

OWNER'S MANUAL

Installation and Pilot's Guide

03716-0602

**ELT 10
EMERGENCY
LOCATOR
TRANSMITTER****1. INTRODUCTION**

The NARCO ELT 10 is an automatically activated emergency locator transmitter. The ELT 10 may be manually activated via the unit ON-OFF-ARM switch and/or via the optional remote switch for testing or when an emergency is imminent. When activated, the ELT 10 will radiate an omnidirectional RF signal on the international distress frequencies of 121.5 MHz and 243.0 MHz. The radiated signal is modulated with a "distinctive" audio swept tone.

The NARCO ELT 10 is for "AVIATION EMERGENCY USE ONLY."

The NARCO ELT 10 Emergency Locator Transmitter is designed, manufactured, and tested under the strictest quality control procedures. The ELT 10 is approved under FAA Technical Standard Order, TSO-C91.

2. PILOTS GUIDE

The ELT should only be activated for test (See Section 11) or when an emergency landing is imminent. If the pilot has time prior to touch down, he should use his high power communications transmitter tuned to 121.5 MHz and make as many MAYDAY CALLS for assistance as possible using standard MAYDAY procedures.

MAYDAY Procedure

1. MAYDAY, MAYDAY, MAYDAY
2. Aircraft identification - 3 times
3. Type of Aircraft
4. Position or estimated position (state which)
5. Heading (True or Magnetic) (state which)
6. True or estimated airspeed (state which)
7. Altitude
8. Fuel remaining in hours and minutes
9. Nature of distress
10. Pilots intention (bail out, ditch, crash landing, etc.)
11. Assistance desired
12. Two 10 second dashes with mike button followed by aircraft identification and OVER.

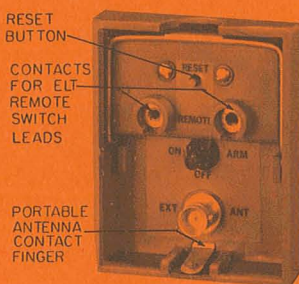
NOTE: The ELT will block communication on 121.5 MHz when it is activated so don't activate the ELT manually until all communication that is possible has been completed. After landing the ELT can be manually activated and SHOULD be activated if the landing was "soft", and an emergency exists.

KNOW YOUR ELT AND ITS OPERATION!

All ELT 10 transmitters contain an impact "G" switch that will automatically activate the transmitter when an emergency landing of sufficient "G" force is encountered.

The ELT is an orange plastic box that will be generally located within arms length and visible by the pilot OR mounted where it can't be seen, near the tail assembly. When mounted near the tail it most likely will be behind an inspection plate and within 60 inches of the fixed ELT antenna. (In some aircraft the ELT may be as far as 15 feet away.)

KNOW HOW AND WHEN TO MANUALLY ACTIVATE IT.



ELT 10 CONTROL HEAD

FIGURE 1

The ELT can be manually activated by setting the ON-OFF-ARM switch located on the Control Head to ON and/or setting the ELT Remote Switch that is located on the instrument panel to ON.

KNOW HOW TO REMOVE AND USE THE ELT 10 (you may need some tools)

When the ELT has no wires attached to it, simply hold the ELT with one hand, release the latch on the strap and slide the ELT off the bracket.

Extend portable antenna by pulling antenna tab out. Refer to Figure 2.

VIEW A: Shows the ELT 10 mounted.

VIEW B: Shows the POP-UP action of the blade antenna as the PULL TO EXTEND tab is drawn out.

VIEW C: Shows the ELT in its proper position, antenna fully extended.

Position the ON-OFF-ARM switch to ON.

If the ELT has wires attached to it, the ELT can still be removed from the aircraft. Remove the large wire with the connector on it by pushing it in, turn it counterclockwise \curvearrowright , then pull up. The connector will be free. This action will also pull out the plastic contact separator that is attached to the cable. The other two wires require a screwdriver to remove them. If a screwdriver is unavailable, cut or break the wires.

Extend the antenna as explained above.

