

# **BROADCAST AUDIO EQUIPMENT**

## **Type BC-6A Dual Channel Consolette**



**RADIO CORPORATION OF AMERICA  
ENGINEERING PRODUCTS DIVISION CAMDEN, N. J.**

## EQUIPMENT LOST OR DAMAGED IN TRANSIT

When delivering the equipment to you, the truck driver or carrier's agent will present a receipt for your signature. Do not sign it until you have (a) inspected the containers for visible signs of damage and (b) counted the containers and compared with the amount shown on the shipping papers. If a shortage or if evidence of damage is noted, insist that notation to that effect be made on the shipping papers before you sign them.

Further, after receiving the equipment, unpack it and inspect thoroughly for concealed damage. This should be done within 15 days, if possible. If concealed damage is discovered immediately notify the carrier, confirmed in writing and insist upon an inspection and report.

In addition to the above, the shortages or damages should also be reported to RCA, but do not return any damaged equipment unless we have furnished complete return shipping instructions.

Transportation companies are required to adjust for damage resulting from their negligence and RCA will assist you, if necessary, in obtaining settlement. Accordingly, you should save all shipping papers, letters or invoices concerning the shipment until it is certain that the equipment was delivered in good condition or until any damage has been adjusted.

## REPLACEMENT PARTS

When ordering replacement parts, please give symbol, description, and stock number of each item ordered.

The part which will be supplied against an order for a replacement item may not be an exact duplicate of the original part. However, it will be a satisfactory replacement differing only in minor mechanical or electrical characteristics. Such differences will in no way impair the operation of the equipment.

The following tabulations list service parts and electron tube ordering instructions according to your geographical location.

### SERVICE PARTS

LOCATION	ORDER SERVICE PARTS FROM:
Continental United States, Alaska and Hawaii	Service Parts Order Service, Bldg. 60, 19th & Federal Sts., Camden 5, New Jersey or through your nearest RCA Regional Office. Emergency orders may be telephoned, telegraphed, or teletyped to RCA Emergency Service, Bldg. 60, Camden, N. J. (Telephone: WO 3-8000).
Dominion of Canada	RCA Victor Company Limited, 1001 Lenoir Street, Montreal, Quebec or through your local Sales Representative or his office.
Outside of Continental United States, Alaska, Hawaii and the Dominion of Canada	RCA International Division, Clark, N.J., U.S.A. or through your local Sales Representative.

### ELECTRON TUBES

LOCATION	ORDER ELECTRON TUBES FROM:
Continental United States, Alaska and Hawaii	Local Tube Distributor
Dominion of Canada	RCA Victor Company Limited, 1001 Lenoir Street, Montreal, Quebec or through your local Sales Representative or his office.
Outside of Continental United States, Alaska, Hawaii and the Dominion of Canada	Local Tube Distributor or from: Tube Department RCA International Division 30 Rockefeller Plaza New York 20, New York, U.S.A.

If for any reason, it is desired to return tubes, please return them to the place of purchase.

**PLEASE DO NOT RETURN TUBES DIRECTLY TO RCA WITHOUT AUTHORIZATION AND SHIPPING INSTRUCTIONS.**

It is important that complete information regarding each tube (including type, serial number, hours of service and reason for its return) be given.

When tubes are returned, they should be shipped to the address specified on the Return Authorization form. A copy of the Return Authorization and also a Service Report for each tube should be packed with the tubes.

### LIST OF RCA REGIONAL OFFICES

Atlanta 3, Georgia 522 Forsyth Bldg. Lamar 7703	Boston 16, Mass. Room 2301, John Hancock Bldg. 200 Berkley St. Hubbard 2-1700	Chicago 54, Ill. 1186 Merchandise Mart Plaza Delaware 7-0700	Cleveland 15, Ohio 1600 Keith Bldg. Cherry 1-3450
Dallas 1, Texas 1907-11 McKinney Ave. Riverside 1371	Hollywood 28, Calif. RCA Bldg., 1560 N. Vine St. Hollywood 9-2154	Kansas City 6, Missouri 340 Dierks Bldg. Harrison 6480	New York 20, New York 36 W. 49th St. Judson 6-3800
Branch—San Francisco 2, Calif. 420 Taylor St. Ordway 3-3027			

# BROADCAST AUDIO EQUIPMENT

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INSTRUCTIONS

## **Type BC-6A** **Dual Channel Consolette**

MI-11638

RADIO CORPORATION OF AMERICA  
ENGINEERING PRODUCTS DIVISION, CAMDEN, N. J.

PRINTED IN U.S.A.  
5106 - 537

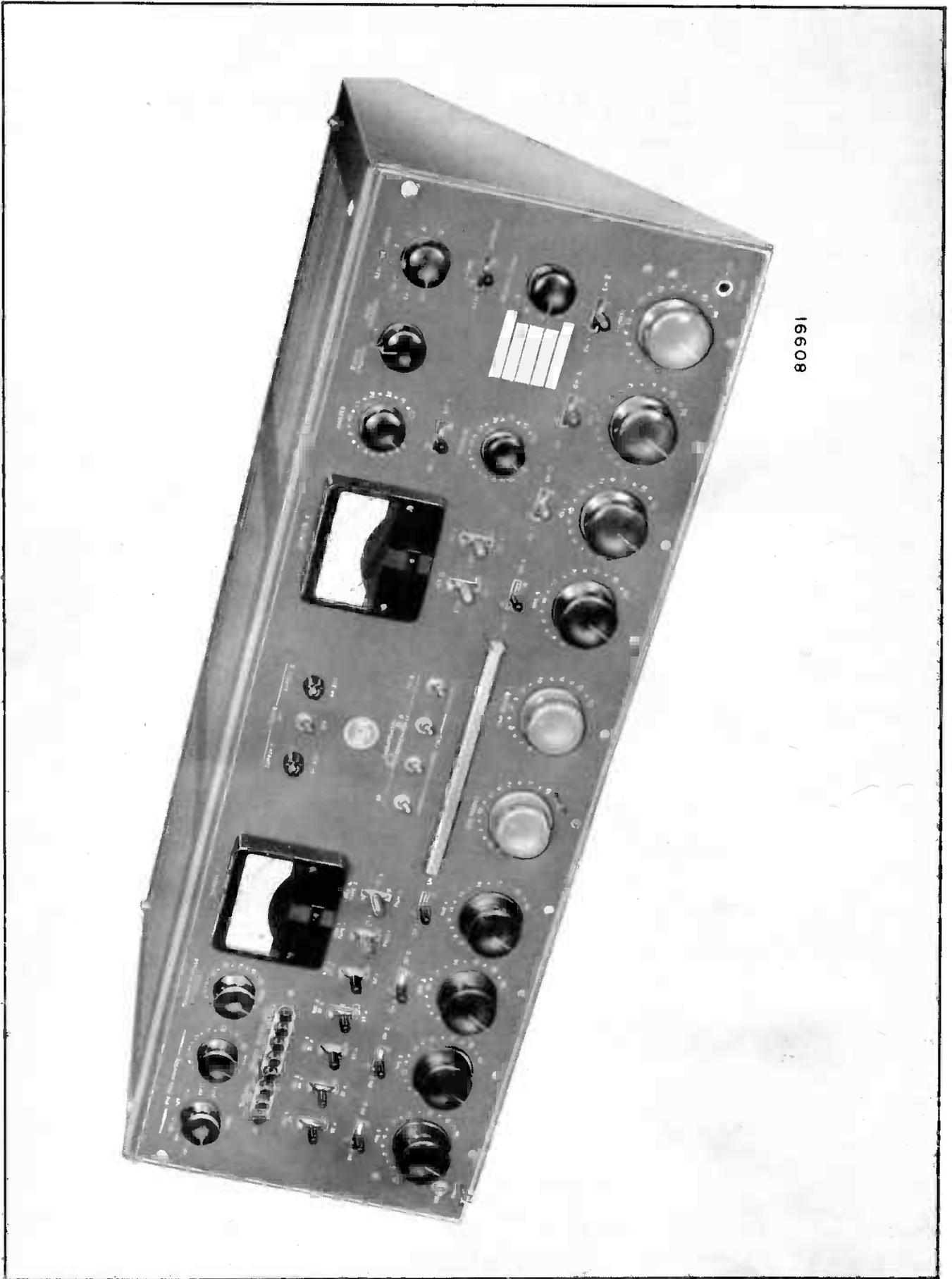


Figure 1—Type BC-6A Consolette MI-11638

# TECHNICAL DATA

## Power Required

100-130 volts, 50/60 cycles  
300 watts

## Amplifiers

- 9 RCA Preamplifiers 5AR1 thru 5AR9
- 3 RCA Preamplifiers 5AR10 thru 5AR12
- 2 RCA Program Amplifiers 5AR13, 5AR14
- 2 RCA Monitor Amplifiers 5AR15, 5AR16
- 2 RCA Power Supplies 5PS1, 5PS2

## Inputs

- 10 Microphones 30/150 ohms
- 2 Tape, Turntable or Film 150 ohms
- 5 Remote Lines 600 ohms
- 1 Network 600 ohms
- 3 Cue Lines 20,000 ohms

## Output Lines

- 2 Program Lines 600 ohms 18 dbm
- 2 External Monitors 600 ohms 12 dbm
- 5 Speakers 15 ohms 6 watts (total)
- 5 Remote Lines (Cue) 600 ohms 18 dbm

## VU Meter

Two 4-inch illuminated VU Meters with Type B scale

## Channels

- CH 1 Two independent program output channels
- CH 2 or single output channel with split mixing

## Frequency Response

Program: ±1.5 db 30 to 15,000 cps  
Monitor: ±2.5 db 30 to 15,000 cps

## Distortion

Program Line: Less than 0.5%  
(100-15,000 cps at 18 dbm output)  
Monitor: Less than 1.5%  
(50-15,000 cps at 6w)

## Signal to Noise Ratio

Microphone to Program Line  
(68 db gain, 18 dbm output) 68 db

## Tube Complement (MI-11484 Kit Required, not supplied)

- 2 5R4GY
- 4 12AU7
- 2 6X4
- 4 12AX7
- 4 6V6GT
- 10 MI-11299 (RCA selected 12AY7)
- 12 12AY7

## Dimensions and Weight

Width — 38 inches  
Height — 11½ inches  
Depth — 21½ inches  
Weight — 127 pounds

## Finish

Two-tone umber gray

# DESCRIPTION

The Type BC-6A Dual Channel Audio Console is designed to provide audio amplification, switching control and monitoring facilities essential to large radio and TV stations. The equipment is completely self contained. The use of etched wiring circuits for all amplifiers has allowed space for the two power supplies and additional features. The BC-6A incorporates nine mixer positions and provides all the facilities needed to accommodate one or two studios, an announce booth microphone, a control room microphone, two transcription turntables, tape, film, five remote lines, network, and three cue circuits.

Colored knobs on switches and controls are matched to indicate related functions. A metal bracket is mounted in the center between the VU meters to support the program script. A selector switch indicates single channel or dual channel operation: one Master gain control is used for simultaneous con-

trol of both channels and two Sub-Master controls for individual control of each output channel. A total of twenty-two inputs are available. Two VU meters, one for each channel, are mounted on the control panel.

The styling of the BC-6A matches the other RCA audio consoles, BC-2B, BC-3B and BC-5A, as well as the Auxiliary Mixer BCM-1A and Switching Console BCS-11A. The styling is also suitable for alignment with TV Terminal equipment. The console should be mounted on a flat topped desk or surface of adequate dimensions. Electrical connections are made to power and audio terminal blocks at the back of the console. Knockout holes of 1-1/16 inch diameter are provided in the rear panel and on the rear bottom of the console housing for the terminating conduits. The front panel is hinged at the bottom to the console housing and may be

tilted forward for servicing the inside. Two supports hold the panel in position when open so as not to allow the weight of the panel to rest on the controls. The louvred top cover may be easily removed. The tubes are supplied separately as tube kit MI-11484 and are listed in the Technical Data.

**Associated Equipment**

The necessary auxiliary units such as microphones, loudspeakers, turntables, tape recorders and warning lights, may be selected from the RCA catalogs. A separate sheet of instructions is packed with each unit.

In regard to loudspeakers, however, a few points should be emphasized. A maximum of five speakers may be connected to each BC-6A consolette. The loudspeaker should have a voice coil impedance of 15 ohms, or an impedance matching transformer MI-11731 must be provided.

As to warning lights, the MI-11706 series are recommended for the studios, control room and announce booth. The lights which are available with inscription, are listed as follows:

ON AIR	MI-11706-1
REHEARSAL	MI-11706-2
AUDITION	MI-11706-3
STAND-BY	MI-11706-4
SILENCE	MI-11706-5

An MI-11702-A Warning Light Relay is required for each warning light.

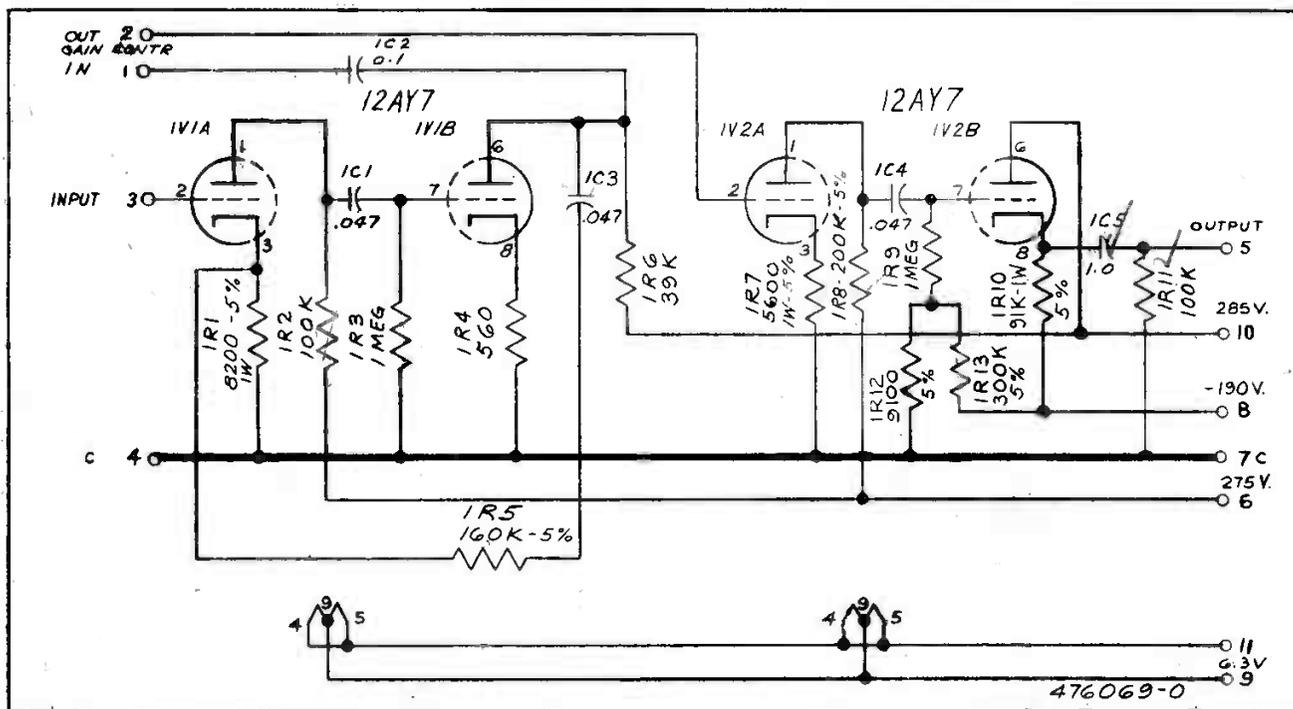
**Circuit Description**

The BC-6A Consolette amplifiers are constructed on individual etched circuit boards. External connections are made through turret type terminals on each board. The boards are secured with standard hardware to a metal chassis and are easily loosened or removed to gain access to the etched wiring.

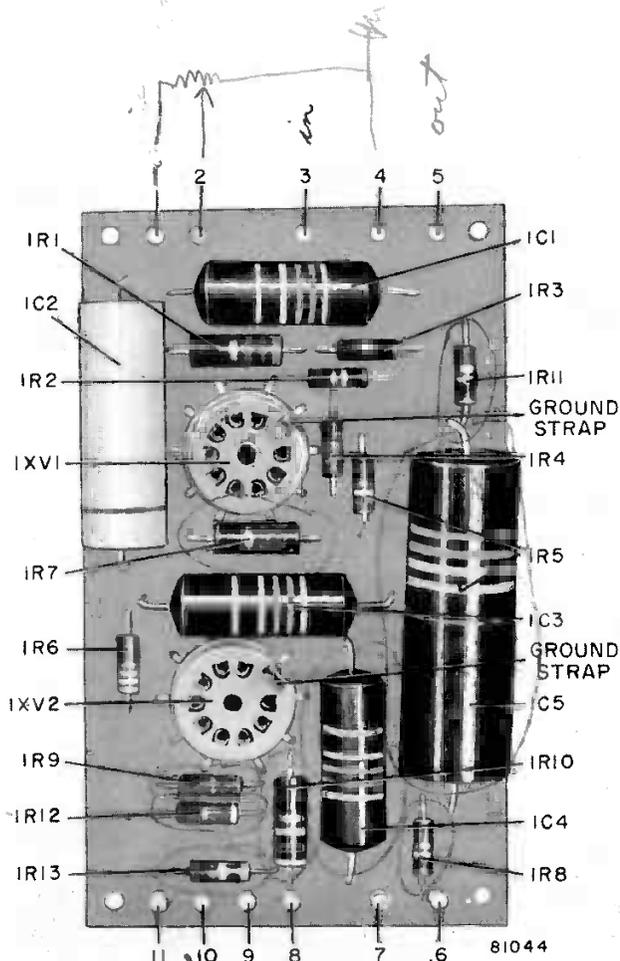
**Preamplifiers 5AR1 — 5AR7**

Twelve preamplifiers are used in the consolette, two units, however, are used as line amplifiers and three units as booster amplifiers.

