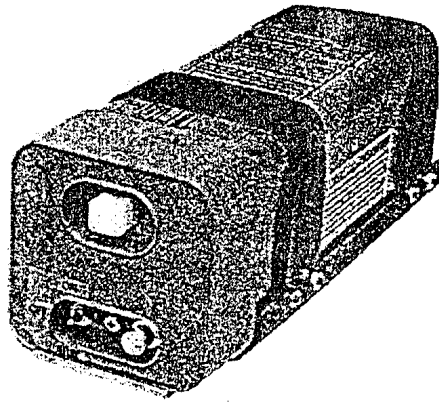




NARCO AVIONICS INC
270 COMMERCE DRIVE
FT. WASHINGTON, PA. 19034
U.S.A.



**ELT 910
EMERGENCY LOCATOR TRANSMITTER**

**OWNER'S MANUAL
&
PILOT'S GUIDE**

03754-0621

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1.1 INTRODUCTION

The Narco ELT910 system is an automatically-activated Emergency Locator Transmitter consisting of the ELT910 Assembly, an Antenna Assembly, a Remote Switch Assembly and an optional Audio Alarm.

The ELT910 may be manually activated via its header ON-OFF-ARM switch and/or via its remote switch when an emergency is imminent or for testing. When activated, the ELT910 will radiate an omnidirectional R.F. signal on the distress frequencies of 121.5 MHz and 243.0 MHz. The radiated signal is modulated with a distinctive audio sweep tone.

The Narco ELT910 is for **"AVIATION EMERGENCY USE ONLY"**.

The Narco ELT910 Emergency Locator Transmitter is designed, manufactured, and tested under the strictest quality control procedures.

1.1.1 APPROVALS

FAA TSO-C91a, type(AF)
FCC Part 87 (including 25 kHz occupied bandwidth)

1.1.2 DESIGN FEATURES

- single unit transmitter
- alkaline battery power supply
- optimum performance fixed type antenna
- sealed "G" switch
- remote switch activation
- remote audio alarm capability

1.1.3 EQUIPMENT LIST AND REPLACEMENT PARTS

Item No.	Description	Part #
1	ELT910 Emergency Locator Transmitter (TSO'd) includes Transmitter Unit with Battery Pack, Mounting Tray	03754-0300
2	ELT910 Replacement Batteries	56995-0101
3*	ELT910 Install. Kit	01475-0400
4*	Mounting Bracket Ass'y	01475-1370
5*	Remote Switch Ass'y	56988-0101
6**	Antenna W/60" Cable (TSO'd)	01652-0101
7**	Antenna W/84" Cable (TSO'd)	01652-0102

* - Included with unit

** - Optional but required

NARCO AVIONICS ELT910

1.2 SPECIFICATIONS

1.2.1 ELT910 PERFORMANCE DATA

Operating Frequencies:	121.5 & 243.0 MHz \pm .005%
Operating Life:	50 Hrs. minimum @50 mW min. PERP @ -20 °C
Modulation Characteristics:	80% amplitude modulated emission Audio Frequency downward sweep not less than 700 Hz between 1600 and 300 Hz Sweep repetition rate... between 2 and 4 Hz Coherency
Modulation Duty Cycle:	33% minimum to 55% max.
Transmitter Duty Cycle:	Continuous
Peak effective radiated power (PERP):	50 mW minimum on each frequency
Occupied bandwidth:	25 kHz maximum
Operating temperature range:	-20°C to +55°C

Environment which the ELT910 is designed to withstand:

Temperature	-50°C to +85°C
Altitude	50000 ft.
Vibration	10 G, 5 Hz to 2000 Hz
Shock	500 G @ 4+1 mS
Humidity	95% for 48 Hrs.
Crash Worthiness	100 G @ 23 +2 mS

Automatic Activation:

- a. Will not activate with less than 1.7 G with a change in velocity of 3.0 fps.
- b. Will automatically activate with a force greater than 2.3 G with a change in velocity of 4.0 fps.
- c. The input of a 30 G cross axis load (applied in any direction) does not effect the automatic activation.

Manual activation:

- a. Activated by switch located on ELT (ON OFF ARM) or by the cockpit mounted switch (TEST/RESET).

