

## GATESWAY 80 - Eight Channel Monophonic Transistor Audio Console

### Features:

- Eight monaural mixing channels
- Eighteen inputs to the mixers
- Extremely low distortion
- Three unwired utility keys allow for expansion
- Interchangeable cue, monitor and program amplifiers
- All solid state plug-in amplifiers
- Cue intercom to two studios, built in
- Excellent frequency response

The Gatesway 80 is the third generation of the world-famous Gatesway consoles, and combines excellent audio, a wide choice of inputs, and operating ease in a unit which is attractively and functionally styled.

This is a high-quality monophonic console which provides all necessary studio functions and facilities for the typical AM, FM, or TV station that broadcasts monophonic programs exclusively.

**INPUTS:** The flexibility of the Gatesway 80 is in its wide choice of inputs. Eighteen inputs can be switched into eight mixing channels. These include five microphones, four turntables, five tapes (cartridge or reel-to-reel), three remotes and network. Three unwired utility keys are provided for future expansion.

**MIXING CHANNELS:** Channels 1 and 2 are equipped with low-noise preamplifiers, and are

to be used with low-impedance, broadcast-type microphones. Each of these channels may select from two different input signals by means of a front-panel switch.

Channel 3 is equipped with a low-noise preamplifier and is also intended for use with a low-impedance, broadcast-type microphone. This channel has a single input and is assigned to the control room since this microphone functions as part of the talkback system.

Channels 4, 5, 6, and 7 are all medium level inputs and may be used with turntable preamplifiers, reel-to-reel tape, or cartridge machines. All channels have input transformers whose center taps may or may not be grounded, depending upon the given installation. They are shipped with the center taps ungrounded. A nominal level of  $-20$  dBm or  $+4$  dBm at 600 ohms is required. Input pads for the  $+4$  dBm are provided on the various tape inputs.

Channel 8 is specifically designed to function with network and remote lines as sources. Various combinations of preview, talkback, and program cue are possible using the front panel switches. A nominal input of at least  $-20$  dBm at 600 ohms is required.

All eight channels may be switched to either the program or audition positions to permit independent monitoring of any of the incoming sources without disturbing programming. Channels 4 through 8 have a cue position associated with the channel attenuator which provides signal to the amplified cue system. This signal can be monitored by an internal speaker or external headphones. On Channels 1 and 2, the center position of the program audition key switch provides a microphone cue signal to the cue selector switch. On Channel 3 this position is used with the control room microphone for talkback.



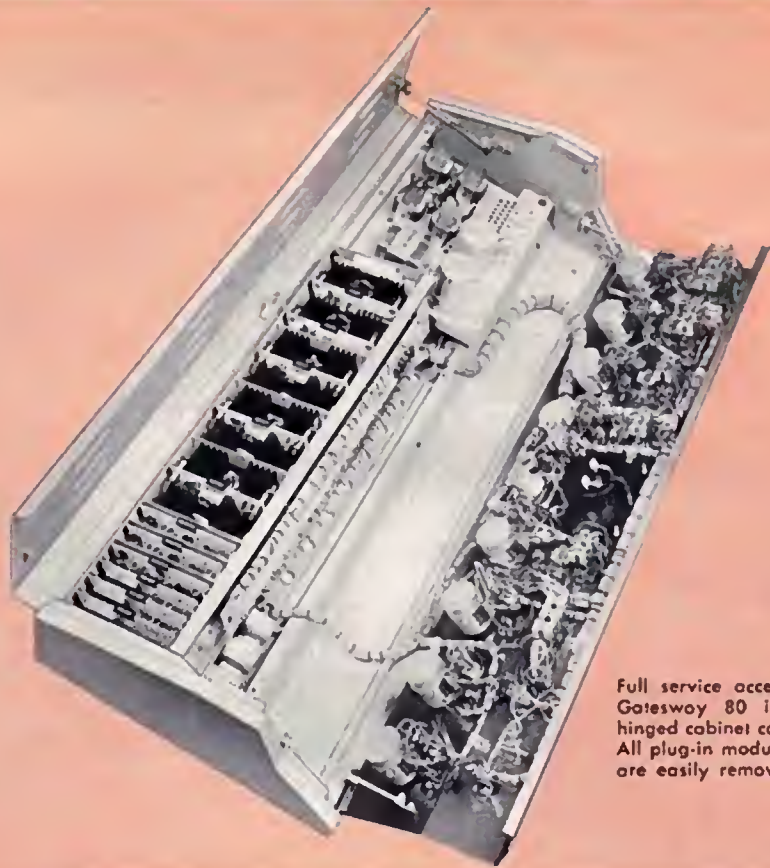
# GATES

**HARRIS**  
COMMUNICATION  
TECHNOLOGY

## GATESWAY 80

8 Channel  
Audio Control  
Console





Full service accessibility to the Gatesway 80 is through the hinged cabinet cover and panel. All plug-in modular components are easily removed for service.

**SOLID STATE MUTING:** A protective system of warning lights and solid state speaker muting is provided to prevent acoustic feedback and broadcasting of cue signal when "live" microphones are nearby.

**UNSURPASSED AUDIO:** Gates advanced all solid state plug-in amplifiers are one of the many reasons for the excellence of the Gatesway 80. Audio response is excellent, and distortion is at an extremely low level. The Gatesway 80 provides first-class audio quality for AM, FM, TV broadcasting, and recording studios.

**MODULAR CONSTRUCTION:** Each amplifier is mounted on a separate printed circuit board, which in turn mounts in a cord-rock holder. These modules are as follows: three preamplifier modules, three booster amplifier modules, three output amplifier modules and two power supply regulator modules. Silicon transistors are used to assure the meeting of performance specifications

and assure optimum console operation over a wide ambient temperature range. All amplifiers are completely accessible when the top of the console is opened, simplifying maintenance.

**INTERCHANGEABILITY:** Program, cueing, and monitor amplifiers all have the same electrical design and construction, and are completely interchangeable. As a result, two backup program amplifiers are provided as part of the console.

**HIGH LEVEL, HIGH FIDELITY OUTPUT:** The dynamic range of the preamplifiers will accommodate microphone levels to  $-25$  dBm without overload or distortion. The program amplifiers deliver  $+32$  dBm output and the monitor amplifiers  $+40$  dBm, all with wide frequency response, low distortion and low noise.

The Gatesway 80 is handsomely styled with satin-anodized aluminum front panels, and rich beige-gray Pebble-Tex cabinet. The modern design will complement any control room decor.

# GATESWAY 80

## Specifications

**OPERATING MODE:** Single channel mono with audition positions.

**MIXING CHANNELS:** Total—8. Three microphones, two turntables, three tapes and one remote/network.

**INPUT CIRCUITS:** Total—18. Five microphones, four turntables, two tape machines, three cartridge tape machines, three remote lines, one network.

**AMPLIFIERS AND POWER SUPPLIES PROVIDED:** Three preamplifiers, three boosters, three output modules—program, monitor and cue (interchangeable as supplied). Two power supply modules.

**OUTPUT CIRCUITS:** One program output @ +8 VU, one monitor speaker output unmuted for lobby, three monitor speakers muted, two headphone outputs.

**MONITOR OUTPUT:** Each speaker output is designed for use with an 8 ohm speaker.

**GAIN:** Microphone to line: 100 dB,  $\pm 2$  dB. Medium level to line: 60 dB,  $\pm 2$  dB.

**IMPEDANCES:** Microphones: 150/250 ohms balanced. Turntable/tape: 600 ohms balanced. Network/remote: 600 ohms balanced. Monitor output: 8

ohms nominal balanced. Program output: 600/150 ohms balanced.

**RESPONSE:** Program:  $\pm 1.0$  dB, 20 Hz to 20 kHz. Monitor:  $\pm 1.0$  dB, 30 Hz to 15 kHz.

**DISTORTION:** Program circuits: 0.5% maximum, 20 Hz to 20 kHz @ +24 dBm. Monitor circuits: 1.0% maximum, 20 Hz to 20 kHz @ +40 dBm (10 watts).

**NOISE:** Program circuits: 75 dB below +18 dBm with -50 dBm input (-125 dBm equivalent input noise, measured 20 Hz to 20 kHz). Medium level inputs: (program) 83 dB below +18 dBm with -10 dBm input. Monitor circuits: signal/noise = 80 dB below +40 dBm output.

**FINISH:** Satin-anodized aluminum panels with lettering in black. Cabinet color . . . beige-gray Pebble-Tex.

**POWER:** 117/234 volts, 50/60 Hz, single-phase. Consumption: 60 watts, maximum.

**MECHANICAL SIZE:** 39 inches wide, 15 $\frac{3}{4}$  inches deep, 7 $\frac{3}{4}$  inches high. Weight: 88 lbs.

**SHIPPING DATA:** Packed weight: domestic, 190 lbs.; export, 230 lbs. Cubage: 17.5 cubic feet.

## ORDERING INFORMATION

Gatesway 80, eight channel console, complete with three 994-6756-001 preamplifiers; three 994-6755-001 boosters; three 994-6754-001 program/monitor/cue output modules (interchangeable) and two 994-6753-001 power supplies 994-6699-001



**GATES**  
A DIVISION OF HARRIS-INTERTYPE

QUINCY, ILLINOIS • 62301 • U.S.A.

# GATESWAY 80

## 8-Channel Solid-State Audio Control Console

- Eight monaural mixing channels
- Eighteen Inputs to the mixers
- Extremely low distortion
- Interchangeable cue, monitor and program amplifiers
- All solid state plug-in amplifiers
- Excellent frequency response
- User serviceability

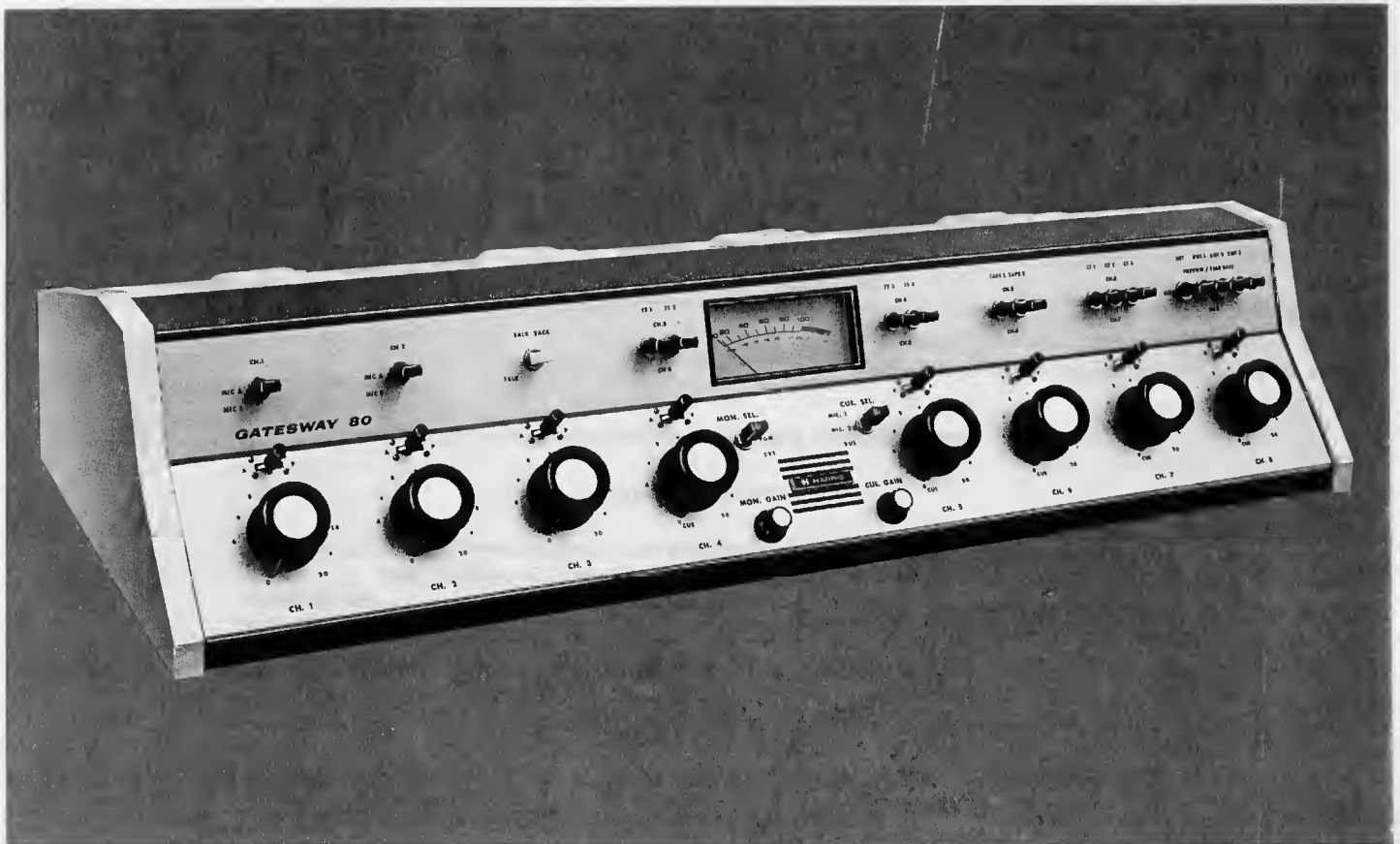
The Gateway 80 combines excellent audio, a wide choice of inputs, and operating ease in a unit which is attractively and functionally styled.

This is a high-quality monophonic console which provides all necessary studio functions and facilities for the typical AM, FM, or TV station that broadcasts monophonic programs exclusively.

**INPUTS.** The flexibility of the Gateway 80 is in its wide choice of inputs. Eighteen inputs can be switched into eight mixing channels. These include five microphones, four turntables, five tapes (cartridge or reel-to-reel), three remotes and network.

**MIXING CHANNELS.** Channels 1 and 2 are equipped with low-noise preamplifiers, and are to be used with low-impedance, broadcast-type microphones. Each of these channels may select from two different input signals by means of a front-panel switch.

4995  
3695



# TECHNICAL MANUAL

## GATESWAY 80 CONSOLE

994 6699 004



**HARRIS CORPORATION**

**Broadcast Products Division**

T.M. No. 888 1514 001

Printed: May 1975  
Revision A: July 1981



## GATESWAY 80 SPECIFICATIONS

**OPERATING MODE:** Single channel mono with audition positions.

**MIXING CHANNELS:** Total—8. Three microphones, two turntables, two tapes and one remote/network.

**INPUT CIRCUITS:** Total—18. Five microphones, four turntables, two tape machines, three cartridge tape machines, three remote lines, one network.

**AMPLIFIERS AND POWER SUPPLIES PROVIDED:** Three preamplifiers, three boosters, three output modules—program, monitor and cue (interchangeable as supplied). Two power supply modules.

**OUTPUT CIRCUITS:** One program output @ +8 VU, one monitor speaker output unmuted for lobby, three monitor speakers muted, two headphone outputs.

**MONITOR OUTPUT:** +40 dBm @ 8 ohm minimum load. Multi-speaker operation should use high-impedance speakers (32-45 ohms) or accessory speaker matching transformer (48/8 ohms) for minimum load of 8 ohms.

**GAIN:** Microphone to line: 100 dB  $\pm$  2 dB. Medium level to line: 60 dB  $\pm$  2 dB.

**IMPEDANCES:** Microphones: 150/250 ohms balanced. Turntable/tape: 600 ohms balanced. Network/remote: 600 ohms balanced. Monitor output: 8 ohms unbalanced.

**RESPONSE:** Program:  $\pm$ 1.0 dB, 20 Hz to 20 kHz.  
Monitor:  $\pm$ 1.0 dB, 30 Hz to 15 kHz.

**DISTORTION:** Program circuits: 0.5% maximum, 20 Hz to 20 kHz @ +18 dBm.  
Monitor circuits: 1.0% maximum, 30 Hz to 15 kHz @ +40 dBm (10 watts.)

**NOISE:** Program circuits: 75 dB below +18 dBm with -50 dBm input (-125 dBm equivalent input noise, measured 20 Hz to 20 kHz). Medium level inputs: (program) 80 dB below +18 dBm with -10 dBm input. Monitor circuits: signal/noise = 80 dB below -40 dBm output.

**FINISH:** Satin-anodized aluminum panels with lettering in black. Cabinet color . . . neutral white, blue trim.

**POWER:** 117/234 volts, 50/60 Hz, single-phase. Consumption: 60 watts, maximum.

**MECHANICAL SIZE:** 39 inches wide, 15 $\frac{3}{4}$  inches deep, 7 $\frac{3}{4}$  inches high. Weight: 88 lbs.

**SHIPPING DATA:** Packed weight: domestic, 120 lbs.; export, 170 lbs. Cubage: 12.8 cubic feet (domestic).

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

### ORDERING INFORMATION

Gatesway 80, eight channel console, complete with three preamplifiers; three boosters; three program/monitor/cue output modules (interchangeable) and two power supplies .....994-6699-001  
Speaker Matching Transformer .....478-0291-000

**HARRIS CORPORATION** Broadcast Products Division  
P. O. Box 4290, Quincy, Illinois 62301 U.S.A. 217/222-8200

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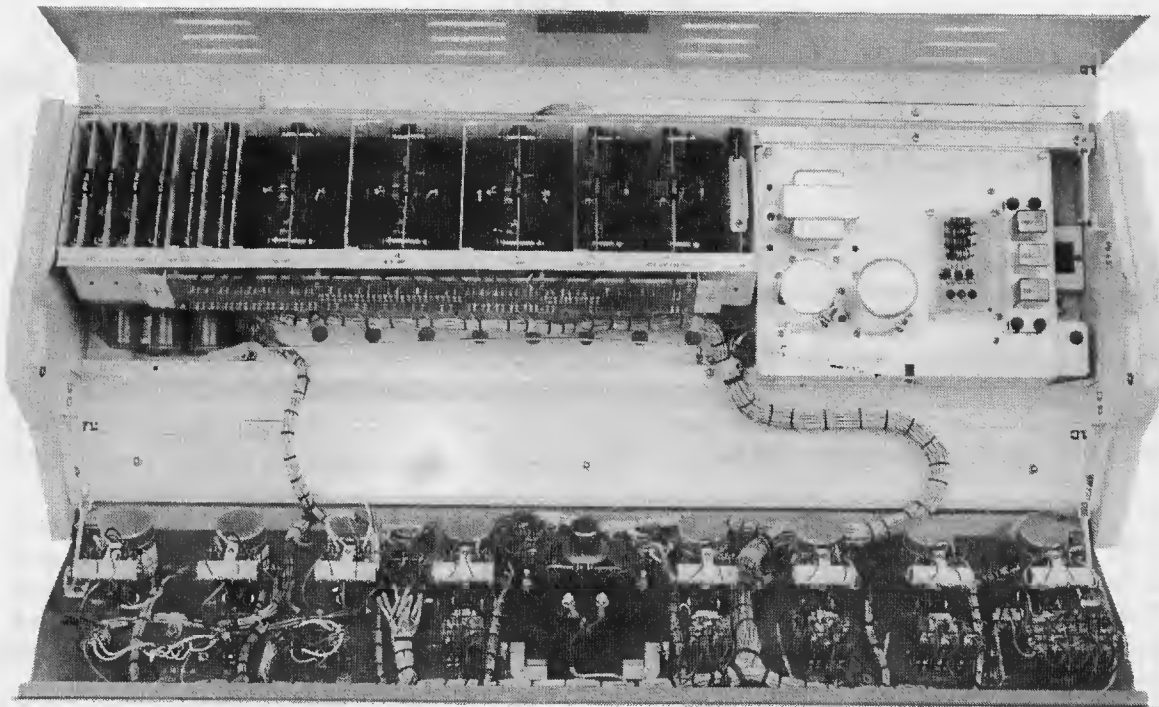


Figure 1-1. Gateway 80 Console

## SECTION I

### GENERAL INFORMATION

#### 1-1. INTRODUCTION

This manual contains all information necessary to install, operate, and service the Gatesway 80 Console, Model No. 994 6699 004. This section covers equipment identification, specifications, and other basic information. Figure 1-1 shows front and interior views of equipment supplied.

