



# THE PERSONAL RADIO RECEIVER

By HENRY HOWARD

A SERIES of personal miniature receivers, thought to be the last word in neat design, were recently brought out by the industry. But, almost as soon as they hit the store windows, the public was asking for a-c/d-c line operation, having been educated along this line through the experience of the previous few years when the popular type of standard large portables went through the same procedure. Now we hear that honest-to-goodness pocket sets will be coming along soon which won't require a policeman's overcoat pocket!

Portable sets have always had unique appeal—probably because of complete isolation from home surroundings, antennas and power lines. Even in the comparatively early days of radio, cigar box receivers were continually appearing in amateur and experimenters' magazines. They were not commercial designs, however, being the product of hobbyists.

Just as the low drain series of 1.4-volt tubes made the standard portable loop receivers possible a few years ago, the new series of miniature tubes and small i-f transformers made the present personal models feasible. The power requirements haven't changed, but the new tubes are very much smaller. They are more fragile, too, having no bases. The prongs are supported by the glass



General Motors' personal radio. Case is molded of Tenite. Photo courtesy Eastman Kodak Co.

itself which can cause cracked envelopes. Socket manufacturers have to design the small sockets for these miniature tubes since misfits cause strains.

The tube types are as follows: 1T4 r-f and i-f, 1R5 oscillator-converter, 1S5 diode pentode for detector and first audio, and 1S4 power output. The filament of the last tube draws 100 ma, the others 50 ma. The type 3S4 is some-

times used in place of the 1S4, the only difference being that the filament is tapped for either parallel or series operation, making it convenient for line operation with the filaments in series. The converter and i-f tubes have a tendency to be microphonic, so shock-proof sockets must be used.

A-c/d-c operation creates a serious ventilation problem in personal sets, there being so little chance for heat dissipation. Screen bezels are generously used, the back of the cabinet is sometimes left open by means of a leather tab with two snaps, resistance line cords are still employed and special efficient rectifier tubes are being developed—all for the sake of line operation. One type of gas rectifier takes no cathode power during operation, thus eliminating most of the heating. Due to the low voltage, a filament is needed to start rectifying action, but this is connected only momentarily. A new tube, the 45Z3, is just being announced. Rated at 75 ma with 60 ma d-c output, this miniature size rectifier will have UL approval when used with a 5-watt, 1000-ohm internal resistor.

Circuit of General Electric Model LS-412 receiver.

