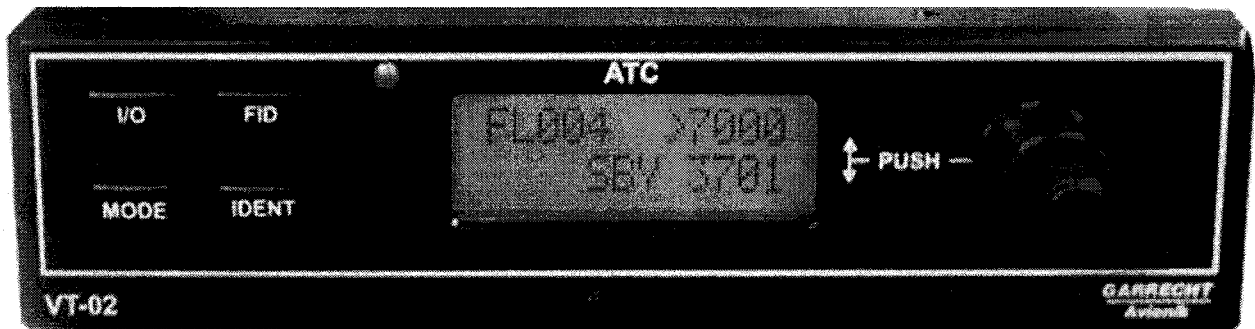


SECTION 9

**Airplane Flight Manual Supplement
Mode S Transponder GARRECHT VT-02**

This AFM-Supplement is applicable and must be inserted into Section 9 of the Airplane Flight Manual if the Garrecht VT-02 Mode S Transponder is installed in the AQUILA AT01. The information of this AFM-Supplement adds or replaces information of the basic Airplane Flight Manual.



The technical content of this Airplane Flight Manual Supplement is approved under the authority of DOA No. EASA.21J.025.

Schönhausen, 19.03.2009

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0.1 LIST OF REVISIONS AND AMENDMENTS

Revision	Reason for Amendment/Revision	Affected Pages	Date of Issue
A.01	Initial Issue (minor change MB-AT01-00297)	all	2009 19. March

0.2 LIST OF EFFECTIVE PAGES

Page	Revision	Date
AVE22-1 to AVE20-9	A.01	19.03.2009

Page	Revision	Date

0.3 TABLE OF CONTENTS

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1. GENERAL

This Supplement provides the information necessary for the efficient operation of the AQUILA AT01 when the Mode S Transponder GARRECHT VT-02 is installed. It contains a general description of the Transponder, its basic operation and its integration into the AQUILA AT01. For a detailed description of the Mode S Transponder GARRECHT VT-02 and full operating instructions, refer to the effective issue of the VT-02 User Manual , 02.0200.10E.

The information contained within this Supplement is to be used in conjunction with the complete Airplane Flight Manual. Furthermore, the VT-02-User Manual should always be carried on board of the aircraft during flight.

2. OPERATING LIMITATIONS

A connection of the VT-02 with a TCAS collision avoidance system is currently not intended for the AQUILA AT01. The operating limitations of the basic Airplane Flight Manual apply without any changes or restrictions.

3. EMERGENCY PROCEDURES

3.13.3 TO TRANSMIT A SIGNAL REPRESENTING LOSS OF ALL COMMUNICATION (IN CONTROLLED AIRSPACE):

- “**Mode**” Key: Press until Mode “**ALT**” active.
- Double shaft rotary encoder outer knob Select **7600** operating code.
- Inner knob of the double shaft rotary encoder Push, activate **7600** operating code.

3.15.2 TO TRANSMIT AN EMERGENCY SIGNAL:

- “**Mode**” Key: Press until Mode “**ALT**” active.
- Double shaft rotary encoder outer knob Select **7700** operating code.
- Inner knob of the double shaft rotary encoder Activate **7700** operating code.

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4. NORMAL PROCEDURES

NOTE

The expected coverage of the VT-02 is limited to the „line of sight“. Low altitude or aircraft antenna shielding by the aircraft itself may result in reduced range. Range can be improved by climbing to a higher altitude.

4.5.3 BEFORE TAXIING

1. Avionic Master Switch **ON**

The transponder will switch into the standby (**SBY**) mode.
The transponder is activated but will not respond to any interrogations from the ATC Secondary Surveillance Radar.

4.5.5 BEFORE TAKE-OFF

1. Transponder Mode Selection Key **ALT**

In this mode the transponder will respond in Mode A, Mode C and Mode S operation (identification and altitude) to interrogations from ATC and TCAS equipped aircrafts.

NOTE

Pressing the Mode Selection Key “**ON**” activates only Mode A-operation of the Transponder. The Transponder will respond to interrogations with the identification code only. The replies do not include altitude information.

4.5.12 AFTER LANDING

1. Transponder Mode Selection Key **SBY**

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 Garrecht VT-02 Mode S Transponder has to be

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determined and recorded in accordance with section 6 of the basic Airplane Flight Manual.

7. SYSTEMS DESCRIPTION

GENERAL

The Garrecht VT-02 panel mounted Non-Diversity Mode S Transponder is a radio transmitter and receiver that operates on radar frequencies, receiving ground radar or TCAS interrogations at 1030 MHz and transmitting a coded response of pulses to ground-based radar on a frequency of 1090 MHz. The VT-02 is equipped with IDENT capability that activates the Special Position Identification (SPI) pulse for 18 seconds. Mode S transmit/receive capability also requires 1090 MHz transmitting and 1030 MHz receiving for Mode S functions.