The various sections of this manual provide information as follows:

a. SECTION II, INSTALLATION, provides information relative to incoming inspection, power requirements, input and output connections, and mounting requirements.

b. SECTION III, OPERATION, provides identification and functions of front panel controls and indicators, and other information relative to operating the unit.

c. SECTION IV, PRINCIPLES OF OPERATION, provides a description of electrical circuits.

d. SECTION V, MAINTENANCE, provides information for service and fault location.

e. SECTION VI, PARTS LISTS, provides information for ordering electrical parts and assemblies.

f. SECTION VII, DRAWINGS, provides block and schematic diagrams and other drawings necessary for maintaining the unit.

#### 1-2. EQUIPMENT SUPPLIED.

The Gatesway 80 Console contains the following printed circuit modules: three preamplifier cards, three audio booster cards, three audio output cards, and two power supply cards. All cards of the same type are interchangeable. A power transformer assembly with power cord and connecting cable is supplied as a separate unit. Also supplied with the console are the following items:

- a. Extender Card
- b. Knob Decal Kit
- c. Cue and Program Phone Jacks

1-3. DESCRIPTION

The Gateway 80 is a monaural audio console of solid state design and modular construction utilizing transistor circuitry mounted on printed circuit boards. Featuring eight mixing channels and one program channel with monitor and cue capability, the Gateway 80 Console provides all necessary studio functions and facilities for the typical AM or FM station that broadcasts monophonic programs exclusively. Audition outputs are provided for recording and general production use. Selection of eighteen inputs include: five microphones, four turntables, five tapes (cartridge and reel-to-reel), three remote lines, and a network line.

1-4. Mixing Channels

1-5. Channels 1 and 2. These channels are equipped with low-noise preamplifiers for use with low-impedance, broadcast-type microphones. Each of these channels may select from two different input signals by means of a front panel switch.

1-6. Channel 3. This channel is equipped with a low-noise preamplifier and is also intended to be used with a low-impedance, broadcast-type microphone. Since this channel is assigned to the control room and functions as part of the talkback system, a single input is provided.

1-7. Channels 4, 5, 6, and 7. These channels are designed for medium level inputs and may be used with turntable preamplifiers, cartridge tape machines, or reel-to-reel tape machines. Inputs are selected by means of front panel switches. Input assignments are as follows:

Turntables (TT-1, TT-2, TT-3, TT-4): channel 4 or 5  
Tapes (Tape 1, Tape 2): channel 5 or 6  
Cartridge Tapes (CT-1, CT-2, CT-3): channel 6 or 7

1-8. Channel 8. This channel is specifically designed to function with network and remote lines as sources. Various combinations of preview, talkback, and program cue are possible using the front panel switches. Switching options for network and remote lines are as follows:

Network: Preview/Talkback or Channel 8 (center position is off)  
Remote 1: Preview/Talkback or Program Cue or Channel 8  
Remote 2: Preview/Talkback or Program Cue or Channel 8  
Remote 3: Preview/Talkback or Program Cue or Channel 8

1-9. Program Channel and Audition Selection. Any of the eight Mixing Channels may be switched to either the Program or Audition positions to permit independent monitoring or recording of incoming sources without disturbing programming. Channels 4 through 8 have a cue position associated with the channel attenuator which provides signal to the amplified cue system. This signal can be monitored by an internal speaker or external headphones. On Mixing Channels 1 and 2, the center position of the Program-

Audition key switch provides a microphone cue signal to the Cue Selector switch. On Mixing Channel 3, this position is used with the control room microphone for talkback. All Mixing Channels include front panel, variable attenuators for setting output signal levels.

#### 1-10. Program Channel

The Program Channel consists of a booster amplifier, audio output amplifier, VU meter, and a master gain control. The master gain control, an internal adjustment, is preset at the factory to remove 16 dB of gain from the circuit which is the optimum setting for providing adequate operating margins of signal-to-noise and "headroom". The VU meter is a standard volume indicator used in conjunction with the mixing channel attenuators to establish a reference volume of 0 VU which is equivalent to an output level of +8 dBm. Program Channel outputs are available on the input/output terminal board, TB1. Provisions for connecting high-impedance headphones are also available on TB1.

#### 1-11. Monitor Circuit

The monitor circuit consists of an audio booster amplifier, audio output amplifier, gain control, and an input selector switch. The Monitor Gain control and the Monitor Selector switch are available on the front panel. The Monitor Selector switch provides selection of three inputs: Program, Audition, or external source. The amplified output from the monitor circuit is available on terminal board TB3 for connection to Lobby, Studio, and Control Room monitor speakers.

#### 1-12. Cue Circuit

The cue circuit consists of a booster amplifier, audio output amplifier, gain control, input selector switch, and a push-to-talk switch. The Cue Gain control, Cue Select switch and Talkback switch are front panel controls. The Cue Select switch provides selection of three inputs: Channel 1 microphone, Channel 2 microphone, or cue bus. The cue bus includes all medium level inputs and the network-remote lines. The Talkback switch, when placed in the TALK position, connects the Control Room microphone (CH. 3) to the cue circuit input and applies amplified output to studio intercom speakers or remote lines.

#### 1-13. Power Supplies

The console includes two regulated dc power supplies, PS-1 and PS-2. Power supply PS-1 provides +45V dc for circuits associated with the Program Channel and the preamplifiers associated with Mixing Channels 1, 2, and 3. Power Supply PS-2 provides +45V dc for monitor and cue circuits. Both power supplies are contained on plug-in, printed circuit cards and receive primary power from power transformer T18 which is supplied as a separate unit.

1-14. Muting and Warning Lights

A protective system of warning lights and speaker muting is provided to prevent acoustic feedback and broadcasting of a cue signal when "live" microphones are nearby.

1-15. SPECIFICATIONS

Equipment specifications are listed in Table 1-1. These specifications are the performance standards, or limits against which the equipment may be tested. Table 1-2 lists supplemental performance characteristics. Supplemental characteristics are not specifications but are typical characteristics included as additional information for the user.

Table 1-1. Specifications

MICROPHONE (Channels 1, 2, & 3 Program Line Out)

Maximum Gain:	100 <u>+2</u> dB
Frequency Response:	<u>+1</u> dB, 20 to 20,000 Hz
Distortion:	Less than 0.5%, 20 to 20,000 Hz at +24 dBm output
Noise:	More than 75 dB below +18 dBm output with -50 dBm input. Equivalent input noise is better than -125 dBm, 20 to 20,000 Hz
Crosstalk:	Less than 10 dB above rated Noise, with normal levels and control settings 30 Hz to 15 kHz
Microphone Impedance:	150 ohms, balanced, with C.T. 37.5 ohms, balanced, no C.T.

MEDIUM LEVEL (Channels 4 through 7 to Program Line Out)

Maximum Gain:	60 <u>+2</u> dB or 36 <u>+2</u> dB
Frequency Response:	<u>+1</u> dB, 20 to 20,000 Hz
Distortion:	Less than 0.5%, 20 to 20,000 Hz at +24 dBm output
Noise:	More than 78 dB below +18 dBm output with -10 dBm input, 20 to 20,000 Hz
Crosstalk:	Less than 10 dB above rated Noise, normal levels and control settings, 30 Hz to 15 kHz
Input Impedance:	600 ohms, balanced

NETWORK/REMOTES (Channel 8 to Program Line Out)

Maximum Gain:	60 <u>+2</u> dB
Frequency Response:	<u>+1</u> dB, 20 to 20,000 Hz
Distortion:	Less than 0.5%, 20 to 20,000 Hz at +24 dBm output

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Table 1-1. Specifications (cont'd)

Noise:	More than 78 dB below +18 dBm output with -10 dBm input, 20 to 20,000 Hz
Crosstalk:	Less than 10 dB above rated Noise, with normal levels and control settings at 15 kHz
Input Impedance:	600 ohms, balanced

MONITOR CIRCUITS

Maximum Gain:	Mic - Pgm - Mon Out-131 <u>+2</u> dB
	Mic - Aud - Mon Out-116 <u>+2</u> dB
	Med - Pgm - Mon Out-91 <u>+2</u> dB
	Med - Aud - Mon Out-76 <u>+2</u> dB
	Ext - Mon - Mon Out-48 <u>+2</u> dB
Frequency Response:	<u>+1</u> dB, 30 to 15,000 Hz
Distortion:	Less than 1%, 30 to 15,000 Hz at +40 dBm (10 Watts) output
Noise:	More than 78 dB below +40 dBm (10 Watts) output, 30 to 15,000 Hz
Crosstalk:	Less than 10 dB above rated Noise, with normal levels and control settings, 30 Hz to 15 kHz

AUDITION CIRCUITS

Maximum Gain:	Mic to Aud Out-50 dB <u>+2</u> dB
	Med to Aud Out-10 dB <u>+2</u> dB
	Net to Aud Out-10 dB <u>+2</u> dB
Frequency Response:	<u>+1</u> dB, 20 to 20,000 Hz
Distortion:	Less than 0.5%, 20 to 20,000 Hz
Output Impedance:	600 ohms, built-out

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Table 1-2. Supplemental Performance Characteristics

POWER REQUIREMENTS	
Line Voltage and Frequency:	117 V (as supplied)/234 V, 50/60 Hz
Power Consumption:	60 Watts Maximum
PHYSICAL SIZE	
Console:	39 inches wide (99.06 cm) 15.5 inches deep (39.37 cm) 7.75 inches high (19.685 cm)
Console Weight:	88 lbs. (39.916 kg)
Power Transformer (Separate):	Approx. 6 inches long (15.24 cm) 4 inches wide (10.16 cm) 3.5 inches high (8.89 cm)

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SECTION II  
INSTALLATION

2-1. INTRODUCTION

This section explains how to prepare the Gateway 80 Console for operation. Also included is information relative to power requirements, environmental requirements, input and output connections, etc.

2-2. INITIAL INSPECTION

Upon receipt of the Gateway 80 Console, inspect the shipping container for damage. If damage is evident, the shipping container and cushioning material should be kept until the unit has been checked mechanically and electrically.

The contents of the shipment should be as indicated on the packing list. If the contents are incomplete or if the unit is damaged electrically or mechanically, notify the carrier and Harris Corporation Broadcast Equipment Division. Keep the shipping materials for carrier's inspection.

2-3. PREPARATION FOR USE

2-4. Power Requirements

The Gateway 80 Console requires a power source of 117 or 234V ac  $\pm$  10%, 50 to 60 Hz, single phase. Power consumption is approximately 60 watts. The Power Transformer, as delivered from the factory, is connected for operation from 117V ac.

2-5. Power Transformer Assembly. The separate power transformer is normally mounted beneath the desk or table, and should be separated several feet from the console in a position which permits free-air circulation around it. As shipped from the factory for domestic use, the transformer's primary windings are parallel-connected for 117V ac, 50/60 Hz operation. However, the two primary windings are accessible by removing the transformer top cover, and may be reconnected in series for 234V ac, 50/60 Hz operation, if desired. These connections are illustrated in the Transformer Diagram in Section VII. Connect the secondary of the Power Transformer to J12 located at the right end of the console on the main base plate.

2-6. Power Cable. In accordance with international safety standards this unit is equipped with a three-wire power cable. When connected to an appropriate power line outlet, this cable grounds the transformer case. The cable includes a standard three-wire plug. In some countries, it may be necessary to obtain a special adapter for operation from 234V ac service. These adapters are normally available at local electrical supply houses. The console assembly includes a ground stud for connection to the station ground system.

## 2-7. Operating Environment

The operating environment should be within the following limitations:

- a. Temperature: 0°C to +55°C
- b. Relative Humidity: 5% to 95%, non-condensing
- c. Altitude: 10,000 feet

## 2-8. Mounting

As supplied from the factory, the Gateway 80 has four "bumper" feet for desk-top mounting. These bumpers space the bottom of the console away from the desk surface to provide proper air ventilation. If permanent, desk-top mounting is required, remove the hardware from the "bumper" feet and replace it with longer bolts or screws, but remount the bumpers in their original position to allow the necessary air circulation beneath the console. All cable connections are made through the bottom of the console.

## 2-9. Input Connections

The input cables should be solder-connected to the terminals of TB1 (figure 2-1) which is located along the front surface of the module compartment. These cables should be 2-conductor shielded wire, with an overall vinyl jacket. The vinyl jacket prevents the shield from shorting to other building grounds and resulting in a troublesome ground loop. Tie the input shields to the shield ground-bus provided beside TB1. Input connections are listed in Table 2-1. Also refer to the overall schematic provided in Section VII.

### CAUTION

To prevent unwanted ground loops, all wiring connected to TB1 should be free from ground connections in the source equipment (microphones, turntable, preamplifiers, tape recorders, etc.). An ohmmeter check is recommended to be certain each wire is not grounded before connecting it to the console input. If this check is made, those sources showing no grounds may exhibit lower noise if the input transformer center tap is grounded.

2-10. Microphone Inputs. Mic A, Ch 1 and Mic A, Ch 2 inputs are assigned (see Muting Assignments) as Studio A microphone inputs. Mic B, Ch 1 and Mic B, Ch 2 inputs are assigned as Studio B microphone inputs. The input for Channel 3 is for the control room microphone. The nominal level to these inputs is -60 dBm at 150 ohms. Microphones with impedances from 100 ohms to 250 ohms may be used. To use 30/50 ohm microphones, an internal modification is necessary.

Table 2-1. Input Connections

<u>MIXING CHANNEL</u>	<u>INPUT</u>	<u>TERMINAL BOARD CONNECTIONS</u>
1	Mic A	TB1- 1 and 3
1	Mic B	TB1- 5 and 7
2	Mic A	TB1- 9 and 11
2	Mic B	TB1-13 and 15
3	Cont. Rm. Mic	TB1-17 and 19
4 or 5	TT-1	TB1-21 and 23
4 or 5	TT-2	TB1-25 and 27
4 or 5	TT-3	TB1-29 and 31
4 or 5	TT-4	TB1-33 and 35
5 or 6	Tape 1	TB1-37 and 39
5 or 6	Tape 2	TB1-41 and 43
6 or 7	CT-1	TB1-45 and 47
6 or 7	CT-2	TB1-49 and 51
6 or 7	CT-3	TB1-53 and 55
8	Network	TB1-57 and 59
8	Remote 1	TB1-61 and 63
8	Remote 2	TB1-65 and 67
8	Remote 3	TB1-69 and 71
	External Monitor	TB1-73 and 75

2-11. Modification Procedure for 30/50 ohm Microphones. To use 30/50 ohm microphones, the following modification is necessary:

- a. Remove all modules from the card guide, noting their location.
- b. Remove the twenty-four screws which hold the sockets in place in the bottom of the card guide, noting that the sockets "float" in their mountings.
- c. Remove the six screws which hold the card guide to the console chassis and tip the card guide forward, toward the front panel.
- d. Locate the desired transformer, T1, T2, or T3. Note that the primary leads go to terminals 7 and 12 of the associated socket.
- e. Using a very small, flat screwdriver, insert it into the terminal 7 slot on the rear side of the socket, and pull on the blue wire; it should come out with only a slight amount of effort. If necessary, rock the screwdriver while removing the wire. Apply insulating tape to the terminal of the blue wire and dress it back out of the way.

1514

f. Attach a new terminal to the white wire of the transformer. Insert the white wire terminal into the No. 7 space of the socket.

g. Replace the card rack and align the plastic sockets. Fasten the sockets to the card rack and replace the modules.

#### NOTE

Do not over tighten the screws which hold the plastic sockets. These sockets must "float" in their mounting to allow self-alignment with the modules.

2-12. Medium Level Inputs. All medium level input channels, 4 through 7, present a 600 ohm, balanced input impedance. Nominal input levels are -20 dBm for the turntable inputs and +4 dBm for all tape inputs. The input levels for the various tape inputs can be lowered to -20 dBm by removing the correct pad on TBl. (See the overall schematic for resistor numbers.) Only if the specific input sources are free of grounds, may the center taps of the corresponding input transformers be grounded for lowest noise.

2-13. Network and Remote Inputs. The Network/Remote inputs on Channel 8 all present a 600 ohm, balanced input impedance. Nominal input level is -20 dBm for these inputs. This level may be raised as needed by installing the appropriate balanced H pad in place of the straight through connection now used. See the Loss Pad Chart (figure 2-2) for resistor values. The pad board is located next to switch S11 on the upper right of the front panel, and the change effects all inputs on Channel 8.

2-14. External Monitor Input. The external monitor input presents a balanced 600 ohm input to match a 600 ohm source. The nominal input level is -8 dBm.

2-15. Output Connections

Output connections are provided on the Input/Output terminal board, TBl (figure 2-1). Refer to table 2-2 and the overall schematic provided in section VII.

2-16. Program Channel. The Program Channel output is 600 ohms balanced, and provides +8 dBm output level when the VU meter reads 0 VU. This output appears at terminals 77 and 79 of TBl. When loaded with 600 ohms, the maximum output level obtainable at this point is in excess of +30 dBm. This output level provides an adequate amount of headroom to prevent clipping of the program signal peaks. A high-impedance headphone output is available at terminals 83 and 84 of TBl. This output is bridged across the program output line before the 6-dB line pad and is balanced.

