

## Emergency Locator Transmitters

Orolia S.A.S. - McMurdo Group

# OPERATION MANUAL



## AF INTEGRA / AF-H INTEGRA ELT With built-in GPS & Integral Antenna

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## INTRODUCTION

INTEGRA ELTs are an extension of the range of KANNAD ELTs. The development of this type of ELTs is based on the improvement of safety of flights either for light aircraft, business aircraft or commercial aviation.

The safety of flights is strengthened thanks to a **built-in GPS** giving a more accurate position transmitted within minutes following the distress and an **Integral Antenna** which may replace the external antenna in case of unavailability of the latter.

AF<sup>(1)</sup> INTEGRA is designed for fixed wing aircraft or helicopters, AF-H INTEGRA is designed for flat installation on board helicopters only.

The AF INTEGRA (ER) and AF-H INTEGRA (ER) ELTs are evolutions of AF INTEGRA and AF-H INTEGRA ELTs. The main evolution consists in the extension to -40°C of temperature range.

The instructions in this manual provide the information necessary for the installation and the operation of AF INTEGRA, AF-H INTEGRA, AF INTEGRA (ER) and AF-H INTEGRA (ER) ELTs.

Servicing instructions of ELT are normally performed by shop personnel. For detailed instructions , refer to Service & Support section of Kannad Aviation Website.

For the initial installation, please refer to Initial Installation Manual supplied with AF INTEGRA, AF-H INTEGRA, AF INTEGRA (ER) and AF-H INTEGRA (ER) ELTs.

FOR REGULATORY REQUIREMENTS, PLEASE CONSULT YOUR NATIONAL AVIATION AUTHORITY.

NOTE: (1) AF for Automatic Fixed

**WARRANTY****1. Scope**

The equipment is warranted against all material or manufacturing defect for a period of two years from the date of installation on the aircraft or thirty months from the date of shipment from Orolia S.A.S. facilities whichever occur first.

Work carried out under the warranty shall not have the effect of extending the warranty period.

In respect of this warranty, after a defect has been noted by our services, the sole obligation incumbent upon us shall be the repair of the equipment or the element identified as being defective by our services or possibly its replacement free of charge, to the exclusion of all compensation or damages.

This warranty covers the cost of parts and labour in our factories.

The costs of transportation of the equipment replaced or repaired are the purchaser's exclusive responsibility.

The risks shall be borne by the purchaser.

**2. Exclusion**

Defects and deterioration caused by natural wear of the product or by external accident (poor maintenance, abnormal conditions of use, etc.) or by modification of the equipment and tools not recommended nor specified by our company, are excluded from the warranty.

Also the warranty shall not cover visible defects which the purchaser wouldn't have formally notified Orolia S.A.S within 48 hours of receipt of the equipment.

**SYSTEM OVERVIEW**

**1. Cospas-Sarsat System**

**A. Description**

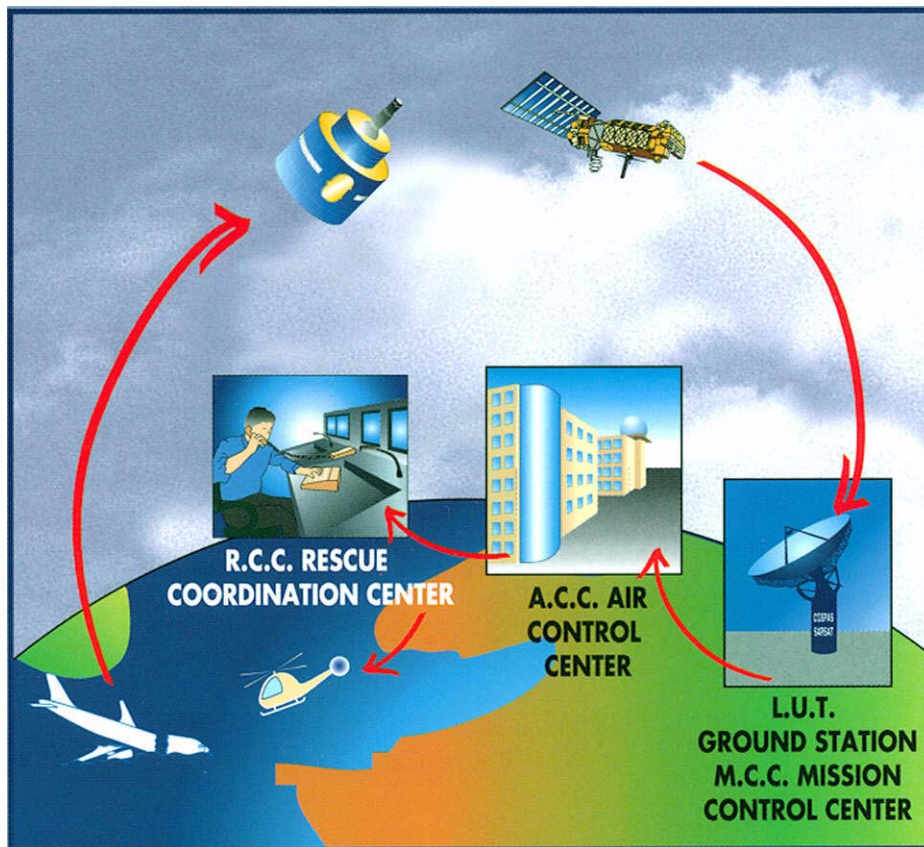
Launched in the early eighties by the four founder countries (Canada, France, Russia, USA), the Cospas-Sarsat system provides satellite aid to search and rescue (SAR) operations for maritime, aeronautical and terrestrial vehicles anywhere in the world.

It uses distress beacons fitted on mobiles and a constellation of LEO and GEO satellites which relay and process the 406 MHz signal to ground stations (LUT) where the beacon positions are determined with a precision of less than 2 NM with the Doppler effect.

Several types of beacons are designed to match the various applications of the Cospas-Sarsat system:

- EPIRB (Emergency Position Indicating Radio Beacon) for maritime applications.
- ELT (Emergency Locator Transmitter) for aeronautical applications.
- PLB (Personal Locator Beacon) for land expeditions.

*Figure 1: Cospas-Sarsat System*



***B. World coverage with the Cospas-Sarsat system***

The major improvement is the use of the Cospas-Sarsat system for processing aeronautical emergencies.

The 406 MHz transmission carries digital data which enable the identification of the aircraft in distress and facilitate SAR operation (type of the aircraft, number of passengers, type of emergency).

The 406 MHz message is transmitted to the Cospas-Sarsat satellites. This message is downloaded to one of the 64 ground stations (44 LEOLUTs and 20 GEOLUTs).

The aircraft is located by Doppler effect by the LEO satellites with a precision better than 2 NM (4 km) at any point of the earth.

**Thanks to the built-in GPS receiver**, the position (accuracy typically about 60 meters) will be transmitted by the ELT within minutes following the distress.

The 121.5 MHz frequency is no more processed by Cospas-Sarsat system but is still used by SAR services for homing in the final stage of rescue operations.

***C. Operation***

In the event of a crash, the ELT activates automatically and transmits a sweep tone on 121.5 MHz and the 406 MHz signal.

In a crash, a G-Switch (shock detector) turns the ELT "ON" when the ELT is subjected to an important change of velocity (or deceleration).

Activation may also be accomplished by means of a Remote Control Panel (RCP) from the cockpit or directly from a switch of the ELT's front panel.

**In the event the external antenna is unavailable due to the crash, the integral antenna will replace it to transmit the 406 MHz signal to the Cospas-Sarsat satellites.**

**NOTE: The integral antenna has not been tested and approved by Cospas-Sarsat.**

***D. Environmental improvements of ELTs***

The certification of an ELT includes a range of severe mechanical tests:

- resistance to flame;
- impact and crush tests;
- resistance up to 500 G shocks;
- watertightness;
- anti-deflagration;
- extreme temperatures .



## 2. KANNAD 406 ELT System Presentation

AF INTEGRA and AF-H INTEGRA belong to the AF type of ELTs which are permanently attached to an aircraft. AF INTEGRA and AF-INTEGRA (ER) are designed to be installed on fixed wing aircraft or helicopters. AF-H INTEGRA and AF-H INTEGRA (ER) are designed for flat installation on board helicopters only.

The INTEGRA ELT system ([Refer to Section Figure 2: ELT Standard System Description page 4](#)) is composed of:

1. the ELT transmitter:
  - P/N S1851501-01 for AF INTEGRA (ER) or,
  - P/N S1851501-02 for AF INTEGRA or,
  - P/N S1852501-01 for AF-H INTEGRA (ER) or,
  - P/N S1852501-02 for AF-H INTEGRA
2. a mounting bracket (P/N S1840502-01, S1840502-02, S1850551-02 or S1850551-04);
3. an approved external whip, rod or blade antenna;
4. a remote control panel<sup>(see NOTE 1)</sup>;
5. a DIN-12 connector, programming dongle or dongle IF GPS RS232<sup>(2)</sup> when the optional RCP is connected.
6. an outside buzzer (optional).

**NOTE: (1) The RCP is optional only if the commands and controls of the ELT are reachable and visible from the pilot seated position.**

(RTCA DO-204A):

*"Equipment control and indicator installed for in-flight use **shall** be readily accessible from the cockpit crew position. The cockpit crew **shall** have an unobstructed view of visual indicator when in the normal seated position."*

**NOTE: (2) GPS/NAV Interface with an onboard RS232 GPS. Data position from an onboard RS232 GPS is only available if a dongle IF GPS RS232 is connected instead of programming dongle or DIN-12 connector.**

For details of approved part number of INTEGRA ELT system, [Refer to Section 6. Compatibility list page 111.](#)

The transmitter and bracket are installed in the aircraft near the tail. The external antenna is mounted on the fuselage near the tail. The remote control panel is installed in the cockpit and connected to the ELT with a DIN-12 connector or a programming dongle and a 2, 3, 4 or 5-wire bundle (not supplied)

Figure 2: ELT Standard System Description

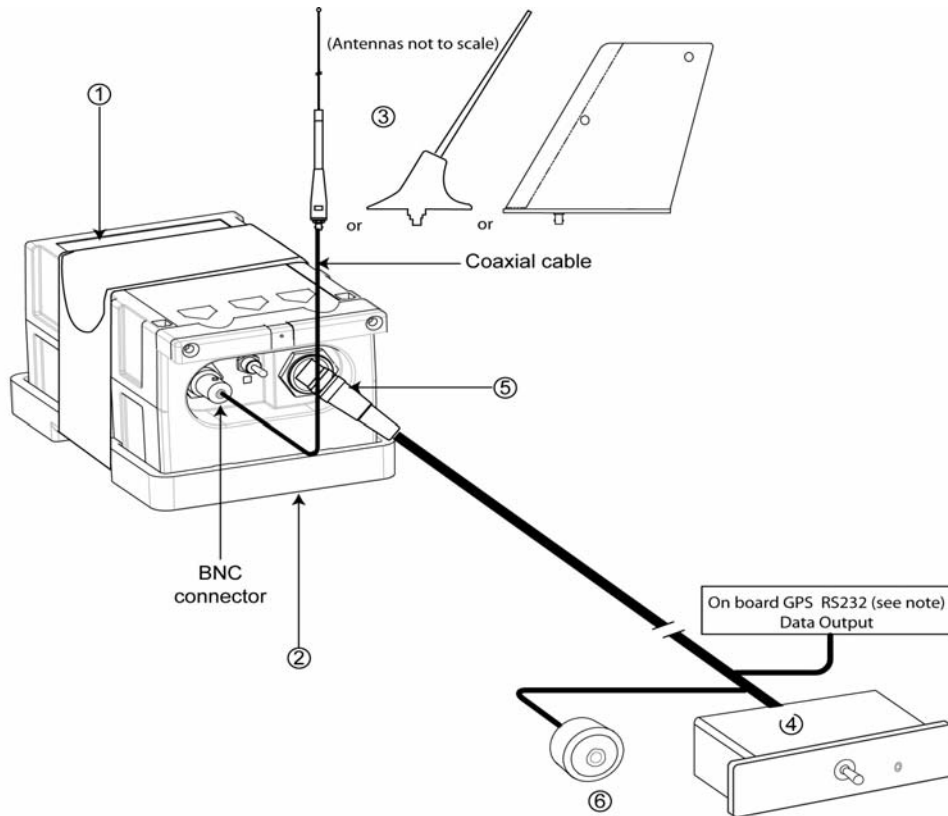
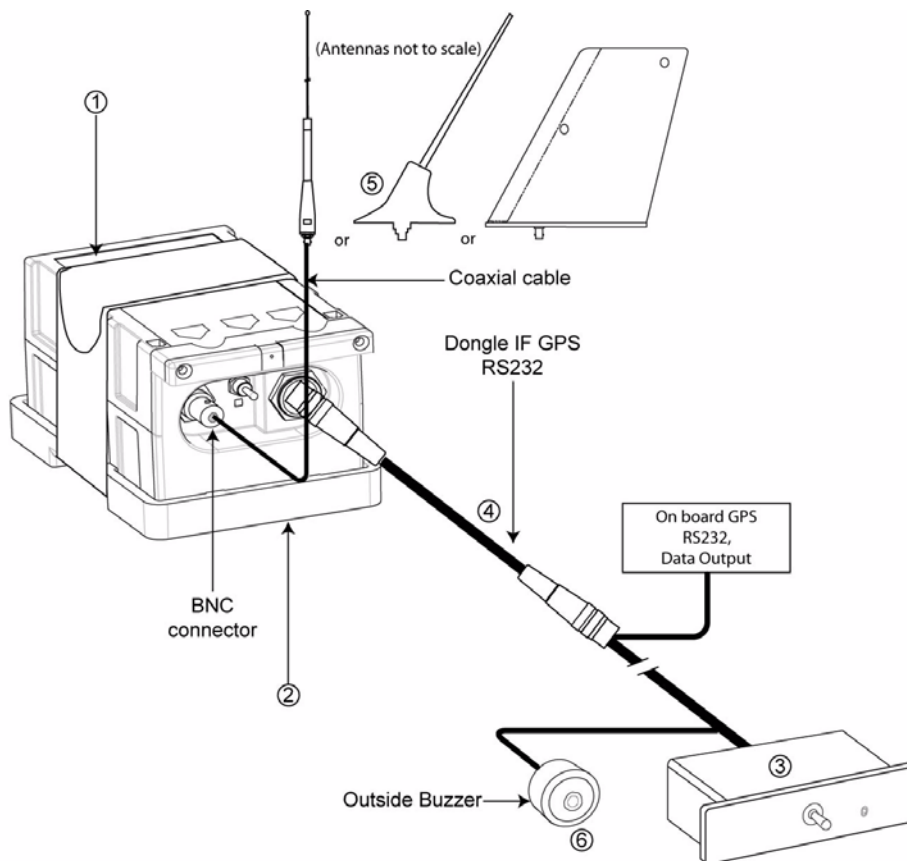


