



## BOOSTER AMPLIFIERS

## MODELS MT-60A & MT-125B

### UNPACKING

The amplifier was thoroughly checked before leaving the factory. Inspect the amplifier and shipping container carefully for evidence of improper handling during shipment. In case of damage, make an immediate claim to the dealer or distributor from whom the unit was purchased. If the amplifier was shipped to you, notify the carrier without delay and file a claim.

### INPUT CONNECTIONS

Keep input leads away from the output leads and AC power cables. Unless the driving source provides a low-impedance output, keep the input lead under ten feet in length. Refer to "Companion Units and Accessories" for Bogen preamplifiers suitable for use with the amplifier.

### TECHNICAL SPECIFICATIONS

	MT60A	MT125B
RATED OUTPUT POWER	60W	125W
TOTAL HARMONIC DISTORTION FREQUENCY RESPONSE HUM & NOISE REGULATION	Less than 2% at rated output 50 to 15,000 Hz 2 dB 20 to 20,000 Hz -85 dB below rated output Better than 2 dB no load to full load	
INPUT SENSITIVITY INPUT IMPEDANCE	200mV for rated output Hi-Z 50K ohm; Lo-Z 500/600 ohm with TL600 xfmr; Bridging input 1:1 with TL 100 xfmr	
CONTROLS AND INDICATORS OUTPUT LOADS (Const. Volt.)	Level control, illuminated power switch, speech filters 25V CT, 25V, 70V, 110V	
OUTPUT LOADS (Spkr. <b>Imp.</b> )	8 and 16 ohms (See <i>chart for other impedances</i> )	4, 8 and 16 ohms (See <i>chart for other impedances</i> )
SEMICONDUCTORS POWER CONSUMPTION	6 Transistors, 7 Diodes 120VAC, 60Hz, 180 watts @ Rated output 120VAC 60Hz, 25 watts @ Quiescent (no output) 48-56 VDC, 3 Amp @ Rated output 48-56 VDC, 350 mA @ Quiescent (no output)	10 Transistors, 6 Diodes 120VAC 60Hz, 360 watts @ Rated output 120VAC 60Hz, 45 watts @ Quiescent (no output) 48-56 VDC, 6 Amps @ Rated output 48-56 VDC, 600 mA @ Quiescent (no output)
OVERLOAD PROTECTION	AC Circuit Breaker Thermal Circuit Breaker Transient Protection Diodes	
DIMENSIONS	3.1" x 8.5" x 14" (8 x 21.5 x 36 cm)	5.25" x 8.5" x 15" (13 x 21.5 x 38 cm)
WEIGHT	18% lbs. (8.40 kg.)	27 lbs. (12.3 kg.)

**COMPANION UNITS AND ACCESSORIES**

Model	Description and Inputs
CAM	Mixer-Preamplifier, 4 Hi-Z/Lo-Z Bal MIC, 1 AUX
CDM	Mixer-Preamplifier, 6 Lo-Z Bal MIC
CSM	Studio Mixer, 4 Lo-Z Bal MIC
CFC-1	2/ 3 Octave Equalizer
RPK-37	Rack Mounting Kit 19" x 5¼" (48.26cm x 17.78 cm; mounts 2 units)
TL100	1: 1 Bridging Input Transformer
TL600	Line Input Transformer, plug-in, 500/600-ohm impedance

**High impedance input**

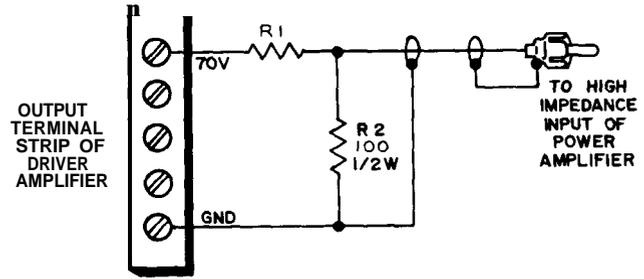
The amplifier can be driven to full output from any source developing 200 mV across one of the Hi-Z inputs. Wire a single-conductor, low-capacity shielded input cable to a standard phono plug (Cinch 18A, or equivalent) and connect to one of the Hi-Z jacks on the rear of the chassis. Amplifiers may also be connected in parallel by connecting a patch cord from Hi-Z input to Hi-Z input of the amplifiers without loss of gain.

