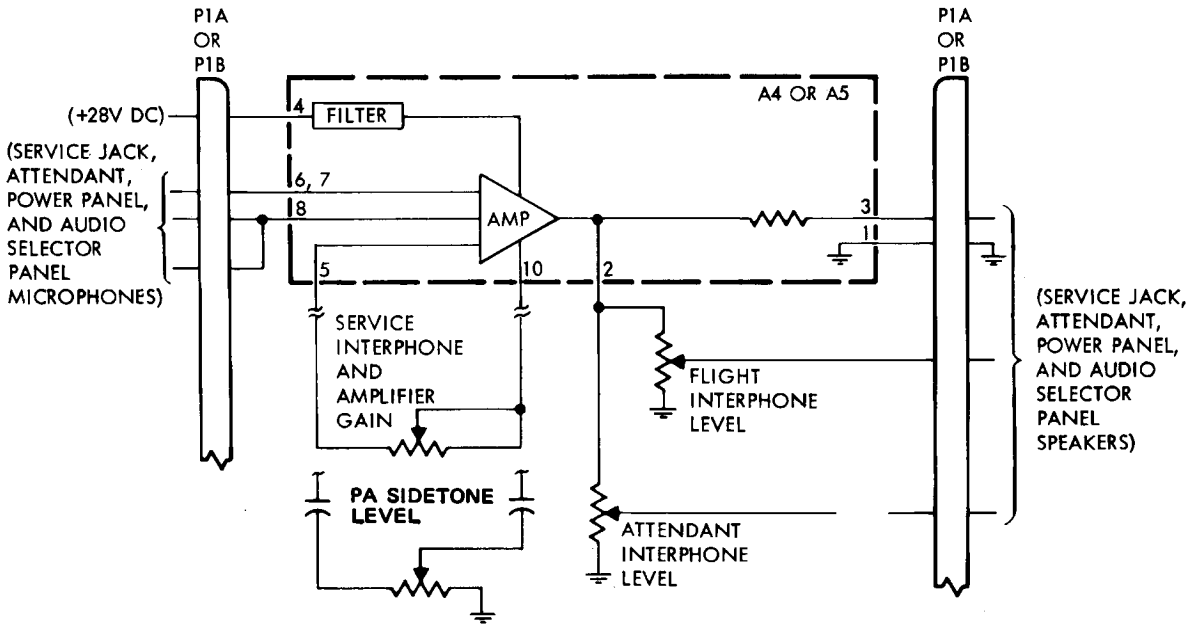
      (1) Diode and resistor circuits on printed circuit assembly A3 perform sensitivity and output control of various audio circuits.

   D. Interphone Amplifier

      (1) Interphone amplifiers A4 and A5 provide audio gain and output level regulation for the flight, attendant and service interphone systems.

(2) Interphone amplifiers A4 and A5 operation are functionally identical. See Fig. 1 and refer to schematic diagram for audio accessory unit assembly pin numbers.

(a) With +28 volts dc applied to printed circuit assembly pin 4 and pin 1 grounded, circuit will amplify signals applied at pins 6, 7 and 8. The output signal level at pins 2 and 3 can be adjusted with the service interphone and amplifier gain control potentiometer.



Common Simplified Interphone Amplifier Circuit
Figure 1

E. Filters

(1) Filters FL1 and FL2 divide the station identification signals (range) and the communications (voice) outputs of the ADF receivers.

(a) FL1 and FL2 are functionally identical and only FL1 will be discussed. The FL1 input is connected to pin A-36 and pin B-51 is grounded. The filter transmits a narrow frequency band around 1020 Hz, at pin A-26, when range output is used. The voice output at pin A-27 is transmitted in a wide frequency range except for the narrow band (700 to 1500 Hz) around 1020 Hz.

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REPAIR

1. All repair can be accomplished using standard industry practices and procedures contained in SOPM 20-11-04 except as noted in Par. A and B.

   A. If electrical wires require replacement, replace with same length as removed. Use electrical cable, Specification BMS 13-16, Type 1, Class 1, wire size AWG 24 except as noted on schematic diagram.