The preamplifier is a two-staged RC coupled amplifier using a selected 12AY7 (MI-11299) twin triode. The input signal for the microphone preamplifier is derived from an unloaded input transformer which is mounted under the preamplifier mounting shelf. Negative feedback is applied from the plate of the second stage to the cathode of the input stage. The output of the second stage is fed to the potentiometer type gain control (mixer, sub-master or monitor gain control). The output signal from the gain control is applied to the grid of the third stage and then to a cathode follower output stage. A 12AY7 tube is used for the third and fourth stages. To reduce the static charge on the output coupling capacitor 1C5, which could cause switching clicks, the cathode resistance 1R10 is returned to a negative supply and grid bias is obtained through a voltage divider 1R12 and 1R13 such that the cathode



**Figure 2—Schematic Diagram for Preamplifier (5AR1 — 5AR9)**



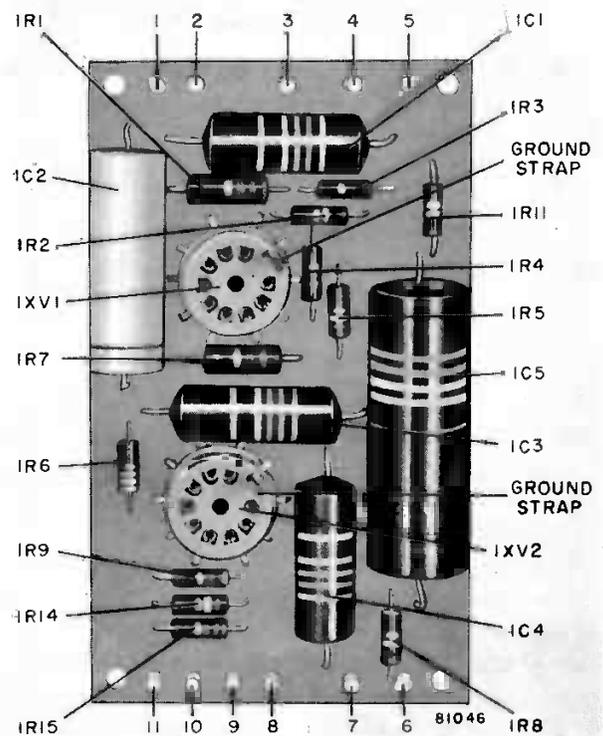
**Figure 3—Preamplifier (5AR1 — 5AR9)  
Printed Circuit Board**

of the output stage is approximately at ground potential.

#### **Preamplifiers 5AR8, 5AR9 as Line Amplifiers**

The full gain of the amplifier is not required for the network and remote line preamplifiers 5AR8 and 5AR9, therefore, the input tube 1V1 is omitted and input connection is made to the grid of the third stage. However, all the components are available for special applications requiring more gain. The full gain of the preamplifiers 5AR8 and 5AR9 may be restored by the following changes:

1. Remove resistors 5R9 and 5R10 which are connected between terminals 7 and 9 of 5T8 and 5T9 respectively.
2. Remove wire #597 from terminal 9 of 5T8 and connect it to terminal 1 of 5AR8.
3. Connect terminal 9 of 5T8 to terminal 3 of 5AR8.
4. Remove wire #598 from terminal 9 of 5T9 and connect it to terminal 1 of 5AR9.
5. Connect terminal 9 of 5T9 to terminal 3 of 5AR9.



**Figure 4—Preamplifier (5AR10, 5AR11, 5AR12)  
Printed Circuit Board**

6. Insert MI-11299 selected 12AY7 tubes in the socket nearest the front of the preamplifiers 5AR8 and 5AR9.

#### **Preamplifiers 5AR10, 5AR11 and 5AR12 as Booster Amplifiers**

When the preamplifiers are used as booster amplifiers, they vary from the preamplifiers 5AR1 through 5AR9 as shown in figures 2 and 3. The cathode resistors 1R14 and 1R15 are connected to ground. Self bias is obtained through the voltage drop across 1R15. Since no switching is performed following the amplifier, the buildup of a charge on the output coupling capacitor 1C5 is permissible. The CH 1 Booster Amplifier 5AR11 and CH 2 Booster Amplifier 5AR10 are controlled by CH 1 SUB-MASTER and CH 2 SUB-MASTER controls respectively. The PGM-TB-MON Booster Amplifier 5AR12 is controlled by the PGM MON Gain Control 5AT12.

The preamplifiers, less input transformers, have a voltage gain of 46 db. An input signal of  $-50$  dbm to the input transformer will produce an output voltage of approximately 1 volt.

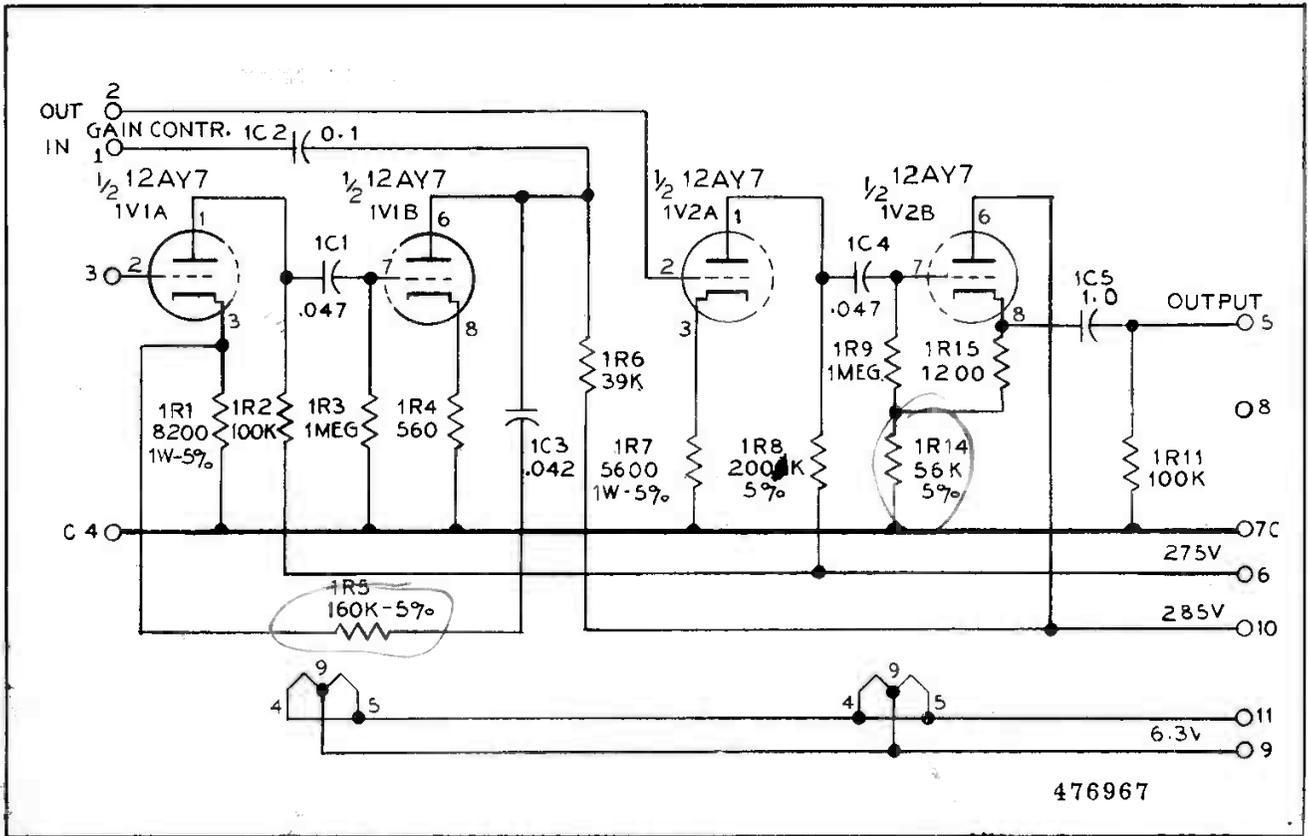


Figure 5—Schematic Diagram for Preamplifiers 5AR10, 5AR11 and 5AR12

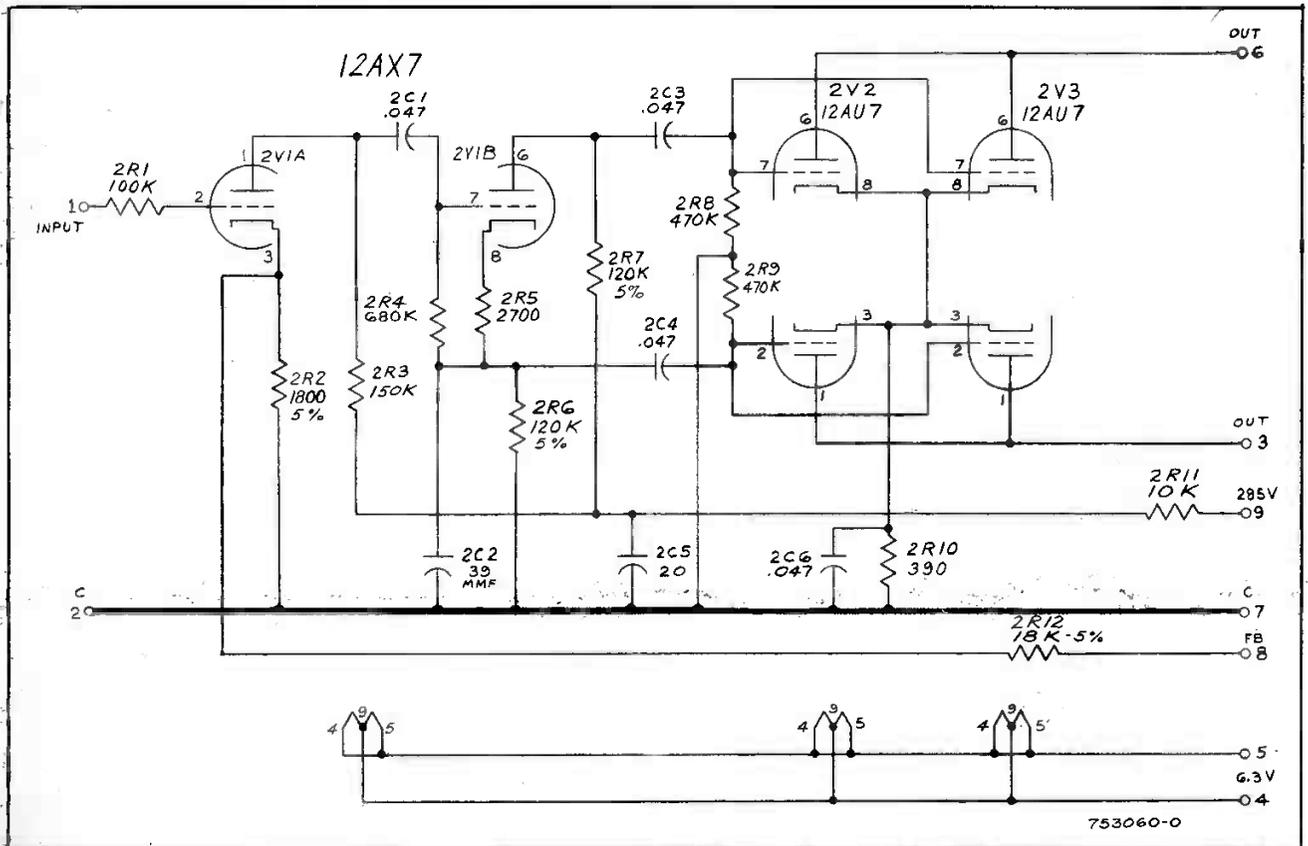
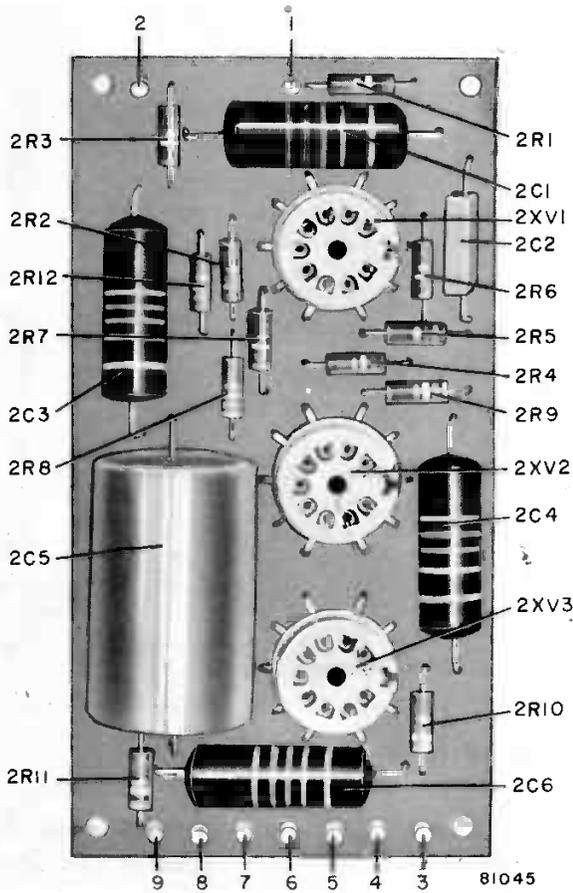


Figure 6—Schematic Diagram for Program Amplifiers 5AR13, 5AR14



**Figure 7—Program Amplifier 5AR13, 5AR14**

**Program Amplifiers 5AR13 — 5AR14**

The program or line amplifiers in the BC-6A are identified as CH 1 LINE AMP, 5AR13 and CH 2

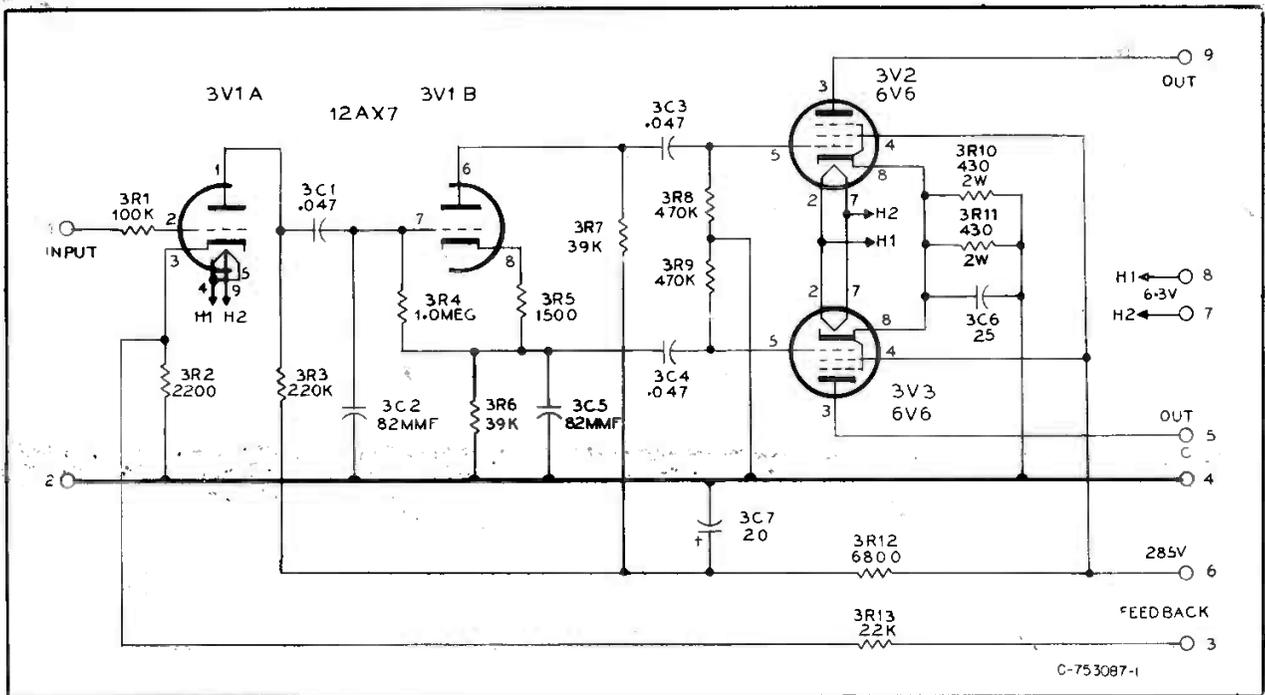
LINE AMP, 5AR14. The etched wiring board contains all the electrical components except the output transformers 5T10 and 5T11 which are mounted on the chassis directly in the front of each program amplifier 5AR14 and 5AR13 respectively. A 12AX7 twin triode is used for the input and phase inverter stages, driving two 12AU7 twin triodes which are connected in push-pull parallel. Negative feedback is derived from a tertiary winding on the output transformer. An input voltage of approximately 1.35 volts is required to obtain an output of 30 dbm.

