

SECTION 9

Pilot's Operating Handbook Supplement AS-08

Mode S Transponder GARMIN GTX 328 / GTX 330



This supplement is applicable and must be inserted into Section 9 of the POH when a GARMIN GTX 328 or GTX 330 Mode S Transponder is installed in the AQUILA AT01-100. The information in this supplement adds to or replaces information in the basic POH.

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0.1 RECORD OF REVISIONS

Issue	Reason for Change	Effectuated Pages	Date of Issue
A.01	Initial Issue	All	28.05.2013
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0.2 LIST OF CURRENT PAGES

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1. GENERAL

This supplement provides the information necessary for the efficient operation with the Mode S transponder GARMIN GTX 328 / 330. It contains a general description of the transponder and its basic operation and integration into the AQUILA AT01-100. For a detailed description of the GARMIN GTX 328 / 330 and full operating instructions, please refer to the current issue of the GTX 328 / 330 Pilot's Guide.

The information contained in this supplement must be used in conjunction with the complete Pilot's Operating Handbook. Furthermore, the GTX 328 or GTX 330 Pilot's Guide must always be carried on board the aircraft during flight.

2. OPERATING LIMITATIONS

The operating limitations of the basic Pilot's Operating Handbook apply without any changes or restrictions.

NOTE

Only the GTX 330 Mode S Transponder is capable of exchanging information for the "Traffic Information Service (TIS)". TIS is currently only available in North America.

3. EMERGENCY PROCEDURES

TO TRANSMIT AN EMERGENCY SIGNAL:

- "ALT" Key: PRESS
- Numeric Keys „0-7“: Squawk **7700**

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

- "ALT"- Key: PRESS
- Numeric Keys „0-7“: Squawk **7600**

TO TRANSMIT A SIGNAL DURING A HIJACKING:

- "ALT" Key: PRESS
- Numeric Keys „0-7“: Squawk **7500**

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4. NORMAL PROCEDURES

NOTE

The range of the GTX 328 / 330 is limited to "line of sight". Low altitude or shielding of the antenna by the aircraft itself may result in reduced range. Range can be improved by climbing to a higher altitude.

AFTER ENGINE START

1. **Avionics** switch ON

The transponder will switch into standby (**STBY**) mode.

The transponder is active in this mode, but will not respond to any interrogations from ATC secondary surveillance radar.

BEFORE TAKE-OFF

1. Transponder mode selection key ALT

In this mode the transponder responds to interrogations from ATC secondary surveillance radar and from TCAS systems on board other aircraft operating in Mode A and Mode C (identification and altitude).

NOTE

*Pressing the mode selection key "**ON**" activates only Mode A operation of the transponder. The transponder responds to interrogations with the identification code only. Replies do not include altitude information.*

AFTER LANDING

1. Transponder mode selection key STBY or OFF

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5. PERFORMANCE

No change to the basic Pilot's Operating Handbook.

6. WEIGHT AND BALANCE

The change in empty weight and the corresponding center of gravity after installation or removal of the GARMIN GTX 328 / 330 Mode S transponder must be determined and recorded in accordance with section 6 of the basic Airplane Flight Manual.

7. SYSTEMS DESCRIPTION

GENERAL

The GARMIN GTX 328 / 330 panel mounted Mode S transponder is a radio transmitter and receiver that operates on radar frequencies. It receives ground radar or TCAS interrogations with 1030 MHz and transmits a coded response to ground-based radar on a frequency of 1090 MHz. The GTX 328 / 330 is equipped with the IDENT capability that activates the special position identification (SPI) pulse for 18 seconds. The Mode S transmit/receive capability also transmits with 1090 MHz and receives with 1030 MHz.

In addition to displaying the selected transponder code, reply symbol and mode of operation, the GTX 328 / 330 screen also displays the REPLY symbol, the current mode, pressure altitude and timer functions. The unit also features an altitude monitor and a flight timer. A voice or tone audio output announces altitude deviation and count-down timer expiration. The audio output is only available if the aircraft is equipped with an audio panel.

The GTX 328 / 330 transponder is turned on by pressing the **STBY**, **ALT** or **ON** keys. After switching on, a start-up page is displayed while the unit performs a self-test. To turn on the transponder, the switch **ALT1 / BAT** as well as the switch **Avionics** must be in the **ON** position.

