



# **GTX 3X5 Part 27 AML**

## **Maintenance Manual**

**Contains Instructions for Continued Airworthiness for  
STC SR02124SE**

Rotorcraft make, model, registration number, and serial number and accompanying STC configuration information in appendix A must be completed and saved with Rotorcraft permanent records.

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## RECORD OF REVISIONS

Revision	Revision Date	Revision Summary
1	11/11/16	Initial release of document.

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## DEFINITIONS OF WARNINGS, CAUTIONS, AND NOTES



### WARNING

*A Warning means that injury or death is possible if the instructions are not obeyed.*



### CAUTION

*A Caution means that damage to the equipment is possible.*



### NOTE

*A Note provides more information.*



## **WARNING**

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## **WARNING**

*Perchlorate Material - special handling may apply. Refer to [www.dtsc.ca.gov/hazardouswaste/perchlorate](http://www.dtsc.ca.gov/hazardouswaste/perchlorate).*



## **CAUTION**

*The GTX 335/345 units have a special anti-reflective coated display that is sensitive to waxes and abrasive cleaners. CLEANERS CONTAINING AMMONIA WILL CAUSE DAMAGE TO THE ANTI-REFLECTIVE COATING. Clean the display with a clean, lint-free cloth, with a cleaner that is safe for anti-reflective coatings.*



## **NOTE**

*Screen shots are intended to provide visual reference only. All information depicted in screen shots, such as software file names, versions, and part numbers, is subject to change and may not be up to date.*

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## **1.1 Content, Scope, Purpose**

This document provides Instructions for Continued Airworthiness (ICA) of the GTX 3X5 with ADS-B functionality installed and compliant to ADS-B Out version 2, under AML STC SR02124SE. This document satisfies the requirements for continued airworthiness as defined by 14 CFR Part 27.1529 and 14 CFR Part 27 Appendix A. Information in this document is required to maintain the continued airworthiness of the GTX 3X5.

## **1.2 Organization**

The following outline briefly describes the organization of this manual.

### **Section 2: System Overview**

- Equipment Features
- Electrical Load Information
- Weight and Balance

### **Section 3: Control and Operation**

- Controlling the GTX
- Using the GTX 3X5 Install Tool

### **Section 4: Instructions for Continued Airworthiness**

- Applicability
- Airworthiness Limitations
- Service Information
- Maintenance Intervals
- Bonding Test

### **Section 5: Troubleshooting**

- General Troubleshooting
- Failure Annunciations
- Connector Pinout Information

### **Section 6: Unit Removal and Reinstallation**

- Removal and Reinstallation of the GTX
- Removal and Reinstallation of the Garmin Altitude Encoder
- Removal and Reinstallation of the Transponder Antenna
- Removal and Reinstallation of the Traffic Annunciator (If Installed)

### **Section 7: Software**

- Software Check
- Software Update

### **Section 8: System Configuration and Checkout**

- System Checkout
- Configuration
- GTX Tests

### **Section 9: System Return to Service Procedure**

- Maintenance Records

## **Appendix A: Rotorcraft Specific Information**

- Rotorcraft Specific Information Form
- Equipment Interfaced to the GTX
- Wire Routing
- Configuration Logs

## **Appendix B: Special Bonding Procedures**

- Surface Preparation
- Aluminum Tape Repair and Replacement Considerations

### **1.3 Applicability**

This document applies to all rotorcraft with the GTX 3X5 installed in accordance with STC SR02124SE. Modification of a rotorcraft by this Supplemental Type Certificate (STC) obligates the rotorcraft operator to implement the specific maintenance practices and/or airworthiness limitations provided in this document. This is in addition to the rotorcraft's existing approved maintenance, inspection, and airworthiness limitations programs.

### **1.4 Publications**

In addition to this manual, the following documents are recommended to perform maintenance based on the installed and interfaced equipment. It is the responsibility of the owner/operator to ensure the latest applicable versions of these documents are used during operation, servicing, or maintenance of the rotorcraft.

**Table 1-1 Reference Documentation**

Document	Garmin P/N	Applicable Sections
GTX 3X5 Part 27 AML STC Equipment List	005-00734-A5	All
GTN 625/635/650 Pilot's Guide	190-01004-03	2.1 and 15.3.2
GTN 725/750 Pilot's Guide	190-01007-03	2.1 and 16.3.2

### **1.5 Revision and Distribution**

This document is required for maintaining the continued airworthiness of the rotorcraft. Garmin Dealers may obtain the latest revision of this document at the Garmin [Dealer Resource Center](#) website.

Dealers are notified of manual revision changes by way of a Garmin Service Bulletin.

Owner and operators may obtain the latest revision of this document at [www.flyGarmin.com](http://www.flyGarmin.com) or by contacting a Garmin dealer. Garmin contact information is available at [www.flyGarmin.com](http://www.flyGarmin.com).

## 1.6 Reference

### 1.6.1 Terminology

Except where specifically noted, references made to the GTX 3X5 will apply to the GTX 335/335R/345/345R. ADS-B or ADS-B Out refers to version 2 ADS-B Out only. ADS-B In refers to TIS-B traffic and FIS-B weather received from ground stations over UAT as well as ADS-B and ADS-R traffic targets received directly over 1090 MHz or UAT.

Throughout this document references will be made to metallic rotorcraft. For the purposes of this manual, metallic rotorcraft will be those with an aluminum skin. Nonmetallic rotorcraft refers to all other rotorcraft (e.g., rotorcraft with composite skin).

Unless otherwise stated, all units of measure are US standard units.

The term squitter refers to a burst or broadcast of data that is transmitted periodically by a Mode S transponder without interrogation.

### 1.6.2 Acronyms

<b>AC:</b>	Advisory Circular	<b>ICA:</b>	Instructions for Continued Airworthiness
<b>ADC:</b>	Air Data Computer	<b>ICAO:</b>	International Civil Aviation Organization
<b>ADS-B:</b>	Automatic Dependent Surveillance - Broadcast	<b>I/O:</b>	Input/Output
<b>AHRS:</b>	Attitude Heading Reference System	<b>MFD:</b>	Multifunction Display
<b>AML:</b>	Approved Model List	<b>PED:</b>	Portable Electronic Device
<b>ATC:</b>	Air Traffic Control	<b>SBAS:</b>	Satellite-Based Augmentation System
<b>ATCRBS:</b>	Air Traffic Control Radar Beacon System	<b>SPI:</b>	Special Position Identifier
<b>EGNOS:</b>	European Geostationary Navigation Overlay Service	<b>SRM:</b>	Structural Repair Manual
<b>ES:</b>	Extended Squitter	<b>STC:</b>	Supplemental Type Certificate
<b>FAA:</b>	Federal Aviation Administration	<b>TAS:</b>	Traffic Advisory System
<b>FIS-B:</b>	Flight Information System-Broadcast	<b>TCAS:</b>	Traffic Alert and Collision Avoidance System
<b>GAE:</b>	Garmin Altitude Encoder	<b>TIS:</b>	Traffic Information Service
<b>GNS:</b>	Garmin Navigation System	<b>TSO:</b>	Technical Standard Order
<b>GNSS:</b>	Global Navigation Satellite System	<b>UAT:</b>	Universal Access Transceiver
<b>GPS:</b>	Global Positioning System	<b>VSWR:</b>	Voltage Standing Wave Ratio
<b>GTN:</b>	Garmin Touchscreen Navigator	<b>WAAS:</b>	Wide Area Augmentation System
<b>GTX:</b>	Garmin Transponder		

## 2 SYSTEM DESCRIPTION

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Garmin GTX 3X5 units operate on radar frequencies, receiving ground radar or TCAS interrogations. The GTX transmits a coded response of pulses to ground-based radar on a frequency of 1090 MHz. Each unit has IDENT capability and replies to ATCRBS Mode A, Mode C and Mode S All-Call interrogation. The GTX 345/345R units include ADS-B In which provides TIS-B and FIS-B data via UAT and 1090 MHz. The GTX 3X5 units offer an optional Garmin Altitude Encoder to meet the required barometric pressure altitude source and an optional internal GPS/SBAS source to meet the required GNSS position source integrity for ADS-B Out.

The Garmin transponders approved by this STC are the family of GTX 3X5 transponders.

The GTX 3X5 units all provide ADS-B Out functionality. GTX 345/345R units provide ADS-B In. The GTX 3X5 models include:

- GTX 335
- GTX 345
- GTX 335R
- GTX 345R

Automatic Dependent Surveillance-Broadcast (ADS-B) technology improves situational awareness and flight safety. A Garmin transponder with ADS-B capabilities will automatically transmit position, velocity, and heading information to other aircraft and ground stations. The current air traffic control system depends on a transponder request for pertinent aircraft information, whereas ADS-B provides automatic transmission of aircraft information without a request.

## 2.1 GTX 335/335R

The GTX 335/335R units are panel or remote mounted units that have Mode S with ADS-B Out extended squitter capability. The panel mounted unit contains an integrated display while the remote mounted unit requires an interface to a control source for normal operation and functionality.

GTX 335/335R units have these features:

- Mode S transponder
- ADS-B Out capability
- Optional internal GNSS receiver
- Optional GAE pressure sensor module
- Entry of squawk code and flight ID
- Show squawk code and flight ID
- Show pressure altitude
- Show outside air temp
- Show density altitude
- Show flight timers
- Audio output
- TIS-A traffic output to a compatible display

The transponder provides an ADS-B Out failure message to alert the crew that the unit has a degraded ADS-B system.

GTX 335/335R units interface through these:

- ARINC 429
- RS-232
- Gray code
- Discrete I/O

Figure 2-1 provides a summary of the interfaces provided for the GTX 335 or GTX 335R. For interfaces approved by this STC, refer to *GTX 3X5 Part 27 AML STC Installation Manual*.

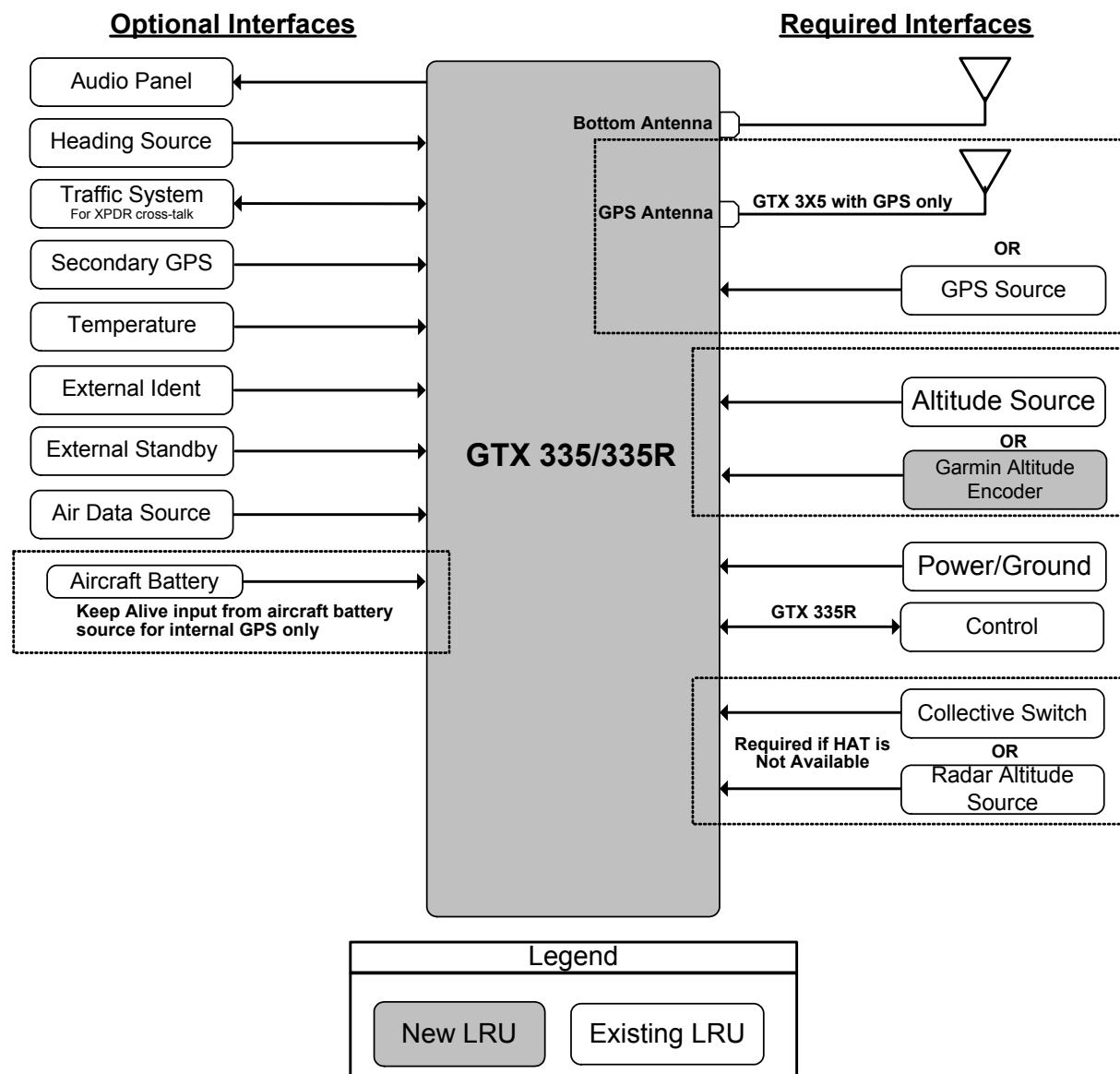


Figure 2-1 GTX 335 or GTX 335R Interface Summary

## 2.2 GTX 345/345R

The GTX 345/345R units are panel or remote mounted units that supply Mode S with ADS-B Out extended squitter, and UAT and 1090 receivers for ADS-B In capabilities. The panel mounted units have an integrated display while the remote mounted unit requires an interface to a control source for normal operation and functionality.

GTX 345/345R units have these features:

- Mode S transponder
- ADS-B Out capability
- ADS-B In capability with built-in 1090 MHz and UAT receivers
- Optional internal GNSS receiver
- Optional GAE pressure sensor module
- Entry of squawk code and flight ID
- Show squawk code and flight ID
- Show pressure altitude
- Show outside air temp
- Show density altitude
- Show flight timers
- Audio output
- Bluetooth interface to show weather and traffic on portable devices

The transponder provides an ADS-B failure message to alert the crew that the unit has a degraded ADS-B (In or Out) system.

GTX 345/345R units interface through these:

- HSDB
- ARINC 429
- RS-232
- RS-422
- Gray code
- Discrete I/O

Figure 2-2 provides a summary of the interfaces provided for the GTX 345 or GTX 345R. For interfaces approved by this STC, refer to *GTX 3X5 Part 27 AML STC Installation Manual*.

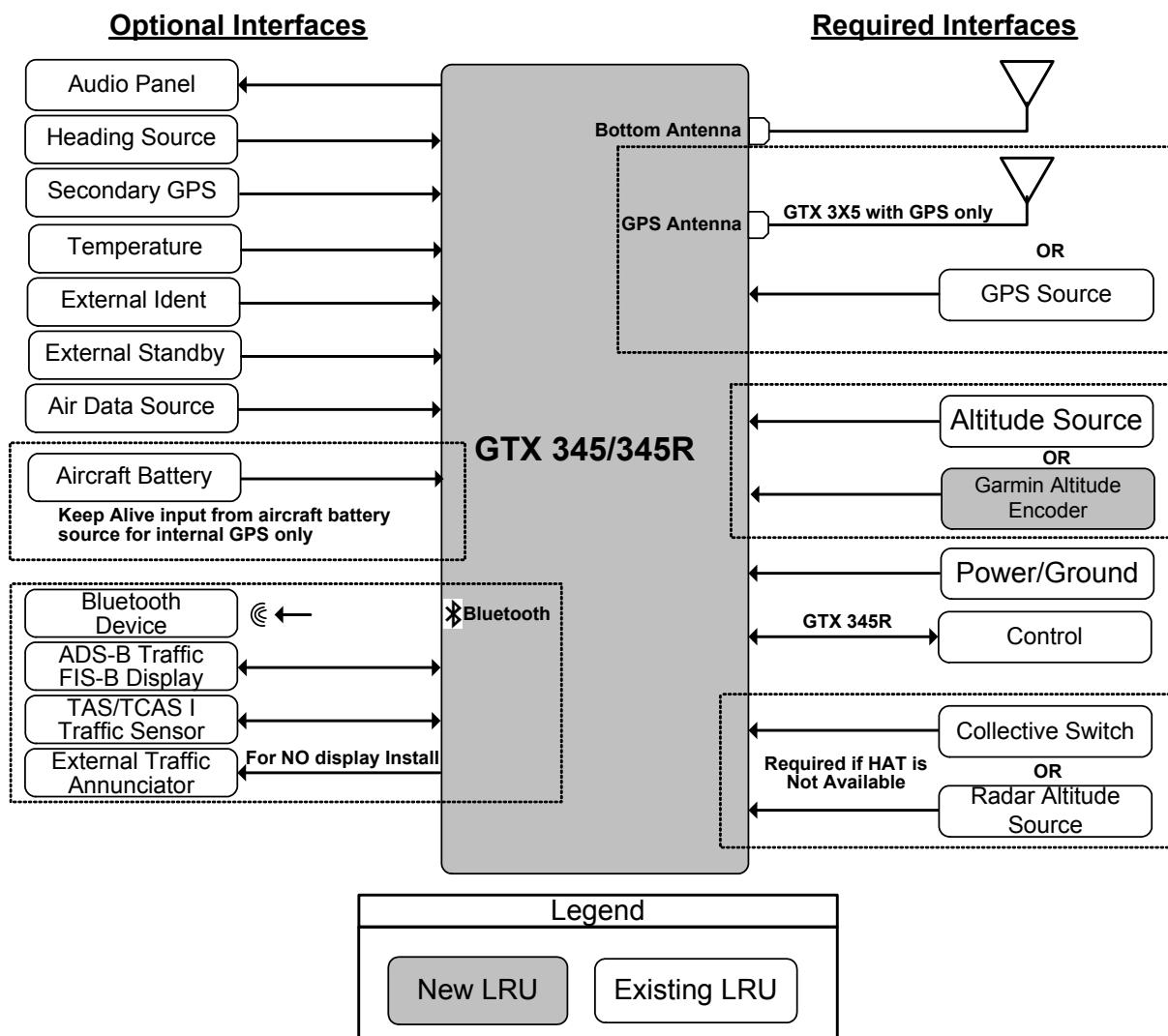


Figure 2-2 GTX 345 or GTX 345R Interface Summary

## 2.3 Electrical Load Information

Table 2-1 contains electrical load information for the GTX. Circuit protection for the GTX is located within the rotorcraft's avionics circuit protection and is labeled "XPDR." Appendix A of this document contains details specific to the load changes for the installation.

**Table 2-1 GTX Electrical Load**

Unit	Characteristic	Specification	
		14 VDC	28 VDC
GTX 335	Input current, typical	0.57 A	0.29 A
	Input current, maximum	0.86 A	0.43 A
GTX 335, GPS	Input current, typical	0.72 A	0.36 A
	Input current, maximum	1.22 A	0.61 A
GTX 345	Input current, typical	0.72 A	0.36 A
	Input current, maximum	1.30 A	0.65 A
GTX 345, GPS	Input current, typical	1.07 A	0.54 A
	Input current, maximum	1.43 A	0.72 A
GTX 335/345, GPS	Input current, GPS KEEP ALIVE	65 µA typical	20 µA typical
		85 µA maximum	40 µA maximum

## 2.4 Weight and Balance

Update the rotorcraft equipment list to indicate any items that are added, removed, or relocated. Each change must include the date and the name and certificate number of the person making the entry.

Table 2-2 contains equipment weights. Table 2-3 provides an example weight and balance calculation.

**Table 2-2 Equipment Weights**

Kit	Description	Weight (lbs/kg)
010-01214-01	GTX 335 Panel Mount	2.8/1.27
010-01214-21	GTX 335 NV Panel Mount	2.8/1.27
010-01214-41	GTX 335 GPS Panel Mount	2.9/1.32
010-01216-01	GTX 345 Panel Mount	3.1/1.41
010-01216-41	GTX 345 GPS Panel Mount	3.2/1.45
010-01215-01	GTX 335 Remote	2.5/1.13
010-01217-01	GTX 345 Remote	2.9/1.32
010-01215-41	GTX 335 GPS Remote	2.7/1.22
010-01217-41	GTX 345 GPS Remote	3.0/1.36

**Table 2-3 Example Weight and Balance Calculation**

Previous Rotorcraft Weight and Balance Calculated (Date)	Useful Load (lbs)	Empty Weight (lbs)	C.G. (in)	Moment
	1093.30	2306.70	138.83	320,239
Description of Items Removed from Rotorcraft		Weight (lbs)	Arm (in)	Moment
KT 76C Unit/Rack		2.61	55.00	143.55
Total removed		-2.61	55.00	-143.55
Description of Items Added to Rotorcraft		Weight (lbs)	Arm (in)	Moment
GTX 345 Unit/Rack/Connector		3.12	55.00	171.60
Total added		3.12	55.00	171.60
Change		.51	55.00	28.05
New Rotorcraft Weight and Balance (Date)	Useful Load (lbs)	Weight (lbs)	C.G. (in)	Moment
	1092.79	2307.21	138.81	320,267

## 2.5 Unit Storage

The GTX 3X5 transponder unit is qualified for an operating temperature range of -55 °C to +85 °C.

Recommended unit storage temperatures (uninstalled) are between 10 °C and 35 °C.

### 3 GTX CONTROL AND OPERATION

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Control and operation of GTX 335/345 units occur through the front panel of the GTX. Control and operation of the remote mounted GTX 335R/345R is handled through the external interface provided via the GTN 6XX/7XX. ADS-B In information from the GTX 345 can be displayed through the external interface provided via the GTN 6XX/7XX or GNS 400W/500W Series. Figure 3-2 and figure 3-3 show the transponder control pages.

#### ***Important Codes***



#### **NOTE**

*The selected identification code must be entered carefully, either one assigned by air traffic control for IFR flight or an applicable VFR transponder code.*

<b>1200</b>	VFR code for any altitude in the US (refer to ICAO standards)
<b>7000</b>	VFR code commonly used in Europe (refer to ICAO standards)
<b>7500</b>	Hijack code (rotorcraft is subject to unlawful interference)
<b>7600</b>	Loss of communications
<b>7700</b>	Emergency

Avoid selecting code 7500 and all codes in the 7600-7777 range. These codes trigger special emergency alerts in ATC monitoring facilities. A rotorcraft's transponder code is used for ATC tracking purposes, therefore be careful when making routine code changes.

### 3.1 GTX 335/345



**Figure 3-1 GTX 335/345 Front Panel**

#### Function Selection Keys



##### NOTE

*If the transponder is in the ON or ALT operating mode, the transponder becomes an active part of the Air Traffic Control Radar Beacon System (ATCRBS). The transponder responds to interrogations from TCAS equipped rotorcraft.*

The function selection keys are:

- |              |   |
|--------------|---|
| <b>OFF</b>   | Powers off the GTX 3X5.   |
| <b>STBY</b>  | Selects the Standby mode. Pressing the <b>STBY</b> key when the GTX 335/345 is powered off automatically powers the unit on in standby mode. When in Standby mode, the transponder does not reply to interrogations but new codes can be entered and a SBY indication appears on the display.   |
| <b>ON</b>    | Selects the On mode, which generates Mode A and Mode S replies, but Mode C altitude reporting is inhibited. Pressing the <b>ON</b> key when the GTX 335/345 is powered off automatically powers on the unit in Mode A and will transmit a squawk code when interrogated. ADS-B Out will not return barometric altitude as it switches to GPS altitude in this mode. Interrogations are indicated by the reply symbol (R). The replies do not include altitude information.  |
| <b>ALT</b>   | Altitude mode is automatically selected when the rotorcraft becomes airborne using the unit's air/ground logic or when the <b>ALT</b> key is pressed. Pressing the <b>ALT</b> key when the GTX 335/345 is powered off automatically powers on the unit in altitude reporting mode. While the rotorcraft is on the ground and in ALT mode, the transponder does not allow Mode A and Mode C replies, but it does permit acquisition squitter and replies to Mode S interrogations.<br><br>While the rotorcraft is in ALT mode and airborne, it will generate Mode A, Mode C and Mode S replies as well as transmit acquisition and extended squitter, including ADS-B Out. All transponder interrogations are indicated by the reply symbol (R). |
| <b>IDENT</b> | Pressing the <b>IDENT</b> key activates the Special Position Identification (SPI) Pulse for 18 seconds, identifying the transponder return from others on an air traffic controller's screen. During the IDENT period, the word "IDENT" appears in the upper left corner of the display.  |
| <b>VFR</b>   | Sets the transponder code to the pre-programmed VFR code selected in Configuration mode (Set to 1200 at the factory). Pressing the <b>VFR</b> key again restores the previous identification code.  |

---

<b>FUNC</b>	In normal mode, pressing the <b>FUNC</b> key changes the subpage group shown on the right side of the display. Subpages include flight ID, pressure altitude, flight time, altitude monitor, system count up, and count down timers. In the Configuration mode, steps through the function pages.
<b>ENT</b>	Confirms entry for selected item and moves the cursor to the next editable item, or function selection, in configuration and normal operation. Starts and stops the altitude monitor, count up, count down, and flight timers.
<b>CRSR</b>	Selects changeable fields in configuration and normal operation. Initiates entry of the starting time for the count down timer and cancels transponder code entry. Holding the <b>CRSR</b> key during power on will place the unit into a Ground Test mode that forces the rotorcraft into an airborne status for testing purposes.
<b>CLR</b>	Resets the count up, count down and flight timers. Cancels the previous key press during code selection, count down entry, or flight ID entry. Used in Configuration mode to scroll through the function pages.
<b>8</b>	Used as a scroll-up key to navigate through page groups in normal and configuration mode.
<b>9</b>	Used as a scroll-down key to navigate through page groups in normal and configuration mode.

### **Code Selection**

Code selection is entered with eight keys (**0** through **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. The numbers **8** and **9** are not used for code entry, only for flight ID entry, count down time, rotorcraft tail number entry, and data selection in Configuration and Normal mode.

### **Configuration Mode**

To enter configuration mode, press and hold the **ENT** key, then energize the unit. To exit configuration mode, press and hold the **OFF** key until the unit de-energizes.

- To cycle through the pages, press the **FUNC** key
- To access items on the page, press the **CRSR** key
- To cycle through the selections of an item on the page, press the **8** or **9** key
- To scroll up or down on the page when nothing is selected, press the **8** or **9** key
- To move within the page, press the **ENT** key
- To move to previous selection on the page, press the **CLR** key
- To exit the page, press the **FUNC** key

GTX 3X5 units may also be configured using the GTX 3X5 Install Tool. For configuration using the GTX 3X5 Install Tool, refer to section 3.3.

## **Function Display**

<b>FLIGHT ID</b>	If ALLOW PILOT TO EDIT FLT ID is configured to YES, the FLIGHT ID can be changed by the pilot at any time in normal mode. This allows the pilot/crew to enter the specific flight ID for transmission to ATC interrogations.
<b>UP COUNTER</b>	Timer controlled by <b>ENT</b> and <b>CLR</b> keys.
<b>DOWN COUNTER</b>	Timer controlled by <b>ENT</b> , <b>CLR</b> , and <b>CRSR</b> keys. The initial count down time is entered with the <b>0</b> through <b>9</b> keys.
<b>FLIGHT TIMER</b>	Displays the Flight Time, controlled by the <b>ENT</b> key or by one of four airborne sources (squat switch, GPS ground speed recognition, air data airspeed recognition, or altitude increase) as configured during installation. The timer begins when the GTX 3X5 determines that the rotorcraft is airborne.
<b>TRIP TIMER</b>	Timer controlled by <b>ENT</b> and <b>CLR</b> keys.
<b>PRESSURE ALT</b>	Displays the altitude data supplied to the GTX 3X5 in feet, hundreds of feet (flight level), or meters, depending on configuration.
<b>ALT MONITOR</b>	Controlled by <b>ENT</b> key. Activates a voice alarm and warning annunciator when altitude limit is exceeded.
<b>SAT/DALT</b>	Displayed when the GTX 3X5 is configured with temperature input. Displays Static Air Temperature and Density Altitude.
<b>CONTRAST/OFFSET</b>	Contrast is controlled by the <b>8</b> and <b>9</b> keys.
<b>BACKLIGHT/OFFSET</b>	This page is only displayed if photocell backlighting mode is selected in Configuration mode. Backlighting is controlled by the <b>8</b> and <b>9</b> keys.
<b>MESSAGES</b>	Alerts crew of transponder faults, fails and advisory messages. MSG appears when a message is generated. <b>CRSR</b> and <b>ENT</b> keys access messages for acknowledgment and viewing.
<b>BLUETOOTH</b>	This page is only shown on the GTX 345 when configured for Bluetooth at installation. When selected, it allows PED to pair to the GTX 345, and device management to show ADS-B In data.
<b>INTERNAL GPS</b>	This page displays Lat/Long accuracy, number of connected satellites, horizontal figure of merit, whether the unit is using internal GPS, and overall status.
<b>1090ES TX CTRL</b>	This is only displayed when the unit is configured for 1090ES OUT CONTROL in Configuration mode to be PILOT SET. Once configured, this can be highlighted by the <b>CRSR</b> key, changed by the <b>8</b> and <b>9</b> keys, and selected by <b>ENT</b> key. Turns the extended squitter function on or off.

