INSTALLATION NOTES RHMJ-275

GENERAL ELECTRIC

TELEVISION AND RADIO RECEIVER MUSAPHONIC INSTRUMENT

MODEL 90

INSTALLATION NOTES

GENERAL ELECTRIC COMPANY

RADIO AND TELEVISION DEPARTMENT, BRIDGEPORT, CONNECTICUT

INSTALLATION INSTRUCTIONS

FOR TELEVISION AND RADIO RECEIVER

MODEL 90

UNPACKING

The unpacking and installation adjustments should be performed only by a competent television service engineer. This service will either be furnished or recommended by your local dealer.

The picture tube is packed in a separate cardboard carton for shipment. Do not open this carton until the receiver unpacking has progressed to the point which requires the installation of the picture tube.

Preparation of Receiver for Picture Tube Installation

After the receiver is removed from the shipping box lay the receiver cabinet on its back and take off the shipping skid by removing the wood screws. Be careful that the cabinet lid does not fly open while the cabinet is on its back. As soon as the skid has been removed set the cabinet upright and move it to the installation location (see section entitled "Location of Receiver").

After locating the receiver release the back cover of the cabinet by removing the three machine screws in the brackets along the bottom and the three wood screws along each side. Pull out on the bottom edge of the back cover first when removing it from the cabinet. Set the back cover to one side while proceeding with the installation preparations.

Pry loose the cardboard carton which is stapled to the bottom shelf of the cabinet. Also take out the envelope which is stapled to one side. This cardboard carton contains all the glass tubes used by the receiver. In order to insure the correct replacement of these tubes in the respective sockets in which they were factory tested, each tube protective paper jacket has been numbered with a black crayon to correspond with similar crayon numberings of the tube sockets. Unpack the tubes one by one and place in their proper sockets.

Untie or otherwise carefully remove the cloth tape which holds the picture tube yoke and cables in place. Check the top opening in the yoke to see that the rubber bushing is resting firmly in the hole. From the front of the receiver raise the top lid. Carefully remove the three wood screws which hold the safety glass panel securely to the cabinet, tap up on the front edge of the safety glass panel until it releases and can be raised and pulled out. (NOTE.—the rear edge of the safety glass panel has a tongue which fits into a groove in the cabinet preventing the rear edge from being raised first.) Set the safety glass panel to one side.

Picture Tube Installation

Special care must be exercised when unpacking the picture tube. It is a high-vacuum tube and requires special handling by someone familiar with such apparatus. The large end of the picture tube bulb, particularly that part at the rim of the viewing surface, must not be struck, scratched, or subjected to more than a moderate pressure. Such damage is most likely to occur when the tube is being mounted in the set. The use of gloves and goggles is recommended when handling this tube. Lift the picture tube out of the carton by raising up on the cardboard (funnel-like) shield. Do not remove the cardboard cap which covers the face of the picture tube. There is no necessity for touching the tube with the hands other than to guide the stem into the yoke. Note the location of picture tube anode terminal which is on the side of the tube. Rotate the tube shield in the hands until the anode terminal is pointed directly in toward the body (the face of the tube being up). Now raise the tube and shield over the opening in the top panel of the cabinet and lower the tube carefully down through the opening. Additional help should be obtained to guide the stem of the tube through the hole in the wooden support bracket and through the opening in the yoke. Let the tube come to rest on the rubber bushing. Be sure the anode terminal is toward the front of the cabinet.

Remove the cardboard cap from the face of the picture tube. Inspect the surface of the tube face for dust and finger print markings. If such exist very lightly rub them off with a soft cloth. Also clean the safety glass window if it appears marked or dirty. Carefully replace the safety glass panel in the top control shelf of the cabinet by first inserting rear edge tongue into the cabinet groove and lowering the safety glass panel gradually as the cardboard tube shield is worked up around the protruding circular flange of the panel. This operation will require two men. After the panel has been replaced insert the three wood screws and tighten them down.

The yoke and clamp assembly was lowered slightly before shipment to insure ease in mounting the picture tube. Loosen the two thumb nuts which hold the yoke in place being careful to support the yoke with one hand. Carefully lift the yoke assembly upward until the picture tube face snugly fits against the rubber pads of the safety glass panel. Secure the yoke assembly in this position by tightening the thumb nuts. Be sure the yoke assembly is level across before clamping, otherwise the television picture is liable to be thrown off to one side of the picture tube face.

