

## **Experiment 16-**

### **Infrared Fiber Optic Audio Links**

In this experiment you will build an infrared opto transmitter that emits a pulse modulated light beam. You will use an optical fiber to link this transmitter to the opto receiver of experiment 5. You will observe how the modulated infrared light is carried through the optical fiber and is detected by the receiver.

The circuit of the transmitter of this experiment is shown in Figure 1. This circuit is identical to the one built on experiment 7. Refer to experiment 7 for a complete description of the operation of the circuit.

#### **Procedure:**

- In this experiment you will not have to build the transmitter shown in figures 1 and 2b. Instead, you can modify the transmitter you built in the previous experiment (experiment 15) by replacing

the clear LED with the infrared LED (IR LED). Notice the location of the flat side of the IR LED shown in figure 2b. When done, verify that the assembly is correct and connect a fresh 9V battery to the snap.

- Take the breadboard with the opto receiver that you assembled in experiment 5 (figure 2a). Connect a fresh 9V battery to the battery snap of this receiver.

- Take an optical fiber and use both hands to hold it between the transmitter and the receiver, as shown in figure 2. As you do this, you will hear the audible tone produced by the transmitter (figure 2b) from the speaker of the receiver (figure 2a).

- Repeat the above procedure using two and three fibers and observe how the intensity of the sound increases with the number of fibers. Be sure the fibers have the same length and are perfectly aligned on both ends.