### 3.2 GTX 335R/345R

Figure 3-2 and figure 3-3 show the GTX control pages associated with the GTN 6XX/7XX. Refer to the specific pilot guide and cockpit reference guide for details regarding control and function. Part numbers for these documents are listed in table 1-1.



Figure 3-2 GTN 7XX Transponder Control



Figure 3-3 GTN 6XX Transponder Control

### 3.3 GTX 3X5 Install Tool



#### NOTE

If the GTX 3X5/3X5R is configured to interface with a display control unit, the display control unit must be turned off or in configuration mode prior to running the GTX 3X5 Install Tool.

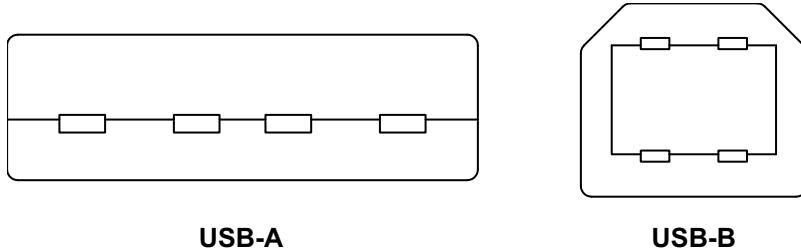


#### NOTE

The GTX 3X5 Install Tool pages shown within this manual reflect GTX 3X5 Install Tool version 2.05. Some differences in operation may be observed when comparing information in this manual to later versions of the install tool.

The GTX 3X5 Install Tool is available for download from the Garmin [Dealer Resource Center](#). The GTX 3X5 Install Tool requires a computer with available USB 2.0 ports and Microsoft Windows XP or later.

A USB A-to-B cable is required to interface between a computer and the GTX 3X5/3X5R. For additional details, refer to figure 3-4. To use the GTX 3X5 Install Tool, remove power from the GTX 3X5/3X5R. Remove power from the display control unit or verify it is in configuration mode. Connect the USB cable between the GTX 3X5 and the computer. Energize the GTX 3X5/3X5R and then run the GTX 3X5 Install Tool.



**Figure 3-4 USB A and USB B Connectors**

The install tool is used to check equipment status, load software, and configure the unit.

To place a GTX 3X5/3X5R unit in configuration mode:

1. In the Unit Mode window, change “Normal Mode” to “Configuration Mode.”
2. Click the **Set** key.

Green boxes indicate a function operating correctly. Red boxes indicate a failure. Yellow boxes indicate a fault or warning. Gray boxes indicate the presence of a message.

The bottom of the install tool displays unit information such as software version, connection status, and unit mode. The tool will annunciate if alerts, faults, failures, or warnings exist. The menu bar at the top of the install tool has a **GTX** key and a **Help** key. The **GTX** key provides the following options:

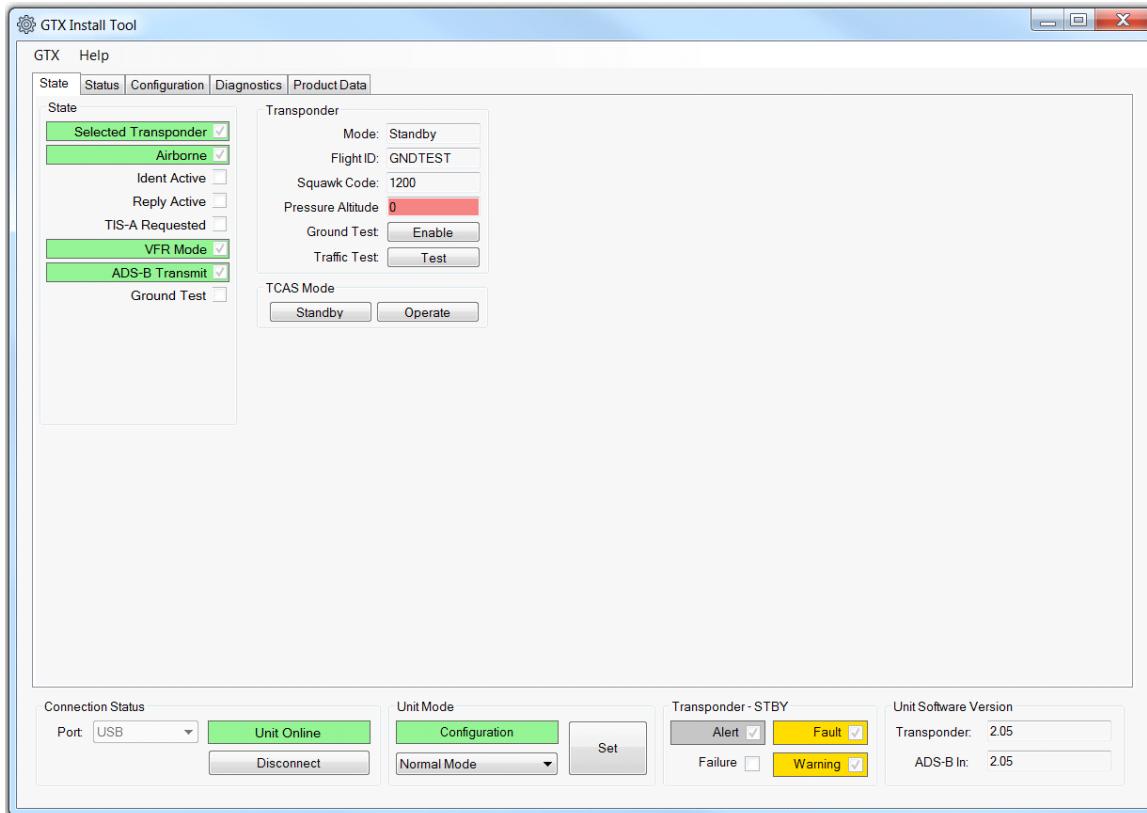
- Save configuration
- Load configuration
- Reset configuration
- Push configuration from install tool to configuration module
- Exit

The **Help** key provides the following information:

- Part number
- Version number
- Copyright statement
- Software license agreements

### 3.3.1 State Page

The State page of the GTX 3X5 Install Tool reports the current mode of the GTX 3X5/3X5R, Flight ID, Squawk Code, and Pressure Altitude. Mode selections include Ground Test and Traffic Test modes. Standby and Operate test modes are also provided for TCAS.



**Figure 3-5 GTX 3X5/3X5R State Page**

### 3.3.2 Status Page

The Status page reports failures, faults, warnings, and pilot alerts. Information such as whether there is a configuration module present is also displayed.

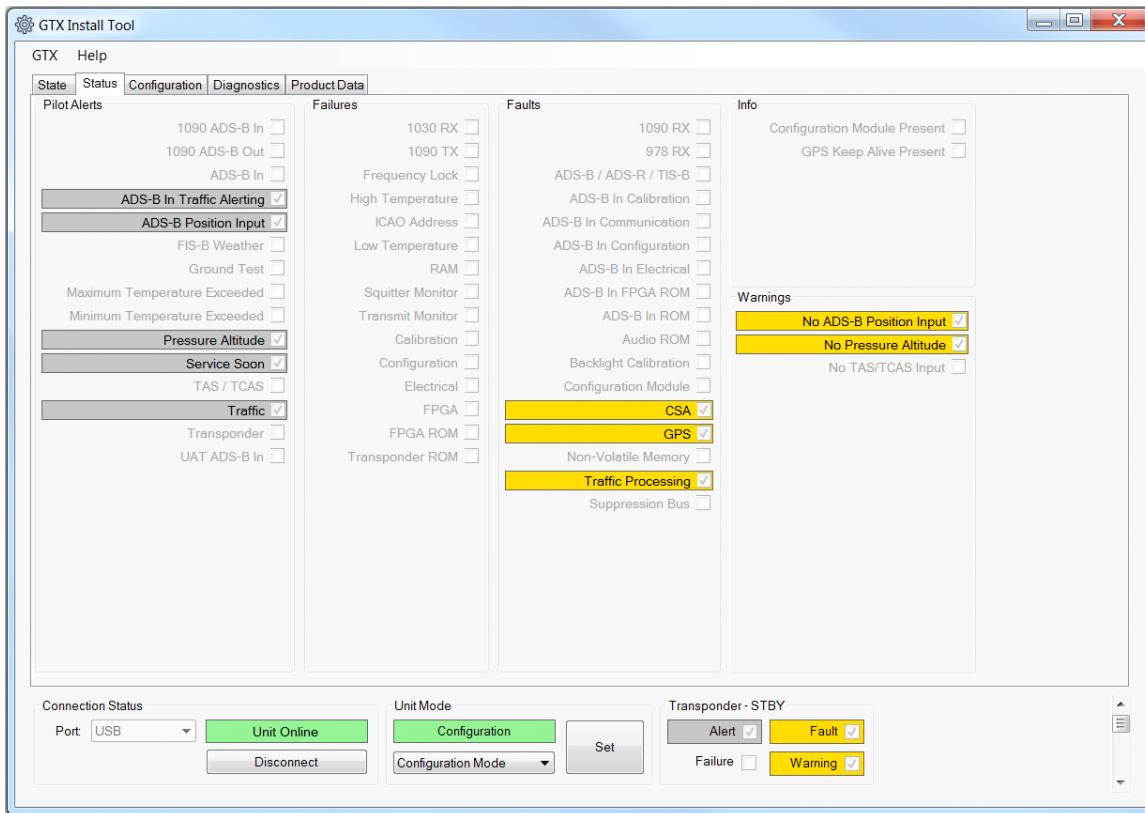


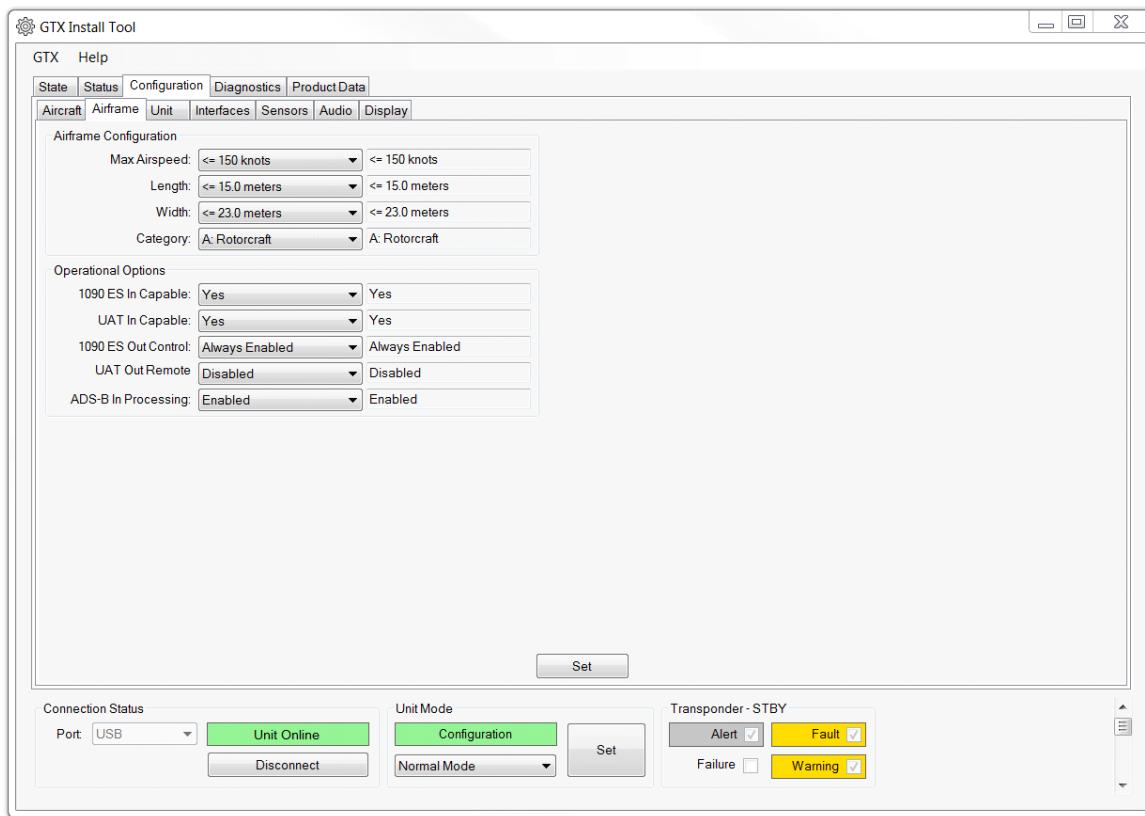
Figure 3-6 GTX 3X5/3X5R Status Page

### 3.3.3 Configuration Group

The Configuration group contains the following pages:

- Aircraft page – allows the configuration of basic aircraft configuration and flight ID settings
- Airframe page – allows the configuration of basic airframe configuration and operational options settings
- Unit page – allows the configuration of identification code, unit options, and display options
- Interfaces page – allows the configuration of serial, A429, discretes, and HSDB settings
- Sensors page – allows the configuration of Garmin altitude encoder, GPS, internal AHRS, and additional sensors
- Audio page – allows the configuration of audio options and alerts
- Display page – allows the configuration of display and key backlight, photocell and lighting bus curves, and default offsets

All configurable settings must match the GTX System Configuration Log retained in the rotorcraft permanent records.



**Figure 3-7 GTX 3X5/3X5R Configuration Group**

### 3.3.4 Diagnostics Group



#### NOTE

*GTX 3X5/3X5R must be in configuration mode to view connection status or get assert log.*

The Diagnostics group contains the following pages:

- DAP – reports the status of the necessary data supporting ADS-B requirements
- Discretes – reports the status of discrete inputs, outputs, and allows the user to override the Output pins for testing purposes
- Connection Status – reports the status of A429 inputs, serial inputs, and HSDB
- Internal GPS – reports GPS acquisition status and signal strength
- Bluetooth – reports Bluetooth receiver status and paired devices
- Assert Log – provides the ability to download assert log for system troubleshooting

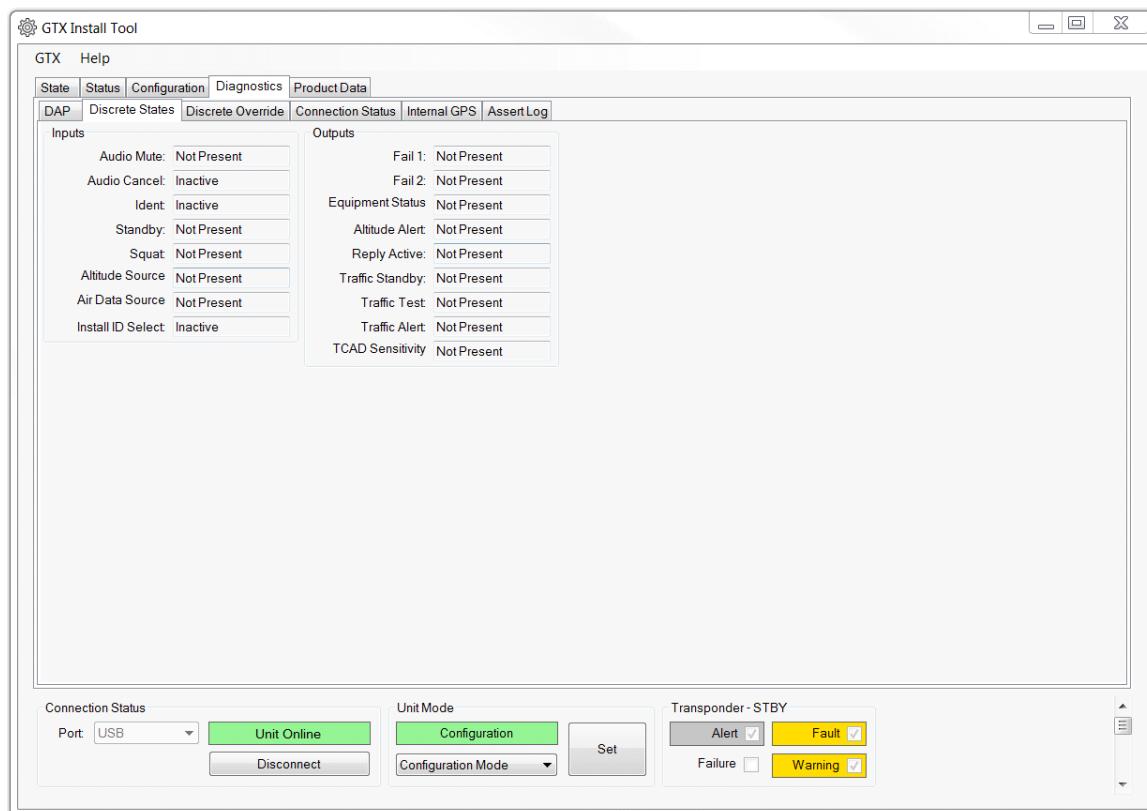
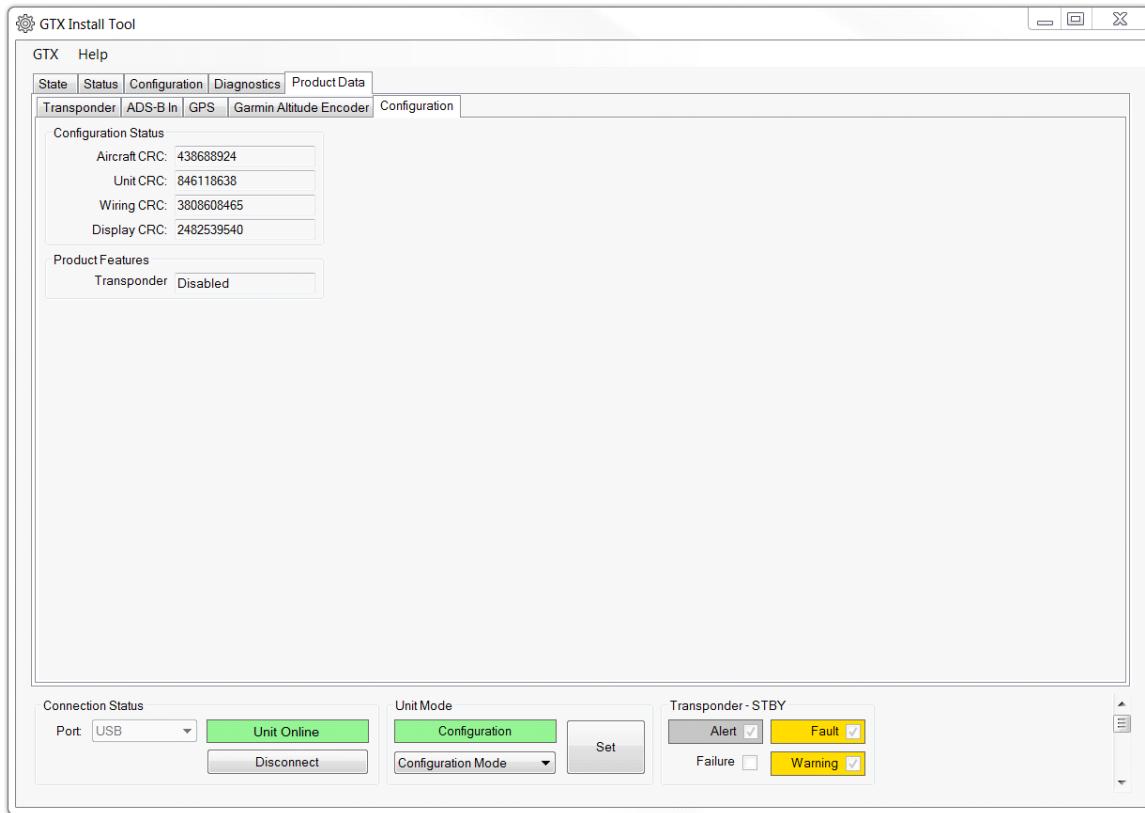


Figure 3-8 GTX 3X5/3X5R Diagnostics Group

### 3.3.5 Product Data Group

The product data group provides the following pages.

- Transponder page – displays basic system, FPGA, Boot Block, and Audio Database information
- ADS-B In page – displays basic system, FPGA, and Boot Block information
- GPS page – displays GPS and GPS loader information
- Garmin Altitude Encoder page – displays the altitude encoder serial number
- Configuration page – displays the configuration status of aircraft, unit, wiring, and display CRCs



**Figure 3-9 GTX 3X5/3X5R Product Data Group**

### 3.3.6 Software Upload Group

Allows GTX 3X5/3X5R software updates. Refer to section 7.2 for details.

## 4 INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

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4.3	Servicing Information .....	4-3
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4.5	Visual Inspection .....	4-5
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4.5.2	GTX 335R/345R Visual Inspection.....	4-6
4.5.3	Antenna Visual Inspection.....	4-6
4.5.4	Post Lightning Strike Inspection.....	4-7
4.5.5	Post Hard Landing Inspection.....	4-7
4.6	Electrical Bonding Test .....	4-7
4.7	Additional Instructions .....	4-7

This section provides Instructions for Continued Airworthiness for the GTX 3X5 with ADS-B installation. This section satisfies the requirements for continued airworthiness as defined by 14 CFR Part 27.1529 and Part 27 Appendix A. Information in this section is required to maintain the continued airworthiness of the GTX 3X5 as installed under this AML STC.

#### 4.1 Applicability

This document applies to all rotorcraft equipped with GTX 3X5 units with ADS-B per STC SR02124SE.

Modification of a rotorcraft by this Supplemental Type Certificate (STC) obligates the helicopter operator to implement the specific maintenance practices and/or airworthiness limitations provided in this document. This is in addition to the rotorcraft's existing approved maintenance, inspection, and airworthiness limitations programs.

Appendices A.1 through A.6 must be filled out by the installer, included as part of FAA Form 337, and filed with the rotorcraft's permanent records. These appendices document GTX 3X5 installation details that are essential to system maintenance and are a part of the rotorcraft Instructions for Continued Airworthiness. These include:

- General rotorcraft and GTX transponder specific information
- Electrical load analysis
- Equipment connected to the installed GTX transponder
- Configuration log of the installed GTX transponder(s) (a printout of the GTX 3X5 configuration from the GTX 3X5 Installation Tool is also acceptable)
- Location of the GTX 3X5 transponder and connected antenna(s) as installed in the rotorcraft, including all wire routing

#### 4.2 Airworthiness Limitations

There are no airworthiness limitations associated with this type design change (STC SR02124SE).

**The Airworthiness Limitations section is FAA approved and specifies inspections and other maintenance required under Secs. 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.**

FAA APPROVED



Michael Warren  
ODA STC Unit Administrator  
ODA-240087-CE

Date

11-Nov-2016

## 4.3 Servicing Information

GTX 3X5 LRU maintenance is “on condition” only.

### 4.3.1 On Condition Servicing

Servicing or replacement may be required if the GTX 3X5/3X5R exhibits symptoms, failures, or alerts as described in this manual.

### 4.3.2 Special Tools

The following tools are required to perform the tasks described in this manual.

- Calibrated milliohm meter with an accuracy of  $\pm 0.1$  milliohm or better
- Calibrated transponder ramp tester
- Calibrated Pitot-static ramp tester
- GTX 3X5 Install Tool
- $50 \Omega$  5 watt antenna load

## 4.4 Maintenance/Inspection Intervals



### NOTE

*The intervals listed in the table below must be adhered to for each installed GTX.*

Table 4-1 shows systems and components, installed by this STC, which must undergo tests or checks at specific intervals. The inspections based on calendar elapsed time have specifically stated intervals.

**Table 4-1 Maintenance/Inspection Intervals**

Item	Description/Procedure	Section No.	Interval
Equipment Removal and Reinstallation	Removal and reinstallation of GTX LRUs.	6	On Condition
Cleaning	<p>The GTX 335/345 display and bezel may be cleaned periodically.</p> <p>Cleaning is accomplished using a soft cotton cloth dampened with clean water.</p> <p><b>DO NOT</b> use any chemical cleaning agents. Avoid scratching the surface of the display.</p>	N/A	On Condition
Antenna Visual Inspection	Removal and replacement.	4.5	On Condition
Lightning Strike - Actual or Suspected	<p>Inspect the coaxial cable connections, GTX bonding hardware (including bonding straps and tape), antenna, and surrounding areas.</p> <p>The GTX 3X5 receiver sensitivity must be tested and shown to comply with Title 14 CFR Part 43 Appendix F.</p>	4.5 8.4.2	On Condition
Testing	The GTX 3X5 must be tested and shown to comply with Title 14 CFR Part 91.227.	8.4.3	Replacement of GPS Position source(s)
Equipment Visual Inspection	A visual inspection of the equipment installed by this STC must be performed.	4.5	12 Calendar Months
Testing	The GTX 3X5 must be tested and shown to comply with Title 14 CFR Part 91.411, 91.413, and Part 43 Appendix E and F.	8.4.2	Refer to Title 14 CFR Part 91.411, 91.413, and Part 43 Appendix E and F
Electrical Bonding Test	An electrical bonding test must be performed on equipment installed by this STC.	4.6	10 Years or 2000 hours
Hard Landing	Inspect the GTX, mounting rack, and rotorcraft structure.	4.5.5	On Condition

## 4.5 Visual Inspection

Perform a visual inspection in accordance with requirements in this section. Check for corrosion, damage, or other defects for each of the installed items. Replace any damaged parts as required. Inspection may require temporary removal of a unit or units to gain access to connectors. For equipment removal and replacement, refer to section 6. For equipment locations, refer to appendix A. For instructions on removing access panels, consult the specific rotorcraft maintenance manual.

### 4.5.1 GTX 335/345 Visual Inspection

During normal rotorcraft inspections, but not to exceed 12 calendar month intervals, conduct a visual inspection of the GTX 335/345 installation in the following locations.

#### ***Instrument Panel***

1. Inspect all GTX 335/345 keys for legibility of labels and markings.
2. Inspect GTX 335/345 unit(s) for security of attachment.
3. Inspect GAE (if installed) for security of attachment.
4. Inspect GTX rack and fasteners for integrity.
  - a. The racks, fasteners, and support structure must be in good condition and the fasteners secured properly.
  - b. There must be no corrosion.
5. Inspect any bonding straps for corrosion, loose connections, or signs of damage. Refer to appendix B for details.
6. Inspect the condition of the wiring harnesses and coaxial cables.
  - a. Inspect all GTX and adjacent wiring and coax for chafing, damage, proper routing of wire bundles, and security of attachment in accordance with AC 43.13-1B, Chapter 11, Section 8, paragraph 11-96. Pay particular attention to possible areas of chafing.
  - b. Verify that the GTX and adjacent wiring show no signs of cracking, chafing, abrasion, melting, or any other form of damage.
  - c. Inspect the GTX rack and LRU connectors for corrosion or other defects. Check the integrity of the shield block ground attachments to the harness connector assembly as well as the integrity of the individual shields and their attachment.

#### 4.5.2 GTX 335R/345R Visual Inspection

During normal rotorcraft inspections, but not to exceed 12 calendar month intervals, conduct a visual inspection of the GTX 335R/345R installation in the following locations.

