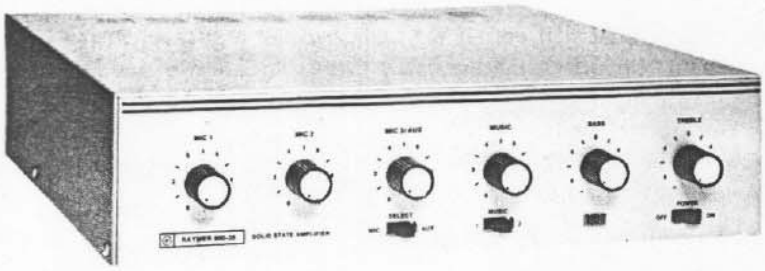
RAYMER



MODEL 800-35

OPERATING INSTRUCTIONS

DESCRIPTION

The Raymer Model 800-35 is a multi-purpose 35 watt RMS monaural all silicon solid state amplifier. It is designed for dependable continuous operation in background music, public address, paging or sound reenforcement systems. Provision has been made for a choice of three microphone inputs (Hi-Z or Lo-Z) and one music input; or two microphone inputs, one music input plus one auxiliary input. Additional provision is made for a choice of one of two separate sources to be connected to the music input. The music or auxiliary inputs are for use with a tuner, a high output ceramic or crystal phono, a tape recorder with its own preamp, or other auxiliary equipment. Model 800-35 is supplied with separate bass and treble controls, which may be used to compensate for room and speaker characteristics. The amplifier has speaker outputs for 4 and 8 ohms, or 25 volt and 70 volt balanced or unbalanced lines.

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

Model 800-35 is equipped with an interlock feature which permits connecting together two or more 800-35 Amplifiers or any Raymer 35 watt amplifier or receiver, so that they may be operated simultaneously to deliver a total power in multiples of 35 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, notify your dealer at once, 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. In addition to the Unit, there should be a warranty card included in the carton.

To insure proper servicing and to protect your rights under the warranty, be sure to fill in the warranty registration card without delay and mail to the factory.

INSTALLATION:

Because of its attractive appearance this unit may be placed on a table or a shelf. Although the unit has ample vents for normal ventilation, sufficient space should be allowed around it to permit free air flow. DO NOT PLACE it on top of vacuum tube equipment. DO NOT STORE OR OPERATE it in areas where the ambient temperature exceeds 140 degrees Fahrenheit. If installed in a cabinet, ample ventilation must be allowed around the unit.

Plug the AC line cord in any outlet furnishing 105 to 120 volts, 60 cycles AC.

An AC receptacle is located on the back of the chassis to supply power to other components such as phonograph motor, etc. The auxiliary equipment connected to the AC receptacle is controlled by the POWER on-off switch so that turning off the unit turns off all equipment.

CONTROLS AND INPUT CONNECTIONS

The music channel has two input jacks 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. A high output ceramic or crystal phono, or a tape recorder with its own preamp, or other auxiliary equipment of a similar nature can be connected to the jack on the back panel marked AUX or MUSIC 1-2. 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-1.

The slide switch directly below the MIC/AUX on the front panel will permit the use of either a microphone (Hi-Z or Lo-Z) or any auxiliary input. When the switch is in the AUX position the auxiliary source will not be controlled by the electronic fading (precedence) circuit. The microphone input jacks are for unbalanced lines only. If it is necessary to use a balanced input, an outboard matching transformer must be used. The switch alongside the microphone input 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.

To avoid possible supersonic oscillation which might result in damage to the unit, it is mandatory that a shielded (metal cover) microphone plug be used.

If it is desirable to fade out the music while paging, a "dispatcher" type of microphone, such as Raymer Model 201, or an equivalent microphone with an auxiliary switch should be used. The microphone is to be connected as shown in Figure 1.

