RAYMER

OPERATING INSTRUCTIONS

MODEL 808-60 AMPLIFIER

WARNING – TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS AMPLIFIER TO RAIN OR MOISTURE.

DESCRIPTION

The Raymer Model 808-60 is a multi-purpose 60 Watt RMS, monaural, all silicon solid state amplifier. It is designed for dependable continuous operation in background music, public address, paging, and sound reinforcement systems.

Provision has been made for a choice of two microphone inputs and one music input; or for one microphone, one auxiliary and one music input. All inputs are unbalanced. Mic-1 which comes wired for high impedance may be converted to a balanced low impedance microphone input by the use of a RAYMER plug in transformer Model MT-3 or to a 500/600 ohm balanced telephone line input by means of RAYMER plug in transformer Model TT-4.

Mic-2 may be switched for either Hi-Z or Lo-Z microphone. Provision has also been made for a choice of one of two separate sources to be connected to the Music input. The Music or Aux inputs are high impedance and are for use with a tuner, a high output ceramic or crystal phono, a tape recorder with its own preamp, or other auxiliary equipment.

The amplifier also features an electronic Music Mute (Precedence) circuit in place of a relay to quickly fade out the music while paging; after the page, the music is smoothly restored. The music fade feature operates only on the music inputs.

Model 808-60 is provided with a switch to protect trumpet speaker diaphragm(s) from damage when used on low frequency signals. The amplifier has a master gain control, as well as separate bass and treble controls, which may be used to compensate for room and speaker characteristics. The amplifier has provision for 4 and 8 ohm unbalanced speaker terminals as well as 25 volt and 70 volt balanced or unbalanced lines.

A unique feature of the amplifier is a red LED overload indicator, which when lit provides a visual warning that the amplifier is operating improperly. This may be caused by a mismatched condition, overload, or oscillation which overdrives the output transistors beyond safe operating limits and could cause component damage.

Model 808-60 has IN and OUT jacks for connecting an equalizer or similar equipment, also for connecting two or more 808-60 amplifiers so that they may be operated simultaneously to deliver a total power in multiples of 60 watts into a speaker line.

UNPACKING

The unit is to be removed carefully from the carton and inspected for any possible damage in transit. If there is any evidence of any damage which might have occurred in shipment, immediately notify your supplier, or the transportation company which delivered it. Claims for damage sustained in transit must be made upon the carrier. Save all packing material for inspection by the claim agent who will furnish you with the proper forms and will also give you the necessary instructions for filing a claim.

INSTALLATION

Model 808-60 amplifier has ample vents for normal ventilation; however, it should be placed so as to permit free air flow around the unit. DO NOT PLACE ANY OBJECT ON TOP OF THE COVER OR IN ANY WAY BLOCK THE AIR FLOW OF THE VENTS. DO NOT STORE OR OPERATE THE AMPLIFIER in areas where the ambient temperature exceeds 140°F.

The amplifier may be mounted in a 3½" vertical panel space in a rack, using a Raymer RPK-5 rack mounting kit. Should multiple units be stacked, or heat generating units be installed immediately above or below the amplifier(s), then at least a 2" spacing must be provided between these units for adequate ventilation.

The amplifier has an AC line cord with a 3 prong plug. The line cord should be plugged into a 3 wire grounded 105 to 120 volt 60Hz AC outlet. This will also ground the amplifier.

The power switch will turn on the amplifier as well as any auxiliary equipment connected to the AC receptacle on the rear panel, and the green LED indicator lamp on the front panel will light.

The AC receptacle on the rear panel is a 3 wire grounded outlet which can supply power to accessory or auxiliary equipment. Any auxiliary equipment connected to this AC receptacle is controlled by the POWER on-off switch so that turning off the power on the unit turns off all equipment.

Individual volume controls are used to adjust the level of the MIC, MUSIC, or AUX input channels. The MASTER control will regulate the gain of all inputs simultaneously.

The BASS and TREBLE controls should be set to compensate for room and speaker characteristics or for undesirable effects of acoustic feedback. When both controls are in the center position they will provide a flat response. Turning the Bass control to the left reduces the bass response. Turning the Treble control to the left reduces the high frequency response of the amplifier.

