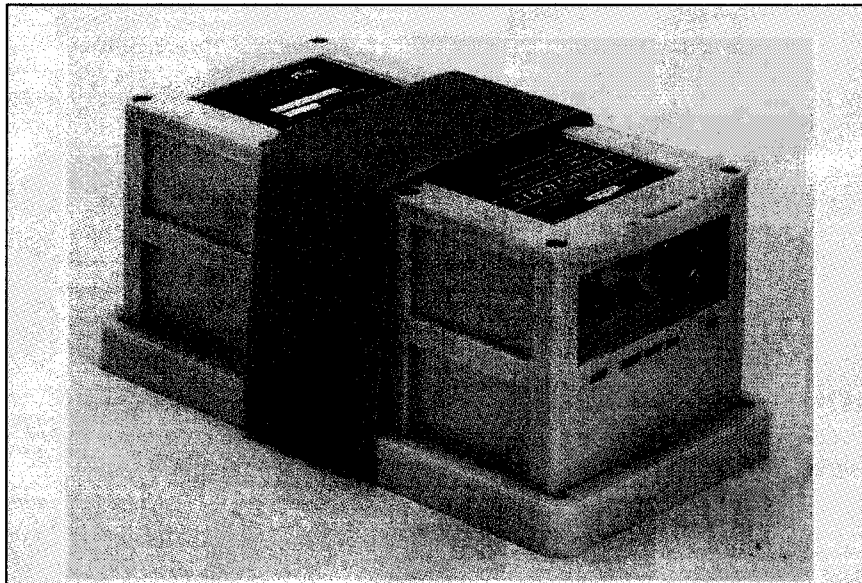


**SECTION 9**

**Airplane Flight Manual Supplement AVE 11**

**Emergency Locator Transmitter (ELT) KANNAD 406 AF / AF-Compact**

If the 406 MHz-ELT KANNAD 406 AF / AF-Compact is installed into the AQUILA AT01, this AFM-Supplement is applicable and must be inserted into Section 9 of the Airplane Flight Manual. The information contained herein adds or replaces information of the basic Airplane Flight Manual.



Revision No. A.11 to Airplane Flight Manual Supplement AVE11 is approved under the authority of DOA No. EASA.21J.025.

Schönhagen, 03/03/2008

*D. Krappel*  
D. Krappel  
Office of Airworthiness

Document No.:	Issue:	Supersedes Issue:	Date:	Page:
FM-AT01-1010-100E	A.11	A.07 (30/07/2004)	30/11/2007	AVE11 - 1

## 0.1 LIST OF REVISIONS AND AMENDMENTS

Revision	Reason for Amendment/Revision	Affected Pages	Date of Issue
A.07	Initial Issue within EASA-approved Major Change AT01-00142	all	30/07/2004
A.11	Documentary Changes to incorporate the KANNAD 406 AF-Compact ELT into this AFM Supplement in line with Minor Change AT01-00245	all	30/11/2007

## 0.2 LIST OF EFFECTIVE PAGES

Page	Revision	Date
AVE11-1 to AVE11-10	A.11	30/11/2007

Page	Revision	Date

## 0.3 TABLE OF CONTENTS OF AFM-SUPPLEMENT AVE 11

<b>Section 1</b>	<b>GENERAL</b>	<b>AVE11 - 3</b>
<b>Section 2</b>	<b>OPERATING LIMITATIONS</b>	<b>AVE11 - 3</b>
<b>Section 3</b>	<b>EMERGENCY PROCEDURES</b>	<b>AVE11 - 4</b>
<b>Section 4</b>	<b>NORMAL PROCEDURES</b>	<b>AVE11 - 4</b>
<b>Section 5</b>	<b>PERFORMANCE</b>	<b>AVE11 - 4</b>
<b>Section 6</b>	<b>WEIGHT AND BALANCE</b>	<b>AVE11 - 4</b>
<b>Section 7</b>	<b>SYSTEMS DESCRIPTION</b>	<b>AVE11 - 4</b>
<b>Section 8</b>	<b>HANDLING, SERVICE AND MAINTENANCE</b>	<b>AVE11 - 10</b>

