

# A SUPER-SENSITIVE ALL-WAVE CRYSTAL SET

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A description of a crystal receiver designed for all-wave reception. This set is an outgrowth of the original set described by the author in our December, 1932 issue. It is especially designed for the man entering the radio field.

**A** SUPER-SENSITIVE all-wave crystal set using plug-in-coils was developed by the writer and described in the December, 1932, issue of RADIO-CRAFT, page 354. Now, a new circuit has been brought out which is much more sensitive and selective than the earlier design. The latest arrangement uses but two plug-in coils (taken from an old S.-W. set), one for each wave band, and there is but one basic change in the circuit. The improved circuit design is shown in Fig. 1.

Using the set with a long antenna and a ground connection, KFI (640 kc.) was the highest possible station to be tuned in. The lower part of the broadcast band and short-wave stations are received with the new set with as much volume and far better selectivity than could be obtained with the old set by using this long outdoor antenna; instead of a ground connection, a 50 ft. indoor antenna is used as a sort of counterpoise. This counterpoise lowers the tuning limit somewhat.

(Other builders of the old circuit report distant reception of air ports and

planes, police, and some S.-W. stations, using about a 60 ft. antenna and a 60 ft. counterpoise and tapping the coil at 3 and 9 turns from the ground end.)

What the set has done: In a few days operation this set has brought in police calls from Seattle, Portland, San Francisco, Berkeley and Denver; air ports in Oregon, Washington, Idaho, Wyoming, Utah, Arizona, Colorado and California, with many 'planes in flight. Heard: Amateur 'phone from half across the U. S. and two S.-W. broadcast stations upon adjacent channels on the night of Feb. 7. (Caught the call of but one at 8:01 P. M. [Pacific time], W3XL, 6,425 kc., 46.96 meters, Bound Brook N. J., playing marimba solo, La Sorrella.) And as for code, some nights it's like a bee hive!

The relative broadness of tuning on this set is an advantage in finding S.W. broadcasts and other voice signals, although, as a crystal set goes, it tunes sharp.

### Building the Set

The coils can be built on celluloid, bakelite, or paper forms 3 ins. in dia.

Use No. 18 or 20 S.G.C. or D.C.C. wire, spaced about 18 turns to the inch.

The large coil, L2, in Fig. 1, has 54 turns, tapped, from the ground end, at 6, 15, 27, and 40 turns. This coil goes far below the broadcast band. For the real short-wave band the coil L2 should have 15 turns, tapped at 3, 6, 9, and 12 turns from the ground end. This coil, using a counterpoise, goes up into the broadcast band and separates stations better, with good volume, than the large coil. It is not known how far this coil will tune below 46.96 meters.

Coil L1, the untuned, fixed, 11-turn primary, is made in the general manner described for coils L2; coil L1 must be made just small enough to slip inside and at the ground end of either of the coils which are used as L2. (This primary is not a very important winding and is used but little, although, if loosely coupled when using a ground, it results in increased selectivity on loud signals.)

The same station will come in on several taps, but use the one which places the station lowest on the tuning. (Continued on page 587)

## THE RADIO BEGINNER

• In this department we shall print every month simple, but effective radio sets and circuits, and other information for radio beginners, or those just starting in radio. There are thousands of radio fans and experimenters who are still interested in building their own, and

in experimenting with home-made sets. The new instruments, as well as the new tubes, make this endeavor of particular importance.

If you build the sets described in these pages, won't you be good enough to advise us what results you are getting?

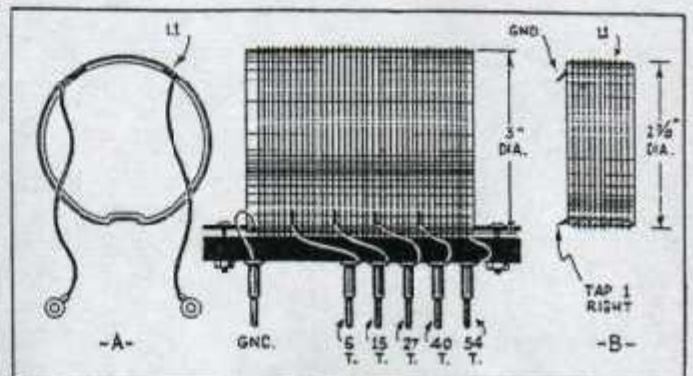
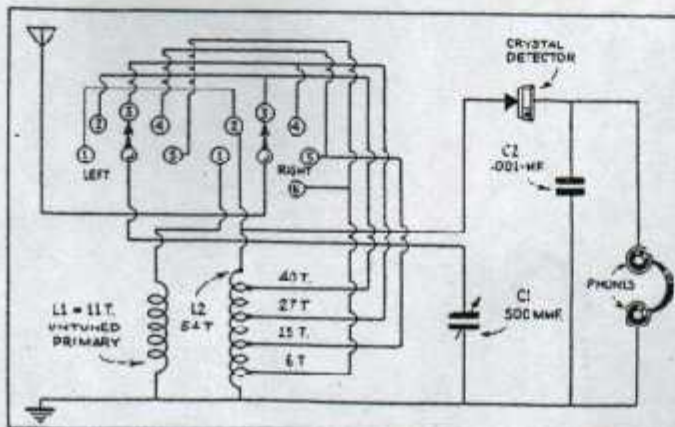


Fig. 1, left. Schematic circuit of the receiver described. Fig. 2, above. Sketch of the tuning coil. Two coils are needed to cover both the broadcast and short-wave bands.

appears in Fig. Q.197. A front-view illustration of the instrument is Fig. Q.197A.

## A SUPER SENSITIVE ALL-WAVE CRYSTAL RECEIVER

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condenser setting for loudest signals.

To tune to the higher frequencies, move the right-hand switch (marked "right" in Fig. 1) forward, clockwise, one to three taps before advancing the left-hand switch arm. The efficiency of this set seems to lie partly in the low-loss coils, but mostly in the one basic change in the circuit, in which the detector is connected permanently to the last turn (from ground) on the tapped coil.

### List of Parts

- One Puretone or Rotozit crystal detector (or a good piece of galena)
- One tuning condenser, 500 mmf., C1;
- One fixed condenser, .001-mf., C2;
- One set of coils (see text) L1, L2;
- One pair of headphones (Baldwin, Brandes, etc.);
- Two tap switches, "left," "right";
- Eleven taps;
- One baseboard, 7 x 12 x  $\frac{1}{8}$ -in.;
- One panel, 7 x 7 x  $\frac{1}{4}$ -in.;
- Hookup wire, screws, etc.

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