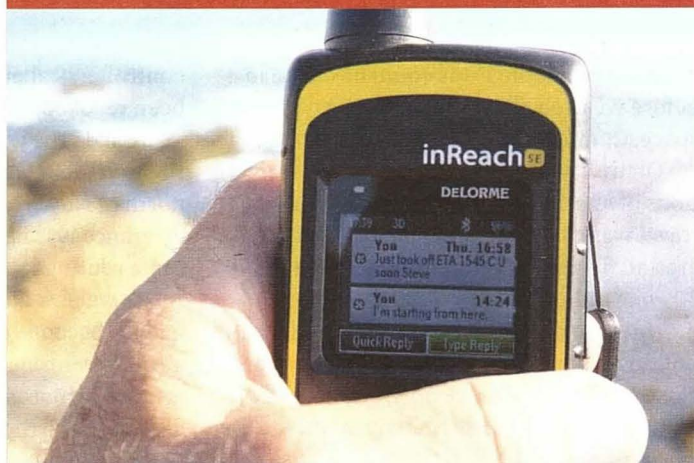




**STEVE ELLS**

COMMENTARY / THE WORKBENCH



# Where You At?

In the event of an unplanned inadvertent off-airport landing

**THE ODDS ARE VERY SMALL** that you or any other EAA member will ever need to be found and rescued following what can politely be called an unplanned inadvertent off-airport landing (UIOAL).

Very small indeed. Reports from the National Oceanic and Atmospheric Administration (NOAA) show that emergency locator transmitter (ELT) signals picked up by the Search and Rescue Satellite Aided Tracking (SARSAT) system resulted in the rescue of 240 people in 2014 and 135 people so far in 2015. The majority of these are rescues at sea and hikers; only 15 in 2014 and 12 so far in 2015 are cited as aviation rescues. Small numbers, but you can bet big money that those rescued were overjoyed when help arrived.

NOAA statistics also reveal that adoption of the modern 406 MHz ELT is not as widespread as was hoped, and that the incidence of false alarms is still alarmingly high.

As of June 2015 the total number of aviation 406 MHz ELTs registered totaled 81,721. The *2014 General Aviation Statistical Databook* published by the General Aviation Manufacturers Association (GAMA) estimated there are more than 199,000 active GA aircraft in the United States.

So it appears only four out of every 10 registered aircraft are equipped with a modern 406 MHz ELT. I'm sure everyone is aware that the old 121.5 MHz ELT signals are no longer detected by the SARSAT system. Even though the SARSAT constellation no longer is tuned to receive the 121.5 MHz signals from older ELTs, all 406 MHz ELTs also broadcast a 121.5 MHz signal used by searchers to pinpoint crash locations.

A 406 MHz data burst signal is picked up instantly; location definition depends on the equipment. The SARSAT system can locate a 406 MHz ELT data burst without GPS location coordinates to a

radius of 2.3 miles by using Doppler shift procedures that depend on a sequence of satellite passes. The process takes at least an hour. If the 406 MHz ELT signal is paired with GPS-derived coordinates, the crash location is centered on a 100-meter radius signal and will be relayed to SAR headquarters within 10 minutes.

406 MHz ELTs are vastly superior to 121.5 MHz ELTs in every way. Broadcast power is many times greater, and ELT location detection is much more definitive. In spite of its superiority, there's no legal mandate to install one. It's perfectly legal to fly along with a 121.5 MHz ELT.

The 406 MHz false alarm frequency is not as bad as the 121.5 MHz ELTs, but it's still pretty dismal. Data requested from SAR headquarters showed that 6,372 alerts were detected in 2014; only 89 were actual distress alerts. The rest, 6,283 or 98.6 percent, were false reports. Fifty-seven percent of the false reports were due to improper testing (do you know how to test and how often to test your 406 MHz ELT?) and poor maintenance practices.

All 406 MHz devices must be registered to maximize SAR capabilities. Registration is required by law and must be updated



every two years. Registration forms identify the owner and include an address, the type of aircraft (single-engine, multiengine), size of aircraft and make, model, and color of aircraft, as well as a list of personal and business contacts.

Up-to-date personal and business contact phone numbers aid SAR teams in gleaning additional information and detecting false alarms prior to launching a SAR mission. SAR teams include federal and state organizations. Here in San Luis Obispo County, California, SAR teams are staffed by volunteers under the sheriff's office. One well-known resource consists of the flying and ground-based staff and volunteers of the Civil Air Patrol (CAP). One SAR command center cites CAP as its number one resource, although the military may assist in SAR missions if its primary mission is not compromised.

Given that the majority of personal aviation fliers have not yet installed 406 MHz ELTs, are these fliers simply out of luck in the event of a UIOAL? Nope. The least expensive and often overlooked locator is the cellphone.

#### **MOBILE PHONE LOCATION SERVICES**

With the proliferation of cellphone coverage, there aren't many places left in the United States with zero cellular coverage. Both the Apple iOS and Android stores show numerous of phone-locating apps. In addition, a quick Internet search revealed dozens of third-party phone finder and phone tracker apps such as Prey, Lookout, Avast, and ZoeMob that advertise the ability to track and locate cellphones. Add cellphone charging to your preflight checklist and make sure someone on your contacts list knows your cellphone number.

