KANNAD

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Emergency Locator Transmitters by KANNAD

# INSTALLATION MANUAL
# OPERATION MANUAL
# INSPECTION LOG


## KANNAD 406 AF-COMPACT

P/N : S1840501-02 Pack ELT KANNAD AF-COMPACT

# RECORD OF REVISIONS

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# RECORD OF REVISIONS

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# INTRODUCTION

The KANNAD 406 AF-COMPACT has been designed to satisfy the requirements of general aviation pilots, built on the long experience of KANNAD ELTs in 406 MHz technology in aviation, maritime and land distress beacons.

The instructions in this manual provide the information necessary for the installation and the operation of KANNAD 406 AF-COMPACT ELT.

Servicing instructions of ELT are normally performed by shop personnel and detailed Section SERVICING, page 601.

For more detailed instructions and identification parts list, refer to CMM 25-63-03.

Servicing and maintenance instructions of RC200 RCP are detailed in ACMM 25-63-21.

For a quick view of installation, please refer to Quick Installation Guide supplied with KANNAD 406 AF-COMPACT.

Antenna is not repairable and must be replaced if damaged.

FOR REGULATORY REQUIREMENTS, PLEASE CONSULT YOUR NATIONAL AVIATION AUTHORITY.

# 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 for the date of shipment from KANNAD S.A.S. Z.I. des Cinq Chemins, 56520 Guidel, France, 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 cost 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 KANNAD 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 the 121.5 / 243 MHz signals and process the 406 MHz signal to ground stations (LUT) where the beacon positions are determined (with a precision of 10 NM with 121.5 / 243 signals and less than 2 NM with 406 signals).

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.

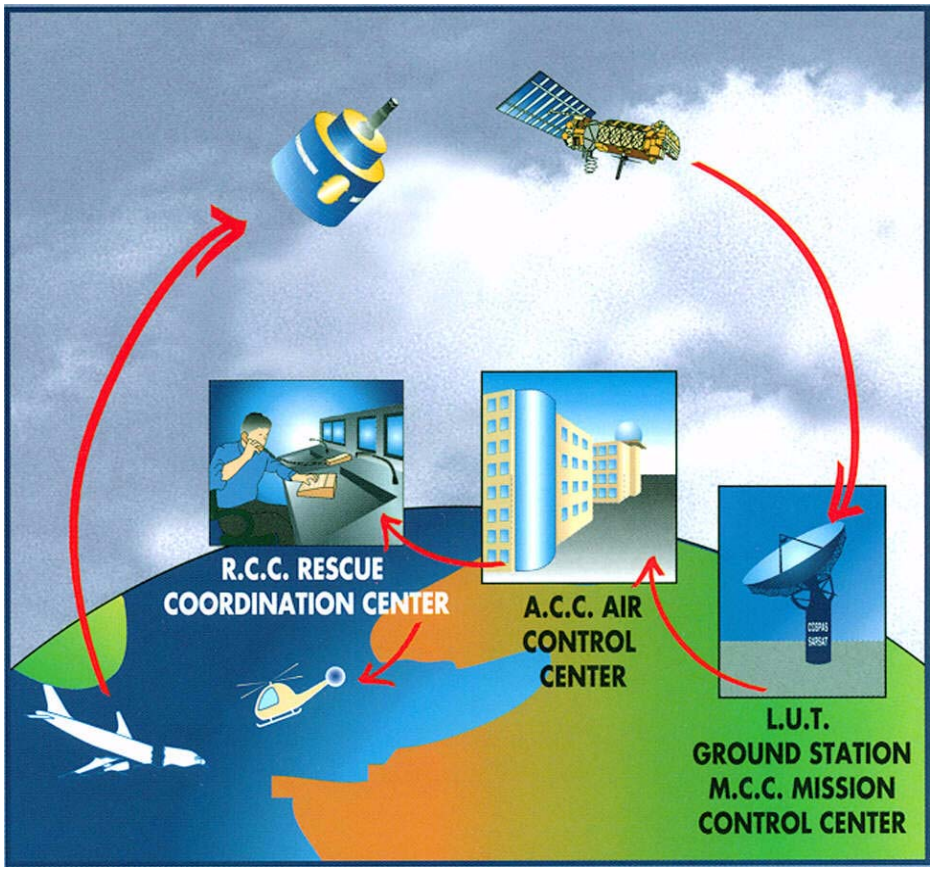



*Figure 1: COSPAS-SARSAT System*

### *B. World coverage with the COSPAS-SARSAT system*

The major improvement is the use of the COSPAS-SARSAT system for processing aeronautical emergencies.

The difference with the 121.5 is that 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.

### *C. Environmental improvements of ELTs*

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

- resistance to flame;
- impact and crush tests;
- resistance to 100 G and 500 G shocks;
- watertightness;
- anti-deflagration;
- extreme temperatures (-20°C to 55°C for more than 48 hours);

### *D. G-Switch (shock detectors)*

The shock detectors equipping old automatic ELTs are the cause of a large number of false alarms. Major work has consisted in studying aircraft crashes (study achieved by the " Crash Research Institute ") and evaluating the acceleration amplitudes involved. As a consequence, G-Switch specifications have been modified to optimize the accuracy of the crash detection.

## 2. KANNAD 406 ELTs Presentation

The KANNAD 406 AF-COMPACT belongs to the AF type of ELTs which are permanently attached to an aircraft. The KANNAD 406 AF-COMPACT is designed to be installed on fixed wing aircraft or helicopters.

The KANNAD 406 AF-COMPACT Pack is composed of:

1. a transmitter (P/N S1840501-01);
2. a mounting bracket (P/N S1840502-01);
3. an RC200 remote control panel (P/N S1820513-11);
4. a DIN-12 connector (P/N S1820514-03);
5. a SUB D 9 Pts Female connector (P/N S1840506-01).

The outside whip (P/N 0141013) antenna is purchased separately.

The transmitter and bracket are installed in the aircraft near the tail. The outside 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 3-wire bundle (not supplied).

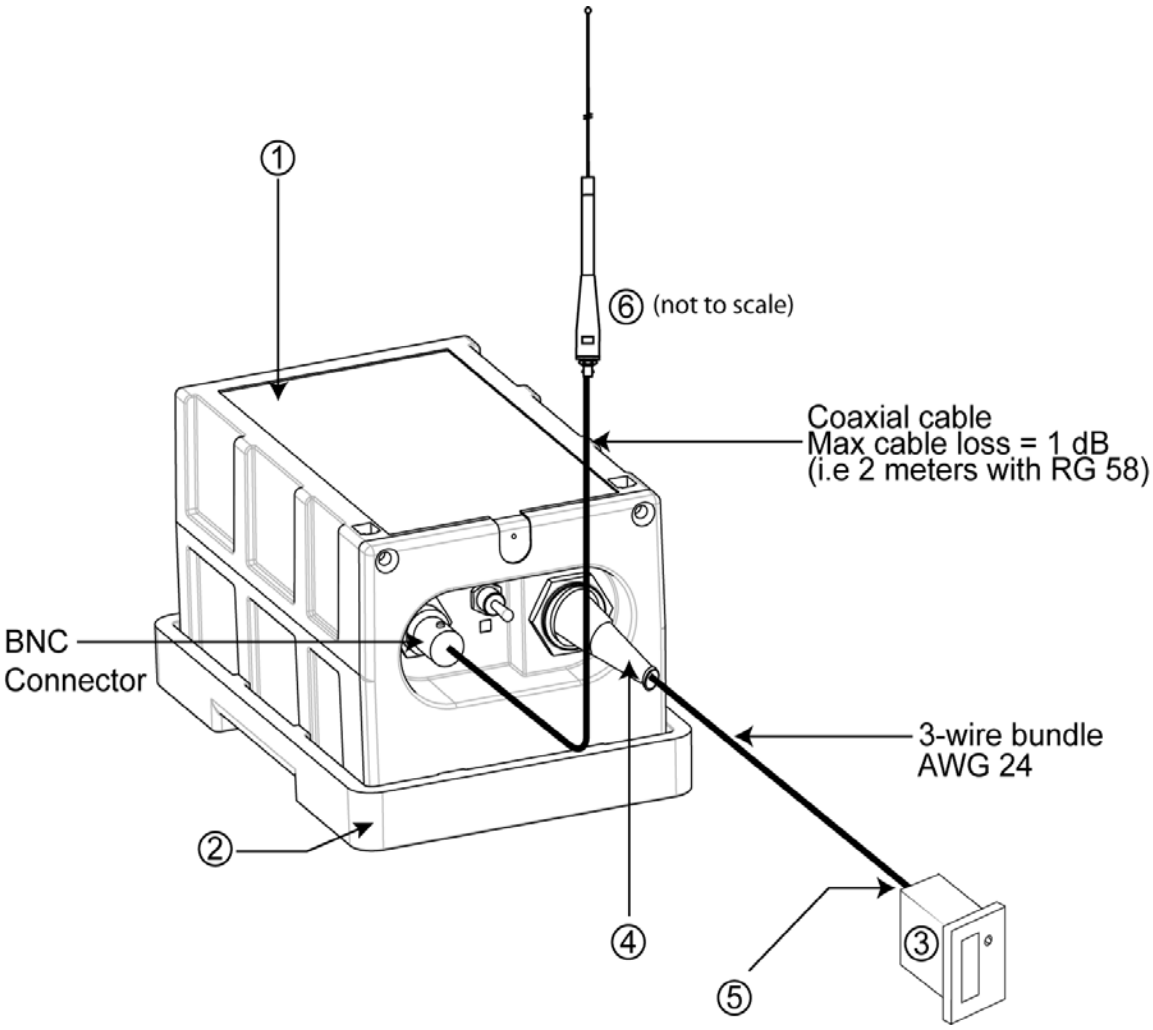



*Figure 2: ELT system description*

## 3. LINE REPLACEABLE UNITS

### *A. Transmitter*

The KANNAD 406 AF-COMPACT is an ELT designed to be installed onboard 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 KANNAD 406 AF-COMPACT is certified as Automatic Fixed (AF) ELT and only works with the outside antenna described in this manual.

The housing of KANNAD 406 AF-COMPACT transmitter is made of moulded plastic with excellent mechanical resistance (Polycarbonate, light yellow colour).

The ELT housing is designed with no sharp edges. It can be easily taken in one hand.


*Figure 3: KANNAD 406 AF-COMPACT Transmitter*

### *B. Bracket*

The bracket installed near the tail is designed to fix the ELT with a Velcro® strap. This enables quick removal of the ELT for maintenance or exchange.


*Figure 4: KANNAD 406 AF-COMPACT with Mounting Bracket*

### *C. Remote Control Panel*

An RC200 remote control panel is available for installation in the cockpit in order to enable the pilot to monitor and control the ELT status.

The following controls are to be found on the panel:

- 3-position switch (ON, ARMED, RESET&TEST);
- red light;

The remote control panel is connected to the ELT via a 3-wire cable equipped with a DIN-12 connector on the ELT side and a D-SUB Female 9Pts connector on the other side.

Note: the 3-wire cable is not supplied.


*Figure 5: RC200 Remote Control Panel*

### *D. Outside antenna*

The outside antenna is a whip antenna (ANT200, P/N 0141013).

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

Note: the 50 Ohm coaxial cable and the male BNC connector are not supplied.

*Figure 6: Whip antenna ANT200*

# SYSTEM FUNCTIONAL DESCRIPTION AND OPERATION

## 1. Transmitter Functional Description

### *A. Transmission*

The KANNAD 406 AF-COMPACT 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 the RC200 Remote Control Panel).

The KANNAD 406 AF-COMPACT 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 with an output power of 100 mW. The modulation is an audio frequency sweeping downwards from 1420 Hz to 490 Hz with a repetition rate of 3 Hz. The AM modulation factor is over 85%.

During operations, a digital message is transmitted on 406.028 MHz every 50 seconds. The output power on 406 MHz is 5 W.

Bi-phase modulation at 400 bps enables transmission of all relevant identification information to the COSPAS-SARSAT satellites in 440 ms.

### *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. Visual indicator (red);
3. DIN 12 socket for connection to Remote Control Panel, programming dongle or programming equipment;
4. BNC connector for the antenna.

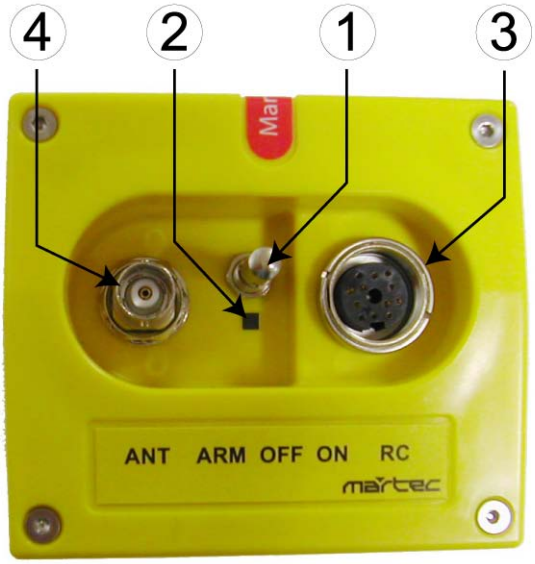



*Figure 101: Front Panel*

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

- after the self test:
  - a series of short flashes indicate the self test failed,
  - one long flash indicates a correct self test;
- in operating mode:
  - periodic flashes during 121.5 transmission,
  - long flash during 406 transmission.

