

Experiment 17-

Infrared Remote Control Receiver

In the next seven experiments you will build infrared remote control receivers, transmitters, and proximity detectors. Infrared light (IR) is widely used in remote control applications (TV and DVD remote controls, etc.) as well as in many other applications. Your eyes can not see IR light, but it behaves in a similar manner to the visible light spectrum.

In this experiment you will build an infrared receiver that will detect the transmission of any infrared remote control transmitter. In this, and in the next experiments, we will use a highly sensitive infrared receiver module (IRM), similar to the ones used in TVs and DVD players. This module, contains a photodiode that detects the infrared light and a receiving preamplifier IC, which will add sensitivity and range to the experiments.

The circuit of this experiment is shown in Figure 1. Resistor R1 supplies the infrared receiver module (IRM) with positive voltage. Notice that one pin of the IRM is also connected to negative. Diode D1, connected to the output of the IRM, rectifies the signal produced by the IRM and sends a negative

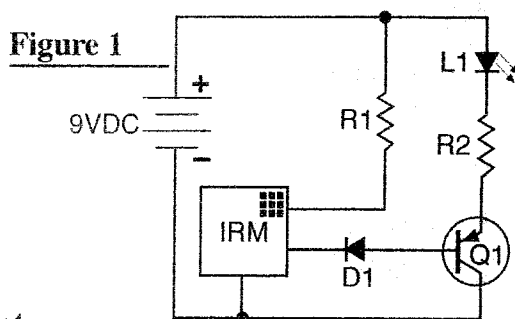
voltage to the base of transistor Q1. Q1 conducts when a negative voltage or pulse is applied to its base, causing LED L1 to turn on. Therefore, every time infrared light strikes the IRM, LED L1 turns on. To test this receiver you can use any IR remote control of your TV, DVD, etc., or the remote control transmitter that you will build in the next experiment.

Procedure:

- Build the circuit shown in figures 1 and 2. Be sure to install the LED and the transistor Q1 in the correct direction. When done verify that the circuit has been properly assembled, and connect a fresh 9V battery to the snap.

- Test the circuit by aiming a TV or DVD remote control transmitter at the IRM. As you do this, the LED will blink with the pulses of IR light sent by the remote control unit. Find out the maximum distance of activation between the transmitter and the receiver (how far away you can activate the receiver). If you do not have a remote control transmitter available, build the remote control transmitter of the next experiment and use it to test this receiver.

Note: Do not disassemble the circuit of this experiment, as you will need it in the next experiments.



Parts List:

R1: 100Ω Resistor (Brown, Black, Brown)

R2: 220Ω Resistor (Red, Red, Brown)

D1: 1N4148 Diode (tiny silicon diode)

IRM: Infrared Receiver Module

L1: Clear LED with mark on the case

Q1: PNP Transistor 2N3906

Misc.: Battery snap, breadboard, and wires.

NOTE: Do not take apart circuit after completing this experiment.

! Make sure that neither R1 or D1 makes contact with the metal case of the IRM.

