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Flight Stream 110/210 TSO Installation Manual

At Garmin, we value your opinion. For comments about this guide, please email Techpubs.Salem@garmin.com. For comments about Garmin aviation products, email Avionics@garmin.com.

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RECORD OF REVISIONS

Revision	Revision Date	Description
A	6/13/2014	Initial Release.
B	10/8/14	Added software update procedure.

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CURRENT REVISION DESCRIPTION

Section Number	Description of Change
1.4.3	Corrected Bluetooth Version.
3.3.2	Updated yaw, pitch, and roll mounting limitations.
4.4	Added software update procedures.

DOCUMENT PAGINATION

Section	Pagination
Table of Contents	iii through vi
Section 1	1-1 through 1-8
Section 2	2-1 through 2-3
Section 3	3-1 through 3-8
Section 4	4-1 through 4-1
Section 5	5-1 through 5-1
Section 6	6-1 through 6-2
Section 7	7-1 through 7-1
Section 8	8-1 through 8-1
Appendix A	A-1 through A-1
Appendix B	B-1 through B-7

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DEFINITIONS OF WARNINGS, CAUTIONS, AND NOTES

WARNING

Warnings indicate that immediate attention must be given to avoid potential equipment damage and personal injury should the instructions be disregarded.

CAUTION

Cautions indicate an alert to potential damage to the equipment if the procedural step is not directly followed.

NOTE

Notes indicate that additional information is required to explain the applicable step, providing further understanding as to the reason for that particular operation.

WARNING

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WARNING

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

HARDWARE MOD LEVEL HISTORY

The following table identifies hardware modification (Mod) Levels. Mod Levels are listed with the associated service bulletin number, service bulletin date, and the purpose of the modification. The table is current at the time of publication of this manual (see date on front cover) and is subject to change without notice. Authorized Garmin Sales and Service Centers are encouraged to access the most up-to-date bulletin and advisory information on the Garmin Dealer Resource web site at www.garmin.com using their Garmin-provided user name and password.

MOD LEVEL	SERVICE BULLETIN NUMBER	SERVICE BULLETIN DATE	PURPOSE OF MODIFICATION

1 GENERAL DESCRIPTION

1.1 Introduction

This manual is intended to provide physical, mechanical, and electrical information for use in the planning and design of a Flight Stream 110/210 unit installation into an aircraft. It is not a substitute for an approved airframe-specific maintenance manual, installation design drawing, or complete installation data package. Attempting to install equipment by reference to this manual alone and without first planning or designing an installation specific to your aircraft, is not recommended. The content of this manual assumes use by competent and qualified avionics engineering personnel and/or avionics installation specialists using standard aviation maintenance practices in accordance with Title 14 of the Code of Federal Regulations and other relevant accepted practices, and is not intended for use by individuals who lack the competencies set forth above.

For additional information, see section 1.6 Limitations.

> **NOTE**
>
> *Except where specifically noted, references made to Flight Stream will equally apply to the Flight Stream 110 and the Flight Stream 210.*

> **NOTE**
>
> *Features may vary due to the many configurations available.*

> **NOTE**
>
> *Garmin™ recommends installation of the Flight Stream units by a Garmin-authorized installer. To the extent allowable by law, Garmin will not be liable for damages resulting from improper or negligent installation of the Flight Stream units. For questions, contact Garmin Aviation Product Support at 1-888-606-5482.*

1.2 Equipment Description

The Flight Stream units bring Bluetooth® technology to the cockpit, allowing portable electronics to stream data to and from the installed avionics.

The Flight Stream 110 provides the following data from the listed wired interfaces to portable electronics using Bluetooth technology:

GDL 69

- SiriusXM Radio Volume/Channel Control
- XM WX Aviation Weather

GDL 88

- FIS-B Weather
- ADS-B Traffic
- GPS Position

The Flight Stream 210 includes all of the features of the Flight Stream 110, an internal AHRS and pressure sensor, as well as the following data from the listed wired interface to portable electronics, using Bluetooth technology:

GNS 430W/530W

- GPS Position
- Flight Plan Input/Output

GTN 6XX/7XX

- GPS Position
- Flight Plan Input/Output
- Attitude (forwarded from a G500/G600 system, when connected)

ARINC 429 Transmitters

- ARINC 429 Receiver

⚠️ **CAUTION**

Bluetooth devices and other non-aviation transmitters require separate authorization for use in an aircraft. If they are present, note interference from such devices may degrade the performance of the Flight Stream wireless remote system. The Flight Stream wireless remote system may also degrade the performance of other wireless transceiver systems which use Bluetooth or IEEE 802.11 operating in the same frequency band, though functional testing suggests these protocols are robust enough to maintain acceptable performance in the presence of the Flight Stream system.

Figure 1-1. Flight Stream Transceiver Unit View
(Flight Stream 210 shown)

🔺 **NOTE**

Flight Stream 210 looks identical to the Flight Stream 110, but includes a direction of flight sticker.

1.3 Interface Summary and Equipment

figure 1-2 shows a block diagram of the possible interfaces for the Flight Stream products.
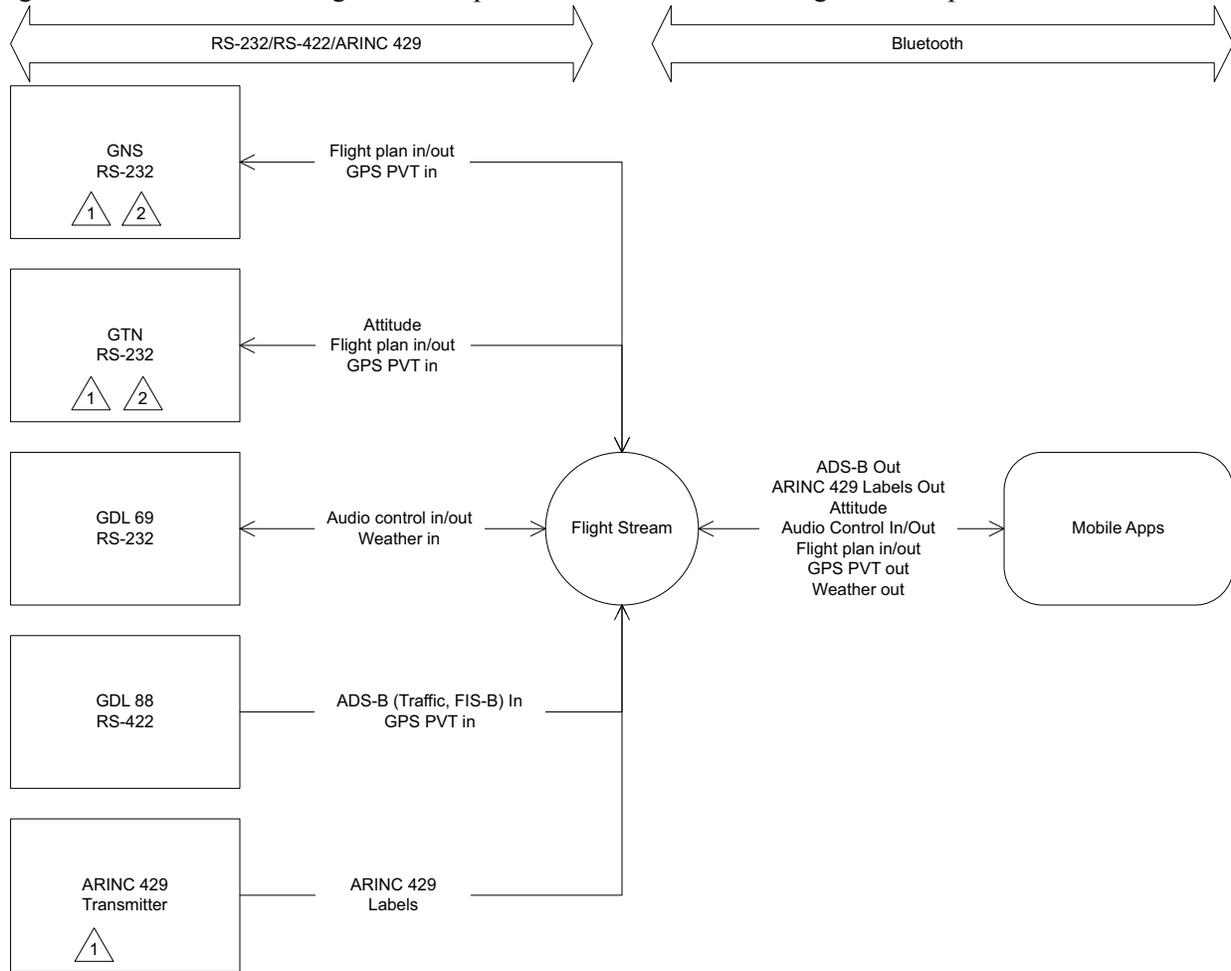
Figure 1-2. Flight Stream Interface Block Diagram

Notes:

⚠1. FLIGHT STREAM 210 ONLY

⚠2. THE FLIGHT STREAM 210 ONLY SUPPORTS A CONNECTION TO ONE GARMIN NAVIGATOR AT A TIME. IT IS RECOMMENDED TO CONNECT IT TO THE #1 NAVIGATOR OR THE GTN IN GTN/GNS INSTALLATIONS.

