

The Airframe

Within the radio frequency range, there are several bands designated for specific aircraft use. The low-frequency (LF) band ranges from 30 to 300 kHz. Long-range navigation (LORAN) utilizes the 90–110-kHz range. A LORAN antenna resembles a communications antenna mounted on the top or bottom of the fuselage.

The automatic direction finder (ADF), which operates in the 190–535-kHz range, falls into both the low-frequency range and the medium-frequency range of 300–3000 kHz. The ADF receives signals from the ground-based nondirectional beacon (NDB). Older aircraft used a long wire antenna, usually running from the top of the cockpit to the top of the horizontal stabilizer and a loop antenna on the underside of the fuselage. Newer aircraft have both antenna mounted in a single teardrop or rectangular-shaped box on the underside of the fuselage.

The very high frequency (VHF) range is from 30–300 MHz, and there are several aircraft radios that operate within this range. Marker beacons, at 75 kHz, are mounted on the underside of the fuselage. They look like a thick wire bent sharply back toward the tail or can also be a 6–8" canoe-shaped antenna.

The VOR/LOC (VHF Omni Range/Localizer navigation) operates within 108–117.95 MHz and has the antenna that is most commonly shaped like a 1.5-foot-long “V” that is horizontally mounted on the vertical fin. There are two other antenna configurations that are sometimes seen. One is the balanced loop or “towel rack” type and the other is the combination nav/comm “boomerang” antenna typically mounted on top of the vertical stabilizer.

Communication radios operate in the 118–137.975-MHz range. Each radio has its own antenna, which is a vertical wire approximately 1.5 feet high and is usually mounted on top of the vertical fin or fuselage.

The ELT operates on 121.5 MHz and has a short vertical wire antenna mounted on the vertical fin or fuselage. Some ELTs only have an antenna directly attached to the ELT unit itself, which is located inside the aircraft.

The ultra high frequency (UHF) range is from 300–3000 MHz and supports several aviation radios. The glideslope operates between 329.15–335 MHz, and its antenna comes in several different configurations. It is often in combination with a VOR antenna or located in a wide, oval plastic container at the top and inside the windshield. Sometimes it is a half-foot-wide boomerang mounted on top and outside of the cockpit or perhaps on the underside of the fuselage.

The antenna that supports distance measuring equipment (DME) is a very small, fin-like antenna, as shown in Figure 1-6, and is mounted on the underside of the fuselage. DME operates in the 962–1213 MHz range.

The transponder receives on 1030 MHz but transmits on 1090 MHz. It uses the same type of antenna as the DME or may also use a 2-inch miniature car-type antenna with a small ball on the tip.

Aircraft equipped with a global positioning system (GPS) will show a small rectangular or teardrop fiberglass antenna mounted on top of the fuselage, as it must receive satellite signals, which are broadcast on 1575 MHz.