**Monitor Amplifiers 5AR15 — 5AR16**

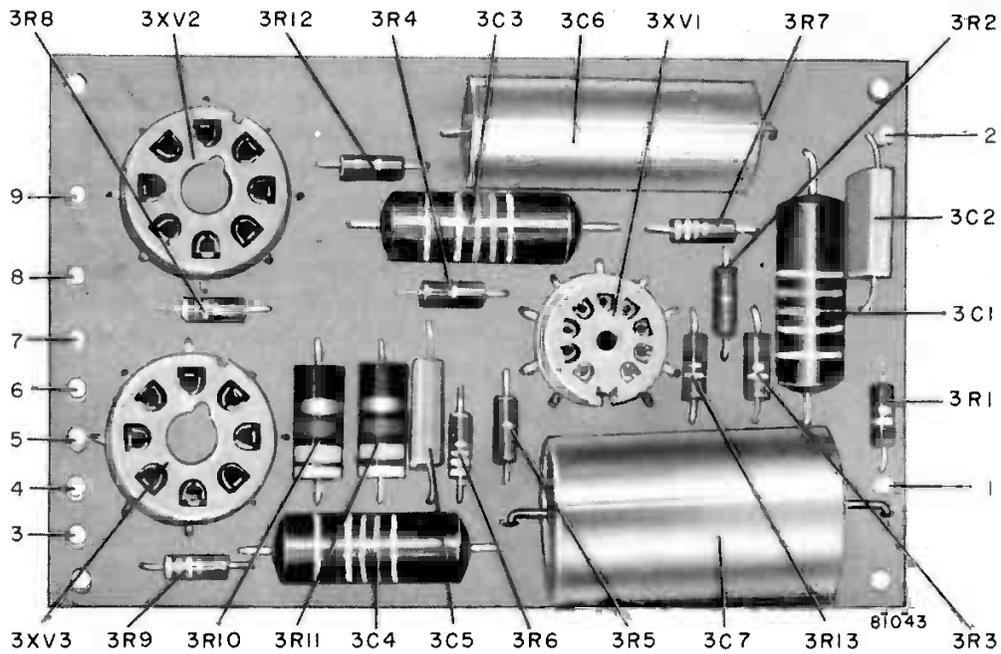
The monitor amplifiers in the BC-6A are identified as CUE FEED MON (5AR15) and PGM TB MON (5AR16) respectively. The circuit and construction of the monitor amplifier are similar to the program amplifiers. The transformers 5T13 and 5T12 are mounted directly in front of the monitor amplifier printed circuit boards. To obtain rated output level of 6 watts, a pair of 6V6-GT tubes are used in a push-pull output stage. Approximately 1.32 volts input are required to obtain 1 watt output. The transformer secondary has taps for 600/150/16/8/4 ohm loading.

**Power Supplies 5PS1 — 5PS2**

The BC-6A has two power supplies, each powers a single channel and alternate pre-amplifiers to provide greater continuity of service. The 5PS1 supplies power



**Figure 8—Schematic Diagram for Monitor Amplifier 5AR15, 5AR16**

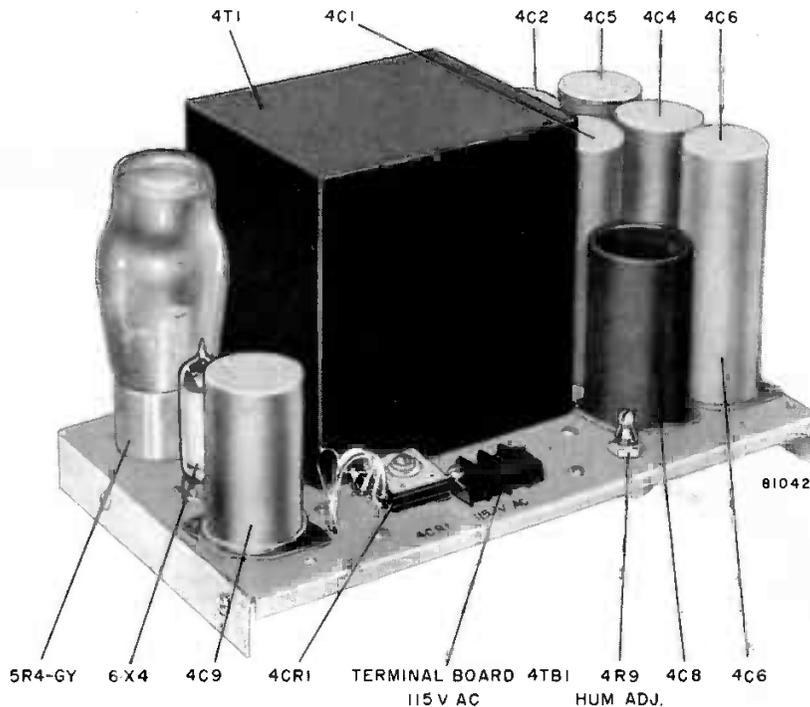


**Figure 9—Monitor Amplifier 5AR15, 5AR16 Printed Circuit Board**

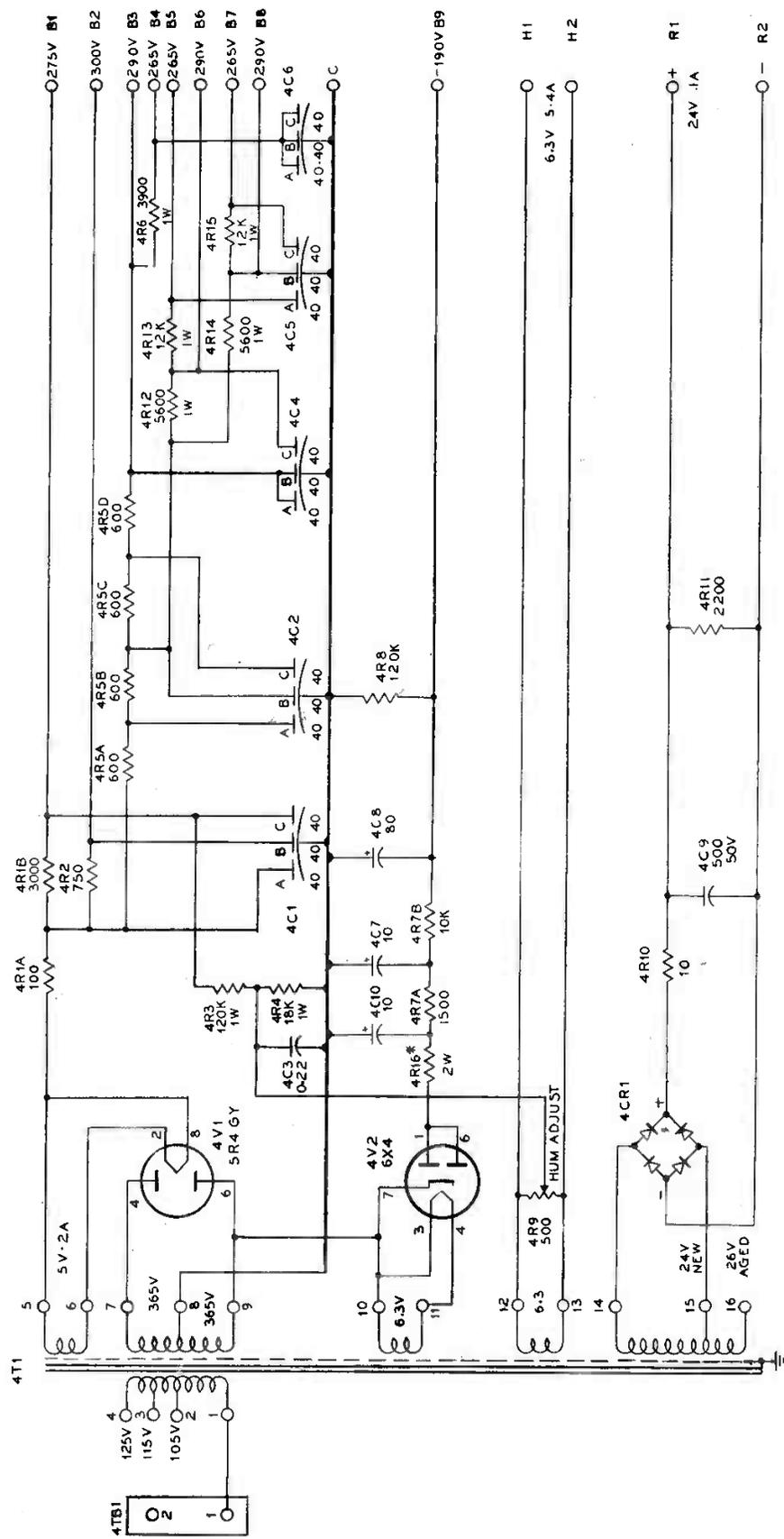
to odd numbered amplifiers and CH 1 VU meter lights; the 5PS2 supplies power to even numbered amplifiers and CH 2 VU meter lights.

The power supply is designed for operation from 100–130 V 50/60 cycle power line. Transformer primary taps are available for nominal line voltage of 105, 115 and 125 volts. The plate supply voltages are

obtained from a 5R4GY full-wave rectifier tube and filtered by several stages of RC networks which provide both isolation and sufficiently low ripple for the various amplifier stages. A negative supply voltage is obtained from a 6X4 tube connected as a half-wave rectifier. The 6.3 v heater winding connects through a hum adjustment potentiometer to a positive bias



**Figure 10—Power Supply 5PS1, 5PS2**



636098-2

ALL RESISTOR VALUE  
 UNLESS OTHERWISE  
 SPECIFIED.  
 \* 4R16, 680Ω WHEN I  
 LED IN M1-11637&M1-11638.  
 LED IN M1-11641.

Figure 11—Schematic Diagram for Power Supply (15PS1, 5PS2)



voltage to minimize hum due to heater to cathode leakage. A full wave bridge type selenium rectifier supplies d.c. power to the speaker relays. A tap is provided on the transformer winding to compensate for ageing of the rectifier.

### Fixed Pads

Etched wiring techniques are employed in the construction of certain fixed attenuators. The same basic board accommodates various circuit configuration and resistance values. The line input pads 5AT15 and 5AT16 are balanced, center-tapped H type having a loss of 30 db. The external monitor pads 5AT17 and 5AT18 are of the balanced L type having a loss of 30 db.

### Relays

Three relays are supplied mounted in the rear of the consolette. These are adequate for many station layouts; however, if two studios, with a control room and an Announce Booth make up the station, an additional relay must be installed. Space has been left for the mounting of an additional relay (5K4) beside 5K3. This fourth relay has been included in the diagrams and photographs. Refer to the figures 22 and 23. Order this relay as MI-11748 Speaker Relay Kit.

### Script Holder

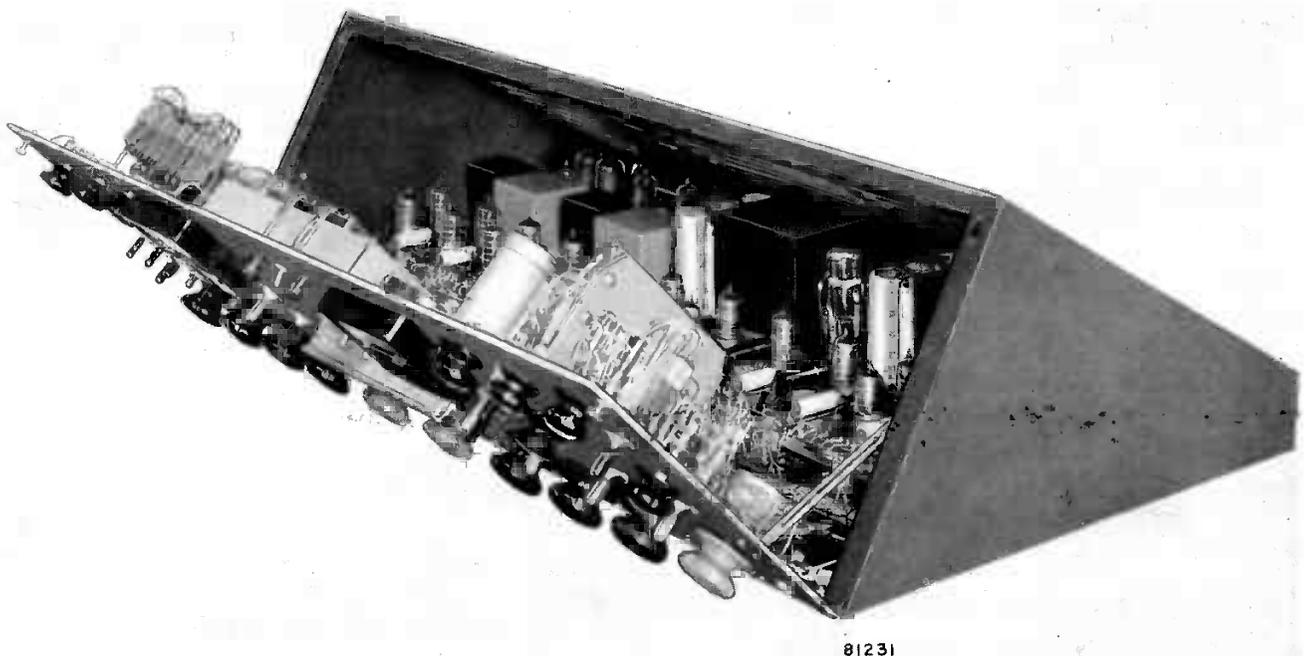
As shown in figure 1, an aluminum bracket is mounted on the BC-6A Control Panel just under the

loudspeaker toggle switches. This bracket is designed to hold the clip board which is used in broadcast stations to hold the standard 8½" x 11" script sheets.

### Overall System

As shown in the block diagram, figure 22, there are five mixing channels for low level microphone inputs and two low level inputs for either turntable, tape or film sources. Two high level mixing channels have been provided for the network and remote line input channels.

The inputs to the nine mixer channels are selected by means of the input switches 5S1 to 5S8. The gain of each of the high level mixing channels is controlled by the mixer attenuators 5AT1 to 5AT9. The output of each mixing channel may be connected to either the channel 1 or channel 2 mixer busses. The signal is then amplified by the CH 1 and CH 2 Booster Amplifiers. The gain of these amplifiers is controlled by the CH 1 and CH 2 sub-master gain controls. With the single-dual channel switch 5S22 in the dual position, the output of each booster amplifier is fed through a section of the ganged Master gain control to the respective line amplifier. With the switch in the single position, the output of the two booster amplifiers are combined and then fed to both line amplifiers. The LINE 1 switch 5S23 and LINE 2 switch 5S24 permit connection of either or both lines to either channel. Two VU meters, one for each channel, indicate program output level. Bridging pads are provided for connection of external monitor amplifiers to



81231

Figure 13—Type BC-6A Consolette with Panel Open

both program channels. Two monitor amplifiers are provided. One for program monitoring and talk-back, which connects to the speaker terminals through muting relays. The input to this amplifier is selected by means of a push-button switch 5S18 from control room microphone for talk-back, from the output of channel 1 or channel 2 line amplifiers for monitoring and from three cue line inputs.

A cue feed monitor amplifier is provided for feeding cue or background sound to the studios or control room speakers without going through the speaker muting relays. The position of the switches 5S25, 5S26, 5S27 and 5S28 determines whether the speakers are fed from the Program-Talkback Monitor amplifier or the Cue Feed Monitor amplifier. The input to the Cue Feed Monitor amplifier is selected by a rotary switch 5S19 from REC CUE, REC 1, REC 2, NET, and REMOTE input channels and the CH 1 and CH 2 outputs.

The speaker muting relays are actuated by the microphone input selector switches and the associated

mixer output switches, and the talk-back switches to prevent acoustic feedback from speaker to microphone and to prevent talkback to a studio which is On Air. The same switches and the line output switches also control the signal light circuits for the control room, studios and announce booth. There are provisions for adapting the interlock circuits to various types of installation.

With the switch 5S21 in the OVERRIDE position, the remote lines are connected to the input of the program-monitor amplifier such that a call received over any of the remote lines will be heard over the monitor speakers. With the switch 5S21 in the PHONE position, the remote lines or output channels may be monitored by means of headphones plugged-in to the MON-PHONE jack 5J2. The line to be monitored is selected by means of the REMOTE-CUE-PHONE switch 5S20. With the switch 5S21 in the remote position, the output of the program-talk-back monitor is fed to the remote line selected by the switch 5S20.

## INSTALLATION

### Location of Console

The BC-6A Console may be installed on any flat top desk or table of suitable size. A minimum of  $\frac{1}{2}$  inch clearance should be allowed between the rear of the console and the wall. Refer to the typical installation and dimensional drawings figures 14 and 15.

### Type of Installation

A typical broadcast installation for a dual channel studio system using the BC-6A Console is shown in figure 16.

## WARNING

Do not remove top cover or open front panel with power turned on unless thoroughly familiar with this equipment. High voltages appear on the etched wiring boards and terminal blocks. Caution must be exercised when replacing tubes or servicing this equipment with power turned on.

