

# BOGEN®



**MODEL MU1250**  
50 WATT TRANSISTORIZED  
MOBILE PUBLIC ADDRESS AMPLIFIER

LEAR SIEGLER, INC.

**LSi**®  
BOGEN DIVISION  
P.O. BOX 500  
PARAMUS, N. J. 07652

## INSTALLATION AND OPERATING MANUAL

READ THOROUGHLY BEFORE OPERATING EQUIPMENT

**IMPORTANT: BEFORE INSTALLATION READ CAREFULLY "CAUTION NOTES" ON PAGE 3**



# DESCRIPTION

The Bogen Model MU1250 is a 50-watt transistorized mobile public address amplifier. The microphone input, phase inverter, and driver amplifier stages are plug-in modules, which facilitates maintenance of the unit.

Five separate inputs are provided on the amplifier. Two are for microphones, either high or low impedance. No plug-in transformer is required with low-impedance microphones. One of these inputs will also accept signals from a magnetic phono or tape head.

The two auxiliary inputs will accommodate a crystal or ceramic phonograph, a radio, a tape recorder or other high-level, high-impedance input. A master volume control regulates the over-all gain, and separate

bass and treble controls are incorporated for adjusting tonal balance.

The model MU1250 may be used with either a 117 volt, 50/60 cycle AC source or with a 12-15 volt battery. Two power cables are provided, one for AC power, the other for DC. The DC power cable is provided with alligator clips for connection to a 12-15 volt battery.

Outputs are provided for use with 4 ohm, 8 ohm and 16 ohm impedance speakers as well as for operation with 25 volt and 70 volt line speaker systems. Two quick-disconnect plugs are furnished for making rapid connections to the speaker system.

## TECHNICAL SPECIFICATIONS

**POWER OUTPUT:** 70 watts peak; 50 watts at less than 10% distortion (continuous).

**FREQUENCY RESPONSE:** 30 to 15,000 Hz (cps),  $\pm 2$  db.

**HUM AND NOISE (below rated output):** MIC input, 65 db; AUX input, 70 db.

**GAIN:** MIC input, 125 db, AUX input, 95 db; MAG input, 110 db.

**SENSITIVITY:** MIC input, 2 millivolts (low impedance), 3 millivolts (high impedance); AUX input, 0.5 volts; MAG input, 18 millivolts.

**INPUTS:** 1 MIC (high or low impedance); 1 MIC (high or low impedance) or Mag Phono or Tape Head; 2 AUX (high impedance, high level).

**OUTPUTS:** 4, 8 and 16 ohm speakers, 25 volt balanced line, 70 volt line. (Two quick-

disconnect sockets and connectors provided in addition to screw-type terminals.)

**TONE CONTROL ACTION:** Treble (at 10 kHz), -11 db; Bass (at 50 Hz), +14 to -9 db.

**CONTROLS:** MIC 1 Volume, Input 2 Volume, MIC 1 Impedance Selector switch, Input 2 Selector switch, AUX 1 and 2 Volume (fader type), Master Volume, Bass, Treble, Power switch.

**TRANSISTORS AND DIODES:** Two 2N3053, four MPS6521, three MPS6514, two 2N1558; three silicon diodes; two zener diodes.

**POWER CONSUMPTION:** At 117 VAC, no signal, 16 watts, max signal, 116 watts. At 14 VDC, no signal, 0.3 amp; max signal, 6.7 amp.

**OPERATING TEMPERATURES:** -20° C to +65° C (-4° F to +149° F).

**DIMENSIONS:** 15 $\frac{3}{4}$ " wide x 6 $\frac{3}{4}$ " high x 10" deep.

**SHIPPING WEIGHT:** 23 lbs.

**NOTE:** The units of frequency measurement, cps (cycles per second), KC (kilocycles), and MC (megacycles) are being replaced by the designations Hz (Hertz), KHz (Kilohertz), and MHz (Megahertz), respectively. These new designations, now in standard use throughout the rest of the world, have recently been adopted by the Institute of Electrical and Electronic Engineers (IEEE).



# ACCESSORIES

## MODEL 404B MICROPHONE

The Bogen model 404B low-impedance microphone is recommended for use with the MU1250 amplifier. The microphone, in a plastic case, is furnished with a cable terminated in an Amphenol 75-MC1F connector for connection to the amplifier.

