



# **GPS 175/GNX 375 Part 23 AML STC Maintenance Manual**

**with Instructions for Continued Airworthiness  
STC SA02636SE**

Aircraft make, model, registration number, and serial number, along with the applicable STC configuration information, must be completed in Appendix A and saved with aircraft permanent records.

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## RECORD OF REVISIONS

Revision	Revision Date	Description
1	3/22/2019	Initial Release

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## 1. INTRODUCTION

### 1.1 Content, Scope, Purpose

This document provides Instructions for Continued Airworthiness (ICA) and Maintenance Manual (MM) for the GPS 175 and GNX 375 as installed under STC SA02636SE. The installation of the GPS 175, GNX 375, and associated wiring is performed in accordance with their respective installation manual listed in Table 1-1. This document satisfies the requirements for continued airworthiness as defined by 14 CFR Part 23.1529 and appendix G. Information in this document is required to maintain the continued airworthiness of the GPS 175 and GNX 375.

### 1.2 Organization

The following outline briefly describes the organization of this manual:

#### ***Section 2: System Description***

Provides a description of the GPS 175/GNX 375 system equipment installed by this STC.

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

Provides basic control and operation information specifically tailored to maintenance practices.

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

Provides Instructions for Continued Airworthiness of the GPS/GNX system LRUs.

#### ***Section 5: Troubleshooting***

Provides troubleshooting information, including connector information, and pinouts to aid in diagnosing and resolving problems with GPS/GNX system equipment.

#### ***Section 6: Equipment Removal and Re-Installation***

Provides instructions for the removal and replacement of GPS 175 & GNX 375 units.

#### ***Section 7: Software***

Provides instructions for loading software on GPS 175 & GNX 375 units.

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

Provides system configuration information and checkout procedures for the GPS 175/GNX 375.

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

Specifies return-to-service procedures to be performed upon completion of maintenance to GPS 175/GNX 375 system equipment.

#### ***APPENDIX A: Aircraft & Installation Specific Information***

Contains the documentation required for recording the aircraft and configuration information.

### 1.3 Applicability

This document applies to all aircraft with either the GPS 175 or the GNX 375 installed in accordance with STC SA02636SE. Modification of an aircraft by this STC obligates the aircraft operator to include the maintenance information provided by this document in the operator's Aircraft Maintenance Manual and the operator's Aircraft Scheduled Maintenance Program.

### 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 airplane.

**Table 1-1 Reference Documentation**

Part Number	Document
190-02207-A1	<i>GPS 175 Part 23 AML STC Installation Manual</i>
005-01206-A2	<i>GPS 175/GNX 375 Part 23 AML STC Equipment List</i>
005-01206-A1	<i>GPS 175/GNX 375 Part 23 AML STC Master Drawing List</i>
190-02207-A3	<i>Airplane Flight Manual Supplement or Supplemental Airplane Flight Manual for Garmin GPS 175/GNX 375</i>
190-02207-A4	<i>GNX 375 Part 23 AML STC Installation Manual</i>

### 1.5 Revision and Distribution

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

Dealers are notified of manual revision changes via 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

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 aircraft. For the purposes of this manual, metallic aircraft will be those with an aluminum skin. Nonmetallic aircraft refers to all other aircraft (e.g., wooden aircraft, aircraft with composite skin, or aircraft with tube and fabric construction).

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

The term squitter refers to a burst or broadcast of aircraft-tracking data that is transmitted periodically by a Mode S transponder without interrogation from a controller's radar.

### 1.6.2 Acronyms

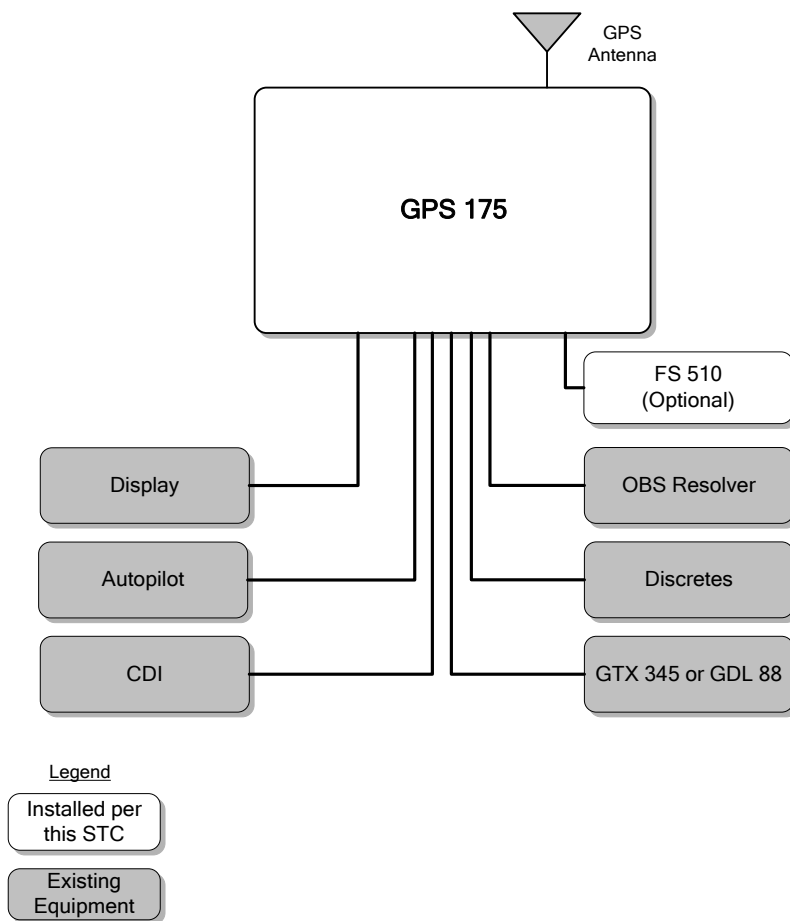
<b>ADS-B:</b>	Automatic Dependent Surveillance - Broadcast	<b>LOI:</b>	Loss of Integrity
<b>AHRS:</b>	Attitude and Heading Reference System	<b>LPV:</b>	Localizer Performance with Vertical Guidance [Approach]
<b>AML:</b>	Approved Model List	<b>LRU:</b>	Line-Replaceable Unit
<b>ARINC:</b>	Aeronautical Radio, Incorporated	<b>OAT:</b>	Outside Air Temperature
<b>ATC:</b>	Air Traffic Control	<b>OBS:</b>	Omni Bearing Selector
<b>BIT:</b>	Built In Test	<b>ODA:</b>	Organization Designation Authorization
<b>CDI:</b>	Course Deviation Indicator	<b>PC:</b>	Personal Computer
<b>CFR:</b>	Code of Federal Regulations	<b>PED:</b>	Personal Electronic Device
<b>FAA:</b>	Federal Aviation Administration	<b>RF:</b>	Radio Frequency
<b>GAE:</b>	Garmin Altitude Encoder	<b>RS:</b>	Radiated Susceptibility
<b>GDL:</b>	Garmin Datalink LRU	<b>SBAS:</b>	Satellite Based Augmentation System
<b>GDU:</b>	Garmin Display Unit	<b>SD:</b>	SanDisk Memory
<b>GNX:</b>	Garmin 2" Navigator/Transponder	<b>SDA:</b>	System Design Assurance
<b>GPS:</b>	Global Positioning System	<b>SDI:</b>	Source/Destination Identifiers
<b>GTR:</b>	Garmin Transmitter / Receiver	<b>STC:</b>	Supplemental Type Certificate
<b>GTX:</b>	Garmin Transponder	<b>SVT:</b>	Synthetic Vision Technology
<b>HSDB:</b>	High Speed Data Bus	<b>SW:</b>	Software
<b>HSI:</b>	Horizontal Situation Indicator	<b>UAT:</b>	Universal Access Transceiver
<b>ICA:</b>	Instructions for Continued Airworthiness	<b>UTC:</b>	Coordinated Universal Time
<b>ID:</b>	Identifier	<b>VCDI:</b>	Vertical Course Deviation Indicator
<b>IFR:</b>	Instrument Flight Rules	<b>WAAS:</b>	Wide Area Augmentation System
<b>LED:</b>	Light Emitting Diode	<b>XM:</b>	XM Satellite Radio
<b>LOC:</b>	Localizer	<b>XPDR:</b>	Transponder

## 2. SYSTEM DESCRIPTION

### 2.1 Equipment Descriptions

#### 2.1.1 GPS 175

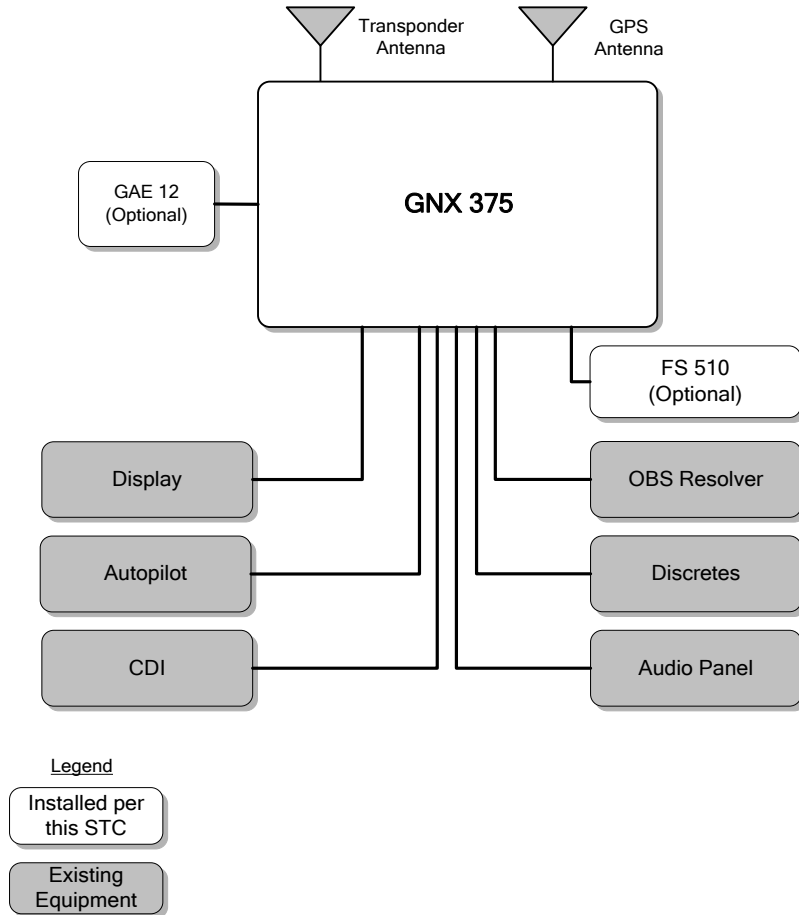
The GPS 175 is a panel-mounted 2" GPS Navigator. The GPS 175 features a capacitive touch-screen, full-color moving map display, power/home button, dual concentric rotary knob with push entry, SD card slot, and photo cell. The internal AHRS sensor cannot be used to drive anything other than the display of attitude on a non-certified PED. The built in Bluetooth allows for flight plan I/O and GPS position interface with a PED (Database concierge only available through Flight Stream 510). The GPS 175 is capable of providing TSO-C146e compliant GPS/WAAS navigation for en route, terminal, non-precision and precision capabilities (LPV) when interfaced with a CDI. The GPS 175 is also a certified ADS-B Out position source. The bezel of the GPS 175 is 2 inches x 6.25 inches and is designed to fit in the same location as older 2 inch avionics, such as GNC 255 or GTR 225.



**Figure 2-1 GPS 175 System Diagram**

### 2.1.2 GNX 375

The GNX 375 is a panel-mounted 2" GPS Navigator and Transponder. The GNX 375 features a capacitive touch-screen, full-color moving map display, power/home button, dual concentric rotary knob with push entry, SD card slot, and photo cell. The GNX 375 has the same capabilities as the GPS 175, but has a Mode S transponder and ADS-B receiver. The internal AHRS sensor cannot be used to drive anything other than the display of attitude on a non-certified PED. The built in Bluetooth will allow flight plan I/O, GPS position, and ADS-B Weather/Traffic interface with a PED but will not allow software or database loading. The GPS navigation function is capable of providing TSO-C146e compliant GPS/WAAS navigation for en route, terminal, non-precision and precision capabilities (LPV) when interfaced with a CDI. The bezel of the GPS 175 is 2 inches x 6.25 inches and is designed to fit in the same location as older 2 inch avionics, such as GTX 327.



**Figure 2-2 GNX 375 System Diagram**

### 2.1.3 Flight Stream 510



#### NOTE

*The Flight Stream 510 is a wireless-enabled data card that is inserted into the SD card slot.*

The Flight Stream 510 interfaces to the GPS 175/GNX 375 by replacing the front-loaded data card to allow wireless database transfer with PEDs over Wifi.



**Figure 2-3 Flight Stream 510**

### 2.1.4 GAE 12

The GNX 375 allows for the use of an optional GAE 12 module as a transponder pressure altitude input. The GAE 12 module directly attaches to the GNX 375 backplate and connects to the aircraft static pressure system. The GAE 12 module replaces and functions the same as the configuration module.



**Figure 2-4 GAE 12**

### 3. CONTROL AND OPERATION

Control and operation of the GPS 175 and GNX 375 units occurs through the use of the touch display, dual rotary knob, and the home/power key. The *Home* page, seen below in Figure 3-1 & Figure 3-2, is the first page displayed after the startup prompts. All functions of the GPS 175/GNX 375 can be accessed through the *Home* page. At any time, the **Home/Power** key can be pressed to return to the *Home* page.

#### 3.1 GPS 175

The GPS 175 *Home* page is shown below in Figure 3-1. The figure below also contains labels identifying key aspects of the GPS 175 features and controls. These features and controls are as follows:

- **Function Keys** - Touch the function keys to access the features or pages described on the key.
- **Direct-To Key** – This key is used to initiate and activate navigation to a waypoint.
- **Annunciations** - The area of the screen displays annunciations to the pilot.
- **Photocell** – The photocell may be configured to be used by the display to automatically adjust the display backlighting with no further prompt.
- **Data Card Slot** - A card slot in the unit that accepts standard SD cards, Loader cards, and Flight Stream 510.
- **Home/Power Key** – This key can be pressed once to return to the *Home* page at any time, or can be held down to power off the unit.
- **Large and Small Knobs** – Control knobs that can be used to scroll through selections or various options on the display. Pressing the inner knob acts as an enter or selection of the currently highlighted information.
- **Dual Rotary Knob Function Hints** - This area of the screen provides more detailed information on the operation of the dual concentric knobs for the given page.

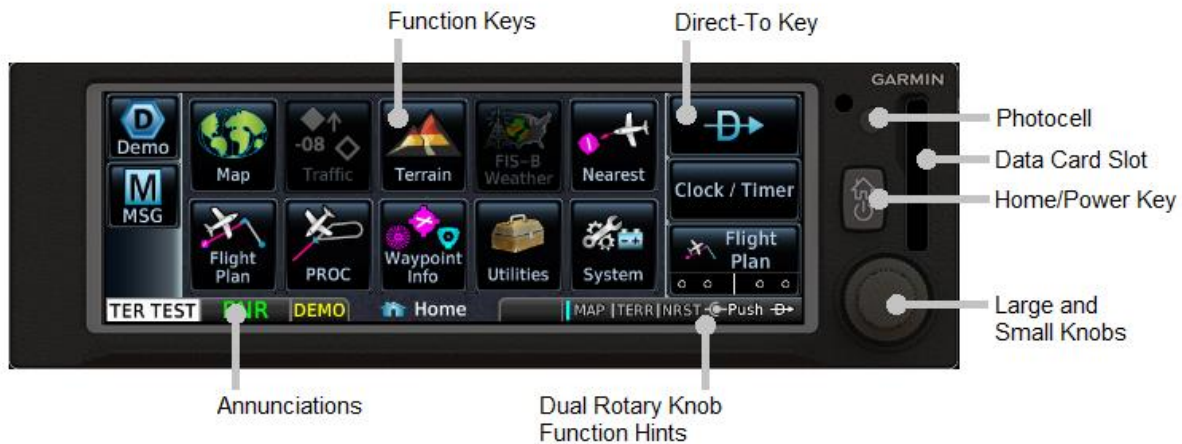


Figure 3-1 GPS 175 Home Page

### 3.2 GNX 375

The GNX 375 *Home* page is shown below in Figure 3-2. The figure below also contains labels identifying key aspects of the GNX 375 features and controls. These features and controls are as follows:

- **Function Keys** - Touch the function keys to access the features or pages described on the key.
- **Direct-To Key** – This key is used to initiate and activate navigation to a waypoint.
- **XPDR Panel Controls** – This key is used to access transponder functions and modes.
- **Annunciations** - The area of the screen displays annunciations to the pilot.
- **Photocell** – The photocell may be configured to be used by the display to automatically adjust the display backlighting with no further prompt.
- **Data Card Slot** - A card slot in the unit that accepts standard SD cards, Loader cards, and Flight Stream 510.
- **Home/Power Key** – This key can be pressed once to return to the *Home* page at any time, or can be held down to power off the unit.
- **Large and Small Knobs** – Control knobs that can be used to scroll through selections or various options on the display. Pressing the inner knob acts as an enter or selection of the currently highlighted information.
- **Dual Rotary Knob Function Hints** - This area of the screen provides more detailed information on the operation of the dual concentric knobs for the given page.



**Figure 3-2 GNX 375 Home Page**

### 3.3 Configuration Mode Overview

Configuration mode is used to configure the GPS 175/GNX 375 settings for each specific installation. To access Configuration mode, hold down the inner knob and press the power/home button. When the configuration mode home page appears as shown below, release the knob.

The *Configuration Mode* page is the first page that is displayed in this mode. For detailed information regarding how to configure the GPS 175, refer to *GPS 175 Part 23 AML STC Installation Manual*. For detailed information regarding how to configure the GNX 375, refer to *GNX 375 Part 23 AML STC Installation Manual*. While in configuration mode, different pages can be selected by touching the desired key on the display. Some pages may require scrolling to view all of the information and keys. Scrolling pages are indicated by a series of dots along the bottom of the page, and scrolling is done by touching the screen and dragging the page in the desired direction.

