GARMIN

G600
AML STC Installation Manual

190-00601-06 November 2008 Rev. B

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RECORD OF REVISIONS

Revision	Revision Date	Description
1	3/28/2008	Initial Release
2	5/30/2008	Added more detail to installation requirements.
3	6/13/08	Clarify shield ground requirements.
A	7/23/08	Production Release
B	11/13/08	Incorporated feedback from the field. Added autopilots and/or flight directors (Cessna 300B/400B/800B IFCS, Collins AP-106-107, Honeywell KFC 275/325, S-TEC 60-2/65). See Current Revision Description for a complete list of changes.

CURRENT REVISION DESCRIPTION

Revision	Page Number(s)	Section Number	Description of Change
B	1-13	1.8	Added caution to warn that supplemental data cards are locked to the particular display after the data card has been inserted.
	2-1	2.3	Added the GTP 59 to the G600 LRU Kit Contents (Table 2-1).
	2-2	2.4.1	Removed the GTP 59 from the accessories kit (Table 2-3).
	2-3	2.4.3	Added new section for creating a new software loader card.
	2-6	2.5.3.1	Added the words 'circuit breaker' to the G600 labels (Table 2-4).
	2-11	2.5.9	Added information that an external HDG/GPSS switch is required to utilize the roll steering conversion feature.
	2-11	2.5.9.1	Added information about relocating the ADI to the copilot's side.
	2-11	2.5.9.4	Added new section about ADIs with Integral Flight Director Presentation.
	2-20	2.5.11.5	Added a note that a Magnetic Interference Survey must be completed after mounting the GMU 44. Added a note that if reusing wiring for the GMU 44, the existing wiring must meet the requirements specified for the GMU 44.
	2-26	2.5.11.8	Added new section and figure defining requirements for relocating ADI with flight director to the copilot's side ADI.
	2-27	2.5.16	Added new section about GPSS roll steering considerations. This clarifies when an external GPSS switch will be required.
	3-1	3.1	Added sight compass to the special tools required list. Also added a USB to RS-232 converter.
	3-70	3.2.5	Corrected the type of screws called out for the mounting rack of the GDC 74A (figure was correct). Removed recommended torque.
	3-81	3.4	Added statement that only wire specified in section 2.4.2 should be used for G600 connections.
	3-84	3.4.2.1	Added a caution to not use self-tapping screws supplied with slide lock.
	5-4	5.4	Added a note that a Software Loader Card can be created.
	5-14	5.5.5	Added a note that in order to enable or disable features an Installer Unlock Card is required.
	5-16	5.5.9	Included additional Cessna and Collins autopilots in Table 5-2.
	5-17	5.5.10	Updated Table 5-3, GDU 620 Flight Director Type Settings to include additional Collins, Honeywell and S-TEC flight directors.
	5-18	5.5.10.1	Added section about configuring flight director settings using manual entry.
	5-19	5.5.10.1	Added Table 5-3A, GDU Manual Flight Director ACTIVE Settings.
	5-22	5.6.2	Revised CAUTION to address use of a sight compass when completing the Magnetometer Calibration Procedure.
	5-24	5.6.3	Revised compass swing procedure to allow the use of a sight compass.
	5-32	5.8.2	Added a note that it is possible to induce attitude and/or heading errors when conducting air data tests.
	5-34	5.8.4	Clarified a step to look for LOC 2 on the PFD for installations with dual navigators.
	5-36	5.8.5.3	Added a note that if an ADI is installed on the copilot's side, the flight director for that ADI must be aligned to its aircraft symbol before doing the G600 flight director calibration.
	5-39	5.8.5.5	Added a step (#9) to the heading course and error test.
	6-4	6.2	Added troubleshooting information to table.

CURRENT REVISION DESCRIPTION

Revision	Page Number(s)	Section Number	Description of Change
	C-10	Appendix C	Updated Figure C-9, GDU 620 Cutout Dimensions to remove semicircular notch on right side of cutout.
	D-9	D.2	Removed Figure D-12 (it was a duplicate).
	E-2	E.3	Included additional Cessna, Collins and Honeywell autopilots, and added notes [4] and [5] to table.
	E-3	E.4	Included additional Cessna, Collins, Honeywell, and S-TEC external flight directors in table.
	E-4	E.6	Added Avidyne TCAD as an approved traffic source (display only).
	F-3	Fig F-1	Clarified meaning of Essential and Main bus.
	F-5	Fig F-2	Clarified meaning of Essential and Main bus.
	F-6	Fig F-3	Clarified meaning of Essential and Main bus.
	F-11	Fig F-10	Added interconnect data for flight directors.
	F-19	Fig F-11	Added interconnect data for S-TEC ST-670 flight director. Incorporated Installation Bulletin 842.
	F-26	Fig F-13	Added interconnect data for Collins AP-106/107 autopilots/flight directors.
	F-32	Fig F-14	Added interconnect data for Cessna 300B IFCS/400B IFCS/800B IFCS autopilots/flight directors.
	F-36	Fig F-17	Added Interconnect data for Avidyne TCAD. Incorporated Installation Bulletin 834.
	F-43	Fig F-23	Added Ethernet architecture information.
	G-1	G.1	Updated of laptop or PC requirements to complete the magnetic interference survey.

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WARNING

This product, its packaging, and its components contain chemicals known to the State of California to cause cancer, birth defects, or reproductive harm. This Notice is being provided in accordance with California's Proposition 65. If you have any questions or would like additional information, please refer to our web site at www.garmin.com/prop65.

WARNING

Perchlorate Material – special handling may apply, See www.dtsc.ca.gov/hazardouswaste/perchlorate.

CAUTION

The GDU 620 uses a lens coated with a special anti-reflective coating that is very sensitive to skin oils, waxes and abrasive cleaners. CLEANERS CONTAINING AMMONIA WILL HARM THE ANTI-REFLECTIVE COATING. It is very important to clean the lens using a clean, lint-free cloth and an eyeglass lens cleaner that is specified as safe for anti-reflective coatings

CAUTION

All GDU 620 screen shots used in this document are current at the time of publication. Screen shots are intended to provide visual reference only. All information depicted in screen shots, including software file names, versions and part numbers, is subject to change and may not be up to date.

This manual is written for software version 2.0 or later. The software version and information in this document are subject to change without notice. Visit the Garmin web site (www.garmin.com) for current updates and supplemental information concerning the operation of this and other Garmin products.

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1 General Description

1.1 Introduction

This manual covers the G600 system, which includes the GDU 620 display, GDC 74A air data computer, GRS 77 AHRS, GMU 44 magnetometer and GTP 59 temperature probe. This manual describes the physical, mechanical and electrical characteristics, as well as instructions and other conditions and limitations for installation and approval for all components of the G600 system. It is intended for use by persons certified by the Federal Aviation Administration (FAA) to install avionics. It includes installation and checkout procedures for the G600 to standards described in Title 14 CFR Part 43.

1.2 Scope

This installation manual applies to the modification of an aircraft to support the installation of the G600 system and the required standby instruments. *Interfacing* to additional equipment is also covered by this manual; however, the *installation* of such peripheral equipment (traffic / weather sensors, GPS, NAV, autopilot systems, etc.) is not covered. Those systems require other installation data and approval.

The data contained within this manual is FAA approved under the G600 AML STC SA02153LA, which is applicable for implementation within airplanes that are type certificated under the Civil Air Regulation 3/4 (CAR 3/4) or Title 14 Code of Federal Regulations (CFR) Part 23. Currently the STC data supports aircraft identified via AC 23.1309-1C as Class I, II, or III. The G600 system installation covered by this STC is not appropriate for Part 23 Commuter Category (Class IV), or Part 25 Transport Category aircraft, nor is it appropriate for Part 27/29 Rotorcraft.

Installation of the G600 system in an aircraft imposes specific limitations which may affect the operational capabilities of some aircraft, specifically RVSM compliance. Section 7 of this manual lists all the Limitations of the STC, which should be carefully reviewed prior to any installation.

1.2.1 Approved Aircraft with Systems not Covered by the STC

Aircraft identified on the Approved Model List have been determined to meet a minimum required configuration for applicability of the STC. However, since some of these aircraft may have been modified over the years or may have been manufactured with systems which are not identified or approved in this manual for integration with the G600, it may be difficult to use the data herein to completely substantiate the installation in compliance with the STC. It is the installer's responsibility to make the final determination of applicability for each aircraft. Use Section 2 of this manual to assess each installation prior to modifying any Type Certified aircraft to ensure the applicability of the G600 AML STC.

It is possible / permissible for installers and other appropriately certificated persons to seek approval for installation and operational use of the G600 with systems not identified in this manual. It is the responsibility of such persons to validate any compatibility and document any limitations of such interfaces and to provide that data to the FAA for approval by means of a TC, STC, or Field Approval prior to returning the aircraft to service.

1.2.2 Class I/II aircraft not identified on the AML

Aircraft identified via AC 23.1309-1C as Class I or II airplanes which are not identified on the G600 AML STC may be valid candidates for the G600 AML STC. Installers should contact Garmin Tech Support with detailed drawings of the aircraft's proposed installation. Engineering analysis may allow for the inclusion of these aircraft in a future revision of the FAA Approved Model List.

1.2.3 Class III Aircraft not Identified on the AML

Some aircraft identified via AC 23.1309-1C as Class III airplanes have been delayed inclusion on the AML based upon additional data required by the Small Aircraft Directorate and Aircraft Evaluation Group. Field Approvals for this class of aircraft should not be made; instead, installers or other appropriately agencies should contact Garmin directly to develop the required data needed to support an installation of this type under the STC.

1.2.4 Other Aircraft Not Covered by the G600 AML STC

Commuter Category Aircraft (Part 23 Class IV), Transport Category Aircraft (Part 25), and Rotorcraft (Part 27/29) are not part of the G600 AML STC. The data in this installation manual and the components of the G600 system have not been tested to operate under the standards specified for these types of aircraft. Field Approvals for these aircraft should not be made.

1.2.5 Required Documentation for All Installations

Regardless of applicability of the AML STC or alternative field approval application for installation and operational approval, prior to completing the installation and before returning the airplane to service, the installer or other appropriately certificated person is required to complete and submit an FAA Form 337; "Major Repair and Alteration Airframe, Powerplant, Propeller, or Appliance" to the appropriate FAA Flight Standards District Office describing the work accomplished. The FAA Form 337 must detail the equipment and systems to which the respective G600 System is interfaced and reflect appropriately approved or acceptable data for which any follow-on FAA Field Approval is being sought. See AC 43.9-1E for instructions for completing the FAA Form 337. In addition, the G600 Configuration and Checkout Log must be completed and attached with the Instructions for Continued Airworthiness such that any aircraft with the modifications detailed in this manual may be properly maintained.

1.3 G600 System Overview

The G600 system is designed to replace the standard "six-pack" instruments, along with any external CDIs and ADF indicator. Standby instruments (ADI, airspeed indicator and altimeter) are required, and these usually go in the locations vacated by the removed instruments. An overview of the G600 system is shown in Figure 1-1 and Figure 1-2. Further detail on each of the LRUs is provided in the following sections.

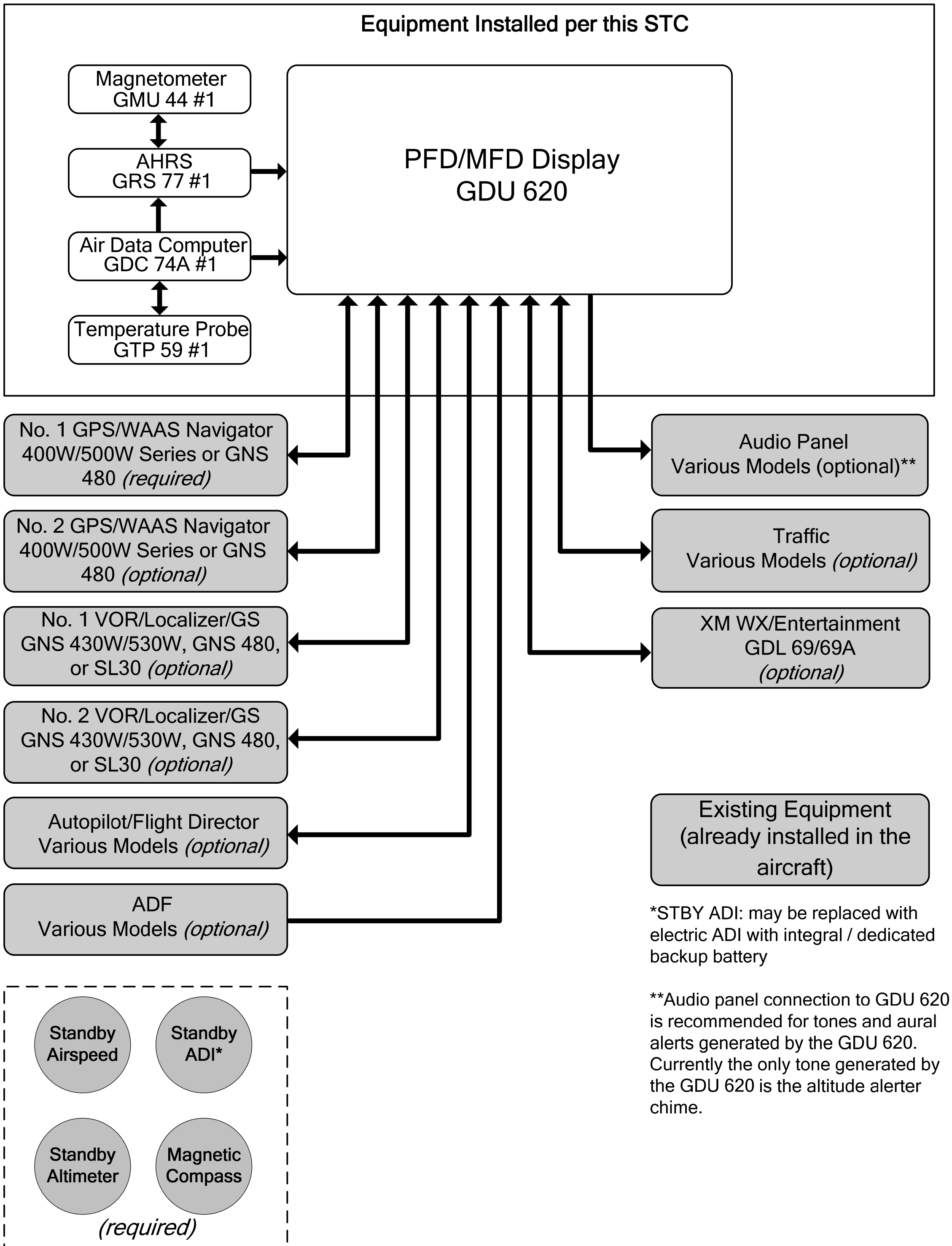


Figure 1-1. G600 System Overview – Single GDU

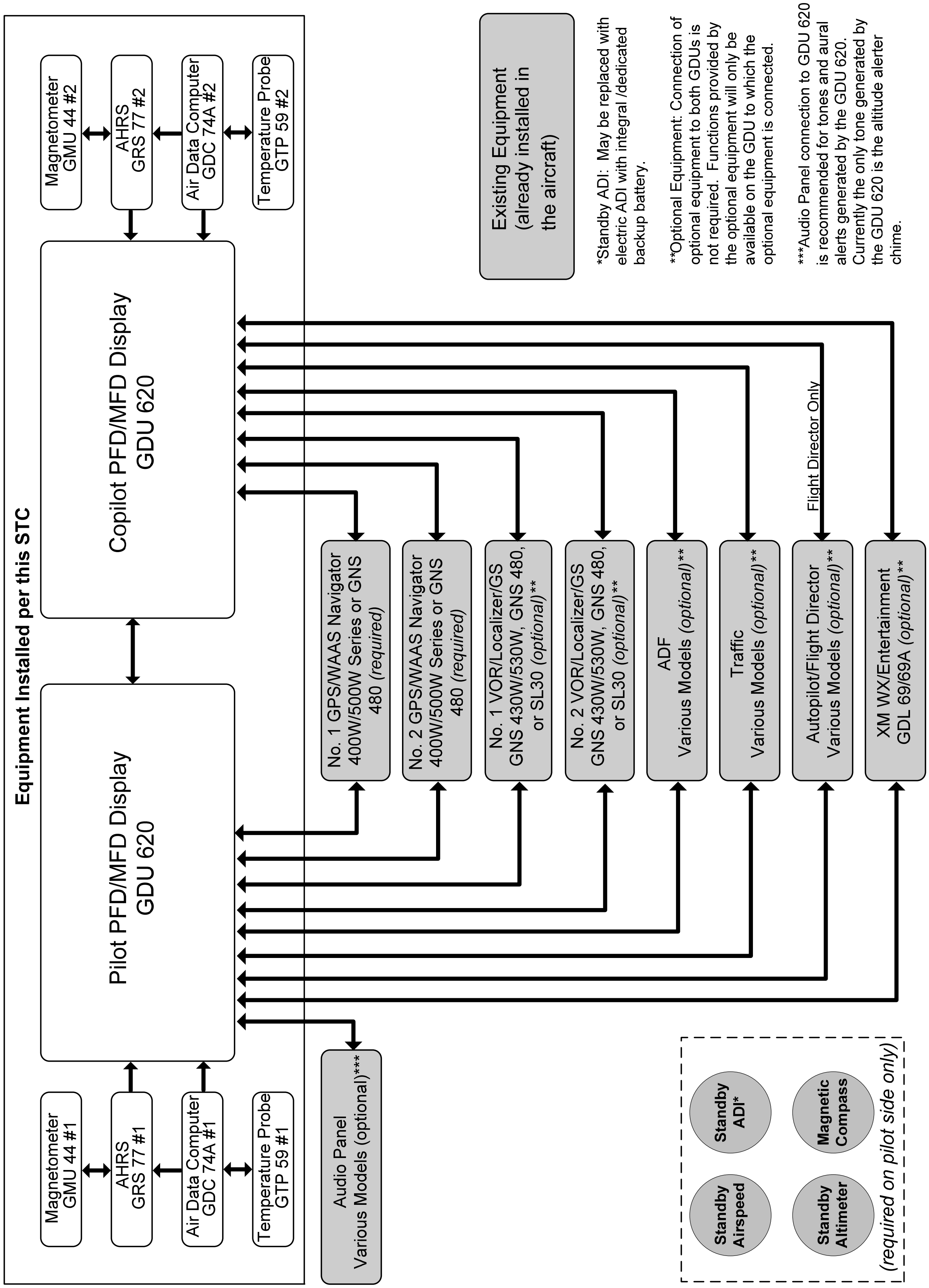


Figure 1-2. G600 System Overview – Dual GDUs

1.3.1 G600 LRU Descriptions

<u>GDU 620</u>: The GDU 620 has dual VGA (640 x 480 pixels) 6.5-inch LCD displays. The left side of the GDU is the primary flight display (PFD) and the right side is the multi-function display (MFD). The PFD shows primary flight information. The MFD shows navigation and flight plan information, traffic, weather and terrain. An external configuration module is used, so no configuration is required if the GDU 620 is replaced for any reason.

<u>GRS 77</u>: The GRS 77 is an attitude, heading and reference unit, or AHRS, that provides aircraft attitude and flight characteristics information to the GDU 620. The unit contains advanced tilt sensors, accelerometers, and rate sensors. In addition, the GRS 77 interfaces with both the GDC 74A air data computer and the GMU 44 magnetometer. The GRS 77 also utilizes GPS signals sent from the GPS/WAAS navigator. Actual attitude and heading information is sent using ARINC 429 digital interface to the GDU 620.

<u>GMU 44</u>: The GMU 44 magnetometer senses magnetic field information. Data is sent to the GRS 77 AHRS for processing to determine aircraft magnetic heading. This unit receives power directly from the GRS 77 and communicates with the GRS 77 using an RS-485 digital interface.

<u>GDC 74A</u>: The GDC 74A air data computer receives information from the pitot/static system and the GTP 59 outside air temperature (OAT) sensor. The GDC 74A is responsible for providing pressure altitude, airspeed, vertical speed, and OAT information to the G600 system. The GDC 74A provides data to the GDU 620 and GRS 77 using ARINC 429 digital interfaces. The GDC 74A also communicates maintenance and configuration information to the GDU 620 using an RS-232 interface.

1.3.2 Required GPS Navigator

At least one of the following WAAS/GPS navigators is required, although the G600 system will support two independent navigators. For dual GDU 620 installations, two navigators are required (these do not have to be the same navigators).

400W/500W Series: The 400W/500W Series unit is a panel-mount WAAS/GPS navigator with a color moving map. Position and flight plan data are displayed on the GDU 620 MFD via RS-232 and ARINC 429 interfaces. GPS position information is also forwarded to the GRS 77 AHRS in order to ensure normal AHRS operation. The GNS 430W/530W also provides LOC/GS information for display on the GDU 620 HSI via an ARINC 429 interface.

GNS 480: The GNS 480 unit is a panel-mount WAAS/GPS navigator / with a built-in navigation receiver and a color moving map. Position and flight plan data are displayed on the GDU 620 MFD via RS-232 and ARINC 429 interfaces. GPS position information is also forwarded to the GRS 77 AHRS in order to ensure normal AHRS operation. LOC/GS information is provided on an ARINC 429 interface and displayed on the GDU 620 HSI.

1.3.3 Required Standby Instruments

When the G600 system is installed, an independent attitude indicator, airspeed indicator and altimeter must be installed. In many cases the existing instruments can be retained for use as standby instruments.

1.3.4 Optional Systems

SL30 NAV/COM: The GDU 620 can receive VOR/ILS information from an SL30 transceiver. The lateral and vertical deviations from the navigation receiver can be displayed on the GDU 620 HSI.

Traffic Sensor: The GDU 620 can receive traffic information from various traffic sensors, including the Garmin GTX 330/330D, Goodrich SkyWatch, Honeywell TAS/IHAS and Ryan TCAD. Traffic information is received over an ARINC 429 interface, and optional control is provided using discrete(s). All aural traffic alerts are still generated by the traffic system.

GDL 69/69A: The GDU 620 can receive data link information from the GDL 69/69A, which is an XM Satellite Radio data link receiver that receives broadcast weather data. The GDL 69A is the same as the GDL 69 with the addition of XM Satellite Radio audio entertainment. Weather data and control of audio channel and volume is displayed on the GDU 620 MFD, via a High-Speed Data Bus (HSDB) Ethernet connection. The GDL 69A is also interfaced to an audio panel for distribution of the audio signal.

ADF: The GDU 620 can receive bearing information from an ADF receiver. The ADF bearing information can be displayed on the GDU 620 HSI on a pilot-selectable bearing pointer.

1.3.5 Interface Summary

A summary of the individual interface types between the LRUs in the G600 system is shown in Figure 1-3 and Figure 1-4.

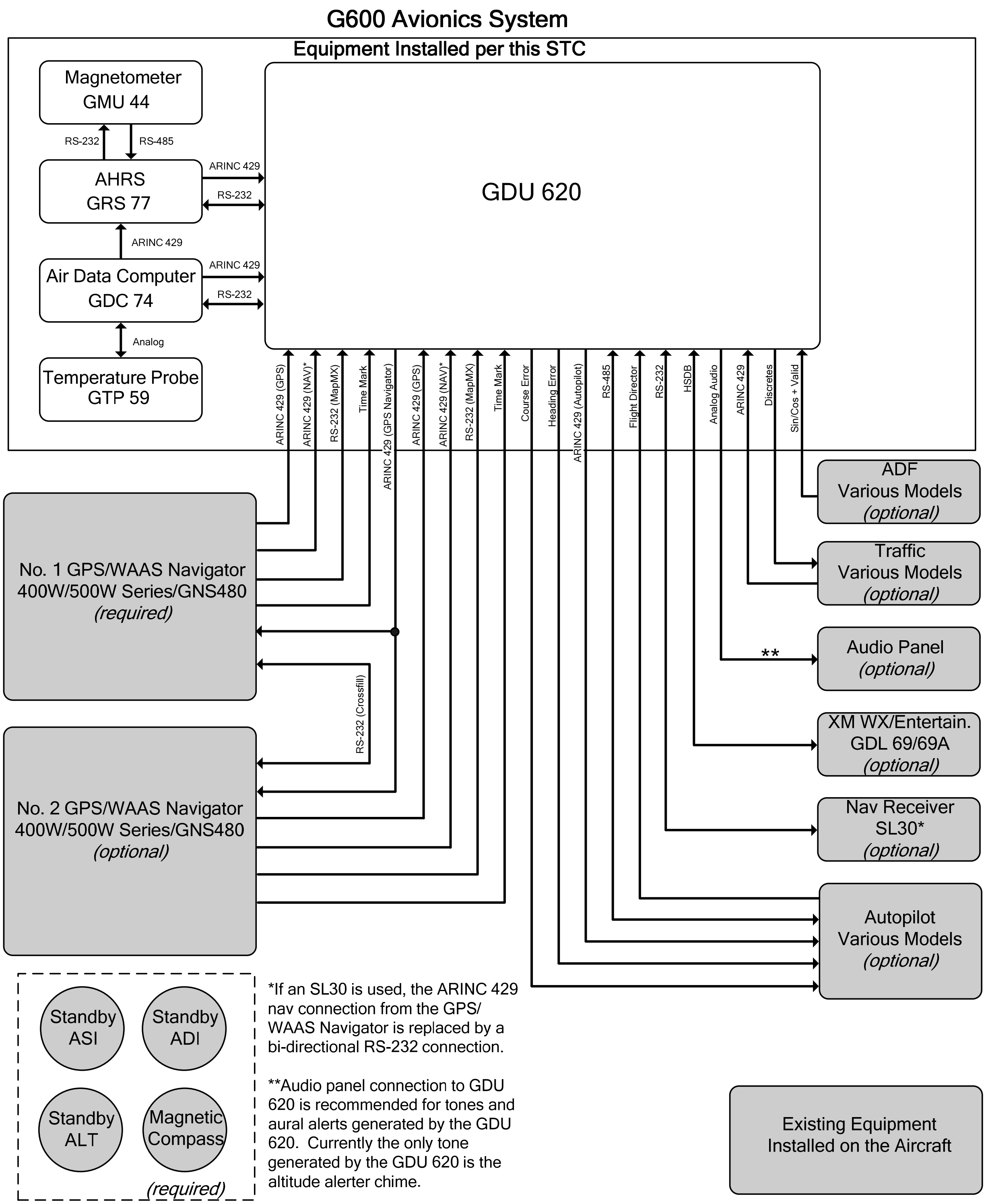


Figure 1-3. G600 Interfaces – Single GDU

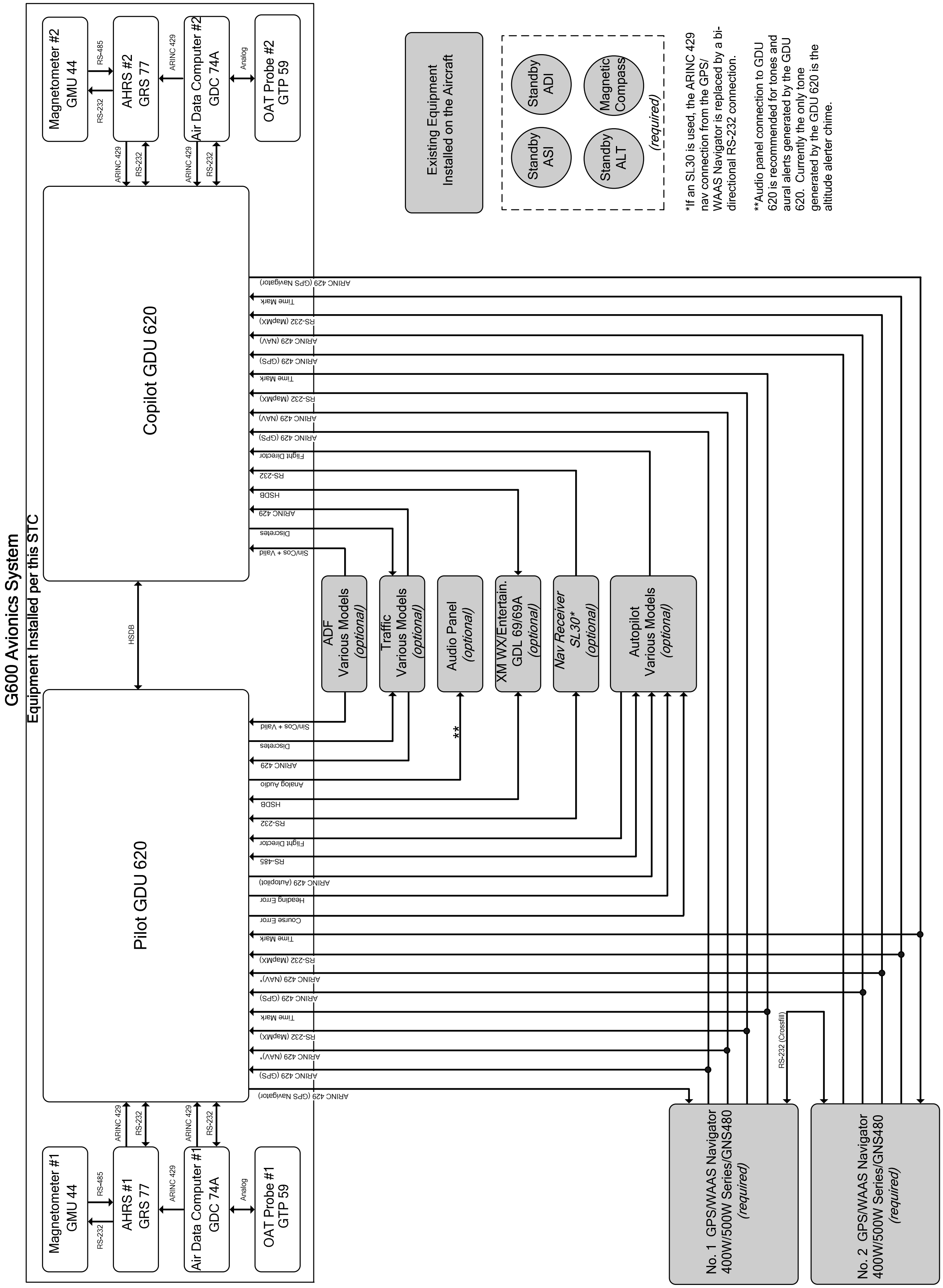
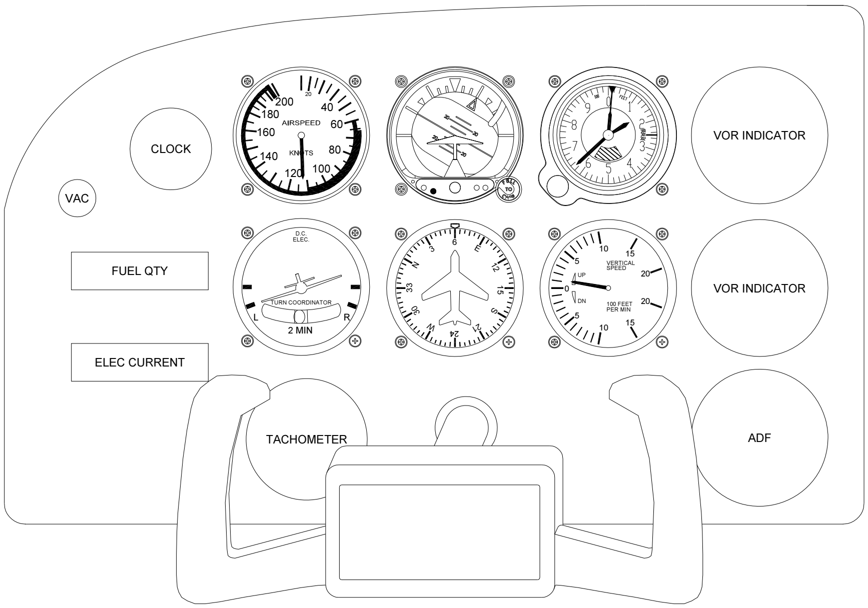


Figure 1-4. G600 Interfaces – Dual GDUs

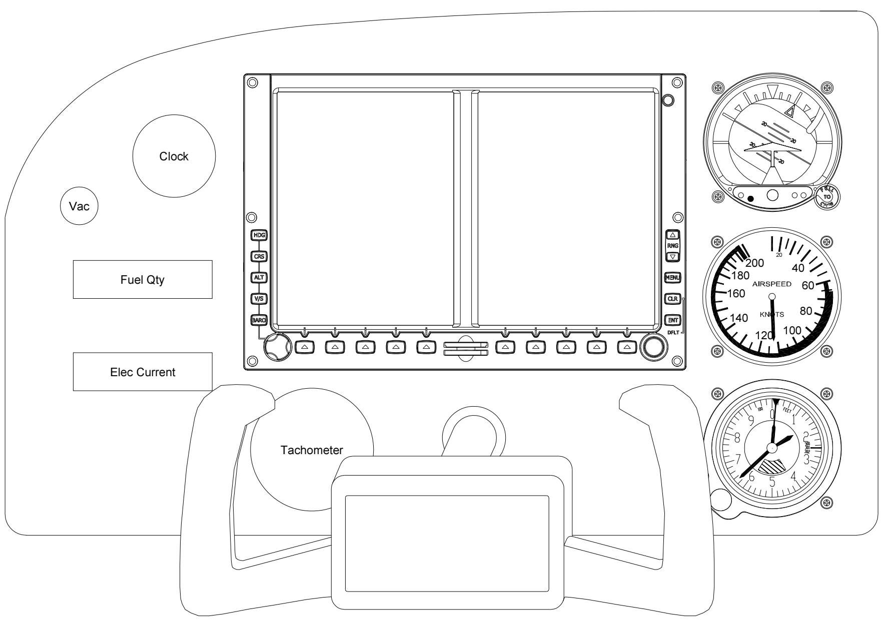
1.4 G600 Installation

1.4.1 Installation Overview

The G600 system is designed to replace the standard “six pack” instruments, along with any external CDIs and ADF indicator. Standby instruments (ADI, airspeed indicator and altimeter) are required, and these usually go in the locations vacated by the removed instruments. A typical installation is shown in Figure 1-5.



TYPICAL INSTRUMENT PANEL BEFORE MODIFICATION



TYPICAL INSTRUMENT PANEL AFTER G600 INSTALLATION

Figure 1-5. Typical Instrument Panel Modification

1.4.2 Installation Configurations

The G600 system can be installed with a single GDU 620 (display) or dual GDU 620s.

In a single GDU 620 installation the attitude, air data, autopilot and external sensors are connected directly to the GDU 620. Refer to Figure 1-1.

In dual GDU 620 installations two independent attitude systems and two air data computers are required. The primary and secondary GDU 620s share information over a cross-fill bus. The primary GDU 620 is connected to the autopilot, although either GDU can control the course and heading inputs into the autopilot. External systems are interfaced to each GDU as required. Refer to Figure 1-2. For installations with dual GDU 620s, standby instruments are only required by the pilot (primary) GDU 620.

1.5 Technical Specifications

1.5.1 Environmental Qualification Forms

The latest revision of the Environmental Qualification Forms for each G600 LRU is available directly from Garmin under the part numbers listed in Table 1-1.

Table 1-1. G600 Equipment Environmental Qualification Forms

Document	Garmin Part Number
GDU 620 Environmental Qualification Form	005-00313-20
GRS 77 Environmental Qualification Form	005-00165-31
GMU 44 Environmental Qualification Form	005-00164-31
GDC 74A Environmental Qualification Form	005-00191-77
GTP 59 Environmental Qualification Form	005-00191-97

To obtain a copy of these forms, see the dealer/OEM portion of the Garmin web site (www.garmin.com).

1.5.2 Physical Characteristics

All width, height, and depth measurements are taken with unit rack (if applicable) and connectors.

Table 1-2. G600 LRU Physical Specifications

LRU	Width	Height	Depth	Unit Weight	Unit Weight w/Rack & Connector Weight
GDU 620	10.0 inches (25.4 cm)	6.70 inches (17.0 cm)	5.50 inches (14.0 cm)	6.38 lbs. (2.90 kg)	7.04 lbs. (3.20 kg)
GRS 77	3.62 inches (9.19 cm)	3.32 inches (8.43 cm)	9.84 inches (24.99 cm)	2.80 lbs. (1.27 kg)	3.46 lbs. (1.57 kg)
GMU 44	N/A [1]	2.10 inches (5.33 cm)	N/A [1]	0.35 lbs. (0.16 kg)	0.50 lbs. (0.23 kg)
GDC 74A	3.10 inches (7.87 cm)	3.23 inches (8.20 cm)	9.64 inches (24.49 cm)	1.58 lbs. (0.72 kg)	2.30 lbs. (1.04 kg)

[1] Diameter of GMU 44 is 3.35 inches (8.51 cm), including flange.

1.5.3 Power Requirements

All LRUs are capable of operating at either 14 or 28 VDC. See the individual LRU specific Environmental Qualification Form for details on surge ratings and minimum/maximum operating voltages. See Table 1-3 for current draw specifications.

Table 1-3. LRU Current Specifications

LRU	14 Volt Current Draw		28 Volt Current Draw	
	Typical	Maximum	Typical	Maximum
GDU 620	3.9 A	5.4 A	1.9 A	2.7 A
GRS 77/GMU 44	600 mA	1.0 A [1]	300 mA	1.0 A [1]
GDC 74A	410 mA	480 mA	200 mA	235 mA

[1] Maximum current draw occurs momentarily at startup or when the supply voltage drops to 9 VDC.

1.6 Certification

1.6.1 TSO Compliance

The TSO compliance for each LRU is with the software part numbers listed below:

LRU	Applicable LRU SW Part Numbers
GDU 620 PFD/MFD	006-B0498-( )
GRS 77 AHRS	006-B0223-( )
GMU 44 Magnetometer	006-B0224-( )
GDC 74A ADC	006-B0261-( )
GTP 59 OAT Probe	Not Applicable

1.6.1.1 GDU 620

Refer to the GDU 620 Installation Manual, P/N 190-00601-04.

1.6.1.2 GRS 77

Function	TSO/ETSO/SAE/RTCA/EUROCAE	Category
Turn and Slip Instrument	TSO-C3d ETSO-C3d AS8004	
Bank and Pitch Instruments	TSO-C4c ETSO-C4c AS8001	Category A
Direction Instrument, Magnetic (Gyroscopically Stabilized)	TSO-C6d ETSO-C6d AS8013A	

1.6.1.3 GMU 44

Function	TSO/ETSO/SAE/RTCA/EUROCAE	Category
Direction Instrument, Magnetic (Gyroscopically Stabilized)	TSO-C6d ETSO-C6d AS8013A	

1.6.1.4 GDC 74A

Function	TSO/ETSO	Category
Air Data Computer	TSO-C106 ETSO-C106	

1.6.1.5 GTP 59

Function	TSO/ETSO	Category
Air Data Computer	TSO-C106 ETSO-C106	

1.7 G600 System Documentation

Table 1-4. Garmin G600 Reference Documentation

Document	Garmin Part Number
G600 System Installation Manual	190-00601-06
GDU 620 Installation Manual	190-00601-04
GDL 69 Activation Instructions	190-00355-04

Table 1-5. Other Reference Documentation

Document	Part Number
Mid-Continent 4300-3XX and 4300-5XX Series Electric Attitude Indicator Installation Manual	9015692
Mid-Continent 4300-4XX Series Electric Attitude Indicator Installation Manual	9015762
Mid-Continent 4200 Series Electric Attitude Indicator Installation Manual	9016182
Mid-Continent MD420 Emergency Power System Installation Manual	9016391

Table 1-6. Optional Garmin System Reference Documentation

Document	Garmin Part Number
400W Series Installation Manual	190-00356-02
500W Series Installation Manual	190-00357-02
GNS 480 (CNX80) Color GPS/Nav/Com Installation Manual	560-0982-01
GTX 330 Installation Manual	190-00207-02
GDL 69/69A Installation Manual	190-00355-02

1.8 Databases

The GDU 620 utilizes various databases. With the exception of the Navigation database and IGRF model, which reside internal to the GDU 620, all databases are stored on a single SD memory card that is inserted into the bottom slot of the GDU 620. The following sections describe each database and how the databases are updated.

CAUTION

The databases on the Supplemental Data Card are locked to specific GDU 620 displays. The first time the Supplemental Data Card is inserted in a display it becomes "locked" to that particular display and will not work in other displays.

1.8.1 Basemap Database

The basemap provides ground based references such as roads and bodies of water. The database is stored in internal memory of the GDU 620 display. The basemap does not have a scheduled update cycle and as such does not have an expiration date.

The basemap database is updated very infrequently. Should this database have to be updated in the future, Garmin will provide details on how to load the updated data into the GDU 620.

1.8.2 Navigation Database

The Jeppesen Navigation Database provides the G600 system with the required information for displaying flight plan information.

The GDU 620 utilizes a database stored on an SD memory data card for easy updating and replacement. The Navigation database may be updated by simply inserting an updated Navigation database update card into the top SD card slot in the front panel in the GDU 620. The actual database is downloaded into the unit, so the card can be removed after the update. Each card will only update one system. Alternately, the Navigation database may be updated by copying the database to the Garmin-supplied Supplemental Data card. It will be downloaded into the GDU 620 on first use, and the file can be left on the Supplemental Data card until the next update cycle.

The navigation database on the GDU 620 database card is generated from current Jeppesen Sanderson data and converted to a format that is used by the GDU 620. The data conversion process is performed using software that is developed and maintained under Garmin configuration management according to RTCA/DO-200A, Standards for Processing Aeronautical Data.

GDU 620 users update their database card by purchasing database subscription updates from Garmin. The database card is programmed using the supplied SD card reader. Contact Garmin at 800-800-1020 or fly.garmin.com for more information and instructions.

1.8.3 FliteCharts Database

FliteCharts resemble the paper version of National Aeronautical Charting Office (NACO) terminal procedures charts. The charts are displayed with high-resolution and in color for applicable charts. When viewing these charts on the MFD, the aircraft position is not depicted on the chart.

The FliteCharts database is updated by removing the database card from the GDU 620, updating the database on the card and reinserting the card. Each card can only be used with one system. GDU 620 users update their database card by purchasing database subscription updates from Garmin. The database card is programmed using the supplied SD card reader. Contact Garmin at 800-800-1020 or fly.garmin.com for more information and instructions.

1.8.4 ChartView Database

ChartView resembles the paper version of Jeppesen terminal procedures charts. The charts are displayed in full color with high-resolution. The MFD depiction shows the aircraft position on the moving map in the plan view of approach charts and on airport diagrams. The ChartView database is stored on an SD memory card that remains in the GDU 620 for normal operation.

The ChartView database is updated by removing the database card from the GDU 620, updating the database on the card and reinserting the card. Each card can only be used with one system. GDU 620 users update their ChartView data by purchasing database subscription updates from Jeppesen Sanderson. The database card is programmed using the supplied SD card reader and Jeppesen-provided software. Contact Jeppesen at 800-621-5377 or www.jeppesen.com for more information and instructions.

ChartView is an optional feature that must be activated. Instructions for activating the ChartView function are found in Section 5.5.5.1.

1.8.5 SafeTaxi Database

SafeTaxi diagrams provide detailed taxiway, runway, and ramp information at more than 700 airports in the United States. The SafeTaxi database is stored on an SD memory card that remains in the GDU 620 for normal operation.

The SafeTaxi database is updated by removing the database card from the GDU 620, updating the database on the card and reinserting the card. Each card can only be used with one system. GDU 620 users update their database card by purchasing database subscription updates from Garmin. The database card is programmed using the supplied SD card reader. Contact Garmin at 800-800-1020 or fly.garmin.com for more information and instructions.

1.8.6 Terrain and Airport Terrain Databases

The Terrain database is used to provide basic Terrain awareness functionality. The Airport Terrain database provides higher resolution terrain information near most airports. Both databases are available for updating as needed and are available from Garmin. The terrain databases are updated by removing the database card from the GDU 620, updating the databases on the card and reinserting the card in the lower card slot on the GDU 620 front panel. The Terrain databases can be downloaded via the internet and the card programmed using the supplied SD card reader. Contact Garmin at 800-800-1020 or fly.garmin.com for more information or instructions.

1.8.7 Obstacles Database

The obstacle database provides identification of known obstacles greater than 200 feet AGL. This database is also used with Terrain awareness functionality. The Obstacle database is updated by removing the database card from the GDU 620, updating the database on the card and reinserting the card. The Obstacle database can be downloaded via the internet and the card programmed using the supplied SD card reader. Contact Garmin at 800-800-1020 or fly.garmin.com for more information or instructions.

1.8.8 IGRF Model

The IGRF (International Geomagnetic Reference Field) model is contained in the GRS 77 and is only updated once every five years. The IGRF model is part of the Navigation Database. At system power-up, the IGRF models in the GRS 77 and in the Navigation Database are compared, and if the IGRF model in the GRS 77 is out of date, the user is prompted to update the IGRF model in the GRS 77. The prompt will appear after the G600 splash screen is acknowledged on the MFD.

2 INSTALLATION OVERVIEW

2.1 Introduction

The following section contains an overview of the steps required for the installation of the Garmin G600 System. This section includes requirements for selection of proper locations in the aircraft, as well as requirements for supporting structure, mechanical alignment and electrical wiring. Any restrictions on nearby equipment and requirements are also specified herein.

The post-installation calibration procedures required prior to flight are described in Section 5.

2.2 Pre-Installation Information

Always follow acceptable avionics installation practices in FAA Advisory Circulars (AC) 43.13-1B, 43.13-2A, or later FAA approved revisions of these documents.

Follow the installation procedure in this manual as it is presented for a successful installation. Read the entire manual before beginning the procedure. Prior to installation, consider the structural integrity of the G600 system installation as defined in AC 43.13-2A, Chapter 1 and Section 3.3 herein. Perform the post installation checkout before closing the work area in case problems occur.

Complete an electrical load analysis in accordance with AC 43.13-1B, Chapter 11 on the aircraft prior to starting modification to ensure aircraft has the ability to carry the additional load of the G600 equipment. Refer to Section 3.7 for the power consumption information.

2.3 Available Equipment

The G600 system is supplied as an LRU kit and a G600 installation kit. For a description of the individual units see Section 1.3.1.

Table 2-1. G600 LRU Kit K10-00004-00 Contents, Black

Model	Unit P/N	Catalog P/N	Color	Voltage (VDC)
GDU 620 [1]	011-01264-00	010-00482-00	BLK	14/28
GRS 77	011-00868-10	010-00295-10	-	14/28
GMU 44	011-00870-00	010-00296-00	-	N/A
GDC 74A	011-00882-10	010-00336-10	-	14/28
GTP 59	011-00978-00	011-00978-00	-	N/A
--	010-00769-42	010-00769-42	-	N/A

[1] A gray GDU 620 P/N 011-01264-10 (LRU Kit P/N K10-00006-00) is also available.
Contact Garmin for availability and ordering information.

Table 2-2. Options Available

Item	Part Number	Garmin Order Number
GDU 6xx ChartView Activation Card – Heavy Aircraft [1]	010-00769-50	010-00770-00
GDU 6xx ChartView Activation Card – Light Aircraft [1]	010-00769-53	010-00770-10
GDU 6xx Altitude Preselect Activation Card [1] [2]	010-00769-52	010-00770-30

[1] An SD activation card is required to enable the indicated feature. Each activation card can only be used once and, once used, the card will be only work with that particular G600 system.
[2] The Altitude Preselect option is only available for certain autopilots. Contact Garmin for availability for a specific autopilot.

2.4 Installation Materials

2.4.1 Accessories Available from Garmin

Table 2-3. G600 Installation Kit P/N K10-00005-00 Accessories

Used With	Item	Part Number
GDU 620	Connector Kit, GDU 620 [1] Mounting Screw Kit, GDU 620 [2] Trim Plate, Thin (0.032") [3] Trim Plate, Thick (0.063") [3]	011-01656-00 011-02078-00 115-01009-00 115-01009-10
GRS 77	Connector Kit, SB, GRS 77 [1] GRS 77 Universal Mount Kit Installation Rack, GRS 77	011-00869-01 011-01780-00 115-00459-00
GMU 44	Connector Kit, GMU 44 [1] GMU44 Universal Mount Kit Installation Rack, GMU 44	011-00871-00 011-01779-01 115-00481-00
GDC 74A	Connector Kit, SB, GDC 74A Mounting Rack, GDC 74A	011-01010-01 011-01011-00

[1] Connector kit includes the unit configuration module.
[2] Mounting screw kit contains screws P/N 211-64307-14 (quantity 6).
[3] Trim plate is not painted. It must be cut to size and painted to match the installation.

The following items are available from Garmin and can be used for multiple installations:

Item	Garmin P/N
GDU 620 Cutout Template [1]	115-01010-00
G600 Downloadable Software SD Card [2] [4]	010-00768-00
GDU 6xx Installer Unlock Card [3]	010-00769-60
G600 Software Loader Card [4]	010-00771-( )

[1] Cutout Template is clamped to instrument panel and used to mark the cutout required by the GDU 620. It is also used as a drill template to drill the holes for the six GDU 620 mounting screws. This template can be used to make multiple cutouts.
[2] The G600 Downloadable Software SD Card is a blank SD card that can be used to make a G600 Software Loader card when the G600 software is downloaded from the Garmin Dealer website. Refer to Section 2.4.3 for additional details.
[3] The Installer Unlock Card is required to access all pages in Configuration Mode when configuring the system for a particular installation.
[4] The G600 Software Loader Card contains software for all G600 LRUs and the GDL 69/69A (an equivalent card can be made using the G600 Downloadable Software SD Card and downloading the software from the Garmin Dealer website). Contact Garmin to obtain the latest G600 Software Loader Card.

2.4.2 Materials Required but Not Supplied

The G600 equipment is intended for use with standard aviation accessories. The following items are required for each installation:

- Wire (MIL-W-22759/16 or equivalent)
- Shielded Wire (MIL-C-27500 or equivalent)
- Aircraft Grade Category 5 Ethernet Cable (only required for installations with the GDL 69/69A or for dual GDU installations)
- Circuit Breakers
- Miscellaneous Nuts, screws, washers, rivets… (Standard installation hardware, including AN525-1032R8 screws, MS20426AD4-6 rivets, MS21059L3 rivet nut plates, MS21071-06 reduced rivet spacing nut plates)
- Pitot/Static fittings and lines (for GDC 74A installation)
- Tie wraps or lacing cord
- Ring Terminals (for grounding)
- Shield Terminators
- Silicon Fusion Tape

2.4.3 Software Loader Card

A G600 Software Loader card may be created using a G600 Downloadable Software SD Card P/N 010-00768-00 in conjunction with a G600 software application downloaded from the Dealer Resource section of www.garmin.com.

NOTE

The downloadable application to create card only runs on Windows PC's (Windows 2000, XP and Vista are supported). There is no Mac support at this time.

NOTE

An SD card reader is needed to create the G600 Loader Card using the application that is downloaded from Garmin. The approved readers are SanDisk SDDR-99 and SDDR-93, although other SD card readers will work.

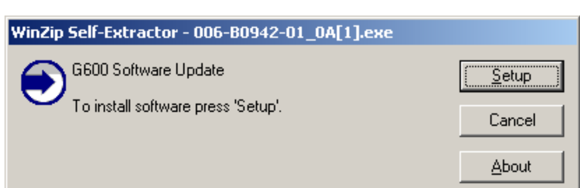
Create a G600 Software Loader Card as follows:

1. Go to the Dealer Resource section of www.garmin.com.

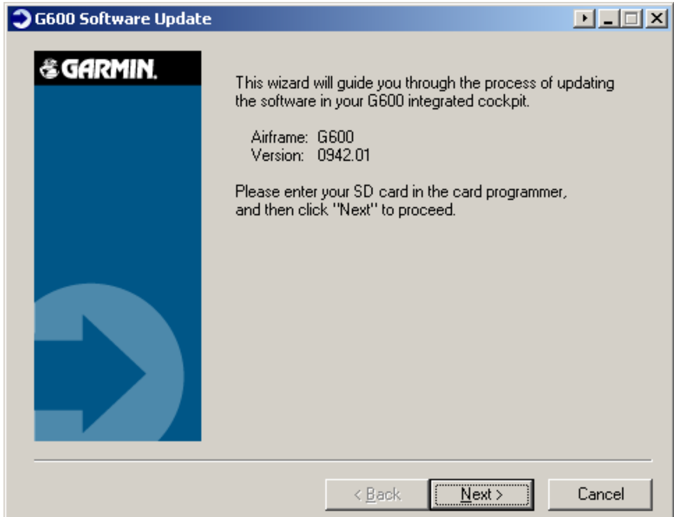
2. Download the G600 Cockpit Display System software 006-B0942-( ).

3. Ensure that you have an SD card reader connected to the PC. Insert the G600 Downloadable Software SD Card P/N 010-00768-00 into the card reader.

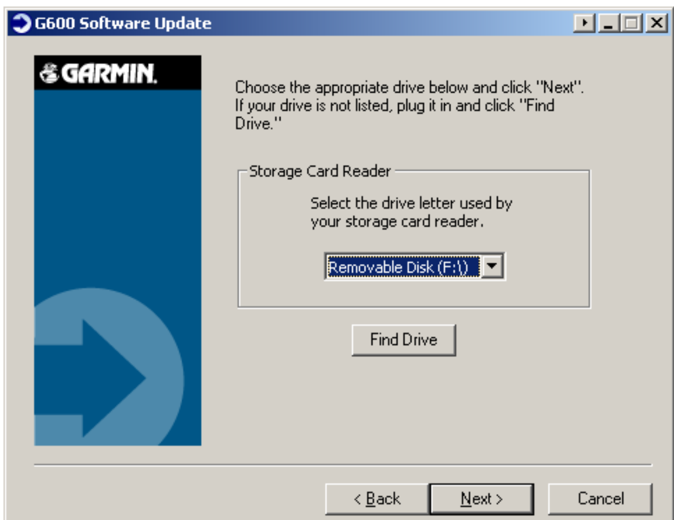
4. Run the executable file that was downloaded. The following window will appear:



5. Click on Setup and the following window will appear to guide you through the software loader card creation process:



6. Click on Next to get to the following window:

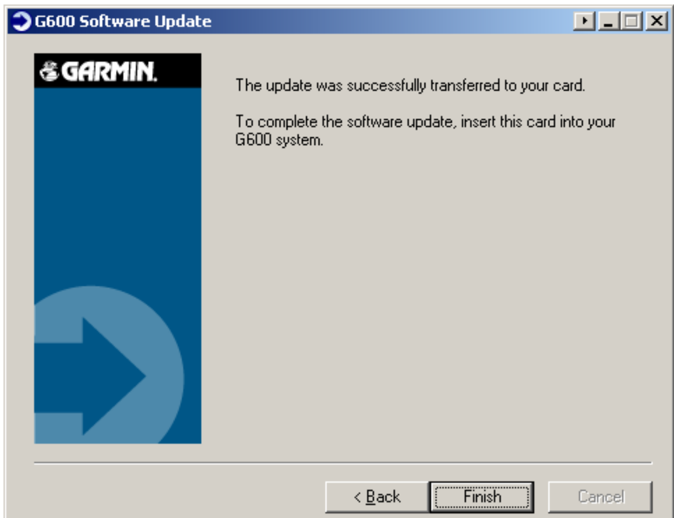


CAUTION

In order to create a loader card, the drive that you select will be completely erased.

7. Ensure that the correct drive is selected. Click Next to create the card (click Next to acknowledge any warnings that appear). The following window will appear when the card is being created:

8. After the card has been created the window below will appear. Click Finish to complete the process.



9. Eject the card from the card reader (or stop the card reader in Windows). The G600 software loader card is now ready to use.

2.5 Installation Considerations

2.5.1 Minimum System Configuration

The minimum G600 installation requires the following items:

- GDU 620 Display
- GRS 77 AHRS
- GMU 44 Magnetometer
- GDC 74A Air Data Computer
- External GPS Navigation sensor: 400W/500W Series (software version 3.10 or later), or GNS 480 (software version 2.2 or later)

In addition to the G600 equipment, standby instruments ***must*** be installed as described in Section 2.5.2.

2.5.2 Standby Instruments

When installing the GDU 620 in the instrument panel, a standby attitude indicator, airspeed indicator and altimeter must be installed. Either two-inch or three-inch standby instruments may be used, depending upon panel space constraints. The standby instruments must be located as described in Section 2.5.11.2. For aircraft covered by this STC, installations with dual GDU 620s only require standby instruments by the pilot (primary) GDU 620.

CAUTION

Only pneumatic airspeed indicators and altimeters may be used for standby instruments. The original pneumatic air-driven ADI is acceptable for the standby ADI. If it is desired to use an electric ADI, only those ADIs listed in Section E.1 can be used due to failure criticalities and stringent environmental requirements consequent from the G600 AML STC System Safety Analysis.

2.5.3 Placards and Labels

All placards and labels should be readable in all lighting conditions. Ambient flood lighting is acceptable.

2.5.3.1 New Labels

New circuit breakers and switches installed for the G600 system must be labeled as shown in the applicable interconnect drawing in Appendix F. These labels are summarized in Table 2-4.

Table 2-4. G600 Labels

LRU/Item	Label (Single GDU Installation)	Label (Dual GDU Installation)
GDU 620 Circuit Breaker	PFD	PFD 1/PFD 2
GRS 77 AHRS Circuit Breaker	AHRS	AHRS 1/AHRS 2
GDC 74A Circuit Breaker	ADC	ADC 1/ADC 2
Electric Standby ADI Circuit Breaker *(If Installed)*	STBY ADI	STBY ADI
GPSS Switch *(If Installed)*	AP HDG DATUM *pos'n 1:* HDG *pos'n 2:* GPSS	AP HDG DATUM *pos'n 1:* HDG *pos'n 2:* GPSS

2.5.3.2 Existing Placards

If an existing placard must be relocated because of the installation of the GDU 620, the new placard must meet the requirements below:

- The font size of the new placard is the same as the old placard it is replacing
- The color of the new placard is identical to the color of the placard which it is replacing
- The text on the new placard is identical to the text on the placard which it is replacing (it can be arranged differently as required by space constraints, but the wording must be the same)

2.5.4 Power Distribution

Circuit protection devices for the G600 LRUs must be push-pull manually resettable circuit breakers (e.g. Klixon 7274 or 7277 Series circuit breakers).

For a single GDU 620 installation, the G600 equipment (GDU 620 display, GRS 77 AHRS and GDC 74A air data computer) must be connected to a bus that receives power as soon as the battery master switch is turned on. All G600 equipment must be connected to the same bus. If an electric standby ADI is used it must also be connected to this bus (except in aircraft with multiple "essential" buses). If the aircraft has multiple power buses, the G600 equipment and Standby ADI should be connected to the "essential" bus. If there is more than one "essential" bus, the Standby ADI should be connected to a different "essential" bus than the G600 equipment.

CAUTION

If there is a separate avionics power bus the G600 equipment and Standby ADI must NOT be connected to this bus.

For a dual GDU 620 installation, the primary system (No. 1 GDU 620 display, No. 1 GRS 77 AHRS and No. 1 GDC 74A air data computer) and electric Standby ADI must be connected as described for a single GDU 620 installation. The secondary system (no. 2 GDU 620 display, no. 2 GRS 77 AHRS and no. 2 GDC 74A air data computer) may be connected to a "non-essential" bus or the avionics bus.

2.5.5 Pitot-Static Plumbing

For a single GDU 620 installation, the pitot-static connections that originally went to the pilot's instruments must go to the GDC 74A and standby instruments.

For a dual GDU 620 installation, the pitot-static connections that originally went to the pilot's instruments must go to the GDC 74A that is connected to the pilot's GDU (i.e. ADC 1). The pitot-static connections that originally went to the copilot's instruments must go to the GDC 74A that is connected to the copilot's GDU (i.e. ADC 2). The standby instruments are installed near the pilot's GDU, so the pitot-static connections that originally went to the pilot's instruments must also go to the standby instruments (i.e. the same pitot-static plumbing that goes to ADC 1).

2.5.6 External Annunciators

The GDU 620 provides all of the necessary external annunciations for the GNS 400W/500W Series units and the GNS 480, eliminating the need for an external annunciator panel. The GDU 620 also provides all of the required TAWS annunciations for the 500W TAWS Series units and eliminates the need for a TAWS annunciator panel.

2.5.7 External Course Deviation Indicators

The GDU 620 PFD is capable of displaying the lateral and vertical deviation from the GPS source(s) and navigation receiver(s) in the aircraft. Based on the G600 System Safety Assessment, the G600 system can be used as the sole display for all CDI information for Class I, Class II and Class III aircraft, allowing the existing CDIs to be removed.

It is not recommended to use external CDIs in conjunction with the G600 system. If it is desired to utilize one or more external CDIs, **the CDI(s) can only be used to display VOR/ILS information.** These must be installed as specified below:

- GNS 430W/530W: The VOR/ILS Indicator Output or VOR/LOC composite output (and ILS Glideslope deviations/flags) from P4006/P5006 must be used to drive an external CDI. *Both VOR and ILS information will be available (a resolver type indicator such as the Garmin GI 106A, or a composite indicator such as the Bendix/King KI 209 are supported).*
- GNS 480: The Composite output from P7 must be used to drive an external CDI. *Only VOR and Localizer information can be displayed on the CDI. No vertical deviation information can be displayed (a VOR/LOC composite indicator such as the Bendix/King KI 208 is supported).*
- SL30: The Composite output and Glideslope deviations/flags must be used to drive an external CDI. *Both VOR and ILS information will be available (a VOR/ILS composite indicator such as the Bendix/King KI 209 is supported).*

Refer to Section 7 for associated Limitations.

2.5.8 External Sensors

External serial data sources intended for use with the G600 system should be checked for compatibility before installation. The list of supported devices is located in Appendix E of this manual.

When the G600 system is installed with external sensors, these sensors must be installed in accordance with manufacturer's data. Installation of any external sensors not approved by this manual is beyond the scope of this manual and STC.

2.5.8.1 GPS Navigator

Interfacing the GDU 620 to a GPS navigator is required for proper system operation. GPS information is used by the GDU 620 for the moving map and forwarded to the GRS 77 AHRS. The GDU 620 supports interfacing to two independent GPS navigators, although only one is required.

If a 500W Series with TAWS is used, it must be connected as GPS 1 – only TAWS annunciations from GPS 1 are displayed on the PFD. If two TAWS-equipped units are installed, the TAWS-equipped unit that is connected to the audio panel must be connected as GPS 1.

2.5.8.2 Navigation Receiver

Interfacing the GDU 620 to a navigation receiver allows VOR and ILS information to be displayed on the PFD HSI. The GDU 620 supports interfacing to two independent navigation receivers.

2.5.8.3 Weather

2.5.8.3.1 Data Link Weather

Interfacing the GDU 620 to a GDL 69/69A allows XM weather data to be displayed on a dedicated weather page or overlaid on the moving map.

2.5.8.3.2 Weather Radar *(function not currently supported)*

Interfacing the GDU 620 to an external weather radar system will allow weather radar information to be displayed the GDU 620. Although the function is not currently supported, provisional wiring can be installed at the time of G600 system installation.

2.5.8.4 Traffic

Interfacing the GDU 620 to a TIS/TAS traffic system allows traffic data to be displayed on a dedicated traffic page or overlaid on the moving map. The GDU 620 can be configured to provide display of traffic data only, or display and control of the traffic system.

NOTE

If the original installation has the traffic system configured to use a heading source other than ARINC 429 (e.g. synchro), the traffic system must be rewired and reconfigured to use ARINC 429 heading from the G600 system.

NOTE

If the original installation has the traffic system configured to use an altitude source other than ARINC 429 (e.g. Gray Code), the traffic system must be rewired and reconfigured to use ARINC 429 altitude from the G600 system.

NOTE

Only one traffic sensor may be interfaced to the G600 system (GDU 620).

2.5.8.5 ADF

Interfacing the GDU 620 to an ADF receiver allows ADF bearing information to be displayed on a bearing pointer on the PFD HSI and allows the existing ADF indicator to be removed.
The GDU 620/G600 will not control the ADF receiver.

2.5.8.6 Stormscope (function not currently supported)

Interfacing the GDU 620 to a Stormscope system will allow Stormscope information to be displayed the GDU 620. The GDU 620 can be configured to provide display of Stormscope data only, or display and control of the Stormscope system. Although the function is not currently supported, provisional wiring can be installed at the time of G600 system installation.

NOTE

If the original installation has the Stormscope system configured to use a heading source other than serial, the traffic system must be rewired and reconfigured to use RS-232 heading from the G600 system.

2.5.8.7 External TAWS (function not currently supported)

Interfacing the GDU 620 to an external TAWS system will allow TAWS information to be displayed the GDU 620.

NOTE

The GDU 620 will not display terrain data from an external source; however, if a 500W Series unit with TAWS is connected, the GDU 620 will display all of the required TAWS annunciations from GPS 1 and eliminate the need for a separate TAWS annunciator panel.

2.5.9 Autopilot/Flight Director Interface

The G600 is designed to interface with a wide variety of autopilots. Autopilots intended for use with the G600 system should be checked for compatibility before installation. The list of tested and supported autopilots is located in Section E.3 of this manual.

When the G600 system is interfaced to an autopilot, the autopilot must be installed in accordance with manufacturer's data. Installation of the autopilot system is beyond the scope of this manual and STC.

The G600 (GDU 620) can provide AC or DC heading and course datum (error) outputs based on the setting of the heading bug and course pointer on the HSI. When enabled, the GDU can drive the heading datum output based upon GPS steering (GPSS) information from the selected navigator, acting like a roll-steering converter. An external HDG/GPSS switch is required to utilize the roll-steering conversion feature (refer to Section 2.5.16). The GDU 620 also provides analog deviation outputs and associated flags based upon the navigation source currently selected on the HSI and outputs ARINC 429 GPSS information from the currently selected navigator.

2.5.9.1 Autopilot ADIs and Gyros

ADIs that interface with the existing autopilot on the aircraft will have to be relocated if located in the installation location for the GDU 620. Because this instrument is supplying attitude information to the autopilot, the ADI must be retained. It can be used as a standby instrument and be relocated to an approved location for the standby instruments (refer to Section 2.5.11.2). Alternately, this ADI may be relocated to the copilot's side. If the ADI is relocated to the copilot's side and it is desired to display flight director information on it, this ADI must be installed in the approved location for the copilot ADI (refer to Section 2.5.11.8). If the ADI used by the autopilot is an electric-driven gyro, in order to meet the requirements of 2.5.11.2, the electric ADI should be relocated to the copilot's side. A vacuum-driven or suitable electric ADI (refer to Section 2.5.11.2.4.1) must then be installed as a standby instrument on the pilot's side. Any gyros that are required for proper operation of the ADI (e.g. for a KCI 310 ADI) must also be retained. Remote gyros, such as the KVG 350, must be retained in order for the autopilot to function properly.

2.5.9.2 Autopilot Turn Coordinators

Instrument panel mounted Turn Coordinators that interface with the existing autopilot on the aircraft will have to be retained and might have to be relocated. Due to space constraints it may be necessary to blind mount the turn coordinator. The installer must ensure that the relocated Turn Coordinator is installed in accordance to its installation manual for panel incline and other applicable requirements.

2.5.9.3 Altitude Pre-Selector and Remote Annunciators

The G600 may provide the altitude pre-selector function to an autopilot (For Interface requirements and approved autopilot models for this function see Section E.3). If the G600 is configured to provide the altitude pre-selector functions, the original altitude pre-selector must be removed. Autopilots that use altitude pre-selectors that also function as a remote annunciator for the autopilot are not supported in the G600 AML STC. Remote annunciators must not be removed, and if relocated must meet manufacturer requirements for installation.

2.5.9.4 ADIs with Integral Flight Director Presentation

In some cases an ADI that must be retained to provide attitude information to the autopilot has an integral flight director presentation (e.g. the KI 256 ADI). If this ADI is used as a standby instrument for the G600, the flight director presentation must be disabled. If this ADI is relocated to the copilot's side, the flight director presentation may be left enabled provided that the location requirements in Section 2.5.11.8 are met.

2.5.10 Part 121/Part 135 Considerations

For certain aircraft operated under Part 121 or Part 135, a third attitude source is required. Aircraft requiring the third attitude source are described in 14 CFR § 121.2 and 14 § CFR 135.2. This third attitude source may be a second gyroscopic attitude indicator or a second G600 system, and it must meet the requirements of 14 CFR § 121.305(k).

Single-engine aircraft operated under Part 121 or Part 135 must have two independent electrical sources or a standby battery or generator/alternator capable of supplying 150% of the electrical loads of all required instruments and equipment necessary for emergency operations of the aircraft for 60 minutes in accordance with 135.163(f). For multi-engine aircraft operated under Part 121 or Part 135 the electrical load of all required instruments and equipment necessary for emergency operations must not be greater then one-half of the total generated power in accordance with 135.163(g). The definition of the electrical loads that are "required instruments and equipment necessary for emergency operations" should be expanded to include the pilot's GDU 620, GRS 77, and GDC 74A.

2.5.11 Mounting Considerations

2.5.11.1 GDU 620 Location and Mounting

The GDU 620 is designed to mount on the aircraft instrument panel in place of the existing primary instruments. The location must be such that the GDU 620 is not blocked by the glare shield on top, or by the control yoke on the bottom.

The FAA has determined that the acceptable installation location for the GDU 620's ADI shall not dramatically differ from the location of the original type certificated (TC'd) ADI. Consequently, the GDU 620's ADI, when installed, must intersect the original TC'd ADI.

The GDU 620 ADI area is defined as the top section of the left screen (PFD), as shown in Figure 2-1.

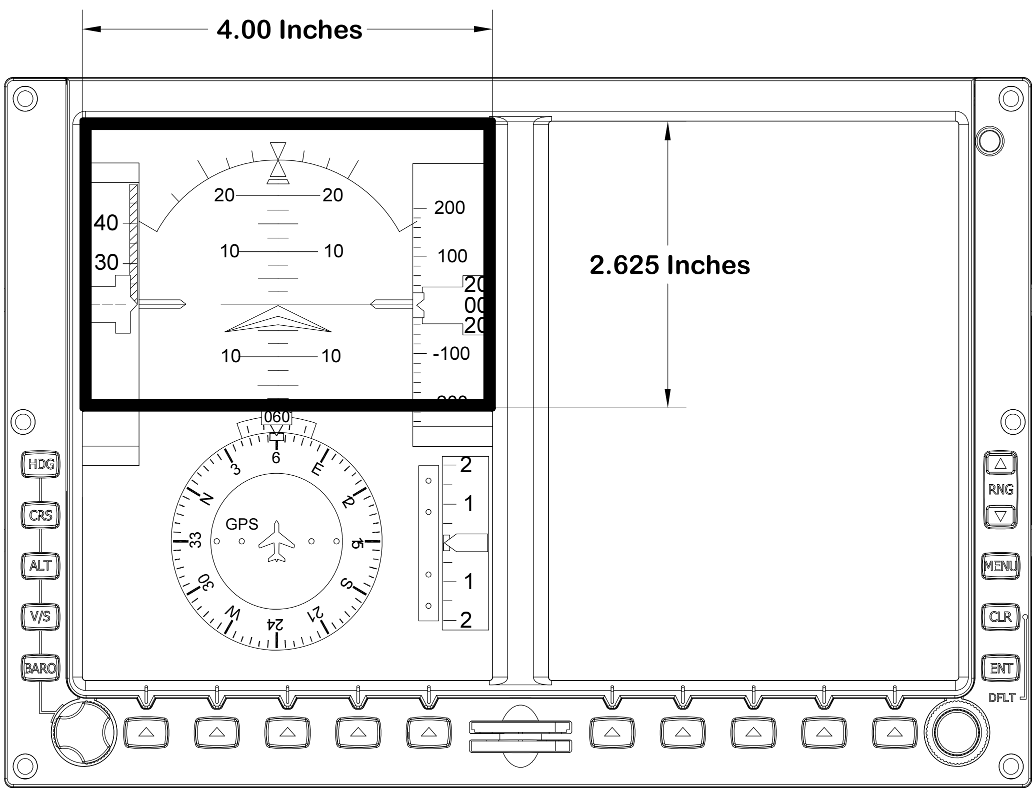


Figure 2-1. GDU 620 ADI Location

The original TC'd ADI area is defined as the area inside the **outer** perimeter of the instrument bezel, as shown in Figure 2-2.

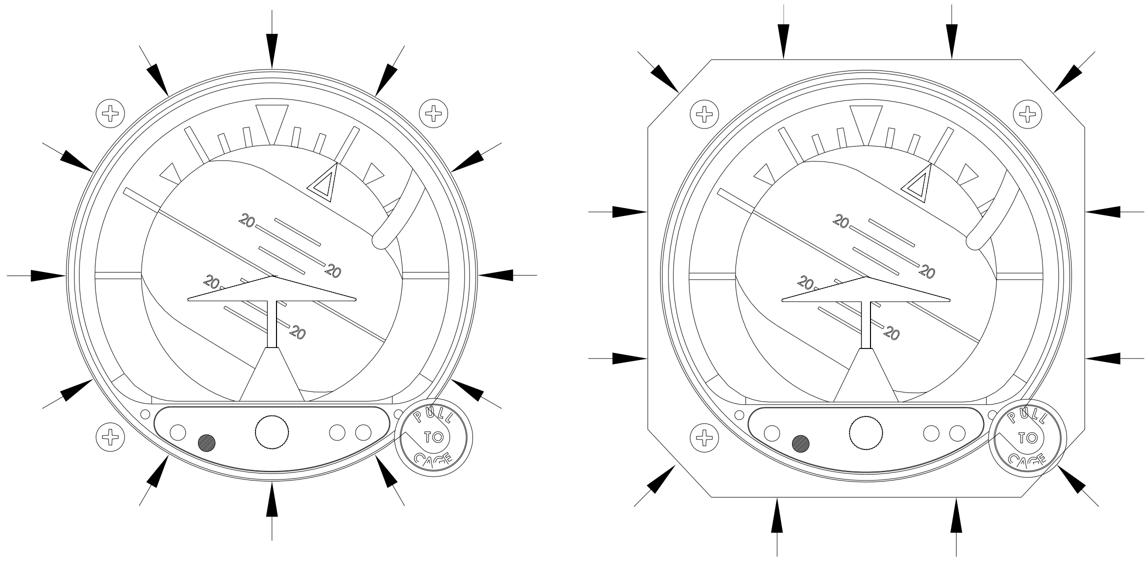


Figure 2-2. Original ADI Area

When installed, the GDU 620's ADI area must intersect the original TC'd ADI installation location, as shown in the example in Figure 2-3.

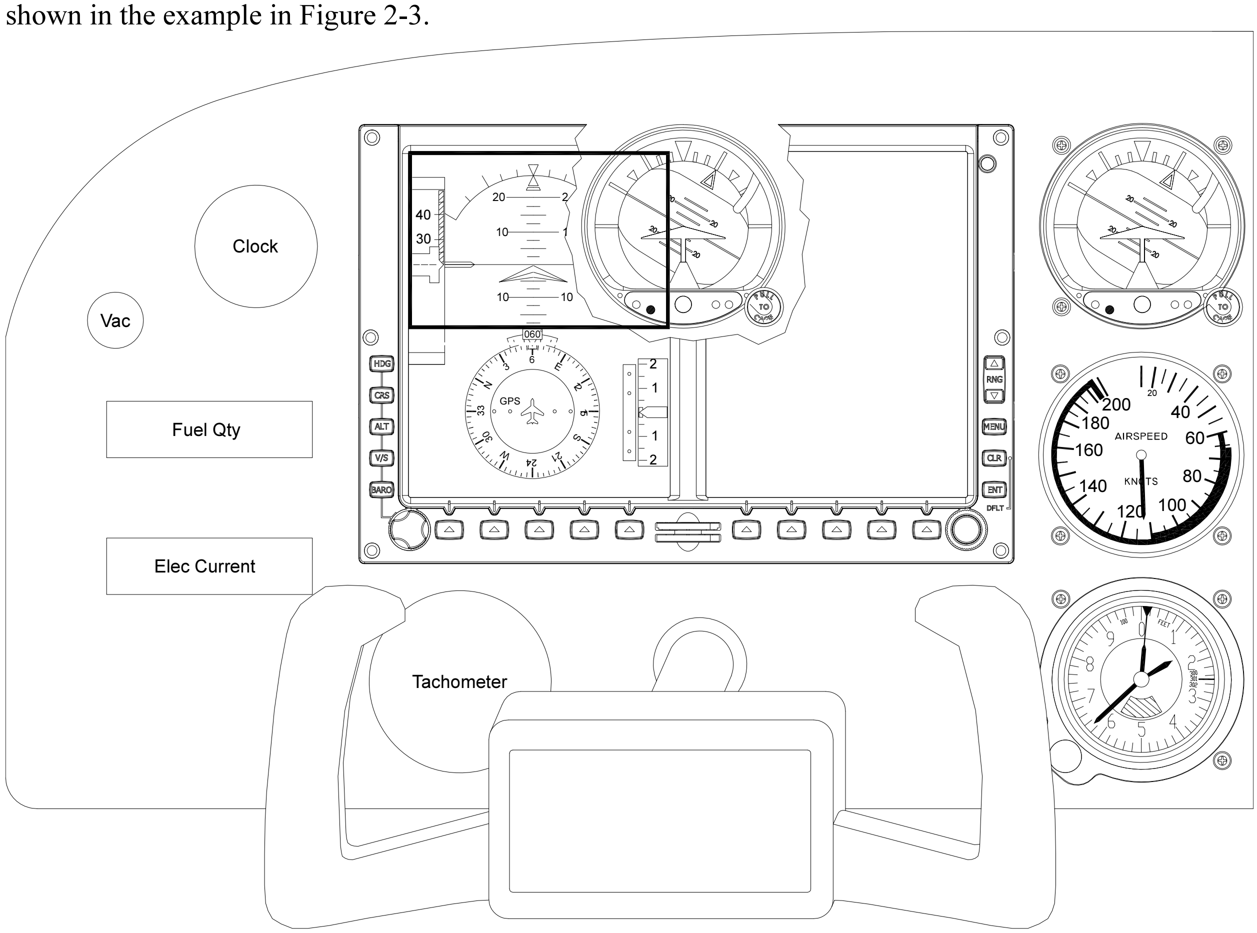


Figure 2-3. GDU 620 ADI Location Requirement

Some installations of the GDU 620 will require the use of one of the GDU 620 trim plates provided with the GDU 620 installation kit. The trim plates are manufactured plates which can be used for cosmetic appeasement or structural support. Refer to Section 3.2.1 for additional information on the use of the trim plate. Due to the extent of the modifications required for some installations, it may be easier to replace the instrument panel entirely. Refer to Section 2.5.11.3 for a list of items to consider when deciding whether or not to replace the instrument panel.

2.5.11.2 Standby Instrument Location

The FAA has determined that the acceptable location of the standby instruments is directly adjacent to the GDU 620 (to the right, to the left, below, diagonal, or above). In cases in which the instrument panel is stepped, 3 1/8 inch standby instruments may be located on the stepped part of the instrument panel as long as there are no instruments located in between the GDU 620 and the standby instrument. Standby instruments must be located entirely within the area defined in Sections 2.5.11.2.1, 2.5.11.2.2 or 2.5.11.2.3.

If the standby instruments are arranged vertically, the preferred order is:

- Attitude Indicator *(top)*
- Airspeed Indicator
- Altimeter *(bottom)*

If it is not possible to place the attitude indicator on top due to space constraints, an alternate arrangement for vertically arranged instruments is:

- Airspeed Indicator *(top)*
- Attitude Indicator
- Altimeter *(bottom)*

If the standby instruments are arranged horizontally, the preferred order is:

- Airspeed Indicator *(left),* Attitude Indicator, Altimeter *(right)*

If it is not possible to arrange the standby instruments vertically or horizontally, as described above, any order for standby instruments is acceptable, provided they are located entirely within the specified area.

In most cases the previously certified ADI, Airspeed Indicator and Altimeter can be used as standby instruments. These instruments can be installed in pre-existing mounting locations for instruments that are no longer required because their functions are replaced by the G600 system (e.g. VORs, CDIs, ADF bearing pointers, RMIs, etc.). If the previously certified ADI is electric powered, **it must be replaced** with an ADI listed in E.1. All pneumatic ADIs are acceptable for standby instruments and do not require replacement.

In some installations it may be desirable to locate one or more standby instruments in the bolster immediately below the instrument panel. Refer to Section H.2 in Appendix H for information on how to do this.

2.5.11.2.1 Acceptable Area for 3 1/8” Standby Instruments

If all three standby instruments are 3 1/8”, the instruments must be located entirely within the area outlined in Figure 2-4 and Figure 2-5.

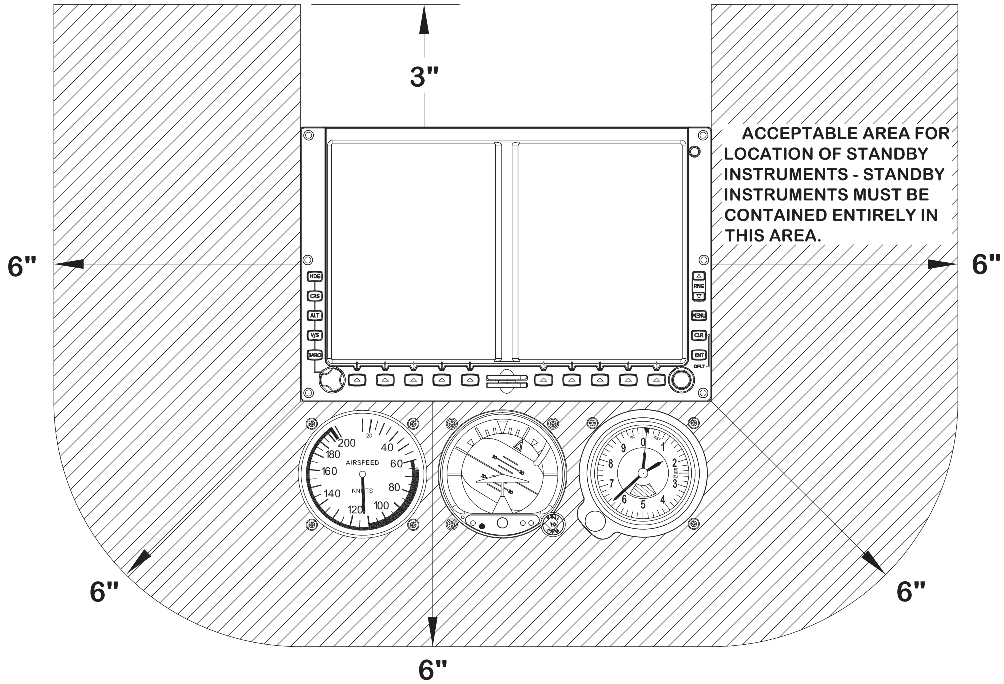


Figure 2-4. Acceptable Installation Area for 3 1/8 Inch Standby Instruments

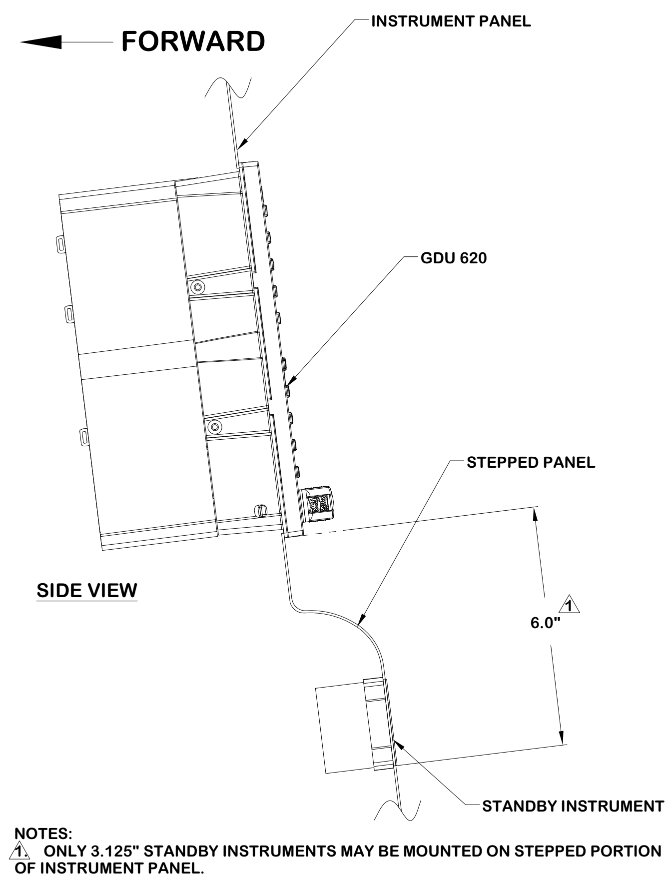


Figure 2-5. Side View Stepped Panel for 3 1/8 Inch Standby Instruments

2.5.11.2.2 Acceptable Area for 2 1/4" Standby Instruments

If all three standby instruments are 2 1/4", the instruments must be located entirely within the area outlined in Figure 2-6.

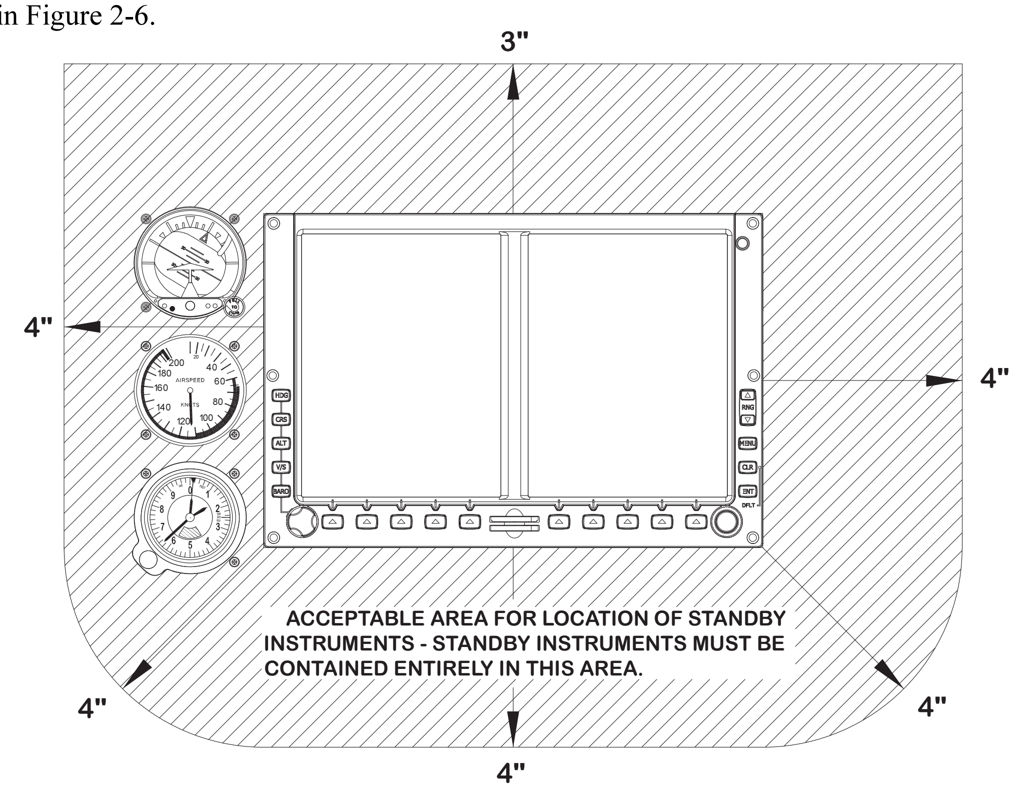


Figure 2-6. Acceptable Installation Area for 2 ¼ Inch Standby Instruments

2.5.11.2.3 Utilizing Both 2 1/4” and 3 1/8” Standby Instruments

In some installations it may be desired to use 3 1/8” standby instruments, but there is insufficient space to accommodate such an arrangement. Consequently, some 2 1/4” instruments may be used. If both 2 1/4” and 3 1/8” standby instruments are used, the instruments must be located entirely within the area outlined in Figure 2-7.

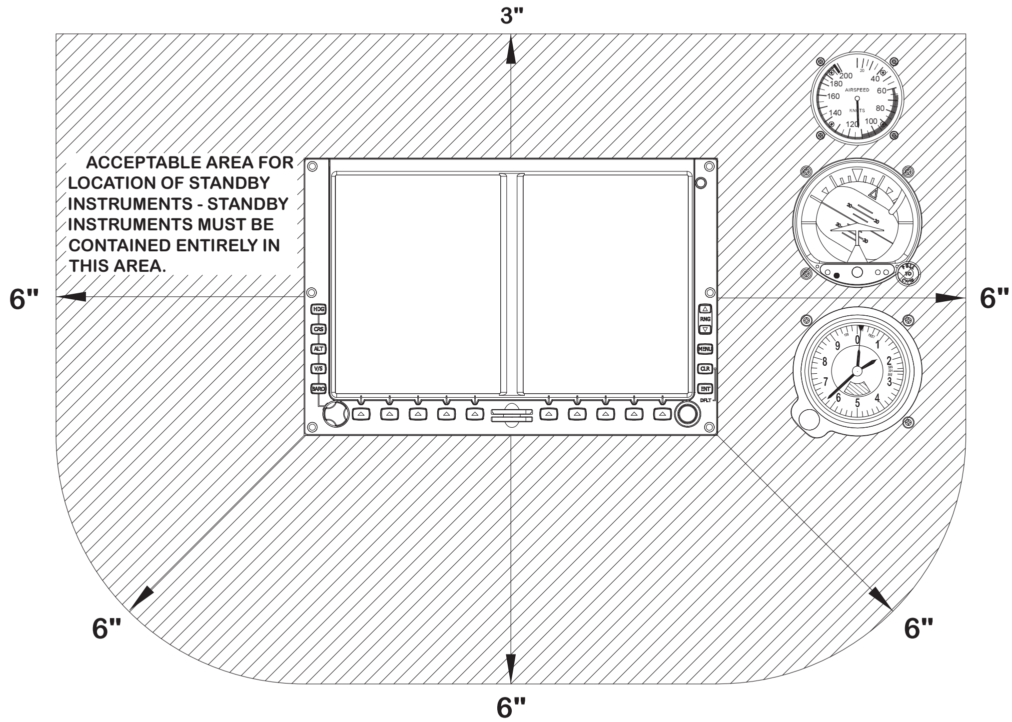


Figure 2-7. Acceptable Installation Area for Mixed Standby Instruments

2.5.11.2.4 Mid-Continent Instruments Standby Instruments

2.5.11.2.4.1 Electric ADI

The model 4300-4( ) (3 1/8 inch) and 4200-( ) (2 1/4 inch) are currently the only ***electric*** standby attitude indicators that may be installed as standby attitude instruments under the G600 AML STC; all non-electric attitude indicators are acceptable and do not need to be replaced. The 4300-4( ) with the internal backup battery and the 4200-( ) with the required remote mounted MD420-Emergency Power Supply have the ability to continue to operate in excess of 30 minutes (in accordance with FAR 23.1353(h)) in the event aircraft electrical power is lost and have been tested to meet the reliability and environmental conditions required by the G600 AML STC.

NOTE

The Mid-Continent model 4200-( ) (2 ¼ inch) ADI requires the use of the MD420 Emergency Power System, which must be mounted separately.

2.5.11.2.4.2 2 ¼ Inch Instruments

For G600 installations that require 2 1/4 inch standby instruments, an altimeter and airspeed indicator may be purchased as a package with the 4200-( ) ADI from Mid-Continent Instruments. Refer to Appendix E for acceptable model numbers. Contact Mid-Continent Instruments for ordering instructions to obtain an airspeed indicator with markings applicable to aircraft.

2.5.11.2.4.3 Mid-Continent Contact Information

For ordering information contact:

MID-CONTINENT INST. CO., INC
9400 E 34th Street N, Wichita, KS 67226 USA
Phone: 316-630-0101
Fax: 316-630-0723
www.mcico.com

This information was current at the time of publication.

2.5.11.3 New Instrument Panel Considerations

Some installations may require deviations from the original layout that will result in a substantial amount of panel modifications, e.g. moving the standby instruments by one-half inch in any direction would require modification of the original cutouts and therefore modification of the original panel may not be adequate due to cosmetic and structural issues. In such cases, a blank panel is preferred and may be manufactured.

NOTE

Blank instrument panels may be manufactured for any aircraft on the Approved Model List. These panels shall not be part of the primary structure of the aircraft.

A new panel, whether newly manufactured or purchased from the aircraft manufacturer, must comply with the following requirements:

- Material shall be the same thickness and type as the original instrument panel (with a minimum thickness of 0.063").
- Use sheet metal techniques (bend radius, fillets…) appropriate to the material thickness and hardness type – refer to AC 43.13-1B, Chapter 4, Section 4 (Metal Repair Procedures).
- Material shall have some type of corrosion protection (primer, alodine …).
- The original mounting locations, shape, form, and/or bends shall not be modified from the original design.
- Bends in the material must conform to the minimum bend specification of the material used.
- OEM processes may allow for tighter bends (e.g. a 'soft' material is formed then heat treated to increase hardness).
- Panels shall not be combined (i.e. an original two-piece panel cannot be combined to create a single-piece panel). Likewise, panels shall not be split (e.g. creating a two-piece panel from a single-piece panel).

NOTE

Instrument panels are often more than a single piece of aluminum: they are an assembly with other brackets and components permanently or semi-permanently attached to the main panel. For example, angles may have been riveted to create attach points for other pieces of equipment (such as the radio rack) or they may be used to resist bending of the panel due to weight and center of gravity of the instruments; brackets or channels may exist to create additional attach points to the aircraft. The new instrument panel must not alter the design of the instrument panel assembly features from the original design. These features must be duplicated in the new panel structure.

NOTE

The only intended differences between the new instrument panel assembly and the old are the cutout for the GDU 620 display unit and the location of the standby instruments. Every other feature of the panel, including aspects of the structure invisible to the pilot, must be duplicated. Modification of the instrument panel that will not comply with these requirements is not approved under this STC.

The GDU 620 must intersect the original certified ADI as specified in the GDU 620 location and mounting (see Section 2.5.11.1). Since there is some freedom on the position of the GDU 620 in such a case, it is preferred to have the GDU 620 PFD as close to top center as possible without compromising the area required for the standby instruments or other indicators. Also, review the requirements for the standby instruments prior to finalizing their location. Whenever manufacturing a new panel, verify that all requirements in the following sections are met to ensure proper installation:

- GDU 620 Location, Section 2.5.11.1
- Standby Instrument Location, Section 2.5.11.2

When fabricating a new instrument panel, movement or consolidation of additional instruments or engine gauges may be needed in order to achieve the desired panel layout. However, this is beyond the scope of the G600 STC and will require additional aircraft manufacturer's data or FAA approval.

When fabricating a new instrument panel, lighting for existing items that are retained must be considered. However, this is beyond the scope of the G600 STC and will require additional aircraft manufacturer's data or FAA approval.

Compound curves and tooled bends formed into the instrument panel may not be easily replicated in the field. The installer should consider contacting the aircraft manufacturer for a panel blank or modifying the existing panel with a flat plate overlay conforming to the guidelines of this installation manual. Any overlay should be secured to the original panel as if it were a structural repair in accordance with AC 43.13-1B, Chapter 4 Section 4.

2.5.11.4 GRS 77 Location and Mounting

The GRS 77 includes extremely sensitive inertial measurement sensors. It must be mounted rigidly to the aircraft primary structure. Do not use shock mounting. Shock mounts used for other types of inertial systems are not acceptable for the GRS 77 AHRS. The mounting system must have no resonance with the unit installed that would amplify the aircraft natural levels. Vibrations may result in degraded accuracy. The installation vibration levels are checked using the Engine Run-Up Vibration Test in Section 5.6.5.

Some metal structures of the GRS 77 may become magnetized if closely exposed to permanent magnets. While this will not affect the GRS 77 itself, it may slightly affect nearby magnetic instruments in the aircraft (e.g. whiskey compass). Ordinary use of magnetic screwdrivers to tighten the GRS 77 fasteners will not cause problems, but non-magnetic screwdrivers are preferred. Avoid placing the GRS 77 within one inch of magnetically mounted antennas, speaker magnets, or other strongly magnetic items. The GRS 77 must be mounted in a serviceable location in the aircraft (e.g. accessible through an access panel. Installation in an unpressurized area of a pressurized aircraft is acceptable.

Under baggage compartments or under the cockpit floor may be good mounting locations providing the floor attachments meet the strength requirements. Avoid unprotected areas on or near the main cabin, where the GRS 77 may be kicked or damaged by people or baggage placed in the aircraft. The GRS 77 must be mounted in a serviceable location in the aircraft (e.g. accessible through an access panel). Installation in an unpressurized area of a pressurized aircraft is acceptable.

The GRS 77 must be mounted within 13 feet (4.0 meters) longitudinally and 6.5 feet (2.0 meters) laterally of the aircraft center of gravity. The mounting location for the GRS 77 should be protected from rapid thermal transients, in particular, large heat loads from nearby high-power equipment.

The GRS 77 must be leveled to within 3.0° of the aircraft level reference. The aircraft leveling procedure described in Section 5.6.1 must be carried out prior to flight.

The GRS 77's forward direction must be aligned in heading to within 1.0° of the aircraft forward direction. (The arrow symbol on the rack points forward.)

2.5.11.5 GMU 44 Location and Mounting

The GMU 44 is an extremely sensitive three-axis magnetic sensor. It is more sensitive to nearby magnetic disturbances than a flux gate magnetometer. For this reason, when choosing a mounting location for the GMU 44, it is recommended that the minimum distances specified in Table 2-5 be observed. In the event that all of the minimum distances cannot be observed, Table 2-5 also specifies magnetic disturbances to avoid in order of priority. **The chosen location must be surveyed prior to installation of the GMU 44 to verify its acceptability** (refer to Section 3.2.4.3). Section 6.1 provides guidance on troubleshooting the GMU 44 magnetometer location. Acceptable locations are shown in Figure 2-8.

NOTE

If mounting the GMU 44 in the location used by an existing flux valve or flux gate, the Magnetic Interference Survey (Section 3.2.4.3) MUST STILL BE SUCCESSFULLY COMPLETED. Although the location may have been satisfactory for a flux valve or flux gate, it may not be acceptable for the GMU 44.

NOTE

If planning to reuse the existing flux valve or flux gate wiring for the GMU 44, it must be verified that the existing wiring meets the requirements specified for the GMU 44 (i.e. same number of shielded conductors, minimum wire AWG, equivalent wire type, etc.). In many cases the existing wiring will have to be replaced.

Table 2-5. Magnetic Disturbances

Disturbance Source	Priority	Recommended Min Distance
Electric motors and relays, including servo motors	1	10 feet (3.0 meters)
Ferromagnetic structure greater than 1 kg total (iron, steel, or cobalt materials, especially landing gear structure)	2	8.2 feet (2.5 meters)
Ferromagnetic materials less than 1 kg total, such as control cables	3	3 feet (1.0 meter)
Any electrical device drawing more than 100 mA current	4	3 feet (1.0 meter)
Electrical conductors passing more than 100 mA current (may require to be twisted shielded pair if within close proximity to GMU 44)	5	3 feet (1.0 meter)
Electrical devices drawing less than 100 mA current	6	2 feet (0.6 meter)
Magnetic measuring device (e.g. installed flux gates, even if not powered)	7	2 feet (0.6 meter)
Electrical conductors passing less than 100 mA current (May require to be twisted shielded pair if within close proximity to GMU 44)	8	1.3 feet (0.4 meter)

Ensure that any electrical conductor that comes within close proximity (approximately three feet) of the GMU 44 is installed as a twisted shielded pair, not a single-wire conductor (if possible, the shield should be grounded at both ends).

Use nonmagnetic materials to mount the GMU 44, and replace any magnetic fasteners within 20 inches with nonmagnetic equivalents (e.g. replace zinc-plated steel screws used to mount wing covers or wingtips with nonmagnetic stainless steel screws.)

In general, wing mounting of the GMU 44 magnetometer is strongly preferred. If wing mounting is not possible, it may be necessary to install the GMU 44 in the tail section of the aircraft. Fuselage mounting is permitted, but NOT within two feet of the cabin area because of numerous potential disturbances that can interfere with accurate operation. Refer to Figure 2-7. If the GMU 44 is mounted within the fuselage, a structural validation of the GMU 44 mount is required, as described in Section 3.3.

The GMU 44 must be mounted in a serviceable location in the aircraft (e.g. accessible through an access panel). Installation in an unpressurized area of a pressurized aircraft is acceptable.

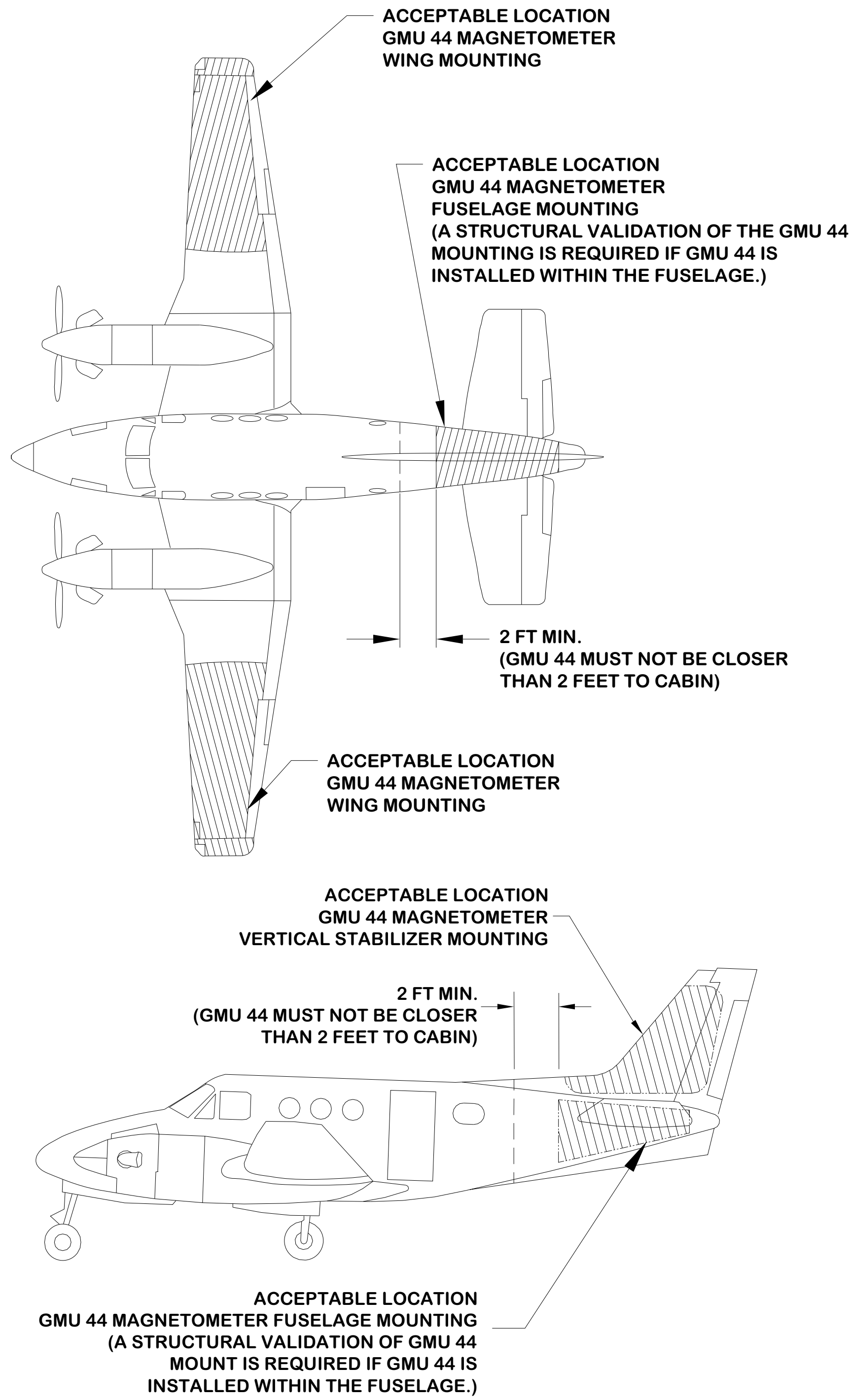


Figure 2-8. Acceptable Locations for GMU 44 Magnetometer

The GMU 44 must be leveled to within 3.0° of the aircraft level reference in pitch and roll, as shown in Figure 2-9.

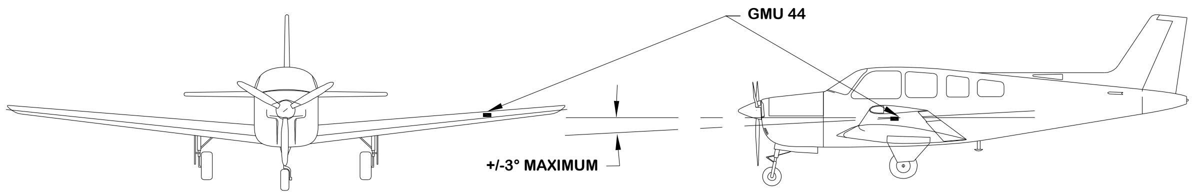


Figure 2-9. Level Mounting of GMU 44 Magnetometer

The GMU 44's forward direction should be within 0.5° in heading of the aircraft forward direction (longitudinal axis). If it is not possible to guarantee this accuracy, installation alignment to within 2.5° is acceptable in combination with the Post Installation Heading Compensation procedure described in Section 5.6.4. It is strongly preferred that the GMU 44 alignment is as aligned as close as possible to the aircraft longitudinal axis. Refer to Figure 2-10.

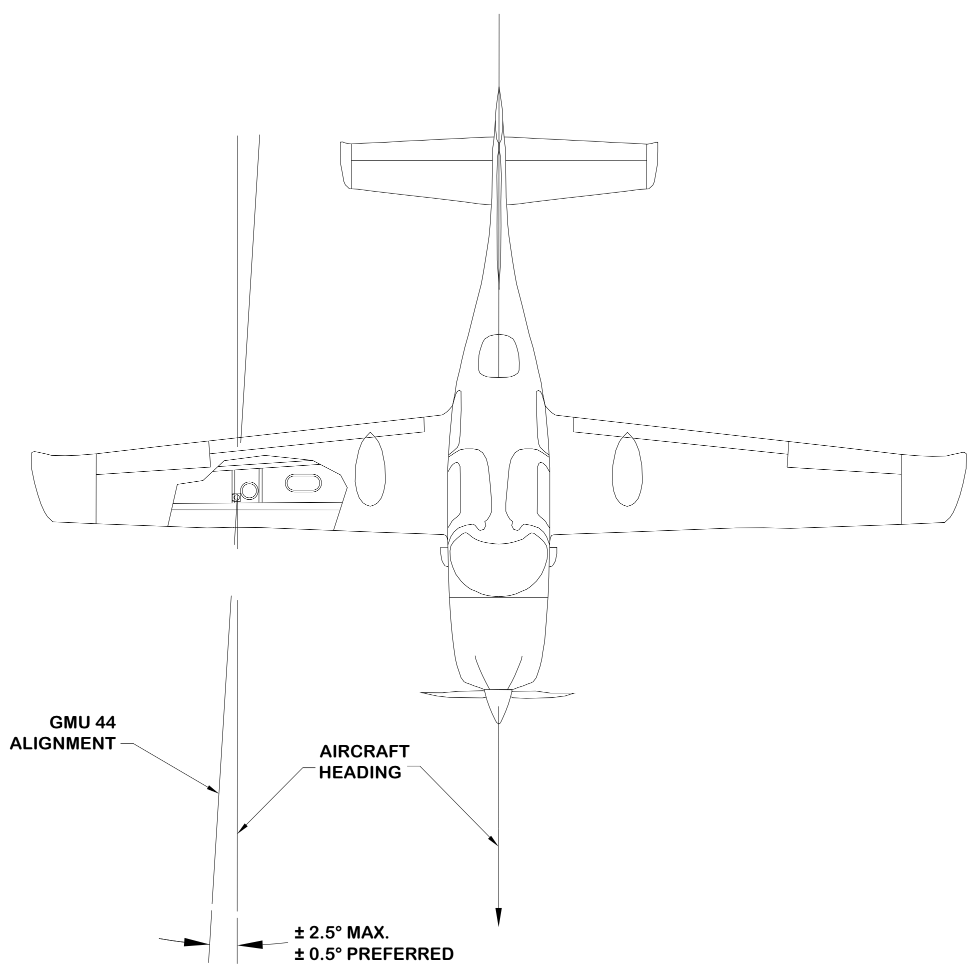


Figure 2-10. Heading Offset Limit GMU 44 Magnetometer

2.5.11.5.1 Considerations for Wing Grounded Light Fixtures

The following installation practices are recommended when installing the GMU 44 in the wing.

1. The wing tip lights should not have a power ground referenced to the chassis of the light assembly that would then be referenced back to the airframe ground via the light assembly mounting.
2. A dedicated power ground should be used and returned as a twisted pair with the power source back into the fuselage for a wing mounted GMU 44.

These installation practices will prevent magnetically interfering currents from flowing in the wing skin that encloses the GMU 44. Electrically isolating the light assembly should not be used as an alternative to item 1 above, unless the isolated light assembly has been analyzed for adequate protection against direct effects of lightning.

2.5.11.6 GDC 74A Location and Mounting

The GDC 74A can be installed in any section of the aircraft's fuselage or the forward equipment bay for multi-engine aircraft. The GDC 74A must be mounted in a serviceable location in the aircraft (e.g. accessible through an access panel). Installation in an unpressurized area of a pressurized aircraft is acceptable. It is recommended to install the GDC 74A as close to the pitot static lines as possible to avoid running long pitot static lines throughout the aircraft fuselage.

The GDC 74A can be oriented in any position from horizontal to 45° past vertical. Figure C-7 and Figure C-8 show the acceptable range of GDC 74A mounting orientation.

The GDC 74A has two ports that are connected to the aircraft's pitot pressure source and static pressure source. The two ports are labeled on the unit (refer to Figure 2-11). The pressure ports have 1/8-27 ANPT female threads. The mating fitting must have 1/8-27 ANPT male threads.

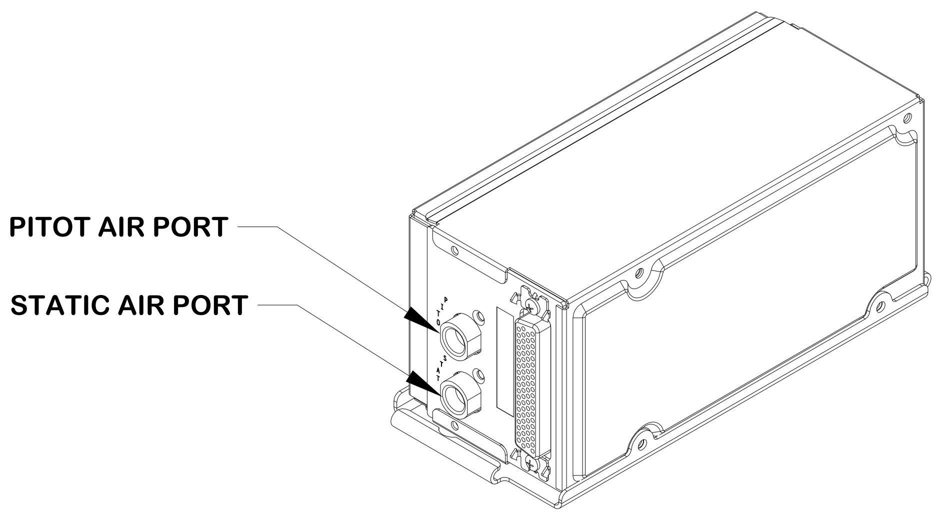


Figure 2-11. GDC 74A Air Hose Fitting Locations

Use appropriate air hoses and fittings to connect the pitot and static lines to the unit. Avoid sharp bends and routing near aircraft control cables. The GDC 74A should not be at the low point of the pitot or static plumbing lines, to avoid moisture or debris collecting at or near the unit. Ensure that no deformations of the airframe surface have been made that would affect the relationship between static air pressure and true ambient static air pressure for any flight condition. Refer to Part 43, Appendix E for approved practices while installing hoses and connections.

2.5.11.7 GTP 59 Location and Mounting

In general, the GTP 59 may be mounted on any location on the aircraft skin as long as it is kept away from heat sources, e.g. exhaust, engine cowlings, etc. The GTP 59 is designed to protrude through the aircraft skin. Refer to Figure 2-12 and Figure 2-13 for acceptable locations for the GTP 59 temperature probe.

The GTP 59 OAT probe has no icing protection. If ice accumulates on the GTP 59 OAT probe, its accuracy is unknown. Consequently, air temperature measurements may be incorrect if ice accumulates on the probe. Furthermore, computations dependent upon air temperature measurements may be affected (e.g. true airspeed and delta-ISA)

It is recommended that the GTP 59 be mounted on the bottom of the wing near an access panel.

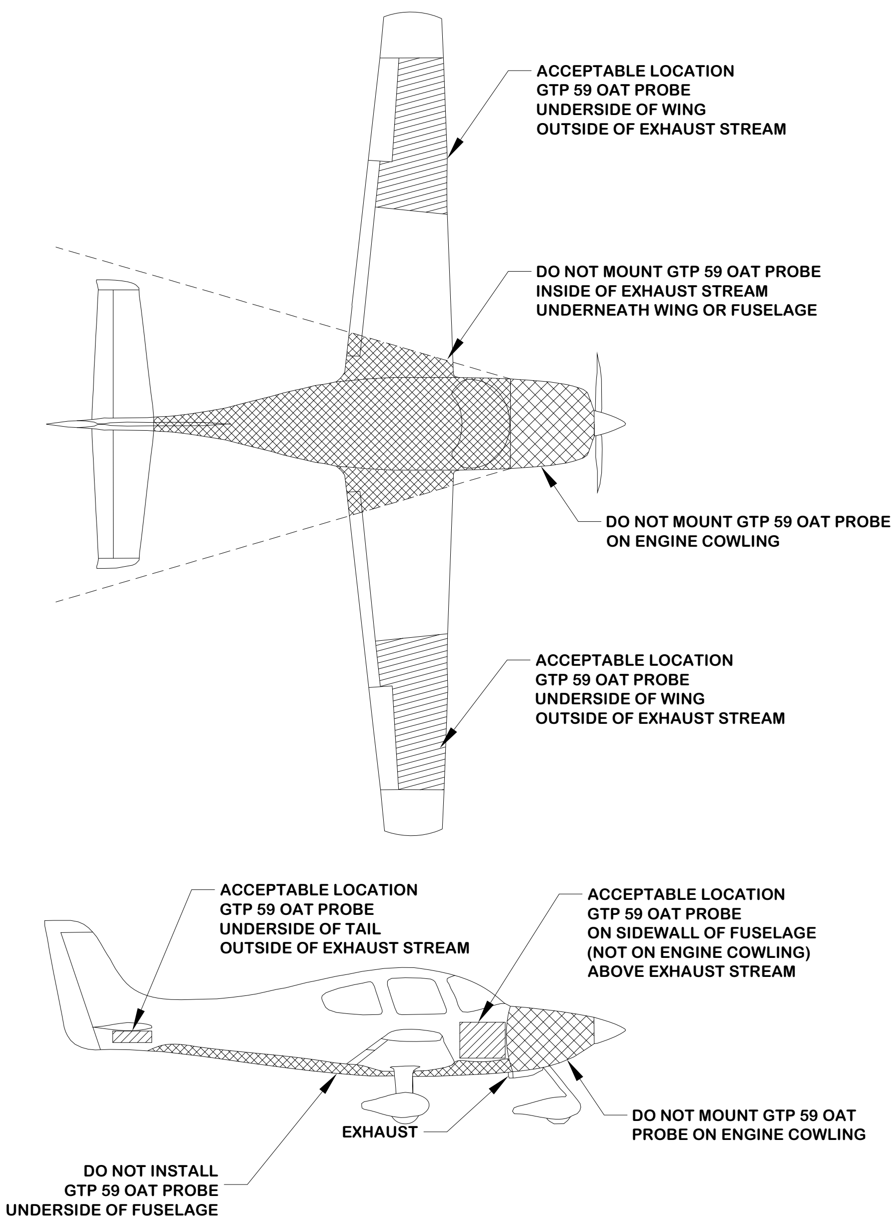


Figure 2-12. Acceptable Locations for GTP 59 Temperature Probe – Single Engine Aircraft

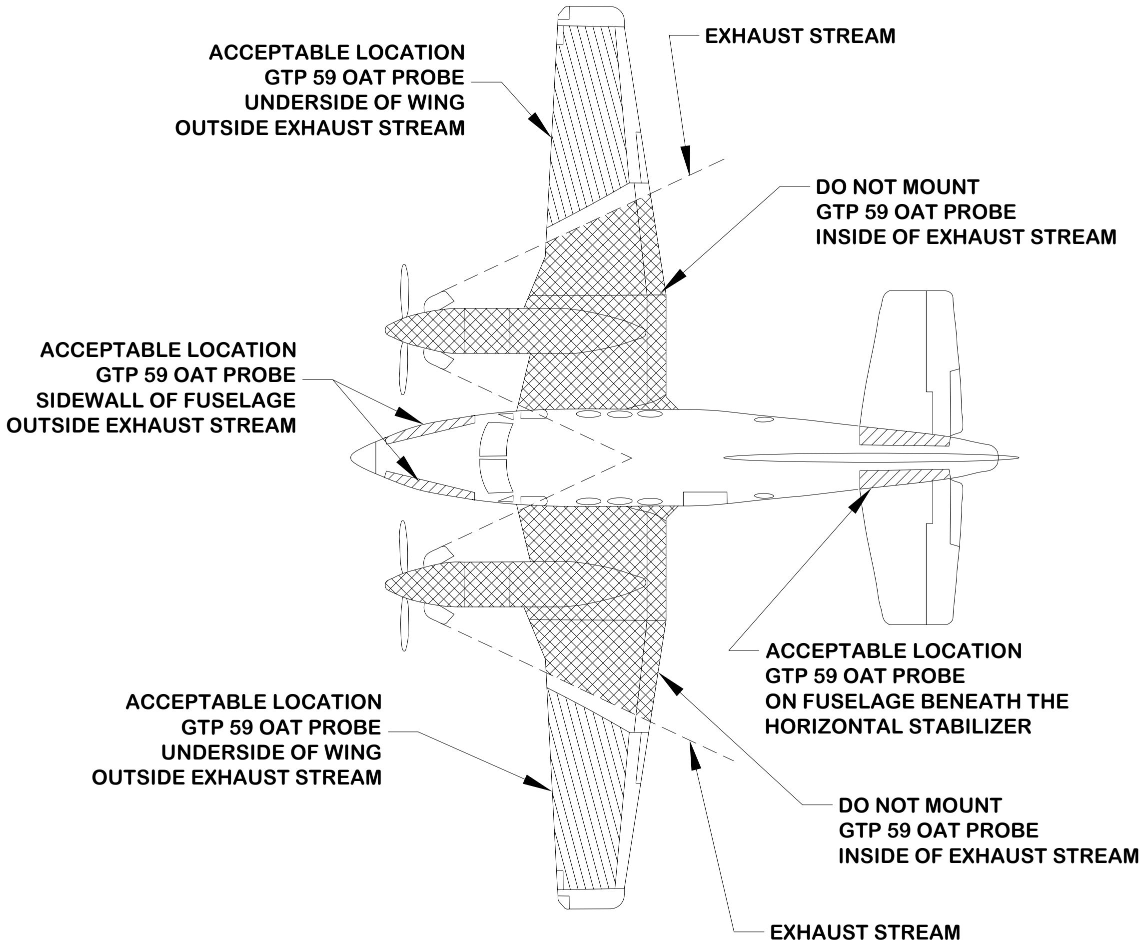
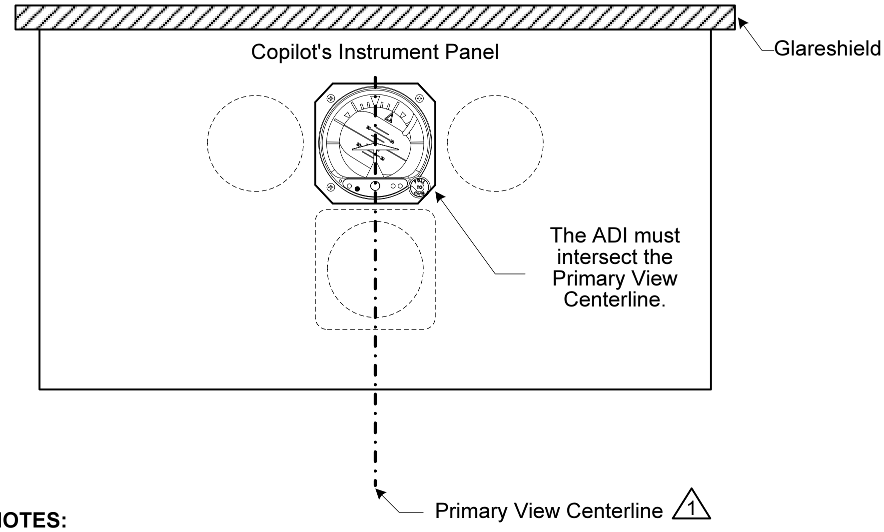


Figure 2-13. Acceptable Locations for GTP 59 Temperature Probe – Twin Engine Aircraft

2.5.11.8 Copilot ADI with Flight Director – Location

In some installations it may be desired to install an ADI with a flight director on the copilot's side (e.g. an ADI with a flight director that must be retained to for proper autopilot operation, such as the KI 256, is being relocated to the copilot's side). If it is desired to relocate this ADI to the copilot's side and retain the flight director presentation, this ADI must intersect the copilot's primary view centerline as shown in Figure 2-13A.