## MODEL LK-5 LOCKING PLATE

The model LK-5 Locking Plate is designed to prevent unauthorized tampering with the controls of

the amplifier. The unit is furnished with instructions and a set of two keys. As a safety factor, key cannot be removed when lock is in open position.

## CARRYING CASE AND SPEAKERS

A Bogen Model CC12S carrying case with two speakers is available for portable systems. Each section of the case contains a high-efficiency 12" PM magnet speaker and 25 feet of interconnecting cable with plug.

# INSTALLATION

## UNPACKING

The unit was carefully checked before leaving the factory. Inspect shipping container and amplifier carefully for indication of improper handling in shipment. If unit has been damaged, make an immediate claim to the dealer or distributor from whom it was purchased. If unit was shipped to you, notify transportation company without delay and file a claim.

## CONNECTIONS BETWEEN COMPONENTS

Use single-conductor, low-capacity shielded wire for connecting the record player, tape recorder or other sound sources to the amplifier. Keep leads under ten feet in length.

Connect speakers with standard flexible line cord (zip cord). Up to 100 feet of cable may be used without appreciable loss.

Make certain that all audio cables are kept away from speaker cables, power cables and power transformers. Speaker cables must also be kept away from power cables.

## POWER

Two separate power cables are provided. One is for use with a 117 volt AC source and the other with a 12-15 volt DC battery. The DC power cable has alligator clips for connection to the battery.

Plug the connector of the appropriate cable into the six-prong receptacle on the rear of the amplifier

chassis. If an AC power cable is used, connect it to an outlet supplying 117 volt, 50 or 60 cycle power. Connect the alligator clips of the DC power cable to a 12-15 volt DC source.

Carefully observe that proper polarity is maintained when making DC connections. Connect the red lead of the power cable to the positive side of the battery, and the black lead to the negative side. If proper polarity is not observed, amplifier will not operate.

## CAUTIONS READ CAREFULLY

1. The amplifier has been shipped for use with a DC power source which is negatively grounded. Connect ground shorting jumper (located on top of chassis near power transformer) to proper grounded polarity of DC power source (see figure 4). If MU1250 chassis is grounded to a positive-grounded DC power source, remove shorting jumper to allow SW1 to operate.
2. Do not operate amplifier in ambient temperatures above 65° C. (149° F.).
3. The amplifier is shipped with a jumper between the COM and GND terminals on the output terminal strip, which effectively grounds the outputs. When it is necessary to isolate the output windings from ground for use in a balanced line, remove this jumper. The output windings will then be floating above ground potential.

# INPUT CONNECTIONS

## MICROPHONE

Two microphones may be connected to the amplifier, utilizing the MIC 1 and MIC 2 inputs. The microphones may be either high or low impedance type.

When using MIC 1 input, move the MIC 1 INPUT SELECTOR switch to the appropriate HIGH or LOW position for the microphone being used. When using the MIC 2 input, the INPUT 2 SELECTOR switch is

moved to the appropriate HIGH or LOW position.

For connecting high-impedance microphones, it is recommended that a single-conductor shielded cable under 35 feet in length be used. The cable should be terminated with a Bogen 85-0130-01 connector, or an equivalent connector such as Amphenol 75-MC1F.



