INSTALLATION AND OPERATION MANUAL
EMERGENCY LOCATOR TRANSMITTER, MODEL AK-450

Document No.: IM-450

INSTALLATION & OPERATION MANUAL

Rev A
dated 10-18-95
for

Model AK-450
ELT EMERGENCY LOCATOR TRANSMITTER
Per TSO-C91a and DO-160c Requirements

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INSTALLATION AND OPERATION MANUAL
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APPLICABILITY

- Model AK-450, Part No. AK-450: ELT Emergency Locator Transmitter with Voice Transmitting Capability.
- Model AK-450, Part No. AK-450-1: ELT Emergency Locator Transmitter with Voice Transmitting Capability with Optional Multi Axes Acceleration Switch for Helicopters.

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EMERGENCY LOCATOR TRANSMITTER, MODEL AK-450

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SECTION I
GENERAL INFORMATION

1.1 SCOPE

This manual contains information necessary for the installation, test and operation of the model AK-450, Emergency Locator Transmitter, manufactured by Ameri-King Corporation, California, U.S.A.

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

1.2 DESCRIPTION

The AK-450 ELT Emergency Locator Transmitter is an electronic solid-state based equipment. It is extremely reliable equipment, designed to meet TSO-C91a requirements, batteries operated and self contained.

The ELT Emergency Locator Transmitter is designed only for emergency use. The model AK-450 may be used as one or more of the following ELT types:

a. Automatic Fixed-ELT (AF):
The ELT is designed to be permanently attached to the aircraft before and after a crash and is designed to aid the SAR teams in locating a crash site.

b. Automatic Portable-ELT (AP):
The ELT is designed to be rigidly attached to the aircraft before the crash, but readily removable from the aircraft after a crash. It functions as an ELT (AF) during a crash sequence. The aircraft mounted antenna may be disconnected and a portable antenna (mounted on the ELT mounting tray) is attached to the ELT. This ELT can be tethered to a survivor or a life raft. This ELT is designed to aid the SAR teams in locating the crash site.

The model AK-450 consists of an ELT Main Unit, an ELT Remote Unit, two aircraft mounted Fixed and Portable Antennas, two Interconnect Cable Assemblies, a Mounting Tray and a Clamp.

The Main Unit features include:

- ON / OFF / ARM Main Switch
- ON LED Light
- RESET Push Button Switch
- MIC input for Voice Transmission

The Remote Unit features include:

- ON Push Button Switch
- ON LED Light
- RESET Push Button Switch.

1.3 TECHNICAL CHARACTERISTICS

SPECIFICATIONS:	CHARACTERISTICS:
TSO COMPLIANCE:	TSO-C91 a

PHYSICAL CHARACTERISTICS:

* SIZE AND WEIGHT:

Main Unit:	(4.27"Wx2.95"Hx5.64"L) 2lbs 10oz
Remote Unit:	(2.17"W x 1.20"H x 1.18"L) 1.0 oz
Fixed Antenna:	(14.5"L) 2.0 oz
Portable Antenna:	(25.5"L) 1.5 oz
Mounting Tray & Clamp:	(4.39"W x 0.75"H x 5.76"L) 3.0 oz

*MOUNTING HOLE SPACING:

Mounting Tray:	4 Trapezoid Corners (L1=2.76"; L2=1.76"; H=2.01")
Remote Unit:	4 Rectangular Corners (2.365"W x 1.150"H)
Fixed Antenna:	1 Hole (0.500" Diameter)

*CASE AND COLOR: No Sharp Edges, High Impact, Fire Resistant, Waterproof, High Temperature ABS Plastic. Safety International Orange Color.

GENERAL SPECIFICATIONS (STANDARD CONDITIONS):

* TRANSMITTER:

Operating Frequencies:	121.500 MHz +/- 0.0025 %
	243.000 MHz +/- 0.0025 %
Modulation Characteristics:	Audio Sweep Frequency: Download Sweeping (1600-300) Hz
	Sweep Rate: 3 Hz +/- 1 Hz
	Modulation Factor: More than 0.85
	Occupied Bandwidth: Less than 25 KHz
	Voice Modulation: Included

Modulation Duty Cycle:	(33-55) % Square Wave AM
Duty Cycle:	Continuous
Peak Effective Radiated Power (PERP):	160mW (22.0dBm) @ 121.5 MHz (Typ) 150mW (21.7dBm) @ 243.0 MHz (Typ)

* BATTERY REQUIREMENTS:

Transmitter Main Unit:	6 DURACELL MN1300 "D" Size, Alkaline Manganese Dioxide.
Remote Unit:	1 DURACELL DL 1/3 NB, Lithium Cell

*AUTOMATIC CRASH ACTIVATION: Velocity Change of 2 +/- 0.3 G (3.5 +/- 0.5) FPS

*ANTENNA RADIATION CHARACTERISTICS: Radiation on 121.5 and 243.0 MHz. Vertically polarized & Omnidirectional in the Horizontal Plane.

*CRASHWORTHINESS: 100g, 23 msec, 6 directions

*ACTIVATION MONITOR: Manual ON and RESET functions are enable on both ELT Main Unit and Remote Unit. The two ON LED lights, located on the ELT Main Unit and Remote Unit are used to indicate when the ELT is transmitting. Both ELT Main Unit and Remote Unit are self-powered by their internal Batteries. Automatic Activation is remained, regardless whether the Cable Interconnection between the Main Unit and the Remote Unit is open or shorted.

ENVIORNMENTAL TEST SPECIFICATIONS:

*RTCA DO-183

*RTCA DO-160C ENV. CAT.: C1AC/XXXSXXXSXXXXBXB

* TEMP. AND ALTITUDE:	Category C1
Low Temperature:	-20 deg. C Operating; -55 deg. C Storage.
High Temperature:	+55 deg. C Operating; +85 deg. C Storage.
* OPERATING LIFE:	65mW (18.1 dBm) @ 121.5 MHz (Typ) 50mW (17.0 dBm) @ 121.5 MHz (Minimum Requirement throughout a 50 hour period at –20 deg. C) 63mW (18.0 dBm) @ 243.0 MHz (Typ) 50mW (17.0 dBm) @ 243.0 MHz (Minimum Requirement throughout a 50 hour period at –20 deg. C)
* TEMP VARIATION:	Category C1 10 deg. C minimum per minute
* HUMIDITY:	Category A 95% RH, 50 hours operating
* SHOCK:	500G, 4 +/- 1 msec
* IMPACT:	Penetration of 55 lbs mass, 6 drops, 4 surfaces
* CRUSH:	1000 lbs, 4 surfaces
* VIBRATION:	10G, Sinusoidal, (5-2000) Hz, 3 axes
* WATERPROOF:	Category S 15 minutes Spray, 6 sides
* IMMERSION SALT WATER:	Category S, 24 hours Immersion, 160 hours at + 55 deg. C
* SALT SPRAY:	Category S, 48 hours exposure to the Salt Fog, and 48 hours drying

1. 4 ACCESSORIES SUPPLIED

1.4.1 INSTALLATION KIT:

PART NO.	DESCRIPTION
450004	Remote Unit Assembly
4500041	Remote Cable Assembly
450013	Mounting Tray
450014	Clamp
450017	Fixed Antenna Assembly
4500171	Coaxial Cable Assembly
450018	Portable Antenna Assembly
450019	Hex Key Tool

1.5 LICENSE REQUIREMENT

Radio Station License Data:

With a current Private Aircraft Radio Station License, no further Station licensing is required for the ELT installation. A Private Aircraft Radio Station license may be obtained by filling FCC Form 404.

The ELT may be installed, used, and tested for up to 30 days without a station license after filling the FCC Form and while awaiting receipt of the station license, provided a copy of the submitted FCC Form 404 is kept in the aircraft.

Installation and use in countries other than the U.S.A. shall be in accordance with that country's licensing regulations and in conjunction with this manual.

SECTION II
INSTALLATION AND TEST

2.1 UNPACKING AND INSPECTING EQUIPMENT

Extreme care when unpacking the equipment. Visual inspection of the equipment for evidence of damage incurred during shipment. Any claim should be promptly filed with the transportation company. Save the shipping container to substantiate the claim. Retain the container and packaging material for possible future use.

2.2 MECHANICAL INSTALLATION

The ELT is designed with the installer in mind. All accessories, which are required for complete ELT system installation, are provided, including Mounting Tray, Clamp, Coaxial Cable Assembly and Wiring Cable Assembly.

Because of the critical nature of an ELT, it is very important that the installation be performed according to the following instructions. Installation of the ELT is somewhat unique, as is the installation of any TSO-C91a ELT; it requires experience in sheet metal work and avionics. Only licensed technicians should install the ELT.

Many problems associated with the older ELTs were due to poor installation. Therefore, duplicating a previous ELT installation with the AMERI-KING ELT may not be acceptable.

In addition to the procedures outlined herein, the installer must adhere to the guidelines established in FAA-AC 43.13-2A, specifically chapters 1 through 3, 11 and 13 (Acceptable Methods, Techniques and Practices of Aircraft Alterations).

By signing either the aircraft logbooks or the FAA Form 337, you are stating that the installation has been performed in accordance with the current FARs and with the steps and procedures outlined herein.

In Canada, all installations must be performed in accordance

with the Engineering and Inspection Manual Part II, Chapter III, Section 3.12.

Remember: Your Professional installation may save someone's life.

2.2.1 ELT MAIN UNIT LOCATION AND INSTALLATION

2.2.1.1 ELT LOCATION DETERMINATION:

Many of the original ELT installations are inadequate as far as unit location and surface rigidity are concerned. Just because the "old" ELT was located in a particular position doesn't mean the "new" ELT should be located there as well.

The tail section of an airplane is least likely to be damaged during a crash and therefore, it provides a good mounting environment for the ELT unit. Refer to Figure 1 and Figure 1.1 for Direction Determination for Fixed Wing Aircraft and Helicopter, respectively.

Accessibility of the unit is an important factor in the location of the ELT. Mount the unit as far aft as practical but where it can be easily retrieved for maintenance.

The mounting surface must be extremely rigid; therefore, mounting the ELT directly to the aircraft skin is unacceptable. Mounting an ELT directly to the aircraft skin induces "crash hiding" vibration and provides a very poor structural mounting surface. The mounting location must be able to support 100 pounds of force in any direction with no appreciable distortion in the structure. It must also be able to withstand a 350-pound force in any direction without tearing or breaking the aircraft structure.

