

SWITCH TO 406

Your Lifeline to Survival

Some MYTHS AND Realities

Search and rescue satellites will not detect 121.5 or 243 MHz ELTs after February 1, 2009.

MYTH#1

It will cost \$4,000 or more to buy and install a 406 MHz ELT in most light airplanes.

REALITY

Most of the compact 406 MHz ELTs now being produced for general aviation airplanes retail for \$1,100 USD or less. Unless advanced work is required, the cost to install one should also be less than \$1,000.

The type of 121.5 MHz ELT currently installed in an airplane may influence options and associated costs for obtaining a 406 MHz unit. Some manufacturers have designed 406 MHz ELT packages that are compatible with existing "second-generation" 121.5 MHz ELT (TSO-C91a) components, which may reduce installation costs.

MYTH#2

Only a specialized avionics shop is permitted to install a 406 MHz ELT.

REALITY

If a 406 MHz ELT is not going to be connected to an on-board GPS or other navigation system, it may be installed by an Aviation Maintenance Engineer (AME) or by an Approved Maintenance Organization (AMO) with an applicable aircraft type rating.

Any AME can install a 406 MHz ELT, unless it is going to be integrated with avionics such as a Global Positioning System (GPS) or a Flight Management System. In such cases, the installation is considered to be specialized maintenance, and must be done by an Avionics AMO. Regardless of type, it is critical that all ELTs be installed and maintained in full compliance with Transport Canada requirements and the manufacturer's instructions. Improper installation and maintenance have contributed to ELTs failing to operate during crashes.

MYTH#3

406 MHz ELTs offer no advantage over existing 121.5 MHz ELTs. They're not worth the extra money.

REALITY

406 MHz ELTs have several advantages over 121.5 MHz units, including:

- Direct alerting of search and rescue authorities can occur within minutes over most of the globe. Why? The digital signals from 406 MHz ELTs can be picked up by geostationary search and rescue satellites; analog 121.5 MHz ELT signals cannot.
- Greater frequency stability and better location accuracy: A properly-registered 406 ELT can be located within 5 km on the first satellite pass. At least 2 passes are required to locate a 121.5 MHz ELT within 20 km.
- The uniquely coded digital signal of a 406 MHz ELT allows it to be matched to a specific aircraft, unlike an anonymous 121.5 MHz ELT. If properly registered, a 406 MHz ELT alert can be quickly followed up with a phone call to the owner's emergency contacts, potentially yielding valuable information about the aircraft's status.
- 406 MHz ELTs transmit their primary digital signal at 5 Watts. Older 121.5 ELTs transmit between 0.05 and 0.1 Watts.

MYTH#4

121.5 MHz will stop being monitored as a voice distress frequency after Feb. 1, 2009.

REALITY

It's business as usual for 121.5 MHz as an aviation voice distress frequency. After February 1, 2009, it is only the search and rescue satellites that will stop listening for ELTs on 121.5 and 243 MHz.

There will be no change to the current operational use of 121.5 MHz as the international VHF voice emergency channel. Many high-flying aircraft monitor 121.5 MHz as a courtesy to aviators (the "Guard" frequency). In Canada, however, only control towers and flight service stations monitor 121.5 MHz during their hours of operation; other remote communication facilities do not. Consult the latest version of Transport Canada's *Aeronautical Information Manual* (AIM) for additional information on emergency voice communications, and the use of 121.5 MHz.

For more information:
National Search and Rescue Secretariat
www.nss-snr.gc.ca

MYTH#5

Aircraft radios cannot tune 406 MHz. It is therefore impossible to test a 406 MHz ELT without specialized equipment.

REALITY

All 406 MHz ELTs are equipped with a test function that verifies the unit is operating correctly. All 406 MHz ELTs are also equipped with a continuous 121.5 MHz homing signal that can be heard on an aircraft radio tuned to 121.5 MHz, just like the older ELTs.

Every manufacturer publishes a specific internal test procedure for their 406 MHz ELT which should be followed closely. Since some 406 MHz ELTs also transmit on 121.5 MHz when the test function is activated, ELTs should be tested only during the first 5 minutes of every UTC (Zulu) hour. This will avoid false alerts, including reception of the 121.5 MHz signal by air traffic services and overflying aircraft that may interpret it as an actual distress transmission.

MYTH#6

A 406 MHz Personal Locator Beacon (PLB) is essentially the same thing as a 406 MHz ELT, but at a much lower price.

REALITY

While it also operates with the COSPAS-SARSAT system, and will send an alert automatically to Canada's search and rescue Mission Control Centre, a 406 MHz PLB is not the same as a 406 MHz ELT. It should not be considered an equal substitute.

- A PLB does not activate automatically. It does not have a "G"-switch that will turn it on in the event of a crash. If no one is conscious after a crash, or no one can reach the PLB to turn it on, it is just another piece of debris.
- PLBs are not designed specifically for aviation use. They do not have to undergo the same certification process, including impact and flame testing, that 406 MHz ELTs must successfully complete.
- PLBs do not have an external antenna to enhance signal propagation outside the aircraft while airborne.
- Unlike ELTs which are fixed to the aircraft structure, PLBs are portable. Like other portable objects, they can inadvertently be left behind.

MYTH#7

Search and rescue crews will need specialized equipment to find 406 MHz ELTs.

REALITY

All 406 MHz ELTs also transmit a homing signal on 121.5 MHz (and in some cases, 243 MHz too). These continuous analog signals can be located using the standard equipment already used by government, military, and volunteer search and rescue units.

The faster and more accurate location capabilities of digital 406 MHz ELTs quickly narrow the search area for rescuers. The auxiliary homing signal helps guide search and rescue units the final distance, particularly during hours of darkness, or when visibility is reduced (e.g. fog, snow, heavy vegetation). The strength of the homing signal may range from 0.025 to 0.1 W, depending upon the ELT manufacturer. Most military SAR aircraft are also equipped with 406 MHz homing equipment.

MYTH#8

The decision to end satellite monitoring of 121.5 and 243 MHz was made unilaterally by Canada.

REALITY

The decision to end satellite monitoring of 121.5 and 243 MHz was made in 2000 by COSPAS-SARSAT, the international satellite system for search and rescue. Canada is one of 40 countries and organizations worldwide that participate in the COSPAS-SARSAT Programme.

In Canada, users of marine and land-based emergency beacons have already made the switch to 406 MHz technology. Only Emergency Position-Indicating Radio Beacons (EPIRBs) and Personal Locator Beacons (PLBs) that transmit on a primary frequency of 406 MHz are currently permitted for use in Canada.