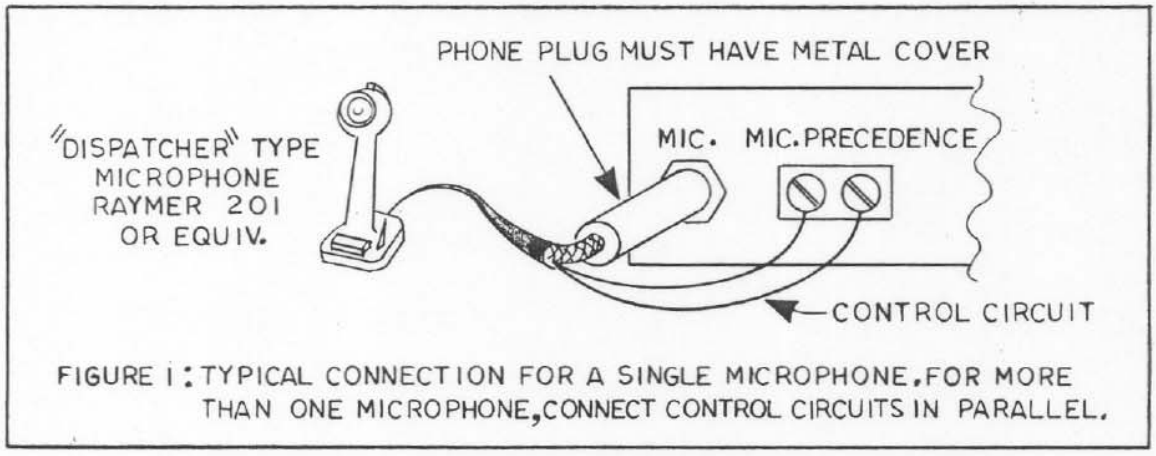


FIGURE 1: TYPICAL CONNECTION FOR A SINGLE MICROPHONE, FOR MORE THAN ONE MICROPHONE, CONNECT CONTROL CIRCUITS IN PARALLEL.

The separate Bass and Treble controls provide a flat response when set in a center position. These controls can either boost or reduce the bass and treble to compensate for room and speaker charactersitics.

In installations which use horn loaded drivers, the Bass control on the amplifier should be turned counter-clockwise to its 9 o'clock position or lower. This reduces the bass frequencies and protects the driver diaphragms. In installations with cone type speakers only, the Bass control may be placed in any position.

OUTPUT CONNECTIONS

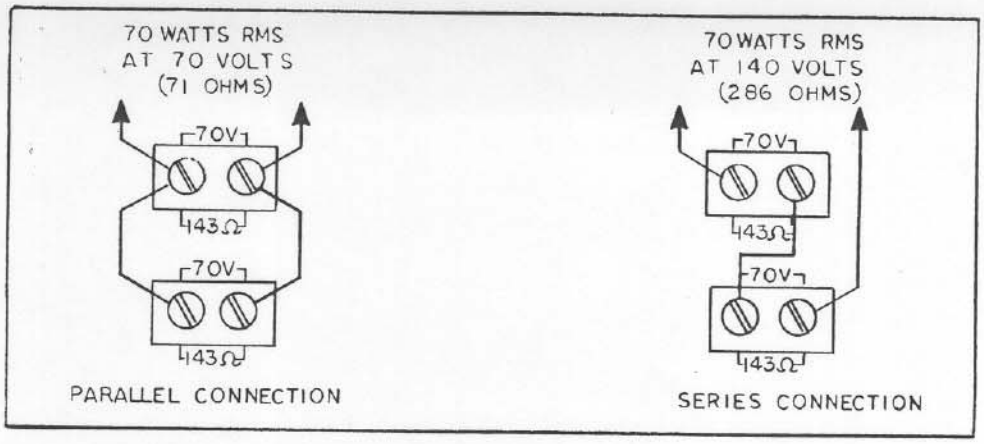
All connections are made on the rear panel of the unit.

The INTERLOCK/EXTERNAL AMPLIFIER jack is connected electrically between the preamplifier and power amplifier section of Model 800-35. It may either be used as the output of the preamplifiers into an external amplifier or tape recorder, or to connect to an additional Raymer 35 watt amplifier or receiver for increased power to a speaker line.

By inter-connecting the INTERLOCK jacks of two or more Raymer 35 watt amplifiers or receivers with a patchcord, they may be operated simultaneously to deliver a total output power in multiples of 35 watts into one speaker line.