Cautiously place the black insulated cap of the anode lead on the picture tube anode terminal. Lightly press the picture tube socket connector on the base of the tube. If the socket sticks and fails to slip on the tube base, the cause of the trouble should be investigated and removed. The socket should never be forced. Check all cable connectors

for firm connections. Remove the fuse plate on the back edge of the power chassis and test the fuse connections for security. Replace the fuse plate.

Tubes

Make certain that all tubes are pressed down firmly in their sockets. Be sure the short flexible grid leads and the molded grid cap leads are securely attached to the dome terminals of the proper tubes as shown on the label on the back cover.

The receiver is now ready for replacing the back cover. Insert the top edge first and secure the cover in position using the six wood screws and three machine screws previously removed.

LOCATION OF RECEIVER

The best location for this receiver is determined by the following three factors:

1. Locate so that antenna lead-in is as short as possible.
2. Locate conveniently near an a-c outlet.
3. Locate so that the room illumination in daytime or nighttime can be controlled easily.

If the daylight illumination cannot be controlled easily, do not place the receiver in such a position that the light from a window falls directly on the picture-tube screen. For nighttime use, it is unnecessary to turn out all lights when viewing; however, experimenting with shaded lamps in the background to give the best effect without eyestrain will be necessary.

It may be found advisable to control the degree to which the lid is opened to prevent daylight coming through a window from reflecting in the mirror directly on to the face of the picture tube.

Make sure the receiver has at least a five-inch air space in back so that adequate ventilation will be assured.

GROUND CONNECTION

At no time should the receiver power be turned on unless a good ground connection is made to the "G" terminal on the antenna-ground terminal board (see Fig. 2). This is absolutely necessary to avoid possible harm from an electric shock. It should be as short and direct as possible, and should preferably be made to a cold-water pipe or to a 5-ft length of pipe driven in moist ground.

ANTENNA INSTALLATION

Unlike the ordinary broadcast receiver, the proper selection and installation of the antenna is the most important item in assuring good pictures. For this purpose General Electric has developed a television antenna, Model HT-8, which has been designed to insure maximum results with the Model HM-275-3A television and radio receiver.

Full instructions accompany each antenna and these instructions should be followed very carefully. In general the dipole should be erected with arms parallel to the ground and at right angles to the direction of the television station. If noise or reflection interference exist, it may be better to point the dipole arms in the direction of the interference.

While for the great majority of cases the use of the Model HT-8 television dipole antenna should be entirely adequate, under certain conditions a greater directivity and gain may be required. This may occur when the signal is low or when the effect of some local electrical interference has to be reduced. In this case a special reflector Model HT-8R should be used in conjunction with the dipole. The addition of this reflector gives the antenna directional properties, by increasing the signal pick-up in one direction and decreasing it in the other. The reflector therefore can be used to increase signal voltage to the receiver, and to reduce interference. This applies even in cases where the signal strength is so great that an antenna pad has to be used with the receiver. Increasing the signal strength as much as possible, then reducing it with pads, will naturally increase the signal-to-noise ratio. The transmission line is connected to terminals A and A on the antenna terminal board. Terminal "G" as mentioned previously should be connected to a good ground.

After a picture is being received the antenna should be turned until the best picture is noted, then fastened for a permanent installation.

Antenna Pads

In regions of very high signal strength it is often desirable to use an antenna pad to cut down the signal strength and prevent receiver overloading. General Electric antenna pads are available with the following attenuation characteristics:

General Electric HM-10	10 db.
General Electric HM-20	20 db.
General Electric HM-30	30 db.
General Electric HM-40	40 db.

These are installed by merely connecting them between the antenna twisted lead-in wires and the receiver A and A terminals.

POWER CONNECTION

Check the television "Off" key to be sure it is depressed. Untie the power cord and insert the plug into a power supply receptacle of 110–125 volts, 60-cycle rating. If in doubt as to the voltage and frequency of the supply, telephone the local power company.

CONTROLS

There are two sets of controls used for adjusting the picture details on this receiver. They are the normal operating controls (see Fig. 1) and the preset or occasional adjustment controls (see Fig. 2).

Fig. 1. Top Panel Control Location

OPERATING CONTROLS

Immediately to the right ot the picture tube are the operating controls necessary to tune this receiver to the frequency band desired and to adjust the vision channel for maximum results. These controls consist of six knobs and seven keys.

Power Control

Power is turned "on" for television reception by depressing any one of the "numbered" keys. For radio reception depress the "Broadcast" key. (NOTE —each key, when pressed, locks in a depressed position until another key is pressed.)

