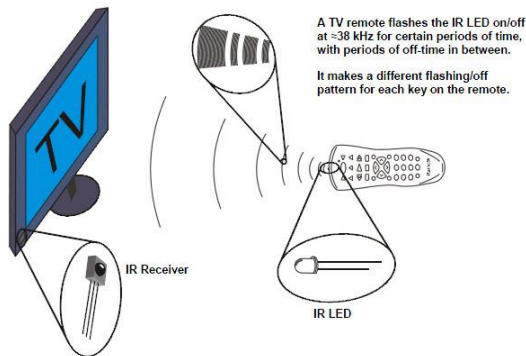


Infrared (IR)

DID YOU KNOW?

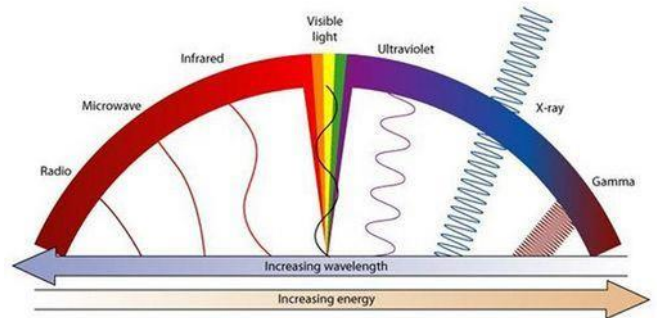
- **Infra means below, so infrared means below red**
- Infrared radiation was first discovered by William Herschel around 1800.
- Infrared radiation is a type of electro-magnetic radiation. Infrared (IR) light is on the red side of the EM (Electromagnetic) spectrum which is invisible to human eyes.
- A spectrometer measures the magnitude of radiant power at different wavelengths.
- Half of the energy produced by the sun is infrared. We feel it as heat.
- Remote controls send pulses of infrared that spell out codes to an electronic device.



- Infrared lasers produce infrared beams that are used to read information on compact discs.
- infrared receivers are sensitive to interference from other light sources, including sunlight and fluorescent lights.
- Infrared Waves can be used for muscle relaxation, inflammation, pain relieving, cleaning teeth and other medical uses.
- Infrared allows large office buildings to keep cool even in summer. Gold

transparent films in the windows reflect infrared and help to keep temperatures cool.

INFRARED & ITS USES:



The infrared spectrum is sub divided into five categories:

1. **Near Infrared:** are used in electronic equipment such as remote control, mobile phones as infrared ports.
2. **Short wavelength Infrared:** is used for long distance telecommunication. Signals are sent through fibre optic cables and transmit audio to sound systems and for high-speed Internet connections.
3. **Mid wavelength Infrared:** This band is used in guided missile technology. The head of the homing missile is designed to work under this region
4. **Long wavelength Infrared:** This region is used for thermal imaging. Warm objects,



such as the human body, produce large amounts of infrared. This heat is detected by infrared sensors and produce a picture. Night-vision devices allow people or

animals to be observed without the observer being detected. They are used in warfare, security cameras and animal research.

5. **Far Infrared:** Infrared allows astronomers to take pictures and study stars and galaxies.

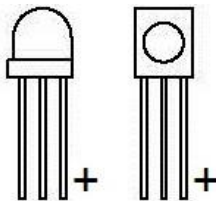
INFRARED TRANSMITTER LED

This component is a type of LED that works in the invisible light spectrum. You will not know if it is working by looking at it. It has 2 leads and will not work if incorrectly positioned on the PCB. It uses the same methods as a normal LED.

INFRARED RECEIVER LED

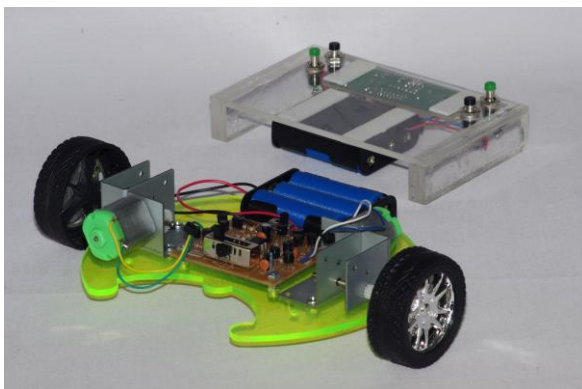
There are two possible packages for the IR receiver diode. They both perform exactly the same task but look very different. The positive lead for both versions is shown. Make sure the positive lead is inserted into the + on the PCB or your project will not work.

1. On the round IR diode the flat on the rim of marks the positive lead.
2. On the rectangular IR diode the positive lead is on the right when the raised section faces you.



INFRARED IN ACTION

Students can familiarise themselves with Infrared by constructing Scorpio project kits –



Jouster or Pat's Microcontroller with an Infrared add-on for all of Pat's Microcontroller projects.

The Jouster is a small agile vehicle driven by 2 motors, infrared control – the motors respond to inputs from 4 push button switches each with forward and reverse motion. It has an infrared control.

The PCBs are available in a number of variants – either 4 or 6 switchable Bands to allow 4 or 6 **Jousters** to operate at the same time allowing students to joust with their model. Kits are available in a choice of assembled or unassembled gearbox and PCBs. The kit includes the infrared PCBs and control unit.

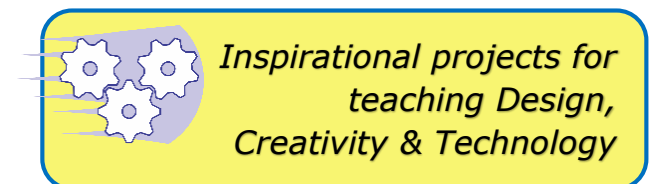


Pat's Microcontroller with IR add on adds a further dimension to the standard Micro-controller. The add on Infrared kit provides the infrared remote and the additional parts that need to be soldered to the Micro-controller. Use the infrared remote in many other applications.



REFERENCES:

- www.livescience.com > Planet Earth
- <http://study.com/academy/lesson/infrared-waves-definition-uses-examples.html>
- <http://physics.tutorvista.com/waves/infrared-waves.html>
- <https://www.quora.com/>
- <https://www.sciencedaily.com>
- <http://www.explainthatstuff.com/electromagnetic-spectrum.html>
- <https://spaceplace.nasa.gov/ir-photo-album/en/>
- <https://socratic.org>
- <http://clipart-library.com/clipart/zTX4zGqRc.htm>



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