GPS 175 TSO Installation Manual

190-02207-00 January 2020 Revision 3

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Revision Record

REVISION	REVISION DATE	CHANGE DESCRIPTION
1	02/01/2019	Initial release of document.
2	02/27/2019	Updated first deviation of TSO-C195b.
3	01/23/2020	Updates for software version 3.10 and other minor edits.

Current Revision Description

SECTION	CHANGE DESCRIPTION
Page iv	Added warning about lithium battery disposal.
1.1	Added deviations to TSO-C157b in table 1-5 “TSO Deviations.”
2.1	Added “GI 275” to table 2-1 “Compatible Garmin Devices.”
2.1	Added “GI 275” to figure 2-1 “System Interfaces.”
7.4.1	Updated figure 7-8 “Interfaced Equipment Page” for the addition of the GI 275.
7.4.1	Added “GI 275” subsection.
7.4.3	Added “ALT SRC Input” to table 7-9 “Main System Selections.”
7.8	Added information about enabling auto reconnect.
7.9	Added information about enabling auto reconnect.
8.1.5	Added “Lighting Bus Interface Check” section.
11	Added figure 11-12 “GI 275 Interconnect.”
11	Updated figure 11-20 “GTX 3X/3XX/3000.”

Manual Layout

The aim of this installation manual is to provide clear and concise guidance in a layout designed to follow the logical order of a typical installation.

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Definitions of Warnings, Cautions, and Notes

WARNING
A WARNING MEANS INJURY OR DEATH IS POSSIBLE.

CAUTION
A CAUTION MEANS THAT DAMAGE TO THE EQUIPMENT IS POSSIBLE.

NOTE
A note provides more information.

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WARNING
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WARNING
THIS PRODUCT CONTAINS A LITHIUM BATTERY THAT MUST BE RECYCLED OR DISPOSED OF PROPERLY. BATTERY REPLACEMENT AND REMOVAL MUST BE PERFORMED BY A GARMIN-AUTHORIZED PROFESSIONAL SERVICES.

CAUTION
TAKE PRECAUTIONS TO PREVENT ELECTROSTATIC DISCHARGE (ESD) WHEN HANDLING THE UNIT, CONNECTORS, AND ASSOCIATED WIRING. ESD CAN DAMAGE THE UNIT. ESD DAMAGE CAN BE PREVENTED BY TOUCHING AN OBJECT OF THE SAME ELECTRICAL POTENTIAL AS THE UNIT BEFORE HANDLING THE UNIT ITSELF.

CAUTION
CLEAN THE DISPLAY WITH A CLEAN, LINT-FREE CLOTH AND A CLEANER THAT IS SAFE FOR ANTI-REFLECTIVE COATINGS. THIS UNIT HAS A SPECIAL ANTI-REFLECTIVE COATED DISPLAY THAT IS SENSITIVE TO SKIN OILS, WAXES, AND ABRASIVE CLEANERS. CLEANERS CONTAINING AMMONIA WILL HARM THE ANTI-REFLECTIVE COATING.

Acronyms and Initialisms

A	
ADC	Air Data Computer
ADS-B	Automatic Dependent Surveillance - Broadcast
ADS-R	Automatic Dependent Surveillance Rebroadcast
AFM	Aircraft Flight Manual
AGL	Above Ground Level
AHRS	Attitude Heading Reference System
API	Appliance Project Identifier
ASA	Aircraft Surveillance Applications
C	
CDI	Course Deviation Indicator
CDTI	Cockpit Display of Traffic Information
CDU	Control and Display Unit
CFR	Code of Federal Regulation
D	
DC	Direct Current
DME	Distance Measuring Equipment
E	
EAR	Export Administration Regulations
EFIS	Electronic Flight Instrument System
ETSO	European Technical Standard Order
F	
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
FDE	Fault Detection and Exclusion
FIS-B	Flight Information Services-Broadcast
FLTA	Forward looking Terrain Avoidance
FSK	Frequency Shift Keying
G	
GA	Go Around
GAD	Garmin Adapter
GAE	Garmin Altitude Encoder
GDC	Garmin Air Data Computer
GDL	Garmin Data Link
GDU	Garmin Display Unit
GMA	Garmin Marker/Audio

G	
GNS	Garmin Navigation System
GNSS	Global Navigation Satellite System
GNX	Garmin Navigator-Transponder
GP	Glide Path
GPS	Global Positioning System
GRS	Garmin Reference System
GTP	Garmin Temperature Probe
GTX	Garmin Transponder
H	
HSDB	High Speed Data Bus
HSI	Horizontal Situation Indicator
I	
ICAO	International Civil Aviation Organization
IFR	Instrument Flight Rules
L	
LOC	Localizer
LOI	Loss of Integrity
LRU	Line Replaceable Unit
M	
MFD	Multi-Function Display
MSL	Mean Sea Level
MSR	Message Success Rate
N	
NEXRAD	Next-Generation Radar
O	
OAT	Outside Air Temperature
OBS	Omni-Bearing Selector
OEM	Original Equipment Manufacturer
P	
PED	Portable Electronic Device
P/N	Part Number
PPM	Parts Per Million
PVT	Position, Velocity, and Time
R	
RAIM	Receiver Autonomous Integrity Monitoring
RAM	Random Access Memory

S	
SBAS	Satellite-Based Augmentation System
SBS	Surveillance and Broadcast Service
SD	Secure Digital (card)
SURF	Surface Situation Awareness
T	
TC	Type Certificate
TCAS	Traffic Alert and Collision Avoidance System
TFR	Temporary Flight Restriction
TIS-B	Traffic Information Service Broadcast
TNC	Threaded Neill-Concelman
TSO	Technical Standard Order
U	
UTC	Universal Time Coordinated
V	
VOR	Very High Frequency Omni-directional Range
W	
WAAS	Wide Area Augmentation System

1 Declaration of Design and Performance

NOTE

Garmin recommends installation by a Garmin-authorized installer. Garmin is not liable for damages resulting from improper or negligent installation to the extent permitted by law.

This section contains the definition and statement of compliance of the GPS 175. This section is written in accordance with EASA Commission Regulation (EU) No 748/2012 dated 3 August 2012.

This installation manual provides mechanical and electrical information necessary to install the GPS 175. It is not equivalent to an approved airframe-specific maintenance manual, installation design drawing, or installation data package. Attempting to install equipment referencing this manual alone and without first planning or designing an installation specific to an aircraft may compromise safety and is not recommended. The content of this manual assumes use by competent and qualified personnel using standard maintenance procedures in accordance with Title 14 of the Code of Federal Regulation and other related accepted procedures.

1.1 Certification

The GPS 175 has been shown to meet compliance with the claimed TSO(s) when interfaced with the equipment defined in this installation manual, and installed in accordance with the requirements and limitations as defined in this installation manual.

The installer must verify that non-Garmin devices to be interfaced meet the installation requirements identified in this manual to assure the installed system will comply with the Garmin TSO Authorization. Garmin installation requirements will usually specify that the interfaced device has appropriate TSO authorization, and in some cases, such as for TSO-C144 antennas, may also require that the non-Garmin device meet additional Garmin specifications.

The conditions and tests required for approval of this article are minimum performance standards. Those installing this article either on or within a specific type or class of aircraft must determine that the aircraft installation conditions are within the standards which include any accepted integrated functions not specified by the standards. TSO articles and any accepted integrated function(s) not specified in the standard must have separate approval for installation in an aircraft. The article may be installed only according to 14 CFR part 43 or the applicable airworthiness requirements. This is an incomplete system intended to provide the functions identified in table 1-1, and when installed according to the installation manual.

To meet the accuracy requirements of TSO-C165a, it is recommended that compensation be made for the installation-dependent GPS antenna offset, or the GPS antenna should be located within 50.5 feet (15.38 meters) of the nose of the aircraft.

The GPS 175 Appliance Project Identifier (API) is GMN-01823 and is used for project identification with the FAA.

Table 1-1 TSO Description

FUNCTION	TSO	CATEGORY
Stand-alone Airborne Navigation Equipment Using the Global Positioning System (GPS)	C146e	Class 3
Aircraft Flight Information Services Broadcast (FIS-B)	C157b	1
Electronic Map Display Equipment	C165a	
Avionics Support Automatic Dependent Surveillance-Broadcast (ADS-B) Aircraft Surveillance Applications (ASA)	C195b	B1, B3, B5, B7

Table 1-2 TSO Compliance

MAIN SW	TSO	APPLICABLE P/N
v2.xx	C146e, C157b, C165a, C195b	Software 006-B2799-00 thru -0( )Main Bootblock 006-B2800-00 thru -0( )Main 006-B2016-BF thru -B( )Touch Boot 006-B2016-05 thru -0( )Touch GPS/WAAS 006-B1827-20 thru -2( )Main 006-B1827-B0 thru -B( )Main Bootblock 590-00039-02 thru -0( )CLD [1]

MAIN SW	TSO	APPLICABLE P/N
v3.xx	C146e, C157b, C165a, C195b	Software 006-B2799-10 thru -1( )Main Bootblock 006-B2800-10 thru -1( )Main 006-B2016-BF thru -B( )Touch Boot 006-B2016-05 thru -0( )Touch GPS/WAAS 006-B1827-20 thru -2( )Main 006-B1827-B0 thru -B( )Main Bootblock 590-00039-02 thru -0( )CLD [1]

[1] Developed to DO-178B level B.

Table 1-3 Non-TSO Functions

FUNCTIONS	APPLICABLE LRU SW P/Ns
Terrain Garmin Terrain is a non-TSO-C151b certified terrain awareness system designed to increase situational awareness and help reduce controlled flight into terrain (CFIT). Using valid 3-D GPS position and a valid terrain/obstacle database, it can provide visual alerts based on Forward Looking Terrain Avoidance and Premature Descent Alerting.	006-B2800-00 thru -1( ) Main 006-B1827-20 thru -2( ) GPS Main

Table 1-4 Standard TSO Deviations

TSO	TSO DEVIATIONS
All TSOs	1. Garmin was granted a deviation to use RTCA DO-160G instead of an earlier version as the standard for environmental conditions and test procedures for airborne equipment.
	2. Garmin was granted a deviation to include only product name, part number, serial number, and a statement "TSO-C146e Class 3 See IM for Add'l Approvals" on the exterior of the unit.

Table 1-5 TSO Deviations

TSO	TSO DEVIATIONS
C146e	1. Garmin was granted a deviation to use GPS antennas that meet Garmin minimum performance specifications instead of DO-301 qualified antennas.
C157b [1]	1. Garmin was granted a deviation to process and display six additional FIS-B products: Icing Forecast, Cloud Tops Forecast, Turbulence Forecast, Lightning, G-AIRMET and Center Weather Advisory.
	2. Garmin was granted a deviation to process and display G-AIRMET (ID 14) and CRL-based G-AIRMET completeness instead of SBS AIRMET product (ID 11).
C195b	1. Garmin was granted a deviation from the TSO, paragraph 3.1(4) that requires databases used to support moving maps integrated with the SURF application must meet at least 5 meter accuracy and 1 meter resolution.

[1] Applicable to units running software v3.10 and later.

1.2 Design Assurance Level

Table 1-6 Software Assurance Level (DO-178B)

FUNCTION	RTCA/DO-178 LEVEL
Display of GPS Navigation Data	C
Output of GPS PVT Data to External Device	C
Output of Data to Automatic Flight Control System	C
Output of Data to External CDI/VDI	C
Display of Situation Awareness Information	C
Display of Vertical Calculation (VCALC)	C
Display of Database Information	C
Display of Miscellaneous Flight Planning Information	C
Display of Schedule Reminders	C
Display of Data Link Weather Information	C
Display of Automatic Dependent Surveillance - Broadcast (ADS-B) Traffic Information	C
Provide Bluetooth® Capability	E
Input/Output of Flight Plan Data from/to PED via Bluetooth	E [1]
Wireless Input/Output of Data from/to PED	E
Display of Status of Bluetooth Transfer of Data	C
Utilization of Databases	C

[1] Input/output of flight plan data is validated against the NAV database to Level C.

1.2.1 Transmitter Grant of Equipment Authorization

Table 1-7 Equipment Authorization

MODEL	FCC ID
GPS 175	IPH-03285

1.3 License Requirements

NOTE

The UHF Transmitter in this equipment is guaranteed to meet Federal Communications Commission acceptance over the operating temperature range. Modifications not expressly approved by Garmin could invalidate the license and make it unlawful to operate the equipment.

NOTE

For non-US installations consult the local spectrum management agency for requirements.

The Telecommunications Act of 1996, effective February 8, 1996, provides the FCC discretion to eliminate radio station license requirements for aircraft and ships. The GPS 175 installation must obey current transmitter licensing requirements. In the US, to find out the specific details on whether a particular installation is exempt from licensing, visit the FCC website https://www.fcc.gov/wireless/bureau-divisions/mobility-division/aviation-radio-services.

If an aircraft license is necessary, apply for a license on FCC Form 404, Application for Aircraft Radio Station License. The FCC also has a fax-on-demand service to supply forms by fax. The GPS 175 owner accepts all responsibility for obtaining the proper licensing before using the transponder.

1.4 Reference Documentation

Table 1-8 Garmin Reference Documents

DOCUMENT	P/N
Antenna Minimum Performance Specification for Garmin's GPS/WAAS Receiver System	004-00287-00
G5 Electronic Flight Display Installation Manual for Non-Certified Aircraft	190-02072-01
Garmin Performance-Based Navigation Capabilities	190-02223-00
Garmin Pilot for Android	190-01532-00
Garmin Pilot for iOS	190-01501-00
GMC 605 Installation Manual	190-01488-01
GPS 175 Environmental Qualification Form	005-01206-90
GPS 175/GNC355/GNX 375 Pilot's Guide	190-02488-01
RTCA/DO-200A List of Applicable Avionics Systems	190-01999-00

Table 1-9 Federal Aviation Administration Documents

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

Table 1-10 Industry Standards

DOCUMENT	P/N
Aerospace Systems Electrical Bonding and Grounding for Electromagnetic Compatibility and Safety	SAE ARP 1870
Application for Aircraft Radio Station License	FCC Form 404

1.4.1 Environmental Qualification Form

It is the responsibility of the installing agency to obtain the EQF necessary for the unit. Forms are available on the Dealer Resource Center.

1.4.2 Database

For information on certification compliance for databases, refer to *RTCA/DO-200A List of Applicable Avionics Systems* on flyGarmin.com.

1.4.3 Periodic Maintenance and Continued Airworthiness

Maintenance of the GPS 175 is "on condition" only. For regulatory periodic functional checks, refer to the approved aircraft maintenance manuals or manual supplements. The aircraft must be returned to service in a means acceptable to the cognizant aviation authority.

1.5 System Limitations

1.5.1 GPS Antenna

The unit's GPS/SBAS receiver must be used with the GPS/SBAS antennas listed in section 3.1.1.

1.5.2 Operation

Navigation is not authorized north of 89 degrees north latitude or south of 89 degrees south latitude.

1.5.3 ADS-B

The unit supports ADS-B traffic only and must not connect to a GDL 88 or GTX 345 interfacing to a TCAS.

1.6 Considerations

1.6.1 AFM/RFM/AFMS/RFMS/POH Considerations

Refer to *Garmin Performance-Based Navigation Capabilities* for information on the operational capabilities, approvals, and limitations of the Garmin Navigation System when developing an approved AFM, RFM, AFMS, RFMS, and/or POH.

Various certification authority guidance for RNAV and RNP operations require a pre-flight RAIM or FDE prediction be performed before beginning a flight. Garmin provides a free on-line RAIM/FDE prediction service which takes into account the performance of Garmin GPS receivers. This service is available at flyGarmin.com.

1.6.2 Installation

Certain non-aviation radios, including marine transceivers, can interfere with civil aviation navigation and surveillance equipment. When installing the GPS 175, it is the responsibility of the installer to ensure that the installation is compatible with all previous aircraft modifications. Verify there is no interference in aircraft modified with non-aviation radios. Ensure there is no interference if non-aviation radios are installed in an aircraft after the GPS 175. If interference is detected, remove it by:

- Relocating antennas
- Rerouting cables
- Installing filters

If these techniques do not eliminate the interference, it may be necessary to remove or replace the interfering radio.

2 System Specifications & Functionality

2.1 System Functionality

The GPS 175 is a 2-inch navigator that contains an internal GPS receiver. The unit has a capacitive touch-screen, full-color display, and a rotary knob. Functions include:

- Database concierge via Wi-Fi from Flight Stream 510 (ground use only)
- Bluetooth (Flight plan/position/weather/traffic)
- Navigation via internal GPS/SBAS receiver
- Moving map display
- Terrain
- Processing and display of TIS-B traffic data from GTX 345 or GDL 88
- Processing and display of FIS-B weather data from GTX 345 or GDL 88

Table 2-1 Compatible Garmin Interfaces

• Flight Stream 510	• G3X	• GDU 700P
• GDL 88	• GDU 620	• GDU 700L
• GDU 1060	• GFC 500 (G5/GAD 29)	• GFC 600 (GMC 605)
• GTX 3X/3XX/3000	• GTX 345	• GI 275
• MX20/GMX 200	• GDL 82	

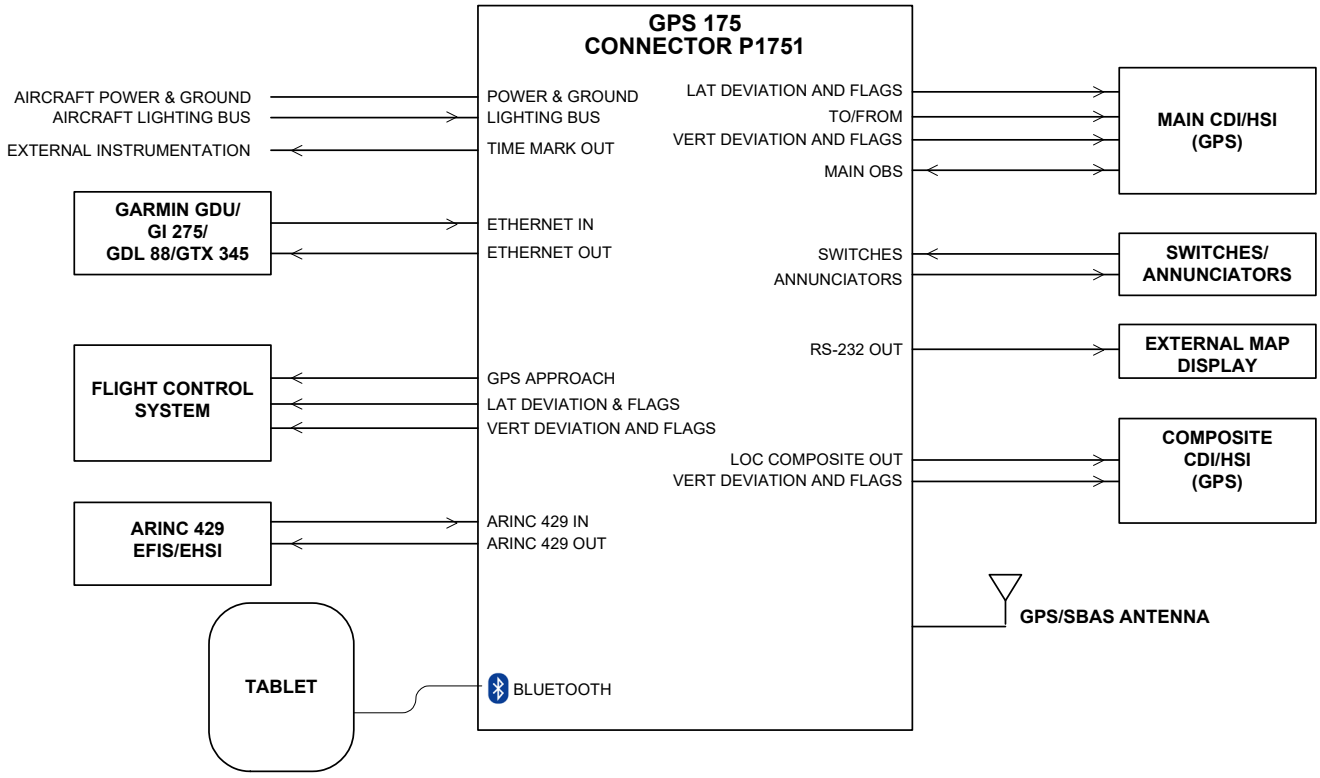


Figure 2-1 System Interfaces

Table 2-2 Interface Summary

INTERFACE DESCRIPTION	QTY	INPUT/OUTPUT
RS-232	3	I/O
ARINC 429	1	Out
	2	In
HSDB	1	I/O
Discrete I/O	4	I/O

2.2 Bluetooth Capabilities

With Bluetooth enabled, the GPS 175 supports the following features on an available PED through the Garmin Pilot app.

- GPS/WAAS - PVT
- Pressure altitude
- AHRS
- Magnetic heading
- Flight plan transfer

2.3 Unit Specifications

Figure 2-2 GPS 175 Bezel

Table 2-3 Display Specifications

CHARACTERISTICS	SPECIFICATIONS
Display size	4.8 in (122.5 mm) diagonal
Active Area	4.6 in (116 mm) (W) x 1.5 in (38 mm) (H)
Resolution	732 pixels (W) x 240 pixels (H)
Viewing angle (With 10:1 contrast ratio minimum)	**Left**: 45° from perpendicular at left side **Right**: 45° from perpendicular at right side **Up**: 30° up from perpendicular at bottom edge **Down**: 30° down from perpendicular at top edge

Table 2-4 Physical Specifications

CHARACTERISTICS	SPECIFICATIONS
Bezel height	2.02 in (51.0 mm)
Bezel width	6.25 in (159.0 mm)
Rack height (dimple to dimple)	2.025 in (51.0 mm)
Rack width	6.30 in (160.0 mm)
Depth behind panel with connectors (measured from face of aircraft panel to rear of connector backshells)	6.58 in (167 mm)
Unit weight	1.3 lb (0.6 kg)
Unit weight with rack, backplate, and connectors	1.9 lb (0.84 kg)
Humidity	95% non-condensing
Maximum altitude	35,000 ft
Input voltage range	9 VDC - 33 VDC
Brightness range	0.015 fL - 260 fL
Operating temperature range	-20° C to 55° C (-4° F to 131° F)

Table 2-5 Power Specifications

14 VOLT CURRENT DRAW		28 VOLT CURRENT DRAW	
Typical	Maximum	Typical	Maximum
0.6 A	0.9 A	0.3 A	0.6 A

Table 2-6 Bluetooth Specifications

CHARACTERISTICS	SPECIFICATIONS
Bluetooth version	4.2
Bluetooth class	2
Maximum transmitter power	+4 dBm
Unimpeded Bluetooth range	100 ft

2.4 GPS Specifications

Table 2-7 GPS Receiver Specifications

CHARACTERISTICS	SPECIFICATIONS
Number of channels	15 (12 GPS and 3 GPS/WAAS/SBAS)
Frequency	1575.42 MHz L1, C/A code
Sensitivity (acquisition, no interference)	-134.5 dBm GPS -135.5 dBm WAAS
Sensitivity (drop lock)	-144 dBm
Dynamic range	>20 dB
LAT/LON position accuracy	<1.25 meter RMS horizontal, < 2 meter vertical, with WAAS
Velocity	1,000 knots maximum (above 60,000 feet)
TTFF (Time To First Fix)	1:45 min. typical with current almanac, position, and time
Reacquisition	10 seconds typical
Position update interval	0.2 sec (5 Hz)
1PPS (Pulse Per Second)	±275 ns of UTC second
Datum	WGS-84
SATCOM compatibility	SATCOM compatibility is dependent upon antenna selection
Antenna power supply	35 mA typical, 40 mA max at 4.7 VDC

2.5 Flight Stream 510

Table 2-8 Flight Stream 510 Specifications

CHARACTERISTICS	SPECIFICATIONS
Wi-Fi class	802.11a/b/g/n
Maximum Wi-Fi transmitter power	10 dBm (10 mW)
Effective unimpeded Wi-Fi range	65 feet (20 m)

3 Installation Materials

This section describes hardware equipment required for GPS 175 installations. Installation should follow the aircraft TC or STC requirements. The installing agency fabricates the wire harness to fit each aircraft. For retro-fit installations, AC 43.13-1B and AC 43.13-2B guidance may be useful.

3.1 Materials

The GPS 175 is available under the following part numbers. Catalog part numbers are listed with and without the installation kit.

Table 3-1 Part Numbers

DESCRIPTION	UNIT ONLY	STANDARD KIT [1]	UNIT SUBASSEMBLY
GPS 175	010-01822-00	010-01822-01	011-04377-00

[1] Includes unit, connector kit, installation rack, back plate, and configuration module.

Table 3-2 Standard Kit - P/N 010-01822-01

ITEM DESCRIPTION	P/N	QTY
Installation rack	115-02813-01	1
Back plate assembly	011-04780-01	1
Connector kit	011-04779-00	1
Configuration module	011-00979-03	1

Table 3-3 Connector Kit - P/N 011-04779-00

ITEM DESCRIPTION	P/N	QTY
Subassembly, backshell w/ hardware, 37/62 pin	011-00950-03	1
Subassembly, ground adapter, shell 4&5	011-01169-01	1
Screw, 4-40 x.250, FLHP 100°, SS/P, nylon	211-63234-08	2
Connector Male, HD D-sub, 62 ckt	330-00185-62	1
Connector, pin, mil crimp, size 22D	336-00021-00	62

Table 3-4 Configuration Module P/N 011-00979-03

ITEM DESCRIPTION	P/N	QTY
Configuration module, sub-assy, potted	011-02178-00	1
Harness, 4 cond	325-00122-00	1
Contacts, pin, mil crimp, size 22D	336-00021-00	5

3.1.1 GPS Antenna

Use an antenna from the following table to achieve acceptable antenna performance. These antennas meet specifications in the document *Antenna Minimum Performance Specification for Garmin's GPS/WAAS Receiver System.* All Garmin antennas include four mounting screws and one O-ring.

Table 3-5 Acceptable GPS Antennas

MODEL	ANTENNA TYPE	CONNECTOR TYPE	MANUFACTURER	P/N
A33W	GPS/WAAS	TNC	Garmin	013-00261-( )
			Aero Antenna	AT575-332G( )-TNCF-000-RG-27-NM
GA 35	GPS/WAAS [1]	TNC	Garmin	013-00235-( )
			Aero Antenna	AT575-93G( )-TNCF-000-RG-27-NM
GA 36	GPS/WAAS	TNC	Garmin	013-00244-( )
			Aero Antenna	AT575-126G( )-TNCF-000-RG-27-NM
GA 37	GPS/WAAS/XM	TNC	Garmin	013-00245-( )
			Aero Antenna	AT2300-126G( )-TNCF-000-RG-27-NM
N/A	GPS/VHF	TNC/BNC	Comant	CI-2580-200
N/A	GPS/VHF	TNC/BNC	Comant	CI-2728-200
N/A	GPS/XM/VHF	TNC/TNC/BNC	Comant	CI-2580-410
N/A	GPS/XM/VHF	TNC/TNC/BNC	Comant	CI-2728-410
N/A	GPS/WAAS	TNC	Comant	CI-428-200

[1] Same mounting hole pattern as GA 56, except GA 35 has a physically larger footprint.

3.2 Optional Accessories

3.2.1 Flight Stream 510

The Flight Stream 510 is a wireless data card that provides Wi-Fi connectivity to the unit. The card uses Wi-Fi when loading databases from a PED (ground use only).

Table 3-6 Optional Accessories

ITEM	UNIT ONLY KIT P/N	STANDARD KIT P/N	UNIT P/N
Flight Stream 510	010-01322-00	010-01322-01	011-03595-00

3.3 Display Database Options

Databases can be updated with a data card or the Flight Stream 510. Users update databases by purchasing subscription updates from Garmin or Jeppesen. Contact Garmin at flyGarmin.com. Contact Jeppesen at (800) 621-5377 or www.jeppesen.com. For information on certification compliance of databases, refer to *RTCA/DO-200A List of Applicable Avionics Systems* at flyGarmin.com.

It is necessary to have the Garmin Pilot application on a PED if updating databases using a Flight Stream 510 wireless card. When the Flight Stream 510 is inserted in the unit and powered on in normal mode, a prompt displays instructions on transferring databases. Download *Garmin Pilot for Android* or *Garmin Pilot for iOS* from garmin.com for additional information.

Navigation

The navigation database supplies airport, NAVAIDs, and waypoint information.

Basemap

- The basemap database provides ground based references such as roads and bodies of water.
- The basemap database does not have a scheduled update cycle or expiration date, and updates infrequently.
- Basemap database updates, when issued, are available from flyGarmin.com.

Safe Taxi

SafeTaxi diagrams provide detailed taxiway, runway, and ramp information.

Terrain

The terrain database supports terrain awareness functionality.

Obstacles

The obstacle database provides identification of known obstacles greater than 200 feet AGL, and includes hazardous power lines.

Table 3-7 Database SD Cards

DATA CARDS	P/N
Database, GPS 175/GNX 375/GNC 355, International	010-02090-01
Database, GPS 175/GNX 375/GNC 355, Americas	010-02090-02

3.4 Materials Required but Not Supplied

The unit is intended for use with standard aviation accessories. The following items are required for installation, but not supplied.

NOTE
If using MIL-W-22759/18, support and protect the wire.

1. Wire (MIL-W-22759/16 or equivalent)
2. Shielded wire (MIL-C-27500 or equivalent)
3. Push/pull (manually resettable) circuit breakers
4. Tie wraps or lacing cord
5. MS25036 or MS20659 ring terminals
6. M83519/2-X shield terminators
7. A-A-59163 (MIL-I-46852C) silicone fusion tape
8. Aircraft grade category 5 Ethernet cable
9. Coaxial cable (RG-400 or equivalent)
10. TNC connectors for the GPS antenna

Table 3-8 Approved Ethernet Cable Manufacturers

MANUFACTURER	P/N
CARLISLE	392404 (24 AWG)
EMTEQ	D100-0824-100 (24 AWG)
	D10004-664 (24 AWG)
PIC WIRE AND CABLE	E10422 (22 AWG) [1]
	E10424 (24 AWG)
	E12424 (24 AWG)
	E51424 (24 AWG)
TENSOLITE	NF24Q100 (24 AWG)
THERMAX	MX100Q-24 (24 AWG)

[1] Not recommended due to larger wire diameter. 24 AWG is preferred.

3.5 Special Tools

The following special tools are required for building the wire harness:

Milliohm Meter

A milliohm meter with an accuracy of +0.1 milliohm (or better) to verify electrical bond.

Multi-Meter

A multi-meter to perform continuity and power/ground checks.

Crimp Tool

A crimp tool meeting MIL specification M22520/2-01 and a positioner/locator are required to ensure consistent, reliable crimp contact connections for the rear D-sub connectors.

Table 3-9 Recommended Crimp Tool

MANUFACTURER	HAND CRIMPING TOOL	22-28 AWG		22-24 AWG	
		POSITIONER [2]	INSERTION/ EXTRACTION TOOL	POSITIONER	INSERTION/ EXTRACTION TOOL
Military P/N	M22520/2-01	M22520/2-09	M81969/14-01 M81969/1-04	M22520/2-08	M81969/1-02
ITT Cannon [3]	995-0001-584	995-0001-739	N/A	N/A	N/A
Positronic	9507	N/A	N/A	9502-5	M81969/1-02
AMP	601966-1	601966-6	91067-1	601966-5	91067-2
Daniels	AFM8	K42	N/A	K13-1	M81969/1-02
Astro	615717	615725	N/A	615724	M81969/1-02

[1] Non-Garmin part numbers shown are not maintained by Garmin and are subject to change without notice.

[2] For configuration module pins, ensure the crimp tool is set to crimp 28 AWG wire (indenter setting of "4").

[3] Insertion/extraction tools from ITT Cannon are all plastic. All others are plastic with metal tips.

The following tools may be required:

- Laser square
- Digital level
- Protractor
- #30 drill bit
- #27 drill bit
- 3/32" hex drive tool

4 Installation Planning & Considerations

4.1 Installation Requirements

4.1.1 Cooling

An integrated cooling fan draws air through the bezel and exhausts out the bottom of the unit. When mounting, do not block airflow to these areas. External cooling is not required.

4.1.2 Electrical Bonding

Electrical equipment, supporting brackets, and racks should be electrically bonded to the aircraft's main structure. When surface preparation is required to achieve electrical bond refer to SAE ARP 1870 section 5. An equivalent OEM procedure may also be substituted. The electrical bond should achieve DC resistance less than or equal to 2.5 milliohms to local structure where the equipment is mounted. Compliance should be verified by inspection using a calibrated milliohm meter.

