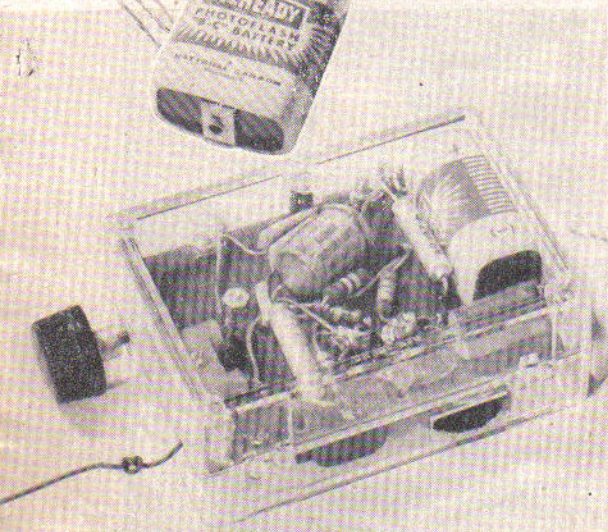
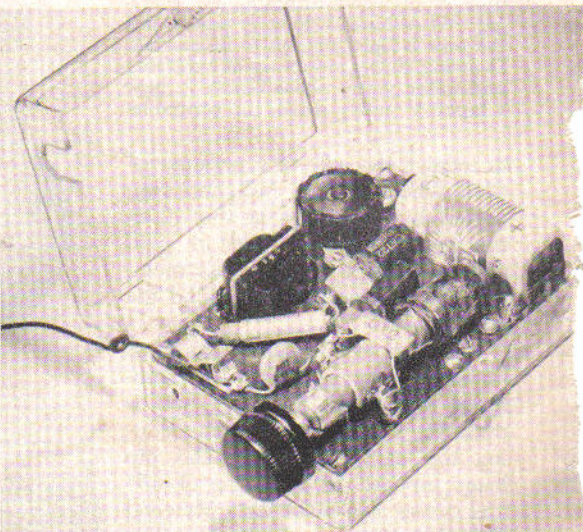


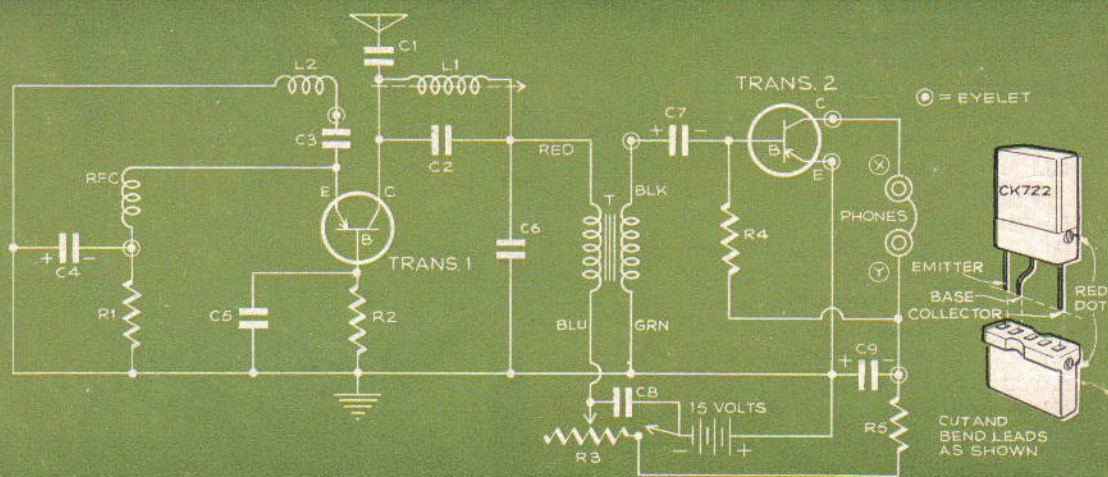
Two transistors pack unusual volume



UNDERSIDE VIEW shows tight assembly. Both ends of all components are securely fastened, enabling the set to withstand rough handling. Wires pass through holes in panel or are soldered to eyelets or terminal lugs.



WITH THE CASE OPEN, battery is easily replaced. Phone tips enter socket through holes in lower box section. Lid is notched around tuning shaft and for regeneration control knob. Ground wire can be added if desired.