Where a system either has acoustic feedback or is on the verge of feedback, the undesirable effects may sometimes be reduced by adjustments of both the Bass and Treble controls.

In order to protect horn loaded drivers, the TRUMPET PROTECT switch on the rear panel should be placed in the "Trumpet Protect" position. This reduces the bass frequencies and protects the driver diaphragms from possible damage. For use with cone type loud speakers, the switch should be placed in the "Normal" position.

PREAMP OUTPUT, AMPLIFIER INPUT – These jacks may be used for either input or output applications. They are connected electrically between the preamplifier and power amplifier sections of Model 808-60 and may therefore be used (1) as the output of the preamplifiers into an external amplifier and/or tape recorder, or (2) from the output of an external source into the power amplifier section. When the Preamp Output jack is used to feed an external amplifier or tape recorder, the bridging circuit is affected by the Master Volume, Bass, and Treble controls. When the Amplifier Input jack is used as the input from an external source (such as a microphone mixer-preamplifier when additional microphones are required) the reproduction from the external source will not be affected by the Bass and Treble controls.

By interconnecting or bridging the PREAMP OUTPUT or the AMPLIFIER INPUT jack of two or more Raymer 808-60 amplifiers with a patchcord, they may be operated simultaneously to deliver a total output in multiples of 60 watts into one speaker line, or separate speaker lines if desired. See Figure 6.

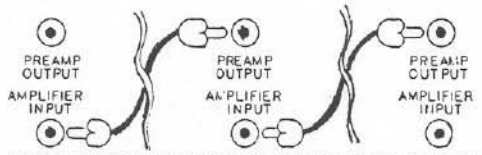


FIGURE 6: EITHER JACK MAY BE USED TO PARALLEL 810-10C AMPLIFIERS, ONLY IF INTERNAL JUMPER HAS NOT BEEN REMOVED.

CAUTION: BEFORE OPERATING AMPLIFIERS CONNECTED EITHER IN SERIES OR PARALLEL, MAKE CERTAIN THAT THE TRUMPET PROTECT SWITCHES ARE IN THE SAME POSITION ON ALL AMPLIFIERS. WHEN CONNECTING THE OUTPUTS IN SERIES, MAKE CERTAIN THAT THERE IS NO JUMPER CONNECTION BETWEEN COM AND GND ON THE SCREW TERMINAL BOARD.

The output terminals of the 808-60 have been phased at the factory so that each terminal is in phase with the corresponding terminal of any other Raymer 60 Watt amplifier. For connecting the amplifier in either parallel or series, the terminals should be wired as shown in Figure 7.

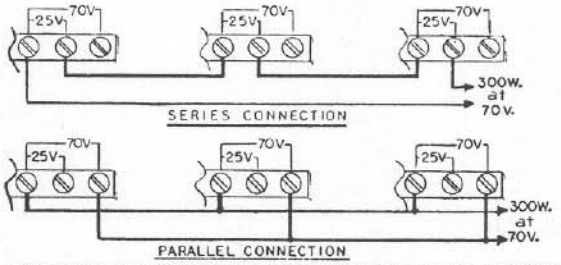


FIGURE 7: OUTPUT CONNECTIONS FOR SERIES OR PARALLEL OPERATION.

In the event it is desired to connect an equalizer or similar equipment to a single 808-60 amplifier, the PREAMP OUTPUT and AMPLIFIER INPUT jacks are to be used. In order to use the additional equipment, it will be necessary to remove the jumper wire between the jacks which is located internally. When this external equipment is to be used with amplifiers paralleled for increased power to the speaker lines, the interior jumper wire shorting the jacks in each amplifier must be removed. The PREAMP OUTPUT jacks of all the amplifiers are connected together with a patchcord and the AMPLIFIER INPUT jacks are also connected together in a similar manner as shown in Figure 8. Note – All internal jumper wires must be removed by a qualified service technician.