Figure 3: ELT System with Dongle IF GPS RS232 Description



### 3. LINE REPLACEABLE UNITS

#### A. Transmitter

The AF INTEGRA and AF-H INTEGRA are ELTs designed to be installed on board aircraft to transmit a distress signal on frequencies:

- 406 MHz (Cospas-Sarsat frequency) for precise pinpointing and identification of the aircraft in distress.
- 121.5 MHz used for homing in the final stages of the rescue operations.

The AF INTEGRA and AF-H INTEGRA are certified as Automatic Fixed (AF) ELTs with the approved external antennas.

The housing of AF INTEGRA and AF-H INTEGRA transmitters are made of molded plastic with excellent mechanical resistance.

The ELT housing is designed with no sharp edges.

*Figure 4: ELT Transmitter*



#### B. Bracket

The ELT must be installed into one of the approved mounting brackets. The mounting bracket preferably installed near the tail is designed to secure the ELT with a strap. This enables quick removal of the ELT for maintenance or exchange.

Mounting brackets with hook-and-loop (Velcro®) strap are ETSO-2C126 / TSO-C126a approved.

Mounting brackets with draw latch strap (non-hook-and-loop) are ETSO-126a / TSO-C126b approved.

Drilling holes of Universal Mounting Bracket are compatible with former mounting brackets to re-use existing drilling for retrofit.

All mounting brackets are designed to allow the fastening mechanism to be placed either to the left or to the right of the ELT.

**IMPORTANT: Orolia S.A.S. recommends the use of TSO-C126b approved mounting bracket.**

**Installation of INTEGRA and INTEGRA (ER) ELT with hook-and-loop mounting brackets invalidates the TSO-C126b.**

The summary of compatible mounting brackets is as follows:

| P/N         | Designation  | Strap         | Approval  |
|-------------|--|---------------|-----------|
| S1840502-01 | COMPACT Mounting Bracket                               | Hook-and-loop | TSO-C126a |
| S1840502-02 | COMPACT Universal Mounting Bracket                     | Hook-and-loop | TSO-C126a |
| S1850551-04 | Mounting Bracket INTEGRA AF                            | Draw latch    | TSO-C126b |
| S1850551-02 | Bracket Universal for INTEGRA ARINC e-NAV for ELT (AF) | Draw latch    | TSO-C126b |

(Refer to DOC09081, Initial Installation Manual for the outline dimensions of these brackets).

(1) *ELT with hook-and-loop Mounting Bracket*

*Figure 5: INTEGRA ELT with Mounting Bracket P/N S1840502-01*

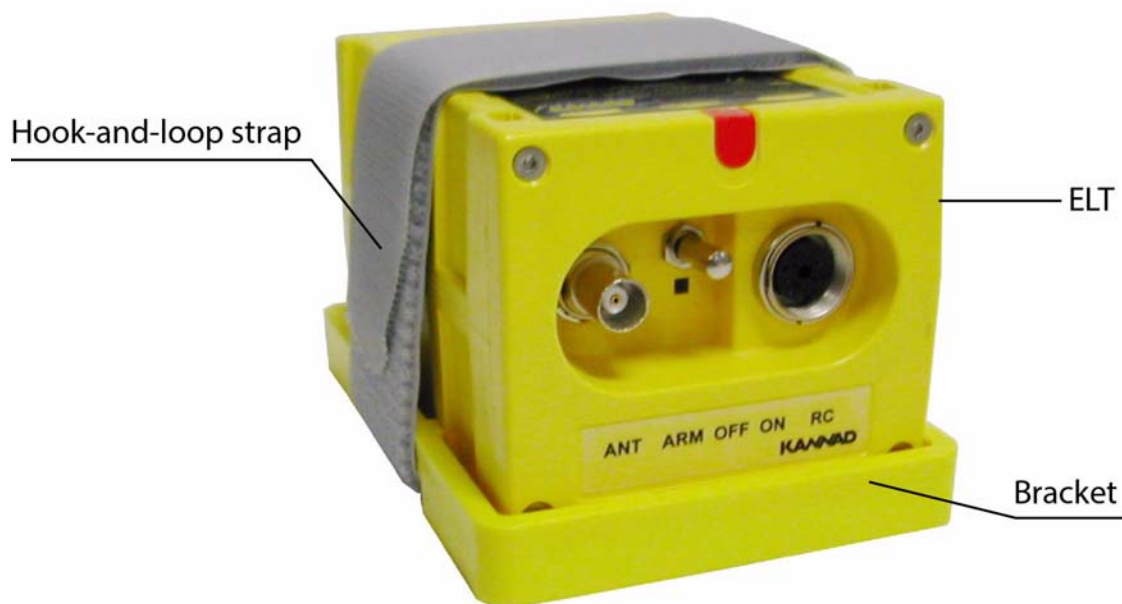


Figure 6: INTEGRA ELT with Mounting Bracket P/N S1840502-02



(2) ELT with draw latch Mounting Bracket

Figure 7: INTEGRA ELT with Mounting Bracket P/N S1850551-04

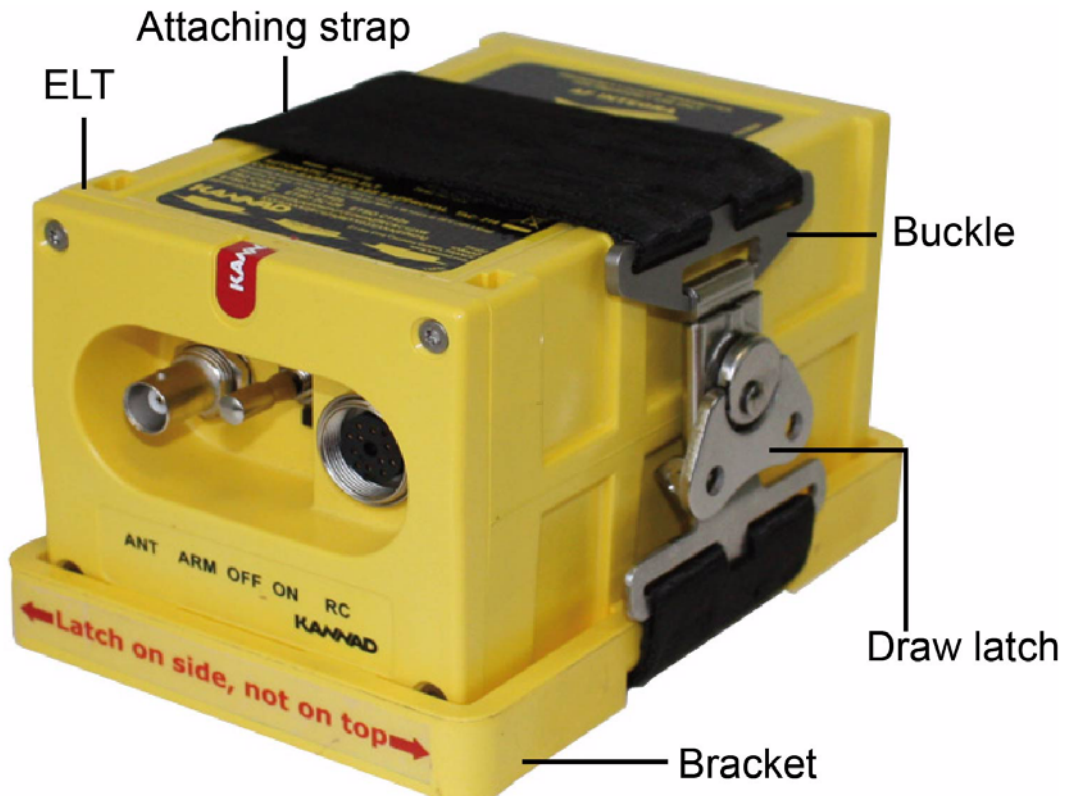
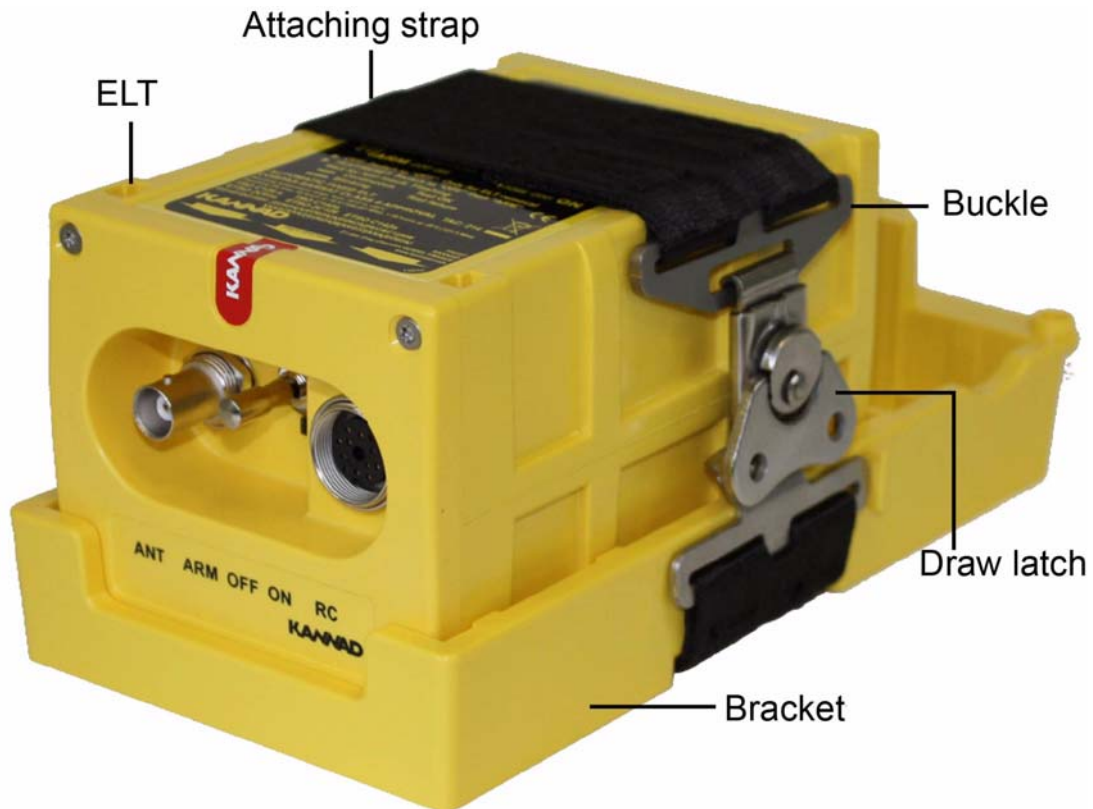


Figure 8: INTEGRA ELT with Mounting Bracket P/N S1850551-02



### C. External antenna

Only approved antennas may be installed ([Refer to Section 6. Compatibility list page 111](#)).