Position the ON-OFF-ARM switch to ON.

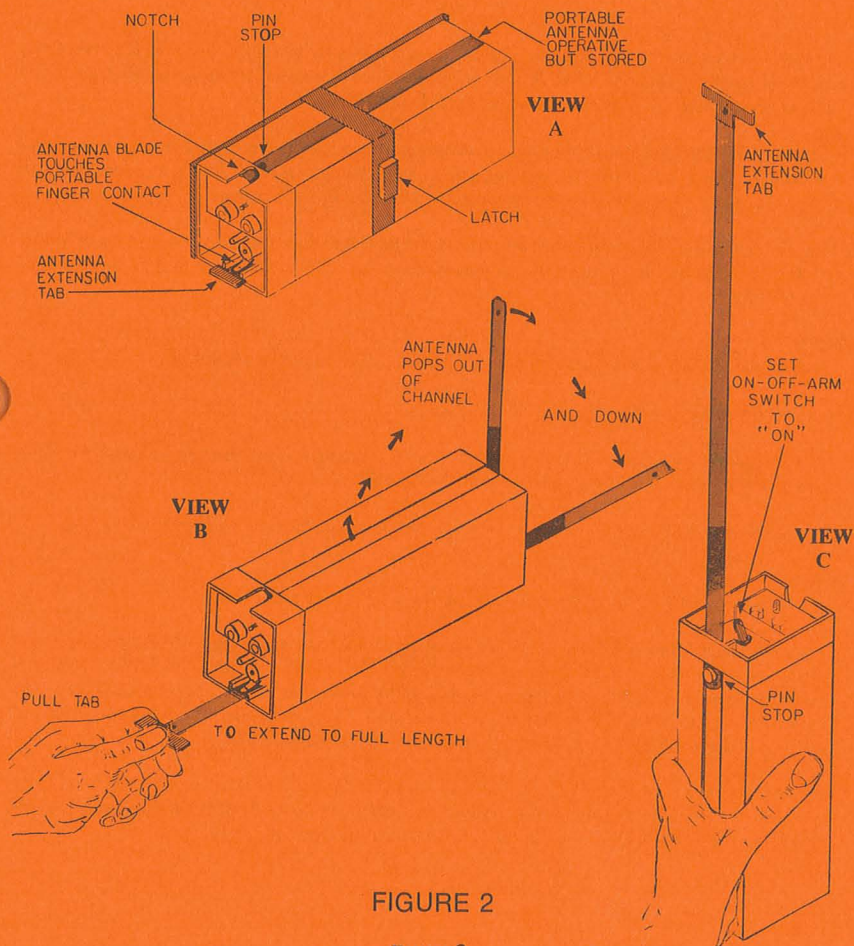


FIGURE 2

ADDITIONAL NOTES

As in all radio transmissions you don't hear your broadcast going out over the air, for the same reasons you will not hear your ELT transmitting when the "G" switch is activated or when you position the ON-OFF-ARM SWITCH to ON. (If your aircraft receiver is functioning, the receiver may be tuned to 121.5 MHz and you will then be able to hear your signal.)

When using the ELT in temperatures below freezing keep the transmitter inside your jacket with the antenna outside for longest operating life.

Under normal temperature (60 to 80°F) the ELT will continue to emit signals for over 7 days although not at full strength. After extended operation turning the ELT off, intermittently, will extend battery power.

The ELT should operate in temperatures of -40 to +160°F although at the extremes, some performance is lost.

If the aircraft is located in a valley, it is suggested to remove the ELT and position it (antenna pointing skyward) in a clearing, on top of a knoll, the top of a hill, or other high spot to provide greater transmission range.

The ELT 10 is water resistant and is not affected if submerged for up to 15 hours. The shock of an emergency landing - ground or water - will activate the unit. Should a water landing be made, attempt to retrieve the ELT 10 as soon as possible, especially if the plane is submerged.

Occasionally an ELT will be activated as a result of hard landings, bumping over a hanger threshold, equipment malfunctions, etc. All ELT's are subject to this inadvertent activation in varying degrees since they are designed to detect and activate upon shock forces.