### Tube Installation

Tubes are not supplied with the console and must be ordered as MI-11484. Insert the tubes in the

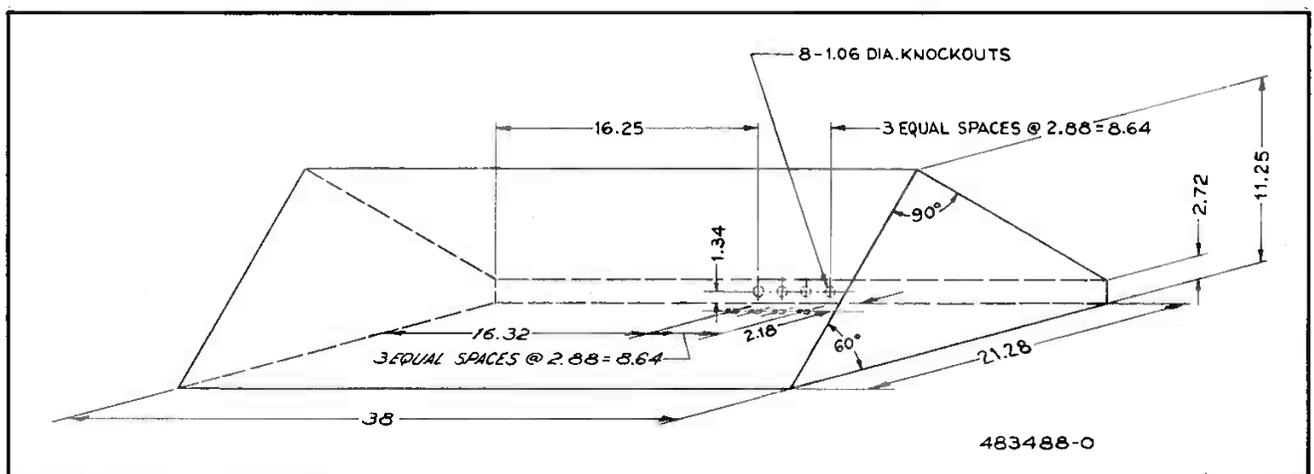
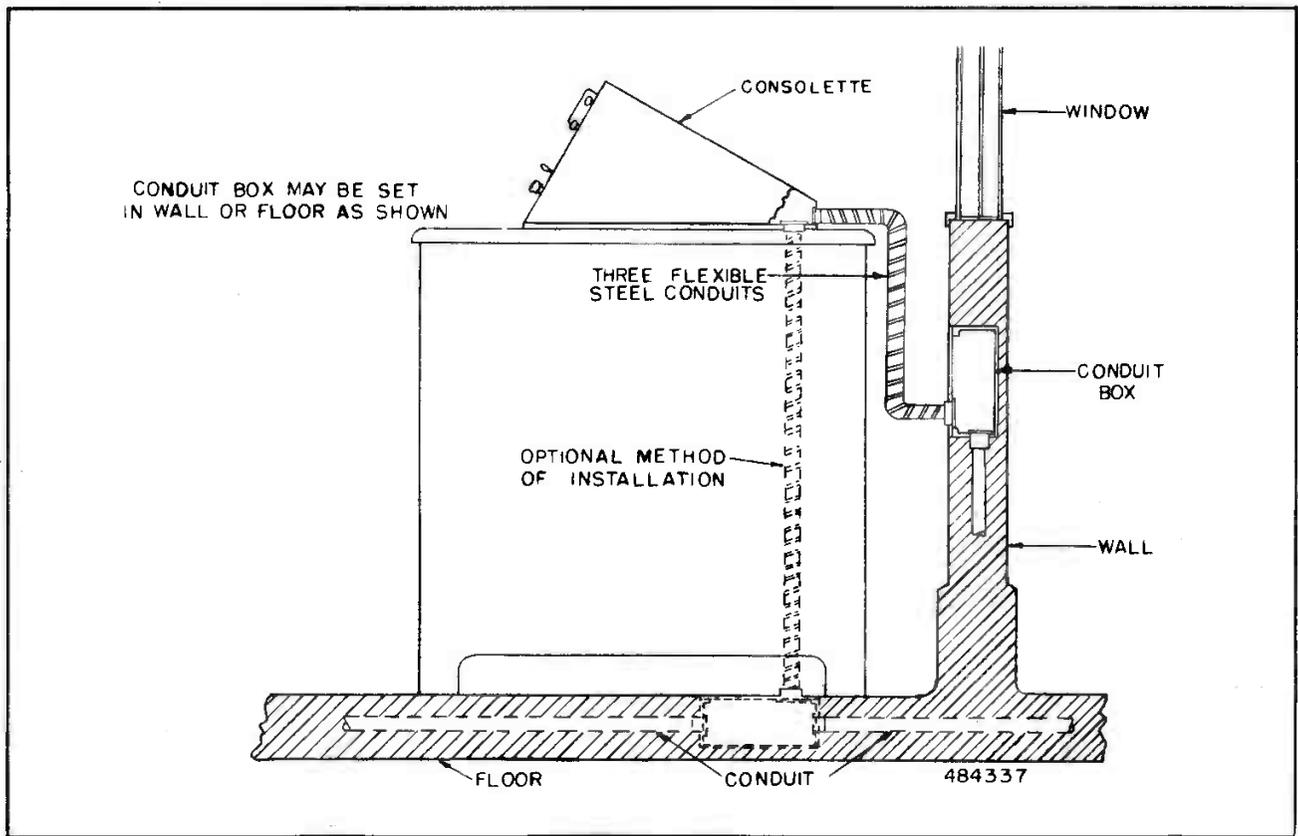


Figure 14—Installation Diagram for BC-6A



**Figure 15—Typical Cable Installation**

sockets as called for by figure 20. Install the selected 12AY7 (MI-11299) tubes in the sockets nearest the front (or top) of the preamplifiers and booster amplifier printed wiring boards. Slip the shields over the tubes where tube shield ground straps are provided on the sockets making certain that the ground strap is wedged between the tube envelope and the shield.

### Power Supply Connections

The Consolette has two power supply units, 5PS1 and 5PS2; each unit powers a single channel and alternate pre-amplifiers which provides a greater continuity of service. Both units are completely self-contained.

When shipped, the power transformers are connected for power line voltage of 110 to 120 volts. If the line voltage is outside this range, remove the four screws in each corner of the power supply chassis. Turn the power supply units chassis upside down. Remove the wire leading to terminal #3 of the power transformer 4T1. If the line voltage is between 100 and 110 volts, connect this wire to terminal #2; if it is between 120 and 130 volts, connect the wire to terminal #4. Replace the Power Supply. Connect the a.c. power line to the barrier type terminal block

4TB1 directly behind the power transformer on power supply 5PS1.

### Microphones, Turntables, Tape Recorders and Film Projectors

Connect microphones and turntables according to the table of connections on 5TB1. All microphones installed in the same studio should be phased alike. The input transformers 5T1 through 5T7 are connected for a balanced 150-ohm input. If a 600-ohm input is desired, reconnect as shown for 5T8 by removing the jumper between terminals 1 and 3 and 4 and 6 and jumper terminals 3 and 4. Remove the wire leading to terminal 5 and connect to terminal 4.

If a 37.5 ohm input is desired, remove the jumpers between terminals 1 and 3 and 4 and 6 and jumper 1 and 5 and 2 and 6. A center tap is not available for this impedance. If the tape recorders and film projectors have a higher output than microphone level ( $-50$  dbm), an attenuator network (pad) should be connected between the output of each recorder or projector and the input of the consolette.

### Remote Line and Network Inputs

Two 600/600 ohm pads, 5AT15 and 5AT16, having a loss of 30 db are inserted ahead of the input

transformers 5T8 and 5T9 respectively. This pad may be modified or removed if so desired. The input transformers 5T8 and 5T9 are connected for 600-ohm input. If desired they may be connected for 150-ohms by arranging the jumpers as shown in the schematic and wiring diagrams for 5T1.

### Line Equalizer

A line equalizer such as the RCA BE-2A (MI-11752) may be connected between terminals 45-46 of 5TB1 (input) and 49-50 (output). If a four terminal equalizer is used, the jumpers between 45-49 and 46-50 should be removed.

### Program Lines

The program output lines, LINE 1 and LINE 2, are connected to terminals 73 and 74, and 75 and 76 respectively. A dividing and isolation network having a loss of 6 db is included in the console.

### External Monitor Output

External monitor amplifiers may be connected to the built-in bridging pads 5AT17 and 5AT18, having an output impedance of 600 ohms, by making connections to terminals 77 and 78 for the CH 1 EXT. MON 1 and terminals 79 and 80 for the CH 2 EXT. MON 2.

### Loudspeaker Connections

The control room speakers are connected to terminals 89 and 90 and 91 and 92. Studio A speaker is connected to terminals 93 and 94; Studio B speaker to terminals 95 and 96 and the Announce Booth speaker to terminals 97 and 98.

The loudspeakers should have a voice coil impedance of 15-16 ohms. For other voice coil impedances, a matching transformer is suggested.

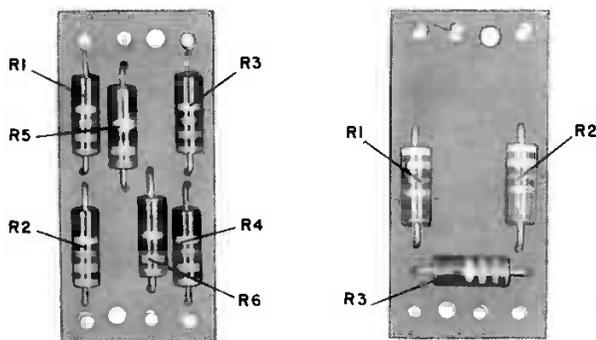


Figure 16—Fixed Pads 5AT15 (5AT16) and 5AT17 (5AT18).

### External Connections

Audio wiring should be segregated into low level (microphone, turntable, tape recorder or film) and high level (line input and output) cables or conduits; low level audio wiring should be kept away from AC power and signal light circuits. Connect a ground to the heavy bus wire adjacent to the audio terminal block.

#### CONNECTIONS AT TERMINAL BLOCK 5TB1

CR Microphone	1-2
Studio A Microphone 1	3-4 57
Announce Booth Microphone	5-6
Studio A Microphone 2	7-8 52
Studio B Microphone 3	9-10
Studio A Microphone 3	11-12 53
Studio B Microphone 4	13-14
Studio A Microphone 4	15-16 54
Studio B Microphone 5	17-18
Studio A Microphone 5	19-20
Tape 1	21-22
Film 1	23-24
Turntable 1	25-26
Tape 2	27-28
Film 2	29-30
Turntable 2	31-32
Network	33-34
Remote Line 1	35-36
Remote Line 2	37-38
Remote Line 3	39-40
Remote Line 4	41-42
Remote Line 5	43-44
Equalizer Input	45-46
Equalizer Output	49-50
CUE 1	53-54
CUE 2	55-56
CUE 3	57-58
Line Amp CH 1 (output)	65-66
Line Amp CH 2 (output)	67-68
PGM TB MON (Input CH 1)	69-70
PGM TB MON (Input CH 2)	71-72
Line 1 OUT	73-74
Line 2 OUT	75-76
EXT. MON CH 1	77-78
EXT. MON CH 2	79-80
PGM TB MON (output) (4 ohm)	81-82
PGM TB MON (output) (600 ohm)	83-84
CUE FEED MON (output) (4 ohm)	87-88
CR CUE (speaker)	89-90
CR MON (speaker)	91-92
ST A (speaker)	93-94
ST B (speaker)	95-96
AN B (speaker)	97-98
24 v Relay supply	101-102
✓Control Room CH 1 Signal Light Rly.	105-106
✓Control Room CH 2 Signal Light Rly.	107-108
✓Studio A CH 1 Signal Light Rly.	109-110
✓Studio A CH 2 Signal Light Rly.	111-112
✓Studio B CH 1 Signal Light Rly.	113-114
✓Studio B CH 2 Signal Light Rly.	115-116
ANN Booth CH 1 Signal Light Rly.	117-118
ANN Booth CH 2 Signal Light Rly.	119-120

### Announce Booth Speakers

If an announce booth speaker is to be used in addition to a single studio and control room, as a program source for the console, the announce booth speaker should be connected to the Studio B speaker terminals (95-96). If the announce booth is used in a two studio installation, an additional relay, 5K4, resistor 5R72 and capacitor 5C4 must be installed in the space provided on the relay bracket adjacent to the 5K3 relay. These components may be obtained by ordering the MI-11748 Speaker Relay Kit. All wiring is provided. Follow the wiring diagram in making connections.

### Warning Lights

MI-11702A warning light relays, operated by the microphone input selector switches, mixer and line output switches may be connected to the appropriate terminals of 5TB1 (see table of connections). These relays in turn will actuate the MI-11706 Series of warning lights.

### Hum Adjustments

Before placing the console in operation, make the following adjustments:

1. Set the input selector switches 5S1 to 5S5 to the center OFF position. Make sure that the other inputs are terminated in a resistance.
2. Set the mixer output switches 5S9, 11, 13, 15, and 17 to CH 1 and 5S10, 12, 14 and 16 to CH 2.

3. Set mixer and sub-master and master gain controls to max. gain position (5AT1 to 5AT11 and 5AT14). Set SINGLE-DUAL CHANNEL switch 5S22 to DUAL.
4. With the LINE 1 output switch on CH 1, adjust the hum control 4R9 on the power supply 5PS1 for minimum hum at LINE 1 output terminals 73-74. With the LINE 1 output switch on CH 2, adjust the hum control 4R9 on the power supply 5PS2 for minimum hum at LINE 1 output, terminals 73-74.

### Cue Switches on Mixer Gain Controls

The mixer attenuators 5AT6 and 5AT7 in the Turntable, Tape or Film channels are provided with switches which connect the output of the first two stages of the pre-amplifiers to the Cue Feed Mon. Amplifier when the cue feed selector switch 5S19 is in the REC. CUE position. This permits the cueing of one turntable, tape recorder, or film projector while the other is feeding program.

If it is desired to have cue switches on the other mixer control, attenuators with built-in cue switches may be obtained from Replacement Parts by ordering Stock #211003.

### VU Meter Attenuator

Two VU meters, one for each channel, are mounted on the front panel of the BC-6A Console. Each VU meter attenuator is designed to give a meter reading of 100 (0 on the VU scale) with an output

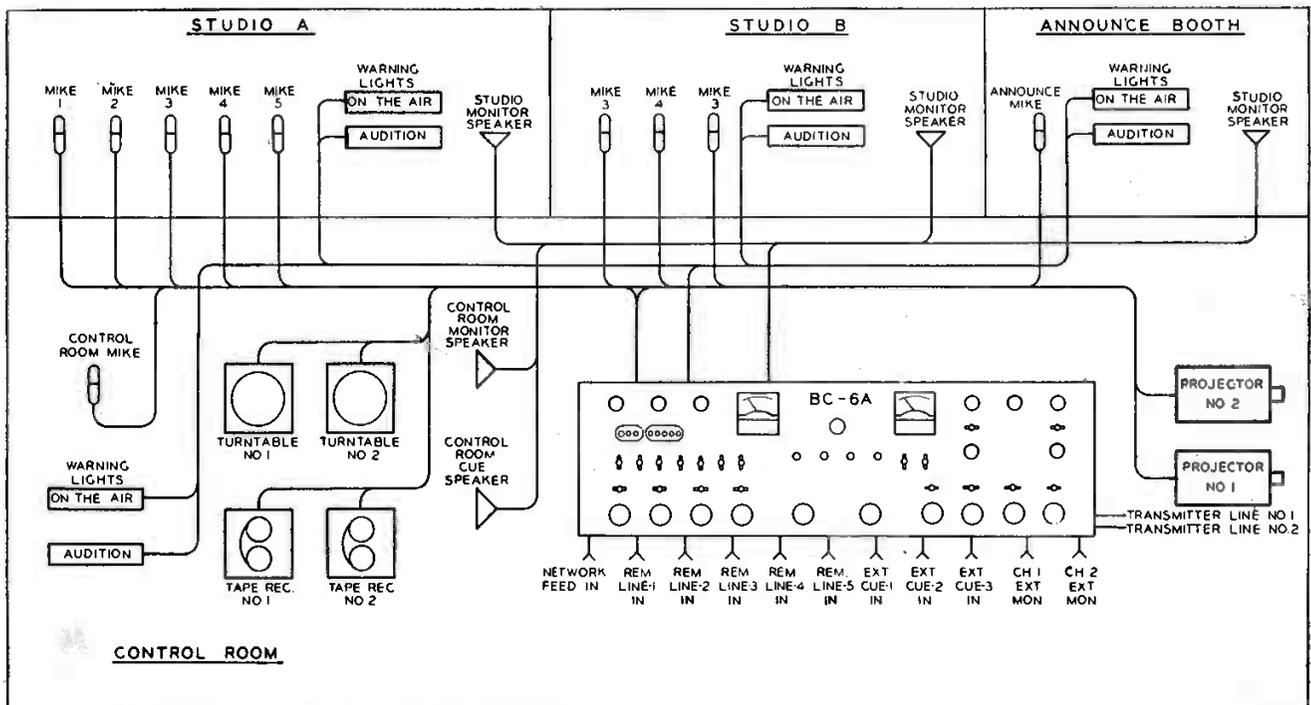


Figure 17—Typical Installation for Studio

of 8 dbm delivered to a 600-ohm load connected to the program output terminals for each channel. If it is desired to have the meters read 100 at another output level, replace resistors 5R33, 5R34, 5R35 for meter 5M1 and resistors 5R47, 5R48, 5R49 for meter 5M2 with the values contained in the table shown below:

Output Level (DBM)	5R33 and 5R47 ohms	5R34 and 5R48 ohms	5R35 and 5R49 ohms
-2	0	3600	omit
0	447	4047	16790
2	883	4482	8180
4	1296	4896	5220
6	1679	5279	3690
8	2026	5626	2741
10	2334	5934	2091
12	2603	6203	1621
14	2833	6433	1268

**Control Circuits**

The consolette is shipped with the control circuits wired for installations consisting of a control room and two studios. Refer to figure 23.