2-17. Cue Headphones. The cue headphone jack connection points are terminals 90, 91, and 92 of TBl, and are intended for a shorting-switch phone jack. If this type jack is not used, a jumper across terminals 90

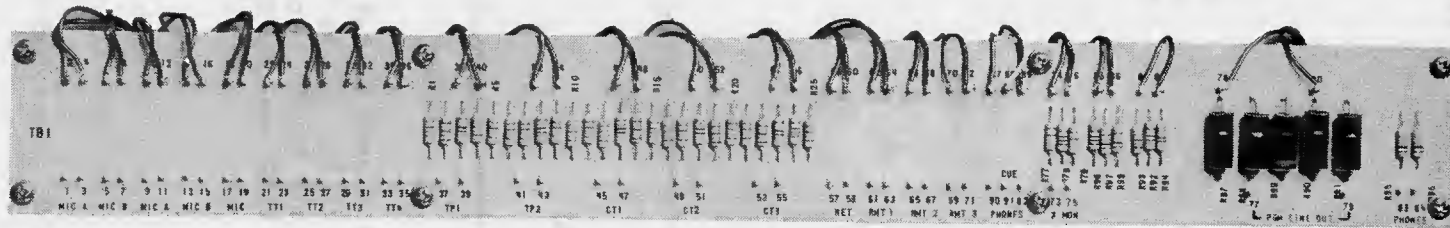
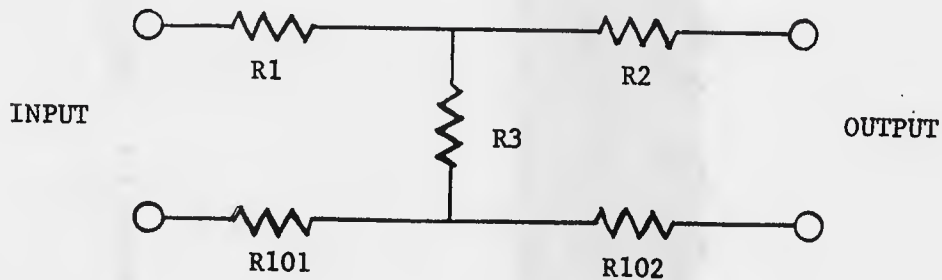


Figure 2-1. Input/Output Terminal Board

600/600 ohms "T" pads			150/150 ohms "T" pads		
dB loss	R1-R2 ohms	R3 ohms	dB loss	R1-R2 ohms	R3 ohms
2	68	2700	2	18	750
4	130	1200	4	36	330
6	200	820	6	51	200
8	270	510	8	62	120
10	330	390	10	82	100
15	430	220	15	110	56
20	470	120	20	120	30
25	510	68	25	130	16

600/150 ohms "T" pads			
dB loss	R1 ohms	R2 ohms	R3 ohms
12(min)	510	6.8	160
15	510	51	110
20	560	100	62
25	560	120	33



NOTE: This chart may be used for H pads by halving R1 and making R101 equal to half of R1, and by halving R2 and making R102 equal to half of R2. For T pads, simply short out R101 and R102 and use R1 and R2 values directly.

Figure 2-2. Loss Pad Chart



Table 2-2. Output Connections

<u>OUTPUT</u>	<u>TERMINAL BOARD CONNECTION</u>
Program Channel	TB1-77 and 79
Headphones	TB1-83 and 84
Audition	TB1-93 and 95
Cue Headphones	TB1-90, 91, and 92

and 91 must be used. Using this jumper, however, will not allow the inserted headphones to disable the internal cue speaker, which may be desirable.

2-18. Audition Output. The audition output is available on terminals 93 and 95 of TB1 and provides a -26 dBm output level when the VU meter indicates 0 VU. The audition output provides a convenient source for recording and may be used for other purposes. This feature, which is independent of the monitor circuitry, permits the operator to record from any input channel selected for audition while simultaneously monitoring the channel selected for broadcast.

2-19. Monitor and Intercom Speakers. The connections for the monitor and intercom speakers are located on terminal board TB3 (figure 2-3), which is below the swing-up transformer deck at the right end of the console. Loosening the two thumb screws at the back of the transformer deck will allow it to swing upward toward the front panel, exposing TB3. Speaker connections are provided in table 2-3.

Table 2-3. Monitor and Intercom Speaker Connections

<u>SPEAKER</u>	<u>CONNECTION</u>	<u>MUTING</u>
Lobby	TB3- 1 and <sup>2</sup> <del>3</del>	not muted
Studio A	TB3- 3 and 4	muted
Studio B	TB3- 5 and 6	muted
Control Room	TB3- 7 and 8	muted.
Studio A Intercom	TB3- 9 and 10	muted
Studio B Intercom	TB3-11 and 12	muted

It is important to make certain that the total load on the amplifier, from all speakers, does not drop below 8 ohms. Load impedance below 8 ohms will cause automatic protection circuitry in the output amplifier to function, causing the output to sound very distorted or garbled. If several 8-ohm speakers are needed, use the accessory 48/8-ohm speaker-matching transformer, part number 478 0291 000. Any combination of speakers is satisfactory if the total load is 8 ohms or greater.

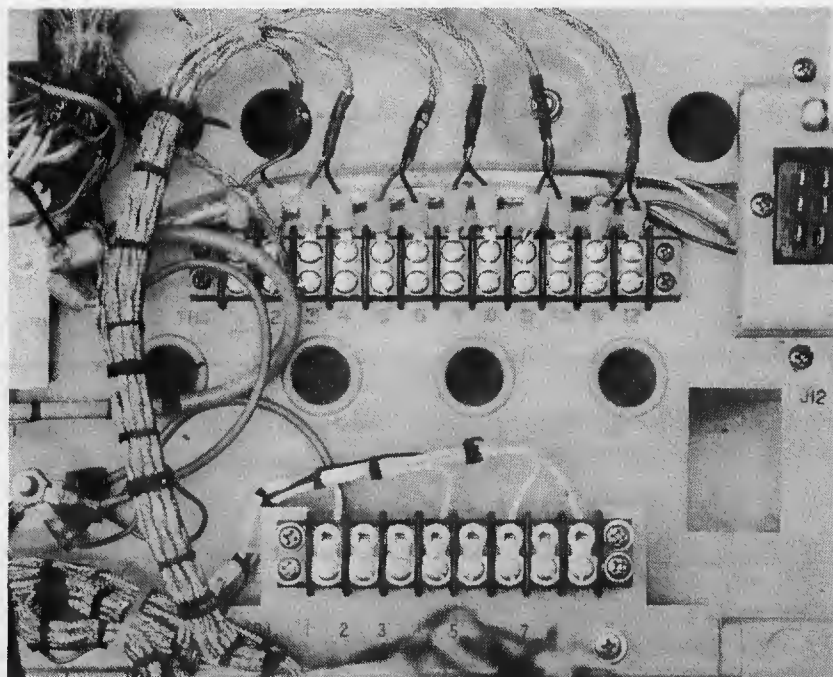


Figure 2-3. Monitor and Intercom Speaker Connections

2-20. Warning Lights. The connections for the Warning Lights are on terminal board TB4 which is also located underneath the swing-up transformer deck, figure 2-3. Terminals 1 and 2 are for the 117V ac 60 Hz input voltage. If possible, connect the neutral side of the line to terminal 2 and the hot side to terminal 1. Terminals 7 and 8 are for Studio A terminals, 5 and 6 are for Studio B, and terminals 3 and 4 are for the Control Room. The warning lights should not be grounded, except through the power line, and they should not exceed 2 amperes of current.

2-21. Muting.

As supplied from the factory, the Gateway 80 is arranged to mute in the following manner: Mic A, Ch 1 and Mic A, Ch 2 will mute the Studio A speakers. Mic B, Ch 1 and Mic B, Ch 2 will mute the Studio B speakers. The microphone on Channel 3 is intended for the Control Room and will mute the Control Room speaker and the Internal Cue speaker in the console.

This assignment is arbitrary for Channels 1 and 2; Channel 3 is fixed and must remain as assigned. It is, however, easy to change Channels 1 and 2 if the operation of the muting system is understood. It operates as follows:

A control signal is derived from terminal 1 of the Relay and Muting Driver Board. This signal is fed to each of the PROGRAM/AUDITION switches associated with a microphone, Channels 1, 2, and 3. In the case of Channel 3, if the key switch is placed in either the Program or Audition mode, this signal is then fed back to terminal 11 of the Relay and Muting

Driver Boards and mutes the Control Room as a result. (See MUTING ASSIGNMENT Drawing.) In the case of Channels 1 and 2, if the Program/Audition key is thrown, the drive signal is then fed to the wiper of the appropriate MIC A/ MIC B selector switch. Depending upon what position the selector switch is in, the drive signal is then fed to terminals 1, 2, 5, or 6 of WT-20, which is located between S1 and S2 on the rear of the front panel. Terminal 3 of WT-20 represents the receive point for the Studio A muting drive signal and terminal 4 is the Studio B receive point.

With this information, it is possible to set up any muting configuration by adding or changing several jumpers on WT-20 (figure 2-4).

For example:

Mic A/Ch 1, Mic A/Ch 2 to mute Studio A: Jump 1 to 3 and 5 to 3 on WT-20.

Mic A/Ch 1, Mic A/Ch 2 to mute Studio B: Jump 1 to 4 and 5 to 4 on WT-20.

All Mic's to mute Studio A: Jump 1 to 3, 2 to 3, 5 to 3, and 6 to 3 on WT-20.

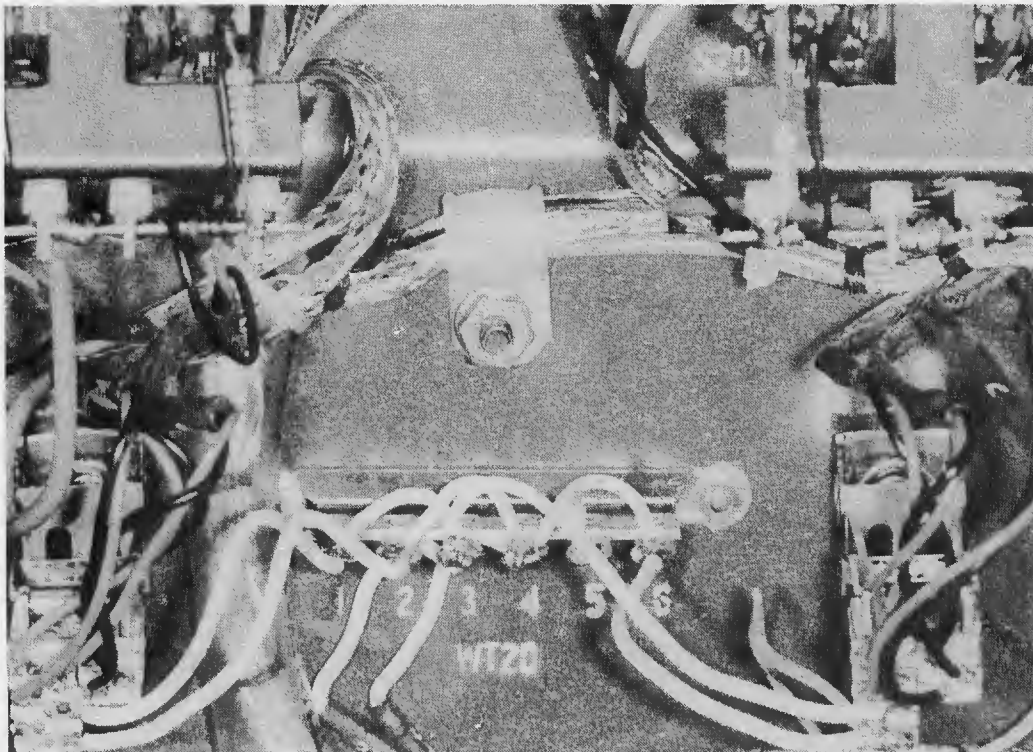


Figure 2-4. Muting Connections

2-22. Station Grounding

The ground stud, located underneath the transformer deck at the front left corner, should be connected to the station ground by means of a heavy copper wire or strap. This should be the only ground connection to the Gateway 80 console.



## SECTION III

### OPERATION

#### 3-1. INTRODUCTION

This section provides operating instructions for the Gateway 80 Console.

#### 3-2. CONTROLS AND INDICATORS

All operating controls are contained on the console front panel. Figure 3-1 shows the front panel controls and indicators and provides reference to table 3-1 which describes the function of each control and indicator.

#### 3-3. CONTROL ADJUSTMENTS

##### 3-4. General

The Master Gain control for the Program Channel (R76) is an internal adjustment. All Mixing Channel gain adjustments should be made with the Program Channel Master Gain control adjusted as delivered from the factory. In this position, the Master Gain control removes 16 dB of gain from the circuit. This position is the best choice in providing adequate operating margins of signal-to-noise and "headroom".

##### 3-5. Procedure

a. Adjust the CUE and MONITOR GAIN controls to mid-range and all channel attenuators to "12" on the dial (about 1:00 o'clock position). Apply power to the console and check to see that the VU meter is illuminated.

b. With a program signal on one of the medium level inputs (for example, TT1), set the TT1 input selector to the CH. 4 position and set the key switch for Channel 4 to the P (program) position. The VU meter should respond to the program level variations. Adjust the program level at the source of the signal (Tape Recorder, etc.) for a proper indication on the VU meter.

c. Set the Monitor Selector switch to the PGM position and adjust the Monitor Gain control for a comfortable level from the Control Room monitor speaker.

d. Set the Channel 4 key switch in the A (Audition) position; this removes the signal from the program channel and connects it to the Audition channel. There should be signal present at the Audition output terminals. Resetting the MON. SEL. switch to the AUD position allows monitoring of the Audition channel with the same monitor speaker level as before.

WARNING: Disconnect primary power prior to servicing.

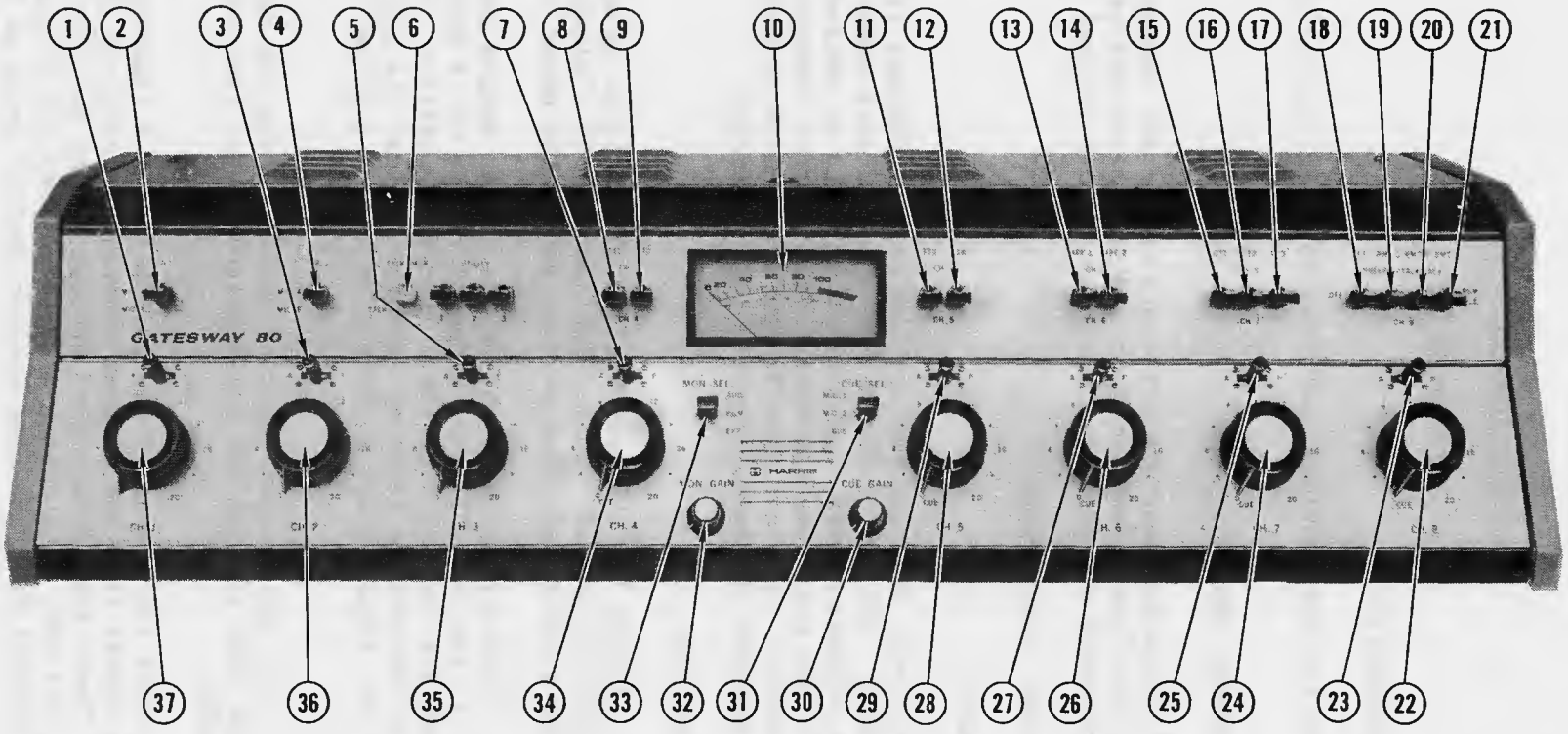


Figure 3-1. Controls and Indicators

Table 3-1. Controls and Indicators

REF	CONTROL/INDICATOR	FUNCTION
1 3 5	A-P (Audition-Program) Key Switches Mixing Channel 1, S19 Mixing Channel 2, S20 Mixing Channel 3, S21	A position: applies the output of Mixing Channel to the Monitor Select switch and Audition output terminals. Center position: applies the output of Mixing Channel to Cue Select switch. P position: applies the output of Mixing Channel to Program Channel.
2	CH. 1 MIC A/MIC B Input Select Switch, S1	MIC A position: selects MIC A input for Mixing Channel 1. MIC B position: selects MIC B input for Mixing Channel 1.
4	CH. 2 MIC A/MIC B Input Select Switch, S2	MIC A position: selects MIC A input for Mixing Channel 2. MIC B position: selects MIC B input for Mixing Channel 2.
6	TALKBACK/TALK switch, S29	TALK position: 1. connects Control Room Mic to cue Circuit. 2. applies output from cue circuit to intercom speakers and PREVIEW/TALKBACK position of NET/RMT switches.
7 29 27 25 23	A-B Program Channel Key Switches Mixing Channel 4, S22 Mixing Channel 5, S23 Mixing Channel 6, S24 Mixing Channel 7, S25 Mixing Channel 8, S26	A position: applies the output of Mixing Channel to Monitor Select switch and Audition output terminals. Center position: off. B position: applies the output of Mixing Channel to Program Channel.

WARNING: Disconnect primary power prior to servicing.

Table 3-1. Controls and Indicators (Continued)

REF	CONTROL/INDICATOR	FUNCTION
8	TT-1 CH. 5/CH. 4 Mixing Channel Select Switch, S3	CH. 5 position: connects TT-1 (turntable 1) to Mixing Channel 5. Center position: off. CH. 4 position: connects TT-1 to Mixing Channel 4.
9	TT-2 CH. 5/CH. 4 Mixing Channel Select Switch, S4	CH. 5 position: connects TT-2 to Mixing Channel 5. Center position: off. CH. 4 position: connects TT-2 to Mixing Channel 4.
10	PROGRAM CHANNEL VU meter, M1	Standard volume indicator used in conjunction with Mixing Channel attenuators to establish a reference volume level of 0 VU which is equivalent to an output level of +8 dBm.
11	TT-3 CH. 4/CH. 5 Mixing Channel Select Switch, S5	CH. 4 position: connects TT-3 to Mixing Channel 4. Center position: off. CH. 5 position: connects TT-3 to Mixing Channel 5.
12	TT-4 CH. 4/CH. 5 Mixing Channel Select Switch, S6	CH. 4 position: connects TT-4 to Mixing Channel 4. Center position: off. CH. 5 position: connects TT-4 to Mixing Channel 5.
13	TAPE 1 CH. 5/CH. 6 Mixing Channel Select Switch, S7	CH. 5 position: connects tape machine 1 (reel-to-reel) to Mixing Channel 5. Center position: off. CH. 6 position: connects tape machine 1 to Mixing Channel 6.