Following are the FAA guidelines for mounting a TSO-C91a ELT, per RTCA DO-183 paragraph 3.1.8:

1. "The ELT shall be mounted to primary aircraft load carrying structures such as trusses bullheads, longerons, spars, or floor beams."

2. "The mounts shall have a maximum static local deflection no greater than 2.5 mm (0.1 in) when a force of 450 Newtons (100lbs) is applied to the mount in the most flexible direction. Deflection measurements shall be made with reference to another part of the airframe not less than 0.3 meters (3 feet) from the mounting location."

In addition, RTCA Document number DO-182 recommends that "all ELT system components which must survive a crash intact, ...should be attached to the airframe in such a manner that the attachment system can support a 100g load...in the plus and minus directions of the three principal axes of the aircraft."

The ELT must be mounted with the arrow which is printed on the battery case pointing in the direction of flight. The ELT should be mounted with its longitudinal axis aligned within 10 degrees of the longitudinal axis of the aircraft fuselage. Avoid mounting the ELT near sources of strong EMI/RFI radiation.

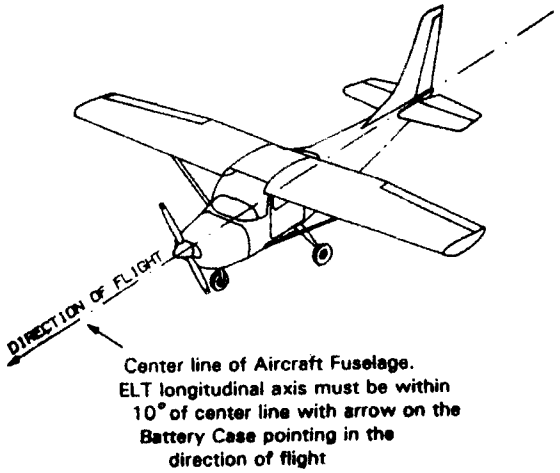


Figure 1. Direction Determination for Fixed Wing Aircraft

The ELT can be installed in a helicopter with very few changes in the aircraft installation steps described herein. All procedures remain the same except that the ELT unit is mounted with the "Direction Of Flight" arrow pointing downward at a 45 degree angle to the horizontal plane rather than parallel to it. See Figure 1.1 below.

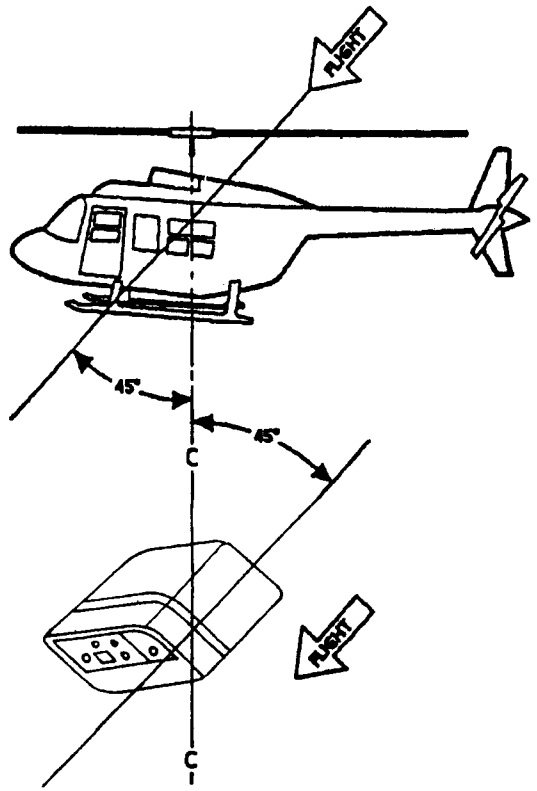


Figure 1.1. Direction Determination for Helicopter

2.2.1.2. MOUNTING TRAY AND CLAMP INSTALLATION:

After selecting a suitable location meeting all of the above requirements, drill and mount the ELT Mounting Tray and Clamp as shown in Figure 2. Mark the 4 holes in trapezoidal locations needed for the tray using the tray as a guide. Be sure the arrow on the tray aligns within 10 degrees of the longitudinal axis of the aircraft (and in direction of flight).

The purpose of 4 holes in trapezoidal configuration is to assure that the Mounting Clamp will be placed in the correct location (near to the Center of Gravity of the ELT Main Unit). Therefore, make sure the direction of the 4 mounting holes in trapezoidal configuration is correct.

If a reinforcement (Doubler) plate is needed to meet the rigidity requirements of paragraph 2.2.1.1, fabricate one using the tray as a guide.

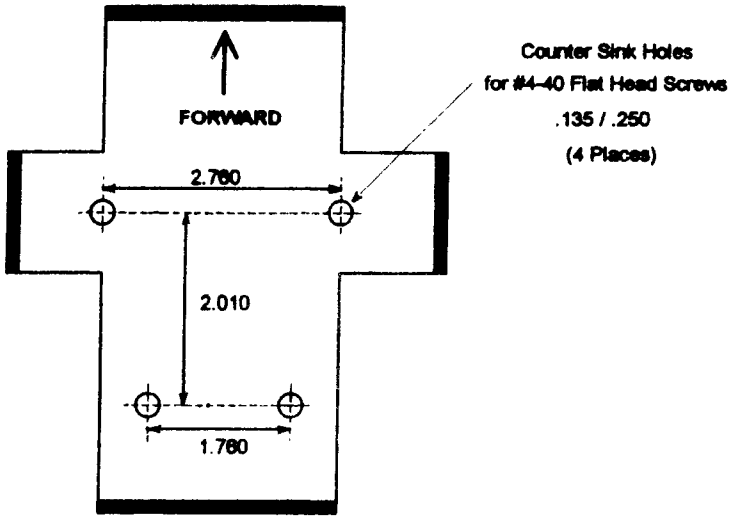


Figure 2. Mounting Tray and Clamp Installation

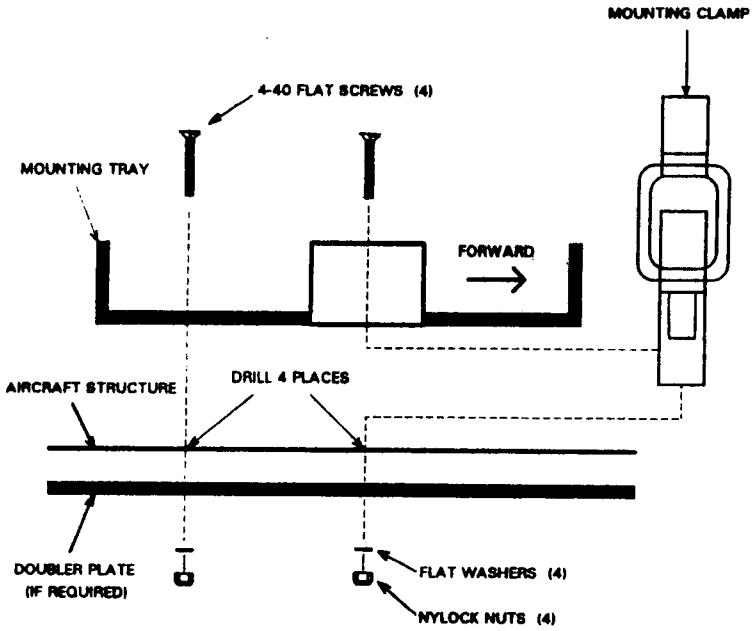


Figure 2. Mounting Tray and Clamp Installation (Continued)

2.2.2 ANTENNA LOCATION AND INSTALLATION

In order to meet the requirements of TSO-C91a and FAR 91.52, an External Antenna must be used. The Portable Antenna supplied with the unit is for use only after the unit has been removed from the aircraft. The External Antenna supplied is a Quarterwave Coil-loaded Monopole design. Use only the Ameri-King supplied Antenna. Use of other manufacturer antenna in lieu of Ameri-King supplied Antenna is not recommended.

2.2.2.1 ANTENNA LOCATION DETERMINATION:

The mounting location of the External Antenna is determined to a great extent by the mounting location chosen for the ELT Transmitter. The Antenna should be mounted as close to the ELT Transmitter as practical. The Coaxial Cable connecting the Antenna to the ELT should avoid crossing aircraft production breaks (i.e. riveted fuselage sections). The Antenna must be within 20 degrees of vertical when the aircraft is in a normal flight attitude. If the Antenna is mounted to a non-metallic airframe, a supplementary ground plane must be installed. The installed Antenna must be able to withstand a static load of 100 times its weight (12. 5 lbs) applied to the base of the Antenna along the longitudinal axis of the aircraft. The Antenna should be placed a minimum distance of 3 feet (1 meter) from any vertically polarized communication Antennas (i.e. Antennas radiating in the 118-137 MHz band).

2.2.2.2 ANTENNA INSTALLATION:

After determining the Antenna mounting location per paragraph 2.2.2.1, install the Antenna as shown in Figure 3.

1. Drill a 1/2 " diameter hole in the aircraft structure at the Antenna mounting location.
2. Install the Antenna and determine if the Antenna meets the static load requirements. If not, a Doubler should be fabricated.

A 12.5 pound force applied in the direction shown in Figure 3 below should not cause an appreciable distortion in the aircraft skin.

3. If the Antenna is being mounted on a non-conductive portion of the airframe, a supplementary ground plane must be installed. The supplemental ground plane must have a minimum diameter of 36" and be centered about the base of the Antenna. This maybe provided using a conductive metallic coating painted on the inside of the aircraft structure (SPRAYLAT Series 559 or equivalent) or may be fabricated out of aluminum foil and attached to the inside of the aircraft structure. A Doubler Plate should be used to provide increased surface contact area between the ground plane and the Antenna.

4. Assemble of the Antenna as shown in Figure 3. Make sure the rubber washer, which forms a moisture seal between the Antenna base and the aircraft structure, is in place before installing the Antenna. Also make sure the serrated locking washing is in place.

