

# BROADCAST AUDIO EQUIPMENT



## *Instructions*

RADIO CORPORATION OF AMERICA, Industrial Electronic Products

Type BC-6B

Dual Channel Console

## 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. If concealed damage is discovered, immediately notify the carrier, confirming the notification in writing, and secure an inspection report. This item should be unpacked and inspected for damage **WITHIN 15 DAYS** after receipt.

Report all shortage and damages to RCA, Broadcast Marketing Section, Camden 2, N. J.

Radio Corporation of America will file all claims for loss and damage on this equipment so long as the inspection report is obtained. Disposition of the damaged item will be furnished by RCA.

## 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

<p><i>Atlanta 3, Georgia</i> 1121 Rhodes-Haverty Bldg. 134 Peachtree St. N.W. JACKSON 4-7703</p>	<p><i>Boston 16, Mass.</i> Room 2301, John Hancock Bldg. 200 Berkley St. HUBBARD 2-1700</p>	<p><i>Chicago 54, Ill.</i> 1186 Merchandise Mart Plaza DELAWARE 7-0700</p>	<p><i>Cleveland 15, Ohio</i> 1600 Keith Bldg. CHERRY 1-3450</p>
<p><i>Dallas 35, Texas</i> 7901 Empire Freeway FLCETWOOD 2-3911</p>	<p><i>Hollywood 28, Calif.</i> RCA Bldg., 1560 N. Vine St. HOLLYWOOD 9-2154</p>	<p><i>Kansas City 6, Missouri</i> 340 Home Savings Bldg. HARRISON 1-6480</p>	<p><i>New York 20, New York</i> 36 W. 49th St. JUDSON 6-3800</p>
	<p><i>Branch—San Francisco 2, Calif.</i> 420 Taylor St. ORDWAY 3-8027</p>	<p><i>Seattle, Washington</i> 2250 First Ave., S. MAIN 2-8350</p>	

# *BROADCAST AUDIO EQUIPMENT*

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INSTRUCTIONS

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

MI-11638-A

**RADIO CORPORATION OF AMERICA**  
**INDUSTRIAL ELECTRONIC PRODUCTS, CAMDEN, N. J.**

PRINTED IN U. S. A.  
DU-559

1B-24788-2



1-16608

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

## TECHNICAL DATA

### Power Required

100-130 volts, 50/60 cycles  
270 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	-6 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:  $\pm 1.5$  db 30 to 15,000 cps  
Monitor:  $\pm 2.5$  db 30 to 15,000 cps

### Harmonic Distortion

Program (18 dbm output) 1% at 30 cps, 0.75% at  
50 cps; 0.5% 100 to 15,000 cps  
Monitor (6 watt total) 1.5% at 50 to 15,000 cps

### Signal to Noise Ratio

With MIXER, SUB MASTER and MON GAIN controls set to 10, MASTER control set to 20 and a -50 dbm reference signal applied to the microphone or turntable inputs or 16 dbm applied to the network or remote line inputs, hum and noise: 68 db below reference at program line outputs  
66 db below reference at monitor output

### Gain

Microphones and Turntables to Program Lines	108 $\pm$ 2 db
Network and Remote Lines to Program Lines	40 $\pm$ 2 db*
Microphones and Turntables to External Monitor	84 $\pm$ 3 db
Microphones and Turntables to Remote Lines (Remote Cue)	121 $\pm$ 3 db
Microphones and Turntables to Speakers (Pgm Monitor)	135 $\pm$ 3 db
Microphones and Turntables to Speakers (Cue Feed Mon.)	128 $\pm$ 3 db
Network and Remote Lines to Speakers (Pgm Monitor)	67 $\pm$ 3 db*
Network and Remote Lines to Speakers (Cue Feed Mon.)	60 $\pm$ 3 db*
Cue Lines to Speakers (Program Monitor)	44 $\pm$ 3 db
Control Room Microphone to Speakers (Talkback)	85 $\pm$ 3 db

\* Can be increased 30 db by removal of pad.

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

2 5R4GY  
4 12AU7  
4 12AX7  
4 6V6GT  
10 MI-11299 (RCA selected 12AY7)  
13 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-6B 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-6B 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-6B matches the other RCA audio consolettes, BC-3C and BC-5B. The styling is also suitable for alignment with TV Terminal equipment. The consolette 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 consolette. Knock-out holes of 1-1/16 inch diameter are provided in the rear panel and on the rear bottom of the consolette housing for the terminating conduits. The front panel is hinged at the bottom to the consolette 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-A 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-6B consolette. The loudspeaker should have a voice coil impedance of 15 ohms, or an impedance matching transformer such as 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-6B 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.

### Preampifiers 5AR1 — 5AR7

The circuit of the microphone preampifiers is shown in the schematic diagram of figure 2. The

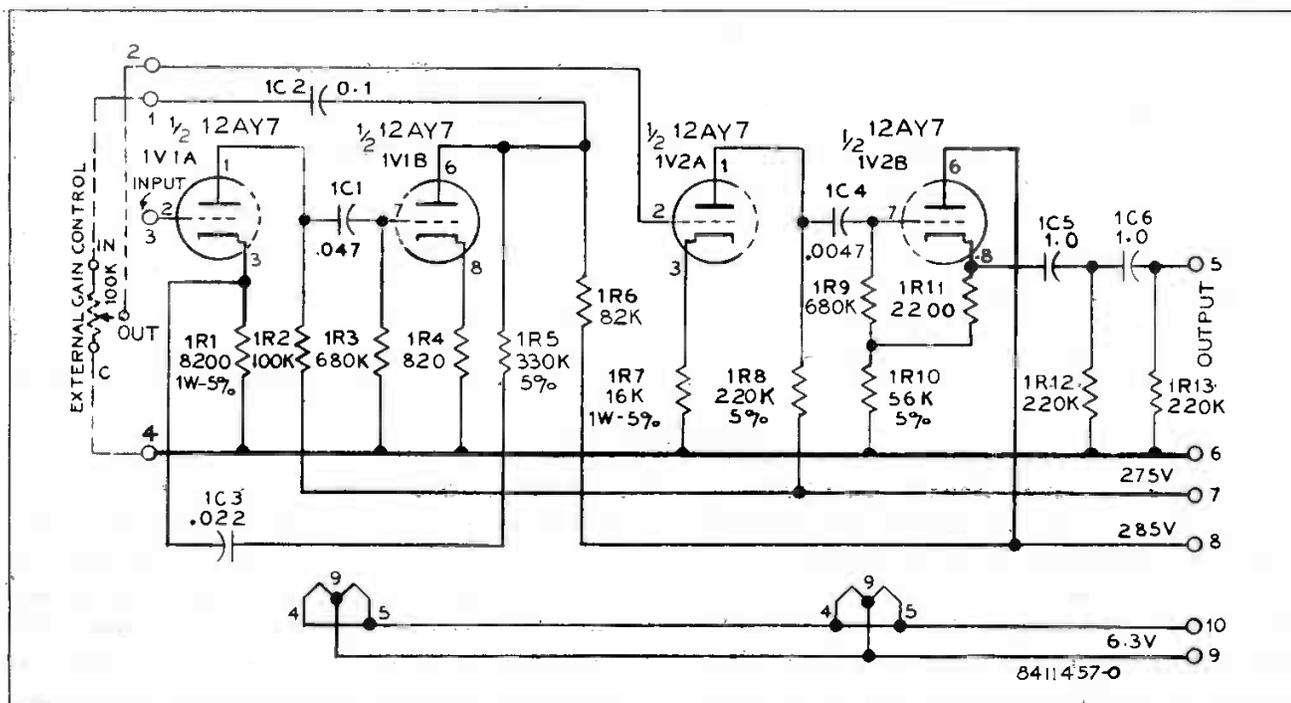
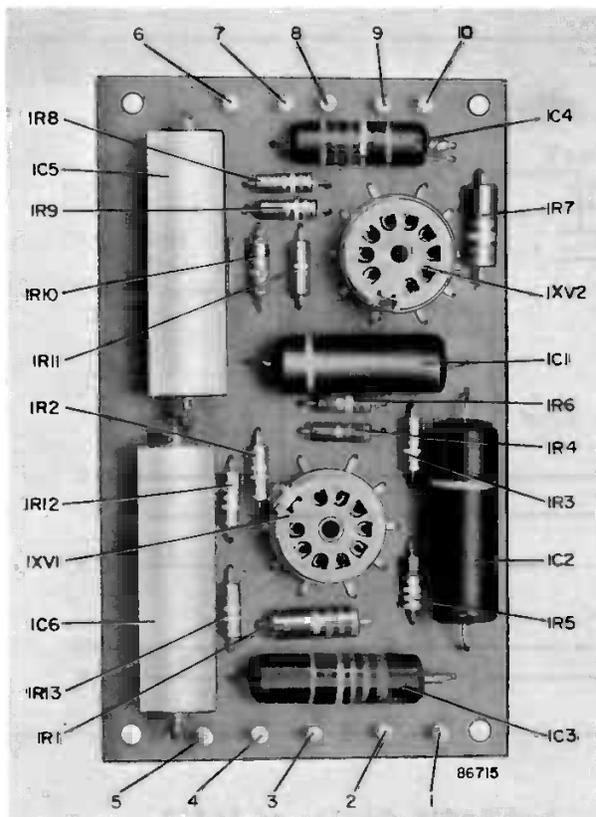


Figure 2—Schematic Diagram for Preamplifier (5AR1 — 5AR7)

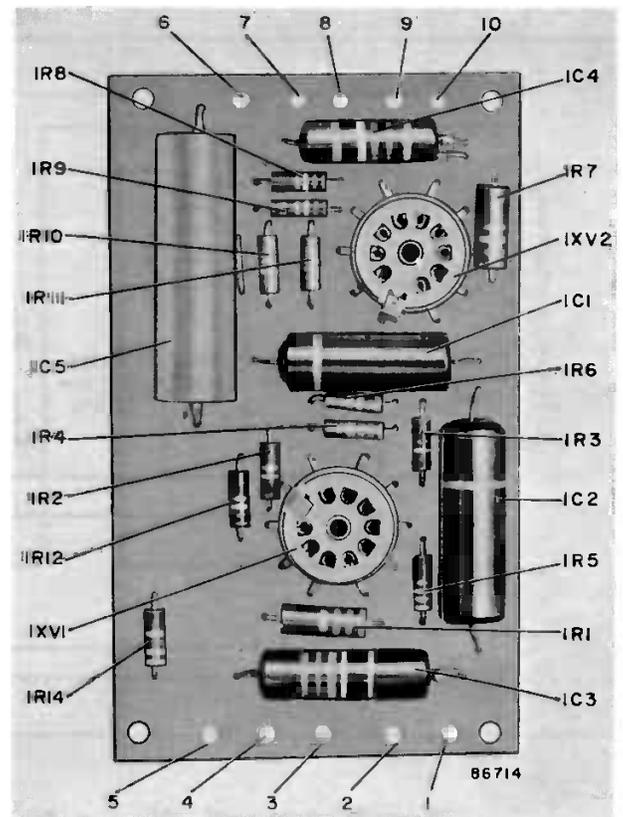


**Figure 3—Pre-amplifier (5AR1 — 5AR9)  
Printed Circuit Board**

input signal is derived from an unloaded step-up transformer which is mounted under the preamplifier mounting shelf and is applied to the grid of the input stage. This stage is RC coupled to the second stage with negative feedback from the plate of the second stage applied to the cathode of the input stage. This minimizes distortion at high input levels. A MI-11299 tube which is a 12AY7 selected for low noise is used in this stage. The output of the second stage is connected through the coupling capacitor 1C2 to a potentiometer type gain control and hence to the grid of the third stage. The output of this stage is capacitively coupled to the cathode follower output stage. A 12AY7 tube is used here. To eliminate any d-c output voltage which could produce switching clicks, two capacitors 1C5 and 1C6 are connected in series between the cathode and the output terminal with shunt resistors 1R12 and 1R13 bleeding any charge to ground. The voltage gain of the amplifier is approximately 46 db. An input signal to the transformer primary of  $-50$  dbm produces an output signal of approximately one volt when the mixer control is adjusted for 20 db attenuation.

