PHILCO SERVICE

PHILCO Factory-Supervised Service

New Product News

AUGUST, 1951

RADIO

NON-RADIATING FM TABLE MODEL

FIGURE 1. Philco Radio Model 52-944

Philco has just announced a new table model AM-FM receiver, Model 52-944 (Figure 1) that has several new quality features. In keeping with our policy of continual leadership, this new set has been considerably improved sensitivity wise. The new models sensitivity is two microvolts better than the preceding comparable model. This will be of particular advantage to fringe area users. However, the big advantage of this set is that the radiation from the FM local oscillator has been kept at an exceedingly low level. While this radiation can be measured with laboratory equipment, for all practical purposes this set does not radiate. It causes no interference to television reception nor to any of the other radio services. The radiation is well within the limits, proposed by the Federal Communications Commission, covering the allowable local oscillator radiation of receiving equipment.

The minimum radiation characteristic of this model has been accomplished by very careful engineering design. The factors contributing to the accomplishment of the non-radiating FM receiver are both electrical and mechanical. Shielding of under-chassis components is taken care of by the mounting of a metal base plate covering the entire length and width of the chassis. The oscillator tube is shielded to prevent any radiation from the tube itself and the tuning gang is completely enclosed to prevent any radiation from the associated oscillator circuits. The FM antenna tuning is both electrically and physically removed from the gang to prevent any coupling between the FM local oscillator and the antenna circuit so that the oscillator signal cannot appear on the FM antenna. The tuning of the antenna circuit is accomplished by means of a variable iron core geared to the gang but shielded from it. This is shown in Figure 2. The rotor shaft of the variable condenser tuning gang is grounded and the frame is bonded to chassis at several points. The absence of radiation from the radio is also effected by the careful selection of ground points and it should be noted that these grounds are critical. Whenever servicing this model or replacing parts, particular attention should be paid to maintaining the original lead length, lead dress, placement of components, and use of ground points. The appearance of the FM oscillator signal on the AM antenna is prevented by the strategic placement of an R-F choke, L8, between the loop and the AM antenna section of the tuning gang. It was also found necessary to add filtering in the B+ lead which goes above

chassis to the output transformer. This is done by a 220 MMF ceramic condenser, C44, in parallel with the electrolytic filter section. The reduction of radiation is further helped by by-passing both sides of the AC line to chassis ground by 100 MMF condensers at the point of entry of the line.

It is very interesting to note that, in spite of the shielding and by-passing required to maintain the non-radiating feature, both the sensitivity and the signal-to-noise ratio have been improved. This has been done by increasing the antenna stage gain by increasing the positive feedback between the cathode and the control grid. The cathode by-pass condenser, C5, has been lowered in value from a normal 100 MMF to 22 MMF. This value represents an optimum between gain and stability. From this established value, there are two possible effects, depending on whether the capacitance is increased or decreased. If the condenser value is decreased, the feedback will increase to a point where regeneration (and accompanying instability) begins. If, however, the condenser value is increased, the feedback is decreased so that the effective input voltage is also decreased with no improvement in stability. By using the value of 22 MMF for the cathode by-pass condenser a higher effective input voltage is attained (than when using a higher capacity cathode by-pass) which also raises the effective input impedance and Q of the antenna coil. In this way the antenna stage gain is increased which accounts for the improvement in FM sensitivity. By the same manner, anything which increases the input signal strength will increase the signal-to-noise ratio. This is of importance in maintaining the quality expected of FM reception.