1.2.2 NARCO FIXED ANTENNA ELT

- Type Vertical Monopole attached to outside of aircraft-top-loaded
- Radiation Pattern Omnidirectional
- Impedance 50 Ohms nominal at both frequencies
- Operating Speed 250 knots (288 mph) IAS maximum
- Cable RG 58 C/U Coax with BNC Connector Termination

1.2.2.1 OPTIONAL ANTENNAS (FAA/DOT Approved)

DORNE & MARGOLIN

- DMQ-2 : Coax. cable length 50" (127 mm) only.
- DMQ 18-1A : Coax. cable length 120" (304.8 mm) maximum.
- DMQ 18-3 : Coax. cable length 50" (127 mm) maximum.
- DMQ 18-4 : Coax. cable length 50" or 120" only.

1.2.3 WEIGHTS AND MEASURES

- ELT910 Assembly (including mounting tray assembly) 5.4 lbs. (2.5 kg.)
- NARCO Fixed Antenna (connector, coax, cable, antenna) 0.2 lbs. (91 g)

Note: Allow a minimum of 2 inches clearance for connector and antenna's coax cable. For mounting and overall dimensions, see figure 1.

1.2.4 ENVIRONMENTAL QUALIFICATION FORM

An environmental qualification form (Number 1 03754-622a) is included with each ELT910 as shipped from the factory. This two page form identifies the TSO categories to which the ELT910 was designed and tested as outlined in RTCA documents DO-160B and DO-183. The installing agency must ensure that the owner of the ELT910 is given this form which he should place in his avionics equipment file.

NARCO AVIONICS ELT910

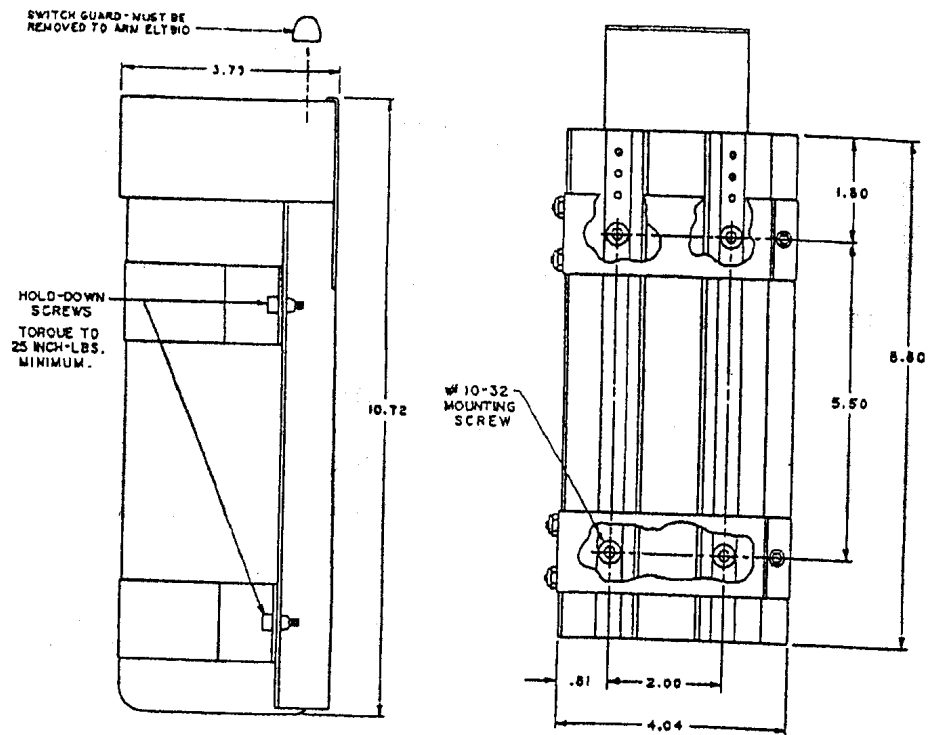


FIGURE 1. ELT910 ASS'Y INSTALLATION

1.3 LICENSE DATA - U.S.A.

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 ELT910 may be installed, used, and tested for up to 30 days without a station license after filing the F.C.C. Form 404 and while awaiting receipt of the station license, providing a copy of the submitted form is kept in the aircraft.

*There are several proposed rule changes pertaining to ELT's 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 requiring radio operation only by a person holding an operator's permit would be eliminated with respect to ELT's.

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

1.3.1 OTHER COUNTRIES

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

2.1 PILOT'S GUIDE

2.1.1 EMERGENCY PROCEDURE

The ELT should only be activated for test (see the Functional Testing Section 2.2) 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 his assistance as possible using standard MAYDAY procedures.

