

# GTX<sup>™</sup> 328

*Mode S Transponder*



pilot's guide

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***CAUTION:*** *The GTX 328 should be turned off before starting or shutting down aircraft engine(s).*

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***NOTE:*** *Contact a Garmin dealer for software updates.*

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**NOTE:** *The expected coverage from the GTX 328 is limited to "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. It may be possible to minimize antenna shielding by locating the antenna where dead spots are only noticed during abnormal flight attitudes.*

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The GTX 328 transponder is powered on by pressing the **STBY**, **ALT** or **ON** keys, or by a remote avionics master switch (if applicable). After power on, a start-up page is displayed while the unit performs a self test.

## Mode Selection Keys

**OFF** — Powers off the GTX 328. Pressing **STBY**, **ON** or **ALT** Key powers on the transponder displaying the last active identification code.

**STBY** — Selects the standby mode. When in standby mode, the transponder will not reply to any interrogations.

**ON** — Selects Mode A. In this mode, the transponder replies to interrogations, as indicated by the Reply Symbol (Ⓜ). Replies do not include altitude information.

**ALT** — Selects Mode A and Mode C. In **ALT** mode, the transponder replies to identification and altitude interrogations as indicated by the Reply Symbol (Ⓜ). Replies to altitude interrogations include the standard pressure altitude received from an external altitude source, which is not adjusted for barometric pressure. The **ALT** mode may be selected in aircraft not equipped with an optional altitude encoder; however, the reply signal will not include altitude information.

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 aircraft.



## Code Selection

Code selection is done with eight keys (**0** – **7**) providing 4,096 active identification codes. Pushing one of these keys begins the code selection sequence. Digits that are not yet entered appear as dashes. The new code is activated when the fourth digit is entered. Pressing the **CLR** Key moves 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. 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, and contrast and display brightness.



## **Important Codes:**

**1200**— The VFR code for any altitude in the US (Refer to ICAO standards elsewhere)

**7000**— The VFR code commonly used in Europe (Refer to ICAO standards)

**7500**— Hijack code (Aircraft is subject to unlawful interference)

**7600**— Loss of communications

**7700**— Emergency

**7777**— Military interceptor operations (Never squawk this code)

**0000**— Military use

Avoid selecting codes 0000, 7500, and all codes in the 7600-7777 range. These codes trigger special indicators in automated facilities. An aircraft's transponder code is used for ATC tracking purposes, therefore exercise care when making routine code changes!

## **Keys for Other GTX 328 Functions**



**IDENT**— Pressing the **IDENT** Key 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.



**VFR**— Sets the transponder code to the pre-programmed VFR code selected in Configuration Mode (this is set to 7000 at the factory). Pressing the **VFR** Key again restores the previous identification code. If the VFR Key is disabled (dependent upon installation configuration) a 'VFR Key Disabled' message appears, to indicate that no operation took place.



**FUNC**— Changes the page shown on the right side of the display. Display data includes Pressure Altitude, Flight Time, Altitude Monitor, Count Up and Count Down timers. Also displays Outside Air Temperature, Density Altitude, Contrast, and Display (dependent upon installation configuration).



**START/STOP**— Starts and stops the Altitude Monitor, Count Up, Count Down and Flight timers.



**CRSR**— Initiates starting time entry for the Count Down timer and cancels transponder code entry.



**CLR**— Resets the Count Up, Count Down and Flight timers. Cancels the previous keypress during code selection and Count Down entry. Returns cursor to the fourth code digit within five seconds after entry.



**8**— Reduces Contrast and Display Brightness when the respective fields are displayed (dependent upon installation configuration) and enters the number eight into the Count Down timer.



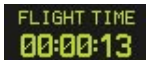
**9**— Increases Contrast and Display Brightness when the respective fields are displayed (dependent upon installation configuration) and enters the number nine into the Count Down timer.

## Function Display



PRESSURE ALT  
FL 123

**PRESSURE ALT:** Displays the altitude data supplied to the GTX 328 in feet, hundreds of feet (i.e., flight level), or meters, (dependent upon installation configuration).



FLIGHT TIME  
00:00:13

**FLIGHT TIME:** Timer start is configured as either Manual or Automatic. When Manual, displays the Flight Time, controlled by the **START/STOP** and **CLR** keys. When Automatic, the timer begins when take off is sensed.



ALT MONITOR  
200% ABOVE

**ALTITUDE MONITOR:** Controlled by **START/STOP** Key. Activates a voice alarm and warning annunciator when altitude limit is exceeded.



OAT 0°  
DALT 13386%

**OAT/DALT:** Displayed when the GTX 328 is configured with temperature input. Displays Outside Air Temperature and Density Altitude.



COUNT UP  
00:01:05

**COUNT UP TIMER:** Controlled by **START/STOP** and **CLR** keys.



COUNT DOWN  
00:03:25

**COUNT DOWN TIMER:** Controlled by **START/STOP**, **CLR**, and **CRSR** keys. The initial Count Down time is entered with the **0 – 9** keys.



CONTRAST

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



DISPLAY

**DISPLAY:** This page is only displayed if manual backlighting mode is selected during installation configuration. Backlighting is controlled by the **8** and **9** keys.

