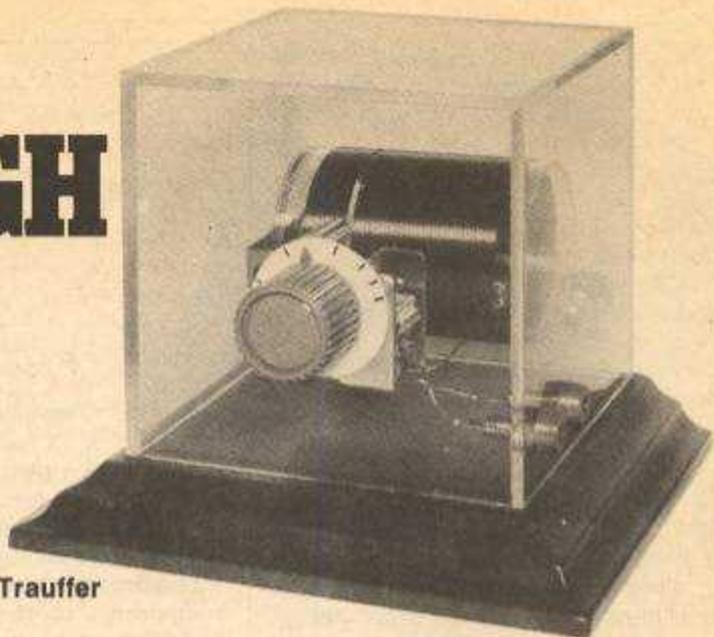


Build the SEE-THROUGH CRYSTAL RADIO RECEIVER

by Art Trauffer



□ Have you ever wanted to recreate those old days of listening to AM radio on a crystal set and headphones? No tubes, no batteries, no hum, no nothing but pure clean sound drifting out of the ether into your headset? If you have the yen to get a crystal set which has the advantage of using a crystal diode instead of the old unreliable cats-whisker and galena crystal, this radio is the one for you to build. In addition to being about as good a power-supplyless AM receiver as you can make, it's also a pleasure to look at.

It closely resembles the beautiful glass-enclosed radio receivers that were custom-built by manufacturers for display in radio exhibitions in the 1920's. Manufacturers of radio receiver kits mounted and wired their kits in glass cabinets so the visitors could see the "works" from all angles instead of lifting the lid to look inside. Those glass cabinet radios are now rare collectors

items.

This crystal radio also saves you the work and expense of making a wood cabinet, and it is low-loss for radio frequencies because the cabinet and coil form are made of styrene plastic which is a good dielectric material. The cabinet is simply a clear plastic 4-in. square photo display cube, and the coil form is a clear plastic pill container about 2-in. in diameter.

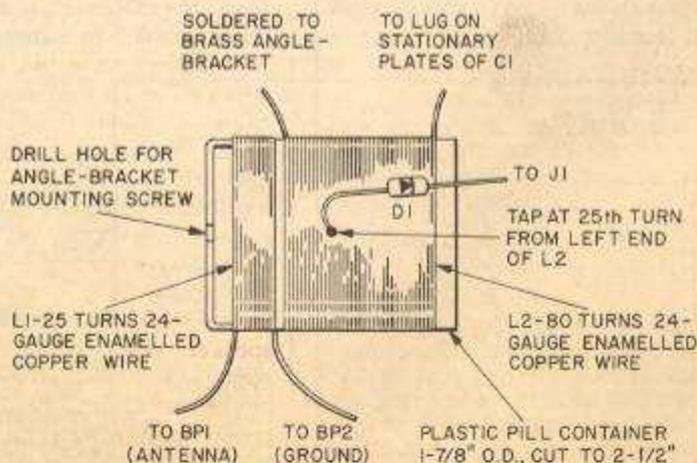
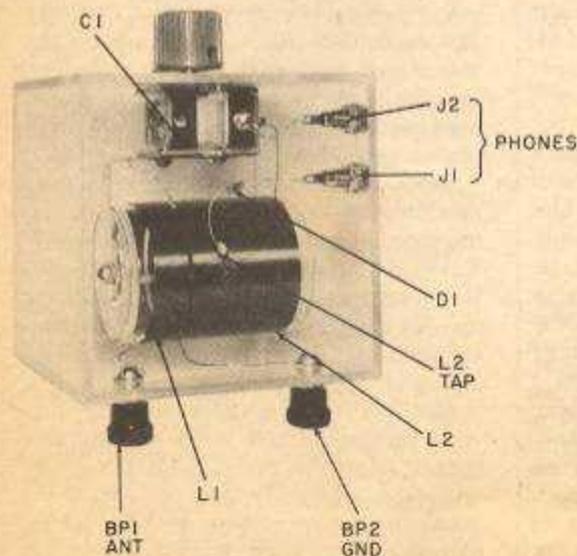
Circuit Description. The simple schematic diagram shows a time-tested hookup which is still widely used, but it's improved here by connecting one side of the crystal diode to a tap on the secondary, L2. This greatly increases the receiver's selectivity and helps you separate the powerful local stations.