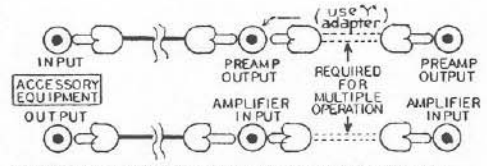


FIGURE 8: OPERATION WITH ACCESSORY EQUIPMENT REQUIRES REMOVAL OF INTERNAL JUMPER IN AMPLIFIER.

The red LED "Overload" indicator on the front panel monitors the output transistors and when it is illuminated continuously it is a warning that the amplifier is being operated improperly. This condition could be caused by mismatch of output load, incorrect output impedance, short circuit in the output, or that the amplifier is oscillating (which could be caused by improper shielding or position of input leads) and may result in the circuit breaker tripping.

To correct and localize the problem, first turn each input control to "0". If the LED is still illuminated, then reduce the Master control to "0". If the LED light goes out, then the trouble is more than likely in the external equipment plugged into the PREAMP OUTPUT/AMPLIFIER INPUT jacks. If the light does not go out, have the amplifier serviced by a qualified service technician or return the unit to the factory.

Occasional flickering of the LED means that the amplifier is being driven to the maximum on peaks of the program material, which is not harmful nor will in any way damage the amplifier.

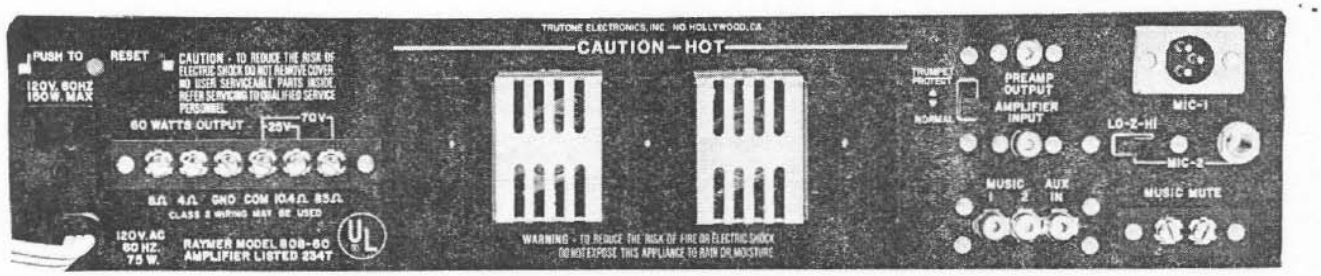


Figure 1. Rear Panel of Amplifier

CONNECTIONS

All connections are made on the rear panel as shown in Figure 1.

INPUT CONNECTIONS AND CONTROLS

All patch cords and input leads other than Music Mute must be shielded cables. The Music Mute leads do not have to be shielded. When output leads are run near an unshielded microphone input plug, or when run together with the microphone precedence leads, a supersonic oscillation may occur. When this does occur, it will appear as a distortion in the amplifier output, and oftentimes will cause the circuit breaker to "trip".

To prevent this oscillation from occurring, it is recommended that shielded microphone plugs be used wherever possible. In the event that an unshielded plug or a molded cable assembly is used, keep the output leads away from the Microphone input(s) and Microphone precedence leads.

In order to make the connection to MIC-1 use a Cannon XLR-311C or equivalent connector wired as shown in Figure 2.

FIGURE 2: MICROPHONE 1 INPUT CONNECTIONS.

MIC-1 is wired for an unbalanced high impedance microphone. For a low impedance balanced microphone input remove the cover of the amplifier as well as the jumpers in the socket inside the amplifier, and insert a Raymer Model MT-3 microphone transformer in the socket.

When the paging source is from telephone lines, the Raymer Model TT-4 telephone input transformer is to be inserted in the socket. Typical input wiring from telephone lines is shown in Figure 3. The two pair of lines furnished by the telephone company are identified as RING AND TIP (voice transmission pair) and CONTACT CLOSURE (normally open relay contacts). When it is not necessary to mute the music during page or the music channel of the amplifier is not used, the CONTACT CLOSURE pair is not required.

