G500H Rotorcraft STC Installation Manual

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RECORD OF REVISIONS

Revision	Revision Date	Description
1	2/3/10	Initial Release
2	3/17/10	Update for GDU software 4.01.

Revision	Page Number(s)	Section Number	Description of Change
2	i		Updated software level to 4.01.
	1-4	1.4.1	Corrected part number GDU 620.
	5-2	5.2.4	Corrected description and NOTE for Vyse. Also added Vne to table.
	5-45	5.8.10	New section for Discrete Check.
	5-46	5.9	Changed placard to read, “Approved for Day/Night VFR”.
	5-52	Checkout Log	Removed ADF Bearing Display from Flight Checks and added Discrete Check.
	7-1	7.2.1.2	Added new section, “GNS 500W Series HTAWS Annunciation.
	D-12	Appendix D	Updated sheet 2 and 3 of Figure D-8.
	E-11	Table E-1	Removed cyclic, pedal, and collective actions from table.

DOCUMENT PAGINATION

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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 4.01 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 G500H system, which includes the GDU 620 display, GDC 74H air data computer, GRS 77H 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 G500H system. It includes installation and checkout procedures for the G500H.

1.2 Terminology

All references made to the "GDU 620" apply equally to the GDU 620 with the reversed display (011-01264-60) version unless otherwise noted.

Also, throughout this manual the term "aircraft" and "rotorcraft" will be used interchangeably.

1.3 Scope

This installation manual applies to the modification of a rotorcraft to support the installation of the G500H 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, etc.) is not covered. Those systems require other installation data and approval.

The data contained within this manual is FAA approved under STC SR02295LA, which is applicable to installation in rotorcraft limited to VFR operations listed on the STC. Installation of the G500H system in a rotorcraft imposes specific limitations which may affect the operational capabilities of the rotorcraft. Section 7 of this manual lists all the Limitations, which should be carefully reviewed prior to any installation.

1.3.1 Approved Rotorcraft with Systems not Covered by the STC

The rotorcraft identified have been determined to meet a minimum required configuration for applicability of the STC. However, since some of these rotorcraft may have been modified over the years or may have been manufactured with systems which are not identified or approved in these manuals for integration with the G500H, 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 rotorcraft. Use Section 2 and the general arrangement drawing listed in the MDL (005-C0577-00) of this manual to assess each installation prior to modifying any Type Certified rotorcraft to ensure the applicability of the data.

It is possible/permissible for installers and other appropriately certificated persons to seek approval for installation and operational use of the G500H 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 governing airworthiness authority for approval.

1.3.2 Required Documentation for All Installations

Regardless of applicability of the STC or alternative field approval application for installation and operational approval, prior to completing the installation and before returning the helicopter to service, the installer or other appropriately certificated person is required to complete the appropriate documentation. In addition, the G500H Configuration and Checkout Log must be completed and attached with the Instructions for Continued Airworthiness such that any rotorcraft with the modifications detailed in this manual may be properly maintained.

1.4 System Overview

The G500H system is designed to replace the primary six round analog instruments, along with any external CDIs. A standby altimeter and airspeed are required. The existing magnetic compass must be retained in its existing location. An overview of the G500H system is shown in Figure 1-1. Further detail on each of the LRUs is provided in the following sections.

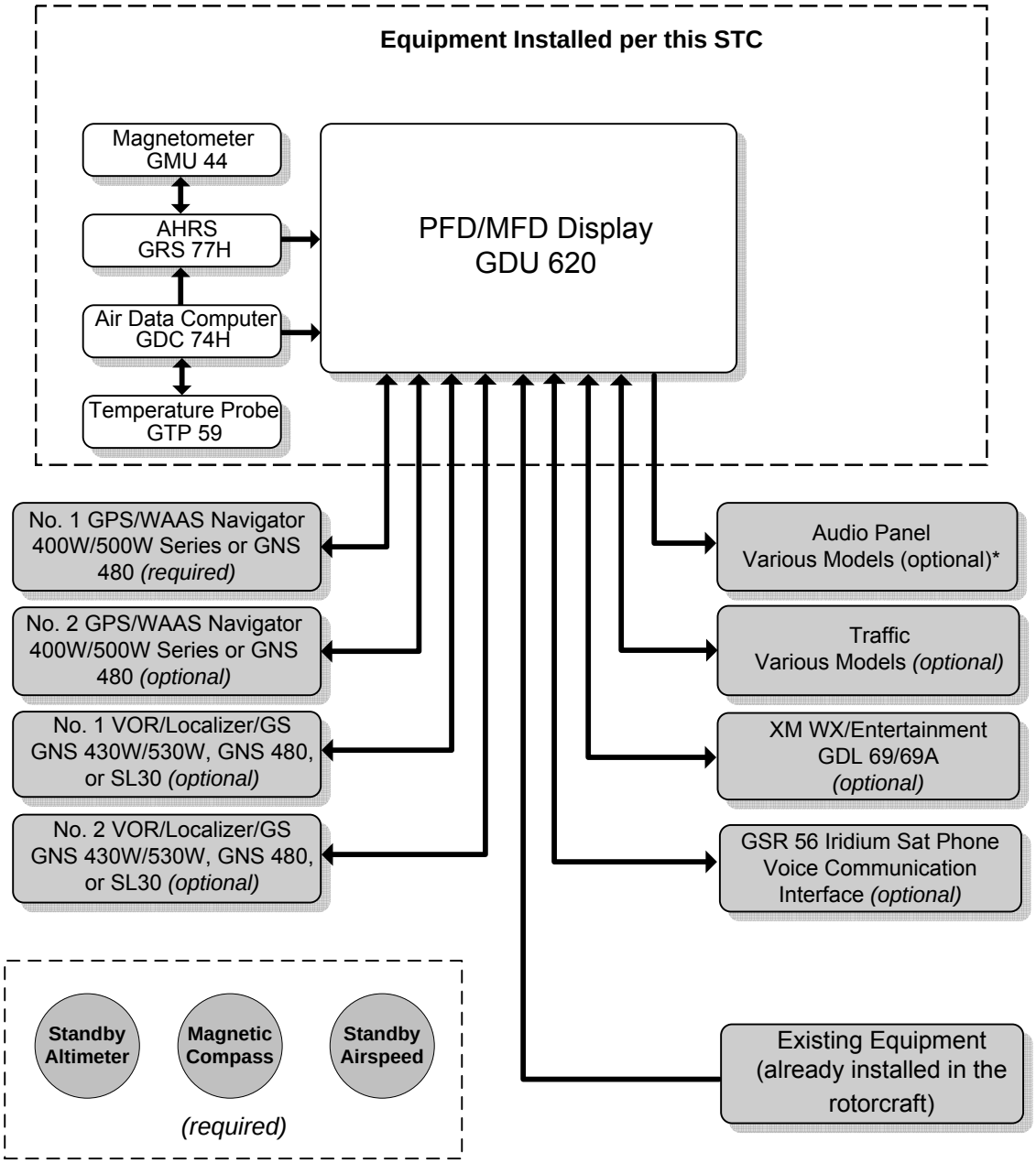


Figure 1-1. G500H System Overview

1.4.1 LRU Descriptions

GDU 620 (011-01264-50): The GDU 620 has dual VGA (640 x 480 pixels) 6.5-inch LCD displays. The left side of the GDU 620 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.

GDU 620 (011-01264-60): The GDU 620 (011-01264-60) is a variant of the GDU 620 (011-01264-50) in which the MFD and PFD are on opposite sides—The PFD is on the right side and the MFD is on the left side. The knobs and buttons are located near the display associated with their function.

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

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

GDC 74H: The GDC 74H air data computer receives information from the pitot/static system and the GTP 59 outside air temperature (OAT) sensor. The GDC 74H is responsible for providing pressure altitude, airspeed, vertical speed, and OAT information to the G500H system. The GDC 74H provides data to the GDU 620 and GRS 77H using ARINC 429 digital interfaces. The GDC 74H also communicates maintenance and configuration information to the GDU 620 using an RS-232 interface.

GTP 59: The GTP 59 provides outside air temperature information to the GDC 74H ADC.

1.4.2 Required GPS Navigator

At least one of the following WAAS/GPS navigators is required, although the G500H system will support two independent 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 77H 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 77H 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.

1.4.3 Required Standby Instruments

When the G500H system is installed in accordance with the G500H STC SR02295LA limited to VFR operations, a standby altimeter and standby airspeed **must** be installed. In many cases the existing altimeter and airspeed indicator can be retained for use as a standby. In addition, the existing magnetic compass must remain in its existing location.

NOTE

A standby attitude indicator is **not** required.

1.4.4 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 GTS 8XX TAS/TCAS I, Garmin GTX 330/330D, L3 Communications SkyWatch, Honeywell TAS/IHAS and Avi 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.

GSR 56; The GDU 620 can receive RS 232 data information from the GSR 56. The GSR 56 provides airborne low speed data link and voice communication capability to the G500H installations. The GSR 56 contains a transceiver that operates on the Iridium Satellite network.

1.4.5 Interface Summary

A summary of the individual interface types between the LRUs in the G500H system is shown in Figure 1-2.

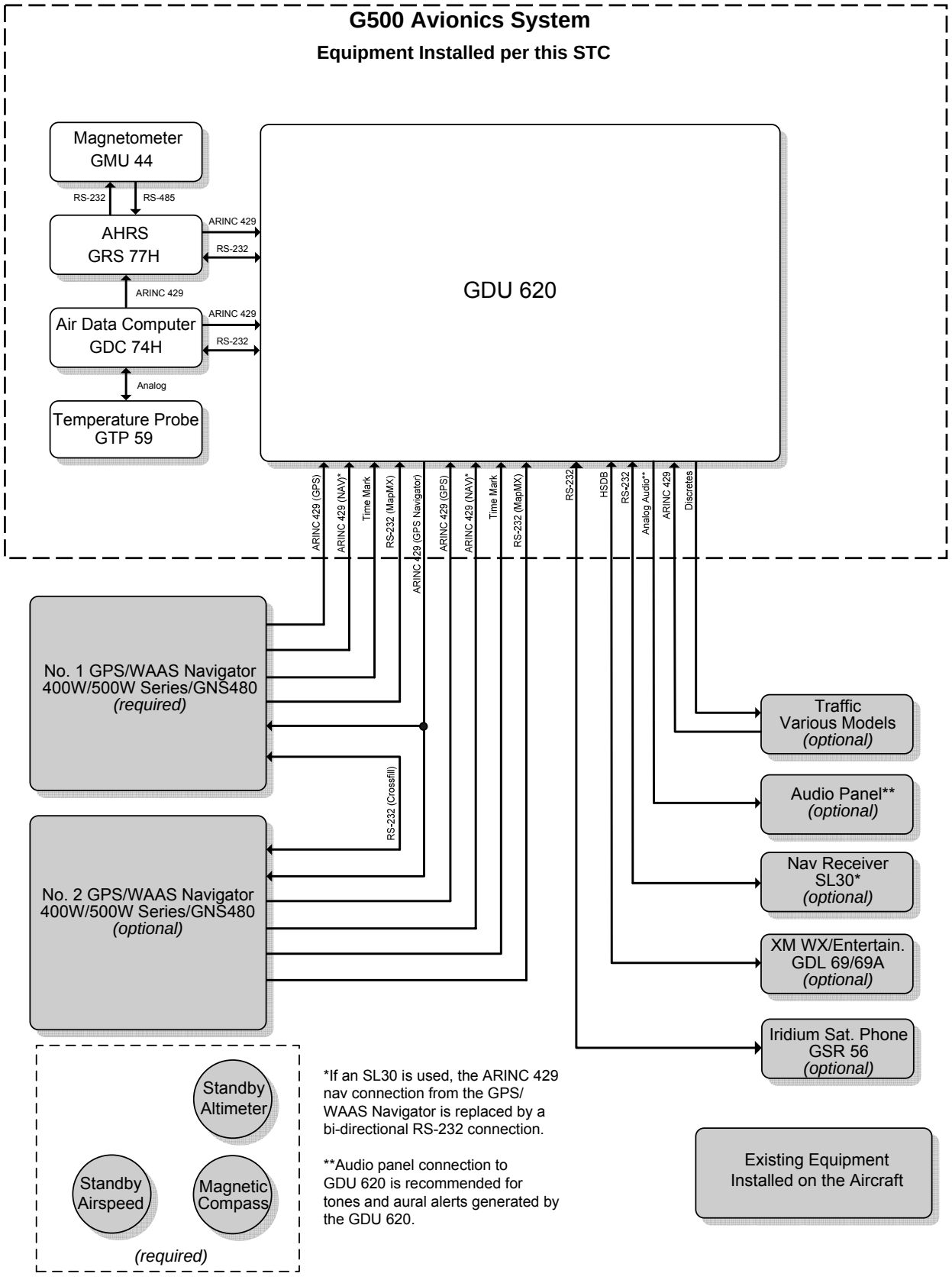
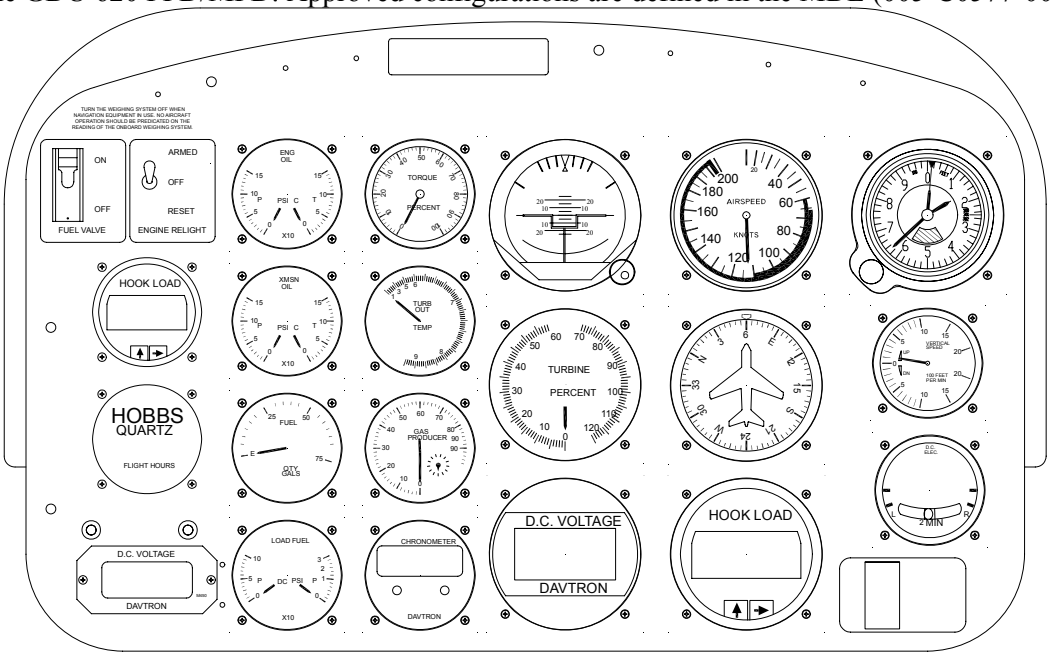


Figure 1-2. G500H Interfaces

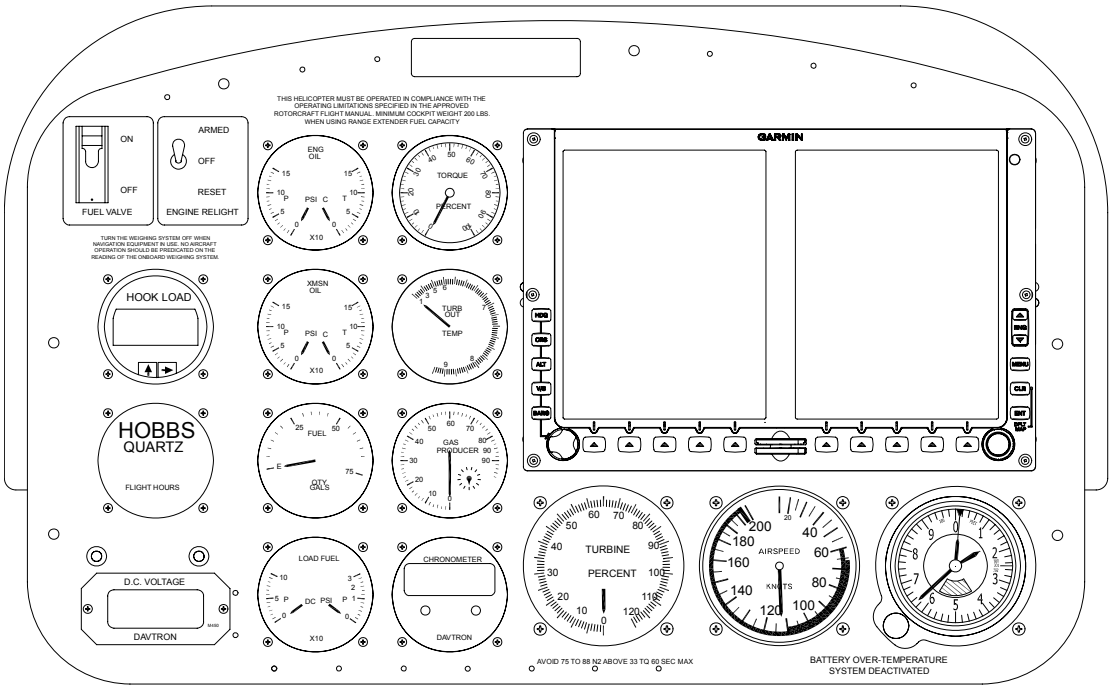
1.5 G500H Installation

1.5.1 Installation Overview

The G500H system is designed to replace the primary six round analog instruments, along with any external CDIs. The existing altimeter, airspeed and magnetic compass must be retained as standby instruments. A typical installation is shown in Figure 1-3. The Dual Tach and Altimeter are relocated below the GDU 620 PFD/MFD. Approved configurations are defined in the MDL (005-C0577-00).



TYPICAL INSTRUMENT PANEL BEFORE MODIFICATION



TYPICAL INSTRUMENT PANEL AFTER G500H INSTALLATION

Figure 1-3. Typical Instrument Panel Modification

1.6 Technical Specifications

1.6.1 Environmental Qualification Forms

The latest revision of the Environmental Qualification Forms for each G500H LRU is available directly from Garmin under the part numbers listed in Table 1-1.

Table 1-1. G500H Equipment Environmental Qualification Forms

Document	Garmin Part Number
GDU 620 Environmental Qualification Form	005-00313-20
GRS 77H Environmental Qualification Form	005-00165-31
GMU 44 Environmental Qualification Form	005-00164-31
GDC 74H 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).

1.6.2 Physical Characteristics

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

Table 1-2. G500H 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 77H	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 74H	3.05 inches (7.75 cm)	3.06 inches (7.77 cm)	8.87 inches (22.53 cm)	1.70 lbs. (0.77 kg)	1.92lbs. (0.87 kg)

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

1.6.3 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 77H/GMU 44	600 mA	1.0 A [1]	300 mA	1.0 A [1]
GDC 74H	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.

1.7 Certification

1.7.1 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-B1071-( )
GRS 77H AHRS	006-B0223-( )
GMU 44 Magnetometer	006-B0224-( )
GDC 74H ADC	006-B0261-( )
GTP 59 OAT Probe	Not Applicable

1.7.1.1 GDU™ 620

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

1.7.1.2 GRS 77H

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	

1.7.1.3 GMU 44

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

1.7.1.4 GDC 74H

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

1.7.1.5 GTP 59

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

1.8 G500H System Documentation

Table 1-4. Garmin G500H Reference Documentation

Document	Garmin Part Number
G500H Rotorcraft STC Installation Manual	190-01150-06
GDU 620 Installation Manual	190-00601-04
GDL 69 Activation Instructions	190-00355-04
G500H Flight Display System STC Installation Master Drawing List	005-C0577-00

Table 1-5. Optional Garmin System Reference Documentation

Document	Garmin Part Number
400W Series Installation Manual	190-00356-08
500W Series Installation Manual	190-00357-08
GNS 480 (CNX80) Color GPS/NAV/COM Installation Manual	560-0982-01
GTX 330 Installation Manual	190-00207-02
GSR 56 Satellite Receiver Installation Manual	190-00836-00
GDL 69/69A Installation Manual	190-00355-02
GTS 8XX Installation Manual	190-00993-00 190-00993-03 190-00993-04 190-00993-05

Table 1-6A. Non-Garmin System Reference Documentation

Document	Document Number
Aerospace Systems Electrical Bonding and Grounding for Electromagnetic Compatibility and Safety	SAE ARP1870

1.9 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 installations. The first time the Supplemental Data Card is inserted into a display it becomes "locked" to that particular rotorcraft installation and will not work in other installations.

1.9.1 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.

1.9.2 Navigation Database

The Jeppesen Navigation Database provides the G500H 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.

1.9.3 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 rotorcraft 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.

1.9.4 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 rotorcraft 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 5.5.6.1.

1.9.5 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.

1.9.6 Terrain and Airport Terrain Databases

The Terrain database is used to provide basic Terrain awareness functionality. All 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.

1.9.7 Obstacles Database

The obstacle database provides identification of known obstacles. 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.

1.9.8 IGRF Model

The IGRF (International Geomagnetic Reference Field) model is contained in the GRS 77H 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 77H and in the Navigation Database are compared, and if the IGRF model in the GRS 77H is out of date, the user is prompted to update the IGRF model in the GRS 77H. The prompt will appear after the G500H splash screen is acknowledged on the MFD.

1.10 STC Data

1.10.1 STC Information

The STC Master Drawing List (Garmin P/N 005-C0577-00) information is available on the Garmin web site at www.garmin.com. Download from the Dealers Only page.

1.10.2 Permission to use STC

Consistent with FAA Order 8110.4B and FAA 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.

1.10.3 Continued Airworthiness Instructions

Refer to the G500H Instructions for Continued Airworthiness listed in the MDL (005-C0577-00). Itmay be downloaded from the Dealers Only portion of the Garmin web site at www.garmin.com.

1.10.4 Applicable Rotorcraft Models

The data contained within this manual is currently FAA approved under the G500H STC SR02295LA limited to VFR operations, which is applicable for installation in the models listed on the STC

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2 INSTALLATION OVERVIEW

2.1 Introduction

The following section contains an overview of the steps required for the installation of the Garmin G500H System. 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 described in Section 2.5.8.

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 G500H system installation as defined in Section 3.3 herein. Perform the post installation checkout before closing the work area in case problems occur.

Complete an electrical load analysis referenced in the MDL (005-C0577-00) on the rotorcraft prior to starting modification to ensure rotorcraft has the ability to carry the additional load of the G500H equipment. Refer to Section 1.6.3 for the power consumption information.

2.3 Available Equipment

The G500H system is supplied as an LRU kit and a G500H installation kit (refer to Table 2-1 and Table 2-4 for additional information). For a description of the individual units see Section 1.4.1.

