

Locating Non-distress ELTs and EPIRBs

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More than 95 percent of searches for Emergency Locator Transmitters will be concluded as a non-distress condition—often at airports, harbors, or homes. These “false alarm” ELTs and EPIRBs must be located and deactivated rapidly to avoid their interfering with bonafide emergency signals or overloading the search and rescue satellite system. Some of these urban searches can be just as challenging as those for a crash in mountain wilderness. This article will address the equipment and techniques that will enable you to locate these transmitters quickly and efficiently.

ELT location requires a receiver to hear the signal and a way to measure either signal strength or direction (preferably both). Direction can be measured using left-right homing, beam antennas, or body shielding; strength is measured by meter or by sound. The L-Tronics Little L-Per is used as an example in this article because it can do all of these things. If something is unclear, or for more information on the mechanics of using a system, refer to the section at the end of this article which summarizes the procedures, and to your equipment’s operating manual for more details.

Not only should you understand the mechanics of how your equipment works, you should also know how the ELT signal behaves so you can interpret the information your equipment gives you. Figure 1 shows an ELT on an airport ramp, which represents one of the simplest conditions you’ll find; however, these principles can be applied to all ELT location situations.

1. **The signal becomes stronger as you approach the ELT.** The direction finder at (2) will have a stronger signal than that at (4), while the strongest signal will be near the ELT at (1). The rate of change will also be faster as you get closer. When you’re very near the ELT, you will have a noticeable increase in signal strength by moving just a few yards closer.
2. **The ELT signal will travel in a straight line unless something obstructs it.** In the figure, the radio waves will radiate outward until they reach an obstruction (the hangar), which reflects and blocks them.
3. **Conductive objects block or reflect the signal.** An extension of the second principle, the figure shows how the direction finders at four different locations will receive the ELT.

The DF at (1) will have a strong signal because it’s close and will give a clean direction to the ELT because there is nothing to block or reflect the signal.

At (2), the signal comes by two paths: one direct from the ELT and one somewhat weaker by reflection from Hangar A. The reflection will cause both the indicated direction and strength to vary around their true values. You can reduce much of these effects by averaging the readings of the DF while walking. Bearing quality will be poorer than at (1), but still quite usable.

At (3), the direct signal is blocked by Hangar A, making the reflections from Hangar B stronger than the true signal. Strength will be much