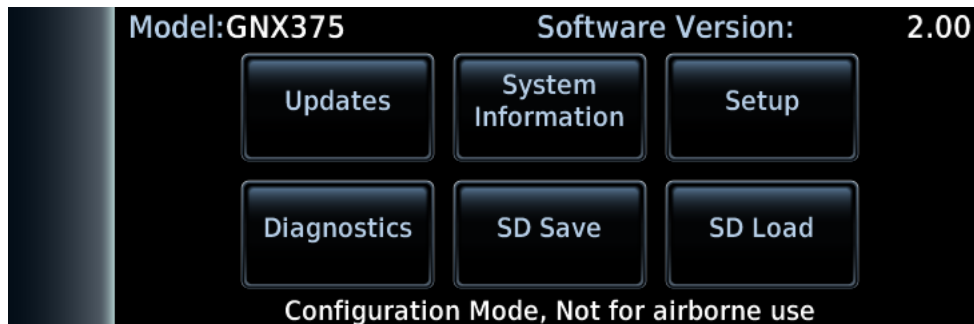


Figure 3-3 Configuration Mode Home Screen

#### 3.3.1 Updates

The *Software Updates* page allows the user to update the GPS 175/GNX 375 software versions. For more information on software updates and instructions see Section 7.2.

#### 3.3.2 System Information

The *System Information* page displays general and board specific information for the GPS 175/GNX 375. This page is used when checking for software versions as described in Section 7.1.

#### 3.3.3 Setup

This section provides a brief overview of the pages that are accessed from the GPS 175/GNX 375 *Setup* page. To access the GPS 175/GNX 375 *Setup* page, touch the **Setup** key from the *Configuration Mode* page, as shown in Figure 3-3.



Figure 3-4 GNX 375 Setup Page

### 3.3.3.1 Interfaces

The *Interfaced Equipment* page allows for the configuration of the various input and outputs that support interfaces to the GPS 175/GNX 375.

#### 3.3.3.1.1 ARINC 429

The *Interfaced Equipment – ARINC 429* page allows the configuration of data formats and speeds of ARINC 429 inputs and outputs.

#### 3.3.3.1.2 RS-232 (RS-422)

The *Interfaced Equipment – RS-232 / RS-422* page allows the configuration of data formats for both **Port 1** and **Port 2**.

- **Port 1** is capable of operating as either an RS-232 port or an RS-422 port.
- **Port 2** is only capable of operating as an RS-232 port.

#### 3.3.3.1.3 GDU

The **GDU** toggle key indicates whether or not a GDU is **Present** or **Not Present** in the installation.

### 3.3.3.2 Lighting Configuration

The *Lighting Configuration* page allows the user to configure the backlight and key lighting brightness display parameters. This page also allows the configuration of the photocell and the lighting bus settings.

### 3.3.3.3 Main System

The *Main System* allows the user to configure system related settings for the GPS 175/GNX 375. Page settings include the following:

- Air/Ground Threshold
- Fuel Type
- GPS Select
- System ID
- RF Procedure Legs
- Ownship Icon
- Terrain Alerts
- Graphical Edit
- Composite CDI
- Bluetooth
- ADS-B Logging (GNX 375 Only)
- External FPL

#### 3.3.3.4 Main Indicator (Analog)

The *Main Indicator (Analog)* page allows the user to calibrate the OBS resolver and configure the selected course behavior.

#### 3.3.3.5 XPDR (GNX 375 Only)

The *XPDR Configuration* page allows the user to configure the transponder related settings for the GNX 375. Page settings include the following:

- Sensors
- Options
- Test
- Airframe
- Flight ID
- Clear XPDR Settings

#### 3.3.3.6 GPS Antenna Offset

The *GPS Antenna Offset* page allows the configuration of GPS antenna height, lateral offset, and longitudinal offset.



### 3.3.3.7 AHRS

The *AHRS* page allows the user to set the display orientation, yaw offset, and calibrate the internal AHRS. The **Display Orientation** must be set and the aircraft must be level before calibrating the internal AHRS.

### 3.3.4 Diagnostics

The *Diagnostics* page provides access to pages that are helpful for unit maintenance and troubleshooting. Ground checks are performed using the tools on this page. The following pages are accessible within the *Diagnostics* page:

- ARINC Inputs
- Serial Inputs
- Discrete Inputs
- Discrete Outputs
- HSDB Ethernet
- XPDR (GNX 375 Only)
- Main Indicator (Analog)
- Composite Indicator
- Analog Inputs
- Gillham Encoder (GNX 375 Only)
- Power Stats
- WAAS
- Temps
- Logs
- Main Data Inputs
- XPDR Main Data (GNX 375 Only)
- Clear Config Settings

#### 3.3.4.1 ARINC Inputs

This page displays the ARINC 429 data that is being received over each ARINC 429 port. Each port is chosen for display by touching the **ARINC 429 Port** key to toggle between the input ports. Select a port to display. The GPS 175/GNX 375 will then display the label, SSM, Data, and SDI for each ARINC 429 packet received by the selected port. This is useful for determining if the expected labels are being received and for troubleshooting incorrect or swapped wiring to the input ports. The data log can be paused/resumed by touching the **Pause** key. The displayed data log can be cleared by touching the **Clear Log** key.

#### 3.3.4.2 Serial Inputs

This page displays the status of each serial data port. For each serial port, the status will say either **Not Configured**, **Receiving**, or **Not Receiving**. This data is useful for determining if the serial data ports are configured and operating as intended.

#### 3.3.4.3 Discrete Inputs

This page displays the state of each of the discrete input pins on the GPS 175/GNX 375. For each discrete input, the pin number, pin function and pin active state are shown. This page is useful for diagnosing and troubleshooting discrete wiring issues.

#### 3.3.4.4 Discrete Outputs

This page displays the state of each of the discrete outputs on the GPS 175/GNX 375. This page also allows for the discrete outputs to be toggled between the **Active** and **Inactive** states. This is useful for ensuring that these signals output are properly connected to annunciator lights, or other LRUs, and that they are receiving the signal.

#### 3.3.4.5 HSDB Ethernet

This page displays the status of the HSDB ethernet port and the status of any LRUs that are interfaced to the GPS 175/GNX 375 via HSDB. The ethernet port will display either **Not Configured**, **Receiving**, or **Not Receiving**. For each LRU (GDU/GDL 88/GTX 345), the page will display either **Online** or **Offline**.

#### 3.3.4.6 XPDR (GNX 375 Only)

The GNX 375 monitors internal systems to verify functionality. Errors are displayed as Pilot Alerts, Failures, Faults, and Warnings. Failures are the most severe, followed by Faults, Warnings, then pilot alerts. This page allows the user to view the status of all failure conditions, active faults, active warnings,

and associated pilot alerts. For troubleshooting of these errors see the **XPDR Alert Troubleshooting** flowcharts start at Figure 5-6.

#### **3.3.4.7 Main Indicator (Analog)**

This page displays the status of the analog deviation and flag outputs to the CDI. These can be changed and the output viewed on the CDI for the purpose of performing ground checks on the analog CDI interface.

#### **3.3.4.8 Composite Indicator**

This page displays the status of the composite deviation and vertical/lateral flag outputs to the CDI. These can be changed and the output viewed on the CDI for the purpose of performing ground checks on the composite CDI interface.

#### **3.3.4.9 Analog Inputs**

This page displays the lighting bus voltages for **Bus Setting** and **Input Voltage**.

#### **3.3.4.10 Gillham Encoder (GNX 375 Only)**

The *Gillham Diagnostics* page displays the status and discrete pin settings for the Gillham altitude input.

#### **3.3.4.11 Power Stats**

This page displays the number of times the GPS 175/GNX 375 has powered up and the total elapsed operating hours for the GPS 175/GNX 375.

#### **3.3.4.12 WAAS**

This page displays the WAAS engine status, including UTC date/time, current latitude/longitude, and navigation status. This page also allows the GPS/WAAS engine to be reset.

#### **3.3.4.13 Temps**

This page displays the current, minimum, maximum, and average temperatures for the processor, display, and LED boards.

#### **3.3.4.14 Logs**

This page allows for the export and clearing of the error log, maintenance log, ADS-B data log (GNX 375 only) and WAAS data log. The **Clear Log** key removes all messages from the selected log and the **Save to SD Card** key saves the selected information to the SD card.

#### **3.3.4.15 Main Data Inputs**

The *Main Data Inputs* page displays ARINC 429, RS-232, and other electrical inputs information. Data not received is dashed out. The page aids in verifying electrical interfaces during installation and troubleshooting.

#### **3.3.4.16 XPDR Main Data (GNX 375 Only)**

This page provides the user access to the *GPS Data Diagnostics* and *Air Data Diagnostics* pages.

#### **3.3.4.17 Clear Config Settings**

To reset the unit to the original factory configuration values, tap **Clear Config Settings** > **OK**. Then restart the unit.

### 3.3.5 SD Save

SD Save exports the configuration to an SD card. This allows specific airframe configuration information to be loaded to a difference unit. Use the following instructions to save the configuration information to an SD card:

1. Insert an SD card into the card slot.
2. Power on the unit in configuration mode.
3. Touch the **SD Save** key.
4. Tap **OK** to acknowledge a successful export.

### 3.3.6 SD Load

SD Load allows a previously saved configuration to be loaded from an SD card. The System ID and software version must match the unit saved to the card. Before configuring, determine if a previously saved configuration is available. Use the following instructions to load the saved configuration information to a unit:

1. Power the unit on in configuration mode.
2. Insert SD card into the card slot.
3. Tab **SD Load**.
4. Tap a file to load.
5. Restart the unit.
6. Verify settings on Interface Settings page are correct.

#### 4. INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

##### 4.1 Airworthiness Limitations

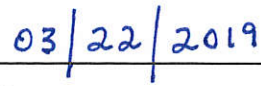
There are no new (or additional) airworthiness limitations associated with this equipment and/or installation.

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

FAA APPROVED



JR Brownell



Date

ODA STC Unit Administrator

ODA-240087-CE

## **4.2 Servicing Information**

The GPS 175 and GNX 375 do not require servicing. In the event of system failure, troubleshoot the GPS 175/GNX 375 in accordance with Section 5.

### **4.2.1 Periodic Maintenance**

The GPS 175/GNX 375 are designed to detect internal failures. A thorough self-test is executed automatically upon application of power to the units. The built-in tests (BIT) are continuously executed. Detected errors are indicated as failure annunciations, system messages or a combination of the two.

Antenna installations are not covered under this STC. Inspect and maintain all antennas in accordance with the data provided for that specific antenna installation.

### **4.2.2 Special Tools**

A milliohm meter with an accuracy of  $\pm 0.1 \text{ m}\Omega$  (or better) is required to measure the electrical bonding between the GPS 175/GNX 375 system components and aircraft ground.

### 4.3 Maintenance Intervals

Table 4-1 below shows the 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 Periodic Maintenance**

Item	Description/Procedure	Interval
Equipment Removal and Replacement	Removal and reinstallation of the GPS 175/GNX 375 LRUs.	On Condition
Cleaning	<p>The GPS 175 and GNX 375 display and bezel may be cleaned periodically.</p> <p>The front bezel and display should be cleaned with 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>	On Condition
Electrical Bonding Test	An electrical bonding test must be performed on equipment installed by this STC.	10 years or 2000 flight hours
Testing	The GPS 175/GNX 375 must be tested and shown to comply with Title 14 CFR Part 91.277.	Replacement of GPS Position source(s).
Visual Inspection	A visual inspection of the equipment installed by this STC must be performed.	12 Calendar Months

#### 4.4 Visual Inspection

Conduct a visual inspection of the GPS 175/GNX 375 unit(s), switches, Flight Stream 510 and their wiring harnesses to ensure that they continue to comply with the STC SA02636SE.

1. Inspect the GPS 175/GNX 375 unit for security of attachment, including visual inspection of mounting racks and other supporting structure attaching the racks to aircraft instrument panel.
  - **GPS 175/GNX 375** – Verify the countersunk fastener heads are in full contact with the unit mounting rack holes. Re-torque the mounting screws  $8.0 \pm 1.0$  in-lb, if required.
  - **Flight Stream 510** – Ensure the data card is properly oriented (label facing left), fully inserted, and locked into position in the card slot on the front right side of the unit.
2. Inspect for corrosion.
3. Inspect switches, knobs, and buttons for damage.
4. Inspect condition of wiring, shield terminations, routing, and attachment/clamping.
5. Check the fan intake/outlet slots on the GPS/GNX unit's bezel for dust, dirt, or obstructions. Clean as needed.
6. Conduct a visual check of the GPS/SBAS antenna cable overbraid (if installed).
7. Conduct a visual check of and bonding strap or conductive tape used for electrical bonding.
8. Replace any damaged or torn straps. Refer to Section 6.7 for details.
9. Replace any torn bonding tape using a heavy duty aluminum foil tape, such as 3M P/N 436 or 438 or another foil with aluminum that is 7.2 mils thick or greater. If strap termination hardware is loose, tighten and re-test bonding. Refer to Section 6.7 for details.

## 4.5 Electrical Bonding Test

### 4.5.1 GPS 175/GNX 375 Bonding Check (Metallic or Tube-and-Fabric Aircraft)



#### NOTE

*A bonding test failure may occur if a fastener is not torqued to the specified torque value. For installations that use screws in lieu of rivets to secure the rack to surrounding structure, verify that the screws are torqued to the appropriate value before proceeding to remove the rack. Refer to Section 4.4 for torque values.*

Perform an electrical bonding check as follows:

1. Remove the GPS 175 or GNX 375 from the mounting rack.
2. Remove the backplate assembly from the rack.
3. Measure the resistance between the mounting rack and nearby exposed portion of aircraft metallic structure and verify it is less than or equal to 5 mΩ.

In the event of bonding test failure, remove the GPS 175/GNX 375 rack, clean the attachment points with a bonding brush at both the GPS 175/GNX 375 rack and the aircraft, and re-attach the rack to the rails in the panel. Measure the resistance between the mounting rack and nearby exposed portion of aircraft metallic structure and ensure that the resistance is less than or equal to 2.5 mΩ.

4. Re-install the backplate assembly and re-install the GPS 175/GNX 375 in the mounting rack.

### 4.5.2 GPS 175/GNX 375 Bonding Check (Composite Aircraft)



#### NOTE

*A bonding test failure may occur if a fastener is not torqued to the specified torque value. For installations that use screws in lieu of rivets to secure the rack to surrounding structure, verify that the screws are torqued to the appropriate value before proceeding to remove the rack. Refer to Section 4.4 for torque values.*

Perform an electrical bonding check as follows:

1. Remove the GPS 175 or GNX 375 from the mounting rack.
2. Remove the backplate assembly from the rack.
3. Measure the resistance between the mounting rack and the instrument panel, verify it is less than or equal to 10 mΩ.

In the event of bonding test failure, remove the GPS 175/GNX 375 rack, clean the attachment points with a bonding brush at both the GPS 175/GNX 375 rack and the aircraft, and re-attach the rack to the rails in the panel. Measure the resistance between the mounting rack and the instrument panel and ensure that the resistance is less than or equal to 5 mΩ.

4. Re-install the backplate assembly and re-install the GPS 175/GNX 375 in the mounting rack.

## 4.6 Overhaul Period

The system does not require overhaul at a specific time period. Power on self-test and BIT will monitor the health of the GPS 175/GNX 375 system. If any LRU indicates an internal failure, the unit may be removed and replaced. See Section 5 of this document for fault corrective actions.

## 4.7 Additional Instructions

None.



## 5. TROUBLESHOOTING

### 5.1 General Troubleshooting

This section provides information to assist troubleshooting if problems occur after completing the maintenance. Refer to the GPS 175/GNX 375 System Configuration Log retained in the aircraft permanent records for system configuration data. When troubleshooting the GPS 175 or GNX 375 system, refer to the wire routing drawings and interconnect wiring diagrams that are retained in the aircraft permanent records.

**Table 5-1 GPS 175 General Troubleshooting Guide**

Symptom	Possible Cause	Corrective Action
The GPS 175 does not power on.	The unit is not getting power to the main connector P1751.	Check circuit breakers and main avionics switch. Ensure power is connected to the main 62-pin connector P1751, pins 21 and 42, and ground to P1751, pins 20 and 41.
The GPS 175 does not compute position.	Not receiving adequate GPS signals.	Check the GPS antenna connections. Make sure the aircraft is clear of obstructions (hangars, buildings, trees, etc.).
GPS signal level drops when avionics are turned on.	Noise interference from other avionics.	Turn off all other avionics, then turn on each piece of avionics one at a time to locate the source of the interference. Route the GPS cable and locate the GPS antenna away from the unit that is causing the interference.
GPS signal levels are very low.	Improper antenna installation or routing.	Check GPS antenna installation, connections, and cable routing. The GPS antenna must be mounted on the top of the aircraft.
	Antenna shaded from satellites.	Make sure the aircraft is clear of obstructions (hangars, buildings, trees, etc.).
OBS resolver wont calibrate	Incompatible resolver or improper connection.	Check the resolver specifications and wiring.
OBS indication on GPS 175 does not agree with OBS setting.	OBS resolver input not calibrated or calibrated incorrectly.	Check wiring and calibration.
GPS 175 is not receiving heading from compass system (ARINC 429 heading input).	Incorrect ARINC 429 input speed setting.	Check ARINC 429 input port speed setting for the port that the device is connected to and verify that the speed is correct for that device.
	Wiring connections are incorrect.	The raw data being received by the GPS 175 can be monitored on the <i>ARINC Inputs</i> page found on the <i>Diagnostics</i> page. Refer to Section 3.3.4.1. Check wiring connections.