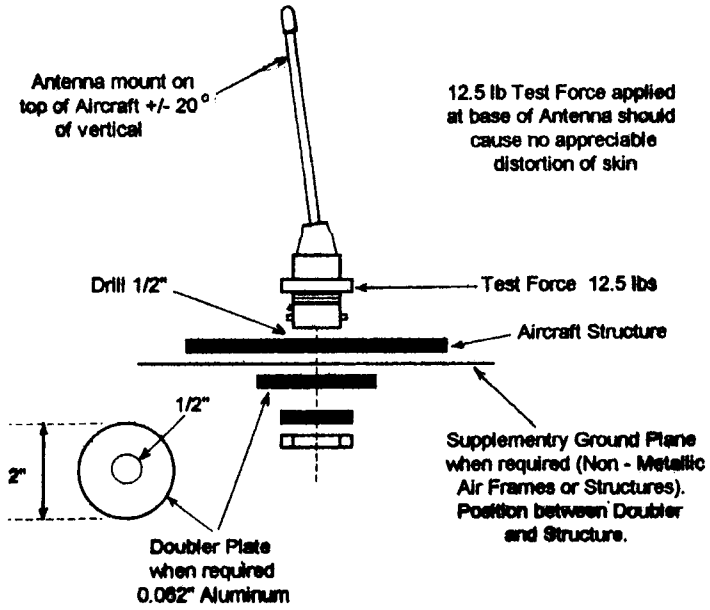


Figure 3. Antenna Installation

2.2.3 ELT REMOTE UNIT LOCATION AND INSTALLATION

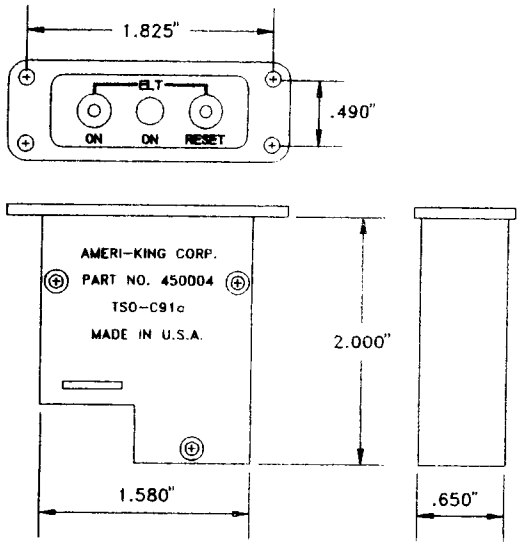
The ELT Remote Unit assembly must be mounted in the cockpit where the pilot can easily reach the switches and see the light.

Note: The Remote Unit is required by C91a. It is not optional.

It is strongly recommended that the Remote Unit be located in an area that is part of the pilots normal instrument scan.

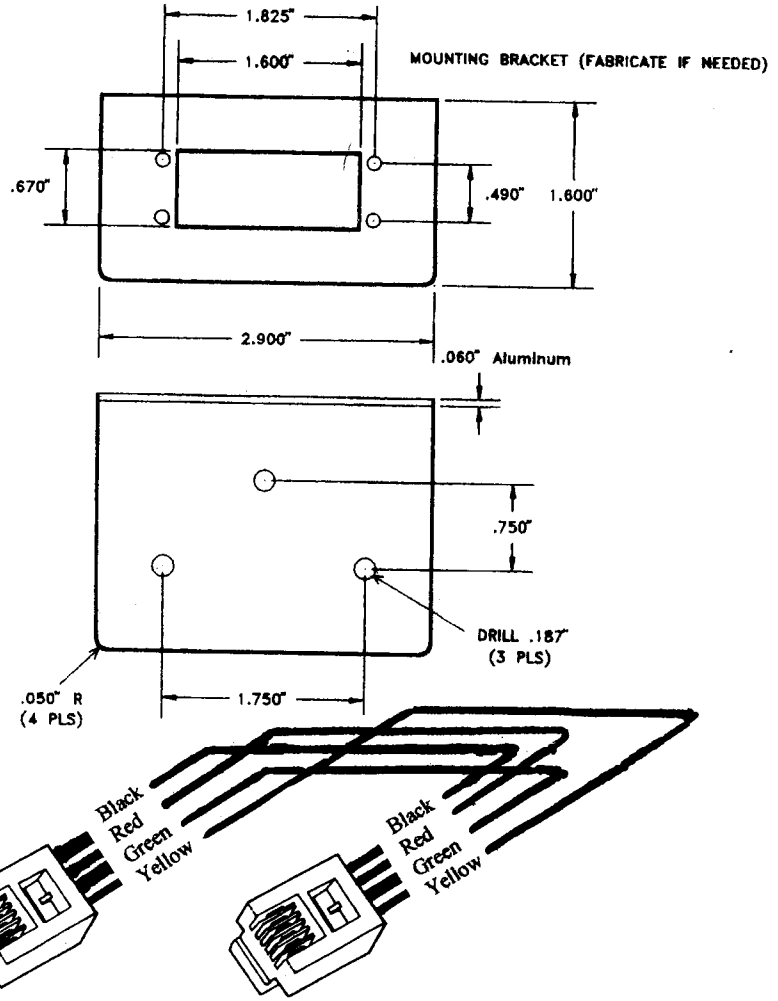
Mark a cutout for the cockpit panel switch with the dimensions shown in Figure 4. Install the Remote Unit assembly by fitting it into the cutout, using four 4-40 screws and Nylock nuts.

If the unit is to be mounted in a location that does not have a flush mounting surface (i.e. beneath the panel glare shield), an angle bracket should be fabricated. See Figure 4.



ELT REMOTE UNIT, PART NO. 450004

Figure 4. ELT Remote Unit Installation



Note: The interconnecting wiring is a straight 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 Modular Plugs RJ-11, **side by side**, (with both Clips of the Plugs must be on the same side), you must see wiring color codes, are Black/Red/Green/Yellow **alternately**, on both Plugs.
The wiring configuration is not a telephone application. (Telephone application is a cross wire configuration,i.e.Pin 1 to 4, Pin 2 to 3, Pin 4 to 1)
To convert from cross wire to straight wire configuration, just simply reverse either Plug upside down.

Figure. 4.0 Interconnecting Cable between ELT Remote Unit and MainUnit.

2.2.4 WIRING CABLE INSTALLATION

After installing the ELT Main Unit, Antenna and Remote Unit in the aircraft, install the Coaxial Cable between the ELT Main Unit and the Antenna. The Cable should not cross any production breaks and must have a reasonable amount of slack at the ELT Main Unit. This slack is necessary to allow for easy removal of the Coax Cable during maintenance and when needed as a Portable Device. If a longer Coaxial Cable than the one supplied with the unit (6 feet), it may be fabricated using RG-58 Cable and AMP 227079-5 Connectors or King KC-59-123 BNC Connectors or their equivalent. Insertion Loss of the Cable should not exceed 2 dbm. Secure the Coaxial Cable using Tie Wraps or other appropriate methods. Make sure the Cable is protected from abrasion. RG 400/U or equivalent is acceptable.

The Remote Unit is connected to the ELT Main Unit via means of RJ-11 Standard Type Modular Connectors. The RJ-11 Connecting Cable is included with each ELT. To install the Cable, connect each modular plug at end of the Interconnecting Cable to the ELT Main Unit Jack and the ELT Remote Unit Jack. Avoid running this cable near sources of strong EMI/RFI radiation. Secure the Cable along its run with Tie wraps or other suitable methods. The interconnecting cable may be shortened or a longer cable of up to 200 feet may be used if required. M22759/18 or /35 (24 AWG) or equivalent is acceptable.

2.3 ELECTRICAL INSTALLATION

Since both the ELT Main Unit and the Remote Unit have their own internal batteries, there is no electrical connection required between the entire ELT system and the Aircraft Electrical Power System.

2.4 POST INSTALLATION TEST

After completing the mechanical installation, the following Post Installation Function Tests must be performed. Regulations require that Transmitter Tests only be done

during the first 5 minutes of each hour and must not last for more than 3 audio sweeps (1.5 seconds). If you are at a location where there is an FAA Control Tower or other monitoring facility, notify the facility before beginning the tests.

1. Monitor 121.5 MHz using the Aircraft Communication Receiver or a Portable Hand Held Receiver. **Important: The Squelch must be turned all the way UP (Max) to hear he sweep tone on most receivers.**

2. Place the Main Switch on the front of the ELT Main Unit in the "ON" position and verify that the Audio Sweep Tone can be heard on the COM Radio. Verify that both the LED lights, located on the ELT Main Unit and the ELT Remote Unit, are illuminated.

   Place the Main Switch in the "OFF" position. Verify that the Audio Sweep Tone is ceased and the two LED lights are extinguished.

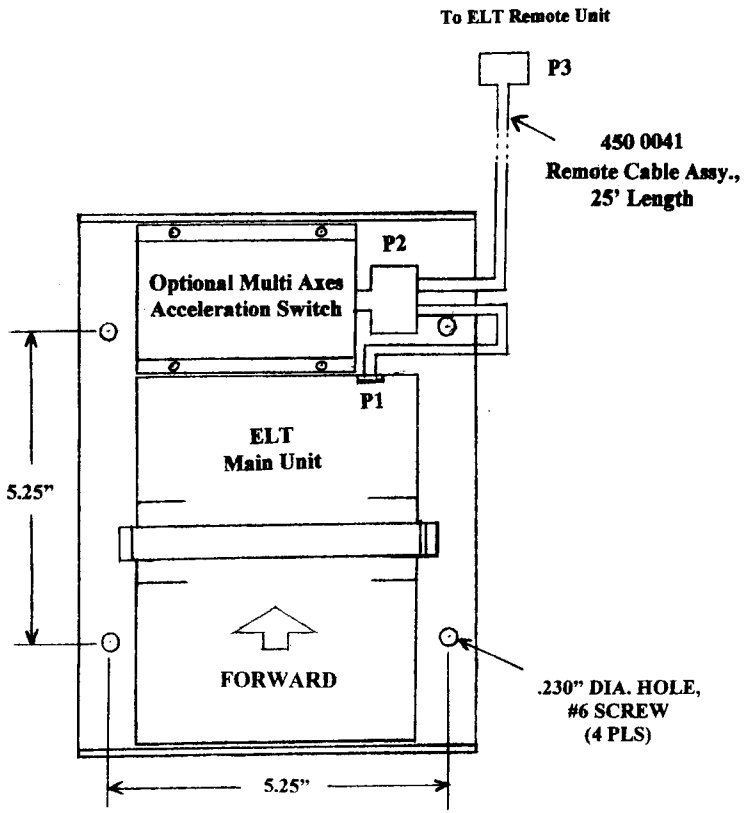
3. Place the Main Switch on the ELT Main Unit in the "ARM" position. While seated at the Pilots normal operating position, press the "ON" button on the Remote Unit. Verify that the LED light is illuminated and is readily visible from the Pilots operating position. Verify that the Audio Sweep Tone can be heard on the Com Receiver.