4.1.3 Mounting

The GPS 175 mounts in the instrument panel. The GPS mounting hardware accommodates various sheet metal panel thicknesses, from 0.063" to 0.125". For cable routing, allow an additional two inches of clearance behind mating connectors on the rear of unit.

4.1.4 Compass Safe Distance

If the GPS 175 is mounted less than twelve inches from the compass, recalibrate the compass and make the necessary changes for noting correction data.

5 Connector Pinouts

5.1 J1751 Connector

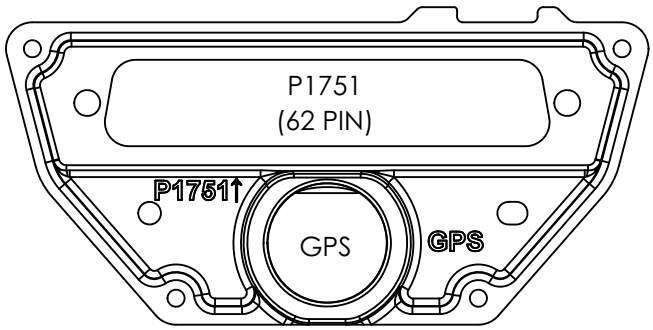


Figure 5-1 GPS 175 Rear Connector Layout

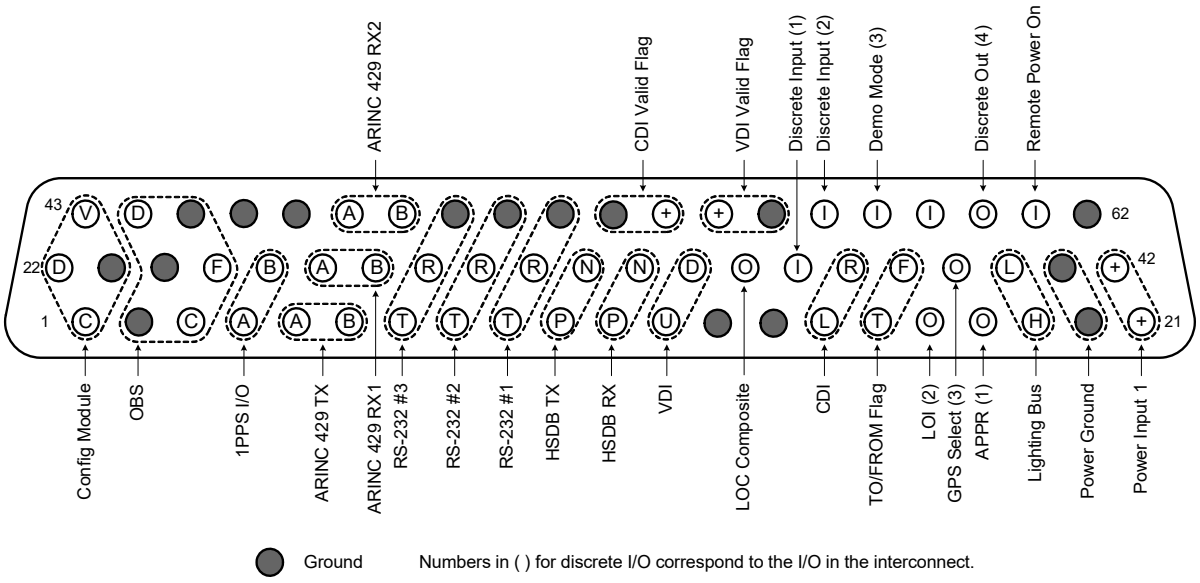


Figure 5-2 J1751 62-Pin Connector
View Rear of Unit

Table 5-1 J1751 Connector

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

5.2 GPS Antenna Connector

Uses a TNC coaxial connector on the backplate.

5.3 Functional Descriptions

5.3.1 Power

- Compatible with 14 VDC and 28 VDC aircraft electrical systems
- Accepts input power from 9 VDC to 33 VDC

Table 5-2 Power Pins

PIN NAME	CONNECTOR	PIN	I/O
Power Gnd	J1751	20	--
Power Input 1	J1751	21	In
Power Gnd	J1751	41	--
Power Input 1	J1751	42	In

5.3.2 Power Control Input

Enables the power auto on feature - automatically powers the unit on when avionics master is turned on.

Table 5-3 Power Control Input

PIN NAME	CONNECTOR	PIN	I/O
REMOTE POWER ON	J1751	61	In

Table 5-4 Power Control Function

POWER CONTROL	DESCRIPTION
Open	Auto on disabled
Ground	Auto on enabled

5.3.3 Lighting

- Display and keys configure to track 28 VDC, 14 VDC, 5 VDC, or 5 VAC lighting buses
- Display and keys automatically adjust for ambient lighting conditions when configured for photocell
- Photocell is on the front of the unit
- Connect both LIGHTING BUS HI and LIGHTING BUS LO for a 5 VAC lighting bus
- Connect LIGHTING BUS HI for a DC input, do not connect LIGHTING BUS LO

Table 5-5 Lighting

PIN NAME	CONNECTOR	PIN	I/O
LIGHTING BUS HI	J1751	19	In
LIGHTING BUS LO	J1751	40	In

5.3.4 Configuration

- Located in the J1751 connector backshell.
- Stores installation-specific configuration information.
- Eliminates the need to reconfigure aircraft specific items when replacing a LRU.

Table 5-6 Configuration Module

PIN NAME	CONNECTOR	PIN	I/O
CONFIG MODULE POWER	J1751	43	Out
CONFIG MODULE GROUND	J1751	23	Out
CONFIG MODULE CLOCK	J1751	1	Out
CONFIG MODULE DATA	J1751	22	In/Out

5.3.5 Discrete Inputs

Discrete input signals are Active-Low pins.

- Active (low) state:
  Input signal is < 3.5 VDC and/or resistance to ground < 375 ohm
- Inactive (open/high) state:
  Input signal is between 6.5 VDC and 33 VDC and/or resistance to ground > 100 kilohm

Table 5-7 Discrete Inputs

PIN NAME	CONNECTOR	PIN	I/O
REMOTE GO AROUND	J1751	36	In
DISCRETE IN 2	J1751	57	In
DEMO MODE	J1751	58	In

Remote Go Around

Active signal from momentary switch activates the missed approach procedure.

Demo Mode

CAUTION
DO NOT CONNECT DEMO MODE SELECT IN AN AIRCRAFT INSTALLATION.

- Selects the Demo mode
- Allows the unit to simulate inputs
- A low at time of unit power-up enables Demo mode

5.3.6 Discrete Outputs

Discrete output signals are Active-Low pins. Each is an open drain output and can sink up to 250 mA when active.

Table 5-8 Discrete Outputs

PIN NAME	CONNECTOR	PIN	I/O
GPS APPROACH ANNUNCIATE	J1751	18	Out
LOI ANNUNCIATE	J1751	17	Out
GPS SELECT	J1751	39	Out
DISCRETE OUT 4	J1751	60	Out

GPS Approach Annunciate

Active when:

- Unit is in approach mode

OR

- CDI full scale deflection is set to 0.3 nm

LOI Annunciate

Active when LOI of GPS signal occurs and "LOI" displays on the status bar.

GPS Select

NOTE
Connect this output to GPS SELECT input of King KAP 140 and KFC 225 autopilots.

Active when:

- GPS Select configuration setting is set to auto and the system is in GPS approach mode
- GPS Select configuration setting is set to prompt, the system is in GPS approach mode, and the pilot has acknowledged the prompt

5.3.7 RS-232

- All RS-232 serial ports are configurable.
- The RS-232 outputs are compatible with EIA Standard RS-232C, with an output voltage swing of at least ±5 V when driving a standard RS-232 load.
- Data input and formatting are dependent on the configured function.
- To configure port settings refer to the wiring diagrams in section 11.

Table 5-9 RS-232

PIN NAME	CONNECTOR	PIN	I/O
RS-232 OUT 1	J1751	9	Out
RS-232 IN 1	J1751	31	In
RS-232 GND 1	J1751	52	--
RS-232 OUT 2	J1751	8	Out
RS-232 IN 2	J1751	30	In
RS-232 GND 2	J1751	51	--
RS-232 OUT 3	J1751	7	Out
RS-232 IN 3	J1751	29	In
RS-232 GND 3	J1751	50	--

5.3.8 ARINC 429 In

Table 5-10 ARINC 429 In

PIN NAME	RECOMMENDED FUNCTION	CONNECTOR	PIN	I/O
ARINC 429 IN 1A	Garmin GDU/ Standby EFIS	J1751	27	In
ARINC 429 IN 1B	Garmin GDU/ Standby EFIS	J1751	28	In
ARINC 429 IN 2A	3rd Party EFIS/ Standby EFIS	J1751	48	In
ARINC 429 IN 2B	3rd Party EFIS/ Standby EFIS	J1751	49	In

5.3.9 ARINC 429 Out

Outputs are compatible with the latest ARINC 429 electrical specifications when up to five standard receivers are connected.

Table 5-11 ARINC 429 Out

PIN NAME	RECOMMENDED FUNCTION	CONNECTOR	PIN	I/O
ARINC 429 OUT 1A	GPS	J1751	5	Out
ARINC 429 OUT 1B	GPS	J1751	6	Out

5.3.10 Main Indicator

The main indicator displays both lateral and vertical deviation from selected course, to/from indications, lateral and vertical flags and superflags.

An OBS resolver connection to the GPS is preferred, but not required.

Deviation Outputs

- Each deviation output provides ±150 mV full scale ± 15 mV
- Drives up to a 333 ohm load (i.e., a maximum of three 1 kilohm loads connected in parallel)
- 0 mVDC ± 4.5 mVDC indicates centered

Table 5-12 Deviation Outputs

PIN NAME	CONNECTOR	PIN	I/O
LATERAL +LEFT OUT	J1751	15	Out
LATERAL +RIGHT OUT	J1751	37	Out
VERTICAL +UP OUT	J1751	12	Out
VERTICAL +DOWN OUT	J1751	34	Out

To/From Outputs

- Drives up to three 200 ohm loads
- The active flag is present when the output provides 225 mV ± 75 mV
- When invalid information is present the flag output provides 0 mV ± 20 mV

Table 5-13 To/From Outputs

PIN NAME	CONNECTOR	PIN	I/O
+TO OUT	J1751	16	Out
+FROM OUT	J1751	38	Out

Flag Outputs

- When valid information is present each low-level flag output provides 375 mV ± 75 mV
- When invalid information is present each low-level flag output provides 0 mV ± 20 mV
- Drives up to a 333 ohm load (i.e., a maximum of three 1 kilohm loads connected in parallel)

Table 5-14 Flag Outputs

PIN NAME	CONNECTOR	PIN	I/O
LATERAL +FLAG OUT	J1751	54	Out
LATERAL -FLAG OUT	J1751	53	--
VERTICAL +FLAG OUT	J1751	55	Out
VERTICAL -FLAG OUT	J1751	56	--

OBS Outputs

OBS Rotor C and OBS Rotor H GND are a buffered output intended to drive the OBS rotors. OBS Stator D and OBS Stator F are amplitude shifted versions of the OBS Rotor C output. Each pair is intended to read one of the two windings of the indicator's OBS stator.

Table 5-15 OBS Outputs

PIN NAME	CONNECTOR	PIN	I/O
OBS Rotor C	J1751	3	Out
OBS Rotor H GND	J1751	2	--
OBS Stator D	J1751	44	In
OBS Stator E GND	J1751	45	--
OBS Stator F	J1751	25	In
OBS Stator G GND	J1751	24	--

Composite Output

LOC Composite is a standard localizer composite output signal which drives left and right deviation for navigation indicators with internal converters. The amplitude of the LOC Composite output is 0.350 $\pm$0.05 Vrms into a 10 kilohm load when the GPS navigation system outputs a valid (non-flagged) cross-track deviation.

Table 5-16 Composite Outputs

PIN NAME	CONNECTOR	PIN	I/O
LOC Composite	J1751	35	Out

5.3.11 Ethernet

Table 5-17 Ethernet

PIN NAME	CONNECTOR	PIN	I/O
ETHERNET IN 1A	J1751	11	In
ETHERNET IN 1B	J1751	33	In
ETHERNET OUT 1A	J1751	10	Out
ETHERNET OUT 1B	J1751	32	Out

5.3.12 Input Source Priority

The unit accepts data from multiple sources. If multiple sources supply data to the unit, only valid data from the highest priority source is used. Source priorities are shown from highest to the lowest.

Table 5-18 Indicated Airspeed Source Priority

PRIORITY	SOURCE
1	ARINC 429 label 206 from an ADC
2	ARINC 429 label 206 from an EFIS/ADC
3	HSDB indicated airspeed from a Garmin GDU
4	HSDB indicated airspeed from GI 275
5	ARINC 429 label 206 from a standby EFIS

Table 5-19 True Airspeed Source Priority

PRIORITY	SOURCE
1	ARINC 429 label 210 from an ADC
2	ARINC 429 label 210 from an EFIS/ADC
3	HSDB true airspeed from a Garmin GDU
4	HSDB true airspeed from GI 275
5	ARINC 429 label 210 from a standby EFIS

Table 5-20 Magnetic Heading Source Priority

PRIORITY	SOURCE
1	ARINC 429 label 320 from a Garmin GDU
2	ARINC 429 label 320 from a heading source, an AHRS, or EFIS/ADC
3	HSDB magnetic heading from a Garmin GDU
4	HSDB magnetic heading from GI 275
5	ARINC 429 label 320 from a standby EFIS

Table 5-21 Pressure Altitude Source Priority

PRIORITY	SOURCE
1	ARINC 429 label 203 from a Garmin GDU
2	ARINC 429 label 203 from an EFIS/ADC
3	HSDB pressure altitude from a Garmin GDU
4	HSDB pressure altitude from GI 275
5	ARINC 429 label 203 from a standby EFIS

Table 5-22 True Heading Source Priority

PRIORITY	SOURCE
1	ARINC 429 label 314 from a heading source
2	ARINC 429 label 314 from an AHRS
3	ARINC 429 label 314 from an EFIS/ADC
4	RS-232 from a remote control panel
5	True heading calculated from magnetic heading received via HSDB from a Garmin GDU
6	True heading calculated from magnetic heading received via HSDB from GI 275
7	ARINC 429 label 314 from a standby EFIS

Table 5-23 Static Air Temperature Source Priority

PRIORITY	SOURCE
1	ARINC 429 label 213 from a Garmin GDU
2	ARINC 429 label 213 from an EFIS/ADC
3	HSDB static air temperature from a Garmin GDU
4	HSDB static air temperature from GI 275
5	ARINC 429 label 213 from a standby EFIS

Table 5-24 Total Air Temperature Source Priority

PRIORITY	SOURCE
1	ARINC 429 label 211 from a Garmin GDU
2	ARINC 429 label 211 from an EFIS/ADC
3	HSDB total air temperature from a Garmin GDU
4	HSDB total air temperature from GI 275
5	ARINC 429 label 211 from a standby EFIS

Table 5-25 Selected Course Source Priority

PRIORITY	SOURCE
1	ARINC 429 label 100 from a Garmin GDU
2	ARINC 429 label 100 from an EFIS/ADC
3	HSDB selected course from a Garmin GDU
4	HSDB selected course from GI 275
5	ARINC 429 label 100 from a standby EFIS
6	To/From course from the OBS control

5.3.13 Time Mark

Can be used as an output to provide 1 PPS to other equipment in aircraft.

Table 5-26 Time Mark

PIN NAME	CONNECTOR	PIN	I/O
TIME MARK A	J1751	4	Out
TIME MARK B	J1751	26	Out

5.4 Interface Communication

5.4.1 RS-232 Aviation Data Format

Electrical Interface

The output signals are compatible with RS-232C. Data is generated at 9600 baud with a word length of 8 bits, one stop bit, and no parity.

Aviation General Output Format

The GPS 175 RS-232 aviation output data has the following general format.

STX	ASCII start-of-text character (02 hex)
t1s	Type 1 output sentences (refer to following paragraphs for description)
t2s	One or more type 2 output sentences (refer to following paragraphs for description)
ETX	ASCII end-of-text character (03 hex)

Aviation Output Sentence Type 1

The Type 1 output sentences have the following general format.

id	item designator (single ASCII alphabetic character)
dddd	item data (1 to 10 printable ASCII characters)
CR	ASCII carriage return character (0D hex)
LF	ASCII line feed character (0A hex) (not output if configured for Aviation Output 2)

Each Type 1 sentence is output by the unit approximately once every second.

The track, desired track, and bearing to waypoint angles, and the magnetic variation are output according to the current mode of the unit (automatic magnetic heading, magnetic variation computed at last known position; true heading, magnetic variation of E00.0°; or user-defined magnetic heading, magnetic variation as entered by user).

The following table describes the Type 1 output sentence item designator (id) and item data (dddd) fields. If data for these sentences is invalid or unavailable, dashes ("-") are used to fill in all non-blank character positions.

Table 5-27 Type 1 Output Sentence Format

Ident (1 byte)	Data (10 bytes)										Description
	1	2	3	4	5	6	7	8	9	0	
z	a	a	a	a	a						Current GPS altitude in feet *
A	s		d	d		m	m	h	h		Current latitude, where: s N (north) or S (south) dd degrees mm minutes hh hundredths of minutes
B	s		d	d	d		m	m	h	h	Current longitude, where: s E (east) or W (west) ddd degrees mm minutes hh hundredths of minutes
C	d	d	d								Track in whole degrees
D	s	s	s								Ground speed in knots
E	d	d	d	d	d						Distance to waypoint in tenths of nautical miles
G	s	n	n	n	n						Cross track error, where: s L (left) or R (right) of course nnnn error in hundredths of nautical miles
I	d	d	d	d							Desired track in tenths of degrees
K	c	c	c	c	c						Active waypoint identifier (will be blank filled on right if less than 5 characters in identifier)
L	d	d	d	d							Bearing to active waypoint in tenths of degrees
Q	s	d	d	d							Magnetic variation, where: s E (east) or W (west) ddd tenths of degrees
S	-	-	-	-	f						NAV valid flag status, where: f - N (NAV flagged) or - (NAV valid)
T	-	-	-	-	-	-	-	-	-		Warnings status, only data transmitted are dashes (-). Used to indicate end of Type 1 sentences.
l (lower case Lima)	d	d	d	d	d	d					Distance to destination waypoint in tenths of nautical miles.

Aviation Output Sentence Type 2

The Type 2 output sentence has the following general format.

id	item designator (3 ASCII characters)
seq	sequence number (1 binary byte)
wpt	waypoint identifier (5 ASCII characters)
lat	waypoint latitude (3 binary bytes)
lon	waypoint longitude (4 binary bytes)
mvar	magnetic variation at waypoint (2 binary bytes)
CR	ASCII carriage return character (0D hex)
LF	ASCII line feed character (0A hex)

Each waypoint in the route being navigated has a Type 2 sentence output by the unit approximately once every second.

If no route is being navigated (i.e., the active route is empty), the following Type 2 sentence is output approximately once every second.

id	item designator (3 ASCII characters; route sequence number is “01”)
seq	sequence number (1 binary byte; last waypoint flag is set; route sequence number is 1)
CR	ASCII carriage return character (0D hex)
LF	ASCII line feed character (0A hex)

The following table describes the Type 2 output sentence item designator (id), sequence number (seq), waypoint identifier (wpt), waypoint latitude (lat), waypoint longitude (lon), and magnetic variation at waypoint (mvar) fields.

Table 5-28 Type 2 Output Sentence Format

Field	Byte	Format 7	6	5	4	3	2	1	0	Description
id	1 2-3									ASCII character "w" (77 hex) Two ASCII numeric characters representing route sequence number of waypoint (01 to 31)
seq	1	x	l	a	n	n	n	n	n	x undefined l 1 if last waypoint in route a 1 if active to waypoint nnnnn route sequence number of waypoint (unsigned binary)
wpt	1-5									Destination waypoint identifier (will be blank filled on right if less than 5 characters in identifier)
lat	1	s	d	d	d	d	d	d	d	s 0 (north) or 1 (south) ddddddd latitude degrees (unsigned binary)
	2	x	x	m	m	m	m	m	m	xx undefined mmmmmm latitude minutes (unsigned binary)
	3	x	h	h	h	h	h	h	h	x undefined hhhhhhh hundredths of latitude minutes (unsigned binary)
lon	1	s	x	x	x	x	x	x	x	s 0 (east) or 1 (west) xxxxxxx undefined
	2	d	d	d	d	d	d	d	d	ddddddddd longitude degrees (unsigned binary)
	3	x	x	m	m	m	m	m	m	xx undefined mmmmmm latitude minutes (unsigned binary)
	4	x	h	h	h	h	h	h	h	x undefined hhhhhhh hundredths of latitude minutes (unsigned binary)
mvar	1-2									Two's complement binary in 16ths of degrees. Easterly variation is positive. MSB output first.

5.4.2 ARINC 429 Communication

Table 5-29 GAMA Format 1

LABEL	DATA
001	Distance to GO (BCD)
002	Time to Go (BCD)
012	Ground Speed (BCD)
074G	Data Record Header
075G	Active Wpt From/To Data
100P	Selected Course 1
113G	Message Checksum
114	Desired Track (True)
115	Waypoint Bearing (True)
116G [1]	Cross Track Distance
117G	Vertical Deviation
121	Horizontal Command (to Autopilot)
125	Greenwich Mean Time (BCD)
147G	Magnetic Variation
150	Greenwich Mean Time (BNR)
251G	Distance to Go
252	Time to Go
260G	Date (BCD)
261G	GPS Discrete Word 1
275G	LRN Status Word
300G	Station Declination, Type, and Class
303	Message Length/Type/Number
304G	Message Characters 1-3
305G	Message Characters 4-6
306G	NAV/Waypoint/Airport Latitude
307G	NAV/Waypoint/Airport Longitude
310	Present Position Latitude
311	Present Position Longitude
312	Ground Speed

LABEL	DATA
313	Track Angle (True)
314	True Heading
315	Wind Speed
316	Wind Angle (True)
320	Magnetic Heading
321	Drift Angle
326G [1]	Lateral Scale Factor
327G	Vertical Scale Factor
351G	Distance to Destination (Via Flight Plan)
352G	Estimated Time to Destination (Via Flight Plan)
371G	Specific Equipment ID
377	Equipment Hex ID Code

[1] Optional resolution extension bits 11-13 used.

Table 5-30 GAMA Format 3

LABEL	DATA
001	Distance to GO (BCD)
002	Time to Go (BCD)
012	Ground Speed (BCD)
074G	Data Record Header
075G	Active Wpt From/To Data
100P	Selected Course 1
113G	Message Checksum
114	Desired Track (True)
115	Waypoint Bearing (True)
116G [1]	Cross Track Distance
117G	Vertical Deviation
121	Horizontal Command (to Autopilot)
125	Greenwich Mean Time (BCD)
147G	Magnetic Variation
150	Greenwich Mean Time (BNR)
251G	Distance to Go
252	Time to Go

LABEL	DATA
260G	Date (BCD)
261G	GPS Discrete Word 1
275G	LRN Status Word
300G	Station Declination, Type, and Class
303G	Message Length/Type/Number
304G	Message Characters 1-3
305G	Message Characters 4-6
306G	NAV/Waypoint/Airport Latitude
307G	NAV/Waypoint/Airport Longitude
310	Present Position Latitude
311	Present Position Longitude
312	Ground Speed
313	Track Angle (True)
314	True Heading
315	Wind Speed
316	Wind Angle (True)
320	Magnetic Heading
321	Drift Angle
326G [1]	Lateral Scale Factor
327G	Vertical Scale Factor
330	Conic Arc Inbound Course
331	Conic Arc Radius
332	Conic Arc Course Change Angle
333	Airport Runway Azimuth
334	Airport Runway Length in Feet
335	Left/Right Hand Holding Pattern Azimuth
340	Left/Right Procedure Turn Azimuth
351G	Distance to Destination (Via Flight Plan)
352G	Estimated Time to Destination (Via Flight Plan)
371G	Specific Equipment ID
377	Equipment Hex ID Code

[1] Optional resolution extension bits 11-13 used.

EFIS/Air Data

Table 5-31 EFIS/Air Data

LABEL	DATA	PERIODIC TIMEOUT
100	Selected Course #1	1000 ms
203	Altitude	200 ms
204	Baro-Corrected Altitude #1	200 ms
206	Indicated Airspeed	400 ms
210	True Airspeed	400 ms
211	Total Air Temperature	2000 ms
213	Static Air Temperature	2000 ms
314	True Heading	200 ms
320	Magnetic Heading	200 ms

GDU Format 1

Table 5-32 GDU Format 1

LABEL	DATA	PERIODIC TIMEOUT
100	Selected Course #1	1000 ms
203	Altitude	200 ms
204	Baro-Corrected Altitude #1	200 ms
206	Indicated Airspeed	400 ms
210	True Airspeed	400 ms
211	Total Air Temperature	2000 ms
213	Static Air Temperature	2000 ms
314	True Heading	200 ms
320	Magnetic Heading	200 ms

6 Installation Procedures

This chapter describes the procedures necessary to install the GPS 175. Steps should be performed in the order they are presented. All materials needed are identified in section 3.

For all components covered under this TSO, this section explains:

- Locating a mounting position
- Preparing mounting locations
- Installing the electrical portions of the system
- Installing all components

6.1 Cabling and Wiring General Instructions

CAUTION

ENSURE THERE ARE NO WIRING ERRORS BEFORE CONNECTING THE CABLES. INCORRECT WIRING COULD DAMAGE COMPONENTS.

NOTE

Shield terminations to the unit connector backshell must be less than 3.0". Shield terminations for interfaced equipment should be as short as practical. Wiring must be shielded as required in section 11.

Install wire in accordance with AC 43.13-1B, chapter 11. Allow adequate space for installation of cables and connectors. For connector and tooling information, refer to section 3. The installer supplies and fabricates all of the cables according to information in this manual. Cable lengths will vary depending on installation. Ground and shield terminations of interfaced equipment can vary. For more information refer to the equipment manufacturer's installation manual. The following considerations should also be addressed.

- Cable harness should not be located near controls/control cables, high voltage lines, or fuel lines
- Cable harness should be in a protected area of the aircraft (e.g., isolated from engine rotor burst)
- Cable harness should not be routed near high voltage or electrical noise sources
- Use wire gauge specified in section 11
- Route and secure the wire bundle as appropriate
- Avoid sharp bends and chafing

6.1.1 Shielded Cable Preparation

1. At the end of the shielded cable, strip back 2.5 inch maximum length of the jacket to expose the braid.
2. Remove the exposed braid.
3. Carefully score the jacket 1/4 inches to 5/16 inches from the end and remove the jacket to leave the braid exposed.
4. Connect a 20 or 22 AWG wire to the exposed braid of the prepared cable. For termination techniques, refer to AC 43.13.

Preferred Method

a. Slide a solder sleeve (1) onto the prepared cable and shrink using a heat gun. The chosen size of solder sleeve must accommodate the number of conductors present in the cable assembly. Refer to M83519/1-2 for 2-conductor and M83519/1-3 for 3-conductor solder sleeves. Solder sleeves with preinstalled leads are acceptable.

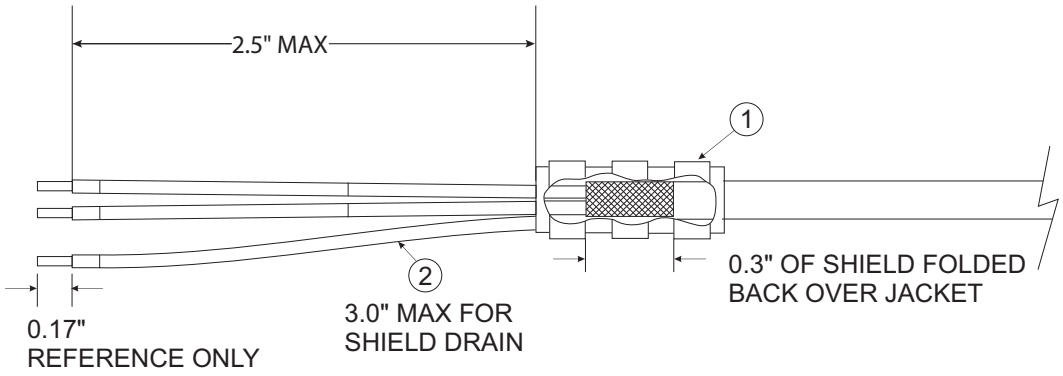


Figure 6-1 Preferred Shield Termination Method

Alternate Method

a. Solder the wire (2) to the exposed braid of the prepared cable.
b. Ensure a solid electrical connection through the use of acceptable soldering practices.
c. Slide a piece of shrink tube (1) onto the prepared cable and shrink using a heat gun. The chosen size of shrink tube must accommodate the number of conductors present in the cable.

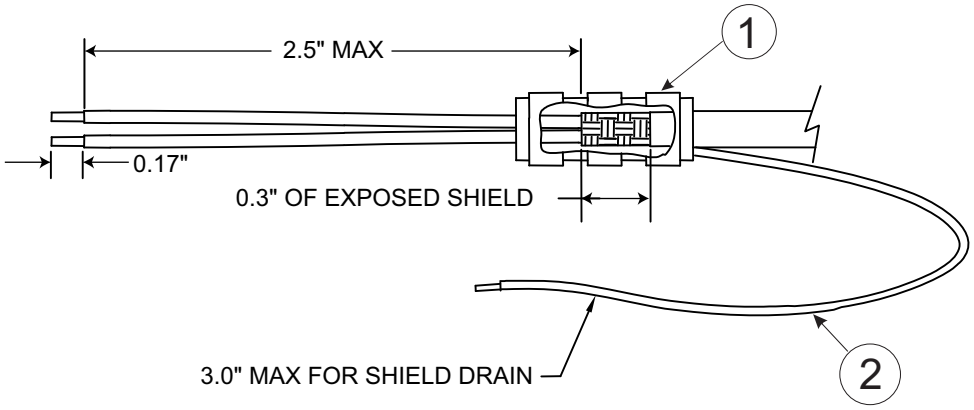


Figure 6-2 Alternate Shield Termination Method

5. Repeat steps 1 through 4 as needed for the remaining shielded cables.

6.1.2 Instructions to Crimp Pins to Wires

1. Strip back approximately 0.17 inches of insulation from each wire.
2. Insert the wire (1) into the pin/socket (2) and crimp with one of the recommended crimping tools.
3. Insert the pin into the connector housing location as specified by the interconnect drawings in section 11.
4. Verify the pin is properly engaged in the connector by tugging on the wire.

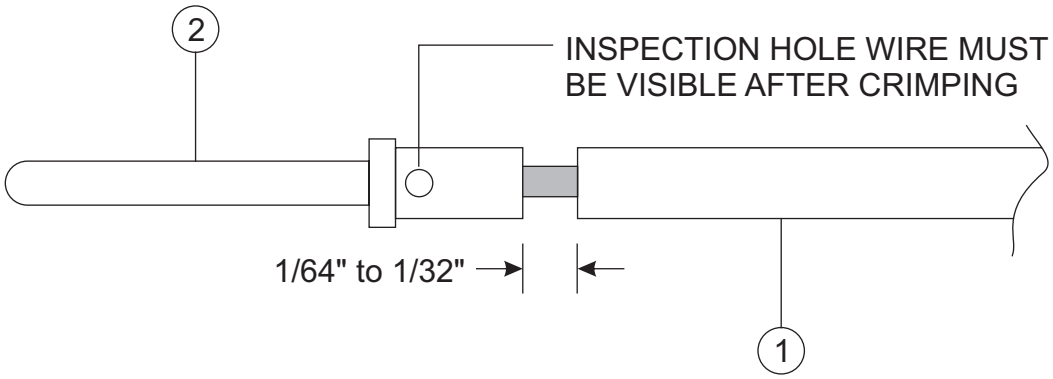


Figure 6-3 Insulation to Pin/Socket Clearance

6.1.3 Configuration Module

The backshell assembly houses the configuration module. The configuration module and the GAE use the same connector pin locations and cannot be used at the same time. To assemble:

1. Strip back approximately 0.17 inches of insulation from each wire of the wire harness (2).
2. Crimp a pin (3) or socket (8) to each conductor.
3. Insert wires into the connector housing (4).
4. Insert the configuration module (1) into the backshell (5) recess.
5. Plug the wire harness into the connector on the module (1).