Connection to the ELT will be carried out with a 50 Ohm coaxial cable (RG58 for example) ended with a male BNC connector.

#### IMPORTANT NOTICE:

Orolia S.A.S. recommends a cable with radio electric properties similar or better to those of a RG58 cable.

NOTE: The 50 Ohm coaxial and the male BNC connector are not supplied

**SYSTEM FUNCTIONAL DESCRIPTION AND OPERATION**

**1. Transmitter Functional Description**

**A. Transmission**

The transmitter can be activated either automatically when the crash occurs (thanks to a shock sensor) or manually (thanks to a switch on the transmitter itself or on a RCP).

The transmitter is designed to transmit on two frequencies (121.5 and 406 MHz). The 121.5 Mhz is mainly used for homing in the final stages of the rescue operations. The 406 MHz frequency is used by the Cospas-Sarsat satellites for precise pinpointing and identification of the aircraft in distress.

Once activated, the transmitter operates continuously on 121.5 MHz.

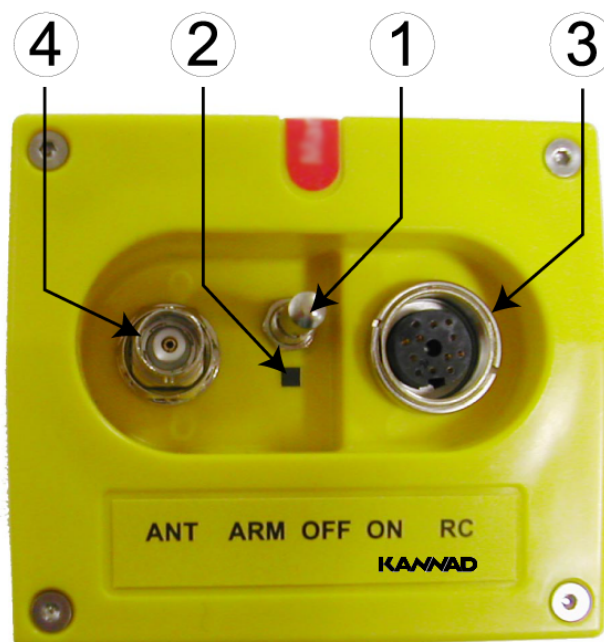
During operations, a digital message is transmitted on 406.037 MHz every 50 seconds.

**B. Controls & Connectors**

The following controls are to be found on the ELT front panel (from left to right):

1. 3-position switch ARM/OFF/ON;
2. Red visual indicator;
3. DIN 12 socket for connection to an optional Remote Control Panel, a programming dongle, dongle IF GPS RS232 or a programming equipment;
4. BNC connector for the external antenna.

*Figure 101: Front Panel*



The red visual indicator gives an indication on the working mode of the beacon:

- after the self test:
  - a serie of short flashes, 200 ms, indicates a faulty functioning;
  - one long flash, 1s, indicates a proper functioning;
- in operating mode:
  - periodic flashes during 121.5 transmission;
  - long flash during 406 transmission.

A buzzer gives audio information on the beacon working mode:

- continuous tone during self test;
- 1 beep every 0.7 second during 121.5 transmission;
- silence during 406 transmission.

### ***C. Working mode information***

The ELT has 4 different modes:

- Off.
- Self-test (temporary mode).
- Armed (standby mode to enable automatic activation by the shock sensor or by an optional remote control panel).
- On (transmission).

Transmission is effective if the beacon is activated (either manually on the ELT control panel, automatically by the shock sensor, or remotely by the "ON" switch of an optional remote control panel when connected).

#### *(1) Off*

The ELT is off when the switch is in the "OFF" position, no part of the ELT is energized.

This mode must **only** be selected when the ELT is removed from the aircraft or when the aircraft is parked for a long period or for maintenance.

#### *(2) Self-Test*

The self-test mode is a temporary mode (max duration 15 seconds) in which the ELT checks the main characteristics of the transmitter (Battery voltage, Programming...) and enables digital communication with programming and test equipment.

This mode is selected:

- when switching from "OFF" to "ARM";
- when switching to "RESET / TEST" on an optional Remote Control Panel (provided that the switch of the ELT is in the "ARM" position);
- when switching to "ON" prior to transmission.

The buzzer operates during the self-test procedure.



After about 10 seconds, the test result is displayed on the red visual indicator as follows:

- One long flash, duration 1s, indicates a proper functioning.
- A serie of short flashes, 200 ms, indicates a faulty functioning.

The number of flashes indicates the type of failure:

- 3 + 1 = LOW BATTERY VOLTAGE.
- 3 + 2 = LOW TRANSMISSION POWER.
- 3 + 3 = FAULTY VCO LOCKING (FAULTY FREQUENCY).
- 3 + 4 = NO IDENTIFICATION PROGRAMMED.
- 3 + 5 = FAULTY VSWR (LINK TO EXTERNAL ANTENNA).
- 3 + 6 = INTERNAL GPS SERIAL LINK.

It is recommended to test the ELT regularly in order to detect any possible failure ([Refer to Section A. Periodicity page 301](#)).

The number of self-tests carried out is recorded. This information is available when the ELT is connected to a programming equipment (PR600).

### (3) Armed

In order to enable activation by the G-Switch or with an optional Remote Control Panel, the ELT must be in standby mode with the switch in the "ARM" position.

**This mode is mandatory during flight.** The ELT should remain in the "ARM" position except when the aircraft is parked for a long period or for maintenance.

### (4) On

This mode is selected:

- manually by switching the ELT to "ON";
- by switching an optional Remote Control Panel switch to "ON" (provided that the ELT switch is in the "ARM" position);
- automatically when a crash occurs (provided that the ELT switch is in the "ARM" position).

When this mode is selected, the ELT starts transmitting:

- after 50 seconds on 406 MHz (one 406 MHz burst every 50 seconds) to the external antenna;
- after the GPS lock on 121.5 MHz (continous transmission between each 406 MHz burst). If GPS lock does not occur within 5 minutes, the 121.5 MHz will be activated.

The red visual indicator on the ELT (and on an optional remote control panel when connected) flashes and the buzzer operates.

- Red visual indicator:
  - 1 short flash during ELT transmission on 121.5 MHz (every 0.7 seconds);
  - 1 long flash during ELT transmission on 406 MHz (every 50 seconds).
- Buzzer:
  - 1.5 Hz pulse signal (recurrence 0.7 s) during ELT transmission on 121.5 MHz [except if the ELT has switched to internal antenna: [Refer to D. VSWR Switch function \(External / Integral antenna\)](#)].

In case of accidental activation, the ELT can be reset either by switching it to "OFF" or by switching to "RESET" on an optional Remote Control Panel when connected.

The number of 406 MHz bursts transmitted is recorded. This information is available when the ELT is connected to a programming and test equipment (PR600).

#### **D. VSWR Switch function (External / Integral antenna)**

During the 406 MHz burst, the Voltage Standing Wave Ratio (VSWR) is measured. After 5 bursts with wrong VSWR measurements, the ELT switches from the external to the internal antenna in order to optimize transmitted signal.

In On mode, after 36 bursts, the ELT decides to re-switch or not according to the result of 2 new VSWR measurements.

NOTE: When shifting from the external to the integral antenna the pulse signal of the buzzer shifts from one beep every 0.7 second to 2 beeps every 0.7 second.

**NOTE: The integral antenna has been not tested and approved by Cospas-Sarsat.**

#### **E. GPS Strategy**

##### *(1) Basic Installation (without NAV Interface equipment)*

To avoid consumption, the internal GPS receiver is not power supplied in Armed mode. After a crash (automatic activation) or manual activation, the internal GPS will try to acquire a position in continuous mode during one hour and by different sequences up to 24 hours of 406 MHz transmission. If the internal GPS receiver acquires a valid position, then the message will contain the true position in the next 406 MHz burst. If the internal GPS receiver does not acquire a valid position, then the message will contain the default value

(GPS position not valid).

(2) *Installation including a NAV Interface equipment (Dongle IF GPS RS232)*

When valid, the position of the internal GPS will always take priority, even if a Dongle IF GPS RS232 is connected to the GPS equipment of the aircraft (external GPS):

- If only the external GPS acquires a valid position, then the message will contain the true position of the external GPS in the 406 MHz burst;
- If both internal and external GPS acquire a valid position, then the message will contain the true position of the internal GPS;
- If neither the internal GPS, nor the external GPS acquire a valid position, then the message will contain the default value (GPS position not valid).

According to § 4.5.5.2 of Cospas Sarsat C/S T001, if, after providing valid data, the navigation input fails or is not available, the beacon message retains the last valid position for 4 hours ( $\pm 5$  min) after the last valid position data input. After 4 hours the encoded position is set to the default values.

#### **F. Autonomy**

The energy is provided by a battery pack composed of a LiMnO<sub>2</sub> two-element battery (See pages page 107 & [page 602](#) for Kit battery reference).

***Lithium cells, lithium batteries and equipment containing such batteries are subjected to regulations and classified under class 9 as from 1st of January 2003.***

#### Battery

Type: LiMnO<sub>2</sub> two-element battery

Battery Expiry Date: 7 years from date of cell manufacturing (CDOM)

Battery Replacement: according to expiry date written on the battery pack and on the ELT label.

**IMPORTANT: If the ELT has been activated for more than 1 hour, the battery shall be replaced (See [Refer to Section 2. Battery replacement requirements page 602](#))**

Until the battery expiry date, the duration of the 121.5 transmission is over 48 hours at -20°C for INTEGRA ELTs and over 48 hours at -40°C for INTEGRA (ER) ELTs.

As it is therefore preferable to keep the battery power for 121.5 MHz homing frequency transmission for the rescue operations, in compliance with Cospas-Sarsat specifications, the 406 MHz transmission is deliberately stopped after 24 hours to extend the 121.5 MHz transmission for as long as possible.

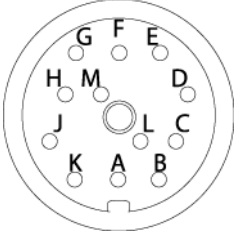
**G. Electrical interfaces**

**J1**

DIN 12 socket J1 is dedicated for connection to an optional Remote Control Panel, to a Programming or Maintenance Dongle or to a programming equipment (PR600).

**IMPORTANT:**

**Shielded cables are recommended. The required wires are AWG24.**

| J1   | PIN  | Signal Name   | Destination | Direction |
|--|------|---------------|-------------|-----------|
| <p>Viewed from Front Face</p>  | J1-A | RCP RESET     | RCP         | IN        |
|  | J1-B | DONGLE RX     | SMM / PGM   | IN        |
|  | J1-C | DONGLE CS     | SMM         | OUT       |
|  | J1-D | DONGLE SK     | SMM         | OUT       |
|  | J1-E | DONGLE TX     | SMM / PGM   | OUT       |
|  | J1-F | DONGLE ALE2P  | SMM         | OUT       |
|  | J1-G | RCP COMMON    | RCP         | OUT       |
|  | J1-H | RCP BUZZER    | RCP         | OUT       |
|  | J1-J | RCP LED       | RCP         | OUT       |
|  | J1-K | RCP ON        | RCP         | OUT       |
|  | J1-L | DONGLE GND    | SMM / PGM   | OUT       |
|  | J1-M | RCP 2W COMMON | RCP         | OUT       |

*Table 1: J1 connector pin-out*

**J2**

BNC female connector J2 is used to connect the external antenna through a 50 Ω coaxial cable.