   Push the "RESET" button on the Remote Unit. Verify that the Audio Sweep Tone is ceased and the two LED lights are extinguished.

IMPORTANT NOTE: IN NORMAL OPERATION, THE MAIN SWITCH LOCATED ON THE ELT MAIN UNIT MUST BE SELECTED AT "ARM" POSITION AT ALL TIMES.

2.4.1 OPTIONAL MULTI AXES ACCELERATION SWITCH INSTALLATION:

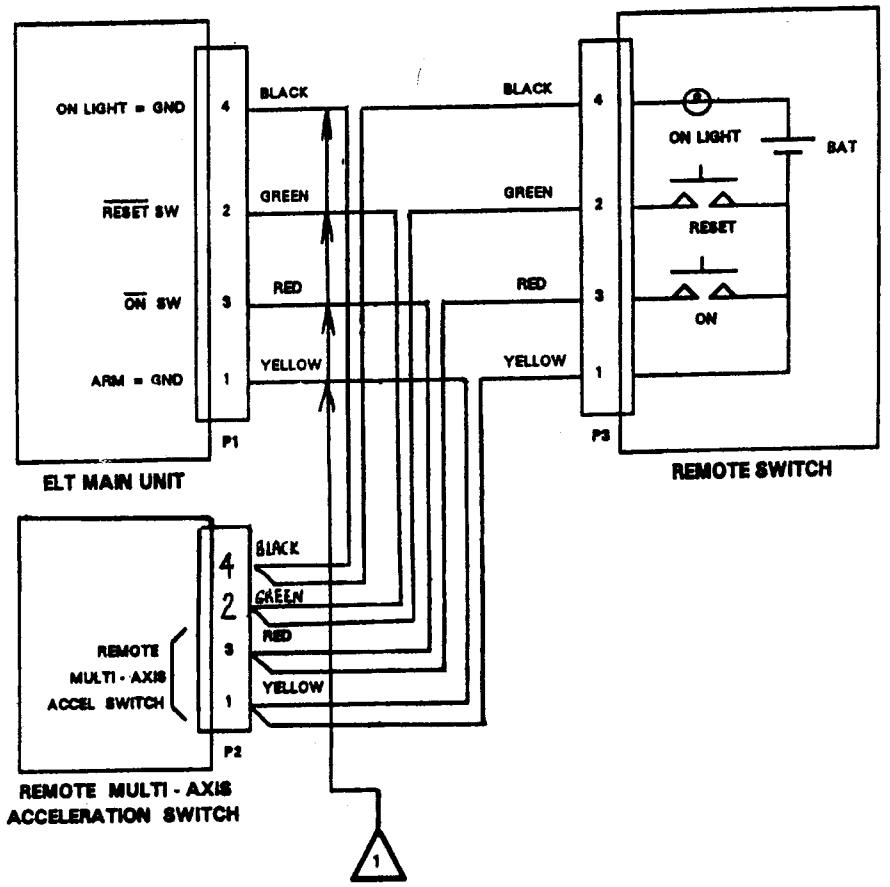
Refer to Figures 4.1 and 4.2 for Dimensional Drawing and Wiring Diagram, for Optional Multi Aces Acceleration Switch, respectively.



Notes:

1. The Mounting Tray for both ELT Main Unit and Optional Multi-axes Acceleration Switch must be installed on the Horizontal Plane. Therefore, mounting at 45 degree angle downward per Figure 1.1 is not applied.
   The Optional Multi-axes Acceleration Switch must be installed next to the ELT Main Unit for Crash Safety.
2. In addition to the main Acceleration Switch, which located inside the ELT Main Unit, the remote Optional Multi-axes Acceleration Switch Assy contains 6 separated individual acceleration switches that allows operation on different axes.
   Lacking of the remote optional multi-axes acceleration switch assy, has no effect to the ELT operation.
   This multi-axes sensing, using active axis parallel to the longitudinal axis of the aircraft, moving in the forward direction.

Figure 4.1 Dimensional Drawing for Mounting Tray for ELT Main Unit with Optional Multi Axes Acceleration Switch.



NOTES:

1. WIRING BETWEEN P1 & P2 MUST BE AS SHORT AS POSSIBLE (12" MAX) TO ENSURE NO DAMAGE UPON CRASH (FOR CRASH SAFETY).
2. ALL WIRES ARE 26 AWG OR 28 AWG WITH JACKET COVERED.
3. ALL WIRING INTERCONNECT ARE SUPPLIED BY AMERI-KING CORP.

Figure 4.2 Wiring Diagram for Optional Multi Axes Acceleration Switch.

2.5 BATTERY INSTALLATION AND REPLACEMENT

2.5.1 ELT MAIN UNIT BATTERY INSTALLATION AND REPLACEMENT

The Ameri-King Corp. Model AK-450 ELT is designed to use only Duracell MN1300 Alkaline Batteries that are dated by the Manufacturer.

The use of any other battery will void any warranties of the ELT by Ameri-King Corp. The ELT does not meet the requirements of TSO-C91a or FAR 91.52 if used with any other type of battery.

Battery replacement is required upon reaching the date marked upon each cell. All cells must be replaced at the same time and all cells must have the same expiration date.

Although not required, we strongly recommend that the batteries be replaced on a yearly basis. After one year of storage at normal temperatures, the cells still have over 95% of their original capacity left and may be used to power other non-critical electrical devices.

FAR 91.52 (d)(i) requires that batteries be replaced when the transmitter has been in use for more than one cumulative hour.

The expiration date of the batteries must be indicated on the outside of the ELT battery case and recorded in the aircraft logs. Adhesive labels are provided to record this information.

Batteries replacement may be performed by the owner or operator, provided that the accessibility, removal and reinstallation of the ELT can be considered "simple" as prescribed in Advisory Circular 91-44A, Paragraph 8.a (See Appendix B).

The following is a step-by-step instruction for replacing ELT Batteries:

1. Using the 3/32" Hex Driver supplied with the ELT, remove the 4 retaining screws and split lock washers that attach the battery case to the ELT Transmitter Assembly (See Figure 5). If the ELT contains batteries, loosen the screws evenly a few turns at a time until the batter contact spring pressure is relieved.

2. Remove batteries from the battery case. The six batteries that fit in the bottom of the battery case are designed to be a snug fit. Make sure the expired batteries are either discarded or removed from the work area before continuing onto step 3. Examine the battery contacts for any dirt or corrosion. If there is any, it should be removed using an Electrical Contact cleaner and a stiff brush. Do not use Abrasive cleaners or materials to clean the contacts. The contacts are nickel and gold plated spring steel. Abrasive material will remove this plating. If the contacts appear to be badly corroded, they must be replaced.

3. Record the battery replacement date of the new cells being installed using one of the adhesive labels provided with the ELT. The battery replacement date is found on each Duracell MN1300 cell (See Figure 5). It reads as follows: "Best if installed by (Date)." The date indicated is the date by which the batteries must be replaced. All cells must have the same date. Install the new batteries as indicated by the battery installation placards which are affixed to the inside of the battery case.

4. After installation, a voltage and polarity check must be performed to insure that the batteries have been installed correctly (See Figure 5).

5. After performing the above voltage check, install the battery case to the transmitter Assembly, making sure that all +/- Polarities Arrow markings located on the battery case, the battery separator and the transmitter assembly are in the same direction.

Ensure that the O-Ring seal is in place (See Figure 5).

6. Place the Transmitter Assembly face down on a bench. Press down on the battery case to compress the battery contact springs. Replace the four battery retaining screws and lock washers and evenly tighten until the battery case is pulled flat against the Transmitter Assembly. If the O Ring appears to be pinched between the Case and the Transmitter, back up the screws slightly and push the O Ring back into place with athin screwdriver or a piece of sheet metal.

7. Remove any existing battery replacement date labels from the battery case and install the new label you prepared in step 3 above in a readily visible location on the ELT.

8. After battery replacement, a transmitter function test must be performed as described in section 3.3 of this manual.

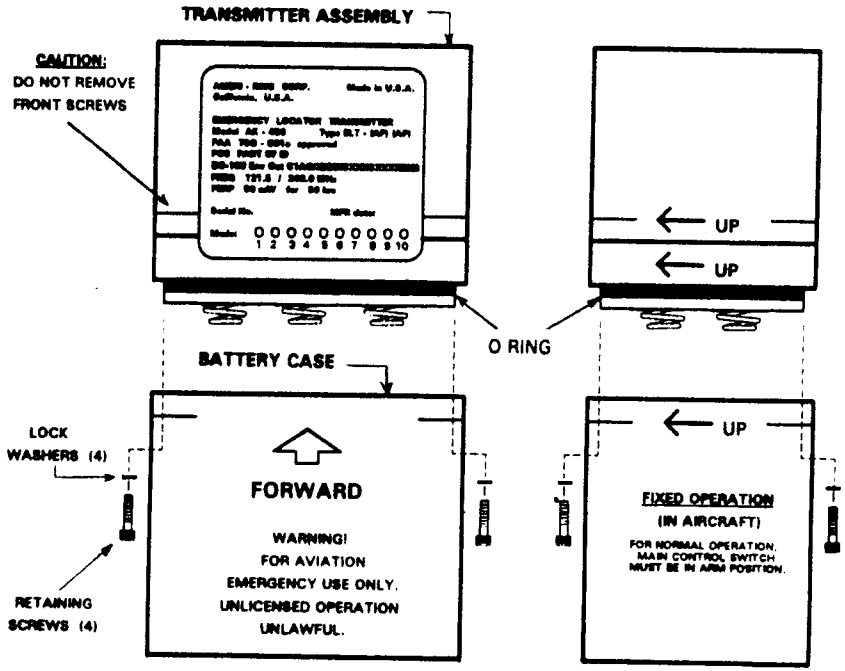
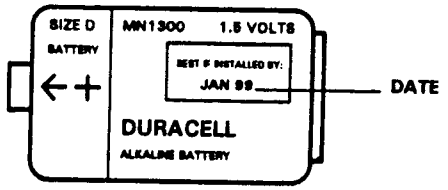


Figure 5. Battery Replacement for ELT Main Unit.



