

### A Buyer's Guide: ELTs

# WHO'S LISTENING NOW?

## 406 MHz Emergency Locator Transmitter Comparisons

BY PAUL NOVACEK

**T**he simple acronym ELT is short for emergency locator transmitter. These little orange or yellow boxes tucked back in the tail of your airplane are designed to give you and your passengers a fighting chance if things go horribly wrong.

The ELT is designed to transmit a homing signal to satellites or search parties when it's been activated by an excessive G-load typical of a crash or, as the FAA sometimes calls it, an unscheduled landing.

Those little ELTs happily do absolutely nothing for much of their operational lives. But when they're called into action to perform their sworn duty, we hope they've been taken care of properly.

This year, the monitoring of ELT signals has changed dramatically. Every certified aircraft is required to have an ELT installed and checked annually. Many different models exist, each offering various features, but all required to perform the specific duty of transmitting a homing signal after being activated by an excessive G-load.

In basic flight school, you are taught to memorize the international emergency frequency of 121.5 MHz and how to rely on it when you need to ask for help. This was the frequency ELTs used, along with the UHF frequency of

243 MHz, when transmitting their special sweeping tone, announcing to the world, "I'm here; save me!"

The network to monitor the emergency VHF frequency of 121.5 MHz and its first harmonic UHF military frequency of 243 MHz was vast and comprehensive. Local airport towers and remote listening posts monitored the frequencies from ground level, and during search-and-rescue operations, specially equipped aircraft could home in on the signal to locate a downed aircraft. Then, with the launching of special Cospas-Sarsat satellites in both low-altitude and geostationary orbits around the globe, international monitoring stations could locate the distress signal's origin with pinpoint accuracy.

But things have changed. While the extensive listening network is still as capable, the satellites stopped listening for the 121.5/243 MHz signals beginning Feb. 1, 2009. Now, they only listen for the improved and more capable 406 MHz distress signal. The reasons are many for monitoring only the higher emergency frequency.

The 121.5/243 MHz ELTs were prone to false activations, resulting in countless and expensive emergency scrambles by search-and-rescue teams looking for aircraft that simply had hard landings or

because an ELT was thrown in the trash.

The international community, including the marine industry and wilderness backpacking community, has been switched over to exclusive use of the 406 MHz frequency for a while now.

Saying goodbye to the old 121.5 MHz ELT was a smart move by the authorities, who conducted lengthy studies and long debates about the final decision for the satellites to listen strictly on 406 MHz.

Although the satellites no longer will monitor 121.5 MHz signals, the search-and-rescue community will still respond when notified through other means. Originally, ELTs were intended to use 121.5 MHz to inform air traffic control and pilots monitoring the frequency of an emergency. The frequency will continue to serve in this role in a limited capacity, relying on fellow pilots and ground-based radio facilities to monitor the signals.

Pilots flying aircraft equipped with 121.5 MHz-only ELTs now must depend on pilots of overflying aircraft or ground stations monitoring 121.5 MHz to hear and report distress alert signals transmitted from a possible crash site. Upgrading to a 406 MHz ELT gives you more of a fighting chance when you need it the most.

Those little ELTs happily do absolutely nothing for much of their operational lives. But when they're called into action to perform their sworn duty, we hope they've been taken care of properly.

The following manufacturers offer 406 MHz ELTs conforming to the FAA TSO-C126 and ETSO 2C126 equipment standards.

### **ACK TECHNOLOGIES**

ACK Technologies, in Van Nuys, Calif., was founded in 1972, and began manufacturing aircraft ELTs in 1988. With more than 62,000 ELTs built since then, its products have never been subject to any airworthiness directives or had any safety-related recalls or service bulletins issued.

ACK Technologies manufactures a single model of 406 MHz ELT. The ACK E-04 is certified to the TSO-C126 requirements and comes standard with a latitude and longitude interface from Bendix/King, Garmin or NEMA 183 GPS interfaces. The unit also comes standard with a sealed lithium battery pack good for five years of standby operation.

