GARMIN

G1000™

Transponder Pilot's Guide

Record of Revisions			
Revision	**Date of Revision**	**Revision Page Range**	**Description**
A	04/30/04	5-1 – 5-7	Initial release.
B	11/29/04	5-1 – 5-7	Added information on flight ID reporting.
C	05/3/05	5-1 – 5-5	Changes per Software 4.02.
D	07/20/05	5-1 – 5-5	New cover plus minor edits.

5.1 GTX 33 TRANSPONDER

The GTX 33 transponder is integrated into the G1000 system, offering Mode A, Mode C and Mode S interrogation and reply capabilities. This pilot's guide provides a description of the transponder operation and information on Mode S capability.

The transponder controls are located on the G1000 Primary Flight Display (PFD) on the lower portion of the screen (see figures below).

TRANSPONDER SOFTKEYS

The transponder function spans three levels of softkeys; the Top-level, the Mode Selection and the Code Selection softkeys.

When the Top-level **XPDR** softkey is pressed, the following softkeys appear in the softkey bar (Figure 5.1.2): **STBY**, **ON**, **ALT**, **VFR**, **CODE**, **IDENT**, **BACK**.

When the **CODE** softkey is pressed, the number softkeys appear in the softkey bar (Figure 5.1.3): **0**, **1**, **2**, **3**, **4**, **5**, **6**, **7**, **IDENT**, **BKSP**, **BACK**. The digits **8** and **9** are not used for code entry. Pressing the **BKSP** softkey backs up code selection to the previous digit.

Pressing the **BACK** softkey during code selection reverts to the **MODE** Selection softkeys (Figure 5.1.2). Pressing the **BACK** softkey during Mode Selection reverts to the Top-level softkeys (Figure 5.1.1).

NOTE: *After 45 seconds of transponder softkey inactivity, the system reverts back to the Top-level softkeys (Figure 5.1.1).*

TRANSPONDER STATUS BAR

The Transponder Status bar is located to the left of the System Time box and contains, a four-digit code field, a mode field and a reply status indicator. In Standby mode, both the code field and the mode field appear in white. In all other modes, these fields appear in green.

Figure 5.1.1 Top-level Softkeys

*Pressing **XPDR** displays the Mode Selection softkeys*

*Pressing **BACK** displays the Top-level softkeys*

Figure 5.1.2 Mode Selection Softkeys

*Pressing **CODE** displays the Code Selection softkeys*

*Pressing **BACK** displays the Mode Selection softkeys*

Figure 5.1.3 Code Selection Softkeys

MODE S FEATURES

The GTX 33 transponder is equipped with selective addressing or **Mode Select** (Mode S), capability. Mode S functions include the following features:

- Level-2 reply data link capability (used to exchange information between aircraft and various ATC facilities)
- Surveillance identifier capability
- Flight ID reporting
- Altitude reporting
- Airborne status determination
- Transponder capability reporting
- Mode S Enhanced Surveillance (EHS) requirements
- Acquisition squitter

Flight ID Reporting – The G1000 transponder reports aircraft identification as either the aircraft registration or a FLT ID (Flight Identification). The system is configured for either option by an authorized Garmin service center.

If configured for Flight ID entry, the pilot must enter the appropriate flight ID on the PFD. After the correct Flight ID is entered, the aircraft identification reported in response to ATC radar interrogations is properly correlated with the associated call sign for voice communication.

The flight ID is not to exceed seven (7) characters. No space is needed when entering Flight ID. When a Flight ID contains a space, the system automatically removes it upon completion of Flight ID entry. (See ICAO documents 8168, 4444 and 8585 for further details).

If the Flight ID is set to 'SAME AS TAIL' no entry is required. In this configuration, the transponder then reports the aircraft registration number to ATC.

Acquisition Squitter – Acquisition squitter, or short squitter, is the transponder 24-bit identification address. The transmission is sent periodically, regardless of the presence of interrogations.

The purpose of acquisition squitter is to enable Mode S ground stations and Traffic Collision Avoidance System (TCAS) equipped aircraft to recognize the presence of Mode S-equipped aircraft for selective interrogation.

TRAFFIC INFORMATION SERVICE (TIS)

Mode S provides a data link for Traffic Information Service (TIS). TIS is a ground-based service that sends out location, direction, altitude and climb/descent information relative to all transponder-equipped aircraft within a radius of 55 miles from select sites.

For aircraft not equipped with TCAS or TAS, TIS provides a graphic display of traffic information. TIS displays up to eight (8) traffic targets within 7.5 nautical miles from 3,000 feet below to 3,500 feet above your aircraft. TIS data is updated approximately once every five (5) seconds.