NARCO AVIONICS ELT910

MAYDAY Procedure

NOTE: The ELT910 may block communication on 121.5 MHz when it is activated; do not activate the ELT910 manually until all possible communications have been completed. After landing, the ELT910 can be manually activated and SHOULD be activated if the landing was "soft". The ELT910 transmitter contains an impact "G" switch that will automatically activate the transmitter when an emergency landing of sufficient "G" force is encountered.

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. Pilot's intention (ball out, ditch, crash landing, etc.)
11. Assistance desired
12. Two, 10 second dashes with mike button followed by aircraft identification and OVER.

2.1.2 GENERAL OPERATING INSTRUCTIONS

After ELT has been used in an emergency situation, the batteries must be replaced. **** Use only genuine NARCO Avionics Inc. replacement batteries.**** Failure to do so will result in a malfunction of your ELT910.

These instructions apply to aviation emergency use only. Unauthorized operation is prohibited.

	<u>TRANSMITTER "ON"</u>	<u>TO RESET INTO AUTOMATIC MODE</u>
Automatic Mode (Applicable to all installa- tions)	Transmitter circuit is automatically activated when aircraft is subjected to specified shock. Set ON-OFF-ARM Switch position to ARM position (remote switch warning light blinks and optional audio alarm sounds when transmitter is activated)***	Press remote switch to ON position, wait 2 seconds. Press to ARM position or gain access to ELT910. Set ON-OFF-ARM switch to OFF and then set back to ARM.
Manual mode (remote)	Set ELT's remote switch to ON position (warning light will blink and optional audio alarm sounds when transmitter is activated)***	Press remote switch to ARM position
Manual mode	Gain access to ELT, set ON-OFF-ARM switch to ON position (optional audio alarm will sound when transmitter is activated)***	Set ON-OFF-ARM switch to ARM position
Inadvertent Activation		Set remote switch to ON position, wait 2 seconds. Set ON-OFF-ARM switch to OFF position, then back to ARM position

*** In a crash situation, the warning light will flash and the optional audio alarm will sound only if the aircraft's power supply lines are still intact. If the power supply lines are severed, the alarm will not sound and the warning light will not blink. The ELT's power supply is independent of the aircraft power supply, and if the ON-OFF-ARM switch is in the ON position (or in the ARM position during and after a crash), the ELT is transmitting.

2.1.2.1 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.)

Under normal temperatures (60 to 80°F/15.6 to 26.7°C) the ELT will continue to emit signals for over 7 days although not at full strength.

NARCO AVIONICS ELT910

2.1.2.1 Continued

The ELT should operate in temperatures of -4 to +131°F (-20°C to +55°C) although at extremes, some performance is lost.

Occasionally an ELT may be activated as a result of hard landings, bumping over a hangar 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.

Your ELT is designed and built to survive a crash, sense that a crash has occurred and automatically transmit a distinctive signal at a radiated power level sufficient to be detected by high-flying aircraft and a COSPAS/SARSAT satellite. Your ELT will operate over a broad range of harsh environmental conditions.

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.

2.1.3 PREFLIGHT

1. Inspect that the antenna, the ELT910, and that all connections are secure.
2. Inspect that there are no signs of corrosion in vicinity of the ELT.
3. Check that ELT's manual switch and remote switch are in the "ARM" position before flight.
4. Test for normal operation by listening with an aircraft communications receiver. See Section 2.2. Refer also to FAA Advisory Circular AC91-44A of 12/12/80 and FAR 91.52.

2.1.4 POSTFLIGHT

Turn communications receiver on. Set it to 121.5 MHz. If an ELT tone is heard, check immediately that it is not you. Do not change receiver settings. (If no tone was heard, it can be presumed that your ELT was not inadvertently activated.)

1. Set your remote switch to the ON position. If there is no change in the tone it is probably you. Set the remote switch back to the ARM position, this will automatically reset the ELT. Blinking warning light on remote switch panel and optional audio alarm indicate activated ELT.
2. Alternate method: set ON-OFF-ARM switch on ELT to the ON position, if there is no change in the tone it is probably you.
3. If you are unable to reset your ELT, turn the ON-OFF-ARM switch on the ELT to the OFF position. Unplug the battery pack (see section 4.2) and return the ELT to your authorized Narco dealer.

