McMartin

10 WATT UNIVERSAL AMPLIFIER LT–80C/108C

instruction manual

mcmartin industries inc. • 4500 south seventy sixth street • omaha, nebraska 68127

LT-80C/108C

INSTRUCTION MANUAL

INDEX

A. SPECIFICATIONS

Power output:	10 watts rms---16 ohms unbalanced; 25/70.7 volt balanced line 12.5 watts rms---8 ohms unbalanced 15 watts rms---4 ohms unbalanced
Frequency Response:	±1 dB, 50-15,000 Hz
Distortion:	1% or less, 50-20,000 Hz at 12.5 W output
Hum & Noise:	
Mic:	60 dB below 10 watts output
Pgm:	70 dB below 10 watts output
Outputs:	4/8/16 ohms unbalanced; 25/70.7 volt balanced line
Program/Line Input:	25K-ohm unbalanced; 600 ohms balanced with optional MT-3 plug-in card
Program/Line Sensitivity:	300 millivolts, 25K ohm unbalanced input -10 dBm (balanced 10K ohm bridging with MT-3 plug-in card) 0 dBm (balanced 600-ohm matching with MT-3 plug-in card)
Operating Temperature:	to 150° F
Power Requirements:	115 VAC, 50/60 Hz, 30 watts (Primary taps for 105 and 125 VAC)
Mic Input:	150 ohms balanced (internal transformer)

	LT-80C	108-C
Mic Termination:	XL 3-pin male connector	Screw terminals

B. GENERAL DESCRIPTION

The McMartin LT-80C and 108C are conservatively rated wide power-bandwidth amplifiers capable of delivering from 10 to 15 watts rms, depending on the output load impedance.

The two models utilize identical printed circuit boards and differ only in certain features.

The low-impedance microphone input for the LT-80C appears on a rear-chassis mounted, three-pin, push lock XL male receptacle. The 108C microphone input appears on screw terminal connections on the rear chassis.

The LT-80C incorporates electronic muting. This permits quiet alternate-action muting of the microphone and program inputs. A single-pole external closure is required to enable the microphone channel and mute the program channel during paging operation.

The LT-80C and 108C provide identical 20 dB treble cut tone controls. In the LT-80C this is a front panel knob control. In the 108C, the tone control is recessed behind the front panel and is a screw driver adjustment.

Both models employ automatic electronic drive limit circuitry which senses the output stage collector currents and attenuate the input signal if an overload condition occurs.

C. INSTALLATION

The LT-80C and 108C are designed for either shelf or rack mounting. The 3½" height allows for mounting in a standard 19" rack by addition of two rack mount brackets furnished in the MRP-3 kit. These brackets attach to the sides of the unit with four #6-32 screws (provided).

Two units may also be rack mounted side by side in a 3½" rack panel height. The MRP-4 kit must be used for this installation. When fastening the two units together, it is necessary to first remove the top covers. Secure the two amplifiers with the four #6 washer head sheet metal screws. Use the four #6 flat washers as spacers between the two units. The rack mount ears are then attached as with the MRP-3 kit. The top covers may be reinstalled and secured with the two screws in one end of each cover.

The amplifier should be located so that operating temperatures are below 150°F.

After mounting the amplifier, connect all input and output cabling and apply power. Adjust gain levels and tone control as desired for both microphone and program. The LT-80C is factory shipped with the electronic muting disabled. This leaves the microphone and program channels open at all times. To activate the mute circuit, the top cover must be removed and jumpers J1 and J2 must be cut. Removing J1 enables the microphone mute, and removing J2 enables the program mute. A SPST closure between the mute terminal and ground allows for alternate control of either channel. With mute line open, the program is on and the microphone channel is off. Grounding the mute terminal mutes the program and opens the microphone channel.

If balanced line input is required on the program channel, it will be necessary to install the MT-3 transformer plug-in card. This provides 600-ohm balanced matching input. If bridging input is required, it will be necessary to remove the input pad shunt resistor, and the shunt resistor on the secondary side of the input transformer. (See MT-3 schematic).

INSTALLATION (continued)

The units are shipped from the factory wired for 115/125V operation. If the line voltage is consistently above or below this value, the power transformer primary connection may be changed (See Schematic).