Table 1-1. Flight Stream Interfaces

Interface Description	Number of Ports
ARINC 429 In (Flight Stream 210 Only)	1
Bluetooth	N/A
RS-232 In/Out	3
RS-422 In/Out	1

Table 1-2. Flight Stream Interfaced Equipment List

Description	Software Version (or later FAA approved version)
GTN 6XX/7XX Navigator	5.10
GNS 400W Series Navigator	5.20
GNS 500W Series Navigator	5.20
GDL 88	3.00
GDL 69 [1]	3.30
GDU 620 [2]	7.00

[1] The Flight Stream must be connected to RS-232 Port 1 of the GDL 69.

[2] The Flight Stream does not directly interface to the GDU 620. However, attitude information may be forwarded from the GDU 620 through a GTN 6XX/7XX with GDU 620 software version 7.00.

1.4 Technical Specifications

The Flight Stream is TSO authorized under TSO-C157. It is the responsibility of those desiring to install this equipment either on or within a specific type of class of aircraft to determine the aircraft installation standards are within the prescribed standards. The following sections present general environmental specifications. For detailed specifications, refer to the Environmental Qualification Form.

1.4.1 Environmental Qualification Form (EQF)

It is the responsibility of the installing agency to obtain the latest revision of the Flight Stream EQF. For the latest EQF visit the Dealer Resource Center. The Flight Stream 110 and Flight Stream 210 use the same EQF.

The EQF is available directly from Garmin under the following name and part number:

Garmin Flight Stream 110/210 Environmental Qualification Form, P/N 005-00818-03.

1.4.2 Physical Characteristics

Table 1-3. Flight Stream Transceiver Dimensions

Characteristic	Specification
Width	2.74" (7.0 cm)
Height	0.92" (2.3 cm)
Length (excluding connector kit)	3.93" (10.0 cm)
Unit Weight (excluding connector kit)	0.156 lbs (0.07 kg)
Unit Weight (including connector kit)	0.27 lbs (0.12 kg)

1.4.3 General Specifications

Table 1-4. Flight Stream Transceiver Specifications

Flight Stream Transceiver Characteristics	Specification
Operating Temperature Range	-20° C to +70° C
Input Voltage Range	9.5 to 33.0 VDC
Software Compliance	RTCA DO-178B Level E
Environmental Compliance	RTCA DO-160F

Table 1-5. Bluetooth Specifications

Characteristics	Specification
Bluetooth Version	3.0
Bluetooth Class	2
Maximum Transmitter Power	4 dBm (2.5 mW)
Effective Unimpeded Range	33 feet (10 m)

1.4.4 Power Specifications

Table 1-6. Flight Stream Transceiver

Unit Status	Max Current @ 28 VDC	Max Current @ 14 VDC
On	50 mA	100 mA

NOTE

Circuits should be protected in accordance with guidelines in AC 43.13-1B, Chapter 11, Section 4.

1.5 Certification

The conditions and tests required for TSO approval of this article are minimum performance standards. It is the responsibility of those installing this article either on or within a specific type or class of aircraft to determine the aircraft installation conditions are within the TSO standards. TSO articles must have separate approval for installation in an aircraft. The article may be installed only in compliance under 14 CFR part 43 or the applicable airworthiness requirements.

1.5.1 TSO Compliance

The Flight Stream is TSO-C157 authorized as an incomplete system.

Table 1-7. TSO Compliance

TSO Function	TSO/SAE/RTCA/ EUROCAE	Applicable LRU SW P/Ns
XM Radio Weather Data	TSO-C157 DO-267A	006-B1779-00 through 006-B1779-( )

1.5.2 TSO Deviations

None.

1.5.3 Non-TSO Functions

The Flight Stream includes the following non-TSO functions.

Table 1-8. Non-TSO Functions

Function	Applicable SW P/N
Remote Audio Entertainment	006-B1779-00 through 006-B1779-( )
Conversion of serial data from the GDL 69 to Bluetooth wireless signals	

1.5.4 Design Assurance Levels

This device complies with DO-178B design assurance Level E.

1.5.5 Transmitter Grant of Equipment Authorization

FCC ID: IPH-02318
IC: 1312A-02318
IC M/N: GMN-01194

> **NOTE**
> *This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference which may cause undesired operation.*

> **NOTE**
> *This device does not contain any user-serviceable parts. Repairs should only be made by an authorized Garmin service center. Unauthorized repairs or modifications could result in permanent damage to the equipment, and void your warranty and your authority to operate this device under Part 15 regulations.*

Industry Canada Statement:

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil est conforme aux normes RSS sans licence d'Industrie Canada. Son fonctionnement est soumis aux conditions suivantes: (1) cet appareil ne doit pas causer d'interférences et (2) doit accepter toute interférence,y compris les interférences pouvant entraîner un fonctionnement indésirable de l'appareil.

European Union Declaration of Conformity:

"Hereby, Garmin, declares that this Flight Stream product is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC. To view the full Declaration of Conformity, see the Garmin Web site for your Garmin product: www.garmin.com".

1.6 Limitations

1.6.1 Operation

The optional Flight Stream wireless remote system has been tested for interference. Its operation must not interfere with the proper operation of any required aircraft equipment or systems. The installation requires the installer to verify there is no interference using the post-installation check-out procedure, see section 4.

1.6.2 Installation

For preservation of essential equipment in aircraft with multiple power busses, the Flight Stream should be powered from a non-essential bus.

1.7 Reference Documents

The following publications are sources of additional information for installing the Flight Stream wireless remote system. Before installing the Flight Stream, the technician should read all referenced materials applicable to the installation along with this manual.

Table 1-9. Referenced Publications

Document	P/N
FAA Advisory Circular, *Acceptable Methods, Techniques, and Practices – Aircraft Inspection and Repair*	FAA AC 43.13-1B
FAA Advisory Circular, *Acceptable Methods, Techniques, and Practices – Aircraft Alterations*	FAA AC 43.13-2B
GDL 69 Series TSO Installation Manual	190-00355-07
GDL 88 TSO Installation Manual	190-01122-00
GNS 400W Series Installation Manual	190-00356-08
GNS 500W Series Installation Manual	190-00357-08
GTN 625/635/650 TSO Installation Manual	190-01004-02
GTN 725/750 TSO Installation Manual	190-01007-02

2 INSTALLATION OVERVIEW

2.1 Introduction

This section provides the equipment information for installing the Flight Stream and related optional accessories. Installation of the Flight Stream should follow the data detailed in this manual. Cabling is typically fabricated by the installing agency to fit each particular aircraft. Always follow acceptable avionics installation practices per advisory circulars AC 43.13-1B and AC 43.13-2B or later FAA approved revisions.

2.1.1 Unit Configurations

The Flight Stream is available with the following part numbers.

Table 2-1. Units and Part Numbers

Model	Unit P/N	Unit Only	Kit P/N
Flight Stream 110	011-03257-00	010-01194-00	010-01194-01
Flight Stream 210	011-03257-40	010-01194-40	010-01194-41
Connector Kit	011-03258-00	N/A	N/A

2.2 Installation Material Required but Not Supplied

The Flight Stream units are intended for use with standard aviation accessories. The following items are required for installation but not supplied:

- Wire (MIL-W-22759/16 or MIL-W-22759/18 or equivalent). If MIL-W-22759/18 wire is utilized, extra care must be taken to adequately support and protect the wiring due to its thinner insulation.
- Shielded Wire (MIL-C-27500 cable utilizing M22759/18 wire (TG) or ETFE jacket (14), or equivalent).
- Aircraft hardware for installation, including #6 screws, nuts/nutplates, washers, and rivets
- Push/Pull (manually resettable) Circuit Breaker
- Tie Wraps or Lacing Cord
- Ring Terminals (MS25036 or equivalent)
- Shield Terminators (MIL-S-83519 or equivalent)
- Silicon Fusion Tape (Garmin P/N 249-00114-00 or equivalent)
- Compatible portable electronic device (PED)
- Garmin Pilot™ App

2.3 Special Tools Required

Table 2-2. Pin Contact Numbers

Wire Gauge	15-pin connectors 20-24 AWG
Garmin P/N	336-00021-00
Military P/N	M39029/58-360

Table 2-3. Recommended Crimp Tools

| Wire Gauge | Hand Crimping Tool | 20-24 AWG | |
		Positioner	Insertion/Extraction Tool
Military P/N	M22520/2-01	M22520/2-09	M81969/1-04
Positronic	9507	9502-4	M81969/1-04
AMP	601966-1	601966-6	91067-1
Daniels	AFM8	K42	DAK95-22MB/ DRK95-22MB
Astro	615717	615725	M81969/1-04

> ⚠ **NOTE**
> *Non-Garmin part numbers shown are not maintained by Garmin and are subject to change without notice.*

2.4 Cabling and Wiring

Wiring should be installed in accordance with AC 43.13-1B Chapter 11. When wire separation cannot be achieved, the following issues should be addressed:

- The cable harness should not be located near flight control cables, high electrical capacity lines, or fuel lines.
- The cable harness should be located in a protected area of the aircraft.
- Do not route cable near high-energy sources.