WARNING: Disconnect primary power prior to servicing.



Table 3-1. Controls and Indicators (Continued)

REF	CONTROL/INDICATOR	FUNCTION
14	TAPE 2 CH. 5/CH. 6 Mixing Channel Select Switch, S8	CH. 5 position: connects tape machine 2 to Mixing Channel 5. Center position: off. CH. 6 position: connects tape machine 2 to Mixing Channel 6.
15	CT-1 CH. 6/CH. 7 Mixing Channel Select Switch, S9	CH. 6 position: connects cartridge tape 1 to Mixing Channel 6. Center position: off. CH. 7 position: connects cartridge tape 1 to Mixing Channel 7.
16	CT-2 CH. 6/CH. 7 Mixing Channel Select Switch, S10	CH. 6 position: connects cartridge tape 2 to Mixing Channel 6. Center position: off. CH. 7 position: connects cartridge tape 2 to Mixing Channel 7.
17	CT-3 CH. 6/CH. 7 Mixing Channel Select Switch, S11	CH. 6 position: connects cartridge tape 3 to Mixing Channel 6. Center position: off. CH. 7 position: connects cartridge tape 3 to Mixing Channel 7.
18	NET PREVIEW/TALKBACK/CH. 8 Select Switch, S12	PREVIEW TALKBACK position: applies network input to Cue bus for selection by CUE SEL. switch. Center position: off.

WARNING: Disconnect primary power prior to servicing.

Table 3-1. Controls and Indicators (Continued)

REF	CONTROL/INDICATOR	FUNCTION
19	RMT 1 PREVIEW/TALKBACK/CH. 8 Select Switch, S13	<p>CH 8 position: applies network input to Mixing Channel 8.</p> <p>PREVIEW/TALKBACK position: applies remote line 1 input to cue bus for selection by CUE SEL. switch.</p> <p>Center position: provides Program Cue function by applying output of monitor circuit to remote line 1.</p> <p>CH. 8 position: applies remote line 1 input to Mixing Channel 8.</p>
20	RMT 2 PREVIEW/TALKBACK/CH. 8 Select Switch, S14	<p>PREVIEW/TALKBACK position: applies remote line 2 input to cue bus for selection by CUE SEL. switch.</p> <p>Center position: provides Program Cue functions by applying output of monitor circuit to remote line 2.</p> <p>CH. 8 position: applies remote line 2 input to Mixing Channel 8.</p>
21	RMT 3 PREVIEW/TALKBACK/CH. 8 Select Switch, S15	<p>PREVIEW/TALKBACK position: applies remote line 3 input to cue bus for selection by CUE SEL. switch.</p> <p>Center position: provides Program Cue function by applying output of monitor circuit to remote line 3.</p> <p>CH. 8 position: applies remote line 3 input to Mixing Channel 8.</p>

WARNING: Disconnect primary power prior to servicing.

Table 3-1. Controls and Indicators (Continued)

REF	CONTROL/INDICATOR	FUNCTION
22 24 26 28 34 35 36 37	Mixing Channel Attenuators CH. 8, AT8 CH. 7, AT7 CH. 6, AT6 CH. 5, AT5 CH. 4, AT4 CH. 3, AT3 CH. 2, AT2 CH. 1, AT1	Provide variable attenuation of selected input signals to establish the desired volume reference level as indicated on the Program Channel VU meter. Attenuators for Mixing Channels 4 through 8 have a CUE position which provides signal to the amplified cue system.
30	CUE GAIN control, R85	Controls gain of Cue circuit and used to establish desired volume level of Cue speaker/headphones after Mixing Channel attenuators have been set for proper indication on VU meter.
31	CUE SEL. switch, S28	Provides selection of the following inputs for Cue system: Mixing Channel 1 microphone, Mixing Channel 2 microphone, or Cue Bus.
32	MON. GAIN control, R80	Controls gain of Monitor Circuit and is used to establish desired volume level of the Control Room speaker after Mixing Channel attenuators have been set for proper indication on VU meter.
33	MON. SEL	Provides selection of the following inputs for the Monitor System: Program, Audition, or External source.

WARNING: Disconnect primary power prior to servicing.

e. Set the TTL input selector to the CH. 5 position, set the key switch for Channel 5 to the P position, and note that the VU meter is indicating program variations which are now controlled by the Channel 5 attenuator. Monitor and Audition operation will be the same as Channel 4, described above.

f. Adjust the Channel 5 attenuator to the CUE position, and adjust the CUE GAIN control for a comfortable level from the cue speaker in the console or headphones.

g. Similarly, set the other medium-level inputs (TT2, TAPE 1, CT1, etc.), adjusting the program level at the source of the signal. This technique allows all channel attenuators to be used in approximately the same position ("12" on the dial) for normal VU meter indications.

h. Set the CH. 1 microphone input selector to MIC A and the CH. 1 key switch to the P (Program) position. Speaking about one foot from the microphone should give a normal indication on the VU meter. The microphone signal may be switched to the Audition Channel by setting CH. 1 key switch to A (Audition) position, and monitored in a similar manner. If the muting assignments are correct, the monitoring speakers near the microphone should be muted and the warning lights in the area should be lit. Similarly, operate Channel 2 and Channel 3 to check levels and muting assignments.

By leaving the Channel 1 and 2 key switches in the center or neutral position, and selecting MIC 1 or MIC 2 on the CUE SEL. switch, you should be able to monitor these microphones through the cue system. The center position of the Channel 3 key switch is associated with the Talk Back system as described below.

The sources feeding Mixing Channels 4, 5, 6, and 7 are directed to the correct channel by using the input selector switch on the upper part of the front panel. When a given source selector is set downward, the signal is directed into the channel directly below the switch. When set in the "up" position, it goes to a different channel. Each input is clearly labeled above the input selector switch.

The four input selectors above the Channel 8 attenuator are for the Network feed and the Remote lines. When in the "down" position, all four inputs mix into Channel 8. The center position of the Network switch provides a 600-ohm terminated input for the feed line. While the center position of the three Remote switches provide a program cue to the remote location through the monitor amplifier in the console. In the "up" position, all four inputs can be previewed through the Cue system. The three Remote inputs also use this position for Talk Back.

#### NOTE

The Network input selector key should never be in the "up" position when the Talk Back feature is used.

3-6. Talk Back to Remote Location

During remote programming, Talk Back to the remote location is accomplished in the following manner:

- a. Place the correct input selector switch, RMT1, RMT2, or RMT 3, in the "up" (Preview/Talk Back) position.
- b. Place the CUE SEL. switch in the BUS position.
- c. The Control Room (CH. 3) Program-Audition key switch is in the center or neutral position.

The signal coming from the remote location is placed on the cue bus and is heard over the cue speaker or headphones. The level is controlled by the CUE GAIN control. When you wish to talk to the remote location, talk into the Control Room microphone while holding down the white push-to-talk switch, located on the left side of the top panel. In doing this, the output of the Control Room microphone preamplifier is fed directly to the cue amplifier, whose output is then fed down the remote line. The level going to the remote position should be adjusted by using the Channel 3 attenuator. Use the push-to-talk switch only while talking.

3-7. Talk Back to Studio A and Studio B

Talk back to Studio A and Studio B is accomplished as follows:

- a. Set input selector switches NET, RMT 1, RMT 2, and RMT 3 to center (PROGRAM CUE) or down (MIX). This will prevent a studio conversation from going out on the remote or net lines.
- b. Set the CUE SEL. switch to either MIC 1 or MIC 2, depending on the studio microphone assignment. This permits studio conversations to be heard through the console cue system. Use the console CUE GAIN control to adjust the level of the cue speaker.
- c. With the Control Room (CH. 3) Program-Audition key switch in the center position, set the TALK BACK switch in the TALK position and talk into the control room microphone. This conversation will be heard in both studios. Use the channel gain control (CH. 3) to adjust the level going out to the studios.

## SECTION IV

### PRINCIPLES OF OPERATION

#### 4-1. INTRODUCTION

This section provides a description of the printed circuit modules contained in the card guide. Refer to the overall schematic diagram and the circuit schematic diagrams provided in section VII. Location of modules in the card guide is shown in figure 6-1.

#### 4-2. CIRCUIT DESCRIPTION

#### 4-3. Audio Preamplifier, Schematic 827 9272 001

The audio input signal is derived from the series-fed secondary winding of the associated microphone input transformer, T1, T2, or T3 (refer to overall schematic, section VII). The high side of the secondary winding supplies the audio input signal to the base of transistor Q1 with the dc bias voltage from the decoupled emitter resistor, R14, of transistor Q2. Resistor R4 and capacitor C2 provide a high frequency load for the secondary of the input transformer, thereby preventing a rising response.

The input signal is amplified by transistor Q1 and directly coupled to the base of transistor Q2, where additional amplification takes place. Diodes CR1 and CR2 provide forward bias for the complementary output stage formed by transistors Q3 and Q4. The bias current is adjustable by means of variable resistor R10, which is shunted across CR1 and CR2.

Base resistors R8 and R11 prevent oscillation in output transistors Q3 and Q4. The feedback path from the output of Q3 and Q4 to the emitter of Q1 is through resistors R5 and R6, which set the gain of the preamplifier to 12. Capacitor C9 provides high frequency compensation.

Power supply filtering is provided by resistor R15 and capacitor C7. Additional filtering for transistor Q1 is provided by resistor R1 and capacitor C3.

#### 4-4. Audio Booster, Schematic 828 8000 001

The input signal is supplied to the base of transistor 3Q1 by means of a series-fed secondary winding of an external transformer, T11 or T12 (refer to overall schematic, section VII). The secondary winding also provides the dc bias voltage to the base of transistor 3Q1 from the decoupled emitter resistor 3R10 of transistor 3Q2.

Transistor 3Q1 provides voltage gain to the input signal, which is directly coupled to the base of transistor 3Q2. Transistor 3Q2 supplies additional voltage gain to audio signal and provides the drive signal to the output stage, transistor 3Q3. The output signal is coupled to the load through capacitor 3C9 and back to the emitter of transistor 3Q1 through

resistor 3R5. The ratio of feedback resistor 3R5 and emitter resistor 3R3 sets the voltage gain of the booster amplifier at 6.8.

Resistors 3R1 and 3R6 and capacitors 3C3, 3C10, and 3C5 provide RFI protection. Resistor 3R9 is a parasitic suppressor; capacitor 3C4 provides high frequency compensation. Capacitor 3C11 is a high frequency load for the secondary winding of the input transformer.

Power supply filtering is provided by resistor 3R11 and capacitor 3C8. Additional filtering for the input stage is provided by resistor 3R4 and capacitor 3C2.

An alternate input is used for the Cue Booster circuit. The input signal is coupled from terminal 9 through capacitor 3C1 to the base of transistor 3Q1. Bias for 3Q1 is provided by an external 1K ohm resistor, R86, connected between terminals 8 and 12 (refer to the overall schematic, section VII).

#### 4-5. Audio Output, Schematic 827 7491 002

The input signal is applied to the base of transistor 2Q1 through blocking capacitor 2C2 and 2R26, a parasitic suppression resistor. The audio signal is amplified by 2Q1 and directly coupled to the base of transistor 2Q3, which also provides voltage gain. Transistor 2Q2 and associated components 2CR1, 2R2, and 2R7, form a constant current source which functions as the collector load for 2Q3.

Diodes 2CR2, 2CR3, and 2CR4 provide forward bias for the NPN driver and output transistors, 2Q4 and 2Q8, and the PNP driver and output transistors, 2Q7 and 2Q9. Transistors 2Q8 and 2Q9 form a complementary-symmetry output circuit. Output bias is adjusted by variable resistor 2R4.

High frequency compensation for the amplifier is provided by capacitor 2C3; capacitors 2C10 and 2C4 provide RFI protection. Power supply decoupling for the first stage, 2Q1, is provided by resistor 2R1 and capacitor 2C1.

Resistor 2R18 and capacitor 2C5 form a high frequency load across the output. The dc feedback path is through resistors 2R19 and 2R20. The ac feedback path is through capacitors 2C7 and 2C6 and resistors 2R21 and 2R20.

The amplifier protection circuit is formed by transistors 2Q5 and 2Q6, capacitors 2C8, 2C9, and 2C11, resistors, 2R12, 2R13, 2R14, 2R15, 2R16, and 2R17, and diodes 2CR5, 2CR6, 2CR7, 2CR8, 2CR9, and 2CR10. This circuit senses a combination of load current and output voltage and reduces drive to the output stage when an abnormal operating condition is present.

#### 4-6. Power Supply, Schematic 827 9311 001

Single-phase full-wave rectification is accomplished by diodes 1CR1 and 1CR2 in conjunction with the center-tapped secondary winding of

the external power transformer, T18. The rectified voltage is fed to a large filter capacitor, which is external to the pc board, and to the collector of series pass transistor 1Q1 and the collectors of drive transistors 1Q2 and 1Q3.

The regulated output voltage appears at the emitter of 1Q1 and flows through current sensing resistors 1R7 and 1R8 to the output terminals. This voltage is also applied to resistors 1R11, 1R12, and 1R13 which form a voltage divider, with resistor 1R12 being variable to provide adjustment of the output voltage.

The variable voltage from resistor 1R12 is applied to the base of the reference amplifier transistor, 1Q5. Reference voltage, generated by diodes 1CR9 and 1CR10 and resistor 1R14 which is connected to the regulated output, is applied to the emitter of 1Q5. Capacitor 1C2 is a filter across the reference diodes. Regulation is accomplished by varying the amount of current available from the current source (1CR3 and 1CR4) to the base of the current amplifying transistors, 1Q3 and 1Q2, in response to variations in dynamic collector impedance of 1Q5. A foldback current limiting circuit is formed by transistor 1Q4, diode 1CR11, and resistors 1R7, 1R8, 1R9, and 1R10.

Diodes 1CR3, 1CR5, 1CR6, 1CR7, and 1CR8 provide reverse voltage protection. Resistors 1R1, 1R2, and 1R3 are parasitic suppressors. Thermostat 1S1 provides high temperature protection by activating at 100°C and applying ground to the base of 1Q3. Capacitors 1C1 and 1C3 provide high frequency compensation for the regulator.



## SECTION V

### MAINTENANCE

#### 5-1. INTRODUCTION

This section provides information for servicing the Gateway 80 Console. Standard testing techniques for semiconductor devices apply to the circuitry contained in this unit.

Measure dc voltages with the same meter that will be used for performing maintenance. Record these voltages on the schematic for reference should troubleshooting be required.

Do not remove or insert transistors with power applied. The failure time for transistors is measured in microseconds and a momentary short is all that is required to damage them in some circuits. Observe polarities when installing new capacitors and diodes.

#### 5-2. PREVENTIVE MAINTENANCE

Preventive maintenance for this unit is limited to standard good housekeeping practices. Dust and dirt should be removed periodically. Using a soft brush, remove dust and dirt from power transformers, rectifiers, and other components that require heat dissipation for proper operation.

#### 5-3. CORRECTIVE MAINTENANCE

#### 5-4. Bias Adjustments

The following measurements, and other general module testing, may be easily performed by using the PC Extender Board supplied with the console. Remove the module, insert the Extender Board in its place, and plug the module into the Extender Board, maintaining the same orientation as the other modules. Reversed orientation may damage the module. Bias adjustments should be performed whenever circuit components are replaced or component value changes are suspected.

5-5. Preamplifier. Referring to schematic 827 9272 001 contained in section VII, locate and adjust variable resistor R10 to set the no-signal dc voltage across resistor R17 to 25mV +5mV.

5-6. Audio Output Amplifier. Referring to schematic 827 7491 002 contained in section VII, locate and adjust variable resistor 2R4 to set the no-signal dc voltage across resistor R15 to 12mV +2.5mV.

#### 5-7. Troubleshooting

5-8. General Troubleshooting Techniques. When a malfunction occurs, the first step is to isolate the problem in a particular channel or amp-

lifier. This is done by noting which signal paths and controls affect the troublesome operation. Possibly, disconnecting certain input or output wiring will stop the malfunction, indicating a bad ground connection or shorted-load condition.

If the trouble is in the console, the next step is to measure the dc circuit voltages. The individual amplifiers are of the direct-coupled type, and proper biasing of each circuit is indicated by a single module measurement at the output of each circuit. These voltages are listed in table 5-1. These measurements will indicate any circuit problems except "open" capacitors.

Table 5-1. DC Circuit Voltages

<u>MODULE</u>	<u>VOLTAGE</u>	<u>TEST POINT</u>
Preamplifier	21.5 Vdc	positive (+) side of Capacitor C8
Booster Amplifier	36.0 Vdc	positive (+) side of capacitor C9
Output Amplifier	22.0 Vdc	junction of resistors 2R14 and 2R15
Power Supply	45.0 Vdc	negative (-) side of diode CR7

Since all signal circuits are connected to regulated power supply modules, their voltages may be expected to be very constant. However, variations in the power line will cause proportionate variations in the voltage across filter capacitors C4 and C5 (64 Vdc), and Muting Relays K1, K2, and K3.

5-9. Fault Location Guide. The information contained in Table 5-2, Fault Location Guide, is presented as an aid to troubleshooting. This table lists the most common trouble symptoms for this type of equipment and includes the probable cause and corrective action required.

Table 5-2. Fault Location Guide

TROUBLE SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
ALL CHANNELS AND FUNCTIONS INOPERATIVE.	<ol style="list-style-type: none"> <li>1. Power Transformer Fuse.</li> <li>2. Power Transformer Input Connector, J12.</li> <li>3. Power Supplies PS-1 and PS-2.</li> </ol>	<ol style="list-style-type: none"> <li>1a. Check and replace if required.</li> <li>2a. Provide proper connection.</li> <li>3a. Check power supply output for 45 Vdc.</li> </ol>
PROGRAM CHANNEL OPERATES PROPERLY, BUT NO MONITOR OR CUE.	<ol style="list-style-type: none"> <li>1. Monitor/Cue Power Supply (PS-2) Capacitor, C4.</li> <li>2. Monitor/Cue Power Supply, PS-2.</li> <li>3. Cue or Monitor Modules.</li> </ol>	<ol style="list-style-type: none"> <li>1a. Check capacitor C4 for 45 Vdc.</li> <li>2a. Check output of PS-2 for 45 Vdc.</li> <li>2b. Interchange power supplies if 45 Vdc is not present.</li> <li>3a. If the same output voltage results, remove the Cue Booster, Cue Output, and Monitor Output Modules while monitoring the output voltage. If the voltage returns to 45 Vdc, repair or replace the defective module.</li> <li>3b. Check all interconnecting wiring.</li> </ol>
NO OUTPUT FROM PROGRAM CHANNEL, BUT CUE AND MONITOR OPERATE PROPERLY EXCEPT ON MIXING CHANNELS 1, 2, AND 3.	<ol style="list-style-type: none"> <li>1. Program Power Supply (PS-1) Capacitor, C5.</li> <li>2. Program Power Supply, PS-1.</li> </ol>	<ol style="list-style-type: none"> <li>1a. Check C5 for 64 Vdc.</li> <li>2a. Check output of PS-1 for 45 Vdc.</li> </ol>

WARNING: Disconnect primary power prior to servicing.