##### **Remote Mount Rack**

1. Inspect GTX 335R/345R unit(s) for security of attachment.
2. Inspect GAE (if installed) for security of attachment.
3. Inspect GTX rack and fasteners for integrity.
  - a. The racks, fasteners, and support structure must be in good condition and the fasteners properly secured.
  - b. There must be no corrosion.
  - c. For composite shelf, aluminum foil tape used to ground the GTX must not be torn, damaged, or corroded. If any of these occur, the tape must be replaced. Refer to appendix B for details.
4. Inspect any bonding straps for corrosion, loose connections, or signs of damage. Refer to appendix B for details.
5. Inspect the condition of the wiring harnesses and coaxial cables.
  - a. Verify that all GTX wiring and cables are securely fastened.
  - b. Verify that the GTX and adjacent wiring show no signs of cracking, chaffing, abrasion, melting, or any other form of damage.
  - c. Inspect the GTX rack and LRU connectors for corrosion or other defects. Check the integrity of the shield block ground attachments to the harness connector assembly as well as the integrity of the individual shields and their attachment.

#### 4.5.3 Antenna Visual Inspection

During normal rotorcraft inspection, but not to exceed 12 calendar months, visually inspect the transponder antenna(s) for the following.

1. Erosion of the antenna blade leading edge, cracks, dents, or other physical damage. If any of these conditions are present, the antenna must be replaced. For antenna replacement details, refer to the antenna manufacturer instructions.
2. Secure attachment of the antenna to the rotorcraft structure. If the attachment is not secure, re-work the installation and complete the electrical bonding test, as described in the applicable antenna installation instructions.
3. Condition of the environmental seal at the base of the antenna. A damaged or compromised seal must be replaced and the electrical bonding tested, as described in the applicable antenna installation instructions.

#### **4.5.4 Post Lightning Strike Inspection**

An inspection must be performed following a suspected or actual lightning strike to antennas or any sensor(s) connected to the GTX unit. The antenna, sensor, and rotorcraft structure to which they are mounted must be inspected for physical damage, particularly the location(s) where lightning may have attached. If visible physical damage is present, the antenna and sensor must be replaced.

The coax cable connecting the antenna to the GTX unit must be inspected, including grounding fasteners, bonding straps, or aluminum tape. The rotorcraft structure supporting the installation of the remotely mounted GTX must be inspected to verify that no physical damage has occurred. If damaged, the structure must be repaired in accordance with the model specific rotorcraft structural repair manual, or the rotorcraft manufacturer instructions. Damaged components must be replaced followed by completion of the electrical bonding test described in section 4.6.

#### **4.5.5 Post Hard Landing Inspection**

An inspection must be performed following a hard landing. The GTX, mounting rack, and rotorcraft structure to which they are mounted must be inspected for physical damage, particularly the location(s) of the mounting hardware. If visible physical damage is present, the GTX, mounting rack, and rotorcraft structure must be replaced or repaired in accordance with the model specific rotorcraft structural repair manual, or the rotorcraft manufacturer instructions. Any component repair or replacement must be followed by completion of the electrical bonding test described in section 4.6.

### **4.6 Electrical Bonding Test**

1. Disconnect all connectors from the GTX 3X5. This includes the antenna coaxial cable.
2. Measure the DC resistance between the aircraft ground and the metal case of the GTX 3X5. Verify that the resistance is less than or equal to 10 milliohms.
3. If the resistance is more than 10 milliohms, the electrical bond must be improved such that the direct current resistance, when measured with a 4-wire meter, is less than or equal to 2.5 milliohms. For instructions on how to create a new electrical bond, refer to appendix B.

### **4.7 Additional Instructions**

Electrical load information for the GTX is provided in section 2.3.

## 5 TROUBLESHOOTING

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5.3.7	HSDB Input/Output .....	5-20

### 5.1 GTX General Troubleshooting

This section provides information to assist troubleshooting if problems occur after completing maintenance. Refer to the GTX System Configuration Log retained in the rotorcraft permanent records for a list of the interfaced equipment and system configuration data. When troubleshooting the GTX, refer to the wire routing drawings and interconnect wiring diagrams that are retained in the rotorcraft permanent records.

The following diagram describes possible symptoms associated with the Garmin transponders and provides corresponding actions for troubleshooting.

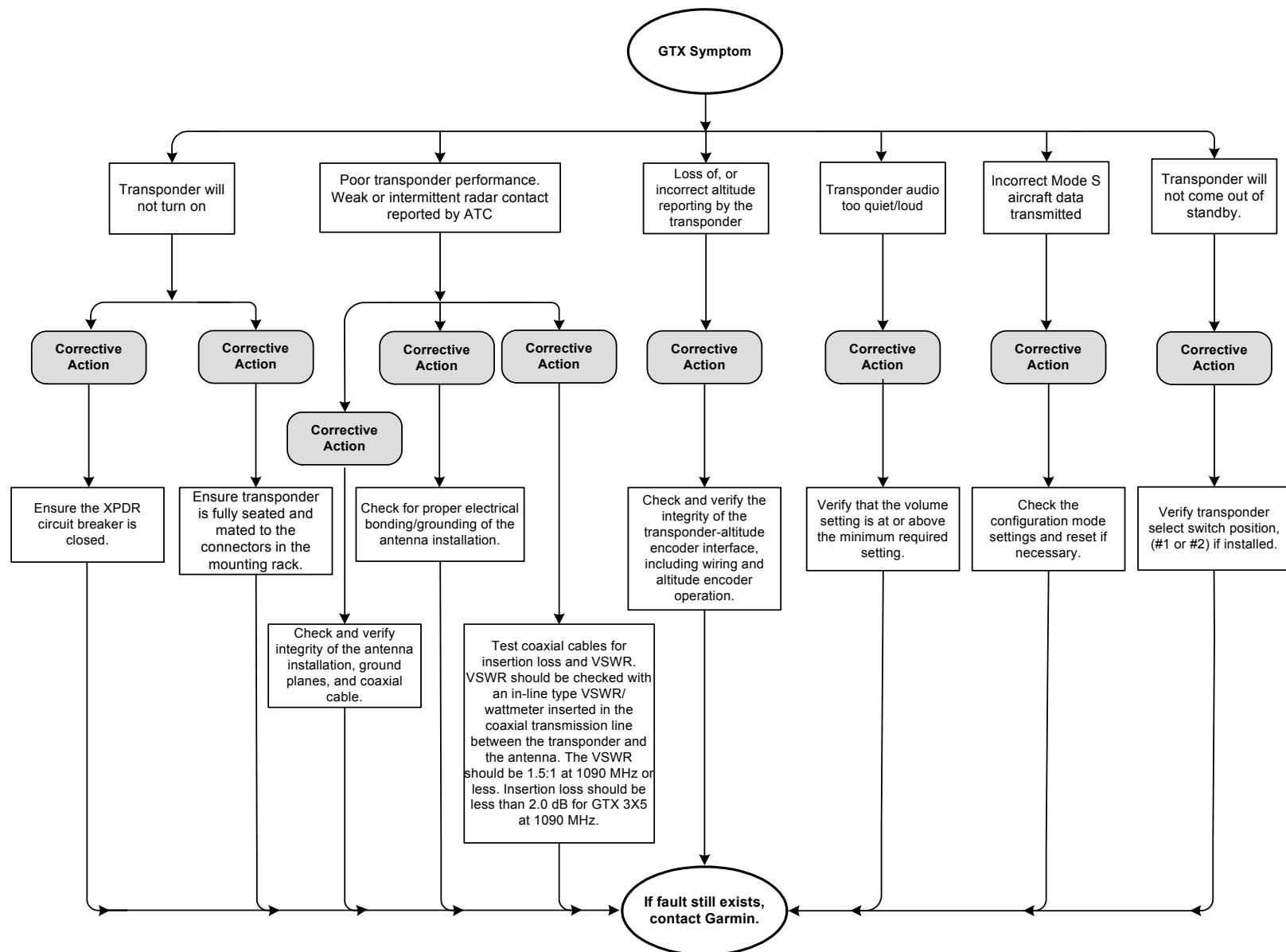
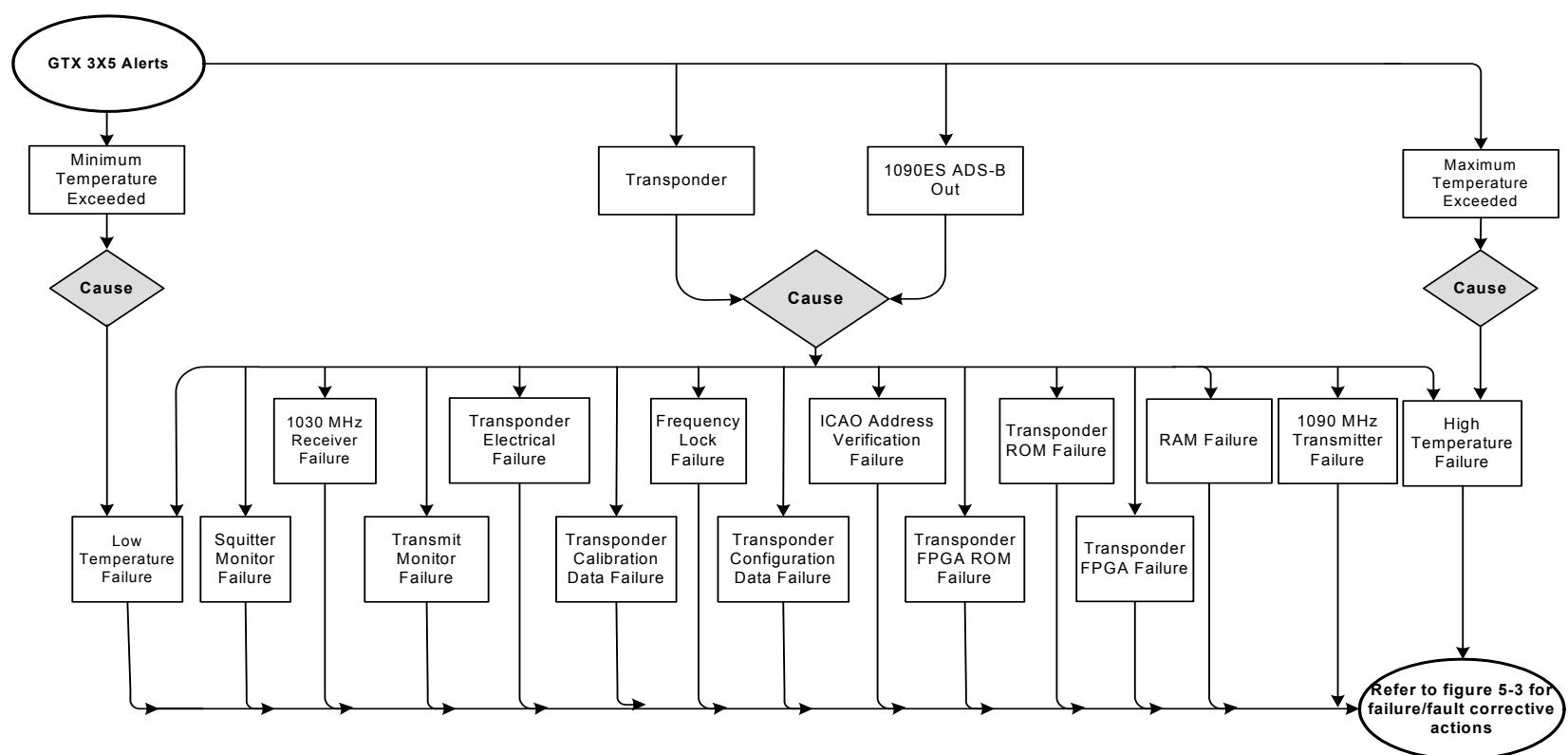
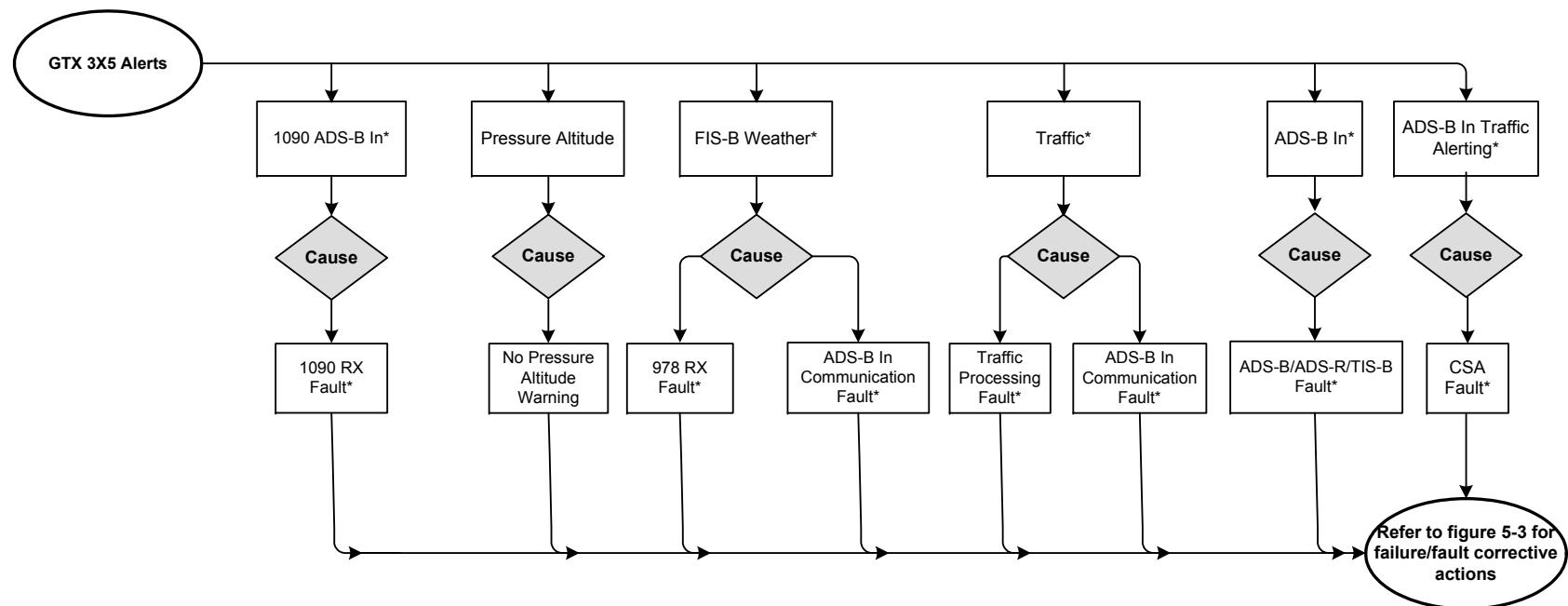


Figure 5-1 GTX Transponder Troubleshooting (All Models)

## 5.2 GTX Failure Annunciations



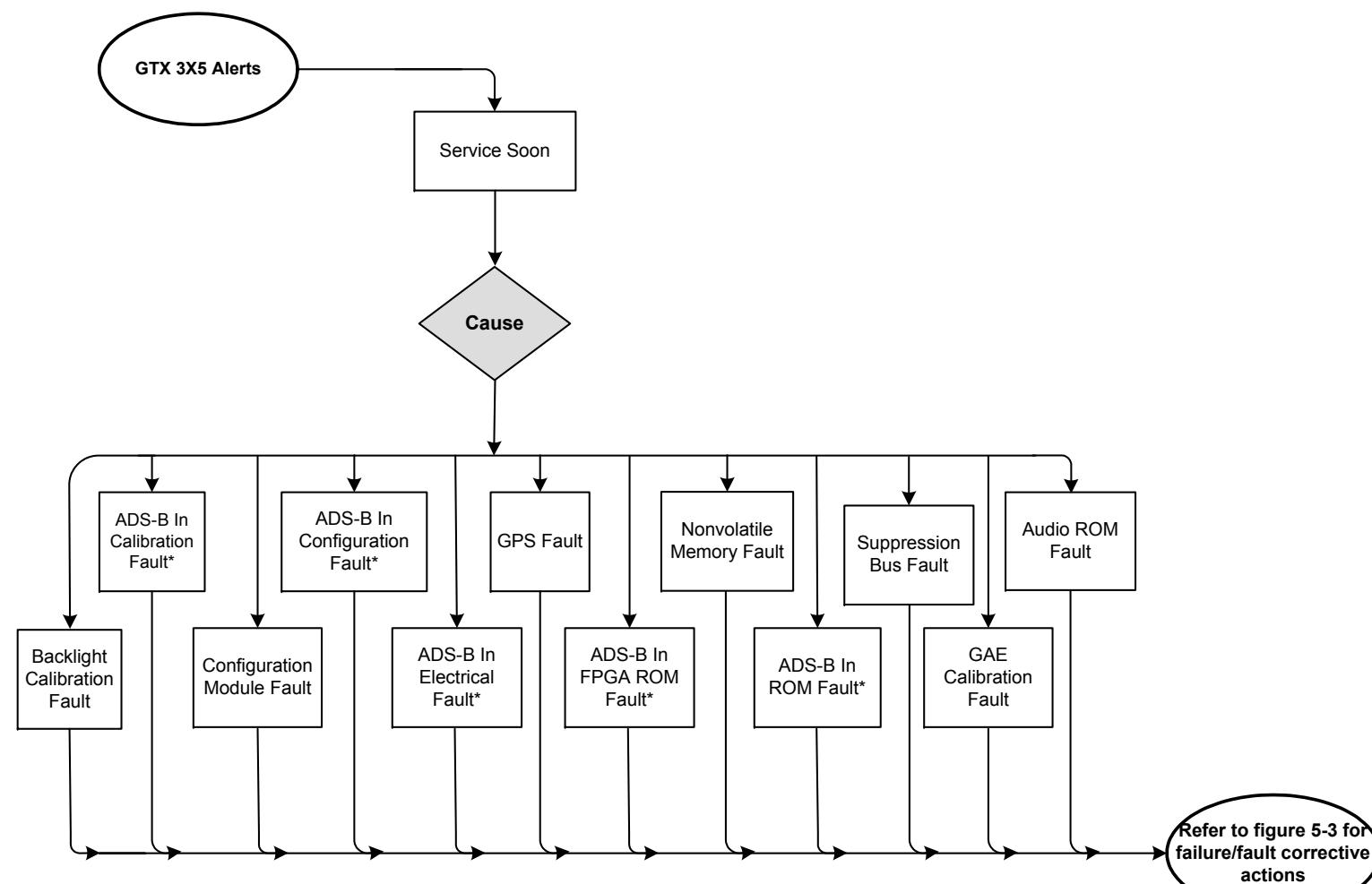
**Figure 5-2 GTx 3X5 Transponder Alerts**  
Sheet 1 of 4



**Note:**

\*For GTX 345 only.

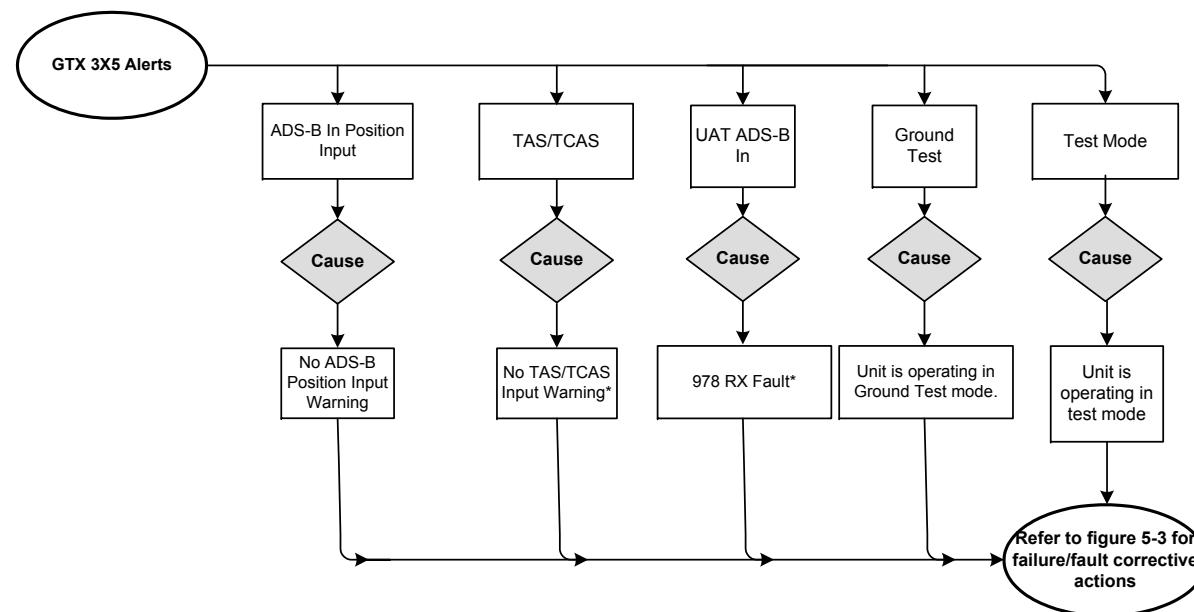
**Figure 5-2 GTX 3X5 Transponder Alerts**  
**Sheet 2 of 4**



**Note:**

\*For GTX 345 only.

**Figure 5-2 GTX 3X5 Transponder Alerts**  
Sheet 3 of 4



**Note:**

\*For GTX 345 only.

**Figure 5-2 GTX 3X5 Transponder Alerts**  
**Sheet 4 of 4**

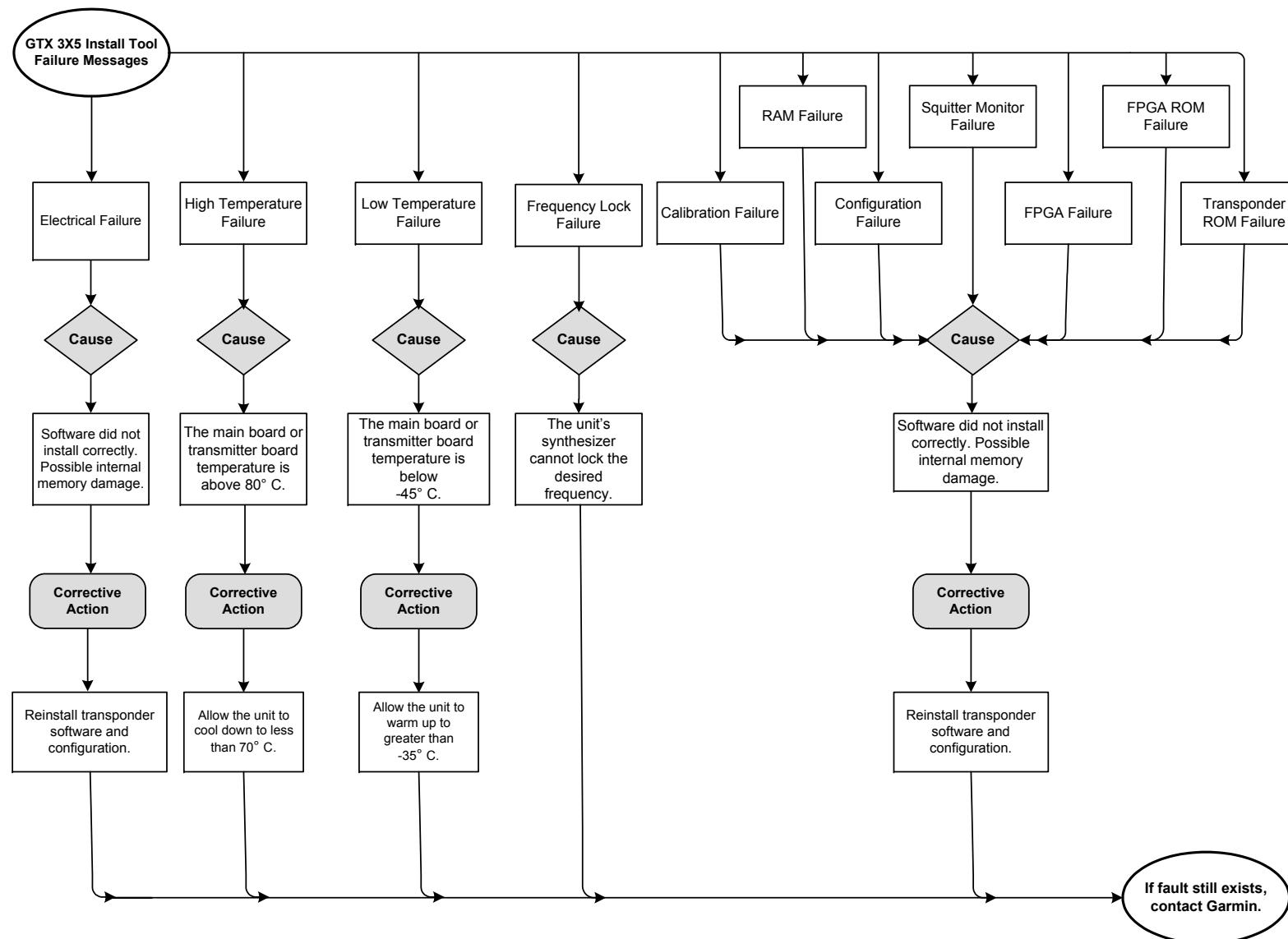
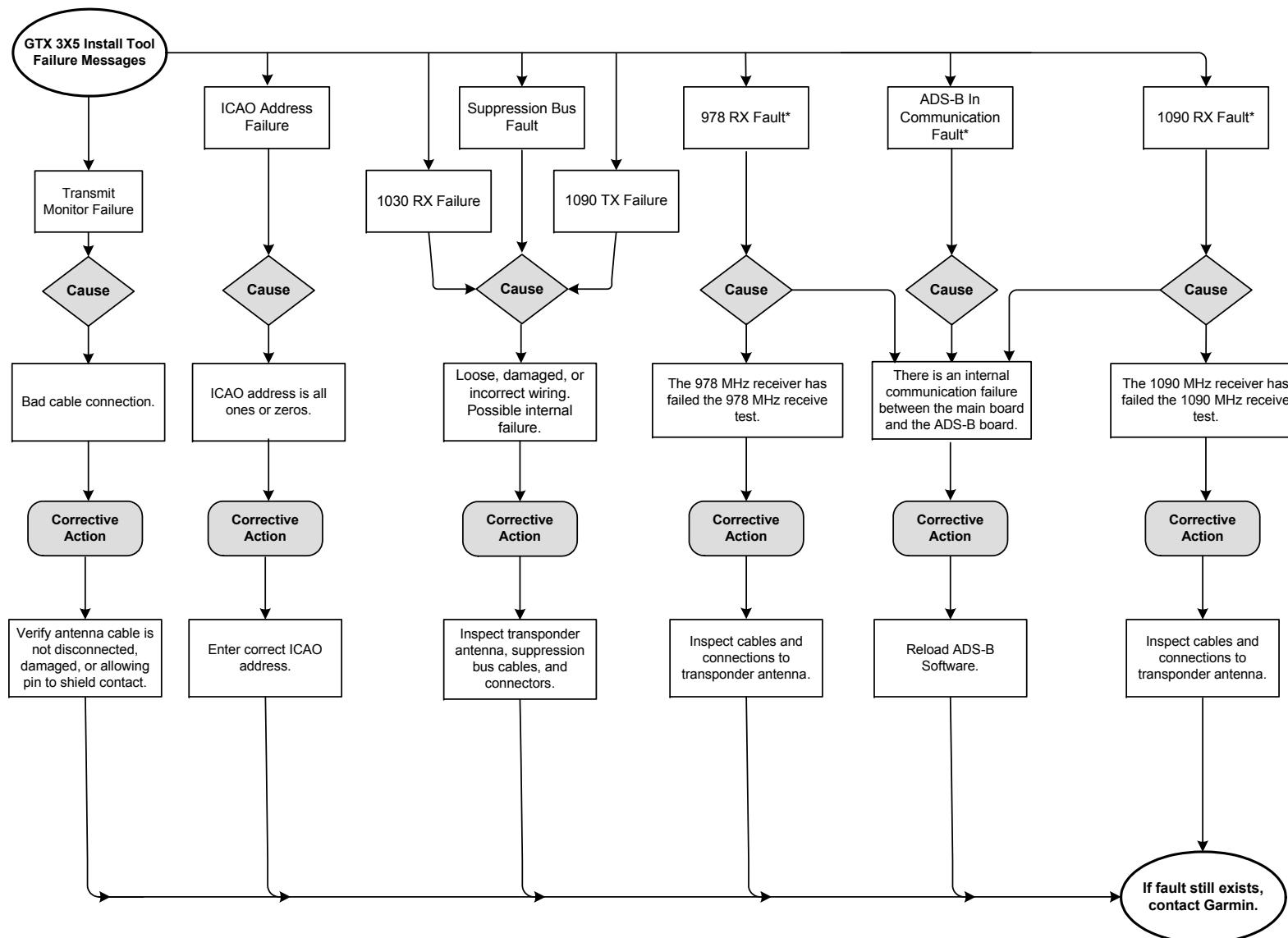
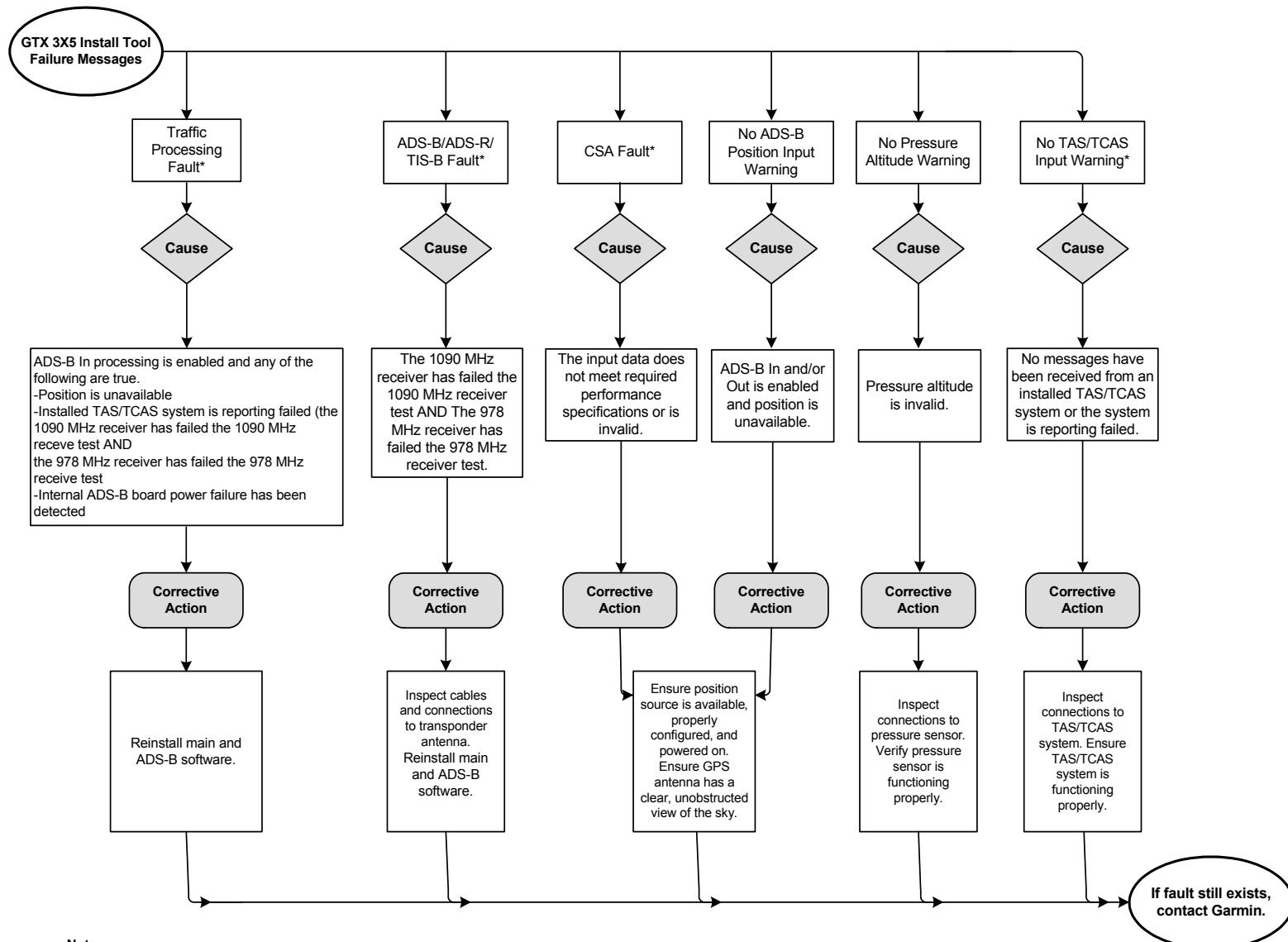