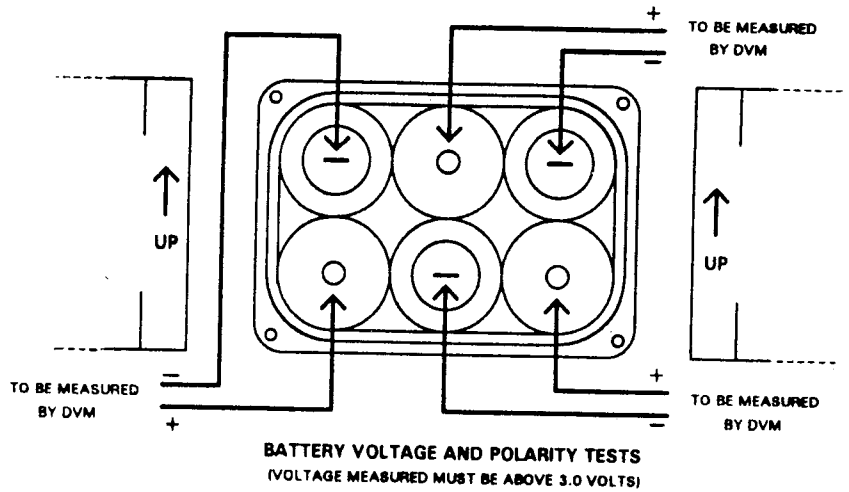


Figure 5. Battery Replacement for ELT Main Unit (Continued)

2.5.2 ELT REMOTE UNIT BATTERY INSTALLATION AND REPLACEMENT

The ELT Remote Unit is designed to be powered by a single Duracell DL1/3NB 3 Volt Lithium Battery. Under normal operating conditions, the **Lithium battery** must be replaced every **eight years**. Alkaline type cells are available from various manufacturers and may be used in place of the Lithium cell. Under normal operating conditions, the **Alkaline Battery** must be replaced every **four years**. If the ELT is activated for an unknown period of time, the battery, lithium or alkaline, must be replaced.

To install or replace the Remote Unit Battery, follow these steps:

1. Remove the three Retaining Screws which secure the top and bottom half of the remote unit (Figure 6).

2. Loosen the two Switch Retaining nuts located on the front of the unit (Figure 6).

3. Carefully remove the top half of the Remote unit, exposing the battery compartment (Figure 6). If replacing an old battery, carefully inspect the battery contacts for dirt or corrosion. If the contacts need cleaning, use only non-abrasive electrical contact cleaner and a stiff brush. Abrasive cleaners will remove the nickel and gold plating from the contacts. Badly corroded contacts should be replaced.

4. Insert the battery with the polarity as shown in Figure 6. The polarity is also engraved on the bottom of the battery compartment.

5. Replace the top half of the remote unit and replace the three retaining screws and tighten the two switch retaining nuts.

6. The next remote battery replacement date should be recorded on one of the adhesive labels supplied and affixed to the ELT in a readily visible location.

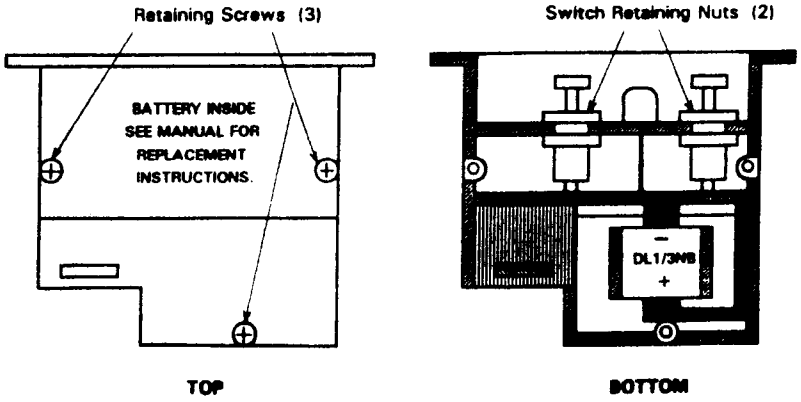


Figure 6. Battery Replacement for ELT Remote Unit

SECTION III
OPERATION

3.1 GENERAL

This section describes the operation of the ELT, Emergency Locator Transmitter, Model AK-450.

The following types are applicable for the Model AK-450:

a. Automatic Fixed – Fixed ELT (AF):
The Model AK-450 ELT is intended to be permanently attached to the aircraft before and after a crash and is designed to aid SAR teams in locating a crash site.

b. Automatic Portable – ELT (AP):
The Model AK-450 ELT is intended to be rigidly attached to the aircraft before the crash, but readily removable from the aircraft after a crash. It functions as an ELT (AF) during the crash sequence. The aircraft mounted antenna may be disconnected and an auxiliary antenna (stored on the ELT case) attached to the ELT. The ELT can be tethered to a survivor or a life raft. The ELT is intended to aid SAR teams in locating the crash site or survivors(s).

The AK-450 ELT is a "second generation ELT," transmitting on 121.5 and 243.0 MHz . The ELT is designed to meet or exceed the requirements of TSO-C91a and the mandatory automatic ELT requirements of FAR Part 91. The ELT meets the requirements of DOT Aviation Regulations, Section 3, Chapter 3, Part 2.

The ELT automatically activates during a crash and transmits the standard swept tone.

The LED ON lights, located on both the ELT Main Unit and the Cockpit Remote Unit, indicate when the ELT is active. The ON switch on the Remote Unit allows you to turn on the unit ON for testing. The RESET Switch on the Remote Unit enables to

reset the ELT. In normal operation,. the Main Switch on the Main Unit must be selected at "ARM" position. You cannot "disarm" or disable the unit from the cockpit; you can only deactivate the ELT after it has been activated.

The ELT unit is able to withstand extremely harsh environments. Units, exactly like yours, have been subjected to numerous 500g Shock pulses, 1000 pound crash weights and severe penetrator tests, and continue to operate normally. Continued operation in a temperature range of –20 Celsius through +55 degrees Celsius is assured.

3.2 OPERATION

The AK-450 ELT, Emergency Locator Transmitter, is a state of the art CMOS technology , long lasting, solid state based equipment. It is an extremely reliable, highest standard of quality, designed to meet TSO-C91a requirements for critical application.

The entire ELT system is self-powered by its own internal batteries. Interface with aircraft electrical power system is not required.

The AK-450 ELT is automatically activated upon sensing a change of velocity of 3.5 +/- 0.5 Feet/Second, along its longitudinal axis (Automatic Fixed - ELT (AF) Configuration). It is designed to be removed from the aircraft and used as a personal locating device when it is necessary to leave the scene of the accident (Automatic Portable ELT (AP) Configuration).

3.3 TRANSMITTER FUNTIONAL TEST

NOTE: **The ELT should be tested every 3 months.** The test consists of turning the unit "ON" and then "resetting" it to verify that the Transmitter, Latch Circuit, Batteries, and associated equipment are operating properly. Regulations require that Transmitter tests only be done during the first 5 minutes of each hour and must not last for more than 3 Audio Sweeps (1.5 seconds).

If you are at a location where there is an FAA Control Tower or other monitoring facility, notify the facility before beginning the tests. **Never activate the ELT while airborne for any reason.** See Figure 7 for the ELT Front Panels for both ELT Main Unit and Remote Unit.

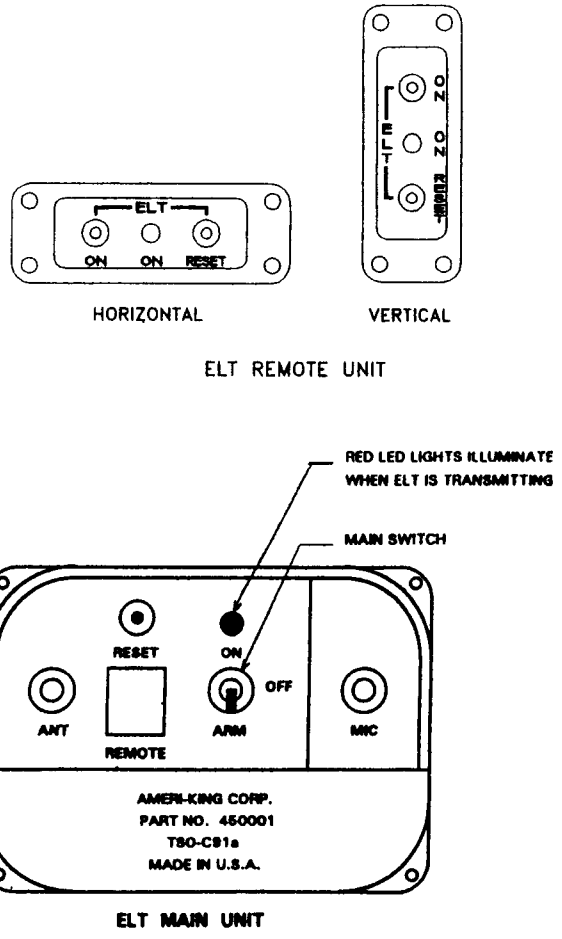


Figure 7. ELT Front Panels Main Unit and Remote Unit

1. Monitor 121.5 MHz using the Aircraft Com Receiver or Portable Hand Held Receiver. Turn the Squelch all the way UP.

2. Select the Main Switch on the ELT Main Unit to the ARM position, push the ON button on the Cockpit Remote Unit. Verify that both the LED ON lights, located on the Main Unit and the Cockpit Remote Unit, are illuminated. Verify that the Audio Sweep Tone can be heard on the Com Receiver. Push the RESET button on the Remote unit. Verify that the two LED ON lights are extinguished and the Audio Sweep Tone should stop.

NOTE: In normal configuration, the main switch on the ELT Main Unit must be selected to the "ARM" position. Whenever both the LED ON lights, located on the Main Unit and the Remote Unit, illuminate, they indicate the ELT is transmitting. Should the ELT be accidently activated by turbulence, hard landing, etc., or should this occur under any conditions other than an accident requiring immediate assistance, the ELT should be reset by pressing the RESET button on the Remote Unit.
If the aircraft is on the ground and the RESET button on the Remote Unit does not cause the LED ON light to extinguish, the RESET button on the Main Unit should be pressed.