A buzzer gives audio information on the beacon working:

- continuous tone during self test;
- 2 beeps per second during 121.5 transmission;
- silence during 406 transmission.

### *C. Working mode information*

The KANNAD 406 AF-COMPACT has 4 different modes:

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

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

*(1) Off*

The ELT is off when the switch is in position "OFF".

No part of the ELT is energized.

This mode must **only** be selected when the ELT is removed from the aircraft.

*(2) Self-Test*

The self-test mode is a temporary mode (max duration 5 sec) 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 the Remote Control Panel (provided that the switch of the ELT is in position "ARM");
- 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 visual indicator as follows:

- One long flash indicates valid test.
- A series of short flashes indicates false test result.

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.

It is recommended to test the ELT regularly in order to detect any possible failure (Refer to 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 and test equipment (PR600).

*(3) Armed*

In order to enable activation by the G-Switch or with the 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.

The Remote Control Panel is energized by the ELT when the ELT's switch is on "ARM" position.

*(4) On*

This mode is selected:

- manually by switching the ELT to "ON";
- by switching the 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);
- on 121.5 MHz (continous transmission between each 406 MHz burst).

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

- Red visual indicator:
  - 1 short flash during ELT transmission on 121.5 MHz (every 0.5 seconds);
  - 1 long flash during ELT transmission on 406 MHz (every 50 seconds).
- Buzzer:
  - 2 Hz pulse signal (recurrence 500 ms) during ELT transmission on 121.5 MHz.

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

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

### *D. Autonomy*

The energy is provided by a battery pack composed of a $LiMnO_2$ two-element battery (See pages 108 & 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.***

The duration of the 121.5 transmissions is over 48 hours at -20°C

Unlike other ELTs, the 406 MHz transmission of KANNAD 406 AF-COMPACT is not stopped after 24 hours and 406 MHz transmission is continuing beyond 48 hours.

The transmitter battery expiry date is fixed at 6 years after manufacturing. If no activation of the ELT occurs during the battery lifetime, it shall be replaced every 6 years(see note below).

NOTE: The useful life time of batteries is twelve (12) years. To be in compliance with FAR regulations, they have to be replaced every (6) years when 50 percent of their useful life has expired.

## *E. Transmitter Technical characteristics*

*(1) Mechanical characteristics*

The ELT housing is to be installed on a Mounting Bracket (P/N S1840502-01).

*(2) Material*

- Material: Polycarbonate.
- Treatment: Light yellow color (RAL 1018), Fire classification M0.

*(3) Overall Dimensions*

Refer to 1. ELT Outline Dimensions, page 501

- Transmitter outline dimensions: 131 x 86 x 75.4 mm (5.157 x 3.385 x 2.968 inches).
- Outline dimensions with mounting bracket: 140 x 98 x 86.4 mm (5.512 x 3.858 X 3.40 inches).

*(4) Weight*

- Typical: 850 gr (1.874 lb).
- Max.: 875 g.r (1.929 lb).

*(5) Electrical characteristics*

Transmitter power supply: $LiMnO_2$ two-element battery.

*(6) Electrical interface*

When installed onboard, the ELT has to be connected:

- to RC200 Remote Control Panel via a DIN12 socket (J1);
- to an outside antenna via a BNC female connector (J2).

The DIN12 socket is also used to connect programming dongle or programming and test equipment.

(a) J1

DIN 12 socket J1 is dedicated for connection to the Remote Control Panel, to a Programming or Maintenance Dongles and/or to a programming equipment (PR600).

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

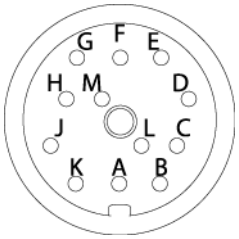
| J1 | PIN | Signal Name | Destination | Direction |
|---|---|---|---|---|
| Viewed from Front Face   | J1-A | RCP TEST/RESET | RCP | IN |
| | J1-B | DONGLE RX | SMM / PGM | IN |
| | J1-C | DONGLE CS | SMM | OUT |
| | J1-D | DONGLE SK | SMM | OUT |
| | J1-E | DONGLE TX | SMM / PGM | OUT |
| | J1-F | DONGLE ALE2P | SMM | OUT |
| | J1-G | RCP COMMON | RCP | OUT |
| | J1-H | RCP BUZZER | Not used | |
| | J1-J | RCP LED | RCP | OUT |
| | J1-K | N/C | | |
| | J1-L | DONGLE GND | SMM / PGM | OUT |
| | J1-M | N/C | | |

*Table 1: J1 connector pin-out*

(b) J2

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

IMPORTANT: The length of the coaxial cable should not exceed 2 meters (6 ft) for a standard RG58 or equivalent coaxial cable. If the cable length exceeds 2 meters, a low loss cable of attenuation less than 1 dB must be used.

## *F. Transmitter Technical Specifications*

**TYPE**
- Two-frequency ELT (121.5 / 406.028 MHz)
- Automatic fixed
- COSPAS-SARSAT Category II (-20°C to +55°C).

**406 MHz TRANSMISSION**
- Frequency: 406.028 Mhz+/-1 kHz
- Output power: 5W (37 dBm +/- 2 dB)
- Modulation type: 16K0G1D (Biphase L encoding)
- Transmission duration: 440ms (short message) every 50 sec.
- Autonomy: Over 48 hours at -20°C

**121.5 MHz TRANSMISSION**
- Frequencies: 121.5 MHz +/- 6 kHz
- Output power: 100 to 400 mW (20dBm to 26 dBm)
- Modulation type: 3K20A3X
- Modulation rate: > 85 %
- Frequency of modulation signal: 1420 Hz to 490 Hz with decreasing sweep
- Autonomy: Over 48 hours at -20°C

**CONTROLS**
- ARM / OFF / ON switch
- Bright red visual indicator
- BNC antenna connector
- DIN12 socket for remote control panel (RCP) and pin programming option.
- Buzzer

**G-SWITCH SENSOR**
Mechanical G-switch sensor compliant with EUROCAE ED62 specifications

**BATTERY**
KIT BAT200, P/N: S1840510-01
$LiMnO_2$ two-element battery for transmitter power supply
Replacement every 6 years

**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)
Overall dimensions:
max 140 x 98 x 86.4 mm
(5.512 x 3.858 x 3.4 inches)
Weight including batteries:
- typical 850 gr. (1.874 lb);
- max 875 gr. (1.929 lb).

Tightness: O-rings

**ENVIRONMENTAL CONDITIONS**
RTCA DO-160E / EUROCAE Section 4 to 26:
[ED62]X[ED62]A[ED62][SYLMC]EYXXXXZXXX[ZC][ED62]B[XXXXX]XXX[ED62]

**QUALIFICATIONS**
ETSO-2C91a & ETSO-2C126 (EASA)
***TSO-C126 Pending***
COSPAS-SARSAT TAC N° 167

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

## 2. Remote Control Panel RC200 Functional Description

### *A. General*

The RC200 Remote Control Panel is designed to be installed in the cockpit to enable the pilots to control the ELT onboard.

The RC200 enables the remote control of the primary functions of the KANNAD Emergency Locator Transmitters (Manual activation, Reset, Test) as well as visual monitoring.

### *B. RC200 Controls and Connector*

The following elements are to be found on the RC200 Remote Control Panel:

1. On / Armed / Reset-Test, a 3-position switch.
2. Red led annunciator.
3. J1, single male 9-pin D-SUB connector.

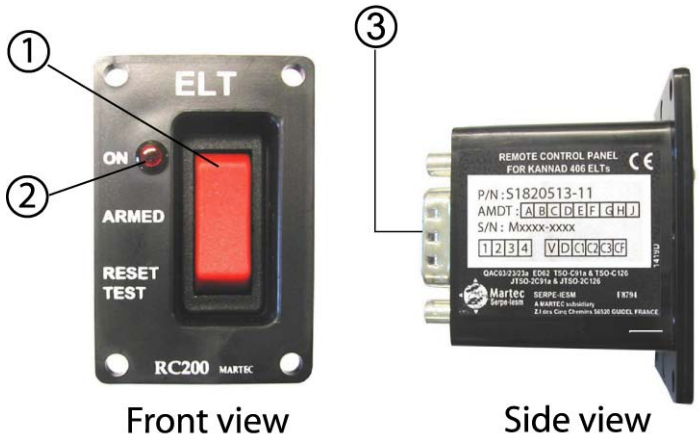



*Figure 102: RC200, Controls and Connectors*

### *C. RC200 Working mode information*

The RC200 enables remote control and remote monitoring of the KANNAD 406 AF-COMPACT **provided that the ELT switch is in armed position**.

*(1) Remote Control*

Remote control is accomplished through a 3-position switch:

- ON (transmission) enables manual activation of the ELT.
- ARMED (stand by mode to enable automatic activation by the shock sensor) is an idle position. **Unless there is an emergency, the switch must stay in this position.**
- RESET-TEST is used either to stop the ELT transmission if activated or to perform a self-test.

The "OFF" mode is not available on the remote control panel but directly on the ELT itself by switching it in "OFF" position.

*(2) Monitoring*

Monitoring is accomplished through a led operating in the same way as the ELT visual indicator:

- Transmission:
  - 2 Hz pulsed signal during ELT transmission on 121.5 MHz;
  - 1 long flash during ELT transmission on 406 MHz (every 50 seconds).
- Self-test:
  - 1 short flash at the beginning of the self-test sequence;
  - 3 + N flashes at the end of the self-test sequence if the ELT is faulty (N depends of type of failure, Refer to (2) Self-Test, page 103);
  - 1 long flash at the end of the self-test sequence if the ELT is correct.

### *D. RC200 Technical Characteristics*

*(1) Mechanical characteristics*

The RCP housing is to be fixed:

- either on the instrument panel with 4 rivets bush (not supplied);
- or below the instrument panel with a special mounting tray (supplied).

(a) Material

- Material: Moulded plastic.
- Color: Black with matt finish.

(b) Overall Dimensions

Refer to 3. RC200 Outline Dimensions, page 503

Outline dimensions: 33 x 50 x 43 mm (1.3 x 1.97 x 1.69 inches).

(c) Weight

Approx. 40 gr. (0.088 lbs).

*(2) Electrical Characteristics*

The RC200 RCP is energized by the ELT when the ELT's switch is on ARM position.

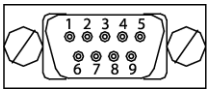
- Switch:
  - ON / ARM / RESET-TEST 3-position switch.
  - Type of contacts: alloyed silver.
  - Conductive material: Silver-plate alloyed copper.
  - RESET: unstable position
- Led annunciator:
  - Color: red.
  - Peak - Wavelength: 635 nm.
  - Viewing angle: 50 degrees.

*(3) Electrical Interfaces*

A single male 9-pin D-SUB connector (J1) enables to connect the RC200 remote control panel to the KANNAD 406 AF-COMPACT with a 3-wire cable (AWG 24, shielded recommended).

On the ELT side, the wires are soldered to a male DIN 12 connector.

On the RCP side, the wires are connected to a female 9 pin D-SUB connector.

| Sub-D 9 Pts Male | | Signal name | Destination |
|---|---|---|---|
| Viewed from Front Face   | 1 | Not used with KANNAD AF Compact | |
| | 2 | RCP BUZZER(1) | ELT |
| | 3 | BUZZER GND(1) | BUZZER |
| | 4 | RCP RESET | ELT |
| | 5 | RCP ON | ELT |
| | 6 | Not used with KANNAD 406 AF-Compact | |
| | 7 | | |
| | 8 | RCP COMMON | ELT |
| | 9 | RCP LED | ELT |

***Note: (1) RCP buzzer functionnality not featured by this model.***

*Table 2: J1, D-SUB 9 Pts Male Pin-out*

| Receptacle | |
|---|---|
| Standard designation | D-SUB - Male - 9 Pts |
| Number of pins | 9 |
| Locking device | Inserts, Threaded UNC 4-40 |
| KANNAD Reference | 0127012 |

*Table 3: D-SUB 9 Pts Male Characteristics*

| Mating connector | |
|---|---|
| Standard designation | D-SUB - Female - 9 Pts |
| Number of pins | 9 |
| KANNAD Reference | S1840506-01 |

*Table 4: D-SUB 9 Pts female, Mating Connector Characteristics*

### *E. RC200 Technical Specifications*

*(1) Photovoltaic Relay*

- Insulation: 1 KV
- Commutation 1A 60V

*(2) Environmental specifications*

- Operating temperature: - 20°C to + 55°C (DO160D section 4 category A2).
- Storage temperature: - 55°C to + 85°C (DO160D section 4 category A2).
- Magnetic effect: According to DO-160D section 15 category Z.