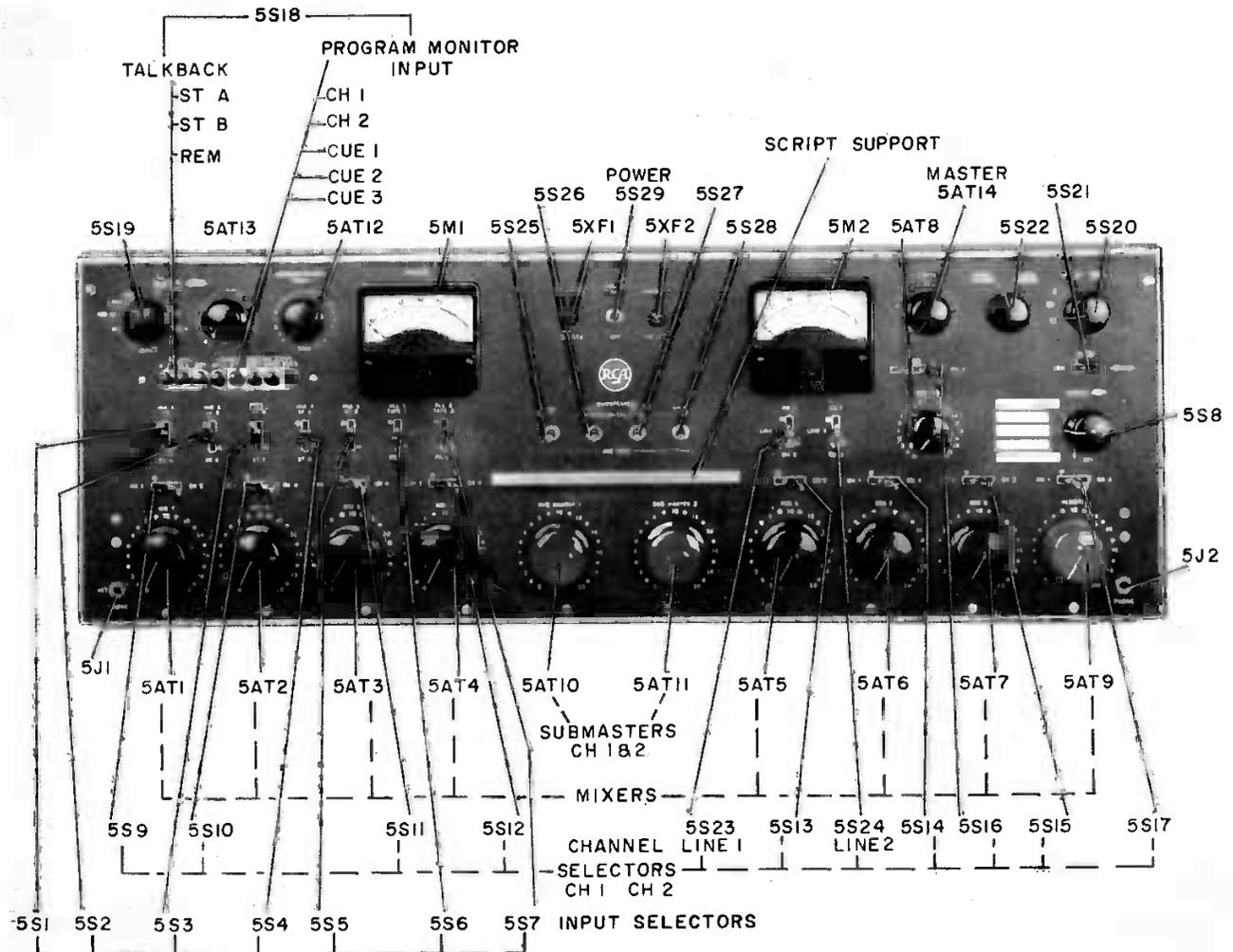
**Single Studio Installation**

If the consolette is to be used with a single studio, the Studio A and Studio B microphones may be combined in the one studio. To adapt the interlocking functions for the type of operation, the strapping on terminal board 5TB2 must be changed. This terminal board is located on the inside of the panel between the two VU meters. Remove all jumper wires between terminals and add jumpers between the following terminals: 8-9, 12-19, 13-20, 14-15, 16-17, 21-22 and 23-24.

**Talkback Interlock**

The control circuits are interlocked to prevent talkback to a studio when a studio microphone feeds on output line through either channel.

If it is desired to use CH 1 as one audition channel to permit talkback to the studios while a microphone is feeding an output line through channel 2, install jumpers between terminals 5-20 and 6-7 on terminal board 5TB2.



**Figure 18—Control Panel**

## OPERATION

The front panel, figure 18, and the chart *Control Functions* supply complete identification and function of all controls and switches on the control panel. It is advisable to be familiar with this information for thorough understanding of the flexibility of the equipment.

### Routine Procedure

Turn the power switch ON and allow the equipment to warm up approximately 5 minutes. The operating procedure for putting a program ON the air from either studio, using any combination of inputs is as follows:

1. Select the input desired.
2. Move the corresponding CH 1/CH 2 mixer switch to the desired channel.
3. Turn corresponding mixer attenuator up.
4. Turn the MASTER and SUB-MASTERS 1 or 2 gain controls to the level desired. The master gain control 5AT14 should normally be set at or near the maximum clockwise position.
5. Check the level on the VU meter.
6. Monitor the selected input by pressing the PROGRAM TALKBACK Monitor-INPUT pushbuttons CH 1 or CH 2, to the selected input. The NET or REM inputs may be monitored through headphones plugged into the jacks 5J1 and 5J2 respectively.

### Single and Dual Operation with Master Gain Controls

The SINGLE CHANNEL/DUAL CHANNEL switch should be set immediately after the power is turned ON. While the program sources may be adjusted by the individual mixer, groups of mixers may be adjusted with the sub-master or master gain controls.

The possible adjustments for each type of operation are as follows:

#### 1. Dual Channel Operation

Dual channel operation is the transmitting of two programs over two separate outputs; each program is a combination of inputs. Each input is adjusted by its individual mixer. Then adjust the SUB-MASTER gain controls until the VU meters, one for each channel, indicate peaks of 100%. If it is desired to fade each channel independently, use the appropriate sub-master gain control. If it is desired to fade both channels simultaneously, use the

MASTER gain control. In the usual operation, however, this control should be set between 16 and 20. Set the LINE 1 and LINE 2 lever switches to the corresponding CH 1 and CH 2 positions.

#### 2. Single Channel Operation

Single Channel operation is the transmitting of one program over one or both output lines. The program sources may be adjusted for the desired output level by the individual mixers or in groups by the SUB-MASTER gain controls. These program sources if divided between the outputs, CH 1 or CH 2, may be adjusted as desired using the SUB-MASTER gain controls or the whole program may be faded in or out by means of the MASTER gain control. Set the LINE 1 and LINE 2 output switches to either CH 1 or CH 2 as the same program is being fed over both the CH 1 and CH 2 line amplifiers.

### Program Monitoring

1. Set the LOUDSPEAKER toggle switches, 5S25 through 5S28, to the PROGRAM TALKBACK position.
2. Press pushbutton CH 1 or CH 2 of switch 5S18 to monitor the output of the line amplifiers for CH 1 or CH 2 respectively.
3. Adjust the PROGRAM TALKBACK MONITOR gain control 5AT12 for the desired output level over the loudspeakers.
4. The program monitor will be heard over the control room, studio and announce booth speakers provided the microphone in the same room is not "ON". By "ON" is meant that an input selector switch is set to the particular room (Control Room, Announce Booth, Studio A or B) and its associated mixer output switch is in either the CH 1 or CH 2 position.

### Talkback

1. *To talkback to Studio A or B*
  - a. Make certain that the studio selected for the talkback operation is not on the air. Due to interlocking circuits, it is impossible to talkback to a studio which is on the air.
  - b. Press the pushbutton STA or STB on the TALKBACK switch 5S18.
  - c. Use the control room microphone.
  - d. Adjust the level by means of the PROGRAM-TALKBACK MONITOR gain control 5AT12.

## CONTROL FUNCTIONS

<i>Panel Designation</i>	<i>Symbol</i>	<i>Color Knob</i>	<i>Function</i>	<i>Coordinated with</i>
<b>INPUT SELECTOR SWITCHES</b>				
MIC 1 CR ST A	5S1	Black	Connect microphone in control room or in Studio A through preamplifier 5AR1 to mixer 5AT1	5S9, 5AT1
MIC 2 AN B ST A	5S2	Black	Connects microphone in announce booth or in Studio A through preamplifier 5AR2 to mixer 5AT2	5S10, 5AT2
MIC 3 ST B ST A	5S3	Black	Connects microphone in Studio B or in Studio A through preamplifier 5AR3 to mixer 5AT3	5S11, 5AT3
MIC 4 ST B ST A	5S4	Black	Connects microphone in Studio B and Studio A through preamplifier 5AR4 to mixer 5AT4	5S12, 5AT4
MIC 5 ST B ST A	5S5	Black	Connects microphone in Studio B and Studio A through preamplifier 5AR5 to mixer 5AT5	5S13, 5AT5
REC 1 TAPE 1 FILM 1 TT 1	5S6	Blue	Connects tape recorder 1, film projector 1 or turntable 1 through preamplifier 5AR6 to mixer 5AT6	5S14, 5AT6
REC 2 TAPE 2 FILM 2 TT 2	5S7	Blue	Connects tape recorder 2, film projector 2 or turntable 2 through preamplifier 5AR7 to mixer 5AT7	5S15, 5AT7
REMOTE INPUT	5S8	Black	Connects from 5 lines through the preamplifier 5AR9 to mixer 5AT9	5S17, 5AT8
<b>MIXER ATTENUATORS</b>				
MIC 1	5AT1	Black	Controls the gain of mic in control room and Studio A	5S1, 5S9
MIC 2	5AT2	Black	Controls the gain of mic in announce booth and Studio A	5S2, 5S10
MIC 3	5AT3	Black	Controls the gain of mic in Studio B and A	5S3, 5S11
MIC 4	5AT4	Black	Controls the gain of mic in Studio B and A	5S4, 5S12
MIC 5	5AT5	Black	Controls the gain of mic in Studio B and A	5S5, 5S13
REC 1	5AT6	Blue	Controls gain for tape reproducing, film or turntable for unit 1	5S6, 5S14
REC 2	5AT7	Blue	Controls gain for tape reproducing, film or turntable for unit 2	5S7, 5S15
NETWORK	5AT8	Black	Controls gain of network line	5J1, 5S16
REMOTE	5AT9	Red	Controls gain for remote lines (5)	5S8, 5S17
<b>CHANNEL SELECTOR SWITCHES</b>				
CH 1 — CH 2	5S9 5S10 5S11 5S12 5S13 5S14 5S15 5S16 5S17	Black Black Black Black Black Blue Blue Black Red	Connects the output of preamplifiers to CH 1 bus or CH 2 bus	5AT1 5AT2 5AT3 5AT4 5AT5 5AT6 5AT7 5AT8 5AT9
<b>GAIN CONTROLS</b>				
MASTER	5AT14	Black	Controls gain of CH 1 and CH 2 outputs	
SUB MASTER 1	5AT11	Green	Controls the gain for CH 1 output only	
SUB MASTER 2	5AT10	Green	Controls the gain for CH 2 output only	

<i>Panel Designation</i>	<i>Symbol</i>	<i>Color Knob</i>	<i>Function</i>	<i>Coordinated with</i>
<b>LINE OUTPUT SWITCHES</b>				
LINE 1	5S23	Green	Selects channel 1 or channel 2 output	
LINE 2	5S24	Green	Selects channel 1 or channel 2 output	
<b>SELECTOR SWITCH</b>				
SINGLE CHANNEL	5S22	Black	Selects type of operation; two independent output channels (DUAL) or single output channel with split mixers (SINGLE)	
DUAL CHANNEL				
<b>REMOTE LINE CONTROLS</b>				
REM CUE PHONE	5S20	Black	Positions: CH 1 — CH 2 — Remote Line 1 through 5. Selects input to monitor phone (5J2). Selects remote line for talk-back and CUE	5S8 5S21
REMOTE PHONE OVERRIDE	5S21	Black	Three-position switch; PHONE to hear the remote program and determine if it is one desired through headphones in jack 5J2. OVERRIDE position connects input of PGM TB MON to unused remote lines. Signal from remote line overrides program being monitored. REMOTE position used to talkback to remote line.	5AR16
<b>MONITORING CONTROLS</b>				
PROGRAM MONITOR INPUT	5S18		Selects input for program talkback monitor channel	5AT12
ST A		Red	Pushbuttons Talkback to Studio A	
ST B		Red	Talkback to Studio B	
REM		Red	Talkback to Remote Line	5S20, 5S21
CH 1		Black	Pushbuttons Monitor Program CH 1	
CH 2		Black	Monitor Program CH 2	
CUE 1		Black	Monitor Cue Line 1	
CUE 2		Black	Monitor Cue Line 2	
CUE 3		Black	Monitor Cue Line 3	
PROGRAM TALK-BACK MONITOR GAIN	5AT12	Black	Adjusts output Level of program-talkback monitor amplifier	5S18
CUE FEED MONITOR INPUT SELECTOR	5S19	Black	Selects input for Cue Feed Monitor amplifier	5AT13
OFF				
REC: CUE			Recorded Input Channels	5S6, 5S7 5AT6, 5AT7
REC 1			REC. Input 1	5S6, 5AT6
REC 2			REC. Input 2	5S7, 5AT7
NET			NET	5AT8
REMOTE			Remote lines 1 to 5	5S8, 5AT9
CH 1			Channel 1	
CH 2			Channel 2	
CUE FEED MONITOR GAIN CONTROL	5AT13	Black	Controls output Level of Cue Feed Monitor Amplifier	5S19
<b>LOUDSPEAKER SWITCHES</b>				
CR	5S25	Chrome	Control Room Speaker	
ST A	5S26	Chrome	Studio A Speaker	
ST B	5S27	Chrome	Studio B Speaker	
AN B	5S28	Chrome	Announce Booth Speaker	
			Each toggle switch has two positions: PROGRAM—TALKBACK: CUE FEED	

- e. In a single studio installation, use the STA button to talk to the studio and the STB button to talk to the Announce Booth.
- f. In a two-studio installation, use any talkback button to talk to the Announce Booth.

NOTE: The above procedure "f" is applicable only when the optional relay is installed.

2. *To talkback over a remote line*

- a. Press the REM pushbutton of the TALKBACK switch 5S18.
- b. All loudspeakers are silent.
- c. Select the remote line on the REMOTE-CUE-PHONE selector switch 5S20.
- d. Place the OVERRIDE-PHONE-REMOTE switch 5S21 at the REMOTE position.

### Cue Line Monitoring

Three cue lines may be selected by means of the CUE 1, CUE 2 and CUE 3 buttons of the switch 5S18. This is heard over the program talkback monitor.

### Cue and Background

Set the loudspeaker toggle switches, 5S25 through 5S28 which correspond to the speaker over which cue or background sound is to be transmitted to the CUE FEED position.

NOTE: If a separate CUE FEED speaker is installed in the Control Room, it is not necessary to throw the switch 5S25 to the CUE FEED position.

1. *To cue recorded input channels*

- a. Set the cue feed monitor input selector switch 5S13 to REC CUE position.
- b. Set the selector switch 5S6 or 5S7 to the source to be cued—TAPE, TT, FILM.
- c. Turn the mixer gain control of the channels to be cued to 0 or maximum counter clockwise position.
- d. Adjust the gain by means of CUE-FEED-MONITOR GAIN control, 5AT13.

2. *To cue or feed background from the REC 1 or REC 2 channels*

- a. Set 5S19 to REC 1 or REC 2 position.
- b. Set 5S6 or 5S7 to the desired source.
- c. Output level is determined by the position of the mixer gain controls 5AT6 or 5AT7 and 5AT13.

3. *To cue or feed background from NETWORK or REMOTE LINES*

- a. Set at 5S19 to the NET or REMOTE position.
- b. Select the remote source by means of 5S8.
- c. Adjust the level by means of 5AT8 or 5AT9 and 5AT13.

4. *To derive cue or background with switch 5S19 set at CH 1 or CH 2*

- a. Care should be taken not to feed background to a studio from CH 1 or CH 2 if a microphone in that studio is a source for CH 1 or CH 2 since the loudspeakers are not muted when connected to the cue feed monitor amplifier.
- b. Background may be fed to a studio from a program originating in another studio, control room or announce booth provided there is sufficient acoustic isolation.

### Locating Program Over Remote Lines

If it is not known over which of the five remote lines a program is to be received, either of the following procedures may be used:

1. *Using Headphones*

- a. Plug a headset into the MONITOR PHONE jack 5J2.
- b. Set the switch 5S21 to the PHONE position.
- c. Rotate the switch 5S20 through line 1 to line 5 position until the desired program is heard.
- d. The pointer of the switch knob (5S20) indicates the number of the desired line.

2. *Using Monitor Speaker*

- a. Set the switch 5S21 to the OVERRIDE position.
- b. Rotate the switch 5S20 through line 1 to line 5 positions until the desired program is not heard.
- c. The pointer of the switch (5S20) knob indicates the number of the desired line.

NOTE: With either of the above methods, it is not possible to hear a program originating over a remote line which is selected by the remote input selector switch 5S8. Do *not* depress the CH 1 or CH 2 buttons of the PROGRAM-TALKBACK MONITOR input selector switch 5S18 while using the override feature.

- e. In a single studio installation, use the STA button to talk to the studio and the STB button to talk to the Announce Booth.
- f. In a two-studio installation, use any talkback button to talk to the Announce Booth.

NOTE: The above procedure "f" is applicable only when the optional relay is installed.

2. *To talkback over a remote line*
  - a. Press the REM pushbutton of the TALKBACK switch 5S18.
  - b. All loudspeakers are silent.
  - c. Select the remote line on the REMOTE-CUE-PHONE selector switch 5S20.
  - d. Place the OVERRIDE-PHONE-REMOTE switch 5S21 at the REMOTE position.

### Cue Line Monitoring

Three cue lines may be selected by means of the CUE 1, CUE 2 and CUE 3 buttons of the switch 5S18. This is heard over the program talkback monitor.

### Cue and Background

Set the loudspeaker toggle switches, 5S25 through 5S28 which correspond to the speaker over which cue or background sound is to be transmitted to the CUE FEED position.

NOTE: If a separate CUE FEED speaker is installed in the Control Room, it is not necessary to throw the switch 5S25 to the CUE FEED position.

1. *To cue recorded input channels*
  - a. Set the cue feed monitor input selector switch 5S13 to REC CUE position.
  - b. Set the selector switch 5S6 or 5S7 to the source to be cued—TAPE, TT, FILM.
  - c. Turn the mixer gain control of the channels to be cued to 0 or maximum counter clockwise position.
  - d. Adjust the gain by means of CUE-FEED-MONITOR GAIN control, 5AT13.
2. *To cue or feed background from the REC 1 or REC 2 channels*
  - a. Set 5S19 to REC 1 or REC 2 position.
  - b. Set 5S6 or 5S7 to the desired source.
  - c. Output level is determined by the position of the mixer gain controls 5AT6 or 5AT7 and 5AT13.