NOTES:

1 DETERMINE THE COPILOT'S PRIMARY VIEW CENTERLINE AS FOLLOWS:

- AN IMAGINARY LINE EXTENDED THROUGH THE CENTER OF THE COPILOT'S SEAT AND PROJECTED ONTO THE INSTRUMENT PANEL SHOULD BE USED AS THE PRIMARY VIEW CENTERLINE
- IF THE CONTROL YOKE OR STICK IS OFFSET FROM THE CENTER OF THE COPILOT'S SEAT, THE CENTER OF THE CONTROL YOKE OR STICK IN THE NEUTRAL POSITION MAY BE USED AS THE PRIMARY VIEW CENTERLINE.

Figure 2-13A. Location of Copilot ADI with Flight Director Presentation

2.5.12 Cable and Wiring Considerations

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

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

2.5.12.1 HIRF Considerations

In order to meet the HIRF requirements the wiring must comply with the following:

- The length of wires between the G600 LRUs must not exceed 10.8 ft (3.3 m) unless otherwise specified in Table 2-6.
- The length of shield drain connections at the G600 LRU connectors must not exceed 3.0”.

Table 2-6. Maximum Wire Lengths

From LRU	To LRU	Maximum Length
GDU 620 PFD/MFD	GRS 77 AHRS	21.6 ft (6.6 m)
GDC 74A ADC	GTP 59 Temperature Probe	32.5 ft (9.9 m)
GRS 77 AHRS	GMU 44 Magnetometer	43.3 ft (13.2 m).
GRS 77 AHRS	GDC 74A ADC	21.6 ft (6.6 m)

2.5.12.2 Pressurized Aircraft Considerations

In Pressurized Aircraft, wiring that penetrates the pressure vessel must be installed in accordance with the Type Design of the aircraft. Any wires that penetrate the pressure bulkhead must use existing provisions such as spare pins in the existing bulkhead connectors, or existing sealed wire thoroughfares in accordance with the aircraft maintenance manual.

Substantiation for additional holes in the pressure vessel is beyond the scope of this manual and would require additional data from the aircraft manufacturer or other FAA approved data.

2.5.13 Cooling Requirements

The GDU 620 has two cooling fans integrated into the bottom of the chassis to supply forced-air cooling to the unit. The mounting configuration should not restrict intake airflow into the fans at the bottom of the display, or exhaust airflow from the ducts at the top of the display.

2.5.14 Magnetic Compass Recalibration

After reconfiguring the avionics in the cockpit panel recalibrate the compass and make the necessary changes for noting correction data.

2.5.15 RVSM Considerations

Aircraft operating at or above RVSM published altitudes will not meet the RVSM requirements with the G600 installation as outlined in this manual. RVSM compliance may be a future enhancement of the G600 system.

2.5.16 GPSS (Roll Steering) Considerations

The G600 system can support autopilots using ARINC 429 GPSS, or act as a roll-steering converter by providing analog GPSS information via its heading datum/error output.

2.5.16.1 ARINC 429 GPSS

The G600 (GDU 620) has an ARINC 429 output that can be connected to autopilots that are capable of utilizing ARINC 429 GPSS information. On the AUTOPILOT ARINC 429 output, the GDU 620 forwards GPSS information from the navigator (1 or 2) that is currently selected on the GDU 620 CDI – there is no need to provide external switching. For installations with autopilots that accept 429 GPSS (e.g. S-TEC 55X and Honeywell (Bendix-King) KFC 225) an external GPSS switch is NOT required.

2.5.16.2 G600 Roll Steering Converter Function

The GDU 620 can act as a roll-steering converter. It will receive the ARINC 429 GPSS information from the selected navigator (1 or 2) and translate it to a heading error. The GPSS Enable In* discrete input (P6201-8) may be used to control the GPS Steering (roll steering) function of the GDU 620. If GPSS

Enable In* (P6201-8) is grounded, the GDU 620 heading datum (error) output will be driven based upon ARINC 429 GPSS information. If this input is open, the GPSS function will be disabled and the heading datum output will be based upon the setting of the heading bug.

For installations that utilize the GDU 620 as a roll-steering converter, an external GPSS switch is required (refer to Figure F-19 in Appendix F). The autopilot must be in HDG mode to use the GDU 620 for GPSS.

3 Installation Procedure

3.1 Special Tools Required

Laser Square

A laser square with a line accuracy of ± 3/32 inches end-to-end at 15 feet perpendicular distance (or better) is optional, but recommended, for GMU 44 magnetometer installation. Stanley Laser Level Square 77-188 S2 meets the line accuracy requirement.

Digital Level

A digital level is recommended for use when installing the GRS 77 AHRS and GMU 44 magnetometer.

Protractor Tool

A protractor tool is required to measure the angle offset during the magnetometer installation.

Plumb-bob

A plumb-bob is required for leveling and installing the magnetometer unit.

Aircraft Jack Set

A set of aircraft jacks is recommended for stabilizing the aircraft after it is leveled.

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. Refer to Table 3-5 for a list of recommended crimp tools.

Sight Compass

Although the use of compass rose is highly recommended, a sight compass may be used for the GMU 44 magnetometer calibration procedures in Section 5.6 if a compass rose is not readily available. Barfield Sight Compass SC063 (or equivalent) may be used for this purpose.

Tools Needed for Magnetic Interference Survey

Laptop or PC

A laptop or PC is required to run the magnetic interference survey software (refer to Appendix G). This laptop or PC must meet the following minimum requirements:

Operating System	Windows 2000 SP4, XP
Processor Speed	850 MHz
Hard Drive Free Memory	500 MB
RAM Memory	256 MB
Screen Resolution	1024 x 768
CD-ROM Drive	
USB to RS-232 Converter	*Required only if the laptop or PC does not have a serial port.*

DC Power Supply

A DC power supply capable of supplying 12VDC / 200 mA is required to perform the magnetic interference survey (refer to Appendix G) prior to installing the GMU 44 Magnetometer.

RS-485 to RS-232 Converter *(not required in most cases)*

A RS-485 to RS-232 converter may be required to perform the magnetic interference survey (refer to Appendix G) prior to installing the GMU 44 Magnetometer. A suitable converter is B&B Electronics Model 422LP9R (or equivalent).

GMU 44 Location Survey Software P/N 006-A0240-00

GMU 44 Location Survey Software P/N 006-A0240-00 is required to perform the magnetic interference survey (refer to Appendix G). This software can be downloaded under part number 006-A0241-00 from the Dealers Only page on the Garmin website at www.garmin.com.

Magnetic Interference Survey Test Cable

A test cable fabricated by the installer is required to perform the magnetic interference survey (refer to Section G.2 in Appendix G for details on manufacturing this cable).

Stopwatch or Watch with a Second Hand

A stopwatch or watch with a second hand is required to measure the time for turning equipment on and off during the survey test sequence.

3.2 Equipment Installation

Equipment dimensions and other physical characteristics can be found in Table 1-2 and Appendix C.

3.2.1 GDU 620 Display Location and Mounting

When installing the GDU 620 display the following steps must be performed:

- Select a general location for the GDU 620 cutout as specified in Section 3.2.1.1.
- Address any considerations specific to the installation as specified in Section 3.2.1.2.
- Remove instruments necessary to facilitate installation and temporarily install the GDU 620 cutout template. Refer to Section 3.2.1.3.
- Determine if the use of a trim plate is necessary for the installation. If necessary, determine which type of trim plate is required. Refer to Section 3.2.1.4.
- Install the trim plate (if necessary). Refer to Section 3.2.1.5.
- Install the GDU 620. Refer to Section 3.2.1.6.

3.2.1.1 GDU 620 Display Location

Determine a suitable location for the GDU 620 (refer to Section 2.5.11.1 for placement information). Example instrument panel layouts can be found in Section D.1.

In general, most six-pack instrument configurations usually consist of, but are not limited to, the primary instruments - airspeed indicator, attitude indicator, altimeter, horizontal situation indicator (HSI)/directional gyro (DG), vertical speed indicator, and turn coordinator. An ideal six-pack would have the instruments configured so that they are aligned both vertically and horizontally with each other, evenly spaced and adjacent to one another (Figure 3-1). Other six-pack instrument configurations consist of the same primary instruments but with the instruments scattered and/or not aligned on the instrument panel (Figure 3-2).

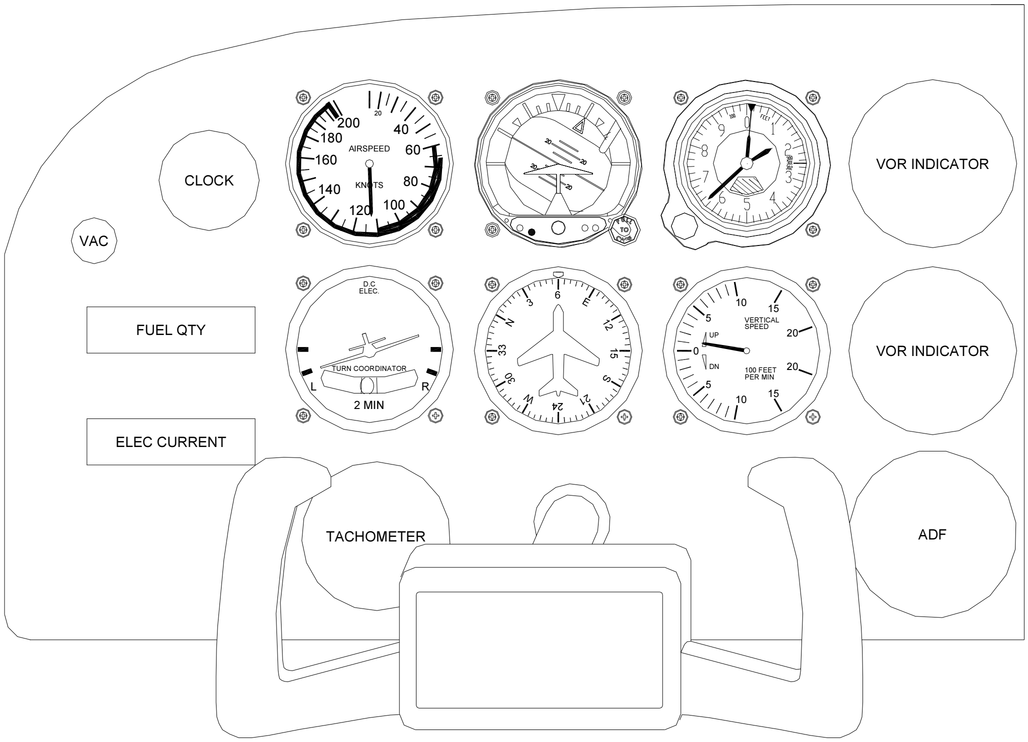


Figure 3-1. Example of an Ideal Six-Pack Instrument Configuration

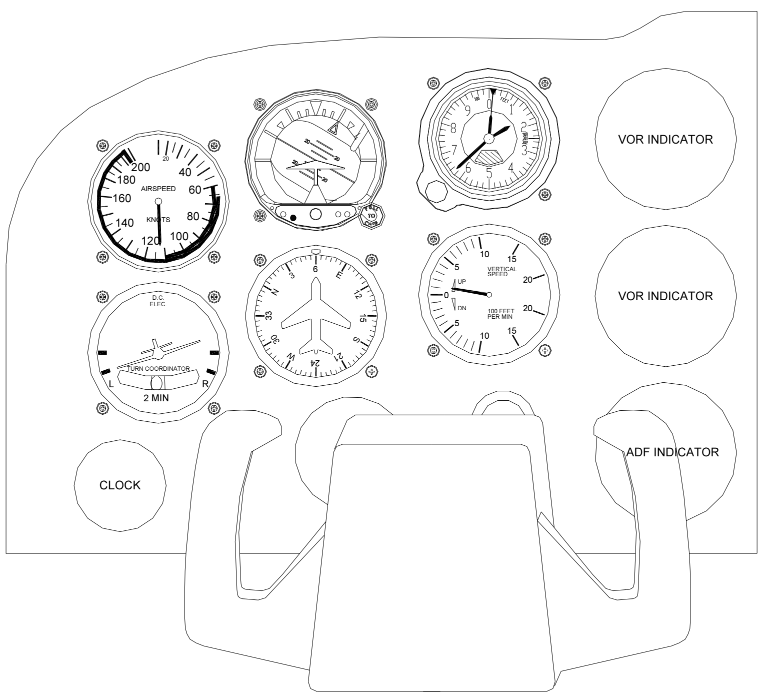


Figure 3-2. Example of a Non-Ideal Six-Pack Instrument Configuration

For any instrument panel, installation of the GDU 620 is not limited to the use of cutouts for the primary instruments. Any combination of the original cutouts for any instrument may be used as long as the GDU 620 location satisfies the ADI intersect criteria (see Section 2.5.11.1). For example, in Figure 3-2 and Figure 3-3 , the VOR indicator cutouts are used in conjunction with the adjacent primary instruments cut outs for the GDU 620 installation.

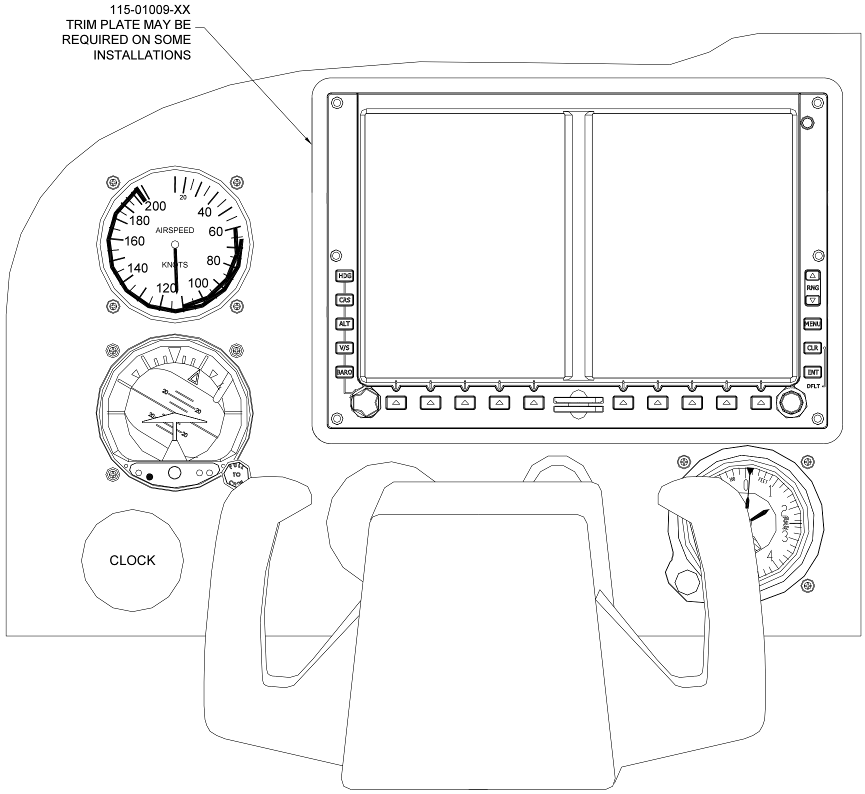


Figure 3-3. GDU 620 Installed, Non-Ideal Six-Pack Instrument Configuration

Using the airspeed and turn coordinator cutouts for the GDU 620 installation in this example would have caused a challenging installation, both structurally and cosmetically.

3.2.1.2 Installation Considerations

Prior to any alteration, consideration should be given to the placement of the standby instruments (see Section 2.5.11.2 for information regarding the location of standby instruments).

Installation of the GDU 620 requires an instrument panel with a minimum thickness of 0.063” to satisfy structural requirements. Ensure that there is sufficient clearance for connectors and wire harness on the GDU 620, as shown in Figure 3-4.

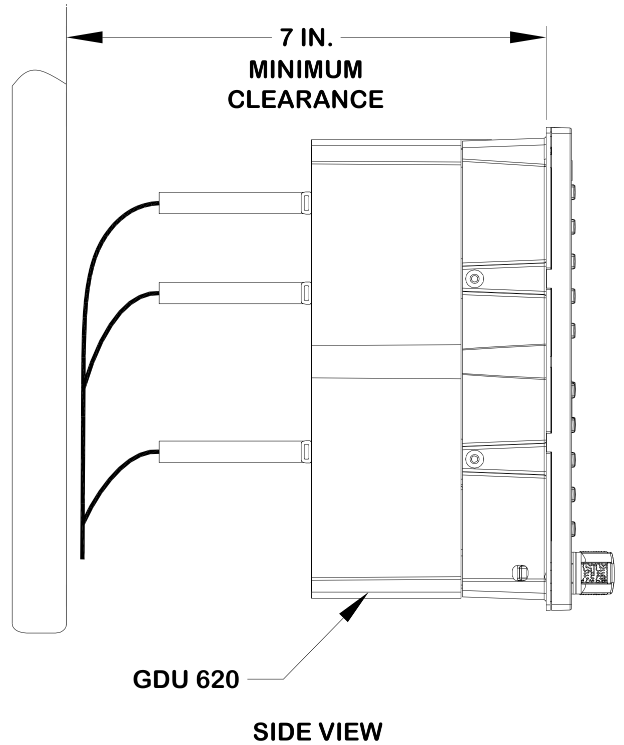


Figure 3-4. GDU 620 Recommended Connector Clearance

3.2.1.3 Temporary Installation of Cutout Template

Remove all instruments required to facilitate the installation of the GDU 620. Temporarily fasten the GDU 620 Cutout Template P/N 115-01010-00 on the instrument panel and transfer the GDU 620 LRU outline **using the outside edges of the cutout pattern**. Also mark the location of the six GDU 620 mounting holes. Remove the template. See Appendix C for cutout template dimensions and reference features.

3.2.1.4 Trim Plate Considerations

A combination of nut plates and screws are used to secure the GDU 620 to the instrument panel. On most aircraft installations with an ideal six-pack configuration, all six nut plates can be riveted to the instrument panel itself. On other aircraft, due to pre-existing cut outs for the original instruments, lack of material on the instrument panel may inhibit installation of nut plates to the instrument panel. Each installation must be evaluated as follows:

1. If all nut plates can be installed to the instrument panel, use the thin trim plate P/N 115-01009-00.
2. If one or two nut plates cannot be installed on the instrument panel due to insufficient material:
   a) It may be possible to install "patches" to the instrument panel. Refer to Appendix H for information on determining whether or not it would be acceptable to use patches. If all six nut plate locations can be accommodated with nut plates on the instrument panel or patches (2 maximum), the thin trim plate P/N 115-01009-00 may be used. It is also acceptable to use the thick trim plate P/N 115-01009-10 if it is not desired to use patches.
   b) If (a) above cannot be met, the thick trim plate P/N 115-01009-10 must be used.
3. If three or more nut plates cannot be installed on the instrument panel due to insufficient material, the thick trim plate P/N 115-01009-10 must be used.

NOTE

If all of the nut plates can be installed onto the instrument panel and no existing cutouts are visible when the GDU 620 is installed, it is not necessary to install any trim plate.

3.2.1.5 Trim Plate Installation (if required)

NOTE

If installing nut plates onto the trim plate it may be necessary to cut out additional material from the instrument panel in order to provide clearance for the attachment of the nut plate to the trim plate.

After it is decided which trim plate is to be used (thin or thick), determine the size of the trim plate and cut it to the required size and pattern. Refer to Appendix C for the dimensions of the trim plates that are furnished with the G600 installation kit.

NOTE

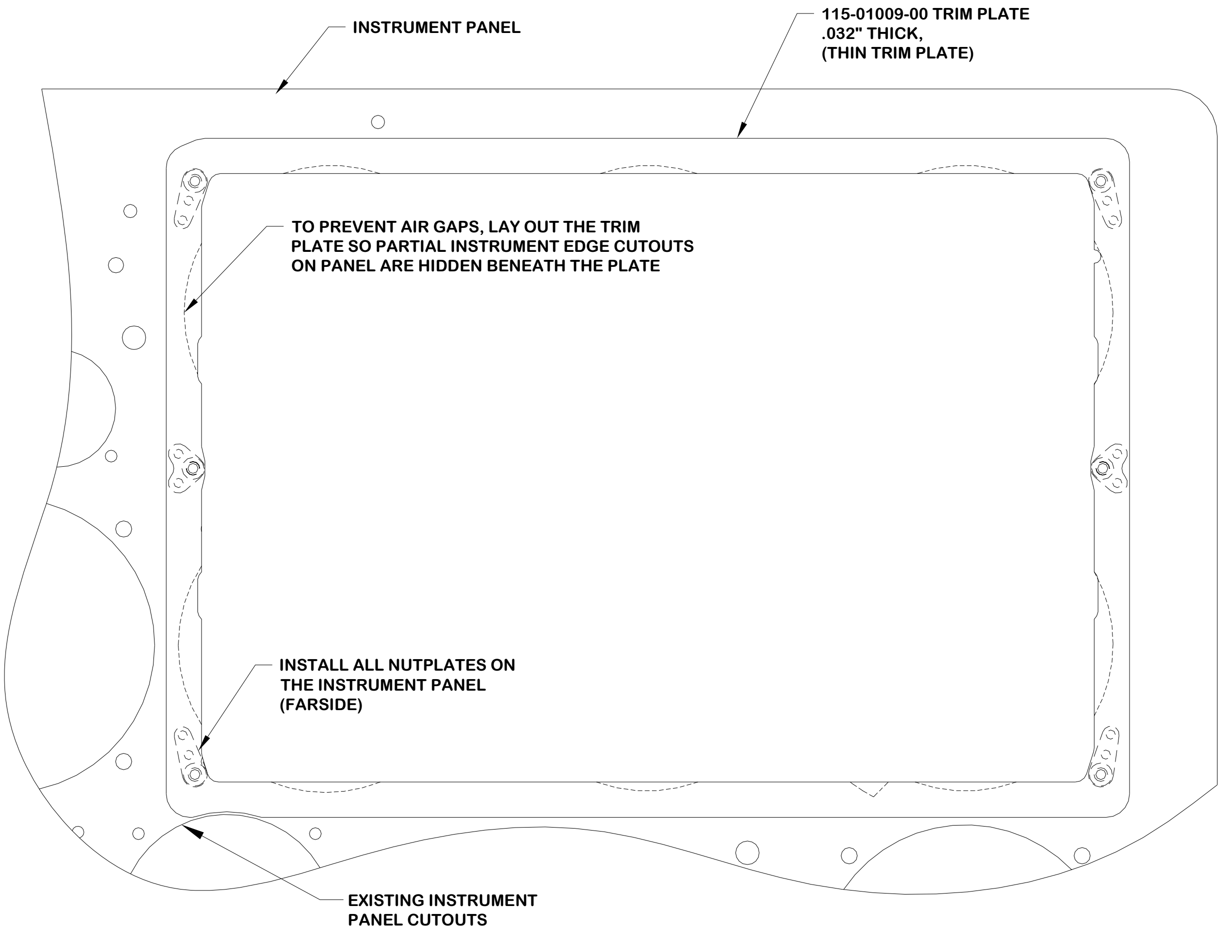
Do not permanently install the trim plate to the instrument panel until the GDU 620 installation hardware (nutplates) has been installed on the instrument panel and/or on the thick trim plate.

Determine locations of fasteners or rivets for securing the trim plate to the instrument panel and the GDU 620 nut plates in accordance with the requirements in Figure 3-5, Figure 3-6, and Figure 3-7.

NOTE

The thin (0.032") trim plate can float on the instrument panel. Rivets or fasteners to secure the thin trim plate P/N 115-01009-00 to the instrument panel are optional. The installation of the GDU 620 will secure the trim plate in place.

If attaching the nut plates to the instrument panel, use the Cutout Template P/N 115-01010-00 as a guide to drill out the holes for the nut plate position. Remove the Cutout Template and install the required nut plates on the instrument panel and, if required, on the trim plate. Once all six of the GDU 620 nut plates have been installed, permanently install the trim plate, if required.



FOR A THIN TRIM PLATE INSTALLATION:

-LOCATE AND INSTALL ALL NUTPLATES ON THE INSTRUMENT PANEL SO
1) RIVET HEADS ARE FLUSH AND HIDDEN BY TRIM PLATE
2) NUTPLATE BODY DOES NOT INTERFERE WITH ADJACENT INSTRUMENT BODIES
3) NUTPLATE BODY DOES NOT LIE IN CUTOUT OPENING
4) ADEQUATE INSTRUMENT PANEL MATERIAL EXISTS.

-APPLY A FINISH COAT OF PAINT TO PLATE PRIOR TO FINAL INSTALL.

-TRIM PLATE OUTSIDE EDGE AS REQUIRED TO CLEAR ADJACENT INSTRUMENTS OR SWITCHES.

-FINISH CORNERS AT R.25" TYP.

Figure 3-5. Trim Plate Installation, Thin

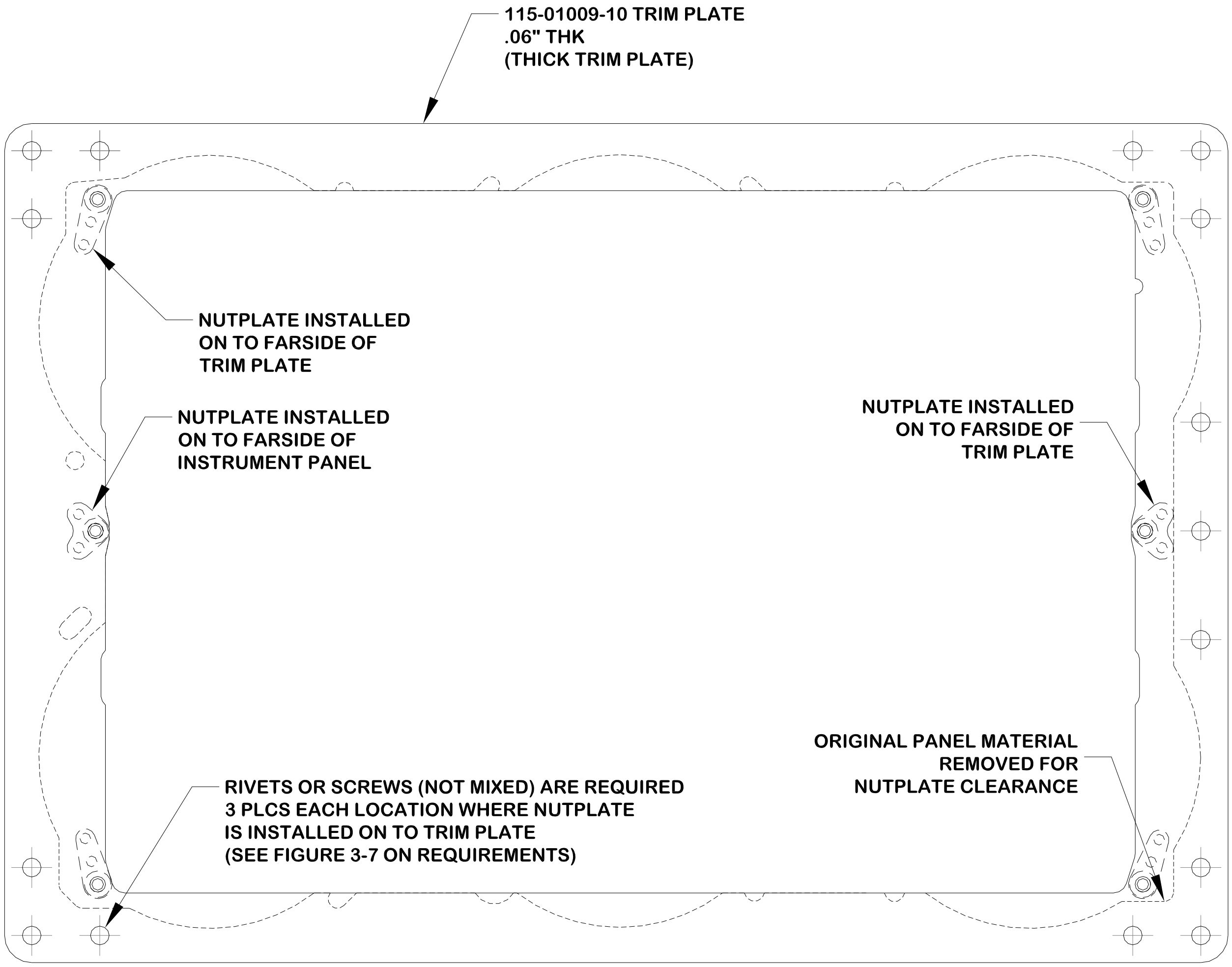
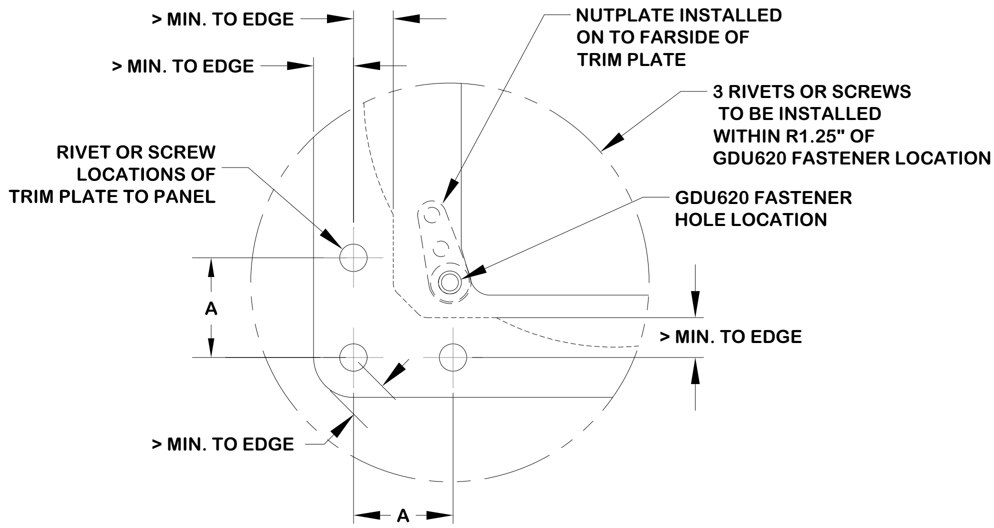
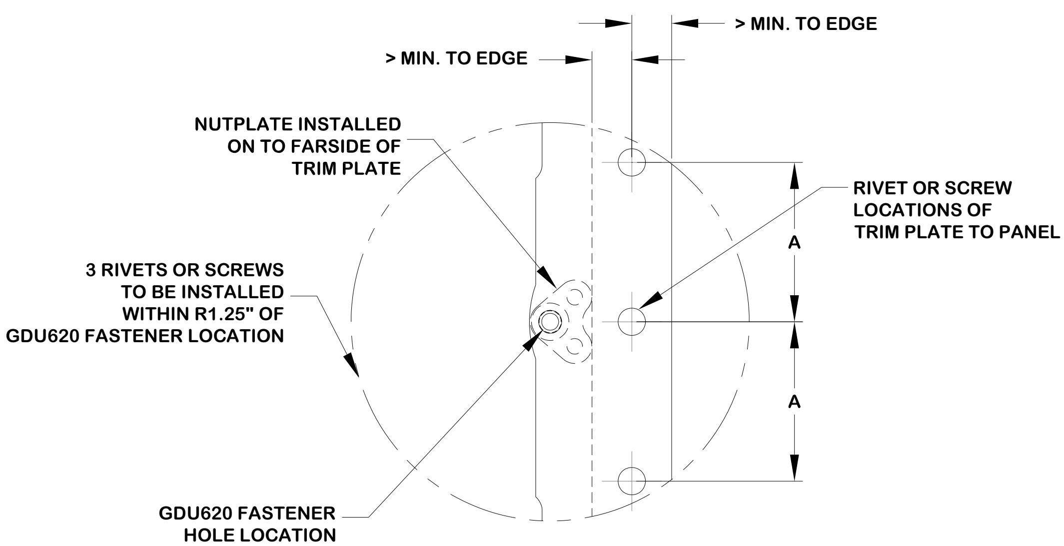


Figure 3-6. Trim Plate Installation, Thick



CORRECT CORNER PLACEMENT DETAIL
OF MS20426AD4 RIVETS
OR #6-32 SCREWS

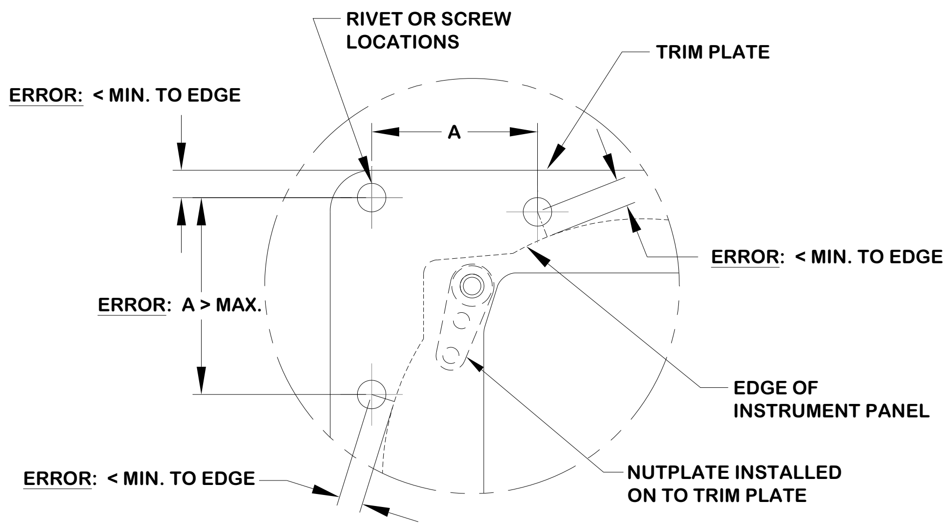


CORRECT SIDE PLACEMENT DETAIL
OF MS20426AD4 RIVETS
OR #6-32 SCREWS

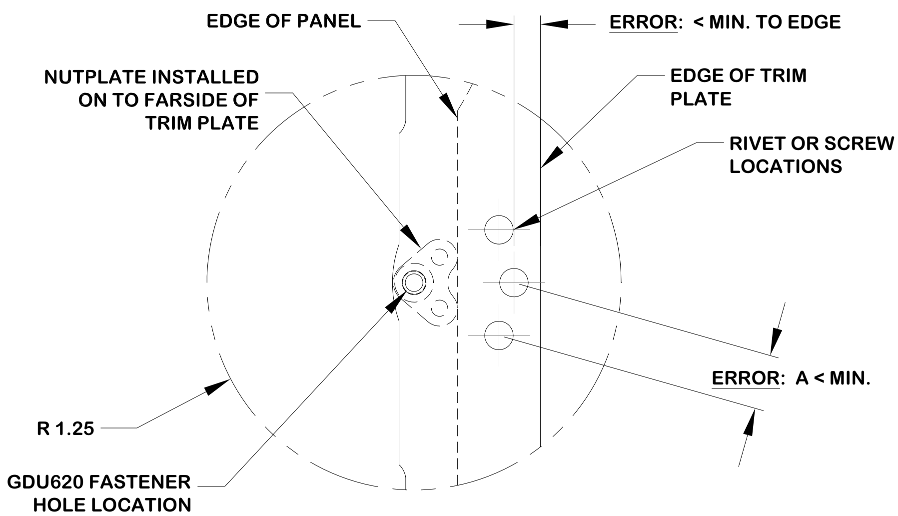
CORRECT GUIDELINE TABLE:

HARDWARE	DIMENSION A	MIN. TO EDGE
RIVETS	0.75" ± 0.25	0.25"
SCREWS	0.75" +.25 / - .125	0.30"

Figure 3-7. Structural Trim Plate Installation, Correct Installation



**INCORRECT CORNER PLACEMENT
OF MS20426AD4 RIVETS
OR #6-32 SCREWS**

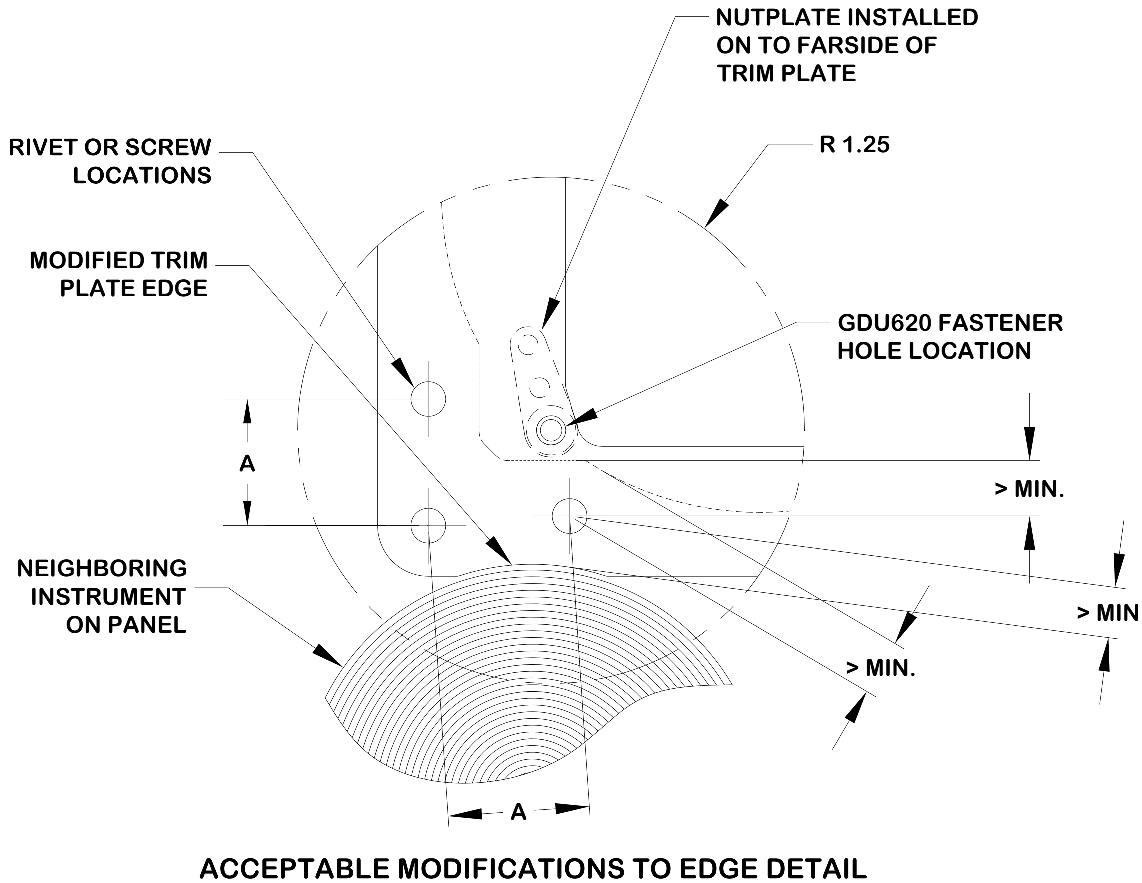


**INCORRECT SIDE PLACEMENT DETAIL
OF MS20426AD4 RIVETS
OR #6-32 SCREWS**

CORRECT GUIDELINE TABLE:

HARDWARE	DIMENSION A	MIN. TO EDGE
RIVETS	0.75" ± 0.25	0.25"
SCREWS	0.75" +.25 / - .125	0.30"

Figure 3-8. Structural Trim Plate Installation, Incorrect Installation



CORRECT GUIDELINE TABLE:

HARDWARE	DIMENSION A	MIN. TO EDGE
RIVETS	0.75" ± 0.25	0.25"
SCREWS	0.75" +.25 / - .125	0.30"

Figure 3-9. Acceptable Modifications to Edge Detail

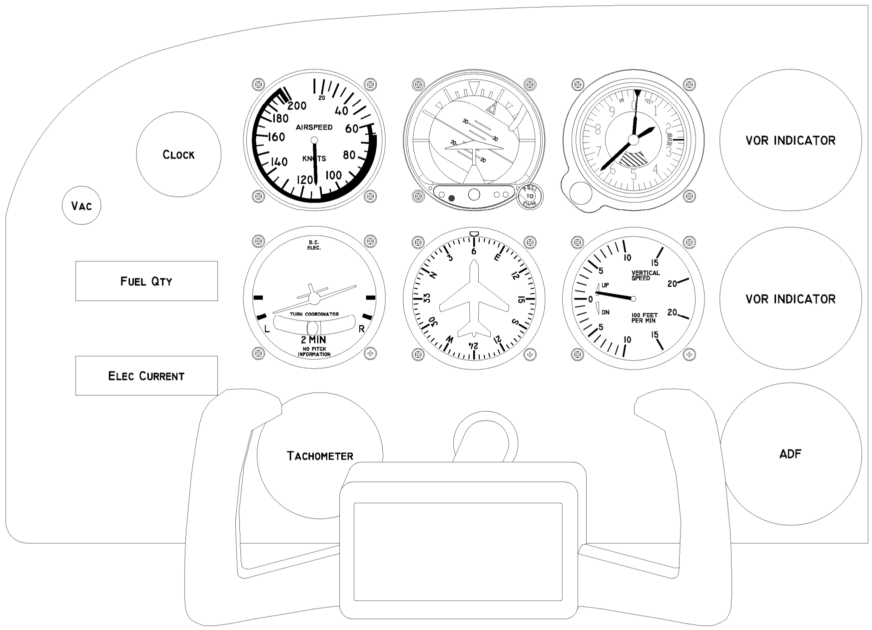
3.2.1.6 GDU 620 Installation

Install the GDU 620 using six hex head screws P/N 211-64307-14 (or equivalent).

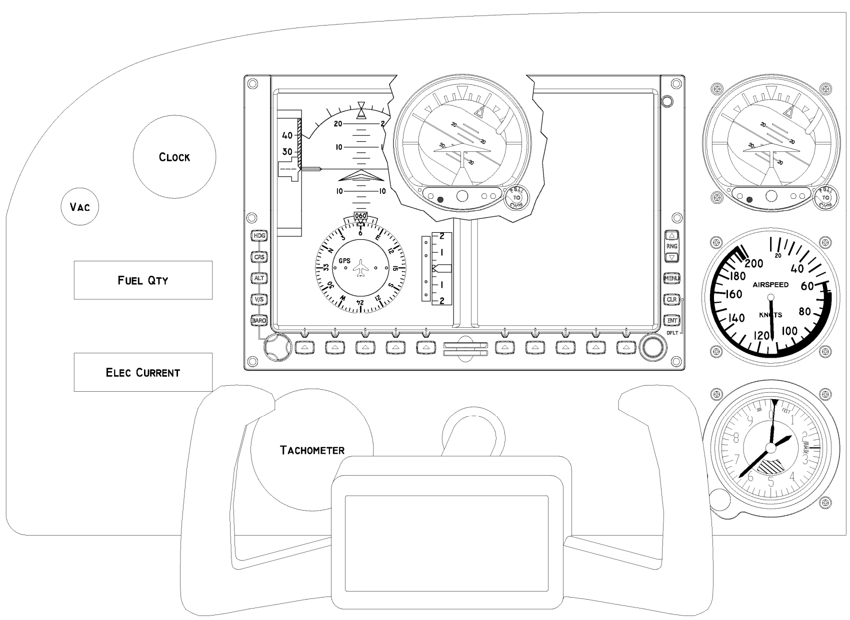
3.2.2 Standby Instruments Location and Mounting

Install the standby airspeed, altimeter and attitude indicator in the pre-existing mounting locations for instruments no longer required, such as VORs, ADF bearing pointers, RMIs, CDIs, etc. If required, new instrument cutouts may be made on the instrument panel and the stepped part of the instrument panel. Existing cutouts may also be modified as required to fit the standby instruments (e.g. cutting a notch for the altimeter baro-correction knob).

Example instrument panel layouts are shown in Figure 3-10, Figure 3-11, and Figure 3-12. Additional examples can be found in Section D.1.



ORIGINAL INSTRUMENT PANEL CONFIGURATION

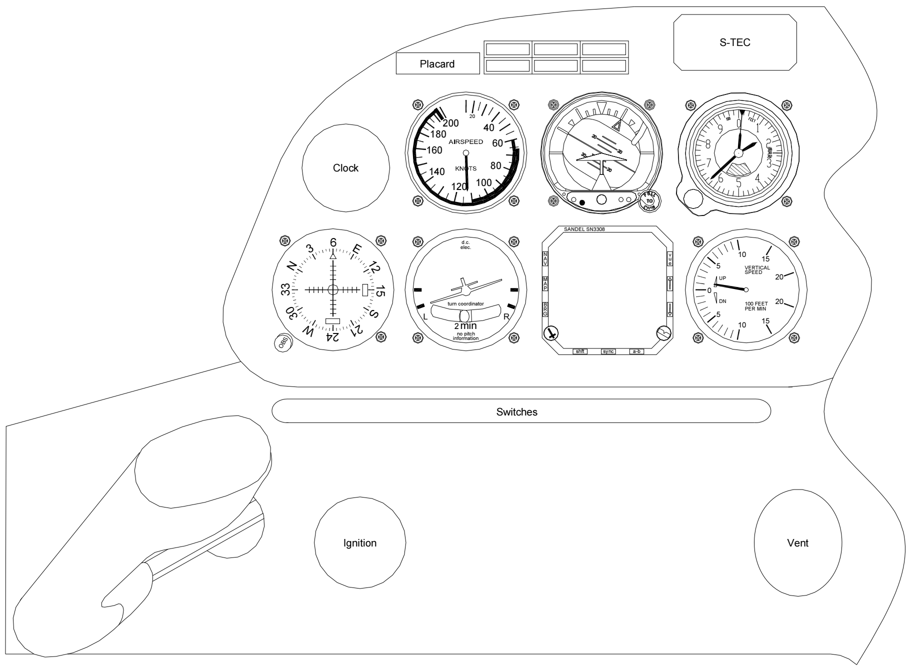


MODIFIED INSTRUMENT PANEL CONFIGURATION

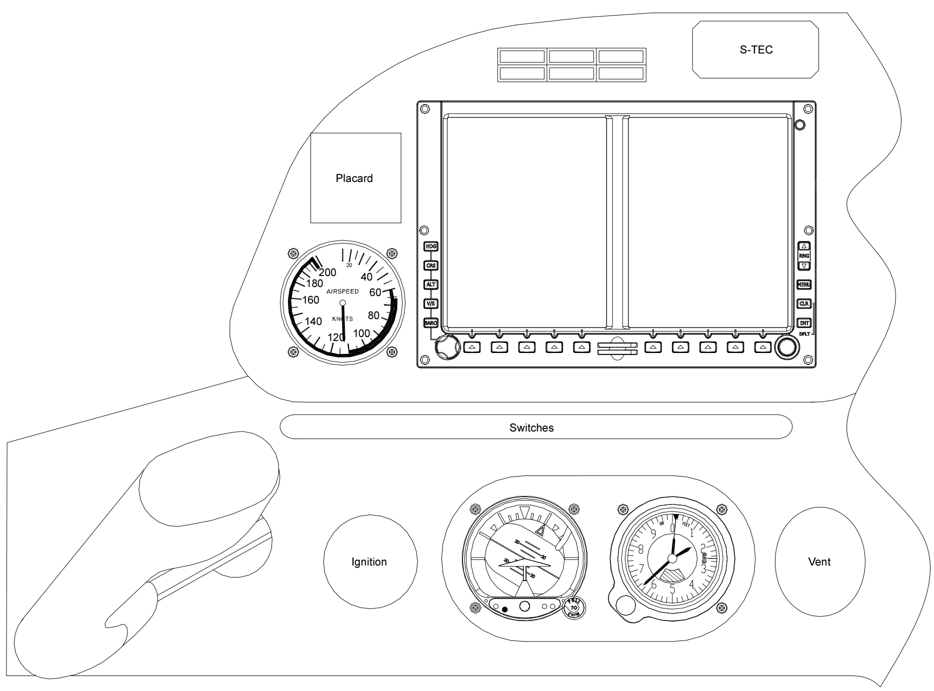
Figure 3-10. Example of Installed GDU 620 - Standby Instruments To the Right and Diagonal

NOTE

Due to the distance from the desired location of a standby instrument on the stepped panel to the GDU 620 and the standby instrument distance requirement from section 2.5.11.2, only 3 1/8” standby instruments are permitted to be installed on stepped panels.



ORIGINAL INSTRUMENT PANEL CONFIGURATION



MODIFIED INSTRUMENT PANEL CONFIGURATION

Figure 3-11. Example of Installed GDU 620 - Standby Instruments on Stepped Part of Panel

In Figure 3-11 the instrument panel bolster was modified to accommodate two of the standby instruments. Refer to Appendix H for details on modifying the bolster to accommodate standby instruments.

Some instrument panels may require additional modifications to address non-standard size instruments (e.g. the KI 256 ADI). Refer to Appendix H for additional information.

Due to space constraints, some installations may require the use of 2 1/4 inch instruments for backup instruments. Previously certified 2 1/4 inch instruments may be used as long as they are pneumatic. If using an electric attitude indicator, the Mid-Continent 4200-( ) (2 1/4 inch display) electric attitude indicator with the MD240-battery backup must be used. For airspeed and altitude indicators, Mid-Continent provides a package of 2 1/4 inch instruments in combination with the specified attitude indicator. For Mid-Continent ordering information see Section 2.5.11.2.4.3.

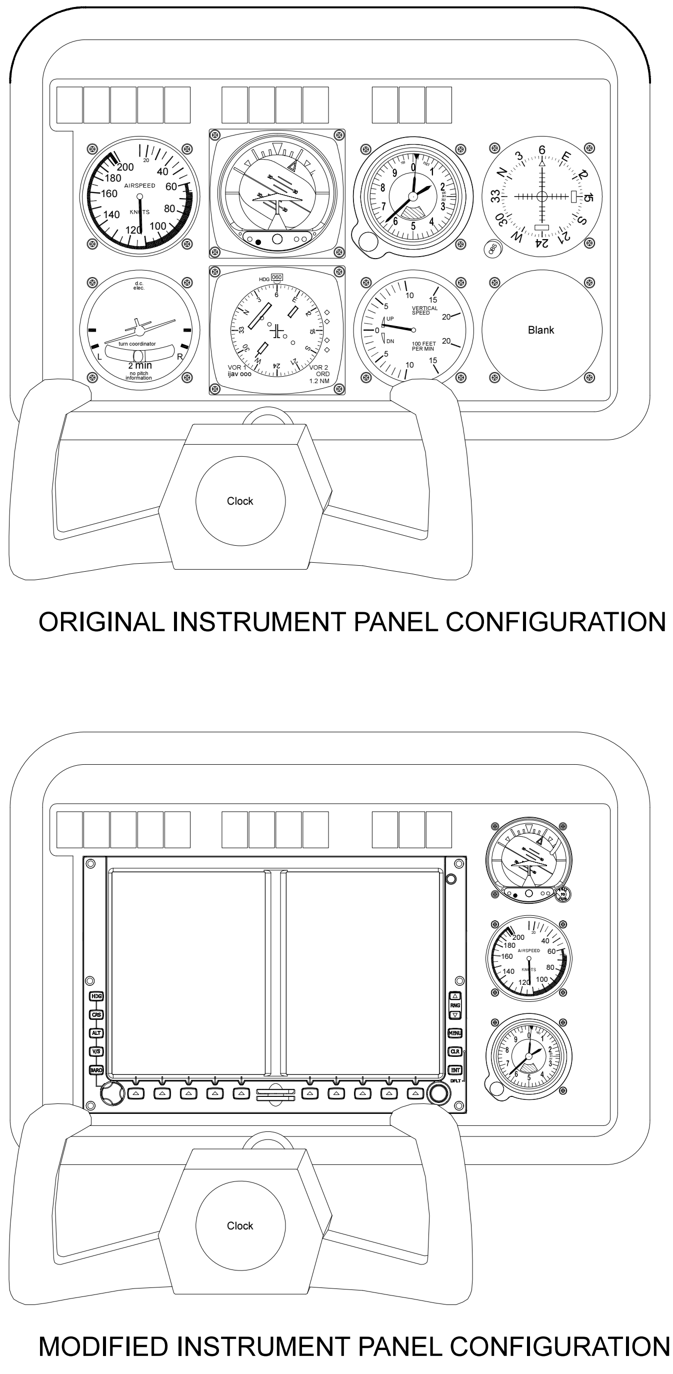


Figure 3-12. Example of GDU 620 Installed with 2 1/4” Standby Instruments

3.2.3 GRS 77 AHRS Location and Mounting

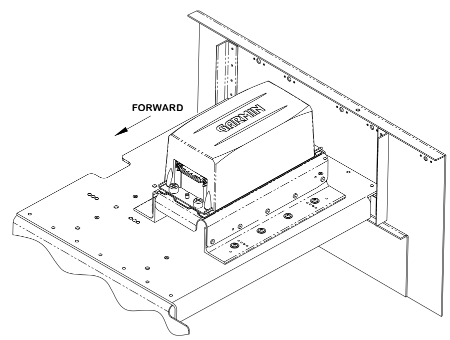
Considering the placement information contained in Section 2.5.11.4, determine a suitable location for the GRS 77. The GRS 77 should be mounted to a surface known to have sufficient structural integrity to withstand additional inertial forces imposed by the GRS 77 unit and any related components. For reference, the GRS 77 with Mounting Rack weighs 3.5 lbs and the addition of the GRS 77 Universal Mount increases the weight to 4.55 lbs. Use of additional brackets or supplemental support structure will also increase weight.

Table 3-1 provides an overview of possible GRS 77 mounting options for installation with and without the GRS 77 Universal Mount. Each option references a subsequent section where further details and considerations may be found. Furthermore, Section 3.2.3.1 identifies conditions that must be met for every GRS 77 installation, regardless of use of the GRS 77 Universal Mount.

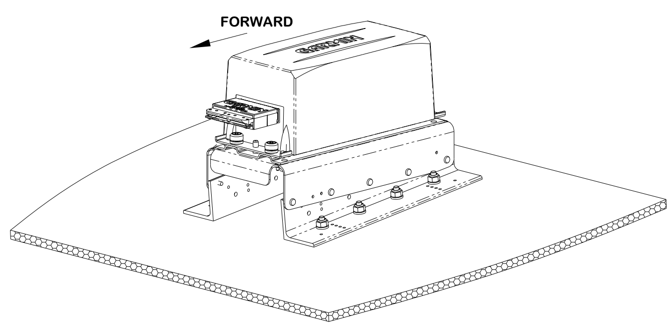
Table 3-1. Overview of Possible GRS 77 Mounting Options with GRS 77 Universal Mount

<table>
<tr><th colspan="2">Installation of GRS 77 Universal Mount (Typical)</th></tr>
<tr><td>Description:

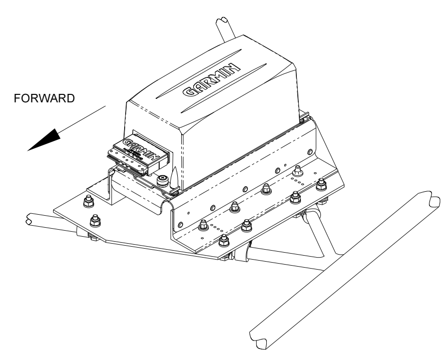
The intent of the GRS 77 Universal Mount is to allow minor adjustments in angle of the AHRS installation relative to the mounting surface in the aircraft. In some cases, the universal mount can be attached directly to existing structure in the aircraft, where only the mounting holes need to be added to structure.

Reference Section 3.2.3.2.3</td><td>
</td></tr>
<tr><th colspan="2">Installation of GRS 77 Universal Mount (Composite Aircraft)</th></tr>
<tr><td>Description:

Some composite aircraft have a solid fuselage structure that with a GRS 77 Universal Mount, will meet the requirements for the GRS 77 installation. Modification of the fuselage involves adding points of attachment.

Reference Section 3.2.3.2.4</td><td>
</td></tr>
<tr><th colspan="2">Installation of GRS 77 Universal Mount (Tube and Fabric Aircraft)</th></tr>
<tr><td>Description:

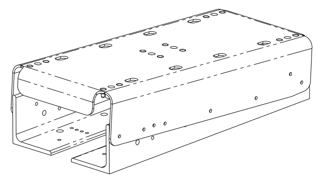
The GRS 77 Universal Mount can be assembled with an installation plate to existing fuselage tube structure. The installation plate provides a stable platform for the Universal Mount, which allows the assembly to be corrected for the aircraft level reference.

Reference Section 3.2.3.2.5</td><td>
</td></tr>
</table>

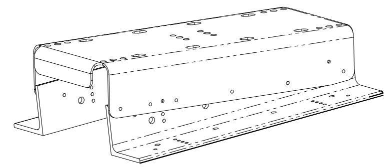
Installation of GRS 77 Universal Mount Using Existing Points from Previously-Installed Equipment

Description:

If the aircraft has a Bendix/King KG 102/102A gyro, a Mid Continent 4305-128 gyro, Mid Continent 4305-150 gyro or a Cirrus 14357-001 gyro currently installed, and it is being removed for this installation, the location may provide an adequate mounting location for the GRS 77 AHRS. The GRS 77 Universal Mount will allow for installation to an existing hole pattern for the KG 102/102A



USE FOR MID-CONTINENT 4305-128 OR 4305-150
USE FOR CIRRUS 14357-001



USE FOR BENDIX KING KG 102 / 102A

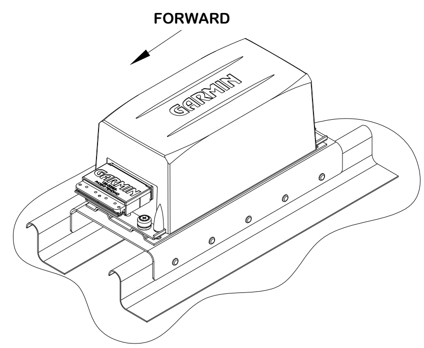
Reference Section 3.2.3.2.6

Table 3-2. Overview of Possible GRS 77 Mounting Options without GRS 77 Universal Mount

Mounting Bracket – Attachment to Stringers or Longerons

Description:

Closely spaced stringers or longerons extending fore/aft along the bottom of the fuselage may provide adequate structure to support a mounting bracket. Look for an area that will provide ample space forward of the GRS 77 for the connector and wire harness. Additionally, ensure that the location is not shared by equipment capable of inducing vibration in the structure which can be transmitted back to the GRS 77, such as a location near the engine or landing gear.



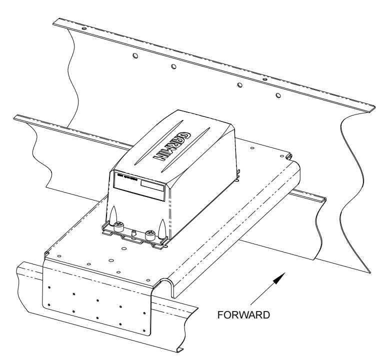
Reference Section 3.2.3.3.1

Modify Existing Floor Panel or Add Mounting Surface to Attach GRS 77 Mounting Plate

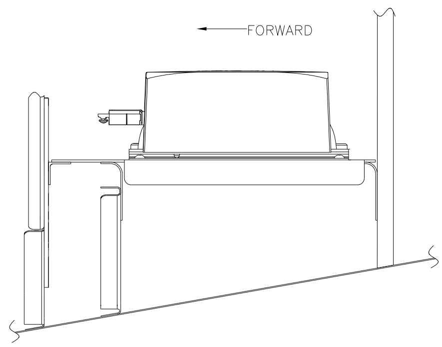
Description:

A false floor may exist over airframe structure to make room for avionics or baggage. If the false floor surface is level and meets structural requirements, it may provide an adequate surface for mounting the GRS 77 directly.

Alternately, existing frame structure may provide a level plane to which a plate may be attached for mounting the GRS 77. An example would be multiple frames with flanges at the same water line (WL).



Reference Section 3.2.3.3.2

Plate, Angle Bracket Assembly – Attachment to Existing Frame and Bulkhead Structure	
Description: Angle brackets may be fabricated to attach to existing frame and bulkhead structure, to which a plate may be attached. Although multiple frames and bulkhead structure may be available for the AHRS location, they may not be at the same water line (WL). One or more brackets may be needed to create a level plane. The intent is to ensure the plate remains parallel to the aircraft level reference and firmly supported across its span. Reference Section 3.2.3.3.3	

3.2.3.1 Considerations for all GRS 77 Installations

In order to satisfy the structural requirements for the operation of the GRS 77 the following conditions shall be met:

1. If support racks, brackets or shelves need to be fabricated, they should be fabricated and attached to the aircraft structure in accordance with the methods outlined in AC43.13-2A Chapter 2 and the following requirements:
   a) Material shall be 2024-T3 sheet aluminum
   b) Material shall have some type of corrosion protection (primer, alodine, etc.)
   c) Material shall be a minimum of 0.063” for single-sheet aluminum. Aluminum honeycomb core panels are also acceptable, and have no minimum thickness requirements.
   d) Use sheet metal techniques (bend radius, fillets, etc) appropriate to the material thickness and type.
2. Any supporting structure must be rigidly connected to the aircraft primary structure through strong structural members capable of supporting substantial loads. Avoid areas that are prone to severe vibration (e.g., areas close to engine mounts and landing gear).
3. If a new mounting plate is fabricated for the GRS 77, the plate shall not span greater than 12” in width or length without direct attachment to primary structure. If the mounting plate must span more than 12”, stiffeners and/or flange reinforcements will be necessary to provide adequate support.
4. Final installation shall be resistant to visual deflection during the validation of structures test per Section 3.3.
5. Maintain a minimum of 3” between the forward edge of the mounting rack and any object to ensure clearance for connector and wire harness.
6. For all installations, level and heading alignment of the GRS 77 will require the use of one of the following:
   a) GRS 77 Universal Mount P/N 011-01780-00,
   b) Fabricated mounting equipment, e.g. brackets, shelves, mounting platform, etc., or
   c) A combination of both.

For the installation of the GRS 77 level the aircraft in both the longitudinal and lateral axes. Refer to the aircraft’s maintenance manual for leveling instructions. The aircraft should be placed on jacks while in a level state to avoid inadvertently placing the aircraft in a non-level position when entering, exiting, or working in the aircraft.

If the intent is to use the GRS 77 Universal Mount, refer to details found in Section 3.2.3.2. If the intent is to use or modify existing structure without the GRS 77 Universal Mount, refer to details found in Section 3.2.3.3.

3.2.3.2 Preparation for Installation with GRS 77 Universal Mount

3.2.3.2.1 GRS 77 Universal Mount Description

The GRS 77 Universal Mount P/N 011-01780-00 allows for aircraft level installation of the GRS 77 AHRS on mounting structures with inclines up to ±6° in 2° increments. Depending on the installation, the Angle Brackets contained within the GRS 77 Universal Mount kit can be assembled and installed facing in or out, as shown in Figure 3-13 and Figure 3-14. The use of the GRS 77 Universal Mount is optional.

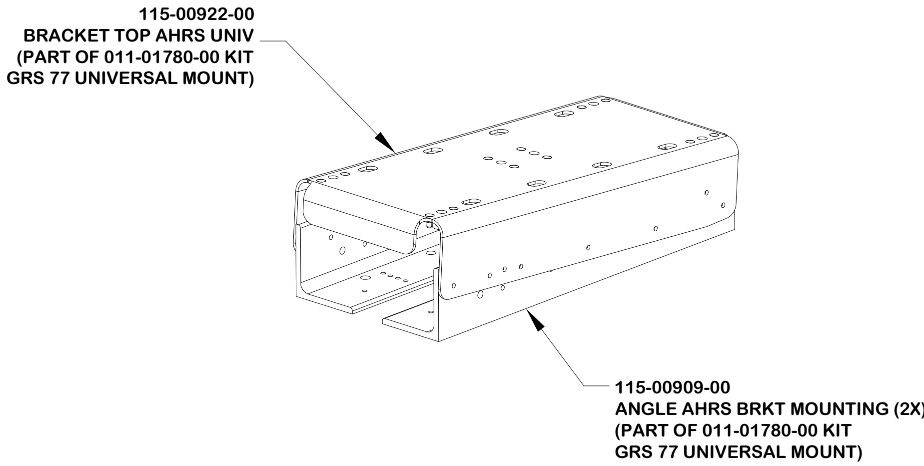


Figure 3-13. GRS 77 Universal Mount (Inward Facing Angle Brackets)

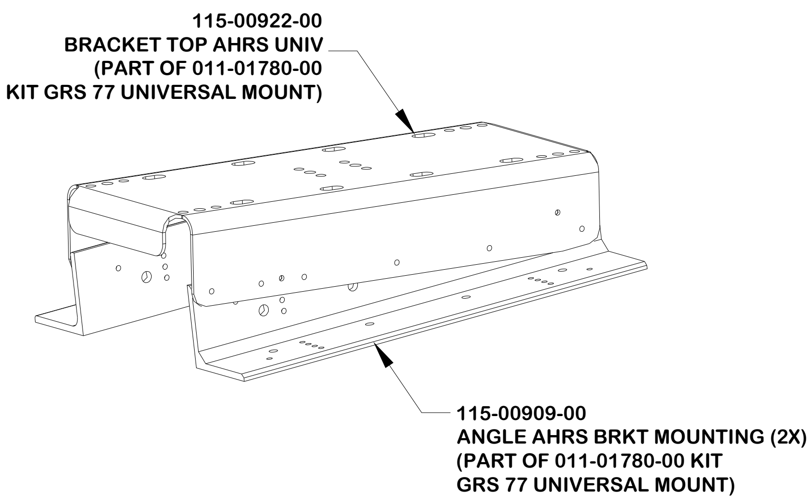


Figure 3-14. GRS 77 Universal Mount (Outward Facing Angle Brackets)

3.2.3.2.2 Assembly of the Universal Mount

Cleco the pivot hole of the top bracket to the angle bracket on both sides as shown in Figure 3-15.

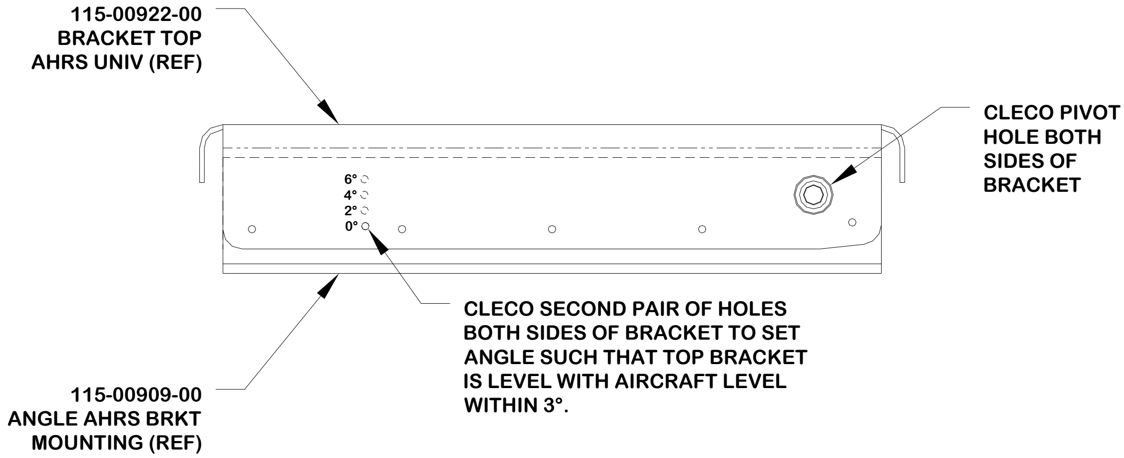


Figure 3-15. GRS 77 Universal Mount Assembly

NOTE

The incline of the mounting location may be determined by using a level meter such as the PRO 360 or equivalent. It is recommended to use a level surface on the aircraft itself as reference for a more accurate installation.

Determine and set the incline offset required for level installation. Cleco the second pair of holes of the top bracket to the angle bracket as shown in Figure 3-16. Drill hole-pattern from top bracket to angle bracket (0.1285” diameter holes – #30 drill bit), 5 places each side.

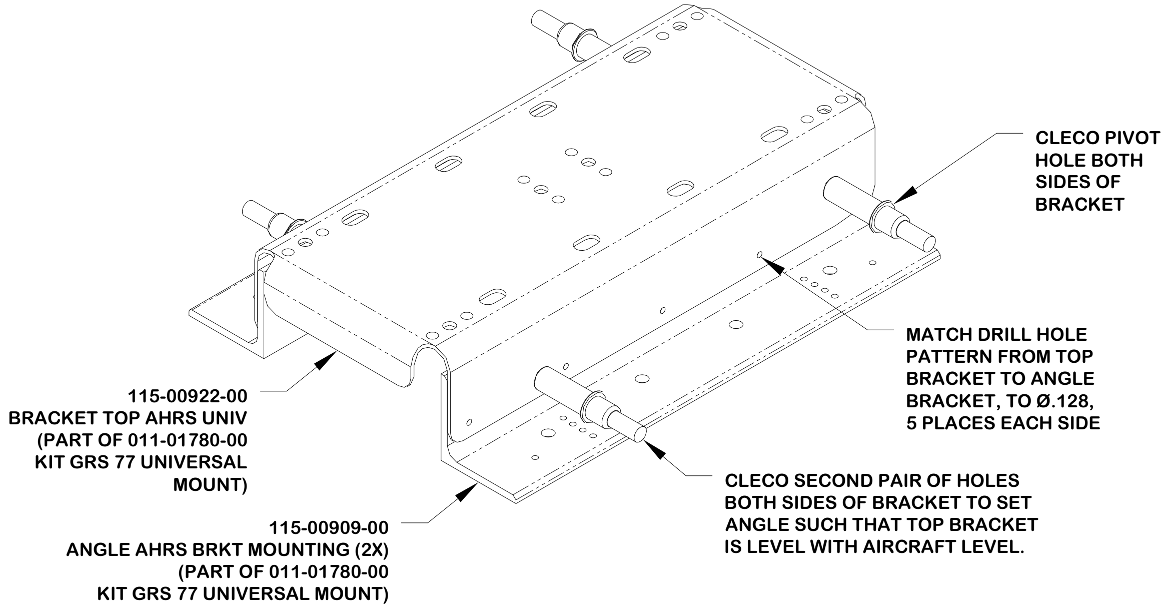


Figure 3-16. Hole-Pattern Configuration to Set Incline in Assembly for Aircraft Level

As shown in Figure 3-17, rivet top bracket to angled brackets with MS20470AD4-6 rivets (alternate CR3213-4-4 blind rivets) and remove Clecos.

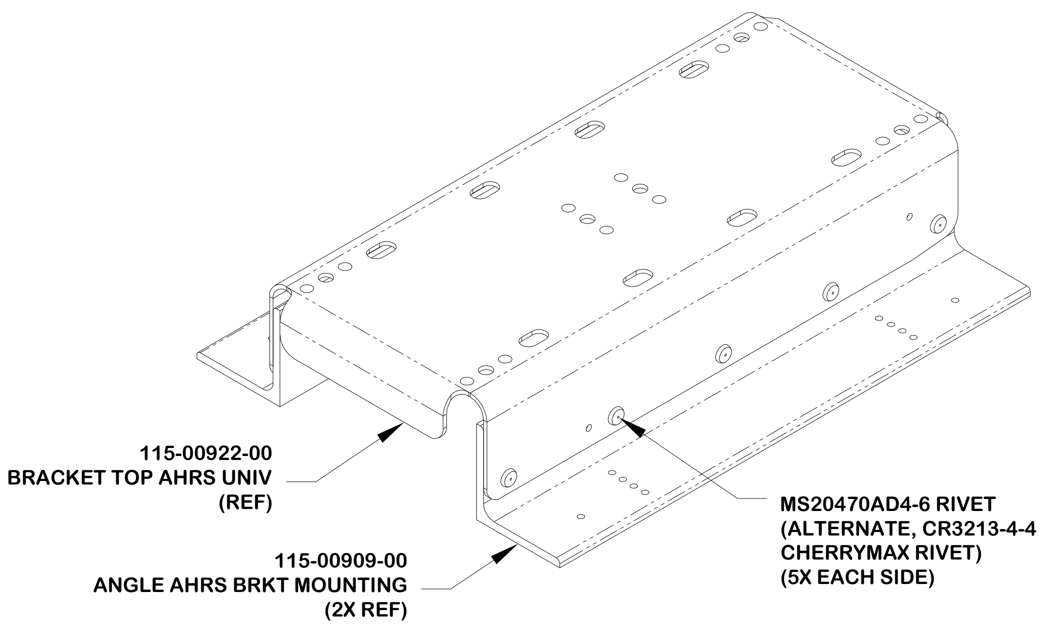


Figure 3-17. Top Bracket to Angle Bracket Assembly

NOTE

If the GRS 77 Universal Mount has been assembled with the angle brackets facing in, installing the GRS 77 mounting rack on the universal mount will prevent access to tighten the universal mount screws to the mounting plate. It is recommended to install the universal mount to the mounting plate before mounting the GRS 77 mounting rack on the universal mount for this situation.

Install the GRS 77 Mounting Rack P/N 115-00459-00 to the GRS 77 Universal Mount using 5 AN525-1032R8 Screws, as shown in Figure 3-18. The recommended torque is 20-25 inch lbs. Ensure correct orientation of mounting rack on universal bracket (the arrow on the GRS 77 Mounting Rack must point forward).

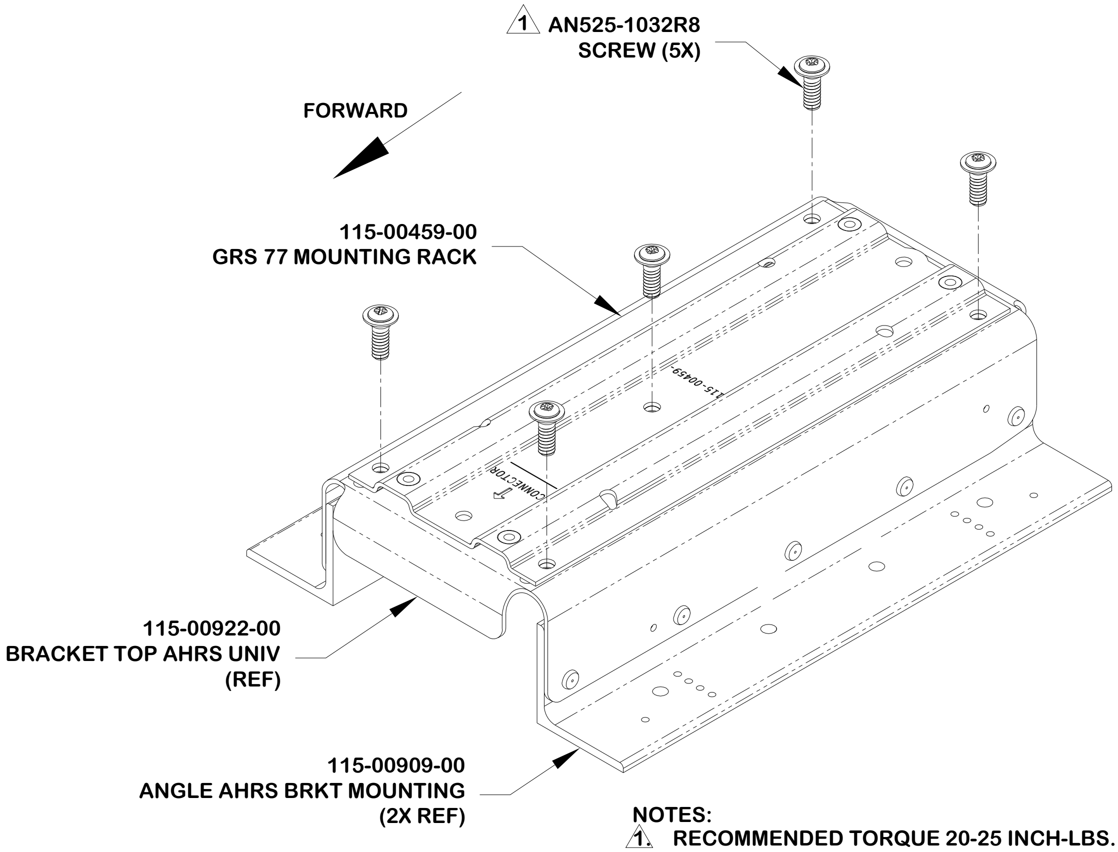


Figure 3-18. Assembling GRS 77 Mounting Rack to GRS 77 Universal Mount

3.2.3.2.3 Installation of GRS 77 Universal Mount (Typical)

NOTE

Aircraft structures such as the firewall, bulkhead and support frames are usually perpendicular to the aircraft heading and may be used as reference for determining the relative position of the installation to the aircraft heading.

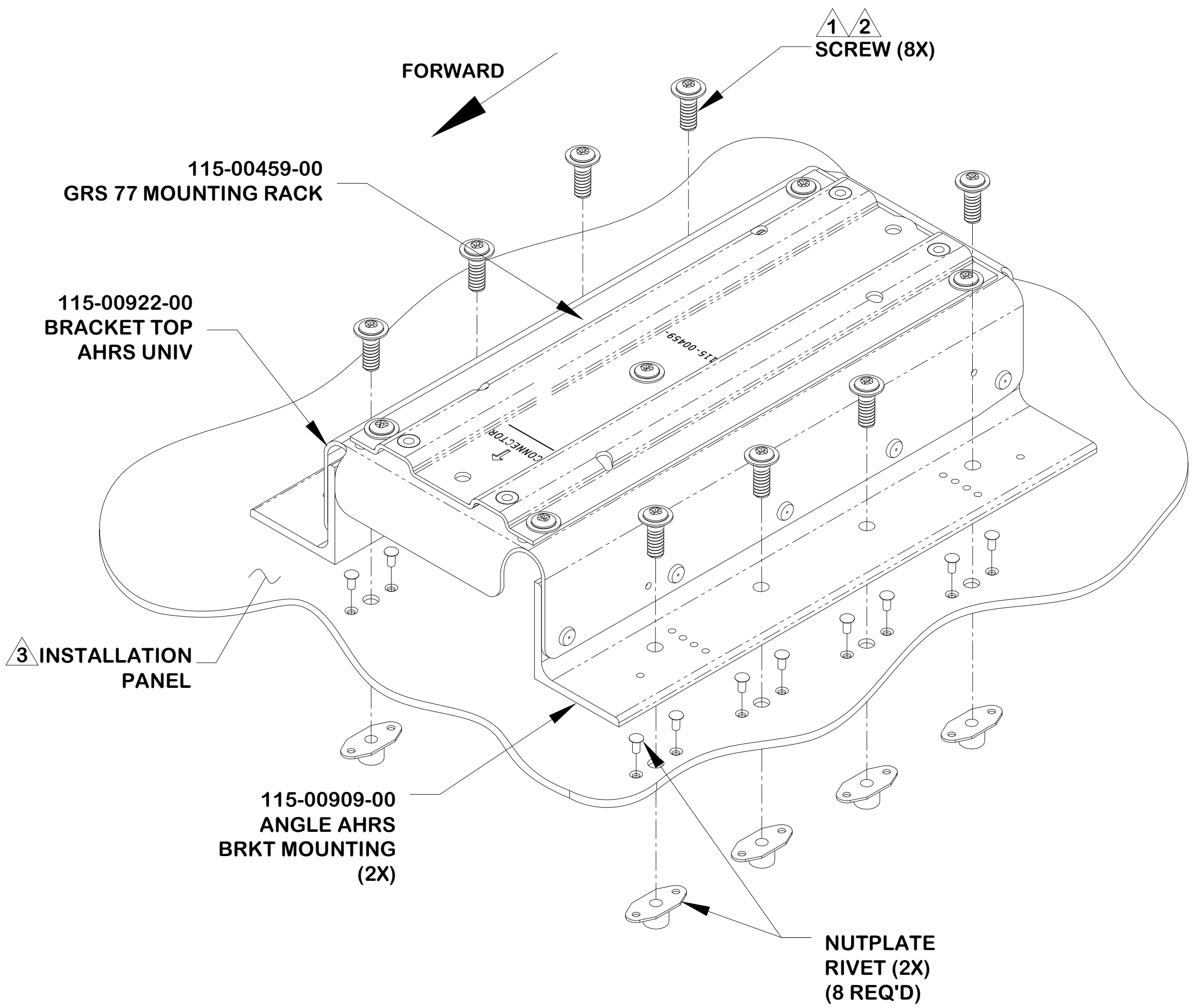
Position the GRS 77 Universal Mount assembly on the mounting platform so that it is aligned to the aircraft heading. Transfer the hole-pattern from the Angle Brackets to the mounting platform, 4 places each side. Ensure that the arrow on the mounting rack is facing the forward direction.

Remove the GRS 77 Universal Mount assembly from the mounting platform and drill the marked hole-pattern for #10 hardware (0.189” diameter holes – #12 drill bit) into the mounting platform. The preferred method of assembly utilizes nutplates installed to the mounting platform: rivet nut plates (MS21059L3) with MS20426AD3-X rivets to the mounting platform. Ensure that installed rivets are flush with the installation panel. Remove any burrs or excess rivet heads.

Install the GRS 77 Universal Mount to the mounting plate using AN525-1032R8 screws (8 total, 4 on each side for the Universal Mount). See Figure 3-19. Alternate hardware includes other screws, bolts, washers, nuts, and nutplates; these are noted in the table within Figure 3-19. The recommended torque is 20-25 inch lbs. Perform a structural validation test per Section 3.3.

NOTE

It is acceptable to install the Universal AHRS Mounting Bracket assembly to the aircraft structure with four pieces of hardware (bolts or screws at opposite ends of each angle) as long as the installation allows the GRS 77 AHRS to pass the Engine Run-up Vibration Test outlined in Section 5.6.5. Use of eight fasteners is strongly recommended.



NOTES:

1. RECOMMENDED HARDWARE OPTIONS FOR ASSEMBLY:

HARDWARE	SPECIFICATIONS			
SCREWS	MS35207 (#10-32 LENGTH A/R); OR NAS603 (#10-32 LENGTH A/R)			
BOLTS	AN3-XA (#10-32, LENGTH A/R)			
WASHERS	AN960-10; AN960-10L; NAS1149F0332P; OR NAS1149F0363P	OR	NUTPLATES	(M)F5000-3; (M)K1000-3; (M)K2000-3; OR F2000-3
NUTS	AN364-1032A (MS21083N3); OR MS21042L3		RIVETS	MS20426AD3-X

2. RECOMMENDED TORQUE 20-25 INCH-LBS.
3. MINIMUM THICKNESS .063", UNLESS ALUMINUM HONEYCOMB CORE PANEL (NO MINIMUM THICKNESS REQUIREMENT).

Figure 3-19. Installation of Universal Mount to Mounting Plate

3.2.3.2.4 Installation of the GRS 77 Universal Mount (Composite Aircraft)

CAUTION

This procedure only applies to secondary aircraft structures. It is not acceptable to use this procedure for primary structure or structural load carrying members. This procedure applies to honeycomb composite material used in areas such as false floors or avionics shelves. After the installation is complete, refer to Section 5 for system configuration, calibration and checkout.

NOTE

The GRS 77 AHRS will not provide valid outputs until the post installation calibration procedures are completed.

Assemble the GRS 77 Universal mount per section 3.2.3.2.2. Place the GRS 77 Universal Mount assembly on the mounting surface ensuring that the forward direction is aligned with the aircraft heading. Mark holes (4 on each side, 8 total) and edges of angle brackets for future reference. See Figure 3-20.

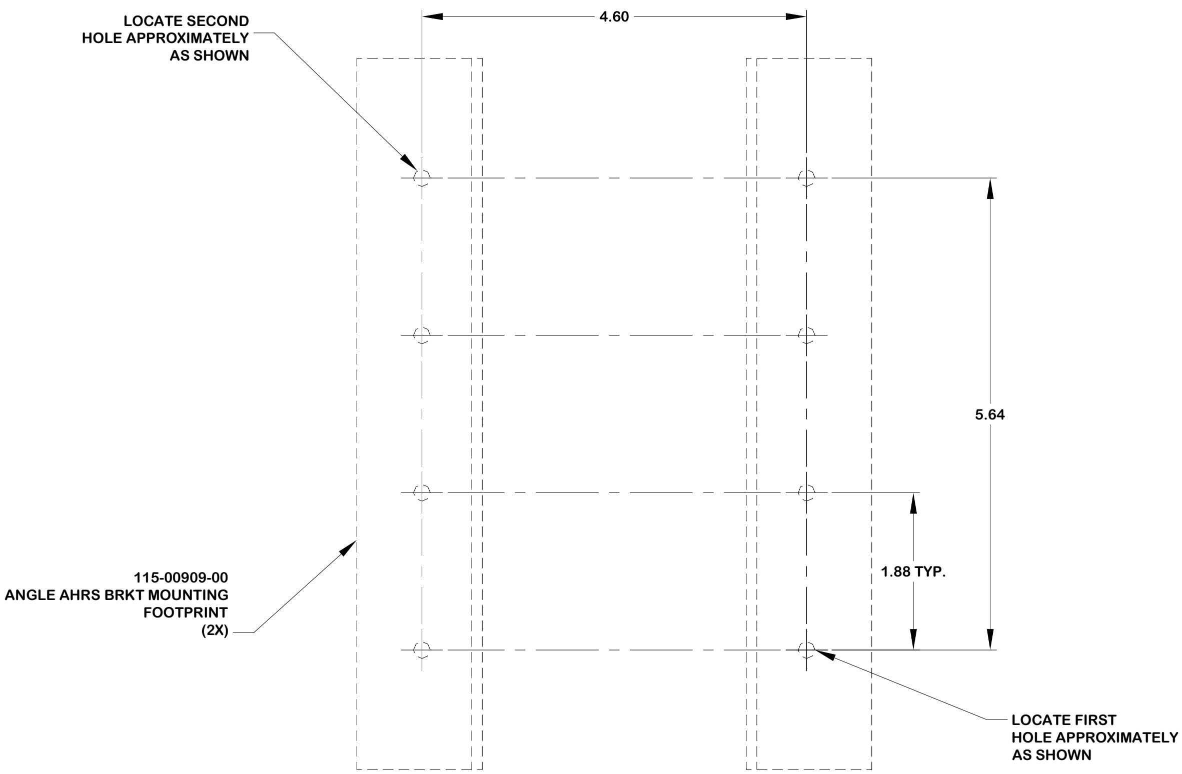


Figure 3-20. Mounting Location (Composite Aircraft)

At each bolt location, drill a hole in the mounting surface large enough to accommodate an AN3 bolt head (approximately 0.50 inches in diameter). Remove core between the inside and outside mounting surface layers as shown (Approximately 1.00 inches in diameter). See Figure 3-21. Do not penetrate the opposite side of honeycomb core.

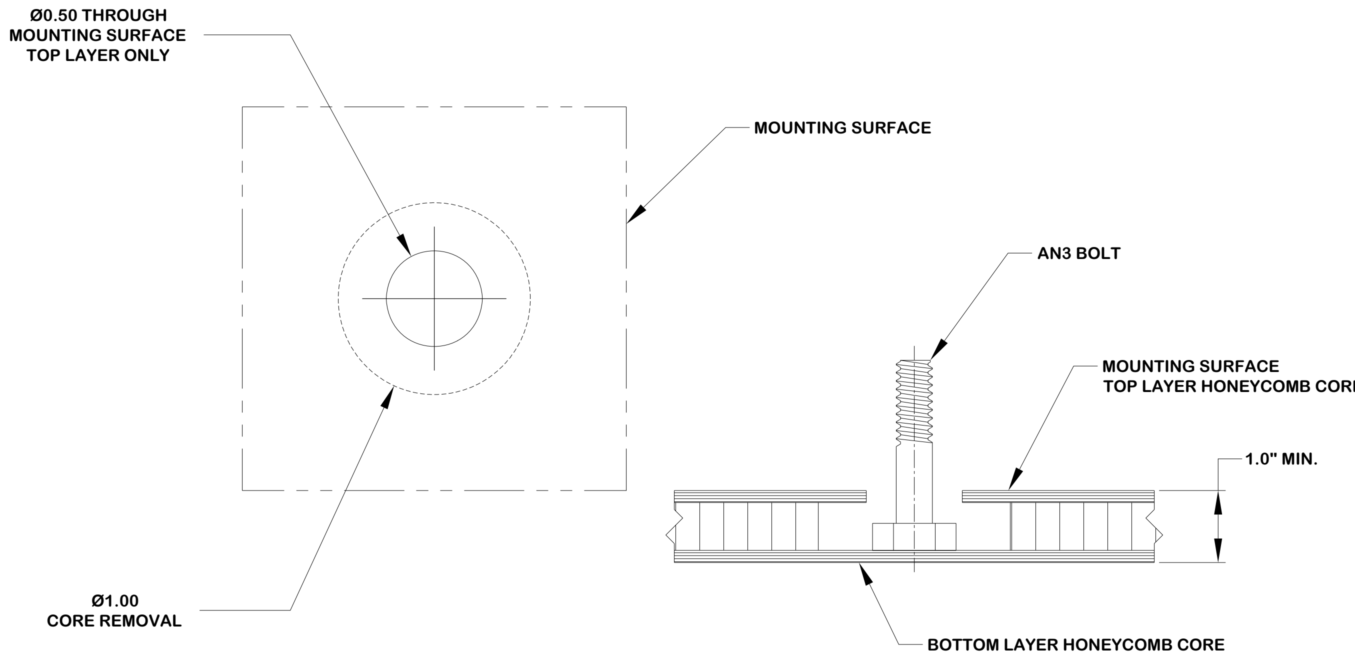


Figure 3-21. Mounting Bolt Preparation (Composite Aircraft)

Tape the underside of the angle brackets with packaging tape to keep the brackets clean of the epoxy/flox mixture. Poke holes in the tape at all bolt hole locations. Fill each bolt cavity with epoxy and flox mix. Insert each bolt head into cavity; epoxy and flox should just barely flow over the hole in the inner layer.

Align bolts with the angle brackets by laying taped angle brackets on the mounting surface, taped side down against epoxy/flox mixture, with bolts sticking through the brackets. Ensure bolts remain perpendicular to the angles and mounting surface as shown in Figure 3-22. The angle bracket taped faces should remain flush with the mounting surface.

Ensure brackets remain aligned with the reference marks on the fuselage. Once epoxy/flox mix has set, remove angles from mounting surface and remove tape from angle brackets.

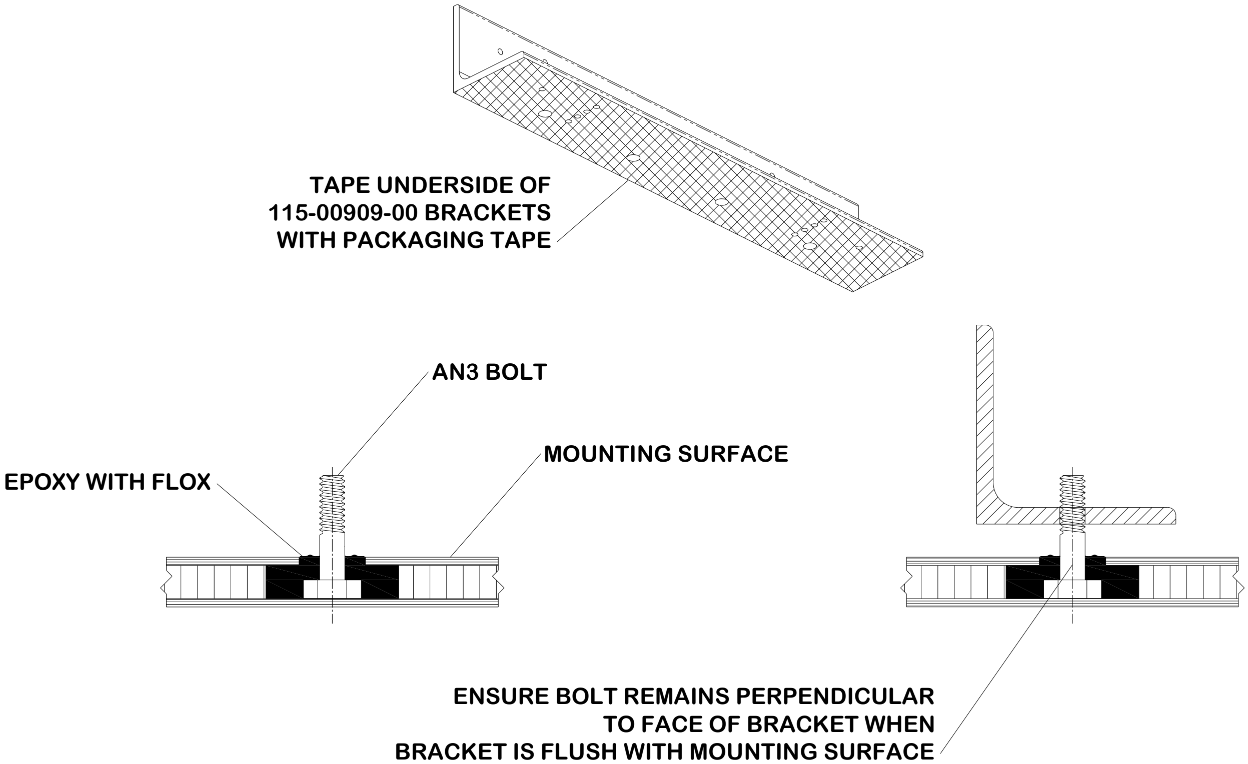


Figure 3-22. Mounting Bolt Installation and Alignment (Composite Aircraft)

After bolts have been installed in the mounting surface, lay two layers of cloth over the mounting location. Dimensions and location of the first sheet are shown, overlap the mounting location by 0.5 inches. See Figure 3-23.

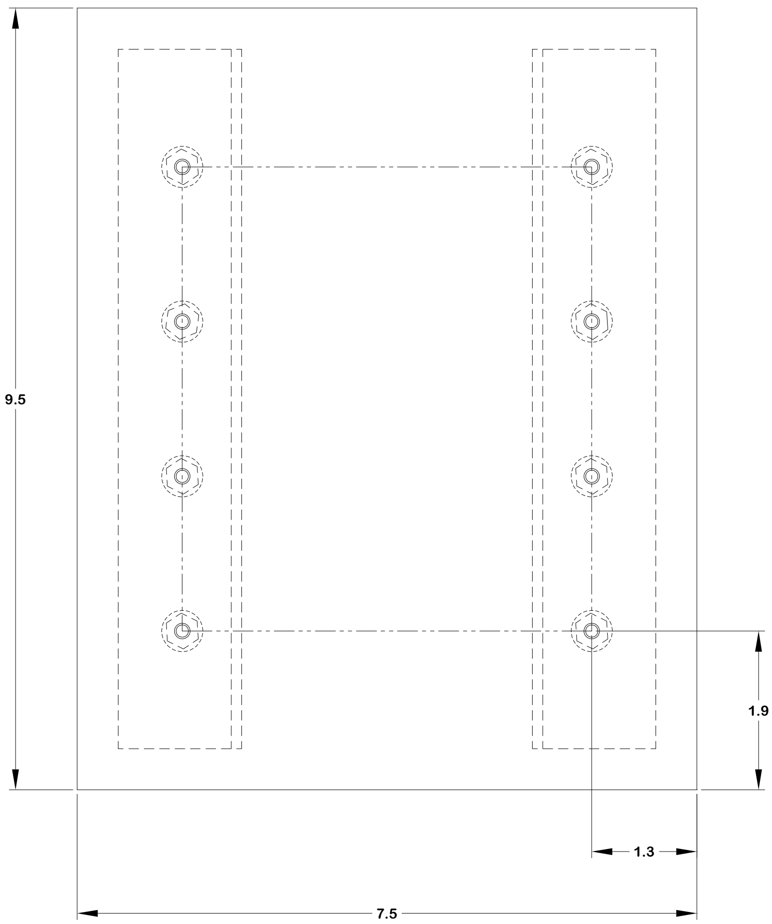


Figure 3-23. First Cloth Installation for Mounting Bolts (Composite Aircraft)

After laying up the first sheet of cloth, lay up a second sheet oriented 45° from first sheet as shown in Figure 3-24.

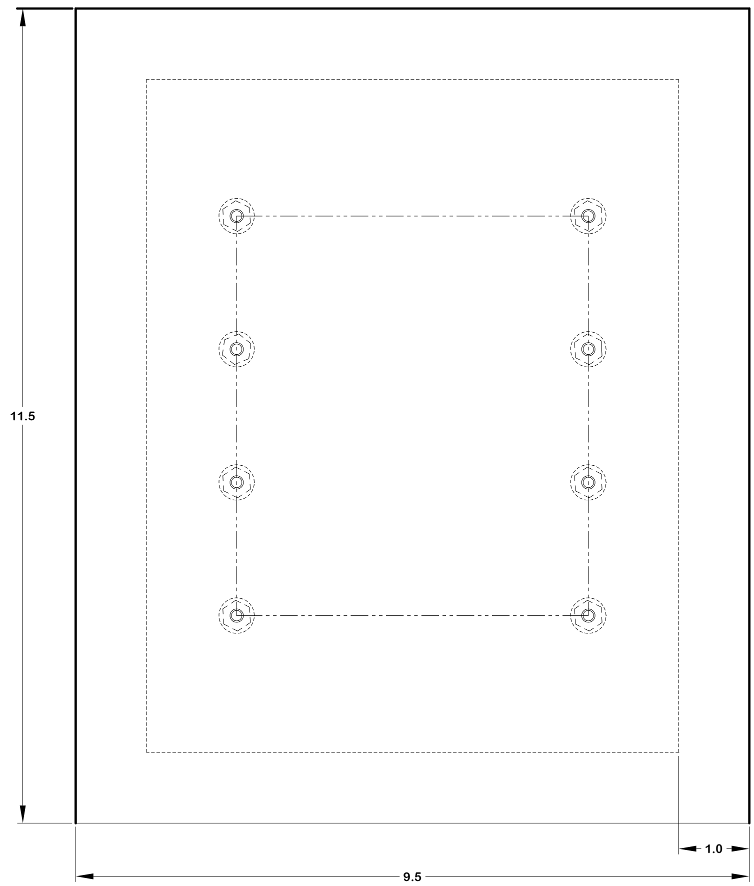


Figure 3-24. 2nd Cloth Installation for Mounting Bolts (Composite Aircraft)

Allow for the material to set and perform a structural validation per Section 3.3.

Install the GRS77 universal mount onto bolts and secure with AN365-1032A Nuts and AN960-10 washers (8 places). The recommended torque is 20-25 inch lbs. Perform a structural validation test per Section 3.3.

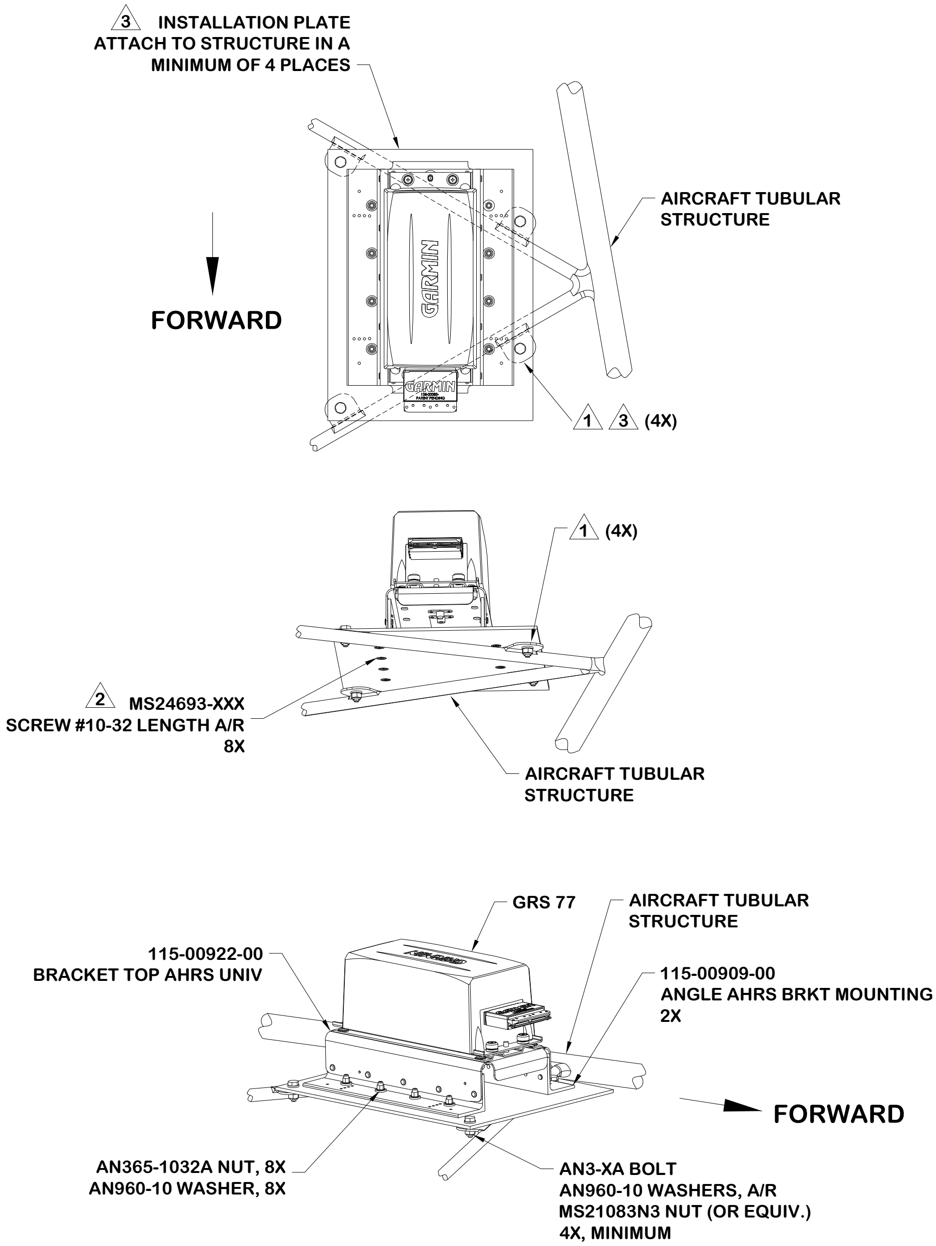
3.2.3.2.5 Installation of GRS 77 Universal Mount (Tube and Fabric Aircraft)

For tube and fabric aircraft, it is possible to use the tube structure as the support structure for an assembly that includes an installation plate as well as a GRS 77 Universal Mount to set the AHRS to aircraft level. The concept involves the assembly of the installation plate with a GRS 77 Universal Mount. The installation plate offers a surface for attaching the GRS 77 Universal Mount, and the Universal Mount allows the assembly to accommodate an aircraft level, forward orientation for the GRS 77 AHRS unit. Two options are presented: tabs welded to airframe or alternately, MS21919 clamps attached to airframe.

Welded Tabs:

1. The preferred method of installation allows for tabs to be welded to the tube structure for attaching the installation plate.
2. A minimum of four tabs are required and the material must be appropriate to the tube structure of the airframe.
3. An installation plate uses the four mounting points to secure the plate to the airframe. Countersunk screws are used to attach the Universal Mount to the installation plate, to minimize possibility of interference between hardware and the airframe.

4. The installation plate must be at least .125” thickness, 2024-T3. A stiffener may be required depending on plate length.
5. Reference Figure 3-25 and Figure 3-26 for details and illustration.
6. Perform a structural validation test per Section 3.3.
7. Welded tabs must be treated with corrosion protection appropriate to the materials used and the existing protection on the airframe. The installation plate requires corrosion protection (example: zinc primer, alodine etc.) on all surfaces of fabricated parts.



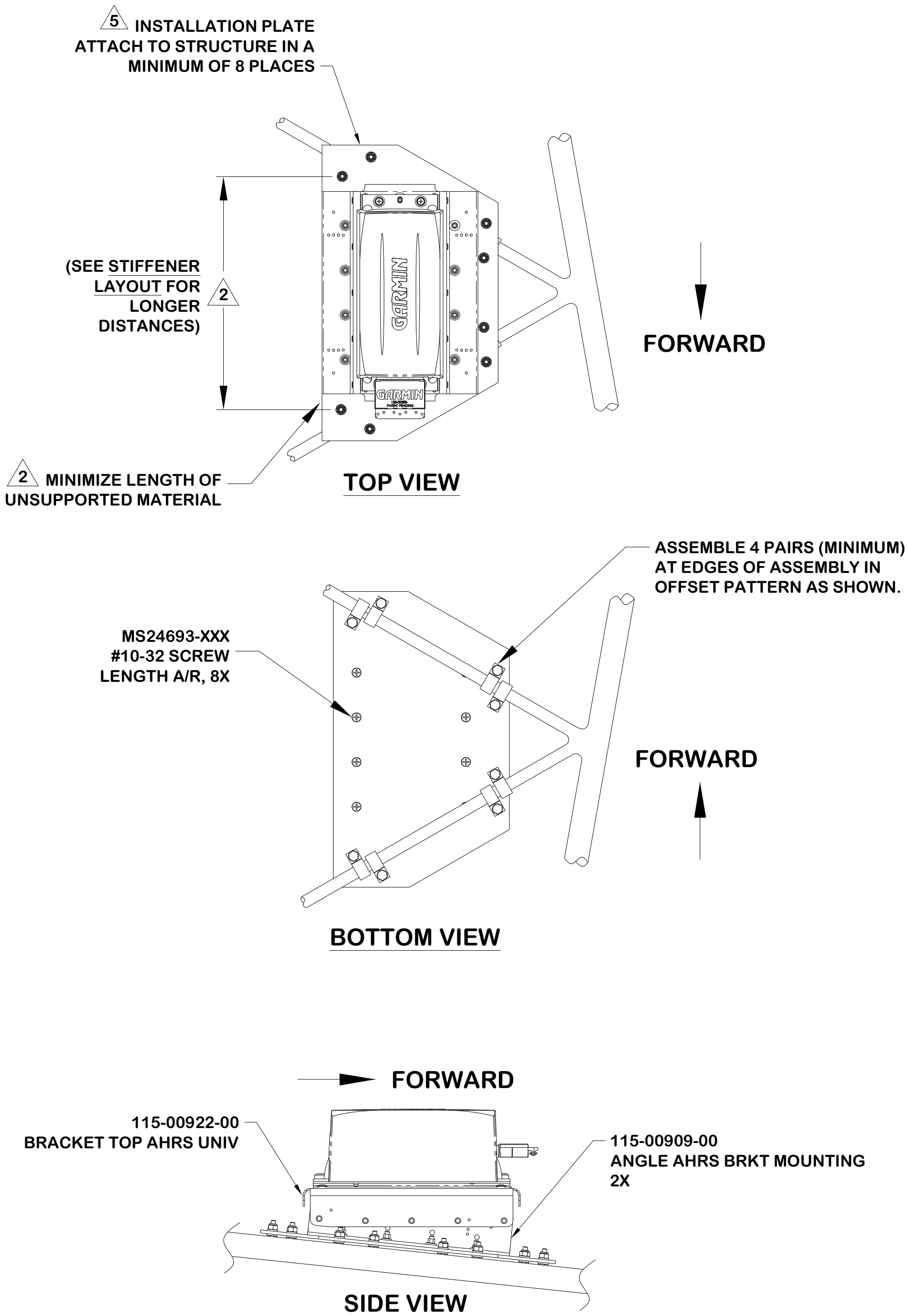
NOTES:

1. WELD TABS TO EXISTING STRUCTURE TO SUPPORT GRS 77 INSTALLATION PANEL. USE MATERIAL APPROPRIATE TO AIRCRAFT CONSTRUCTION.
2. USE #10-32 COUNTERSUNK HARDWARE TO AVOID INTERFERENCE BETWEEN HARDWARE AND STRUCTURES.
3. APPLY CORROSION PROTECTION (EXAMPLE: ZINC PRIMER; ALODINE; ETC. ON ALL SURFACES OF FABRICATED PARTS.

Figure 3-25. Installation of GRS 77 AHRS Universal Mount in Tube and Fabric Aircraft Using Welded Tabs

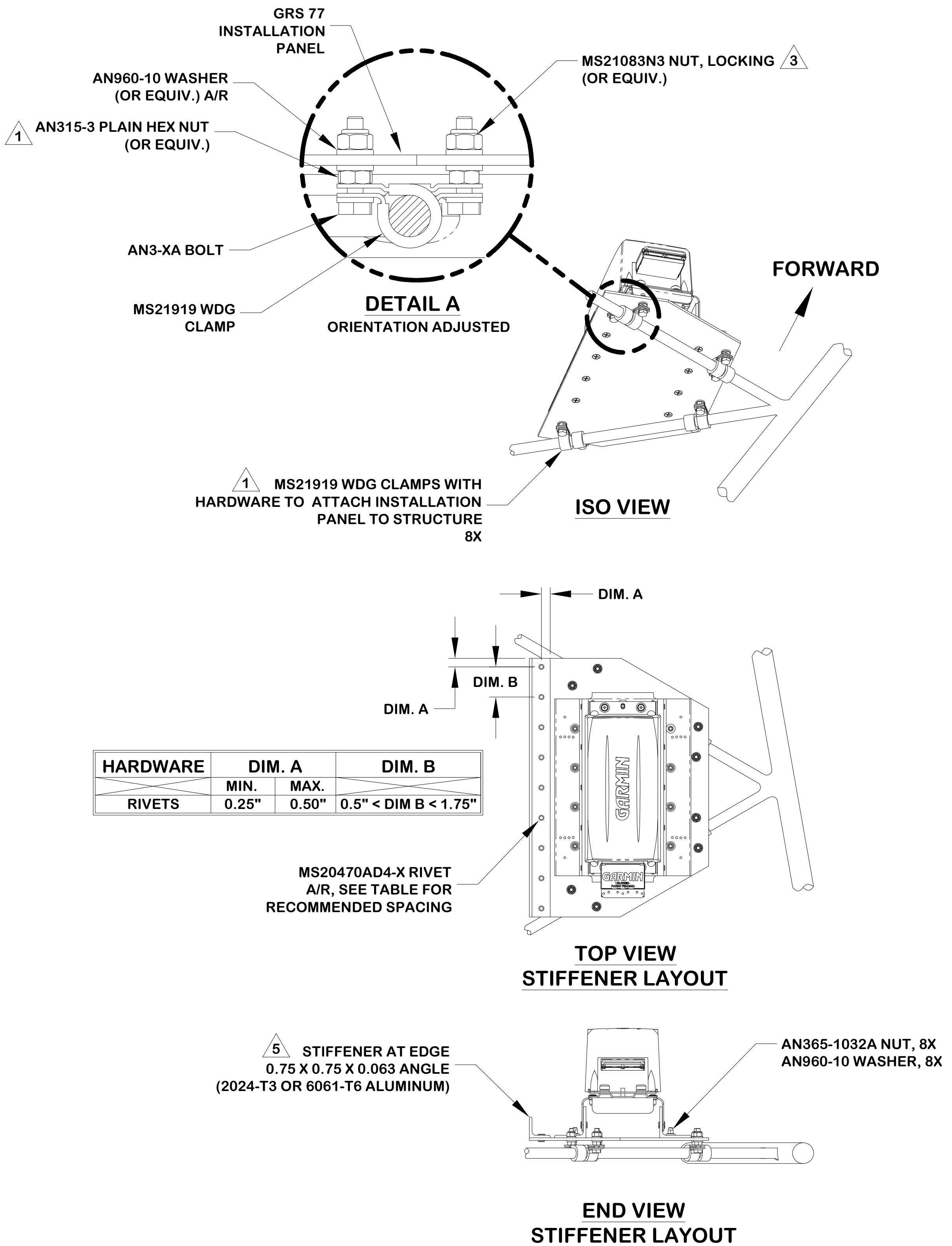
MS21919 Clamps:

1. An alternative method of installation allows for clamps to be assembled to the tube structure for attaching the installation plate.
2. A minimum of four sets of clamps (two clamps per set in offset pattern) are required.
3. An installation plate uses the eight mounting points (four clamp sets) to secure the plate to the airframe. Countersunk screws are used to attach the Universal Mount to the installation plate, to minimize possibility of interference between hardware and the airframe.
4. The installation plate must be at least .125” thickness, 2024-T3. A stiffener may be required dependent on plate length. Reference Figure 3-26.
5. Reference Figure 3-26 for details and illustration.
6. Perform a structural validation test per Section 3.3.



NOTES:
1. USE JAM NUTS IN ASSEMBLY TO SET LOCATION OF CLAMPS PRIOR TO ASSEMBLING INSTALLATION PANEL TO STRUCTURE.
2. IF DISTANCE BETWEEN CLAMP ATTACHMENTS IS GREATER THAN 12", A STIFFENER IS REQUIRED ON THIS EDGE. AN UNSUPPORTED DISTANCE GREATER THAN 16" IS NOT ACCEPTABLE.
3. RECOMMENDED TORQUE IS 20-25 INCH-LBS.
4. RECOMMENDED HARDWARE IS AS NOTED.
5. APPLY CORROSION PROTECTION (EXAMPLE: ZINC PRIMER; ALODINE; ETC.) ON ALL SURFACES OF FABRICATED PARTS.

Figure 3-26. Installation of GRS 77 AHRS Universal Mount in Tube and Fabric Aircraft Using MS21919 Clamps
Sheet 1 of 2



HARDWARE	DIM. A		DIM. B
	MIN.	MAX.	
RIVETS	0.25"	0.50"	0.5" < DIM B < 1.75"

Figure 3-26. Installation of GRS 77 AHRS Universal Mount in Tube and Fabric Aircraft Using MS21919 Clamps
Sheet 2 of 2

3.2.3.2.6 Installation of GRS 77 Universal Mount Using Existing Points from Previously Installed Equipment

For aircraft that have the Bendix/King KG 102/102A unit, Mid-Continent 4305-128 or 4305-150, or Cirrus 14357-001 installed, the mounting pattern is accommodated in the design of the GRS 77 Universal Mount. See Figure 3-27 for detail on how the angles assemble to the main bracket to accommodate the previously-installed equipment locations. These locations may be used for the GRS 77 AHRS installation if they meet the requirements defined in Section 3.2.3.1.

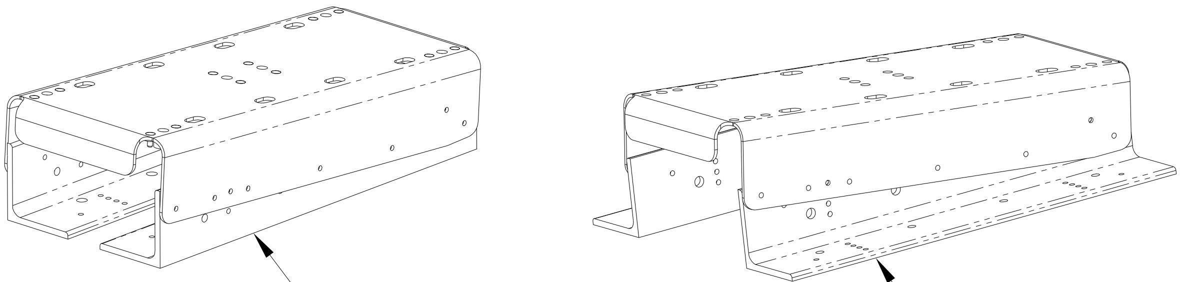


Figure 3-27. Using the GRS 77 Universal Mount in Locations of Previously-Installed Equipment

3.2.3.3 Preparation for Installation without GRS 77 Universal Mount

NOTE

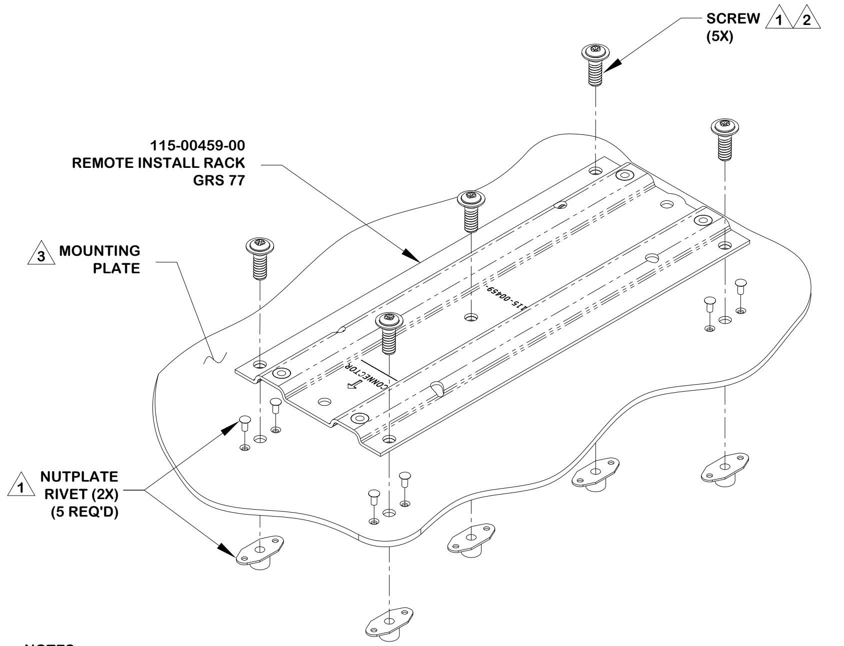
Aircraft structures such as the firewall, bulkhead and support frames are usually perpendicular to the aircraft heading and may be used as reference for determining the relative position of the installation to the aircraft heading.

Position the GRS 77 Mounting Rack to the mounting or installation panel so that it is aligned to the aircraft heading and transfer the hole-pattern to the mounting plate from the angle bracket 5 places. Ensure that the arrow on the mounting rack is facing the forward direction.

Drill the marked hole-pattern (0.210 diameter holes) and rivet nut plates (MS21059L3 or equivalent) with MS20426AD3-X rivets (Countersunk rivets). Ensure that installed rivets are countersunk and are flush with the installation panel. Remove any burrs or excess rivet heads. See Figure 3-28 for illustration and alternate hardware options.

Perform a structural validation per Section 3.3.

Install the Mounting Rack, whichever applies, to the mounting plate using AN525-1032R8 (5 total). The recommended torque is 20-25 inch lbs. Perform a structural validation test per Section 3.3.