Volume Control

When this control is in the extreme counterclockwise position, the volume of the sound receiver will be at a minimum. By clockwise rotation, volume may be increased to any degree until the full output of the sound receiver is obtained.

Tone Control

This control changes the audio response of the sound receiver and is continuously variable from bass (counterclockwise) to full range.

Program Keys

Each of the five television channel keys tunes to a separate television program channel. The keys are numbered one to five as shown in Fig. 1. and the assigned channel frequency is as follows:

KEY NUMBER	FREQUENCY BAND
1	44–50 MC
2	50–56 MC
3	66–72 MC
4	78–84 MC
5	84–90 MC

To tune for a particular program channel merely depress the desired station key until it clicks into position. This tuning operation sets the tuned circuits approximately. For final adjustment, the vernier tuning adjustment, described in the following paragraph, must be properly made.

PICTURE ADJUSTMENTS WITH OPERATING CONTROLS

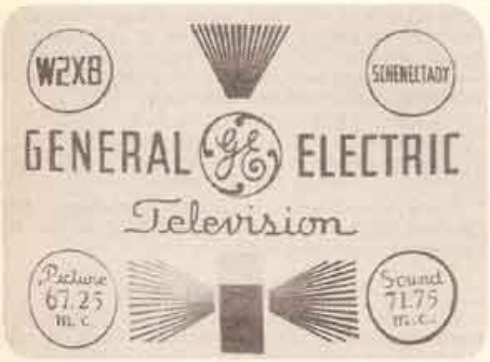

FIG. 3. CORRECT AJDUSTMENT

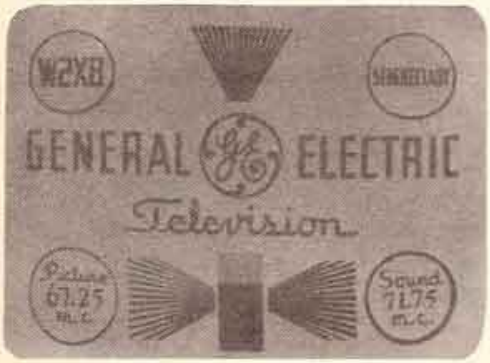

FIG. 4. EXCESSIVE CONTRAST, LOW BRIGHTNESS

FIG. 5. LOW CONTRAST, EXCESSIVE BRIGHTNESS

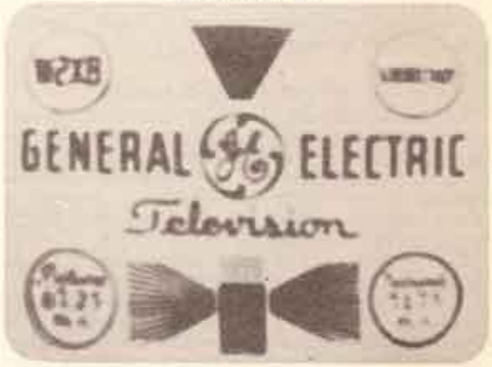

FIG. 6. INCORRECT FOCUS ADJUSTMENT

PICTURE ADJUSTMENTS WITH PRESET CONTROLS

FIG. 7. INCORRECT SETTING OF HORIZONTAL LINEARITY CONTROL

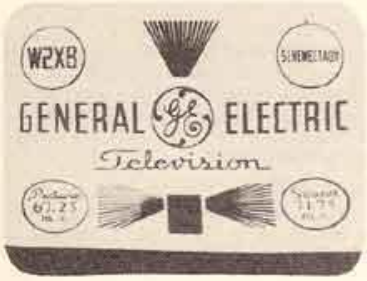

FIG. 8. INCORRECT SETTING OF VERTICAL LINEARITY CONTROL

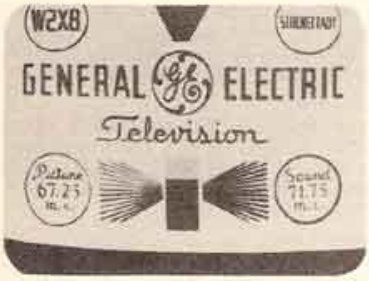

FIG. 9. INCORRECT SETTING OF VERTICAL CENTERING CONTROL

FIG. 10. INCORRECT SETTING OF VERTICAL SIZE CONTROL

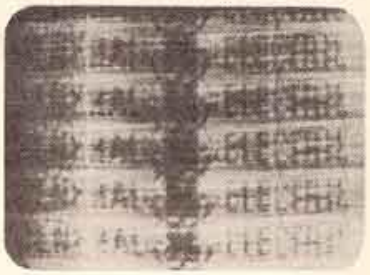

FIG. 11. INCORRECT SETTING OF VERTICAL SPEED CONTROL

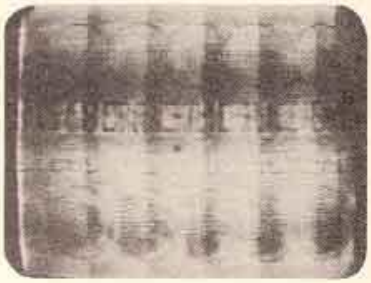

FIG. 12. INCORRECT SETTING OF HORIZONTAL SPEED CONTROL

FIG. 13. INCORRECT SETTING OF HORIZONTAL SIZE CONTROL

FIG. 14. INCORRECT SETTING OF HORIZONTAL CENTERING CONTROL

Tuning Control

The program keys select the television frequency band and tune the receiver approximately. Correct tuning is essential for good picture detail and tonal reproduction. Therefore, a tuning control is provided for final adjustment.

Turn the volume control about halfway on. Adjust the tuning control to that point where the tonal response of the sound output is the clearest. This tuning point automatically insures a best vision adjustment of tuning. Should adjustment of the tuning control produce excessive sound volume, reduce the volume control—never reduce volume by detuning.

Contrast Control

As the name suggests this control adjusts the black and white shades of the picture being received by changing the sensitivity of the receiver. Turn this control up until the picture remains still on the screen. Too much contrast is apparent when the picture is lacking in detail in black and white, while with too little contrast, the picture appears faded, being composed entirely of grays. See Figs. 4 and 5.

Brightness Control

This control regulates the brilliancy of the received picture. Turning clockwise increases the brightness. A too brilliantly lit screen will often result in a loss of detail and it is advisable to strike a proper balance between the contrast and brightness-control settings. See Figs. 4 and 5.

