



**instruction
manual**

McMartin®

MS-25B

25 WATT AMPLIFIER

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MS-25B

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I. SPECIFICATIONS

POWER OUTPUT...25 watts rms 35 watts music 50 watts peak
DISTORTIONLess than 2% THD @ rms rated power 50-15000 Hz
OUTPUT REGULATION .....	.....2 dB
FREQUENCY RESPONSE	
Music Channel ..	.....±1.0 dB 30-15000 Hz ±1.5 dB 20-20000 Hz
Mic Channel ....	.....Flat response ±2 dB 50-15000 Hz Equalized for speech, -12 dB @ 50 Hz
Aux Channel.....	.....±1.5 dB 20-20000 Hz
Music Tone Compensation ...	.....Bass ±15 dB @ 50 Hz Treble ±15 dB @ 15 kHz
HUM & NOISE	
Music Channel ..	.....70 dB below rated power output
Mic Channel ....	.....60 dB below rated power output
Aux Channel.....	.....70 dB below rated power output
INPUTS (4)	
Music .....	.....25K-ohm standard 10K-ohm bridging or 600-ohm matching with optional MT-4 or MT-6 input transformer
Microphone.....	.....50-150-ohm balanced
(2 optional)	
Auxiliary .....	...40K-ohm nominal, auxiliary gain control standard
GAIN	
Music	
Bridging 600-ohm with optional	
MT-4,MT-6 ...	.....54 dB
Matching.....	.....64 dB
Auxiliary .....	.....44 dB
Microphone.....	.....108 dB
OUTPUTS.....	....8 ohm unbalanced, 25 and 70.7 V balanced

II. GENERAL DESCRIPTION

BASIC AMPLIFIER

The amplifier consists of a complementary power amplifier circuit, power supply, and speaker line matching transformer. This basic unit may be used for back-

ground music applications where microphones and tone equalization are not required. Provision is made for two medium level inputs; (1) music input - which may be used unbalanced or balanced with the MT-4 or MT-6 (600 ohms or 10 K bridging) transformers, front and rear panel control, (2) auxiliary inputs which may be used for an auxiliary program source. This input is unbalanced only and may be adjusted by a rear panel screwdriver adjust control which comes as standard equipment. Output connections provide for either 8 ohm unbalanced load or 25 volt and 70.7 volt balanced speaker systems. A three wire unswitched utility outlet (300 watt capacity), AC power indicator light and maximum output indicator light also come standard with the basic amplifier. Electrical protection is provided by AC fusing as well as diode current limiting for short circuit fault protection.

The basic amplifier provides for insertion of additional accessory modules such as one or two microphone preamplifiers with balanced input, telephone page adaptor, feedback type individual bass and treble controls and an electronic page mute adaptor for controlling all input muting. See catalog sheets for full MSA-Module items. For convenience, the most commonly used modules, MSA-1, 2 & 3 are described here.

TONE CONTROLS (MSA-2)

A separate plug-in circuit card (MSA-2) is available for bass and treble tone equalization for installations where this is desired. The tone controls affect the music channel only and provide 15 dB of bass boost or cut and 15 dB of treble boost or cut. They are screwdriver adjustable through the rear panel to prevent tampering. The tone control network is of the active feedback type having unity gain with the controls centered. Therefore, the input sensitivity does not change when the controls are installed.

MICROPHONE PREAMPLIFIER (MSA-1)

The microphone preamplifier is a self-contained plug-in module (MSA-1) with 40 dB gain, circuit board mounted gain control, and mu-metal shielded transformer accepting lo-Z balanced microphones. The three stage preamplifier provides for 30 dB of overload, instantaneous overload recovery, RF suppression, paging connection (12 dB bass cut), two microphone input impedance taps, and reversible front panel gain control for either external or concealed screwdriver adjustment. Either one or two of these modules may be installed in the MS-25B. Screw terminal connections are provided on the rear panel for microphone termination.