NOTES:
1. RECOMMENDED HARDWARE OPTIONS FOR ASSEMBLY:

HARDWARE	SPECIFICATIONS			
SCREWS	AN525-X (#10-32 LENGTH A/R); MS35206-X (#10-32 LENGTH A/R; OR NAS603 (#10-32 LENGTH A/R			
WASHERS	AN960-10; AN960-10L; NAS1149F0332P; OR NAS1149F0363P	OR	NUTPLATES	(M)F5000-3; (M)K1000-3; (M)K2000-3; OR F2000-3
NUTS	AN364-1032A (MS21083N3); OR MS21042L3		RIVETS	MS20426AD3-X

2. RECOMMENDED TORQUE 20-25 INCH-LBS.
3. MINIMUM THICKNESS .063", UNLESS ALUMINUM HONEYCOMB CORE PANEL.

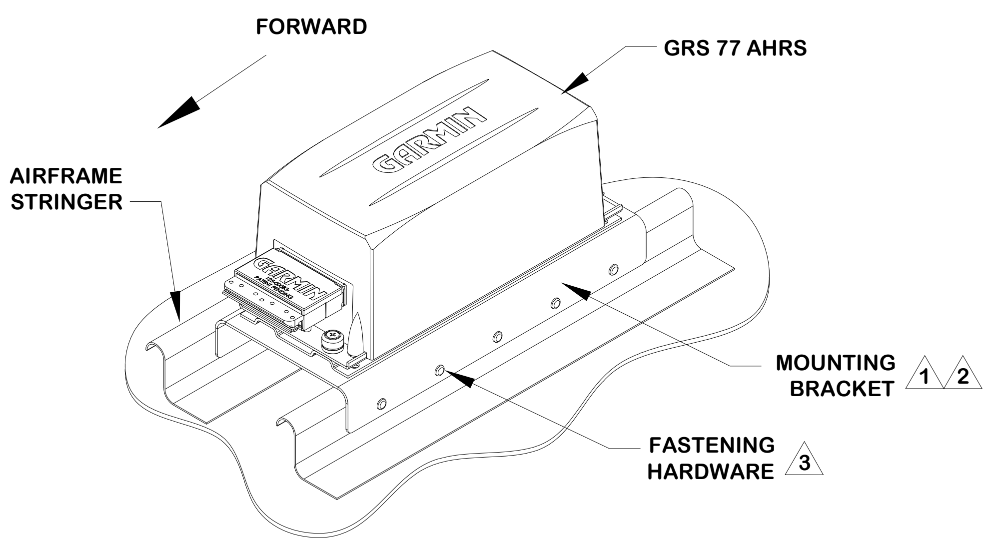
Figure 3-28. Installation of the Mounting Rack to the Mounting Plate

3.2.3.3.1 Mounting Bracket – Attachment to Stringers or Longerons

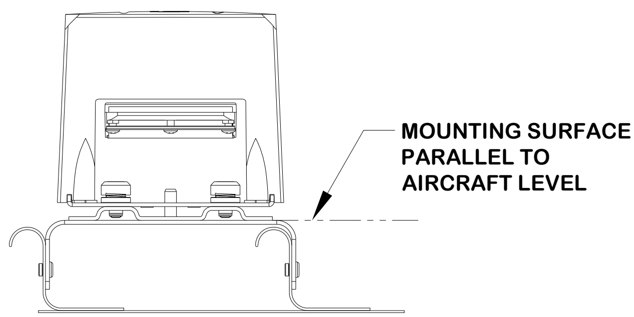
The option of creating a mounting bracket that attaches to stringers or longerons is shown in Figure 3-29. The following items should be considered when creating the mounting bracket:

- Mounting bracket requirements should follow conditions noted in Section 3.2.3.1, unless otherwise indicated.
- Distance between stringers or longerons should be less than 16.0 inches. For a distance between 12.0 and 16.0 inches, use a stiffener down the centerline of the mounting hole pattern (see Figure 3-29). At a minimum, the stiffener should be made of 0.75 x 0.50 x 0.063” angle, with the 0.75” leg used for attachment to the mounting bracket, and should run the length of the bracket. A nutplate for the GRS 77 Mounting Plate (center hole in the 5-hole pattern) may be attached directly to the stiffener. Use MS20426AD3 or MS20426AD4 rivets to secure the stiffener to the mounting bracket. The vertical leg of the stiffener must be at least 0.25” from the skin of the aircraft.
- Ensure at least 3 inches forward of AHRS remains clear for connector and wire harness.
- Fabricate a U-shaped mounting bracket keeping edge flanges as short as possible. The flange should be no more than 0.5 inches higher than the stringers (see Figure 3-29).
- Minimal access to underside of bracket requires use of blind fasteners for the bracket to structure and for the GRS 77 to the bracket.

ISOMETRIC VIEW



VIEW LOOKING AFT



NOTES:

1. USE 2024-T3 SHEET ALUMINIUM, 0.063" THICKNESS OR GREATER. USE A BEND RADIUS APPROPRIATE TO THE MATERIAL TYPE AND THICKNESS. (EXAMPLE: USE BEND RADIUS 0.24" FOR 0.063" THICKNESS 2024-T3 ALUMINUM)

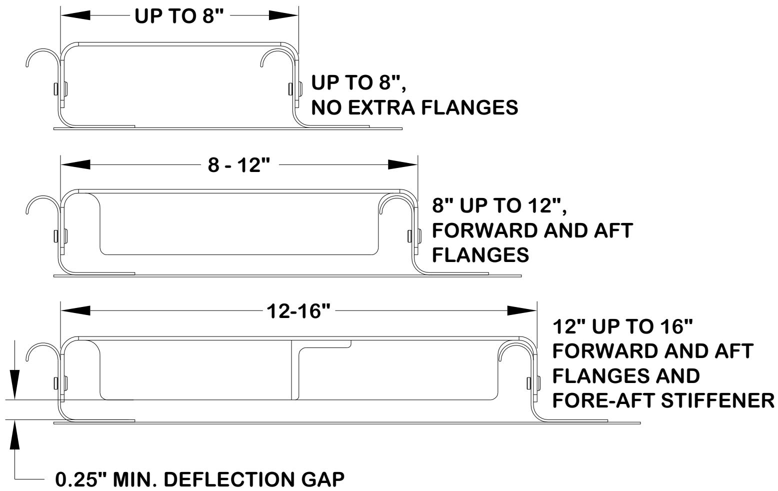
2. APPLY CORROSION PROTECTION (EXAMPLE: ZINC PRIMER; ALODINE; ETC.) ON ALL SURFACES OF PART.

3. A RIGID CONNECTION TO AIRCRAFT STRUCTURE IS REQUIRED. RECOMMENDED HARDWARE OPTIONS ARE:

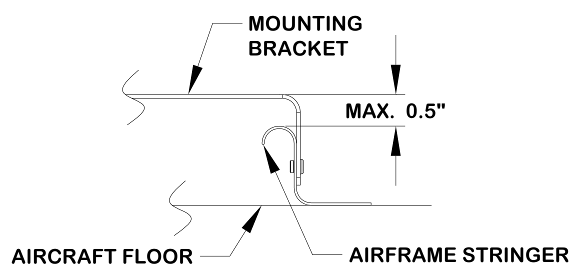
<table>
<tr><th>HARDWARE</th><th colspan="4">SPECIFICATIONS</th></tr>
<tr><td>RIVETS</td><td colspan="4">PREFERRED: CR3213-4-X (CHERRY MAX); OR ALTERNATE: MS20470AD4-X</td></tr>
<tr><td>SCREWS</td><td colspan="4">MS35206 (#6-32 LENGTH A/R); OR NAS601 (#6-32 LENGTH A/R)</td></tr>
<tr><td>WASHERS</td><td>AN960-6; AN960-6L;
NAS1149FN632P;
OR NAS1149FN616P</td><td rowspan="2">OR</td><td>NUTPLATES</td><td>(M)F5000-06; (M)K1000-06;
(M)K2000-06; OR F2000-06</td></tr>
<tr><td>NUTS</td><td>AN364-632A (MS21083N06);
OR MS21042L06</td><td>RIVETS</td><td>MS20426AD3-X</td></tr>
</table>

Figure 3-29. Installation of GRS 77 on Aircraft Stringers (Adapter riveted to Aircraft Skin)
Sheet 1 of 2

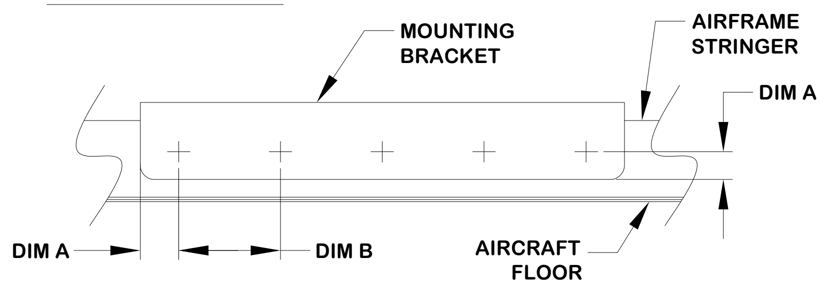
WIDTH DETAIL



MAX. HEIGHT DETAIL



FASTENER SPACING



CORRECT GUIDELINE TABLE:

HARDWARE	DIM. A		DIM. B
	MIN.	MAX.	
RIVETS	0.25"	0.50"	0.5" < DIM B < 1.75"
SCREWS	0.30"	0.50"	0.5" < DIM B < 1.75"

Figure 3-29. Installation of GRS 77 on Aircraft Stringers (Adapter riveted to Aircraft Skin) Sheet 2 of 2

3.2.3.3.2 Modify Existing Floor Panel or Add Mounting Surface to Attach GRS 77 Mounting Plate

Some aircraft may have an existing floor panel, such as in an avionics bay or in the baggage compartment, that is suitable for AHRS installation. Alternately, a simple panel may be installed where existing structure creates a level plane, creating a mounting surface for the GRS 77 AHRS. The following items should be considered when modifying a floor panel or adding a mounting surface:

- The panel to which the GRS 77 is mounted must be rigid enough to not transmit vibrations into the GRS 77. The minimum thickness for sheet metal structure is 0.063 inches. It is acceptable to install the AHRS to honeycomb structure used in some avionics bays.
- If the GRS 77 is installed in an area used for baggage, extra care must be taken to ensure the GRS 77 is protected from damage. This may require fabrication of a protective cover for the GRS 77. At least 0.25" space must exist between the surfaces of the AHRS and associated brackets, and the fabricated cover must not deflect enough to touch the unit when impacted by baggage.
- The GRS 77 Universal Mount is not required when the mounting surface (existing or added) is level with the aircraft level reference.

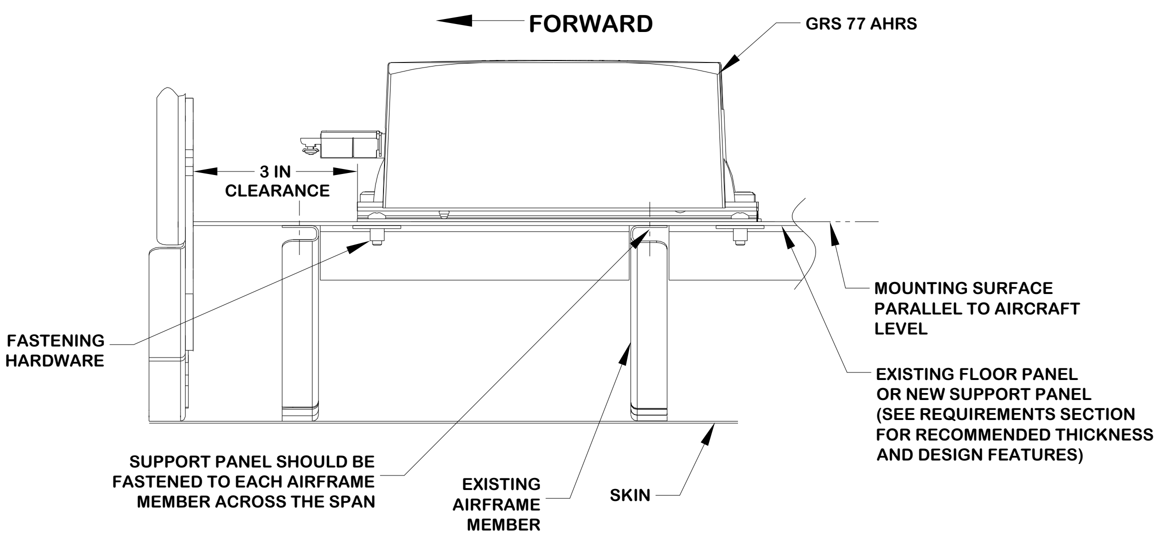


Figure 3-30. Installation of GRS 77 on Existing Floor Panel or Installed Support Panel

3.2.3.3.3 Plate – Attachment to Existing Frame Structure

Some aircraft will have frame members with flanges that face forward or aft, where the flanges for each frame member are at different water lines. This presents several possibilities for the AHRS installation. If the flanges are long enough to install hardware Figure 3-31.

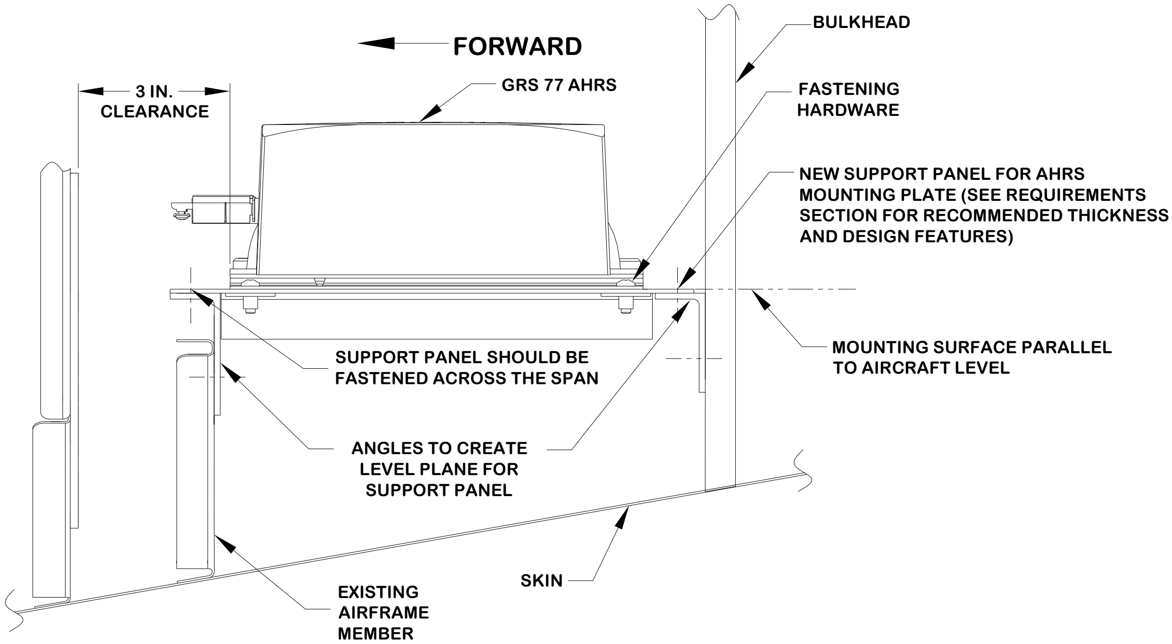


Figure 3-31. Installation of GRS 77 with Installed Support Plate

3.2.3.4 GRS 77 Rack to Unit Flatness Check

NOTE

Place the unit on its rack, and tighten the screw fasteners on one end of the unit to the rack (recommended torque is 22-25 inch pounds), but leave the screw fasteners on the other end of the unit unfastened.

At the unfastened end of the unit, there should now be a gap between the unit baseplate and the rails of the mounting rack. Measure the gap to determine if it is within tolerances. See Figure 3-32. Using feeler gauges, check to ensure that the gap between the unit and each rack rail is at least 0.010 inch, but less than 0.070 inch. See Figure 3-32.

If the gaps between the unit and each rack rail are within tolerance (0.010 inch, but less than 0.070 inch) tighten the remaining two screw fasteners to hold the GRS 77 unit firmly to its rack (recommended torque is 22-25 inch pounds).

If the gap is less than 0.010 inch, or greater than 0.070 inch, then the proper amount of preload will not be exerted on the unit baseplate when the unit is fastened down, and the installation is not acceptable.

Possible causes for a failure of this check include the following:

1. The rack is fastened down to a surface that is not sufficiently flat
2. The rack is warped or damaged
3. The GRS 77 has a center baseplate external shim that is damaged or has been removed
4. The GRS 77 baseplate has been warped or damaged

In the event of a failed test (gap on unfastened end of unit not within the range of 0.010 inch to 0.070 inch), these possibilities must be examined, and any deficiencies corrected to pass this check before the installation is acceptable.

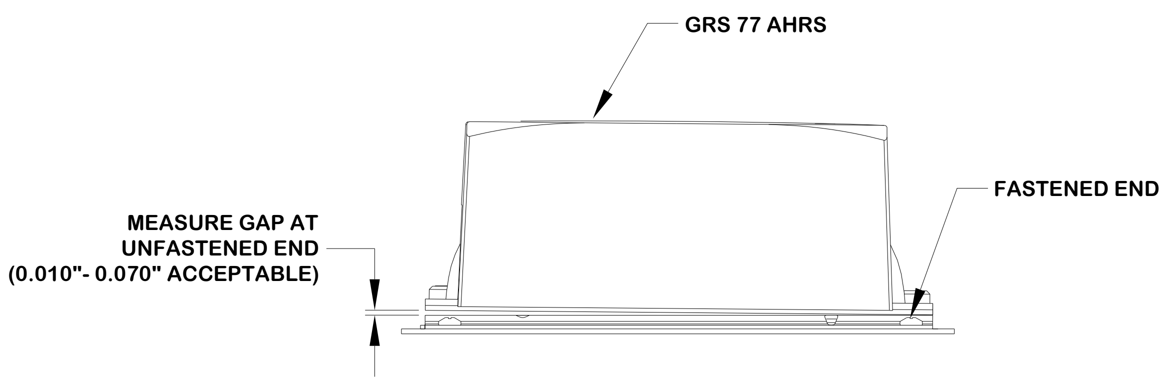


Figure 3-32. Measuring GRS 77 to Mounting Rack with Feeler Gauge

NOTE

Use a #2 Phillips screwdriver to tighten the GRS 77 to the rack, rather than hand tightening the knurled screws. The recommended torque is 22-25 inch pounds.

While installing the GRS 77 unit on its rack, a flatness check is required to ensure that the unit's base is properly preloaded after installation. Perform a flatness check.

After completion and satisfactorily passing the flatness check, tighten the four mounting screws securing the GRS 77 unit to the rack.

Refer to Section 5.5 for system configuration, calibration and checkout.

3.2.3.5 Installation of the GRS 77 AHRS

The GRS 77 AHRS may be installed after the mounting rack has been assembled to the Universal Mount or equivalent support structure and the flatness check is complete. While installing the GRS 77 unit on its rack, a flatness check is required to ensure that the unit's base is properly preloaded after installation. Perform a flatness check per Section 3.2.3.4.

NOTE

Use a #2 Phillips screwdriver to tighten the GRS 77 to the rack, rather than hand tightening the knurled screws. The recommended torque is 22-25 inch pounds.

After completion and satisfactorily passing the flatness check, tighten the four mounting screws securing the GRS 77 unit to the rack. See Figure 3-33.

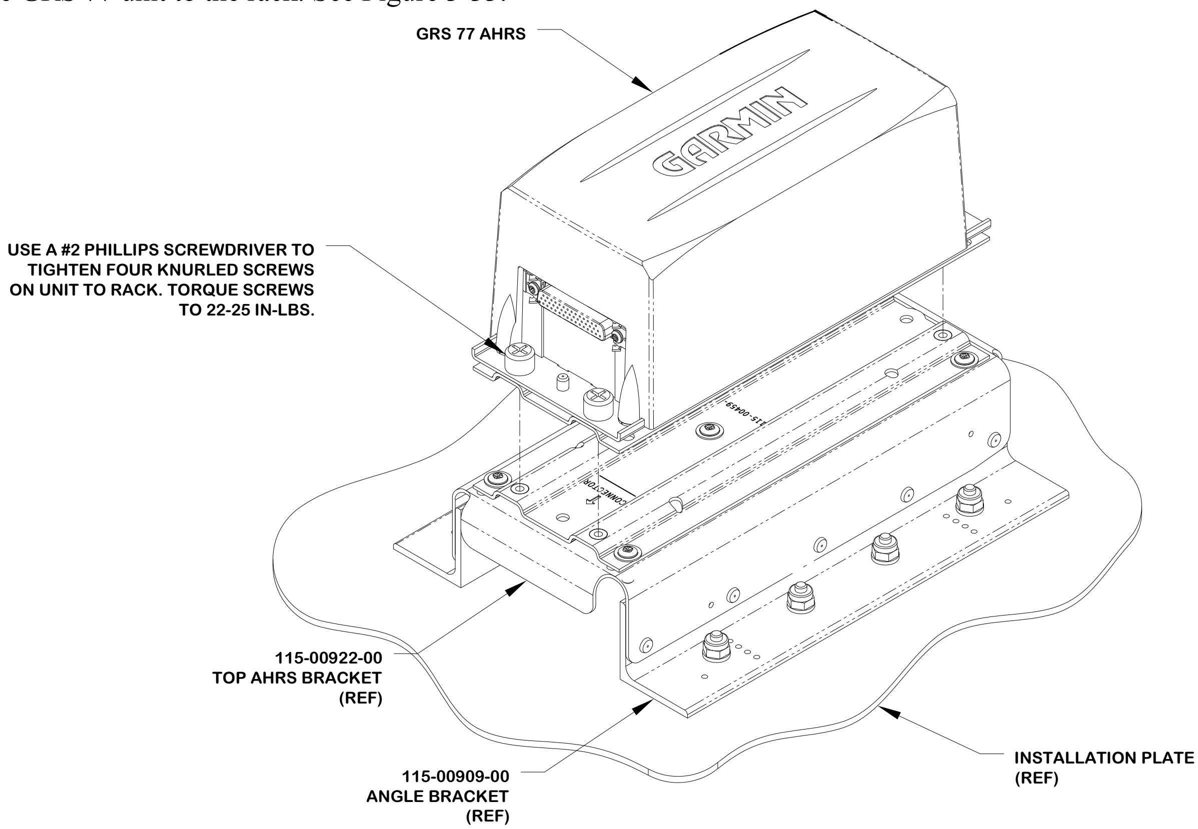


Figure 3-33. GRS 77 Final Installation Example

After the installation is complete, refer to Section 5.5 for system configuration, calibration and checkout.

NOTE

The GRS 77 AHRS will not provide valid outputs until the post installation calibration procedures are completed.

3.2.4 GMU 44 Magnetometer Location and Mounting

Determine a suitable location for the GMU 44 (refer to Section 2.5.11.5 for placement information). Example GMU 44 installations can be found in Section D.2.

The GMU 44 mounting rack must be installed within 3° of the aircraft level reference for pitch and roll. It is preferred that the forward direction of the GMU 44 mounting rack is aligned to within 0.5° in heading of the aircraft forward direction (longitudinal axis). If it is not possible to guarantee this accuracy, installation alignment to within 2.5° in heading is acceptable, in combination with a post-installation heading alignment of the aircraft to a precise heading to determine and set a heading offset. The heading offset procedure is described in Section 5.6.4. For all installations, level and heading alignment will require the use of one of the following:

1. GMU 44 Universal Mount P/N 011-01779-01
2. Fabricated mounting equipment, e.g. brackets, shelves, mounting platform, etc.
3. Or a combination of both.

For the installation of the GMU 44 level the aircraft in both the longitudinal and lateral axes. Refer to the aircraft's maintenance manual for leveling instructions. It is preferred that the aircraft is placed on jacks while leveled to avoid inadvertently placing the aircraft in a non level position when entering, exiting or working the aircraft.

CAUTION

After a location has been selected and a GMU 44 mounting method chosen, a magnetic interference survey must be performed at that location **prior** to fabricating or assembling any parts for the GMU 44 mounting. It is possible that the location will fail the survey and the installation will require a new location, with different installation requirements.

3.2.4.1 GMU 44 Universal Mount (Optional)

GMU 44 Installation may require the use of the GMU 44 Universal Mount P/N 011-01779-01. The GMU 44 Universal Mount allows for level installation and aircraft heading alignment.

The GMU 44 Universal Mount Allows for aircraft level installation of the GMU 44 Magnetometer on mounting structures with inclines up to ±6° in 2° increments and 360° of forward direction offset.

Depending on installation, the GMU 44 may be installed in the following configurations:

1. Installed inside of the GMU 44 Universal Mount
   a) Side Plate Mounted, Figure 3-34
   b) Bottom Plate Mounted, Figure 3-35
2. Installed suspended from the GMU 44 Universal Mount
   a) Side Plate Mounted, Figure 3-36
   b) Bottom Plate Mounted, Figure 3-37

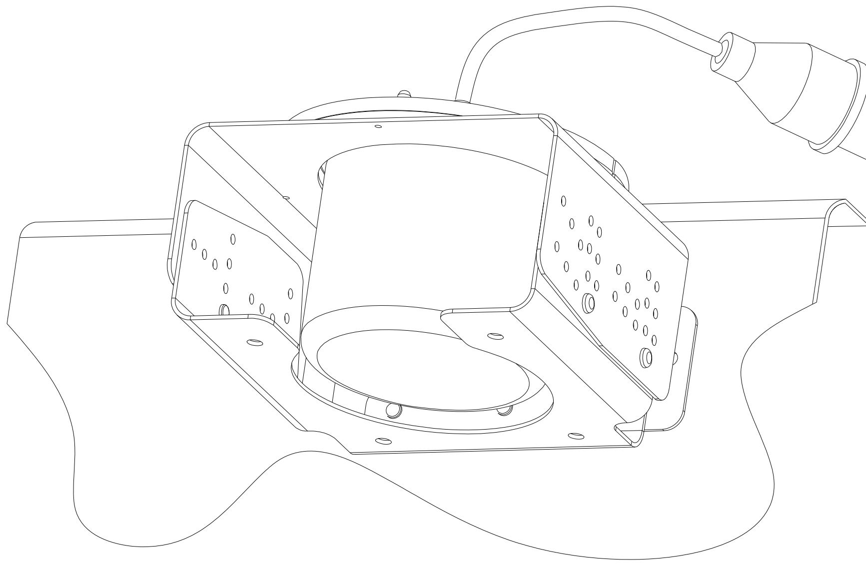


Figure 3-34. GMU 44 Universal Mount, Side Plate Mounted

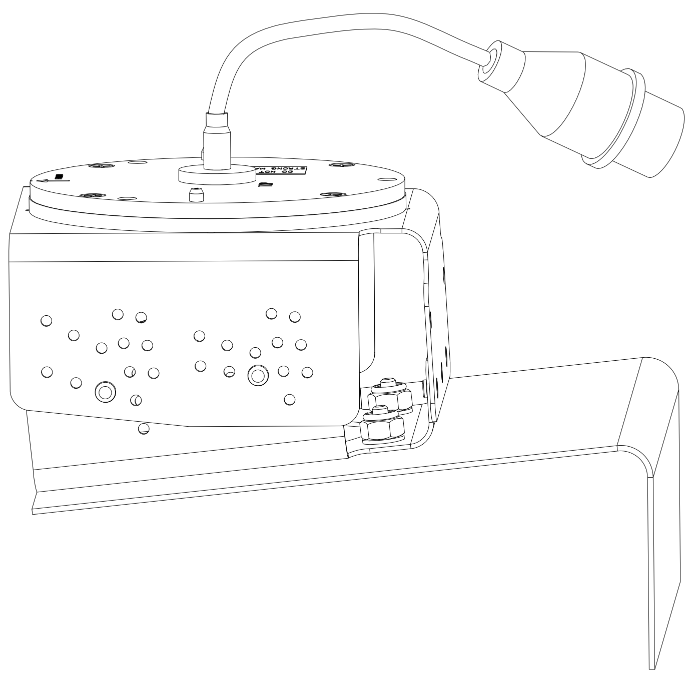


Figure 3-35. GMU 44 Universal Mount, Bottom Plate Mounted

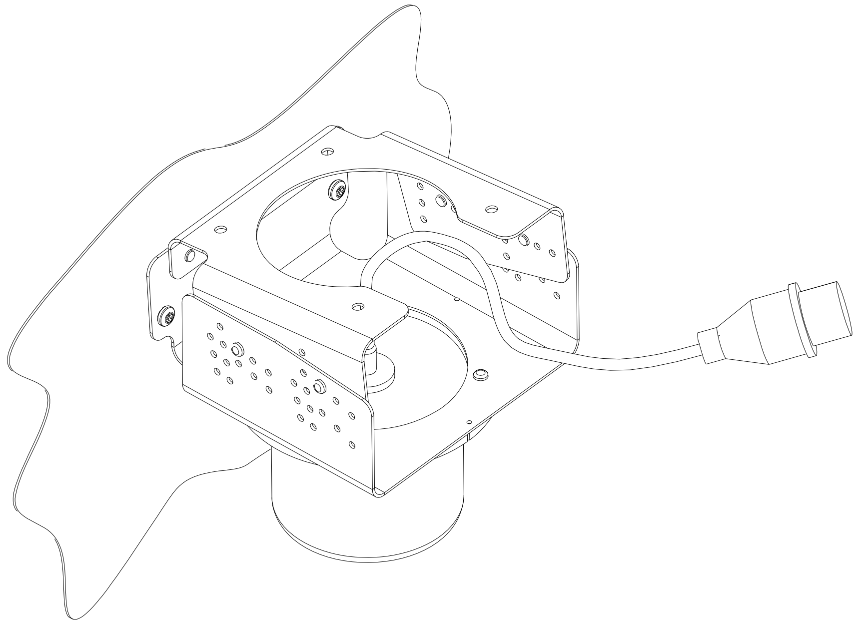


Figure 3-36. GMU 44 Universal Mount, Side Plate Mounted - Suspended

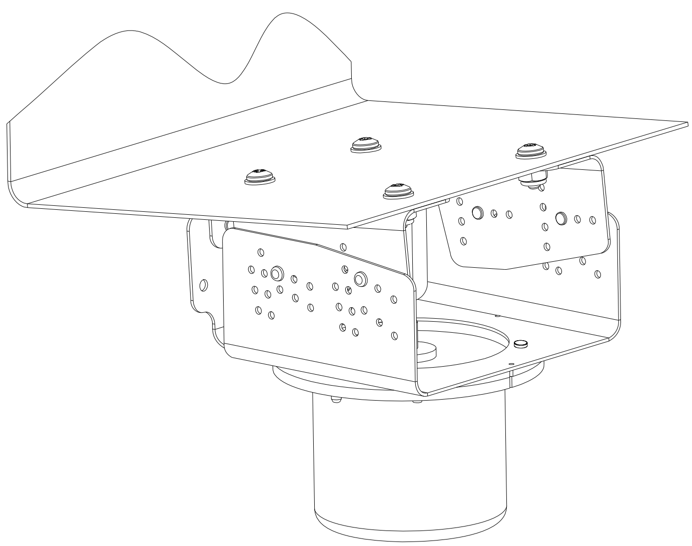


Figure 3-37. GMU 44 Universal Mount, Bottom Plate Mounted – Suspended

For side plate installations (Figure 3-38 and Figure 3-39), Lateral and longitudinal (2 axis) level installation can be accomplished through the level placement of the mounting holes and the incline setting (±2°, ±4° ±6°) of the GMU 44 Universal Mount.

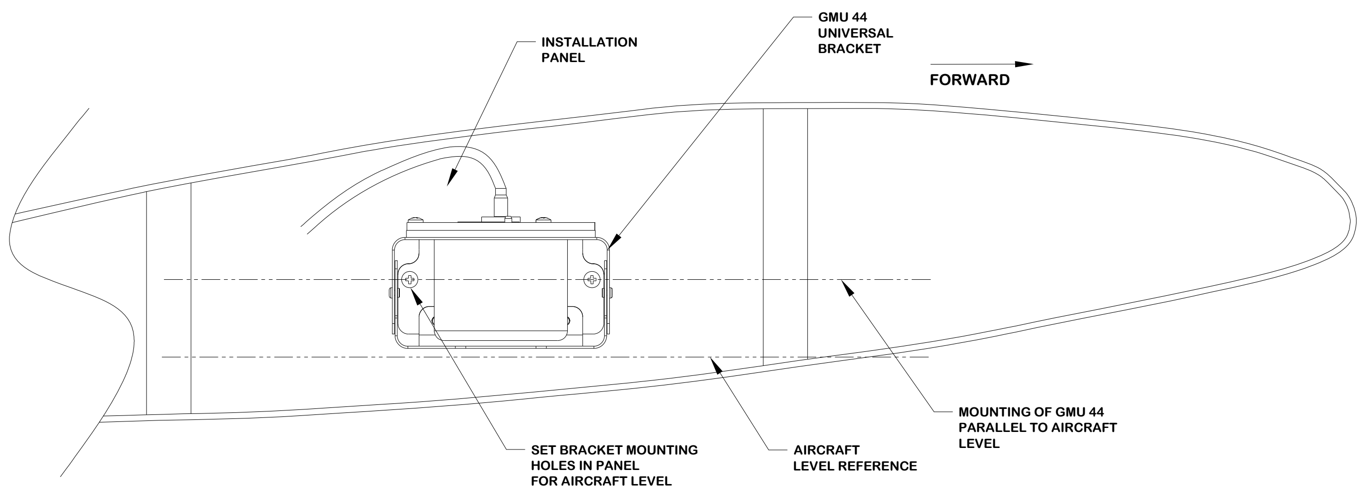


Figure 3-38. GMU 44 Universal Mount Level Installation Axis 1

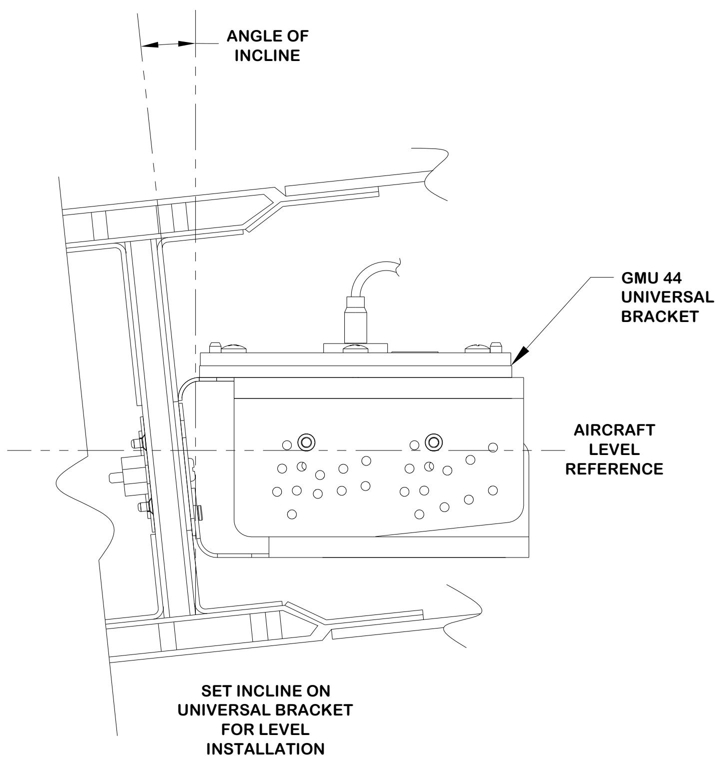


Figure 3-39. GMU 44 Universal Mount Level Installation Axis 2

For bottom mounted installations requiring incline offset on both the lateral and longitudinal axis, level installation can be accomplished through level placement of support equipment, such as mounting brackets, shelves, panels on one axis and setting the incline on the GMU 44 Universal Mount (±2°, ±4°, ±6°) for the other axis. An example is shown in Figure 3-40.

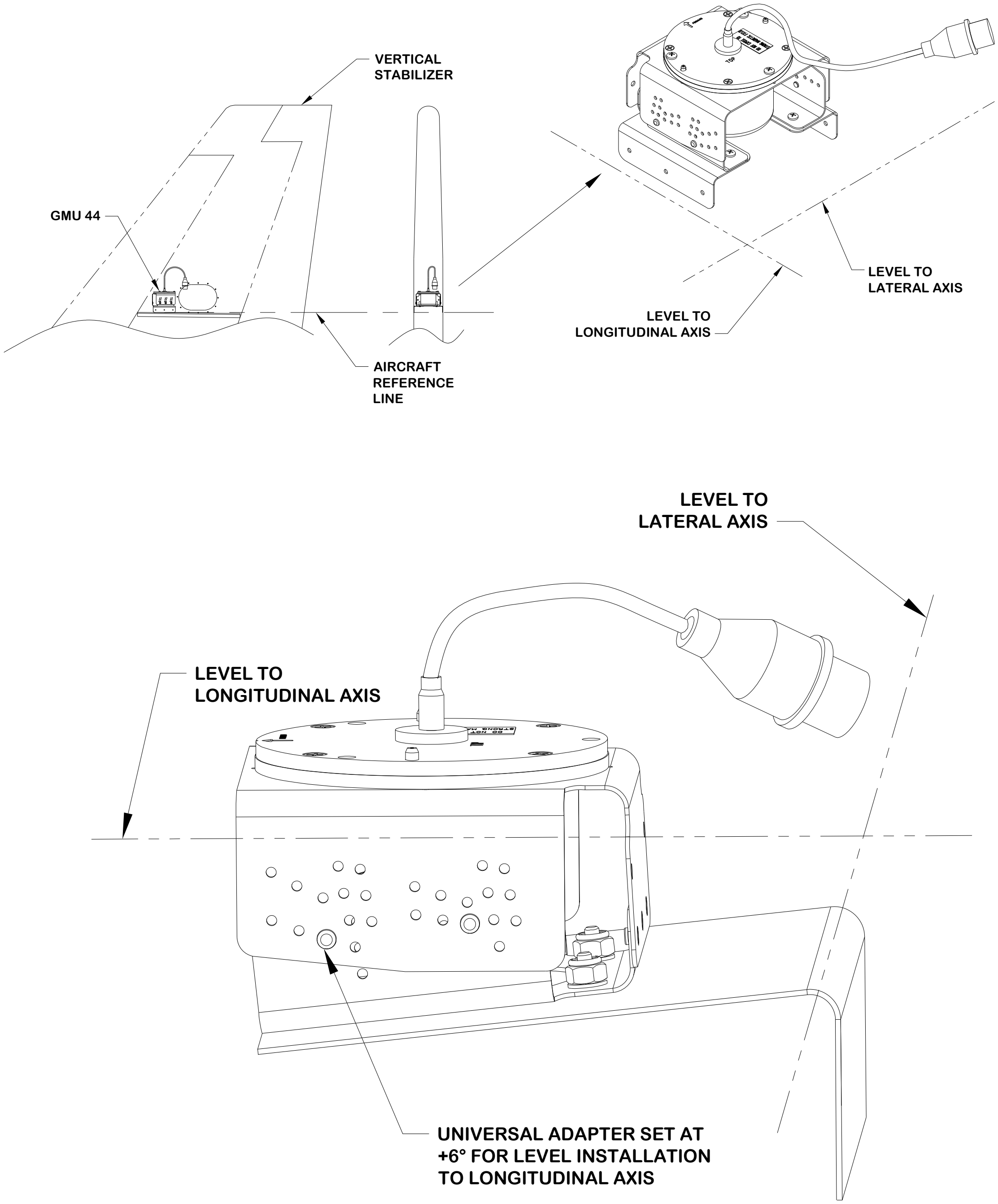


Figure 3-40. GMU 44 Universal Mount Level Installation Using Support Equipment, Examples.

Heading alignment is accomplished by installing the GMU 44 Universal Mount's top plate to the top bracket so that the forward direction is aligned with the aircraft heading.

3.2.4.2 Installation of GMU 44 Magnetometer with GMU 44 Universal Mount

3.2.4.2.1 Assembling the GMU 44 Universal Mount

Use the offset angle calculated from Section 3.2.4.4 to align the top plate to the universal bracket (Figure 3-41) and mark the drill hole-pattern to the bracket; diameter of 0.128 inches, 3 places.

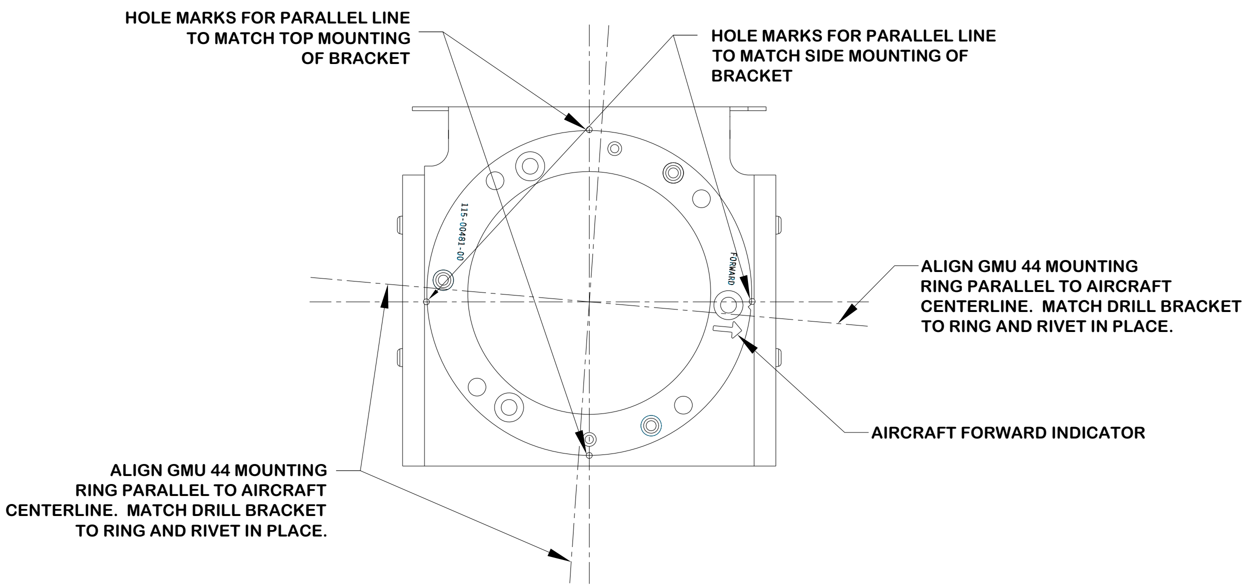


Figure 3-41. Top Plate Alignment to Aircraft Heading

Rivet the installation plate to the top bracket using MS20426AD5-6 rivets (3 Places). See Figure 3-42 and Figure 3-43.

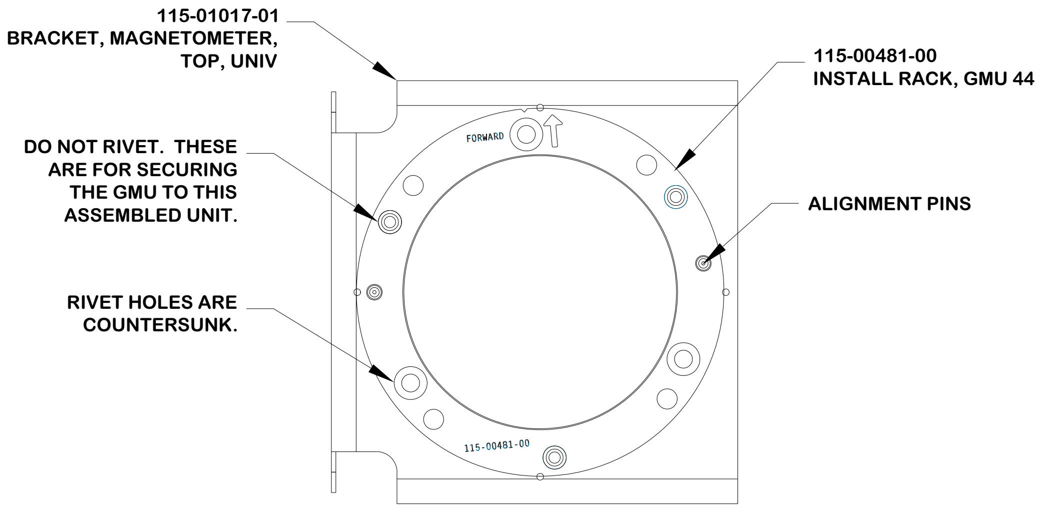


Figure 3-42. Installation Rack Rivet Through Holes

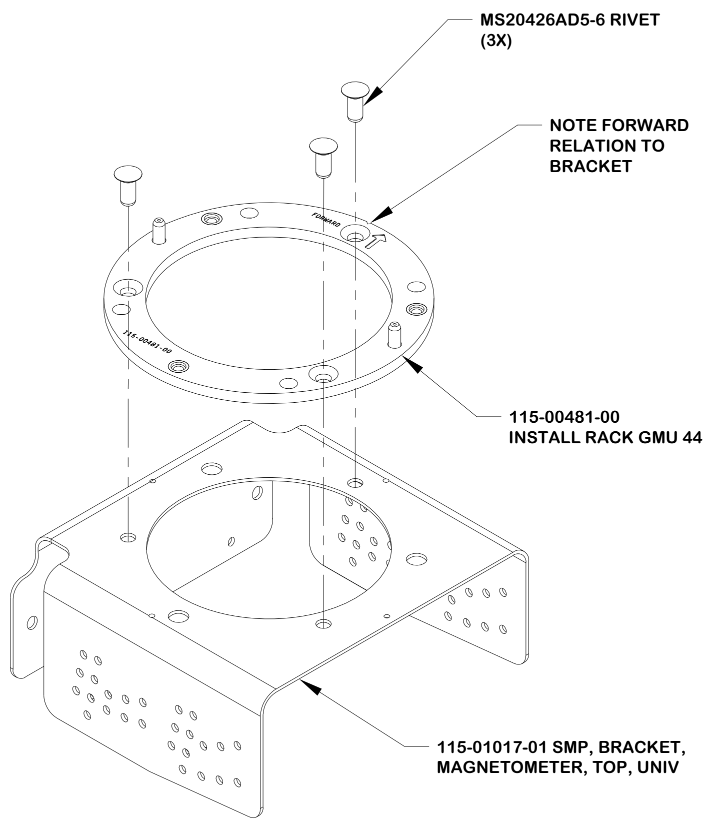
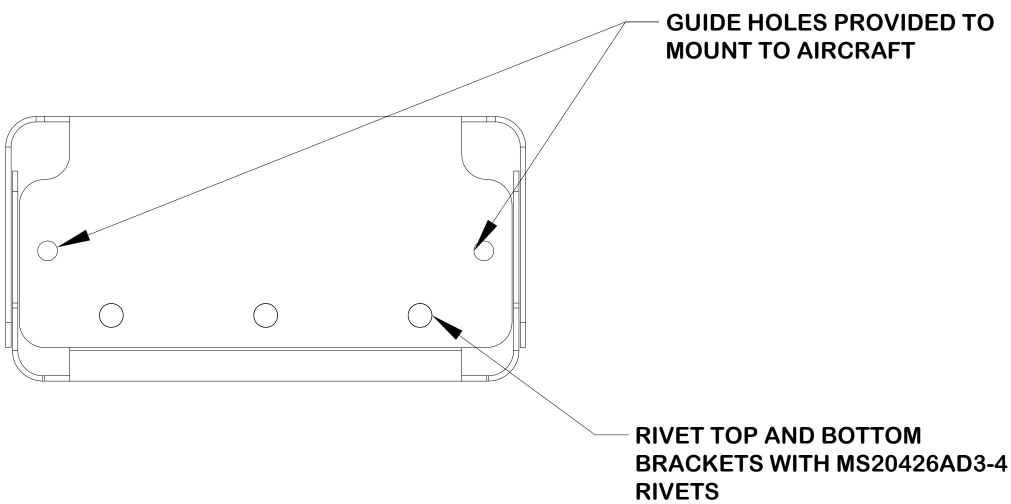


Figure 3-43. Installation Rack to Top Bracket Installation

Assemble the top bracket to the bottom bracket and rivet using MS20426AD3-4 rivets (3 places). See Figure 3-44. Ensure that installed rivets are countersunk and flush. Remove any burrs or excess rivet heads.



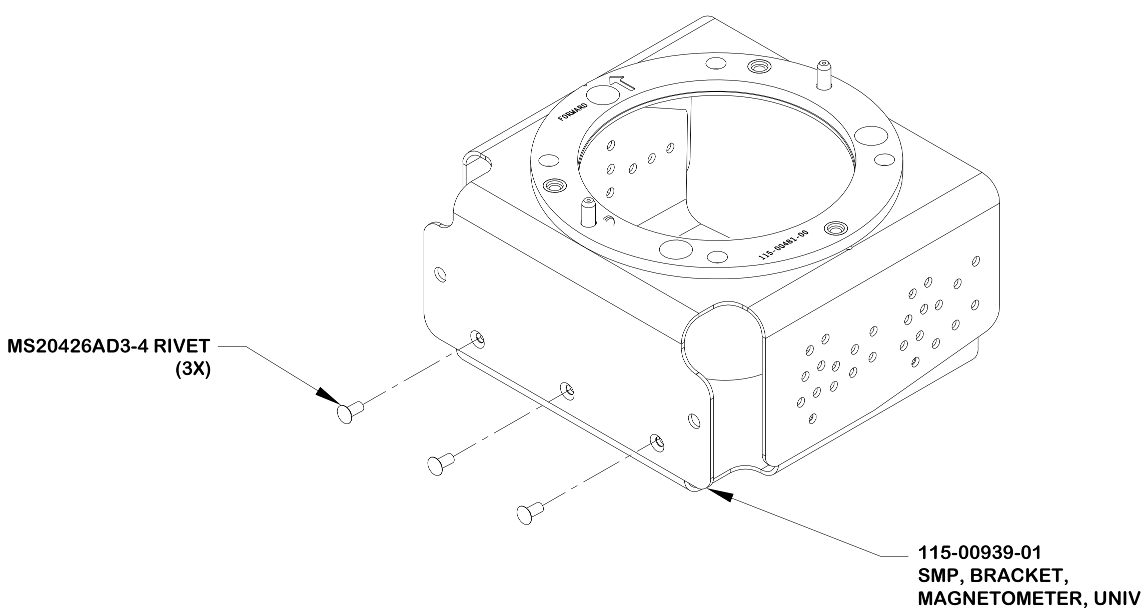


Figure 3-44. GMU 44 Universal Mount Top and Bottom Bracket Assembly

NOTE

The incline of the mounting location may be determined by using a level meter such as the PRO 360 or equivalent. It is recommended to use a level surface on the aircraft itself as reference for a more accurate installation.

Determine and set the incline offset required for level installation. Move the top bracket forward or aft relative to the bottom bracket to achieve desired angle setting for side plate installations or move the top bracket up or down relative to the bottom bracket to achieve the desired angle setting for bottom plate installations. Ensure alignment of holes for desired setting (0°, 2°, 4° or 6°). See Figure 3-45 through Figure 3-49 for details on achieving desired angle settings.

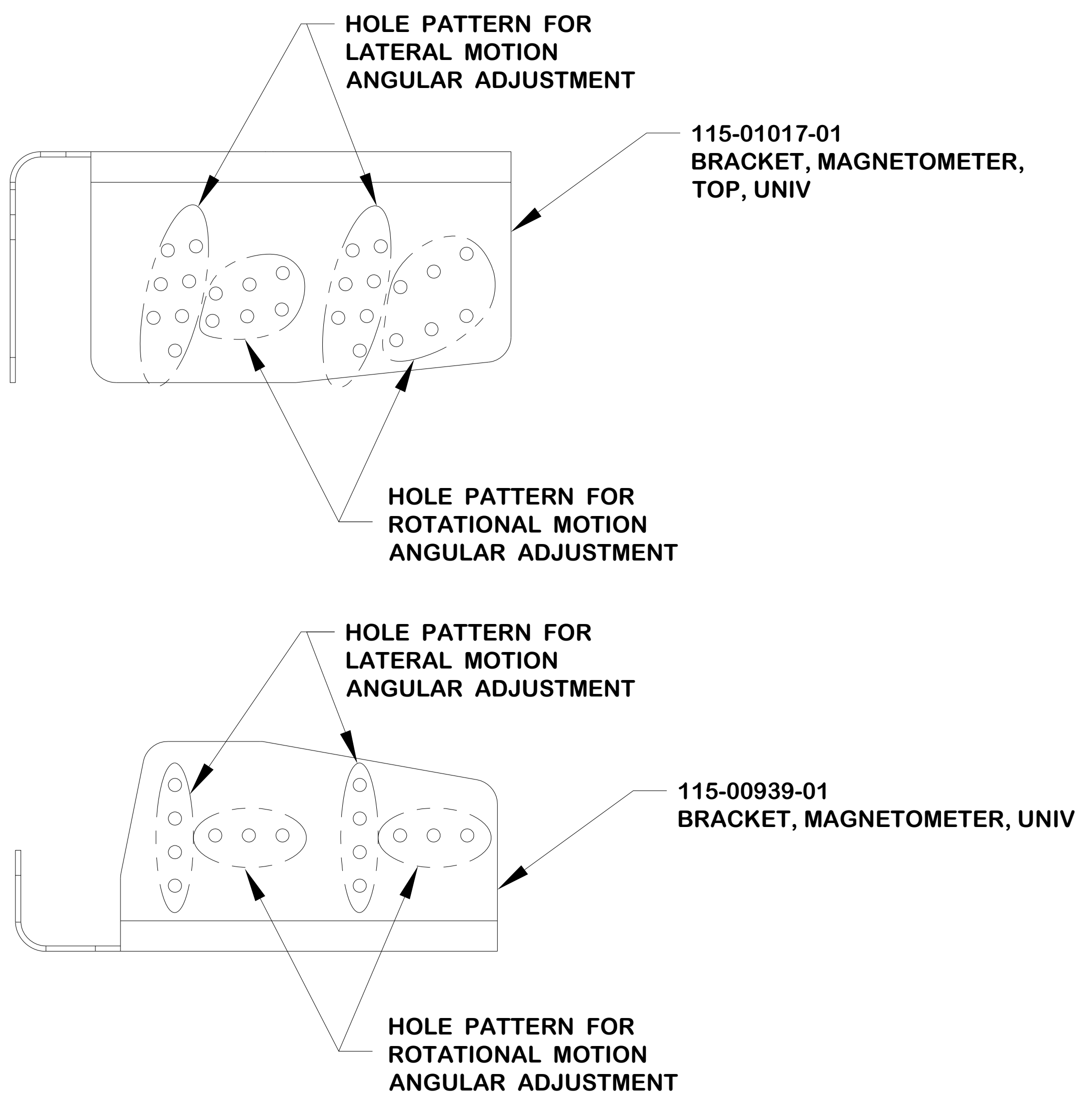


Figure 3-45. GMU 44 Universal Mount Top and Bottom Hole-Patterns

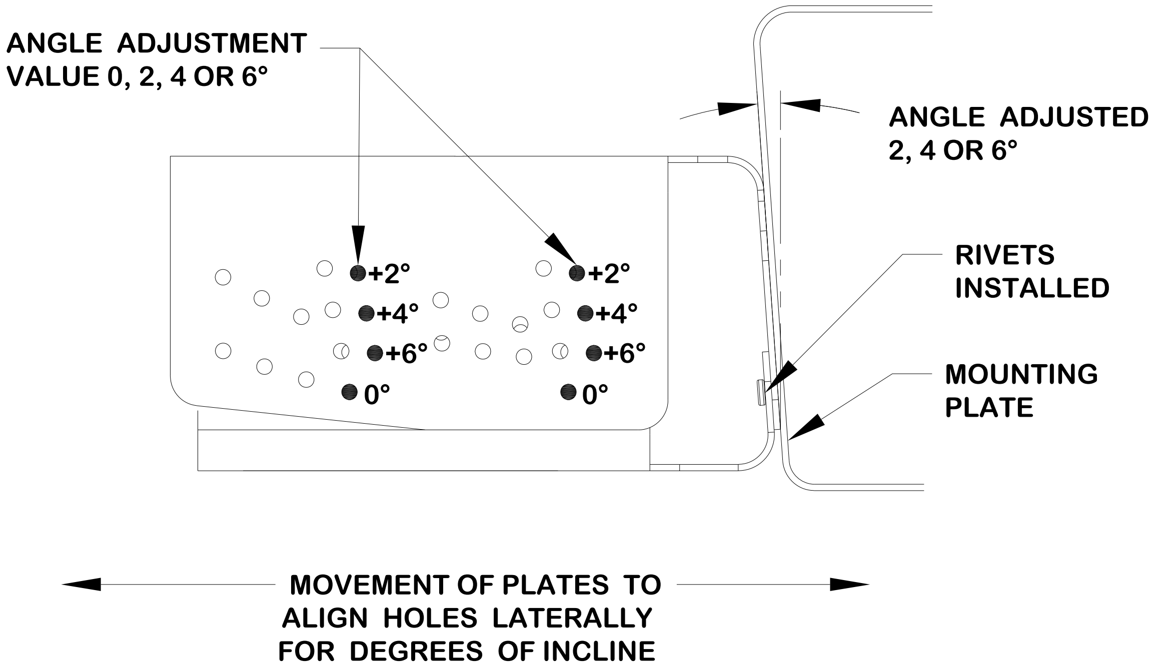


Figure 3-46. GMU 44 Universal Mount Hole Alignment, Lateral Method (Side Plate Mounted)

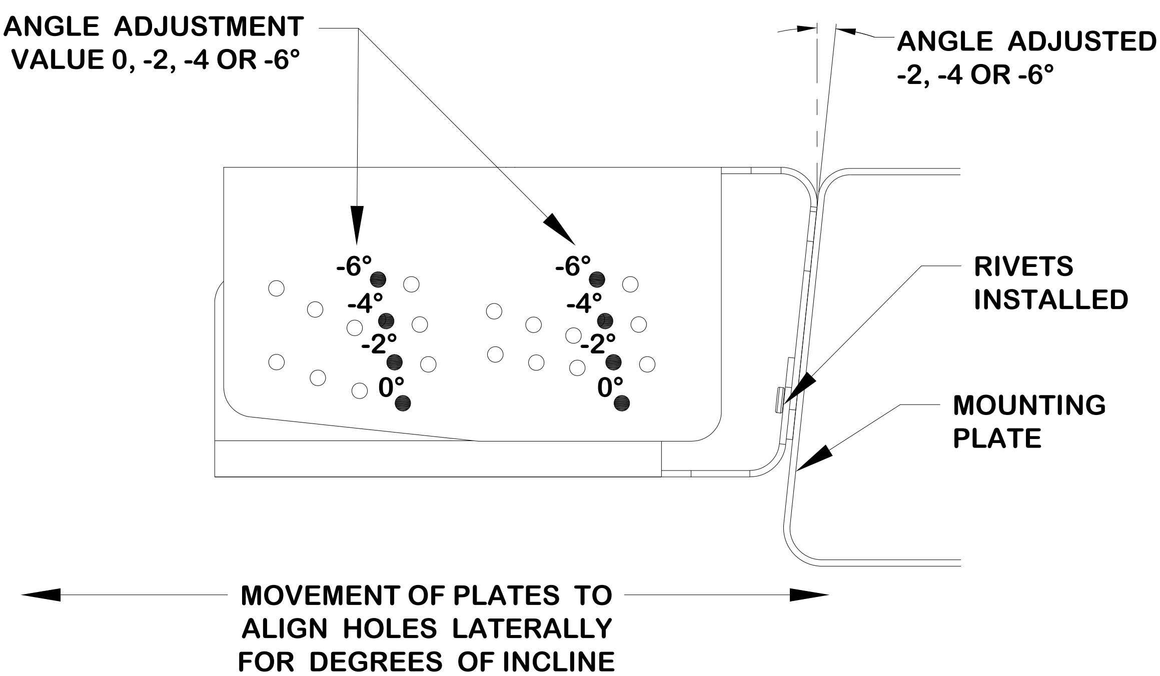


Figure 3-47. GMU 44 Universal Mount Hole Alignment, Lateral Method (Side Plate Mounted)

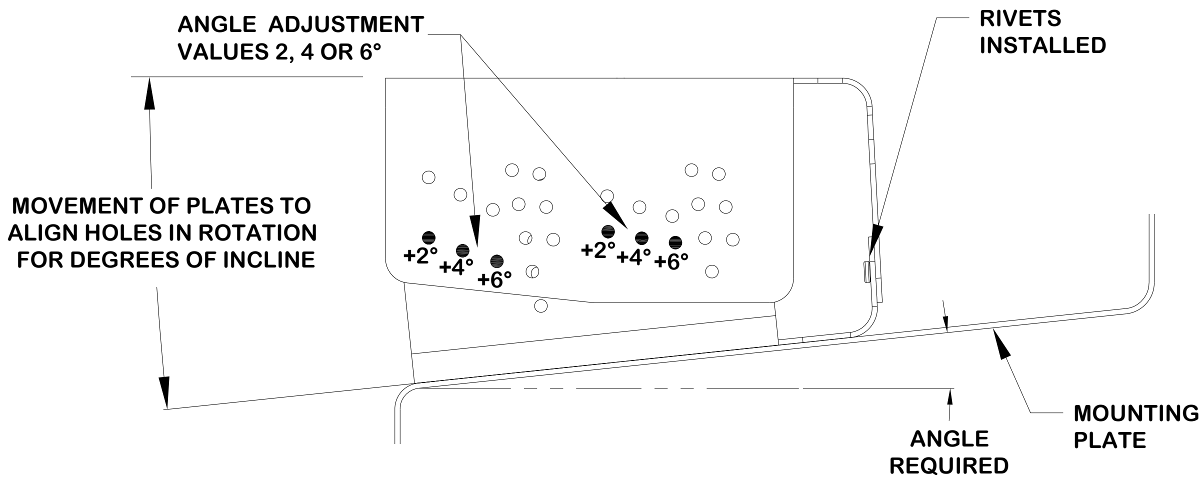


Figure 3-48. GMU 44 Universal Mount Hole Alignment, Rotational Method (Bottom Plate Mounted)

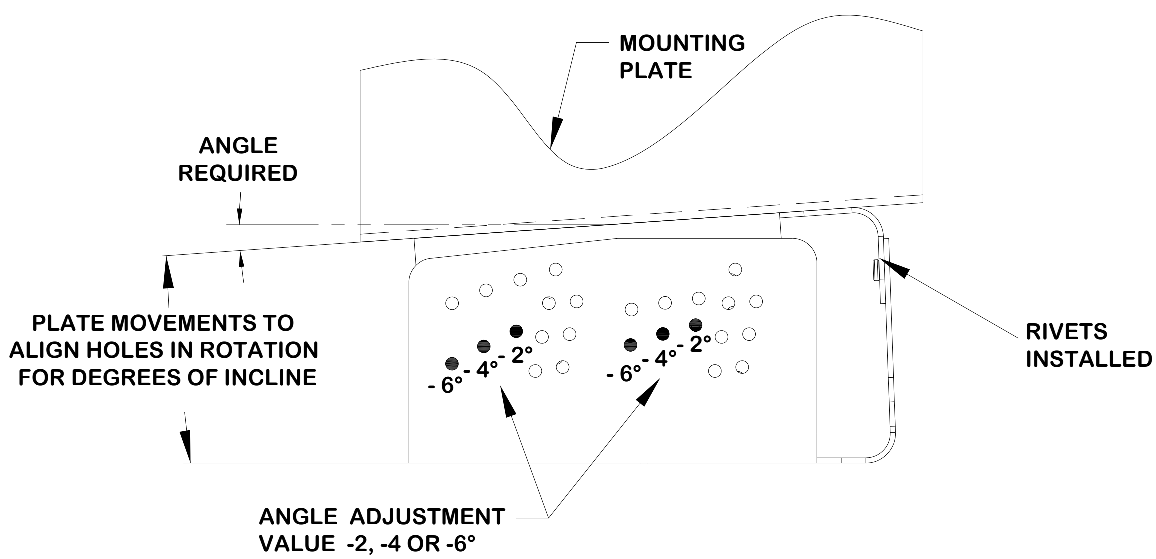


Figure 3-49. GMU 44 Universal Mount Hole Alignment, Rotational Method (Bottom Plate Mounted)

Cleco the desired angle and rivet the top bracket to the bottom bracket on both sides (2 each side) using MS20470AD3-4 rivets as shown in Figure 3-50 and Figure 3-51. Examples are shown in Figure 3-52 and Figure 3-53.

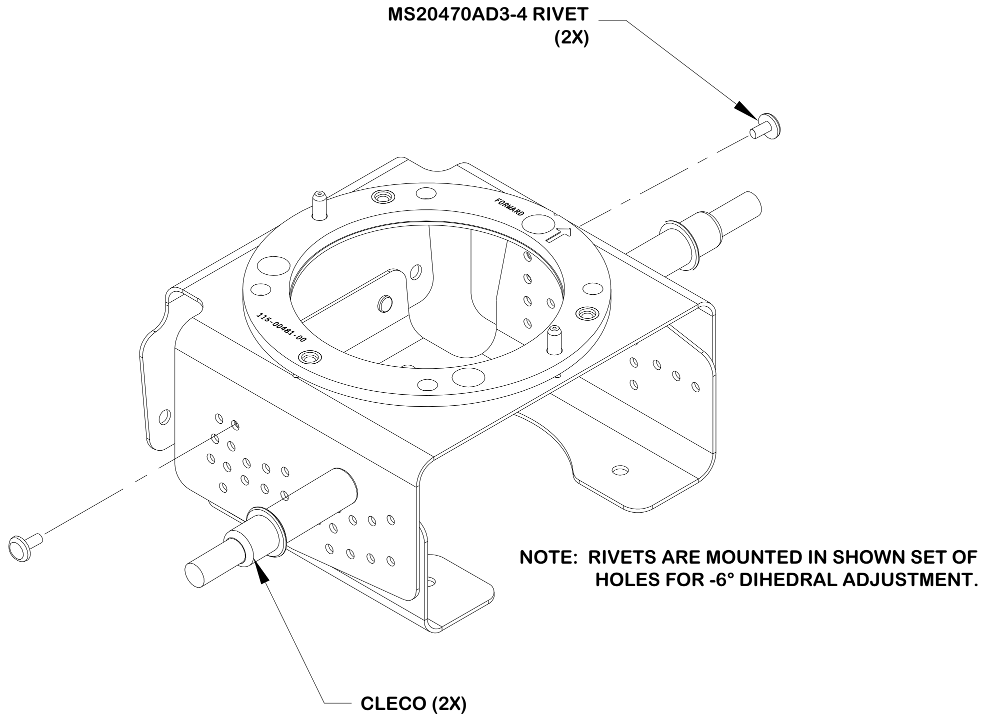


Figure 3-50. GMU 44 Universal Mount Incline Offset Procedure

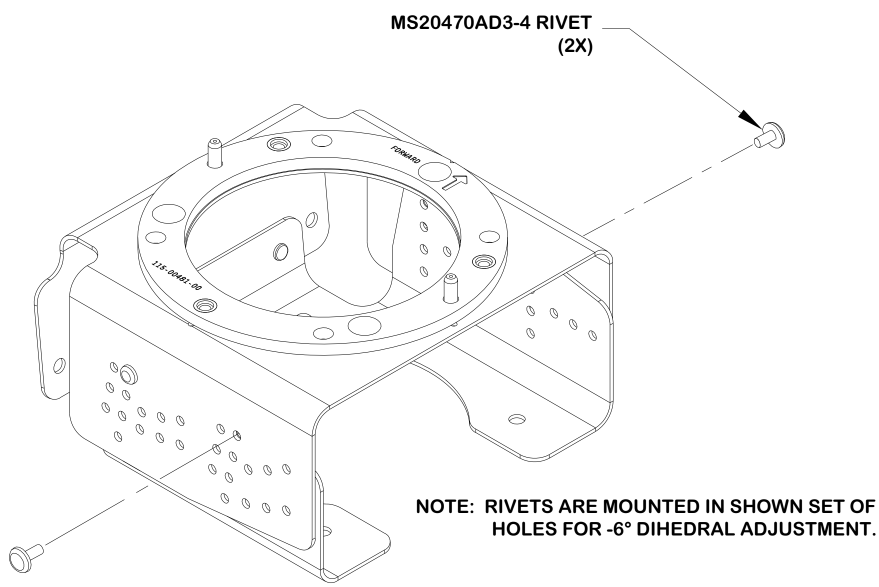


Figure 3-51. GMU 44 Universal Mount Incline Offset Procedure

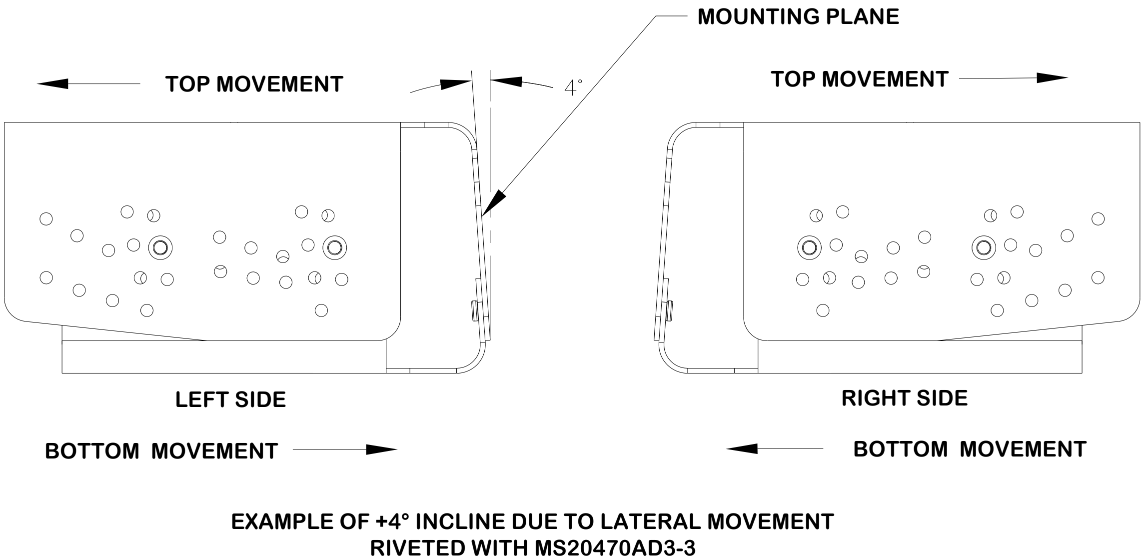


Figure 3-52. Example of a 4° Lateral Incline GMU 44 Universal Mount

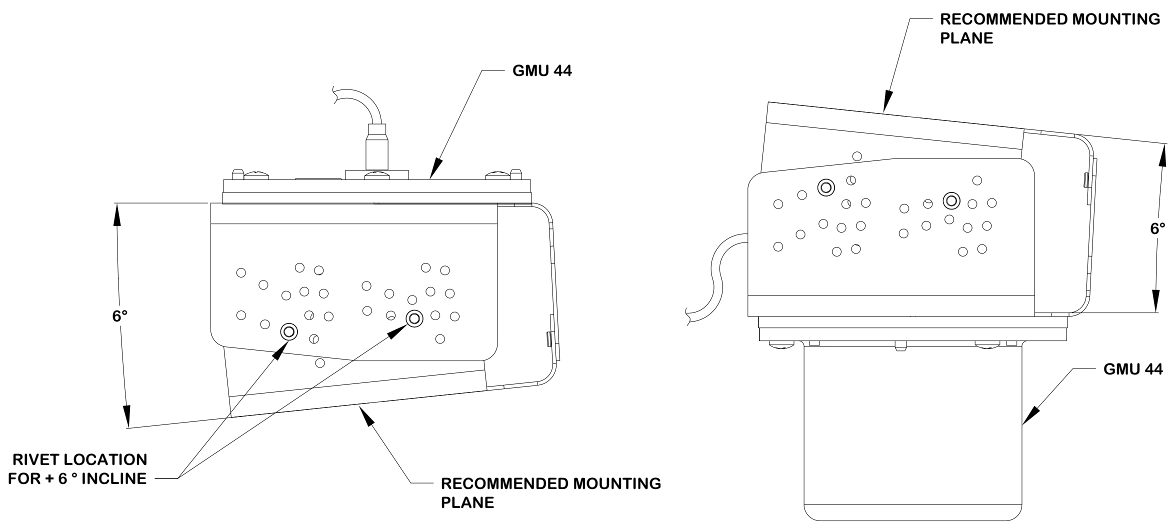


Figure 3-53. Example of a 6° Rotated Incline GMU 44 Universal Mount

Install the GMU 44 into the GMU 44 Universal Mount using three screws P/N 211-60037-08, taking care to tighten the mounting screws firmly. See Figure 3-54.

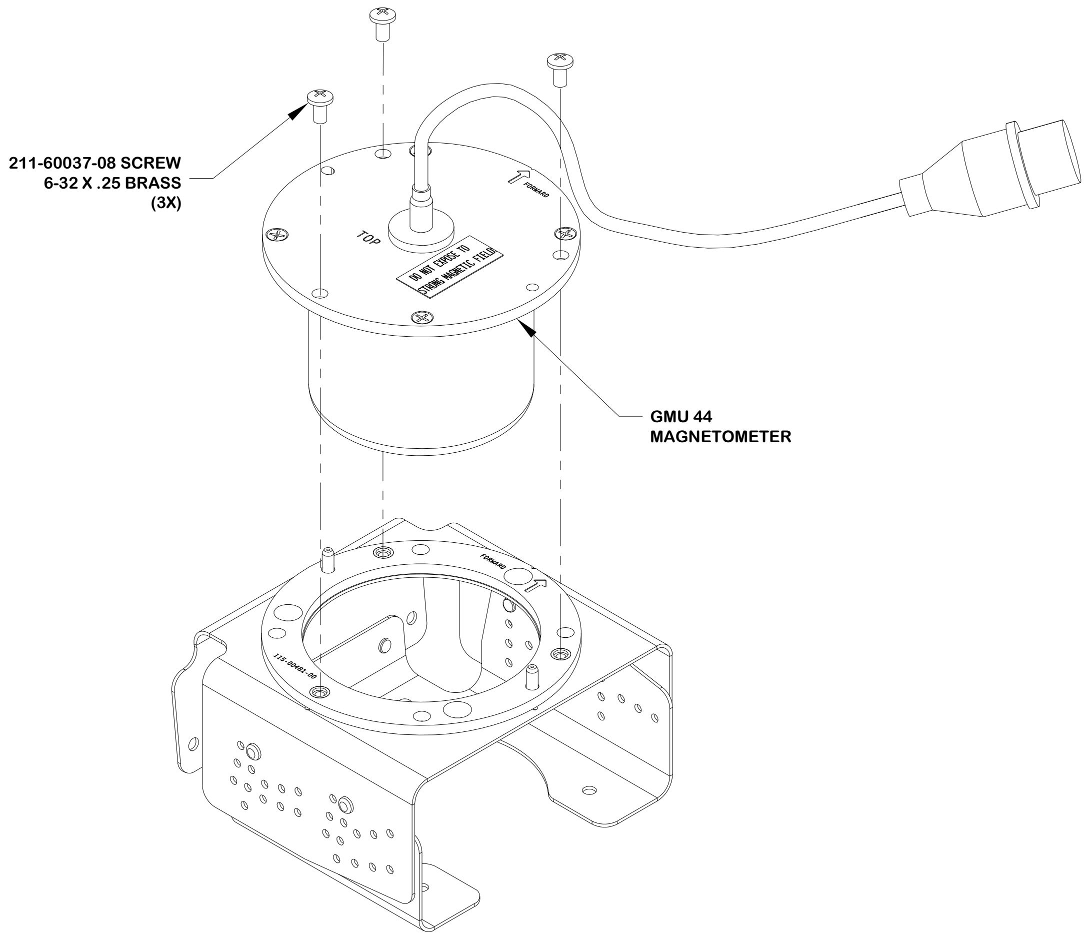


Figure 3-54. Installation of the GMU 44 into the GMU 44 Universal Mount

3.2.4.2.2 GMU 44 Universal Mount Installation

Determine a suitable location for the GMU 44 (refer to Section 2.5.11.5 for placement information). Example GMU 44 installations can be found in Appendix D.
Installation of the GRS 77 requires the aircraft to be leveled both in the longitudinal and lateral axis. Refer to the aircraft maintenance manual for leveling instructions. It is preferred that the aircraft is placed on jacks while leveled to avoid inadvertently placing the aircraft in a non level position when entering, exiting or working in the aircraft.

NOTE

Prior to installing any equipment necessary for the installation of the GMU 44, a Magnetic Interference Survey must be completed to determine if the desired location is acceptable for the installation of the GMU 44 Magnetometer.

Complete the Magnetic Interference Survey per Section 3.2.4.3

NOTE

In most cases support components for the installation of the GMU 44 Universal Mount is not required. For some aircraft that require installing the magnetometer in the vertical stabilizer, support brackets may be required to compensate for the extreme inclines and/or awkward positioning. In such cases it is recommended to provide a level installation using the manufactured brackets or other support equipment, especially if the GMU 44 Universal Mount is secured through the bottom bracket.

If required, install the support components (e.g. manufactured brackets or other equipment used to support the GMU 44 Universal Mount) required for the installation of the GMU 44 Universal Mount in accordance with the aircraft maintenance manual and AC43.13-2A Chapter 2. Verify clearances and requirements per Figure 3-55.

In order to satisfy the structural requirements for the operation of the GMU 44 the following conditions shall be met:

If support racks, brackets or shelves need to be fabricated, they should be fabricated and attached to the aircraft structure in accordance with the methods outlined in the aircraft maintenance manual, AC43.13-2A Chapter 2 and the following requirements:

- Material shall be 2024-T3 sheet aluminum
- Material shall have some type of corrosion protection (primer, alodine, etc.)
- Material shall be a minimum of 0.040” thickness
- Use sheet metal techniques (bend radius, fillets, etc) appropriate to the material thickness and type.

Any supporting structure must be rigidly connected to the aircraft primary structure through strong structural members capable of supporting substantial loads.

Mounting platform shall not span greater than 12” in width or length without direct attachment to primary structure. If mounting platform does span greater than 12”, add necessary stringers, doublers, bulkhead flange reinforcements, etc., to provide adequate support.

Maintain a minimum of 1 1/4” between the top of the GMU 44 unit and any object to ensure clearance for connector and wire harness. Refer to Figure 3-55.

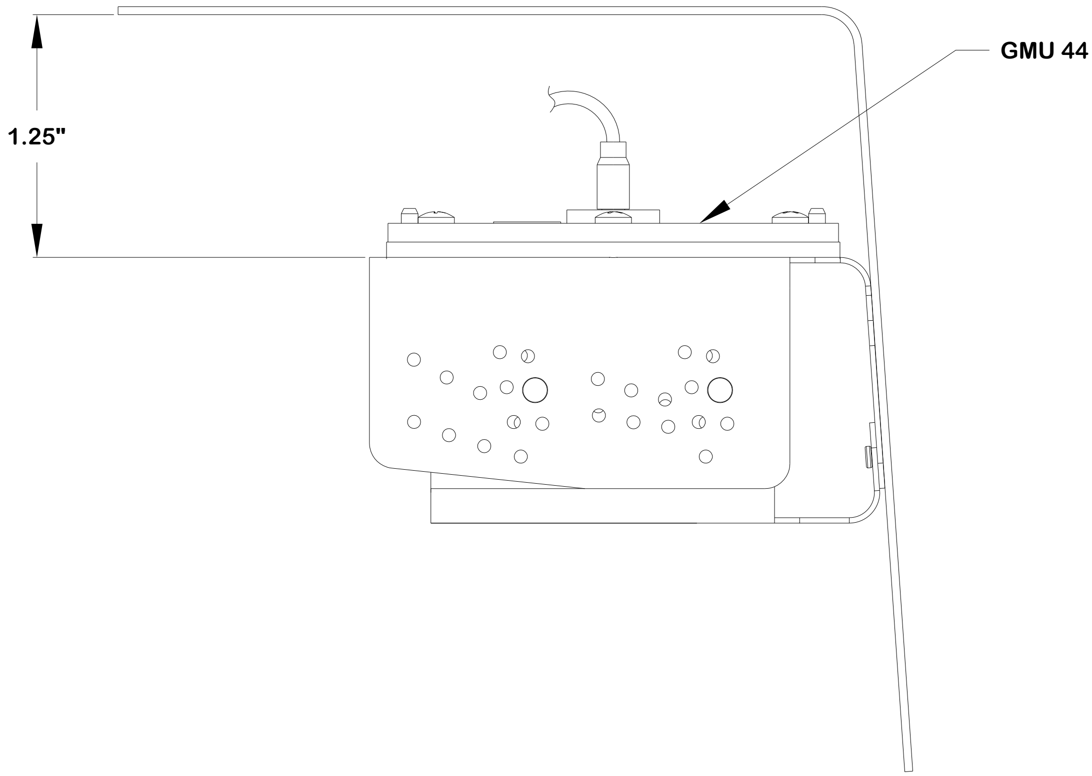


Figure 3-55. GMU 44 Installation Clearance

Determine the angle offset for level installation and heading angle offset for aircraft heading alignment.

The incline of the mounting location may be measured using a level meter such as the PRO 360 or equivalent. It is recommended to use a level surface on the aircraft itself as reference for a more accurate installation.

NOTE

For vertical stabilizer installation, aircraft structures such as the bulkheads and support frames are usually perpendicular to the aircraft heading and may be used as reference for determining the relative position of the installation to the aircraft heading.

For wing installations it may require the transferring of both the aircraft heading reference line and the mounting panel's line to the shop floor for comparison and angle measurement. Refer to Section 3.2.4.4 for typical methods to determine the heading angle offset.

Assemble the GMU 44 Universal Mount per Section 3.2.4.2.1.

NOTE

For GMU 44 Mounting examples see Section D.2.

For side plate installations, position the GMU 44 Universal Mount on the aircraft mounting structure. Transfer the hole-pattern from the side-plate of the GMU 44 Universal Mount to the mounting structure (0.144” diameter drill holes, two places). See Figure 3-56, left side.

For bottom plate installations, drill four holes (0.128” diameter) on the bottom plate (two on each side) of the GMU 44 Universal Mount. Position the GMU 44 Universal Mount on the mounting platform. Transfer the hole-pattern from the bottom plate of the GMU 44 Universal Mount to the mounting plate (0.144” inch diameter, four places). See Figure 3-56, right side.

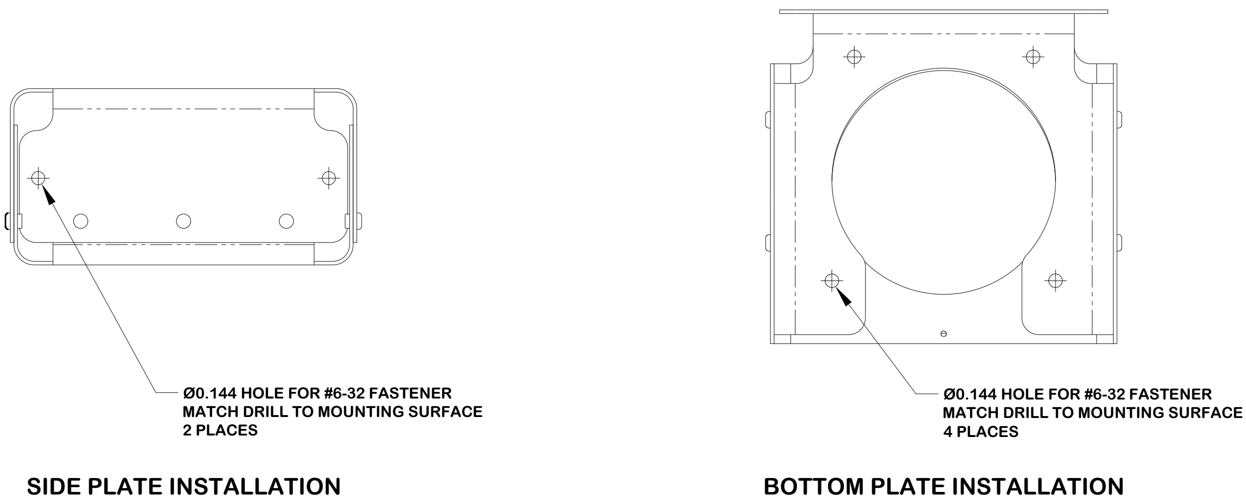


Figure 3-56. Possible Hole-Patterns on the GMU 44 Universal Mount

NOTE

For installations that have the clearance and access to install and remove the GMU 44 without disturbing the GMU 44 Universal Mount, the GMU 44 Universal Mount may be installed on the mounting platform prior to installing the GMU 44 on it. In this case, rivets may be used to secure the GMU 44 Universal Mount to the mounting platform since removal of the GMU for maintenance or replacement will not require the removal of the GMU 44 Universal Mount. When using rivets, use CR3242-4 (Length A/R) Cherry Max rivets or MS20470AD5 Solid Universal Head rivets. It is acceptable to oversize the holes in the Universal Mount brackets to a #21 drill size (0.159”) for installation of MS20470AD5 rivets.

NOTE

Installation hardware for the GMU 44 Universal Mount should be non-magnetic. Acceptable nutplates include #6-32 variations of the following: MS21048, MS21050, MS21052, MS21054, MS21056, MS21058, MS21060, MS21070, MS21072, and MS21074. Do not use floating nutplates. Acceptable nuts include #6-32 variations of the following: AN363C, AN364C, or AN365C. Acceptable screws include MS5197, #6-32, length as appropriate. Acceptable washers include AN960C-6, AN960C-6L, AN960PD-6, AN960-PD-6L, or their NAS equivalents.

Rivet nut plates (MS21059L3) with MS20426AD4-6 rivets (Countersunk rivets) onto mounting platform. Ensure that installed rivets are countersunk and are flush with the installation panel. Remove any burrs or excess rivet heads. In some cases, such as with composite aircraft, self locking nuts may be used instead of rivet nuts.

Install the GMU 44 into the GMU 44 Universal Mount using hardware included in the GMU 44 Installation Kit. The recommended torque is 12-15 inch lbs.

The metal components in the GMU 44's connector may slightly affect the magnetic field sensed by the GMU 44. Place the connector at least 2 inches from the body of the GMU 44 to minimize this effect. After attaching the GMU 44's connector to its mate in the aircraft wiring, secure the connector in place using good installation practices. This will ensure that any remaining magnetic effect can be compensated for using the Magnetometer Calibration Procedure in Section 5.6.

After the installation is complete, refer to Section 5 for system configuration, calibration and checkout.

NOTE

The GMU will not provide valid outputs until the post installation calibration procedures are completed.

3.2.4.3 Magnetic Interference Survey

CAUTION

Do not permanently rivet the GMU 44 Universal Mount together. Use rivets held in place with tape to hold GMU 44 Universal Mount together temporarily. Clecos, clamps or other devices that are metal or magnetic should not be used. It is possible that the location will fail the survey and the installation will require a new location, with a different incline.

Temporarily assemble the GMU 44 Universal Mount per section 3.2.4.2.1 for level installation using tape to hold rivets in place. Set the GMU and installation rack onto the GMU 44 Universal Mount. It is preferable to have the GMU 44 forward direction aligned to the aircraft heading, but not required. Place the GMU 44 and GMU 44 Universal Mount on the desired installation location and secure in place using tape. Do not use clamps or other devices that are ferrous or magnetic.

Prepare a detailed test sequence and conduct a survey of the chosen location in accordance with Section G.4.

Run the magnetic interference survey using the magnetic interference software – refer to Appendix G for details.

If the test passes, the location is considered reliable for the installation of the GMU 44.

If the test fails, the location should be considered unreliable until the source of the magnetic interference is identified, remedied and the location is retested and passes the test. Refer to Section 6.1 for additional information on troubleshooting and correcting the GMU 44 magnetometer installation. If the magnetic interference cannot be remedied, another location should be chosen and tested.

3.2.4.4 Method for Determining Heading Angle Offset for Wing Installation

One method of determining the heading angle offset for wing mounted installations is as follows:

1. First, transfer the mounting plate alignment to the underside of the wing.

NOTE

For some metal aircraft, it may be possible to use the rivets that secure the plate to the aircraft skin to translate the plate line. See Figure 3-57. For aircraft that do not have rivets for reference, such as composite aircraft, dividers may be used.

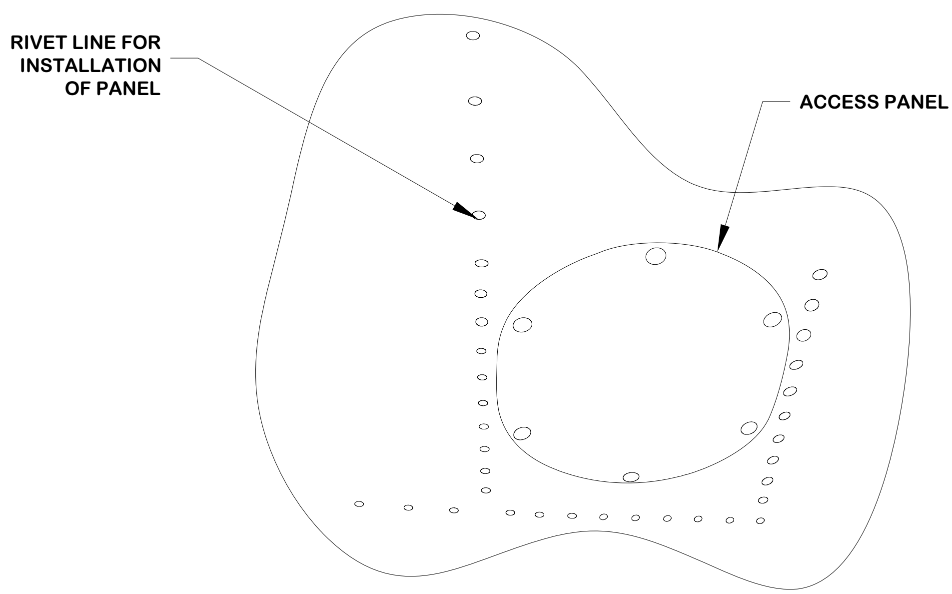


Figure 3-57. Rivet Line Method to Determine Mounting Panel Alignment

NOTE

Up/down movement of the dividers may offset the location of the mark on the underside of the wing relative to other marks. It is important to note the holding position of the dividers and ensure the same holding technique is used for all markings.

2. Using a pair of dividers (similar to those shown in Figure 3-58), transfer the installation plate line to the skin of the aircraft. Place packing tape on the underside of the wing for marking.

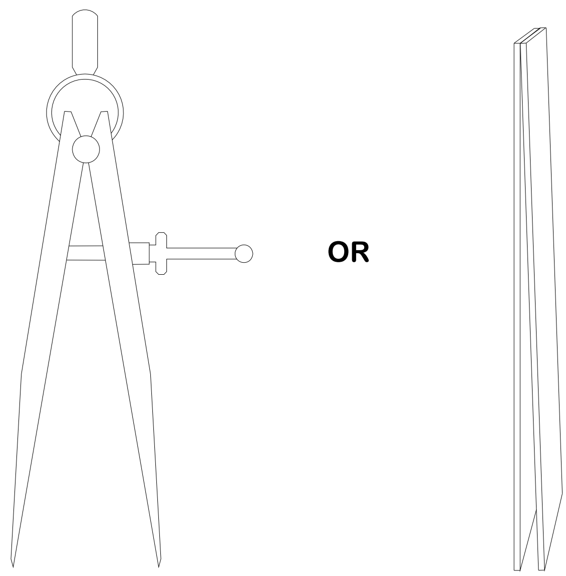


Figure 3-58. Dividers Used to Transfer Panel alignment

Place one side of the divider inside the aircraft wing with the point making contact with the mounting plate surface, as shown in Figure 3-59.

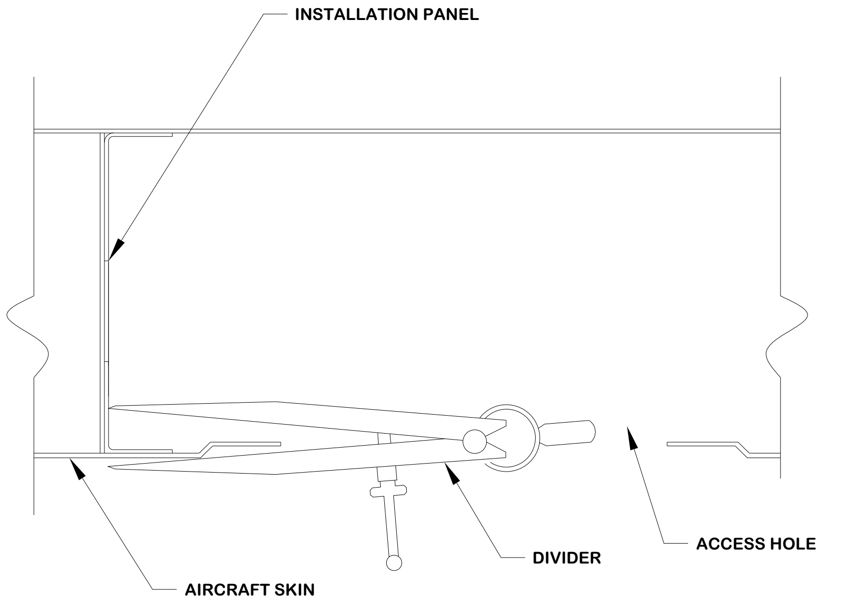


Figure 3-59. Using Dividers to Transfer the Panel Alignment to the Underside of the Aircraft Wing

Place the other side of the divider outside the aircraft wing and mark the point on the tape holding the divider as flush to the wing as possible, as shown in Figure 3-60.

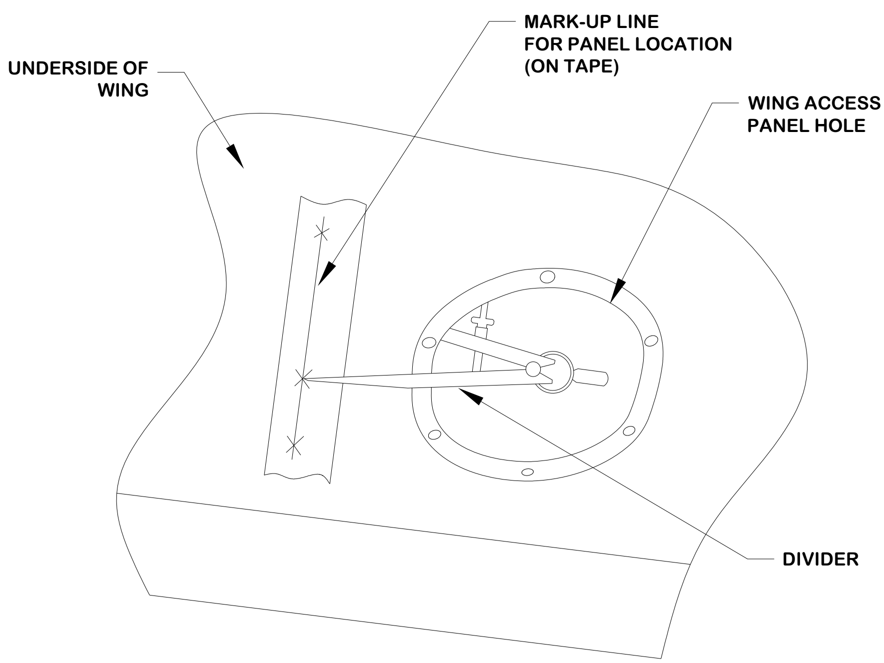


Figure 3-60. Transferring The Mounting Plate Alignment To The Underside Of The Wing

NOTE

To verify that a measurement error did not occur due to the holding position of the dividers, ensure that a straight line intersects all marks.

Mark at least three points along the mounting plate and draw a straight line through the points. Verify that the line intersects all points marked.

Using a plumb bob transfer the mounting panel line from the underside of the wing to the shop floor. Mark at least 3 points and draw a straight line. Verify that the line intersects all points. See Figure 3-61.

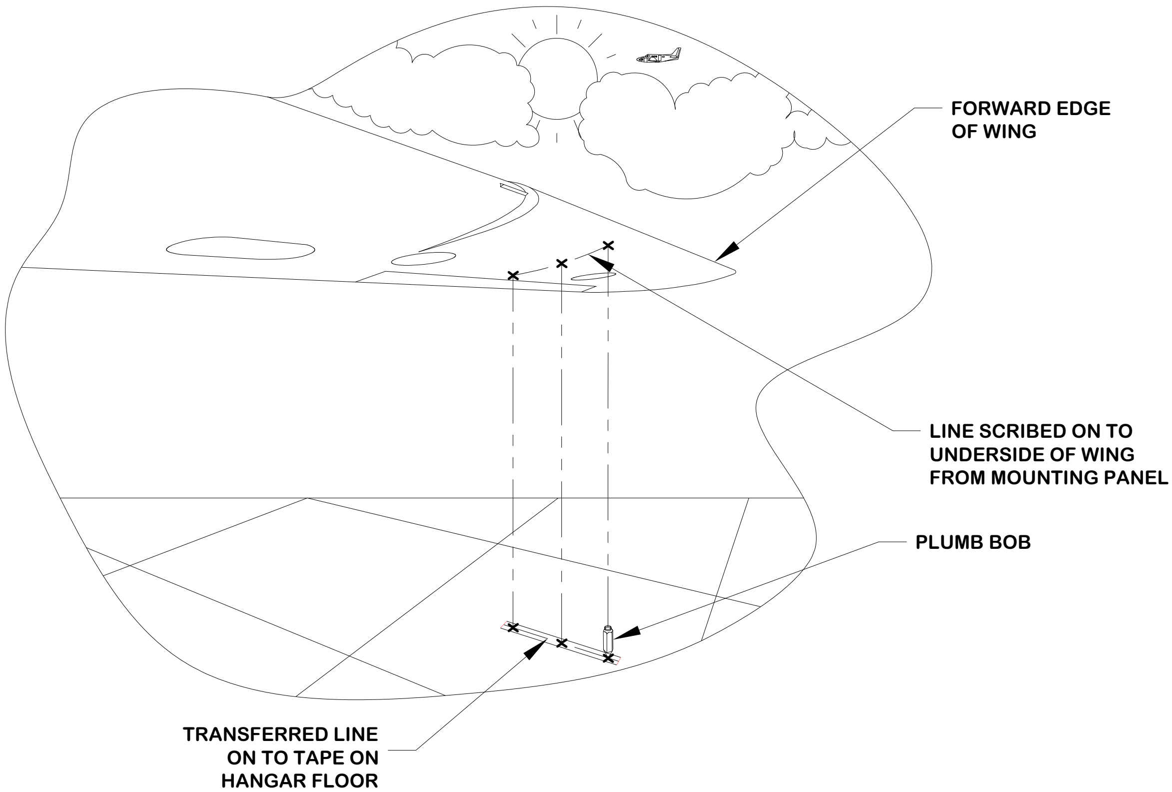


Figure 3-61. Transferring the Mounting Panel Line from the Underside of the Wing to the Shop Floor Using a Plumb Bob

Next find the aircraft centerline:

Drop a plumb bob along each side of the fuselage to the left and right at the cowl line or skin line near the front of the fuselage. Make a mark for the two plumbs on the floor, as shown in Figure 3-62.

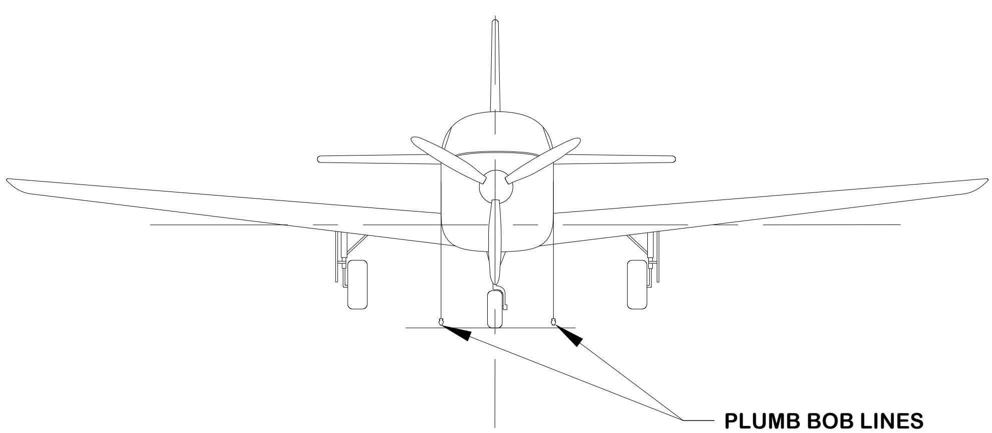


Figure 3-62. Centerline Plumb Bob Method for the Forward Fuselage

Strike a line between the two marks using a chalk line. Measure the distance between the two marks and mark the half way point. This will be the centerline mark for the forward fuselage. See Figure 3-63.

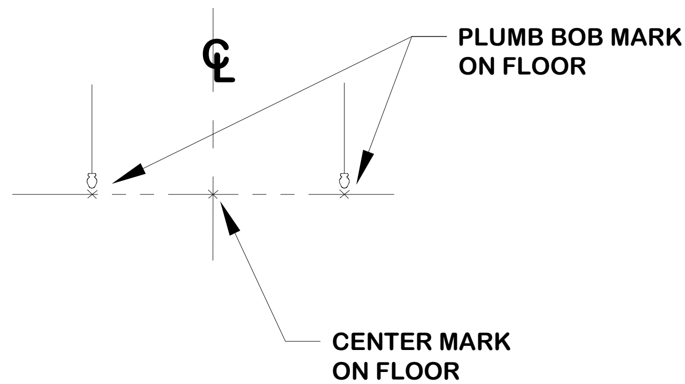


Figure 3-63. Center Mark for the Forward Fuselage (Plumb Bob Method)

Perform the same procedure to find the center point for the aft end of the fuselage, as shown in Figure 3-64.

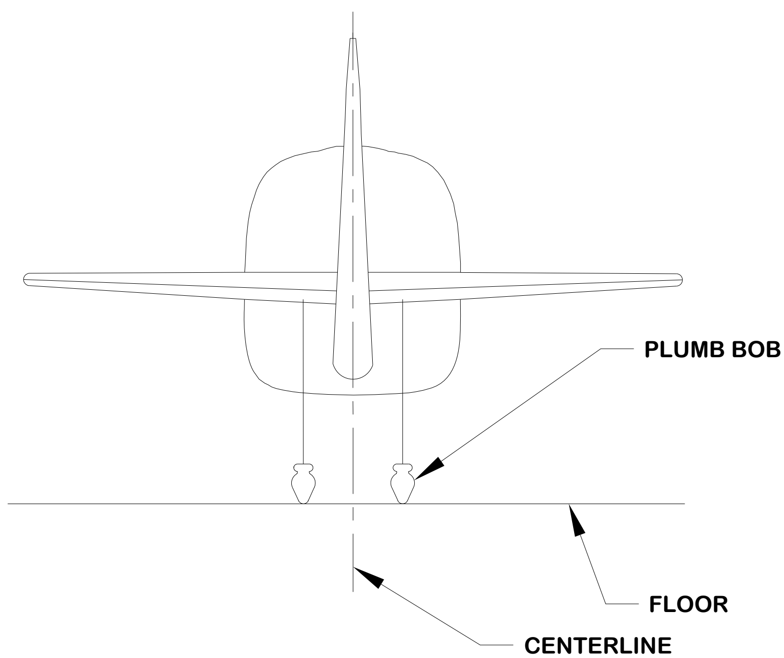


Figure 3-64. Centerline Plumb Bob Method for the Aft Fuselage

Strike a line between the centerline mark of the forward fuselage and the centerline mark at the aft end using a chalk line, as shown in Figure 3-65. This will be the aircraft heading reference line.

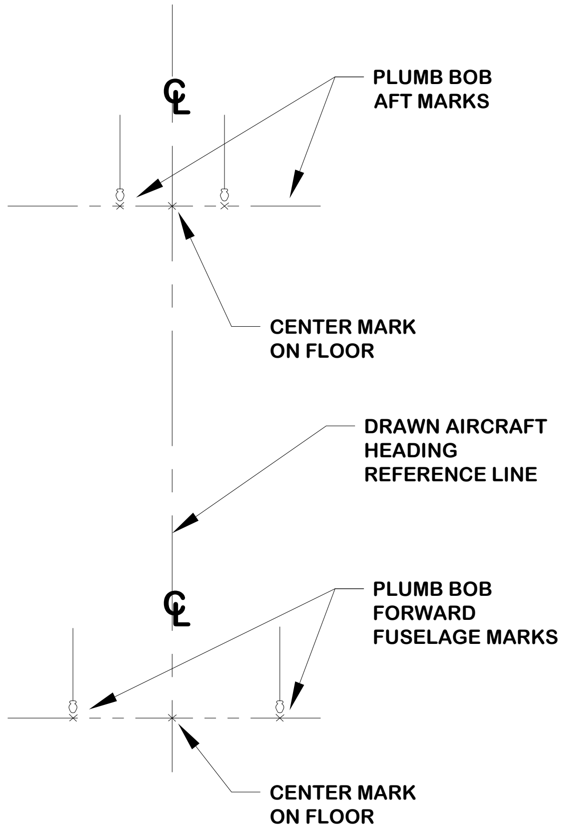


Figure 3-65. Center Line (Plumb Bob Method)

The heading angle offset is determined by comparing the aircraft reference center line to the mounting plate alignment.

Transfer the aircraft center line to the mounting plate line for heading angle offset measurement.

Align the laser square to the aircraft reference line so that the other laser line is perpendicular to it and intersects the mounting plate line drawn on the floor, as shown in Figure 3-66.

Mark the point of intersection of the plate line and the laser line. Strike a line on the laser line (between the center reference line and the mounting plate line) using a chalk line.

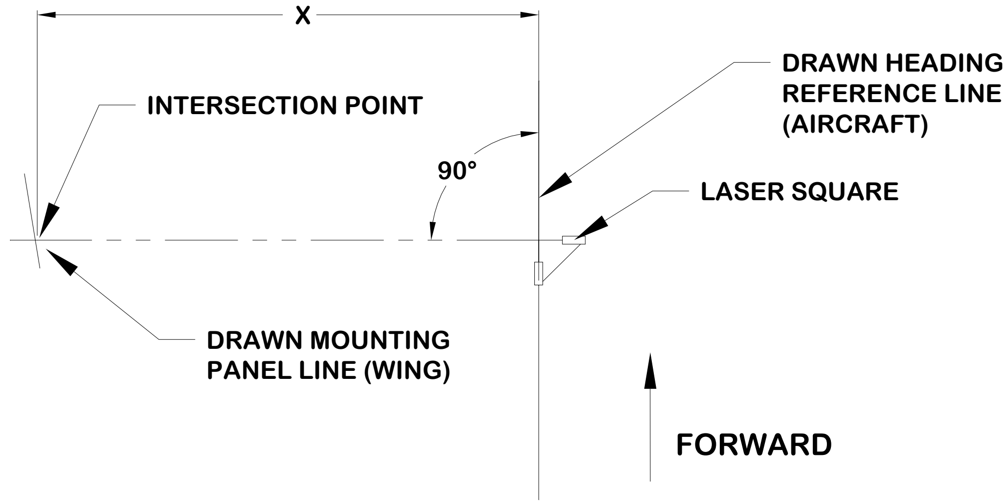


Figure 3-66. Transferring Center Line Step 1 (Laser Square Method)

Position the laser square at the intersection point and align one of the lasers to the chalk line from the previous step. Strike a line on the laser line parallel to the center reference line using a chalk line. This chalk line will be the transferred aircraft heading reference line and is used to determine the heading angle offset. See Figure 3-67.

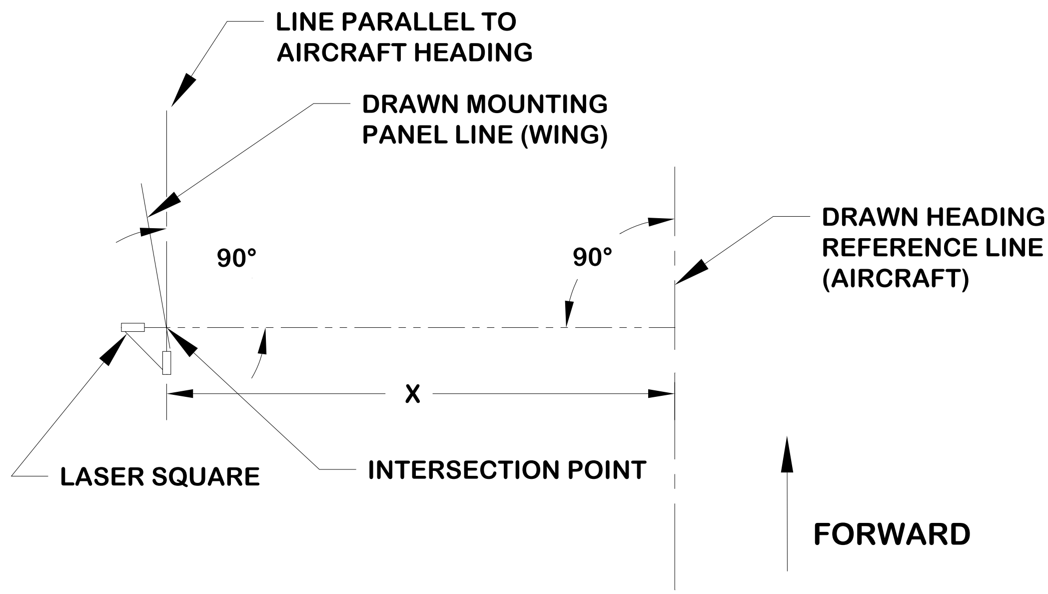


Figure 3-67. Transferring Center Line Step 2 (Laser Square Method)

Use a protractor to determine the angle difference between the aircraft heading reference line and the plate line. See Figure 3-68. This is the heading angle offset that will be used for the magnetometer top plate installation.

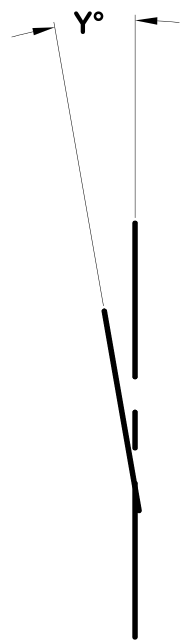


Figure 3-68. Measuring the Heading Angle Offset

An alternate method to the Laser Square is the use of the "3-4-5" Triangle:

Mark a point (A) on the aircraft heading reference line that is just aft of the installation location.

Measure three feet forward on the aircraft heading reference line and mark it (B). See Figure 3-69.

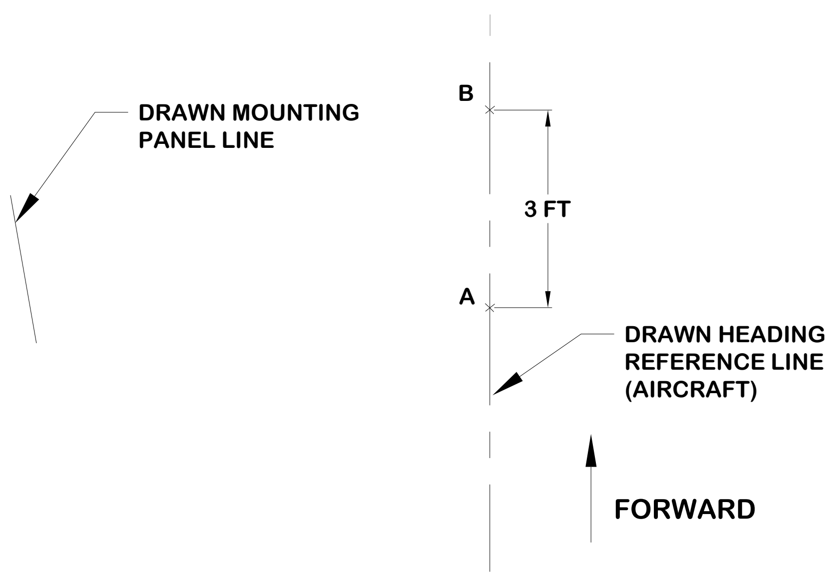


Figure 3-69. 3-4-5 Triangle Method Step 1

From point A measure 4 feet, as perpendicular as possible and draw an arc. See Figure 3-70.

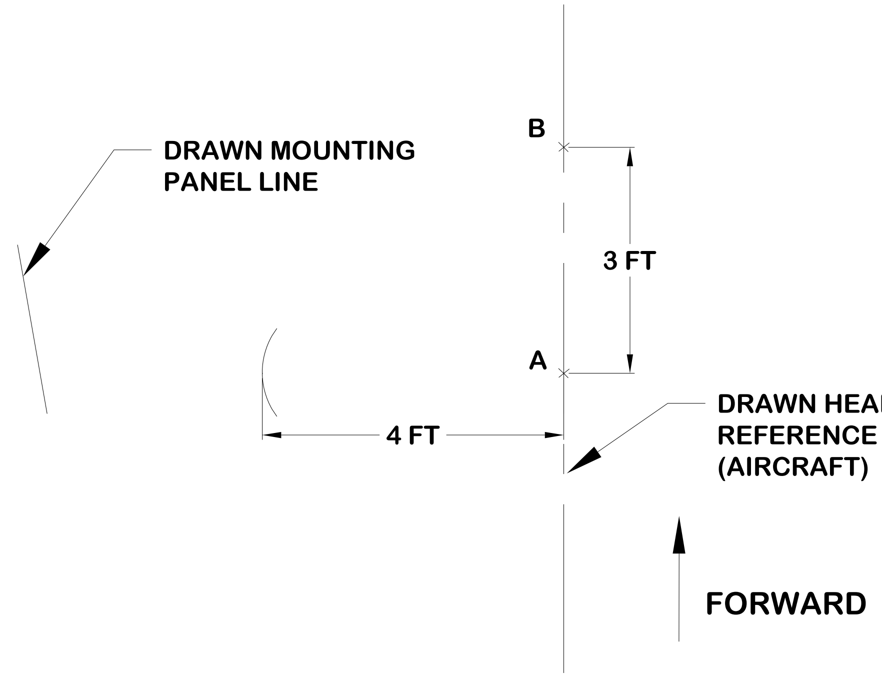


Figure 3-70. 3-4-5 Triangle Method Step 2

From Point B measure 5 feet and draw an arc which intersects the other, this will be point C.

Draw a straight line from point C to Point A. This line is perpendicular to the aircraft heading reference line.

Extend the A-C line to intersect with the Panel Line. See Figure 3-71.

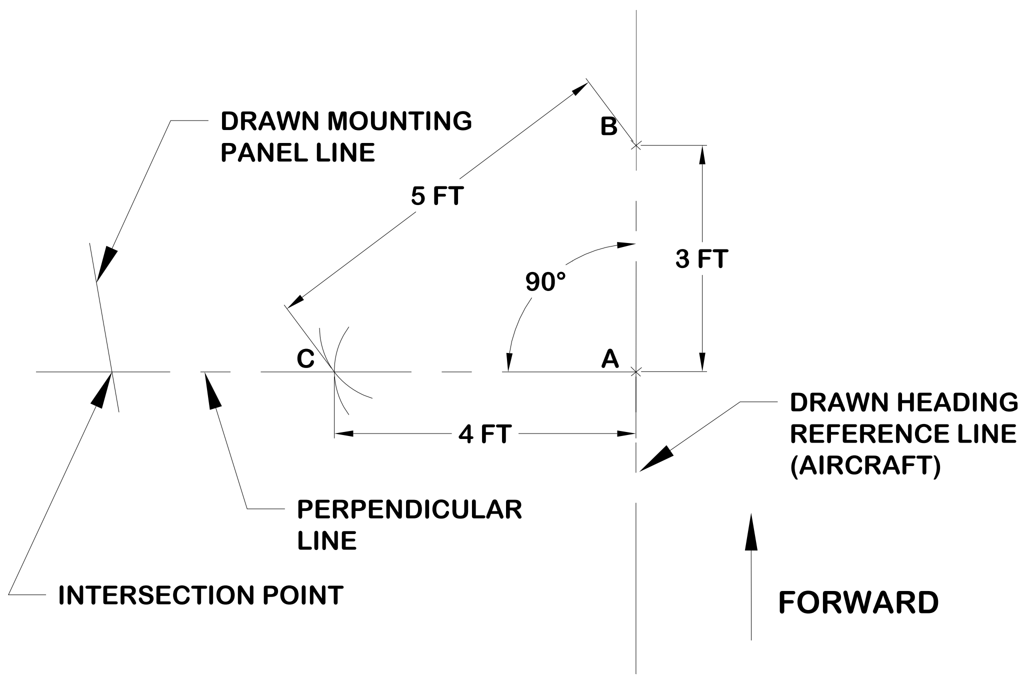


Figure 3-71. 3-4-5 Triangle Method Step 3

Perform the Same procedure to find a perpendicular line to the A-C line. Ensure the base of the 3-4-5 triangle lies on the intersection point of the A-C line and the Panel line. See Figure 3-72.

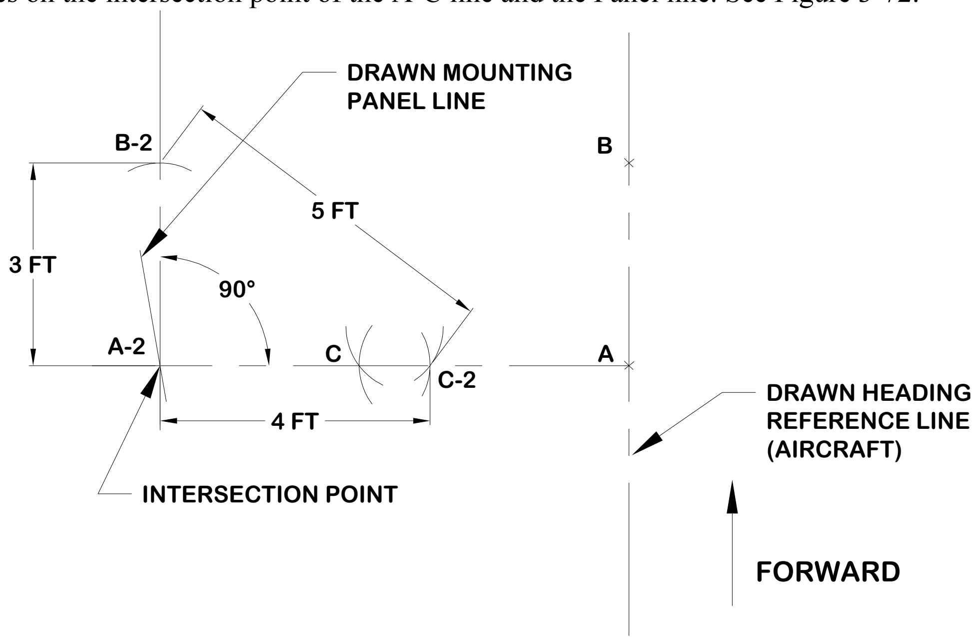


Figure 3-72. 3-4-5 Triangle Method Step 4

Measure the heading angle offset.

3.2.5 GDC 74A ADC Mounting

Determine a suitable location for the GDC 74A (refer to Section 2.5.11.6 for placement information). Sample GDC 74A installations can be found in Section D.3.

The GDC 74A should be mounted to a surface known to have sufficient structural integrity to withstand additional inertial forces imposed by a 2.04 pound unit (weight of GDC 74A and Mounting Rack). If it is necessary to build a shelf or bracket to mount the GDC 74A or if it is not certain that the chosen location is of sufficient structural integrity, refer to Section 3.3.

In order to satisfy the structural requirements for the operation of the GDC 74A the following conditions shall be met:

If support racks, brackets or shelves need to be fabricated, they should be fabricated and attached to the aircraft structure in accordance with the methods outlined in AC43.13-2A Chapter 2, AC43.13-1B Chapter 4, and the following requirements:

- Material shall be 2024-T3 sheet aluminum
- Material shall have some type of corrosion protection (primer, alodine, etc.)
- Material shall be a minimum of 0.040”
- Use sheet metal techniques (bend radius, fillets, etc) appropriate to the material thickness and type.

Any supporting structure must be rigidly connected to the aircraft primary structure through strong structural members capable of supporting substantial loads.

Mounting platform shall not span greater than 12” in width or length without direct attachment to primary structure. If mounting platform does span greater than 12”, add necessary stringers, doublers, bulkhead flange reinforcements, etc., to provide adequate support.

Maintain a minimum of 3” between the forward edge of the mounting rack and any object to ensure clearance for connector, wire harness and pitot static lines, as shown in Figure 3-73.

