

# **BROADCAST AUDIO EQUIPMENT**

---

## **INSTRUCTIONS**

# **Type BC-3B Standard Console**

**MI-11641**

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

PRINTED IN U.S.A.  
576-517

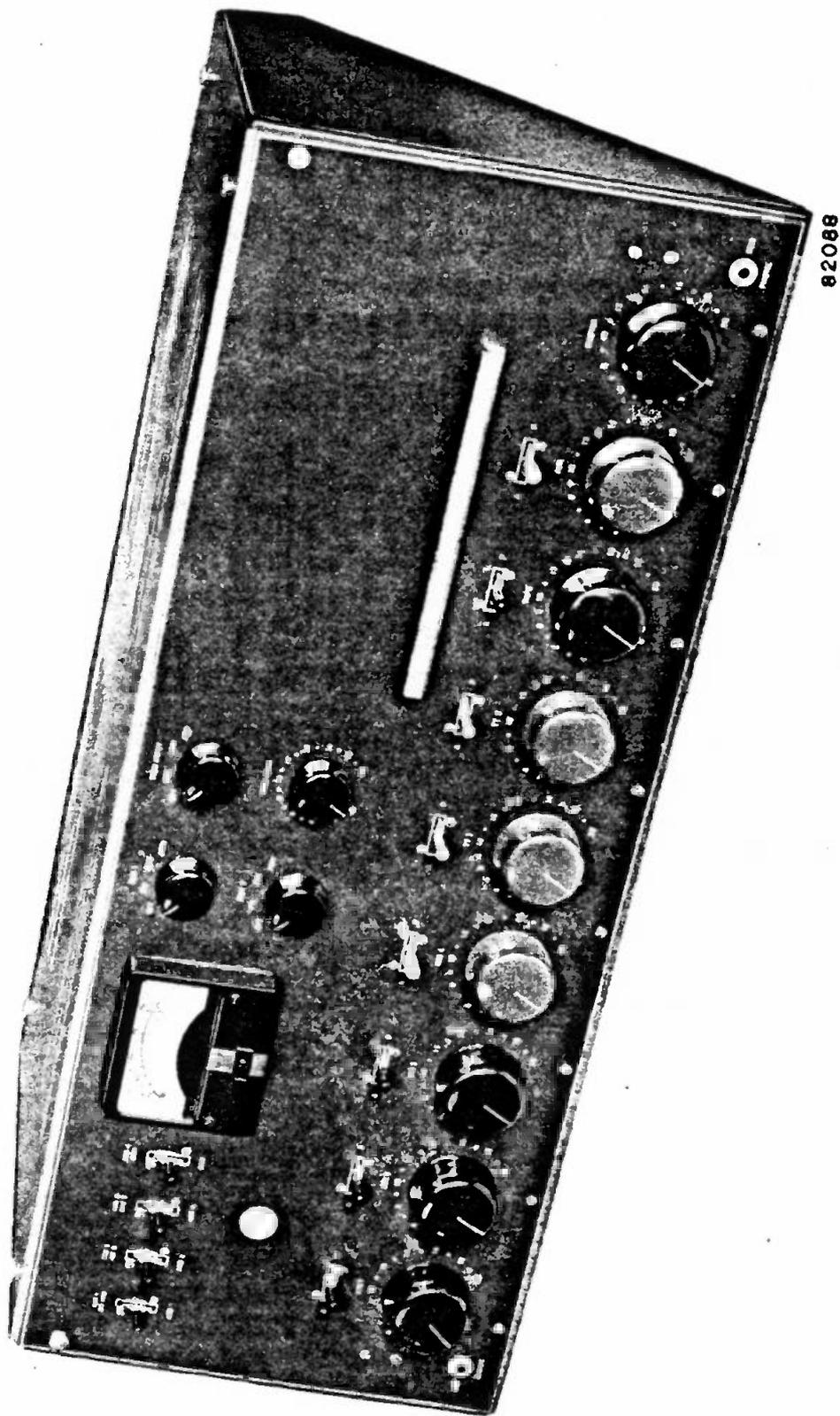


Figure 1—Type BC-3B Standard Console

## TECHNICAL DATA

<b>Power Required</b>		<b>Gain</b>	
100-130 volts ac, single phase 50/60 cycles		Microphone to Program Line	108 db
<b>Power Consumed</b>		Network or Remote to Program Line	30 db
155 watts		Turntable, Tape or Auxiliary to Program Line	60 db
<b>Inputs</b>		Microphone to Speaker (Audition)	125 db
6 microphones (4 Studio, 1 Control Room, 1 Announce Booth)	37.5/150/600 ohms	<b>Frequency Response</b>	
2 turntable inputs	150 ohms	Program: $\pm 1.5$ db	30 to 15,000 cps
2 Remote Lines	600 ohms	Monitor: $\pm 2.5$ db	30 to 15,000 cps
1 Network	600 ohms	<b>Harmonic Distortion</b>	
1 Tape	150 ohms	Program 18 dbm output	1% 30 cps, .75% 50 cps, 0.5% 100-15,000 cps
1 Auxiliary	150 ohms	Monitor	6w total 1.5% 50-10,000 cps
<b>Outputs</b>		<b>Tube Complement MI-11486</b>	
1 Program Line	600 ohms 18 dbm	2 6V6GT	
2 Monitor Speakers	16 ohms 3 W each	1 6X4	
1 External Monitor	600 ohms -8 dbm	2 12AU7	
2 Remote Lines Cue	600 ohms 18 dbm	2 12AX7	
1 Turntable Cue	150 ohms	1 5R4GY	
<b>Amplifiers</b>		7 12AY7	
3 Preamplifier		5 MI-11299 (selected 12AY7)	
2 Mixer Booster Amplifier		<b>Dimensions and Weight</b>	
2 Preamplifiers used as Boosters		Width—33 inches	
1 Program Amplifier		Height—11¼ inches	
1 Monitor Amplifier		Depth—21¼ inches	
		Weight—88 pounds	
		Finish: two tone umber gray	

## DESCRIPTION

The BC-3B Standard Consolette is designed to handle the programming schedules of a station equipped with one or two studios, an announce booth, a control room, two turntables, one tape recorder and one auxiliary such as a film projector. The thirteen inputs include six microphones, two turntables, one tape, one network, two remote and one auxiliary.

The network and remote lines may be monitored by using the headset jacks. Eight inputs may be simultaneously mixed. Separate audition and program channels are provided and the monitoring amplifier may be switched from the turntable cue position, program line or audition line.

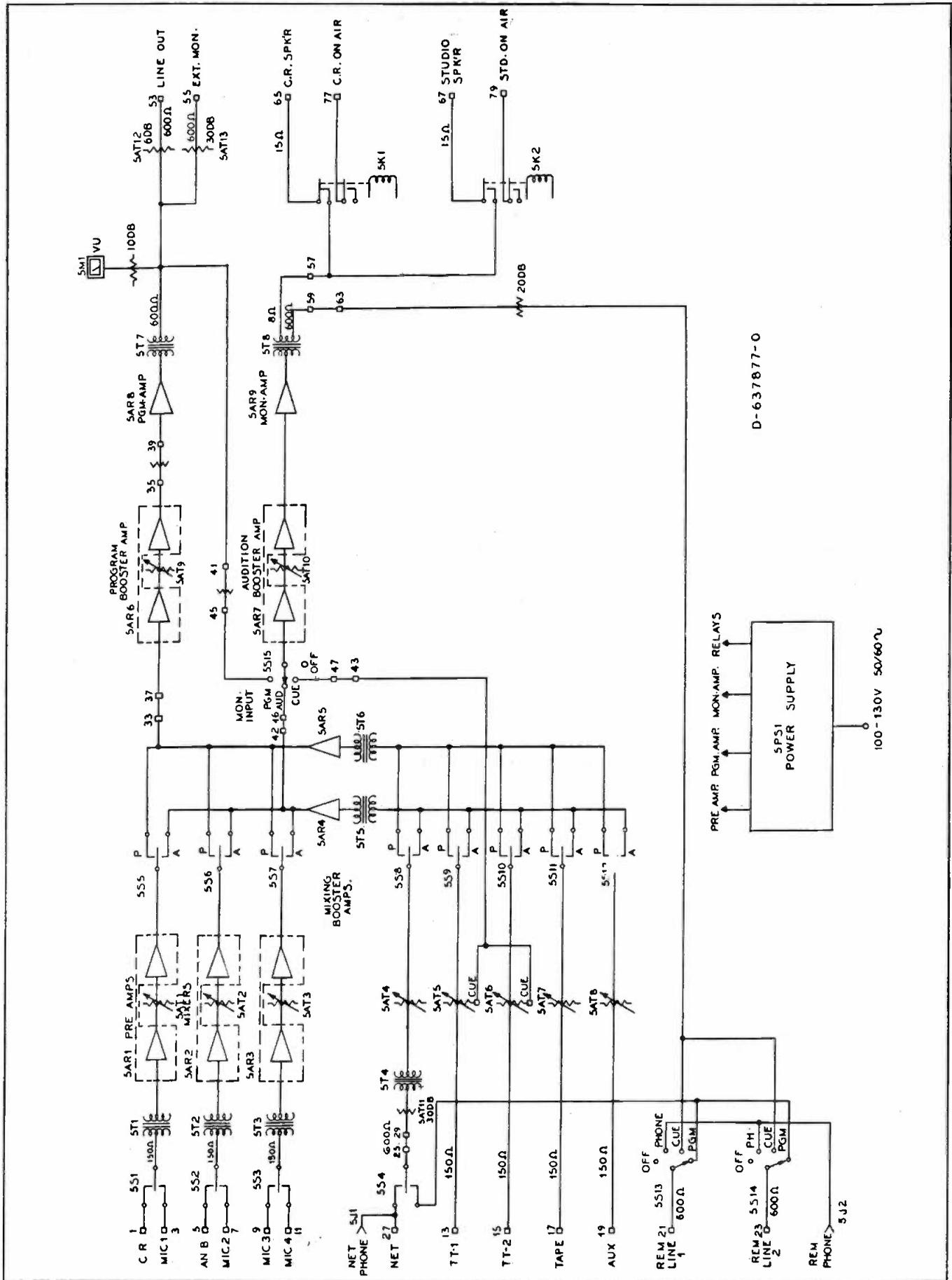
The BC-3B is completely self-contained, including the amplifiers and power supply. The unit is styled for convenience in operation, with the logical arrangement of controls using colored knobs and for convenience in servicing, with the hinged

front panel and removable louvred top cover. All RCA Audio Consolettes are similar in design so that the auxiliary units or combinations of two units present a uniform appearance. The BMC-1A Mixer may be used to give additional microphone inputs. Another convenient feature is the script holder which keeps the program where the operator may check it.

### 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 two speakers may be connected to each BC-3B consolette. The loudspeaker should have a voice coil im-



D-637877-0

Figure 2—Block Diagram

pedance 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 Studio and Control Room. The lights which are available with inscription, are listed as follows:

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

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

**Circuit Description**

The BC-3B 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 5AR1-5AR3**

Seven preamplifiers are used in the BC-3B Consolette; four units, however, are used as booster amplifiers. Two of the boosters, 5AR4 and 5AR5, are used as mixing boosters.

The preamplifier is a two-stage RC coupled amplifier using a selected 12AY7 MI-11299 twin

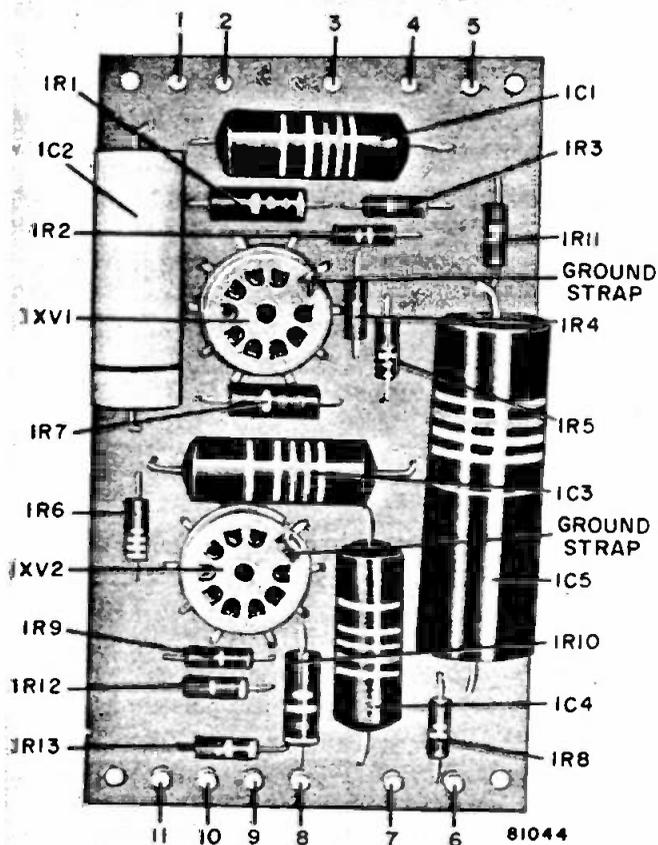


Figure 3—Preamplifier (5AR1—5AR3) Printed Circuit Board

triode. The input signal for the microphone preamplifier is derived from an unloaded transformer which is mounted under the preamplifier mounting

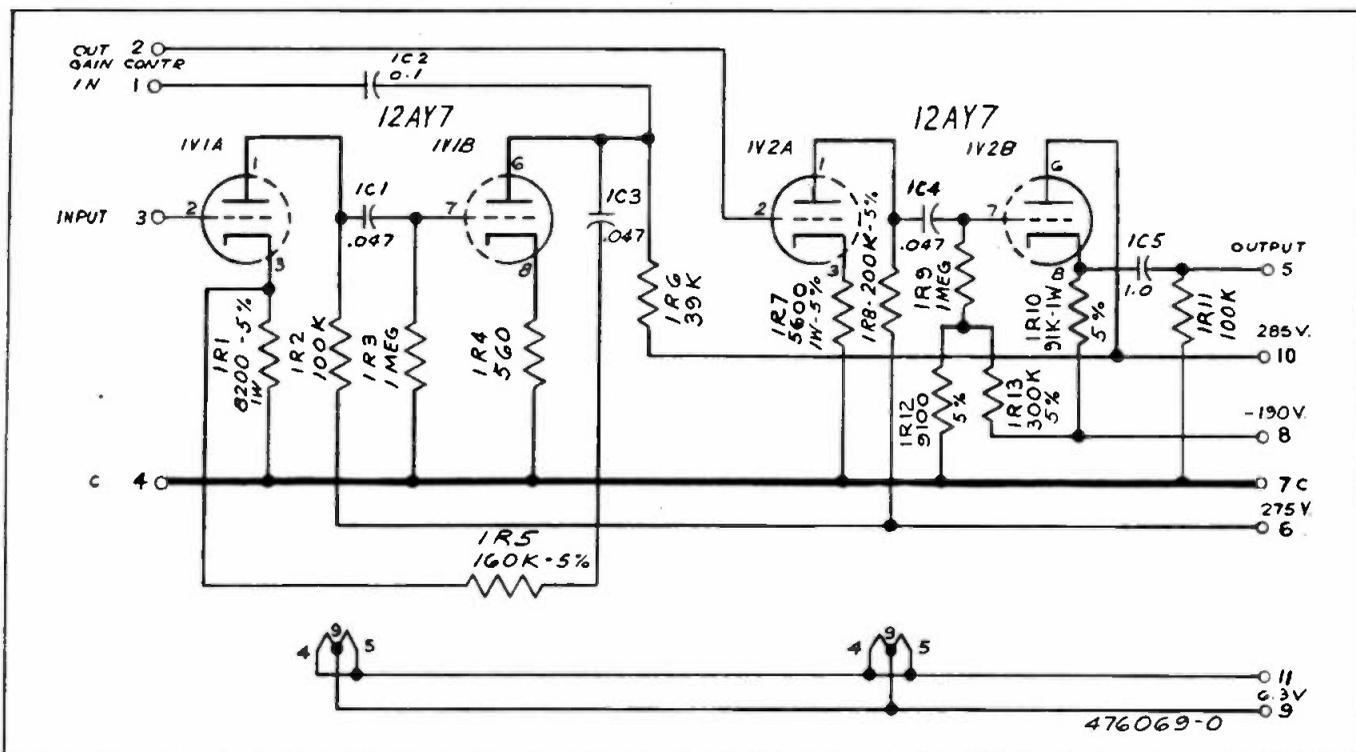


Figure 4—Schematic Diagram for Preamplifier (5AR1—5AR3)

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, master or monitor gain control). The output signal from the gain control is applied to the grid of the third stage and then to the 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 IC5, 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 of the output stage is approximately at ground potential.