Figure 5-3 GTX 3X5 Install Tool Failure/Fault Messages  
Sheet 1 of 5

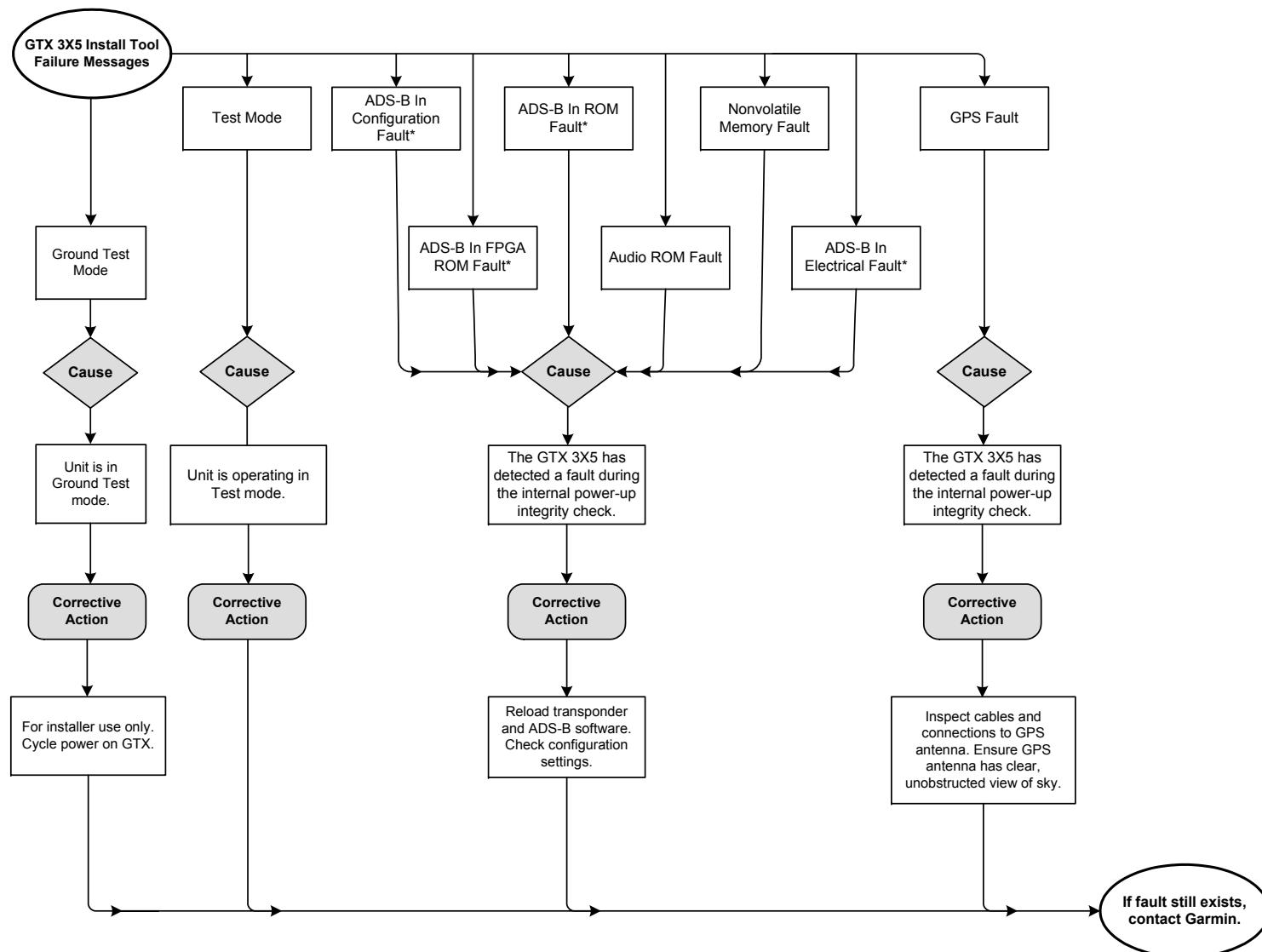


**Note:**  
\*For GTX 345 only.

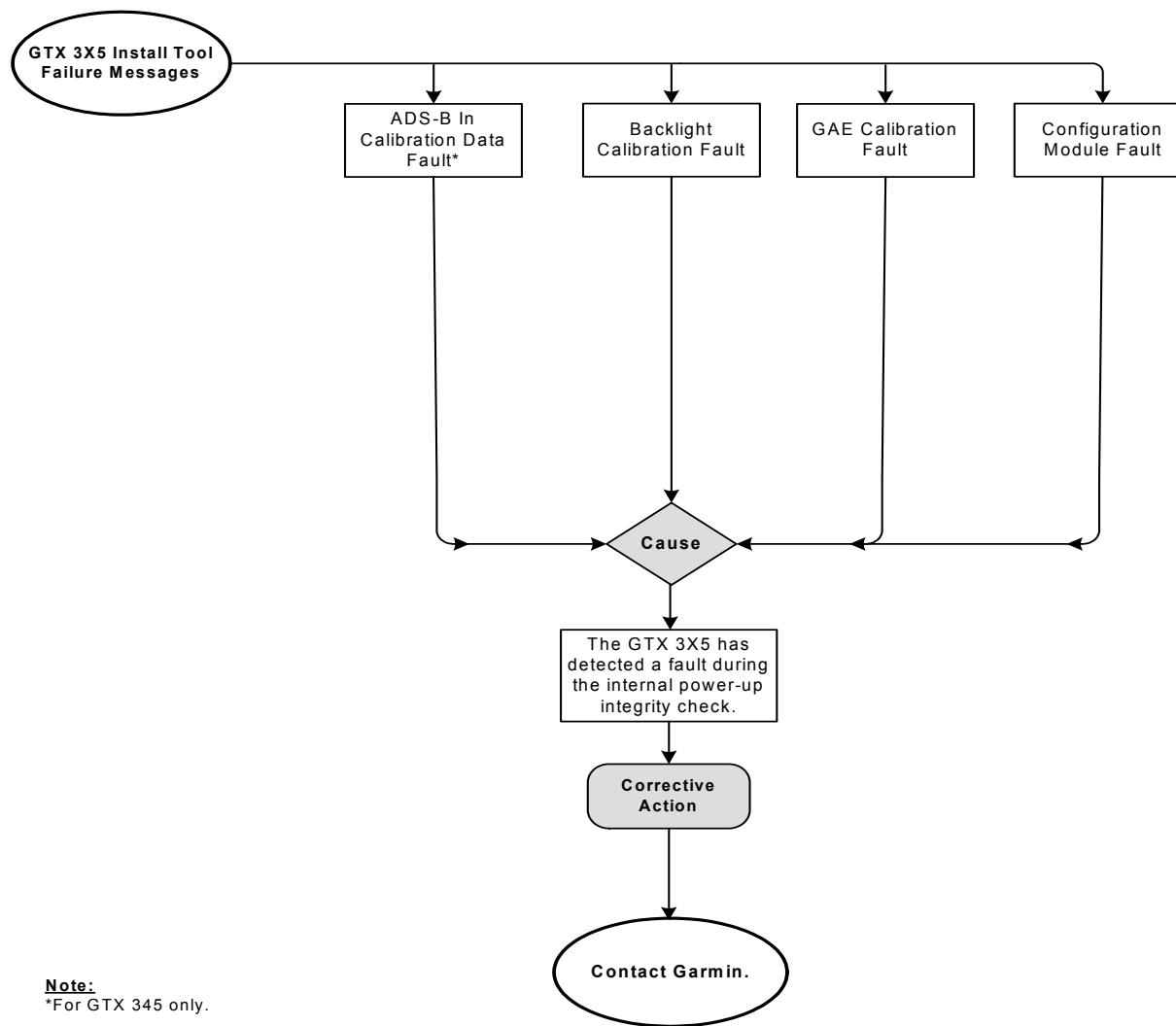
**Figure 5-3 GTX 3X5 Install Tool Failure/Fault Messages**  
**Sheet 2 of 5**



**Figure 5-3 GTX 3X5 Install Tool Failure/Fault Messages**  
**Sheet 3 of 5**



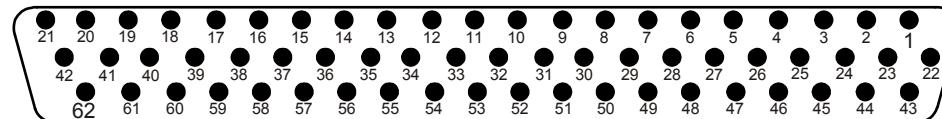
**Figure 5-3 GTX 3X5 Install Tool Failure/Fault Messages**  
**Sheet 4 of 5**



**Figure 5-3 GTX 3X5 Install Tool Failure/Fault Messages**  
**Sheet 5 of 5**

## 5.3 Connector Pinout Information

### 5.3.1 GTX 3X5



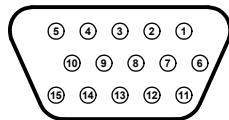
**Figure 5-4 Rear View, Connector J3251**

**Table 5-1 J3251 Pinout**

Pin	GTX 3X5 Pin Name	I/O
1	ALT ENCODER/CONFIG MODULE CLOCK	I/O
2	USB DATA HI	I/O
3	TEMP PROBE IN	In
4	TIME MARK A	I/O
5	ARINC 429 OUT A	Out
6	ARINC 426 OUT B	Out
7	RS-232 OUT 3	Out
8	RS-232 OUT 2	Out
9	RS-232 OUT 1	Out
10	ALITUDE A1	In
11	ALITUDE B1	In
12	ALITUDE C1	In
13	ALITUDE D4	In
14	EXTERNAL STANDBY SELECT	In
15	CONFIGURABLE DISCRETE 1	I/O
16	CONFIGURABLE DISCRETE 2	I/O

Pin	GTX 3X5 Pin Name	I/O
17	XPDR FAIL 1	Out
18	EXTERNAL SUPPRESSION	I/O
19	LIGHTING BUS HI	In
20	ROTORCRAFT GROUND	In
21	ROTORCRAFT POWER 1	In
22	ALT ENCODER/CONFIG MODULE DATA	I/O
23	ALT ENCODER/CONFIG MODULE GND	In
24	USB DATA LO	I/O
25	TEMP PROBE OUT	Out
26	TIME MARK B	I/O
27	ARINC 426 IN 1A	In
28	ARINC 429 IN 1B	In
29	RS-232 IN 3	In
30	RS-232 IN 2	In
31	RS-232 IN 1	In
32	ALTITUDE A2	In
33	ALTITUDE B2	In
34	ALTITUDE C2	In
35	RESERVED	In
36	EXTERNAL IDENT SELECT	In
37	AUDIO INHIBIT 2	In
38	POWER CONTROL	In
39	SWITCHED POWER OUT	Out
40	LIGHTING BUS LO	In
41	ROTORCRAFT GROUND	--

Pin	GTX 3X5 Pin Name	I/O
42	ROTORCRAFT POWER 1	--
43	ALT ENCODER/CONFIG MODULE POWER	--
44	USB VBUS POWER	I/O
45	USB GND	--
46	AUDIO OUT HI	Out
47	AUDIO OUT LO	Out
48	ARINC 429 IN 2A	In
49	ARINC 429 IN 2B	In
50	RS-232 GND 3	--
51	RS-232 GND 2	--
52	RS-232 GND 1	--
53	ALTITUDE A4	In
54	ALTITUDE B4	In
55	ALTITUDE C4	In
56	ALTITUDE GROUND	--
57	SQUAT SWITCH	In
58	AIR DATA SELECT	In
59	POWER CONFIG	In
60	GPS KEEP ALIVE	--
61	ROTORCRAFT POWER 2	--
62	ROTORCRAFT POWER 2	--



**Figure 5-5 Rear View, Connector J3252**

**Table 5-2 J3252 Pinout**

Pin	GTX 345/345R Pin Name	I/O
1	ETHERNET OUT 1B	Out
2	ETHERNET IN 1B	In
3	ETHERNET OUT 2B	Out
4	ETHERNET IN 2B	In
5	RS-232 OUT 4	Out
6	ETHERNET OUT 1A	Out
7	ETHERNET IN 1A	In
8	ETHERNET OUT 2A	Out
9	ETHERNET IN 2A	In
10	RS-232 IN 4	In
11	RS-422 A	Out
12	RS-422 B	Out
13	CONFIGURABLE DISCRETE 11	I/O
14	CONFIGURABLE DISCRETE 12	I/O
15	RS-232 GND 4	--

### 5.3.2 Altitude Functions

Gillham code altitude inputs are considered active if either the voltage to ground is < 1.9 V or the resistance to ground is < 375 Ω. These inputs are considered inactive if the voltage to ground is 11-33 VDC. The GTX 3X5/3X5R discrete I/O pins are configurable. If the Gillham input is not enabled in the configuration menu, then the Gillham code altitude pins can be used for other discrete input functions. If the Gillham input is enabled, these pins will not be available for selection on other discrete inputs in the configuration menu.

**Table 5-3 GTX 3X5/3X5R Encoded Altitude Pin Assignments**

Pin Name	Pin Number	I/O	Connector
ALTITUDE D4	13	In	J3251
ALTITUDE A1	10	In	J3251
ALTITUDE A2	32	In	J3251
ALTITUDE A4	53	In	J3251
ALTITUDE B1	11	In	J3251
ALTITUDE B2	33	In	J3251
ALTITUDE B4	54	In	J3251
ALTITUDE C1	12	In	J3251
ALTITUDE C2	34	In	J3251
ALTITUDE C4	55	In	J3251
ALTITUDE COMMON	56	--	J3251

### 5.3.3 Discrete Functions

#### *Discrete Outputs*

**Table 5-4 GTX 3X5/3X5R Discrete Outputs**

Pin Name	Pin Number	I/O	Unit (335/345/ 335R/345R)	Connector
TRANSPOUNDER FAIL 1	17	Out	All	J3251
EXTERNAL SUPPRESSION	18	I/O	All	J3251
REPLY ACTIVE	X	Out	All	J3251/J3252
TRANSPOUNDER FAIL #2	X	Out	All	J3251/J3252
ALTITUDE ALERT*	X	Out	All	J3251/J3252
EQUIPMENT STATUS	X	Out	All	J3251/J3252
TRAFFIC ALERT	X	Out	345/345R	J3251/J3252
TRAFFIC STANDBY	X	Out	345/345R	J3251
TRAFFIC TEST	X	Out	345/345R	J3251
TCAD SENSITIVITY	X	Out	345/345R	J3251/J3252
* INACTIVE: $10 \leq V_{in} \leq 33$ VDC or $R_{in} \geq 100 \text{ k}\Omega$ (Open) ACTIVE: $V_{in} \leq 1.9$ VDC with $\geq 75 \mu\text{A}$ sink current, or $R_{in} \leq 375 \Omega$ (GND) Sink current is internally limited to 200 $\mu\text{A}$ max for a grounded input.				
X Denotes that this discrete output can be configured to any available discrete output pin on either the J3251 or J3252 connectors. Refer to table 5-5 for a list of configurable output pins.				

**Table 5-5 GTX 3X5/3X5R Configurable Output Pins**

Pin Name	Pin Number	I/O	Unit (335/345/ 335R/345R)	Connector
TRANSPOUNDER FAIL #1	17	Out	All	J3251
CONFIGURABLE DISCRETE #1	15	I/O	All	J3251
CONFIGURABLE DISCRETE #2	16	I/O	All	J3251
CONFIGURABLE DISCRETE #11	13	I/O	345/345R	J3252
CONFIGURABLE DISCRETE #12	14	I/O	345/345R	J3252

## Discrete Inputs

**Table 5-6 GTX 3X5/3X5R Discrete Inputs**

Pin Name	Pin Number	I/O	Unit (335/345/ 335R/345R)	Connector
TIS-A SELECT*	X	In	335/335R	J3251
ALTITUDE SOURCE*	X	In	All	J3251/J3252
AUDIO INHIBIT #1*	X	In	All	J3251/J3252
AUDIO INHIBIT #2*	37	In	All	J3251
AIR DATA SOURCE*	58	In	All	J3251
SQUAT	57	In	All	J3251
IDENT*	36	In	All	J3251
STANDBY*	14	In	All	J3251
INSTALL ID SELECT	13	In	All	J3251
EXTERNAL SUPPRESSION I/O	18	I/O	All	J3251
* INACTIVE: $10 \leq V_{in} \leq 33$ VDC or $R_{in} \geq 100$ kΩ (Open) ACTIVE: $V_{in} \leq 1.9$ VDC with $\geq 75$ uA sink current, or $R_{in} \leq 375$ Ω (GND) Sink current is internally limited to 200 uA max for a grounded input.				
X Denotes that this discrete input can be configured to any available discrete input pin on either the J3251 or J3252 connectors. Refer to table 5-7 for a list of configurable input pins.				

**Table 5-7 GTX 3X5/3X5R Configurable Input Pins**

Pin Name	Pin Number	I/O	Unit (335/345/ 335R/345R)	Connector
AUDIO INHIBIT #2	37	In	All	J3251
AIR DATA SELECT	58	In	All	J3251
SQUAT SWITCH	57	In	All	J3251
EXTERNAL IDENT	36	In	All	J3251
EXTERNAL STANDBY	14	In	All	J3251
EXTERNAL SUPPRESSION I/O	18	I/O	All	J3251
CONFIGURABLE DISCRETE #1	15	I/O	All	J3251
CONFIGURABLE DISCRETE #2	16	I/O	All	J3251
CONFIGURABLE DISCRETE #11	13	I/O	345/345R	J3252
CONFIGURABLE DISCRETE #12	14	I/O	345/345R	J3252

### 5.3.4 RS-232 Input/Output

**Table 5-8 GTX 3X5/3X5R RS-232 Connections**

Pin Name	Pin Number	I/O	Unit (335/345/ 335R/345R)	Connector
RS-232 OUT 1	9	Out	All	J3251
RS-232 IN 1	31	In	All	J3251
RS-232 OUT 2	8	Out	All	J3251
RS-232 IN 2	30	In	All	J3251
RS-232 OUT 3	7	Out	All	J3251
RS-232 IN 3	29	In	All	J3251
RS-232 OUT 4	5	Out	345/345R	J3252
RS-232 IN 4	10	In	345/345R	J3252

### 5.3.5 ARINC 429 Input/Output

**Table 5-9 GTX 3X5/3X5R ARINC 429 Connections**

Pin Name	Pin Number	I/O	Unit (335/345/ 335R/345R)	Connector
ARINC 429 IN 1A	27	In	All	J3251
ARINC 429 IN 1B	28	In	All	J3251
ARINC 429 OUT 1A	5	Out	All	J3251
ARINC 429 OUT 1B	6	Out	All	J3251
ARINC 429 IN 2A	48	In	All	J3251
ARINC 429 IN 2B	49	In	All	J3251

### 5.3.6 RS-422 Out

**Table 5-10 GTX 3X5/3X5R RS-422 Connections**

Pin Name	Pin Number	I/O	Unit (335/345/ 335R/345R)	Connector
RS-422 A	11	Out	345/345R	J3252
RS-422 B	12	Out	345/345R	J3252

### 5.3.7 HSDB Input/Output

Table 5-11 GTX 345/345R HSDB Connections

Pin Name	Pin Number	I/O	Unit (335/345/ 335R/345R)	Connector
ETHERNET OUT 1A	6	Out	345/345R	J3252
ETHERNET IN 1A	7	In	345/345R	J3252
ETHERNET OUT 1B	1	Out	345/345R	J3252
ETHERNET IN 1B	2	In	345/345R	J3252
ETHERNET OUT 2A	8	Out	345/345R	J3252
ETHERNET IN 2A	9	In	345/345R	J3252
ETHERNET OUT 2B	3	Out	345/345R	J3252
ETHERNET IN 2B	4	In	345/345R	J3252

## 6 UNIT REMOVAL AND REINSTALLATION

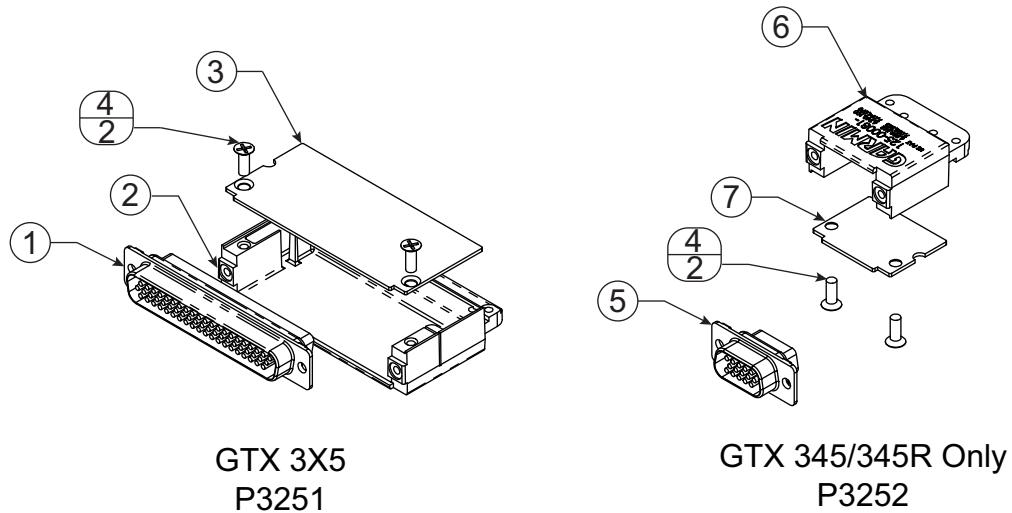
6.1	GTX 3X5 .....	6-2
6.1.1	GTX 335/345 Panel Mounted Units .....	6-8
6.1.2	GTX 3X5R with Horizontal Install Rack .....	6-11
6.1.3	GTX 3X5R with Vertical Install Rack .....	6-13
6.1.4	Garmin Altitude Encoder .....	6-15
6.2	Transponder Antenna.....	6-17
6.3	Traffic Annunciator (If Installed) .....	6-17

## 6.1 GTX 3X5

This section contains parts, procedures, and requirements for assembly, removal, and reinstallation of GTX 3X5 equipment installed under STC SR02124SE. After removal and reinstallation, the GTX 3X5 return to service procedures must be performed in accordance with section 9. After re-installation of the GTX 3X5, verify that the electrical bond is equal to or less than 2.5 milliohms per section 4.6.

