COLLINS

instruction book

Collins Radio Company

RON NOTT

212V-1 Audio Console

BROADCAST EQUIPMENT GUARANTEE

The equipment described herein is sold under the following guarantee:

a. Except as set forth in paragraph b. of this section, Collins agrees with Buyer to repair or replace, without charge, any properly maintained equipment, parts or accessories which are defective as to design, materials, or workmanship and which are returned in accordance with Collins instructions by Buyer to Collins factory, transportation prepaid, provided:
   1. Notice of a claimed defect in the design, materials or workmanship of the equipment manufactured by Collins is given by Buyer to Collins within five (5) years from date of delivery, with exception of rotating machinery such as blowers, motors, and fans whereby notice must be given by Buyer to Collins within two (2) years from date of delivery.
   2. Notice of a claimed defect in the design, materials or workmanship of the following described Collins manufactured equipment is given by Buyer to Collins within two (2) years from the date of delivery:

20V-3	26U-2	81M	172G-2	216C-2	313T-4	642A-2	820F-1	830D-1	830F-2A
26J-1	42E-7	144A-1	212H-1	313T-1	356H-1	786M-1	A830-2	830E-1	830H-1A
26U-1	42E-8	172G-1	212Z-1	313T-3	564A-1	820E-1	830B-1	830F-1	830N-1A

b. The above guarantee does not extend to other equipment, accessories, tubes, lamps, fuses, and tape heads manufactured by others which are subject to only adjustment as Collins may obtain from the supplier thereof.

c. Collins further guarantees that any radio transmitter described herein will deliver full radio frequency power output at the antenna lead when connected to a suitable load, but such guarantee shall not be construed as a guarantee of any definite coverage or range of said apparatus.

d. The guarantee of this section is void if:
   1. The equipment malfunctions or becomes defective as a result of alterations or repairs by others than Collins or its authorized service center, or
   2. The equipment is exposed to environmental conditions more severe than specified by Collins in equipment manuals.

e. NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR INTENDED PURPOSE, SHALL BE APPLICABLE TO ANY EQUIPMENT SOLD HEREUNDER.

f. THE FOREGOING SHALL CONSTITUTE THE BUYER'S SOLE RIGHT AND REMEDY UNDER THE AGREEMENTS IN THESE SECTIONS. IN NO EVENT SHALL COLLINS HAVE ANY LIABILITY FOR CONSEQUENTIAL DAMAGES, OR FOR LOSS, DAMAGE OR EXPENSE DIRECTLY OR INDIRECTLY ARISING FROM THE USE OF THE PRODUCTS, OR ANY INABILITY TO USE THEM EITHER SEPARATELY OR IN COMBINATION WITH OTHER EQUIPMENT OR MATERIALS, OR FROM ANY OTHER CAUSE.

g. The guarantees of this section and limitations thereon will also accrue to the benefit of any purchaser of Buyer's F.C.C. license, provided:
   1. Notice of the sale of the F.C.C. license is given by Buyer to Collins in writing within thirty (30) days after the consummation of said sale; and
   2. No greater rights are granted to the purchaser of Buyer's F.C.C. license than are granted herein to Buyer.

How to Return Material or Equipment If, for any reason, you should wish to return material or equipment, whether under the guarantee or otherwise, you should notify us, giving full particulars including the details listed below, insofar as applicable. If the item is thought to be defective, such notice must give full information as to nature of defect and identification (including part number if possible) of part considered defective. (With respect to tubes we suggest that your adjustments can be speeded up if you give notice of defect directly to the tube manufacturer.) Upon receipt of such notice, Collins will promptly advise you respecting the return. Failure to secure our advice prior to the forwarding of the goods or failure to provide full particulars may cause unnecessary delay in the handling of your returned merchandise.

ADDRESS:

Collins Radio Company
Customer Returned Goods, 412-023
1225 North Alma Road
Richardson, Texas 75080

INFORMATION NEEDED:

(A) Type number, name and serial number of equipment
(B) Date of delivery of equipment
(C) Date placed in service
(D) Number of hours of service
(E) Nature of trouble
(F) Cause of trouble if known
(G) Part number (9 or 10 digit number) and name of part thought to be causing trouble
(H) Item or symbol number of same obtained from parts list or schematic
(I) Collins number (and name) of unit subassemblies involved in trouble
(J) Remarks

How to Order Replacement Parts When ordering replacement parts, you should direct your order as indicated below and furnish the following information insofar as applicable. To enable us to give you better replacement service, please be sure to give us complete information.

ADDRESS:

Collins Radio Company
Service Parts, 412-024
1225 North Alma Road
Richardson, Texas 75080

INFORMATION NEEDED:

(A) Quantity required
(B) Collins part number (9 or 10 digit number) and description
(C) Item or symbol number obtained from parts list or schematic
(D) Collins type number, name and serial number of principal equipment
(E) Unit subassembly number (where applicable)

1 December 1967

523-0561269-001431
14 April 1969

COLLINS

instruction book

212V-1 Audio Console

Collins Radio Company | Dallas, Texas

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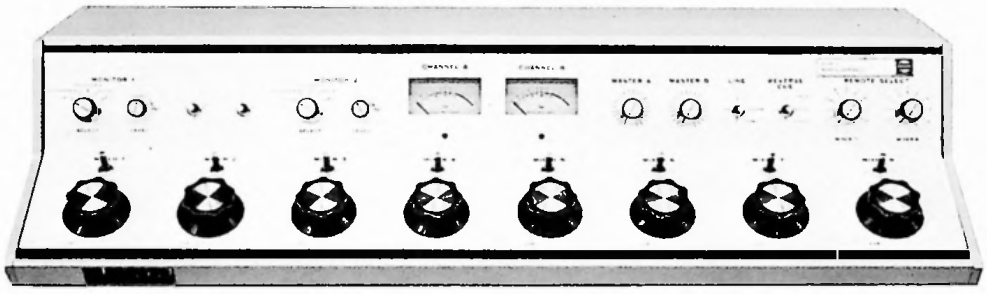

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Figure 1-1. 212V-1 Audio Console.

section 1
general description

1.1 PURPOSE OF INSTRUCTION BOOK

This instruction book contains information for the installation, operation, and maintenance of the 212V-1 Audio Console (figure 1-1).

1.2 PURPOSE OF EQUIPMENT

The 212V-1 is an 8-channel audio console for use in broadcast applications. The console amplifies and mixes eight audio input sources. The audio output is a program source that drives a telephone line, tape recorder, or radio transmitter. Special monitoring circuits monitor any or all of the signals processed by the console.

1.3 PHYSICAL AND MECHANICAL DESCRIPTION

The console is assembled in an aluminum frame 38 inches long, 15 inches deep, and 12 inches high, and weighs approximately 40 pounds. The top cover folds upward and the slanted control panel folds forward to expose the components and wiring. The top and front panels are mounted on the chassis that holds two printed circuit cards, the power supply, and all wiring terminals. Air vent holes in the chassis and rear side provide convection cooling. Connecting cables enter the console from the rear or through the table top into the bottom.

1.4 FUNCTIONAL DESCRIPTION

Refer to figure 1-2. The console can accept three types of inputs: A, microphone input is low-level audio, 50 or 150 ohms (factory connected for 150 ohms); B, high-level input is high-level balanced line audio, 600 ohms; and C, phono input is low-level audio, 50 kilohms. (Because 1 through 6 are alike, preamplifier 1 is used as an example).

Mike and high-level inputs connect to preamplifier A1Z1 through impedance-matching transformer A1T4. The signal amplified by A1Z1 connects to step-attenuator AT1. Program bus select switch S1 connects the adjusted signal level from AT1 to either program bus A or bus B. The step-attenuator CUE position connects preamplifer A1Z1 output directly to the cue bus. Input C connects to phono preamplifier A1Z2 for processing. The signal, input C, then connects to either the program bus A, program bus B, or cue bus as did inputs A and B.

Inputs 7 and 8 differ from inputs 1 through 6 as follows: inputs 7 and 8 are high-level only, and one of eleven inputs can be selected by S13 and by S14. Otherwise, the input circuits are identical to inputs 1 through 6 up to the program and cue buses.

Signals present on program bus A connect to program preamplifier A1Z9 and MONITOR 1 SELECT switch S9. The signals present on program bus B connect to program preamplifier A2Z9 and to MONITOR 2 SELECT switch S10. Signals on the cue bus connect to monitor preamplifier A2Z11 through cue level control A2R38.

Program preamplifiers A1Z9 and A2Z9 amplify the bus signals and connect them to MASTER A and B level controls where the input level to the program amplifiers are adjusted. Signals processed by program amplifiers A1Z10 and A2Z10 connect to the output circuit and to MONITOR SELECT switches S9 and S10. Vu meters M1 and M2 indicate program amplifier output signal levels. A 6-db line pad isolates the program output circuits from the program lines. LINE reverse switch S11 provides the option of selecting either program output to be connected to either program line. J3 and J4 are headphone jacks to monitor actual program output.

MONITOR SELECT switches S9 and S10 select 1 of 4 inputs to be applied to the monitor circuits. The selected signal level, adjusted by MONITOR LEVEL controls R1 and R2, connects to preamplifiers A1Z11 and A2Z11. Each preamplifier processes the signal and connects it to monitor amplifiers A1Z12 and A2Z12. Monitor amplifiers 1 and 2 supply outputs to headphone jacks J1 and J2, local speaker connections, studio speaker connections, and REVERSE CUE switch S12. A console speaker connects to monitor amplifier 2.

The reverse cue signal selected by S12 connects to a remote input line through one of two paths. Path number 1 is through T9, S7 in the neutral position, and to a selected remote line that is selected by S13. Path number 2 is through T9, S8 in the neutral position, and to a selected remote line that is selected by S14.

1.5 TECHNICAL CHARACTERISTICS

1.5.1 Power Source

117 vac ±10%, 50-60 Hz, single-phase

1.5.2 Input Characteristics

Six Customer-Strapped Inputs For High-Level, Phono, or Microphone

Two High-Level Switch Select Inputs

Input Impedances:
High-level, 600 ohms
Microphone, 50 to 150 ohms (factory strapped for 150 ohms)
Phono, 50 kilohms

Input Levels:
High-level, -10 dbm to +10 dbm
Microphone, -65 dbm to -50 dbm
Phono, 6 millivolts nominal, 100 millivolts maximum

1.5.3 Output Characteristics

Two Program Outputs

Two Monitor Outputs

Output Impedances:
Program outputs, 600 ohms balanced
Monitor outputs, 4 to 16 ohms unbalanced

Output Levels:
Program outputs, +8 dbm nominal, +18 dbm maximum
Monitor outputs, 3 watts into 8 ohms maximum

1.5.4 Frequency Response

Program Outputs:
±1 db from 1 kHz reference, 50 Hz to 15 kHz on high-level and microphone inputs

Monitor Outputs:
±1.5 db from 1 kHz reference, 50 Hz to 15 kHz on high-level and microphone inputs

1.5.5 Distortion

Program Outputs:
Less than 0.75%

Monitor Outputs:
Less than 1.5%

1.5.6 Emission

Audio, 50 to 15 kHz

1.5.7 Mounting

Table Top

1.5.8 Service Conditions

Ambient Temperature:
+15° to +40°C (60° to 100°F)

Humidity:
0 to 95% relative humidity

Altitude:
10,000 feet maximum

Vibration and Shock:
Normal handling and shipping

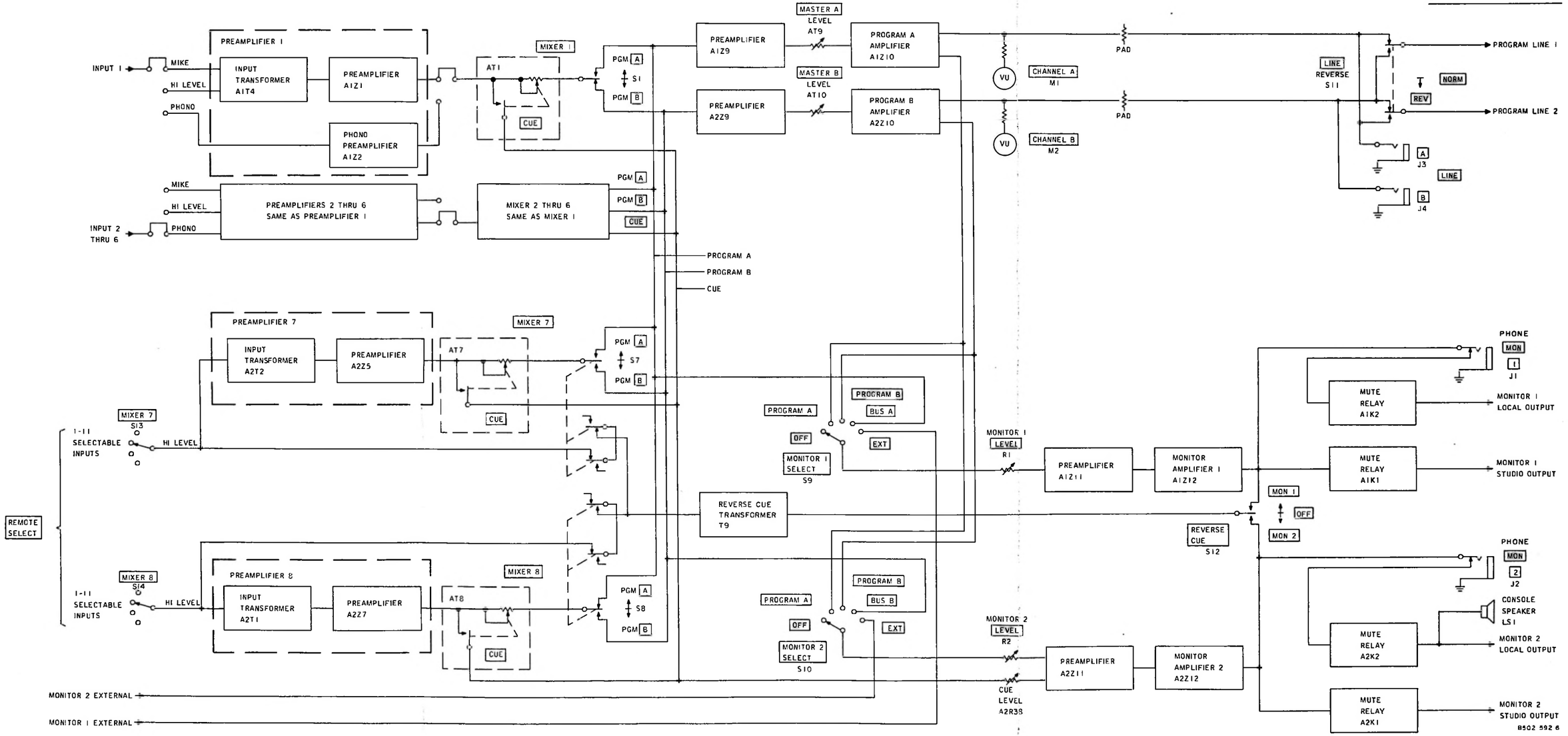


Figure 1-2. 212V-1 Audio Console, Block Diagram.

section 2
installation

2.1 UNPACKING AND INSPECTING THE EQUIPMENT

Remove all packing material and carefully lift the unit from the package. Check the equipment against the packing slips. Visually inspect the unit for damaged or missing components. Check all controls for proper operation. Any claims for damage should be filed promptly with the transportation agency. If such claims are to be filed, all packing material must be retained.

2.2 INSTALLATION

2.2.1 General

The arrangement of studio and control room facilities determines the location of the console in a particular station. Carefully plan the placement of equipment and wiring before beginning installation.

Note

Ground the cable shields at the console end only. Shield solder lugs are provided on both ends of the terminal board inputs for MIXERS 1 through 6. Shield terminals are provided for all 22 remote inputs. Audio leads should be shielded twisted pair. High- and low-level audio leads should be separated. All audio leads must be separated from power and control wiring.

