AVIDYNE

AXP340 MODE S TRANSPONDER
PILOT GUIDE

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SYSTEM OVERVIEW

It is the pilot's responsibility to ensure he/she is appropriately licensed, is proficient in operation of the aircraft and its equipment, and is in compliance with all governing flight regulations.

All images contained in this manual are for reference use only, and are subject to change.

Avidyne strongly recommends that pilots use the AXP340 system only under VFR conditions until completely familiar with its operation and use.

Boxed areas marked as **NOTE** within this manual identify certain situations or areas of operation having safety implications. While it is important for the operator to be familiar with all of the information in the manual, it is essential to the safe use of the AXP340 that pilots give careful attention to the material contained within these **NOTE**s.

AXP340 Mode S ADS-B Out Transponder

The AXP340 is a panel-mount Mode S transponder with support for 1090 MHz Automatic Dependent Surveillance Broadcast (ADS-B) Extended Squitter (ES), also known as "ADS-B Out" that meets all the requirements for Mode S elementary surveillance transponders for both IFR and VFR flight.

The AXP340 transmits at a nominal 240 watts and responds to both legacy Mode A/C interrogations and to Mode S interrogations from both ground radar and airborne collision avoidance systems. When connected to a compatible ADS-B compliant GPS source, the AXP340 transmits the required ADS-B Out signals including GPS-derived position along with ground track, ground speed, and altitude information.

FUNCTIONAL OVERVIEW

The Avidyne AXP340 Mode S ADS-B Transponder supports the following functions:

- Mode C transponder operations;
- Mode S transponder operations;
- ADS-B Out capable;
- Flight Timer;
- Stopwatch;
- Altitude Monitor;
- Flight ID reporting;
- Brightness adjustment.

COOL FEATURE
ADS-B Compliance When combined with any of Avidyne's TAS6X0A ADS-B capable Traffic Advisory Systems, and an ADS-B compliant GPS source and display (e.g. Avidyne IFD540 or 440), the combined system will meet the full 1090 MHz ADS-B compliant mandate.

AXP340 Transponder

DISPLAY

The display shows the operating mode of the transponder, the pressure altitude, and the current squawk code. The reply indicator is active when the transponder replies to interrogations and the IDENT indicator is active when the bezel IDENT button has been pressed.

The pressure altitude is normally displayed as a Flight Level, which is the pressure altitude in hundreds of feet and is the altitude referenced to standard sea level pressure (1013.2 hPa or 29.92 inHg). When non-standard atmospheric conditions apply, this may not match the altimeter indicated altitude, but will be correctly displayed on the ATC radar.

BEZEL CONTROLS

SELECTOR KNOB

The selector knob on the right side of the front panel is used to select data such as characters for Flight ID or move through the menu options. Pressing the selector knob confirms the selection or selection of one of the options presented. A label on the right side of the display describes the action which will be taken when the selector knob is pressed.

NUMERIC BUTTONS

The numeric buttons are used to select a new Squawk code or change Flight ID numbers. Pressing buttons 0 through 7 will immediately edit the current squawk code unless in Flight ID edit.

CLR

Press the CLR button to return to original settings or back space through partially complete data entry or reverse through a menu.

IDENT

Press the IDENT button when ATC instructs you to "Ident" or "Squawk Ident". This activates the ident pulse in the transponder for 18 seconds. "IDENT" will appear in the display.

VFR

Pressing the VFR button sets the transponder to the pre-programmed regional VFR code. Pressing the button again restores the previous squawk code.

Pressing the VFR button while in 'Flight ID edit' changes the Flight ID to the pre-programmed ID set up during configuration of the transponder.

FUNC

Pressing the FUNC button cycles through the flight timer, stopwatch, Flight ID editing, ADS-B monitor (depending on installation), altitude monitor and front panel dimming functions.

POWER ON/OFF

The AXP340 will automatically power on when avionics power is applied and will display the Avidyne logo, product identification and software version information while the unit is self-testing.

AXP340 Initialization Screen
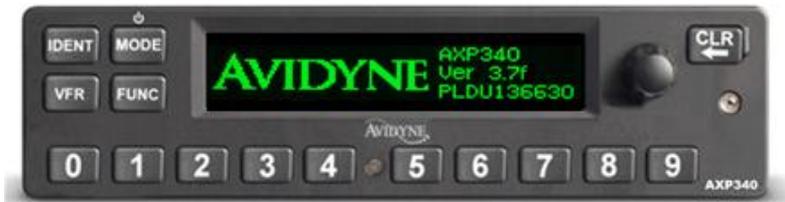
Following a successful power-on self-test, the AXP340 will transition to an operating mode and present the squawk code and Pressure Altitude display page.