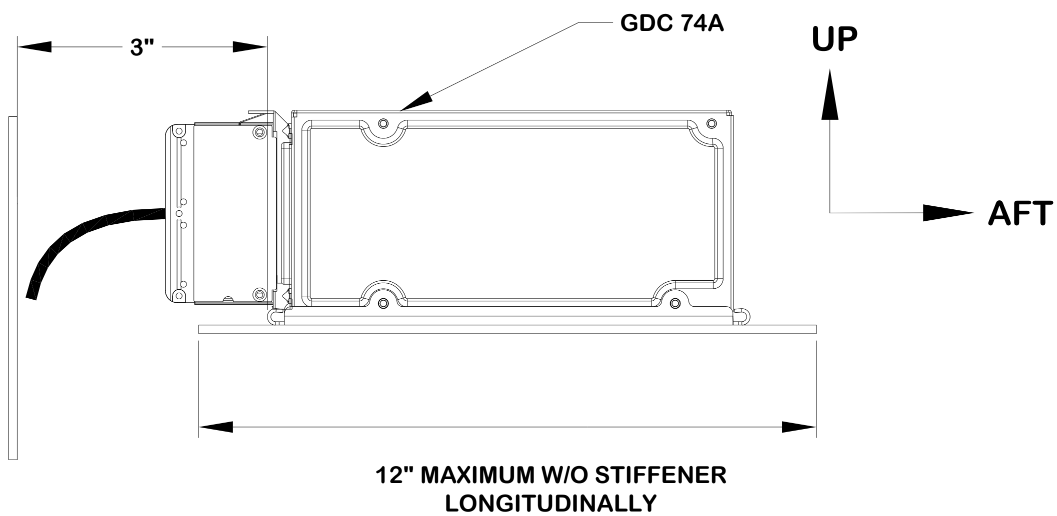
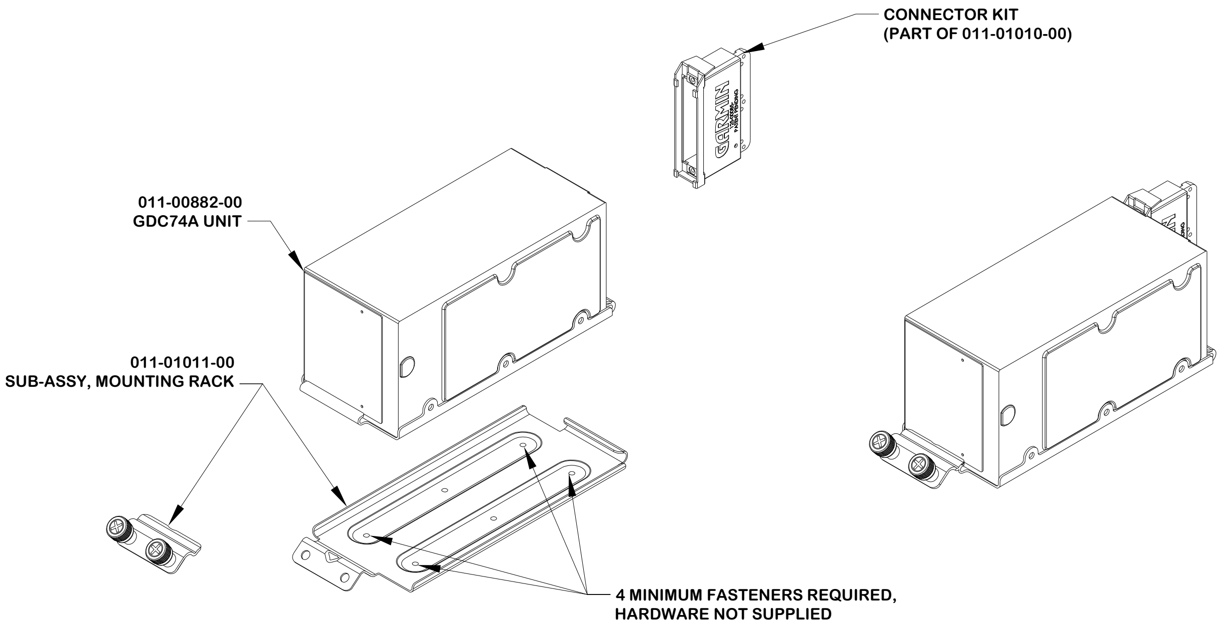


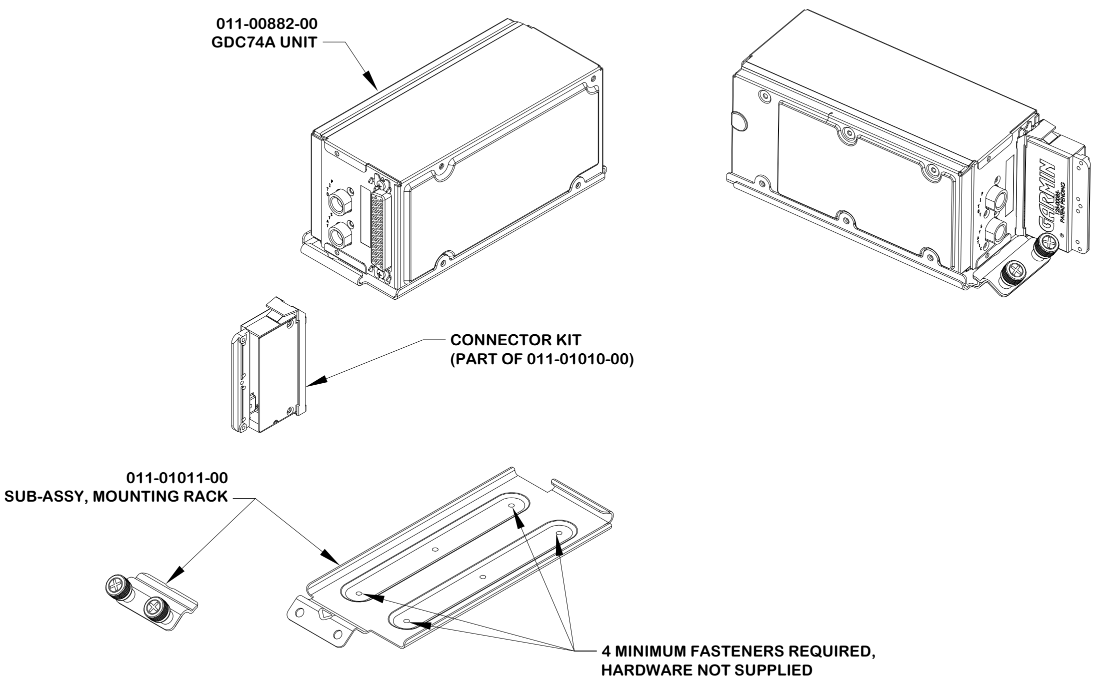
Figure 3-73. GDC 74A Recommended Clearance

There are two ways to install the GDC 74A. Refer to the outline and installation drawings shown below:

1. ***Mounting Option I*** - Remote mounted rack with connector and fittings opposite the screw down mounting hardware.



2. ***Mounting Option II*** - Remote mounted rack with connector and fittings on the same end as the screw down mounting hardware.

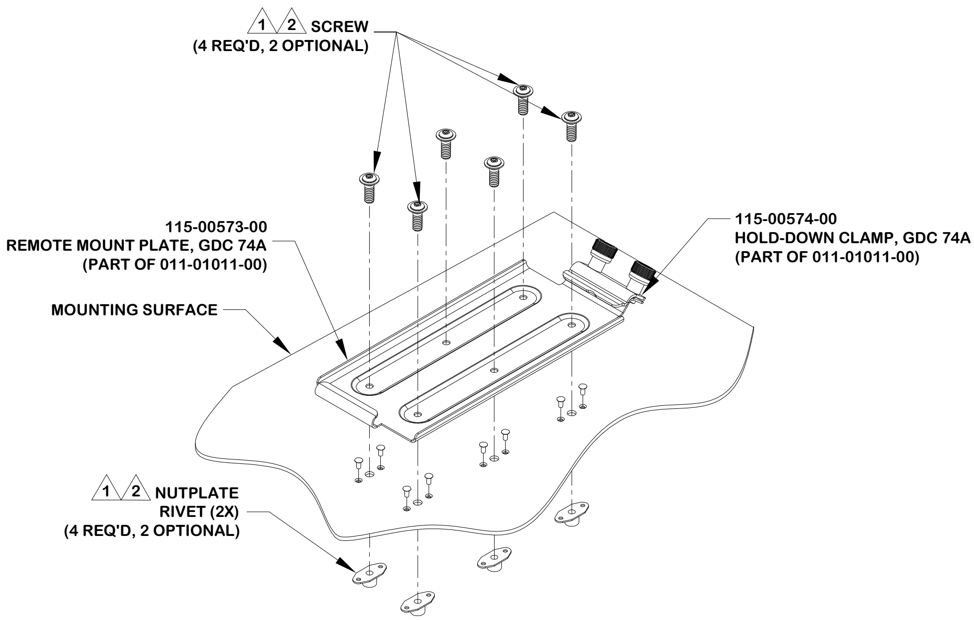


Position the GDC 74A mounting rack to the mounting panel and transfer the hole-pattern to the mounting plate from the angle bracket 6 places (4 required, 2 optional). Ensure installation requirements per Section 2.5.11.6 are met.

Remove mounting plate, drill the marked hole-pattern (0.144 inch diameter holes) and rivet nut plates (MS21047 or noted equivalent) with rivets (countersunk rivets). Acceptable hardware is identified in Figure 3-74. Ensure that installed rivets are flush with the installation panel. Remove any burrs or excess rivet heads. See Figure 3-74.

Perform a structural validation per Section 3.3.

Install the mounting rack to the mounting plate using MS35206 or NAS601 screws (4 required, 2 optional).



NOTES:

1. RECOMMENDED HARDWARE OPTIONS FOR ASSEMBLY:

HARDWARE	SPECIFICATIONS			
SCREWS	MS35206 (#6-32 LENGTH A/R); OR NAS601 (#6-32 LENGTH A/R)			
WASHERS	AN960-6; AN960-6L; NAS1149FN632P; OR NAS1149FN616P	OR	NUTPLATES	(M)F5000-06; (M)K1000-06; (M)K2000-06; OR F2000-06
NUTS	AN364-632A (MS21083N06); OR MS21042L06		RIVETS	MS20426AD3-X

2. IN THE HORIZONTAL INSTALLATION THE TWO CENTER HOLE FASTENERS ARE NOT REQUIRED FOR MOUNTING.

Figure 3-74. Installation of the Mounting Rack to the Mounting Plate

NOTE

Use a #2 Phillips screwdriver to tighten the GDC 74A to the rack, rather than hand tightening the knurled screws.

Place the GDC 74A into its mounting rack and tighten the mounting screws firmly.

3.2.5.1 Pitot-Static Connections to GDC 74A

The installer is required to fabricate pitot-static hose connections and attach the aircraft pitot pressure source and aircraft static pressure source to the GDC 74A.

CAUTION

Check pitot-static connections for errors before operating the GDC 74A. Incorrect plumbing could cause internal component damage. Observe the following cautions when connecting pneumatic lines.

1. Make sure the aircraft static pressure port is plumbed directly to the unit static pressure input port and the aircraft pitot pressure port is plumbed directly to the unit pitot pressure input port. Refer to Figure 3-75 and Figure 3-76 (refer to Figure 2-11 for the location of the pitot and static ports on the GDC 74A).
2. Seal the threads of pneumatic fittings at the connector ports. Use caution to ensure there are no pneumatic leaks.
3. Use care to avoid getting fluids or particles into the pitot and static lines connected to the GDC 74A).

Refer to Section 5 for system configuration, calibration and checkout.

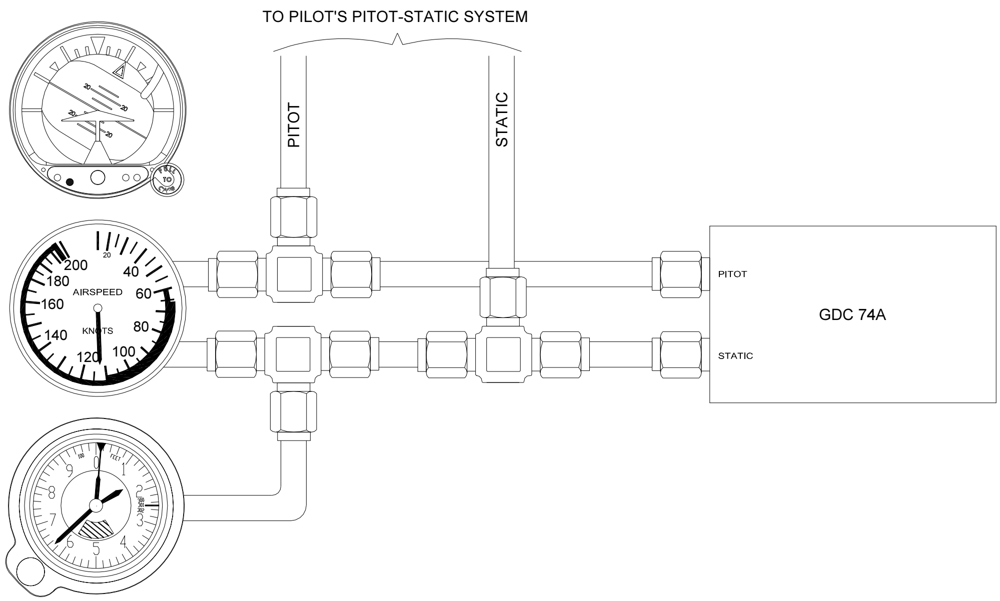


Figure 3-75. Pitot-Static Connections for Single GDU Installation

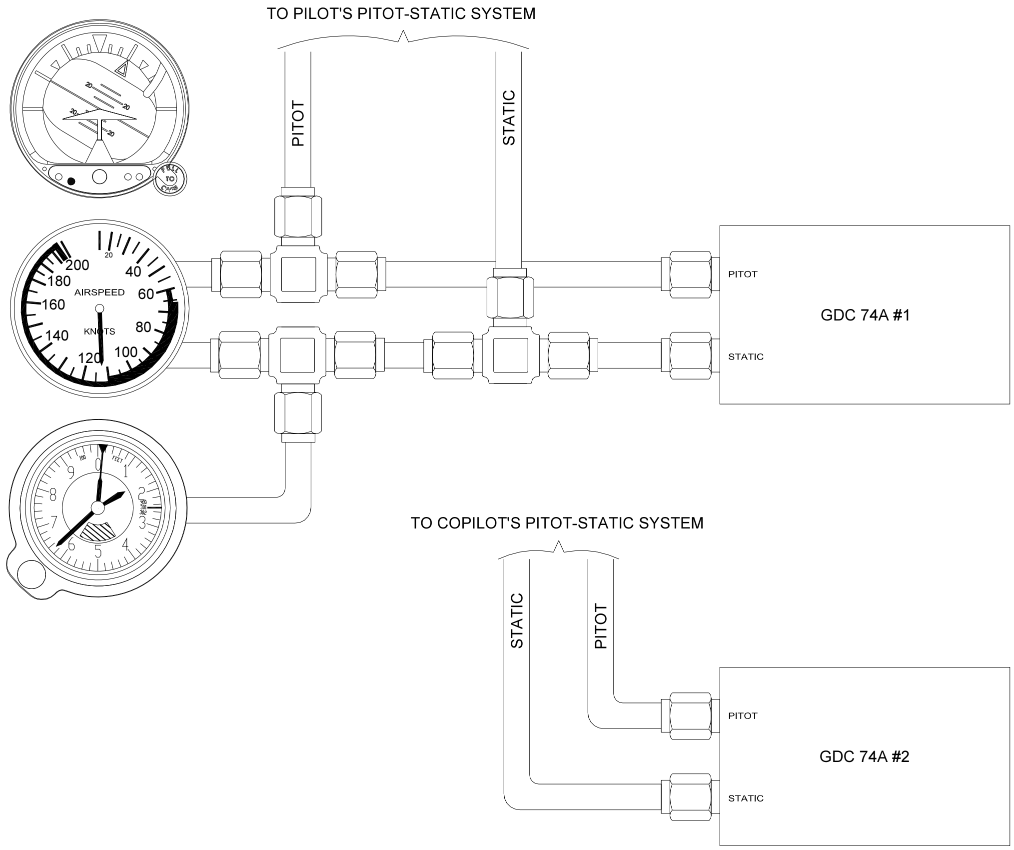


Figure 3-76. Pitot-Static Connections for Dual GDU Installation

3.2.5.2 Composite Aircraft GDC 74A ADC Installations

It is recommended to use an offset bracket to install the GDC 74A on composite aircraft. Brackets may be manufactured in accordance with the requirements outlined in section 3.2.5 for manufactured custom equipment and recommendations in this section.

Flange should be a minimum of 1 inch wide. Flange should have 0.159 inch diameter through holes 0.5 inches apart to provide flow through for the composite flox/epoxy and better adherence to the aircraft's inside skin surface, as shown in Figure 3-77.

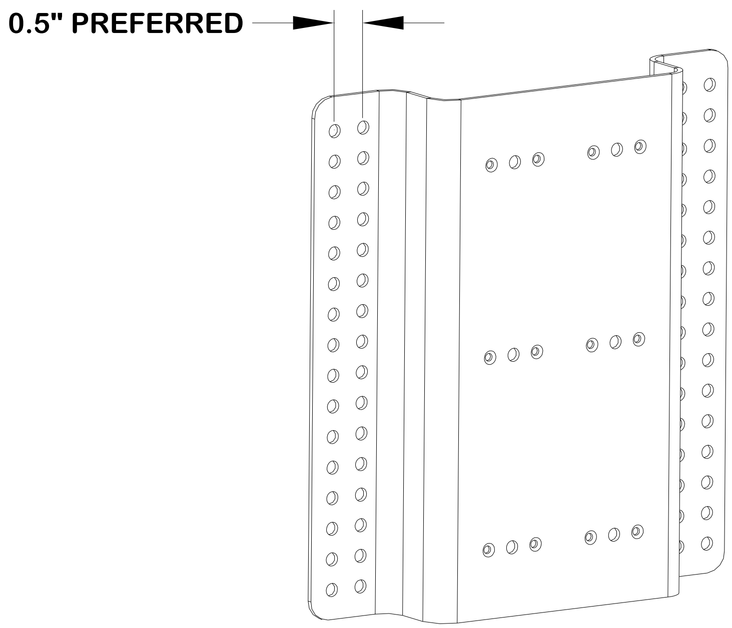


Figure 3-77. Drilling Hole-Pattern on Mounting Rack for Composite Aircraft

Scuff the flange, top and bottom, with 80 grit sand paper to provide better adherence to the epoxy/flox. Place epoxy/flox mix onto the mounting location and press the support bracket flanges into it so that the epoxy/flox mix flows through and over the flange holes. See Figure 3-78.

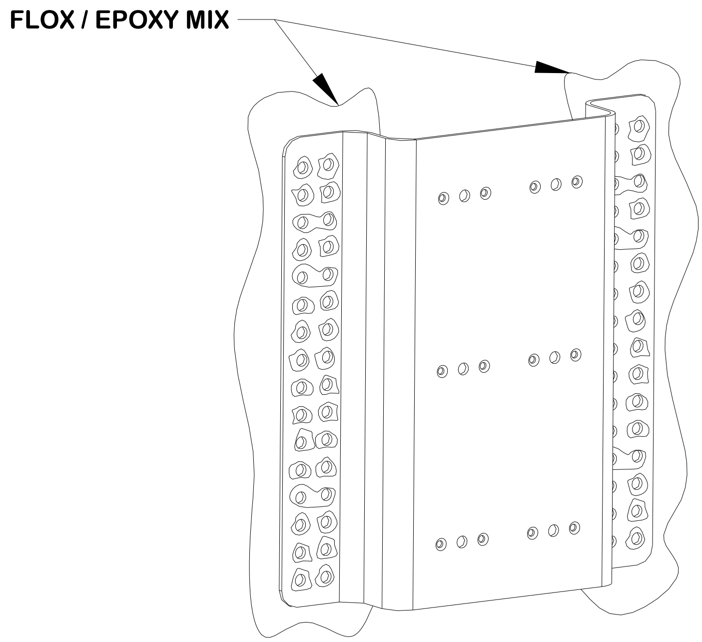


Figure 3-78. Pressing Mounting Rack Into Flox/Epoxy Mix (Composite Aircraft)

Lay a sheet of fiberglass cloth on top of each flange, overlapping the flange by 0.5 inches. Lay up a second sheet oriented 45° from the first sheet. Spread the epoxy/flox mix over the installation area so that it is fairly smooth and even. See Figure 3-79

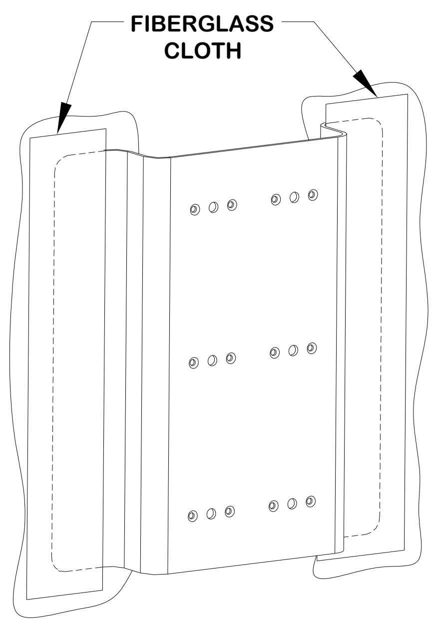


Figure 3-79. Cloth lay-up for Mounting Rack (Composite Aircraft)

Allow the material to set and perform a structural validation per Section 3.3.

Install the mounting rack to the mounting plate using MS35206 or NAS601 (#6-32) screws (6 total). The recommended torque is 12-15 inch lbs.

Place the GDC 74A into its mounting rack and tighten the mounting screws firmly. See Figure 3-80.

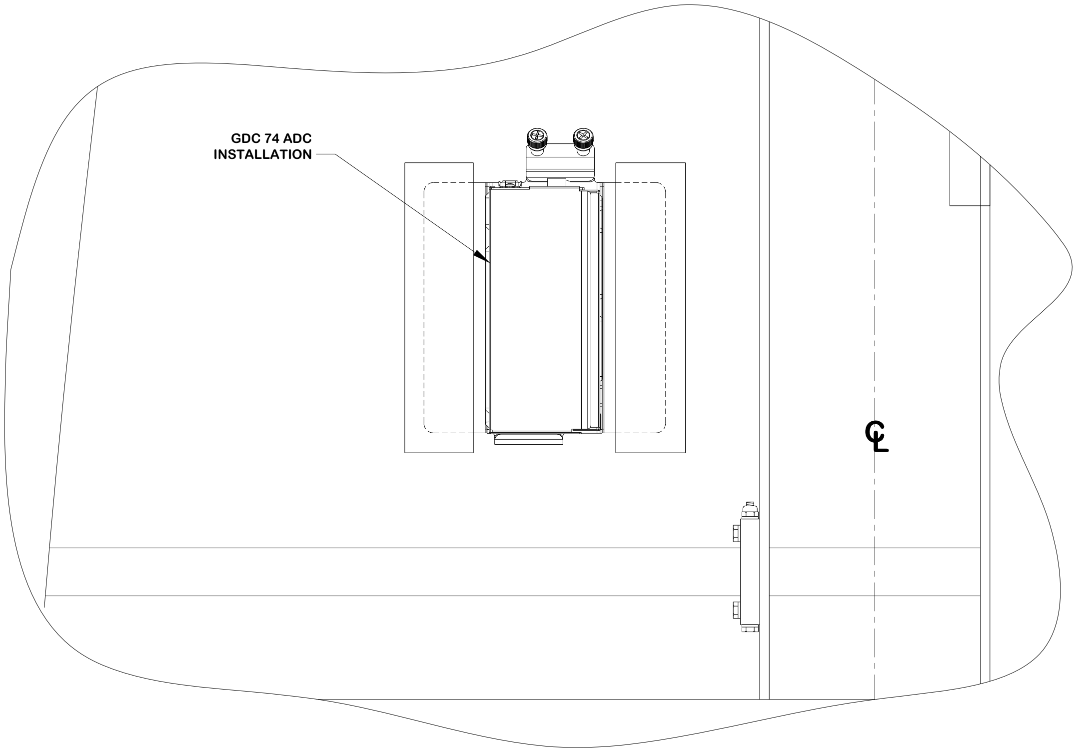


Figure 3-80. GDC 74A Final Installation Example (Composite Aircraft)

3.2.6 GTP 59 Temperature Probe Mounting

The GTP 59 OAT Probe Kit (P/N 011-00978-00) contains the items listed in Table 3-3.

Table 3-3. OAT Probe Kit P/N 011-00978-00

Figure 3-81 Ref	Description	Garmin P/N	Qty	Notes
1	Washer, Lock, Self-Sealing, 5/16	212-00026-00	1	
2	Nut, 5/16", Hex, Skirt	210-00055-00	1	
3	Outside Air Temperature Sensor	494-00022-xx	1	
-	Screw, 4-40 x .250, PHP, SS/P, w/NYL	211-60234-08	2	[1]
-	Contact, Pin, Mil Crimp, Size 22D	336-00021-00	5	[1]
4	Ring Terminal	336-00021-00	0	[2]

[1] This item is not used for installation of the probe. It is used for termination of the wiring at the GDC 74A connector P741. Refer to Section 3.4 for additional details.

[2] Ring terminal is part of OAT sensor assembly.

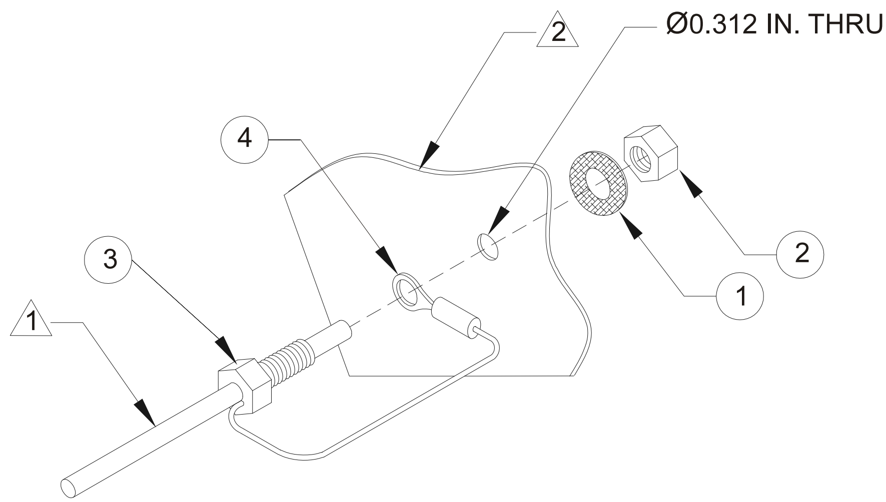
Install the GTP 59 probe as shown in Figure 3-81 and as follows:

1. Determine a suitable location for the GTP 59 (refer to Section 2.5.11.7 for placement information).
2. Drill a 5/16 inch hole through the aircraft skin at the desired location and install the GTP 59.
3. Prepare the surface. The metal body of the OAT probe should be grounded to the aircraft. The installation requirements vary depending on the airframe material composition.
    a. Aluminum airframe: When a mounting location has been found, prepare the inside surface of the aircraft. Remove all paint from the contracting area and clean with degreaser.
    b. Composite airframe: If possible, mount the OAT probe through a grounded metal strap or band. Otherwise, mount the OAT probe in an area of the airframe that has a significant amount of underlying metal foil or mesh. To ensure adequate conductivity, it may be necessary to mount the OAT probe through a metal doubler. Use fasteners that allow a conductive path to the airframe.
4. Mount the OAT probe on the prepared surface. Place the ring terminal (4) over the end of the OAT probe (3). Insert the probe and ring terminal into the hole in the skin of the aircraft. Place the washer (1) over the end of the end of the OAT probe on outside skin of the aircraft. Thread the nut (2) onto the OAT probe. Holding the OAT probe on the inside, tighten the nut (2) to 100 inch lbs. ± 20 inch-lbs.

NOTE

The GTP 59 probe comes with a 10 ft cable. On some installation the wiring provided with the GTP 59 may not be long enough and it may be necessary to extend the wiring. Splicing or installing in-line connectors are acceptable methods to extend the wiring.

5. Route the OAT probe cable to the GDC 74A.



1 CABLE: M27500-22TE3V14

2 MATERIAL THICKNESS:
- 0.032 INCHES MINIMUM IF GTP 59 IS MOUNTED ON ALUMINUM AIRCRAFT SKIN.
- 0.020 INCHES MINIMUM IF GTP 59 IS MOUNTED ON ACCESS PANEL.

Figure 3-81. GTP 59 OAT Probe Installation

3.3 Construction and Validation of Structures

This section includes information necessary for testing load-carrying capabilities of equipment mounting structures (such as shelves, mounting plates and mounting brackets) used to mount the GRS 77, GDC 74A and GMU 44 (if required).

If support racks, brackets or shelves need to be fabricated, they should be fabricated and attached to the aircraft structure in accordance with the methods outlined in AC43.13-2A Chapter 2. After the structure is installed, it should be tested as outlined in AC43.13-2A chapter 1 to verify that it is capable of supporting the required loads.

The GRS 77, GDC 74A and GMU 44 (if mounted within the fuselage) installations must be capable of withstanding the Static Test Load Factors listed in the corresponding tables below for at least three seconds in each direction specified direction without damage or permanent deformation. In addition, there should not be noticeable deflection of the GRS 77 mounting structure. Note that these required loads differ somewhat from those normally required for equipment installations. The following tables show the static test loads for the GRS 77, GDC 74A and GMU 44.

3.3.1 GRS 77 Static Test Loads

The combined weight of the GRS 77, connector and mounting rack is 3.50 lbs. The static loads which must be applied (Load Factor x 3.50 lbs.) will be the following:

Direction of Force	**Load Factor**	**Static Test Load** ***(Load Factor x (GRS 77 + Mounting Rack Weight))***
Downward	6.6 g	(6.6 x 3.5) = 23.10 lbs
Upward	6.0 g	(6.0 x 3.5) = 21.00 lbs
Sideward	4.5 g	(4.5 x 3.5) = 15.75 lbs
Forward	18.0 g	(18.0 x 3.5) = 63.00 lbs

The combined weight of the GRS 77, connector, mounting rack and GRS 77 Universal Mount is 4.55 lbs. The static loads which must be applied (Load Factor x 4.55 lbs.) will be the following:

Direction of Force	**Load Factor**	**Static Test Load** ***(Load Factor x (GRS 77 + Mounting rack and Universal Bracket Weight))***
Downward	6.6 g	(6.6 x 4.55) = 30.03 lbs
Upward	6.0 g	(6.0 x 4.55) = 27.30 lbs
Sideward	4.5 g	(4.5 x 4.55) = 20.48 lbs
Forward	18.0 g	(18.0 x 4.55) = 81.90 lbs

3.3.2 GDC 74A Static Test Loads

The combined weight of the GDC 74A, connector and mounting rack is 2.30 lbs. The static loads which must be applied (Load Factor x 2.30 lbs.) will be the following:

Direction of Force	**Load Factor**	**Static Test Load** ***(Load Factor x (GDC 74A + Mounting Rack Weight))***
Downward	6.6 g	(6.6 x 2.3) = 15.18 lbs
Upward	6.0 g	(6.0 x 2.3) = 13.80 lbs
Sideward	4.5 g	(4.5 x 2.3) = 10.35 lbs
Forward	18.0 g	(18.0 x 2.3) = 41.40 lbs

NOTE

Structural validation for the GMU 44 mounting structure is only required if the GMU 44 is mounted within the fuselage, and not if mounted in the wing or vertical stabilizer.

3.3.3 GMU 44 Static Test Loads

The combined weight of the GMU 44, connector and mounting rack is 0.50 lbs. The static loads which must be applied (Load Factor x 0.50 lbs.) will be the following:

Direction of Force	Load Factor	Static Test Load *(Load Factor x (GDC 74A + Mounting Rack Weight))*
Downward	6.6 g	(6.6 x 0.50) = 3.30 lbs
Upward	6.0 g	(6.0 x 0.50) = 3.00 lbs
Sideward	4.5 g	(4.5 x 0.50) = 2.25 lbs
Forward	18.0 g	(18.0 x 0.50) = 9.00 lbs

The combined weight of the GMU 44, connector, mounting rack and GMU 44 Universal Mount is 0.72 lbs. The static loads which must be applied (Load Factor x 0.72 lbs.) will be the following:

Direction of Force	Load Factor	Static Test Load *(Load Factor x (GDC 74A + Mounting Rack Weight))*
Downward	6.6 g	(6.6 x 0.72) = 4.75 lbs
Upward	6.0 g	(6.0 x 0.72) = 4.32 lbs
Sideward	4.5 g	(4.5 x 0.72) = 3.24 lbs
Forward	18.0 g	(18.0 x 0.72) = 12.96 lbs

3.3.4 Test Procedures

One method of determining the static load capability is as follows:

NOTE

Previously installed nut plates for mounting the GRS 77, GDC 74A or GMU 44 may be used for testing. For installation on an existing aircraft panel (which will require no removal) testing may be accomplished prior to installing nut plates using the method below.

Mark and drill the holes where the mounting rack or Universal Mount will be installed, whichever is applicable to the installation.

For a GRS 77 installation, install four #10-32 machine screws (see Figure 3-19 for Universal Mount and Figure 3-28 for the Mounting Rack) in the corner holes used to attach the Universal Mount or Mounting Rack to structure. For a GDC 74A installation, install four 6-32 machine screws (See Figure 3-74) in the four corner holes, when attaching the GDC 74A mounting rack to existing structure. If special brackets are used between the mounting rack and existing structure, the bracket attachment to structure must be tested. For the GMU 44 installation, install two, three, or four pieces of hardware. If using the Universal Mount in a side mount installation configuration, use two #6-32 machine screws, (stainless), as demonstrated in Figure 3-56 (left side) and supported by a subsequent hardware discussion. If using the Universal Mount in a bottom mount installation configuration, use four #6-32 machine screws (stainless), as demonstrated in Figure 3-56 (right side) and supported by a subsequent hardware discussion. If installing the GMU 44 Installation Rack directly to existing structure, use the three pan head screws that arrive with the GMU 44 installation kit.

For testing downward loading, place shot bags or other suitable weights totaling the static test load weight of the equipment plus the rack within the footprint outlined by the four screw holes.

Verify that there is no damage, permanent deformation or noticeable deflection of the structure during and after three seconds.

Fasten a 36 inch loop of suitable material such as fishing line, braided wire, or other similar material having a breaking strength of at least 150lbs, diagonally between two of the screws. Fasten another loop diagonally between the other two screws, adjusting the length of the loop so it exactly matches the first.

Hook a calibrated force gauge through both loops and apply a sustained pull for at least three seconds in each of the other three directions (upward, sideward and forward). Figure 3-82 illustrates the upward static load test and Figure 3-83 illustrates the forward static load test. The sideward static load test is similar to the forward load test, in a direction perpendicular to the forward load. The force applied must correspond to the static test load calculated for unit and rack configuration being installed (the static test load values are found in the tables above).

Examine the support structure carefully. If there has been damage, permanent deformation or noticeable deflection, the structure is not suitable and must be replaced with one which is strong enough to withstand the test loads. Examine all aircraft stringers, bulkheads and skin surfaces, which may have direct or indirect contact with the fabricated parts. If it is determined that no damage or permanent deformation has occurred, the structure is of sufficient strength and the GRS 77, GDC 74A or GMU 44 equipment may be used to permanently mount the equipment.

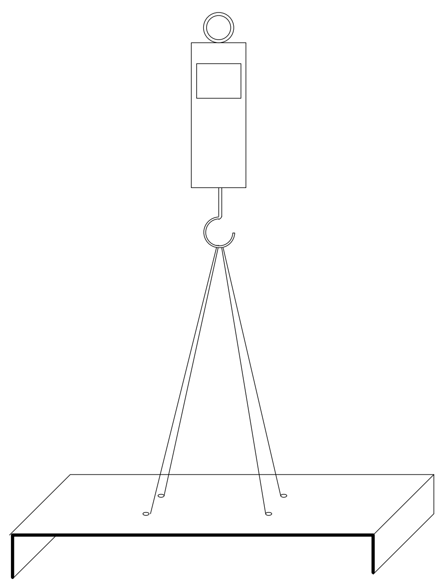


Figure 3-82. Upward Static Load Test

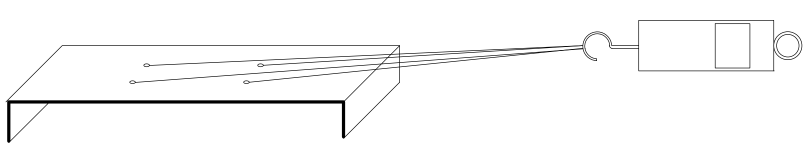


Figure 3-83. Forward Static Load Test

3.4 Cabling and Wiring

The installation kits for the G600 system LRUs include connectors and crimp contacts. Use wire specified in Section 2.4.2 for all G600 connections. Make the crimp connections with a crimp tool as specified in Table 3-5.

Refer to the interconnection diagrams in Appendix F for the appropriate interconnections. Use 22 or 24 AWG wire for all connections except for power. Use 20 AWG for power/ground. Install the configuration modules as described in Section 3.4.2.2. Once the cable assemblies have been made, attach the backshell/connector to the rear of the mounting unit. Route the wiring bundle as appropriate. Avoid sharp bends.

3.4.1 Wiring Harness

Allow adequate space for installation of cables and connectors. The installer supplies and fabricates all of the cables. All electrical connections to the G600 equipment are made through the following connectors provided by Garmin:

- GDU 620 - a 37-pin D-Subminiature connector (female), a 50-pin D-subminiature connector (female) and a 62-pin D-subminiature connector (male)
- GRS 77 – a 44-pin D-Subminiature connector (male)
- GMU 44 – a 9-pin circular connector (female)
- GDC 74A – a 78-pin D-Subminiature connector (male)

Construct the wiring harness according to the information contained in this and the following sections. Cable lengths will vary depending upon installation. Strip all wires going to the connectors 1/8". Insert the wire into the pin and crimp with one of the recommended (or equivalent) crimping tools. Insert the pin into the connector housing location as specified by the interconnect drawing in Appendix F. Verify that the pin is properly engaged into the connector by gently tugging on the wire. Route and secure the cable runs from the G600 LRUs away from sources of electrical noise.

Appendix B provides the pin-out information for all G600 LRUs. Required connectors and associated hardware are supplied with the connector kits. See Appendix F for interconnect wiring diagrams.

CAUTION

Check wiring connections for errors before connecting the cables to the LRUs. Incorrect wiring could cause component damage.

Table 3-4. Socket Contact Part Numbers

Wire Gauge	**37-pin connector (P6201) 50-pin connector (P6202) 9-pin connector (P441)**	**Configuration Module 50-pin connector (P6202)**	**62-pin connector (P6203) 44-pin connector (P771) 78-pin connector (P741)**
	20-24 AWG [1]	**28 AWG** [3]	**22-28 AWG**
Garmin P/N	336-00022-00	336-00022-01	336-00021-00
Military P/N	M39029/63-368	N/A	M39029/58-360
AMP	N/A	N/A	204370-2
Positronic	N/A	N/A	MC8522D
ITT Cannon	N/A	N/A	030-2042-000

Table 3-5. Recommended Crimp Tools

Manufacturer	Hand Crimping Tool	20-24 AWG (P6201/P6202) [3]		22-28 AWG (P741, P771, P6203)	
		Positioner	Insertion/ Extract Tool	Positioner	Insertion/ Extract Tool
Military P/N	M22520/2-01	M22520/2-08	M81969/14-02 M81969/1-02	M22520/2-09	M81969/14-01 M81969/1-04
Positronic	9507	9502-11	N/A	9502-3	M81969/1-04
ITT Cannon	995-0001-584	N/A	N/A	995-0001-739	N/A
AMP	601966-1	N/A	N/A	601966-6	91067-1
Daniels	AFM8	K13-1	N/A	K42	N/A
Astro	615717	615724	N/A	615725	N/A

Notes:

[1] Contacts listed are not to be used for configuration module wiring. Use the contacts supplied with the configuration module when installing configuration module wires in P6202.

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

[3] For configuration module pins, ensure that the crimp tool is set to crimp 28 AWG wire.

3.4.2 Backshell Assembly and D-Subminiature Connectors

The G600 LRU connector kits (P/N 011-01656-00 [GDU 620], P/N 011-00869-01 [GRS 77] and P/N 011-01010-01 [GDC 74A]) include Garmin backshell assemblies and Garmin ground adapter assemblies. Backshell connectors give the installer the ability to terminate shield grounds at the backshell housing using the shield block ground kit. Table 3-6 lists Garmin part numbers for the D-sub connectors and the backshell assemblies.

Table 3-6. Backshell Assembly

Figure 3-84 thru Figure 3-86 Ref	Description	Garmin P/N	Notes
1	Backshell (P771) Backshell (P6201, P6203) Backshell (P741, P6202)	125-00083-00 125-00084-00 125-00085-00	[2]
2	Shield block (P771) Shield block (P741, P6201, P6202, P6203)	117-00147-00 117-00147-01	[3]
3	Screw, 4-40 x.250, FLHP100°, SS/P, Nylon	211-63234-08	[3]
4	Slide Lock Spring	N/A	[4]
5	Slide Lock Lever	N/A	[4]
6	Screw,4-40x.375,PHP,SS/P, w/Nylon	211-60234-10	[2], [5]
7	Strain Relief (P771) Strain Relief (P741, P6201, P6202, P6203)	115-00499-02 115-00499-03	[2]
8	Cover (P771) Cover (P6201, P6203) Cover (P741, P6202)	115-00500-02 115-00500-03 115-00500-04	[2]
9	Screw,4-40x.187,FLHP100,SS/P, w/Nylon	211-63234-06	[2]
10	Connector, D-Sub, HD, 78 Pin (P741) Connector, D-Sub, HD, 44 Pin (P771) Connector, D-Sub, 37 Socket (P6201) Connector, D-Sub, 50 Socket (P6202) Connector, D-Sub, HD, 62 Pin (P6203)	330-00366-78 330-00366-44 330-00502-37 330-00502-50 330-00366-62	[5]

Figure 3-84 thru Figure 3-86 Ref	Description	Garmin P/N	Notes
11	Multiple Conductor Shielded Cable (See Interconnect Diagrams, Appendix F)	As Required	[6]
12	Shield Terminator	As Required	[6], [7]
13	Wire, Insulated (20-22 AWG), 3" max length	As Required	[6], [7]
14	Socket Contacts, #20 (P6201, P6202) Pin Contacts, #22D (P741, P771, P6203)	336-00022-00 336-00021-00	
15	Ring terminal, #8, insulated, 18-22 AWG, 14-16 AWG	MS25036-149, MS25036-153, MS25036-156	[6], [8]
16	Screw, PHP, 8-32x.312", Stainless or Cad Plated Steel	MS51957-42, MS35206-242	[6], [8]
17	Split Washer, #8, (.045" compressed thickness) Stainless or Cad-plated steel	MS35338-137, MS35338-42	[6], [8]
18	Flat Washer, #8, .032" thick, .174"ID, .375" OD, Stainless or Cad Plated Steel	NAS1149CN832R, NAS1149FN832P	[6], [8]
19	Silicon Fusion Tape	249-00114-00	[6]

[1] All items are applicable to P741, P771, P6201, P6202 and P6203 unless otherwise specified.

[2] Supplied as part of Backshell Kits P/N 011-00950-02 (P771), P/N 011-00950-03 (P6201, P6203) and P/N 011-00950-04(P741, P6202).

[3] Supplied as part of Ground Adapter Kits P/N 011-01169-00 (P771) and P/N 011-01169-01 (P741, P6201, P6202, P6203).

[4] Supplied as part of Slide Lock Kit P/N 330-90006-02 (P771), P/N 330-90006-03 (P6201, P6203) and P/N 330-90006-04 (P741, P6202).

[5] Supplied as part of LRU Connector Kit P/N 011-01010-01 (GDC 74A), P/N 011-00869-01 (GRS 77) and P/N 011-01656-00 (GDU 620).

[6] Not supplied – must be purchased separately.

[7] Solder sleeve with pre-installed braid strap may be used instead of items 12 and 13.

[8] Not a Garmin part number.

3.4.2.1 Shield Block Assembly Procedure

The parts for the connector and backshell assemblies for the GDC 74A, GRS 77 and GDU 620 installations are listed in Table 3-6. Backshell connectors give the installer the ability to terminate shield grounds at the backshell housing using the Shield Block ground kit. Table 3-6 lists Garmin part numbers for the GDC 74A, GRS 77 and GDU 620 D-sub connectors and the backshell assemblies.

CAUTION

When mounting the slide lock, use only the specified screws (6). Do not attempt to use the self-tapping screws supplied in the slide lock kit, as these will damage the backshell housing.

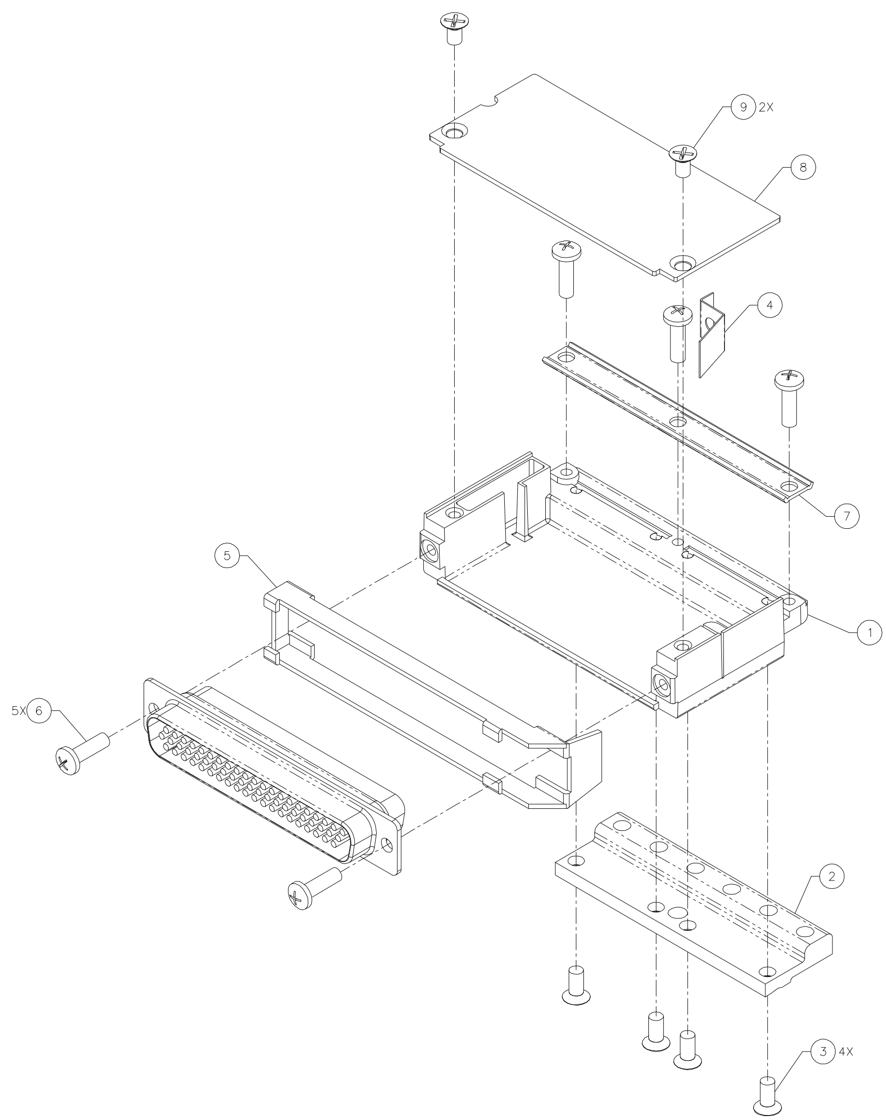


Figure 3-84. Connector and Backshell Assembly

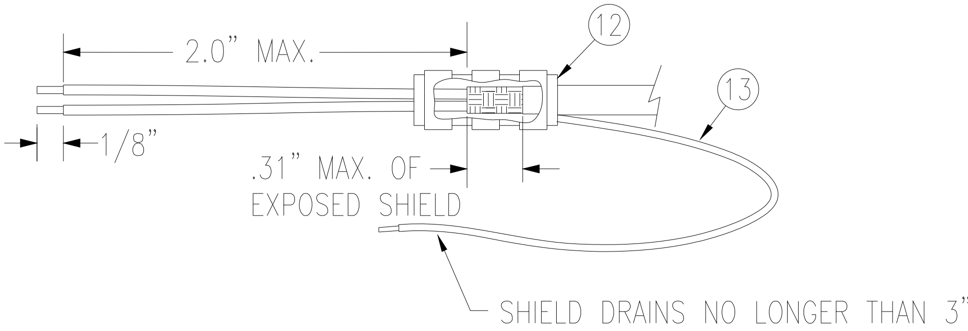


Figure 3-85. Shielded Cable Preparation

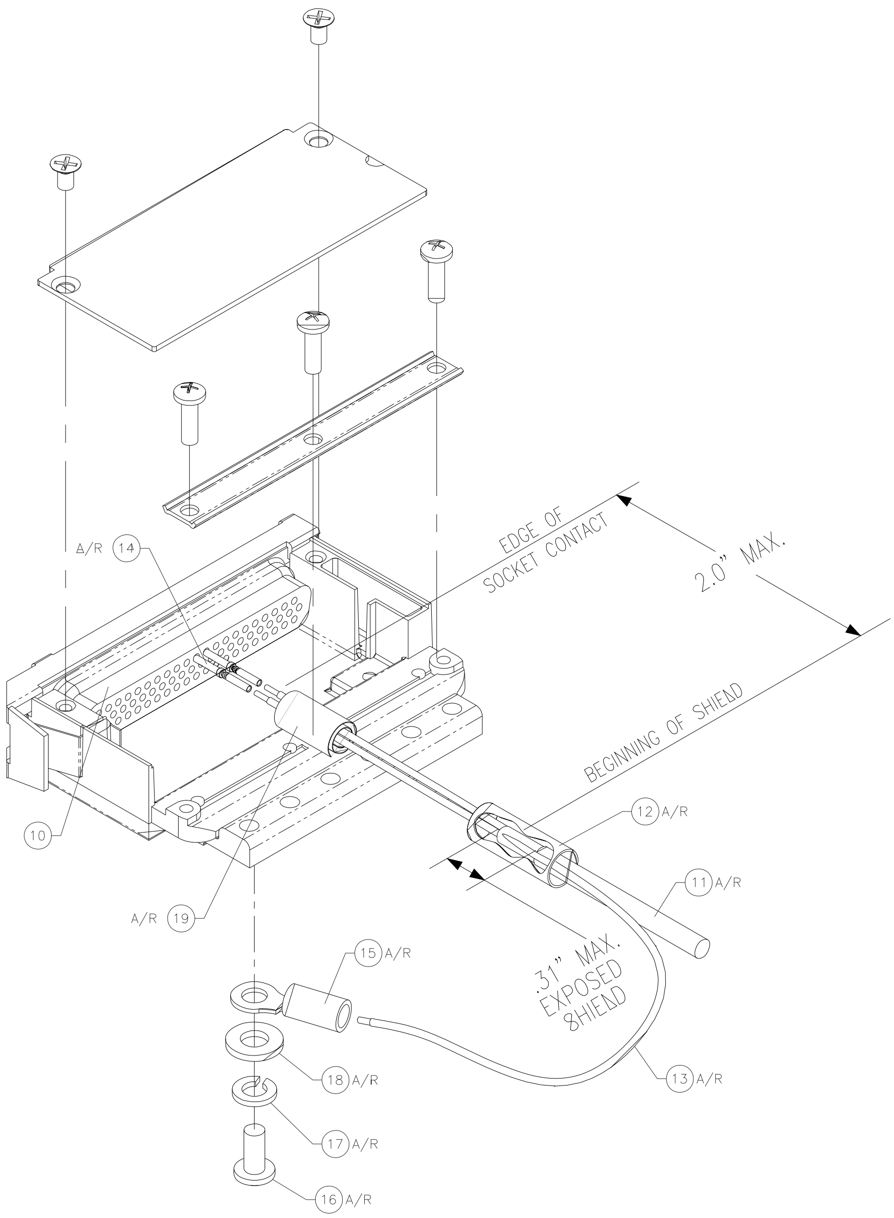


Figure 3-86. Shield Termination on Backshell Assembly

Prepare all of the shielded cables as shown in Figure 3-85. Refer to Figure 3-86 for details of the shield termination to the connector backshell.

1. At the end of the shielded cable (11), strip back a 2" maximum length of the jacket to expose the braid. Remove this exposed braid. Carefully score the jacket 1/4" to 5/16" from the end and remove the jacket to leave the braid exposed.

NOTE

Solder sleeves with pre-installed shield drains may be used instead of separate shield terminators and individual wires.

2. Connect a 20 or 22 AWG wire (13) to the exposed shield of the prepared cable assembly. (See Figure 3-85). AC 43.13 maybe a helpful reference for termination techniques.

NOTE

Solder Sleeves with pre-installed lead: A preferred solder sleeve is the Raychem S03 Series with the thermochromic temperature indicator. These solder sleeves come with a pre-installed lead and effectively take the place of items 12 and 13. For detailed instructions on product use, refer to Raychem installation procedure.

3. Slide a shield terminator (12) onto the prepared cable assembly (11) and connect the wire (13) to the shield using a heat gun approved for use with solder sleeves. The chosen size of solder sleeve must accommodate both the number of conductors present in the cable and the wire (13) to be attached.

4. Repeat steps 1 through 3 as needed for the remaining shielded cables.

5. Crimp pins/sockets (14) onto the wires and terminate in the connector (10) in accordance with the aircraft wiring drawings.

6. For P6202, install the configuration module wires into the connector. Refer to Section 3.4.2.2, steps 1 and 2 for instructions on installing the configuration module.

Assemble the backshell onto the connector:

10. Attach the Shield Block (2) to the backshell (1) by inserting the flathead screws (3) through the holes on the Shield Block and threading into the tapped holes on the backshell (1). (See Figure 3-84).

CAUTION

When mounting the slide lock, use only the specified screws (6). Do not attempt to use the self-tapping screws supplied in the slide lock kit, as these will damage the backshell housing.

11. Place the slide lock (5) over the connector (10). While holding the slide lock in place, attach the connector / slide lock to the backshell (1) by inserting two screws (6) through the holes on the connector and threading into the tapped holes on the backshell (1). (See Figure 3-84)

12. Wrap the cable bundle with Silicone Fusion Tape (19 or a similar version) at the point where the backshell strain relief and cast housing will contact the cable bundle.

CAUTION

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

13. Place the smooth side of the backshell strain relief (7) across the cable bundle and secure using the three screws (6).

14. For P6202, install the configuration module into the connector backshell. Refer to Section 3.4.2.2 steps 3 through 6 for instructions on installing the configuration module into the backshell.
15. Insert the slide lock spring (4) into the backshell (1). Attach the cover (8) to the backshell using two screws (9).

NOTE

Each tapped hole on the shield block (2) may accommodate only two ring terminals (15). It is preferred that a maximum of two wires (13) be terminated per ring terminal. Two wires per ring terminal will necessitate the use of a ring terminal, #8, insulated, 14-16 AWG (MS25036-153). If only a single wire is left or if only a single wire is need for this connector a ring terminal, #8, insulated, 18-22 AWG (MS25036-149) can accommodate this single wire. If more wires exist for the connector than two per ring terminal, it is permissible to terminate three wires per ring terminal.

16. Install ring terminals (15) onto the wires (13), grouping wires as appropriate for the connector.
17. Terminate the ring terminals to the shield block (2) by placing items on the pan head screw (16) in the following order: split washer (17), flat washer (18), first ring terminal, second ring terminal if needed, before finally inserting the screw into the tapped holes on the shield block.

3.4.2.2 Configuration Module Installation (P741, P771 and P6202 Only)

Table 3-7 and Table 3-8 list part numbers for the Configuration Module Kits, which are used with P741, P771 and P6202 only.

Table 3-7. Configuration Module Kit – 011-00979-00 (for P741 and P771)

Figure 3-87 Ref	Description	Garmin P/N
1	Configuration Module, PCB Board Assembly w/EEPROM	012-00605-00
2	Spacer, Configuration Module	213-00043-00
3	4-Conductor Harness	325-00122-00
4	Pin Contact, Crimp, #22D	336-00021-00

Table 3-8. Configuration Module Kit – 011-00979-02 (for P6202)

Figure 3-87 Ref	Description	Garmin P/N
1	Configuration Module, PCB Board Assembly w/EEPROM	012-00605-00
2	Spacer, Configuration Module	213-00043-00
3	4-Conductor Harness	325-00122-00
4	Socket Contact, Crimp, #20	336-00022-01

Table 3-9. Configuration Module Wire Color Reference Chart

Color	Function	P741 Contact	P771 Contact	P6202 Contact
Black	Ground	1	1	50
Red	Vcc	21	17	49
Yellow	Data	40	16	32
White	Clock	60	31	33

Assemble the configuration module:

1. Crimp socket contacts (4) onto each wire of the four-conductor wire harness (3). Strip 1/8” of insulation from each wire prior to crimping.
2. Insert newly crimped socket contacts and wires (3, 4) into the appropriate connector housing location as shown in Figure 3-87, Figure F-1, Figure F-2, and Figure F-3.
3. Apply the spacer (2) by wrapping it around the PCB board (1) making sure to insert the plastic connector mounted on the board into the hole provided in the spacer.
4. Plug the four-conductor wire harness (3) into the connector on the PCB board (1).
5. With pad (2) in position, insert PCB board (1) into the backshell recess.
6. Orient the connector housing so that the inserted four conductor wire harness (3) is on the same side of the backshell as the inserted PCB board (1), as shown in Figure 3-87.

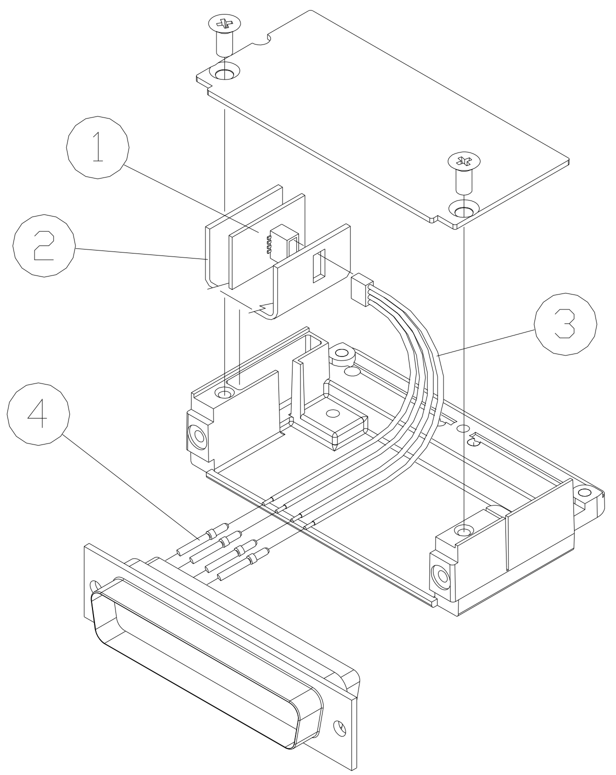


Figure 3-87. Configuration Module Installation

3.5 Unit Replacement

Whenever removing or replacing units, remove power from the LRU by removing aircraft power or opening the LRU circuit breaker.

3.5.1 GDU 620 Unit Replacement

3.5.1.1 Removal

1. Remove the six mounting screws from the bezel of the GDU 620.
2. Pull the GDU 620 far enough out from the instrument panel to access the three rear connectors.
3. Disconnect the rear connectors.
4. Remove the GDU 620.

3.5.1.2 Replacement

1. Visually inspect the connectors to ensure that there are no bent or damaged pins. Repair any damage.
2. Connect the rear connectors, ensuring that each slidelock is secured on both sides.
3. Set the GDU 620 into place.
4. Install the six mounting screws into the bezel of the GDU 620.

NOTE

The installation configuration settings are stored in the configuration module and will be retained when the GDU 620 is replaced with a new unit. User settings, such as map orientation preferences, are stored internally and will be lost when the GDU 620 is replaced with a new unit.

Original GDU 620 is Reinstalled

If the original GDU 620 is reinstalled, then no software loading is required. No configuration is required. Verify that the configuration is correct using the previously completed checkout log in Section 5.11.3.

New GDU 620 is Installed

If the GDU 620 is replaced with a new unit (new serial number) then software must be loaded. No configuration is required.

NOTE

Upon first power-up after installing a new GDU 620, it is normal to see a series of "LOADING…" messages appear on the screen. These messages indicate that the GDU 620 is updating its configuration settings from the configuration module.

Continue to the GDU 620 Software Loading procedure in Section 5.4.1 followed by the Manifest Configuration in Section 5.5.4, and the Configuration Module Update in Section 5.5.11.

GDU 620 Configuration Module is Replaced

If the GDU 620 Configuration Module is replaced, the GDU 620 will update the configuration module from its internally-stored settings when the UPDT CFG soft key is pressed as described in Section 5.5.11. Verify that the configuration is correct using the previously completed checkout log in Section 5.11.3. If the GDU 620 is replaced at the same time as the Configuration Module, then the System Setup will need to be performed per Section 5.5. To replace the configuration module, reference Section 3.4.2.2.

3.5.1.3 Return to Service

After removing and reinstalling the GDU 620 per the instructions above, a simple return-to-service check should be performed.

1. Power up the GDU 620 in configuration mode. Verify that the configuration settings match those recorded in the checkout log in Section 5.11.3.
2. Power up the GDU 620 in normal mode. Verify that there are no red-Xs and that no alerts are present. If red Xs or alerts are present, troubleshoot using Sections 6.2 and 0.

3.5.2 GRS 77 Unit Replacement

3.5.2.1 Removal

1. Disconnect the GRS 77 connector.
2. Loosen the four Phillips thumbscrews with a screwdriver.
3. Gently lift the GRS 77 from the mounting plate (if the supports for the mounting plate are removed, the GRS 77 must be recalibrated. See Section 5.6)

3.5.2.2 Replacement

1. Place the GRS 77 on the mounting plate, ensuring the orientation is correct.
2. Fasten the unit to the plate using the Phillips thumbscrews. Recommended torque is 22-25 inch pounds.
3. Visually inspect the connectors to ensure there are no bent or damaged pins. Repair any damage.
4. Connect the connector to the GRS 77, ensuring that each slidelock is secured on both sides.

Original GRS 77 is Reinstalled

If the original GRS 77 is reinstalled, then no software loading is required. Reference Table 3-10 to determine whether recalibration is required.

New GRS 77 is Installed

If the GRS 77 is replaced with a new unit (new serial number) then software must be loaded per Section 5.4.2. Reference Table 3-10 to determine whether re-calibration is required.

GRS 77 Configuration Module is Replaced

If the GRS 77 Configuration Module is replaced, the GRS 77 must be re-calibrated. Reference Table 3-10. To replace the configuration module, reference Section 3.4.2.2.

3.5.2.3 Return to Service

After removing and reinstalling the GRS 77, the following return-to-service checks should be performed.

1. Power up the G600 system with the GDU 620 in normal mode.
2. Verify that the GDU displays valid heading and attitude within approximately one minute. Note that heading can remain invalid if the magnetometer is near a large metal structure such as a hangar wall or if the magnetometer is close to a large ground power cart.
3. Verify that no unexpected alerts are present. If alerts are present, troubleshoot using Sections 6.2 and 0.

Table 3-10. GRS 77 Calibration Criteria

Condition	Calibrations Required		
	GRS 77 Pitch/Roll Offset Section 5.6.1	**GRS/GMU Magnetic Calibration** Section 5.6.2	**Engine Run-up Vibration Test** Section 5.6.5
GRS 77 AHRS was removed and/or replaced. The mounting tray was NOT removed and the mounting tray bolts were NOT loosened.	None Required.		
GRS 77 AHRS was removed and/or replaced. The mounting tray WAS removed and/or mounting tray bolts WERE loosened.	X	X	X
GRS 77 AHRS Configuration Module was replaced.	X	X	X

3.5.3 GMU 44 Unit Replacement

3.5.3.1 Removal

1. Gain access to the GMU 44 magnetometer.
2. Unscrew the three screws that hold the GMU 44 to its mounting rack.
3. Carefully lift the GMU 44 from the rack.
4. Disconnect the wiring harness.

3.5.3.2 Replacement

1. Visually inspect the connectors to ensure there are no bent or damaged pins. Repair any damage.
2. Connect the wiring harness to the GMU 44.
3. Lower the GMU 44 into the rack and secure the plate with the three Phillips screws.

Original GMU 44 is Reinstalled

If the original GMU 44 was reinstalled, then software loading is not required. Recalibration is required *only if the mount for the magnetometer was changed*. If the magnetometer mount was changed, continue to Section 5.6.2 for the GRS 77/GMU 44 Magnetic Calibration. After the GRS 77/GMU 44 Magnetic Calibration is performed, the criteria in Sections 5.6.3 and 5.6.4 should be used to determine whether the Heading Offset Compensation is necessary.

New GMU 44 is Installed

If the GMU 44 was replaced with a new unit (new serial number) then software must be loaded and the GRS 77/GMU 44 Magnetic Calibration must be performed. Continue to Section 5.4.3 for software loading and Section 5.6.2 for the GRS 77/GMU 44 Magnetic Calibration. After the GRS 77/GMU 44 Magnetic Calibration is performed, the criteria in Sections 5.6.3 and 5.6.4 should be used to determine whether the Heading Offset Compensation is necessary.

3.5.3.3 Return to Service

After removing and reinstalling the GMU 44, the following return-to-service checks should be performed.

1. Power up the G600 system with the GDU 620 in normal mode.
2. Verify that the GDU displays valid heading within approximately one minute. Note that heading can remain invalid if the magnetometer is near a large metal structure such as a hangar wall or if the magnetometer is close to a large ground power cart.
3. Verify that no unexpected alerts are present. If alerts are present, troubleshoot using Sections 6.2 and 0.

3.5.4 GDC 74A Unit Replacement

3.5.4.1 Removal

1. Disconnect the pitot/static plumbing from the rear of the unit. Disconnect the single connector.
2. Loosen each thumbscrew on the hold-down clamp and remove the clamp.
3. Carefully remove the unit from its mount.

3.5.4.2 Replacement

1. Place the unit in the mounting tray.
2. Position the locking clamp and fasten using the thumbscrews.
3. Connect the pitot/static plumbing.
4. Inspect the connector and pins for damage. Repair any damage.
5. Connect the connector to the unit, ensuring that each slidelock is secured on both sides.

Original GDC 74A is Reinstalled

If the original GDC 74A is re-installed, then no software loading is required.

New GDC 74A is Installed

If a new GDC 74A (new serial number) is installed, then software must be loaded to the unit. Continue to the GDC 74A Software Loading procedure in Section 5.4.4.

GDC 74A Configuration Module is Replaced

If the GDC 74A Configuration Module is replaced, the GDC 74A must be configured. Continue to Section 5.5.7. To replace the configuration module, reference Section 3.4.2.2.

3.5.4.3 Return to Service

After removing and reinstalling the GDC 74A, the following return-to-service checks should be performed.

1. Power up the G600 system with the GDU 620 in normal mode.
2. Verify that the GDU displays valid air data within approximately one minute.
3. Verify that no unexpected alerts are present. If alerts are present, troubleshoot using Sections 6.2 and 0.
4. Perform a leak check of the pitot-static system and observe the airspeed, altitude, and vertical speed for proper operation.

3.5.5 Mid-Continent Electric Standby ADI System Replacement (if installed)

The Mid-Continent electric ADI and associated LRUs must be replaced with the same P/N (including panel tilt and lighting voltage) as the unit(s) being replaced. Except for the MD420 emergency power supply, these units require no configuration when removed or replaced. On the MD420 battery module, the Lighting Voltage Select switch must be set to match the lighting voltage of the unit that was removed.

3.5.5.1 Return to Service

After removing and reinstalling the Mid-Continent electric ADI or associated LRUs, the following return-to-service checks should be performed.

1. Power up the standby ADI system from aircraft power.
2. Verify that the power indicator flag is out of view.
3. After approximately three minutes verify that the attitude presentation is correct (the ADI may need to be caged).
4. Remove aircraft power from the standby ADI system and press the STBY PWR button on the standby ADI system. Verify that the power indicator flag remains out of view and the ADI continues to run on battery power.
5. Verify that lighting is still provided to the ADI.
6. Restore aircraft power to the standby ADI.

3.6 Weight and Balance

Weight and balance computation is required after the installation of the G600 system. Follow the guidelines as established in AC 43.13-1B, Chapter 10, Section 2. Make appropriate entries in the equipment list indicating items added, removed, or relocated along with the date accomplished. Include your name and certificate number in the aircraft records. Refer to the Table 3-11 below for unit dimensions and center of gravity. A sample calculation is shown in Figure 3-88.

Table 3-11. Unit Weight and Balance Data

Item	Weight	Dimensions and CG
GDU 620	6.38 lbs (2.90 kg)	See Figure C-2
GRS 77	2.80 lbs (1.27 kg)	See Figure C-4
GRS 77 and Mounting Rack	3.50 lbs (1.59 kg)	See Figure C-4
GRS 77, Mounting Rack and Universal Mount	4.55 lbs (2.07 kg)	See Figure C-4and Figure C-11
GDC 74A	1.69 lbs (0.77 kg)	See Figure C-5and Figure C-6
GDC 74A and Mounting Rack	2.04 lbs (0.93 kg)	See Figure C-5and Figure C-6
GMU 44	0.35 lbs (0.16 kg)	See Figure C-3
GMU 44 and Mounting Rack	0.50 lbs (0.23 kg)	See Figure C-3
GMU 44, Mounting Rack and Universal Mount	0.72 lbs (0.33 kg)	See Figure C-3 and Figure C-

Previous Aircraft Weight and Balance	Useful Load	Empty Weight	C.G.	Moment
Calculated 03/10/06	1093.3	2306.70	138.83	320233.96
Description of items removed from aircraft		**Weight**	**Arm**	**Moment**
VSI		0.85	116.90	99.37
CDI		1.30	116.60	151.58
Clock and OAT		0.30	117.40	35.22
Sandel HSI		3.60	114.10	410.76
HSI Gyro Remote		4.90	181.00	886.90
Magnetometer (Old)		0.40	151.00	60.40
Attitude Indicator		2.20	114.50	251.90
Altimeter		1.10	116.10	127.71
Total removed		14.65		2023.84
Description of items added to aircraft		**Weight**	**Arm**	**Moment**
GDU 620		6.38	114.10	727.96
GRS 77, mounting rack, and universal mount		4.55	181.00	823.55
GDC 74A and mounting rack		2.04	113.30	231.13
GMU 44, mounting rack, and universal mount		0.72	146.00	105.12
Standby attitude indicator		3.70	121.00	447.70
Standby altimeter		1.10	121.00	133.10
Total added		18.49		2468.56
Change		**3.84**		**444.73**
New Aircraft Weight and Balance	**Useful Load**	**Weight**	**C.G.**	**Moment**
6/21/2008	**1089.46**	**2310.54**	**138.79**	**320678.69**

Figure 3-88. Sample Weight and Balance Calculation

3.7 Electrical Load Analysis

An electrical load analysis should be completed on each aircraft prior to installation in accordance with AC 43.13-1B, Chapter 11 and recorded on FAA Form 337. Use the following values for computation:

Table 3-12. LRU Current Requirements

LRU	14 Volt Current Draw		28 Volt Current Draw	
	Typical	Maximum	Typical	Maximum
GDU 620	3.9 A	5.4 A	1.9 A	2.7 A
GRS 77/GMU 44	600 mA	1.0 A [1]	300 mA	1.0 A [1]
GDC 74A/GTP 59	410 mA	480 mA	200 mA	235 mA

[1] Maximum current draw occurs momentarily at startup or when the supply voltage drops to 9 VDC

NOTE

Circuits should be protected in accordance with the approved data in this document (see Appendix F for recommended G600 LRU circuit breaker ratings) and the guidelines in AC 43.13-1B, Chapter 11, Section 4.

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4 System Interconnect

For pin out information for each G600 LRU, refer to Appendix B. For G600 interconnect information refer to Appendix F.

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5 System Configuration/Checkout

5.1 System Configuration Overview

Once the G600 system has been installed, the system must be configured for the particular installation. In order to access all of the configuration pages an Installer Unlock Card (P/N 010-00769-60) must be inserted into the GDU at the time the system is powered up. A summary of the steps for system configuration and calibration follows:

- Gather the airframe-specific information as specified in Section 5.2.
- Perform the installation checks specified in Section 5.3.
- Load software into the G600 LRUs as specified in Section 5.4.
- Configure the G600 system for the particular installation, as specified in Section 5.5. This includes setting the airframe-specific parameters and enabling interfaces to external systems.
- Enable optional features (this can be done at a later time).
- Perform an alignment and calibration of the GRS 77 AHRS as specified in Section 5.6. An engine run-up test is also conducted to verify the mounting of the GRS 77.
- Perform a check of the pitot-static system to verify the installation of the GDC 74A air data computer and standby instruments. The correct settings of the airspeed tape are also verified during this check. Refer to Section 5.8.
- Perform the ground checks to verify the interfaces to external settings, as specified in Section 5.8.
- Verify all placards have been relocated, as specified in Section 5.9
- Perform the flight checks specified in Section 5.10.
- Update the aircraft documentation as specified in Section 5.11.

5.2 Required Airframe-Specific Information

This section only provides guidance for gathering the required information particular to each installation. This information will be used for entering data on the Airframe Configuration page. Record the information below in the configuration and checkout log sheet in Section 5.11.3.

5.2.1 PFD

The distance/speed (DIS.SPD) and altitude/vertical speed (ALT.VS) units can be configured to match a particular installation. These units **MUST** be set to those currently used in the airplane.

The vertical speed tape range can be configured for several ranges. It is recommended that the ±2000 fpm range be used; however, this is left to the installer's discretion (e.g. a larger range may be desired if the VSI being removed has a larger range).

The attitude indicator on the PFD has two pointers on the roll scale. When banking, one pointer indicates the aircraft bank angle and the other pointer remains stationary. The pointer that indicates bank angle can either point up (Sky Pointer) or down (Ground Pointer). This pointer must be configured to match the Standby ADI being installed in the aircraft.

5.2.2 MFD

The default distance/speed (DIS.SPD) and altitude/vertical speed (ALT.VS) units can be configured to match a particular installation. It is recommended that the same units as the PFD be used; however, this is left to the installer's discretion. The pilot will be able to change these units on the first AUX page on the MFD.

5.2.3 GDL 69 Audio Mute Speed

If a GDL 69A is connected to the GDU 620, the GDL 69A audio output will become muted whenever the airspeed is below the MUTE SPEED value. If this is set to OFF, the GDL 69A will never be muted based upon airspeed.

5.2.4 Airspeeds (PFD)

The information listed in Table 5-1 must be obtained for every installation. The POH/AFM column lists a suggested location for obtaining this information. **This information must be taken from the AFM or POH for the airplane being modified.**

NOTE

If the airspeed values are listed in the POH/AFM for both indicated airspeed (IAS) and calibrated airspeed (CAS) use the values for IAS.

Table 5-1. Airframe Specific Configuration Data

Item	Description	POH/AFM Section	Note
Vs0	stall speed in landing configuration	2-Limitations	Bottom of white arc on ASI
Vs1	stall speed in a specific flight configuration	2-Limitations	Bottom of green arc on ASI
Vfe	maximum flap extended speed	2-Limitations	Top of white arc on ASI - if more than one flap speed is given, use the lowest speed
Vno	normal operating speed	2-Limitations	Top of green arc/bottom of yellow arc on ASI - if the aircraft has no yellow arc but has a green arc that extends to the red radial, set Vno to the same value as Vne.
Vne	never exceed speed	2-Limitations	Red radial on ASI
GLIDE	glide speed	3-Emergency Procedures	*Optional* - set to 0 Kt (off) if not listed in the AFM/POH
Vr	reference airspeed	4-Normal Procedures	*Optional* - typically set to rotation speed - set to 0 Kt (off) if not listed in the AFM/POH
Vx	best angle of climb speed	4-Normal Procedures	*Optional* - set to 0 Kt (off) if not listed in the AFM/POH (if there are two speeds listed (gear up/gear down), use the speed listed for gear down)
Vy	best rate of climb speed	4-Normal Procedures	*Optional* - set to 0 Kt (off) if not listed in the AFM/POH (if there are two speeds listed (gear up/gear down), use the speed listed for gear up)
Vle	maximum landing gear extended speed	2-Limitations	set to 0 Kt (off) for fixed gear aircraft
Vmca	minimum controllable airspeed for twin engine aircraft with only one engine operational	2-Limitations	Lower red radial on ASI of light twins - set to 0 Kt (off) for single engine aircraft
Vyse	single engine best rate of climb speed for a twin engine aircraft	3-Emergency Procedures or 4-Normal Procedures	Blue radial on ASI of light twins - set to 0 Kt (off) for single engine aircraft

5.3 Mounting, Wiring and Power Checks

Verify that all cables are properly secured and shields are connected to the shield block of the connectors. Check the movement of the flight and engine controls to verify that there is no interference. Ensure wiring is installed in accordance with AC 43.13-1B, Chapter 11.

Prior to installing any LRUs, the wiring harness should be checked for proper connections to the aircraft systems and other avionics systems. Point to point continuity should be checked to expose any faults such as shorting to ground. Any faults or discrepancies found should be corrected before proceeding.

After accomplishing a continuity check, perform power and ground checks to verify proper power distribution to the LRUs. Any faults or discrepancies should be corrected at this time. Remove power to the aircraft upon completion of harness checkout.

Upon completion of continuity and power checks, the LRUs can be installed. Each LRU must be installed into its respective rack and secured. The units and accessories must be connected to the wiring harness. Any additional connections, such as pitot/static plumbing, must also be accomplished at this time.

NOTE

Throughout the next section of this document, many screen shots and examples are used to illustrate the software and checkout loading process. Although every effort has been made to ensure accuracy of such examples, changes may occur. Always refer to the Master Data List for the correct software versions and part numbers.

5.4 Software Loading

The G600 LRUs come pre-loaded with software. However, to ensure that the latest software is loaded it is recommended that software from a current G600 Software Loader Card P/N 010-00771-( ) be loaded into each LRU. For dual GDU 620 installations the software loading procedures below must be carried out on each GDU.

NOTE

A G600 Software Loader Card can also be created. Refer to Section 2.4.3 for additional information.

Apply power to the aircraft and the G600 system.

5.4.1 GDU 620 Software Loading

1. Pull the PFD circuit breaker.
2. Insert the correct G600 Loader Card into the top card slot and Installer Unlock Card (P/N 010-00769-60) into the bottom slot.
3. While holding the ENT key, restore power by closing the PFD circuit breaker.
4. When the words INITIALIZING SYSTEM appear in the upper center of the PFD/MFD, release the ENT key.
5. Press the ENT key to acknowledge the following prompt:

   ```
   DO YOU WANT TO UPDATE SYSTEM FILES?
   PRESS ENT KEY FOR YES OR CLR KEY FOR NO.
   NO WILL BE ASSUMED IN 11 SECONDS.
   ```

6. The following item is displayed:

   ```
   UPDATING SYSTEM FILES
   DO NOT TURN OFF THE POWER
   ```

7. New software is loaded to the GDU. When complete, the following screen is displayed.

NOTE

The screen shown is for reference only. The actual number of files updated may vary.

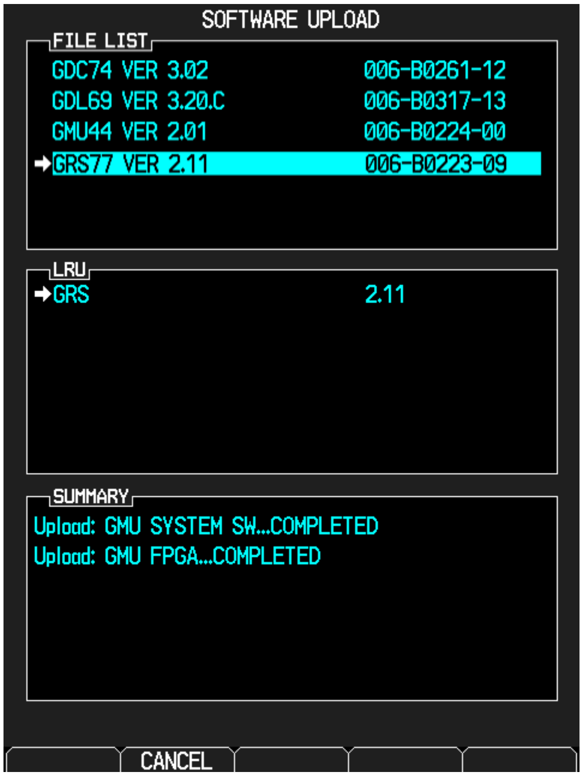
```
UPDATED 83 FILES SUCCESSFULLY!
PRESS ANY KEY TO CONTINUE.
CONTINUING IN 7 SECONDS.
```

8. Press any soft key to acknowledge the prompt, and the GDU starts in configuration mode.

5.4.2 GRS 77 Software Loading

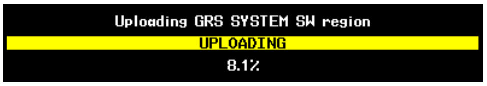
Go to the SOFTWARE UPLOAD page.

1. Highlight the GRS 77 software file. Ensure that GRS is shown in the LRU window as shown.

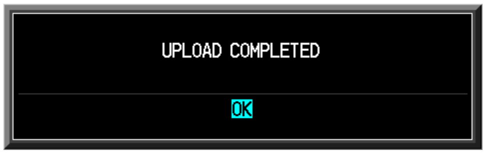


2. Press the LOAD soft key.
3. Select OK and press the ENT key to acknowledge the following prompt:

4. The software for the GRS 77 AHRS begins to load. Monitor the upload status as it progresses:



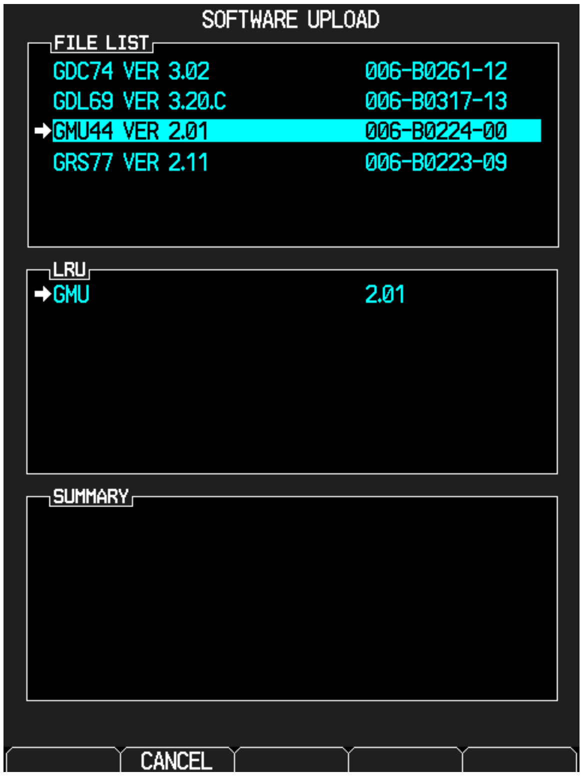
5. After the files finish loading, press the ENT key to acknowledge the following prompt:



6. Check the SUMMARY window to ensure the load is 'COMPLETE'.

5.4.3 GMU 44 Software Loading

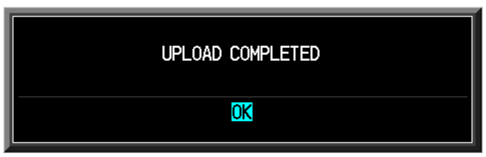
1. Highlight the GMU44 software file. Ensure that the GMU appears in the LRU window as shown.



2. Press the LOAD soft key.
3. Select OK and press the ENT key to acknowledge the following prompt:

4. The software for the GMU 44 Magnetometer begins to load. Monitor the upload status as it progresses:

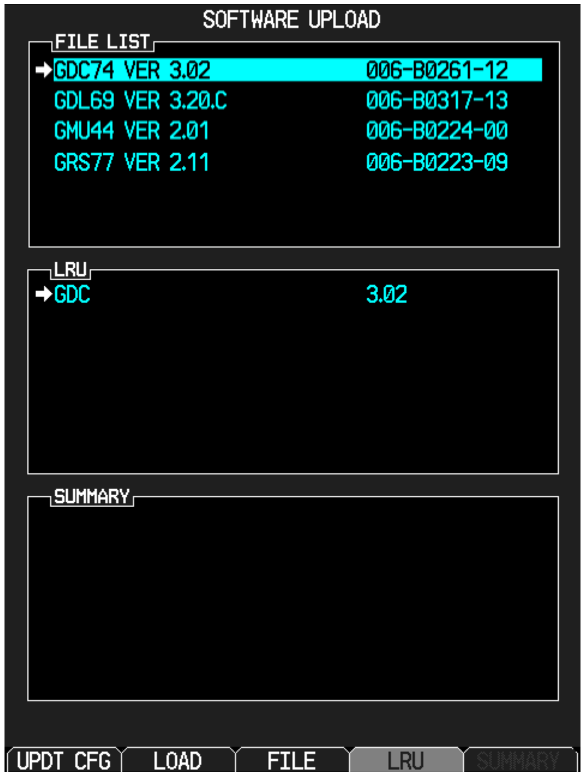
5. After the files finish loading, press the ENT key to acknowledge the following prompt:



6. Check the SUMMARY window to ensure the load is 'COMPLETE'.

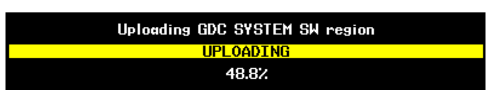
5.4.4 GDC 74A Software Loading

1. Highlight the GDC74 software file. Ensure that the GDC appears in the LRU window as shown.

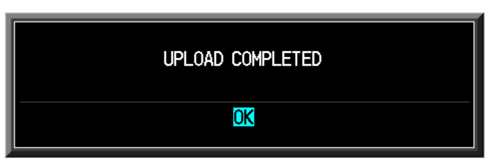


2. Press the LOAD soft key.
3. Select OK and press the ENT key to acknowledge the following prompt:

4. The software for the GDC 74A Air Data Computer begins to load. Monitor the upload status as it progresses:



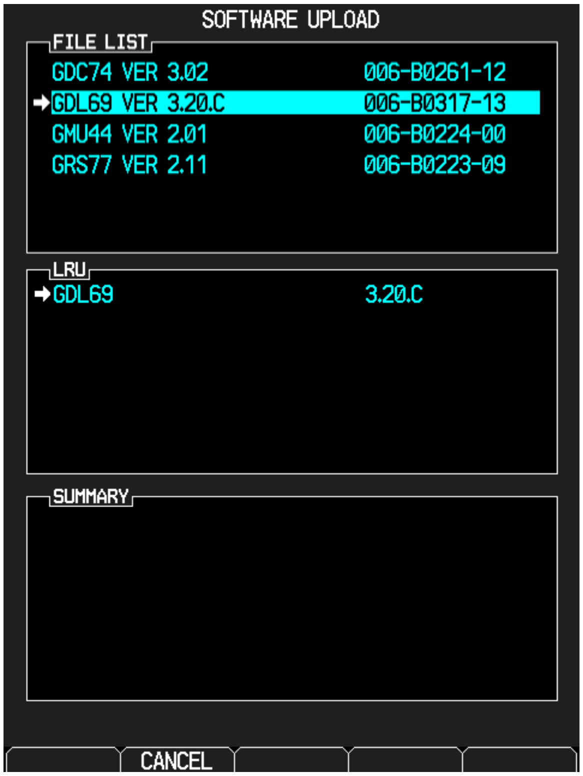
5. After the files finish loading, press ENT to acknowledge the following prompt:



6. Check the SUMMARY window to ensure the load is 'COMPLETE'.

5.4.5 GDL 69/69A Software Loading (Optional)

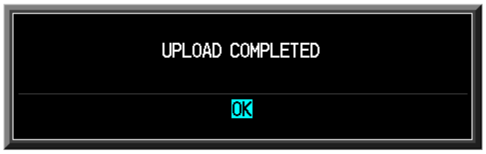
1. Highlight the GDL69 software file. Ensure that the GDL appears in the LRU window as shown.



2. Press the LOAD soft key.
3. Select OK and press the ENT key to acknowledge the following prompt:

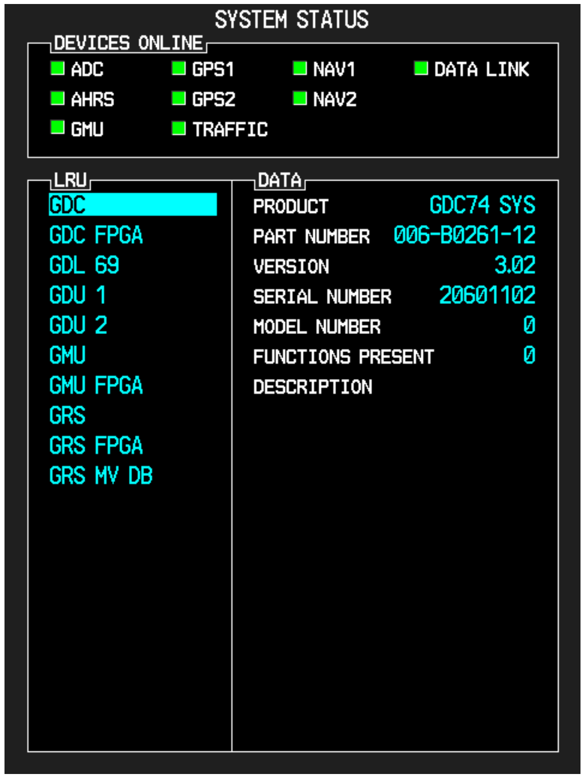
4. The software for the GDL 69/69A begins to load. Monitor the upload status as it progresses:

5. After the files finish loading, press ENT to acknowledge the following prompt:



6. Check the SUMMARY window to ensure the load is 'COMPLETE'.

5.4.6 Software Load Confirmation



1. Activate the cursor on the System Status page on the PFD.
2. Highlight the following items in the LRU window, and verify that the software part number and version matches the information in found in the STC Master Data List 005-C0313-00 :

LRU	SW OK	LRU	SW OK	LRU	SW OK
GDC	_____	GDU [1]	_____	GRS	_____
GDC FPGA	_____	GMU	_____	GRS FPGA	_____
GDL 69	_____	GMU FPGA	_____		

[1] For a dual GDU 620 installation GDU1 and GDU2 are shown. The software P/N for each GDU must be verified.

3. De-activate the cursor.

NOTE

For dual GDU 620 installations, remove the G600 loader card from the top slot of the first GDU 620 and repeat sections 5.4.1 through 5.4.6 using the second GDU 620. The GDL 69/69A software does not need to be reloaded.

5.5 System Setup

The GDU 620 configuration mode allows the G600 system to be configured for a particular installation. Refer to Section 5 of the GDU 620 Installation Manual 190-00601-04 for details on using the configuration mode. Record all of the settings in the checkout log sheet provided in Section 5.11.3. For dual GDU 620 installations each GDU 620 must be set up as described herein.

Any required configuration settings for approved interfacing systems can be found in Appendix E. Any required configuration settings for the G600 are found in this section.

If not already in configuration mode with the Installer Unlock Card, ensure that the Installer Unlock Card P/N 010-00769-60 is installed in the GDU and cycle power to the GDU while holding the ENT key.

NOTE

After configuring all necessary items, ensure the configuration module is updated. Refer to Section 5.5.11.

5.5.1 System Configuration

Go to the SYSTEM CONFIGURATION page in the SYS page group. For each external data source that is connected to the GDU 620, set the corresponding interfacing system PRESENT and select the type accordingly.

5.5.2 Airframe Configuration

Go to the AIRFRAME CONFIGURATION page in the SYS page group. Set the parameters to the values determined in Section 5.2.

5.5.3 Lighting Configuration

The following guidance is recommended to help the installer determine a suitable setup. A test flight is recommended upon completion of the setup.

NOTE

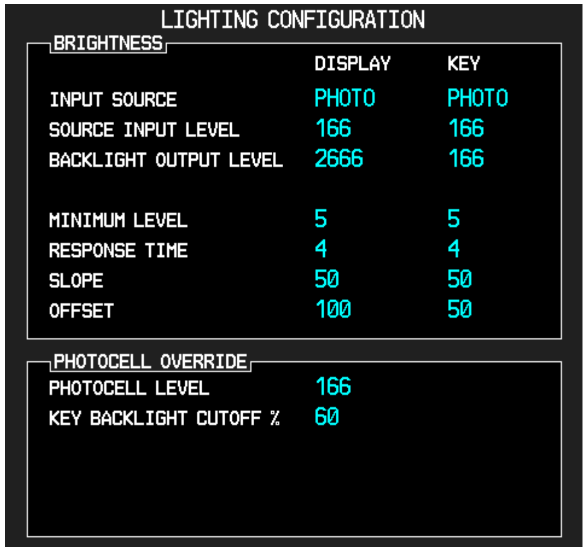
A description of the available adjustments can by found in Section 5 of the GDU 620 Installation Manual 190-00601-04.

NOTE

To accurately configure the lighting, the ability to adjust ambient light conditions is required. The installer should be prepared to simulate complete darkness in the cockpit. Simply covering the photocells may not allow the installer's eye to properly judge whether the display brightness is too bright or too dim for night use.

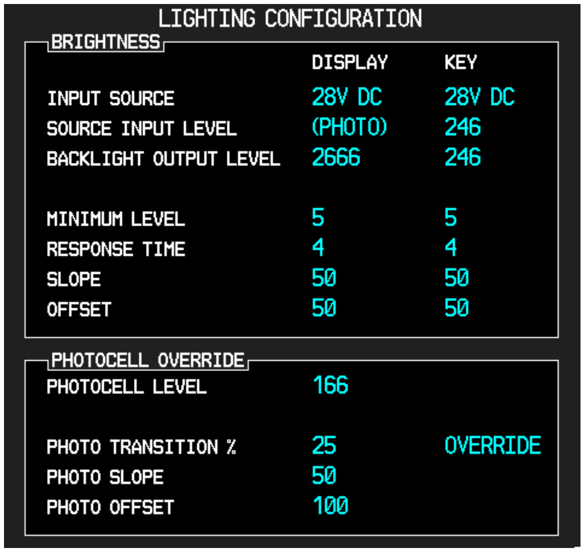
Go to the LIGHTING CONFIGURATION page in the SYS page group and proceed according to the *Photocell Configuration* or *Dimmer Bus Configuration* as appropriate for the installation:

Photocell Configuration:



1. Set the RESPONSE TIME to a low level (such as 2) to allow the display to adjust more quickly to light conditions.
2. It is recommended to start configuration with a SLOPE of 50%.
3. Minimize photocell input levels by simulating night conditions in the cockpit. Any other instrument panel or cockpit lighting should be turned on for this adjustment. Seek uniform consistency between display lighting, bezel/key lighting, and any other illuminated objects.
   a) If a display/keypad is too bright, lower the minimum level and/or adjust the lighting slope to achieve the desired brightness.
   b) If the display is not bright enough, raise the minimum level to the desired brightness.
4. Simulate direct maximum sunlight in the cockpit (best if done outside).
   a) Verify that the display produces maximum brightness on the backlight output level. (~10,000).
5. Simulate average sunlight conditions in the cockpit (between 5000-7500 input level).
   a) If the display is too bright or too dim, vary the SLOPE and/or OFFSET to achieve desired brightness at mid-range lighting input levels.
   b) Ensure that the lighting SLOPE, OFFSET and MINIMUM LEVEL still maintain the low-light configuration achieved in Step 2. Repeat Step 2 if necessary to re-adjust night lighting settings.
6. Adjust the RESPONSE TIME to smooth changes to brightness as required.
7. Adjust the KEY BACKLIGHT CUTOFF PERCENTAGE so that the key backlighting is switched off in bright light.

Dimmer Bus Configuration:



1. Select the appropriate source voltage for the dimmer bus. Set the PHOTO TRANSITION % to 0 for initial dimmer knob calibration.
2. Set the RESPONSE TIME to a low level (such as 2) to allow the display to adjust more quickly to dimmer bus input changes.
3. Simulate night conditions in the cockpit. Turn the dimmer bus knob to its minimum setting and observe the SOURCE INPUT LEVEL for corresponding change to the input level. Seek uniform consistency between display lighting, bezel key lighting, and any other cockpit illuminated information.
   a) If a display/keypad is too bright, lower the minimum level and/or adjust the lighting slope to achieve the desired brightness.
   b) If the display is too dim, increase the minimum level to achieve desired levels.
   c) Slowly adjust the dimmer bus knob to its maximum setting. Adjust the SLOPE and OFFSET to obtain uniform consistency between display lighting, bezel key lighting, and any other cockpit illuminated information over the full range of the dimmer bus.
   d) Set the PHOTO TRANSITION % such that the photocell is used when the dimmer bus is switched off (OVERRIDE will appear in the PHOTO TRANSITION % setting in the KEY column).
   e) With the dimmer bus OFF, adjust the PHOTO OFFSET to a value so that the display and bezel keys remain readable.
4. With the dimmer bus OFF, simulate direct sunlight conditions in the cockpit (best if done outside).
   a) If the brightness is below maximum level, adjust the PHOTO SLOPE setting to achieve maximum brightness (~10,000).
5. Adjust the RESPONSE TIME to smooth changes to brightness as required.

NOTE

The display and key lighting can independently be set to track the photocell or dimmer bus.

5.5.4 Manifest Configuration

Go to the MANIFEST CONFIGURATION page in the SYS page group. The manifest will be empty on first use.

1. Wait for the GRS 77, GMU 44, GDC 74A and GDL 69/69A (if installed) to power up.
2. Press the MANIFEST soft key to automatically populate the manifest.
3. Ensure that the manifest contains the correct software part numbers and version numbers. Refer to the Master Data List 005-C0313-00 for a list of approved version numbers.

CAUTION

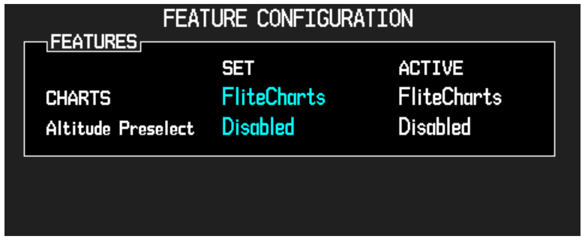
If using the MANIFEST soft key to automatically enter the manifest information, ensure that each LRU has the correct software loaded prior to pressing the MANIFEST soft key. Failure to do so will result in an incomplete list of software part numbers and version numbers being stored in the manifest. If an incomplete list of software part numbers or version numbers is stored in the manifest, the MANIFEST soft key can be pressed again to reflect the current information.

5.5.5 Optional G600 Feature Activation

NOTE

In order to enable/disable features, an Installer Unlock Card (P/N 010-00769-60) is required. However, it is possible to view the status of optional features without using an Installer Unlock Card.

Ensure that any optional features are enabled. All optional features are activated using the FEATURE CONFIGURATION page of the GDU 620.



5.5.5.1 ChartView

The GDU 620 can display Jeppesen charts using the optional ChartView feature, which must be activated. This section describes how to activate the ChartView feature in the GDU 620.

1. Turn the GDU 620 off.

NOTE

The ChartView Activation Card only can only be used on one GDU 620 display (for dual GDU 620 installations a separate ChartView Activation Card must be used on each GDU 620). A new ChartView Activation card must be used for each GDU 620 that has the ChartView feature activated.

2. Remove the database SD card from the front SD card slot and insert a ChartView Activation Card P/N 010-00769-50 (heavy aircraft) or P/N 010-00769-53 (light aircraft).
3. Enter configuration mode on the GDU 620 by applying power to GDU 620 while holding the ENT key.
4. Go to the FEATURE CONFIGURATION page in the SYS page group. Activate the cursor and change the set value for CHARTS to ChartView. Press ENT to confirm your selection.
5. Press ENT to acknowledge the prompt and activate ChartView.
6. When the ChartView feature is activated, “ChartView” will appear in the ACTIVE column.

NOTE

Navigation or chart data must not be programmed on the ChartView Activation Card.

5.5.5.2 Altitude Preselect

When the optional Altitude Preselect feature is enabled, the GDU 620 can provide selected altitude information to certain autopilots, allowing the autopilot to capture the selected altitude. This section describes how to activate the Altitude Preselect feature in the GDU 620.

1. Turn the GDU 620 off.
2. Remove the database SD card from the front SD card slot and insert an Altitude Preselect Activation Card P/N 010-00769-52.
3. Enter configuration mode on the GDU 620 by applying power to GDU 620 while holding the ENT key.

4. Go to the FEATURE CONFIGURATION page in the SYS page group. Activate the cursor and change the set value for Altitude Preselect to Enabled. Press ENT to confirm your selection.
5. Press ENT to acknowledge the prompt and activate the Altitude Preselect feature.
6. When the Altitude Preselect feature is activated, "Enabled" will appear in the ACTIVE column.

5.5.6 Audio Alert Configuration

The alert volume level has an initial default of 0 dB (maximum volume value). The volume of the GDU 620 audio output must be set so as to ensure that aural messages are audible under all anticipated noise environmental conditions.

1. Go to the AUDIO ALERT CONFIGURATION page in the SYS page group.
2. Activate the cursor and select the Audio Message type and then select the PLAY field. Press ENT to play the message.
3. Using the VOLUME ADJUST field, adjust the volume so the alert message is audible under all anticipated noise environmental conditions.
   - Evaluate the audio messages for acceptable volume and intelligibility during both low and high cockpit noise levels.
   - Adjust the audio volume by moving the cursor to the VOLUME ADJUST field and rotating small right knob. Turn the knob to the right to increase the volume and to the left to decrease the volume.

5.5.7 GDC Configuration

The OAT probe type must be set for the GDC 74A.

1. Go to the GDC CONFIGURATION page in the GDC page group.
2. Activate the cursor and select the GTP 59 OAT probe type.
3. Deactivate the cursor.

5.5.8 GDL 69/69A Configuration

If installed, the GDL 69/69A must be configured to match the installation.

1. Go to the GDL 69 CONFIGURATION page in the GDL page group.
2. Activate the cursor and adjust the Antenna Gain and Cable Loss to match the installation. Refer to the GDL 69/69A Installation Manual (190-00355-02) to determine the correct values.
3. Enable any Ethernet ports as required by the installation.
4. Deactivate the cursor.

NOTE

The GDL 69/69A XM must be activated before use. If the XM activation has not already been done, see the GDL 69/69A Installation Manual (190-00355-02) and the GDL 69/69A XM Activation Instructions (190-00355-04).

5.5.9 Autopilot Configuration

If an autopilot is connected to the G600, the GDU 620 must be configured to provide the correct heading and course datum information to the autopilot.

1. Go to the AUTOPILOT CONFIGURATION page in the FCS page group.
2. Press ENT to set the autopilot to PRESENT.
3. Move the cursor to the TYPE field and set the value according to Table 5-2.

Table 5-2. GDU 620 Autopilot Type Settings

Autopilot Model	Autopilot TYPE Setting	Notes
Century 2000	Century 2000	
Century 21 / 31 / 41	Century 21/31/41	
Century IV (AC)	Century NSD 360 AC	
Century IV (DC)	Century IV	
All Century A/Ps with Radio Couplers	Century NSD 360 AC	
Cessna 300 IFCS/400 IFCS/800 IFCS	Cessna 400B AC	
Cessna 400B	Cessna 400B AC or DC	[1]
Cessna 400B IFCS/800B IFCS	Cessna 400B DC	
Collins AP-106/107	Collins PN 101	
Collins APS-65	APS-65	
Honeywell (Bendix/King) KAP-100	King KI 525	
Honeywell (Bendix/King) KAP-140	King KI 525	
Honeywell (Bendix/King) KAP-150	King KI 525	
Honeywell (Bendix/King) KAP-200	King KI 525	
Honeywell (Bendix/King) KFC-150	King KI 525	
Honeywell (Bendix/King) KFC-200	King KI 525	
Honeywell (Bendix/King) KFC-225	King KI 525	
Honeywell (Bendix/King) KFC-250	King KFC 250	[2]
Honeywell (Bendix/King) KFC-275	King KI 525	
Honeywell (Bendix/King) KFC-325	King KFC 325	[2]
Sperry SPZ-500	Sperry SPZ-500	
S-TEC 20/30/40/50/55/55X/60/65/60-2	King KI 525	[3]

[1] Select “Cessna 400B AC” or “Cessna 400B DC” based upon whether the autopilot is strapped for AC or DC course/heading error inputs.

[2] If the King autopilot is installed with a KA 52 or KA 57 autopilot adapter, the TYPE must be set to “King KI 525” and not the indicated setting.

[3] If the autopilot has been previously configured to operate with the "NSD-360”, the TYPE must be set to “Century NSD 360 DC” and not “KI-525”. If the autopilot is configured to operate with any other heading system it must be reconfigured to either NSD-360 or KI-525 (KCS-55) in order to be compatible with the G600.

NOTE

Selecting the Autopilot TYPE will set default values for the autopilot. These values may require adjustment based upon the flight check. Refer to Section 5.10.2 for additional details.

5.5.10 Flight Director Configuration

If an external flight director input is connected to the G600, the GDU 620 must be configured to enable the display of the flight director. This section describes how to configure the GDU 620 to enable the flight director.

1. Go to the FLIGHT DIRECTOR page in the FCS page group.
2. Activate the cursor and press ENT to set the flight director to PRESENT.
3. Move the cursor to the TYPE field and set the value according to Table 5-3.

Table 5-3. GDU 620 Flight Director Type Settings

Manufacturer	Flight Director (Autopilot) Model	Flight Director TYPE Setting	Notes
Cessna	400B IFCS/800B IFCS	Manual Entry	See 5.5.10.1 for settings
Collins	APS-65	Collins APS-65	
	AP-106/107	Manual Entry	See 5.5.10.1 for settings
Honeywell (Bendix/King)	KFC 150/200/225/275	King KI 256	
	KFC 250/325	Manual Entry	See 5.5.10.1 for settings
S-TEC	55X	S-TEC 55X	
	60-2/65	Manual Entry	See 5.5.10.1 for settings

NOTE

Selecting the Flight Director TYPE will set default values for the flight director. These values may require adjustment based upon the flight director check. Refer to Sections 5.8.5.3 and 5.10.2.1 for additional details.

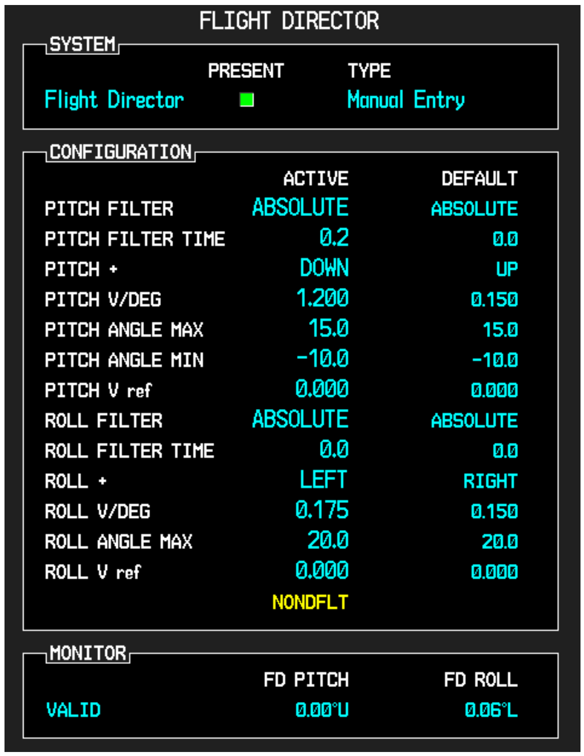
5.5.10.1 Flight Director Settings Using Manual Entry

If the current version of GDU 620 software does not have a configuration setting for the flight director, the flight director may be set up manually. Specific configurations for the settings below will be included in future revisions of the software.

NOTE

The values shown in the figure are for reference only. Refer to Table 5-3A for the correct settings.

1. Go to the FLIGHT DIRECTOR page in the FCS page group.



2. Activate the cursor and press ENT to set the flight director to PRESENT.
3. Move the cursor to the TYPE field, select Manual Entry and press ENT.
4. Using the cursor, set the ACTIVE values according to Table 5-3A.

Table 5-3A. GDU 620 Manual Flight Director ACTIVE Settings

Flight Director / Autopilot Model	Parameter	ACTIVE Setting [1]	Notes
Cessna **400B IFCS** **800B IFCS**	PITCH FILTER	ABSOLUTE	
	PITCH FILTER TIME	0.2	
	PITCH +	UP	
	PITCH V/DEG	0.040	
	PITCH ANGLE MAX	15.0	
	PITCH ANGLE MIN	-10.0	
	PITCH Vref	0.000	
	ROLL FILTER	ABSOLUTE	
	ROLL FILTER TIME	0.1	
	ROLL +	RIGHT	
	ROLL V/DEG	0.030	
	ROLL ANGLE MAX	30.0	
	ROLL Vref	0.000	
Collins **AP-106** **AP-107**	PITCH FILTER	ABSOLUTE	
	PITCH FILTER TIME	0.0	
	PITCH +	DOWN	
	PITCH V/DEG	0.150	
	PITCH ANGLE MAX	15.0	
	PITCH ANGLE MIN	-15.0	
	PITCH Vref	0.000	
	ROLL FILTER	ABSOLUTE	
	ROLL FILTER TIME	0.0	
	ROLL +	RIGHT	
	ROLL V/DEG	0.150	
	ROLL ANGLE MAX	30.0	
	ROLL Vref	0.000	
S-TEC **60-2** **65** *with ST-670*	PITCH FILTER	ABSOLUTE	
	PITCH FILTER TIME	0.2	
	PITCH +	DOWN	
	PITCH V/DEG	1.200	
	PITCH ANGLE MAX	15.0	
	PITCH ANGLE MIN	-10.0	
	PITCH Vref	0.000	
	ROLL FILTER	ABSOLUTE	
	ROLL FILTER TIME	0.0	
	ROLL +	LEFT	
	ROLL V/DEG	0.175	
	ROLL ANGLE MAX	20.0	
	ROLL Vref	0.000	
Honeywell **(Bendix/King)** **KFC 250** **KFC 325** *with KCI 310*	PITCH FILTER	ABSOLUTE	
	PITCH FILTER TIME	0.0	
	PITCH +	UP	
	PITCH V/DEG	1.000	
	PITCH ANGLE MAX	15.0	
	PITCH ANGLE MIN	-15.0	
	PITCH Vref	0.000	
	ROLL FILTER	ABSOLUTE	
	ROLL FILTER TIME	0.0	
	ROLL +	RIGHT	
	ROLL V/DEG	0.750	
	ROLL ANGLE MAX	21.0	
	ROLL Vref	0.000	

Notes:

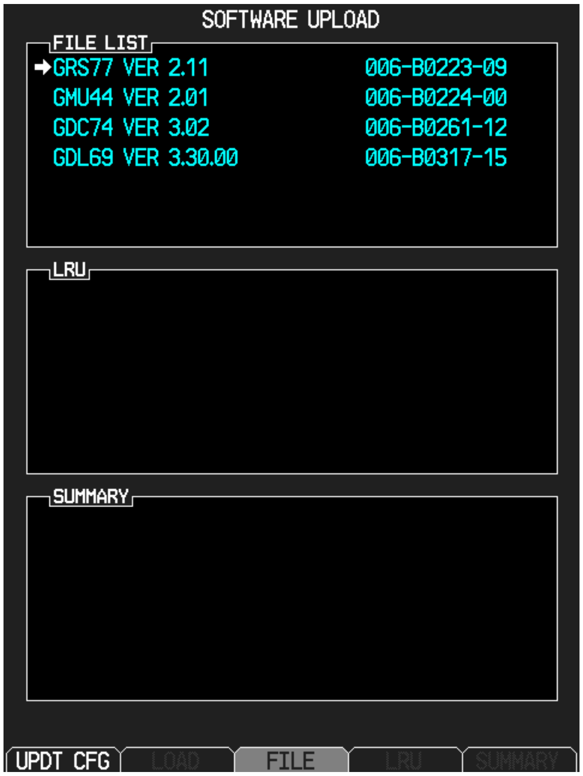
[1] ACTIVE setting values were evaluated via flight test in a specific installation. If you are experiencing performance problems with the settings listed above, please contact Garmin technical support before making adjustments.

5.5.11 Updating the Configuration Module

When all of the items have been configured as described in this section, go to the Software Upload page and press the UPDT CFG soft key. Press ENT to confirm and update the configuration module.

NOTE

The softkeys shown below are only displayed if an Installer Unlock Card is inserted in the GDU.



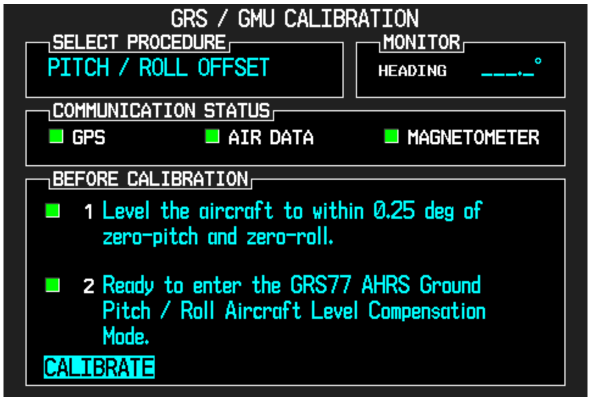
5.6 GRS 77 AHRS Calibration and Check

The GRS 77 AHRS will not provide valid outputs until the following calibration procedures are completed. The Magnetometer Calibration Procedure must be carried out at a site that is determined to be free of magnetic disturbances. If it is unsure whether the site is ‘clean’ the technician should verify that the site is ‘clean’ by following the guidance provided in Section 5.7. The technician may skip Section 5.7 if the site condition is acceptable.

5.6.1 GRS 77 Pitch/Roll Offset Compensation

NOTE

In order to run the Pitch/Roll Offset Compensation Procedure, an Installer Unlock Card (P/N 010-00769-60) is required.



This procedure must be carried out with the engine off. Select the GRS page group on the MFD and go to the GRS/GMU calibration page.

1. Level the aircraft to within ±0.25° of zero pitch and zero roll using the procedures in the Airplane Maintenance Manual.
2. Initiate the AHRS Ground Pitch/Roll Aircraft Level compensation mode by performing the following steps:
   a) Select PITCH/ROLL OFFSET, then press the ENT key.
   b) Follow the checklist items displayed on the MFD and press the ENT key as each one is completed or confirmed. When the CALIBRATE field is blinking, press the ENT key to begin the procedure.
   c) After several seconds, a new checklist appears in the lower half of the MFD. Press the ENT key as each item is confirmed. When the CONFIRM AIRCRAFT IS LEVEL field is blinking, press the ENT key to continue.
3. The result of the pitch/roll offset compensation is displayed on the MFD. If successful, the AHRS records the required pitch and roll offsets, informs the operator of a successful conclusion and returns to normal operation.
4. Press the ENT key to conclude this procedure.
5. For dual GDU 620 installations, repeat steps 2 through 4 with the other GDU.

5.6.2 GRS 77/GMU 44 Magnetometer Calibration

CAUTION

This Magnetometer Calibration Procedure should be carried out on a compass rose in order to guarantee measurements free of environmental magnetic disturbances. However, if a compass rose is not readily available a sight compass may be used. Attempting to carry out this procedure on a typical ramp area may not yield a successful calibration. The accuracy of the AHRS cannot be guaranteed if this calibration is not performed on a magnetically clean and level surface. If the magnetic cleanliness of the proposed surface is not known, it is recommended that the technician follow the guidance in Section 5.7.

NOTE

In order to run the Magnetometer Calibration procedure, an Installer Unlock Card (P/N 010-00769-60) is required.

NOTE

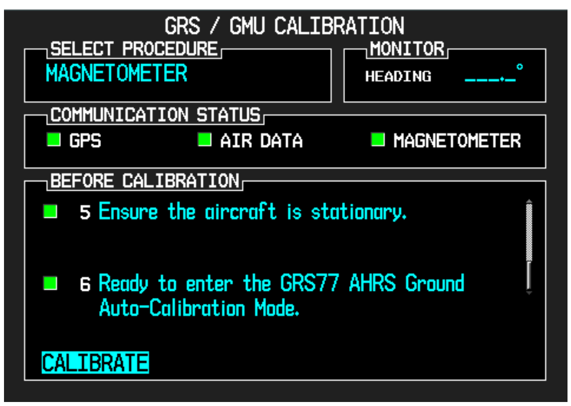
Performing the Magnetometer Calibration removes any stored heading offset values.

1. Start the aircraft engine in accordance with the aircraft Airplane Flight Manual or Pilot's Operating Handbook.
2. After aircraft engine startup, taxi the aircraft to a properly calibrated compass rose.
3. At the compass rose, align the aircraft to a heading of magnetic north (±5°).

NOTE

For dual GDU 620 installations, the following procedure must be performed on *each* GDU 620. The calibration on each GDU can be done simultaneously. When performing the steps below, follow the turn prompts on GDU1.

4. Ensure an Installer Unlock Card is inserted in the bottom slot of the GDU 620.
5. Restart the GDU in configuration mode.
6. Go to the GRS Page Group on the MFD and select the GRS/GMU Calibration page.



7. Activate the cursor and highlight the SELECT PROCEDURE window and select MAGNETOMETER.
8. Press the ENT button.
9. Use the cursor to highlight the BEFORE CALIBRATION window.
10. Follow the checklist items displayed on the MFD and press the ENT key as each one is completed or confirmed. When the CALIBRATE field is blinking, press the ENT key to begin the procedure.

11. The MFD display advises the operator when to turn the aircraft, when to stop, and when to turn again.
12. Upon instruction to turn, taxi the aircraft in a right turn. After approximately 25° to 30° of turn from the last heading, the MFD display advises the operator to stop the aircraft.

NOTE

Due to the difficulties in executing smooth, accurate turns the MFD may incorrectly interpret a station and instruct to “HOLD POSITION” prior to full completion of a 30° turn. If this scenario is encountered, it is best for the operator to ignore the “HOLD POSITION” command and instead use outside references to complete the approximate 30° turn. Instead of using the MFD instruction to turn as a real-time indication of when to turn, simply judge the 30° (±5°) turn increments of the aircraft by using the compass rose radials. Dwelling at these 30° increments for the time recommended by the MFD should result in successful calibration.

13. The MFD guides the operator to dwell at multiple headings around a complete circle.

NOTE

Due to high winds or excessive airframe vibration, the operator may encounter a condition where the MFD restarts the 18-second countdown without full completion of the previous countdown. If this is encountered more than once for a given station, the operator should begin turning to the next station (approximately 30°). A minimum of 2 successful stations per quadrant is required, where a successful station is a full 18-second countdown followed by instruction to move. Ensure that at least 2 stations per quadrant are completed. Thus, it may sometimes be required to dwell at a station after a countdown restart. A maximum of 20 stations is allowed for the entire calibration procedure. If too many countdown restarts are encountered, the calibration will fail with the message, “TOO MANY STATIONS.”

14. Repeat the turn-and-stop process until the MFD advises that a successful calibration is complete. The GRS 77 AHRS then enters its normal operational mode. Press the ENT key on the GDU to conclude this procedure.

5.6.3 Compass Swing

After the Magnetic Calibration Procedure is completed, a compass swing must be performed to verify the GRS 77/GMU 44 heading accuracy. If each heading displayed on the PFD (or PFD 1 and PFD 2) is within ±3° of the actual heading no further adjustments are necessary. Otherwise, additional adjustments are required, as described below the procedure in Section 5.6.4 must be performed.

1. With all of the aircraft and avionics systems powered and operating normally, position the aircraft on a known compass rose at a heading 360° (North), or select a level and magnetically clean location and use a sight compass to position the aircraft to a heading of 360° (North).
2. Record the heading displayed on the PFD (or PFD1 **and** PFD2 for a dual GDU installation) in Table 5-4. Also record the heading displayed on the standby compass (these values can be used to complete the standby compass calibration card).
3. Repeat step 2 for each of the headings listed in Table 5-4.

Table 5-4. Heading Verification

PFD or PFD1 (for dual GDU installations)

Heading (A)	Displayed PFD or PFD1 Heading (B)	Heading Error (A-B)	Stby Compass Heading
360° (North)			
30°			
60°			
90° (East)			
120°			
150°			
180° (South)			
210°			
240°			
270° (West)			
300°			
330°			

PFD2 (for dual GDU installations only)

Heading (A)	Displayed PFD2 Heading (B)	Heading Error (A-B)
360° (North)		
30°		
60°		
90° (East)		
120°		
150°		
180° (South)		
210°		
240°		
270° (West)		
300°		
330°		

4. Calculate the heading errors by subtracting the displayed (B) value from the actual (A) value for each of the headings in Table 5-4.

FOR SINGLE GDU INSTALLATIONS:

1. If **all** calculated heading errors for the PFD are between -3° and +3° inclusive, the installation is acceptable and no further work is required to correct the GMU 44 installation. Proceed to Section 5.6.5.
2. If **all** calculated heading errors are between -5° and +5° inclusive, the heading offset procedure can be used to correct the GMU 44 installation. Proceed to Section 5.6.4.

NOTE

If at least one Heading Error (A-B) is greater than 5° / less than –5°, DO NOT perform the heading offset procedure in Section 5.6.4 until the GMU 44 installation has been physically corrected.

3. If at least one Heading Error (A-B) is greater than 5° / less than -5°, calculate the average error by adding all errors and dividing by 12. This is the angle by which the GMU 44 must be physically rotated to correct the installation.
4. Modify the installation to rotate the GMU 44 by the amount calculated in the previous step. When looking down at the GMU 44, rotate clockwise for positive values, and counterclockwise for negative values.
5. After physically correcting the GMU 44 installation, repeat the procedures in Sections 5.6.2 and 5.6.3.

FOR DUAL GDU INSTALLATIONS:

The installation of both GMU 44s must be verified individually using GDU1 for GMU 44 No. 1, and GDU2 for GMU 44 No. 2.

1. If **all** calculated heading errors for PFD1 are between -3° and +3° inclusive, the installation of the No. 1 system is acceptable and no further work is required to correct the GMU 44 No. 1 installation. Go to step 6 for No. 2 system checks, and proceed to Section 5.6.5 for further tests to be performed on GDU1.
2. If **all** calculated heading errors are between -5° and +5° inclusive, the heading offset procedure can be used to correct the GMU 44 No. 1 installation. Go to step 6 for No. 2 system checks, and proceed to Section 5.6.4 for further tests to be performed on GDU1.