**Low impedance input**

The amplifier will match a low-impedance (500/600 ohm) source if a Bogen Model TL-600 transformer is installed in socket XI on the circuit board. Connect a twisted, shielded pair (Bogen BB-8450, or equiv.) input cable to the BAL INPUT LOW Z terminal strip on the rear of the unit. Use the two outside terminals on the strip for input and connect the cable shield to the GND terminal. If an unbalanced input is required, connect a jumper from the GND terminal to an adjacent input terminal.

**CAUTION**

*Remove all power from unit before installing transformers.*



AT 70V R1 - 10K, ½ W  
AT 25V R1 = 3.3K, ½ W

74-0736-A

**Figure 1 – Input from another amplifier**

**Balanced bridging input**

The inputs for two or more amplifiers may be paralleled without loss of gain. To do this, install a Bogen Model TL100 transformer in socket XI. Connect the 600Ω source to the BAL LOW Z terminal strip on the rear of the unit. Use the two outside terminals on the strip and connect the cable shields to the GND terminal. If an unbalanced input is required, connect a jumper from the GND terminal to an adjacent input terminal.

**Input from another amplifier**

The amplifier can be driven from a standard public address amplifier that provides a 25-volt or 70-volt constant voltage output. To do this, connect the output of the amplifier to one of the Hi-Z INPUT jacks via a resistor network (see figure 1). The resistors shown in figure 1 are in addition to the normal loudspeaker load on the output of the public address amplifier.

**OUTPUT CONNECTIONS**

**CAUTION**

*Be sure to follow local electrical codes when connecting amplifier output.*

A variety of outputs is provided from the amplifier, either balanced or unbalanced. Refer to Table 1 for appropriate connections. Generally, the ground link does not need to be connected unless an unbalanced output is especially desired.

**TABLE 1 – Output Connections**

OUTPUT VOLTAGE	IMPEDANCE (ohms)		 1 2 3 4 5 6 7
	MT 60A	MT 125B	
*110V	260	125	** JUMPER 1 to 3 OUTPUT 2-7
70v	83.3	40	OUTPUT 3-7
50V	42	20	" 5-7
45V	-	16	" 3-6
32.5V	-	8to 10	" 4-6
31v	16	-	" 3-6
25v	8 to 10.5	4 to 5	" 3-5
* 13v	2.8	1.4	" 1-2
12.5V	2.5	1.25	" 3-4

*\*Unbalanced output only*

*\*\*Disconnect link between COM and GND*

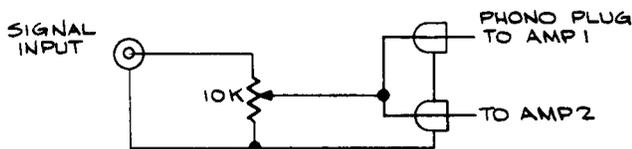


Figure 2 – External level control for amplifiers

### 70V constant-voltage output

For 70V constant voltage operation, connect the speaker leads to the 70V and COM terminals on the rear of the unit. If grounding is required, connect the link from COM to **GND**.

### 25V constant-voltage output

For 25V constant-voltage unbalanced operation, connect the speaker leads to 25V and COM, leaving the link connected between COM and GND. For balanced operation, open the link between COM 1 and GND. If the output transformer center tap must be grounded, connect a jumper between 25VCT and GND.