Historical data collected by government agencies clearly indicated that the Narco ELT 10 has a remarkably low incident rate of inadvertent activations and probably the lowest of all ELT's as a percentage of equipped aircraft. Nevertheless, inadvertent activations can and will happen.

ADD the ELT to your preflight and postflight check list. This will be a great aid to the efficiency of Search and Rescue Operations by reducing the number of false alarms. This clearly is in the best interest of all of us who fly.

Preflight:

1. Inspect the antenna security and connections and security of unit installation.
2. Inspect for signs of corrosion in vicinity of ELT.
3. Test for normal operation by listening with an aircraft communications receiver. See page 14. Refer also to FAA Advisory Circular AC91-44 of 2/20/76 and FAR 91.52.
4. Check that ELT's manual switch and remote switch is in the "ARM" position before flight.

Postflight:

1. Check that your ELT (Control Head and/or Remote Switch) is set to ARM.
2. Tune 121.5 MHz, if the ELT tone is heard it may be you or someone else, check by waiting a moment or two to hear if it stops. If it doesn't stop and your ELT is within reach, press the RESET button. If the tone ceased simultaneously with the pushing of the button, the switch could be malfunctioning, have it checked by a NARCO Authorized Service Station. The impact "G" switch can only be turned off by pushing the RESET button or switching the Control Head switch to OFF.
3. Another way to verify if the ELT tone you hear is yours or not is to set your ELT switch to ON for a moment. If there is **no change in the tone** it is probably YOU! The RESET button must be pushed and/or the ON-OFF-ARM switch in the Control Head must be set to OFF.

3. DESIGN FEATURES

- Single unit transmitter and power supply
- "Reserve Power" battery pack
- MILITARY type damage proof portable antenna
- Optimum performance fixed type antenna
- Sealed "G" switch
- Remote switch activation capability

4. TYPE DESIGNATION

The NARCO ELT 10 is approved under TSO-C91 for the following type categories:

- Personnel Type (See Section 8) ELT (P)
- Automatic Portable Type ELT (AP)
- Automatic Fixed Type ELT (AF)

5. EQUIPMENT LIST

ORDER ITEMS AS APPLICABLE

Item No.	Description	Part No.
1	ELT 10 Emergency Locator	
	Transmitter Assy	03716-0300
	Complete With:	
	Battery Pack	57674-0001
	Mounting Bracket Assy	
	Mounting Bracket Label . .	04476-0001
	Mounting Bracket Strap . . .	57682-0101
	Mounting Bracket	57666-0001
2	ELT 10 Fixed Antenna	
	Assy (60" cable)	01652-0101
	ELT 10 Fixed Antenna	
	Assy (84" cable)	01652-0102
3	Optional Remote Switch Kit . .	03716-0500
	Complete with:	
	Switch, Locking	61588-0001
	Switch, Plate	04489-0001
	Label, Warning	04469-0001

6. SPECIFICATIONS

The ELT 10 meets all the requirements of:

- FAA TSO-C91
- FCC Part 87 (including 25 KHz occupied bandwidth)
- Canadian Approval - DOC RSS 147 issue 2

7. PERFORMANCE DATA

Operating Frequencies:

121.5 and 243.0 MHz \pm .005%

Operating Life:

52 hours, minimum

Modulation Characteristics:

Type of emission 100% Amplitude Modulated (A9)

Audio Frequency downward sweep not less than 700 Hz between the limits of 1600 and 300 Hz.

Sweep Repetition Rate between 2 and 4 Hz

Modulation Duty Cycle:

33% minimum to 55% maximum

Transmitter Duty Cycle: continuous

Peak Effective Radiated Power (PERP):

75 MW minimum on each frequency

Operating Temperature Range:

-20°C to +55°C meets all performance requirements

Environment which the ELT 10 is designed to withstand:

Temperature: -65°C to +71°C

Altitude: 50,000 ft.