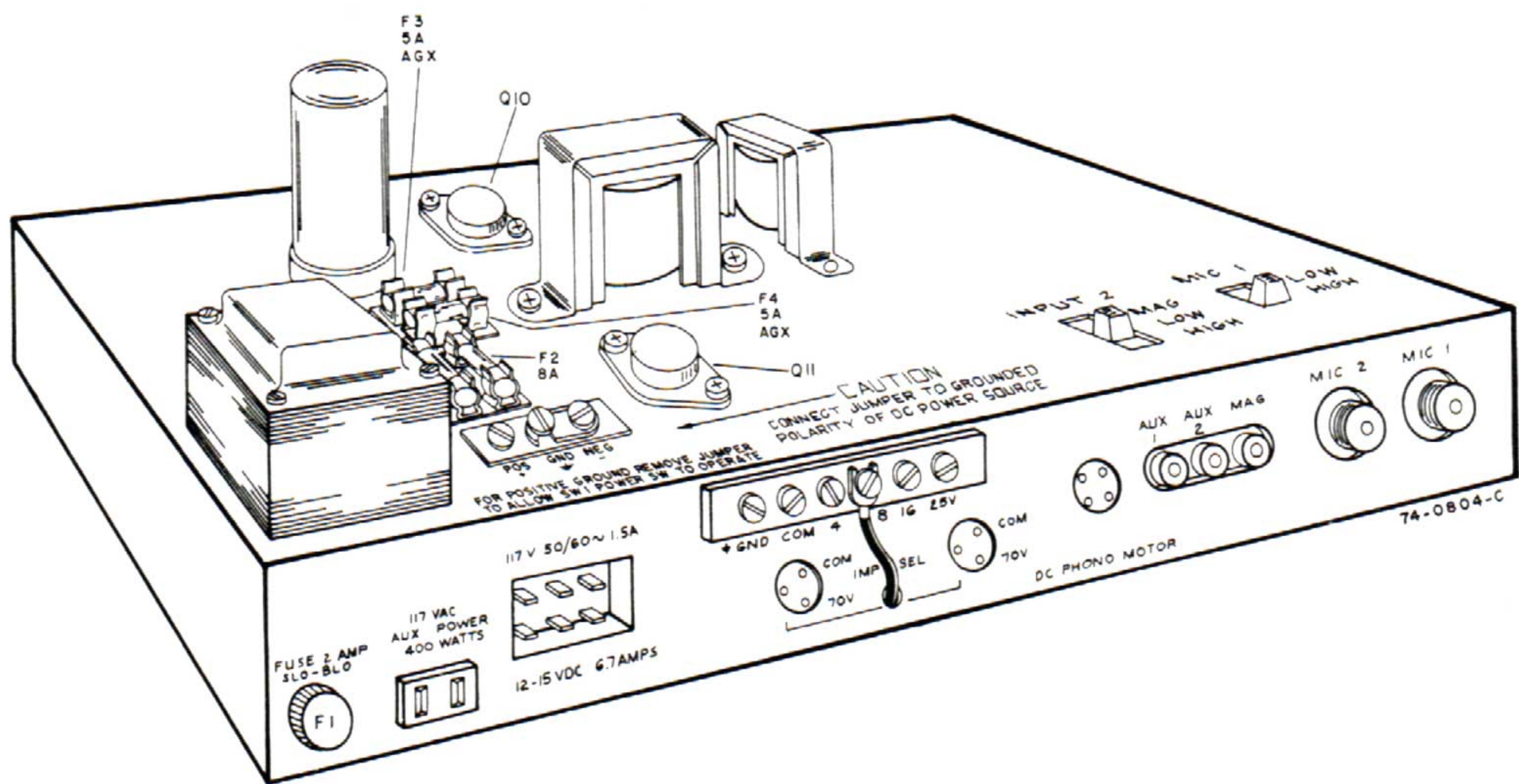


Figure 1 - Rear View of Amplifier

## PHONO

Phonographs employing magnetic, ceramic or crystal cartridges may be connected to the amplifier. For phonographs with a magnetic cartridge, connect the input cable to the MAG receptacle and move the INPUT 2 SELECTOR switch to the MAG position.

Phonos employing a ceramic or crystal cartridge may be connected to either AUX 1 or AUX 2 receptacles. Use a single-conductor shielded cable terminated in a standard single-prong phono plug.

To minimize hum pickup, it is recommended that a separate ground wire be connected between the phono

player base and the GND terminal on the output terminal strip of the amplifier.

## AUXILIARY

AUX Input 1 and AUX Input 2 may be used for sources other than crystal or ceramic phonographs. Any signal source having a high-level, high impedance output may be connected to these inputs, including all tuners and tape recorders with preamplifiers. An input signal level of approximately 0.5 volts is required to obtain full output from the amplifier.

# OUTPUT CONNECTIONS

## SPEAKERS

The amplifier may be connected to speakers rated at 4, 8 and 16 ohms impedance or used with a 25 volt or 70 volt constant voltage speaker system. For detailed information on installing multiple speaker systems, see Speaker Installation Bulletin No. 54-5001 shipped with this unit.

In permanent installations, connect the speaker system directly to the Speaker Output terminals. Connect one lead to the COM terminal and the other to the terminal which corresponds to the impedance of the speaker.

In systems that are moved continually, connections should be made to the speaker sockets to provide a means of quickly disconnecting the speaker. Two quick-disconnect plugs (Bogen 85-0147-01 or Amphenol 71-3S) are provided with the amplifier for this purpose.

When speaker plugs are used, connect the speaker impedance selector lead to the appropriate speaker impedance terminal. This connection is not required for 70 volt operation. For 70 volt operation, connect leads to pins 1 and 3. For standard impedance and 25 volt operation, connect leads to pins 1 and 2. (See figure 2.)

