

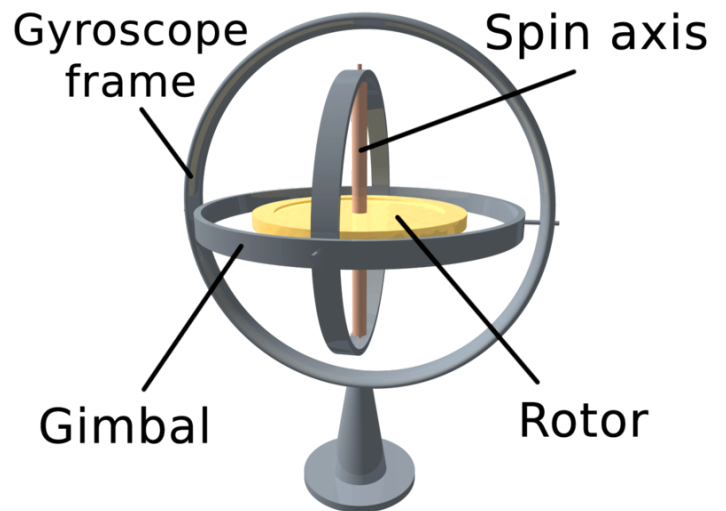


Gyroscope

A gyroscope measures the orientation of an object. It allows three degrees of movement. These are normally called:

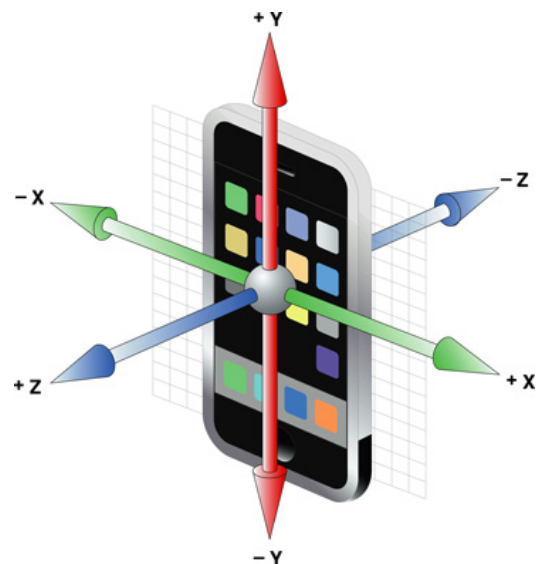
- Pitch (up and down like a plane taking off and landing)
- Yaw (left and right like steering a car)
- Roll (imagine barrel rolling a fighter jet)

The Astro Pi board has a very tiny Gyroscope built into it. It will give values for pitch, roll and yaw between 0 and 360 degrees.



Accelerometer

At rest, an accelerometer will measure the direction and force of gravity but in motion it measures the direction and force of the acceleration as it moves. It measures in 3-dimensions.





Magnetometer

A magnetometer is used to measure the strength and direction of a magnetic field. Most often they're used to measure the Earth's magnetic field in order to find which way North is. If your phone or tablet has a compass it will most probably be using a magnetometer to find North

Temperature Sensor

A temperature sensor is used to measure hot and cold. It's exactly like the thermometer that you would put in your mouth to take your own temperature. Except it's an electronic one built into the Astro Pi board and reports the temperature as a number, in Celsius .





Barometric Pressure Sensor

The Astro Pi board has an air pressure sensor built in and will report air pressure to you using either Pascals or Millibars.



Humidity sensor

A humidity sensor measures the amount of water vapour in the air. There are several ways to measure it but the most common is *relative humidity*. One of the main properties of air is that the hotter it is the more water vapour can be suspended within it. So relative humidity is a ratio, usually a percentage, between the actual amount of suspended water vapour to the maximum amount that could be suspended for the current temperature





Visible light and Infrared Cameras



There will be two Astro Pi's sent to the International Space Station; one will have a visible light camera while the other is fitted with an infrared camera. These are both just like those found in a normal mobile phone, although one has its usual infrared filter removed. .

The IR camera comes with a special filter which allows it to take photographs or video of chlorophyll production levels in green plants

Note: For the First European Astro Pi challenge (2016 – 2017) the use of the two cameras is not foreseen.

Joystick and Buttons

A standard direction pad, like those found on games consoles, for *up*, *down*, *left*, *right* and *centre*. A number of general purpose buttons will also be available.