**Table 6-1 GTX 3X5 Connector Kit Hardware**

Item	Description	P/N	Qty
1	Connector, hi-dense, D-sub, mil crimp 62 ckt	330-00185-62	1
2	Sub-assembly, backshell with hardware, 37/62 pin	011-00950-03	1
3	Sub-assembly, ground adapter, shell 4&5	011-01169-01	1
4	Screw, 4-40 X .250, FLHP 100, SS/P, nylon	211-63234-06	2 ea connector
5	Connector, hi-dense, D-sub, mil crimp, 15 ckt	330-00185-15	1
6	Sub-assembly, backshell with hardware, 9/15 pin	011-00950-00	1
7	Sub-assembly, ground adapter, shell 1-3	011-01169-00	1

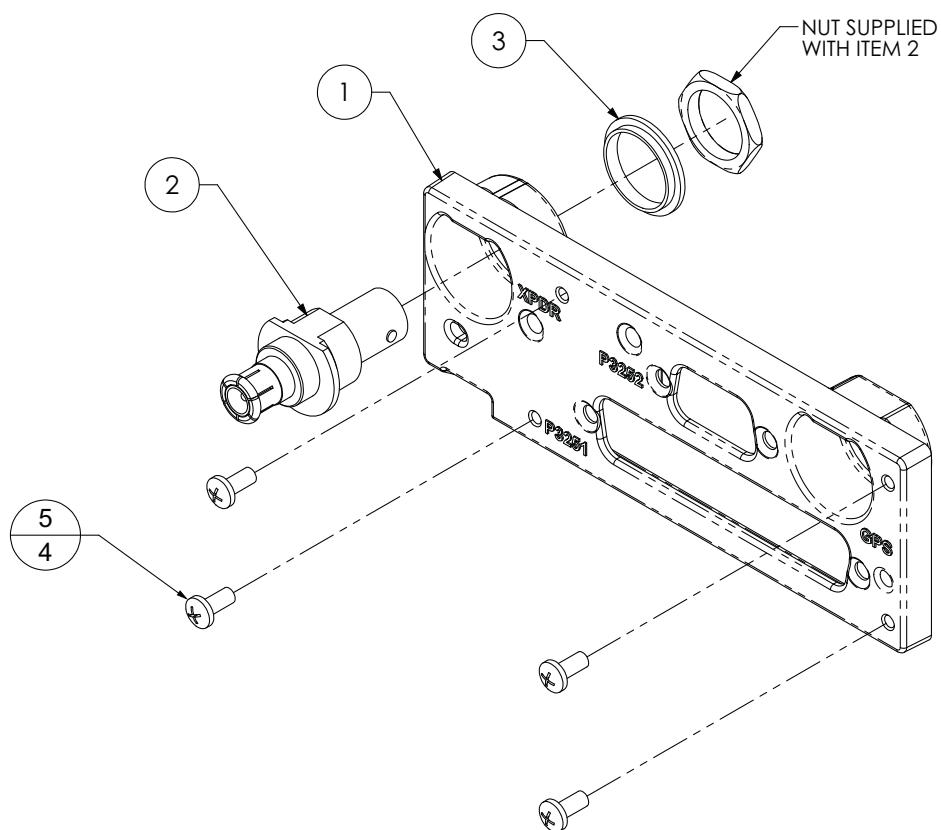


**Figure 6-1 GTX 3X5 Connector Kits**

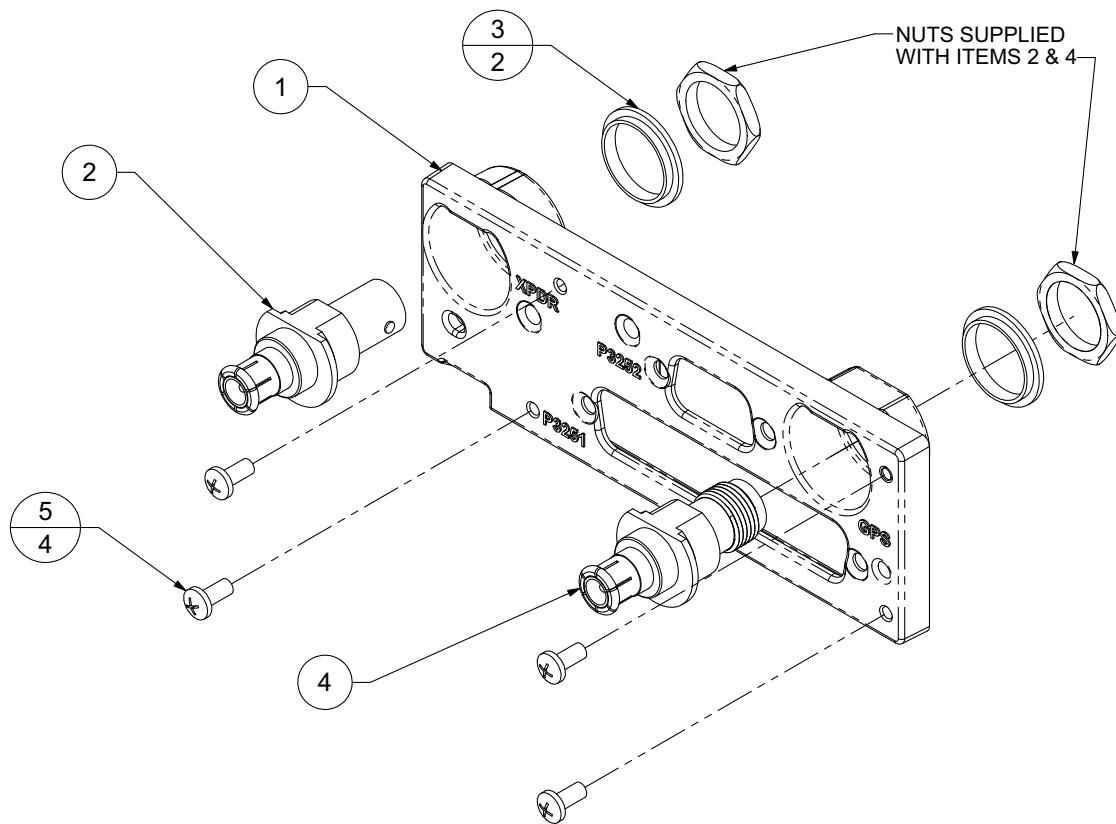
For a list of the backplate items associated with the standard mounting assembly, refer to table 6-2. For detailed drawings of the backplate assembly, refer to figure 6-2 and figure 6-3.

**Table 6-2 Standard Mount Backplate Hardware (011-02976-00 and -01)**

Item	Description	P/N	Qty
1	DCP, connector plate, GTX 3X5, w/secondaries	125-00307-10	1
2	Connector, male/female special, BNC	330-00053-01	1
3	Washer, shoulder, GNC 400	212-00022-00	2
4	Connector, male/female, special, BNC/TNC	330-00053-02	1
5	Screw, 4-40 X .250, PHP, SS/P, nylon	211-60234-08	4



**Figure 6-2 GTX 3X5 without GPS Backplate Assembly  
(P/N 011-02976-00)**

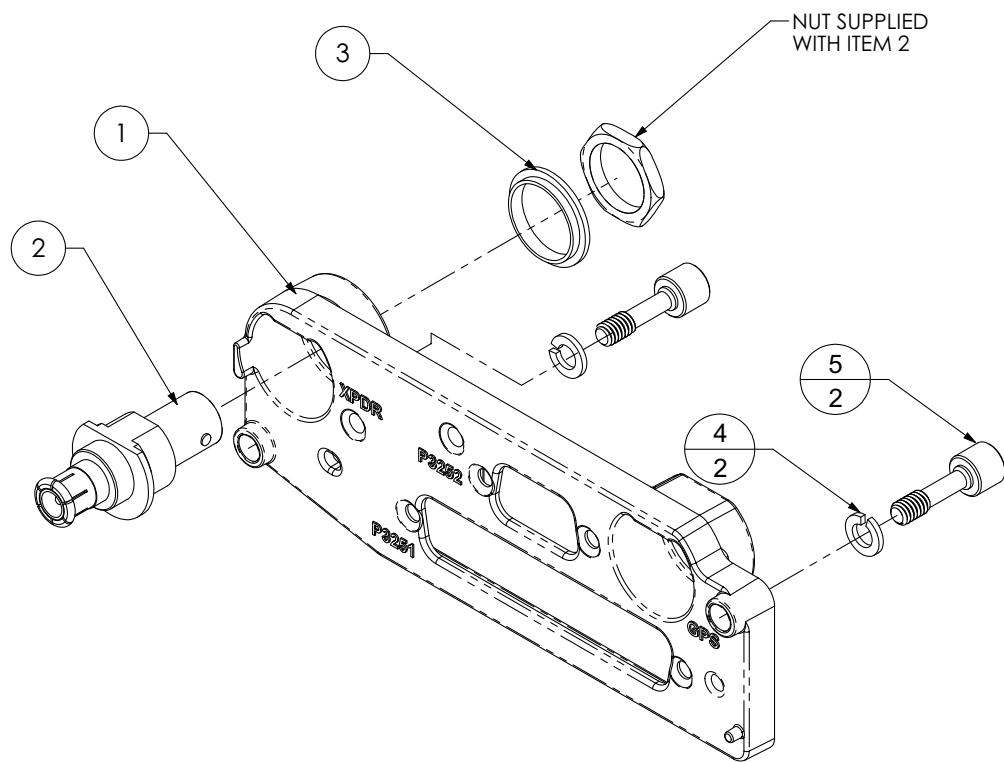


**Figure 6-3 GTX 3X5 with GPS Backplate Assembly  
(P/N 011-02976-01)**

For a list of the backplate items associated with the vertical mounting assembly, refer to table 6-3. For detailed drawings of the backplate assemblies, refer to figure 6-4, figure 6-5, and figure 6-6.

**Table 6-3 Vertical Mount Backplate Hardware (011-02976-10)**

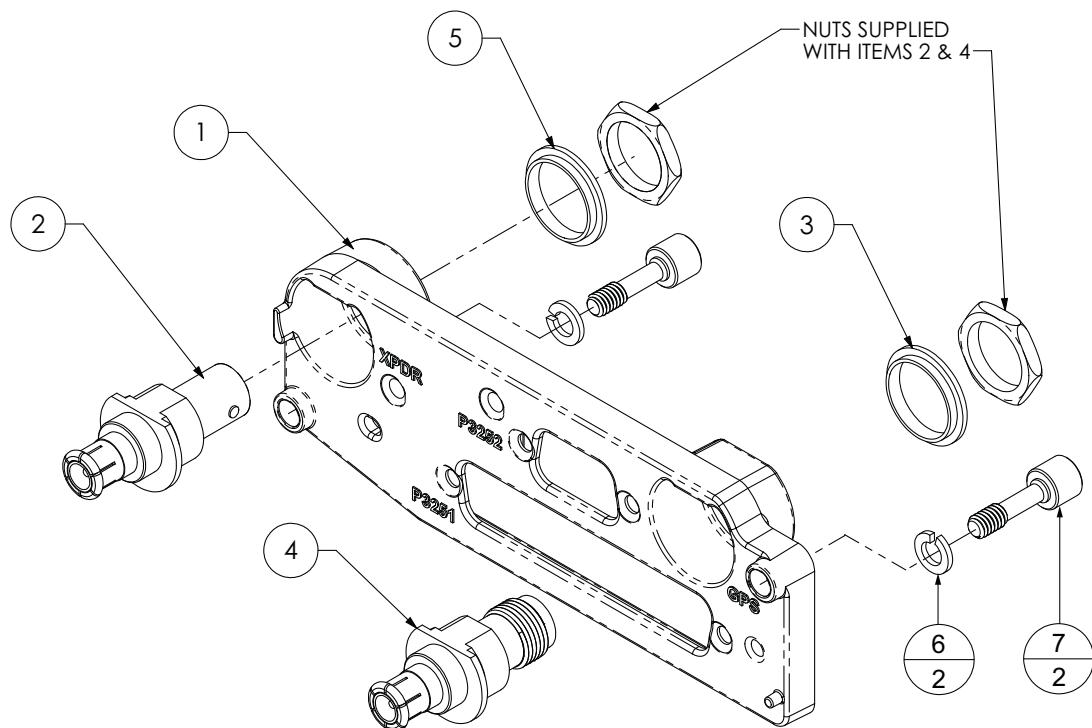
Item	Description	P/N	Qty
1	DCP, connector plate, remote, GTX 3X5, w/secondaries	125-00343-10	1
2	Connector, male/female special, BNC	330-00053-01	1
3	Washer, centering, no float	212-00022-10	1
4	Washer, split lock, size 8	212-00018-04	2
5	Screw, captive, 8-32, .62", 3/32 hex drv	211-00290-00	2



**Figure 6-4 GTX 3X5 Vertical Mount without GPS, Backplate Assembly  
(P/N 011-02976-10)**

**Table 6-4 Vertical Mount Backplate Hardware (011-02976-11)**

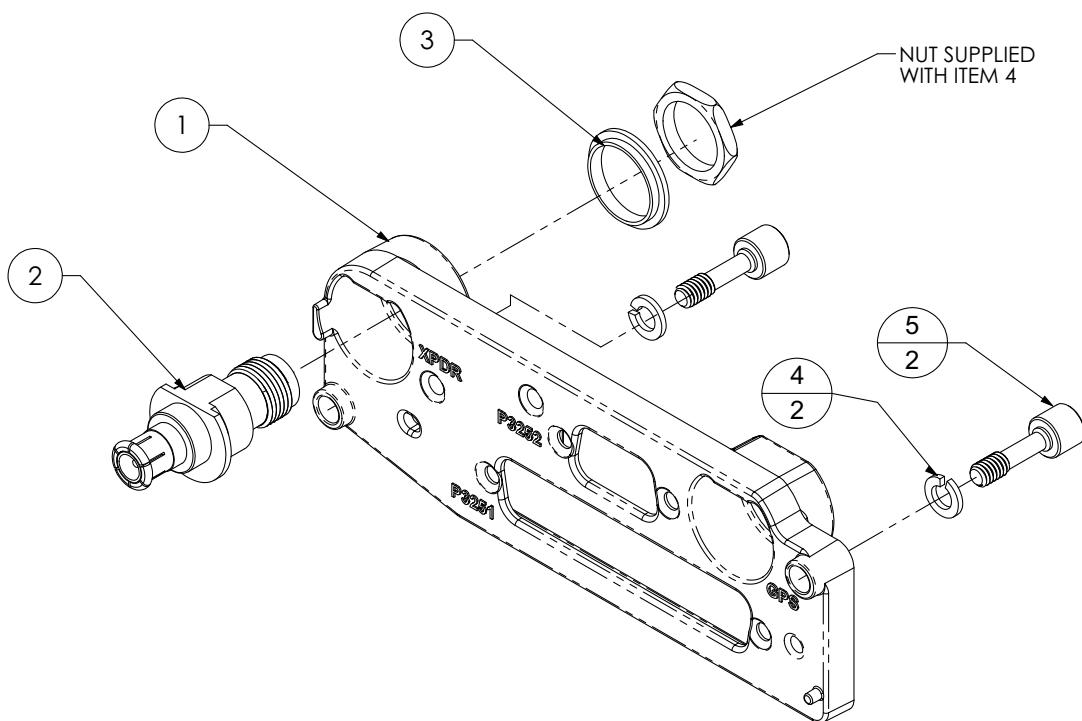
Item	Description	P/N	Qty
1	DCP, connector plate, remote, GTX 3X5, w/secondaries	125-00343-10	1
2	Connector, male/female special, BNC	330-00053-01	1
3	Washer, shoulder, GNC 400	212-00022-00	2
4	Connector, male/female, special, BNC/TNC	330-00053-02	1
5	Washer, centering, no float	212-00022-10	1
6	Washer, split lock, size 8	212-00018-04	2
7	Screw, captive, 8-32, .62", 3/32 hex drv	211-00290-00	2



**Figure 6-5 GTX 3X5 Vertical Mount with GPS, Backplate Assembly  
(P/N 011-02976-11)**

**Table 6-5 Vertical Mount Backplate Hardware (011-02976-12)**

Item	Description	P/N	Qty
1	DCP, connector plate, remote, GTX 3X5, w/secondaries	125-00343-10	1
4	Connector, male/female, special, BNC/TNC	330-00053-02	1
3	Washer, centering, no float	212-00022-10	1
4	Washer, split lock, size 8	212-00018-04	2
5	Screw, captive, 8-32, .62", 3/32 hex drv	211-00290-00	2



**Figure 6-6 GTX 3X5 Vertical Mount with TNC XPDR Backplate Assembly  
(P/N 011-02976-12)**

### 6.1.1 GTX 335/345 Panel Mounted Units



#### **CAUTION**

*Ensure that the rotorcraft power is off before removal or reinstallation of the GTX 3X5.  
Unplug any auxiliary power supply.*

This section contains procedures and requirements for removal and reinstallation of the GTX 335/345 panel-mounted units installed under STC SR02124SE. After removal and reinstallation, the GTX 335/345 return to service procedures must be performed in accordance with section 9.

#### **Removal**

1. Insert the hex drive tool into the access hole on the unit face and rotate counterclockwise until the unit is forced out about 3/8 inch.
2. Pull the unit straight out of the rack.

#### **Reinstallation**



#### **CAUTION**

*Be sure not to over-tighten the unit into the rack. Torque exceeding 8 in-lbs can damage the locking mechanism.*



#### **NOTE**

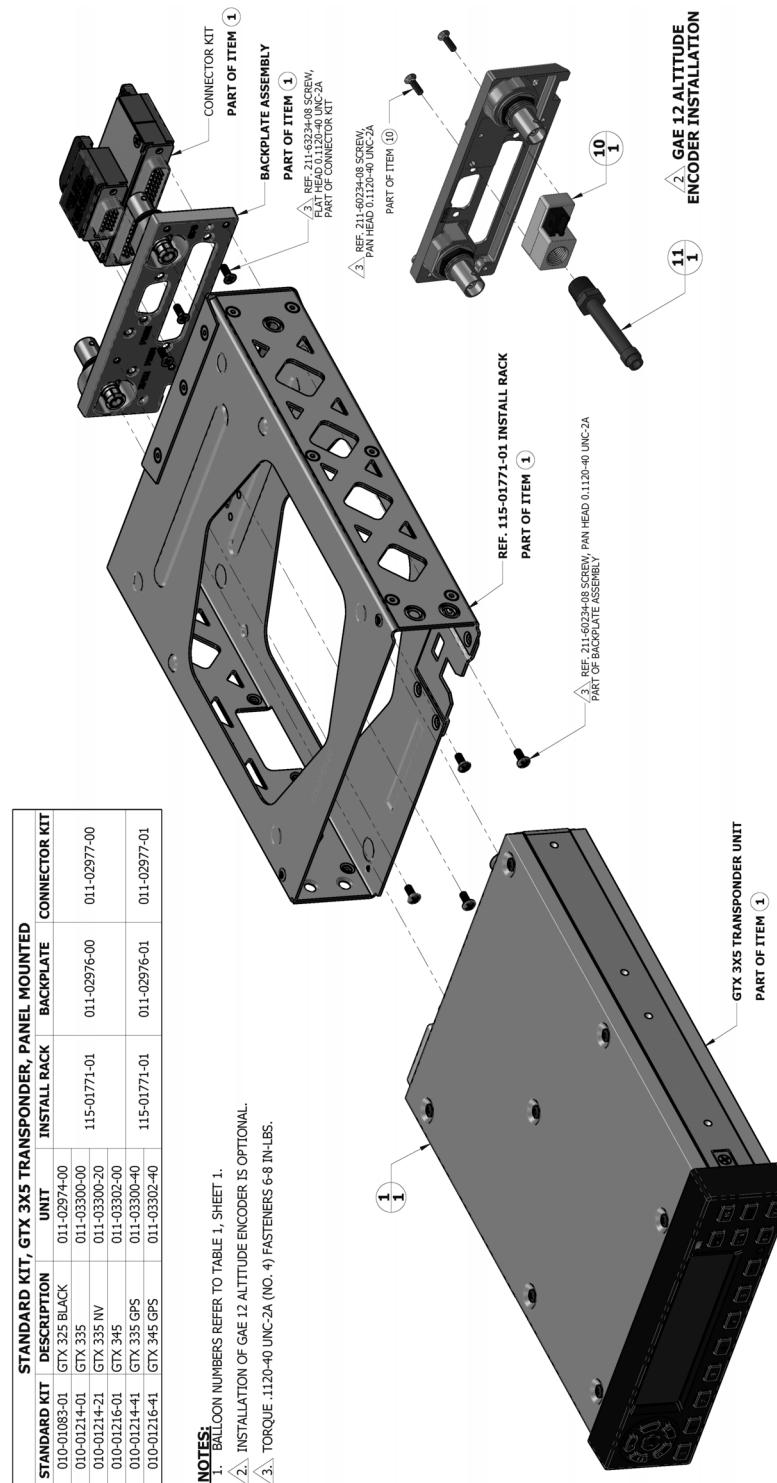
*It may be necessary to insert the hex drive tool into the access hole and rotate the cam mechanism 90° counterclockwise to ensure correct position prior to placing the unit in the rack.*

1. Slide the GTX 3X5 straight in the rack until it stops, about one inch short of the final position.
2. Insert a 3/32-inch hex drive tool into the access hole at the bottom of the unit face.
3. Turn the hex tool clockwise while pressing on the left side of the bezel until the unit is firmly seated in the rack.
4. Count the number of complete revolutions the hex screw can be turned, not exceeding 8 in-lbs of torque. Be careful not to over-tighten. Three turns is the minimum for proper installation. If fewer than three turns are possible, ensure nothing obstructs the unit from fully seating in the rack.
5. Complete the applicable return to service procedures in section 9.

For a complete list of GTX 3X5 transponder components, refer to table 6-6. For detailed assembly drawings, refer to figure 6-7, figure 6-8, and figure 6-9.

**Table 6-6 GTX 3X5 Transponder Parts List**

Item	Description	P/N	
1	GTX 335 Standard Kit	010-01214-01	OR
	GTX 335 NV Standard Kit	010-01214-21	
	GTX 335 GPS, Standard Kit	010-01214-41	
	GTX 345, Standard Kit	010-01216-01	
	GTX 345 GPS, Standard Kit	010-01216-41	
2	GTX 335 Remote, Standard Kit	010-0215-01	OR
	GTX 335 Remote GPS, Standard Kit	010-0215-41	
	GTX 345 Remote, Standard Kit	010-0217-01	
	GTX 345 Remote GPS, Standard Kit	010-0217-41	
3	GTX 335 Remote, Vertical Mount, Standard Kit	010-0215-02	OR
	GTX 335 Remote GPS, Vertical Mount, Standard Kit	010-0215-42	
	GTX 345 Remote, Vertical Mount, Standard Kit	010-0217-02	
	GTX 345 Remote GPS, Vertical Mount, Standard Kit	010-0217-42	
4	Screw, machine, flat, countersunk head 100 degrees, cross-recessed, 0.1380-32UNC-2A	MS24693-S26	
5	Nut, self-locking, plate, one lug, reduced rivet spacing, low height, steel, 0.138-32 UNC-3B	MS21071-06	
6	Rivet, solid, countersunk 100 degrees, precision head, 3/32 in. OD, 3/16 in. long	MS20426AD3-3	
7	Nut, self-locking plate, two-lug, reduced rivet spacing, low height, steel, 0.138-32 UNC-3B	MS21069L3	
8	Screw, machine, flat, countersunk head, 100 degrees, cross-recessed, 0.1900-32 UNF-2A, 0.625 in. long	MS24693-S273	
9	Insert, screw thread, molded-in, blind threaded, self-locking, floating, sandwich panel, 0.190-32 UNJF-3B	NAS1835A-3	
10	GAE 12 Altitude Encoder, Standard Kit	011-03080-00	
11	Adapter, straight, 1/8 in. pipe to 1/4 in. hose	AN840-4D	



**Figure 6-7 Panel Mounted GTX 3X5 Transponder**

### 6.1.2 GTX 3X5R with Horizontal Install Rack



#### **CAUTION**

*Ensure that the rotorcraft power is off before removal or reinstallation of the GTX 3X5R.  
Unplug any auxiliary power supply.*

This section contains procedures and requirements for removal and installation of GTX 335R/345R equipment installed using a standard remote mount. After removal and reinstallation, the GTX 335R/345R return to service procedures must be performed in accordance with section 9.

#### **Removal**

1. Gain access to the transponder.
2. Insert the hex drive tool into the access hole on the unit face and rotate counterclockwise until the unit is forced out about 3/8 inch.
3. Grab the pull-tab on the front of the unit and pull the unit straight out of the rack.

#### **Reinstallation**



#### **CAUTION**

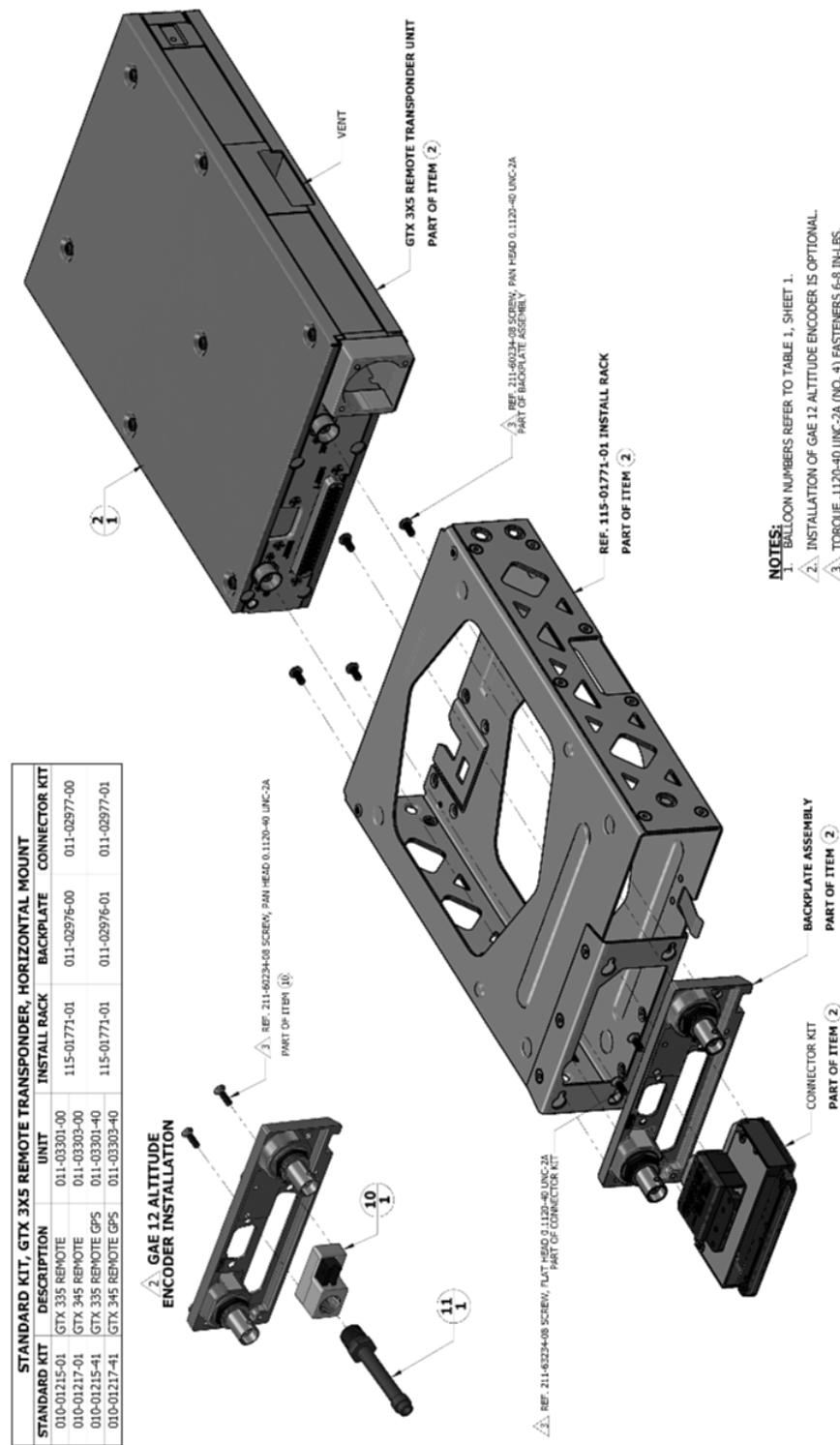
*Be sure not to over-tighten the unit into the rack. Torque exceeding 8 in-lbs can damage the locking mechanism.*



#### **NOTE**

*It may be necessary to insert the hex drive tool into the access hole and rotate the cam mechanism 90° counterclockwise to ensure correct position prior to placing the unit in the rack.*

1. Visually inspect the connectors and pins to ensure they are not bent or damaged. Repair any damage.
2. Slide the GTX 3X5 straight in the rack until it stops, about one inch short of the final position.
3. Insert a 3/32-inch hex drive tool into the access hole at the bottom of the unit.
4. Turn the hex tool clockwise while pressing on the left side of the unit until the unit is firmly seated in the rack.
5. Count the number of complete revolutions the hex screw can be turned, not exceeding 8 in-lbs of torque. Be careful not to over-tighten. Three turns is the minimum for proper installation. If fewer than three turns are possible, ensure nothing obstructs the unit from fully seating in the rack.
6. Complete the applicable return to service procedures in section 9.