Caution

Be sure that cable shields do not come into contact with the printed circuit card.

2.2.2 212V-1 Audio Console Mounting Procedure

Refer to figure 2-1. Console location determines the position of input/output wiring to the console wiring access holes. These four holes, 3 by 3/4 inches, are located on the lower side of the rear panel; or four holes, 1-1/2 inches in diameter, are located in the bottom of the chassis. If the wiring is to enter the bottom of the chassis, matching holes must be drilled in the table top.

2.2.3 Wiring Instructions

Make all external input connections at terminal boards TB7, 8, and 12 through 18. Make all console output connections at terminal boards TB9, 10, and 11. See figure 6-1 for terminal board locations.

2.2.4 Wiring Instructions for Audio Input

2.2.4.1 Input Amplifiers 1 Through 6

Determine each mixer use. When this selection is made, proceed with input connections. Make the input connections to mixers 1 through 6 at TB7, 8, and 12. See table 2-1. If any MIXER is to be used as a phono preamplifier, connect the step attenuator input to the phono preamplifier output. Make these connections on TB1 thru TB6, ie., TB1 - AT1, TB2 - AT2, etc. See table 2-1 and figure 7-1 for connections. See figure 6-1 for location.

2.2.4.2 Microphone Input Impedance

All low-level inputs are factory wired for 150-ohm MIC input. This impedance may be changed by making wiring changes between input terminal boards and input transformers on any of the six identical preamplifiers. See figure 6-1 for location and figure 7-1, NOTE 3, for schematic information.

2.2.4.3 Phono Preamplifier Equalization

For RIAA equalization, +3-db treble boost, or -3-db treble cut for any input used as a phono preamplifier see figure 6-3 and figure 7-1 for wiring changes. (Factory strapped for standard RIAA equalization.)

2.2.4.4 Remote Inputs 7 and 8

Remote input connections are made at TB13 through TB18 as indicated in table 2-1. See note in paragraph 2.2.1. The REVERSE CUE function is interlocked in S13C and S14C so that any remote input may be wired to remote input MIXER 7 and MIXER 8 in parallel. See figure 7-1.

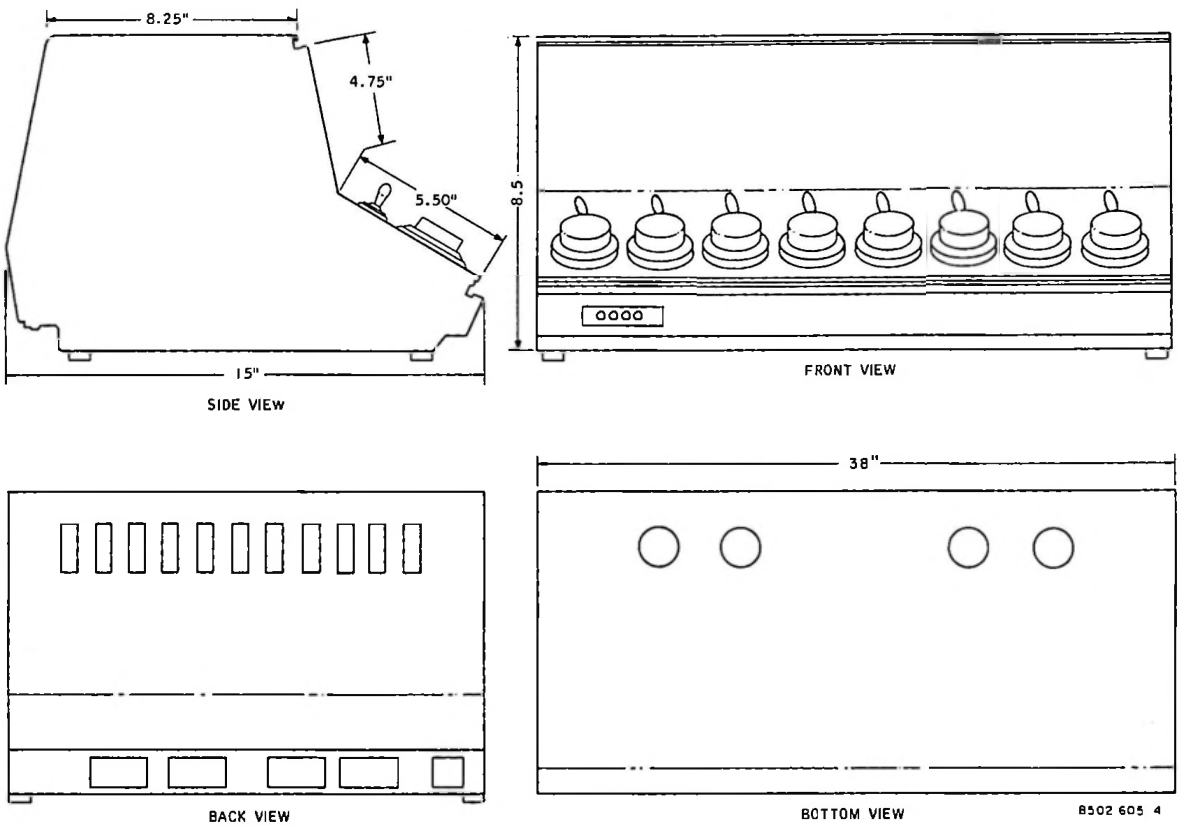


Figure 2-1. 212V-1 Audio Console, Outline and Dimensions.

2.2.4.5 External Monitor Inputs

One external monitor input may be connected to each monitor amplifier at TB9 as indicated in table 2-1. External monitor input impedance is 150 ohms.

2.2.5 Wiring Instructions for Interlocked Connections

2.2.5.1 Mute Relay Interlocked Lines

Four interlocked lines are provided at TB9 as indicated in table 2-1. See note below.

Note

Relay contacts are rated at 1 ampere maximum for 28 volts dc or 115 volts ac operation.

2.2.5.2 Mute Relay Control

The four relay control lines are stored for shipment at TB19, terminals 9, 10, 11, and 12. The relay control lines are a 4-wire cable, brown A1K1, red A1K2, orange A2K1, yellow A2K2. Relay A2K2 is factory wired to interlock (mute) the built-in speaker. Connect the relay control lines as indicated in table 2-1. Also see paragraph 2.2.5.3.

2.2.5.3 Remote Operate Lines

Remote operate grounds (common) are located at TB19. These remote operate lines may be connected as desired. See table 2-1.

2.2.5.4 Remote Inputs 7 and 8 Interconnect

See paragraph 2.2.4.2.

Table 2-1. Connections to Terminal Boards.

TERMINAL BOARD	TERMINAL	FUNCTION	POLARIZATION (CODING)
TB1	1	Preamplifier output to AT1	Signal
TB1	2	Preamplifier output to AT1	Common
TB1	3	Equalized preamplifier output to AT1	Common
TB1	4	Equalized preamplifier output to AT1	Signal
TB2	1	Preamplifier output to AT2	Signal
TB2	2	Preamplifier output to AT2	Common
TB2	3	Equalized preamplifier output to AT2	Common
TB2	4	Equalized preamplifier output to AT2	Signal
TB3	1	Preamplifier output to AT3	Signal
TB3	2	Preamplifier output to AT3	Common
TB3	3	Equalized preamplifier output to AT3	Common
TB3	4	Equalized preamplifier output to AT3	Signal
TB4	1	Preamplifier output to AT4	Signal
TB4	2	Preamplifier output to AT4	Common
TB4	3	Equalized preamplifier output to AT4	Common
TB4	4	Equalized preamplifier output to AT4	Signal
TB5	1	Preamplifier output to AT5	Signal
TB5	2	Preamplifier output to AT5	Common
TB5	3	Equalized preamplifier output to AT5	Common
TB5	4	Equalized preamplifier output to AT5	Signal
TB6	1	Preamplifier output to AT6	Signal
TB6	2	Preamplifier output to AT6	Common
TB6	3	Equalized preamplifier output to AT6	Common
TB6	4	Equalized preamplifier output to AT6	Signal
TB7	1	High-level input to A1Z1 (MIXER 1)	Signal
TB7	2	High-level input to A1Z1 (MIXER 1)	Signal
TB7	3	Microphone input to A1Z1 (MIXER 1)	Signal
TB7	4	Microphone input to A1Z1 (MIXER 1)	Signal
TB7	5	Phono input to A1Z2 (MIXER 1)	Common
TB7	6	Phono input to A1Z2 (MIXER 1)	Signal
TB7	7	High-level input to A1Z3 (MIXER 2)	Signal
TB7	8	High-level input to A1Z3 (MIXER 2)	Signal
TB7	9	Microphone input to A1Z3 (MIXER 2)	Signal
TB7	10	Microphone input to A1Z3 (MIXER 2)	Signal
TB7	11	Phono input to A1Z4 (MIXER 2)	Common
TB7	12	Phono input to A1Z4 (MIXER 2)	Signal
TB8	1	High-level input to A1Z5 (MIXER 3)	Signal
TB8	2	High-level input to A1Z5 (MIXER 3)	Signal
TB8	3	Microphone input to A1Z5 (MIXER 3)	Signal
TB8	4	Microphone input to A1Z5 (MIXER 3)	Signal
TB8	5	Phono input to A1Z6 (MIXER 3)	Common
TB8	6	Phono input to A1Z6 (MIXER 3)	Signal
TB8	7	High-level input to A1Z7 (MIXER 4)	Signal
TB8	8	High-level input to A1Z7 (MIXER 4)	Signal
TB8	9	Microphone input to A1Z7 (MIXER 4)	Signal
TB8	10	Microphone input to A1Z7 (MIXER 4)	Signal
TB8	11	Phono input to A1Z8 (MIXER 4)	Common
TB8	12	Phono input to A1Z8 (MIXER 4)	Signal

Table 2-1. Connections to Terminal Boards (Cont).

TERMINAL BOARD	TERMINAL	FUNCTION	POLARIZATION (CODING)
TB9	1	External input connection monitor to amplifier 1	Signal
TB9	2	External input connection monitor to amplifier 1	Shield
TB9	3	External input connection monitor to amplifier 2	Signal
TB9	4	External input connection monitor to amplifier 2	Shield
TB9	5	External connection to mute relay contacts A1K1 Studio	ON AIR LITES Stu
TB9	6	External connection to mute relay contacts A1K1 Studio	
TB9	7	External connection to mute relay contacts A1K2 Control rm.	ON AIR LITES Control rm
TB9	8	External connection to mute relay contacts A1K2 Control rm	
TB9	9	External connection to mute relay contacts A2K1 Stu	Stu on air
TB9	10	External connection to mute relay contacts A2K1 Stu	
TB9	11	External connection to mute relay contacts A2K2 Cont rm	Control on air
TB9	12	External connection to mute relay contacts A2K2 Cont rm	
TB10	1	Program A-B line output	Signal
TB10	2	Program A-B line output	Signal
TB10	3	Spare	
TB10	4	Monitor 1 output (studio)	Signal
TB10	5	Monitor 1 output (studio)	Common
TB10	6	Spare	
TB10	7	Monitor 1 output (local)	Signal
TB10	8	Monitor 1 output (local)	Common
TB11	1	Program A-B line output	Signal
TB11	2	Program A-B line output	Signal
TB11	3	Spare	
TB11	4	Monitor 2 output (studio)	Signal
TB11	5	Monitor 2 output (studio)	Common
TB11	6	Spare	
TB11	7	Monitor 2 output (local)	Signal
TB11	8	Monitor 2 output (local)	Common
TB11	9	Monitor 2 output (console speaker)	Signal
TB12	1	High-level input to A2Z1 (MIXER 5)	Signal
TB12	2	High-level input to A2Z1 (MIXER 5)	Signal
TB12	3	Microphone input to A2Z1 (MIXER 5)	Signal
TB12	4	Microphone input to A2Z1 (MIXER 5)	Signal
TB12	5	Phono input to A2Z2 (MIXER 5)	Common
TB12	6	Phono input to A2Z2 (MIXER 5)	Signal
TB12	7	High-level input to A2Z3 (MIXER 6)	Signal

Table 2-1. Connections to Terminal Boards (Cont).

TERMINAL BOARD	TERMINAL	FUNCTION	POLARIZATION (CODING)
TB12	8	High-level input to A2Z3 (MIXER 6)	Signal
TB12	9	Microphone input to A2Z3 (MIXER 6)	Signal
TB12	10	Microphone input to A2Z3 (MIXER 6)	Signal
TB12	11	Phono input to A2Z4 (MIXER 6)	Common
TB12	12	Phono input to A2Z4 (MIXER 6)	Signal
TB13	1	Remote input number 1 to MIXER 7	Signal
TB13	2	Remove input number 1 to MIXER 7	Signal
TB13	3	Remote input number 1 to MIXER 7	Shield
TB13	4	Remote input number 2 to MIXER 7	Signal
TB13	5	Remote input number 2 to MIXER 7	Signal
TB13	6	Remote input number 2 to MIXER 7	Shield
TB13	7	Remote input number 3 to MIXER 7	Signal
TB13	8	Remote input number 3 to MIXER 7	Signal
TB13	9	Remote input number 3 to MIXER 7	Shield
TB13	10	Remote input number 4 to MIXER 7	Signal
TB13	11	Remote input number 4 to MIXER 7	Signal
TB13	12	Remote input number 4 to MIXER 7	Shield
TB14	1	Remote input number 1 to MIXER 8	Signal
TB14	2	Remote input number 1 to MIXER 8	Signal
TB14	3	Remote input number 1 to MIXER 8	Shield
TB14	4	Remote input number 2 to MIXER 8	Signal
TB14	5	Remote input number 2 to MIXER 8	Signal
TB14	6	Remote input number 2 to MIXER 8	Shield
TB14	7	Remote input number 3 to MIXER 8	Signal
TB14	8	Remote input number 3 to MIXER 8	Signal
TB14	9	Remote input number 3 to MIXER 8	Shield
TB14	10	Remote input number 4 to MIXER 8	Signal
TB14	11	Remote input number 4 to MIXER 8	Signal
TB14	12	Remote input number 4 to MIXER 8	Shield
TB15	1	Remote input number 5 to MIXER 7	Signal
TB15	2	Remote input number 5 to MIXER 7	Signal
TB15	3	Remote input number 5 to MIXER 7	Shield
TB15	4	Remote input number 6 to MIXER 7	Signal
TB15	5	Remote input number 6 to MIXER 7	Signal
TB15	6	Remote input number 6 to MIXER 7	Shield
TB15	7	Remote input number 7 to MIXER 7	Signal
TB15	8	Remote input number 7 to MIXER 7	Signal
TB15	9	Remote input number 7 to MIXER 7	Shield
TB15	10	Remote input number 8 to MIXER 7	Signal
TB15	11	Remote input number 8 to MIXER 7	Signal
TB15	12	Remote input number 8 to MIXER 7	Shield
TB16	1	Remote input number 5 to MIXER 8	Signal
TB16	2	Remote input number 5 to MIXER 8	Signal
TB16	3	Remote input number 5 to MIXER 8	Shield
TB16	4	Remote input number 6 to MIXER 8	Signal
TB16	5	Remote input number 6 to MIXER 8	Signal
TB16	6	Remote input number 6 to MIXER 8	Shield

Table 2-1. Connections to Terminal Boards (Cont).