NOTE

If at least one Heading Error (A-B) is greater than 5° / less than –5°, DO NOT perform the heading offset procedure in Section 5.6.4 until the GMU 44 No. 1 installation has been physically corrected.

3. If at least one Heading Error (A-B) is greater than 5° / less than -5°, calculate the average error by adding all PFD1 heading errors and dividing by 12. This is the angle by which GMU 44 No. 1 must be physically rotated to correct the installation.
4. Modify the installation to rotate the GMU 44 No. 1 by the amount calculated in the previous step. When looking down at the GMU 44, rotate clockwise for positive values, and counterclockwise for negative values.
5. After physically correcting the GMU 44 No. 1 installation, repeat the procedures in Sections 5.6.2 and 5.6.3 on PFD 1 only.
6. If **all** calculated heading errors for PFD2 are between -3° and +3° inclusive, the installation of the No. 2 system is acceptable and no further work is required to correct the GMU 44 No. 2 installation. Proceed to Section 5.6.5 for further tests to be performed on GDU2.
7. If **all** calculated heading errors are between -5° and +5° inclusive, the heading offset procedure can be used to correct the GMU 44 No. 2 installation. Proceed to Section 5.6.4 for further tests to be performed on GDU2.

NOTE

If at least one Heading Error (A-B) is greater than 5 degrees / less than –5 degrees, DO NOT perform the heading offset procedure in Section 5.6.4 until the GMU 44 No. 2 installation has been physically corrected.

8. If at least one Heading Error (A-B) is greater than 5 degrees / less than -5 degrees, calculate the average error by adding all PFD2 heading errors and dividing by 12. This is the angle by which GMU 44 No. 2 must be physically rotated to correct the installation.
9. Modify the installation to rotate the GMU 44 No. 2 by the amount calculated in the previous step. When looking down at the GMU 44, rotate clockwise for positive values, and counterclockwise for negative values.
10. After physically correcting the GMU 44 No. 2 installation, repeat the procedures in Sections 5.6.2 and 5.6.3 on PFD 2 only.

5.6.4 Heading Offset Compensation

NOTE

The heading offset compensation procedure is not required if it was determined in Section 5.6.3 that all calculated heading errors are between -3° and +3° inclusive. If at least one heading error was greater than 3° or less than -3°, but all heading errors were between -5° and +5° inclusive, use the heading offset compensation procedure to correct the errors. Otherwise, physically correct the appropriate GMU 44 installation BEFORE performing the heading offset compensation procedure.

NOTE

If heading offset compensation procedure must be performed on both GDU1 and GDU2 it is permitted to run the procedure below simultaneously on each GDU.

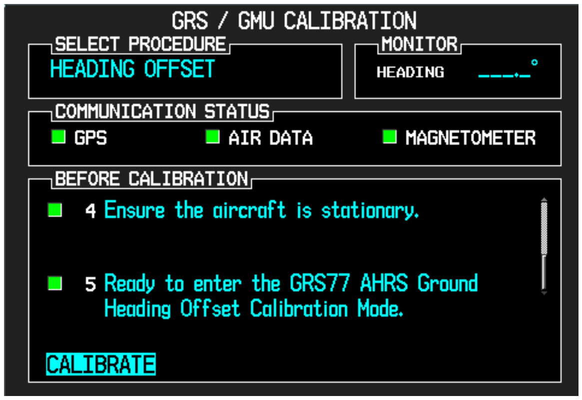
NOTE

In order to run the Heading Offset Compensation procedure an Installer Unlock Card (P/N 010-00769-60) is required.

NOTE

Magnetometer Calibration procedure must be performed BEFORE the Heading Offset Compensation procedure. Performing the Magnetometer Calibration removes any stored heading offset values.

1. Ensure an Installer Unlock Card is inserted in the bottom slot of the GDU 620.
2. Restart the appropriate GDU in configuration mode.
3. Go to the GRS Page Group on the MFD and select the GRS/GMU Calibration page.



4. Select the HEADING OFFSET procedure and press the ENT key.
5. Follow the checklist items displayed on the MFD, and press the ENT key as each one is completed or confirmed (press ENT on each GDU if the procedure is being run simultaneously on both GDUs). When the CALIBRATE field is blinking, press the ENT key to begin the procedure.
6. The MFD display instructs the operator to turn to headings of 360°, 90°, 180° and 270°. Press the ENT key to confirm each heading.
7. When the operator has successfully completed the heading offset procedure, CALIBRATION SUCCESSFUL will flash. Press the ENT key on the GDU to conclude this procedure.

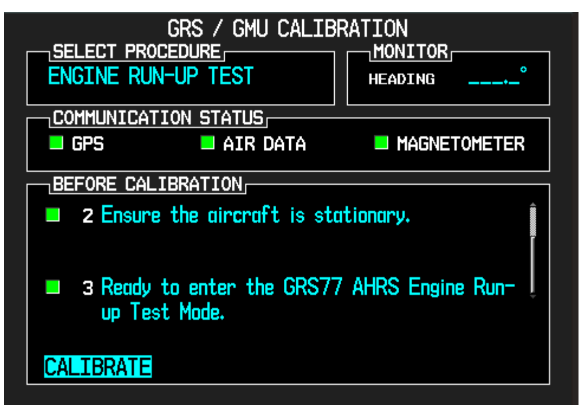
5.6.5 Engine Run-Up Vibration Test

NOTE

An Installer Unlock Card is **not** required to run the Engine Run-Up Test.

NOTE

The calibration procedures in Sections 5.6.1 through 5.6.4 do not have to be completed prior to performing this procedure.



Initiate the AHRS engine run-up vibration test procedure by performing the following steps:

1. Select the ENGINE RUN-UP TEST procedure and press the ENT key.
2. Follow the checklist items displayed on the MFD, and press the ENT key as each one is completed or confirmed. When the CALIBRATE field is blinking, press the ENT key to begin the procedure.

3. The MFD display instructs the operator to gradually increase power from idle to full throttle and back to idle over a period of 1-2 minutes.
4. When the operator has completed the engine run-up and the engine is back to an idle setting, press the ENT key to indicate that the process is complete. When this is done, the TEST COMPLETE field stops blinking.
5. The MFD informs the operator if the installation has passed or failed the vibration test. If the test fails, the specific measurements causing the failure are identified and numeric values are displayed on the MFD.
6. Press the ENT key on the MFD to conclude this procedure.

NOTE

If failures are indicated, the engine run-up test may be repeated at most two more times. If the test does not pass after three attempts, then the installation should not be considered reliable until the source of the vibration problem is identified and remedied. In the event of repeated failure of the engine run-up test, record the values that are reported to be out of range for future reference.

The following are potential causes for failure of the engine run-up test:

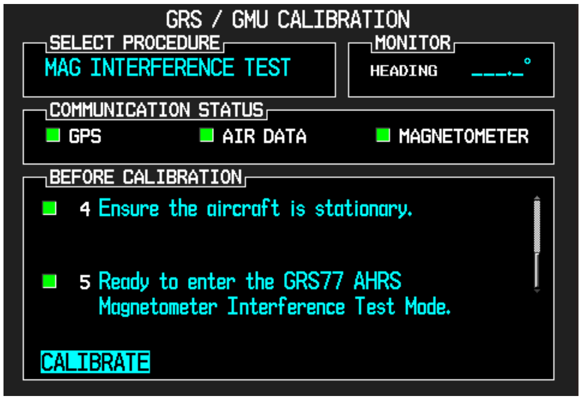
1. Vibration motion of GRS 77 and/or GMU 44 caused by neighboring equipment and/or supports.
2. Mounting screws and other hardware for GRS 77 and/or GMU 44 not firmly attached.
3. GRS 77 connector not firmly attached to unit.
4. Cabling leading to GRS 77 or GMU 44 not firmly secured to supporting structure.
5. An engine / propeller that is significantly out of balance.

The aircraft can now be taxied back and the engine can be shut down for final testing. Following a successful AHRS calibration, when the PFD powers up in normal mode, the AHRS attitude and heading information displayed should become valid within 1 minute of power-up.

5.6.6 Magnetometer Interference Test

NOTE

An Installer Unlock Card is **not** required to run the Magnetometer Interference Test.



With the GDU 620 in configuration mode, initiate the GRS 77 AHRS magnetometer interference test procedure by performing the following steps:

1. Select the GRS page group on the MFD, go to the GRS/GMU calibration page, select the MAG INTERFERENCE TEST procedure and press the ENT key.
2. Follow the checklist items displayed on the MFD, and press the ENT key as each one is completed or confirmed.

NOTE

The third item on the checklist instructs the operator to prepare a detailed test sequence list with precise start and stop times for exercising all electronic devices. Only the electronic devices that are likely to affect the operation of the GMU 44 magnetometer need be included in the test sequence. The list of relevant electronic devices varies from aircraft to aircraft. This sequence is the same sequence developed for the magnetometer interference survey in Section 3.2.4.3.

3. When the CALIBRATE field is blinking, press the ENT key to begin the procedure (as soon as the ENT key is pressed this time, a CALIBRATION PROCEDURE window will appear). Have a stopwatch ready to begin recording the elapsed time.
4. The operator should carry out the actions called for in the prepared test sequence.

NOTE

It is important that all actions are carried out in the order and at the precise elapsed time as specified in the prepared test sequence.

5. After the "Begin test sequence" white text appears, wait approximately five seconds and perform each of the actions listed in the test sequence table (refer to Table G-1 in Appendix G for an example of a test sequence).
6. When the test sequence is completed, wait approximately five seconds and then press the ENT key to complete the test. When this is done, the TEST COMPLETE field stops blinking.

7. The MFD informs the operator if the installation has passed or failed the magnetometer interference test.
   a) If the test passes, no further action is required.
   b) If the test fails, the installation should be considered unreliable until the source of magnetic interference is identified and remedied. The magnetometer interference test must be repeated until passed. When the magnetometer interference test fails, record the three magnetometer maximum deviation values and their corresponding timestamps. A maximum deviation value greater than 5.0 milligauss in either the X or Y axes, or greater than 8.0 milligauss in the Z axis indicates a problem that must be resolved. Compare the corresponding timestamps with the prepared test sequence to identify which action produced the problem. Contact Garmin for assistance in resolving the problem.

NOTE

Two common reasons for a failed magnetometer interference test are:

- New equipment is installed in close proximity to the GMU 44 magnetometer.
- An existing or new electronic device has become grounded through the aircraft structure instead of via the proper ground wire in a twisted shielded pair, especially if the ground return path through the aircraft structure passes near the GMU 44.

8. Press the ENT key on the MFD to conclude this procedure.

5.7 Site Evaluation of Magnetic Disturbances (Optional)

NOTE

Typically, a compass rose is an acceptable location to perform the magnetometer calibration procedure. However, because not all compass roses are well maintained, even an existing compass rose should be regularly evaluated using the method described here to determine if it is free of magnetic disturbances. If evaluation of an existing compass rose indicates that magnetic disturbances are present, then an alternative location must be found to perform the Magnetometer Calibration Procedure.

NOTE

In order to perform the Site Evaluation for Magnetic Disturbances, an Installer Unlock Card (P/N 010-00769-60) is required.

A G600-equipped airplane can be used to evaluate a candidate site for magnetic disturbances and determine whether it is a suitable location to perform the magnetometer calibration procedure. The magnetometer calibration procedure itself contains the logic to simultaneously survey the location for magnetic cleanliness while it is computing the magnetometer calibration parameters.

The G600-equipped airplane used to evaluate the site must have already completed the Pitch/Roll offset compensation procedure (Section 5.6.1). However, prior completion of the Magnetometer Calibration Procedure (Section 5.6.2) is not required.

In order to evaluate a candidate site, the Magnetometer Calibration Procedure must be performed twice: once turning clockwise around the site, and once turning counter-clockwise. Both times, the procedure should be conducted as described in Section 5.6.2 of this document, with the exception of the direction of turns around the site.

NOTE

Although Section 5.6.2 indicates that the Magnetometer Calibration Procedure should be performed by making a series of clockwise turns around the site, the procedure can also be performed by making counter-clockwise turns for the purpose of evaluating the site for magnetic disturbances.

If, upon completion of the Magnetometer Calibration Procedure in each clockwise and counter-clockwise direction, the PFD displays the "CALIBRATION SUCCESSFUL / SITE IS CLEAN" message, then the candidate site is sufficiently free of magnetic disturbances and is acceptable for performing the Magnetometer Calibration Procedure. It is important to obtain successful results in both the clockwise and counter-clockwise directions to ensure that the magnetometer sweeps over a large enough area at the candidate site.

If, upon completion of the Magnetometer Calibration Procedure in either of the two directions, the PFD displays either the "MAG FIELD AT SITE NOT UNIFORM", or "MAG FIELD AT SITE DIFFERS FROM IGRF MODEL" message, then the site contains magnetic disturbances that are too large and an alternate site should be used for the GRS 77/GMU 44 Magnetic Calibration procedure.

5.8 Ground Checks

The steps that are not applicable to a particular installation may be skipped.

NOTE

Throughout the checkout section references are made to particular GDU 620 functions. If the function is not available, ensure that the GDU 620 has been configured correctly as described in Section 5.5.

5.8.1 Database Check

1. Ensure a G600 database card is inserted in the bottom slot of the GDU 620.
2. Turn on power to the G600 system.
3. Verify all self-tests pass on the main startup screen.

NOTE

Databases that have expired will be displayed in yellow text on the MFD startup screen. Databases will also be yellow until a valid GPS Position has been acquired.

4. Verify the expiration on the Jeppesen NavData Database.
5. If activated, verify the expiration of the Electronic Charts Database.

5.8.2 Pitot-Static, ADC and Airspeed Tape Settings Checks

Verify correct operation of the GDU 620 altitude and airspeed tapes, standby altimeter and standby airspeed indicator using a pitot/static ramp tester. The static port and airspeed tape / altimeter must be verified in accordance with Title 14 of the Code of Federal Regulations (CFR) § 91.411 and Part 43 Appendix E.

NOTE

When conducting air data tests it is possible to induce attitude and/or heading errors on the GDU 620 – this is normal system behavior. Refer to Section 6.2 for additional details.

NOTE

The airspeeds referenced in the following steps are those determined in Section 5.2.4.

NOTE

For a dual GDU 620 installation, this check must be completed for each GDU 620 – both may be verified at the same time.

Verify correct operation of the GDC 74A ADC as follows:

1. Turn on power to the G600 system.
2. Verify all self-tests pass on the main startup screen.
3. Check the outside air temperature (OAT) measurement shown on the PFD to ensure it reads ambient temperature.
4. Using a pitot/static ramp tester increase the airspeed until the PFD airspeed tape pointer is at the bottom of the white band (V_{S0}). Verify that the bottom of the white arc/band on the ASI and PFD airspeed tape are at the same airspeed value.
5. *Only applicable to twin engine aircraft:* Increase the airspeed to the lower red radial (V_{mca}). Verify that the red radial on the ASI and PFD airspeed tape are at the same airspeed value.

6. Change the airspeed until the PFD airspeed tape pointer is at the bottom of the green band (V_{S1}). Verify that the bottom of the green arc/band on the ASI and PFD airspeed tape are at the same airspeed value.
7. *Only applicable to twin engine aircraft:* Increase the airspeed to the blue radial (V_{yse}) Verify that the blue radial on the ASI and PFD airspeed tape are at the same airspeed value.
8. Change the airspeed until the PFD airspeed tape pointer is at the top of the white band (V_{fe}). Verify that the top of the white arc/band on the ASI and PFD airspeed tape are at the same airspeed value.
9. Change the airspeed until the PFD airspeed tape pointer is at the top of the green band / bottom of the yellow band (V_{no}). Verify that the top of the green arc/band on the ASI and PFD airspeed tape are at the same airspeed value.
10. Increase the airspeed to the upper red radial/top of yellow arc (V_{ne}). Verify that the red radial on the ASI and PFD airspeed tape are at the same airspeed value.
11. Decrease the airspeed to zero, stopping at all of the airspeeds listed in the Table 5-5 (airspeeds above V_{ne} should not be checked). Verify that the PFD and standby airspeed indicator display the values within the tolerances indicated:

Table 5-5. Airspeed Test Points

Test Set air speed (knots)	PFD Allowed Tolerance (knots)	Standby ASI and PFD Tolerance (knots) [1]
50	±5.0	±5.0
80	±3.5	±5.0
100	±2.0	±5.0
120	±2.0	±5.0
150	±2.0	±5.0
180	±2.0	±5.0
210	±2.0	±5.0
250	±2.0	±5.0
290	±3.0	±5.0

[1] This is the maximum allowable difference between the standby airspeed indicator and the PFD airspeed tape.

5.8.3 GPS Receiver Interface Test

The GDU 620 receives position and flight plan and navigation data from an external GPS navigation source. This check verifies that the units are communicating.

1. Select GPS (or GPS1) as the navigation source for the PFD CDI.
2. Turn on the external GPS Navigator (GPS1 for installations with dual navigators). If there are dual GPS navigators installed, ensure the second GPS navigator is switched off.
3. For a 400W/500W Series unit, while on the power-up self-test page verify that the GDU 620 CDI displays the correct lateral and vertical deviation information.
   For a GNS 480 unit, while it is going through its power-up sequence, verify that the GDU 620 CDI displays the correct lateral and vertical deviation information.
4. Wait until the navigator acquires a position before proceeding.
5. Review the active alerts on the GDU 620 (if any) and verify that the GPS1 PPS FAIL (GPS2 PPS FAIL if using GPS 2) alert is not present.
6. Create/activate a flight plan on the GPS navigation source.
7. Verify that the MFD is not displaying the message NO GPS POSITION. Verify that the active waypoint displayed in the PFD WPT field is the same as the active waypoint on the navigator.
8. Wait one minute, and verify that the alert "AHRS1 GPS –AHRS1 not receiving any GPS information" is not displayed on the MFD by pressing the ALERTS soft key and verifying all active alerts.
9. Verify that the flight plan is displayed on the GDU 620 using the flight plan (FPL) function.
10. On the GPS navigator, enter OBS mode.
11. Press the CRS button on the PFD and adjust the course using the PFD knob. Verify that the course to the active waypoint changes as the PFD course pointer is rotated.
12. Exit OBS mode on the navigator.
13. If dual GPS receivers are installed, power off GPS 1 and power on GPS 2. Select GPS2 on the CDI and repeat steps 6 through 12.

5.8.4 Navigation Receiver Interface Test

The GDU 620 can receive bearing and deviation information from a navigation receiver. This check verifies that the units are communicating.

1. Ensure that the external navigation receiver (VLOC1 for installations with dual NAVNAV receivers) is turned on. If there are dual NAVNAV receivers installed, ensure the second NAVNAV receiver is switched off.
2. Select the navigation receiver (or navigation receiver 1) as the navigation source for the PFD CDI.
3. Tune the navigation receiver to a localizer frequency (for this check it is not necessary that a valid localizer signal is being received).
4. Verify that the CDI on the PFD displays LOC (or LOC 1/LOC 2 for installations with dual navigators).
5. If dual navigation receivers are installed, power off NAV 1 and power on NAV 2. Select navigation receiver 2 on the CDI. Repeat steps 3 through 4.

5.8.5 Autopilot Interface Test

The GDU 620 can interface with various autopilots. Before proceeding with the autopilot interface tests, verify that the GDU 620 has been configured for the installed autopilot and flight director, if applicable, as defined in Section E.3. Only those interfaces which are directly affected by the G600 STC are covered by this manual; if any other autopilot modifications were performed, check them in accordance with the autopilot installation manual.

WARNING

It is important that the GDU 620 be properly configured in order to prevent signals from the GDU 620 from damaging the autopilot computer. Refer to Section E.3.

5.8.5.1 Autopilot Engagement Test

This section verifies that the autopilot can be engaged.

1. Power up the G600 and other aircraft systems. Allow the GDU 620 to obtain a valid heading, attitude, altitude, and GPS location (from the navigator).
2. Engage the autopilot. If the autopilot cannot be engaged, troubleshoot it in accordance with the autopilot installation manual.
3. Disengage the autopilot.

5.8.5.2 Flight Director Test

This section verifies that the flight director interface between the autopilot computer and the GDU 620 is functional. This test needs to be performed only if the flight director outputs from the autopilot computer have been connected to the GDU 620, and if the GDU 620 supports that flight director. For dual-G600 installations, the flight director should be wired to each GDU, and each GDU should be configured separately for that flight director. Refer to Section E.3 for instructions on configuring the GDU 620 to display the flight director.

1. Activate the flight director with the autopilot in pitch/roll or heading/altitude mode. It is not necessary for the servos to be engaged for this test.
2. Verify that the flight director is displayed on the GDU 620. If the flight director is not displayed, troubleshoot using the guidelines in Table 6-3.
3. With the GDU 620 in normal mode and the flight director displayed, command the flight director to pitch up. Verify that the command bars move up.
4. Command the flight director to pitch down. Verify that the command bars move down.
5. Command the flight director to roll right. Verify that the command bars move to the right.
6. Command the flight director to roll left. Verify that the command bars move to the left.
7. Press the Go Around button, if present. Verify that the command bars center laterally and move to command a climb.
8. If the expected movement of the command bars does not occur, troubleshoot using the guidelines in Table 6-3.

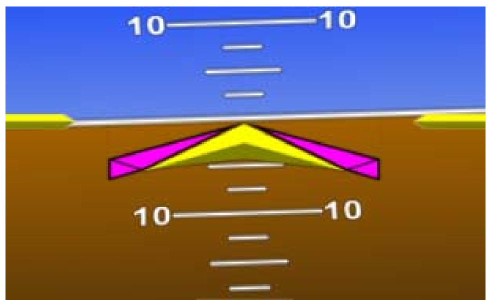
5.8.5.3 Flight Director Offset Calibration (if required)

NOTE

If an ADI with a flight director presentation is installed on the copilot's side, the flight director for this ADI must be aligned to its aircraft symbol **before** running this G600 flight director offset calibration procedure. Refer to the ADI/autopilot manufacturer's documentation for instructions on ADI flight director alignment.

The previous section verified the wiring between the flight director/autopilot computer. This section describes how to correct any offset that may be present in the flight director command bars.

1. Center the heading bug on the GDU 620 by pressing the knob on the PFD.
2. Activate the autopilot in heading and altitude hold mode.
3. Observe the position of the flight director bar in relation to the aircraft icon the GDU 620 attitude indicator.

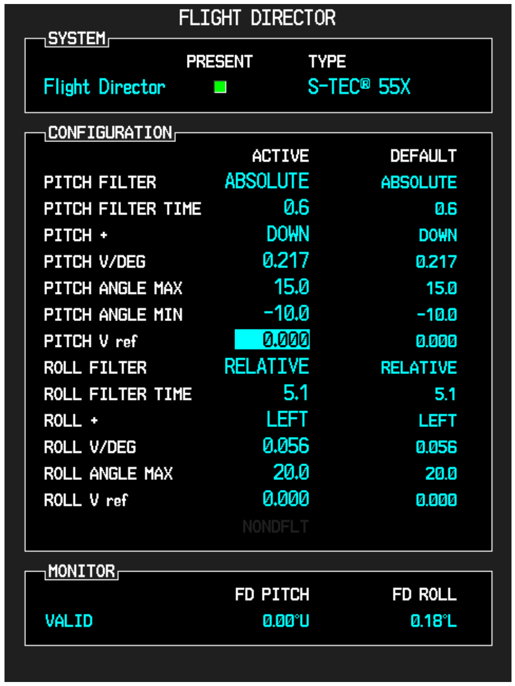


4. If the flight director command bars are offset from the aircraft icon in the pitch axis, take note of the number of degrees of offset for adjustment.

NOTE

Some autopilots have a flight director pitch adjustment that is used to correct for parallax errors in mechanical steering horizons. If possible, correct any flight director offset using the autopilot adjustment before making changes to the GDU configuration.

5. Ensure an Installer Unlock Card is inserted in the GDU 620.
6. Start the GDU 620 in configuration mode and navigate to the FLIGHT DIRECTOR page in the FCS page group.



7. Change PITCH V Ref as needed. Note that the V/DEG ratio for the flight director is displayed on the same page. In the sample screenshot, the PITCH V/DEG is 0.217. Changing the PITCH V ref by 0.217 would move the flight director by one degree.
8. The resulting FD Pitch can be read at the bottom of the screen. Adjust the PITCH V ref until the FD Pitch is 0.00 ± 0.25°.
9. Restart the GDU 620 in normal mode and verify that the flight director is matched to the aircraft icon.
10. For dual-GDU 620 systems, change PITCH V ref on GDU 620 #2 to the same value as PITCH V ref on GDU #1.

5.8.5.4 Altitude Preselector Test

This test verifies that the altitude preselector between the GDU 620 and the autopilot is functional. For dual-G600 installations, the altitude preselector input to the autopilot is connected only to the pilot's GDU.

NOTE

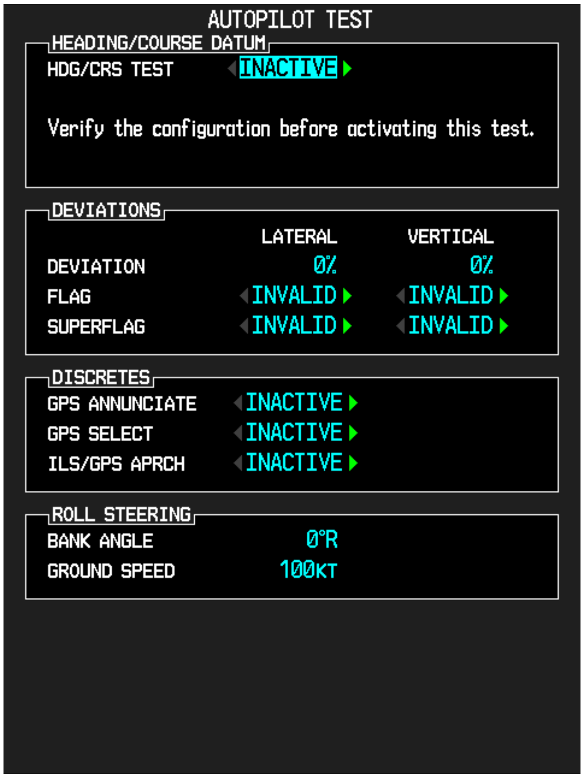
This test is applicable only for S-TEC autopilots which have the RS-485 altitude preselector input connected to the GDU 620. The GDU 620 also must be configured for the altitude preselector option. Reference section 5.5.5.2 for instructions on configuring the GDU 620 for the altitude preselector.

1. Power up the GDU 620 in normal mode and wait until valid air data is displayed.
2. On the GDU 620, set the selected altitude to match the displayed field elevation plus approximately 1000 feet.
3. Engage the autopilot in HDG mode. Press ALT and VS simultaneously to select altitude select mode.
4. Verify that ALT and VS are displayed on the autopilot. If ALT is not displayed, the autopilot is not receiving the RS-485 altitude preselector data from the GDU 620. Troubleshoot using the guidelines in Table 6-3.
5. Disengage the autopilot.

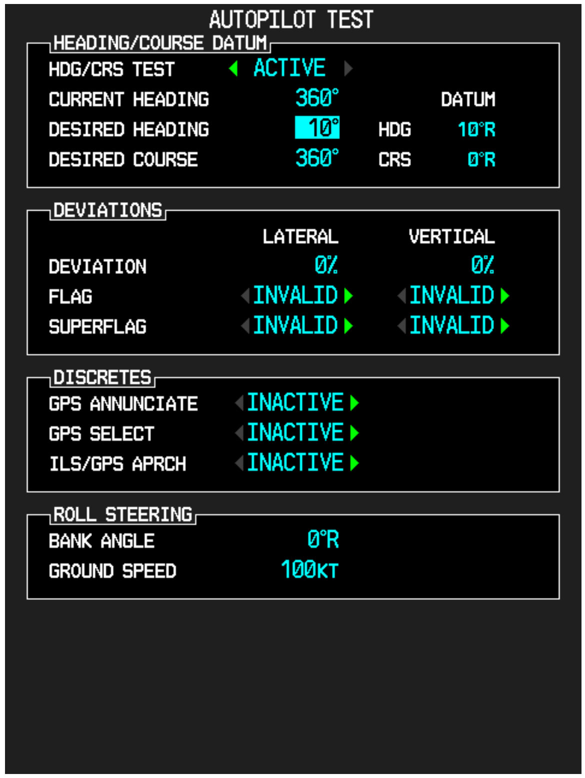
5.8.5.5 Heading and Course Error Test

This section verifies that the heading and course error interface between the GDU 620 and autopilot computer is functional. For dual-G600 installations, only the pilot's GDU is wired to the autopilot, and the following instructions apply only to the pilot's GDU.

1. Start the GDU 620 in configuration mode by holding the ENT key until INITIALIZING SYSTEM appears on the screen. Navigate to the Autopilot Test page.



2. Engage the autopilot in heading mode.
3. On the GDU 620, set the HDG/CRS TEST to ACTIVE. In configuration mode, changes are made by turning the outer and inner FMS knob on the lower right side of the display.
4. Set the DESIRED HEADING to 10° and press the ENT key.

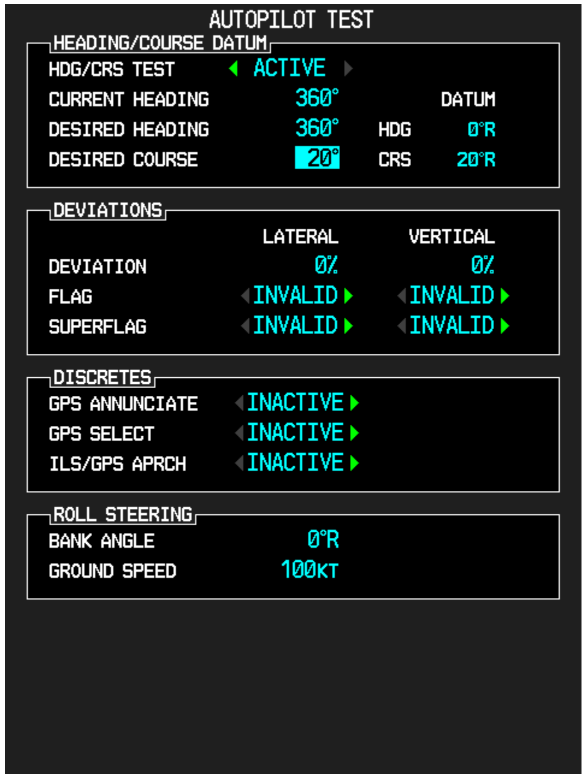


5. Verify that the control yoke or stick moves to the right.
6. Set the DESIRED HEADING to 350° and press the ENT key.
7. Verify that the control yoke or stick moves to the left.

NOTE

If the control yoke or stick moves in the opposite direction to what is expected, reverse the LEFT/RIGHT polarity of the HDG+ setting on the AUTOPILOT CONFIGURATION page. Refer to Table 5-7 in Section 5.10.2.2 for a description of the autopilot configuration settings.

8. Set the DESIRED HEADING to 360° and press the ENT key.
9. Set the lateral flag and superflag to VALID.
10. Set the DESIRED COURSE to 20° and press the ENT key.



11. Put the autopilot into NAV mode.
12. Verify that the control yoke or stick moves to the right.
13. Set the DESIRED COURSE to 340° and press the ENT key.
14. Verify that the control yoke or stick moves to the left.
15. Set the DESIRED COURSE to 360° and press the ENT key.
16. Disengage the autopilot.

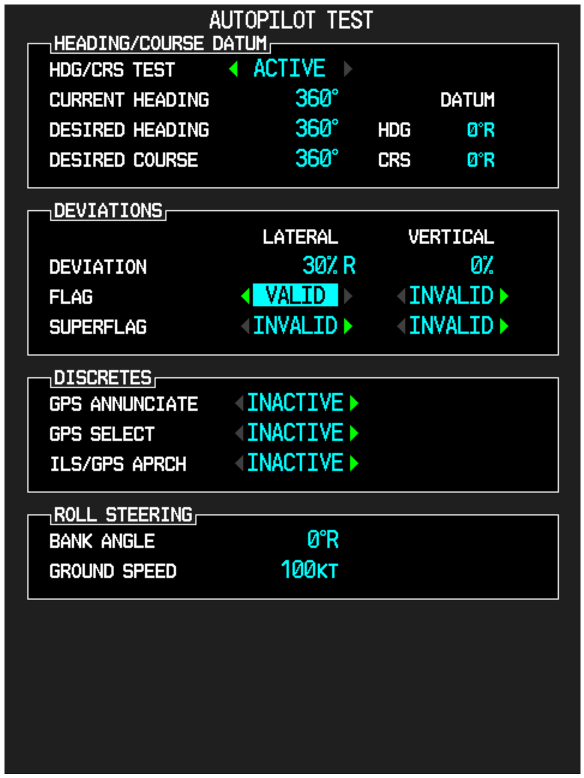
NOTE

If the control yoke or stick moves in the opposite direction to what is expected, reverse the LEFT/RIGHT polarity of the CRS+ setting on the AUTOPILOT CONFIGURATION page. Refer to Table 5-7 in Section 5.10.2.2 for a description of the autopilot configuration settings.

5.8.5.6 VOR/Localizer and Glideslope Deviation Tests

This test verifies that the lateral deviation, vertical deviation, lateral flag/superflag, and vertical flag/superflag interfaces between the GDU 620 and autopilot are correct. Throughout this section, set either the flag or superflag status depending on which output from the GDU 620 is connected to the autopilot. For dual-G600 installations, only the pilot's GDU is wired to the autopilot, and the following instructions apply only to the pilot's GDU. Reference the interconnect drawing in Appendix F.

1. Engage the autopilot in heading/altitude mode.
2. On the GDU 620 Autopilot Test page in configuration mode, set the lateral deviation to 30% R.
3. Set the lateral flag/superflag to VALID.



4. Put the autopilot into APR mode.
5. Verify that the autopilot moves the control yoke or stick to the right.
6. Set the lateral deviation to 30% L.
7. Verify that the autopilot moves the control yoke or stick to the left.
8. Set the lateral deviation to 0%.
9. Set the lateral flag/superflag to INVALID.
10. Verify that the autopilot exits APR mode.
11. Set the lateral flag/superflag back to VALID and put the autopilot back into APR mode if necessary.
12. Set the ILS/GPS APRCH to ACTIVE.
13. Set the vertical deviation to 30% UP.
14. Set the vertical flag/superflag to VALID.
15. Verify that the autopilot indicates that it is capturing or tracking the glideslope.

16. Verify that the autopilot moves the control yoke or stick aft.
17. Set the vertical deviation to -30% DN.
18. Verify that the autopilot moves the control yoke or stick forward.
19. Set the ILS/GPS APRCH to INACTIVE.
20. Verify that the autopilot indicates that it is no longer capturing or tracking the glideslope.
21. Set the vertical flag/superflag to INVALID, the vertical deviation to 0%, and the lateral flag/superflag to INVALID.
22. Disengage the autopilot.

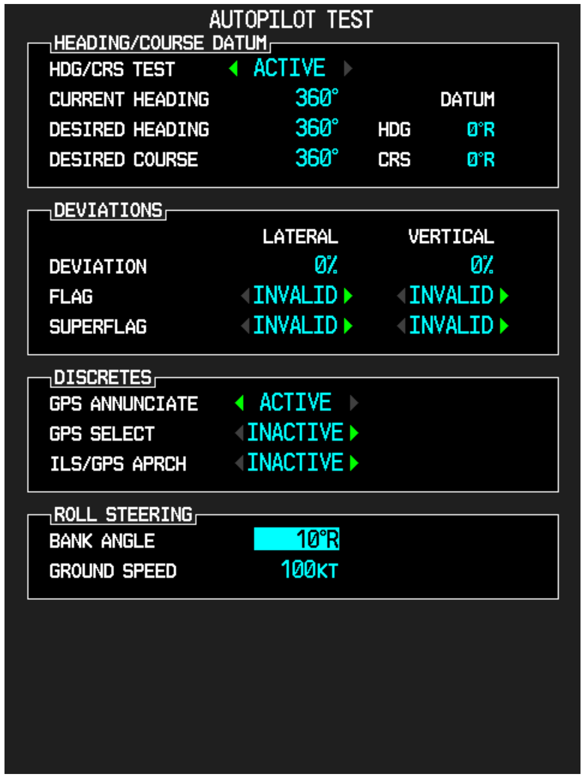
5.8.5.7 ARINC 429 GPS Roll Steering Test

This test verifies that the GPS roll steering interface between the GDU 620 and the autopilot is functional. For dual-G600 installations, only the pilot's GDU is wired to the autopilot, and the following instructions apply only to the pilot's GDU.

NOTE

GPS roll steering is handled in one of three ways. First, if the autopilot has an ARINC 429 roll steering input, the GDU 620 can provide ARINC 429 roll steering directly to the autopilot. Second, if an external roll steering converter has been installed, the GDU can provide ARINC 429 roll steering to the converter, which then outputs an analog heading error signal to the autopilot. Third, the GDU can provide the roll steering via the heading error output, taking the place of a separate roll steering converter. The autopilot is left in heading mode, and the GDU varies the heading error output to steer the autopilot. Only the ARINC 429 interface will be tested in this section.

1. Engage the autopilot in GPSS roll steering mode. If an external roll steering converter is used, engage the autopilot in heading mode and set the roll steering converter to roll steering.
2. On the GDU 620 Autopilot Test page in configuration mode, set the GPS ANNUNCIATE discrete output to ACTIVE.
3. Set the BANK ANGLE to 10°R.



4. Verify that the autopilot rolls the control yoke or stick to the right.
5. Set the bank angle to 0°.
6. Verify that the autopilot rolls the control yoke or stick level.
7. Set the bank angle to 10°L.
8. Verify that the autopilot rolls the control yoke or stick to the left.
9. Disconnect the autopilot.

NOTE

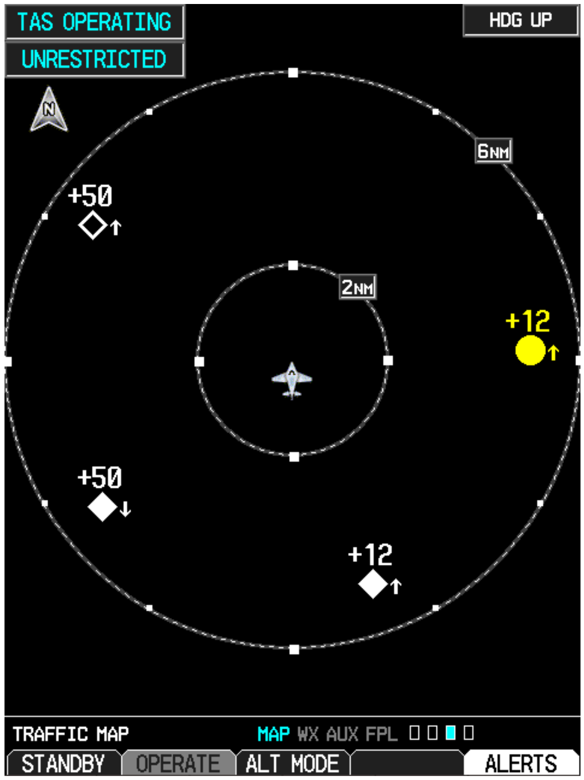
For troubleshooting issues with the operation of the autopilot with the G600, refer to Section 6.4.

5.8.6 Traffic System Interface Test

The GDU 620 can provide mode control and display data from various traffic systems. This check verifies that the GDU 620 is configured correctly and is receiving and transmitting data to the traffic system.

5.8.6.1 TAS Traffic Interface Test

If an L3 Communications SKY497/SKY899 SkyWatch® sensor , a Honeywell (Bendix/King) KTA 810 TAS/KMH 820 IHAS/KTA 910 TAS/KMH 920 IHAS or an Avidyne TAS 620 (Ryan 9900BX TCAD) has been connected to the GDU 620, the traffic interface should be verified as described in this section.



1. Select the Traffic Map page on the GDU 620.
2. Verify that the amber TAS FAIL is not displayed in the upper left corner, and NO DATA (amber) is not displayed over the ownship symbol.
3. On the upper left corner of the Traffic Map page, verify that the status of the traffic system is either TAS Standby or TAS operating (i.e. TIS should not be displayed).

NOTE

If the GDU 620 is configured for an external control (i.e. a display other than the GDU 620 is controlling the traffic system), then the following steps do not have to be carried out.

4. Alternately press the STANDBY soft key and OPERATE soft key to change the mode of the traffic system. It may take several seconds for the traffic system to change modes. Verify that the mode of the traffic system can be changed.

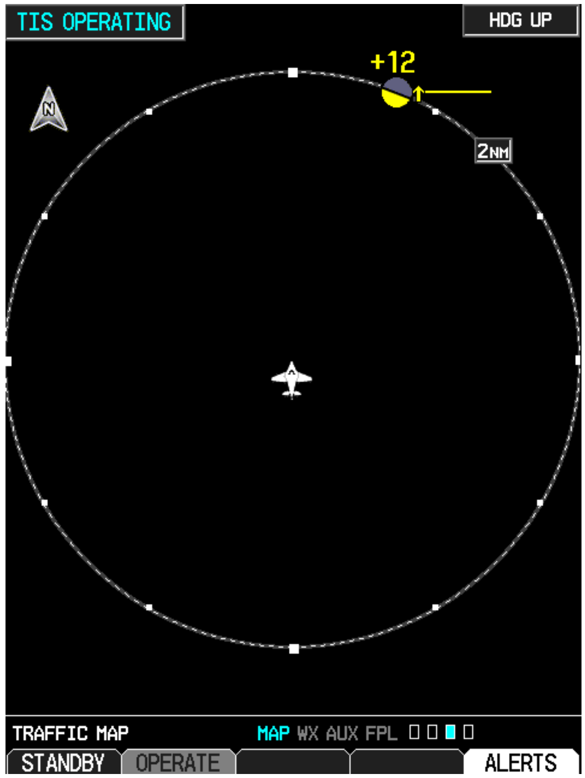
NOTE

The Self Test menu option will not be available if the traffic system is operating.

5. Put the traffic system in Standby mode. Press the MENU key and press ENT to initiate a traffic system self test. Verify that the traffic system runs a self-test and the self-test traffic pattern is displayed.

5.8.6.2 TIS (Garmin GTX 33/330) Interface Test

If a Garmin GTX 33/330 sensor has been connected to the GDU 620, the traffic interface should be verified as described in this section.



1. Select the Traffic Map page on the GDU 620.
2. Verify that the amber TIS FAIL is not displayed in the upper left corner, and NO DATA (amber) is not displayed over the ownship symbol.
3. On the upper left corner of the Traffic Map page, verify that the status of the traffic system is either TIS Standby or TIS Operating/Unavailable (i.e. TAS should not be displayed).

NOTE

If the GDU 620 is configured for an external control (i.e. a display other than the GDU 620 is controlling the traffic system), then the following steps do not have to be carried out.

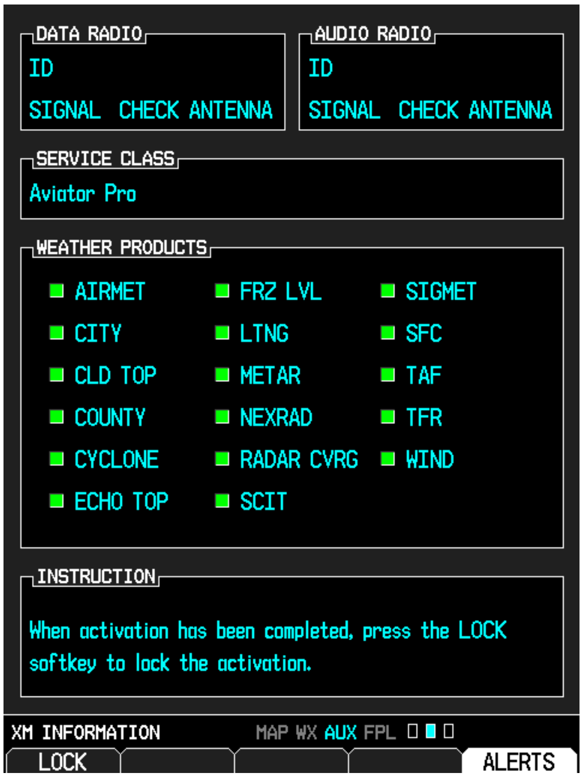
4. Pull the GDC breaker and verify the Air data fields are red X'd.
5. Turn off all navigators to remove a valid GPS position to the GDU
6. If a squat switch (or airspeed switch) to the GTX 330 squat switch input is present, ensure that this is in AIR mode.
7. Alternately press the STANDBY soft key and OPERATE soft key to change the mode of the traffic system. It may take several seconds for the traffic system to change modes. Verify that the mode of the traffic system can be changed.

5.8.7 Garmin GDL 69/69A Checkout Procedure

Locate the aircraft where there is a clear view of the southeastern or southwestern sky. XM Satellite Radio satellites are located above the equator over the eastern and western coasts of the continental United States.

NOTE

The following section only verifies correct installation and activation of appropriate GDU 620 functions. It does not activate the GDL 69/69A XM data link radio. Complete instructions for activating the GDL 69/69A XM data link radio can be found in document 190-00355-04.



1. Go to the XM INFORMATION page in the AUX page group.
2. Verify that the Data Radio ID field has a valid value and is not blank.

NOTE

The following steps only have to be completed for GDL 69A installations.

NOTE

If the XM Satellite Radio audio subscription has not been activated, audio is available only on Channel 1. If the audio subscription has been activated, audio should be available on multiple channels.

3. Select the XM RADIO page in the AUX page group.
4. Unmute the XM volume and verify that audio can be heard over the headsets. Adjustment of the volume may be required.

5.8.8 ADF Interface Checkout Procedure

The GDU 620 can receive relative bearing information from an external ADF source. This check verifies that the units are communicating.

1. Ensure that the G600 and ADF are powered up.
2. Press the PFD soft key on the PFD. Repeatedly press the BRG 1 soft key until ADF is displayed as the source for the No. 1 bearing pointer.
3. Verify that the ADF window is not invalid (no red 'X').
4. Using an ADF test set, generate a bearing to a station.
5. Tune the ADF receiver to the same frequency as the test set.
6. Verify that the ADF bearing pointer indicates the correct relative bearing.
7. Verify correct display for three other bearings, at 90° increments.
8. If the ADF flag is used in the installation, tune the ADF receiver to an unused frequency and verify that the bearing pointer is removed from the PFD.

5.8.9 GDU Cross-Fill Checkout Procedure *(Dual GDU 620 Installations Only)*

If dual GDU 620s are installed, one GDU 620 can share information with the other GDU 620. This check verifies that the units are communicating.

1. Ensure that both G600 systems are powered up.
2. On the GDU 620 #1 MFD go to the AUX page and ensure that BARO SYNCHRONIZATION is ON.
3. Press the BRO key on GDU 620 #1 and use the knob to change the barometric setting.
4. Verify that the barometric setting on both GDUs change to the same value.
5. Press the BRO key on GDU 620 #2 and use the knob to change the barometric setting.
6. Verify that the barometric setting on both GDUs change to the same value.

5.8.10 EMI/RFI Check

After installing the GDU 620 and verifying that all interfaces to external equipment are working correctly, a brief EMI/RFI check must be conducted. This check will verify that the GDU 620 does not produce unacceptable interference in other avionics systems, and other avionics systems do not produce unacceptable interference in the GDU 620.

1. Start the aircraft engines and switch to aircraft power. Turn on all avionics except the GDU 620.
2. With the GDU 620 switched off, verify that all existing avionics systems are functioning properly.
3. Turn the GDU 620 on and remove power from all other avionics systems.

NOTE

Removing power from systems interfaced to the GDU 620 will cause the associated system flags on the GDU 620 to be displayed. This is normal behavior and does not constitute a test failure.

4. Apply power to the other avionics systems one at a time and verify that the system is functioning properly without any unacceptable interference caused by the GDU 620. Ensure that there is no unacceptable interference in the GDU 620 when the avionics system is powered up. Wait for the system to begin functioning normally before applying power to the next system.

5.9 Placard Relocation/Switch Labeling

If any placards were relocated as a result of the GDU 620 installation, verify the following:

- The font size of the new placard is the same as the old placard it is replacing
- The color of the new placard is identical to the color of the placard which it is replacing
- The text on the new placard is identical to the text on the placard which it is replacing (it can be arranged differently as required by space constraints, but the wording must be the same)

If the new switches were added as a result of the G600 installation, verify the following:

- The font size is legible from the pilot's seat
- The labels are readable in all ambient light conditions. In particular, the labels are readable with ambient flood lighting in darkness.

5.10 Flight Checks

5.10.1 General System Flight Check

During flight the following items should be verified:

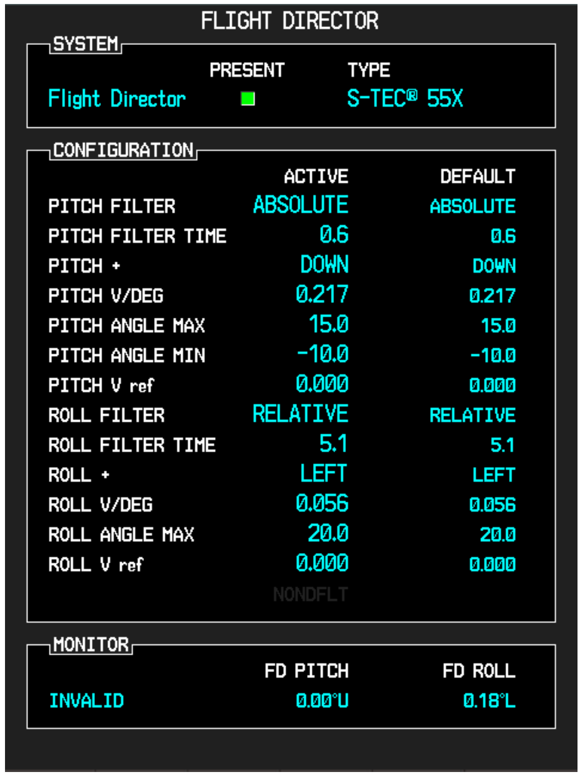
- The display of attitude, airspeed and heading on the GDU 620 while maneuvering.
- The display of attitude, airspeed and heading on the standby instruments.
- Navigation using each GPS and VLOC source on the GDU 620 CDI. For navigation receivers, both VOR and ILS should be verified.
- The audibility of the altitude alerter chime.
- The display of traffic from any interfaced traffic system (if applicable)
- The display of bearing from any interfaced ADF (if applicable).
- The display of weather from the GDL 69/69A (if applicable).
- The control of GDL 69A audio functions (if applicable).

5.10.2 Autopilot Flight Checks and Final Adjustments

After verifying the autopilot interfaces as described in Section 5.8.5, the autopilot must be flight tested and, if necessary, adjusted for the particular airframe. This section provides general guidelines for verifying the autopilot and flight director performance and also for making necessary adjustments. Any adjustments made must be reflected in the Checkout Log (Section 5.11.3).

5.10.2.1 Flight Director Performance

It is best to evaluate the flight director with the autopilot coupled in order to assess the performance of the flight director versus the autopilot. Evaluate the flight director performance in level flight, turns, climbs, and descents. Observe any excessive fluctuations in pitch or roll, as well as how closely the autopilot follows the movements of the flight director.



The flight performance can be adjusted by changing the settings on the Flight Director Configuration page in configuration mode. For dual-G600 systems, all flight director configuration changes must be made on both GDUs.

Table 5-6. Flight Director Configuration Settings

Parameter	Description
PITCH FILTER *(leave set at default value)*	**Relative:** Angles filtered in this setting are relative to the aircraft. Sets the filter to be applied to inputs regardless of A/C orientation. **Absolute:** Setting accounts for changes in aircraft body before applying the filter. Sets the filter to be applied to inputs including A/C orientation.
PITCH FILTER TIME	Sets the time in seconds for the flight director display to change from the current value to the commanded value.
PITCH +	Sets the polarity of the pitch response of the flight director.
PITCH V/DEG	Sets the number of volts required for one degree of flight director movement.
PITCH ANGLE MAX	Sets the maximum pitch up angle that the flight director can reach. The displayed FD will not exceed this value even if a larger pitch up angle is received from the autopilot computer.
PITCH ANGLE MIN	Sets the maximum pitch down angle that the flight director can reach. The displayed FD will not exceed this value even if a larger pitch down angle is received from the autopilot computer.
PITCH V ref	Sets the zero pitch reference point.
ROLL FILTER *(leave set at default value)*	**Relative:** Angles filtered in this setting are relative to the aircraft. Sets the filter to be applied to inputs regardless of A/C orientation. **Absolute:** Setting accounts for changes in aircraft body before applying the filter. Sets the filter to be applied to inputs including A/C orientation.
ROLL FILTER TIME	Sets the time in seconds for the flight director display to change from the current value to the commanded value.
ROLL +	Sets the polarity of the roll response of the flight director.
ROLL V/DEG	Sets the number of volts required for one degree of flight director movement.
ROLL ANGLE MAX	Sets the maximum roll angle that the flight director can reach. The displayed FD will not exceed this value even if a larger roll angle is received from the autopilot computer.
ROLL V ref	Sets the zero roll reference point.

5.10.2.2 Autopilot Performance

The autopilot performance can be adjusted by changing the settings on the Autopilot Configuration page in configuration mode. For dual-G600 systems, all autopilot configuration changes should be made on the pilot's GDU only.

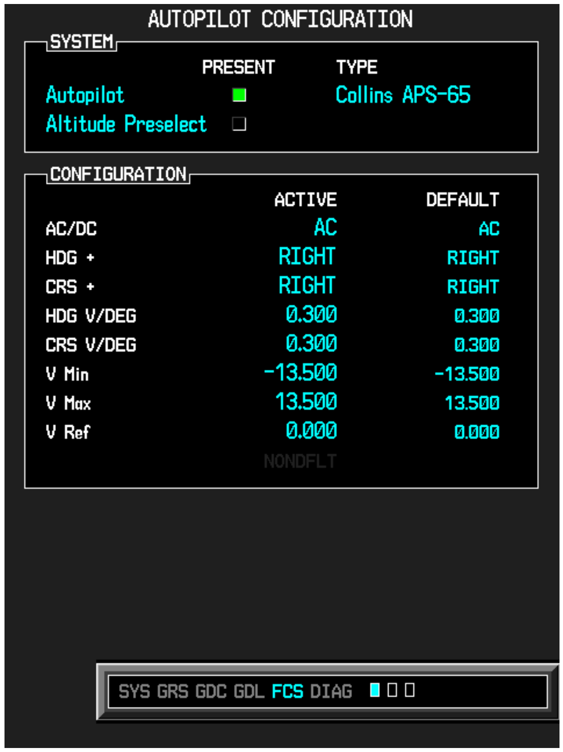


Table 5-7. Autopilot Configuration Settings

Parameter	Description
AC/DC	Selects whether the autopilot receives AC or DC heading and course error signals. This parameter should not be changed.
HDG +	Changes the polarity of the heading error signal.
CRS +	Changes the polarity of the course error signal.
HDG V/DEG	Changes the gain of the heading error signal.
CRS V/DEG	Changes the gain of the course error signal.
V Min	Sets the minimum voltage that the GDU 620 will send to the autopilot. This parameter should not be changed.
V Max	Sets the maximum voltage that the GDU 620 will send to the autopilot. This parameter should not be changed.
V Ref	Sets the zero reference for the heading and course error signals.

1. To evaluate the autopilot heading performance, center the heading bug and engage the autopilot in HDG mode. Change the heading bug by at least 45°. The autopilot should follow the heading bug and roll out smoothly, without undershooting or overshooting the selected heading. If the autopilot undershoots the selected heading, increase the HDG V/DEG appropriately. If the autopilot overshoots the selected heading, decrease the HDG V/DEG appropriately.

2. To evaluate the autopilot course performance, engage the autopilot in NAV mode. Tune to a NAV frequency that is out of range and select that NAV for display on the CDI, so that the GDU invalidates the lateral deviation signal. Change the course by at least 45°. The autopilot should turn to the new course and roll out smoothly, without undershooting or overshooting the selected course. If the autopilot undershoots the selected course, increase the CRS V/DEG appropriately. If the autopilot overshoots the selected course, decrease the CRS V/DEG appropriately.

5.10.2.3 Roll Steering Performance

NOTE

GPS roll steering is handled in one of three ways. First, if the autopilot has an ARINC 429 roll steering input, the GDU 620 can provide ARINC 429 roll steering directly to the autopilot. Second, if an external roll steering converter has been installed, the GDU can provide ARINC 429 roll steering to the converter, which then outputs an analog heading error signal to the autopilot. Third, the GDU can provide the roll steering via the heading error output, taking the place of a separate roll steering converter. The autopilot is left in heading mode, and the GDU varies the heading error output to steer the autopilot.

1. Set up a GPS flight plan that includes at least two legs with an angle between them. Set the CDI to display the active GPS. Engage the autopilot in GPS roll steering mode. If the autopilot uses the heading error input for roll steering, engage the autopilot in HDG mode and activate the GPSS switch. When the switch is active the following annunciation will appear on the PFD:

2. Verify that the autopilot flies the airplane smoothly through the turn between the two legs.

5.10.2.4 Altitude Preselector Performance

NOTE

This test is applicable only for S-TEC autopilots which have the RS-485 altitude preselector input connected to the GDU 620 and have the altitude preselector option enabled in the GDU 620.

1. Set the altitude preselector on the GDU 620 to an altitude above the present altitude.
2. Engage the autopilot in altitude select mode by pressing the VS and ALT buttons simultaneously.
3. Set a positive vertical speed on the autopilot.
4. Verify that the autopilot climbs and captures the selected altitude.
5. Set the altitude preselector on the GDU 620 to an altitude below the present altitude.
6. Set a negative vertical speed on the autopilot.
7. Verify that the autopilot descends and captures the selected altitude.

5.11 Documentation Checks

5.11.1 AFMS

Ensure that the Airplane Flight Manual Supplement (AFMS) is completed and inserted in the Airplane Flight Manual (AFM) or Pilot's Operating Handbook (POH).

1. Fill in the required airplane information in the AFMS.
2. In AFMS Section 4.4 (Autopilot Operations), fill in all applicable checkboxes corresponding to the interfaces to the autopilot. More than one box may be checked, depending upon the installation. These are further described below.

   ☐ This installation *does not* interface with the autopilot (basic wing leveling autopilot or no autopilot is installed in the aircraft)

   - Check this box if there are no interfaces between the G600 system and the autopilot, or if no autopilot is installed in the aircraft. No other boxes should be checked if this box is checked.

   ☐ Course / NAV Selection coupling to the autopilot

   - Check this box if the course datum signal is connected to the autopilot.

   ☐ Heading Bug coupling capability to the autopilot

   - Check this box if the heading datum signal is connected to the autopilot.

   ☐ Roll Steering emulated via the heading mode

   - Check this box if an external GPSS switch is installed with the G600.

   ☐ Roll Steering capable autopilot

   - Check this box if the ARINC 429 output from the GDU 620 is connected to the autopilot.

   ☐ Altitude Pre-Selector integrated with the autopilot

   - Check this box if the Altitude Preselect option is enabled (unlocked).

   ☐ Flight Director display driven from external autopilot or FD computer

   - Check this box if an external flight director is connected to and configured on the GDU 620.

3. Insert the completed AFMS into the AFM or POH.

5.11.2 Instructions for Continued Airworthiness (ICAW)

Ensure that the appropriate aircraft information is filled in on the Instructions for Continued Airworthiness (ICAW) is completed and inserted in the aircraft permanent records.

1. Fill in the Aircraft Make, Model, Reg. No. and S/N information on the cover of the ICAW (Garmin document 190-00601-00).
2. In the ICAW Appendix A, fill in the locations of all LRUs that were installed as part of the G600 installation. Also sketch the location of the wire runs for the G600 LRUs.
3. Insert the completed ICAW in the aircraft permanent records.

5.11.3 Configuration and Checkout Log

The completed checkout log sheet should be maintained with the aircraft permanent records. If a dual GDU 620 installation is being done, a checkout log for each system must be completed.

Table 5-8. G600 System Configuration and Checkout Log
Page 1 of 4

G600 Configuration and Checkout Log

Date: ____ /____ /____
By: ________________

INSTALLATION INFORMATION:

- ❑ Single GDU
- ❑ Dual – GDU #1
- ❑ Dual – GDU #2

AIRCRAFT MODEL ____________________ **AIRCRAFT SERIAL #** ____________

GDU 620	P/N 011 - 01264 - _______	Mod Level __________	
	Serial # ______________________		
GRS 77	P/N 011 - 00868 - _______	Mod Level __________	
	Serial # ______________________		
GMU 44	P/N 011 - 00870 - _______	Mod Level __________	
	Serial # ______________________		
GDC 74A	P/N 011 - 00882 - _______	Mod Level __________	
	Serial # ______________________		
GTP 59	P/N 011 - 00978 - _______	Mod Level __________	
	Serial # ______________________		
4300-4( ) [❑ N/A]	P/N 4300-4_______	Panel Tilt _______°	Lighting______V
	Serial # ______________________		
4200-( ) [❑ N/A]	P/N 4200-_______	Panel Tilt _______°	Lighting______V
	Serial # ______________________		
MD420 [❑ N/A]	P/N **MD420**	Set for lighting voltage______V	
	Serial # ______________________		

EQUIPMENT LOCATION:

For each unit listed below, record the fuselage station and provide a brief description of the location.

Unit	*Station (CG)*	*Description of Location*
GRS 77 AHRS	_____________ (in)	______________________________
GDC 74A ADC	_____________ (in)	______________________________
GMU 44 Mag.	_____________ (in)	______________________________
GTP 59 OAT	_____________ (in)	______________________________
MD420 [❑ N/A]	_____________ (in)	______________________________

Table 5-8. G600 System Configuration and Checkout Log
Page 2 of 4

CONFIGURATION ITEMS:

System Configuration

Cross-side GDU:	❑ Present ❑ Not Present	Type:	**GDU 620**
AHRS:	❑ Present ❑ Not Present	Type:	**GRS 77**
ADC:	❑ Present ❑ Not Present	Type:	**GDC 74**
GPS1:	❑ Present ❑ Not Present	Type:	________
GPS2:	❑ Present ❑ Not Present	Type:	________
NAV1:	❑ Present ❑ Not Present	Type:	________
NAV2:	❑ Present ❑ Not Present	Type:	________
ADF:	❑ Present ❑ Not Present ❑ + Superflag	Type:	________
Traffic:	❑ Present ❑ Not Present ❑ + External Control	Type:	________
Data Link:	❑ Present ❑ Not Present	Type:	________

Airframe Configuration

PFD

DIS. SPD: ❑ Nautical ❑ Imperial ❑ Metric

ALT. VS: ☒ **Feet**

VS Tape Range: ❑ 2000 ❑ 3000 ❑ 4000

ADI ROLL POINTER: ❑ Sky ❑ Ground

MFD

DIS. SPD: ❑ Nautical ❑ Imperial ❑ Metric

ALT. VS: ☒ **Feet**

Aircraft Icon: ____________

Airspeeds (PFD)

V_{S0}:________	V_r:________
V_{S1}:________	V_x:________
V_{fe}:________	V_y:________
V_{no}:________	V_{le}:________
V_{ne}:________	V_{mca}:________
GLIDE :________	V_{yse}:________

Lighting Configuration

Brightness	Display	Key
Input Source:	________	________
Minimum Level:	________	________
Response Time:	________	________
Slope:	________	________
Offset:	________	________

Photocell Override		
Key Backlight Cutoff %:	[❑ N/A]	________
Photo Transition %:	[❑ N/A]	________
Photo Slope:	[❑ N/A]	________
Photo Offset:	[❑ N/A]	________

Manifest Configuration

GDU	006-B0498-_____	ver ______	GMU	006-B0224-______	ver _______
GDC	006-B0261-_____	ver ______	GMU FPGA	006-C0048-______	ver _______
GDC FPGA	006-C0055-_____	ver ______	GRS	006-B0223-______	ver _______
GDL 69 [❑ N/A]	006-B0317-_____	ver ______	GRS FPGA	006-C0049-______	ver _______

Table 5-8. G600 System Configuration and Checkout Log
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CONFIGURATION ITEMS (CONT'D):

Feature Configuration	*Audio Alert Configuration*
Charts: ❑ None ❑ FlightCharts ❑ ChartView Altitude Preselect ❑ Enabled ❑ Disabled	Volume Adjustment: _______________ dB
GDC Configuration	***GDL 69/69A*** [❑ N/A]
OAT Type: **GTP 59**	Antenna Gain (Lower): __________ dB Cable Loss (Nominal) __________ dB GDL 69/69A Activated ❑ Yes ❑ No
Autopilot [❑ N/A]	***Flight Director*** *[❑ N/A]*
Autopilot ❑ Present ❑ Not Present Type:__________________ **Configuration** (Active settings)**:** AC/DC: ❑ AC ❑ DC HDG +: ❑ RIGHT ❑ LEFT CRS +: ❑ RIGHT ❑ LEFT HDG V/DEG: ________________ CRS V/DEG: ________________ V Min: ________________ V Max: ________________ V Ref: ________________	Flight Director ❑ Present ❑ Not Present Type:_____________________ **Configuration** (Active settings)**:** Pitch Filter: ❑ Absolute ❑ Relative Pitch Filter Time: ____________________ Pitch +: ❑ DOWN ❑ UP Pitch V/DEG: _______________________ Pitch Angle Max: ___________________ Pitch Angle Min: ___________________ Pitch Vref: ___________________ Roll Filter: ❑ Absolute ❑ Relative Roll Filter Time: ____________________ Roll +: ❑ LEFT ❑ RIGHT Roll V/DEG: _______________________ Roll Angle Max: ___________________ Roll Vref: ___________________
GRS/GMU CALIBRATION	
Pitch/Roll Offset completed? ❑ Magnetometer Cal completed? ❑ Heading Offset completed? [❑ N/A] ❑	Engine Run-up Test passed? ❑ Mag Interference Test passed? ❑

Table 5-8. G600 System Configuration and Checkout Log
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SYSTEM CHECKOUT

Ground Checks

DATABASE CHECKS

- ❑ Jeppesen NavData current
- ❑ Electronic Charts current
- ❑ Terrain current

PITOT STATIC / ADC / TAPE CHECKS

- ❑ Pitot Static system leak checked
- ❑ CFR accuracy check completed
- ❑ Airspeed tape settings checked
- ❑ Airspeed accuracy checked

GENERAL CHECKS

EMI/RFI Check	❑ Pass	❑ Fail
All placards relocated	❑ [❑ N/A]	
All labels are readable	❑ [❑ N/A]	

SYSTEM INTERFACE CHECKS

- ❑ GPS Receiver Interface checked
- ❑ [❑ N/A] Nav Receiver Interface checked

Autopilot Checks [❑ N/A]

- ❑ Autopilot Engagement Check
- ❑ [❑ N/A] Flight Director Check
- ❑ [❑ N/A] FD Offset Calibration
- ❑ [❑ N/A] Altitude Preselect Check
- ❑ Heading and Course Error Check
- ❑ VLOC and GS Deviation Check
- ❑ GPS Roll Steering Check

- ❑ [❑ N/A] Traffic System Interface checked
- ❑ [❑ N/A] GDL 69/69A Interface checked
- ❑ [❑ N/A] ADF Interface checked
- ❑ [❑ N/A] GDU Cross-fill checked

Flight Checks

GENERAL SYSTEM CHECKS

- ❑ Primary Attitude, Heading and Airspeed
- ❑ Standby Attitude, Heading and Airspeed
- ❑ GPS1 Navigation
- ❑ [❑ N/A] GPS2 Navigation
- ❑ [❑ N/A] Nav1 Navigation
- ❑ [❑ N/A] Nav2 Navigation
- ❑ [❑ N/A] Altitude Alerter Audibility
- ❑ [❑ N/A] Traffic Display
- ❑ [❑ N/A] ADF Bearing Display
- ❑ [❑ N/A] GDL 69/69A Weather Display
- ❑ [❑ N/A] GDL 69A Audio Control

AUTOPILOT CHECKS [❑ N/A]

- ❑ [❑ N/A] Flight Director Performance
- ❑ Autopilot Performance
- ❑ [❑ N/A] FD Offset Calibration
- ❑ [❑ N/A] Altitude Preselect Check
- ❑ VLOC and GS Deviation Check
- ❑ [❑ N/A] GPS Roll Steering Check

Documentation Checks

- ❑ AFMS completed and in POH/AFM
- ❑ ICAW completed and included in aircraft records

COMMENTS:

6 Troubleshooting

This section provides information to assist troubleshooting if problems occur with a G600 installation.

6.1 GMU 44 Magnetometer Troubleshooting

When performing a magnetic interference survey numerous issues may arise. This section lists some common causes for failures of the magnetometer interference test, and a description of some of the things that can be done to remedy them.

6.1.1 Common Causes for Failures of the Magnetometer Interference Test

6.1.1.1 Electrical Current Return Paths

If electrical loads are grounded through the airframe, the returning electrical current will flow through the airframe toward the alternator, generator, or battery. If the magnetometer lies along this current return path, the current can cause significant magnetic interference. Electrical current return paths are the most common cause of magnetic interference issues. Common examples of this problem are the navigation lights at the wingtips for wing-mounted magnetometers or the strobe light on the tail for vertical stabilizer-mounted magnetometers.

Before making changes to the aircraft, isolate the particular electrical load which is causing the interference by running the GMU 44 Location Survey Tool while turning the load on and off or by running the magnetometer interference test with the load on and again with it off.

To correct the problem, ground the electrical load through a wire rather than through the airframe. The ground wire should run into the fuselage for wing-mounted magnetometers so that the return current no longer flows through the airframe past the magnetometer. Ideally this ground wire should be routed beside the power wire for that electrical load. This will maximize cancellation of the associated magnetic field that is generated by the current.

6.1.1.2 Nearby Electrical Loads

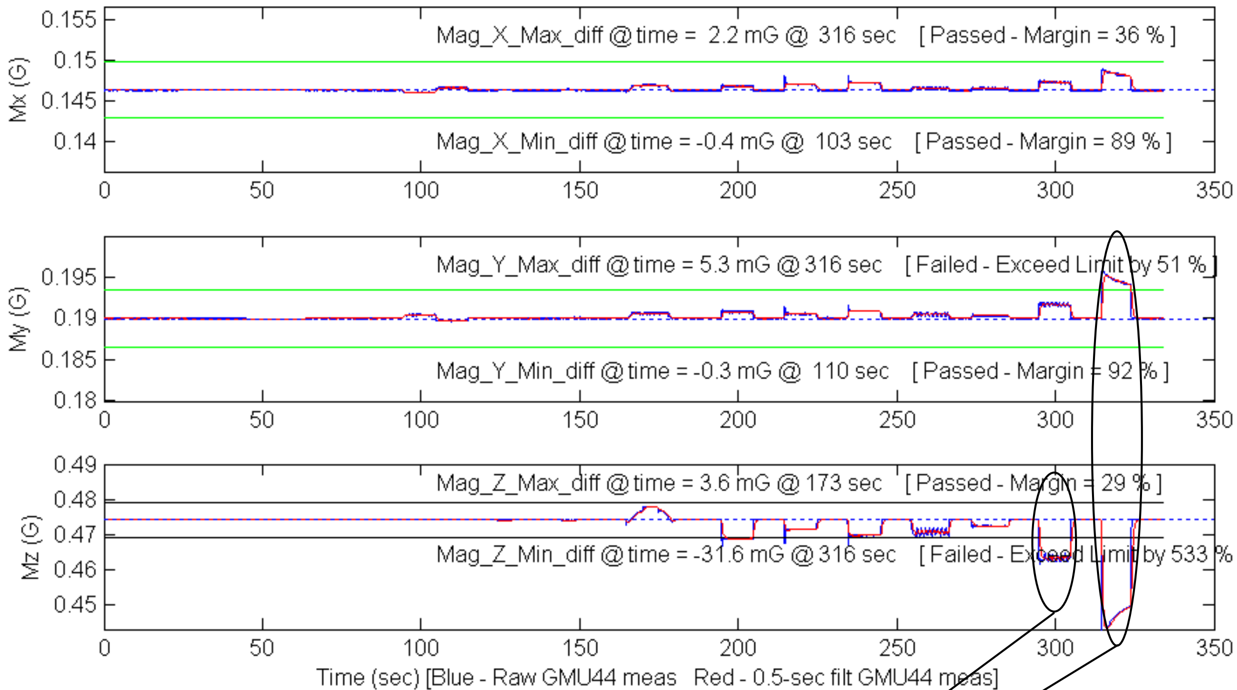
Large electrical loads that are close to the magnetometer can generate significant magnetic interference. It is important to install the GMU 44 using the guidelines provided in Section 2.5.11.5 and Table 2-5.

6.1.1.3 Ferromagnetic Materials

Ferromagnetic materials can become magnetized and cause magnetic interference. It is important to use nonmagnetic materials to mount the GMU 44, and replace any magnetic fasteners within 20” (0.5 m) with nonmagnetic equivalents (e.g. replace zinc-plated steel screws used to mount wing covers or wingtips with nonmagnetic stainless steel screws.)

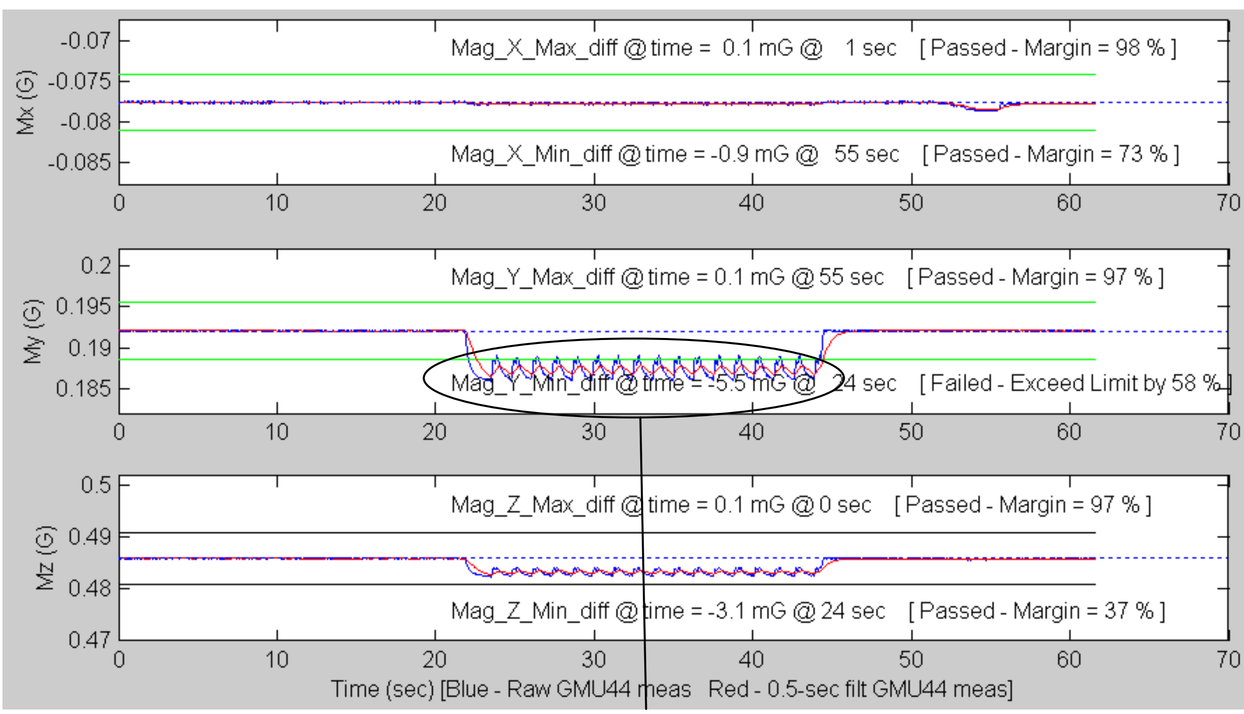
6.1.2 Examples of Magnetic Interference Problems

In order to isolate the cause the magnetic interference, first review the results from the GMU 44 Location Survey Tool as described in Appendix G. Compare the survey results to the detailed test sequence to identify which item caused the failure. Two examples of common survey failures are shown below.



Interference From The Wingtip Nav And Strobe Lights
Interference From The Pitot Heat

The cause of both of the interference issues above was determined to be electrical current return paths through the airframe, as described in Section 6.1.1.1. Two options were available at this point: (1) run new ground wires for the pitot heat, strobe light, and NAVNAV light, or (2) choose a different location for the GMU 44. Since it was determined that running new ground return wires through the wing would be difficult, the GMU 44 was relocated to more suitable location in the aft fuselage.



Interference From The Strobe Light On Vertical Stabilizer

The cause of the interference above was determined to be an electrical current return path through the airframe, as described in Section 6.1.1.1. The power return for strobe light power supply was through the chassis of the power supply (the design for this power supply did not have a separate connection for a power ground). To correct the problem, the power supply was replaced with a new power supply that had a separate power ground that was isolated from the chassis. A new ground wire was run from the strobe light power supply and attached to the airframe forward of the GMU 44.

6.2 G600 Troubleshooting

Table 6-1. GDU 620 Troubleshooting Guide

Problem	Cause	Solution
Unit does not power up – blank screen.	Improper wiring; circuit breaker open.	Ensure power is properly wired to the GDU 620 and the circuit breaker is closed.
	Unit intensity turned down.	Ensure that unit is not in manual intensity control mode with the intensity turned down.
All expected configuration pages are not displayed.	An Installer Unlock Card is not inserted into the GDU 620.	Insert the Installer Unlock Card P/N 010-00769-60 into the bottom slot of the GDU 620 and cycle power.
The GDC OAT probe type shows up as UNKNOWN	The RS-232 connection to the GDC 74A is not working.	Ensure that the GDC 74A RS-232 connection to the GDU is properly wired, and ensure that the GDC 74A circuit breaker is closed.
When loading software, the LRU software is not being displayed on the SOFTWARE UPLOAD page.	The software loader card is installed in the bottom slot of the GDU 620.	Insert the loader card in the top slot and cycle power to the GDU.
	The software loader card contains no information.	Repeat the process for making the software loader card.
Configuration errors are displayed on power-up, before the GDU enters normal mode.	The configuration module has not been updated.	Update the configuration module – refer to Section 5.5.11.
Vertical GPS deviation is not displayed on the GDU 620.	For 400W/500W Series units, the ARINC 429 vertical deviation labels are not being transmitted.	Enable Labels on the 400W/500W Series unit ARINC 429 configuration page.
Unable to control the GPS course when in OBS mode.	The GPS navigator is not correctly configures as LNAV1/2 or SYS1/2.	Configure the ARINC 429 inputs/outputs for LNAV1 (SYS1) or LNAV2 (SYS2) based upon whether the navigator is GPS1 or GPS2.
Data is not being received from an ARINC 429 device. (valid data is being received on the 429 input port as shown on the GDU 620 PORT MONITORING page)	ARINC 429 bus hi and low are swapped.	Verify wiring.
	Wrong device is connected to port on	
Data is not being received from an ARINC 429 device. (no data is being received on the 429 input port as shown on the GDU 620 PORT MONITORING page)	On the transmitting LRU, the ARINC 429 transmitter speed is not set correctly.	Set the ARINC 429 transmitter speed to correct speed.
	Wiring is not correct.	Check for continuity/shorts and correct as required.

Problem	Cause	Solution
Attitude and heading on GDU 620 red ‘X’ / GRS 77 resets during air data ground testing.	Attitude and heading errors/resets are possible if the air data tests are conducted indoors without a good GPS signal. With marginal or no GPS signals present, sudden changes in airspeed caused by using a pressure tester may result in attitude and heading errors and possibly cause the GRS 77 to reset. This occurs because the artificial changes in airspeed cause disagreement with the other sensor measurements internal to the GRS 77. This sensor disagreement will not occur in the normal conditions of flight.	This is expected behavior and no troubleshooting is required if this occurs. To reduce the chances of inducing attitude and heading errors/resets while conducting the air data tests, ensure that the G600 is receiving good GPS signals.
Heading red ‘X’ during air data ground testing	Invalidation of heading is possible if the air data tests are conducted indoors, due to typical magnetic anomalies, even with a good GPS signal.	This is expected behavior and no troubleshooting is required if this occurs.

6.3 G600 Alerts

The G600 will display a number of alerts on the GDU 620 MFD. These are listed in the following table.

Table 6-2. GDU 620 Alert Troubleshooting Guide

Alert Text	Cause	Solution
AHRS GPS	AHRS is using the backup GPS information	
AHRS1 GPS - AHRS is not receiving any GPS information	AHRS is not receiving any GPS information.	
AHRS1 GPS	AHRS is operating exclusively in no-GPS mode.	
AHRS1 SRVC	AHRS magnetic field model should be updated. Appears on ground only.	Update GRS 77 IGRF model (current model is with aviation database).
AHRS1 TAS	AHRS is not receiving true airspeed from ADC.	GDC not powered up. Close ADC C/B.
		GDC not receiving input from GTP 59 OAT probe. Verify wiring is correct.
		ARINC 429 connection from GDC 74A to GRS 77 is not working. Verify wiring is correct.
		There is a magnetic anomaly
CAL LOST	Registry reports that it has lost calibration data.	
CNFG MISMATCH	GDU in normal mode has received updated crossfill tags for configuration registry entries.	
CNFG MODULE	The configuration module is inoperative.	Verify wiring to configuration module
		Replace configuration module
DATA LOST	Pilot stored data was lost. Recheck data and settings.	
FAN 1 FAIL	Fan 1 has reported 0 RPM when it was powered with a PWM duty cycle higher than or equal to 10%	
FAN 2 FAIL	Fan 2 has reported 0 RPM when it was powered with a PWM duty cycle higher than or equal to 10%	
GDL69 CONFIG	Error in the configuration of the GDL69.	
GDU (1/2) COOLING	Specific GDU has poor cooling, and power usage is being reduced.	Ensure fans on indicated GDU are functioning
		Ensure fans on indicated GDU are not obstructed
GDU (1/2) DB ERR	Error in specific database, where GDU (1/2) DB denotes specific database.	

Alert Text	Cause	Solution
GDU (1/2) VOLTAGE	GDU supply voltage is below 12 VDC.	Increase the voltage above 12VDC.
GPS(1/2) FAIL	No GPS1 or GPS2 data is available.	Ensure GPS (1/2) is turned on
		Verify RS-232 wiring from the GPS to the GDU 620.
GPS(1/2) PPS Failure	This alert will be set if the PPS signal has not been received in more than 5 sec. If the unit is configured for dual GPSs then the side will be specified in the error.	Ensure GPS (1/2) is turned on
		Verify 1PPS wiring from the GPS to the GDU 620.
GPS2 FPL USED	The GPS1 has failed and GPS2 is configured and operating.	
HDG FAULT	AHRS magnetometer fault has occurred.	GRS 77 not receiving information from GMU 44. Verify wiring to GMU 44.
<LRU> SERVICE	Specific LRU should be serviced, where <LRU> denotes specific LRU.	Return indicated LRU to Garmin for service.
MANIFEST	GDU has received product data for an LRU that should have a manifest entry, but is not in the manifest.	Ensure the manifest is properly configured. Refer to Section 5.5.4 for additional information.
NAV1 FAIL	No navigation receiver 1 data.	
NAV2 FAIL	No navigation receiver 2 data.	
SIMULATOR	The simulator mode is active.	Ensure P6202-36 is not grounded.
SW MISMATCH	GDU software version strings do not match.	
TRAFFIC FAIL	The traffic information system has failed.	The GDU 620 is not receiving traffic information from the traffic sensor. Verify wiring between GDU 620 and traffic sensor.
		The GDU 620 is receiving information from the traffic sensor, but the information is indicating that the traffic sensor has failed. Troubleshoot traffic system.

6.4 Autopilot Troubleshooting

Table 6-3. Autopilot Troubleshooting Guide

Problem	Cause	Solution
Autopilot will not engage.	External input to autopilot not valid.	Troubleshoot in accordance with the autopilot installation manual.
	Internal problem in the autopilot computer, autopilot control panel, or servos.	
Autopilot servos turn opposite direction of flight director.	GDU 620 not properly configured for flight director inputs.	Check GDU 620 flight director configuration settings per Section 5.5.10.
	Flight director signal wiring reversed.	Check flight director signal wiring between autopilot and GDU 620. Reference the interconnect drawing in Appendix F.
	Autopilot servo rigged incorrectly.	Check autopilot servo rigging if it was changed during G600 installation.
Flight director not displayed on GDU 620.	GDU 620 not configured for flight director.	Configure GDU 620 for flight director per Section 5.5.10.
	Flight director valid signal not received by GDU 620.	Verify valid signal wiring between autopilot and GDU 620. Reference the interconnect drawing in Appendix F.
		The valid signal status can be observed on the GDU 620 on the Flight Director page in configuration mode.
Flight director bars are displayed on the GDU 620 but do not move.	GDU 620 not properly configured for flight director inputs.	Check GDU 620 flight director configuration settings per Section 5.5.10.
	Flight director signals not being received by GDU 620.	Check flight director signal wiring between autopilot and GDU 620. Reference the interconnect drawing in Appendix F.
Flight director bars move in wrong direction laterally on the GDU 620.	GDU 620 not properly configured for flight director inputs.	Check the GDU 620 autopilot and flight director configuration settings per Sections 5.5.9 and 5.5.10.
	Flight director signal wiring reversed. GDU 620 heading error and/or course error inputs not configured correctly.	Check flight director signal, heading error, course error, and lateral deviation signal wiring between the autopilot and GDU 620. Reference the interconnect drawing in Appendix F.
	Heading/course error signal wiring between the GDU 620 and autopilot reversed.	
	Lateral deviation signal wiring between the GDU 620 and autopilot reversed.	

Problem	Cause	Solution
Flight director bars move in wrong direction vertically on the GDU 620.	GDU 620 not properly configured for flight director inputs. Flight director wiring reversed. Glideslope deviation signal wiring between the GDU 620 and autopilot reversed.	Check the GDU 620 flight director configuration settings per Section 5.5.10. Check flight director signal and glideslope deviation signal wiring between the autopilot and GDU 620. Reference the interconnect drawing in Appendix F.
Autopilot rolls the control yoke or stick in the wrong direction in heading mode.	GDU 620 not properly configured for the heading error output.	Check the GDU 620 autopilot configuration settings per Section 5.5.9.
	Heading error wiring between GDU 620 and autopilot reversed.	Check the heading error signal wiring between the GDU 620 and autopilot. Reference the interconnect drawing in Appendix F.
Autopilot rolls the control yoke or stick in the wrong direction in NAVNAV or approach mode.	GDU 620 not properly configured for the course error output.	Check the GDU 620 autopilot configuration settings per Section 5.5.9.
	Course error wiring between the GDU 620 and autopilot reversed. Lateral deviation signal wiring between the GDU 620 and autopilot reversed.	Check the course error signal and lateral deviation signal wiring between the GDU 620 and autopilot. Reference the interconnect drawing in Appendix F.
Autopilot does not roll the control yoke or stick to follow the heading bug when in heading mode.	Autopilot not receiving heading error signal from the GDU 620.	Check the heading error signal wiring between the GDU 620 and autopilot. Reference the interconnect drawing in Appendix F.
Autopilot does not roll the control yoke or stick to correct lateral deviation from the course when in NAVNAV or approach mode.	Autopilot not receiving course error signal from the GDU 620. Autopilot not receiving the lateral deviation signal from the GDU 620. Autopilot not receiving the lateral flag from the GDU 620.	Check the course error signal, lateral deviation signal, and lateral flag wiring between the GDU 620 and autopilot. Reference the interconnect drawing in Appendix F.
Autopilot does not move the control yoke or stick to correct glideslope deviation when in approach mode with a valid glideslope signal.	Autopilot not receiving glideslope deviation signal from the GDU 620. Autopilot not receiving the vertical flag from the GDU 620.	Check the glideslope deviation and vertical flag signal wiring between the GDU 620 and autopilot. Reference the interconnect drawing in Appendix F.
Autopilot remains in ARM mode and does not capture VOR, localizer, or glideslope.	Autopilot not receiving lateral or vertical flag from the GDU 620.	Check the lateral and vertical flag signal wiring between the GDU 620 and autopilot. Reference the interconnect drawing in Appendix F.

Problem	Cause	Solution
Autopilot does not respond to altitude preselector in the GDU 620.	Autopilot does not support altitude preselector interface with the GDU 620.	Verify that the autopilot supports the altitude preselector interface with the GDU 620.
	GDU 620 not configured for altitude preselector output to autopilot.	Check the GDU 620 autopilot configuration settings per Section 5.5.9.
	Autopilot not receiving the RS-485 altitude preselector setting from the GDU 620.	Check the RS-485 altitude preselector wiring between the GDU 620 and autopilot. Reference the interconnect drawing in Appendix F.
Autopilot does not follow GPS roll steering (ARINC 429 roll steering autopilots).	GDU 620 not in GPSS mode.	Verify that the GDU 620 is in GPSS mode. This is controlled by an external switch and is annunciated (see Section 5.10.2.3 for a screenshot).
	Autopilot not receiving ARINC 429 roll steering from the GDU 620.	Check the ARINC 429 roll steering wiring between the GDU 620 and autopilot. Reference the interconnect drawing in Appendix F.
Autopilot does not follow GPS roll steering (analog roll steering autopilots).	GDU 620 not in GPSS mode. Roll steering converter not receiving ARINC 429 roll steering from the GDU 620.	Verify that the GDU 620 is in GPSS mode. This is controlled by an external switch and is annunciated (see Section 5.10.2.3 for a screenshot).
	Autopilot not receiving analog heading error signal from GDU 620 or roll steering converter.	Check the wiring between the GDU 620, roll steering converter (if installed), and autopilot. Reference the interconnect drawing in Appendix F.

6.5 Mid-Continent Standby ADI System (if installed)

Table 6-4. Mid-Continent Standby ADI Troubleshooting Guide

Problem	Cause	Solution
The Standby ADI system does not run from aircraft power.	Unit is not getting aircraft power.	Ensure that STBY ADI circuit breaker is closed.
		Verify that power wiring to ADI is correct.
The Standby ADI system does not operate from battery power.	The battery power is not supplied to the ADI.	Verify that STBY PWR switch has been pressed.
		Verify that standby battery is charged.
		If the MD420 emergency power supply is being used, verify that wiring from emergency power supply to the ADI is correct.

6.6 Contacting Garmin for Assistance

If the G600 fails to operate despite troubleshooting efforts, contact Customer Service for assistance.

GARMIN International, Inc.
1200 East 151st Street
Olathe, KS 66062-3426
USA
Phone: 913 397 8200
FAX: 913 397 8282
http://www.garmin.com

Be prepared to offer the following information about the installation:

- Installation configuration (accessories, interfaced systems, completed configuration sheet)
- Model numbers, part numbers with mod levels, and serial numbers
- Software versions for GDU 620, GRS 77, GMU44, GDC 74A and GNS navigator(s).
- Description of problem
- Efforts made to isolate the problem

7 LIMITATIONS

7.1 Operation

All functions of the G600 System meet the appropriate design assurance qualifications for primary flight displays in Class I, Class II, and Class III aircraft in accordance with AC 23.1309-1C, Figure 2. The TSO authorizations by function are listed in Section 1.6. The installation instructions in this manual must be followed in order to ensure an airworthy installation for aircraft operating under Title 14 CFR Parts 91, 121, & 135 with the limitations of those installations listed here.

7.2 STC Installations

The physical mounting of the GDU 620 and required standby instruments are covered within this manual. However, if it is necessary to relocate any required instrumentation in an instrument panel to make room for the GDU 620 or required standby instruments, the relocation of these instruments is beyond the scope of the STC. The installer should reference the aircraft manufacturer's data or other approved alteration methods.

Instruments relocated in accordance with this manual should use the original lighting system provided by the type design. When modifying or re-fabricating an instrument panel which has an overlay for lighting the installer must modify the lighting overlay in accordance with the manufacturer's data or replace that lighting with an approved lighting technique covered by the TC, applicable STC, or other approved method.

For preservation of essential equipment in aircraft with multiple power busses, the GDU 620, GRS 77, and GDC 74A must be powered from the essential bus. For aircraft with a single bus feed, this equipment must be powered from the main bus. Operation of the pilot's (primary) system on an avionics bus or secondary bus is prohibited.

Backup CDIs which support GPS or GPS/NAV will not operate properly under all conditions; as such, if a backup CDI is installed, it must be limited to VOR/LOC and/or ILS indications only.

Installations which utilize a standby attitude indicator with a flight director presentation integral to the unit must disable the flight director presentation. The parallax view of the flight director requires FAA evaluation to determine suitability for each panel location of the attitude indicator. Driving multiple flight director displays from some autopilot / flight director computers may overload the signal and affect the amplitude and overall delay of the presentation. Approval for the display of the flight director on the standby attitude instrument may be done via TC, STC, or FAA Field Approval, but is beyond the scope of the G600 AML STC.

Aircraft requiring a third attitude instrument for operations under Part 121 or 135 must still comply with the G600 standby instrument requirements and placement; as such, one additional attitude indicator is required for the copilot's position. This third attitude indication may be a traditional gyro, or second G600 system installed in accordance with this manual.

Aircraft operating at or above RVSM published altitudes will not meet the RVSM requirements with the G600 installation as outlined in this manual. RVSM compliance may be a future enhancement of the G600 system.

7.2.1 Penetration of Aircraft Pressure Vessels

In pressurized aircraft some components of the G600 system may be mounted outside the pressurized area, requiring that wires penetrate through the pressure vessel. This installation must utilize the provisions of bulkhead penetrations, such as sealed connectors or wiring, as provided by the manufacturer and in accordance with the aircraft maintenance manual. Substantiation for additional holes in the pressure vessel is beyond the scope of the G600 AML STC and would require additional data from the aircraft manufacturer or other FAA approved data.

7.2.2 Equipment Interfaced to the G600 System

Connections from the G600 to aircraft systems other than those shown in this installation manual are outside the scope of the G600 AML STC and may require further evaluation and / or certification approval.

All equipment interfaced to the G600 must be previously or concurrently approved.

7.2.2.1 GNS 500W Series TAWS Annunciation

Only TAWS annunciations received from the No. 1 System (i.e. GPS or GPS 1) are displayed on the PFD. If the aircraft's TAWS system is embedded in a GNS 500W Series Navigator configured as system No. 2, the remote annunciations will not display on the PFD of the G600.

7.2.2.2 Altitude Alerter and Pre-Selectors

Some autopilot systems support altitude capture during flight level changes. Of those systems, only a subset of autopilots support external vertical speed and/or pre-selected altitudes. The G600 Altitude Alerter can function as an Altitude Pre-Selector only for those systems identified in this installation manual and only when the option is enabled in the G600 as a system upgrade. The functional extent of the Altitude Alerter must be communicated to the pilot via the Airplane Flight Manual Supplement.

7.2.2.3 Traffic Sensor Interfaced to the G600

The G600 System is certified to support only one traffic sensor for a given installation. The system supports multiple types (TAS, TCAS I, TIS) of traffic systems, but only one system may be configured for use.

7.2.3 Major Alterations

The installation of the G600 system is a major alteration to the aircraft type design. Before returning the airplane to service, installers are required to complete and submit an FAA Form 337; "Major Repair and Alteration Airframe, Powerplant, Propeller, or Appliance" to the appropriate FAA Flight Standards District Office describing the work accomplished. The FAA Form 337 must detail the equipment and systems to which the G600 system is interfaced.

7.2.4 Instructions for Continued Airworthiness

Before returning the airplane to service, the G600 Configuration and Checkout Log must be completed and attached with the Instructions for Continued Airworthiness so that any aircraft with the modifications detailed in this manual may be properly maintained.

8 PERIODIC MAINTENANCE

The G600 is designed to not require any regular maintenance. Maintenance of all G600 LRUs is “on condition” only.

8.1 Cleaning

The front bezel, keypad, and display of the GDU 620 can be cleaned with a soft cotton cloth dampened with clean water. DO NOT use any chemical-cleaning agents. Care should be taken to avoid scratching the surface of the display.

8.2 GDC 74A

Per Part 43 Appendix E, paragraph (b)(2), the GDC 74A must be checked using a test procedure equivalent to Part 43 Appendix E, paragraph (b)(1) with two exceptions:

- The tests of sub-paragraphs (iv) (Friction) and (vi) (Barometric Scale Error) are not applicable because the digital outputs of the GDC 74A are not susceptible to these types of errors.

Other than for regulatory testing pertaining to Part 43 Appendix E and F, (Pitot/Static leak test as described in Part 91.411) maintenance of the GDC 74A is “on condition” only.

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Appendix A STC Data

A.1 STC/PMA Information

The STC with Approved Model List (AML), Master Data List (Garmin P/N 005-C0313-00) information is available on the Garmin web site at www.garmin.com. Download from the Dealers Only page.

A.2 Permission to use STC

Consistent with Order 8110.4B and AC 21-40, a permission letter to use this STC data is available for download on the Dealers Only portion of the Garmin website at www.garmin.com.

A.3 Continued Airworthiness Instructions

Refer to the GDU 620 Instructions for Continued Airworthiness (Garmin P/N 190-00601-00) which is available on the Garmin web site at www.garmin.com. Download from the Dealers Only page.

A.4 STC Approved Model List

The G600 STC includes an Approved Model List (AML) attached to the STC. The G600 system is approved for installation on all aircraft listed on the AML following installation instructions and limitations described in this G600 System Installation Manual. The AML is attached to the STC and may be downloaded from the Dealers Only portion of the Garmin web site at www.garmin.com.

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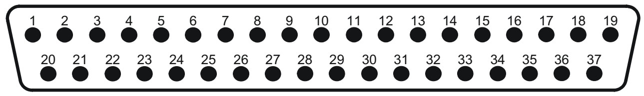
Appendix B LRU Connector Pin-Out Information

B.1 GDU 620 PFD/MFD

Pin-out information is listed below. For a complete description of the signals refer to 190-00601-04 GDU 620 Installation Manual.

B.1.1 P6201 Connector

View of J6201 connector from back of unit

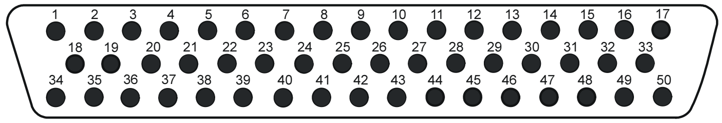


Pin	Pin Name	I/O
1	COMPOSITE VIDEO IN 1	In
2	RESERVED	--
3	AUDIO INHIBIT IN*	In
4	CDU SYSTEM ID PROGRAM*	In
5	SPARE DISC IN* 4	In
6	SPARE DISC IN* 5	In
7	SPARE DISC IN* 6	In
8	GPSS ENABLE IN*	In
9	FD ENABLE IN	In
10	ADF VALID IN	In
11	ETHERNET IN 1A	In
12	ETHERNET IN 1B	In
13	ETHERNET OUT 1A	Out
14	ETHERNET OUT 1B	Out
15	FLIGHT DIRECTOR PITCH UP	In
16	FLIGHT DIRECTOR PITCH DOWN	In
17	ADF X/COS IN	In
18	ADF Y/SIN IN	In
19	RESERVED	--
20	COMPOSITE VIDEO IN 2	In
21	RESERVED	--
22	GROUND	--
23	AUDIO ACTIVE OUT*	Out
24	SPARE DISC OUT* 5	Out
25	SPARE DISC OUT* 6	Out
26	TIS/TAS STANDBY*	Out
27	TAS TEST*	Out
28	AUDIO OUT HI	Out
29	AUDIO OUT LO	Out
30	ETHERNET IN 2A	In
31	ETHERNET IN 2B	In
32	ETHERNET OUT 2A	Out
33	ETHERNET OUT 2B	Out
34	FLIGHT DIRECTOR ROLL LEFT	In
35	FLIGHT DIRECTOR ROLL RIGHT	In
36	ADF DC REF IN	In
37	RESERVED	--

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

B.1.2 P6202 Connector

View of J6202 connector from back of unit

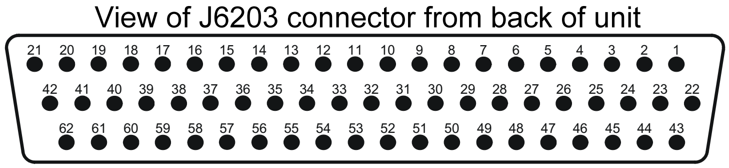


Pin	Pin Name	I/O
1	AIRCRAFT POWER	In
2	AIRCRAFT GROUND	--
3	ARINC 429 OUT 1A	Out
4	ARINC 429 IN 1A	In
5	ARINC 429 IN 2A	In
6	ARINC 429 IN 3A	In
7	ARINC 429 IN 4A	In
8	ARINC 429 IN 5A	In
9	ARINC 429 IN 6A	In
10	RS-232 IN 1	In
11	RS-232 IN 2	In
12	RS-232 IN 3	In
13	RS-232 IN 4	In
14	RS-232 IN 5	In
15	LIGHTING BUS HI	In
16	LIGHTING BUS LO	In
17	RESERVED	--
18	AIRCRAFT POWER	In
19	AIRCRAFT GROUND	--
20	ARINC 429 OUT 1B	Out
21	ARINC 429 IN 1B	In
22	ARINC 429 IN 2B	In
23	ARINC 429 IN 3B	In
24	ARINC 429 IN 4B	In
25	ARINC 429 IN 5B	In
26	ARINC 429 IN 6B	In
27	RS-232 OUT 1	Out
28	RS-232 OUT 2	Out
29	RS-232 OUT 3	Out
30	RS-232 OUT 4	Out
31	RS-232 OUT 5	Out
32	CONFIG MODULE DATA	I/O
33	CONFIG MODULE CLOCK	Out
34	AIRCRAFT POWER	In
35	AIRCRAFT GROUND	--
36	DEMO MODE SELECT*	In
37	RESERVED	--
38	GROUND	--
39	RESERVED	--
40	TIME MARK IN 1A	In
41	TIME MARK IN 1B	In

Connector P6202 (continued)		
Pin	**Pin Name**	**I/O**
42	TIME MARK IN 2A	In
43	TIME MARK IN 2B	In
44	RS-232 GND 1	--
45	RS-232 GND 2	--
46	RS-232 GND 3	--
47	RS-232 GND 4	--
48	RS-232 GND 5	--
49	CONFIG MODULE POWER	Out
50	CONFIG MODULE GND	--

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

B.1.3 P6203 Connector



Pin	Pin Name	I/O
1	ARINC 429 OUT 2A	Out
2	ARINC 429 OUT 3A	Out
3	ARINC 429 OUT 4A	Out
4	ARINC 429 IN 7A	In
5	ARINC 429 IN 8A	In
6	RS-232 IN 6	In
7	RS-232 IN 7	In
8	RS-232 IN 8	In
9	RS-485 1A	I/O
10	RS-485 2A	I/O
11	RS-485 3A	I/O
12	RS-485 4A	I/O
13	RESERVED	--
14	ARINC 708/453 IN 1A	In
15	ARINC 708/453 IN 1 TERM A	In
16	ARINC 708/453 IN 2A	In
17	ARINC 708/453 IN 2 TERM A	In
18	A/P HEADING ERROR HI	Out
19	A/P COURSE ERROR HI	Out
20	A/P AC REF HI	In
21	RESERVED	--
22	RESERVED	--
23	ARINC 429 OUT 2B	Out
24	ARINC 429 OUT 3B	Out
25	ARINC 429 OUT 4B	Out
26	ARINC 429 IN 7B	In
27	ARINC 429 IN 8B	In
28	RS-232 OUT 6	Out
29	RS-232 OUT 7	Out
30	RS-232 OUT 8	Out
31	RS-485 1B	I/O
32	RS-485 2B	I/O
33	RS-485 3B	I/O
34	RS-485 4B	I/O
35	RESERVED	--
36	ARINC 708/453 IN 1B	In
37	ARINC 708/453 IN 1 TERM B	In
38	ARINC 708/453 IN 2B	In
39	ARINC 708/453 IN 2 TERM B	In
40	A/P HEADING ERROR LO	--
41	A/P COURSE ERROR LO	--

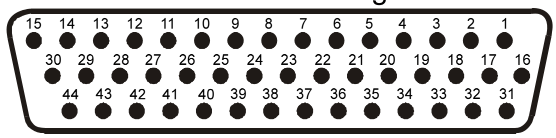
Connector P6203 (continued)		
Pin	**Pin Name**	**I/O**
42	A/P AC REF LO	In
43	RESERVED	--
44	GPS ANNUNCIATE*	Out
45	GPS SELECT*	Out
46	ILS/GPS APPROACH*	Out
47	WX RADAR ON*	Out
48	GROUND	--
49	RS-232 GND 6	--
50	RS-232 GND 7	--
51	RS-232 GND 8	--
52	LATERAL +LEFT OUT	Out
53	LATERAL +RIGHT OUT	Out
54	LATERAL +FLAG OUT	Out
55	LATERAL –FLAG OUT	Out
56	VERTICAL +UP OUT	Out
57	VERTICAL +DOWN OUT	Out
58	VERTICAL +FLAG OUT	Out
59	VERTICAL –FLAG OUT	Out
60	LATERAL SUPERFLAG OUT	Out
61	VERTICAL SUPERFLAG OUT	Out
62	RESERVED	--

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

B.2 GRS 77 AHRS

B.2.1 P771 Connector

View of J771 connector looking at rear of unit.



Pin	Pin Name	I/O
1	CONFIG MODULE GROUND	--
2	AHRS SYSTEM ID PROGRAM* 1	In
3	AHRS SYSTEM ID PROGRAM* 2	In
4	RESERVED	--
5	SPARE	--
6	GPS 2 RS-232 IN	In
7	RESERVED	--
8	SPARE RS-232 IN 1	In
9	MAGNETOMETER POWER OUT	Out
10	MAGNETOMETER RS-232 OUT	Out
11	GPS 1 RS-232 IN	In
12	ARINC 429 OUT 3 A (CDU 1, high-speed)	Out
13	ARINC 429 OUT 2 A (GIA 2, high-speed)	Out
14	ARINC 429 OUT 1 A (GIA 1, high-speed)	Out
15	ARINC 429 IN 1 A (AIR DATA, low speed)	In
16	CONFIG MODULE DATA	I/O
17	CONFIG MODULE POWER OUT	Out
18	AIRCRAFT POWER 1	In
19	ARINC 429 OUT 3 B (CDU 2, high-speed)	Out
20	AIRCRAFT POWER 2	In
21	GPS 2 RS-232 OUT	Out
22	POWER GROUND	--
23	SPARE RS-232 OUT 1	Out
24	POWER GROUND	--
25	MAGNETOMETER RS-485 IN A	In
26	GPS 1 RS-232 OUT	Out
27	ARINC 429 OUT 3 B (CDU 1, high-speed)	Out
28	ARINC 429 OUT 2 B (GIA 2, high-speed)	Out
29	ARINC 429 OUT 1 B (GIA 1, high-speed)	Out
30	ARINC 429 IN 1 B (AIR DATA, low-speed)	In
31	CONFIG MODULE CLOCK	Out
32	SPARE	--
33	ARINC 429 OUT 3 A (CDU 2, high-speed)	Out
34	SPARE	--
35	SIGNAL GROUND (GPS 2)	--
36	SPARE	--
37	SIGNAL GROUND	--
38	SIGNAL GROUND (MAGNETOMETER)	--
39	MAGNETOMETER RS-485 IN B	In

Connector P771, continued		
Pin	**Pin Name**	**I/O**
40	MAGNETOMETER GROUND	--
41	SIGNAL GROUND (GPS 1)	--
42	SIGNAL GROUND (CDU 1)	--
43	SIGNAL GROUND (AFCS)	--
44	SIGNAL GROUND (AIR DATA)	--

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

B.2.1.1 Power Function

Pin Name	Connector	Pin	I/O
AIRCRAFT POWER 1, GRS 77	P771	18	In
AIRCRAFT POWER 2, GRS 77	P771	20	In
MAGNETOMETER POWER OUT	P771	9	Out
MAGNETOMETER GROUND	P771	40	--
POWER GROUND, GRS 77	P771	22	--
POWER GROUND, GRS 77	P771	24	--
+12 VDC POWER, GMU 44	P441	9	In
POWER GROUND, GMU 44	P441	6	--

Power-input pins accept 14/28 VDC. AIRCRAFT POWER 2 is for connecting to an alternate power source, such as on aircraft with two electrical buses.

B.2.1.2 Serial Data

B.2.1.2.1 RS-232

Pin Name	Connector	Pin	I/O
GPS 1 RS-232 IN	P771	11	In
GPS 2 RS-232 IN	P771	6	In
SPARE RS-232 IN 1	P771	8	In
GPS 1 RS-232 OUT	P771	26	Out
GPS 2 RS-232 OUT	P771	21	Out
SPARE RS-232 OUT 1	P771	23	Out
MAGNETOMETER RS-232 OUT	P771	10	Out
GPS 1 RS-232 IN	P441	8	In

The RS-232 outputs conform to EIA/TIA-232C with an output voltage swing of at least ±5 V when driving a standard RS-232 load.

B.2.1.2.2 RS-485

Pin Name	Connector	Pin	I/O
MAGNETOMETER RS-485 IN B	P771	39	In
MAGNETOMETER RS-485 IN A	P771	25	In
MAGNETOMETER GROUND	P771	40	--
RS-485 OUT A	P441	4	Out
RS-485 OUT B	P441	2	Out

B.2.1.2.3 ARINC 429

Pin Name	Connector	Pin	I/O
ARINC 429 OUT 3A (high-speed)	P771	12	Out
ARINC 429 OUT 3A (high-speed)	P771	33	Out
ARINC 429 OUT 3B (high-speed)	P771	27	Out
ARINC 429 OUT 3B (high-speed)	P771	19	Out
SIGNAL GROUND	P771	42	--
ARINC 429 OUT 1A (high-speed)	P771	14	Out
ARINC 429 OUT 2A (high-speed)	P771	13	Out
ARINC 429 OUT 1B (high-speed)	P771	29	Out
ARINC 429 OUT 2B (high-speed)	P771	28	Out
SIGNAL GROUND	P771	43	--
ARINC 429 IN 1A (low-speed)	P771	15	In
ARINC 429 IN 1B (low-speed)	P771	30	In
SIGNAL GROUND	P771	44	--
SIGNAL GROUND	P771	41	--
SIGNAL GROUND	P771	35	--
SIGNAL GROUND	P771	37	--

B.2.1.3 Configuration Module Connections

Pin Name	Connector	Pin	I/O
CONFIG MODULE GROUND	P771	1	--
CONFIG MODULE DATA	P771	16	I/O
CONFIG MODULE POWER OUT	P771	17	Out
CONFIG MODULE CLOCK	P771	31	Out

B.2.1.4 AHRS System ID Strapping

Pin Name	Connector	Pin	I/O
AHRS SYSTEM ID PROGRAM* 1	P771	2	In
AHRS SYSTEM ID PROGRAM* 2	P771	3	In

By hard strapping the program pins to ground, the GRS 77 is assigned a System ID. IDs identify a GRS 77 as an All Call, #1, #2, or #3 unit. For a single system, the pins are left open (All Call).

The GRS 77 has an associated Source/Destination Identifier (SDI or System ID) that is coded into its ARINC 429 output messages/labels. The System ID may be used to uniquely distinguish the source of the GRS 77 ARINC 429 labels in a system with more than one GRS 77. The GRS 77 System ID is set as follows:

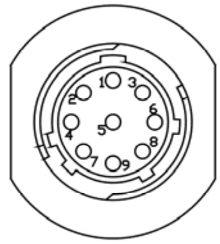
P771 Strapping to Achieve Desired System ID

System ID Number	ARINC System ID 1 Pin 2	ARINC System ID 2 Pin 3
All Call	Open	Open
#1	Ground	Open
#2	Open	Ground
#3	Ground	Ground

B.3 GMU 44 Magnetometer

B.3.1 J441 Connector

View of J441 connector looking at face of connector pigtail.



Pin	Pin Name	I/O
1	SIGNAL GROUND	--
2	RS-485 OUT B	Out
3	SIGNAL GROUND	--
4	RS-485 OUT A	Out
5	SPARE	--
6	POWER GROUND	--
7	SPARE	--
8	RS-232 IN	In
9	+12 VDC POWER	In

B.3.1.1 Power Function

Pin Name	Connector	Pin	I/O
+12 VDC POWER, GMU 44	P441	9	In
POWER GROUND, GMU 44	P441	6	--

B.3.1.2 Serial Data

B.3.1.2.1 RS-232

Pin Name	Connector	Pin	I/O
GPS 1 RS-232 IN	P441	8	In

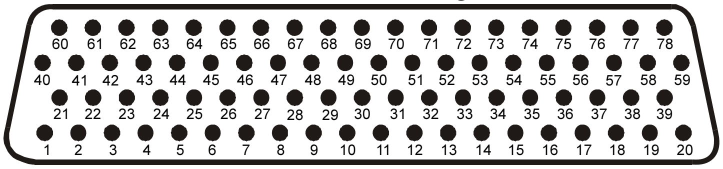
B.3.1.2.2 RS-485

Pin Name	Connector	Pin	I/O
RS-485 OUT A	P441	4	Out
RS-485 OUT B	P441	2	Out

B.4 GDC 74A

B.4.1 P741 Connector

View of J741 connector looking at rear of unit.



Pin	Pin Name	I/O
1	CONFIG MODULE GROUND	--
2	OAT PROBE POWER OUT	Out
3	OAT PROBE IN HI	In
4	OAT PROBE IN LO	In
5	SIGNAL GROUND	--
6	ADC SYSTEM ID PROGRAM* 1	In
7	SIGNAL GROUND	--
8	DISCRETE IN* 6	In
9	SIGNAL GROUND	--
10	RS-232 IN 1	In
11	RS-232 OUT 1	Out
12	SIGNAL GROUND	--
13	RS-232 IN 2	In
14	RS-232 OUT 2	Out
15	SIGNAL GROUND	--
16	RESERVED	--
17	POWER GROUND	--
18	POWER GROUND	--
19	POWER GROUND	--
20	POWER GROUND	--
21	CONFIG MODULE POWER OUT	Out
22	SPARE	--
23	ARINC 429 IN 1 A	In
24	ARINC 429 IN 1 B	In
25	SIGNAL GROUND	--
26	ARINC 429 OUT 1 A	Out
27	ARINC 429 OUT 1 B	Out
28	SIGNAL GROUND	--
29	ARINC 429 OUT 2 A	Out
30	ARINC 429 OUT 2 B	Out
31	SIGNAL GROUND	--
32	ARINC 429 OUT 3 A	Out
33	ARINC 429 OUT 3 B	Out
34	SIGNAL GROUND	--
35	ARINC 429 IN 2 A	In
36	ARINC 429 IN 2 B	In
37	SIGNAL GROUND	--

* Indicates Active Low

Connector P741, continued		
Pin	**Pin Name**	**I/O**
38	SPARE	--
39	SPARE	--
40	CONFIG MODULE DATA	I/O
41	ARINC 429 OUT 1 A	Out
42	ARINC 429 OUT 1 B	Out
43	SIGNAL GROUND	--
44	ARINC 429 OUT 2 A	Out
45	ARINC 429 OUT 2 B	Out
46	SIGNAL GROUND	--
47	ARINC 429 OUT 3 A	Out
48	ARINC 429 OUT 3 B	Out
49	SIGNAL GROUND	--
50	DISCRETE IN 7	In
51	SIGNAL GROUND	--
52	DISCRETE IN 8	In
53	SIGNAL GROUND	--
54	SPARE	--
55	AIRCRAFT POWER 1	In
56	SPARE	--
57	SPARE	--
58	AIRCRAFT POWER 2	In
59	SPARE	--
60	CONFIG MODULE CLOCK	Out
61	DISCRETE IN* 1	In
62	SIGNAL GROUND	--
63	DISCRETE IN* 2	In
64	SIGNAL GROUND	--
65	DISCRETE IN* 3	In
66	SIGNAL GROUND	--
67	DISCRETE IN* 4	In
68	SIGNAL GROUND	--
69	DISCRETE IN* 5	In
70	SIGNAL GROUND	--
71	ADC SYSTEM ID PROGRAM* 2	In
72	SIGNAL GROUND	--
73	ARINC 429 IN 3 A	In
74	ARINC 429 IN 3 B	In
75	SIGNAL GROUND	--
76	ARINC 429 IN 4 A	In
77	ARINC 429 IN 4 B	In
78	SIGNAL GROUND	--

* Indicates Active Low

B.4.1.1 Power

Pin Name	Connector	Pin	I/O
AIRCRAFT POWER 1	P741	55	In
AIRCRAFT POWER 2	P741	58	In
OAT PROBE POWER OUT	P741	2	Out
POWER GROUND	P741	17	--
POWER GROUND	P741	18	--
POWER GROUND	P741	19	--
POWER GROUND	P741	20	--
CONFIG MODULE POWER OUT	P741	21	Out

The power-input pins accept 14/28 VDC. AIRCRAFT POWER 2 is for connecting to an alternate power source, such as on aircraft with two electrical buses. AIRCRAFT POWER 1 (Pin 55) and AIRCRAFT POWER 2 (Pin 58) are internally "diode ORed" to provide power redundancy.

B.4.1.2 Serial Data

B.4.1.2.1 RS-232 Input/Output

Pin Name	Connector	Pin	I/O
RS-232 IN1	P741	10	In
RS-232 OUT 1	P741	11	Out
RS-232 IN 2	P741	13	In
RS-232 OUT 2	P741	14	Out
SIGNAL GROUND	P741	12	--
SIGNAL GROUND	P741	15	--

The RS-232 outputs conform to EIA/TIA-232C with an output voltage swing of at least ±5 V when driving a standard RS-232 load.

B.4.1.2.2 ARINC 429 Input/Output

Pin Name	Connector	Pin	I/O
ARINC 429 OUT 1 A	P741	26,41	Out
ARINC 429 OUT 1 B	P741	27,42	Out
SIGNAL GROUND	P741	28	--
SIGNAL GROUND	P741	43	--
ARINC 429 OUT 2 A	P741	29,44	Out
ARINC 429 OUT 2 B	P741	30,45	Out
SIGNAL GROUND	P741	31	--
SIGNAL GROUND	P741	46	--
ARINC 429 OUT 3 A	P741	32,47	Out
ARINC 429 OUT 3 B	P741	33,48	Out
SIGNAL GROUND	P741	34	--
SIGNAL GROUND	P741	49	--
ARINC 429 IN 1 A	P741	23	In
ARINC 429 IN 1 B	P741	24	In
SIGNAL GROUND	P741	25	--
ARINC 429 IN 2 A	P741	35	In
ARINC 429 IN 2 B	P741	36	In
SIGNAL GROUND	P741	37	
ARINC 429 IN 3 A	P741	73	In
ARINC 429 IN 3 B	P741	74	In
SIGNAL GROUND	P741	75	--
ARINC 429 IN 4 A	P741	76	In
ARINC 429 IN 4 B	P741	77	In
SIGNAL GROUND	P741	78	--

The ARINC 429 transmitters currently operate at low speed. The receivers are capable of accepting either high-speed or low-speed data. Unless high-speed transmission is necessary, low-speed transmission is preferred.

B.4.1.3 Temperature Inputs

Temperature input is used for Outside Air Temperature (OAT) computations. The temperature input is a three-wire temperature probe interface. OAT Power Out and OAT High are connected internally at the OAT probe. A GTP 59 or other supported temperature probe is required for the GDC 74(X) ADC (Air Data Computer) installation. The GTP 59 is a Resistive Temperature Device (RTD).

Pin Name	Connector	Pin	I/O
OAT PROBE POWER OUT	P741	2	Out
OAT PROBE IN HI	P741	3	In
OAT PROBE IN LO	P741	4	In

B.4.1.4 Discrete Signal Inputs

Pin Name	Connector	Pin	I/O
DISCRETE IN* 1	P741	61	In
DISCRETE IN* 2	P741	63	In
DISCRETE IN* 3	P741	65	In
DISCRETE IN* 4	P741	67	In
DISCRETE IN* 5	P741	69	In
DISCRETE IN* 6	P741	8	In
DISCRETE IN* 7	P741	50	In
DISCRETE IN* 8	P741	52	In

DISCRETE IN* pins:
INACTIVE: $10 \leq$ Vin $\leq$ 33VDC or Rin $\geq$100kΩ
ACTIVE: Vin $\leq$ 1.9VDC with $\geq$ 75 uA sink current, or Rin $\leq$ 375Ω
Sink current is internally limited to 200 uA max for a grounded input

DISCRETE IN pins:
INACTIVE: Vin $\leq$ 3.5VDC
ACTIVE: $10 \leq$ Vin $\leq$ 33VDC with $\geq$ 75 uA source current
Source current is internally limited to 1.5 mA max for a 10-33VDC input

B.4.1.5 Configuration Module Connections

Pin Name	Connector	Pin	I/O
CONFIG MODULE GROUND	P741	1	--
CONFIG MODULE DATA	P741	40	I/O
CONFIG MODULE POWER OUT	P741	21	Out
CONFIG MODULE CLOCK	P741	60	Out

The configuration module, mounted in the unit connector backshell, contains an EEPROM.