Table 2-1. G500H LRU RH Kit K10-00079-00 Contents, Black

Model	Unit P/N	Catalog P/N	Color	Voltage (VDC)
GDU 620 [1]	011-01264-50	010-00482-50	BLK	14/28
GRS 77H	011-00868-20	010-00295-20	-	14/28
GMU 44	011-00870-10	010-00296-10	-	N/A
GDC 74H	011-00882-11	010-00336-11	-	14/28
GTP 59	011-00978-00	011-00978-00	-	N/A
SD Card Helicopter Enablement	010-00769-59	010-00769-59	-	N/A
SD Card Americas, North[2]	010-00769-4A	010-00769-4A	-	N/A
SD Card Americas, South[2]	010-00769-4B	010-00769-4B	-	N/A
SD Card Atlantic, North[2]	010-00769-4C	010-00769-4C	-	N/A
SD Card Atlantic, South[2]	010-00769-4D	010-00769-4D	-	N/A
SD Card Pacific, North[2]	010-00769-4E	010-00769-4E	-	N/A
SD Card Pacific, South[2]	010-00769-4F	010-00769-4F	-	N/A

[1] GDU 620 P/N 011-01264-0X is part of the G600 system and cannot be used as a part of the G500H system.

[2] Choose a SD card with the correct terrain for the region that is needed.

Table 2-2. G500H LRU LH Kit K10-00080-00 Contents, Black

Model	Unit P/N	Catalog P/N	Color	Voltage (VDC)
GDU 620 [1]	011-01264-60	010-00482-60	BLK	14/28
GRS 77H	011-00868-20	010-00295-20	-	14/28
GMU 44	011-00870-10	010-00296-10	-	N/A
GDC 74H	011-00882-11	010-00336-11	-	14/28
GTP 59	011-00978-00	011-00978-00	-	N/A
SD Card Helicopter Enablement	010-00769-59	010-00769-59	-	N/A
SD Card Americas, North[2]	010-00769-4A	010-00769-4A	-	N/A
SD Card Americas, South[2]	010-00769-4B	010-00769-4B	-	N/A
SD Card Atlantic, North[2]	010-00769-4C	010-00769-4C	-	N/A
SD Card Atlantic, South[2]	010-00769-4D	010-00769-4D	-	N/A
SD Card Pacific, North[2]	010-00769-4E	010-00769-4E	-	N/A
SD Card Pacific, South[2]	010-00769-4F	010-00769-4F	-	N/A

[1] GDU 620 P/N 011-01264-0X is part of the G600 system and cannot be used as a part of the G500H system.

[2] Choose a SD card with the correct terrain for the region that is needed.

Table 2-3. Options Available

Item	Part Number
GDU 6xx ChartView Enablement Card – Heavy Aircraft [1]	010-00769-50
GDU 6xx Helicopter SVT Enablement Card [1]	010-00769-55

[1] An SD enablement card is required to enable the indicated feature. Each enablement card can only be used once and, once used, the card will be only work with that particular rotorcraft installation.

2.4 Installation Materials

2.4.1 Accessories Available from Garmin

Table 2-4 lists the items provided in the G500H installation kit.

Table 2-4. G500H 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	011-01656-00 011-02078-00
GRS 77H	Connector Kit, SB, GRS 77H [1] Installation Rack, GRS 77H	011-00869-01 115-00459-00
GMU 44	Connector Kit, GMU 44 Installation Rack, GMU 44	011-00871-00 115-00481-10
GDC 74H	Connector Kit, SB, GDC 74H [1]	011-01010-03

[1] Connector kit includes the unit configuration module.

The following items are available from Garmin:

Item	Garmin P/N
G500H Downloadable Software SD Card [1] [3]	010-00844-00
GDU 6xx Installer Unlock Card [2]	010-00769-60
G500H Software Loader Card [3]	010-00908-00
GRS 77H Universal Mount Kit	011-01780-00
GMU44 Universal Mount Kit	011-01779-01

[1] The G500H Downloadable Software SD Card is a blank SD card that can be used to make a G500H Software Loader card when the G500H software is downloaded from the Garmin Dealer website. Refer to Section 2.4.3 for additional details.

[2] The Installer Unlock Card is required to access all pages in Configuration Mode when configuring the system for a particular installation.

[3] The G500H Software Loader Card contains software for all G500H LRUs and the GDL 69/69A (an equivalent card can be made using the G500H Downloadable Software SD Card and downloading the software from the Garmin Dealer website). Contact Garmin to obtain the latest G500H Software Loader Card.

2.4.2 Materials Required but Not Supplied

The G500H equipment is intended for use with standard aviation accessories. The following items are required for each installation:

- Wire (MIL-W-22759/18 or equivalent)
- Shielded Wire (MIL-C-27500 cable utilizing M22759/18 wire (TG) and ETFE jacket (14), or equivalent)
- Aircraft Grade Category 5 Ethernet Cable (only required for installations utilizing HSDB interfaces, such as the GDL 69/GDL69A or the GTS 8XX.)
- Circuit Breakers
- Miscellaneous hardware (nuts, screws, washers, rivets)
- 2024T3 Aluminum sheet, thickness and size as required
- Pitot/Static fittings and lines (for GDC 74H installation)
- Tie wraps or lacing cord
- Ring Terminals (for grounding)
- Shield Terminators
- Silicon Fusion Tape

2.4.3 Software Loader Card

A G500H Software Loader card may be created using a G500H Downloadable Software SD Card P/N 010-00844-00 in conjunction with a G500H software application downloaded from the Dealer Resource section of www.garmin.com.

NOTE

The downloadable application to create card only runs on Windows PCs (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 G500H 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.

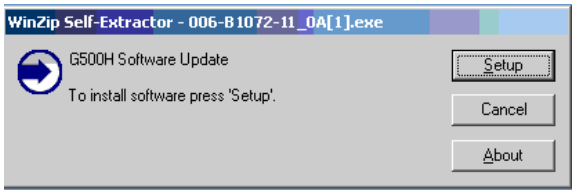
Create a G500H Software Loader Card as follows:

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

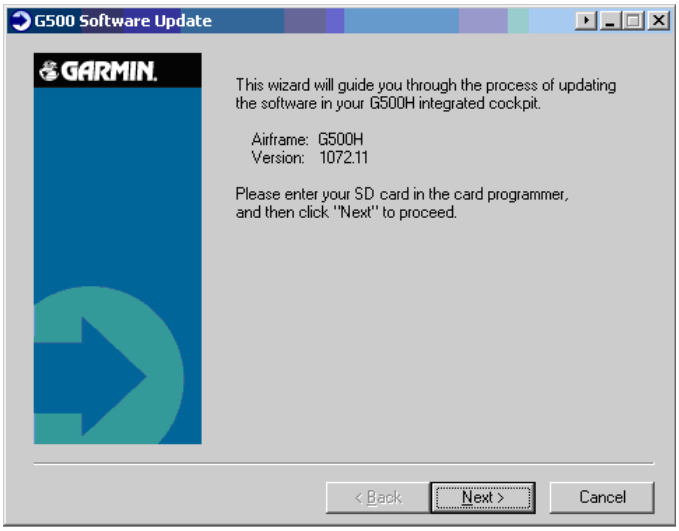
2. Download the G500H Cockpit Display System software 006-B1071-( ).

3. Ensure that you have an SD card reader connected to the PC. Insert the G500H Downloadable Software SD Card P/N 010-00844-00 into the card reader.

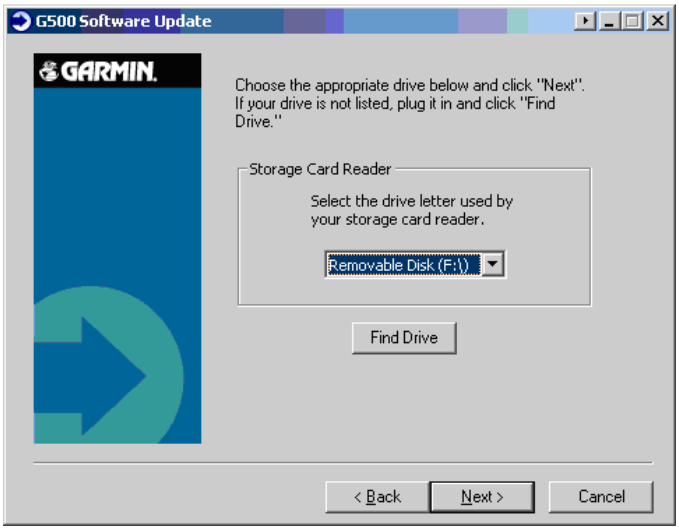
4. Run the executable file that was downloaded. The following window will appear:



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:

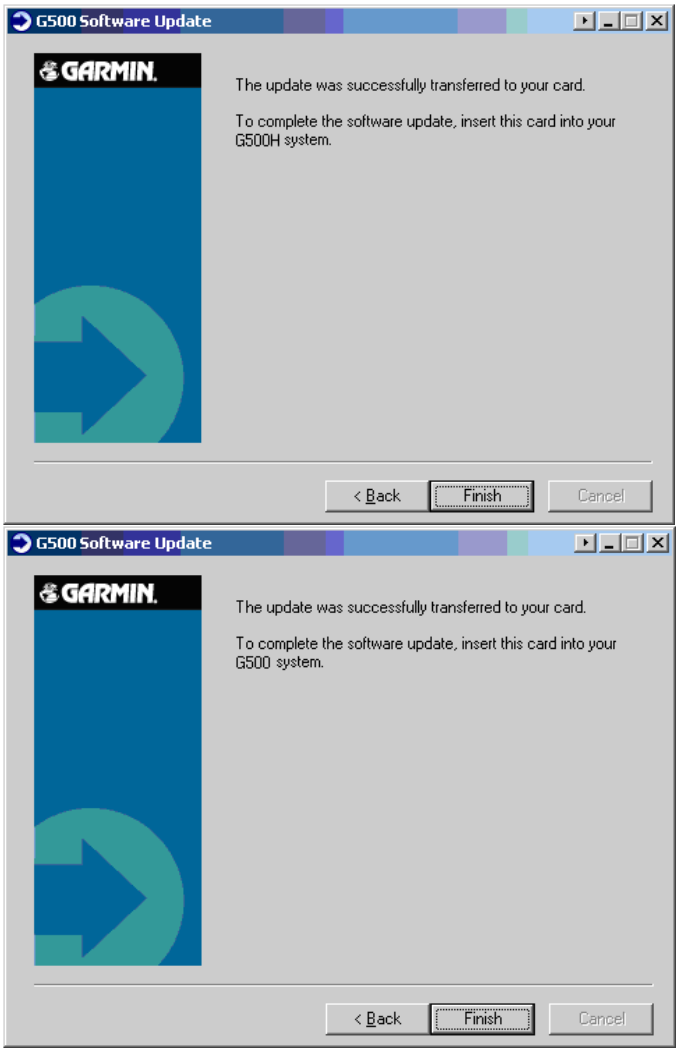


CAUTION

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 G500H software loader card is now ready to use.

2.5 Installation Considerations

2.5.1 Minimum System Configuration

The minimum G500H installation is defined in equipment list specified by the MDL (005-C0577-00):

2.5.2 Power Distribution

The required G500H equipment (GDU 620 display, GRS 77H AHRS and GDC 74H air data computer) must be connected to a bus that receives power as soon as the battery master switch is turned on. All required G500H equipment must be connected to the same bus.

CAUTION

If there is a separate avionics power bus the required G500H equipment must NOT be connected to this bus.

2.5.3 Pitot-Static Plumbing

The pitot-static connections to the original instruments will remain. The GDC 74H connections will tee into the existing pitot-static plumbing.

2.5.4 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.

2.5.5 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 rotorcraft. Based on the G500H System Safety Assessment, the G500H system can be used as the sole display for all CDI information, allowing the existing CDIs to be removed.

It is not recommended to use external CDIs in conjunction with the G500H 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 CDI (lateral) and Glideslope (vertical) deviations and flags may be used to drive an external CDI. *Both VOR and ILS information will be available (a standard VOR/ILS indicator with resolver output such as the Mid-Continent MD200 is supported).* Optionally, the Composite output and Glideslope deviations/flags may 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

2.5.6 External Sensors

External serial data sources intended for use with the G500H system should be checked for compatibility before installation. The list of supported devices is located in Appendix C.

When the G500H 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.

2.5.6.1 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 77H AHRS. The GDU 620 supports interfacing to two independent GPS navigators, although only one is required.

2.5.6.2 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.

2.5.6.3 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.

2.5.6.4 Traffic

Interfacing the GDU 620 to a TIS/TAS/TCAS I 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 G500H 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 G500H system.

NOTE

Only one traffic sensor may be interfaced to the G500H system (GDU 620).

2.5.6.5 External HTAWS

Interfacing the GDU 620 to an external HTAWS system will allow HTAWS annunciations to be displayed on the GDU 620

NOTE

The GDU 620 will not display terrain data from an external source; however, if a 400W/500W Series HTAWS enabled unit is connected, the GDU 620 will display all of the required HTAWS annunciations from GPS 1 and eliminate the need for a separate HTAWS annunciator panel.

If the aircraft has HTAWS installed, and SVT is enabled on the G500H, the GDU 620 must be configured to suppress Terrain-SVT aurals by setting EXT TAWS to INSTALLED (refer to Section 5.5.7A.2 for additional information).

2.5.6.6 Iridium Satellite Phone

Interfacing to the GSR 56 adds airborne satellite position reporting capability.

2.5.7 Mounting Considerations

2.5.7.1 GDU™ 620 Location and Mounting

The GDU 620 is designed to mount on the rotorcraft instrument panel in place of the existing primary instruments.

Due to the extent of the modifications required for some installations, it may be easier to replace the instrument panel entirely. Refer to Section 2.5.7.3 or a list of items to consider when deciding whether or not to replace the instrument panel.

Refer to the MDL (005-C0577-00) for the general arrangement drawing for a specific mounting location.

2.5.7.2 Standby Altimeter and Airspeed Location

Refer to the MDL (005-C0577-00) for the general arrangement drawing for the appropriate location to mount the standby altimeter and airspeed.

The previously certified Airspeed Indicator and Altimeter must 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 G500H system (e.g. VORs, CDIs, ADF bearing pointers, RMIs, etc.).

2.5.7.3 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.

2.5.7.4 GRS 77H Location and Mounting

The GRS 77H includes extremely sensitive inertial measurement sensors. It must be mounted rigidly to the rotorcraft primary structure. The mounting system must have no resonance with the unit installed that would amplify the rotorcraft natural levels. Vibrations may result in degraded accuracy. The installation vibration levels are checked using the Vibration Test in Section 5.6.5.

Some metal structures of the GRS 77H may become magnetized if closely exposed to permanent magnets. While this will not affect the GRS 77H itself, it may slightly affect nearby magnetic instruments in the rotorcraft (e.g. whiskey compass). Ordinary use of magnetic screwdrivers to tighten the GRS 77H fasteners will not cause problems, but non-magnetic screwdrivers are preferred. Avoid placing the GRS 77H within one inch of magnetically mounted antennas, speaker magnets, or other strongly magnetic items.

The mounting location for the GRS 77H should be protected from rapid thermal transients, in particular, large heat loads from nearby high-power equipment.

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

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

Refer to the MDL (005-C0577-00) for the general arrangement drawing for a specific mounting location.

2.5.7.5 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 location must be surveyed prior to installation of the GMU 44 to verify its acceptability** (refer to Section 3.2.4.1.1). Section 6.1 provides guidance on troubleshooting the GMU 44 magnetometer location.

Refer to the MDL (005-C0577-00) for the general arrangement drawing for a specific mounting location.

CAUTION

If mounting the GMU 44 in the location used by an existing flux valve or flux gate, the Magnetic Interference Survey (Section 3.2.4.1.1) 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.

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.

The GMU 44 must be mounted in a serviceable location in the rotorcraft (e.g. accessible through an access panel).

The GMU 44 must be leveled to within 3.0° of the rotorcraft level reference in pitch and roll.

The GMU 44's forward direction should be within 0.5° in heading of the rotorcraft 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 rotorcraft longitudinal axis.

2.5.7.5.1 Considerations for Tail Boom Grounded Light Fixtures

The following installation practices are recommended when installing the GMU 44 in or near the tail boom of the rotorcraft.

1. Any lights located aft of the magnetometer 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 tail boom mounted GMU 44.
3. If wiring modification is not desirable then the use of LED equivalent lighting is acceptable.

These installation practices will prevent magnetically interfering currents from flowing in the tail boom 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.

2.5.7.6 GDC 74H Location and Mounting

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

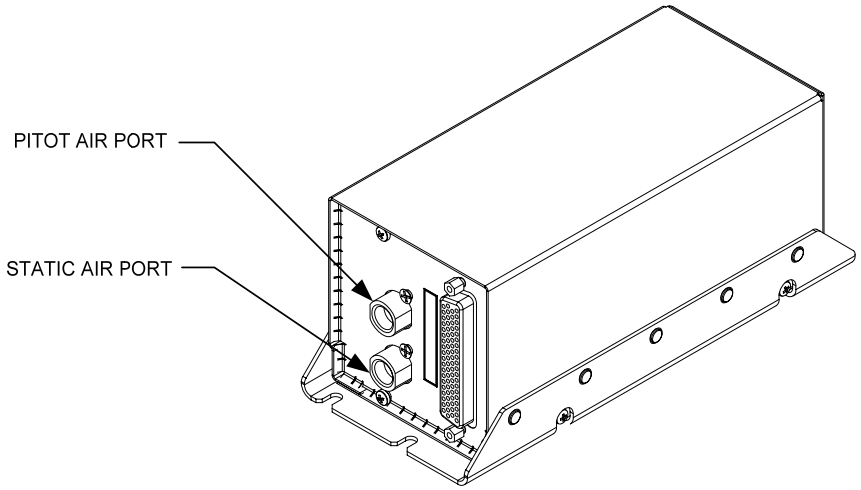


Figure 2-1. GDC 74H Air Hose Fitting Locations

Use appropriate air hoses and fittings to connect the pitot and static lines to the unit. Avoid sharp bends and routing near rotorcraft control cables. The GDC 74H 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.

Refer to the MDL (005-C0577-00) for the general arrangement drawing for a specific mounting location.

2.5.7.7 GTP 59 Location and Mounting

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)

NOTE

The GTP 59 must be electrically bonded to the rotorcraft skin.

Refer to the MDL (005-C0577-00) for the general arrangement drawing for a specific mounting location.

2.5.8 Cable and Wiring Considerations

Wiring should be installed in accordance with the following requirements. When wire separation cannot be achieved, the following issues should be addressed:

- It should not be possible for a cable harness to be exposed to wire chafing;
- The cable harness should not be located near flight control cables and controls, high electrical capacity lines or fuel lines;
- The cable harness should be located in a protected area of the aircraft (e.g., isolated from engine rotor burst); and

Do not route cable near high-energy or high-heat sources. Wires and cables should be supported by suitable clamps or grommets every 24 inches, unless contained within troughs, ducts, or conduits.

Wire bundles must be routed in accessible areas that are protected from damage from maintenance activity. Ensure that wires and cables are routed in such a manner that chafing will not occur against the airframe or other components. Metal standoffs should be used to maintain clearance between wires and structure. If wire is run through holes in sheet metal structure, ensure that phenolic blocks, plastic liners, or rubber grommets are installed to protect the wire from chafing.

Wire harness should be properly bound and supported so that there is no interference between other wires, cables, or equipment.

Avoid sharp bends. Ensure that cable harness bends are more than 10 times the outside diameter of the largest wire or cable in the harness.

Ensure that wires and cable harness are not located near mechanical control cables. Wires should be no less than ½ inch from such controls when light hand pressure is applied to the wires or mechanical control cables.

Ensure that wires and cables have enough slack to allow ease of maintenance and prevent mechanical strain on the wires, cables, junctions, and supports.

Install lacing or ties to secure wire groups and bundles to provide ease of maintenance, inspection, and installation. Use braided lacing tape per MIL-T43435.

Ensure that a drip loop is installed in the harness to protect against moisture condensation. A drip loop is an area where the wire is dressed downward to a connector, terminal block, or panel. Wires or harness should enter a piece of equipment in an upward direction where possible. This prevents moisture from running down the wires into the G500H LRUs.

Install a service loop in the wire harness to ensure ease of maintenance. The service loop must maintain a minimum bend radius of at least 3 times the harness diameter. Support the service loop to prevent chafing. Use a cushion clamp and a connector at the harness termination.

NOTE

Wiring which is required to be shielded per the diagrams referenced in the general arrangement drawing must be shielded

Refer to the general arrangement drawing listed in the MDL (005-C0577-00) for the appropriate wiring connections to assemble the wiring connector.

2.5.8.1 HIRF and Lightning Considerations

In order to meet the HIRF and lightning protection for the installed systems the following attributes must be complied with per data in the MDL (005-C0577-00):

- The harness assembly uses both shielded and unshielded cables and these must match.
- When preparing shield terminations the exposed wires and shield drains (or pigtails) shall be kept as small as possible and no greater than that specified.
- Electrical bonding of equipment to the airframe is essential to maintaining the required shielding performance of the installed wiring.

2.5.9 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.

2.5.10 Magnetic Compass Recalibration

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

2.5.11 Altitude Encoder Function

The GDU 620 receives ARINC 429 altitude data from the GDC 74H and can output RS-232 serial altitude in the Shadin format (9600 baud). This altitude output can be provided to the transponder, allowing the existing altitude encoder to be removed when the G500H is installed.

2.5.12 Equipment Bonding Considerations

For all G500H installations the instrument panel must be made of aluminum and electrically grounded to the rotorcraft structure. The GDU 620 must be electrically bonded to it (refer to the MDL (005-C0577-00) for the general arrangement drawing for specific bonding instructions).

The GDU 620 display, GRS 77H AHRS, GDC 74H ADC, GTP 59 temperature probe and GMU 44 magnetometer and any supporting brackets must be electrically bonded to rotorcraft ground through the airframe metallic structure (refer to the MDL (005-C0577-00) for the general arrangement drawing for specific bonding instructions).

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 77H 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 3-2 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 E). 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 E) 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 E) 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 E). 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 E.2 in Appendix E 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

3.2.1 GRS 77H Universal Mount Description

The GRS 77H Universal Mount P/N 011-01780-00 allows for aircraft level installation of the GRS 77H AHRS on mounting structures with inclines up to ±6° in 2° increments. Depending on the installation, the Angle Brackets contained within the GRS 77H Universal Mount kit can be assembled and installed facing in or out, as shown in Figure 3-1 and Figure 3-2. The use of the GRS 77H Universal Mount is optional.

NOTE

Flanges on the universal mount illustrations in this manual are shown both inward and outward facing. Refer to the MDL(005-C0577-00) for the correct orientation.