Table 5-2. Fault Location Guide (Continued)

TROUBLE SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
INTERMITTENT OPERATION	3. Program Channel Modules.  1. Power Supplies overheating.	2b. Interchange power supplies if 45 Vdc is not present. 3a. If the same output voltage results, sequentially remove the Program Booster and Output Modules, and Preamplifier Modules while monitoring the output voltage. If the voltage returns to 45 Vdc, repair or replace the defective module. 3b. Check all interconnecting wiring.  1a. Check the power supply modules. If they are very hot, the thermostat switches may be operating to protect the power supply module. Check the modules and wiring for shorts.
PROGRAM CHANNEL INOPERATIVE	1. Program Booster or Output Module.	1a. Check Booster and Output Modules by voltage measurement or substitution. 1b. Check interconnecting wiring and switching circuits.

WARNING: Disconnect primary power prior to servicing.

Table 5-2. Fault Location Guide (Continued)

TROUBLE SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
<p>MONITOR INOPERATIVE.</p> <p>CUE SPEAKER INOPERATIVE.</p> <p>MUTING INOPERATIVE.</p>	<p>1. Monitor Booster Module or Output Module.</p> <p>1. Headphone Jack.</p> <p>2. Cue Select Switch, S28, or Talkback/Talk Switch, S29.</p> <p>3. Muting Assignment.</p> <p>4. Cue Booster and Output Modules.</p> <p>1. Muting Driver Board.</p>	<p>1a. Check Booster and Output Modules by voltage measurement or substitution.</p> <p>1b. Check interconnecting wiring and switching circuits.</p> <p>1a. Check the headphone jack switching circuit.</p> <p>1b. Determine that headset is properly plugged into jack.</p> <p>1c. Check jumper across terminals 90 and 91 or TBI.</p> <p>1d. Determine that correct type of headphone jack was installed.</p> <p>2a. Check contacts of S28 and S29.</p> <p>3a. Check muting assignment.</p> <p>4a. Check Booster and Output modules by voltage measurement or substitution.</p> <p>1a. Check muting driver board for +64 Vdc between pin 1 and ground.</p>

WARNING: Disconnect primary power prior to servicing.

Table 5-2. Fault Location Guide (Continued)

TROUBLE SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
<p>WARNING LIGHTS DO NOT OPERATE PROPERLY.</p>	<ol style="list-style-type: none"> <li>1. Relays K1, K2, and K3.</li> <li>2. Relay and Muting Driver Board.</li> <li>3. AC Input Voltage.</li> </ol>	<ol style="list-style-type: none"> <li>1b. With all key switches in the OFF position, check for 63.4 Vdc (0.6 Vdc less than pin 1 reading) on pins 3, 7, and 11.</li> <li>1c. Check for 63.4 Vdc on terminals 3 and 4 of TB20.</li> <li>1d. Check relays K1, K2, and K3 for proper operation.</li> <li>1a. Check relay coils.</li> <li>2a. Check diodes CR2, CR3 and CR4.</li> <li>2b. Check wiring from board to relay and relay to TB4.</li> <li>3a. Check the ac input voltage on TB4, terminals 1 and 2.</li> </ol>
<p>HIGH FREQUENCY OSCILLATION.</p>	<ol style="list-style-type: none"> <li>1. Input or output line improperly grounded.</li> <li>2. Power improperly grounded.</li> </ol>	<ol style="list-style-type: none"> <li>1a. Check input and output line ground connections. Restore connections if required.</li> <li>2a. Check system power ground and input/output devices for ground loops.</li> </ol>
<p>MICROPHONE INOPERATIVE ON MIXING CHANNELS 1, 2, or 3, BUT MEDIUM LEVEL CHANNELS OPERATE PROPERLY.</p>	<ol style="list-style-type: none"> <li>1. Preamplifier Module associated with inoperative mixing channel.</li> </ol>	<p>On the suspected preamplifier module:</p> <ol style="list-style-type: none"> <li>1a. Check for +45 Vdc in pin 9.</li> <li>1b. Check for 21 Vdc at positive (+) side of capacitor C8.</li> </ol>

WARNING: Disconnect primary power prior to servicing.

Table 5-2. Fault Location Guide (Continued)

TROUBLE SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
METER POINTER NOT AT "0".	Mechanical "0" not properly adjusted.	<ul style="list-style-type: none"> <li>1c. Check for good ground connection on pin 10.</li> <li>1d. Check for continuity between the module (pins 5 and 10) and the associated channel attenuator.</li> <li>1e. Check the input wiring for signal at pins 6 and 11 of the module plug.</li> <li>1f. Check the transformer connections to pins 6, 7, 11, and 12.</li> </ul> <p>Adjust the mechanical "0" by means of the adjustment screw located on the rear surface of the meter case, between the terminals.</p>

WARNING: Disconnect primary power prior to servicing.

## SECTION VI

### PARTS LIST

#### 6-1. INTRODUCTION

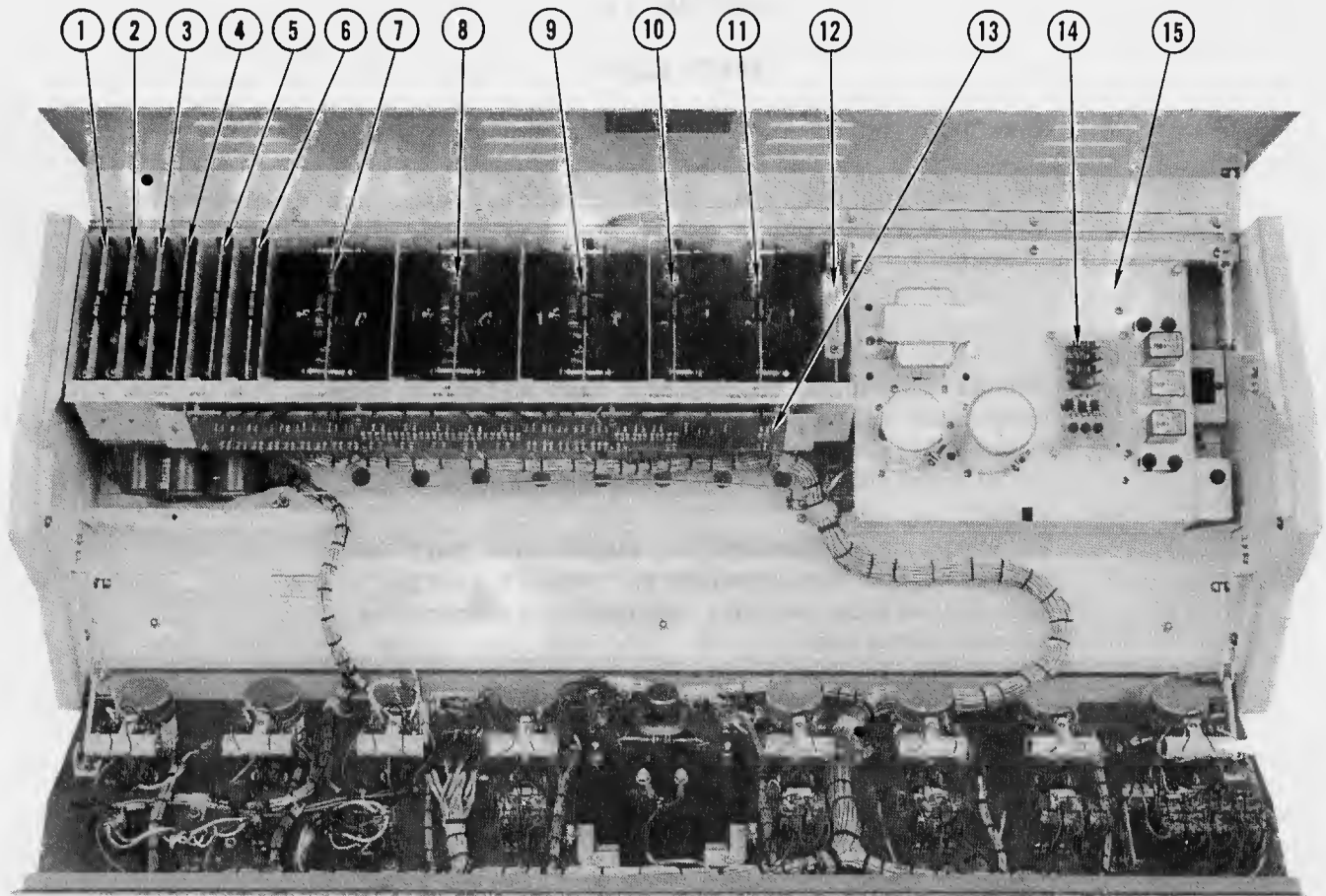
This section provides a description, reference designation, and order number for replaceable electrical parts and assemblies. Figure 6-1 provides identification of major assemblies.

#### NOTICE

Actual component values may vary slightly from component values contained in schematics and parts lists. Due to industry-wide shortages of electrical components, it is sometimes necessary to use parts other than those specified. In every case, however, a substitute part is selected for conformance to overall design specifications so that equipment performance is not affected.

\* Indicates Recommended Spare Parts.





<u>REF.</u>	<u>ASSEMBLY</u>	<u>REF.</u>	<u>ASSEMBLY</u>
1.	Ch. 1 Preamplifier, J1	10.	Program Power Supply, J10
2.	Ch. 2 Preamplifier, J2	11.	Mon./Cue Power Supply, J11
3.	Ch. 3 Preamplifier, J3	12.	Extender Board
4.	Program Booster Ampl., J4	13.	Input/Output Terminal Board
5.	Monitor Booster Ampl., J5	14.	Relay Driver Board
6.	Cue Booster Ampl., J6	15.	Pwr. Sup. Transformer Deck
7.	Program Output Ampl., J7		(Located under X'former Deck)
8.	Monitor Output Ampl., J8		(1) Relay Deck
9.	Cue Output Ampl., J9		(2) Pwr. Sup. Terminal Bd.
			(3) Terminal Board TB3
			(4) Terminal Board WT20

Figure 6-1. Location of Major Assemblies

Table 6-1. Replaceable Parts List Index

TABLE NO.	UNIT NOMENCLATURE	PART NO.	PAGE
6-2	Basic Gateway 80 Console	994 6699 004	6-4
6-3	*Gateway 80 Audio Booster Printed Circuit Card	994 7686 001	6-8
6-4	*Gateway 80 Audio Output Printed Circuit Card	994 6754 001	6-9
6-5	*Gateway 80 Audio Preamplifier Printed Circuit Card	994 6911 001	6-11
6-6	Gateway 80 Input Terminal Board	992 3134 001	6-13
6-7	*Gateway 80 Power Supply Regulator Card	994 6866 002	6-14
6-8	Gateway 80 Power Supply/Transformer Deck	992 3132 001	6-16
6-9	Power Supply/Transformer Deck Relay Driver Printed Circuit Board	992 3428 001	6-17
6-10	Gateway 80 Power Supply Terminal Board	992 3407 001	6-18

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Table 6-2. Basic Gateway 80 Console-994 6699 004

REF. SYMBOL	HARRIS PART NO.	DESCRIPTION	QTY.
AT1,AT2,AT3	554 0188 000	Attenuator, 150/300 ohm, 2 dB	3
AT4 thru AT8	554 0182 000	Attenuator, 150/300 ohm, 2 dB	5
AT9	915 4564 001	Pad Board	1
C4,C5	524 0146 000	Capacitor, 900 uF, 100V	2
C6	516 0393 000	Capacitor, 0.025 uF, 500V	1
C7 thru C14	516 0080 000	Capacitor, 0.01 uF, 600V	8
C15 thru C20	516 0080 000	Capacitor, 0.01 uF, G.M.V.	6
C21	500 0913 000	Capacitor, 1200 pF, 500V, 5%	1
J1 thru J11	612 0432 000	Receptacle	X
J12	610 0080 000	Receptacle, Jones	1
LS1	722 0009 000	Speaker, 45 ohm	1
M1	630 0171 000	Meter, VU "B" Scale	1
R26 thru R35	540 1130 000	Resistor, 620 ohm, $\frac{1}{2}$ W, 5%	10
R36 thru R43,R73	540 1190 000	Resistor, 240 ohm, $\frac{1}{2}$ W, 5%	9
R46,R47,R50,R51, R54,R55,R56,R57, R59,R60,R62,R63, R65,R66,R68,R69	540 1191 000	Resistor, 560 ohm, $\frac{1}{2}$ W, 5%	16
R58,R61,R64,R67, R70	540 1219 000	Resistor, 62 ohm, $\frac{1}{2}$ W, 5%	5
R71,R72	540 1218 000	Resistor, 43 ohm, $\frac{1}{2}$ W, 5%	2
R74	540 1117 000	Resistor, 150 ohm, $\frac{1}{2}$ W, 5%	1
R75	540 1183 000	Resistor, 5.6K ohm, $\frac{1}{2}$ W, 5%	1
R76	550 0379 000	Potentiometer, 10K ohm, Locking	1
R80,R85	550 0215 000	Potentiometer, 10K ohm,	2

Table 6-2.. Basic Gateway 80 Console-994 6699 004 (Continued)

REF. SYMBOL	HARRIS PART NO.	DESCRIPTION	QTY.
R81	540 0579 000	Resistor, 47 ohm, 2W, 5%	1
R82	540 1128 000	Resistor, 200 ohm, $\frac{1}{2}$ W, 5%	1
R83	540 1174 000	Resistor, 16 ohm, $\frac{1}{2}$ W, 5%	1
R84	540 1116 000	Resistor, 1.0K ohm, $\frac{1}{2}$ W, 5%	1
R86	540 1116 000	Resistor, 1.0K ohm, $\frac{1}{2}$ W, 5% (Part of Cable)	X
R107	540 1148 000	Resistor, 75 ohm, $\frac{1}{2}$ W, 5%	1
R108	540 1220 000	Resistor, 130 ohm, $\frac{1}{2}$ W, 5%	1
R109	540 0601 000	Resistor, 390 ohm, 2W, 5%	1
R110	540 1105 000	Resistor, 5.1K ohm, $\frac{1}{2}$ W, 5%, LN	1
S1,S2	602 0089 000	Switch, Lever, 2P	2
S3 thru S11, S28	602 0080 000	Switch, Lever, 3P	10
S12 thru S15	602 0095 000	Switch, Lever, 3P	4
S19 thru S26	602 0079 000	Switch, Lever, 3P	1
S27	602 0094 000	Switch, Lever, 3P	1
S29	602 0082 000	Switch, Lever, 2P	1
T1,T2,T3	928 4841 002	Input Transformer, MIC	3
T4 thru T8,T13	478 0311 000	Input Transformer, Medium Level	6
T9,T10	478 0312 000	Line Transformer, Remote	2
T11,T12	928 4841 001	Input Transformer, MIC	2
TB3	614 0012 000	Terminal Board, 12 Terminals	1
TB4	614 0030 000	Terminal Board	1
WT7,WT9	614 0148 000	Terminal Strip, 2 Positions	2
WT8,WT10,WT11, WT12,WT15	614 0131 000	Terminal Strip, 2 Positions	5

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Table 6-2. Basic Gateway 80 Console-994 6699 004 (Continued)

REF. SYMBOL	HARRIS PART NO.	DESCRIPTION	QTY.
WT13	614 0129 000	Terminal Strip, 1 Position	1
WT14	614 0159 000	Terminal Board Assembly, 3 Positions	1
WT16,WT17,WT18	614 0161 000	Terminal Board Assembly, 5 Positions	3
WT19,WT20	614 0162 000	Terminal Board Assembly, 6 Positions	2
WT21	614 0128 000	Terminal Board Assembly, 1 Position	1
WT22	614 0129 000	Terminal Board Assembly, 1 Position	1
	992 3134 001	Input Terminal Board (TB1) (Refer to Table 6-7)	1
	992 3407 001	Power Supply Terminals Board (TB2) (Refer to Table 6-11)	1
	927 8444 001	Cable, J12 to TB2	1
	927 8446 001	Cable, From TB2	1
	927 8447 001	Cable, TB2 Assembly	1
	927 8449 001	Cable, From TB2 Assembly	1
	927 8450 001	Cable, Front Panel to TB1	1
	927 8475 002	Cable, Main	1
	994 7686 001	Audio Booster Card (Refer to Table 6-4)	3
	994 6754 002	Audio Output Card (Refer to Table 6-5)	3
	994 6911 001	Audio Pre-Amp Card (Refer to Table 6-6)	3
	994 6820 001	Extender Card	1

Table 6-2. Basic Gateway 80 Console-994 6699 004 (Continued)

REF. SYMBOL	HARRIS PART NO.	DESCRIPTION	QTY.
	994 6753 002	Power Supply Card (Refer to Table 6-8)	2
	992 3132 002	Power Supply/Transformer Deck (Refer to Table 6-9)	1
	*396 0106 000	Lamp, 28V, 40 MA, #334	2

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WARNING: Disconnect primary power prior to servicing.

