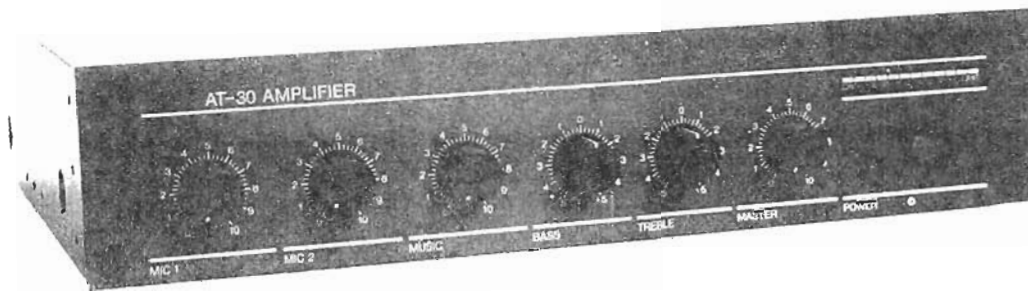
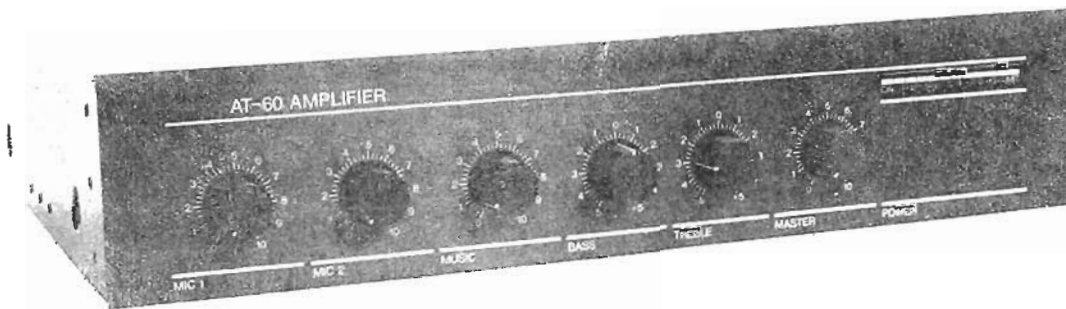


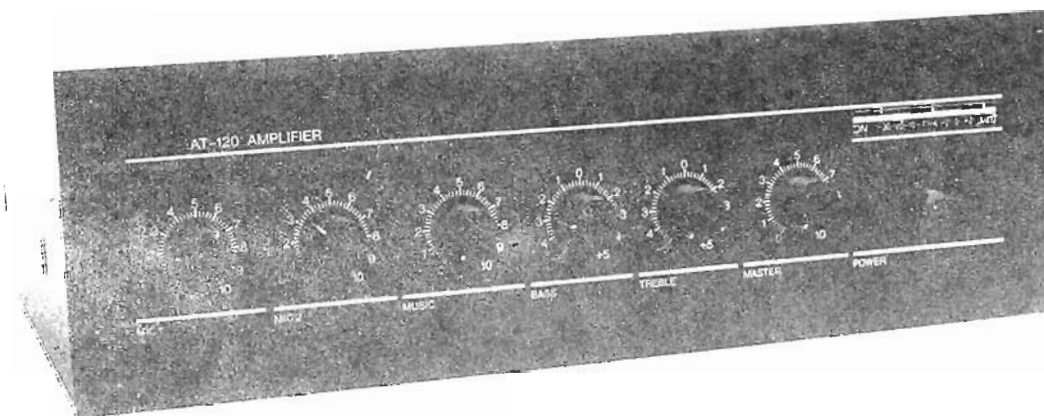
# MUSIC, PAGING & PUBLIC ADDRESS AMPLIFIERS



MODEL AT-30 AMPLIFIER: 3M PART #78-6911-1555-0



MODEL AT-60 AMPLIFIER: 3M PART #78-6911-1556-8



MODEL AT-120 AMPLIFIER: 3M PART #78-6911-1557-6

APRIL 1986

78-8050-2286-6

Sound Products  
Broadcasting and Related Products/3M  
544-1E 3M Center  
St. Paul, MN 55144



The 3M AT Series is a commercial line of integrated audio amplifiers designed to provide high quality, reliable sound amplification. The AT Series Amplifiers give continuous, long-term, trouble-free operation. The AT-120, AT-60, and AT-30 Amplifiers deliver 120, 60, and 30 watts, respectively into balanced or unbalanced 4-ohm or 8-ohm speaker loads or to 25V or 70V lines. (The 4-ohm output is applicable to the AT-60 Amplifier only.)