#### **Pre-amplifier 5AR8 as Line Amplifier**

In the case of the network preamplifier 5AR8, the



**Figure 4—Pre-amplifier (5AR10, 5AR11, 5AR12)  
Printed Circuit Board**

full gain is not required, 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 preamplifier 5AR8 may be restored by the following changes:

1. Remove resistor 5R9 which is connected between terminals 7 and 9 of 5T8.
2. Remove wire #597 from the terminal 9 of 5T8 and connect it to terminal 1 of 5AR8.
3. Connect terminal 9 of 5T8 to terminal 3 of 5AR8.
4. Insert a MI-11299 selected 12AY7 tube in the socket nearest the front of the preamplifier 5AR8.

#### **Pre-amplifier 5AR9, Cue and Remote Lines**

The first two stages of this amplifier are used to obtain additional amplification when cuing turntables, network and remote lines through the CUE position of the mixer controls.

The third and fourth stages are used for amplification of the remote line input.

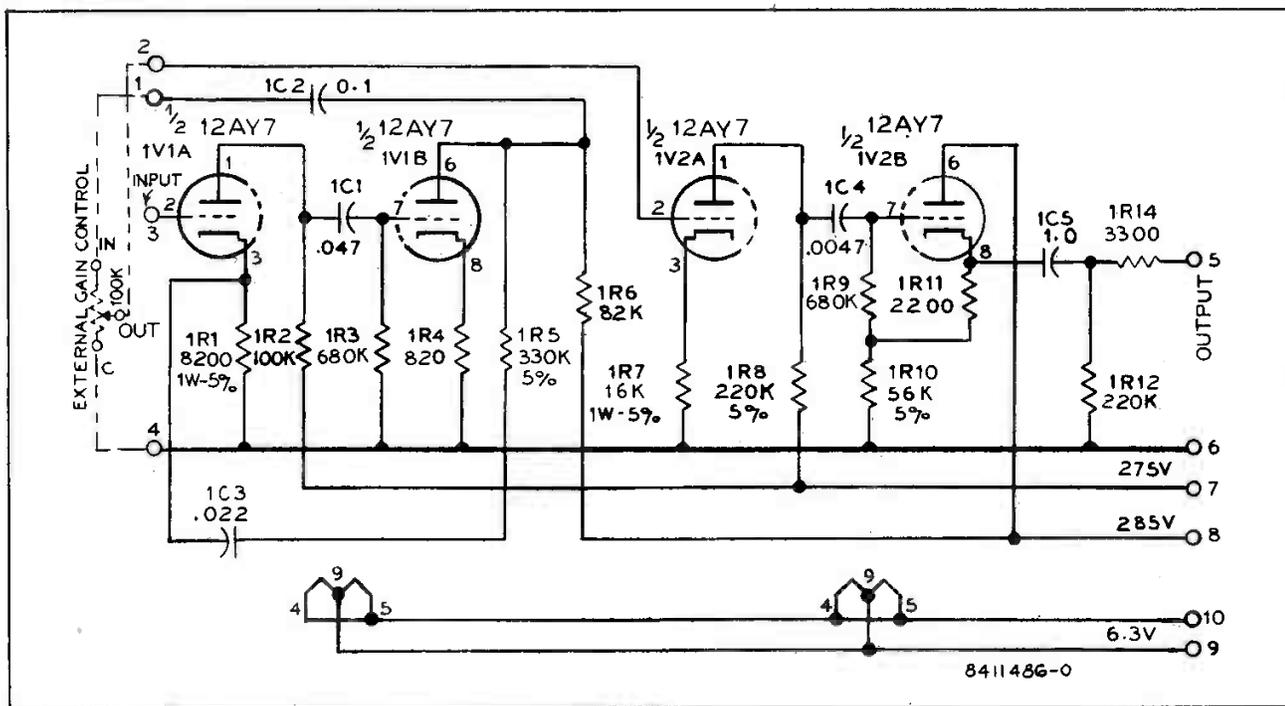


Figure 5—Schematic Diagram for Preamplifiers 5AR10, 5AR11 and 5AR12

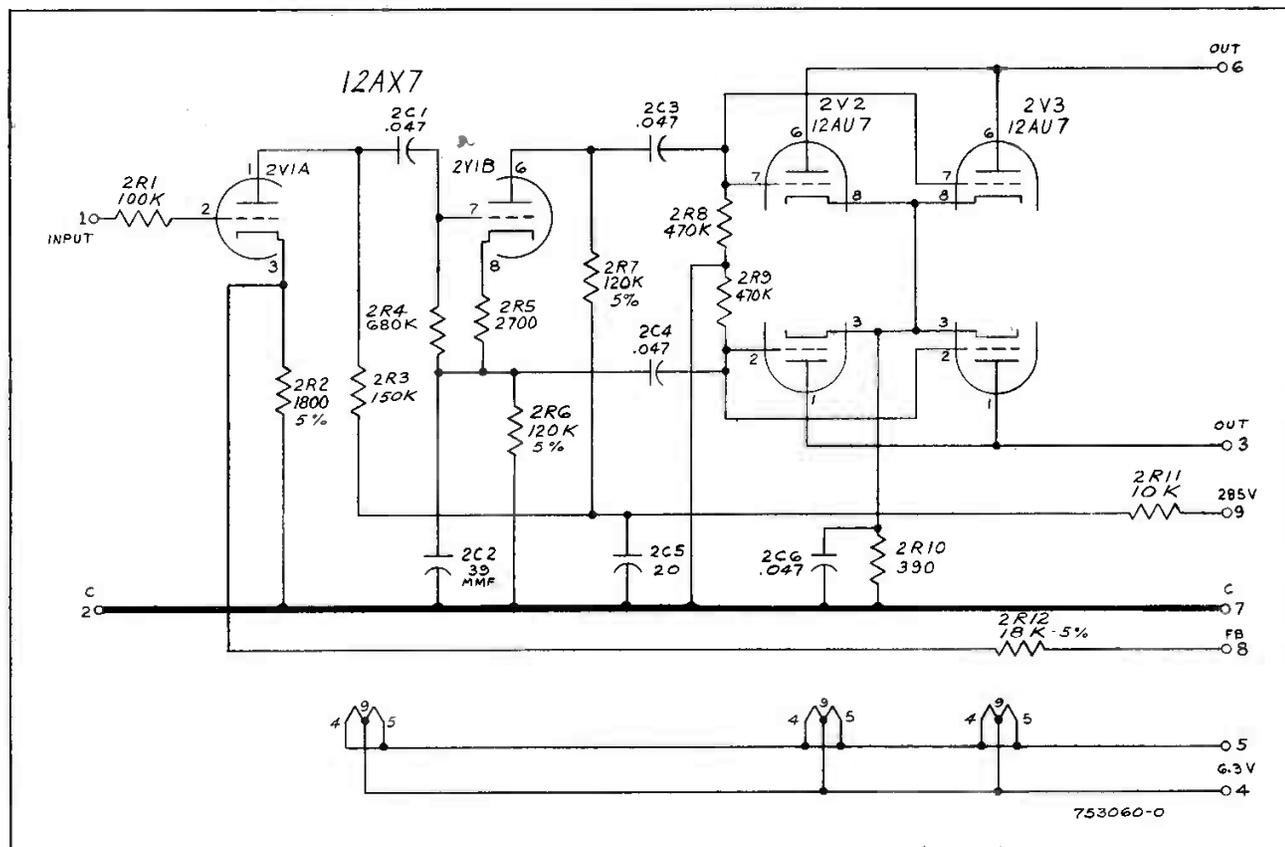
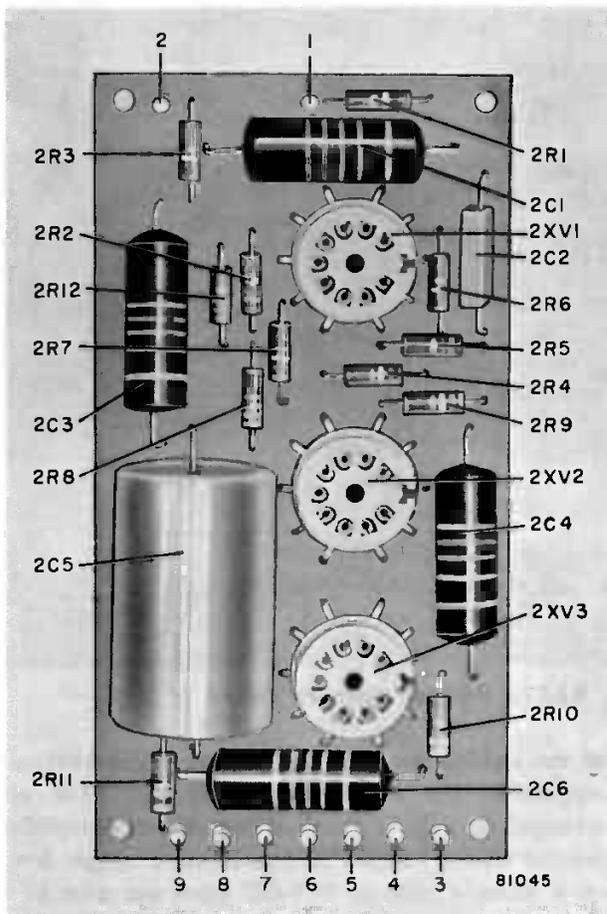


Figure 6—Schematic Diagram for Program Amplifiers 5AR13, 5AR14



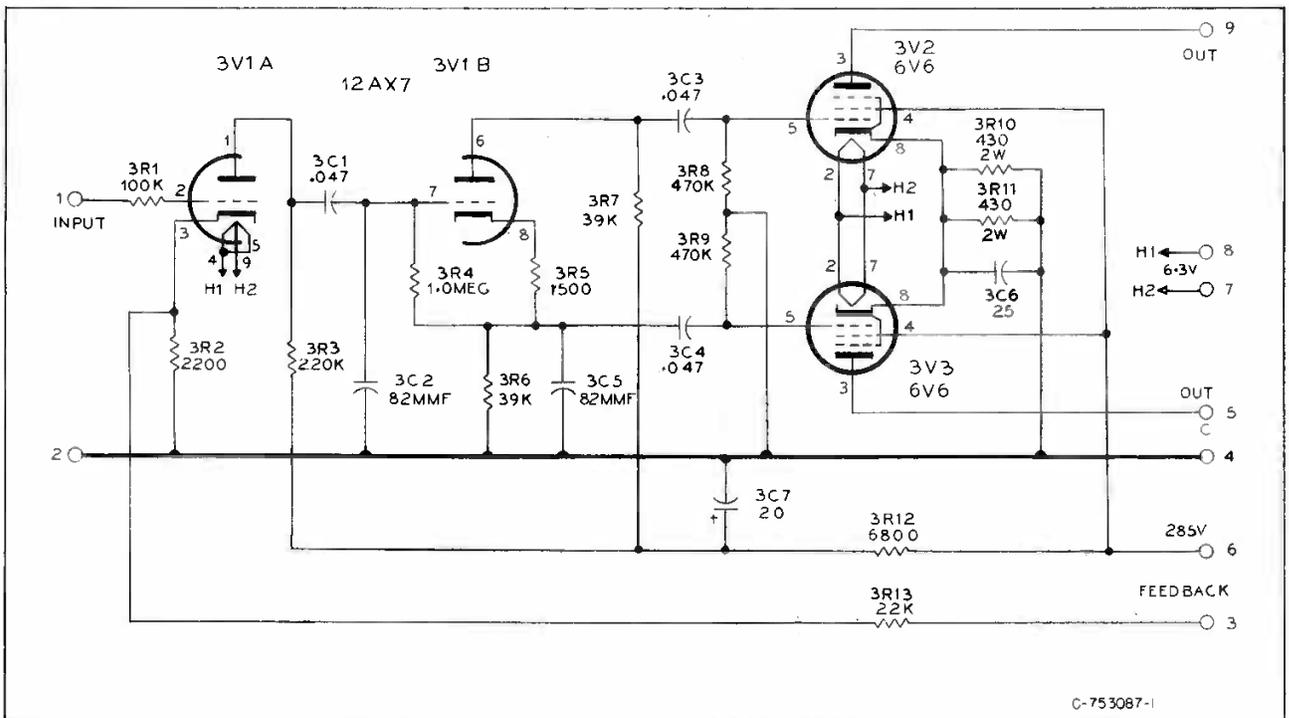
**Figure 7—Program Amplifier 5AR13, 5AR14 Printed Circuit Board**