If airborne and the RESET button on the Remote unit does not cause the LED to extinguish, the main switch on the ELT should be set to the OFF position and the RESET button on the Main unit should be pressed, if the ELT is accessible. If the ELT is not accessible in flight, you should land at the nearest suitable airport and set the Main Switch to the OFF position, and pressing the RESET button on the Main Unit. In either case, the unit should be inspected by qualified facility as soon as possible. The Aircraft may be operated with the ELT removed for inspection or repair subject to the conditions of FAR 91.52.

In the event of an accident, ensure that the External Aircraft Antenna has no damage. **Important: If the ELT is accessible after the accident, place the Main Switch in the ON position and monitor it on 121.5 MHz for proper operation if possible.** If the Antenna is broken off of the Aircraft, the ELT Unit should be removed and the portable antenna used in its fully extended position.

If the ELT Unit is to remain at the Aircraft site, it should be placed on a large metallic portion of the airframe with its Antenna pointing skyward. The LED ON lights should be On after the accident. The LED ON lights should be ON after the accident.

If the ELT is to be taken along as the Portable Unit when leaving the scene of the accident, place the Main switch in the ON position and keep the Antenna vertically oriented as much as possible. The ELT LED ON light should be illuminated. When used as a portable unit in cold weather, the ELT Unit should be kept as warm as possible by placing it inside your clothing with the antenna protruding.

Voice Transmission may be achieved by connecting a Microphone to the MIC input of the ELT Main Unit., The voice modulation is designed at low level so that it will not affect the Carrier Frequency Transmission. Use CARBON type MIC.

In order to conserve Battery power, the following guidelines must be adhered:

- **Do not use Voice Transmission until a search Aircraft is seen within the crash area.**
- **Do not use Voice Transmission during Transmitter Functional Test**

3.4 PERIODIC MAINTENANCE

REFERENCES: FAR Part 91.52, Part 91.169, Part 43 Appendix D (i).

PURPOSE: To insure continued reliability of your ELT, it must be inspected for damage and wear which could be caused by age, exposed elements, vibrations, etc. Even the best designed equipment, if not properly maintained and cared for, will eventually fail.

IMPORTANT NOTES: The following inspections **must be performed a minimum of one time each 12 months:**

1. Inspect the ELT Main Unit and Mounting Tray to insure all fasteners and mechanical assemblies are secure.

2. Inspect the Coaxial Cable connecting the ELT Main Unit to the Antenna for cuts or abrasions on its outer jacket. Disconnect the BNC connectors on each end. Examine both the BNC connectors and the mating plug on the Antenna and the ELT Main Unit for any signs of corrosion.

3. Inspect the Modular Cable, connecting the ELT Main Unit to the Remote Unit, for signs of wear or abrasion on its outer jacket. Remove the Modular Connecting Cable and inspect and jack and plug assembly for corrosion.

4. Check the expiration date of the ELT Main Unit and the Remote Unit Batteries. Replace if necessary.

5. Remove the Battery Case and inspect the Battery Compartment for signs of corrosion or battery leakage. If any battery leakage is present, all batteries must be replaced. Although not required, we strongly recommend that the batteries be replaced on a yearly basis. After one year of storage at normal temperatures, the cells still over 95% of their original capacity left and may be used to power other non-critical electrical devices.

6. After completing the above inspections, a functional test as described in Paragraph 3.3 must be performed to verify proper operation.

7. Ensure that the Main Switch on the ELT main unit must be selected at "ARM" position at all times. Activate the ELT using applied force. The direction for mounting and force activation is indicated on the ELT. A TSO-C91a ELT can be activated by using a rapid forward (throwing) motion coupled by a rapid reversing action.

Verify that the ELT has been activated by use of a Wattmeter, the Airplane's VHF Radio Communications Receiver when tuned to 121.5 MHz, or other means (see Note 1). The ELT must then be reset by pressing either the RESET push button located on the ELT main unit or the ELT Remote Unit.

Note 1: This is not a measured check. It only indicates that the G-Switch is working.

8. Activate the ELT, either by pressing the "ON" Button Switch, located on the ELT Remote Unit, with the Main Switch located on the ELT Main Unit, selected at "ARM" position, or by selecting the ELT main switch, located on the ELT main unit to the "ON" position. A low quality AM Broadcast Radio Receiver should be used to determine if energy is being transmitted from the Antenna. When the Antenna of this Radio (tuning dial on any setting) is held about 6 inches from the activated ELT Antenna, the ELT Aural tone will be heard (see notes 2 and 3). The ELT must be reset by pressing either the RESET push button located on the ELT Main unit or the ELT Remote Unit.

Note 2: This is not a measured check, but it does provide confidence that the Antenna is radiating with sufficient power to aid search and rescue. The Aircraft's VHF Receiver, tuned to 121.5 MHz, may also be used. This Receiver however is more sensitive and could pick up a weak signal even if the radiating ELT's Antenna is disconnected. Thus, it does not check the integrity of the ELT System or provide the same level of confidence as does an AM Radio.

Note 3: Because the ELT radiates on the emergency frequency, the Federal Communications Commission allows these tests to be conducted only within the first 5 minutes after any hour and limits the tests to 3 sweeps of the Transmitter Audio Modulation.

IMPORTANT NOTE: IN NORMAL CONFIGURATION, THE MAIN SWITCH, LOCATED ON THE ELT MAIN UNIT, MUST BE SELECTED AT "ARM" POSITION AT ALL TIMES.

3.5 PERIODIC MAINTENANCE FOR CANADIAN INSTALLATION:

REFERENCES: Department of Transport DOT, Engineering and Inspection Manual, Par II, Chapter III, Section 3.12.7.

PURPOSE: To insure continued reliability of your ELT, it must be inspected for damage and wear which could be caused by age, exposed elements, vibration, etc. Even the best designed equipment, if not properly maintained and cared for, will eventually fail.

IMPORTANT NOTES: The ELT must be "performance tested within the 12 month period preceding installation in an Aircraft and within 12 months intervals thereafter..."

The following Supplemental Installation and Periodic Maintenance requirements must be complied with when installing the Model AK-450 ELT in Canadian Aircraft:

INSTALLATION

1. Installation and maintenance of the ELT must comply with Transport Canada Engineering and Inspection Manual, Part II, Chapter III, Section 3.12.

2. A Placard shall be fabricated and installed near the Remote Unit which states:

   FOR AVIATION EMERGENCY USE ONLY
   UNAUTHORIZED OPERATON PROHIBITED

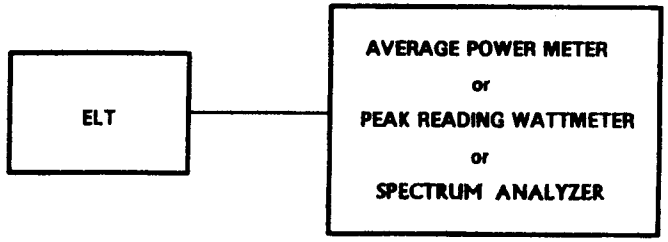
PERIODIC MAINTENANCE

In addition to the periodic maintenance requirements prescribed in Paragraph 3.4, the following tests must be performed to comply with Engineering and Inspection Manual, Part II, Chapter III, Section 3.12.7 (e).

NOTE: These tests should be performed only within an RF Screen Room or Facility providing shielding of RF Emissions.

2.5.1 POWER OUTPUT TEST

1. Connect the Equipment as shown below:



2. Connect the RF Output of the ELT to an Average Power Meter or a Peak Reading Wattmeter or a Spectrum Analyzer.

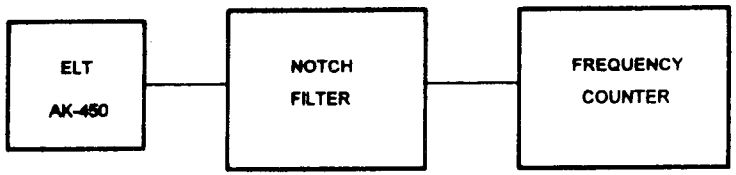
   NOTE: If measuring power with an Average Power meter, be sure to add +3 dBm to the average measurements to obtain Peak Power (50% Square Wave Modulation).

3. The minimum power allowed on 121.5 MHz is 20.5 dBm (or 112 mW) and on 243.0 Mhz is 19.5 dBm (or 89 mW).

3.5.2 FREQUENCY TEST:

The ELT Transmitter frequency may be measured as follows:

1. Connect the Frequency Counter as shown below:



2. Select the Notch filter as appropriate, i.e. 234 notch when measuring 121.5 MHz.

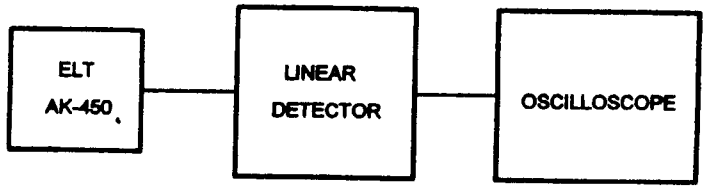
3. The ELT frequency should be within 50ppm (+/- 6.075 KHz) of 121,500,000 Hz.

4. Repeat with the 121.5 MHz Notch Filter. The ELT frequency should be within 50 ppm (+/- 12.150 KHz) of 243,000,000 Hz.

NOTE: The Amplitude Modulation may be suppressed by connecting a Microphone to the MIC input of the ELT Main Unit with its key pressed in.

2.5.2 MODULATION DUTY CYCLE:

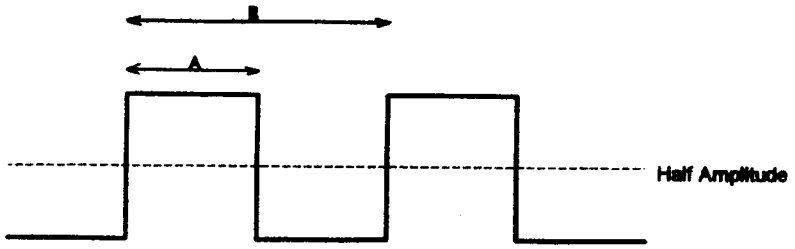
1. Connect the Equipment as shown below:



2. Acquire waveform.

3. Using the following formula, verify that the Modulation Duty Cycle is between 33% and 55%:

Duty Cycle = A/B x 100%



3.5.4. AUDIO MODULATION:

During the swept tone portions, the audio should "sound" like an ELT. Also the Morse code (if equipped) on the ELT should be checked for clarity and accuracy.