Vibration: 10G, 5 Hz to 2,000 Hz

Shock: 50G, 11 milliseconds

Humidity: 95% for 48 hours.

Automatic Activation:

automatically activated when a force in excess of 5 (+2, -0) Gs for a duration of 11 (+5, -0) milliseconds or greater is applied in a direction longitudinal to the aircraft axis from the front.

Manual Activation:

may be activated by switch located on transmitter or by remote switch.

Portable Antenna -

Type vertical monopole - storable in ELT 10 case.

Radiation Pattern omnidirectional

Fixed Antenna - ELT (AP) (AF):

Type . . . vertical monopole attached to outside of aircraft - top loaded

Radiation Pattern omnidirectional

Impedance 50 ohms nominal at both frequencies

Cable Length Supplied* . . . 60 inches (152.4cm) RG-58 A/U coax, with BNC connector termination.

System Weight:

Transmitter (including battery pack, portable antenna, and mounting bracket) . . . 3.5 pounds (1.6 kg)

NARCO Fixed Antenna (including attached coax cable and connector) 0.2 pounds (91 grams)

Size: (excluding antenna)

8-13/16 x 2-9/16 x 3-1/8 (224 x 65 x 79mm) (See Figure 7)

8. INSTALLATION

To insure the installer that the ELT 10 is NOT transmitting during installation, due to accidental activation, it is recommended that a nearby VHF receiver be turned ON and tuned to 121.5 or 243. MHZ. This will allow the installer to hear the signal and switch the unit to OFF.

The ELT is approved for use in the Personnel configuration, however, should the Unit be activated within the aircraft; its antenna, extended or not, will not radiate a good strong signal. Therefore to insure desired safety and best signal radiation, it is recommended that the ELT 10 be installed only in the ELT (AP) or (AF) configuration . . . thus install with an external antenna!

1. The installation must be performed in accordance with FAA requirements AC 43.13-2 or other applicable airworthiness authority directives.
2. Mounting Location

ELT (AP) install in area where unit is readily accessible for portable deployment. Fixed antenna must be mounted outside the aircraft but within 60 inches* of the transmitter.

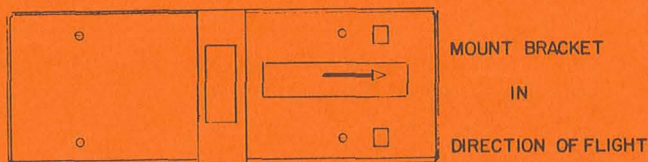
ELT (AF) . . . the location of the ELT is important for maximum protection in the event of a damaged aircraft due to an emergency landing. Far aft such as the central tailcone section is a recommended location. If possible, mount away from the aircraft skin to reduce the effects of damage due to external sources. DO NOT mount the unit in the bilge as plugged drain holes could cause total sustained submersion and possible unit failure. The fixed antenna should be located on the outside of the aircraft as close as possible to the ELT 10. Allow slack in the coax cable if possible.

* See Figure 3

3. The ELT 10 may be installed on a horizontal or vertical surface as long as the longitudinal (length-wise) axis of the unit is parallel ($\pm 10^\circ$) to the longitudinal axis of the aircraft.
 4. The mounting bracket must be installed with the ARROW pointing in the direction of flight.
- No. 6 steel pan head screws, or screws having at least the equivalent bearing area, should be used for mounting the bracket. The screws are installed from the top side of the bracket.

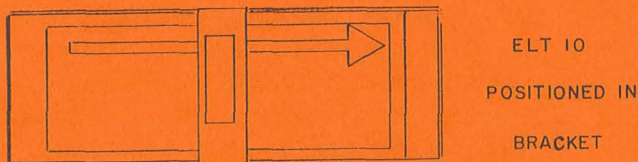
When mounted to sheet metal between .020" and .040" thick, 1/2" minimum diameter washers should be used at each mounting screw. When mounted to sheet metal less than .020" thick, the sheet metal should be reinforced with .030" thick pads of 1 square inch minimum (1-1/4" diameter washers) at each mounting screw.