TERMINAL BOARD	TERMINAL	FUNCTION	POLARIZATION (CODING)
TB16	7	Remote input number 7 to MIXER 8	Signal
TB16	8	Remote input number 7 to MIXER 8	Signal
TB16	9	Remote input number 7 to MIXER 8	Shield
TB16	10	Remote input number 8 to MIXER 8	Signal
TB16	11	Remote input number 8 to MIXER 8	Signal
TB16	12	Remote input number 8 to MIXER 8	Shield
TB17	1	Remote input number 9 to MIXER 7	Signal
TB17	2	Remote input number 9 to MIXER 7	Signal
TB17	3	Remote input number 9 to MIXER 7	Shield
TB17	4	Remote input number 10 to MIXER 7	Signal
TB17	5	Remote input number 10 to MIXER 7	Signal
TB17	6	Remote input number 10 to MIXER 7	Shield
TB17	7	Remote input number 11 to MIXER 7	Signal
TB17	8	Remote input number 11 to MIXER 7	Signal
TB17	9	Remote input number 11 to MIXER 7	Shield
TB18	1	Remote input number 9 to MIXER 8	Signal
TB18	2	Remote input number 9 to MIXER 8	Signal
TB18	3	Remote input number 9 to MIXER 8	Shield
TB18	4	Remote input number 10 to MIXER 8	Signal
TB18	5	Remote input number 10 to MIXER 8	Signal
TB18	6	Remote input number 10 to MIXER 8	Shield
TB18	7	Remote input number 11 to MIXER 8	Signal
TB18	8	Remote input number 11 to MIXER 8	Signal
TB18	9	Remote input number 11 to MIXER 8	Shield
TB19	1	Remote operate from MIXER 1 output select A	Common
TB19	2	Remote operate from MIXER 1 output select B	Common
TB19	3	Remote operate from MIXER 2 output select A	Common
TB19	4	Remote operate from MIXER 2 output select B	Common
TB19	5	Remote operate from MIXER 3 output select A	Common
TB19	6	Remote operate from MIXER 3 output select B	Common
TB19	7	Remote operate from MIXER 4 output select A	Common
TB19	8	Remote operate from MIXER 4 output select B	Common
TB19	9*	Remote operate from MIXER 5 output select A	Common
TB19	10*	Remote operate from MIXER 5 output select B	Common

*See footnote at end of table.

Table 2-1. Connections to Terminal Boards (Cont).

TERMINAL BOARD	TERMINAL	FUNCTION	POLARIZATION (CODING)
TB19	11*	Remote operate from MIXER 6 output select A	Common
TB19	12*	Remote operate from MIXER 6 output select B	Common
TB19	13	Remote operate from Mixer 7 output select A	Common
TB19	14	Remote operate from MIXER 7 output select B	Common
TB19	15	Remote operate from MIXER 8 output select A	Common
TB19	16	Remote operate from MIXER 8 output select B	Common
*See Paragraph 2.2.5.2.			

2.2.5.5 Studio Speakers

Each monitor amplifier has studio (remote) speaker connections at TB10 and TB11 as indicated in table 2-1. The speaker connections are interlocked through muting relays A1K1 and A2K1.

2.2.5.6 Local Speakers

Each monitor amplifier has local speaker connections at TB10 and TB11 as indicated in table 2-1. The speaker connections are interlocked by muting relays A1K2 and A2K2.

2.2.6 Wiring Instructions for Audio Output

2.2.6.1 Program Outputs

Each program amplifier is connected to a program LINE jack and to a terminal board, TB10 and TB11, as indicated in table 2-1. See figure 7-1.

2.2.6.2 Monitor Outputs

Each monitor amplifier is connected to a monitor jack. See Figure 7-1. See also paragraphs 2.2.5.5 and 2.2.5.6 for interlocked monitor outputs.

2.3 INPUT POWER CONNECTIONS

Connect the power cable supplied with the unit to the power supply. Then connect the power cable to any available 115-vac, 50 to 60-Hz, single-phase, 90-volt ampere line.

2.4 PERFORMANCE CHECK

To check the performance of the 212V-1, each channel must be independently checked using external test equipment. No initial adjustments are required for the 212V-1 after installation.

2.5 EQUIPMENT SUPPLIED

See table 2-2 for a list of equipment supplied.

2.6 CUSTOMER USE SWITCHES

Two switches are provided for any use desired. See figure 2-2 for schematic.

Table 2-2. Equipment Supplied.

ITEM	TYPE	COLLINS PART NUMBER
Broadcast audio console	212V-1	777-1504-001
Power cable	Moulded connections	426-5426-000
Instruction manual	212V-1 Audio Console	523-0561269-001431

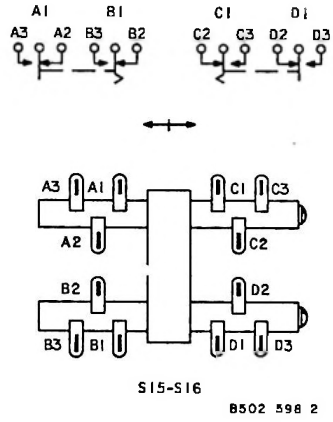


Figure 2-2. 212V-1 Audio Console, Customer Use Switches.

section 3
operating controls

3.1 GENERAL

This section contains operating instructions for the 212V-1 Audio Console.

3.2 OPERATING CONTROLS AND INDICATORS

Table 3-1 describes the operation of all controls and indicators on the 212V-1. The location of the controls and indicators is shown in figure 3-1.

3.3 TYPICAL OPERATING PROCEDURES

The following procedures are presented as examples only; exact operating procedure depends on operational need of user.

3.3.1 Example 1

The following procedure can be used to process an input to an output. First, assume the following conditions; then, proceed to the operating steps. See figure 1-2.

Table 3-1. Operating Control and Indicators.

NAME	FUNCTION
MIXER switches 1, 2, 3, 4, 5, 6, 7, and 8	Connects output of channel to either program bus A or bus B. Manually controls operation of mute relays A1K1, A1K2, AsK1, and A2K2 when wired for this function. (See paragraphs 2.2.5.2 and 2.2.5.3 and table 2-1 for connections).
MIXER attenuator-CUE controls 1,2,3,4	Disconnects the REVERSE CUE when in the A or B position.
MIXER attenuator-CUE controls 1,2,3,4 5,6,7, and 8	Adjusts signal level applied to program bus A or bus B for each channel. Selects channel CUE in the ccw detent position. Each channel output is connected to monitor amplifier 2 in the CUE position.
MONITOR 1:	
SELECT switch	Selects input to monitor amplifier 1.
LEVEL control	Controls the input level to monitor amplifier 1
MONITOR 2:	
SELECT switch	Selects input to monitor amplifier 2.
LEVEL control	Controls the input level to monitor amplifier 2.
CHANNEL A vu meter M1	Indicates program A output signal level.
CHANNEL B vu meter M2	Indicates program B output signal level.
MASTER A level control	Adjusts program A output signal level.
MASTER B level control	Adjusts program B output signal level.
LINE reverse switch	Connects and provides LINE reverse function of program A and program B outputs to program LINE 1 and program LINE 2.

Table 3-1. Operating Control and Indicators (Cont).

NAME	FUNCTION
REVERSE CUE switch	Provides REVERSE CUE function to any remote line from MON 1 or MON 2 amplifier. The REVERSE CUE function is applied through either MIXER 7 or MIXER 8 select switches in the neutral position to the associated REMOTE SELECT switch.
REMOTE SELECT:	
MIXER 7 switch	Selects a remote line that connects to MIXER 7 input. Interlocks with MIXER 8 REMOTE SELECT switch to mute the REVERSE CUE signal when both REMOTE SELECT switches are in the same position.
MIXER 8 switch	Selects remote line that connects to MIXER 8 input. Interlocks with MIXER 7 REMOTE SELECT switch to mute the REVERSE CUE signal when both REMOTE SELECT switches are in the same position.
Customer use switches S15 and S16	See Paragraph 2.6 for details.
Headphone jacks:	
MON 1 and MON 2	Headphone connections for each monitor amplifier.
LINE A and B	Headphone connections for each program amplifier LINE output.

Conditions:

a. Microphone input is connected to channel 1.
b. Program LINE 1 is final output connection.
c. Program B amplifier is to be used.
d. Audio output monitored by console speaker.
e. All MIXER switches set to neutral.
f. All level controls turned to the ccw position. (MIXER level controls are not in the detent position.)

Steps of procedure are as follows:

a. Set MASTER B level control to near midposition.
b. Set LINE reverse switch to the REV position.
c. Set MIXER 1 switch S1 to B.
d. Slowly adjust MIXER 1 level control clockwise until the autio peaks observed on CHANNEL B VU meter indicate 0 vu.
e. Set MONITOR 2 SELECT switch to PROGRAM B.
f. Slowly adjust MONITOR 2 LEVEL control until the sound from the console speaker is at a comfortable listening level.

3.3.2 Example 2

The following procedure can be used to process an input as a reverse cue signal to a remote line. First assume the following conditions, then proceed to the operating steps. See figure 1-2.

Conditions:

a. Phonograph input is connected to channel 1.
b. Remote line 4 of REMOTE SELECT MIXER 8 is final reverse cue output connection.
c. Monitor Amplifier 1 to be used.
d. All MIXER switches set to neutral.
e. All level controls turned to the ccw position. (MIXER level controls are not in the detent position.)

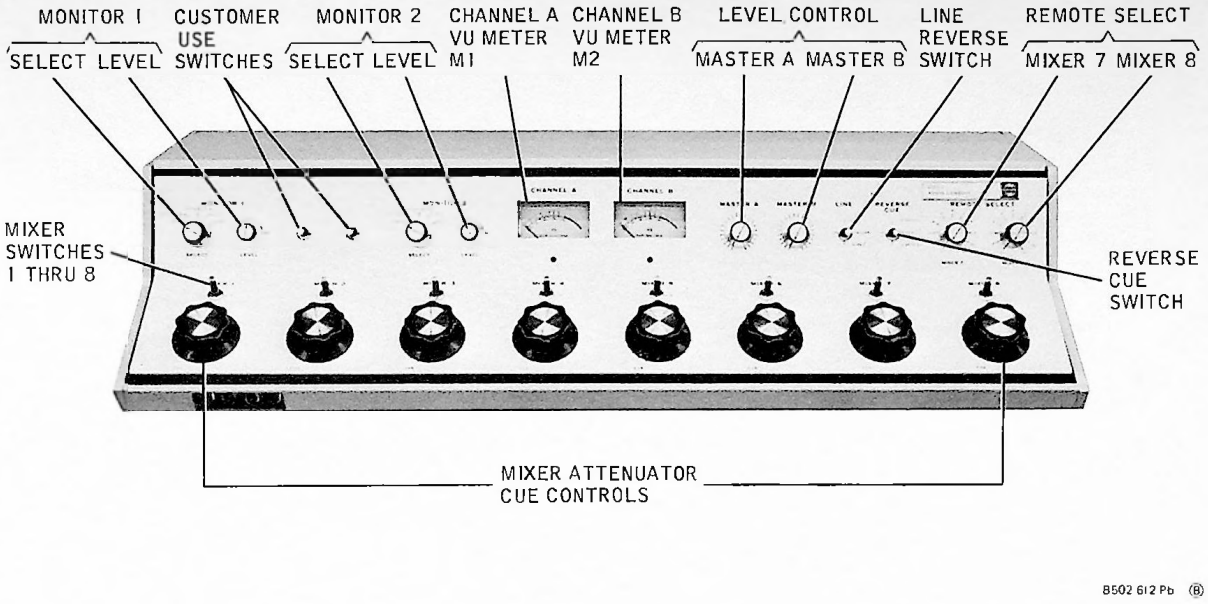


Figure 3-1. 212V-1 Audio Console, Operating Controls and Indicators.

Steps of procedure are as follows:

a. Plug headphones into MON 1 jack J1.
b. Set MIXER 1 level control to near midposition.
c. Set MIXER 1 switch S1 to A.
d. Set MONITOR 1 SELECT switch to BUS A or PROGRAM A.
e. Slowly adjust MONITOR 1 LEVEL control until the headphone audio level is at a comfortable listening level.
f. Set REVERSE CUE switch to MON 1.
g. Set MIXER 7 program select switch S7 to B.
h. Make sure MIXER 8 program select switch S8 is in the neutral position.
i. Set REMOTE SELECT MIXER 7 switch to any position except position 4.
j. Set REMOTE SELECT MIXER 8 switch to position 4.

section 4
principles of operation

4.1 GENERAL

This section describes the principles of operation for the 212V-1 Audio Console. Refer to figure 1-2, block diagram, and figure 7-1, detailed schematic diagram.

4.2 INPUT CIRCUITS

4.2.1 Mike/High-Level Preamplifiers (A1Z 1, 3, 5, 7, and A2Z 1, 3, 5, 7)

Each two-stage amplifier (Q1 and Q2) uses degenerative feedback through R3 to improve the frequency response and to maintain a near constant audio level. Compared to a 1-kHz reference signal, this response is ±1 db from 50 Hz to 15 kHz. An emitter follower (Q3) provides output impedance matching.

4.2.2 Phono Preamplifiers (A1Z 2, 4, 6, 8 and A2Z 2, 4)

Each two-stage phono amplifier (Q1 and Q2) uses degenerative feedback through R5 to improve the frequency response and to maintain a near constant audio level. The RIAA compensation network connected from the collector of Q2 to the emitter of Q1 provides the option of standard RIAA compensation, +3-db treble boost, or -3-db treble cut. (See NOTE 2 figure 7-1.) An emitter follower (Q3) provides output impedance matching.

4.2.3 MIXER Inputs (1-6)

This paragraph describes the use of any of the six MIXER inputs as a mike/high-level input or as a phono input.

4.2.3.1 Mike/High-Level Input

The input connects to a balanced input impedance-matching transformer. The input-impedance of the high-level connections is 600 ohms for signal levels of -10 dbm to +10 dbm. The input-impedance of the microphone connection is 150 ohms for signal levels of -65 dbm to -50 dbm. A 50-ohm microphone input option is available (see NOTE 3, figure 7-1). The transformer couples the input signal to the preamplifier where the signal is amplified and connected to the step-attenuator. The step-attenuator adjusts the output signal level and connects it to the program bus select switch. When step-attenuator is in the CUE position, the amplifier output connects to the CUE bus. The program bus select switch connects the adjusted signal output to program bus A or to program bus B.

4.2.3.2 Phono Input

The high-impedance phono input connects to amplifier Q1. The nominal input signal level across the 50-kilohm input impedance is 6 millivolts. The maximum input signal level is 100 millivolts. The preamplifier amplifies the input signal and connects it to the step-attenuator. The step-attenuator and bus select switch operate the same for the phono input and the mike/high-level input.

4.2.4 MIXER Inputs (7 and 8)

Inputs 7 and 8 are switch-select high-level inputs. The two REMOTE SELECT switches, S13 and S14, each select any one of 11 possible inputs. Any input may be wired to both S13 and S14 in parallel. S13C and S14C provide REVERSE CUE mute to permit parallel input connection. (See paragraph 4.3.1.d for description of the REVERSE CUE function.) A remote input connects to the input impedance-matching transformer. This impedance-matching input is for high-level 600-ohm balanced inputs with signal levels of -10 dbm to +10 dbm. The transformer couples the input signal to the preamplifier where the signal is processed and connected to the step-attenuator. The step-attenuator adjusts the signal output level and connects it to the bus select switch. When the step-attenuator is in the CUE position, the amplifier connects to the cue bus.

4.3 OUTPUT CIRCUITS

4.3.1 Monitor Amplifiers (A1 and A2 - Z11)

a. The two-stage preamplifier (Q1 and Q2) uses degenerative feedback through R3 to improve

the frequency response and to maintain a near constant audio level. An emitter follower (Q3) provides output impedance matching. The output connects to the monitor amplifier (A1 and A2Z12) input. Input amplifier Q1 amplifies and connects the input signal to the phase driver circuit, Q3, CR1, CR2, CR3, CR4, and R5. The phase driver circuit supplies a drive signal to both Q2 and Q5 that is separated by a dc level (4 diode voltage drops). This separation voltage biases Q2, Q4 and Q5, Q6 to prevent output crossover distortion. Complementary pairs Q2, Q4 and Q5, Q6 eliminate the need for a phase splitter. Pair Q2, Q4 conducts on the positive swing of the collector of Q3, and Q5, Q6 conducts on the negative swing. Pairs Q2, Q4 and Q5, Q6 are emitter followers for low-output impedance characteristics. The average output level (dc) is the supply voltage for Q1. Resistors R6, R4, and capacitor C2 develop the dc voltage. A constant load, R40 and C5, and C3 help to prevent driver oscillations.