Perform the transmitter tests by activating the ELT and listening on 121.5 MHz. Be sure to follow the procedures as outlined under Paragraph 3.3 Transmitter Functional Test.

An Amplitude Modulation (AM) Broadcast Radio Receiver should then be used to determine if energy is being transmitted from the Antenna.

Hold the AM Broadcast receiver about 6 inches from the ELT either at the unit or from the front panel switch. An ELT aural tone should be heard on the AM Broadcast Radio Receiver. (This is not a measure check, thus it does not verify adequacy of the power output. The signal may be weak even if it is picked up by an Aircraft Receiver located at a considerable distance from the radiating ELT).

NOTE: All ELT "ON" tests should be performed within the first five minutes of the hour.

SECTION IV
WARRANTY

4.1 LIMITED WARRANTY

All equipments manufactured by Ameri-King Corp. are guaranteed against defective materials and workmanship for a period of two years.

Any equipment found to be defective due to material and workmanship during this limited warranty will be repaired and put in original manufactured operating condition.

An option of extended third and fourth year limited warranty become valid at the end of this second year, which will warrant to the original owner.

This Ameri-King Corp. warranty is void unless the Warranty Registration Card is filled out and returned to Ameri-King Corp. within 15 days after original installation.

Ameri-King Corp.'s liability under this warranty is limited to servicing, repairing, replacing or adjusting any equipment returned prepaid to the factory by express written or oral authorization for that purpose and to repair or replace defective parts thereof. This limited warranty does not include any damage caused by the leakage of batteries. Repaired equipment will be returned to the equipment user freight pre-paid. Shipping charge will be paid one way only by Ameri-King Corp.

Upon discovery of a condition believed to be caused by a defect in manufacturing, Ameri-King Corp. must be notified. No equipment to be shipped to Ameri-King Corp. without prior authorization. Any equipment returned to Ameri-King Corp. should be accompanied by a failure report, in writing, giving full particulars in support of the claim.

This limited warranty does not cover or apply to any of the followings, including: misuse of the equipment; installation or operation not in accordance with factory instructions; accidents or negligent damage; alterations of any manner; repair by other factory; changes in calibration occurring as a result of normal use of equipment; the cost of labor, material, or other expense incidental to the repair, installation, removal from the aircraft or replacement of the equipment; damaged during shipment or installation; any personal injuries or damage to property resulting from the installation or the operation of the equipment or the failure of the equipment or any part thereof, the equipment user assumes the risks of all such injuries or damage. In such cases, the repair will be billed at cost. An estimate will be submitted for approval before repair is initiated.

Any equipment which is returned for warranty and found not to be defective shall be charged a minimum handling and service charge and returned C.O.D.

No warranty will be activated for Ameri-King Corp. products unless the installation is approved by an FAA Certified Installer and the warranty card is completed by the supplying dealer or upon receipt by Ameri-King Corp. of form(s) 337 or 8130-().

THE IMPLIED WARRANTY AND ALL OTHER IMPLIED WARRANTIES ARE HEREBY EXCULED. AMERI-KING CORP. MAKES NO OTHER WARRANTY OR REPRESENTATION OF ANY KIND WHATSOEVER EXPRESSED OR IMPLIED, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED.

AMERI-KING CORP.'S MAXIMUM LIABILITY HEREUNDER IS LIMITED TO THE PURCHASED PRICE OF THE PRODUCT. IN NO EVENT SHALL AMERI-KING CORP. BE LIABLE FOR ANY CONSEQUENTIAL, INDIRECT, INCIDENTAL OR SPECIAL DAMAGES OF ANY NATURE ARISING FROM THE SALE OR USE OF THE PRODUCT, WHETHER BASED IN CONTRACT, TORT, STRICT LIABILITY OR OTHERWISE.

4.2 REPAIR/EXCHANGE SERVICE

All equipments manufactured by Ameri-King Corp. must be repaired/exchanged at the facility of Ameri-King Corp.

The entire repair/exchange service shall be performed and completed within 3 days upon repairing estimate is approved by equipment user or installation dealer.

IMPORTANT NOTE: In order to prevent accidental activation of the ELT during transit, the ELT batteries must be removed before shipping.

4.3 FACTORY COMPREHENSIVE TEST SERVICE

Factory Comprehensive Test Service including G-Switch activation levels testing, RF Peak Effective Radiated Power, Operating Carrier Frequency, Modulation Characteristics, Duty Cycles and Activation Monitor is available. There is a service charge for this service. All equipments returned for Factory Comprehensive Test Service must be sent freight prepaid.

APPENDIX A

FAA ACTION NOTICE A 8150.3
EMERGENCY LOCATOR TRANSMITTER RECOMMENDED SUPPLEMENTAL INSPECTION PROCEDURE
(FAR PART 91 OPERATIONS)

1. Remove all interconnections to the ELT Main Unit and ELT antenna. Visually inspect and confirm proper seating of all connector pins. Special attention should be given to coaxial center conductor pins, which are prone to retracting into the connector housing.

2. Remove ELT from the mount and inspect the mounting hardware. All required mounting hardware should be reinstalled and secured.

3. Gain access to the ELT battery and inspect. No corrosion should be detectable. Verify that the ELT battery is approved and check its expiration date.

4. Activate the ELT using applied force. The direction for mounting and force activation is indicated on the ELT. A TSO-C91a ELT can be activated by using a quick rap with the palm. A TSO-C91a ELT can be activated by using a rapid forward (throwing) motion coupled by a rapid reversing action. Manufacturer's instructions should be referred to prior to activation. Verify that the ELT has been activated by use of a Wattmeter, the airplane's VHF Radio Communications Receiver when tuned to 121.5MHz,or other means(see Note 1)

5. Reinstall the ELT into its mount and verify the proper direction for crash activation. Reconnect all cables. They should have some slack at each end be properly secured to the Airplane structure for support and protection.

6. Activate the ELT using the "ON" or "Test" Switch. A low quality AM Broadcast Radio Receiver should be sued to determine if energy is being transmitted from the Antenna. When the Antenna of this Radio (tuning dial on any setting) is held about 6 inches from the activated ELT Antenna, the ELT Aural tone will be heard (see notes 2 and 3).

7. Verify that all switches are properly labeled and positioned.

Note 1: This is not a measured check. It only indicates that the G-Switch is working.

Note 2: This is not a measured check, but it does provide confidence that the Antenna is radiating with sufficient power to aid search and rescue. The Aircraft's VHF Receiver, tuned to 121.5 MHz, may also be used. This Receiver, however, is more sensitive and could pick up a weak signal even if the radiating ELT's Antenna is disconnected. Thus, it does not check the integrity of the ELT System or provide the same level of confidence, as does an AM Radio.

Note 3: Because the ELT radiates on the emergency frequency, the Federal Communications Commission allows these tests to be conducted only within the first 5 minutes after any hour and limits the tests to 3 sweeps of the Transmitter Audio Modulation.

APPENDIX B

EXCERPT FROM FAA AC 91-44A PARAGRAPH 8.A WHICH DEFINES WHEN BATTERY REPLACEMENT MAY BE DONE UNDER FAR 43.3 (h) AS PREVENTIVE MAINENANCE

"... The replacement can be done by the Pilot if the Preventive Maintenance limitations of Part 43.3 (h) of the FAR are complied with. For example, a portable type ELT that is readily accessible and can be removed and reinstalled in the Aircraft by a simple operation should be considered Preventive Maintenance. Fixed type ELT installations are often permanently mounted in a remote area of the Aircraft near flight control cables, vital Aircraft components and critical attachments to the Aircraft structures. Installations of this nature require an external Antenna and often a remote ON / OFF transmitter control switch that is usually located near the pilot's flight position. This type installation is complex and battery replacement should be accomplished by a Certificated Mechanic or Certificated Repair Station ... "

APPENDIX C-1
APPROVAL LETTER FROM FAA USA

U.S. Department of Transportation
Federal Aviation Administration

TRANSPORT AIRPLANE DIRECTORATE
AIRCRAFT CERTIFICATION SERVICE
LOS ANGELES AIRCRAFT CERTIFICATION OFFICE
3960 PARAMOUNT BOULEVARD
LAKEWOOD, CA 90712-4137

MAR 31 1995

Ameri-King Corporation
18842 Brookhurst Street
Fountain Valley, California 92708

Gentlemen:

Ameri-King Corporation, Emergency Locator Transmitter;
Technical Standard Order C91a

Your application dated March 15, 1995, requesting the issuance of a Technical Standard Order (TSO) authorization in accordance with the procedural requirements of Federal Aviation Regulation (FAR) Part 21, Subpart O, has been reviewed. Based upon your data and statement of conformance certifying your article(s) has met the requirements of FAR Part 21, Subpart O, and the minimum performance standards of TSO C91a (Ref. FAR 21.305(b)), authorization is hereby granted for the following:

MODEL	DESCRIPTION
AK-450	ELT Emergency Locator Transmitter

The technical data submitted with your application has been reviewed and accepted as fulfilling the requirements for a TSO authorization and will be retained in our files. For your information, the conditions and tests required for TSO approval are minimum performance standards. The article(s) may be installed on or within a specific type or class of aircraft only if further evaluation by the user/installer documents an acceptable installation that is approved by the Administrator.

The quality control procedures contained in your quality control manual, currently on file at the Los Angeles Manufacturing Inspection District Office, and your statement that those procedures will be applied to the manufacture of the subject article at the above address, are considered adequate in accordance with FAR 21.143.

Effective this date, your authorization to use TSO procedures is extended to include the subject article(s). You may identify the article(s) with the applicable TSO markings as required by TSO C91a.

INSTALLATION AND OPERATION MANUAL
EMERGENCY LOCATOR TRANSMITTER, MODEL AK-450

APPENDIX C-1
APPROVAL LETTER FROM FAA USA

As recipient of this TSO authorization, except as provided in FAR 21.3(d), you are required to report any failure, malfunction, or defect in any product or part manufactured by you or your contracted suppliers, and which you have determined has resulted or could result in any of the occurrences listed in FAR 21.3(c). The report should be communicated initially by telephone to the Manager, Technical and Administrative Branch, ANM-103L, (310) 627-5300, within 24 hours after it has been determined the failure has occurred, and followed up with a written notice. FAA Form 8010-4 (Malfunction or Defect Report) or other appropriate format is acceptable in transmitting the required details. As required by FAR 21.613(b), you must also notify the FAA when you no longer manufacture a TSO approved article(s).