D. FIELD SERVICING

The LT-80C or 108C, once installed, should require very little maintenance. Low powered solid state amplifiers generally do not create many field problems. The current-limiting short circuit protection will prevent output stage failure even with a dead short on the output of the unit. All components are operating well within manufacturer's specifications. The amplifiers are totally enclosed to prevent accummulation of dirt in controls and power switch, or the inadvertant entry of foreign metal objects.

In the event the amplifier does not appear to be working, the following preliminary checks should be followed:

1. Make certain that AC power is being provided to the amplifier. Check the power source, line cord plug, and the position of the front panel power switch. Also check the ½ ampere line fuse.
2. Check speaker system and speaker connections on the rear panel of the amplifier. Make sure speaker load is connected to the proper terminals. If any question exists regarding speaker system impedance, a device such as the McMartin TX-700 may be used to check the load.
3. Make certain that signal is being applied to the amplifier. Check for shorted or open microphone wiring. Make sure the push-lock microphone connector is fully inserted in the rear panel microphone receptacle on the LT-80C.

Also check program source for proper connections and signal. Remember, if balanced line input is used, an MT-3 input transformer card must be inserted in the internal line transformer input socket. If unbalanced program input is used through the rear panel pin jack, the jumper must be installed in the transformer socket. Check for proper front panel control settings and also check the remote switch closure for the mute circuit if used. The mute line must be open to enable the program input and closed to enable the microphone input.

In the event the above conditions are satisfied and the system is still not operating, it may be assumed the amplifier is at fault. The unit should be removed from the installation and sent back to the factory or service shop for repair.

E. SHOP REPAIR AND SERVICING

Shop repair should be performed only by persons familiar with solid state audio equipment. McMartin Industries has a full time staff of qualified personnel to provide this service. Factory repair also insures that original equipment parts will be used rather than similar type replacements.

The following chart should be helpful if shop repair is attempted:

SYMPTOM	CAUSE
Fuse fails when power applied	Shorted driver and output transistors (Q10, 11, 12, 13 LT-80C) (Q7, 8, 9, 10 108C)
	Shorted rectifiers (D7, 8 LT-80C) (D4, 5 108C)
	Shorted filter capacitor (C21 LT-80C) (C19 108C)
	Shorted output capacitor (C19 LT-80C) (C17 108C)
	Open bias diodes (D5, 6 LT-80C) (D2, 3 108C)
	Shorted power transformer
	Shorted primary wiring
Distorted output at low levels	Incorrect bias current adjustment
	Insert 0-100 milliampere DC meter in series with power transformer center tap. Adjust idling current for 20-30 milliamperes, (amplifier cold), with normal line voltage (115-120 VAC)
	Caution: Short meter leads when applying power. The filter capacitor inrush current will damage the meter if this procedure is not followed.
No output or distorted output at all levels	Open output transistor (Q11 or Q13 LT-80C) (Q8 or Q10 108C)
	Low DC supply voltages, check 24 VDC preamplifier voltage (positive end of C22 LT-80C)(C20 108C) and also 36 VDC

SYMPTON	CAUSE
	(positive end of C21 LT-80C) (C19 108C). Defective protection circuit transistor or diode. (Q8, D4 LT-80C) (Q5, D1 108C) Open output stage emitter resistor (R42, 43 LT-80C) (R37, 38 108C) Defective boost amplifier (Q7 LT-80C) (Q4 108C)
Output normal on microphone but no program output (LT-80C)	Mute circuit defect (shorted Q5 or D3 or open Q6) Jumper or transformer missing. Mute line grounded.
Output normal on program but no output through microphone channel	Defective microphone transformer (T1 LT-80C) (T3 108C) Defective preamplifier (Q1, 2, 3 LT-80C and 108C) Defective mute circuit; check (Q4). (LT-80C) No supply voltage on preamplifier (+24VDC) No mute line closure (LT-80C)
Output normal on 4-16 ohms but no output on 25V or 70.7V terminals	Defective output transformer (T2 LT-80C) (T1 108C)

F. WARRANTY

McMartin products are warranted to be free from defects and workmanship for a period of one year after shipping date, when subjected to normal usage and service. All warranties are void if (a) equipment has been altered or repaired by others without McMartin's specific prior authorization; or (b) equipment is operated under environmental conditions or circumstances other than those specifically described in McMartin literature or instruction manuals.