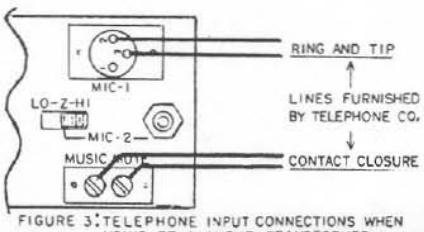


FIGURE 3: TELEPHONE INPUT CONNECTIONS WHEN USING TT-4 INPUT TRANSFORMER.

THE REMOVAL OF THE COVER AND JUMPER WIRES FOR THE INSERTION OF EITHER TRANSFORMER MUST BE DONE BY A QUALIFIED TECHNICIAN. BE SURE THE POWER CORD IS DISCONNECTED BEFORE REMOVING THE COVER.

Interconnection to a private telephone system is shown in Figure 4.

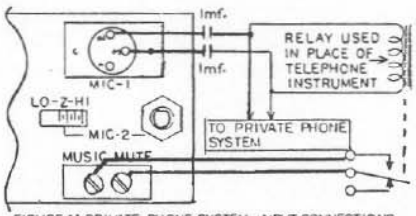


FIGURE 4: PRIVATE PHONE SYSTEM INPUT CONNECTIONS WHEN USING TT-4 INPUT TRANSFORMER.

The slide switch directly below the MIC-2/AUX on the front panel will permit the use of either a microphone (Hi-Z or Lo-Z) or any auxiliary high impedance input. When this switch is in the AUX position the auxiliary source is not controlled by the electronic fading (muting) circuit. The microphone input jack is for unbalanced lines only. If it is necessary to use a balanced microphone input, use Raymer Model LMT-150 microphone matching transformer. The switch alongside the MIC-2 input jack selects the proper input impedance. The Hi-Z position will match either crystal or high impedance dynamic microphones; the Lo-Z position will match microphones in the 150 to 500 ohm range.

The music channel has two input jacks (MUSIC 1-2) for selection of the desired signal source. This selection is controlled by a slide switch directly below the MUSIC control and is marked "1-2" on the front panel. Either input is for a high impedance source such as a tuner, a high output ceramic or crystal phono, a tape recorder with its own preamp, or other auxiliary equipment of a similar nature. If the signal source is a telephone line or a 500 ohm input, the connection can be made to the amplifier by means of a Raymer Telephone Matching Adaptor Model TM-2.

If it is desirable to fade out the music while paging, a "dispatcher" type of microphone with an auxiliary switch having a pair of normally open contacts should be used. The microphone is to be connected as shown in Figure 5.

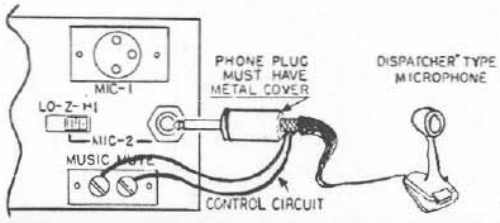


FIGURE 5: MIC-2 CONNECTION FOR A SINGLE MICROPHONE. FOR MORE THAN ONE MICROPHONE, CONNECT CONTROL CIRCUITS IN PARALLEL.

OUTPUT CONNECTIONS

The speaker(s) or line matching transformers are connected to the screw terminal board located on the rear panel. For short distances any ordinary insulated wire, such as parallel lamp cord, may be used.

Long lines have an appreciable resistance with resultant power loss. The use of parallel matching transformers on either 25 volt or 70 volt lines is recommended for long distances. In all cases, it is advisable to run as heavy a wire as possible consistent with the requirements. To avoid inducing hum in the system, do not parallel speaker cables with any AC line power cables.

70 volt distribution systems often require the speaker lines to be run in conduit. To determine whether they should be run in conduit check with local city codes for 70 volt system requirements.

The 4 OHM or 8 OHM output is used when connecting directly to the speaker voice coils. When a speaker with an impedance of 8 ohms is connected to the amplifier, use the terminals on the amplifier marked GND and 8Ω. For a 4 ohm speaker or two 8 ohm speakers in parallel, use GND and 4Ω.

