

# Instrument Landing System (ILS)

ILS stands for Instrument Landing System and is a standard International Civil Aviation Organisation (ICAO) precision landing aid that is used to provide accurate azimuth and descent guidance signals for guidance to aircraft for landing on the runway under normal or adverse weather conditions.

An Instrument landing system (ILS) facility is a highly accurate and dependable means of navigating to the runway in Instrument Flight Rules (IFR) conditions.

The ILS provides the lateral and vertical guidance necessary to fly a precision approach. When all components of the ILS system are available, including the approved approach procedure, the pilot may execute a precision approach and specifically for low visibility operations under IFR.

This means that ILS equipment is needed near to the runway and is required to be installed within its obstacle free zone area.

ICAO and National Authority standards are clear that no equipment shall be installed within such defined areas close to the runway and approach area which may be seen as an obstacle and hence affect the safety of aircraft EXCEPT for equipment which is deemed necessary for navigation purposes.

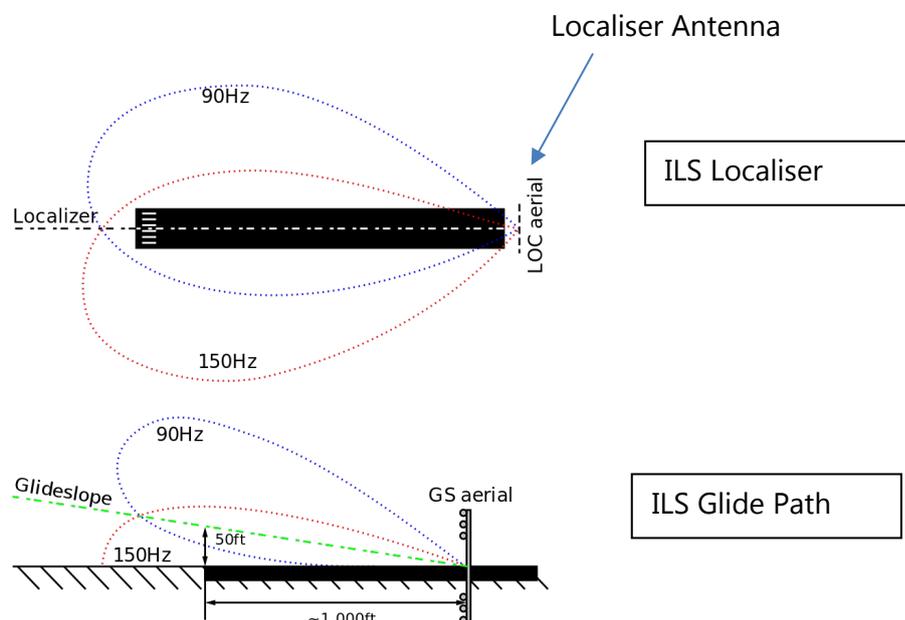
An ILS is one such system which is deemed necessary for categorised and runway operations under Instrument Flight Rules (IFR).

ICAO References :

- Annex 14 Vol 1 Chapter 9
- Aerodrome Design Manual Part 6
- Annex 10 Vol 1 Chapter 3 + Attachment C

**ILS Localiser:-** The primary component of the ILS is the localiser, which provides lateral guidance. The transmitter and antenna are on the extended runway centreline at the opposite end of the runway from the approach threshold.

**ILS Glide Path:-** The glide path component of ILS provides vertical guidance to the pilot during the approach. Glide path is located some 750 to 1,250 feet (ft) down the runway from the threshold, offset 400 to 600 ft from the runway centreline.



## The Localiser :

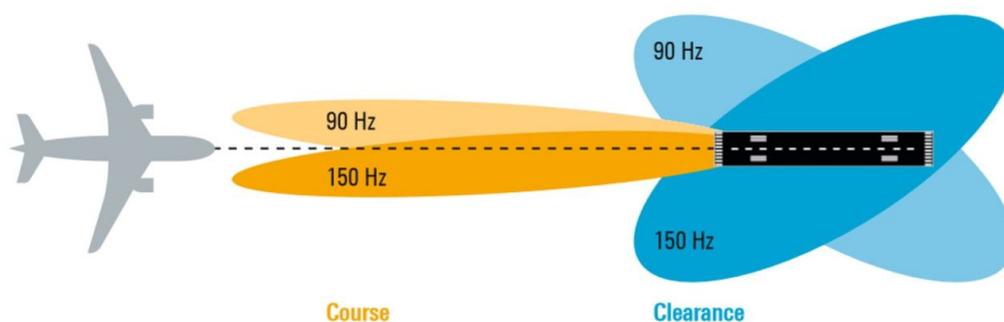
The localizer of the ILS is made up of two lobes. A lobe to the right of the runway centre line and a lobe to the left of the centre line. The lobes overlap right on the centre line and are transmitted in the direction of aircraft approaching the runway for landing.



Localizer antenna. Photo: [goldcoastairport.com](http://goldcoastairport.com)

To differentiate the two lobes, the right lobe is modulated to a frequency of 150 Hz, while the left lobe is modulated to 90 Hz. This way, the onboard (aircraft) ILS receiver can identify the lobe at which it is flying.

When an aircraft moves or drifts away from the centre line, the depth of modulation (DOM) or the amplitude of the signal increases. What this means is that, for example, if an aircraft is to the left of the runway centre line, it receives more of the 90 Hz signal compared to the 150 Hz right signal. This difference is known as the difference in depth of modulation (DDM). This DDM is converted to an angular displacement by the aircraft receiver, which is shown to the pilot in his or her instruments and commands him or her to go to the right.



When the pilot flies with the indicator centred, the DDM is zero, and the aircraft is on the centreline of the runway.