Focus Control

As the name implies, this control focuses the received picture on the screen. It is merely necessary to set the control at the point which gives the sharpest definition in the picture (see Fig. 6).

Picture Alignment

If the television picture as viewed in the mirror slants as a wall picture would if hung off center (in other words is not square) turn off the power. Remove the cabinet back cover, loosen the yoke clamp screws slightly and rotate the yoke slightly in the required direction. Tighten the yoke clamp screw and then replace the cabinet back cover. This operation is not required normally.

PRESET (Occasional Adjustment) CONTROLS

The preset controls are located on the rear of the television receiver chassis (see Fig. 2) and are accessible through holes provided in the back cover. Slotted control shafts allow ease in adjustment by means of a screw driver.

These controls are adjusted for maximum performance at the factory and should require very little attention over a long period of time. Study the illustrations on page 5 for maladjustments and means of remedy.

Horizontal Linearity

The uppermost control adjusts the picture for correct horizontal proportions. A maladjustment shows up as either crowding of the right or left side of the picture. The adjustment of this control should be made along with the horizontal size control as they have a tendency to react on each other (see Fig. 7).

Fig. 2. Rear Cover Terminal and Control Location

Vertical Linearity

The second control from the top gives the proper vertical proportions to the picture. Improper adjustment will either crowd the lower or upper half of the picture (see Fig. 8). This adjustment will throw off the height so as to necessitate the adjustment of the vertical size control.

Vertical Centering

This is a screw-driver control and moves the picture either up or down in a vertical direction. Proper adjustment is indicated when the picture is centered in a vertical direction on the screen. An improper adjustment of this control is shown in Fig. 9.

Vertical Size

The height of the picture is changed by the vertical size control. Correct adjustment is indicated when the borders of the picture just fill up the picture-tube mask in the vertical direction (see Fig. 10).

Vertical Speed

The vertical speed control locks the received picture in synchronism with the transmitted picture in the vertical direction. Incorrect adjustment of this control will cause the picture to lose frame or flicker badly (see Fig. 11).

Horizontal Speed

The horizontal speed control locks the picture in synchronism with the transmitted picture. Improper adjustment will either result in the loss of intelligence of the received picture or will cause it to "tear out" in a horizontal direction (see Fig. 12).

Horizontal Size

This control changes the horizontal size of the picture (see Fig. 13). Adjust the width of the picture so that it just fills up the mask of the picture tube in the horizontal direction.

Horizontal Centering

The horizontal-centering control moves the picture either to the left or right in a horizontal direction. Proper adjustment is indicated when the picture is centered on the screen. Fig. 14 shows the effect of an incorrect setting of this control.