   B. If keying plugs (14) require replacement locate as follow:

      (1) Insert new plug in J1 connector between 5 and 6.

      (2) Insert new plug in J2 connector between 7 and 8.

      (3) Insert new plug in J3 connector between 13 and 14.

      (4) Insert new plug in J4 or J5 connector between 9 and K.

TESTING

1. Test Equipment (Fig. 1)

NOTE: Equivalent substitutes may be used in place of listed equipment

Test Equipment	69-64953-1
Power Supply, 28 vdc, 0.5 amperes	1
Audio Signal Generator, HP205AG	1
Vacuum Tube Voltmeter, HP400H	1
Multimeter, Simpson 260	1
Headset, 600 ohms, Telephones TC-149G, P/N 20046-1	1
Capacitor, 47 uf, 35 volt	1
Resistors:	
3k, ±5%, 1/2 w	1
150 ohms, ±5%, 1/2 w	3
330 ohms, ±5%, 1/2 w	
Frequency Counter PH524 C/D	1
Switches: SPDT	5
SP 3-position	2
SPDT center off	
Rotary 4-position	
Rotary 6-position	

Test Equipment List
Figure 701

2. Functional Test

A. Procedure

(1) Ground pin B-51. (This pin shall remain grounded for the duration of test.)

(2) Verify continuity within pin groups listed in Fig. 701A.

B30, B22, B39, B51
A12, A13
A1, A2
B49, B40
B33, B50
B41 and chassis

Continuity Checks
Figure 701A

(3) Measure electrical resistance between pins listed and verify resistance values noted in Fig. 702.

Component Tested		
69-64953-1	Pins	Value (ohms)
A1R1	B51, B56	560 ±40
A1R2	B51, B47	560 ±40
A1R3	B51, B28	560 ±40
A1R4	B51, B44	560 ±40
A1R5	B51, B38	560 ±40
A1R7	B51, B57	560 ±40
A1R8	B51, B55	560 ±40
A1R9	B51, B37	560 ±40
A1R10	B51, B45	560 ±40
A1R11	B51, B54	560 ±40
A1R6	B51, B46	560 ±40
A1R13	B36, B27	1.8k ±130 *[1]
A1R12	B36, B26	1.2k ±90 *[2]
A1R14	B25, B34	1.2k ±90 *[2]
A1R15	B25, B35	1.8k ±130 *[1]
A3R9	A1, A3	200 ±15
A3R8	A3, A4	390 ±30
A3R7	A4, A5	620 ±45
A3R6	A5, A6	820 ±60
A3R5	A6, A7	2k ±150
A3R4	A12, A14	200 ±15
A3R3	A14, A15	390 ±30
A3R2	A15, A16	820 ±60
A3R1	A16, A17	1k ±70

*[1] 91k ±10% if 65-54485-40 card installed in A1 position
*[2] 22k ±10% if 65-54485-40 card installed in A1 position

Resistance Checks
Figure 702

(4) Verify the resistance of 1000 ±120 ohms between A31 and B51.

(5) Verify that the PA ADJUST "R4 S.T. LEV" control varies the resistance between pins A31 and A21 from 0 (+5) ohms with R4 fully CW to 1000 ±120 ohms with the control fully CCW.

(6) Set "R4 S.T. LEV" control for a resistance of 200 ohms between pins A21 and A31. Lock R4.

(7) Check the diodes by measuring the resistance between pins listed in Fig. 703.

Pins	25 Ohms Max With (+) at	100k Min With (+) at	Component Tested 69-64953-1
A24, A34	A24	A34	A3CR1
A25, A34	A25	A34	A3CR2
B16, B5	B16	B5	A3CR3
B15, B5	B15	B5	A3CR4
B6, B10	B6	B10	A7CR2
B6, B11	B6	B11	A7CR4
B6, B12	B6	B12	A7CR6
B6, B13	B6	B13	A7CR8
B6, B14	B6	B14	A7CR10
B1, B10	B1	B10	A7CR1
B2, B11	B2	B11	A7CR3
B3, B12	B3	B12	A7CR5
B4, B13	B4	B13	A7CR7
B23, B14	B23	B14	A7CR9

Diode Checks
Figure 703

(8) Connect assembly to test setup shown in Fig. 705. Voltmeter shall indicate 6.7 ±1 volts dc with S1 in ON position and the same value with S1 in OFF position.