These amplifiers accept five separate inputs (two microphone inputs, a telephone paging input, a music input, and a tone generator input). The amplifiers are delivered with the microphone and telephone paging inputs balanced (low impedance). The microphone inputs, however, can be changed to unbalanced (high impedance) if required. To convert an input to high impedance, refer to the installation discussion. There are two music inputs, one balanced and one unbalanced. The tone generator input is unbalanced and cannot be converted.

Four of the five inputs, the tone generator input is the exception, are routed through preamps which include output level controls. The tone generator input feeds into the music level control. (In normal use its output level is adjusted by varying the amplitude of the input signal.) The music input can be muted by supplying an external contact closure. (The tone generator input is not muted.) The music input circuitry includes dedicated bass and treble controls.

**NOTE**

*Inputs are all active (live). The user must manage the inputs as appropriate to the facility.*

All level controls, excluding the paging control, are front panel controls. (The telephone paging level control is an internal screw-driver adjustment.) The music input bass and treble controls are also front panel controls. In addition, the front panel has a master level control which affects all signals.

Amplifier status is displayed by means of a horizontal 12 segment LED bar graph indicator located in the upper right of the front panel. The left-most segment of the graph is the POWER indicator. Power is on when the indicator is lit (green). The next segment is a separator (never lights). The next eight segments give an output indication in dB. The reference is the maximum specified output of the amplifier and is, by definition, 0 dB. The first seven segments (-30 to 0 dB) are green when lit and indicate the amplifier is operating within specified output limits. The actual level is indicated by the last lighted segment. The last output level indicator segment (8) is marked +2. This segment is red, and when lit, indicates the output is above the specified maximum. The eleventh segment is another separator which never lights. The last segment (right-most) is a limit indicator. The segment is red, and when lit, indicates internal action has taken place to protect the unit. The amplifier will have no output.

The AT-120, AT-60, and AT-30 amplifiers incorporate two additional features. 1. A graphics equalizer, such as the 3M AT-1000 (Part. No. 78-6912-1526-1), can be inserted into the amplifier signal path. Addition of a graphic equalizer allows the user to customize the sound to the specific requirements of a facility. 2. A bridging input/output is provided on the rear panel. This feature permits the system to be expanded (i.e., two amplifiers to be interconnected).

**SPECIFICATIONS**

Parameter	AT-30 78-6911-1555-0	AT-60 78-6911-1556-8	AT-120 78-6911-1557-6
1. Power Output (RMS Watts)	30 (Into 8 Ohms) 30 (@ 70 Volts)	60 (Into 4 Ohms) 60 (@ 70 Volts)	120 (Into 8 Ohms) 120 (@ 70 Volts)
2. Distortion (@ Rated Power)	< 1% 50 to 15000 Hz	< 1% 50 to 15000 Hz	< 1% 50 to 15000 Hz
3. Frequency Response			
Music Input	50-20 KHz +/- 1dB	50-20 KHz +/- 1dB	50-20 KHz +/- 1 dB
Mic Input	50 Hz -10 +/- 2dB	50 Hz -10 +/- 2dB	50 Hz -10 +/- 2dB
Mic Input	10 KHz -6 +/- 1dB	10 KHz -6 +/- 1dB	10 KHz -6 +/- 1dB
4. Sensitivity (For Rated Output)			
Music Input	0.3	0.3	0.3
Mic Input	0.3 MV (at LO Z) 1.2 MV (at HI Z)	0.3 MV (at LO Z) 1.2 MV (at HI Z)	0.3 MV (at LO Z) 1.2 MV (at HI Z)
Bridging	0.3V	0.3 V	0.3 V
Telephone Paging	0.12V	0.12 V	0.12 V
5. Hum & Noise (20 Hz - 20 KHz)			
Music Input	-75dB	-75dB	-75dB
Mic Input	-55dB	-55dB	-55dB