Table 6-3. Gateway 80 Audio Booster  
Printed Circuit Card-994 7686 001

REF. SYMBOL	HARRIS PART NO.	DESCRIPTION	QTY.
3C1	526 0336 000	Capacitor, 47 uF, 10V, Tantalum	1
3C2	526 0318 000	Capacitor, 10 uF, 35V, Tantalum	1
3C3	516 0043 000	Capacitor, 470 pF, 1000V	1
3C4, 3C10	500-0804 000	Capacitor, 10 pF, 500V, <u>+5%</u>	2
3C5	500 0830 000	Capacitor, 240 pF, 500V, 5%	1
3C6, 3C8, 3C9	522 0394 000	Capacitor, 100 uF, 50V	3
3C11	500 0784 000	Capacitor, 300 pF, 500V	1
3Q1, 3Q2	*380 0147 000	Transistor, TZ-1218	2
3Q3	*380 0179 000	Transistor, MPS-U45	1
3R1, 3R6, 3R8	540 1117 000	Resistor, 150 ohm, $\frac{1}{2}$ W, 5%, LN	3
3R2, 3R4	540 1198 000	Resistor, 470K ohm, $\frac{1}{2}$ W, 5%, LN	2
3R3	540 1315 000	Resistor, 1100 ohm, $\frac{1}{2}$ W, 5%, LN	1
3R5	540 1106 000	Resistor, 6200 ohm, $\frac{1}{2}$ W, 5%, LN	1
3R7	540 1196 000	Resistor, 43K ohm, $\frac{1}{2}$ W, 5%, LN	1
3R9, 3R11	540 1116 000	Resistor, 1K ohm, $\frac{1}{2}$ W, 5%, LN	2
3R10	540 1172 000	Resistor, 56K ohm, $\frac{1}{2}$ W, 5%, LN	1
	828 8066 001	P.C. Board	1

Table 6-4. Gateway 80 Audio Output  
Printed Circuit Card-994 6754 002

REF. SYMBOL	HARRIS PART NO.	DESCRIPTION	QTY.
2C1	522 0394 000	Capacitor, 100 uF, 50V	1
2C2	522 0242 000	Capacitor, 25 uF, 25V	1
2C3	500 0753 000	Capacitor, 56 pF, 500V, 5%	1
2C4	500 0835 000	Capacitor, 470 pF, 500V, 5%	1
2C5	508 0268 000	Capacitor, 0.10 uF, 100V	1
2C6	522 0385 000	Capacitor, 680 uF, 25V	1
2C7	526 0323 000	Capacitor, 3.3 uF, 50V, Tantalum	1
2C8,2C9	508 0266 000	Capacitor, 0.05 uF, 100V	2
2C10	516 0054 000	Capacitor, 0.001 uF, 1000V, <u>+10%</u>	1
2C11	526 0050 000	Capacitor, 1.0 uF, 35V, <u>+20%</u> , Tantalum	1
2CR1,2CR2	*384 0256 000	Diode, MZ2361	2
2CR3,2CR4	*384 0255 000	Diode, MZ2360	2
2CR5,2CR6	*386 0100 000	Diode, 1N4747A, Zener	2
2CR7 thru 2CR10	*384 0020 000	Diode, 1N2071	4
2Q1, 2Q6	*380 0112 000	Transistor, 2N5087	2
2Q2,2Q7	*380 0045 000	Transistor, 2N4036	2
2Q3	*380 0111 000	Transistor, 2N3417	1
2Q4	*380 0127 000	Transistor, 2N2102	1
2Q5	*380 0115 000	Transistor, 2N5088	1
2Q8	*380 0128 000	Transistor, 2N4914	1
2Q9	*380 0107 000	Transistor, 2N4905	1
2R1	540 1185 000	Resistor, 39K ohm, $\frac{1}{2}$ W, 5%, LN	1
2R2,2R19	540 1111 000	Resistor, 10K ohm, $\frac{1}{2}$ W, 5%, LN	2



Table 6-4. Gateway 80 Audio Output  
Printed Circuit Card-994 6754 002 (Continued)

REF. SYMBOL	HARRIS PART NO.	DESCRIPTION	QTY.
2R3,2R5	540 1109 000	Resistor, 33K ohm, $\frac{1}{2}$ W, 5%, LN	2
2R4	552 0815 000	Potentiometer, 500 ohm, $\frac{1}{4}$ W	1
2R6	540 1127 000	Resistor, 820 ohm, $\frac{1}{2}$ W, 5%, LN	1
2R7,2R24,2R25	540 1102 000	Resistor, 100 ohm, $\frac{1}{2}$ W, 5%, LN	3
2R8,2R9,2R26	540 1116 000	Resistor, 1000 ohm, $\frac{1}{2}$ W, 5%, LN	3
2R10,2R11	540 1118 000	Resistor, 220 ohm, $\frac{1}{2}$ W, 5%, LN	2
2R12,2R17	540 1188 000	Resistor, 270 ohm, $\frac{1}{2}$ W, 5%, LN	2
2R13,2R16	540 1189 000	Resistor, 9.1K ohm, $\frac{1}{2}$ W, 5%, LN	2
2R14,2R15	542 1072 000	Resistor, 0.51 ohm, 2W, 5%	2
2R18	540 0563 000	Resistor, 10 ohm, 1W, 5%	1
2R20	540 1192 000	Resistor, 51 ohm, $\frac{1}{2}$ W, 5%, LN	1
2R21	540 1106 000	Resistor, 6.2K ohm, $\frac{1}{2}$ W, 5%, LN	1
2R22,2R23	540 1151 000	Resistor, 10 ohm, $\frac{1}{2}$ W, 5%, LN	2
2R27	540 1128 000	Resistor, 200 ohm, $\frac{1}{2}$ W, 5%, LN	1
	915 1824 001	P.C. Board and Terminal	1
	404 0294 000	Transistor Socket	2

Table 6-5. Gateway 80 Audio Preamplifier  
Printed Circuit Card-994 6911 001

REF. SYMBOL	HARRIS PART NO.	DESCRIPTION	QTY.
C1	500 0759 000	Capacitor, 100 pF	1
C2	500 0830 000	Capacitor, 240 pF	1
C3	526 0318 000	Capacitor, 10 uF, 35V, Tantalum	1
C4,C5,C6	526 0336 000	Capacitor, 47 uF, 10V, Tantalum	3
C7	522 0394 000	Capacitor, 100 uF, 50V	1
C8	522 0529 000	Capacitor, 470 uF, 50V	1
C9	500 0806 000	Capacitor, 15 pF	1
CR1,CR2	*384 0256 000	Diode, MZ2361	2
Q1,Q2	*380 0147 000	Transistor, Selected, TZ1218	2
Q3	*380 0179 000	Transistor, MPS-U45, Darlington	1
Q4	*380 0183 000	Transistor, MPS-U95, Darlington	1
R1,R2	540 1162 000	Resistor, 1.0M ohm, $\frac{1}{2}$ W, 5%	2
R3,R18	540 1117 000	Resistor, 150 ohm, $\frac{1}{2}$ W, 5%	2
R4	540 1194 000	Resistor, 13K ohm, $\frac{1}{2}$ W, 5%	1
R5	540 1208 000	Resistor, 11K ohm, $\frac{1}{2}$ W, 5%	1
R6	540 1116 000	Resistor, 1.0K ohm, $\frac{1}{2}$ W, 5%	1
R7	540 1210 000	Resistor, 150K ohm, $\frac{1}{2}$ W, 5%	1
R8,R11	540 1111 000	Resistor, 10K ohm, $\frac{1}{2}$ W, 5%	2
R9	540 1106 000	Resistor, 6.2K ohm, $\frac{1}{2}$ W, 5%	1
R10	550 0315 000	Potentiometer, Variable, 10K ohm, $\frac{1}{2}$ W	1
R12	540 1116 000	Resistor, 1.0K ohm, $\frac{1}{2}$ W, 5%	1
R13	540 1104 000	Resistor, 2.0K ohm, $\frac{1}{2}$ W, 5%	1
R14	540 1195 000	Resistor, 16K ohm, $\frac{1}{2}$ W, 5%	1

Rev. A: 7/81

6-11

WARNING: Disconnect primary power prior to servicing.

Table 6-5. Gateway 80 Audio Preamplifier  
 Printed Circuit Card-994 6911 001 (Continued)

REF. SYMBOL	HARRIS PART NO.	DESCRIPTION	QTY.
R15	540 1102 000	Resistor, 100 ohm, $\frac{1}{2}$ W, 5%	1
R16,R17	540 1151 000	Resistor, 10 ohm, $\frac{1}{2}$ W, 5%	2
	827 9361 001	P.C. Board	1

WARNING: Disconnect primary power prior to servicing.

Table 6-6. Gateway 80 Input Terminal Board-992 3134 001

REF. SYMBOL	HARRIS PART NO.	DESCRIPTION	QTY.
R1,R2,R4,R5,R6, R7,R9,R10,R11, R12,R14,R15,R16, R17,R19,R20,R21, R22,R24,R25	540 1188 000	Resistor, 270 ohm, $\frac{1}{2}$ W, 5%	20
R3,R8,R13,R18, R23	540 1148 000	Resistor, 75 ohm, $\frac{1}{2}$ W, 5%	5
R77,R79	540 1118 000	Resistor, 220 ohm, $\frac{1}{2}$ W, 5%	2
R78,R98	540 1117 000	Resistor, 150 ohm, $\frac{1}{2}$ W, 5%	2
R87,R88,R90,R91	540 0587 000	Resistor, 100 ohm, 2W, 5%	4
R89	540 0609 000	Resistor, 820 ohm, 2W, 5%	1
R92,R94	540 1106 000	Resistor, 6.2K ohm, $\frac{1}{2}$ W, 5%	2
R93	540 1183 000	Resistor, 5.6K ohm, $\frac{1}{2}$ W, 5%	1
R95,R96	540 1111 000	Resistor, 10K ohm, $\frac{1}{2}$ W, 5%	2
R97,R99	540 1207 000	Resistor, 4.3K ohm, $\frac{1}{2}$ W, 5%	2
R111,R112	540 1163 000	Resistor, 300 ohm, $\frac{1}{2}$ W, 5%	2
	938 5194 001	P.C. Board Assembly	1

Table 6-7. Gateway 80 Power Supply Regulator Card-994 6753 002

REF. SYMBOL	HARRIS PART NO.	DESCRIPTION	QTY.
1C1,1C3	516 0074 000	Capacitor, .005 uF, 20%	2
1C2	522 0394 000	Capacitor, 100 uF, 50V	1
1CR1,1CR2,1CR3, 1CR7,1CR8,1CR11	*384 0020 000	Diode, 1N2071	6
1CR4	*384 0621 000	Diode, 1N5286	1
1CR5,1CR6	*384 0282 000	Diode, 1N3253	2
1CR9	*384 0255 000	Diode, MZ2360	1
1CR10	*386 0106 000	Diode, 1N4737, Zener	1
1Q1	*380 0157 000	Transistor, 2N4348	1
1Q2	*380 0156 000	Transistor, 40373	1
1Q3,1Q4,1Q5	*380 0158 000	Transistor, 2N5550	3
1R1	540 1101 000	Resistor, 1.0 ohm, ½W, 5%	1
1R2	540 1151 000	Resistor, 10 ohm, ½W, 5%, LN	1
1R3	540 1102 000	Resistor, 100 ohm, ½W, 5%, LN	1
1R4,1R5,1R6	540 1152 000	Resistor, 75K ohm, ½W, 5%, LN	3
1R7,1R8	542 1162 000	Resistor, 3.0 ohm, 10W, 5%	2
1R9	540 1187 000	Resistor, 1.3K ohm, ½W, 5%, LN	1
1R10	540 1113 000	Resistor, 18K ohm, ½W, 5%, LN	1
1R11	540 1147 000	Resistor, 27K ohm, ½W, 5%, LN	1
1R12	550 0315 000	Potentiometer, 10K ohm	1
1R13	540 1165 000	Resistor, 3.3K ohm, ½W, 5%, LN	1
1R14	540 1154 000	Resistor, 7.5K ohm, ½W, 5%, LN	1
1S1	442 0021 000	Thermostat, Close @100°C.	1

Table 6-7. Gateway 80 Power Supply Regulator Card-994 6753 002 (Continued)

REF. SYMBOL	HARRIS PART NO.	DESCRIPTION	QTY.
	915 4514 001	P.C. Board	1
	404 0294 000	Transistor Socket	1

Table 6-8. Gateway 80 Power Supply/Transformer Deck-992 3132 002

REF. SYMBOL	HARRIS PART NO.	DESCRIPTION	QTY.
C1	916 9498 001	Capacitor, Modified	1
C2	524 0150 000	Capacitor, 6000 uF, 50V, w/Ins. Case	1
E1,E2,E3	614 0347 000	Standoff	3
K1,K2,K3	574 0214 000	Relay 4PDT, 48V	3
R100,R101	540 1175 000	Resistor, 36 ohm, $\frac{1}{2}$ W, 5%	2
R102	540 1174 000	Resistor, 16 ohm, $\frac{1}{2}$ W, 5%	1
T13	478 0310 000	Transformer, Line	1
WT2	614 0160 000	Terminal Strip, 4 Positions	1
WT3	614 0158 000	Terminal Strip, 2 Positions	1
	927 8460 002	Cable, Transformer Deck to Relay Deck	1
	928 0364 001	Cable, Warning Lights	1
	992 3428 001	Relay Driver, P.C.Board (Refer to Table 6-10)	1
TB5	927 8969 001	Terminal Board	1

Table 6-9. Power Supply/Transformer Deck Relay Driver  
Printed Circuit Board-992 3428 001

REF. SYMBOL	HARRIS PART NO.	DESCRIPTION	QTY.
CR1	*386 0123 000	Diode, Zener, 1N4732A	1
CR2,CR3,CR4	*384 0020 000	Rectifier, 1N2071	3
Q1,Q2,Q3	*380 0151 000	Transistor, 2N4356 F	3
R1,R2,R3	540 1116 000	Resistor, 1000 ohm, $\frac{1}{2}$ W, 5%	3
R4,R5,R6	540 0609 000	Resistor, 820 ohm, 2W, 5%	3
R7	540 0635 000	Resistor, 10,000 ohm, 2W, 5%	1
	915 4345 001	P.C. Board	1

1514



Table 6-10. Gateway 80 Power Supply Terminal Board-992 3407 001

REF. SYMBOL	HARRIS PART NO.	DESCRIPTION	QTY.
C3	522 0394 000	Capacitor, 100 uF, 50V	1
C24,C25	522 0432 000	Capacitor, 450 uF, 50V	2
	915 4353 001	P.C. Board	1

WARNING: Disconnect primary power prior to servicing.

4TCT

## SECTION VII

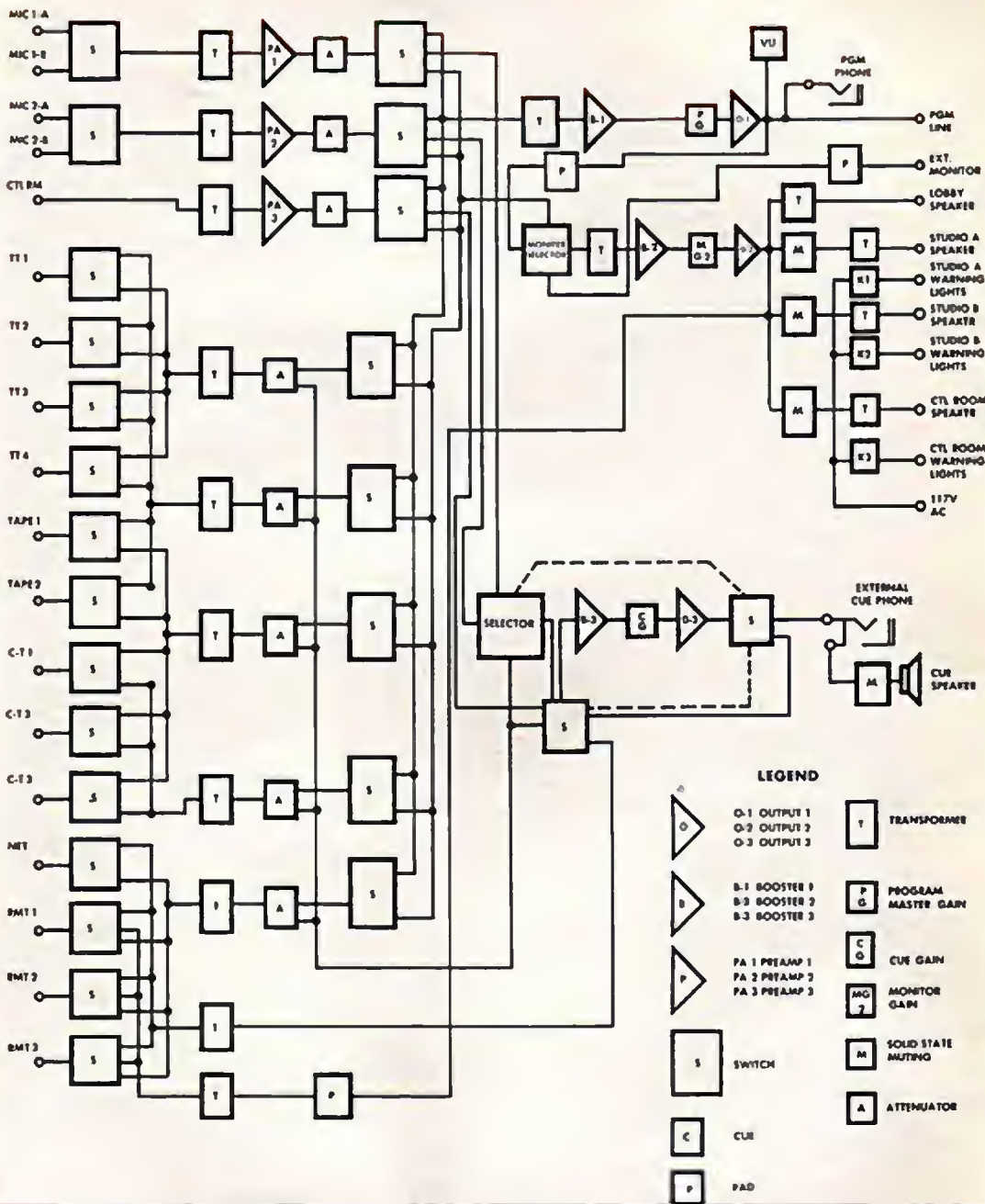
### DIAGRAMS

#### 7-1. INTRODUCTION

This section provides block and schematic diagrams and other drawings necessary for maintaining the Gateway 80 Console. The following diagrams are contained in this section.