(9) Connect assembly to test setup shown in Fig. 706. Set S1 to ON and S2 to position 1. Set the audio generator impedance to 50 ohms and adjust the output of the generator at 1000 Hz to produce 0.25 volt rms.

(10) Adjust R3 FLT/SERV INPH GAIN control to verify that output between pins B33 and B51 varies from not more than 0.15 volt (CCW position) to not less than 2.5 volts rms (CW position). Set R3 to 1.0 volt rms and lock the control.

(11) Set S2 to position 2 and measure at least 0.7 volt with R1 fully CW. Set R1 to 0.5 volt rms and lock the control.

(12) Set S2 to position 3 and verify that at least 0.7 volt is obtained with R2 fully CW. Set R2 to 0.5 volt rms and lock the control.

(13) Set S1 to OFF. Connect a headset between B50 and ground and verify that a 1000-Hz signal is present.

(14) Connect assembly to test setup shown in Fig. 707.

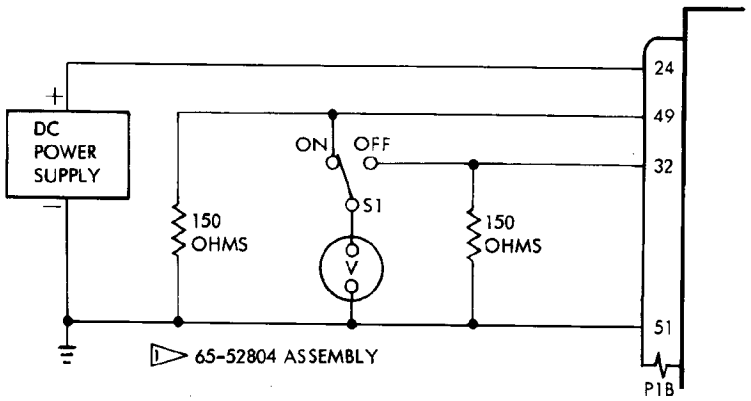
(15) Perform the test steps of Fig. 704. Measure frequency with frequency counter and voltage with vacuum tube voltmeter.

Step	Switch Position				Voltage	Frequency (± 5 Hz)
	S1	S2	S3	S4	Volts rm	Hz
A	OFF		ON		8 *[1]	700
B	ON	ON	OFF	1	100 mv max	700
C	ON	ON	OFF	2	1 volt min	700
D	OFF		ON		8 *[1]	1020
E	ON	ON	OFF	1	1 volt min	1020
F	ON	ON	OFF	2	100 mv max	1020
G	OFF		ON		8 *[1]	1500
H	ON	ON	OFF	1	100 mv max	1500
I	ON	ON	OFF	2	1 volt min	1500
J	OFF		ON		8 *[1]	700
K	ON	OFF	OFF	3	100 mv max	700
L	ON	OFF	OFF	4	1 volt min	700
M	OFF		ON		8 *[1]	1020
N	ON	OFF	OFF	3	1 volt min	1020
O	ON	OFF	OFF	4	100 mv max	1020
P	OFF		ON		8 *[1]	1500
Q	ON	OFF	OFF	3	100 mv max	1500
R	ON	OFF	OFF	4	1 volt min	1500

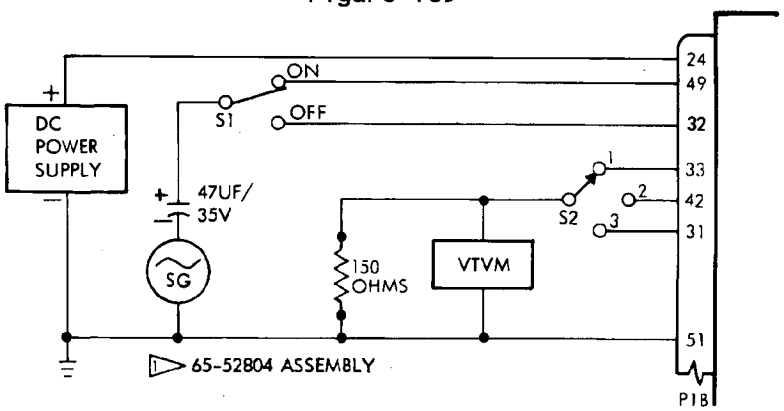
*[1] Input voltage

Filter Checks
Figure 704

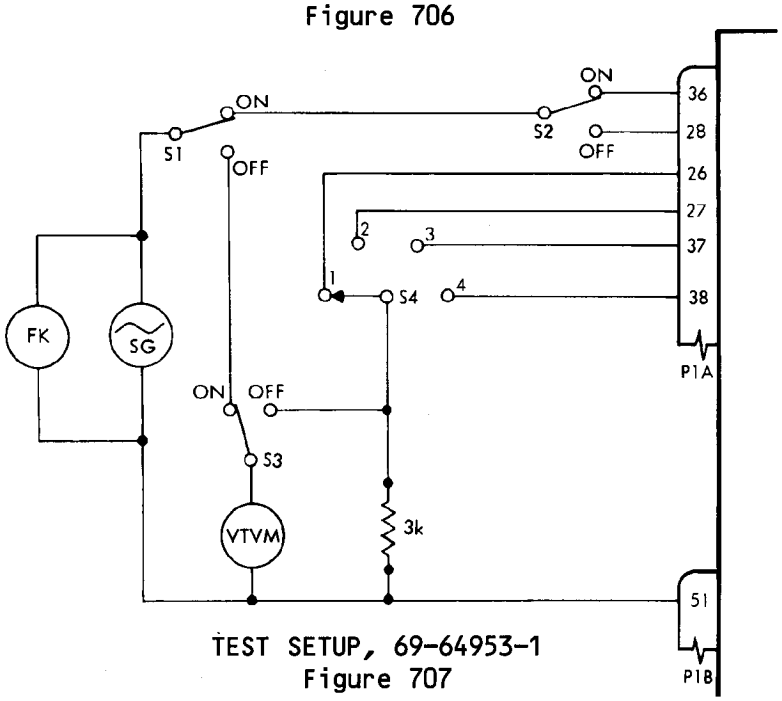
(16) Turn off power supply and remove assembly from test setup.



TEST SETUP, 69-64953-1
Figure 705



TEST SETUP, 69-64953-1
Figure 706



TEST SETUP, 69-64953-1
Figure 707

1579095

B. Verify indexing on rear connector per Fig. 708.

Assembly	Indexing
69-64953-1	

NOTE: Darkened portion indicates extended part of keying post.

Connector Indexing
Figure 708

1577185

TROUBLE SHOOTING

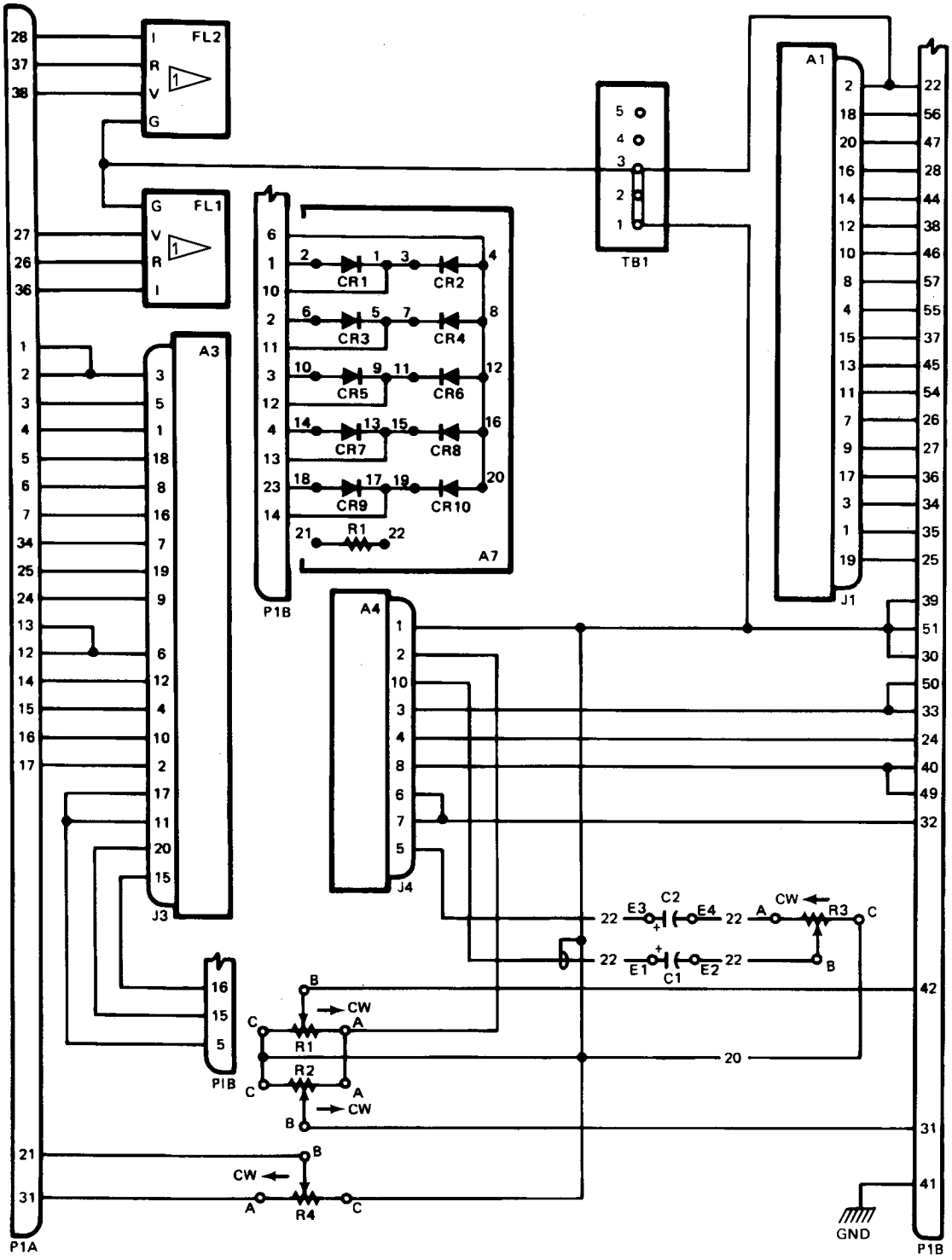
1. If failure of a test occurs, check for defective connections, incorrect wiring connections, and defective components.

   NOTE: Trouble shooting is keyed to steps of functional test procedures. Trouble shooting is written with the assumption that all previous steps of the functional test were satisfactorily completed.

2. When trouble has been isolated to a specific component, or associated circuitry, it will be necessary to replace components.

3. Trouble Shooting

	Trouble	Possible Cause and Corrective Action
A.	Paragraph 2.A.(2)	Wiring
B.	Paragraph 2.A.(3)	Component tested
C.	Paragraphs 2.A.(4) or 2.A.(5)	R4
D.	Paragraph 2.A.(7)	Component tested
E.	Paragraph 2.A.(8)	A4
F.	Paragraphs 2.A.(10) or 2.A.(12)	A4 or R2
G.	Paragraphs 2.A.(11) or 2.A.(13)	A4 or R3
H.	Paragraph 2.A.(14)	R1
I.	Paragraph 2.A.(15)	R3
J.	Paragraph 2.A.(16)	R2
K.	Paragraph 2.A.(17)	Wiring
L.	Paragraph 2.A.(18)	
	Steps B thru I	FL1
	Steps K thru R	FL2



1 REFER TO APPLICABLE MANUFACTURER'S INSTRUCTIONS

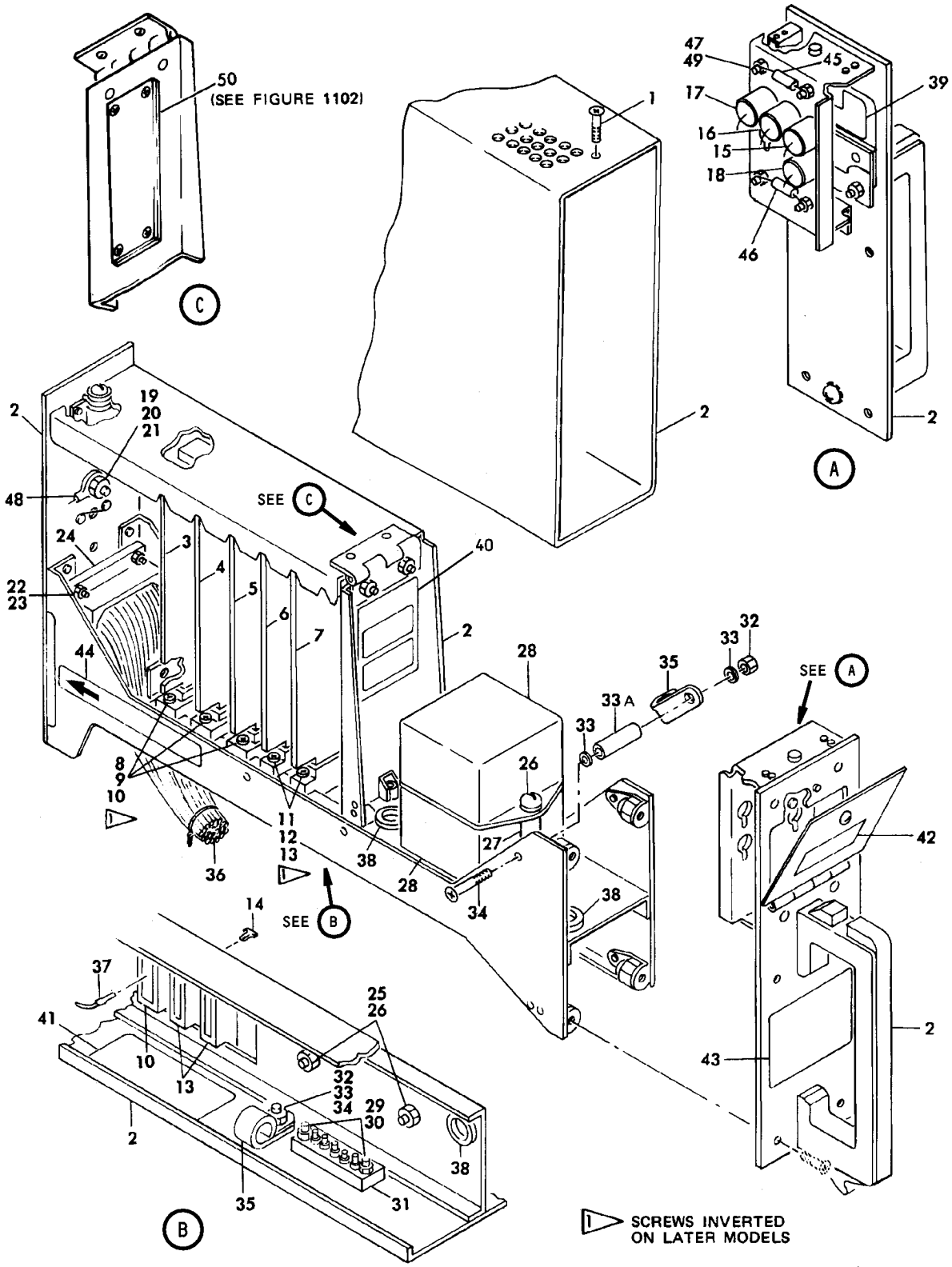
Schematic Diagram
Figure 801

1579099

ILLUSTRATED PARTS LIST

VENDOR

V00779	TYCO ELECTRONICS CORP., 2800 FULLING MILL RD., BLDG-38, MIDDLETOWN, PENNSYLVANIA 17057-3142
V019L2	MACLEAN-FOGG COMPANY, 611 COUNTRY CLUB RD., POCAHONTAS, ARKANSAS 72455-8803
V71468	ITT CORP., 666 E. DYER RD, SANTA ANA, CALIFORNIA 92702-5612
V72962	(REPLACED BY V019L2)
V75382	(REPLACED BY V83330)
V80223	UNITED TRANSFORMER CORP., 300 RED SCHOOL LANE, PHILLIPSBURG, NEW JERSEY 08865-2233
V81312	WINCHESTER ELECTRONICS CORP., 62 BARNES INDUSTRIAL RD. N., WALLINGFORD, CONNECTICUT 06492-1846
V83330	DIALIGHT CORP., 1501 STATE ROUTE 34 S., FARMINGTON, NEW JERSEY 07727-3932
V88245	(REPLACED BY V81312)
V91833	KEYSTONE ELECTRONIC CORP., 3107 20TH RD., LONG ISLAND CITY, NEW YORK 11105-2017



Audio Accessory Unit Assembly (M69)
Figure 1101

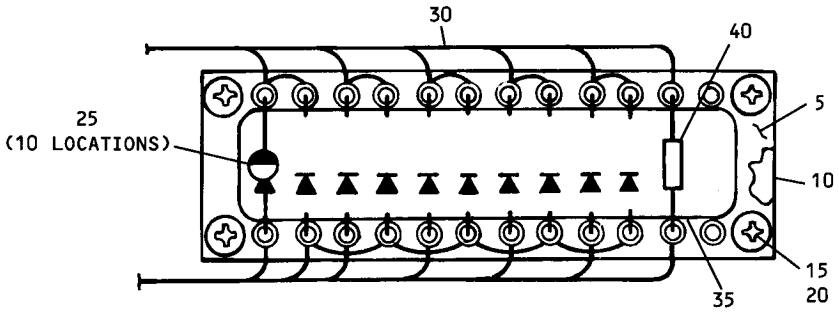
1579110

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
1101-					
	69-64953-1		AUDIO ACCESSORY UNIT ASSY (M69)		RF
1	AN500-6-4		. SCREW (REPLD BY AN500A6-4)		1
1	AN500A6-4		. SCREW (REPLS AN500-6-4 AND AN500D6-4)		1
2	65-52800-15		. CHASSIS ASSY		1
3	65-54485-2		. PRINTED CIRCUIT ASSY (REPLD BY 65-54485-40)		1
5	65-54485-5		. PRINTED CIRCUIT ASSY		1
6	65-70390-3		. PRINTED CIRCUIT ASSY		1
6	65-54400-1		. PRINTED CIRCUIT ASSY (OPT)		1
8	BACN10DN40		. NUT		4
9	NAS600-9P		. SCREW		4
10	582583-1		. CONNECTOR, V00779		2
11	BACN10DN40		. NUT		2
12	NAS600-9P		. SCREW		2
13	582551-1		. CONNECTOR, V00779		1
14	582507-1		. KEYING PLUG, V00779		1
15	RV6LAYSA102A		. POTENTIOMETER, 1K, 28 VDC		1
16	RV6LAYSA251A		. POTENTIOMETER, 250 OHMS, 28 VDC		1
17	RV6LAYSA103A		. POTENTIOMETER, 10K $\pm$10%, 0.5 W		1
18	RV6LAYSA102A		. POTENTIOMETER, 1K, 28 VDC		1
19	22NM107-62		. NUT, V72962		1
20	AN960D6L		. WASHER		2
21	NAS514P632		. SCREW		1
22	BACN10DN40		. NUT		4
23	NAS514P440-6		. SCREW		4
24	DPX2MA57P57P 34B0046		. CONNECTOR, V71468 (REPLD BY DPX2MB57P57P34B0046)		1
-24	DPX2MB57P57P 34B0046		. CONNECTOR, V71468 (REPLS DPX2MA57P57P34B0046)		1
25	22NM408-82		. NUT, V019L2		2
26	NAS602-28P		. SCREW		2
27	NAS43DD3-85		. SPACER		2
28	JL986		. FILTER, V80223		2
29	BACN10DN40		. NUT		2
30	NAS514P440-8		. SCREW		2
31	411GMF1903-5-12A		. TERMINAL BLOCK, V75382		1
32	22NM107-62		. NUT, V019L2		2
33	AN960-6L		. WASHER		3
33A	NAS43D1-60		. SPACER		1

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
1101-					
34	NAS514P632-24		. SCREW		2
35	BACC10DK		. CLAMP		2
37	66143-2LP		. TAB TERMINAL		AR
38	NAS557-6A		. GROMMET		2
39	BAC27DEX604		. MARKER		1
40	BAC27DEX296		. MARKER		1
41	69-34180-13		. METAL LABEL (REPLD BY BAC27DEX1216)		1
41	BAC27DEX1216		. MARKER (REPLS 69-34180-13)		1
42	BAC27DEX220		. MARKER (727 ONLY)		1
43	BAC27DEX3245		. NAMEPLATE		1
43	69-31184-30		. NAMEPLATE (OPT)		1
43	69-31184-53		. NAMEPLATE (OPT)		1
45	M39003-01-2356		. CAPACITOR, 1 UF ±10%, 50 VDC		1
46	M39003-01-2374		. CAPACITOR, 10 UF ±10%, 50 VDC		1
47	1409F		. TERMINAL, V88245		4
48	BACT12AC		. TERMINAL LUG		1
49	BACN10DN40		. NUT		4
50	69-63592-3		. TERMINAL BD COMPONENT ASSY		1

REFERENCE DESIGNATION INDEX (SEE SCHEMATIC DIAGRAM)		
REFERENCE DESIGNATION	PART NUMBER	ITEM NO.
A1	65-54485-2	3
A3	65-54485-5	5
A4	*65-70390-3	6
A4	65-54400-1	6
A7	69-63592-3	50
C1	M39003-01-2356	45
C2	M39003-01-2374	46
FL-1, FL-2	JL986	28
J1, J2, J3	582583-1	10
J4, J5	582551-1	13
P1A, P1B	DPX2MA57P57P34B0046	24
P1A, P1B	DPX2MB57P57P34B0046	24
R1	RV6LAYSA102A	15
R2	RV6LAYSA103C	16
R2	RV6LAYSA104A	16
R2	RV6LAYSA102A	16
R2	RV6LAYSA251A	16
R3	RV6LAYSA251A	17
R3	RV6LAYSA104A	17
R3	RV6LAYSA103C	17
R3	RV6LAYSA103A	17
R4	RV6LAYSA102A	18
TB1	411GMF1903-5-12A	31

* PREFERRED PART



ASSEMBLY 65-63592-3

Terminal Board Component Assembly
Figure 1102

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
1102-					
	69-63592-3		TERMINAL BOARD COMPONENT ASSY (ITEM 50, FIG. 1101)		
5	MOD15511SP1		. TERMINAL BOARD, V91833		1
10	MOD15511SP2		. TERMINAL BOARD, V91833		1
10	MOD15511SP2		. INSULATOR, V91833		1
15	NAS600-5P		. SCREW		4
20	BACN10DN40		. NUT		4
25	1N5061		. DIODE		10
30	69-63592-4		. WIRE BUNDLE		1
35	BAC27DEX999		. MARKER		1
40	RCR07G123JM		. RESISTOR, 12K ±5%, 1/4 WATT		1

FIGURE 1102 REFERENCE DESIGNATION INDEX (SEE SCHEMATIC DIAGRAM)		
REFERENCE DESIGNATION	PART NUMBER	ITEM NO.
CR1-CR10	1N5061	25
R1	RC07G123JM	40

1577191