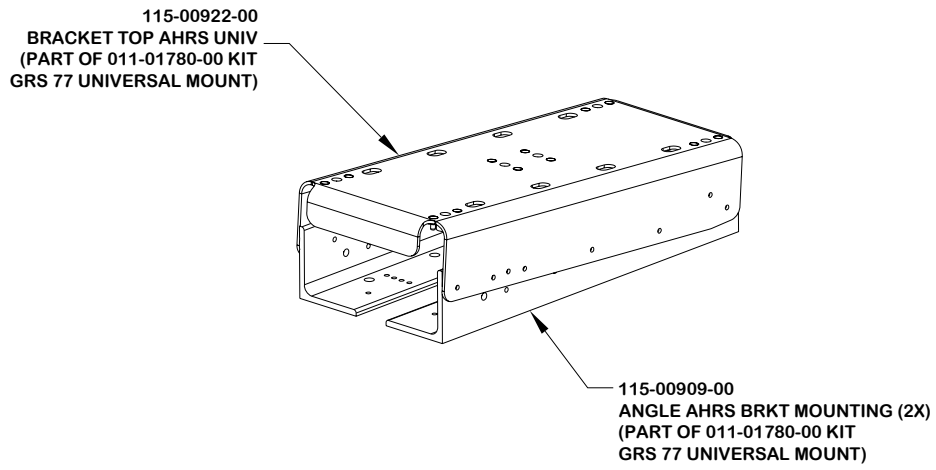


Figure 3-1. GRS 77H Universal Mount (Inward Facing Angle Brackets)

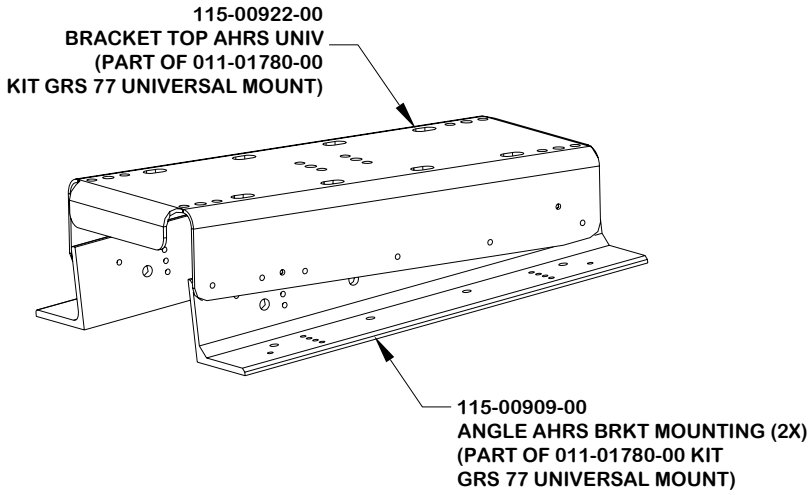


Figure 3-2. GRS 77H Universal Mount (Outward Facing Angle Brackets)

3.2.1.1 Assembly of the Universal Mount

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

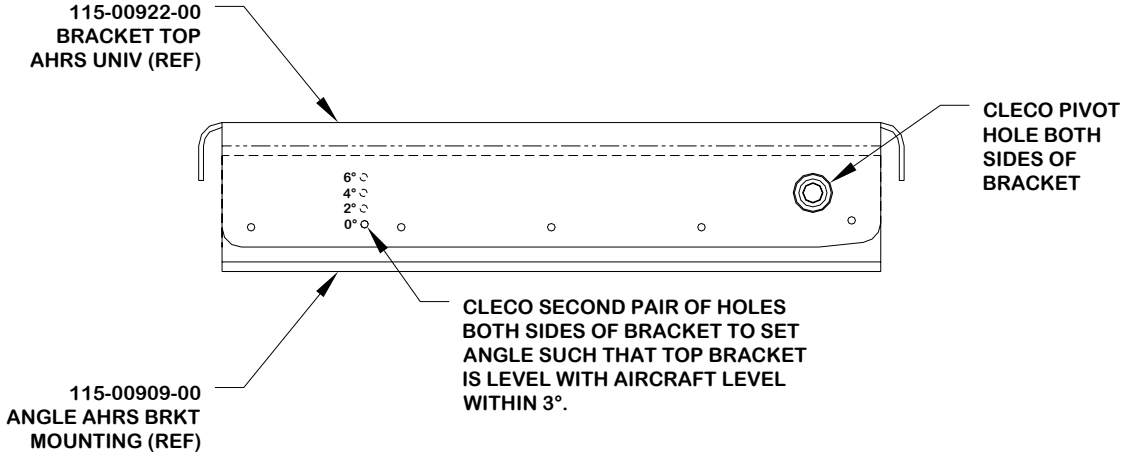


Figure 3-3. GRS 77H Universal Mount Assembly

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 3-4. Drill hole-pattern from top bracket to angle bracket (0.1285” diameter holes – #30 drill bit), 5 places each side.

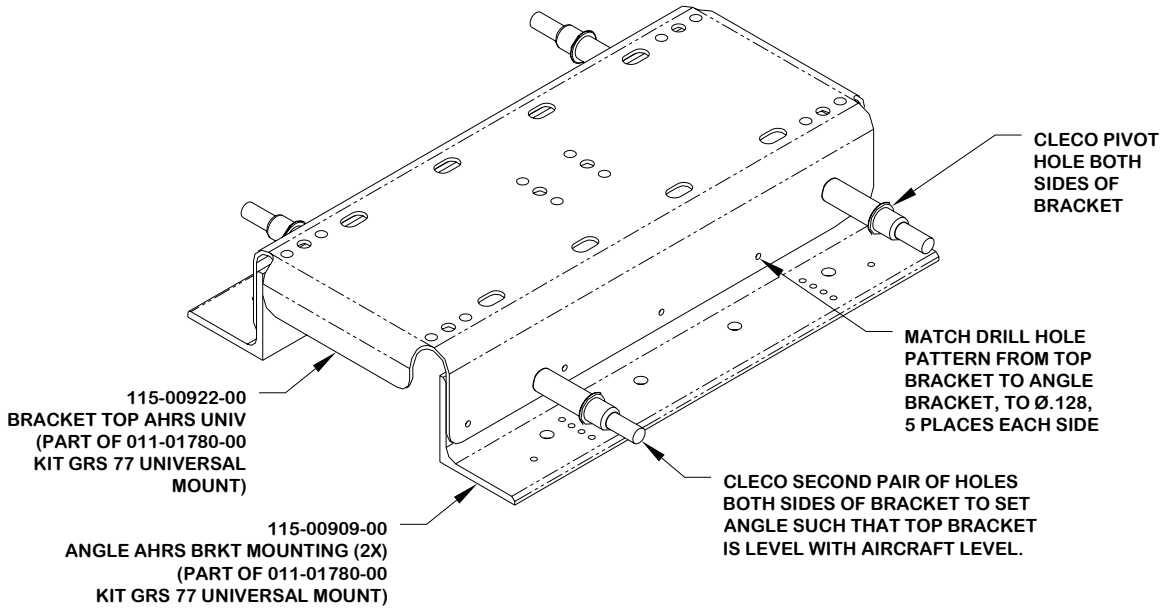


Figure 3-4. Hole-Pattern Configuration to Set Incline in Assembly for Aircraft Level

As shown in Figure 3-5, rivet top bracket to angled brackets with MS20470AD4-6 rivets (alternate CR3213-4-4 blind rivets) and remove Clecos.

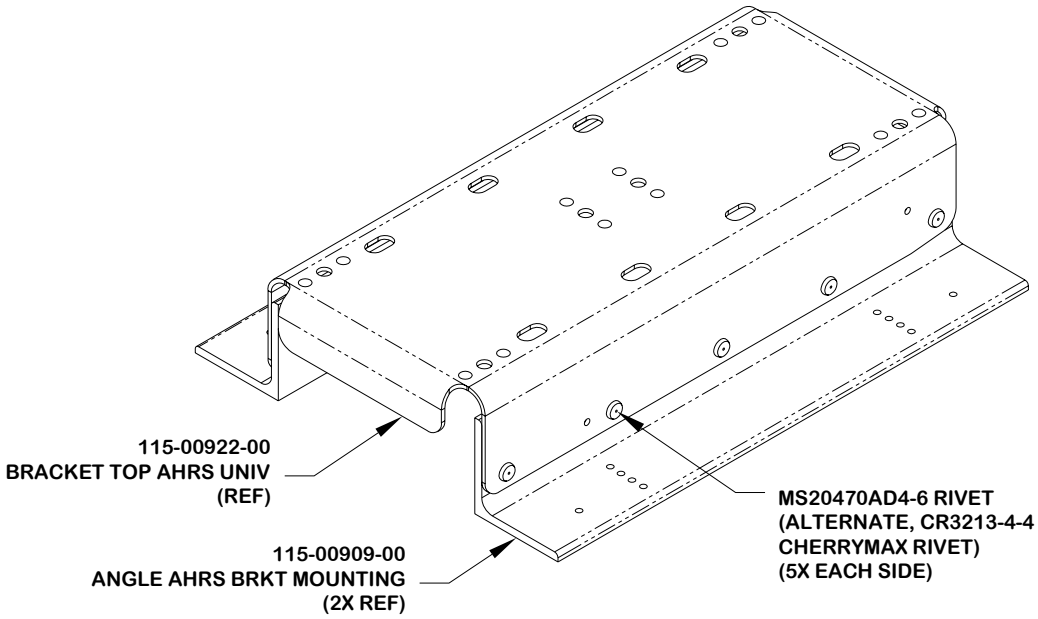


Figure 3-5. Top Bracket to Angle Bracket Assembly

NOTE

If the GRS 77H Universal Mount has been assembled with the angle brackets facing in, installing the GRS 77H 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 77H mounting rack on the universal mount for this situation.

Install the GRS 77H Mounting Rack P/N 115-00459-00 to the GRS 77H Universal Mount using 5 AN525-1032R8 Screws, as shown in Figure 3-6. The recommended torque is 20-25 inch lbs. Ensure correct orientation of mounting rack on universal bracket (the arrow on the GRS 77H Mounting Rack must point forward).

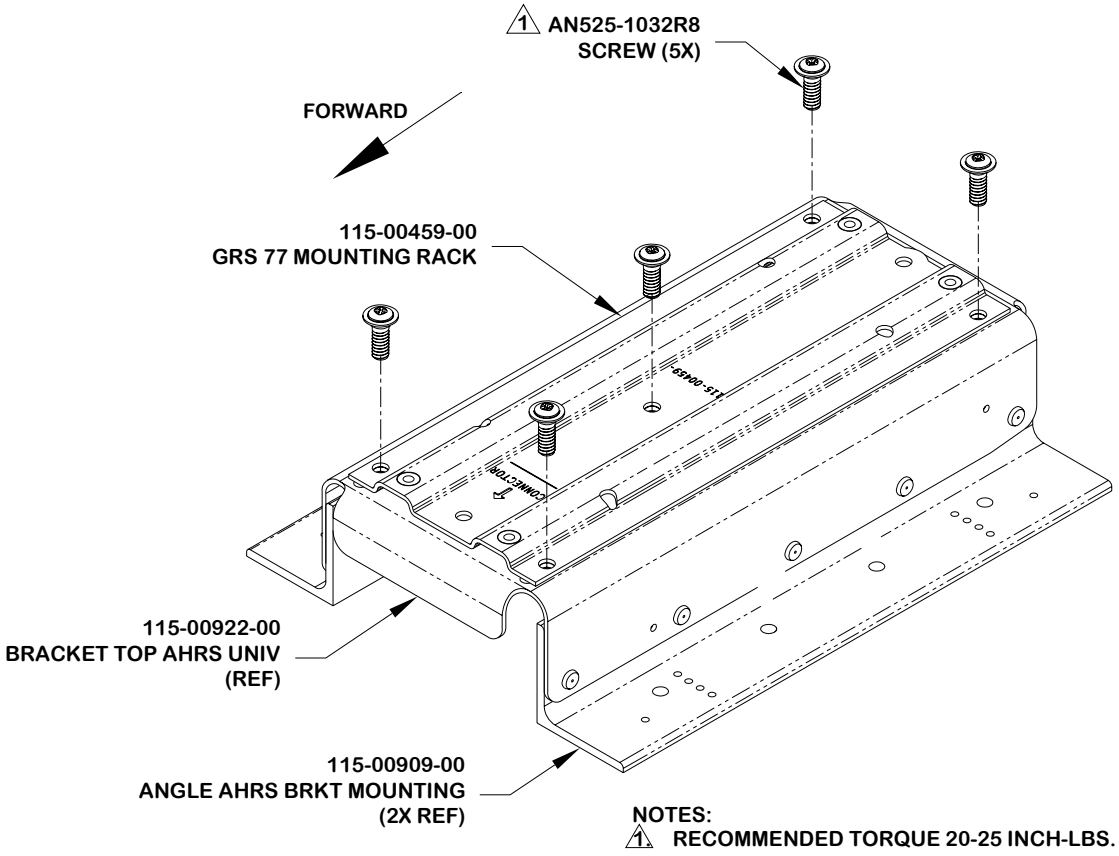


Figure 3-6. Assembling GRS 77H Mounting Rack to GRS 77H Universal Mount

3.2.2 GRS 77H 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 3-7. 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 3-7.

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 77H 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 77H has a center baseplate external shim that is damaged or has been removed
4. The GRS 77H 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.

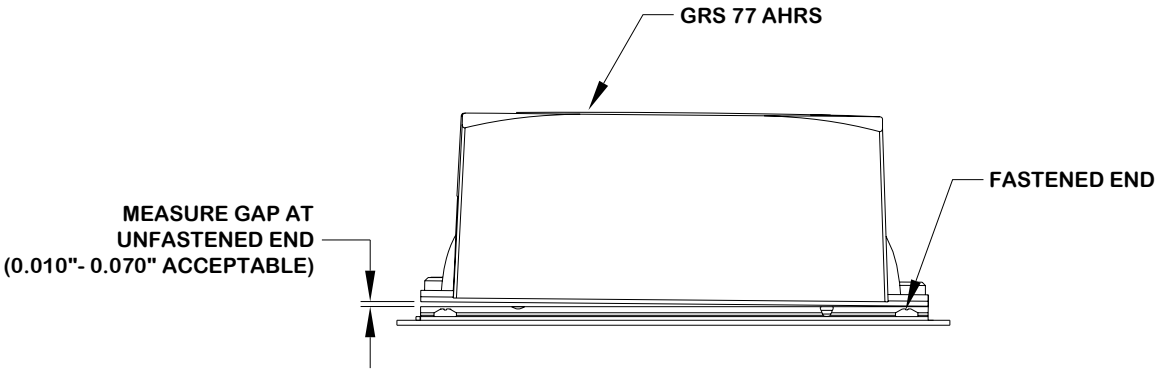


Figure 3-7. Measuring GRS 77H to Mounting Rack with Feeler Gauge

NOTE

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

While installing the GRS 77H 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 77H unit to the rack.

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

3.2.3 Installation of the GRS 77H AHRS

The GRS 77H 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 77H 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 3.2.2.

NOTE

Use a #2 Phillips screwdriver to tighten the GRS 77H 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 77H unit to the rack.

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

NOTE

The GRS 77H 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 the general arrangement drawing listed in the MDL (005-C0577-00) for placement information).

3.2.4.1 Assembling the GMU 44 Universal Mount

Refer to the general arrangement drawing listed in the MDL (005-C0577-00) to align and install the GMU 44 Install Rack to the universal bracket.

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 3-8 through Figure 3-10 for details on achieving desired angle settings.

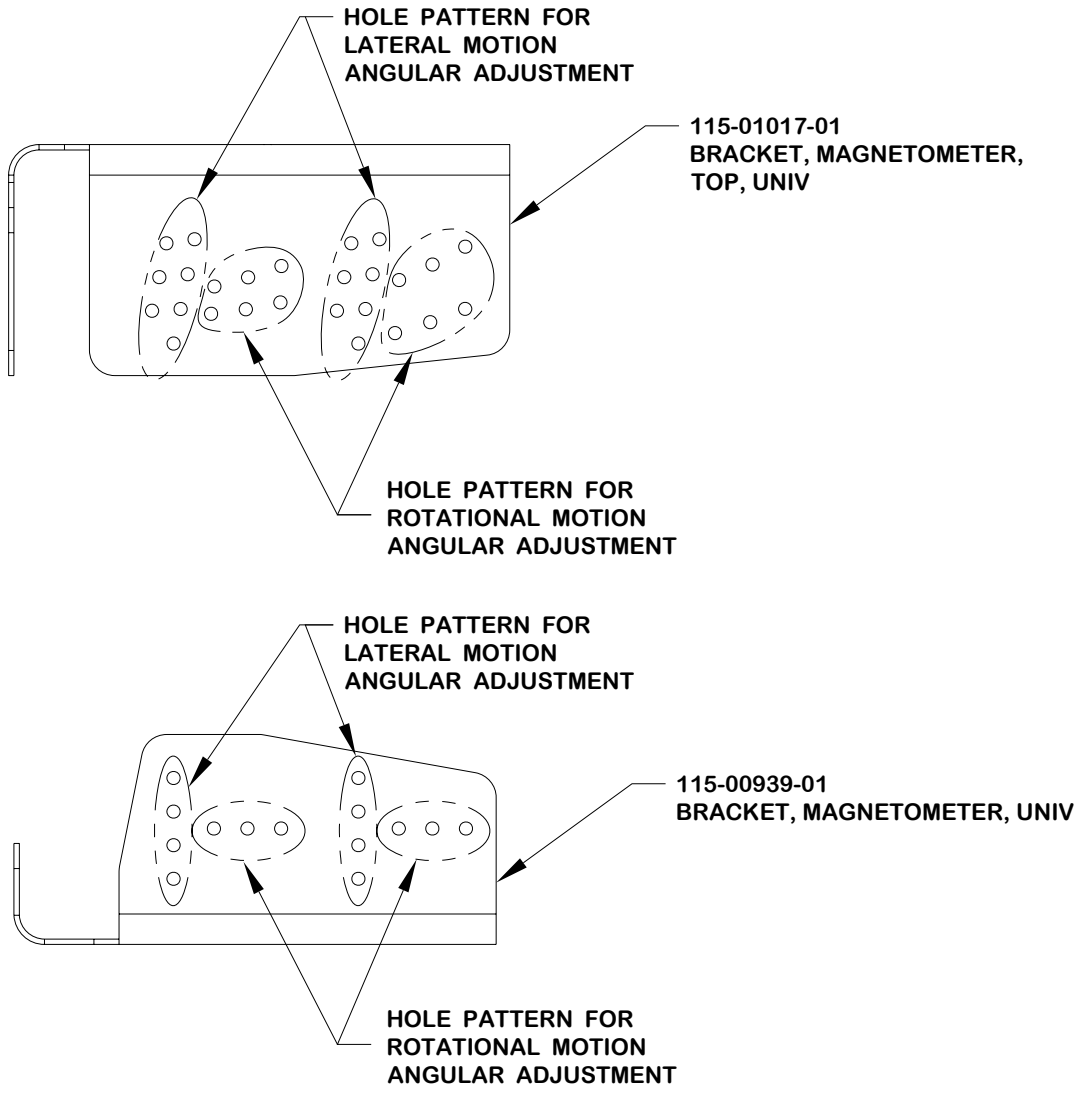


Figure 3-8. GMU 44 Universal Mount Top and Bottom Hole-Patterns

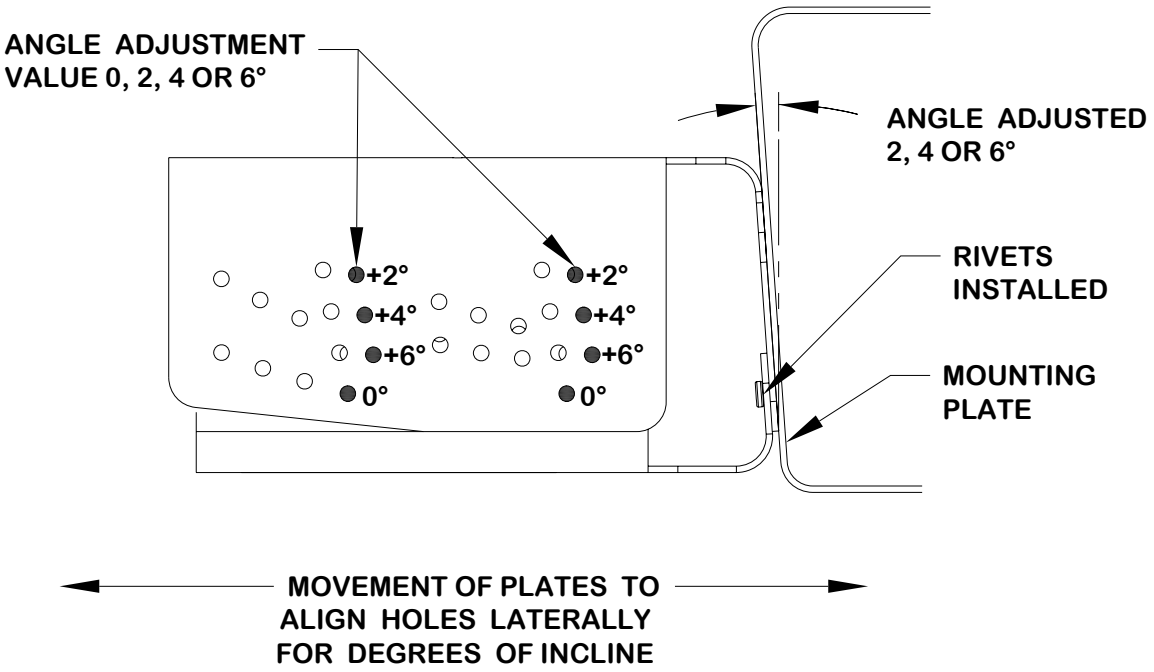


Figure 3-9. GMU 44 Universal Mount Hole Alignment, Lateral Method (Side Plate Mounted)

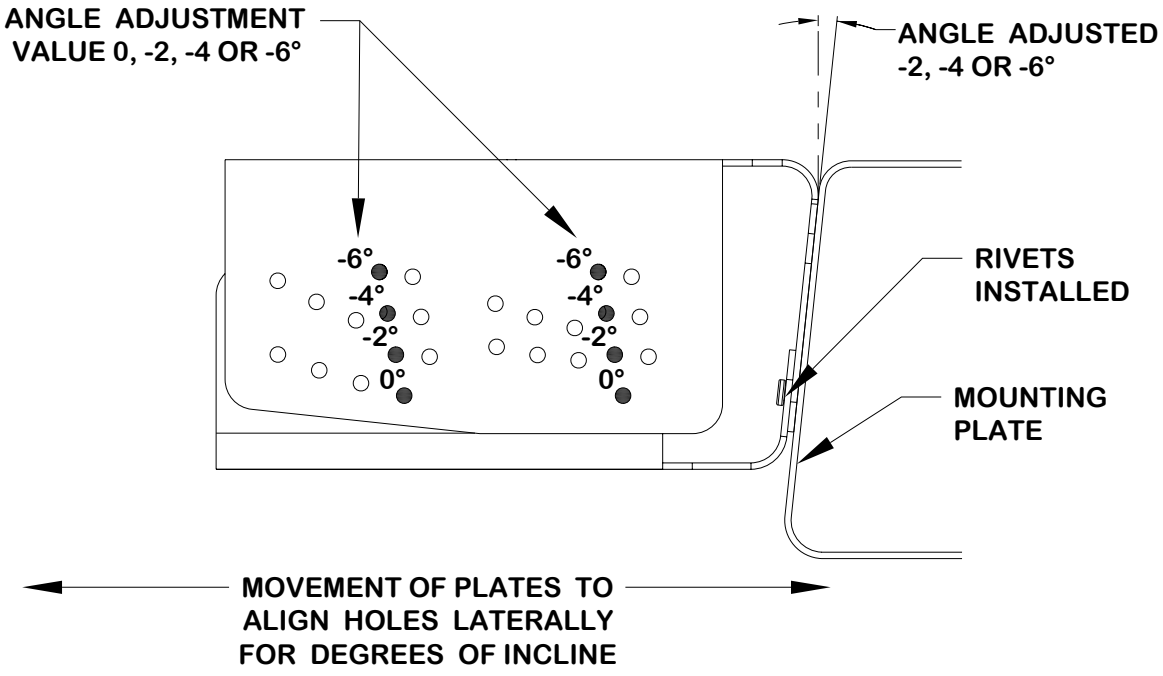


Figure 3-10. GMU 44 Universal Mount Hole Alignment, Lateral Method (Side Plate Mounted)

3.2.4.1.1 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 different location, with a different incline.