Upon notification within the applicable warranty period, McMartin agrees without charge, to repair, replace, or supply replacement parts for any properly maintained equipment or parts that are defective as to design, materials, or workmanship and that are returned in accordance with McMartin's instructions to the Buyer. At McMartin's sole discretion, the Buyer may be requested to return the defective part of equipment to McMartin, FOB Omaha, Nebraska. Parts or equipment may be returned only with McMartin's prior authorization and must be identified by a return authorization number issued by McMartin's Customer Service Department. All merchandise so returned must be sent transportation prepaid, at Buyer's risk. Full details of the failure or malfunction should be included so as to expedite repair or replacement. Repair parts or repaired or replaced equipment will be returned to the Buyer, FOB factory.

G. PARTS LIST

The components contained in the LT-80C/108C amplifiers are of values and/or tolerances generally available from local electronics wholesalers. Those items of critical values or tolerances, or of McMartin manufacture are listed below.

LT-80C

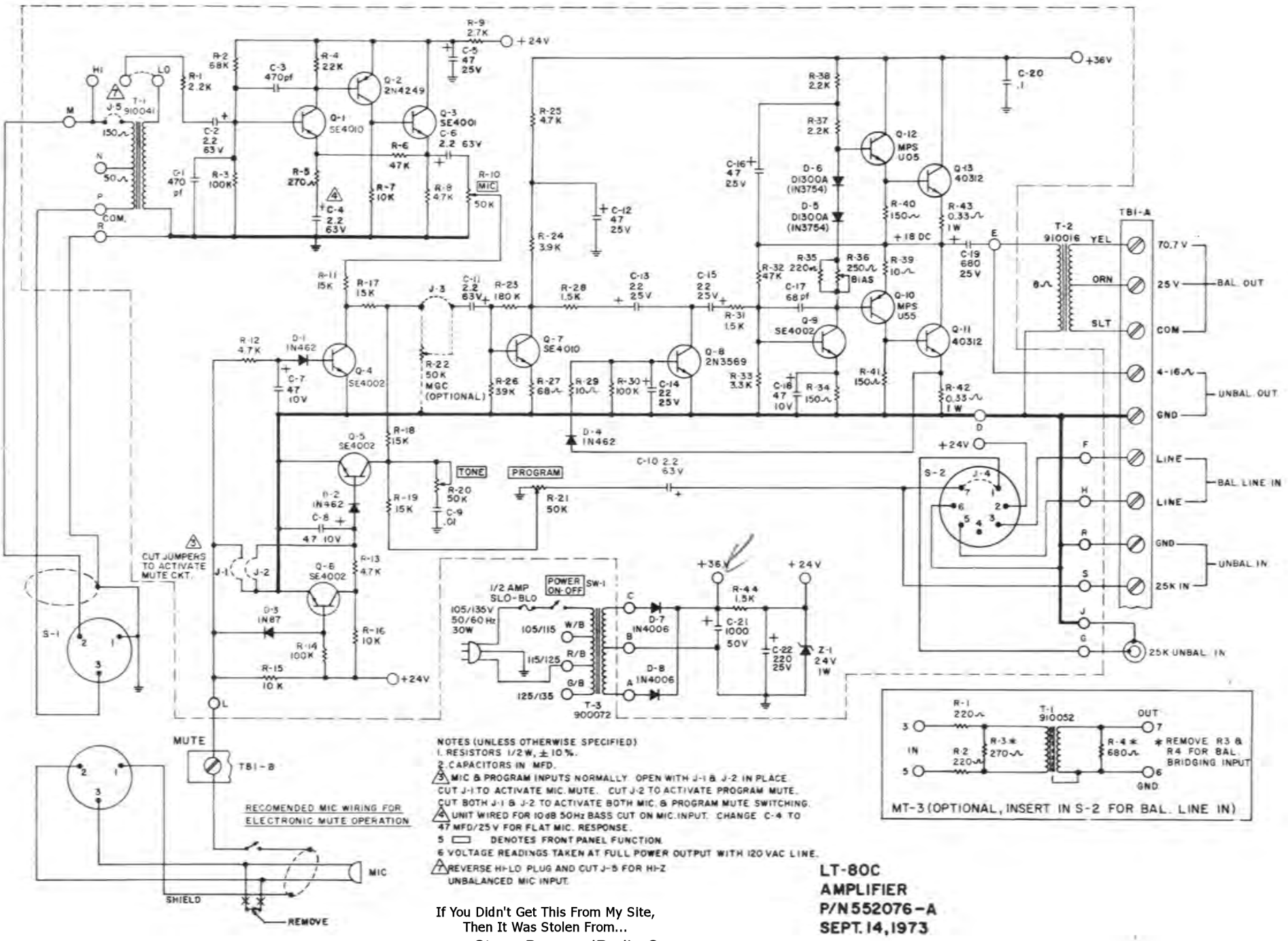
Symbol	McMartin Part No.	Description
D 1,2,4	220003	1N462 diode
D 3	220006	1N87 diode
D 5,6	220014	1N3754 diode
D 7,8	210008	1N4006 diode
Q 1,7	201050	SE-4010 transistor
Q 2	201052	2N4249 transistor
Q 3	201022	SE-4001 transistor
Q 4,5,6,9	201049	SE-4002 transistor
Q 8	201056	SN3569 transistor
Q 10	201072	MPS-U55 transistor
Q 11, 13	201058	40312 transistor
Q 12	201071	MPS-U05 transistor
R 10, 20, 21	400039	50K-ohm control, nylon shaft
R 36	400050	250-ohm trim potentiometer
T 1	910041	Input transformer
T 2	910016	Output transformer
T 3	900007	Power transformer
Z 1	220011	24-volt, 1-watt Zener diode