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.

**Preamplifiers 5AR4, 5AR5, 5AR6, 5AR7 Used as Booster Amplifiers**

When the preamplifiers are used as booster amplifiers, they vary from the preamplifiers 5AR1 through 5AR3 as shown in figures 5 and 6. The Mixing Booster amplifiers are 5AR4 and 5AR5; the booster amplifiers are Program Booster 5AR6 and Audition Booster 5AR7. In the mixing boosters, the first stage is not used as the full gain of the amplifiers is not required for the network and remote line nor for the TT1, TT2, TAPE and AUX

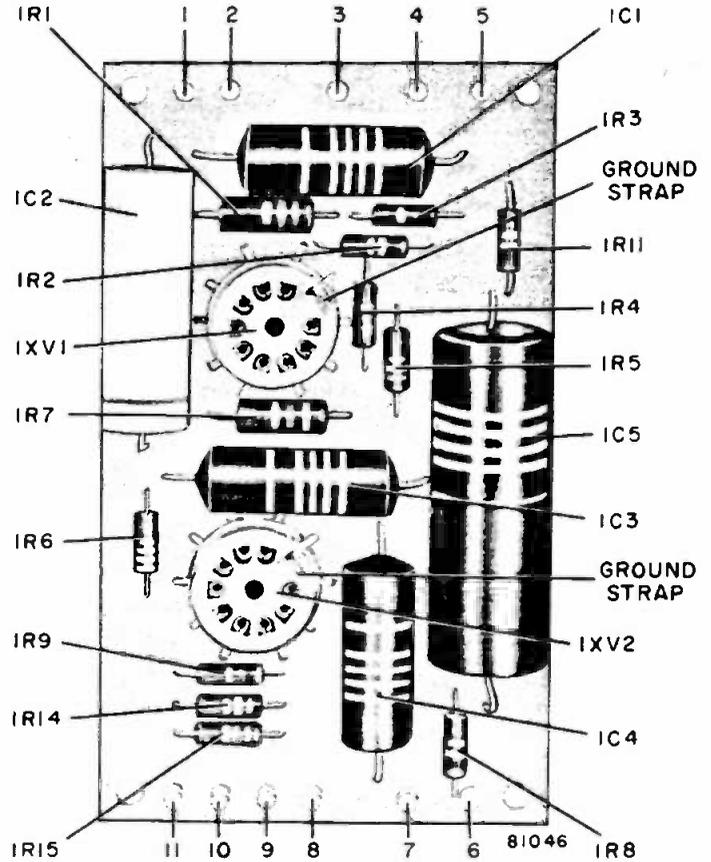


Figure 5—Preamplifier (5AR4—5AR7) Printed Circuit Board

inputs. 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 spe-

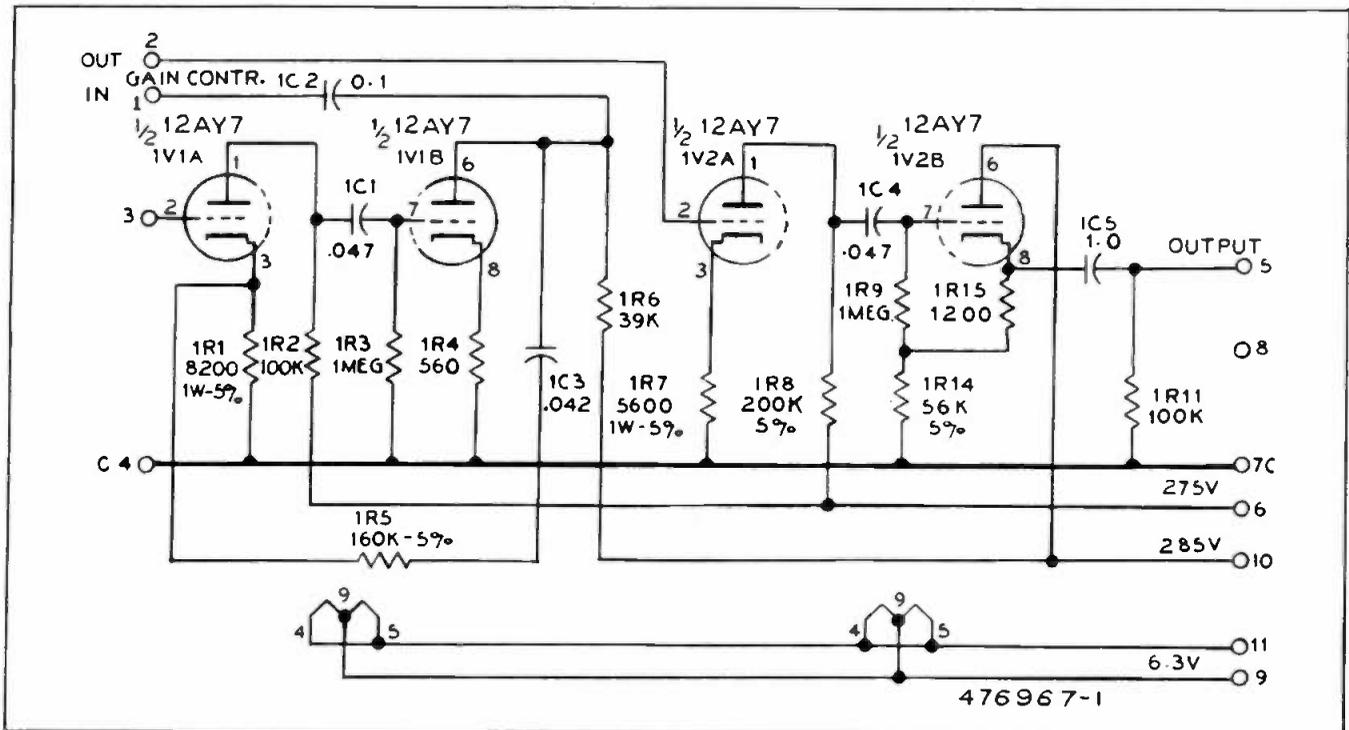


Figure 6—Schematic Diagram for Preamplifier (5AR4—5AR7)

cial applications requiring more gain. The full gain of 5AR4 and 5AR5 may be restored if desired. Refer to the procedure *To Restore Full Gain to Mixing Boosters 5AR4 and 5AR5* in Installation.

In all four of the booster amplifiers, 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 build-up of a charge on the output coupling capacitor 1C5 is permissible.

**Program Amplifier 5AR8**

The program amplifier etched circuit board contains all the electrical components except the output transformer 5T7 which is mounted on the chassis directly in front of the amplifier. A 12AX7 twin triode is used for the input and phase inverter stage, 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 Amplifier 5AR9**

The circuit and construction of the monitor amplifier are similar to the program amplifier. The output transformer 5T8 is mounted directly in front of the monitor amplifier printed circuit boards. To obtain a rated output level of 6 watts,

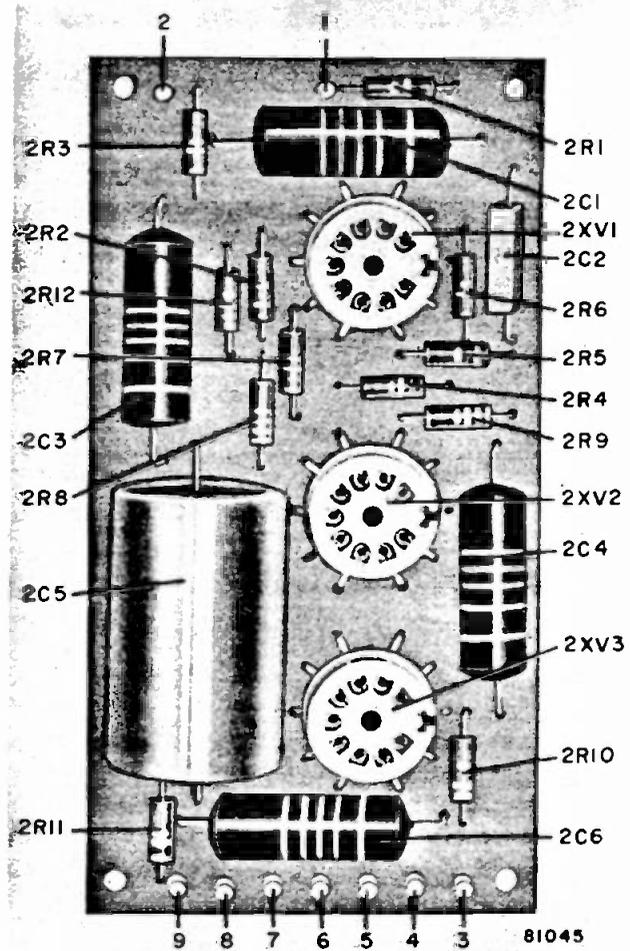


Figure 7—Program Amplifier 5AR8 Printed Circuit Board

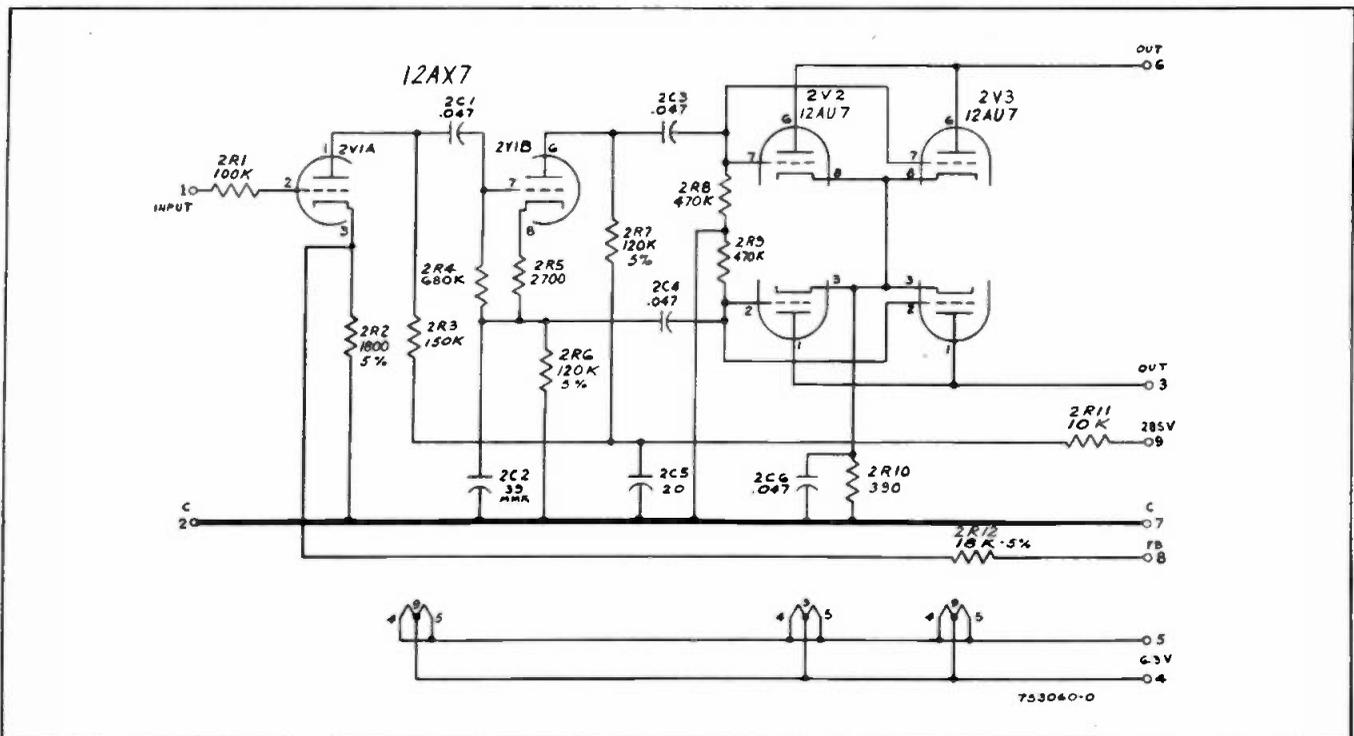


Figure 8—Schematic Program Amplifier 5AR8

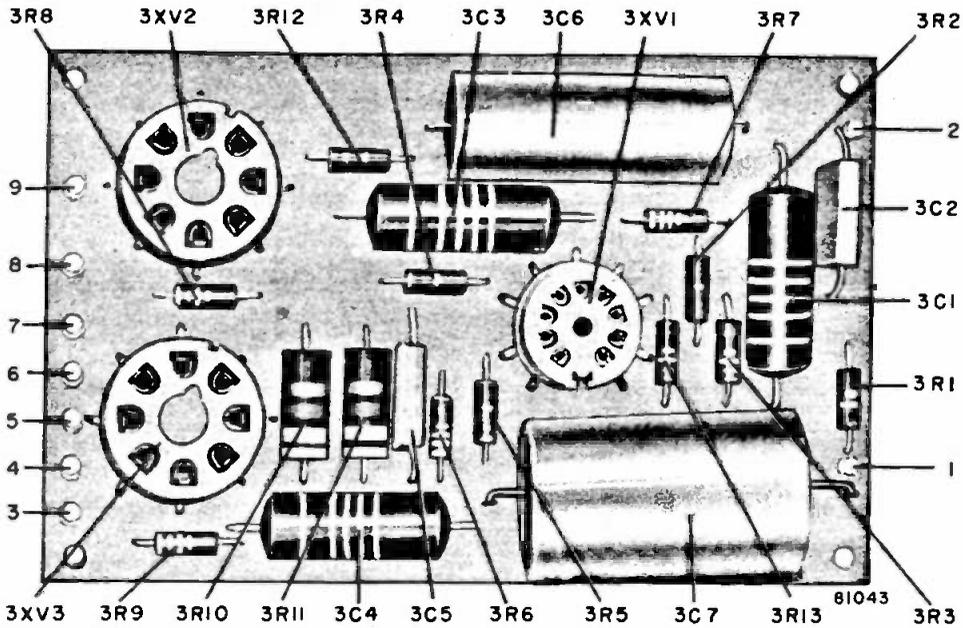


Figure 9—Monitor Amplifier 5AR9 Printed Circuit Board

a pair of 6V6GT 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 Supply 5PS1**

The power supply is designed for operation from 100-130 volt 50/60 cycle power line. Transformer primary taps are available for nominal line voltages 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 6.3v 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 aging of the rectifier.