See the interconnection diagrams in appendix B for the appropriate wiring. Once the cable assemblies have been made, attach the cable connector. Route the wiring bundle as appropriate. Avoid sharp bends.

For the Flight Stream, use 22 AWG wire for all connections including power/ground.

> ⚠ **CAUTION**
> *Check wiring connections for errors before connecting the 15-pin D-sub to the Flight Stream. Incorrect wiring could cause component damage.*

2.5 Mounting Requirements

The Flight Stream may be mounted in a pressurized or unpressurized location. To achieve optimal Bluetooth reception, mount the Flight Stream as close as possible to the cockpit.

3 INSTALLATION PROCEDURE

This section provides hardware equipment information for installing the Flight Stream. For interconnects with interfaced equipment, see appendix B.

3.1 Wiring Harness Installation

Allow adequate space for installation of cables and connectors. All electrical connections are made through a 15-pin D-sub connector provided by Garmin. Construct the wiring harness according to the information contained in this and the following sections. Cable lengths will vary depending upon installation.

1. Strip all wires going to the D-sub connectors 0.17".
2. Insert the wire into the pin and crimp with one of the recommended (or equivalent) crimping tools.
3. Insert the pin into the D-sub connector housing locations as specified by the interconnect drawing in appendix B.
4. Verify the pin is properly engaged into the connector by gently tugging on the wire.
5. Route and secure the cable run from the Flight Stream to the other units away from sources of electrical noise.

section 6 defines the electrical characteristics of all input and output signals. Required connectors and associated hardware are supplied with the connector kit. See appendix B for interconnect wiring diagrams.

3.2 Flight Stream Backshell Assembly and D-sub Connector

3.2.1 Flight Stream Connector Assembly

Table 3-1. Connector and Backshell Assembly

See figure 3-1	Description	Garmin P/N
1	Screw, 4-40x.187, FLHP100, SS/P with Nylon	211-63234-06
2	Cover, Backshell, Jackscrew	115-01079-00
3	Screw, 4-40x.375, PHP, SS/P with Nylon	211-60234-10
4	Clamp, Backshell, Jackscrew	115-01078-00
5	Backshell, Jackscrew, 15 Pin	125-00171-00
6	Conn, HD D-Sub, 15 Pin	330-00626-15

3.2.2   Backshell Assembly Procedure

The parts for the connector and backshell assembly for Flight Stream installations are listed in table 3-1 and shown in figure 3-1.
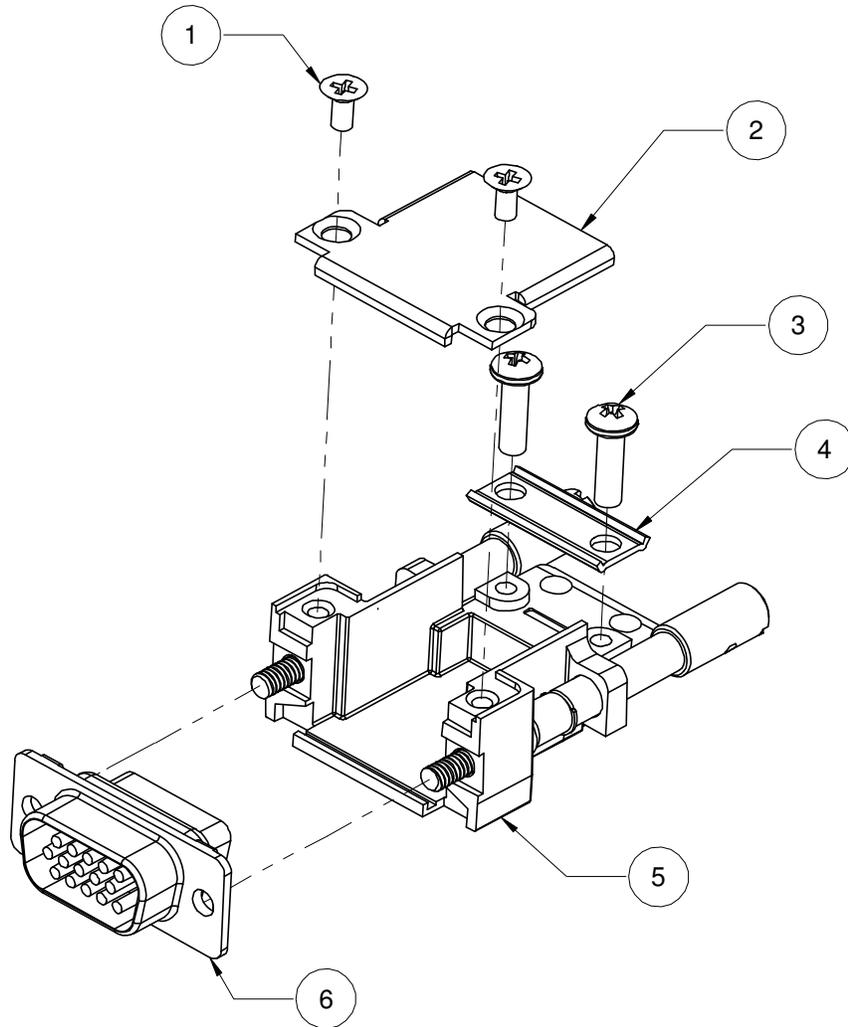

Figure 3-1. Connector and Backshell Assembly
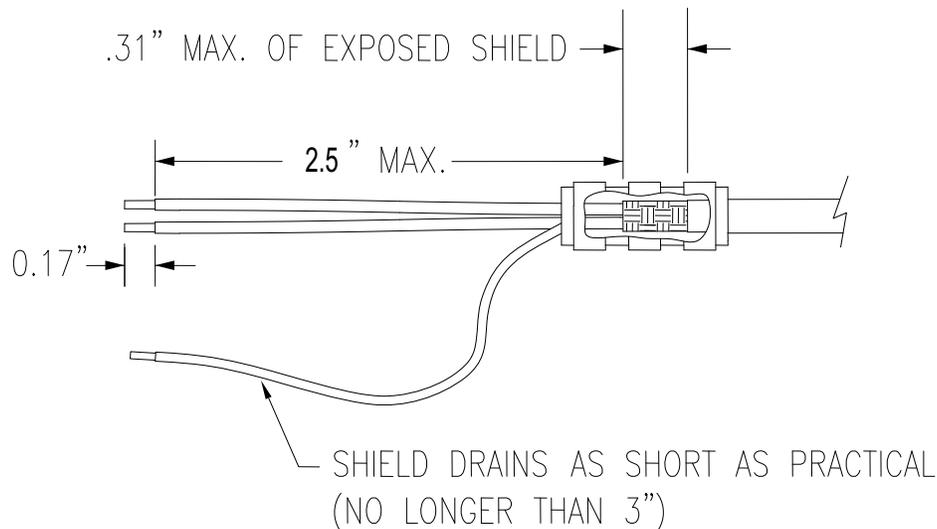
Figure 3-2. Shielded Cable Preparation

1. At the end of the shielded cable, strip back a 2.5" maximum length of the jacket to expose the braid. Remove this exposed braid. Carefully score the jacket 1/4" to 5/16" from the end and remove the jacket to leave the braid exposed.

> **NOTE**
>
> *Solder sleeves with pre-installed shield drains may be used instead of separate shield terminators and individual wires. Using solder sleeves with pre-installed lead effectively takes the place of step 7.*

2. Connect a 22 AWG wire to the exposed shield of the prepared cable assembly. AC 43.13 may be a helpful reference for termination techniques.

> **NOTE**
>
> *Solder Sleeves with pre-installed lead: A preferred solder sleeve is the Raychem S02 Series with the thermochromic temperature indicator. These solder sleeves come with a pre-installed lead. For detailed instructions on product use, refer to Raychem installation procedure.*

3. Slide a shield terminator onto the prepared cable assembly and connect the wire to the shield using a heat gun approved for use with solder sleeves. The chosen size of solder sleeve must accommodate both the number of conductors present in the cable and the wire to be attached.