### CONNECTING AMPLIFIERS IN SERIES

#### CAUTION

*Connect only amplifiers of the same model in series; do not mix different amplifier types.*

Bogen MT125B or MT60A amplifiers may be connected in series to increase total power output *where absolutely necessary*

to a single speaker line. Typical output connections are shown in Table 2. *Note: GND straps on all except AMP 1 must be opened.*

### Input connections

If the amplifier Hi-Z inputs are being driven directly, simply parallel the amplifier Hi-Z inputs with a phono patch cord, and connect the input line to one amplifier. When a balanced input transformer is being used, parallel the inputs at the screw terminals.

### Level control adjustment

It is extremely important that the amplifiers have the same gain and produce equal power output. This adjustment is most easily accomplished by setting both amplifier level controls to maximum and then providing an external gain control as shown in figure 2. Make sure speech filter switches are in the same position. If an external control cannot be provided, amplifier gain must be set with the use of an external tone source, adjusting the amplifiers to produce the same output with inputs paralleled. Always keep level controls at approximately the same position even when setting up the amplifiers.

### CONNECTING AMPLIFIERS IN PARALLEL

It is not recommended that amplifiers be connected in parallel. However, this is sometimes unavoidable. If it is necessary to connect amplifiers in this configuration, consult our Engineering Department for instructions.

### POWER CONNECTIONS

The booster amplifier may be operated from 120VAC or 48V to 56VDC.

TABLE 2 – Amplifier Series Connection

No. of Amplfs.	Type	Total power	output	Connections
2	MT60A	120W, 42Ω	70v	
3	MT60A or MT125B	180W, 28Ω 375w, 13Ω	70v	
2	MT60A or MT125B	120W, 5.2Ω 250W, 2.5Ω	25v	
2	MT60A or MT125B	120W, 12051 250W, 58Ω	120v	
2	MT125B	250W 20Ω	70v	

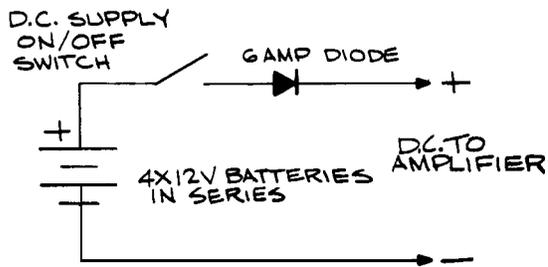


Figure 3 - DC connections

### 120VAC source

Connect the AC power cord to a 120VAC source. Use a 3-wire receptacle with the center pin connected to earth ground.

### 48V-56VDC source

Connect the amplifier to a DC source capable of delivering power indicated in the Technical Specifications table. A polarized plug is supplied with the amplifier for making DC connections. Connect DC cable to source, making certain to observe proper polarity. An isolation diode should be used in series with the DC supply as in figure 3.

## OPERATION

### VOLUME CONTROL

A volume control located on the rear of the unit is used primarily to compensate for variations in preamplifier output levels. The VOLUME control permits the gain of the amplifier to be preset so that the preamplifier volume control may be operated near the center of its range, rather than at an extreme maximum or minimum. The VOLUME control is a screwdriver adjustment which needs to be set only once for any given preamplifier input.

### DC POWER OPERATION

When the amplifier is operated from a DC power source, the AC power switch and AC power indicator lamp will be inoperative. Turn the amplifier on and off from the power switch on the DC power supply or by inserting and removing the DC power leads on the rear of the unit.

### AC OPERATION

There are two overload protective devices used with AC operation, the circuit breaker and the temperature overload thermal breaker.

#### AC circuit breaker

If the circuit breaker opens, the AC power lamp will go out and the amplifier will have no output. Set the AC power switch to off and momentarily depress the red button on the circuit breaker to reset it. Return the AC power switch to on. If the breaker trips again, do not attempt to reset it but have the trouble investigated by a qualified technician.