**Figure 6-8 GTX 3X5R Remote Transponder with Horizontal Mount**

### 6.1.3 GTX 3X5R with Vertical Install Rack



#### **CAUTION**

*Ensure the rotorcraft power is off before removal or reinstallation of the GTX 3X5R.  
Unplug any auxiliary power supply.*

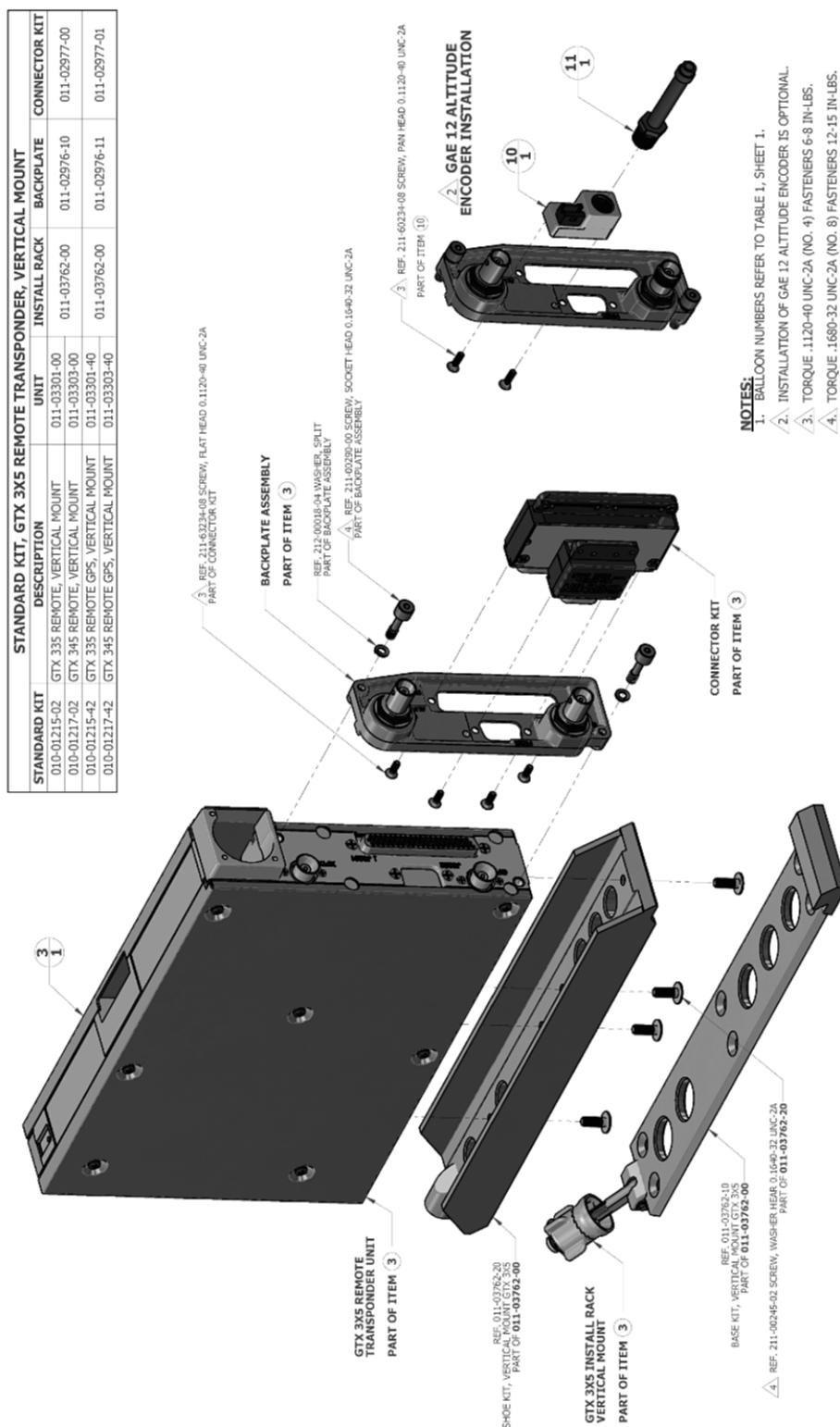
This section contains procedures for removal and installation of the GTX 335R/345R equipment installed using a vertical mount. After removal and reinstallation, the GTX 335R/345R return to service procedures must be performed.

#### ***Removal***

1. Access the transponder.
2. Remove the two captive screws securing the backplate to the transponder body using a 3/32" hex tool.
3. Carefully remove the backplate and connector assembly from the unit.
4. While pulling, turn the large knob at the base of the unit counterclockwise until it can be pulled off the tab on the base plate.
5. Tilt the unit so that the toe of the GTX 3X5 shoe fully disengages the base plate.

#### ***Installation***

1. Tilt the unit so that the toe of the GTX 3X5 shoe fully engages the base plate.
2. Ensure that the unit is fully engaged and in line with the base.
3. Lift the large knob on the install rack up and over the tab on the base plate.
4. Turn the large knob clockwise until the unit is secure.
5. Carefully install the backplate onto the unit.
6. Secure with the two captive screws using a 3/32" hex tool.
7. Complete the applicable return to service procedures in section 9.



**Figure 6-9 GTX 3X5R Remote Transponder with Vertical Mount**

#### 6.1.4 Garmin Altitude Encoder



##### **CAUTION**

*Ensure that the rotorcraft power is off before removal or reinstallation of the GTX 3X5/3X5R. Unplug any auxiliary power supply.*

This section contains procedures and requirements for removal and installation of the Garmin altitude encoder equipment installed under STC SR02124SE. After removal and reinstallation, the GTX 3X5/3X5R return to service procedures must be performed in accordance with section 9.

##### ***Removal***

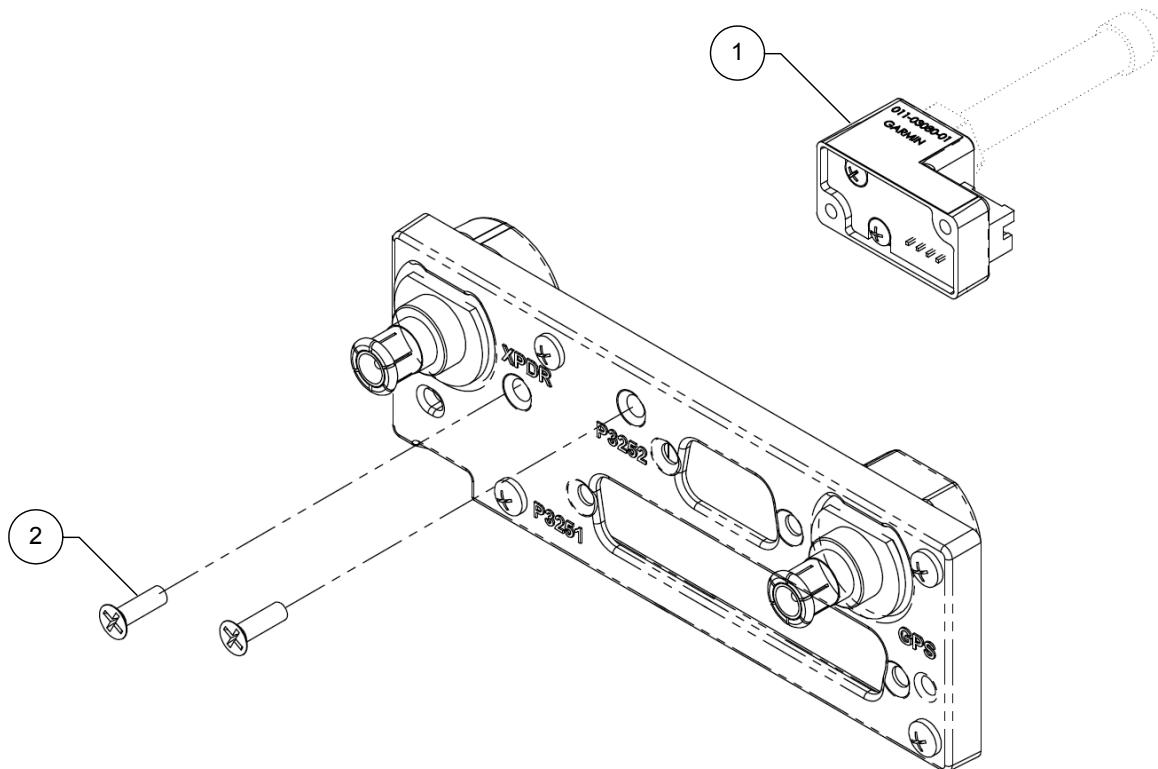
1. Remove the transponder. Refer to section 6.1 for details.
2. Remove the static line attached to the altitude encoder.
3. Disconnect wiring harness at the altitude encoder.
4. Remove the two screws securing the unit to the backplate.

##### ***Installation***

1. Secure the altitude encoder to backplate assembly with two screws, torque to 8 in-lbs.
2. Connect wiring harness to altitude encoder.
3. Secure the static line to the altitude encoder using standard practices.
4. Install transponder. Refer to section 6.1 for details.
5. Complete the applicable return to service procedures in section 9.
6. Complete the static system and transponder checks described in section 8.4.2.

**Table 6-7 Garmin Altitude Encoder Kit (P/N 011-03080-00)**

Item	Description	P/N	Qty
1	Sub-assembly, altitude encoder, unit only	011-03080-01	1
2	Screw, 4-40 X .250, PHP, SS/P, w/nyl	211-60234-08	2

**Figure 6-10 Garmin Altitude Encoder with Backplate Assembly**

## 6.2 Transponder Antenna

The transponder antenna(s) are not installed by this STC. Refer to the antenna manufacturer's maintenance information for removal and reinstallation instructions.

## 6.3 Traffic Annunciator (If Installed)



### CAUTION

*Ensure that the rotorcraft power is off before removal or reinstallation of the GTX 3X5/3X5R. Unplug any auxiliary power supply.*

This section contains procedures and requirements for removal and installation of the Vivisun Traffic annunciator installed under STC SR02124SE. After removal and installation, the Traffic annunciator return to service procedures must be performed in accordance with section 9.

#### **Removal**

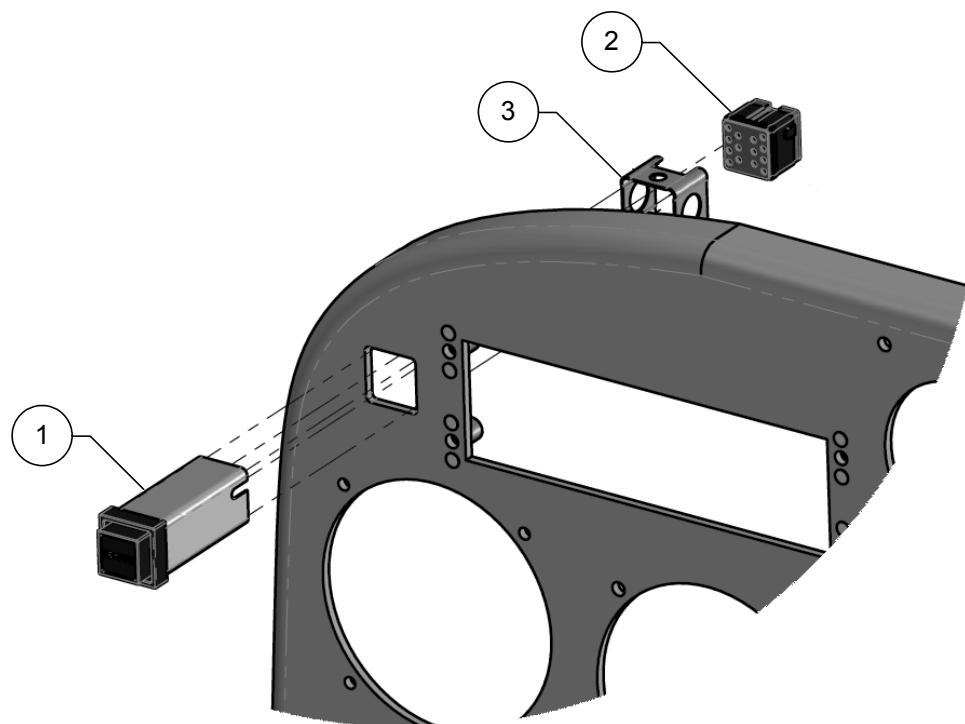
1. Disconnect all annunciator wiring.
2. Remove the annunciator indicator cap by applying pressure on the two sides of the switch cap and pulling the switch cap from the switch body.
3. Gently remove the cap pins from the hinged slide retainer.
4. From the front of the indicator, locate the two slotted head integral mounting screws. Loosen the two screws and remove the locking sleeve from the back of the indicator.
5. Pull the indicator out through the front of the mounting panel.

#### **Installation**

1. Insert the indicator body through the front of the mounting panel.
2. Slide the locking sleeve onto the indicator body until it touches the mounting panel.
3. From the front of the switch body, locate the two slot head integral mounting screws in the base of the body. Tighten the two screws until the mounting hardware pulls the mounting sleeve against the mounting panel. Recommended torque is 18-25 inch ounces.
4. Reconnect all annunciator wiring.
5. Push in transponder circuit breaker.

**Table 6-8 Traffic Annunciator Installation Hardware**

Item	Description	P/N	Qty
1	Annunciator, Traffic, Vivisun	LED-40-17-HAI-E1G30	1
2	Plug, Quick Connect, Vivisun	18-200	1
3	Mounting Sleeve (Part of Annunciator)		

**Figure 6-11 Traffic Annunciator Installation**

## 7 SOFTWARE

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7.1.2 GTX 3X5R Software Version Check (GTN 6XX/7XX).....	7-3
7.2 GTX 3X5/3X5R Software Update.....	7-4

## 7.1 Software Check



### NOTE

*It is essential that the software version is correct. If the software version and/or part number does not match those specified, or if the software is not successfully loaded, DO NOT continue. Troubleshoot and resolve the issue before continuing.*



### NOTE

*Screen shots in this section are provided for reference only. For approved GTX software versions, refer to GTX 3X5 ADS-B AML STC Equipment List.*

If software is loaded during maintenance, conduct a final software review.

### 7.1.1 GTX 3X5 Software Version Check

1. Start the GTX 3X5 in normal mode.
2. Observe the start-up screen until you see “PRESS ENT FOR PRODUCT DATA.” Refer to figure 7-1 for details.



**Figure 7-1 GTX 3X5 Start-Up Screen**

3. Press the ENT key to navigate to the software version screen.
4. Verify the version number matches the approved version listed in the STC Equipment List. Refer to figure 7-2 for details.



**Figure 7-2 GTX 3X5 Product Data Page**

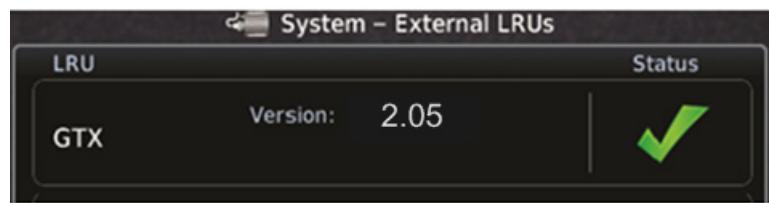
### 7.1.2 GTX 3X5R Software Version Check (GTN 6XX/7XX)



#### NOTE

*The following procedures provide an overview to verify the software version of the GTX 3X5R when interfaced with the GTN 6XX/7XX.*

1. On the GTN 6XX/7XX System Page, touch the **External LRUs** key.
2. Observe the reported GTX software version number. Refer to figure 7-3 for details.
3. Verify the version number matches the approved version listed in the STC Equipment List.



**Figure 7-3 GTN 6XX/7XX System Page**

## 7.2 GTX 3X5/3X5R Software Update



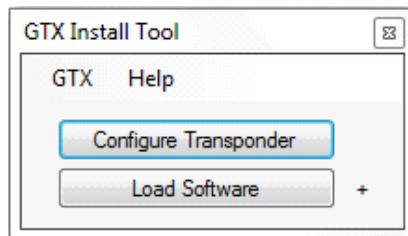
### CAUTION

*If the unit is removed from the rotorcraft and operated, connect the transponder antenna connection to a 50 Ω 5 watt load. The GTX transmits Mode S acquisition squitter pulses once per second whether interrogations are received or not. Failure to connect a dummy load or antenna during this procedure will cause the transponder to fail and possibly damage the unit.*

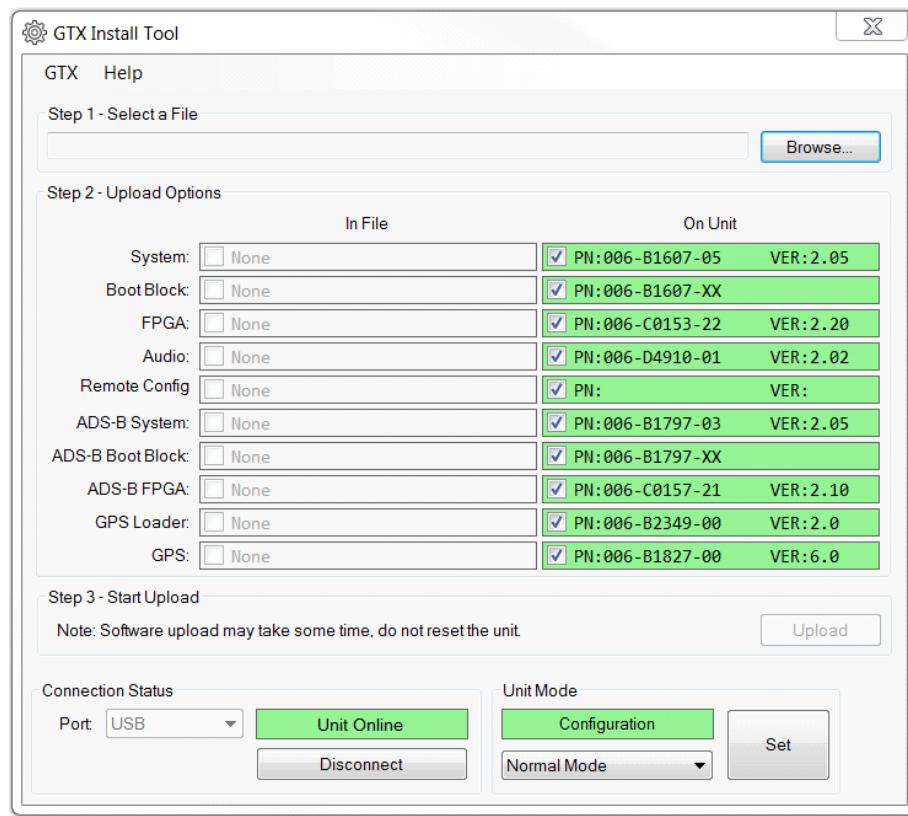
If a unit is replaced and does not have the approved version of software installed, software can be downloaded from the Dealer Resource Center at [www.flyGarmin.com](http://www.flyGarmin.com). For dual GTX installations the software loading procedures below must be carried out on each GTX.

Software may be loaded by performing the following steps on the GTX Install Tool Software Upload page. Refer to figure 7-5.

1. Download the GTX 3X5/3X5R software from the Garmin [Dealer Resource Center](#).
2. Under “Step 1 - Select a File,” select the **Browse** key. Locate the Boot Block software file containing the previously downloaded GTX 3X5/3X5R software.
3. Under “Step 2 - Upload Options,” select the options to be updated.
4. Under “Step 3 - Start Upload,” select the **Upload** key.
5. Wait for the upload to complete. Individual files will be marked as complete as they are installed.
6. Under “Step 1 - Select a File,” select the **Browse** key. Locate the Main System software file containing the previously downloaded GTX 3X5/3X5R software.
7. Under “Step 2 - Upload Options,” select the “In File” versions to be updated.
8. Under “Step 3 - Start Upload,” select the **Upload** key.
9. Wait for the upload to complete. Individual files will be marked as complete as they are installed.
10. After successful completion, verify that the correct software versions and part numbers display on the Transponder page of the Product Data group.
  - a. To view the Product Data group, it may be necessary to exit the Software Upload page and select **Configure Transponder**. Refer to figure 7-4.



**Figure 7-4 Install Tool Dialog Box**



**Figure 7-5 GTX 3X5 Install Tool Software Upload Page**

## 8 SYSTEM CONFIGURATION AND CHECKOUT

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## 8.1 Overview



### NOTE

*EMI Testing is required as part of the Post Installation Checkout. It is not required as part of regular maintenance.*

This section contains instructions for configuring the GTX as well as checks to ensure the system is properly installed and functioning correctly. The steps that are not applicable to a particular installation may be skipped.

## 8.2 System Checkout

### ***Original GTX is Reinstalled***

If the original GTX is being reinstalled, configuration and software loading are not required. Continue to the GTX Test described in section 8.4.

### ***New, Repaired, or Exchanged GTX is Installed***

If a new, repaired, or exchanged GTX is installed, AML approved software (refer to section 7.1 and section 7.2) must be loaded to the unit.

## 8.3 Configuration



### NOTE

*Ensure the Post Installation Checkout Log remains with the rotorcraft permanent records upon completion of any maintenance activities.*

Retrieve the Post Installation Checkout Log from the rotorcraft permanent records. For the maintenance activities that repaired or replaced the previous GTX, verify the configuration of the GTX as defined by the data contained in the Post Installation Checkout Log.

### 8.3.1 GTX 3X5 Configuration

Hold down the **ENT** key and press the **ON** key to access the configuration pages. The **FUNC** key sequences forward through the configuration pages. The **CLR** key reverses through the pages. The **8** or **9** key scrolls up or down through the items on each configuration page. The **CRSR** key highlights selectable fields on each page. When a field is highlighted, the **0 – 9** keys enter numeric data and the **8** or **9** keys move through list selections. Press the **ENT** key to accept changes. When a field is highlighted, pressing the **FUNC** key moves to the next configuration page without saving the changes.

Changes made through the configuration pages are stored internally in the GTX 3X5 unit and in the configuration module located in the rack connector backshell. To exit the configuration pages, turn the power off. Then turn on again (without holding the **ENT** key) for normal operation.

### 8.3.2 GTX 3X5R Configuration (GTN 6XX/7XX)

For GTX 3X5R installations interfacing to a GTN 6XX/7XX, configuration of the GTX is accomplished through the GTX Installation Tool. Within the GTX Installation Tool, an Offline Mode is available under the GTX menu that allows configuration as if a unit is connected. This allows for the saving, loading, and generating summaries of configuration. Refer to GTX 3X5/3X5R Software Update (section 7.2) for instructions on downloading, installing, and connecting the installation tool to the GTX 3X5/3X5R unit.

## 8.4 GTX Test



### NOTE

*For dual transponder installations, the procedures contained in this section must be completed for each installed transponder.*

Operation of the GTX 3X5 is accomplished using the faceplate of the unit. Refer to section 3.1 and section 3.1 for details. The GTX 3X5R is controlled using the GTN 6XX/7XX. Refer to section 3.2 for details. Refer to the operational documents listed in table 1-1 for basic GTX operation.

### 8.4.1 Airborne Mode

The transponder must be placed in an airborne state to reply to any Mode A or Mode C interrogations. The GTX uses advanced Air/Ground logic to determine the state of the transponder. This logic must be temporarily defeated in order to place the transponder in an airborne state for testing. To place the transponder into an airborne state, perform the following applicable procedure.

#### Panel Mounted Transponder

1. Start the GTX in Ground Test mode (hold the **CRSR** key and press the **ON** key).
2. “GROUND TEST MODE” alert message will be displayed on the GTX 3X5 message screen.

#### Remote Mounted Transponder (GTN Interface)



### NOTE

*A GTX or GTN in Ground Test mode or Airborne Test mode will automatically return to normal operation of the Air/Ground logic when the unit is powered off and then turned on in normal mode. When the unit is in Ground Test or Airborne Test mode, an alert message will be annunciated on the GTX or GTN screen.*

1. Start the GTN in configuration mode (hold the **HOME** key while cycling power).
2. Navigate to the XPDR 1 Installation Settings page.
  - a. Select **External Systems**.
  - b. Select **XPDR**.
3. Press the **Force Airborne Test** key.
4. Restart the GTN in normal mode.

#### Remote Mounted Transponder (GTX 3X5R Only)



### NOTE

*Airborne Test mode is for testing purposes only. Once testing is complete, either return the collective switch to original settings or remove the GTX from Ground Test mode.*

1. Connect the GTX 3X5 installation tool to GTX 3X5R unit.
2. Place unit into Ground Test mode located on the State page.

#### 8.4.2 Regulatory Test

With the transponder operating in normal mode and in an airborne or Ground Test state (refer to section 8.4.1), the following regulatory tests are required to be performed every 24 calendar months, or any time the transponder is removed, replaced, or modified.

1. Altitude reporting equipment tests in accordance with 14 CFR Part 91.411 and Part 43 Appendix E.
2. ATC transponder tests and inspections in accordance with 14 CFR Part 91.413 and Part 43 Appendix F.

These regulatory tests require the use of a Mode S transponder ramp tester such as an Aeroflex IFR-6000 or TIC TR-220. Specific instructions for operating the ramp tester are contained in the applicable operator's manual.

#### 8.4.3 ADS-B Out Test



##### NOTE

*Software version 5.30 or later is required on the TR-220.*

The following ADS-B Out parameters must be verified in accordance with Title 14 of the Code of Federal Regulations (14 CFR) § 91.227 any time the position source (GPS) is replaced/modified. The test is performed using a transponder ramp test set, such as the Aeroflex IFR-6000 or TIC TR-220. For instructions on operating the ramp tester, refer to the manufacturer's documentation.

1. Ensure the rotorcraft is in a location where a GPS signal can be received (e.g., outdoors with a clear view of the sky).
2. Power on the rotorcraft/avionics and ensure that the GTX is powered on.
3. If the GTX is configured for pilot control of the ADS-B transmitter, ensure ADS-B TX is selected ON.
4. Temporarily put the GTX into airborne mode. Refer to section 8.4.1.
5. If dual GPS sources are connected to the GTX, each GPS source must be checked separately by disabling the GPS source not being checked. Disable the GPS source not being checked by covering the GPS antenna or removing power from that navigator. Verify that the GPS source not being checked is no longer receiving satellite data.
6. Ensure the GPS source being checked has acquired a position.
7. Select ALT mode on the GTX.
8. Using the transponder test set, verify the following ADS-B Out parameters are being transmitted:
  - NACv  $\geq$  1
  - SDA  $\geq$  2
  - SIL  $\geq$  3
  - NACp  $\geq$  8
  - NIC  $\geq$  7

9. If dual GPS sources are connected to the GTX, repeat steps 5 through 8 for the other GPS source.
10. Revert the GTX to its previous configuration as follows.
  - a. If a connected air/ground switch was defeated in step 4, then place the connected switch back to the on-ground position.
  - b. If the GTX squat switch configuration settings were changed in step 4, revert the GTX settings back to the previous configuration.
11. Select STBY mode on the GTX.

If no other service is to be performed, continue to the return-to-service checks in section 9.1.

#### **8.4.4 Traffic Annunciator Test (If Installed)**

To test the annunciator, press the Traffic Test key on the GTX 3X5 Install Tool State page, and verify that the Traffic annunciator illuminates.

## 9 SYSTEM RETURN TO SERVICE PROCEDURE

### 9.1 Maintenance Records..... 9-1

After removing and re-installing or replacing the GTX 3X5, perform the system checkout procedures in section 8.2.

#### 9.1 Maintenance Records

After conducting the required return-to-service procedures in this manual, a record of maintenance should be provided to the owner/operator in accordance with 14 CFR 43.9 and 14 CFR 91.417.

The following should be provided in the maintenance record entry:

- Part number and version number of any software updates performed during maintenance
- Part number and serial number of any LRU which was replaced
- Any other applicable information related to the maintenance work performed on the rotorcraft

## **APPENDIX A     INSTALLATION-SPECIFIC INFORMATION**

A.1	Rotorcraft Specific Information .....	A-2
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## A.1 Rotorcraft Specific Information

Date: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ By: \_\_\_\_\_

---

### ROTOCRAFT

ROTOCRAFT MAKE: \_\_\_\_\_

ROTOCRAFT MODEL: \_\_\_\_\_

ROTOCRAFT SERIAL #: \_\_\_\_\_

ROTOCRAFT REG. #: \_\_\_\_\_

HEX ADDRESS: \_\_\_\_\_

---

### GTX #1

Unit P/N: \_\_\_\_\_ Mod Level: \_\_\_\_\_

Unit Model: \_\_\_\_\_ Serial #: \_\_\_\_\_

---

### GTX #2 [N/A]

Unit P/N: \_\_\_\_\_ Mod Level: \_\_\_\_\_

Unit Model: \_\_\_\_\_ Serial #: \_\_\_\_\_

---

**ELECTRICAL LOAD ANALYSIS**

ITEMS REMOVED FROM ROTOCRAFT	ELECTRICAL LOAD (A) [1]	COMMENT
<b>Subtotal:</b>		

ITEMS ADDED TO ROTOCRAFT	ELECTRICAL LOAD (A) [1]	COMMENT
<b>Subtotal</b>		

<b>Net Change in Bus Load:</b>	
--------------------------------	--

[1] Use typical current draw when performing this calculation.