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

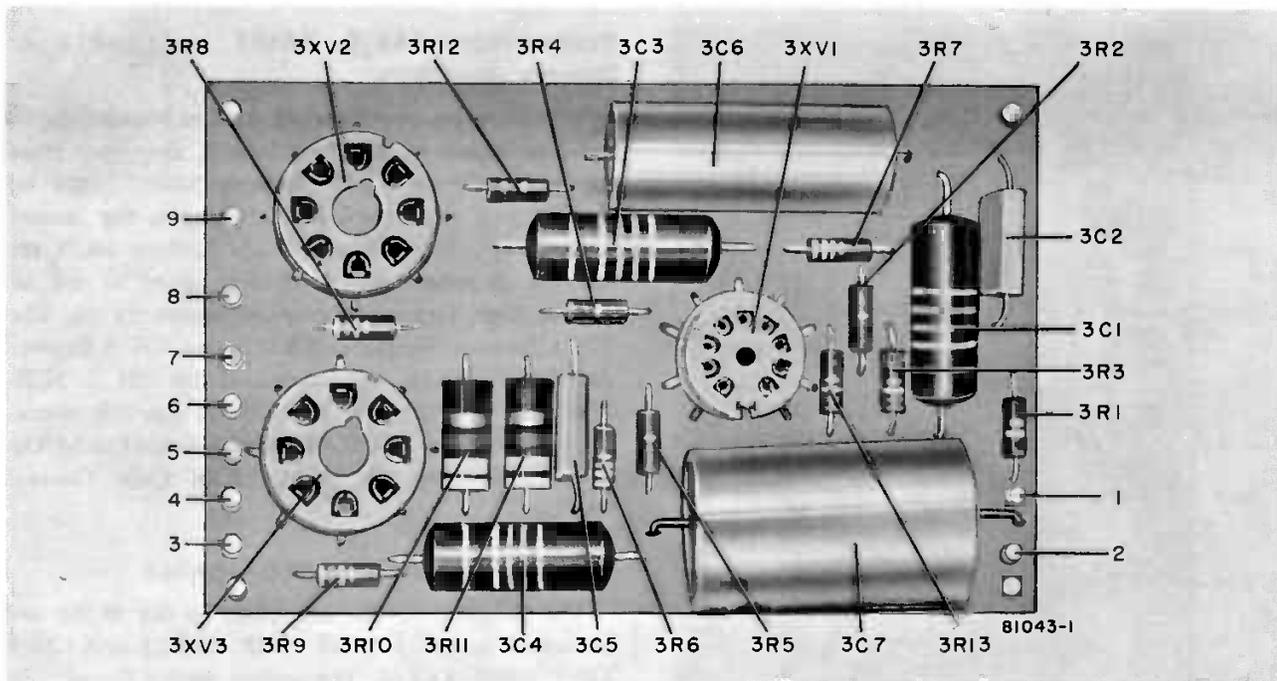
When the preamplifiers are used as booster amplifiers, as shown in figures 4 and 5, they vary from the preamplifiers 5AR1 through 5AR9. Since no switching is performed in the output, the second output capacitor 1C6 and shunt resistor 1R13 are omitted. A series resistor 1R14 is added to roll off of the high frequency response above 15 kc. 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.

**Program Amplifiers 5AR13 — 5AR14**

The program or line amplifiers in the BC-6B 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. The amplifiers will operate with only slight degradation of quality with either one of the 12AU7 tubes burnt out or removed from the socket. Negative feedback is derived from



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



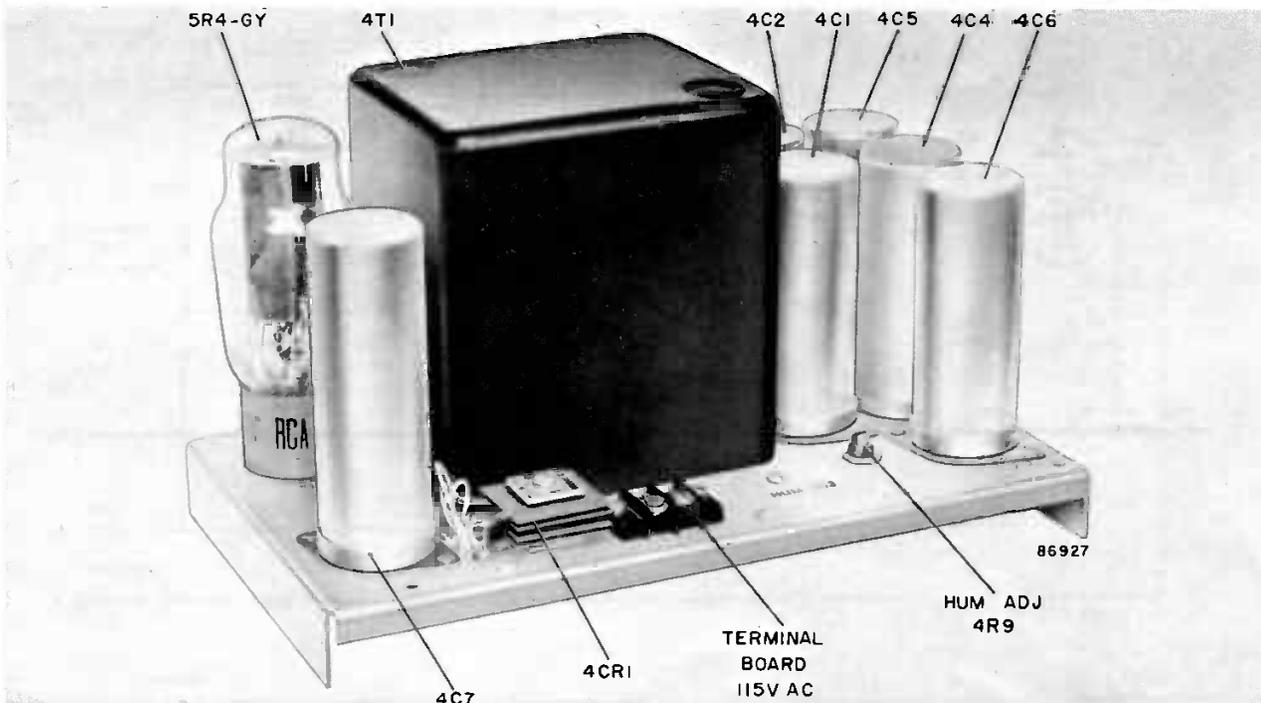
**Figure 9—Monitor Amplifier 5AR15, 5AR16 Printed Circuit Board**

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-6B 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.



**Figure 10—Power Supply 5PS1, 5PS2**

### Power Supplies 5PS1 — 5PS2

The BC-6B has two power supplies, each powers a single channel and alternate pre-amplifiers to provide greater continuity of service. The 5PS1 supplies power 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. The 6.3 v heater winding connects through a hum adjustment potentiometer to a positive bias 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. The CH 1 and CH 2 program monitor pads 5AT19 and 5AT20 are balanced H type with a loss of 60 db.

### Relays

Three relays are supplied mounted in the rear of the console. 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-6B 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 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



WIRE TABLE			PARTS LIST 8905257-502	
WIRE NO. INCLUSIVE	P.S. OR DISK NO.	ITEM NO.	OPEN NOS.	
1-11	TINNED COPPER .032 DIA.	805-57	50	5,8,5,9
20-22	WHITE - RED	805-7	51	
30-31	RED/YEL	805-7	52	
40	RED/BLK	805-7	53	
50-62	7/910	805-6	54	60
80	BLACK	805-6	55	
90	YELLOW	805-6	57	
100	BROWN	805-6	58	
110	BRN/BLK.	805-6	59	
120-124	ORANGE	805-6	60	12,2
131-133	RED/BLUE	805-6	61	
140	RED/GRN.	805-6	62	
150-151	RED/YEL.	805-6	63	
170-176	WHITE - YEL/GRN/OLIO	805-6	64	
190	SLEEVING, BLK. .042 I. D.	805-6	6	4,6
	SLEEVING, .133 I. D.	805-6	8	4,4

- NOTES
- 1- THE FOLLOWING WIRES ARE TWISTED PAIRS.  
120&121  
20&30  
90&100
  - 2- SOLDER ALL ELECTRICAL CONNECTIONS USING ITEM 67.
  - 3- BEND TERMINALS OF 4R5 TOWARD BOTTOM OF CHASSIS.

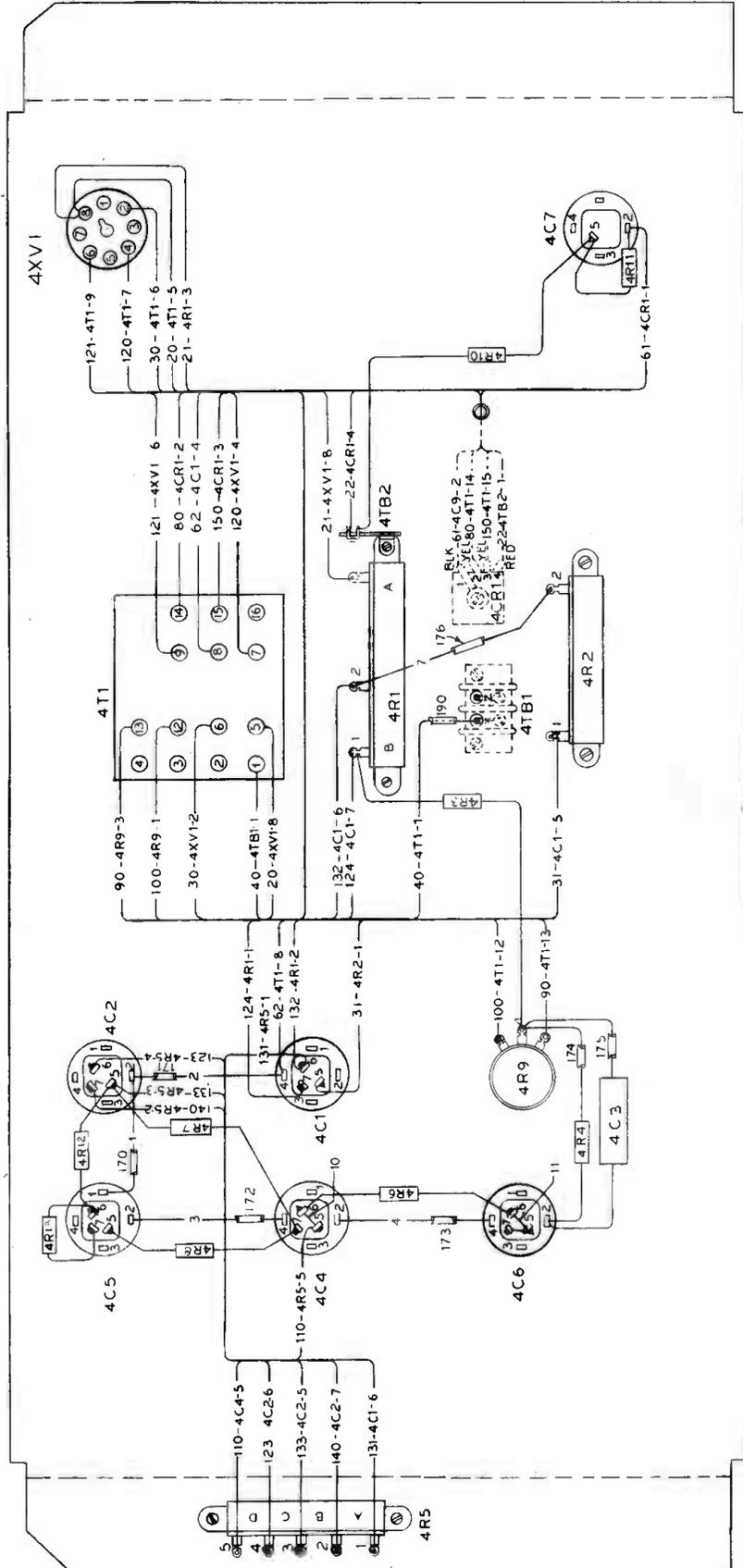
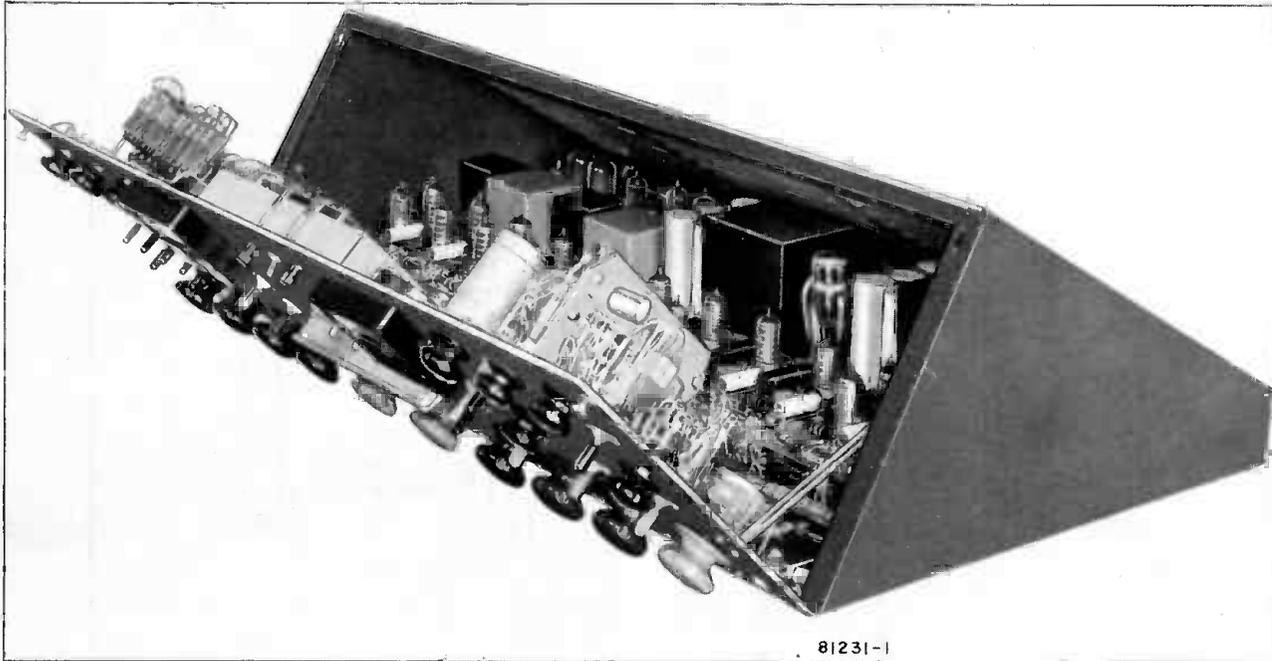