#### Thermal breaker

If the thermal breaker opens, there will be no audio output but the AC power lamp will remain on. Wait approximately five minutes for the breaker to reset. If the breaker resets and then opens again, investigate the cause of the high temperature overload. This may be due to improper connections at the output terminals or to excessive environmental heat with inadequate ventilation. The thermal breaker will open when the temperature at any one of the output transistors is excessive.

## MAINTENANCE

### CAUTION

*There are no user-replaceable parts within the unit. Have all internal servicing done by a qualified technician.*

### BOGEN SERVICE

We are interested in your Bogen equipment for as long as you have it. If trouble ever develops, 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, N.J. 07652.

When communicating with us, give the model and series designation of your unit. Describe the difficulty and include details on the electrical connections to and the types of associated equipment, such as preamplifier, speakers, etc. We will send you service information if the trouble appears simple. If the trouble requires servicing, we will send you the name and address of the nearest authorized Bogen service agency.

Before returning any equipment to Bogen, contact the Bogen Service Department at the above address. If you do ship the unit, pack it carefully to avoid damage in transit. Send the unit fully insured and prepaid. It will be promptly repaired and returned to you freight collect.

### REPLACEMENT PARTS

Most components used in the amplifier are standard parts available through reputable parts suppliers. The parts listed here may be obtained from Bogen distributors, service agencies or directly from the factory. When ordering a part, specify the part number and the description of the part as listed. Specify the model of the unit and give the series designation, which is a letter followed by numbers, stamped on the chassis. For parts on circuit boards, also give the component board assembly number, which begins with "45".

When replacing transistors, use those made by the manufacturers specified. Transistors from other suppliers may not be satisfactory. Certain resistors must be Allen-Bradley. These are designated by "AB" on the schematic diagram.

#### Replacing transistors

If a transistor must be unsoldered for testing or replacement, be certain to remove all power from the unit to prevent possible voltage transients in the circuit which might damage the transistor. To prevent overheating the transistor when soldering or unsoldering a lead, grip the lead between the point of heat and the case with pliers or tweezers. These will act as a heat sink to conduct heat away from the transistor. Do not bend a transistor lead closer than 1 / 16" from the transistor case.

Power transistors must be properly mounted to insure good heat dissipation. Make certain there is no foreign matter on the contact surfaces between the transistor and the heat sink and brush a thin coating of heat transfer compound (such as Dow Corning No. 340 Compound silicon grease) on both surfaces. Similarly coat any insulators used between the transistor and the heat sink and secure the transistor firmly to the heat sink.