**Table 5-2 GNX 375 General Troubleshooting Guide**

Symptom	Possible Cause	Corrective Action
The GNX 375 does not power on.	The unit is not getting power to the main connector P3751.	Check circuit breakers and main avionics switch. Ensure power is connected to the main 62-pin connector P3751, pins 21 and 42, and ground to P3751, pins 20 and 41.
The GNX 375 does not compute position.	Not receiving adequate GPS signals.	Check the GPS antenna connections. Make sure the aircraft is clear of obstructions (hangars, buildings, trees, etc.).
GPS signal level drops when avionics are turned on.	Noise interference from other avionics.	Turn off all other avionics, then turn on each piece of avionics one at a time to locate the source of the interference. Route the GPS cable and locate the GPS antenna away from the unit that is causing the interference.
OBS resolver wont calibrate	Incompatible resolver or improper connection.	Check the resolver specifications and wiring.
OBS indication on GNX 375 does not agree with OBS setting.	OBS resolver input not calibrated or calibrated incorrectly.	Check wiring and calibration.
GNX 375 is not receiving heading from compass system (ARINC 429 heading input).	Incorrect ARINC 429 input speed setting.	Check ARINC 429 input port speed setting for the port that the device is connected to and verify that the speed is correct for that device.
	Wiring connections are incorrect.	The raw data being received by the GNX 375 can be monitored on the <i>ARINC Inputs</i> page found on the <i>Diagnostics</i> page. Refer to Section 3.3.4.1. Check wiring connections.
Poor transponder performance. Weak or intermittent radar contact reported by ATC.	Improper transponder antenna installation or routing.	Check transponder antenna installation, connections, cable routing, ground planes, and coaxial cable.
Loss of, or incorrect altitude reporting by the transponder.	Improper altitude source installation or configuration.	Check the altitude source configuration and verify that the primary and secondary sources are properly configured.
Incorrect Mode S aircraft data transmitted.	Incorrect Flight ID configuration.	Check the Flight ID Configuration Page and verify the settings are configured correctly.

## 5.2 Failure Annunciations

If data fields become invalid, the GPS 175/GNX 375 typically annunciates the failures with a large red “X”, as shown in Figure 5-1.



