

# Why Old Radio Don't Work

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People who have an old radio often wonder why it doesn't work. "Probably a tube," they think. "Just replace it and the set will work just fine." Well, I'm sorry to say that it's not that simple as that. Radios have many different kinds of parts in them; tubes, resistors, capacitors, coils, transformers, speakers, switches, volume controls, etc. Many of these parts have gotten worn with use over the years or have just deteriorated with time to the point where they fail. As a result, an old radio is likely to have not just one problem, but many problems. Let's take a closer look at the various components of a radio and see what common problems occur.

**Tubes:** Tubes are surprisingly rugged and long-lived. If they've been used a long time they can get weak or burn out. However, while the set was working, the owner probably tested the tubes periodically and replaced the weak or burned out ones. Also, tubes do not go bad with age, so it is likely that there are only one or two bad tubes in a set.

**Capacitors:** These electronic parts are typically small round tubes of plastic or wax-coated paper with a wire coming out at each end. A radio may have anywhere from 8-50 of them depending on the complexity of the set. Due to their construction, capacitors have the highest failure rate of all the components in a set. Typically, the capacitors consist of two sheets of metal foil separated by a thin sheet of paper. Even though the capacitors are sealed in wax or a sheet of plastic, air and moisture get in and they deteriorate. Corrosion may break the connection between the wire leads and the foil; the capacitor then becomes "open." Electrolytic capacitors are a special type that have a moist paste in the paper. Eventually, the paste dries out and the capacitor does not work. Sometimes the two sheets of metal foil in capacitors touch, allowing unwanted electrical currents to pass through the connection. The capacitor is then said to be "shorted."

**Resistors:** Resistors are usually hard rods composed of carbon and other materials, brightly colored or with stripes to indicate their electrical value. A wire usually extends from each end. A radio may have anywhere from 10-55 resistors depending on the complexity of the set. Resistors seldom go bad, even on long storage. A few may change

in electrical characteristics to the point they do not function well. Some may "open up" (become disconnected inside). Sometimes, through the fault of another component in the set, too much electricity flows through a resistor and it burns up. Volume controls, tone controls, and some other controls are variable resistors. These usually wear out after long use.

**Transformers, Coils, and Speakers:** These are usually large items in a set, easily identifiable. Coils and transformers are often inside round or square cans to protect them. They consist of coils of wire, wound on a form, through which electrical currents flow. The trouble comes from the fact that sometimes the wire is very fine and it breaks, stopping the flow of current. Similarly, a tiny spot of dirt or residue may gradually eat away at the wire eventually causing it to open up. A fault in another part of the circuit may cause too much current to flow through the coil, causing it to burn out. Also, the wire may touch another piece of metal causing electricity to flow to a different, unwanted part of the circuit. This is an example of a "short."

**Miscellaneous Components:** Besides these components many other parts in a set can go bad. A common problem is the mechanical linkage connecting the tuning knob to the tuning capacitor. This is usually a cord or belt. Eventually, these break so that one cannot tune the radio.

**Miscellaneous Problems:** Besides the actual failure or change in characteristics of these components, other problems often arise.

**Bad Connections:** Some electrical connections consist simply of one metal part touching another metal part; e.g., the pins of a tube pressing against the contacts of a tube socket. With time, dirt may accumulate between the two pieces of metal or a layer of corrosion may form between them preventing a good electrical connection between them.

**Bad Solder Joints:** This problem often arises if at some time the set has been worked on by an unqualified person. To make a good electrical connection between the various components in a radio, a melted alloy, solder, is applied to the joint, binding it together. If this has not been done correctly, the parts may eventually separate, breaking the electrical connection between them. This is often difficult to detect visually; a meter or signal

tracer must be used to detect them. More troublesome are intermittents; weak connections that unexpectedly open up at odd times or under various conditions. These are probably the repairman's worst nightmare.

**Mishandling:** These are problems that arise simply from carelessness or ignorance. For example, a tube may have been put in the wrong socket, or one tube may have been misread for another (e.g. 6SQ7 for 6S7). An unqualified repairman may have replaced a bad part with a similar-looking one with different characteristics. To improve the performance of a poorly-working set, someone may have tampered with the tuning adjustments, making its performance still worse. Radio repairmen will usually have many fascinating tales of bizarre and unexpected problems they have encountered.

I hope that through this discussion I have made you more familiar with the various parts in a radio and what kinds of problems can arise. Even a small radio has many parts and so you can see how likely it is for an old set not to work. This is also why repair of an old radio can be time-consuming and expensive.



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