### SPECIFICATIONS (Cont.)

Parameter	AT-30 78-6911-1555-0	AT-60 78-6911-1556-8	AT-120 78-6911-1557-6
6. Inputs			
Music Input	Bal. Lo Z = 600 Ohm or Unbal. Hi Z $\Delta$ 10 K Ohm	Bal. Lo Z = 600 Ohm or Unbal. Hi Z $\Delta$ 10 K Ohm	Bal. Lo Z = 600 Ohm or Unbal. Hi Z $\Delta$ 10 K Ohm
MIC 1 Input	Bal. Lo Z = 600 Ohm or Unbal. Hi Z $\Delta$ 10 K Ohm	Bal. Lo Z = 600 Ohm or Unbal. Hi Z $\Delta$ 10 K Ohm	Bal. Lo Z = 600 Ohm or Unbal. Hi Z $\Delta$ 10 K Ohm
MIC 2 Input	Bal. Lo Z = 600 Ohm or Unbal. Hi Z $\Delta$ 10 K Ohm	Bal. Lo Z = 600 Ohm or Unbal. Hi Z $\Delta$ 10 K Ohm	Bal. Lo Z = 600 Ohm or Unbal. Hi Z $\Delta$ 10 K Ohm
Telephone Paging	600 Ohm Balanced	600 Ohm Balanced	600 Ohm Balanced
Tone Generator	Hi Z Unbalanced	Hi Z Unbalanced	Hi Z Unbalanced
7. Outputs			
4 Ohm	N.A.	Unbalanced	5.2 Ohm Unbalanced
8 Ohm	Bal. or Unbal.	10.4 Ohm Bal. or Unbal.	Bal. or Unbal.
25 Volt	Bal. or Unbal.	Bal. or Unbal.	Bal. or Unbal.
70 Volt	Bal. or Unbal.	Bal. or Unbal.	Bal. or Unbal.
Music on Hold	N.A.	N.A.	N.A.
8. Input/Output Bridging Equalizer	-10dBV, 10 K Ohm Hi Z Unbalanced	-10dBV, 10 K Ohm Hi Z Unbalanced	-10dBV, 10 K Ohm Hi Z Unbalanced
9. Input Connections	Screw Terminals	Screw Terminals	Screw Terminals
10. Output Connections	Screw Terminals	Screw Terminals	Screw Terminals
11. Input/Output Connections (Bridging and Equalizer)	RCA Phono	RCA Phono	RCA Phono
12. Music Tone Control Action	Bass at 100 Hz +/- 10dB Treble at 10 KHz +/- 10dB	Bass at 100 Hz +/- 10dB Treble at 10 KHz +/- 10dB	Bass at 100 Hz +/- 10dB Treble at 10 KHz +/- 10dB
13. Mute (On Music)	Yes	Yes	Yes
14. Indicators Power LED VU	Left Seg. of VU Display Yes	Left Seg. of VU Display Yes	Left Seg. of VU Display Yes
15. Circuit Protection	1. Reset Breaker 2. Overload Prot. Circ.	1. Reset Breaker 2. Overload Prot. Circ.	1. Reset Breaker 2. Overload Prot. Circ.
16. Controls	Power Switch Tele. Paging (Internal) Music Gain MIC 1 Gain MIC 2 Gain Bass Control Treble Control Master Gain	Power Switch Tele. Paging (Internal) Music Gain MIC 1 Gain MIC 2 Gain Bass Control Treble Control Master Gain	Power Switch Tele. Paging (Internal) Music Gain MIC 1 Gain MIC 2 Gain Bass Control Treble Control Master Gain
17. AC Power	120V 50/60 Hz	120V 50/60 Hz	120V 50/60 Hz
18. Rack Mount Kit Available	Yes	Yes	Yes
19. Dimensions Inches Millimeters	W x D x H 18.5 x 12.6 x 3.5 420 x 320 x 88	W x D x H 18.5 x 12.6 x 3.5 420 x 320 x 88	W x D x H 18.5 x 14.6 x 5.2 420 x 370 x 133
20. Weight Pounds Kilograms	17.1 7.7	21.0 9.5	31.4 14.3
21. Agency Approvals U.L. C.S.A.	Yes Yes	Yes Yes	Yes Yes

PENDING

## INSTALLATION

### UNPACKING

The AT Series Amplifiers are thoroughly checked and tested before shipment. Carefully inspect the shipping container and the unit to determine if the unit has been damaged during shipping. If damage has occurred, make an immediate claim to the dealer from whom it was purchased. If shipment was directly to you, notify the carrier without delay and place your claim.

### MOUNTING

AT amplifiers are basically designed to sit on a shelf. They can, however, be configured for mounting in a standard 19-inch equipment rack or a console by installing brackets (one on each side). The brackets mount via screws to pre-existing holes. The AT-120 bracket has four mounting holes. The AT-60 and AT-30 brackets have three holes. The appropriate rack mounting kit must be ordered. The kit will contain the brackets and all required hardware.