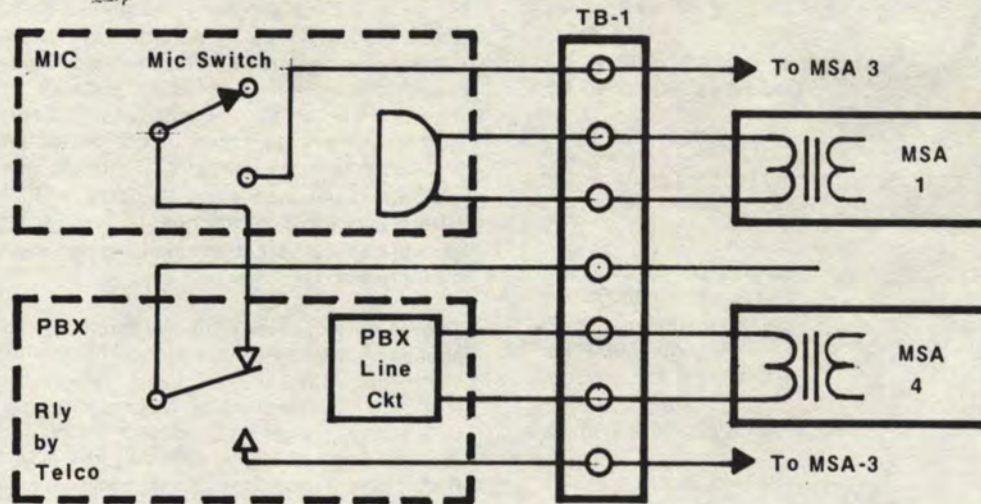
PAGE MUTE MODULE (MSA-3)

Microphone and program muting is accomplished by a separate plug-in electronic gating module. This circuit when installed mutes both microphone channels and leaves the auxiliary input and music input on. When either or both microphone inputs are activated (by grounding the appropriate mute connection) the music and auxiliary inputs are muted and the microphone channel is activated. A screwdriver adjust control is also provided on the module (accessible through the rear panel) to adjust the music level while the microphone channel is activated if complete muting of the music is not desired. By changing the location of one resistor on the power amplifier board it is also possible to bypass the mute circuit on the auxiliary input channel to keep this input open at all times.

If priority of input is desired (MIC-1 over MIC-2, etc.) the 'ground' path is simply run in series through the muting contacts as shown in Figure 1.

RACK MOUNTING KIT (MRP-1)

The MS-25B requires 3½" of rack space and may be rack mounted by the addition of the optional rack mounting kit.



NOTE: Series ground must originate at amplifier.

Figure 1 CHANNEL 2 HAS PRIORITY

III. INSTALLATION AND OPERATION

The MS-25B is designed to operate from line voltages of 105 to 125 volts AC. Both are equipped with power transformer primary taps for 105-115 volts AC and also 115-125 volts AC. The amplifier is normally shipped with the tap connected for 115-125 volts AC. Actually, higher line voltages than this may be tolerated for short periods without endangering the safety of the amplifier. The primary tap should only be changed to the 105-115 volt position in the event of sustained low line voltage.

After selecting a suitable location for the amplifier, remove the top cover and install the necessary accessory circuit cards, line transformer, etc. Connect the speaker lines to the 25, 70.7 or 8 ohm connections as required. Also connect all inputs, unbalanced or balanced music inputs, microphones, page mute, etc.

Balanced music inputs may be connected for either 10K ohm bridging or 600 ohm matching input (connections are provided on the rear chassis terminals). Unbalanced program sources may be fed to either the auxiliary input (phono plug) or the 10K ohm terminals without the line transformer installed. (Make sure jumpers are installed in socket from pins 5 to 8 and 6 to 9). The 10K terminal marked (G) is the ground connection for unbalanced input.