**IMPORTANT NOTICE:**

**The use of a low attenuation coaxial cable is recommended. The maximum permitted attenuation in the coaxial cable is 2 dB@406 MHz.**

**H. Transmitter Technical Specifications**

**TYPE**

- Two-frequency ELT (121.5 / 406.037 MHz)
- Automatic Fixed
- Cospas-Sarsat Class
- **INTEGRA AF (ER)/AF-H (ER):** Class I, -40°C to +55°C
- **INTEGRA AF/AF-H:** Class II, -20°C to +55°C

**406 MHz TRANSMISSION**

- Frequency: 406.037 MHz ±1 kHz
- Output power: 5W (37 dBm ±2 dB)
- Modulation type: 16K0G1D (Biphase L encoding)
- Transmission duration: 520ms (long message) every 50 s.
- Autonomy  
**INTEGRA (ER):** 24 Hours @-40°C  
**INTEGRA:** 24 Hours @-20°C

**121.5 MHz TRANSMISSION**

- Frequency: 121.5 MHz ±6 kHz
- Output power: 50 to 400 mW (17dBm to 26 dBm), typical 100 mW
- Modulation type: 3K20A3X
- Modulation rate: > 85 %
- Frequency of modulation signal: 1600 Hz to 300 Hz with decreasing sweep
- Autonomy  
**INTEGRA (ER):** over 48 hours@-40°C  
**INTEGRA:** over 48 hours@-20°C

**G-SWITCH SENSOR**

Mechanical G-switch sensor compliant with EUROCAE ED62 specifications

**RF Field strenght limits**

INTEGRA (ER): 0.471 V/m  
INTEGRA: 0.474 V/m

**CONTROLS**

- ARM / OFF / ON switch
- DIN12 socket for RCP and pin programming option
- Bright red visual indicator
- Buzzer
- BNC antenna connector

**BATTERY**

KIT BAT200, P/N: S1840510-01  
LiMnO<sub>2</sub> two-element battery for transmitter power supply  
Battery expiry date: 7 years from date of cell manufacturing

**HOUSING**

Material: Polycarbonate  
Color: Yellow (color compounded)  
Transmitter dimensions:  
131 x 86 x 75.4 mm  
( 5.157 x 3.385 x 2.968 inches)  
Weight:  
• AF: typical 755 g. (1.66 lb).  
• AF-H: typical 760 g. (1.67 lb).

Tightness: O-ring

**ENVIRONMENTAL CONDITIONS**

RTCA DO-160F / EUROCAE ED14F  
Section 4 to 26:

**INTEGRA AF / AF (ER)**

[ED62A]X[ED62A]A[ED62A][R(C&C1)]XW  
XXXSZXXXZ[ED62A]B[XXG33]XXA  
[ED62A]

**INTEGRA AF-H / AF-H (ER)**

[ED62A]X[ED62A]A[ED62A][U(G)]XWXX  
XSZXXXZ[ED62A]B[XXG33]XXA  
[ED62A]

**QUALIFICATIONS**

ETSO-C126a / TSO-C126a / TSO-C126b

**NOTE: Installation of INTEGRA and INTEGRA (ER) ELT with brackets P/N S1840502-01 and S1840502-02 invalidates the TSO-C126b.**

FOR USE OUTSIDE OF THE USA OR EASA RULES, CONTACT YOUR LOCAL CIVIL AVIATION AUTHORITY.

*Table 2: ENVIRONMENTAL QUALIFICATION FORM*

| Conditions                                 | Section       | Description of tests conducted              |
|--|---------------|---|
| Temperature and Altitude                   | 4.0           | As per ED-62A                               |
| Low Temperature                            | 4.5.1         | As per ED-62A -40°C                         |
| High Temperature                           | 4.5.2 & 4.5.3 | As per ED-62A +55°C                         |
| In-Flight Loss Cooling                     | 4.5.4         | Cat. X, no test performed                   |
| Altitude                                   | 4.6.1         | As per ED-62A 50,000 ft                     |
| Decompression                              | 4.6.2         | As per ED-62A                               |
| Overpressure                               | 4.6.3         | As per ED-62A                               |
| Temperature Variation                      | 5.0           | As per ED-62A                               |
| Humidity                                   | 6.0           | Cat. A                                      |
| Operational Shock and Crash Safety         | 7.0           | As per ED-62A                               |
| Vibration                                  | 8.0           | AF type Cat. R(C,C1)<br>AF-H Type Cat. U(G) |
| Explosive Atmosphere                       | 9.0           | Cat. X, no test performed                   |
| Waterproofness                             | 10.0          | Cat. W                                      |
| Fluids Susceptibility                      | 11.0          | Cat. X, no test performed                   |
| Sand and Dust                              | 12.0          | Cat. X, no test performed                   |
| Fungus                                     | 13.0          | Cat. X, no test performed                   |
| Salt Fog                                   | 14.0          | Cat. S                                      |
| Magnetic Effect                            | 15.0          | Cat. Z                                      |
| Power Input                                | 16.0          | Cat. X, no test performed                   |
| Voltage Spike                              | 17.0          | Cat. X, no test performed                   |
| Audio Frequency Susceptibility             | 18.0          | Cat. X, no test performed                   |
| Induced Signal Susceptibility              | 19.0          | Cat. Z                                      |
| Radio Frequency Susceptibility             | 20.0          | As per ED-62A                               |
| Radio Frequency Emission                   | 21.0          | Cat. B                                      |
| Lightning Induced Transient Susceptibility | 22.0          | XXG33                                       |
| Lightning Direct Effects                   | 23.0          | Cat. X, no test performed                   |
| Icing                                      | 24.0          | Cat. X, no test performed                   |
| Electrostatic Discharge                    | 25.0          | Cat. Z                                      |
| Fire, Flammability                         | 26.0          | As per ED-62A                               |

## 2. Equipment limitations

Antenna - ELT cable with maximum permitted attenuation: 2 dB@406 MHz.

### **WARNING:**

**ELTS ARE RADIO TRANSMITTERS WHICH EMIT RADIO FREQUENCY RADIATION WHEN ACTIVATED. WHEN TRANSMITTING, THE USER'S MINIMUM DISTANCE OF EXPOSURE IS 0.20 METER.**

For RF Field strength limits, please [Refer to Section H. Transmitter Technical Specifications page 107](#). RF Field strength limits have been calculated according to Canadian RSS-102 Standard "Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)".

For Canadian user, any information and/or contact on Radiofrequency (RF) Energy and Health may be found on:

<http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf08792.html>.

## 3. Activation

### **A. Standby mode for automatic activation**

In order to be automatically activated by the crash sensor, the ELT must be in standby mode. This mode is mandatory during the flight. We recommend to switch off the ELT only when removed from the aircraft or when the aircraft is parked for a long period or for a maintenance operation.

- Check that the antenna is correctly connected.
- Switch to "ARM".

To operate the ELT with an optional Remote Control Panel, ensure that:

- The ELT switch is in the "ARM" position .

### **B. Manual activation**

- Check that the antenna is correctly connected.
- Switch to "ON" (either on the ELT or on an optional Remote Control Panel when connected):
  - The ELT starts with the self-test sequence then, after 50 seconds, transmits on:
    - 406 MHz (one 406 MHz burst every 50 seconds);
    - 121.5 MHz (continuous transmission between each 406 MHz burst after the GPS lock) .
  - During transmission, the buzzer operates and the red visual indicator flashes.

#### 4. Off

It is possible to stop the ELT in case of unintentional activation:

- Switch to "OFF".

***Regulations state that no transmission must be interrupted unless every means are used to contact and inform the Air Traffic Controller of this action.***

#### **IMPORTANT NOTICE:**

***As 406 MHz transmission is effective 50 seconds after the ELT activation, if it is switched off within this delay, no further radio contact will be necessary.***

#### 5. Self-Test

[Refer to Section 1. Self-test page 301](#)



## 6. Compatibility list

### A. Mounting brackets

| Designation  | Part Number |
|--|-------------|
| COMPACT MOUNTING BRACKET KIT                           | S1840502-01 |
| COMPACT UNIVERSAL MOUNTING BRACKET KIT                 | S1840502-02 |
| BRACKET UNIVERSAL for INTEGRA ARINC e-NAV for ELT (AF) | S1850551-02 |
| MOUNTING BRACKET INTEGRA AF                            | S1850551-04 |

#### IMPORTANT:

Installation of INTEGRA and INTEGRA (ER) ELT with brackets P/N S1840502-01 and S1840502-02 invalidates the TSO-C126b.

Orolia S.A.S. recommends the use of TSO-C126b approved mounting brackets.

### B. Remote control panels (RCP)

| Designation   | Part Number |
|---|-------------|
| RC100 KIT   | S1820513-03 |
| RC102 KIT   | S1820513-21 |
| RC200   | S1820513-11 |
| RC300   | S1820513-09 |
| RC300-NVG   | S1820513-10 |
| RC310-NVG   | S1820513-26 |
| RC600 NVG (Y) <sup>(See Important Notice below)</sup> | S1820513-12 |
| RC600-NVG (W) <sup>(See Important Notice below)</sup> | S1820513-13 |
| RC800   | S1820513-15 |
| RC810   | S1820513-23 |

#### IMPORTANT NOTICE:

**RC600 RCP: Non ETSO equipment only designed to be installed on military aircraft**

**C. DIN-12 connector or programming dongles**

| <b>Designation</b>              | <b>Part Number</b>         |
|---------------------------------|----------------------------|
| DIN-12 connector                | S1820514-03                |
| Programming dongle              | S1820514-01                |
| Programming dongle Assy         | S1820514-06                |
| Programming dongle INTEGRA / LR | S1820514-07                |
| Dongle IF GPS RS232             | S1820514-08 <sup>(1)</sup> |
| Programming dongle INTEGRA / SA | S1820514-11                |

NOTE (1): Fulfills functions of ELT to RCP cable, programming dongle and GPS/NAV equipment interface when connected to an onboard RS232 GPS.

**D. Outside buzzer**

| <b>Designation</b> | <b>Part Number</b> |
|--------------------|--------------------|
| OUTSIDE BUZZER KIT | S1820515-06        |

**E. External antennas**

| <b>Orolia Designation</b> | <b>Manufacturer</b>            | <b>Orolia Part Number</b> |
|---------------------------|--------------------------------|---------------------------|
| N/A                       | CHELTON 1327-82                | N/A                       |
| WHIP ANT AV100            | RAMI AV-100                    | 0147444                   |
| WHIP ANT AV200            | RAMI AV-200                    | 0146150                   |
| ROD ANT AV300             | RAMI AV-300                    | 0146151                   |
| BLADE ANT500              | SENSOR SYSTEMS<br>S65-8282-406 | 0124222                   |
| BLADE ANT560              | DAYTON GRANGER<br>ELT10-696-1  | 0145787                   |
| BLADE ANT650              | CHELTON 2624-82                | 0124251                   |
| N/A                       | CHELTON 2632-82                | N/A                       |
| N/A                       | CHELTON 21-41                  | N/A                       |

**INSTALLATION / REMOVAL****1. Registration*****A. General***

The ELT must be registered prior to installation on board.

When a 406 MHz ELT is installed in an aircraft, it is imperative the aircraft owner register the ELT. Each 406 MHz ELT contains a unique identification code that is transmitted to the satellite. This helps the "Rescue Coordination Center" (RCC) to determine whether an emergency has actually occurred. The unique identification permits accessing a data base.

The registration card available from the local registration authority must be completed and returned to this authority.

Any change of ownership shall also be declared and registered with the local registration authority.

***B. Registration in USA***

Mail or Fax your registration form to:

SARSAT BEACON REGISTRATION

NOAA

NSOF, E/SPO53

1315 East West Hwy

Silver Spring, MD 20910

or Save Time! Register your beacon online at:

[www.beaconregistration.noaa.gov](http://www.beaconregistration.noaa.gov)

All online registrations will be entered into the National 406 MHz Beacon Registration Database on the same day of entry. Registration forms received via postal mail will be entered within 2 business days of receipt. For online registrations, a confirmation letter with your completed registration information form will be sent immediately via e-mail or fax (if provided). Confirmation letters sent via postal mail should arrive within two weeks. Once your registration confirmation is received, please review all information. Any changes or updates to your registration information can be done via the internet, fax, e-mail or postal mail. If you do not receive your registration confirmation from NOAA on the same day you submit it over the internet or within two weeks if you submit it by postal mail, please call NOAA toll-free at: 1-888-212-SAVE (7283) or 301-817-4515 for assistance.

After initial registration (or re-registration) you will receive a NOAA Proof of Registration Decal by postal mail. This decal is to be affixed to the beacon and

should be placed in such a way that it is clearly visible. If for some reason you do not receive the registration decal within two weeks, please call NOAA toll-free at: 1-888-212-SAVE (7283) or 301-817-4515.

Failure to register, re-register (as required every two years), or to notify NOAA of any changes to the status of your 406 MHz beacon could result in penalties and/or fines being issued under Federal Law. The owner or user of the beacon is required to notify NOAA of any changes to the registration information at any time. By submitting this registration the owner, operator, or legally authorized agent declares under penalty of law that all information in the registration information is true, accurate, and complete. Providing information that is knowingly false or inaccurate may be punishable under Federal Statutes. Solicitation of this information is authorized by Title 47 - Parts 80, 87, and 95 of the U.S. Code of Federal Regulations (CFR). Additional registration forms can be found on the NOAA-SARSAT website at:

[www.sarsat.noaa.gov](http://www.sarsat.noaa.gov) or at: [www.beaconregistration.noaa.gov](http://www.beaconregistration.noaa.gov)

### ***C. Registration in Canada***

Beacon information is held in the Canadian Beacon Registry maintained by the National Search and Rescue Secretariat for use in search and rescue operations. Online access to the Registry is available for all beacon owners to register new beacons or to update their beacon information. You can add or update your beacon information by accessing the registry directly, sending in a completed registration form or by talking to one of our beacon registry representatives.