Figure 12—Connection Diagram for Power Supply (5PS1, 5PS2)

**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.



**Figure 13—Type BC-6B Console with Panel Open**  
**INSTALLATION**

#### **Location of Console**

The BC-6B 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-6B 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**

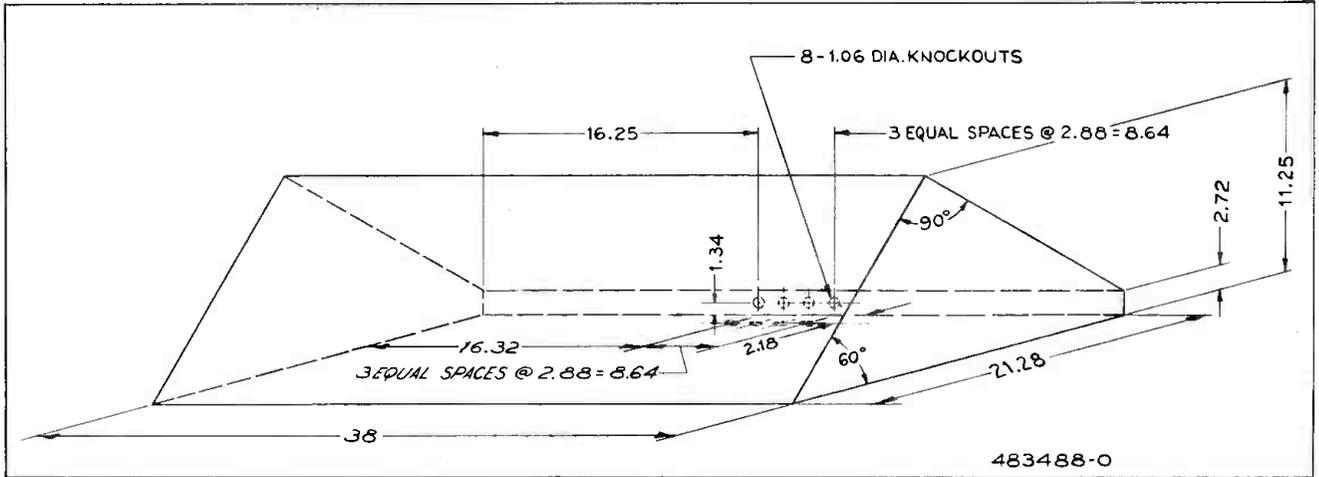
**EXERCISED WHEN REPLACING TUBES OR SERVICING THIS EQUIPMENT WITH POWER TURNED ON.**

#### **Removal of Shipping Bolts**

Remove the nuts and lockwashers located between preamplifiers 5AR1 and 5AR2 as well as 5AR8 and 5AR9. Remove the shipping screws by pulling through holes in the underside of the console housing. Removal of this shipping hardware permits the preamplifier mounting shelf to float freely on its rubber vibration mounts.

#### **Tube Installation**

Tubes are not supplied with the console and must be ordered as MI-11484-A. Insert the tubes in the sockets as called for by figure 21. Install the selected 12AY7 (MI-11299) tubes in the sockets nearest the front (or top) of the preamplifiers and booster amplifier printed wiring boards. A 12AY7



**Figure 14—Installation Diagram for BC-6B**

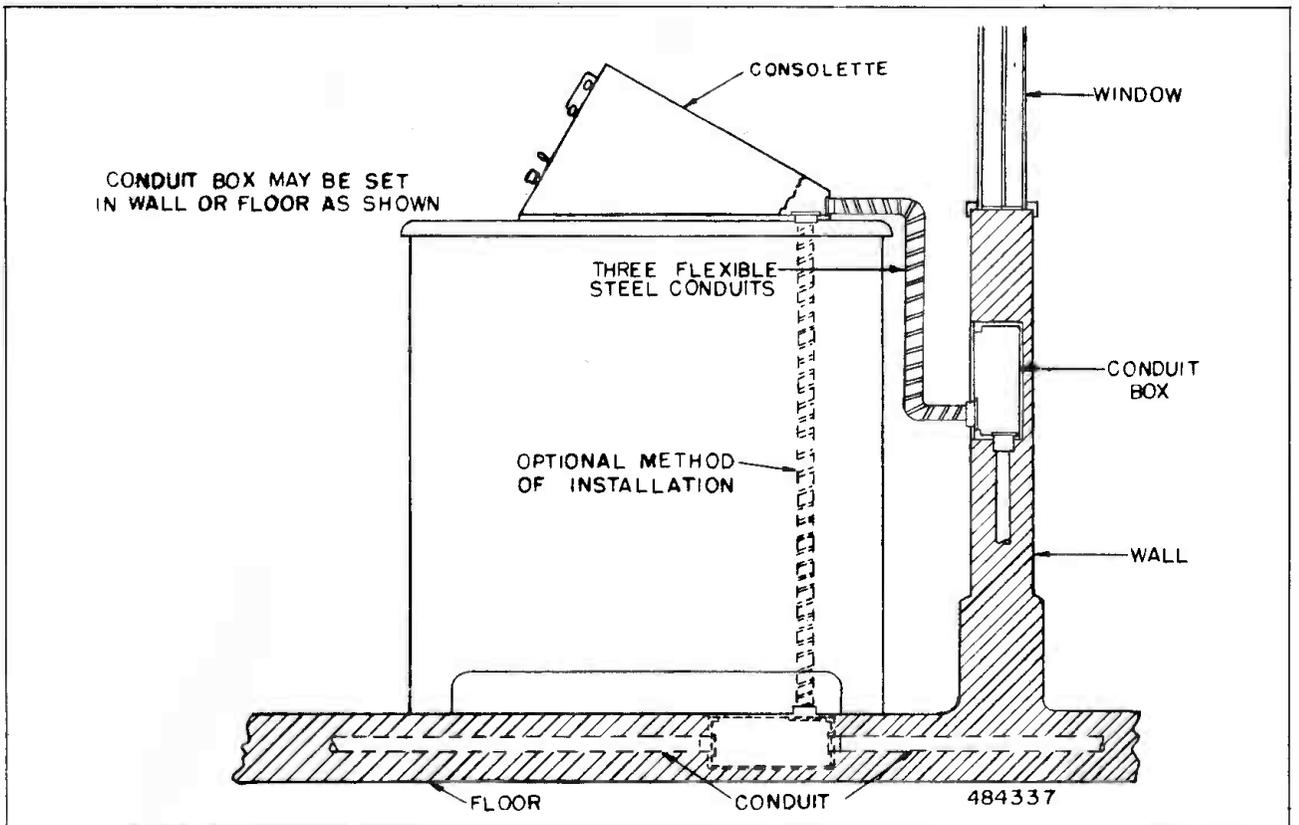
tube is used in the front socket of the amplifier 5AR9 which is used as the cue amplifier. Slip the shields over the tubes where tube shield ground straps are provided on the sockets making certain that the ground strap is wedged between the tube envelope and the shield. No tube is required in the front socket of the network preamplifier 5AR8.

**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



**Figure 15—Typical Cable Installation**

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 console.

### 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.

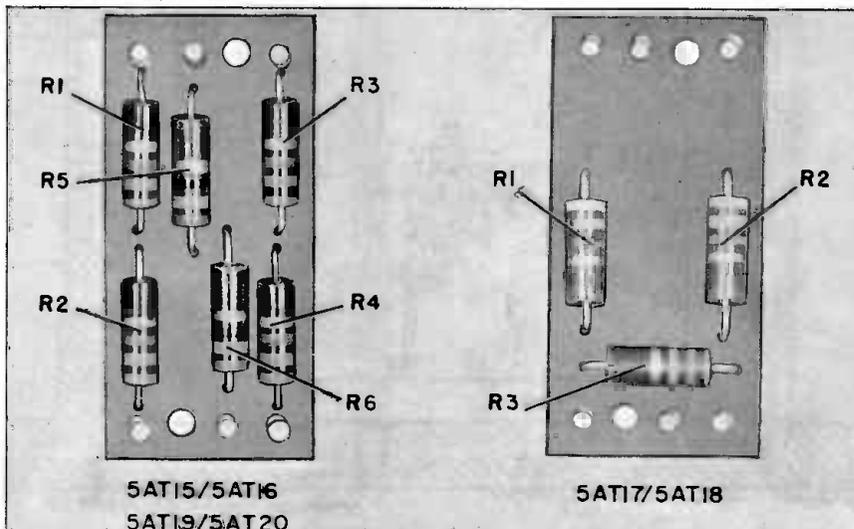


Figure 16—Fixed Pads 5AT15 (5AT16, 5AT19, 5AT20) and 5AT17 (5AT18)

### 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.

### 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
Announce Booth Microphone	5-6
Studio A Microphone 2	7-8
Studio B Microphone 3	9-10
Studio A Microphone 3	11-12
Studio B Microphone 4	13-14
Studio A Microphone 4	15-16
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
Not Used	65-66
Not Used	67-68
Not Used	69-70
Not Used	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, 5AT7, 5AT8 and 5AT9 in the Turntable, Tape or Film channels, Remote Lines and Network channels are provided with switches which connect the output of the first two stages of the preamplifiers to the Cue Feed Mon amplifier when the cue feed selector switch 5S19 is in the REC CUE position. This permits convenient cuing of turntable, tape recorder, film projector, network or remote line by turning the mixer control knob counterclockwise past the detent stop.

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-6B Console. Each VU meter attenuator is designed to give a meter reading of 100 (0 on the VU scale) with an output 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 console is shipped with the control circuits wired for installations consisting of a control room and two studios. Refer to figure 23.