**Schematic**

Ref. Part No. Description

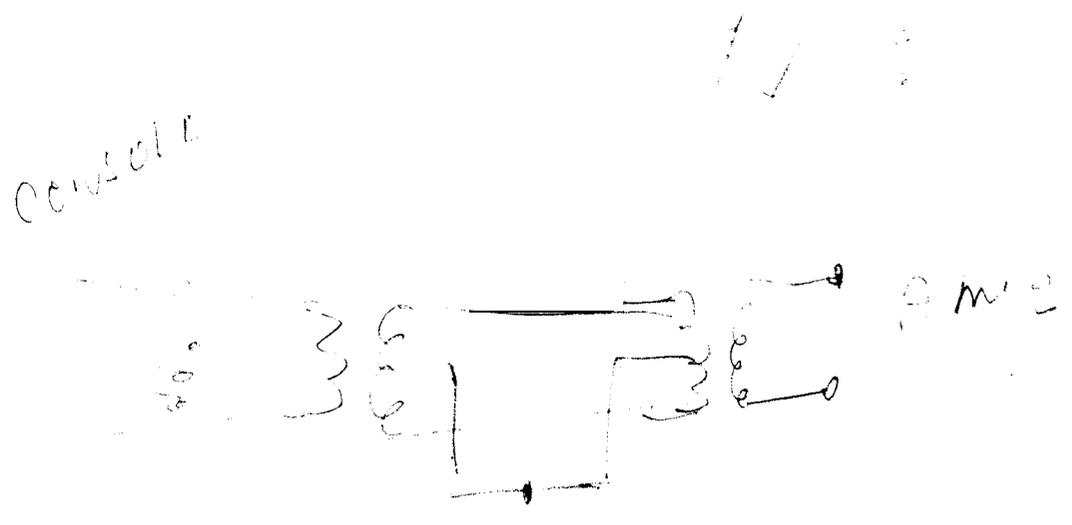
*Chassis*

CI01	79-1 18-004	Cap, elect, 8800 $\mu$ F, 75V (MT-125B)
CI02	79-1 18-002	Cap, elect, 13,000 $\mu$ F, 40V (MT-125B)
C201	79-509-05s	Capacitor, electrolytic, 6000 $\mu$ F, 75V (MT-60A)
C202	79- 118-006	Cap, elect, 5000 $\mu$ F, 50V (MT-60A)
CB201	94-0017-09	Circuit breaker, hold, 1.65A (MT-60A)
	94-0017-18	Circuit breaker, 3.9A (MT-125B)
CB102	94-0014-07	Thermal breaker, 105°C
CR101	96-52024 1	Diode, HVR3
CR202, 203	96-5241-01	Diode, 300 piv @ 3A (MT-60A)
CR102	96-5373-01	Bridge rectifier, 35A (MT-125B)
LI01	95-5173-01	Coil, .5 $\mu$ H
QI01, 102	96-5385-01	Transistor, 2N3055H RCA (MT-60A) or
Q101-106	96-5385-01	Transistor, 2N3055H RCA (MT-125B)
R204	76-114-101	Resistor, .1 ohm, 5W (MT-60A)

R102, 103, 105, 106	76-1 14-099	Resistor, .22 ohm, 5W (MT-125B)
R104, 107	76-1 14-107	Resistor, 3.3 ohm, 5W (MT-125B)
SIO1	81-100-001	Switch, power
T201	83-755-000	Transformer, power (MT-60A)
TIO1	83-794-000	Transformer, power (MT-125B)
T202	83-450-000	Transformer, output (MT-60A)
T102	83-454-000	Transformer, output (MT-125B)
FIO1	94-0005- 18	Fuse, 3A slo-blo (MT-60A)
FIO1	94-0005-20	Fuse, 6¼A slo-blo (MT-125B)

*P.C. board*

—	45-7084-01	Board assembly (MT-125B)
—	45-7048-01	Board assembly (MT-60A)
c2	79-5 12-040	Capacitor, tantalum, 6.8 $\mu$ F, 35V
C4	79-008-065	Cap, electrolytic, 10 $\mu$ F, 63V
c9	79-008-062	Cap, elect, 100 $\mu$ F, 50V
C10	79-1 12-001	Cap, elect, 500 $\mu$ F, 65V
CR1-4	96-5333-01	Diode, 400 piv @ 1A
Q1	96-5321-01	Transistor, MPS-6767
Q2	96-5365-0 1	Transistor, MPS-A56
Q4	96-5316-01	Transistor, (2N6107)
Q3	96-5327-01	Transistor, (2N6292)
R1	77-001-743	Control, 200 kohm, screw-adjust
R3	75-1 54-304	Resistor, 300 kohm, 1/4W, 1%
R4	75-154-104	Resistor, 100 kohm, 1/4W, 1%
R8	75-154-124	Resistor, 120 kohm, 1/4W, 1%
R11	76-520-680	Resistor, 68 ohm, 1/2W, 5%, fire retardant
R16, 17	76-107-096	Resistor, .82 ohm, 2W
R20	76-1 14-101	Resistor, .1 ohm, 5W (MT60A)
S1	8 1-003-067	Switch, slide DPDT