<i>Document No.:</i>	<i>Issue:</i>	<i>Supersedes Issue:</i>	<i>Date:</i>	<i>Page:</i>
FM-AT01-1010-100E	A.11	A.07 (30/07/2004)	30/11/2007	AVE11 - 2

## 1. GENERAL

This Airplane Flight Manual Supplement provides a general description of the 406 MHz-ELT KANNAD 406 AF/AF-Compact, its basic operation and its integration into the AQUILA AT01. For a more detailed description of the KANNAD 406 AF/AF-Compact and full operating instructions, refer to the effective issue of the KANNAD Installation Manual/Operation Manual/Inspection Log, DMA 174L Ref. 0139162L for the KANNAD 406 AF or DOC06006C Ref. 0141922C for the KANNAD 406 AF-Compact, respectively.

The information contained in this Supplement is to be used in conjunction with the complete Airplane Flight Manual. Furthermore, the KANNAD Installation Manual/Operation Manual/Inspection Log should always be carried on board of the aircraft during flight.

## 2. OPERATING LIMITATIONS

The KANNAD 406 AF/AF-Compact ELT is installed as optional equipment whose failure is uncritical under all operational conditions. The operating limitations defined in section 2 of the basic Airplane Flight Manual apply without any changes or restrictions.

If the KANNAD 406 AF/AF-Compact ELT is installed into the aircraft the following placards must be installed at the locations stated below:

- 1) Placard no. 29 (refer to section 2.16 of the basic AFM) on the outer surface of the fuselage at the position of the ELT:

**ELT**  
INSTALLED HERE

- 2) Placard no. 35 (refer to section 2.16 of the basic AFM) on the instrument panel adjacent to the ELT Remote Control Panel (only in case of ELT-Remote Control Panel is optionally installed):

**ELT-REMOTE-CONTROL**  
To activate switch transmitter  
to ARMED!

- 3) Placard no. 49 (refer to section 2.16 of the basic AFM) in the upper right section of the instrument panel:

**ELT and Fire-Extinguisher**  
behind Co-Pilot seat  
(if installed)

<i>Document No.:</i>	<i>Issue:</i>	<i>Supersedes Issue:</i>	<i>Date:</i>	<i>Page:</i>
FM-AT01-1010-100E	A.11	A.07 (30/07/2004)	30/11/2007	AVE11 - 3

### 3. EMERGENCY PROCEDURES

The KANNAD 406 AF/AF-Compact ELT is installed as optional equipment whose failure is uncritical under all operational conditions. The emergency procedures defined in section 3 of the basic Airplane Flight Manual apply without any changes or restrictions.

### 4. NORMAL PROCEDURES

No change to the basic Airplane Flight Manual. A short description regarding the operation of the KANNAD 406 AF/AF-Compact ELT is contained in section 7 of this supplement.

### 5. PERFORMANCE

No change to the basic Airplane Flight Manual.

### 6. WEIGHT AND BALANCE

The change of the empty weight and corresponding centre of gravity after the installation or removal of the KANNAD 406 AF/AF-Compact has to be determined and recorded in accordance with section 6 of the basic Airplane Flight Manual.