For those aircraft with the older ACK E-01 (121.5 MHz) ELT already installed, the new 406 MHz E-04 uses the existing mounts and remote-control panel indicator. However, the external whip antenna used for the old E-01 will need to be replaced with a new antenna (up to 250 knots) needed for the higher 406 MHz frequency. An optional blade

antenna is available for those aircraft with speeds up to Mach 1.

For more information, visit [www.ackavionics.com](http://www.ackavionics.com).

### **AMERI-KING**

Ameri-King Corp., in Huntington Beach, Calif., began building certified aircraft parts in 1989. The company offers a single model of 406 MHz ELT, the Ameri-King AK-451. The unit is available for installation in fixed-wing general aviation and corporate aircraft.

An option enables the AK-451 to be installed in helicopters using a five-axis G-switch. Another option allows a latitude and longitude interface to Garmin, Bendix/King, Trimble and ARNAV GPS navigators via an RS-232 aviation protocol. Ameri-King offers three external antenna models: a whip (up to 300 knots), a rod (up to 350 knots) and a blade antenna type (up to Mach 1).

The AK-451 transmits on all three emergency frequencies of 121.5, 243 and 406 MHz using a five-year lithium battery pack. The installation kit includes all accessories, including a pre-fabricated harness, remote control panel, audible warning buzzer and universal mounting tray.

For more information, visit [www.ameri-king.com](http://www.ameri-king.com).

### **ARTEX/COBHAM**

Artex Aircraft Supplies, in Aurora, Ore., operates as a division of Cobham Avionics & Surveillance. It manufactures an extensive line of ELT products, from basic models for small airplanes and helicopters to models for installation in Boeing airliners. Each of its 406 MHz models is certified to TSO-C126.

The Artex ME406 is designed specifically for fixed-wing and rotary-wing general aviation applications. The lightweight design transmits on both 121.5 and 406 MHz. The mounting base and hole pattern is compatible with all legacy Artex as well as some other ELT manufacturers' mounting bases. The ME406 features a single antenna output feeding a wire whip or a rod antenna for installations in aircraft speeds below 350 knots. The lithium battery is good for six years of service.

The Artex G406-4 series transmits on all three emergency frequencies (121.5, 243 and 406 MHz), and was designed for use within the general aviation market. The ELT automatically activates during a crash and transmits the standard swept tone on 121.5 and 243 MHz. The G406-4 also transmits a 406 MHz encoded digital message to the Cospas-Sarsat

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## ELT COMPARISONS

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satellite system. The optional GPS interface enhances the digital message with precise positioning, allowing for rapid identification and reduced response time. The G406-4 is available for use with Artex's low-cost whip antennas or a sturdy fiberglass rod antenna.

The Artex C406-1 series ELT is available for fixed-wing aircraft with a single directional G-switch and for helicopter applications with a multi-axis G-switch. The C406-1 ELTs transmit on all three emergency frequencies. It uses a single coax cable to accommodate all three frequencies. The C406-1 is available for use with Artex's whip antenna, rod antenna (up to 350 knots) or a blade antenna (up to 600 knots).

The C406-1 can be interfaced with the optional Artex ELT/nav interface, enabling latitude and longitude data to be transmitted as part of the 406 MHz digital message. The Artex C406-2 series is similar to the C406-1 model; however, it transmits on all three emergency frequencies using two coax cables.

The Artex C406N series incorporates latitude and longitude information from the aircraft navigation system. All three emergency frequencies utilize the same signal output, which requires only a single antenna cable to connect to the Artex single-input antennas. By the use of an optional programming adapter, the ELT harness can be programmed with the 24-bit address for fleet operators, enabling the C406N to be stocked as a rotatable replacement unit. The C406-N series ELT is available for fixed-wing aircraft using a single-directional G-switch and for helicopter applications using a multi-axis G-switch.