consolid

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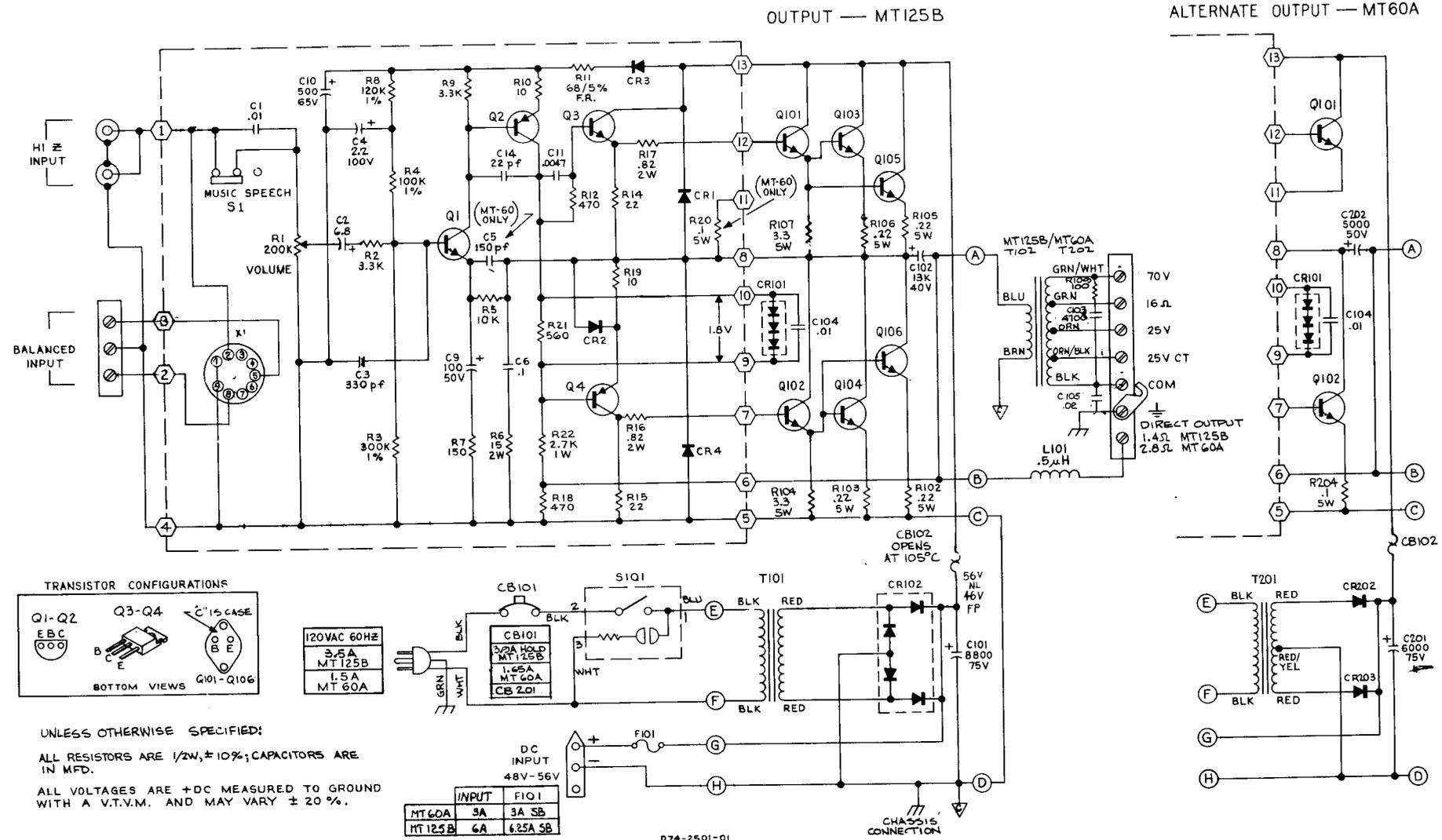


Figure 4 — Schematic diagram, MT 60A/MT 125B