### 7. SYSTEMS DESCRIPTION

#### 7.1 GENERAL

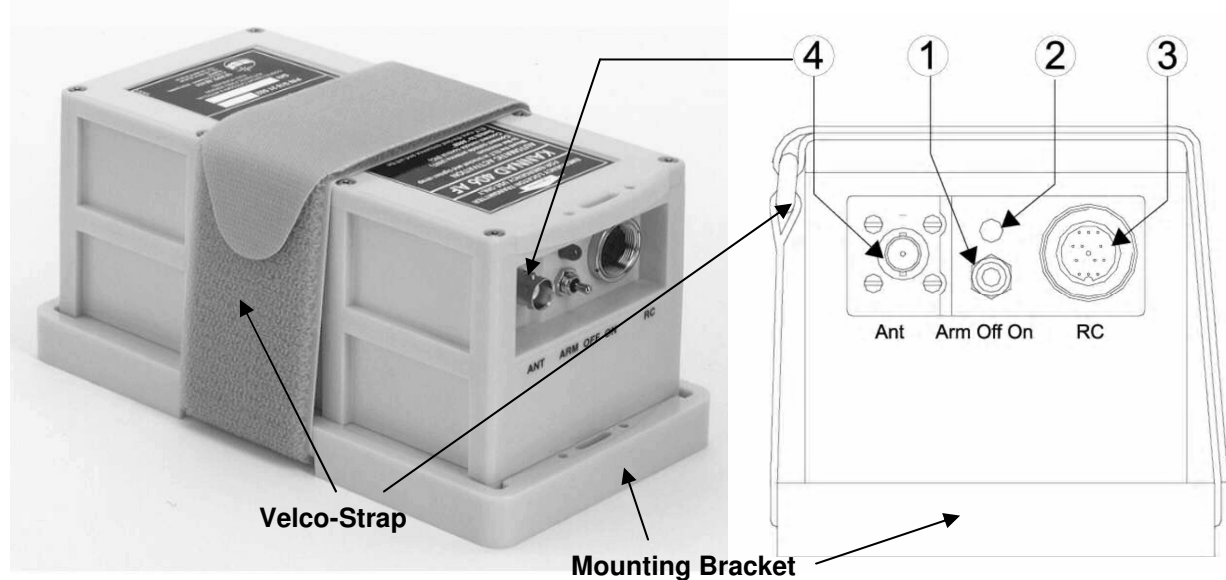
The Emergency Locator Transmitter (ELT) is an emergency transmitter that, if activated, transmits signals on both, the international civilian distress frequency (121.5 MHz) as well as the military distress frequency (243.0 MHz), to enable rescue teams locating a crashed aircraft within a shorter period of time. Furthermore, this ELT transmits also defined digital messages on 406 MHz that can be processed by satellites of the COSPAS-SARSAT system which was established to aid and coordinate search and rescue (SAR) operations all over the world. Besides of the processing and relaying of the signals received on 406 MHz, these satellites also relay the signals transmitted on both international distress frequencies 121.5 and 243 MHz to one of the 64 ground stations within the COSPAS-SARSAT system where the SAR operation is initiated and coordinated. The transmitted signal on 406 MHz carries data which enables the identification of the aircraft in distress and facilitate SAR operations. The aircraft is located by Doppler effect with a precision of less than 2 NM at any point of the earth.

<i>Document No.:</i>	<i>Issue:</i>	<i>Supersedes Issue:</i>	<i>Date:</i>	<i>Page:</i>
FM-AT01-1010-100E	A.11	A.07 (30/07/2004)	30/11/2007	AVE11 - 4

**INTEGRATION OF THE KANNAD ELT INTO THE AQUILA AT01**

The ELT is installed in the baggage compartment of the aircraft attached to the floor panel on the right side behind the copilot’s seat. The ELT rod antenna (RAYAN ANT 300) is mounted outboard on the upper fuselage skin behind the baggage compartment bulkhead of the aircraft. Optionally, a Remote Control Panel for the ELT may be installed in the right section of the instrument panel above the engine instruments. The connection between the ELT and its Remote Control Panel is accomplished by a separate wiring loom which is routed along with the fuselage wiring loom through the cockpit section. On the ELT side, the wiring loom is equipped with a DIN-12 connector and with a D-SUB Female 9-Pin connector on the Remote Control Panel side.