Monitor amplifier characteristics are as follows:

Output impedance:
Less than 4 ohms unbalanced

Output level:
3 watts into 8 ohms

Frequency response:
±1.5 db from 1-kHz reference, 50 Hz to 15 kHz.

b. Monitor amplifier inputs are selected by S9 or S10. Both SELECT switches select one of four inputs, two of which are common, PROGRAM A and PROGRAM B. Switch S9 selects program BUS A and S10 selects program BUS B. The selected input connects to the LEVEL control where Z11 input signal level is adjusted. If any MIXER step-attenuator is in the CUE position, that preamplifier output is connected to monitor amplifier 2 through cue level control A2R38. The preamplifier and amplifier amplify the adjusted signal and supply an output.

c. Monitor 1 output circuits are: headphone connection MON 1 on the console front; speaker connections, local and remote, at TB10; and reverse cue signal to S12. Monitor 2 output circuits are: headphone connection MON 2 on the console front; speaker connections, local and remote, at TB11; console speaker connections at TB11; and reverse cue signal to S12. All speaker outputs, local, remote, and console, are relay-contact interlocked for muting when the muting relays, A1K1, A2K1, A1K2, A2K2, are wired for this function. The local and console speakers are interlocked through the MON 1 and 2 headphone jacks J1 and J2.

d. A reverse cue signal is either monitor amplifier output signal, selected to be applied to a remote input line. The signal, MON 1 or MON 2 selected by S12, connects to S14C. When S13 and S14 are not in the same position, the signal path is from S14C to S13C, out S13C-12 to transformer T9. T9 couples the reverse cue signal from a low-impedance unbalanced circuit to a 600-ohm balanced circuit. The reverse cue signal connects through S7 or S8, in the neutral position, to either REMOTE SELECT switch S13 or S14. S13 or S14 selects the remote line to which the reverse cue signal connects.

4.3.2 Program Amplifiers

The inputs to the program amplifiers are program bus A (program amplifier A) and program bus B (program amplifier B). Bus A connects to transformer T7 and bus B connects to T8. Each transformer output connects to a program preamplifier. The preamplifier circuits (A1Z9 and A2Z9) process the input signal the same as the monitor preamplifiers (A1Z11 and A2Z11). MASTER level controls (A and B) adjust the preamplifier output signal level to be amplified by program amplifiers A and B (A1Z10 and A2Z10). The program amplifier operates the same as the monitor amplifier (A1Z12 and A2Z12) except that it operates on a lower supply voltage and supplies less output power.

Transformer T5 couples the program amplifier output to the output circuits. A VU meter (M1 and M2), with its impedance-matching network R26, R27, R28, indicates program signal level. The 6-db pad isolates the program amplifier output circuit from external source signals appearing on the program lines.

Program amplifier characteristics are:

Output Impedance:
600 ohms balanced

Output Level:
+8 dbm nominal, +18 dbm maximum

Frequency Response:
±1 db from 1-kHz reference,
50 Hz to 15 kHz

Program amplifier A outputs are:

Program A balanced output to S11
Headphone jack A (front panel)
Monitor amplifier input to S9 and S10

Program amplifier B outputs are:

Program B balanced output to S11
Headphone jack B (front panel)
Monitor amplifier input to S9 and S10

S11 is the program LINE reverse switch. It selects either program output and connects it to either program line 1 or program line 2.

4.4 POWER SUPPLY

There are two separate power sources for the 212V-1 Audio Console. The +25-vdc supply is the power source for the monitor amplifiers. All other circuits use the +15-vdc power source.

Transformer A3T1 steps the 115 vac down to the input level of the rectifier (15 or 25 volts). Rectifiers CR1 and CR2 are full-wave bridge rectifier assemblies. Resistors R1 and R2, and Q2 are the series regulating units of the +25-vdc supply. Capacitor C1 is a ripple filter. Resistor R1, CR3, CR4, and CR7 bias Q1 and A2. Diode CR7 is also the output voltage reference level. Capacitor C2 is a ripple filter and R3 is a constant load. Capacitor C3 is a ripple filter. Transistor Q3, R6, and Q4 are the series regulating units of the +15-vdc supply. Resistor R4, R5, CR5, CR6, and CR8 bias Q3 and Q4. Diode CR8 is also the output voltage reference level. Capacitor C4 is a bias ripple filter. Resistor R7 is a constant load and R8 is a series current-limiting resistor for the mute relays. All power supply outputs connect to A3TB1. Decoupling networks between the power source and each circuit card prevent interaction between the cards.

section 5
maintenance

5.1 GENERAL

The following paragraphs contain maintenance information for the 212V-1 Audio Console.

5.2 PREVENTIVE MAINTENANCE

See Section VI for locations.

a. Clean the MIXER controls (step-attenuators) when necessary (noisy).
b. Clean the MASTER level controls (step-attenuators) when necessary (noisy).
c. Clean the lever switches only when absolutely necessary. Contacts are easily bent or damaged.
d. Periodically check for loose or damaged terminals and frayed insulation.

5.3 SPARE PARTS

Spare parts may be ordered from the following address:

Collins Radio Company
Service Parts, 412-024
1225 North Alma Road
Richardson, Texas 75080

5.4 TEST EQUIPMENT

Tables 5-1 and 5-2 list the suggested test equipment and load devices needed for trouble analysis or the CUE level adjustment. Test equipment with the same characteristics may be used.

5.5 ADJUSTMENT

The cue level control A2R38 is the only adjustment to be made in the 212V-1 Audio Console. The adjustment should only be made when necessary. (Audio level is too loud or not loud enough.)

5.5.1 Adjustment Procedure (Cue Level Control)

a. Connect the 8.2-ohm resistor across the monitor 2 output, TB11-4 to TB11-5. See figure 6-1 for location.
b. Set all MIXER select switches to center.
c. Set all MIXER level controls to midscale.
d. Connect the signal generator to the MIXER 1 mike input, TB7-3 to TB7-4.
e. Set the signal generator controls to 1 kHz and 150 ohms.
f. Using the voltmeter, adjust the signal generator output to -55 dbm.
g. Set the MIXER 1 level control in the CUE position.
h. Connect the voltmeter across the 8.2-ohm resistor.

Table 5-1. Test Equipment.

EQUIPMENT	MANUFACTURER AND MODEL
Volt-ohm-milliammeter	Triplett, 630-A
Oscillator	Hewlett-Packard, 200CD
Oscillator	Hewlett-Packard, 206A
Oscilloscope	Hewlett-Packard, 130C
Attenuator	Hewlett-Packard, 350D
Voltmeter	Hewlett-Packard, 403B
Distortion analyzer	Hewlett-Packard, 334A

Table 5-2. Load Devices.

LOADS	DESCRIPTION	COLLINS PART NUMBER
619-ohm resistor (2) 8.2-ohm resistor (2)	±1% 1/2 watt fixed film ±5% 6.5 watt wire-wound	CPN 705-7086-000 CPN 747-5418-000

i. Adjust the monitor 2 output level to 4.0 ±0.1 volts rms with the cue level control, A2R38. See figure 6-3 for location. The cue level may be adjusted for a comfortable listening level if desired.
j. Disconnect the test equipment and remove the 8.2-ohm resistor from TB11.

5.6 TROUBLE ANALYSIS

Before troubleshooting, make certain a malfunction exists. Check input connections, input levels, switch and MIXER level control operation, and output connections. A quick check of these items may eliminate the problem.

Trouble analysis procedures for the 212V-1 are as follows:

a. Isolate the trouble to an input circuit or an output circuit.
b. Test the suspected circuit for improper operation.
c. Isolate the trouble to a portion of the circ-
c cuit, i.e., preamplifier, step-attenuator, switch amplifier, etc.
d. Make resistance/voltage measurements until trouble source is found.
e. Repair or replace defective item according to paragraph 5.7.

Listed in table 5-3 are representative voltage levels taken from a 212V-1 console operating under the test conditions given. These signal levels are to be used as comparative readings only and are not meant to be absolute values.

5.6.1 Microphone Input Circuit

Steps 1 and 2 of table 5-3 are readings taken with a 403B voltmeter operating on internal batteries. The input signal generator is a 206A with the following settings:

Frequency, 1 kHz

Impedance, 150 ohms

Amplitude, -50 dbm

See table 2-1 and figure 7-1 for specific terminal board connections to each channel.

5.6.2 High-Level Input Circuit

Steps 3 and 4 of table 5-3 are readings taken with a 403B voltmeter operating on internal batteries. The input signal generator is a 206A with the following settings:

Frequency, 1 kHz

Impedance, 600 ohms

Amplitude, -10 dbm

See table 2-1 and figure 7-1 for specific terminal board connections to each channel.

5.6.3 Phono Input Circuit

Steps 5 and 6 of table 5-3 are readings taken with a 403B voltmeter operating on batteries. The input signal generator is a 200CD with frequency setting of 1 kHz. The output signal was connected to 305D with the signal level adjusted to 6 millivolts rms. See table 2-1 and figure 7-1 for specific terminal board connections to each channel.

5.6.4 Program Channel

Steps 7 through 10 of table 5-3 are readings taken with a 403B voltmeter operating on batteries. The input signal was channel 1 connected to the program bus. See figure 7-1 for specific connections.

5.6.5 Monitor Channel

Steps 11 through 14 of table 5-3 are readings taken with a 403B voltmeter operating on batteries. The input signal was program channel A connected to the MONITOR SELECT switch. See figure 7-1 for specific connections.

Table 5-3. Representative Voltage Levels. (All readings taken with HP 403B Voltmeter.)

LOCATION OF TEST	SIGNAL LEVEL	NOTES
	MICROPHONE INPUT	
1. Input terminal board (bottom of console)	2.5 millivolts rms	Balanced input
2. Input preamplifier output terminal board (bottom of console next to front panel) 1 to 2	380 millivolts rms	Terminal 2 ground
	HIGH-LEVEL INPUT	
3. Input terminal board (bottom of console)	250 millivolts rms	Balanced input
4. Input preamplifier output terminal board (bottom of console next to front panel) 1 to 2	380 millivolts rms	Terminal 2 ground
5. Input terminal board (bottom of console)	6 millivolts rms	Unbalanced input
6. Input preamplifier output terminal board (bottom of console next to front panel) 3 to 4	88 millivolts rms	Terminal 3 ground
	PROGRAM CHANNEL	
7. Program bus (program bus select switch, back of front panel)	10 millivolts rms	Adjust signal to this level with input channel step-attenuator.
8. MASTER attenuator IN (back of front panel).	1.0 volts rms	MASTER attenuator terminal C is ground
9. MASTER attenuator OUT (back of front panel).	35 millivolts rms	Adjust signal to this level with MASTER attenuator.
10. 600-ohm line termination (bottom of console on output terminal board).	1.85 volts rms	Balanced
	MONITOR CHANNEL	
11. A1E509 (on circuit card A1)	18.5 millivolts rms	Program amplifier output level set at 1.85 volts rms
12. A1E503 or A2E503 (on circuit cards)	8.6 millivolts rms	Adjust signal to the level with MONITOR LEVEL control.
13. A1E522 or A2E522 (on circuit cards)	175 millivolts rms	Z11 preamplifier output.
14. A1-27 or A2-27 (on circuit cards)	2 volts rms	Monitor amplifier output.

5.6.6 Distortion and Clipping Tests

Use the distortion analyzer and the oscilloscope when you suspect distortion or clipping problems. See paragraph 1.5 for electrical characteristics.

5.7 REPAIR OF PLANAR PROCESS BOARDS WITH PLATED THRU HOLES

Use the following procedure to repair the printed circuit cards. Use extreme care when repairing connections to terminal boards or front panel components.

Caution

Exercise extreme care during component replacement to avoid damage to the circuit board. Heat applied for more than 5 seconds may cause the plated thru holes to become loose or broken and severely damage the board. Do not attempt to repair a damaged board. Return the damaged board to the factory for repair.

a. Replace components with accessible leads (resistors, capacitors, etc.) in accordance with the following procedures.
   1. Cut the component lead beyond the bend (nearest the board). Make sure the cut lead is straight.
   2. Remove all burrs by rounding or squeezing the lead with the long-nosed pliers.
   3. Apply heat (5 seconds, maximum) to the lead on the backside of the board and remove the molten solder with a solder sipper (Collins part number 024-0676-010).
   4. Allow the board to cool completely between heatings and repeat step 3 as necessary.
   5. Carefully break the lead loose from the hole, and gently remove the cold lead. If necessary, slightly heat the lead from the component side of the board while carefully removing the lead from the bottom.
   6. Carefully insert the lead of the replacement component into the hole. Be sure the lead is straight.
   7. Apply heat to the lead on the backside of the board (5 seconds, maximum) and allow fresh solder to flow into the hole. Cut off any excess lead. Do not bend the lead.

b. Replace components without accessible leads (transistors, relays, board-mounted potentiometers, etc.) in accordance with the following procedure.
   1. Apply heat (5 seconds, maximum) to the component lead on the backside of the board and remove the molten solder with a solder sipper.
   2. Allow the board to cool completely between heatings and repeat step 1. as necessary.
   3. Use long-nosed pliers to gently straighten the lead if it is bent. The lead must be as straight as possible.
   4. If possible, cut the lead and remove all burrs by rounding or squeezing the lead with the long-nosed pliers.
   5. Repeat steps 1. and 2. until the lead can be carefully broken loose from the hole.
   6. Slowly and very gently remove the component from the board.
   7. Carefully insert the replacement component. Be sure the lead is straight.
   8. Apply heat to the lead on the backside of the board (5 seconds, maximum) and allow fresh solder to flow into the hole. Cut off any excess lead. Do not bend the lead.

section 6
parts list

6.1 GENERAL

This section contains a list of all repairable/ replaceable electrical, electronic and critical mechanical parts for the 212V-1 Audio Console.

6.2 SYMBOL

This column contains the electrical symbols of all parts that have been assigned to schematics on wiring diagrams, and/or index numbers for all parts for which symbols have not been assigned. When a symbol, within a series of symbols, has not been assigned a part number, the unassigned symbol will be reflected as "NOT USED" in the DESCRIPTION column.

6.3 DESCRIPTION

This column will contain the identifying noun or item name followed by a brief description. The description for electrical/electronic parts will include the applicable ratings and tolerances. For consecutively listed identical parts within an assembly, "SAME AS - - -" will be reflected in the description of subsequent listings, referencing to the first listing within the assembly.

6.4 MANUFACTURERS PART NUMBER

The part number for each item not manufactured by Collins Radio Company will be reflected in the column.

6.5 MFR CODE

The manufacturers codes, in accordance with Federal Supply Codes for Manufacturers Handbook H4-1, are reflected in this column. Manufacturers not listed in Handbook H4-1 are assigned a 5-letter code. This column is left blank for items manufactured by Collins Radio Company. Refer to paragraph 6.9, Manufacturers Code and Name Index.

6.6 COLLINS PART NUMBER

The Collins Radio Company Specification or drawing number, for each item in the parts list, is reflected in this column.