1.	Gateway 80 Block Diagram	838 5626 003
2.	Gateway 80 Schematic	852 6626 003
3.	Preamplifier Schematic	827 9272 001
4.	Audio Booster Schematic	828 8000 001
5.	Audio Output Schematic	827 7491 002
6.	Power Supply Schematic	827 9311 001
7.	Relay and Muting Driver Board Schematic	815 4265 001
8.	Muting Assignment Schematic	815 5455 001
9.	Power Transformer Primary Connections	815 3540 001
10.	Installation (External) Diagram	815 3546 002
11.	Installation, Input/Output Cable Routing	815 5458 002
12.	Installation, Mounting Dimensions	839 0725 001

# GATEWAY 80 BLOCK DIAGRAM



## LEGEND

- |  |   |  |                     |
|--|---|--|---------------------|
|  | O-1 OUTPUT 1<br>O-2 OUTPUT 2<br>O-3 OUTPUT 3    |  | TRANSFORMER         |
|  | B-1 BOOSTER 1<br>B-2 BOOSTER 2<br>B-3 BOOSTER 3 |  | PROGRAM MASTER GAIN |
|  | PA 1 PREAMP 1<br>PA 2 PREAMP 2<br>PA 3 PREAMP 3 |  | CUE GAIN            |
|  | SWITCH  |  | MONITOR GAIN        |
|  | CUE   |  | SOLID STATE MUTING  |
|  | PAD   |  | ATTENUATOR          |

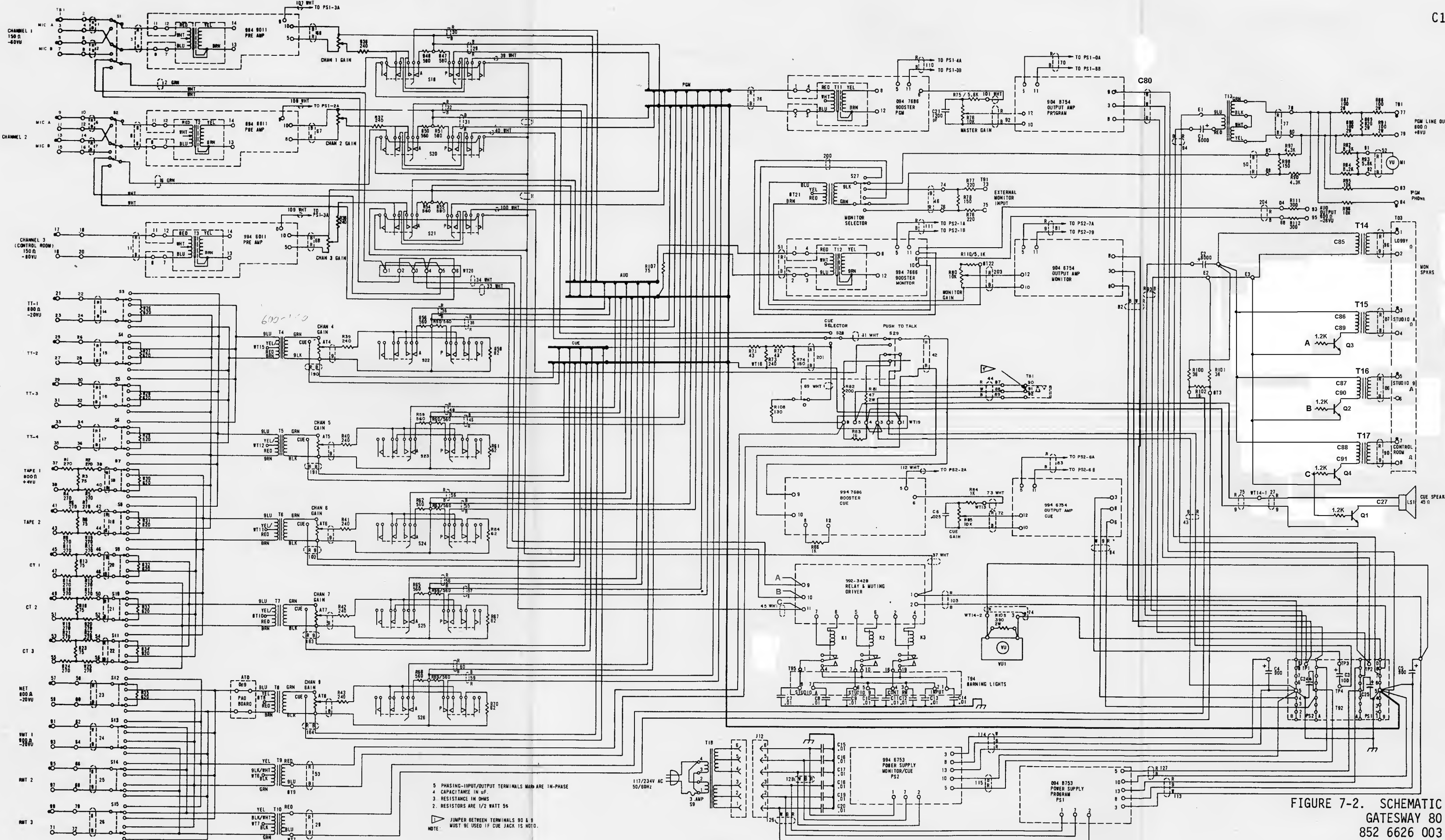
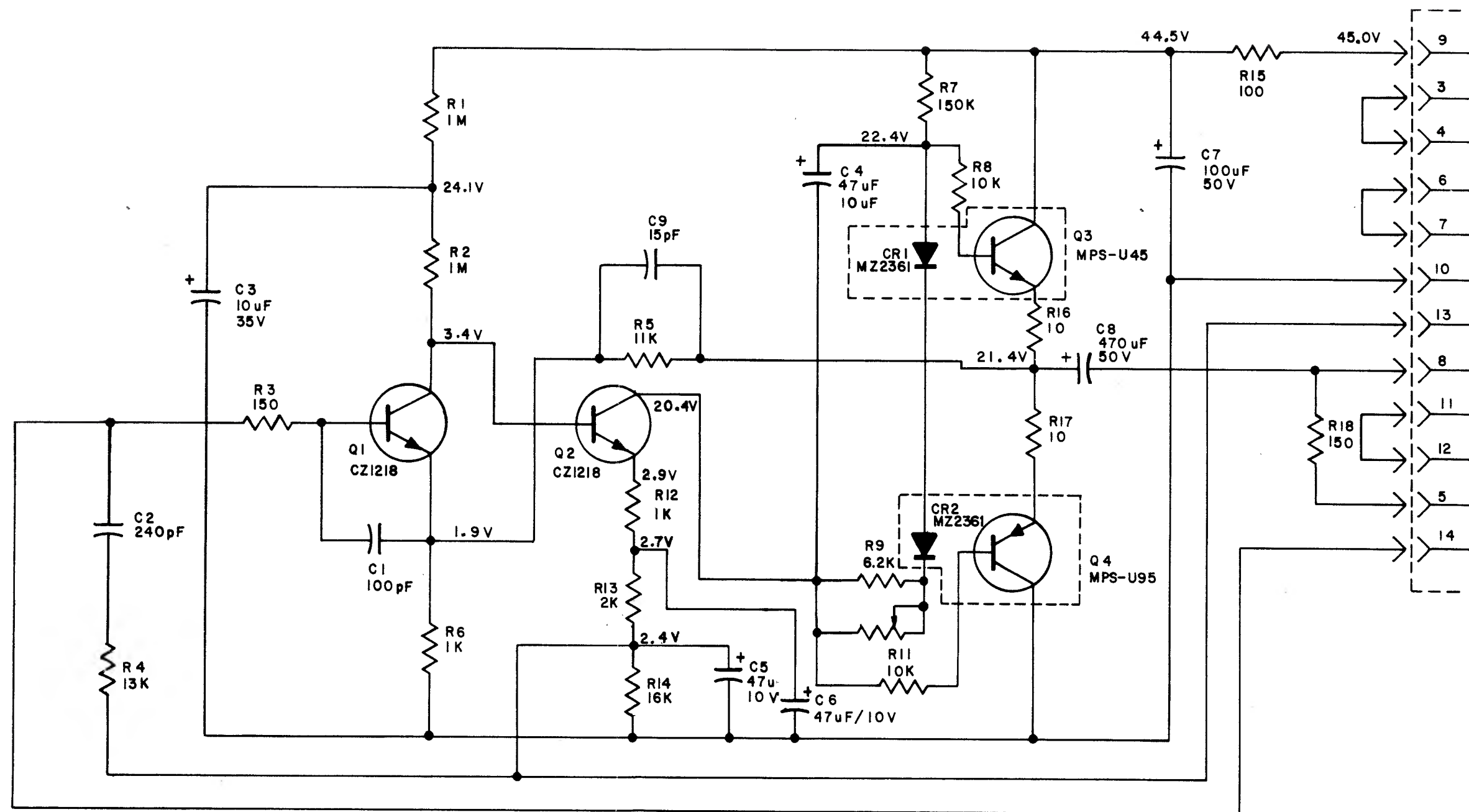
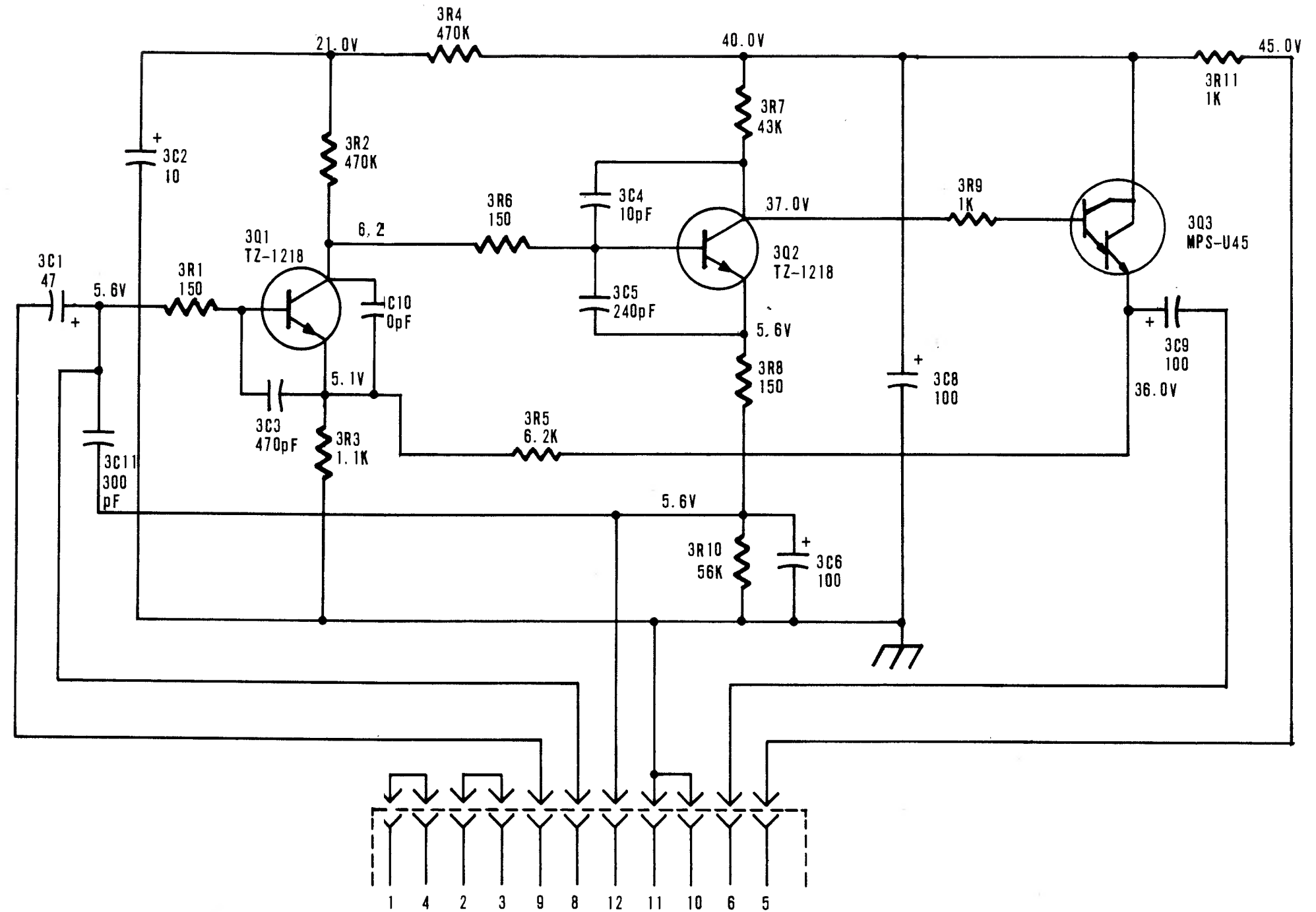


FIGURE 7-2. SCHEMATIC  
 GATESWAY 80  
 852 6626 003



3. D.C. VOLTAGES ARE UNDER NO SIGNAL CONDITIONS.
2. RESISTANCE IN OHMS.
1. RESISTORS ARE 1/2 WATTS 5%  
UNLESS OTHERWISE NOTED.

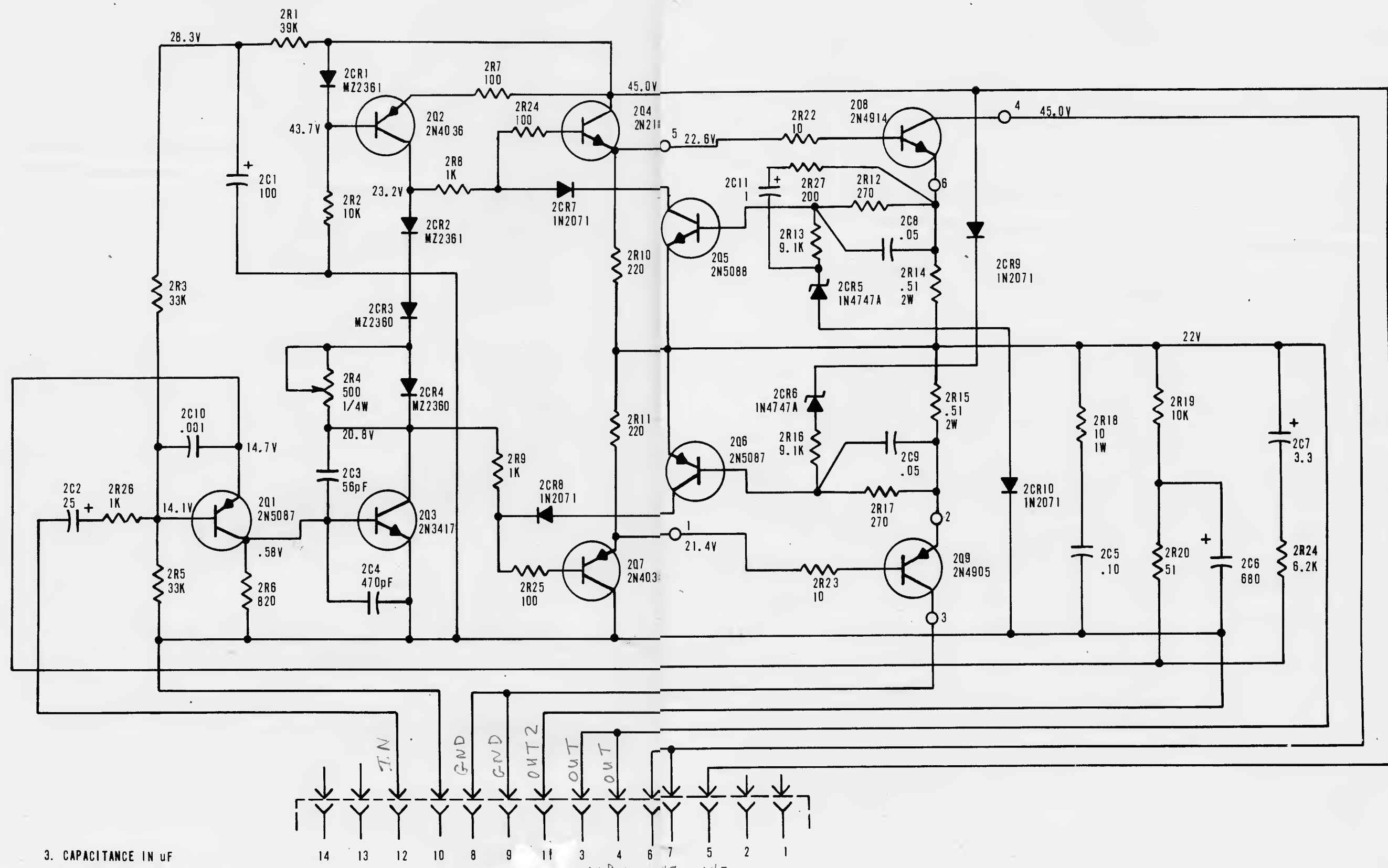
FIGURE 7-3. SCHEMATIC  
PREAMPLIFIER  
827 9272 001



- 4. VOLTAGE MEASUREMENTS MADE WITH 1K OHM BETWEEN TERMINALS NUMBER 8 AND 12
  - 3. CAPACITANCE IN  $\mu$ F
  - 2. RESISTANCE IN OHMS
  - 1. RESISTORS ARE 1/2 WATT 5%
- UNLESS OTHERWISE NOTED:

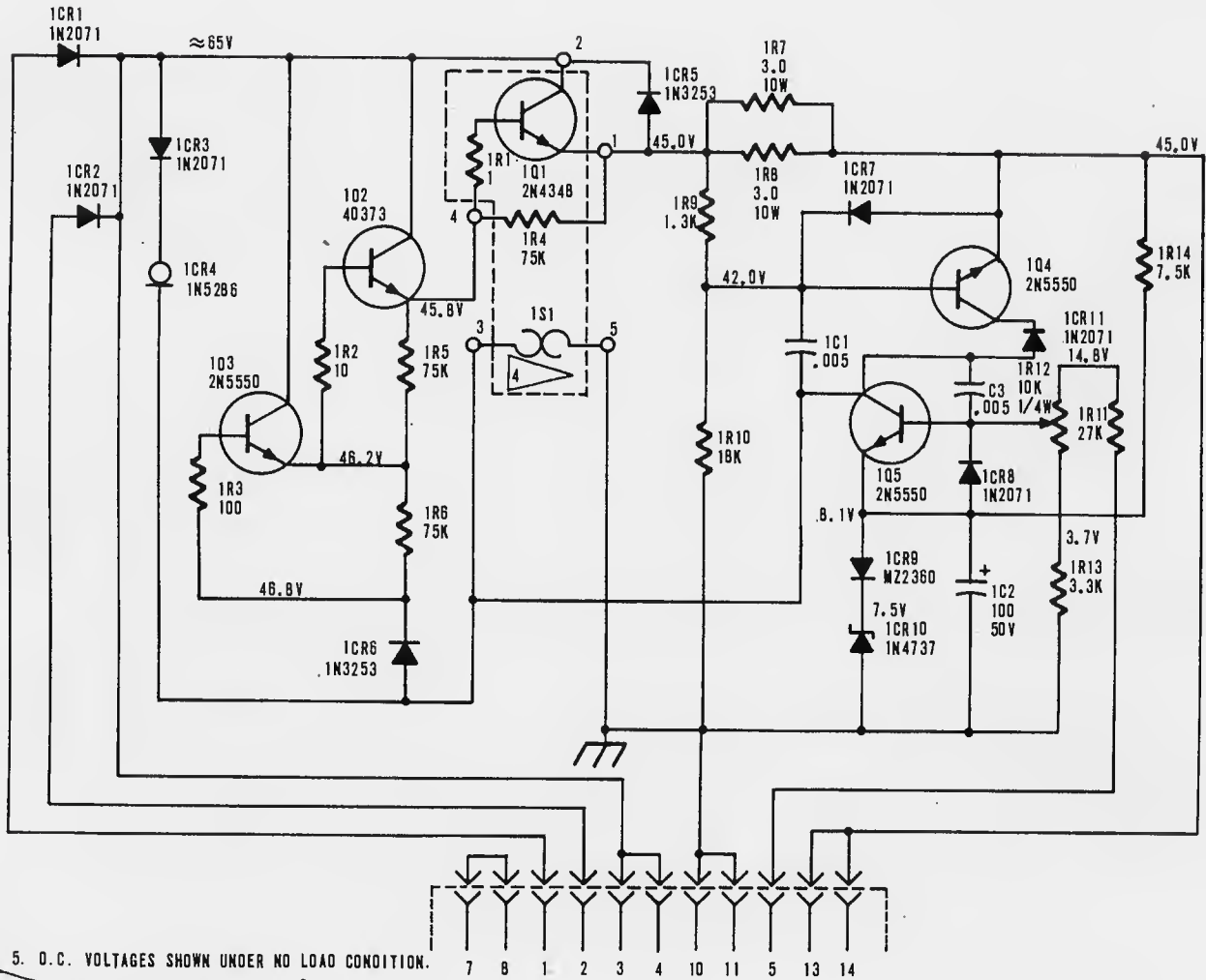
AUDIO BOOSTER

FIGURE 7-4. SCHEMATIC AUDIO BOOSTER 828 8000 001



3. CAPACITANCE IN UF  
 2. RESISTANCE IN OHMS  
 1. RESISTORS ARE 1/2 WATT 5%  
 UNLESS OTHERWISE NOTED:

FIGURE 7-5. SCHEMATIC  
 AUDIO OUTPUT  
 827 7491 002



5. D.C. VOLTAGES SHOWN UNDER NO LOAD CONDITION.  
 4. ON HEAT SINK CLOSES AT 100°C  
 3: CAPACITANCE IN  $\mu$ F  
 2. RESISTANCE IN OHMS  
 1. RESISTORS 1/2 WATT 5%  
 UNLESS OTHERWISE NOTED:

POWER SUPPLY

FIGURE 7-6. SCHEMATIC  
 POWER SUPPLY  
 827 9311 001

7-13/7-14

WARNING: Disconnect primary power prior to servicing.