4. Repeat steps 6 through 8 as needed for the remaining shielded cables.

NOTE

Each tapped hole on the shield block may accommodate only two ring terminals. It is preferred that a maximum of two wires be terminated per Ring Terminal. Two wires per ring terminal will necessitate the use of a ring terminal, #8, insulated, 14-16 AWG (MS25036-153). If only a single wire is left, or if only a single wire is needed for this connector a ring terminal, #8, insulated, 18-22 AWG (MS25036-149) can accommodate this single wire. If more wires exist for the connector than two per ring terminal, it is permissible to terminate three wires per ring terminal.

5. Terminate the ring terminals to the shield block by placing items on the pan head screw in the following order: split washer, flat washer, first ring terminal, second ring terminal if needed, before finally inserting the screw into the tapped holes on the shield block.

6. Wrap the cable bundle with silicone fusion tape (P/N 249-00114-00 or a similar version) at the point where the backshell strain relief, and cast housing will contact the cable bundle.

7. Place the smooth side of the backshell strain relief across the cable bundle and secure using the two screws.

WARNING

Placing the grooved side of the strain relief across the cable bundle may damage wires.

8. Attach the cover to the backshell using two screws.

3.3   Equipment Mounting

⚠️ **NOTE**

If mounting Flight Stream 210 in a pressurized location, disable the internal pressure sensor using the application on the connected portable electronic device (PED).

⚠️ **NOTE**

*Ensure the serial number located on the bottom of the unit is noted and saved for future reference.*

AVIONICS RACK
AFT OF BAGGAGE AREA
(Recommended on Smaller Aircraft Only)

FLOOR MOUNTED
BENEATH SEAT

FORWARD AVIONICS BAY (NOSE)

FLOOR MOUNTED
BENEATH SEAT

AFT AVIONICS BAY
(Recommended on Smaller Aircraft Only)
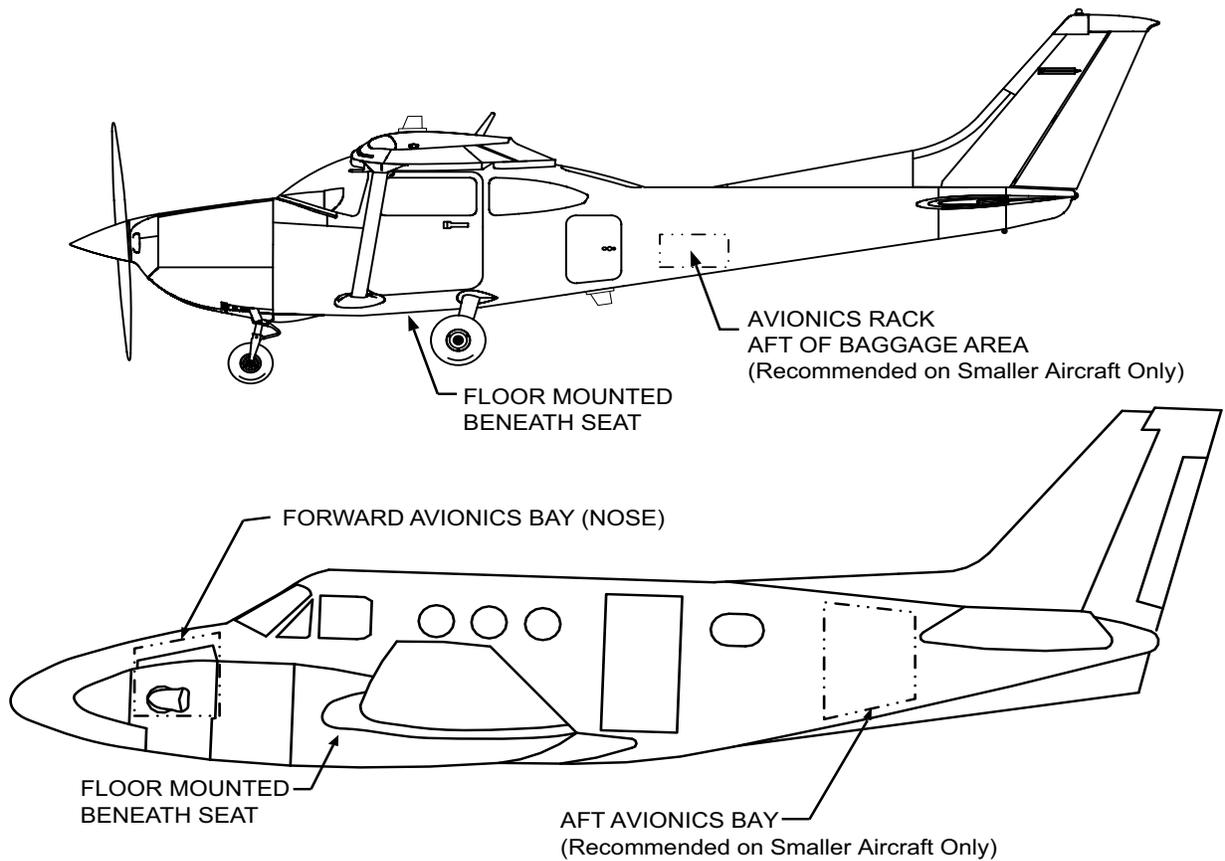
Figure 3-3. Suggested Mounting Locations

3.3.1 Flight Stream Mounting

The Flight Stream transceiver is mounted using four #6 pan head screws (MS35206, AN526, or equivalent) onto a solid surface. Install the Flight Stream in accordance with AC 43.13-2B Chapter 2. Torque fasteners until snug, plus 1/4 turn. Because the weight of the Flight Stream is only 0.27 lbs, the impact of the weight to the surrounding structure is negligible. The Flight Stream should be mounted inside the cabin to get better signal strength.

> ⚠️ **CAUTION**
>
> *Care should be taken when applying torque to the mounting screws of the Flight Stream 210. Excessive torque may damage the mounting flange.*

FLIGHT STREAM 110: P/N 011-03257-00

FLIGHT STREAM 210: P/N 011-03257-40

CONNECTOR KIT ASSEMBLY: P/N 011-03258-00
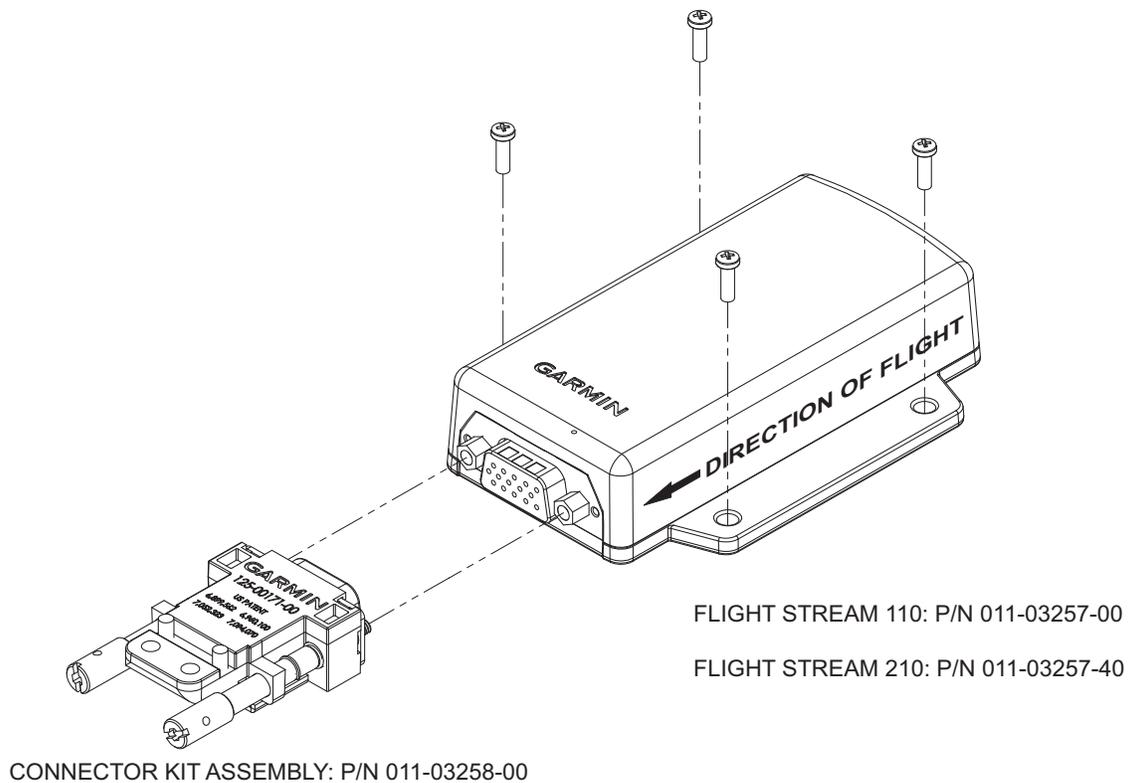
Figure 3-4. Flight Stream Mounting
(Flight Stream 210 with Direction of Flight Sticker Shown)

3.3.2 Flight Stream 210 with AHRS

The Flight Stream 210 contains an attitude and heading sensor so it must be mounted rigidly to the aircraft primary structure where vibration is minimized. Do not use shock mounting. Mounting in a vibration prone area may result in degraded accuracy. The Flight Stream can be mounted in any direction up to 180 degrees on the roll axis and up to and including 45 degrees from centerline for the pitch axis see figure 3-5 and figure 3-6 for details. The Flight Stream may be mounted offset from the aircraft center line but must be mounted with the connector pointed in the direction of flight to within 3 degrees of the yaw axis. The arrow symbol on the side of the unit points in the direction of flight. Failure to mount the Flight Stream with the connector pointed in the direction of flight will result in an AHRS error.

