

GARMIN<sup>®</sup>

# GTX™ 330/330D

*Mode S Transponder*



Pilot's Guide

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This manual is written for software version 7.00 or later, and is not suitable for earlier software versions. Some differences in operation may be observed when comparing the information in this manual to earlier or later software versions.

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**CAUTION:** *The GTX 330 should be turned off before starting or shutting down aircraft engine(s).*

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**NOTE:** *Reference to the GTX 330 Transponder throughout this Pilot's Guide includes operation of the GTX 330D Diversity Transponder also.*

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

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## **Limited Warranty**

This Garmin product is warranted to be free from defects in materials or workmanship for two years from the date of purchase. Within this period, Garmin will at its sole option, repair or replace any components that fail in normal use. Such repairs or replacement will be made at no charge to the customer for parts or labor, provided that the customer shall be responsible for any transportation cost. This warranty does not cover failures due to abuse, misuse, accident or unauthorized alteration or repairs.

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To obtain warranty service, contact your local Garmin Authorized Service Center. For assistance in locating a Service Center near you, call Garmin Customer Service at one of the numbers shown below.

Garmin International, Inc.	Garmin (Europe) Ltd.
1200 East 151st Street	Liberty House, Bulls Copse Road
Olathe, Kansas 66062, U.S.A.	Hounslow Business Park
Phone: 913/397.8200	Southampton, SO40 9RB, U.K.
FAX: 913/397.8282	Phone: 44/0870.8501241
	FAX: 44/0870.8501251



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**NOTE:** *It is the responsibility of the GTX 330 owner to obtain proper licensing before using the transponder.*

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**NOTE:** *The coverage expected from the GTX 330 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 330 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 330. 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** — In this mode, the transponder replies to interrogations, as indicated by the Reply Symbol (  ). Replies do not include altitude information.

**ALT** — 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. 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, and for adjusting contrast and display brightness.



When the transponder code is changed, a notification is sent to ATC by the GTX 330. This notification is temporary and may not be sent if the GTX is not active (i.e., set to **ON**, **ALT** or **GND**) when the code is changed.



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**NOTE:** *On a dual transponder installation, change the code on the active transponder. This ensures the notification is transmitted to ATC.*

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### **Keys for Other GTX 330 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 during this time.



**VFR**— Sets the transponder code to the pre-programmed VFR code selected during installation configuration (this is set to 1200 at the factory). Pressing the VFR key again restores the previous identification code. If the VFR Key is pressed when 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, Display, and ADS-B Operation (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.

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## Function Display



**NOTE:** GTX 330 options are normally set at time of installation. For changes to the GTX 330 parameters, contact your Garmin authorized dealer.

PRESSURE ALT  
FL 123

**PRESSURE:** ALT: Displays the altitude data supplied to the GTX 330 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°C  
DALT 13386%

**OAT/DALT:** Displayed when the GTX 330 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  
[Progress bar]

**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  
[Progress bar]

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

ADS-B TX  
ON

**ADS-B:** This page is displayed if the ADS-B pilot set option is selected during installation configuration of an ES enabled GTX 330. ADS-B defaults to ON at each power cycle. ADS-B ON/OFF is controlled by the START/STOP key. Turn ADS-B OFF only at the request of ATC.

ADS-B TX  
OFF

NO ADSB

**NO ADSB:** Will appear in the upper left corner when ADS-B is configured on but cannot transmit the position of the aircraft. Or when ADS-B TX is manually turned off.



## **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 initially set during transponder installation.

## **Timer Operation**

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

- 1) Press the **FUNC** key until FLIGHT TIME is displayed.
- 2) If the GTX 330 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, the message "Timer Expired" is heard, 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 330 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 (dependent upon installation configuration), the GTX 330 waits a specified length of time after landing before changing to GND mode.

## **Failure Annunciation**

If the unit detects an internal failure or an ADS-B transmission 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 330 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 330 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.

## **Altitude Monitor Operation**

### **To operate the Altitude Monitor:**

- 1)** Climb to assigned altitude.
- 2)** Press the **FUNC** key until ALT MONITOR is displayed.
- 3)** Press **START/STOP** key to start monitoring altitude.
- 4)** Press **START/STOP** key again to cancel Altitude Monitor.