3. *To cue or feed background from NETWORK or REMOTE LINES*
  - a. Set at 5S19 to the NET or REMOTE position.
  - b. Select the remote source by means of 5S8.
  - c. Adjust the level by means of 5AT8 or 5AT9 and 5AT13.
4. *To derive cue or background with switch 5S19 set at CH 1 or CH 2*
  - a. Care should be taken not to feed background to a studio from CH 1 or CH 2 if a microphone in that studio is a source for CH 1 or CH 2 since the loudspeakers are not muted when connected to the cue feed monitor amplifier.
  - b. Background may be fed to a studio from a program originating in another studio, control room or announce booth provided there is sufficient acoustic isolation.

### Locating Program Over Remote Lines

If it is not known over which of the five remote lines a program is to be received, either of the following procedures may be used:

1. *Using Headphones*
  - a. Plug a headset into the MONITOR PHONE jack 5J2.
  - b. Set the switch 5S21 to the PHONE position.
  - c. Rotate the switch 5S20 through line 1 to line 5 position until the desired program is heard.
  - d. The pointer of the switch knob (5S20) indicates the number of the desired line.
2. *Using Monitor Speaker*
  - a. Set the switch 5S21 to the OVERRIDE position.
  - b. Rotate the switch 5S20 through line 1 to line 5 positions until the desired program is not heard.
  - c. The pointer of the switch (5S20) knob indicates the number of the desired line.

NOTE: With either of the above methods, it is not possible to hear a program originating over a remote line which is selected by the remote input selector switch 5S8. Do not depress the CH 1 or CH 2 buttons of the PROGRAM-TALKBACK MONITOR input selector switch 5S18 while using the override feature.

### To Feed Cue to a Remote Line

1. Select the program to be fed over a remote line on the Program Talkback Monitor amplifier.
2. Select the remote line over which the cue signal is to be fed by means of the switch 5S20.
3. Set the switch 5S21 to REMOTE position.
4. Adjust the level by means of the PROGRAM-TALKBACK MONITOR GAIN control 5AT12.

### Emergency Operation

In case of failure of one power supply, the program may be continued with reduced facilities on one channel. Power Supply 5PS1 supplies power to odd-numbered pre-amplifiers, channel 1 booster and line amplifiers, cue feed monitor amplifier, and channel 1 VU meter lamps. Power Supply 5PS2 supplies power to the even-numbered pre-amplifiers, the channel 2 booster and line amplifiers, the program talkback

monitor amplifier and the channel 2 VU meter lamps. Each power supply is individually fused. The fuse holders are mounted on the front panel between the VU meters.

In case of failure of the power supply 5PS1, switch the mixer output selector switches and line output selector switches to CH 2. Use only MIC 2, MIC 4, REC 1 and NET mixing channels. If a remote program is to be carried, the remote line should be patched into the network input.

In case of failure of the power supply 5PS2, switch the mixer output selector switches and the line output switches to the channel 1 position. Use only MIC 1, MIC 3, MIC 5, REC 2 and REMOTE mixing channels. If it is necessary to transmit a network program, patch the network line into one of the remote line inputs. Use the cue feed monitor amplifier for monitoring the program.

## MAINTENANCE

The BC-6A Dual Channel Audio Console may be easily serviced without disturbing the installation. The top cover which can be easily removed is fastened to the console by four Camloc fasteners. The front panel is hinged at the bottom and secured at the top by two Camloc fasteners. The front panel is held in the open position by two fall-supports.

### Tubes

The tubes of the amplifiers and power supply should be checked periodically either in a tube tester or by measuring the socket voltages. Refer to the Tube Socket Voltage chart. The values shown are measured with a voltmeter having a resistance of 20,000 ohms-per-volt. Slight variations may be due to component tolerances.

### TUBE SOCKET VOLTAGES

Tube Socket	1	2	3	4	5	6	7	8	9
<b>PRE-AMPLIFIER (5AR1 — 5AR9)</b>									
1XV1	175-205	0	4-5	*	*	140-170	0	1.7-2.0	**
1XV2	115-140	0	3-4	*	*	285	—	-0.2 +0.2	**
<b>BOOSTER-PREAMPLIFIERS (5AR10 — 5AR12)</b>									
1XV1	175-205	0	4-5	*	*	140-170	0	1.7-2.0	**
1XV2	115-140	0	3-4	*	*	285	—	110-130	**
<b>PROGRAM AMPLIFIER (5AR13 — 5AR14)</b>									
2XV1	130-150	0	1.15-1.40	*	*	180-210	—	55-65	**
2XV2	280	0	10-12	*	*	280	0	10-12	**
2XV3	280	0	10-12	*	*	280	0	10-12	**
<b>MONITOR AMPLIFIER (5AR15 — 5AR16)</b>									
3XV1	125-145	0	1.10-1.30	*	*	225-250	—	38-48	**
3XV2	—	*	285-290	290	—	—	**	15-18	—
3XV3	—	*	285-290	290	—	—	**	15-18	—
<b>POWER SUPPLY (5PS1 — 5PS2)</b>									
4XV1	—	380***	—	365 AC	—	365 AC	—	380***	—
4XV2	-380	—	365 AC*	365 AC*	—	-380	365 AC	—	—

5 VAC between points marked \*\*\*

6.3 VAC between terminals marked by single and double asterisks.

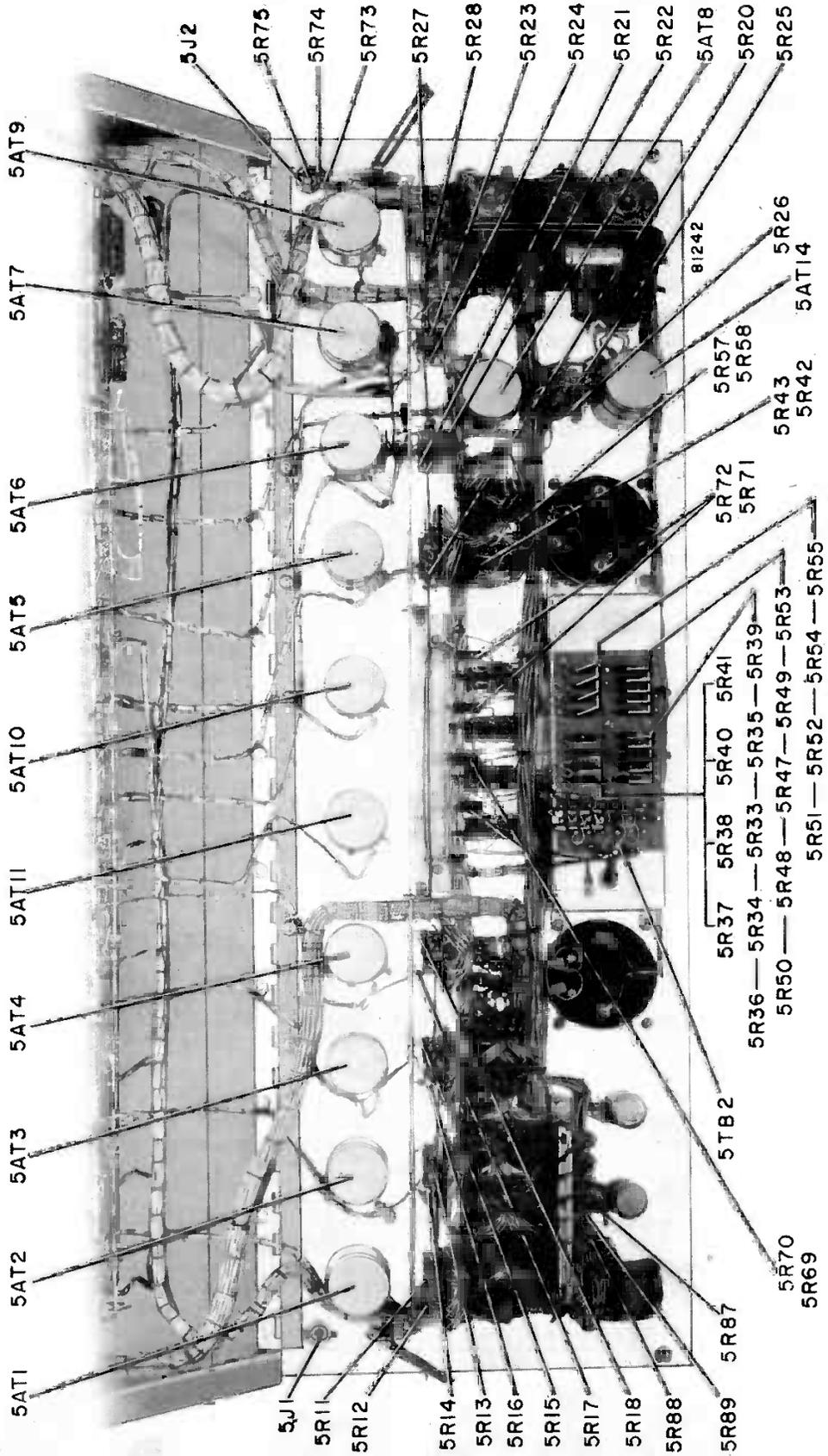


Figure 19—Console Control Panel (Rear View)

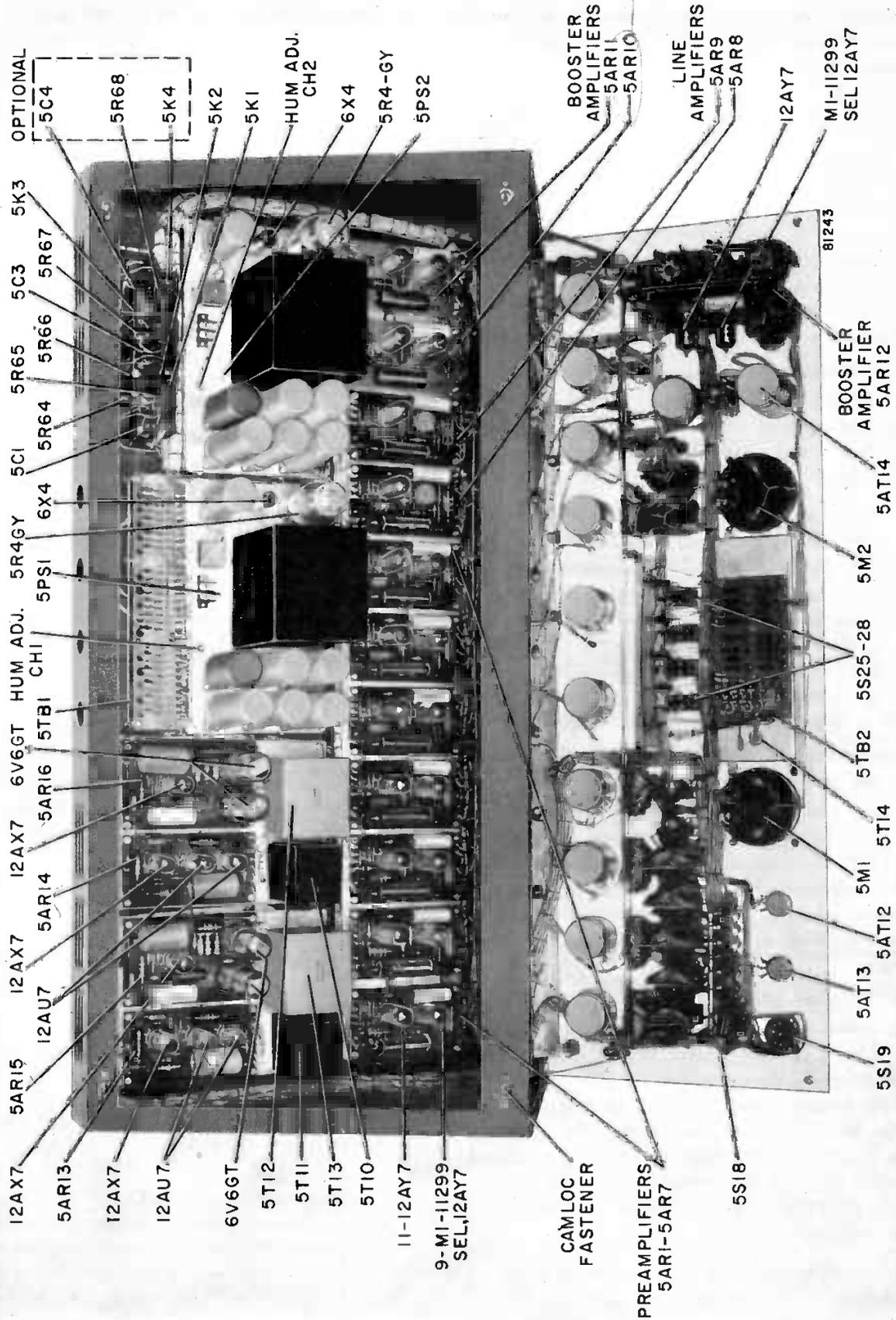


Figure 20—Internal View of Console

## Fuse

Two power fuses are located on the control panel center top. These fuses should be replaced only with a Type 3AG, 3 amp time lag fuse.

## Care of Variable Attenuators

To remove the attenuator cover, press the latch under the cover and remove it by twisting the cover counterclockwise. The rear section of the MASTER gain control 5AT14 may be removed to gain access to the contacts of the front section. Apply Davenoil to the contacts and rotate the knob several times. Wipe the contacts clean using a soft cloth and apply a thin film of Davenoil. Replace attenuator cover. A bottle of Davenoil is packed with the consolette.

## Care of Switches, Relays and Sockets

The switches and relay contacts do not require periodic maintenance and should not be tampered with. Contacts of the tube sockets are cleaned best by pulling tubes in and out of the socket several times.

## Replacement of Input Transformers 5T1 to 5T9

To gain access to the input transformers, the pre-amplifier mounting shelf must be loosened. Remove the top cover and open the front panel if desirable. Remove the four screws and hardware located between the 5AR1 and 5AR2 and between the 5AR10 and 5AR11 amplifier circuit boards. This hardware is visible in figure 20. Lift the shelf up from the front and tilt it backwards to expose the transformers.

## Replacement of Output Transformers 5T10 thru 5T13, and Attenuators 5AT17 and 5AT18

To gain access to the terminals and mounting hardware of the output transformers and pads 5AT17 and 5AT18, the mounting shelf of the program and monitor circuit boards must be tilted up. Remove the four screws, one from each corner. No leads need to be removed from the circuit boards to service these assemblies.

## Power Supplies 5PS1 and 5PS2

Each power supply chassis is secured to the consolette cabinet by four screws, one in each corner. To gain access to the components and wiring underneath the chassis, remove the screws and carefully turn the power supply upside down. The interconnecting leads are long enough to permit this change in position without disconnecting them. Make sure that the power is turned off when attempting to service the power supplies.

## Servicing of the Etched Wiring Board Assemblies

The etched wiring boards are made of .062 inch thick paper base phenolic laminate to one side of

which is bonded a thin sheet of copper. The conductor pattern is formed by an etching process. Component leads are threaded through holes which are punched into the board. The ends of the leads extending through the board are bent over against the copper conductors. The complete assembly is subsequently dip-soldered.

Components may be replaced easily by following these simple instructions. Care should be observed not to break or crack the board by undue stress or to damage the bonding adhesive by applying too much heat during soldering.

### 1. Tools Required

1. A small (35 watt or less) pencil type soldering iron
2. A pair of small diagonal cutters
3. A pair of small long nose pliers
4. A scribe or pick
5. A small knife

### 2. Emergency Repairs

If it is known which compound is defective, it may be replaced without removing the board from its mounting.

- a. In the case of a small component, such as a  $\frac{1}{2}$  or 1 watt resistor, cut the component in half using diagonal pliers. Crush the body by means of the long nose pliers. This is done to obtain extra lead length. In the case of larger components, clip the leads as close as possible to the component body.
- b. Using long nose pliers, form a loop of the lead ends as shown in figure 21.
- c. Thread the leads of the new components through these loops. Cut off the excess lead, crimp and solder the connection.

### 3. Permanent Repairs

- a. Remove the hardware fastening the board to the chassis and tilt board up.
- b. Isolate the defective component. If it is necessary to disconnect a component from the circuit for test, heat the junction of the component lead and the etched wiring with the soldering iron. The heat should be concentrated on the component lead rather than the etched wiring pattern. Pry up and straighten the bent-over portion of the component lead with a knife blade, then pull lead through the hole with pliers.

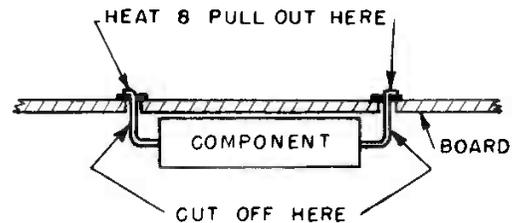
- c. To remove the defective component, snip the leads off at the component side of the board. See figure 21.
- d. Using a small soldering iron (35 watt or less) heat the leads and remove them from the printed wiring side of the board. Be careful not to apply too much heat or force to avoid damage to the thin copper conductors.
- e. Clean and preform the leads of the new component and insert through the holes until the component body is tight against the board.
- f. On the circuit side, grasp the component lead and bend it over in the direction of the circuit pattern.
- g. Crimp the wire tightly against the board (see figure 21), and cut off the excess component lead. Leave about 1/16 inch of wire protruding from the edge of the hole.
- h. Heat the lead and apply rosin core solder. **DO NOT USE PASTE OR ACID FLUX.** Remove excess rosin from the joints with alcohol.
- i. Replace the circuit board, using the original hardware.

#### 4. Replacement of Tube Socket

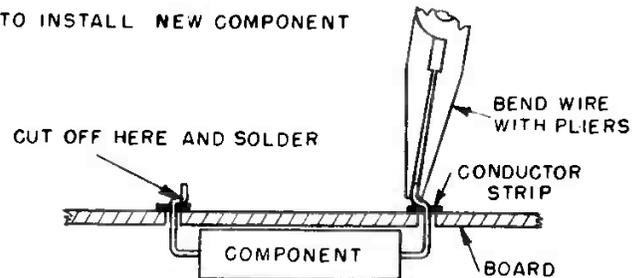
Heat each socket terminal lead and pry up and straighten with knife blade. Pull socket out applying heat to terminal leads, if necessary. Clean holes free of solder. Prepare new socket for installation as follows: If tube shield ground strap (stock #210773) is required, insert strap from top of socket in slot provided until firmly seated. Small ridges on strap must point outward. Bend lead terminal of strap radially outward.