## A.2 Equipment Interfaced to the GTX



### NOTE

*This information is optional and is not required to be completed or maintained with the rotorcraft records.*

Document the equipment which is interfaced to the GTX. Use the following guidance when filling out the information. When applicable, check that the correct LRU is used for the interface, or write in the GTX port number or numbers used for the interface. This is generally applicable only to serial ports, such as RS-232 and ARINC 429.

**GTX #1 INTERFACED EQUIPMENT**

Manufacturer/Model	GPS Source	Remote Control & Display	ADS-B In Traffic/Weather Display	Altitude Source	Heading Source	Radar Altitude Source	External Traffic (TAS/TCAS) Source	Audio Panel	Data Forwarding
Garmin GTX 3X5( )									
Garmin GTN 6XX/7XX									
Garmin GNS 400W/500W									
Garmin G500H (GDU 620)									
Garmin GDL 69A (SXM)									
Garmin GDC 74( )									
Garmin GAE									
ACK Tech A-30									
Icarus Instruments 3000									
Sandia SAE 5-35									
Shadin 8800T									
Shadin F/ADC-200									
Shadin F/ADC-2000									
Shadin ADC 200+									
Trans-Cal Industries IA-RS232-X									
Trans-Cal Industries SSD120									
B & D 90004-003									
Honeywell (Bendix King) KDC 281									
Honeywell (Bendix King) KDC 481									
Aspen 1000-PFD									

Manufacturer/Model	GPS Source	Remote Control & Display	ADS-B In Traffic/Weather Display	Altitude Source	Heading Source	Radar Altitude Source	External Traffic (TAS/TCAS) Source	Audio Panel	Data Forwarding
Aspen 1000H-PFD									
Avidyne EXP 5000									
Collins AHS-85E									
Bendix King EFS 40/50 (SG465)									
Sandel SN 3308									
Sandel SN 3500									
Garmin GRS 77( )									
Garmin GAD 42( )									
Free Flight RA-4500									
Honeywell KRA 405B									
Garmin GRA 55/5500									
Avidyne (Ryan) TAS 6XX (9900BX)									
L3 Skywatch SKY497									
L3 Skywatch SKY899									
Honeywell (Bendix King) KTA 870/810 KMH 880/820									
Honeywell (Bendix King) KTA 970/910 KMH 980/920									
Garmin GTS 8XX (800/820/850)									
Garmin GTS Processor (825/855)									
Garmin SL 10(____)									
Garmin SL 15(____)									
Garmin GMA 35( )									

Manufacturer/Model	GPS Source	Remote Control & Display	ADS-B In Traffic/Weather Display	Altitude Source	Heading Source	Radar Altitude Source	External Traffic (TAS/TCAS) Source	Audio Panel	Data Forwarding
Garmin GMA 340 / 347									
Garmin GMA 350									
Garmin GMA 1347									
Honeywell (Bendix King) KMA 24									
Honeywell (Bendix King) KMA 24H-70/71									
Honeywell (Bendix King) KMA 26									
Honeywell (Bendix King) KMA 28									
PS Engineering PMA 6000									
PS Engineering PMA 7000									
PS Engineering PMA 8000									
Techinonics A710 / A711									
Becker DVCS 6100									
NAT AMS 42 / AMS 44									
NAT AMS 50									

**GTX #2 INTERFACED EQUIPMENT**

Manufacturer/Model	GPS Source	Remote Control & Display	ADS-B In Traffic/Weather Display	Altitude Source	Heading Source	Radar Altitude Source	External Traffic (TAS/TCAS) Source	Audio Panel	Data Forwarding
Garmin GTX 3X5()									
Garmin GTN 6XX/7XX									
Garmin GNS 400W/500W									
Garmin G500H (GDU 620)									
Garmin GDL 69A (SXM)									
Garmin GDC 74()									
Garmin GAE									
ACK Tech A-30									
Icarus Instruments 3000									
Sandia SAE 5-35									
Shadin 8800T									
Shadin F/ADC-200									
Shadin F/ADC-2000									
Shadin ADC 200+									
Trans-Cal Industries IA-RS232-X									
Trans-Cal Industries SSD120									
B & D 90004-003									
Honeywell (Bendix King) KDC 281									
Honeywell (Bendix King) KDC 481									
Aspen 1000-PFD									

Manufacturer/Model	GPS Source	Remote Control & Display	ADS-B In Traffic/Weather Display	Altitude Source	Heading Source	Radar Altitude Source	External Traffic (TAS/TCAS) Source	Audio Panel	Data Forwarding
Aspen 1000H-PFD									
Avidyne EXP 5000									
Collins AHS-85E									
Bendix King EFS 40/50 (SG465)									
Sandel SN 3308									
Sandel SN 3500									
Garmin GRS 77()									
Garmin GAD 42()									
Free Flight RA-4500									
Honeywell KRA 405B									
Garmin GRA 55/5500									
Avidyne (Ryan) TAS 6XX (9900BX)									
L3 Skywatch SKY497									
L3 Skywatch SKY899									
Honeywell (Bendix King) KTA 870/810 KMH 880/820									
Honeywell (Bendix King) KTA 970/910 KMH 980/920									
Garmin GTS 8XX (800/820/850)									
Garmin GTS Processor (825/855)									
Garmin SL 10(____)									
Garmin SL 15(____)									
Garmin GMA 35( )									

Manufacturer/Model	GPS Source	Remote Control & Display	ADS-B In Traffic/Weather Display	Altitude Source	Heading Source	Radar Altitude Source	External Traffic (TAS/TCAS) Source	Audio Panel	Data Forwarding
Garmin GMA 340 / 347									
Garmin GMA 350									
Garmin GMA 1347									
Honeywell (Bendix King) KMA 24									
Honeywell (Bendix King) KMA 24H-70/71									
Honeywell (Bendix King) KMA 26									
Honeywell (Bendix King) KMA 28									
PS Engineering PMA 6000									
PS Engineering PMA 7000									
PS Engineering PMA 8000									
Techinonics A710 / A711									
Becker DVCS 6100									
NAT AMS 42 / AMS 44									
NAT AMS 50									

### A.3 GTX 3X5 Airframe Specific Installation

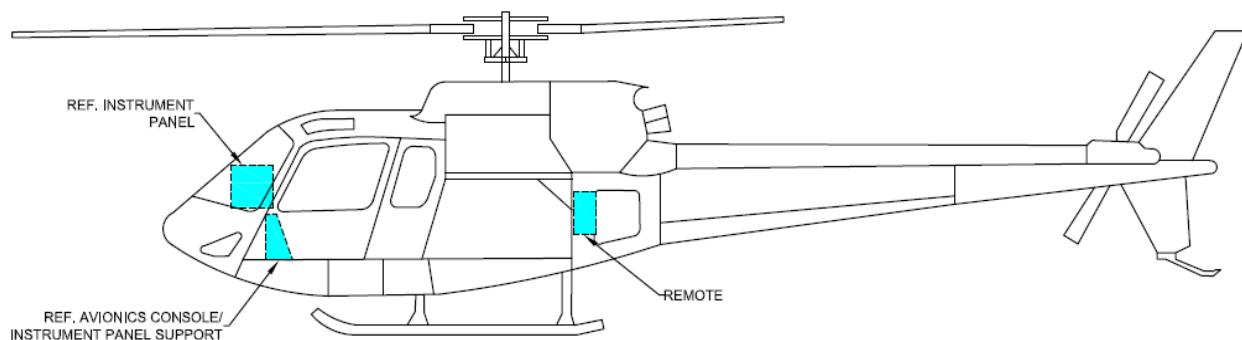
For each applicable diagram in this section:

- Document the unit location as installed in the aircraft, including W/L, B/L, F/S, and item weight.
- Annotate the LRU location on the provided rotorcraft diagram. Include the location of all antennas connected to the GTX 3X5 transponder. Shaded boxes depict common installation locations.
- Annotate the GTX wire harness routing on the provided rotorcraft diagram. Include the cable routing for all antennas connected to the GTX 3X5 transponder.
- Annotate the location of the circuit breaker for the GTX 3X5 transponder.
- Document all steps required to access the LRU. This is necessary if the procedure to access the LRU is outside the scope of the rotorcraft manufacturer's technical data.

**Airbus Helicopters AS-350, AS-350B, AS-350B2, AS-350B3, AS-350BA, and AS-350D**

Installation Location	W/L	B/L	F/S	Item Weight
<input type="checkbox"/> Instrument Panel (per figure 6-7)				
<input type="checkbox"/> Avionics Console/Instrument Panel Support (per figure 6-7)				
<input type="checkbox"/> Remote <ul style="list-style-type: none"> <li><input type="checkbox"/> Horizontal Mount (per figure 6-8)</li> <li><input type="checkbox"/> Vertical Mount (per figure 6-9)</li> </ul>				

For instructions on how to access installation locations, refer to the rotorcraft manufacturer's technical data or document. Document all necessary steps in the space below.


**AIRBUS HELICOPTERS AS-350**

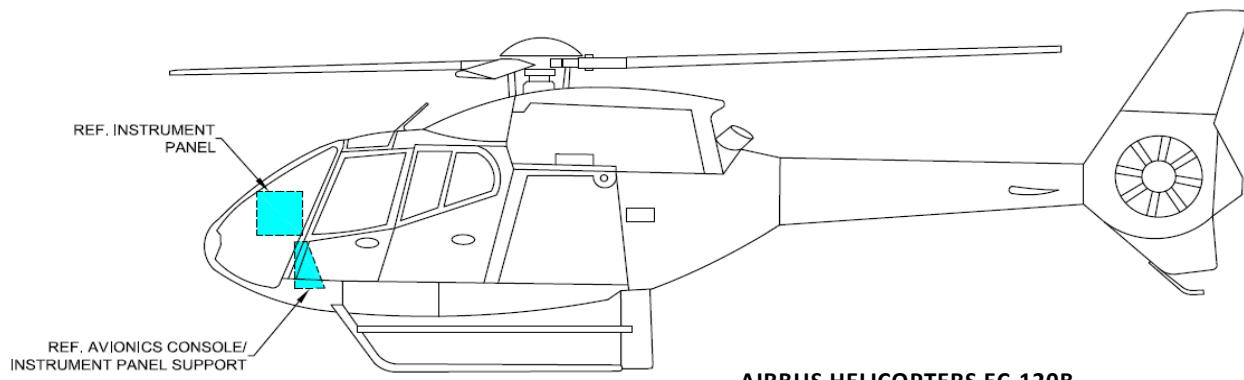
MODEL AS-350B2 SHOWN

MODELS AS-350B, AS-350B3, AS-350BA, and AS-350D SIMILAR

**Airbus Helicopters EC-120B**

Installation Location	W/L	B/L	F/S	Item Weight
<input type="checkbox"/> Instrument Panel (per figure 6-7)				
<input type="checkbox"/> Avionics Console/Instrument Panel Support (per figure 6-7)				
<input type="checkbox"/> Remote <ul style="list-style-type: none"> <li><input type="checkbox"/> Horizontal Mount (per figure 6-8)</li> <li><input type="checkbox"/> Vertical Mount (per figure 6-9)</li> </ul>				

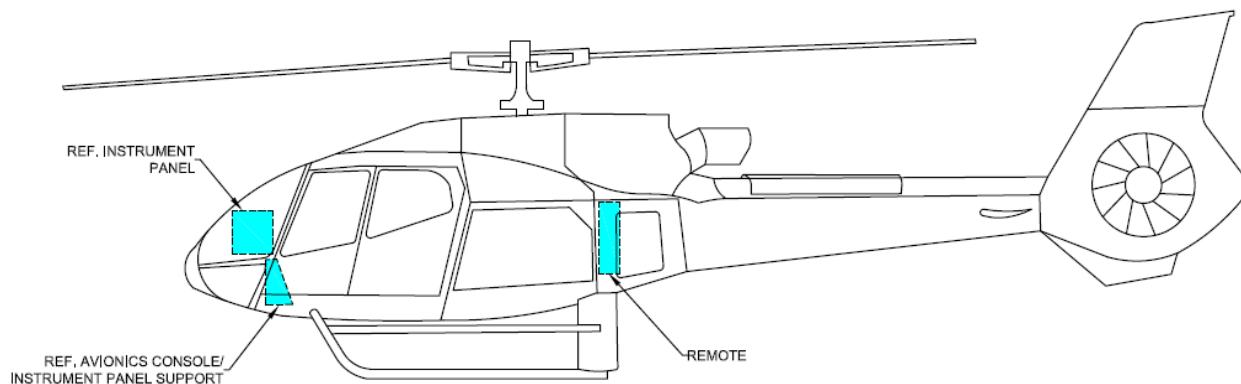
For instructions on how to access installation locations, refer to the rotorcraft manufacturer's technical data or document. Document all necessary steps in the space below.


**AIRBUS HELICOPTERS EC-120B**

**Airbus Helicopters EC-130T2 and EC-130B4**

Installation Location	W/L	B/L	F/S	Item Weight
<input type="checkbox"/> Instrument Panel (per figure 6-7)				
<input type="checkbox"/> Avionics Console/Instrument Panel Support (per figure 6-7)				
<input type="checkbox"/> Remote <ul style="list-style-type: none"> <li><input type="checkbox"/> Horizontal Mount (per figure 6-8)</li> <li><input type="checkbox"/> Vertical Mount (per figure 6-9)</li> </ul>				

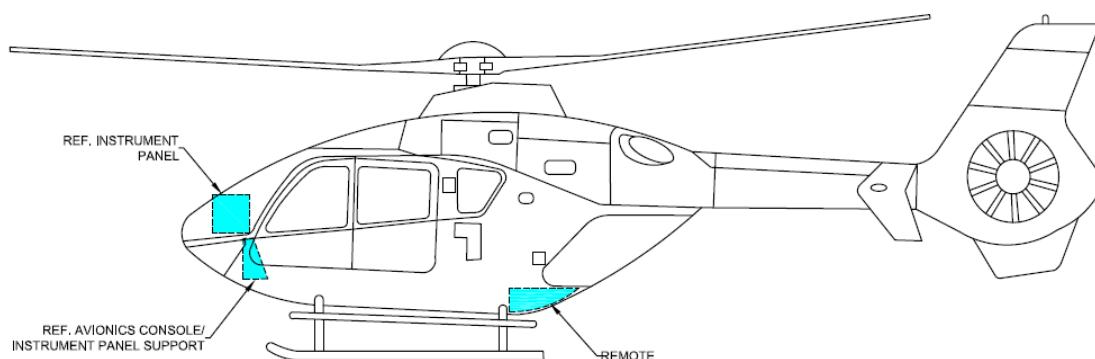
For instructions on how to access installation locations, refer to the rotorcraft manufacturer's technical data or document. Document all necessary steps in the space below.



**AIRBUS HELICOPTERS EC-130T2**  
MODEL EC-130T2 SHOWN, MODEL EC-130B4 SIMILAR

**Airbus Helicopters EC-135, EC-135P1, EC-135P2, EC-135P2+, EC-135T1, EC-135T2, and EC-135T2+**

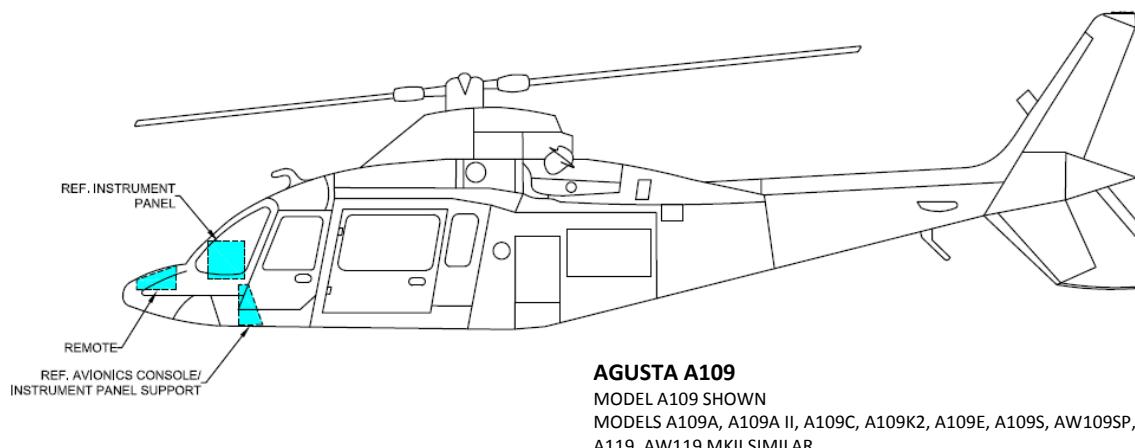
Installation Location	W/L	B/L	F/S	Item Weight
<input type="checkbox"/> Instrument Panel (per figure 6-7)				
<input type="checkbox"/> Avionics Console/Instrument Panel Support <input type="checkbox"/> (per figure 6-7)				
<input type="checkbox"/> Remote <input type="checkbox"/> Horizontal Mount (per figure 6-8) <input type="checkbox"/> Vertical Mount (per figure 6-9)				
For instructions on how to access installation locations, refer to the rotorcraft manufacturer's technical data or document. Document all necessary steps in the space below.				



**AIRBUS HELICOPTERS EC-135**  
MODEL EC-135P1 SHOWN  
MODELS EC-135P2, EC-135P2+, EC-135T1, EC-135T2, EC-135T2+ SIMILAR

**Agusta A109, A109A, A109A II, A109C, A109K2, A109E, A109S, AW109SP, A119,  
and AW119 MKII**

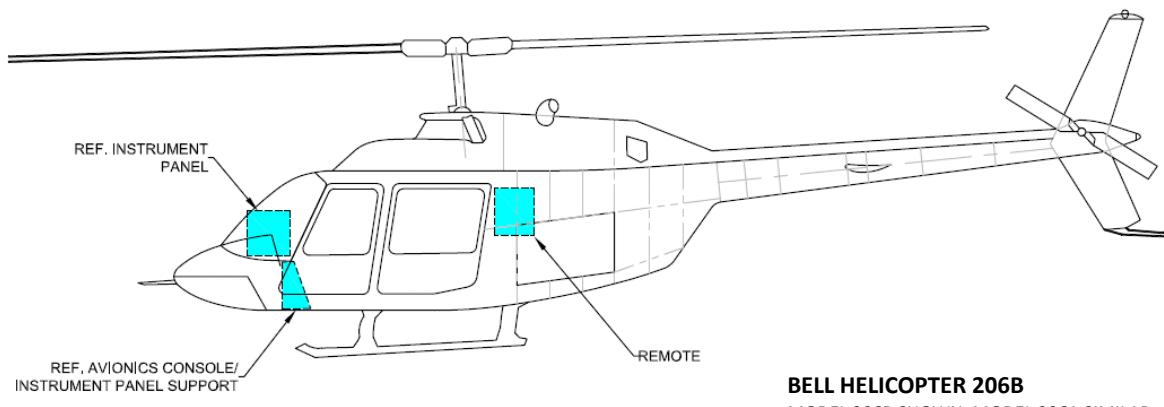
Installation Location	W/L	B/L	F/S	Item Weight
<input type="checkbox"/> Instrument Panel (per figure 6-7)				
<input type="checkbox"/> Avionics Console/Instrument Panel Support <input type="checkbox"/> (per figure 6-7)				
<input type="checkbox"/> Remote <ul style="list-style-type: none"> <li><input type="checkbox"/> Horizontal Mount (per figure 6-8)</li> <li><input type="checkbox"/> Vertical Mount (per figure 6-9)</li> </ul>				
For instructions on how to access installation locations, refer to the rotorcraft manufacturer's technical data or document. Document all necessary steps in the space below.				



## Bell 206A and 206B

Installation Location	W/L	B/L	F/S	Item Weight
<input type="checkbox"/> Instrument Panel (per figure 6-7)				
<input type="checkbox"/> Avionics Console/Instrument Panel Support (per figure 6-7)				
<input type="checkbox"/> Remote <ul style="list-style-type: none"> <li><input type="checkbox"/> Horizontal Mount (per figure 6-8)</li> <li><input type="checkbox"/> Vertical Mount (per figure 6-9)</li> </ul>				

For instructions on how to access installation locations, refer to the rotorcraft manufacturer's technical data or document. Document all necessary steps in the space below.



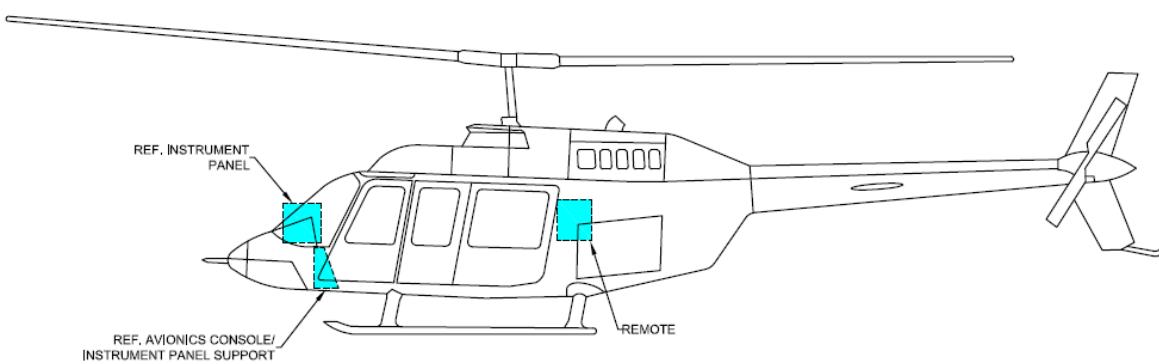
**BELL HELICOPTER 206B**

MODEL 206B SHOWN, MODEL 206A SIMILAR

**Bell 206L, 206L-1, 206L-3, and 206L-4**

Installation Location	W/L	B/L	F/S	Item Weight
<input type="checkbox"/> Instrument Panel (per figure 6-7)				
<input type="checkbox"/> Avionics Console/Instrument Panel Support (per figure 6-7)				
<input type="checkbox"/> Remote <ul style="list-style-type: none"> <li><input type="checkbox"/> Horizontal Mount (per figure 6-8)</li> <li><input type="checkbox"/> Vertical Mount (per figure 6-9)</li> </ul>				

For instructions on how to access installation locations, refer to the rotorcraft manufacturer's technical data or document. Document all necessary steps in the space below.

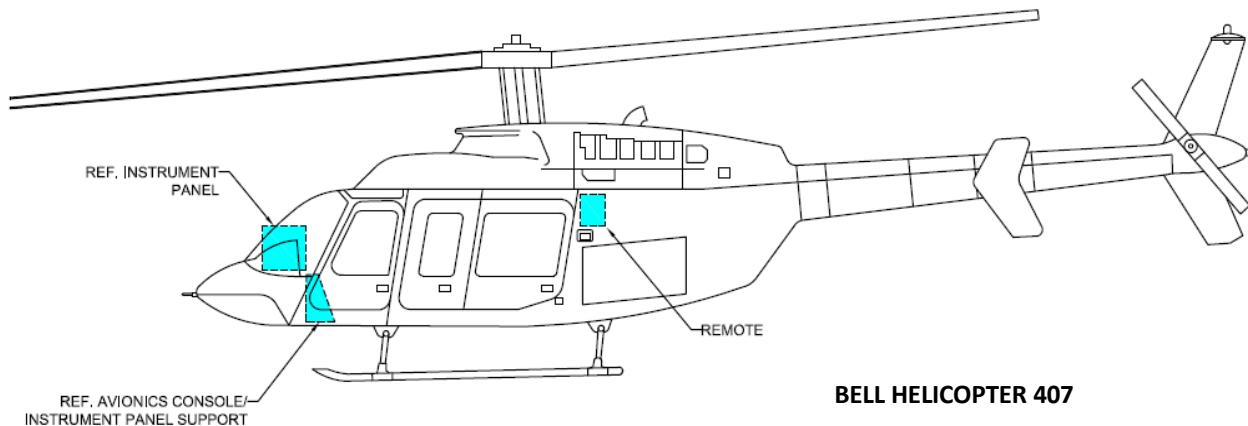

**BELL HELICOPTER 206L**

MODEL 206L SHOWN, MODELS 206L-1, 206L-3, 206L-4 SIMILAR

**Bell 407**

Installation Location	W/L	B/L	F/S	Item Weight
<input type="checkbox"/> Instrument Panel (per figure 6-7)				
<input type="checkbox"/> Avionics Console/Instrument Panel Support <input type="checkbox"/> (per figure 6-7)				
<input type="checkbox"/> Remote <ul style="list-style-type: none"> <li><input type="checkbox"/> Horizontal Mount (per figure 6-8)</li> <li><input type="checkbox"/> Vertical Mount (per figure 6-9)</li> </ul>				

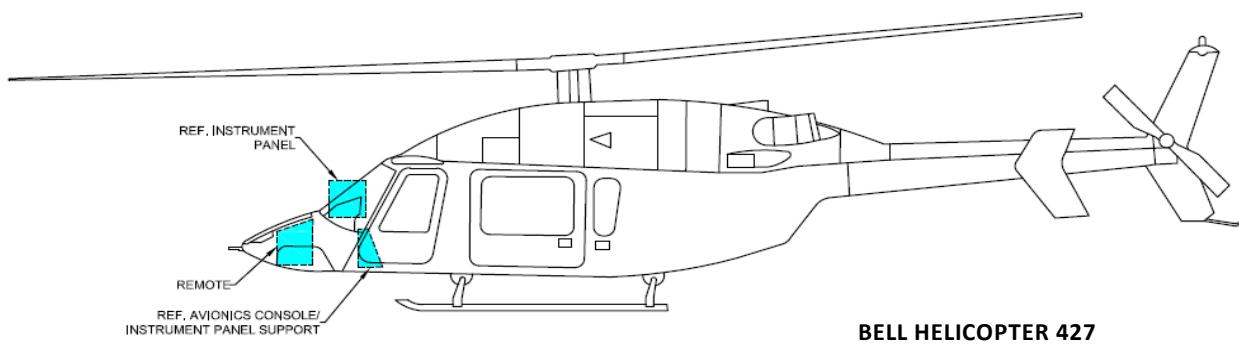
For instructions on how to access installation locations, refer to the rotorcraft manufacturer's technical data or document. Document all necessary steps in the space below.


**BELL HELICOPTER 407**

**Bell 427 and 429**

Installation Location	W/L	B/L	F/S	Item Weight
<input type="checkbox"/> Instrument Panel (per figure 6-7)				
<input type="checkbox"/> Avionics Console/Instrument Panel Support <input type="checkbox"/> (per figure 6-7)				
<input type="checkbox"/> Remote <ul style="list-style-type: none"> <li><input type="checkbox"/> Horizontal Mount (per figure 6-8)</li> <li><input type="checkbox"/> Vertical Mount (per figure 6-9)</li> </ul>				

For instructions on how to access installation locations, refer to the rotorcraft manufacturer's technical data or document. Document all necessary steps in the space below.

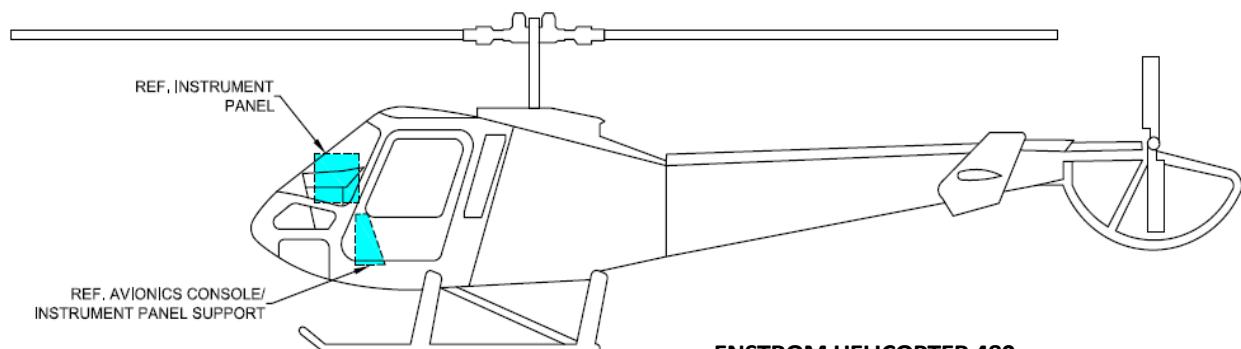


**BELL HELICOPTER 427**  
MODEL 427 SHOWN, MODEL 429 SIMILAR

**Enstrom Helicopters 480, 480B, F-28, F-28A, F-28C, 280, 280C, 280F, and 280FX**

Installation Location	W/L	B/L	F/S	Item Weight
<input type="checkbox"/> Instrument Panel (per figure 6-7)				
<input type="checkbox"/> Avionics Console/Instrument Panel Support <input type="checkbox"/> (per figure 6-7)				
<input type="checkbox"/> Remote <ul style="list-style-type: none"> <li><input type="checkbox"/> Horizontal Mount (per figure 6-8)</li> <li><input type="checkbox"/> Vertical Mount (per figure 6-9)</li> </ul>				

For instructions on how to access installation locations, refer to the rotorcraft manufacturer's technical data or document. Document all necessary steps in the space below.