**KANNAD 406 AF/AF-Compact FRONT VIEW**



**CONTROLS & CONNECTORS**

The following controls are to be found on the ELT front panel (refer to picture above):

1. 3-Position-Switch ARM/OFF/ON \*
2. Red Light (LED) \*
3. DIN 12 socket for connection to Remote Control Panel, CS144 interface module (KANNAD 406 AF only), dongle or programming equipment
4. BNC connector for the antenna

**\* Position 1 and 2 are interchanged for the KANNAD 406 AF-Compact ELT.**

The red light (LED) 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 that the self-test is OK.

<i>Document No.:</i>	<i>Issue:</i>	<i>Supersedes Issue:</i>	<i>Date:</i>	<i>Page:</i>
FM-AT01-1010-100E	A.11	A.07 (30/07/2004)	30/11/2007	AVE11 - 5

- In operating mode: periodic flashes during 121.5/243 MHz transmissions and a long flash during 406 MHz transmission.

A buzzer gives aural information on the working mode of the beacon:

- Continuous tone during self-test.
- 2 beeps per second during 121.5/243 MHz transmission.
- Silence during 406 MHz transmission.

### **ELT-REMOTE CONTROL PANEL**

A Remote Control Panel (RC200) is optionally available for the installation in the cockpit in order to enable the pilot to monitor and control the ELT status. If the aircraft is furnished with the Remote Control Panel, it is installed in the right section of the instrument panel above the engine instruments.



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

- 3-Position Switch (ON/ARMED/RESET TEST)
- Red Light (LED adjacent to the “ON” marking)

### **NOTE**

**The ELT can only be operated by the Remote Control Panel if the ELT-Switch is in the “ARM”-Position.**

### **TRANSMITTER**

The KANNAD 406 AF/AF-Compact can be activated either automatically by the shock sensor (when a crash occurs) or manually by the switch on the ELT or on its optional Remote Control Panel. The ELT is designed to transmit on the following frequencies:

- Basic international emergency frequencies 121.5 and 243 MHz as well as 406 MHz for COSPAS/SARSAT services (**KANNAD 406 AF only**)
- Basic international emergency frequency 121.5 MHz as well as 406 MHz for COSPAS/SARSAT services (**KANNAD 406 AF-Compact**)

Both basic international emergency frequencies (121.5 and 243 MHz) are mainly used for homing in the final stages of the SAR (Search and Rescue) operations whereas the 406 MHz frequency serves for the precise pinpointing and identification of the aircraft in distress using the COSPAS-SARSAT system. Once activated, the transmitter operates continuously on 121.5 MHz (and 243 MHz for the KANNAD 406 AF) with an output power of 100 mW. During the first 24 hours of operation, a digital message is

<i>Document No.:</i>	<i>Issue:</i>	<i>Supersedes Issue:</i>	<i>Date:</i>	<i>Page:</i>
FM-AT01-1010-100E	A.11	A.07 (30/07/2004)	30/11/2007	AVE11 - 6

transmitted on 406 MHz every 50 seconds to the COSPAS-SARSAT satellites with an output power of nearly 5W. After this lapse of time, the KANNAD 406 AF stops the transmission on 406 MHz to extend the 121.5/243 MHz transmission for as long as possible. The KANNAD 406 AF-Compact ELT does not stop the 406 MHz transmission after this time period, it continues to transmit on that frequency even beyond 48 hours.

### **POWER SUPPLY**

The ELT is supplied with electrical power independent from the onboard electrical system of the aircraft. The energy supply is provided by a battery pack composed of three (KANNAD 406 AF) or one (KANNAD 406 AF-Compact) LiMnO<sub>2</sub> D cells, respectively. The autonomy of the battery pack for the 121.5/243 MHz transmission is close to 100 hours at -20°C for the KANNAD 406 AF and more than 48 hours at -20°C for the KANNAD 406 AF-Compact with new batteries.

The transmitter battery expiry date is fixed at 6 years after manufacturing.