PARTS LIST

L1, L2: Loop-antenna replacement (Vari-Loopstick) with added winding
 T: Interstage transformer (UTC SSO-7)
 RFC: 500 microhenry RF choke (Millen J300-500)
 C1: 47 mmfd. ceramic (CRL DD-471)
 C2: 300 mmfd. ceramic (CRL DM-301)
 C3, C6: .001 mfd. ceramic (CRL DM-102)
 C4, C7, C9: subminiature electrolytic, 2 mfd., 6-volt
 C5: .25 mfd., 200-volt subminiature paper (Aerovox type P82)
 C8: .1 mfd. 200-volt (same type)
 R1, R2: 10,000 ohms, 1/2-watt carbon

R3: 1/2 meg. subminiature variable with switch (CRL B16-218)
 R4: 250,000 ohms, 1/2-watt carbon
 R5: 12,000 ohms, 1/2-watt carbon
 Tr1, Tr2: Raytheon CK722 transistors
 Miscellaneous: two 5-prong subminiature sockets (Cinch 2H5), crystal socket for phones (Cinch 2KB), 15-volt miniature battery, 1/16" linen Bakelite panel, plastic case, tuning knob and bushing, 2-56 bolts and nuts, lugs, eyelets, etc.

All parts, including tested transistors, sold by Regenerated Purchaser Inc., 66 Dey St., NYC 7.

and battery life into this

Pocket Radio

Step-by-step drawings and wiring instructions make it easy to build this lively little tubeless receiver.

By Howard G. McEntee

PACKED into a 3" fishing-tackle box along with this midget radio are a few surprises. The first is ample earphone volume—you can enjoy listening even in noisy surroundings.

The second is sensitivity. In the wee hours, you may pull in stations halfway across the country. At the beach, on picnics or camping trips, the set will deliver almost any station on the dial.

You'll have to wait for the third surprise. It's more battery life than you would dream of getting from a tiny 15-volt flash-gun battery. No need to stint on listening; this little can of juice should last for upwards of 100 hours.

Transistors do the trick. No sub-miniature tube could deliver that kind of economy. But transistors work on as little as a thousandth the current tubes need.

The Raytheon CK722s used are low in price (about \$4.50 each). Not every CK722 you may buy will oscillate in the regenerative detector circuit. However, the source given in the list of materials will sell pairs of these units, one of them tested and identified as a detector.

Add a tickler winding. The first step in construction is to modify the loop-antenna replacement used for a tuning coil. This has a ferrous core on a threaded shaft. I jammed a threaded bushing on the shaft, and fastened a knob on the bushing. In doing this, make sure the core will screw in to within 1/16" of the end, to tune in the low frequencies.

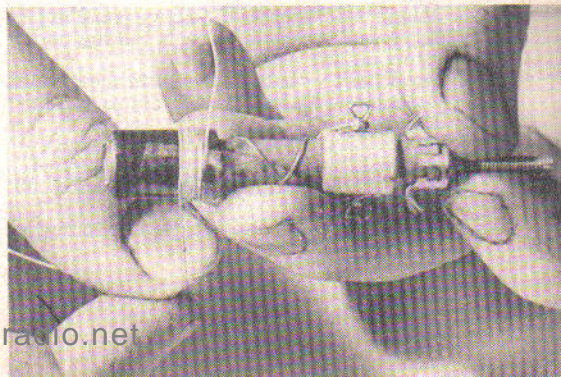


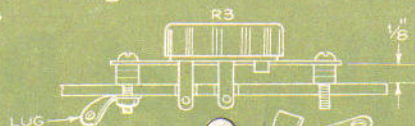
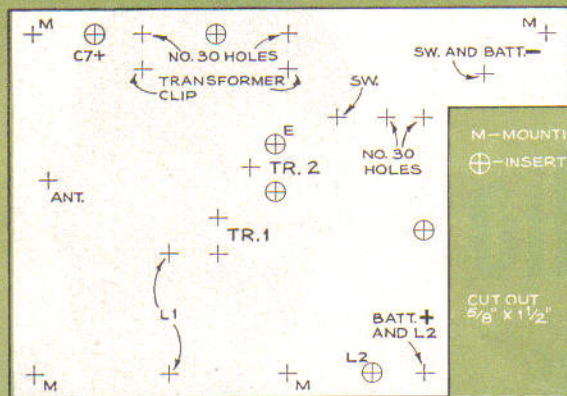
Unwind the short length of wire attached to one of the coil terminals, cut it off, and wind it over one end of the coil sleeve for L2 as shown below.