As an example: The 70 volt outputs of two 35 watt Raymer amplifiers or receivers may be connected in parallel to deliver 70 watts to a 70 volt line, or in series to deliver 70 watts to a 140 volt line. If a system requires 105 watts of power, the 25 volt outputs of three Raymer 35 watt units may be connected in series to drive a 70 volt line with no appreciable mismatch.

The output terminals of Model 800-35 have been phased at the factory so that each terminal is in phase with the corresponding terminal of any other Raymer 35 watt amplifier or receiver.



CAUTION: BEFORE OPERATING AMPLIFIERS CONNECTED IN EITHER SERIES OR PARALLEL, MAKE SURE THE INTERLOCK JACKS HAVE BEEN CONNECTED TOGETHER BY MEANS OF A JUMPER CABLE WITH A PHONO PLUG AT EACH END.

WHEN CONNECTING THE OUTPUTS IN SERIES, MAKE SURE THE JUMPER BETWEEN COMMON (COM) AND GROUND (GND) IS REMOVED.

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.

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.

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 impedance value of the 25 volt tap is 18 ohms; however, a 16 ohm speaker or speaker system may be connected to the 25 volt tap without damage to the unit. 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 the jumper remains connected between COM and GND as supplied; if a balanced output line is used, disconnect the jumper between COM and GND.

Long lines have an appreciable resistance with a resultant power loss. The use of parallel matching transformers on either 25 volt or 70 volt lines is recommended for long distances. When it is desired to have less than 15% power loss on 8 ohm line and 5% on high impedance lines, the following table may be used as a guide for the proper wire size to be used. In all cases, it is advisable to run as heavy a wire as possible consistent with the requirements.

WIRE SIZE B & S	MAXIMUM LENGTH OF LINE BETWEEN OUTPUT AND LOAD			
	4 Ohms	8 Ohms	18 Ohms (25V)	143 Ohms (70V)
14	125'	250'	490'	1500'
16	75'	150'	330'	1000'
18	50'	100'	220'	600'
20	25'	50'	110'	400'

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.

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 installations where there is no alternative but to run both output and microphone precedence lines together, a .1 Mfd capacitor is to be connected from one side of the Microphone Precedence terminal to ground. This will shunt out the feedback signal and more than likely prevent the supersonic oscillation.

The power transistors are mounted on the back panel. 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 back panel.
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.

CAUTION:

THIS UNIT IS EQUIPPED WITH A CIRCUIT BREAKER DESIGNED TO PROTECT THE TRANSISTORS AGAINST OVERLOAD. IN THE EVENT THAT THE CIRCUIT BREAKER CONSTANTLY "KICKS OUT", CHECK THE LOAD ON THE OUTPUT OF THE AMPLIFIER FOR EITHER A SHORT CIRCUIT OR AN IMPEDANCE LOWER THAN THE VALUE RECOMMENDED. IF THERE IS NO SHORT CIRCUIT AND THE LOAD IS CORRECT, CHECK TO SEE IF POSSIBLY THE INPUT AND OUTPUT OR MICROPHONE PRECEDENCE LEADS ARE RUNNING CLOSE TOGETHER. IF THEY ARE, THEY SHOULD BE SEPARATED AND TREATED AS INDICATED ABOVE. IN THE EVENT THAT THE LOAD IS CORRECT AND THE LEADS ARE NOT RUNNING TOGETHER, DO NOT ATTEMPT TO DEFEAT THE FUNCTION OF THE CIRCUIT BREAKER BUT HAVE THE UNIT CHECKED FOR OTHER DEFECTS.

WARRANTY

This unit has been very carefully inspected and should require no further service. Each unit 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 delivery to the original purchaser. If this unit appears to be defective, the factory will repair any unit returned within said one year, providing all transportation charges are pre-paid, and which our examination shall disclose to our satisfaction to be defective.

This Warranty does not include free labor, nor is it applicable to any unit which shall have been subject to accident, tampered with, mis-used, abused, or altered in any manner whatsoever. Further, this Warranty shall not apply to any unit which has been connected improperly.

It is recommended that any unit on which service is required, be processed through your dealer 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.

TRUTONE ELECTRONICS, INC.

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