NOTE: *TIS is intended only to assist in visual acquisition of other aircraft in Visual Meteorological Conditions (VMC).*

NOTE: *Aircraft without an operating transponder are invisible to TIS.*

5.2 OPERATION

MODE SELECTION

Mode selection can be automatic (Ground and Altitude modes) or manual (Standby, ON and Altitude modes). The **STBY**, **ON** and **ALT** softkeys can be accessed by pressing the **XPDR** softkey.

Ground Mode (Automatic)

Ground mode is automatically selected when the aircraft is on the ground. A green **GND** indication appears in the mode field of the Transponder Status bar. In Ground mode, the transponder does not allow Mode A and Mode C replies, but it does permit acquisition squitter and replies to discretely addressed Mode S interrogations.

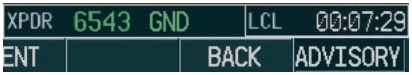

Figure 5.2.1 Ground Mode

NOTE: *Ground mode can be overridden by pressing any one of the Mode Selection softkeys.*

Standby Mode (Manual)

The Standby mode can be selected at any time by pressing the **STBY** softkey. In Standby mode, the transponder does not reply to interrogations, but new codes can be entered. If the Standby mode is selected, a white **STBY** indication appears in the mode field of the Transponder Status bar.

Figure 5.2.2 Standby Mode

NOTE: *In Standby mode, the **IDENT** function is inhibited.*

Manual ON Mode

The **ON** mode can be selected at any time by pressing the **ON** softkey. **ON** mode generates Mode A and Mode S replies, but Mode C altitude reporting is inhibited. In **ON** mode, a green **ON** indication appears in the mode field of the Transponder Status bar.

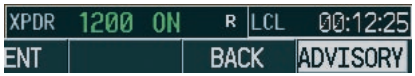

Figure 5.2.3 ON Mode

Altitude Mode (Automatic or Manual)

Altitude mode is automatically selected when the aircraft becomes airborne. Altitude mode may also be selected manually by pressing the **ALT** softkey.

If Altitude mode is selected, a green **ALT** indication is displayed in the mode field of the Transponder Status bar, and all transponder replies requesting altitude information are provided with pressure altitude information.

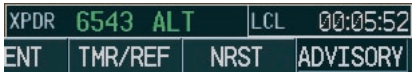

Figure 5.2.4 Altitude Mode

Reply Status

When the transponder sends replies to interrogations, an **R** indication appears momentarily in the reply status field of the Transponder Status bar.

Figure 5.2.5 Reply Indication

CODE SELECTION

Entering a Code

A total of 4,096 discrete identification codes can be selected with the Code Selection softkeys.

To enter a transponder code:

1. Press the **XPDR** softkey to display the transponder Mode Selection softkeys.
2. Press the **CODE** softkey to display the transponder Code Selection softkeys, for digit entry.
3. Press the digit softkeys to enter the code in the code field. When entering the code, the next key in sequence must be pressed within 10 seconds, or the entry is cancelled and restored to the previous code. Five seconds after the fourth digit has been entered, the transponder code becomes active.

Figure 5.2.6 Entering a Code

NOTE: *When entering a code, press the **BKSP** (backspace) softkey to back up and change code digits.*

VFR Code

The VFR code can be entered either manually, each digit at a time, or by pressing the **XPDR** softkey, then the **VFR** softkey. When the **VFR** softkey is pressed, the pre-programmed VFR code is automatically displayed in the code field of the Transponder Status bar.

Pressing the ***VFR*** softkey again restores the previous identification code.

NOTE: *The pre-programmed VFR code is set at the factory to* ***1200.***

Important Codes

Following is a list of important codes:

- 1200 – VFR code in the U.S. (refer to ICAO standards for VFR codes in other countries).
- 7000 – VFR code commonly used in Europe (refer to ICAO standards).
- 7500 – Hijack code.
- 7600 – Loss of communication code.
- 7700 – Emergency code.
- 7777 – Military interceptor operations code (NEVER SQUAWK THIS CODE).
- 0000 – Code for military use in the U.S.

IDENT FUNCTION

Pressing the **IDENT** softkey sends an ID indication to Air Traffic Control (ATC). The ID return distinguishes your transponder from all others on the air traffic controller's radar screen.

The **IDENT** softkey appears in all levels of transponder softkeys. When the **IDENT** softkey is pressed, a green **IDENT** indication is displayed in the mode field of the Transponder Status bar for a duration of 18 seconds.

Figure 5.2.7 IDENT Indication

When the ***IDENT*** softkey is pressed while in Mode or Code Selection, the system reverts to the Top-level softkeys.

NOTE: *In Standby mode, the* ***IDENT*** *softkey is inoperative.*

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