

Experiment 5-

Opto Receiver

In this experiment you will build an opto (optical) receiver that is able to receive a modulated light beam, and extract and process the modulated information (audio signal). You will use this receiver with several opto transmitters that you will build in the next experiments.

The schematic diagram of this experiment is shown in figure 1. The phototransistor Q1 converts the light beam into a variable electric current. This current is sent, through capacitor C1, to the input of the audio amplifier: pin 3 of IC1. Resistor R1 provides the necessary positive voltage to the collector of Q1. IC1 amplifies the signal from Q1 and sends it to the speaker through capacitor C3. Capacitor C2 acts as a filter providing stability for the circuit.

This circuit will be able to extract the audio signal (information) modulated in the beam of light that strikes the phototransistor Q1, and to amplify and reproduce it from the speaker.

Procedure:

Assemble the circuit of this experiment on the small breadboard according to figures 1 and 2. Be sure to install the capacitors, the IC, and the phototransistor Q1 in the correct direction, as shown in figure 2. When done, verify that the assembly is correct and go to experiment 6. You will test the opto receiver of this experiment with the opto transmitter of experiment 6.

Parts List:

R1: 24K Ω Resistor (Red, Yellow, Orange)

C1: 10uF Electrolytic Capacitor

C2: 47uF Electrolytic Capacitor

C3: 100uF Electrolytic Capacitor

Q1: Phototransistor (small, clear LED type)

IC1: LM 386 Integrated Circuit

SPK: Speaker

Misc: Battery snap, breadboard, wires.

Figure 1

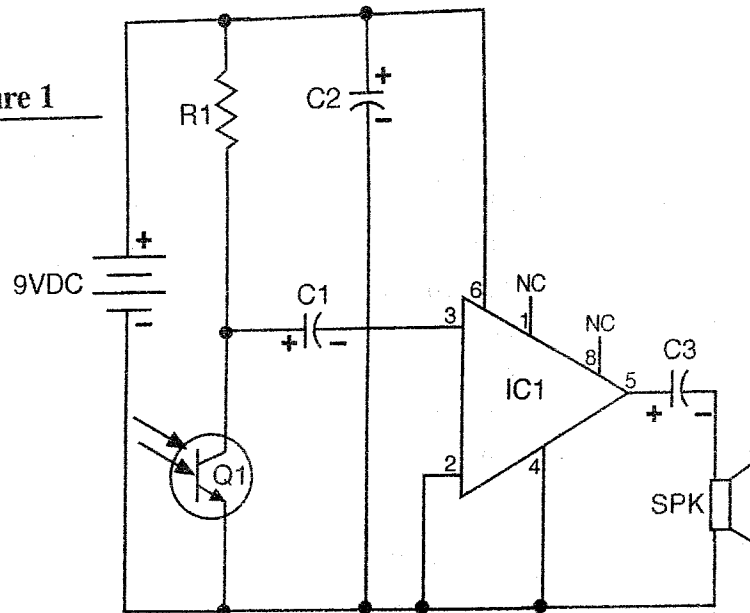


Figure 2

NOTE: Be sure to assemble this circuit on the small bread board (breadboard with the least amount of rows). Also, do not take this circuit apart when finished as you will use it with later experiments.

IMPORTANT NOTE: Build this project so that the photo transistor extends over the side of the protoboard as shown.