## *F. Antennas Technical Specifications*

ANT200 is a whip dual frequency antenna for aircraft up to 250 kts.

- Frequencies: 121.5 / 406 MHz.
- Impedance: 50 ohms.
- VSWR:
  - 2.0:1 or better at 121.5 MHz.
  - 1.5:1 or better at 406 MHz.
- Weight: 170 gr. max (0.375 lb).
- Temperature: -65°C to +71°C
- Connector: BNC female
- Mount: Ø 13 mm hole required (0.515 in.).
- Overall dimensions: 634.5 x 25 mm max (24.98 x 1 in.).
- Antenna height: 609.6 mm (24 in.).
- Speed rating: 250 Knots

Refer to 5. ANT200 Outline Dimensions, page 505.

## 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 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 the Remote Control Panel, ensure that:

- The ELT switch is the "ARM" position .

### *B. Manual activation*

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

## 4. Reset

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

***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 reset within this delay, no further radio contact will be necessary.***

### *A. Manual reset*

- Switch to " OFF ".

### *B. Reset with Remote Control Panel*

- The switch has to be in position "ARM" on the ELT.
- Switch to " RESET & TEST" on the remote control panel.

## 5. Self-Test

Refer to 1. Self-test, page 301

# INSTALLATION / REMOVAL

## 1. Registration and Programming

***The ELT must be registered prior to installation onboard.***

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

***The "Programming Datasheet" (DIM0300) must be completed and returned to your distributor.***

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

The KANNAD 406 AF-COMPACT is fully compatible with the four programming protocols defined by the COSPAS-SARSAT C/S G005 document:

- Serialised Number.
- Aircraft 24-bit Address (the same as MODE S ATC or TCAS).
- Aircraft Operator Designator + serialised number up to 4096.
- Aircraft Nationality and Registration marking (Tail Number). This identification consists of up to 7 alphanumeric characters.

Programming of the ELT can be carried out either:

- by KANNAD or the distributor (order must include programming details).
- in the shop or onboard with programming and test equipment (PC interface and DOS or Windows® software).
- onboard the aircraft with a programming equipment or Programming Dongle.

This operation takes less than 2 minutes and does not need any hardware operation. The identification is simply downloaded to the ELT when connected to the KANNAD programming equipment via the DIN 12 connector.

### *A. "Pin programming" option*

The KANNAD 406 AF-COMPACT 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 onboard. This Programming Dongle contains the identification information of the aircraft and remains onboard 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 onboard".

When a maintenance dongle is connected:

- Country code is ***227*** (France).
- Protocol is **Test**.
- Identification number is ***SI + 5 digits*** (the last 5 digits of 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*

## 2. ELT Installation

### *A. ELT and bracket installation recommendations*

The ELT shall not be installed within 60cm (2 ft) of a compass or flux gate.

Use cable of loss ≤ 1dB.

The ELT front panel should be easily accessible to connect the outside antenna and the remote control panel device and to check the ELT good operation (controls and lights).

*(1) FAA Recommendations*

Installation must be made by qualified personnel in accordance with FAA regulations. Duplicating a previous installation may not be acceptable. Refer to:

***FAA - Advisory Circular 43.13-2A (Acceptable Methods, Techniques, and Practices - Aircraft Alterations), specifically, Chapters 1, 2, 11 and 13.***

*(2) TSO C126 Paragraph D Requirements*

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

*(3) RTCA DO-182 Recommandations*

"*All ELT system components which must survive to a crash intact,...should be attached to the airframe in such a manner that the attachment system can support a 100g load... in the plus and minus directions of the three principal axes of the aircraft.*"

*(4) RTCA DO-204 Requirements*

*"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 Newton (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 meters (1 foot) nor more than 1.0 meter (3 feet) from the mounting location*."

### *B. Bracket installation procedure*

- Determine the location of the ELT onboard according to paragraph A. ELT and bracket installation recommendations page 203.
- The G-Switch axis shall be directed to sense the primary crash pulse along the longitudinal axis of the aircraft. Reference to the G-Switch is given by the arrow "Flight direction" on the label affixed to the top of the ELT.

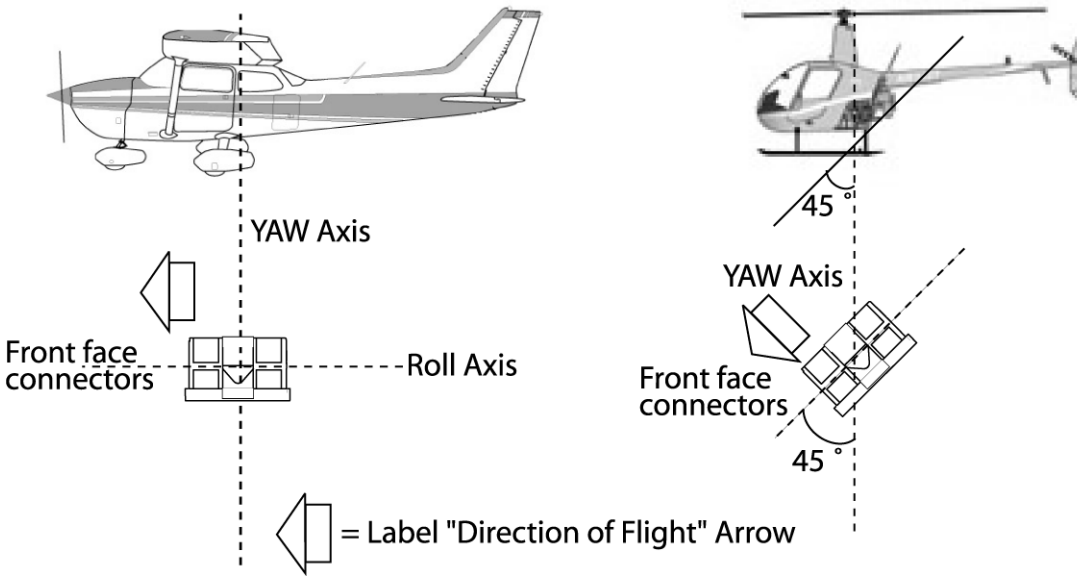



*Figure 202: KANNAD 406 AF-COMPACT, axis of installation*

*(1) Fixed wing aircraft*

The G-Switch sensor axis shall be pointed to sense the primary crash pulse along the longitudinal axis of the aircraft (with maximum tolerance of 15°). Consequently, the KANNAD 406 AF-COMPACT shall be mounted with the arrow of the "Flight direction" label pointed towards the front of the aircraft.

*(2) Helicopters*

The standard version of the KANNAD 406 AF-COMPACT may be installed on helicopter. The ELT unit should be mounted:

- with the front face connectors pointing downwards at a 45° angle to the yaw axis;
- and with "Flight direction" arrow towards the front of the helicopter.

*NOTE: Should the KANNAD 406 AF-COMPACT be installed onboard helicopter, it will be necessary to make a special mounting base to install the ELT.*

- Drill 4 holes Ø 6 mm in the aircraft structure according to "Drilling mask". Inner holes (1, 2, 3, 4) shall be preferred.
- If the aircraft structure is not solid enough to withstand a 500 kg traction on the bracket, a reinforcement plate (not supplied) should be installed as shown Figure 203: Bracket installation.
- Fix the bracket with the 4 screws, 8 washers and 4 nylstop nuts supplied. **IMPORTANT: tighten to a torque between 4 and 5 Newton x meter.**
- Verify that the ELT identification label matches the aircraft tail number.

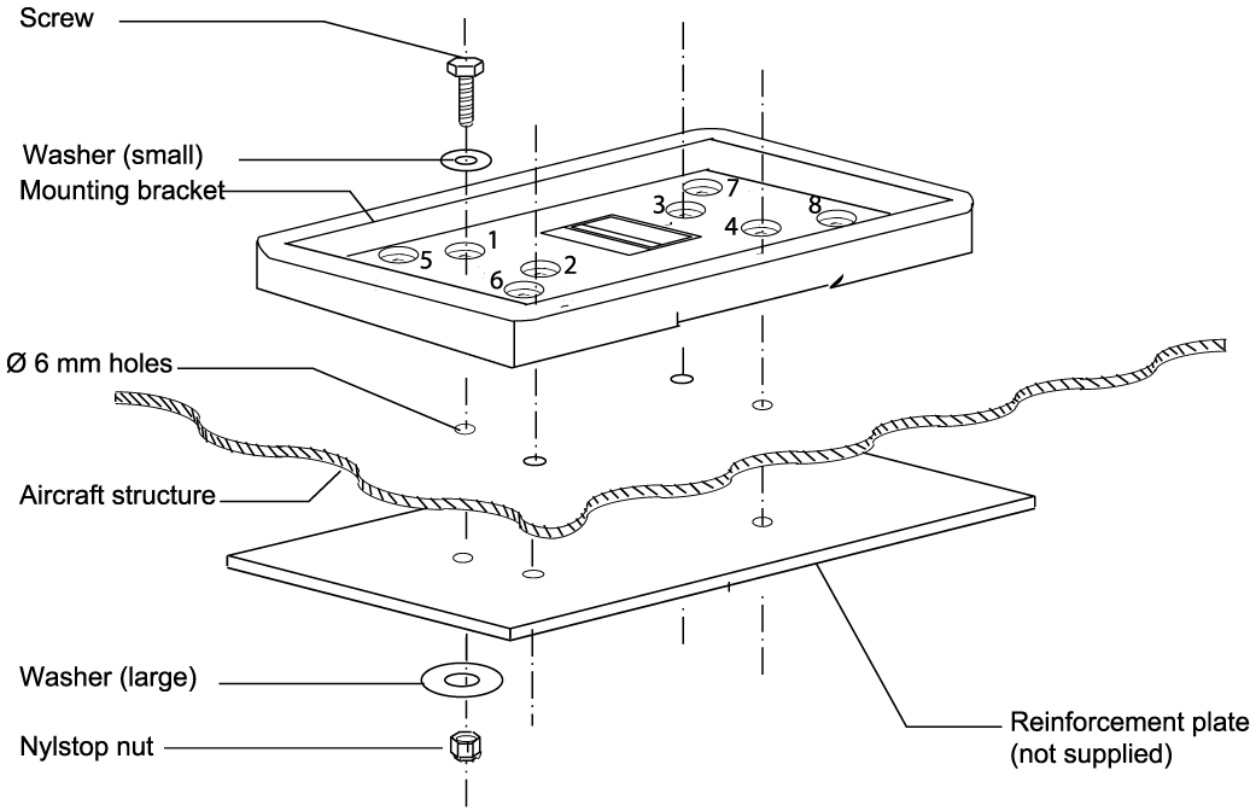



*Figure 203: Bracket installation*

### *C. ELT installation procedure*

1. Mount the transmitter on the bracket "Flight direction" arrow pointed towards the front of the aircraft (Figure 202: KANNAD 406 AF-COMPACT, axis of installation).
2. Slide the self-stripping 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 self-stripping strap tightly.

