GARMIN

GTX™ 330
Mode S Transponder

pilot's guide

This manual is written for software version 4.01 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.

NOTE: The GTX 330D Diversity Mode S Transponder requires top and bottom mounted antennas.

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

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.

THE WARRANTIES AND REMEDIES CONTAINED HEREIN ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED OR STATUTORY, INCLUDING ANY LIABILITY ARISING UNDER ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, STATUTORY OR OTHERWISE. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, WHICH MAY VARY FROM STATE TO STATE.

IN NO EVENT SHALL GARMIN BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, WHETHER RESULTING FROM THE USE, MISUSE, OR INABILITY TO USE THIS PRODUCT OR FROM DEFECTS IN THE PRODUCT. Some states do not allow the exclusion of incidental or consequential damages, so the above limitations may not apply to you.

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.	Garmin (Europe) Ltd.
1200 East 151st Street	Unit 5, The Quadrangle, Abbey Park
Olathe, Kansas 66062, U.S.A.	Industrial Estate, Romsey, SO51 9DL, U.K.
Phone: 913/397.8200	Phone: 44/0870.8501241
FAX: 913/397.8282	FAX: 44/0870.8501251

> **NOTE:** *The GTX 330D owner accepts all responsibility for obtaining the proper licensing before using the transponder.*

> **NOTE:** *The coverage you can expect 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. (See your Garmin dealer for software upgrades.)*

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 — 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. The new code is not activated until 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 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 (Not enterable)

Avoid selecting code 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 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 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 1200 at the factory). Pressing the **VFR** key again restores the previous identification code.

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.

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 and enters the number eight into the Count Down timer.

9— Increases Contrast and Display Brightness when the respective fields are displayed and enters the number nine into the Count Down timer.

Function Display

PRESSURE ALT: Displays the altitude data supplied to the GTX 330 in hundreds of feet (i.e., flight level), or meters, depending on 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 in Configuration Mode. Contrast is controlled by the **8** and **9** keys.

DISPLAY: This page is only displayed if manual backlighting mode is selected in Configuration Mode. 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 your authorized Garmin Aviation Service Center.

The GTX 330's options are normally set at time of installation. To request any changes of the GTX 330 parameters, contact your 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 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, you may 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 330 is configured with 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 330 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 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.

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 may cover the whole **FLT ID** or may be on the first character space for data entry, depending on how the **FLT ID** was last entered.

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.

When no **FLT ID** appears or the **FLT ID** must be changed, press the **CLR** key to begin character entry.

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. 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 you make an error entering a **FLT ID**, you can 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 330 off. Then turn it back on again and reenter the correct **FLT ID**.

GTX 330 Mode S Transponder Features

<u>Traffic Information Service</u>

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 your 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 430 or 530, GNS 480 and MX20. Aircraft without an operating transponder are invisible to TIS. Refer to 400/500 series, GNS 480 or MX20 pilot literature for details.

<u>Audio Alerts</u>

(Setting options; male/female voice or tone, and volume level.)
- "Leaving Altitude" Altitude deviation is exceeded.
- "Traffic" TIS traffic alert is received.
- "Traffic Not Available" TIS service is not available or out of range.
- "Timer Expired" for countdown time.