108-C

D 1	220003	1N462 diode
D 2,3	220014	1N3754 diode
D 4,5	210008	1N4006 diode
Q 1,4	201050	SE-4010 transistor
Q 2	201052	2N4249 transistor
Q 3	201022	SE-4001 transistor
Q 5	201056	2N3569 transistor
Q 6	201049	SE-4002 transistor
Q 7	201072	MPSU55 transistor
Q 8, 10	201058	40312 transistor
Q 9	201071	MPSU05 transistor

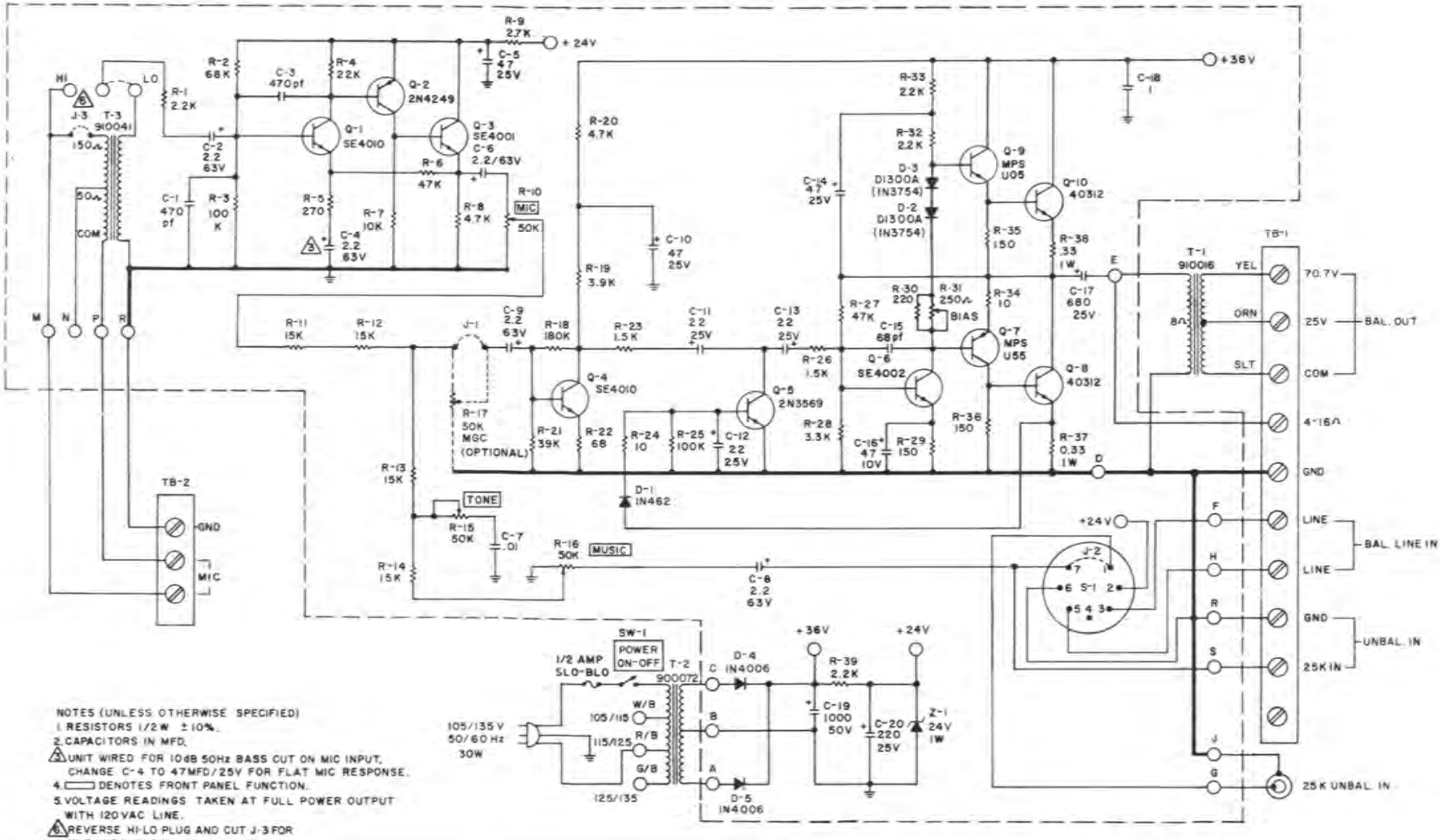
108-C

R 10,15,16	400039	50K-ohm control
R 31	400050	250-ohm trim potentiometer
T-1	910016	Output transformer
T-2	900007	Power transformer
T-3	910041	Input transformer
Z-1	220011	24-volt, 1-watt Zener diode

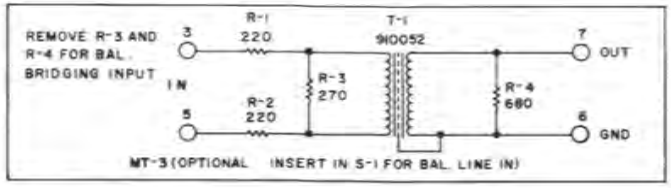


NOTES (UNLESS OTHERWISE SPECIFIED)
1. RESISTORS 1/2 W, ± 10 %.
2. CAPACITORS IN MFD.
3. MIC & PROGRAM INPUTS NORMALLY OPEN WITH J-1 & J-2 IN PLACE. CUT J-1 TO ACTIVATE MIC. MUTE. CUT J-2 TO ACTIVATE PROGRAM MUTE. CUT BOTH J-1 & J-2 TO ACTIVATE BOTH MIC. & PROGRAM MUTE SWITCHING.