Temporarily assemble the GMU 44 Universal Mount 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 called out in the general arrangement drawing listed in the MDL (005-C0577-00) 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 E.4.

Run the magnetic interference survey using the magnetic interference software – refer to Appendix E 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.

3.2.5 Pitot-Static Connections to GDC 74H

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 74H.

CAUTION

Check pitot-static connections for errors before operating the GDC 74H. 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 3-11 (refer to Figure 2-1 for the location of the pitot and static ports on the GDC 74H).
2. Insure there are no low points in the system below drain points.
3. Seal the threads of pneumatic fittings at the connector ports. Use caution to ensure there are no pneumatic leaks.
4. Use care to avoid getting fluids or particles into the pitot and static lines connected to the GDC 74H).

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

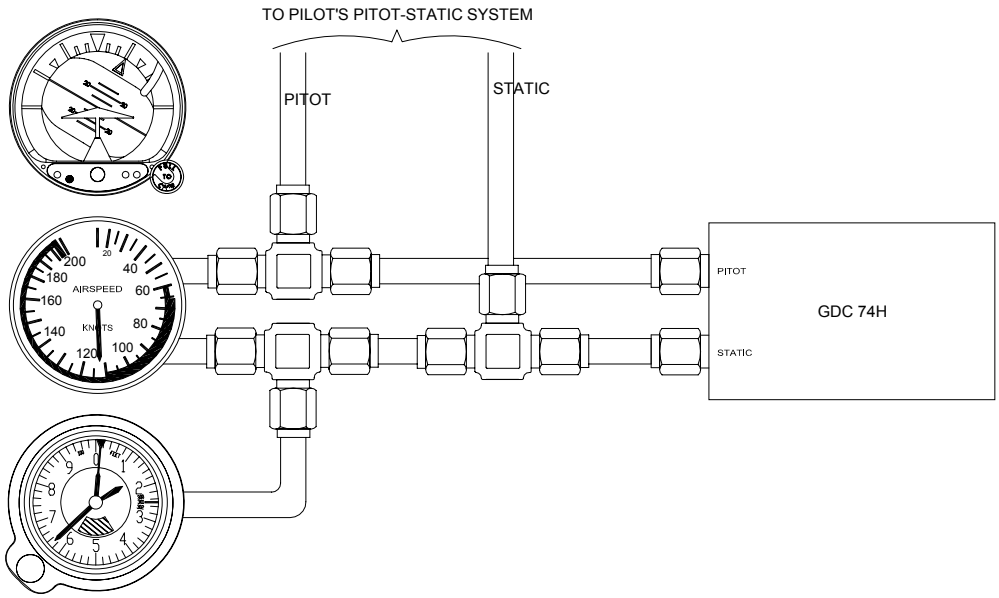


Figure 3-11. Pitot-Static Connections for Single GDU Installation

3.2.6 GTP 59 Temperature Probe Mounting

Refer to the MDL (005-C0577-00) to get the mounting instructions for the GTP 59.

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 77H, GDC 74H and GMU 44.

The GRS 77H, GDC 74H and GMU 44 (when 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 77H mounting structure. The following tables show the static test loads for the GRS 77H, GDC 74H and GMU 44.

3.3.1 G500H Static Test Loads

3.3.1.1 GRS 77H Static Test Loads

The combined weight of the GRS 77H, 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 77H + Mounting Rack Weight))*
Downward	20.0 g	(20.0 x 3.50) = 70.0 lbs
Upward	4.0 g	(4.0 x 3.50) = 14.0 lbs
Sideward	8.0 g	(8.0 x 3.50) = 28.0 lbs
Forward	16.0 g	(16.0 x 3.50) = 56.0 lbs
Rearward	1.5 g	(1.5 x 3.50) = 5.3 lbs

The combined weight of the GRS 77H, connector, mounting rack and GRS 77H 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 77H + Mounting rack and Universal Bracket Weight))*
Downward	20.0 g	(20.0 x 4.55) = 91.0 lbs
Upward	4.0 g	(4.0 x 4.55) = 18.2 lbs
Sideward	8.0 g	(8.0 x 4.55) = 36.4 lbs
Forward	16.0 g	(16.0 x 4.55) = 72.8 lbs
Rearward	1.5 g	(1.5 x 4.55) = 6.8 lbs

3.3.1.2 GDC 74H Static Test Loads

The combined weight of the GDC 74H, connector and mounting rack is 1.92 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 74H + Mounting Rack Weight))*
Downward	20.0 g	(20.0 x 1.92) = 38.4 lbs
Upward	4.0 g	(4.0 x 1.92) = 7.7 lbs
Sideward	8.0 g	(8.0 x 1.92) = 15.4 lbs
Forward	16.0 g	(16.0 x 1.92) = 30.7 lbs
Rearward	1.5 g	(1.5 x 1.92) = 2.9 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.

3.3.1.3 GMU 44 Static Test Loads

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 (GMU 44 + Mounting Rack + Universal Mount Weight))*
Downward	20.0 g	(20.0 x 0.72) = 14.4 lbs
Upward	4.0 g	(4.0 x 0.72) = 2.88 lbs
Sideward	8.0 g	(8.0 x 0.72) = 5.76 lbs
Forward	16.0 g	(16.0 x 0.72) = 11.52 lbs
Rearward	1.5 g	(1.5 x 0.72) = 1.08 lbs

3.4 Cabling and Wiring

The installation kits for the G500H system LRUs include connectors and crimp contacts. Use wire specified in the cable harness drawing found in the MDL (005-C0577-00)) for all G500H connections. Make the crimp connections with a crimp tool as specified in Table 3-2 .

Refer to the interconnection diagrams in Appendix D 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 according to the wire routing diagram for the applicable rotorcraft model. 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 G500H 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 77H – a 44-pin D-Subminiature connector (male)
- GMU 44 – a 9-pin circular connector (female)
- GDC 74H – a 78-pin D-Subminiature connector (male)

Construct the wiring harness according to the information contained in this and the drawings listed in the MDL (005-C0577-00). Cable lengths will vary depending upon installation. Strip all wires going to the connectors 0.17”. 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 wiring diagram for the applicable rotorcraft model. Verify that the pin is properly engaged into the connector by gently tugging on the wire. Route and secure the cable runs from the G500H LRUs away from sources of electrical noise.

Appendix A provides the pin-out information for all G500H LRUs. Required connectors and associated hardware are supplied with the connector kits. See Appendix D for interconnect wiring diagrams.

CAUTION

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

Table 3-1. Socket Contact Part Numbers (reference)

Wire Gauge	37-pin connector (P6201) 50-pin connector (P6202/P431) 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 3-2. Recommended Crimp Tools

Manufacturer	Hand Crimping Tool	20-24 AWG (P6201/P6202/P431) [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 (indenter setting of '4').

3.4.2 Backshell Assembly and D-Subminiature Connectors

The G500H LRU connector kits (P/N 011-01656-00 [GDU 620], P/N 011-00869-01 [GRS 77H], and P/N 011-01010-03 [GDC 74H]) 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 3-3 lists Garmin part numbers for the D-sub connectors and the backshell assemblies.

Table 3-3. Backshell Assembly

Figure 3-12 thru Figure 3-15 Ref	Description	Garmin P/N	Notes
1	Backshell (P771) Backshell (P6201, P6203) Backshell (P6202) Backshell (P741)	125-00083-00 125-00084-00 125-00085-00 125-00175-00	[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 (P6201, P6202, P6203) Strain Relief (P741)	115-00499-02 115-00499-03 115-01078-04	[2]
8	Cover (P771) Cover (P6201, P6203) Cover (P6202) Cover (P741)	115-00500-02 115-00500-03 115-00500-04 115-01079-04	[2]
9	Screw,4-40x.187, FLHP100,SS/P, w/Nylon	211-63234-06	[2]

Figure 3-12 thru Figure 3-15 Ref	Description	Garmin P/N	Notes
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)	330-00626-78 330-00366-44 330-00502-37 330-00502-50 330-00366-62	[5]
11	Multiple Conductor Shielded Cable (See Interconnect Diagrams, Appendix D)	As Required	[6]
12	Shield Terminator	As Required	[6], [7]
13	Wire, Insulated (20-22 AWG), 3” max length OR Braid, Flat (19-20 AWG equivalent, tinned plated copper strands 36 AWG, Circular Mil Area 1000 - 1300)	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, 12–10 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 P431, 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), P/N 011-01855-04 (P741), and P/N 011-00950-04 (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 (P6202).

[5] Supplied as part of LRU Connector Kit P/N 011-01010-01 (GDC 74H), P/N 011-00869-01 (GRS 77H), 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 74H, GRS 77H, and GDU 620 installations are listed in Table 3-3. Backshell connectors give the installer the ability to terminate shield grounds at the backshell housing using the Shield Block ground kit. Table 3-3 lists Garmin part numbers for the GDC 74H, GRS 77H, 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.

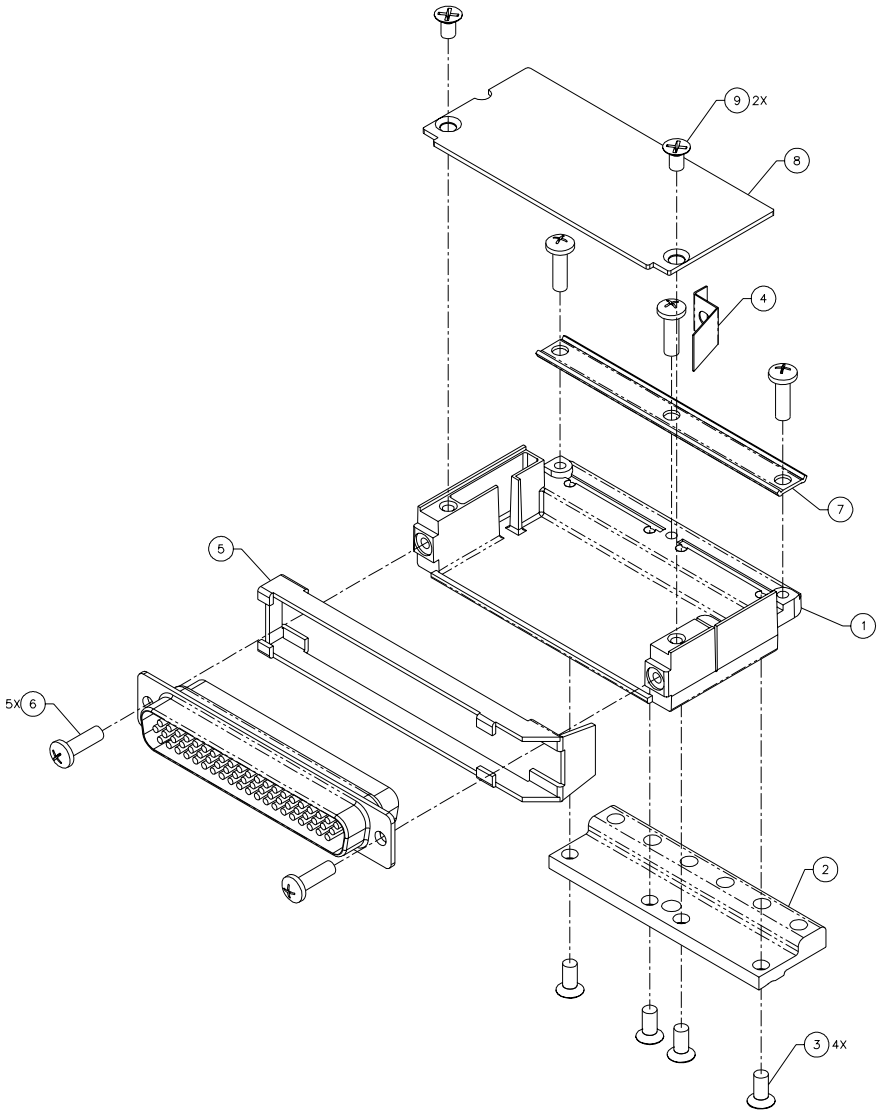
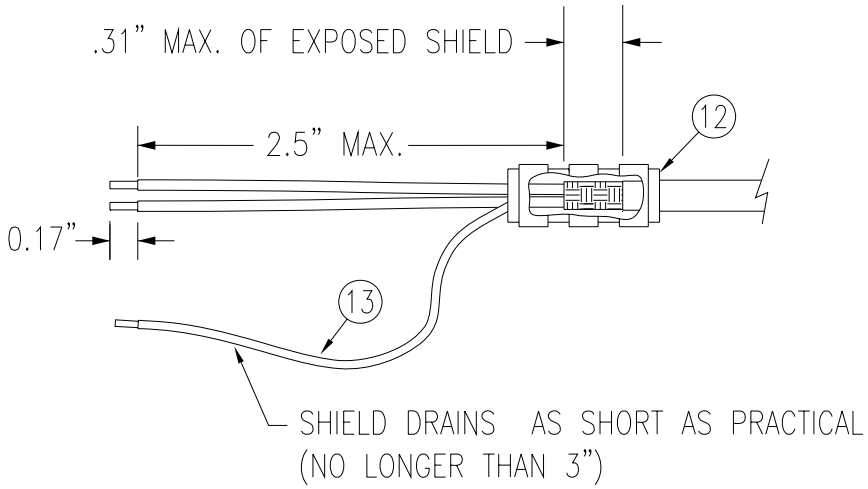
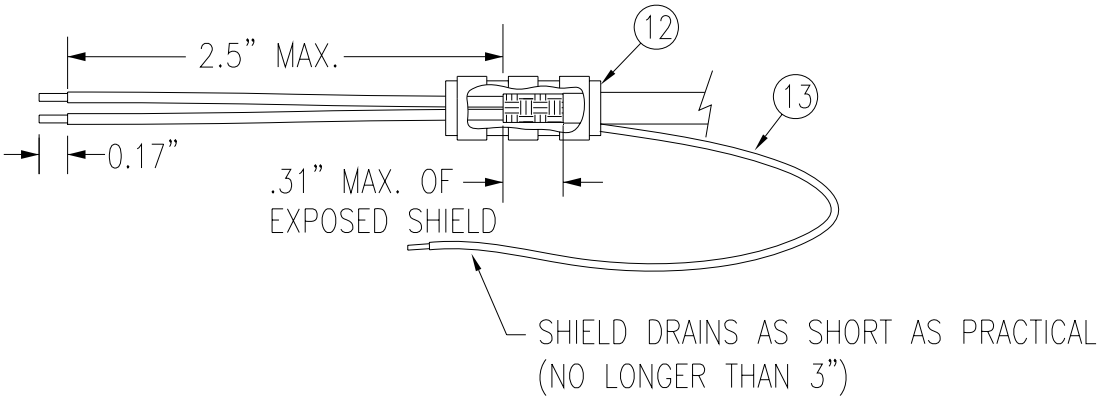


Figure 3-12. Connector and Backshell Assembly

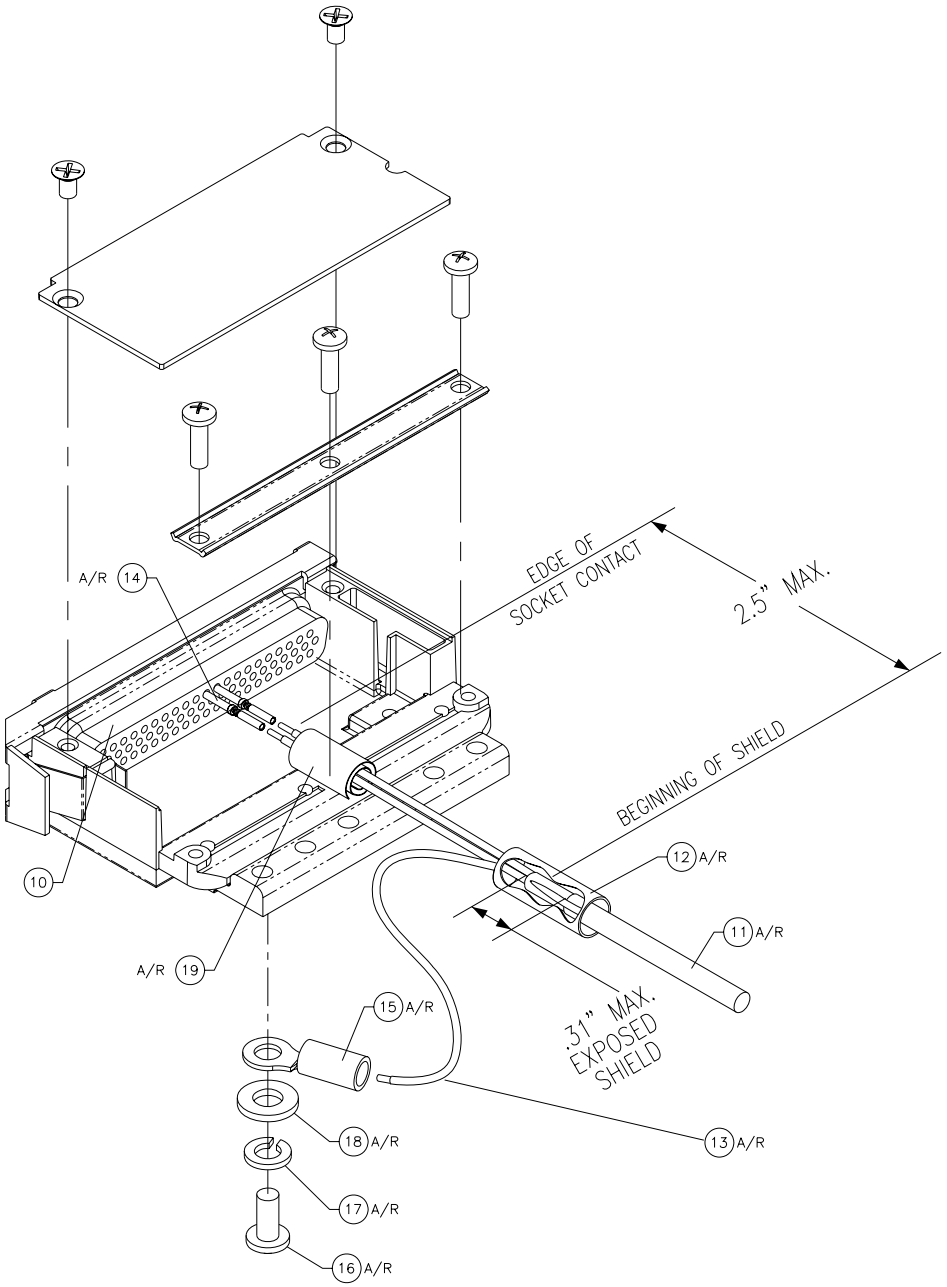


Preferred Method



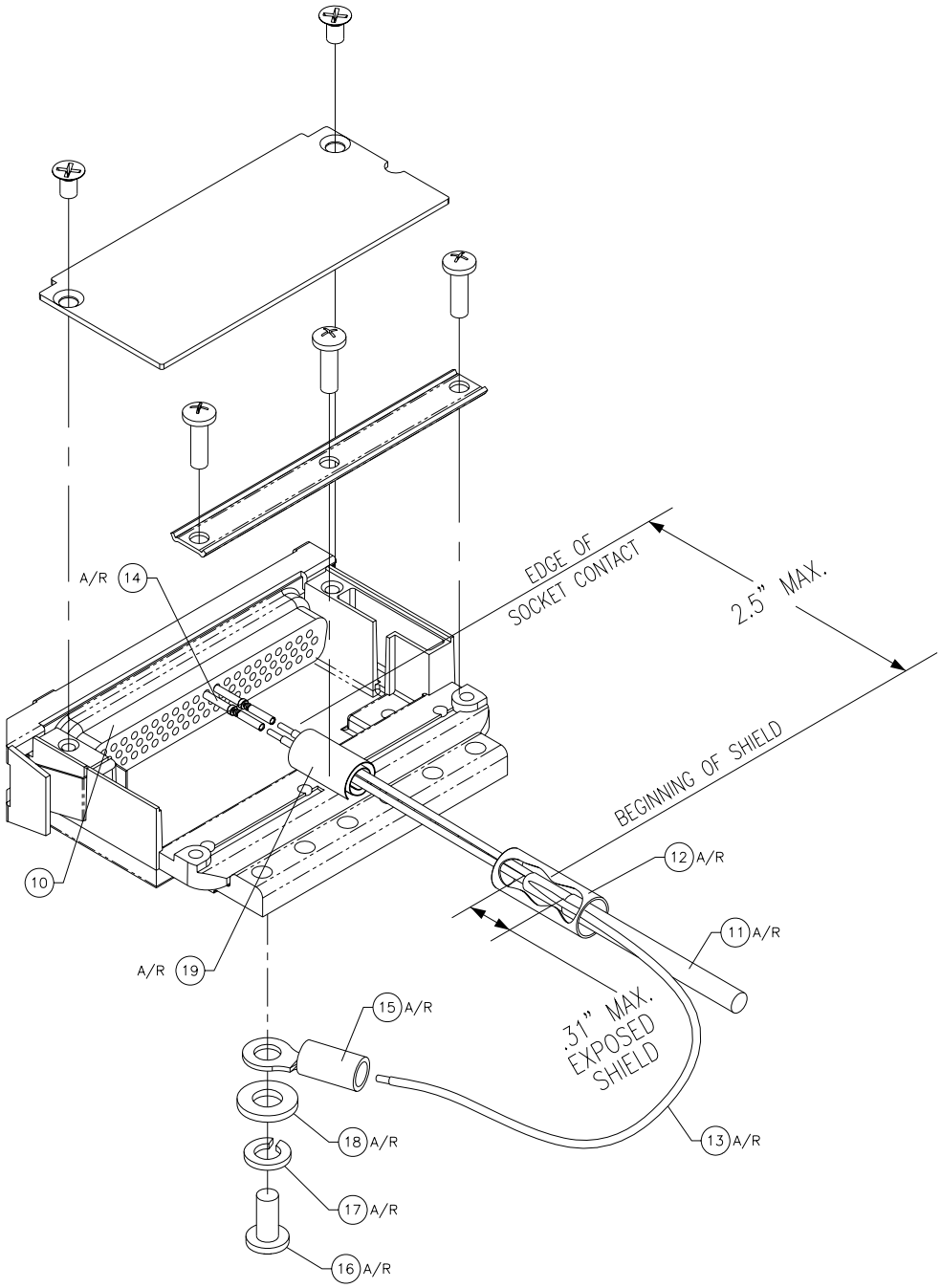
Alternate Method

Figure 3-13. Shielded Cable Preparation



Preferred Method

Figure 3-14. Shield Termination on Backshell Assembly
Sheet 1 of 2



Alternate Method

Figure 3-15. Shield Termination on Backshell Assembly
Sheet 2 of 2

Prepare all of the shielded cables as shown in Figure 3-13. Refer to Figure 3-14 and Figure 3-15 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 3-13).

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:

1. 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 3-12).

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.

2. 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 3-12) (Proceed to next step if this is P741)

3. 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.

4. Place the smooth side of the backshell strain relief (7) across the cable bundle and secure using the three screws (6).
5. 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.
6. 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.

