RAYMER

MODEL 872-35 AM-FM RECEIVER OPERATING INSTRUCTIONS

DESCRIPTION

The Raymer Model 872-35 is an all solid state monaural background music receiver. It consists of a sensitive high fidelity AM-FM tuner and a 35 watt RMS audio amplifier with microphone preamplifier. The receiver has an external amplifier jack, a crystal phono jack, a multiplex converter jack, and a microphone jack with switch for either Hi or Lo impedance input. Model 872-35 nas a tone control that can be turned to the position most pleasing to the listener. The receiver has speaker outputs for 4 and 8 ohms, or 25 volt and 70 volt balanced or unbalanced lines.

The receiver 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.

Model 872-35 is equipped with an interlock feature which permits connecting together two or more Raymer 35 watt amplifiers or receivers, 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.

INPUT CONNECTIONS

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/PHONO. 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 TM-1.

The Multiplex jack can be used for connecting to a Multiplex Converter to receive simultaneous signals on both FM and Multiplex broadcast, and for Multiplex Stereo Reception.

The microphone input jack is for an unbalanced line 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.

In the event a telephone switchboard, a dial access telephone, or internal telephone system is used as a paging source in place of a microphone, the Raymer TM-1 Adaptor may be used to match the telephone line to the microphone input.

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.

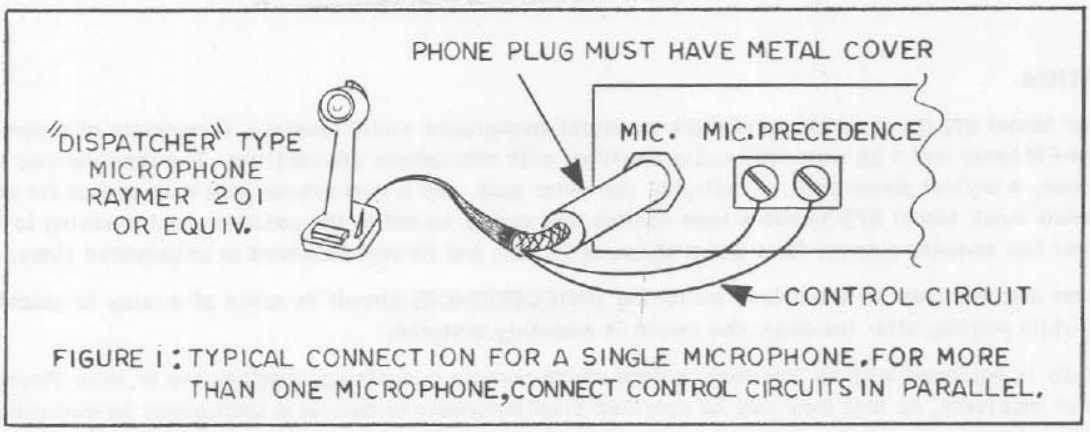


FIGURE 1: TYPICAL CONNECTION FOR A SINGLE MICROPHONE. FOR MORE THAN ONE MICROPHONE, CONNECT CONTROL CIRCUITS IN PARALLEL.

OUTPUT CONNECTIONS

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

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.

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.

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.