If the pad is bonded to the aircraft sheet metal and acts as a doubler plate, any combination that brings the total cross section thickness to .040" or greater is acceptable.



5. Install the ELT 10 transmitter into the bracket.

The mounting bracket and the ELT 10 case are tapered thus the unit can fit the bracket but one way. Install case with the ARROWED label side showing. (Both bracket arrow and unit arrow should point forward.)



Secure the mounting strap.

6. Press the RESET impact switch button. The impact switch may have been activated during handling or shipping, however, a shipping guard locks the ON-OFF-ARM switch in the OFF position preventing undesired transmission.

If required, 5 ft. antenna cable may be lengthened by adding one BNC terminated extension whose length is one of the following:

- 2 ft.
- 4 ft.
- 6 ft.
- 8 ft.
- 10 ft.

Max overall cable length 15 ft.

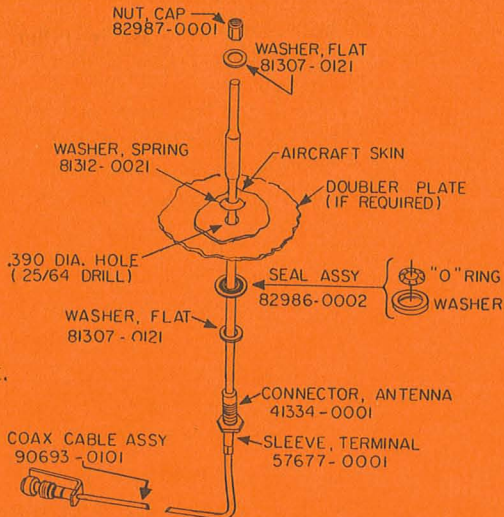
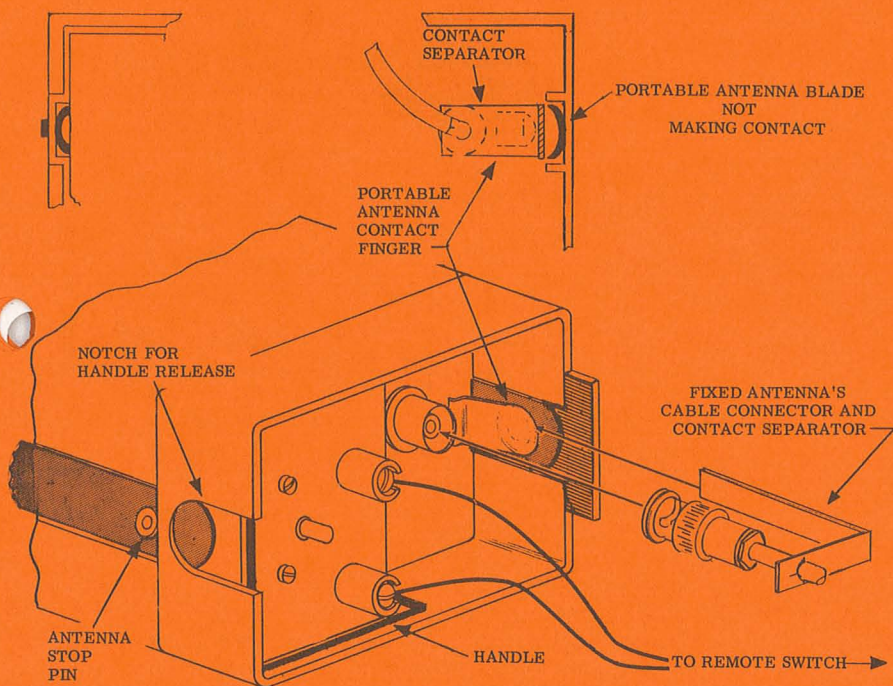


FIGURE 3



ELT (AP) and ELT (AF) WITH ANTENNA
INACTIVATED FOR USE WITH FIXED
ANTENNA

FIGURE 4

7. Remove the shipping guard and discard. Keep the toggle switch in the OFF (center) position.
8. Install the Narco ELT 10 fixed antenna as shown in Figure 3. Before installing the antenna make certain that the 60 inch coax cable will reach the ELT 10's external antenna connector.