If the installation includes an automatic air/ground input, such as a gear squat switch, IFD540 speed-based air/ground discrete, or similar external input, the AXP340 will start in GND mode on the ground and will automatically transition to ALT mode during takeoff roll/liftoff. If no air/ground input has been configured, the transponder will start in ALT mode.

To manually power the AXP340 off, press and hold the MODE button for at least 3 seconds. A countdown timer will be

displayed on the left side of the display and the unit will completely power down upon reaching 0. To manually power the AXP340 on following a manual power off, press and hold the MODE button for approximately 1 second.

Manual Power Off Method

MODE CONTROL

The MODE button also controls the operating mode of the transponder.

The possible states are as follows:

ALT The transponder will respond to all interrogations.

ON The transponder will respond to all interrogations, but altitude reporting is suppressed.

SBY The transponder is on, but will not reply to any interrogations.

GND The transponder will respond to Mode S ground interrogations from surface movement radar. This mode is only available in installations that send a ground/air discrete signal to transponder.

When airborne, the transponder should always be set to ALT unless otherwise directed by Air Traffic Control.

Aircraft installations that include a ground/air state input (e.g. gear squat switch or wired discrete from a GPS/Nav/Com such as the IFD540) will automatically select GND on landing or while taxiing and will automatically select ALT when airborne. In these installations, the pilot selectable states are ALT-ON-SBY when in-air and GND-SBY when on-ground.

SQUAWK CODE ENTRY

Press any of the numeric buttons (0 through 7) to start modifying the squawk code.   A new squawk code is set when the fourth digit is entered.

If an incorrect digit is entered, press the CLR button as required to back space through the squawk code entry and make the desired correction.

If the code entry is not completed within 7 seconds, the changes are ignored and the previous code restored.

Some standard squawk codes are listed below

1200	VFR code in the USA
7000	VFR code commonly used in Europe
7500	Hijack code
7600	Loss of communications
7700	**Emergency code**

ADDITIONAL FUNCTIONS

FLIGHT TIMER
The Flight Timer (labelled "Flight Time") records the time for
which the transponder has been powered on and operating in
flight mode – either ON or ALT. Press the FUNC button to
display the Flight Timer.

Flight Timer Function Display

Pressing the CLR button resets the flight time counter. Pressing
the selector knob starts or stops the flight timer. Pressing the
FUNC button moves to the next screen and leaves the flight timer
in the current state.

STOPWATCH
The stopwatch can be used as a convenient timer.

Stopwatch Function Display

Press the FUNC button to display the stopwatch. Pressing the
selector knob starts and stops the timer. Pressing the CLR button
resets the timer.

FLIGHT ID ENTRY

The Flight ID should correspond to the aircraft call sign entered on your flight plan. If no flight plan is active, the aircraft registration should be used as your Flight ID. Use only letters and digits. If the Flight ID is less than 8 characters long, entering a blank character will end it. Select the Flight ID edit screen using the FUNC button.

Flight ID Entry Function Display

To change the Flight ID, press the selector knob.

The display shows the alpha numeric characters selected via the rotary selector knob or numeric buttons. When the correct character is shown in the flight ID section of the screen, press the selector knob to accept and advance to the next digit. When the selector knob is pressed on the last digit or a space, the new Flight ID will replace the previous value. If a button is not pressed for 30 seconds, the changes are ignored and the previous code restored.

Flight ID Entry In-Process Example

ALTITUDE MONITOR

The Altitude Monitor activates an audio annunciator or annunciator light (depending on installation) when the aircraft pressure altitude differs from the selected altitude by more than 200 feet. Press the FUNC button to display the altitude monitor enable screen.

Altitude Monitor Function Display

 Pressing selector knob toggles the altitude monitor at the current altitude.

When altitude monitoring is in use, "ABOVE or "BELOW" is displayed adjacent to the altitude display on the transponder. The Altitude Monitor will automatically be disabled when the deviation exceeds 999 feet or 300 meters. When disabled, "OFF" is displayed below the "Alt Monitor" title and no deviation distance is displayed.

ADS-B MONITOR

The ADS-B Monitor is only available on installations that include an ADS-B position source. The ADS-B Monitor provides a display of the position information that is being transmitted in ADS-B position reports. This can provide confirmation that the correct information is being transmitted.

ADS-B Monitor Function Display

In the event that valid position information is NOT available from the GPS, the latitude and longitude display will be replaced by dashes; if no valid latitude and longitude is shown then ADS-B position information is NOT being transmitted.

Loss of ADS-B position information will also result in a WARNING message being displayed ("No ADSB Position").