Figure 5-1 Failure Screen

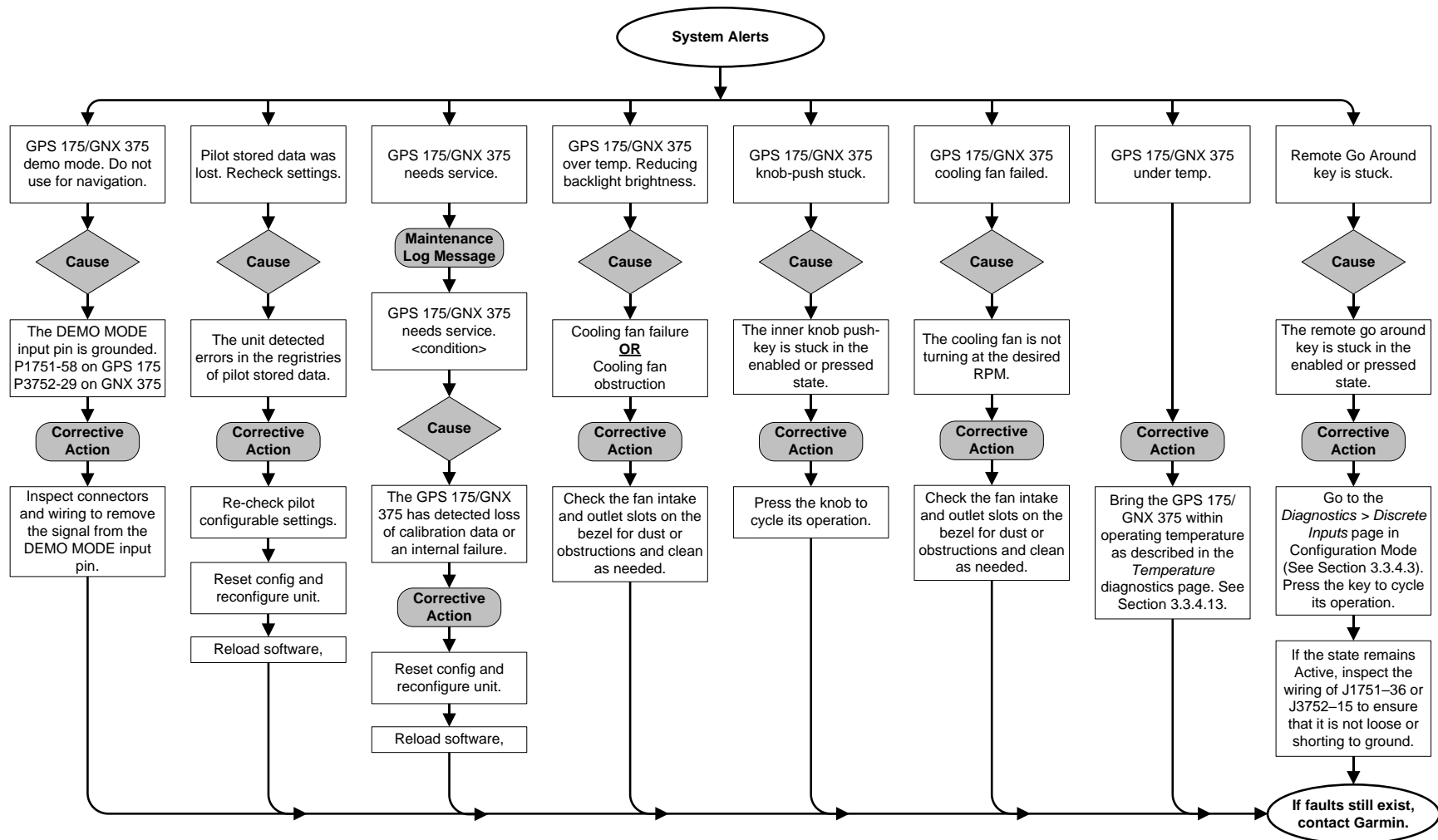


Figure 5-2 GPS 175/GNX 375 System Alert Troubleshooting

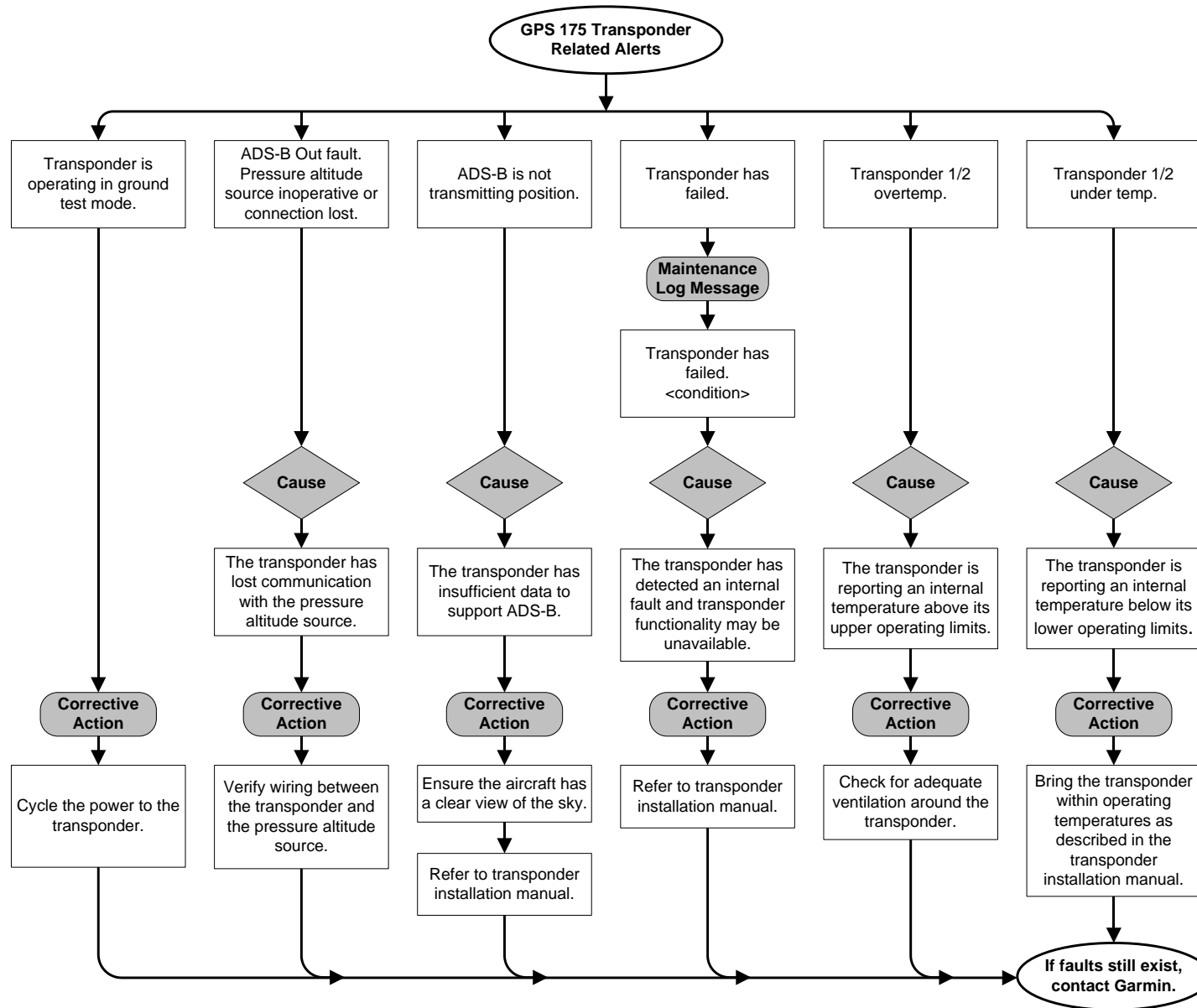


Figure 5-3 GPS 175 Transponder Alert Troubleshooting

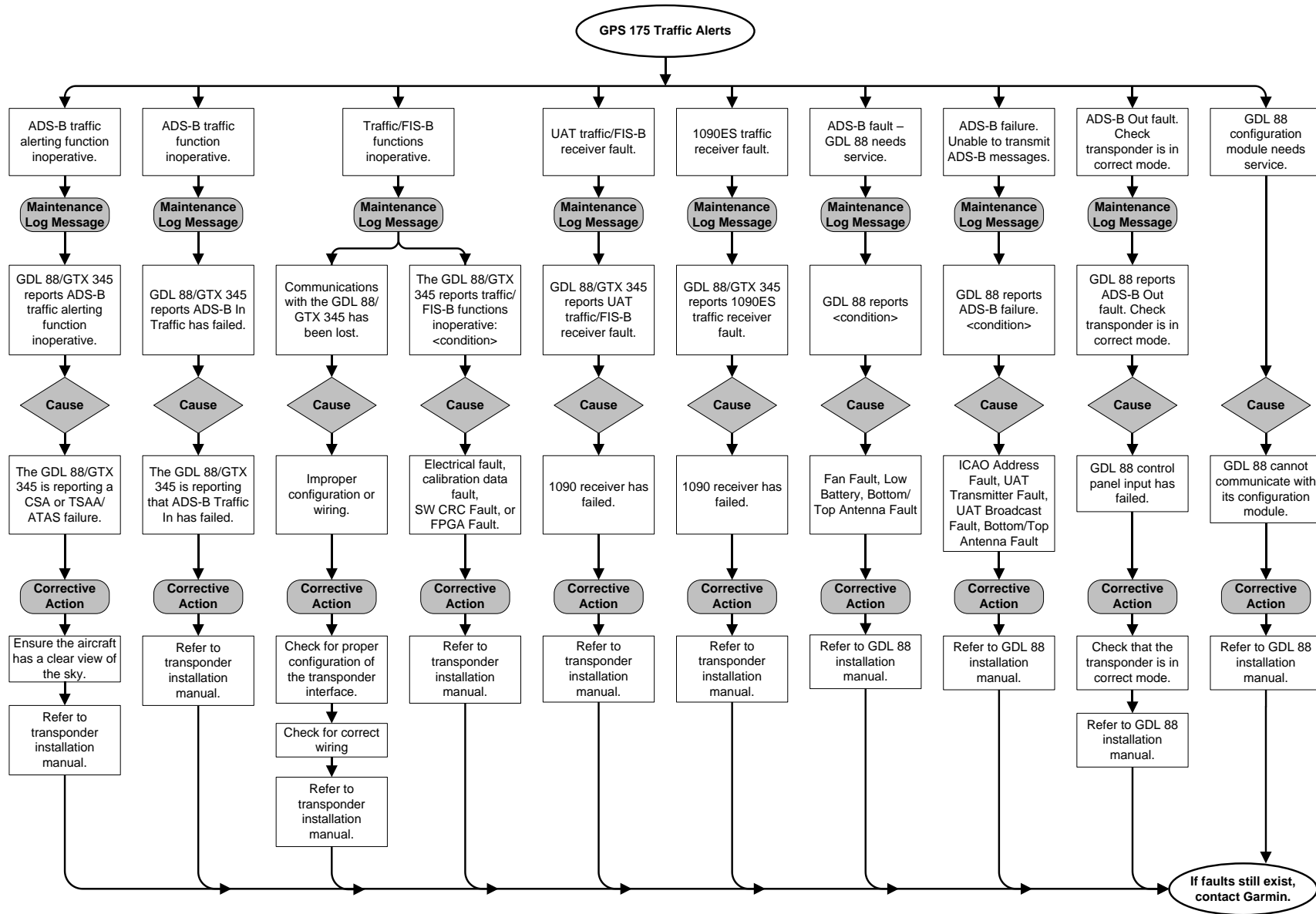


Figure 5-4 GPS 175 Traffic Alert Troubleshooting

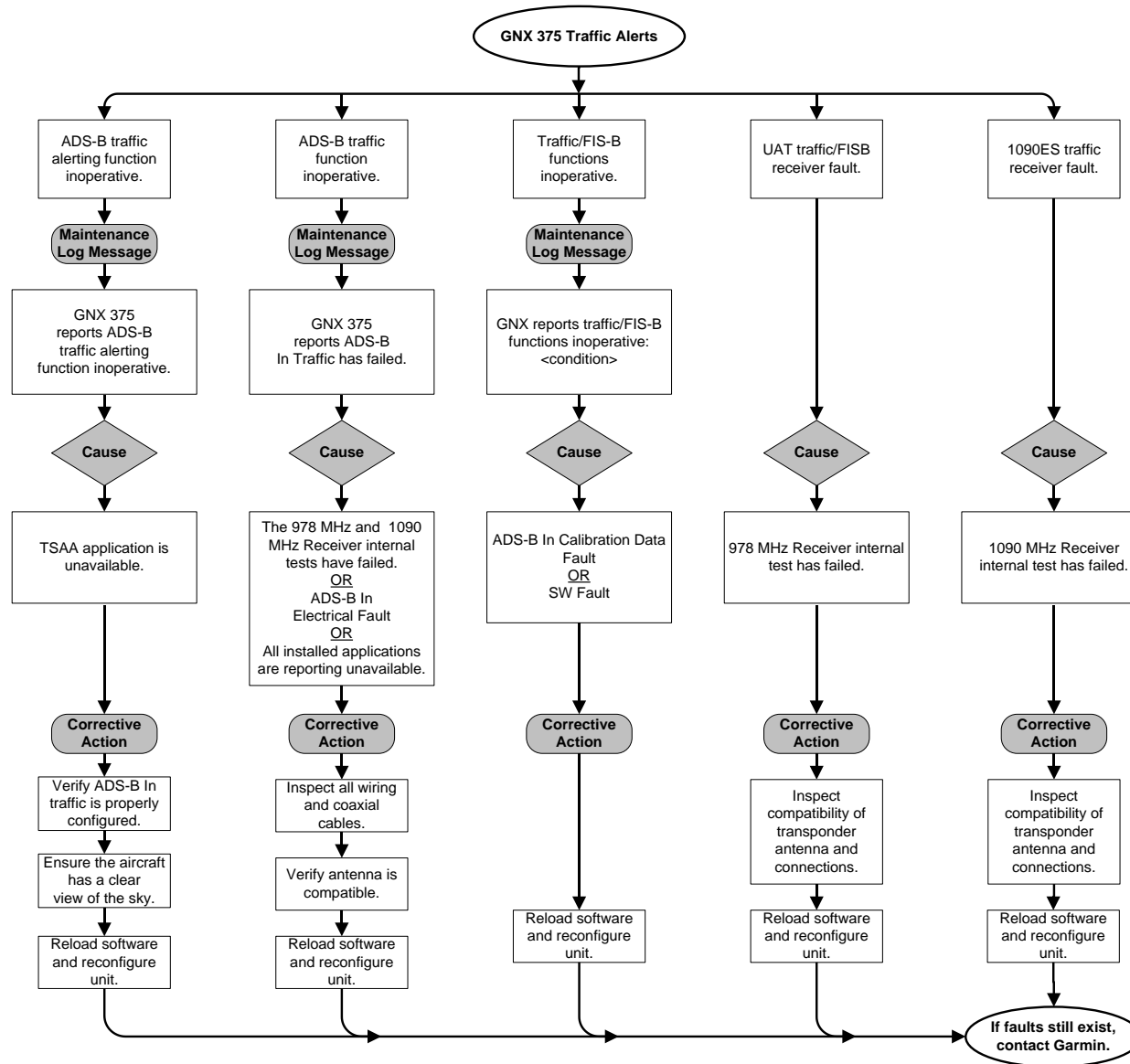


Figure 5-5 GNX 375 Traffic Alert Troubleshooting

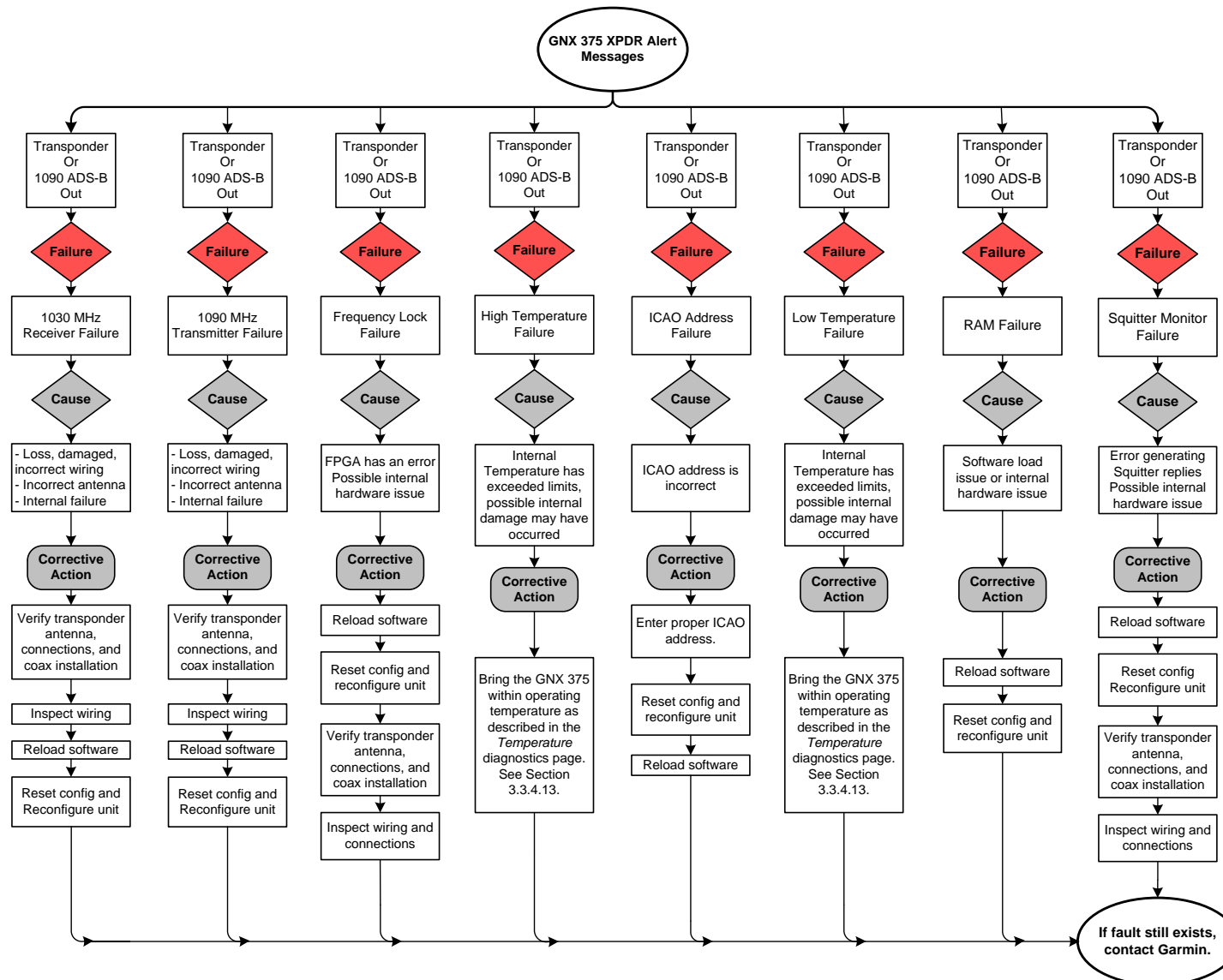


Figure 5-6 XPDR Alert Troubleshooting  
Sheet 1 of 5



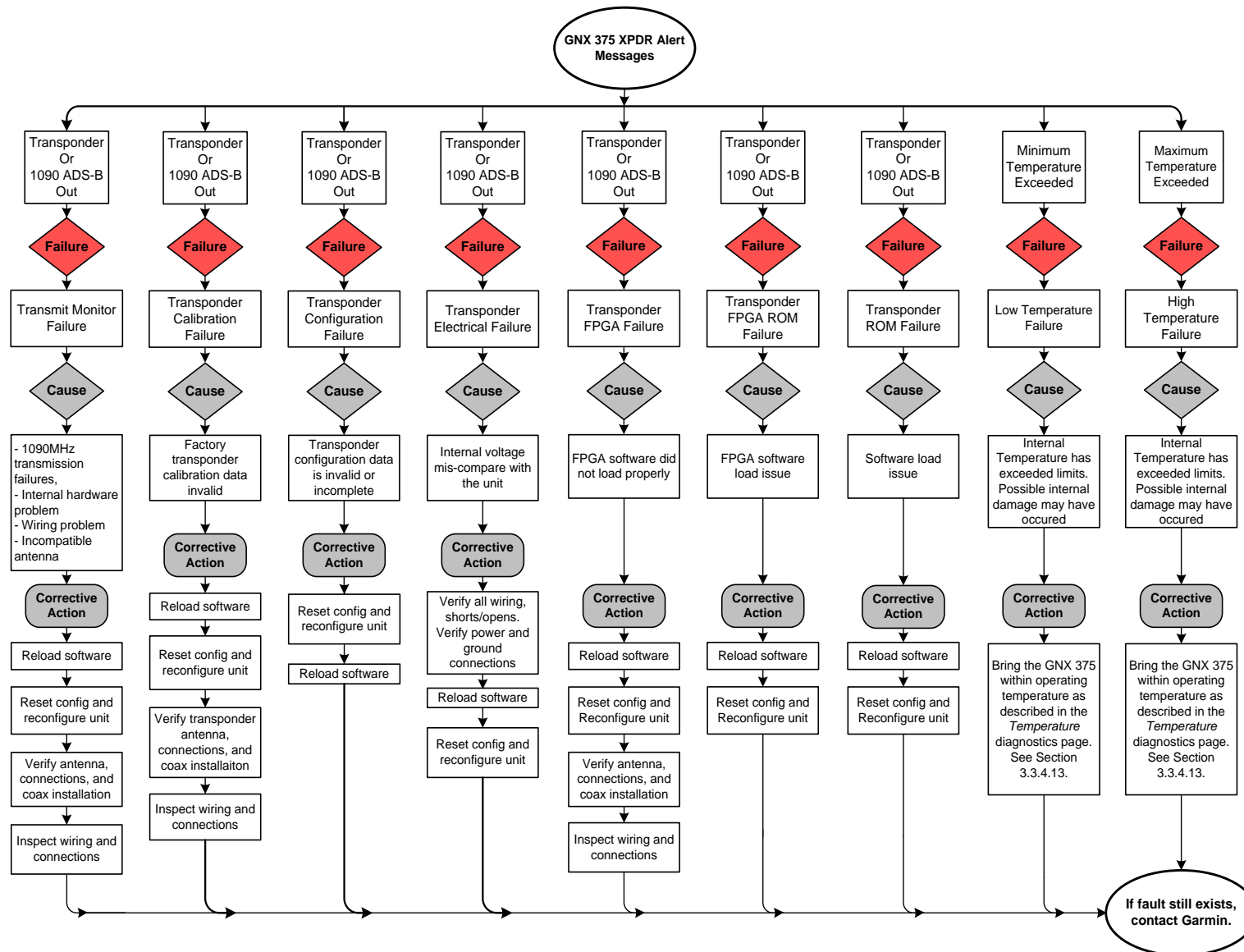


Figure 5-7 XPDR Alert Troubleshooting  
Sheet 2 of 5

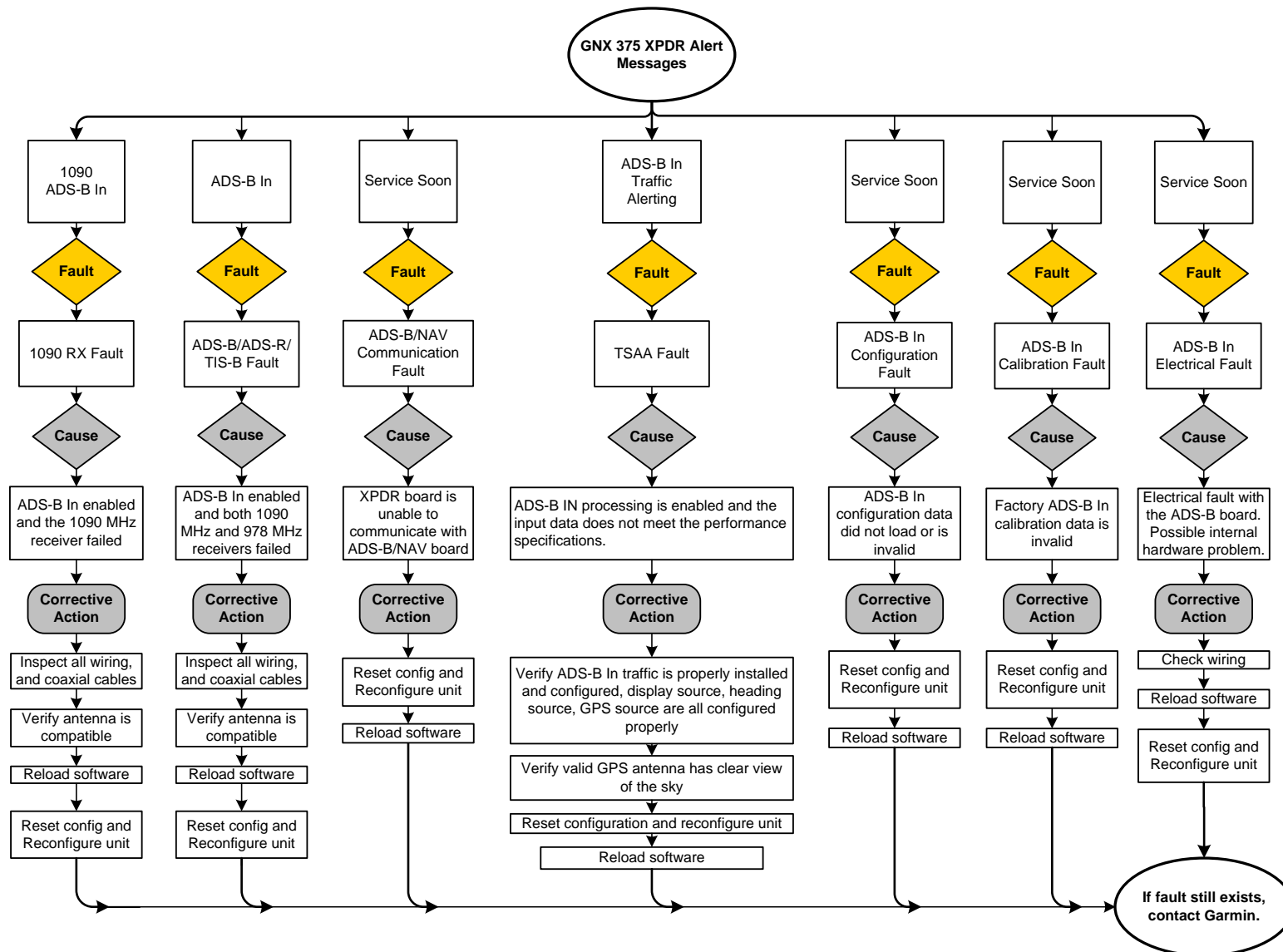


Figure 5-8 XPDR Alert Troubleshooting  
