



SIMPLE WIRELESS CONTROL WITH IR



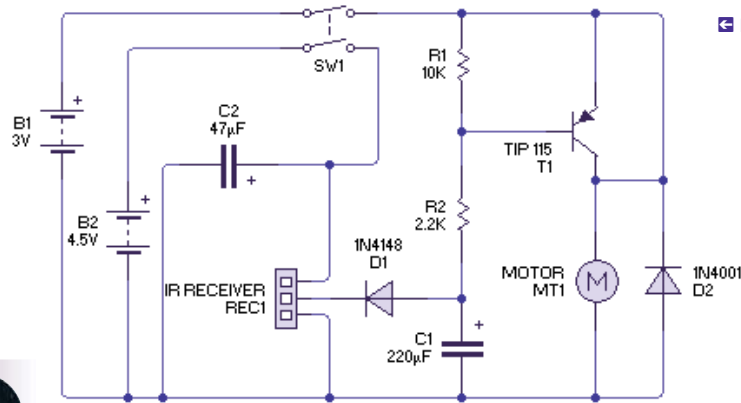
Allen Bower, Senior Lecturer in Design and Technology at Nottingham Trent University and TEP associate introduces a basic IR receiver circuit that can be integrated into a range of project applications.

Infra-red receiver

There are now many possibilities for remote control using electronic, off the shelf solutions, which can be quite expensive, with circuits which can also be quite complex. However, second-hand TV and Video handsets provide a ready supply of IR transmitters for schools and while they have a variety of coded outputs as PPM (Pulse Position Modulated) signals, we can neatly avoid the complication of having to decode the signals at the receiver end using the simple circuit featured here. This circuit has been trialled in an old TEP favourite 'Jitterbug' project. Any button on the IR remote control will set things in motion.



↑ Inside view of the Jitterbug IR circuit



↳ Livewire Circuit Schematic

↑ Typical IR Photo Module



↑ Infrared Controlled Jitterbug

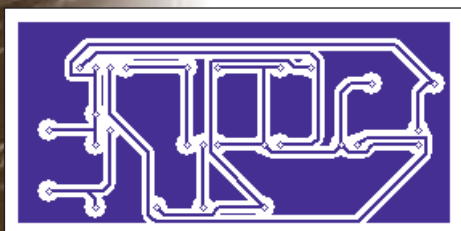
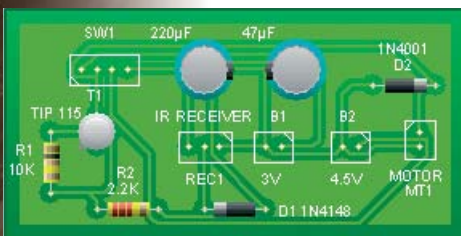
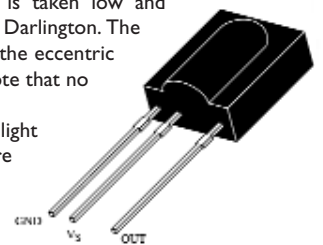
Circuit Description

The IR sensor used is a photodiode and preamplifier circuit encapsulated in a 3 pin casing. It neatly amplifies an incoming signal and the output stage supports a 5 volt control circuit. The device TSOP1738 is a relatively inexpensive device and is widely available.

There are many such devices on the market that essentially carry out the same function but obviously have different characteristics. This circuit employs a module with active low output, hence the need for diode D1.

On receipt of a 38kHz carrier frequency the receiver output is taken low and discharges C1, effectively grounding the base of the PNP Power Darlington. The motor in the circuit is then energised. In the 'jitterbug' application the eccentric connected to the motor produces the desired jitter movement. Note that no decoding is carried out in this circuit format.

With low power consumption, high levels of immunity to ambient light levels and excellent IR sensitivity, this component and circuit are sure to be a hit with students wishing to build in some basic IR remote control. With such low consumption using smaller AAA batteries to reduce weight and size is a realistic option.



↑ PCB Wizard - 'Real world view' (top) and 'Artwork' (below)

Further applications

With a little imagination it is possible to use this motor switching circuit in other applications. Replacing the motor with other suitable output devices will open up many possibilities. It is hoped that this general-purpose circuit will provide a basis for the development of some exciting activities for Key Stage 3. We would like to hear of any developments explored. You can download the PCB wizard file from the TEP website under the News and Views support tab. The author would like to thank independent consultant John Thorpe for his help and support on this project.