#### **FLIGHT FOLLOWING**

IFR flights can be tracked in near real time on the FlightAware

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website. Sometimes the flight tracks of VFR flights receiving flight-following services are also displayed but not always. I've been told the sure way to ensure every leg of a VFR flight is displayed is to file an IFR flight plan—which gets the airplane N number into the ATC system—and ask for flight following without opening the flight plan.

#### PORTABLE LOCATION DEVICES

Non-aviation portable devices are relatively inexpensive and readily available. The devices, which transmit emergency location signals to satellite networks, fall into two categories: personal locator beacons (PLBs) and satellite messengers. Both derive location information from the Sarsat networks and send messages and tracking information through the Iridium or Globalstar satellite networks.

#### THE 406 MHZ ELT RESPONSE

When an SOS signal from a 406 MHz ELT is detected, its location is transmitted to a network of ground stations before being relayed on to the U.S. Mission Control Center (USMCC) in Suitland, Maryland. The USMCC processes the distress signal and coordinates with the Air Force Rescue Coordination Center (AFRCC) before alerting search and rescue authorities. When the owner of a PLB or a satellite messenger pushes the SOS button, different networks jump to respond.

#### GEOS ALLIANCE RESPONSE

When a PLB or satellite messenger user pushes his or her SOS button, a signal is relayed to the GEOS Alliance International Emergency Response Coordination Center (IERCC) near Houston, Texas. The IERCC first attempts to contact the owner of the device by cellphone to gather details about the emergency. Second, the phone numbers the owner previously entered on the device registration are called to gather additional information to help determine if the SOS is a true emergency. If IERCC determines help is needed, it contacts the emergency response team nearest the location of the radiated signal with

the information needed to start an emergency response.

The GEOS alliance also offers additional prepaid membership plans. These include the SAR50, which provides \$100,000 (\$50,000 per incident) per year to fund the cost of SAR efforts almost anywhere around the world. The new SAR100 plan provides \$100,000 of coverage for a single incident. These plans are surprisingly affordable and provide funds to hire additional SAR providers in the event the local providers are unable to mount a timely search effort. They are especially valuable when flying in countries with spotty SAR resources.

#### PLBS

The most common PLBs are small, light, and weather resistant and are manufactured by ACR Electronics. These include the ResQLink, the ResQLink+, the AquaLink, and the AquaLink View models. These range in price from around \$260 to \$400 depending on the model.

One important caveat when using a PLB: It must have a clear view of the sky to send that SOS signal.

#### SATELLITE MESSENGERS

Satellite messengers get their location data from the Sarsat network. The messaging capabilities depend on other satellite arrays. Units by DeLorme use the Iridium satellite network for messaging, while SPOT messengers use the Globalstar satellite network. Both Iridium and Globalstar are capable satellite networks providing near-worldwide coverage. For more detailed coverage information check each company's website.

Both devices require users to purchase a service account for access to its system. DeLorme has a number of accounts to fit a wide range of users.

One of the best features of the DeLorme units for aviators is the Automatic Flight Following and Ping-Me Locating service. The DeLorme SE and the DeLorme Explorer can also be used to send and receive 160 character text and e-mail messages, track movement progress, and send messages and updates to social media such

as Facebook and Twitter. During initial setup, message recipients' addresses and short pre-selected messages such as "Just took off" or "Just landed" can be added to a message database.

For what it's worth, the DeLorme website claims the most common text message sent from its portable messengers is "I love you."

The SPOT 3 is the latest iteration of Globalstar's messenger. SPOT messaging is limited to sending (via e-mail and text) pre-written messages or "check-in" messages to a maximum of 10 contacts. There's also an "Assist" message that is sent when non-emergency help is needed.

Launched in 2007, the company website claims SPOT devices have already affected more than 3,000 rescues. Like all the devices mentioned in this article, SPOT must have an unobstructed view of the sky for reliable results.

The initial cost of the SPOT 3 unit is very reasonable (less than \$100). Annual subscriptions (there's only one size) run about \$150 a year. This fee includes SOS notifications, messaging, and Basic SPOT Tracking, which sends position updates to Google Maps every 10 minutes. Unlimited and Extreme Tracking programs add more options to tracking such as position reporting at selected intervals (every 2-1/2, 5, 10, 30, or 60 minutes).

Spidertracks also makes a satellite messenger, but it's designed to be an aircraft tracking device for fleet operators tracking airplane movements and times. If a disruption of normal operations is detected, it automatically sends a location message to contact list addresses.

Today there is a large selection of flight tracking and emergency alerting tools that can be used in the unlikely event of a UIOAL. Few pilots believe it will happen to them, but it can, and if it does, the pilot who carries a fully charged cellphone, PLB, or satellite messenger has taken steps to up the odds of getting rescued sooner. *EAA*

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