**\* After completing this experiment remove the components of both breadboards.**

#### **Parts List:**

**R1:** 4.7K $\Omega$  Resistor (Yellow, Violet, Red)

**R2:** 1K $\Omega$  Resistor (Brown, Black, Red)

**R3:** 100 $\Omega$  Resistor (Brown, Black, Brown)

**P1:** 50K $\Omega$  Potentiometer

**C1:** .1 $\mu$ F Disc Capacitor (104)

**C2:** .01 $\mu$ F Disc Capacitor (103)

**IC1:** 555 IC

**L1:** Infrared LED (clear LED)

**Misc.:** Battery snap, breadboard, wires, optical fibers, and assembled experiment 5.

Figure 1

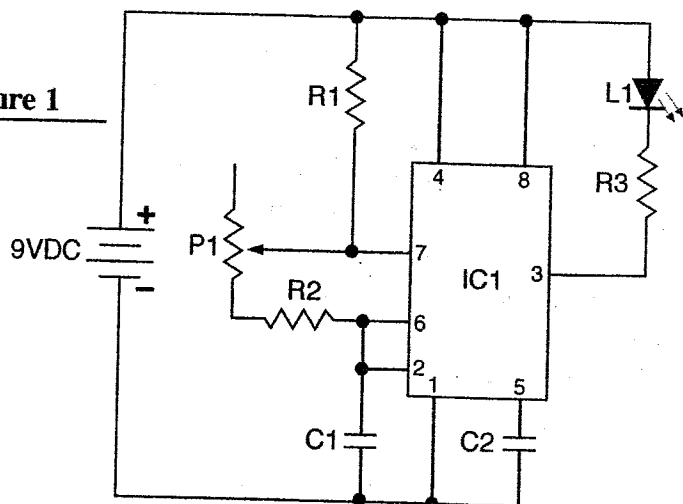
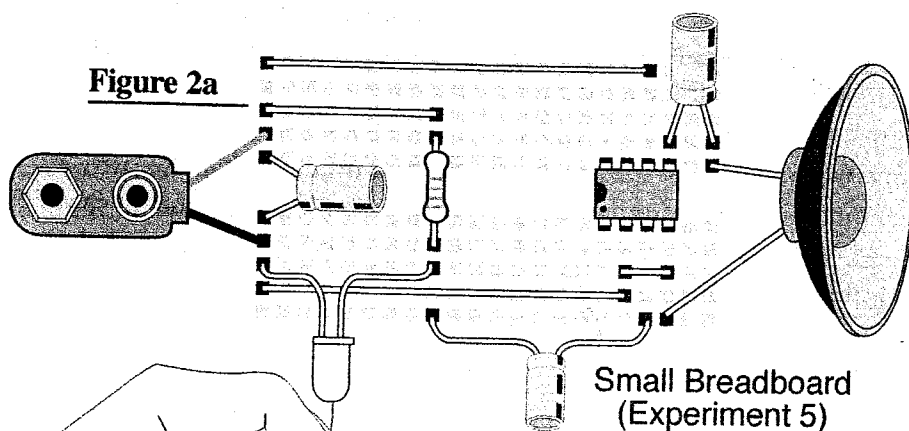
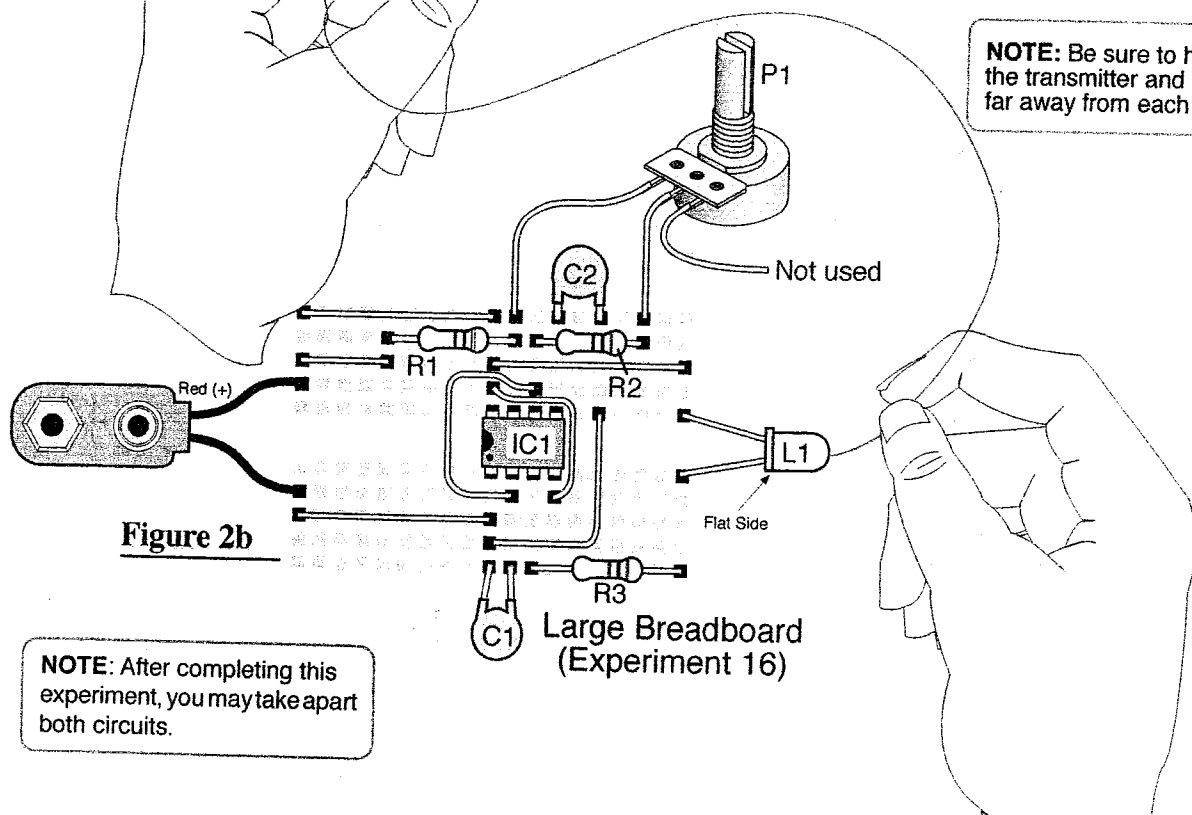


Figure 2a



Small Breadboard  
(Experiment 5)



**NOTE:** Be sure to have the transmitter and receiver far away from each other.

Figure 2b

**NOTE:** After completing this experiment, you may take apart both circuits.