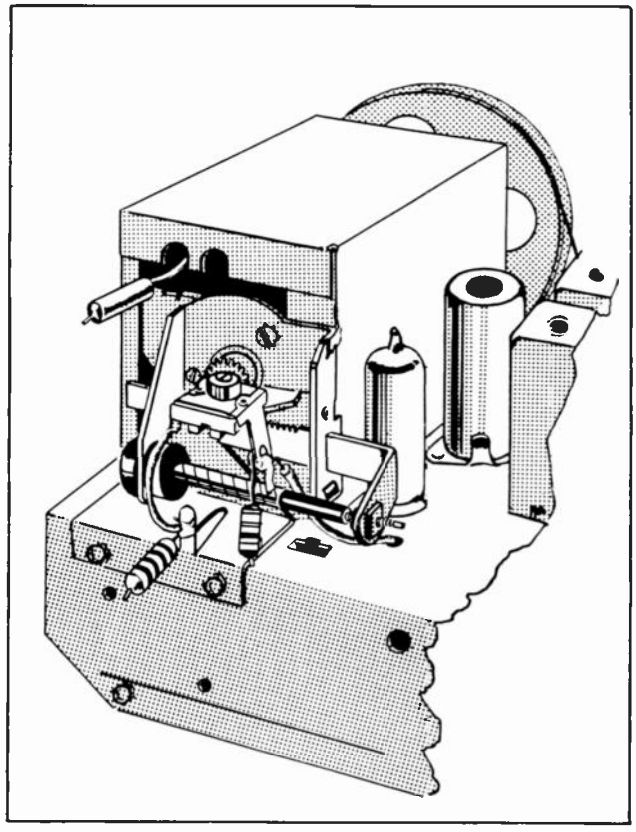

FIGURE 2

RADIO-APPLIANCE CLOCK MODELS 51-538 and 52-544

Philco is now offering a radio-clock which not only supplies the features of a sensitive 5-tube superhetrodyne radio, an accurate electric clock, and automatic control of the radio by the clock, but also the additional convenience of automatic control of such external electric appliances as toasters, lamps, coffee-makers, heaters, television receivers, etc. The clock may be pre-set to turn on the radio (or an appliance if desired) at any selected time; it also has a delayed "off" feature which can be set to shut off the power at any other desired time up to sixty minutes. These automatic control features may be used singly or in combination, as for example: to turn the radio on automatically to avoid missing a favorite program, or to turn the radio off after the listener has retired and turn it on again at any desired time.

The appliance may be turned off and on in the same manner as the radio, simply by plugging the appliance cord into the receptacle provided on the rear of the radio. The radio covers the full broadcast band from 540 kilocycles (kc.) and is designed for operation on a power supply of 115 volts, alternating current (a.c.). The appliance receptacle has a maximum current-carrying capacity of 10 amperes (1100 watts).