> ⚠️ **NOTE**
> *Errors less than 45 degrees in the pitch axis and less than 180 degrees in the roll axis can be zeroed out using the application cage function on the connected portable electronic device (PED). Errors in the yaw axis cannot be zeroed out.*
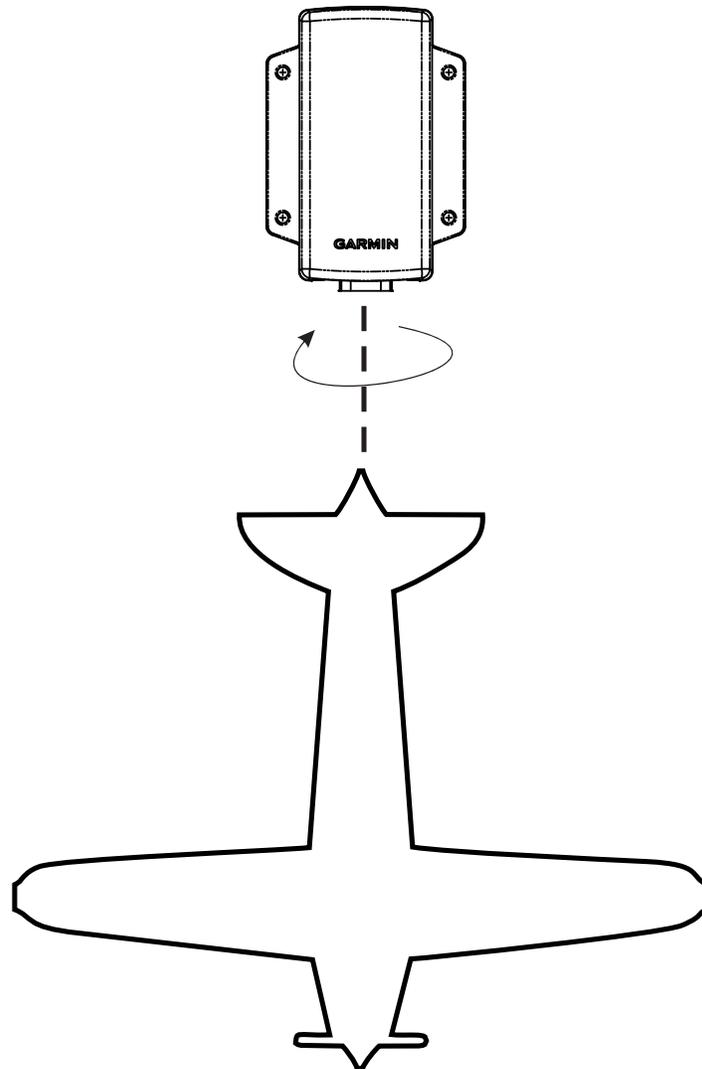

**Figure 3-5. Mounting Orientation
Roll Axis**
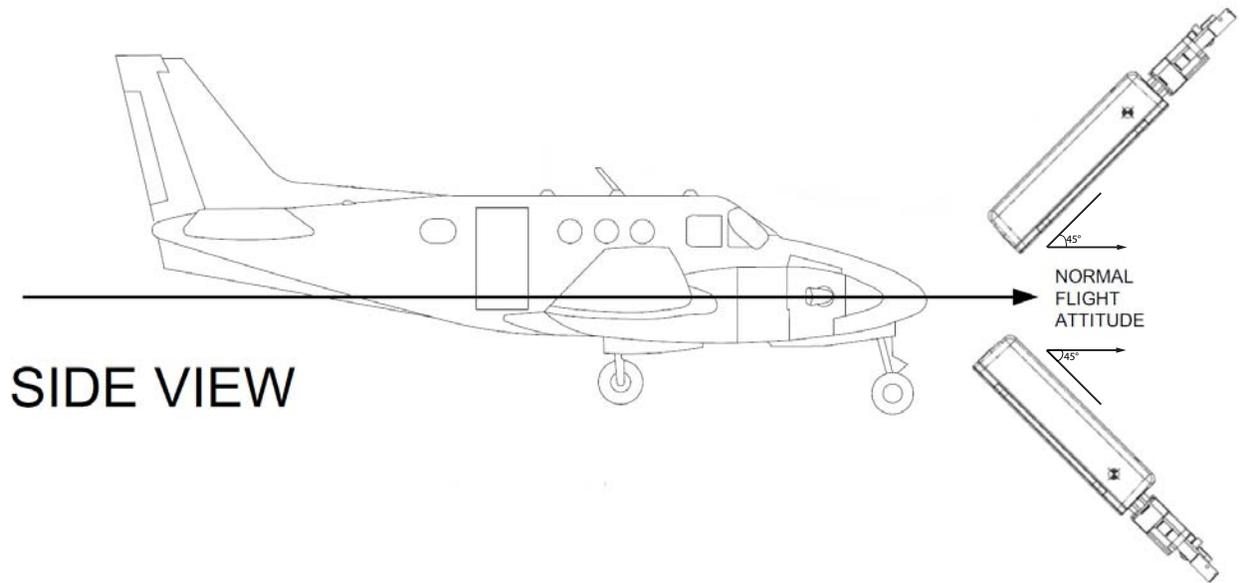
Figure 3-6. Mounting Orientation Side View
Pitch Axis

4 POST-INSTALLATION CONFIGURATION AND CHECKOUT

Once the Flight Stream has been installed, complete the checkout procedures herein to verify proper operation.

4.1 Mounting, Wiring, and Power Checks

Check that the Flight Stream is mounted rigidly. Do not connect Flight Stream to aircraft harness until the following checks have been performed:

1. **Flight Stream 210 only:** Check that the Flight Stream is mounted with arrow on side of unit pointing in the direction of flight.
2. Check that all cables are properly secured and shields are connected to the shield block of the connector. Check the movement of the flight and engine controls to verify there is no interference between the cabling and control systems. Check that all wiring is installed in accordance with section 3.1.
3. Prior to powering up the Flight Stream, check the wiring harness for point to point continuity to expose any faults such as shorting to ground. Any faults or discrepancies must be corrected before proceeding.
4. After accomplishing a continuity check, perform power and ground checks to verify proper power distribution to the Flight Stream. Any faults or discrepancies should be corrected at this time. Remove power from the aircraft upon completion of the harness checkout.

The Flight Stream connector can be plugged in after completion of the continuity and power checks.

4.2 Bluetooth Setup

1. When the Flight Stream device is powered on, the Flight Stream 110 will immediately go into pairing mode. When the Flight Stream 210 device is powered on, pairing mode won't be enabled until the Bluetooth configuration page is opened on the GTN or GNS (if GTN or GNS is connected) or one minute has elapsed (if a GTN or GNS is not connected).
2. Enable Bluetooth connectivity on the portable electronic device to be connected to the Flight Stream.
3. Select the Flight Stream from the list of available Bluetooth devices on the portable electronic device. The default Flight Stream Bluetooth name is "Flight Stream" followed by the three-digit model number (110 or 210) and then the last four digits of the MAC address (e.g. Flight Stream 210 4000).
4. A pop-up will appear on the screen asking the pilot to confirm the new Bluetooth pairing when the Flight Stream 210 is interfaced with a GTN or GNS. Flight Stream 110 installations, or Flight Stream 210 installations without a GTN or GNS, will automatically accept pairing requests.Bluetooth setup only needs to be run when pairing with a device for the first time. Once a connection is established with a Bluetooth device, the Flight Stream will automatically connect to the Bluetooth device upon power-up. The Flight Stream may be connected up to four Bluetooth devices simultaneously. The Flight Stream will also save up to twenty Bluetooth device pairings.