**ENSTROM HELICOPTER 480**

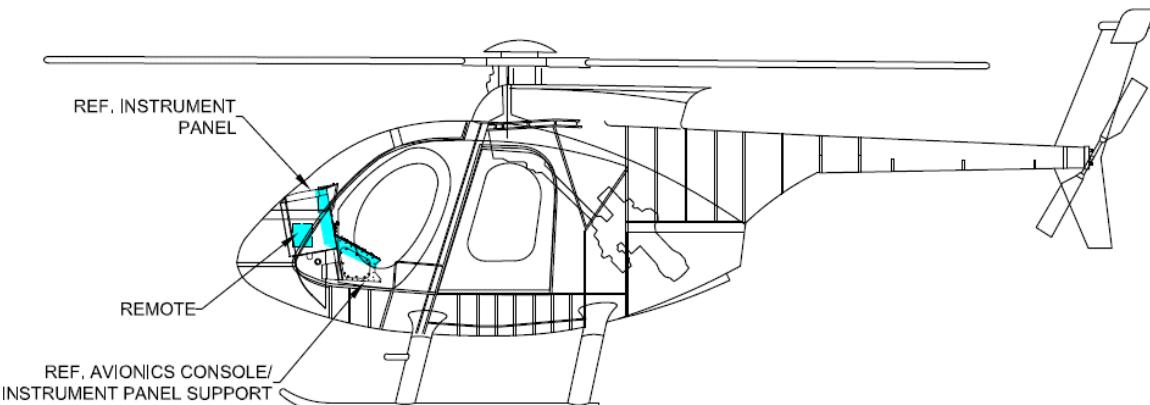
MODEL 480/480B SHOWN

MODELS F-28, F-28A, F-28C, 280, 280C, 280F, 280FX SIMILAR

**MD Helicopters 369, 369D, 369E, 369F, 369FF, and 500N**

Installation Location	W/L	B/L	F/S	Item Weight
<input type="checkbox"/> Instrument Panel (per figure 6-7)				
<input type="checkbox"/> Avionics Console/Instrument Panel Support <input type="checkbox"/> (per figure 6-7)				
<input type="checkbox"/> Remote <ul style="list-style-type: none"> <li><input type="checkbox"/> Horizontal Mount (per figure 6-8)</li> <li><input type="checkbox"/> Vertical Mount (per figure 6-9)</li> </ul>				

For instructions on how to access installation locations, refer to the rotorcraft manufacturer's technical data or document. Document all necessary steps in the space below.


**MD HELICOPTER 369**

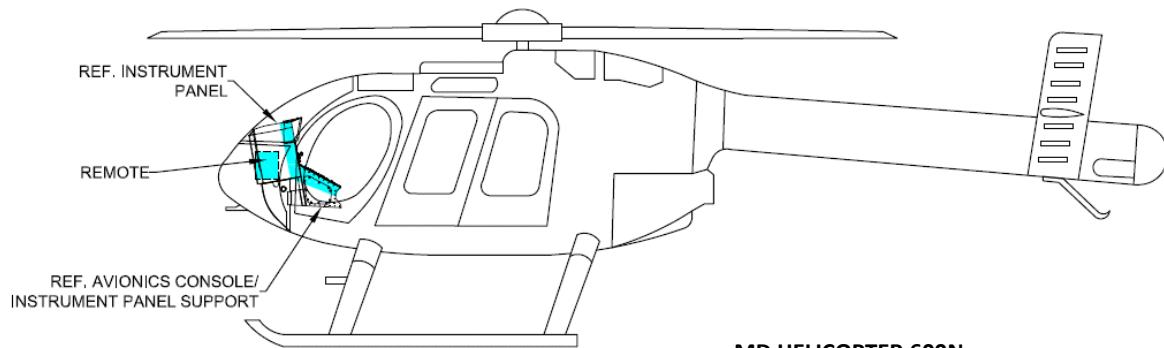
MODEL 369E SHOWN

MODELS 369D, 369F, 369FF, 500N SIMILAR

**MD Helicopter 600N**

Installation Location	W/L	B/L	F/S	Item Weight
<input type="checkbox"/> Instrument Panel (per figure 6-7)				
<input type="checkbox"/> Avionics Console/Instrument Panel Support <input type="checkbox"/> (per figure 6-7)				
<input type="checkbox"/> Remote <ul style="list-style-type: none"> <li><input type="checkbox"/> Horizontal Mount (per figure 6-8)</li> <li><input type="checkbox"/> Vertical Mount (per figure 6-9)</li> </ul>				

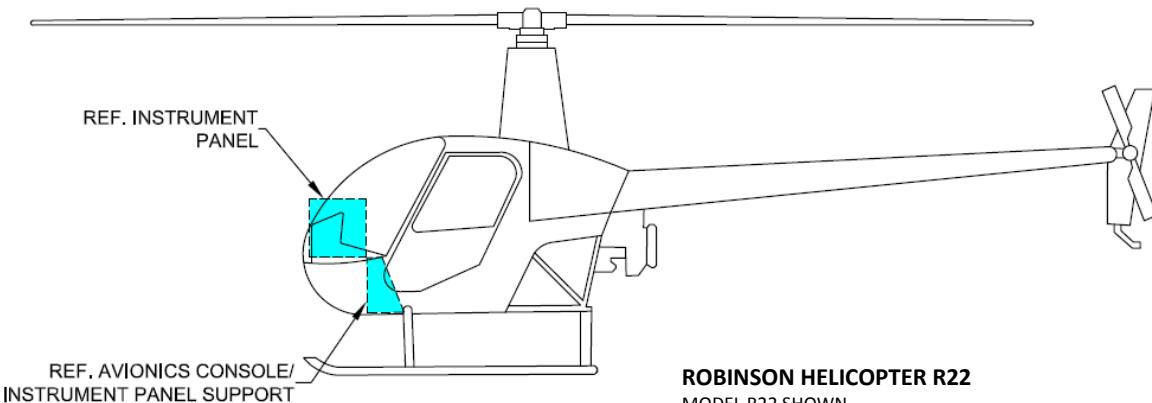
For instructions on how to access installation locations, refer to the rotorcraft manufacturer's technical data or document. Document all necessary steps in the space below.


**MD HELICOPTER 600N**

**Robinson R22, R22 Alpha, R22 Beta, and R22 Mariner**

Installation Location	W/L	B/L	F/S	Item Weight
<input type="checkbox"/> Instrument Panel (per figure 6-7)				
<input type="checkbox"/> Avionics Console/Instrument Panel Support (per figure 6-7)				
<input type="checkbox"/> Remote <ul style="list-style-type: none"> <li><input type="checkbox"/> Horizontal Mount (per figure 6-8)</li> <li><input type="checkbox"/> Vertical Mount (per figure 6-9)</li> </ul>				

For instructions on how to access installation locations, refer to the rotorcraft manufacturer's technical data or document. Document all necessary steps in the space below.


**ROBINSON HELICOPTER R22**

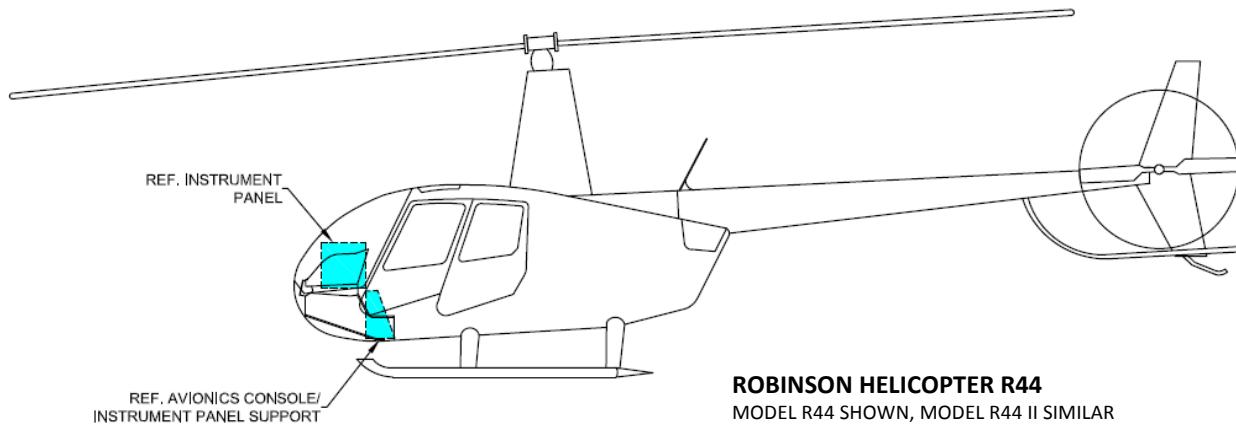
MODEL R22 SHOWN

MODELS R22 ALPHA, R22 BETA, R22 MARINER SIMILAR

**Robinson R44 and R44 II**

Installation Location	W/L	B/L	F/S	Item Weight
<input type="checkbox"/> Instrument Panel (per figure 6-7)				
<input type="checkbox"/> Avionics Console/Instrument Panel Support (per figure 6-7)				
<input type="checkbox"/> Remote <ul style="list-style-type: none"> <li><input type="checkbox"/> Horizontal Mount (per figure 6-8)</li> <li><input type="checkbox"/> Vertical Mount (per figure 6-9)</li> </ul>				

For instructions on how to access installation locations, refer to the rotorcraft manufacturer's technical data or document. Document all necessary steps in the space below.

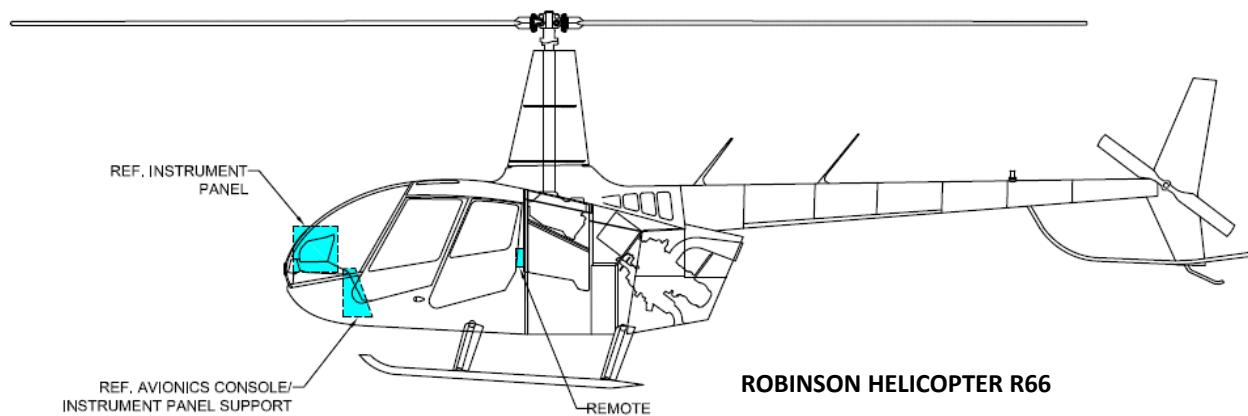

**ROBINSON HELICOPTER R44**

MODEL R44 SHOWN, MODEL R44 II SIMILAR

**Robinson R66**

Installation Location	W/L	B/L	F/S	Item Weight
<input type="checkbox"/> Instrument Panel (per figure 6-7)				
<input type="checkbox"/> Avionics Console/Instrument Panel Support <input type="checkbox"/> (per figure 6-7)				
<input type="checkbox"/> Remote <input type="checkbox"/> Horizontal Mount (per figure 6-8) <input type="checkbox"/> Vertical Mount (per figure 6-9)				

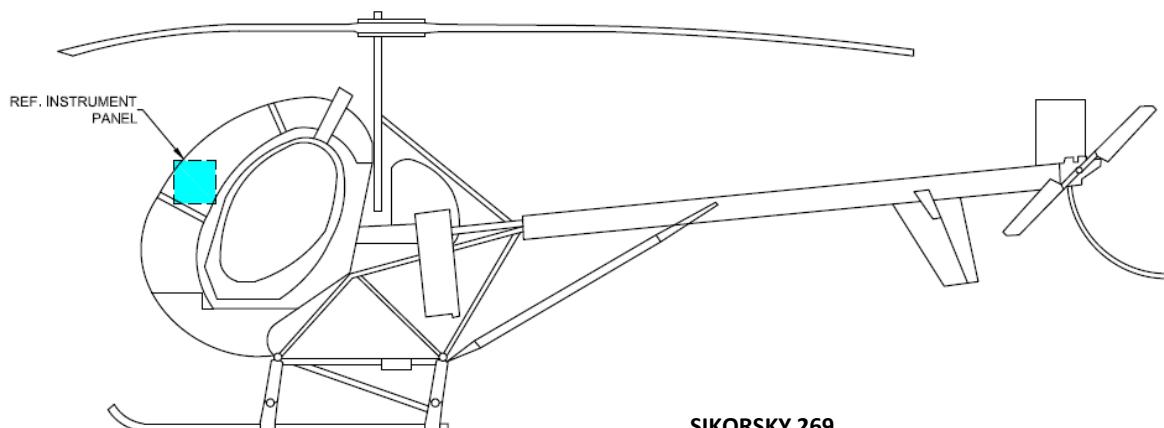
For instructions on how to access installation locations, refer to the rotorcraft manufacturer's technical data or document. Document all necessary steps in the space below.



**Sikorsky 269, 269C, 269C-1, and 269D**

Installation Location	W/L	B/L	F/S	Item Weight
<input type="checkbox"/> Instrument Panel (per figure 6-7)				
<input type="checkbox"/> Avionics Console/Instrument Panel Support (per figure 6-7)				
<input type="checkbox"/> Remote <ul style="list-style-type: none"> <li><input type="checkbox"/> Horizontal Mount (per figure 6-8)</li> <li><input type="checkbox"/> Vertical Mount (per figure 6-9)</li> </ul>				

For instructions on how to access installation locations, refer to the rotorcraft manufacturer's technical data or document. Document all necessary steps in the space below.



**SIKORSKY 269**  
MODEL 269C SHOWN, MODELS 269C-1, 269D SIMILAR

## A.4 GTX 3X5 Configuration Log



### NOTE

*This page applies to both GTX 335/335R and GTX 345/345R units. Each log must be completed for your specific installation.*

A post-installation configuration log can be automatically generated using the install tool. This log includes the data recorded in appendices A.4, A.5, and A.6. To print the configuration log for the GTX 3X5, perform the following steps.

1. Select GTX and then select **Configuration**.
2. Select the **View Summary** option.
3. Select the **File** option.
4. Select the **Print** option.

If printer access is not available, the following post-installation configuration logs are provided for convenience.

### RS-232 Configuration

#### Transponder #1

**Port 1:** Input \_\_\_\_\_  
Output \_\_\_\_\_  
**Port 2:** Input \_\_\_\_\_  
Output \_\_\_\_\_  
**Port 3:** Input \_\_\_\_\_  
Output \_\_\_\_\_  
Only available for GTX 345/345R  
**Port 4:** Input \_\_\_\_\_  
Output \_\_\_\_\_

#### Transponder #2

**Port 1:** Input \_\_\_\_\_  
Output \_\_\_\_\_  
**Port 2:** Input \_\_\_\_\_  
Output \_\_\_\_\_  
**Port 3:** Input \_\_\_\_\_  
Output \_\_\_\_\_  
Only available for GTX 345/345R  
**Port 4:** Input \_\_\_\_\_  
Output \_\_\_\_\_

### ARINC 429 CONFIGURATION

#### Transponder #1

**Port 1:** Input \_\_\_\_\_  
Output \_\_\_\_\_  
**Port 2:** Input \_\_\_\_\_

**Speed:** \_\_\_\_\_  
**Speed:** \_\_\_\_\_  
**Speed:** \_\_\_\_\_

#### Transponder #2

**Port 1:** Input \_\_\_\_\_  
Output \_\_\_\_\_  
**Port 2:** Input \_\_\_\_\_

**Speed:** \_\_\_\_\_  
**Speed:** \_\_\_\_\_  
**Speed:** \_\_\_\_\_

DISCRETE			
INPUT		OUTPUT	
FUNCTION	PIN	FUNCTION	PIN
<input type="checkbox"/> TIS-A SELECT		<input type="checkbox"/> TRANSPONDER FAIL #1	
<input type="checkbox"/> ALTITUDE DATA SELECT		<input type="checkbox"/> EXTERNAL SUPPRESSION I/O	
<input type="checkbox"/> AUDIO INHIBIT #1		<input type="checkbox"/> REPLY ACTIVE	
<input type="checkbox"/> AUDIO INHIBIT #2		<input type="checkbox"/> TRANSPONDER FAIL #2	
<input type="checkbox"/> AIR DATA SELECT		<input type="checkbox"/> ALTITUDE ALERT ANNUNCIATE	
<input type="checkbox"/> SQUAT SWITCH		<input type="checkbox"/> ADS-B FUNCTION FAILURE	
<input type="checkbox"/> EXTERNAL IDENT SELECT		<input type="checkbox"/> TRAFFIC ALERT	
<input type="checkbox"/> EXTERNAL STANDBY SELECT		<input type="checkbox"/> TRAFFIC STANDBY/OPERATE	
<input type="checkbox"/> EXTERNAL SUPPRESSION I/O		<input type="checkbox"/> TRAFFIC TEST	

## A.5 GTX 335/335R Configuration Log



### NOTE

*A post-installation configuration log is available for the GTX 345/345R following this configuration log.*

#### INSTALLATION SETTINGS

(All settings in this section must be the same for each installed transponder, where applicable.)

##### AUDIO

Audio Output: \_\_\_\_\_  
 Volume: \_\_\_\_\_  
 Voice: \_\_\_\_\_  
 Test Audio: \_\_\_\_\_

Altitude Alert: \_\_\_\_\_  
 Timer Expired Alert: \_\_\_\_\_  
 Traffic Alert: \_\_\_\_\_

##### UNIT

Altitude Units: \_\_\_\_\_  
 Temperature Units: \_\_\_\_\_  
 Altitude Alert Deviation: \_\_\_\_\_  
 Restore Pages On Power-Up: \_\_\_\_\_

Installation ID: \_\_\_\_\_  
 VFR ID: \_\_\_\_\_

##### DISP (Only for Panel Mounted units)

Display Backlight: \_\_\_\_\_  
 Minimum Level: \_\_\_\_\_  
 Photocell Transition: \_\_\_\_\_  
 Slope: \_\_\_\_\_  
 Offset: \_\_\_\_\_  
 Default Backlight Offset: \_\_\_\_\_

Keypad Backlight: \_\_\_\_\_  
 Minimum Level: \_\_\_\_\_  
 Lighting Bus Input VLTG: \_\_\_\_\_  
 Slope: \_\_\_\_\_  
 Offset: \_\_\_\_\_  
 Default Contrast Offset: \_\_\_\_\_

##### SNSR

OAT Sensor Installed: \_\_\_\_\_  
 GPS 1 SRC: \_\_\_\_\_  
 INTGRTY: \_\_\_\_\_  
 LAT OFST: \_\_\_\_\_  
 LON OFST: \_\_\_\_\_  
 Internal ALT Encoder Installed  
 Installed: \_\_\_\_\_  
 Ceiling: \_\_\_\_\_  
 Test Points: \_\_\_\_\_

Altitude Source 1: \_\_\_\_\_  
 Altitude Source 2: \_\_\_\_\_  
 GPS 2 SRC: \_\_\_\_\_  
 INTGRTY: \_\_\_\_\_  
 LAT OFST: \_\_\_\_\_  
 LON OFST: \_\_\_\_\_  
 Internal ALT Encoder Adjustment  
 TEST ALT: \_\_\_\_\_  
 Correction: \_\_\_\_\_  
 Measured: \_\_\_\_\_

##### ADSB

ACFT CATGRY: \_\_\_\_\_  
 ACTF MAX A/S: \_\_\_\_\_  
 1090ES OUT Control: \_\_\_\_\_  
 UAT OUT RMT Control: \_\_\_\_\_  
 Aircraft Tail Number:  
 Address: \_\_\_\_\_  
 Number: \_\_\_\_\_  
 ADS-B IN Processing: \_\_\_\_\_

Aircraft Length: \_\_\_\_\_  
 Aircraft Width: \_\_\_\_\_  
 1090ES IN Control: \_\_\_\_\_  
 UAT IN Capable: \_\_\_\_\_  
 Allow Pilot to edit FLT ID: \_\_\_\_\_  
 Default FLT ID: \_\_\_\_\_  
 FLT ID PREFIX: \_\_\_\_\_

## A.6 GTX 345/345R Configuration Log

### INSTALLATION SETTINGS

(All settings in this section must be the same for each installed transponder, where applicable.)

#### AUDIO

Audio Output: \_\_\_\_\_  
 Volume: \_\_\_\_\_  
 Voice: \_\_\_\_\_  
 Test Audio: \_\_\_\_\_

#### UNIT

FIS-B Processing: \_\_\_\_\_  
 Installation ID: \_\_\_\_\_  
 VFR ID: \_\_\_\_\_  
 Bluetooth Control: \_\_\_\_\_

Altitude Units: \_\_\_\_\_  
 Temperature Units: \_\_\_\_\_  
 Altitude Alert Deviation: \_\_\_\_\_  
 Restore Pages On Power-Up: \_\_\_\_\_

#### DISP (Only for Panel Mounted units)

Display Backlight: \_\_\_\_\_  
 Minimum Level: \_\_\_\_\_  
 Photocell Transition: \_\_\_\_\_  
 Slope: \_\_\_\_\_  
 Offset: \_\_\_\_\_  
 Default Backlight Offset: \_\_\_\_\_

Keypad Backlight: \_\_\_\_\_  
 Minimum Level: \_\_\_\_\_  
 Lighting Bus Input VLTG: \_\_\_\_\_  
 Slope: \_\_\_\_\_  
 Offset: \_\_\_\_\_  
 Default Contrast Offset: \_\_\_\_\_

#### SNSR

OAT Sensor Installed: \_\_\_\_\_  
 GPS 1 SRC: \_\_\_\_\_  
 INTGRTY: \_\_\_\_\_  
 LAT OFST: \_\_\_\_\_  
 LON OFST: \_\_\_\_\_  
 Internal ALT Encoder Installed  
 Installed: \_\_\_\_\_  
 Ceiling: \_\_\_\_\_  
 Test Points: \_\_\_\_\_  
 Internal AHRS Orientation  
 Connectors: \_\_\_\_\_  
 Vent: \_\_\_\_\_  
 Yaw: \_\_\_\_\_

Altitude Source 1: \_\_\_\_\_  
 Altitude Source 2: \_\_\_\_\_  
 GPS 2 SRC: \_\_\_\_\_  
 INTGRTY: \_\_\_\_\_  
 LAT OFST: \_\_\_\_\_  
 LON OFST: \_\_\_\_\_  
 Internal ALT Encoder Adjustment  
 TEST ALT: \_\_\_\_\_  
 Correction: \_\_\_\_\_  
 Measured: \_\_\_\_\_

#### ADSB

ACFT CATGRY: \_\_\_\_\_  
 ACTF MAX A/S: \_\_\_\_\_  
 1090ES OUT Control: \_\_\_\_\_  
 UAT OUT RMT Control: \_\_\_\_\_  
 Aircraft Tail Number: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 Number: \_\_\_\_\_  
 ADS-B IN Processing: \_\_\_\_\_

Aircraft Length: \_\_\_\_\_  
 Aircraft Width: \_\_\_\_\_  
 1090ES IN Control: \_\_\_\_\_  
 UAT IN Capable: \_\_\_\_\_  
 Allow Pilot to edit FLT ID: \_\_\_\_\_  
 Default FLT ID: \_\_\_\_\_  
 FLT ID PREFIX: \_\_\_\_\_

<b>RS-422 Configuration (Only available for GTX 345/345R)</b>
---

<b>Transponder #1</b>
Port 1: Output _____

<b>Transponder #2</b>
Port 1: Output _____

<b>HSDB Configuration (Only available for GTX 345/345R)</b>
---

<b>Transponder #1</b>
Port 1: _____
Port 2: _____

<b>Transponder #2</b>
Port 1: _____
Port 2: _____

## APPENDIX B ELECTRICAL BONDING PROCEDURES

Refer to SAE ARP1870, Section 5 when surface preparation is required to achieve electrical bond.

The correct material finish is important when mating untreated or bare dissimilar metals. Materials must be galvanically-compatible. When corrosion protection is removed to make an electrical bond, any exposed area after the bond is completed must be protected again. Additional guidance can be found in AC 43.13-1B and SAE ARP1870.

The following general procedure is recommended to prepare an aluminum surface for proper electrical bonding.

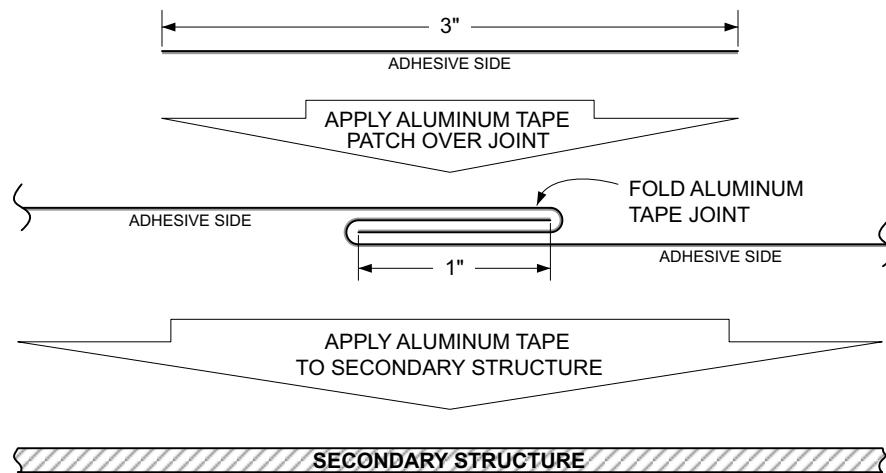
1. Clean grounding location with solvent.
2. Remove non-conductive films or coatings from the grounding location.
3. Apply a chemical conversion coat such as Alodine 1200 to the bare metal.
4. Once the chemical conversion coat is dry, clean the area.
5. Install bonding equipment at grounding location.
6. After the bond is complete, reapply a suitable film or coating to the surrounding area, if any films or coatings were removed from the surface.

For a more detailed procedure, refer to SAE ARP1870, sections 5.1 and 5.5.

When repair or replacement of the aluminum tape is required, use 3M 436, 438, or other adhesive-backed dead soft aluminum foil with a minimum 7.2 mils metal thickness. The maximum length-to-width ratio of the tape must not exceed 7:1 (maximum seven inches in length for every one inch in width).

Additional requirements include:

1. The tape must have no tears in the joint or along the length of the tape.
2. The tape must be folded over twice to itself when bonding to metal part.
3. The tape must have clean metal-to-metal contact points with fasteners.
4. The tape must have maximum 2.5 milliohms direct current resistance between the rotorcraft ground plane.
5. Maintain the same tape width and routing when replacing the tape. For additional guidance, refer to AC 43.13-1B and SAE ARP1870, sections 5.1 and 5.5.
6. Reinstall the GTX 3X5 transponder unit in accordance with section 3. Verify that the direct current (DC) resistance of electrical bond between the unit and rotorcraft ground plane is less than or equal to 2.5 milliohms.
7. When replacing the bonding strap, the strap length must not exceed five inches in length.
8. The strap must not loop back on itself and bend more than 45 degrees. For guidance on bonding strap installation, refer to AC 43.13-1B, Chapter 11.



**Figure B-1 Aluminum Tape Joint**