Making the Coil. To make coils L1 and L2 the four ends of the coils are anchored in small holes drilled through the wall of the plastic container and spotted with Duco cement. You can also

make small holes by pushing a hot sewing needle through the plastic. To make the tap on the coil, simply twist a small loop in the coil and spot it with Duco cement. Scrape the enamel insulation off the loop, and solder to it.

Build Your Own or Ours. The plastic cube makes a very attractive enclosure, as you can see in the photographs. However, the parts layout isn't at all critical, and you can breadboard this radio any way you want, so long as it's wired correctly. If you want to have a beautiful-looking radio you can show off you'll follow the model I made which is shown in the photographs.

Mounting The Parts. The photograph shows how the parts mount inside the plastic box. The coil form is mounted to the rear of variable capacitor C1 by means of a brass angle-bracket. Use lockwashers wherever needed to hold the screws, binding posts, and phone tip jacks securely to the plastic material.

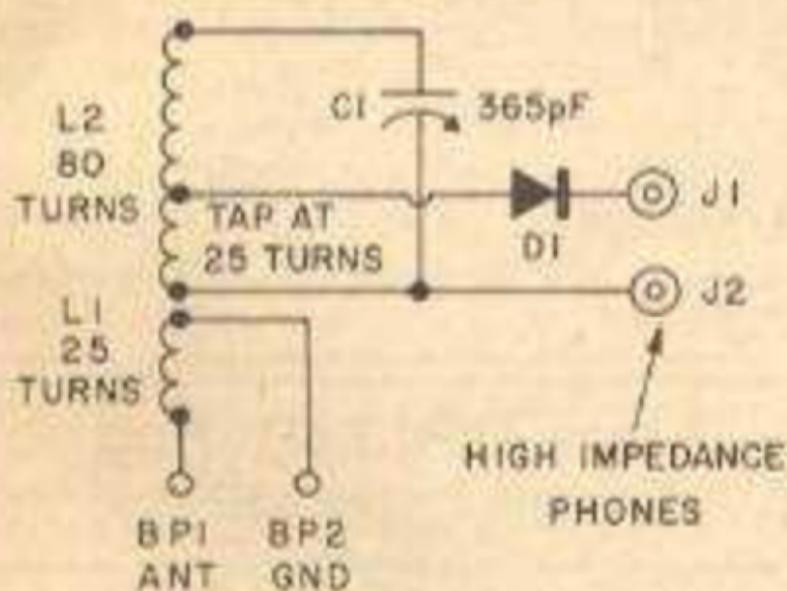


Apart from getting hold of the parts, construction of the See-Through Crystal Set should take you less than two hours in all. You can use any kind of box you want, but the lucite box shown will make it into a real showpiece.

When assembling and wiring this receiver be careful not to scratch the plastic, and keep the soldering iron well away from the plastic. If you use rosin core solder, protect the plastic by covering it with pieces of paper taped in place to keep the rosin from splattering on the plastic.

The completed crystal radio is mounted on a fancy walnut base purchased from a woodworking shop. The plastic box is secured to the wood base by spotting the four corners of the bottom of the box with Duco cement. The dial for the pointer knob is simply a small disc of white double-weight paper held to the plastic box with a spot of Duco cement. Make pencil marks at the places where your local stations come in.

Use of a pair of sensitive high-impedance magnetic or crystal earphones, a good connection to a cold water pipe, and a long outdoor antenna (for best results, put up a long single-wire, random-length antenna.) With a simple crystal set it becomes particularly important that the antenna-ground system be the best possible. Remember, unlike its bigger cousin, the superheterodyne, the crystal set does not have rf amplifiers and other circuitry to help it pull in all those signals floating around out there in the ether. ■



PARTS LIST FOR CRYSTAL RADIO

BP1, 2—Binding posts for antenna and ground connections, may be any convenient type

C1—365-pF variable tuning capacitor, single-gang.

D1—Small-signal, general purpose diode, similar to 1N34.

J1, 2—Jacks for headphones (dependent on phone(s) selected).

Misc.—Headphone(s), high impedance. May be crystal or magnetic, or small earphone as supplied with transistor radios and portable tape machines; plastic photo display cube, approx. 4-in. each dimension; plastic pill container, 1 7/8-in. diameter, for use as coil form; 1/4-lb. 24-gauge enamelled copper magnet wire (Radio Shack 278-004 or equiv.); brass mounting strip, assorted screws, nuts and lockwashers.