2.2 FUNCTIONAL TESTING

The ELT910 is FOR AVIATION EMERGENCY USE ONLY. However, should an operational check for 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/TC Air Traffic Control Facility (Tower, FSS, etc.) prior to the test.
- b. Monitor the transmission with a VHF receiver in your aircraft or that in a nearby aircraft. If neither is available, request the FAA/DOT Facility to listen for your transmission.
- c. The monitoring VHF receiver should be turned ON and channeled to 121.5 Mhz, its volume control should be positioned to the center of its range. On some receivers the automatic squelch must be overridden.
- d. A distinctive downward swept tone should be heard from the monitoring receiver when the switch on the ELT, or the ELT remote switch is set to ON.
- e. Set the switch to ON for 2 seconds, then return it to ARM position. During the 2 second activation period observe the following:
 1. The remote switch warning light should flash on and off two times. The optional audio alarm will sound in conjunction with the warning light.
 2. The distinctive downward sweep tone should be heard through the VHF receiver on 121.5 Mhz.
- f. The ELT910 should have been activated. If the tone was heard and the annunciators functioned as described, the ELT910 is operating properly.
 1. IF NO TONE WAS HEARD :
 - Check that the external antenna connector is secure...re-test.
 2. IF NO TONE OR ANNUNCIATORS :
 - Check that the remote switch connections are secure and that the ELT910's ON-OFF-ARM switch is set to ARM...re-test.
 - Check that the battery is still within its dated use period.
- g. If the ELT910 still does not operate properly, obtain services from a NARCO Authorized Repair Station for further test and for repair.

3.1 INSTALLATION INSTRUCTIONS

3.1.1 GENERAL AIRCRAFT INSTALLATIONS

The installation must be performed in accordance with FAA requirements AC 43.13.2 and other applicable airworthiness directives. For Canadian installations reference E & I Manual Part II, Chapter III, Section 3.12 .

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3.1.2 LOCATION, MOUNTING, AND EXTERNAL SURFACE MARKING

The location of the ELT910 is important for maximum protection in the event of a damaged aircraft due to an emergency landing. If possible, mount away from the aircraft skin to reduce the effects of damage due to external sources. DO NOT mount the ELT910 in the bilge as plugged drain holes could cause total sustained submersion and possible ELT failure. The fixed antenna should be located on the outside of the aircraft as close as possible to the ELT910 to provide a one foot loop in the coax cable.

Ideally, the ELT910 should be located as far aft as possible, such as in the central tailcone section, and near an inspection access panel for convenience, allowing for testing and servicing.

Ensure that the location chosen provides rigidity and is not subject to excessive vibration in flight which might activate the ELT910.

The ELT910 requires the use of an approved external antenna in all installations.

3.1.3 MOUNTING LOCATIONS

The Mounting Bracket Assembly may be installed on a horizontal or vertical surface as long as the longitudinal (lengthwise) axis of the ELT is parallel ($\pm 10^\circ$) to the longitudinal axis of the aircraft (for helicopters, see Section 3.1.4).

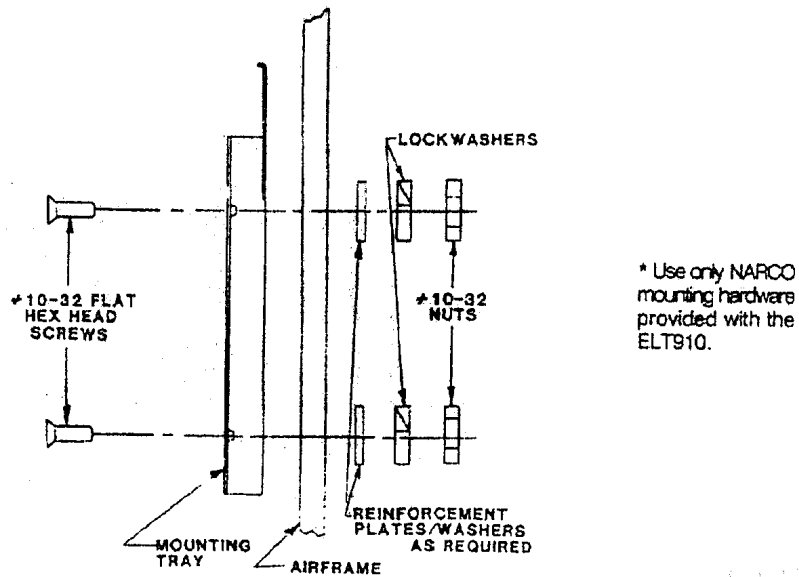


FIGURE 2 MOUNTING TRAY INSTALLATION

The ELT shall be mounted to primary aircraft load-carrying structures such as trusses, bulkheads, longerons, spars, or floor beams (not aircraft skin). The mounts shall have a maximum static local deflection no greater than 2.5 mm (0.1 inch) when a force of 450 Newtons (100 lbf.) 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 meter (1 foot) nor more than 1.0 meter (3 feet) from the mounting location.

