

# Blind to the Satellites

## Satellite monitoring of 121.5 ELTs ends soon

By Ian J. Twombly

### 406 MHZ ELT OPTIONS

As the 406 ELT market continues to grow, more options are becoming available to owners who chose to upgrade. Artex was the first to come to market with a unit tailored to light, general aviation airplanes. Currently the company offers units in the \$950 to \$1,500 price range. Kannad, a French company trying to make inroads in the United States, certified its unit earlier this year. It's being offered for around \$1,000, as is a unit from the Electronic Beacon Corporation. ACK is expected to come out with a new model in the near future, hopefully at a reduced price. Although most installations can use the existing wiring and ground switch, GPS enabling may require additional installation time, making installation possibly cost as much as the unit itself.—*IJT*

### PERSONAL LOCATOR BEACONS

Another option for the budget-conscious pilot is a personal locator beacon (PLB). PLBs are portable ELTs that can be used anywhere. They cost around \$500, require no installation, and can be used in the air, on a boat, while hiking, or anywhere else a user may need assistance. The benefits are the same as an installed ELT. When activated, a signal is sent via 406 to NOAA SARSAT, which then sends out SAR crews. Most are also GPS-enabled, allowing for precise searching. Units can even be registered with personal information like an installed unit. The one major drawback is that many PLBs do not activate automatically on impact.—*IJT*

We're cruising at 1,500 feet above the ground. The Becker direction finder is searching for the signal, but it's nowhere to be found. We're listening to 121.5 MHz hoping to hear the distinctive beeps, but only static comes through our headsets. It's hard to believe we're less than five miles from the crash site. Then suddenly the Becker latches on and the faint drone of an ELT comes through the radio. Now practically on top of the crash

site, the signal is strong and clear. The Becker points to the accident site like a proud hunting dog and we spot the airplane in a clearing.

The Civil Air Patrol runs drills like this practically every day of the year all over the country. On this day, we were flying with 1st Lt. Greg Gillen, a member of the Maryland Wing. The Wing's Cessna 182 is equipped with a host of high-tech add-ons, including the Becker SAR-DF 517 direction finder. The Becker allows Gillen and his fellow CAP members to search and home in on ELT signals. But even though the Maryland Wing has equipment of the future, the future is changing.

### **No one's watching**

In recent history, ELT signals have been monitored in two basic ways—both aurally on 121.5 MHz by air traffic control, fellow pilots, and others, and by a smattering of satellites around the world. In the United States, the National Oceanic and Atmospheric Administration (NOAA) is tasked with overseeing the Search and Rescue Satellite-Aided Tracking System (SARSAT), mainly because the monitoring capability is attached to its weather satellites. Because traditional ELT signals are in a high-use area of the spectrum, faulty components on ATM machines, and other random devices can give the monitoring system false alarms. “Sometimes we don't know if these are actual beacons or TVs or video games at Chuck E. Cheese,” said Lt. Jeffrey Shoup, SARSAT operations support officer.

The high number of false positives prompted the worldwide SAR community to embrace a new ELT that transmits on 406 MHz. They urged ICAO to require owners to install the new equipment, which it did for those flying internationally. Now countries around the world are deciding if they want to require a 406 ELT for those flying domestically. The overarching issue, and one that owners need to take note of, is that the SAR community has decided to no longer monitor 121.5 ELTs via satellite, beginning February 1, 2009. ATC facilities, military aircraft, and some civilian aircraft that choose to do so will still monitor 121.5. However, 121.5 ELT signals are limited to line of sight, so the chances of these ELTs alerting anyone to a crash are extremely limited.

The FAA has given no indication that it will change the current regulations to require owners to switch from a 121.5 ELT to a 406 ELT. AOPA continues to oppose any mandated installation. “The decision on whether or not to equip with a 406 ELT should lie with the aircraft owner,” said Rob Hackman, AOPA's director of regulatory affairs. “That decision should be based on a number of factors, including where and how they

fly, when they fly, and what other survival equipment they carry including cell phones, personal locator beacons, and other available technologies.”