In some cases, it may be desirable to use both the speaker output terminal strip and the speaker socket for making connections to speakers. It is not necessary that the speaker system connected to the terminal strip have the same impedance as the speakers connected to the speaker socket. However, it is essential that proper impedance matching be provided

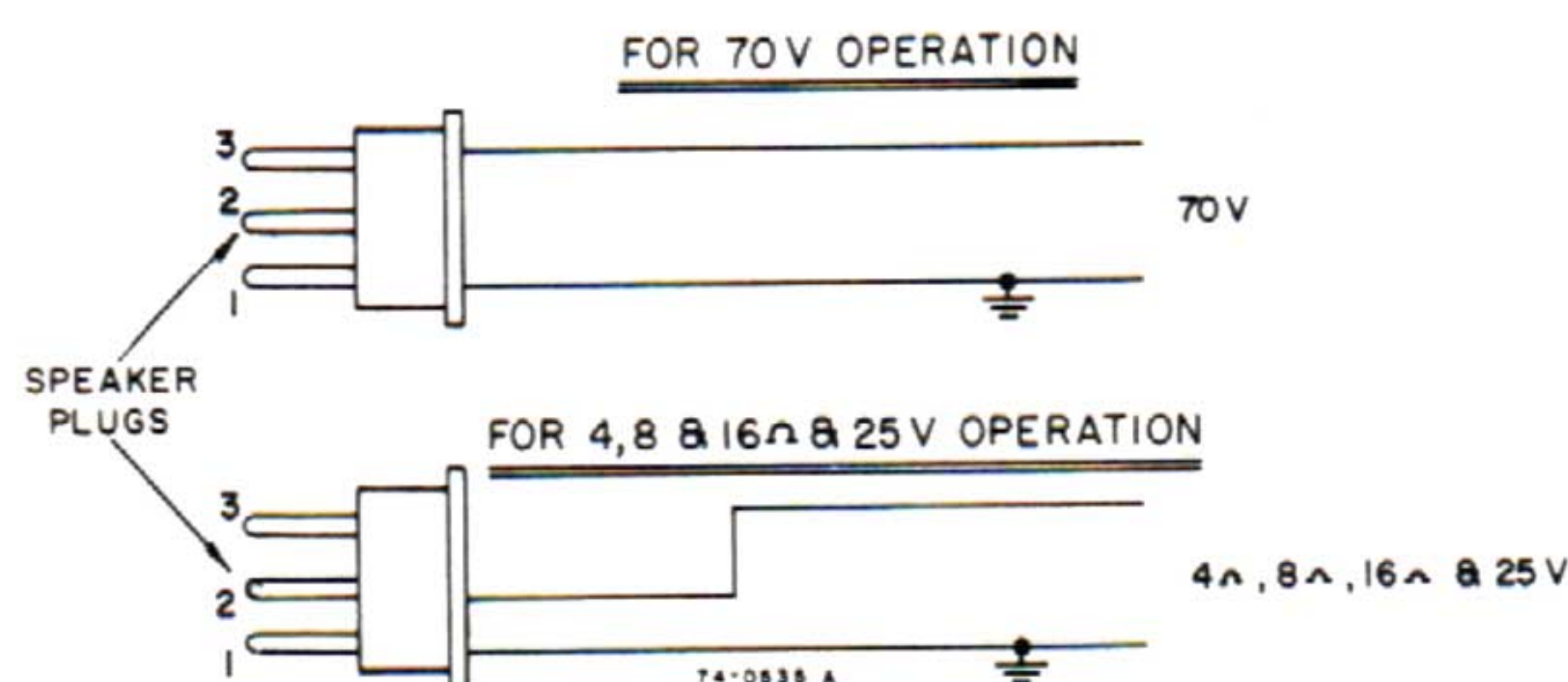


Figure 2 - Speaker Output Plug Wiring



for all speakers to obtain maximum power output from

the amplifier.

## CONTROL FUNCTIONS

### MICROPHONE 1

This control adjusts the volume of the microphone 1 input. Rotate the control clockwise (in the direction of the higher numbers) to increase the level. Set the control to the minimum position (0) when the microphone input is not used.