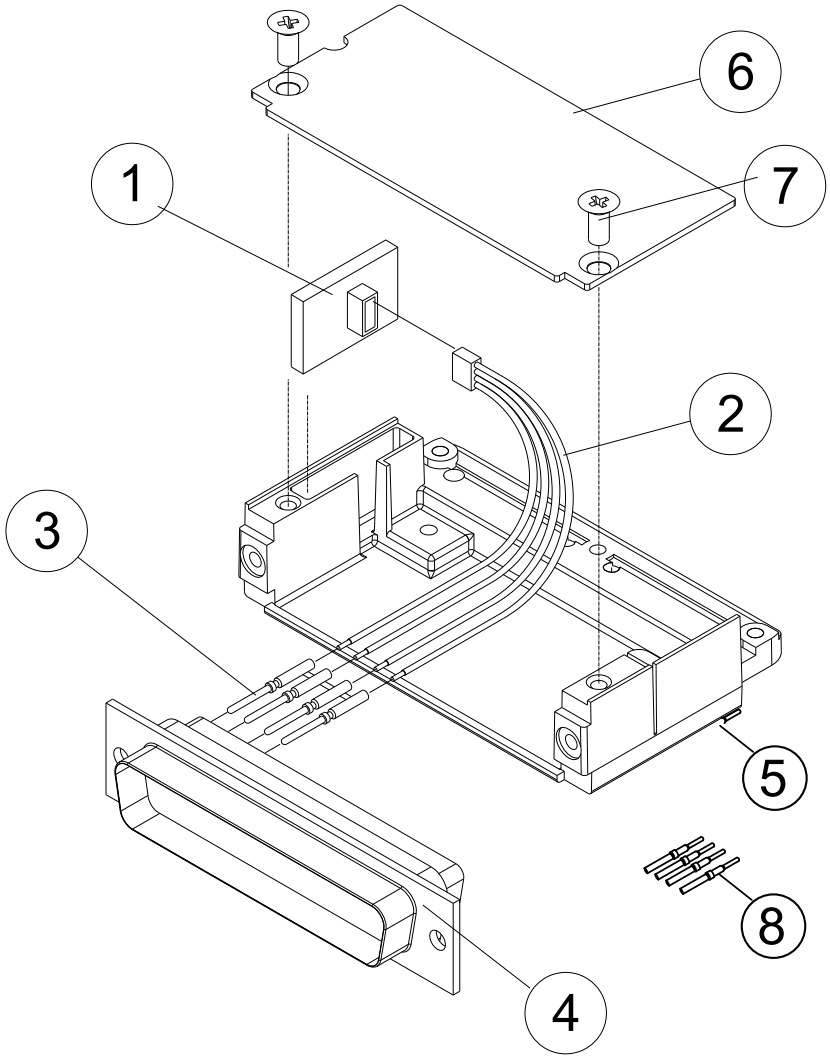


Figure 6-4 Configuration Module Assembly

6.1.4 Backshell Assembly

CAUTION

PLACE THE SMOOTH SIDE OF THE STRAIN RELIEF CLAMP ACROSS THE CABLE BUNDLE. PLACING THE CONCAVE SIDE AGAINST THE CABLE BUNDLE WILL DAMAGE WIRES.

Each tapped hole on the backshell may accommodate up to two ring terminals. It is preferred that only two wires be terminated per ring terminal. This necessitates 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 be used. If more wires exist for the connector than two per ring terminal, it is permissible to terminate three wires per ring terminal. For this procedure refer to figure 6-5 and figure 6-6.

1. Insert flat head screws (3) through holes on the shield block (2).
2. Attach to the backshell (1).
3. Insert the crimped wire harness contacts (14) in the D-sub connector (10).
4. Install the configuration module or GAE wires into the connector.
5. Wrap the cable bundle with silicone fusion tape (19) where the strain relief clamps the bundle.
6. Place the smooth side of the backshell strain relief clamp (7) across the cable bundle.
7. Secure strain relief with three 4-40 x 0.375 pan head screws (6).
8. Attach configuration module.
9. Attach the cover (8) to the backshell using the supplied screws (9).
10. Install a ring terminal onto the cable shield drains, grouping wires as appropriate for the connector.
11. Place the following items on the 8-32 x 0.312 pan head shield terminal screw in the order they are presented.
    a. Split washer (17)
    b. Flat washer (18)
    c. First ring terminal (15)
    d. Second ring terminal (if necessary)
12. Insert the pan head shield terminal screw (16) into the tapped holes on the shield block (2).

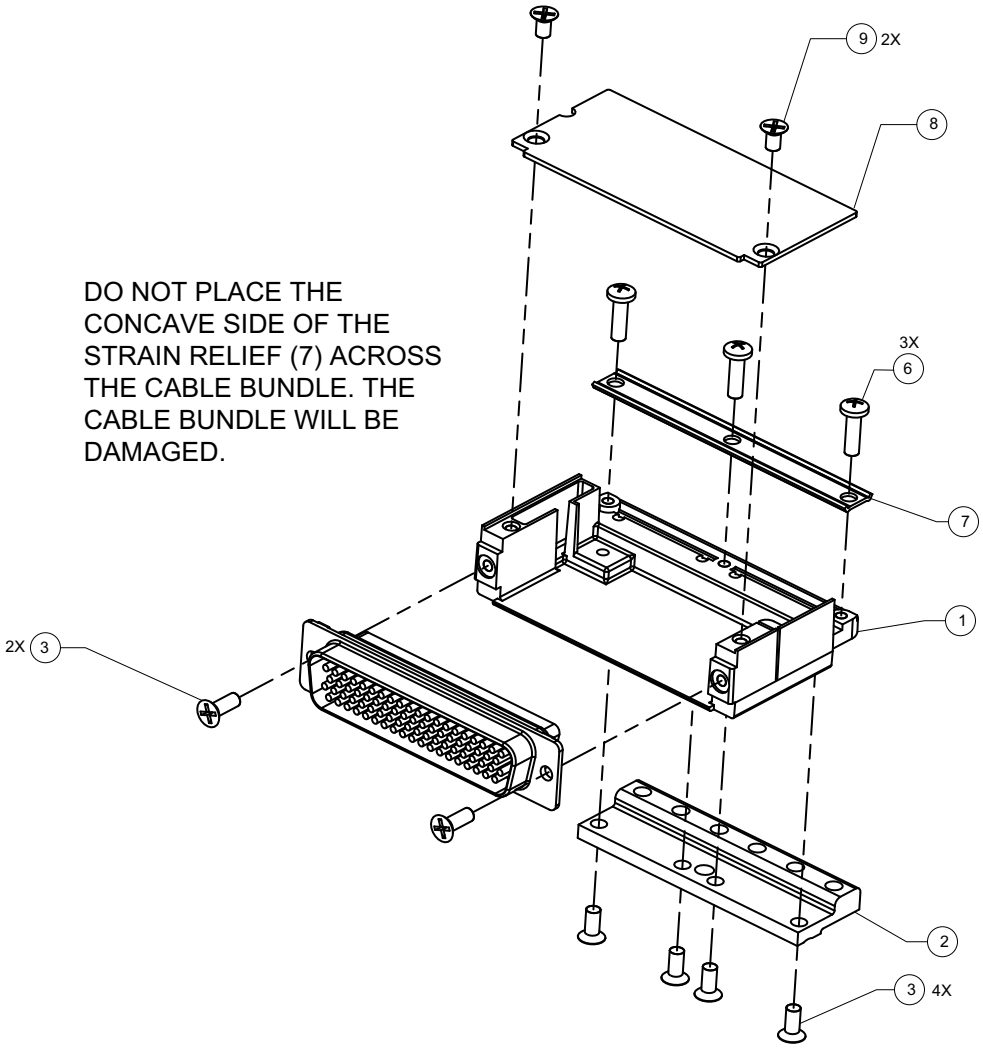


Figure 6-5 Backshell Assembly Example

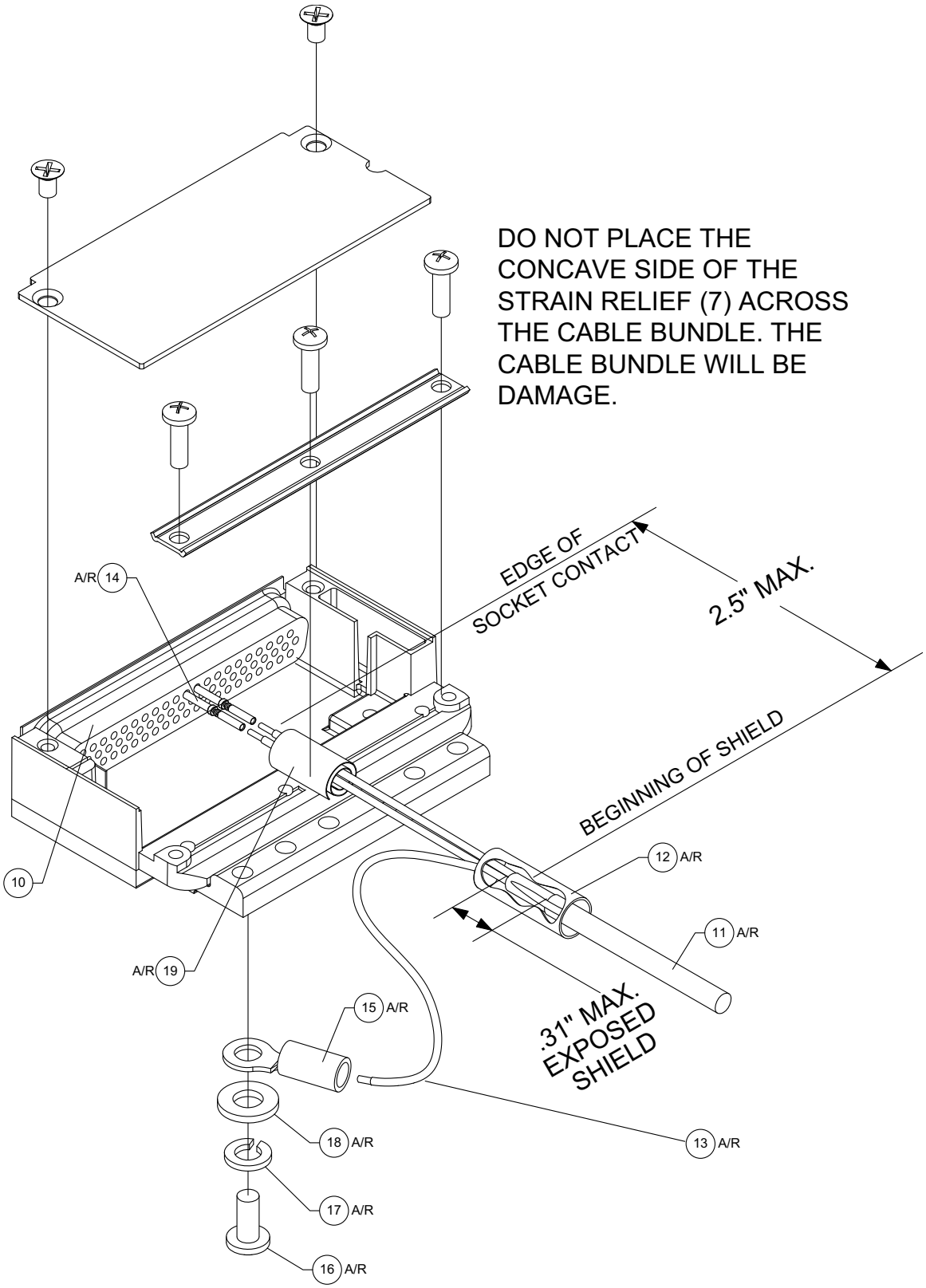


Figure 6-6 Backshell Shield Termination

6.1.5 Coaxial Cable Installation

Make sure the length is set for the necessary cable loss. Some antennas have minimum cable loss specifications that may need a cable longer than the physical run in the aircraft. To install coax cables:

1. Route the coaxial cable to the radio rack location keeping in mind the recommendations of section 6.3 and section 3.
2. Attach the cable in accordance with AC 43.13-1B, chapter 11, section 11.
3. Trim the cable to the applicable length.
4. Install the connectors per the manufacturer's instructions.

6.1.6 Wiring and Power Checks

CAUTION

VERIFY ALL LIGHTING BUSES ARE SET TO THE LOWEST ADJUSTMENT BEFORE APPLYING POWER TO THE UNIT. THE LOWEST ADJUSTMENT SETTING PREVENTS DAMAGE TO THE UNIT IF THERE ARE ANY WIRING ERRORS.

Examine the wire harness to make sure the connection to aircraft systems and avionics equipment is correct before the unit is energized. Point-to-point continuity checks must be performed to expose any faults such as shorting to ground or wiring discrepancies. All faults or discrepancies must be corrected before continuing.

Before and during the installation ensure:

- Cables are properly attached
- Shields are connected to connector shield blocks
- Cables do not touch controls and control systems over entire range of movement
- Wires are installed as described

Make sure these items are completed after the installation.

- Power and ground checks
- Continuity checks
- Faults and discrepancies are corrected
- Unit is correctly attached

6.2 Unit Installation

The GPS 175 is designed to mount in the aircraft instrument panel. The primary unit location should minimize pilot head movement when transitioning between looking outside of the cockpit and viewing/operating the unit. The location should be such that the unit is not blocked by the glare shield on top, or throttles, control yoke, etc., on the bottom. If the aircraft has a throw-over yoke, make sure the yoke does not interfere with the unit.

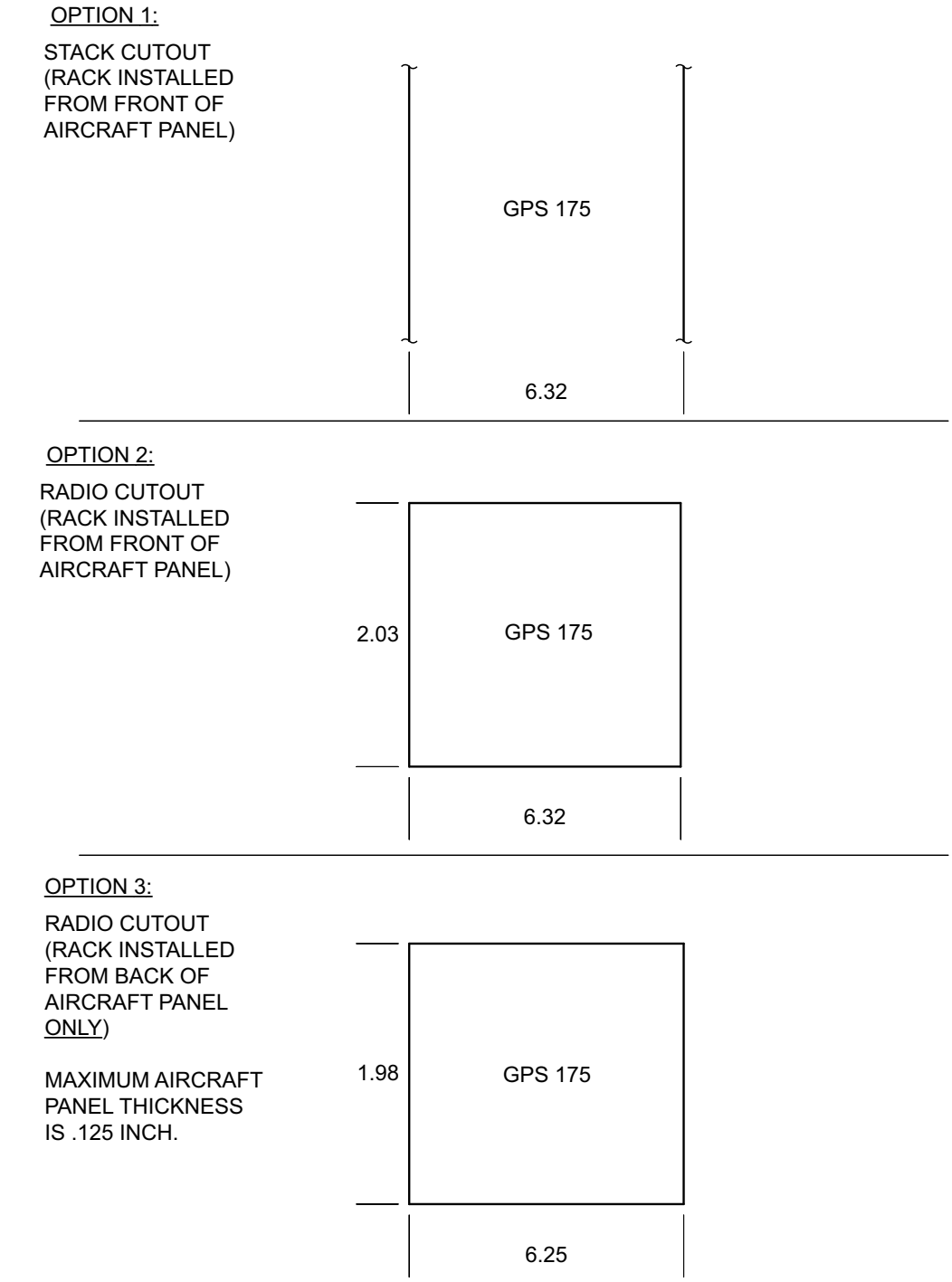
Ensure there is sufficient clearance behind the GPS 175 location for connectors, wire harness, and Pitot-static plumbing before cutting the panel.

6.2.1 Rack Installation

CAUTION

BE CAREFUL WHEN INSTALLING THE RACK IN THE INSTRUMENT PANEL. DEFORMATION OF THE RACK WILL MAKE IT DIFFICULT TO INSTALL AND REMOVE THE GPS 175.

1. Use the dimensions in figure 6-7 to mark the panel. Alternatively, the mounting rack may be used as a template for drilling the mounting holes.
2. Drill four 0.1285" holes for the mounting points using a #30 drill bit.
3. Enlarge the mounting holes to 0.144" using a #27 drill bit.
4. Cut out the outline on the instrument panel.
5. Install the rack in the instrument panel with six #6-32 flat head screws and six self-locking nuts.
6. Insert the screws from the inside through the holes in the sides of the rack. The top front lip of the rack should be flush with, or extend slightly beyond the finished aircraft panel. If the front lip of the mounting rack is behind the surface of the instrument panel, the unit connectors may not fully engage.



NOTES, ALL OPTIONS:
1. DIMENSIONS ARE IN INCHES
2. IF THE FRONT LIP OF THE MOUNTING RACK IS BEHIND THE SURFACE OF THE AIRCRAFT INSTRUMENT PANEL, THE UNIT CONNECTORS MAY NOT FULLY ENGAGE.
3. TOLERANCE: ±0.03 INCHES.

Figure 6-7 Panel Cutout

6.2.2 Backplate Installation

CAUTION

MAKE SURE THE GROUND LUGS ON THE CONNECTOR BACKSHELL FACE AWAY FROM EACH OTHER WHEN INSTALLING THE CONNECTORS IN THE BACKPLATE. FAILURE TO DO SO MAY CAUSE DAMAGE TO PINS OR INTERMITTENT FAILURES WHEN UNIT IS INSERTED.

1. Visually inspect the connectors to ensure that there are no bent or damaged pins.
2. Repair any damage.
3. Connect the rear connectors to the backplate.
4. Align the backplate so that the backplate screw heads pass through the keyed holes in the back of the rack.
5. Slide the backplate to the right (viewing from cockpit) until it clicks into place.
6. Secure the backplate by tightening the four #4-40 screws.

6.2.3 Unit Removal and Installation

CAUTION

ALWAYS CONNECT AN ANTENNA OR A DUMMY LOAD TO THE UNIT WHEN OPERATING. FAILURE TO DO SO WILL CAUSE THE UNIT TO FAIL AND POSSIBLY DAMAGE IT.

Removal

1. Insert a 3/32" hex drive tool into the access hole on the unit face.
2. Rotate counterclockwise until the unit is forced out about 3/8" and the hex drive tool completely stops.
3. Pull the unit from the rack.

Installation

CAUTION

DO NOT OVER TIGHTEN THE UNIT INTO THE RACK. TORQUE EXCEEDING 15 IN-LBS CAN DAMAGE THE LOCKING MECHANISM.

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.

1. Slide the unit straight into the rack until it stops, approximately 3/8" short of the final position.
2. Insert a 3/32" hex drive tool into the access hole near the top right of the unit face.
3. Turn the tool clockwise while pressing on the left side of the bezel until the unit is firmly seated in the rack.

6.3 GPS Antenna Installation

NOTE

If twelve inch spacing is not practical, the maximum center-to-center spacing must be used, but never less than nine inches. Spacing less than nine inches results in unacceptable antenna pattern degradation.

NOTE

It may be beneficial to temporarily locate the GPS/SBAS antenna with coax connected to the unit and check the GPS/SBAS performance as described in section 8.2.3. Once a suitable location has been verified, then permanently mount the antenna.

The installation guidelines meet the intent of AC 20-138D chapter 13. The greater the deviation from these guidelines, the greater the chance of decreased signal quality and availability. It is possible that all of the installation guidelines cannot be met. These guidelines are listed in order of importance to get the best performance. The installer should use best judgment to balance the installation guidelines.

6.3.1 Antenna Location

The GPS antenna should:

1. Be installed as near to level as possible with respect to the normal cruise flight attitude of the aircraft.
2. Be installed in a location to minimize the effects of airframe shadowing during typical maneuvers.
3. Be installed a minimum of two feet from any VHF COM antenna or any other antenna which may emit harmonic interference at the L1 frequency of 1575.42 MHz.
4. Be installed a minimum of two feet from any antennas emitting more than 25 watts.
5. Be installed a minimum of nine inches (center to center) from other antennas, including passive antennas such as another GPS or XM antenna.
6. Be installed a minimum of three inches from the windscreen.
7. Have a twelve inch center to center spacing between GPS antennas.

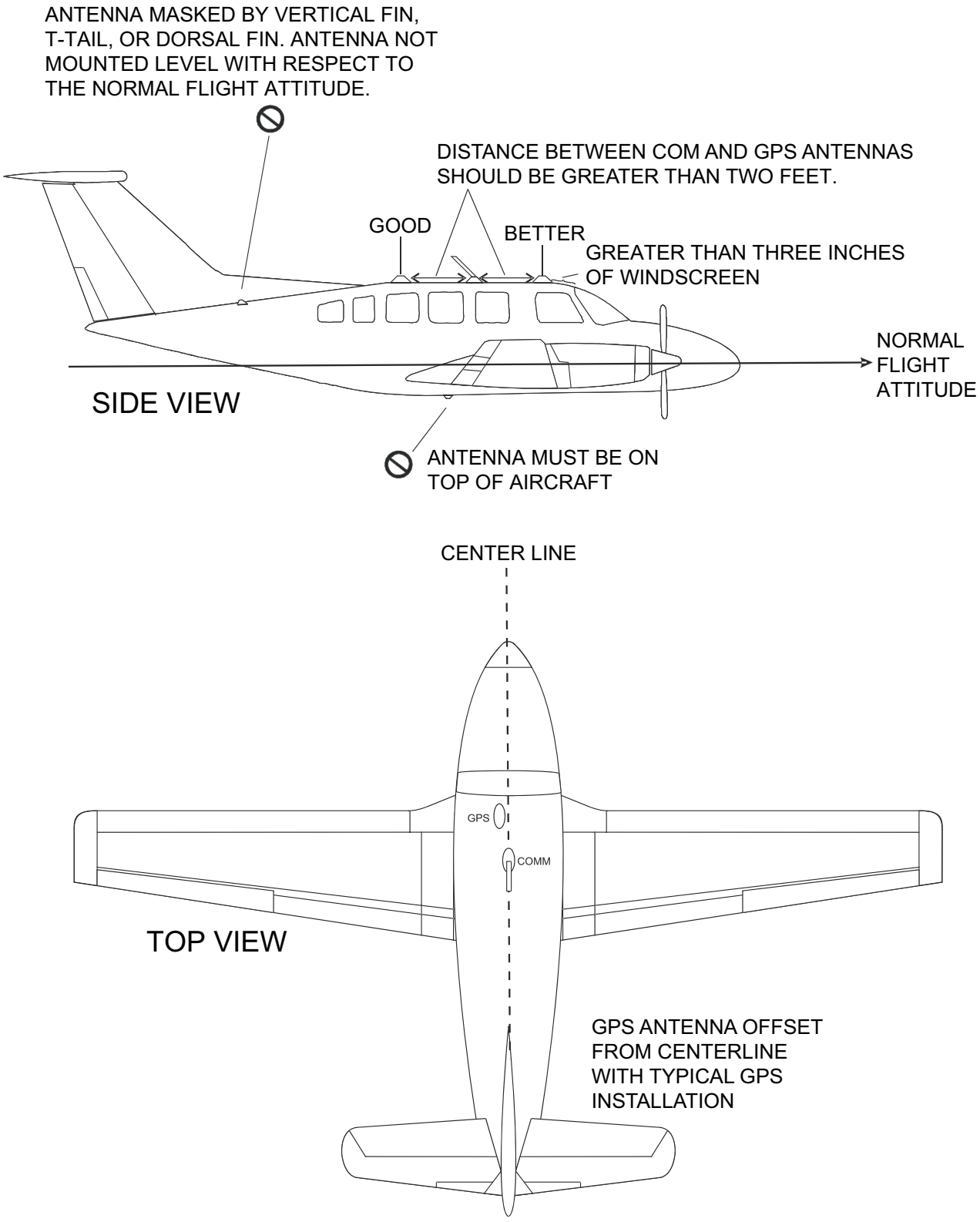


Figure 6-8 GPS Antenna Locations

6.3.2 GPS Antenna Cable

Once the antenna mounting position has been prepared, route the coax cable from the antenna to the unit. Proper selection of coax cable and assembly of connectors is critical to GPS signal performance. Cable loss from the GPS/SBAS antenna must be between 1.5 dB and 6.5 dB in order to maintain proper rejection to interference signals.

Coaxial connectors and adapters, such as TNC to BNC, add additional loss to the cable and should be considered when computing the cable loss. A typical loss of 0.2 dB can be used for each connection. To maintain integrity of the SBAS signal, the GPS antenna coaxial cable must have a minimum of two shields (e.g., RG-400 or RG-142B).

NOTE

If RG-142B or RG-400 is used, 1.5 dB equates to a length of approximately 6.5 feet of cable with a connector on each end. RG-142B or RG-400 cable can be used as long as the length is less than 35 feet. For longer lengths, use low-loss double or triple shielded 50 ohm coax.

For very short runs, where the loss is less than 1.5 dB, additional cable should be used to increase the loss to within 1.5 dB to 6.5 dB. This additional cable may be coiled, taking into account the minimum bend radius of the cable.

During the post-installation checkout, susceptibility to harmonics of VHF COM transmitters will be evaluated. If problems arise, then better isolation, or distance, may be required between the GPS and COM antennas, or a 1575.42 MHz notch filter, Garmin P/N 330-00067-00, may be installed in series with the antenna coax of the VHF COM transceiver to reduce or eliminate the harmonic interference.

If a VHF COM transmitter causes problems with the GPS on the selected frequencies as listed in the post-installation checkout, the problem may be due to the ELT. This can be verified by disconnecting the ELT antenna coax at the ELT unit. If the ELT is found to cause the problem, then contact the ELT manufacturer or replace the ELT.

6.3.3 GPS Antenna

GA 35 Antenna

The antenna includes four 8-32 UNC-2A x 1.00" SS 303 mounting screws and one O-ring. If it is necessary to use an antenna doubler refer to the applicable antenna installation data.

1. Attach the antenna with four #8 washers and four #8 self-locking nuts. Alternatively, nut plates can be attached to the doubler.
2. Torque the four supplied 8-32 stainless steel screws 12-15 in-lbs. Apply torque equally across all mounting screws to avoid deformation of the mounting area.
3. Use a TNC plug to connect the GPS antenna coax cable.

GA 36 Antenna

The antenna includes four 10-32 UNF-2A x 1.00" SS 303 mounting screws and one O-ring. If it is necessary to use an antenna doubler refer to the applicable antenna installation data.

1. Attach the antenna with four #10 washers and four #10 self-locking nuts. Alternatively, nut plates can be attached to the doubler.
2. Torque the four supplied 10-32 stainless steel screws 20-25 in-lbs. Apply torque equally across all mounting screws to avoid deformation of the mounting area.
3. Use a TNC plug to connect the GPS antenna coax cable.

GA 37 Antenna

The antenna includes four 10-32 UNF-2A x 1.00" SS 303 mounting screws and one O-ring. If it is necessary to use an antenna doubler refer to the applicable antenna installation data.

1. Attach the antenna with four #10 washers and four #10 self-locking nuts. Alternatively, nut plates can be attached to the doubler.
2. Torque the four supplied 10-32 stainless steel screws 20-25 in-lbs. Apply torque equally across all mounting screws to avoid deformation of the mounting area.
3. Use a TNC plug to connect the GPS antenna coax cable.

A33W Antenna

The antenna includes four 6-32 UNC-2A x 1.00" SS 303 mounting screws and one O-ring. If it is necessary to use an antenna doubler refer to the applicable antenna installation data.

1. Attach the antenna with four #6 washers and four self-locking nuts. Alternatively, nut plates can be attached to the doubler.
2. Torque the four supplied 6-32 stainless steel screws 3-5 in-lbs. Apply torque equally across all mounting screws to avoid deformation of the mounting area.
3. Use a TNC plug to connect the GPS antenna coax cable.

7 System Configuration

This section provides complete instructions for configuring a GPS 175. Specific configuration steps vary depending on the installed system and software version. No references are needed outside the scope of this section to successfully configure the unit. Perform all section topics in the order presented. Screen shots are for reference only.

System Configuration Map

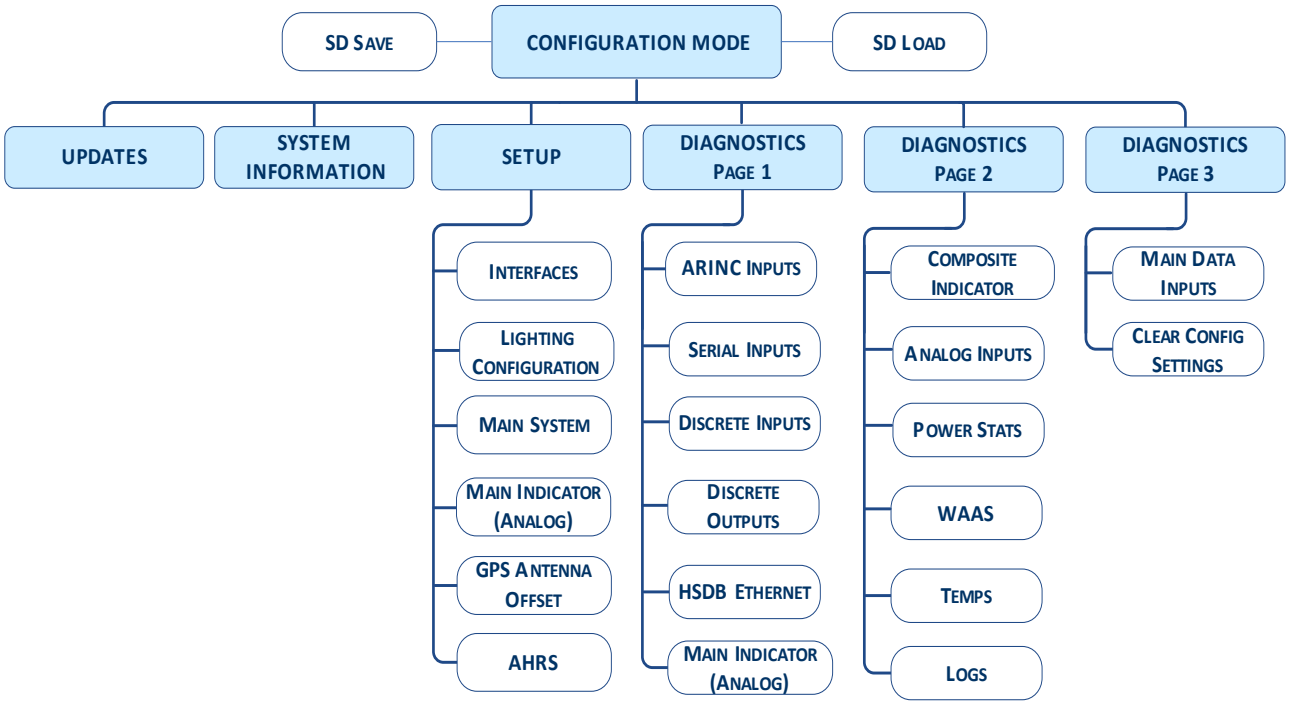


Figure 7-1 Configuration Map

7.1 Configuration Mode

Perform all configurations, calibrations, and test procedures in configuration mode.

Dots display above the page name when more than one page is in a group. A cyan dot indicates the active page. Swipe left or right to change pages.

When entering configuration mode with a software update card installed, the unit displays the main software version on the card.

To Enter Configuration Mode

1. Push and hold the inner knob.
2. Push the power key.
3. When the configuration mode home page displays, release the knob.