Keep the ELT 10 fixed antenna installation as far from the communication antenna as possible.

9. Install the Narco ELT 10 fixed antenna as shown in Figure 4. Keep the ELT 10 and antenna as close together as possible. DO NOT cut the cable length. It is desirable to leave slack in the cable to prevent cable breakage due to aircraft stresses which may occur in an emergency landing.

Keep the ELT 10 fixed antenna installation as far from the communication antenna as possible.

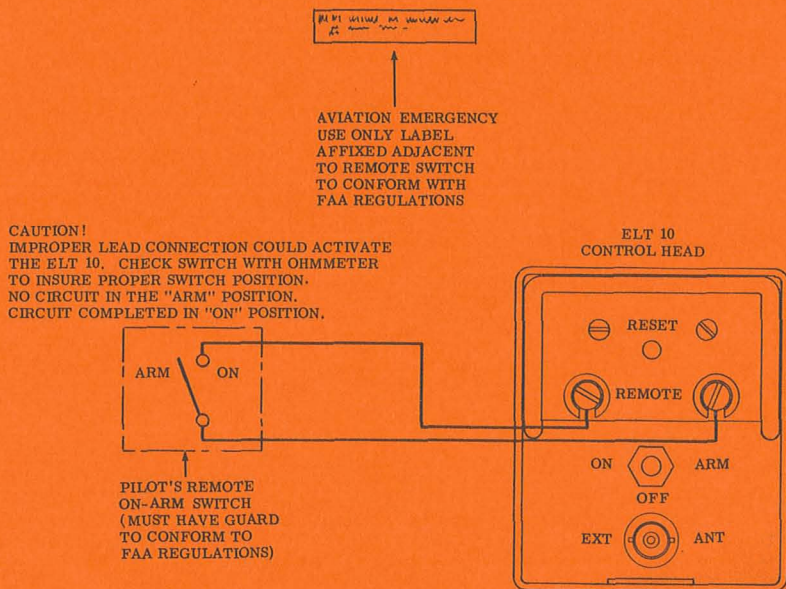


FIGURE 5

10. If a pilot's remote switch for the ELT (AP) or (AF) is desired, connect two #24 AWG wires from the two screws marked REMOTE on the ELT 10 to an ON-ARM guarded switch mounted on the instrument panel. See Figure 5. Set the Remote Switch to ARM.

To conform to FAA regulations the remote switch MUST have a guard, to prevent accidental activa-

tion, and a warning label affixed adjacent to the switch. NARCO's Remote Switch Kit contains such a switch and warning label. See Section 5, Equipment List for kit part number.

11. The final step of the installation of the ELT 10 is that of positioning the ELT switch to ARM. This completes the installation. *

* Should an installed checkout be desired, refer to Section 11.

9. MAINTENANCE

Every **three months or after 100 hours** of aircraft flight time, whichever comes first, the battery pack should be removed and inspected.

1. Check visually for leakage. Leakage will show up as a white residue which normally occurs first around battery leads.
2. Check visually for corrosion at battery terminals, P.C. board and components.
3. Check for secure battery leads.

General:

All shop maintenance tests should be performed in a screen room.

Should the ELT 10 transmitter be found defective by a NARCO Authorized Repair Station, a new replacement pretested printed circuit board can be obtained from NARCO (P/N 01651-0101).

The board may be removed by:

1. Set the ON-OFF-ARM switch to OFF.
2. Extend the portable antenna.
3. Unscrew the four screws that hold the control head to the battery casing.
4. Disconnect the battery by unsnapping the snap-off battery pigtail terminals from the bottom of the board.
5. Unsolder the three lead connections. (See Figure 6)
6. Remove the four screws that hold the board to the control head.

Reassemble in the reverse order of the above. Press the reset button and then set the ON-OFF-ARM switch to ARM. (Reinstall antenna as shown in Figure 4.)