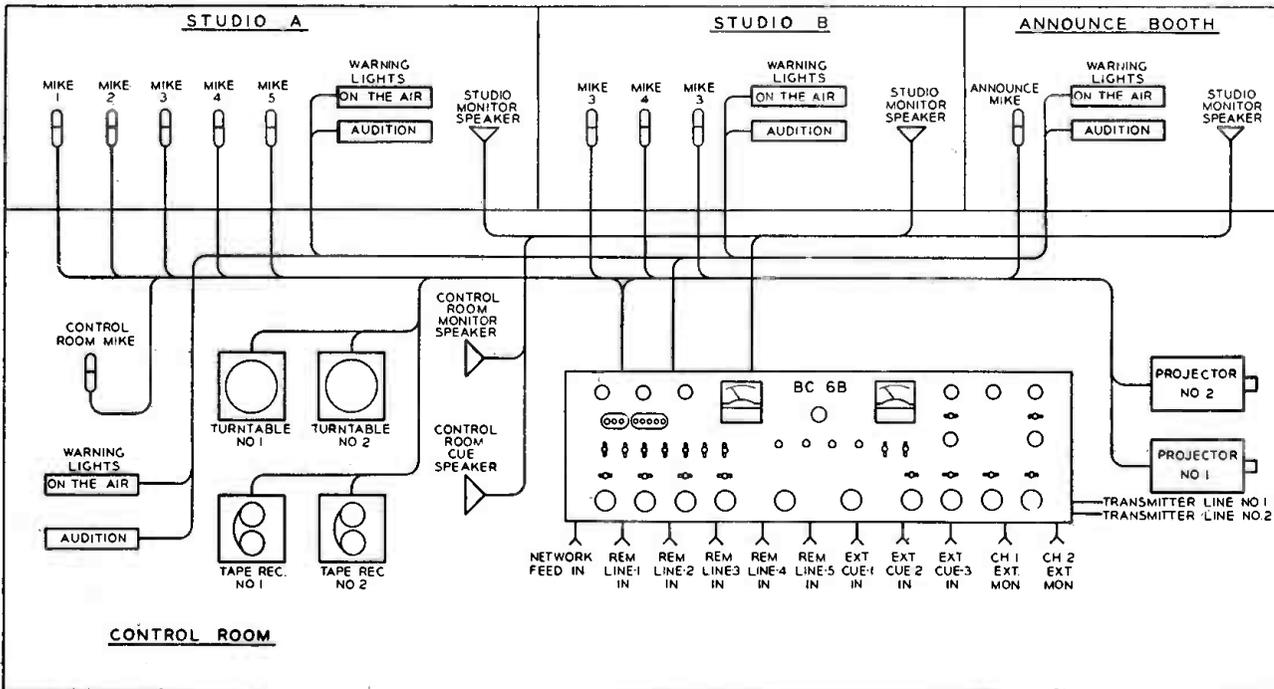
**Single Studio Installation**

If the console 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 17—Typical Installation for Studio**

## 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.

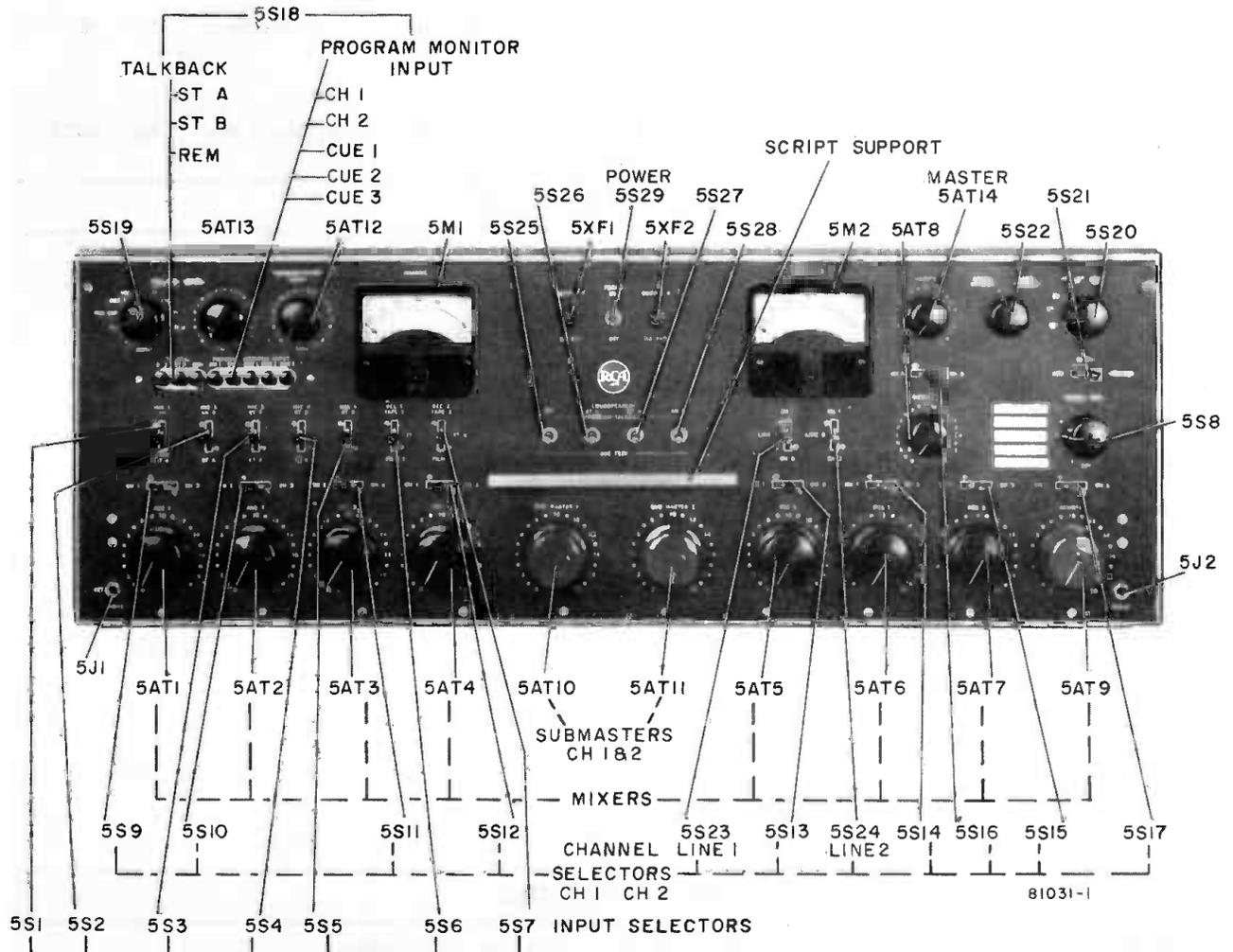


Figure 18—Control Panel

## 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	5AT12	Black	Adjusts output Level of program-talkback monitor amplifier	5S18
MONITOR GAIN				
CUE FEED MONITOR INPUT	5S19	Black	Selects input for Cue Feed Monitor amplifier	5AT13
SELECTOR				
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
REMOVE			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	

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.

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-CUEPHONE 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, network and remote lines using cue switch on mixer controls*

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 or 5S8 to the remote line to be cued.

c. Turn the mixer gain control of the channels to be cued to 0 or maximum counterclockwise position (past the detent stop).

d. Adjust the gain by means of CUE-FEED-MONITOR GAIN control, 5AT13.

NOTE: Do not turn mixer controls counterclockwise past the detent stop if not used for cueing.

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-6B 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.

### 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 console.

### 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.

## TUBE SOCKET VOLTAGES

Tube Socket	1	2	3	4	5	6	7	8	9
<b>PREAMPLIFIER (5AR1 — 5AR12)</b>									
1XV1	195-239	0	4.2-5.0	*	*	112-138	0	1.4-1.8	**
1XV2	175-205	0	4.2-6.0	*	*	285	0	75-93	**
<b>PROGRAM AMPLIFIER (5AR13 — 5AR14)</b>									
2XV1	130-150	0	1.15-1.40	*	*	180-210	—	55-65	**
2XV1	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***	—

5 VAC between points marked \*\*\*

6.3 VAC between terminals marked by \* and \*\*

## Power Supplies 5PS1 and 5PS2

Each power supply chassis is secured to the console 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 component is defective, it may be replaced without removing the board from its mounting.

a. In the case of a small component, such as a 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 19.

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 19.

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.

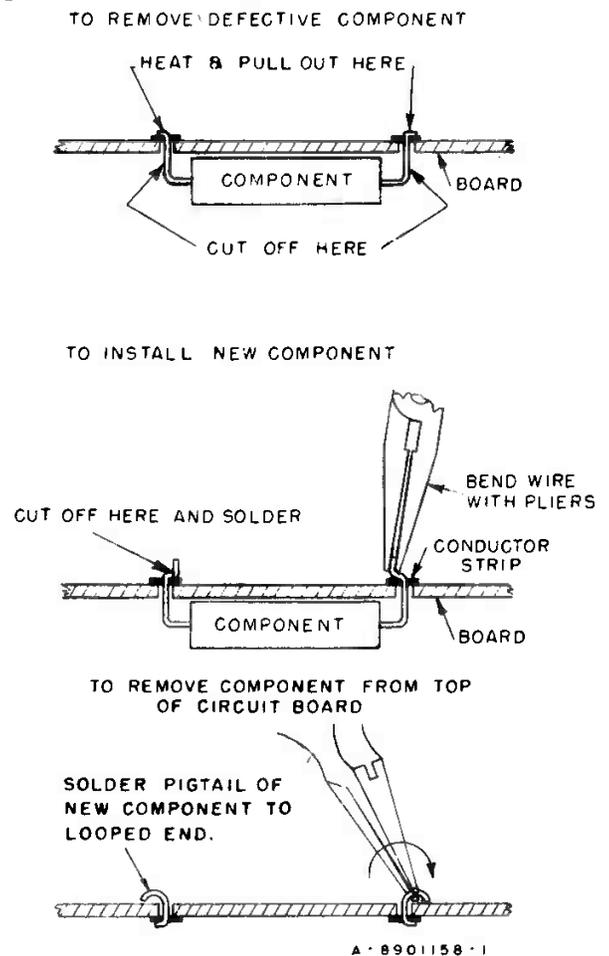


Figure 19—Replacement of Components in Printed Circuits



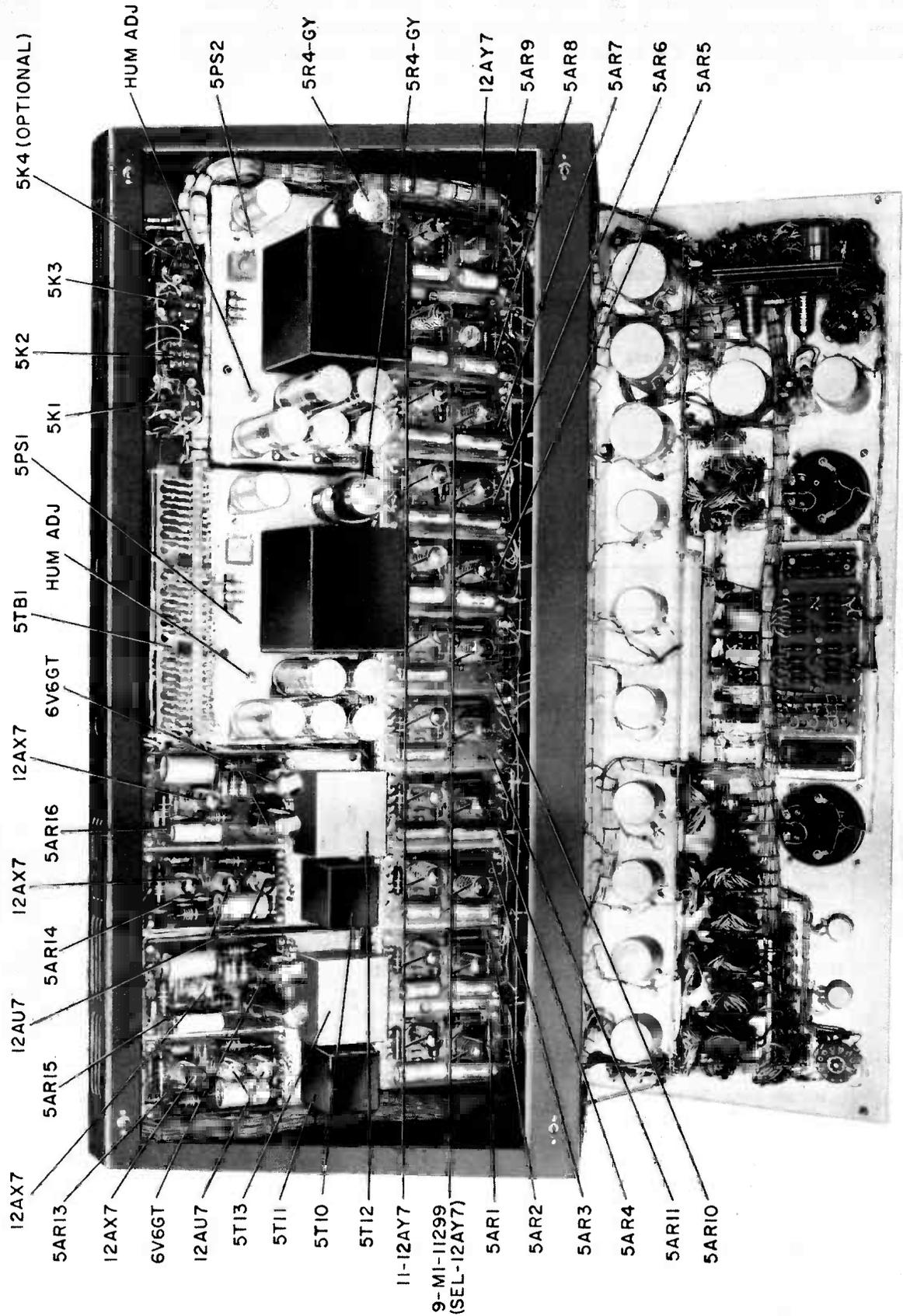


Figure 21—Internal View of Console

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 19), 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.