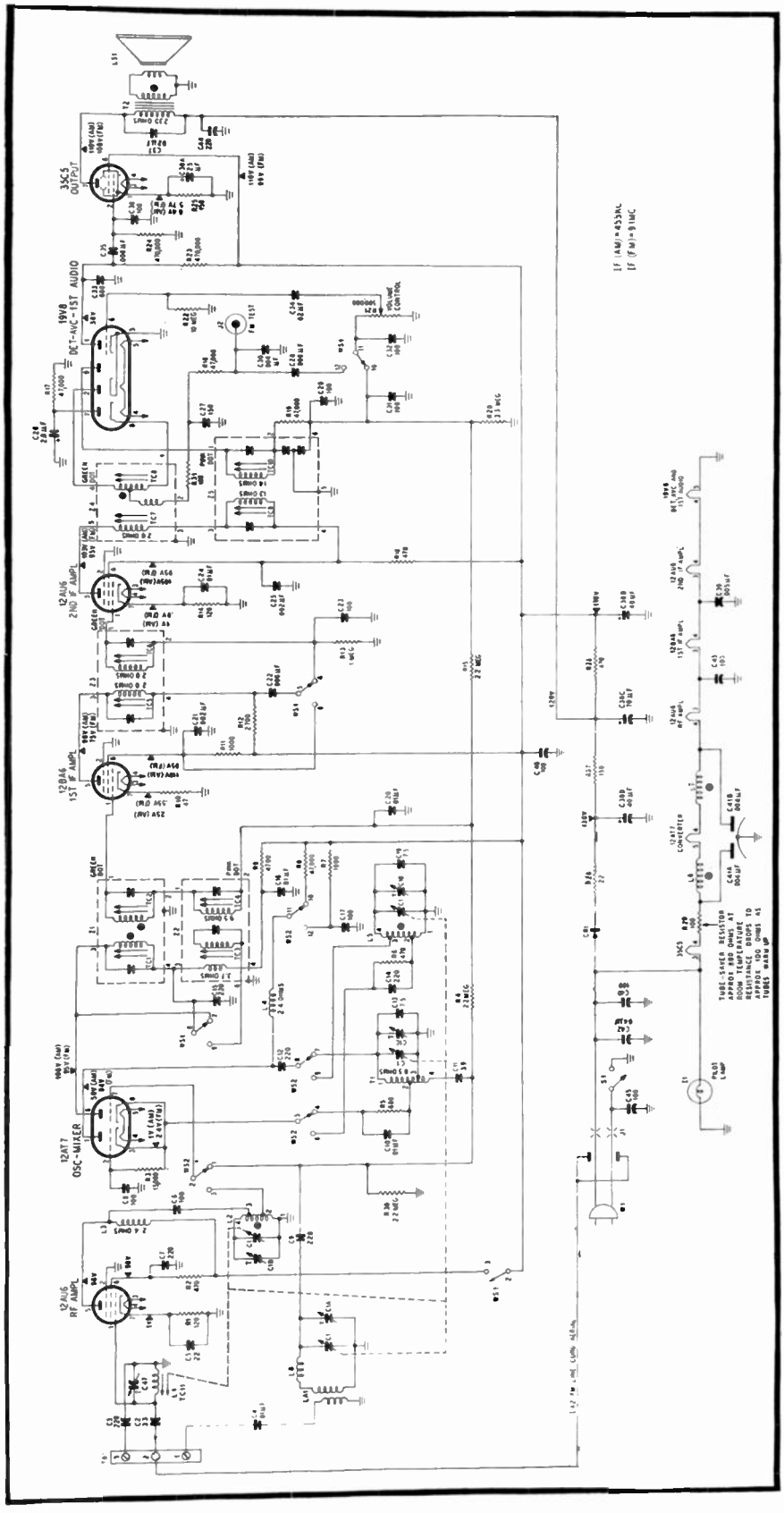

FIGURE 3. Philco Radio Model 52-944, Schematic Diagram

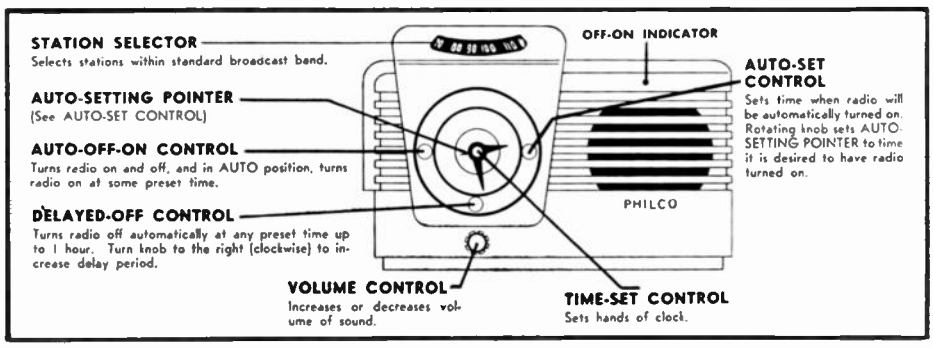

FIGURE 4

TO OPERATE THE RADIO MANUALLY

1. Turn the AUTO-OFF-ON control to the ON position.
2. After the OFF-ON indicator is illuminated, wait a short time for the tubes to warm up.
3. Turn the VOLUME control to the right (clockwise) about halfway through its range.
4. Rotate the STATION SELECTOR to obtain the desired station.
5. Turn the VOLUME control to the left (counterclockwise) until the station can just be heard.
6. Adjust the STATION SELECTOR for the best tone quality and the least background noise.
7. Readjust the VOLUME control for the desired level of sound. If there is a slight hum when the volume is turned low, reverse the power-cord plug. NEVER USE THE STATION SELECTOR TO ADJUST THE VOLUME. If the above procedure is not followed, poor tone quality, increased noise, or station interference may result.

AUTOMATIC OPERATION

If the radio is to be controlled, set the STATION SELECTOR and VOLUME control to the positions of the radio station and volume desired. If any appliance also is to be controlled, insert the appliance power-cord plug into the receptacle on the rear of the radio; if radio sound is not desired, turn the VOLUME control to the left (fully counterclockwise). After setting radio controls or connecting appliance, automatic-control operation is as follows:

To automatically turn on the radio or appliance at a preset time, set the clock controls as follows:

1. Set the AUTO-SET control for the desired time.
2. Turn the AUTO-OFF-ON control to AUTO.

NOTE

For radio-alarm operation it is advisable to select a local station, because of the wide variation between daytime and night time reception.

To automatically turn off the radio or appliance within any time interval up to 60 minutes, set the clock controls as follows:

1. Set the AUTO-OFF-ON control to OFF.
2. Turn the DELAYED-OFF control to the right (clockwise) for the desired period of time. (for example: halfway for 30 minutes, fully clockwise for 60 minutes.)

To automatically turn off the radio or appliance within any interval of time up to 60 minutes, and then on again at a preset time, set the clock controls as follows:

1. Set the AUTO-OFF-ON control to AUTO.
2. Turn the DELAYED-OFF control to the right (clockwise) for the desired time interval.
3. Set the AUTO-SET control for the time at which it is desired to turn the radio or appliance on again.