(Note that the battery case mates the control head only one way, match the screw holes.)

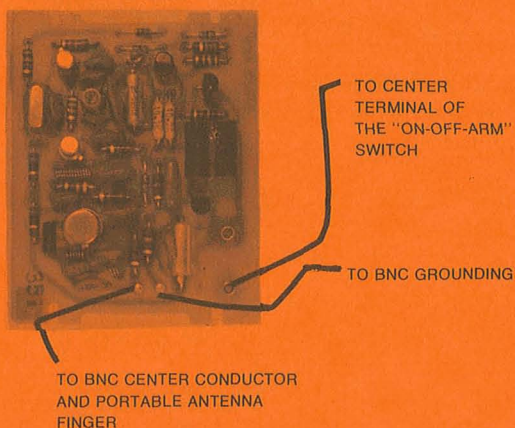


FIGURE 6

10. BATTERY PACK REPLACEMENT

Replace battery (Narco P/N 57674-0001) for any of the following reasons:

- A. Visual inspection shows signs of leakage, corrosion or non-secure leads.
- B. Past replacement date noted on battery pack.
- C. After any emergency use.
- D. After one cumulative hour of use.
- E. After operation of unknown duration.
- F. If the transmitter is stored in an area where the temperature is normally above 38°C (100°F), the battery should be replaced at no greater than 12 month intervals. Battery storage at temperature in excess of 55°C (130°F) must be avoided.

Replacement Procedure:

1. Set the ON-OFF-ARM switch to OFF.
2. Remove the ELT 10 from its mounting bracket.
3. Extend the portable antenna.
4. Unscrew the four screws that hold the control head to the battery casing. Control Head-Battery Case slide apart. Battery connection leads are approximately 3" long.)

10. Continued

5. Disconnect the battery by unsnapping the snap-off battery pigtail terminals from the bottom of the transmitter printed circuit board.
6. Discard the old battery pack. **DO NOT DISCARD BATTERY IN FIRE!**
7. Apply a bead of sealant (supplied with each battery pack) around joint of Control Head (Transmitter Module) with a small stiff bristle brush or stick.
8. Connect new battery pack terminals to the bottom of the transmitter printed circuit board.
9. Reinsert the control head section into the battery pack being careful not to pinch wires, and replace the four screws. If the four holes do not line up, rotate the battery pack 180° and reinsert.
10. Reinstall the portable antenna as shown in Figure 4.
11. If applicable:
 - a. check that the fixed antenna connector is secure.
 - b. check that contact separator is inserted between the antenna contact finger and the portable antenna. (See Figure 4)
 - c. check that the screws attaching the remote switch leads are secure.
12. Press the RESET button and set the ON-OFF-ARM switch to ARM.

11. ROUTINE OPERATION CHECKS

The ELT 10 is FOR AVIATION EMERGENCY USE ONLY. However should an operational check of the ELT be desired, follow the procedure outlined here.

- a. Conduct the test only within the time period made up of the first 5 minutes, AFTER any hour or advise the nearest FAA Air Traffic Control Facility (Tower, FSS, etc.) prior to the test.
- b. Monitor the transmission with the VHF or UHF receiver in your aircraft or that in a nearby aircraft. If neither is available request the FAA Facility to listen for your transmission.
- c. The monitoring VHF or UHF receiver should be turned ON and channeled to 121.5 or 243 MHz, its volume control should be positioned to the center of its range.
- d. A distinctive downward swept tone should be heard from the monitoring receiver when the switch of the ELT, or the ELT remote switch is set to ON.
- e. Set the switch to ON for approximately one second then return it to ARM.
- f. The ELT 10 should have been activated. If the tone was heard the ELT 10 is functioning properly. If the tone was not heard the problem could be one of the following.
 - Check that the external antenna connector and the contact separator are secure. [(ELT (AP) and (AF) units only)] . . . retest.
 - Check that the remote switch connections are secure and that the unit's ON-OFF-ARM switch is set to ARM . . . retest.
 - Check that the battery is still within its dated use period.
- g. If the unit still does not transmit, obtain services from a NARCO Authorized Repair Station for further test and/or repair.