### INPUT 2

This control adjusts the volume of either the microphone 2 input or the magnetic phono input, depending on the input selected by the INPUT 2 SELECTOR switch. Rotate the control clockwise toward the higher numbers to increase the level. Set the control to the minimum (0) position when the microphone 2 input or magnetic phono input are not in use.

### AUXILIARY

This control selects and adjusts the volume of either of the two auxiliary inputs. To select the AUX 1 input, rotate the control counterclockwise past the center position. Turning the control further counterclockwise increases the AUX 1 volume. AUX 2 inputs are selected by rotating the knob clockwise past the center position. The further clockwise the control is turned, the higher the AUX 2 volume becomes. If no auxiliary inputs are used, the control should be set to the mid position (off).

The control may also be used as a "fader" control when both auxiliary inputs are used. This makes it possible to gradually and smoothly reduce the level of one input and then increase the other, producing an effect of fading from one input to another.

### MASTER

This control is used to adjust the overall volume after the MIC and AUX input volume controls have been set to mix the inputs as desired. Rotate this control clockwise in the direction of higher numbers to increase the level and counterclockwise to reduce it.

**NOTE:** All four volume controls are provided with reset markers on the skirt of each knob. These markers make it possible to instantly reset a control to a previously determined level. After the desired volume setting has been established for each control, slide the reset marker to coincide with the midpoint mark on the front panel. The knob may now be set to zero or any other point required, and then instantly reset to the setting indicated by the marker for each control.

### BASS

This control is used to adjust the bass response of the amplifier output. The center position of the control provides full frequency response and is generally used when program sources and speaker systems are of highest quality.

Rotation of the control in the counterclockwise direction reduces or "cuts" the bass response of the amplifier; clockwise rotation increases it.

The Bass control should be used to remove low frequency noise, such as phono rumble or hum. The control may also be used to overcome the effect of acoustic feedback (howling). Rotating the control counterclockwise reduces the feedback effect and permits operation at higher levels than would otherwise be possible.

### TREBLE

This control adjusts the treble or high frequency response of the amplifier output. The extreme clockwise position provides full frequency response and should be used with program sources and speakers of the highest quality.

Rotation of the control in a counterclockwise direction reduces the high frequency response. Hence this control should be used to remove high frequency noise, such as needle scratch. It may also be used to reduce the likelihood of acoustic feedback (howling).

### POWER

This slide switch, located on the front panel is used to turn the amplifier on and off. When this switch