You can access the registry:

- online: [www.canadianbeaconregistry.com](http://www.canadianbeaconregistry.com)
- by email: [CBR@Sarnet.dnd.ca](mailto:CBR@Sarnet.dnd.ca)
- by fax: 1-613-996-3746
- by telephone: 1-800-727-9414 or 1-613-996-1616

The registration information must be updated when the aircraft ownership changes as per the Canadian Airworthiness Notice AN B029 (refer to following link):

[http://www.nss.gc.ca/site/Emergency\\_Beacons/canadian\\_beacon\\_registry\\_e.asp](http://www.nss.gc.ca/site/Emergency_Beacons/canadian_beacon_registry_e.asp)

Additional information and registration forms can be found on the Canadian NSS website at:

[http://www.nss.gc.ca/site/cospas-sarsat/INTRO\\_e.asp](http://www.nss.gc.ca/site/cospas-sarsat/INTRO_e.asp)

## 2. Programming

### A. "Pin programming" option

The INTEGRA family offers pin-programming capabilities to facilitate maintenance operations especially in the case of removals and/or replacement.

A special DIN 12 connector with a Serial Memory Module (called "Programming Dongle") is connected to the ELT when installed on board. This Programming Dongle contains the identification information of the aircraft and remains on board the aircraft. When an unprogrammed ELT is installed and connected to this Programming Dongle and the "ELT" is switched to "ARM", it automatically updates its own memory with the identification data contained in the Programming Dongle memory.

When the ELT is removed from the aircraft, it keeps its identification data.

For maintenance purposes, it is possible to delete the identification information of the ELT by connecting a "Maintenance Dongle" to the ELT. Any accidental transmission with this "maintenance dongle" will not involve SAR operation as the identification code transmitted is recognised by Cospas-Sarsat as "not on board".

When a maintenance dongle is connected:

- Country code is **227** (France).
- Protocol is **Test**.
- Identification number is **K + 6 digits** (the 6 digits of the CSN number).

If the pin programming option is selected by the owner, the following equipment are required:

- a "Programming Dongle" on each aircraft;
- a "Maintenance Dongle" on each ELT spare.

*Figure 201: Maintenance Dongle*



### 3. ELT installation procedure

(1)ELT Installation with hook-and-loop mounting brackets

Refer to Figure 202: ELT installation with a hook-and-loop mounting bracket page 205

NOTE: Initial installation (bracket installation and first wiring) is described in Initial installation manual, DOC09081 also supplied with the transmitter.

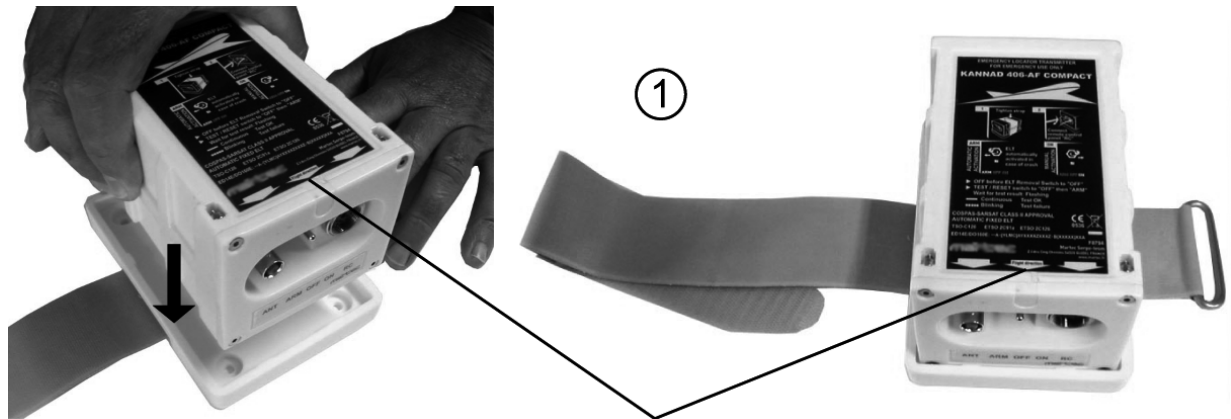
1. Mount the transmitter on the bracket
  - For AF INTEGRA or AF INTEGRA (ER), with "Flight direction" arrow of the ELT pointed towards the front of the aircraft according to Section 4. [Outline dimensions and weight with Mounting Bracket INTEGRA AF P/N S1850551-04 page 504.](#)
  - For AF-H INTEGRA or AF-H INTEGRA (ER), with "Flight direction" arrow of the ELT pointed towards the front or downwards the helicopter according to Section 5. [AF INTEGRA ELTs , axis of installation page 505.](#)
2. Slide the strap through the buckle. **Ensure the buckle is correctly positioned (indifferently on right or left side of ELT) regarding the horizontal center line of ELT as shown Detail A.**
3. Fasten the strap tightly.

**IMPORTANT: Once installed in the mounting bracket, the installer must be sure that the transmitter is firmly attached in its bracket by trying to extract it manually, thereby verifying there is no play and that it remains attached when extraction from the bracket is attempted.**

**CAUTION:**

**AN INCORRECT TIGHTENING OF THE HOOK AND LOOP FASTENER COULD LEAD TO AN UNSAFE SITUATION BY THE ELT PREVENTING THE TRANSMISSION OF THE DISTRESS MESSAGE**

*Figure 202: ELT installation with a hook-and-loop mounting bracket*



Flight Direction arrow



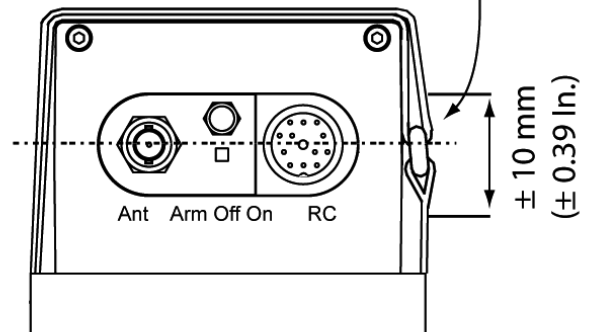
②



Detail A



③



(2) *ELT installation with draw latch mounting bracket P/N S1850551-02*

Refer to: [Figure 203: ELT installation with Bracket Universal for INTEGRA ARINC e-NAV P/N S1850551-02](#)

1. Place the INTEGRA ELT onto the Bracket with "Flight Direction Arrow" of the ELT pointed towards the front of the aircraft.
2. Pass the strap with the buckle above the ELT.
3. Do a quarter turn counterclockwise to the latch then bring the hook of the latch onto the buckle of the attaching strap.
4. Do a quarter turn clockwise to the latch to fix the attaching strap by sliding the hook down.
5. Pull down the latch to lock the attaching strap.

**CAUTION:**

**WHEN LOCKED, THE CENTER OF THE LATCH SHALL BE ALIGNED WITH THE CENTER OF THE BUCKLE (Refer to: [Figure 203: ELT installation with Bracket Universal for INTEGRA ARINC e-NAV P/N S1850551-02](#), picture 5).**

6. Check that the ELT is firmly attached:

**IMPORTANT:**

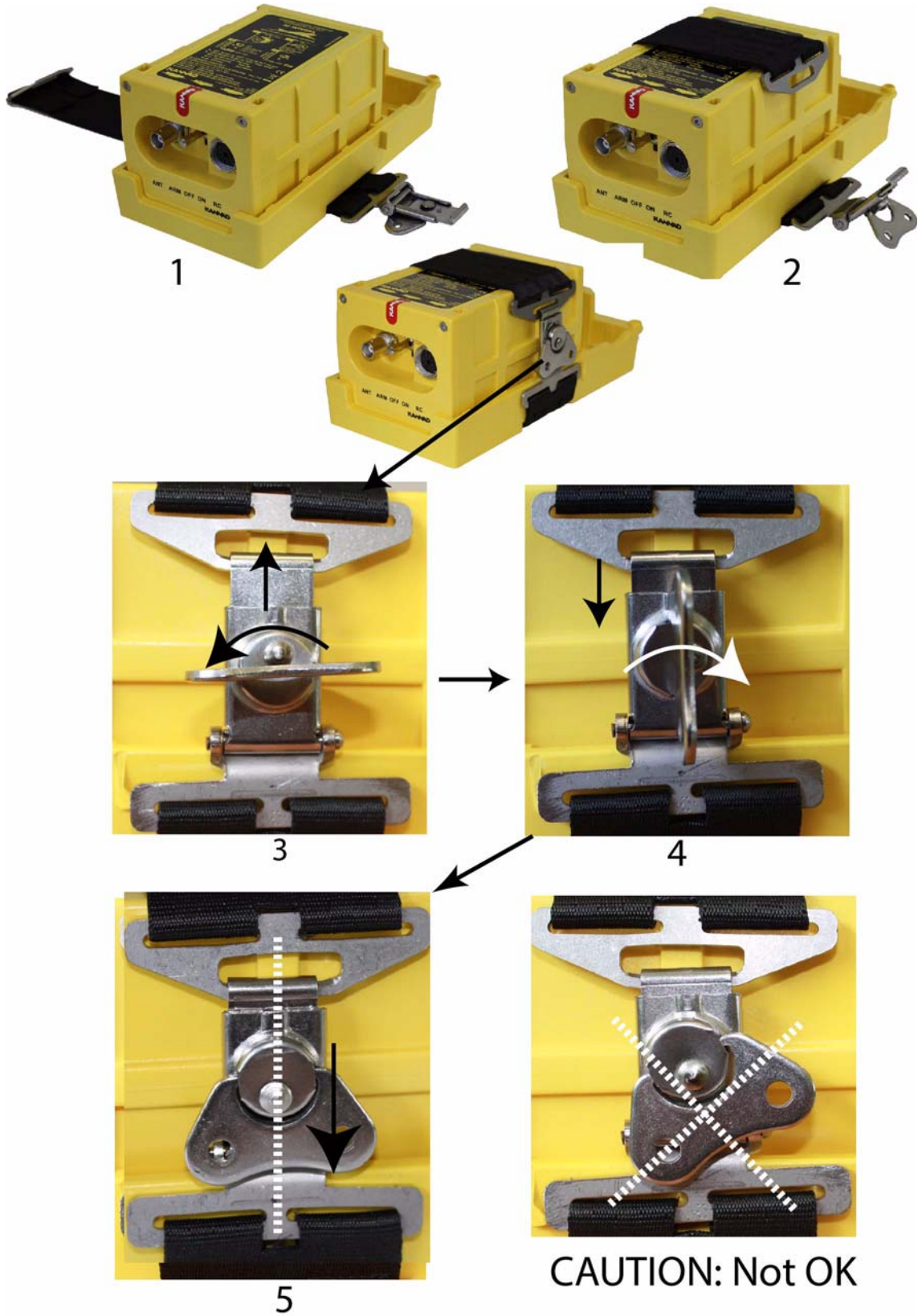
**Once installed in the mounting bracket, the installer must be sure that the transmitter is firmly attached in its bracket by trying to extract it manually, thereby verifying there is no play and that it remains attached when extraction from the bracket is attempted.**

**CAUTION:**

**AN INCORRECT LOCKING OF THE LATCH COULD LEAD TO AN UNSAFE SITUATION BY THE ELT PREVENTING THE TRANSMISSION OF THE DISTRESS MESSAGE.**



Figure 203: ELT installation with Bracket Universal for INTEGRA ARINC e-NAV  
P/N S1850551-02



(3) *ELT installation with draw latch mounting bracket P/N S1850551-04*

Refer to: [Figure 204: ELT installation with Mounting Bracket INTEGRA AF P/N S1850551-04](#)

1. Place the INTEGRA ELT onto the Bracket with "Flight Direction Arrow" of the ELT pointed towards the front of the aircraft.
2. Pass the strap with the buckle above the ELT.
3. Do a quarter turn counterclockwise to the latch then bring the hook of the latch onto the buckle of the attaching strap.
4. Do a quarter turn clockwise to the latch to fix the attaching strap by sliding the hook down.
5. Pull down the latch to lock the attaching strap.