Altitude deviation is shown in hundreds of feet ABOVE or BELOW the selected altitude. When the aircraft's altitude exceeds the deviation limit, ABOVE or BELOW flashes and an audio tone or the message "Leaving Altitude" is heard. ABOVE or BELOW flashes until the aircraft returns to within 100' of the selected altitude.

To select a new monitored altitude, press the **START/STOP** key to deactivate, then press again to activate the new monitored altitude.

If another function is selected for viewing, such as a Timer or Pressure Altitude, the Altitude Monitor is automatically displayed with a flashing alert when the altitude excursion exceeds the configured deviation value. The Altitude Monitor stops when the current deviation exceeds 1000 feet plus the configured deviation value.

The maximum configured deviation values that can be set by a Garmin authorized service center are as follows:

- Flight Level or Feet Maximum Limits – 300 feet BELOW, 0 feet to 1999 feet ABOVE
- Meters Maximum Limits – 300 meters BELOW, 0 meters to 609 meters ABOVE



## 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 330 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 330 configuration.

No space is needed when entering Flight ID characters. When a Flight ID contains a space, the GTX 330 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. 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 [ ] OK?  
ABC DEF GHI JKL MNO PQR STU VWX YZ  
0 1 2 3 4 5 6 7 8 9



FLT ID PWR-UP ENTRY AIR123 [3] 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. 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. After accepting the FLT ID, any FLT ID changes require a power cycle.



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

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 on a single GTX 330 installation after the unit begins operation, turn the GTX 330 off. Then turn it back on and re-enter the correct FLT ID.

On a dual transponder installation, FLT ID changes may be entered on the standby transponder. When the transponder FLT ID is changed, a notification is sent to ATC by the GTX 330. This notification is temporary and may not be sent if the GTX 330 is not active (i.e., set to **ON**, **ALT**, or **GND**). Therefore, the standby transponder must be activated immediately following a FLT ID change.



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**NOTE:** Flight ID changes require a power cycle. The GTX 330 must be set to **ON**, **ALT**, or **GND** immediately following a FLT ID change in order for ATC to be notified of the change.

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## **GTX 330 Mode S Transponder Features**

### **GTX 330D Diversity Mode S Transponder**

The GTX 330D Diversity Mode S Transponder incorporates antennas mounted on the top and bottom of the aircraft for dependable operation while maneuvering. Top and bottom antennas are less prone to antenna shadowing by the aircraft structure while turning. A top mounted antenna is in a better viewing position for interrogation and reply to overhead aircraft.

### **Traffic Information Service**

The GTX 330 Mode S transponder provides a data link for Traffic Information Service (TIS). TIS is derived through a Mode S transponder data link and viewed on a multifunction display. ATC radar sends a traffic picture within a radius of 55 miles from select sites. The TIS protected area is a cylinder of 7-mile radius, extending 3500' above and 3000' below the aircraft. Refer to the AIM Chapter 1 for more details.

TIS provides a graphic display of traffic information in the cockpit for non-TCAS equipped aircraft. Transponder-equipped aircraft can be displayed within the coverage volume within range of your position on indicators such as a Garmin GNS 430 or GNS 530, GNS 480, and GMX 200. Aircraft without an operating transponder are invisible to TIS. Refer to 400/500 series, GNS 480, or GMX 200 pilot literature for details.

### **GTX 330 ES Options**

Automatic Dependent Surveillance-Broadcast (ADS-B) technology improves situational awareness and flight safety. With ADS-B capabilities, position, velocity, and heading information are automatically transmitted to other aircraft and ground stations. The current air traffic control system depends on a transponder request for pertinent aircraft information and does not include 3D position. ADS-B provides automatic transmission of aircraft information without a request.



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***NOTE: The GTX 330 with software version 7.00 or later, has been shown to comply with TSO-C166b and AC 20-165 and is eligible for use as an ADS-B out Transmitter meeting the requirements of 14 CFR 91.225 and 91.227 when installed in accordance with Garmin's installation instructions. Refer to the AFMS for more information on your installation and whether it is ADS-B version 2 compliant.***

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### **Audio Alerts**

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

- “Leaving Altitude” - Altitude Monitor deviation is exceeded.
- “Traffic” - TIS traffic alert is received.
- “Traffic Not Available” - TIS service is not available or out of range.
- “Timer Expired” - Count down time has expired.





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