12. LICENSE DATA *

The Federal Communications Commission requires that the operator of the transmitter in this equipment hold a Restricted Radio-Telephone Operator Permit, or higher class license. A permit may be obtained by any U.S. citizen from the nearest field office of the F.C.C.: no examination is required.

If the aircraft has a current Private Aircraft Radio Station License no further Station licensing is required for the installation of the Emergency Locator Transmitter.

If the aircraft does not have a Private Aircraft Radio Station License one must be obtained by filing F.C.C. Form 404.

The ELT 10 may be installed, used, and tested for up to 30 days without a station license after filing the F.C.C. Form and while awaiting receipt of the station license, providing a copy of the submitted F.C.C. Form 404 is kept in the aircraft.

*There are several proposed rule changes pertaining to ELTs under consideration by the F.C.C. that affect licensing.

It was proposed that Section 87.183 (1) be modified to permit the single frequency assignment of 121.5 MHz to aircraft stations when used only for an emergency locator transmitter. No application filing fee would be required if an authorization for an ELT only is requested. The present rule making requiring radio operation only by a person holding an operator's permit would be eliminated with respect to ELTs.

The licensee should inquire at the time of licensing to see if these rules are in effect.

13. LIMITATIONS AND RESTRICTIONS

- A. The ELT 10 Emergency Locator Transmitter is for "AVIATION EMERGENCY USE ONLY."
- B. Testing the ELT 10 must be performed according to the latest FAA and/or FCC directives.
- C. When the transmitter is activated, it may be necessary to confine voice communications to channels several megahertz removed from the emergency frequencies of 121.5 and 243. Interference with communications can occur due to the unique modulation characteristics required.
- D. The remote ON-ARM switch must be installed with a GUARD and left in the ARM position except for testing and emergency use.
- E. Only the following ELT whip antennas are TSO'd and approved by NARCO to be used with the ELT 10:

Narco Fixed Antenna — 60" — 01652-0101

Narco Fixed Antenna — 84" — 01652-0102

Dorne and Margolin — DMQ 18-1/A

Communications Components Corp.,

ELT-10-214-2 and ELT-10-209 (coax cable not to exceed 60"),

ELT-10-234 (Coax cable not to exceed 48").

The above CCC antennas, can only be used with Narco's ELT 10 Chassis Level BBB or later.

NOTE: A contact separator, such as that shown in Figure 4, page 9 should be used with ALL installations of whip (remote) antennas.

- F. The battery pack must be replaced according to the date marked on the ELT 10 label or after one (1) cumulative hour of use. This conforms with the half-life and use requirements of FAA TSO-C91.
- G. The battery pack must be replaced with NARCO battery pack part number 57674-0001.
- H. The antenna contact separator must be in place when the fixed antenna cable connector is connected to the ELT.

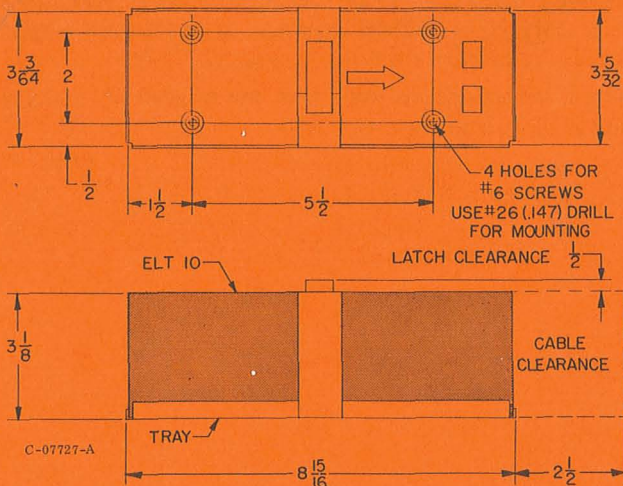


FIGURE 7