This authorization pertains only to manufacturing operations at the above address. This office must be notified in advance of any proposed facility relocation to preclude interruption while awaiting quality control approval of that facility.

Sincerely,

Natalie Phan-Tran, Acting Manager,
Technical & Administrative
Support Staff, ANM-103L

APPENDIX C-1
APPROVAL LETTER FROM FCC USA

FEDERAL COMMUNICATIONS COMMISSION

WASHINGTON, D.C. 20554

GRANT OF EQUIPMENT AUTHORIZATION

Type Acceptance

Ameri King Corporation
18842 Brookhurst Street
Fountain Valley, CA 92708

Date of Grant: July 24, 1995
File No: 31010/EQU 17.9
Application dated: April 1, 1995

Attention: Keith Van, QC Manager

NOT TRANSFERABLE

EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations listed below.

FCC IDENTIFIER: [redacted]

Name of Grantee: [redacted]

Equipment Class : Non-Broadcast Transmitter

Note(s)	Rule Part(s)	Frequency Range (MHz)	Output Watts	Frequency Tolerance	Emission
LT	87.141(i)	121.5	.05	.005	3K20A3X
LT	87.141(i)	243	.05	.005	3K20A3X

LT: Type accepted as an emergency locator transmitter (ELT) as defined by Section 87.5 and meets bandwidth and modulation requirements of Sections 87.135 and 87.141. Type acceptance is limited to use, when authorized under Part 87, as an ELT, as equipment in survival craft stations or otherwise used for survival purposes, or as an ELT test station. (See Sections 87.187(k), 87.475(d). No determination has been made by the FCC as to the capability of this equipment to meet other than FCC requirements.

In correspondence concerning this grant, please refer to the FCC IDENTIFIER, File No., and date of grant.

pp 8315335007

FCC 731A
October 1991

APPENDIX C-2
APPROVAL LETTER FROM FAA CANADA

Transport Canada / Transports Canada

Type Approval Certificate

AP-28

Pursuant to Section 214 of the Air Regulations and the conditions specified in Chapter 511 of the Airworthiness Manual, this Type Approval Certificate is issued to:

Ameri-King Corporation
18842 Brookhurst St.,
Fountain Valley, CA
92708

For the Following Aeronautical Product(s):

Emergency Locator Transmitter (ELT) Model AK-450 Series
Type (F) (AF) (AP) (P)

Details of type design, basis of approval, operating limitations and other associated airworthiness requirements, which shall be complied with, are specified in:

Department of Transport Type Approval Data Sheet
AP-28 Issue 1

or latest revision

[redacted]

Director, Airworthiness Branch
for the Minister of Transport

October 19, 1995
Date of Issue

Canada

APPENDIX C-2
APPROVAL LETTER FROM FCC CANADA

Industry Canada / Industrie Canada

1241 Clyde Avenue
Ottawa, Ontario
K2C 1Y3

FAX. NO. (613)952-1088
PHONE NO. (613)941-8155

September 20, 1995

OUR FILE: 6030-2474
SUBMISSION NO. 11178R

AMERI-KING CORPORATION
18842 BROOKHURST STREET
FOUNTAIN VALLEY, CA
92708, USA

Attention: Mr. Keith Van

Dear Mr. Van:

This is in reply to the application for certification for the equipment listed below. The submission was received on September 15, 1995.

We have reviewed the documents provided. The equipment has been certified as requested. Our field offices have been notified of the approval. A Certification certificate is attached for:

MODEL NO.	CERTIFICATE NO.	CERTIFICATION NO.
AK-450	5622	2474 873 105F/AF/AP/P

The assigned certification number and the name of your firm must be shown on each equipment model. This certification identification information may be shown on the equipment model identification plate or on a separate label that shall be indelible and tamper proof. The certification number shall be prefixed with the phrase "CANADA".

Radio equipment is certified as described on the attached certification certificate.

Yours truly,

Neil McGrath
Certification Officer
Telecom Certification Section

NM/sc
Att: certificate 5622

Canada

INSTALLATION AND OPERATION MANUAL
EMERGENCY LOCATOR TRANSMITTER, MODEL AK-450

APPENDIX C-2
APPROVAL LETTER FROM FCC CANADA

Industry Canada / Industrie Canada

No. ▶ 5622

RADIO EQUIPMENT CERTIFICATE OF TYPE APPROVAL

CERTIFICAT D'HOMOLOGATION DE MATÉRIEL RADIO

CERTIFICATION No. / No. DE CERTIFICATION	▶ 2474 873 105F/AF
ISSUED TO / DÉLIVRÉ A	▶ AMERI-KING CORPORATION
TYPE OF EQUIPMENT / GENRE DE MATÉRIEL	▶ ELT EMERGENCY LOCATOR TRANSMITTER
TRADE NAME AND MODEL / MARQUE ET MODELE	▶ AK-450
FREQUENCY RANGE / BANDE DE FRÉQUENCES	▶ 121.5 MHz and 243 MHz
EMISSION DESIGNATION / DESIGNATION D'ÉMISSION	▶ 3K20A3X
R.F. POWER RATING / PUISSANCE NOMINALE H.F.	▶ 50 mWatts
CERTIFIED TO / CERTIFIÉ SELON LE	▶ SPECIFICATION / CAHIER DES CHARGES RSS187 ISSUE / ÉDITION 3 Draft.

This ELT is certified as A, AF, AP and P categories.

Certification of equipment means only that the equipment has met the requirements of the above noted specification. License applications, where applicable to use certified equipment, are acted on accordingly by the issuing office and will depend on the existing radio environment, service and location of operation.

This certificate is issued on condition that the holder complies and will continue to comply with the requirements of the radio standards specifications and procedures issued by the department.

ISSUED UNDER THE AUTHORITY OF MINISTER OF COMMUNICATIONS
DÉLIVRÉ AVEC L'AUTORISATION DU MINISTRE DES COMMUNICATIONS

DATE September 20, 1995

La certification du matériel signifie seulement qu'il est conforme aux exigences du cat des charges mentionné ci-dessus. Les demandes de licence, le cas échéant en vue l'utilisation de matériel certifié seront traitées en conséquence par le bureau chargé d délivrer lesdites licences, en tenant compte du milieu radioélectrique ambiant, du service radio existant et de l'emplacement de la station.

Le présent certificat est délivré à condition que le détenteur se conforme et continue à se conformer aux cahiers des charges et procédures sur les normes radioélectrique publiées par le ministère,

For

DIRECTOR GENERAL ENGINEERING PROGRAMS BRANCH

DIRECTEUR GÉNÉRAL DIRECTION DES PROGRAMMES TECHNIQUES

Canada

APPENDIX C-3
APPROVAL LETTER FROM FAA SWITZERLAND

3003 Berne, February 2nd. 1996

Ameri-King Corporation
18842 Brookhurst Street
Fountain Valley, CA 92708
U.S.A.

Ref. 274.02 gas
Tel. (031) 325 97 37
Fax. (031) 325 80 51

Authorisation for Installation and Operation of
Ameri-King AK-450, ELT Transmitter

Bundesamt für Zivilluftfahrt (BAZL)
Office fédéral de l'aviation civile (OFAC)
Ufficio federale dell'aviazione civile (UFAC)
Uffizi federal da l'aviaziun civila (UFAC)
Federal Office for Civil Aviation (FOCA)

Dear Sirs,

As requested please find enclosed the type acceptance mentioned above.

As per "Verordnung über die Gebühren des Bundesamtes für Zivilluftfahrt" dated September 25, 1989, a fee is due and will be charged by a separate invoice.

Yours sincerely,

Federal Office for Civil Aviation
Type Certification Section

M.-A. Gasser b.o.

M.-A. Gasser for John R. Dütsch

Enclosure mentioned.

Copy to:

- Mr. P. Kupferschmied, Köschenrütistr. 28, 8052 Zürich (incl. invoice)
- GD PTT, RC 51, Speichergasse 6, 3011 Bern
- intern: FLI, FG

INSTALLATION AND OPERATION MANUAL
EMERGENCY LOCATOR TRANSMITTER, MODEL AK-450

APPENDIX C-3
APPROVAL LETTER FROM FAA SWITZERLAND

Bundesamt für Zivilluftfahrt (BAZL)
Office fédéral de l'aviation civile (OFAC)
Ufficio federale dell'aviazione civile (UFAC)
Federal Office for Civil Aviation (FOCA)

Ameri-King Corporation
18842 Brookhurst Street
USA - Fountain Valley, CA 92708

Authorisation for Installation and Operation of
Ameri-King AK-450, ELT Transmitter

Based on the documents listed in attachment 1, the Swiss Federal Office for Civil Aviation authorizes the installation and operation of the ACK-450 ELT in Swiss registered aircraft in the authorisation class 2 , (AP,AF)

Base of conformance: TSO C91A
RTCA DO-160C, DO-183

Limitations:
- The limitations stated by the environmental categories must be considered.

The system approval includes the following components:

Component	Description	Part.No.	DO-160C Env. Categories
AK-450	ELT	no P/N	see Env. Qual. Form
	Remote Unit	450004	
	Fixed Antenna	450017	
	Portable Antenna	450018	

Installations into Swiss registered aircraft must be made in accordance with an approved STC or be FOCA approved in a Major Alteration procedure complying with JAR/FAR installation requirements.

The Swiss type acceptance is based on chapter 3 of "Verordnung über die Zulassung und den Unterhalt von Luftfahrzeugen", dated July 8, 1985.

The documentation provided to the Federal Office for Civil Aviation in support of the acceptance process is listed in attachment 1 and will be kept in our files.

Performance and accuracy of production components must correspond to the type approved. The applicant (manufacturer) will inform the Federal Office for Civil Aviation about all further design changes or modifications (Service Bulletins)

The present authorization is limited to components imported and identified with applicable TSO markings as approved by the FAA.

Berne, 24 January 1996

Section for Type Certifications
b.o.
J. Dütsch
John Dütsch