6.7 ILLUSTRATIONS

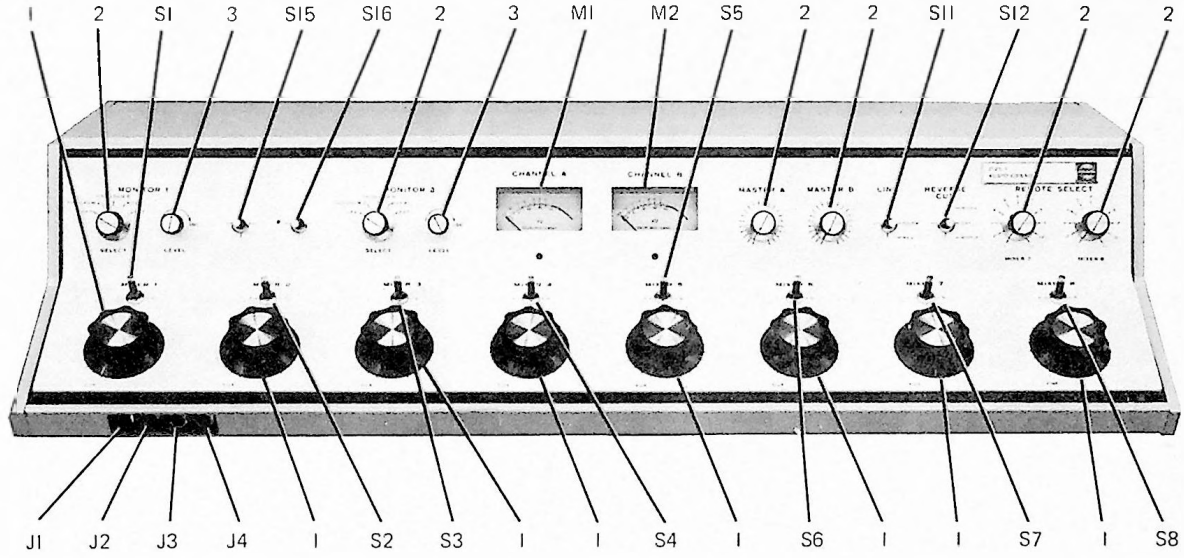
All parts listed in the SYMBOL column are located on corresponding illustrations. The illustration will always precede the parts list.

6.8 LIST OF EQUIPMENT

6.9 MANUFACTURERS CODE AND NAME INDEX

CODE	NAME AND ADDRESS
01121	Allen Bradley Co. Milwaukee, Wis. 53204
01548	Capitol Machine and Switch Co. Danbury, Conn. 06810
04713	Motorola Semiconductor Products, Inc. Phoenix, Ariz. 85008
07688	Military Specifications
11236	CTS of Berne, Inc. Berne, Ind. 46711
11502	IRC, Inc. Greenway Road Boone, N. C. 28607
11700	JB Electronic Transformers, Inc. Chicago, Ill. 60647
13103	Thermalloy Co. 8717 Diplomacy Row Dallas, Texas 75247
14655	Cornell Dubilier Electric Corp. Newark, N. J.
17419	Deutsch Co. Los Angeles, Calif. 90009

CODE	NAME AND ADDRESS
21394	Florida Hindle Transformer Deland, Fla. 32721
32001	Jensen Mfg. Co. Chicago, Ill. 60638
37942	CP Mallory and Co., Inc. 3029 East Washington Street Indianapolis, Ind. 46206
56289	Sprague Electric Co. Marshall St. North Adams, Mass. 01247
70309	Allied Control Co., Inc. New York, N.Y. 10021
70674	ADC Products, Inc. Minneapolis, Minn. 55426
71400	Bussmann Mfg. Division of McGraw-Edison Co. 2536 W. University St. St. Louis, Mo. 63017
71471	Cinema Plant Hi-Q, Division Aerovox Corp. Burbank, Calif. 91503
71785	Cinch Mfg Co. and Howard B. Jones Div. Chicago, Ill. 60624
72982	Erie Technological Products, Inc. Erie, Pa. 16512
73445	Amperex Electronic Co., Div. of North American Philips Co., Inc. Hicksville, N. Y. 11801
74545	Hubbell Harvey, Inc. Bridgeport, Conn. 06603
75382	Kulka Electric Corp. 520 S. Fulton Ave. Mt. Vernon, N. Y. 10550
75915	Littlefuse, Inc. 800 E. Northwest Hwy. Des Plaines, Ill. 60016
76854	Oak Mfg. Co. Crystal Lake, Ill.
80223	United Transformer Co. New York, N. Y. 10013
80294	Bourns, Inc. Riverside, Calif. 92506
81030	International Instruments, Inc. Orange, Conn. 06477
81349	Military Specifications
83003	Varo, Inc. 800 W. Garland Ave. Garland, Texas 75040
87930	Tower Mfg. Corp. 158 Pine St. Providence, R. I. 02903
91146	ITT Cannon Electric, Inc. Salem Division Salem, Mass.
91662	Elco Corp. Willow Grove, Pa. 19090
96906	Military Specifications



B700 320 Pb

Figure 6-1. 212V-1 Audio Console (Sheet 1 of 4).

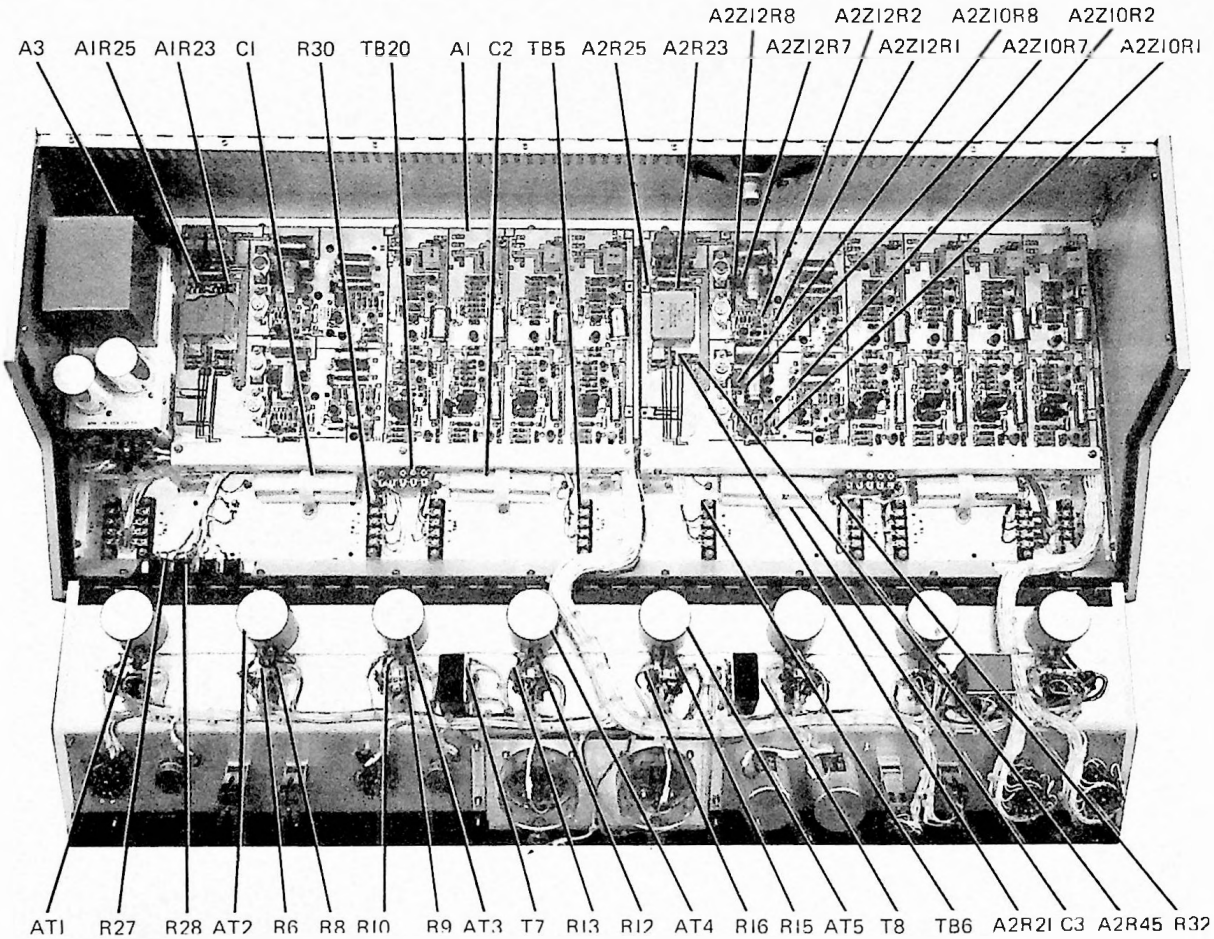
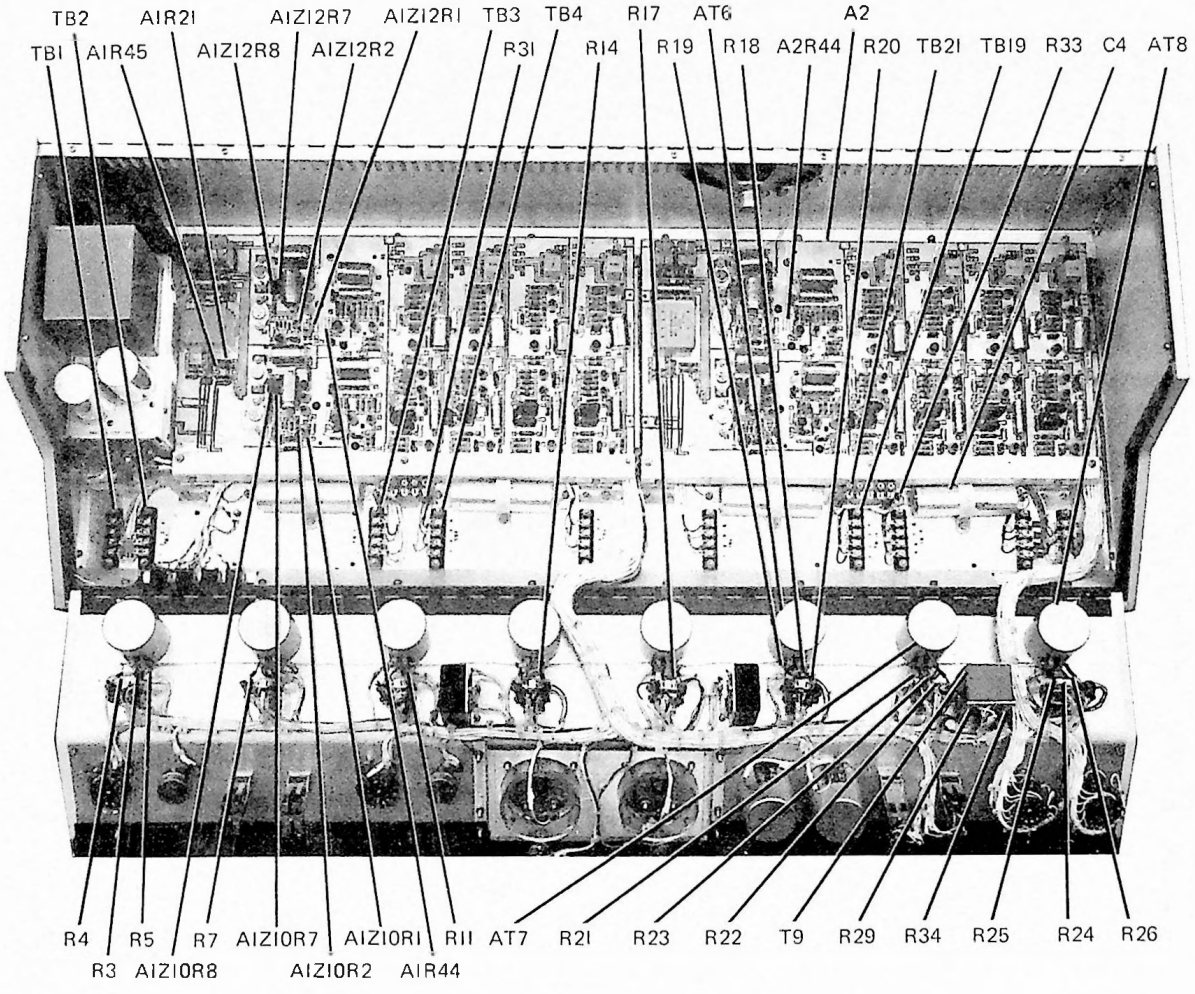


Figure 6-1. 212V-1 Audio Console (Sheet 2 of 4).



8700 321 Pb

Figure 6-1. 212V-1 Audio Console (Sheet 3 of 4).

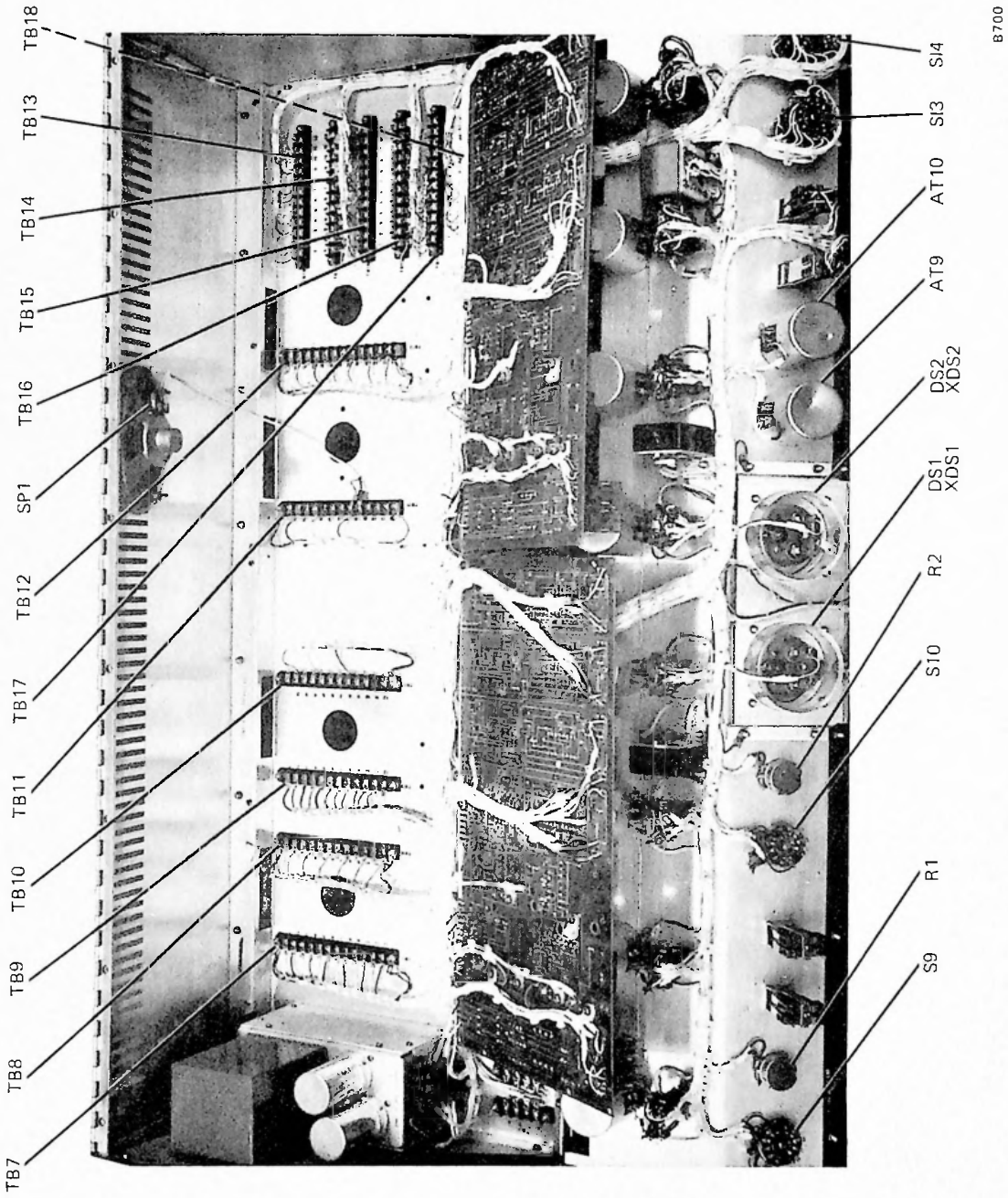


Figure 6-1. 212V-1 Audio Console (Sheet 4 of 4).