Sheet 3 of 5

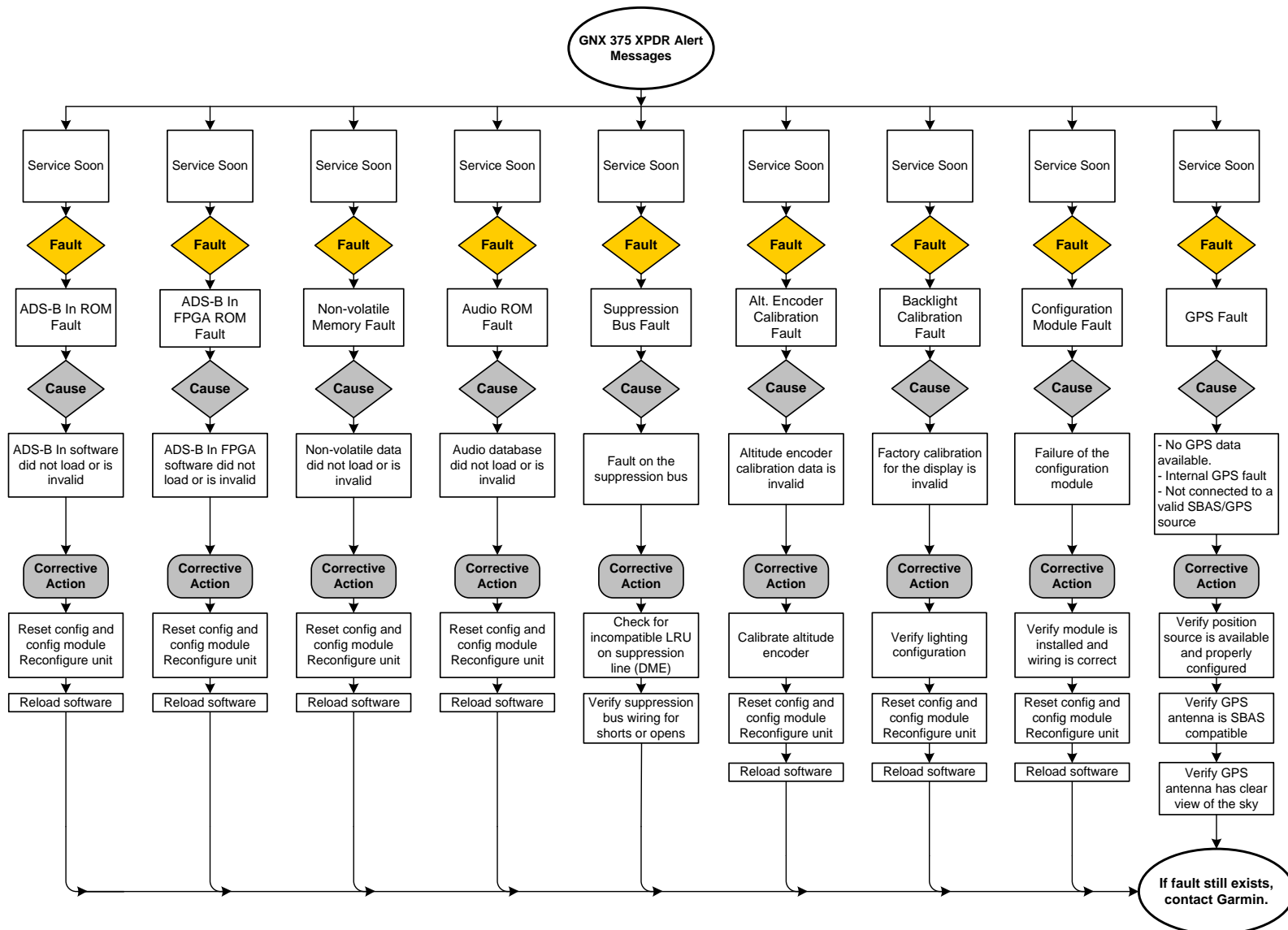


Figure 5-9 XPDR Alert Troubleshooting  
Sheet 4 of 5

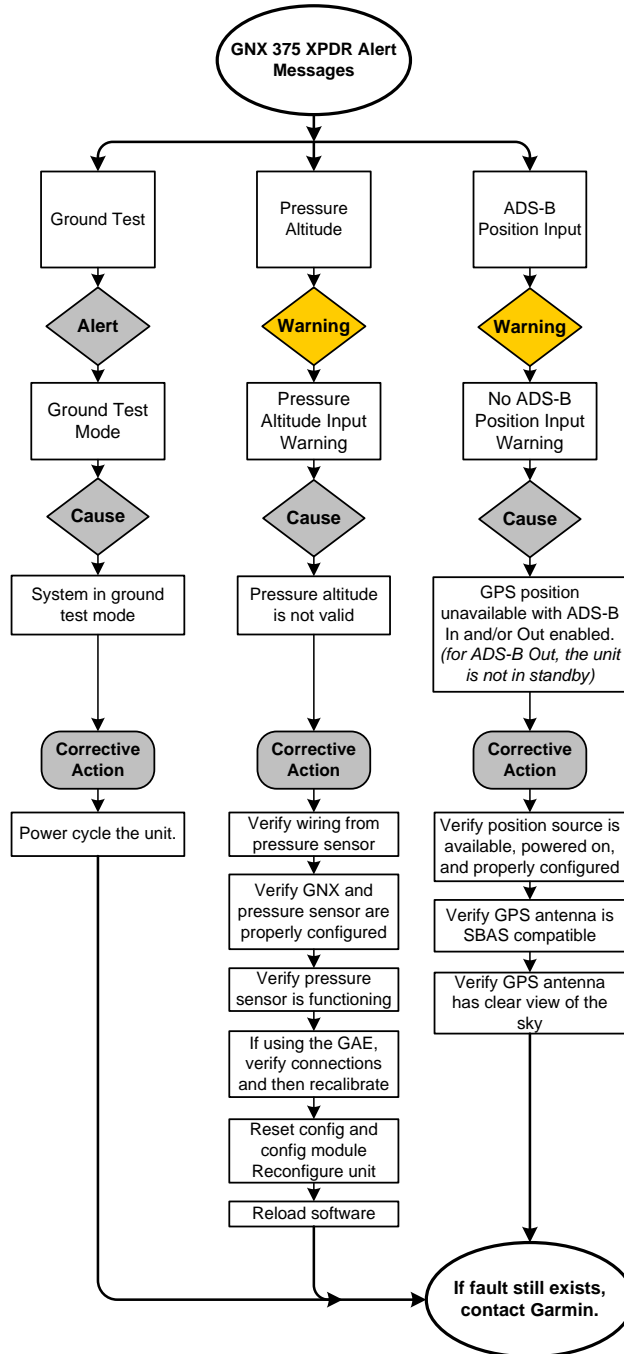


Figure 5-10 XPDR Alert Troubleshooting  
Sheet 5 of 5

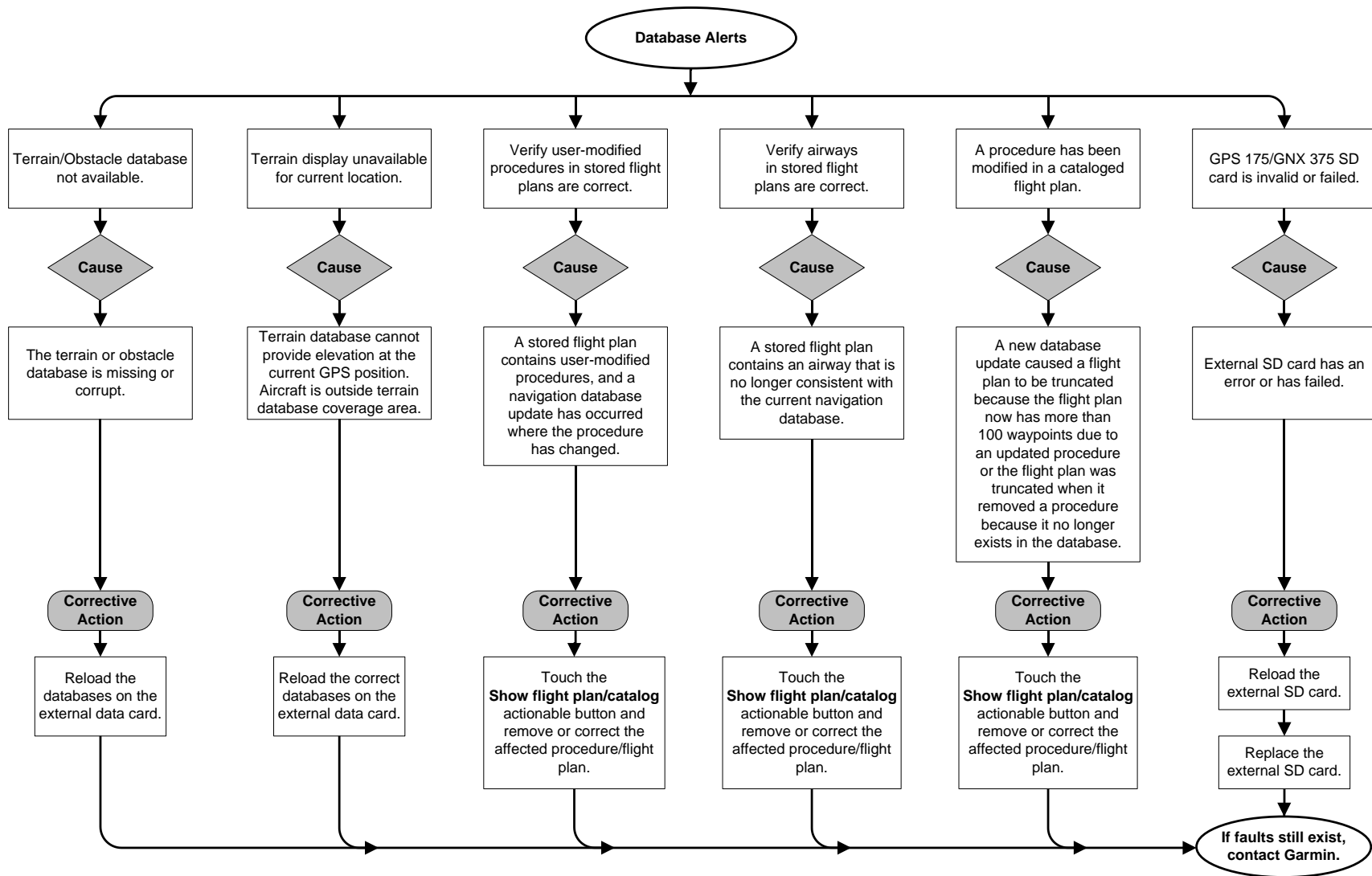


Figure 5-11 Database Alert Troubleshooting

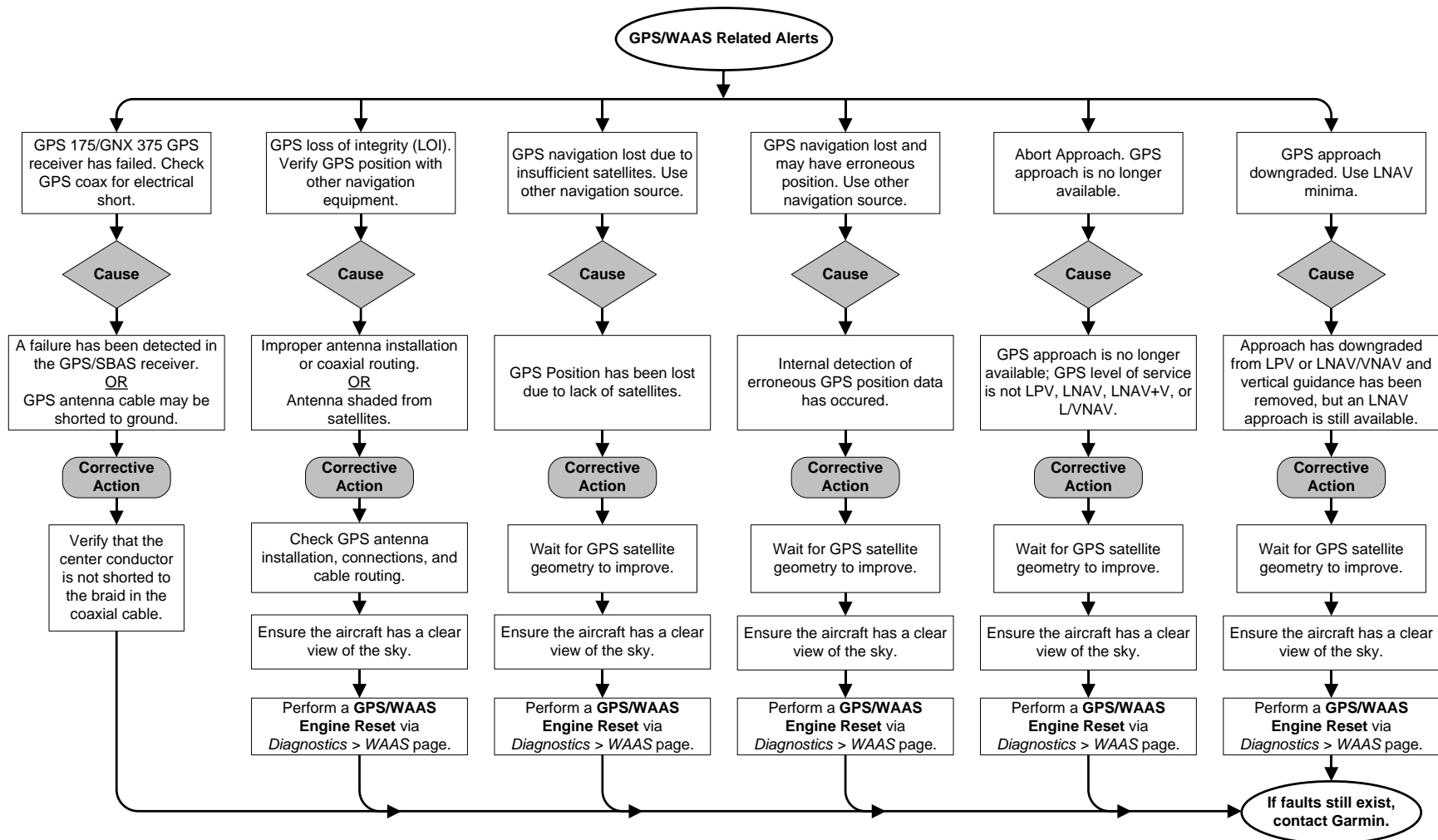


Figure 5-12 GPS/WAAS Alert Troubleshooting  
Sheet 1 of 2

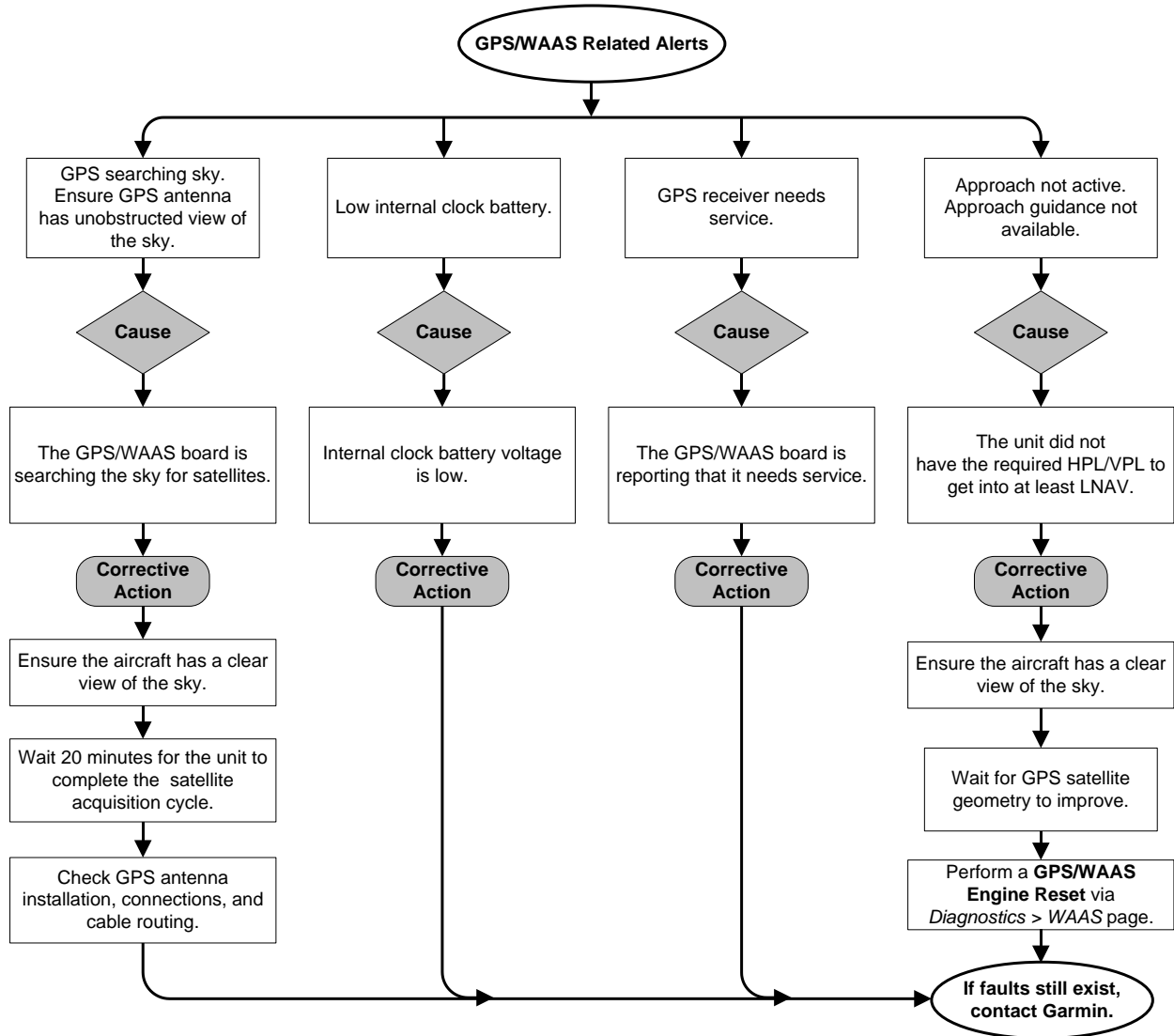


Figure 5-13 GPS/WAAS Alert Troubleshooting  
Sheet 2 of 2

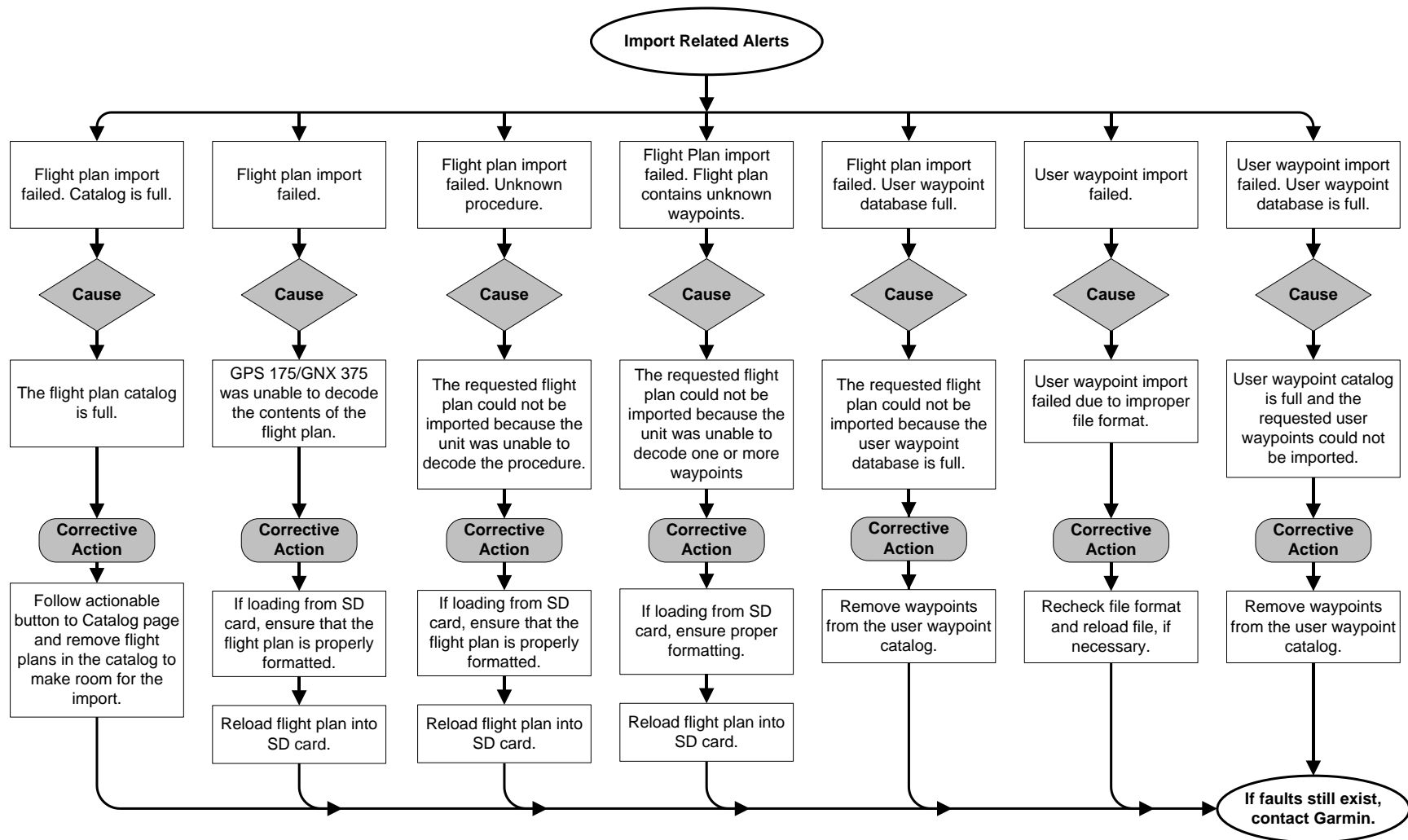


Figure 5-14 Import Alert Troubleshooting



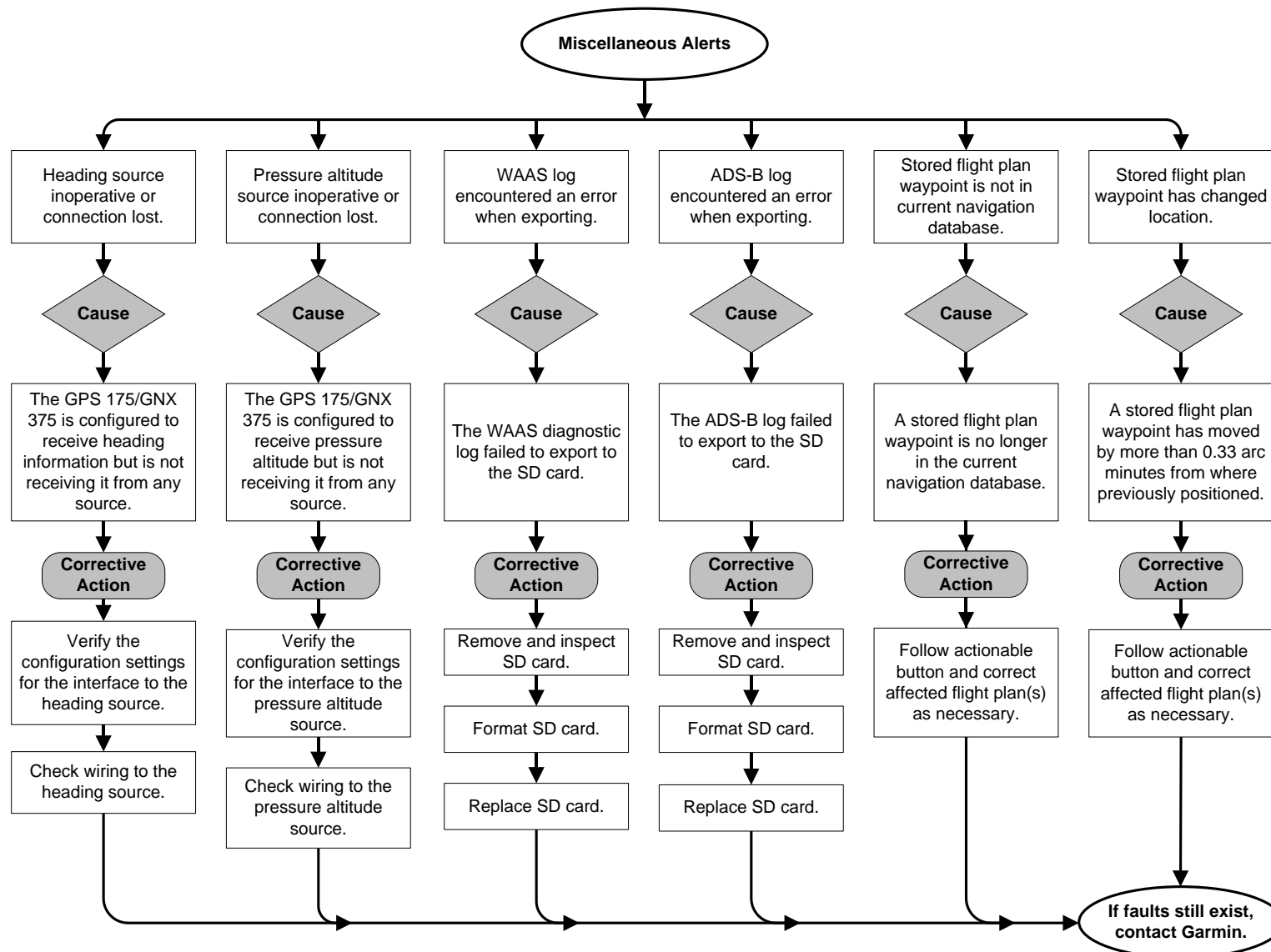
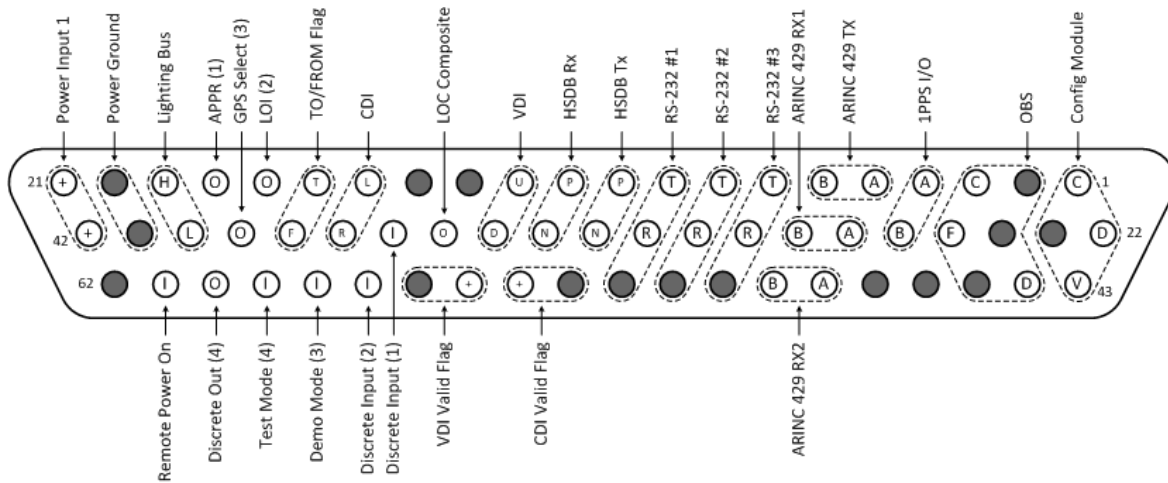