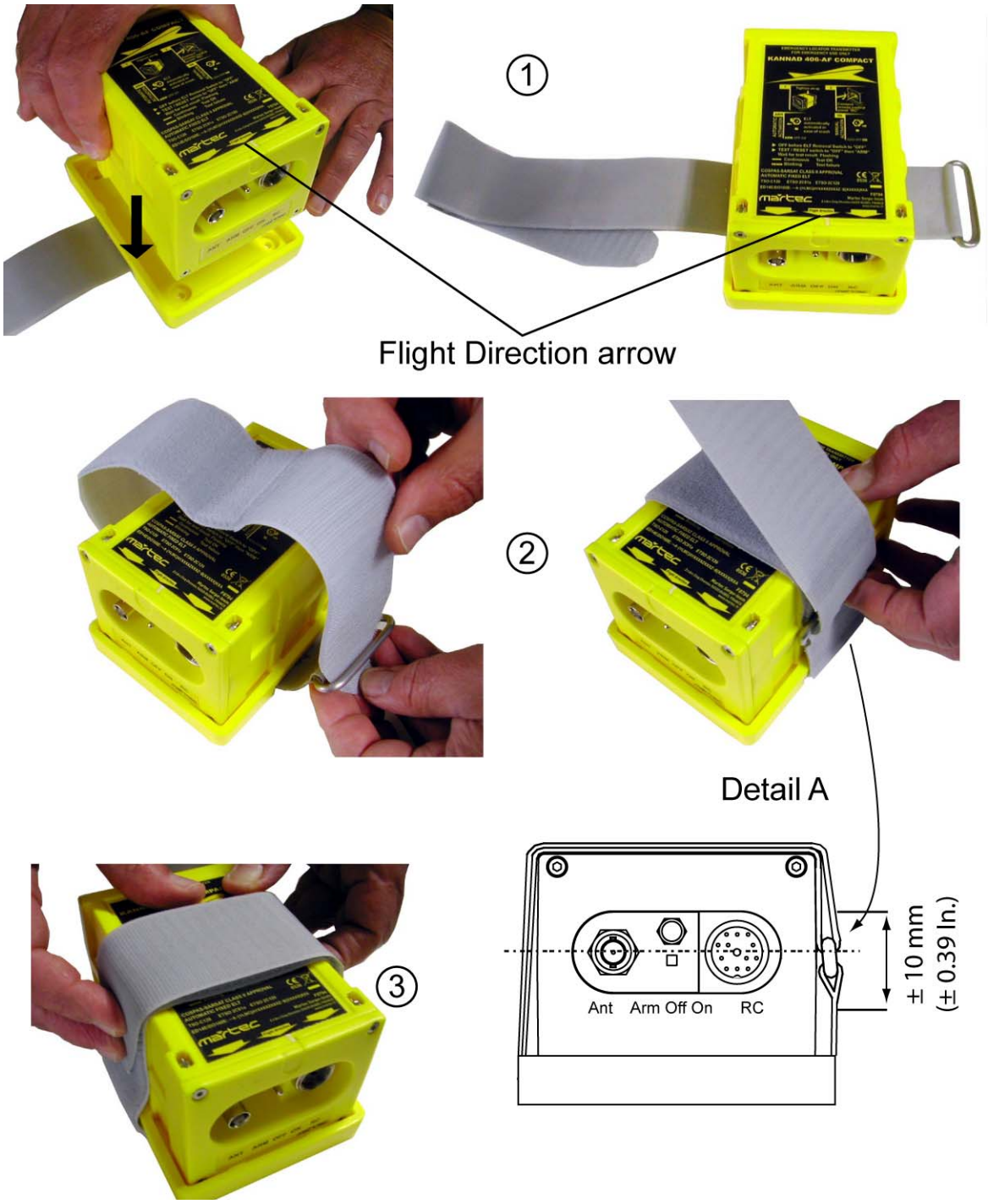



*Figure 204: Installing the transmitter on the bracket*

## 3. Antenna Installation

Use only whip approved antenna (ANT200).

### *A. Antenna Installation Recommendations*

*(1) FAA Recommendations*

Installation must be made by qualified personnel in accordance with FAA regulations. Duplicating a previous installation may not be acceptable. Refer to:

**FAA - Advisory Circular 43.13-2A (Acceptable Methods, Techniques, and Practices - Aircraft Alterations), specifically, Chapters 1, 3, 11 and 13.**

*(2) RTCA DO-204 Requirements*

"*The antenna shall be mounted to provide either right-hand circular or vertical polarization when the aircraft is in the normal flight attitude.*"

"*The antenna shall be installed as close to the unit as possible. The proximity of the ELT antenna to any vertically-polarized communications antenna shall be such as to minimize radio frequency interference and radiation pattern distorsion of either antenna.*"

"*The antenna mounting surface shall be able to whistand a static load equal to 100 times the antenna's weight applied at the antenna mounting base along the longitudinal axis of the aircraft".*

### *B. Antenna mounting location*

The antenna must be mounted on the top of the aircraft to assure maximum visibility of satellites. The upper aft portion of the fuselage should be preferred. It should be mounted away from projections such as a propeller, tail surfaces, or the shadow of large antennas.

Locate a position on the fuselage where:

- the antenna can be installed vertically with at least antenna length [(o.61 meters, 24 inches) clearance from other antennas (specially VHF) mounted on the aircraft,
- when installed, the coaxial cable of the antenna will not cross any major structural sections in the aircraft so that, in the event of a crash, the ELT and the antenna are in the same section (placing the antenna directly above the ELT unit being the best solution).

If the ELT transmitter and outside antenna are on opposite sides of an airframe production break, the components should be secured to each other by a tether that can support a 100 G load (ELT weight x 100). The interconnecting antenna-to-ELT cable should have sufficient slack on both ends that it will not

be subjected to any tensile load and should be tied loosely to the tether.

### *C. Antenna installation procedure*

Ensure that the antenna mounting location meets the requirements as described § B. Antenna mounting location.

A double plate will most likely be necessary for the antenna to meet rigidity specifications in § B. Antenna mounting location.

A 9 Kilogram force (20 pound force) applied in all direction should not cause an appreciable distorsion in the aircraft skin.

Each of the approved antennas requires a ground plane. On fabric-covered aircraft or aircraft with other types on nonmetallic skins, a ground plane must be added. This can be accomplished by providing a number of metal foil strips in a radial position from the antenna base and secured under the fabric or wood skin of the aircraft. The length of each foil radial should be at least equal to the antenna length [(0.61 meter, 24 inches for ANT200)].

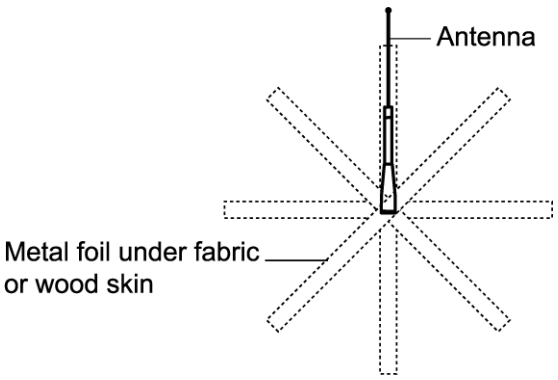



*Figure 205: Antenna ground plane for non metallic aircraft*

According to the antenna to be installed, use the appropriate outline drawings and drilling masks to determine the hole patern and drill size (Refer to § 5. ANT200 Outline Dimensions, page 505).

Fabricate a 50 Ohms coaxial cable long enough to reach between the ELT installation location and the antenna location.

**IMPORTANT: The length of the coaxial cable should not exceed 2 meters (6 ft) for a standard RG58 or equivalent coaxial cable. If the cable length exceeds 2 meters, a low loss cable of attenuation less than 1 dB must be used.**

Fit both ends of coaxial cable with a waterproof Male BNC connector (not supplied), reference RADIALL R141007 or equivalent.

Connect one Male BNC connector to the antenna Female BNC socket.

## 4. RCP installation

### *A. RCP Installation Recommendations*

The RC200 shall be readily accessible from the pilot's normal seated position. If possible, the RC200 should be installed in the cockpit in an area that is not directly exposed to sun rays.

### *B. RCP Installation Procedure*

The RC200 is designed to be installed:

- either on the instrument panel with 4 screws (rivets bush recommended, not supplied );
- or below the instrument panel with a special mounting tray (supplied).

*(1) Installation on the instrument panel*

- Determine RC200 location on the instrument panel:
- Mark a cutout on the instrument panel according to the Drilling mask (Refer to § 4. RC200 Drilling Mask, page 504).
- Make the cutout.
- Mark the 4 holes needed for the RC200 using the drilling mask or the RC200 as a guide.
- Drill the 4 marked holes, diameter depending on rivets bush used.
- Install the RC200 by fitting it into the cutout.
- Secure the RC200 (4 rivets bush recommended).
  Note: Rivets bush are not supplied.

*(2) Installation below the instrument panel*

Figure 206: Installation of RC200 with mounting tray

Determine RC200 location below the instrument panel (be sure the location meets the requirements established in RTCA-DO-204).

- According to the "area to be drilled" (1) of the mounting tray (3), determine the location of the screws or rivets (2) used to secure the mounting tray (3) to the instrument panel (4).
- Drill 2 holes on the mounting tray and on the instrument panel, diameter depending on screws or rivets used.
- Secure the mounting tray (3) to the instrument panel (4).
- Secure the RC200 (5) to the mounting tray (3) with the 2 screws (6) supplied (torque 0.8 Nm).

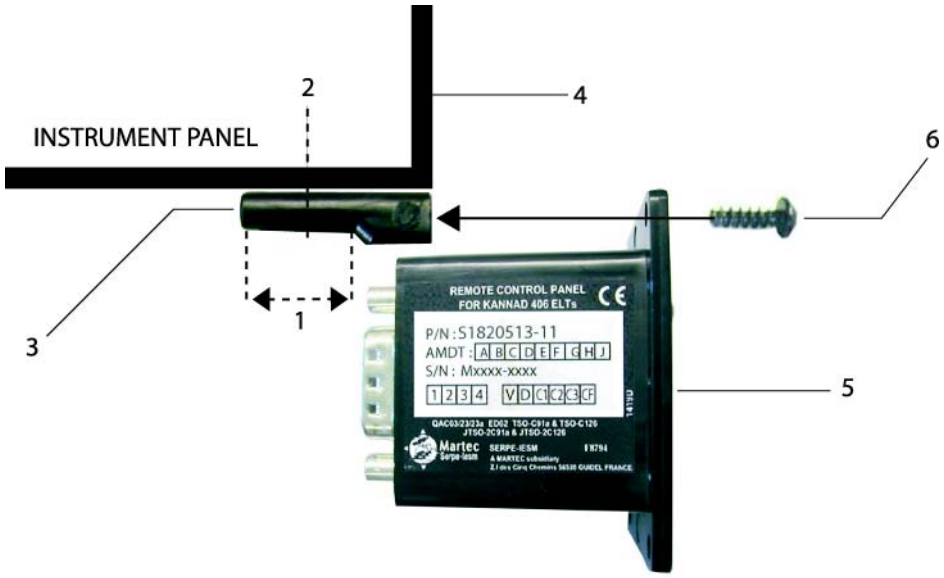



*Figure 206: Installation of RC200 with mounting tray*

*(3) Connection*

Fabricate a 3-wire bundle (AWG 24, shielded preferred) long enough to reach between the ELT installation location and the cockpit panel RCP location.

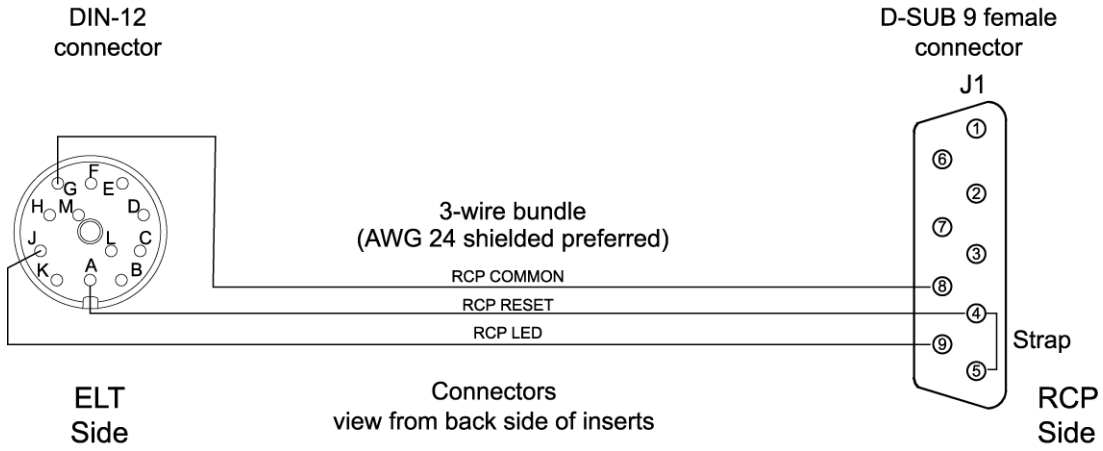



*Figure 207: Wiring of 3-wire bundle*

Slide heat-shrinkable sleeves on both sides of each wire.

On the ELT side:

- Solder the wires to the DIN12 connector supplied with the pack:
  - solder the wires to pins G (RCP COMMON), A (RCP RESET) and J (RCP LED) of the connector.
  - Put heat-shrinkable sleeves to protect the pins

On the RCP side:

- Strap pins 4 and 5 of the female 9-pin D-SUB connector supplied with the pack.
- Solder the wires to the female 9-pin D-SUB connector as follows:
  - Pin 8 (RCP COMMON) has to be connected to Pin G (RCP COMMON) of the ELT;
  - Pin 4 (RCP RESET) has to be connected to Pin A (RCP RESET) of the ELT;
  - Pin 9 (RCP LED) has to be connected to Pin J (RCP LED) of the ELT.
  - Put heat-shrinkable sleeves to protect the pins.
- Connect the female 9-pin D-SUB connector to the male 9-pin D-SUB socket of the RC200.

## 5. ELT Connection

1. Connect the cable of the outside antenna to the BNC connector of the front panel.
2. Connect the DIN12 connector of the Remote Control Panel cable to the DIN 12 socket of the front panel.
3. Set the 3-position switch of the front panel to ARM.