### LIST OF PARTS

Symbol No.	Description	Stock No.
5AR1 to 5AR9	Pre-Amplifier: circuit board assy., complete with 6 capacitors, 13 resistors, 2 tube sockets and 2 ground straps (components listed under pre-amplifiers)	215365
5AR10 to 5AR12	Pre-Amplifiers: circuit board assy., complete with 5 capacitors, 13 resistors, 2 tube sockets, and 2 ground straps (components listed under pre-amplifiers)	215366
5AR13, 5AR14	Program Amplifier: circuit board assy., complete with 6 capacitors, 12 resistors, and 3 tube sockets (components listed under program amplifiers)	211000
5AR15, 5AR16	Monitor Amplifier: circuit board assy., complete with 7 capacitors, 13 resistors, 3 tube sockets, (components listed under monitor amplifiers)	211001
5AT1 to 5AT5	Resistor: variable, attenuator, 100,000 ohms, 20 steps, 2 DB per step, last step tapered to infinity	211002
5AT6 to 5AT9	Resistor: variable; attenuator, 100,000 ohms, 20 steps, 2 DB per step, last step tapered to infinity with cue switch	211003
5AT10, 5AT11	Resistor: variable, attenuator, 100,000 ohms, 20 steps, 2 DB per step, last step tapered to infinity. Same as 5AT1	211002
5AT12, 5AT13	Resistor: variable, composition, 100,000 ohms, $\pm 10\%$ , 2 w	209286

Symbol No.	Description	Stock No.
5AT14	Resistor: variable attenuator, 15,000/15,000 ohms, 20 steps, 2 DB 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	
5AT19, 5AT20	Fixed Pad: parts listed under fixed pads	
5C1 to 5C4	Capacitor: fixed, paper, 0.47 mf, $\pm 20\%$ , 200 v	
5C5	Capacitor: paper, 0.1 mf, $\pm 10\%$ , 400 v	
5C6, 5C7	Capacitor: fixed, mica, 220 mmf, $\pm 10\%$ , 500 v	39636
5F1, 5F2	Fuse: 3 amp., 125 v, slo-blow	99164
5J1, 5J2	Jack: open circuit	53401
5K1 to 5K4	Relay: DPDT	205255
5M1, 5M2	Meter: VU	205249
5PS1, 5PS2	Power Supply:	
5R1 to 5R5	Resistor: fixed, composition, 150 ohms, $\pm 10\%$ , $\frac{1}{2}$ w	502115
5R6	Resistor: fixed, composition 4700 ohms, $\pm 10\%$ , $\frac{1}{2}$ w	
5R7	Resistor: fixed, composition, 680 ohms, $\pm 10\%$ , $\frac{1}{2}$ w	
5R8	Resistor: fixed, composition, 560 ohms, $\pm 10\%$ , $\frac{1}{2}$ w	502156
5R9, 5R10	Resistor: fixed, composition, 100,000 ohms, $\pm 5\%$ , $\frac{1}{2}$ w	
5R11 to 5R28	Resistor: fixed, composition 22,000 ohms, $\pm 10\%$ , $\frac{1}{2}$ w	
5R29	Resistor: fixed, composition, 18,000 ohms, $\pm 5\%$ , $\frac{1}{2}$ w	

Symbol No.	Description	Stock No.
5R30, 5R31	Resistor: fixed, composition, 12,000 ohms, $\pm 5\%$ , $\frac{1}{2}$ w	
5R32	Resistor: fixed, composition, 18,000 ohms, $\pm 5\%$ , $\frac{1}{2}$ w. Same as 5R29	
5R33	Resistor: fixed, composition, 2000 ohms, $\pm 5\%$ , $\frac{1}{2}$ w	
5R34	Resistor: fixed, composition, 5600 ohms, $\pm 5\%$ , $\frac{1}{2}$ w	
5R35	Resistor: fixed, composition, 2700 ohms, $\pm 5\%$ , $\frac{1}{2}$ w	
5R36 to 5R41	Resistor: fixed, composition, 100 ohms, $\pm 5\%$ , 1 w	
5R42 to 5R44	Resistor: fixed, composition, 560 ohms, $\pm 10\%$ , $\frac{1}{2}$ w. Same as 5R8	502156
5R45, 5R46	Not Used	
5R47	Resistor: fixed, composition, 2000 ohms, $\pm 5\%$ , $\frac{1}{2}$ w. Same as 5R33	
5R48	Resistor: fixed, composition, 5600 ohms, $\pm 5\%$ , $\frac{1}{2}$ w. Same as 5R34	
5R49	Resistor: fixed, composition, 2700 ohms, $\pm 5\%$ , $\frac{1}{2}$ w. Same as 5R35	
5R50 to 5R55	Resistor: fixed, composition, 100 ohms, $\pm 5\%$ , 1 w	512110
5R56 to 5R58	Resistor: fixed, composition, 560 ohms, $\pm 10\%$ , $\frac{1}{2}$ w. Same as 5R8	502156
5R59	Resistor: fixed, composition, 100,000 ohms, $\pm 5\%$ , $\frac{1}{2}$ w. Same as 5R9	
5R60	Resistor: fixed, composition, 27,000 ohms, $\pm 5\%$ , $\frac{1}{2}$ w	
5R61, 5R62	Resistor: fixed, composition, 1500 ohms, $\pm 5\%$ , 1 w	
5R63	Resistor: fixed, composition, 820 ohms, $\pm 5\%$ , $\frac{1}{2}$ w	
5R64 to 5R72	Resistor: fixed, wire wound, 15 ohms, $\pm 10\%$ , 5 w	97441
5R73, 5R74	Resistor: fixed, composition, 4700 ohms, $\pm 10\%$ , $\frac{1}{2}$ w. Same as 5R6	
5R75	Resistor: fixed, composition, 680 ohms, $\pm 10\%$ , $\frac{1}{2}$ w. Same as 5R7	
5R76 to 5R85	Resistor: fixed, composition, 4700 ohms, $\pm 10\%$ , $\frac{1}{2}$ w. Same as 5R6	
5R86	Resistor: fixed, composition, 680 ohms, $\pm 10\%$ , $\frac{1}{2}$ w. Same as 5R7	
5R87	Resistor: fixed, composition, 10,000 ohms, $\pm 10\%$ , $\frac{1}{2}$ w	
5R88	Resistor: fixed, composition, 150 ohms, $\pm 10\%$ , $\frac{1}{2}$ w. Same as 5R1	502115
5R89	Resistor: fixed, composition, 10,000 ohms, $\pm 10\%$ , $\frac{1}{2}$ w. Same as 5R87	

Symbol No.	Description	Stock No.
5R90, 5R91	Resistor: fixed, composition, 470,000 ohms, $\pm 10\%$ , $\frac{1}{2}$ w	
5R92, 5R93	Resistor: fixed, composition, 56,000 ohms, $\pm 10\%$ , $\frac{1}{2}$ w	
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
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
	MISCELLANEOUS	
	Board: terminal, 46 terminals	211030
	Board: terminal, 120 terminals	211031
	Button: push, black	32120
	Button: push, red	32121
	Clamp: cable, white nylon, 3/16" ID	209652
	Clamp: cable, white nylon, 3/8" ID	210391
	Clamp: cable, white nylon, 1/2" ID	213250
	Clamp: cable, white nylon, 1/8" ID	209653
	Clamp: cable, white nylon, 1/4" ID	211034
	Fastener: receptacle, silicon, bronze	94641

Symbol No.	Description	Stock No.
	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, black	96755
	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" ID x 1 3/8" ht., aluminum	211035
	Support: fall, single link, 6 1/4" lg. with 5 1/2" slot	94647

#### PRE-AMPLIFIERS 5AR1 — 5AR12

1C1	Capacitor: fixed, paper, 0.047 mf, $\pm 10\%$ , 400 v	
1C2	Capacitor: fixed, paper, 0.1 mf, $\pm 10\%$ , 400 v	
1C3	Capacitor: fixed, paper, 0.022 mf, $\pm 10\%$ , 400 v	
1C4	Capacitor: fixed, paper, 0.0047 mf, $\pm 5\%$ , 600 v	
1C5, 1C6	Capacitor: fixed, paper, 1.0 mf, $\pm 10\%$ , 200 v. (1C6 used only in 5AR10 to 5AR12)	
1R1	Resistor: fixed, composition, 8200 ohms, $\pm 5\%$ , 1 w	
1R2	Resistor: fixed, composition, 100,000 ohms, $\pm 10\%$ , 1/2 w	
1R3	Resistor: fixed, composition, 680,000 ohms, $\pm 10\%$ , 1/2 w	
1R4	Resistor: fixed, composition, 820 ohms, $\pm 10\%$ , 1/2 w	
1R5	Resistor: fixed, composition, 330,000 ohms, $\pm 5\%$ , 1/2 w	
1R6	Resistor: fixed, composition, 82,000 ohms, $\pm 10\%$ , 1/2 w	
1R7	Resistor: fixed, composition, 16,000 ohms, $\pm 5\%$ , 1 w	
1R8	Resistor: fixed, composition, 220,000 ohms, $\pm 5\%$ , 1/2 w	
1R9	Resistor: fixed, composition, 680,000 ohms, $\pm 10\%$ , 1/2 w. Same as 1R3	
1R10	Resistor: fixed, composition, 56,000 ohms, $\pm 5\%$ , 1/2 w	
1R11	Resistor: fixed, composition, 2200 ohms, $\pm 10\%$ , 1/2 w	

Symbol No.	Description	Stock No.
1R12, 1R13	Resistor: fixed, composition, 220,000 ohms, $\pm 10\%$ , 1/2 w. (1R13 used in 5AR10 to 5AR12 only)	
1R14	Resistor: fixed, composition, 3300 ohms, $\pm 10\%$ , 1/2 w	
1XV1, 1XV2	Socket: tube, 9 contact miniature Strap: ground, for miniature tube socket	209284 210773

#### PROGRAM AMPLIFIERS 5AR13, 5AR14

2C1	Capacitor: fixed, paper, 0.047 mf, $\pm 10\%$ , 400 v	
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	
2R1	Resistor: fixed, composition, 100,000 ohms, $\pm 10\%$ , 1/2 w	
2R2	Resistor: fixed, composition, 1800 ohms, $\pm 5\%$ , 1/2 w	
2R3	Resistor: fixed, composition, 150,000 ohms, $\pm 10\%$ , 1/2 w	
2R4	Resistor: fixed, composition, 680,000 ohms, $\pm 10\%$ , 1/2 w	
2R5	Resistor: fixed, composition, 2700 ohms, $\pm 10\%$ , 1/2 w	
2R6, 2R7	Resistor: fixed, composition, 120,000 ohms, $\pm 5\%$ , 1/2 w	
2R8, 2R9	Resistor: fixed, composition, 470,000 ohms, $\pm 5\%$ , 1/2 w	
2R10	Resistor: fixed, composition, 390 ohms, $\pm 5\%$ , 1/2 w	
2R11	Resistor: fixed, composition, 10,000 ohms, $\pm 10\%$ , 1/2 w	
2R12	Resistor: fixed, composition, 18,000 ohms, $\pm 5\%$ , 1/2 w	
XV1 to XV3	Socket: tube, 9 contact miniature	209284