Using the old socket as a guide, bend terminal leads at right angles to fit mounting holes provided in board. Insert socket terminals through holes making sure that socket terminal numbers correspond to the numbers etched on the board near the tube socket mounting holes. Bend socket terminals radially inward. If necessary, clip off excess length to prevent short circuit with adjacent conductors. Solder terminals to the etched wiring.

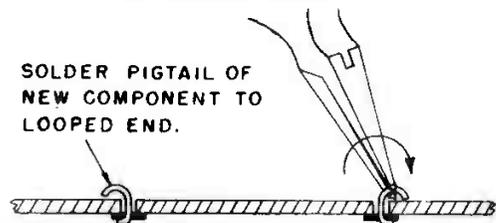
TO REMOVE DEFECTIVE COMPONENT



TO INSTALL NEW COMPONENT



TO REMOVE COMPONENT FROM TOP OF CIRCUIT BOARD



A-8901158-1

Figure 21—Replacement of Components in Printed Circuits

### LIST OF PARTS

Symbol	Description	Stock No.
<b>CONSOLETTTE</b>		
5AR1 to 5AR9	Preamplifier: circuit board assembly complete with 5 capacitors, 13 resistors, 2 tube sockets and 2 ground straps. (Components listed under Preamplifier)	210998
5AR10, 5AR11, 5AR12	Preamplifier: circuit board assembly complete with 5 capacitors, 12 resistors, 2 tube sockets and 2 ground straps. (Components listed under Preamplifier)	210999

Symbol	Description	Stock No.
5AR13, 5AR14	Program Amplifier: circuit board assembly complete with 6 capacitors, 12 resistors and 3 tube sockets. (Components listed under Program Amplifier)	211000
5AR15, 5AR16	Monitor Amplifier: circuit board assembly complete with 7 capacitors, 13 resistors and 3 tube sockets. (Components listed under Monitor Amplifier)	211001

Symbol	Description	Stock No.
5AT1 to 5AT5	Resistor: variable, attenuator, 100,000 ohm, pot., 20 steps, 2DB per step, last step tapered to infinity	211002
5AT6, 5AT7	Resistor: variable, attenuator, 100,000 ohm, pot., 20 steps, 2DB per step, last step tapered to infinity with cue switch	211003
5AT8 to 5AT11	Resistor: variable, attenuator, 100,000 ohm, pot., 20 steps, 2DB per step, last step tapered to infinity. Same as 5AT1	211002
5AT12, 5AT13	Resistor: variable, composition, 100,000 ohm $\pm 10\%$ , 2 w	209286
5AT14	Resistor: variable, attenuator, 15,000/15,000 ohm, dual pot., 20 steps, 2DB per step, last step tapered to infinity	211004
5AT15, 5AT16	Fixed Pad: Parts listed under Fixed Pads	
5AT17, 5AT18	Fixed Pad: Parts listed under Fixed Pads	
5C1 to 5C3	Capacitor: fixed, paper, 0.47 mf $\pm 20\%$ , 200 v	73787
5C4	Not Used	
5C5	Capacitor: fixed, paper, 2700 mmf $\pm 10\%$ , 600 v	73599
5F1, 5F2	Fuse: 3 amp, 125 v, slow-blow type	99164
5J1, 5J2	Jack: open circuit	53401
5K1, 5K2, 5K3	Relay: D.P.D.T.	205255
5M1, 5M2	Meter: VU	205249
5PS1, 5PS2	Power Supply: Parts listed under Power Supply	
5R1 to 5R5	Resistor: fixed, composition, 150 ohm $\pm 10\%$ , $\frac{1}{2}$ w	502115
5R6	Resistor: fixed, composition, 4700 ohm $\pm 10\%$ , $\frac{1}{2}$ w	502247
5R7	Resistor: fixed, composition, 680 ohm $\pm 10\%$ , $\frac{1}{2}$ w	502168
5R8	Resistor: fixed, composition, 560 ohm $\pm 10\%$ , $\frac{1}{2}$ w	502156
5R9, 5R10	Resistor: fixed, composition, 100,000 ohm $\pm 5\%$ , $\frac{1}{2}$ w	502410
5R11 to 5R28	Resistor: fixed, composition, 22,000 ohm $\pm 5\%$ , $\frac{1}{2}$ w	502322
5R29	Resistor: fixed, composition, 18,000 ohm $\pm 5\%$ , $\frac{1}{2}$ w	502318
5R30, 5R31	Resistor: fixed, composition, 15,000 ohm $\pm 5\%$ , $\frac{1}{2}$ w	502315
5R32	Resistor: fixed, composition, 18,000 ohm $\pm 5\%$ , $\frac{1}{2}$ w. Same as 5R29	502318
5R33	Resistor: fixed, composition, 2000 ohm $\pm 5\%$ , $\frac{1}{2}$ w	502220
5R34	Resistor: fixed, composition, 5600 ohm $\pm 5\%$ , $\frac{1}{2}$ w	502256
5R35	Resistor: fixed, composition, 2700 ohm $\pm 5\%$ , $\frac{1}{2}$ w	502227
5R36 to 5R41	Resistor: fixed, composition, 100 ohm $\pm 5\%$ , 1 w	512110

Symbol	Description	Stock No.
5R42 to 5R44	Resistor: fixed, composition, 560 ohm $\pm 10\%$ , $\frac{1}{2}$ w. Same as 5R8	502156
5R45, 5R46	Resistor: fixed, composition, 27,000 ohm $\pm 5\%$ , $\frac{1}{2}$ w	502327
5R47	Resistor: fixed, composition, 2000 ohm $\pm 5\%$ , $\frac{1}{2}$ w. Same as 5R33	502220
5R48	Resistor: fixed, composition, 5600 ohm $\pm 5\%$ , $\frac{1}{2}$ w. Same as 5R34	502256
5R49	Resistor: fixed, composition, 2700 ohm $\pm 5\%$ , $\frac{1}{2}$ w. Same as 5R35	502227
5R50 to 5R55	Resistor: fixed, composition, 100 ohm $\pm 5\%$ , 1 w. Same as 5R36	512110
5R56 to 5R58	Resistor: fixed, composition, 560 ohm $\pm 10\%$ , $\frac{1}{2}$ w. Same as 5R8	502156
5R59	Resistor: fixed, composition, 100,000 ohm $\pm 5\%$ , $\frac{1}{2}$ w. Same as 5R9	502410
5R60	Resistor: fixed, composition, 27,000 ohm $\pm 5\%$ , $\frac{1}{2}$ w. Same as 5R45	502327
5R61, 5R62	Resistor: fixed, composition, 1500 ohm $\pm 5\%$ , 1 w	512215
5R63	Resistor: fixed, composition, 820 ohm $\pm 5\%$ , $\frac{1}{2}$ w	502182
5R64 to 5R67	Resistor: fixed, wire wound, 15 ohm $\pm 10\%$ , 5 w	97441
5R68	Not Used	
5R69 to 5R71	Resistor: fixed, wire wound, 15 ohm $\pm 10\%$ , 5 w. Same as 5R64	97441
5R72	Not Used	
5R73, 5R74	Resistor: fixed, composition, 4700 ohm $\pm 10\%$ , $\frac{1}{2}$ w. Same as 5R6	502247
5R75	Resistor: fixed, composition, 680 ohm $\pm 10\%$ , $\frac{1}{2}$ w. Same as 5R7	502168
5R76 to 5R85	Resistor: fixed, composition, 4700 ohm $\pm 10\%$ , $\frac{1}{2}$ w. Same as 5R6	502247
5R86	Resistor: fixed, composition, 680 ohm $\pm 10\%$ , $\frac{1}{2}$ w. Same as 5R7	502168
5R87	Resistor: fixed, composition, 10,000 ohm $\pm 10\%$ , $\frac{1}{2}$ w	502310
5R88	Resistor: fixed, composition, 150 ohm $\pm 10\%$ , $\frac{1}{2}$ w. Same as 5R1	502115
5R89	Resistor: fixed, composition, 10,000 ohm $\pm 10\%$ , $\frac{1}{2}$ w. Same as 5R87	502310
5R90, 5R91	Resistor: fixed, composition, 560 ohm $\pm 5\%$ , $\frac{1}{2}$ w	502156
5R92, 5R93	Resistor: fixed, composition, 680 ohm $\pm 10\%$ , 2 w	522168
5S1 to 5S5	Switch: key lever, 4 "A", 4 "B" and 4 "D" type contacts, 2 way locking	211008
5S6, 5S7	Switch: key lever, 4 "D" type contacts, 2 way locking	211009
5S8	Switch: rotary, wafer type, 14 circuit, 3 section, 6 position, shorting contacts	211010
5S9 to 5S13	Switch: key lever, 4 "A", 4 "B" and 2 "D" type contacts, 2 way locking	94141
5S14 to 5S17	Switch: key lever, 2 "D" type contacts, 2 way locking	94142
5S18	Switch: push, multiple, 8 plungers, 3 non-locking, 5 interlocking	94440

Symbol	Description	Stock No.
5S19	Switch: rotary, wafer type, 1 circuit, 1 section, 8 position, non-shorting contacts	211012
5S20	Switch: rotary, wafer type, 4 circuit, 4 section, 8 position, non-shorting contacts	211013
5S21	Switch: key lever, 2 "A", 4 "B" and 2 "C" type contacts, 2 way locking	94144
5S22	Switch: rotary, wafer type, 3 circuit, 1 section, 2 position, shorting contacts	211014
5S23, 5S24	Switch: key lever, 2 "A", 6 "B" and 4 "E" type contacts, 2 way locking	211015
5S25 to 5S28	Switch: toggle, DPDT, 3/6 amp @ 250/125 v, bat handle	52133
5S29	Switch: toggle, SPST, 3 amp @ 250 v, bat handle	46425
5T1 to 5T9	Transformer: audio, input	205326
5T10, 5T11	Transformer: audio, output	209281
5T12, 5T13	Transformer: audio, output	207434
5T14	Transformer: audio, input	211017
5XF1, 5XF2	Holder: fuse	205914
	Board: terminal, 46 terminals	211030
	Board: terminal, 120 terminals	211031
	Button: push, black	32120
	Button: push, red	32121
	Clamp: cable, white nylon, 3/16" I.D.	209652
	Clamp: cable, white nylon, 3/8" I.D.	210391
	Fastener: receptacle, silicon, bronze	94641
	Fastener: stud steel, with retaining ring	96145
	Grommet: rubber	37396
	Knob: control, black with white filled pointer, 2" dia.	17269
	Knob: control, black with white filled pointer, 1-7/16" dia.	17268
	Knob: control, blue with white filled pointer, 2" dia.	94444
	Knob: control, red with white filled pointer, 2" dia.	94446
	Knob: control, green with white filled pointer, 2" dia.	96928
	Knob: key lever switch, blue	94442
	Knob: key lever switch, green	96929
	Knob: key lever switch, red	94441
	Mounting: shock, isolator	211029
	Oil: attenuator	20752
	Ring: retaining, fastener	98480
	Shield: tube, 53/64" I.D. x 1 3/8" ht., aluminum	211035
	Support: fall, single link, 6 1/4" lg. with 5 1/2" slot	94647
<b>PREAMPLIFIERS</b>		
1C1	Capacitor: fixed, paper, 0.047 mf $\pm 10\%$ , 400 v	73553

Symbol	Description	Stock No.
1C2	Capacitor: fixed, paper, 0.1 mf $\pm 10\%$ , 400 v	73551
1C3, 1C4	Capacitor: fixed, paper, 0.047 mf $\pm 10\%$ , 400 v. Same as 1C1	73553
1C5	Capacitor: fixed, paper, 1.0 mf $\pm 10\%$ , 200 v	208077
1R1	Resistor: fixed, composition, 8200 ohm $\pm 5\%$ , 1 w	512282
1R2	Resistor: fixed, composition, 100,000 ohm $\pm 10\%$ , 1/2 w	502410
1R3	Resistor: fixed, composition, 1 megohm $\pm 10\%$ , 1/2 w	502510
1R4	Resistor: fixed, composition, 560 ohm $\pm 10\%$ , 1/2 w	502156
1R5	Resistor: fixed, composition, 160,000 ohm $\pm 5\%$ , 1/2 w	502416
1R6	Resistor: fixed, composition, 39,000 ohm $\pm 10\%$ , 1/2 w	502339
1R7	Resistor: fixed, composition, 5600 ohm $\pm 5\%$ , 1 w	512256
1R8	Resistor: fixed, composition, 200,000 ohm $\pm 5\%$ , 1/2 w	502420
1R9	Resistor: fixed, composition, 1 megohm $\pm 10\%$ , 1/2 w. Same as 1R3	502510
1R10	Resistor: fixed, composition, 91,000 ohm $\pm 5\%$ , 1 w	512391
1R11	Resistor: fixed, composition, 100,000 ohm $\pm 10\%$ , 1/2 w. Same as 1R2	502410
1R12	Resistor: fixed, composition, 9100 ohm $\pm 5\%$ , 1/2 w	30671
1R13	Resistor: fixed, composition, 300,000 ohm $\pm 5\%$ , 1/2 w	502430
1R14	Resistor: fixed, composition, 56,000 ohm $\pm 10\%$ , 1/2 w	502356
1R15	Resistor: fixed, composition, 1200 ohm $\pm 10\%$ , 1/2 w	502212
1XV1, 1XV2	Socket: tube, 9 contact miniature	209284
	Strap: ground, for miniature tube socket	210773
<b>PROGRAM AMPLIFIER</b>		
2C1	Capacitor: fixed, paper, 0.047 mf $\pm 10\%$ , 400 v	73553
2C2	Capacitor: fixed, mica, 39 mmf $\pm 10\%$ , 500 v	39618
2C3, 2C4	Capacitor: fixed, paper, 0.047 mf $\pm 10\%$ , 400 v. Same as 2C1	73553
2C5	Capacitor: electrolytic 20 mf -10 +50%, 450 v	99149
2C6	Capacitor: fixed, paper, 0.047 mf $\pm 10\%$ , 400 v. Same as 2C1	73553
2R1	Resistor: fixed, composition, 100,000 ohm $\pm 10\%$ , 1/2 w	502410
2R2	Resistor: fixed, composition, 1800 ohm $\pm 5\%$ , 1/2 w	502218
2R3	Resistor: fixed, composition, 150,000 ohm $\pm 10\%$ , 1/2 w	502415
2R4	Resistor: fixed, composition, 680,000 ohm $\pm 10\%$ , 1/2 w	502468

Symbol	Description	Stock No.
2R5	Resistor: fixed, composition, 2700 ohm $\pm 10\%$ , $\frac{1}{2}$ w	502227
2R6, 2R7	Resistor: fixed, composition, 120,000 ohm $\pm 5\%$ , $\frac{1}{2}$ w	502412
2RB, 2R9	Resistor: fixed, composition, 470,000 ohm $\pm 5\%$ , $\frac{1}{2}$ w	502447
2R10	Resistor: fixed, composition, 390 ohm $\pm 5\%$ , $\frac{1}{2}$ w	30498
2R11	Resistor: fixed, composition, 10,000 ohm $\pm 10\%$ , $\frac{1}{2}$ w	502310
2R12	Resistor: fixed, composition, 18,000 ohm $\pm 5\%$ , $\frac{1}{2}$ w	502318
2XV1, 2XV2, 2XV3	Socket: tube, 9 contact miniature	209284
<b>MONITOR AMPLIFIER</b>		
3C1	Capacitor: fixed, paper, 0.047 mf $\pm 10\%$ , 400 v	73553
3C2	Capacitor: fixed, mica, 82 mmf $\pm 10\%$ , 500 v	39626
3C3, 3C4	Capacitor: fixed, paper, 0.047 mf $\pm 10\%$ , 400 v. Same as 3C1	73553
3C5	Capacitor: fixed, mica, 82 mmf $\pm 10\%$ , 500 v. Same as 3C5	39626
3C6	Capacitor: electrolytic, 25 mf -10 +250%, 25 v	52518
3C7	Capacitor: electrolytic, 20 mf -10 +50%, 450 v	99149
3R1	Resistor: fixed, composition, 100,000 ohm $\pm 10\%$ , $\frac{1}{2}$ w	502410
3R2	Resistor: fixed, composition, 2200 ohm $\pm 5\%$ , $\frac{1}{2}$ w	502222
3R3	Resistor: fixed, composition, 220,000 ohm $\pm 10\%$ , $\frac{1}{2}$ w	502422
3R4	Resistor: fixed, composition, 1 megohm $\pm 10\%$ , $\frac{1}{2}$ w	502510
3R5	Resistor: fixed, composition, 1500 ohm $\pm 10\%$ , $\frac{1}{2}$ w	502215
3R6, 3R7	Resistor: fixed, composition, 39,000 ohm $\pm 5\%$ , $\frac{1}{2}$ w	502339
3R8, 3R9	Resistor: fixed, composition, 470,000 ohm $\pm 10\%$ , $\frac{1}{2}$ w	502447
3R10, 3R11	Resistor: fixed, composition, 430 ohm $\pm 5\%$ , 2 w	522143
3R12	Resistor: fixed, composition, 6800 ohm $\pm 10\%$ , $\frac{1}{2}$ w	502268
3R13	Resistor: fixed, composition, 22,000 ohm $\pm 5\%$ , $\frac{1}{2}$ w	502322
3XV1	Socket: tube, 9 contact miniature	209284
3XV2, 3XV3	Socket: tube, octal	207707
<b>FIXED PADS 5AT15, 5AT16</b>		
R1, R2 R3, R4	Resistor: fixed, composition, 270 ohm $\pm 5\%$ , 1 w	512127
R5, R6	Resistor: fixed, composition, 18 ohm $\pm 5\%$ , 1 w Board: circuit, etched, with 6 terminals	59486 211018