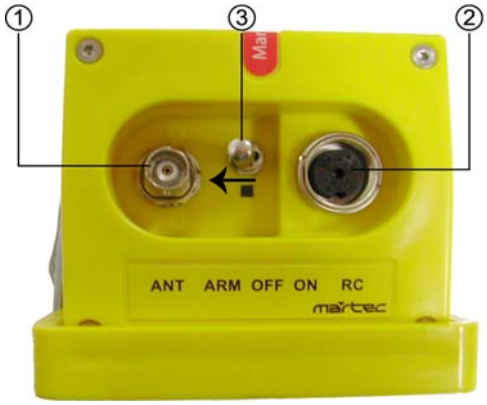



*Figure 208: Installation, controls and connectors*

- Perform the first power up procedure (Refer to § 6. First power up, page 212).

## 6. First power up

*Note: Antenna and RCP must be connected.*

*Caution: never switch to ARM or ON if neither antenna cable nor 50 ohm load is connected to the ELT (1. BNC connector),* ***risk of ELT damage.***

Perform the following tests:

1. ELT operational tests:
   - connect RCP to J1 and outside antenna to J2;
   - switch the ELT from OFF to ARM;
   - check that the Self-Test result is OK (one long flash).
2. RCP operational tests:
   Refer to § B. RCP operational tests, page 302.
3. 406 & 121.5 MHz transmission tests (optional):
   Refer to § C. 406 and 121.5 MHz transmission test, page 303.

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

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

- either automatically by G-Switch sensor if a crash occurs;
- or manually by RC200 Remote Control Panel.
  ***Note : switching to ON directly on the ELT front panel will also activate the ELT.***

## 7. Removal

1. Switch the ELT to OFF.
2. Disconnect the outside antenna from the BNC connector of the ELT.
3. Disconnect the DIN 12 Connector of Remote Control Panel 3-wire bundle from the DIN12 socket of the ELT.
4. Unfasten the self-stripping strap.
5. Remove the transmitter from the bracket.

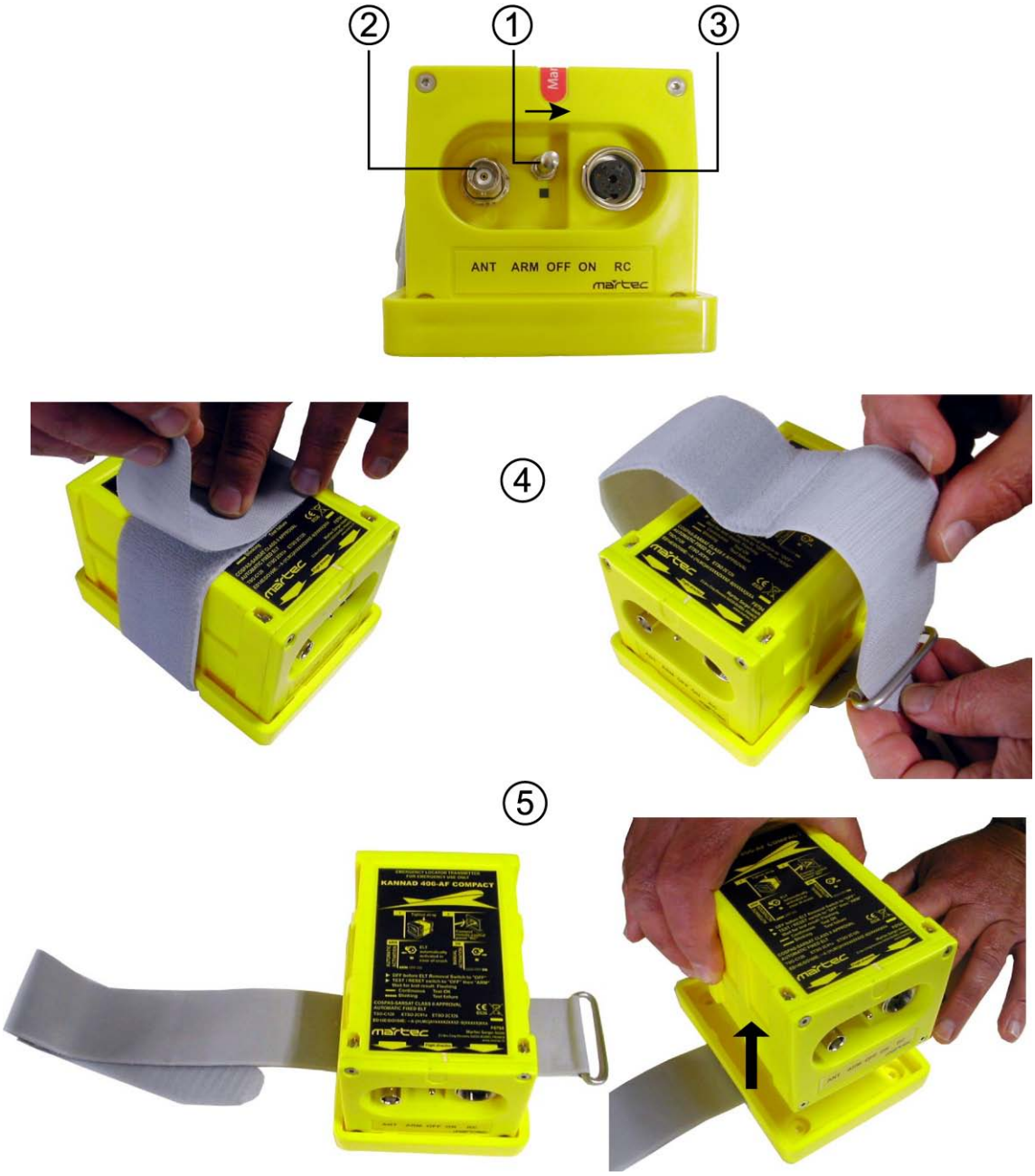



*Figure 209: Removing the transmitter*

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## CHECK

### 1. Self-test

#### *A. Periodicity*

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

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

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.

***Do not perform Self-test without the antenna connected.***

#### *B. Self-test procedure*

- Check that the antenna is correctly connected.
- Switch from position "OFF" to position "ARM" or press "RESET & TEST" on the Remote Control Panel (ensure that the ELT switch is in position "ARM").
  - The buzzer operates during the whole Self-test procedure.
  - After a few seconds, the test result is displayed with the LED as follows:
    - One long flash indicates that the system is operational and that no error conditions were found.
    - A series of short flashes indicates the test has failed.
- Switch back to "OFF".

***If self-test fails, contact the distributor as soon as possible. Unless a waver is granted, flight should be cancelled.***

***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 |

## 2. Operational tests

These tests must be performed by maintenance personnel when performing the first power up procedure or to check RCP monitoring and control (Refer to B. RCP operational tests) or transmitter (Refer to C. 406 and 121.5 MHz transmission test).

### *A. ELT operational tests*

- connect RCP to J1 and outside antenna to J2;
- switch the ELT from OFF to ARM;
- check that the Self-Test result is OK (one long flash).

### *B. RCP operational tests*

Check correct operation of RCP LED annunciator and external buzzer by switching ELT and RCP as described in the sequential procedure hereunder (with ELT switch in the "ARM" position).

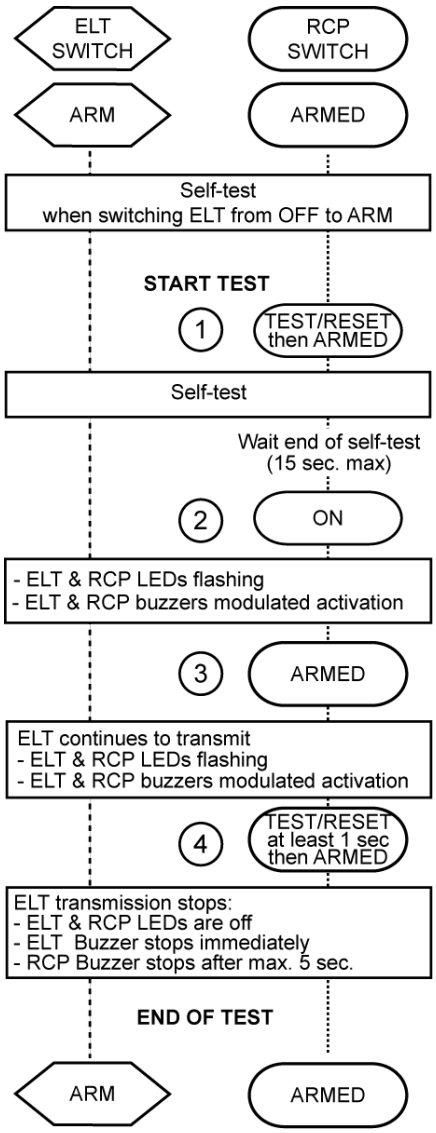


*Figure 301: RCP LED operation*

### *C. 406 and 121.5 MHz transmission test*

*(1) 406 MHz*

This test must be carried out with a COSPAS-SARSAT decoder.

- Perform self-test (Press RESET and 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 53 C3 24 97 38 0B A6 0F D0 F5 20*

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

*FF FE D0 53 C3 24 97 38 0B A6 0F D0 F5 20*

*(2) 121.5 MHz*

***This check shall only be conducted during the first five minutes of any UTC, (co-ordinated universal time) hour, and restricted in duration to not more than five seconds. Be sure to notify any nearby control tower of your intentions.***

This test must be carried out with a VHF receiver (Aircraft VHF receiver may be used).

- Tune VHF receiver to 121.5 MHz;
- Start transmission:
  - either on ELT: ON position;
  - or on the RCP: ON position (the ELT shall be in ARM position);
- Listen to the two 121.5 MHz "sweep tones" **during not more than the first five seconds** then stop transmission (see imporant notice below):
  - either on ELT: OFF or ARM position;
  - or on the Remote Control Panel: press TEST and RESET (the ELT shall be in ARM position).

**IMPORTANT: Do not allow test duration to exceed 5 seconds. If the ELT operates for approximately 50 seconds, a 406 MHz signal is transmitted and is considered valid by the satellite system.**

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# TROUBLESHOOTING

## 1. General

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

## 2. Faults on Self-test

### *A. Visual Indicator*

When the self-test is carried out, the number of flashes gives an indication of the faulty parameter detected during the self-test.

*(1) 3+1 flashes*

- Low battery voltage:
  Replace battery: Refer to § (4) Battery pack replacement, page 604.

*(2) 3+2 flashes*

- Low RF power:
  Check 406 MHz power: Refer to § (3) Measurement of output powers, frequencies and verification of digital message, page 603.
  If power too low, refer to CMM 25-63-03 for repair.

*(3) 3+3 flashes*

- Faulty VCO locking (faulty frequency):Refer to § (3) Measurement of output powers, frequencies and verification of digital message, page 603.
  If test fails, refer to CMM 25-63-03 for repair.

*(4) 3+4 flashes*

- No identification programmed
  Check programming: Refer to § (3) Measurement of output powers, frequencies and verification of digital message, page 603.
  To re-program the ELT refer to PR600 Programming kit user manual (included in WinProg CD-Rom, programming software).