When mounting to sheet metal under .040 inch thick, the sheet metal must be reinforced with .030 inch thick reinforcement plates, one square inch minimum (or 1-1/4 inch O.D. washers) at each mounting screw (4).

When mounting to sheet metal between .040 and .060 inches thick, 1/2 inch diameter washers (minimum) must be used at each mounting screw.

3.1.4 INSTALLING THE ELT910

Place the ELT910 into the mounting tray assembly. The ELT's arrow and the arrow on the mounting tray should point in the direction of flight. Secure the ELT with the mounting straps.

3.1.5 ANTENNA INSTALLATION

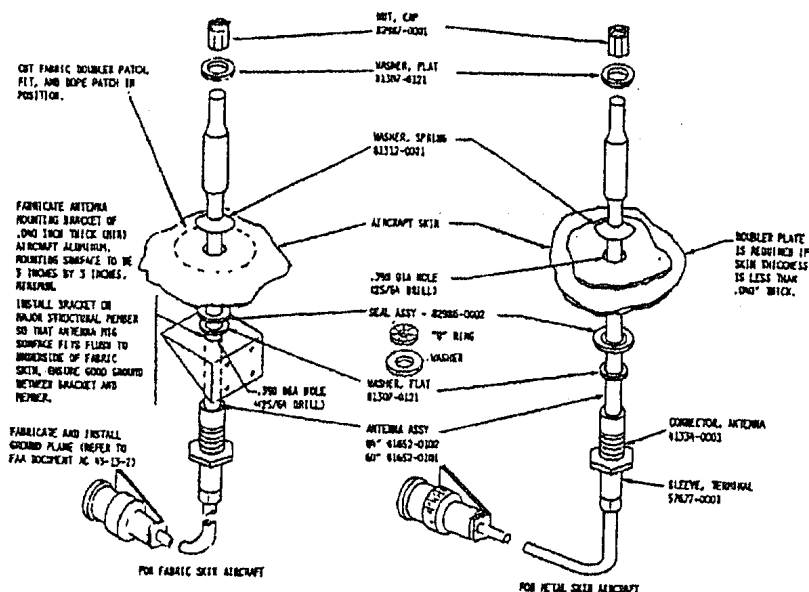


FIGURE 3. FIXED ANTENNA INSTALLATION

NARCO AVIONICS ELT910

NOTE: When selecting the antenna location, observe the following:

- Mount the antenna as far aft as possible.
- Mount the antenna as far from the communication antenna as possible: 2 feet (0.6 m) minimum.
- Distance between the ELT910 and the antenna should normally not exceed 2 feet (0.6 m).
- Include a minimum 1 foot (0.3 m) loop in the cable.

3.1.6 ARMING THE ELT

- Remove switch guard (this is for shipping purposes only.)
- Attach the coax cable to the BNC antenna connector.
- Set the ON-OFF-ARM switch to the "ARM" position, cockpit switch must also be in the "ARM" position.
- Make a function check (refer to Section 2.2).

3.1.7 HELICOPTER INSTALLATION

To install ELT910 assembly in helicopter perform the same procedure given in the sections of 3.1 for fixed wing aircraft. However, the ELT910 must be oriented as shown in Figure 4.

The ELT assembly must be located on or close to the primary structure supporting the rotor shaft and transformation. In selecting location of ELT910, consideration should be given for future access for testing and servicing.

The mounting bracket and ELT910 must be mounted so that flight arrows (marked on the ELT's case and bracket) are inclined approximately 45° downward in the forward direction in the fore and aft plane.

3.2 EXTERNAL MARKING

The external surface of the aircraft (or helicopter) should be marked to indicate ELT location.

Such marking is recommended for installations in the USA and is REQUIRED in Canada.

3.3 REMOTE SWITCH

The ELT910 assembly is usually mounted out of the pilot's reach. An aircraft panel mounted remote switch is now required. The remote switch kit is included with the ELT910 assembly.