BRIGHTNESS AND LIGHTING CONTROLS

The following table describes the means available by which to control the display and bezel backlighting/brightness:

Lighting Control Method	Comments
Dimming Bus	If set up to use the dimming bus in the Configuration pages at installation, then both the bezel and the display brightness/backlighting are controlled via the cockpit dimming bus controls, typically a dimming rheostat.
Ambient Light Sensor	If set up to use the ambient light sensor that is embedded in the AXP340 bezel from the Configuration pages at time of installation, then both the bezel and the display brightness/backlighting are automatically controlled via internal software algorithms in response to measured ambient light conditions.
Combined Dimming Bus and Ambient Light Sensor	If set up to use the combined input of the dimming bus and the ambient light sensor at installation ("Normal mode"), then the display backlighting is controlled from the ambient light sensor and the bezel brightness is controlled via the cockpit dimming bus controls.
Manual Control (display only)	Accessible via the FUNC key on the AXP340 front panel. Once the LCD Brightness page is displayed, push in the bezel selector knob and then twist the knob to adjust display brightness. Using this control will override any automatic settings set up in the Configuration maintenance pages.

ALERTS

ALERT MESSAGES

If the transponder detects a problem, the screen will indicate WARNING and a brief statement of the problem. Depending on the nature of the problem, your transponder may not be replying to interrogations. Note the message on the screen and pass that information to your avionics maintenance organization. The WARNING message should clear when the event has cleared. Press CLR to clear the message at any time; if the fault is still present the message may reappear.

The warning messages and recommended action are:

Message	Description	Recommended Action
Antenna Fault	The transponder has detected that there is a fault in the antenna cabling or antenna connection.	Have an approved Service Center check antenna cabling and connections.
Output Power Low	The transponder has detected that it transmitted at a lower power level than expected. This may be caused by a poor antenna connection in the transponder tray, or poor antenna cable connections, or a transponder hardware fault.	Have an approved Service Center check the connection at the transponder tray and transmitter cabling.
No ADSB Position	Valid ADS-B position data has not been received for either 180 seconds from system startup, or 2 seconds once GPS position data has been received by the transponder.	Have an approved Service Center check the GPS is operating correctly, including antenna position and cabling. Check the cabling between the GPS and the transponder.

FAULT ANNUNCIATION

If the transponder detects an internal failure, the screen will indicate FAULT and a brief statement of the problem. No replies will be made to interrogations when a fault is detected.

Some FAULT indications can be recovered by switching the transponder off and back on again, although in all cases a FAULT message implies that there is a fault with the transponder or the installation. Note the FAULT message at the bottom of the screen, if able, and pass that information to your avionics maintenance organization. In every case, the corrective action in the event of a FAULT is to contact Avidyne or an approved Service Center.

CONFIGURATION MODE

The system is configured when it is first installed by your avionics supplier. Configuration items include the Mode S aircraft address, the interface to the other aircraft systems (e.g. external ident input, weight on wheels input, external standby input, serial altitude output, Gray Code and serial altitude inputs, etc), lighting, the aircraft category, and the pre-programmed values for VFR squawk code. To view or change these settings you must use Configuration Mode as described in the product Installation Manual.

NOTE
Configuration Mode Do not use Configuration Mode in-flight. Check with your avionics installer before changing the configuration.

To enter configuration mode, hold down the FUNC button while switching on the transponder. Configuration items can be changed using the selector knob or numeric buttons for data input. Press the selector knob to accept the selection. Pressing FUNC advances to the next configuration item.

When configuration is complete, switch the transponder off. The new configuration will become active when the transponder is powered back on.

LOW TEMPERATURE OPERATION

The AXP340 is certified to operate correctly down to -25C, but at low temperatures the display may be impaired. On a cold day you may need to wait for the cockpit to warm up to ensure normal operation.

SOFTWARE UPDATES

The AXP340 is a software-enabled transponder and all anticipated software updates can be performed at your avionics shop.

PLUG AND PLAY

The AXP340 is plug & play compatible with the King KT-76A transponder. Details of the installation are covered in the AXP340 Installation Manual.

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Website There is a website that provides more information on this product at http://www.avidyne.com/products/axp340/index.asp

Service Hotline A hotline has been established to service questions or issues regarding Avidyne products. The U.S. Toll Free number is 1-888-723-7592. International toll free numbers are listed at http://www.avidyne.com/contact/intphones.asp

Email Customer/product support issues can be emailed as well

- Europe – support@avidyneeurope.com

- Australia & Asia – support@avidyneaustralasia.com

- Everywhere else should email techsupport@avidyne.com

When calling or emailing for product-related help, please have the following information available, if able:

- □ Customer Name/Account Information
- □ Aircraft tail number
- □ AXP340 serial number and software versions (software version is displayed on power-up splash screen).
- □ A good description of the problem or question.