Balanced microphone inputs should be connected to the appropriate screw terminals on the rear of the unit. The ground connections are for shield grounds and for the page mute ground returns. A three-conductor microphone cord with shield may be used with one lead for the page mute line. The page mute circuit may then be activated by a remote microphone switch. **NOTE:** Always disable

the microphone audio line shunt switch when using the MSA-3 mute module (See Figure 1)

Once all connections have been made, apply power and set controls on front panel to the appropriate levels. A gain limit control is provided on the rear of the unit to set the maximum level of the music input. The gain control for the auxiliary input, the tone controls, and the music mute level controls are also located on the rear of the unit. When maximum output of the amplifier has been reached (with proper loading) the maximum output light will flash, indicating the 70.7 volt line level clipping point has been reached. This light may flash occasionally with program peaks, but should not stay on continuously. Overdriving the amplifier in this manner will cause excessive distortion.

INSTALLATION AND REMOVAL OF MODULES

To install page-mute and tone control modules, it is necessary to remove the amplifier top cover, (remove jumper from pins 4 and 7 and resistor from tone control socket) and carefully plug the modules in the appropriate sockets. Position the printed circuit board mounting stud over the chassis hole and secure board with one number 4-40 screw.

To install microphone preamplifiers insert felt washers over control shaft, remove hole plug and install preamplifiers; then proceed the same as above for the tone controls. After the preamplifier is secured, place one nylon washer over outside of control shaft and install knob. Squeeze control and knob together gently and tighten set screw. Be sure control is turned full counter clockwise and knob pointer is set over 0° mark. (7 o'clock position).

IV PARTS LIST

Non-Standard parts only (all other parts available locally)
 Basic amplifier (Power amplifier, power supply and chassis)

SYMBOL	P/N	DESCRIPTION
Q-1	201050	Transistor SE 4010
Q-2, 3	201056	Transistor 2N 3569
Q-4, 6	201067	Transistor MJE 2901
Q-5	201068	Transistor MJE 2801
D-1, 2, 3, 4, 5	210008	Diode Rectifier 8D8 800 PIV at 750 MA
Z-1	220008	Diode Zener 36 Volts
R-15, 29, 30	400042	Control 50 K Linear
R-19	502028	*Resistor 3.3 ohm 1/2 watt
R-28	400039	Control 50 K Audio
C-7	600039	Capacitor 1000 MFD at 50 Volts DC
C-11, 12	600040	Capacitor 1000 MFD at 75 Volts Tubular
F-1	280009	Fuse 0.75 Amp 125 volts slo blo
PL-1	291001	Pilot Lamp WHT Lens NE 2 PT
PL-2	291002	Red Lens NE 2 PT
SW-1	480011	Switch Rocker
T-1	900047	Transformer 2-P-117 A
T-2	910043	Transformer 2-A-93 A

*This value may vary from 0 to 10 ohms

PARTS LIST MSA-1 (MICROPHONE PREAMPLIFIER MODULE)

SYMBOL	P/N	DESCRIPTION
Q-1	201052	Transistor SE 4010
Q-2	201050	Transistor 2N 4249
Q-3	201022	Transistor SE 4001
R-7	400039	Control 50 K Audio
T-1	910041	Transformer Input Microphone

PARTS LIST MSA-2 (TONE CONTROL MODULE)

SYMBOL	P/N	DESCRIPTION
Q-1, 2	201049	Transistor SE 4002
Q-3	201022	Transistor SE 4001
R-2, 11	400042	Control 50 K Linear

PARTS LIST MSA-3 (PAGE MUTE MODULE)

SYMBOL	P/N	DESCRIPTION
Q-1, 2, 3, 4	201049	Transistor SE 4002
D-1, 2, 3	220003	Diode IN 462
D-4, 5	220006	Diode IN 87
R-3	400042	Control 50 K Linear