7. Install ring terminals (15) onto the wires (13), grouping wires as appropriate for the connector.
8. 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 3-4 and Table 3-5 list part numbers for the Configuration Module Kits, which are used with P741, P771 and P6202 only.

Table 3-4. Configuration Module Kit – 011-00979-00 (for P771)

Figure 3-16 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 3-5. Configuration Module Kit – 011-00979-02 (for P6202)

Figure 3-16 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 3-6. Configuration Module Kit – 011-00979-20 (for P741)

Figure 3-17 Ref	Description	Garmin P/N
1	Potted Module (w/EEPROM and Temp Sensor)	012-00605-00
2	Pan Head Screw	211-60232-07
3	4-Conductor Harness	325-00122-00
4	Pin Contact, Crimp, #22D	336-00021-00

Table 3-7. 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

NOTE

The socket contacts supplied with the GDU 620 configuration module are specifically made to accommodate 28 AWG wire. The crimp tool should have the indenter set to '4' when crimping these contacts to the configuration module harness.

Assemble the Configuration Module:

1. Crimp socket contacts (4) onto each wire of the four-conductor wire harness (3). Strip 0.17" 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 3-16, and Table 3-6.
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 3-16.

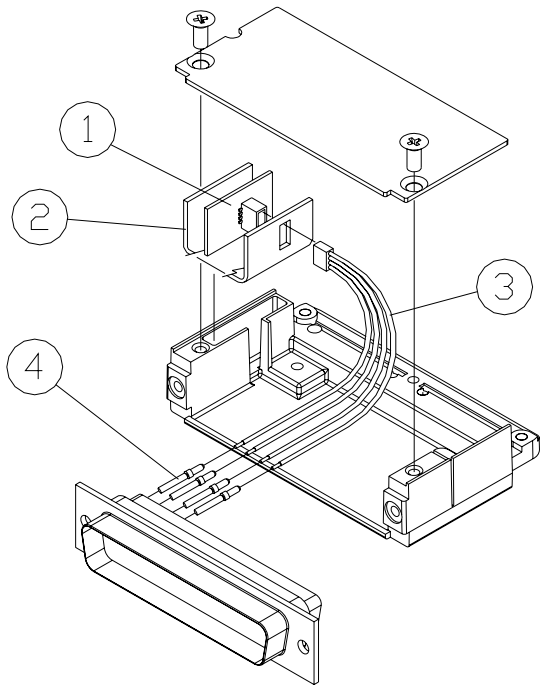


Figure 3-16. Configuration Module Installation

1. Crimp socket contacts (4) onto each wire of the four-conductor wire harness (3). Strip 0.17” 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 3-16, and Table 3-6.
3. Plug the four-conductor wire harness (3) into the connector on the PCB board (1).
4. With screw (2) in position, insert PCB board (1) into the backshell recess. Gently tighten the screw (2) in the backshell
5. 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 3-16.

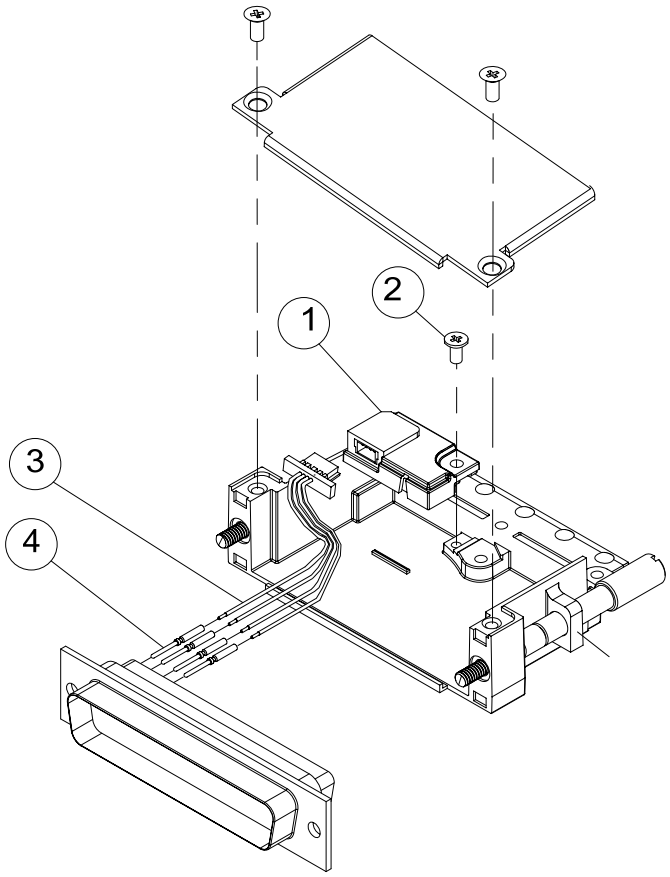


Figure 3-17. Jackscrew Configuration Module Installation

3.5 Unit Removal and Installation

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

3.5.1 GDU™ 620 Unit

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 Installation

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.
5. Perform the electrical bond check per Section 3.6 and verify it is less than 20 mΩ.

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. This does not include units that were returned for repair as their software and configuration files are deleted during the repair process. No configuration is required. Verify that the configuration is correct using the previously completed checkout log in Section 5.11.3.

New, Repaired or Exchange GDU 620 is Installed

If a new, repaired, or exchange GDU 620 unit is installed, 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 5.5.5, and the Configuration Module Update in Section 5.5.12.

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 5.5.12. 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 6.3.

3.5.2 GRS 77H Unit

3.5.2.1 Removal

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

3.5.2.2 Installation

1. Place the GRS 77H 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. Perform the electrical bond check per Section 3.6 and verify it is less than 10 mΩ.
4. Visually inspect the connectors to ensure there are no bent or damaged pins. Repair any damage.
5. Connect the connector to the GRS 77H, ensuring that each slidelock is secured on both sides.

Original GRS 77H is Reinstalled

If the original GRS 77H is reinstalled, then no software loading is required. This does not include units that were returned for repair as their software and configuration files are deleted during the repair testing process. Reference Table 3-8 to determine whether recalibration is required.

New, Repaired, or Exchange GRS 77H is Installed

If a new, repaired, or exchange GRS 77H unit is installed then software must be loaded per Section 5.4.2. Reference Table 3-8 to determine whether re-calibration is required.

GRS 77H Configuration Module is Replaced

If the GRS 77H Configuration Module is replaced, the GRS 77H must be re-calibrated. Reference Table 3-8. To replace the configuration module, reference Section 3.4.2.2.

3.5.2.3 Return to Service

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

1. Power up the G500H 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 6.3.

Table 3-8. GRS 77H Calibration Criteria

Condition	Calibrations Required		
	GRS 77H 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 77H AHRS was removed and/or replaced. The mounting tray was NOT removed and the mounting tray bolts were NOT loosened.	None Required.		
GRS 77H AHRS was removed and/or replaced. The mounting tray WAS removed and/or mounting tray bolts WERE loosened.	X	X	X
GRS 77H AHRS Configuration Module was replaced.	X	X	X

3.5.3 GMU 44 Unit

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 Installation

1. Visually inspect the connectors to ensure there are no bent or damaged pins. Repair any damage.
2. Lower the GMU 44 into the rack and secure the plate with the three Phillips screws.
3. Perform the electrical bond check per Section 3.6 and verify it is less than 10 mΩ.
4. Connect the wiring harness to the GMU 44.

Original GMU 44 is Reinstalled

If the original GMU 44 was reinstalled, then software loading is not required. This does not include units that were returned for repair as their software and configuration files are deleted during the repair testing process. 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 77H/GMU 44 Magnetic Calibration. After the GRS 77H/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, Repaired or Exchange GMU 44 is Installed

If a new, repaired, or exchange GMU 44 unit is installed, then software must be loaded and the GRS 77H/GMU 44 Magnetic Calibration must be performed. Continue to Section 5.4.3 for software loading and Section 5.6.2 for the GRS 77H/GMU 44 Magnetic Calibration. After the GRS 77H/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 G500H 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 6.3.

3.5.4 GDC 74H Unit

3.5.4.1 Removal

1. Disconnect the pitot/static plumbing from the rear of the unit. Disconnect the single connector.
2. Remove the two (2) screws on the mounting plate near the pitot/static ports. Loosen the other two (2) screws.
3. Carefully remove the unit from its mounting location.

3.5.4.2 Installation

1. Place the unit in the mounting tray.
2. Position the unit and fasten using the four (4) screws.
3. Perform the electrical bond check per Section 3.6 and verify it is less than 10 mΩ.
4. Connect the pitot/static plumbing.
5. Inspect the connector and pins for damage. Repair any damage.
6. Connect the connector to the unit, ensuring that each jackscrew is secured.

Original GDC 74H is Reinstalled

If the original GDC 74H is re-installed, then no software loading is required. This does not include units that were returned for repair as their software and configuration files are deleted during the repair testing process.

New, Repaired or Exchange GDC 74H is Installed

If a new, repaired, or exchange GDC 74H unit is installed, then software must be loaded to the unit. Continue to the GDC 74H Software Loading procedure in Section 5.4.4.

GDC 74H Configuration Module is Replaced

If the GDC 74H Configuration Module is replaced, the GDC 74H must be configured. Continue to Section 5.5.8. To replace the configuration module, reference Section 3.4.2.2.

3.5.4.3 Return to Service

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

1. Power up the G500H 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 6.3.
4. Perform a leak check of the pitot-static system in accordance with section 8.2 and observe the airspeed, altitude, and vertical speed for proper operation.

3.6 Equipment Bonding

All LRU bonding measurements must be made with the connector(s) disconnected from the LRU. After the initial installation the GDU 620 can be checked with the connectors connected.

The GDU 620, GRS 77H, GDC 74H, GMU 44, GTP 59 and any supporting brackets must be electrically bonded to the aircraft metallic structure that forms the ground plane, with a resistance between mating surfaces of 2.5mΩ or less. The overall resistance between the following LRUs and the aircraft ground plane must be 10 mΩ or less: GRS 77H, GDC 74H, and GMU 44. The overall resistance between the GDU 620 and the aircraft ground plane must be 20 mΩ or less. The resistance between the GTP 59 and the aircraft skin must be 2.5 mΩ or less. Refer to Section 3.6.1 for details on the aluminum surface preparation prior to bonding.

3.6.1 Aluminum Surface Preparation

In order to prepare the aluminum surface for proper bonding, the following general steps should be followed. For a detailed procedure, reference SAE ARP1870 Sections 5.1 and 5.5.

1. Clean grounding location with solvent.
2. Remove non-conductive films or coatings from the grounding location.
3. Apply a chemical conversion coat such as Alodine 1200 to the bare metal.
4. Once the chemical conversion coat is dry, clean the area.
5. Install bonding aluminum tape or equipment at grounding location.

After the bond is complete, if any films or coatings were removed from the surface, reapply a suitable film or coating to the surrounding area.

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4 System Interconnect

For pin out information for each G500H LRU, refer to Appendix A. For G500H interconnect information refer to Appendix D. Refer to the MDL (005-C0577-00) to get the wiring information for a specific rotorcraft model.

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5 System Configuration/Checkout

NOTE

Screenshots shown herein are based upon GDU 620 software version 4.00. Actual screen content may vary depending upon the version of GDU 620 software being used.

5.1 System Configuration Overview

Once the G500H system has been installed, the system must be configured for the particular installation. In order to enable the helicopter features a Helicopter enablement card is needed (P/N 010-00769-59). 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 5.2.5.
- Load software into the G500H LRUs as specified in Section 5.4.
- Configure the system for Rotary Wing Section 5.5.1
- Configure the G500H 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 77H AHRS as specified in Section 5.6. An engine run-up test is also conducted to verify the mounting of the GRS 77H.
- Perform a check of the pitot-static system to verify the installation of the GDC 74H air data computer and standby instruments. The correct settings of the airspeed tape are also verified during this check. Refer to Section 5.5.3.
- 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 4
- 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 helicopter.

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 existing ADI that is being removed.

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 is referenced in the general arrangement drawing listed in the MDL (005-C0577-00). **If the values are different than the existing values for the rotorcraft then use the existing values.**

NOTE

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

Table 5-1. Airframe Specific Configuration Data

Item	Description	POH/RFM Section	Note
Vs0	stall speed in landing configuration	2-Limitations	Bottom of white arc on ASI **(Set to 0)**
Vs1	stall speed in a specific flight configuration	2-Limitations	Bottom of green arc on ASI **(Set to 0)**
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 **(Set to 0)**
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 RFM/POH
Vr	reference airspeed	4-Normal Procedures	*Optional* - typically set to rotation speed - set to 0 Kt (off) if not listed in the RFM/POH
Vx	best angle of climb speed	4-Normal Procedures	*Optional* - set to 0 Kt (off) if not listed in the RFM/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 RFM/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 rotorcraft
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 rotorcraft
Vyse	maximum autorotation speed	3-Emergency Procedures or 4-Normal Procedures	Blue radial on ASI. (Select based on current ASI color). If not used, set to 0 knots.

Item	Description	POH/RFM Section	Note
Vne (Power Off)	maximum autorotation speed	3-Emergency Procedures or 4-Normal Procedures	Red/White radial on ASI. (Select based on current ASI color) If not used, set to 0 knots.

5.2.5 Attitude Sync

This feature is used to synch the rotorcraft to the horizon in level flight. To enable this feature, activate the cursor and change the selection to ON.

5.2.6 Heliport/Airport Criteria

For installations with SVT enabled, the GDU 620 provides aural and visual terrain alerts. The alerting algorithm relaxes the terrain alerting criteria at nearby heliport/airports. At the time of installation the GDU 620 must be configured to specify the minimum criteria that an airport must meet to be considered as a nearby heliport/airport for the purpose of terrain alerting. For installations with SVT enabled, obtain the information listed in Table 5-1A.

Table 5-1A Airframe Specific Configuration Data

Item	Description	POH/RFM Section	Note
Rnwy Surface	Type of surfaces that runway must have	N/A	Set to type of runway surface that the aircraft will typically use.
Min Length	Minimum length that runway must have before being considered a runway by Terrain alerting.	5-Performance	Set to the shortest ground roll distance required for takeoff/landing operations (typically the distance given for sea level using the coldest temperature given in the POH/RFM).

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 Section 2.5.8.

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 Drawing List (005-C0577-00) for the correct software versions and part numbers.

5.4 Software Loading

NOTE

Screenshots in this section are provided for reference only. For actual LRU software versions, refer to the STC Master Drawing List (005-C0577-00).

The G500H LRUs come pre-loaded with software. However, to ensure that the latest software is loaded it is recommended that software from a current G500H Software Loader Card P/N 010-00908-(00) be loaded into each LRU.

NOTE

A G500H Software Loader Card can also be created. Refer to Section 2.4.3 for additional information.

Apply power to the aircraft and the G500H system.

5.4.1 GDU™ 620 Software Loading

1. Pull the PFD circuit breaker.
2. Insert the correct G500H 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:

6. The following item is displayed:

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

NOTE

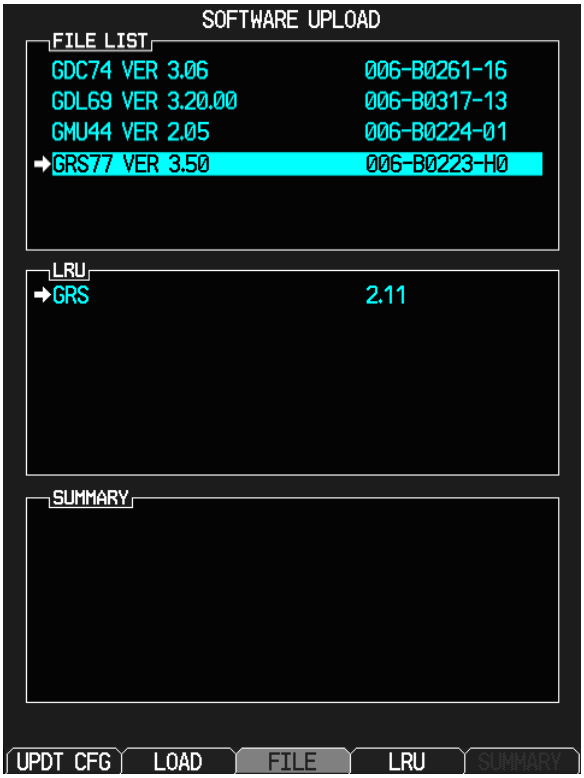
The screen shown is for reference only. The actual number of files updated may vary.

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

5.4.2 GRS 77H Software Loading

Go to the SOFTWARE UPLOAD page.

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



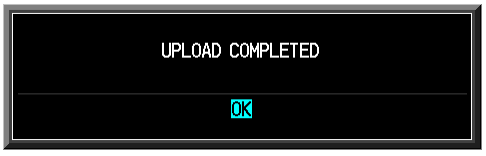
2. Press the LOAD soft key.
3. Select OK and press the ENT key to acknowledge the following prompt:

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

NOTE

When software is loaded into the GRS 77H, two separate files will be loaded automatically (a SYSTEM file and an FPGA file).

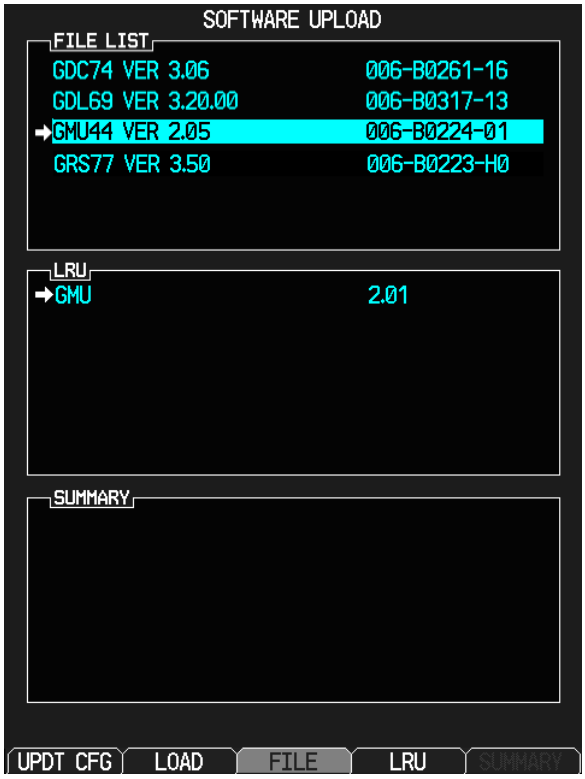
5. After the files finish loading, press the ENT key to acknowledge the following prompt:



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

5.4.3 GMU 44 Software Loading

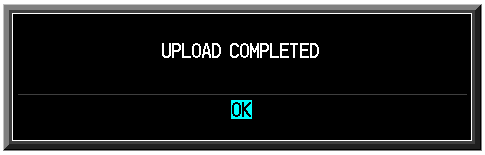
1. Highlight the GMU44 software file. Ensure that the GMU appears in the LRU window as shown.



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:

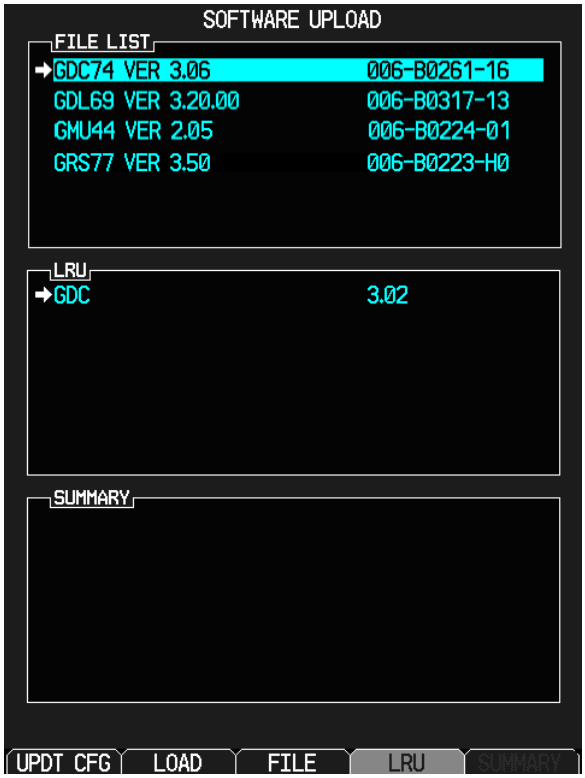
5. After the files finish loading, press the ENT key to acknowledge the following prompt:



6. Check the SUMMARY window to ensure the load is ‘COMPLETE’.

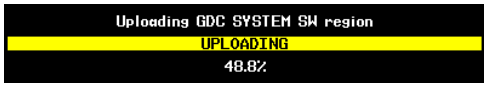
5.4.4 GDC 74H Software Loading

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

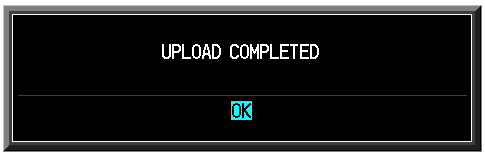


2. Press the LOAD soft key.
3. Select OK and press the ENT key to acknowledge the following prompt:

4. The software for the GDC 74H 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:

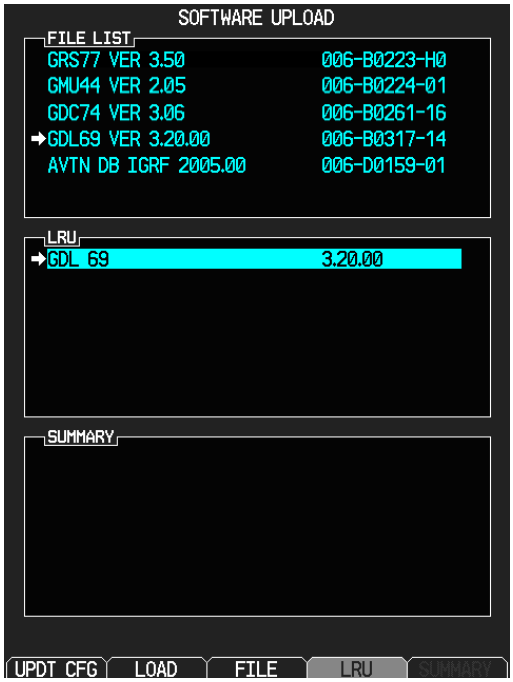


6. Check the SUMMARY window to ensure the load is ‘COMPLETE’.

5.4.5 Software Loading for Optional LRUs

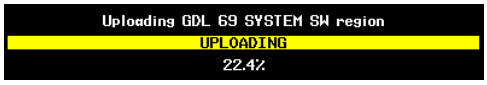
5.4.5.1 GDL 69/69A Software Loading

1. Highlight the GDL69 software file. Ensure that the GDL 69 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:

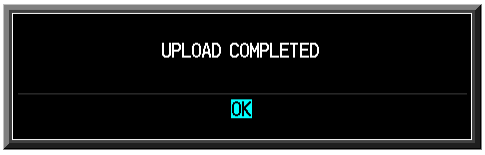
4. The software for the GDL 69/69A begins to load. Monitor the upload status as it progresses:



NOTE

When software is loaded into the GDL 69 three separate files will be loaded automatically (a SYSTEM file, KERNEL file and a LOADER file).