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
	212V-1 AUDIO CONSOLE			777-1504-001
A1	AMPLIFIER BOARD See breakdown on page 6-11/6-12 (NOTE) Additional componets used on A1 for the 212V-1			774-7547-001
A1R21	RESISTOR, Fxd, composition 1K ohms, 5% tol, 1/2 watt	RC20GF102J	81349	745-1351-000
A1R23	RESISTOR, Fxd, composition 270 ohms, 5% tol, 1/2 watt	RC20GF271J	81349	745-1327-000
A1R25	SAME AS A1R23			
A1R44	RESISTOR, Fxd, composition 1K ohms, 10% tol, 1 watt	RC32GF102K	81349	745-3352-000
A1R45	RESISTOR, Fxd, composition 15K ohms, 5% tol, 1/2 watt	RC20GF153J	81349	745-1327-000
A1Z10R1	RESISTOR, Fxd, composition 27K ohms, 10% tol, 1/2 watt	RC20GF273K	81349	745-1400-000
A1Z10R2	RESISTOR, Fxd, composition 82K ohms, 10% tol, 1/2 watt	RC20GF823K	81349	745-1433-000
A1Z10R7	RESISTOR, Fxd, wire wound 2.2 ohms, 5% tol, 3 watts	RW69V2R2	83827	747-5307-000
A1Z10R8	SAME AS A1Z10R7			
A1Z12R1	RESISTOR, Fxd, composition 33K ohms, 10% tol, 1/2 watt	RC20GF333K	81349	745-1415-000
A1Z12R2	RESISTOR, Fxd, composition 47K ohms, 10% tol, 1/2 watt	RC20GF473K	81349	745-1422-000
A1Z12R7	RESISTOR, Fxd, wire wound 1 ohm, 5% tol, 3 watts	RW69V1R0	83827	747-5300-000
A1Z12R8	SAME AS A1Z12R7			
A2	SAME AS A1 (NOTE) Additional componets used on A2 for the 212V-1			
A2R21	SAME AS A1R21			
A2R23	SAME AS A1R23			
A2R25	SAME AS A1R25			
A2R44	SAME AS A1R44			
A2R45	SAME AS A1R45			
A2Z10R1	SAME AS A1Z10R1			
A2Z10R2	SAME AS A1Z10R2			
A2Z10R7	SAME AS A1Z10R7			
A2Z10R8	SAME AS A1Z10R7			
A2Z12R1	SAME AS A1Z12R1			
A2Z12R2	SAME AS A1212R2			
A2Z12R7	SAME AS A1Z1R27			
A2Z12R8	SAME AS A1Z12R7			
A3	POWER SUPPLY ASSEMBLY See breakdown on page 6-18			793-4957-001
AT1	ATTENUATOR, Variable 6 db, 1200 ohms impedance	66766	71471	378-0592-010
AT2 THROUGH AT8	SAME AS AT1			
AT9	ATTENUATOR, Variable 6 db, 600 ohms impedance	66968	71471	378-0592-130
AT10	SAME AS AT9			
C1	CAPACITOR, Fxd, electrolytic 2300 uf, plus 50% minus 10%, 40 vdcw	601D238G040JT4	56289	183-1282-050
C2	CAPACITOR, Fxd, electrolytic 4900 uf, plus 50% minus 10%, 20 vdcw	601D498G020JT4	56289	183-1282-380
C3	SAME AS C1			
C4	SAME AS C2			
DS1	LAMP, Incandescent 0.08 amp current rating	~~756~~ 35X	08806	0264-010 262-~~2133-010~~
DS2	SAME AS DS1			
J1	JACK, Telephone open circuit	N111	82389	360-0430-010
J2	SAME AS J1			
J3	JACK, Telephone Transfer circuit	N113D	82389	360-0430-200

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
J4	SAME AS J3			
M1	METER, Audio level	K305P	11707	455-0008-010
M2	SAME AS M1			
R1	RESISTOR, Variable 5K ohms, 10% tol, 2 watts	RV4NAYSD502A	81349	380-2678-000
R2	SAME AS R1			
R3	RESISTOR, Fxd, composition 1K ohms, 10% tol, 1/2 watt	RC20GF102K	81349	745-1352-000
R4	RESISTOR, Fxd, composition 2.2K ohms, 10% tol, 1/2 watt	RC20GF222K	81349	745-1366-000
R5	SAME AS R4			
R6	SAME AS R3			
R7	SAME AS R4			
R8	SAME AS R4			
R9	SAME AS R3			
R10	SAME AS R4			
R11	SAME AS R4			
R12	SAME AS R3			
R13	SAME AS R4			
R14	SAME AS R4			
R15	SAME AS R3			
R16	SAME AS R4			
R17	SAME AS R4			
R18	SAME AS R3			
R19	SAME AS R4			
R20	SAME AS R4			
R21	SAME AS R3			
R22	SAME AS R4			
R23	SAME AS R4			
R24	SAME AS R3			
R25	SAME AS R4			
R26	SAME AS R4			
R27	RESISTOR, Fxd, composition 100 ohms, 10% tol, 1/2 watt	RC20GF101K	81349	745-1310-000
R28	SAME AS R27			
R29	RESISTOR, Fxd, composition 270 ohms, 10% tol, 1/2 watt	RC20GF271K	81349	745-1328-000
R30	RESISTOR, Fxd, wire wound 2.2 ohms, 10% tol, 3 watts	RW69V2R2	81349	747-5307-000
R31	SAME AS R30			
R32	SAME AS R30			
R33	SAME AS R30			
R34	RESISTOR, Fxd, composition 680 ohms, 10% tol, 1/2 watt	RC20GF681K	81349	745-1345-000
S1	SWITCH, Lever DPDT contact arrangement	1E9902-89	01548	375-1019-020
S2 THROUGH S6	SAME AS S1			
S7	SWITCH, Lever DPDT contact arrangement	1E9903-89	01548	375-1019-030
S8	SAME AS S7			
S9	SWITCH, Rotary DP6T contact arrangement	262358F1	76854	259-2631-050
S10	SAME AS S9			
S11	SWITCH, Lever DPDT contact arrangement	1E9915-89	01548	375-1019-090
S12	SWITCH, Lever DPDT contact arrangement	1E9904-89	01548	375-1019-040
S13	SWITCH, Rotary 3P12T contact arrangement	262357F3	76854	259-2631-040
S14	SWITCH, Rotary 3P12T contact arrangement			259-2631-100
S15	SAME AS S12			
S16	SAME AS S12			
SP1	SPEAKER permanent magnet	4A1ROT	74199	271-0234-000
T1 THROUGH T6	NOT USED			

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
T7	TRANSFORMER, A F 500 volts, 50 Hz to 15 kHz	124A30	11700	667-0187-020
T8	SAME AS T7			
T9	TRANSFORMER, A F 300 volts, 30 Hz to 15 kHz	A17115	70674	667-0196-010
TB1	TERMINAL Board 4 terminals	599C3-4ST4	75382	367-1399-040
TB2 THROUGH TB6	SAME AS TB1			
TB7	TERMINAL Board 12 terminals	599C3-4ST12	75382	367-1399-120
TB8 THROUGH TB18	SAME AS TB7			
TB19	TERMINAL Board 4 terminals (qty 4)	599C3-4ST4	75382	367-1399-040
TB20	TERMINAL Strip 6 terminals	1542A	71785	306-0550-000
TB21	SAME AS TB20			
XDS1	SOCKET miniature	7-14	72619	262-2151-000
XDS2	SAME AS XDS1			
1	KNOB, Black phenolic (qty 8)			757-0233-012
2	KNOB, Black phenolic (qty 6)			757-0233-002
3	KNOB, Black phenolic (qty 2)			757-0232-001

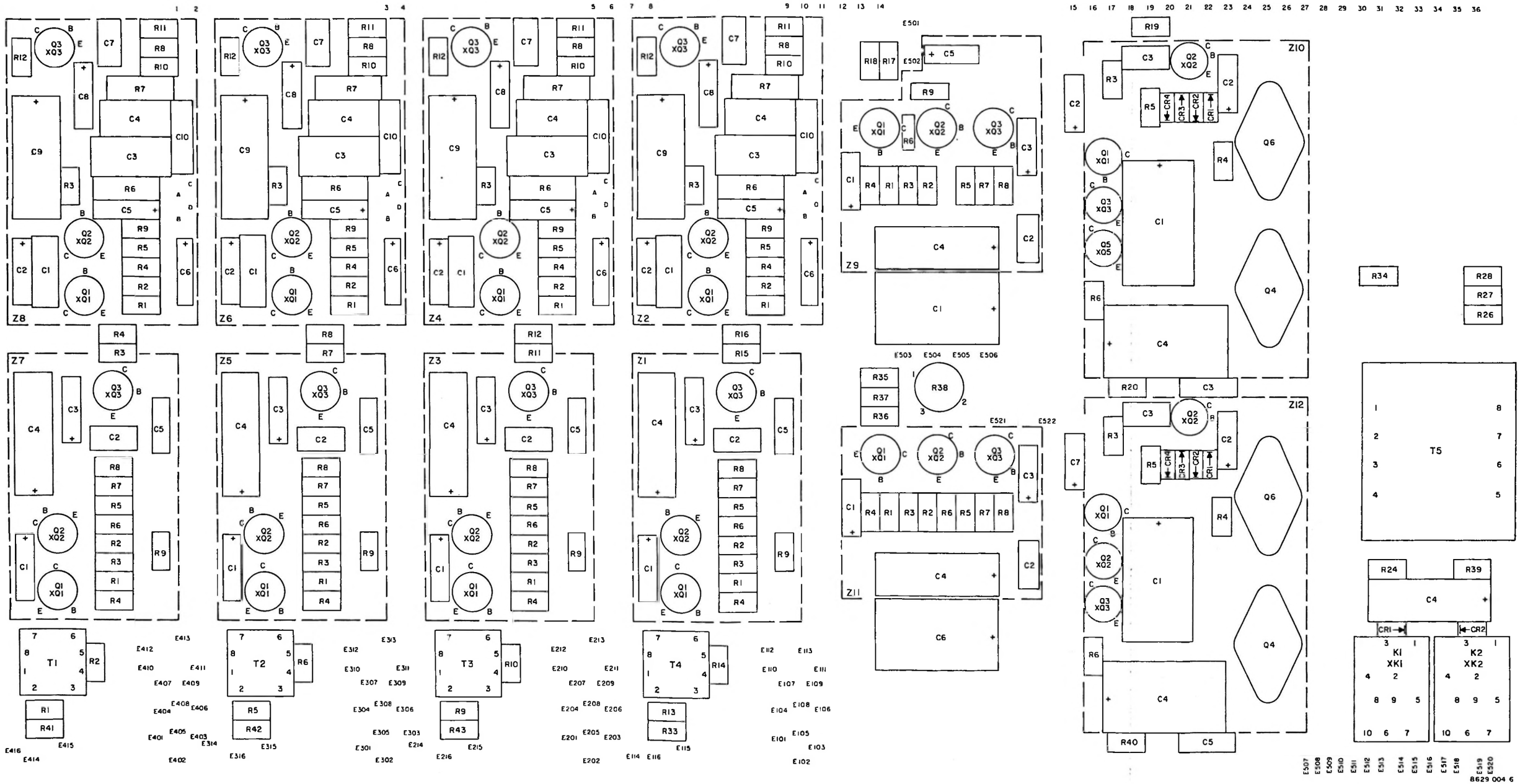


Figure 6-2. Amplifier Board.

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
	AMPLIFIER BOARD, A1, A2			774-7547-001
C1	CAPACITOR, Fxd, electrolytic 640 uf, plus 50% minus 10%, 25 vdcw	C437ARF640	73445	183-2355-120
C2	CAPACITOR, Fxd, electrolytic 40 uf, 20% tol, 10 vdcw	150D406X0010B2	56289	184-7380-000
C3	CAPACITOR, Fxd, ceramic 0.1 uf, plus 80% minus 20%, 25 vdcw	3C19A	56289	913-5516-000
C4	CAPACITOR, Fxd, electrolytic 160 uf, plus 50% minus 19%, 25 vdcw	C437ARF160	73445	183-2355-100
C5	SAME AS C3			
C6	SAME AS C1			
C7	SAME AS C2			
CR1	DIODE	1N4003	07688	353-6442-030
CR2	SAME AS CR1			
K1	RELAY, Armature 2C contact arrangement	TS154CC8-5MA	70309	970-2456-010
K2	SAME AS K1			
R1	RESISTOR, Fxd, composition 56K ohms, 5% tol, 1/2 watt	RC20FG563J	81349	745-1425-000
R2	SAME AS R1			
R3	RESISTOR, Fxd, composition 100K ohms, 5% tol, 1/2 watt	RC20GF104J	81349	745-1435-000
R4	SAME AS R3			
R5	SAME AS R1			
R6	SAME AS R1			
R7	SAME AS R3			
R8	SAME AS R3			
R9	SAME AS R1			
R10	SAME AS R1			
R11	SAME AS R3			
R12	SAME AS R3			
R13	SAME AS R1			
R14	SAME AS R1			
R15	SAME AS R3			
R16	SAME AS R3			
R17	RESISTOR, Fxd, composition 390 ohms, 5% tol, 1/2 watt	RC20GF391J	81349	745-1334-000
R18	RESISTOR, Fxd, composition 1K ohms, 5% tol, 1/2 watt	RC20GF102J	81349	745-1351-000
R19	RESISTOR, Fxd, composition 620 ohms, 5% tol, 1/2 watt	RC20GF621J	81349	745-1343-000
R20	RESISTOR, Fxd, composition 22 ohms, 5% tol, 1/2 watt	RC20GF220J	81349	745-1281-000
R21	NOT USED			
R22	NOT USED			
R23	NOT USED			
R24	RESISTOR, Fxd, composition 10K ohms, 5% tol, 1/2 watt	RC20GF103J	81349	745-1393-000
R25	NOT USED			
R26	RESISTOR, Fxd, film 5.62K ohms, 1% tol, 1/4 watt	RN60D5621F	81349	704-6632-000
R27	RESISTOR, Fxd, film 2.61K ohms, 1% tol, 1/4 watt	RN60D2611F	81349	705-6616-000
R28	RESISTOR, Fxd, film 1.96K ohms, 1% tol, 1/4 watt	RN60D1961F	81349	705-6610-000
R29 THROUGH R32	NOT USED			
R33	RESISTOR, Fxd, composition 560 ohms, 5% tol, 1/2 watt	RC20GF561J	81349	745-1341-000
R34	RESISTOR, Fxd, composition 10 ohms, 5% tol, 1/2 watt	RC20GF100J	81349	745-1267-000