V. 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.

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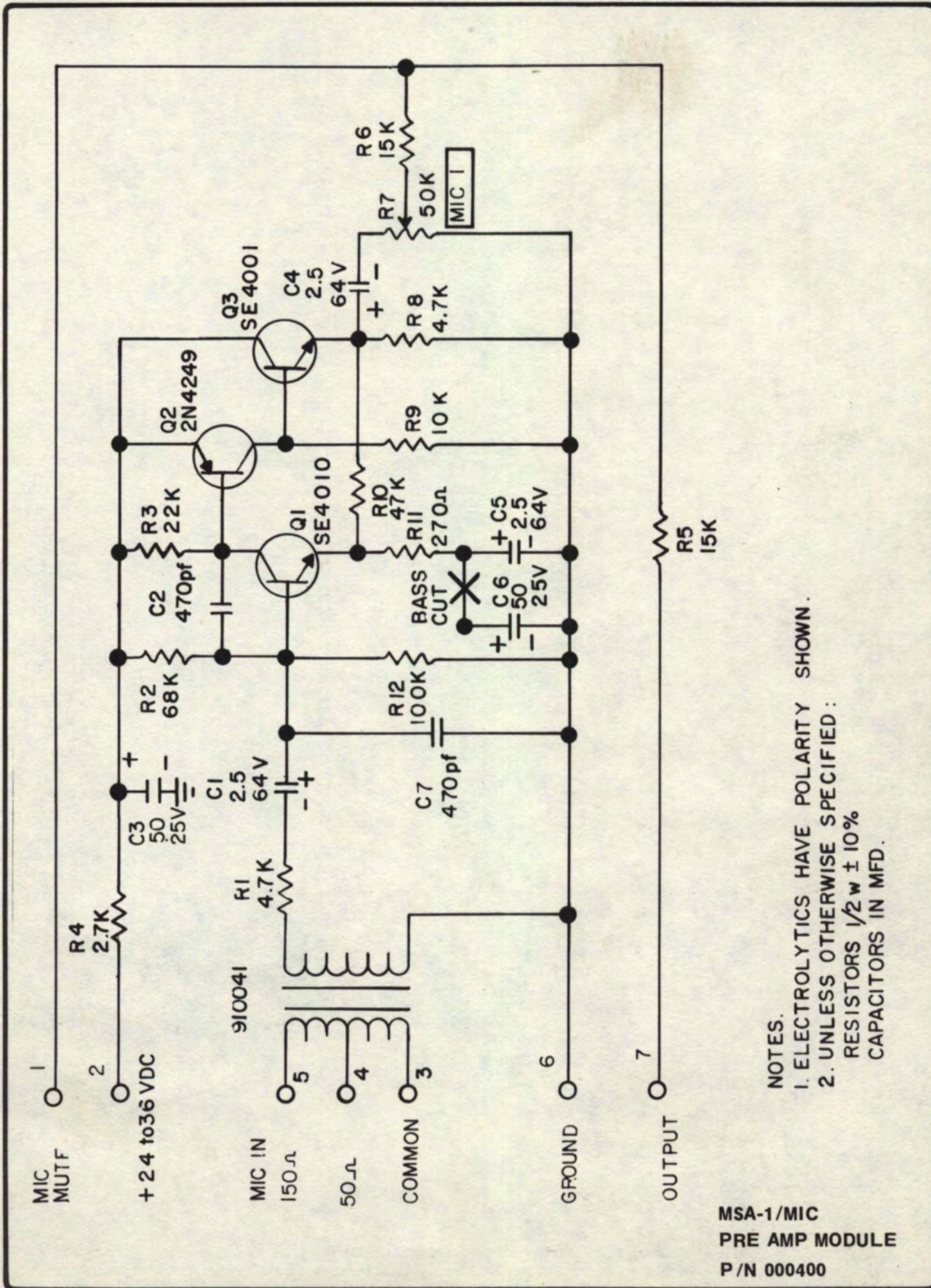