The battery pack must be replaced every 6 years, if no activation of the ELT occurs during the battery lifetime, or if one of the following applies:

- (a) After the transmitter has been used in an emergency situation (including any inadvertent activation of unknown duration).
- (b) After the transmitter has been operated for more than one cumulative hour (e.g. time accumulated in several tests and inadvertent activations of known duration).
- (c) On or before battery replacement date (battery replacement date is marked on the battery pack and at the label at the end of the transmitter).

<b>WARNING</b>
----------------

**Do not attempt to recharge battery pack!**

### **REGISTRATION AND PROGRAMMING**

<b>NOTE</b>
-------------

The ELT must be registered at the local registration authority prior to installation on board of the aircraft. Any change of ownership shall also be declared and registered with the local registration authority and with the distributor.

For the declaration and registration of 406 MHz ELT's, the standard forms available at the local registration authority have to be used. A programming datasheet which contains all the necessary data for the COSPAS-SARSAT protocol has to be completed and returned to the distributor for the programming of the unit. For more information, refer to the Installation/Operation Manual of the ELT or contact your local registration authority.

<i>Document No.:</i>	<i>Issue:</i>	<i>Supersedes Issue:</i>	<i>Date:</i>	<i>Page:</i>
FM-AT01-1010-100E	A.11	A.07 (30/07/2004)	30/11/2007	AVE11 - 7

## **7.2 ACTIVATION AND OPERATING MODES**

### **FAMILIARIZATION WITH THE OPERATION**

It is recommended to observe the following instructions to ensure the best possible operation in case of emergency:

- (a) Become thoroughly familiar with the instructions of this supplement.
- (b) Carry them together with the Installation/Operation Manual of the ELT always on board of the aircraft in flight.
- (c) Visually inspect the unit at the regular intervals specified in the Installation/Operation Manual. Check the ELT attachment, the antenna mounting and all cable connections for tightness and secureness.

### **OPERATING MODES OF KANNAD 406 AF/AF-COMPACT ELT**

The ELT is located in the baggage compartment attached to the floor panel on the right side behind the copilot's seat. Optionally, the associated Remote Control Panel may be installed in the right section of the instrument panel above the engine instruments.

The following table provides an overview of the different operating modes of the ELT:

<b>KANNAD 406 AF/AF-COMPACT ELT SYSTEM</b>		
<b>Mode</b>	<b>Switch on ELT Unit/Remote Control Panel (RCP)</b>	<b>Function</b>
ARMED/ STANDBY	„ARM“ (Normal Flight setting)	Stand-by Mode for automatic activation of the ELT by the crash sensor (g-sensor). This mode is mandatory during flight. The switch on the ELT unit has to be in the “ARM” position to enable the operation of the ELT via the Remote Control Panel.
ON	„ON“	Overrides crash-sensor and activates the ELT transmission manually (refer to Installation Manual of the ELT for operational testing).
OFF	„OFF“ (ELT unit only)	Turns the ELT off in preparation for removal from aircraft or to terminate the emergency signal transmission after rescue or inadvertent operation.
RESET TEST	“RESET TEST” (Remote Control Panel only)	To initiate Self-Test of the ELT and to terminate the transmission of an activated ELT on the Remote Control Panel.

<i>Document No.:</i>	<i>Issue:</i>	<i>Supersedes Issue:</i>	<i>Date:</i>	<i>Page:</i>
FM-AT01-1010-100E	A.11	A.07 (30/07/2004)	30/11/2007	AVE11 - 8



In order to be automatically activated by the crash sensor, the ELT must be in standby (ARM) mode. This mode is mandatory during flight. The same applies when the ELT is to be operated by the Remote Control Panel. If the ELT itself is not in the stand-by mode (ELT switch in ARM position), the ELT can not be operated by the ELT Remote Control Panel. It is recommended to switch the ELT Switch into the OFF position only when the aircraft is parked for a longer period or during maintenance. Ensure that the installed antenna is clear of obstructions.