> ![note icon] **NOTE**
> *If having issues making a Bluetooth connection, reboot the Flight Stream device. Retry making a Bluetooth connection.*

4.3 Ground Checks

NOTE

A compatible PED with the Garmin Pilot Application is required to perform the ground checks.

1. Check that the Flight Stream is paired with Bluetooth Device.
2. Check that Attitude is displayed on Bluetooth device (Flight Stream 210 only).
3. Check that the Flight Stream is oriented correctly (Flight Stream 210 only).

    a) The GTN will forward attitude data from a G500/G600 system to the Flight Stream. For these installations, the AHRS breaker needs to be pulled to perform this check.

    b) With the wiring harness connected to the Flight Stream and the four, #6 screws removed, gently roll the Flight Stream to the left and to the right. Check that attitude matches roll on the portable electronic device.

    c) Mount Flight Stream with four #6 screws. Turn the fasteners until snug and torque an additional 1/4 turn.

    d) Push in AHRS circuit breaker.

4. Check that the Flight Stream has a GPS position fix from the navigator or GDL 88, if connected. (Aircraft must have a clear view of the sky.) A position fix is required to provide traffic and weather.
5. If the Flight Stream is wired to a GDL 69, check that the XM WX data is being received and displayed on the portable electronic device. (Aircraft must have a clear view of the sky.)
6. If the Flight Stream is wired to a GDL 69 and the Volume Lock discrete input is grounded, check that the SiriusXM Satellite Radio volume controls on the portable electronic device are not available or do not work.

4.4 Software Updates

> ⚠ **NOTE**
>
> *To perform software updates, a compatible PED with an active Dealer Mode subscription, and an active Garmin Pilot account, is required.*

> ⚠ **NOTE**
>
> *To perform the software update, Garmin Pilot version 7.10 or later, is required.*

To activate Dealer Mode, contact Aviation Product Support at (888) 606-5482. Request access to update Flight Stream firmware as a Garmin Dealer.

To update Flight Stream software, perform the following steps:

1. Connect to the Flight Stream device. See section 4.2 for details.
2. Open the Garmin Pilot application.
3. From the Home screen, select the **SETTINGS** key.
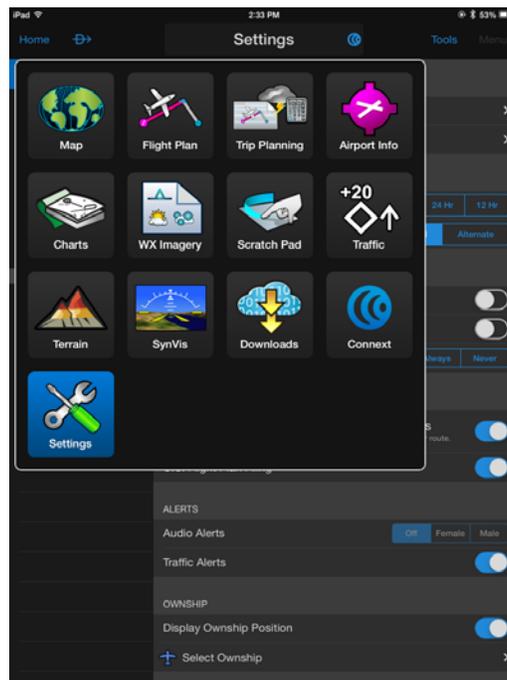
Figure 4-1. Garmin Pilot Home Screen

4. Verify **Dealer Mode** shows as an active subscription.
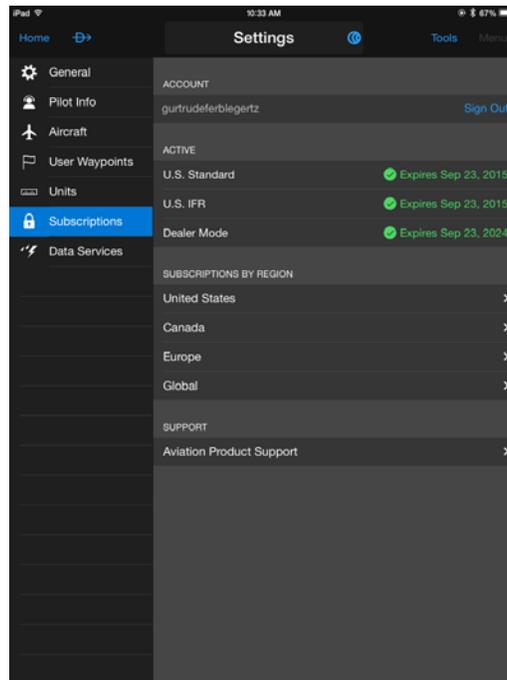
Figure 4-2. Garmin Pilot Settings Screen

5. Select the **HOME** key, then the **Connext** key, followed by the active Flight Stream device. Select **Check for Updates**.
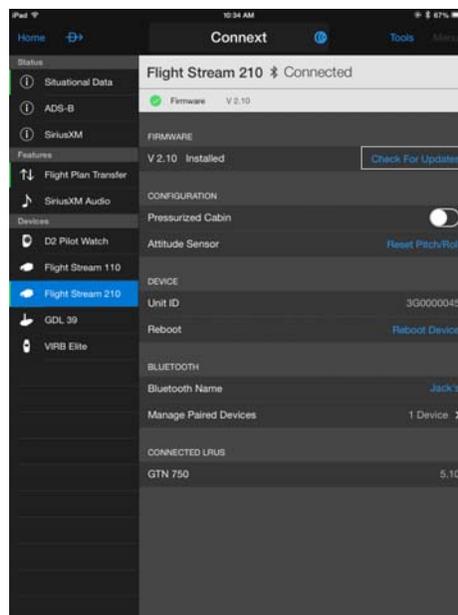
Figure 4-3. Garmin Pilot Connext Screen

6. If an update is available, a popup screen will display listing current options. Select **Update Now** or **Later** depending on your preference.
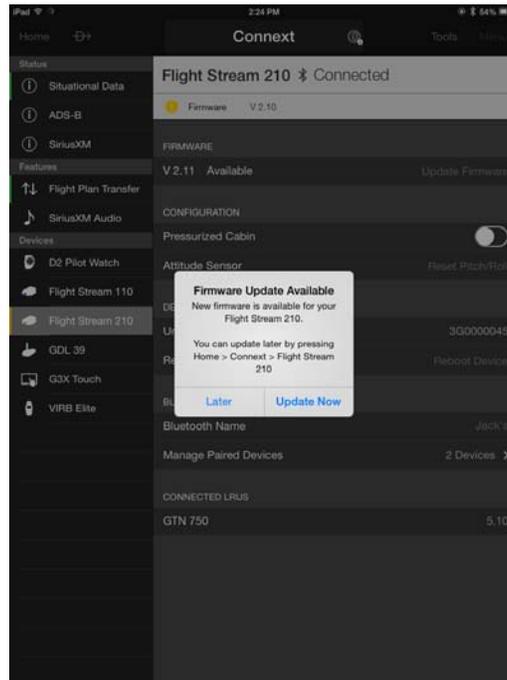

Figure 4-4. Firmware Update Popup

7. Select **Continue** and **Begin Firmware Update** on the following popup screens.

⚠ **NOTE**

Do not disconnect Flight Stream device while updating firmware.

The Flight Stream device will reboot once updated. Allow the Flight Stream device to reconnect to Garmin Pilot.

8. Verify the firmware version now displays the updated software version.
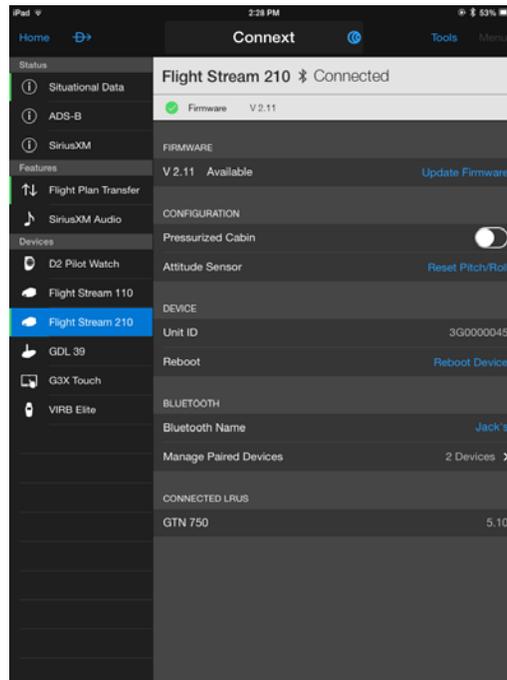
Figure 4-5. Updated Flight Stream

5 CONTINUED AIRWORTHINESS

5.1 Flight Stream 110

Maintenance of the Flight Stream 110 transceiver unit is on-condition.