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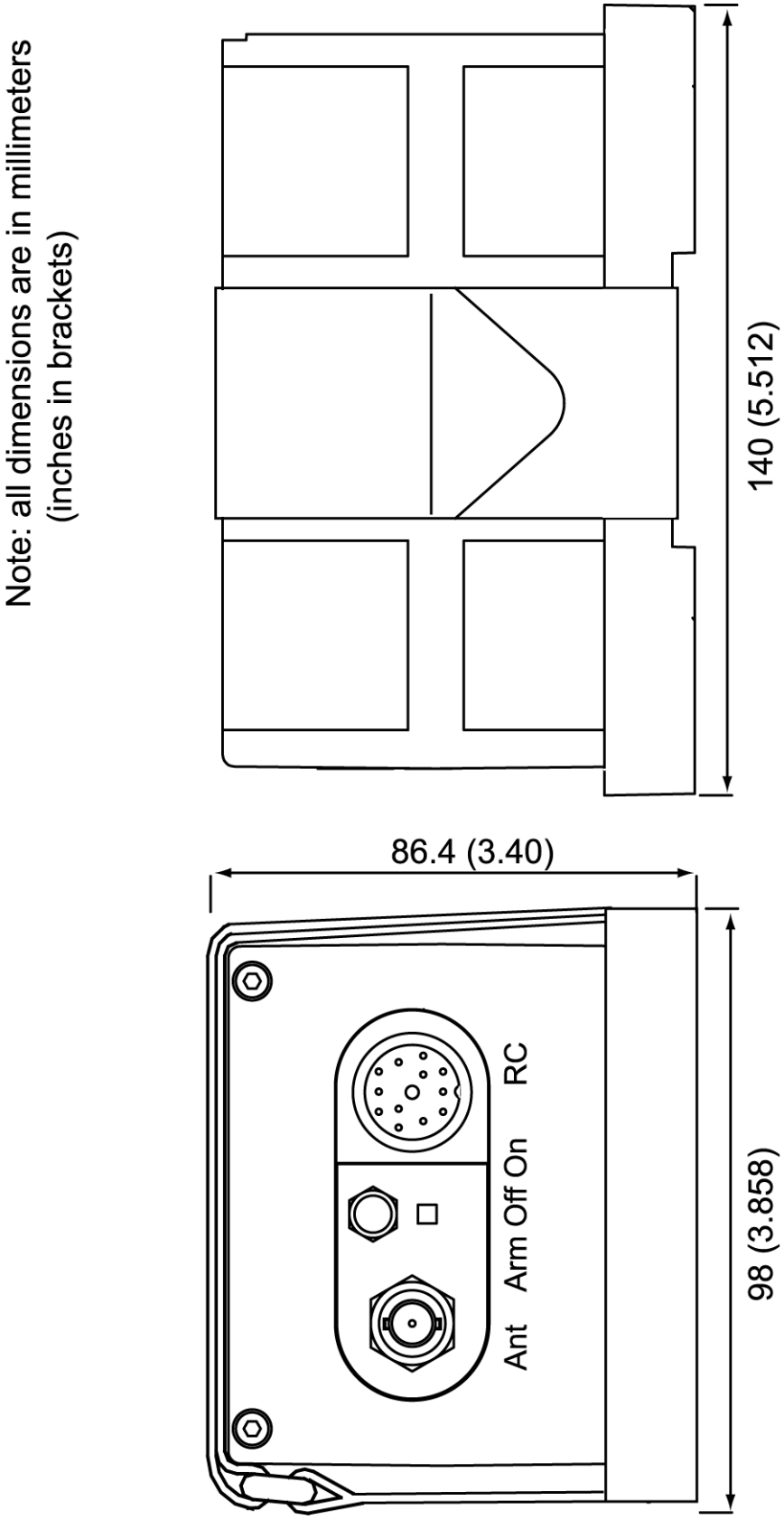
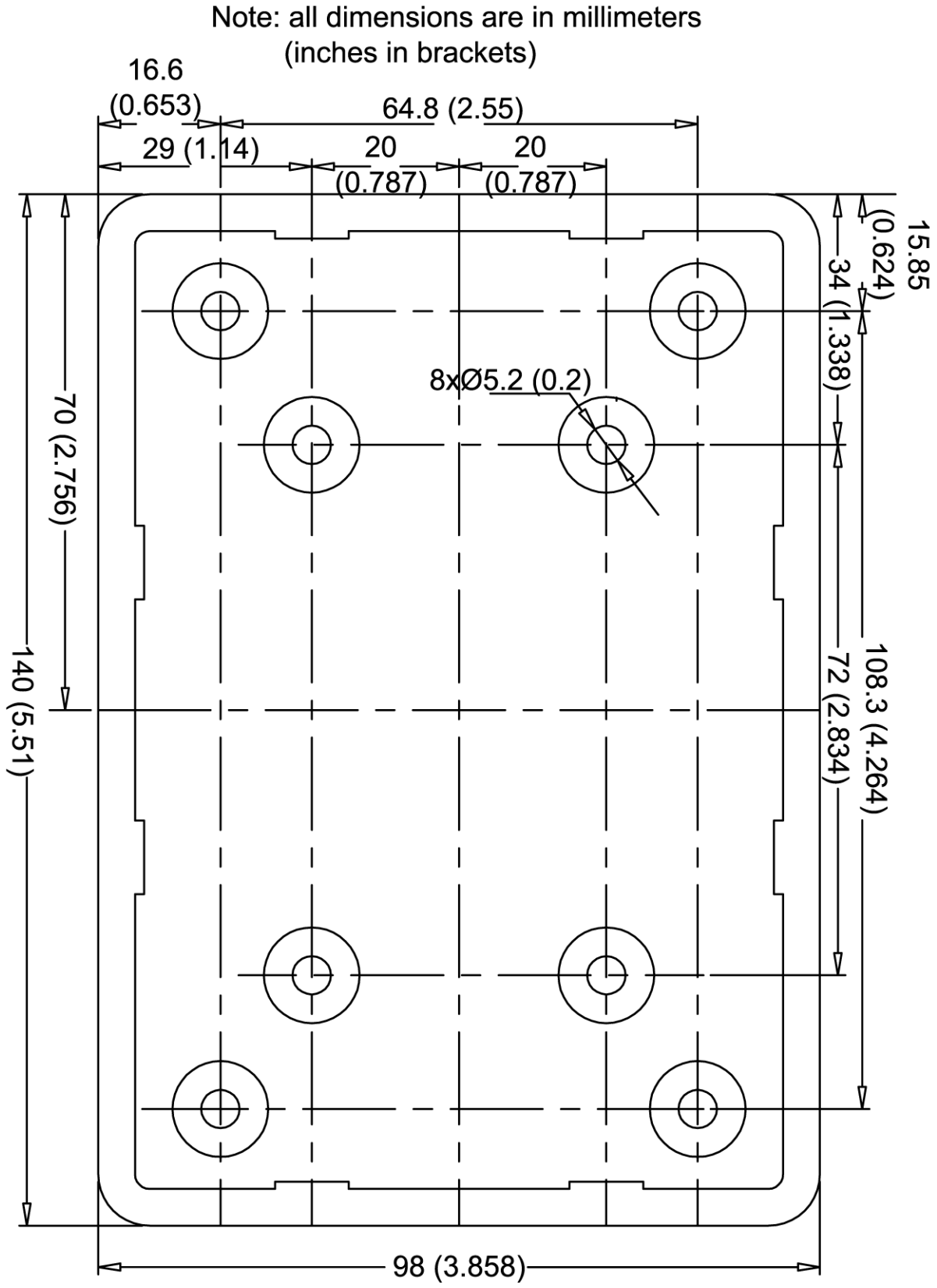
## SCHEMATICS & DIAGRAMS

### 1. ELT Outline Dimensions

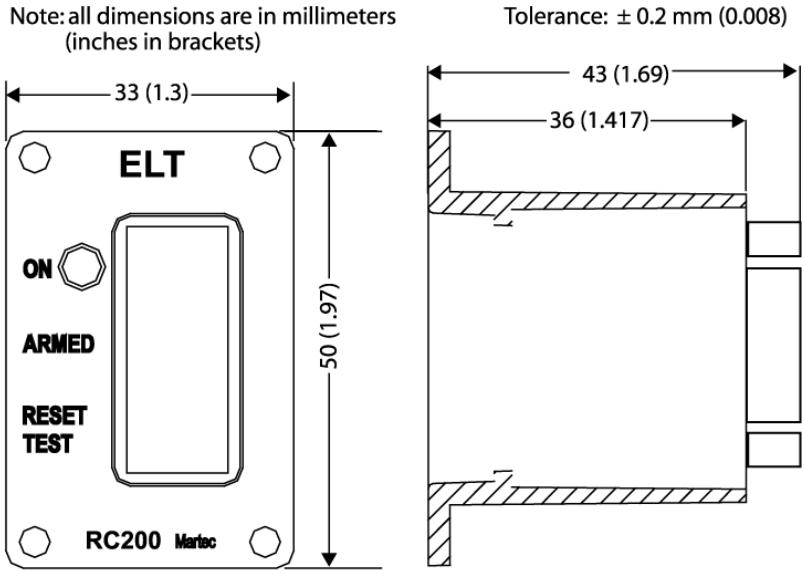
Note: all dimensions are in millimeters
(inches in brackets)