Figure 5-15 Misc Alert Troubleshooting

## 5.4 GPS 175 Connector Pinout Information

### 5.4.1 J1751 62-pin HD-DSUB



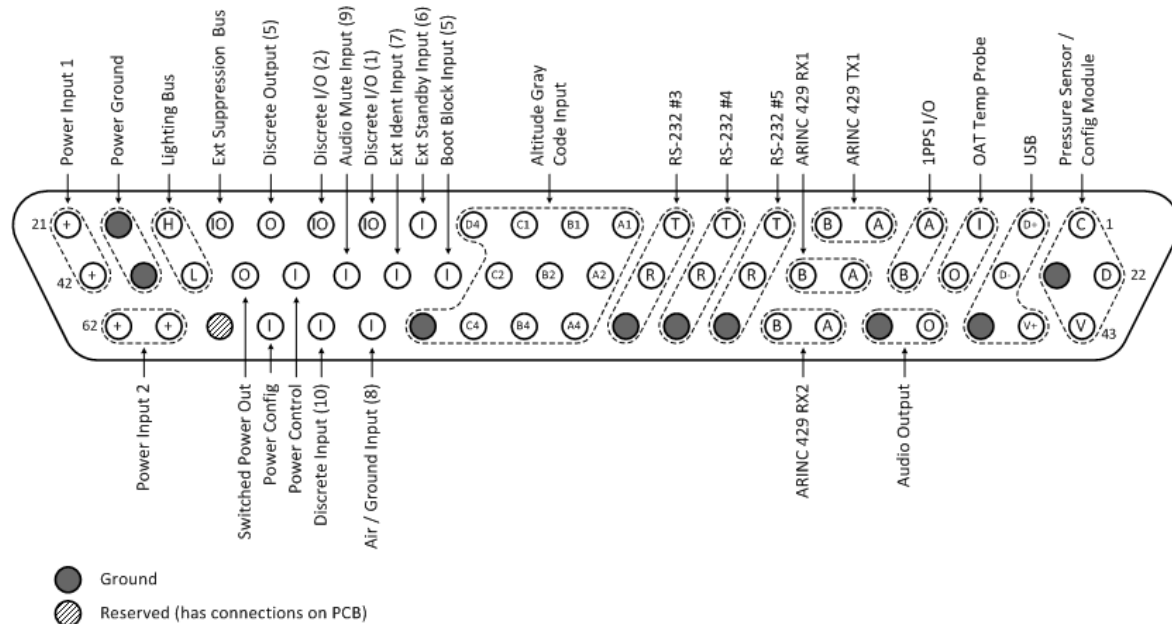
- Ground
- Reserved (has connections on PCB)

Numbers in ( ) for discrete IO correspond to the IO numbers on the schematic.

Pin	Pin Name	I/O	Pin	Pin Name	I/O	Pin	Pin Name	I/O
1	CONFIG MODULE (C)	Out	22	CONFIG MODULE (D)	I/O	43	CONFIG MODULE (V)	Out
2	OBS ROTOR H (GND)	Out	23	CONFIG MODULE (GND)	Out	44	OBS STATOR D	-
3	OBS ROTOR C	Out	24	OBS STATOR G (GND)	-	45	OBS STATOR E (GND)	-
4	TIME MARK A	Out	25	OBS STATOR F	-	46	GND	-
5	ARINC 429 OUT 1 A	Out	26	TIME MARK B	Out	47	GND	-
6	ARINC 429 OUT 1 B	Out	27	ARINC 429 IN 1 A	In	48	ARINC 429 IN 2 A	In
7	RS-232 #3(T)	Out	28	ARINC 429 IN 1 B	In	49	ARINC 429 IN 2 B	In
8	RS-232 #2(T)	Out	29	RS-232 #3(R)	In	50	RS-232 #3 (GND)	-
9	RS-232 #1(T)	Out	30	RS-232 #2(R)	In	51	RS-232 #2 (GND)	-
10	ETHERNET OUT(P)	Out	31	RS-232 #1(R)	In	52	RS-232 #1 (GND)	-
11	ETHERNET IN(P)	In	32	ETHERNET OUT(N)	Out	53	LATERAL FLAG GND	-
12	VERTICAL +UP OUT	Out	33	ETHERNET IN(N)	In	54	LATERAL FLAG OUT	Out
13	GND	-	34	VERTICAL +DOWN OUT	Out	55	VERTICAL FLAG OUT	Out
14	GND	-	35	LOC COMPOSITE	Out	56	VERTICAL FLAG GND	-
15	LATERAL +LEFT OUT	Out	36	REMOTE GO AROUND	-	57	DISCRETE IN 2	In
16	TO FLAG	-	37	LATERAL +RIGHT OUT	Out	58	DEMO MODE	In
17	LOI (DISCRETE OUT 2)	Out	38	FROM FLAG	-	59	TEST MODE	In
18	APPR (DISCRETE OUT 1)	Out	39	GPS SELECT (DISCRETE OUT 3)	-	60	DISCRETE OUT 4	Out
19	LIGHTING BUS(H)	In	40	LIGHTING BUS(L)	In	61	REMOTE POWER ON	In
20	POWER GND	-	41	POWER GND	-	62	GND	-
21	POWER INPUT 1	In	42	POWER INPUT 1	In			

## 5.5 GNX 375 Connector Pinout Information

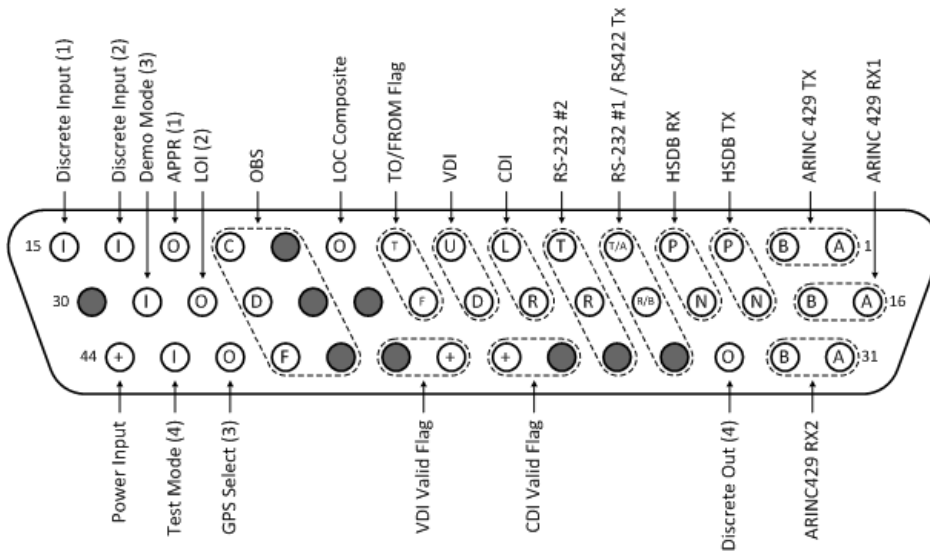
### 5.5.1 J3751 62-pin HD-DSUB



Pin	Pin Name	I/O	Pin	Pin Name	I/O	Pin	Pin Name	I/O
1	PRESSURE SENSOR/CONFIG MODULE(C)		22	PRESSURE SENSOR/CONFIG MODULE(D)	I/O	43	PRESSURE SENSOR/CONFIG MODULE(V)	OUT
2	RESERVED	-	23	PRESSURE SENSOR/CONFIG MODULE(GND)	OUT	44	RESERVED	-
3	OAT TEMP PROBE(I)		24	RESERVED	-	45	RESERVED	-
4	TIME MARK A	OUT	25	OAT TEMP PROBE(O)		46	AUDIO OUT	OUT
5	RESERVED	-	26	TIME MARK B	OUT	47	AUDIO GND	-
6	RESERVED	-	27	ARINC 429 IN 1 A	IN	48	ARINC 429 IN 2 A	IN
7	RS-232 #5 (T)	OUT	28	ARINC 429 IN 1 B	IN	49	ARINC 429 IN 2 B	IN
8	RS-232 #4 (T)	OUT	29	RS-232 #5 (R)	IN	50	RS-232 #5 (GND)	-
9	RS-232 #3 (T)	OUT	30	RS-232 #4 (R)	IN	51	RS-232 #4 (GND)	-
10	ALTITUDE GRAY CODE INPUT (A1)	IN	31	RS-232 #3 (R)	IN	52	RS-232 #3 (GND)	-
11	ALTITUDE GRAY CODE INPUT (B1)	IN	32	ALTITUDE GRAY CODE INPUT(A2)	IN	53	ALTITUDE GRAY CODE INPUT(A4)	IN
12	ALTITUDE GRAY CODE INPUT (C1)	IN	33	ALTITUDE GRAY CODE INPUT(B2)	IN	54	ALTITUDE GRAY CODE INPUT(B4)	IN
13	ALTITUDE GRAY CODE INPUT (D4)	IN	34	ALTITUDE GRAY CODE INPUT(C2)	IN	55	ALTITUDE GRAY CODE INPUT(C4)	IN
14	EXT STANDBY (DISCRETE IN 6)	IN	35	RESERVED	-	56	ALTITUDE GRAY CODE INPUT(GND)	IN
15	DISCRETE I/O 1	I/O	36	EXT IDENT (DISCRETE IN 7)	IN	57	AIR/GROUND (DISCRETE IN 8)	IN

16	DISCRETE I/O 2	-	37	AUDIO MUTE (DISCRETE IN 9)	OUT	58	RESERVED	IN
17	RESERVED	OUT	38	POWER CONTROL	-	59	RESERVED	IN
18	EXT SUPPRESSION BUS	OUT	39	SWITCHED POWER OUT	-	60	RESERVED	OUT
19	LIGHTING BUS(H)	IN	40	LIGHTING BUS(L)	IN	61	POWER INPUT 2	IN
20	POWER GND	-	41	POWER GND	-	62	POWER INPUT 2	-
21	POWER INPUT 1	IN	42	POWER INPUT 1	IN			

### 5.5.2 J3752 44-pin HD-DSUB



- Ground
- Spare
- Reserved (has connections on PCB)

Pin	Pin Name	I/O	Pin	Pin Name	I/O	Pin	Pin Name	I/O
1	ARINC 429 OUT 1 A	OUT	16	RESERVED	-	31	RESERVED	-
2	ARINC 429 OUT 1 B	OUT	17	RESERVED	-	32	RESERVED	-
3	ETHERNET OUT(P)	OUT	18	ETHERNET OUT(N)	OUT	33	DISCRETE OUT 4	OUT
4	ETHERNET IN(P)	IN	19	ETHERNET IN(N)	IN	34	GND	-
5	RS-232 #1(T) / RS-422 A	OUT	20	RS-232 #1(R) / RS-422(B)	IN	35	GND	-
6	RS-232 #2(T)	OUT	21	RS-232 #2(R)	IN	36	LATERAL GND	-
7	LATERAL +LEFT OUT	OUT	22	LATERAL +RIGHT OUT	OUT	37	LATERAL FLAG OUT	OUT
8	VERTICAL +UP OUT	OUT	23	VERTICAL +DOWN OUT	OUT	38	VERTICAL FLAG OUT	OUT
9	TO FLAG	-	24	FROM FLAG	-	39	VERTICAL GND	-
10	LOC COMPOSITE	OUT	25	GND	-	40	OBS STATOR G (GND)	-
11	OBS ROTOR H (GND)	OUT	26	OBS STATOR E (GND)	-	41	OBS STATOR F	-

12	OBS ROTOR C	OUT	27	OBS STATOR D	-	42	GPS SELECT	-
13	APPROACH ANNUNCIATE	OUT	28	LOI ANNUNCIATE	-	43	TEST MODE	IN
14	DISCRETE IN 2	IN	29	DEMO MODE	IN	44	POWER INPUT	IN
15	REMOTE GO AROUND	-	30	GND	-			

## 6. EQUIPMENT REMOVAL AND RE-INSTALLATION

### 6.1 GPS 175

#### 6.1.1 Removal

1. Locate and open the GPS 175 circuit breaker.
2. Locate the unit retention mechanism access hole at the top-right corner of the unit face.
3. Insert a 3/32" hex tool into the access hole and turn the fastener counterclockwise until the unit is forced out about 3/8" and the hex drive tool stops completely.
4. Slide the GPS 175 out of the rack.

#### 6.1.2 Re-installation



##### NOTE

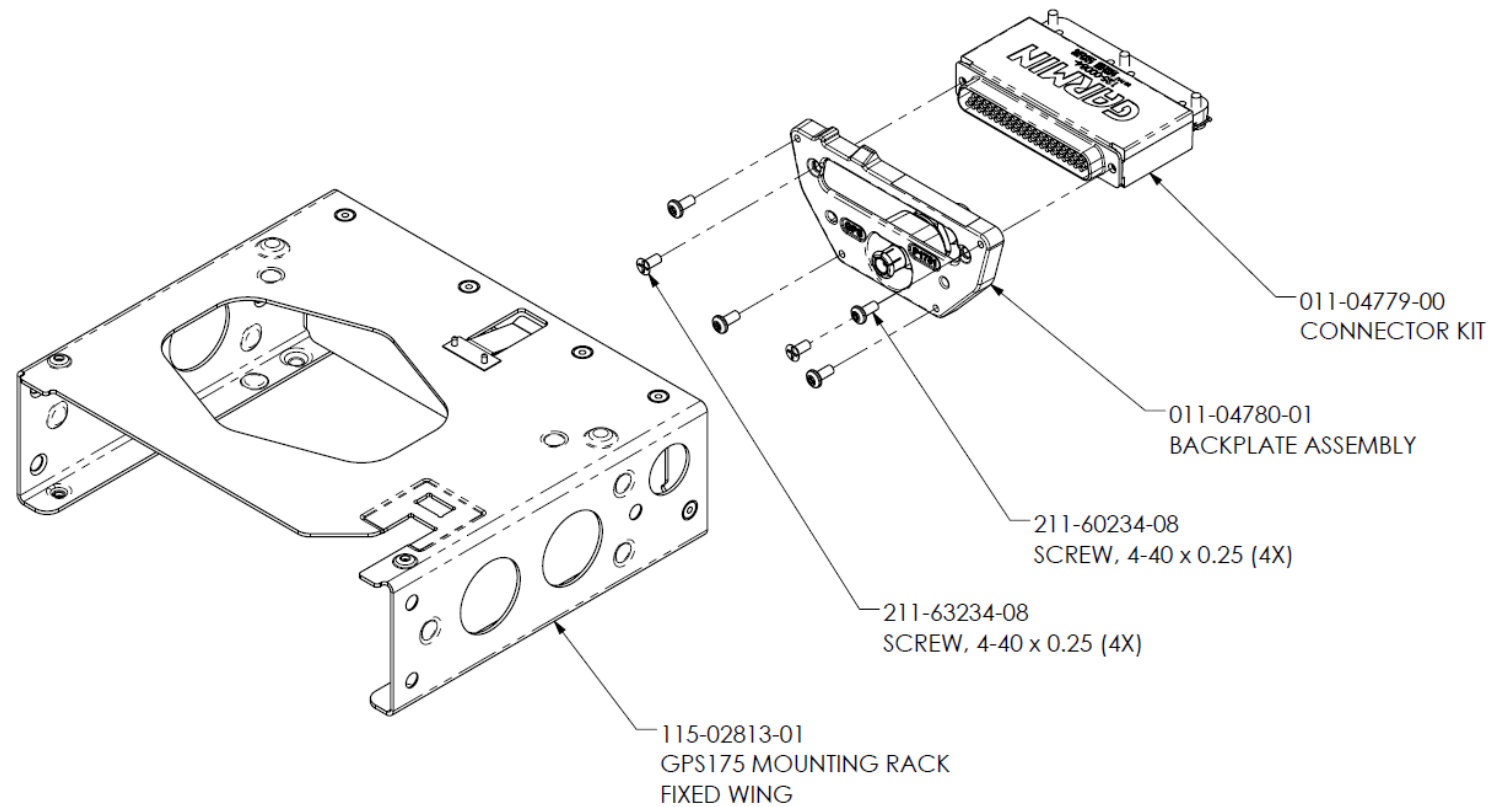
*It may be necessary to insert the hex drive tool into the access hole and turn the tool counterclockwise until it completely stops in order to ensure correct position of the retention mechanism prior to placing the unit in the rack. To ensure connectors mate properly, center the unit in the rack.*



##### CAUTION

*Be sure not to overtighten the unit into the rack. The application of hex drive tool torque exceeding 15 in-lbf can damage the locking mechanism.*

1. Ensure that the GPS 175 circuit breaker is open.
2. Slide the GPS 175 straight back into the rack until it stops about 3/8" short of the fully seated position.
3. Insert a 3/32" hex drive into the unit retention mechanism access hole at the bottom of the unit.
4. Turn the tool clockwise while pressing on the left side of the bezel until the unit is firmly seated in the rack.
5. Once the GPS 175 is re-installed, verify that the unit power-up self-test sequence is successfully complete and no failure messages or configuration error messages are annunciated. Section 6.3 outlines the power-up self-test sequence.



