Selective, Fixed Detector
CRYSTAL SET

Try this new-type crystal set. It really separates the stations, even in the big city

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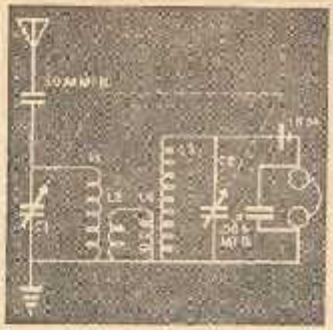


LIST OF MATERIALS

1 1N34 diode detector
1 2 gang 450 mmfd. variable condenser
2 Coils (Allied Radio #80-560)
1 50 mmfd. mica condenser
4 Fahnestock clips
4 L Brackets
8 Wood screws
6 6/32-1/4" R.H. machine screws
1 Tuning knob
7 No. 6 soldering lugs
1 .004 mfd. mica condenser

ONE of the greatest shortcomings of the average crystal set in providing satisfactory broadcast reception, especially in metropolitan areas, is lack of sufficient selectivity to separate stations. The receiver described in this article is an offshoot of the old fashioned crystal set that has been popular for so many years. But it has now been brought up to date, especially with regard to selectivity.

This set is designed to cover the broadcast band and to produce good volume on local stations with better than average selectivity. This is accomplished by the use of two tuned circuits instead of the usual single tuned circuit used in most crystal sets. Like all crystal sets, this receiver requires no external power to operate it. It is simple to construct and operate, and is economical to build.

Of the two important special features of this set, one is the use of a 1N34 crystal diode. It provides for greater sensitivity, eliminates the need for adjustment, requires no special mount, and may be wired into the circuit directly. The crystal is protected from dust and dirt and is less subject to damage in use. Its small size makes it convenient to use. The same crystal, as in this set, was developed during the war for use in radar equipment as a detector. It is now available for general use and, while it is more expensive than the old crystal detector, it is worth the difference.

The variable selectivity incorporated in this crystal set is found in few other crystal sets. It is especially advantageous when the receiver is to be used in an area serviced by two or more local broadcast stations. With the set adjusted for maximum selectivity, the simultaneous reception of two or more local stations which is characteristic of the average crystal set, is greatly

minimized and in most instances it has been entirely eliminated.

Variable condenser tuning is used in preference to tapped coils or otherwise-variable inductances for greater ease of operation and compactness of construction.

In assembling the parts for this set, it is important to first determine the correct position of the variable condenser in relation to the base board. The condenser must be mounted so that when the plates are unmeshed the rotor plates do not hit the base board. The four holes on the bottom of the condenser, two front and two rear nearest the corners, are then tapped to take 6-32 x ¼ inch machine screws to mount the condenser brackets. Self-tapping metal screws may be used instead of tapping the condenser frame but in either instance care must be taken to prevent the ends of the screws from interfering with the movement of the rotor plates or from shorting rotor to stator, depending on the make of variable condenser used. Mount the coils in the manner described above, on the condenser frame using the two holes nearest the top rear corners. Screw fahnstock clips and soldering lugs to the base board of the set.

Before proceeding with the wiring, it is important to note that the end of the coil nearest the bracket is called the "cold" end, and is the bottom of the coils in the schematic diagram. Failure to note this point will result in reduced selectivity, you will find.

After the condenser mounting brackets and coils have been attached to the condenser, the coils should be wired into the circuit with the exception of the variable condenser ground connection and the connection to the series antenna condenser; however, the length of these leads should be approximated and soldered to the variable condenser. The 1N34 is now attached to the variable condenser. Attach the variable condenser and coil assembly to the base board and complete remainder of the wiring.

No special adjustments are required to place the set in operation. Connect antenna, ground, and phones to the proper clips. Selectivity is varied by moving the coupling coils (L-2 and L-4), selectivity increasing as the coils are moved down the tuned coils. It will also be found that as the coupling coils are moved up to decrease selectivity, volume is increased. In areas having few broadcast stations well separated in frequency, it will be found desirable to adjust for minimum selectivity and maximum volume although volume will still be satisfactory when the set is adjusted for maximum selectivity. Care should be exercised in adjusting coupling coils to prevent breaking the coil leads.

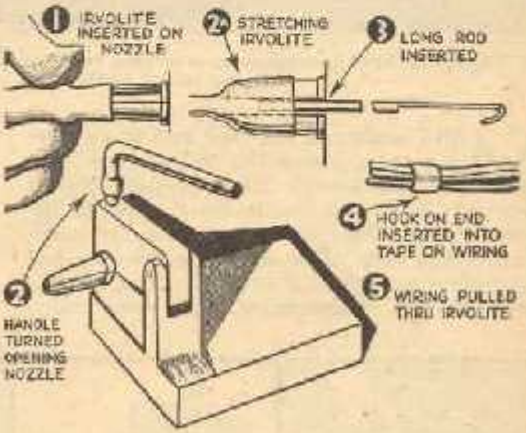
Tune slowly and carefully for maximum volume and re-adjust coupling coils for optimum volume and selectivity when necessary. Also necessary for proper operation are a good antenna and ground. An out-door antenna as high and long as conveniently possible should be used. It is advisable to use high impedance headphones. Although low impedance phones will work they will usually decrease selectivity. Double headphones with a resistance of about 2,000 ohms are preferred. A set of headphones is the only accessory needed to operate the crystal set.

When circuit L1-C1 is tuned to the frequency of a station, current flows in the circuit and sets up a magnetic field which cuts the turns of coils L2, causing a current to flow in circuit L2-L4. By inductive coupling, energy is transferred from L4 to the tuned circuit L3-C2 which is identical to and ganged with L1-C1. The radio frequency current is rectified by the 1N34 and its audio frequency component reproduced by the headphones. Greater selectivity is obtained by using two loosely-coupled tuned circuits. Capacitive coupling between antenna and detector circuit is minimized by grounding the "cold" end of each inductance.

Insulating Wires

ON ELECTRICAL work, the home craftsman is normally at a great disadvantage when it becomes necessary to insert wires in Irvolite and other types of flexible insulation tubing — especially when tight fits and neat appearance are essential. Accompanying drawings indicate a tool and a method with which this disadvantage may be overcome.

The tool is a vise-like gadget whose jaws are arranged to open and close the two halves of a tapered nozzle. Up and down adjustments of the jaws and nozzle are accomplished manually with a handle and screw mechanism.



When the nozzle halves are in contact with one another, the flexible insulating tube can be easily slipped over their outer surfaces. Then, when the nozzle halves are separated, the mouth of the tube is stretched open.

The wires that are to be insulated should then be taped together so that they can be pulled into the required position with a rod-hook through the stretched tube end.—T. A. DICKINSON.