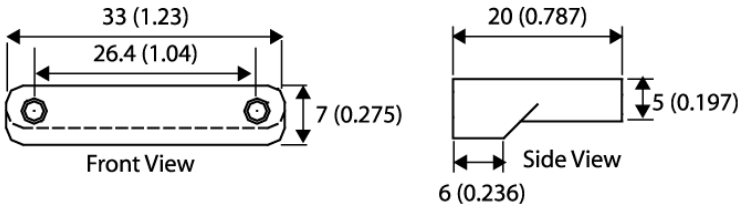
## 2. ELT Drilling Mask



## 3. RC200 Outline Dimensions

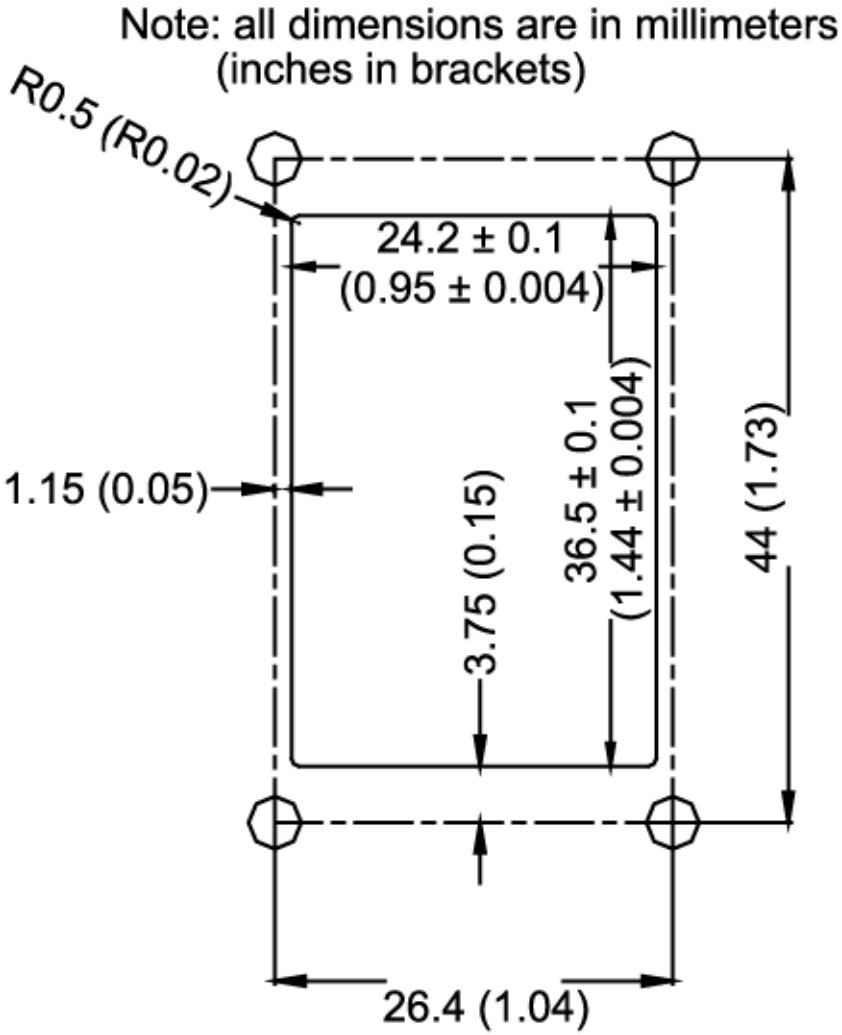



**CONTROL PANEL**



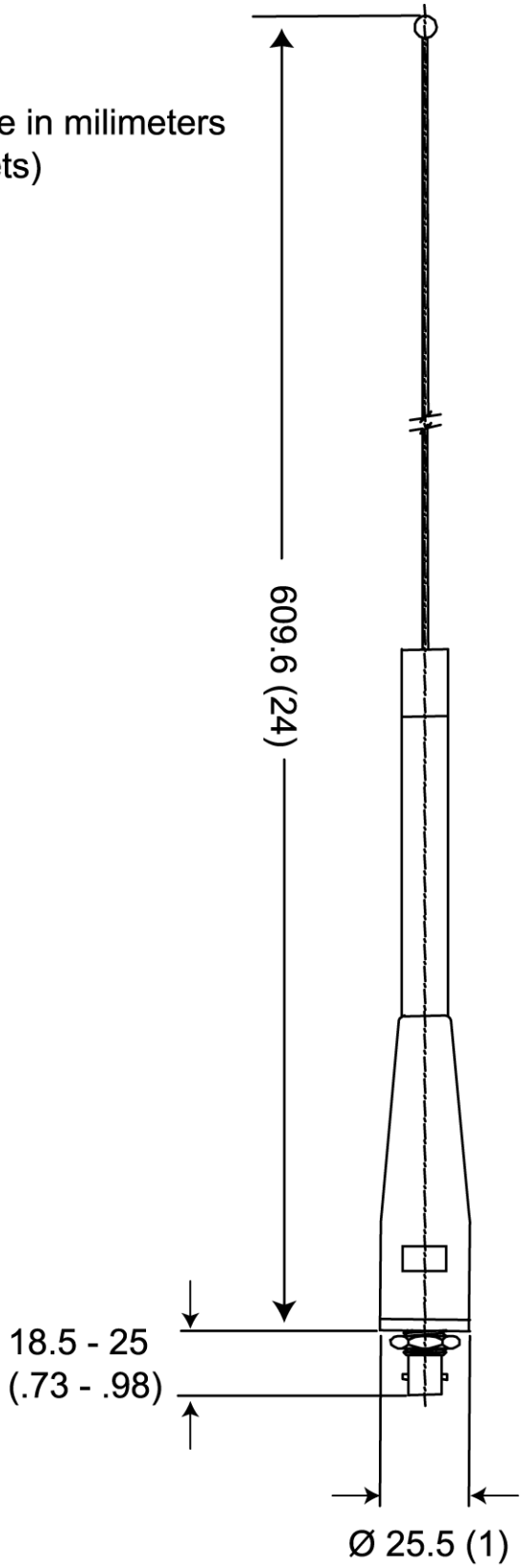

**MOUNTING TRAY**

## 4. RC200 Drilling Mask

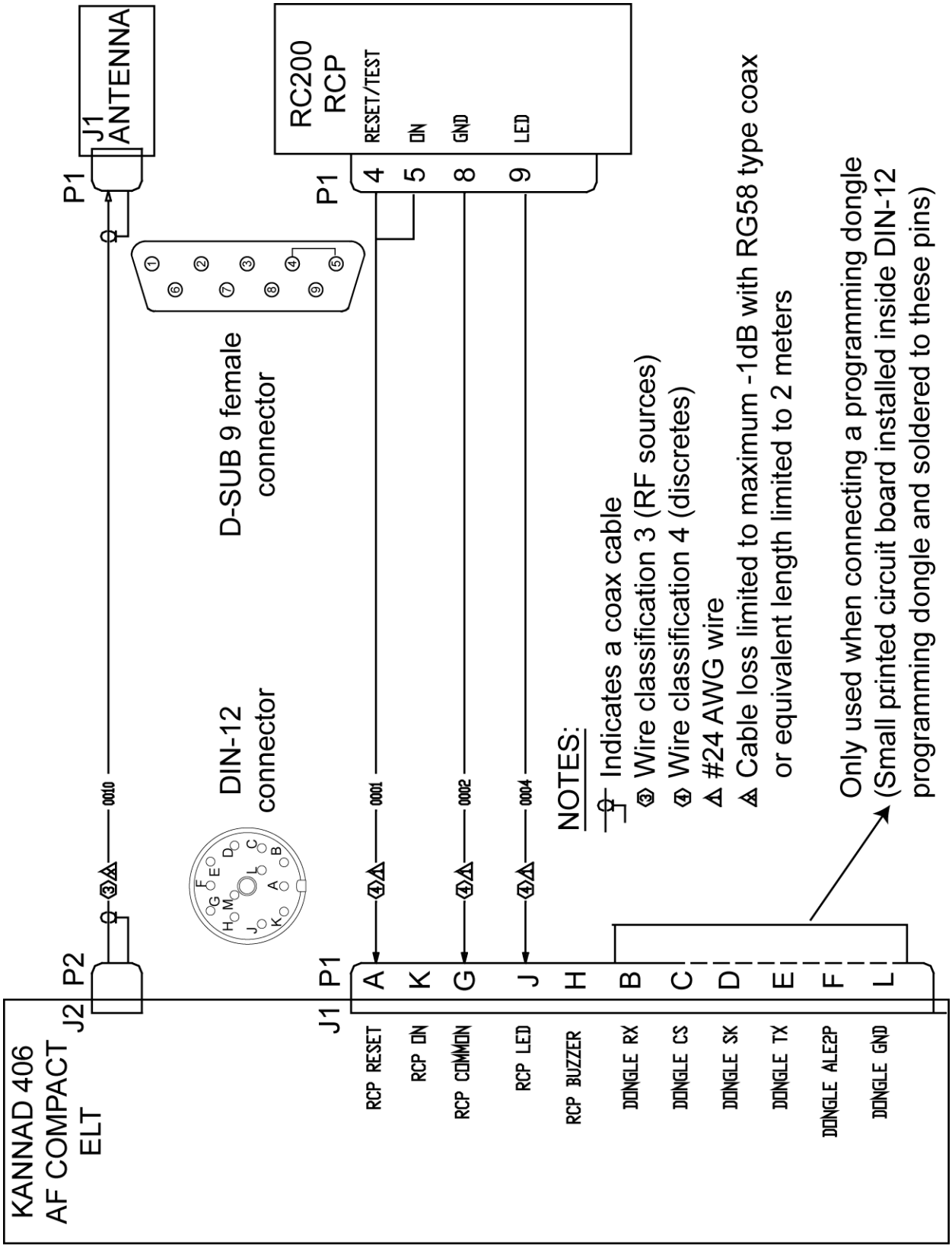


## 5. ANT200 Outline Dimensions

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



## 6. Wiring


J1 ANTENNA
P1
RC200 RCP
RESET/TEST
DN
GND
LED
4
5
8
9
P1
D-SUB 9 female connector
DIN-12 connector
0010
0001
0002
0004
P2
J2
J1 P1
A K G J H B C D E F L
RCP RESET
RCP DN
RCP COMMON
RCP LED
RCP BUZZER
DONGLE RX
DONGLE CS
DONGLE SK
DONGLE TX
DONGLE ALE2P
DONGLE GND
KANNAD 406
AF COMPACT
ELT
NOTES:
Indicates a coax cable
③ Wire classification 3 (RF sources)
④ Wire classification 4 (discretes)
⚠ #24 AWG wire
⚠ Cable loss limited to maximum -1dB with RG58 type coax or equivalent length limited to 2 meters
Only used when connecting a programming dongle (Small printed circuit board installed inside DIN-12 programming dongle and soldered to these pins)

# SERVICING

## 1. Maintenance Schedule

***Periodic inspection and battery replacement can only be carried out by an accredited PART 145 or FAR 145 maintenance station.***

### *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, it is recommended to check the following parameters:

- Proper installation.
- Operation of the controls and crash sensor.
- Transmitted signals.
- Battery corrosion.
  *Note: Due to the technology used for our beacon and battery pack, any corrosions beween two battery replacements is unlikely to happen.However if this inspection is required by Civil Aviation Authority, this check is detailed* *§ (4) Batteries corrosion, page 602*.

This maintenance operation can be carried out without specific tools except a torque wrench with an hexagonal 2 mm bit, a 50 ohm load and the VHF tune receiver of the aircraft.

*(1) Proper installation*

- Remove ELT from its mounting bracket.
  Refer to § 7. Removal, page 213
- Inspect the mounting bracket and the ELT.
  Ensure the mounting bracket and the ELT are free of cracks or other obvious damage.
- Inspect the connection.
  Visually inspect all connector pins.

*(2) Operation of the control crash sensor*

- Connect a 50 Ohm load to the antenna BNC connector.
- Set the 3-position switch on the front panel to ARM.
- Cause abrupt move of the beacon towards the front.
- Make sure the beacon operates (audible buzzer and visual indicator flashing).
- Set the 3-position switch on the front panel to OFF.
- Disconnect and remove the 50 Ohm load.

*(3) Transmitted signals*

- Perform a self-test from the ELT and RCP as explained § B. Self-test procedure, page 301.

The following parameters are checked during self-test:

- Battery voltage.
- 121.5 MHz / 406.028 MHz transmission power.
- 406.028 MHz frequency VCO lock.
- Presence of programmed data.

The number of flashes of the ELT's visual indicator gives an indication of faulty parameters if any (Refer to § B. Self-test procedure, page 301).

- Check 121.5 MHz frequency.
  This test will be performed after re-installation of the ELT.
  Refer to § (5) Check of 121.5 MHz frequency, page 602.

*(4) Batteries corrosion*

Refer to § (4) Battery pack replacement, page 604 to remove and re-install the battery pack and check the watertightness of beacon.

- Remove the battery pack from the ELT.
- Inspect the battery pack.
  The battery pack and connector should be free of corrosion.
- Ensure the battery housing is free of cracks or other visible damage.
- Verify the battery expiration date and ensure it matches with the expiration date written on the label affixed to the rear side of the ELT housing.
- Replace O-ring, desiccant capsule, screws, nuts and seal as explained § (4) Battery pack replacement, page 604.
- Reinstall the battery pack and close the housing.
- Check beacon watertightness.

*(5) Check of 121.5 MHz frequency*

- Re-install the ELT
  Refer to § C. ELT installation procedure, page 206.
- Check 121.5 MHz frequency using the aircraft tune receiver.
  Refer to § C. 406 and 121.5 MHz transmission test, page 303.

### *B. 6-year inspection*

Replacement of battery pack is mandatory every 6 years (Refer to § C. Battery replacement requirements, page 607).

Testing of the following elements and parameters of the ELT is mandatory every 6 years together with the battery pack replacement.

- Visual control of the housing and accessories
- Operation of the controls and crash sensor
- Measurement of 406 and 121.5 MHz output power and frequencies.
- Verification of digital message (coding).

This maintenance operation can be carried out with at least a Cospas-Sarsat decoder capable of measuring output powers and frequencies, a torque wrench with an hexagonal 2 mm bit, a 50 ohm load and the VHF tune receiver of the aircraft.

MARTEC Serpe-Iesm suggests to measure output power, frequencies and check the digital message using the WS TECHNOLOGY BT100AVTRIPLE Cospas-Sarsat decoder (this decoder can be supplied by MARTEC Serpe-Iesm under P/N 0140956) or AEROFLEX IFR 4000 NAV/COMM Ramp Test Set. Other beacons testers can be used if they are capable to fill the functions required to measure power and frequencies of 121.5 and 406 MHz transmitters and to decode the digital message. Refer to the applicable operation manual included with the test set.

6-year inspection must be performed in the order listed below.

*(1) Visual control of the housing and accessories*

- Remove ELT from its mounting bracket.
  Refer to § 7. Removal, page 213
- Inspect the mounting bracket and the ELT.
  Ensure the mounting bracket and the ELT are free of cracks or other obvious damage.
- Inspect the connection.
- Visually inspect all connector pins.

*(2) Operation of the controls and crash sensor*

Refer to § (2) Operation of the control crash sensor, page 601.

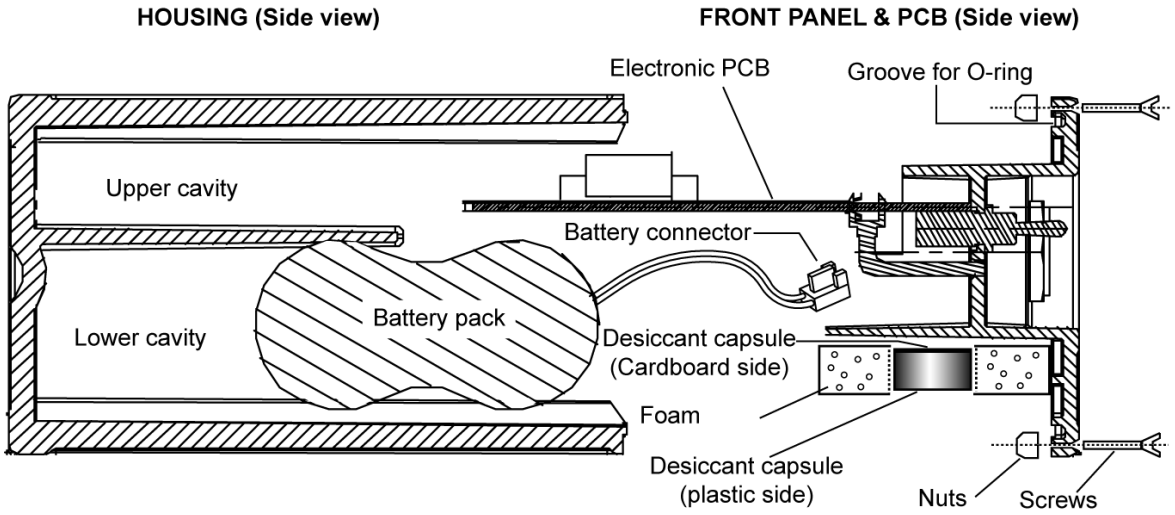
*(3) Measurement of output powers, frequencies and verification of digital message*

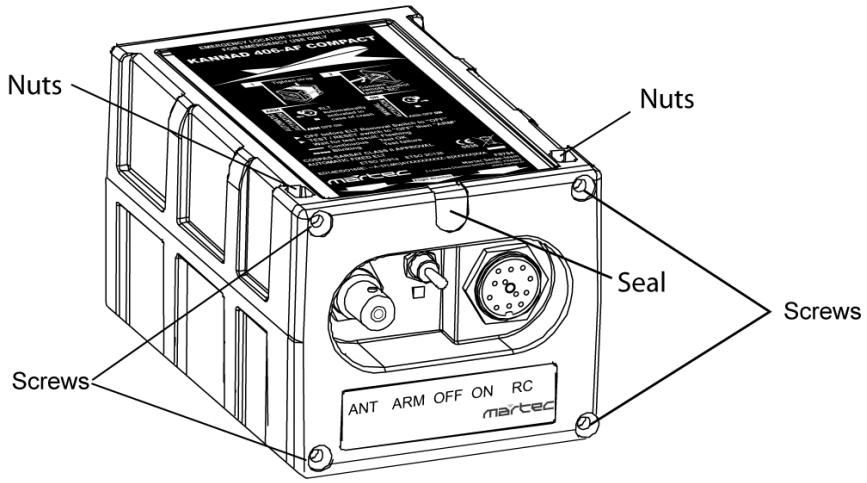
- Connect the decoder to the BNC connector of the ELT front panel.
  Refer to the applicable operation manual included with the decoder to perform the following measurements.
  **CAUTION: some decoders may require the use of an attenuator**

**(risks of damage to test set), refer to the applicable operation manual included with the decoder.**

- Measurement of output powers
  - Perform a self-test (Refer to § B. Self-test procedure, page 301).
    Read value of 121.5 MHz: 100 to 400 mW (20 dBm to 26 dBm).
    Read value of 406.028 MHz: 5 W (37 dBm ± 2 dB).
- Measurement of frequencies
  - Perform a self-test (Refer to § B. Self-test procedure, page 301).
    Read value of 121.5 MHz: 121.5 ± 0.006 MHz
    Read value of 406.028 MHz: 406.028 ± 0.001 MHz
- Verification of digital message (coding)
  - Perform a self-test (§ B. Self-test procedure, page 301).
    Check that, except for the 5th and the 6th digits, the decoder message is identical to the programmed message.
    *Note: the message transmitted during self-test sequence always begins with FF FE DO instead of FF FE 2F.*

*(4) Battery pack replacement*



When replacing the battery pack, the following components must also be replaced

- O-ring and desiccant capsule;
- Screws and nuts;
- Seal;

The battery pack and all the above components are included in the battery replacement kit : KIT BAT 200, P/N S1840510-01

Beacon watertightness must be check at the end of this task.