- 1 PART OF 011-04377-00 (GPS175) KITS.
- 2 REFERENCE 010-01822-01 (GPS175, STANDARD).
- 3 TORQUE TO 8±1 IN-LB.

**Figure 6-1 GPS 175 Rack Installation**

## 6.2 GNX 375

### 6.2.1 Removal

1. Locate and open the GNX 375 circuit breaker.
2. Locate the unit retention mechanism access hole at the top-right corner of the unit face.
3. Insert a 3/32" hex tool into the access hole and turn the fastener counterclockwise until the unit is forced out about 3/8" and the hex drive tool stops completely.
4. Slide the GNX 375 out of the rack.

### 6.2.2 Re-installation



#### NOTE

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

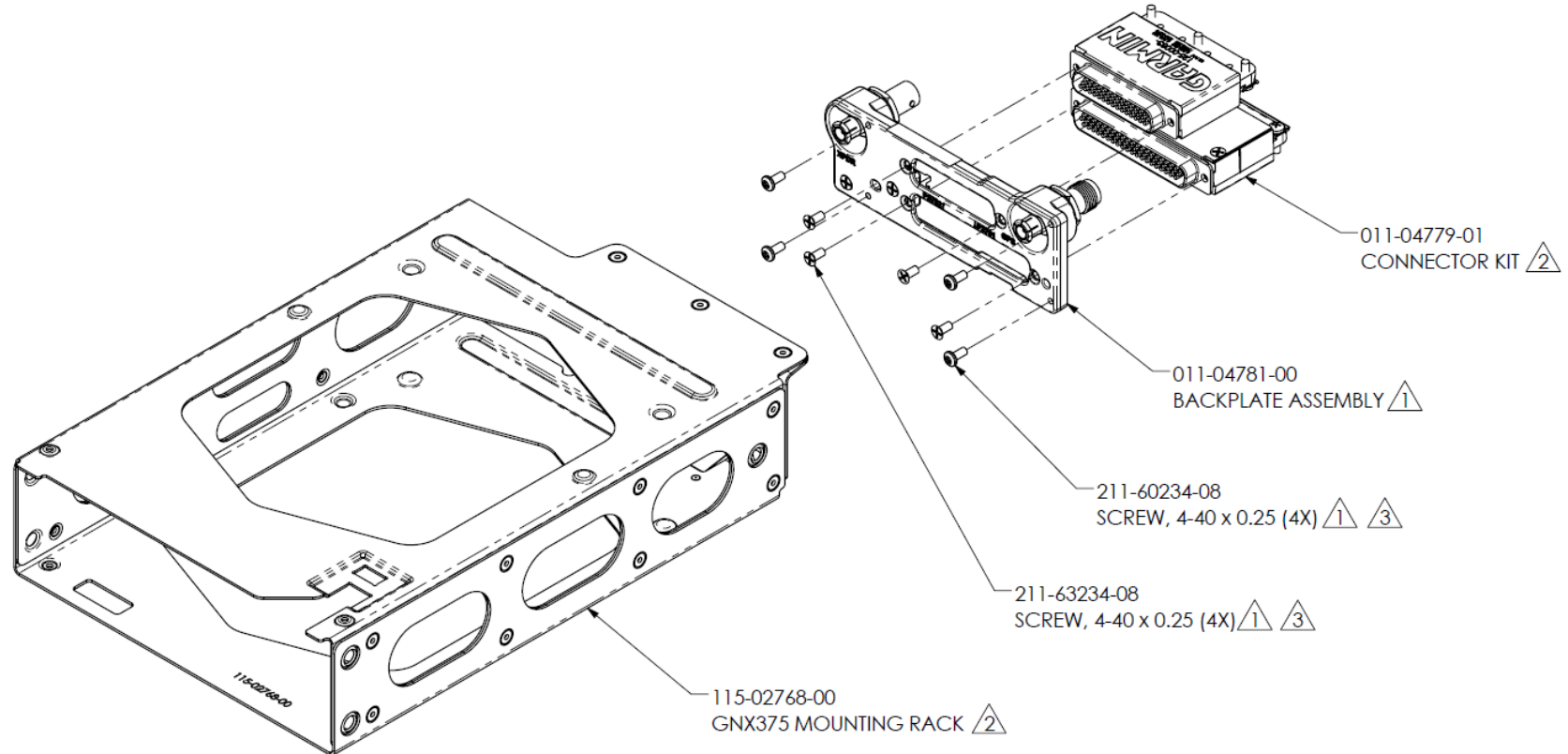


#### CAUTION

*Be sure not to overtighten the unit into the rack. The application of hex drive tool torque exceeding 15 in-lbf can damage the locking mechanism.*

1. Ensure that the GNX 375 circuit breaker is open.
2. Slide the GNX 375 straight back into the rack until it stops about 1 inch short of the fully seated position.
3. Insert a 3/32" hex drive into the unit retention mechanism access hole at the bottom of the unit.
4. Turn the tool clockwise while pressing on the left side of the bezel until the unit is firmly seated in the rack.
5. Once the GNX 375 is re-installed, verify that the unit power-up self-test sequence is successfully complete and no failure messages or configuration error messages are annunciated. Section 6.3 outlines the power-up self-test sequence.





- <sup>1</sup> PART OF 011-04378-00 (GNX375) KITS.
- <sup>2</sup> REFERENCE 010-01823-01 (GNX375, STANDARD).
- <sup>3</sup> TORQUE TO 8±1 IN-LB.

**Figure 6-2 GNX 375 Rack Installation**

### 6.3 Display of Self-Test Data

During the normal power-up sequence, the splash screen is displayed, followed by the *SW/Databases* page, followed by the *Instrument Test* page. While on the *SW/Databases* page, touch **Continue** to advance to the *Instrument Test* page. During this time, electrical outputs are activated and set to the values listed below.

**Table 6-1 Instrument Test Data**

Parameter	Instrument Test Value
LCDI	Half Left
LFLG	Out of View
VCDI	Half Up
VFLG	Out of View
TO/FROM	N/A
OBS	The GNX displays the OBS value (149.5° if interfaced to an HSI with driven course pointer).
DTK	149.5° (Displayed as 150°)
Items below do not display on the <i>Instrument Test</i> page.	
Distance to Go	10.0 nautical miles
Time to Go	4 minutes
Active Waypoint	GARMIN
Groundspeed	150 knots
Present Position	N 39°04.05', W 94°53.86'
Waypoint Alert	Active
Phase of Flight	En Route
Message Alert	Active
Leg/OBS Mode	Leg Mode
GPS Integrity	Invalid
Roll Steering (if applicable)	Flight Director commands 0° bank (level flight) for 5 seconds, increasing right bank at 1°/second for 5 seconds, 5° right bank for 5 seconds, decreasing right bank at 1°/second for 5 seconds until 0° bank is reached. This cycle repeats continuously.

## 6.4 Configuration Module Replacement

To replace a GPS 175/GNX 375 configuration module, perform the following procedure:



### NOTE

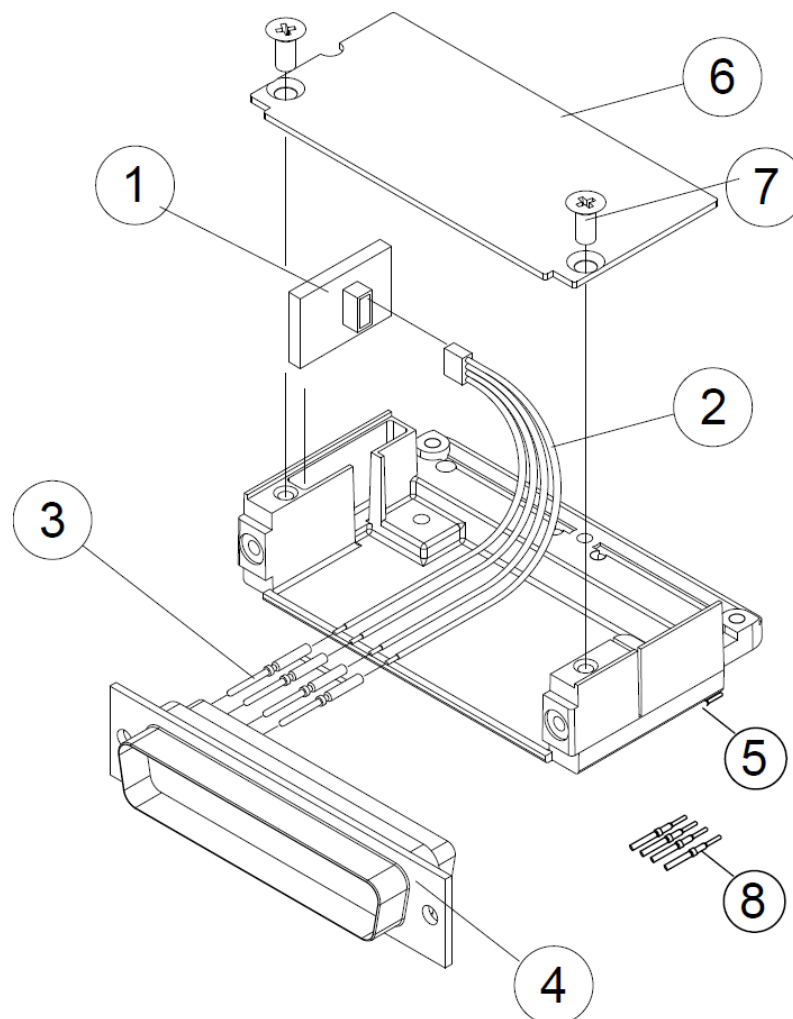
Ensure the current configuration is saved on to an SD card in accordance with the instructions contained in Section 3.3.5.



### NOTE

All item numbers in this procedure reference Figure Figure 6-3.

1. Remove the GPS 175/GNX 375 in accordance with Section 6.1.1 or 6.2.1.
2. Remove the backshell cover (6) by removing the two screws (7).
3. Lift the configuration module (1) out of the backshell (5) and disconnect the wiring harness (2) from the module.
4. Inspect the wiring harness (2) and connector pins (3) for damage, loose wiring, or corrosion. Replace all deficient components if any of these conditions are found.
5. Connect the harness to the new configuration module.
6. Install the new configuration module in the connector backshell (5) and re-install the cover (6).
7. Re-install the GPS 175/GNX 375 in accordance with Section 6.1.2 or 6.2.2.



**Figure 6-3 Configuration Module Assembly**

## 6.5 Data Card/Flight Stream 510

### 6.5.1 Removal

1. Ensure the GPS 175/GNX 375 is powered off.
2. Remove the data card/Flight Stream 510 by pressing the card until it disengages and then pull the card to remove it from the unit.

### 6.5.2 Re-Installation

1. Insert the new data card/Flight Stream 510, with the label facing left, into the data card slot on the front-right of the unit.
2. Push the card into the slot until it is fully inserted and locked into position.

## 6.6 GAE 12

### 6.6.1 Removal

1. Remove the GPS 175/GNX 375 in accordance with Section 6.1.1 or 6.2.1.
2. Disconnect the four-conductor wire harness and the static pressure source tubing from the GAE.
3. Remove the two countersunk screws connecting the GAE to the backplate, as shown in Figure 6-4, and remove the unit.

### 6.6.2 Re-Installation

1. Mount the GAE to the backplate using the two countersunk screws as shown in Figure 6-4.
2. Torque screws to 8 in-lbs.
3. Attach the aircraft static pressure source to the GAE 12 and verify there are no pneumatic leaks by performing a static leak check.
4. Inspect the four-conductor wiring harness and connector pins for damage, loose wiring, or corrosion.
5. Plug the four-conductor wire harness into the connector on the GAE.
6. Verify that there are no leaks, sealants, fluids, or particles in the pneumatic lines or fittings.

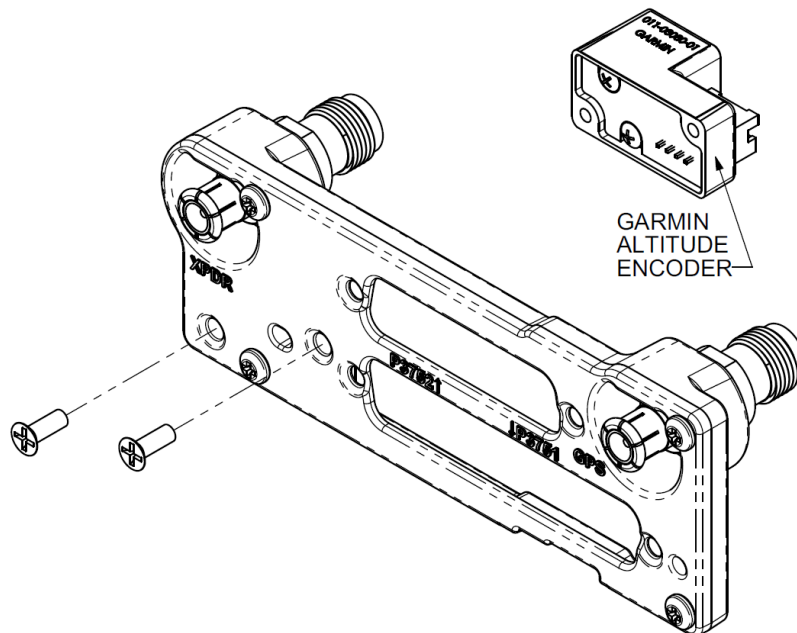


Figure 6-4 GAE Assembly

## 6.7 Bonding Strap

The following steps are provided as guidance for replacing a damaged bonding strap.

### 6.7.1 Removal

The bonding strap is attached in two locations. The terminal lug is secured with a lock nut. To remove the strap, access both sides of the bonding strap and unbolt the hardware.

### 6.7.2 Replacement

1. Construct a bonding strap in accordance with the guidance provided in Section 4.2 of *GPS 175 Part 23 AML STC Installation Manual, 190-02207-A1* or *GNX 375 Part 23 AML STC Installation Manual, 190-02207-A4*.
2. If needed, clean the attachment locations with a bonding brush.
3. Secure each end of the bonding strap to the previously installed locations. Ensure that the strap does not loop back on itself and that the hardware is as described in the installation manual. The bonding strap hardware must seat fully against the aircraft metallic structure, without overhang or interference from other hardware.
4. Using a milliohm meter, verify that the resistance between the connected structure is less than 2.5 m $\Omega$ .

## 7. SOFTWARE

### 7.1 Software Check

#### GPS 175/GNX 375 Software Version Check

1. Power on the GPS 175/GNX 375 in configuration mode by holding down the inner knob and pressing the power/home button.
2. Tap the **System Information** box.
3. Observe the installed software version and part number and verify that the version number and part number matches the approved version listed in the Equipment List.

### 7.2 Software Updates

Tap the System Information box to determine the current software loaded to the unit. Refer to the GPS 175/GNX 375 Part 23 AML Equipment List, 005-01206-A2, for the current approved software for this STC. If the software needs to be updated a software loader card will need to be created to update the software. An SD card, SD card reader, and a PC running Windows 2000, XP, Vista, Windows 7, Windows 8, or Windows 10 are necessary. There is no Mac support currently.

#### 7.2.1 Software Loader Card Instructions

The following steps describe how to create a software loader card:

1. Log into the Dealer Resource Center.
2. Download the appropriate system software to a PC.
3. Connect an SD card reader to the PC.
4. Insert the SD card into the card reader.
5. Run the \*.exe file downloaded from the Dealer Resource Center.
6. Follow the screen prompts to create the loader card.
7. Click **Finish**.
8. Eject the loader card.

#### 7.2.2 Software Update Instructions

To update the GPS 175/GNX 375 software, perform the following steps:

1. Power off the unit.
2. Remove the database card and insert the correct GPS 175/GNX 375 Software Loader Card into the data card slot. Refer to Section 7.2.1 for creating a GPS 175/GNX 375 Software Loader Card.
3. Power on the unit.
4. The GPS 175/GNX 375 is now in configuration mode, as shown in Figure 3-3. Touch **Updates** to display the available software updates.
5. Check that the software version being loaded to the GPS 175/GNX 375 matches the software version listed in *GPS 175/GNX 375 Part 23 AML STC Equipment List*. The *Updates* page displays the software version that is currently installed on the unit, and the software version on the loader card.
6. Touch the software versions or packages to select them for updating. To update the GPS 175/GNX 375 with all available software, touch the **Select All** key in the upper-right corner of the display.
7. To begin the software update, touch the **Update** key in the lower-right corner of the display.
8. When the updates are complete, power off the unit and re-insert the database card into the data card slot.

## 8. SYSTEM CONFIGURATION AND CHECKOUT

### 8.1 Overview

This section contains instructions for configuring the GPS 175/GNX 375 as well as checks to ensure the systems is properly installed and functioning correctly. The steps that are not applicable to a particular installation may be skipped.