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
R35	RESISTOR, Fxd, composition 2.2K ohms, 5% tol, 1/2 watt	RC20GF222J	81349	745-1365-000
R36	SAME AS R35			
R37	SAME AS R18			
R38	RESISTOR, Var, composition 10K ohms, 20% tol, 1.2 watts	FR103M	01121	380-3761-070
R39	RESISTOR, Fxd, composition 47 ohms, 5% tol, 1/2 watt	RC20GF470J	81349	745-1295-000
R40	SAME AS R20			
R41	SAME AS R33			
R42	SAME AS R33			
R43	SAME AS R33			
T1	TRANSFORMER, AF	JB204	80223	667-0174-010
T2	SAME AS T1			
T3	SAME AS T1			
T4	SAME AS T1			
T5	TRASFORMER, AF	A17115	70674	667-0196-010
XK1	SOCKET, Relay 5 amp current rating	30055-3	70309	220-1518-000
XK2	SAME AS XK1			
Z1	PREAMPLIFIER See breakdown on page 6-14			774-7536-001
Z2	PHONOGRAPH PREAMPLIFIER See breakdown on page 6-15			774-7538-001
Z3	SAME AS Z1			
Z4	SAME AS Z2			
Z5	SAME AS Z1			
Z6	SAME AS Z2			
Z7	SAME AS Z1			
Z8	SAME AS Z2			
Z9	BUFFER AMPLIFIER See breakdown on page 6-15			786-1553-001
Z10	AMPLIFIER See breakdown on page 6-16			774-7603-001
Z11	BUFFER AMPLIFIER See breakdown on page 6-17			774-7602-001
Z12	SAME AS Z10			
	PREAMPLIFIER, A1Z1, A1Z3, A1Z5, A1Z7, A2Z1, A2Z3, A2Z5, A2Z7			744-7536-001
C1	CAPACITOR, Fxd, electrolytic 40 uf, 20% tol, 10 vdcw	150D406X0010B2	56289	184-7380-000
C2	CAPACITOR, Fxd, mica 27 uuf, 5% tol, 500 vdcw	CM05ED270J03	81349	912-2774-000
C3	SAME AS C1			
C4	CAPACITOR, Fxd, electrolytic 1000 uf, plus 50% minus 10%, 16 vdcw	C437ARE1000	73445	183-2355-090
C5	CAPACITOR, Fxd, electrolytic 180 uf, 20% tol, 10 vdcw	109D187X0010F2	56289	184-7784-000
Q1	TRANSISTOR	2N3565	07688	352-0638-010
Q2	SAME AS Q1			
Q3	TRANSISTOR	2N3569	07688	352-0629-030
R1	RESISTOR, Fxd, composition 47K ohms, 5% tol, 1/2 watt	RC20GF473J	81349	745-1421-000
R2	SAME AS R1			
R3	RESISTOR, Fxd, composition 62K ohms, 5% tol, 1/2 watt	RC20GF623J	81349	745-1427-000
R4	RESISTOR, Fxd, composition 1.2K ohms, 5% tol, 1/2 watt	RC20GF122J	81349	745-1355-000
R5	RESISTOR, Fxd, composition 6.8K ohms, 5% tol, 1/2 watt	RC20GF682J	81349	745-1386-000
R6	RESISTOR, Fxd, composition 1K ohms, 5% tol, 1/2 watt	RC20GF102J	81349	745-1351-000
R7	RESISTOR, Fxd, composition 560 ohms, 5% tol, 1/2 watt	RC20GF561J	81349	745-1341-000

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
R8	RESISTOR, Fxd, composition 150 ohms, 5% tol, 1/2 watt	RC20GF151J	81349	745-1316-000
R9	RESISTOR, Fxd, composition 2.2K ohms, 5% tol, 1/2 watt	RC20GF222J	81349	745-1365-000
XQ1	PAD, TRANSISTOR	05-3307-51	91662	352-9552-290
XQ2	SAME AS XQ1			
XQ3	PAD, TRANSISTOR	7717-43 DAP	13103	352-9552-290
	PHONOGRAPH PREAMPLIFIER, A1Z2, A1Z4, A1Z6, A1Z8, A2Z2, A2Z4, A2Z6, A2Z8			774-7538-001
C1	CAPACITOR, Fxd, mica 620 uuf, 5% tol, 500 vdcw	CM06FD621J03	81349	912-2986-000
C2	CAPACITOR, Fxd, electrolytic 1 uf, 20% tol, 35 vdcw	150D105X0035A2	56289	184-7398-000
C3	CAPACITOR, Fxd, mica 0.015 uf, 5% tol, 500 vdcw	CM07FD153J03	81349	912-2741-000
C4	CAPACITOR, Fxd, mica 4700 uuf, 5% tol, 500 vdcw	CM06FD472J03	81349	912-3052-000
C5	CAPACITOR, Fxd, electrolytic 40 uf, 20% tol, 10 vdcw	150D406X0010B2	56289	184-7380-000
C6	SAME AS C5			
C7	CAPACITOR, Fxd, mica 27 uuf, 5% tol, 500 vdcw	CM05ED270J03	81349	912-2774-000
C8	SAME AS C5			
C9	CAPACITOR, Fxd, aluminum 160 uf, plus 50% minus 20%, 25 vdcw	C437ARF160	73445	183-2355-100
C10	CAPACITOR, Fxd, mica 3300 uuf, 5% tol, 500 vdcw	CM06FD332J03	81349	912-3040-000
Q1	TRANSISTOR	2N3565	07688	352-0638-010
Q2	SAME AS Q1			
Q3	SAME AS Q1			
R1	RESISTOR, Fxd, composition 56K ohms, 5% tol, 1/2 watt	RC20GF563J	81349	745-1425-000
R2	RESISTOR, Fxd, composition 1.5 megohms, 5% tol, 1/2 watt	RC20GF155J	81349	745-1484-000
R3	RESISTOR, Fxd, composition 130K ohms, 5% tol, 1/2 watt	RC20GF134J	81349	745-1441-000
R4	RESISTOR, Fxd, composition 1.6K ohms, 5% tol, 1/2 watt	RC20GF162J	81349	745-1361-000
R5	RESISTOR, Fxd, composition 820K ohms, 5% tol, 1/2 watt	RC20GF824J	81349	745-1474-000
R6	RESISTOR, Fxd, film 316K ohms, 1% tol, 1/2 watt	RN65D3163F	81349	705-7216-000
R7	RESISTOR, Fxd, film 18.7K ohms, 1% tol, 1/2 watt	RN65D1872F	81349	705-7156-000
R8	RESISTOR, Fxd, composition 39K ohms, 5% tol, 1/2 watt	RC20GF393J	81349	745-1418-000
R9	RESISTOR, Fxd, composition 4.7K ohms, 5% tol, 1/2 watt	RC20GF472J	81349	745-1397-000
R10	RESISTOR, Fxd, composition 2.7K ohms, 5% tol, 1/2 watt	RC20GF272J	81349	745-1369-000
R11	RESISTOR, Fxd, composition 560 ohms, 5% tol, 1/2 watt	RC20GF561J	81349	745-1341-000
R12	RESISTOR, Fxd, composition 47 ohms, 5% tol, 1/2 watt	RC20GF470J	81349	745-1295-000
XQ1	PAD, Transistor	05-3307-51	91662	352-9552-290
XQ2	SAME AS XQ1			
XQ3	SAME AS XQ1			
	BUFFER AMPLIFIER, A1Z9, A2Z9			786-1553-001
C1	CAPACITOR, Fxd, electrolytic 40 uf, 20% tol, 10 vdcw	150D406X0010B2	56289	184-7380-000

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
C2	CAPACITOR, Fxd, mica 390 uuf, 5% tol, 500 vdcw	CM05FD391J03	81349	912-2858-000
C3	SAME AS C1			
C4	CAPACITOR, Fxd, aluminum 160 uf, plus 50% minus 10%, 25 vdcw	C437ARF160	73445	183-2355-100
C5	CAPACITOR, Fxd, electrolytic 180 uf, 20% tol, 10 vdcw	109D187X0010F2	56289	183-7784-000
Q1	TRANSISTOR	2N3565	07688	352-0638-010
Q2	SAME AS Q1			
Q3	TRANSISTOR	2N3569	07688	352-0629-030
R1	RESISTOR, Fxd, composition 47K ohms, 5% tol, 1/2 watt	RC20GF473J	81349	745-1421-000
R2	SAME AS R1			
R3	RESISTOR, Fxd, composition 62K ohms, 5% tol, 1/2 watt	RC20GF623J	81349	745-1427-000
R4	RESISTOR, Fxd, composition 1.2K ohms, 5% tol, 1/2 watt	RC20GF122J	81349	745-1355-000
R5	RESISTOR, Fxd, composition 6.8K ohms, 5% tol, 1/2 watt	RC20GF682J	81349	745-1386-000
R6	RESISTOR, Fxd, composition 1K ohms, 5% tol, 1/2 watt	RC20GF102J	81349	745-1351-000
R7	RESISTOR, Fxd composition 560 ohms, 5% tol, 1/2 watt	RC20GF561J	81349	745-1341-000
R8	RESISTOR, Fxd, composition 150 ohms, 5% tol, 1/2 watt	RC20GF151J	81349	747-1316-000
R9	RESISTOR, Fxd, composition 2.2K ohms, 5% tol, 1/2 watt	RC20GF222J	81349	745-1365-000
XQ1	PAD, Transistor	7717-43DAP	13103	352-9552-290
XQ2	SAME AS XQ1			
XQ3	SAME AS XQ1			
	AMPLIFIER, A1Z10, A1Z12, A2Z10, A2Z12			774-7603-001
C1	CAPACITOR, Fxd, aluminum 400 uf, plus 50% minus 10%, 16 vdcw	C437ARG400	73445	183-2355-160
C2	CAPACITOR, Fxd, electrolytic 40 uf, 20% tol, 10 vdcw	150D406X0010B2	56289	184-7380-000
C3	CAPACITOR, Fxd, mica 27 uf, 5% tol, 500 vdcw	CM05ED270J03	81349	912-2774-000
C4	CAPACITOR, Fxd, aluminum 1000 uf, plus 50% minus 10%, 16 vdcw	C437ARE1000	73445	183-2355-090
CR1	DIODE	1N914	07688	352-2906-000
CR2	SAME AS CR1			
CR3	SAME AS CR1			
CR4	SAME AS CR1			
Q1	TRANSISTOR	2N3567	07688	352-~~0773-030~~ 0629-010
Q2	TRANSISTOR	2N3565	07688	352-0638-010 ✓
Q3	TRANSISTOR	2N3645	07688	352-~~0629-010~~ 0732-020
Q4	TRANSISTOR	2N3766	07688	352-~~0638-010~~ 0689-010
Q5	TRANSISTOR	2N4250	07688	352-~~0732-020~~ 0773-030
Q6	TRANSISTOR	2N3740	07688	352-0695-010
R1	NOT USED			
R2	NOT USED			
R3	RESISTOR, Fxd, composition 12K ohms, 5% tol, 1/2 watt	RC20GF123J	81349	745-1397-000
R4	RESISTOR, Fxd, composition 2.2K ohms, 5% tol, 1/2 watt	RC20GF222J	81349	745-1365-000
R5	RESISTOR, Fxd, composition 4.7K ohms, 5% tol, 1/2 watt	RC20GF472J	81349	745-1379-000
R6	RESISTOR, Fxd, composition 27K ohms, 5% tol, 1/2 watt	RC20GF273J	81349	745-1141-000
XQ1	PAD, Transistor	05-3307-51	91662	352-9552-290
XQ2	SAME AS XQ1			
XQ3	SAME AS XQ1			
XQ4	NOT USED			
XQ5	SAME AS XQ1			

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
	BUFFER AMPLIFIER, A1Z11, A2Z11			774-7602-001
C1	CAPACITOR, Fxd, electrolytic 40 uf, 20% tol, 10 vdcw	150D406X0010B2	56289	184-7380-000
C2	CAPACITOR, Fxd, mica 390 uuf, 5% tol, 500 vdcw	CM05FD391J03	81349	912-2858-000
C3	SAME AS C1			
C4	CAPACITOR, Fxd, electrolytic 160 uf, 50% minus 10%, 25 vdcw	C437ARF160	73445	183-2355-100
Q1	TRANSISTOR	2N3565	07688	352-0638-010
Q2	SAME AS Q1			
Q3	TRANSISTOR	2N3569	07688	353-0629-030
R1	RESISTOR, Fxd, composition 47K ohms, 5% tol, 1/2 watt	RC20GF473J	81349	745-1421-000
R2	SAME AS R1			
R3	RESISTOR, Fxd, composition 62K ohms, 5% tol, 1/2 watt	RC20GF623J	81349	745-1427-000
R4	RESISTOR, Fxd, composition 1.2K ohms, 5% tol, 1/2 watt	RC20GF122J	81349	745-1355-000
R5	RESISTOR, Fxd, composition 6.8K ohms, 5% tol, 1/2 watt	RC20GF682J	81349	745-1386-000
R6	RESISTOR, Fxd, composition 3.3K ohms, 5% tol, 1/2 watt	RC20GF332J	81349	745-1372-000
R7	RESISTOR, Fxd, composition 560 ohms, 5% tol. 1/2 watt	RC20GF561J	81349	745-1341-000
R8	RESISTOR, Fxd, composition 150 ohms, 5% tol, 1/2 watt	RC20GF151J	81349	745-1316-000
XQ1	PAD, Transistor	7717-43DAP	13103	352-9552-290
XQ2	SAME AS XQ1			
XQ3	PAD, Transistor	7717-90-DAP	13103	352-9552-510

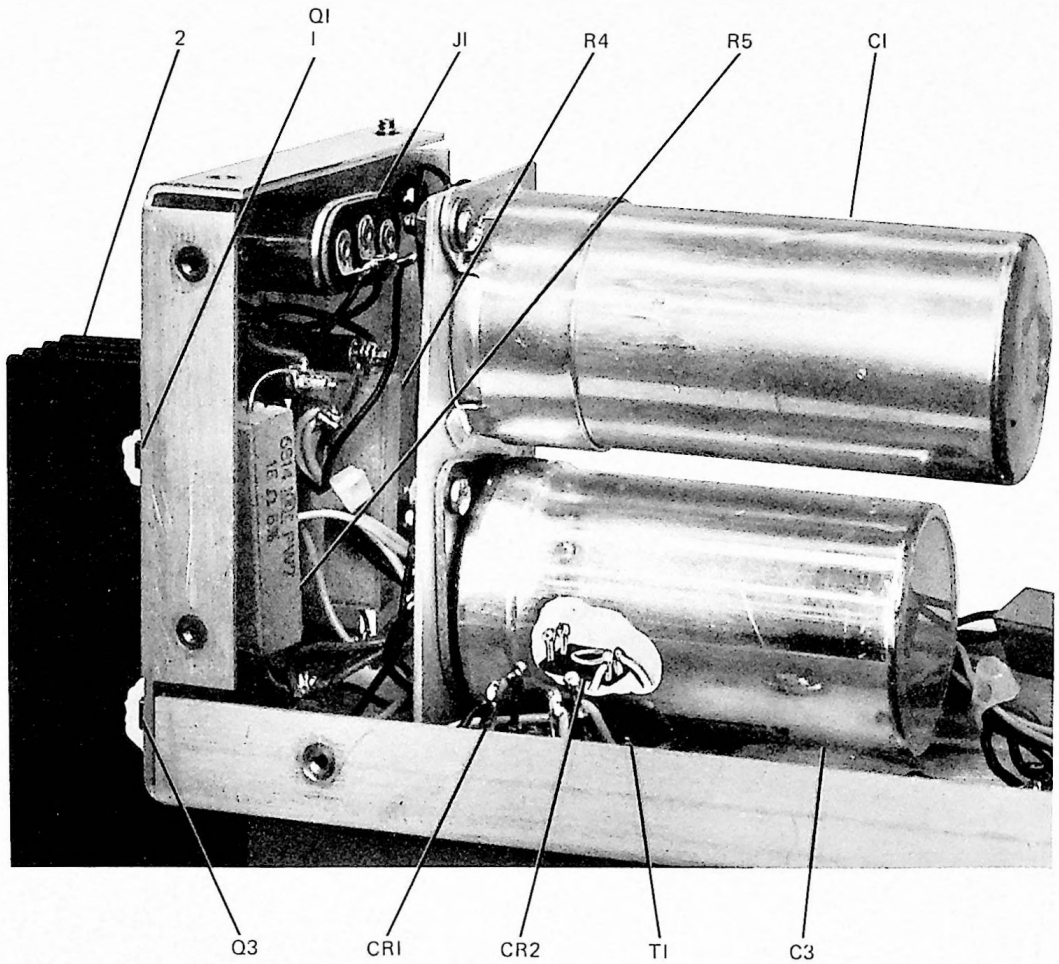


Figure 6-3. Power Supply Assembly (Sheet 1 of 2).