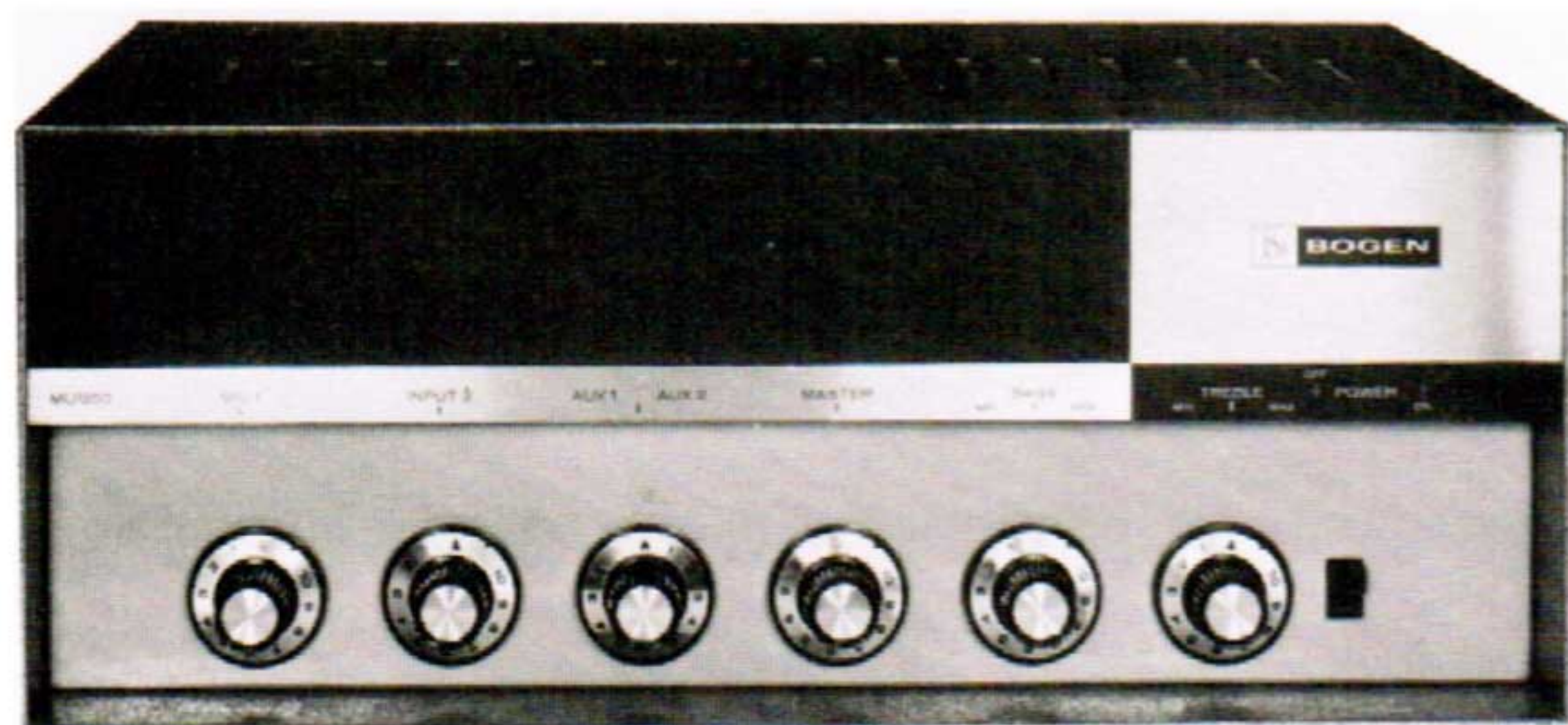


Figure 3 – Front View of Amplifier



is on, power will also be supplied to a DC phonograph plugged into the Phono Motor receptacle.

### **MIC 1 SELECTOR**

This control, located on top of the chassis permits the selection of either LOW or HIGH impedance

microphone input.

### **INPUT 2 SELECTOR**

This control, located on top of the chassis permits the selection of either MAG phono or MIC 2 (LOW or HIGH impedance) for the Input 2 signal source.

## **INSTALLATION AND OPERATING HINTS**

### **FEEDBACK**

If speakers are located too close to the microphone, acoustic feedback, producing squealing and howling, may result.

If this difficulty is encountered, adjust the volume controls and set the Treble and Bass tone controls to the point where feedback is eliminated. Moving the speakers to increase their distance from the microphones will also help.

### **MICROPHONE TECHNIQUE**

Speak directly into the microphone in a normal voice, at a distance of 6 inches to one foot from the microphone. Speak deliberately with even speed and loudness and without shouting. Sound final consonants and do not drop words here and there.

Speak the final word of a sentence with the same emphasis as the first word. Be conscious of the sound of each word as you speak it. Each word spoken into the microphone must be clearly heard for the meaning to be understood.

## **MAINTENANCE**

### **BOGEN SERVICE**

We are interested in your Bogen unit for as long as you have it. If trouble ever develops with your unit, please do not hesitate to ask our advice or assistance. Information can be obtained by writing to Service Department, Bogen Division, P.O. Box 500, Paramus, New Jersey, 07652.

When communicating with us, give the model number and series number of your unit and describe the difficulty encountered. Explain the effects each operating control has upon the symptoms of trouble. Include details on electrical connections to associated equipment and list such equipment.

When we receive this information, we will send you service information if the trouble appears to be simple, such as a bad component or incorrect connections. If trouble requires servicing, we shall send you the name and address of the nearest authorized Bogen service agency to which you can send your unit for repair.

When shipping your unit, pack the equipment well, using the equivalent of the original shipping carton and filler material to prevent damage in transit. Send unit, fully insured and prepaid, via railway express. Do not ship via parcel post unless so instructed. The unit will be promptly repaired and returned to you via express collect.

### **FUSES**

Four fuses are provided in the unit to protect various circuits in the amplifier see figure 1. The 8 ampere fuse F1, located on top left of chassis protects the equipment against improper or shorted

connections to the power source. A 2 amp slo-blo fuse F2 on the rear left of the chassis permits the amplifier to operate during temporary voltage surges, but will blow on sustained overloads.

Two 5 amp fuses F3 and F4 are located on top of the chassis. These provide protection against an overload in the output transistors Q10 and Q11.

If the replacement fuse blows soon after it has been installed, do not operate the equipment. Contact a qualified service man or a Bogen representative for inspection of the unit.

A spare 8 amp fuse is located in a holder adjacent to the operating fuse.