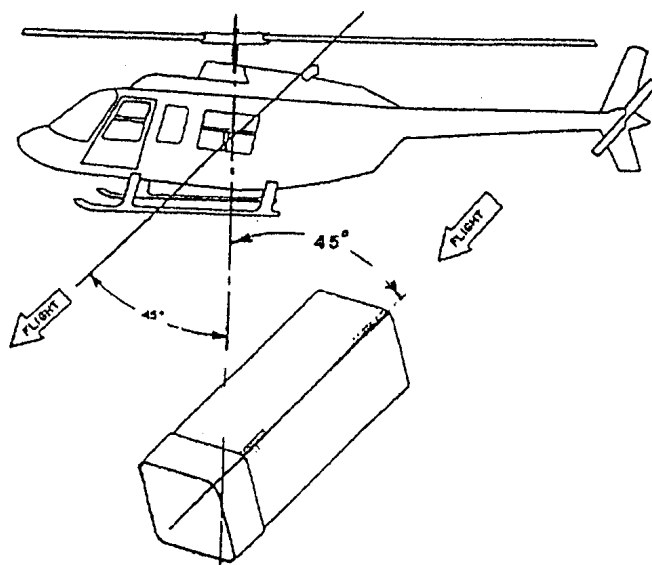


FIGURE 4 ELT910 INSTALLATION IN HELICOPTER

Pilot's remote switch installation:

- 1) Mount the ELT910 in the mounting tray assembly (refer to section 3.1.4).
- 2) Using Molex connectors and crimp pins provided, make a wiring harness of required length. Refer to schematic (figure 6). Male pins go to the ELT side and female pins go to the switch side. Use MOLEX Crimp Tool HT-1921, Narco P/N 41314-1 or equivalent.
- 3) Use aircraft quality wires, FAA/TC approved, #18 - #22 AWG wire only. Connect the ELT910 and the cockpit switch with the wiring harness. Provide a strain relief for the wires by clamping the harness to the airframe within 3 to 6 inches of the connections.
- 4) Make cutout in instrument panel and install switch ass'y (see figure 7). For best results, the cutout dimensions should not vary from those shown in figure 7. Use #4 sheet metal screws (3/4 inch long max.) to attach the switch assembly to the instrument panel.

NARCO AVONICS ELT910

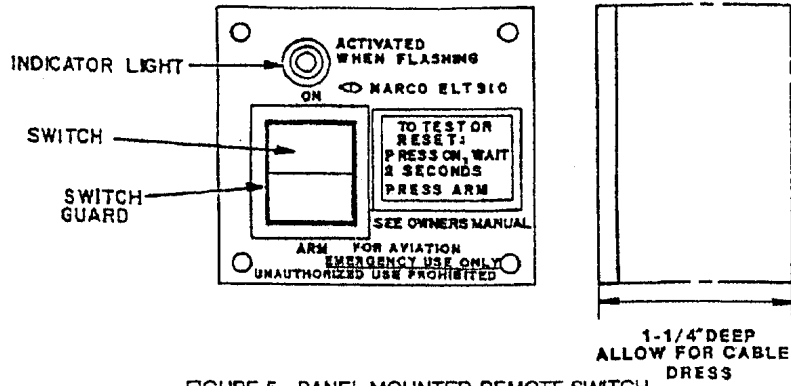
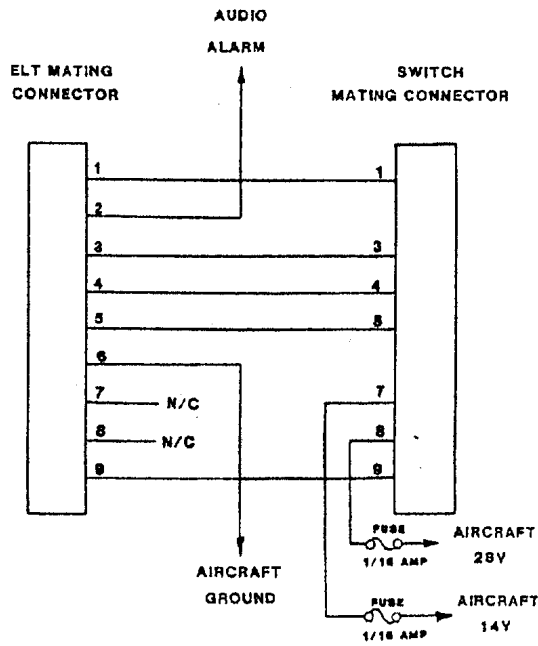