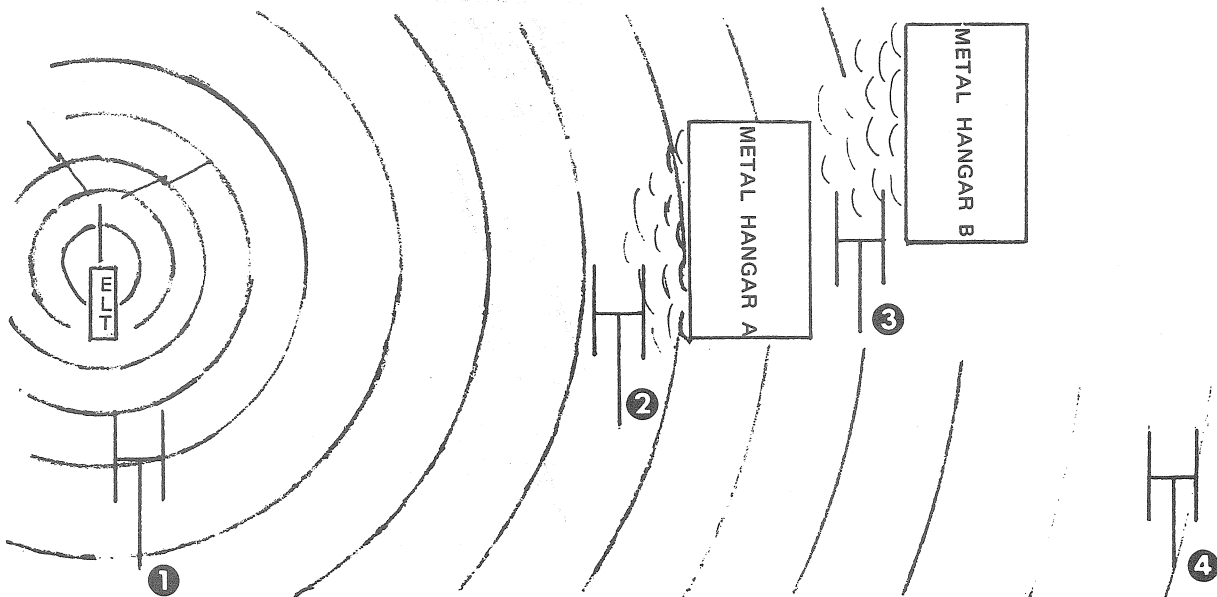


Figure 1

weaker than at (2) and DF information will be erratic or misleading. Reflections are a problem only if the direct path to the ELT is significantly blocked, as it is here.

At (4), the signal will be weaker than at (1) or (2) because it is further away, but stronger than at (3) because it is not blocked by the hangars. DF information will be quite good because the hangar reflections fade rapidly with distance.

LOCATING AN E.L.T. ON AN AIRPORT RAMP

Use your receiver with an external antenna on the vehicle (see page 4) and drive completely around the airport, or as nearly so as you can. Determine where your left-right homer indicates the location of the ELT or the area of highest signal strength so you can begin your foot search close to the problem. If your mission is at night or in bad weather, particularly at an airport without an operating control tower, don't rule out the possibility of an actual crash on or very near the airfield—it HAS happened!

To begin your foot search, walk out on the ramp away from buildings, planes, cars, etc., where you have a good view of the airport. Find the direction to the ELT using the left-right DF mode, maximum signal strength in the RECeive mode, or by body shielding. (See page 6 for details on using the three techniques). Walk to another clear area about 50 yards away while watching the meter as you move. In DF mode, left to right needle swing is normal; just keep swings about equal. Needle movement can also be expected in the RECeive mode. The DF will point to an area of hangars, buildings, or aircraft. Walk in the indicated direction while listening to the ELT.

It is important to continue to decrease the sensitivity control of your receiver (or detune a tunable receiver) as the volume or strength of the ELT increases. DON'T adjust the volume control; this is particularly critical during that "last 100 yards" to the ELT. DON'T remove the antenna; with no antenna, the volume of many radios depends more on how they are held than the signal direction.

If the ELT is in an aircraft (or vehicle) parked out in the open on the ramp, you should be able to walk right to it with whatever equipment you're us-

ing. With a left-right DF, the sensitivity will be at minimum and you can walk completely around the plane and the DF will keep pointing to it. In RECeive mode, sensitivity will be at minimum and the signal will quickly fade away if you walk away from the plane. With a tunable radio, you'll be able to hear the ELT while tuning over almost the entire band.

Look for the ELT antenna on top of the aircraft fuselage aft of the cabin. To double-check your finding, select 121.6 MHz on your receiver, touch the DF antenna to the suspected ELT antenna. Adjust the sensitivity (not volume) until the signal is weakly audible. If the ELT signal disappears when the antennas are separated by only a few inches, you have the right one.

If your DF is convinced you've found the right airplane, but you don't find an external antenna, there may be a portable ELT located inside. This is common for home-built or experimental aircraft and small helicopters.

E.L.T.s IN HANGARS AND BUILDINGS

If your search takes you to an area of hangars or buildings, note the receiver control settings and strength of the ELT as you walk. You may need to return to areas of strongest signal later.

When you reach the building, circle it while 200 feet or so away (or as far away as open space permits) before entering to make sure you have isolated the right building. A left-right or beam type DF will point to the building with the ELT in it on ALL sides, even though the signal is leaking out at very odd places. Signal strength should fade out as you walk away from the building in any direction.

Once you have isolated the ELT to a single building, go inside and look around. Ask occupants if there's an ELT stored nearby (radio shop, store room, parachute, personal locker, etc.). When you're inside a building, many reflective objects are so close that DF is not possible, even with averaging. In a small, confined area, it becomes practical to select RECeive mode and look for the strongest signal; you can fold the elements of the antenna for ease of handling inside, but do not use any receiver without an antenna. Check the ELT antennas of each airplane in the hangar with your receiver on 121.6 MHz as described earlier.

If you are unable to find the ELT, return to areas where you had strong signals and work them. Remember, when you're close, the sensitivity control will be near minimum (the signal will be very loud). In a very tough problem, get back into the open and take a few more bearings from clear areas.