B.4.1.6 ADC ARINC 429 System ID Connections

Pin Name	Connector	Pin	I/O
ADC SYSTEM ID PROGRAM* 1	P741	6	In
ADC SYSTEM ID PROGRAM* 2	P741	71	In

By hard strapping the program pins to ground, the GDC 74A is assigned a System ID. IDs identify a GDC 74A as an All Call, #1, #2, or #3 unit. For a single system, the pins are left open (All Call).
The GDC 74A has an associated Source/Destination Identifier (SDI or System ID) that is coded into its ARINC 429 output messages/labels. The System ID may be used to uniquely distinguish the source of the GDC 74A ARINC 429 labels in a system with more than one GDC 74A. The GDC 74A System ID is set as follows:

Table B-1. P741 Strapping to Achieve Desired System ID

System ID Number	ARINC System ID 1 Pin 6	ARINC System ID 2 Pin 71
All Call	Open	Open
#1	Ground	Open
#2	Open	Ground
#3	Ground	Ground

Appendix C Outline and Installation Drawings

C.1 Drawing List

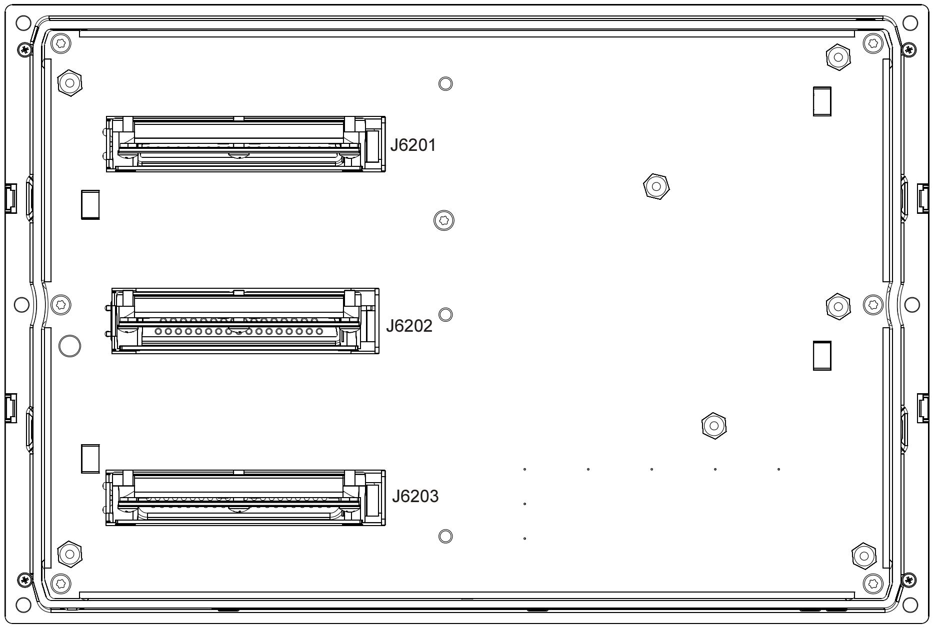


Figure C-1. GDU 620 Connector Locations

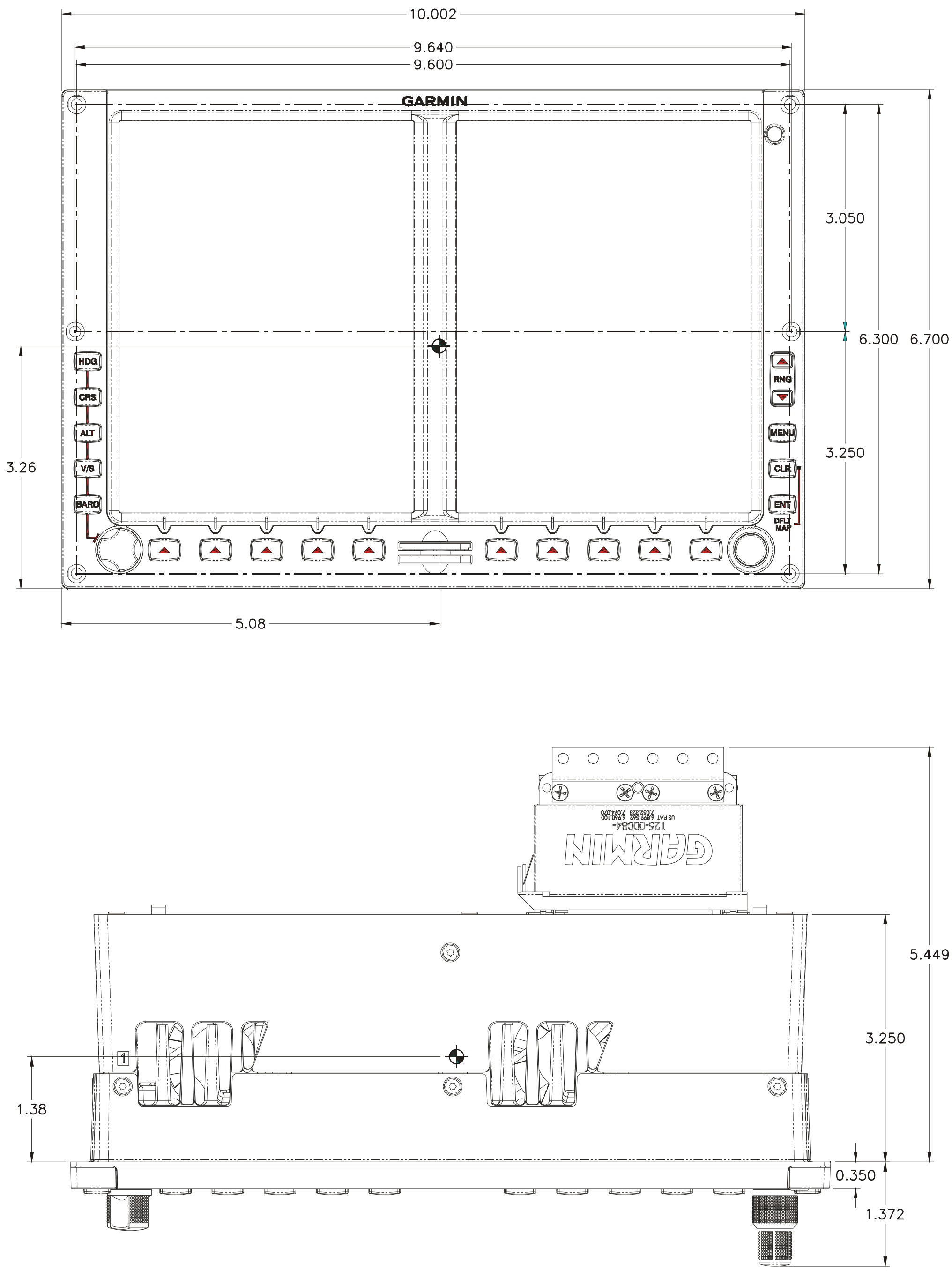


Figure C-2. GDU 620 Dimensions and Center of Gravity

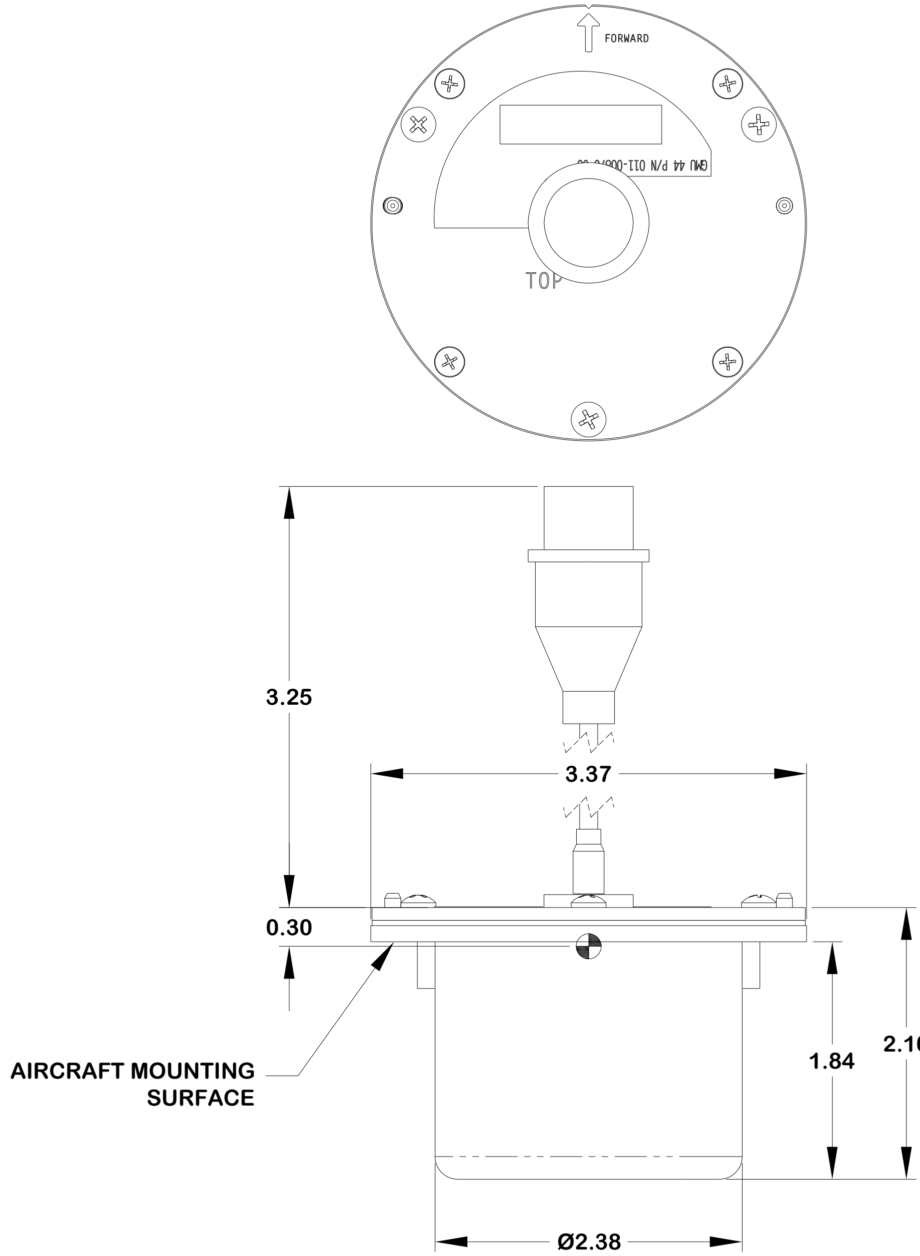


Figure C-3. GMU 44 and Mounting Rack Dimensions and Center of Gravity

NOTE:
1. DIMENSIONS IN INCHES [mm].
2. SEE DOCUMENT ENTITLED "REQUIREMENTS FOR AIRCRAFT MOUNTING OF GRS 77 AHRS AND GMU 44 MAGNETOMETER UNITS" FOR SPECIFIC MOUNTING INSTRUCTIONS.
3. MOUNTING RACK IS NOT SYMMETRIC. GRS 77 UNIT MUST BE MOUNTED WITH CONNECTOR FORWARD.
4. SECURE MOUNTING PLATE TO RIGID LOCATION ON AIRFRAME USING FIVE (5) #10 PAN HEAD OR BUTTON HEAD SCREWS.

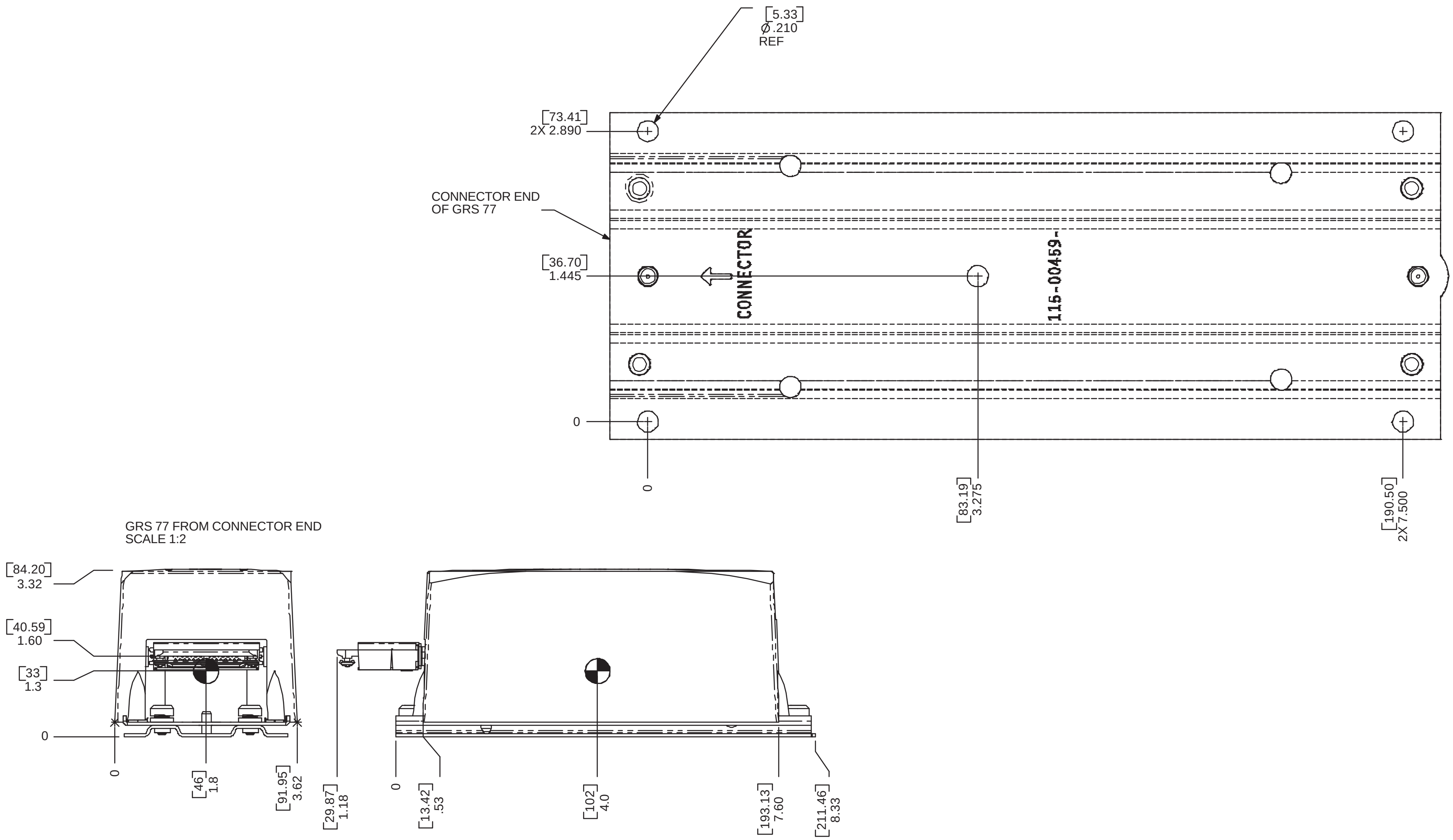


Figure C-4. GRS 77 and Mounting Rack Dimensions and Center of Gravity

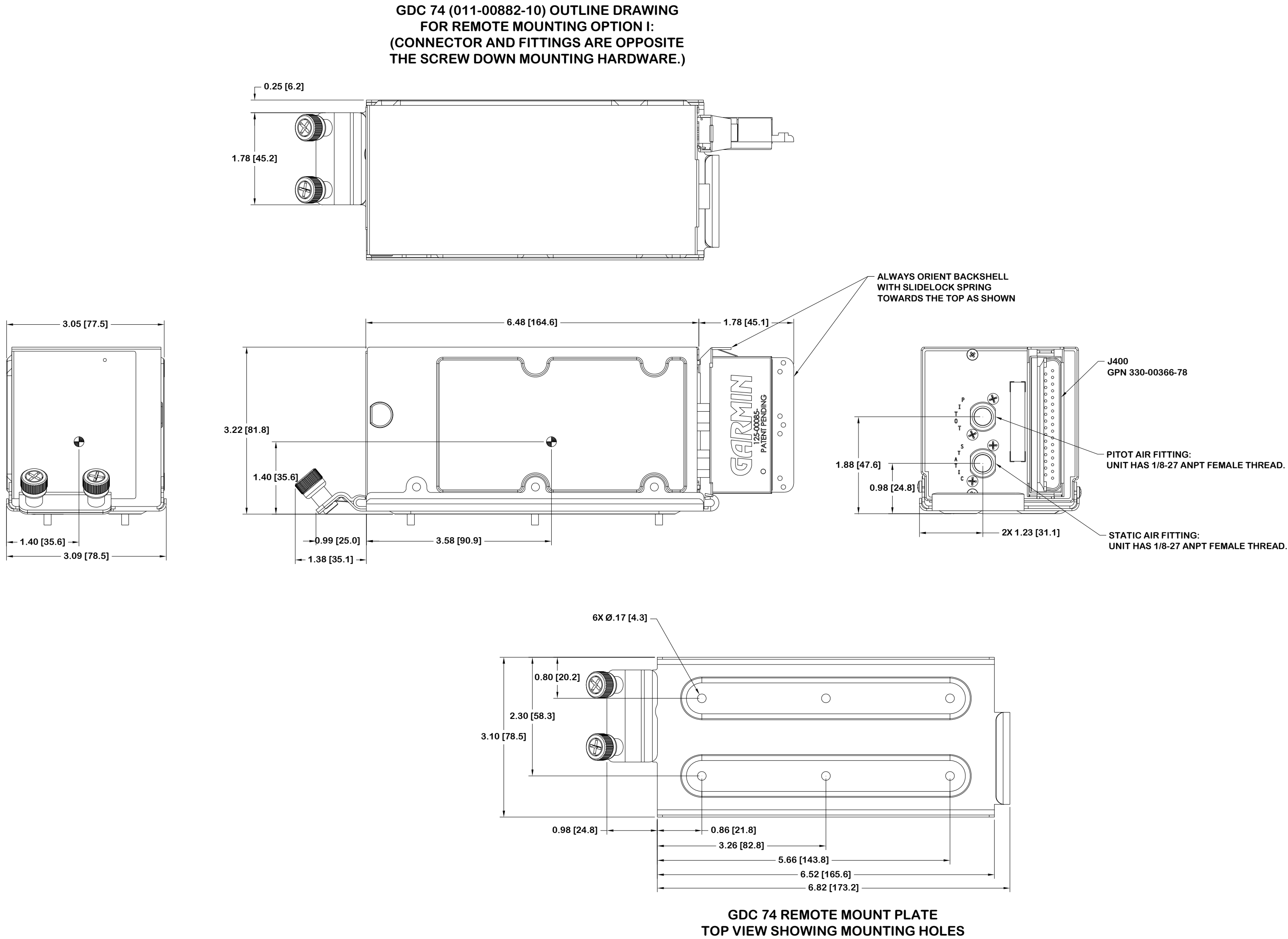


Figure C-5. GDC 74A and Mounting Rack Dimensions and Center of Gravity (Option I)

GDC 74 (011-00882-10) OUTLINE DRAWING
FOR REMOTE MOUNTING OPTION II:
(CONNECTOR AND FITTINGS ARE ON SAME END
AS THE SCREW DOWN MOUNTING HARDWARE.)

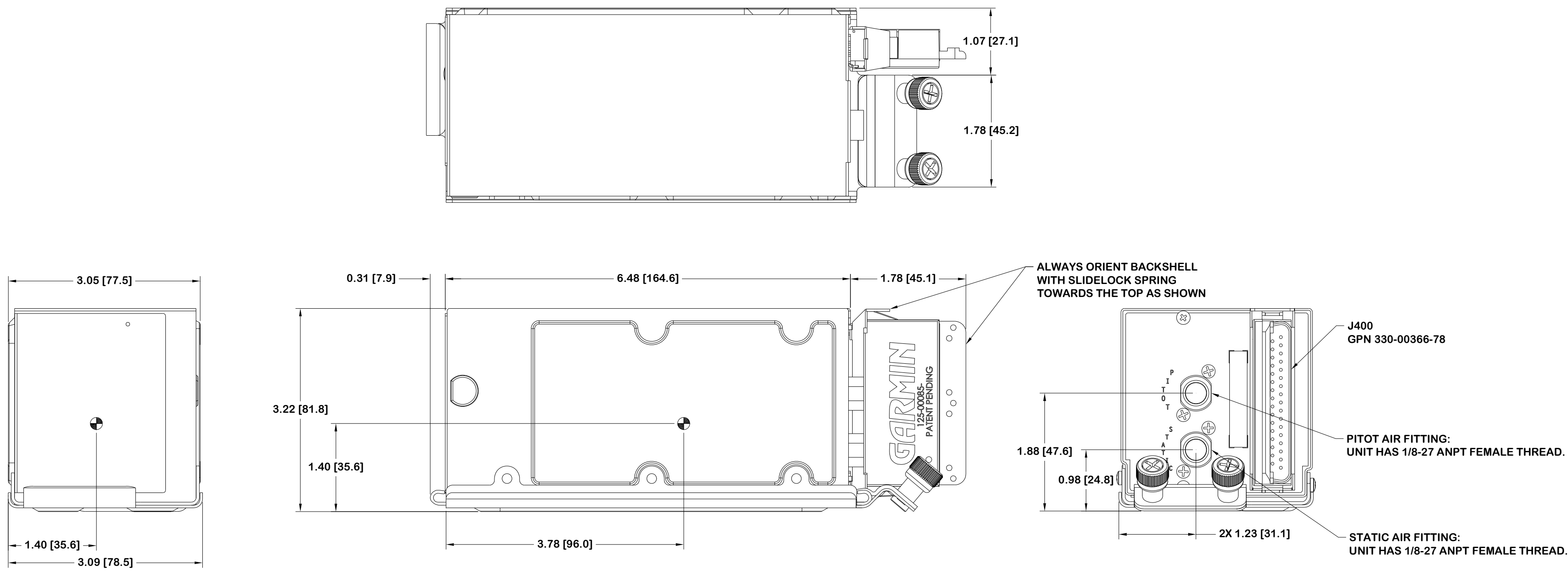
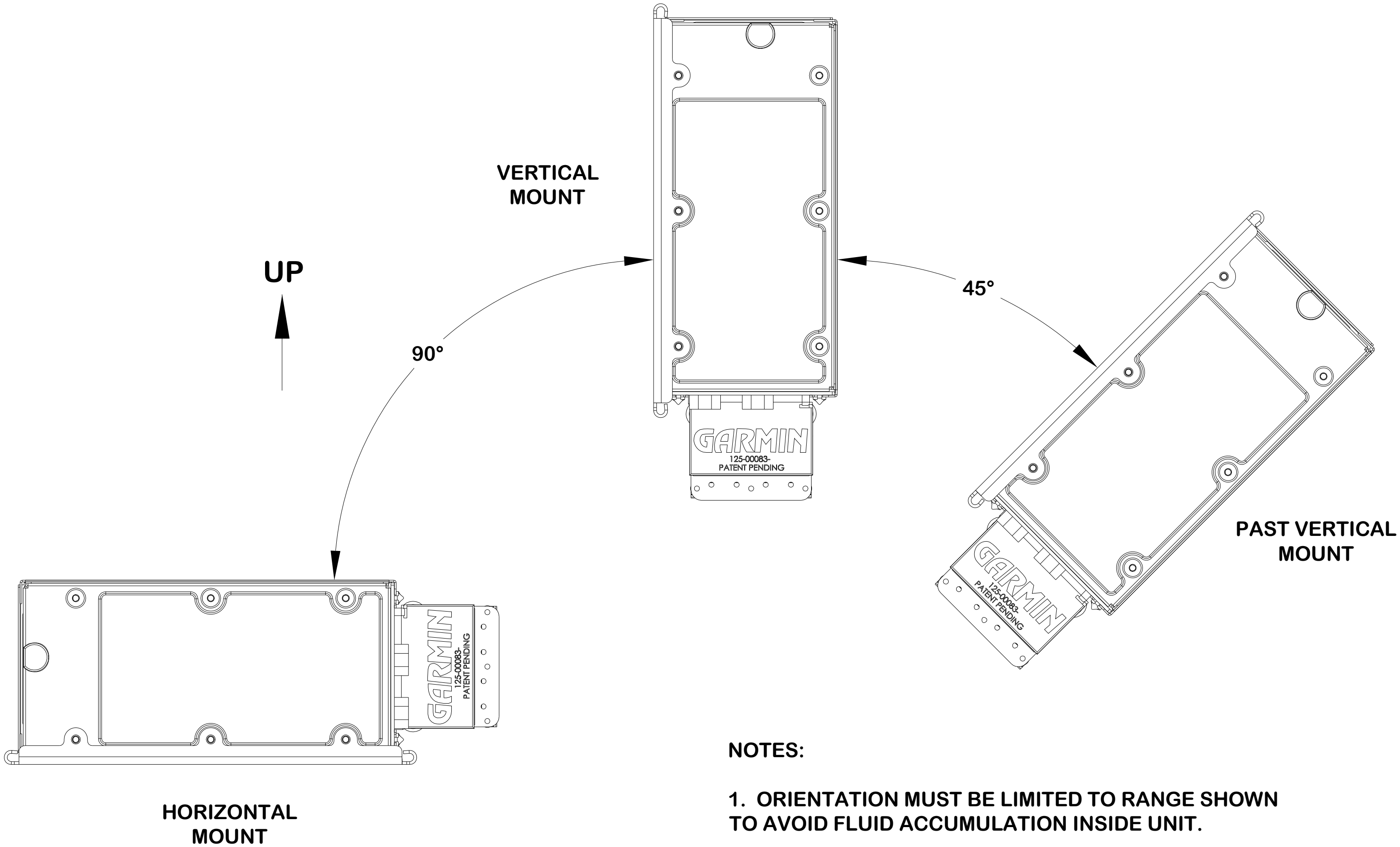


Figure C-6. GDC 74A and Mounting Rack Dimensions and Center of Gravity (Option II)

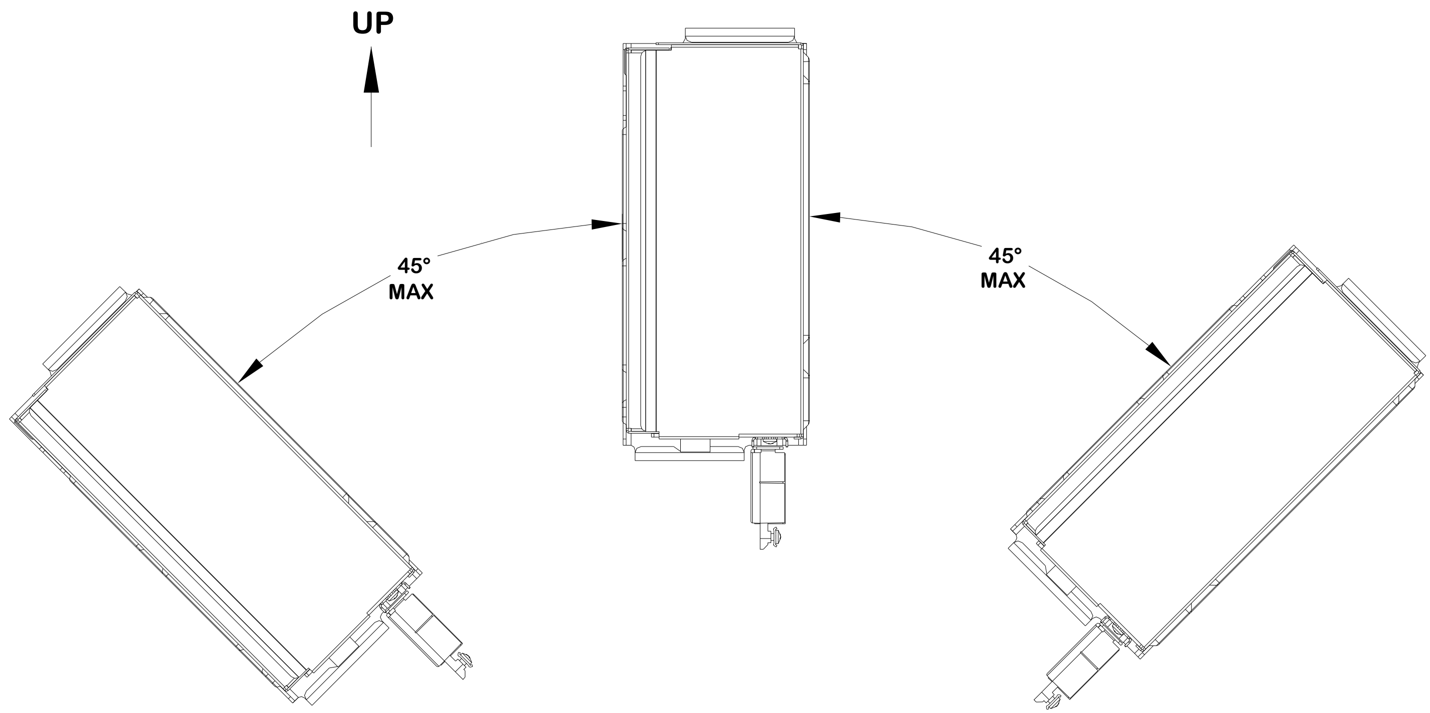


NOTES:

1. ORIENTATION MUST BE LIMITED TO RANGE SHOWN TO AVOID FLUID ACCUMULATION INSIDE UNIT.

2. UNIT MAY BE ORIENTED AS SHOWN IN ANY POSITION FROM HORIZONTAL TO 45 DEGREES PAST VERTICAL.

Figure C-7. GDC 74A Mounting Orientation Limits



NOTES:

1. ORIENTATION MUST BE LIMITED TO RANGE SHOWN
TO AVOID FLUID ACCUMULATION INSIDE UNIT.

2. UNIT MAY BE ORIENTED ON VERTICAL SURFACE AS SHOWN.
MOUNTING ORIENTATION MUST BE WITHIN 45 DEGREES OF VERTICAL.

Figure C-8. GDC 74A Vertical Surface Mounting Orientation

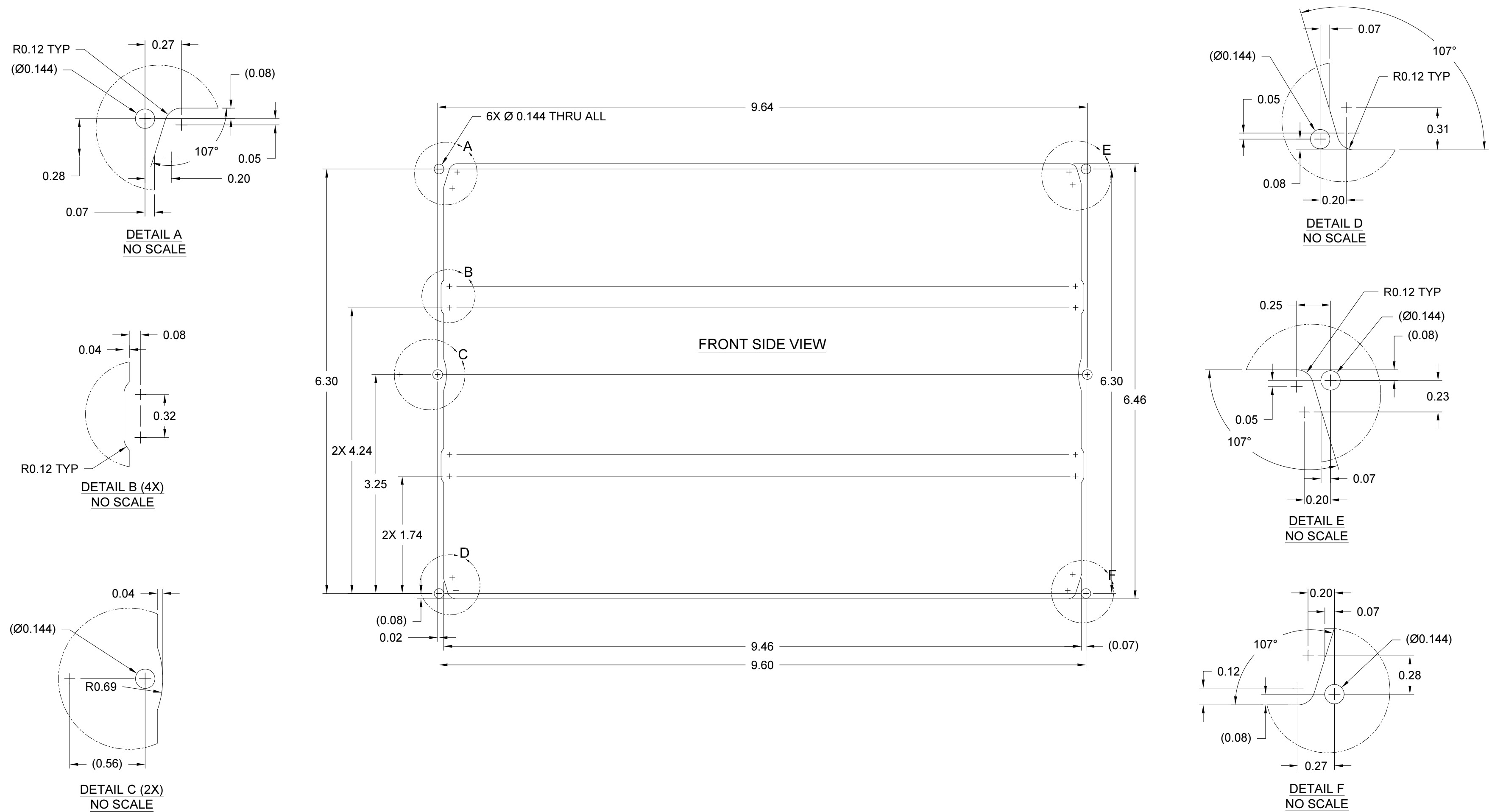
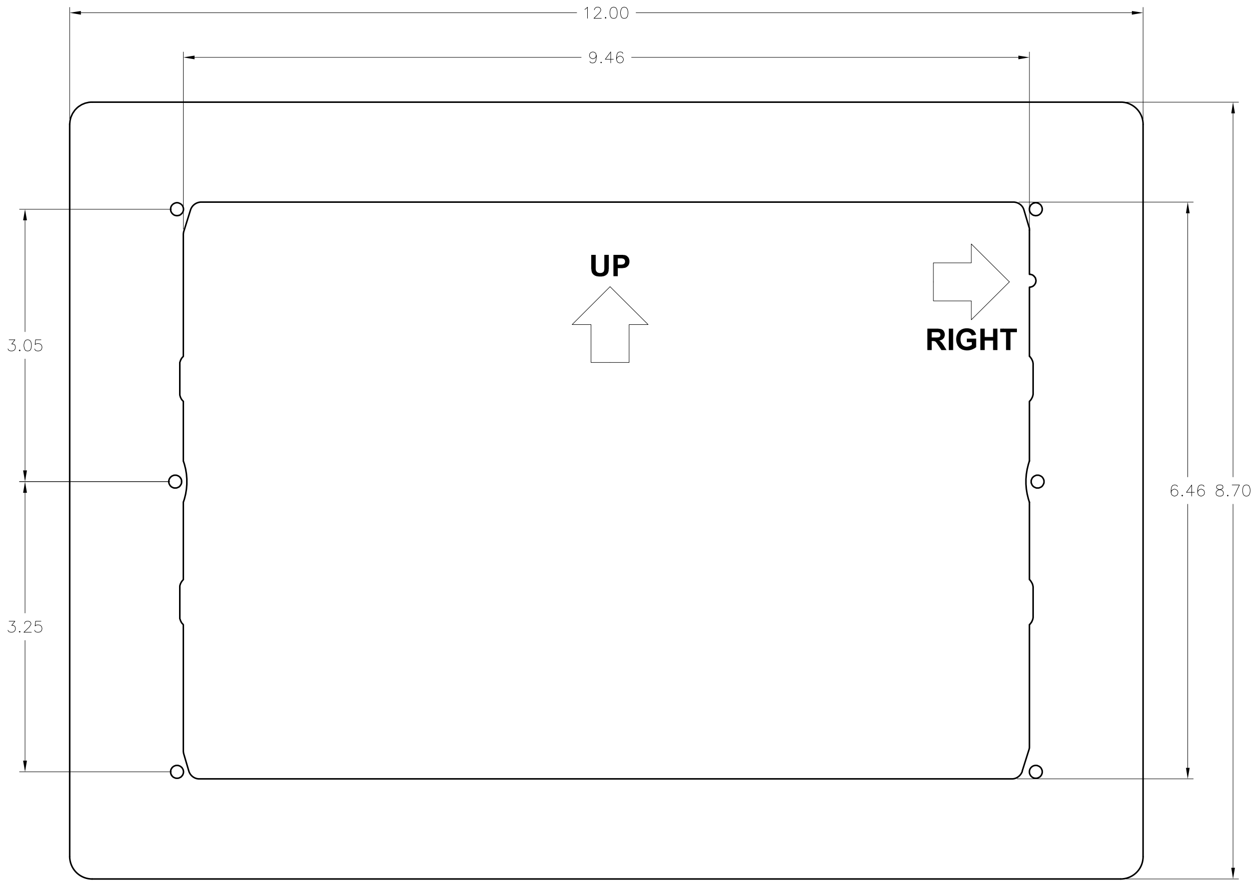


Figure C-9. GDU 620 Cutout Dimensions



PART NUMBER	DESCRIPTION	THICKNESS (in)
115-01009-00	TRIM PLATE, THIN	0.032
115-01009-10	TRIM PLATE, THICK	0.063

NOTES:
1. TWO TRIM PLATES ARE AVAILABLE. BOTH ARE 2024-T3 ALUMINUM, WITH THICKNESSES OF 0.032" AND 0.063".
2. TRIM PLATE IS CHROMATED. IT MUST BE CUT TO THE CORRECT SIZE AND PAINTED TO MATCH EACH INSTALLATION.

Figure C-10. Trim Plate P/N 115-01009-( )

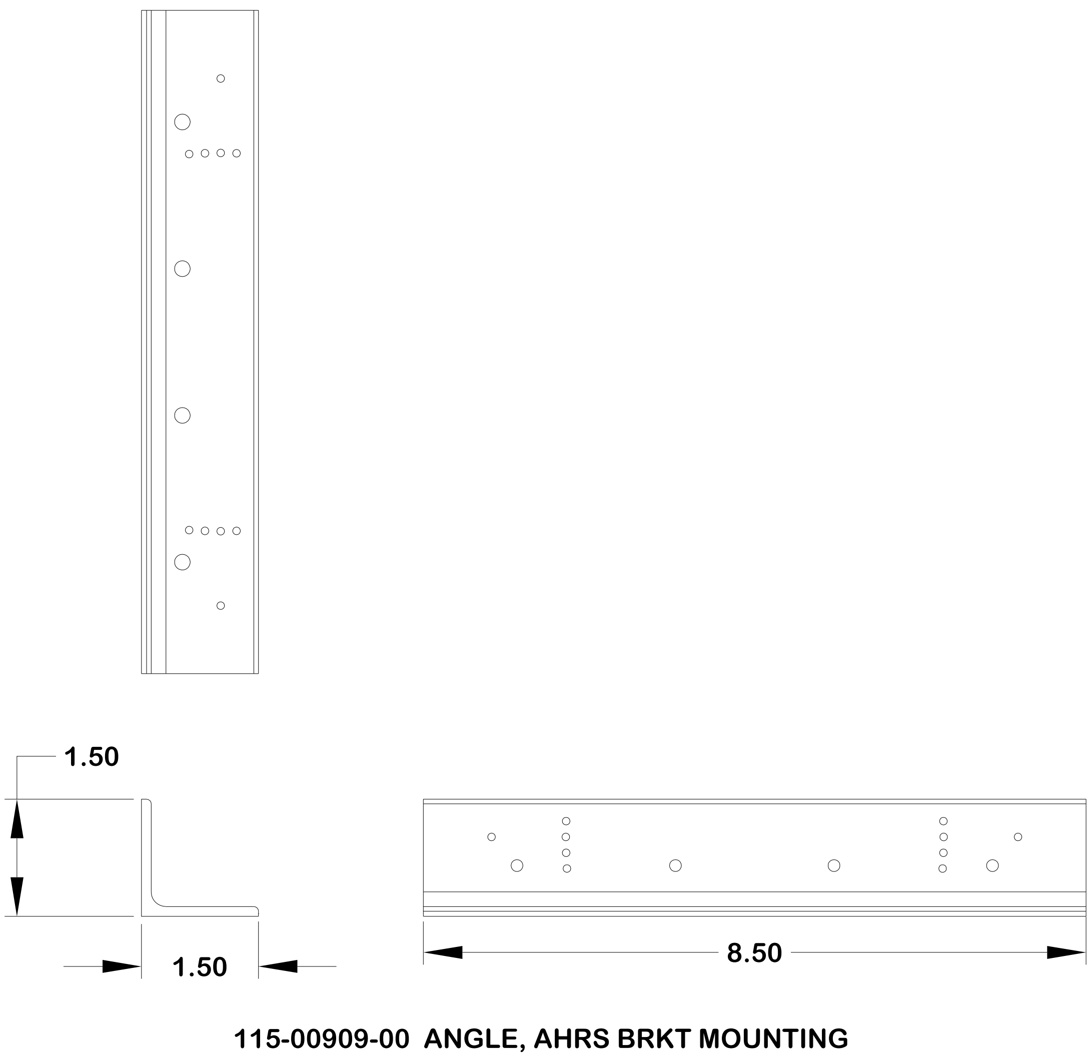
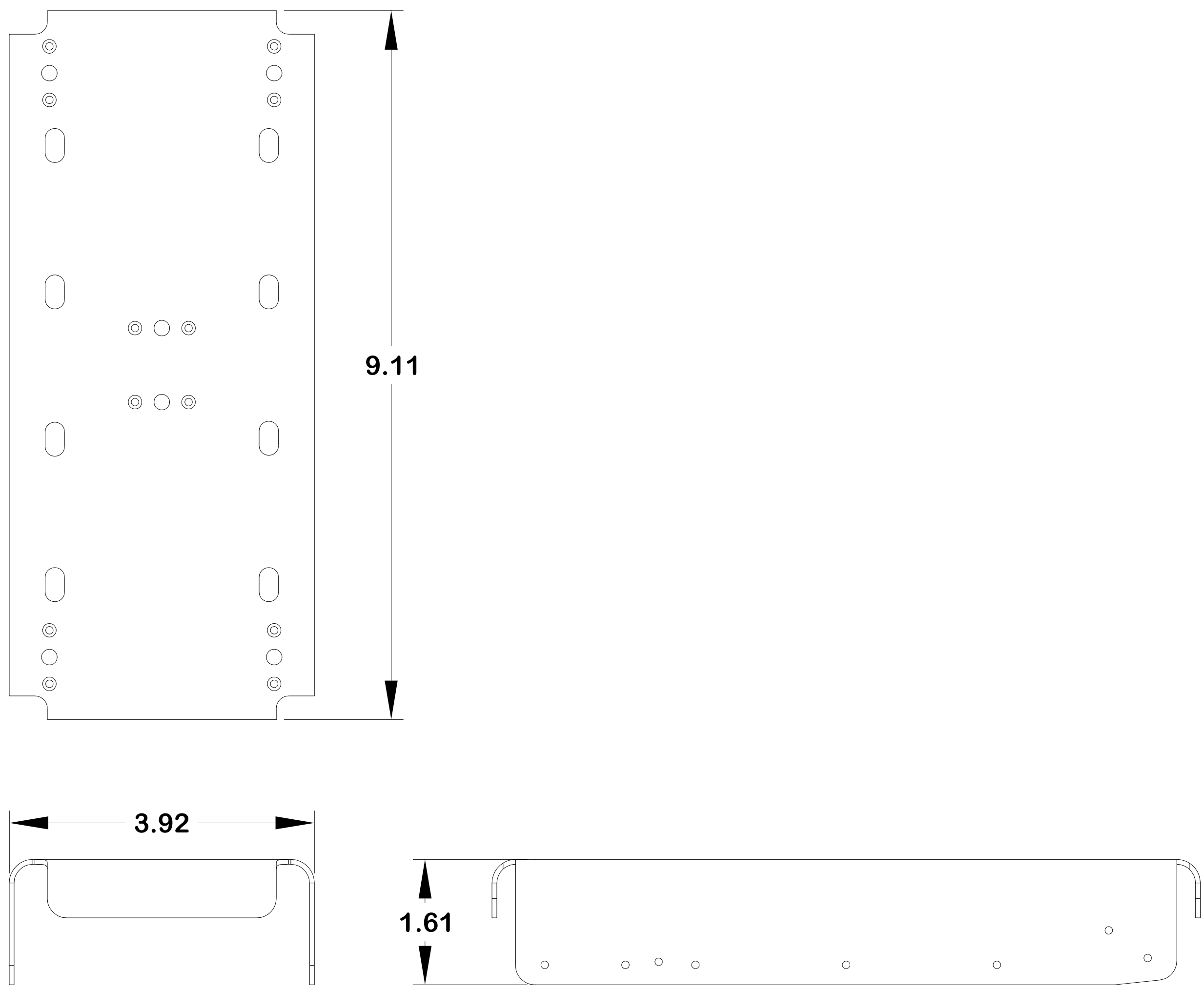
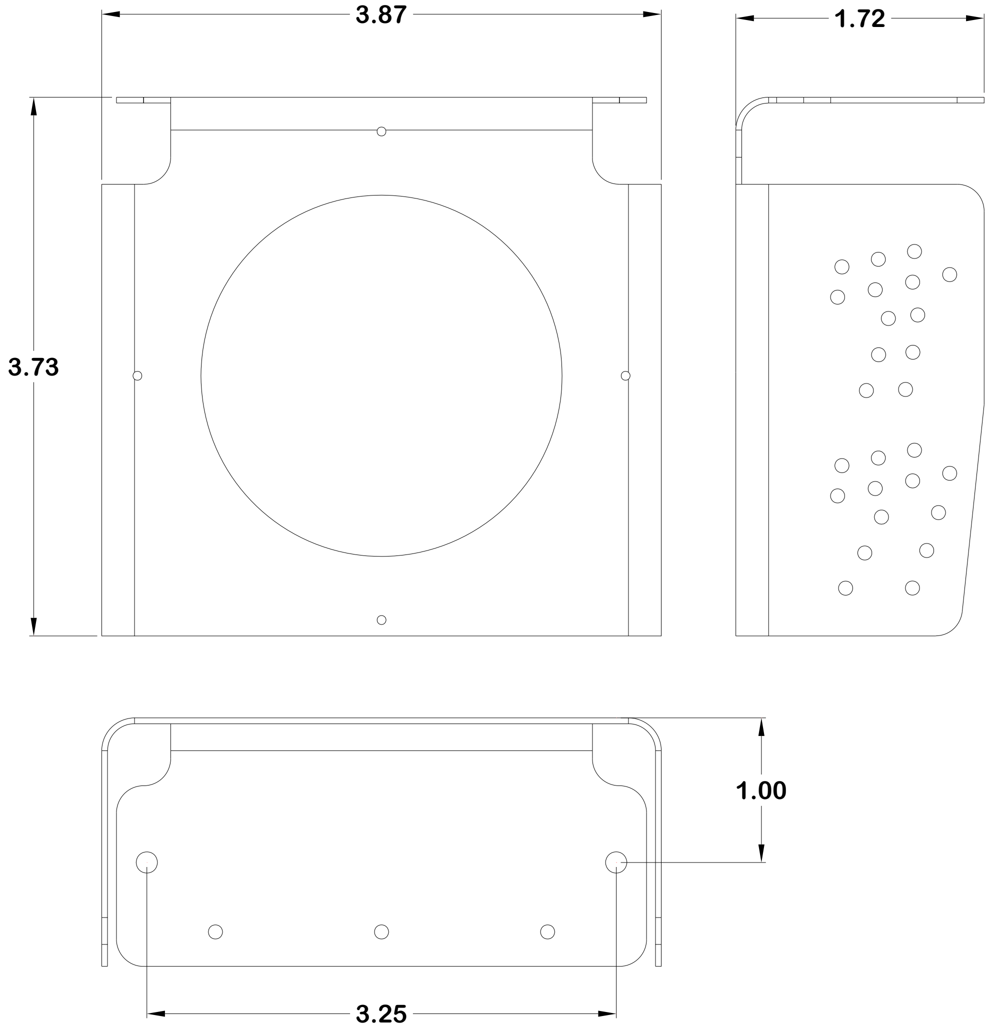


Figure C-11. GRS 77 Universal Mount Dimensions
Sheet 1 of 2



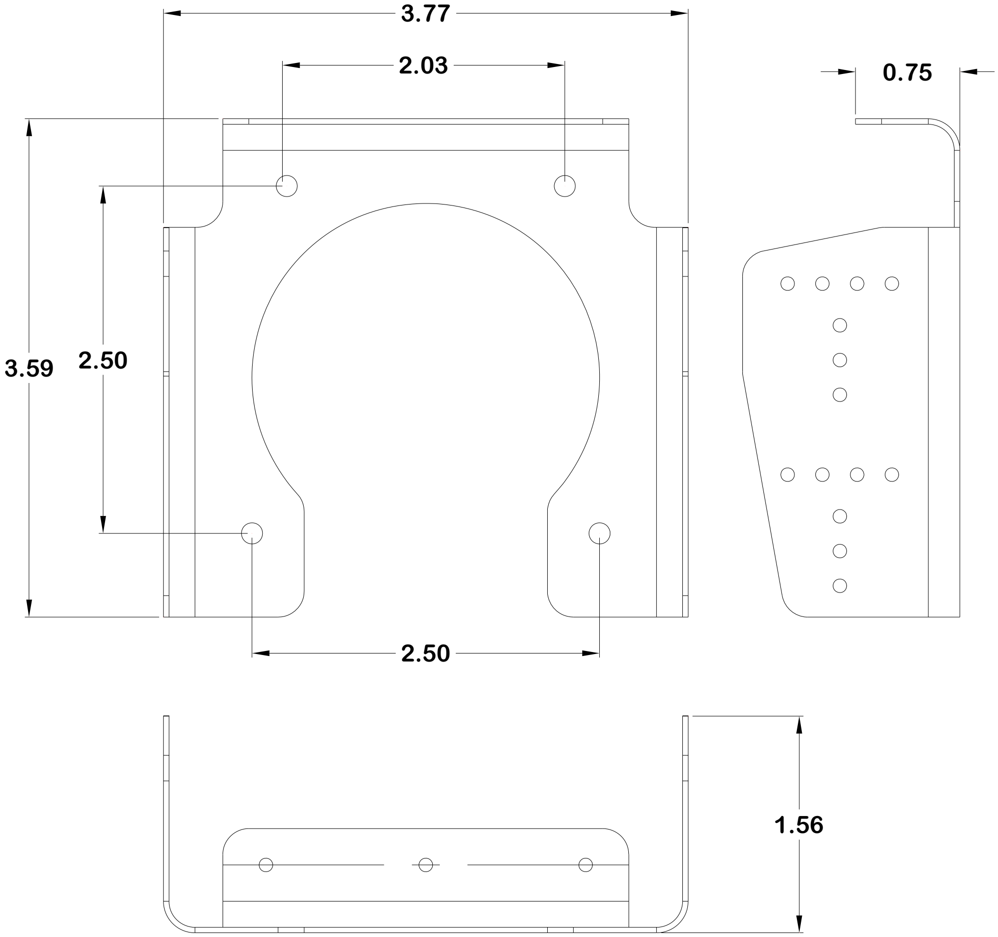
115-00922-00 BRACKET, TOP, AHRS, UNIV

Figure C-11. GRS 77 Universal Mount Dimensions
Sheet 2 of 2



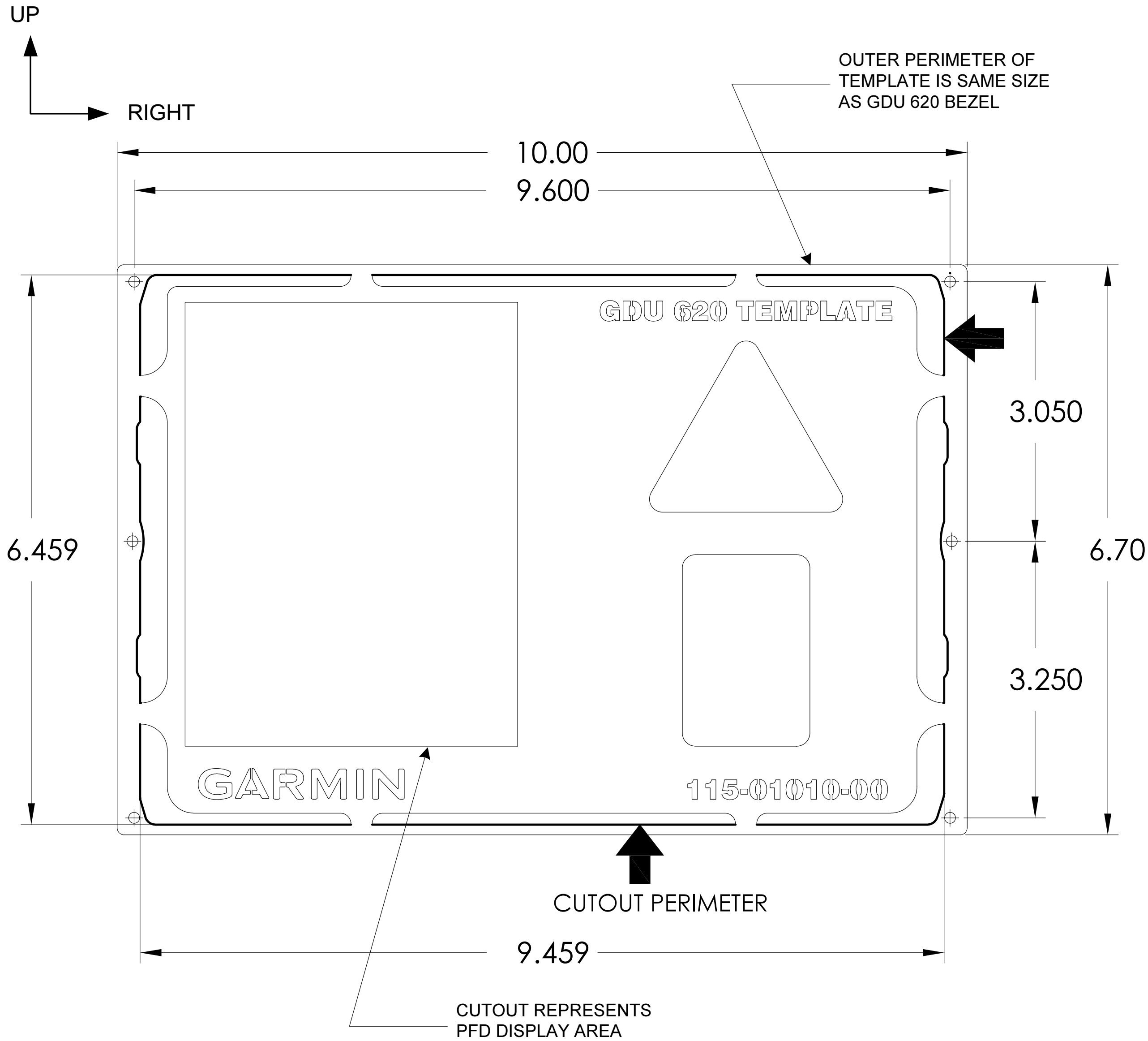
115-01017-01 BRACKET, MAGNETOMETER, TOP, UNIV

Figure C-12. GMU 44 Universal Mount Dimensions
Sheet 1 of 2



115-00939-01 BRACKET, MAGNETOMETER, UNIV

Figure C-12. GMU 44 Universal Mount Dimensions
Sheet 2 of 2



NOTES:

1. CUTOUT TEMPLATE IS MADE FROM STAINLESS STEEL AND CAN BE USED FOR MULTIPLE INSTALLATIONS.
2. CUTOUT TEMPLATE SHOULD BE TEMPORARILY AFFIXED TO INSTRUMENT PANEL IN DESIRED LOCATION PRIOR TO MARKING CUTOUT. **THE OUTSIDE EDGES OF THE CUTOUT PATTERN SHOULD BE USED WHEN MARKING THE CUTOUT ONTO THE INSTRUMENT PANEL.**
3. INSTRUMENT PANEL HOLES FOR GDU MOUNTING NUTPLATES SHOULD BE DRILLED USING A #30 (0.1285") DRILL BIT PRIOR TO REMOVAL OF THE TEMPLATE FROM THE INSTRUMENT PANEL. THE HOLES ARE RESIZED LATER TO THEIR FINAL DIAMETER.

Figure C-13. Cutout Template P/N 115-01010-00 Dimensions

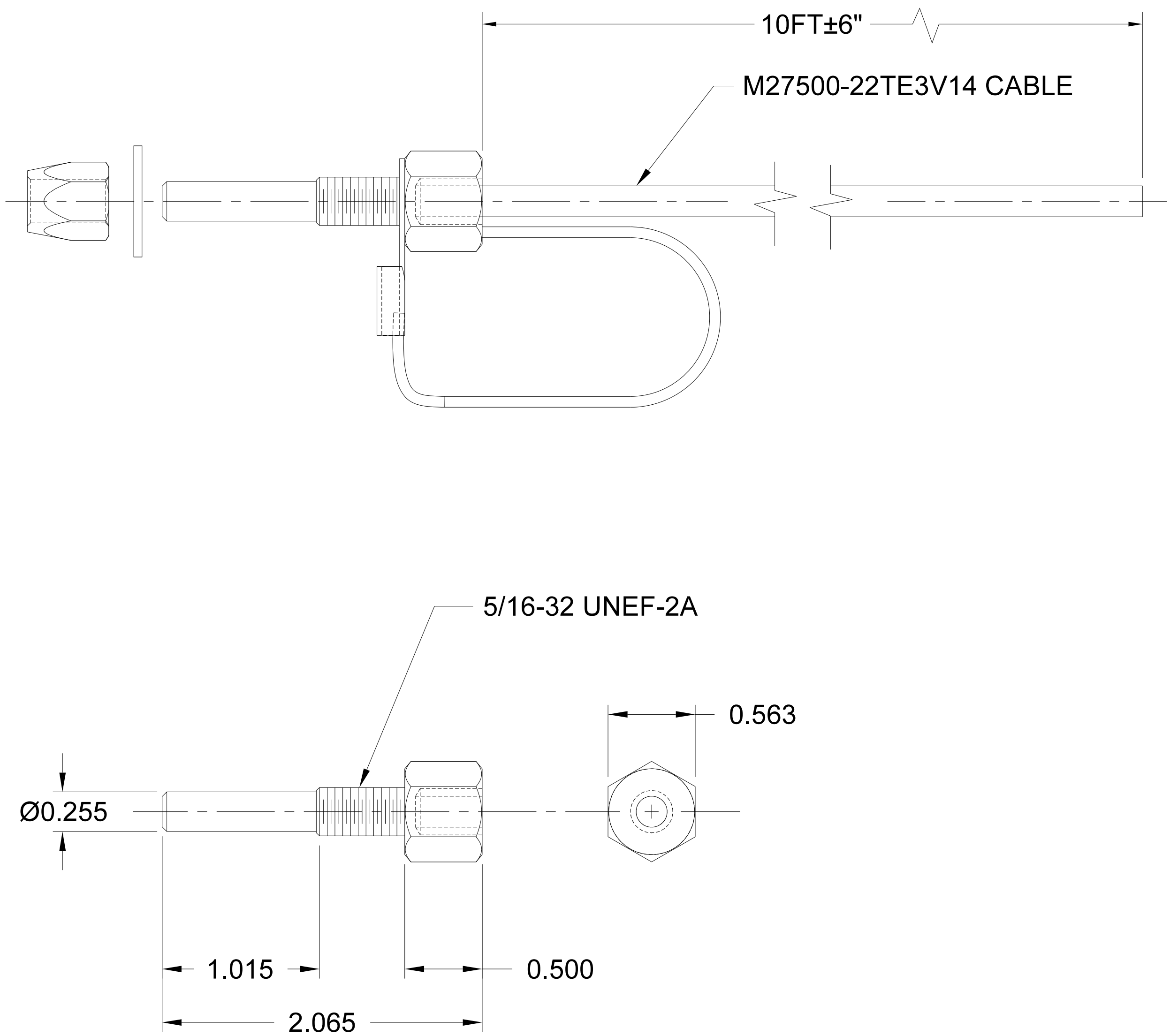


Figure C-14. GTP 59 OAT Probe Dimensions

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Appendix D SAMPLE INSTALLATIONS

D.1 Sample Instrument Panel Layouts

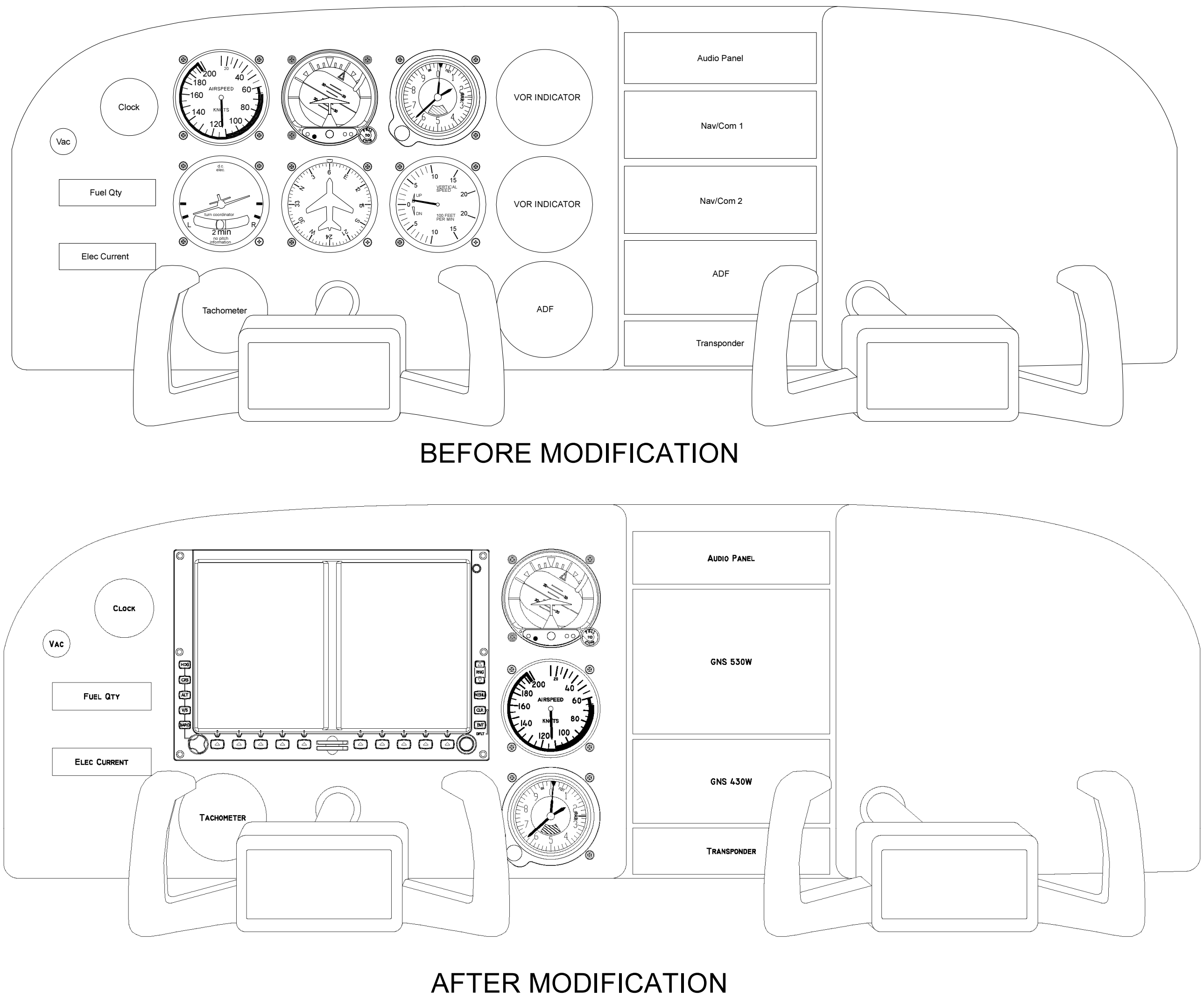
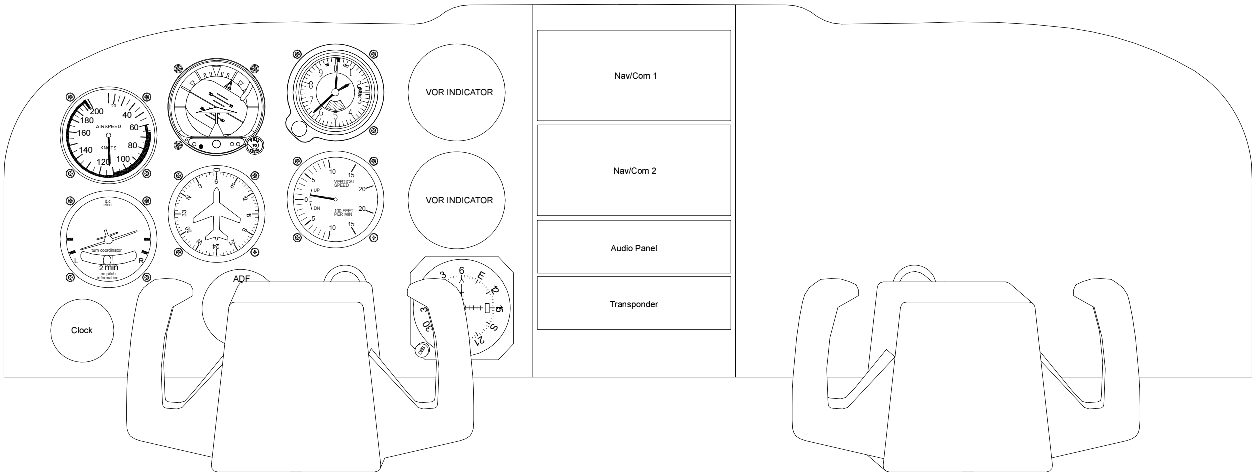
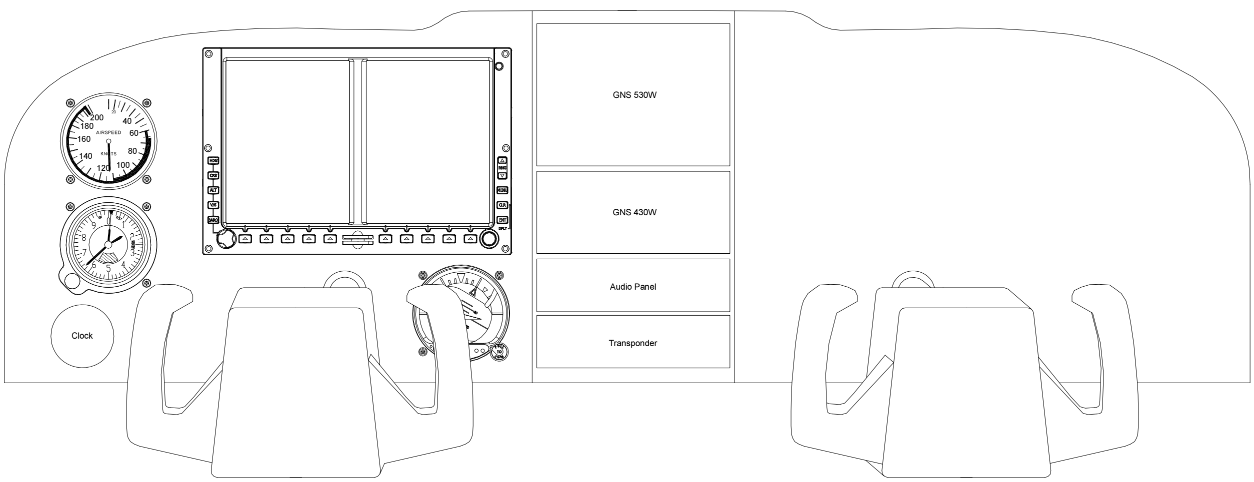


Figure D-1. Installation of GDU 620 with Ideal Six-Pack

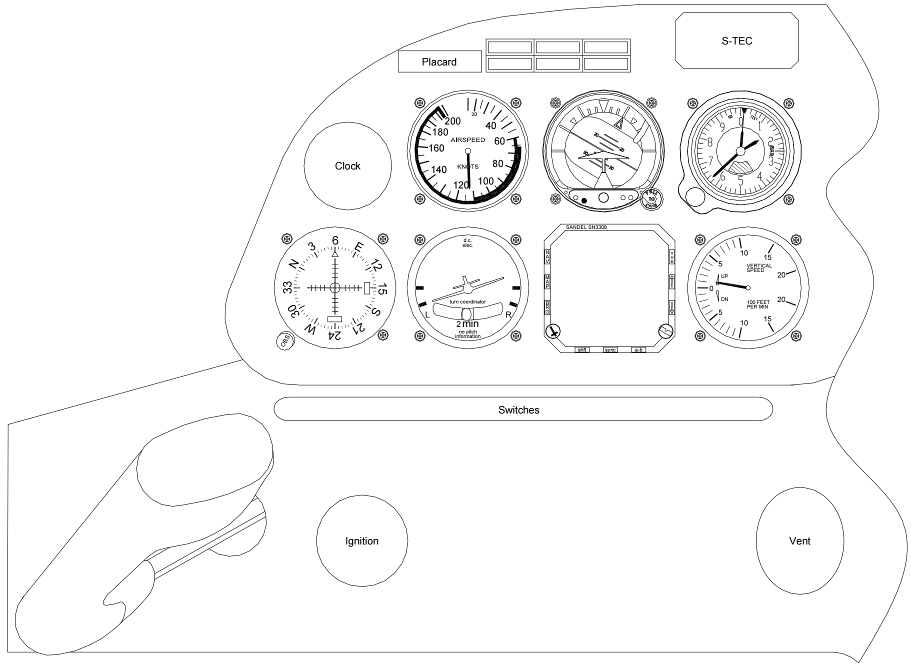


BEFORE MODIFICATION

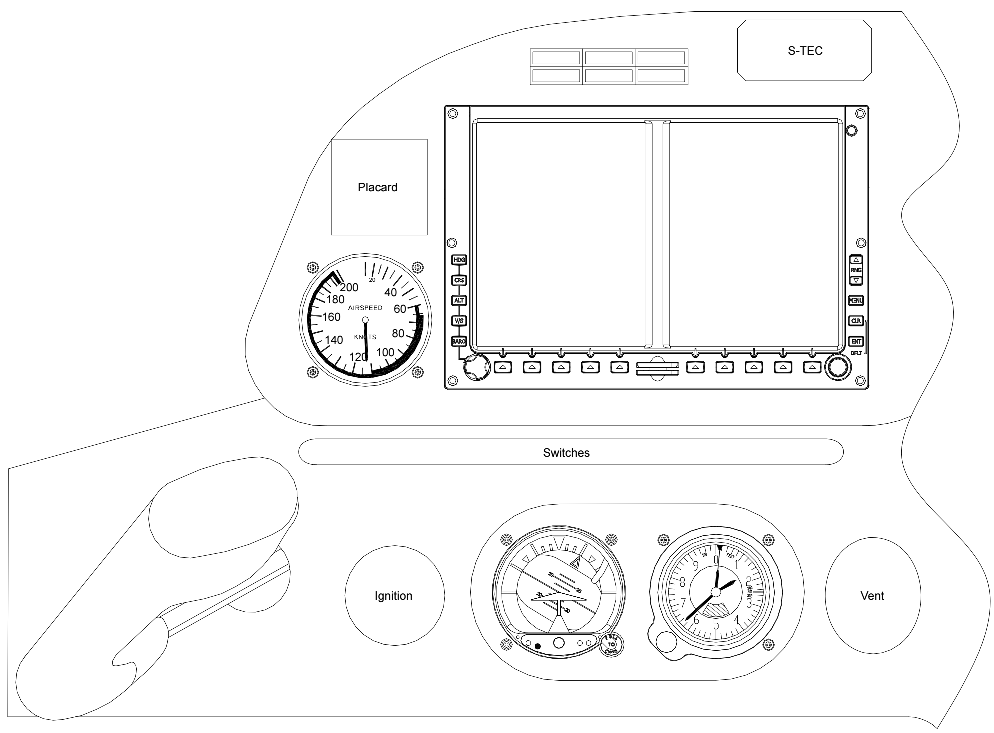


AFTER MODIFICATION

Figure D-2. Installation of GDU 620 with Non-Ideal Six-Pack

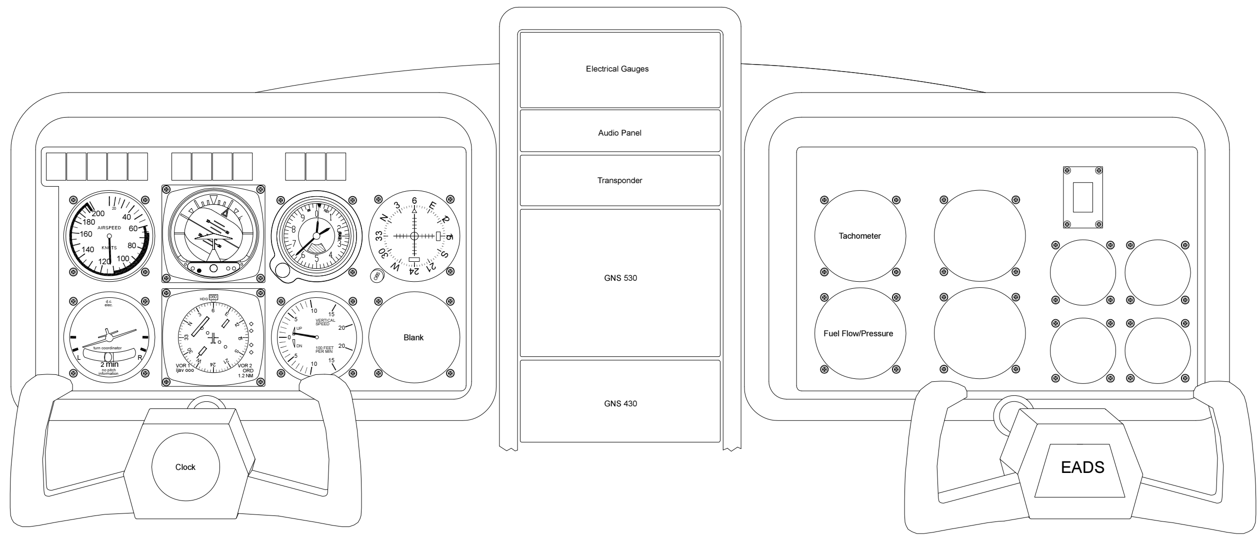


BEFORE MODIFICATION

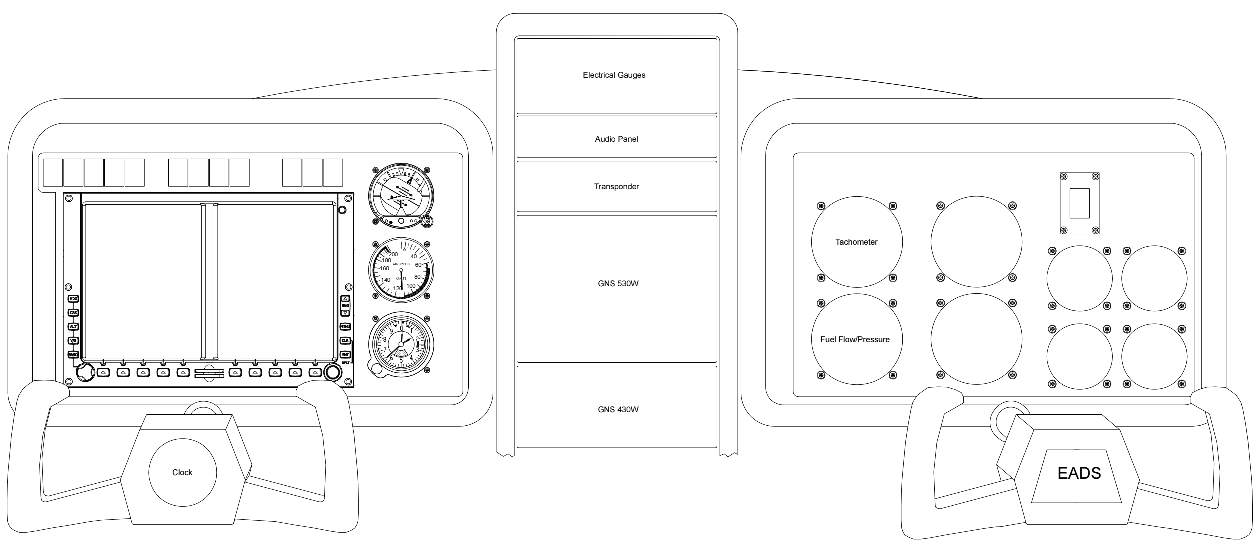


AFTER MODIFICATION

Figure D-3. Installation of GDU 620 with Standby Instruments on Stepped Part of Instrument Panel

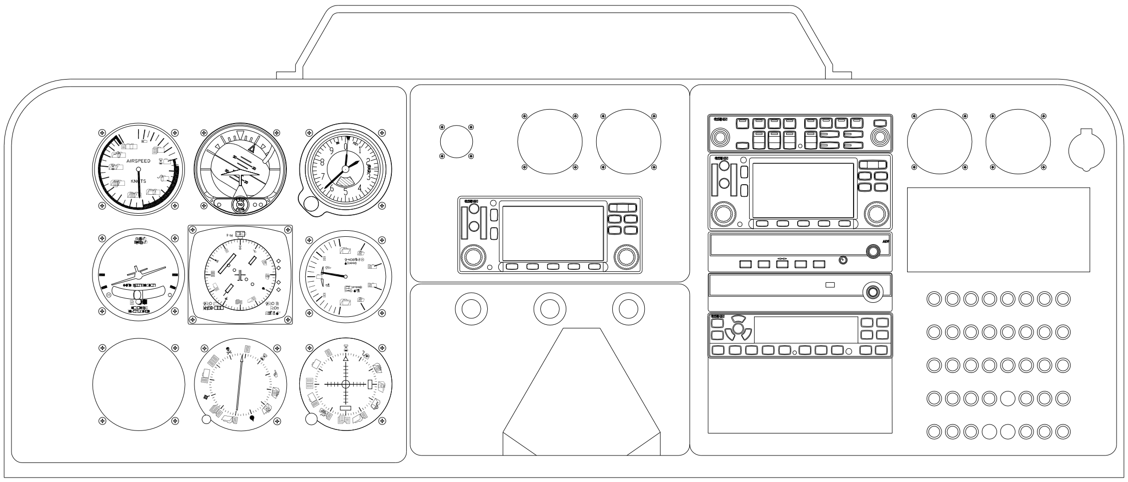


BEFORE MODIFICATION



AFTER MODIFICATION

Figure D-4. Installation of GDU 620 Using 2 1/4 Inch Backup Instruments



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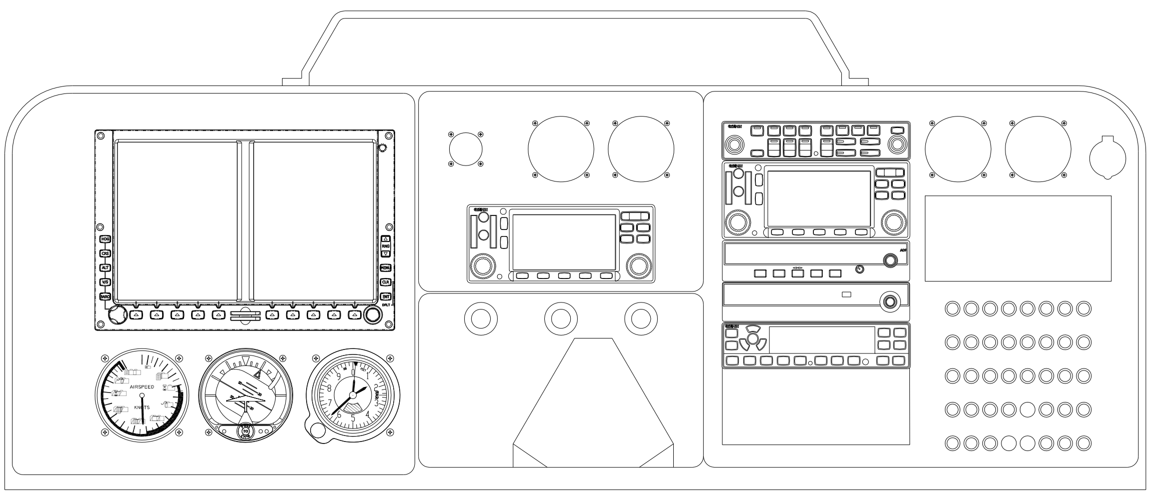
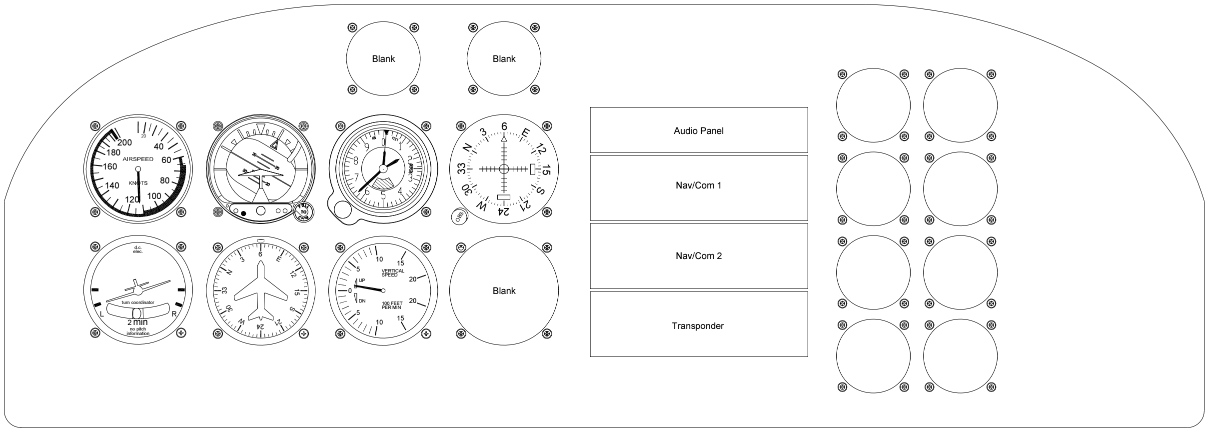


AFTER MODIFICATION

Figure D-5. Installation of GDU 620 with Standby Instruments Below



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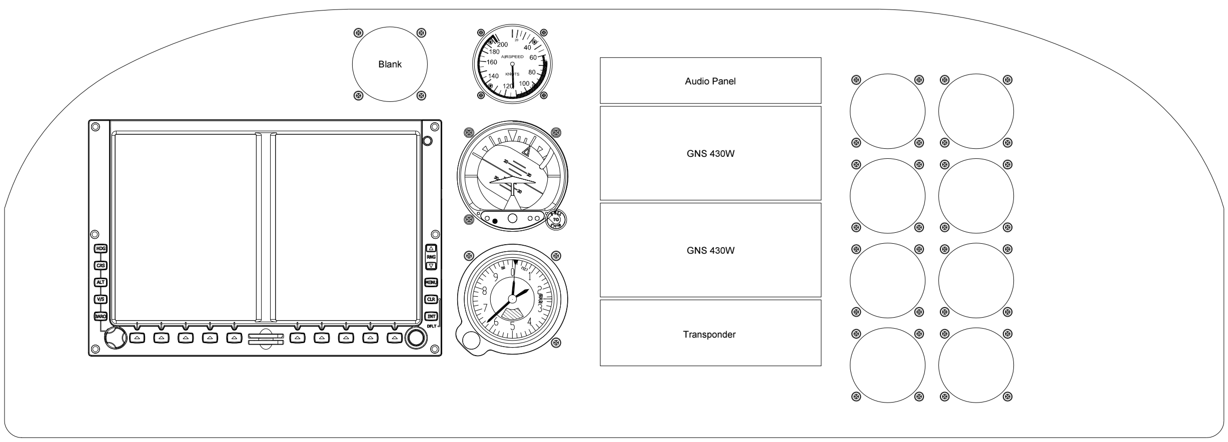


AFTER MODIFICATION

Figure D-6. Installation of GDU Using Both 2 1/4 Inch and 3 1/8 Inch Backup Instruments

D.2 GMU 44 Installation Examples

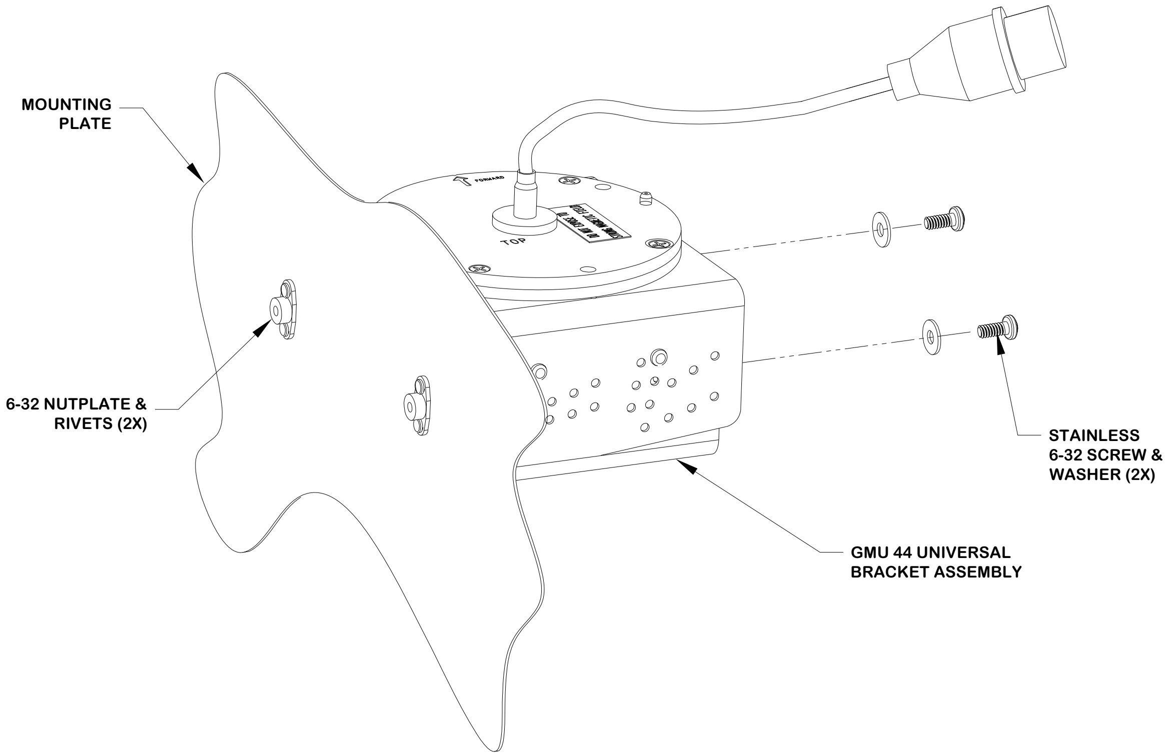


Figure D-7. Installation of GMU 44 with GMU 44 Universal Mount, Side Mounted

For composite aircraft, screws with self locking nuts are an acceptable installation method.

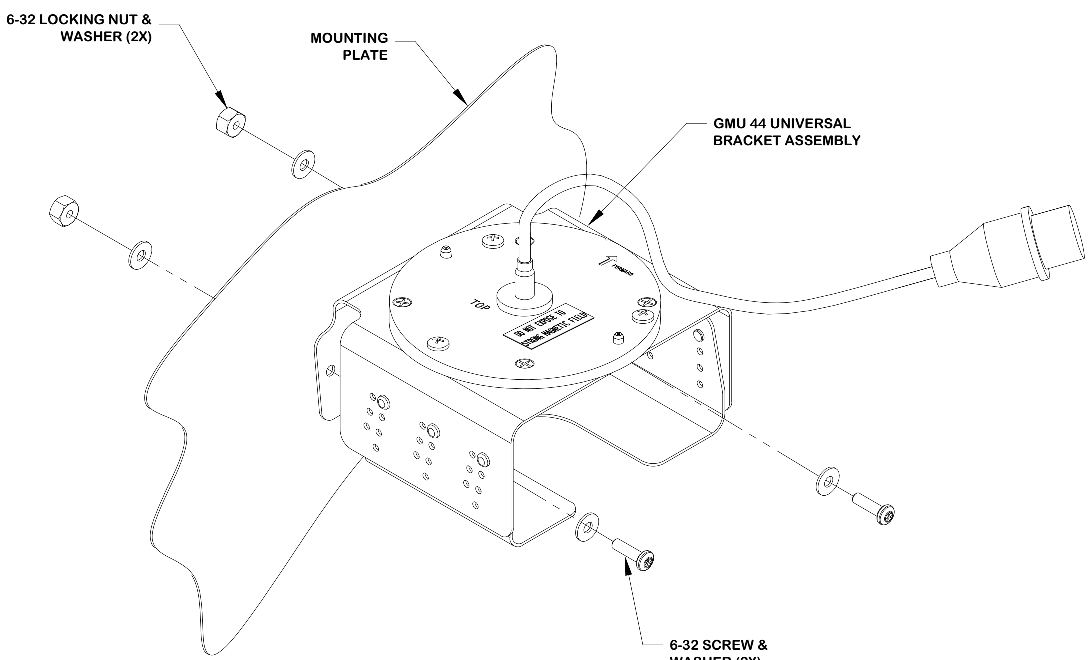


Figure D-8. Installation of GMU 44 with GMU 44 Universal Mount, Side Mounted

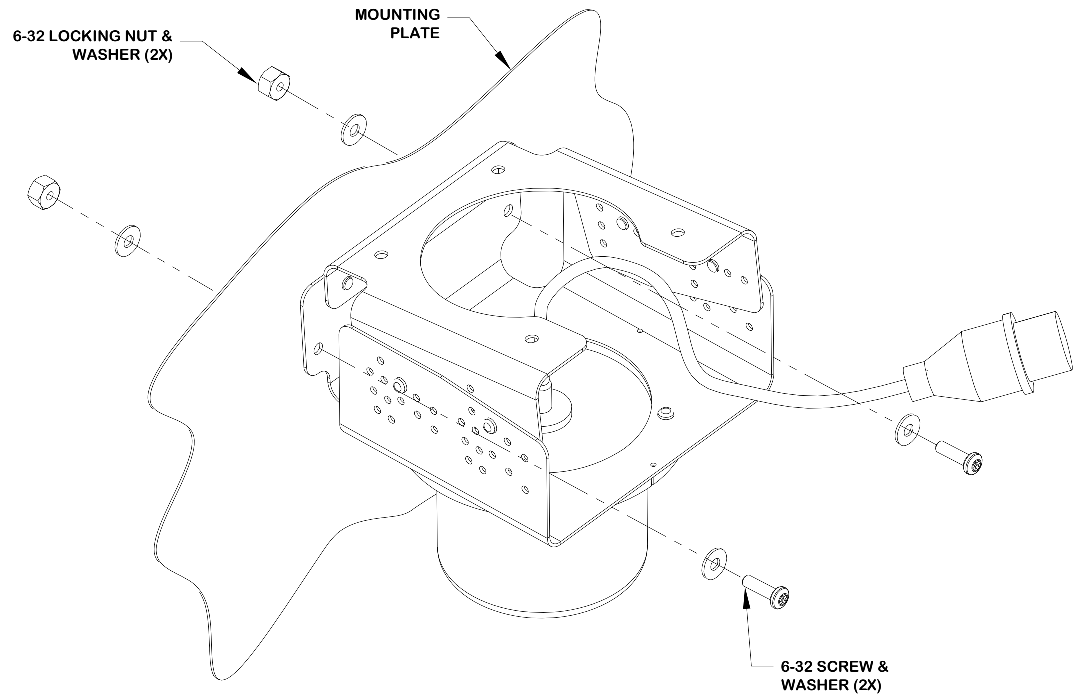


Figure D-9. Installation of GMU 44 with GMU 44 Universal Mount, Suspended - Side Mounted

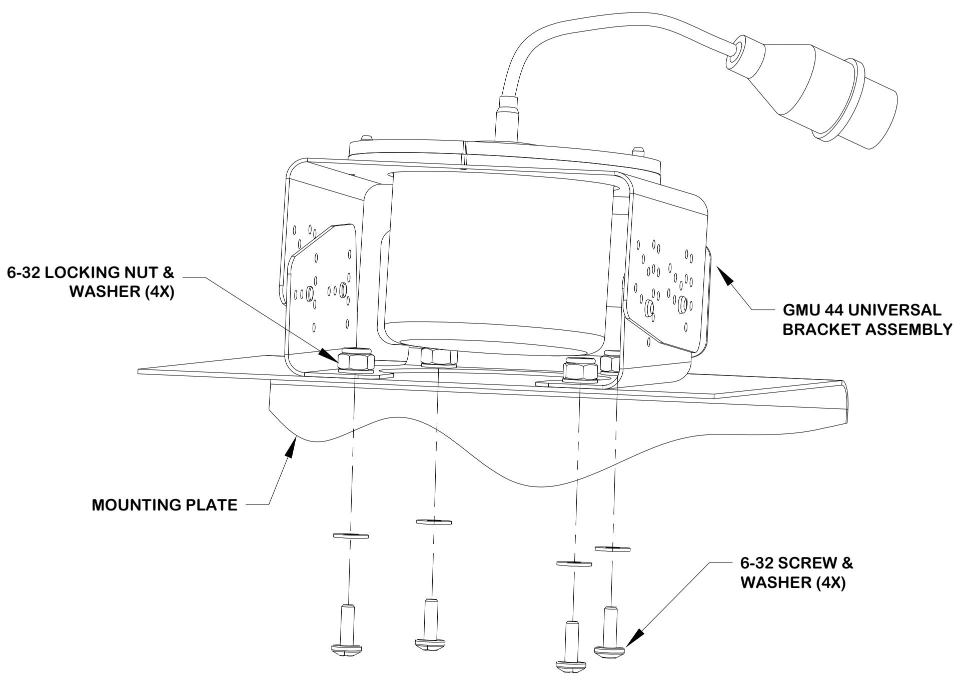


Figure D-10. Installation of GMU 44 with GMU 44 Universal Mount- Bottom Mounted

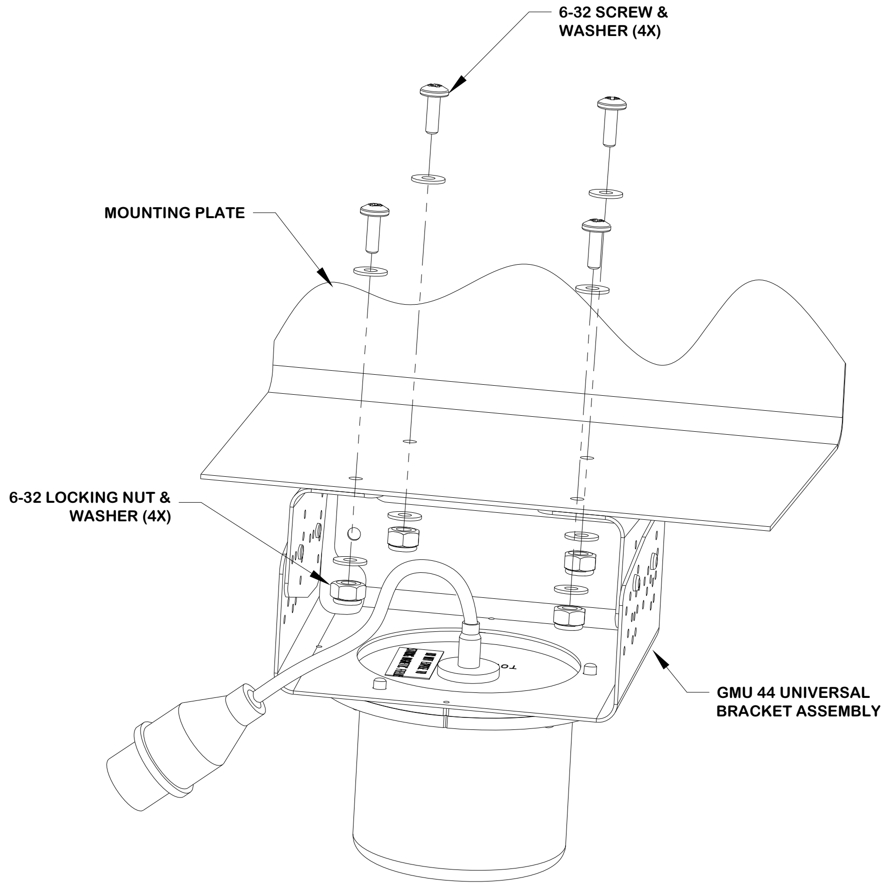


Figure D-11. Installation of GMU 44 with GMU 44 Universal Mount, Suspended - Bottom Mounted

Figure D-12. Not Used

D.3 GDC 74A Installation Examples

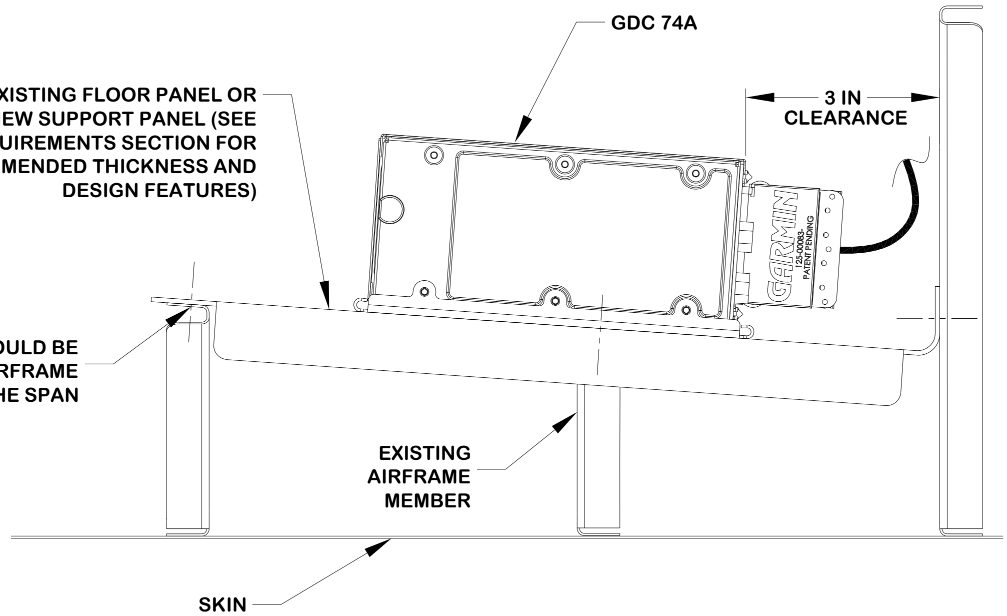


Figure D-13. Installation of GDC 74A to Mounting Plate

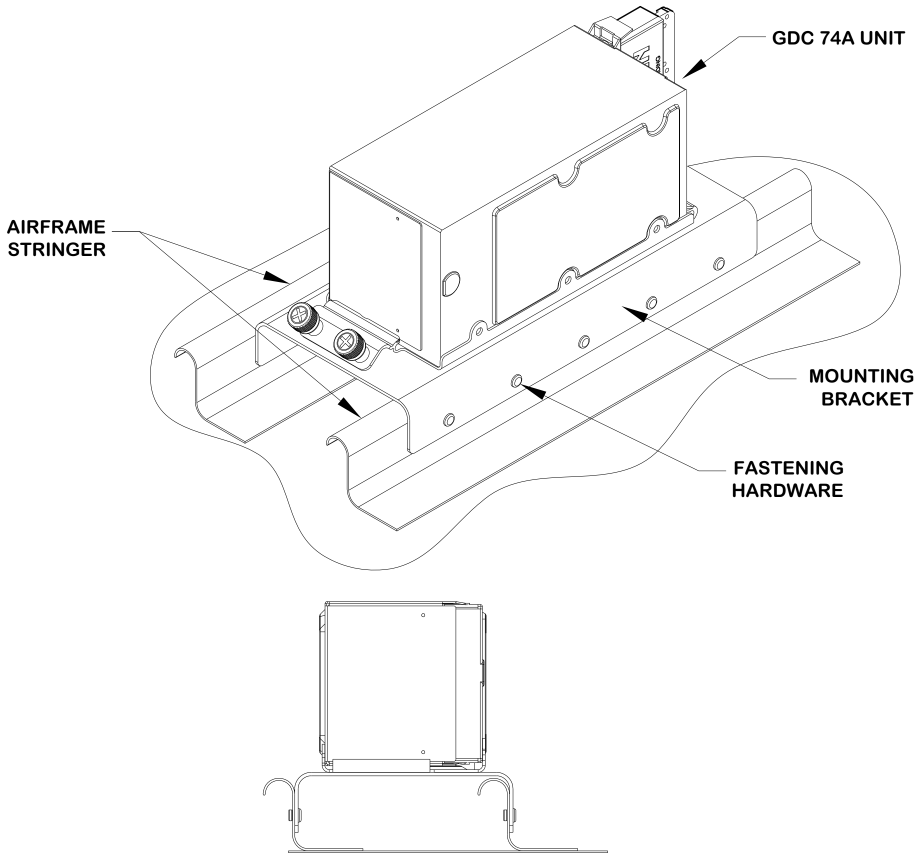
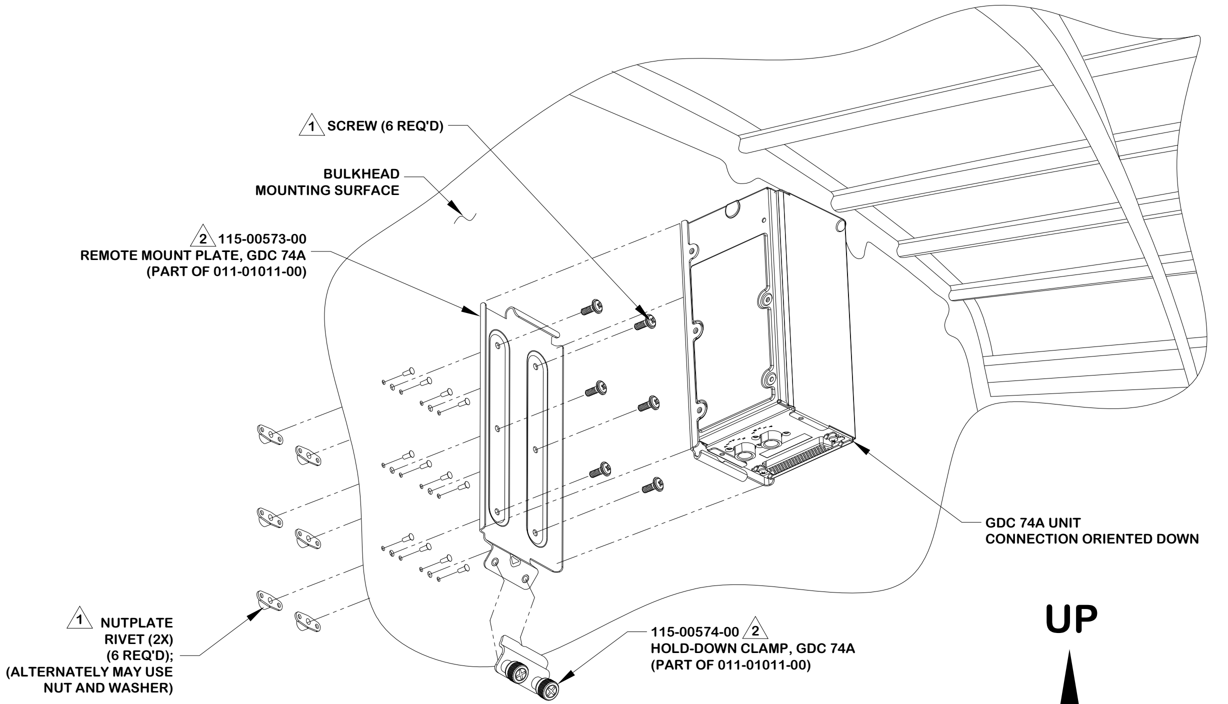


Figure D-14. Installation of GDC 74A – Horizontal Orientation



NOTES:

1. RECOMMENDED HARDWARE OPTIONS FOR ASSEMBLY:

HARDWARE	SPECIFICATIONS			
SCREWS	MS35206 (#6-32 LENGTH A/R); OR NAS601 (#6-32 LENGTH A/R)			
WASHERS	AN960-6; AN960-6L; NAS1149FN632P; OR NAS1149FN616P	OR	NUTPLATES	(M)F5000-06; (M)K1000-06; (M)K2000-06; OR F2000-06
NUTS	AN364-632A (MS21083N06); OR MS21042L06		RIVETS	MS20426AD3-X

2. THE REMOTE MOUNT PLATE MAY ALTERNATELY BE INSTALLED WITH THE HOLD-DOWN CLAMP AT THE TOP OF THE INSTALLATION, SO IT IS AT THE OPPOSITE SIDE FROM THE GDC 74A CONNECTIONS. THE CONNECTION PORTS HOWEVER ARE ALWAYS ORIENTED DOWN.

Figure D-15. Installation of GDC 74A – Vertical Orientation

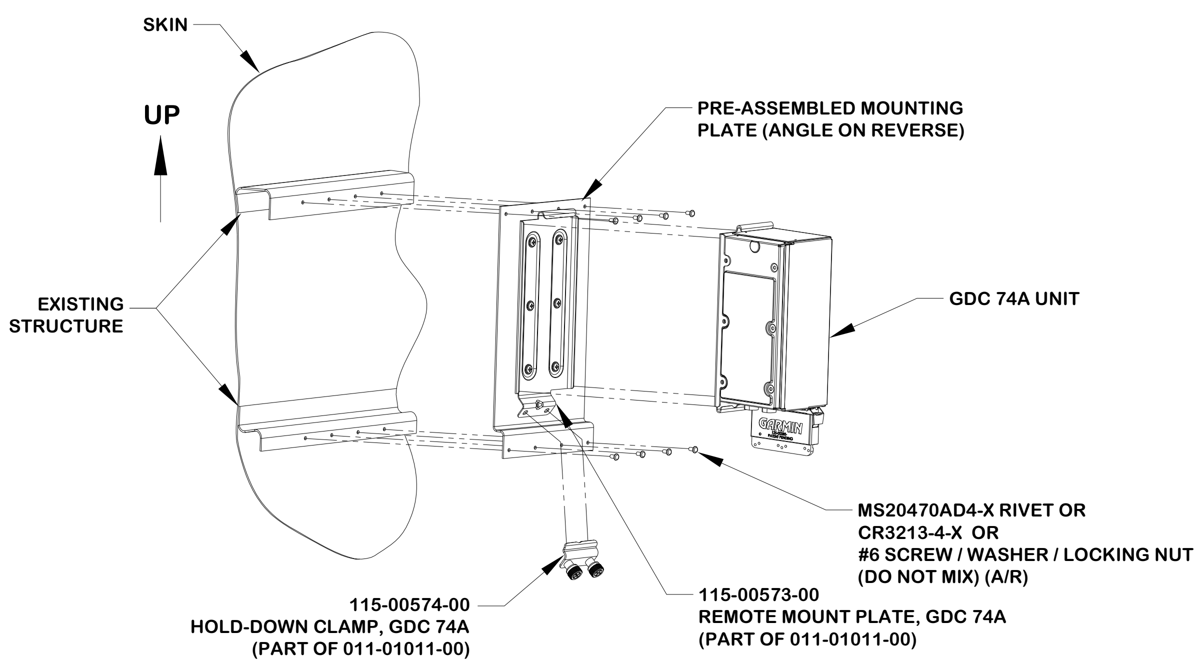
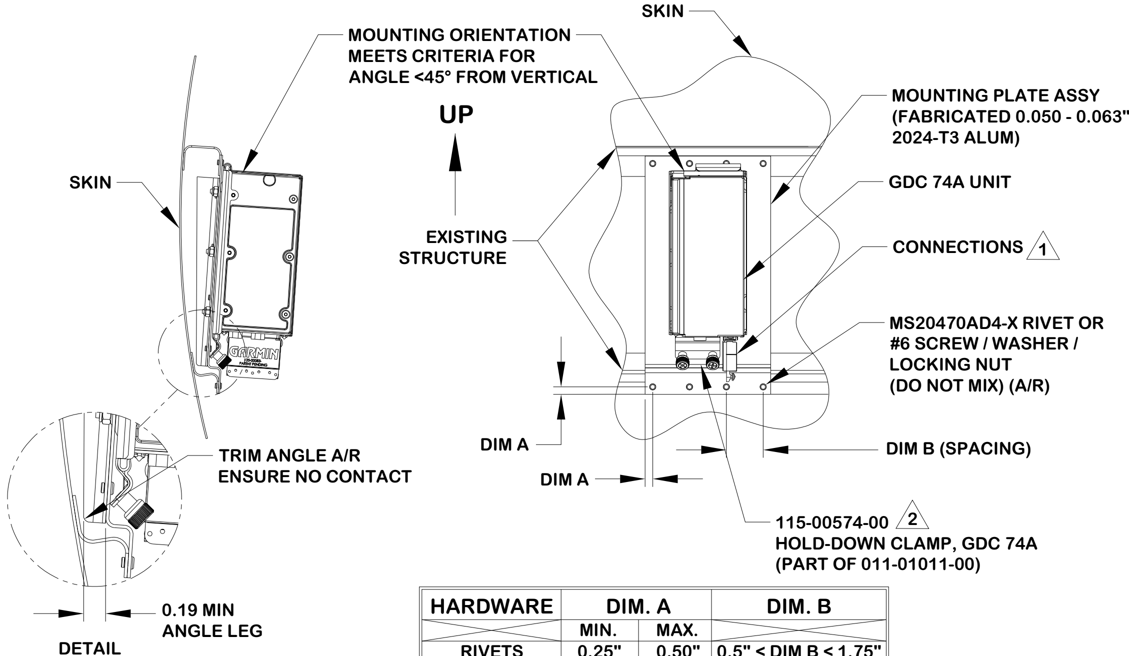


Figure D-16. Installation of GDC 74A – Vertical Orientation using Stringers



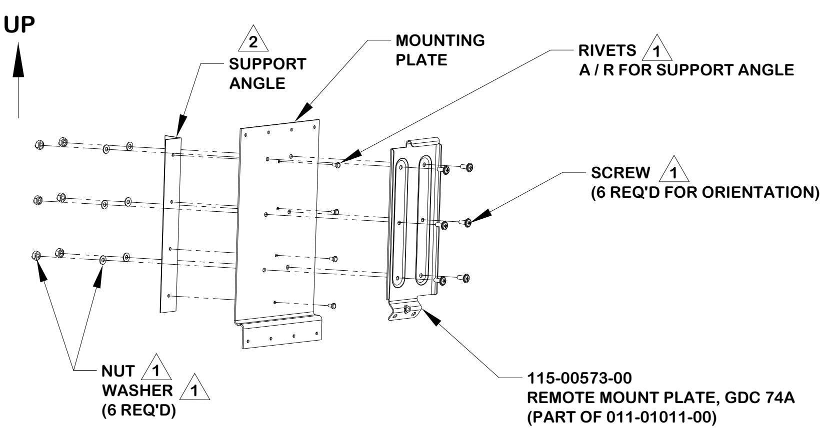
HARDWARE	DIM. A		DIM. B
	MIN.	MAX.	
RIVETS	0.25"	0.50"	0.5" < DIM B < 1.75"
SCREWS	0.30"	0.50"	0.5" < DIM B < 1.75"

NOTES:

1. REFER TO 190-00303-15 GDC 74A INSTALLATION MANUAL FOR APPROVED PRACTICES WHILE INSTALLING LINES AND CONNECTIONS.

2. THE REMOTE MOUNTING PLATE MAY ALTERNATELY BE INSTALLED WITH THE HOLD-DOWN CLAMP AT THE TOP OF THE INSTALLATION, SO IT IS AT THE OPPOSITE SIDE FROM THE GDC 74A CONNECTIONS. THE CONNECTION PORTS HOWEVER ARE ALWAYS ORIENTED DOWN.

Figure D-17. Installation of GDC 74A – Vertical Orientation



NOTES:

1. RECOMMENDED HARDWARE OPTIONS FOR ASSEMBLY:

HARDWARE	SPECIFICATIONS			
SCREWS	MS35206 (#6-32 LENGTH A/R); OR NAS601 (#6-32 LENGTH A/R)			
RIVETS	MS20470AD4-X; OR MS20426AD4-X			
WASHERS	AN960-6; AN960-6L; NAS1149FN632P; OR NAS1149FN616P	OR	NUTPLATES	(M)F5000-06; (M)K1000-06; (M)K2000-06; OR F2000-06
NUTS	AN364-632A (MS21083N06); OR MS21042L06		RIVETS	MS20426AD3-X

2. THE MATERIAL OF THE SUPPORT ANGLE SHOULD MINIMALLY BE 0.5" X 0.5" X 0.063" 2024-T3 or 6061-T6 ALUMINUM. TRIM THE ANGLE LEG THAT IS NORMAL TO THE MOUNTING PLATE AS REQUIRED TO AVOID CONTACT WITH SKIN OR EXISTING STRUCTURES. ONLY ONE ANGLE IS REQUIRED.

Figure D-18. Installation of GDC 74A – Vertical Orientation

Appendix E Equipment Compatibility and Configuration

The following equipment listed in this appendix is compatible with the G600 system when configured as described herein. For G600 configuration information refer to Section 5.5.

E.1 Electric Standby Attitude Indicators

Any air-driven attitude indicator may be used to provide back-up attitude information; however, if an electric attitude indicator is used to provide backup attitude information, it must be one of the following:

Mfg	Model	Data Format	Notes	Interfacing Equipment Configuration Information
Mid-Continent Instruments	4200		2 1/4 inch electric ADI	Must be used with MD420 Emergency Power System
	4300-4XX		3 1/8 inch electric ADI	With supplied Standby Battery Pack

E.2 GPS Source

The following GPS position sources are compatible with the GDU 620:

Mfr	Model	Data Format	Notes	Interfacing Equipment Configuration Information
Garmin	400W/500W Series	ARINC 429 RS-232	Main software version 3.10 or later is required. If a 500W TAWS unit is installed, it MUST be connected as GPS1.	Main ARINC 429 Config: IN 1: Low, Garmin GDU OUT: High, GAMA 429 SDI: LNAV 1 (for GPS 1) LNAV 2 (for GPS 2) VNAV: Enable Labels Main RS-232 Config: CHNL 1: Off / MapMX *Single GDU 620 Installations:* Main CDI/OBS Config: Allow CDI Key (i.e. CDI can be GPS or VLOC) *Dual GDU 620 Installations:* Main CDI/OBS Config: Ignore CDI Key (i.e. CDI is GPS Only)
	GNS 480	ARINC 429 RS-232	Software version 2.2 or later is required.	Serial Setup: CH 1 (RX/TX): MapMX / MapMX ARINC 429 Setup: CH 2 IN: Garmin GDU, Low, Sys 1 (for GPS 1) Sys 2 (for GPS 2) CH 1 OUT: GAMA 429 NO FP *Single GDU 620 Installations:* Misc Setup: CDI SELECT: USE (i.e. CDI can be GPS or NAV) *Dual GDU 620 Installations:* Misc Setup: CDI SELECT: IGNORE (i.e. CDI is GPS Only)

E.3 Autopilot

The following autopilots are compatible with the GDU 620 / G600.

Mfr	Model	Data Format	Notes	Interfacing Equipment Configuration Information
Century	II / III / IV 21 / 31 / 41	Analog [3]	Attitude based autopilot	G600 can interface with radio coupler only.
Cessna	400B	Analog [3]	Attitude based autopilot	
	300 IFCS/400 IFCS/800 IFCS	Analog [3]	Attitude based autopilot	For 400 IFCS, the mode control panel must be adjusted NOT to attenuate the heading or course error signal.
	300B IFCS/400B IFCS/800B IFCS	Analog [3]	Attitude based autopilot	G-579( ) attitude gyro may replace G550A or G1050A ADI to provide attitude information to the autopilot system.
Collins	APS-65	Analog [3]	Attitude based autopilot	The original MCS-65 or YRS-65 heading/yaw rate system must remain in the aircraft in order to provide the yaw rate and compass monitor inputs to the autopilot.
	AP-106/107	Analog [3]	Attitude based autopilot	
Honeywell (Bendix King)	KAP 100/150/200 KFC 150/200/250	Analog [3]	Attitude based autopilot	[1] [2] [4]
	KAP 140	Analog [3]	Rate based autopilot	[1]
	KFC 225/275/325	Analog [3] ARINC 429 GPSS	Attitude based autopilot	[1] [4] [5]
S-TEC	20/30/40/50/55/60 60-2/65	Analog [3], Discrete	Rate based autopilot	Must be configured to operate with either the NSD-360 or KI-525 (KCS-55) heading system.
	55X	Analog [3], Discrete, ARINC 429 GPSS	• Rate based autopilot • Altitude preselect/capture is available as an option.	Must be configured to operate with either the NSD-360 or KI-525 (KCS-55) heading system. If the optional altitude preselect function is activated: • 55X computer must have mod AC/AC (software/hardware). • 55X computer must be strapped for a 01282 altitude selector/alerter (P2-23 must be OPEN).

[1] The compass valid discrete input to the autopilot computer must be grounded when the G600 is installed. The autopilot uses this input to determine the validity of the heading and course datum (error) signals. With mechanical instruments, when heading becomes invalid the heading and course datum signals will remain set to the value when valid heading was last received. However, unlike mechanical instruments, the G600 will automatically set these signals to zero error whenever the heading becomes invalid, resulting in a wings-level condition. This allows GPSS (simulated heading datum) from the G600 to still be used by the autopilot if the gyro heading were to fail.

[2] For KAP 150/KFC 150, EFIS-enabled KC-19X computer (P/N 065-0042-16) is not supported.

[3] Analog signal characteristics for the interfaces from the GDU 620 to the autopilot can be found in Section 4.2.5 of the GDU 620 Installation Manual (Garmin document 190-00601-04). The heading and course signal characteristics are determined by the "Autopilot Type" that is configured. Refer to Section 5.5.9.

[4] KI 256 ADI or KVG 350 Gyro must be retained for the autopilot to function properly. Optionally, the KI 258 ADI may replace the KI 256 ADI to provide attitude information to the autopilot system.

[5] For KFC 325, installations with an existing EFIS are not supported.

E.4 External Flight Directors

The following flight directors are compatible with the GDU 620/G600.

Mfr	Model	Data Format	Notes [1]	Interfacing Equipment Configuration Information
Cessna	300B IFCS/400B IFCS/800B IFCS	Analog		
Collins	APS-65	Analog		N/A
	AP-106/107	Analog	OUT OF VIEW+ signal from autopilot must be inverted to be active-high for correct operation with the G600.	
Honeywell (Bendix King)	KFC 150/200/225/275	Analog		For KFC 150, EFIS-enabled KC-19X computer (P/N 065-0042-16) is not supported.
	KFC 250 / 325	Analog		For KFC 325, installations with an existing EFIS are not supported.
S-TEC	55X	Analog		• ST-645 Remote Annunciator panel must be installed (or retained) if the flight director is displayed on G600. This will provide the required mode annunciations. • Only flight director pitch/roll outputs directly from 55X computer can be used for display on G600 (FD pitch/roll outputs from the Remote Annunciator panel cannot be used). • If FD Logic output from 55/55X P2-4 is connected to P1-20 input on ST-645, it must be disconnected.
	60-2/65 *(with ST-670)*	Analog		• ST-670 Single Cue FD Interface Unit for King KI 256 (PN 01180) must be installed or retained to display flight director information on the G600.

[1] The characteristics of the analog signals are determined by the "Flight Director Type" that is configured. Refer to Section 5.5.10.

E.5 Navigation Receivers

The following navigation receivers are compatible with the GDU 620.