Although an ELT is still required for a majority of Part 91 operations, the FAA is currently not requiring aircraft to be equipped with a new 406 MHz-capable unit. However, at the time of this writing, Canada had just issued proposed rulemaking requiring a 406 ELT for all aircraft flying in Canadian airspace, and Mexico has mandated carriage, but options are being explored. The real question—at least for those flying domestically—becomes: Should you equip?

### **The case to equip**

Not surprisingly, the SAR community would like all owners to equip with 406 ELTs. There are certainly some compelling reasons to do so. Other than the lack of false positives, the SAR community’s arguments for shelling out \$1,000 or more for a new ELT are the “improved accuracy, global coverage, near-instantaneous alerting, and the ability to register it.” NOAA maintains a 406 ELT registry that includes personal information on the owner or operator. That means if a signal goes off, NOAA can bring up specific information about the unit and have SAR crews attempt to contact its registered owner. Whereas with a 121.5 ELT, CAP volunteers would be called out at 2 a.m. to search for an errant signal, now a phone call can be made to possibly resolve the issue.

For owners, the main reason to buy a 406 ELT and have it installed is the increase in likelihood that they will be found after an accident. A main benefit of any ELT is that it is activated automatically after an impact. However, a 406 ELT is only slightly more likely to set off than a 121.5 ELT. The Steve Fossett disappearance in September of last year is an example of where a 406 ELT may not have provided any benefit. Many speculate that if Fossett had one he would have been easy to find. Unfortunately, NOAA never picked up a 121.5 signal for Fossett, meaning a 406 ELT would likely have not been activated either, and thus would have done him no good.

Assuming it does activate, Shoup said SAR assets would have a much better chance of finding a 406 ELT. “The search area for a 121.5 ELT is the size of the Washington, D.C., beltway. The search area for a 406 ELT that is not linked to GPS is that of a few city blocks, and one that is linked to GPS is akin to searching an area the size of a football field,” he said. After the signal goes off, NOAA’s system automatically relays it to a rescue coordination center.

If the accident is over land, the U.S. Air Force Rescue Coordination Center handles the call and will send the CAP. If the signal is off the coast, the Coast Guard responds. Because 406 beacons have been mandated on some boats for a few years, there have been many documented cases of saves involving fixed 406 beacons (called EPIRBs on boats). There have only been two saves thus far involving an installed, certified 406 ELT in an aircraft.

Because of this, CAP has limited experience working with 406 ELT signals. Although the Becker can detect 406 ELTs, most units in the Maryland Wing for example, have never trained with a 406 ELT signal, and many units around the country don't have the capability to even search for one. In addition, none of the nationwide CAP ground crews that play an integral part in finding downed airplanes have the capability to search for a 406 ELT signal.

Shoup says the benefit remains. "We've had Coast Guard rescues where the SAR aircraft has taken off and received the 406 signal more than a hundred miles out," he said. And therein lies one of the biggest potential benefits to the pilot. A 121.5 ELT sends a half-watt signal, while a 406 ELT sends a five-watt signal.

How would the opening scenario of this article have changed if the "crash" airplane had been equipped with a 406 ELT? If the ELT was GPS-enabled, the response probably would have been faster. Although all ELTs still need multiple satellite passes to accurately identify a position, a GPS-enabled 406 ELT bursts a latitude/longitude to the satellite. With two satellites always over the continental United States, the signal can be processed and acted upon very quickly. Also, CAP's Becker direction finder would have received the signal soon after takeoff, making the search much shorter.

The problem remains that finding an airplane is difficult from the air, the reason ground crews are used. 406 ELTs will also transmit on 121.5 so ground crews can home in on the subject airplane (CAP ground crews won't carry portable 406 ELT direction finders because of cost). Will the combination work? We'll have to wait and see.

*E-mail the author at [ian.twombly@aopa.org](mailto:ian.twombly@aopa.org).*