**CAUTION:**

**WHEN LOCKED, THE CENTER OF THE LATCH SHALL BE ALIGNED WITH THE CENTER OF THE BUCKLE (Refer to [Figure 204: ELT installation with Mounting Bracket INTEGRA AF P/N S1850551-04 page 209](#), picture 5).**

**CAUTION:**

**NEVER INSTALL THE ATTACHING STRAP WITH THE LATCH OR GROMMET ON TOP OF THE ELT, THIS WOULD PREVENT THE RADIATION OF THE INTERNAL ANTENNA AND RECEPTION OF GPS SIGNAL. THE LATCH SHALL ALWAYS BE ON SIDE OF THE ELT.**

6. Check that the ELT is firmly attached:

**IMPORTANT:**

**Once installed in the mounting bracket, the installer must be sure that the transmitter is firmly attached in its bracket by trying to extract it manually, thereby verifying there is no play and that it remains attached when extraction from the bracket is attempted.**

**CAUTION:**

**AN INCORRECT LOCKING OF THE LATCH COULD LEAD TO AN UNSAFE SITUATION BY THE ELT PREVENTING THE TRANSMISSION OF THE DISTRESS MESSAGE.**

Figure 204: ELT installation with Mounting Bracket INTEGRA AF  
P/N S1850551-04

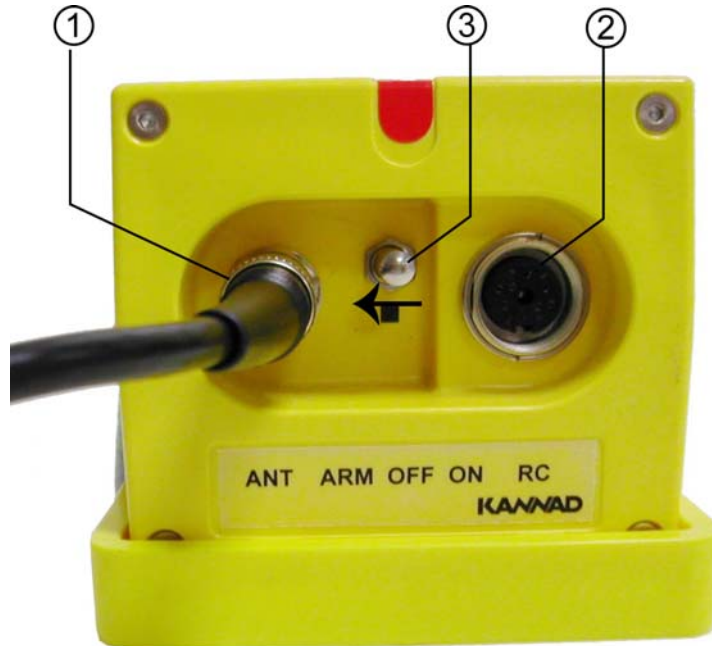


CAUTION: Never install the strap with the latch or grommet on top of the ELT

#### 4. ELT Connection

1. Connect the cable of the external antenna to the BNC connector of the front panel.
2. Connect the DIN12 connector or dongle (make sure the RCP is in the "ARM" position).
3. Set the 3-position switch of the front panel to "ARM".

Figure 205: Installation, controls and connectors



- Perform the first power up procedure (see below).

#### 5. First power up

Perform the following tests:

1. ELT operational tests:
  - make sure the external antenna is connected;
  - switch the ELT from "OFF" to "ARM";
  - check that the Self-Test result is OK (one long flash, duration 1s).
2. 406 & 121.5 MHz transmission tests (optional):  
[Refer to Section B. Test of transmitted signals page 302.](#)

**At the end of the first power up procedure, switch the ELT to "ARM".**

The ELT is now in standby mode and ready to be activated:

- either automatically by G-Switch sensor if a crash occurs;
- or manually by an optional Remote Control Panel (when connected).

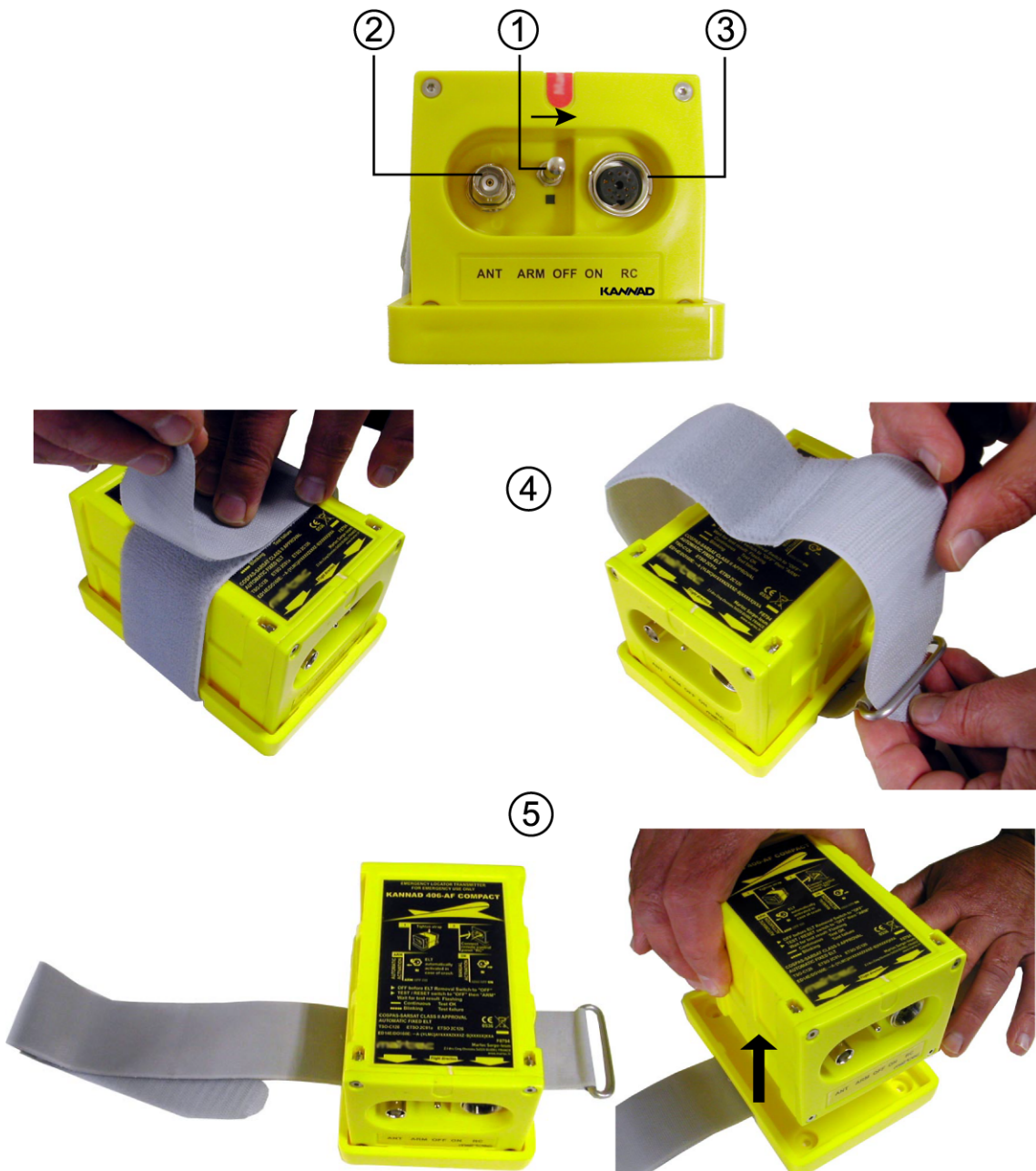
**NOTE : Switching to "ON" directly on the ELT front panel will also activate the ELT.**

**6. ELT removal**

*(1) Removal of the ELT from a hook-and-loop mounting bracket*

1. Switch the ELT to "OFF".
2. Disconnect the external antenna from the BNC connector of the ELT.
3. If connected, disconnect the DIN 12 Connector of Remote Control Panel bundle from the DIN12 socket of the ELT.
4. Unfasten the hook and loop strap.
5. Remove the ELT from the bracket.

*Figure 206: ELT removal from a hook-and-loop mounting bracket*



*(2) Removal of the ELT from a draw latch mounting bracket*

1. Switch the ELT to "OFF".
2. Disconnect the external antenna from the BNC connector of the ELT.
3. If connected, disconnect the DIN 12 Connector of Remote Control Panel bundle from the DIN12 socket of the ELT.
4. Pull up the latch to unlock..
5. Do a quarter turn counterclockwise to the latch to slide up the lock.
6. Lift the latch to disengage the hook of the latch from the buckle.
7. Remove the strap from the ELT.
8. Extract the ELT from the mounting bracket.

*Figure 207: ELT removal from a draw latch mounting bracket*



## CHECK

### 1. Self-test

#### A. Periodicity

##### EUROCAE ED-62A Recommendations

§ 2.8.9 : "The battery source shall provide sufficient capacity for a self-test to be conducted according to the period specified by the manufacturer or at least once a month according to Cospas-Sarsat requirement."

§ 7.5 : "Check the self-test function according to manufacturer's recommendation and that such a test shall occur at least once every six months."

##### Manufacturer Recommendations

It is recommended by the manufacturer to test the ELT to detect any possible failure.

Self-test must be performed regularly by a pilot or maintenance personnel from the cockpit (Remote Control Panel). It is recommended to perform a self-test at least once every six months but it **should not be done more than once a month**.

Each self-test consumes energy from the battery. Should self-tests be carried out more often than the maximum allowed, the battery life-time might be shorter than specified.

#### B. Self-test procedure

- Check that the antenna is correctly connected  
**Do not perform self-test without antenna connected.**
- Tune aircraft VHF receiver to 121.5 MHz and ensure you can hear it.
- Switch from the "OFF" position to the "ARM" position or press "RESET / TEST" on the Remote Control Panel (ensure that the ELT switch is in the "ARM" position).
- Listen for the buzzer or watch the red visual indicator - it operates during the whole Self-test procedure. Close to the end of self-test a short (3 sweeps) 121.5 MHz transmission is made - confirm this on the aircraft radio.
- 10 seconds after the beginning of the self test, the test result is displayed with the red visual indicator and the buzzer operates:
  - One long flash (duration 1 seconds) indicates that the system is operational and that no error conditions were found.
  - A series of short flashes (200 ms) indicates the test has failed.
  -

**Remark: The number of flashes gives an indication of the faulty parameter detected during the self-test.**

|     |                                       |
|-----|---------------------------------------|
| 3+1 | LOW BATTERY VOLTAGE                   |
| 3+2 | LOW RF POWER                          |
| 3+3 | FAULTY VCO LOCKING (FAULTY FREQUENCY) |
| 3+4 | NO IDENTIFICATION PROGRAMMED          |
| 3+5 | FAULTY VSWR (EXT. ANTENNA)            |
| 3+6 | INTERNAL GPS SERIAL LINK              |

**If self-test fails, contact the distributor as soon as possible. Unless a waiver is granted, flight should be cancelled (refer to National Aviation Authorities).**

## 2. Operational tests

These tests must be performed by maintenance personnel when performing the first power up procedure or to check the transmitter ([Refer to B. Test of transmitted signals](#)).

### A. ELT operational tests

NOTE: ELT operational tests only provide the aircraft operator with an indication that the ELT is transmitting; however, a positive result cannot be interpreted as meaning that the ELT meets all operational parameters.

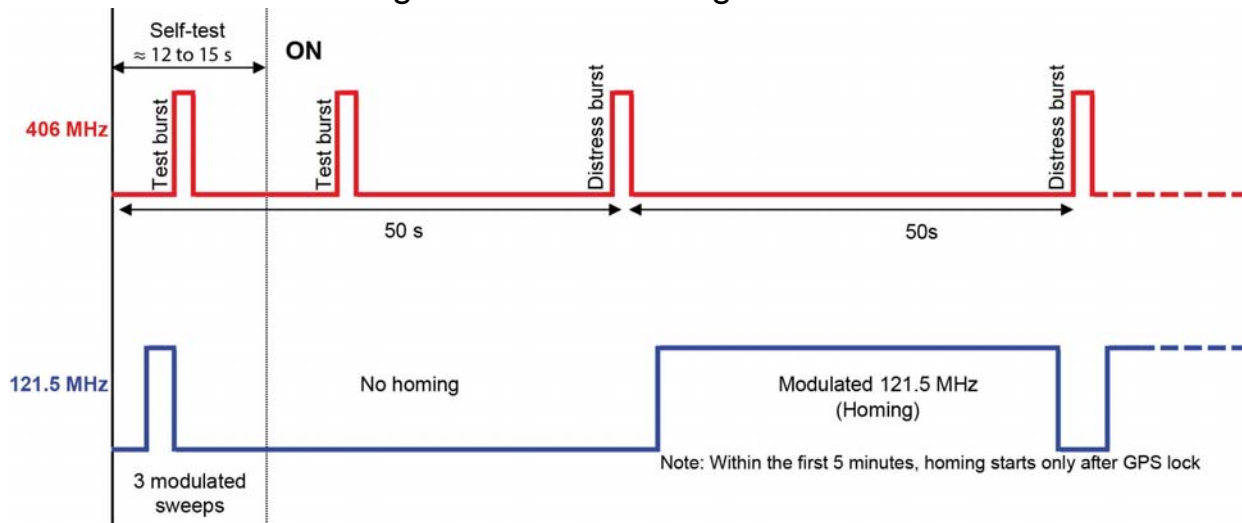
- connect the external antenna to J2;
- switch the ELT from "OFF" to "ARM";
- check that the Self-Test result is OK (one long flash).