Main Software Version on SD Card

Main Software Version Installed on Unit

Figure 7-2 Configuration Mode Home Page

Screen Shots

The GPS 175 captures images on the display to view later. This is a useful tool for troubleshooting.

1. Insert the SD card into the card slot.
2. Push and hold the knob.
3. Push and release the power/home key. The camera icon briefly displays at the bottom right of the screen indicating the image saved to the SD card.

7.2 Updates

The system configuration determines software update options. It is necessary to create a loader card before updating software. An 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 at this time.

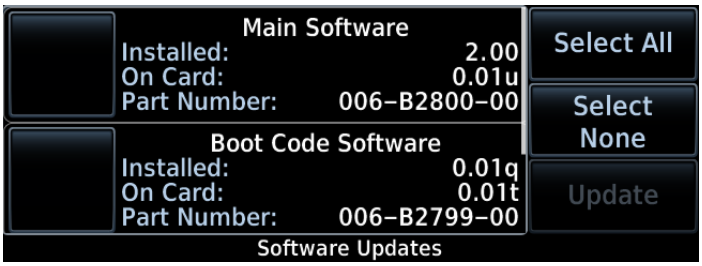


Figure 7-3 Software Package List

- Software Upload page displays the SD card list of files.
- Perform software updates as part of a single package or load individually.
- Unavailable selections display as gray text.

7.2.1 Software Loader Card Instructions

1. Log into the Dealer Resource Center.
2. Download the appropriate system software to a folder on a PC.
3. Connect an SD card reader to the PC.
4. Insert an 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. Tap **Finish**.
8. Eject the loader card.

7.2.2 Software Update Instructions

When selecting software, a green check mark indicates software to be loaded as part of that update.

1. Power the unit off.
2. Insert the software loader card into the slot.
3. Power the unit on. The unit automatically starts in configuration mode.
4. Tap the box of the software or software packages to update.
5. Tap Update.

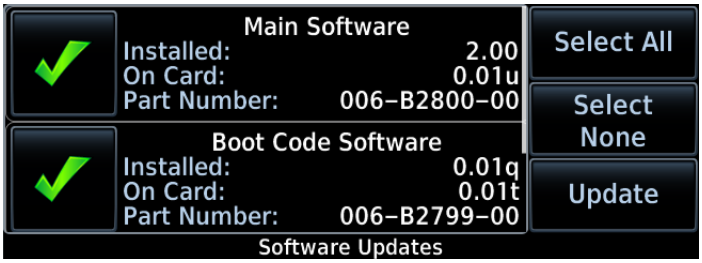


Figure 7-4 Software Upload Page

SELECTION	DESCRIPTION
Select All	Updates all available software packages
Select None	Clears selection
Update	Begins software update

Figure 7-5 Software Upload in Progress

Selecting Cancel during the update process stops remaining updates. This does not cancel the file currently updating.

7.2.3 Flight Stream 510 Software Loading

CAUTION

DO NOT DISCONNECT OR REMOVE POWER FROM THE UNIT WHILE UPDATING SOFTWARE.

NOTE

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

NOTE

To perform the software update, Garmin Pilot version iOS 9.1.5 or later is required.

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

The Flight Stream 510 software can be updated via Wi-Fi during normal power up of the unit. To update Flight Stream software, perform the following steps.

1. Connect the PED to the Flight Stream device. Refer to section 7.9 for additional details.
2. Open the Garmin Pilot application.
3. Tap **Settings** from the home screen.
4. Verify that "Dealer Mode" displays as an active subscription.
5. Tap **Home**.
6. Tap **Connext**.
7. Tap **Firmware**.
8. Select the desired Flight Stream 510 software version.
9. Tap **Update over Wi-Fi**. A Wi-Fi connection is necessary to update Flight Stream 510 software.
10. Connect the PED to the Flight Stream 510 Wi-Fi network. Garmin Pilot provides instructions to connect to the Wi-Fi network.
11. Open the Garmin Pilot Firmware page.
12. Select the desired software version.
13. Tap **Begin Firmware Update**. The Flight Stream device reboots after the update. Allow the Flight Stream device to reconnect to Garmin Pilot.
14. Tap **Continue**.
15. Verify that Garmin Pilot displays the updated Flight Stream software version.

7.3 System Information

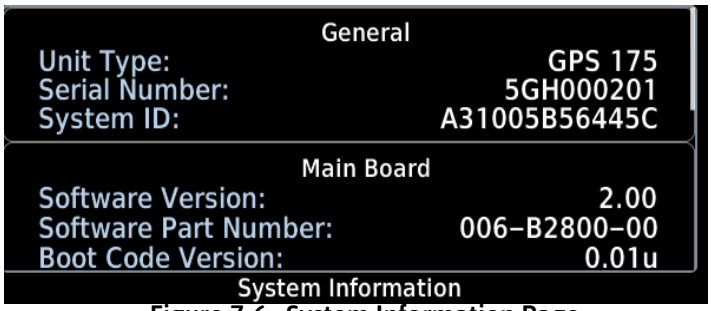


Figure 7-6 System Information Page

The System Information page displays general and board specific information for the GPS 175.

7.4 Setup

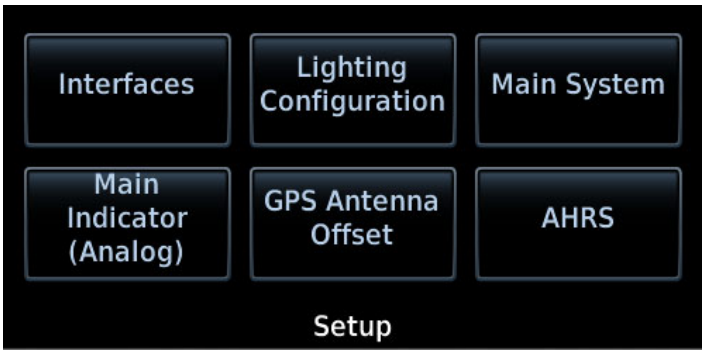


Figure 7-7 Setup Page

The Setup page provides access to the different pages required to configure the GPS 175 for a specific installation. Tap a key associated with a specific page to configure that setting.

7.4.1 Interfaced Equipment

The Interfaced Equipment page allows configuration of ARINC 429/RS-232 ports, selects the source of ADS-B, and set the status of GI 275 and GDU.

Figure 7-8 Interfaced Equipment Page

ARINC 429

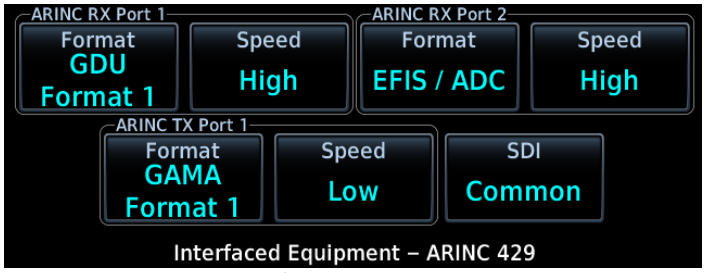


Figure 7-9 Interfaced Equipment - ARINC 429

Table 7-1 ARINC 429 RX Ports 1 and 2

SELECTIONS	OPTIONS	DESCRIPTION
Format	Off	No units connected to this port.
	GDU Format 1	Receives altitude, airspeed, selected course, and heading information from a Garmin GDU.
	EFIS/ADC	Receives altitude, airspeed, selected course, and heading information from EFIS and ADC systems.
	Standby EFIS	Receives altitude, airspeed, selected course, and heading information from a standby EFIS system.
Speed	Low	Low-speed, nominally 12.5 Kb per second
	High	High-speed, nominally 100 Kb per second

Table 7-2 ARINC 429 TX Port 1

SELECTIONS	OPTIONS	DESCRIPTION
Format	Off	No units connected to this port.
	GAMA Format 1	• GDU 620 • GAD 29 • GDU 37X/45X/46X
	GAMA Format 3	• Aspen • Sandel 3308, 3500, and 4500
Speed	Low	Low-speed, nominally 12.5 Kb per second
	High	High-speed, nominally 100 Kb per second

Table 7-3 SDI

OPTIONS	DESCRIPTION
Common	• Accepts all 429 inputs • Generates all 429 outputs with SDI = 0
LNAV1	• Select for number 1 (pilot) navigator • Accepts all 429 inputs with SDI = 0 or 1 • Generates all 429 outputs with SDI = 1
LNAV2	• Select for number 2 (copilot) navigator • Accepts all 429 inputs with SDI = 0 or 2 • Generates all 429 outputs with SDI = 2

RS-232

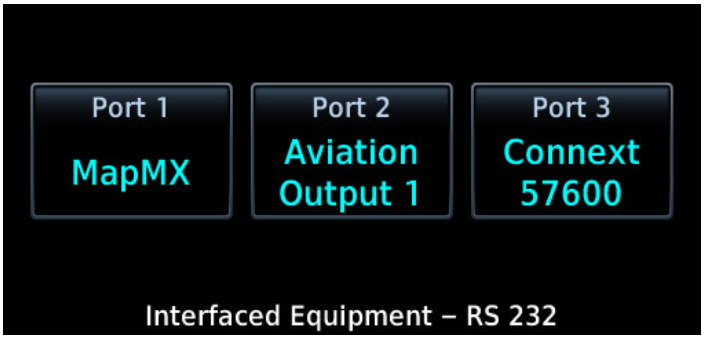


Figure 7-10 Interfaced Equipment - RS-232 Page

Table 7-4 RS-232 Settings

SELECTION	OPTION	NOTES
RS-232 Port 1/2/3	Off	No units connected to this port.
	MapMX Format 1	Provides navigation data (PVT). • MX20 software v5.6 or later • GMX 200 • GDU 620 • G5 • GMC 605
	Aviation Output 1	• Argus 3000, 5000, or 7000 Moving Map • Electronics International FP-5L Fuel Flow Computer (non-TSO'd) • Garmin MX20 (V5.6 or later), GMX 200, GPSMAP 195, GPSMAP 295 or GPS III Pilot, GPSMAP 196, GPSMAP 296, GPSMAP 396, GPSMAP 496, GPSMAP 695, GPS MAP 696, GTX 327 Transponder, GTR 225/GNC 255 • JP Instruments EDM-700 or EDM-760 Engine Monitor, Shadin 9628XX-X Fuel/Air Data Computer, 91204XM and 91053XM Digital Fuel Management Systems. • Stormscope Series II (with NAVAID) Moving Map
	Aviation Output 2	• Garmin MX20 (V5.5 or earlier) • Horizon DDMP
	ADS-B+ Format 1	Transmits necessary ADS-B GPS data at 9600 baud.
	ADS-B+ Format 2	Transmits necessary ADS-B GPS data at 38400 baud.
	Connext 57600	G3X touch system

ADS-B Source

Figure 7-11 Interfaced Equipment - ADS-B Source Page

Table 7-5 ADS-B Source Settings

OPTIONS	DESCRIPTION
Not Present	No ADS-B source connected to GPS 175.
GDL 88	GDL 88 is the ADS-B source and transmit is enabled.
GDL 88 No TX	GDL 88 is the ADS-B source and transmit is not enabled.
GTX #1	GTX 345 #1 is the ADS-B source.
GTX #2	GTX 345 #2 is the ADS-B source.

GDU

Tap GDU to toggle between "Present" and "Not Present." Select "Present" if the unit is interfacing to a GDU.

GI 275

Tap GI 275 to toggle between "Present" and "Not Present." Select "Present" if the unit is interfacing to a GI 275.

7.4.2 Lighting Configuration

The display and bezel keys lighting control source can configure to track either the Photocell or Lighting Bus. The unit adjusts its intensity based on the lighting bus or photocell level.

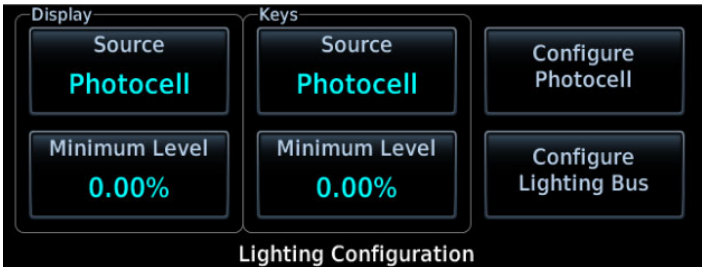


Figure 7-12 Lighting Configuration Page

Display **Source** sets source input for the display backlight. Keys **Source** sets source input for the bezel keys backlight.

To specify a lighting input source, select Display **Source**. Configure parameters affecting the display backlight and key lighting brightness on the Lighting Configuration page.

Table 7-6 Lighting Configuration Selections

SELECTION	DESCRIPTION
Photocell	Sets the lighting input level for day and night curves according to the ambient light level, as measured by the unit photocell.
Lighting Bus	Sets the lighting input level according to the lighting bus dimmer levels.
Minimum Level	Sets the applicable minimum auto brightness of the keys or display.

Photocell Configuration

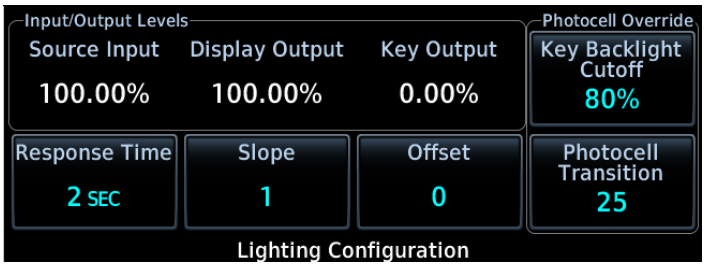


Figure 7-13 Photocell Configuration Page

The Photocell Configuration page displays the set input/output levels for the source, display, and key, and provides keys to change and override parameters.

To configure for photocell:

1. Configure photocell as source for display and/or keys.
2. Tap **Configure Photocell**.
3. Tap **Key Backlight Cutoff** to set the key backlight cutoff percentage. Set to the desired value so the key backlighting switches off in bright light. Type the preferred cutoff value (0.0 - 100.0) > **Enter**.
4. Tap **Response Time** to select the preferred response time (2 - 7). The lower the level, the faster the display adjusts.
5. Tap **Slope** and type the preferred slope value (0 - 100) > **Enter**.
6. Tap **Offset** and type the preferred offset value (0 - 100) > **Enter** to adjust the key brightness.
   - Too bright - lower minimum level and/or adjust lighting slope
   - Too dim - raise minimum level
7. Tap **Photocell Transition** and type the preferred transition value (5 - 50) > **Enter**.
8. Verify the display/keys produce maximum brightness on the backlight output level. Adjust the levels if needed.
   - If the display/keys are too bright or too dim, vary the Slope and/or Offset to achieve desired brightness at mid-range lighting input levels.
   - If the key is too bright or too dim, vary the slope and/or Offset to achieve desired brightness at mid-range lighting input levels.
   - Adjust the response time to smooth changes to brightness as required.
9. Verify adjustments made in the preceding steps are appropriate and functional for all expected lighting conditions.

Table 7-7 Photocell Configuration

SETTING	DESCRIPTION
Key Backlight Cutoff	Configures the point at which key backlights are switched off in bright light (e.g., a value of 70% means the backlights will be off at photocell source input levels above 70%). The default value for this setting is 80%.
Response Time	Sets the speed where the brightness responds to changes in the input level (ambient light). The lower the value, the faster the response. Selections range from 2 to 7 seconds. The default value for this setting is two seconds.
Slope	Sets the display brightness sensitivity according to input level changes. The default value for this setting is 50.
Offset	Adjusts the lighting level up or down for a given input level. The default value for this setting is 50.
Photocell Transition	Sets the lighting bus input level where the lighting bus input is ignored and the photocell is used to control the display backlight. The photocell transition is a percentage of the maximum lighting bus input level. Selections are between 5 and 50. The default value for this setting is 25%.

Lighting Bus Configuration

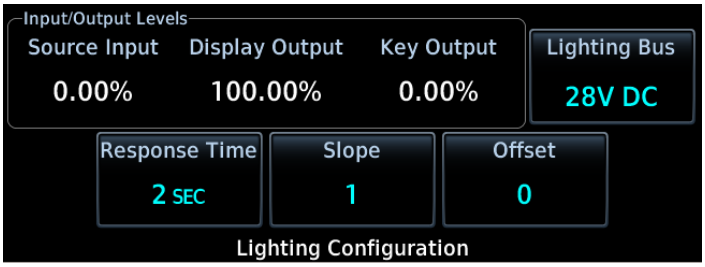


Figure 7-14 Lighting Bus Configuration Page

The Lighting Bus Configuration page displays the set input/output levels for the source, display, and key, and provides keys to change and override parameters.

To configure lighting bus:

1. Configure Lighting Bus as source for display and/or keys.
2. Tap Configure Lighting Bus.
3. Tap Lighting Bus to set lighting bus voltage. Tap the aircraft lighting bus voltage > Enter.
4. Tap Response time to select the preferred response time. The lower the level, the faster the display adjusts.
5. Tap Slope and type the preferred slope value (0 - 100) > Enter.
6. Tap Offset and type the preferred offset value (0 - 100) > Enter to adjust key brightness.
   - Too bright - lower minimum level and/or adjust the lighting slope
   - Too dim - raise minimum level
7. Verify the display/keys produce maximum brightness on the backlight output level. Adjust the levels if needed.
   - If the display/keys are too bright or too dim, vary the Slope and/or Offset to achieve the desired brightness at mid-range lighting input levels.
   - Adjust the Response Time to smooth changes to brightness as required.
8. Verify that adjustments made in the preceding steps are appropriate and functional for all expected lighting conditions.

Table 7-8 Source Configuration

	DESCRIPTION
Lighting Bus	Sets lighting bus source voltage. Selection is determined by the lighting bus voltage source: 14V DC, 28V DC, 5V DC, 5V AC.
Response Time	Sets speed where the brightness responds to changes in the input level (bus voltage). Selections range from 2 to 7 seconds. The default value for this setting is two seconds.
Slope	Sets display brightness sensitivity according to changes in the input level. The default value for this setting is 50.
Offset	Adjusts lighting level up or down for a given input level. The default value for this setting is 50.

7.4.3 Main System

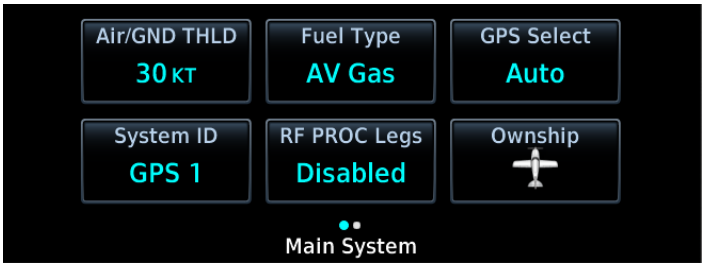


Figure 7-15 Main System Page

The Main System page configures system items unrelated to LRUs.

Table 7-9 Main System Selections

SETTING	SELECTION	DESCRIPTION
Air/GND Thres	Enter 1 kt to 99 kt	The ground speed in which the unit transitions from a ground state to an airborne state, and vice versa.
Fuel Type	Av Gas	Select aircraft fuel type.
	Jet A	
	Jet B	
GPS Select	Auto	GPS Select discrete is open whenever a GPS approach mode is active.
	Prompt	GPS Select discrete is open whenever a GPS approach mode is active and A/P APR Outputs are enabled. For Honeywell (Bendix/King) KFC 225 and KAP 140 autopilots.
System ID	GPS 1	Identifies the position of the GPS in multi-unit installations. If unit is the primary GPS in the aircraft, select GPS 1. If unit is secondary, select GPS 2.
	GPS 2	
RF Proc Legs	Disabled	Procedures with RF legs are not available to load.
	Enabled	Procedures with RF legs are available to load.
Ownship	Varies	Select icon to display on moving map.
Terrain Alerts	Disabled	Enables or disables terrain avoidance alerts.
	Enabled	
Graphical Edit	Disabled	Enables or disables the ability to graphically edit the active flight plan directly on the map display.
	Enabled	
Composite CDI	Disabled	Composite CDI not interfaced to unit.
	Enabled	Composite CDI interfaced to unit.
Bluetooth	Enabled	Bluetooth is enabled on the unit.
	Disabled	Bluetooth is not enabled on the unit.
External FPL	Enabled	The unit will accept active flight plan edits from the G3X touch system.
	Disabled	The unit will not accept active flight plan edits from the G3X touch system.
ALT SRC Input	Connected (Default)	A pressure altitude source is connected to the unit.
	Not Connected	A pressure altitude source is not connected to the unit. If a nuisance altitude source lost message appears a few minutes after power up and no pressure altitude source is present, configure this setting to Not Connected.

7.4.4 Main Indicator (Analog)

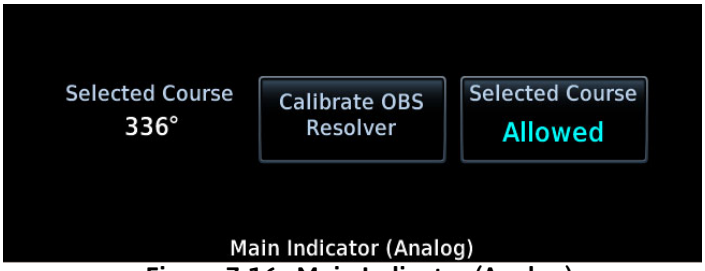


Figure 7-16 Main Indicator (Analog)

The Main Indicator (Analog) configuration page displays the selected course, calibrates the OBS resolver, and if allowed, displays selected course inputs.

Table 7-10 Main Indicator (Analog) Configuration

SETTING	SELECTION	DESCRIPTION
Display of selected course		Displays the selected course received by the unit.
Calibrate OBS Resolver	N/A	Tap Calibrate OBS Resolver and follow the prompts to calibrate the resolver. Verify OBS operation by checking that the displayed course is within 2° of the selected course.
Selected Course	Allowed	Allows selected course inputs for GPS operation in OBS mode.
	Ignored	Ignores selected course inputs for GPS operation.

7.4.5 GPS Antenna Offset

Figure 7-17 GPS Antenna Offset Page

Configures GPS antenna height, lateral offset, and longitudinal offset. Before proceeding, measure:

- Antenna height above ground
- Lateral offset
- Longitudinal offset

Set the GPS Antenna Offset

1. Tap Height above ground.
2. Enter value to the nearest tenth of a foot.
3. Tap Enter.
4. Tap Offset.
5. Enter value to the nearest foot.
6. Tap Enter.
7. Tap Direction to toggle between left and right lateral offset.
8. Tap Offset from nose.
9. Enter value to the nearest foot.
10. Tap Enter.

7.4.6 AHRS

NOTE
The display orientation must be set and aircraft must be level before calibrating the internal AHRS.

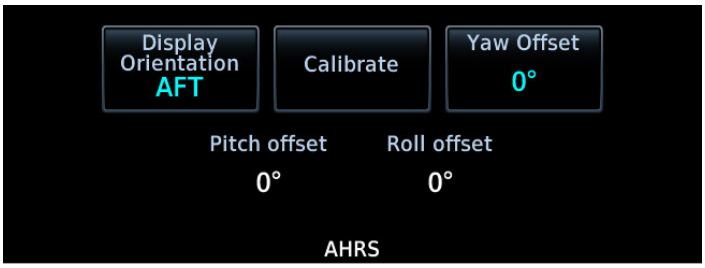


Figure 7-18 AHRS Calibration Page

Use this page to:

- Set the display orientation
- Set the Yaw Offset
- Calibrate the internal AHRS

Table 7-11 AHRS Calibration

SETTING	SELECTION	DESCRIPTION
Display Orientation	• Unknown	N/A
	• AFT	Select this orientation if the display faces aft.
	• Up	Select this orientation if the display faces up.
Calibrate	N/A	Tap Calibrate to calibrate the internal AHRS to level (0° aircraft pitch and 0° aircraft roll).
Yaw Offset	-60° to 60°	Set the yaw angle of the unit relative to the centerline of the aircraft. When setting the yaw angle, a positive angle indicates the unit is rotated clockwise from the longitudinal axis of the airplane (line from nose to tail). A negative angle indicates the unit is rotated counterclockwise.

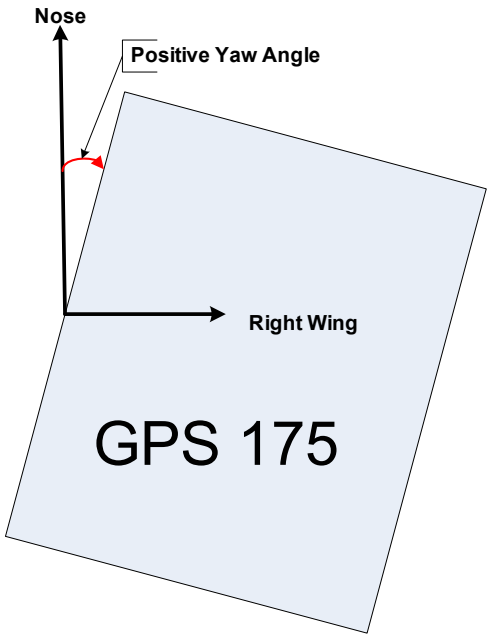


Figure 7-19 Setting the Yaw Angle

7.5 Diagnostics

Diagnostics provide access to pages helpful for maintenance and troubleshooting the system. Not all keys are enabled for every unit configuration.

Table 7-12 Available Diagnostics Pages

PAGE 1	PAGE 2	PAGE 3
ARINC Inputs	Composite Indicator	Main Data Inputs
Serial Inputs	Analog Inputs	Clear Config Settings
Discrete Inputs	Power Stats	
Discrete Outputs	WAAS	
HSDB Ethernet	Temps	
Main Indicator (Analog)	Logs	

7.5.1 ARINC Inputs

The unit auto detects ARINC 429 inputs operating at high or low speed. It processes incoming data at the appropriate rate and displays Label, SSM, Data, and SDI.

Figure 7-20 ARINC 429 Inputs

ARINC 429 Port	Toggles between available ports.
Pause	Interrupts all incoming data.
Clear Log	Clears all logged data.

7.5.2 Serial Inputs

The Serial Inputs page displays serial data received on each serial port.

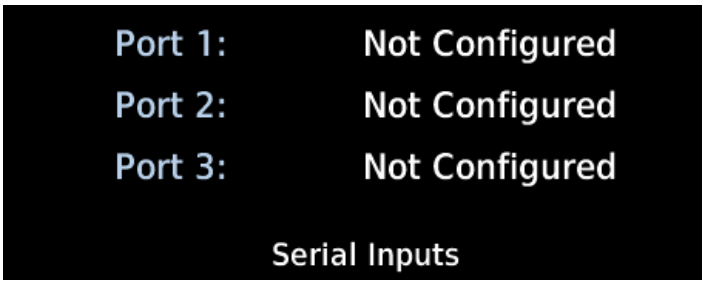


Figure 7-21 Serial Inputs Page

Not Configured	Port is not configured for an LRU.
Receiving	Port is receiving data.
Not Receiving	Port is configured for an LRU, but not receiving data.

7.5.3 Discrete Inputs

Figure 7-22 Discrete Inputs Page

This page shows the status as active or inactive for discrete inputs.

7.5.4 Discrete Outputs

Figure 7-23 Discrete Outputs Page

This page allows discrete outputs to be turned on or off to verify functionality of a specific discrete. Select key to toggle the state active (indicated by green bar) or inactive.

7.5.5 HSDB Ethernet

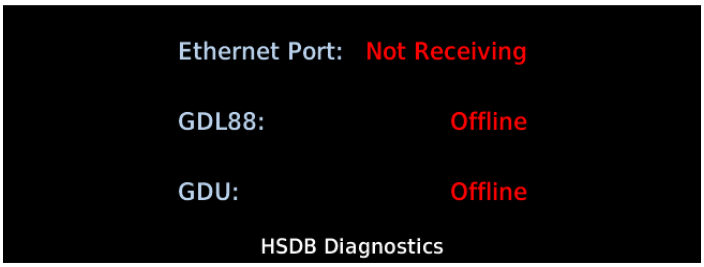


Figure 7-24 HSDB (Ethernet) Page

Table 7-13 HSDB (Ethernet) Page Description

ETHERNET PORT	
Not Configured	Port is not interfaced to an LRU.
Receiving	Port is receiving data.
Not Receiving	Port is interfaced to an LRU, but not receiving data.

GDU/GDL 88/GTX 345/GI 275	
Online	Port is receiving data from LRU.
Offline	Port is interfaced to an LRU, but not receiving data.

7.5.6 Main Indicator (Analog)

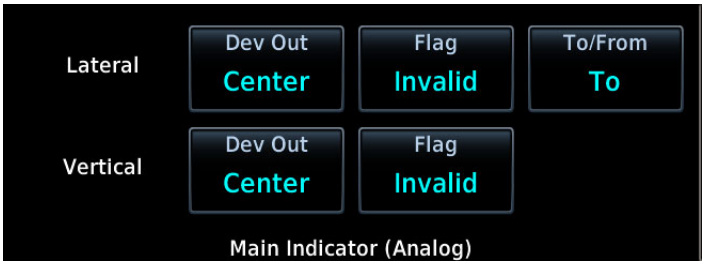


Figure 7-25 Main Indicator (Analog) Page

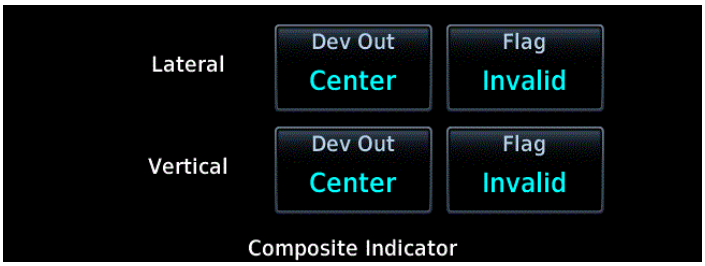
The Main Indicator (Analog) page allows the installer to verify the connected CDI interface and perform a ground check.

Table 7-14 Indicator Selections

SETTING GROUP	SELECTION	CDI STATE
Lateral	Dev Out	Max Left
		Full Left
		Center
		Full Right
		Max Right
	Flag	Valid
		Invalid
	To/From	From
		Hidden
		To
Vertical	Dev Out	Max Up
		Full Up
		Center
		Full Down
		Max Down
	Flag	Valid
		Invalid

7.5.7 Composite Indicator

NOTE
This page only displays if Composite CDI is enabled.



The Composite Indicator page allows the installer to verify the connected CDI interface and perform a ground check.

Figure 7-26 Composite Indicator Page

Table 7-15 Indicator Selections

SETTING GROUP	SELECTION	CDI STATE
Lateral	Dev Out	Max Left
		Full Left
		Center
		Full Right
		Max Right
	Flag	Valid
		Invalid
Vertical	Dev Out	Max Up
		Full Up
		Center
		Full Down
		Max Down
	Flag	Valid
		Invalid

7.5.8 Analog Inputs

The Analog Input page displays the input voltage and bus setting for the lighting bus.

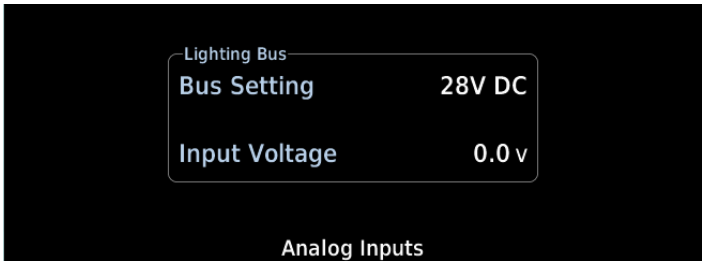


Figure 7-27 Analog Inputs Page

ANALOG INPUTS
• Lighting bus setting • Lighting bus input voltage

7.5.9 Power Statistics

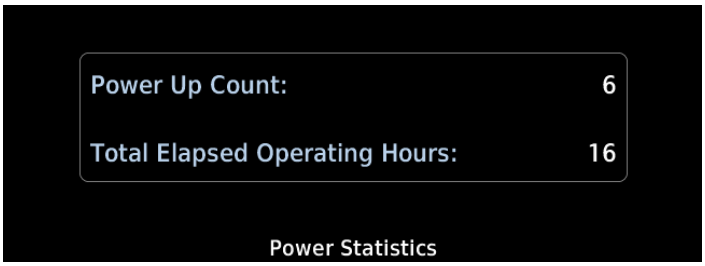


Figure 7-28 Power Statistics Page

Displays power up count and total elapsed operating hours of the unit.

