

RESOURCE

ARTICLE



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Altimeter

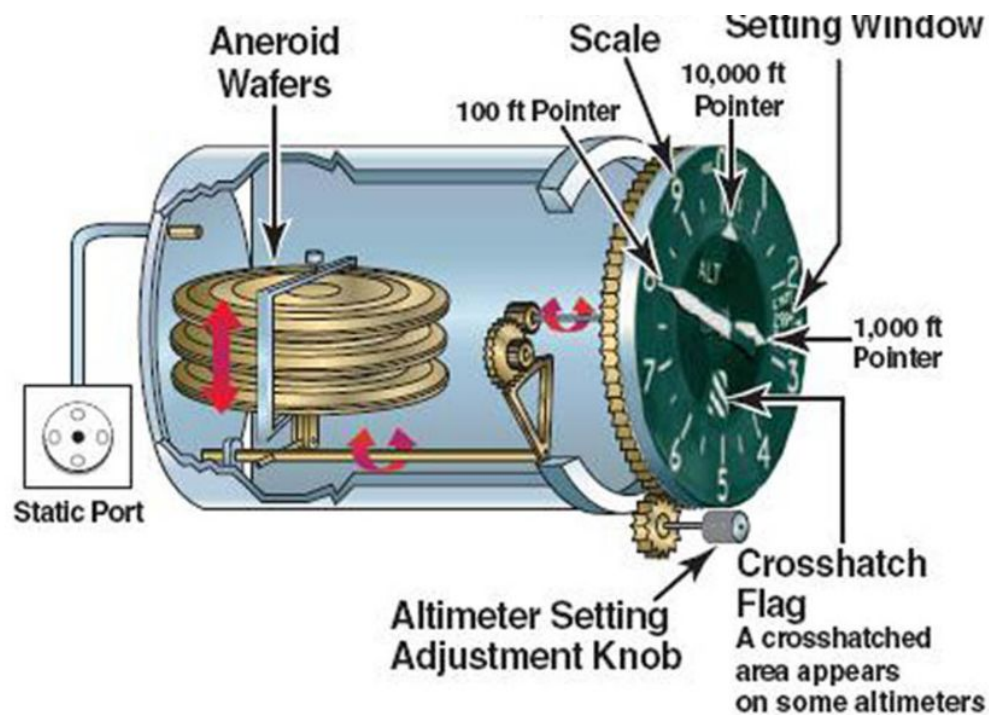
An altimeter is a device that measures altitude, the distance of a point above sea level.

GRADES

9 - 12

SUBJECTS

Engineering, Geography, Geographic Information Systems (GIS), Physical Geography



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Altimeter

This altimeter—the instrument that displays "Height"—shows the altitude of a helicopter that is hovering below sea level near the Dead Sea. Altimeters measure altitude.

PHOTOGRAPH BY LUIS MARDEN, NATIONAL
GEOGRAPHIC



ARTICLE

VOCABULARY

An altimeter is a device that measures altitude, the distance of a point above sea level. Altimeters are important navigation instruments for aircraft and spacecraft pilots who monitor their height above Earth's surface. Skydivers and mountaineers also use altimeters to pinpoint their location in the sky or on the ground.

The most common types of altimeters are barometric. They determine altitude by measuring air pressure. As altitude increases, air pressure decreases. This is because the density of air is lower (thinner) at high altitudes. It exerts less pressure on Earth below.

An altimeter's readings change as elevation changes. The atmospheric pressure on Denali, Alaska, United States, is about half that of Honolulu, Hawai'i, United States. Denali, also known as Mount McKinley, is

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Altitude readings can also change due to weather, as air pressure decreases during storms.

A simple barometric altimeter includes a sealed metal chamber, a spring, and a pointer that shows altitude in meters or feet. The chamber expands as air pressure decreases and contracts as it increases, bending the spring and moving the pointer. An altimeter can be mounted on an aircraft's instrument panel or worn on a person's wrist.

Other Types of Altimeters

Not all altimeters depend on air pressure. The Global Positioning System (GPS), for instance, can provide altitude as part of an area's location by triangulating signals from different satellites.

Radar and laser altimeters, found on some aircraft and spacecraft, work similarly to sonar measurements of the seafloor. These altimeters send a radio or laser signal toward the surface and measure the time it takes for the signal to bounce back. The time it takes for the signal to bounce back (or echo) to the aircraft is then translated to an elevation.

When used in satellites, radar and laser altimeters are able to combine altitude measurements to create accurate topographic maps of both land and ocean surfaces. The radar altimeter aboard the TOPEX/Poseidon satellite, for example, measured the surface topography of 95 percent of the ice-free ocean. Developed by NASA, the U.S. space agency, and CNES, the French space agency, TOPEX/Poseidon's radar altimeter was accurate to within two centimeters (less than one inch)! Coupled with another satellite

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evidence of the connection between global climate change and sea level rise.

Instructional Content

NASA: The Human Altimeter Activity

Website

NOAA: How are satellites used to observe the ocean?

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