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GARMIN GTX 328 / 330 FRONT VIEW



TRANSPONDER MODE SELECTION KEYS

- OFF** Switches the GTX 328 / 330 off. Pressing the **STBY**, **ON** or **ALT** keys switches the transponder back on and displays the last active identification code.
- STBY** Selects the standby mode. When in standby mode, the transponder does not reply to any interrogations.
- ON** Sets the transponder to MODE A operation. In this mode, the transponder replies to interrogations, as indicated by the reply symbol ('R'). Replies do not include altitude information.
- ALT** Sets the transponder to operate in MODE A and MODE C. 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 an external altitude source (altitude encoder), which is not adjusted for barometric pressure.

Any time the transponder is set to **ON** or **ALT**, it becomes an active part of the air traffic control radar beacon system (ATCRBS). The transponder will also respond to interrogations from TCAS-equipped airplanes.

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SELECTING A TRANSPONDER CODE

Code selection is done via eight numeric keys (**0-7**) providing 4096 active identification codes. Pushing one of these keys begins the code selection sequence. The new code will not be activated until the fourth digit is entered. Pressing the **CLR** key will move the cursor back to the previous digit. Pressing the **CLR** key when the cursor is on the first digit of the code or pressing the **CRSR** key during code entry removes the cursor and cancels data entry, restoring the previous code. You may press the **CLR** key up to five seconds after code entry is complete to return the cursor to the fourth digit. The numbers 8 and 9 are not used for code entry, only for entering a count-down time, adjusting contrast and display brightness, and for data selection in the configuration mode.

NOTE

The identification code should be entered with care, regardless if the code was assigned by ATC or if a standard transponder code is being used.

Standard Transponder Codes:

- 1200** - VFR Code in North America (Refer to the ICAO standards)
- 2000** - VFR Code commonly used in Europe (Refer to the ICAO standards)
- 7000** - VFR Code commonly used in Europe (Refer to the ICAO standards)
- 7500** - Hijack
- 7600** - Loss of communications
- 7700** - Emergency

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KEYS FOR OTHER GTX 328 / 330 FUNCTIONS

- IDENT** Pressing the **IDENT** key activates the special position identification (SPI) pulse for 18 seconds, identifying the 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.
- VFR** Sets the transponder code to the VFR code programmed in the configuration mode. Pressing the VFR key again will restore the previous identification code.
- FUNC** Changes the page shown on the right side of the display. The data displayed includes pressure altitude, flight time, altitude monitor, count-up timer and count-down timer. In the configuration mode, pressing this key scrolls through the function pages.
- START/STOP** Starts and stops the altitude monitor, count-up, count-down and flight timers. In the configuration mode, pressing this key scrolls through the functions in reverse.
- CRSR** Starts the entry of the starting time for the count-down timer and cancels transponder code entry. Returns the cursor to last code digit if pressed within five seconds after code entry. Selects changeable fields in the configuration mode.
- CLR** Resets the count-up, count-down and flight timers. Cancels the previous key press during code selection and count-down entry. Returns the cursor to the fourth code digit if pressed within five seconds after code entry. Is also used in the configuration mode.
- 8** Reduces contrast and display brightness when the appropriate fields are displayed and enters the number eight into the count-down timer. Is also used in the configuration mode.
- 9** Increases contrast and display brightness when the appropriate fields are displayed and enters the number nine into the count-down timer. Is also used in the configuration mode.

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FUNCTION DISPLAY

PRESSURE ALT:

Displays the altitude data supplied to the GTX 328 / 330 in feet, hundreds of feet (i.e., flight level), or meters, depending on the configuration.

FLIGHT TIME:

Timer start is configured as either manual or automatic. When manual is configured, the flight time is displayed which is controlled with the **START / STOP** and **CLR** keys. When the timer is set to automatic, the timer begins when the aircraft takes off.

ALTITUDE MONITOR:

Controlled by the **START / STOP** key. Activates a voice alarm and warning annunciator when the altitude limit is exceeded.

OAT/DALT:

Displays the outside air temperature (OAT) and density altitude (DALT) when the GTX 328 / 330 is connected with the appropriate sensors.

COUNT-UP TIMER:

Controlled by **START / STOP** and **CLR** keys.

COUNT-DOWN TIMER:

Controlled by **START / STOP**, **CLR**, and **CRSR** keys. The count-down time is set with the **0-9** keys.

CONTRAST:

This page is only displayed if the manual contrast mode is selected in the configuration mode. Contrast is controlled by the **8** and **9** keys.

DISPLAY BRIGHTNESS:

This page is only displayed if the manual back light mode is selected in the configuration mode. Contrast is controlled by the **8** and **9** keys.