7.5.10 WAAS

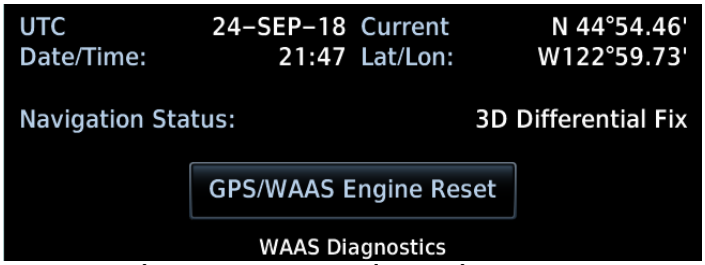


Figure 7-29 WAAS Diagnostics Page

The WAAS diagnostics page displays the WAAS engine status, including UTC date/time, current Lat/Lon, and overall navigation status.

To reset the WAAS engine and clear all almanac data, tap GPS/WAAS Engine Reset. New satellite acquisitions take up to 20 minutes.

7.5.11 Temperatures

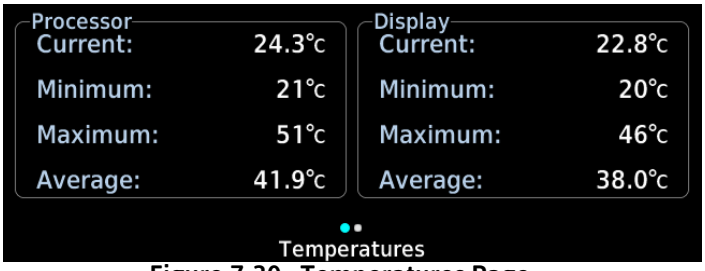


Figure 7-30 Temperatures Page

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

7.5.12 Logs

The Logs page provides the option of copying error and maintenance logs to an SD card, or clearing all log files.

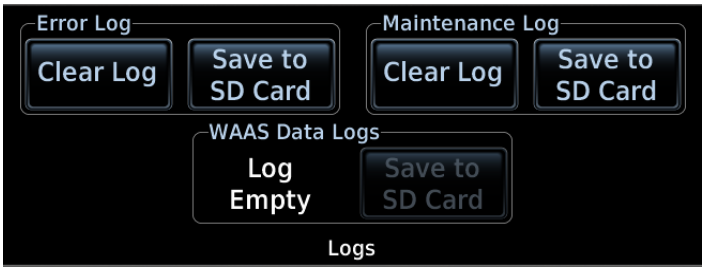


Figure 7-31 Error Log Page

LOGS KEY DESCRIPTIONS	
Clear Log	Removes all messages from the selected log.
Save to SD Card	Saves the selected information to SD card.

7.5.13 Main Data Inputs

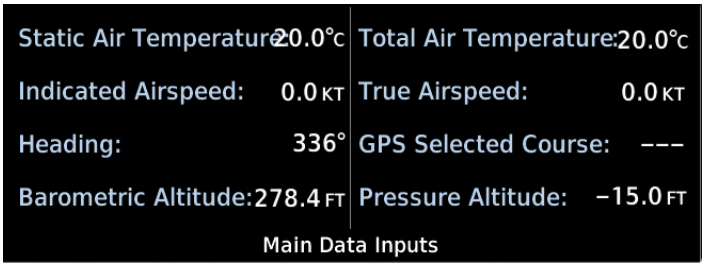


Figure 7-32 Main Data Inputs Page

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.

7.5.14 Clear Config

Before clearing configuration settings, save settings to an SD card.

To reset unit to original factory values, tap Clear Config Settings > OK. Restart the unit.

7.6 SD Save

NOTE
The unit supports up to a 32 GB FAT 32 SD card.

Exporting a configuration to an SD card allows airframe specific configuration information to be loaded to a different unit. Tap **SD Save** on the unit to save configuration information.

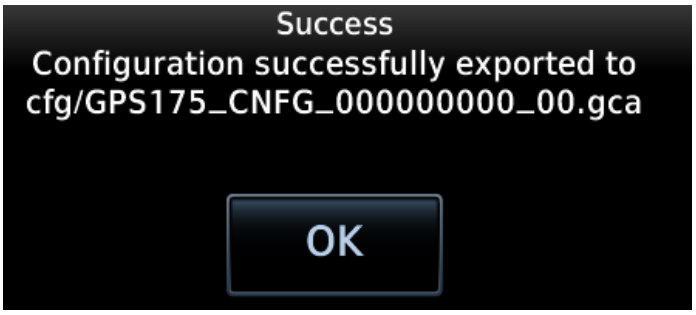


Figure 7-33 Successful Configuration Export

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

Figure 7-34 Failed Configuration Export

An error message displays when the configuration fails to export.

7.7 SD Load

This feature allows a previously saved configuration to load from an SD card.

Loading from an SD Card

The software version must match the unit saved to the card. Before configuring determine if a previously saved configuration is available.

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

Figure 7-35 Import Configuration File Page

7.8 Bluetooth

NOTE
A compatible PED with the Garmin Pilot application is required. Visit Garmin's website for a list of compatible devices.

NOTE
Bluetooth setup is performed in normal mode.

NOTE
If having issues making a Bluetooth connection, cycle power on the unit. Retry making a Bluetooth connection.

Bluetooth Setup

1. Ensure the unit is in normal mode.
2. Tap **System**.
3. Tap **Connext Setup**.
4. Ensure Bluetooth is enabled on the GPS 175.
5. Enable Bluetooth connectivity on the PED. Once enabled, the GPS 175 will be viewable in the list of available devices. The default Bluetooth name is GPS 175 followed by the last four digits of the MAC address (e.g., GPS 175 4000). To change the Bluetooth name:
   - Tap **Device Name.**
   - Type the desired Bluetooth name and tap **Enter**.
6. Select the GPS 175 from the list of available Bluetooth devices on the PED. A pop-up window will appear on the units screen to confirm the new Bluetooth pairing.
7. Tap **Yes** to finish pairing the device.

Bluetooth setup only needs to be performed when pairing with a device for the first time. Once a connection is established with a Bluetooth device, the GPS 175 automatically connects to the Bluetooth device upon power-up if auto reconnect is enabled for that device.

8. On the GPS 175, verify the PED displays as a paired device.
9. On Garmin Pilot, tap **Connext**.
10. Tap **GPS 175** under the devices tab.
11. Verify the GPS 175 is connected.

Figure 7-36 Bluetooth Setup Page

Managing Paired Devices

The GPS 175 can connect to up to three Bluetooth devices simultaneously. The GPS 175 saves up to thirteen Bluetooth device pairings. Remove pairing on both devices before attempting to pair again.

Figure 7-37 Bluetooth Paired Devices

Tap Auto Reconnect to enable the GPS 175 to automatically connect to the Bluetooth device on next power up.

SELECTION	DESCRIPTION
Auto Reconnect	Enables automatic connection between the GPS 175 and paired device when the units are within range of each other.
Remove	• Removes device from the list • Removes GPS 175 pairing • Requires confirmation

7.9 Flight Stream 510

NOTE
A compatible PED with the Garmin Pilot application is required. Visit Garmin's website for a list of compatible devices.

NOTE
Flight Stream 510 Wi-Fi setup is performed during initial startup in normal mode.

NOTE
If having issues making a Wi-Fi connection, cycle power on the unit. Retry making a Wi-Fi connection.

NOTE
Wi-Fi setup only needs to be performed when connecting to a device for the first time. Once a connection is established with a PED, the GPS 175 automatically connects to the device upon power-up if auto reconnect is enabled for that device.

Wi-Fi Setup

1. Power up the unit in normal mode.
2. Tap the display to continue.
3. Wait for "Ready" to display under **WiFi Info**.

4. Tap **WiFi Info**.
5. Enable Wi-Fi connectivity on the PED. Once enabled, the Flight Stream 510 will be viewable in the list of available devices. The default Wi-Fi name is 510 followed by the last four digits of the MAC address (e.g., 510-8672). To change the Wi-Fi name:
   - Tap **SSID**.
   - Type the desired Wi-Fi name and tap **Enter**.
6. Change the Flight Stream 510 password:
   - Tap **Password**.
   - Type the desired password and tap **Enter**.

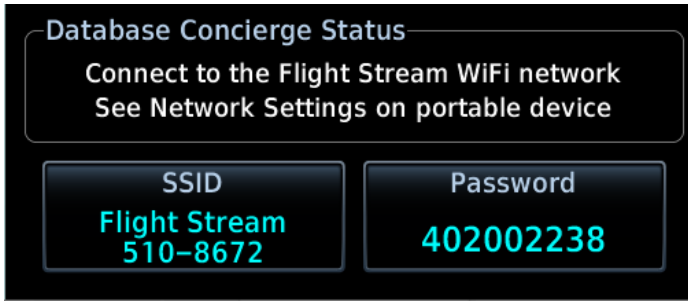


Figure 7-38 Flight Stream 510 Setup Page

7. Select the Flight Stream 510 from the list of available Wi-Fi devices on the PED and enter the password.
8. On Garmin Pilot, tap **Connext**.
9. Tap **GPS 175** under the devices tab.
10. Verify the GPS 175 is connected.

8 System Checkout

8.1 Ground Check (Configuration Mode)

NOTE
Throughout this section, references are made to particular functions and screens. If a function or screen is not available, ensure that the system has been correctly configured.

The configuration mode ground check verifies each LRU and interface is properly configured. The steps that are not applicable to a particular installation may be skipped.

The configuration mode checkout should be performed on every installed GPS 175. Before starting the configuration mode checkout, the following conditions must be met:

1. GPS 175 must be powered on and placed in configuration mode.
2. All system LRUs must be powered on.
3. System must be configured.

8.1.1 Main Indicator

NOTE
This check is not required if the unit is interfaced to an electronic HSI or a Composite CDI and the main indicator analog output is not used.

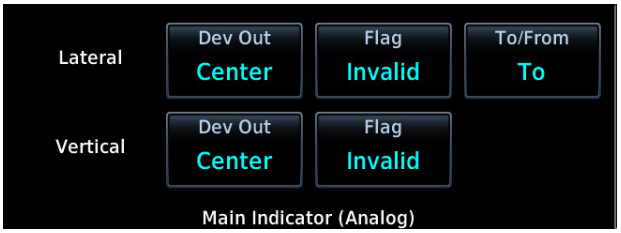


Figure 8-1 Main Indicator (Analog) Page

If the unit is interfaced to an analog indicator, perform the following steps:

1. Tap Diagnostics > Main Indicator (Analog).
2. Verify correct operation of the lateral deviation, flag and TO/FROM flag using the corresponding selections.
3. Verify correct operation of the vertical deviation and flag using the corresponding selections.

8.1.2 Composite Indicator

NOTE

This check is not required if the unit is interfaced to an electronic HSI or a main analog indicator and the composite indicator output is not used.

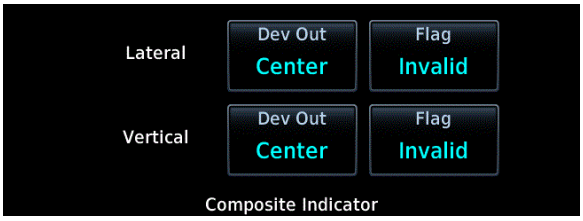


Figure 8-2 Composite Indicator Page

If the unit is interfaced to an composite indicator, perform the following steps.

Tap Diagnostics > Composite Indicator.

1. Verify correct operation of the lateral deviation and flag using the corresponding selections.
2. Verify correct operation of the vertical deviation and flag using the corresponding selections.

8.1.3 Discretes

Tap Diagnostics > Discrete Inputs.

Perform the following steps for each external switch.

1. Set the switch to active.
2. Verify the unit indication displays active.
3. Set the switch to inactive.
4. Verify the unit indication displays inactive.

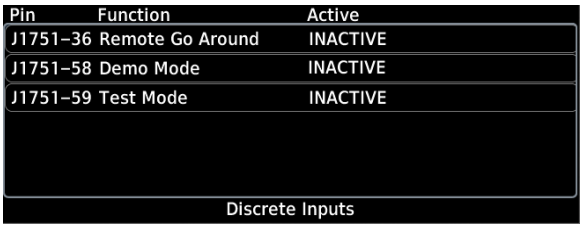


Figure 8-3 Discrete Inputs Page

Tap Diagnostics > Discrete Outputs.

Perform the following steps for each discrete output.

1. Tap the Active key corresponding to the discrete output. A green bar on the key indicates the signal as active.
2. Verify the appropriate external annunciator illuminates or external device input is verified when the output is set to ACTIVE and extinguishes or turns off when the output is set to INACTIVE.

Figure 8-4 Discrete Output Page

8.1.4 HSDB

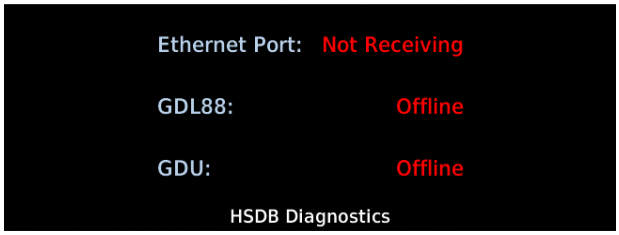


Figure 8-5 HSDB Page

Tap Diagnostics > HSDB Ethernet.

1. Ensure any LRUs connected via HSDB are powered on and properly configured.
2. Ensure any GDU/GDL 88/GTX 345/GI 275 connected via HSDB are powered on and properly configured.
3. Ensure that the status of the connected port displays "Receiving."
4. Ensure that the status of any connected GDU/GDL 88/GTX 345/GI 275 displays "Online."
5. If the previous step did not perform correctly, check the electrical connections and configuration setup.

8.1.5 Lighting Bus Interface Check

CAUTION

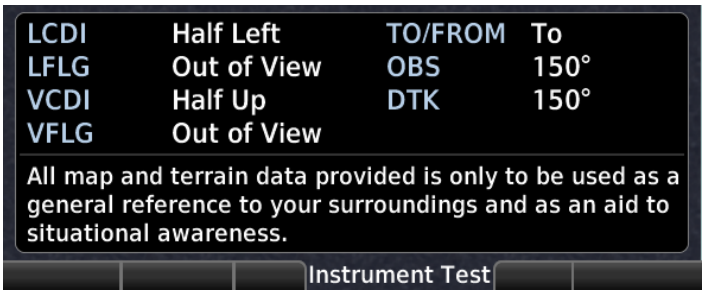
WHEN 14 VDC OR 28 VDC LIGHTING BUSES ARE CONNECTED TO THE UNIT, CONNECTION OF THE AIRCRAFT LIGHTING BUS TO THE INCORRECT INPUT PINS CAN CAUSE DAMAGE TO THE UNIT. ALWAYS START THIS TEST WITH THE DIMMING BUS AT THE LOWEST SETTING, AND SLOWLY INCREASE THE BRIGHTNESS. IF THE BRIGHTNESS LEVEL ON THE DISPLAY DOES NOT INCREASE AS THE LIGHTING IS INCREASED IN BRIGHTNESS, VERIFY THAT THE WIRING IS CORRECT BEFORE PROCEEDING.

The display and bezel key backlighting on the unit tracks an external lighting/dimmer bus input and uses it to vary the display and bezel key backlight levels accordingly. This check verifies the interface.

1. Ensure the lighting bus is set to its minimum setting.
2. Slowly vary the lighting bus level that is connected to the unit.
3. Verify the display brightness tracks the lighting bus setting.
4. Continue to maximum brightness and verify operation.

8.2 Ground Check (Normal Mode)

8.2.1 Instrument Test



This is not a required check. However, this page may be useful for troubleshooting installation issues. During normal power-up, the splash screen displays, followed by the Active Database screen. Tap Continue. When the Instrument Test page displays, the electrical outputs are activated and set to values listed below.

Figure 8-6 Instrument Test

Table 8-1 Instrument Test Data

PARAMETER	INSTRUMENT-TEST VALUE
LCDI	Half Left
LFLG	Out of View
VCDI	Half Up
VFLG	Out of View
TO/FROM	TO
OBS	Displays received OBS angle or dashes if no valid OBS selected course is being received.
DTK	149.5° (Displayed as 150°)
Items below do not display on the INSTRUMENT TEST page.	
Distance to Go	10.0 nautical miles
Time to Go	4 minutes
Active Waypoint	GARMN
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

PARAMETER	INSTRUMENT-TEST VALUE
Roll Steering (if applicable)	Flight Director commands 0° bank (level flight) for 5 seconds, increasing right bank at approximately1°/second for 5 seconds, 5° right bank for 5 seconds, decreasing right bank at approximately1°/second for 5 seconds until 0° bank is reached. This cycle repeats continuously.

8.2.2 Signal Acquisition

NOTE
Turn off all other avionics before beginning this test.

NOTE
Initial position acquisition can take up to 20 minutes. Subsequent acquisitions will not take that long.

1. Power up unit in normal mode.
2. Tap System.
3. Tap GPS Status.
4. Verify 3-D Fix displays.
5. If unable to acquire satellites:
   - Move aircraft away from structures
   - Check GPS antenna installation
   - Verify coaxial cable length meets cable loss guidelines (refer to section 6.3.2)

Once GPS position information is available, perform the following steps:

1. On the GPS Status page, verify that the aircraft position matches a known reference position.
2. While monitoring the GPS Status page, turn on other avionics one at a time and check the GPS signal reception to make sure it is not affected (no significant signal degradation).
3. Before proceeding with the VHF COM interference check, ensure that any connected equipment is transmitting and/or receiving data from the GPS 175, and functioning properly.

8.2.3 VHF COM Interference

If testing a transmitter from a non-aviation device, verify each frequency by transmitting at least 30 seconds on each channel. This check must be completed on all IFR installations. If the GPS "LOI" flag comes into view during this procedure, refer to section 1.6.2.

1. On the GPS Status page, verify at least 7 satellites have been acquired.
2. Verify that the GPS "LOI" flag is out of view.
3. Select 121.150 MHz on the COM transceiver to be tested.
4. Transmit for a period of 35 seconds.
5. Verify that the GPS "LOI" flag does not come into view.
6. Repeat steps 4 and 5 for the following frequencies.

• 121.15 MHz	• 121.22 MHz	• 131.22 MHz	• 131.30 MHz
• 121.17 MHz	• 121.25 MHz	• 131.25 MHz	• 131.32 MHz
• 121.20 MHz	• 131.20 MHz	• 131.27 MHz	• 131.35 MHz

7. For VHF radios that include 8.33 kHz channel spacing, include the following frequencies.

• 121.185 MHz	• 130.285 MHz	• 121.190 MHz	• 131.290 MHz

8. Repeat steps 3 through 7 for all remaining COM transceivers in the aircraft.
9. Turn on the TCAS system and make sure the GPS position remains valid if the aircraft is TCAS equipped.
10. Use the SATCOM system to make sure the GPS position remains valid if the aircraft is SATCOM equipped.

9 Mechanical Drawings

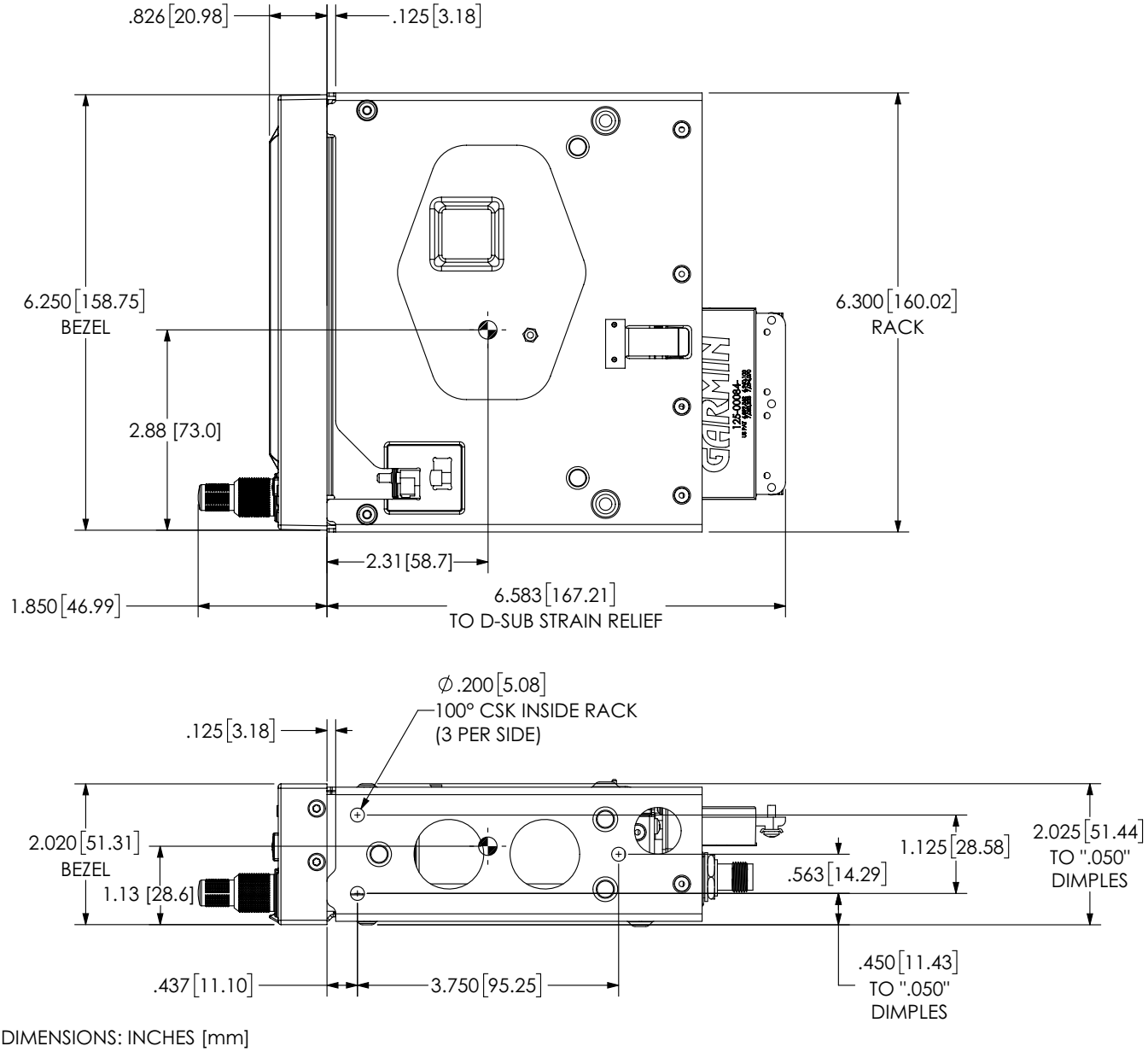
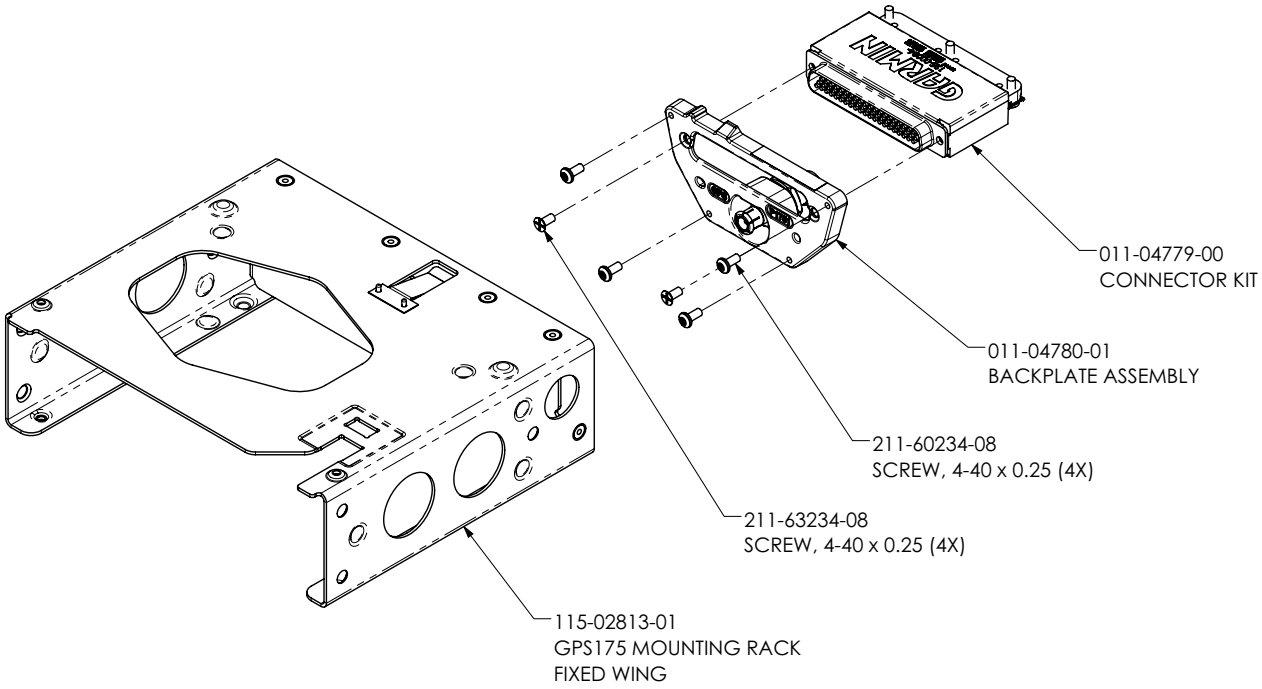
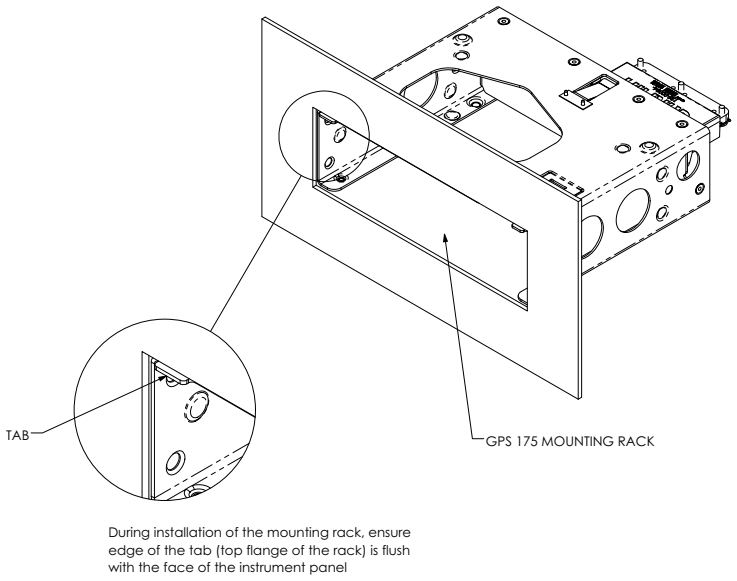


Figure 9-1 Dimensions and Center of Gravity



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

Figure 9-2 Mounting Rack Installation



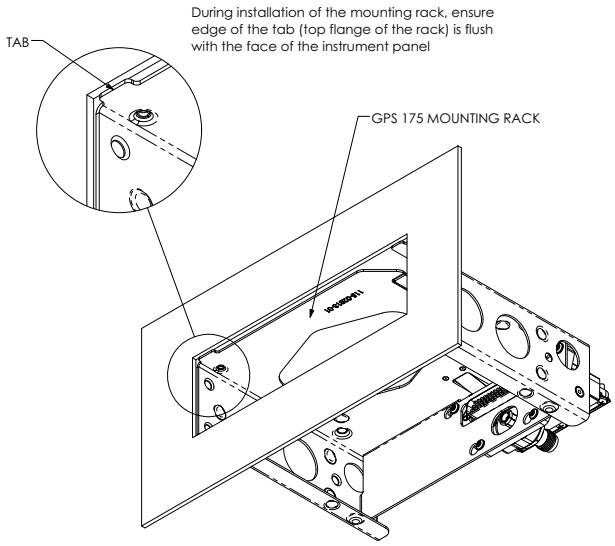


Figure 9-3 Mounting Rack Tab Alignment Detail

10 Equipment Compatibility

10.1 EFIS Displays

Table 10-1 EFIS Displays

MANUFACTURER	MODEL	DATA FORMAT	INTERFACED UNIT CONFIGURATION	GPS 175 CONFIGURATION SETTING
Aspen	EFD1000/500	ARINC 429	ID #1: C ID #2: NONE Description GPS 1, no GPS 2 GAMA Format 3 Low Speed	GAMA Format 3 Low Speed
Garmin	GDU 620	ARINC 429, RS-232, HSDB	GDU 620 Configuration Settings: ARINC 429 Setup: ARINC In 3 for High speed GPS1 ARINC Out 1 for Low speed GPS Navigator	ARINC 429 Setup In: Low, GDU Format 1 Out: High, GAMA Format 1 SDI: LNAV 1 (for GPS 1) LNAV 2 (for GPS 2) RS-232: MAPMX Format 1 GDU: Present
	GDU 700( ) GDU 1060	HSDB	GPS 1: GPS 175	GDU: Present
	G3X GDU 4XX/37X	RS-232, ARINC 429	GDU 4XX/37X: RS-232: MAPMX ARINC 429 in: Garmin GPS and “NAV 1” ARINC 429 Out: EFIS/AIRDATA	RS-232: MAPMX Format 1 ARINC 429 Setup In: Low, GDU Format 1 Out: Low, GAMA Format 1
	GI 275	HSDB	GPS 1: GPS 175	GI 275: Present

10.2 EHSI Displays

Table 10-2 EHSI Displays

MANUFACTURER	MODEL	DATA FORMAT	INTERFACED UNIT CONFIGURATION	GPS 175 CONFIGURATION SETTING
Garmin	G5 (Attitude Indicator)	RS-232	MAPMX	RS-232: MAPMX Format 1
	G5 (HSI)	RS-232, ARINC 429, HSDB	RS-232:MAPMX ARINC 429 Input: Garmin GPS (SDI 1) ARINC 429 Output: EFIS/AIRDATA 1 (SDI 1) (Only used when no autopilot is interfaced)	RS-232: MAPMX Format 1 ARINC 429 Setup In: EFIS/ADC Out: GAMA Format 1 RS-232: MAPMX Format 1 GDU: Present
	GI 275 (HSI)	HSDB	GPS 1: GPS 175	GI 275: Present
Sandel	SN 3308 [1]	Analog/ARINC 429	SN 3308 Configuration Settings: LNAV 1/2 SELECT: GNS 430 (ARINC) ANNUN: SERIAL RELAY SENSE: NAV-2 OFF COURSE: OBS/LEG GPS-1: OFF DEVIATION: ANALOG GPS-2: OFF OBS ROT: NORMAL CDI SRC SEL: OFF OBS CAL: 000.0 RCVR 1/2: OFF	GAMA Format 3, low speed
	SN 3500/4500 [2]	ARINC 429	SN 3500/4500 Configuration Settings: LNAV 1/2 SELECT: GNS 530 (ARINC) ANNUN: SERIAL LAT DV: SERIAL VERT DV: SERIAL SN 3500 VERT ENA: SERIAL SN 4500 VERT ENA: VERT DV FLAG	GAMA Format 3

[1] GPS lateral and vertical guidance is provided using the analog interface.

[2] Vertical Guidance is provided for GPS approaches. Software v3.06 or later is required for SN3500.