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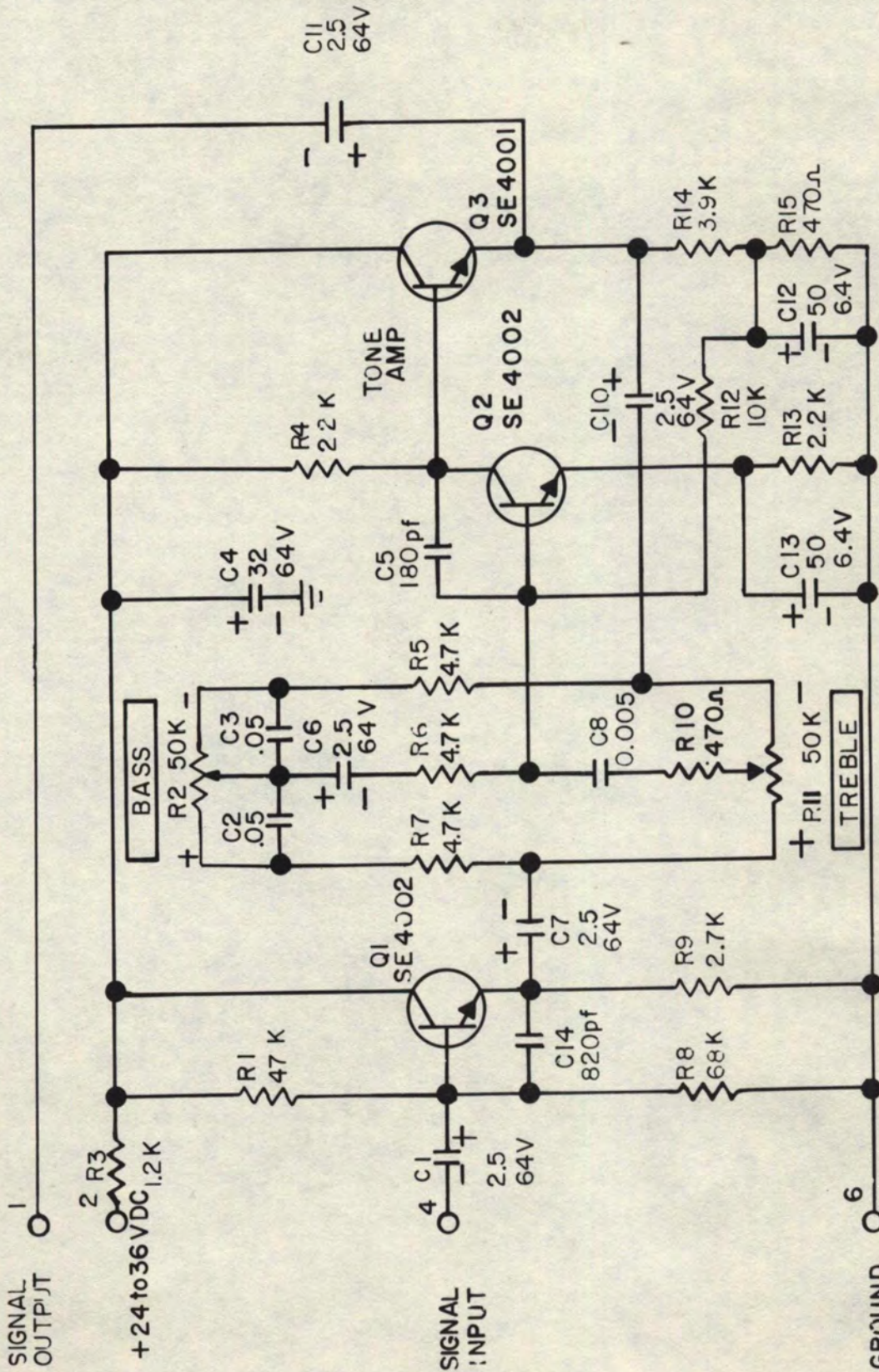
V. SCHEMATIC DIAGRAMS