Mfr	Model	Data Format	Notes	Interfacing Equipment Configuration Information
Garmin	SL30	RS-232	Only one SL30 can be connected	Indicator Head Type Serial
Garmin	GNS 430W/530W	ARINC 429	One or two navigation receivers can be connected	VOR/LOC/GS ARINC 429 Config: RX: Low SDI: VOR/ILS 1 (for NAV 1) VOR/ILS 2 (for NAV 2)
	GNS 480 (CNX80)	ARINC 429	One or two navigation receivers can be connected	ARINC 429 Setup: CH 1 OUT VOR/ILS Low, Sys 1 (for NAV 1) Sys 2 (for NAV 2)

E.6 Traffic Source

The following Traffic sources are compatible with the GDU 620:

Mfr	Model	Data Format	Notes	Interfacing Equipment Configuration Information
Garmin	GTX 33/330	ARINC 429	• TIS • The GDU 620 can control the TIS state, however, it does not provide control of the GTX 33.	429 OUTPUT CHANNEL 2: GARMIN W/TIS (this is a high-speed output)
Honeywell	KTA 810/KMH 820	ARINC 429	TAS	Intruder File Protocol: ARINC 735 Controller Type: Discrete * * Controller type is only required if GDU 620 is used to control the traffic system.
	KTA 910/KMH 920	ARINC 429	TCAS I	
L3 Comm (Goodrich)	SKY497/SKY899	ARINC 429	TAS	For SKY 497, ARINC 735 Alternate Display type must be set to "ARINC735 Type 1" (P1-80 must be grounded).
Avidyne (Ryan)	TAS 620 (9900BX)	ARINC 429	• TAS • GDU does not provide any control of TCAD and will only display TCAD traffic.	External unit capable of displaying traffic and controlling the TCAD is required in addition to GDU 620 (e.g. 400W/500W or Avidyne display/controller).

E.7 Data Link

The following data link is compatible with the GDU 620:

Mfr	Model	Data Format	Notes	Interfacing Equipment Configuration Information
Garmin	GDL 69/69A	Ethernet	XM subscription is required. GDU 620 will also control GDL 69A audio functions.	Ethernet port that is connected to GDU #2 must be enabled.

E.8 2 ¼” Standby Airspeed Indicators and Altimeters

The following 2 ¼” airspeed indicators and altimeters are suitable for use as standby instruments for a G600 installation:

Mfr	Model	Data Format	Notes	Interfacing Equipment Configuration Information
Aerosonic Instruments [1]	25020-0179 25025-0177 25035-0181 25040-0180		200 knots maximum airspeed 250 knots maximum airspeed 350 knots maximum airspeed 400 knots maximum airspeed	Range markings must be added to match the current airspeed indicator in the aircraft.
	15035-0110x 16550-11xx		35,000 ft 50,000 ft	Inches or millibars must match the current altimeter in the aircraft.

[1] These instruments are available through Mid-Continent Instruments.

E.9 ADF Receiver

The following ADF receivers are compatible with the GDU 620:

Mfr	Model	Data Format	Notes	Interfacing Equipment Configuration Information
Collins	ADF-60A	Analog	DC Sin/Cos	
Honeywell	KR 87 KDF 806	Analog	DC Sin/Cos	

E.10 Weather Radar Source

Not currently supported.

E.11 Lightning Source

Not currently supported.

E.12 External TAWS Source

Not currently supported.

NOTE

The GDU 620 will not display terrain data from an external source; however, if a 500W Series unit with TAWS is connected as defined herein, the GDU 620 will display all of the required TAWS annunciations and eliminate the need for a separate TAWS annunciator panel.

Appendix F Interconnect Diagrams

F.1 Drawing List

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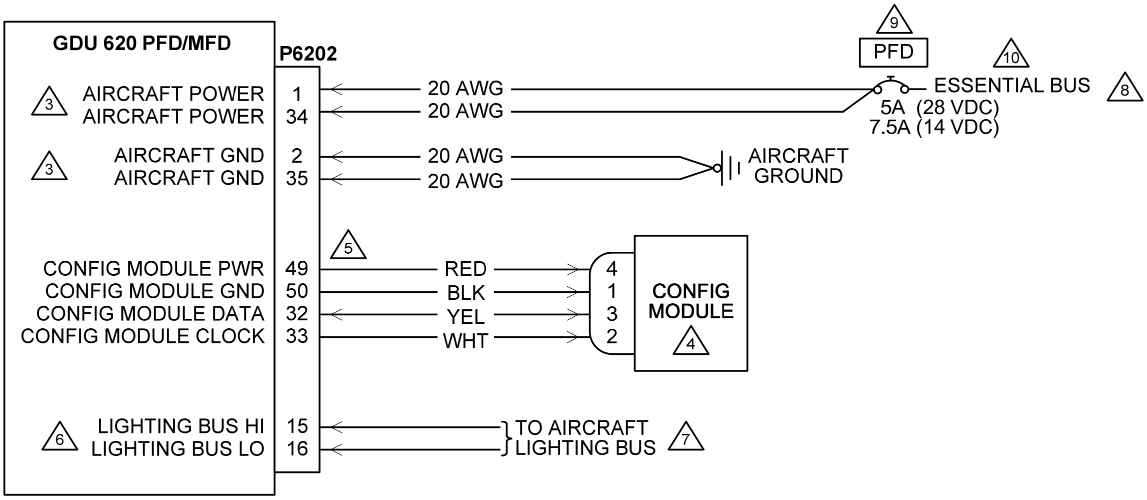


NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. GROUND DESIGNATIONS: SHIELD BLOCK GROUND AIRFRAME GROUND

3. BOTH POWER LEADS AND BOTH GROUND LEADS ARE REQUIRED.

4. CONFIGURATION MODULE IS MOUNTED IN THE BACKSHELL OF THE P6202 CONNECTOR.

5. CONFIGURATION MODULE HARNESS USES 28 AWG WIRES. CONTACTS SUPPLIED WITH CONFIGURATION MODULE MUST BE USED FOR CONNECTING CONFIGURATION MODULE HARNESS TO P6202.

6. THE GDU 620 MUST BE CONFIGURED FOR THE CORRECT LIGHTING BUS VOLTAGE (28 VDC, 14 VDC, 5 VDC OR 5 VAC). NO DAMAGE WILL OCCUR IF THE UNIT IS CONFIGURED INCORRECTLY. A MANUAL LIGHTING CONTROL OPTION IS ALSO AVAILABLE. REFER TO THE POST-INSTALLATION CONFIGURATION PROCEDURE.

7. OPTIONAL CONNECTION. IF NOT CONNECTED, THE GDU 620 LIGHTING MUST BE CONFIGURED TO AUTOMATICALLY COMPENSATE FOR AMBIENT LIGHTING CONDITIONS USING ITS PHOTOCELL. A MANUAL LIGHTING CONTROL OPTION IS ALSO AVAILABLE. REFER TO THE POST-INSTALLATION CONFIGURATION PROCEDURE.

8. THE GDU 620 MUST BE ON THE SAME POWER BUS AS THE GRS 77 AND GDC 74A. THE GDU 620 MUST NOT BE ON THE AVIONICS POWER BUS.

9. CIRCUIT BREAKER SHOULD BE LABELED AS SHOWN.

10. IF THE AIRCRAFT DOES NOT HAVE AN “ESSENTIAL” BUS, CONNECT TO A BUS THAT RECEIVES POWER AS SOON AS THE BATTERY MASTER IS TURNED ON. REFER TO SECTION 2.5.4 FOR ADDITIONAL INFORMATION.

Figure F-1. Power, Lighting and Configuration Module Interconnect (Single GDU)

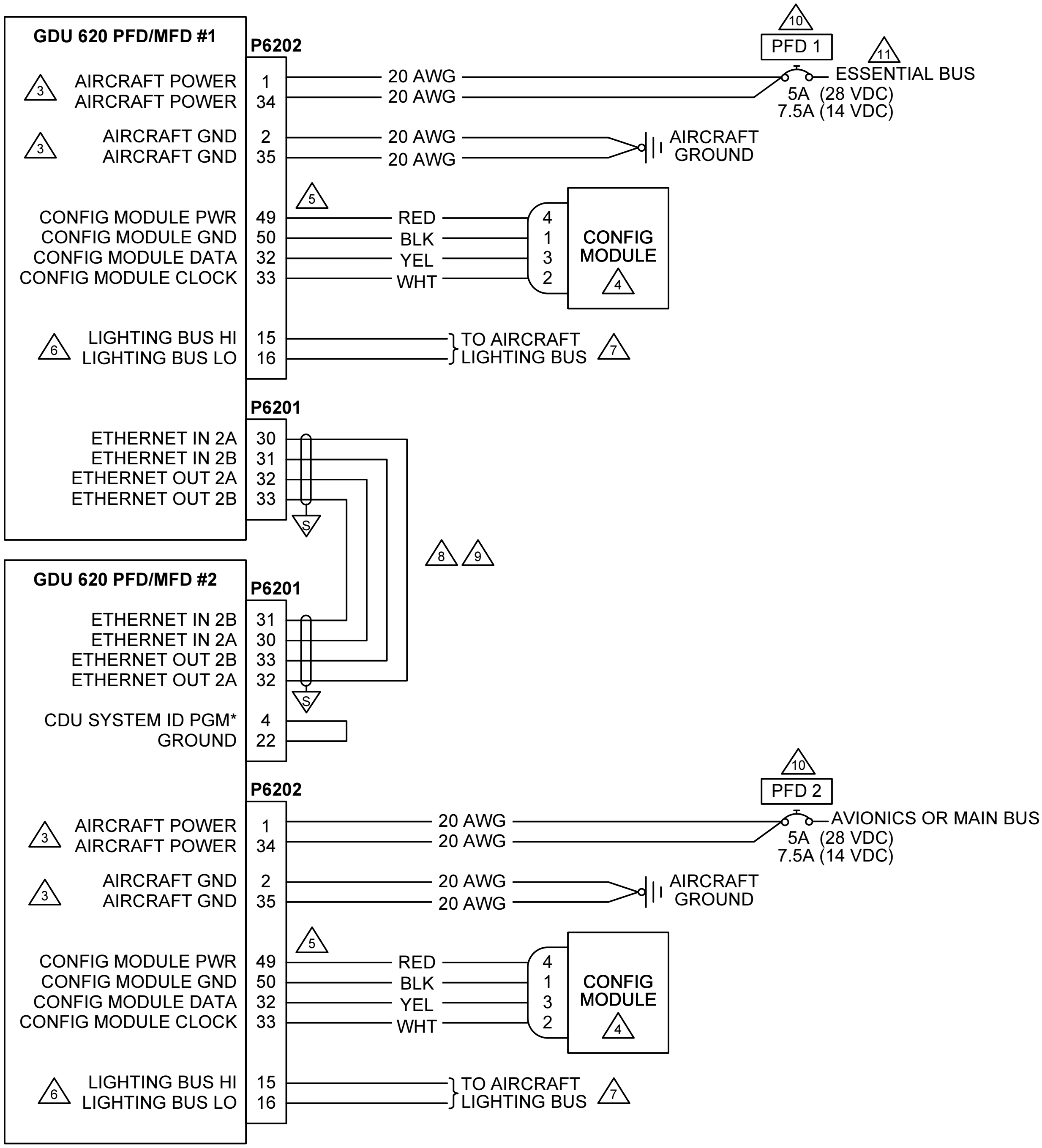


Figure F-2. Power, Lighting and Configuration Module Interconnect (Dual GDUs)
Sheet 1 of 2

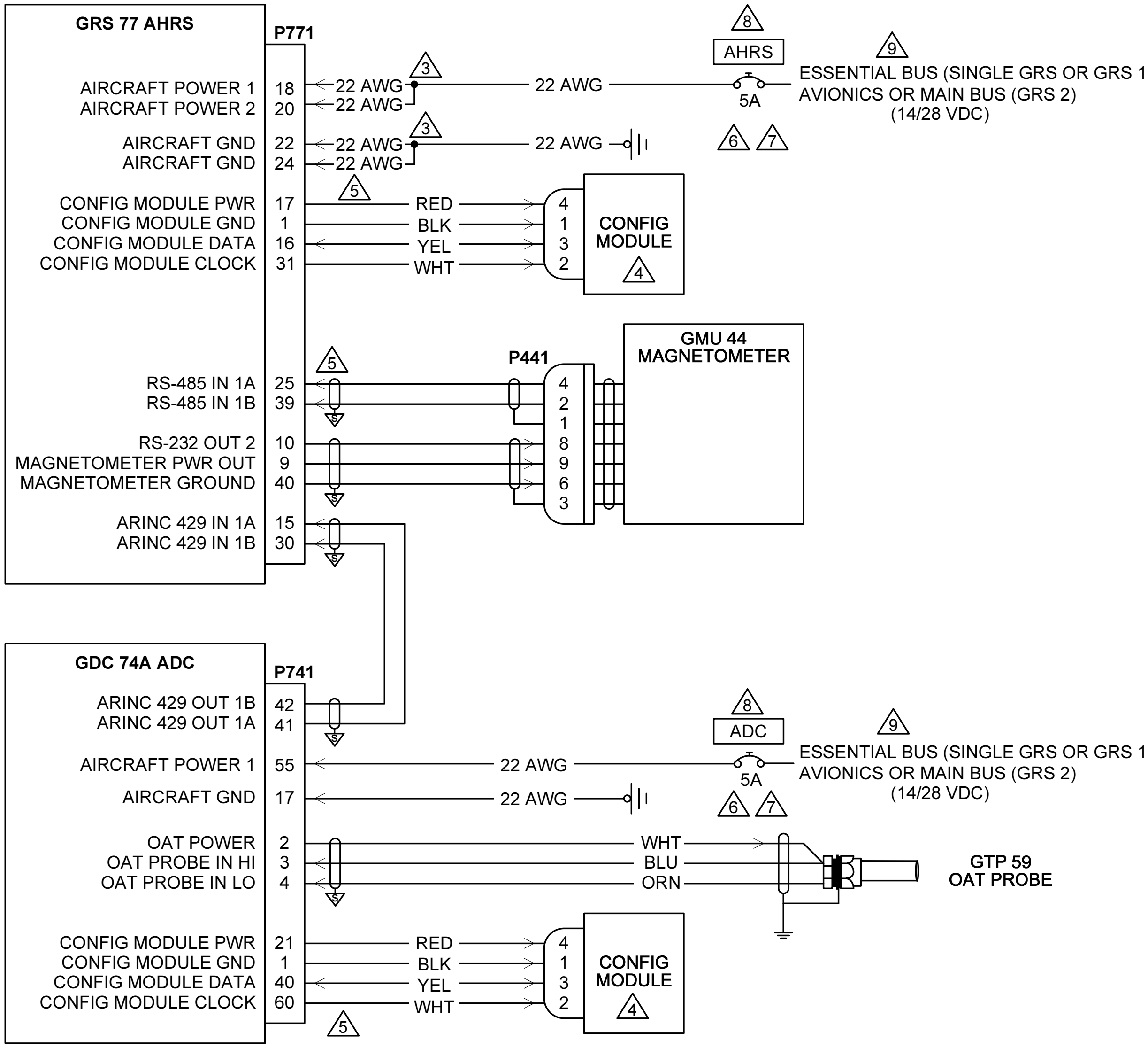
NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. GROUND DESIGNATIONS: SHIELD BLOCK GROUND AIRFRAME GROUND
3. BOTH POWER LEADS AND BOTH GROUND LEADS MUST BE CONNECTED.
4. CONFIGURATION MODULE IS MOUNTED IN THE BACKSHELL OF THE P6202 CONNECTOR.
5. CONTACTS SUPPLIED WITH CONFIGURATION MODULE MUST BE USED FOR CONNECTING CONFIGURATION MODULE HARNESS TO P6202.
6. THE GDU 620 MUST BE CONFIGURED FOR THE CORRECT LIGHTING BUS VOLTAGE (28 VDC, 14 VDC, 5 VDC OR 5 VAC). NO DAMAGE WILL OCCUR IF THE UNIT IS CONFIGURED INCORRECTLY. A MANUAL LIGHTING CONTROL OPTION IS ALSO AVAILABLE. REFER TO THE POST-INSTALLATION CONFIGURATION PROCEDURE.
7. OPTIONAL CONNECTION. IF NOT CONNECTED, THE GDU 620 LIGHTING MUST BE CONFIGURED TO AUTOMATICALLY COMPENSATE FOR AMBIENT LIGHTING CONDITIONS USING ITS PHOTOCELL. A MANUAL LIGHTING CONTROL OPTION IS ALSO AVAILABLE. REFER TO THE POST-INSTALLATION CONFIGURATION PROCEDURE.
8. GDU #1 MUST BE CONNECTED DIRECTLY TO GDU #2. IT IS NOT PERMITTED TO CONNECT ANOTHER DEVICE (E.G. GDL 69/69A) BETWEEN BOTH GDU'S.
9. USE AIRCRAFT GRADE CATEGORY 5 ETHERNET CABLE. THESE INCLUDE THE FOLLOWING:

MANUFACTURER	P/N
PIC WIRE AND CABLE	E10422 (22 AWG)
PIC WIRE AND CABLE	E10424 (24 AWG)
ELECTRONIC CABLE SPECIALIST	392404 (24 AWG)

10. CIRCUIT BREAKER SHOULD BE LABELED AS SHOWN.
11. IF THE AIRCRAFT DOES NOT HAVE AN "ESSENTIAL" BUS, CONNECT TO A BUS THAT RECEIVES POWER AS SOON AS THE BATTERY MASTER IS TURNED ON. REFER TO SECTION 2.5.4 FOR ADDITIONAL INFORMATION.
12. AT THE GDU 620, CONNECT SHIELD GROUNDS TO THE CONNECTOR BACKSHELL -- THE SHIELD LEADS MUST BE LESS THAN 3.0 ".

Figure F-2. Power, Lighting and Configuration Module Interconnect (Dual GDUs)
Sheet 2 of 2



NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. GROUND DESIGNATIONS: SHIELD BLOCK GROUND AIRFRAME GROUND

3. BOTH POWER LEADS AND BOTH GROUND LEADS ARE REQUIRED. THE SPLICE MUST BE INSIDE THE CONNECTOR BACKSHELL.

4. CONFIGURATION MODULE IS MOUNTED IN THE BACKSHELL OF THE LRU CONNECTOR.

5. CONFIGURATION MODULE HARNESS USES 28 AWG WIRES. CONTACTS SUPPLIED WITH CONFIGURATION MODULE MUST BE USED FOR CONNECTING CONFIGURATION MODULE HARNESS TO P771 OR P741.

6. FOR A SINGLE GDU INSTALLATION, CONNECT THE CIRCUIT BREAKER TO THE ESSENTIAL BUS.

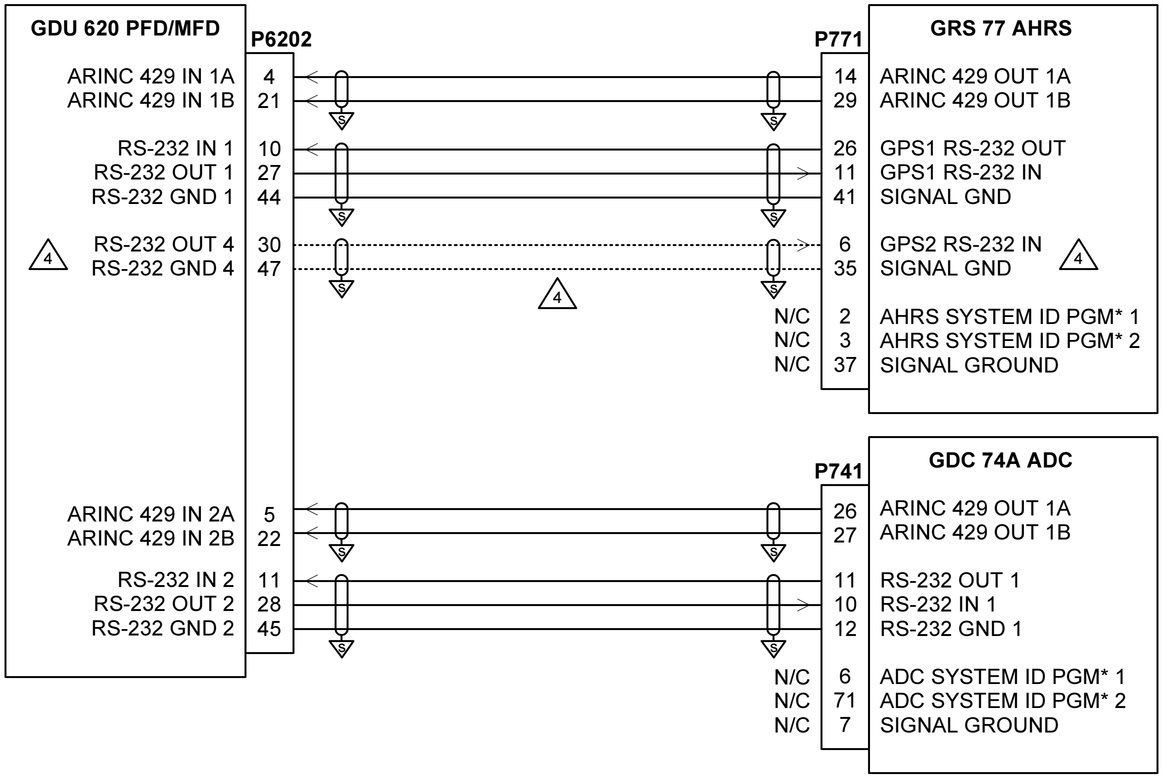
7. FOR A DUAL GDU INSTALLATION, CONNECT THE CIRCUIT BREAKER FOR THE SYSTEM 1 LRU TO THE ESSENTIAL BUS. FOR THE SYSTEM 2 LRU'S THE THE CIRCUIT BREAKER MAY BE CONNECTED TO THE AVIONICS OR MAIN BUS.

8. CIRCUIT BREAKER SHOULD BE LABELED AS SHOWN. LABEL AS SYSTEM 1 OR 2 AS APPROPRIATE FOR DUAL GDU 620 INSTALLATIONS (I.E. "AHRS 1", 'AHRS 2", "ADC 1" OR "ADC2").

9. IF THE AIRCRAFT DOES NOT HAVE AN "ESSENTIAL" BUS, CONNECT TO A BUS THAT RECEIVES POWER AS SOON AS THE BATTERY MASTER IS TURNED ON. REFER TO SECTION 2.5.4 FOR ADDITIONAL INFORMATION.

10 AT GRS 77 AND GDC 74A, CONNECT SHIELD GROUNDS TO THE CONNECTOR BACKSHELL -- THE SHIELD LEADS MUST BE LESS THAN 3.0 ".

Figure F-3. Power/Config Module/OAT- GDC 74A/GRS 77/GMU 44 Interconnect

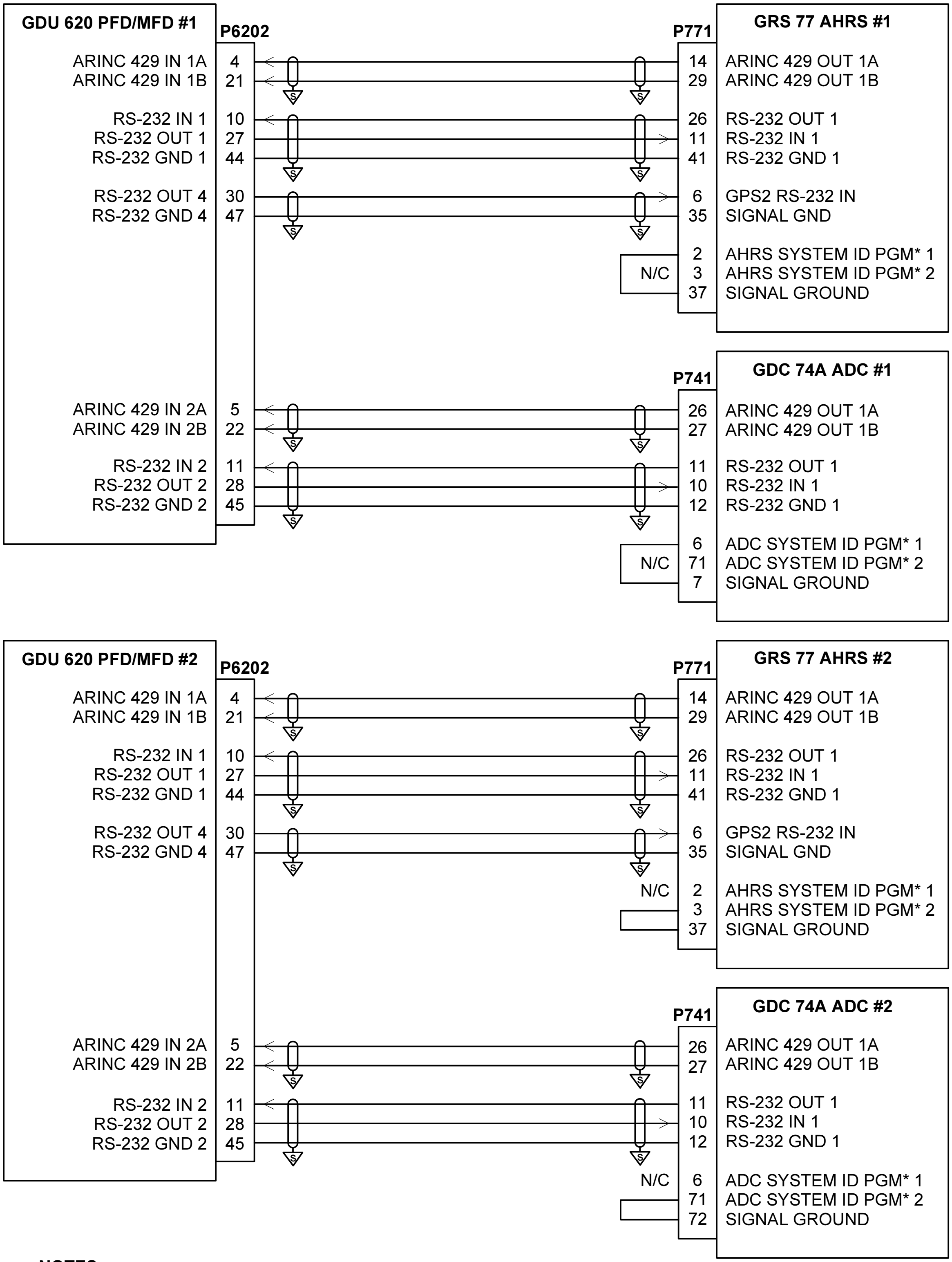


NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. GROUND DESIGNATIONS: SHIELD BLOCK GROUND AIRFRAME GROUND
3. AT GDU 620, GRS 77 AND GDC 74A, CONNECT SHIELD GROUNDS TO THE CONNECTOR BACKSHELL -- THE SHIELD LEADS MUST BE LESS THAN 3.0 ".

4\. THIS CONNECTION IS ONLY REQUIRED IF GPS #2 IS CONNECTED TO THE GDU 620.

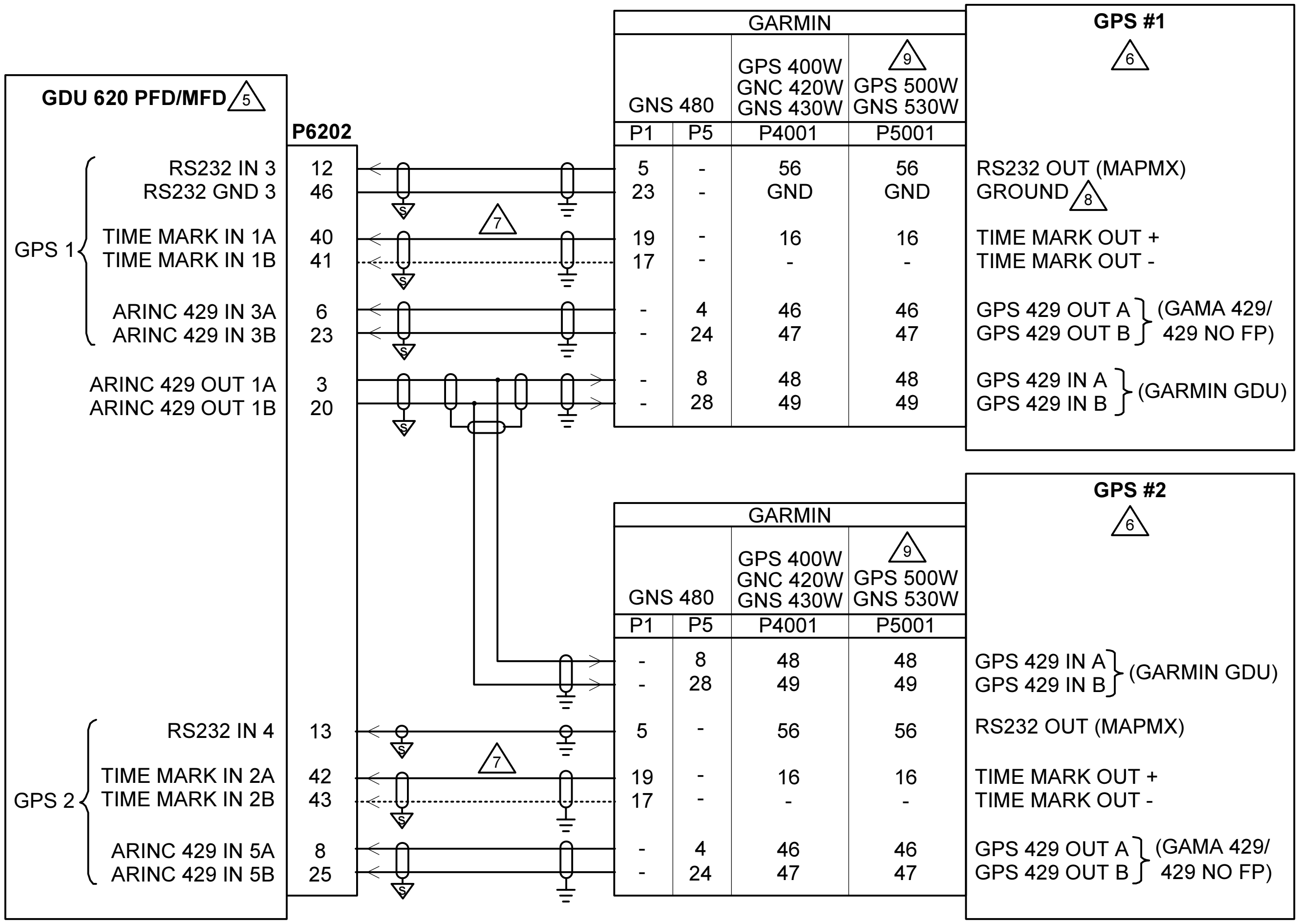
Figure F-4. Attitude and Air Data Interconnect (Single GDU)



NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. GROUND DESIGNATIONS: SHIELD BLOCK GROUND AIRFRAME GROUND
3. AT GDU 620, GRS 77 AND GDC 74A, CONNECT SHIELD GROUNDS TO THE CONNECTOR BACKSHELL -- THE SHIELD LEADS MUST BE LESS THAN 3.0 ".

Figure F-5. Attitude and Air Data Interconnect (Dual GDUs)



NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. GROUND DESIGNATIONS: SHIELD BLOCK GROUND AIRFRAME GROUND
3. AT GDU 620, CONNECT SHIELD GROUNDS TO THE CONNECTOR BACKSHELL -- THE SHIELD LEADS MUST BE LESS THAN 3.0 ". CONNECT OTHER SHIELD GROUNDS TO AIRCRAFT GROUND WITH AS SHORT A CONDUCTOR AS PRACTICAL.
4. IF ONLY ONE NAVIGATOR IS INSTALLED, WIRE AS SHOWN FOR GPS 1.

5. FOR GDU 620 SETUP ITEMS REFER TO SECTION 5.5

6. FOR NAVIGATOR SETUP ITEMS REFER TO APPENDIX E.

7. THE TIME MARK B/- CONNECTION (P6202-41/43) IS NOT REQUIRED FOR THE 400W/500W SERIES UNITS AND MUST BE LEFT UNCONNECTED IN THE INSTALLATION. A SINGLE CONDUCTOR SHIELDED WIRE MAY BE USED FOR THE TIME MARK IN THIS CASE.

8. FOR PINS IDENTIFIED WITH “GND”, CONNECT WIRE TO GROUND AT THE REAR OF THE UNIT.

9. IF A TAWS-EQUIPPED 500W SERIES UNIT IS INSTALLED, IT **MUST** BE CONNECTED AS GPS1 – ONLY TAWS ANNUNCIATIONS FROM GPS1 ARE DISPLAYED ON THE PFD. IF TWO TAWS-EQUIPPED UNITS ARE INSTALLED, THE TAWS-EQUIPPED UNIT THAT IS CONNECTED TO THE AUDIO PANEL **MUST** BE CONNECTED AS GPS1.

10. REFER TO MANUFACTURER’S DOCUMENTATION FOR COMPLETE PIN-OUT AND INTERCONNECT INFORMATION. PIN-OUTS OF OTHER UNITS SHOWN FOR REFERENCE ONLY.

Figure F-6. GPS Source Interconnect (Single GDU)

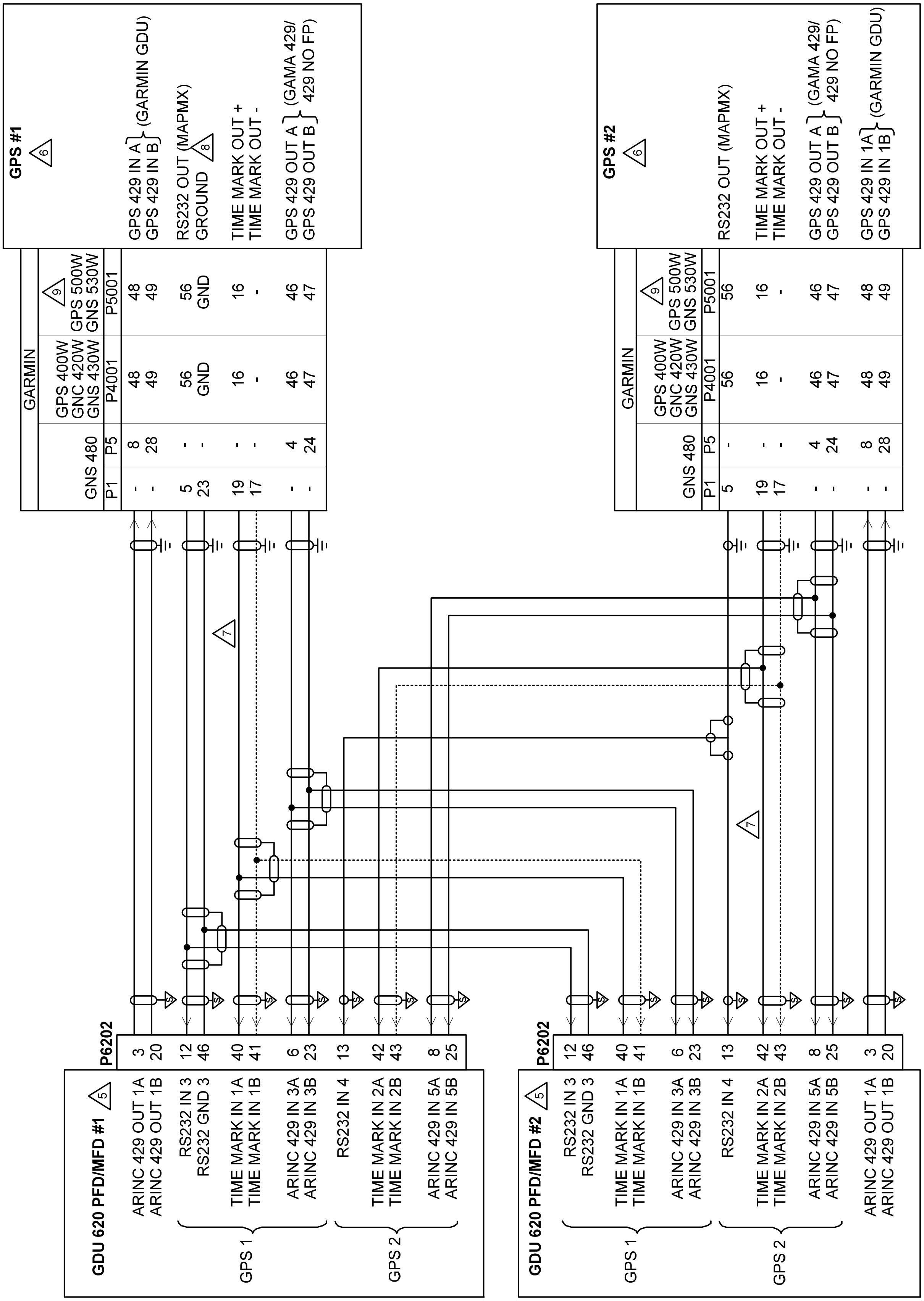


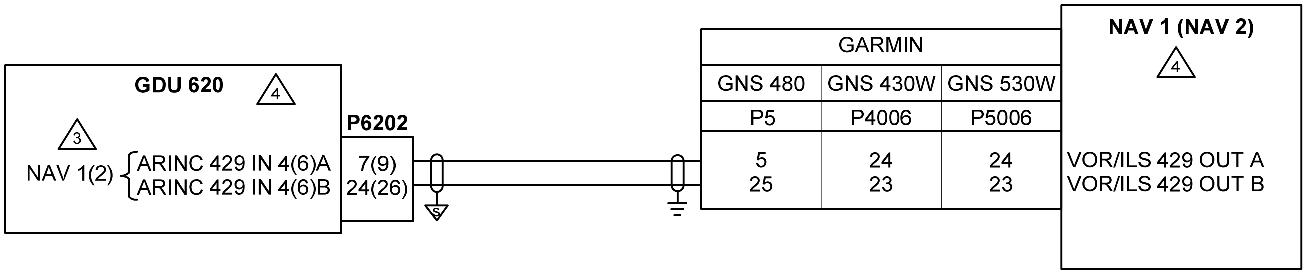
Figure F-7. GPS Source Interconnect (Dual GDUs)
Sheet 1 of 2

NOTES:

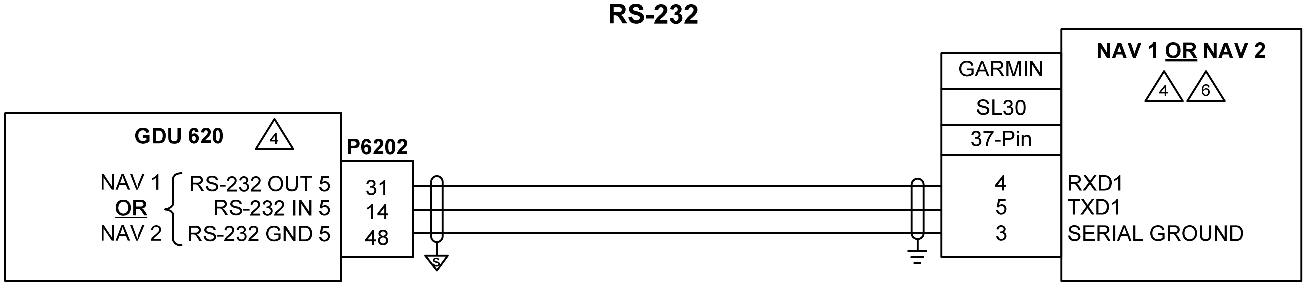
1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. GROUND DESIGNATIONS: SHIELD BLOCK GROUND AIRFRAME GROUND
3. AT GDU 620, CONNECT SHIELD GROUNDS TO THE CONNECTOR BACKSHELL -- THE SHIELD LEADS MUST BE LESS THAN 3.0 ". CONNECT OTHER SHIELD GROUNDS TO AIRCRAFT GROUND WITH AS SHORT A CONDUCTOR AS PRACTICAL.
4. FOR INSTALLATIONS WITH DUAL GDU'S, TWO SUITABLE GPS SENSORS ARE REQUIRED.
5. FOR GDU 620 SETUP ITEMS REFER TO SECTION 5.5
6. FOR NAVIGATOR SETUP ITEMS REFER TO APPENDIX E.
7. THE TIME MARK B/- CONNECTION (P6202-41/43) IS NOT REQUIRED FOR THE 400W/500W SERIES UNITS AND MUST BE LEFT UNCONNECTED IN THE INSTALLATION. A SINGLE CONDUCTOR SHIELDED WIRE MAY BE USED FOR THE TIME MARK IN THIS CASE.
8. FOR PINS IDENTIFIED WITH "GND", CONNECT WIRE TO GROUND AT THE REAR OF THE UNIT.
9. IF A TAWS-EQUIPPED 500W SERIES UNIT IS INSTALLED, IT **MUST** BE CONNECTED AS GPS1 – ONLY TAWS ANNUNCIATIONS FROM GPS1 ARE DISPLAYED ON THE PFD. IF TWO TAWS-EQUIPPED UNITS ARE INSTALLED, THE TAWS-EQUIPPED UNIT THAT IS CONNECTED TO THE AUDIO PANEL **MUST** BE CONNECTED AS GPS1.
10. REFER TO MANUFACTURER'S DOCUMENTATION FOR COMPLETE PIN-OUT AND INTERCONNECT INFORMATION. PIN-OUTS OF OTHER UNITS SHOWN FOR REFERENCE ONLY.

Figure F-7. GPS Source Interconnect (Dual GDUs)
Sheet 2 of 2

ARINC 429



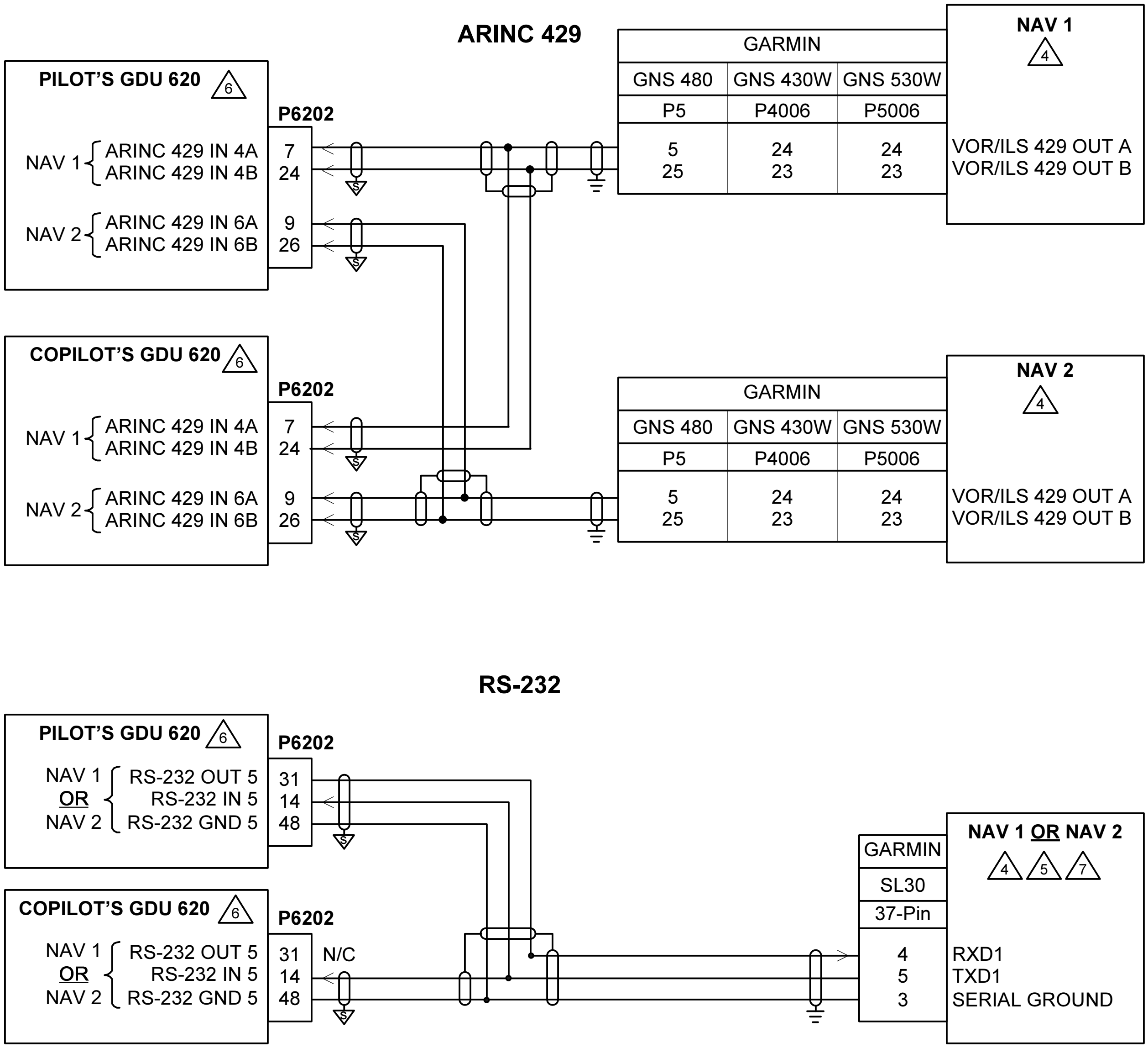
RS-232



NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. AT GDU 620, CONNECT SHIELD GROUNDS TO THE CONNECTOR BACKSHELL -- THE SHIELD LEADS MUST BE LESS THAN 3.0 ". CONNECT OTHER SHIELD GROUNDS TO AIRCRAFT GROUND WITH AS SHORT A CONDUCTOR AS PRACTICAL, IN ACCORDANCE WITH LRU INSTALLATION INSTRUCTIONS.
3. IF ONLY ONE NAV RECEIVER IS INSTALLED, WIRE AS SHOWN FOR NAV 1.
4. FOR GDU 620 SETUP ITEMS REFER TO SECTION 5.5.
5. FOR NAVIGATOR SETUP ITEMS REFER TO APPENDIX E.
6. ONLY ONE SL30 MAY BE CONNECTED TO THE GDU 620. IT CAN BE CONFIGURED AS NAV 1, OR AS NAV 2 IF NAV 1 IS CONFIGURED FOR AN ARINC 429 NAV SOURCE.
7. GROUND DESIGNATIONS: SHIELD BLOCK GROUND AIRFRAME GROUND

Figure F-8. Navigation Receiver Interconnect (Single GDU)



NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. GROUND DESIGNATIONS: SHIELD BLOCK GROUND AIRFRAME GROUND
3. AT GDU 620, CONNECT SHIELD GROUNDS TO THE CONNECTOR BACKSHELL -- THE SHIELD LEADS MUST BE LESS THAN 3.0 ". CONNECT OTHER SHIELD GROUNDS TO AIRCRAFT GROUND WITH AS SHORT A CONDUCTOR AS PRACTICAL, IN ACCORDANCE WITH LRU INSTALLATION INSTRUCTIONS.

4. IF ONLY ONE NAV RECEIVER IS INSTALLED, WIRE AS SHOWN FOR NAV 1.

5. ONLY ONE SL30 MAY BE CONNECTED TO THE GDU 620. IT CAN BE CONFIGURED AS NAV 1, OR AS NAV 2 IF NAV 1 IS CONFIGURED FOR AN ARINC 429 NAV SOURCE.

6. FOR GDU 620 SETUP ITEMS REFER TO SECTION 5.5.

7. THE SL30 MUST BE CONNECTED AS THE SAME NAVIGATION SOURCE TO BOTH GDU'S (I.E. AS NAV 1 ON BOTH GDU'S, OR AS NAV 2 ON BOTH GDU'S).

Figure F-9. Navigation Receiver Interconnect (Dual GDUs)

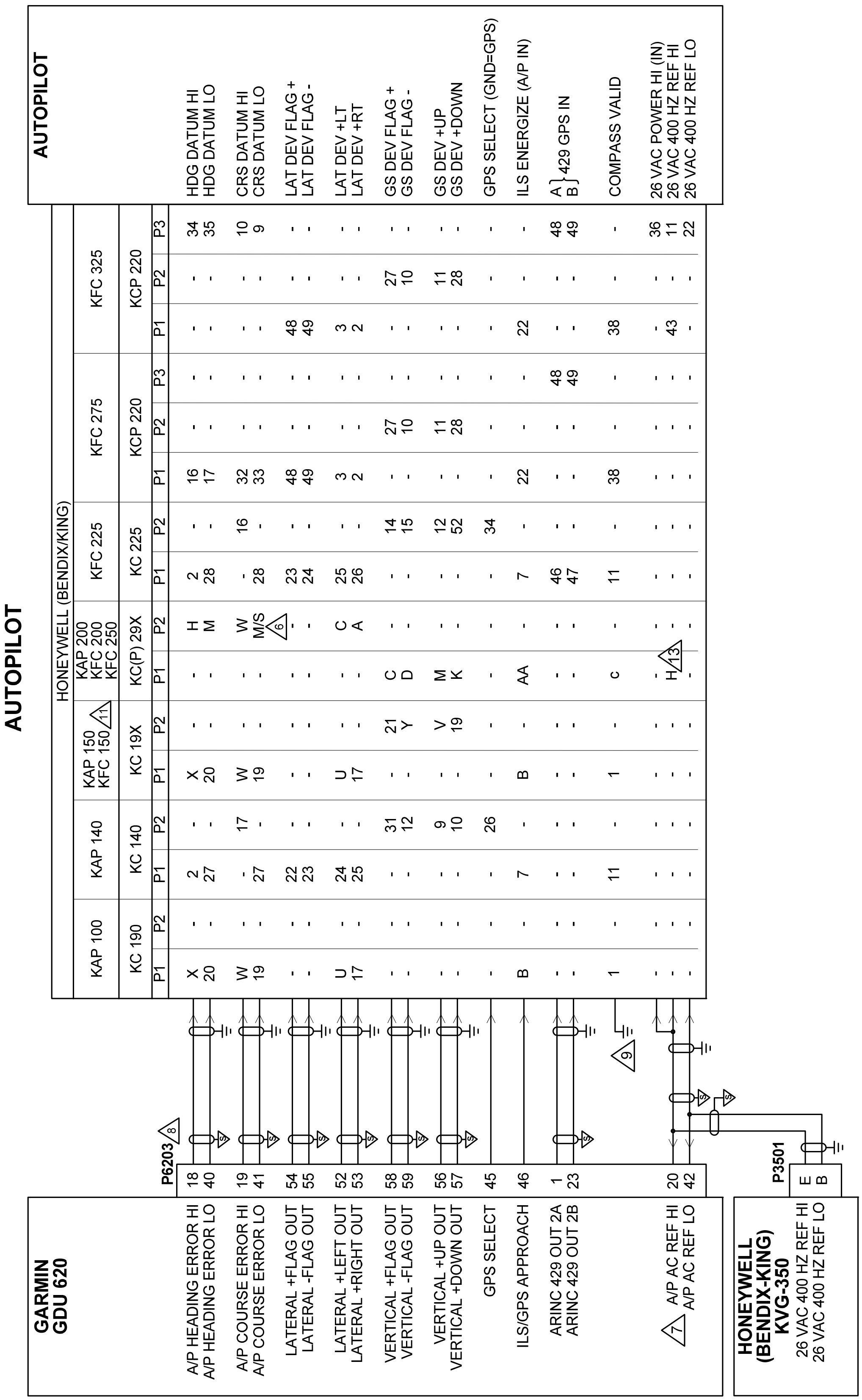


Figure F-10. Honeywell (Bendix/King) Autopilot/Flight Director Interconnect
Sheet 1 of 4

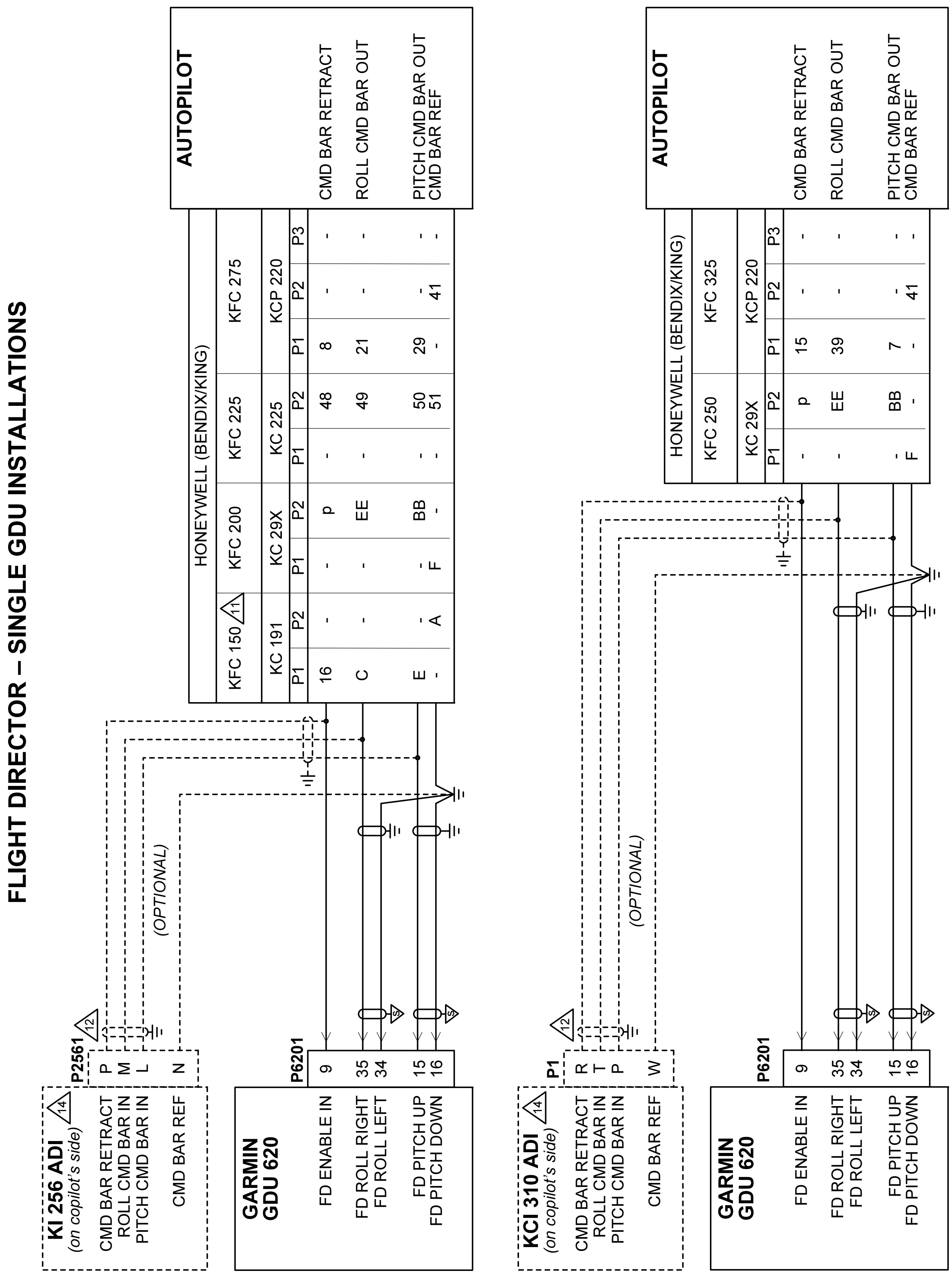


Figure F-10. Honeywell (Bendix/King) Autopilot/Flight Director Interconnect
Sheet 2 of 4

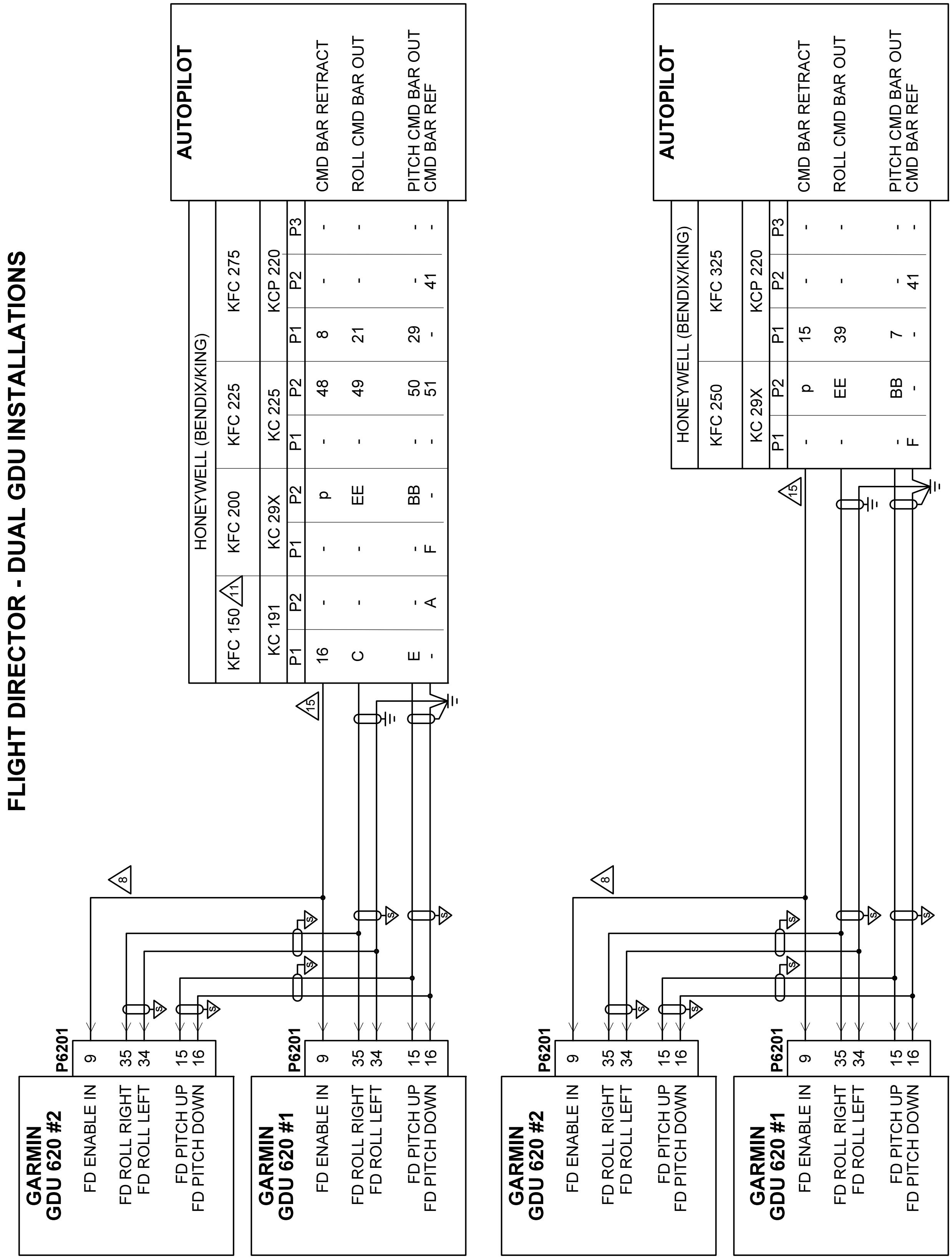


Figure F-10. Honeywell (Bendix/King) Autopilot/Flight Director Interconnect
Sheet 3 of 4

NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. GROUND DESIGNATIONS: SHIELD BLOCK GROUND AIRFRAME GROUND
3. AT THE GDU 620, CONNECT SHIELD GROUNDS TO THE CONNECTOR BACKSHELL -- THE SHIELD LEADS MUST BE LESS THAN 3.0 ". CONNECT OTHER SHIELD GROUNDS TO AIRCRAFT CHASSIS WITH AS SHORT A CONDUCTOR AS PRACTICAL.
4. REFERENCE SECTION 5.5 FOR GDU AUTOPILOT CONFIGURATION.
5. CONNECTIONS ARE REQUIRED ONLY FOR THOSE INPUTS THAT THE AUTOPILOT COMPUTER SUPPORTS.
6. ON THE KFC 200, CONNECT BOTH THE A/P HEADING ERROR LO AND A/P COURSE ERROR LO TO PIN M. ON THE KFC 250, CONNECT THE A/P HEADING ERROR LO TO PIN M AND THE A/P COURSE ERROR LO TO PIN S.
7. A/P AC REFERENCE CONNECTIONS TO THE GDU 620 ARE NEEDED ONLY IF THE AUTOPILOT REQUIRES THE AC REFERENCE.
8. FOR DUAL-GDU 620 SYSTEMS, CONNECT THE FD SIGNALS TO GDU #2 AS SHOWN. ALL OTHER AUTOPILOT SIGNALS SHOULD BE CONNECTED ONLY TO GDU #1.
9. THE COMPASS VALID DISCRETE INPUT TO THE AUTOPILOT MUST BE GROUNDED WHEN THE G600 IS INSTALLED. THE AUTOPILOT USES THIS INPUT TO DETERMINE THE VALIDITY OF THE HEADING AND COURSE DATUM (ERROR) SIGNALS. REFER TO APPENDIX E FOR ADDITIONAL INFORMATION.
10. (NOT USED)
11. EFIS-ENABLED KC 19X COMPUTER (P/N 065-0042-16) IS NOT SUPPORTED.
12. **FLIGHT DIRECTOR WIRING TO EXISTING ADI MUST BE DISCONNECTED IF THIS INDICATOR IS USED AS A STANDBY INSTRUMENT FOR THE G600.** IF THIS INDICATOR IS BEING RELOCATED TO THE COPILOT'S SIDE, WIRING MAY BE CONNECTED IN PARALLEL TO THIS ADI. THE WIRING TO THIS ADI MUST BE CONNECTED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. THIS ADI MUST BE LOCATED ON IN ACCORDANCE WITH SECTION 2.5.11.8.
13. AC REFERENCE APPLICABLE TO THE KFC 250 ONLY.
14. IF THE FLIGHT DIRECTOR IS BEING DISPLAYED ON THE COPILOT'S ADI, THIS FLIGHT DIRECTOR ALIGNMENT MUST BE CORRECTLY ADJUSTED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS PRIOR TO MAKING ANY ADJUSTMENTS TO THE GDU 620.
15. FOR DUAL GDU INSTALLATIONS, FLIGHT DIRECTOR WIRING MUST BE DISCONNECTED FROM THE EXISTING ADI.

Figure F-10. Honeywell (Bendix/King) Autopilot/Flight Director Interconnect
Sheet 4 of 4

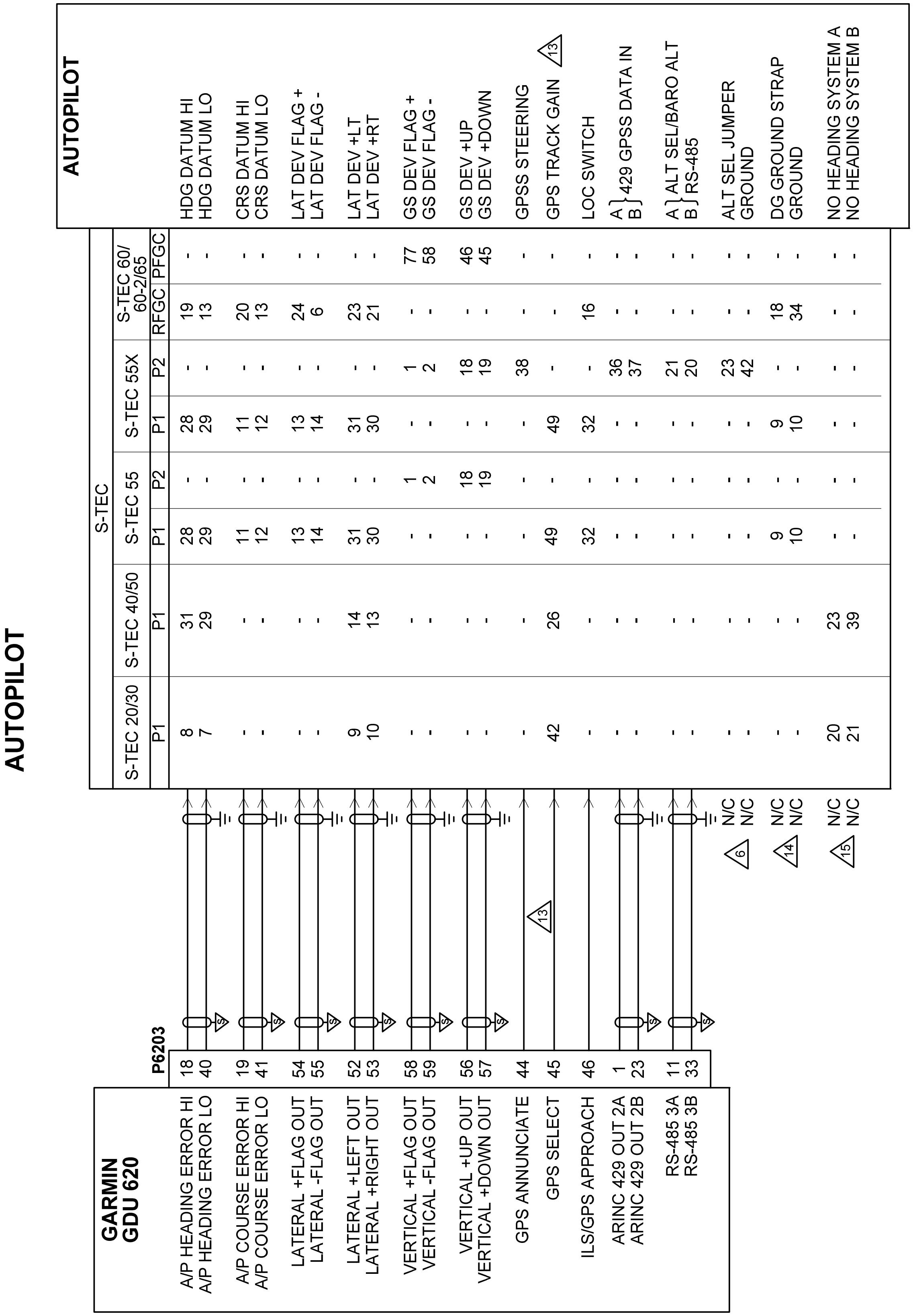


Figure F-11. S-TEC Autopilot/Flight Director Interconnect
Sheet 1 of 4

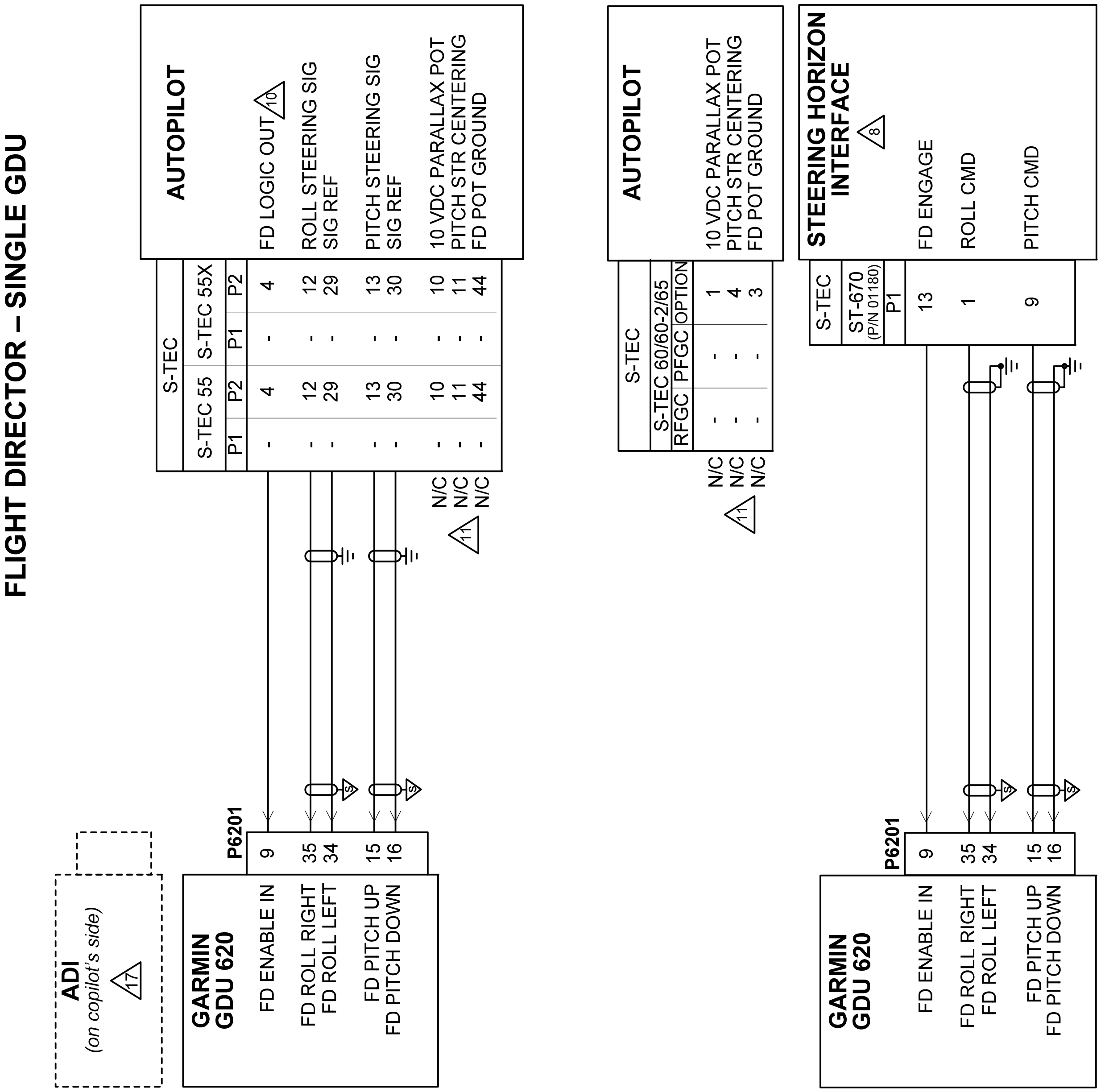


Figure F-11. S-TEC Autopilot/Flight Director Interconnect
Sheet 2 of 4

FLIGHT DIRECTOR (CONT'D)

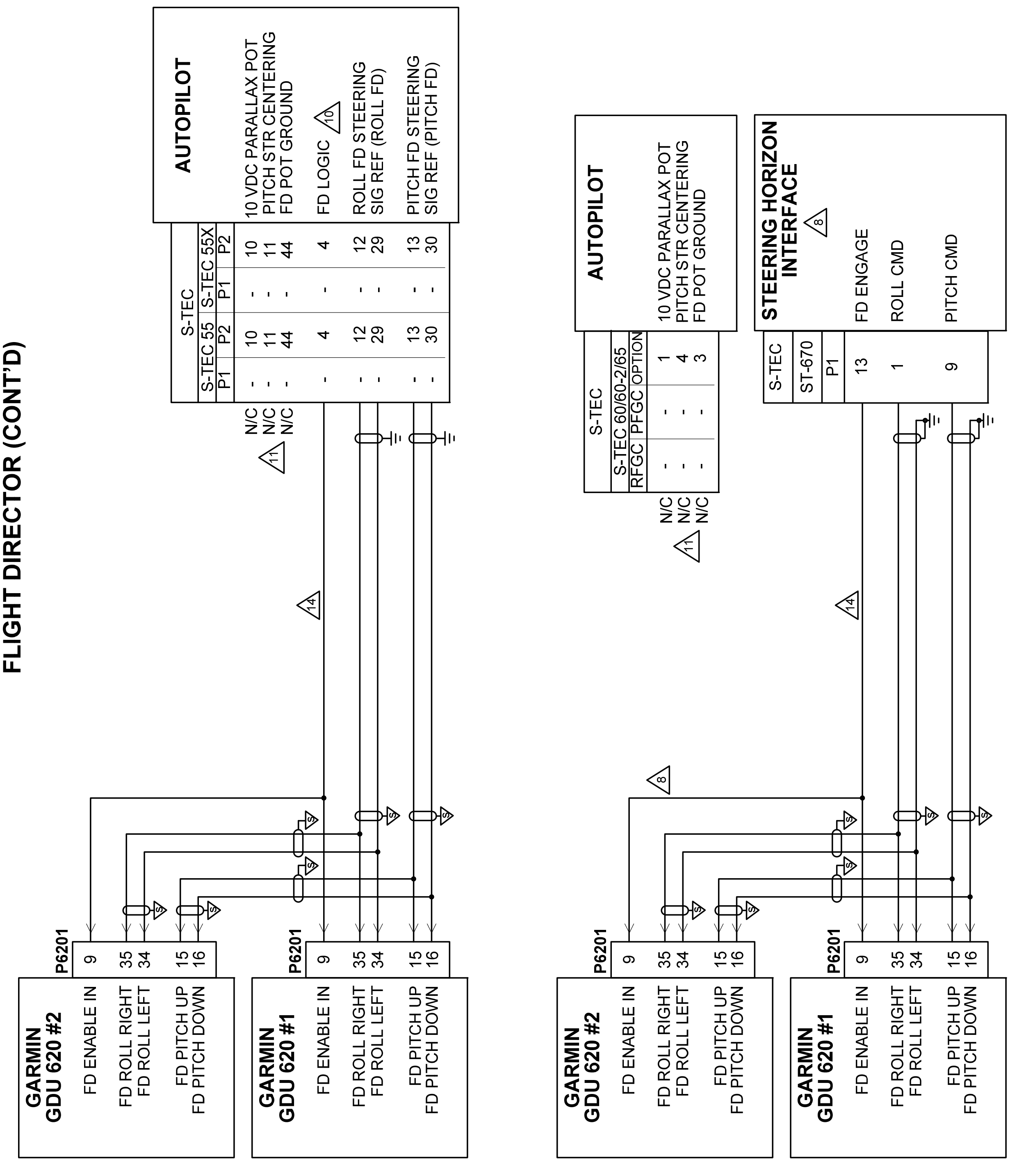


Figure F-11. S-TEC Autopilot/Flight Director Interconnect
Sheet 3 of 4

NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. GROUND DESIGNATIONS: SHIELD BLOCK GROUND AIRFRAME GROUND
3. AT THE GDU 620, CONNECT SHIELD GROUNDS TO THE CONNECTOR BACKSHELL -- THE SHIELD LEADS MUST BE LESS THAN 3.0 ". CONNECT OTHER SHIELD GROUNDS TO AIRCRAFT GROUND WITH AS SHORT A CONDUCTOR AS PRACTICAL.
4. REFERENCE SECTIONS 5.5.9 AND 5.5.10 FOR GDU AUTOPILOT AND FLIGHT DIRECTOR CONFIGURATION.
5. CONNECTIONS ARE REQUIRED ONLY FOR THOSE INPUTS THAT THE AUTOPILOT COMPUTER SUPPORTS.
6. ALT SEL JUMPER SHOULD **NOT** BE INSTALLED IF THE GDU 620 IS PROVIDING THE ALTITUDE PRESELECT FUNCTION. WHEN THE GDU 620 IS USED FOR THE ALTITUDE PRESELECT FUNCTION, IT EMULATES THE S-TEC SA-200 (P/N 01282) ALTITUDE SELECTOR/ALERTER.
7. FOR DUAL-GDU 620 SYSTEMS, CONNECT THE FD SIGNALS TO THE SAME PINS ON GDU #2 AS WELL. ALL OTHER AUTOPILOT SIGNALS SHOULD BE CONNECTED ONLY TO GDU #1.
8. THE ST-670 (P/N 01180 FOR THE KI-256) IS REQUIRED TO SUPPORT THE FLIGHT DIRECTOR DISPLAY FROM THE S-TEC 60, 60-2, AND 65 AUTOPILOTS.
9. FLIGHT DIRECTOR WIRING TO EXISTING ADI MUST BE DISCONNECTED IF THIS INDICATOR IS USED AS A STANDBY INSTRUMENT FOR THE G600.
10. FD LOGIC OUTPUT FROM THE 55/55X (P2-4) MUST **NOT** BE CONNECTED TO ST-645 REMOTE ANNUNCIATOR (P1-20). IF THE ST-645 WAS PREVIOUSLY INSTALLED, THE WIRE CONNECTING THE 55/55X COMPUTER P2-4 TO ANNUNCIATOR P1-20 MUST BE REMOVED OR CAPPED AND STOWED
11. TO SUPPORT THE FLIGHT DIRECTOR INTERFACE WITH THE G600, THE PILOT-ACCESSIBLE PARALLAX POT CONNECTIONS **MUST** BE REMOVED (SINCE THE G600 FLIGHT DIRECTOR PRESENTATION IS ON AN LCD DISPLAY, THERE ARE NO PARALLAX ISSUES).
12. NOT USED.
13. THE AUTOPILOT “GPS TRACK GAIN” INPUT MAY BE CONNECTED TO THE GDU 620 “GPS ANNUNCIATE” OUTPUT (P6203-44) INSTEAD OF THE “GPS SELECT” OUTPUT (P6203-45).
14. IF THE GDU 620 IS REPLACING A DIRECTIONAL GYRO, ENSURE THAT THE “DG GROUND STRAP” JUMPER IS REMOVED.
15. IF THE GDU 620 IS BEING INSTALLED IN AN AIRCRAFT THAT HAD NO HEADING SYSTEM, ENSURE THAT THE “NO HEADING SYSTEM” JUMPER IS REMOVED.
16. CONNECT OTHER PINS THAT ARE NOT SHOWN IN ACCORDANCE WITH THE MANUFACTURER’S INSTRUCTIONS.
17. THE FLIGHT DIRECTOR CANNOT BE DISPLAYED ON AN ADI ON THE COPILOT’S SIDE BECAUSE THERE IS NO WAY TO ADJUST THE FLIGHT DIRECTOR OFFSET FOR THIS ADI AFTER THE PARALLAX POT IS REMOVED.

Figure F-11. S-TEC Autopilot/Flight Director Interconnect
Sheet 4 of 4

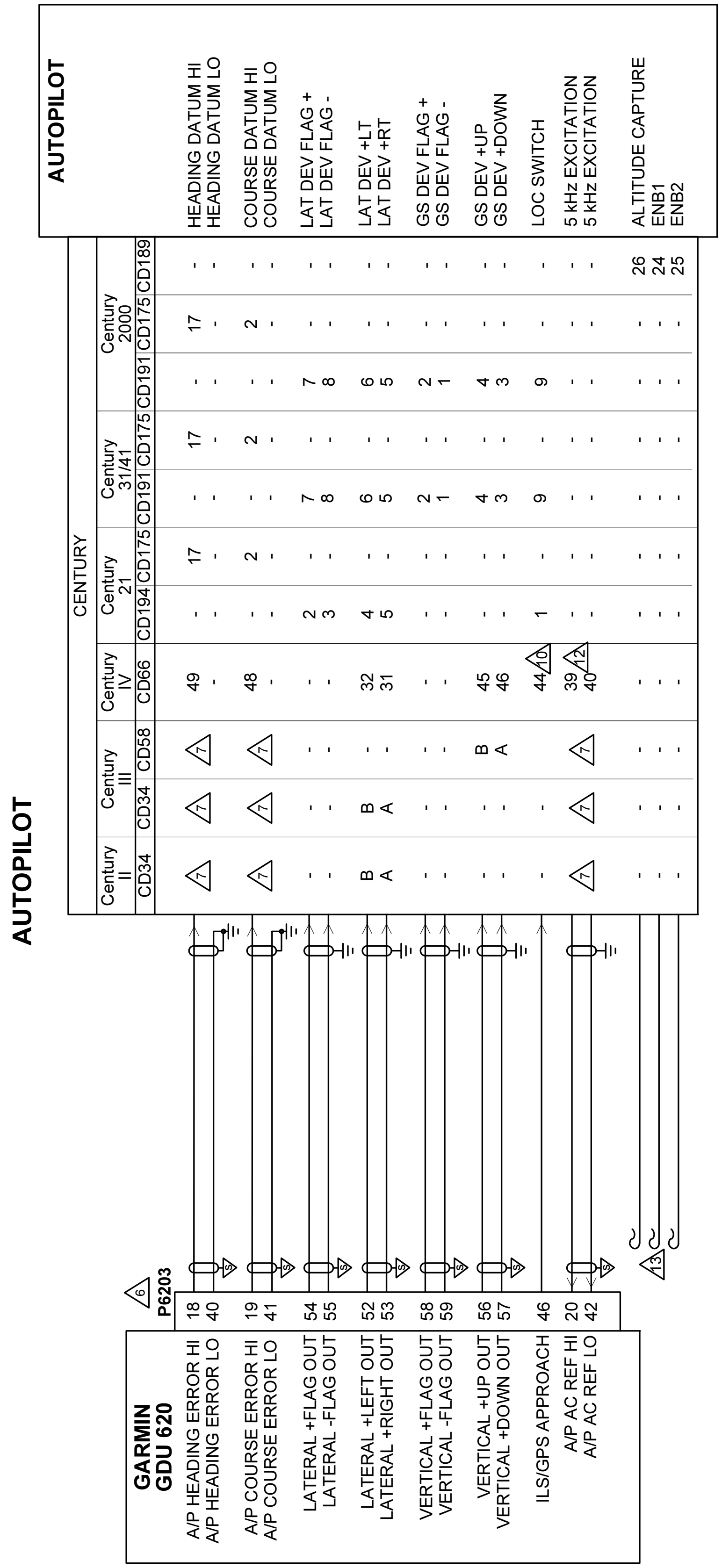


Figure F-12. Century Autopilot/Flight Director Interconnect
Sheet 1 of 4

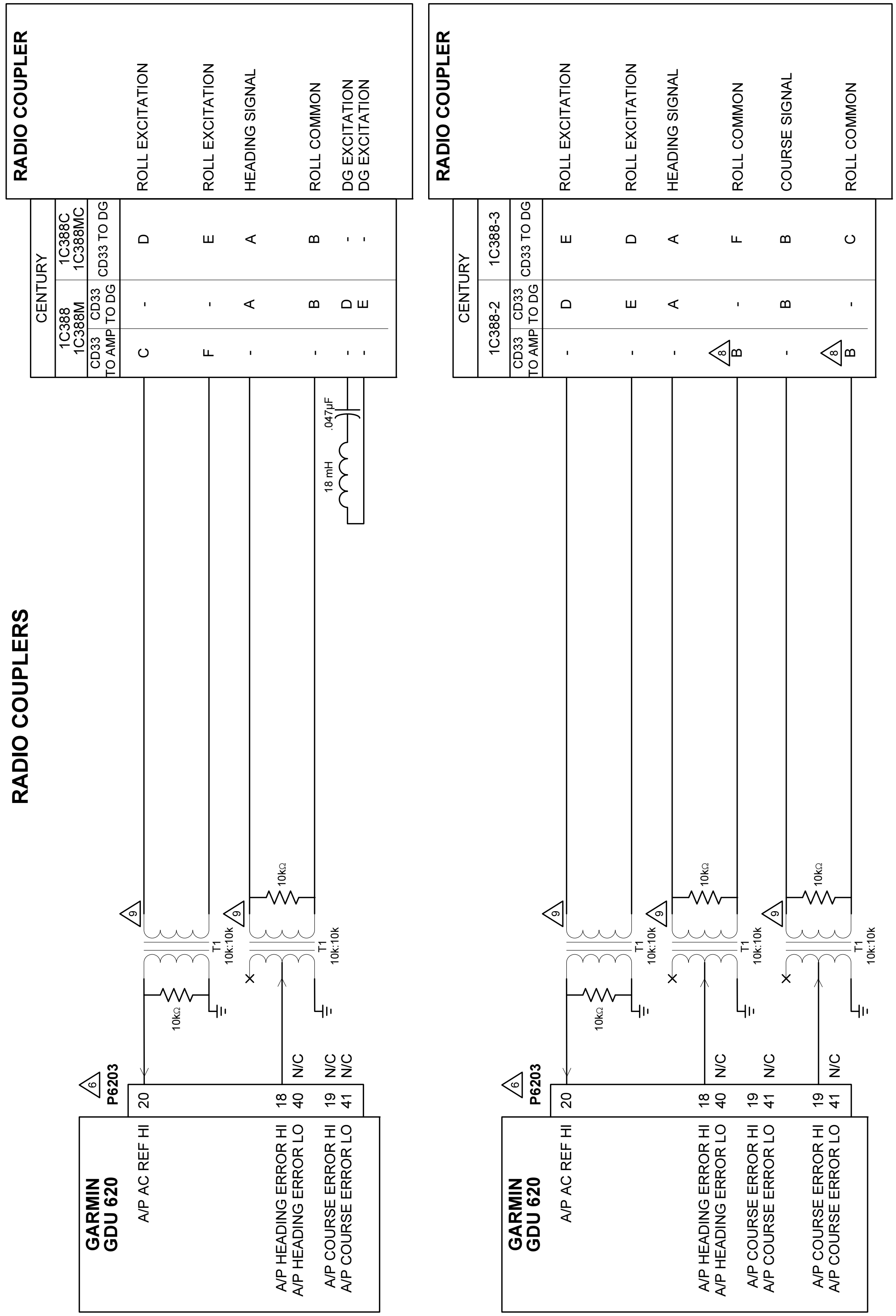


Figure F-12. Century Autopilot/Flight Director Interconnect
Sheet 2 of 4

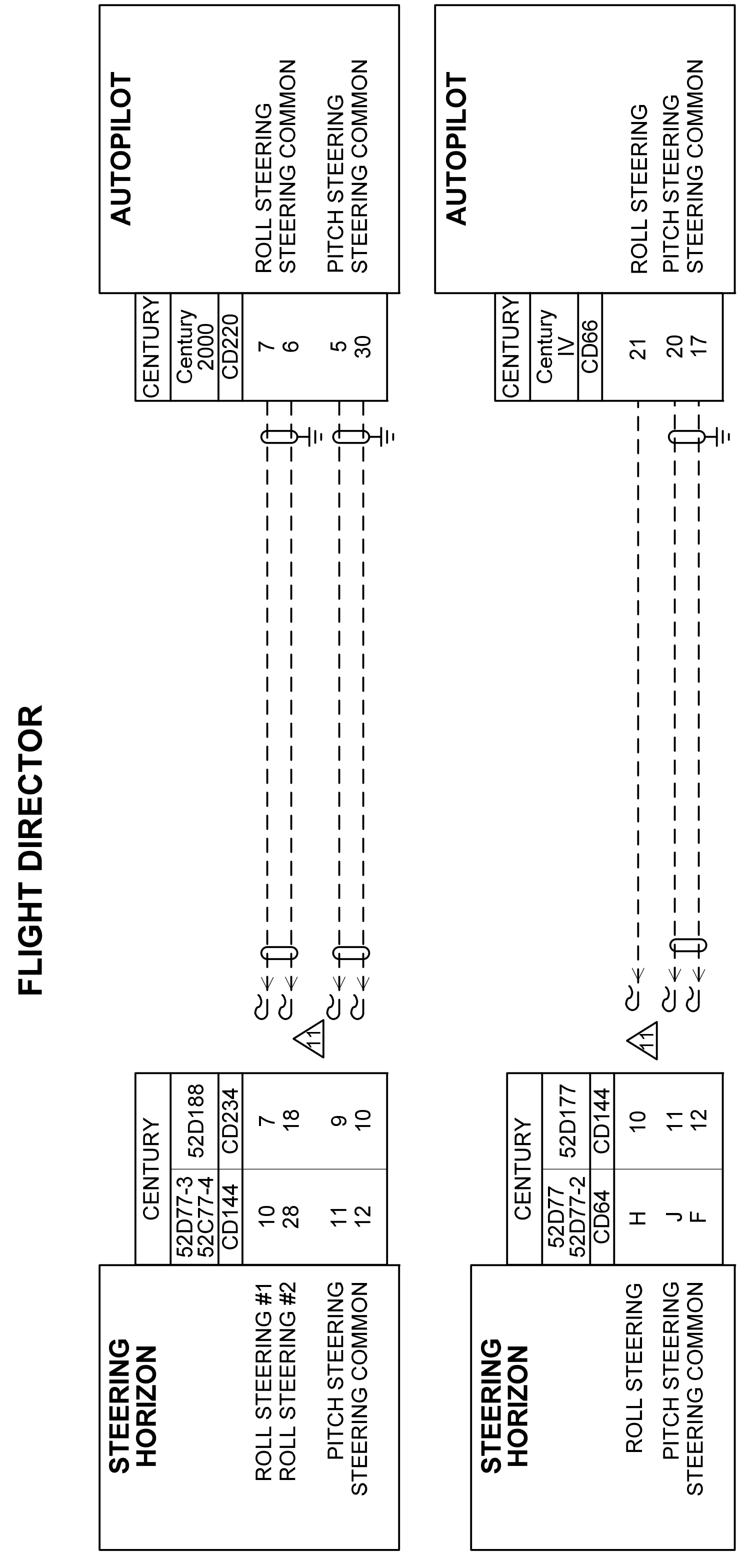
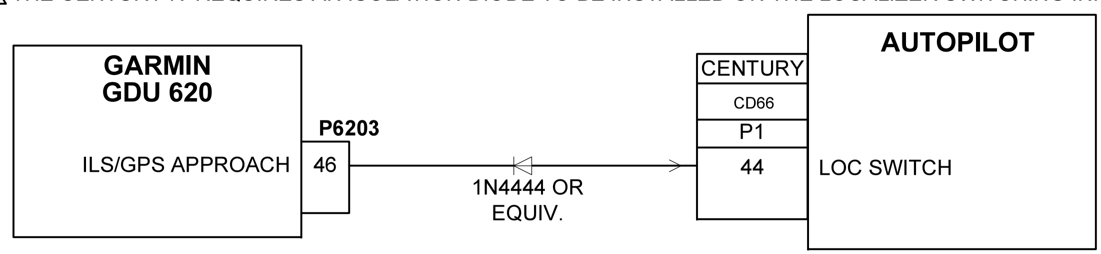


Figure F-12. Century Autopilot/Flight Director Interconnect
Sheet 3 of 4

NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. GROUND DESIGNATIONS: SHIELD BLOCK GROUND AIRFRAME GROUND
3. AT THE GDU 620, CONNECT SHIELD GROUNDS TO THE CONNECTOR BACKSHELL -- THE SHIELD LEADS MUST BE LESS THAN 3.0 ". CONNECT OTHER SHIELD GROUNDS TO AIRCRAFT GROUND WITH AS SHORT A CONDUCTOR AS PRACTICAL.
4. REFERENCE SECTION 5.5 FOR GDU AUTOPILOT CONFIGURATION.
5. CONNECTIONS ARE REQUIRED ONLY FOR THOSE INPUTS THAT THE AUTOPILOT COMPUTER SUPPORTS.
6. FOR DUAL-GDU 620 INSTALLATIONS, CONNECT TO GDU #1 ONLY. THESE PINS ARE NOT CONNECTED ON GDU #2.
7. SEE SEPARATE DRAWING FOR RADIO COUPLER WIRING.
8. SPLICE BOTH WIRES TOGETHER INTO PIN B OF CD33 TO AMP.
9. USE TRIAD TRANSFORMER P/N TY-141P OR EQUIVALENT.
10. THE CENTURY IV REQUIRES AN ISOLATION DIODE TO BE INSTALLED ON THE LOCALIZER SWITCHING INPUT AS SHOWN:



11. REMOVE EXISTING FLIGHT DIRECTOR WIRING FROM ATTITUDE INDICATOR AND STOW NEAR THE PILOT'S GDU 620 P6201.
12. THE 5 kHz EXCITATION SIGNAL IS NEEDED ONLY FOR AC AUTOPILOTS.
13. FOR CENTURY 2000 AUTOPILOTS THAT DO NOT HAVE THE ALTITUDE PRESELECTOR INSTALLED, ROUTE PROVISIONAL WIRES FROM CD189 AND STOW NEAR P6201 ON BACK OF THE PILOT'S GDU 620.

Figure F-12. Century Autopilot/Flight Director Interconnect
Sheet 4 of 4

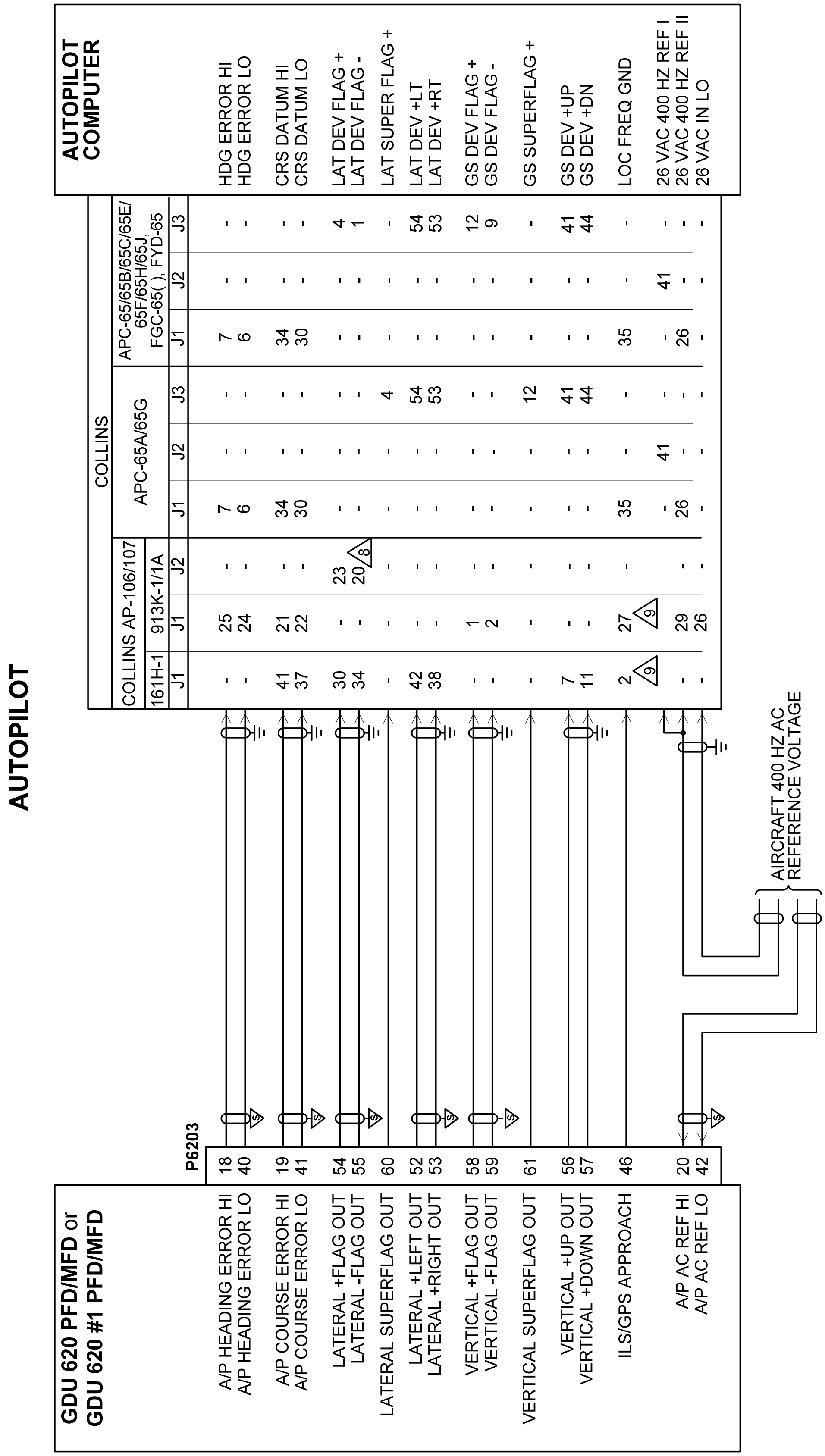


Figure F-13. Collins Autopilot Interconnect
Sheet 1 of 4

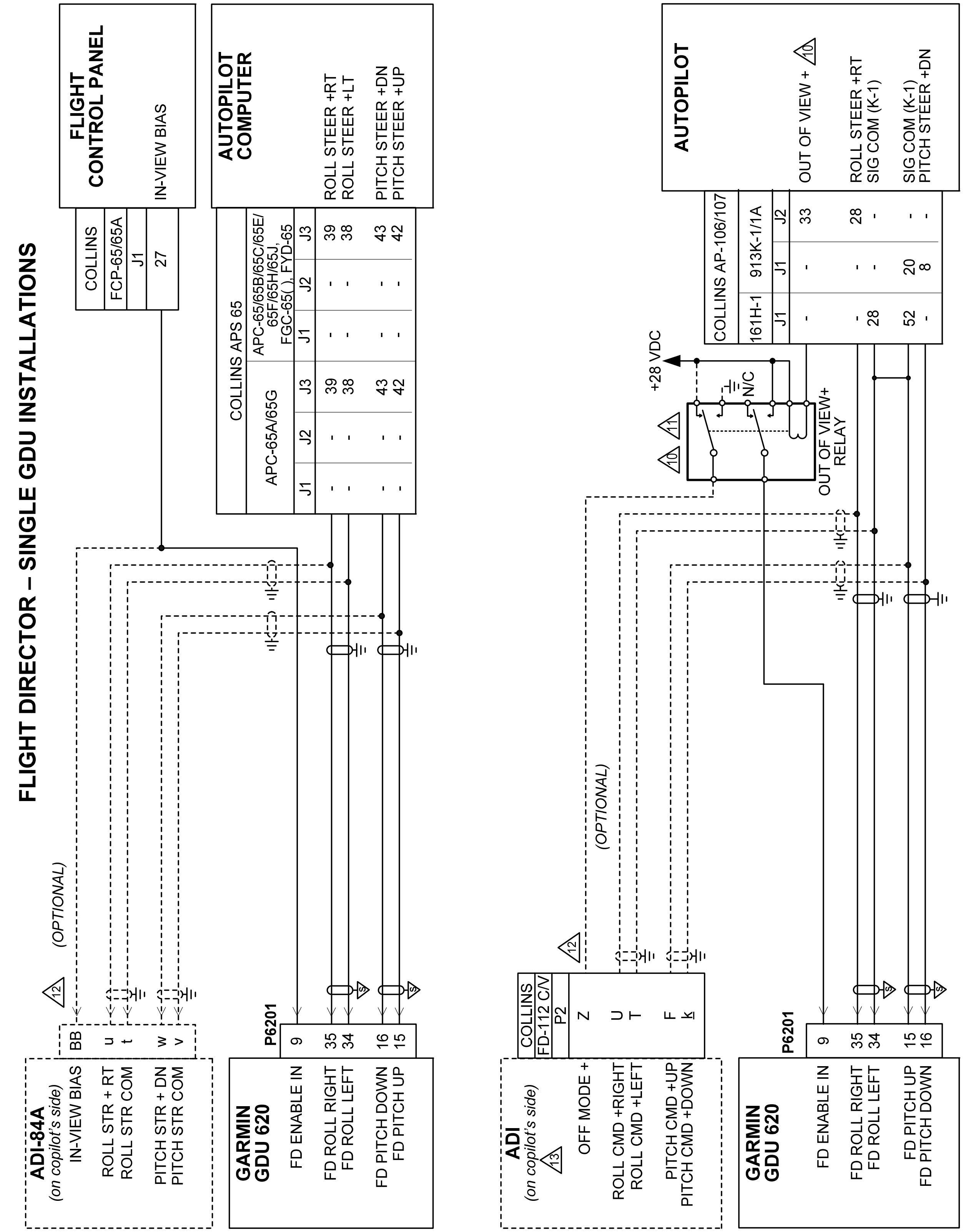


Figure F-13. Collins Autopilot Interconnect
Sheet 2 of 4

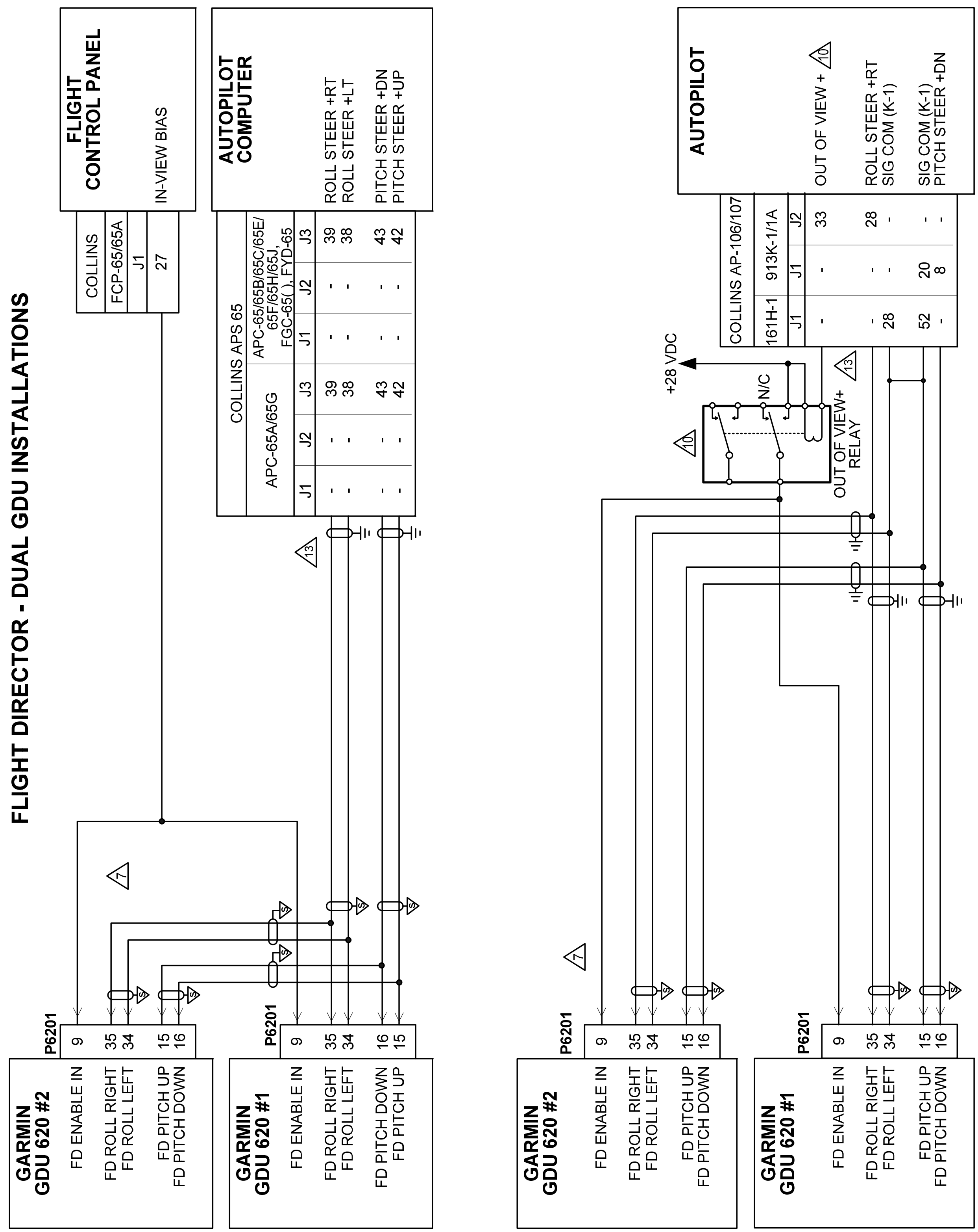


Figure F-13. Collins Autopilot Interconnect
Sheet 3 of 4

NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. GROUND DESIGNATIONS: SHIELD BLOCK GROUND AIRFRAME GROUND
3. AT THE GDU 620, CONNECT SHIELD GROUNDS TO THE CONNECTOR BACKSHELL -- THE SHIELD LEADS MUST BE LESS THAN 3.0 ". CONNECT OTHER SHIELD GROUNDS TO AIRCRAFT GROUND WITH AS SHORT A CONDUCTOR AS PRACTICAL.
4. REFERENCE SECTION 5.5 FOR GDU AUTOPILOT CONFIGURATION.
5. CONNECTIONS ARE REQUIRED ONLY FOR THOSE INPUTS THAT THE AUTOPILOT COMPUTER SUPPORTS.
6. THE ORIGINAL MCS-65 OR YRS-65 HEADING/YAW RATE SYSTEM MUST REMAIN IN THE AIRCRAFT IN ORDER TO PROVIDE THE YAW RATE AND COMPASS MONITOR INPUTS TO THE AUTOPILOT.

7. FOR DUAL-GDU 620 SYSTEMS, CONNECT THE FD SIGNALS TO GDU #2 AS SHOWN. ALL OTHER AUTOPILOT SIGNALS SHOULD BE CONNECTED ONLY TO GDU #1.

8. CONNECT LAT DEV FLAGS FROM 161H-1 TO 913K-1A FOR 913K-1A SYSTEMS ONLY.

9. SEE STRAPPING INFORMATION IN INSTALLATION BOOK 523-0764806, PAGE 4 (REVISED 27 JUNE 1984 - 913K-1/1A STRAPPING OPTIONS) AND PAGE 11 (REVISED 1 MARCH 1977 - 161H-1 STRAPPING OPTIONS). STRAP FOR NEGATIVE-LOGIC LOCALIZER FREQUENCY SIGNAL INPUT. ALTERNATIVELY, CONNECT A RELAY TO INVERT THE SIGNAL FROM THE GDU FOR ACTIVE-HIGH OUTPUT.

10 IT IS NECESSARY TO INSTALL A RELAY TO INVERT THE POLARITY OF THE “OUT OF VIEW+” SIGNAL FROM ACTIVE-LOW TO ACTIVE-HIGH FOR INPUT INTO THE GDU 620. USE M39016/6-204M OR 207M OR EQUIVALENT. RELAY COIL MUST NOT DRAW MORE THAN 50 mA.

11 IF THE OPTIONAL COPILOT’S ADI IS INSTALLED, THE “OFF MODE+” SIGNAL MUST BE DISCONNECTED FROM THE AUTOPILOT (J2-33) AND ISOLATED USING A RELAY AS SHOWN.

12 **FLIGHT DIRECTOR WIRING TO EXISTING ADI MUST BE DISCONNECTED IF THIS INDICATOR IS USED AS A STANDBY INSTRUMENT FOR THE G600 – THE DISPLAY OF THE FLIGHT DIRECTOR MUST BE DISABLED IN THIS CASE.** IF THIS INDICATOR IS BEING RELOCATED TO THE COPILOT’S SIDE, WIRING MAY BE CONNECTED IN PARALLEL TO THIS ADI AND THE FLIGHT DIRECTOR MAY BE ENABLED. THE WIRING TO THIS ADI MUST BE CONNECTED IN ACCORDANCE WITH THE MANUFACTURER’S INSTRUCTIONS. THIS ADI MUST BE LOCATED IN ACCORDANCE WITH SECTION 2.5.11.8.

13 FOR DUAL GDU INSTALLATIONS, FLIGHT DIRECTOR WIRING MUST BE DISCONNECTED FROM THE EXISTING ADI.

Figure F-13. Collins Autopilot Interconnect
Sheet 4 of 4

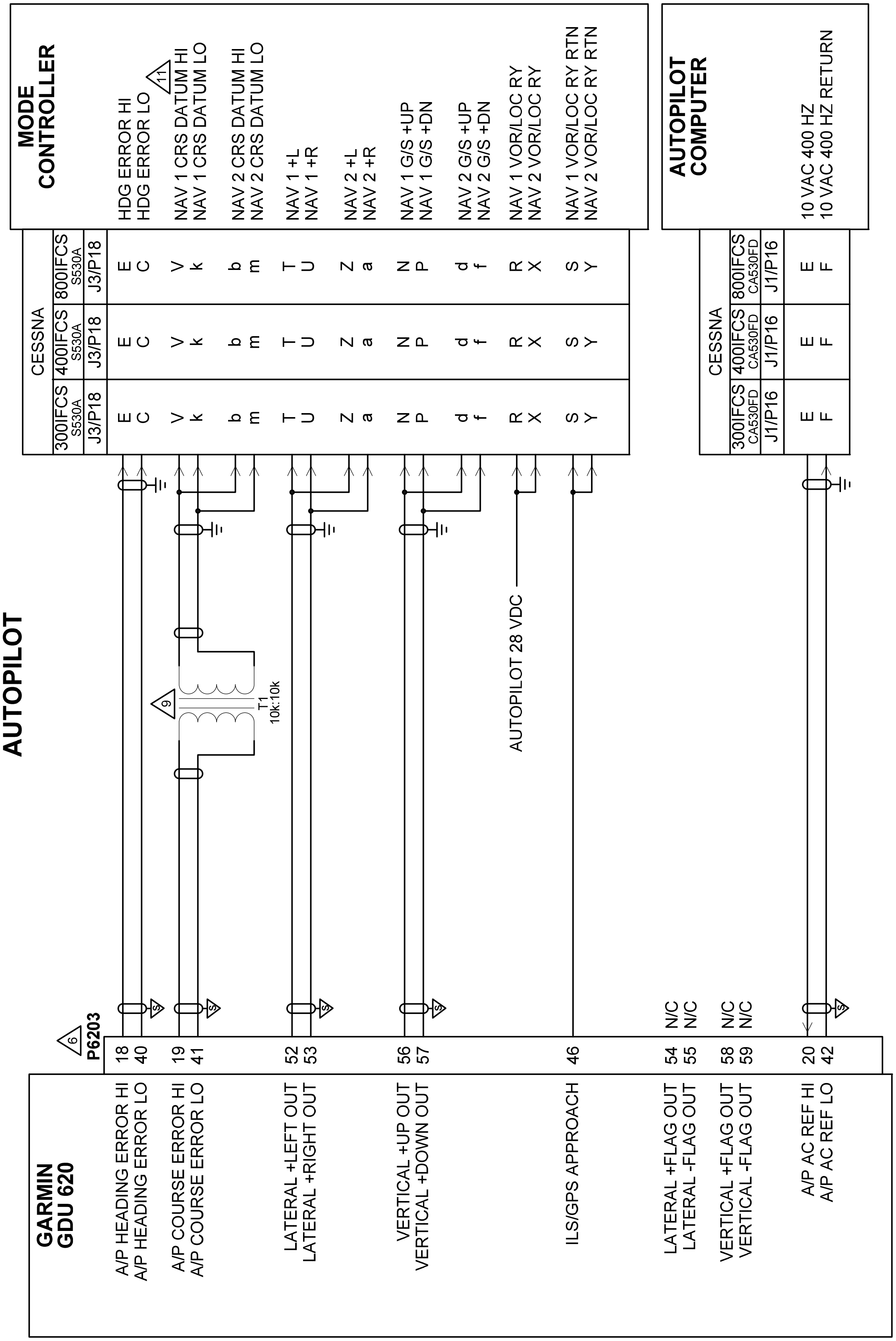


Figure F-14. Cessna Autopilot Interconnect
Sheet 1 of 4

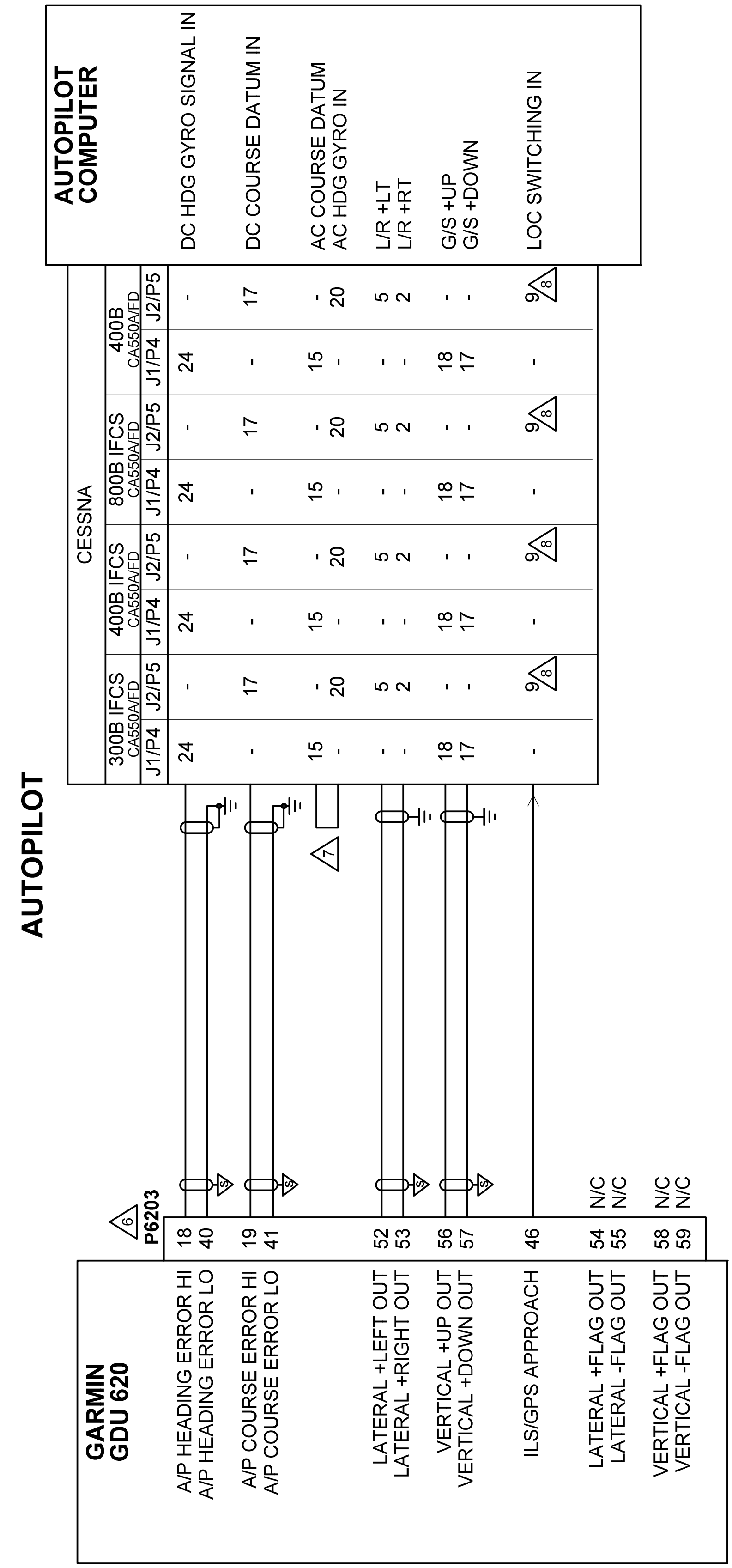


Figure F-14. Cessna Autopilot Interconnect
Sheet 2 of 4

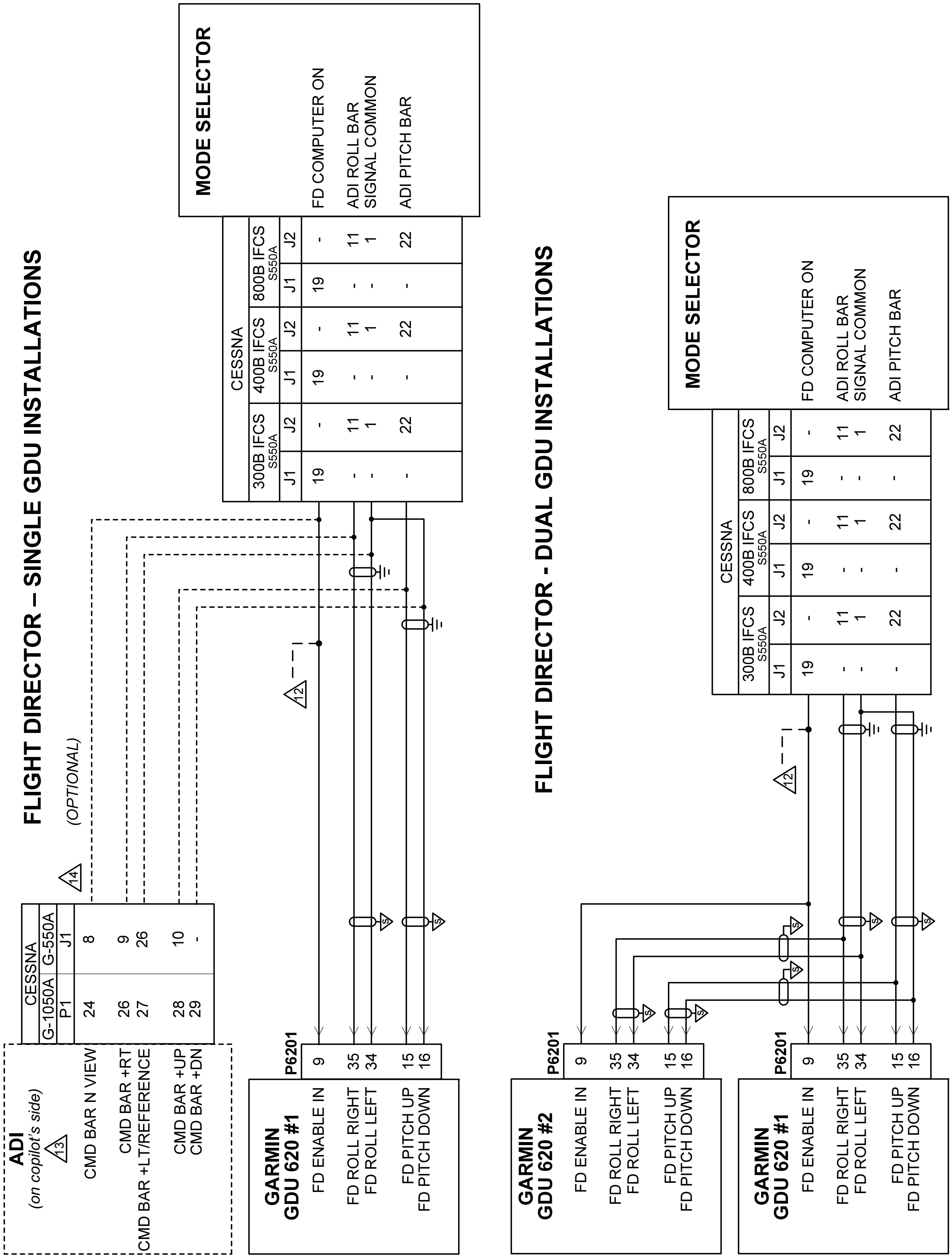
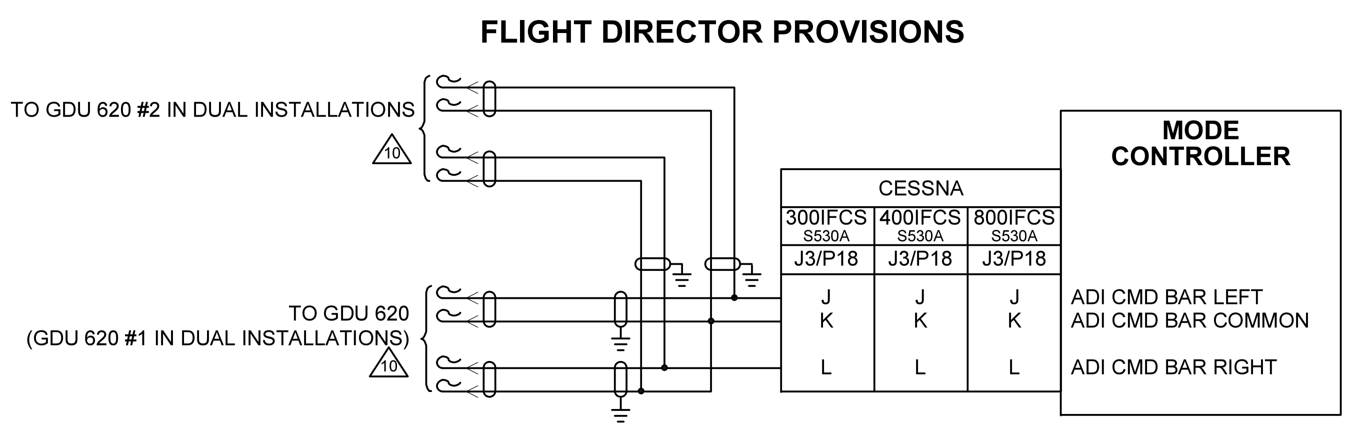


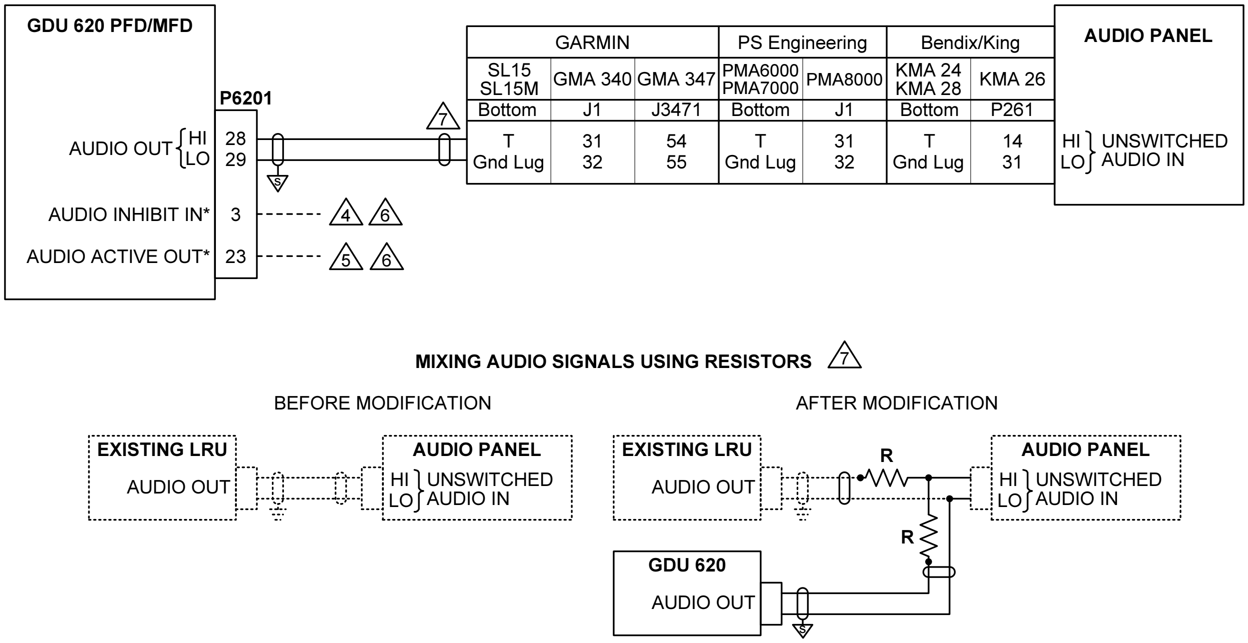
Figure F-14. Cessna Autopilot Interconnect
Sheet 3 of 4



NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. GROUND DESIGNATIONS: SHIELD BLOCK GROUND AIRFRAME GROUND
3. AT THE GDU 620, CONNECT SHIELD GROUNDS TO THE CONNECTOR BACKSHELL -- THE SHIELD LEADS MUST BE LESS THAN 3.0 ". CONNECT OTHER SHIELD GROUNDS TO AIRCRAFT GROUND WITH AS SHORT A CONDUCTOR AS PRACTICAL.
4. REFERENCE SECTION 5.5 FOR GDU AUTOPILOT CONFIGURATION.
5. CONNECTIONS ARE REQUIRED ONLY FOR THOSE INPUTS THAT THE AUTOPILOT COMPUTER SUPPORTS.
6. FOR DUAL-GDU 620 INSTALLATIONS, CONNECT TO GDU #1 ONLY. THESE PINS ARE NOT CONNECTED ON GDU #2.
7. JUMPER IS REQUIRED FOR DC HEADING/COURSE ERROR SIGNALS.
8. THE ILS/GPS APPROACH DISCRETE OUTPUT MUST ALSO BE CONNECTED TO THE BACK COURSE RELAY – REFER TO MANUFACTURER'S DOCUMENTATION FOR ADDITIONAL DETAILS.
9. USE TRIAD TRANSFORMER P/N TY-141P OR SIMILAR.
10. STOW PROVISIONAL FLIGHT DIRECTOR WIRING NEAR P6201 OF THE GDU 620. FOR DUAL-GDU 620 SYSTEMS, SPLICE WIRING AND STOW NEAR P6201 OF EACH GDU 620.
11. TUNE RESISTANCE POTS ON HEADING ERROR HI AND COURSE ERROR HI TO END OF TRAVEL IN ORDER NOT TO AFFECT THE HEADING AND COURSE ERROR SIGNALS.
12. MAINTAIN EXISTING CONNECTION BETWEEN AUTOPILOT COMPUTER AND MODE SELECTOR.
13. OTHER COMPATIBLE FLIGHT DIRECTOR ADI'S MAY BE UTILIZED.
14. **FLIGHT DIRECTOR WIRING TO EXISTING ADI MUST BE DISCONNECTED IF THIS INDICATOR IS USED AS A STANDBY INSTRUMENT FOR THE G600 – THE DISPLAY OF THE FLIGHT DIRECTOR MUST BE DISABLED IN THIS CASE.** IF THIS INDICATOR IS BEING RELOCATED TO THE COPILOT'S SIDE, WIRING MAY BE CONNECTED IN PARALLEL TO THIS ADI AND THE FLIGHT DIRECTOR MAY BE ENABLED. THE WIRING TO THIS ADI MUST BE CONNECTED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. THIS ADI MUST BE LOCATED IN ACCORDANCE WITH SECTION 2.5.11.8.

