



Distressed Over Emergency Beacons?

Know How to 'Save' Yourself

BY PAUL CIANCIOLO

It's not always the crash that kills; sometimes it's the wait to be rescued. One way to reduce the time it takes help to arrive is to ensure that your aircraft has an emergency locator transmitter (ELT) properly installed and working. Congress mandated that all airplanes carry an automated distress beacon after two U.S. congressmen disappeared in a Cessna aircraft over the Alaskan wilderness in 1972 and several other searches that had negative press coverage. One such story was published in the *New Yorker* magazine after a little girl survived a crash that killed her parents. She kept a diary over several days noting what ended up being search planes flying overhead that could unfortunately not see the

crashed aircraft through the dense trees. She died before she was located. If the aircraft had an ELT transmitting a distress signal, she could have been rescued in time.

To review, there are two types of automated emergency beacons for aircraft — digital and analog.

Digital ELTs

The National Oceanic and Atmospheric Administration (NOAA) operates satellites in orbit that can detect a distress signal transmitted over the 406 megahertz (MHz) radio frequency, which is a digital radio frequency comprising 19 channels. ELTs, PLBs (personal locator beacons), and EPIRBs

(emergency position indicating radio beacons for maritime use) all transmit a data burst when manually or automatically activated. The data may include specific GPS coordinates if the beacon is equipped with an optional GPS receiver, and under ideal circumstances, those coordinates could be within 100 yards of the activated beacon. The accuracy of the standard 406 MHz beacon is 2-3 nautical miles (go to www.sarsat.noaa.gov for more about NOAA and its search and rescue satellites).

When NOAA's mission control center picks up a distress signal on 406 MHz, it's relayed to the Air Force Rescue Coordination Center if detected in the continental United States, the Alaska Rescue Coordination Center if in Alaska, or the Coast Guard

if on the water, the latter of which also includes Hawaii, Puerto Rico, and the U.S. Virgin Islands. Their first response action is to call the owner of the beacon. However, that can be

difficult if the owner has not registered the beacon.

If you have not already done so, please register your 406 MHz ELT online at www.beaconregistration.noaa.gov. It may save your life! And if your information changes, be sure to update it with NOAA so authorities don't have to waste time chasing down new leads.

If contact cannot be made with the owner, search and rescue resources are deployed. The ELT also transmits a low-powered analog homing signal on 121.5 MHz that searchers can use once they get to the general area that the satellites have triangulated. All digital ELTs are required by the FAA to have this homing signal when flying in the United States. Be aware, though, that some foreign manufacturers sell ELTs without this FAA-required option.

Never test your digital 406 MHz ELT by activating it, even for a second. Unlike the 121.5 ELTs you are familiar with, these types of beacons have a self-test mode to ensure proper operation. Follow manufacturer instructions. If a live test is absolutely necessary, you must contact the appropriate rescue coordination center first. Due to bandwidth limitations and memory capacity onboard the satellites, live testing could bump

a real distress signal message to make room in its memory before a ground station picks it up.

Analog ELTs

Still authorized for use — in aircraft only — are analog 121.5 MHz ELTs. These were monitored by NOAA satellites until 2009. The distress signal is sent through amplitude modulation of the 121.5 MHz radio frequency.

In order for an analog ELT signal to lead to a rescue, it must be heard and reported to the appropriate rescue coordination center. Most air traffic control towers, flight service stations, Civil Air Patrol aircraft, and many commercial airliners monitor 121.5. If you hear a distress signal (listen to an example at <http://bit.ly/15F13tI>), please contact the nearest air traffic facility to report your altitude, the location you first and last heard the signal, and where the signal was strongest.

Do your part for the general aviation community and listen to 121.5 when airborne, and listen again prior to shutting down your aircraft to ensure that your own ELT is not going off after that rough landing. If you would like to test your own analog ELT, you may do so during the first five minutes of every hour by activating it for no longer than three audible sweeps. To hear those sweeps and verify

Please call immediately for accidental ELT activation.

Rescue Coordination Centers

Air Force: 1-800-851-3051

Alaska: 1-800-420-7230

Coast Guard: 1-855-406-8724



Photo courtesy of ARC/ARTEX Products

that it is working, tune your radio to 121.5 and listen. Remember that this type of test is only authorized for analog ELTs that transmit on 121.5 MHz.

The 121.5 MHz international air distress frequency — also known as “guard” — may be used by any aircraft in distress or for voice communications in an emergency situation. Air traffic controllers sometimes use guard to warn aircraft away from restricted or prohibited airspace. And, of course, this frequency is the one that intercepting air defense aircraft will use to ask for identification or provide specific instructions to aircraft whose pilots have strayed into restricted airspace.

The frequency can get pretty busy. Even TVs and computers like to “talk” over guard — go to <http://bit.ly/13VF01X> to see a video demonstration of an Apple computer transmitting a distress call through amplitude modulation of 121.5 MHz. That said, however, please don’t tune it out. Listen and report. Someone may be transmitting an actual call for help, or you may need to reply to that F-16 flying off your wingtip.

Commercial Tracking

Even if your aircraft does not require an ELT according to 14 CFR section 91.207 (e.g., single seat, experimental, helicopter, glider, powered-parachute, or training within 50 nautical miles of home airport), carrying a portable ELT, PLB, or commercial GPS tracking system is still strongly recommended.

A PLB is free to use, transmits on the same frequency as a digital ELT, and is user-activated. However, commercial tracking systems like SPOT or Spidertracks work in the opposite way of an ELT/PLB. A tracking device uses GPS satellites to determine its location, and then sends that data through a commercial satellite constellation — on average every 2-10 minutes — to a corporate monitoring center. When the signal stops or the emergency button is pressed, an alert will be sent and rescue personnel will be called according to predetermined user agreements established through a paid subscription.

A commercial system is never a substitute when an ELT is required, but it’s a great addition to aid in your rescue if needed. In addition, it gives family members the option to follow along from home.

If you plan to be rescued, it’s a good idea to file a flight plan, and also to let someone know where you are going and when you will be back. And nowadays, it doesn’t hurt to check in or leave a review on social media sites when on the ground, which will aid searchers should you go missing later.

According to the Civil Air Patrol, an average of 75 percent of actual “saves” from conducting missing aircraft searches did not have an ELT detected



Photo by
Tom Hoffmann

by search and rescue satellites to initiate the search mission. These were simply aircraft that were reported as missing because they did not turn up where they were supposed to be. This average hasn’t changed even with the switch from analog to digital distress signal satellite detection. But since an ELT can only help, do yourself a favor and increase the chances of a rescue team getting to you in time — ensure that you have an ELT installed and functioning properly. And if you are looking to upgrade your old analog ELT, consider a new GPS-enabled 406 MHz beacon that alerts authorities faster and more accurately; it’s well worth the cost should you have an accident and need help. ✈️

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Learn More

Title 14 CFR section 91.207 – ELTs

<http://go.usa.gov/TJne>

Aeronautical Information Manual (AIM) chapter 6, section 2-5 – ELTs

<http://go.usa.gov/TJQ5>