5.2 Flight Stream 210

Maintenance of the Flight Stream 210 transceiver unit is on-condition.

6 CONNECTOR PINOUT INFORMATION

6.1 Flight Stream Pin Out List

View looking at connector on unit. Pin 1 is bottom left.
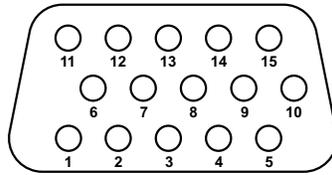
Table 6-1. Flight Stream Pin Out List

Pin #	Name	I/O
1	Volume Lock Discrete Input*	In
2	ARINC 429 RXA	In
3	ARINC 429 RXB	In
4	RS422 RXA	In
5	Aircraft Power	In
6	RS-232 TX3	Out
7	RS-232 RX3	In
8	RS-232 TX2	Out
9	RS-232 RX2	In
10	RS422 RXB	In
11	RS-232 TX1	Out
12	RS-232 RX1	In
13	RS422 TXA	Out
14	RS422 TXB	Out
15	Ground	--

An asterisk (*) following a signal name denotes the signal is an Active-Low, requiring a ground to activate. If there is no asterisk, the signal is an Active-High.

6.1.1 Power

The Flight Stream accepts input power from 9.5 to 33 VDC. The power input pins are connected to the aircraft power bus through a single circuit breaker. See appendix B for recommended power connections.

Table 6-2. Aircraft Power

Pin #	Name	I/O
5	Aircraft Power	In
15	Ground	--

6.1.2 RS-232 Port (Qty 3)

There are three RS-232 ports used to connect the Flight Stream to interfaced equipment.

Table 6-3. RS-232

Pin #	Name	I/O
6	RS-232 TX3	Out
7	RS-232 RX3	In
8	RS-232 TX2	Out
9	RS-232 RX2	In
11	RS-232 TX1	Out
12	RS-232 RX1	In

6.1.3 RS-422 Port (Qty 1)

The Flight Stream has one RS-422 port used to connect the Flight Stream to interfaced equipment.

Table 6-4. RS-422

Pin #	Name	I/O
4	RS422 RXA	In
10	RS422 RXB	In
13	RS422 TXA	Out
14	RS422 TXB	Out

6.1.4 ARINC 429 Port (Qty 1)

The Flight Stream 210 has one ARINC 429 port to connect to interfaced equipment.

Table 6-5. ARINC 429

Pin #	Name	I/O
2	ARINC 429 RXA	In
3	ARINC 429 RXB	In

6.1.5 Volume Lock

The volume lock discrete input is used to disable the volume controls of the portable electronic device. When this input is Active Low (i.e. grounded when active, and open otherwise) the volume up, volume down, and mute features are disabled. All other features of the Flight Stream remain functional. Each input presents a load of greater than 10 kΩ.

Table 6-6. Discrete Inputs

Pin #	Name	I/O
1	Volume Lock Discrete Input*	In

An asterisk (*) following a signal name denotes the signal is an Active-Low, requiring a ground to activate. If there is no asterisk, the signal is an Active-High.

7 TROUBLESHOOTING

Table 7-1. Flight Stream Troubleshooting Guide

| Problem	Action
Flight Stream Not Found	Check Flight Stream wiring and power.
	Check that Flight Stream is not mounted behind RF blocking material (i.e. bulkhead).
	Change mounting location of Flight Stream per recommendation in section 2.5.
	Check that the control/display is in RF range of the Flight Stream.
	Check that pairing mode is enabled see section 4.2 for more information.
Flight Stream Connection Lost	Check that the control/display is in RF range of the Flight Stream.
	Check Flight Stream is not mounted behind RF blocking material (i.e. bulkhead).
	Change mounting location of Flight Stream, per recommendation in section 2.5.
	Remove the Bluetooth pairing from the portable electronic device and the Flight Stream (if Flight Stream 210 is connected to a display), and then attempt to pair the device again.
Flight Stream Attitude Behavior Appears Backwards (Flight Stream 210 only)	Check that Flight Stream is mounted with arrow pointing in direction of flight.

APPENDIX A   OUTLINE AND INSTALLATION DRAWING
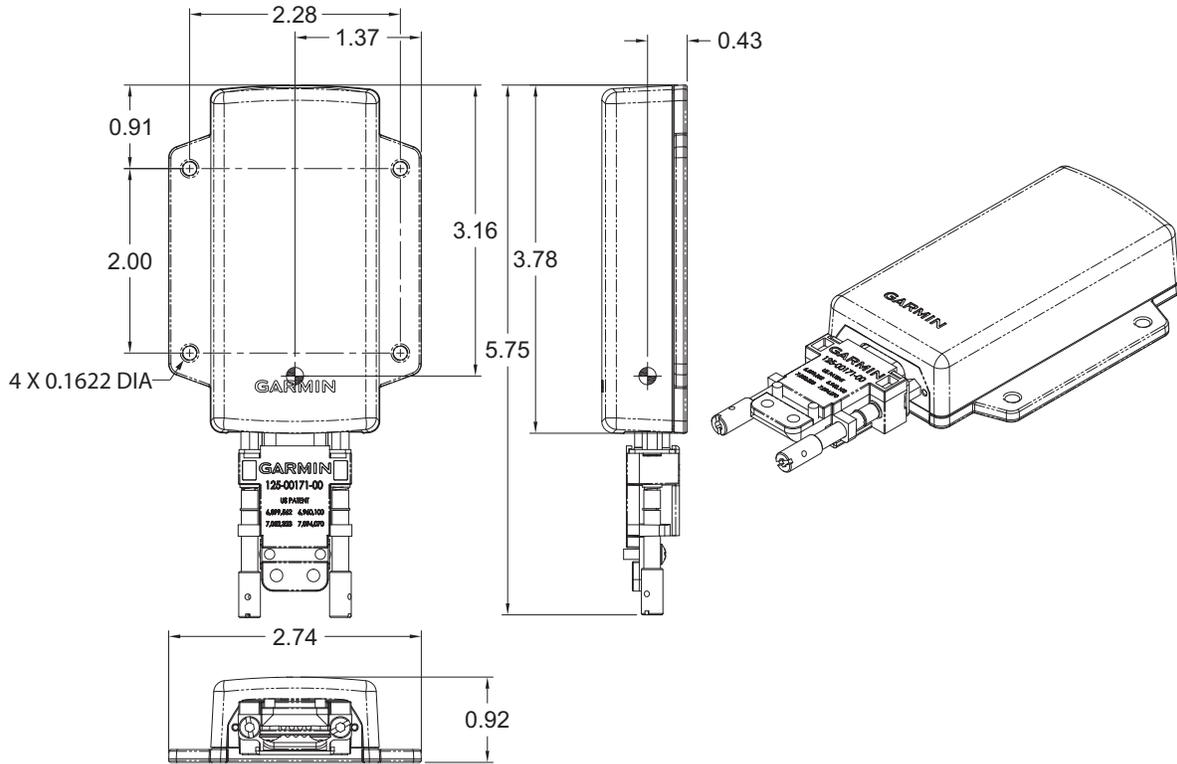
Figure A-1. Flight Stream Transceiver Dimensions

APPENDIX B   INTERCONNECT DRAWINGS

Figure B-1. Flight Stream 110/210 - Power Interconnect
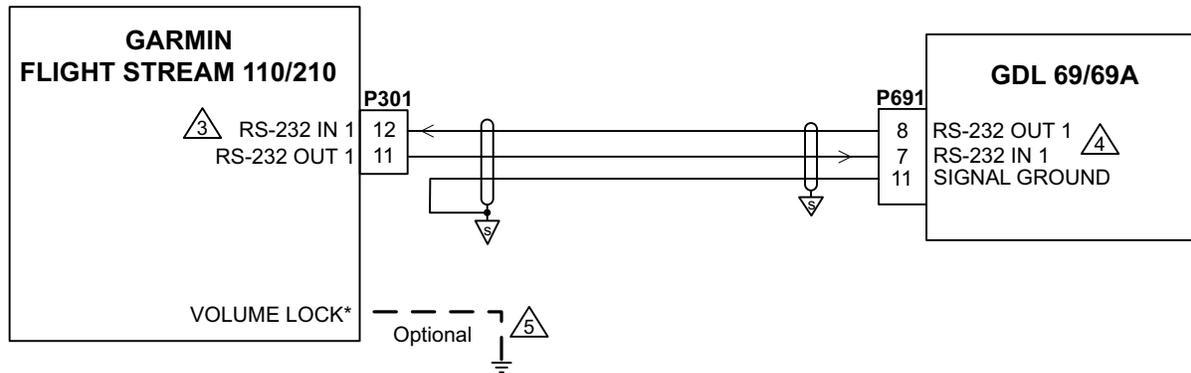
NOTES