#### MONITOR AMPLIFIERS 5AR15, 5AR16

3C1	Capacitor: fixed, paper, 0.047 mf, $\pm 10\%$ , 400 v	
3C2	Capacitor: fixed, mica, 82 mmf, $\pm 10\%$ , 500 v	203411
3C3, 3C4	Capacitor: fixed, paper, 0.047 mf, $\pm 10\%$ , 400 v. Same as 3C1	
3C5	Capacitor: fixed, mica, 82 mmf, $\pm 10\%$ , 500 v. Same as 3C2	203411
3C6	Capacitor: electrolytic, 25 mf, +250 -10%, 25 v	52518
3C7	Capacitor: electrolytic, 20 mf, +50 -10%, 450 v	99149
3R1	Resistor: fixed, composition, 100,000 ohms, $\pm 10\%$ , 1/2 w	
3R2	Resistor: fixed, composition, 2200 ohms, $\pm 5\%$ , 1/2 w	

Symbol No.	Description	Stock No.
3R3	Resistor: fixed, composition, 220,000 ohms, $\pm 10\%$ , $\frac{1}{2}$ w	
3R4	Resistor: fixed, composition, 1 meg., $\pm 10\%$ , $\frac{1}{2}$ w	
3R5	Resistor: fixed, composition, 1500 ohms, $\pm 10\%$ , $\frac{1}{2}$ w	
3R6, 3R7	Resistor: fixed, composition, 39,000 ohms, $\pm 5\%$ , $\frac{1}{2}$ w	
3R8, 3R9	Resistor: fixed, composition, 470,000 ohms, $\pm 10\%$ , $\frac{1}{2}$ w	
3R10, 3R11	Resistor: fixed, composition, 430 ohms, $\pm 5\%$ , 2 w	
3R12	Resistor: fixed, composition, 6800 ohms, $\pm 10\%$ , $\frac{1}{2}$ w	
3R13	Resistor: fixed, composition, 22,000 ohms, $\pm 5\%$ , $\frac{1}{2}$ w	
3XV1	Socket: tube, 9 contact miniature	209284
3XV2, 3XV3	Socket: tube, octal	207707
<b>FIXED PADS 5AT15, 5AT16</b>		
R1 to R4	Resistor: fixed, composition, 270 ohms, $\pm 5\%$ , 1 w	512127
R5, R6	Resistor: fixed, composition, 18 ohms, $\pm 5\%$ , 1 w Board: circuit, etched with 6 terminals	211018
<b>FIXED PADS 5AT17, 5AT18</b>		
R1, R2	Resistor: fixed, composition, 4700 ohms, $\pm 5\%$ , 1 w	
R3	Resistor: fixed, composition, 620 ohms, $\pm 5\%$ , 1 w Board: circuit, etched with 6 terminals	211018
<b>FIXED PADS 5AT19, 5AT20</b>		
R1	Resistor: fixed, composition, 11,000 ohms, $\pm 5\%$ , 1 w	
R2	Resistor: fixed, composition, 62 ohms, $\pm 5\%$ , 1 w	
R3	Resistor: fixed, composition, 11,000 ohms, $\pm 5\%$ , 1 w. Same as 4R1	
R4	Resistor: fixed, composition, 62 ohms, $\pm 5\%$ , 1 w. Same as 4R2	

Symbol No.	Description	Stock No.
R5, R6	Resistor: fixed, composition, 10 ohms, $\pm 5\%$ , 1 w Board: circuit, etched, with 6 terminals	211018
<b>POWER SUPPLY 5PS1, 5PS2</b>		
4C1A/C, 4C2A/C 4C3	Capacitor: electrolytic, 40/40/40 mf, +50 -10%, 450 v Capacitor: fixed, paper, 0.47 mf, $\pm 10\%$ , 200 v	211022
4C4A/C to 4C6A/C	Capacitor: electrolytic, 40/40/40 mf, +50 -10%, 450 v. Same as 4C1A/C	211022
4C7	Capacitor: fixed, dry electrolytic, 1500 mf, 50 v	98180
4CR1	Rectifier: selenium	215368
4R1A, B	Resistor: tapped, wire wound, 100/3000 ohms, $\pm 10\%$ , 7.6/5.4 w	211024
4R2	Resistor: fixed, wire wound, 750 ohms, $\pm 10\%$ , 10 w	211025
4R3	Resistor: fixed, composition, 120,000 ohms, $\pm 10\%$ , 1 w	
4R4	Resistor: fixed, composition, 18,000 ohms, $\pm 10\%$ , 1 w	
4R5A/D	Resistor: tapped, wire wound, 1000/1000/1000/1000 ohms	215369
4R6	Resistor: fixed, composition, 6800 ohms, $\pm 10\%$ , 1 w	
4R7	Resistor: fixed, composition, 10,000 ohms, $\pm 10\%$ , 1 w	
4R8	Resistor: fixed, composition, 22,000 ohms, $\pm 10\%$ , 1 w	
4R9	Resistor: variable, wire wound, 100 ohms, 2 w	45390
4R10	Resistor: fixed, composition, 10 ohms, $\pm 10\%$ , 1 w	
4R11	Resistor: fixed, composition, 1200 ohms, $\pm 10\%$ , 2 w	
4R12	Resistor: fixed, composition, 10,000 ohms, $\pm 10\%$ , 1 w. Same as 4R7	
4R13	Resistor: fixed, composition, 22,000 ohms, $\pm 10\%$ , 1 w. Same as 4R8	
4T1	Transformer: power	215370
4XV1	Socket: tube, octal	68590



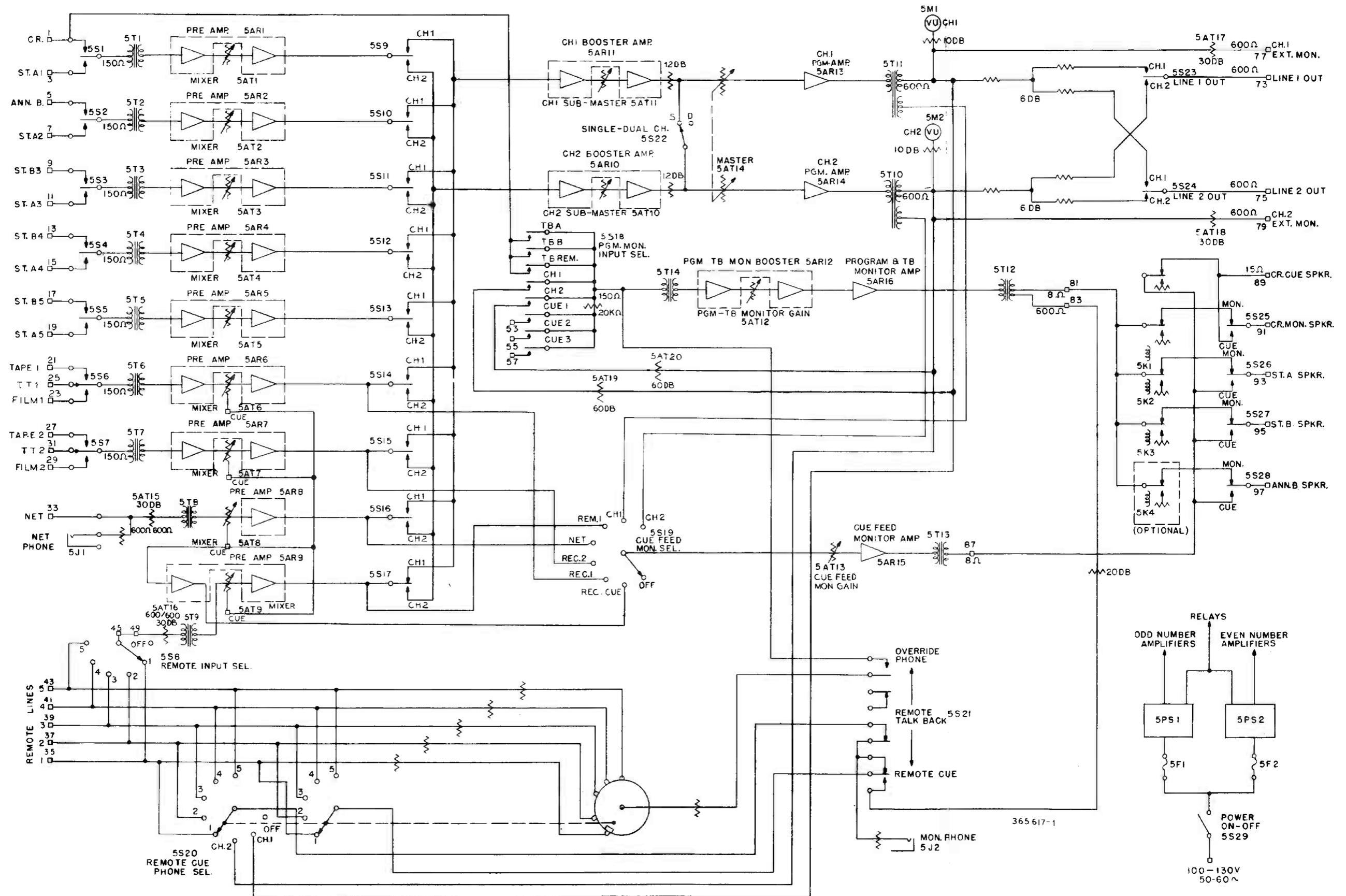
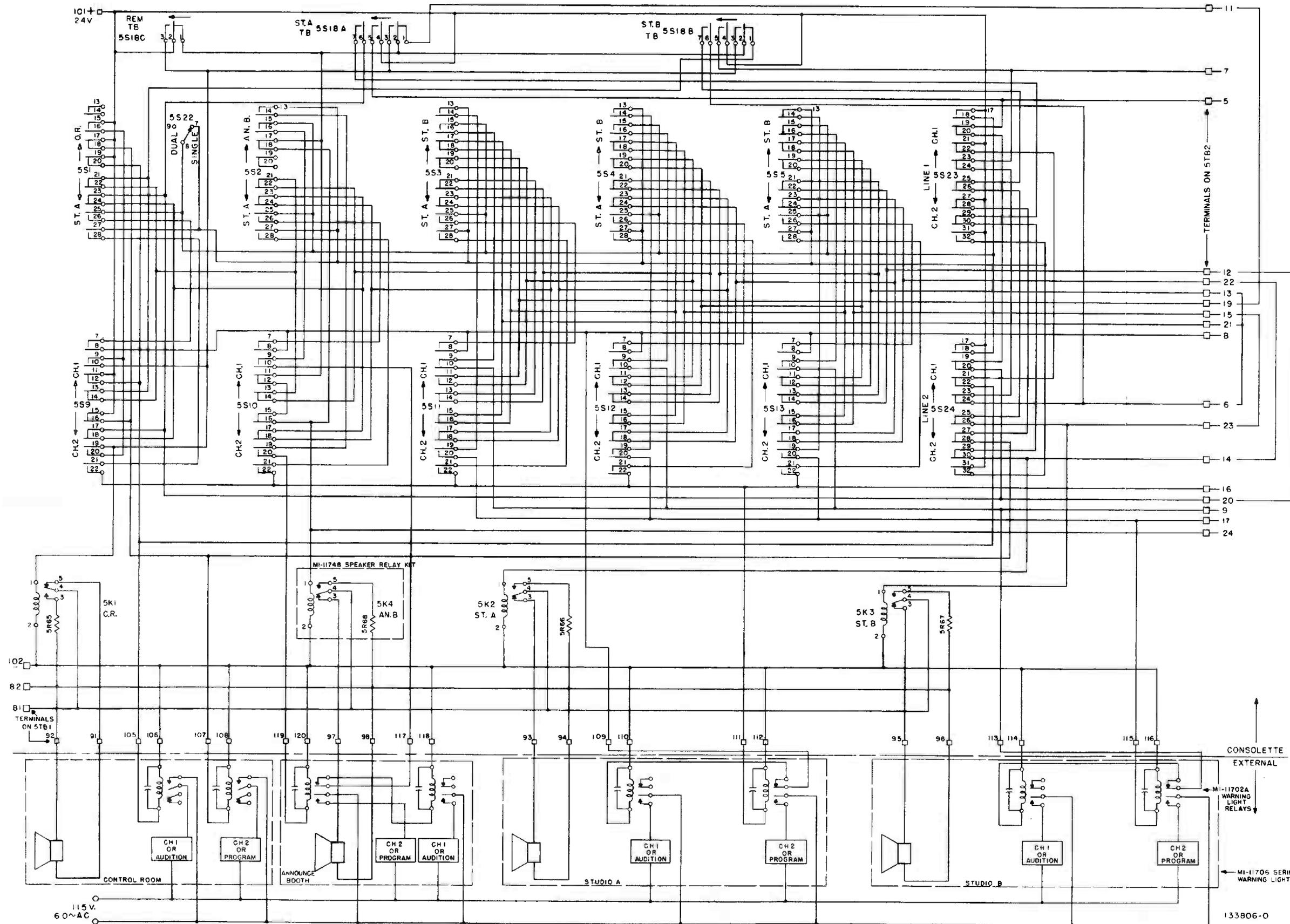
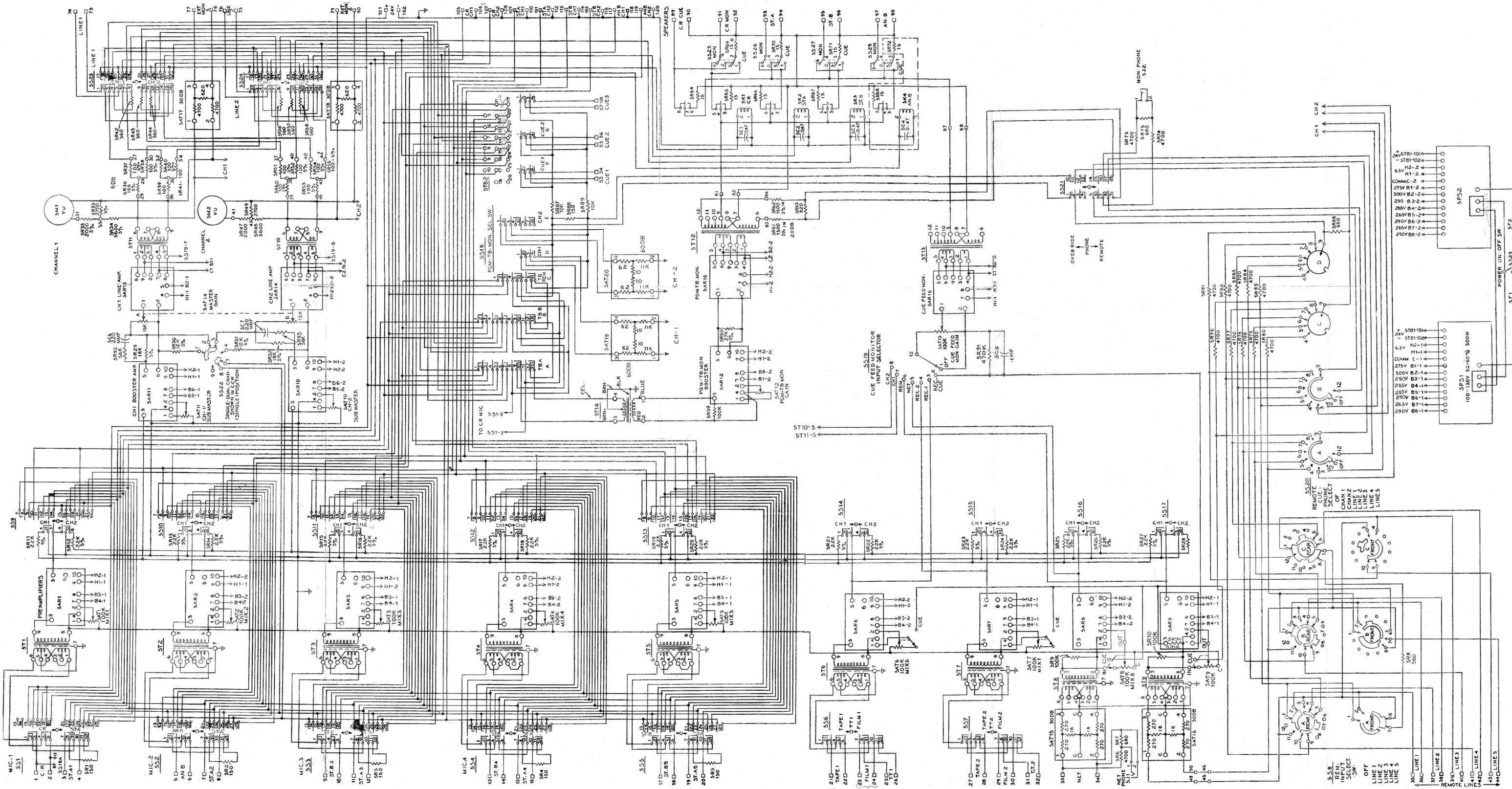