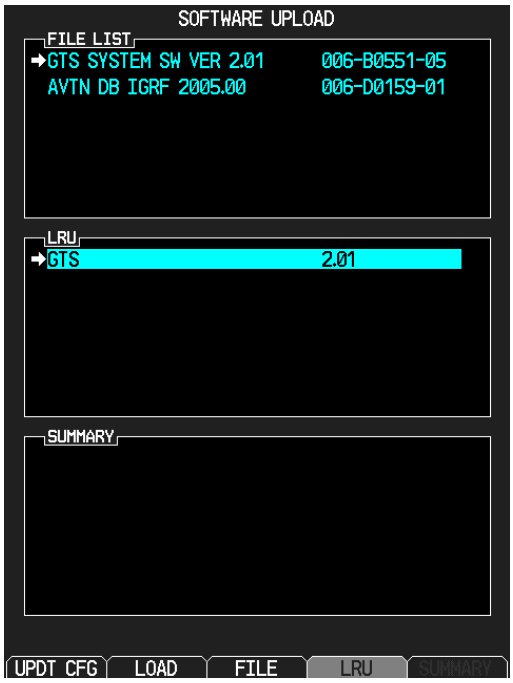
5. After the files finish loading, press ENT to acknowledge the following prompt:



6. Check the SUMMARY window to ensure the load is ‘COMPLETE’.

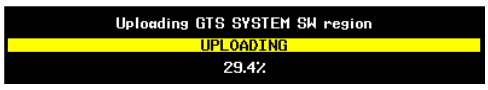
5.4.5.2 GTS 8XX Software Loading

1. Highlight the GTS 8XX software file. Ensure that the GTS 8XX 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:

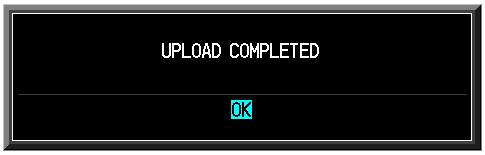
4. The software for the GTS 8XX begins to load. Monitor the upload status as it progresses:



NOTE

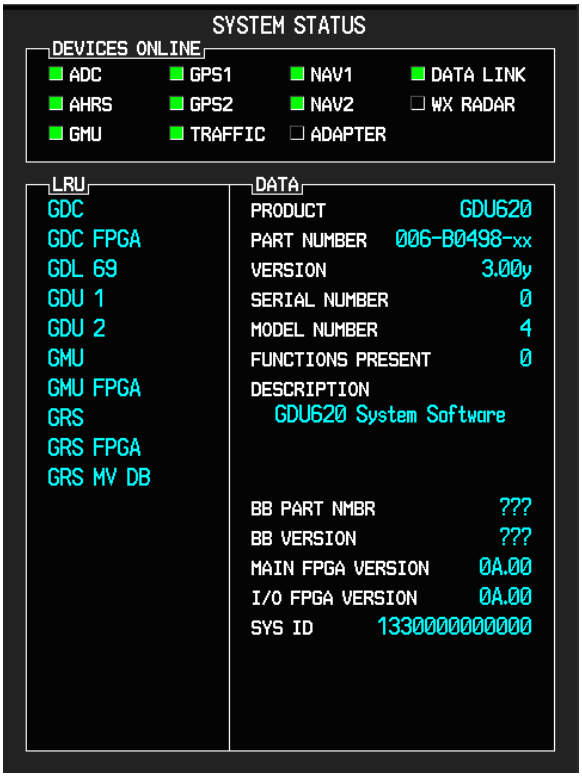
When software is loaded into the GTS 8XX three separate files will be loaded automatically (a SYSTEM file, KERNEL file and a LOADER file).

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 Drawing List 005-C0577-00 :

LRU	SW OK	LRU	SW OK	LRU	SW OK
GDC	_____	GDU [1]	_____	GRS	_____
GDC FPGA	_____	GMU	_____	GRS FPGA	_____
GDL 69 *(optional)*	_____	GMU FPGA	_____		

3. De-activate the cursor.

5.5 System Setup

The GDU 620 configuration mode allows the G500H 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.

Any required configuration settings for approved interfacing systems can be found in Appendix C. Any required configuration settings for the G500H are found in this section.

NOTE

If you have not already enabled the helicopter features using the Helicopter Enablement card (P/N 010-00769-59) then refer to section 5.5.1 for specific instructions to enable Rotary Wing.

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 5.5.12.

5.5.1 Helicopter Airframe Type

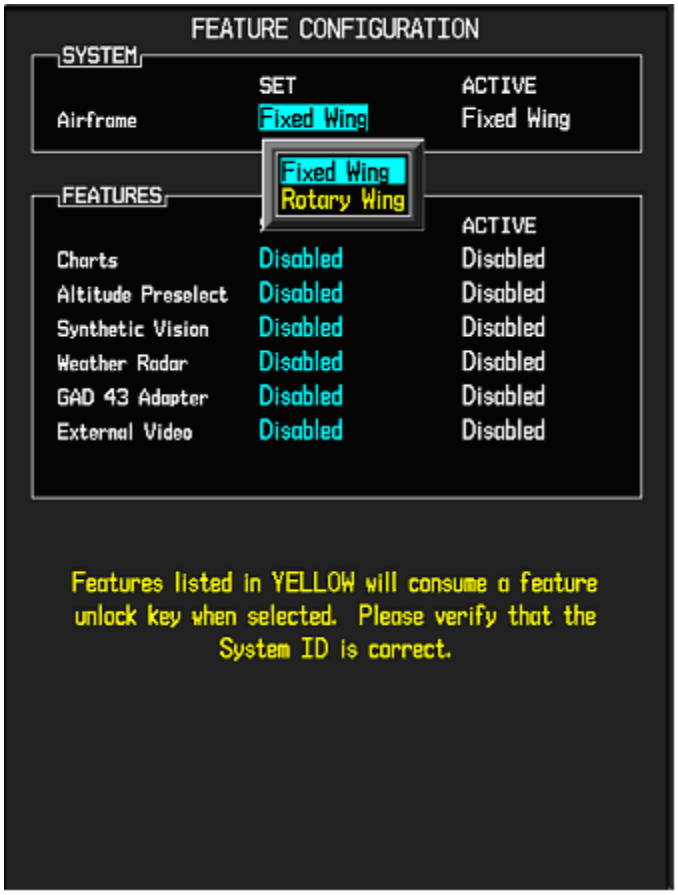
The specific helicopter features need to be enabled using the Helicopter Enablement SD card (010-00769-59).

1. Turn the GDU 620 off.

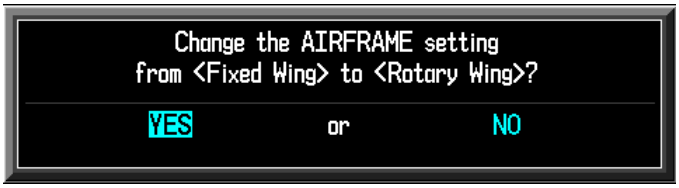
NOTE

The Helicopter Enablement Card only can only be used on one GDU 620 display. A new Helicopter Enablement Card must be used for each GDU 620 that has the Rotary Wing feature activated.

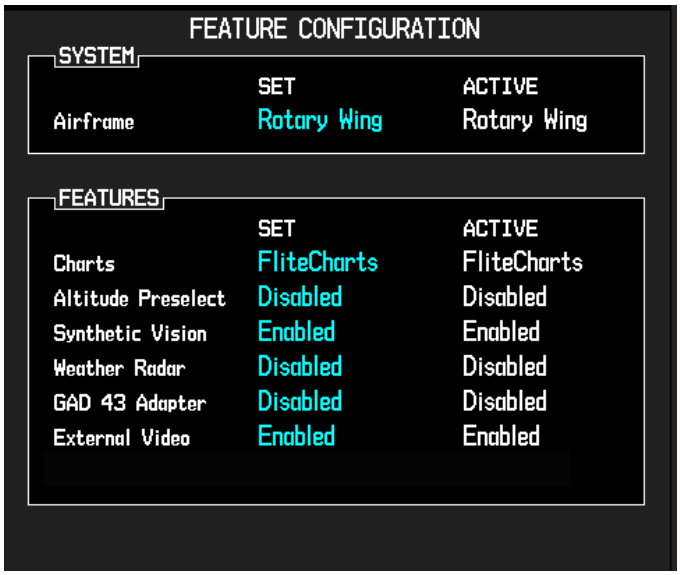
2. Ensure an Installer Unlock Card is inserted.
3. Remove the database SD card from the front SD card slot and insert a Helicopter Enablement SD card P/N 01010-00769-59.
4. Enter configuration mode on the GDU 620 by applying power to GDU 620 while holding the ENT key.
5. Go to the FEATURE CONFIGURATION page in the SYS page group. Activate the cursor and change the set value for Airframe to Rotary Wing. Press ENT to confirm your selection.



6. Press ENT to acknowledge the prompt and activate Rotary Wing.

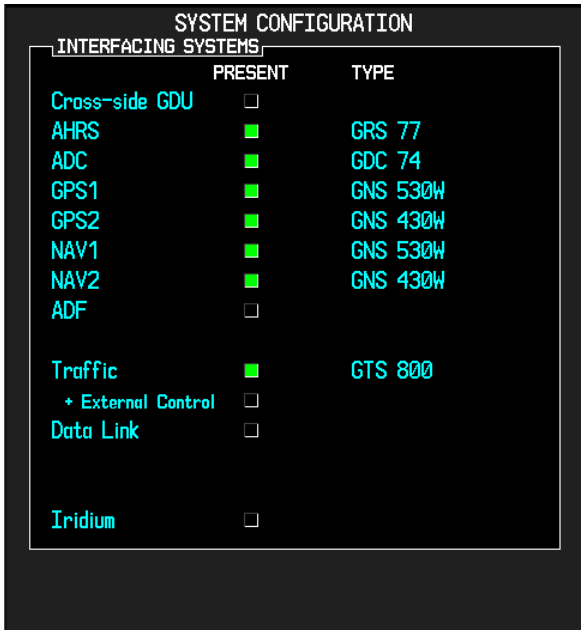


7. When the Rotary Wing feature is activated, “Rotary Wing” will appear in the ACTIVE column.



5.5.2 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 as specified below.



Cross-side GDU

Manufacturer	GDU Model	TYPE Setting	Notes
Garmin	GDU 620	GDU 620	

AHRS

Manufacturer	AHRS Model	TYPE Setting	Notes
Garmin	GRS 77H	GRS 77H	

ADC

Manufacturer	ADC Model	TYPE Setting	Notes
Garmin	GDC 74	GDC 74	

GPS 1/2

Manufacturer	GPS Model	TYPE Setting	Notes
Garmin	GPS 400W	GPS 400W	
	GNC 420W	GNC 420W	
	GNS 430W	GNS 430W	
	GNS 480	GNS 480	
	GNC 500W	GNC 500W	
	GNS 530W	GNS 530W	

NAV 1/2

Manufacturer	NAV Radio Model	TYPE Setting	Notes
Garmin	GNS 430W	GNS 430W	
	GNS 480	GNS 480	
	GNS 530W	GNS 530W	
	SL30	SL30	[1]

[1] SL30 can only be selected for NAV1 *or* NAV 2, not for both.

Traffic

Manufacturer	Traffic System Model	TYPE Setting	Notes
Avidyne (Ryan)	TAS 600/610/620 (9900BX)	SkyWatch	[1]
Garmin	GTX 330/330D GTX 330ES	GTX 330	[2]
	GTS 800	GTS 800	[2]
	GTS 820	GTS 820	
	GTS 850	GTS 850	
Honeywell	KTA 870 / KMH 880	KTA 870	[2]
L3 Com	SKY 497	SkyWatch	[2]
	SKY 899	SkyWatch HP	[2]

[1] The parameter "+External Control" must be set to Present

[2] If the GDU 620 will control the traffic system, "+External Control" must be set to Not Present. If the GDU 620 provides no control for the traffic system, "+External Control" must be set to Present.

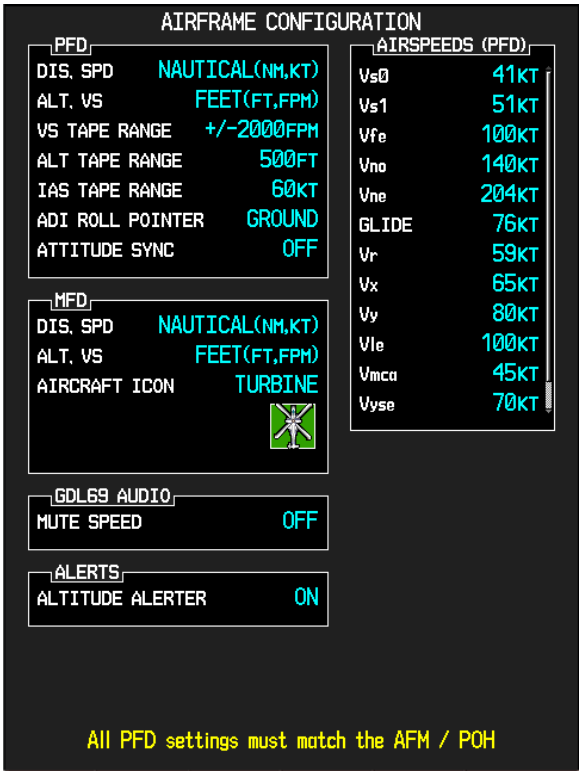
Data Link

Manufacturer	Data Link Model	TYPE Setting	Notes
Garmin	GDL 69	GDL 69	
	GDL 69A	GDL 69A	[1]

[1] If a GDL 69A is installed, it is permissible to set the TYPE to GDL 69. In this case, the XM weather from the GDL 69A will be displayed on the GDU 620, but no control over the audio functions will be available from the GDU 620.

5.5.3 Airframe Configuration

Go to the AIRFRAME CONFIGURATION page in the SYS page group. Set the parameters to the values determined in Section 5.2 and referenced in the general arrangement drawing listed in the MDL (005-C0577-00).



5.5.4 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

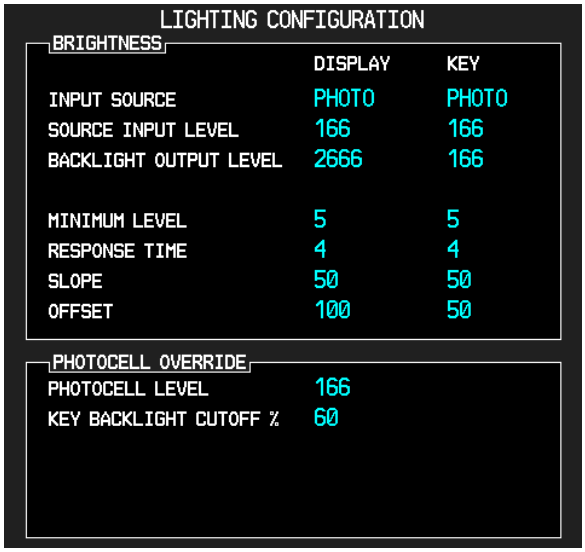
A description of the available adjustments can by found in Section 5 of the GDU 620 Installation Manual P/N 190-00601-04.

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.

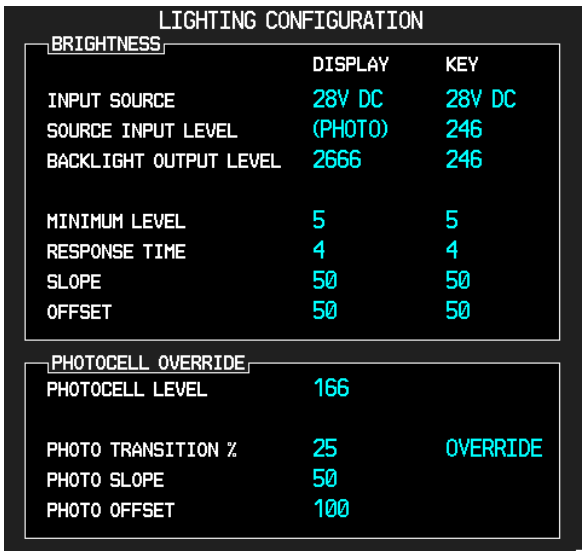
Go to the LIGHTING CONFIGURATION page in the SYS page group and proceed according to the *Photocell Configuration* or *Dimmer Bus Configuration* as appropriate for the installation:

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.

5.5.5 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 77H, GMU 44, GDC 74H, 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 Drawing List 005-C0577-00for 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.

5.5.5.1 Manifest Description

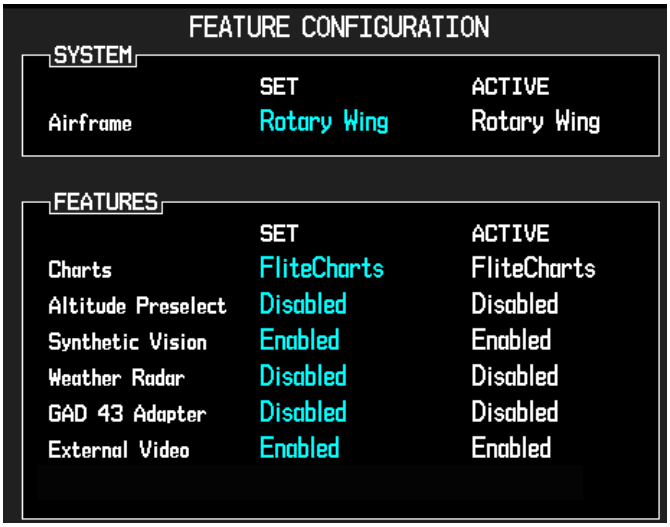
The GDU 620 maintains a list of software part numbers and version numbers (the "manifest") for the G500H system. Each time the G500H system is powered up, the LRUs report their software information to the GDU 620. If the information reported by the LRU does not match the information stored in the manifest, the GDU 620 will not use the data provided by that LRU and will provide a MANIFEST alert.

5.5.6 Optional G500H Feature Activation

NOTE

In most cases, 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 all 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.



CAUTION

Prior to enabling any optional features it is recommended that at least one configuration module update be successfully completed (refer to Section 5.5.12) to verify correct functionality of the configuration module interface. Any optional features that are enabled without a fully functional configuration module will be disabled when the configuration module interface is corrected. The enablement card that was used originally will not work to re-enable the feature in this case.

5.5.6.1 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.
2. Ensure an Installer Unlock Card is inserted.
3. Remove the database SD card from the front SD card slot and insert a ChartView Enablement Card P/N 010-00769-50 (heavy aircraft).
4. Enter configuration mode on the GDU 620 by applying power to GDU 620 while holding the ENT key.
5. 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.
6. Press ENT to acknowledge the prompt and activate ChartView.
7. 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 Enablement Card.

5.5.6.2 Helicopter Synthetic Vision Technology (HSVT™)

When the optional HSVT feature is enabled, the PFD will have the option of displaying synthetic terrain data. This section describes how to activate the Synthetic Vision feature in the GDU 620.

1. Turn the GDU 620 off. Remove the database SD card from the front SD card slot and insert a Helicopter SVT Enablement Card P/N 010-00769-55.
2. Ensure an Installer Unlock Card is inserted.
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 Synthetic Vision to Enabled. Press ENT to confirm your selection.
5. Press ENT to acknowledge the prompt and activate the Synthetic Vision feature.
6. When the Synthetic Vision feature is activated, "Enabled" will appear in the ACTIVE column.

5.5.7 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 clockwise to increase the volume and counterclockwise to decrease the volume.

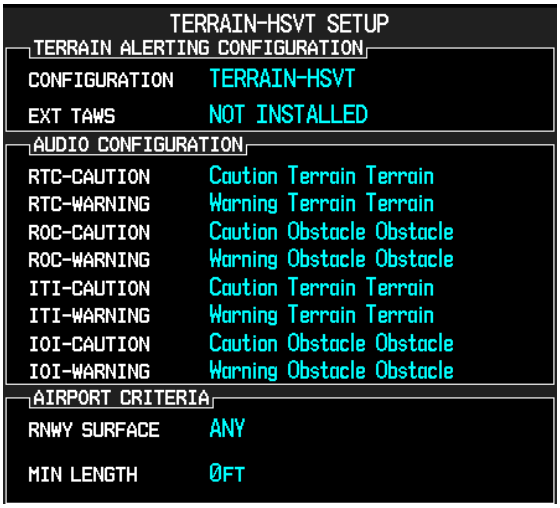
5.5.7A Terrain/Garmin SVT™ Setup

5.5.7A.1 Terrain Proximity Setup (with Garmin HSVT™ disabled)

No setup is required on this page.

5.5.7A.2 Terrain-HSVT™ Setup (with Garmin HSVT™ enabled)

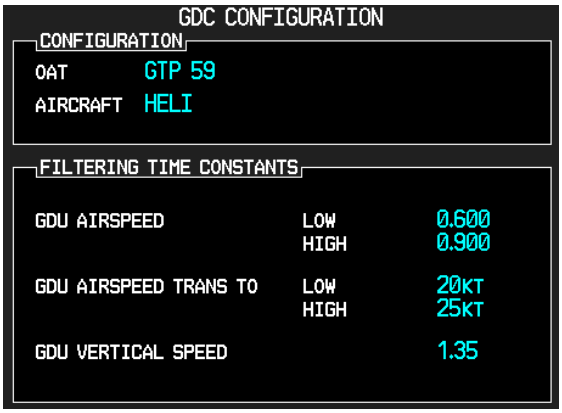
For installations with SVT enabled configure Terrain Alerting and Airport Criteria as follows:



1. Go to the TERRAIN-HSVT SETUP page in the SYS page group.
2. Activate the cursor and set EXT TAWS to NOT INSTALLED if no external HTAWS system is present in the aircraft, or INSTALLED if an external HTAWS system is present in the aircraft.
3. Set the RNWY SURFACE and MIN LENTGH to the values determined in Section 5.2.5.
4. Deactivate the cursor.

5.5.8 GDC Configuration

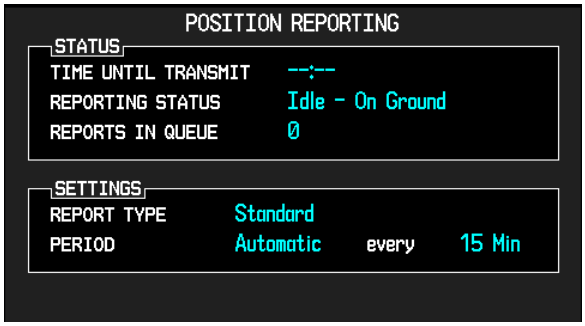
The OAT probe type must be set for the GDC 74H. Refer to the general arrangement drawing listed in the MDL (005-C0577-00) for the filter values.



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. Select AIRCRAFT type. Set to the "HELI" and press the ENT button.
4. Press the ENT button to acknowledge the GDC configuration message.
5. Select the GDU AIRSPEED LOW and adjust to the correct value.
6. Select the GDU AIRSPEED HIGH and adjust to the correct value.
7. Select the GDU AIRSPEED TRANS TO LOW and adjust to the correct value.
8. Select the GDU AIRSPEED TRANS TO HIGH and adjust to the correct value.
9. Select the GDU VERTICAL SPEED and adjust to the correct value.
10. Deactivate the cursor.

5.5.9 GSR 56 Configuration

The report type and period must be set for the GSR 56.



1. Activate the cursor and select REPORT TYPE and choose Standard or AFF.
2. Select PERIOD and select Automatic or Off
3. If Automatic is selected then set an interval between 2 minutes and 60 minutes.

NOTE

A lower position reporting interval may increase the charges for the Iridium service.