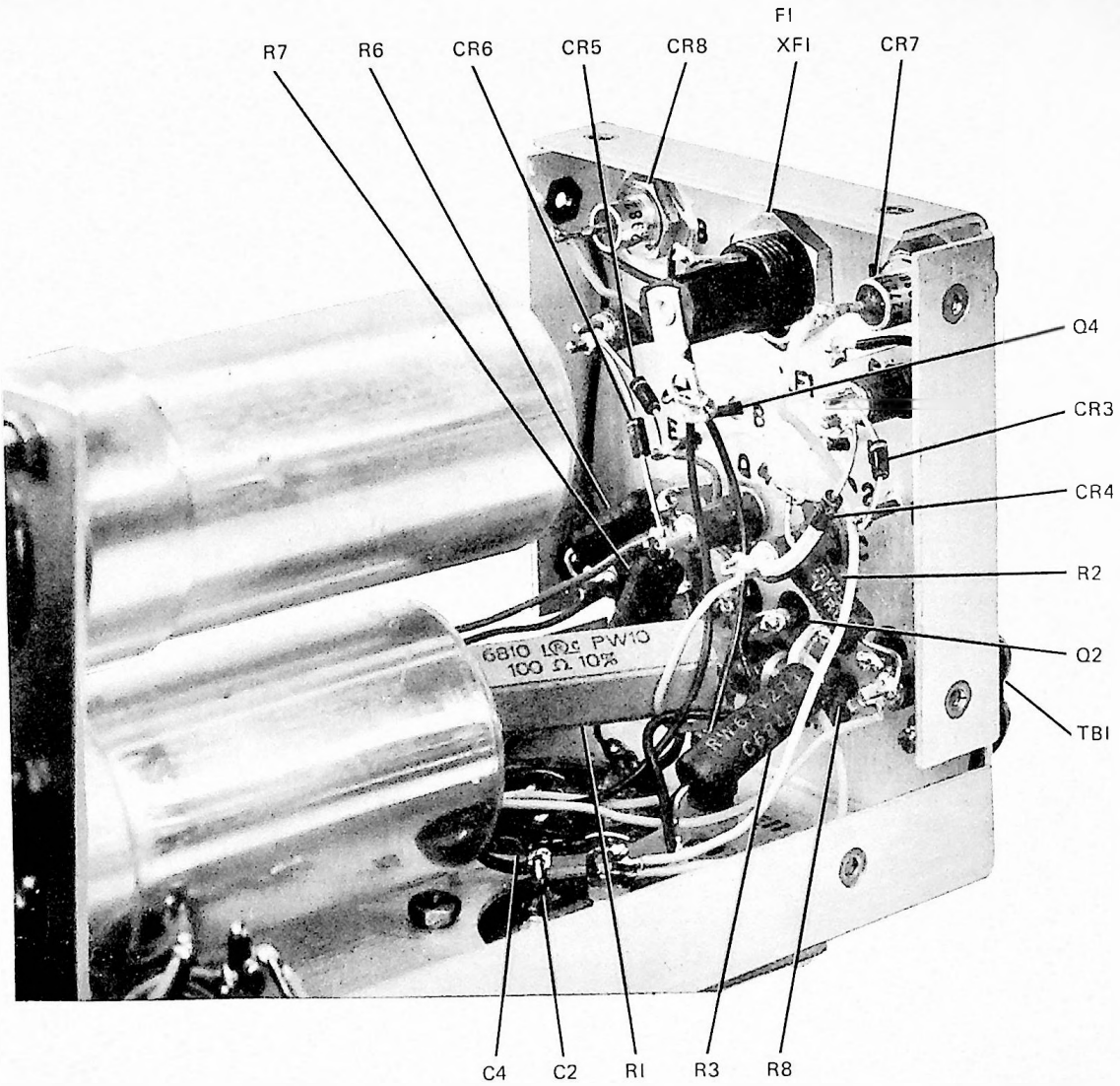


Figure 6-3. Power Supply Assembly (Sheet 2 of 2).

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
	POWER SUPPLY ASSEMBLY, A3			793-4957-001
C1	CAPACITOR, Fxd, electrolytic 2600 uf, plus 100% minus 10%, 50 vdcw	36D262G050AB2A	56289	183-1278-170
C2	CAPACITOR, Fxd, electrolytic 3000 uf, plus 150% minus 10%, 35 vdcw	20-23360	37942	183-1292-050
C3	SAME AS C2			
C4	SAME AS C2			
CR1	DIODE	244	83003	353-6521-010
CR2	SAME AS CR1			
CR3	DIODE	1N4003	07688	353-6442-030
CR4	SAME AS CR3			
CR5	SAME AS CR3			
CR6	SAME AS CR3			
CR7	DIODE	1N2988A	07688	353-1367-000
CR8	DIODE	1N2982B	07688	353-1363-000
F1	FUSE 0.5 amp current rating	MDA1-2	71400	264-1164-000
J1	CONNECTOR, Electrical 3 contacts	1061-1	87930	368-0207-000
Q1	TRANSISTOR	2N3055	07688	352-0583-010
Q2	SAME AS Q1			
Q3	SAME AS Q1			
Q4	SAME AS Q1			
R1	RESISTOR, Fxd, wire wound 4.5K ohms, 10% tol, 10 watts	PW10-4500-10PCT	11502	710-9053-000
R2	RESISTOR, Fxd, wire wound 1 ohm, 5% tol, 3 watts	RW69V1R0	81349	747-5300-000
R3	RESISTOR, Fxd, wire wound 270 ohms, 5% tol, 6.5 watts	RW67V271	81349	747-5449-000
R4	RESISTOR, Fxd, wire wound 15 ohms, 10% tol, 7 watts	PW7-15-10PCT	11502	710-9018-000
R5	SAME AS R4			
R6	SAME AS R2			
R7	RESISTOR, Fxd, wire wound 180 ohms, 5% tol, 6.5 watts	RW67V181	82349	747-5445-000
R8	RESISTOR, Fxd, composition 100 ohms, 10% tol, 2 watts	RC42GF101K	81349	745-5610-000
T1	TRANSFORMER, Power hermetically sealed	124P57	11700	662-0411-010
TB1	BOARD, Terminal 5 terminals	600Y5	75382	367-0013-000
XF1	FUSEHOLDER 15 amp current rating	340138	75915	265-1097-000
1	INSULATOR, Transistor (Qty 4)	43-03-2	13103	352-9605-020
2	HEATSINK			793-4959-001

section 7
illustrations

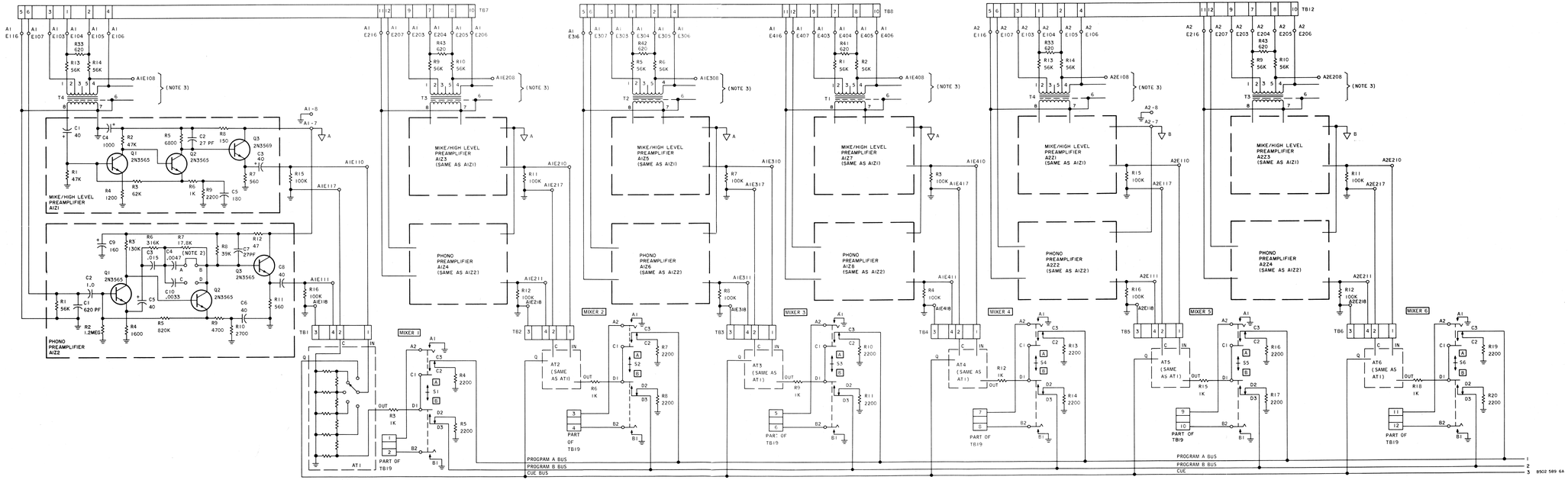


Figure 7-1. 212V-1 Audio Console, Schematic Diagram (Sheet 1 of 3).

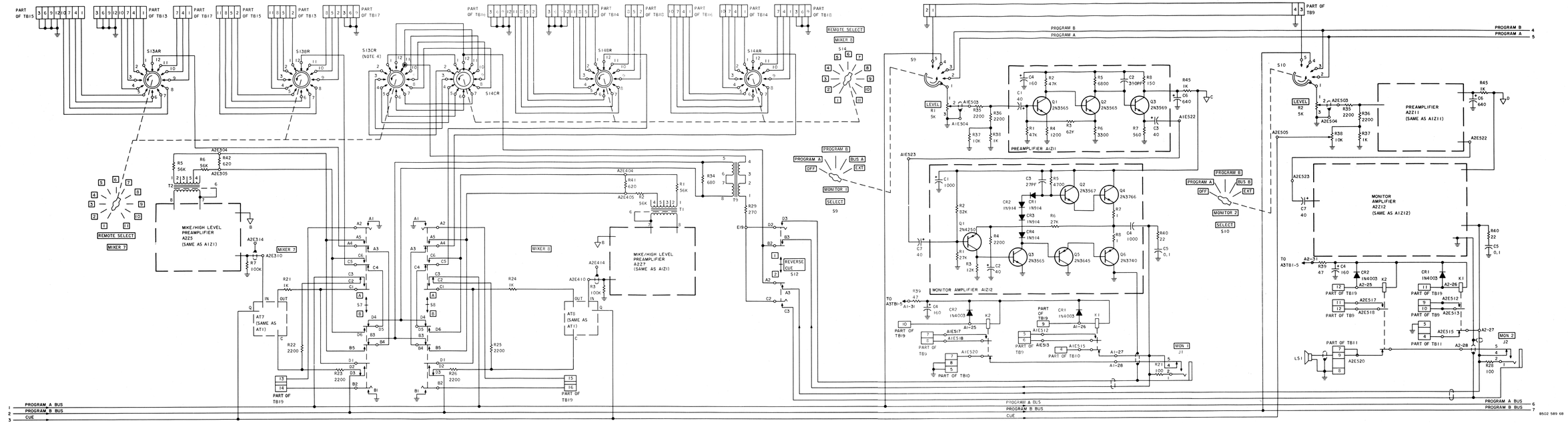
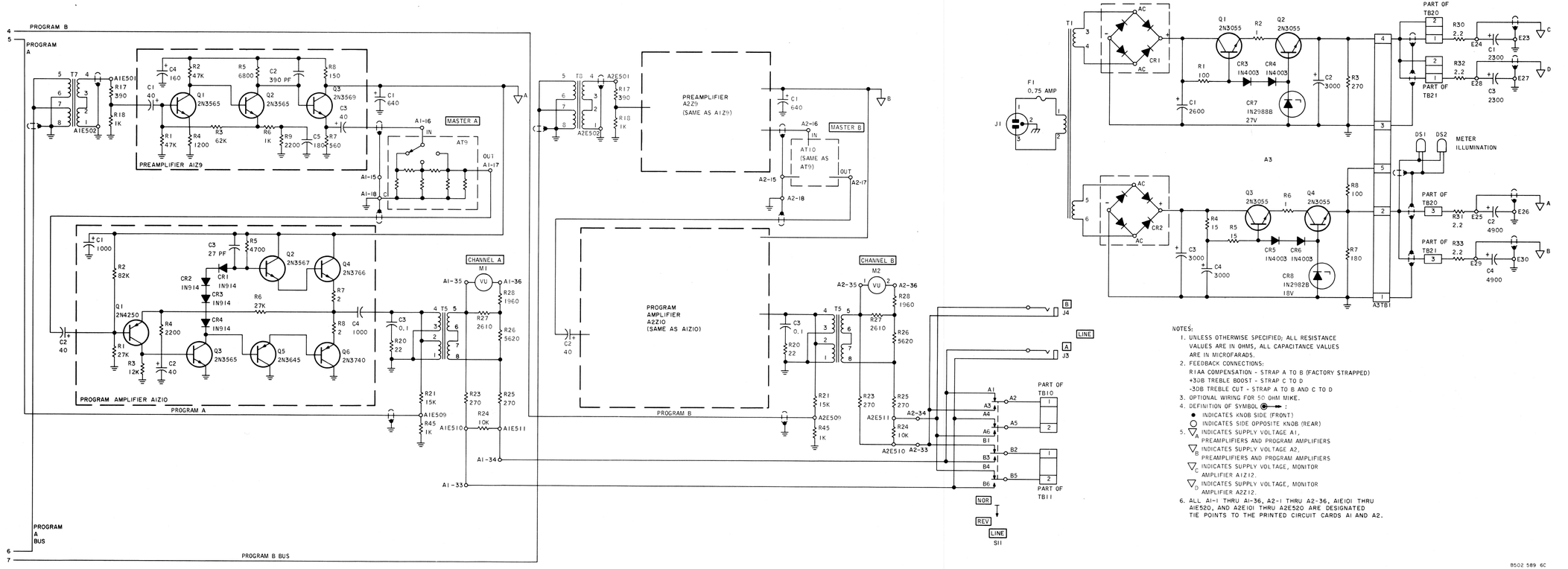


Figure 7-1. 212V-1 Audio Console, Schematic Diagram (Sheet 2 of 3).



NOTES:
1. UNLESS OTHERWISE SPECIFIED; ALL RESISTANCE VALUES ARE IN OHMS, ALL CAPACITANCE VALUES ARE IN MICROFARADS.
2. FEEDBACK CONNECTIONS:
   RIAA COMPENSATION - STRAP A TO B (FACTORY STRAPPED)
   +30B TREBLE BOOST - STRAP C TO D
   -30B TREBLE CUT - STRAP A TO B AND C TO D
3. OPTIONAL WIRING FOR 50 OHM MIKE.
4. DEFINITION OF SYMBOL ⊕—•: ● INDICATES KNOB SIDE (FRONT); ○ INDICATES SIDE OPPOSITE KNOB (REAR)
5. ∇_A INDICATES SUPPLY VOLTAGE A1, PREAMPLIFIERS AND PROGRAM AMPLIFIERS; ∇_B INDICATES SUPPLY VOLTAGE A2, PREAMPLIFIERS AND PROGRAM AMPLIFIERS; ∇_C INDICATES SUPPLY VOLTAGE, MONITOR AMPLIFIER A1ZI2. ∇_D INDICATES SUPPLY VOLTAGE, MONITOR AMPLIFIER A2ZI2.
6. ALL A1-1 THRU A1-36, A2-1 THRU A2-36, A1E101 THRU A1E520, AND A2E101 THRU A2E520 ARE DESIGNATED TIE POINTS TO THE PRINTED CIRCUIT CARDS A1 AND A2.

8502 589 6C

Figure 7-1. 212V-1 Audio Console, Schematic Diagram (Sheet 3 of 3).