

Battery-less One Transistor Amplified Crystal Detector Radio Receiver

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The radio described here is unique in that it allows quality, higher volume radio reception even in areas without any outside power. This germanium, point contact [diode](#) and point contact germanium [transistor](#) detector radio produces an amplified audio signal, which is louder than the usual audio output produced by single diode sets. It does that, however, at the expense of some extra work and components.

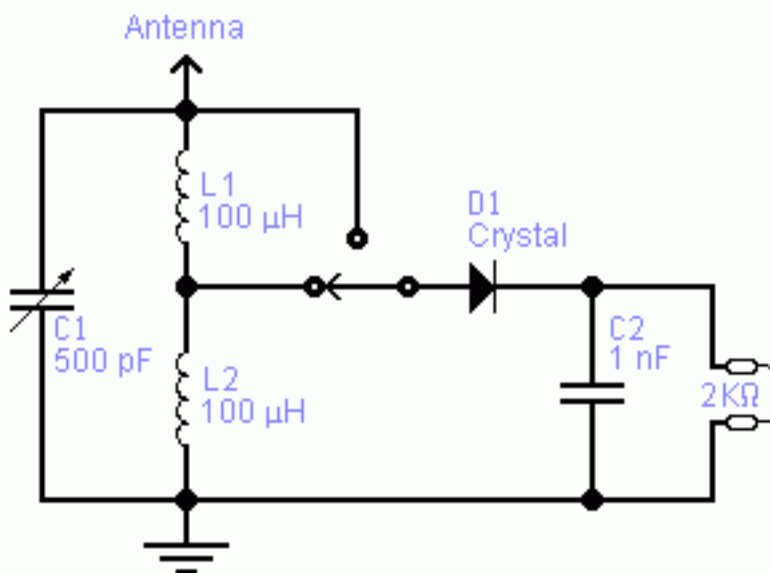


Figure 1. Basic crystal detector radio

Figure 1 shows the schematic diagram for the basic crystal detector radio. This set uses a dual 100 μH coils on a 1/4-inch coil form with a tunable ferrite screw in it. Ferrite has higher magnetizing losses than air, but an air core coil would use a lot longer wire with a higher resistance, the ferrite coil will increase the overall receiver efficiency. The two [coils](#) could be made at the same time, using bifilar winding technique. C1 is a good quality, air dielectric rotary capacitor.

Heavier solid wires can also be used if the preferred Litze wire is not available. To better match the detector impedance to the tuned circuit, the D1 germanium point contact diode, marked crystal, is connected to the center tap on the coil arrangement via a switch. Use long wire, high antenna, tune in a station and set the switch to a position that produces a stronger sound. So far the radio is not unusual, but it is used as a base to develop the amplified version.

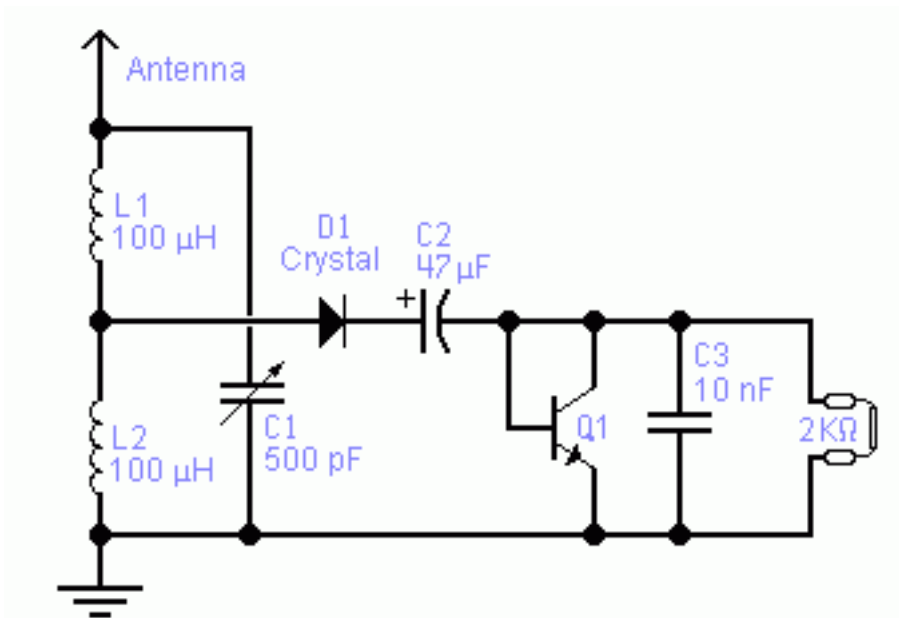


Figure 2. One transistor crystal detector radio

Parts list for one transistor crystal detector radio:

- L1 - Primary, Antenna coil 1 - 100 uH
- L2 - Primary, Antenna coil 2 - 100 uH
- C1 - Rotary Capacitor 500 pF
- C2 - [Electrolytic Capacitor](#) - 47 uF 10 VDC
- C3 - [Filter Capacitor](#) - 1 nF, Disc, 6-10VDC
- D1 - [Diode](#) - Germanium, point contact
- Q1 - [Transistor](#) - Germanium, point contact

Figure 2 shows the schematic diagram of the transistor version of the amplified semi-reflex crystal detector radio. The low capacitance, germanium point contact transistor is connected to the D1 crystal diode via C2, a 47 micro-Farad electrolytic capacitor. Other small signal, germanium transistor may be used, experimentation required to find the best. A solid dielectric or a low leakage tantalum capacitor would be ideal in this circuit. A strong rectified audio signal would develop an operating voltage for transistor Q1, and the audio signal will appear stronger across the 2 Kilo-Ohms magnetic headphone set. The D1 crystal detector can be connected as shown in the diagram, or if it produces a stronger audio, it can be connected to the antenna terminal like it shown on **Figure. 1**.

[Previous Page](#)



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