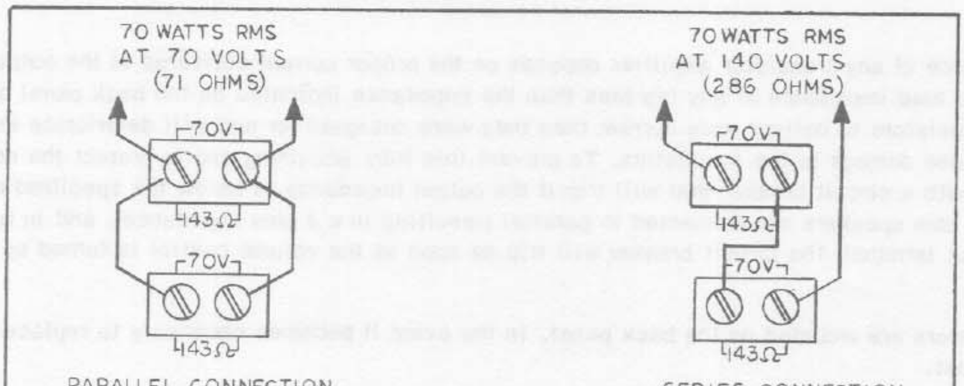
WIRE SIZE	MAXIMUM LENGTH OF LINE BETWEEN OUTPUT AND LOAD			
B & S	4 Ohms	8 Ohms	18 Ohms (25V)	143 Ohms (70V)
14	125'	250'	490'	1500'
16	75'	150'	330'	1000'
18	50'	100'	220'	600'
20	25'	50'	110'	400'

The EXT. AMP./INTERLOCK jack is connected electrically between the preamplifier and power amplifier section of the receiver. It may either be used as the output of the preamplifiers into an external amplifier or tape recorder, or to connect to additional Raymer 35 watt amplifiers or receivers 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 the receiver 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. For parallel or series connection, the terminals should be wired as shown below.



PARALLEL CONNECTION SERIES CONNECTION

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.

OPERATION:

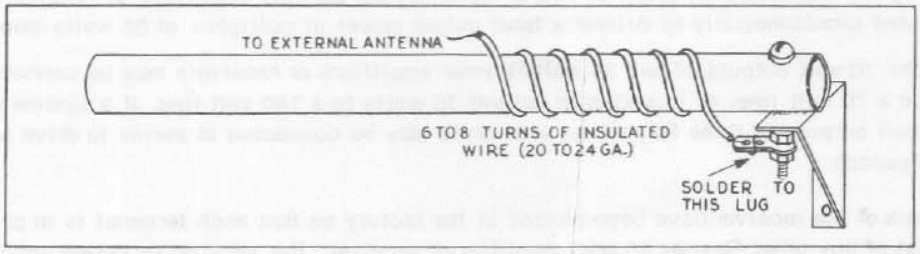
The front panel has five knobs and two slide switches. The functions of the knobs are as indicated. The Microphone Volume Control knob adjusts the level of sound for paging or public address, and is independent of the music volume control knob. The Music Volume Control knob is used to adjust the level of the sound of the FM portion or phono. The Tone Control Knob can be turned to the position that is most pleasing to the listener as it affects both the high and low frequency response. The Tuning knob is to select the desired station.

For FM reception a short wire attached to the antenna terminal is sufficient for most locations. In the event that the unit is located in a remote area an external Dipole antenna will increase the efficiency and a number of distant stations can then be received. This external antenna is to be connected across the terminals marked ANT.

AFC refers to "Automatic Frequency Control" and is an electronic means of keeping the receiver properly tuned to the FM Broadcasting station. Even if the FM Tuner Pointer is not in the exact center of the channel, the AFC will automatically pull in the station to the proper point. However, in tuning a weak station adjacent to a strong one, even if the AFC is in an operating position, it may lock on the stronger signal. It is for this reason that a selector switch has been provided for disabling the AFC.

For normal operation, the AFC selector switch should be left in the "on" position. For very precise tuning, or for tuning a weak station next to a powerful station on FM, it is suggested that the AFC selector switch be set to the "off" position until the station is received the loudest. The switch is then to be moved to the "on" position and the station will be properly tuned and locked in position.

For AM reception, this unit has a built-in Hi-Q Ferrite loopstick antenna which is all that is normally required for local AM reception. To increase the reception of weak AM stations in the fringe area, it may be advisable to rotate the loopstick to obtain the loudest signal. Where greater sensitivity is required, connect an external antenna to the metal lug on the hinged end of the loopstick, as indicated below.



The center marking on the dial glass is a LOG scale for easy recording of the position of the pointer for any specific station.

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 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.