### **TRANSISTORS**

Transistors show little, if any, deterioration with age, and at the present time are considerably more reliable than the best vacuum tubes. Therefore, some transistors are soldered into equipment like resistors or capacitors. It is generally safe to assume that transistors have not failed and that the trouble is elsewhere in the equipment.

However, if tests indicate that a transistor might be faulty, it must be removed from the circuit for checking. The plug-in transistors, of course, are easily removed. To replace plug-in transistors, use Dow Corning No. 340 Compound Silicon Grease (or equivalent). Brush the compound on heat sink and transistor. To insure proper contact, make certain that plug-in transistors are properly inserted into their sockets.

To remove soldered transistors, unsolder the transistor lead, gripping the lead with a pair of pliers



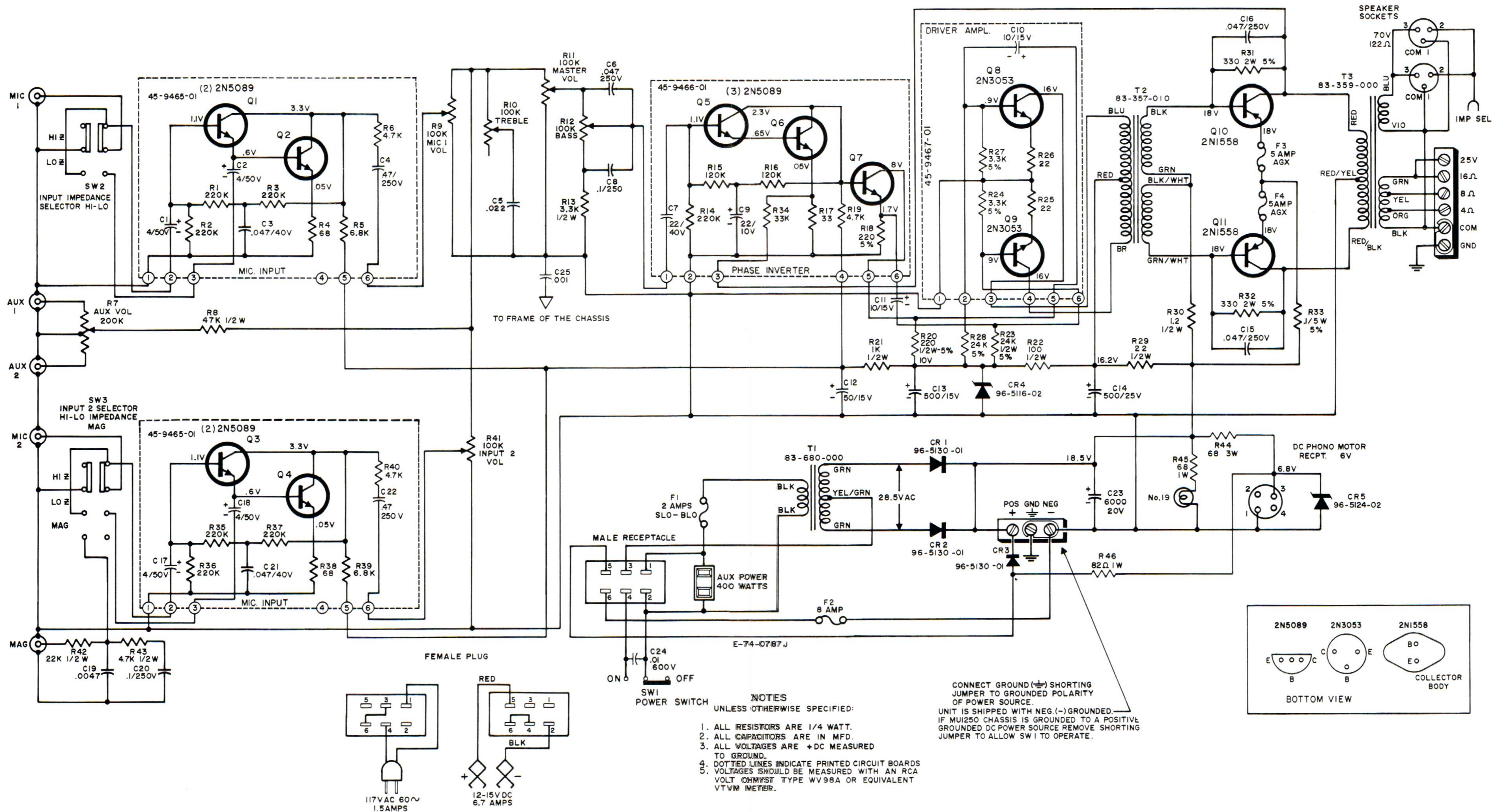


Figure 4 - Schematic Diagram MU1250 Amplifier



between the solder joint and the transistor case. The pliers will act as a heat sink and prevent possible damage to the transistor. Do not bend the transistor wire lead closer than 1/16" from the body of the transistor. It is also important to make or break all connections with the power off to prevent possible voltage transients in the circuit which might damage the transistor.