			page
MSA-1	MIC PRE AMP MODULE	P/N 000400	6
MSA-2	TONE CONTROL MODULE	P/N 000401	7
MSA-3	PAGE MUTE MODULE	P/N 000402	8
MS-25B	MASTER SCHEMATIC	E-2706	9



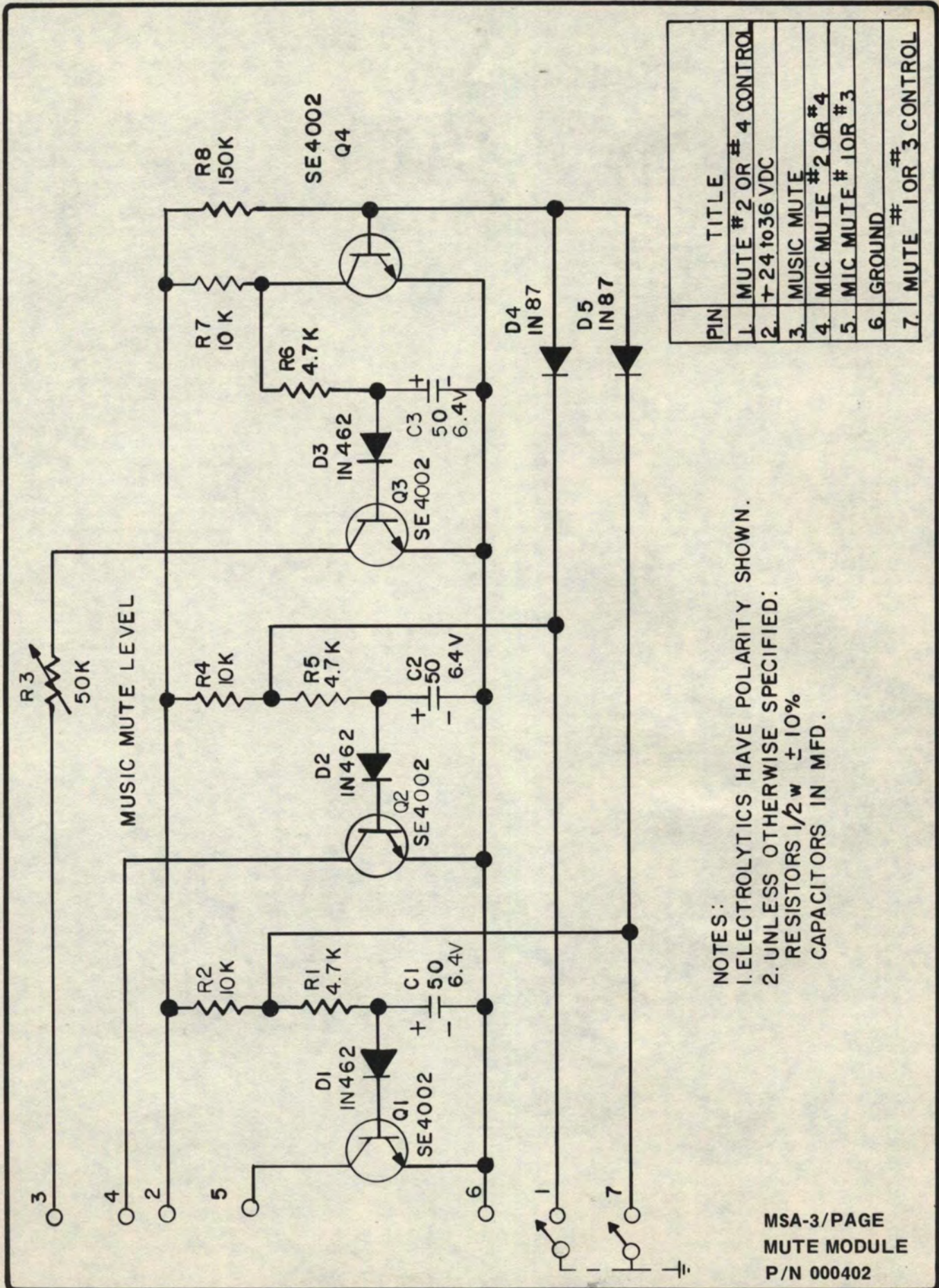
NOTES.
 1. ELECTROLYTICS HAVE POLARITY SHOWN.
 2. UNLESS OTHERWISE SPECIFIED:
 RESISTORS 1/2 w ± 10%
 CAPACITORS IN MFD.