### B. Test of transmitted signals

NOTE: Transmissions tests only provide the aircraft operator with an indication that the ELT is transmitting; however, a positive result cannot be interpreted as meaning that the ELT meets all operational parameters.



The transmission chronogram is the following:



**NOTE: Time base and power not to scale.**

**CAUTION:**

**406 AND 121.5 MHz TRANSMISSION TEST MUST BE PERFORMED IN SELF-TEST MODE ONLY.**

**DO NOT INTEND TO LISTEN TO THE 121.5 MHz BY SWITCHING THE ELT ON: RISK OF FALSE ALERT!**

*(1) 406 MHz Transmission tests*

This test should be carried out with a Cospas-Sarsat decoder.

**NOTE: If a Cospas-Sarsat decoder is not available, the coding sheet supplied by the programmer for the beacon (or dongle) with the corresponding CSN proves that the beacon (or dongle) is correctly programmed. Skip to § (2) 121.5 MHz.**

- Perform self-test (Press "RESET /TEST" on the RCP or switch ELT from "OFF" to "ARM").
- Check with the Cospas-Sarsat decoder that, except for the 5th and the 6th digits, the decoded message is identical to the programmed message.

*NOTE: The message transmitted during self-test sequence always begins with FF FE D0 whereas a programmed message begins with FF FE 2F.*

*Example of message programmed in ELT:*

*FF FE 2F 96 E3 AF 0F 0F 7F DF FF 62 60 B7 83 E0 F6 6C*

*Example of same message decoded by Cospas-Sarsat Decoder:*

*FF FE D0 96 E3 AF 0F 0F 7F DF FF 62 60 B7 83 E0 F6 6C*

(2) 121.5 MHz Transmission test

**REMINDER: The 2 sweep tones is the ONLY way to check the 121.5 MHz.**

**CAUTION:**

**DO NOT INTEND TO LISTEN TO THE 121.5 MHz BY SWITCHING THE ELT ON: RISK OF FALSE ALERT!**

*This check shall only be conducted during the first five minutes of any UTC (co-ordinated universal time) hour. Be sure to notify any nearby control tower of your intentions.*

This test must be carried out with a VHF receiver either with the aircraft VHF receiver or with a not onboard VHF receiver.

**IMPORTANT:**

**Aircraft VHF receiver may be used only if 406 MHz test was carried out with a Cospas-Sarsat decoder, otherwise check 121.5 MHz using a VHF receiver (not the onboard VHF receiver) several dozens meters away from the antenna. This ensures to validate the antenna.**

- Tune VHF receiver to 121.5 MHz;
- Perform self-test (Press "RESET / TEST" on the RCP or switch ELT from "OFF" to "ARM").
- Only 2 "sweep tones" are heard after 5 seconds, then the 121.5 MHz stops.

**At the end of the test, leave the ELT on ARM.**

The ELT is now in standby mode and ready to be activated:

- either automatically by G-Switch sensor if a crash occurs;
- or manually by Remote Control Panel.

*NOTE: Switching to "ON" directly on the ELT front panel will also activate the ELT.*

**TROUBLESHOOTING****1. General**

Procedure for fault isolation on board uses the red visual indicator of the ELT's front panel. This red visual indicator is activated by a self-test capability within the ELT.

**2. Faults on Self-test****A. Red visual indicator**

When the self-test is carried out, the number of flashes on ELT or RCP's red visual indicator gives an indication of the faulty parameter detected during the self-test.

**(1) 3+1 flashes**

- Low battery voltage:  
Replace battery: refer to relevant CMM for tests and repair.

**(2) 3+2 flashes**

- Low RF power:  
Check 406 MHz power: refer to relevant CMM for tests and repair.

**(3) 3+3 flashes**

- Faulty VCO locking (faulty frequency):  
Check frequencies: refer to relevant CMM for tests and repair.

**(4) 3+4 flashes**

- No identification programmed  
Check programming: refer to Kannad ELT Commissioning training.

**(5) 3+5 flashes**

- VSWR Fault  
Check correct connection of antenna  
Perform a VSWR measurement

**(6) 3+6 flashes**

- Internal GPS serial link fault  
Check GPS receiver: refer to relevant CMM for tests and repair.

NOTE: For CMM download and other servicing instructions, refer to the Support section of [mcmurdogroup.com](http://mcmurdogroup.com) website .

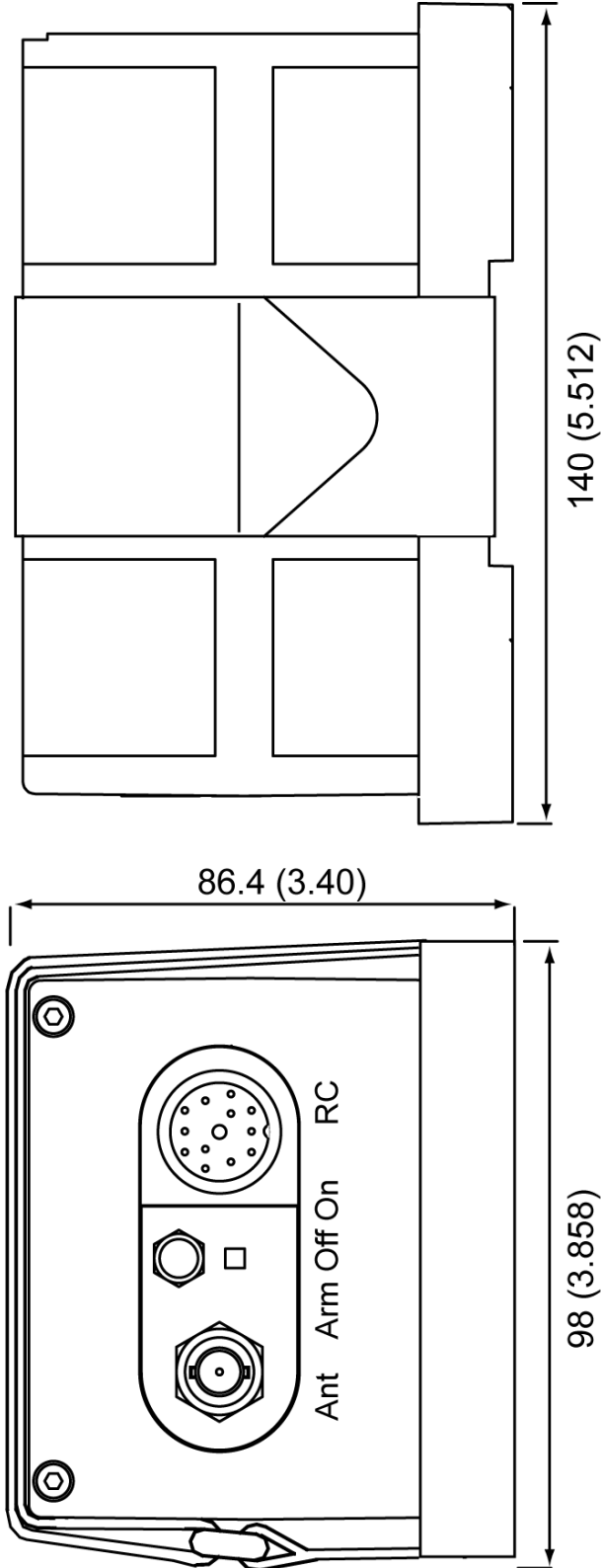
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**SCHEMATICS & DIAGRAMS**

**1. Outline dimensions and weight with Compact Mounting Bracket P/N S1840502-01**

Typical weight with mounting bracket:  
Weight in grams (pounds in brackets)  
AF INTEGRA: 880 (1.94)  
AF-H INTEGRA: 885 (1.95)

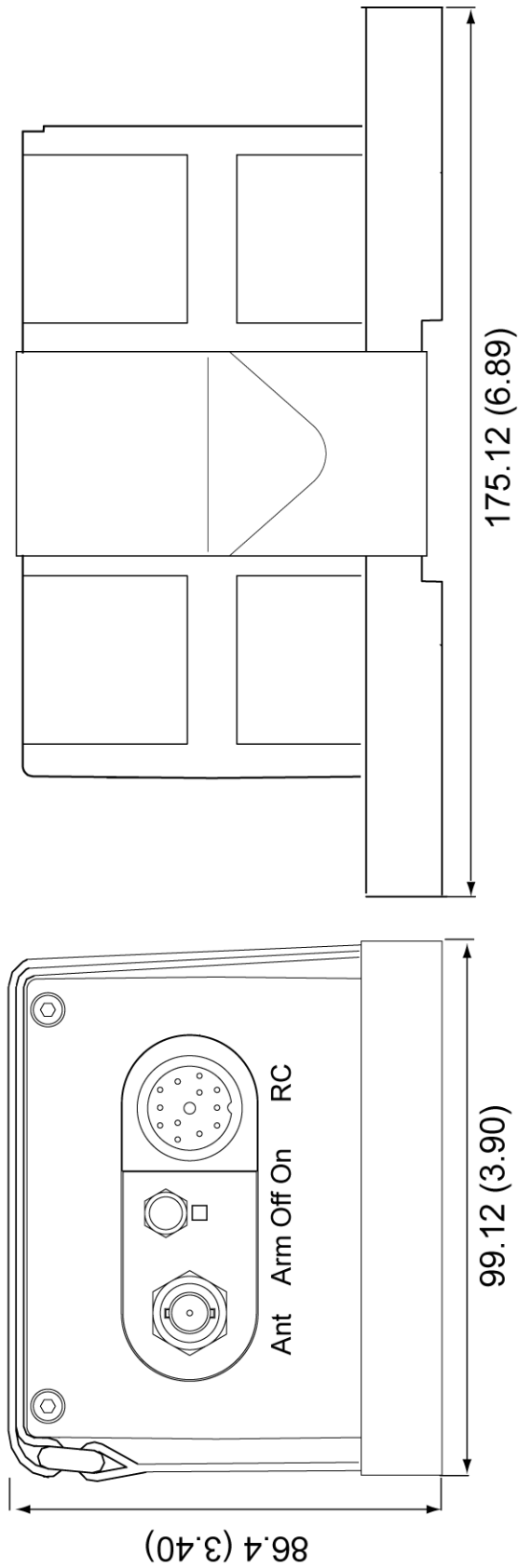
Note: all dimensions are in millimeters  
(inches in brackets)



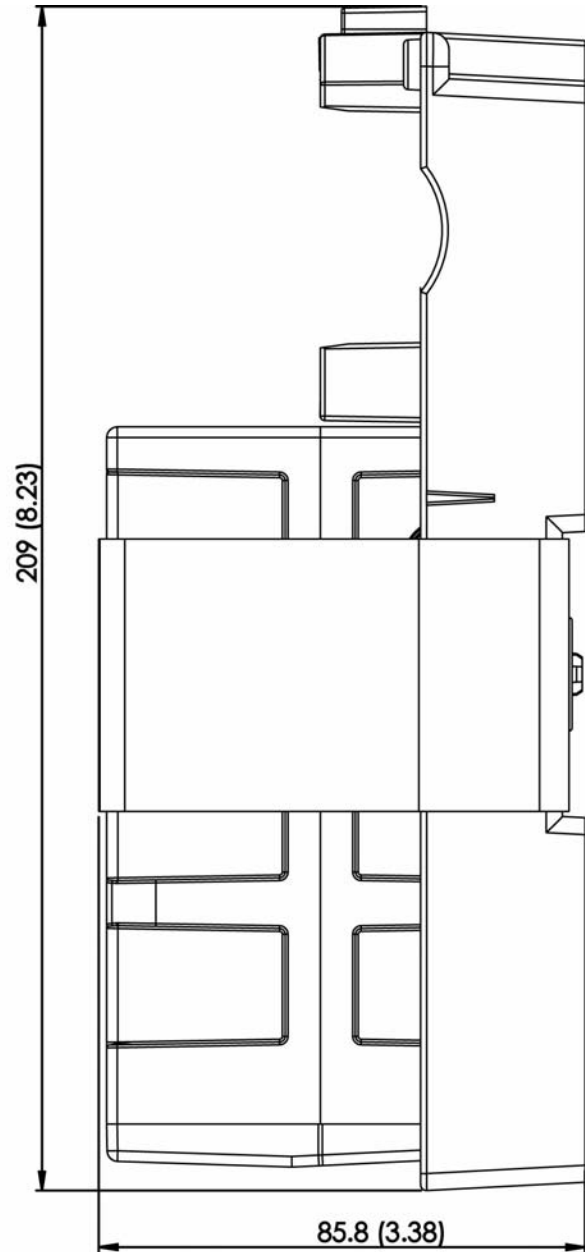
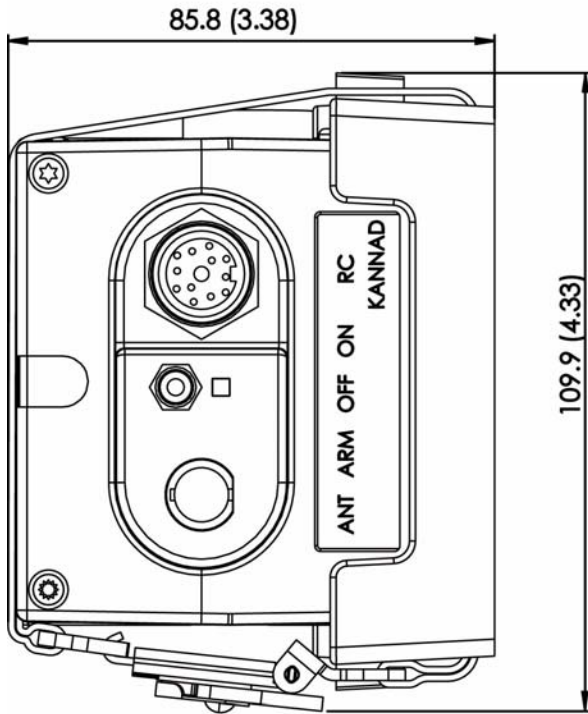
**2. Outline dimensions and weight with Compact Universal Mounting Bracket P/N S1840502-02**