10.3 Multifunction Displays

Table 10-3 Multifunction Displays

MANUFACTURER	MODEL	DATA FORMAT	INTERFACED UNIT CONFIGURATION	GPS 175 CONFIGURATION SETTING
Garmin	MX20	RS-232	Verify external GPS position source port.	Aviation Output 2 format for MX20 v5.5 and earlier. Aviation Output 1 format for MX20 v5.6 and later. (MX20 will not accept GPS altitude even though it is part of Aviation Output 1 Format). MapMX format 1 for MX20 v5.6 or later. Refer to section 7.4.3 if installation enables RF Leg navigation on the GPS 175.
	GMX 200		MapMX	Aviation Output 1 format MapMX format 1 (preferred) Refer to section 7.4.3 if installation enables RF Leg navigation on the GPS 175.
	GI 275 (MFD)	HSDB	GPS 1: GPS 175	GI 275: Present

10.4 VHF COM

Table 10-4 VHF COM

MANUFACTURER	MODEL	DATA FORMAT	INTERFACED UNIT CONFIGURATION	GPS 175 CONFIGURATION SETTING
Garmin	GTR 225	RS-232	Serial Port: AVN IN/MAPCOM	Aviation Format 1

10.5 NAV/COM

Table 10-5 NAV/COM

MANUFACTURER	MODEL	DATA FORMAT	INTERFACED UNIT CONFIGURATION	GPS 175 CONFIGURATION SETTING
Garmin	GNC 255	RS-232	Serial Port: AVN IN/MAPCOM	Aviation Format 1

10.6 ADS-B/Transponders

Table 10-6 ADS-B/Transponders

MANUFACTURER	MODEL	DATA FORMAT	INTERFACED UNIT CONFIGURATION	GPS 175 CONFIGURATION SETTING
Garmin	GTX 335	RS-232	ADS-B+ FMT 1 ADS-B+ FMT 2	ADS-B+ Format 1 ADS-B+ Format 2
	GTX 330/328	RS-232	REMOTE	ADS-B+ Format 1
	GTX 327	RS-232	GPS	Aviation Output 1
	GTX 345	HSDB	HSDB Interface: GTN Present: YES	ADS-B SRC: GTX#1, GTX #2
	GDL 82	RS-232	ADS-B+ Format 2	ADS-B+ Format 2
	GDL 88	HSDB	Ethernet Configuration: GTN 6XX/7XX Present	ADS-B SRC: GDL 88 ADS-B SRC: GDL 88 NO TX

10.7 Autopilots

Table 10-7 Autopilots

MANUFACTURER	MODEL	DATA FORMAT	GPS 175 CONFIGURATION SETTING
Honeywell (Bendix/King)	KAP 100/140/150, KFC 150/200/250/300	Analog Deviation, Discrete	GPS Select: Auto [1]
	KFC 225/275/325	Analog Deviation, Discrete, ARINC 429 GPSS	GPS Select: Auto [1] Configure output to any GAMA format.
Century	I/II/III/IV, 21/31/41, 2000, Triden	Analog Deviation, Discrete	
	AK 1081 [2]	ARINC 429 GPSS	Configure output to any GAMA format.
S-TEC	System 20/30/40/50/55/60-1/60-2/60, PSS/65	Analog Deviation, Discrete	
	System 55X	Analog Deviation, Discrete, ARINC 429 GPSS	Configure output to any GAMA format.
	ST-901 [2]	ARINC 429 GPSS	Configure output to any GAMA format.
Cessna	300B/400B/800B	Analog Deviation, Discrete	
	300 IFCS/400 IFCS/800 IFCS/1000 IFCS [3]		
Collins	APS 65( )		
Garmin	GFC 500/GFC 600	Analog Deviation, ARINC 429, HSDB	

[1] Set GPS Select: Prompt for KAP 140 or KFC 225
[2] GPSS Roll Steering Converter
[3] 400A Nav-o-matic (CA530FD computer)

10.8 Bluetooth

Table 10-8 Bluetooth

MANUFACTURER	MODEL	DATA FORMAT	INPUT/OUTPUT	GPS 175 CONFIGURATION SETTING
Garmin	Internal	Bluetooth	N/A	Bluetooth: Enabled

11 Interconnects

This section contains wiring interconnects and connection examples necessary for unit installation. Each figure contains notes that must be followed. General notes apply to all figures in this section. Refer to manufacturer's documentation for complete pinout and interconnect information.

General Notes

- Unless specified differently, all wires are 24 AWG or larger.
- Connect shield grounds to backshell at GPS 175. Shield leads must be less than 3.0". Connect all other shield grounds to aircraft ground with as short a conductor as practical.
- Connect all power and ground leads.
- Connections marked with "x" OR "X" indicate that there is no recommended connection. Any available port or pin is acceptable.
- Designations for ground connections:

  Shield Block Ground Airframe Ground
- ~ indicates any available similar functioning port or pin may be used. Ports or pins without ~ must be connected as shown.
- * indicates an Active-Low pin.
- † indicates an Active-High pin.
- Antennas and associated cabling are shown for reference only.

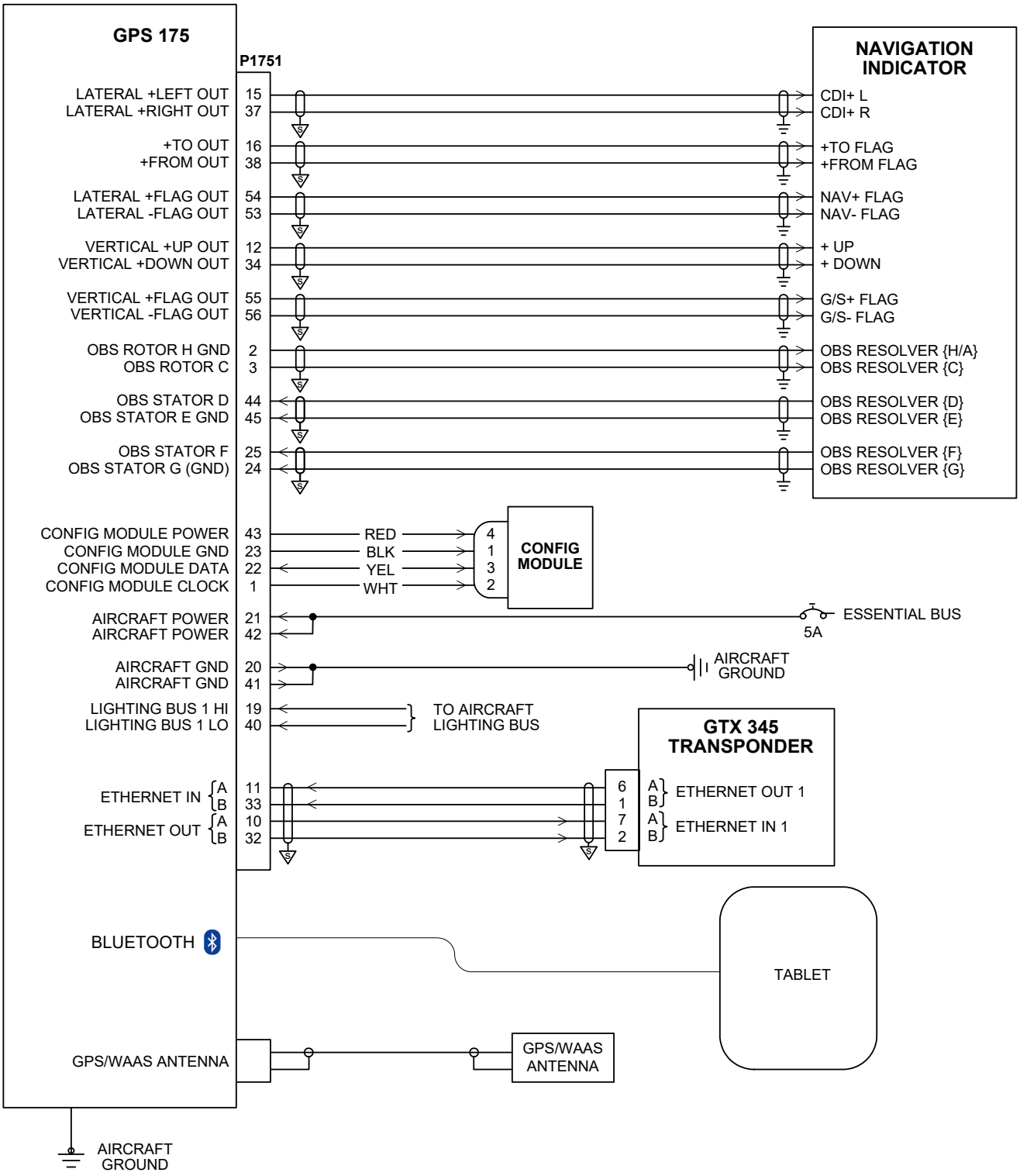
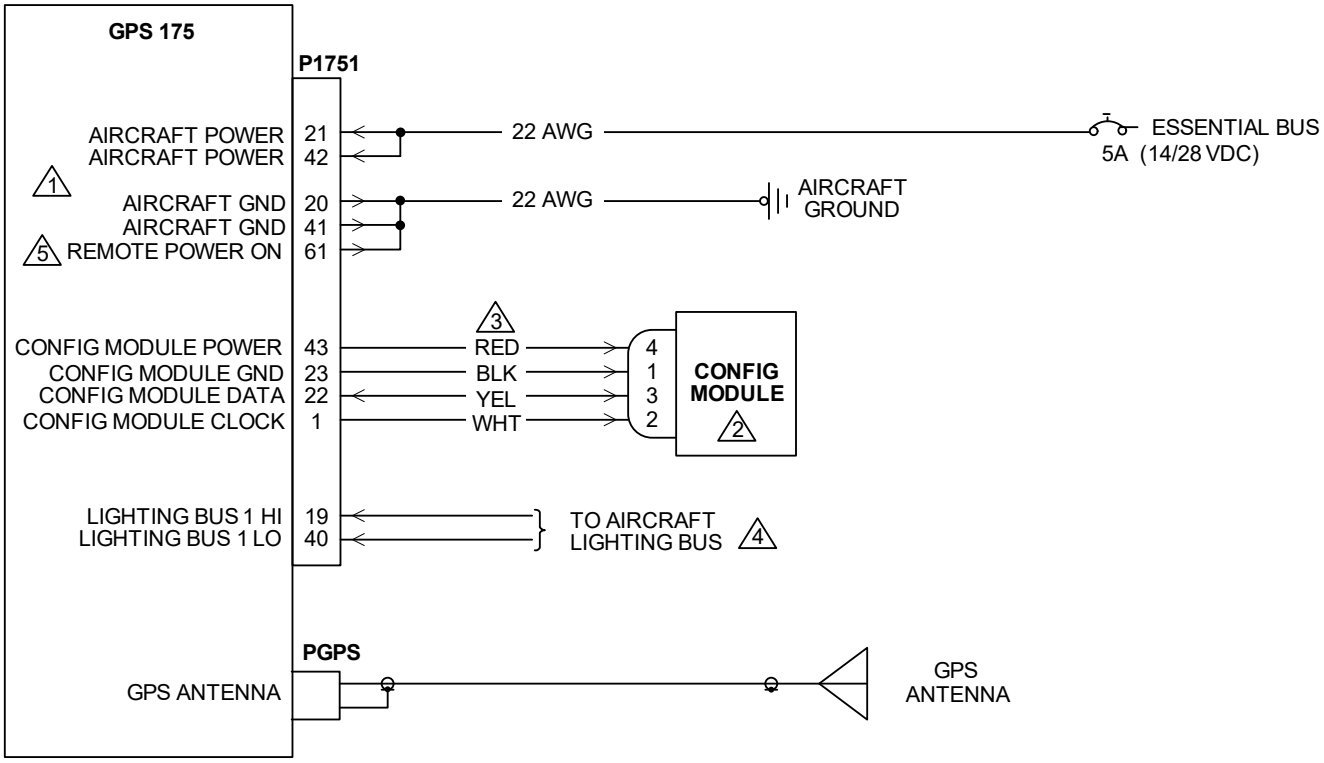


Figure 11-1 Typical Installation Interconnect



NOTES

1. ALL POWER LEADS AND GROUND LEADS ARE REQUIRED.
2. CONFIGURATION MODULE IS MOUNTED IN THE BACKSHELL OF THE P1751 CONNECTOR.
3. THE SUPPLIED CONFIGURATION MODULE HARNESS USES 28 AWG WIRES. USE THE CONTACTS SUPPLIED WITH CONFIGURATION MODULE.
4. OPTIONAL LIGHTING BUS CONNECTION (28 VDC, 14 VDC, 5VDC, OR 5 VAC)
5. THE REMOTE POWER ON DISCRETE IS USED AS THE POWER AUTO ON FEATURE WHEN THE AVIONIC'S MASTER IS TURNED ON.

Figure 11-2 Power, Configuration Module, and Lighting Interconnect

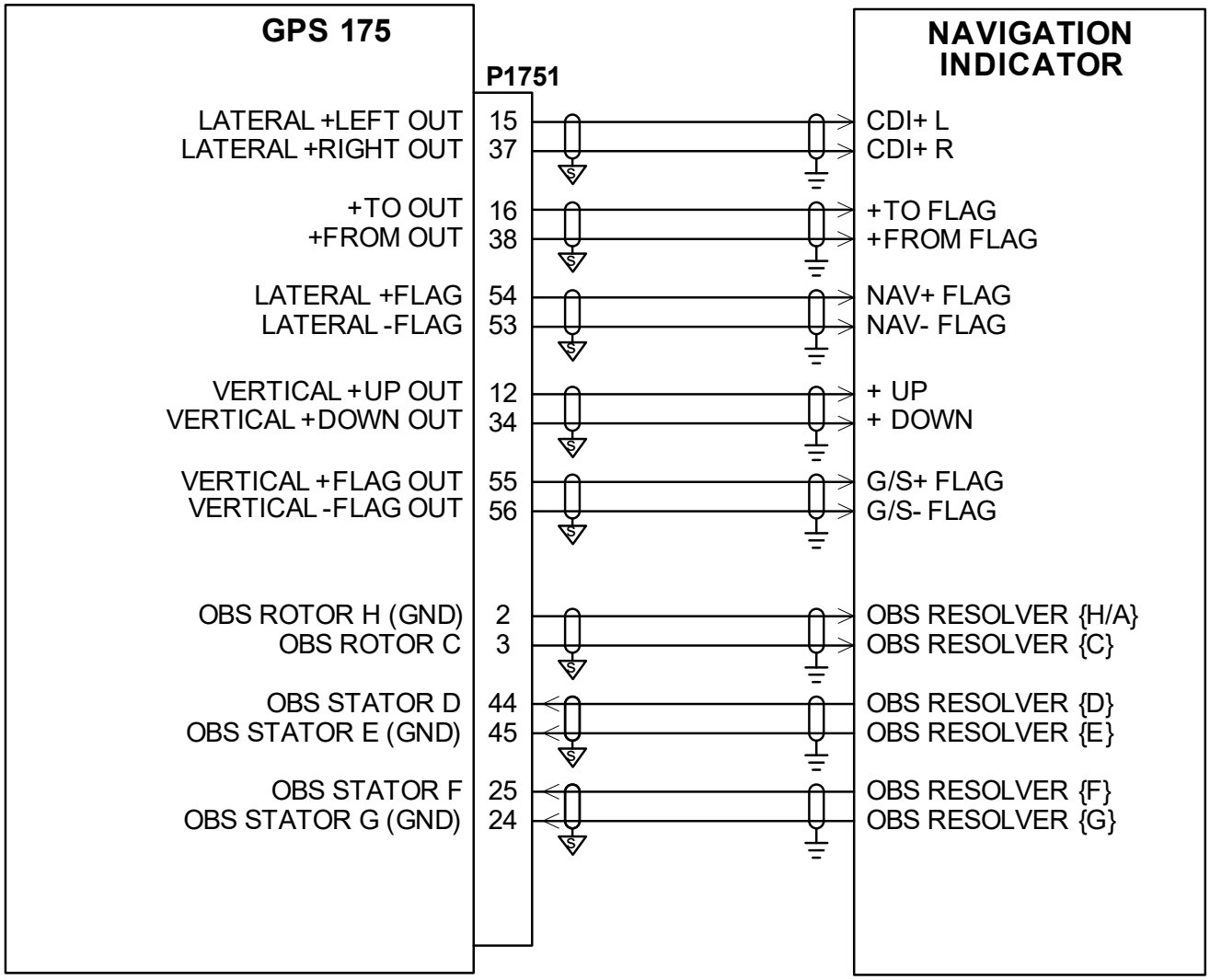
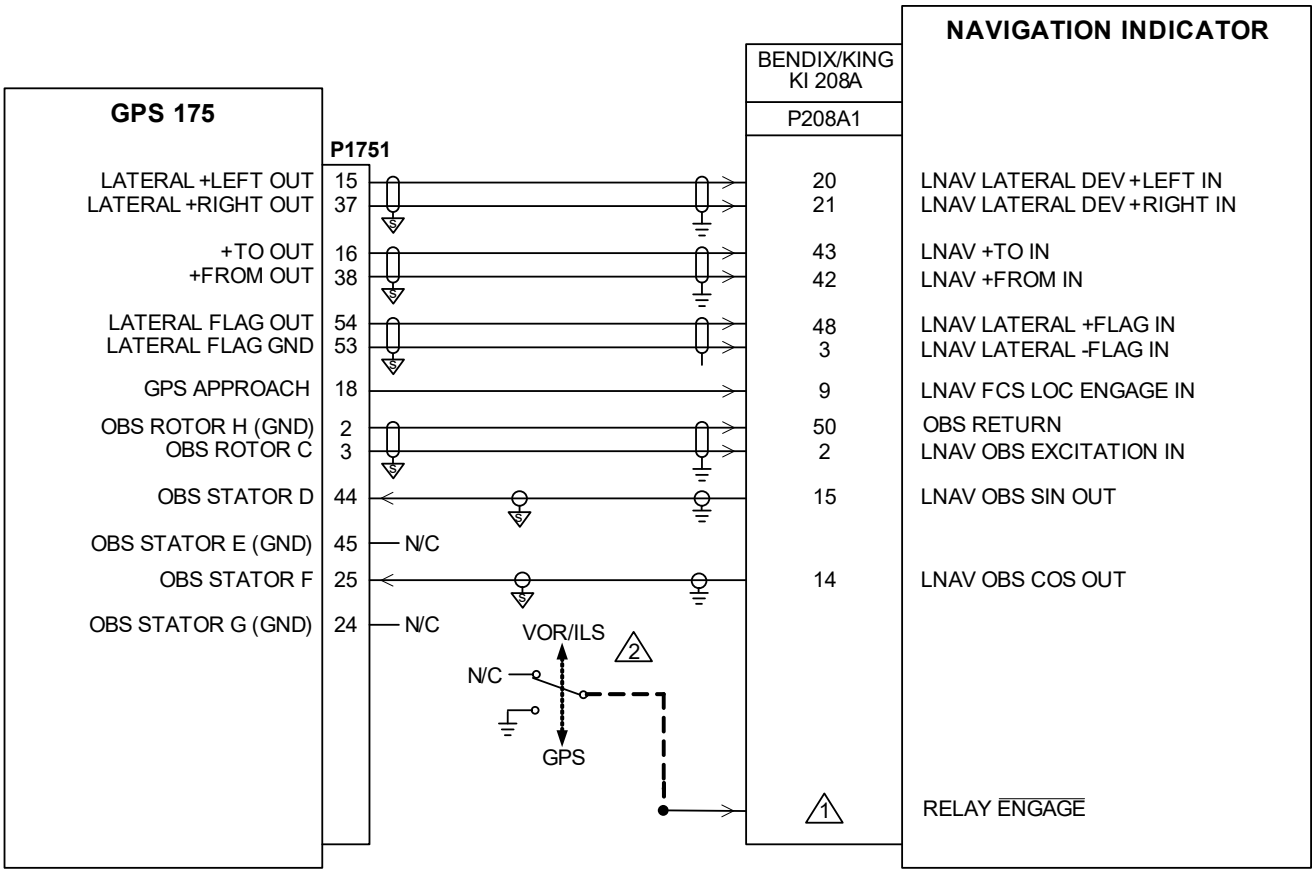


Figure 11-3 Main Indicator Interconnect

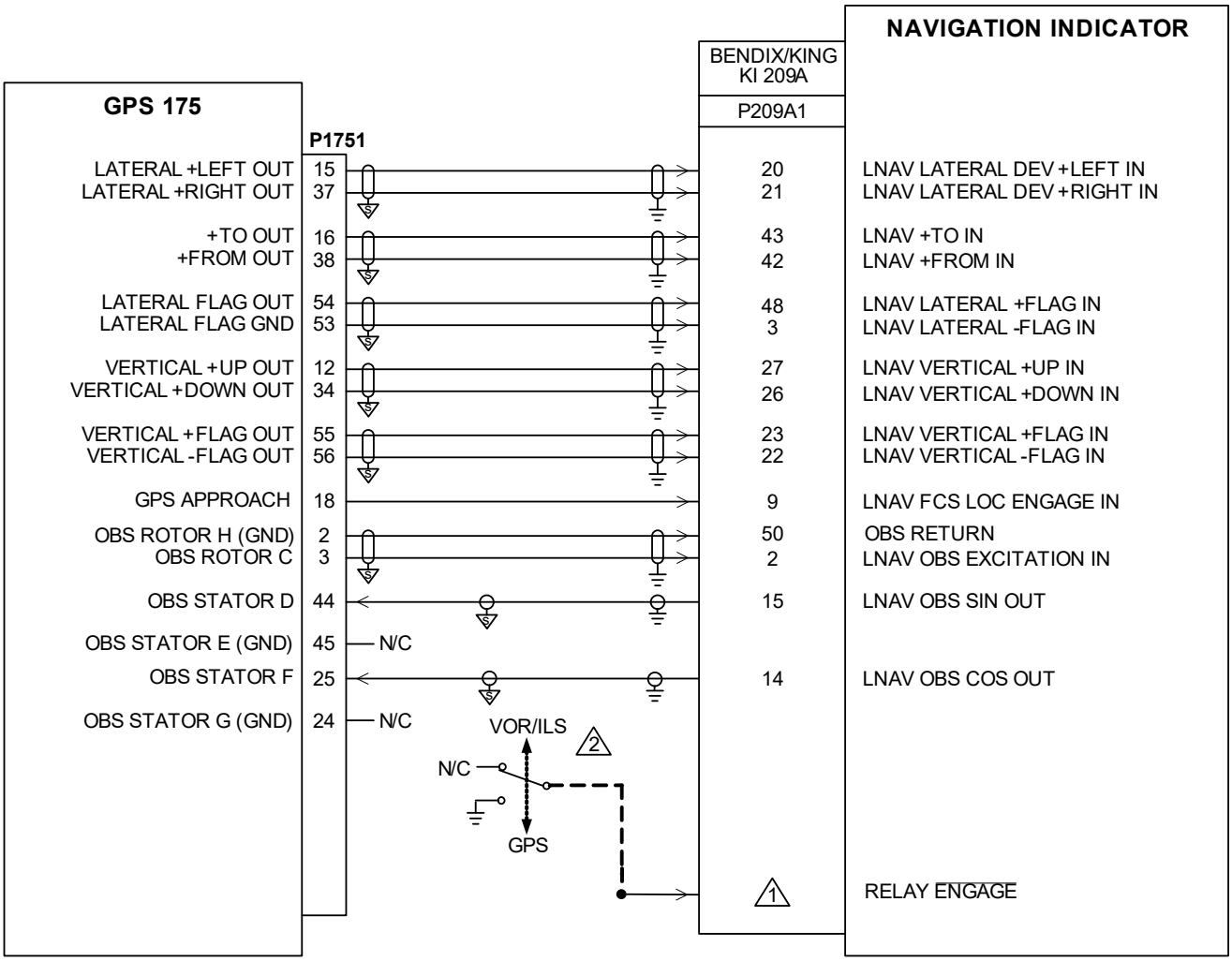


NOTES

1. PROPER CONNECTION OF THE RELAY ENGAGE INPUT OF THE KI 208A IS DEPENDENT ON THE POWER SUPPLY VOLTAGE. REFER TO KI 208A MANUFACTURERS DOCUMENTATION FOR PROPER CONNECTION.

2. IF THE GPS 175 IS INSTALLED AND A VOR/ILS RECEIVER IS AVAILABLE TO DRIVE THE NAVIGATION INDICATOR, AN EXTERNAL SOURCE SELECTION SWITCH MUST BE USED. REFER TO KI 208A MANUFACTURERS DOCUMENTATION FOR ACCEPTABLE SWITCHES.

Figure 11-4 KI 208A NAV Indicator

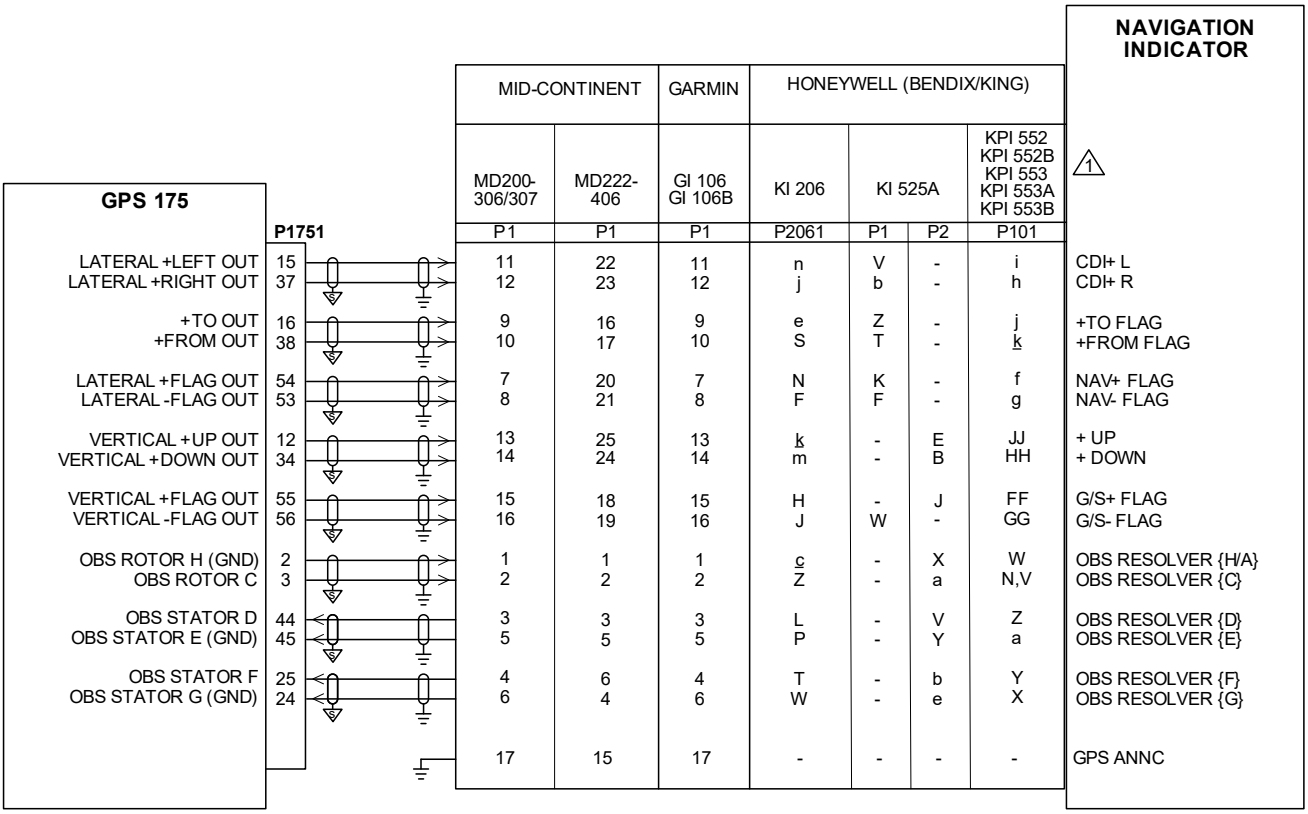


NOTES

1. PROPER CONNECTION OF THE RELAY ENGAGE INPUT OF THE KI 209A IS DEPENDENT ON THE POWER SUPPLY VOLTAGE. REFER TO KI 209A DOCUMENTATION FOR PROPER CONNECTION.

2. IF THE GPS 175 IS INSTALLED, AND A VOR/ILS RECEIVER IS AVAILABLE TO DRIVE THE NAVIGATION INDICATOR, AN EXTERNAL SOURCE SELECTION SWITCH MUST BE USED. REFER TO KI 208A MANUFACTURERS DOCUMENTATION FOR ACCEPTABLE SWITCHES.