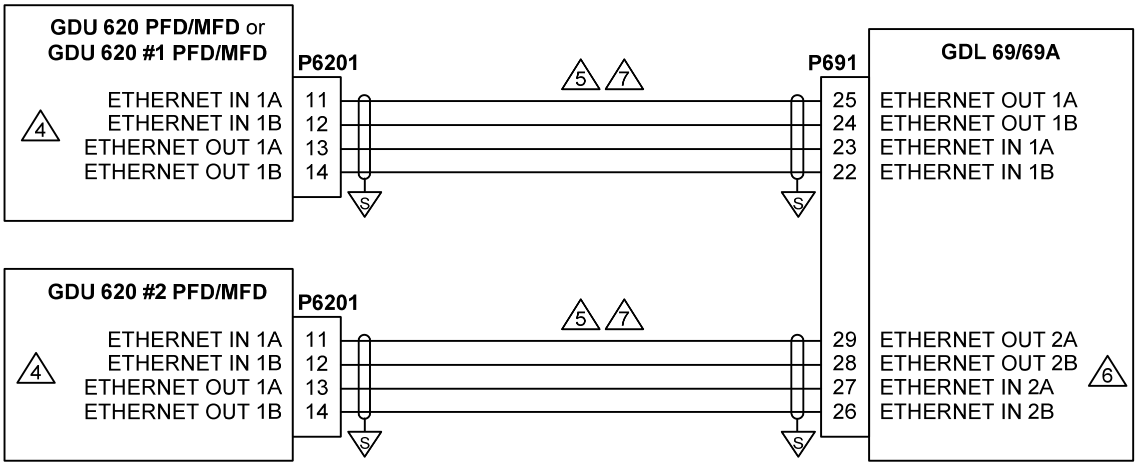
Figure F-14. Cessna Autopilot Interconnect
Sheet 4 of 4



NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. GROUND DESIGNATIONS: SHIELD BLOCK GROUND AIRFRAME GROUND
3. AT GDU 620, CONNECT SHIELD GROUNDS TO THE CONNECTOR BACKSHELL -- THE SHIELD LEADS MUST BE LESS THAN 3.0 ".
4. USE THE AUDIO INHIBIT IN* DISCRETE INPUT TO INHIBIT GDU 620 AURAL ALERTS WHEN A HIGHER PRIORITY SYSTEM IS PLAYING AUDIO MESSAGES.
5. USE THE AUDIO ACTIVE OUT* DISCRETE OUTPUT TO INHIBIT AURAL ALERTS FROM LOWER PRIORITY SYSTEMS WHENEVER THE GDU 620 IS PLAYING AUDIO MESSAGES.
6. FUNCTION NOT CURRENTLY IMPLEMENTED.
7. IF AUDIO PANEL DOES NOT HAVE AN AVAILABLE UNSWITCHED INPUT, AUDIO FROM GDU 620 MUST BE MIXED WITH AN EXISTING AUDIO SOURCE USING RESISTORS TO ISOLATE THE AUDIO OUTPUT FROM EACH LRU. A TYPICAL VALUE FOR MIXING RESISTORS IS 390Ω ¼ W. THE AUDIO LEVELS OF EXISTING AUDIO SOURCES WILL HAVE TO BE RE-EVALUATED AFTER MIXING RESISTORS ARE INSTALLED.

Figure F-15. Audio Interconnect



NOTES:

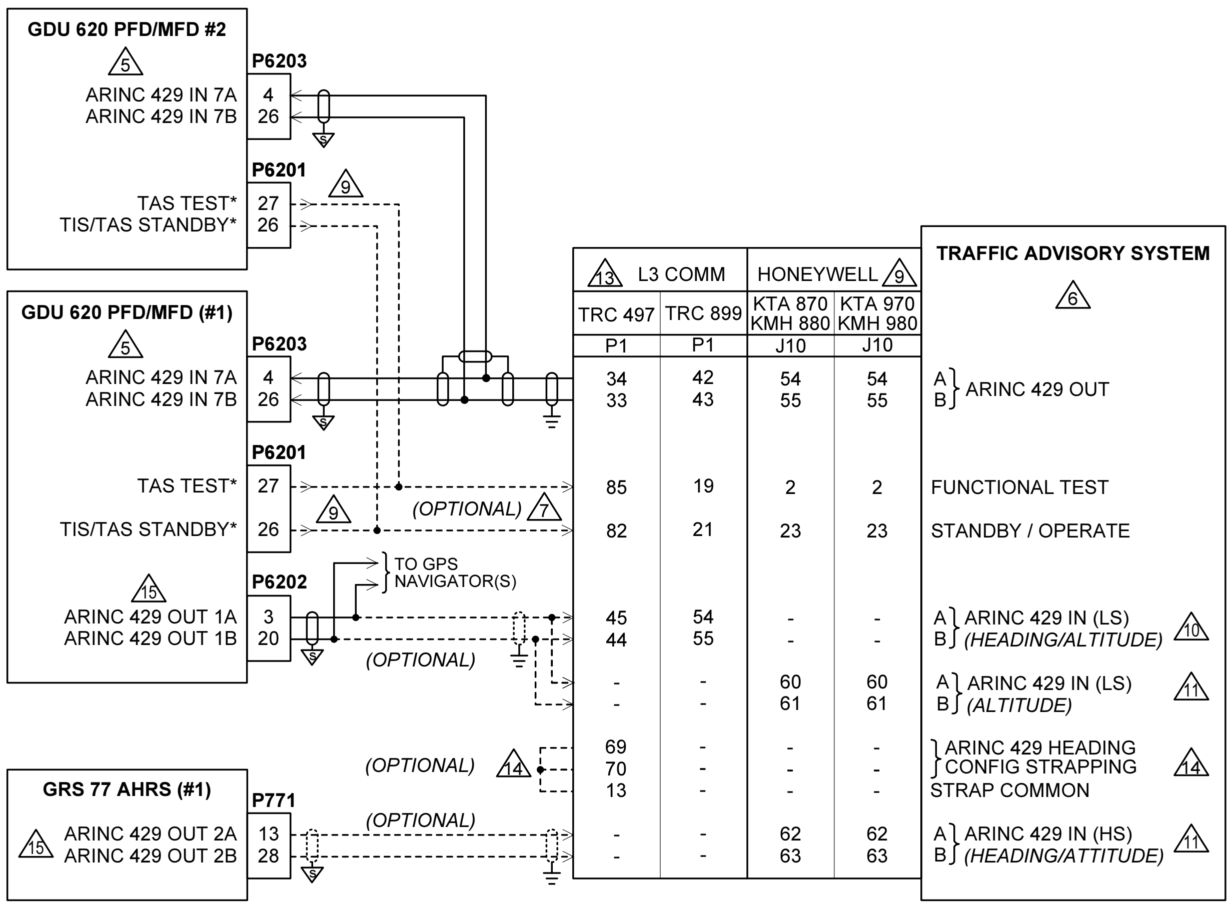
1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. GROUND DESIGNATIONS: SHIELD BLOCK GROUND AIRFRAME GROUND
3. AT GDU 620, CONNECT SHIELD GROUNDS TO THE CONNECTOR BACKSHELL -- THE SHIELD LEADS MUST BE LESS THAN 3.0 ". CONNECT THE SHIELD GROUNDS AT THE GDL 69/69A TO ITS CONNECTOR BACKSHELL IN ACCORDANCE WITH GDL 69/69A INSTALLATION INSTRUCTIONS.
4. ETHERNET PORT 2 MAY BE USED IN LIEU OF ETHERNET PORT 1. IF THERE ARE NO FREE PORTS ON THE GDU 620, THE OTHER LRU MUST BE DISCONNECTED AND THE GDL 69/69A MUST BE CONNECTED TO THE GDU 620 IN ITS PLACE. THE DISCONNECTED LRU MUST BE CONNECTED TO ETHERNET PORT 2, 3, OR 4 ON THE GDL 69/69A.
5. USE AIRCRAFT GRADE CATEGORY 5 ETHERNET CABLE. THESE INCLUDE THE FOLLOWING:

MANUFACTURER	P/N
PIC WIRE AND CABLE	E10422 (22 AWG)
PIC WIRE AND CABLE	E10424 (24 AWG)
ELECTRONIC CABLE SPECIALIST	392404 (24 AWG)

6. ETHERNET PORT 3 OR 4 MAY BE USED INSTEAD. THE PORT THAT IS USED MUST BE ENABLED IN CONFIGURATION MODE. REFER TO THE GDL 69 INSTALLATION MANUAL FOR ADDITIONAL DETAILS.
7. IF GWX 68 WEATHER RADAR IS BEING PROVISIONED FOR, REFER TO FIGURE F-23 FOR SUITABLE WIRING ARRANGEMENTS.

Figure F-16. GDL 69/69A Interconnect

CONNECTIONS TO TAS / TCAS I



CONNECTIONS TO TIS

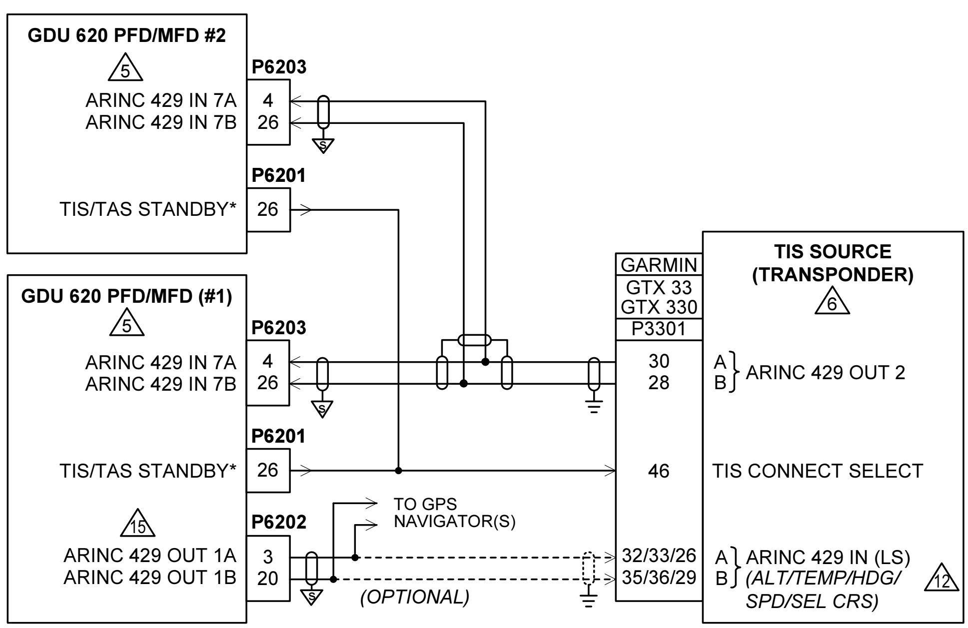
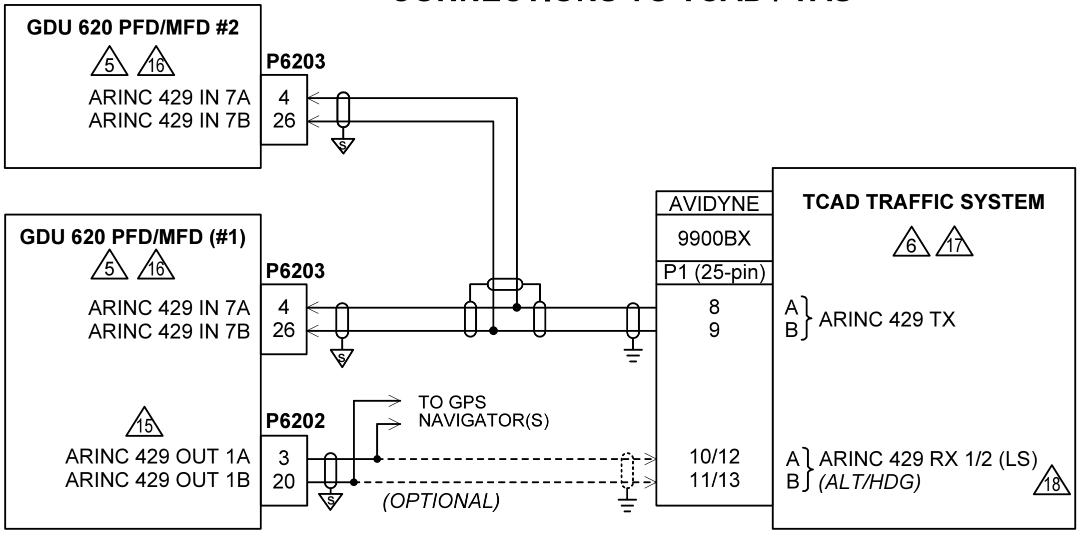


Figure F-17. Traffic Advisory System Interconnect
Sheet 1 of 2

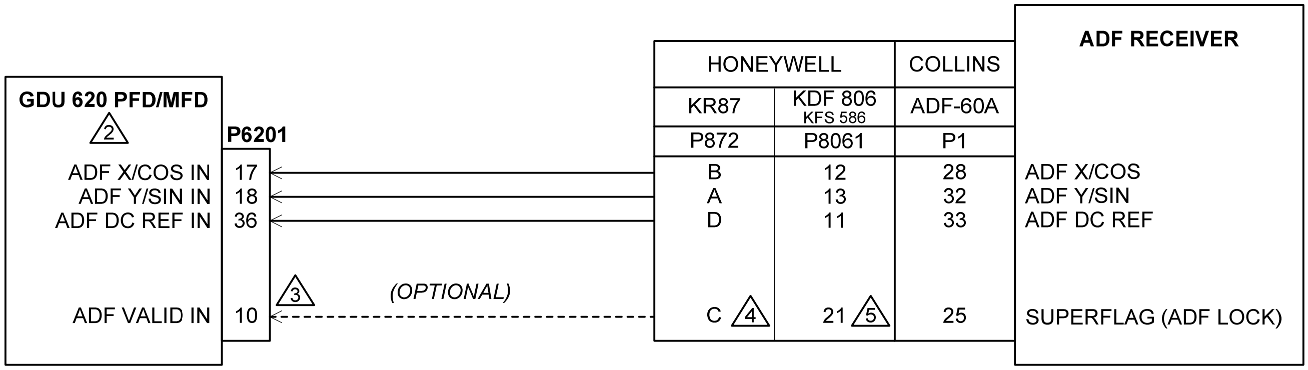
CONNECTIONS TO TCAD / TAS



NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. GROUND DESIGNATIONS: SHIELD BLOCK GROUND AIRFRAME GROUND
3. AT GDU 620, CONNECT SHIELD GROUNDS TO THE CONNECTOR BACKSHELL -- THE SHIELD LEADS MUST BE LESS THAN 3.0 ". CONNECT OTHER SHIELD GROUNDS TO AIRCRAFT CHASSIS WITH AS SHORT A CONDUCTOR AS PRACTICAL.
4. **ONLY ONE TRAFFIC SOURCE MAY BE CONNECTED TO THE GDU 620.**
5. FOR GDU 620 SETUP ITEMS REFER TO SECTION 5.5
6. FOR TAS/TIS SETUP ITEMS REFER TO APPENDIX E.
7. THESE OPTIONAL DISCRETE CONNECTIONS ARE NOT REQUIRED IF THE GDU 620 IS CONFIGURED FOR '+ EXTERNAL CONTROL'. IN THIS CASE, THE GDU 620 WILL NOT CONTROL THE TRAFFIC ADVISORY SYSTEM OPERATION.
8. IF ONLY A SINGLE G600 SYSTEM IS BEING INSTALLED, CONNECT AS SHOWN FOR GDU 620 PFD/MFD (#1)
9. FOR HONEYWELL TRAFFIC SYSTEMS THE "FUNCTIONAL TEST" AND "STBY/OPERATE" DISCRETE INPUTS TO THE TRAFFIC COMPUTER MUST BE CONNECTED TO **ONE** DISPLAY ONLY.
10. IF DESIRED, ALTITUDE AND HEADING MAY BE PROVIDED BY THE G600 SYSTEM TO THE SKYWATCH SYSTEM. ANY AVAILABLE ARINC 429 INPUTS ON THE TRAFFIC COMPUTER MAY BE USED IF THOSE SHOWN ARE ALREADY USED. THE TRAFFIC SYSTEM MAY HAVE TO BE CONFIGURED TO ACCEPT ALTITUDE AND HEADING VIA ARINC 429 (LOW-SPEED). REFER TO THE MANUFACTURER'S INSTALLATION MANUAL FOR ADDITIONAL INFORMATION.
11. IF DESIRED, ALTITUDE, ATTITUDE AND HEADING MAY BE PROVIDED BY THE G600 SYSTEM TO THE HONEYWELL TRAFFIC SYSTEM. THE HONEYWELL TRAFFIC SYSTEM WILL NOT ACCEPT HEADING/ATTITUDE AND ALTITUDE ON A SINGLE ARINC 429 INPUT. CONSEQUENTLY, HEADING/ATTITUDE (HIGH-SPEED) AND ALTITUDE (LOW-SPEED) MUST BE PROVIDED TO SEPARATE INPUTS. THE TRAFFIC SYSTEM MUST BE CONFIGURED TO ACCEPT ARINC 429 ALTITUDE, HEADING AND ATTITUDE.
12. IF DESIRED, ALTITUDE, TEMPERATURE, HEADING, SPEED AND SELECTED COURSE INFORMATION MAY BE PROVIDED BY THE G600 SYSTEM TO THE TRANSPONDER. THE GTX 33/330 WILL HAVE TO BE CONFIGURED TO ACCEPT THIS INFORMATION VIA ARINC 429 (LOW-SPEED).
13. TRC 497 SOFTWARE VERSION 1.6 OR HIGHER IS REQUIRED.
14. THESE STRAPS SET THE HEADING INPUT SOURCE TO ARINC 429. REFER TO THE MANUFACTURER'S INSTALLATION MANUAL FOR ADDITIONAL STRAPPING INFORMATION.
15. FOR DUAL G600 INSTALLATIONS, ONLY ARINC 429 OUTPUTS FROM GDU #1 AND AHRS #1 SHOULD BE CONNECTED TO THE TIS/TAS SYSTEM. ARINC 429 OUTPUTS FROM GDU #2 OR AHRS #2 SHOULD NOT BE CONNECTED TO THE TIS/TAS SYSTEM.
16. THE GDU 620 MUST BE SET TO "SKYWATCH" AND "+EXTERNAL CONTROL" MUST BE SELECTED.
17. AN EXTERNAL UNIT CAPABLE OF DISPLAYING TRAFFIC AND CONTROLLING THE TCAD IS REQUIRED IN ADDITION TO THE GDU 620 (E.G. A 400W/500W OR AVIDYNE DISPLAY).
18. FOR THE TCAD TO ACCEPT ARINC 429 HEADING AND ALTITUDE, PROCESSOR P/N 70-2420-5 OR LATER IS REQUIRED.

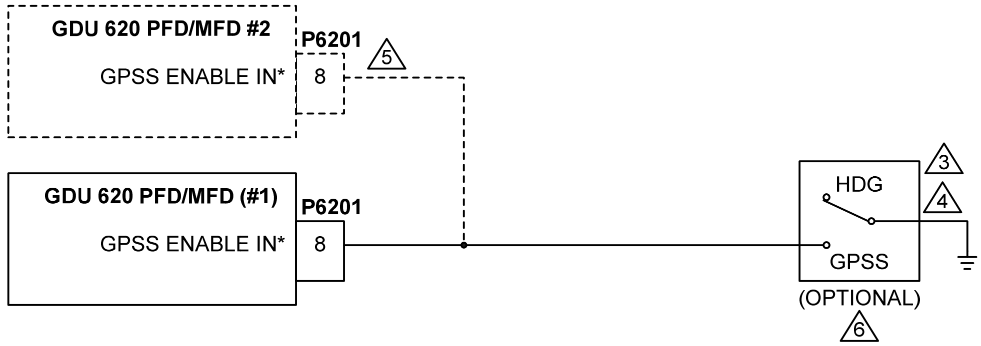
Figure F-17. Traffic Advisory System Interconnect
Sheet 2 of 2



NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. FOR GDU 620 SETUP ITEMS REFER TO SECTION 5.5
3. IF CONNECTING AN ADF RECEIVER WHICH DOES NOT PROVIDE SUPERFLAG OUTPUT, LEAVE P6201-10 UNCONNECTED; OTHERWISE, CONNECT AS SHOWN. ONCE THE GDU 620 IS CONFIGURED FOR A PARTICULAR MODEL OF ADF, THE “+ SUPERFLAG” BOX ON THE GDU 620 SHOULD BE CHECKED OR UNCHECKED AS APPROPRIATE. IF THE SUPERFLAG SIGNAL IS CONNECTED TO THE GDU, THE “+ SUPERFLAG” BOX SHOULD BE CHECKED.
4. THE SUPERFLAG OUTPUT IS ONLY PROVIDED BY 066-1072-04, -05, -06, -07, -14, -15, AND -17 VERSIONS OF THE KR 87 ADF RECEIVER.
5. THE SUPERFLAG OUTPUT IS ONLY PROVIDED BY 066-1077-01 VERSION OF THE KDF 806 ADF RECEIVER.

Figure F-18. ADF Interconnect

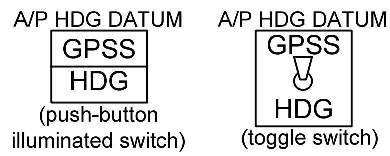


NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. GROUND DESIGNATIONS: SHIELD BLOCK GROUND AIRFRAME GROUND

3. SWITCH MUST BE LOCATED AS NEAR AS PRACTICAL TO THE AUTOPILOT MODE CONTROL PANEL.

4. SWITCH MUST BE LABELED AS SHOWN:
IF “A/P HDG DATUM” WILL NOT FIT, IT IS ACCEPTABLE TO LABEL THE SWITCH “A/P DATUM.”

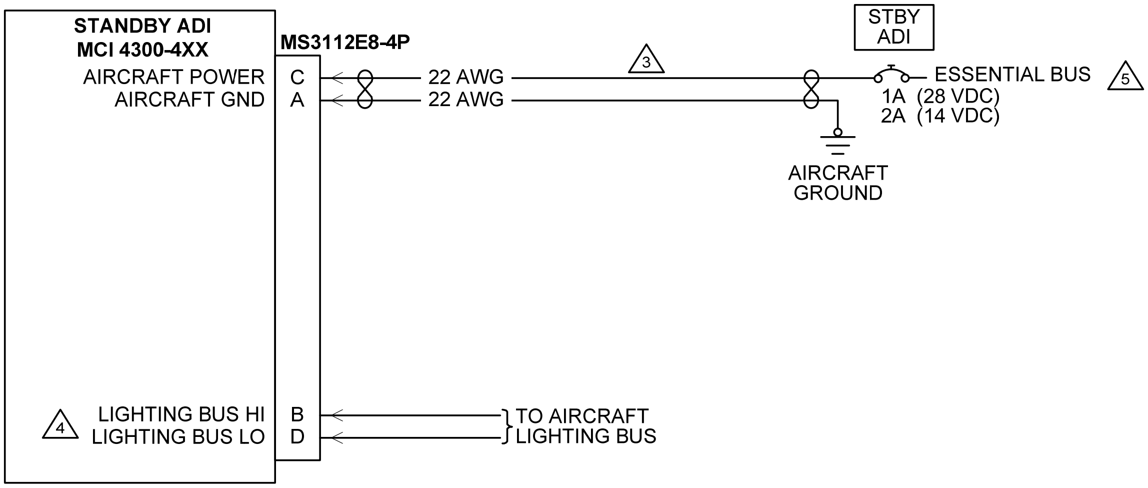


THE “HDG” AND “GPSS” LABELS MAY BE SWAPPED FROM THE POSITIONS SHOWN.

5. FOR DUAL-GDU 620 INSTALLATIONS, CONNECT WIRE TO THE SAME PIN ON BOTH GDU’S.

6. THE OPTIONAL “HDG/GPSS” SWITCH IS ONLY REQUIRED FOR INSTALLATIONS THAT UTILIZE THE GDU 620 AS A GPS ROLL STEERING CONVERTER. INSTALLATIONS WITH AUTOPILOTS THAT UTILIZE ARINC 429 GPSS DO NOT REQUIRE THIS SWITCH. REFER TO SECTION 2.5.16 FOR ADDITIONAL INFORMATION

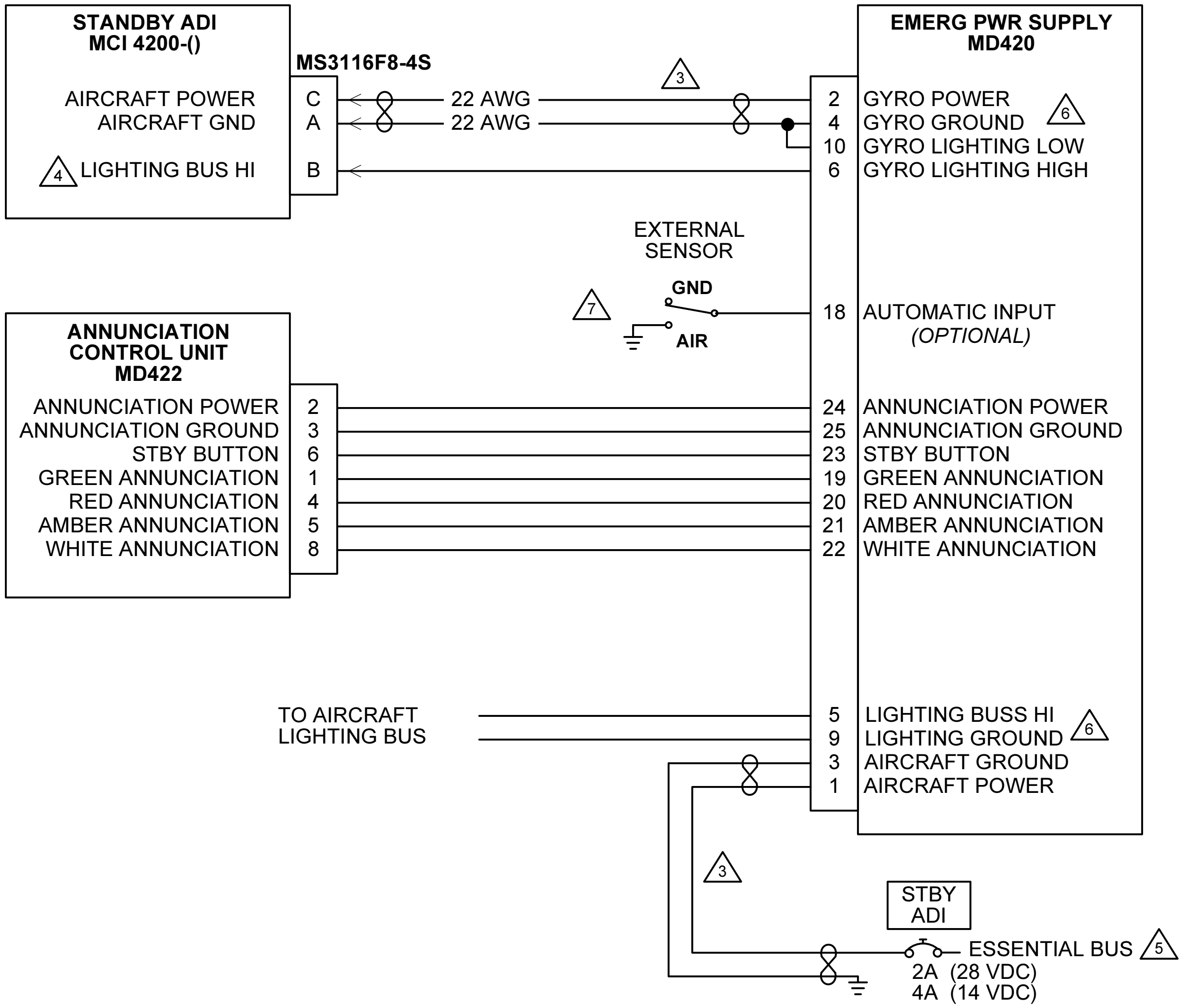
Figure F-19. External Switches (GPSS)



NOTES:

1. ALL WIRES 22 AWG UNLESS OTHERWISE SPECIFIED.
2. GROUND DESIGNATIONS: SHIELD BLOCK GROUND AIRFRAME GROUND
3. POWER WIRES SHALL BE TWISTED PAIR WITH NO MORE THAN 6 INCHES UNTWISTED AT EITHER END.
4. THE MCI BACKUP ADI MUST BE CONFIGURED FOR THE CORRECT LIGHTING BUS VOLTAGE (28 VDC, 14 VDC, 5 VDC OR 5 VAC). PLEASE SEE INSTALLATION MANUAL FOR LIGHT TRAY ASSEMBLY OPTIONS, MID-CONTINENT INSTRUMENTS MANUAL NUMBER 9015762.
5. IF THERE IS MORE THAN ONE ESSENTIAL BUS, THE BACKUP ADI AND G600 MUST BE INSTALLED ON SEPARATE ESSENTIAL BUSSES.

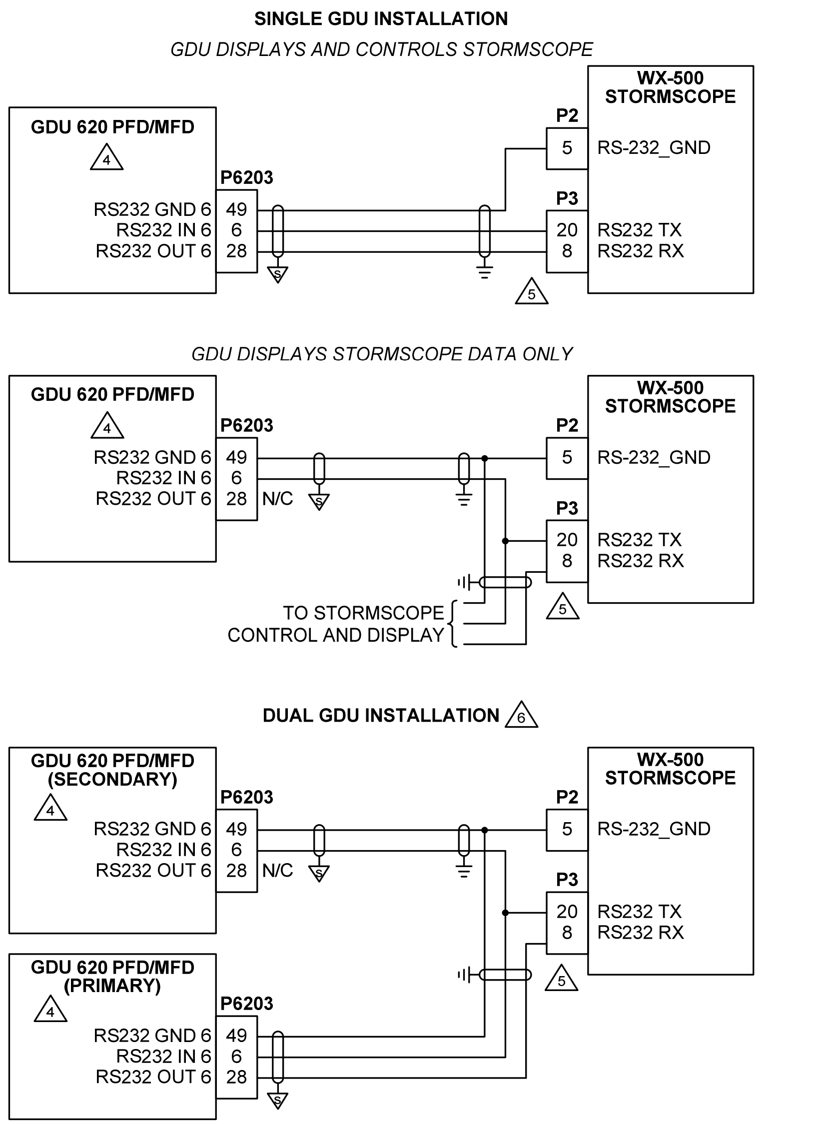
Figure F-20. Mid-Continent Electric Standby ADI Interconnect (Integral Battery)



NOTES:

1. ALL WIRES 22 AWG UNLESS OTHERWISE SPECIFIED.
2. GROUND DESIGNATIONS: SHIELD BLOCK GROUND AIRFRAME GROUND
3. POWER WIRES SHALL BE TWISTED PAIR WITH NO MORE THAN 6 INCHES UNTWISTED AT EITHER END.
4. THE UNIT'S LIGHTING INPUT MUST BE CONFIGURED FOR THE CORRECT LIGHTING BUS VOLTAGE (28 VDC, 14 VDC, 5 VDC). PLEASE SEE INSTALLATION MANUAL FOR SWITCH SELECTION OPTIONS, MID-CONTINENT INSTRUMENTS MANUAL NUMBER 9016182.
5. IF THERE IS MORE THAN ONE ESSENTIAL BUS, THE BACKUP ADI AND G600 MUST BE INSTALLED ON SEPARATE ESSENTIAL BUSSES.
6. INSTALLER MUST SELECT 5V, 14V OR 28V LIGHTING ON THE MD421 BATTERY MODULE. PLEASE SEE INSTALLATION MANUAL FOR SWITCH SELECTION OPTIONS, MID-CONTINENT INSTRUMENTS MANUAL NUMBER 9016391.
7. MAY BE USED INSTEAD OF CONNECTING PITOT AND STATIC PORTS. A GROUND ON PIN 18, WHEN THE AIRCRAFT IS IN FLIGHT, WILL ALLOW FOR FULL AUTOMATIC BACKUP POWER WHEN AIRCRAFT POWER IS LOST. SEE INSTALLATION MANUAL FOR CONFIGURATION REQUIREMENTS, MID-CONTINENT INSTRUMENTS MANUAL NUMBER 9016391.

Figure F-21. Mid-Continent Electric Standby ADI Interconnect (External Battery)



NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. GROUND DESIGNATIONS: SHIELD BLOCK GROUND AIRFRAME GROUND
3. AT GDU 620, CONNECT SHIELD GROUNDS TO THE CONNECTOR BACKSHELL -- THE SHIELD LEADS MUST BE LESS THAN 3.0 ". CONNECT OTHER SHIELD GROUNDS TO AIRCRAFT CHASSIS WITH AS SHORT A CONDUCTOR AS PRACTICAL.

4. STORMSCOPE FUNCTION IS NOT CURRENTLY IMPLEMENTED IN GDU 620.

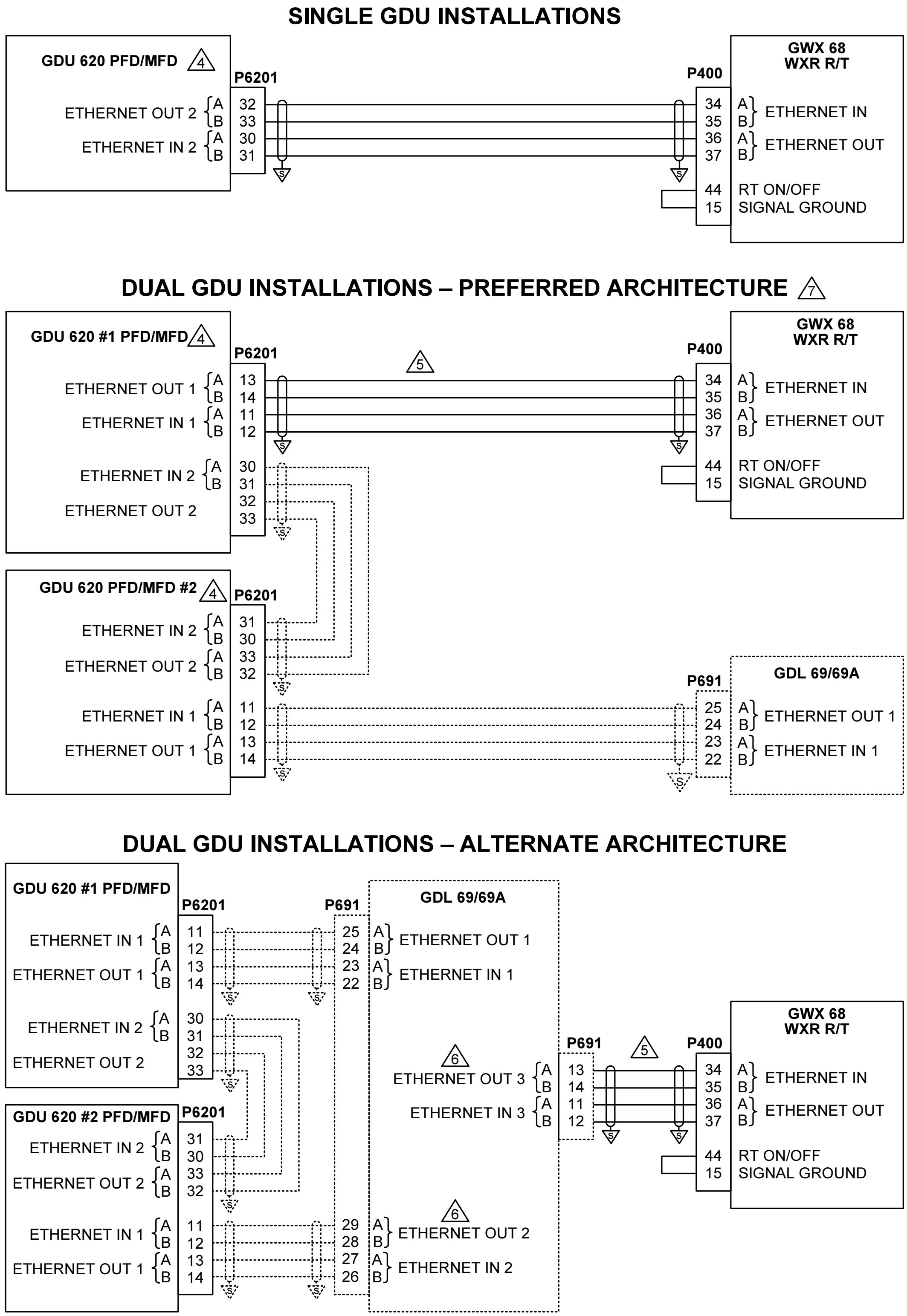
5. RECEIVE CHANNEL INTO STORMSCOPE MUST BE LEFT CONNECTED TO THE CURRENT STORMSCOPE DISPLAY IN THE AIRCRAFT. UNTIL THE GDU 620 STORMSCOPE FUNCTION IS IMPLEMENTED, THE GDU 620 WILL NOT PROVIDE CONTROL OF THE STORMSCOPE.

6. IF DUAL GDU'S ARE INSTALLED, ONLY ONE GDU (THE PRIMARY) CAN CONTROL THE STORMSCOPE. BOTH GDU'S CAN BE USED TO DISPLAY STORMSCOPE DATA. EITHER GDU #1 OR GDU #2 MAY BE CONNECTED AS THE PRIMARY STORMSCOPE DISPLAY.

NOTE

This feature is currently not implemented. However, provisional wiring for the interface defined above may be installed. If installing provisional wiring, ensure that existing display still controls the Stormscope.

Figure F-22. Stormscope Provisions Interconnect



NOTE

This feature is currently not implemented. However, provisional wiring for the interface defined above may be installed.

Figure F-23. Weather Radar Provisions Interconnect
Sheet 1 of 2

NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. GROUND DESIGNATIONS: SHIELD BLOCK GROUND AIRFRAME GROUND
3. AT GDU 620, CONNECT SHIELD GROUNDS TO THE CONNECTOR BACKSHELL -- THE SHIELD LEADS MUST BE LESS THAN 3.0 ". CONNECT THE SHIELD GROUNDS AT THE GWX 68 TO ITS CONNECTOR BACKSHELL IN ACCORDANCE WITH GWX 68 INSTALLATION INSTRUCTIONS.
4. DO NOT CONNECT THE GWX 68 DIRECTLY TO GDU #2 IN DUAL GDU INSTALLATIONS.
5. USE AIRCRAFT GRADE CATEGORY 5 ETHERNET CABLE. THESE INCLUDE THE FOLLOWING:

MANUFACTURER	P/N
PIC WIRE AND CABLE	E10422 (22 AWG)
PIC WIRE AND CABLE	E10424 (24 AWG)
ELECTRONIC CABLE SPECIALIST	392404 (24 AWG)

6. ETHERNET PORT 2, 3 OR 4 MAY BE USED. THE PORT THAT IS USED MUST BE ENABLED IN CONFIGURATION MODE. REFER TO THE GDL 69 INSTALLATION MANUAL FOR ADDITIONAL DETAILS.
7. THIS ARCHITECTURE IS PREFERRED BECAUSE THE LOSS OF A SINGLE LRU WILL NOT RESULT IN COMPLETE LOSS OF WEATHER INFORMATION IN THE COCKPIT.

Figure F-23. Weather Radar Provisions Interconnect
Sheet 2 of 2

Appendix G Magnetic Interference Survey PC Software

G.1 Introduction

The following items are required to complete the magnetic interference survey.

Laptop or PC

A laptop or PC is required to run the GMU 44 Location Survey Tool software. This laptop or PC must meet the following requirements:

Operating System	Windows 2000 SP4*, XP
Processor Speed	850 MHz
Hard Drive Free Memory	500 MB
RAM Memory	256MB
Screen Resolution	1024 x 768
CD-ROM Drive	
USB to RS-232 Converter	Required only if the laptop or PC does not have a serial port.

WinZip® (or equivalent application) is required to extract downloaded file.

Installation software may require user to install the latest version of **Windows Installer which can be downloaded from www.microsoft.com.*

NOTE

The user must have administrative rights on the PC in order to install the GMU 44 Location Survey Tool software.

Magnetic Interference Survey Test Cable

A test cable fabricated by the installer is required to perform the magnetic interference survey (refer to Section G.2 for details on manufacturing this cable).

GMU 44 Location Survey Tool Software P/N 006-A0240-00

GMU 44 Location Survey Tool software P/N 006-A0240-00 is required to perform the magnetic interference survey. This software is supplied as an installation package P/N 006-A0241-00 (refer to Section G.3 for details on downloading and installing this software).

DC Power Supply

A DC power supply capable of supplying 12 VDC/200 mA is required to supply power to the GMU 44 Magnetometer during magnetic interference survey.

RS-485 to RS-232 Converter *(not required in most cases)*

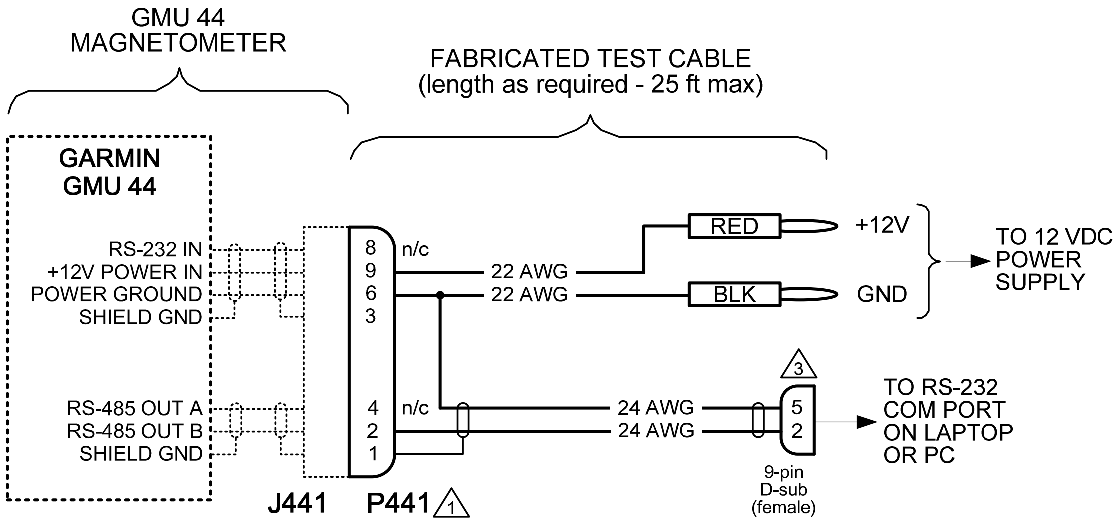
An RS-485 to RS-232 converter may be required to connect the magnetometer to the laptop or PC. Usually a converter is not required, but may be needed if using older laptops or PCs. A suitable converter is B&B Electronics Model 422LP9R (or equivalent).

Stopwatch or Watch with a Second Hand

A stopwatch or watch with a second hand is required measure the times for turning equipment on and off during the survey test sequence.

G.2 Test Cable Requirements

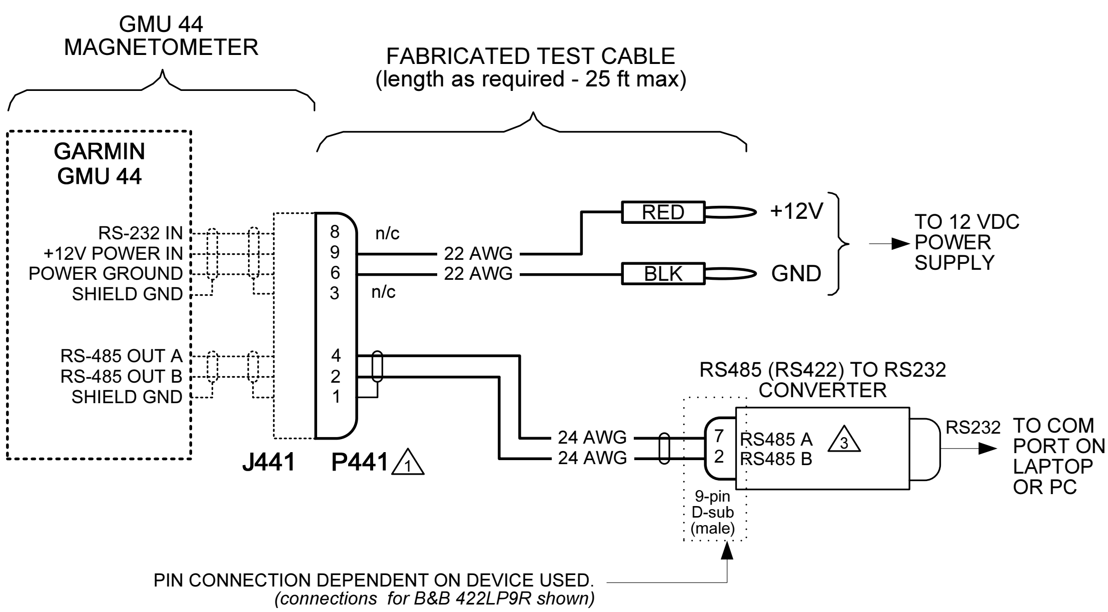
Fabricate a test cable in accordance with one of the following drawings. The cable shown in Figure G-1 should work in most cases; however, if the laptop or PC is not able to communicate with the GMU 44 an RS-485 to RS-232 converter will be required and the cable shown in Figure G-2 should be fabricated.



NOTES:

1. P441 IS GARMIN CONNECTOR KIT P/N 011-00871-00. ALTERNATELY, P441 CAN BE MADE USING AN AMP CONNECTOR P/N 206485-1.
2. WIRE AWG SHOWN IS MINIMUM WIRE AWG. CONNECTORS WILL ACCOMMODATE UP TO 20 AWG WIRE.
3. DIRECT CONNECTION TO A LAPTOP OR PC MAY NOT WORK IN ALL CASES (ESPECIALLY WITH OLDER PC'S). IN THIS CASE, USE THE CABLE THAT ALLOWS CONNECTION TO THE PC USING AN RS-485 TO RS-232 CONVERTER.

Figure G-1. Magnetic Interference Survey Setup with Direct Connection to PC



NOTES:

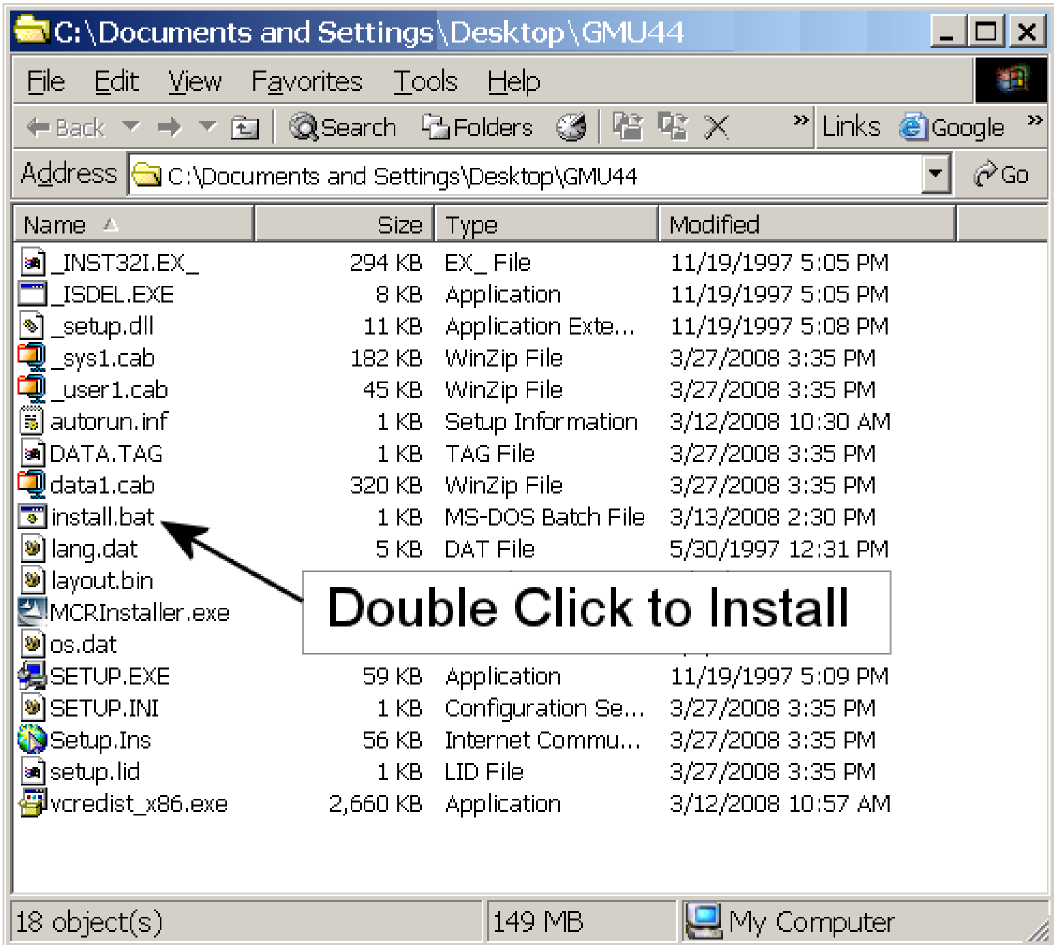
1. P441 IS GARMIN CONNECTOR KIT P/N 011-00871-00. ALTERNATELY, P441 CAN BE MADE USING AN AMP CONNECTOR P/N 206485-1.
2. WIRE AWG SHOWN IS MINIMUM WIRE AWG. CONNECTORS WILL ACCOMMODATE UP TO 20 AWG WIRE.
3. A SUITABLE CONVERTER IS B&B ELECTRONICS MODEL 422LP9R.

Figure G-2. Magnetic Interference Survey Setup using RS-485 to RS-232 Converter

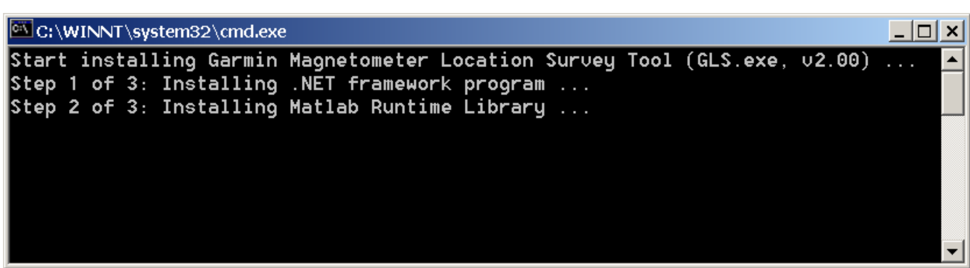
G.3 GMU 44 Location Survey Tool Software Installation Instructions

This installation package will install the GMU 44 Location Survey Tool P/N 006-A0240-00 software on a PC. The laptop or PC used to run the GMU 44 Location Survey Tool software.

To install the software perform the following steps:



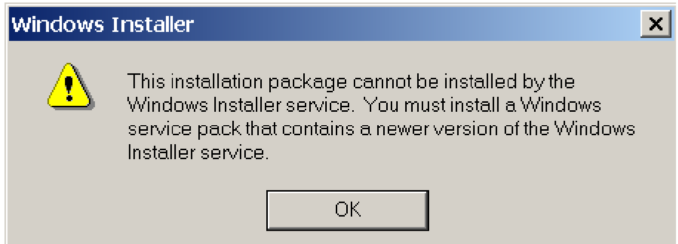
In the newly opened Explorer window, double-click in the "install.bat" file to begin the setup process. The following window will open and indicate the progress of the installation.



NOTE

The installation of the Matlab Runtime environment may take several minutes.

For some installations a Windows Installer error message may appear as shown below. Before proceeding, the installation software requires that the user install the latest version of **Windows Installer**, which can be downloaded from www.microsoft.com.



When the Runtime environment is ready to be installed, an InstallShield Wizard window will appear.

NOTE

The procedure for installing the MATLAB runtime environment depends upon whether or not the runtime environment has been previously installed. Proceed to the applicable section.

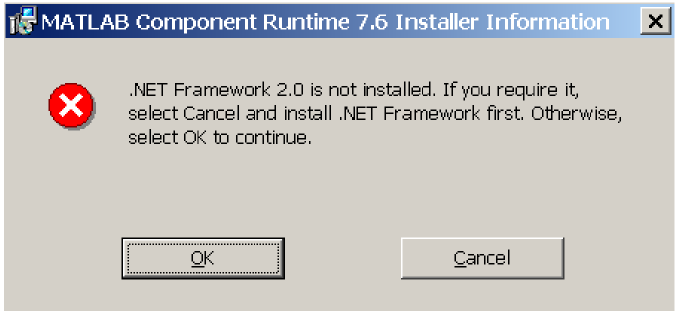
G.3.1 For New MATLAB Installations:

NOTE

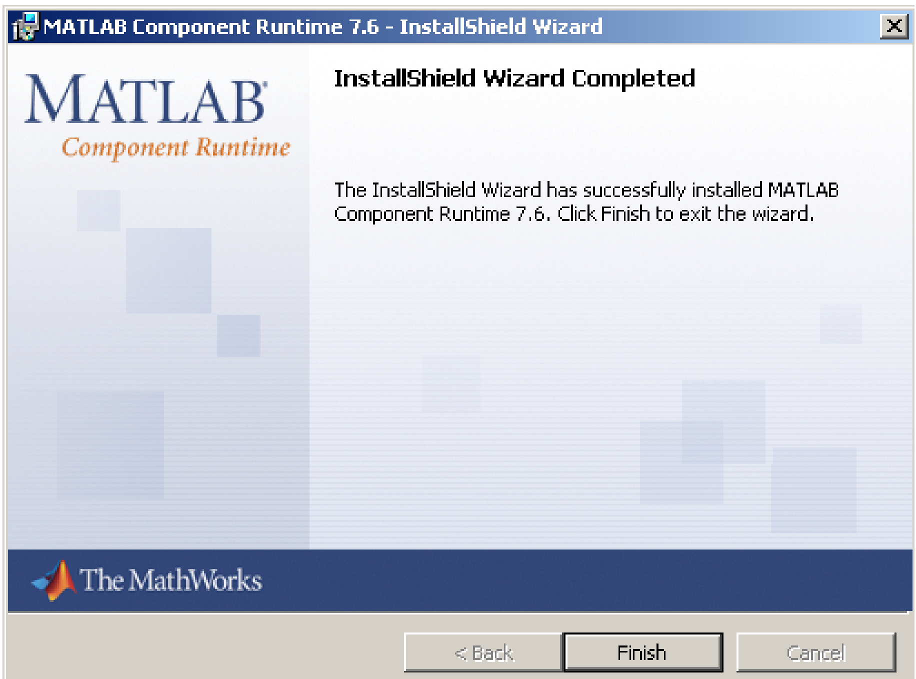
The window below only appears if the MATLAB Runtime environment has not previously been installed. If MATLAB was previously installed, proceed to Existing MATLAB Installations.

Click 'Next: and follow the setup instructions.

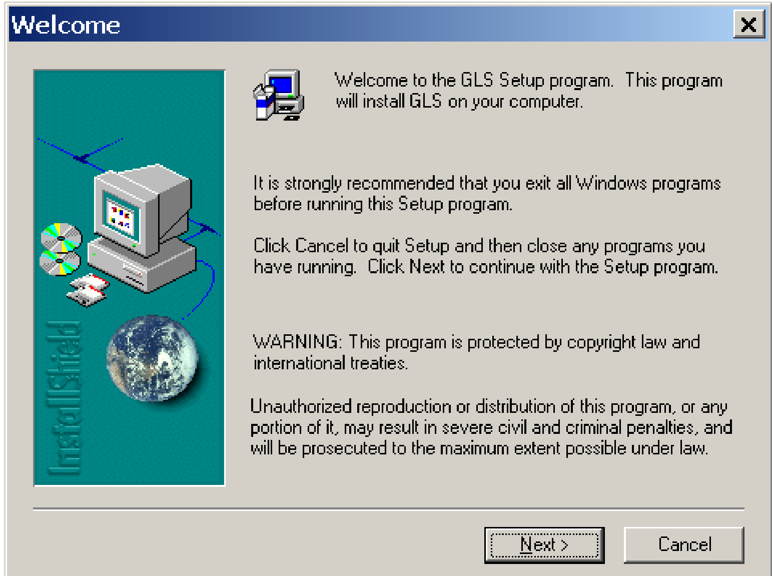
For some installations a MATLAB Runtime error message may appear as shown in the following figure.



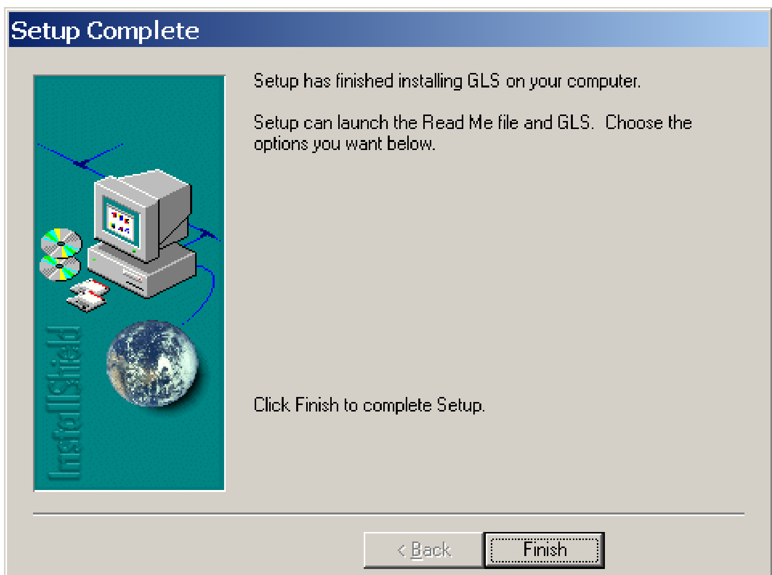
The Garmin GLS tool does not require the software listed in the error message. Click 'OK' to continue installation. The Install Wizard will complete the setup of the MATLAB Runtime and the following screen will appear.



Select 'Finish'. After several moments the setup wizard will continue and install the GMU 44 Location Survey Tool software.



Click 'Next' and follow the final setup instructions. The final screen will appear.



Select 'Finish' to complete the installation. A shortcut for the GLS Tool software will be created on your the desktop.

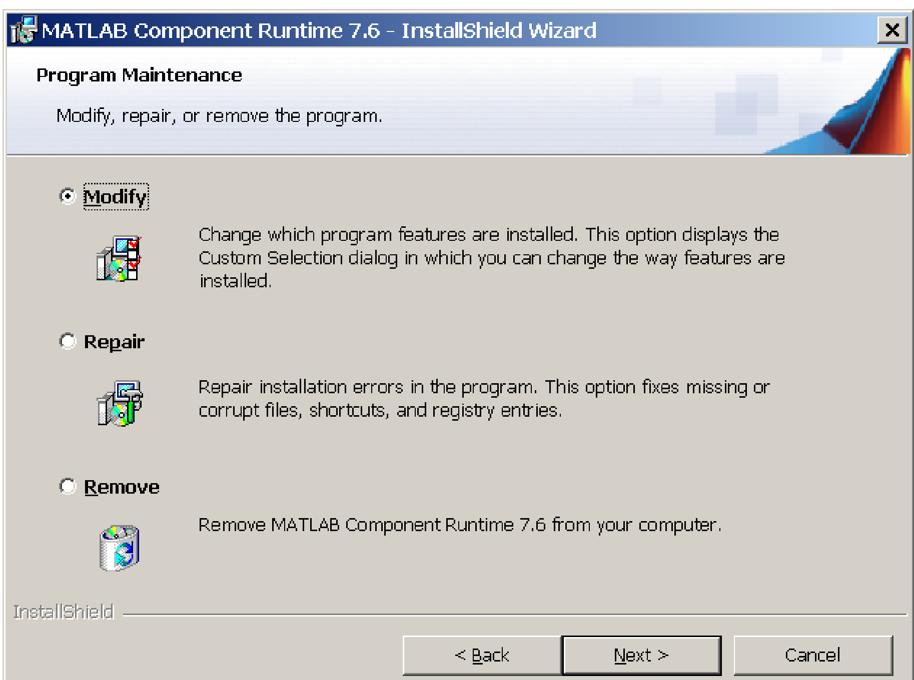
The GLS Tool software is now ready to use. Proceed to Section G.4.

G.3.2 For Existing MATLAB Installations:

NOTE

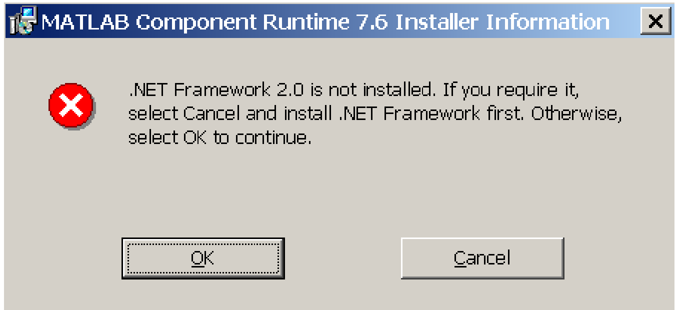
Follow the instructions below if the MATLAB Runtime environment has previously been installed.

Click ‘Next’ and the following window will appear:

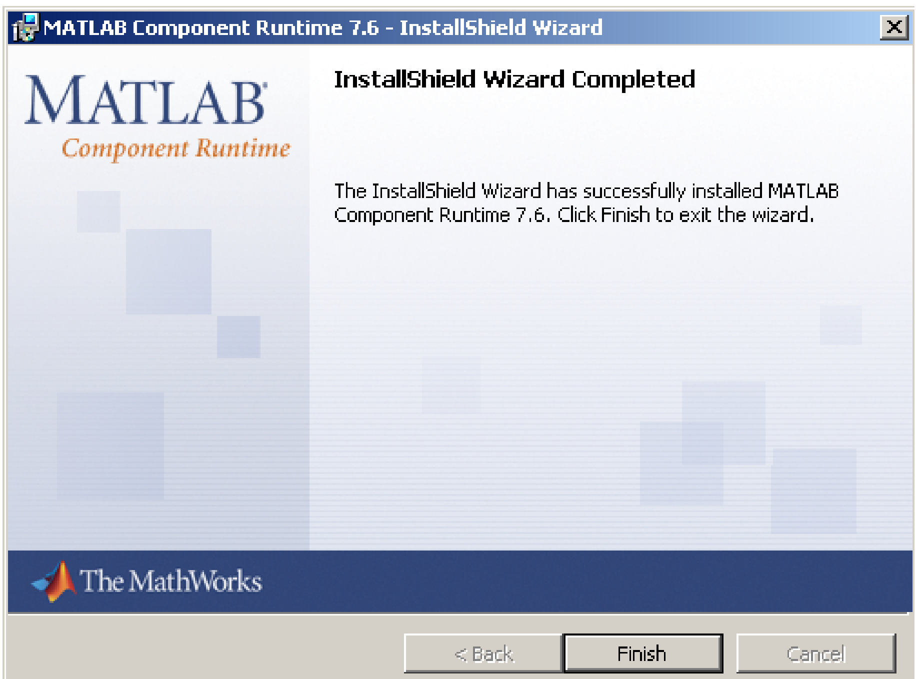


Leave Modify selected and click ‘Next’, ‘Next’ and ‘Install’ to install the required components.

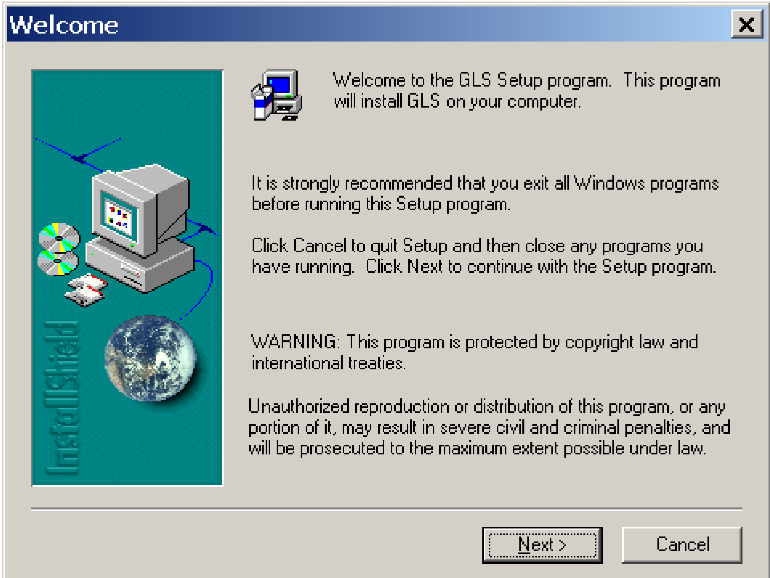
For some installations a MATLAB Component Runtime error message may appear as shown in the following figure.



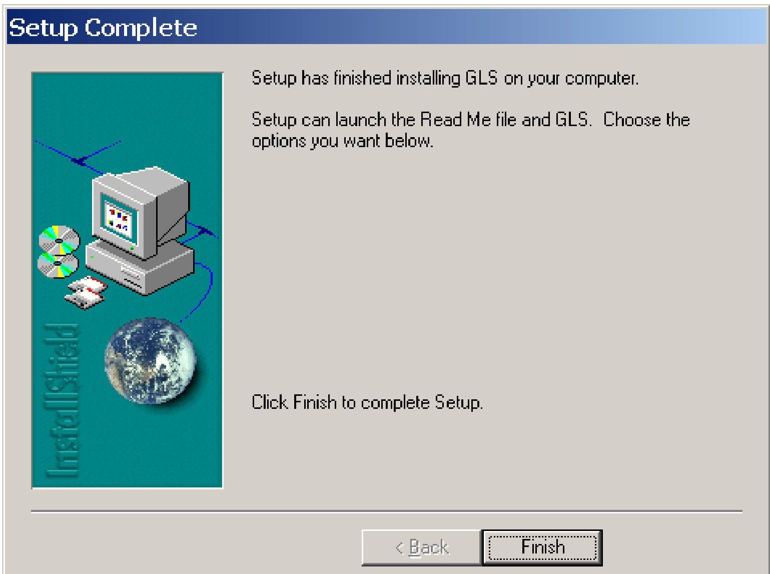
The Garmin GLS tool does not require the software listed in the error message. Click 'OK' to continue installation. The Install Wizard will complete the setup of the MATLAB Runtime and the following screen will appear.



Select 'Finish'. After several moments the setup wizard will continue and install the GMU 44 Location Survey Tool software.



Click 'Next' and follow the final setup instructions. The final screen will appear.



Select 'Finish' to complete the installation. A shortcut for the GLS Tool software will be created on your the desktop.

The GLS Tool software is now ready to use. Proceed to Section G.4.

G.4 Conducting the GMU 44 Location Survey with the GLS Tool

CAUTION

Do not permanently install the GMU 44 prior to successfully completing the magnetic survey. It is possible that the location will fail the survey and a new location will be required.

NOTE

The GLS Tool is designed to identify transient magnetic disturbances. In rare instances the GLS Tool magnetic survey will pass but the installation will fail the magnetometer calibration during the post installation checkout. This is usually due to a constant magnetic field present in the aircraft (e.g. the structure is magnetized). Contact Garmin for assistance if this occurs.

Place the GMU 44 on the desired installation location and secure in place using a non-ferrous material. With the aircraft leveled, ensure that the GMU 44 is within five degrees of level – the actual tilt of the GMU 44 can be confirmed when the survey is completed. Do not use clamps or other devices that are ferrous or magnetic. It is preferable to have the GMU 44 forward direction aligned to the aircraft heading, but not required.

Prepare a detailed test sequence list with precise start and stop times for exercising all items in the aircraft which are likely to affect the operation of the GMU 44 magnetometer. The list of relevant items varies from aircraft to aircraft. An example of a test sequence is given in Table G-1. This sequence contains items that will not be applicable to every installation and should be tailored to each particular installation – additional items may have to be added when doing so.

Connect the test equipment as shown in Figure G-1.

Table G-1. Example Detailed Sequence

A/C Reg. : ____________		Magnetometer Survey Data File: ____________________________
Elapsed Time Since Start of Test (secs)	**Elapsed Time Since Start of Test (min:secs)**	**Action**
0	0:00	Test begins (Calibration Period – no activity permitted)
20	0:20	Calibration Period Ends
30	0:30	Aileron full right
40	0:40	Aileron full left
50	0:50	Aileron level
60	1:00	Rudder full right
70	1:10	Rudder full left
80	1:20	Rudder neutral
90	1:30	Elevators full up
100	1:40	Elevators full down
110	1:50	Elevators neutral
120	2:00	Flaps down
140	2:20	Flaps up
160	2:40	Landing gear up
180	3:00	Landing gear down
190	3:10	Speed brake up
200	3:20	Speed brake down
210	3:30	Navigation lights on
220	3:40	Navigation lights off
230	3:50	Landing lights on
240	4:00	Landing lights off
250	4:10	Taxi lights on
260	4:20	Taxi lights off
270	4:30	Air conditioning on
280	4:40	Air conditioning off
290	4:50	Landing + Taxi lights on
300	5:00	Landing + Taxi lights off
310	5:10	Strobes on
320	5:20	Strobes off
330	5:30	Recognition lights on
340	5:40	Recognition lights off
350	5:50	Turn on all wing-tip lights simultaneously (typically will include navigation lights, recognition lights and strobe)
360	6:00	Turn off all wing-tip lights simultaneously
370	6:10	Beacon on
380	6:20	Beacon off
390	6:30	Autopilot engaged in a pitch and roll mode (to engage servo clutches)
400	6:40	Autopilot disengaged.
410	6:50	Pitot heat on
420	7:00	Pitot heat off
430	7:10	End of test

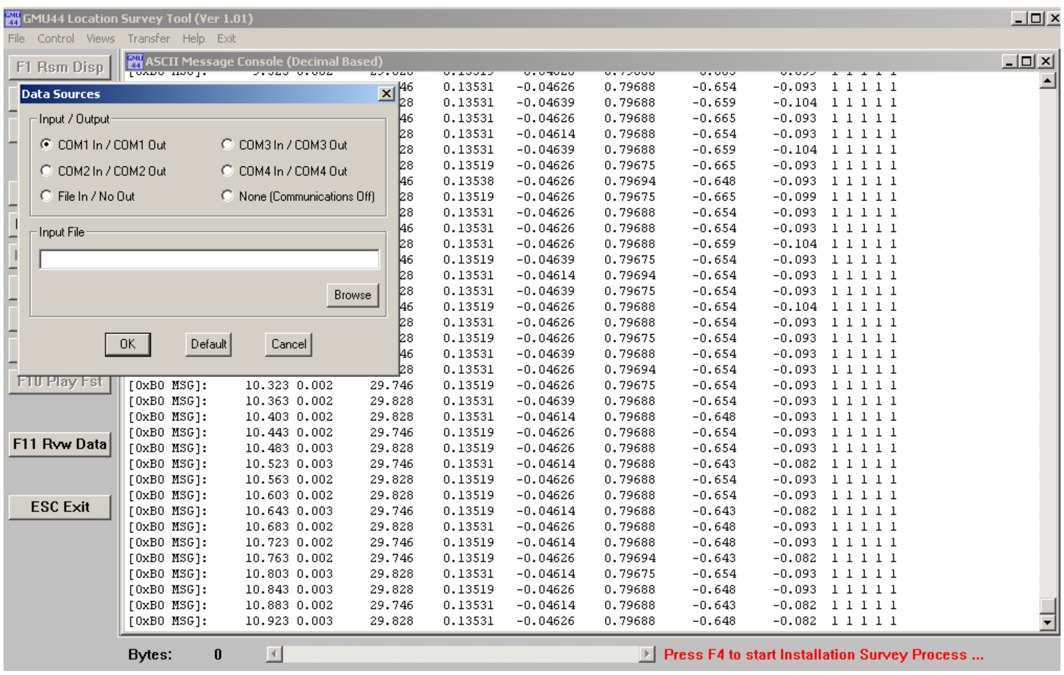
G.4.1 Data Collection

Open the Garmin GLS tool by double-clicking on the shortcut to the Garmin GLS Tool.

NOTE

It may be necessary to adjust your screen settings in order to display the tool screen properly on your laptop or PC. Consult your operating software instruction manual for instructions on how to change screen settings.

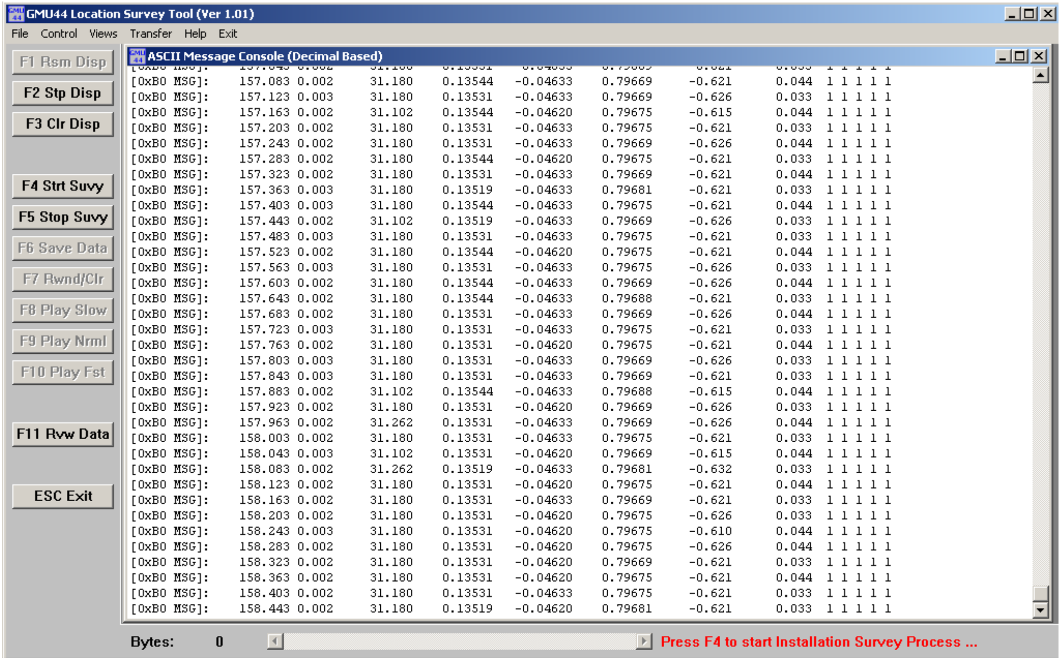
Once the test software is open, pull down the File menu and select ‘Sources’. Select the appropriate COM port and select ‘OK’. This step is only required for the initial setup and does not need to be completed for subsequent use of the GLS Tool software.



NOTE

The Garmin GLS tool will start displaying received data from the GMU 44 as soon as power is applied to the GMU44 (assuming correct test harness interconnect).

Connect the test harness to the appropriate COM port on the laptop and open the test software. Limit current to 200 mA and apply 12V to the GMU.

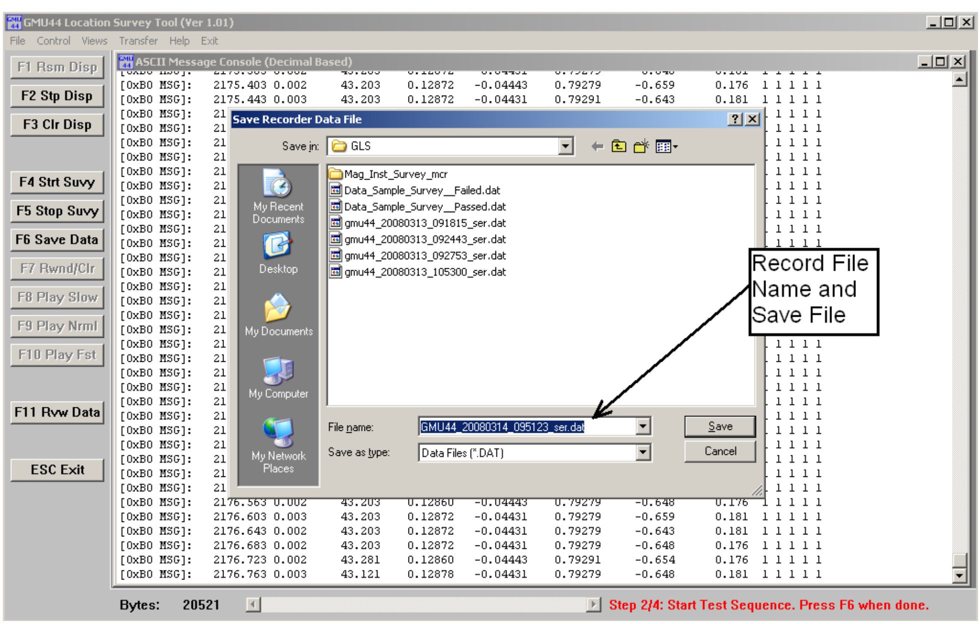


NOTE

To get accurate results from the survey, ensure that the standard power architecture in the aircraft is ON during the first 20 seconds of the survey.

Before beginning the survey, power up the aircraft with the standard power architecture ON (master switch, avionics bus if applicable, etc.) With test sequence in hand, start the survey by selecting 'F4 Strt Suvy' or pressing the F4 key on the keyboard and start the stopwatch simultaneously. Perform the test sequence making sure to follow the timeline for all actions. **Ensure that for the first 20 seconds the aircraft is not disturbed**, i.e. no movement of flight controls or use of instrumentation, etc.

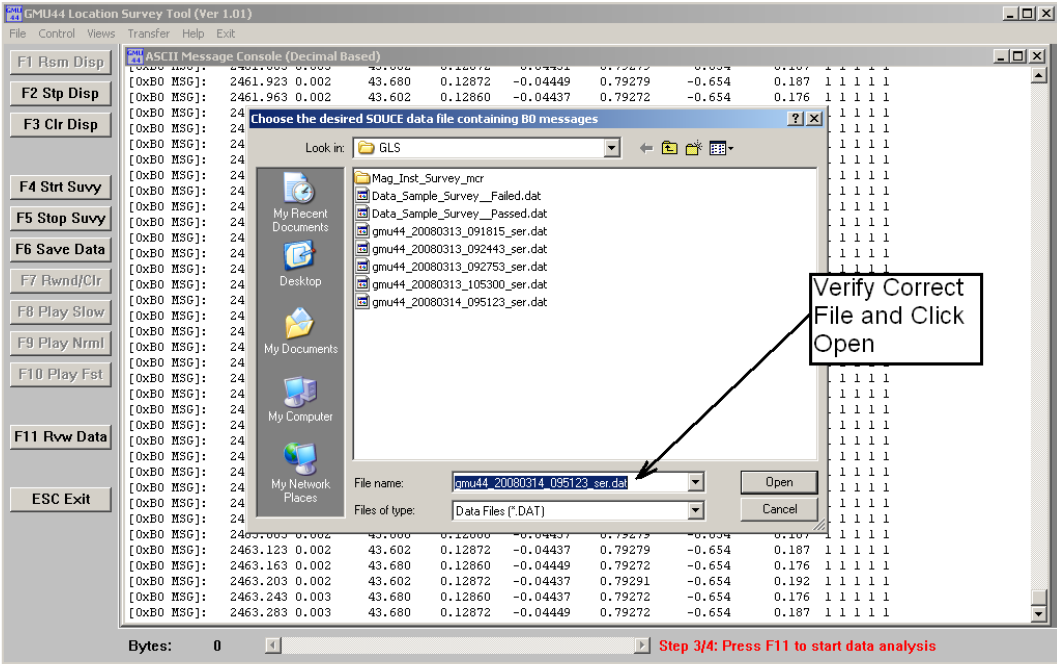
When the operator has completed the actions specified in the test sequence, stop the test software by selecting 'F5 Stop Suvy' or pressing the F5 key. Select 'F6 Save Data' or press the F6 key on the keyboard to save the file. Record file name on the test sequence sheet.



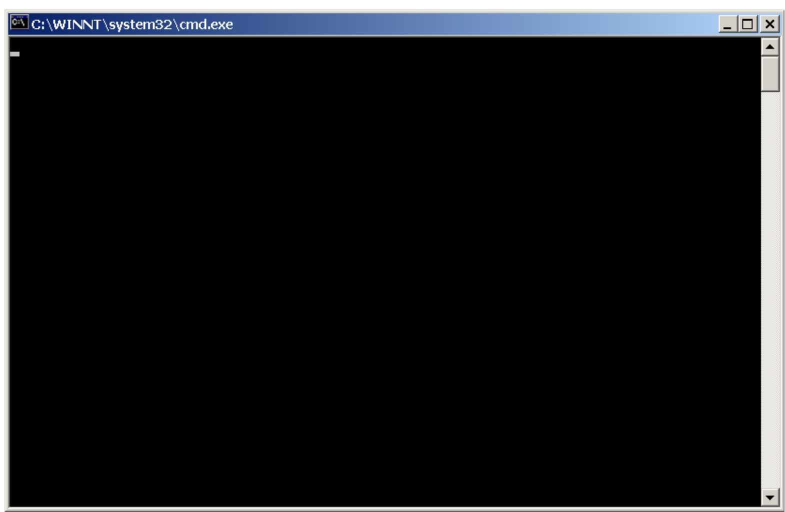
G.4.2 Data Analysis

To analyze the data select the 'F11 Rvw Data' or press the F11 key on the keyboard.

A window will open asking for the file name of the data to be analyzed. Select the saved file for the appropriate test and select 'Open'.

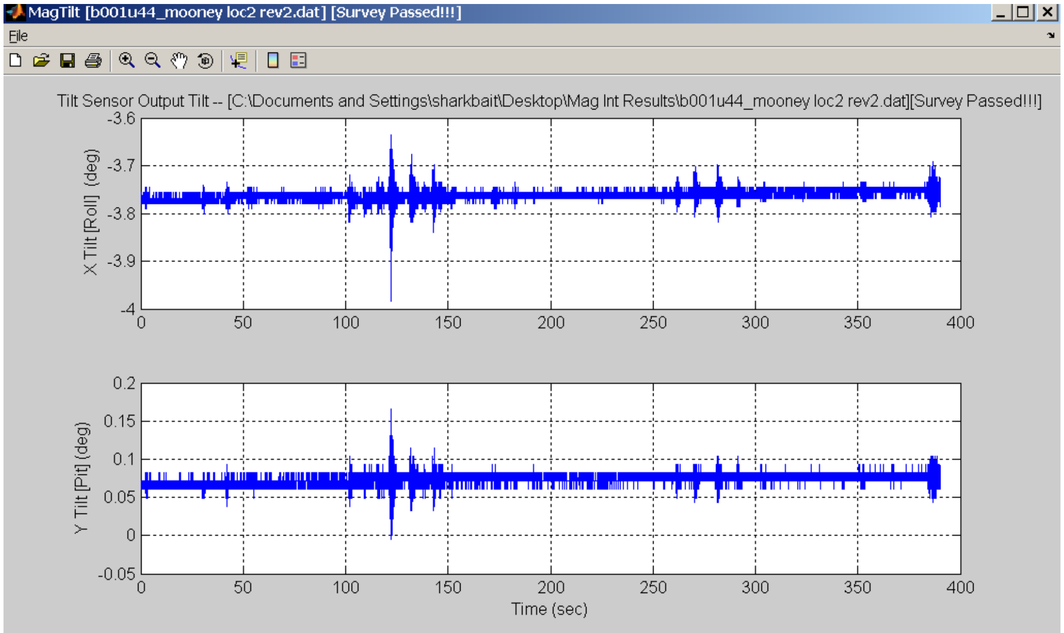


After selecting 'Open' the following DOS window will appear while the data is being analyzed. The analysis may take several minutes, depending upon how much data was recorded.



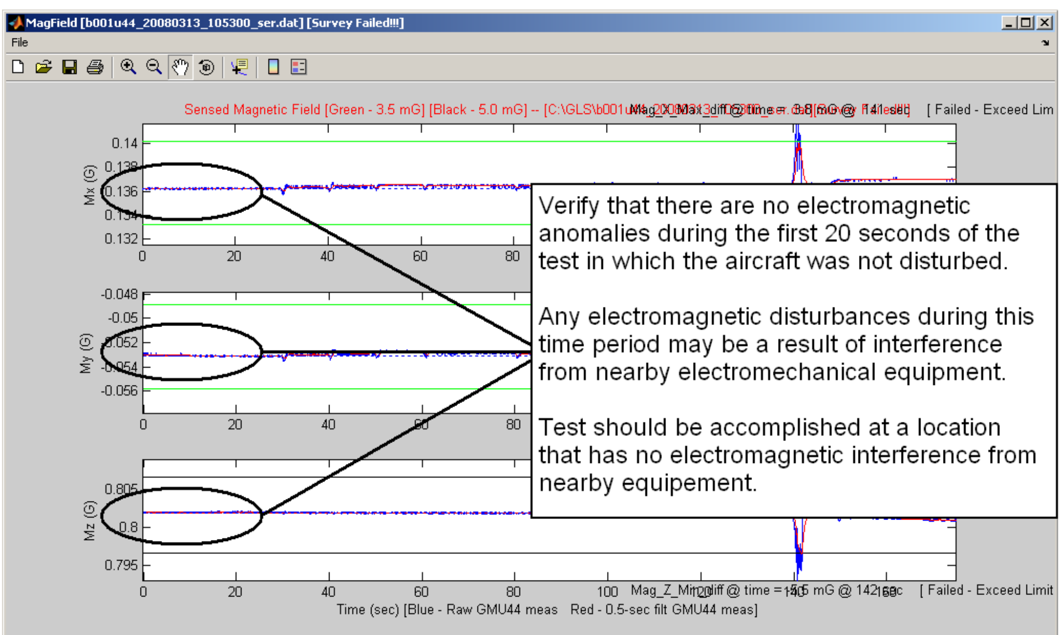
When the analysis is complete, the test results will be displayed in a graph format. Two plots will be displayed – the magnetic survey field results and the magnetometer tilt measurements. The plots of the magnetic interference results and magnetometer tilt will be automatically saved as bitmap (.bmp) files in the same directory as the source data file, with the same name as the source data file – these can be used for future reference.

Select the magnetometer tilt measurements window (MagTilt).

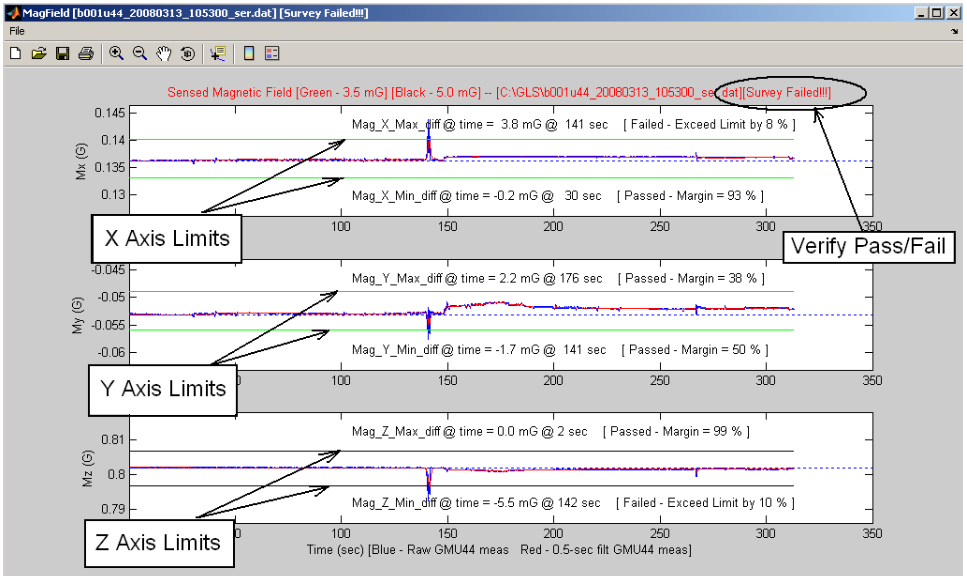


Verify that the X Tilt (Roll) and Y Tilt (Pit) are within the range -5° < X/Y Tilt < 5°. If the tilt is not within 5° of level the temporary GMU 44 installation must be corrected to level the GMU 44, and the survey must be repeated before proceeding.

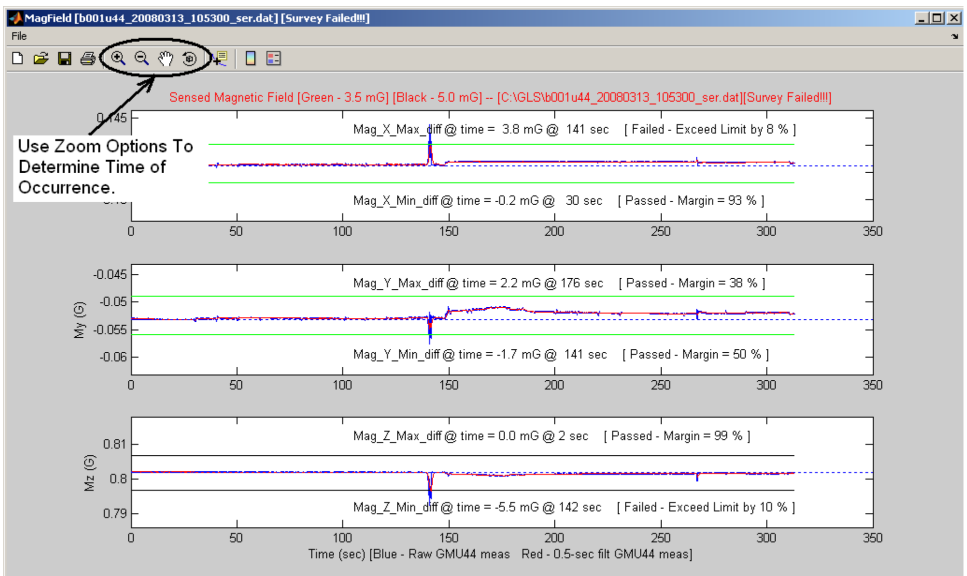
If the tilt is within the acceptable range, select the magnetic survey field results (MagField) window. Verify that there are no electromagnetic anomalies during the first 20 seconds of the test in which the aircraft was not disturbed.



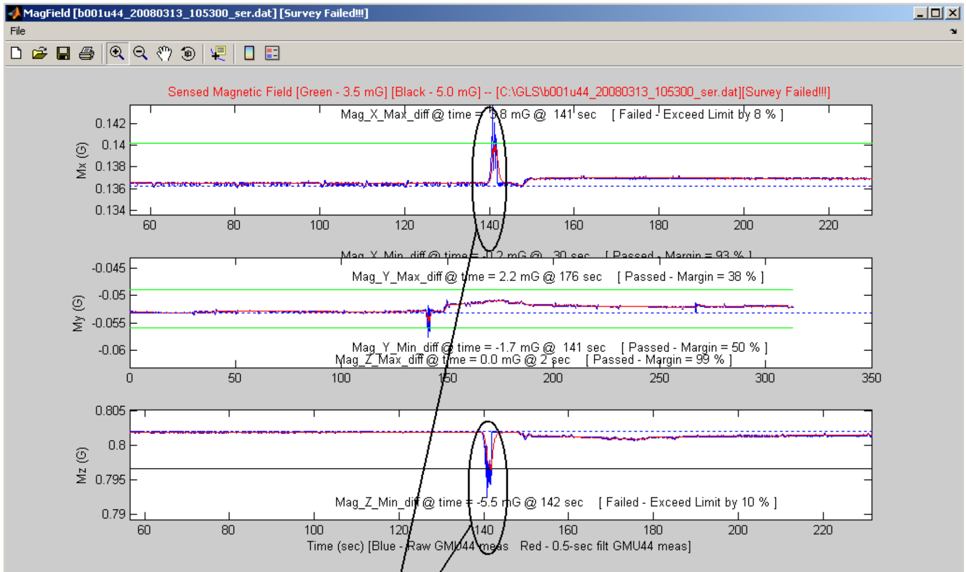
The Graph will show the electromagnetic boundary limits for each axis (X, Y and Z) for information only. The message on top right of the screen will show if the survey has ‘Passed’ or ‘Failed’.



If the survey displays that the survey has failed, use the zoom options to determine the time of occurrence.



Correlate the time of occurrence of the failure with the action performed on the detailed test sequence and correct the source of the interference. Refer to Section 6.1 for additional information on troubleshooting and correcting a GMU 44 magnetometer installation. If the magnetic interference cannot be remedied, another location should be chosen and tested.

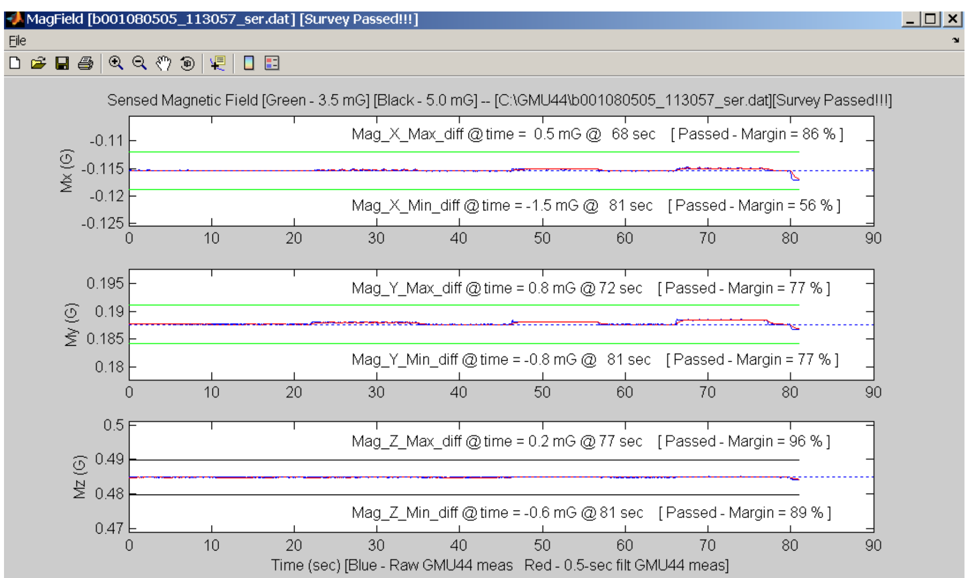


100	1:40	Landing gear up
110	1:50	Landing gear down
120	2:00	Speed brake up
130	2:10	Speed brake down
140	2:20	Navigation lights on
150	2:30	Navigation lights off
160	2:40	Landing lights on

If the test fails, the location should be considered unreliable until the source of the magnetic interference is identified, remedied and the location is retested and passes the test.

If the test passes, the location is considered reliable for the installation of the GMU 44.

The following example is a result from a survey with ideal passing results:



When done, the data analysis windows can be closed by closing the three windows individually, or by returning to the DOS window shown below and pressing the <Enter> key.

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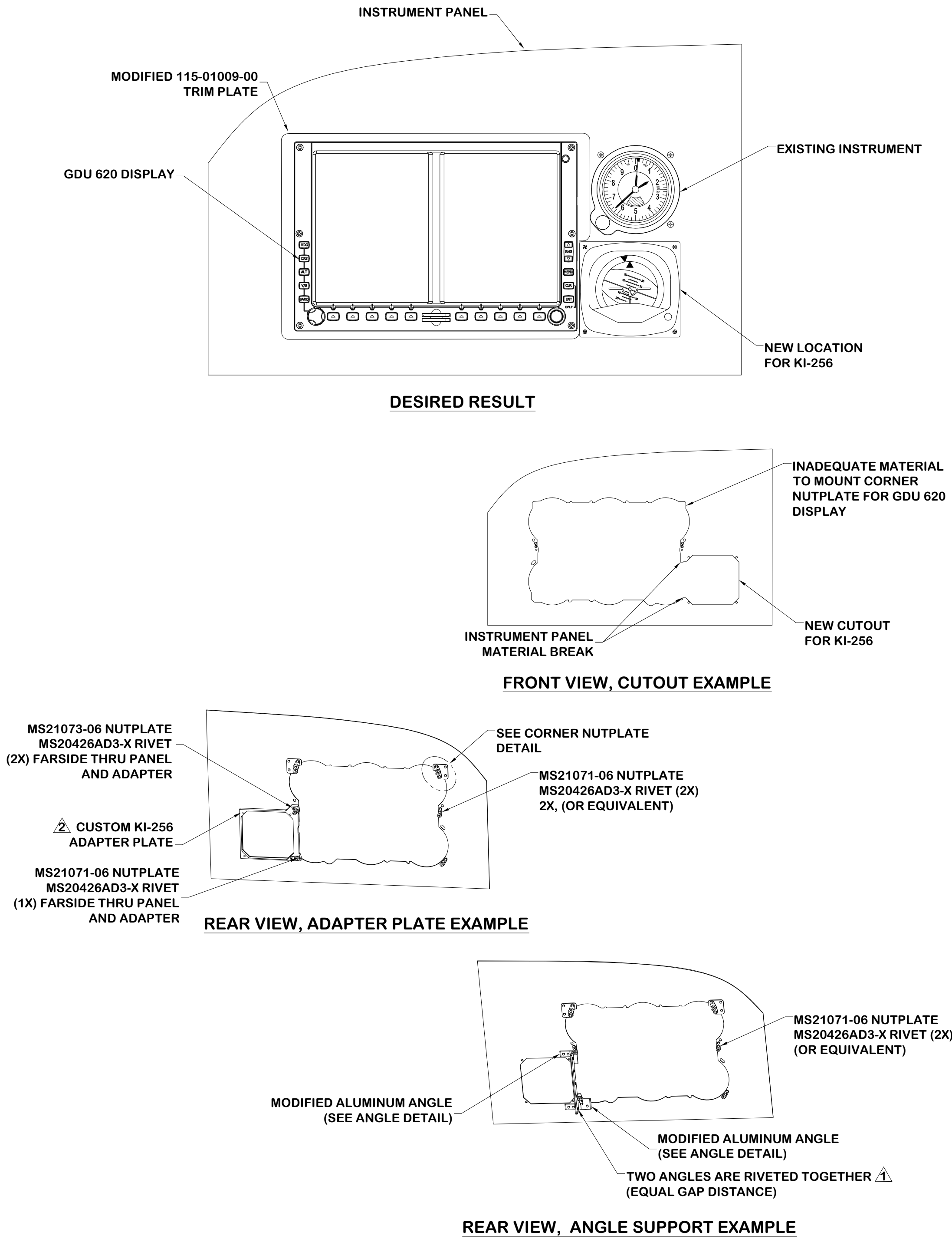
Appendix H Miscellaneous Instrument Panel Installations

H.1 Panel Patches for GDU 620 and Accommodation of Oversize Indicators

In some installations, once the cutout is made for the GDU 620, there is insufficient material remaining on the instrument panel on which to affix nut plates. If at least four nut plates have sufficient material for attachment directly to the instrument panel, it is acceptable to use patch plates for the remaining one or two nut plates. Patch plates may be installed as described in Figure H-1.

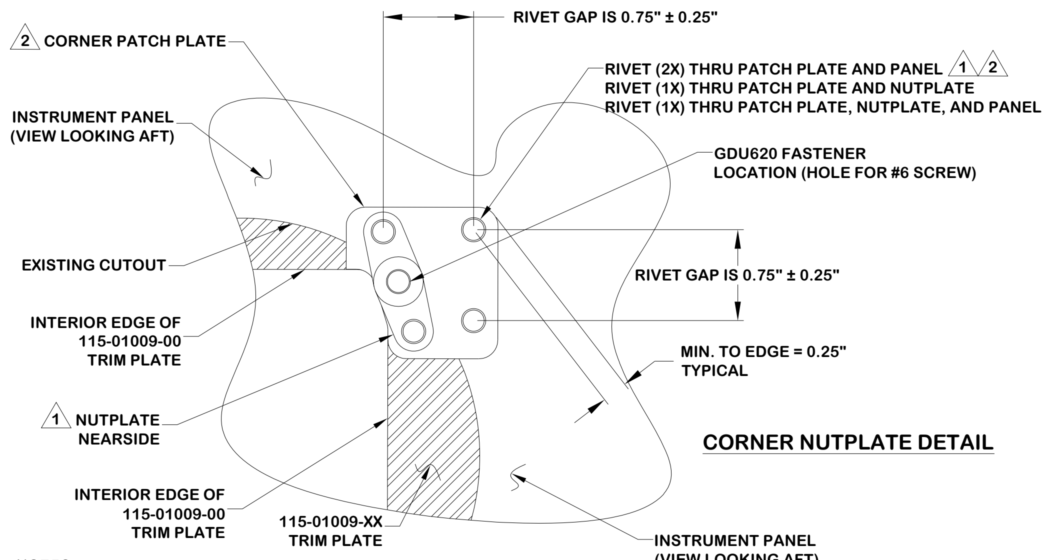
In some installations, once the cutout is made for the GDU 620, there is no material remaining between adjacent instrument cutouts. This usually occurs for oversize indicators, such as the King KI 256. If this occurs for one instrument, it is acceptable to install angle brackets or custom adapter plate, as described in Figure H-1.



NOTES:

1. RECOMMENDED RIVET HARDWARE TO MOUNT ANGLES IS MS20426AD3-X IF FLUSH IS REQUIRED OR MS20470AD3-X IF HEAD CLEARS OTHER ITEMS.
2. FABRICATE CUSTOM ADAPTER PLATE FOR KI-256. PLATE MUST UTILIZE AT LEAST TWO OF THE GDU 620 MOUNTING LOCATIONS AND HAVE PROVISIONS TO SECURE THE KI-256 TO THE PANEL. ADDITIONAL ATTACHMENTS TO THE PANEL (I.E. RIVETS) IS RECOMMENDED FOR EASE OF INSTALLATION. MATERIAL IS 0.125" MIN. THICKNESS 6061-T6 OR 2024-T3 ALUMINUM.

Figure H-1. Instrument Panel Patches (Sheet 1 of 2)



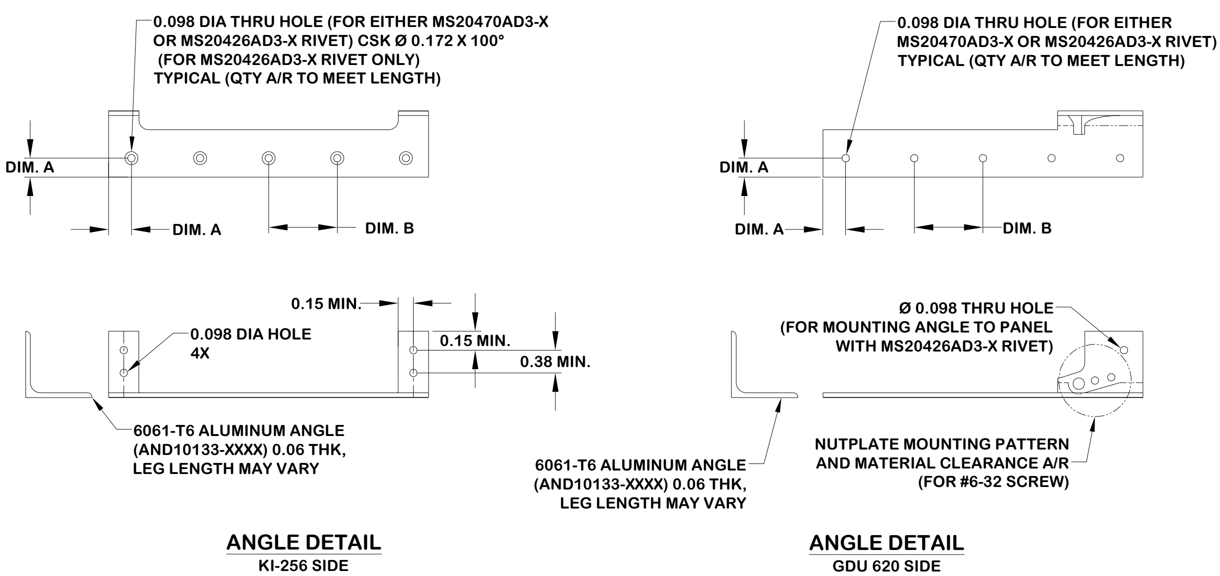
NOTES:

1. RECOMMENDED HARDWARE OPTIONS FOR ASSEMBLY:

HARDWARE	SPECIFICATIONS
RIVETS	MS20426AD3-X
NUTPLATES	(M)F5000-06; (M)K1000-06; (M)K2000-06; OR F2000-06

2. A PATCH PLATE MAY BE REQUIRED FOR ANY GDU620 FASTENING LOCATION DEPENDING UPON THE RAW OPENING OF THE INSTRUMENT PANEL MATERIAL. THE MATERIAL OF THE PATCH PLATE SHOULD BE 0.063" MIN. THICKNESS ALUMINUM 2024-T3. TRIM THE PATCH PLATE TO AVOID CONTACT WITH EXISTING INSTRUMENTS AND MATCH THE PATCH INNER EDGE TO THE OPENING OF THE TRIM PLATE. THREE RIVETS SHOULD PENETRATE AND SECURE THE PATCH PLATE TO THE PANEL. FOLLOW THE DIMENSIONAL GUIDELINES PROVIDED.

3. CORROSION COAT FABRICATED PARTS WITH ZINC CHROMATE PRIMER ALL SURFACES.

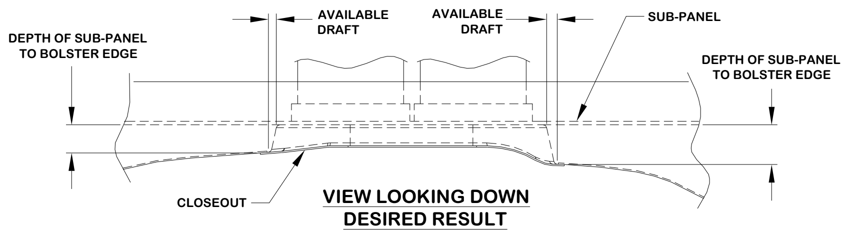


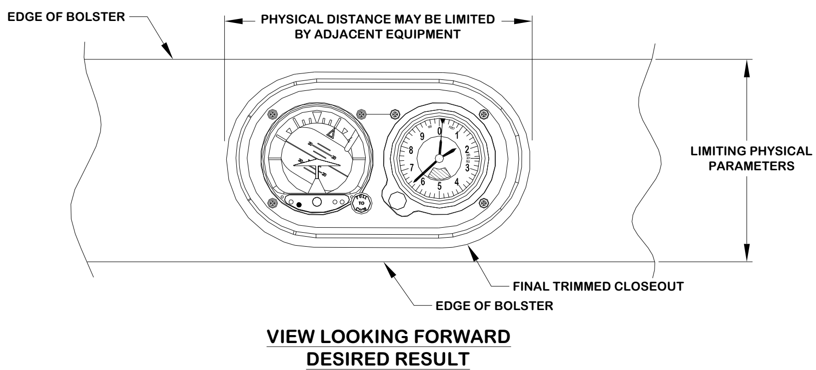
HARDWARE	DIM. A		DIM. B
	MIN.	MAX.	
RIVETS	0.25"	0.50"	0.5" < DIM B < 1.75"
SCREWS	0.30"	0.50"	0.5" < DIM B < 1.75"

Figure H-1. Instrument Panel Patches
(Sheet 2 of 2)

H.2 Bolster Modification for Standby Instruments

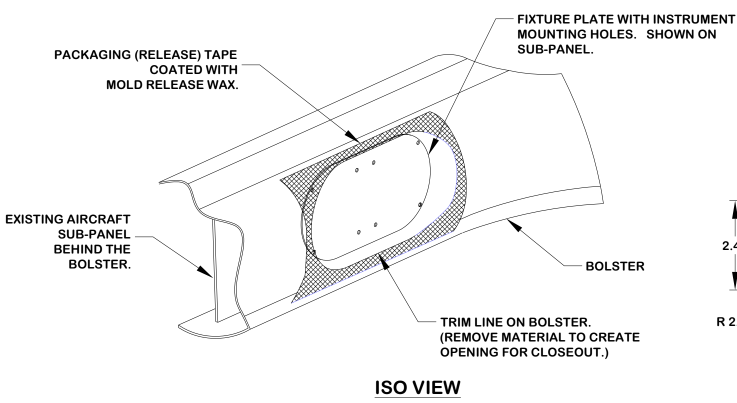
In some installations there is unused space in the bolster immediately below the instrument panel. If the location meets the requirements for the location of 3 1/8" Standby Instruments (refer to Section 2.5.11.2), it may be desirable to install one or more standby instruments in the bolster. It is acceptable to rework the bolster and cut holes in the subpanel as shown in Figure H-2.

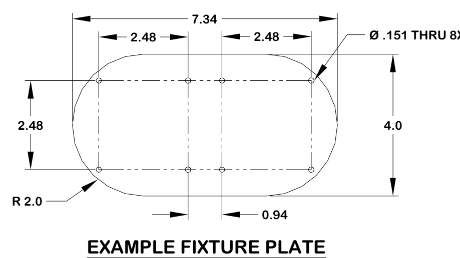




NOTES:

1. WHEN A SUB-PANEL IS CREATED FOR USE IN A BOLSTER, TO SUSTAIN ADEQUATE VISIBILITY, IT IS IMPORTANT TO MAKE THE CUT-OUT ON THE BOLSTER LARGER THAN THE SUB-PANEL SURFACE AREA. THIS WILL CREATE A DRAFT ANGLE IN THE FIBERGLASS CLOSEOUT PART. ACTUAL PHYSICAL SIZE OF THE CUT-OUT WILL DEPEND UPON VARIOUS COCKPIT FACTORS, PRIMARILY WHAT OTHER DEVICES ARE ADJACENT TO THE SELECTED LOCATION AND THE DEPTH DIFFERENCE BETWEEN THE SUB-PANEL AND BOLSTER.



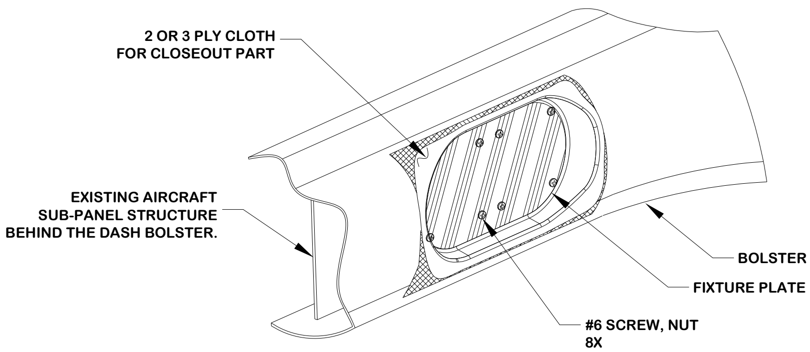


MATERIAL: .13" ALUMINUM PLATE OR .38-.50" PLYWOOD. EXAMPLE SHOWN IS FOR TWO 3.125" INSTRUMENTS. DIMENSIONS SHOWN FOR REF ONLY. ACTUAL DIMENSIONS WILL DEPEND UPON INSTRUMENTS USED.

NOTES:

1. BOLSTER IS INSTALLED IN AIRCRAFT FOR THIS OPERATION.
2. FABRICATE A FIXTURE PLATE THAT CONTAINS THE MOUNTING HOLE PATTERN(S) FOR THE INSTRUMENT(S) TO BE MOUNTED IN THE BOLSTER.
3. TRIM BOLSTER TO PROVIDE DESIRED DRAFT ANGLE IN CLOSEOUT PART. TEMPORARILY AFFIX THE FIXTURE PLATE ONTO THE EXISTING AIRCRAFT SUB-PANEL FORWARD OF THE BOLSTER. CENTRALLY LOCATE THE PLATE TO THE CUTOUT IN THE BOLSTER.
4. MATCH DRILL THE INSTRUMENT MOUNTING HOLES FROM THE FIXTURE PLATE ONTO THE SUB-PANEL.
5. REMOVE THE FIXTURE PLATE. ADD RELEASE TAPE AND MOLD RELEASE WAX TO THE SUB-PANEL AND FIXTURE PLATE.

Figure H-2. Bolster Modification for Standby Instruments (Sheet 1 of 2)

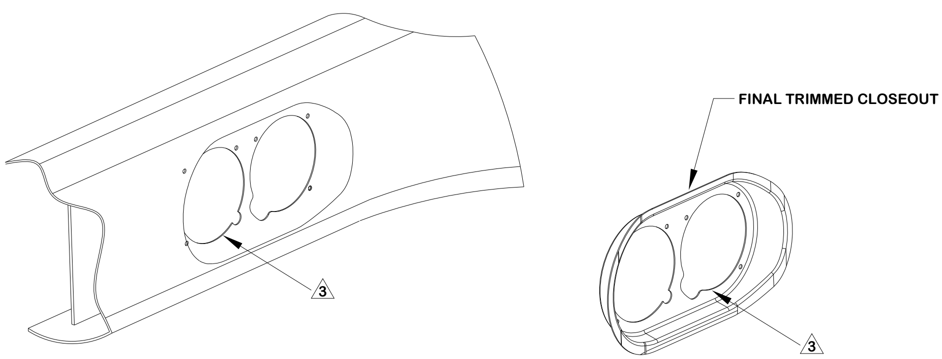


ISO VIEW

(DEVELOPMENT OF CLOSEOUT AND SUB-PANEL)

NOTES:

1. LAY DOWN 2 OR 3 PLY CLOTH IN PLACE. CLOTH ON SUB-PANEL SHOULD BE LYING FLAT. PERFORATE CLOTH AT SUB-PANEL HOLE LOCATIONS FOR INSTRUMENTS. INSERT FIXTURE PLATE. FASTEN WITH SCREWS THAT ARE PRE-COATED WITH MOLD RELEASE WAX.
2. TRIM EDGES OF CLOTH SO ONE CAN TAPE THE WET CLOTH DOWN TO THE FIRST TAPE LAYER ON BOLSTER TO PREVENT THE GLASS CLOTH FROM SAGGING. PULL THE GLASS OUTWARD TO CREATE A GOOD FORM WITHOUT WRINKLES OR SAGS. TAPE THE RESULTANT CLOTH SECURELY TO HOLD THE SHAPE AS IT CURES. CURE IN PLACE.



ISO VIEW

(DEVELOPMENT OF CLOSEOUT AND SUB-PANEL)

NOTES:

1. USING AIR PRESSURE BETWEEN THE NEW CLOSEOUT AND THE BOLSTER, GENTLY REMOVE THE NEWLY FORMED PART.
2. PEEL OFF ALL THE TAPE FROM THE BOLSTER AND SUB-PANEL. CLEAN ALL PARTS.
3. IN THE SUB-PANEL AND CLOSEOUT PART CUT OUT THE LARGE HOLES REQUIRED FOR EACH INSTRUMENT. TEMPORARIILY INSTALL THE INSTRUMENTS TO VALIDATE THE OPENINGS ARE SATISFACTORY.
4. USE BODY AND GLAZING PUTTY FOR FILLING SURFACES ON THE CLOSEOUT. FINISH THE SURFACES AND EDGES WITH SAND PAPER UNTIL A SMOOTH FINISH IS ACCOMPLISHED (WITH 220 GRIT PAPER).
5. PRIME AND PAINT THE CLOSEOUT TO MATCH THE BOLSTER COLOR.

Figure H-2. Bolster Modification for Standby Instruments (Sheet 2 of 2)

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