FIGURE 5 PANEL MOUNTED REMOTE SWITCH



WIRING HARNESS
FIGURE 6 REMOTE SWITCH SCHEMATIC

**** Be sure that the ON-OFF-ARM switch and the remote pilot's switch are both in the "ARM" position.****

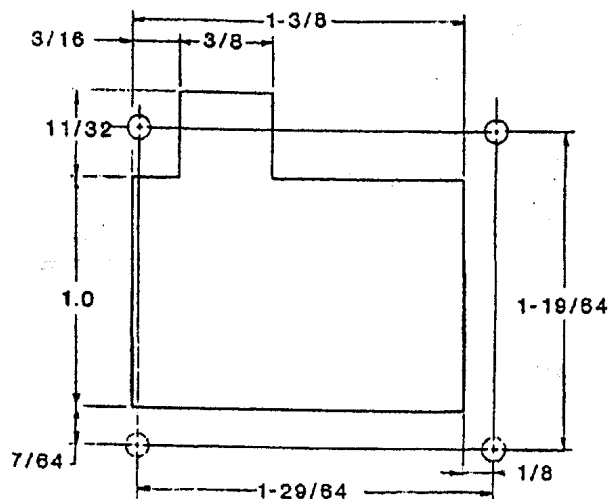


FIGURE 7 INSTRUMENT PANEL CUTOUT

4.1 MAINTENANCE AND SECURITY

- 1) INSPECT THE GENERAL SECURITY OF THE ELT910 ANTENNA, MOUNTING TRAY, MOUNTING STRAPS AND HARDWARE. CONNECTIONS MUST BE FIRM AND SNUG.
- 2) RETURN ELT910 TO NARCO CERTIFIED ELT MAINTENANCE CENTER FOR BATTERY REPLACEMENT AND COMPLETE PERFORMANCE CHECK EVERY (2) YEARS. LOCAL REGULATIONS AND/OR ENVIRONMENTAL CONDITIONS MAY NECESSITATE SHORTER REPLACEMENT/CHECK INTERVALS.
- 3) PERFORM NARCO REQUIRED TESTS (SEE SECTIONS 2.1.3, 2.1.4, 2.2 IN THIS MANUAL)
- 4) THE FAA RECOMMENDS SUPPLEMENTAL TESTING PROCEDURES (PER AC NO. 43-16, ALERTS # 127) AT APPROPRIATE INTERVALS. THESE ARE NOT TO BE PERFORMED IN LIEU OF NARCO REQUIRED PROCEDURES.

4.2 BATTERY PACK

Use only NARCO alkaline batteries, part # 56995-0101, available through NARCO authorized repair facilities.

The only allowable power supply for the NARCO ELT910 is the sealed 10.5V alkaline battery pack. This pack contains software which is required for proper operation of the ELT910. Use of counterfeit batteries will automatically activate the transmitter. The only way to turn the transmitter off in this case would be to unplug the batteries and replace with NARCO batteries.

The battery pack is integral to the ELT910 and is NOT RECHARGEABLE.

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4.2.1 BATTERY PACK REPLACEMENT

Replace the battery pack for any of the following reasons:

1. After use in any emergency.
2. After an inadvertent activation of unknown duration.
3. When the total of all known transmissions (activations) exceeds one hour.
4. On or before replacement date marked on the battery pack.
5. Visual inspection shows signs of leakage or corrosion.
6. If the ELT910 is stored in an area where the temperature is normally above 100°F (30°C), the battery pack should be replaced at no greater than 12 month intervals. Storage at temperatures in excess of 130°F (55°C) must be avoided.

WARNING

Ensure that no short circuit of battery terminals can occur.

WARNING

DO NOT recharge, short circuit, or expose battery pack to high temperatures or fire.

The ELT910 must be removed from the aircraft to replace the battery pack. Set the ELT's on-off-arm switch to "off". Disconnect the antenna cable and wiring harness connector. Remove ELT910 from the mounting tray.

The battery pack is integral to the ELT910.