In addition to displaying the selected transponder code, reply symbol and mode of operation, the VT-02 screen also displays pressure altitude.

The VT-02 transponder is powered on by pressing the “I/O” key. After power on, a start-up page will be displayed while the unit performs a self-test. To activate the Transponder, the **ALT/BAT**-Master Switch as well as the Avionics Master Switch has to be in the **ON** position.

GARRECHT VT-02 FRONT VIEW



TRANSPONDER MODE SELECTION KEYS

Display:

SBY Selects the standby mode. When in standby mode, the transponder will not reply to any interrogations.

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- ON** Selects MODE A operation of the transponder. In this mode, the transponder replies to interrogations, as indicated by the Reply Symbol ('R'). Replies do not include altitude information.
- ALT** Selects MODE A, MODE C and MODE S operation of the transponder. In **ALT** mode, the transponder replies to identification and altitude interrogations, as indicated by the Reply Symbol ('R'). Replies to altitude interrogations include the standard pressure altitude received from the internal altitude source (Altitude Encoder), which is not adjusted for barometric pressure.

Any time the function **ON** or **ALT** is selected, the transponder becomes an active part of the Air Traffic Control Radar Beacon System (ATCRBS). The transponder also responds to interrogations from TCAS equipped airplanes.

CODE SELECTION

Code selection is done with the double shaft rotary encoder providing 4096 active identification codes.

Rotating the outer knob of the double shaft encoder selects the position of the code to be modified. A blinking cursor is indicating the selected position. Use the inner knob to modify the value at the selected position. When all changes are done, press the inner button to activate the modified standby code.

NOTE

The identification code should be entered carefully, irrespective if assigned by ATC, or using a standard transponder code.

Important Codes:

- 1200** - VFR code for any altitude in the US (Refer to ICAO standards)
- 2000** - VFR code commonly used in Europe (Refer to ICAO standards)
- 7000** - VFR code commonly used in Europe (Refer to ICAO standards)
- 7600** - Loss of communications
- 7700** - Emergency

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KEYS FOR OTHER VT-02 FUNCTIONS

I/O To switch on the system, press key “**I/O**” shortly. After the start, the unit performs the built in test and shows the operating mode. For switching off, press key “**I/O**” for at least 3 seconds. Release the key, when the LCD becomes blank.

IDENT **IDENT** key pressed activates the Special Position Identification (SPI) Pulse for 18 seconds, identifying your transponder return from others on the air traffic controller’s screen. The word ‘**IDENT**’ will appear in the upper left corner of the display while the **IDENT** mode is active.

FID Pressing the flight ID key invokes the menu to setup the flight ID. The Flight ID is transmitted with every Mode-S interrogation.

NOTE

The flight id may be changed if required. Usually the FID is the callsign of your aircraft unless field 7 of the flight plan contains other data. Before each flight check always your flight-id has been set correctly.

VFR-Function

To simplify operation, the VT-02 provides a pre-programmable VFR code, which can be invoked by pressing the inner knob of the rotary encoder longer than 2sec.

The previous active reply code will then be moved to the bottom line (inactive area) and overwrites the existing active value there.

If the pre-programmed reply code is identical with the reply code in the bottom line, active and standby reply code will just be interchanged.

FUNCTION DISPLAY

In the upper left corner of the LCD screen the current pressure altitude (related to 1013,25 hPa) will be shown as Flight Level (FL).

Replies are indicated by a blinking “**R**” in the lower left corner of the LCD screen. The current mode is shown in the centre of the bottom line of the screen. The current Transponder identification (Squawk) is indicated in the upper right corner of the LCD screen. The standby Transponder identification is indicated below. The activated mode will be shown centered in the lower row.

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FAILURE ANNUNCIATION

In case of failure, the system shows a “W” on the LCD screen. Additionally, a frequently repeated audio signal occurs. Both can be terminated by pressing the “I/O” key shortly. In case of detecting a fatal failure, the system will be switched into Standby (SBY) mode. All system operating will be terminated to prevent damages to system components. In this case, the system screen will show “FAIL” instead of active and standby reply code. No transponder data will be transferred.

VT-02 MODE S TRANSPONDER FEATURES

MODE S DATA TRANSMISSION

In addition to 4096 codes and pressure altitude, the VT-02 is capable of transmitting airplane registration number or flight ID, transponder capability and maximum speed range.

INTEGRATION INTO THE AQUILA AT01

The electrical circuits of the Mode S Transponder Garrecht VT-02 are connected to the Avionic Bus of the on-board electrical power supply and protected by a 3 A circuit breaker which enables the complete disconnection of the Transponder unit from electric power. The circuit breaker is labelled with a placard denoted “**Transponder**” and is installed in the right section of the instrument panel among the other circuit breakers.

Besides of the transponder unit, which is installed in the avionic rack in the midsection of the instrument panel, a transponder antenna and “Altitude Encoder” is part of the Transponder system.

The “Altitude Encoder” is connected to the on-board Static Pressure System and is integrated in the VT-02-transponder. The transponder antenna is installed on the lower surface of the cockpit structure below the co-pilot’s seat.

For a detailed description of the integration of the Transponder unit into the aircraft and its connection to the on-board electrical system as well as its installation into the AQUILA AT01, refer to the effective revision of the Maintenance Manual of the AQUILA AT01, document no. MM-AT01-1020-100.

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8. HANDLING, SERVICE AND MAINTENANCE

In order to increase the service life of the VT-02 Mode S Transponder, it should always be deactivated during engine start-up and shut-down since electrical surges during the start-up may cause damage to the unit.

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