The 25 VOLT or 70 VOLT output is used when connecting to speakers which have line matching transformers. Connecting to the 25 volt or 70 volt tap on the unit permits the use of a number of speakers each with its own corresponding line matching transformer, thereby eliminating the necessity of calculating impedances. The tap on the line matching transformer is selected to give the power desired for each speaker. The total of all the power settings should be no greater than the amplifier output rating. If the speaker uses a 25 or 70 volt line transformer, connect the speaker transformer to the terminals marked COM and 25V (or 70V) according to the line desired. For an unbalanced line connect a jumper between COM and GND; if a balanced output line is used, no jumper is required.

The power transistors are mounted on the heat sink. In the event it becomes necessary to replace these transistors, be certain that:

1. No grit or metal particles are lodged between the transistor and the mica or heat sink.
2. The mica insulator is not damaged.
3. Both sides of the mica insulator are covered with Dow Corning 7 Silicone Grease or equivalent.
4. The mounting screws are tight, and also that the protective cover does not touch the transistor.

Optimum performance of any transistor amplifier depends on the proper current delivered at the output terminals. Connecting a total load impedance at any tap less than the impedance indicated on the back panel of the amplifier will cause the transistors to deliver more current than they were designed for and will deteriorate the performance of the unit and cause damage to the transistors. To prevent this from occurring and to protect the components, the unit is equipped with a circuit breaker that will trip if the output impedance is below the specified rated value; for example, if two 8 ohm speakers are connected in parallel (resulting in a 4 ohm impedance), and in turn connected to the 8 ohm output terminal, the circuit breaker will trip as soon as the volume control is turned up to the unit's maximum output.

The circuit breaker located on the rear panel protects the unit from drawing excessive AC line current which could cause damage to the internal components. If the circuit breaker opens, the green LED indicator will go out and the amplifier will have no AC applied to it, but there will continue to be power at the auxiliary power receptacle located at the rear panel. Set the AC power switch to OFF and momentarily depress the red button on the circuit breaker to reset it, and slide the AC power switch to ON. Observe the red "Overload" indicator. If it lights, this indicates that the reason that the circuit breaker is tripping is due to a short circuit, or a mismatch of the output, or an oscillation caused by improper shielding or coupling of the input leads. If the overload light does not come on but the circuit breaker continues to trip, then this indicates a failure of an internal component.

IN THE EVENT THAT THE CIRCUIT BREAKER CONTINUES TO TRIP, DO NOT ATTEMPT TO DEFEAT THE FUNCTION OF THE CIRCUIT BREAKER. HAVE THE TROUBLE INVESTIGATED BY A QUALIFIED SERVICE TECHNICIAN OR RETURN THE UNIT TO THE FACTORY.