- **Removal of battery pack**
  - Remove and discard the 4 securing screws and nuts from the ELT front panel.
  - Carefully extract the ELT front panel from the housing up to reach the battery connector.
  - Disconnect the battery connector.
  - Remove the battery pack.
  - Remove and discard O-ring and desiccant capsule.
- **Battery reinstallation**
  - Check the expiration date of the new battery (written on its label).
  - On the first "Periodic Inspection Log" of this manual (Refer to § 2. Periodic Inspection Log, page 608):
    - Fill the field "Next planned battery replacement date" with expiration date of the new battery;
    - check mark the box "Battery change".
  - On the label supplied with the battery kit:
    - Fill the field "Battery Type" with the P/N of the new battery (written on its label);
    - Fill the field "Battery Expiry Date" with expiration of the new battery);
    - Fill the field "Next Control" with the date of next mandatory control according to regulation in effect.
  - Remove the old label from the housing and replace it with the new label.
  - Insert the desiccant capsule supplied with the kit into the hole of the foam stuck on the front panel.
    ***Important: install cardboard side of capsule towards PCB, plastic side towards lower part of the housing.***

- Put the new o-ring supplied with the kit into the groove of the ELT front panel.
- Place the battery pack on the lower side of the ELT front panel and connect the battery pack connector to the PCB.
- Slide the ELT front panel into the ELT housing.
  **CAUTION: When sliding the ELT front panel into housing, take care not to pinch the wires of the battery pack.**
- Replace the 4 securing screws and nuts with those supplied with the kit and torque to 1 newton.meter ± 0.06 (8.85 pound-force inch ± 0.53).
- Remove the broken seal and replace it with the new seal supplied with the battery kit.

- **Check beacon watertightness**
  - Bring the water of a bath to a temperature of 50°C ±5°C.
    **WARNING: If an electrical heating source is used, its power supply must be switched off while handling the beacon in the bath.**
  - Wholy immerse the beacon in the bath at a depth of 50 cm (19.68 in.).
  - Let immersed 5 minutes.
    - Check that no bubble rises.

Remove the beacon from the bath and dry it with compressed air.

- **Check output powers and frequencies**
  Refer to § (3) Measurement of output powers, frequencies and verification of digital message, page 603.

*(5) Check of 121.5 MHz frequency*

- Re-install the ELT
  Refer to § C. ELT installation procedure, page 206.
- Check 121.5 MHz frequency using the aircraft tune receiver.
  Refer to § C. 406 and 121.5 MHz transmission test, page 303.

### *C. 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 battery pack included in battery kit (KIT BAT 200, P/N S1840510-01) supplied by KANNAD can be installed.***

***PLEASE CONTACT YOUR LOCAL DISTRIBUTOR***

***Martec Serpe-lesm refuse all responsibility and invalidate all warranty should other packs be installed.***

Battery available from KANNAD on any KANNADdistributor or dealer.

KANNAD

Z.I. des Cinq Chemins

56520 GUIDEL - FRANCE

Telephone: +33 (0)2 97 02 49 49 Fax: +33 (0)2 97 65 00 20

Web: http://www.kannad.com - E-mail: contact.aviation@kannad.com

Support: support.sar@kannad.com Tel.: +33 (0)2 97 02 49 00

List of distributor available on our Web site:

http://en.kannad.com

Pages Beacons and Instrumental Systems > Aeronautic Search & Rescue.

## 2. Periodic Inspection Log

Type of inspection : ☐ Periodic ☐ Battery change ☐ Repair ☐ Other

Operations carried out (*) :

Next recommended inspection date : _ _ / _ _ _ _

Next planned battery replacement (mandatory) date : _ _ / _ _ _ _

Date : _ _ / _ _ / _ _ _ _

Service station :

Signature and stamp :

Type of inspection : ☐ Periodic ☐ Battery change ☐ Repair ☐ Other

Operations carried out (*) :

Next recommended inspection date : _ _ / _ _ _ _

Next planned battery replacement (mandatory) date : _ _ / _ _ _ _

Date : _ _ / _ _ / _ _ _ _

Service station :

Signature and stamp :

*(*) note complete P/N of replaced components (if battery pack has been changed, also note Batch Number, Tester Name and Date of Manufacture).*

## 3. Periodic Inspection Log

Type of inspection : ☐ Periodic ☐ Battery change ☐ Repair ☐ Other

Operations carried out (*) :

Next recommended inspection date : _ _ / _ _ _ _

Next planned battery replacement (mandatory) date : _ _ / _ _ _ _

Date : _ _ / _ _ / _ _ _ _

Service station :

Signature and stamp :

Type of inspection : ☐ Periodic ☐ Battery change ☐ Repair ☐ Other

Operations carried out (*) :

Next recommended inspection date : _ _ / _ _ _ _

Next planned battery replacement (mandatory) date : _ _ / _ _ _ _

Date : _ _ / _ _ / _ _ _ _

Service station :

Signature and stamp :

*(*) note complete P/N of replaced components (if battery pack has been changed, also note Batch Number, Tester Name and Date of Manufacture).*

## 4. Periodic Inspection Log

Type of inspection : ☐ Periodic ☐ Battery change ☐ Repair ☐ Other

Operations carried out (*) :

Next recommended inspection date : _ _ / _ _ _ _

Next planned battery replacement (mandatory) date : _ _ / _ _ _ _

Date : _ _ / _ _ / _ _ _ _

Service station :

Signature and stamp :

Type of inspection : ☐ Periodic ☐ Battery change ☐ Repair ☐ Other

Operations carried out (*) :

Next recommended inspection date : _ _ / _ _ _ _

Next planned battery replacement (mandatory) date : _ _ / _ _ _ _

Date : _ _ / _ _ / _ _ _ _

Service station :

Signature and stamp :

*(*) note complete P/N of replaced components (if battery pack has been changed, also note Batch Number, Tester Name and Date of Manufacture).*

## 5. Periodic Inspection Log

Type of inspection : ☐ Periodic ☐ Battery change ☐ Repair ☐ Other

Operations carried out (*) :

Next recommended inspection date : _ _ / _ _ _ _

Next planned battery replacement (mandatory) date : _ _ / _ _ _ _

Date : _ _ / _ _ / _ _ _ _

Service station :

Signature and stamp :

Type of inspection : ☐ Periodic ☐ Battery change ☐ Repair ☐ Other

Operations carried out (*) :

Next recommended inspection date : _ _ / _ _ _ _

Next planned battery replacement (mandatory) date : _ _ / _ _ _ _

Date : _ _ / _ _ / _ _ _ _

Service station :

Signature and stamp :

*(*) note complete P/N of replaced components (if battery pack has been changed, also note Batch Number, Tester Name and Date of Manufacture).*

## 6. Periodic Inspection Log

Type of inspection : ☐ Periodic ☐ Battery change ☐ Repair ☐ Other

Operations carried out (*) :

Next recommended inspection date : _ _ / _ _ _ _

Next planned battery replacement (mandatory) date : _ _ / _ _ _ _

Date : _ _ / _ _ / _ _ _ _

Service station :

Signature and stamp :

Type of inspection : ☐ Periodic ☐ Battery change ☐ Repair ☐ Other

Operations carried out (*) :

Next recommended inspection date : _ _ / _ _ _ _

Next planned battery replacement (mandatory) date : _ _ / _ _ _ _

Date : _ _ / _ _ / _ _ _ _

Service station :

Signature and stamp :

*(*) note complete P/N of replaced components (if battery pack has been changed, also note Batch Number, Tester Name and Date of Manufacture).*

## 7. Periodic Inspection Log

Type of inspection : ☐ Periodic ☐ Battery change ☐ Repair ☐ Other

Operations carried out (*) :

Next recommended inspection date : _ _ / _ _ _ _

Next planned battery replacement (mandatory) date : _ _ / _ _ _ _

Date : _ _ / _ _ / _ _ _ _

Service station :

Signature and stamp :

Type of inspection : ☐ Periodic ☐ Battery change ☐ Repair ☐ Other

Operations carried out (*) :

Next recommended inspection date : _ _ / _ _ _ _

Next planned battery replacement (mandatory) date : _ _ / _ _ _ _

Date : _ _ / _ _ / _ _ _ _

Service station :

Signature and stamp :

*(*) note complete P/N of replaced components (if battery pack has been changed, also note Batch Number, Tester Name and Date of Manufacture).*

## 8. Periodic Inspection Log

Type of inspection : ☐ Periodic ☐ Battery change ☐ Repair ☐ Other

Operations carried out (*) :

Next recommended inspection date : _ _ / _ _ _ _

Next planned battery replacement (mandatory) date : _ _ / _ _ _ _

Date : _ _ / _ _ / _ _ _ _

Service station :

Signature and stamp :

Type of inspection : ☐ Periodic ☐ Battery change ☐ Repair ☐ Other

Operations carried out (*) :

Next recommended inspection date : _ _ / _ _ _ _

Next planned battery replacement (mandatory) date : _ _ / _ _ _ _

Date : _ _ / _ _ / _ _ _ _

Service station :

Signature and stamp :

*(*) note complete P/N of replaced components (if battery pack has been changed, also note Batch Number, Tester Name and Date of Manufacture).*

## 9. Programming Log

Identification protocol : ☐ TN ☐ ICAO ☐ AOD ☐ S/N ☐ TEST

Identification number :

Beacon identification (15 HEX ID) :

Aircraft Tail Number :

Date : _ _ / _ _ / _ _ _ _

Service station :

Signature and stamp :

Identification protocol : ☐ TN ☐ ICAO ☐ AOD ☐ S/N ☐ TEST

Identification number :

Beacon identification (15 HEX ID) :

Aircraft Tail Number :

Date : _ _ / _ _ / _ _ _ _

Service station :

Signature and stamp :

## 10.Programming Log

Identification protocol : ☐ TN ☐ ICAO ☐ AOD ☐ S/N ☐ TEST

Identification number :

Beacon identification (15 HEX ID) :

Aircraft Tail Number :

Date : _ _ / _ _ / _ _ _ _

Service station :

Signature and stamp :

Identification protocol : ☐ TN ☐ ICAO ☐ AOD ☐ S/N ☐ TEST

Identification number :

Beacon identification (15 HEX ID) :

Aircraft Tail Number :

Date : _ _ / _ _ / _ _ _ _

Service station :

Signature and stamp :

## 11. Programming Log

Identification protocol : ☐ TN ☐ ICAO ☐ AOD ☐ S/N ☐ TEST

Identification number :

Beacon identification (15 HEX ID) :

Aircraft Tail Number :

Date : _ _ / _ _ / _ _ _ _

Service station :

Signature and stamp :

Identification protocol : ☐ TN ☐ ICAO ☐ AOD ☐ S/N ☐ TEST

Identification number :

Beacon identification (15 HEX ID) :

Aircraft Tail Number :

Date : _ _ / _ _ / _ _ _ _

Service station :

Signature and stamp :

## 12.Pre-delivery Inspection Log


P/N: - AMDT:

S/N: -

CSN:

DOM: /

Controlled By:

Next battery replacement before: /

Date : / / Stamp:

Distributed by

Manufactured by

KANNAD
Z.I. des Cinq Chemins
56520 GUIDEL - FRANCE
Tél. / Phone : +33 (0) 2 97 02 49 49
Fax : +33 (0) 2 97 65 00 20

DOC06006C
Ref: 0141922C