Typical weight with mounting bracket:  
Weight in grams (pounds in brackets)  
AF INTEGRA: 905 (1.99)  
AF-H INTEGRA: 910 (2.00)

Note: all dimensions are in millimeters  
(inches in brackets)



**3. Outline dimensions and weight with Bracket Universal for INTEGRA ARINC e-NAV for ELT (AF) P/N S1850551-02**



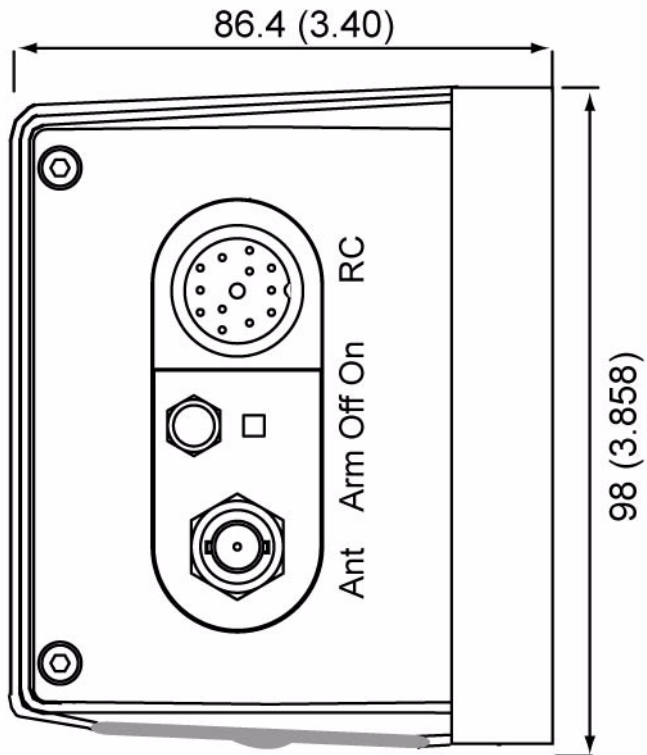
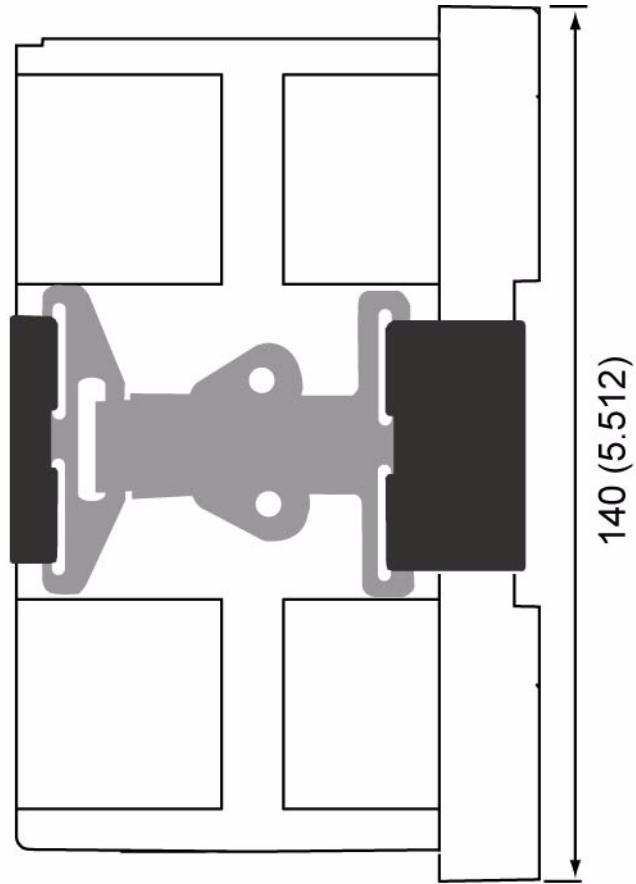
Note: all dimensions are in millimeters  
(inches in brackets)

Typical weight with mounting bracket  
AF INTEGRA : 1154 g. (2.54 lbs)  
AF-H INTEGRA : 1159 g. (2.56 lbs)

**4. Outline dimensions and weight with Mounting Bracket INTEGRA AF  
P/N S1850551-04**

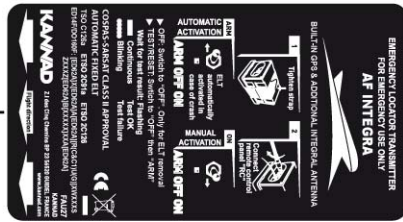
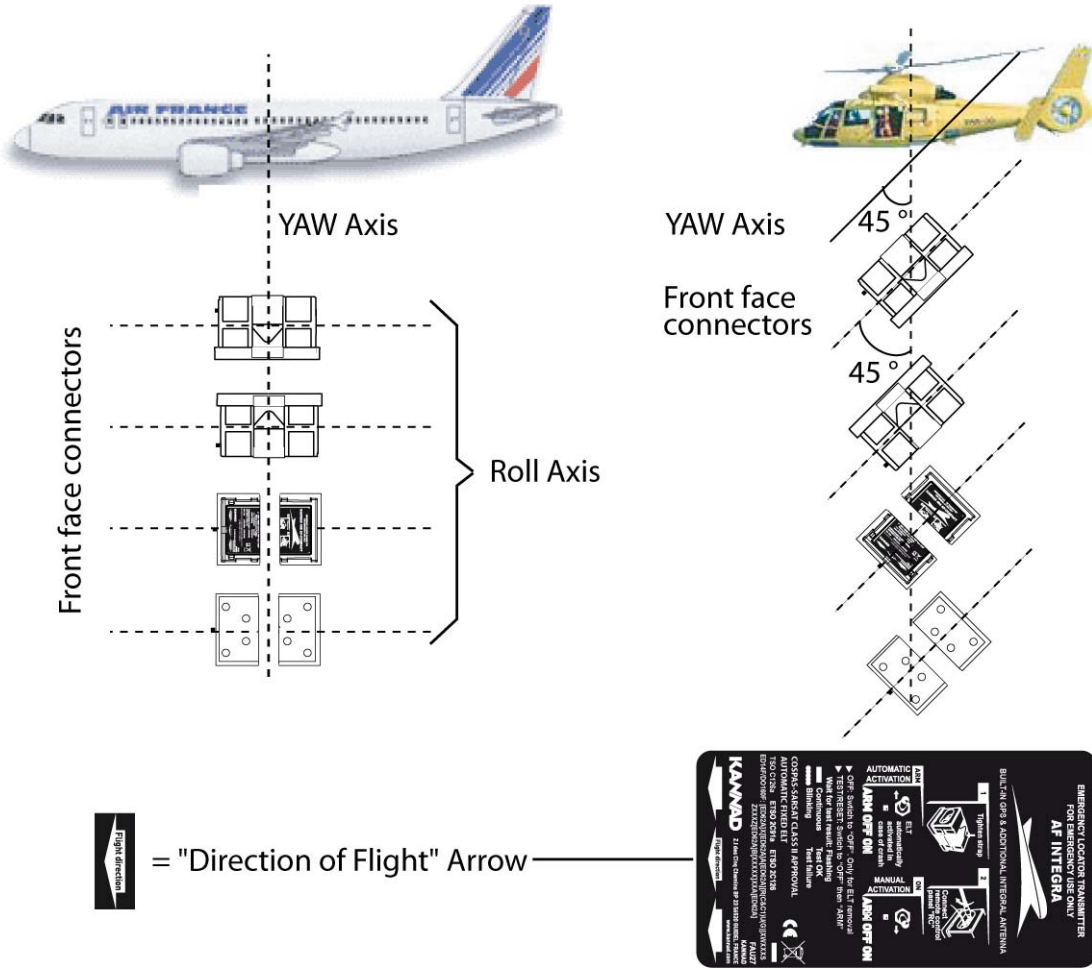
Typical weight with mounting bracket:  
Weight in grams (pounds in brackets)  
AF INTEGRA: 965 (2.13)  
AF-H INTEGRA: 970 (2.14)

Note: all dimensions are in millimeters  
(inches in brackets)

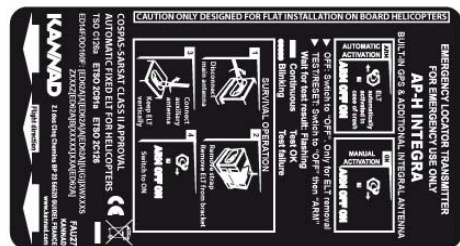
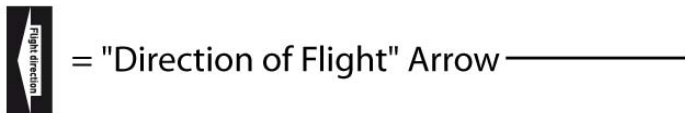




**5. AF INTEGRA ELTs , axis of installation**



**6. AF-H INTEGRA ELTs , axis of installation**



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**SERVICING****1. Maintenance Schedule****Battery replacement:**

carried out by an accredited PART 145 or FAR 145 (or equivalent) maintenance station.

**Periodic inspection:**

depending if the ELT is opened or not, PART 145 or FAR 145 (or equivalent) may be required. Refer to local regulations

***A. Periodic inspection***

***NOTE: (if required by the relevant Civil Aviation Authority).***

Some Civil Aviation Authorities may require the ELT be tested periodically.

In this case, refer to Service Letter SL S1840501-25-05 "Guidelines for periodic inspection" available on the Support section of mcmurdogroup.com website.

***B. Battery replacement***

Testing of various elements and parameters of the ELT is mandatory when the battery is replaced.

- For battery replacement interval, [Refer to § 2. Battery replacement requirements, page 602.](#)
- The testing procedure associated with the battery replacement is described in the relevant level 2 CMM 25-63-08.

For CMM download and other servicing instructions, refer to the Support section of mcmurdogroup.com website .

## 2. Battery replacement requirements

Battery replacement is mandatory:

- after more than 1 hour of real transmission (cumulated duration);
- before or on the battery expiration date;
- after use in an emergency;
- after an inadvertant activation of unknown duration.

***Only original and approved battery pack included in battery KIT BAT200 (P/N S1840510-01) supplied by Orolia S.A.S. can be installed. [SAFT-FRIWO , Lithium Manganese Dioxide, 2 x M20 (D-type) cells]***

***PLEASE CONTACT YOUR LOCAL DISTRIBUTOR***

***Orolia S.A.S. refuses all responsibility and invalidates all warranty should other packs be installed.***

Battery available from any Kannad Aviation distributor or dealer.

List of distributor available on our Web site: <http://www.mcmurdogroup.com>

Orolia S.A.S.

Z.I. des Cinq Chemins CS10028

56520 GUIDEL - FRANCE

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E-mail: [contact.aviation@mcmurdogroup.com](mailto:contact.aviation@mcmurdogroup.com)

Support: [support.sar@mcmurdogroup.com](mailto:support.sar@mcmurdogroup.com) Tel.: +33 (0)2 97 02 49 00

**NOTES**

**NOTES**



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