After a forced landing, it is recommended to tune in 121.5 MHz on the COM transceiver to check if the ELT has been activated. Once the ELT is activated, it can be manually deactivated by switching the ELT switch into the “OFF” position or by turning the switch on the ELT Remote Control Panel for at least 1 second into the “RESET TEST” position and then back to “ARMED”. In case of an unintentional activation, the procedures with regard to the information of the Air Traffic Control defined by the regulations have to be observed.

### 7.3 FUNCTIONAL TESTING

#### GENERAL

The ELT is furnished with a self-test function to perform an operational check and to detect any possible failure. An operational check using the self-test function must be conducted regularly by the pilot or maintenance personnel. The manufacturer recommends conducting a self-test once a month and after every system maintenance event but **not more than once a week** since each self-test consumes electric energy from the batteries. If the self-test is carried out more often than specified above, the life-time of the batteries is accordingly reduced. Functional and operational tests beyond the scope of a self-test like transmission tests have to be conducted by certified maintenance personnel in accordance with the procedures defined in the Installation Manual/Operation Manual/Inspection Log of the ELT. Those kinds of tests have to be conducted after the initial installation of the ELT as well as in regular intervals according to national requirements.

#### SELF-TEST PROCEDURE

<b>NOTE</b>
-------------

Do not perform a Self-Test without the antenna connected!

<b>SELF-TEST</b>	<b>KANNAD 406 AF/AF-Compact without REMOTE CONTROL PANEL</b>
------------------	--

1	Switch ELT Switch into „OFF“-Position	ELT unit is positioned and fixed behind the copilot’s seat on the floor panel. The ELT is switched into the OFF mode
---	---------------------------------------	--

<i>Document No.:</i>	<i>Issue:</i>	<i>Supersedes Issue:</i>	<i>Date:</i>	<i>Page:</i>
FM-AT01-1010-100E	A.11	A.07 (30/07/2004)	30/11/2007	AVE11 - 9

<b>SELF-TEST</b>		<b>KANNAD 406 AF/AF-Compact without REMOTE CONTROL PANEL</b>
2	Switch ELT Switch into „ARM“-Position	<p>The buzzer operates during the whole self-test procedure. After a few seconds the test result is displayed with the LED as follows:</p> <ul style="list-style-type: none"> <li>• One long flash indicates that the system is operational and that no error conditions were found.</li> <li>• A series of short flashes indicates that the test has failed and error conditions were found.</li> </ul>
3	Switch back ELT Switch into „OFF“-Position or retain “ARM” Position	Switching the ELT Switch back into the OFF position turns the ELT off. Before next flight, the ELT has to be switched into the ARMED mode (Stand-by mode).

**NOTE**

If the optional ELT Remote Control Panel is installed into the aircraft, the self-test may be initiated by simply pushing the switch into the RESET TEST position provided that the ELT Switch is in the ARM position. The self-test sequence is conducted in the same way as described above for the ELT unit.

If the self-test fails, contact the manufacturer/distributor as soon as possible.

Remark:

The number of flashes gives an indication of the faulty parameter detected during the test.

<b>Number of flashes</b>	<b>FAILURE MODE</b>
3+1	LOW BATTERY VOLTAGE
3+2	LOW RF POWER
3+3	FAULTY VCO LOCKING
3+4	NO IDENTIFICATION PROGRAMMED

## 8. HANDLING, SERVICE AND MAINTENANCE

The ELT batteries are service life limited and must be replaced after 6 years if no ELT activation occurred in between. Refer to the Installation Manual/Operation Manual/Inspection Log of the ELT and the Maintenance Manual of the AQUILA AT01 for more details and the detailed maintenance schedule.

<i>Document No.:</i>	<i>Issue:</i>	<i>Supersedes Issue:</i>	<i>Date:</i>	<i>Page:</i>
FM-AT01-1010-100E	A.11	A.07 (30/07/2004)	30/11/2007	AVE11 - 10