Fit chassis to case. The chassis or panel was fitted inside a 1"-by-2"-by-2 7/8" plastic fishing-tackle box. Four 7/16" lengths of 1/4" Bakelite rod were tapped 2-56 and cemented into three corners and midway of the front edge.

[Text continued on page 264]

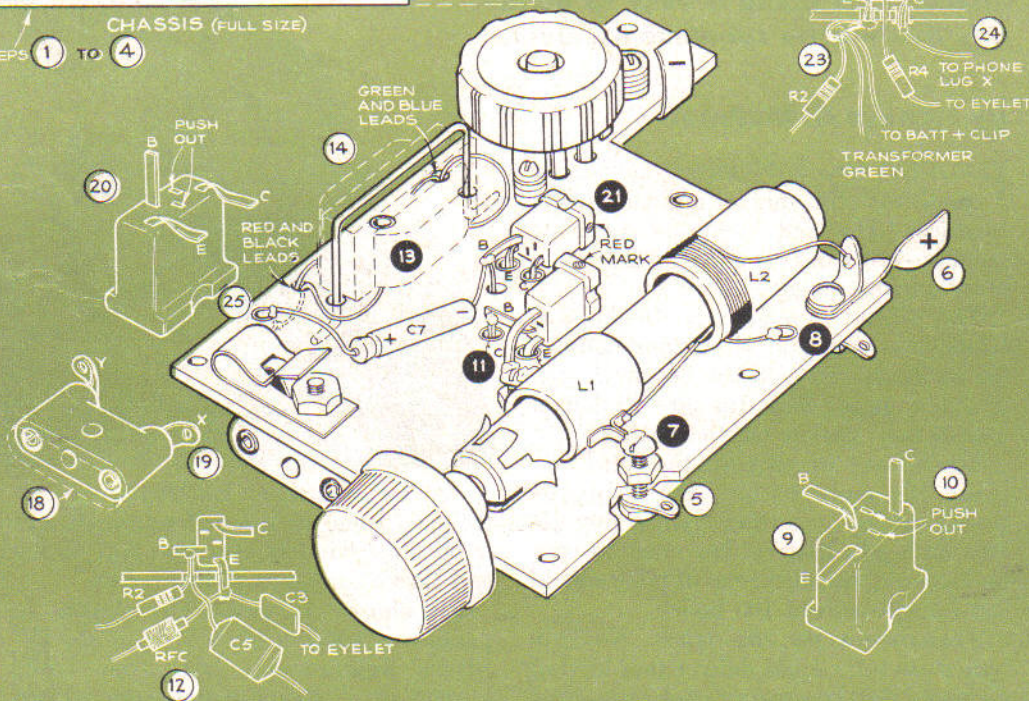
AN EXTRA WINDING is added to an iron-core loop replacement unit like this. Cut loosely wound length of fine wire free of the coil terminal it is soldered to and wind it over one end of the coil, taping ends securely. (For steps in building the pocket radio, turn the page.)





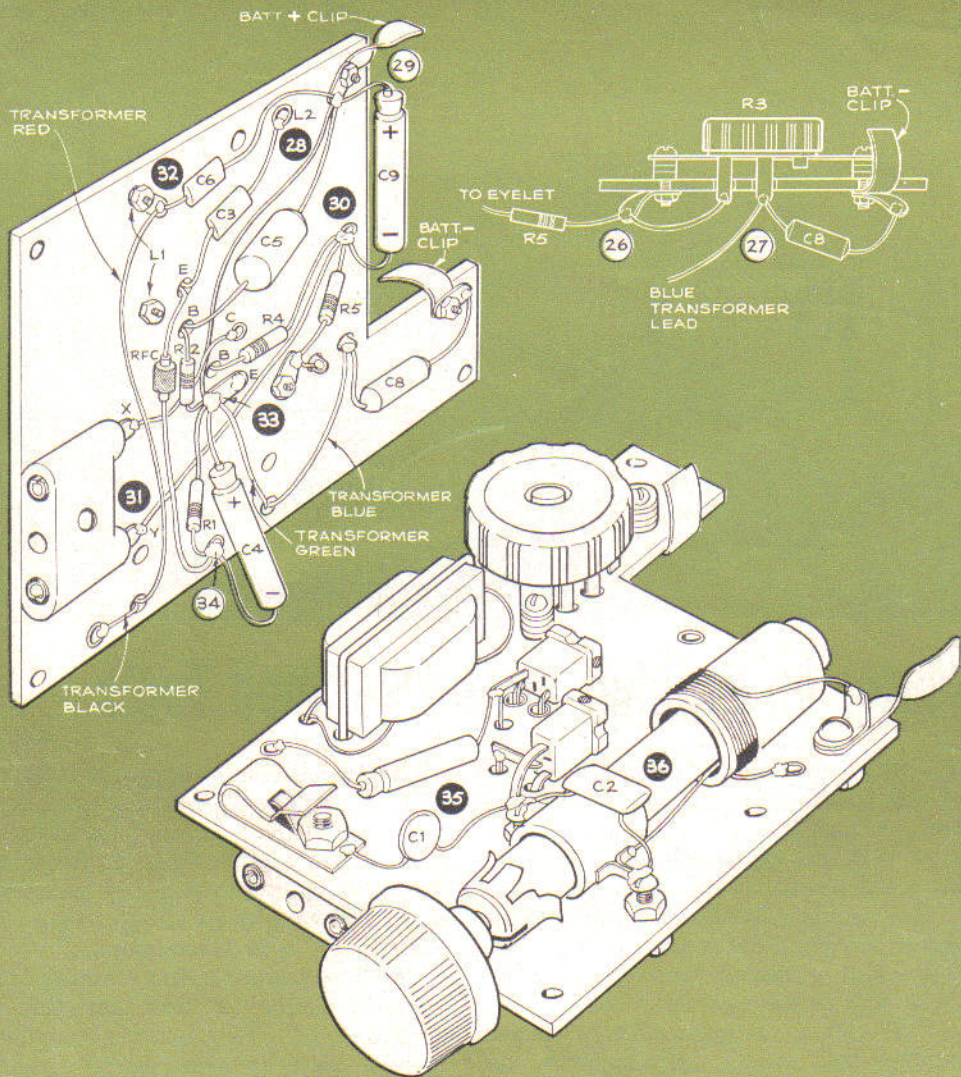
CHASSIS (FULL SIZE)

STEPS 1 TO 4



STEPS IN BUILDING THE POCKET RADIO

1. Cut 2" by 2 3/8" panel from 1/16" linen Bakelite. Cut out battery notch.
2. Prick-mark holes from full-sized drawing.
3. Drill holes No. 42 except four marked No. 30.
4. Set eyelets in circled holes, using a punch. Crimp a lug under E eyelet (Tr. 2) below panel.
5. Mount 2-56 bolts 3/16" above panel in L1 holes with two nuts on each. Put lug under panel on bolt near edge.
6. Bend positive battery clip from sheet metal. Assemble with lugs on bolt above and below panel.
7. Solder L1 coil terminals to screw heads.
8. Solder L2 leads to eyelet and top lug.
9. Bend B and E prongs of one socket 90° as shown.
10. Twist and push out two prongs indicated.
11. Paint a red dot on collector (C) side.
12. Insert E prong in Tr. 1 hole nearer coil. Solder C prong to nearby L1 terminal.
13. Push one lead of R2 and C5 through hole from below and solder to B prong above. Solder one lead of RFC and C3 to E prong below panel.
14. Mount transformer on top of panel with wire clip, bending ends of clip beneath panel.
15. Pull coded transformer leads through holes.
16. Cut one end lug of R3 short as indicated.
17. Mount R3 1/8" above panel with a 2-56 bolt (at left), washers, and a lug under the nut.
18. Bend negative battery clip, clamp it and a lug under nut of second R3 mounting bolt.
19. File end of phone socket down to end of inserts. Squeeze inserts to grip phone tips.



19. Drill bolt hole through socket. Bolt it on below panel, with antenna clip under the nut.
20. Twist and push out the two prongs of Tr. 2 socket indicated. Bend C and E prongs 90 deg.
21. Mount socket by soldering E and C prongs into Tr. 2 eyelets.
22. Run one lead of R4 through hole between eyelets from below panel. Solder it and negative lead of C7 to B prong above panel.
23. Solder free end of R2, green transformer lead, and a 1 3/4" length of wire to E lug.
24. Solder 1 1/2" wire to C prong and phone lug X.
25. Solder positive lead of C7 to eyelet (near corner) above panel, and black transformer lead to same eyelet below the panel.
26. Join end lug of R3 and nearer switch terminal with a short wire. Solder one lead of R5 to lug on terminal. ©
27. Solder blue transformer lead and one lead of C8 to center lug of R3. Solder free end of C8 to negative battery lug.
28. Solder free end of C3 to L2 eyelet.
29. Solder positive lead of C9, free end of C5 and of wire from E lug of Tr 2, and one lead of C6 to positive battery lug.
30. Solder negative lead of C9, free ends of R4 and R5, and 2"-long wire to eyelet.
31. Solder free end of 2" wire to phone lug Y.
32. Solder free end of C6 and red transformer lead to lug on L1 terminal.
33. Solder plus lead of C4 and one end of R1 to lug on E prong of Tr 2.
34. Solder free ends of C4, R1, and RFC (refer to step 12) to eyelet behind transformer.
35. Solder one lead of C1 to antenna clip.
36. Solder free end of C1 and one lead of C2 to L1 inner terminal, and free end of C2 to outer L1 terminal.

Building a Pocket Radio

[Continued from page 205]

To permit easy shifting of the transistors and avoid damaging them with soldering heat, I recommend using five-prong subminiature tube sockets. Remove two prongs from each as in the drawing. Clip the transistor leads short and carefully bend them to enter the proper socket holes.

Eyelets set into the panel serve as tie points and help anchor down both ends of every component, which is important in view of the handling a portable gets.

Wire the set as in the sequence drawings and the keyed instructions on pages 206 and 207. Be sure to mark the collector side of each transistor socket and the positive battery clip with red paint. Remember that the positive side is grounded, the opposite of tube circuits. Any reversal will destroy the transistors.

When soldering in the tiny electrolytic condensers, hold the lead between the soldered joint and the can with pliers to keep heat from damaging the unit.

Checking regeneration. When everything has been wired and double- (or triple- !) checked, temporarily connect earphones across the red and blue transformer leads. If you have a low-range milliammeter, temporarily connect it in series with the battery, taking care that battery polarity is correct with respect to the circuit. Then insert only transistor 1 and turn on the switch.

With the tuning slug fully in and R3 at or near zero resistance, the meter should read about .2 ma. and you should hear a raucous squawk in the phones, indicating regeneration.

If with an oscillation-tested transistor in the socket the detector fails to regenerate, disconnect and reverse the L2 leads. (Be sure you always shut the switch off before pulling a transistor from its socket.)

In the set shown, L2 is centered over

the end of coil L1. It may be necessary to rewind L2 farther up on the coil sleeve to get regeneration over enough of the broadcast band, or to add a few extra turns. Increasing the value of R2 to as much as 50,000 ohms will make some transistors oscillate over more of the range, but do not allow current to rise above .5 ma.

If, on the other hand, regeneration is so harsh that it cannot be controlled with R3, you may have to remove a turn or two from L2 or rewind it farther from L1.

With the detector working, check the amplifier stage by removing transistor 1 (switch off!) and inserting transistor 2. You may get a meter reading from .2 to 1.5 ma. For best results and long battery life, substitute other values for R5 if necessary to bring the current down to about .5 ma. Some CK722s tested drew less than .5 ma. with no resistor at all. In this case, you can omit both R5 and C9.

Now you're set to try for stations. In suburban areas, good reception is possible with the antenna clip on the dialing stop of a telephone, no ground being necessary. With a ground wire (led to the battery-plus clip) bedsprings or a window screen may serve as an antenna.

Best results are had with a good pair of high impedance (2,000 ohms) earphones, but you could use a magnetic hearing-aid phone. Always plug phones in before turning on the switch.

Control R3 must be worked in conjunction with the tuning knob. If there are no strong stations near, omit C1 and connect your antenna right to the coil. If stations overlap, try a smaller C1.

Want it larger? If you don't care about portability, you can use larger parts. The compact tuning system specified regenerates from 650 to 1,300 kc. in the set shown. You can probably reach a favorite way up on the dial by using a 365 mfd. condenser in place of C2. EN

.....HINT TO AN UNHANDY HANDY MAN.....

*Wood putty can cover
Defects in the wood
But can't hide bad botches
You hoped that it could.*

—BERTON BRALEY