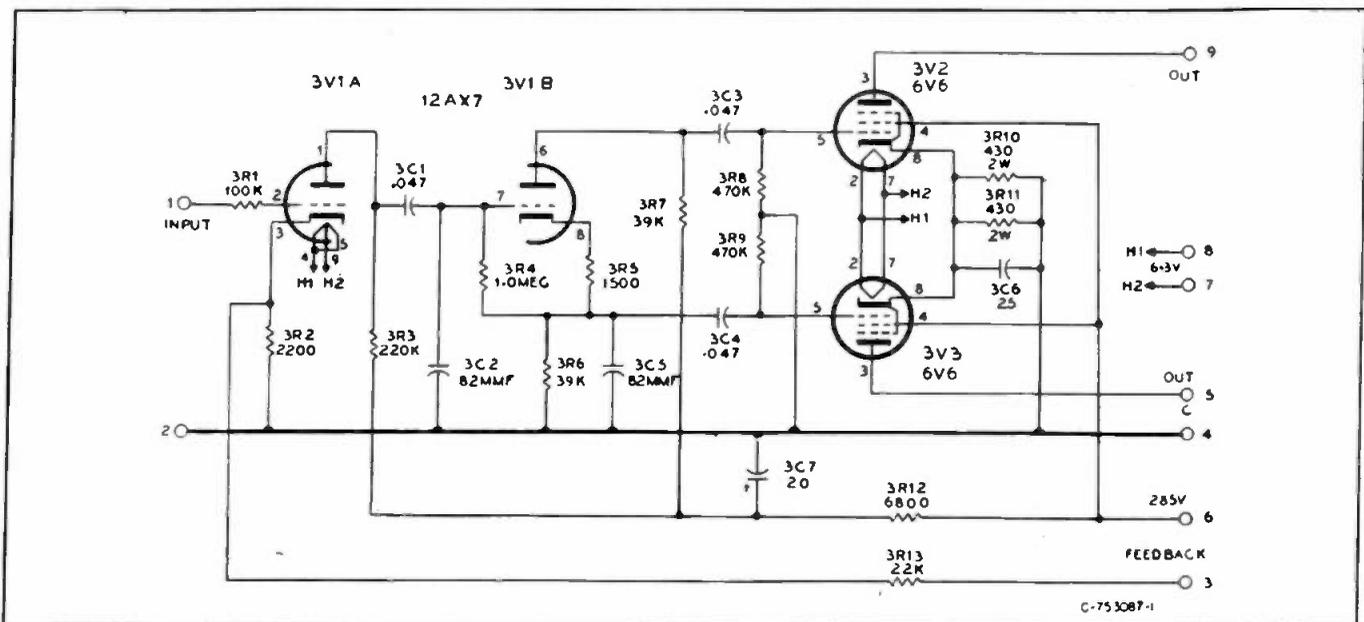


Figure 10—Schematic Monitor Amplifier 5AR9

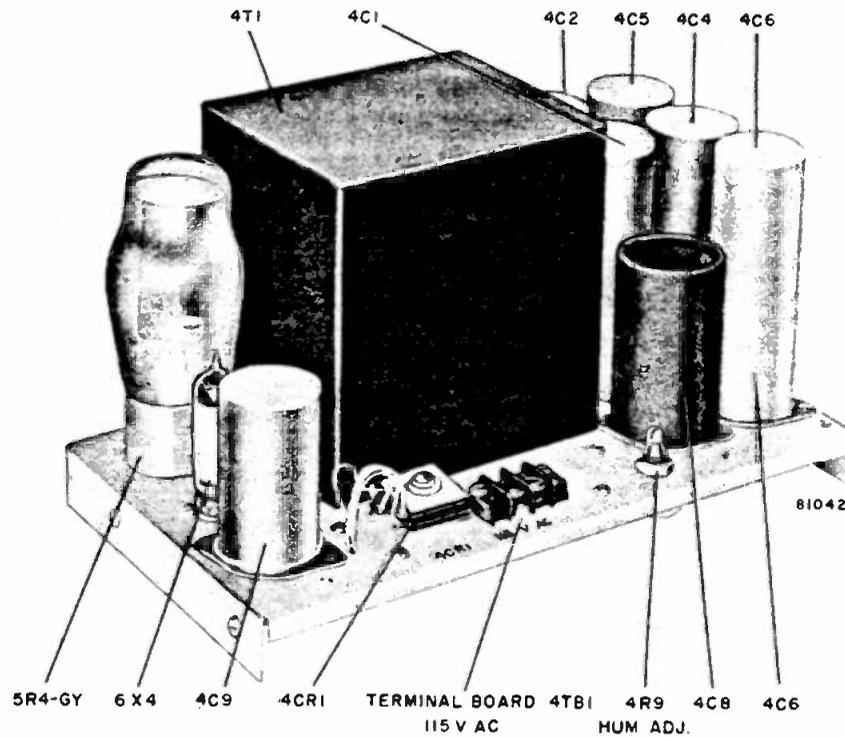


Figure 11—Power Supply 5PS1

### Fixed Pads

Etched wiring techniques are employed in the construction of certain fixed attenuators, the same basic board accommodates various circuit configurations and resistance values. The line input pad 5AT11 is a balanced, center tapped H-type having a loss of 30 db. The line output pad 5AT12 is a balanced H-type having a loss of 6 db. The external monitor pad 5AT13 is of the balanced L-type having a loss of 30 db.

### Mixing and Switching Circuits

The outputs of the microphone preamplifier 5AR1, 5AR2 and 5AR3 are connected through the program-audition switches 5S5, 5S6 and 5S7 respectively to the main program or audition bus.

The attenuators of the high level input channels 5AT4 to 5AT8 connect through the program-audition switches 5S8 to 5S12 respectively to an auxiliary program or audition bus if these auxiliary busses feed a program and audition mixing booster amplifier. The outputs of these amplifiers in turn feed respectively the main program and audition bus. The purpose of the mixing booster amplifiers is to raise the level of the high level inputs after passing through the mixing attenuators and mixing networks and to match the impedance and signal level to that of the main program and audition bus.

### Speaker Muting and Warning Light Relays 5K1 and 5K2

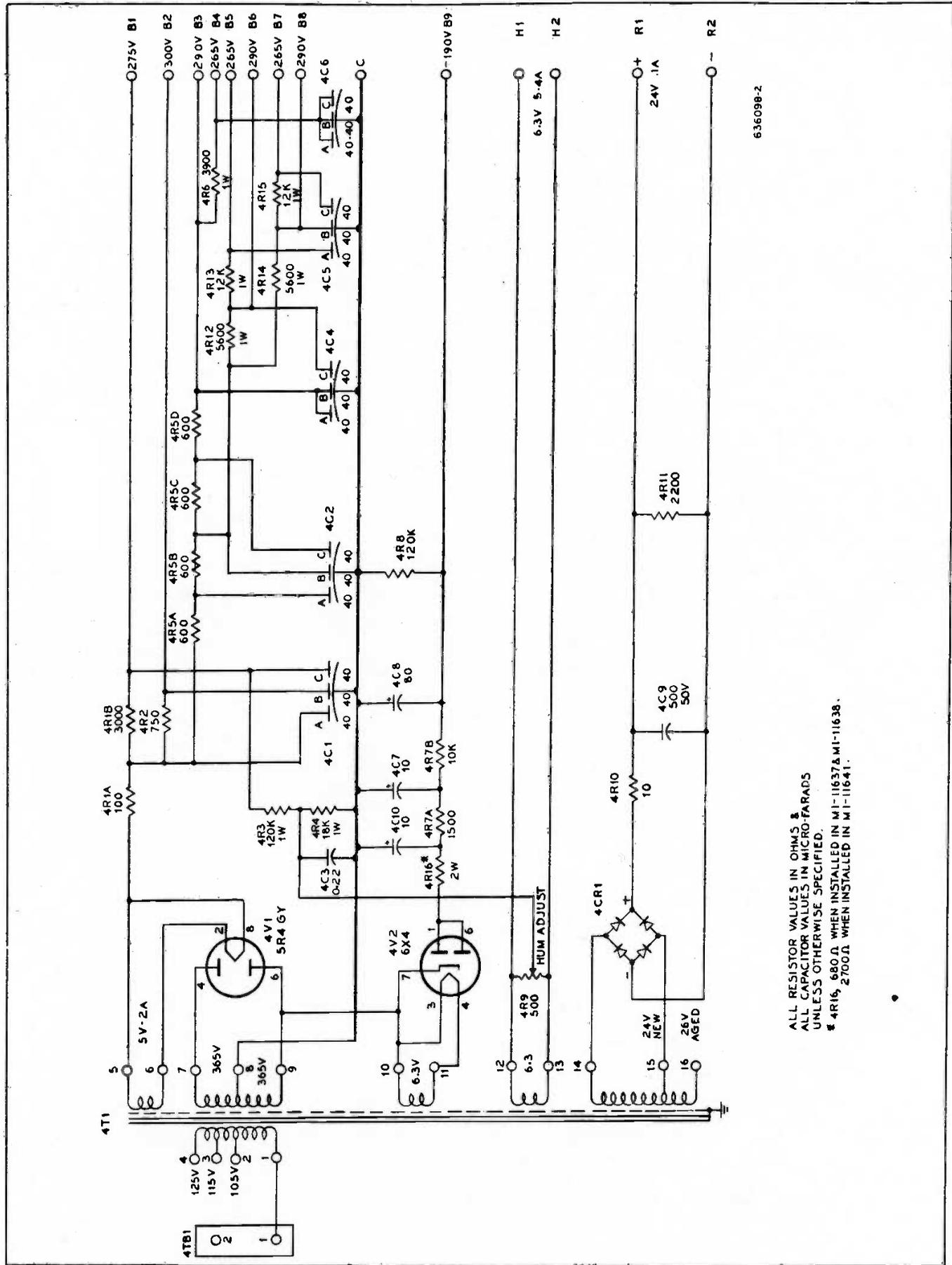
Relay 5K1 controls the control room speaker and control room ON AIR light. Relay 5K2 controls the Studio speaker and Studio ON AIR light. In the de-energized position, the speakers are on and the warning light circuit is open. In the energized position, the speakers are off, a load resistance being connected in their place and the warning light circuit is completed. The relays are controlled by the operation of the microphone selector switches 5S1, 5S2, and 5S3 and the respective Program-Audition switches 5S5, 5S6 and 5S7. The relays are de-energized with the switches in the center (off) position and energized in the other positions. To energize 5K1, 5S1 must be in the CR MIC position. Refer to the chart, page 13.

### Script Holder

As shown in figure 1, an aluminum bracket is mounted on the right hand side of the control panel. 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 2, the BC-3B Console provides eight high level mixing



636098-2

ALL RESISTOR VALUES IN OHMS &  
 ALL CAPACITOR VALUES IN MICRO-FARADS  
 UNLESS OTHERWISE SPECIFIED.  
 \* 4R15, 680 Ω, WHEN INSTALLED IN MI-11637&MI-11638.  
 † 4R16, 2700 Ω, WHEN INSTALLED IN MI-11641.

Figure 12—Schematic Diagram of Power Supply 5PS1

319 318-1

WIRE NO.	WIRE TABLE	PARTS LIST 8905 257-501
11	TINNED COPPER .032 DIA.	OR - ITEM NO OPEN NOS
20-22	WHITE - RED	805-57 50
30-31	RED/YEL 7/0126	805-7 51
40	RED/BLK 7/0126	805-7 52
50	RED/BLK 7/010	805-6 53
60-62	BLACK	805-6 54
80	YELLOW	805-6 55
90	BROWN	805-6 57
100	BRN/BLK.	805-6 58
110	ORANGE	805-6 59
120-124	RED/BLUE	805-6 60
130-133	RED/GRN.	805-6 61
140	RED/YEL.	805-6 62
150-151	WHITE - YEL/GRN/2/OLO	805-6 63
160	SLEEVING, BLK. .186 I.D.	805-6 64
170-182	SLEEVING, BLK. .042 I.D.	805-6 65
190	SLEEVING .133 I.D.	805-6 66

NOTES  
 1- THE FOLLOWING WIRES ARE  
 TWISTED PAIRS.  
 120&121  
 30&20  
 122&130  
 90&100  
 2- SOLDER ALL ELECTRICAL CONNECTIONS  
 USING ITEM 67  
 3- 4R16 IS PART OF FINAL ASSEMBLY

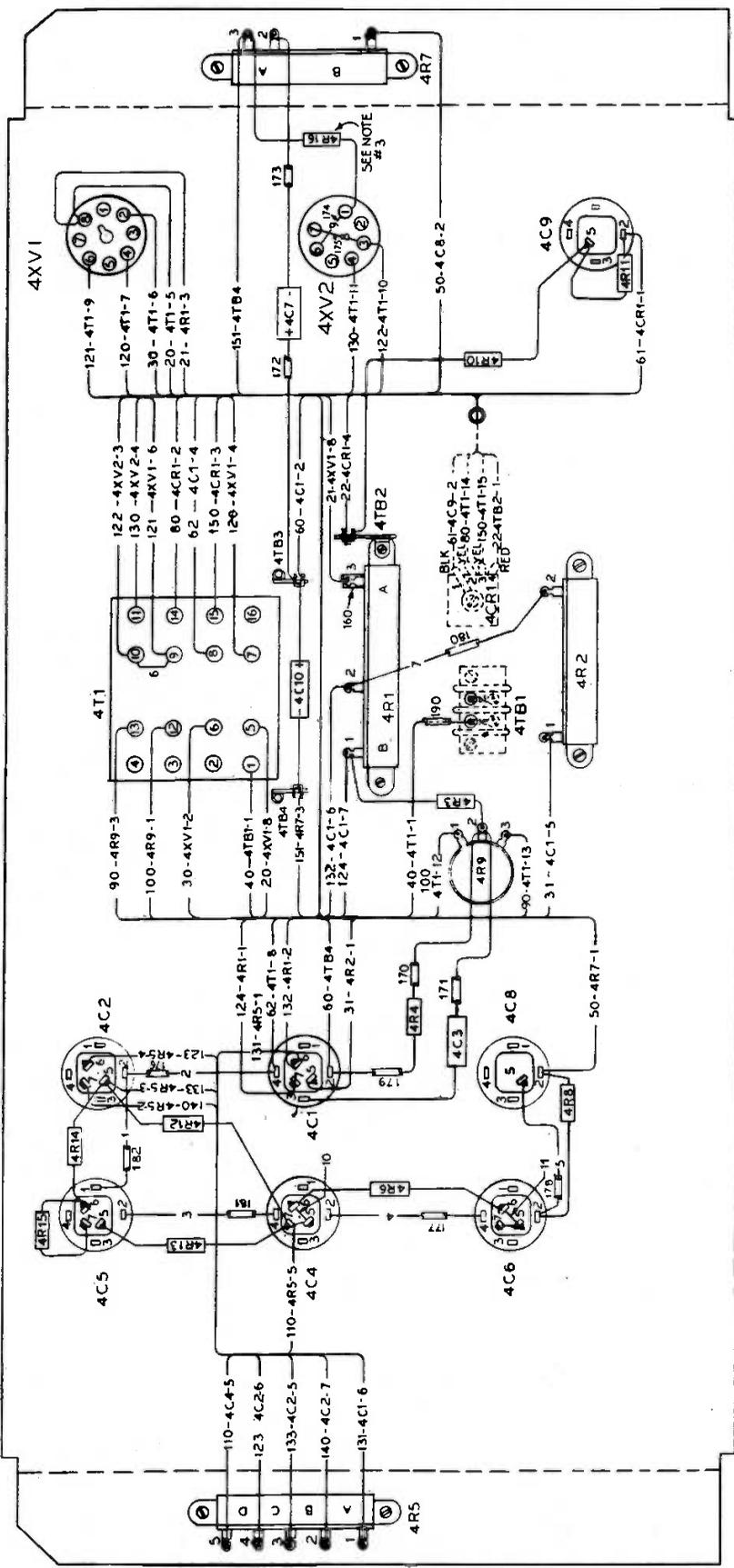


Figure 13—Connection Diagram of Power Supply 5PS1

channels. Three microphone mixing channels are provided with input selector switches to connect to one of a pair of low impedance microphones. There are six microphone inputs, one line input mixer channel with selector switches for one network or two remote line inputs and two high level turntable mixer channels with cuing switches on the mixer attenuators. The two remaining mixing channels may be used for high level tape and auxiliary inputs.

The outputs of each mixing channel may be switched to either a program or audition mixing bus. The program bus feeds into the program booster amplifier and master gain control to the line amplifier and through a 6 db isolation pad to the program line. The VU meter and an external monitor output are bridged across the output of the

program amplifier.

The audition bus is connected through the monitor input selector switch to the audition booster amplifier, the monitor gain control to the monitor amplifier. The monitor input selector switch connected also to the program amplifier output and turntable cue. The output of the monitor amplifier is supplied through separate relays to the control room and studio loudspeakers. These relays are controlled by the microphone input and mixer output switches to mute the speakers when a microphone is turned on in the same location. These relays also control optional ON AIR lights. The monitor amplifier also feeds cue signal to the remote lines through the remote line selector switches. The built-in power supply furnishes power to all amplifiers and relays.

## INSTALLATION

### Location of Console

The BC-3B 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 15 and 16.

### Type of Installation

A typical broadcast installation for a one studio system using the BC-3B Console is shown in figure 17.

## 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 the power turned on.

### Tube Installation

Tubes are not supplied with the console and must be ordered as MI-11486. Insert the tubes in

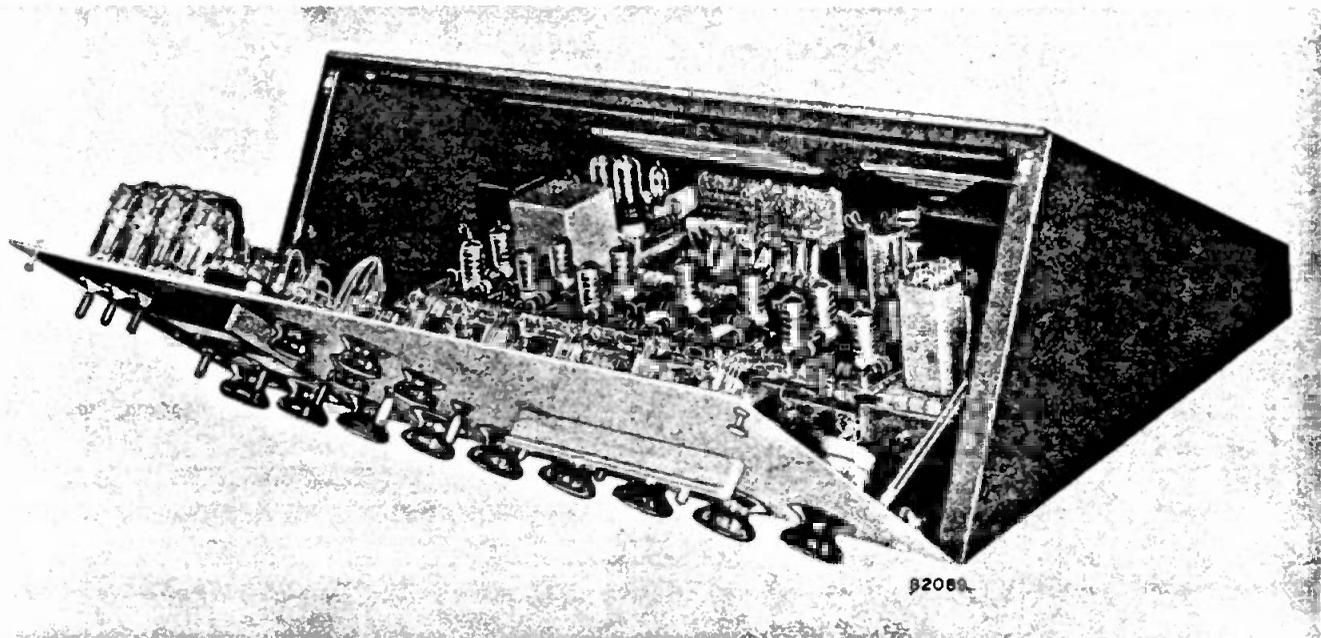


Figure 14—Type BC-3B Console with Panel Open

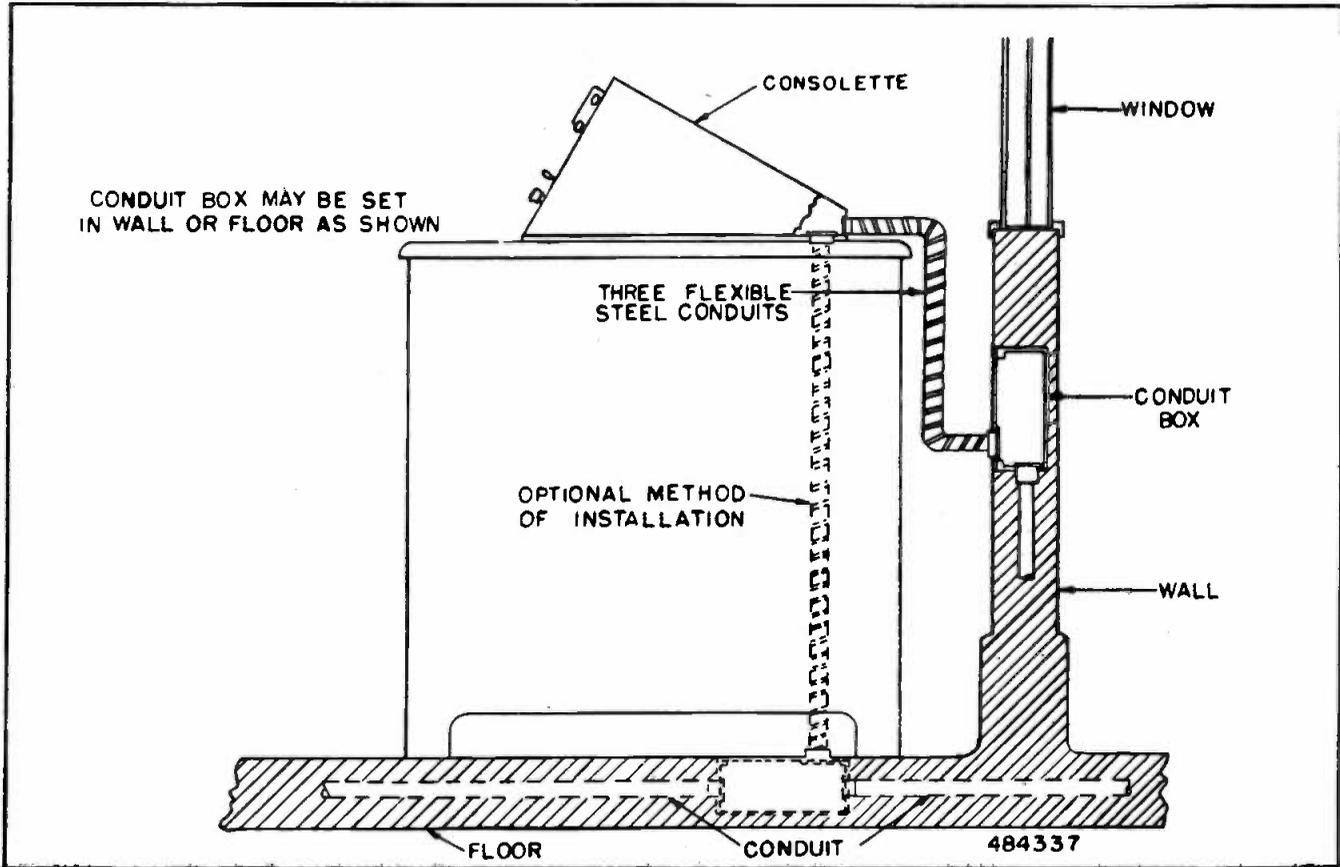


Figure 15—Typical Cable Installation

the sockets as called for on figure 22. Install the selected 12AY7 (MI-11299) tubes in the socket nearest the front of the preamplifier and booster amplifier printed wiring boards. (Except omit tube in 5AR4 and 5AR5.) 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 5PS1 Connections**

The consolette is shipped with the power transformer 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 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 ac power line to the barrier type terminal block 4TB1 directly behind the power transformer. For convenience a power switch may be provided externally to turn the consolette on and off.

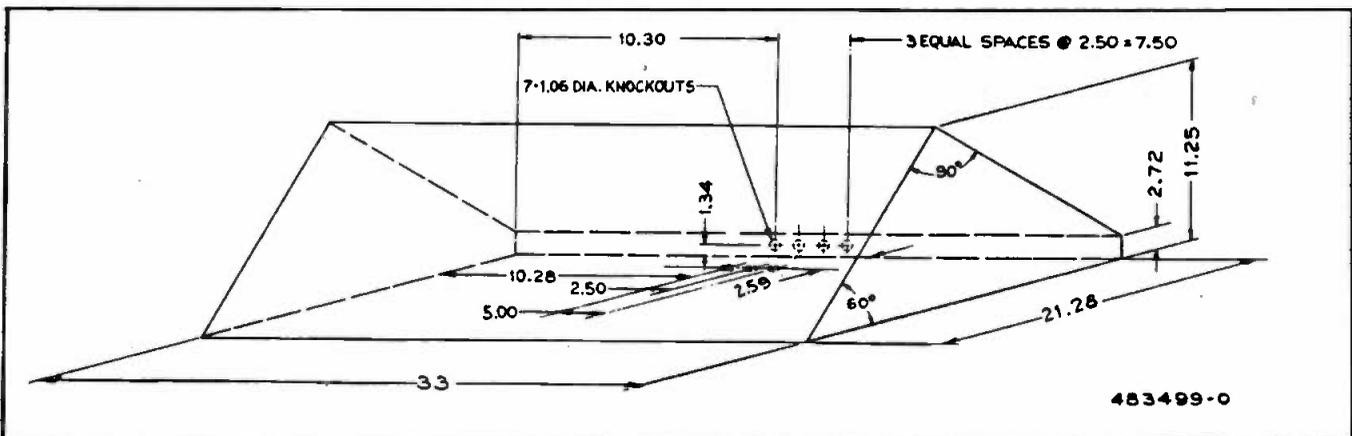


Figure 16—Installation Diagram

### External Connections

Audio wiring should be segregated into low level (microphone and turntable inputs) and high level (line input and output) cables or conduits. Low level audio lines should be shielded twisted pairs with shields preferably insulated and grounded at one end only. 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.

### Microphone and Turntable

Connect microphone and turntable according to the table of connections on 5TB1. All microphones installed in the same studio should be phased alike. The input transformers (5T1, 5T2, 5T3) are connected for a balanced 150-ohm input. If a 600-ohm input is desired, reconnect by removing jumper between terminals 1 and 3 and 4 and 6; jumper terminals 3 and 4. Remove ground connection from 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.

### Remote Line and Network Inputs

A 600/600 ohm pad 5AT11 having a loss of 30 db is inserted ahead of the input transformer 5T4. This pad may be modified or removed if so desired. The input transformer 5T4 is connected for 600-ohm input. If desired it may be reconnected for 150 ohms by removing wire connected to terminal #1 and connecting it to terminal #2, and removing wire connected to terminal #6 and connecting it to terminal #5.

### Line Equalizer

An Equalizer, such as the RCA BE-2A, MI-11752, for compensating the frequency response of the Remote and Network Lines may be connected to terminals 25 and 26.

### Program Line

The program output line is connected to terminals 53 and 54. A 6 db isolation pad 5AT12 having the impedance of 600 ohms is provided within the console.

### External Monitor Output

An external monitor may be connected to a built-in bridging pad 5AT13 having an output impedance of 600 ohms by making connections to terminals 55 and 56.

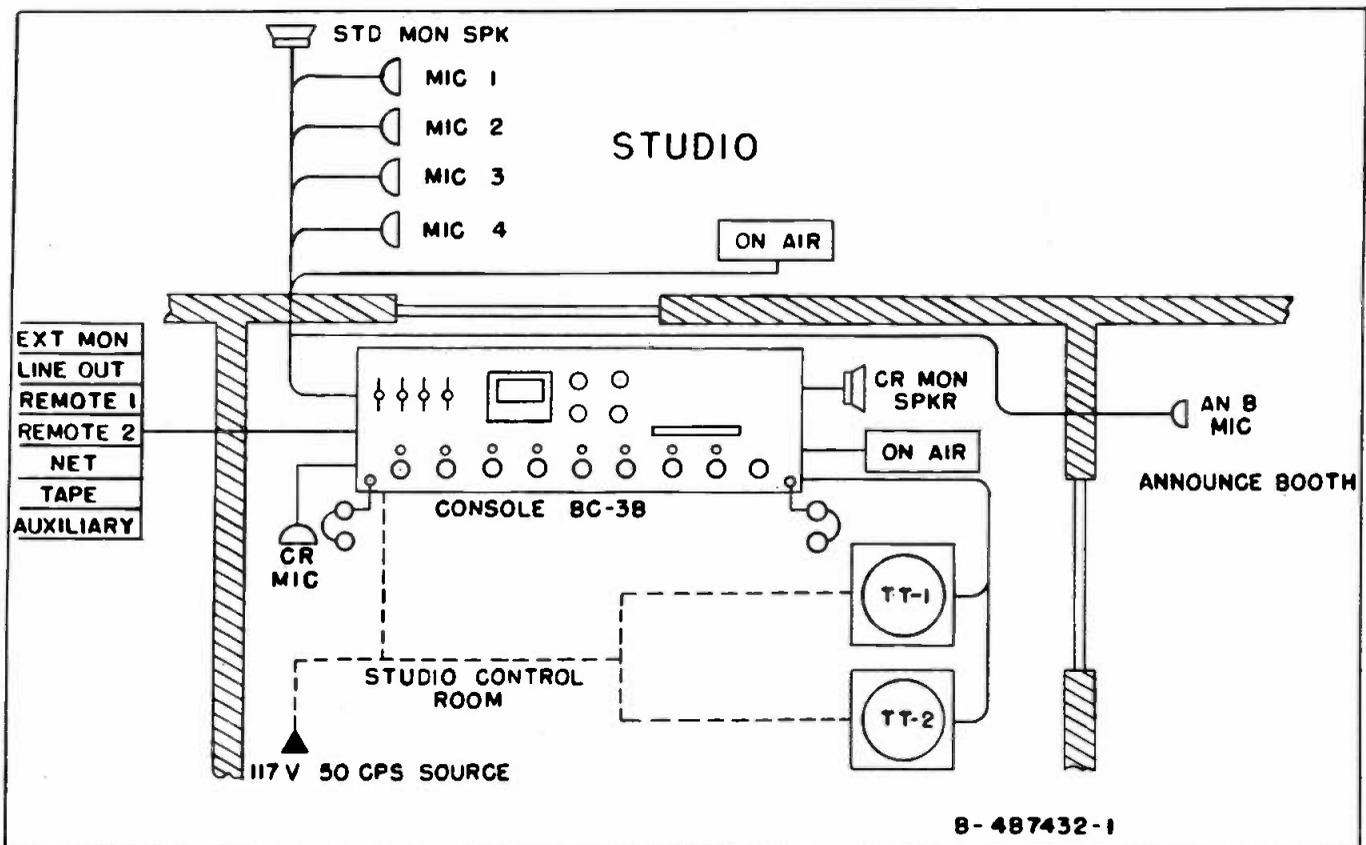


Figure 17—Typical Installation for One Studio

CONNECTIONS AT TERMINAL BLOCK 5T81	
Control Room Microphone	1-2
Studio Microphone 1	3-4
Announce Booth Microphone	5-6
Studio Microphone 2	7-8
Studio Microphone 3	9-10
Studio Microphone 4	11-12
Turntable 1	13-14
Turntable 2	15-16
Tape	17-18
Auxiliary	19-20
Remote Line 1	21-22
Remote Line 2	23-24
Line Equalizer IN	25-26
Network	27-28
Line Equalizer OUT	29-30
No connection	31-32
Program Mixing Bus	33-34
Program Booster Amplifier Output	35-36
Program Booster Amplifier Input	37-38
Program Amplifier Input	39-40
Audition Mixing Bus	42-44
Turntable Cue Output	43-44
Program Monitor Input	45-48
Audition Monitor Input	46-48
Cue Monitor Input	47-48
Not used	49-50
Not used	51-52
Program Line	53-54
External Monitor	55-56
Monitor Output 8 ohm	57-58
Monitor Output 600 ohm	59-60
Not used	61-62
Remote Line Cue Feed	63-64
Control Room Speaker	65-66
Studio Speaker	67-68
Control Circuit	69-70
Control Circuit	71-72
Relay Supply 24 V	73-74
Not used	75-76
Control Room Warning Light	77-78
Studio Warning Light	79-80

### Loudspeaker Connections

The control room speaker is connected to terminals 65 and 66 and the studio speaker to terminals 67 and 68. The loudspeaker should have a voice coil impedance of 15-16 ohms. For other voice coil impedances, a matching transformer is suggested. It is also possible to use speakers having a voice coil impedance of 6-8 ohms by replacing the 15-ohm load resistors 5R40 and 5R41 with 6-8 ohms, 5 w resistors. Reconnect the wire leading to terminal 10 of the monitor output transformer 5T8 to terminal 9.

### Warning Lights

Studio warning lights MI-11706 Series may be operated from the speaker muting relays. It is advisable to use a MI-11702-A Warning Light Relay with each warning light. The Control Room signal light circuit connects to terminals 77 and 78, the studio circuit to 79 and 80.

### Hum Adjustment

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

1. Set the input selector switches 5S1 to 5S3 to the center OFF position. Make sure that the other inputs are terminated in a resistance.
2. Set the mixer output switches 5S5 to 5S7 to program position P.
3. Set mixers 5AT1 and 5AT3 and master attenuator 5AT9 to maximum clockwise position. Set mixers 5AT4 to 5AT8 to maximum counterclockwise position.

### RELAY, SPEAKER AND WARNING LIGHT OPERATION

INPUT	MIXER SWITCHES			LOUDSPEAKERS		LIGHTS		RELAYS	
	5S5	5S6	5S7	CR	STD	CR	STD	5K1	5K2
5S1 OFF	O			ON	ON	OFF	OFF	OPEN	OPEN
5S1 CR MIC	P			OFF	ON	ON	OFF	CLOSED	OPEN
5S1 MIC 1	P			ON	OFF	OFF	ON	OPEN	CLOSED
5S2 AN. B		P		ON	ON	OFF	OFF	OPEN	OPEN
5S2 MIC 2		P		ON	OFF	OFF	ON	OPEN	CLOSED
5S3 MIC 3			P	ON	OFF	OFF	ON	OPEN	CLOSED
5S3 MIC 4			P	ON	OFF	OFF	ON	OPEN	CLOSED
5S1 CR MIC	A			OFF	ON	ON	OFF	CLOSED	OPEN
5S1 MIC 1	A			ON	OFF	OFF	ON	OPEN	CLOSED
5S2 AN. B		A		ON	ON	OFF	OFF	OPEN	OPEN
5S2 MIC 2		A		ON	OFF	OFF	ON	OPEN	CLOSED
5S3 MIC 3			A	ON	OFF	OFF	ON	OPEN	CLOSED
5S3 MIC 4			A	ON	OFF	OFF	ON	OPEN	CLOSED

- Adjust the hum control 4R9 on the power supply chassis for minimum hum in the output to the program line.

**VU Meter Attenuator**

The VU meter attenuator is designed to give a meter reading of 0 on the VU scale with an output of 8 dbm delivered to a 600-ohm load connected to the program output terminals. If it is desired to have the meter read 0 at another output level, replace resistors 5R31, 5R32, and 5R33 with the values contained in the table shown below:

Output Level (DBM)	5R31 ohms	5R32 ohms	5R33 ohms
-2	3600	0	omit
0	4047	447	16790
2	4482	883	8180
4	4896	1296	5220
6	5279	1679	3690
8	5626	2026	2741
10	5934	2334	2091
12	6203	2603	1621
14	6433	2833	1268

**Control Circuit Modification**

If the Announce Booth microphone input is to be used as a studio microphone, jumper terminals 70, 71 and 72 on terminal block 5TB1.

**To Restore Full Gain to Mixing Boosters 5AR4 and 5AR5**

The full gain of the preamplifiers 5AR4 and 5AR5 may be restored by the following charges:

- Remove wire #296 from terminal 2 of 5AR4 and connect it to terminal 3 of 5AR4.
- At 5AR4, connect terminal 1 to 2. Connect a 100K ohm 1/2 w resistor between terminals 2 and 4.
- Remove wire #297 from terminal 2 of 5AR5 and connect it to terminal 3 of 5AR5.
- At 5AR5, connect terminal 1 to 2. Connect a 100K ohm 1/2 w resistor between terminals 2 and 4.
- Insert MI-11299 selected 12AY7 tubes in the socket nearest the front of the preamplifiers 5AR4 and 5AR5.

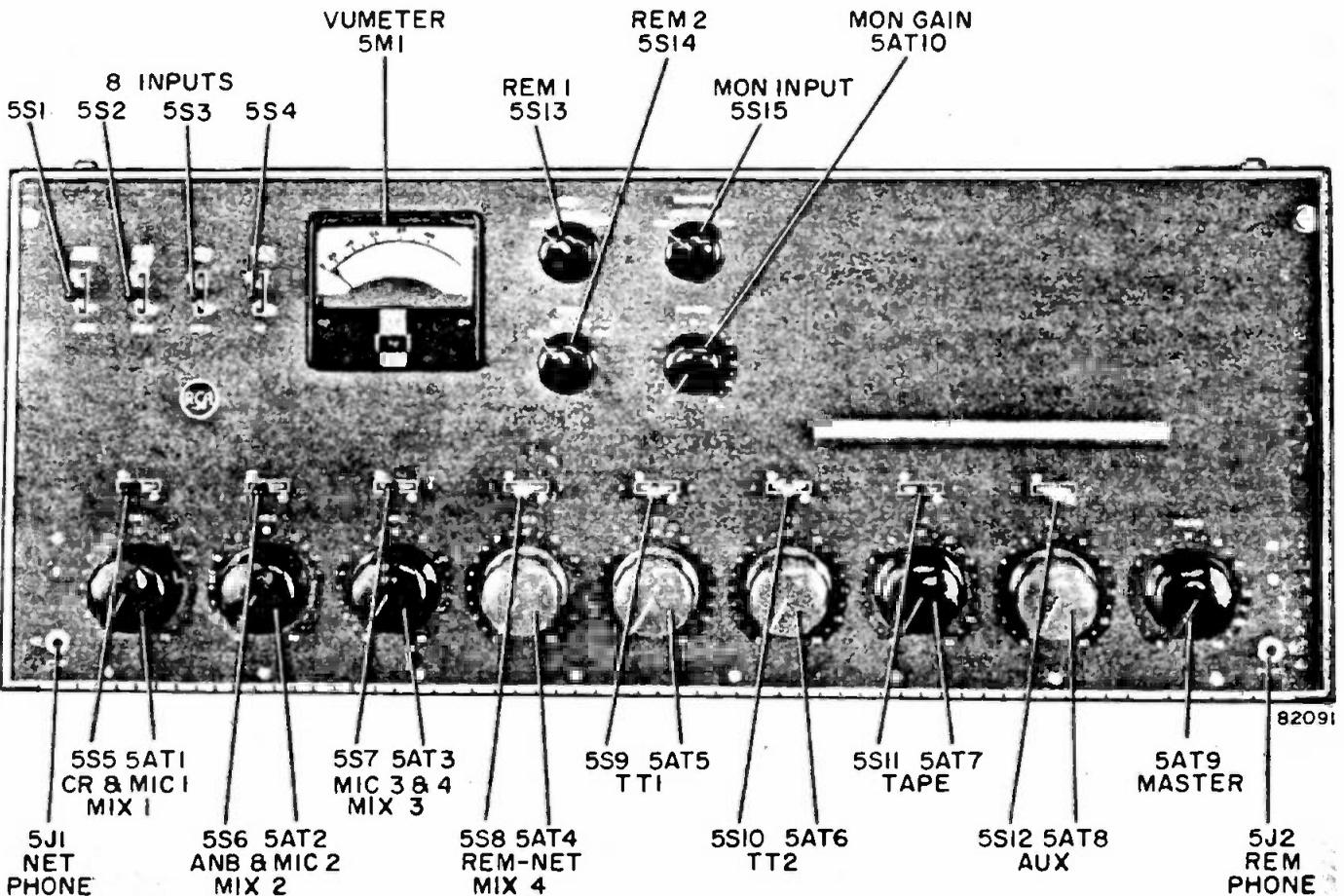


Figure 18—Control Panel

## 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.

### CONTROL FUNCTIONS

<i>Panel Designation</i>	<i>Symbol</i>	<i>Knob Color</i>	<i>Function</i>	<i>Coordinated with</i>
<b>INPUT SELECTOR SWITCHES</b>				
CR MIC MIC 1	5S1	Black	Selects control room or studio microphone 1	5AT1, 5S5
AN B MIC 2	5S2	Black	Selects announce booth or studio microphone 2	5AT2, 5S6
MIC 3 MIC 4	5S3	Black	Selects MIC 3 or MIC 4 in studio	5AT3, 5S7
REM NET	5S4	Red	Selects remote program thru REM 1, REM 2 Selects network program	5AT4, 5S8 5S13, 5S14
<b>MIXER ATTENUATORS</b>				
MIX 1	5AT1	Black	Controls gain of: CR MIC or MIC 1 MIC 2 or AN B MIC MIC 3 or MIC 4 REM or NET lines TT 1 TT 2 TAPE Auxiliary Input	5S1, 5S5
MIX 2	5AT2	Black		5S2, 5S6
MIX 3	5AT3	Black		5S3, 5S7
MIX 4	5AT4	Red		5S4, 5S8
TT 1	5AT5	Blue		5S9
TT 2	5AT6	Blue		5S10
TAPE	5AT7	Black		5S11
AUX	5AT8	Green		5S12
<b>MIXER SWITCHES</b>				
A—P	5S5	Black	When in position P, connects the mixer control to the program channel	5S1, 5AT1
A—P	5S6	Black		5S2, 5AT2
A—P	5S7	Black		5S3, 5AT3
A—P	5S8	Red		5S4, 5AT4
A—P	5S9	Blue		5AT5
A—P	5S10	Blue	When in position A, connects the mixer control to the audition channel	5AT6
A—P	5S11	Black		5AT7
A—P	5S12	Green		5AT8
<b>REMOTE LINE SELECTOR SWITCHES</b>				
REM 1	5S13	Black	Selects remote line #1 for headphone, cue and program	5S4, 5S8 5AT4
REM 2	5S14	Black	Selects remote line #2 for headphone, cue and program	5J2
<b>MASTER GAIN CONTROL</b>				
MASTER	5AT9	Black	Controls gain of program channel	
<b>MONITOR INPUT SELECTOR SWITCH</b>				
MON INPUT	5S15	Black	Selects input of monitor amplifier, position OFF— CUE—PGM—AUD	5AT10
<b>MONITOR GAIN CONTROL</b>				
MON GAIN	5AT10	Black	Adjusts level required for speakers, positions 0-20	5S15

**Routine Procedure**

1. Select the input desired.
2. Move corresponding A-P mixer switch to the desired function, Audition or Program.
3. Turn corresponding mixer attenuator up.
4. Turn MASTER control to level desired. (Adjust MASTER and MIXER controls to approximately the same setting.)
5. Check level on the VU meter; the meter pointer should not swing over the red line on the VU scale.
6. Monitor the selected input by turning MON INPUT to selected function. The NET or REM inputs may be monitored through headphones plugged into the jacks 5J1 and 5J2 respectively.

**To put a local program on the air**

1. Select the microphone inputs desired on 5S1, 5S2, 5S3.
2. Move corresponding Mixer Switches as required to P position.
3. Turn MON INPUT switch 5S15 to PGM.
4. Turn up MIX 1, MIX 2, MIX 3, as required, and adjust to obtain desired balance of output from the microphones.
5. Adjust MASTER gain control 5AT9 to the desired level on the VU meter.
6. The program may be monitored over both loudspeakers except that the Control Room speaker is muted when the CR microphone is in use and the Studio Speaker is muted when a studio microphone is in use. Adjust the level of the speakers as required by MON GAIN 5AT10.

**To audition a program**

1. Select the inputs desired 5S1, 5S2, 5S3 or all three.
2. Move corresponding mixer switches to A.
3. Turn up corresponding MIX 1, 2, 3.
4. Set the Monitor Input Selector with 5S15 to AUD.
5. The audition may be heard as when monitoring a program.

**To put network program on the air**

1. Move the key switch 5S4 to NET.
2. Move Mixer Switch 5S8 to P.

3. Turn MON INPUT switch 5S15 to PGM.
4. Turn up MIX 4.
5. Adjust MASTER gain control to desired level.
6. Network program may be heard over both loudspeakers. Adjust the level of the speakers as required by MON GAIN control.

**To audition a network program**

1. Move key switch 5S4 to NET.
2. Move mixer switch 5S8 to A.
3. Turn MON INPUT switch 5S15 to AUD.
4. Turn up MIX 4.
5. Network audition may be heard over both loudspeakers. Adjust the level of the speakers as required by MON GAIN control.

**To monitor a network program**

Plug the headphones into NET jack to Monitor program as received from the network.

**To put a remote program on the air**

1. Switch REM 1, 5S13 (or REM 2, 5S14) is normally at CUE position before remote operation. Then turn switch corresponding to the desired line to PGM to put program on the air.
2. Move the key switch 5S4 to REM position.
3. Move the corresponding mixer switch 5S8 to P.
4. Turn MIX 4 up and adjust MASTER gain control to desired level.
5. Turn MON INPUT switch 5S15 to PGM.
6. Adjust speaker levels by MON GAIN control.

**To audition a remote program**

1. Select a remote program according to the above procedure except the mixer switch 5S8 is moved to A or the audition position.
2. Turn the MON INPUT switch 5S15 to AUD.
3. Adjust the loudspeaker levels by the MON GAIN control.

**Turntable, Tape and Auxiliary Inputs**

These inputs are used for programming and auditioning in exactly the same manner as the microphone and network-remote inputs except that no input selector switch is used. To cue set the

MON INPUT selector switch 5S15 to the CUE position and turn the mixer control, associated with the input to be cued to the maximum counterclockwise position past the detented off position.

#### **Talkback to Studio**

1. Set the input selector switch 5S1 to CR MIC.
2. Set the mixer switch 5S5 to A position.
3. Set the MONITOR INPUT selector switch 5S15 to AUD.
4. Turn up the mixer gain control 5AT1 and adjust the monitor gain control 5AT10 to desired level.

For the talkback to be heard in the studio, the studio microphone input selector switches or the associated mixer output switches must not be in an ON position.

#### **Remote Talkback (REM 1 or REM 2)**

1. Set the MIX 1 key switch 5S1 to CR MIC.
2. Move corresponding mixer switch (5S5) to A and turn up MIX 1.
3. Turn MON INPUT switch 5S15 to AUD position.
4. Turn REM 1 switch 5S9 (or REM 2, 5S14) to CUE position. The operator in the control room can now talk to the "remote" operator.
5. Plug headphones in REM jack and turn REM 1 (or REM 2) to PH position. The control room operator can now listen to the "remote" operator. By switching the remote line switch (REM 1, 5S13 or REM 2, 5S14) between the CUE and PH positions, the console operator has a two way communication system with the remote operator. This remote talkback may be operated when a program is on the air.

## **MAINTENANCE**

The BC-3B Standard 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

#### **To Feed Cue to Remote Line (REM 1, REM 2)**

Turn switch REM 1 (5S13) or REM 2 (5S14) to the CUE position. Cue will be automatically fed over the remote line from the monitor output.

#### **To Cue Mixer 5AT4 to 5AT8 Inputs**

The turntable, network-remote, tape and auxiliary mixer attenuators, 5AT4 to 5AT8, are equipped with "cue" switches which in the maximum counterclockwise position connect the output of the turntables to the CUE position on the monitor input selector switch 5S15. It is also possible to connect to an external cue amplifier (see Installation).

#### **Remote Line Selector Switches 5S13 and 5S14**

Switch 5S13 controls remote line 1; switch 5S14 controls remote line 2.

The function of these four-position switches is to—

1. Disconnect the remote line (OFF).
2. Connect the remote line to the remote phone jack 5J2 (PH).
3. Connect the remote line to the output of the monitor amplifier (through a post for sending cue (CUE)).
4. To connect the remote line to the network-remote line input channel (through 5S4, 5AT4 and 5S8) (PGM).

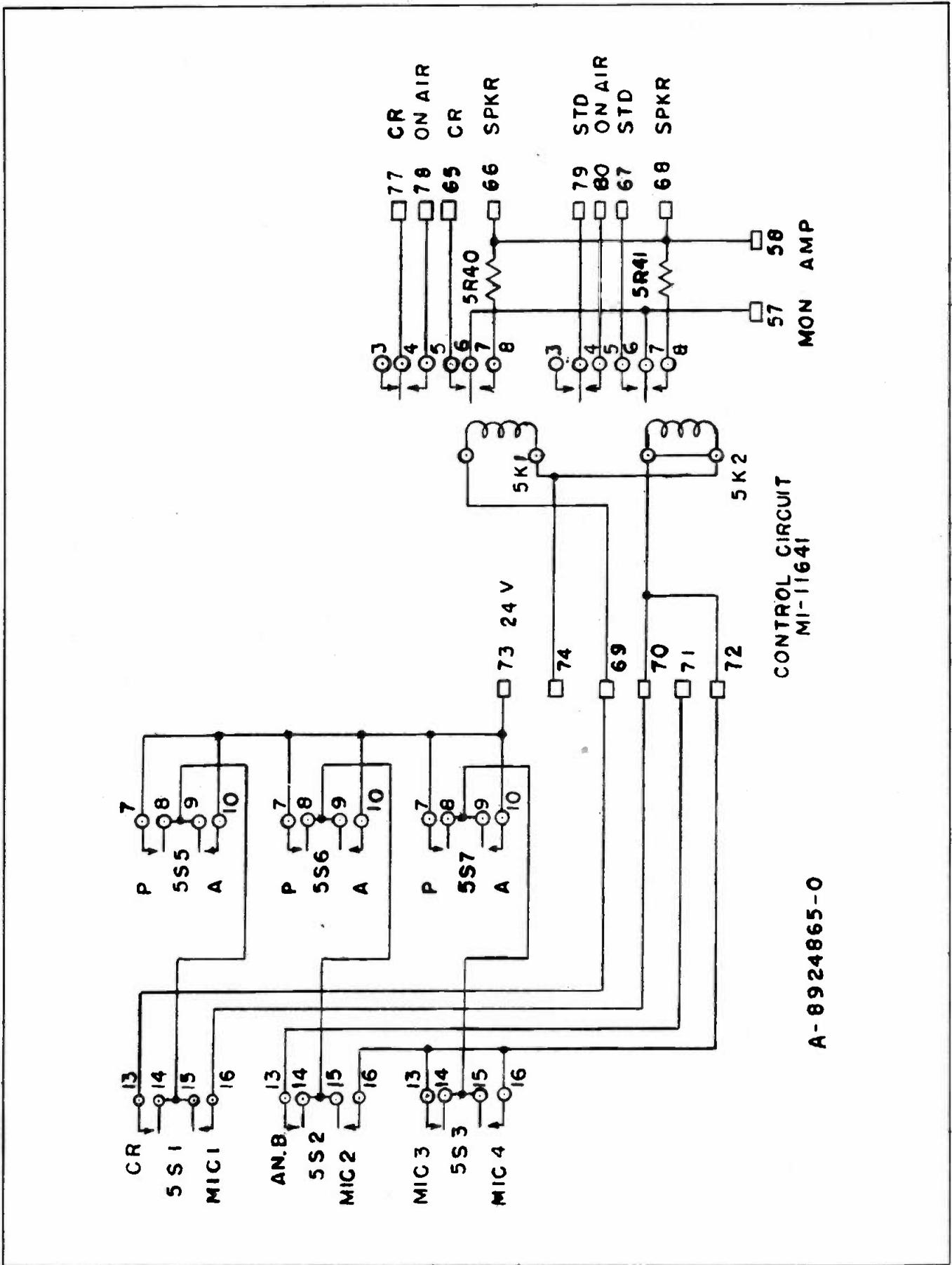
resistance of 20,000 ohms-per-volt. Slight variations may be due to component tolerances.

#### **Fuse**

A power fuse is located at the right front of the preamplifier mounting shelf. This fuse 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. Apply Davenoil to the contacts and rotate the knob several times. Wipe



A-8924865-0

Figure 19—Control Circuits

## TUBE SOCKET VOLTAGES

<i>Tube Socket</i>	1	2	3	4	5	6	7	8	9
<b>PRE-AMPLIFIER (5AR1-5AR3)</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 (5AR4-5AR7)</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 (5AR8)</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 (5AR9)</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)</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 \* and \*\*.

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 and Line Transformers 5T1 to 5T6

To gain access to the input and line transformers, the preamplifier mounting shelf must be loosened.

Remove the top cover and open the front panel if desirable. Remove the four screws and hardware located at either end of the mounting shelf. Refer to figure 22. Lift the shelf up from the front and tilt it backwards to expose the transformers.

### Replacement of Output Transformers 5T7 and 5T8 and Attenuators 5AT12 and 5AT13

To gain access to the terminals and mounting hardware of the output transformers and pads 5AT12 and 5AT13, the mounting shelf of the program and monitor circuit boards must be tilted up. Remove the four screws from each corner. No leads need to be removed from the circuit boards to service these assemblies.

### Power Supply 5PS1

Each power supply chassis is secured to the console cabinet by the 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  $\frac{1}{2}$  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 20.

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 the 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 20.

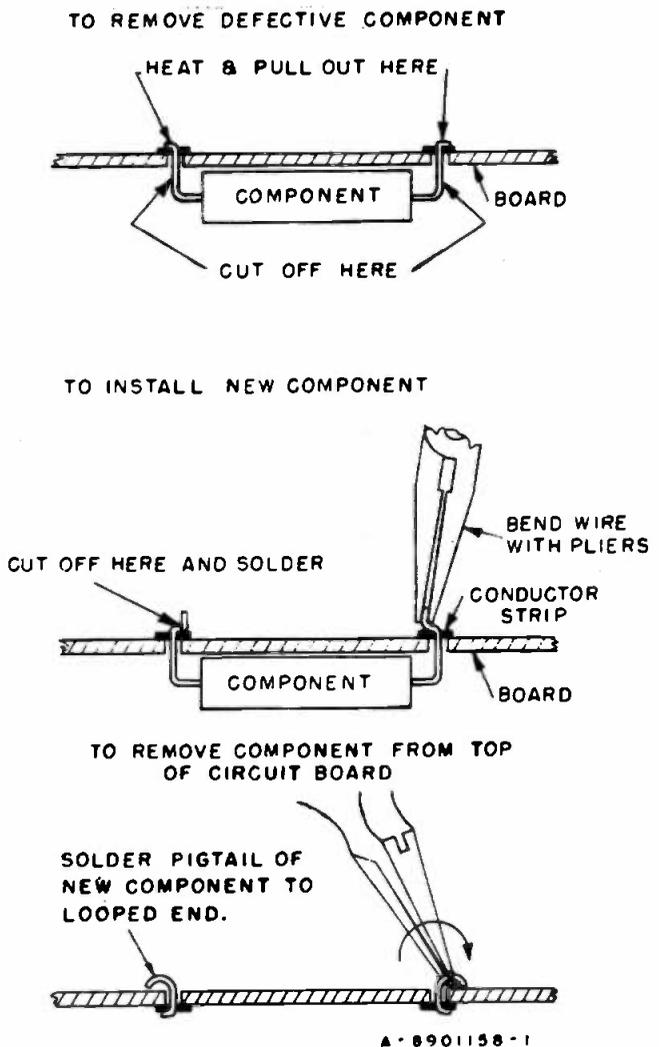


Figure 20—Replacement of Components in Printed Circuits

d. Using a small soldering iron (35 watts 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 20), and cut off the excess component lead. Leave about  $\frac{1}{16}$  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 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 a 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, 5AR2, 5AR3	Pre-Amplifier: circuit board assembly complete with 5 capacitors, 13 resistors, 2 tube sockets and 2 ground straps. Components listed under Preamplifiers	210998
5AR4 to 5AR7	Pre-Amplifier: circuit board assembly complete with 5 capacitors, 12 resistors, 2 tube sockets and 2 ground straps. Components listed under Preamplifiers	210999
5AR8	Program Amplifier: circuit board assembly complete with 6 capacitors, 12 resistors and 3 tube sockets. Components listed under Program Amplifier	211000
5AR9	Monitor Amplifier: circuit board assembly complete with 7 capacitors, 13 resistors and 3 tube sockets. Components listed under Monitor Amplifier	211001
5AT1 to 5AT3	Resistor: variable, attenuator, 100,000 ohm, pot., 20 steps, 2 db per step, last step tapered to infinity	211002
5AT4 to 5AT8	Resistor: variable, attenuator, 150/300 ohm, ladder pad, 20 steps, 2 db per step, last step tapered to infinity, with cue switch	94136
5AT9	Resistor: variable, attenuator, 100,000 ohm, pot., 20 steps, 2 db per step, last step tapered to infinity. Same as 5AT1	211002

Symbol No.	Description	Stock No.
5AT10	Resistor: variable, composition, 100,000 ohm $\pm 10\%$ , 2 w	209286
5AT11	Fixed Pad: Parts listed under Fixed Pads	
5AT12	Fixed Pad: Parts listed under Fixed Pads	
5AT13	Fixed Pad: Parts listed under Fixed Pads	
5C1, 5C2	Capacitor: fixed, paper, 0.47 mf $\pm 20\%$ , 200 v	73787
5C4	Capacitor: fixed, mica, 330 mmf $\pm 10\%$ , 500 v	39640
5F1	Fuse: 3 amp, 125 v, slow-blow type	99164
5J1, 5J2	Jack: open circuit	53401
5K1, 5K2	Relay: D.P.D.T.	205255
5M1	Meter: VU	205249
5PS1	Power Supply: Parts listed under Power Supply	
5R1 to 5R3	Resistor: fixed, composition, 150 ohm $\pm 10\%$ , $\frac{1}{2}$ w	502115
5R4	Resistor: fixed, composition, 560 ohm $\pm 10\%$ , $\frac{1}{2}$ w	502156
5R5	Resistor: fixed, composition, 4700 ohm $\pm 10\%$ , $\frac{1}{2}$ w	502247
5R6	Resistor: fixed, composition, 560 ohm $\pm 10\%$ , $\frac{1}{2}$ w. Same as 5R4	502156
5R7 to 5R11	Resistor: fixed, composition, 180 ohm $\pm 5\%$ , $\frac{1}{2}$ w	502118
5R12 to 5R17	Resistor: fixed, composition, 22,000 ohm $\pm 5\%$ , $\frac{1}{2}$ w	502322

Symbol No.	Description	Stock No.
5R18 to 5R27	Resistor: fixed, composition, 470 ohm $\pm 5\%$ , $\frac{1}{2}$ w	502147
5R28	Resistor: fixed, composition, 5600 ohm $\pm 5\%$ , $\frac{1}{2}$ w	502256
5R29	Resistor: fixed, composition, 18,000 ohm $\pm 5\%$ , $\frac{1}{2}$ w	502318
5R30	Resistor: fixed, composition, 6200 ohm $\pm 5\%$ , $\frac{1}{2}$ w	502262
5R31	Resistor: fixed, composition, 5600 ohm $\pm 5\%$ , $\frac{1}{2}$ w. Same as 5R28	502256
5R32	Resistor: fixed, composition, 2000 ohm $\pm 5\%$ , $\frac{1}{2}$ w	502220
5R33	Resistor: fixed, composition, 2700 ohm $\pm 5\%$ , $\frac{1}{2}$ w	502227
5R34	Resistor: fixed, composition, 27,000 ohm $\pm 5\%$ , $\frac{1}{2}$ w	502327
5R35	Resistor: fixed, composition, 560 ohm $\pm 10\%$ , $\frac{1}{2}$ w. Same as 5R4	502156
5R36	Resistor: fixed, composition, 5600 ohm $\pm 5\%$ , $\frac{1}{2}$ w. Same as 5R28	502256
5R37	Resistor: fixed, composition, 150 ohm $\pm 10\%$ , $\frac{1}{2}$ w. Same as 5R1	502115
5R38	Resistor: fixed, composition, 100,000 ohm $\pm 10\%$ , $\frac{1}{2}$ w	502410
5R39	Resistor: fixed, composition, 27,000 ohm $\pm 5\%$ , $\frac{1}{2}$ w	502327
5R40, 5R41	Resistor: fixed, wire wound, 15 ohm $\pm 10\%$ , 5 w	97441
5R42, 5R43	Resistor: fixed, composition, 56 ohm $\pm 10\%$ , $\frac{1}{2}$ w	502056
5R44, 5R45	Resistor: fixed composition, 39,000 ohm $\pm 5\%$ , $\frac{1}{2}$ w	502339
5R46, 5R47	Resistor: fixed, composition, 1500 ohm $\pm 5\%$ , 1 w	512215
5R48	Resistor: fixed, composition, 820 ohm $\pm 5\%$ , $\frac{1}{2}$ w	502182
5R49	Resistor: fixed, composition, 4700 ohm $\pm 10\%$ , $\frac{1}{2}$ w. Same as 5R5	502247
5R50	Resistor: fixed, composition, 560 ohm $\pm 10\%$ , $\frac{1}{2}$ w. Same as 5R4	502156
5R51	Resistor: fixed, composition, 22,000 ohm $\pm 5\%$ , $\frac{1}{2}$ w. Same as 5R12	502322
5R52, 5R53, 5R54	Resistor: fixed, composition, 47,000 ohm $\pm 5\%$ , $\frac{1}{2}$ watt	502347
5R55	Resistor: fixed, composition, 2700 ohm $\pm 10\%$ , 2 w	52222
5R56	Resistor: fixed, composition, 3300 ohm $\pm 10\%$ , $\frac{1}{2}$ w	502233
5S1 to 5S4	Switch: key lever, 2 "A" and 4 "D" type contacts, 2 way locking	211019
5S5 to 5S8	Switch: key lever, 2 "A" and 2 "D" type contacts, 2 way locking	211020
5S9 to 5S12	Switch: key lever, 2 "D" type contacts 2 way locking	94142
5S13 to 5S15	Switch: rotary, wafer type, 2 circuit 1 section, 4 position, non-shorting contacts	211021
5T1 to 5T3	Transformer: audio, input	205326
5T4	Transformer: audio, line	

Symbol No.	Description	Stock No.
5T5, 5T6	Transformer: audio, input. Same as 5T1	205326
5T7	Transformer: audio, output	209281
5T8	Transformer: audio, output	207434
5XF1	Holder: fuse	205914
<b>MISCELLANEOUS</b>		
	Board: terminal, 80 terminals	211032
	Clamp: cable, white nylon, $\frac{3}{8}$ " I.D.	210391
	Clamp: cable, white nylon, $\frac{3}{16}$ " I.D.	209652
	Clamp: cable, white, nylon, $\frac{1}{8}$ " I.D.	209653
	Clamp: cable, white, nylon, $\frac{1}{4}$ " I.D.	211034
	Clamp: cable, white, nylon, $\frac{1}{2}$ " I.D.	213250
	Clamp: cable, white, nylon, $\frac{3}{8}$ " I.D.	213251
	Fastener: stud, steel, with retaining ring	96145
	Fastener: receptacle, silicon bronze	94641
	Knob: control, black with white filled pointer, 2" dia.	17269
	Knob: control, black with white filled pointer, $1\frac{1}{16}$ " dia.	17268
	Knob: control, blue with white filled pointer, 2" dia.	94444
	Knob: control, green with white filled pointer, 2" dia.	96928
	Knob: control, red with white filled pointer, 2" dia.	94446
	Knob: key lever switch, red	94441
	Knob: key lever switch, blue	94442
	Knob: key lever switch, green	96929
	Mounting: shock, isolator	211029
	Oil: attenuator	20752
	Ring: retaining, fastener	98480
	Shield: tube, $\frac{3}{16}$ " I.D. x $1\frac{3}{8}$ " ht., aluminum	211035
	Support: fall, single link, $6\frac{1}{4}$ " lg., with $5\frac{1}{2}$ " slot	94647
<b>PREAMPLIFIERS (5AR1 to 5AR7)</b>		
1C1	Capacitor: fixed, paper, 0.047 mf $\pm 10\%$ , 400 v	73553
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 $\pm 10\%$ , $\frac{1}{2}$ w	502410
1R3	Resistor: fixed, composition, 1 meg $\pm 10\%$ , $\frac{1}{2}$ w	502510
1R4	Resistor: fixed, composition, 560 ohm $\pm 10\%$ , $\frac{1}{2}$ w	502156
1R5	Resistor: fixed, composition, 160,000 ohm $\pm 5\%$ , $\frac{1}{2}$ w	502416
1R6	Resistor: fixed, composition, 39,000 ohm $\pm 10\%$ , $\frac{1}{2}$ w	502339

Symbol No.	Description	Stock No.
1R7	Resistor: fixed, composition, 5600 ohm $\pm 5\%$ , 1 w	512256
1R8	Resistor: fixed, composition, 200,000 ohm $\pm 5\%$ , $\frac{1}{2}$ w	502420
1R9	Resistor: fixed, composition, 1 meg $\pm 10\%$ , $\frac{1}{2}$ w	502510
1R10	Resistor: fixed, composition, 91,000 ohm $\pm 5\%$ , 1 w	512391
1R11	Resistor: fixed, composition, 100,000 ohm $\pm 10\%$ , $\frac{1}{2}$ w. Same as 1R2	502410
1R12	Resistor: fixed, composition, 9100 ohm $\pm 5\%$ , $\frac{1}{2}$ w	30671
1R13	Resistor: fixed, composition, 300,000 ohm $\pm 5\%$ , $\frac{1}{2}$ w	502430
1R14	Resistor: fixed, composition, 56,000 ohm $\pm 10\%$ , $\frac{1}{2}$ w	502356
1R15	Resistor: fixed, composition, 1200 ohm $\pm 10\%$ , $\frac{1}{2}$ w	502212
1XV1, 1XV2	Socket: tube, 9 contact, miniature  Strap: ground, for miniature tube socket	209284  210773
<b>PROGRAM AMPLIFIER (5AR8)</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 $\pm 10\%$ , $\frac{1}{2}$ w	502410
2R2	Resistor: fixed, composition, 1800 ohm $\pm 5\%$ , $\frac{1}{2}$ w	502218
2R3	Resistor: fixed, composition, 150,000 ohm $\pm 10\%$ , $\frac{1}{2}$ w	502415
2R4	Resistor: fixed, composition, 680,000 ohm $\pm 10\%$ , $\frac{1}{2}$ w	502468
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
2R8, 2R9	Resistor: fixed, composition, 470,000 ohm $\pm 10\%$ , $\frac{1}{2}$ 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 to 2XV3	Socket: tube, 9 contact miniature	209284

Symbol No.	Description	Stock No.
<b>MONITOR AMPLIFIER (5AR9)</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 3C2	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 meg $\pm 10\%$ , $\frac{1}{2}$ 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 watt	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>POWER SUPPLY (5PS1)</b>		
4C1A/C, 4C2A/C	Capacitor: electrolytic, 40/40/40 mf -10 +50%, 450 v	211022
4C3	Capacitor: fixed, paper, 0.47 mf $\pm 10\%$ , 200 v	73787
4C4A/C to 4C6A/C	Capacitor: electrolytic, 40/40/40 mf -10 +50%, 450 v. Same as 4C1	211022
4C7	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	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

Symbol No.	Description	Stock No.
4R3	Resistor: fixed, composition, 120,000 ohm $\pm 10\%$ , 1 w	512412
4R4	Resistor: fixed, composition, 18,000 ohms $\pm 10\%$ , 1 w	512318
4R5A/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

Symbol No.	Description	Stock No.
4XV1	Socket: tube, octal	68590
4XV2	Socket: tube, 7 contact miniature	94925
	Plate: mounting, electrolytic capacitor	18469
<b>FIXED PADS (5AT11)</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	59486
	Board: circuit, etched, with 6 terminals	211018
<b>FIXED PADS (5AT12)</b>		
R1, R2, R3, R4	Resistor: fixed, composition, 100 ohm $\pm 5\%$ , 1 w	512110
R5	Resistor: fixed, composition, 820 ohm $\pm 5\%$ , 1 w	512182
	Board: circuit, etched, with 6 terminals	211018
<b>FIXED PADS (5AT13)</b>		
R1, R2	Resistor: fixed, composition, 4700 ohm $\pm 5\%$ , 1 w	512247
R3	Resistor: fixed, composition, .620 ohm $\pm 5\%$ , 1 w	59488
	Board: circuit, etched, with 6 terminals	211018

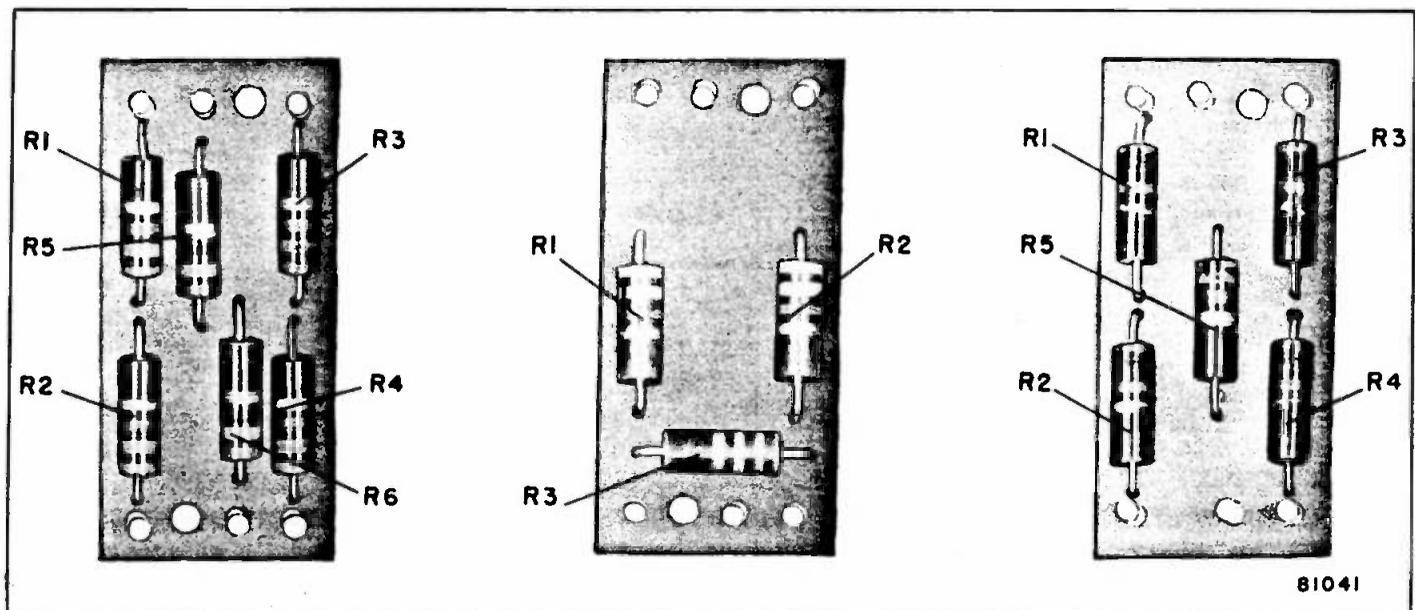


Figure 21—Fixed Pads 5AR11, 5AR13, 5AR12

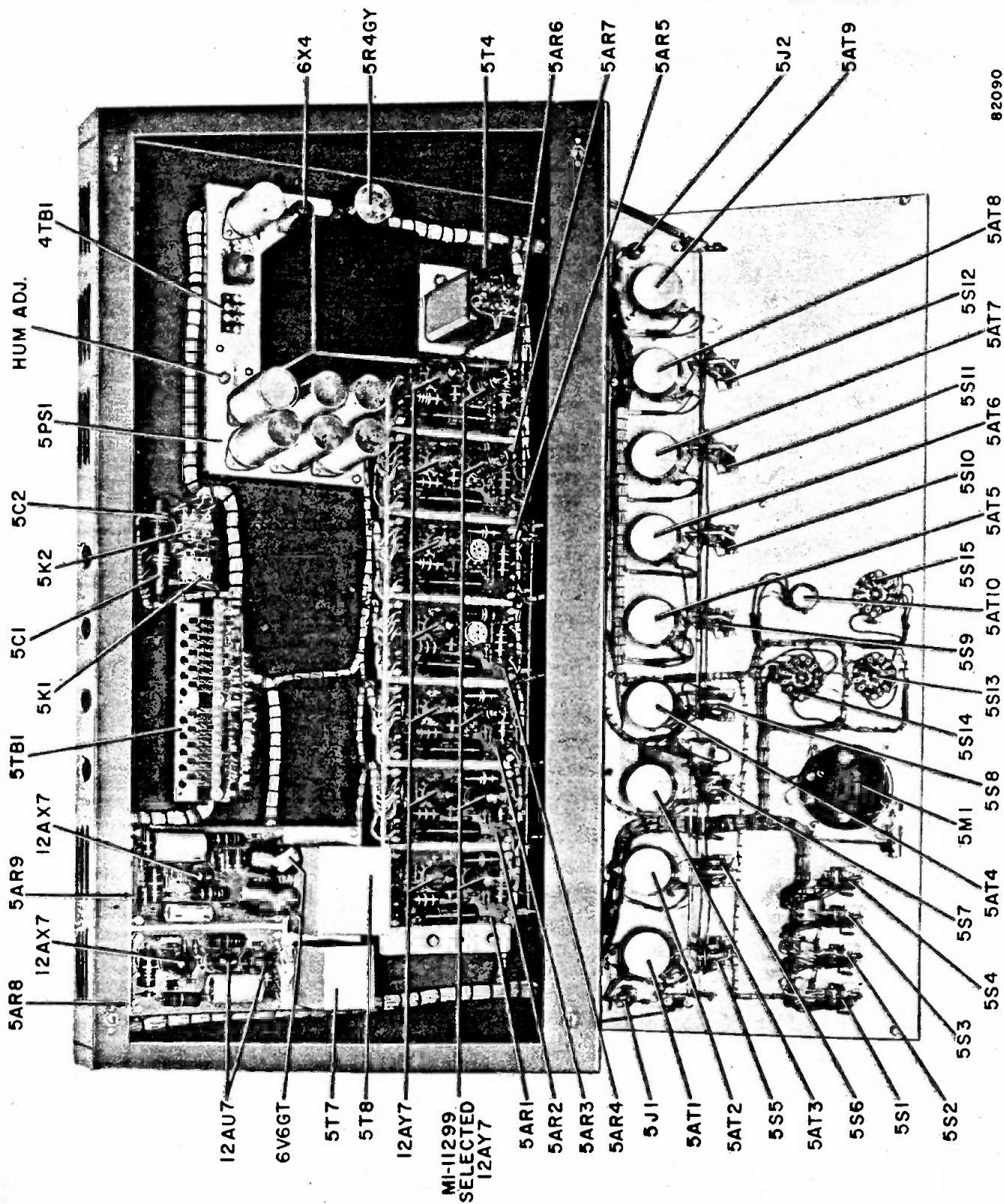


Figure 22—Internal View of Console

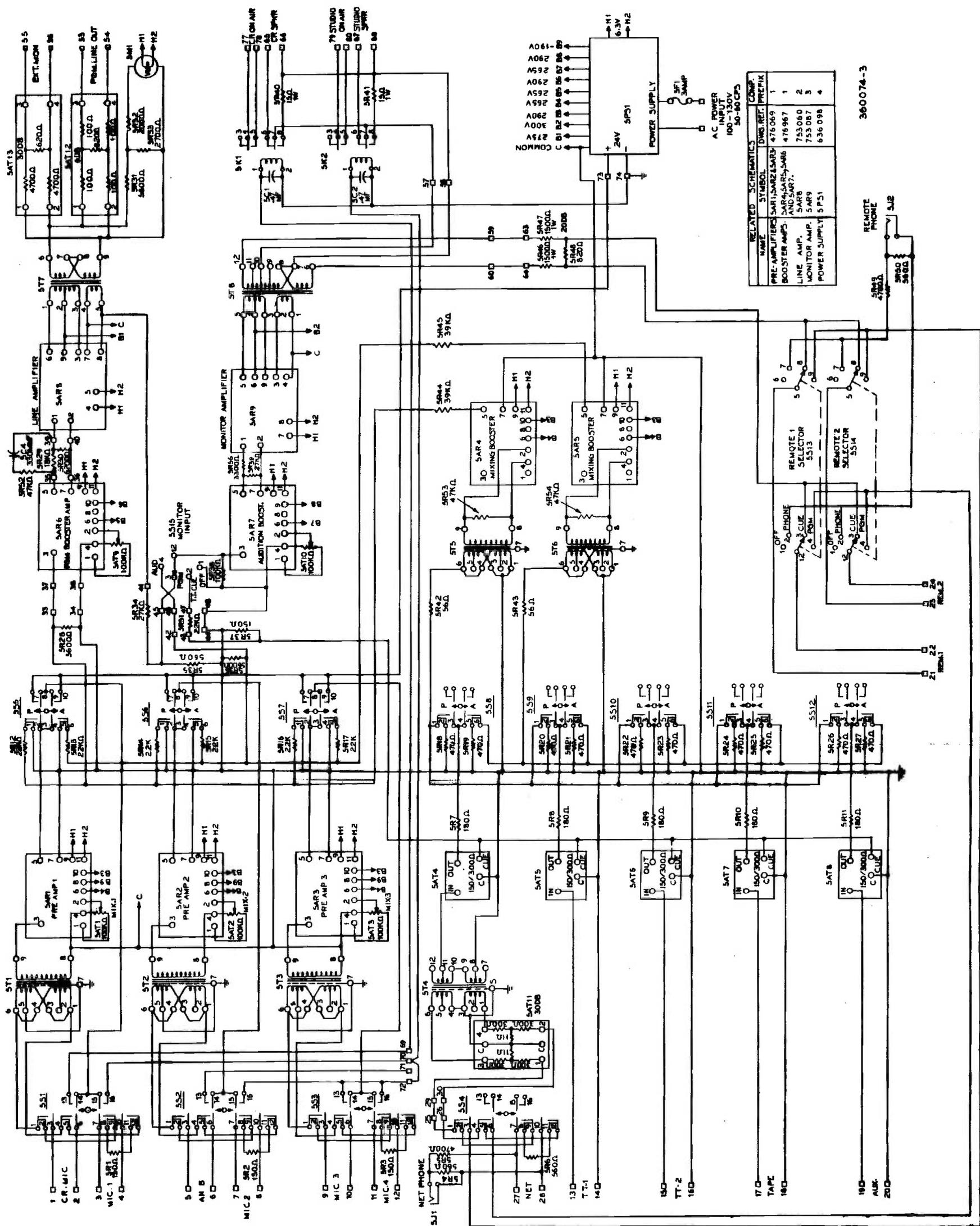
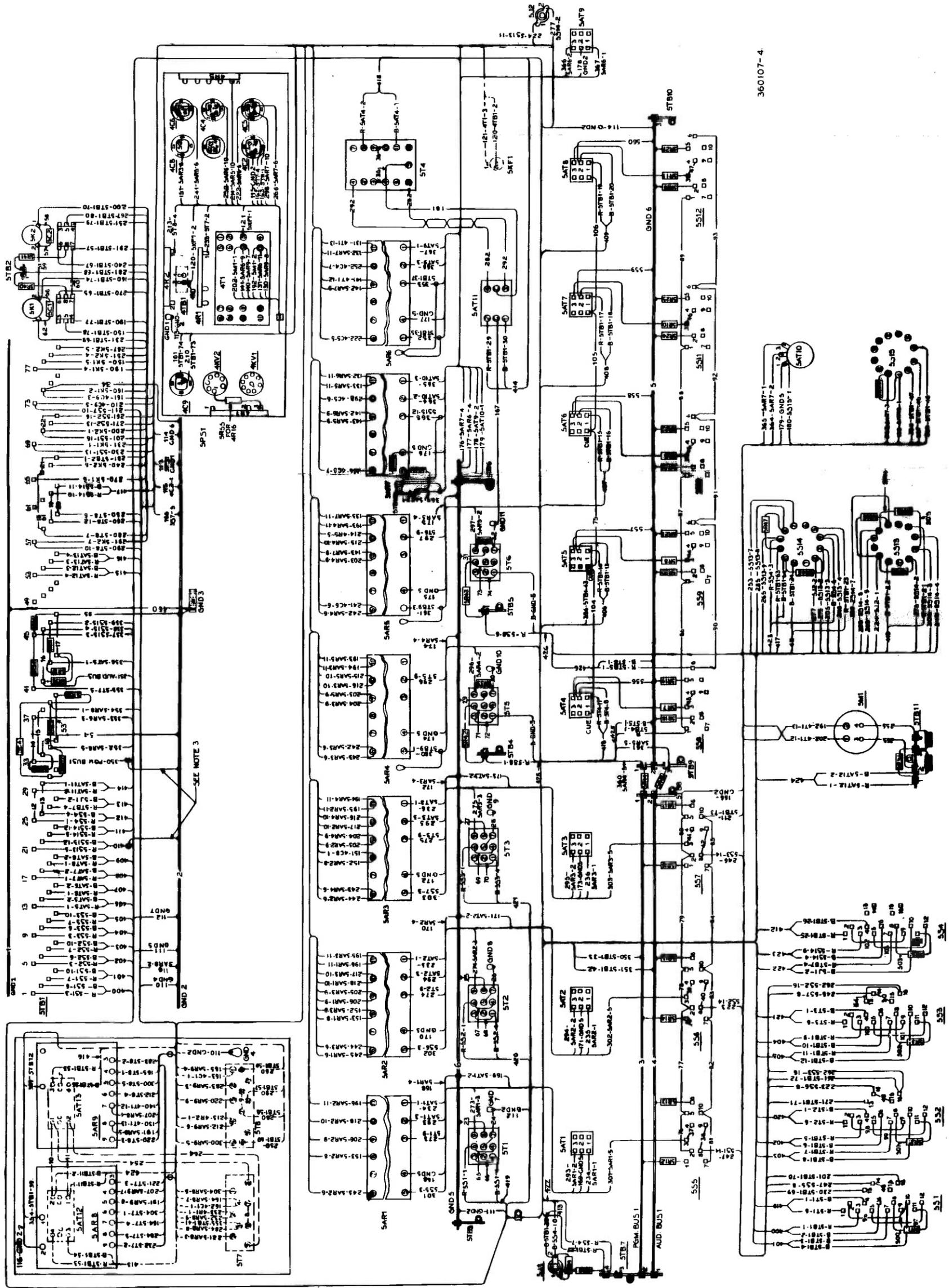


Figure 23—Overall Schematic



WIRE NO	DESCRIPTION	QWG OR T.O. NO	PT. NO
1-8	WIRE (UNINSULATED COPPER) DIA. 1.05	105	112
9-16	WIRE (UNINSULATED COPPER) DIA. 1.05	105	113
17-24	WIRE (UNINSULATED COPPER) DIA. 1.05	105	114
25-32	WIRE (UNINSULATED COPPER) DIA. 1.05	105	115
33-40	WIRE (UNINSULATED COPPER) DIA. 1.05	105	116
41-48	WIRE (UNINSULATED COPPER) DIA. 1.05	105	117
49-56	WIRE (UNINSULATED COPPER) DIA. 1.05	105	118
57-64	WIRE (UNINSULATED COPPER) DIA. 1.05	105	119
65-72	WIRE (UNINSULATED COPPER) DIA. 1.05	105	120
73-80	WIRE (UNINSULATED COPPER) DIA. 1.05	105	121
81-88	WIRE (UNINSULATED COPPER) DIA. 1.05	105	122
89-96	WIRE (UNINSULATED COPPER) DIA. 1.05	105	123
97-104	WIRE (UNINSULATED COPPER) DIA. 1.05	105	124
105-112	WIRE (UNINSULATED COPPER) DIA. 1.05	105	125
113-120	WIRE (UNINSULATED COPPER) DIA. 1.05	105	126
121-128	WIRE (UNINSULATED COPPER) DIA. 1.05	105	127
129-136	WIRE (UNINSULATED COPPER) DIA. 1.05	105	128
137-144	WIRE (UNINSULATED COPPER) DIA. 1.05	105	129
145-152	WIRE (UNINSULATED COPPER) DIA. 1.05	105	130
153-160	WIRE (UNINSULATED COPPER) DIA. 1.05	105	131
161-168	WIRE (UNINSULATED COPPER) DIA. 1.05	105	132
169-176	WIRE (UNINSULATED COPPER) DIA. 1.05	105	133
177-184	WIRE (UNINSULATED COPPER) DIA. 1.05	105	134
185-192	WIRE (UNINSULATED COPPER) DIA. 1.05	105	135
193-200	WIRE (UNINSULATED COPPER) DIA. 1.05	105	136
201-208	WIRE (UNINSULATED COPPER) DIA. 1.05	105	137
209-216	WIRE (UNINSULATED COPPER) DIA. 1.05	105	138
217-224	WIRE (UNINSULATED COPPER) DIA. 1.05	105	139
225-232	WIRE (UNINSULATED COPPER) DIA. 1.05	105	140
233-240	WIRE (UNINSULATED COPPER) DIA. 1.05	105	141
241-248	WIRE (UNINSULATED COPPER) DIA. 1.05	105	142
249-256	WIRE (UNINSULATED COPPER) DIA. 1.05	105	143
257-264	WIRE (UNINSULATED COPPER) DIA. 1.05	105	144
265-272	WIRE (UNINSULATED COPPER) DIA. 1.05	105	145
273-280	WIRE (UNINSULATED COPPER) DIA. 1.05	105	146
281-288	WIRE (UNINSULATED COPPER) DIA. 1.05	105	147
289-296	WIRE (UNINSULATED COPPER) DIA. 1.05	105	148
297-304	WIRE (UNINSULATED COPPER) DIA. 1.05	105	149
305-312	WIRE (UNINSULATED COPPER) DIA. 1.05	105	150
313-320	WIRE (UNINSULATED COPPER) DIA. 1.05	105	151
321-328	WIRE (UNINSULATED COPPER) DIA. 1.05	105	152
329-336	WIRE (UNINSULATED COPPER) DIA. 1.05	105	153
337-344	WIRE (UNINSULATED COPPER) DIA. 1.05	105	154
345-352	WIRE (UNINSULATED COPPER) DIA. 1.05	105	155
353-360	WIRE (UNINSULATED COPPER) DIA. 1.05	105	156
361-368	WIRE (UNINSULATED COPPER) DIA. 1.05	105	157
369-376	WIRE (UNINSULATED COPPER) DIA. 1.05	105	158
377-384	WIRE (UNINSULATED COPPER) DIA. 1.05	105	159
385-392	WIRE (UNINSULATED COPPER) DIA. 1.05	105	160
393-400	WIRE (UNINSULATED COPPER) DIA. 1.05	105	161
401-408	WIRE (UNINSULATED COPPER) DIA. 1.05	105	162
409-416	WIRE (UNINSULATED COPPER) DIA. 1.05	105	163
417-424	WIRE (UNINSULATED COPPER) DIA. 1.05	105	164
425-432	WIRE (UNINSULATED COPPER) DIA. 1.05	105	165
433-440	WIRE (UNINSULATED COPPER) DIA. 1.05	105	166
441-448	WIRE (UNINSULATED COPPER) DIA. 1.05	105	167
449-456	WIRE (UNINSULATED COPPER) DIA. 1.05	105	168
457-464	WIRE (UNINSULATED COPPER) DIA. 1.05	105	169
465-472	WIRE (UNINSULATED COPPER) DIA. 1.05	105	170
473-480	WIRE (UNINSULATED COPPER) DIA. 1.05	105	171
481-488	WIRE (UNINSULATED COPPER) DIA. 1.05	105	172
489-496	WIRE (UNINSULATED COPPER) DIA. 1.05	105	173
497-504	WIRE (UNINSULATED COPPER) DIA. 1.05	105	174
505-512	WIRE (UNINSULATED COPPER) DIA. 1.05	105	175
513-520	WIRE (UNINSULATED COPPER) DIA. 1.05	105	176
521-528	WIRE (UNINSULATED COPPER) DIA. 1.05	105	177
529-536	WIRE (UNINSULATED COPPER) DIA. 1.05	105	178
537-544	WIRE (UNINSULATED COPPER) DIA. 1.05	105	179
545-552	WIRE (UNINSULATED COPPER) DIA. 1.05	105	180
553-560	WIRE (UNINSULATED COPPER) DIA. 1.05	105	181
561-568	WIRE (UNINSULATED COPPER) DIA. 1.05	105	182
569-576	WIRE (UNINSULATED COPPER) DIA. 1.05	105	183
577-584	WIRE (UNINSULATED COPPER) DIA. 1.05	105	184
585-592	WIRE (UNINSULATED COPPER) DIA. 1.05	105	185
593-600	WIRE (UNINSULATED COPPER) DIA. 1.05	105	186
601-608	WIRE (UNINSULATED COPPER) DIA. 1.05	105	187
609-616	WIRE (UNINSULATED COPPER) DIA. 1.05	105	188
617-624	WIRE (UNINSULATED COPPER) DIA. 1.05	105	189
625-632	WIRE (UNINSULATED COPPER) DIA. 1.05	105	190
633-640	WIRE (UNINSULATED COPPER) DIA. 1.05	105	191
641-648	WIRE (UNINSULATED COPPER) DIA. 1.05	105	192
649-656	WIRE (UNINSULATED COPPER) DIA. 1.05	105	193
657-664	WIRE (UNINSULATED COPPER) DIA. 1.05	105	194
665-672	WIRE (UNINSULATED COPPER) DIA. 1.05	105	195
673-680	WIRE (UNINSULATED COPPER) DIA. 1.05	105	196
681-688	WIRE (UNINSULATED COPPER) DIA. 1.05	105	197
689-696	WIRE (UNINSULATED COPPER) DIA. 1.05	105	198
697-704	WIRE (UNINSULATED COPPER) DIA. 1.05	105	199
705-712	WIRE (UNINSULATED COPPER) DIA. 1.05	105	200
713-720	WIRE (UNINSULATED COPPER) DIA. 1.05	105	201
721-728	WIRE (UNINSULATED COPPER) DIA. 1.05	105	202
729-736	WIRE (UNINSULATED COPPER) DIA. 1.05	105	203
737-744	WIRE (UNINSULATED COPPER) DIA. 1.05	105	204
745-752	WIRE (UNINSULATED COPPER) DIA. 1.05	105	205
753-760	WIRE (UNINSULATED COPPER) DIA. 1.05	105	206
761-768	WIRE (UNINSULATED COPPER) DIA. 1.05	105	207
769-776	WIRE (UNINSULATED COPPER) DIA. 1.05	105	208
777-784	WIRE (UNINSULATED COPPER) DIA. 1.05	105	209
785-792	WIRE (UNINSULATED COPPER) DIA. 1.05	105	210
793-800	WIRE (UNINSULATED COPPER) DIA. 1.05	105	211
801-808	WIRE (UNINSULATED COPPER) DIA. 1.05	105	212
809-816	WIRE (UNINSULATED COPPER) DIA. 1.05	105	213
817-824	WIRE (UNINSULATED COPPER) DIA. 1.05	105	214
825-832	WIRE (UNINSULATED COPPER) DIA. 1.05	105	215
833-840	WIRE (UNINSULATED COPPER) DIA. 1.05	105	216
841-848	WIRE (UNINSULATED COPPER) DIA. 1.05	105	217
849-856	WIRE (UNINSULATED COPPER) DIA. 1.05	105	218
857-864	WIRE (UNINSULATED COPPER) DIA. 1.05	105	219
865-872	WIRE (UNINSULATED COPPER) DIA. 1.05	105	220
873-880	WIRE (UNINSULATED COPPER) DIA. 1.05	105	221
881-888	WIRE (UNINSULATED COPPER) DIA. 1.05	105	222
889-896	WIRE (UNINSULATED COPPER) DIA. 1.05	105	223
897-904	WIRE (UNINSULATED COPPER) DIA. 1.05	105	224
905-912	WIRE (UNINSULATED COPPER) DIA. 1.05	105	225
913-920	WIRE (UNINSULATED COPPER) DIA. 1.05	105	226
921-928	WIRE (UNINSULATED COPPER) DIA. 1.05	105	227
929-936	WIRE (UNINSULATED COPPER) DIA. 1.05	105	228
937-944	WIRE (UNINSULATED COPPER) DIA. 1.05	105	229
945-952	WIRE (UNINSULATED COPPER) DIA. 1.05	105	230
953-960	WIRE (UNINSULATED COPPER) DIA. 1.05	105	231
961-968	WIRE (UNINSULATED COPPER) DIA. 1.05	105	232
969-976	WIRE (UNINSULATED COPPER) DIA. 1.05	105	233
977-984	WIRE (UNINSULATED COPPER) DIA. 1.05	105	234
985-992	WIRE (UNINSULATED COPPER) DIA. 1.05	105	235
993-1000	WIRE (UNINSULATED COPPER) DIA. 1.05	105	236

FOR LIST OF PARTS FOR ABOVE WIRE TABLE SEE DWG. 8918 712-501

NOTES

- 1- SOLDER ALL ELECTRICAL CONNECTIONS USING ITEM 148.
- 2- CABLE A PEEKS FACE WIRES, WHERE NECESSARY.
- 3- SOLDER ALL THE ENDS OF THE SHIELDS OF THE SHIELDED CABLES ON STBI TO GROUND BUS (GND2)
- 4- THE FOLLOWING WIRES ARE TWISTED PAIRS

120 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559