MSA-1/MIC
 PRE AMP MODULE
 P/N 000400



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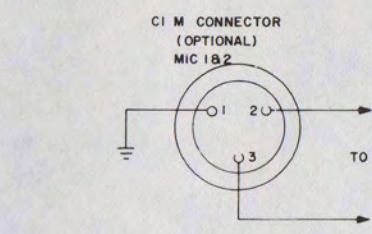
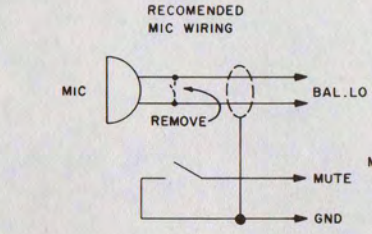
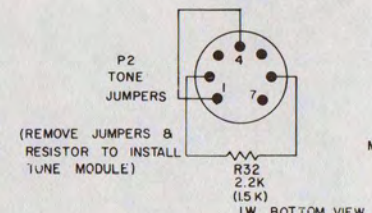
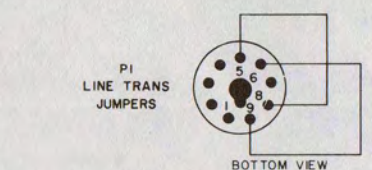
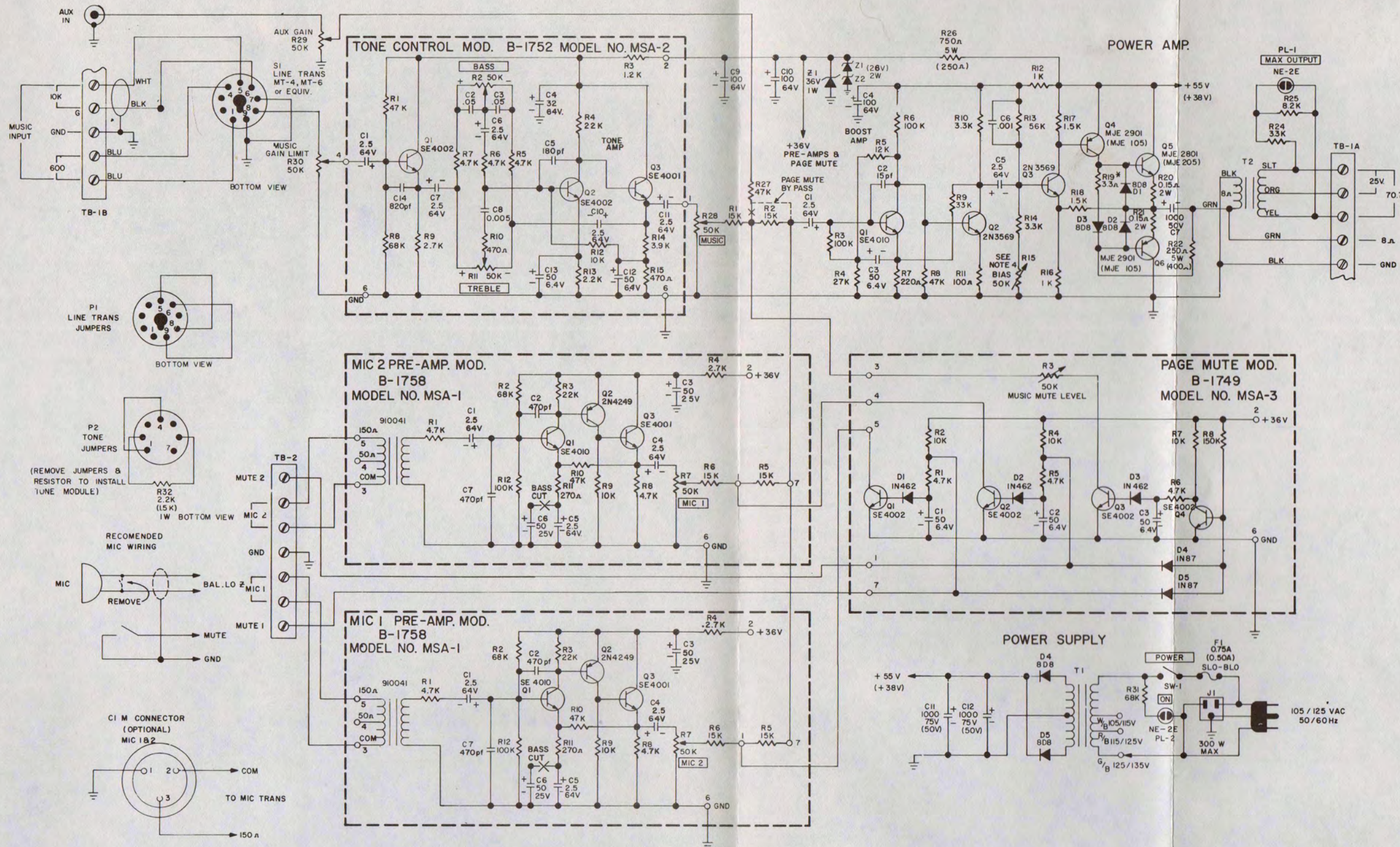
MSA-2/TONE
 CONTROL MODULE
 P/N 000401