## POWER AND GROUNDING

All AT Series Amplifiers have a three-wire power cord terminated in a three-prong plug. The power cord must be plugged into a nominal 120-Volt AC source via a three-wire grounded outlet. It is important to ground the amplifier. If a three-wire outlet is not available, use an adapter (e.g., Leviton No. 5017) to convert a standard two-wire outlet. The pigtail must be connected to a valid ground. If the center screw of the two-wire outlet is not grounded, find a valid ground (water pipe, steam pipe, etc.).

## AUXILIARY RECEPTACLE

The auxiliary power receptacle on the amplifier rear panel is a three-wire outlet which can supply AC power to accessory equipment. (The accessory cannot draw more than 300W.) Proper grounding of the accessory is dependent on the amplifier being properly grounded.

The auxiliary receptacle is not affected by the amplifier on/off power switch or circuit breaker.

## INPUT AND OUTPUT CONNECTIONS

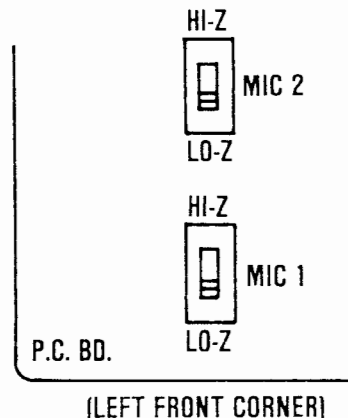
The BRIDGING IN/OUT connector and the EQ IN and EQ OUT connectors are phono jacks (RCA type). All other input and output connections are screw type terminal board connections.

### MUSIC INPUT

There are two music inputs: MUSIC LO-Z BAL and MUSIC HI-Z UNBAL. Both are two-terminal inputs. Only the applicable input is used.

## MICROPHONE INPUTS

There are inputs for two microphones: MIC1 and MIC2. There are LO-Z BAL and HI-Z UNBAL inputs for each microphone. The amplifiers are shipped from the factory with the LO-Z BAL active. To activate the HI-Z UNBAL inputs internal switches must be repositioned. Remove the cover and set the switches as shown below. Disconnect power before removing or replacing the cover.



## TELEPHONE PAGING INPUTS

The telephone paging input, TEL PAGE LO-Z BAL, is designed to connect directly to an output from a standard telephone paging system. It is a two-terminal input. The level of the paging input is set by means of an internal potentiometer. The cover must be removed to gain access to the pot. To adjust this input, set the front panel MASTER level control to its nominal position then adjust the pot for the desired output level (a paging input must be present, of course). The pot is located between the MIC 1 and MUSIC level controls approximately two inches from the front edge of the P.C. board.

## tone generator input

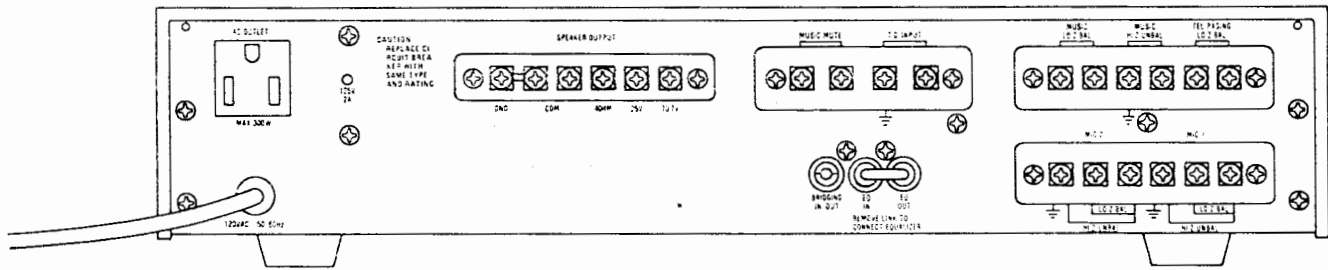
The tone generator input, T.G. INPUT (HI-Z UNBAL), permits a tone generator to be used with the amplifier to generate brief pre-announcement tone signals (or a continuous alarm tone) over all speakers in the system. The MUSIC INPUT, if one is present, is normally muted when a tone is transmitted. (See MUSIC MUTE paragraph.)