5.5.10 GDL 69/69A Configuration

NOTE

If the GDL 69/69A is also connected to a GMX 200 or 400W/500W Series unit, ensure that the GDL 69/69A is configured using the GDU 620.

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

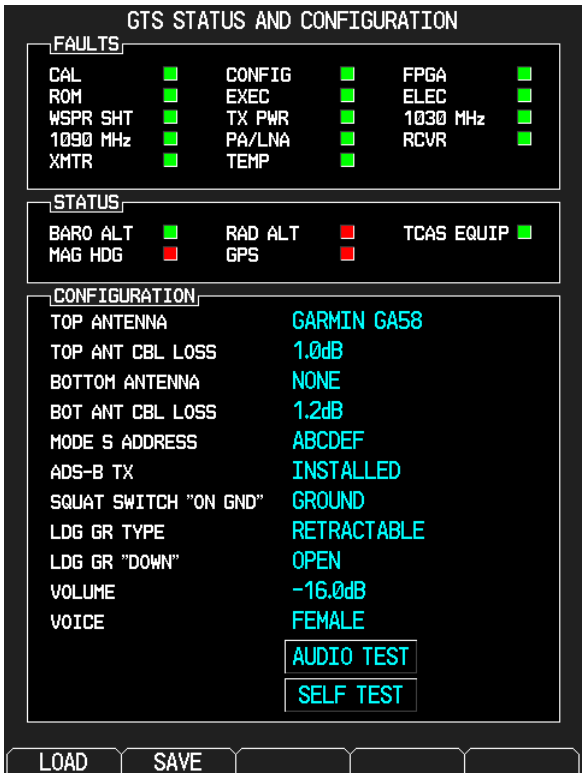
1. Go to the GDL 69 CONFIGURATION page in the GDL page group.
2. Activate the cursor and adjust the Antenna Gain and Cable Loss to match the installation. Refer to the GDL 69/69A Installation Manual (190-00355-02) to determine the correct values.
3. Enable any GDL 69/69A Ethernet ports as required by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

NOTE

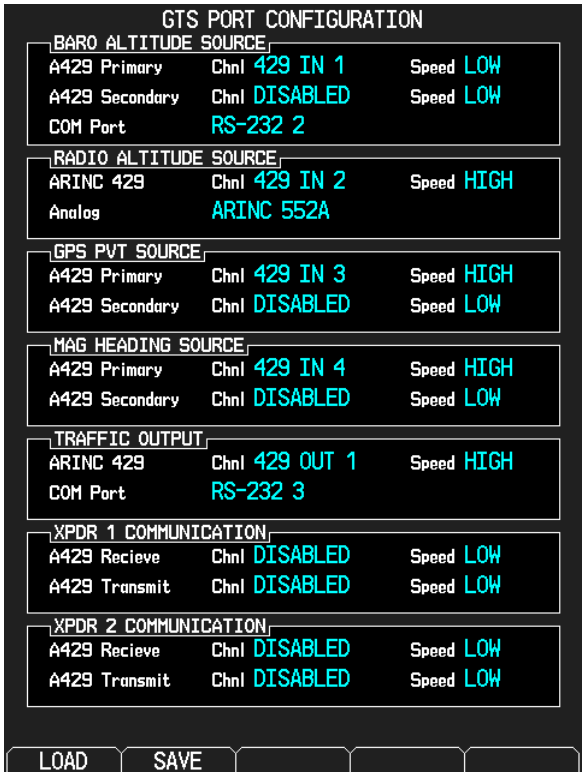
The GDL 69/69A XM must be activated before use. If the XM activation has not already been done, see the GDL 69/69A Installation Manual (190-00355-02) and the GDL 69/69A XM Activation Instructions (190-00355-04).

5.5.11 GTS 8XX Configuration

If a GTS 8XX is connected to the G500H, the GTS 8XX must be configured to provide the correct data to the GDU 620.



1. Activate the cursor and select TOP Antenna and choose GARMIN GA58.
2. Select TOP ANT CBL LOSS and enter in the value of the cable loss between the GA58 and the GTS 8XX. If a GPA 65 is installed then the loss is between the GA58 to GPA 65 and to the GTS 8XX.
3. Select BOTTOM ATENNA and choose the correct antenna that is installed or NONE if no bottom antenna is installed.
4. Select the MODE S ADDRESS and enter in the appropriate value. (Applicable to GTS 820 and GTS 850 Only. Enter the Mode S transponder ID (must match the Mode S ID used by the transponder).
5. Select ADS-B TX and select either Installed or None. (An ADS-B capable TX must be present to enable this such as an GTS 330 ES)
6. Select SQUAT SWITCH “ON GND” and select GROUND or OPEN for the squat switch input.
7. Select LDG GR TYPE and choose RETRACTABLE or FIXED.
8. Select LDG GR “DOWN” and choose OPEN or GROUND for the gear down sense input.
9. Select VOLUME and adjust as needed. To test the volume press the AUDIO TEST button and evaluate the volume compared to other levels.
10. Select VOICE and choose either MALE or FEMALE.
11. Press the SAVE softkey after the changes to this page are complete.
12. Change the page to the GTS PORT CONFIGURATION.



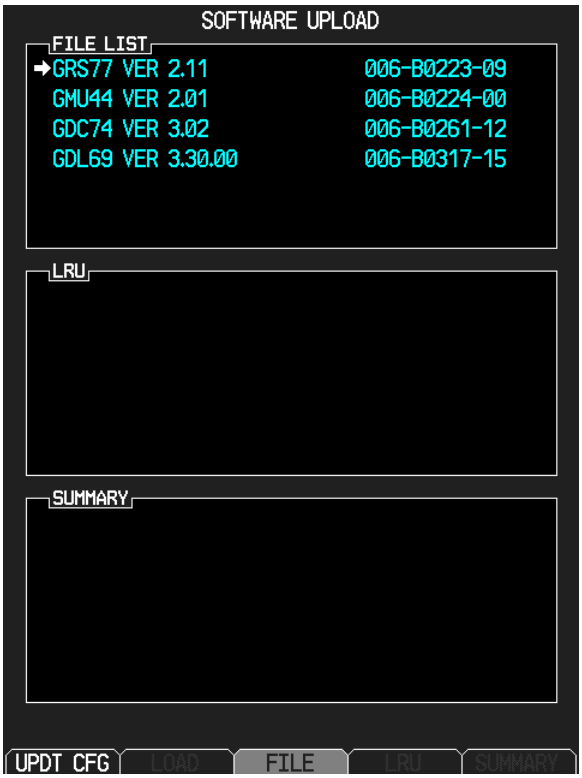
13. Activate the cursor, enable the ports in the BARO ALTITUDE SOURCE where the GTS is getting the Baro altitude data.
14. Select Speed and change it to high or low to match the A429 source.
15. Enable the ports in the RADIO ALTITUDE SOURCE where the GTS is getting the Radio altitude data.
16. Select Speed and change it to high or low to match the A429 source.
17. Enable the ports in the GPS PVT SOURCE where the GTS is getting the GPS data.
18. Select Speed and change it to high or low to match the A429 source.
19. Enable the ports in the MAG HEADING SOURCE where the GTS is getting the heading data.
20. Select Speed and change it to high or low to match the A429 source.
21. Enable the ports in the TRAFFIC OUTPUT that the GTS is sending traffic data from.
22. Select Speed and change it to high or low to match the A429 source.
23. Enable the ports in the XPDR 1 COMMUNICATION that the GTS is getting transponder data from. (Required for a GTS 820/850 installation and a GTX 33/330/33D/330D/328 or a GTX 33/330ES Transponder has to be installed).
24. Select Speed and change it to high or low to match the A429 source.
25. Enable the ports in the XPDR 2 COMMUNICATION that the GTS is getting transponder data from. (Required for a GTS 820/850 installation and a GTX 33/330/33D/330D/328 or a GTX 33/330ES Transponder has to be installed).
26. Select Speed and change it to high or low to match the A429 source.

5.5.12 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 soft keys shown below are only displayed if an Installer Unlock Card is inserted in the GDU.



When the configuration module has been successfully updated, "Config Module Update Complete" will be displayed with no error messages. If error messages are displayed, verify that the configuration module is correctly installed.

5.6 GRS 77H AHRS Calibration and Check

The GRS 77H 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.

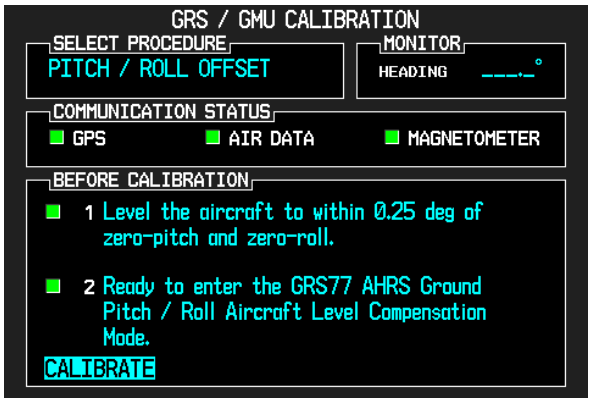
NOTE

Prior to completion of the GRS 77H Pitch/Roll Offset Compensation (Section 5.6.1) and GRS 77H/GMU 44 Magnetometer Calibration (Section 5.6.2) procedures, the annunciation CALIBRATE AHRS/MAG will be displayed on the PFD and the attitude and heading will appear valid. However, as soon as the aircraft moves the displayed attitude and heading will become invalid. This condition is normal and will automatically clear as soon as the two listed calibration procedures are successfully completed.

5.6.1 GRS 77H 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.

5.6.2 GRS 77H/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.

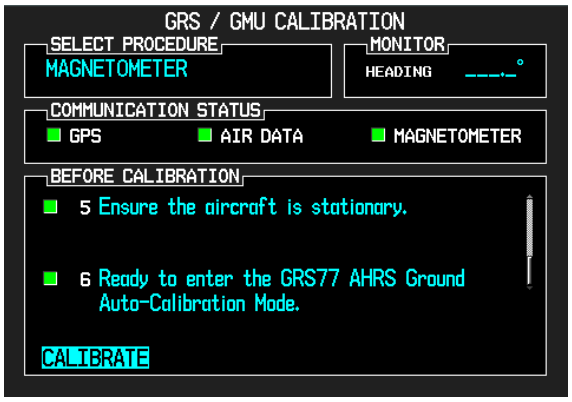
NOTE

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 Rotorcraft 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°).
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 77H 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 77H/GMU 44 heading accuracy. If each heading displayed on the PFD 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 in
   Table 5-2. 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 5-2.

Table 5-2. Heading Verification

	PFD		
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°			

4. Calculate the heading errors by subtracting the displayed (B) value from the actual (A) value for each of the headings in Table 5-2.

HEADING ERROR EVALUATION:

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.

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.

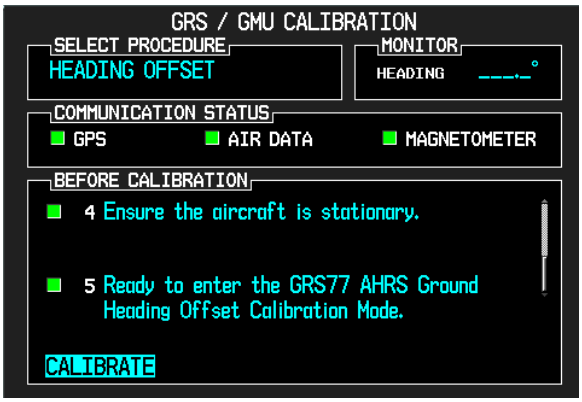
NOTE

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.

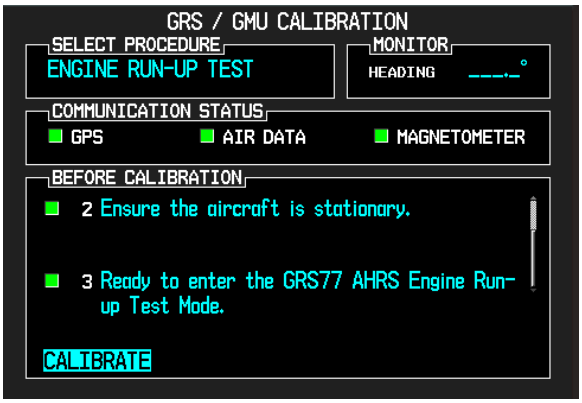
5.6.5 Engine Run-Up Vibration Test

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:

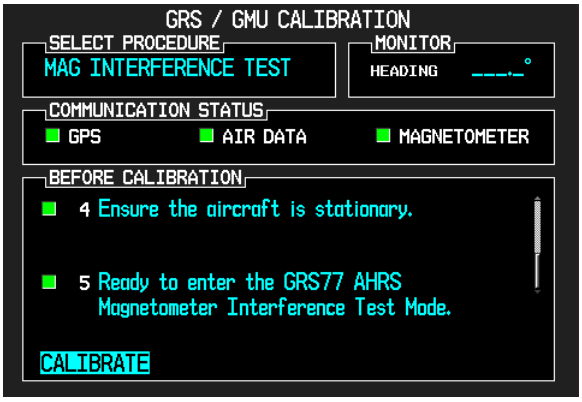
1. Vibration motion of GRS 77H and/or GMU 44 caused by neighboring equipment and/or supports.
2. Mounting screws and other hardware for GRS 77H and/or GMU 44 not firmly attached.
3. GRS 77H connector not firmly attached to unit.
4. Cabling leading to GRS 77H or GMU 44 not firmly secured to supporting structure.
5. An engine / propeller that is significantly out of balance.

The rotorcraft 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 77H 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 3.2.4.1.1.

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 E-1 in Appendix E 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 G500H-equipped helicopter 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 G500H-equipped helicopter 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 77H/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 that a G500H database card is inserted in the bottom slot of the GDU 620.
2. Turn on power to the G500H 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 displayed in 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 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.

Verify correct operation of the GDC 74H ADC as follows:

1. Turn on power to the G500H 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. 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.
6. 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.

7. 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.
8. 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.
9. Decrease the airspeed to zero, stopping at all of the airspeeds listed in the Table 5-3 (airspeeds above V_{ne} should not be checked). Verify that the PFD and standby airspeed indicator display the values within the tolerances indicated:

Table 5-3. 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.

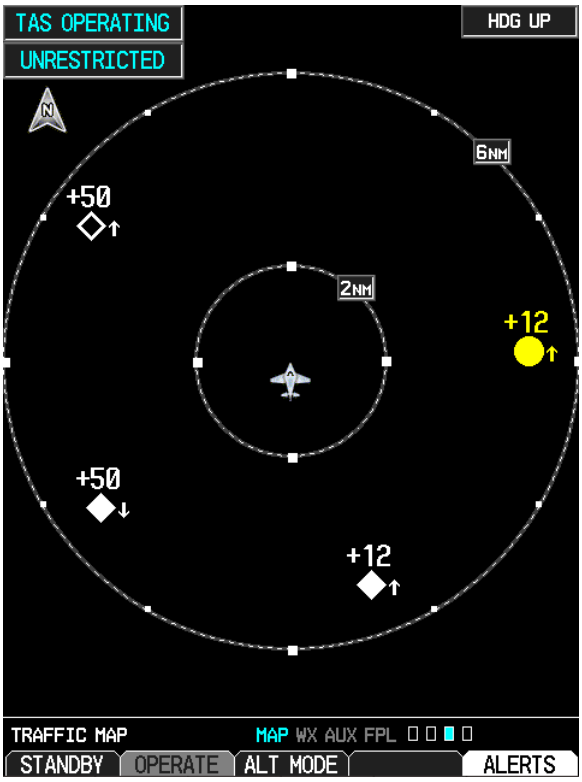
1. Ensure that the external navigation receiver (VLOC1 for installations with dual NAVNAV receivers) is turned on. If there are dual NAVNAV receivers installed, ensure the second NAVNAV receiver is switched off.
2. Select the navigation receiver (or navigation receiver 1) as the navigation source for 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 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.

5.8.5.1 TAS Traffic Interface Test

If a Garmin GTS 8XX TAS/TCAS I, an L3 Communications SKY497/SKY899 SkyWatch® sensor , a Honeywell (Bendix/King) KTA 810 TAS/KMH 820 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.

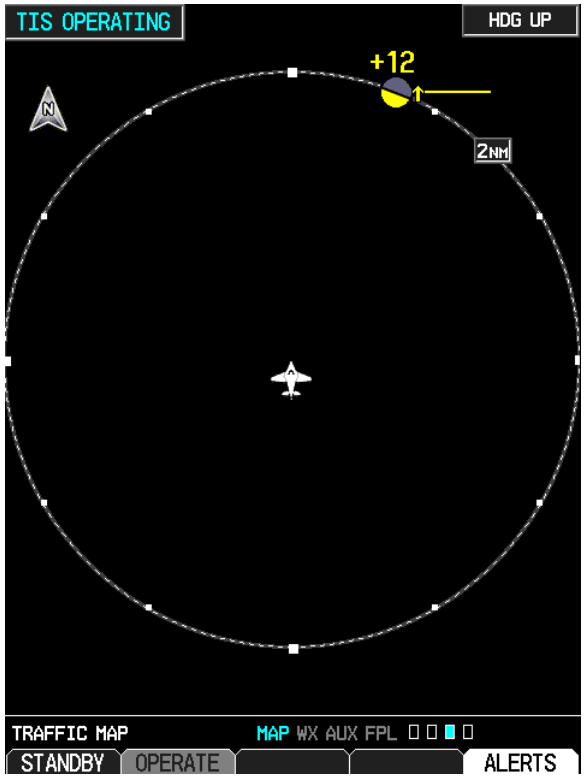
NOTE

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.

5.8.5.2 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.

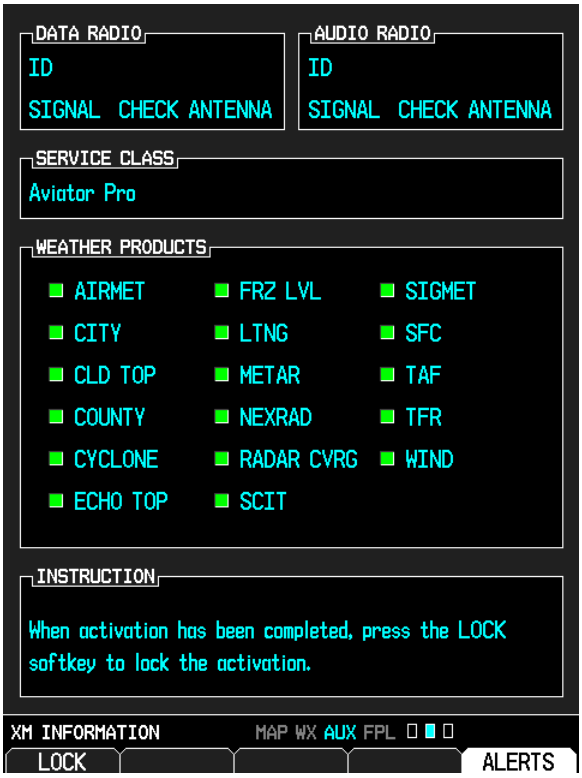
4. Pull the ADC breaker and verify the Air data fields are red X'd.
5. Turn off all navigators to remove a valid GPS position to the GDU 620.
6. If a squat switch (or airspeed switch) to the GTX 330 squat switch input is present, ensure that this is in AIR mode.
7. Alternately press the STANDBY soft 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.
8. Close the ADC circuit breaker.

5.8.6 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 P/N 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

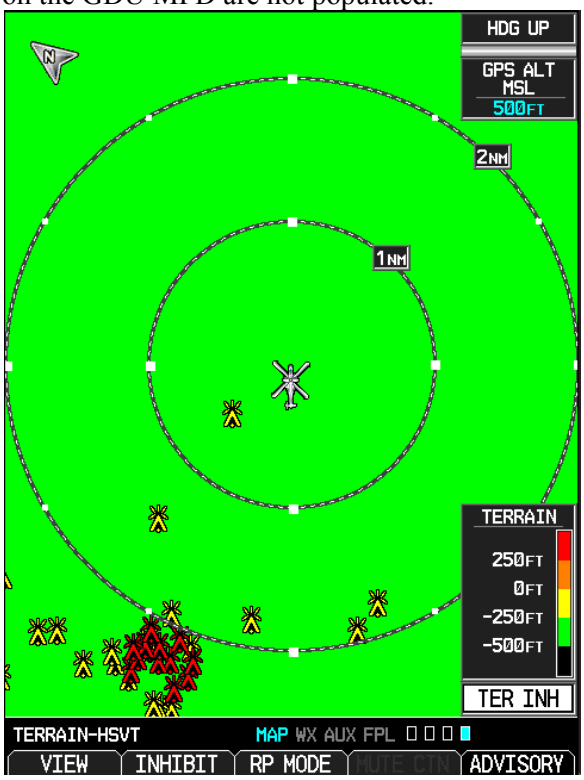
If the XM Satellite Radio audio subscription has not been activated, audio is available only on Channel 1. If the audio subscription has been activated, audio should be available on multiple channels.

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.

5.8.7 HTAWS Verification

The GDU 620 will accept External HTAWS from the GNS 430W/530W units. This check verifies that the units are communicating.

- Ensure the G500H and GNS are powered up.
- Verify the GNS has a valid GPS position.
- Navigate to the TAWS map page on the MFD of the GDU.
- Verify that the softkeys of the MFD are greyed out.
- Turn the GNS power off
- Verify the Softkeys on the GDU MFD are not populated.



5.8.8 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.

5.8.9 Helicopter Synthetic Vision Check *(if HSVT™ enabled)*

1. Ensure that the 010-00769-55 Supplemental Data Card is inserted into the bottom slot.
2. Start the GDU 620 in normal mode.
3. Wait for the G500H system to initialize (attitude, heading, airspeed, altitude and GPS position become valid).
4. On the PFD, press the PFD soft key, followed by the SYN VIS soft key.
5. Press the SYN TERR soft key to turn on synthetic vision.