Figure 11-5 KI 209A NAV Indicator



NOTES

1. THE OBS INTERFACE TO THE GPS 175 WORKS ONLY FOR KPI 552/553/553A UNITS THAT HAVE A COURSE KNOB.

Figure 11-6 Main CDI Indicator (Analog) Interconnect
Sheet 1 of 2

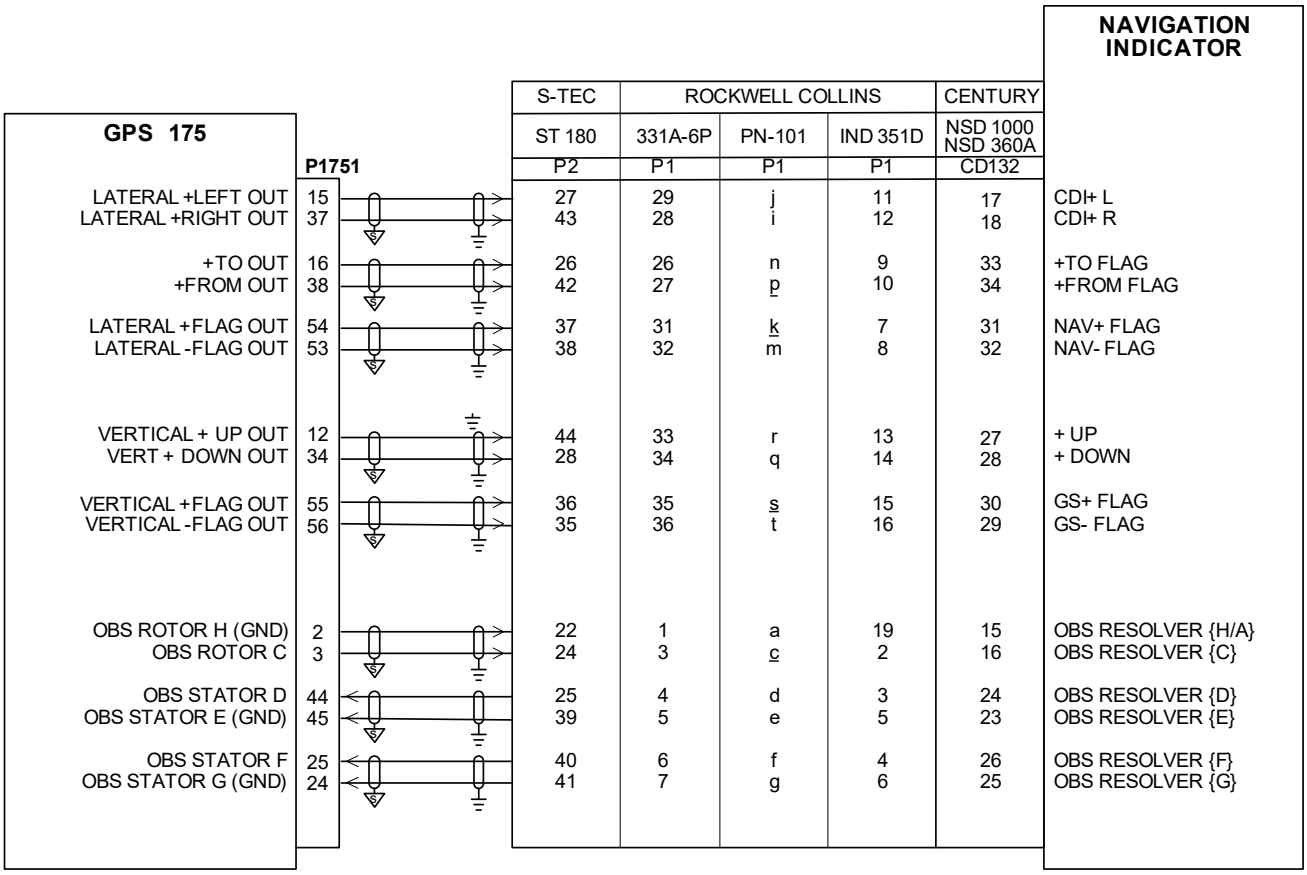


Figure 11-6 Main CDI Indicator (Analog) Interconnect
Sheet 2 of 2

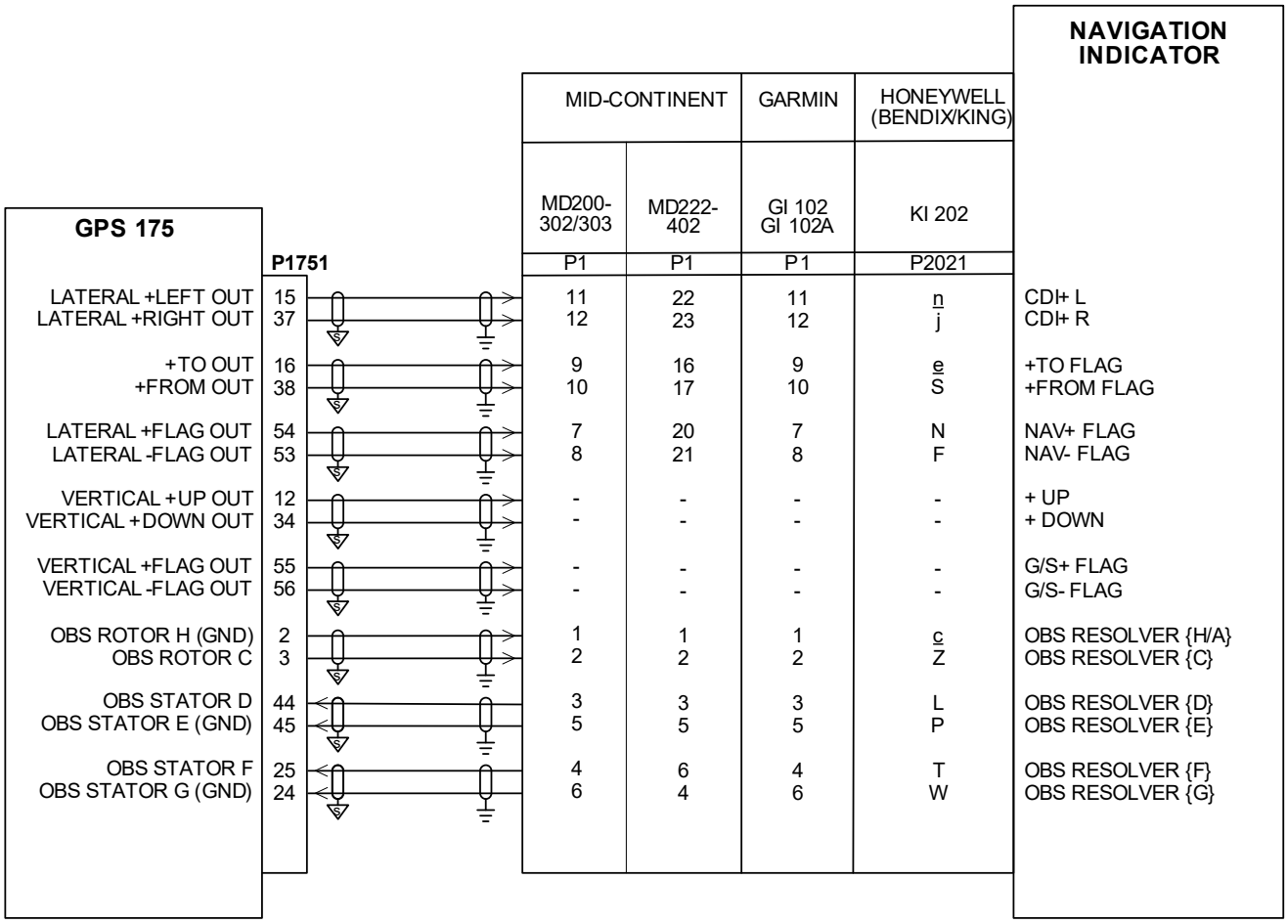


Figure 11-7 Main CDI Indicator VFR (Analog) Interconnect

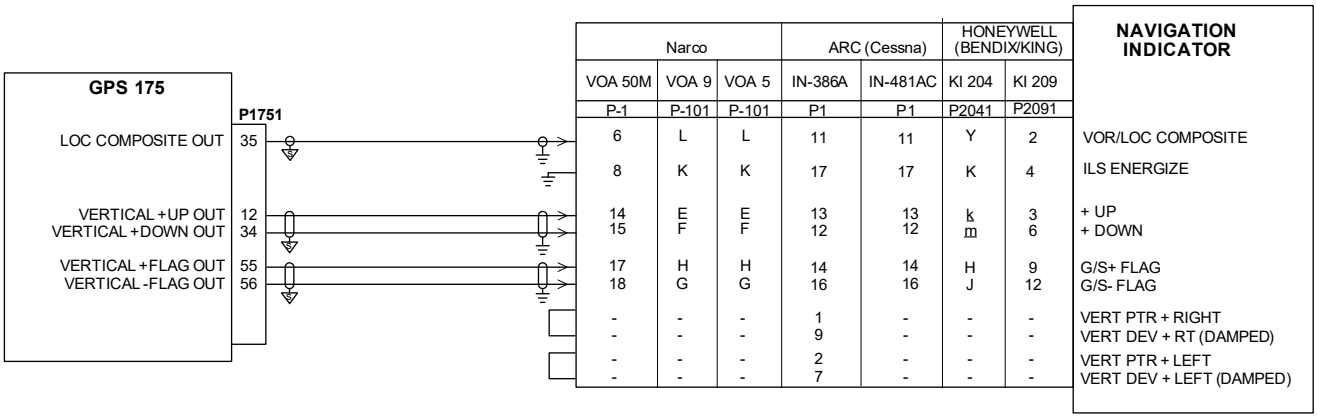
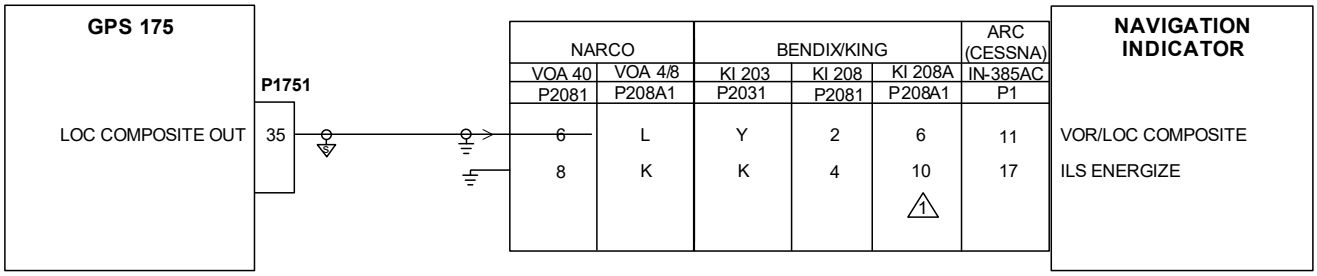


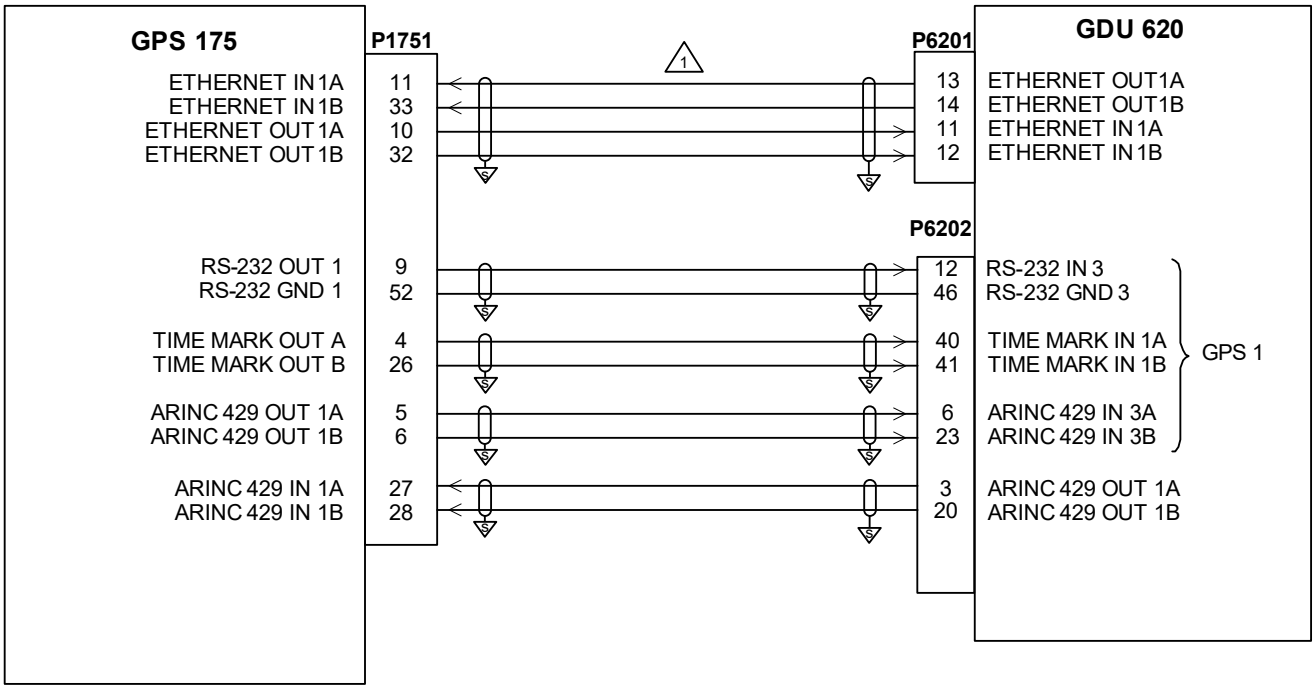
Figure 11-8 Composite CDI Interconnect



NOTES

1. FIGURE 11-4 IS THE PREFERRED CONNECTION FOR KI 208A.

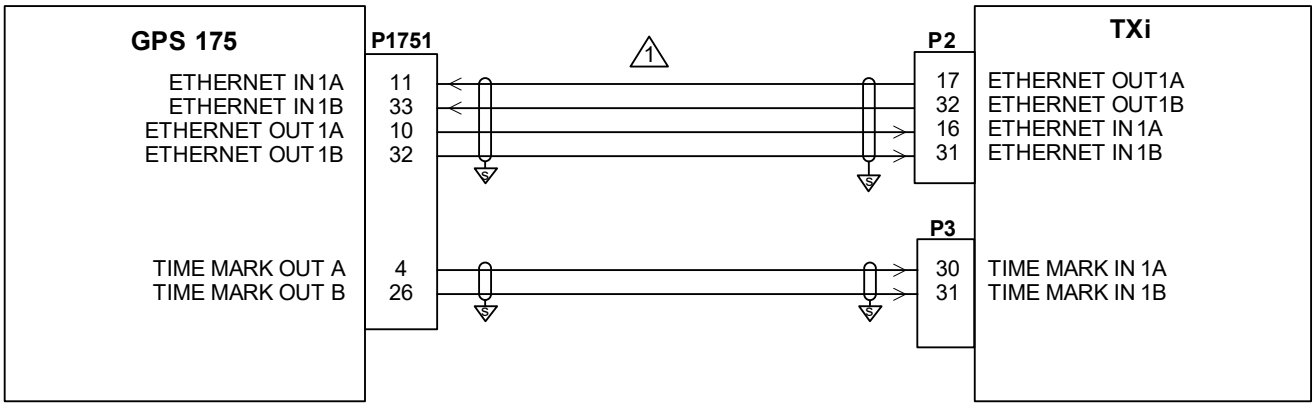
Figure 11-9 Composite CDI VFR Interconnect



NOTES

1. USE AIRCRAFT GRADE CATEGORY 5 ETHERNET CABLE. REFER TO SECTION 3.4 FOR ADDITIONAL INFORMATION.

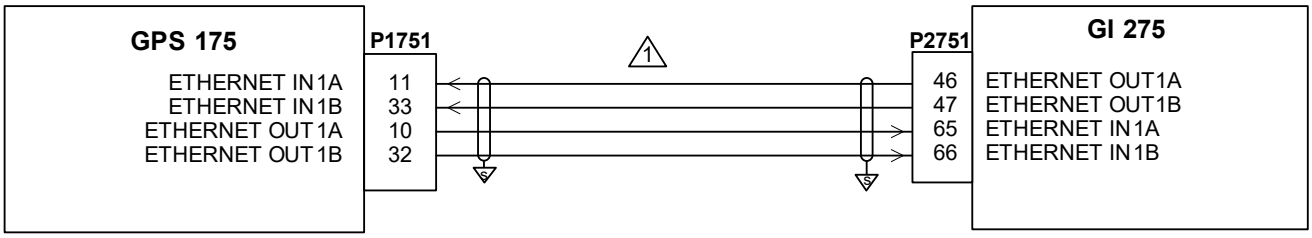
Figure 11-10 G500/600 Interconnect



NOTES

1. USE AIRCRAFT GRADE CATEGORY 5 ETHERNET CABLE. REFER TO SECTION 3.4 FOR ADDITIONAL INFORMATION.

Figure 11-11 G500/600 TXi Interconnect



NOTES

1. USE AIRCRAFT GRADE CATEGORY 5 ETHERNET CABLE. REFER TO SECTION 3.4 FOR PART NUMBERS.

Figure 11-12 GI 275 Interconnect

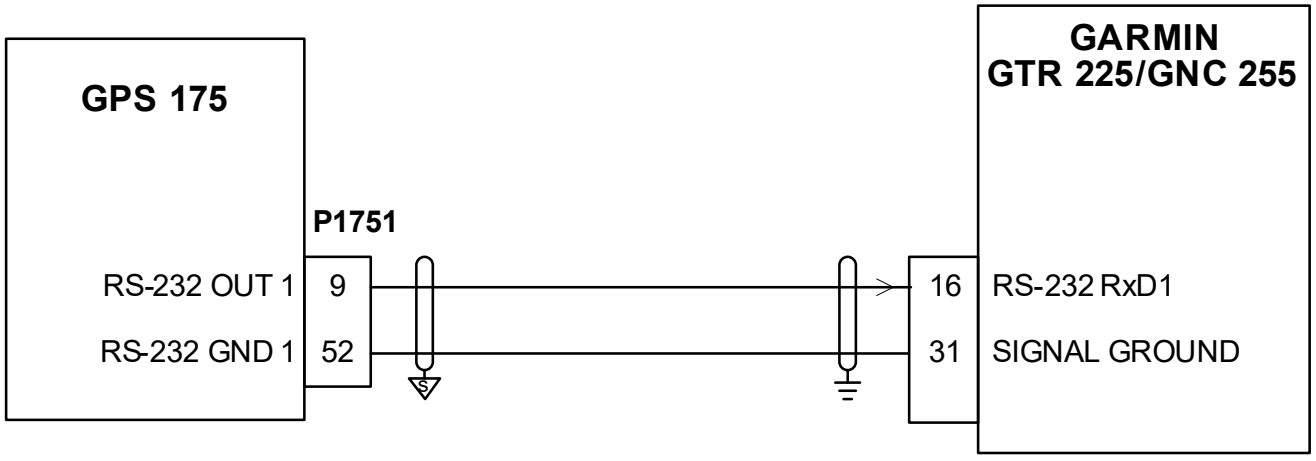
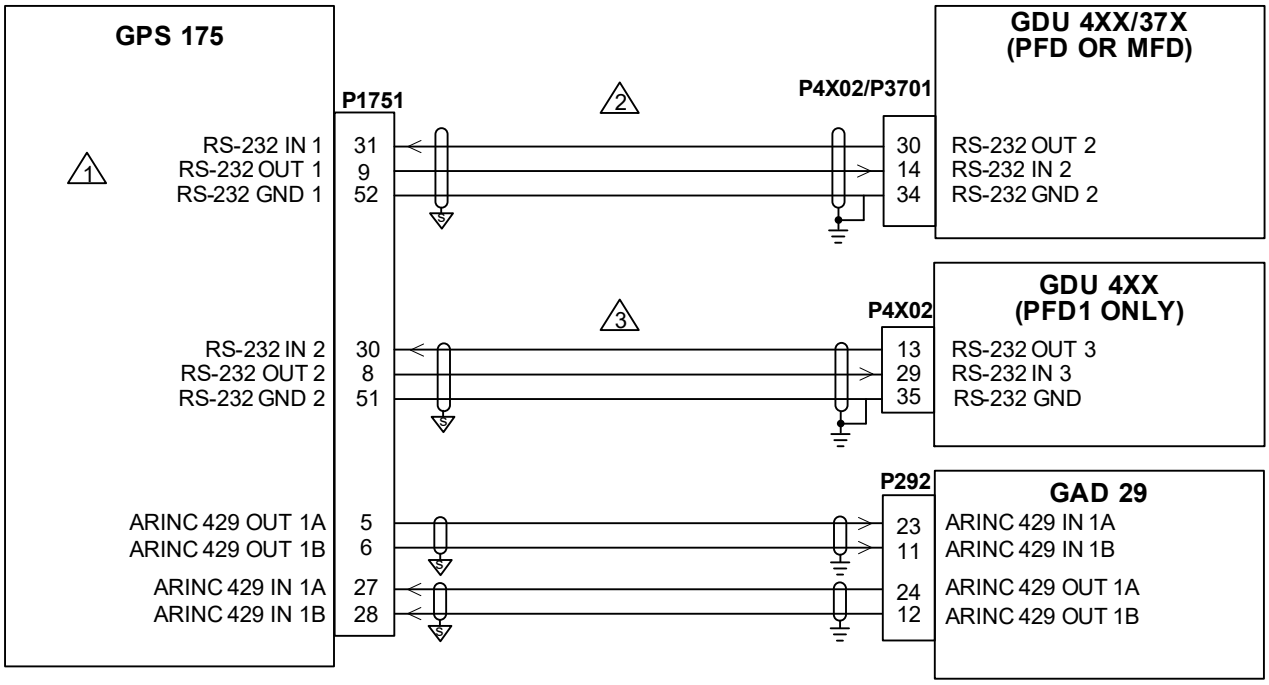


Figure 11-13 GTR/GNC Interconnect



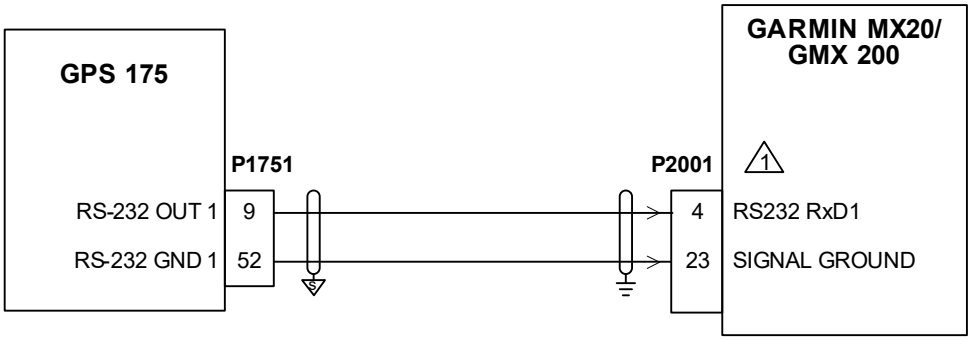
NOTES

1. IF THE SPECIFIED RS-232 PORT ON THE GPS 175 IS ALREADY USED, ANY RS-232 PORT MAY BE CONNECTED.

2. GPS 175 RS-232 CONFIGURATION SET TO “MAPMX FORMAT 1.”

3. GPS 175 RS-232 CONFIGURATION SET TO “CONNEXT 57600.” GDU 4XX RS-232 CONFIG SET TO “GTN CONNEXT 2.”

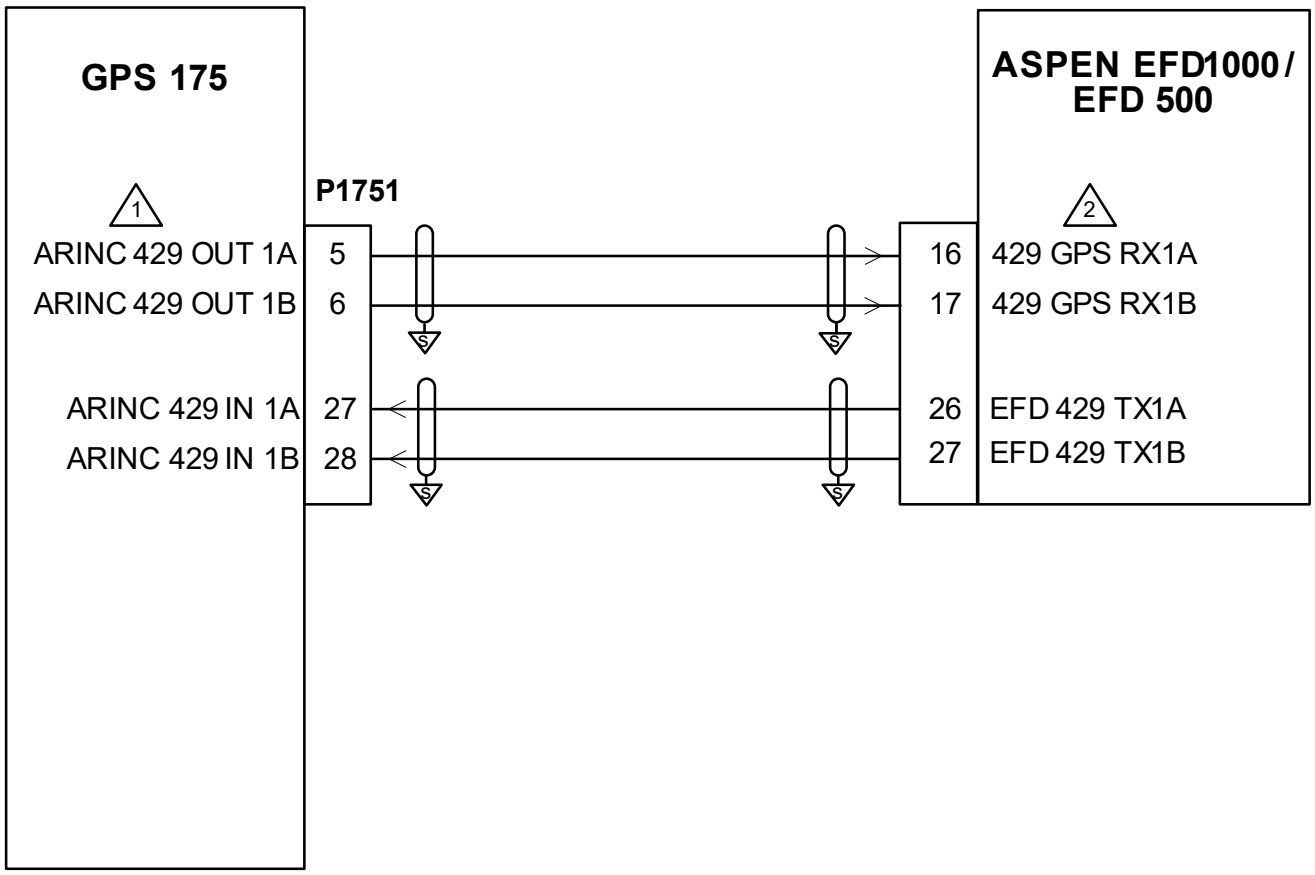
Figure 11-14 G3X Interconnect



NOTES

1. MAPMX IS THE PREFERRED COMMUNICATION PROTOCOL FOR THE MX20/GMX 200. OTHER INPUT PORTS ON THE MX20/GMX 200 MAY BE USED IN LIEU OF THE PORT SHOWN. REFER TO THE APPLICABLE INSTALLATION MANUAL FOR ADDITIONAL DETAILS.

Figure 11-15 MX20/GMX 200 Interconnect



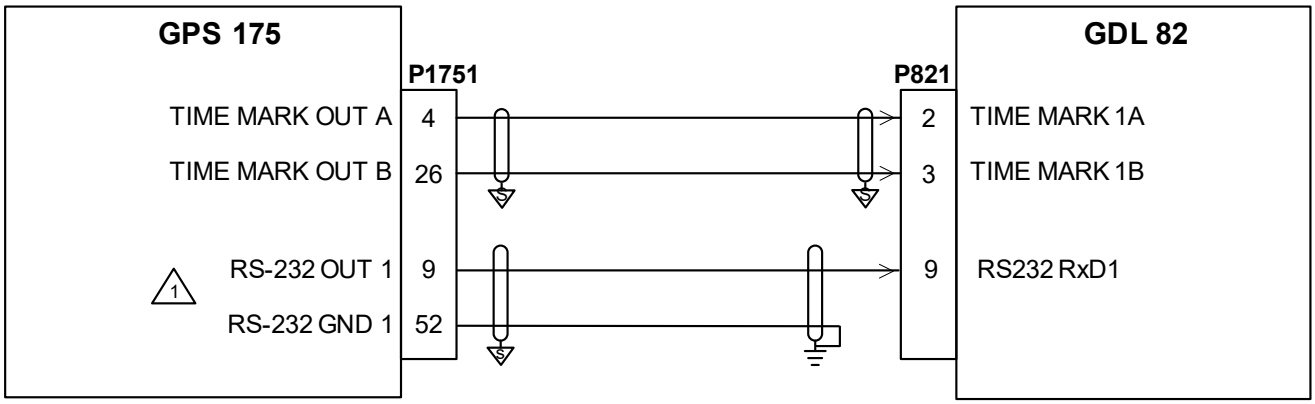
NOTES

1. CONFIGURE GPS 175 ARINC 429 PORT FOR GAMA FORMAT 3 LOW SPEED.

2. CONFIGURE ASPEN EFD 1000/EFD 500 INSTALLATION MENU - NAV SETUP

ID#1	ID#2	DESCRIPTION
C	NONE	GPS1, NO GPS2

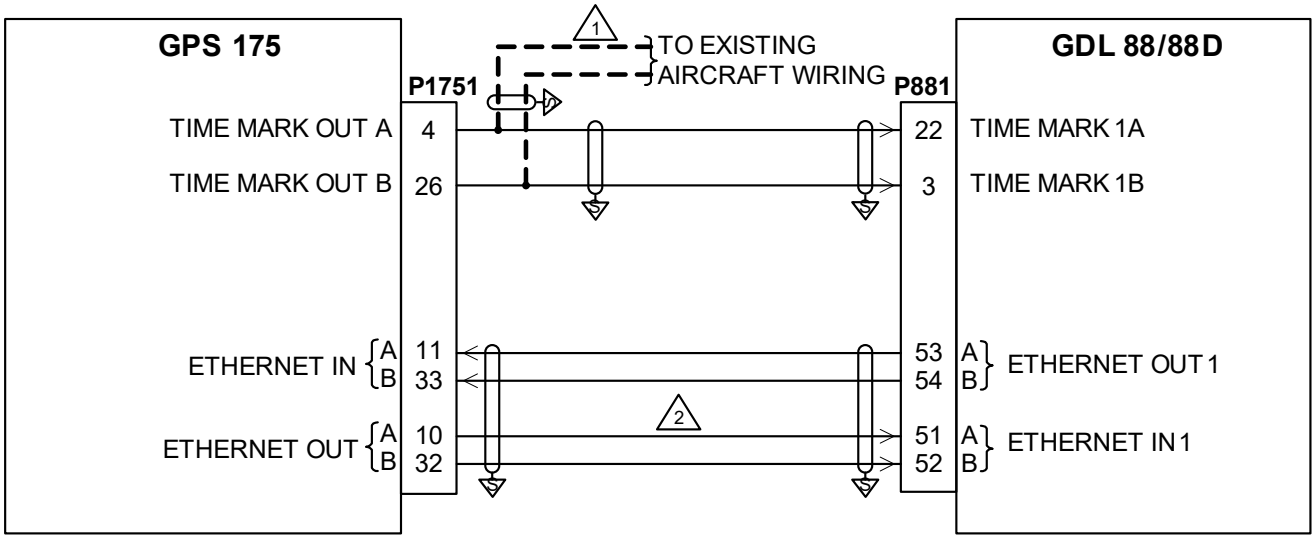
Figure 11-16 ARINC 429 EFIS - Aspen Interconnect



NOTES

1. IF THE SPECIFIED RS-232 PORT IS ALREADY IN USE, ANY RS-232 PORT MAY BE CONNECTED.

Figure 11-17 GDL 82 Interconnect

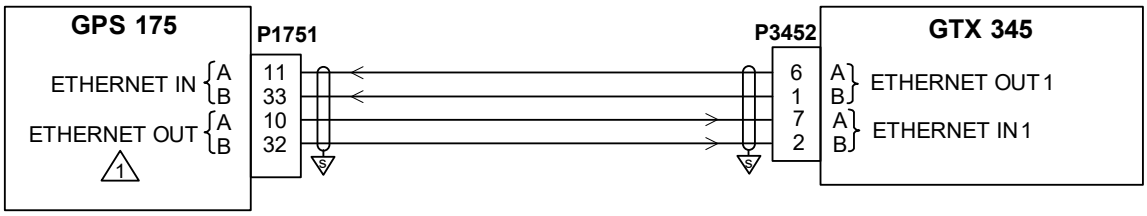


NOTES

1. IF GPS 175 TIME MARK OUTPUT IS ALREADY CONNECTED TO AIRCRAFT WIRING, SPLICE INTO THIS WIRING FOR THE CONNECTION TO THE GDL 88.

2. USE AIRCRAFT GRADE CATEGORY 5 ETHERNET CABLE. REFER TO SECTION 3.4 FOR PART NUMBERS.

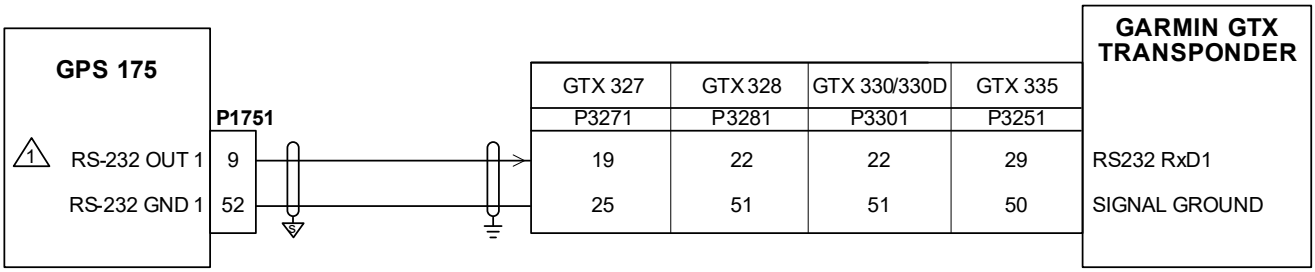
Figure 11-18 GDL 88/88D Interconnect



NOTES

1. USE AIRCRAFT GRADE CATEGORY 5 ETHERNET CABLE. REFER TO SECTION 3.4 FOR PART NUMBERS.

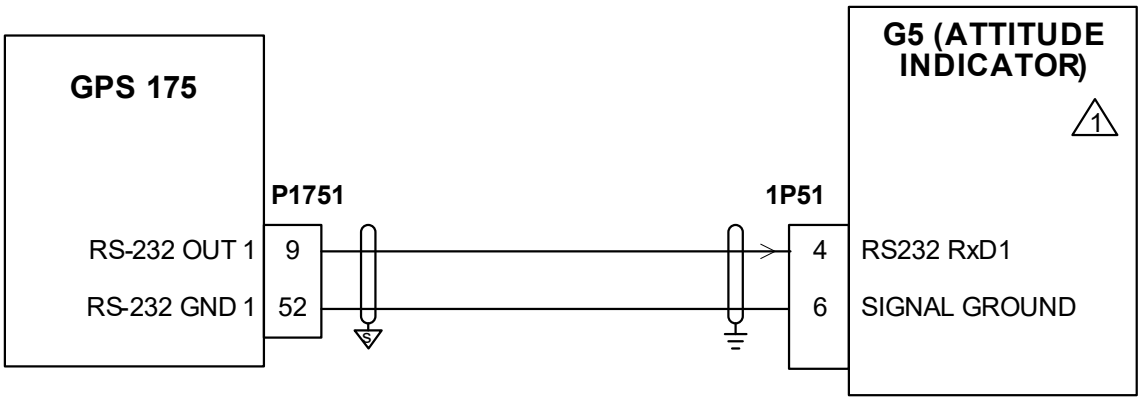
Figure 11-19 GTX 345 Interconnect



NOTES

1. IF THE SPECIFIED RS-232 PORT ON THE GPS 175 IS ALREADY USED, ANY RS-232 PORT MAY BE CONNECTED.

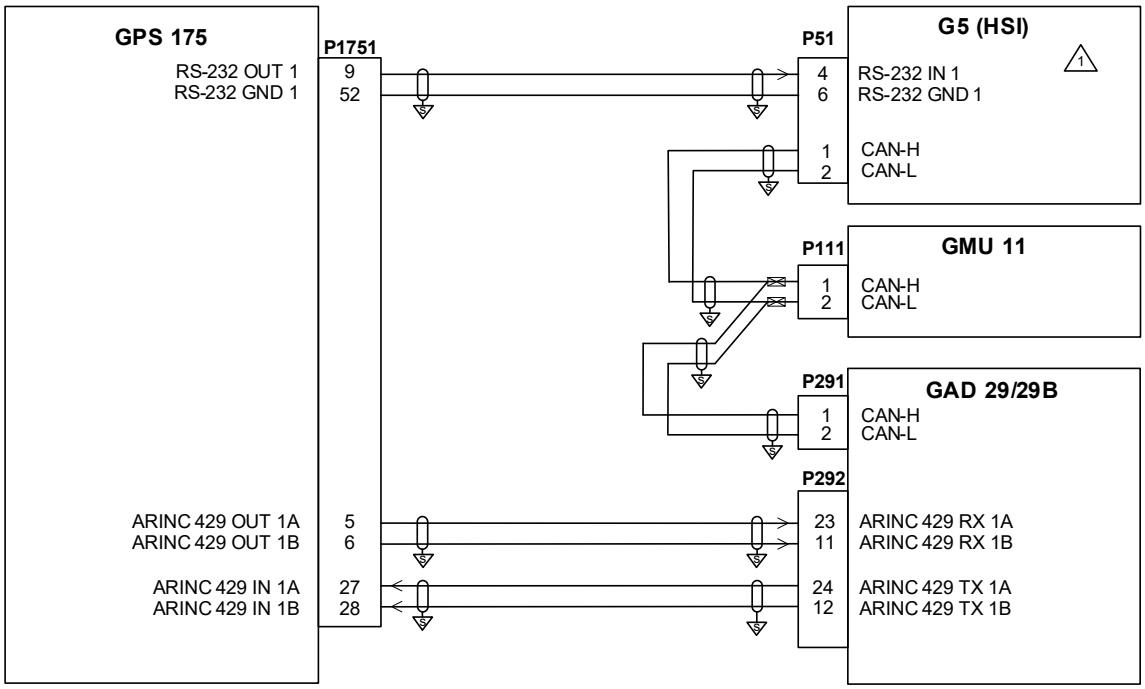
Figure 11-20 GTX 3X/3XX/3000 Interconnect



NOTES

1. REFER TO *G5 ELECTRONIC FLIGHT DISPLAY INSTALLATION MANUAL FOR NON-CERTIFIED AIRCRAFT* FOR COMPLETE PINOUT AND INTERCONNECT INFORMATION.