WARRANTY

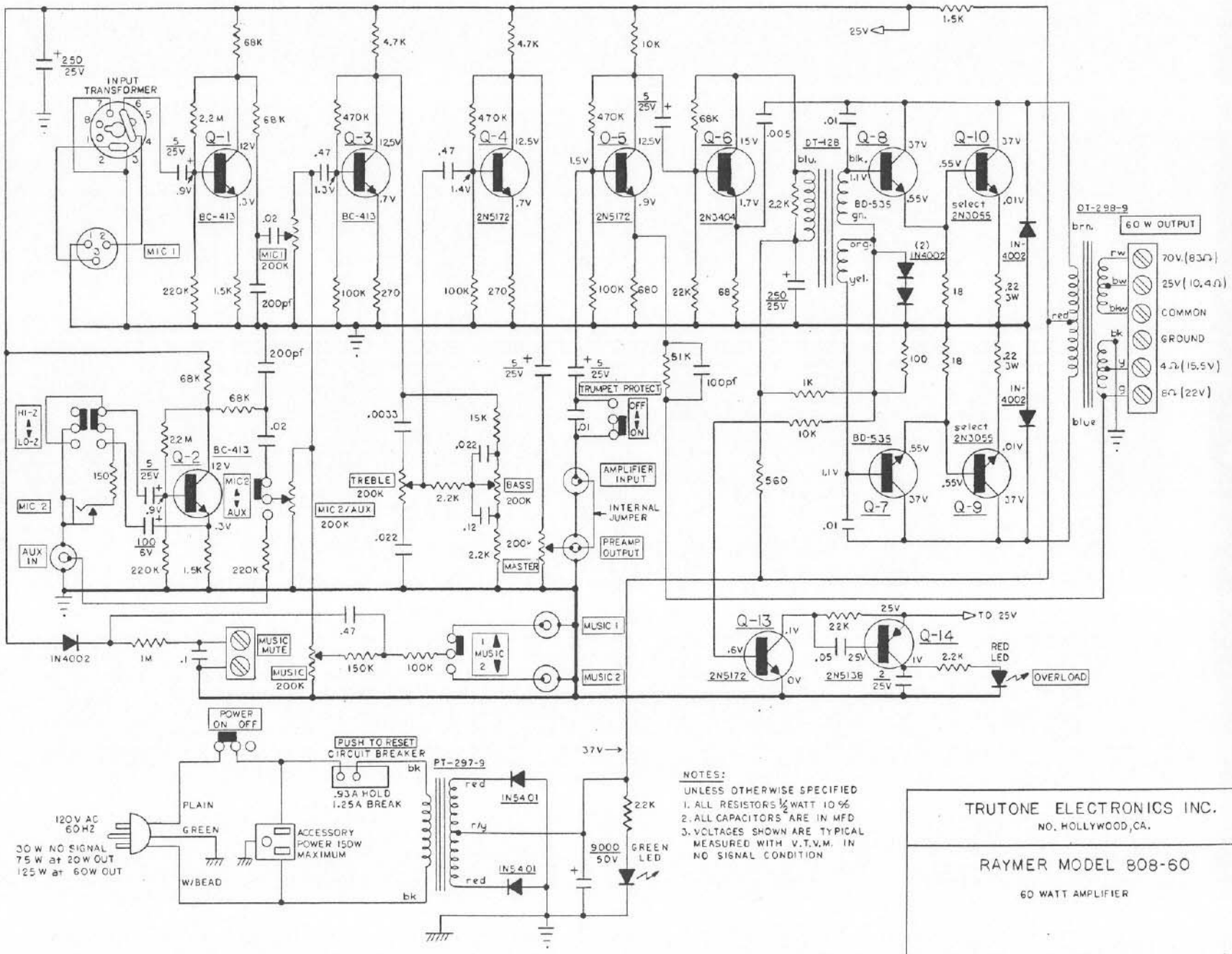
This unit has been very carefully inspected and is warranted to be free from defects in material and workmanship under normal use and service for a period of one year from date of sale to the original purchaser. This Warranty does not extend to any unit which has been subject to abuse, misuse, neglect, accident, improper installation, or alterations. The obligation of Trutone Electronics under this Warranty is limited to the repair of any defect in material or workmanship and/or the replacement of any defective part, provided the unit is returned to Trutone Electronics Inc. transportation paid within the year.

It is recommended that any unit on which service is required be processed through your distributor or installation company wherever possible.

This Warranty is expressly in lieu of all other Warranties, expressed or implied, and of all other obligations or liabilities on our part. We neither assume nor authorize any other person to assume for us any other liability in connection with the products manufactured by Trutone Electronics, Inc.

Made in U.S.A. by

TRUTONE ELECTRONICS, INC. 7315 Fulton Avenue • North Hollywood, California 91605 • (213) 875-0423



NOTES:
UNLESS OTHERWISE SPECIFIED
1. ALL RESISTORS ½ WATT 10%
2. ALL CAPACITORS ARE IN MFD
3. VOLTAGES SHOWN ARE TYPICAL MEASURED WITH V.T.V.M. IN NO SIGNAL CONDITION

TRUTONE ELECTRONICS INC.
NO. HOLLYWOOD, CA.

RAYMER MODEL 808-60

60 WATT AMPLIFIER

ENGINEER: KOGGE | DATE: 6-8-79