## CAUTION

*Transistors may be replaced with suitable alternates if the type furnished with the equipment is not available. However, the wiring configuration of the alternate transistor may vary from the original. See the schematic diagram, figure 4, for the wiring configuration of alternate transistors.*

## REPLACEMENT PARTS

The components used in Bogen equipment, with exception of items listed below, are standard parts available through most parts jobbers. However, several parts should be replaced only with genuine Bogen parts. These parts are listed here and are available through Bogen distributors, service agencies or directly from the factory.

When ordering a part, specify part number and description of the part as listed below. Specify the model and give the series designation, which is a run letter followed by numbers, stamped or screened on the rear of the chassis. Also, give the component board assembly number (45-) for all parts mounted on PC boards.

Ref. No.	Part No.	Description
C1, 2	79-005-055	Capacitor, electrolytic, 4 mfd, 50 V
C10, 11	79-005-042	Capacitor, electrolytic, 10 mfd, 15 V
C12	79-005-036	Capacitor, electrolytic, 50 mfd, 15 V
C13	79-005-052	Capacitor, electrolytic, 500 mfd, 15 V
C14	79-001-050	Capacitor, electrolytic, 500 mfd, 25 V
C17, 18	79-005-055	Capacitor, electrolytic, 4 mfd, 50 V
C23	79-010-057	Capacitor, electrolytic, 6000 mfd, 20 V
CR1-3	96-5130-02	Diode, silicon rectifier, 100 PIV
CR4	96-5116-02	Diode, Zener, 10V
CR5	96-5124-02	Diode, Zener, 6.8V
Q1-Q7	96-5213-01	Transistor, 2N5089
Q8, 9	96-5107-01	Transistor, 2N3053
Q10, 11	96-5086-02	Transistor, 2N1558
R7	77-001-539	Control, Auxiliary Volume
R9	77-001-579	Control, MIC 1 Volume
R10	77-001-579	Control, Treble

Ref. No.	Part No.	Description
R11	77-001-579	Control, Master Volume
R12	77-001-579	Control, Bass
R30	76-105-107	Resistor, Fixed, 1.2 ohm, 1 watt, 5%
R31, 32	75-412-331	Resistor, Fixed, 330 ohms, 2 watt
R33	76-113-097	Resistor, Fixed, 0.1 ohm, 5 watt, 5%
R41	77-001-574	Control, MIC 2 Volume
R44	78-852-680	Resistor, Fixed, 68 ohm, 3 watt
SW1	81-003-017	Switch, Power
SW2	81-003-010	Switch, MIC 1 Input Impedance Selector
SW3	81-003-012	Switch, Input 2 Impedance Selector
T1	83-680-000	Transformer, Power
T2	83-357-010	Transformer, Driver
T3	83-359-000	Transformer, Output
--	45-9465-01	Printed Circuit Assy., Mic Input
--	45-9466-01	Printed Circuit Assy., Phase Inverter
--	45-9467-01	Printed Circuit Assy., Driver Amp.



**OWNER'S WARRANTY**

Bogen solid state sound equipment is guaranteed against defects in material and workmanship for one year from the date of sale to the original purchaser, provided that the equipment has not been subjected to abuse or accident or altered in any way. Any part of the equipment covered by this warranty which, with normal installation and use, becomes defective will be repaired or replaced by Bogen, provided the equipment is delivered or shipped prepaid and insured to our authorized service station or to the Bogen Factory Service Department, Route 4 and Forest Avenue, Paramus, New Jersey 07652. The equipment may be picked up by you personally or will be returned to you freight prepaid.

Models containing vacuum tubes carry the same warranty as above, except that it does not apply to the vacuum tubes, which are guaranteed for 90 days.

*The registration card enclosed with the equipment must be completed and mailed within five days of purchase to place the warranty in effect.*

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