

## Experiment 6: FM radio receiver

### Goal

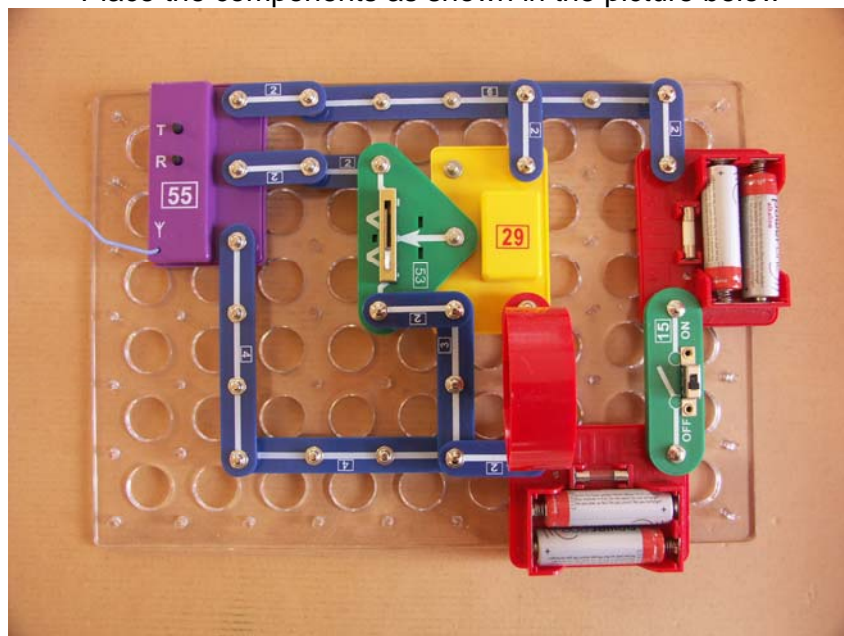
In this experiment you will build a circuit that will allow you to receive FM radio signals. Think about what components you will need, before looking at the parts list below.

### Components

1. An **antenna**. Unless you are sitting right beside the radio transmitter, your radio receiver needs an antenna to help it pick radio waves out of the air. In this circuit the antenna is simply the wire attached to the tuner circuit.
2. A **tuner** circuit. The job of a tuner circuit is to separate one signal from the thousands of radio signals that the antenna receives.
3. A variable resistor. We can control the volume of the radio using a variable resistor.
4. A **detector and amplifier** circuit. The receiver needs this circuitry to extract the voice or sound signal from the electronic signal received by the tuner circuit. The radio next amplifies the signal and sends it to the speaker. The amplifier is made of one or more transistors (more transistors means more amplification and therefore more power to the speakers).
5. A **speaker**. The speaker converts the signal from the receiver into sound which we can hear.
6. Battery packs, switch, and connectors.

### Build it!

Place the components as shown in the picture below



### **In Action**

When you close the slide switch, electric current flows from the battery, through the circuit. Press the channel selection button, T and release it immediately. It should automatically select a channel and lock onto it. Continue to press the T switch to select all channels from 88MHz to 108MHz (the FM band). When it reaches the top of the band, press button R to reset.

You can adjust the volume of your radio receiver by adjusting the variable resistor (part # 53).

### **Real World**

"Radio waves" transmit music, conversations, pictures and data invisibly through the air, often over millions of miles -- it happens every day in thousands of different ways! Even though radio waves are invisible and completely undetectable to humans, they have totally changed society. Can you list some of the many devices that use wireless technology (i.e. radio waves) to communicate?

Here are just a few:

- ✓ Mobile phones
- ✓ Satellite TV
- ✓ GPS signals
- ✓ Baby monitors
- ✓ Cordless phones
- ✓ Police and Fire radios

**WARNING:** Do not attempt to power this circuit or any of the Electronic BrainBox circuits using the mains! The mains voltage is much more powerful than the battery voltage, and would be deadly.