## MUSIC MUTE

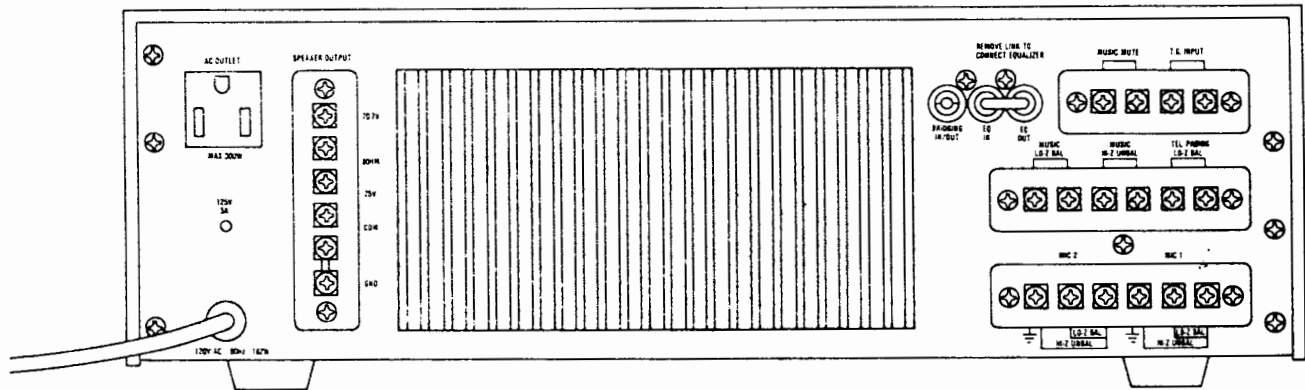
The music input, either LO-Z or HI-Z, can be muted by supplying a contact closure to the MUSIC MUTE terminals. The MUSIC INPUT will be muted as long as the contact closure is maintained.

## SPEAKER CONNECTIONS (OUTPUT)

The AT Series amplifiers provide a 70-Volt output line, a 25-Volt output line, and an 8-ohm output line. (The AT-60 Model provides a 4-ohm output instead of 8 ohms.) Each of the outputs is referenced to a common (COM) line. The COM output is not ground. If this condition is desired, jumper the COM terminal to the GND terminal.



Rear Panel View. AT-30 and AT-60



Rear Panel View. AT-120

## OPERATION

### POWER

The front panel on/off switch applies power to the amplifier. It has no effect on the auxiliary receptacle on the rear panel. The left-most segment of the status display is lit (green) when power switch is on.

### MIC 1 AND MIC 2

Front panel controls. Adjust the output levels of their respective inputs. Clockwise rotation increases output level.

### MUSIC LEVEL

Front panel control. Adjusts output level of the MUSIC INPUT signal. Clockwise rotation increases output level.

### BASS AND TREBLE CONTROLS

Front panel controls. Used to adjust the tonal quality of the music input signal.

### MASTER LEVEL

Front panel control. Adjusts output level of the combined amplifier inputs. Clockwise rotation increases output level.

### LEVEL INDICATOR

The center section (eight segments) of the status indicator provide level information. The first seven segments are green and, when lighted, indicate the amplifier is operating within specified limits. The Zero (0) dB segment, when lighted, indicates the amplifier is operating at maximum specified output level. The +2 dB segment (red) when lighted indicates output level is too high and distortion is present. The right-most section (red) is the limit indicator. When this segment is lit, the amplifier has automatically shut down for self protection.

## MAINTENANCE

There are no user-serviceable parts inside the unit. All servicing should be done by qualified service personnel only.

### CIRCUIT BREAKER

The AT-120, AT-60, and AT-30 amplifiers are protected by a manually resettable circuit breaker in the input power line. The breaker is located beyond the auxiliary receptacle and does not effect it. The circuit breaker will trip if the amplifier begins to draw excess current. If the breaker trips, turn off the front panel power switch then reset the breaker. Turn the amplifier power back on. If the circuit breaker trips again, do not reset it. Have the problem located and corrected by a qualified service technician.

