



Figure 11-147. A satellite weather receiver and antenna enable display of real-time textual and graphic weather information beyond that of airborne weather radar. A handheld GPS can also be equipped with these capabilities. A built-in multifunctional display with satellite weather overlays and navigation information can be found on many aircraft.

Use of Doppler technology enables the origin of the 406 MHz ELT signal to be calculated within 2 to 5 kilometers. Second generation 406 MHz ELT digital signals are loaded with GPS location coordinates from a receiver inside the ELT unit or integrated from an outside unit. This reduces the location accuracy of the crash site to within 100 meters. The digital signal is also loaded with unique registration information. It identifies the aircraft, the owner, and contact information, etc. When a signal is received, this is used to immediately research the validity of the alert to ensure it is a true emergency transmission so that rescue resources are not deployed needlessly.

ELTs with automatic G-force activation mounted in aircraft are easily removable. They often contain a portable antenna so that crash victims may leave the site and carry the operating ELT with them. A flight deck mounted panel is required to alert the pilot if the ELT is activated. It also allows the ELT to be armed, tested, and manually activated if needed. [Figure 11-150]

Modern ELTs may also transmit a signal on 121.5 MHz. This is an analog transmission that can be used for homing. Prior to 2009, 121.5 MHz was a worldwide emergency frequency monitored by the CORPAS-SARSAT satellites. However, it has been replaced by the 406 MHz standard. Transmission on 121.5 MHz are no longer received and relayed via satellite.

The use of a 406 MHz ELT has not been mandated by the FAA. An older 121.5 MHz ELT satisfies the requirements of FAR Part 91.207 in all except new aircraft. Thousands of aircraft registered in the United States remain equipped with ELTs that transmit a .75 watt analog 121.5 MHz emergency signal when activated. The 121.5 MHz frequency is still an active emergency frequency and is monitored by over-flying aircraft and control towers.

Technicians are required to perform an inspection/test of 121.5 MHz ELTs within 12 months of the previous one and inspect for the same integrity as required for the 406 MHz ELTs mentioned above. However, older ELTs often lack the built-in test circuitry of modern ELTs certified to TSO C-126. Therefore, a true operational test may include activating the signal. This can be done by removing the antenna and installing a dummy load. Any activation of an ELT signal is required to only be done between the top of each hour and 5 minutes after the hour. The duration of activation must be no longer than three audible sweeps. Contact of the local control tower or flight service station before testing is recommended.

It must be noted that older 121.5 MHz analog signal ELTs often also transmit an emergency signal on a frequency of 243.0 MHz. This has long been the military emergency frequency. Its use is being phased out in favor of digital ELT signals and satellite monitoring. Improvements in coverage, location accuracy, identification of false alerts, and shortened response times are so significant with 406 MHz ELTs, they are currently the service standard worldwide.

Long Range Aid to Navigation System (LORAN)

Long range aid to navigation system (LORAN) is a type of RNAV that is no longer available in the United States. It was developed during World War II, and the most recent edition, LORAN-C, has been very useful and accurate to aviators as well as maritime sailors. LORAN uses radio wave pulses from a series of towers and an on-board receiver/computer to positively locate an aircraft amid the tower network. There are twelve LORAN transmitter tower “chains” constructed across North America. Each chain has a master transmitter tower and a handful of secondary towers. All broadcasts from the transmitters are at the same frequency, 100 KHz. Therefore, a LORAN receiver does not need to be tuned.