PIN	TITLE
1.	MUTE # 2 OR # 4 CONTROL
2.	+24 to 36 VDC
3.	MUSIC MUTE
4.	MIC MUTE # 2 OR # 4
5.	MIC MUTE # 1 OR # 3
6.	GROUND
7.	MUTE # 1 OR # 3 CONTROL

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 RESISTORS 1/2w ± 10%
 CAPACITORS IN MFD.

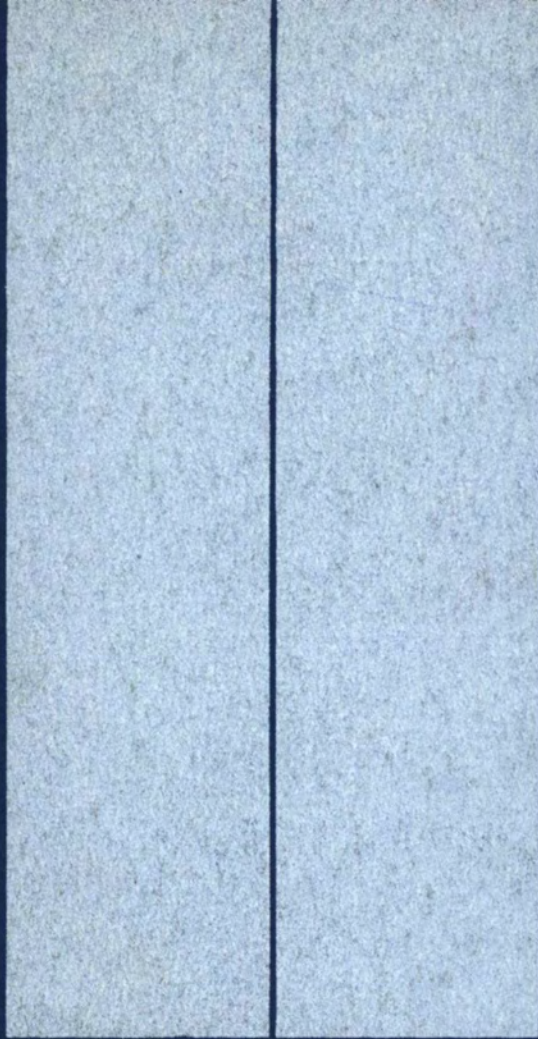
MSA-3/PAGE
 MUTE MODULE
 P/N 000402



NOTES: (UNLESS OTHERWISE SPECIFIED)
 1. FRONT PANEL FUNCTIONS
 2. COMPONENT VALUES SHOWN IN PARENTHESIS USED IN MS-10B. EXAMPLE: (MJE 205)
 3. T1: MS-10B, 900007 MS-25B, 900047
 T2: MS-10B, 910044 MS-25B, 910043
 4. ADJUST BIAS FOR SYMMETRICAL CLIPPING
 5. CAPS IN MFD
 6. RESISTORS 1/2W, ±10%
 7. SOME COMPONENT VALUES IN THIS SCHEMATIC MAY DIFFER WITH THE UNIT. NEW SCHEMATICS WILL BE ISSUED WHEN MAJOR CHANGES OCCUR.
 8. * SELECTED IN PRODUCTION.

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