### THERMAL PROTECTION

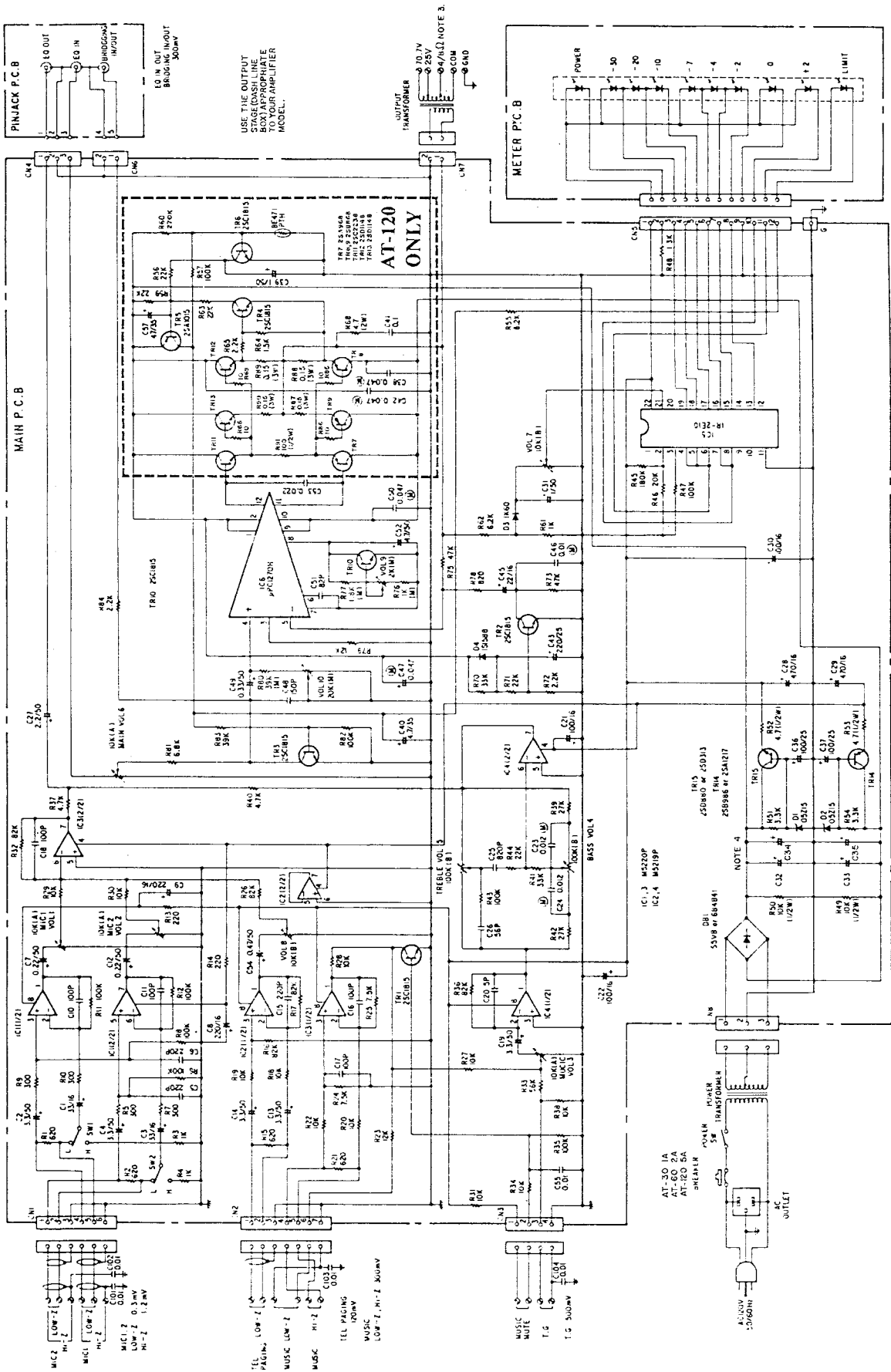
The AT-120 and AT-60 amplifiers are protected by a thermal overload device which shuts the output off when the temperature rises excessively. The device automatically resets itself when the temperature returns to acceptable limits. When the device trips, the signal output is shut down, however, the unit is still powered (power indicator stays lit). If the unit trips, investigate the cause even if the amplifier does automatically reset. Typical causes are excessive output load or inadequate ventilation.

### OVERLOAD PROTECTION

The amplifiers also have built-in protection against shorted outputs. A short on the output causes the amplifier to shut down the output stage (no signal output). The unit remains powered, and if the output short is removed, will automatically resume normal operation.

## SERVICE

3M maintains Customer Service Representatives to provide technical assistance. When you need help, call (612) 733-4912 or (612) 733-4913.



AT SERIES AMPLIFIER SCHEMATIC DIAGRAM