### 8.2 System Checkout

#### ***Original GPS 175/GNX 375 Re-installed***

If the removed GPS 175/GNX 375 is installed in its original position, no software loading or configuration setting changes are required. This does not include units that were returned for repair, as their software and configuration files are deleted during the repair testing process.

If the original GPS 175/GNX 375 is re-installed, configuration and software loading are not required. Continue to Section 6 of *GPS 175 Part 23 AML STC Installation Manual, 190-02207-A1* or *GNX 375 Part 23 AML STC Installation Manual, 190-02207-A4*, as applicable, for installation checkout procedure.

#### ***New, Repaired, or Exchanged GPS 175/GNX 375 is installed***

If a new, repaired, or exchanged GPS 175/GNX 375 is installed, the AML approved software and the configuration files from the Configuration Log in the aircraft permanent must be loaded to the unit.

### 8.3 GPS 175/GNX 375 Configuration

Retrieve the Configuration Log from the aircraft permanent records. For the maintenance activities that repaired or replaced the previous GPS 175/GNX 375, configure the unit as defined by the data contained in the Configuration Log.



#### **NOTE**

*Ensure the Configuration Log remains with the aircraft permanent records upon completion of any maintenance activities.*

### 8.4 Regulatory Test

The following regulatory tests are required to be performed per the 14 CFR sections referenced below. For the purpose of these tests ensure the GNX 375 transponder is in Ground Test Mode to simulate an airborne state. The Altitude Reporting Equipment Test is required to be performed for each altitude source interfaced to the transponder, including the GAE 12. These tests require the use of a Mode S transponder ramp tester such as an Aeroflex IFR-6000 or TIC TR-220. For instructions on the operation of the ramp test equipment, refer to the manufacturer's documentation.

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.

## 8.5 ADS-B Out Test

This test procedure is used to verify that the ADS-B Out parameters meet the performance requirements as described in Title 14 Code of Federal Regulations (14 CFR) § 91.227. This test requires the use of a Mode S transponder ramp tester such as an Aeroflex IFR-6000 or TIC TR-220. For instructions on the operation of the ramp test equipment, refer to the manufacturer's documentation.

1. Verify that the aircraft is in a location where a GPS signal is receivable. (e.g. outdoors with a clear view of the sky.)
2. Power on the aircraft/avionics.
3. With the GNX 375 operating in Normal Mode, verify the GNX 375 has acquired GPS position and has ADS-B Out enabled.
  - a. GPS signal can be verified on the **System > GPS Status** page.
  - b. ADS-B Out enablement can be verified by tapping the **XPDR** icon on the right side of the screen and then tapping **Menu** at the top left of the screen.
4. Using the transponder test set, make sure the following ADS-B Out parameters are being transmitted:
  - a. Aircraft emitter category is Light Airplane < 15,500 pounds (On the TR-220 this is indicated as "A1").
  - b. Aircraft Length documented in the aircraft Configuration Log.
  - c. Aircraft Width documented in aircraft Configuration Log.
  - d. 1090 ADS-B In Capability matches the configuration setting documented in the aircraft Configuration Log.
  - e. UAT (978) ADS-B In Capability matches the configuration setting documented in the aircraft Configuration Log.
5. Place the GNX 375 transponder into Ground Test Mode to simulate an airborne state.
6. On the GNX 375 **XPDR** page, set the mode to **Altitude Reporting**.
7. Using the transponders test set, make sure the following ADS-B Out parameters are being transmitted:
  - a.  $NAC_V > 1$
  - b.  $SDA > 2$
  - c.  $SIL > 3$
  - d.  $NAC_P > 8$
  - e.  $NIC > 7$
8. Cycle the GNX 375 power to disable Ground Test Mode.



## **9. SYSTEM RETURN TO SERVICE PROCEDURE**

### **9.1 Maintenance Records**

After conducting required return to service procedures in accordance with this document and updating aircraft records in accordance with this section and in compliance with 14 CFR 43.9 and 14 CFR 91.417, the aircraft may be returned to service.

Record the following information in the appropriate aircraft maintenance logs:

- Software versions loaded during maintenance
- Part and serial numbers of any LRU replaced
- Any other applicable information related to the maintenance work performed on the aircraft

Verify that replacement LRUs' software versions match those in the Configuration Log from Appendix A in the aircraft records.

## **APPENDIX A AIRCRAFT & INSTALLATION SPECIFIC INFORMATION**

This appendix contains the documentation required for recording the aircraft specific information including aircraft make, model, registration number, and serial number information. This appendix also includes the GPS 175/GNX 375 Configuration Log containing installation specific configuration settings.

## AIRCRAFT SPECIFIC INFORMATION

### GENERAL INFORMATION

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

---

#### AIRCRAFT

AIRCRAFT MAKE: \_\_\_\_\_

AIRCRAFT MODEL: \_\_\_\_\_

AIRCRAFT SERIAL #: \_\_\_\_\_

AIRCRAFT REG. #: \_\_\_\_\_

---

#### GPS 175/GNX 375

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

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

---

#### FLIGHT STREAM 510: [N/A]

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

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

---

#### GAE 12: [N/A]

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

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

---

**GPS 175/GNX 375 PART 23 CONFIGURATION LOG**

**SYSTEM INFORMATION**

**SOFTWARE VERSIONS**

**Main Board**

Software: \_\_\_\_\_ Boot Code: \_\_\_\_\_ FPGA: \_\_\_\_\_

**Touch Controller Board**

Software: \_\_\_\_\_ Boot Code: \_\_\_\_\_

**GPS WAAS Board**

Software: \_\_\_\_\_

**Transponder Board:**  [N/A]

Software: \_\_\_\_\_ Boot Code: \_\_\_\_\_ FPGA: \_\_\_\_\_

Audio: \_\_\_\_\_ Region List: \_\_\_\_\_ Configuration: \_\_\_\_\_

**SETUP MENU**

**INTERFACES – ARINC 429**

**RX Port 1:**  [N/A]

**TX Port 1**

Format: \_\_\_\_\_ Speed:  High  Low    Format: \_\_\_\_\_ Speed:  High  Low

**RX Port 2:**  [N/A]

Format: \_\_\_\_\_ Speed:  High  Low

**INTERFACES – RS-232 (RS-422)**

**Port 1:**

**Port 2:**

Format: \_\_\_\_\_    Format: \_\_\_\_\_

**Port 3:**  [N/A]

Format: \_\_\_\_\_

**INTERFACED EQUIPMENT**

**ADS-B SRC:**  [N/A]

**GDU:**

Selection:  Not Present     Present

LRU: \_\_\_\_\_

---

**SETUP MENU - CONTINUED**

---

**LIGHTING CONFIGURATION**

**Display Source:**  Photocell  Lighting Bus      **Keys Source:**  Photocell  Lighting Bus

**Display Minimum Level:** \_\_\_\_\_%      **Keys Minimum Level:** \_\_\_\_\_%

**Configure Photocell:**

**Response Time:** \_\_\_\_\_ sec      **Slope:** \_\_\_\_\_      **Offset:** \_\_\_\_\_

**Photocell Override:**

**Key Backlight Cutoff:** \_\_\_\_\_%      **Photocell Transition:** \_\_\_\_\_%

**Configure Lighting Bus:**

**Response Time:** \_\_\_\_\_ sec      **Slope:** \_\_\_\_\_      **Offset:** \_\_\_\_\_

**Lighting Bus:**  14V DC     28V DC     5V DC     5V AC

---

**GPS ANTENNA OFFSET**

**Antenna Height:**

**Height above ground:** \_\_\_\_\_ FT

**Lateral Offset:**

**Offset:** \_\_\_\_\_ FT      **Direction:**  Right  Left

**Longitudinal Offset:**

**Offset from nose:** \_\_\_\_\_ FT

---

**MAIN INDICATOR (ANALOG)**

**Selected course:**  Allowed     Ignored

---

**AHRS**

**Display Orientation:**  Unknown     Aft     Up

**Yaw Offset:** \_\_\_\_\_ °

---

**SETUP MENU - CONTINUED**

**MAIN SYSTEM**

**Air/Ground Threshold:** \_\_\_\_\_ KT      **System ID:** \_\_\_\_\_  
**Fuel Type:**  AV Gas    Jet A    Jet B      **GPS Select:**  Auto    Prompt  
**RF PROC Legs:**  Enabled    Disabled      **Terrain Alerts:**  Enabled    Disabled  
**Graphical Edit:**  Enabled    Disabled      **Composite CDI:**  Enabled    Disabled  
**Bluetooth:**       Enabled    Disabled      **External FPL:**       Enabled    Disabled  
**ADS-B Logging:**  [N/A]    Enabled    Disabled

**XPDR – SENSORS**

**Alt Sensor:**  None    Gillham    GAE  
**OAT Sensor:**    Enabled    Disabled  
**Squat Installed:**  Enabled    Disabled  
**Squat On Ground:**  [N/A]    Open    Ground (0V)

**XPDR – AIRFRAME**

**Aircraft Category:** \_\_\_\_\_  
**Aircraft Width:** <= \_\_\_\_\_ Meters      **Aircraft Length:** <= \_\_\_\_\_ Meters  
**Max Airspeed:** <= \_\_\_\_\_ KT      **Stall Speed:** \_\_\_\_\_ KT

**XPDR – OPTIONS**

**1090 ES Out Control:**  Always Disable    Always Enable    Pilot Controlled  
**Automatic Moding:**    Enabled    Disabled

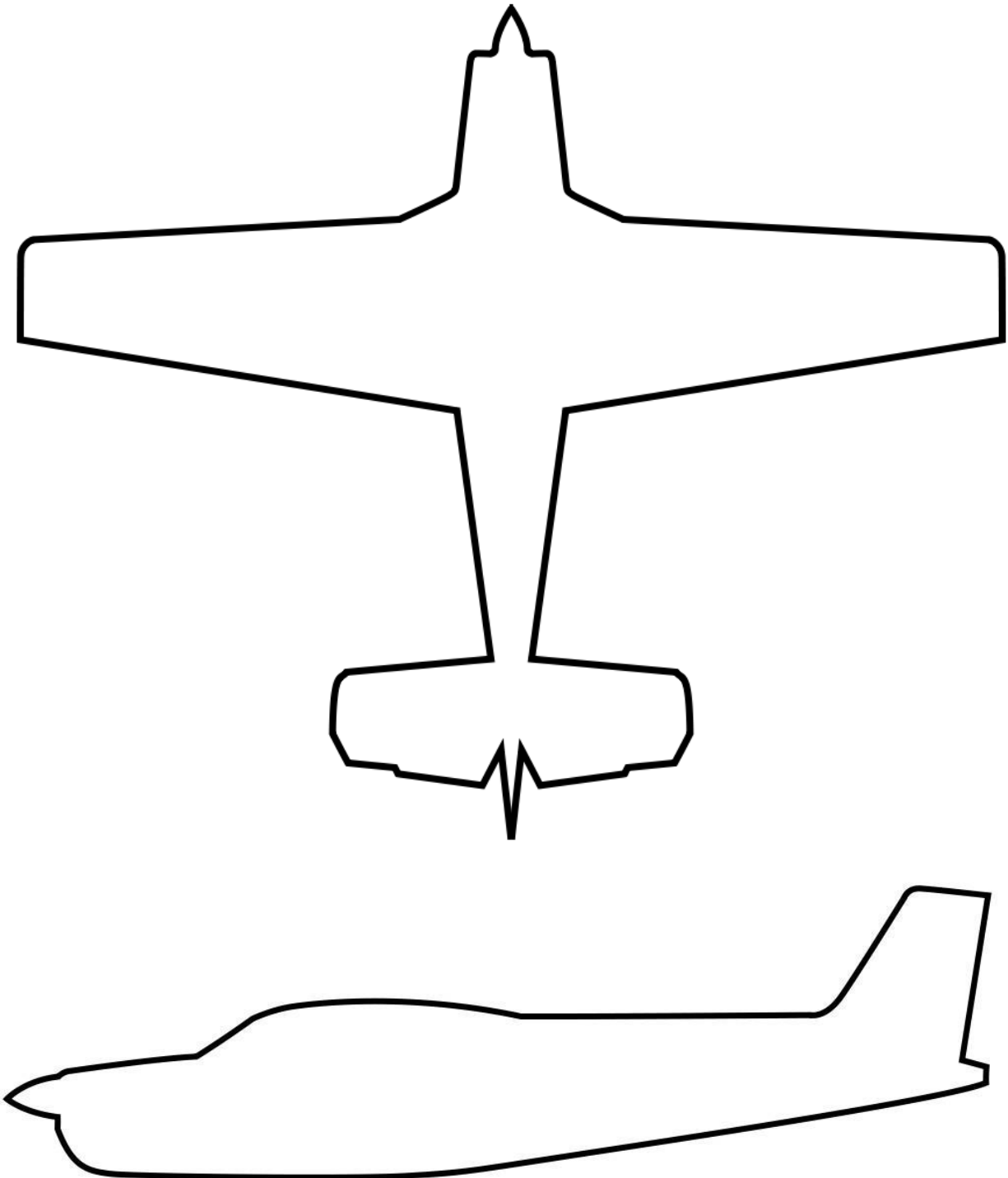
**XPDR – FLIGHT ID**

**Aircraft Registration:** \_\_\_\_\_      **ICAO Address:** \_\_\_\_\_  
**Default Flight ID:**  [N/A] \_\_\_\_\_      **VFR Squawk Code:** \_\_\_\_\_

## Wire Routing

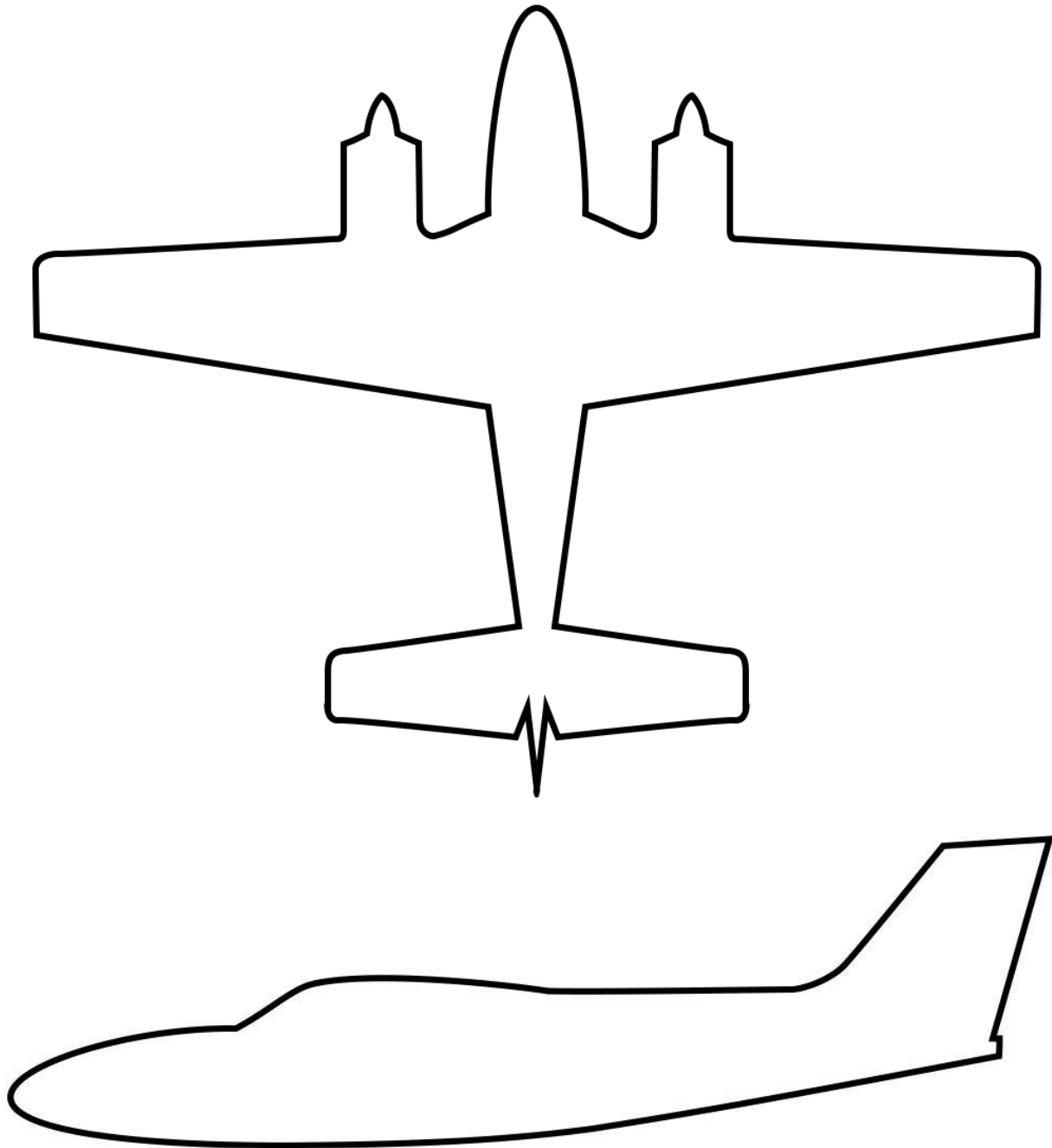
### Single Engine

The following diagram depicts approximate location of all LRUs and antenna(s) along with the wire routing for the GPS 175/GNX 375 throughout the aircraft structure for a single-engine aircraft.



## Twin Engine

The following diagram depicts approximate location of all LRUs and antenna(s) along with the wire routing for the GPS 175/GNX 375 throughout the aircraft structure for a twin-engine aircraft.





## Aircraft Wiring Diagrams

Attach the aircraft wiring diagrams showing the equipment installed by this STC or a markup of the interconnect diagrams from the STC installation manual detailing which equipment was installed and how it was connected.



### NOTE

*Electrical loads for equipment installed by this STC are listed in the GPS 175 Part 23 AML STC Installation Manual and GNX 375 Part 23 AML STC Installation Manual.*

Check all that apply and add a brief description of the location.

### SPLITTER

**Included in Installation:**  Yes  No

Description of Location:

### DIPLEXER

**Included in Installation:**  Yes  No

Description of Location: