MAKE A LOW ENERGY RADIO TRANSMITTER

Demonstrate the principle of low energy radio waves.

Materials Needed

Tape or CD player
Mini audio amplifier (Radio Shack 277-1008 or equivalent) with a 9-vole battery. Note: You can connect a coil directly to a small speaker, but the sound obtained will not be as loud.
Magnet wire, 24 or 26 gauge
Twin lead wire such as speaker wire, 24 or 26 gauge
2 mini phone plugs
Wire cutter
Electrical tape
Scissors
Sandpaper
Wire stripper
Soldering iron
Solder

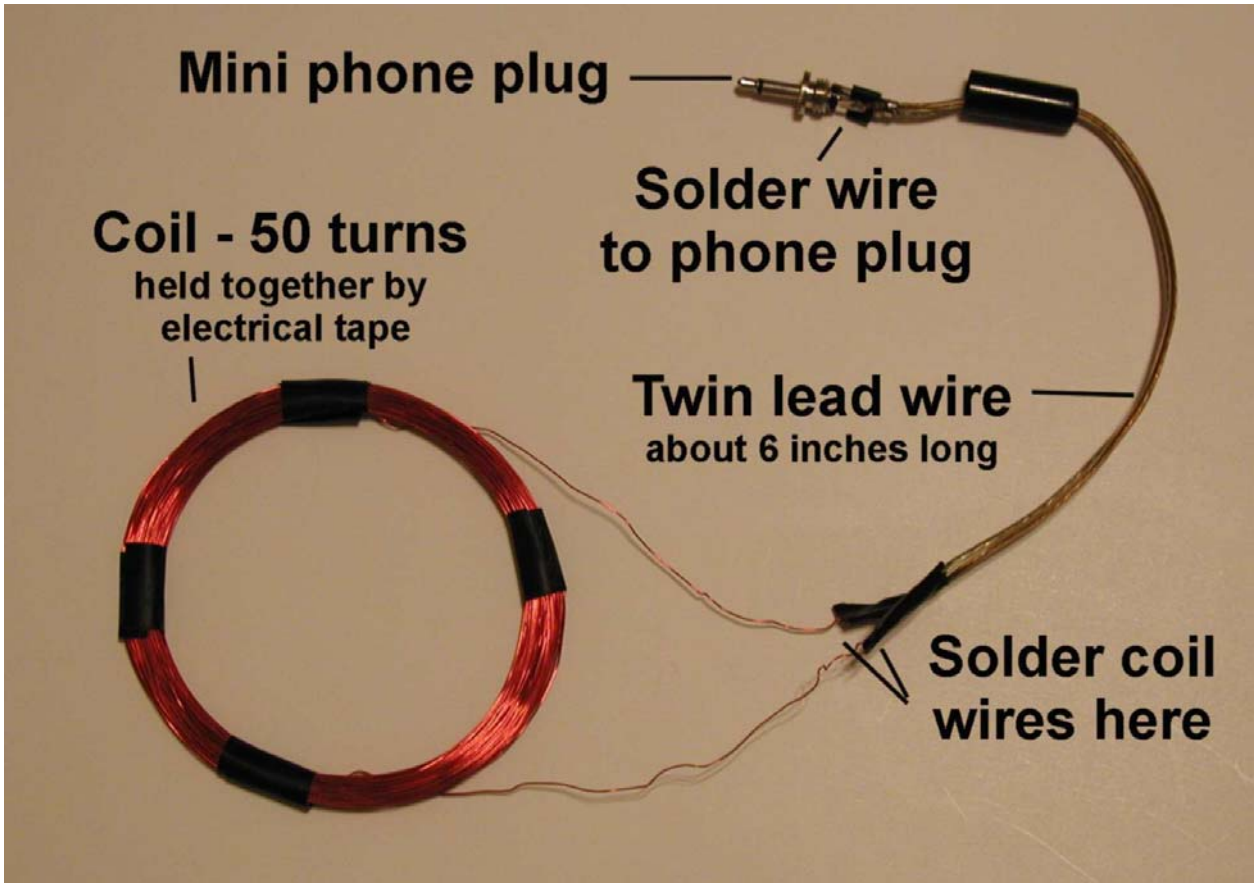
Directions

You will need to make 2 coils

1. Obtain a roll of magnet wire.
2. Obtain a round object such as a 250-mL or 400-mL beaker (approximately 6 to 7.5 cm [2.5 to 3 inches] diameter).
3. Leave an end about 15 cm (6 inches) long.
4. Wrap the write around the round object about 50 times.
5. Carefully remove the coil from the round object. Tape it together with black electrical tape.
6. Cut the wire leaving about a 6 inch end.
7. Using a piece of sandpaper, rub the coating off about 2.5 cm (1 inch) of the ends of the two 15 cm (6-inch) leads from the coil.
8. Obtain a 15 cm (6-inch) long piece of twin lead wire.
9. Strip about 12 mm (½ inch) of insulation from both ends of the wire.
10. Solder the coil to one end of the twin lead wire.
11. Solder the other ends of the twin lead wire to a mini phone plug
12. Insulate the soldered joints using small pieces of electrical tape

To use the coils, you will need a tape or CD player. Plug one coil into the earphone or external speaker jack of the player. Plug the second coil into the input jack of the mini audio amplifier. Play a tape or CD. Depending on the output voltage of the tape or CD player, you should be able to transmit the sound from the recording up to approximately 1 meter.

The waves are polarized. Hold the two coils parallel, then turn one coil so it is perpendicular to the second coil. What happens to the sound?


Mini phone plug
Solder wire
to phone plug
Coil - 50 turns
held together by
electrical tape
Twin lead wire
about 6 inches long
Solder coil
wires here