

GTX™ 330/330D

Mode S Transponder



Pilot's Guide

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This manual is written for software version 8.01 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).*



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



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

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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Garmin retains the exclusive right to repair or replace the unit or software or offer a full refund of the purchase price at its sole discretion. SUCH REMEDY SHALL BE YOUR SOLE AND EXCLUSIVE REMEDY FOR ANY BREACH OF WARRANTY.

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.

1200 East 151st Street

Olathe, Kansas 66062, U.S.A.

Phone: 913/397.8200

FAX: 913/397.8282

Garmin (Europe) Ltd.

Liberty House, Bulls Copse Road

Hounslow Business Park

Southampton, SO40 9RB, U.K.

Phone: 44/0870.8501241

FAX: 44/0870.8501251



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



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.*



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.



NOTE: *If Automatic Airborne Determination senses the aircraft is on the ground, the GTX 330 will not respond to ATCRBS or Mode S All-Call interrogations regardless of the operating mode.*

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 **STBY**) when the code is changed.



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

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 Flight ID, 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 Flight ID entry, 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



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



FLIGHT ID: Displays the Flight ID. The CRSR key opens the Flight ID entry dialog if the 'ALLOW PILOT TO EDIT FLT ID' option is enabled during installation configuration.



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: 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.



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



OAT/DALT: Displayed when the GTX 330 is configured with temperature input. Displays Outside Air Temperature and Density Altitude.



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



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



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: 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: 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. 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 Mode Switching

If the GTX 330 is configured for Automated Airborne Determination, the system automatically switches to ALT Mode when take off is sensed.

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.

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

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 Flight ID (Flight Identification). The GTX 330 may be configured by the installer to allow the flight crew to enter Flight ID for each flight. An example is when air-carrier service requires changing the Flight ID.

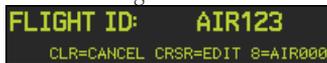
The Flight ID may consist of the aircraft registration or a flight number as agreed upon with the local aviation authority. In either case, the Flight ID must be the same aircraft identification that appears in the flight plan to correlate the aircraft identification seen on ATC radar with the correct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

When flight crew entry of the Flight 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 Flight ID by the flight crew is not possible.

Flight ID Entry Dialog

When ALLOW PILOT TO EDIT FLT ID is enabled at installation, the flight crew may change the Flight ID after power up by navigating to the FLIGHT ID Page and pressing the **CRSR** key. This opens the Flight ID Entry dialog. After the flight crew enters the correct Flight ID, the aircraft identification that is transmitted in response to ATC radar interrogations will properly correlate with the associated call sign for voice communication with the aircraft.

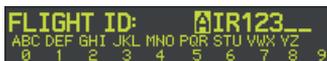
If ALLOW PILOT TO EDIT FLT ID is required but is disabled, contact a Garmin authorized service center for GTX 330 configuration.



Flight ID Entry Dialog

Editing the Flight ID

When the Flight ID Entry dialog is displayed, press the **CRSR** key to begin editing the Flight ID. To change a character, press the number keys corresponding to the alphanumeric character entry. For example, to enter the letter R, press the **5** key four times. 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. Once the last character is entered, press the **CRSR** key to move the cursor over the remaining blank fields to complete Flight ID entry.



Editing the Flight ID



NOTE: 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.



NOTE: If the entered Flight ID is blank (i.e. all spaces), the new Flight ID will not be saved by the GTX 330 and the dialog will remain open.

If an error is made while entering a Flight ID, press the **CLR** key to back up to any point. If the **CLR** key is pressed when the cursor is covering the first Flight ID character, the Flight ID will revert to the last Flight ID entered, and the dialog will remain open. If the **CLR** key is pressed when the Flight ID is not being edited, the dialog will close without saving.

When the transponder Flight 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 **STBY**).



NOTE: For dual transponder installations, change the Flight ID on the active transponder. This ensures the notification is transmitted to ATC.



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

Resetting the Flight ID to Default

If a default Flight ID is configured, the Flight ID Entry dialog will display an option in the lower right corner of the screen “8=<DEFAULT>”, where <DEFAULT> is the configured default Flight ID. Press the 8 key to reset the Flight ID to this default and close the dialog. If a default Flight ID is required but is not configured, contact a Garmin authorized service center for GTX 330 configuration.

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, GTN 6XX/7XX, GNS 480, and GMX 200. Aircraft without an operating transponder are invisible to TIS. Refer to 400/500 series, GTN 6XX/7XX, 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.



NOTE: *The GTX 330 with software version 8.01 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.*

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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