For more information, visit [www.artex.net](http://www.artex.net).

## EMERGENCY BEACON CORP.

Emergency Beacon Corp. of New York was founded in 1968, and is recognized for its dedication to the development, production and sales of avionics used in search-and-rescue operations. The company specializes in ELTs and direction-finding equipment installed in search-and-rescue aircraft.

EBC offers two product lines of 406 MHz ELTs designed with installation flexibility in mind.

The EBC 406AP series is designed for simple installation in the cabin of the aircraft. The dual-frequency (121.5 and 406 MHz), TSO-C126-approved ELTs provide for convenient installation in the cabin within reach of the pilot.

This arrangement eliminates the need for a remote control, reducing installation costs and eliminating the need for precious panel space. Installation in the cabin also allows for easy removal of the ELT in case of an actual emergency. The lithium manganese dioxide battery pack is good for five years of standby operation.

The EBC 406AF series is designed to install in the tail section of the aircraft and uses an external antenna. A remote-control unit is provided with the installation kit, which allows the pilot to control the ELT. As with the EBC 406AP, an attached survival antenna is used when the transmitter is removed from the aircraft.

All EBC 406 ELTs have a built-in, self-test feature, which allows for checking the unit power and antenna cable connection. Optional helicopter models are available for both the cockpit-mounted EBC 406AP and the tail-mounted EBC 406AF models.

For more information, visit [www.emergencybeaconcorp.com](http://www.emergencybeaconcorp.com).

## KANNAD

Based in France, Kannad designs and manufactures a wide range of ELTs installed in helicopters, commercial airliners, business jets, regional aircraft, military and general aviation aircraft. Kannad ELTs are installed by a number of prime aircraft manufacturers in both fixed-wing and rotary-wing fleets.

Kannad has been supplying the European market with ELTs for the past 30 years. Its newest entry into the United States for the 406 MHz market is the model 406 AF-Compact.

The Kannad 406 AF-Compact is designed for light aircraft requiring a very compact, automatic, fixed ELT that is fully FAA TSO-C126-approved. The robust and reliable shock sensor automatically activates the ELT in the event of a crash. The pilot also can manually activate the ELT in case of an emergency.

The 406 AF-Compact is small in size and features a six-year manganese battery good for 120 to 150 hours of transmit time on both the 121.5 and 406 MHz emergency frequencies. Whip or rod ELT antennas are sold separately for installation in aircraft speeds below 300 knots.

The Kannad 406 AF series of ELT models transmit on all three emergency frequencies of 121.5, 243 and 406 MHz, with antenna options available for aircraft speeds up to 650 knots. The compact unit is designed to be installed near the tail of an airplane or in a helicopter and connected to an outside antenna. A sophisticated "shock sensor" will activate the ELT automatically in the event of a crash.

The optional navigation interface (ARINC 429 or RS serial) transmits GPS coordinates to

search-and-rescue personnel, significantly reducing response time. The six-year lithium manganese battery is easily replaced by an avionics shop or maintenance facility. Fleet operators have the option of installing a programmable dongle in each aircraft for identification purposes, enabling the 406 AF to be stocked as a rotatable replacement unit.

The Kannad 406 AP series of ELTs are identical to the AF series; however, they include an auxiliary antenna strapped to the unit and a built-in lanyard. This allows the 406 AP to be used as an autonomous survival beacon able to be carried by crash survivors on a hike-out or open-water survival situation.

All of Kannad's ELTs are designed specifically for ease of maintenance and installation. The 406 AF-Compact is

designed for easy retrofit into existing 121.5 MHz aircraft installations. The heavy-gauge plastic mounting tray accommodates the mounting hole pattern of previous ELT manufacturer hole patterns and can use the existing cockpit switch wire harness.

A new antenna, however, is needed for the new frequency.

Additionally, all of Kannad's ELTs are field-serviceable by local avionics shops and do not require a return to the manufacturer for annual checks. The internal battery is good for six years.

For more information, visit [www.kannad.com](http://www.kannad.com).

### **ELT DISPOSAL: DON'T TRASH THE BEACON**

As aircraft owners remove their 121.5 MHz ELTs and install the newer, more reliable 406 MHz

units, many of the older ELTs are ending up in dumpsters and landfills.

If not removed properly, old ELTs could be activated accidentally, broadcasting a false distress signal. This forces emergency responders, namely the Civil Air Patrol, to physically locate these activated transmitters.

In one case, CAP personnel spent nearly an entire day digging through a landfill searching for an ELT unit that had been accidentally activated.

Any time an ELT of any type is removed from an aircraft, the batteries should be properly disconnected or removed. Additionally, because an ELT is an electronic device, it should be disposed of properly at an approved electronics waste facility.

**Comparison chart on following page...**

## Comparison of Emergency Locator Transmitters TSO-C126 (406 MHz)

MANUFACTURER	MODEL	DESCRIPTION	LIST PRICE
<b>ACK *</b>	E-04	Includes complete installation kit or installs in existing E-01 mount. GPS position input. Audible alert. Lithium battery pack.	\$585
<b>Ameri-King</b>	AK-451	Includes installation kit with cockpit switch. Optional helicopter kit. Optional GPS interface. Lithium battery pack or 4 D-cells. Price dependent on antenna and nav interface.	\$849 - \$2649
<b>Artex *</b>	C406-1	General aviation. Fixed-wing. Optional GPS interface.	\$3,239-\$5,092
	C406-1HM	General aviation. Helicopter. Optional GPS interface.	\$3,543-\$3,838
	C406-2	Fixed-wing. Optional GPS interface.	\$2,793-\$4,132
	C406-2HM	Helicopter. Optional GPS interface.	\$3,291-\$3,790
	C406-N	Fixed-wing and helicopter. GPS interface.	\$3,291-\$3,740
	G406-4	General aviation. Optional GPS interface.	\$1,662-\$2,280
	ME406	General aviation fixed-wing.	\$798
	ME406-HM	General aviation helicopter.	\$1,056-\$1,758
<b>EBC</b>	EBC 406AP	Fixed-wing aircraft. Includes installation kit with whip antenna. Cockpit mount transmitter. Audible alert. Lithium manganese dioxide battery pack.	\$1,662
	EBC 406APH	Helicopter installation. Includes installation kit with whip antenna. Cockpit mount transmitter. Audible alert. Lithium manganese dioxide battery pack.	\$1,750
	EBC 406AF	Fixed-wing aircraft. Empennage mount. Includes installation kit with cockpit switch and whip antenna. Cockpit switch. Lithium manganese dioxide battery pack.	\$1,990
	EBC 406AFH	Helicopter installation. Includes installation kit with whip antenna. Audible alert. Lithium manganese dioxide battery pack.	\$2,080
<b>Kannad *</b>	406 AF	General aviation. Optional GPS interface. Lithium manganese battery pack.	\$1,936
	406 AF-H	Helicopter installation. Optional GPS interface. Lithium manganese battery pack.	\$1,995
	406 AF (6D)	Fixed-wing or helicopter installation.	\$2,239
	406 AP	Fixed-wing installation. Optional GPS interface. Portable antenna. Lithium manganese battery pack.	\$2,100
	406 AP-H	Helicopter installation. Optional GPS interface. Portable antenna. Lithium manganese battery pack.	\$2,164
	406 AF-COMPACT	Fixed-wing general aviation installation. Compact mounting size. Six-year lithium manganese battery pack.	\$949

Manufacturer suggested list prices are subject to change and are dependent on installation kits or optional features. Contact an authorized dealer for current pricing.

\* Denotes Aircraft Electronics Association Member Companies