Figure 22—Block Diagram



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

Figure 23—Control Circuits



NAME	RELATED SYMBOLS	DWG. REF.	COMPONENT
PRE-AMPLIFIERS	SAR10-SAR13	54-1145-7	PRE FLX 1
BOOSTER AMP	SAR10-SAR13	54-1145-7	1
LINE AMP	SAR14-SAR17	54-1145-7	5
MON. AMP	SAR18-SAR21	54-1145-7	5
POWER SUPPLY	5P51, 5P52	54-1145-7	4

ALL RESISTORS ARE IN OHMS  $\frac{1}{2}$ W. 10% UNLESS OTHERWISE SPECIFIED.  
 IF NOT OTHERWISE DESIGNATED:  
 NUMBERED SQUARES INDICATE TERMINALS ON 5P1.  
 NUMBERED CIRCLES INDICATE TERMINALS ON 5P2.  
 ROTARY SWITCHES ARE SHOWN IN MAX.-CC POSITION  
 UNLESS OTHERWISE SPECIFIED.  
 \*15 CONNECTED TO TERMINALS 89-90.

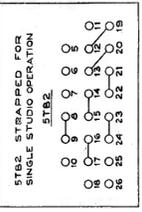
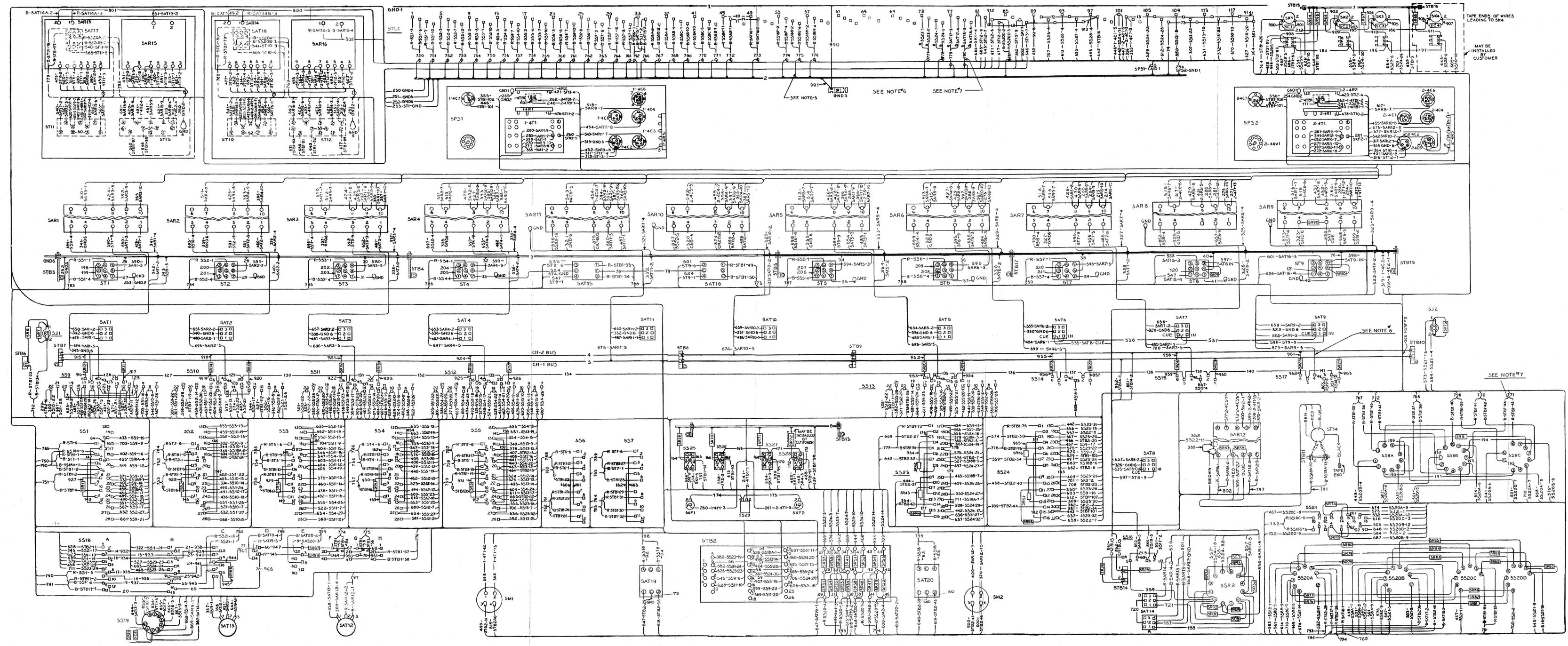


Figure 24—Overall Schematic Diagram



WIRE TABLE

WIRE NO INCL	DESCRIPTION	PS OR WMS	PT. NO	OPEN MD
1	WIRE TINNED COPPER .081 DIA.	105	112	
10	WIRE TINNED COPPER .032 DIA.	105	113	
100-103	TUBING,INSUL, BLK .081 I.D.	805-57	114	
110-111	TUBING,INSUL, BLK .135 I.D.	805-57	115	
120-215	WIRE BLACK .032 DIA	805-57	116	213&214
240-241	WHITE TUBING 1/2 O.D.	805-57	117	
250-255	BLACK		122	
260-261	RED/BLK		123	
270-278	BROWN	77010	124	
280-286	BLK/BRN 1/2 O.D.	805-57	125	
290-308	WHITE	77010	805-6	128
309-344/343	BLACK		129	362&363
365-387	BROWN		130	
390-409	BRN/BLK		131	
420-443	RED/BLUE		132	
450-453	ORANGE		133	
475-503	YELLOW		134	
510-536	GRN		135	
540-562	YEL/BLK		136	
580-584	YEL/BLU		137	
590-617	GRN		138	
630-646	GRN/BLK		139	
650-674	GRN/RED		140	
680-687	GRN/YEL		141	
690-711	WIRE WHITE BLUE 7/010	805-6	142	
750-802	SHIELDED PAIR RED-BLK	705-A2	143	
850-875	SHIELDED SINGLE RED	705-B1	144	
910-931	BRAID TINNED COPPER	449-57	118	
1000-1046	TUBING,INSUL, BLK .085 I.D.	722-9	114	
2000-2060	TUBING,INSUL, BLK .106 I.D.	722-9	116	

FOR LIST OF PARTS FOR ABOVE WIRE TABLE SEE DWG-8911339-502.

- NOTES
- SOLDER ALL ELECTRICAL CONNECTIONS USING ITEM#147
  - CABLE & THEN LACE WIRES WHERE NECESSARY USING LACING GORD ITEM#148
  - SOLDER ALL THE ENDS OF THE SHIELDS OF THE SHIELDED CABLES ON STB1 TO GROUND BUS (GND 2)
  - TWIST IN PAIRS THE FOLLOWING WIRES:  
270, 271, 272, 273, 274, 275, 276, 533, 385, 366, 367, 365, 366, 280, 281, 282, 283, 284, 285, 286, 547, 392, 393, 394, 395, 396, 367, 368, 369, 370, 473, 499, 500, 560, 573, 601, 617, 645, 397, 398, 399, 400, 639, 615, 600, 646, 584, 624, 671, 681, 685.

- ALSO, TWIST THE FOLLOWING
- |     |     |
|-----|-----|
| 240 | 241 |
| 260 | 260 |
| 262 | 261 |
- TAPE SHIELDED CABLES WHERE NECESSARY TO PREVENT SHORTS. USE ITEM#146
  - PLACE ONE PIECE OF ITEM#114 ON EACH END OF ITEM#114 EXCEPT THOSE ENDS WIRED TO TERM. BOARD STB1
  - PLACE ONE PIECE OF ITEM#115 ON EACH END OF ITEM#115 EXCEPT THOSE ENDS WIRED TO TERM. BOARD STB1
  - AT SAT4 LEAVE SLACK IN WIRE TO PERMIT PARTING OF SECTIONS A&B.
  - WRAP COPPER SHIELD STRIP ITEM#120 OVER CABLE WHERE IT PASSES UNDER BUS WIRES, EXTENDING APPROX. 1 INCH ON EITHER SIDE. GROUND STRIP WRAP TAPE, ITEM #146 OVER SHIELD.

E-365120-2

Figure 25—Overall Connections