Figure 11-21 G5 ADI Interconnect

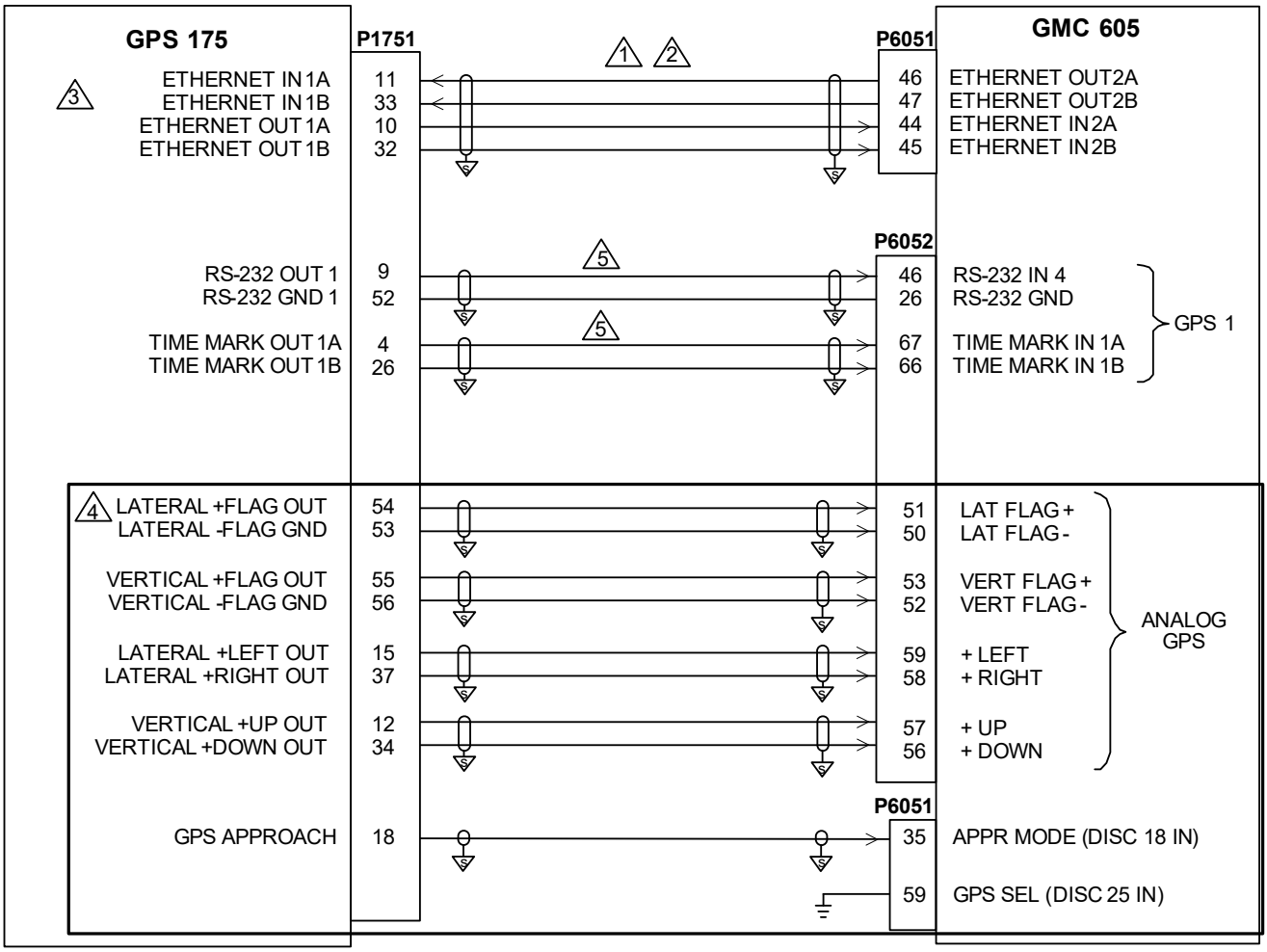


NOTES

1. REFER TO *G5 ELECTRONIC FLIGHT DISPLAY INSTALLATION MANUAL FOR NON-CERTIFIED AIRCRAFT* FOR COMPLETE PINOUT AND INTERCONNECT INFORMATION. PIN-OUTS OF OTHER UNITS SHOWN FOR REFERENCE ONLY. CAN BUS MUST BE TERMINATED IN ACCORDANCE WITH G5 ELECTRONIC FLIGHT DISPLAY INSTALLATION MANUAL FOR NON-CERTIFIED AIRCRAFT.

2. THE GFC 500 SYSTEM REQUIRES THE G5 TO BE AS A PREREQUISITE. REFER TO *G5 ELECTRONIC FLIGHT DISPLAY INSTALLATION MANUAL FOR NON-CERTIFIED AIRCRAFT* FOR ADDITIONAL INFORMATION.

Figure 11-22 G5 HSI Interconnect



NOTES

1. USE AIRCRAFT GRADE CATEGORY 5 ETHERNET CABLE. REFER TO SECTION 3.4 FOR PART NUMBERS.

2. IF INSTALLATION HAS AN EXISTING NAV1/NAV2 SWITCH, WITHOUT A GARMIN GDU OR EFIS, DO NOT CONNECT THE ETHERNET (HSDB) WIRING TO THE GPS 175.

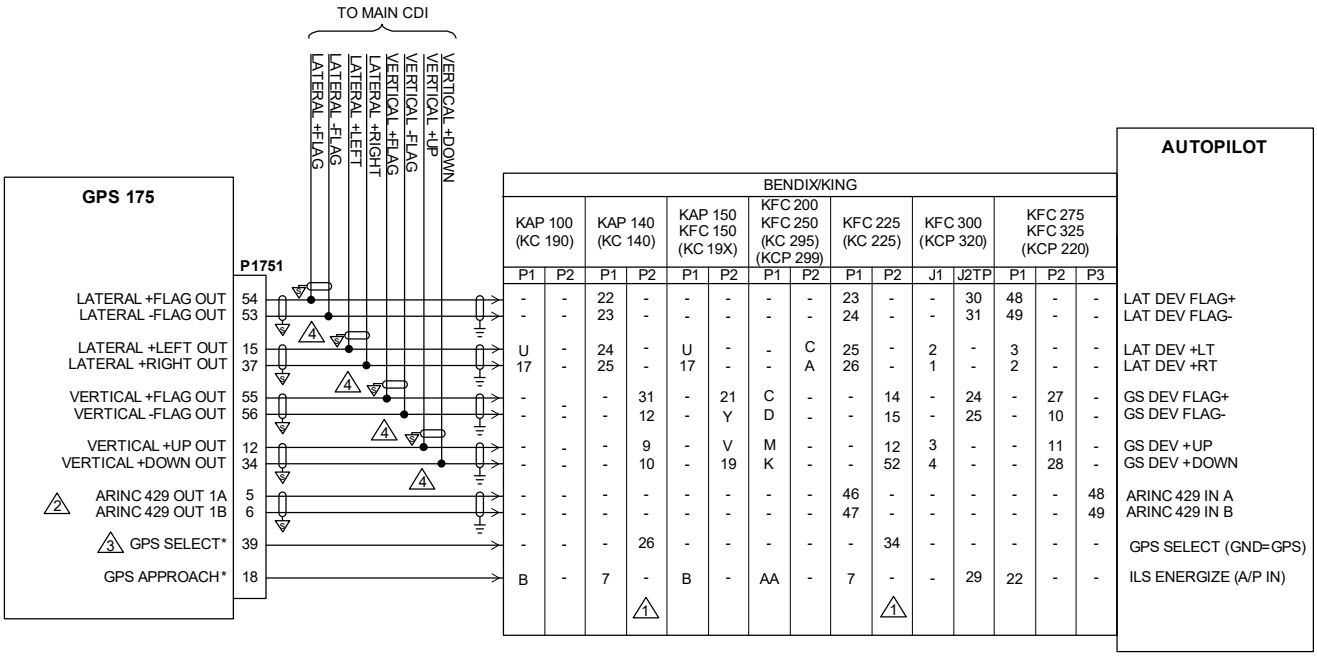
3. FOR GPS 175 INSTALLATIONS WITHOUT A GARMIN GDU, ONLY CONNECT THE ETHERNET (HSDB) WIRING TO GPS 175 #1.

4. ONLY REQUIRED IF INSTALLATION IS A GPS 175 INSTALLATION WITHOUT A GARMIN GDU. THE ANALOG GPS CONNECTIONS MUST BE USED BETWEEN THE GMC 605 AND GPS 175 #1. THE GFC 600 WILL ONLY COUPLE TO NAVIGATION GUIDANCE FROM GPS 175 #1.

5. IT IS ACCEPTABLE TO SPLICE WIRES TO EXISTING WIRING.

6. REFER TO *GMC 605 INSTALLATION MANUAL* FOR COMPLETE PINOUT AND INTERCONNECT INFORMATION. PIN-OUTS OF OTHER UNITS SHOWN FOR REFERENCE ONLY.

Figure 11-23 GFC 600/GMC 605 Interconnect



NOTES

1. THE GPS SELECT OUTPUT MUST BE CONNECTED TO THE GPS SELECT INPUT OF THE AUTOPILOT. THIS OUTPUT IS GROUNDED IN GPS MODE, UNLESS A GPS APPROACH IS ACTIVE AND THE PILOT HAS ENABLED THE A/P APPROACH OUTPUTS. THIS WILL ALLOW THE AUTOPILOT TO CAPTURE THE GPS GLIDEPATH WHILE THE CDI IS DISPLAYING GPS INFORMATION.

2. BOTH GAMA 429 CONFIGURATIONS OF THE GPS ARINC 429 OUTPUT PROVIDE DATA REQUIRED BY THE AUTOPILOT FOR GPSS.

3. REFER TO SECTION 10.7 FOR THE CORRECT GPS SELECT CONFIGURATION SETTINGS. FOR THE BENDIX/KING KFC 225 AND KAP 140 AUTOPILOTS, THE GPS SELECT CONFIGURATION SETTING MUST BE SET TO “PROMPT.”

4. SPLICE MUST BE PERFORMED WITHIN 6.0 INCHES OF CONNECTOR BACKSHELL (WITHIN CONNECTOR BACKSHELL IS PREFERRED).

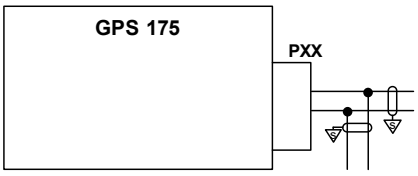
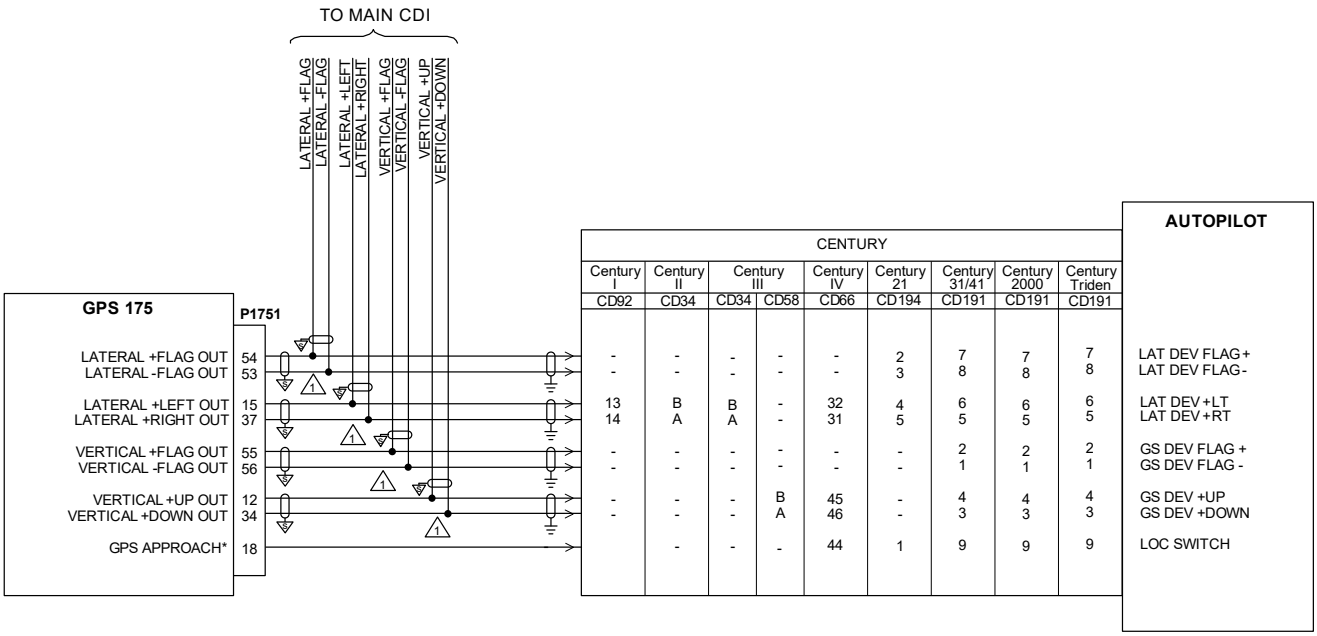


Figure 11-24 Bendix King Autopilots Interconnect



NOTES

1. SPLICE MUST BE PERFORMED WITHIN 6.0 INCHES OF CONNECTOR BACKSHELL (WITHIN CONNECTOR BACKSHELL IS PREFERRED).

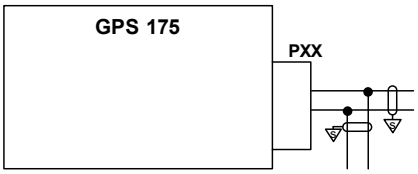
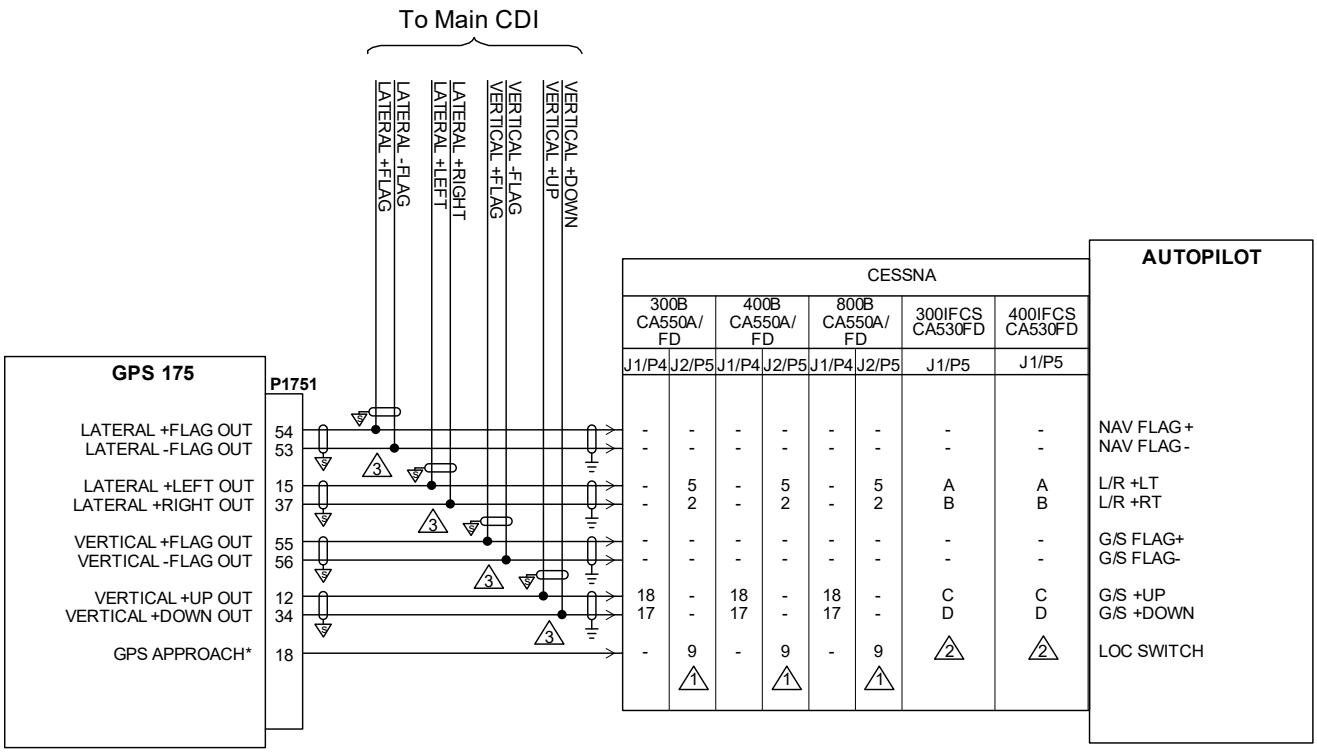


Figure 11-25 Century Autopilots Interconnect



NOTES

1. THE GPS APPROACH DISCRETE OUTPUT MUST ALSO BE CONNECTED TO THE BACK COURSE RELAY - REFER TO MANUFACTURER'S DOCUMENTATION FOR ADDITIONAL DETAILS.

2. REFER TO MANUFACTURERS DOCUMENTATION FOR CORRECT CONNECTION OF THE VOR/LOC RELAY USING AN ACTIVE LOW INPUT.

3. SPLICE MUST BE PERFORMED WITHIN 6.0 INCHES OF CONNECTOR BACKSHELL (WITHIN CONNECTOR BACKSHELL IS PREFERRED).

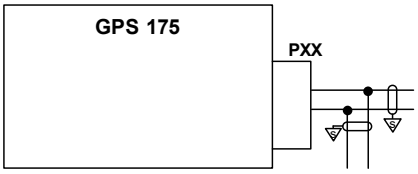
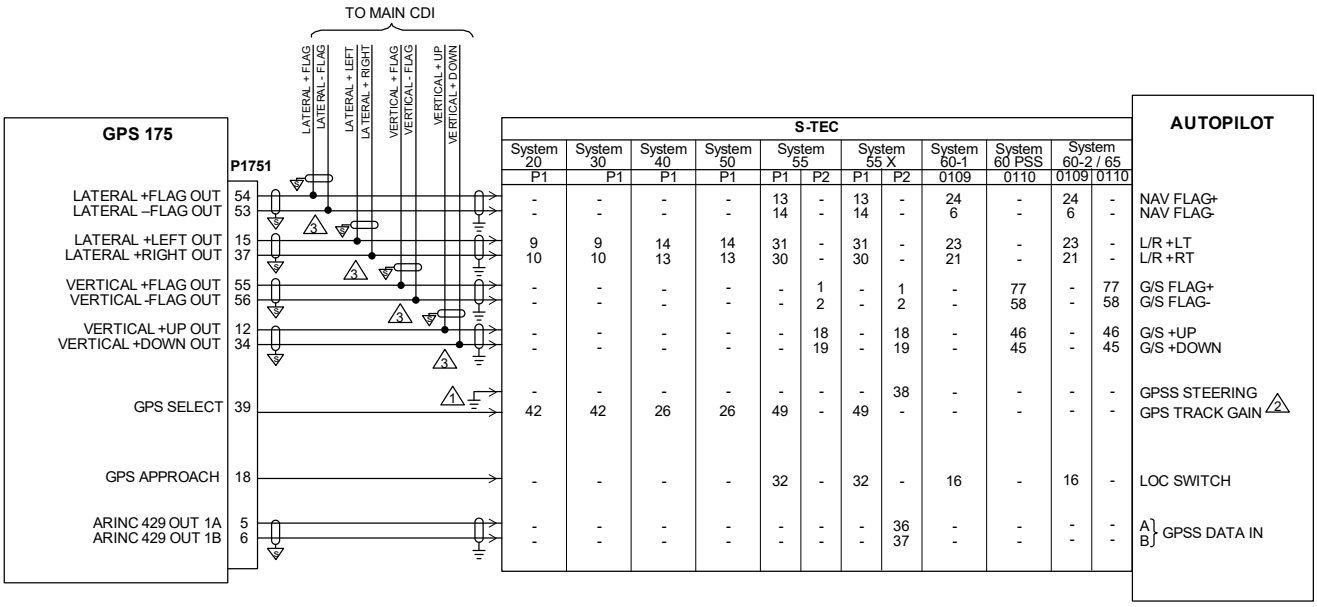


Figure 11-26 Cessna Autopilots Interconnect



NOTES

1. WHEN USED IN CONJUNCTION WITH A NAV RADIO, THESE PINS MUST BE OPEN WHEN THE NAV RADIO IS THE NAVIGATION SOURCE BEING USED BY THE AUTOPILOT.

2. GPS TRACK GAIN IS USED TO IMPROVE TRACKING WHEN GPS IS SELECTED ON THE CDI AND THE AUTOPILOT IS IN ANALOG NAVIGATION MODE (AND ROLL STEERING IS NOT ENGAGED).

3. SPLICE MUST BE PERFORMED WITHIN 6.0 INCHES OF CONNECTOR BACKSHELL (WITHIN CONNECTOR BACKSHELL IS PREFERRED).

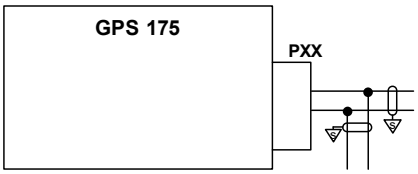


Figure 11-27 S-TEC Autopilots Interconnect

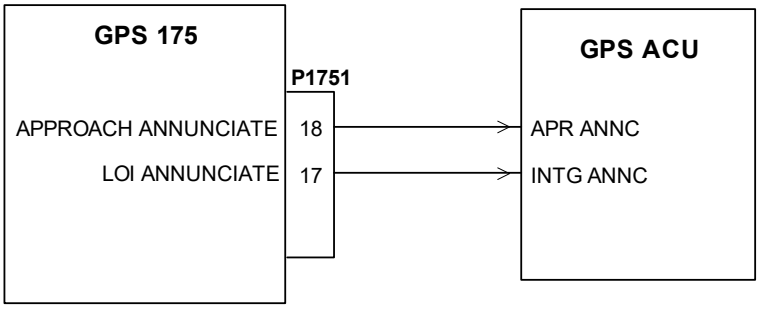
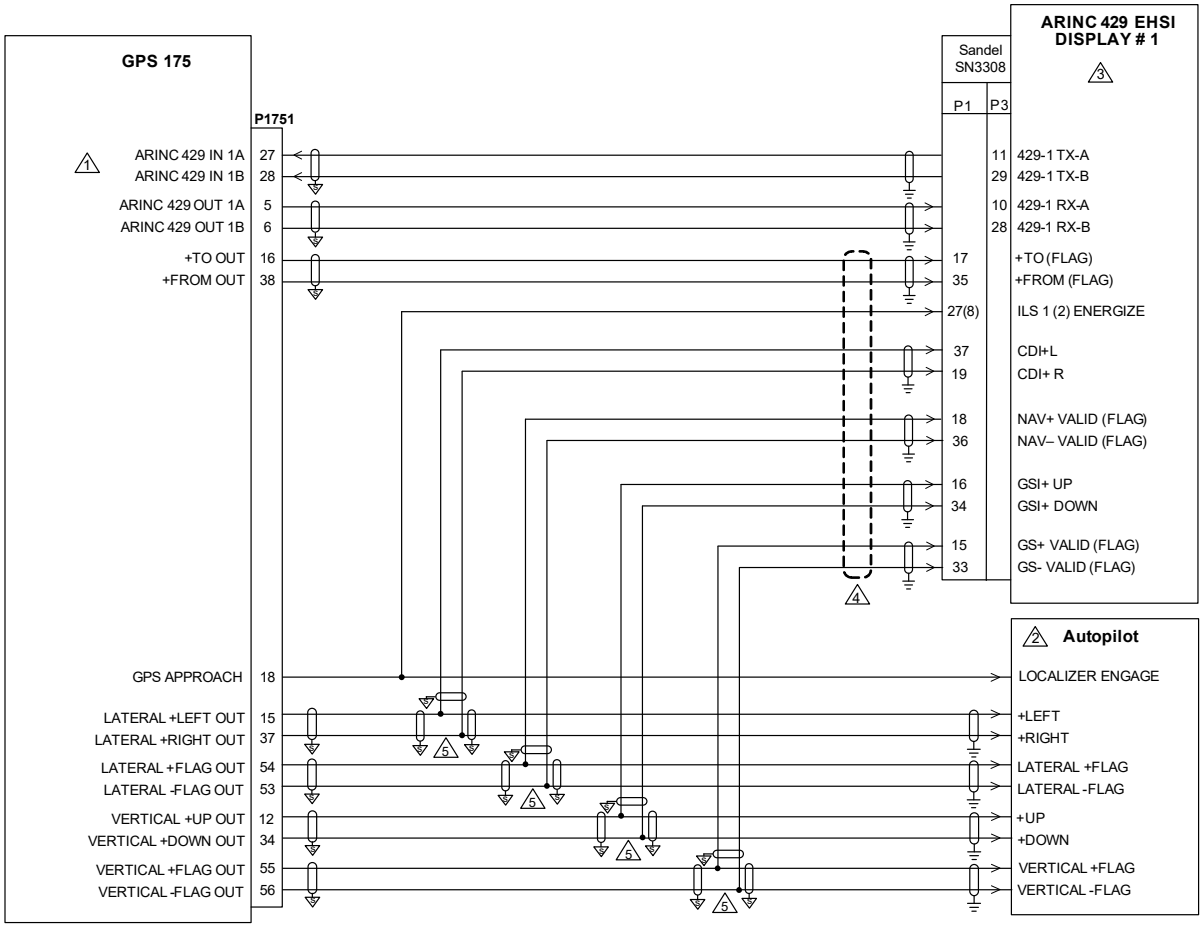


Figure 11-28 GPS Annunciators Interconnect



NOTES

1. IF THE ARINC 429 IN 1 PORT IS ALREADY USED FOR ANOTHER PURPOSE, ANY AVAILABLE ARINC 429 IN PORT MAY BE CONNECTED INSTEAD. REFER TO SECTION 5 FOR PINOUT INFORMATION.

2. AUTOPILOT SHOWN FOR REFERENCE ONLY. REFER TO THE APPROPRIATE AUTOPILOT INTERCONNECT DIAGRAM.

3. REFER TO SECTION 10 FOR CONFIGURATION SETTINGS.

4. FOR SN3308 SOFTWARE VERSIONS PRIOR TO 2.30, ANALOG CONNECTIONS TO SN3308 ARE REQUIRED TO ALLOW VERITCAL GUIDANCE TO BE DISPLAYED FOR GPS APPROACHES. FOR SOFTWARE VERSION 2.30 AND LATER, THESE ANALOG CONNECTIONS ARE NOT REQUIRED.

5. SPLICE MUST BE PERFORMED WITHIN 6.0 INCHES OF CONNECTOR BACKSHELL (WITHIN CONNECTOR BACKSHELL IS PREFERRED).

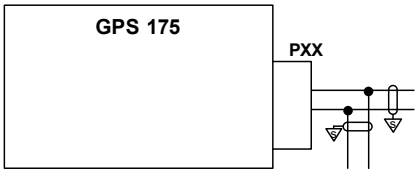
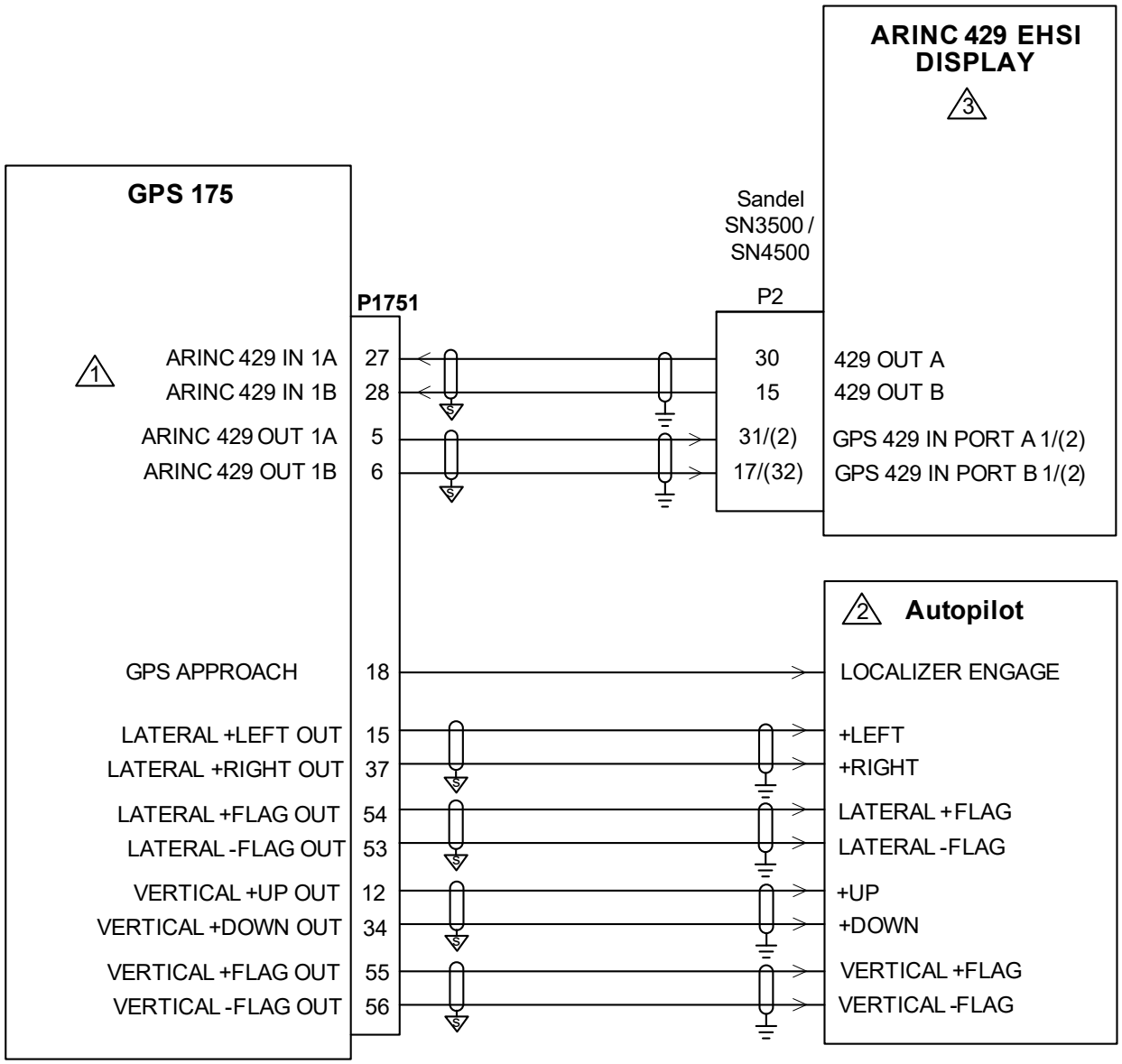


Figure 11-29 Sandel SN3308 Interconnect



NOTES

1. IF THE ARINC 429 IN 1 PORT IS ALREADY USED FOR ANOTHER PURPOSE, ANY AVAILABLE ARINC 429 IN PORT MAY BE CONNECTED INSTEAD. REFER TO SECTION 5 FOR PINOUT INFORMATION.

2. AUTOPILOT SHOWN FOR REFERENCE ONLY. REFER TO THE APPROPRIATE AUTOPILOT INTERCONNECT DIAGRAM.

3. SANDEL SN3500/SN4500 SETUP ITEMS:

LNAV 1/2 SELECT: GNS 530 (ARINC)	ANNUN:	SERIAL
	LAT DV:	SERIAL
	VERT DV:	SERIAL
SN 3500	VERT ENA:	SERIAL
SN 4500	VERT ENA:	VERT DV FLAG

Figure 11-30 Sandel SN3500/4500 Interconnect


GARMIN