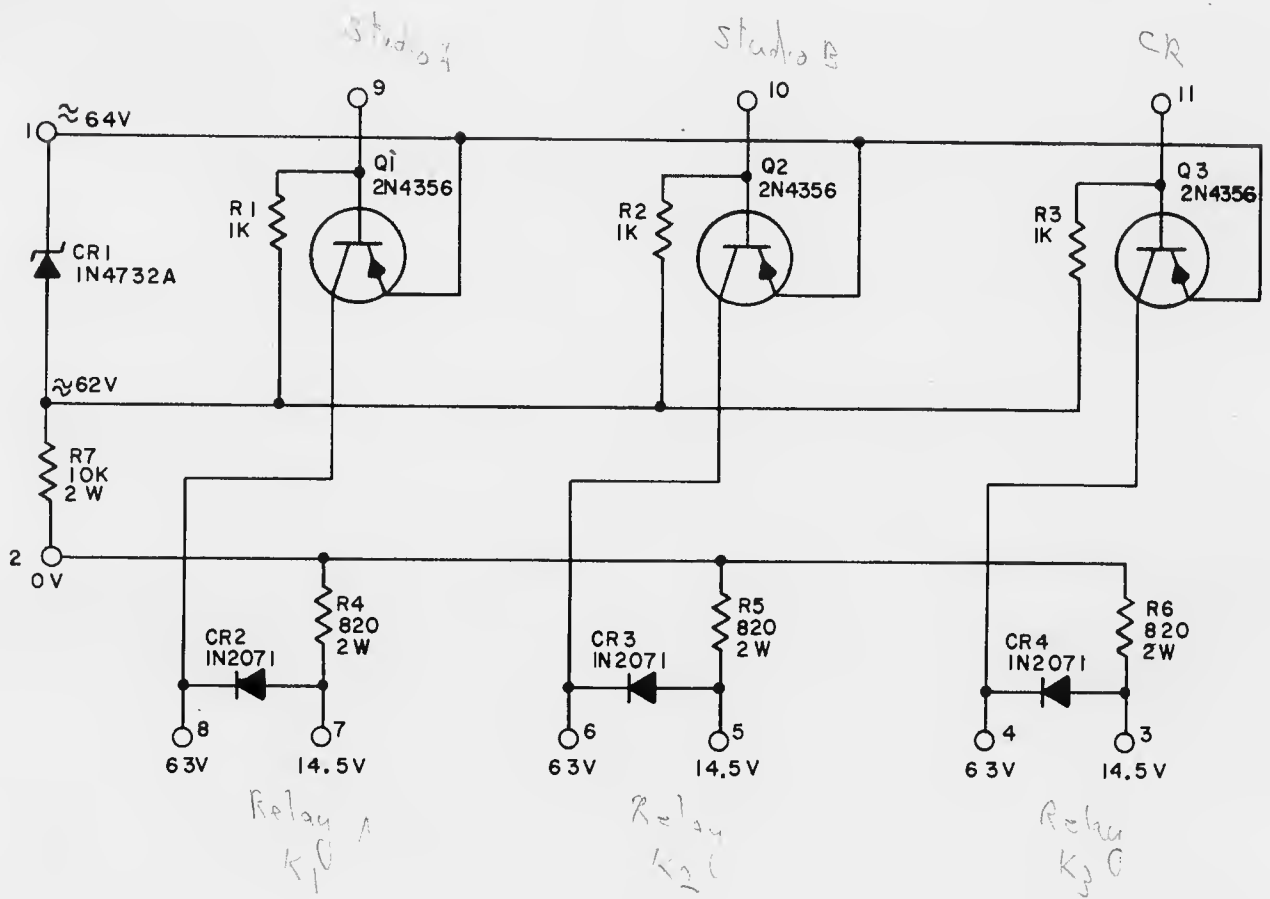


FIGURE 7-7. SCHEMATIC  
 RELAY AND MUTING DRIVER BOARD  
 815 4265 001

7-15/7-16

WARNING: Disconnect primary power prior to servicing.

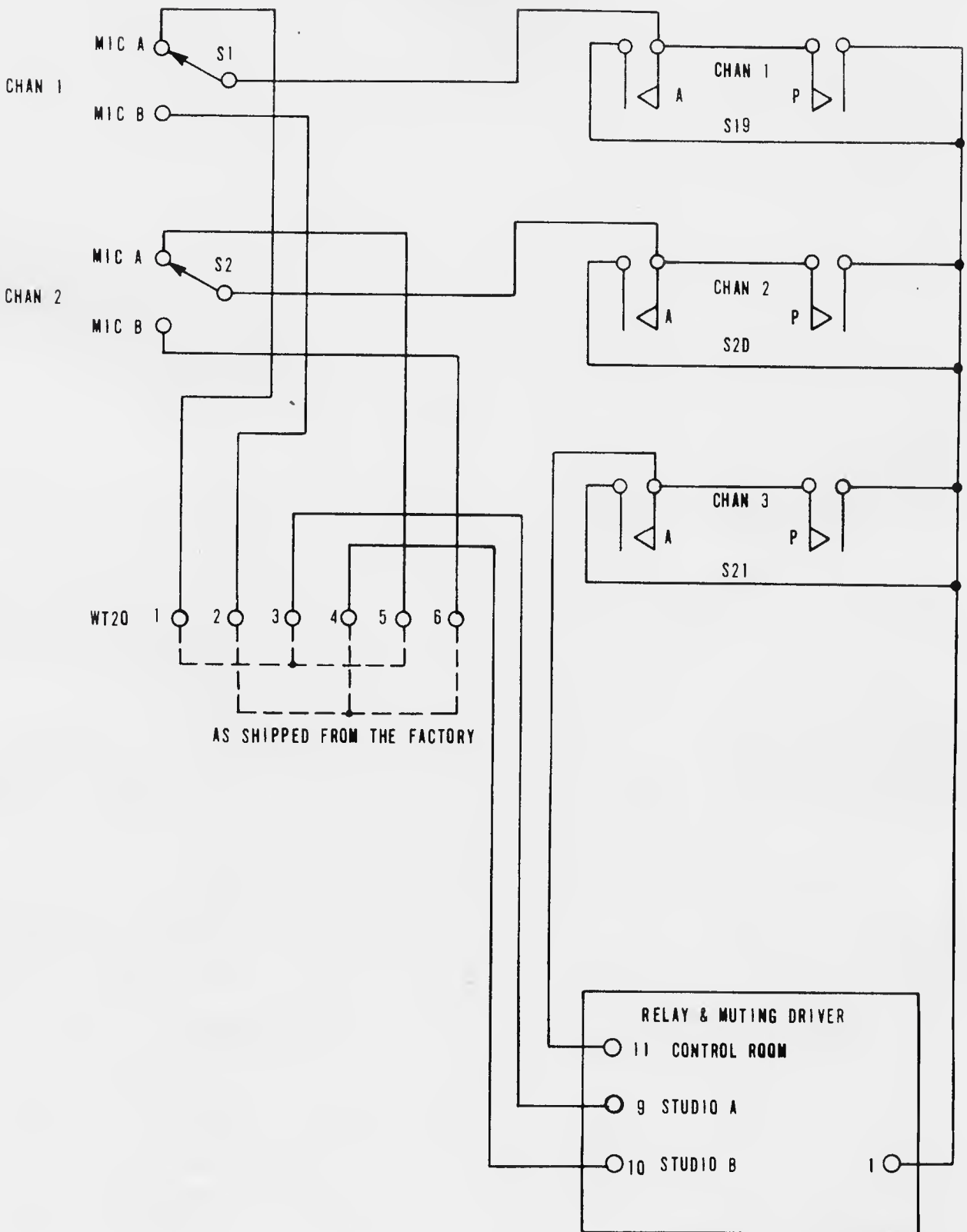
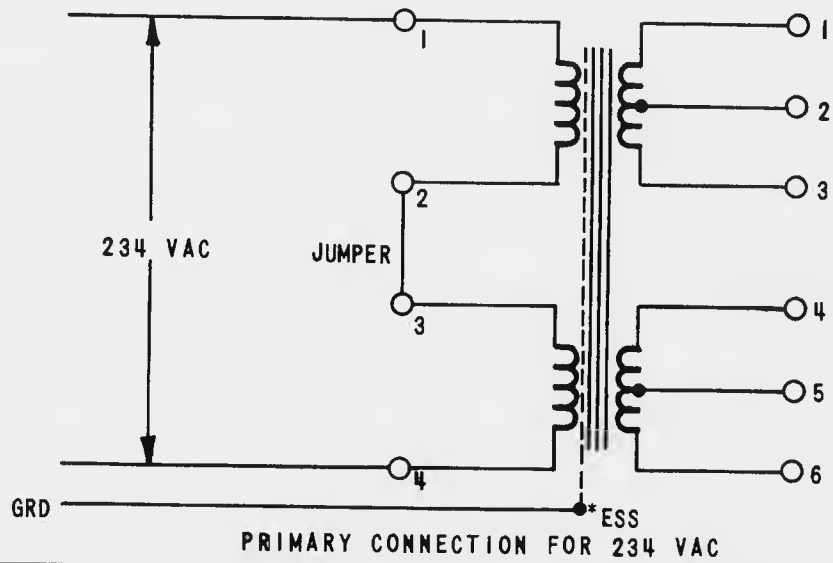
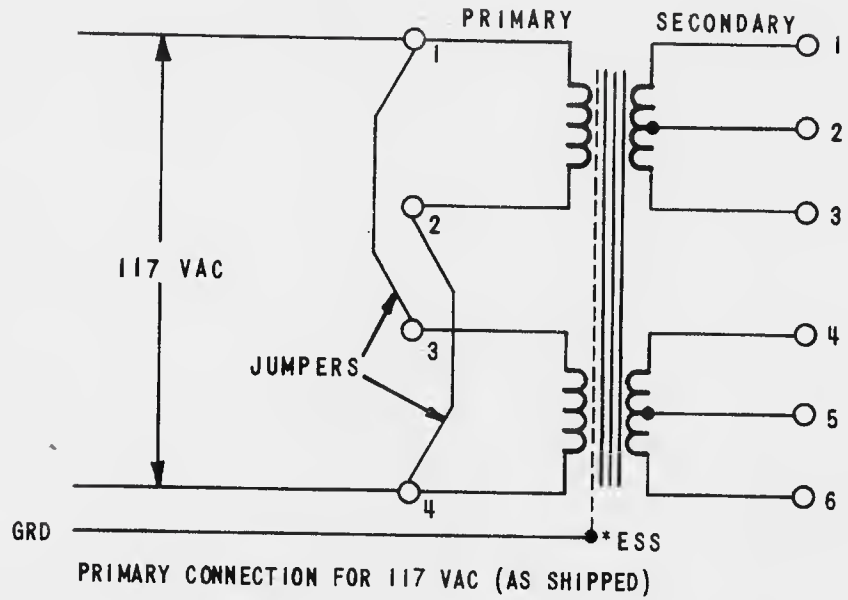


FIGURE 7-8. SCHEMATIC  
MUTING ASSIGNMENT  
815 5455 001

7-17/7-18

WARNING: Disconnect primary power prior to servicing.

#472 0684 000



NOTE\*  
ESS - ELECTROSTATIC SHIELD

POWER TRANSFORMER PRIMARY CONNECTIONS

- A -

FIGURE 7-9. POWER TRANSFORMER  
PRIMARY CONNECTIONS  
815 3540 001

7-19/7-20

WARNING: Disconnect primary power prior to servicing.

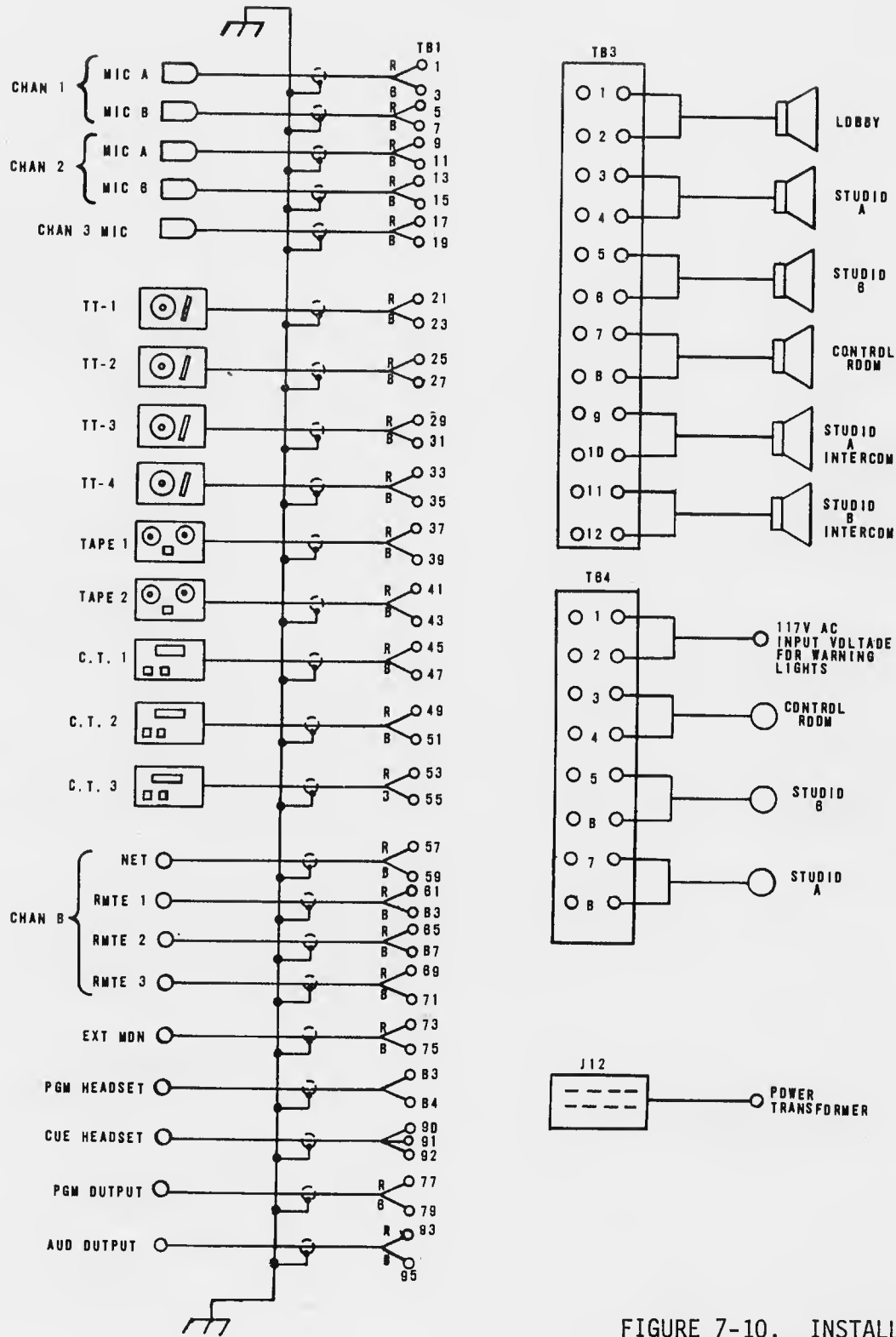


FIGURE 7-10. INSTALLATION  
(EXTERNAL) DIAGRAM  
815 3546 002

7-21/7-22

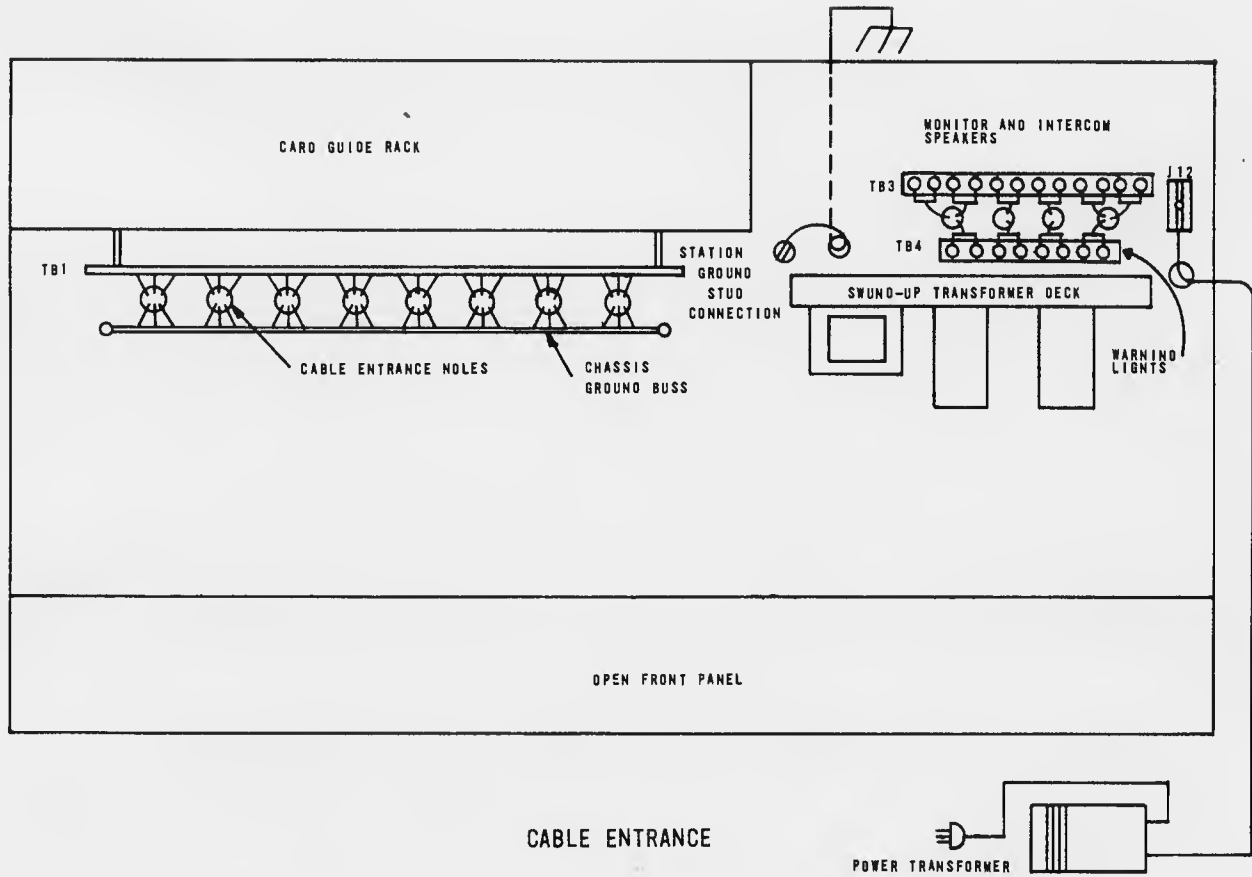


FIGURE 7-11. INSTALLATION  
INPUT/OUTPUT CABLE ROUTING  
815 5458 002

7-23/7-24