1. CIRCUIT BREAKER SHOULD BE LABELED AS SHOWN.
2. GROUND DESIGNATIONS: ⬇ SHIELD BLOCK GROUND ⏚ AIRFRAME GROUND

Figure B-2. Flight Stream - GDL 69/69A Interconnect
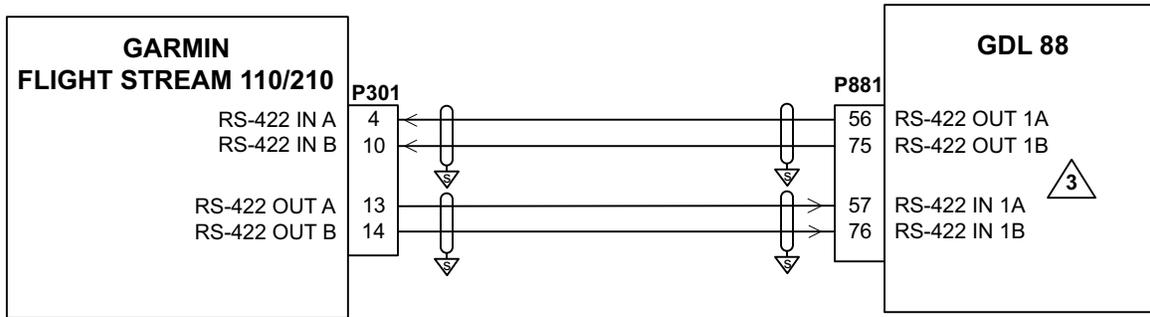
NOTES

1   ALL WIRES 22 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.

2   GROUND DESIGNATIONS: ⊽ₛ SHIELD BLOCK GROUND ⏚ AIRFRAME GROUND

3   ANY RS-232 PORT MAY BE CONNECTED IN LIEU OF THESE PORTS. SEE SECTION 6.1.2 FOR ADDITIONAL DETAILS.

4   THE FLIGHT STREAM MUST BE CONNECTED TO GDL 69/69A RS-232 PORT 1.

5   THE VOLUME LOCK DISCRETE MAY OPTIONALLY BE CONNECTED OR SWITCHED TO GROUND. THIS WILL FORCE THE FLIGHT STREAM TO IGNORE SIRIUSXM SATELLITE RADIO VOLUME COMMANDS FROM WIRELESS DEVICES.

NOTES

1. ALL WIRES 22 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.

2. GROUND DESIGNATIONS: ⟱ SHIELD BLOCK GROUND ⏚ AIRFRAME GROUND

3. ANY RS-422 PORT MAY BE CONNECTED IN LIEU OF THESE PORTS. FOR ADDITIONAL DETAILS, REFER TO THE GDL 88 INSTALLATION MANUAL, PART NUMBER 190-01122-00.

**Figure B-3. Flight Stream - GDL 88 Interconnect**
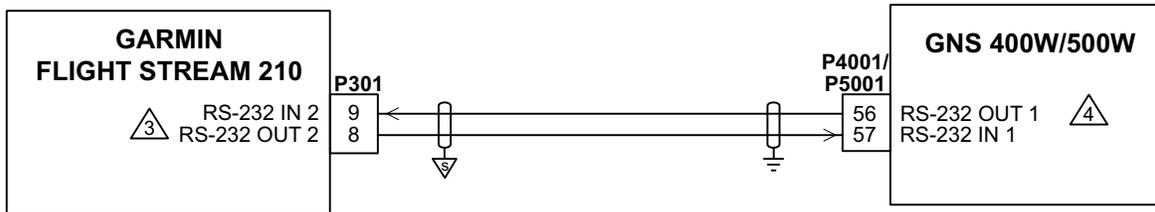
NOTES

1. ALL WIRES 22 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.

2. GROUND DESIGNATIONS: ⏚ SHIELD BLOCK GROUND ⏚ AIRFRAME GROUND

3. ANY RS-232 PORT MAY BE CONNECTED IN LIEU OF THESE PORTS. FOR ADDITIONAL DETAILS, SEE TABLE 6-3.

4. ANY RS-232 PORT MAY BE CONNECTED IN LIEU OF THESE PORTS. REFER TO THE GNS 400W AND GNS 500W INSTALLATION MANUALS, PART NUMBERS 190-00356-08 AND 190-00357-08 RESPECTIVELY, FOR RS-232 SETTINGS.

5. THE FLIGHT STREAM 210 ONLY SUPPORTS A CONNECTION TO ONE GARMIN NAVIGATOR AT A TIME. IT IS RECOMMENDED TO CONNECT IT TO THE #1 NAVIGATOR OR THE GTN IN GTN/GNS INSTALLATIONS.

**Figure B-4. Flight Stream 210 - GNS Interconnect**
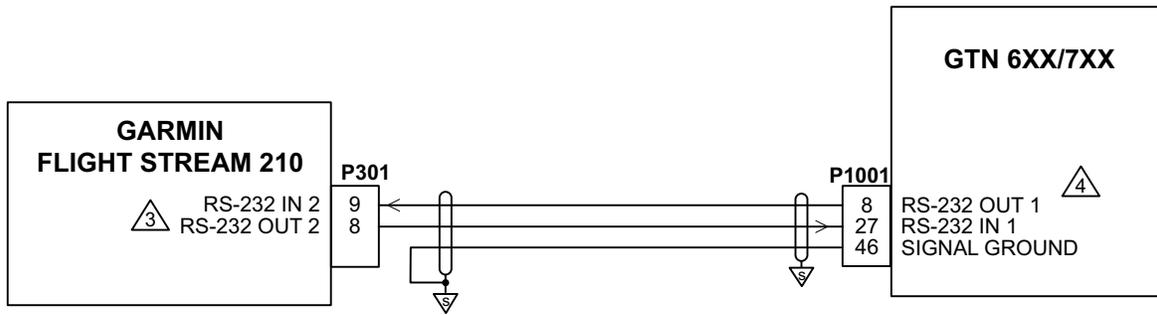
NOTES

1 ALL WIRES 22 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.

2 GROUND DESIGNATIONS: ⏚ SHIELD BLOCK GROUND ⏚ AIRFRAME GROUND

3 ANY RS-232 PORT MAY BE CONNECTED IN LIEU OF THESE PORTS. SEE TABLE 6-3 FOR RS-232 SETTINGS.

4 ANY RS-232 PORT MAY BE CONNECTED IN LIEU OF THESE PORTS. REFER TO THE GTN INSTALL MANUAL FOR RS-232 SETTINGS.

5 THE FLIGHT STREAM 210 ONLY SUPPORTS A CONNECTION TO ONE GARMIN NAVIGATOR AT A TIME. IT IS RECOMMENDED TO CONNECT IT TO THE #1 NAVIGATOR OR THE GTN IN GTN/GNS INSTALLATIONS.

Figure B-5. Flight Stream 210 - GTN 6XX/7XX Interconnect
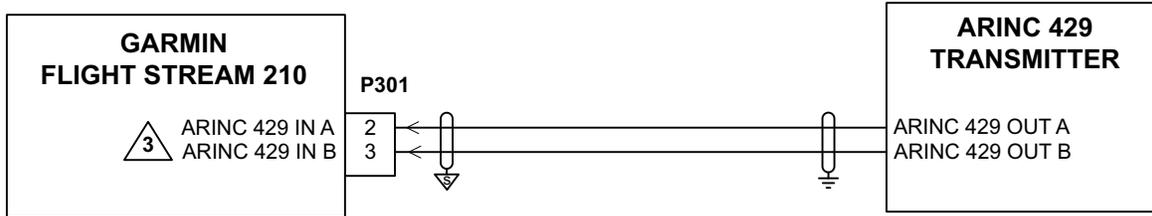
NOTES

1   ALL WIRES 22 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.

2   GROUND DESIGNATIONS: ⩒ SHIELD BLOCK GROUND ⏚ AIRFRAME GROUND

/3\ THE FLIGHT STREAM 210 WILL PASS THROUGH ARINC 429 LABELS RECEIVED ON THIS PORT TO WIRELESS DEVICES.

4   THE FLIGHT STREAM 210 SUPPORTS BOTH HIGH AND LOW SPEED ARINC 429 CONNECTIONS ON THE ARINC 429 INPUT PORT. THE FLIGHT STREAM WILL AUTO-DETECT THE SPEED. NO CONFIGURATION IS NECESSARY.

Figure B-6. Flight Stream 210 - ARINC 429 Interconnect