

AMERI-KING CORP.

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FREQUENTLY ASKED QUESTIONS

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I. GENERAL QUESTIONS

1.1 What is the limitation for all TSO Approved Equipments?

"The conditions and tests required for TSO authorization of this article are minimum performance standards. It is the responsibility of those desiring to install the article either on or within a specific type of class of aircraft to determine that the aircraft installation conditions are within the TSO standards. The article may be installed only when further evaluation by the applicant documents an acceptable installation and is approved by the administrator".

1.2. Does the TSO guarantee installation approval?

No. All TSO approved Equipments require Field Approval for installation. The TSO provides supporting documentation. Contact your local FSDO for details.

1.3 Do I need a Supplemental Type Certificate (STC) to install my TSO approved Equipment?

No. The TSO authorizes installation in any type of aircraft. The installer may do an STC if desired but any questions on how to do an STC need to be directed to their local FAA Flight Standards District Office (FSDO) or Aircraft Certification Office (ACO).

1.4 What Document will include in the FAA TSO and/or FAA PMA approved Equipments?

The FAA TSO and/or FAA PMA approved letters are shown in the applicable Product Installation Manuals.

1.5 What Document will include the Manufacturer C/C Certificate of Conformance?

The Manufacturer C/C Certificate of Conformance is shown on the applicable Product Packing List.

1.6 AMERI-KING REPAIR STATION AND DRUG & ALCOHOL TESTING STATUS:

Ameri-King Rebuilds or Tests all TSO Approved products manufactured by us and returns them to service under the authority of FAR 43.7(d). We

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do not repair or overhaul aircraft parts of appliances which not manufactured by us and are not required to hold a Repair Station certificate.

As an FAA TSO manufacturer, we are not required to have a Drug and Alcohol testing program.

1.7 QUALITY ASSURANCE STATEMENT

All aircraft products produced by Ameri-King Corporation are manufactured under FAA TSO Authorization (TSOA) and FAA Parts Manufacturing Authorization PMA.

The FAA TSO and/or FAA PMA approved letters are shown in the applicable Product Installation Manuals.

All aircraft products produced by Ameri-King Corporation are manufactured under FAA Technical Standard Order Authorization (TSOA) and/or FAA Parts Manufacturing Approval (PMA). Our manufacturing procedures comply with all requirements of FAR Part 21 Subpart O. Our manufacturing facility is regulated and inspected by FAA LA MIDO ANM-108L, 3960 Paramount Blvd, Lakewood, CA 90712. Our last ASCEP evaluation was completed on February 10, 2004.

Ameri-King Corporation was founded in 1976 and began manufacturing aircraft parts in 1989. Since that time we have produced over hundreds thousands Equipments under TSO C-71a; TSO C-88a; TSO C-91a; TSO C-126; TSO C-129a; TSO C-142. These Equipments are now in use world wide. During this period our products have never been subject to any Airworthiness Directives or have had any safety related recalls or service bulletins issued.

All inspection or overhaul or exchange of products and return to service is done under the authority granted us by FAR 43.7(d)

We have on staff a FAA DAR consultant and are able to provide FAA form 8130-3 Export Tag upon request. Any request for form 8130-3 must be in writing or noted upon your purchase order prior to shipment of the merchandise.

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II. FAQ ON MODEL AK-350, ALTITUDE ENCODER

2.1 CONTINUING AIRWORTHINESS REQUIREMENTS FOR MODEL AK-350 ALTITUDE ENCODER:

The model AK350 Altitude Encoder requires no periodical maintenance as a condition for continued airworthiness. Maintenance should be performed when the equipment no longer properly performs the function for which it is intended.

The above statement is not intended to contradict or modify and requirement of FAR 91.411, or of tests and inspections required by Federal Aviation Regulations.

2.2 Qualification and Compliance Basis for supplied Wiring Harness:

The supplied Wiring Harness was qualification tested as part of the entire TSO Altitude Encoder System. In review of AC-25-16, the supplied Wiring Harness meets the requirements per AC-16, paragraphs 5.c.(1) and 5.c.(2) which the Wiring does not create any significant potential for hazard.

2.3 What are the alternatives for Wiring?

M22759/18 or /35 (22 AWG) or equivalent is acceptable for alternative wiring

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III. FAQ QUESTIONS ON MODEL AK-450 ELT

3.1 Can I fly without an ELT if it needs repair?

Yes. Per FAR 91.207(f)(10)(i) "No person may operate the aircraft unless the aircraft records contain an entry which includes the date of removal, the make, the model, serial number, and reason for removing the transmitter, and a placard located in view of the pilot to show "ELT not installed." In Canada, the governing regulation is CAR 605.39.

3.2 Do I have to install an ELT on my aircraft?

Per FAR 91.207 all civil aircraft are required to carry a TSO C91a certified ELT as well as Part 121 operators and operations governed by Part 135. Aircrafts that are not required to carry an ELT include military aircraft, experimental aircraft, balloons and gliders. When in doubt contact your local FAA Flight Standards District Office (FSDO) or Aircraft Certification Office (ACO). Outside the US contact your Civil Aviation Authority

3.3 A GUIDE TO THE COMPLETION OF FAA FORM 377 WHEN INSTALLING THE ELT:

FOR NEW INSTALLATIONS:

Installed Ameri-King model AK-450 Emergency Locator Transmitter S/N (S/N of Unit) which is manufactured and certified under FAA TSO C-91a approval. The installation was accomplished using the manufacturers supplied, TSO approved, Installation data. (A description of the location of the ELT, its associated equipments, and any structural changes such as drilling or cutting should be included. It should be noted that any change in weight and balance was recorded in the appropriate aircraft records.)

FOR REPLACEMENT INSTALLATIONS:

Remove (Make & Model of existing ELT) Emergency Locator Transmitter. Install Ameri-King model AK-450 Emergency Locator Transmitter S/N (S/N of Unit) which is manufactured and certified under FAA TSO C-91a approval. The installation was accomplished using the manufacturers supplied, TSO approved, Installation data. (A description of the location of the ELT its associated equipment and any structural changes such as drilling or cutting should be included. It should be noted that any change in weight and balance was recorded in the appropriate aircraft records, of if

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weight of old ELT was similar that change in weight and balance was negligible.)

Please note:

Many installers when replacing an existing ELT do so as a log book entry as a minor modification. AC 20-41A provides guidance on replacement of TSO approved equipment. Change in weight and balance if any should be noted in the aircraft log books and entered in the aircraft weight and balance data.

Note that per AC 43.9-1E Paragraph h (2) defines the Installation and Operation Manual as FAA approved data.

3.4 CONTINUING AIRWORTHINESS REQUIREMENTS FOR ELT:

The model AK-450 ELT must be inspected yearly to insure continued airworthiness. The procedures as described in the (Periodic Maintenance) of the installation and operation manual Document IM-450 should be followed.

These tests also fulfill the requirements of FAR 91.207. The function test as described in the above reference manual should performed by the Owner/Operator of the aircraft every three (3) Months.

3.5 How do I install an ELT on my Airplane?

Ameri-King does not have specific installation recommendations for specific aircraft. The general guidelines provided in the ELT Installation and Operation Manual are all that we can provide.

Ameri-King is an ELT manufacturer, not an installer. Refer to the Manual and AC 43.13-2A chapters 1 through 3, 11 and 13 with especially for ELTs, Chapter 2 Paragraph 28.

3.6 Can I mount my ELT upside down?

Yes, as long as the ELT longitudinal axis is aligned with the primary direction of flight and the G Switch arrow is pointing in the direction of flight.

3.7 Why the ELT Main Unit is immediately activated, upon the Remote Wiring is plugged in, with the ELT Main Switch is @ ARM position and I am not able to Reset it?

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Your Remote Wiring is in reversed. Refer to Installation Manual for Interconnect Wiring configuration. The ELT wiring configuration is a straight wiring, not cross wiring (not a telephone wiring configuration). i.e. Pin 1 to 1, Pin 2 to 2, Pin 3 to 3, Pin 4 to 4. To verify straight wire configuration, looking at both connector Plugs, side by side, you must see the same color sequence on both plugs.

3.8 Can I mount my ELT at a 45 degree angle, for Helicopters?

Yes, refer to the Installation Manual, showed an allowable installation angle of up to 45° from horizontal, for Helicopters.

3.9 What are the alternative Battery Sources for ELT Main Unit and Remote Switch Unit?

Duracell MX 1300 and PC1300 batteries are approved alternatives for use in the ELT Main Unit.

Sanyo CR1/3N, Eveready 2L76, Kodak K58L, Varta CR1/3N, Maxwell 4LR44 batteries are approved alternatives for use in the ELT Remote Switch Unit.

3.10 What is the Certification Basis for AK-450-1, ELT with Optional Multi Axes Acceleration Switch, for Helicopters?

The Model AK-450-1 includes an additional Multi axes Acceleration Switch. It contains 6 separated individual G Switches that allow operation on 6 different axes. Lacking of the Multi axes Acceleration Switch, has no effect to the ELT operation, because there still remain a main G Switch. This concept of certification of multi axes sensing , using active axis parallel to the longitudinal axis of the aircraft, moving in the forward direction, per TSO requirement.

3.11 Can I mount my AK-450-1 vertically since it has 6 G-Switches?

No, The AK-450-1 was not tested or qualified to be mounted vertically with the primary G-Switch pointing "up". Further, please be advised that mounting the ELT in a manner not described in the Installation and Operation Manual is not recommended and would place the installation in violation of the requirements of FAA TSO C91a. However, it should be noted that the remote Acceleration Switch Assy does contain sensing switches for each of the other 5 axis. Ameri-King has no information on the equivalent level of safety for mounting the ELT in the vertical position. If the AK-450-1 is mounted vertically, the ELT will provide crash sensing

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but not in a manner specifically tested by Ameri-King and would be at the customers own risk.

The mounting Tray for both ELT Main Unit and Optional Multi-axes Acceleration Switch must be installed on the Horizontal Plane.

3.12 Can I mount my AK-450-1, backwards since it has 6 G-Switches?

No, this would violate the TSO. The main G-Switch is required to be pointing forward. The remote G Switch Assy provides sensing for the other axis but are not defined or required by the TSO and are not acceptable for forward sensing

The mounting Tray for both ELT Main Unit and Optional Multi-axes Acceleration Switch must be installed on the Horizontal Plane.

3.13 Can I use my old antenna from my C91 installation?

No. You must install an Ameri-King antenna that has been certified for use with an Ameri-King ELT. The TSO C91a requires that the antenna be part of the approved "system" that the letter of TSO is granted to.

3.14 Can I install my antenna closer to my communication antenna than the 30 inches specified in the ELT Manual?

Ameri-King specifies the 30-inch minimum to reduce the chance of re-radiation problems and GPS interference. Installation of the antenna closer than 30 inches will not violate the TSO but is done so at the installers' risk.

3.15 The only place I can install Antenna, it will put the antenna at a 25° angle- the manual states 20° max, what do I do?

Every effort must be done to find a location that will be within the 20° specified, however if no other option is available, deviations must be approved by their local FSDO.

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3.16 Can I mount the antenna inside my airplane?

Yes, only if the aircraft is fabric or composite where no large metal structures will be blocking the signal in the horizontal plane. The Antenna must still need to be mounted vertically (within $\pm 20^\circ$ of vertical).

3.17 How do I mount an antenna on my fabric-covered aircraft?

Refer to AC 43.13-2A, Chapter 3 on guidelines for fabric covered aircraft.

3.18 What is the airspeed rating of my antenna?

The antenna airspeed is rated at 350 Knots.

3.19 I have a glider, can I mount the antenna inside the fuselage?

Generally yes, in the US gliders are not required to meet TSO therefore "anything goes". Most gliders are fiberglass, which will not greatly affect radio waves. If TSO C91a is a concern, the installation must meet the ELT Manual and AC 43 guidelines.

3.20 Qualification and Compliance Basis for supplied Wiring Harness:

The supplied Wiring Harness was qualification tested as part of the entire TSO ELT System.

In review of AC-25-16, the supplied Wiring Harness meets the requirements per AC-16, paragraphs 5.c. (1) and 5.c. (2) which the Wiring does not create any significant potential for hazard.

3.21 What are the alternatives for Wiring and Coax Cable?

M22759/18 or /35 (24 AWG) or equivalent is acceptable for alternative wiring.

RG-400/U or equivalent is acceptable for alternative coaxial cable.

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IV. FAQ ON MODEL AK-451-(AF)(AP)(S), ELT EMERGENCY LOCATOR TRANSMITTER

4.1 I have an ELT just removed from an airplane. How do I know if it's in working condition?

Follow the instruction how to activate and self test silkscreened on top of the unit.

4.2 What is the post installation checking procedure for AK-451 to ensure the entire ELT system works?

1. ELT Main Switch @ ON position: Both LED Lights must flashing (1 sec On, 4 Sec Off) and the Buzzer sound (1 sec On, 4 Sec Off) This is to save Power.

The ELT swept tone must be heard on the 121.5 MHz VHF radio.

2. ELT Main Switch @ ARM position: Both LED Lights and Buzzer must illuminate and sound for 4 sec, then extinguish.

This is to make sure LED and Buzzer are properly powered.

Note 1: During the next 20 sec, the ELT will accept re-programming, if connected to the ELT Test set.

Note 2: At the end of the (4 sec + 20 sec) above, the ELT will automatically enter self test mode. If ELT is OK, No light illuminate, no buzzer sound.

If ELT malfunctions, the LED Lights and buzzer will show 1 flash. or 2 flashes, or 3 flashes or 4 flashes etc... Refer to Operation Manual of trouble shooting error flashes meaning.

Next, Throw the ELT forward and backward, 2-3 times, the ELT must activate, both LED Lights must flashing (1 sec On, 4 Sec Off) and the Buzzer sound (1 sec On, 4 Sec Off)

The ELT swept tone must be heard on the 121.5 MHz VHF radio. This is to check the G-Switch.

Next, Press either RESET Button, both LED Lights and Buzzer must extinguish, no ELT swept tone heard on the 121.5 MHz VHF radio.

Note 3: Both LED Lights (on the ELT Main Unit and on the Remote Switch Unit) and Buzzer are working in synchronized parallel.

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3. For normal operation, Leave the ELT Main Switch @ ARM position at all times.

No LED light illuminates, No buzzer sound, No ELT swept tone heard on the 121.5 MHz VHF radio.

4.3 After installation of the entire ELT system, lift and flip the switch from OFF to ARM position, press the remote ON switch, why the remote ON light and buzzer do not work?

You have to wait for 24 seconds delay. The remote ON light and the buzzer should flash at 1 second on and 4 seconds off

4.4 I have an airplane that is fabric covered. According to the manual, I am to install the antenna using metal foil strips under the fabric skin of the aircraft. What width of foil do I have to use?

Ameri-King suggests the strip to be 1 (one) to 2 (two) inches wide.

4.5 Can I use metal foil strips under the fabric skin of the aircraft for installation with all antennas?

This concept will work for both rod and whip antennas.

4.6 Can I use the old antenna from my TSO C91a installation?

No, you must install an Ameri-King antenna that has been certified for use with an Ameri-King ELT. Both TSO C91a and TSO C126 require that the antenna be part of the approved "system" that the letter of TSO is granted to.

4.7 Can I install my antenna closer to my communication antenna than the 30 inches specified in the ELT manual?

Ameri-King specifies the 30 inch minimum to reduce the chance of re-radiation problems and GPS interference. Installation of the antenna closer than 30 inches will not violate the TSO but is done at the installers' risk

4.8 I have a blade antenna that I'm installing on a Cessna Citation, the only place I can install it will put the antenna at a 25 deg angle, the manual states 15 deg max, what do I do?

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Every effort must be done to find a location that will be within the 15 deg specified. However, if no other option is available, deviations must be approved by their local FSDO.

4.9 I have a glider; can I mount the antenna inside the fuselage?

Generally yes, in the US, gliders are not required to meet TSO therefore "anything goes". Most gliders are fiberglass, which will not greatly affect radio waves. However, if the glider is made out of carbon fiber, the metal particles in the composite will block the signal in the horizontal plane. If TSO C91a or C126 are a concern, the installation must meet the ELT manual and AC 43 guidelines.

4.10 Can I mount the antenna inside my airplane?

Only if the aircraft is fabric or composite where no large metal structures will be blocking the signal in the horizontal plane. Generally, this will be either the 451017-1B whip antenna or 451017-4S portable antenna. Both of these still need to be mounted vertically (within +/- 15 deg of vertical).

4.11 How do I mount an antenna on my fabric-covered aircraft?

Refer to AC 43.13-2A, Chapter 3 on guidelines for fabric-covered aircraft.

4.12 What is the speed rating of my antenna?

This information is located in the manual.

4.13 What is TAS?

True Air Speed - the speed the aircraft is travelling through the air.

4.14 The manual says that my blade antenna is good for 600 knots TAS; will it work at Mach 1?

Yes, the calculations for the speed of sound (Mach 1) convert to a true air speed of 600 knots at altitude above sea level.

4.15 What are the periodic maintenance requirements on ELTs for continued airworthiness?

In the Installation/Operation manual under the section labeled periodic maintenance, the interval of inspection should be monthly or at least once

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a year unless required more frequently by the FARs (example; 100 hour inspections.)

4.16 The manual lists all sorts of tests. What type of maintenance is required for my ELT?

In the USA, the only requirements are listed in FAR 91.207 (d) which lists the following checks within 12 calendar months of the last inspection or original inspection:

- 1.) proper installation
- 2.) battery corrosion
- 3.) operation of controls and crash sensor (G-Switch)
- 4.) the presence of sufficient signal radiation from its antenna

The additional tests shown in the Manual are for Canada but may be performed if desired for an added level of maintenance.

4.17 I would like to buy an ELT Test Set to test the ELTs and coding programming and GPS Position Check, as per the manual. Where can I obtain the Test Set?

The ELT Test Set TS-451 consists of a laptop computer, coding programming software and ELT shield box. Please contact us for ordering information

4.18 I understand that replacement on battery pack is needed after the date of expiration. I am wondering if your company does replace battery pack and perform testing in your factory after battery pack has been replaced.

When we receive an ELT in that needs a battery replaced, we do a full recertification check before it is sent back. This usually consists of a standard recertification charge and the cost of the battery pack. The ELT is then returned with a Certificate of Conformance tag which indicates that it is airworthy and can be reinstalled in the aircraft.

4.19 If the GPS system giving the ELT the LAT/LONG fails, what does the ELT do? Does it activate? When it activates in a crash does it give the last known lat/long?

The ELT will activate regardless of the validity of the Lat/Long input data. If valid GPS Lat/Long data is not available in the beacon memory at the time the beacon transmits a 406 MHz message, the message shall

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contain default values for position data bits as specified in Cospas-Sarsat spec T.001

The last valid position data before the loss of navigation signal is retained in the 406 MHz beacon digital message for 4 hours (+/- 5 min) from the last valid position data input per Cospas-Sarsat Specification T.001"

4.20 How should I connect the ground on the AK-451 installation?

To prevent EMI interference, a common ground MUST be used for AK-451 ELT, Remote unit assembly, GPS receiver, and Aircraft DC ground. The input data line from the GPS receiver must be using single or double shielded wire.

4.21 Does the AK-451 Interface work with RS-232 or ARINC 429?

The AK-451 does accept the RS-232 GPS data. It will not accept ARINC 429 GPS data, however.

4.22 How do I install an AK-451 on my Mooney 12?

Ameri-King does not have specific installation recommendations for specific aircraft. The general guidelines provided in the ELT Installation and Operation Manual are all we can provide. Ameri-King is an ELT manufacturer, not an installer. Refer to the manual and AC 43.13-2A chapters 1 through 3, 11 and 13 with especially for ELTs, Chapter 2 Paragraph 28.

4.23 Can I mount my 406 MHz ELT up side down (i.e. hang the ELT)?

Yes, as long as the FORWARD Arrow is adhered.

4.24 Can I mount my ELT upside down?

Yes, as long as the ELTs longitudinal axis is aligned with the primary direction of flight, the G-Switch arrow is pointing in the direction of flight and the ELT is mounted with the bottom mounting tray up.

4.25 I am installing an AK-451 into my Bell 412. Can I mount the ELT at a 45 deg angle?

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Yes, unless instructed otherwise from the Helicopter's manufacturer

4.26 Can I mount my AK-451-1 backwards since it has six G-Switches?

No, this would violate the TSO. The main switch is required to be pointing forward. The other G-Switches do provide sensing of the other axis but are not defined or required by the TSO and are not acceptable for forward sensing.

4.27 Can I mount my AK-451-1 vertically?

The AK-451-1 was not tested or qualified to be mounted vertically with the primary switch pointing "up". Further, please be advised that mounting the ELT in a manner not described in the Installation and Operation Manual is not recommended and would place the installation in violation of the requirements of FAA TSO C91a/126. However, it should be noted that the Ameri-King Model AK-451-1 does contain sensing switches for each of the other five axes. These sensing switches activate at a much higher level (12 Gs nominal) than the primary switch (2 Gs - or 3.5 ft/sec acceleration change). Ameri-King has no information of the equivalent level of safety for mounting the ELT in the vertical position. If the ELT AK-451 is mounted vertically, the ELT will provide crash sensing but not in the manner specifically tested by Ameri-King and would be at the customer's own risk.

4.28 What do I use for approved data to complete my FAA Form 337?

Per AC 43.9-1E Paragraph h (2) defines the Installation and Operation Manual as FAA "approved data".

4.29 Can I fly without an ELT if it needs repair?

Yes, Per FAR 91.207(f)(10)(i) "no person may operate the aircraft unless the aircraft record contains an entry which includes the date of removal, the make, the model, serial number and reason for removing the transmitter, and a placard located in view of the pilot to show "ELT not installed". In Canada, the governing regulation is CAR 605.39

4.30 Why do I have to have an Audio Buzzer, I didn't with my old ELT?

One of the major different in going from TSO C91a compliance to TSO C126 compliance was to require an Audio Buzzer, allowing the pilot to monitor of when the ELT is activated. The requirement is outlined in RTCA/DO-204A.

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4.31 Can I fabricate my own remote switch?

Generally no, however exceptions have been made for some OEM's and for installers who do not need a TSO approved installation (such as experimental aircraft).

4.32 Why is the light on my remote switch on all the time?

Wiring error. Please refer to the wiring diagram in the Installation Manual for details.

4.33 Why can't I shut the ELT off with my remote switch?

If this is a new installation, it is likely a wiring error. If this is an installation that was previously working, the ELT may have failed.

4.34 What GPS Lat/Long data format will be accepted by the AK-451?

"The only Aviation RS-232 format which is supported is limited to the following conditions:

Baud rate (fixed): 9600

Parity: None

Data bits: 8

Stop bits: 1"

4.35 Which GPS Navigation Systems are known to interface with the AK-451?

The following manufacturers' GPS navigation systems are known to interface with the AK-451:

Garmin International Inc: All series: 150/250/400/420/430/500/520/530

Honeywell Bendix-King Inc: KLN 88, KLN 89, KLN 89B, KLN 90, KLN 90B, KLN 94, KLN 900

Arnav Systems Inc: R50, R50i, STAR 5000, FMS 5000, MFD (Multi-Functional Display)

II Morrow: FLYBUDDY, 2001 NMS

Trimble Nav Inc: NAV 1000, NAV 2000, TNL 2100, and TNL 3100. The following Trimble systems all require an RS-422 to RS-232 adapter: NAV

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3000, TNL 1000, TNL 2000, TNL 2000A, TNL 3000, 2000 APPROACH,
2000 APPROACH PLUS, 2101 I/O APPROACH PLUS

For other equipment models contact that equipment manufacturer to determine if their equipment supports the Aviation RS-232 format specified above.

4.36 Can you test an ELT to assure that it is operational before a trip?

Yes, all ELTs have a self-test feature.

4.37 Could I use an ELT in a Kidnapping in the Middle East?

While an ELT will work worldwide, it isn't practical in a kidnap scenario since they are too obviously a beacon when in use. No kidnapper or militant group is going to allow you to deploy and activate a beacon and then leave it deployed for hours. They are portable and moderately compact, but not concealable and not readily operable from concealment.

4.38 Do ELTs have a different code for a medical emergency?

No

4.39 Do ELTs transmit a 243.0 MHZ (military) homing signal?

Yes, the AK-451 ELTs transmit a 243 MHz homing signal.

4.40 How does an ELT work?

In simplistic terms, the ELT transmits a coded radio signal that is received by an orbiting satellite. The satellite then re-transmits the signal to a ground station that passes it on to an appropriate Mission Control Center, determined in part by the national code included in the signal.

Through the use of sophisticated technology it is possible to determine the location of the source of the distress signal. In the case of some beacons that also transmit location information derived from aircraft GPS, the location information is already known. From there, the distress information is passed to the appropriate search and rescue authority for action.

For a more complete explanation, see this detailed description of the COSPAS-SARSAT system and how it works.

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4.41 How many rescues can you get out of an ELT?

AN ELT is designed to be used once and then the battery should be replaced to ensure that the full battery is available in case of an emergency.

4.42 How quick will Search and Rescue respond after I turn on my ELT with GPS Position?

If the ELT sends out a GPS location that is received by the geostationary satellites, then search and rescue will often be **dispatched within minutes**, depending on available resources and your location.

If ELT has no GPS location information, it must wait to be received from the satellite's Doppler location mechanism, it may take up to (45 – 90) minutes in the U.S.

4.43 Is an ELT useful for a kidnapping?

While an ELT can be used to signal for help in any emergency, this is not a purpose for which it was designed and as it is very conspicuous it doesn't lend itself to this purpose.

4.44 Once activated in an emergency, should I periodically turn the ELT off for awhile to prolong the use of the battery?

No. Most Search and Rescue authorities do not recommend that strategy.

4.45 Will an ELT purchased and registered in the US work in a foreign country or does it have to be re-registered there?

Yes, it will work and No, you don't have to re-register

4.46 Will a U.S. ELT work worldwide?

Yes

4.47 Will the ELT work for a downed aircraft in the Atlantic Ocean?

ELTs work worldwide.

4.48 How the ELT works

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ELTs transmit signals on internationally recognized distress frequencies. The 406MHz signal is monitored by NOAA (National Oceanic and Atmospheric Administration) and the AFRCC (Air Force Rescue Coordination Center) in the United States.

The Global satellite tracking system is a collection of Russian, Canadian, American, and French satellites known as COSPAS-SARSAT, SARSAT being an English acronym for "Search And Rescue Satellite Aided Tracking". The network is made up of 4 polar orbiting LEO (Low Earth Orbit) Satellites and 3 GOES (Geostationary Operational Environmental Satellites).

Once a signal is received, these satellites can "fix" on the signal using a Doppler Shift location method, or, **when an ELT is hooked up to a GPS, the GPS coordinates can be instantly transmitted without waiting for an orbiting satellite.** The signal is then relayed to a LUT (Local User Terminal). These small satellite tracking stations are located all over the world and provide the link between the satellites and the MCC (Mission Control Center), which in the USA, is NOAA. This signal is then passed on to the Air Force to begin the Search and Rescue procedures.

4.49 Aircraft ID Signal

Each ELT is equipped with a UIN (Unique Identifying Number). This number is a 15 digit alpha-numeric code. This code is what is transmitted in the electronic burst to the satellites.

The UIN is linked to a computer database. The electronic burst provides Search and Rescue with your location, while the UIN links to the database and provides your name, address, phone number and any pertinent information such as medical problems, of which Search and Rescue should be aware.

When you buy an ELT, it is imperative that you register it with NOAA. In doing so, they will tie all your personal information into the 15 digit UIN. That way, when your ELT is activated anywhere on the Planet, Search and Rescue will know, who you are, where you are and how to handle any pre-existing medical problems when they reach you.

4.50 Two Types of 406 MHz ELT signals, with and without GPS Position data:

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These two different signals are 406 MHz which, which carries the UIN# and GPS data to the satellites, and 121.5/243.0 MHz which is a homing frequency.

If you are using a 406 MHz ELT without a GPS, the 406 MHz signal from the satellite will get rescuers to within a 2 mile radius of you. At the same time SAR will be monitoring with a tracking device to home in on the 121.5 MHz frequency put out by the ELT. The notification time to Search and Rescue with this type of ELT could be up to 4 hours, in the continental U.S.

If you are using a 406 MHz ELT with a GPS Position, the 406 MHz signal will guide rescuers to an area less than 100 meters from your position. At the same time SAR will be monitoring with a tracking device to home in on the 121.5 MHz frequency put out by the ELT. The average notification time to Search and Rescue with this type of ELT is 5 minutes! SAR is a responsibility of US Air Force.

The AK-451-() Series transmits triple Frequencies
406(Satellite)/121.5(Civil)/243.0(Military) Mhz.

4.51 What is the advantage of having a GPS Position within ELT?

The advantage of GPS is that:

1. It allows immediate response to the distress alert in most cases because the location is known **immediately**, no wait for a less accurate Doppler position.
2. While aircraft can home in on the 121.5 MHz homing signal, that can be a difficult and time consuming task, possibly delaying rescue for hours or more.
3. Not all SAR aircraft, particularly local and state resources, are equipped with a means to home in on the 121.5 MHz signal. However, they can all fly to a specific GPS location.

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V. FAQ ON MODEL AK-451-PLB/P-ELT/P-EPIRB, PERSONAL LOCATOR BEACON/PERSONAL ELT/PERSONAL EMERGENCY POSITIONING INDICATING RADIO BEACON

5.1 Why do I have to register my PLB/P-ELT/P-EPIRB?

Registering your PLB is mandatory. Registration is FREE and should be continually maintained. When you register your beacon you are providing potential search and rescue personnel with valuable information that will expedite a rescue. If you should be in an emergency and activate your PLB, the MCC will pull up your registration information based on the satellite signal received from your beacon. With this information in hand, they will now know who the beacon belongs to, what type of trip you may be on, and who to contact to verify that this is an emergency. You can also add other valuable information to your registration like any medical conditions that you or someone accompanying you may have. In an emergency, every piece of information helps. Take the time and properly register this beacon.

5.2 Is there a monthly fee for this service?

No, it's FREE.

5.3 Why does my PLB say give clear view to sky, will it work inside my house or car if need be?

Your PLB can work indoors or in a car, but due to the shielding effect on the distress signal your location may be skewed and take SAR personnel longer to identify your location. To maximize the PLB potential, it is best to activate it in an open clearing, with a clear view of the sky. This will decrease the time it takes for SAR forces to know exactly where you are.

5.4 Will my PLB 406/121.5/243 MHz work without any GPS data?

YES, the 243.0 MHz may shorten response time.

Rest assured that the LEOSAR satellites will pinpoint your location using Doppler Shift. With each pass of a satellite, your position is recalculated and the search area is narrowed down. SAR forces will then home in on your location using the 121.5 / 243.0 MHz homing frequency.

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5.5 Can I remove the floating collar from the PLB?

This is your choice, but if you do please know that your PLB will no longer be buoyant.

5.6 Is it okay if I lend my PLB to a friend who is going on a trip?

YES, give a copy of this product support manual so your friend will properly know how to use this beacon in an emergency, along with the responsibilities that come along with owning one. Then you must register the beacon again with your friend's information in case an emergency should arise. Once the PLB is returned to you, update your registration. Remember, registering your beacon is free, so update your registration as often as you want.

5.7 What should I do with my PLB when I am not using it?

Stow it away in a safe location to prevent it from an inadvertent activation.

5.8 What is the telephone connector on top of my PLB for?

The telephone connector is for programming the country code into your PLB. It can only be done by an authorized technician at Ameri-King Corp. or its certified distributors.

5.9 Can I use my PLB outside of the country I have registered it with?

Yes, they work as part of a global system. Be sure to update your registration file with your travel itinerary so that the country your beacon is registered with knows your trip plan so that any useful information can be passed on to the SAR authorities governing the country you are visiting if an emergency should occur.

5.10 If I move to another country, do I need to have my PLB reprogrammed?

If you should move to a new country you should bring your PLB to an authorized Ameri-King's service center to be reprogrammed with that country's national code. Next it is very important to update your registration files. Register your beacon with your new country so that they have your latest information and contact information in case of an emergency. Also, notify the country you previously had your PLB

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registered with that you have moved and that your registration has been updated with your new countries 406 registration database.

5.11 Can I take my PLB on an airplane?

With regards to general aviation, yes, the PLB can be very useful if your plane should happen to crash. A 406 MHz PLB is more likely to summon help faster than a 121.5 MHz ELT. The higher altitudes while flying will not cause your PLB to activate.

With regards to commercial air traveling, it is a personal preference if you want to store your PLB in your carry on bag or your checked baggage. If you choose to carry your PLB in your carry on baggage, you may wish to check with the airline about any restrictions or proper documentation that you may need to carry with your PLB. The higher altitudes while flying will not cause your PLB to activate.

5.12 What is the difference between a PLB, a P-ELT and a P-EPIRB?

For the typical consumer at this point in time there is no difference, they are just PLBs, it is simply a marketing tactic.

The concept, which has not yet been approved by regulatory authorities, is to code PLBs as either an ELT or and EPIRB, creating a Personal ELT and Personal EPIRB. This could make for a theoretically quicker response in some circumstances, though that is hotly debated among SAR experts, many of whom do not feel it will make a difference in the real world.

This is a very controversial idea and has met with a good deal of opposition, since by their very nature the PLB is so portable. It isn't tied to an aircraft or a boat and might easily be used in other environments, confusing SAR instead of helping them. Alerts are already sent to the RCC based on location, land or water, For unlocated alerts, it likely doesn't matter whether you are contacted by the maritime RCC or land RCC, either will ask the same questions in order to determine if the alert is real and if they can launch before a location is received and either will pass along the alert to the other when appropriate.

5.13 Can Search and Rescue home in on a 406 MHz PLB?

Yes, at least in the U.S. The 121.5 MHz homing signal is included in all U.S. PLBs specifically to provide that capability. This is not assured in other countries where a 121.5 MHz homer may not be required. Check with the manufacturer if you live elsewhere.

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In addition, 406 MHz homing equipment is now available and will see wider use in coming years.

5.14 Can you test a PLB to assure that it is operational before a trip?

Yes, all PLBs have a self-test feature.

5.15 Could I use a PLB in a Kidnapping in the Middle East?

While a PLB will work worldwide, it isn't practical in a kidnap scenario since they are too obviously a beacon when in use. No kidnapper or militant group is going to allow you to deploy and activate a beacon and then leave it deployed for hours. They are portable and moderately compact, but not concealable and not readily operable from concealment.

5.16 Do PLBs have a different code for a medical emergency?

No

5.17 Do AK-451 PLBs transmit a 243.0 MHZ (military) homing signal?

Yes, The AK-451-PLB transmits a 243 MHz homing signal.

5.18 How does a PLB work?

In simplistic terms, the PLB transmits a coded radio signal that is received by an orbiting satellite. The satellite then re-transmits the signal to a ground station that passes it on to an appropriate Mission Control Center, determined in part by the national code included in the signal.

Through the use of sophisticated technology it is possible to determine the location of the source of the distress signal. From there, the distress information is passed to the appropriate search and rescue authority for action.

For a more complete explanation, see this detailed description of the COSPAS-SARSAT system and how it works.

5.19 How many rescues can you get out of a PLB?

A PLB is designed to be used once and then the battery should be replaced to ensure that the full battery is available in case of an emergency.

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5.20 How quick will Search and Rescue respond after I turn on my PLB?

This varies. PLB sends out a distress signal, which is received by the geostationary satellites, then search and rescue will often be dispatched, depending on available resources and your location.

SAR initiates contact with the Emergency Contacts listed on your Registration Form, which provided useful location information, then response can begin as soon as that information is received, again, often within minutes.

If location information must wait to be received from the satellite's Doppler location mechanism, it may take up to 90 minutes, though that is more likely 45 minutes or less in the U.S. If a satellite passes overhead sooner, it will be quicker.

5.21 In locations where rescue is likely to take much longer than 24 hours, would it be advantageous to cycle the PLB on and off after the first several hours to conserve the battery?

No. Especially on land, as long as you stay put, they will find you. On the water, they will have used the position changes to create a drift chart and find you that way. Also, the AK-451 battery will last a good deal longer than 78 hours except at the coldest temperatures.

5.23 Is a PLB useful for a kidnapping?

While a PLB can be used to signal for help in any emergency, this is not a purpose for which it was designed and as it is very conspicuous it doesn't lend itself to this purpose.

5.24 Once activated in an emergency, should I periodically turn the beacon off for awhile to prolong the use of the battery?

No, most Search and Rescue authorities do not recommend that strategy.

5.25 Would a PLB be of value in an urban disaster situation?

Unlikely. Most urban survival circumstances requiring distress communications involve being trapped under rubble and this same rubble would likely block the alert from reaching the satellites.

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5.26 What organization regulates PLBs?

Internationally, COSPAS-SARSAT develops the standards for PLBs and other emergency beacons and the satellite distress system that receives their transmissions.

In the U.S., they are regulated by the FCC and the alerting system is run by NOAA. Each country has its own regulatory body for beacons sold in that country.

5.27 Who will respond when I turn on my PLB?

That will depend upon your location.

Typically, the Coast Guard responds to marine distress, but they may also utilize appropriate local or state assets if available and closer.

Inland distress is generally the responsibility of local law enforcement, typically a county sheriff in much of the U.S. often with the assistance of local volunteer search and rescue teams. These may call upon federal or state assets if available.

The Civil Air Patrol generally responds to an aviation distress signal in most states in the U.S., and historically this has been primarily because generally extensive air search is necessary to locate the inaccurate 121.5 MHz beacon. In most cases of a 406 MHz PLB alert they will not be activated unless indications are that it comes from a downed aircraft and that local SAR resources cannot locate and take care of it in short order. That downed aircraft indication will come from providing that data in the Additional Data section, or from the Emergency Contacts listed on the registration form.

In most cases these days where the PLB alert is a remote location, the first assets to arrive will be airborne, typically a helicopter from the closest SAR resource, regardless of who operates it.

5.28 Will a PLB or P-ELT or P-EPIRB purchased and registered in the US work in a foreign country or does it have to be re-registered there?

Yes it will work and no, you don't have to re-register

5.29 Will a U.S. PLB work worldwide?

Yes

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5.30 Will the PLB work for a downed aircraft in the Atlantic Ocean?

PLBs work worldwide.

5.31 How the 406 MHz PLBs work

PLBs transmit signals on internationally recognized distress frequencies. The 406MHz signal is monitored by NOAA (National Oceanic and Atmospheric Administration) and the AFRCC (Air Force Rescue Coordination Center) in the United States.

The Global satellite tracking system is a collection of Russian, Canadian, American, and French satellites known as COSPAS-SARSAT, SARSAT being an English acronym for "Search And Rescue Satellite Aided Tracking". The network is made up of 4 polar orbiting LEO (Low Earth Orbit) Satellites and 3 GOES (Geostationary Operational Environmental Satellites).

Once a signal is received, these satellites can "fix" on the signal using a Doppler Shift location method. The signal is then relayed to a LUT (Local User Terminal). These small satellite tracking stations are located all over the world and provide the link between the satellites and the MCC (Mission Control Center), which in the USA, is NOAA. This signal is then passed on to the Air Force to begin the Search and Rescue procedures.

Personalized Signal

Each PLB is equipped with a UIN (Unique Identifying Number). This number is a 15 digit alpha-numeric code. This code is what is transmitted in the electronic burst to the satellites.

The UIN is linked to a computer database. The electronic burst provides Search and Rescue with your location, while the UIN links to the database and provides your name, address, phone number and any pertinent information such as medical problems, of which Search and Rescue should be aware.

When you buy a PLB, it is imperative that you register it with NOAA. In doing so, they will tie all your personal information into the 15 digit UIN. That way, when your PLB is activated anywhere on the Planet, Search and Rescue will know, who you are, where you are and how to handle any pre-existing medical problems when they reach you.

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5.32 The PLB can take the "search" out of 'Search and Rescue'.

Why Hasn't Anyone Every Heard of this Technology Before??

Well, if you have a marine background and are familiar with EPIRBs (Emergency Position Indicating Radio Beacons) then you know exactly what this product is and how it works.

EPIRBs are basically PLBs that are specific for the Marine Environment. They have been in use for over 20 years and have saved over 15,000 lives. However, the EPIRB/PLB technology was not legal for use in land based applications in the United States. The technology is governed by the FCC (Federal Communications Commission) and was just legalized for terrestrial use by backpackers, campers, hikers, etc. on July 1, 2003.

The reason it was not available is because there was not one unified overseeing body for land based rescues, using one type of Search and rescue software. Each state has different organizations handling different types of rescues and no one agency acted as the point of contact for NOAA. In a marine environment, there is only one rescuing agency, the US Coast Guard. So coordinating rescues and responses has been a relatively easy task.

Now, the FCC, NOAA and the US Air Force have gotten together to make the AFRCC (Air Force Rescue Coordination Center) the point of contact for land based rescues. The AFRCC, in turn has established relationships and points of contact in each state. Each state is upgrading their Search and Rescue software to make it compatible with that of the AFRCC's.

So, whenever a land based PLB is set off, the AFRCC will know exactly who to contact for a rescue response.

The 406 MHz which, which carries the UIN# and GPS data to the satellites, and 121.5 MHz which is a homing frequency. The 406 MHz signal from the satellite will get rescuers. At the same time SAR will be monitoring with a tracking device to home in on the 121.5 MHz frequency put out by the PLB. In addition, the AK-451-PLB also transmit 243.0 MHz distress signal to the SAR (AFRCC)

It is always a good idea to have a visual and audible distress signal such as a signal mirror (daytime) a signal whistle, or a strobe light (nighttime) to make sure that you are seen or heard easily, once Search and Rescue gets close.

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5.33 How Long Will a PLB Transmit?

A PLB is equipped with a Lithium battery. This battery has an 11 year life span, and lays dormant until you flip the switch to activate the PLB.

Since the functionality of a battery is negatively affected by cold, this operational tolerance is a worst case scenario. If the average temperature is 70° F, the battery will be able to operate for approximately twice as long.

It is recommended that your battery be changed every (2-5) years by an authorized BRC (Battery Replacement Center). The Battery IS NOT able to be changed or replaced by the consumer.

Every time your battery is changed, each PLB gets a complete overhaul of new gaskets, seals and a tolerance check to make sure that it will absolutely function, when you need it!

5.34 What Is The Monthly Subscription Fee for this Product?

There is no fee. The satellites are already in orbit, Search and Rescue is already in place.

The efficiency of a Search and Rescue operation is greatly increased when a lost boater or hiker has a PLB.

Instead of needing to organize a massive search party and have helicopters scouring areas, burning fuel, the Search and Rescue Teams know exactly where the lost individual is located, taking the "search" out of Search and Rescue.

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**VI. FAQ QUESTIONS ON MODEL AK-550/551
DC/DC POWER CONVERTER**

6.1 What is the size of the input circuit breaker should I use for the DC/DC Converter application?

Refer to the applicable Installation Manual, Electrical Installation section, for how to calculate the Input Current to the DC/DC Converter against its efficiency.