To replace the battery pack proceed as follows (refer to Figure 8):

- 1) Remove 8 flat head screws from unit. Discard these screws (new screws are provided).
- 2) Carefully separate into 2 sections.
- 3) Unsnap the battery connector (the connector towards the back end of the circuit board).
- 4) Carefully remove battery pack from the ELT (batteries are contained inside the white foam jacket).
- 5) Cut the tape holding the 2 halves of foam together and remove old battery pack.
- 6) Install new battery pack and re-tape the foam together. Use good quality glass filament tape only.
- 7) Re-install battery pack assembly into the ELT. Plug connector into the circuit board.
- 8) Slide the 2 sections back together, be sure red gasket in header is sitting flat.

4.2.1 Continued

- 9) Screw unit back together with new screws provided. Be sure all 8 screws are snugged up.
- 10) Re-Install ELT Into tray, Perform tests in section 2.2

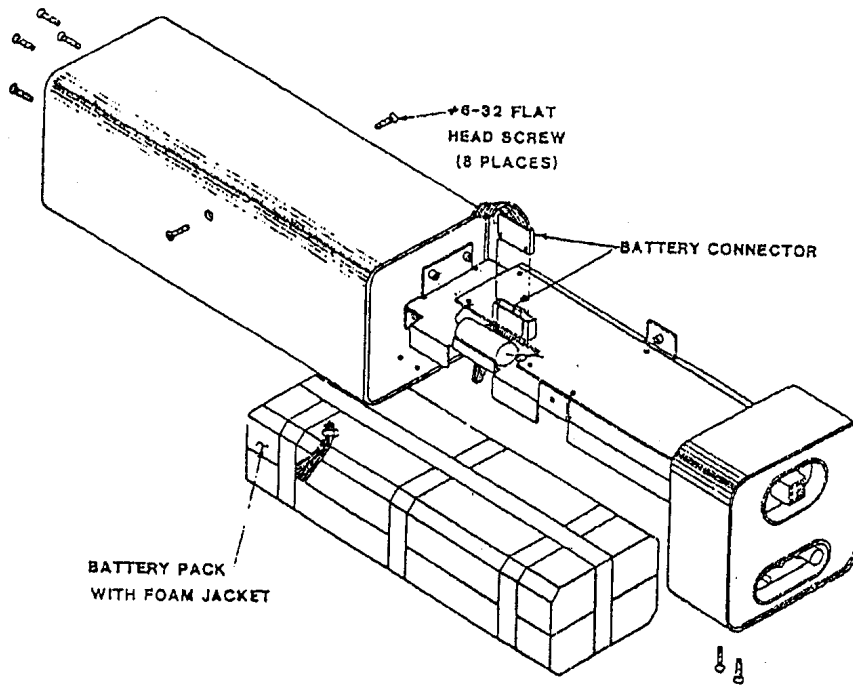


FIGURE 8 BATTERY PACK REPLACEMENT

NARCO AVIONICS ELT910

5.1 RESTRICTIONS AND LIMITATIONS

- A. The ELT910 Emergency Locator Transmitter is for "AVIATION EMERGENCY USE ONLY".
- B. Testing of the ELT910 must be performed according to the latest FAA and/or FCC directives.
- C. The battery pack must be replaced according to the date marked on the ELT910 label or after one cumulative hour of use.
- D. The battery must be replaced with Narco alkaline battery pack part no. 56995-0101 only.

6.1 SPECIAL CANADIAN REQUIREMENTS

In Canada, performance tests (power output, frequency, audio modulation, automatic activation system, etc.) must be performed every 12 months as required by DOT E & I Manual, Part II, Chapter III, Section 3.12.7.

These tests must be performed by a repair facility approved by the Canadian DOT.

The next three sections list the items necessary to test the ELT910.

6.1.1 TEST EQUIPMENT REQUIRED

- 1. Spectrum Analyzer - Hewlett Packard 141S Display
 - 8553 RF Section
 - 8554L RF Section
 - 8552B IF Sectionor equivalent.
- 2. Adjustable Power Supply 30 Vdc @ 2 Amps.
- 3. Digital Volt Meter.
- 4. 20 db Attenuator.
- 5. 50 Ohm Terminator (Alan TBM or equivalent).
- 6. Panel Mounted Remote Switch (P/N 56988-0101).

6.1.2 NARCO TEST FIXTURES REQUIRED

- 1. TF-386-1 Swing Arm Test Fixture (P/N 50067-0101).

6.1.3 NARCO TEST PROCESS DOCUMENTS

- 1. 01475-1391 ELT-910 Recertification Test Process.