## Altitude Trend Indicator

When the 'PRESSURE ALT' page is displayed, an arrow may be displayed to the right of the altitude, indicating that the altitude is increasing or decreasing. One of two sizes of arrows may be displayed depending on the vertical speed rate. The sensitivity of these arrows is set by an authorized Garmin Aviation Service Center.

The GTX 328's options are normally set at time of installation. To request any changes of the GTX 328 parameters, contact an authorized Garmin Aviation Service Center.

## **Timer Operation**

### **To operate the Flight Timer:**

1. Press the **FUNC** Key until 'FLIGHT TIME' is displayed.
2. If the GTX 328 is configured with Automated Airborne Determination, the timer begins automatically when the unit senses that the aircraft has become airborne. The timer may be reset to zero at every take off, continue accumulating time at take off or may be controlled manually.
3. If desired, press **START/STOP** to pause or restart the timer.
4. Press **CLR** to reset the timer to zero.
5. If the timer is configured to start automatically it will stop when the Automated Airborne Determination senses that the aircraft is on the ground.

### **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 begin 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 time value.

## **Automatic ALT/GND Mode Switching**

If the GTX 328 is configured for Automated Airborne Determination, normal operation begins when take off is sensed. When the aircraft is on the ground the screen automatically displays GND. The transponder does not respond to ATCRBS interrogations when GND is annunciated. When a delay time is set in the Configuration Mode, the GTX 328 waits a specified length of time after landing before changing to GND mode.

## **Failure Annunciation**

If the unit detects an internal failure, the screen displays FAIL. When FAIL is annunciated no transponder data is transmitted.

## **Mode S Data Transmission**

In addition to 4096 code and pressure altitude, the GTX 328 is capable of transmitting aircraft identification, transponder capability and maximum speed range. “Aircraft Identification” is commonly referred to as **FLT ID** (Flight Identification). The GTX 328 may be configured by the installer to allow the flight crew to enter **FLT ID** for each flight. An example is when air-carrier service requires changing the **FLT ID**.

The **FLT ID** may consist of the aircraft registration or a flight number as agreed upon with the local aviation authority. In either case, the **FLT ID** must be the same aircraft identification that appears in the flight plan to correlate the aircraft identification seen on ATC radar with the correct voice call sign for the aircraft. If no flight plan is filed with the aviation authority (as may be permitted by regulations), the **FLT ID** entered is the aircraft registration marking.

When flight crew entry of the **FLT ID** is not required, the installer configures the system to report the aircraft identification according to local aviation requirements. In this configuration, alteration of the **FLT ID** by the flight crew is not possible.

### **Entering a Flight ID Number**

When configured for **FLT ID PWR-UP ENTRY** at installation, the flight crew must enter the Flight ID before the GTX 328 will operate. After the flight crew enters the correct Flight ID, the aircraft identification that is transmitted in response to ATC radar interrogations is properly correlated with the associated call sign for voice communication with the aircraft.

If the **FLT ID PWR-UP ENTRY** is required but does not appear at power up, contact a Garmin authorized service center for GTX 328 configuration.

No space is needed when entering Flight ID characters. When a Flight ID contains a space, the GTX 328 automatically removes the spaces upon completion of Flight ID entry.

At system power-up the **FLT ID** may appear with no number (as shown) or with the last **FLT ID** entered. The cursor covers the entire **FLT ID** field.



FLT ID PWR-UP ENTRY [ ] OK?  
ABC DEF GHI JKL MNO PQR STU VWX YZ  
0 1 2 3 4 5 6 7 8 9

If the Flight ID appearing at turn-on is correct, press the **CRSR** Key to move the cursor to the “OK?” field. Press **CRSR** again to accept the **FLT ID**. The transponder then begins normal operation.



FLT ID PWR-UP ENTRY AIR123 [ ] OK?  
ABC DEF GHI JKL MNO PQR STU VWX YZ  
0 1 2 3 4 5 6 7 8 9

When no **FLT ID** appears or the **FLT ID** must be changed, press the number keys corresponding to the alphanumeric character entry. For example, to enter the letter “R” press the **5** Key four times.



FLT ID PWR-UP ENTRY AIR123 [5] OK?  
ABC DEF GHI JKL MNO PQR STU VWX YZ  
0 1 2 3 4 5 6 7 8 9



Each time an alphanumeric character is entered, press the **CRSR** Key to move the cursor to the next blank field. Pressing the **CLR** Key moves the cursor back to the previous character. After the complete **FLT ID** is entered, press the **CRSR** Key to move the cursor to the “OK?” field. Press **CRSR** again to accept the **FLT ID**.

When **FLT ID** entry is complete the transponder begins normal operation.

If an error is made while entering a **FLT ID**, press the **CLR** Key to back up to any point, including highlighting the “OK?” field. If an incorrect **FLT ID** is discovered after the unit begins operation, turn the GTX 328 off. Then turn it back on again and reenter the correct **FLT ID**.

### **Audio Alerts**

(Setting options; male/female voice or tone, and volume level.)

- “Leaving Altitude” Altitude deviation is exceeded.
- “Timer Expired” for countdown time.



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