ALTIMETER:

An “ALTIMETER” is a device used in aircraft to measure its altitude.

Working:

Atmospheric pressure decreases with the increase in height above the sea level,so a BAROMETER measuring the atmospheric pressure can bbe determine the altitude of a place above the sea level.

**There are four main types of altimeter:**

**Barometric altimeter.**

**Radio altimeter.**

**GNSS (GPS, Galileo, etc).**

**Laser altimete**r.

**BAROMETRIC ALTIMETERS:**

 Altitude can be calculated by comparing the atmospheric pressure at the current height with the pressure at sea level. In general terms, the greater the altitude the lower the pressure.

 However, air pressure is affected not only by altitude; air pressure may also fluctuate due to changes in the weather which may cause changes in both pressure and temperature. These variables must be taken into account in order to obtain an accurate reading from a barometric altimeter.

To calculate altitude, a barometric altimeter uses the following equation:

[IMG_256](http://www.uavnavigation.com/support/sites/default/files/Bar_Alt_Eq.png)

where

c is a constant that depends on the acceleration of gravity and the molar mass of the air,

T is absolute temperature,

P is the pressure at altitude z,

and Po is the pressure at sea level.

**Radio altimeter.**

 Radio altimeters are based on the principle of reflection of electromagnetic wave pulses by the surface of the earth or sea. These waves fall within the radio spectrum range.

 Electromagnetic waves travel at the speed of light and thus the calculation of the distance is effectively immediate. Although they are affected by surface irregularities generating deviations in the radio signal, radio altimeters provide a reliable and accurate method of measuring height.

**GNSS:**

 Global Navigation Satellite System (GNSS) receivers can also determine altitude by trilateration with four or more satellites. To make this calculation, the time of flight of radio waves from a known point to another is again used.

 Altitude calculated using GNSS is, however, not accurate or reliable enough to obviate the use of a backup system, such as a barometric altimeter - unless some method of augmentation is used. Errors in height calculation using GNSS are typically in the region of 5 meters.

   Although useful for many Unmanned Aerial Vehicles ([UAV](https://en.wikipedia.org/wiki/Unmanned_aerial_vehicle)) during flight (when a GNSS may provide sufficient accuracy for general navigation), GNSS is not accurate enough to provide height information for precision manoeuvres such as low altitude flight or landing.

**LASER ALTIMETER:**

This type of altimeter works by using electromagnetic waves within the visible range of the spectrum instead of radio waves.

 Laser altimeters work in a similar way to radio altimeters. Again, the time taken for the emitted signal to travel from the transmitter to the surface and back again is measured.

   Once reflected, the beam of light is received and collected using a series of mirrors and lenses which focus the beam onto a photocell detector which is sensitive to infrared light