4. UNIT WIRED FOR 10 dB 50 Hz BASS CUT ON MIC. INPUT. CHANGE C-4 TO 47 MFD/25 V FOR FLAT MIC. RESPONSE.
5. ▭ DENOTES FRONT PANEL FUNCTION.
6. VOLTAGE READINGS TAKEN AT FULL POWER OUTPUT WITH 120 VAC LINE.
7. REVERSE HI-LO PLUG AND CUT J-5 FOR HI-Z UNBALANCED MIC INPUT.

LT-80C
AMPLIFIER
P/N 552076-A
SEPT. 14, 1973



NOTES (UNLESS OTHERWISE SPECIFIED)
1. RESISTORS 1/2 W ±10%.
2. CAPACITORS IN MFD.
3. UNIT WIRED FOR 10dB 50Hz BASS CUT ON MIC INPUT, CHANGE C-4 TO 47MFD/25V FOR FLAT MIC RESPONSE.
4. ▭ DENOTES FRONT PANEL FUNCTION.
5. VOLTAGE READINGS TAKEN AT FULL POWER OUTPUT WITH 120VAC LINE.
6. REVERSE HI-LO PLUG AND CUT J-3 FOR HI-Z UNBALANCED MIC INPUT



108C
AMPLIFIER
P/N 552077-B
SEPT. 17, 1973