Symbol	Description	Stock No.
<b>FIXED PADS 5AT17, 5AT18</b>		
R1, R2	Resistor: fixed, composition, 4700 ohm $\pm 5\%$ , 1 w	512247
R3	Resistor: fixed, composition, 620 ohm $\pm 5\%$ , 1 w Board: circuit, etched, with 6 terminals	59488 211018
<b>POWER SUPPLY</b>		
4C1A, B, C	Capacitor: electrolytic, 40/40/40 mf -10 +50%, 450 v	211022
4C2A, B, C	Capacitor: fixed, paper, 0.47 mf $\pm 10\%$ , 200 v	73787
4C3	Capacitor: fixed, paper, 0.47 mf $\pm 10\%$ , 200 v	73787
4C4A, B, C	Capacitor: electrolytic, 40/40/40 mf -10 +50%, 450 v. Same as 4C1A, B, C	211022
4C5A, B, C	Capacitor: electrolytic, 40/40/40 mf -10 +50%, 450 v. Same as 4C1A, B, C	211022
4C6A, B, C	Capacitor: electrolytic, 10 mf -10 +50%, 450 v	91391
4C7 tube	Capacitor: electrolytic, 10 mf -10 +50%, 450 v	91391
4C8	Capacitor: electrolytic, 80 mf -10 +50%, 450 v	206108
4C9	Capacitor: electrolytic, 500 mf -10 +250%, 50 v	99656
4C10 tube	Capacitor: electrolytic, 10 mf -10 +50%, 450 v. Same as 4C7	91391
4CR1	Rectifier: selenium	211023
4R1A, B	Resistor: tapped, wire wound, 100/3000 ohm $\pm 10\%$ , 7.6/5.4 w	211024
4R2	Resistor fixed, wire wound, 750 ohm $\pm 10\%$ , 10 w	211025
4R3	Resistor: fixed, composition, 120,000 ohm $\pm 10\%$ , 1 w	512412
4R4	Resistor: fixed, composition, 18,000 ohm $\pm 10\%$ , 1 w	512318
4R5A, B, C, D	Resistor: tapped, wire wound, 1000/600/600/600 ohm $\pm 10\%$ , 1.0/1.5/1.5/1.5 w	211026
4R6	Resistor: fixed, composition, 3900 ohm $\pm 10\%$ , 1 w	512239
4R7A, B	Resistor: tapped, wire wound, 10,000/1500 ohm $\pm 10\%$ , 6/4 w	211027
4R8	Resistor: fixed, composition, 120,000 ohm $\pm 10\%$ , 1 w. Same as 4R3	512412
4R9	Resistor: variable, composition, 500 ohm $\pm 20\%$ , $\frac{1}{4}$ w	206037
4R10	Resistor: fixed, composition, 10 ohm $\pm 10\%$ , 1 w	512010
4R11	Resistor: fixed, composition, 2200 ohm $\pm 10\%$ , 1 w	512222
4R12	Resistor: fixed, composition, 5600 ohm $\pm 10\%$ , 1 w	512256
4R13	Resistor: fixed, composition, 12,000 ohm $\pm 10\%$ , 1 w	512312
4R14	Resistor: fixed, composition, 5600 ohm $\pm 10\%$ , 1 w. Same as 4R12	512256
4R15	Resistor: fixed, composition, 12,000 ohm $\pm 10\%$ , 1 w. Same as 4R13	512312
4T1	Transformer: power	211028
4XV1	Socket: tube, octal	68590
4XV2	Socket: tube, 7 contact miniature Plate: mounting, electrolytic capacitor	94925 18469



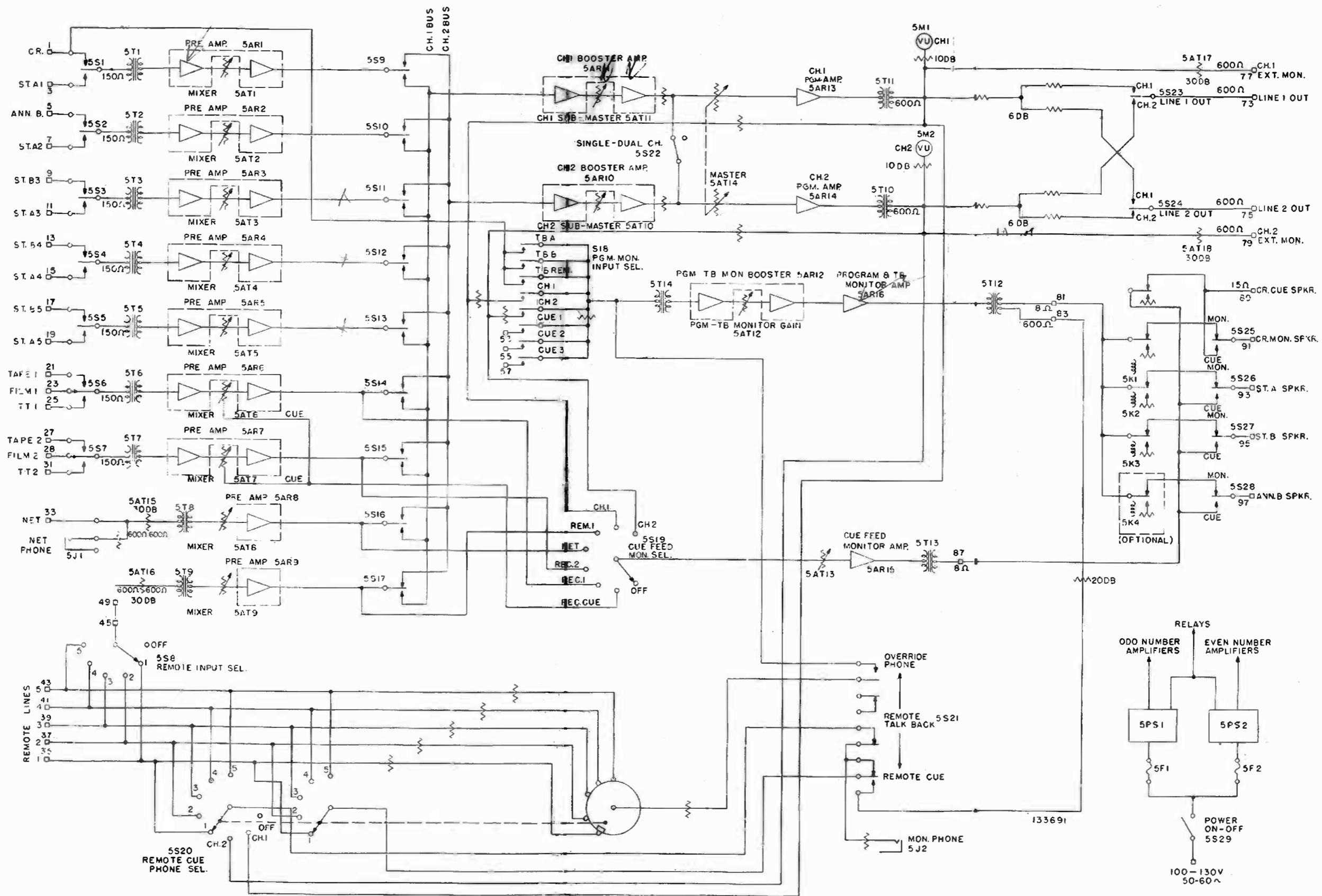
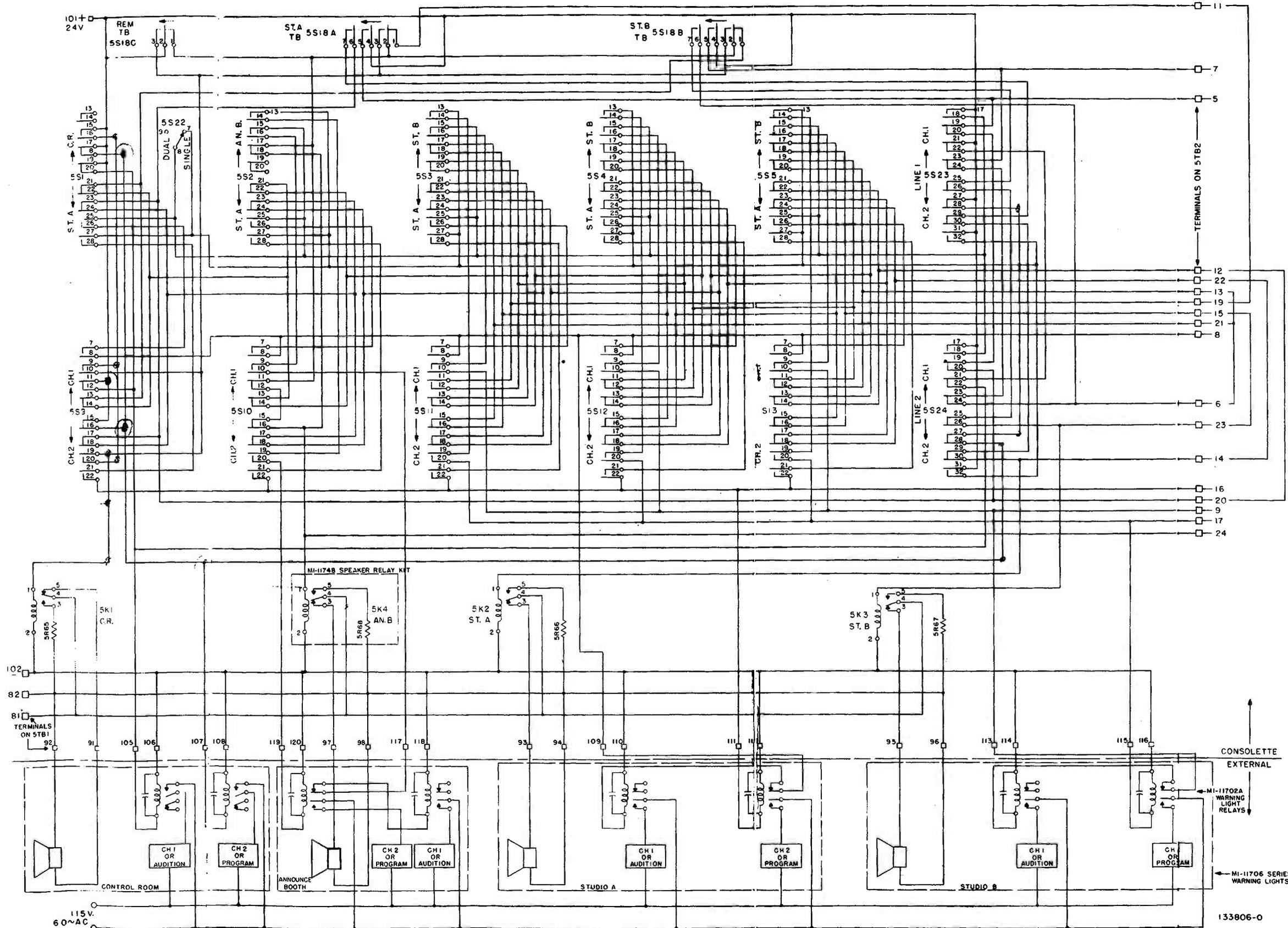


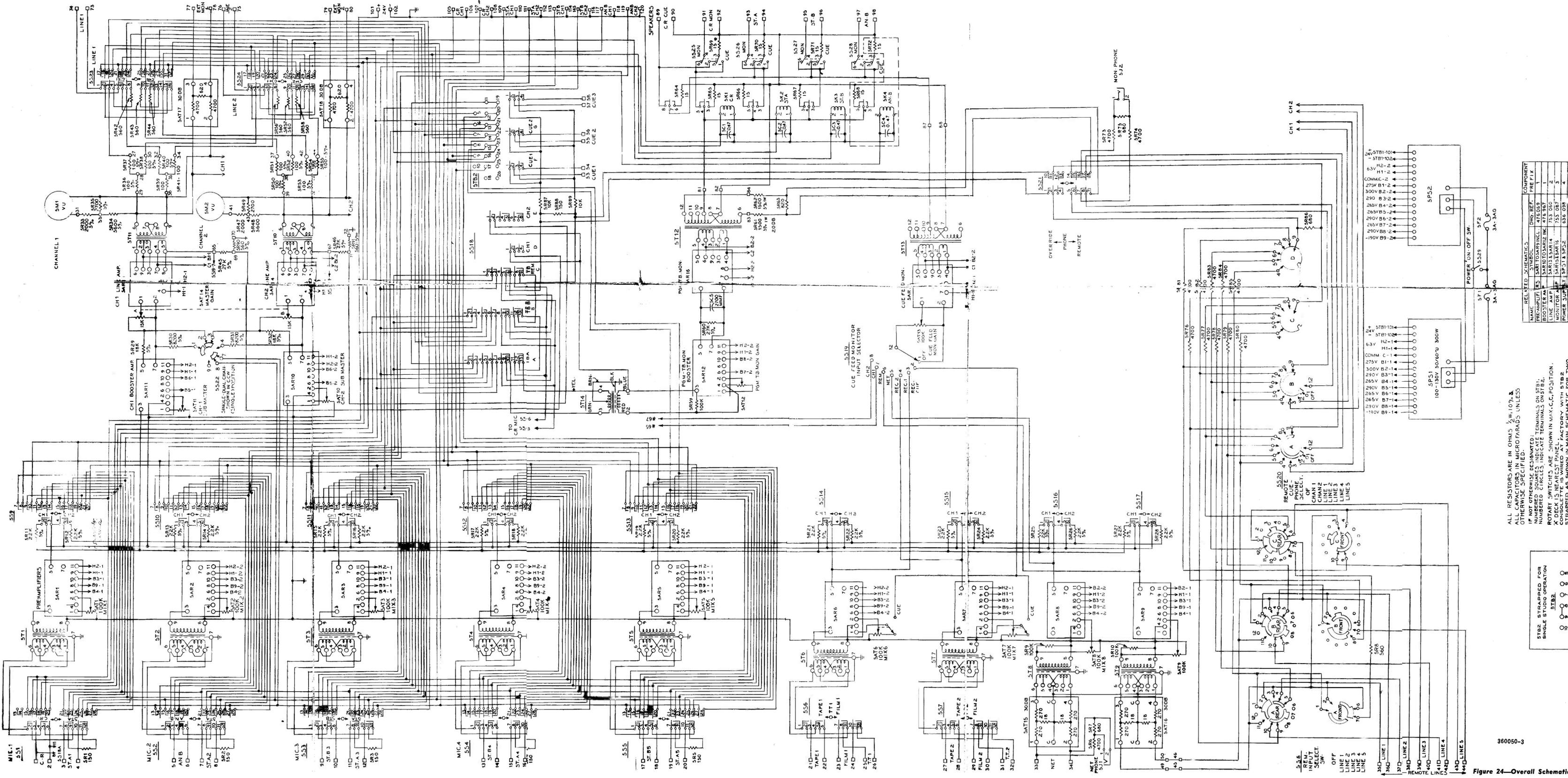
Figure 22—Block Diagram



NOTE: STRAPPING ON 5TB2 SHOWN FOR TWO STUDIO OPERATION.  
 FOR SINGLE STUDIO OPERATION, THE FOLLOWING  
 TERMINALS ON 5TB2 ARE CONNECTED:  
 8-9, 12-19, 13-20, 14-15, 16-17, 21-22 & 23-24.

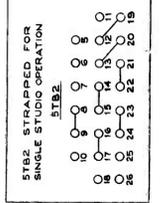
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Figure 23—Control Circuits



REL. REF. SUEMATICS	SWG. REF.	COMPONENT
5518	5518	TRANSFORMER
5519	5519	TRANSFORMER
5520	5520	TRANSFORMER
5521	5521	TRANSFORMER
5522	5522	TRANSFORMER
5523	5523	TRANSFORMER
5524	5524	TRANSFORMER
5525	5525	TRANSFORMER
5526	5526	TRANSFORMER
5527	5527	TRANSFORMER
5528	5528	TRANSFORMER
5529	5529	TRANSFORMER
5530	5530	TRANSFORMER
5531	5531	TRANSFORMER
5532	5532	TRANSFORMER
5533	5533	TRANSFORMER
5534	5534	TRANSFORMER
5535	5535	TRANSFORMER
5536	5536	TRANSFORMER
5537	5537	TRANSFORMER
5538	5538	TRANSFORMER
5539	5539	TRANSFORMER
5540	5540	TRANSFORMER
5541	5541	TRANSFORMER
5542	5542	TRANSFORMER
5543	5543	TRANSFORMER
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5545	5545	TRANSFORMER
5546	5546	TRANSFORMER
5547	5547	TRANSFORMER
5548	5548	TRANSFORMER
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5595	5595	TRANSFORMER
5596	5596	TRANSFORMER
5597	5597	TRANSFORMER
5598	5598	TRANSFORMER
5599	5599	TRANSFORMER
5600	5600	TRANSFORMER

ALL RESISTORS ARE IN OHMS UNLESS OTHERWISE SPECIFIED.  
 IF NOT OTHERWISE DESIGNATED:  
 NUMBERED CIRCLES INDICATE TERMINALS ON STS;  
 NUMBERED SQUARES INDICATE TERMINALS ON STB.  
 ROTARY SWITCHES ARE SHOWN IN MAX. C.C. POSITION.  
 A DECK IS NEAREST PANEL FACTORY WITH B.B. STRAPPED AS SHOWN IN MAIN SCHEMATIC FOR TWO STUDIO OPERATION.  
 TO PERMIT TALKBACK TO STUDIOS WITH OUTPUT TO MONITOR ROOM, CONNECT MON. CUE SW. AHER. TERMINALS 5-20 AND 6-7 ON STB.  
 \* REMOTE. \* IF A CONTROL ROOM CUE SW. AHER. IS CONNECTED TO TERMINALS 89-90.



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Figure 24—Overall Schematic Diagram