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ALTITUDE TREND INDICATOR

When the '**PRESSURE ALT**' page is displayed, an arrow appears to the right of the altitude, indicating if the altitude is increasing or decreasing. Two sizes of arrows are displayed, depending on the rate of climb or descent. The sensitivity of these arrows is set in the GTX 328 / 330 configuration mode.

TIMER OPERATION

TO OPERATE THE FLIGHT TIMER:

1. Press the **FUNC** key until '**FLIGHT TIME**' is displayed.
2. If desired, press **START/STOP** to pause or restart the timer.
3. Press **CLR** to reset the timer to zero.

TO OPERATE THE COUNT-UP TIMER:

1. Press the **FUNC** key until '**COUNT UP**' is displayed.
2. If necessary, press **CLR** to reset the count-up timer to zero.
3. Press **START/STOP** to begin count up.
4. Press **START/STOP** again to pause the timer.
5. Press **CLR** to reset the timer to zero.

TO OPERATE THE COUNT-DOWN TIMER:

1. Press the **FUNC** key until '**COUNT DOWN**' is displayed.
2. Press **CRSR** and use the **0-9** keys to set the initial time. All digits must be entered (use the **0** key to enter leading zeros).
3. Press **START/STOP** to start the count down.
4. Press **START/STOP** again to pause the timer.
5. When the count-down timer expires, the '**COUNT DOWN**' banner is replaced with a flashing '**EXPIRED**', and the time begins counting up.
6. Press **CLR** to reset the timer to the initial value.

AUTOMATIC SWITCHING BETWEEN THE ALT AND GND MODES

If the GTX 328 / 330 is configured to automatically determine if the aircraft is airborne, normal transponder operation begins when take-off is sensed. When the airplane is on the ground, the screen displays '**GND**'. The transponder will not respond to ATCRBS interrogations when the transponder is showing '**GND**'. When a delay time is set in the configuration mode, the GTX 328 / 330 will wait a specified length of time after landing before changing to the GND mode.

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FAILURE ANNUNCIATION

If the unit detects an internal failure, the screen will display '**FAIL**'. When '**FAIL**' is being displayed, no transponder data is transmitted.

GTX 328 / 330 MODE S TRANSPONDER FEATURES

MODE S DATA TRANSMISSION

In addition to 4096 codes and pressure altitude, the GTX 328 / 330 is capable of transmitting aircraft registration or flight ID, transponder capability and maximum speed range.

AUDIO ALERTS (audio panel required)

Configuration options: male/female voice or tone, and volume level.

- '**Leaving Altitude**': altitude deviation exceeded
- '**Timer Expired**': for count-down time

NOTE

The Traffic Information System (TIS) described in the following paragraphs and the associated audio warnings are only supported by the Garmin GTX 330.

TRAFFIC INFORMATION SERVICE (only supported by the Garmin GTX 330)

The GTX 330 Mode S Transponder can exchange information for use by the 'Traffic Information Service (TIS)'. TIS is currently only available in some test areas in North America. The TIS offers a graphical representation of traffic information for aircraft not equipped with a TCAS system. Aircraft with transponders that are in range can be displayed on certain equipment, such as the Garmin GNS 430 or the GNS 530. Aircraft without transponders cannot be detected. Please refer to the 400/500 series pilot literature for more information.

AUDIO ALERTS (only applicable for the Garmin GTX 330)

- '**Traffic**': TIS traffic warning received
- '**Traffic Not Available**': TIS service is not available or is out of range

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INTEGRATION INTO THE AQUILA AT01-100

The GARMIN GTX 328 / 330 Mode S transponder is connected to the avionic bus of the aircraft's electrical system and is protected by a 5A circuit breaker. This allows the transponder to be completely disconnected from the aircraft's electrical system. The circuit breaker is labeled "TXP" and is installed on the right hand side of the instrument panel, along with the other circuit breakers.

In addition to the transponder unit which is installed in the avionic rack in the midsection of the instrument panel, the transponder system consists of a transponder antenna and an altitude encoder. The altitude encoder is connected to the on-board static pressure system and is attached to a support bracket inside the instrument panel. The transponder antenna is installed on the bottom of the fuselage, below the co-pilot's seat.

For a detailed description of the integration and installation of the transponder into the AQUILA AT01-100 and its connection to the electrical system, please refer to the current issue of the Maintenance Manual.

8. HANDLING, SERVICE AND MAINTENANCE

In order to increase the service life of the GTX 328 / 330 Mode S transponder, it should always be turned off during engine start-up and shut-down, as electrical surges during these phases may damage the unit.

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