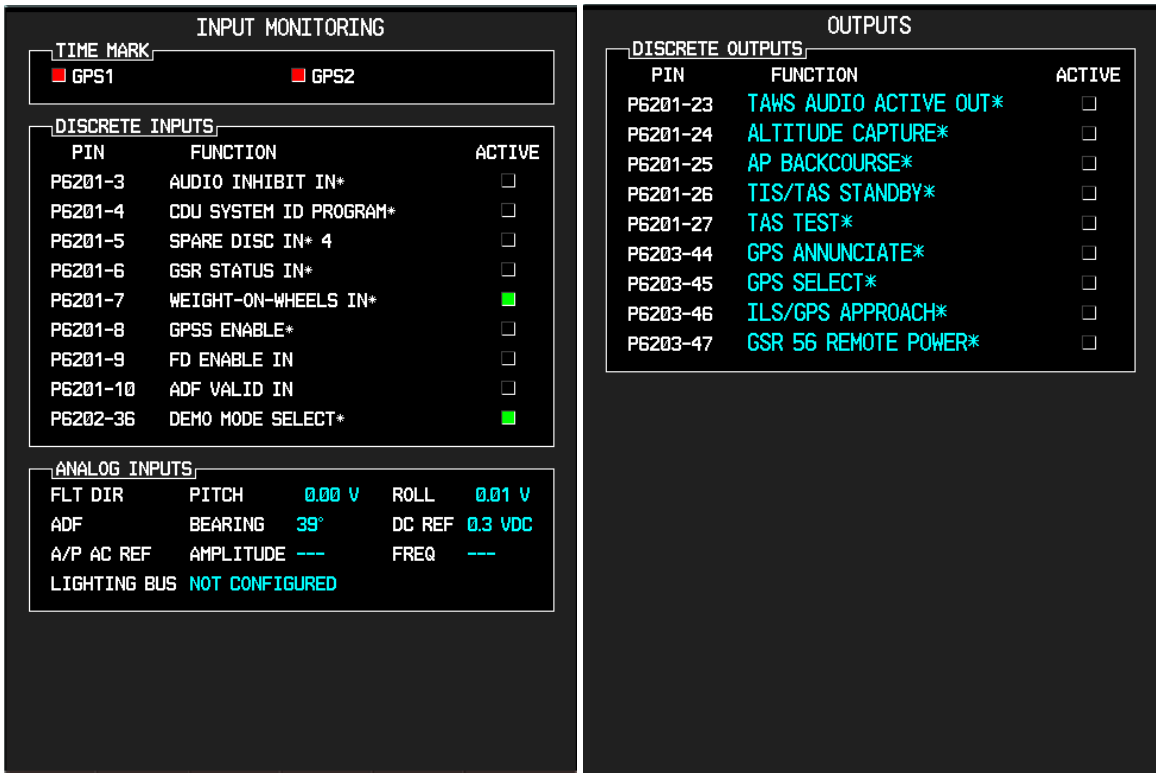
NOTE

It may take up to a minute for the synthetic terrain data to be displayed on the PFD. Until HSVT is active, the horizon display will be the standard blue over brown.

6. Verify that there are no HSVT alerts.
7. Verify that synthetic terrain data is displayed on the PFD.

5.8.10 Discrete Check

1. Start the GDU in configuration mode.
2. Navigate to the DIAG page group.
3. Use the small knob to navigate to the Discrete Input page and verify the discretes toggle as desired.
4. Use the small knob to navigate to the Discrete Output page and verify the discretes toggle as desired.



5.9 Placards and 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 G500H 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.

Verify the following:

- The placard is installed and the text on the placard is "APPROVED FOR DAY/NIGHT VFR"
- The font is at least 0.25" high
- The placard can easily be read from the pilot's seat

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. (if applicable)
- 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.
- Display of External HTAWS (if applicable)
- 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).

5.11 Documentation Checks

5.11.1 RFMS

Ensure that the Rotorcraft Flight Manual Supplement (RFMS) is completed and inserted in the Rotorcraft Flight Manual (RFM).

1. Fill in the required rotorcraft information in the RFMS.
2. Insert the completed RFMS into the RFM.

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. Refer to the MDL (005-C0577-00) to get the ICAW for the appropriate rotorcraft model.
2. 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.

Table 5-4. G500H System Configuration and Checkout Log
Page 1 of 5

G500H Configuration and Checkout Log	Date: ____ /____ /____ By: _____

INSTALLATION INFORMATION:	**AIRCRAFT MODEL** _____ **AIRCRAFT SERIAL #** _____
❑ Single GDU	GDU 620 P/N 011-01264-_____ Mod Level _____ Serial # _____
	GRS 77H P/N 011-00868-_____ Mod Level _____ Serial # _____
	GMU 44 P/N 011-00870-_____ Mod Level _____ Serial # _____
	GDC 74H P/N 011-00882-_____ Mod Level _____ Serial # _____
	GTP 59 P/N 011-00978-_____ Mod Level _____ 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 77H AHRS	_____ (in)	_____
GDC 74H ADC	_____ (in)	_____
GMU 44 Mag.	_____ (in)	_____
GTP 59 OAT	_____ (in)	_____

Table 5-8. G500H System Configuration and Checkout Log
Page 2 of 5

CONFIGURATION ITEMS:

System Configuration

Cross-side GDU:	❑ Present ❑ Not Present	Type: **GDU 620**
AHRS:	❑ Present ❑ Not Present	Type: **GRS 77H**
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	Type: _____
	❑ + Superflag	
Traffic:	❑ Present ❑ Not Present	Type: _____
	❑ + External Control	
Data Link:	❑ Present ❑ Not Present	Type: _____
Iridium Link:	❑ Present ❑ Not Present	Type: _____

Airframe Configuration

PFD

DIS. SPD: ❑ Nautical ❑ Imperial ❑ Metric

ALT. VS: [X] **Feet**

VS Tape Range: ❑ 2000 ❑ 3000 ❑ 4000

ADI ROLL POINTER: ❑ Sky ❑ Ground

Attitude Sync: ❑ On ❑ Off

MFD

DIS. SPD: ❑ Nautical ❑ Imperial ❑ Metric

ALT. VS: [X] **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. G500H System Configuration and Checkout Log
Page 3 of 5

CONFIGURATION ITEMS (CONT'D):	
Feature Configuration	
Airframe: ❑ Rotary Wing	Synthetic Vision: ❑ Enabled ❑ Disabled
Charts: ❑ None ❑ FliteCharts ❑ ChartView	External Video: ❑ Enabled ❑ Disabled
Audio Alert Configuration	
Volume Adjustment: _____ dB	
RS-Port Configuration	
CHNL 8 Output: ❑ Off ❑ Shadin-alt	
Terrain/HTAWS/SVT Configuration	
Terrain Alerting Configuration: ❑ Terrain Proximity ❑ Terrain-SVT	
Ext HTAWS [❑ N/A]: ❑ Installed ❑ Not Installed	Rnwy Surface: [❑ N/A]: _____ Min Length: [❑ N/A]: _____
Video Configuration	
Source: ❑ Video 1 ❑ Video 2	Configured: ❑ Yes ❑ No
Format: ❑ Auto ❑ NTSC ❑ PAL	Rotation: _____ degree
Brightness: _____ %	Contrast: _____ % Saturation: _____ %
Position Reporting	
Report Type: ❑ Standard ❑ AFF	Period: ❑ Off ❑ Automatic Every: _____ min
GDC Configuration	
OAT Type: GTP 59	GDU Airspeed: LOW: _____ High: _____
GDU Airspeed Trans To: LOW _____High: _____	GDU Vertical Speed: _____
GDL 69/69A[❑ N/A]	
Antenna Gain (Lower): _____ dB	Ethernet Port 2: ❑ Enabled ❑ Disabled
Cable Loss (Nominal) _____ dB	Ethernet Port 3: ❑ Enabled ❑ Disabled
GDL 69/69A Activated ❑ Yes ❑ No	Ethernet Port 4: ❑ Enabled ❑ Disabled

Table 5-8. G500H System Configuration and Checkout Log
Page 4 of 5

SYSTEM CHECKOUT

GRS/GMU CALIBRATION

Pitch/Roll Offset completed?	❑	Engine Run-up Test passed?	❑
Magnetometer Cal completed?	❑	Mag Interference Test passed?	❑
Heading Offset completed? [❑ N/A]	❑		

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]
VFR Only placard installed	❑ [❑ N/A]

OPTIONAL FEATURES

❑ [❑ N/A] SVT Checked

SYSTEM INTERFACE CHECKS

- ❑ GPS Receiver Interface checked
- ❑ [❑ N/A] NAV Receiver Interface checked
- ❑ [❑ N/A] Traffic System Interface checked
- ❑ [❑ N/A] GDL 69/69A Interface checked
- ❑ [❑ N/A] ADF Interface checked
- ❑ [❑ N/A] GDU Cross-fill checked

Table 5-8. G500H System Configuration and Checkout Log
Page 5 of 5

SYSTEM CHECKOUT (CONT'D)

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] GDL 69/69A Weather Display
- ❑ [❑ N/A] GDL 69A Audio Control
- ❑ [❑ N/A] HTAWS
- ❑ Discrete Check

Documentation Checks

- ❑ RFMS completed and in POH/RFM
- ❑ ICAW completed and included in aircraft records

COMMENTS:

6 Troubleshooting

This section provides information to assist troubleshooting if problems occur with a G500H 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 strobe light on the tail.

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

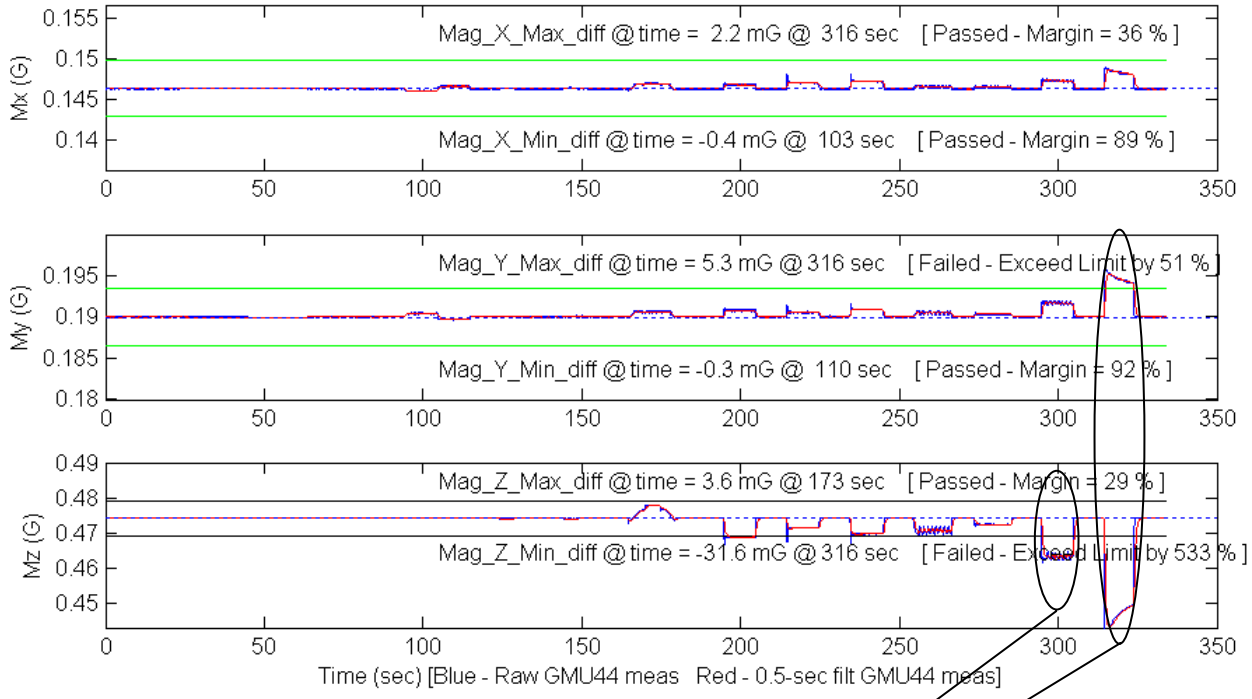
Large electrical loads that are close to the magnetometer can generate significant magnetic interference. It is important to install the GMU 44 using the guidelines and location provided in the general arrangement drawing referenced in the MDL (005-C0577-00).

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

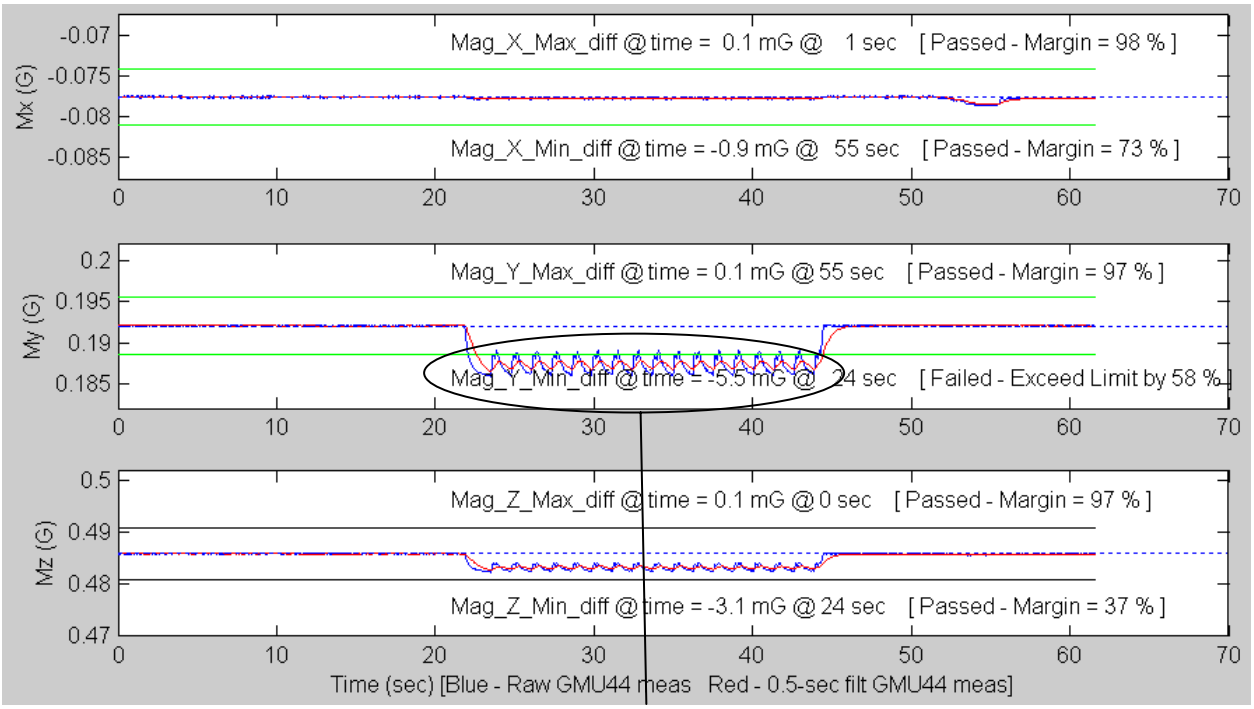
In order to isolate the cause the magnetic interference, first review the results from the GMU 44 Location Survey Tool as described in Appendix E. Compare the survey results to the detailed test sequence to identify which item caused the failure. Two examples of common survey failures are shown below.



Interference From The 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 would be difficult, the GMU 44 was relocated to more suitable location.



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 G500H 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 74H is not working.	Ensure that the GDC 74H RS-232 connection to the GDU is properly wired, and ensure that the GDC 74H 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 5.5.12.
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 GDU 620.	Use correct ports (refer to Appendix D for interconnect details).
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 77H 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 77H to reset. This occurs because the artificial changes in airspeed cause disagreement with the other sensor measurements internal to the GRS 77H. 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 G500H 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 G500H Alerts

The G500H 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
AHRS1 GPS – AHRS 1 using backup GPS source.	AHRS is using the backup GPS information	Verify GPS1 power and check the wiring
AHRS1 GPS - AHRS is not receiving any GPS information	AHRS is not receiving any GPS information.	Verify GPS power and check the wiring
AHRS1 GPS – AHRS 1 operating in exclusively in no-GPS mode.	AHRS is not receiving any GPS information.	Ensure that at least one GPS has acquired a valid position.
		If GDU 620 does not have a valid position, verify wiring between GDU and GPS receiver, and configuration of GDU 620 and GPS receiver.
		If GDU has a valid GPS position, verify wiring between GDU and GRS. Also verify time mark wiring.
AHRS1 GPS – AHRS 1 not receiving backup GPS information.	AHRS is not receiving GPS information from GPS2.	Verify GPS2 power and check the wiring
AHRS1 SRVC	AHRS magnetic field model should be updated. Appears on ground only.	Update GRS 77H 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 74H to GRS 77H is not working. Verify wiring is correct.
CAL LOST	Registry reports that it has lost calibration data.	Contact Garmin Technical Support.
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%	Inspect the GDU fan for an obstruction. Contact Garmin Technical Support.
FAN 2 FAIL	Fan 2 has reported 0 RPM when it was powered with a PWM duty cycle higher than or equal to 10%	Inspect the GDU fan for an obstruction. Contact Garmin Technical Support.

Alert Text	Cause	Solution
GDL69 CONFIG	The GDL 69 configuration information stored in the GDL 69 and the GDU 620 configuration module do not match.	With the GDU 620 in configuration mode, go to the GDL 69 page in the GDL page group. Verify that the SET and ACTIVE configuration settings are the same. If not, use the SET>ACTV soft key to copy the configuration settings from the GDU 620 into the GDL 69.
	The GDL 69 configuration was updated using another LRU (e.g. the GMX 200 or 400W/500W).	Update the GDL 69 configuration using the GDU 620.
GDU CONFIG	This error appears whenever the GDU is replaced with a GDU that was configured for a different installation.	Cycle power to the GDU. This error automatically clears on the second power up with a different configuration module.
	Error in the configuration of the GDU 620.	
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.	Verify the correct card is installed, reload the DB on the card.
GDU (1/2) VOLTAGE	GDU supply voltage is below 12 VDC.	Increase the voltage above 12VDC.
GEO LIMITS	Location is too far north/south for GRS 77H magnetic compass.	
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 77H not receiving information from GMU 44. Verify wiring to GMU 44.
HDG LOST	Heading from the GRS77/ GMU 44 is not valid.	Caused by a local magnetic anomaly. No action required.
<LRU> SERVICE	Specific LRU should be serviced, where <LRU> denotes specific LRU.	Return indicated LRU to Garmin for service.

Alert Text	Cause	Solution
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 5.5.5 for additional information.
	The LRU software P/N and version number in the manifest does not match the values being reported by that LRU.	Update the LRU software to match the manifest (refer to Section 5.4)
		Update the manifest to match the LRU software (refer to Section 5.5.5)
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.
SVT DISABLED - Out of available terrain region.	Location is beyond region covered by terrain database.	
SVT DISABLED - Terrain DB resolution too low.	A 30 arc-second terrain database is being used.	Update the Supplemental Data card with the 9 arc-second terrain database.
SW MISMATCH	GDU software version strings do not match.	Verify the correct SW is loaded
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.
TRK LOST	GPS1 TRK lost. HSI defaulted to GPS2 TRK.	
TRK TRAFFIC	Heading Lost. Traffic is now based on track.	See HDG errors.

6.4 Contacting Garmin for Assistance

If the G500H 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 77H, GMU44, GDC 74H and GNS navigator(s).
- Description of problem
- Efforts made to isolate the problem

7 LIMITATIONS

7.1 Operation

Rotorcraft modified with the G500H system are limited to VFR operations only. See section 5.9 for instructions on VFR ONLY placard requirements.

The installation instructions in this manual must be followed in order to ensure an airworthy installation for rotorcraft 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 this manual. The installer should reference the rotorcraft 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 rotorcraft with multiple power busses, the GDU 620, GRS 77H, and GDC 74H must be powered from the essential bus. For rotorcraft 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.

7.2.1 Equipment Interfaced to the G500H System

Connections from the G500H to rotorcraft systems other than those shown in the wiring diagrams listed in the MDL (005-C0577-00) and Appendix D are outside the scope of the G500H STC and may require further evaluation and / or certification approval.

All equipment interfaced to the G500H must be previously or concurrently approved.

7.2.1.1 Traffic Sensor Interfaced to the G500H

The G500H 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.

7.2.1.2 GNS 500W Series HTAWS Annunciation

Only HTAWS annunciations received from the No. 1 System (i.e. GPS or GPS 1) are displayed on the PFD. If the aircraft's HTAWS system is embedded in a GNS 500W Series Navigator configured as system No. 2, the remote annunciations will not display on the PFD on the G500H.

7.2.2 Major Alterations

The installation of the G500H system is a major alteration to the rotorcraft type design.

7.2.3 Instructions for Continued Airworthiness

Before returning the rotorcraft to service, the G500H Configuration and Checkout Log must be completed and attached with the Instructions for Continued Airworthiness so that any rotorcraft with the modifications detailed in this manual may be properly maintained.

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8 PERIODIC MAINTENANCE

The G500H periodic maintenance is referenced in the ICAW. Refer to the MDL (005-C0577-00) to get the ICAW for the appropriate rotorcraft model.

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 74H

Per Part 43 Appendix E, paragraph (b)(2), the GDC 74H 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 74H are not susceptible to these types of errors.

Other than for regulatory testing pertaining to Part 43 Appendix E, maintenance of the GDC 74H is "on condition" only.

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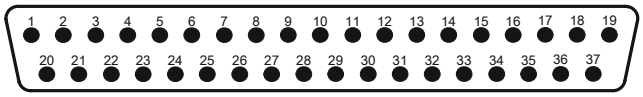
Appendix A LRU Connector Pin-Out Information

A.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.

A.1.1 P6201 Connector

View of J6201 connector from back of unit

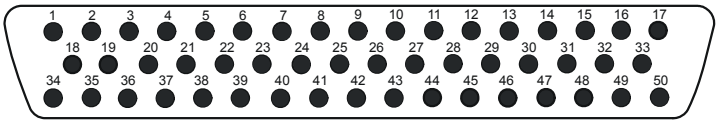


Pin	Pin Name	I/O
1	COMPOSITE VIDEO IN 1	--
2	RESERVED	--
3	AUDIO INHIBIT IN*	In
4	CDU SYSTEM ID PROGRAM*	In
5	4” FD ENABLE IN	In
6	GSR STATUS IN*	In
7	AIR/GROUND STATUS IN*	In
8	GPSS ENABLE IN*	In
9	FD ENABLE IN	In
10	ADF VALID IN	In
11	ETHERNET IN 1A	In
12	ETHERNET IN 1B	In
13	ETHERNET OUT 1A	Out
14	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	Out
21	RESERVED	--
22	GROUND	--
23	TAWS AUDIO ACTIVE OUT*	Out
24	ALTITUDE CAPTURE*	Out
25	A/P BACKCOURSE*	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.

A.1.2 P6202 Connector

View of J6202 connector from back of unit



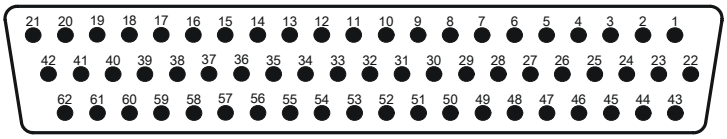
Pin	Pin Name	I/O
1	AIRCRAFT POWER	In
2	AIRCRAFT GROUND	--
3	ARINC 429 OUT 1A	Out
4	ARINC 429 IN 1A	In
5	ARINC 429 IN 2A	In
6	ARINC 429 IN 3A	In
7	ARINC 429 IN 4A	In
8	ARINC 429 IN 5A	In
9	ARINC 429 IN 6A	In
10	RS-232 IN 1	In
11	RS-232 IN 2	In
12	RS-232 IN 3	In
13	RS-232 IN 4	In
14	RS-232 IN 5	In
15	LIGHTING 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.

A.1.3 P6203 Connector

View of J6203 connector from back of unit



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-422/RS-485 1B	I/O
32	RS-422/RS-485 2B	I/O
33	RS-422/RS-485 3B	I/O
34	RS-422/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	--

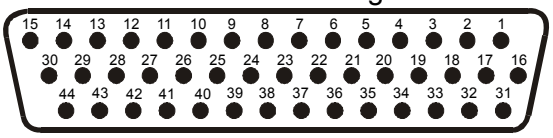
Connector P6203 (continued)		
Pin	**Pin Name**	**I/O**
42	A/P AC REF LO	In
43	RESERVED	--
44	GPS ANNUNCIATE*	Out
45	GPS SELECT*	Out
46	ILS/GPS APPROACH*	Out
47	WX RADAR ON | GSR RMT PWR ON*	Out
48	GROUND	--
49	RS-232 GND 6	--
50	RS-232 GND 7	--
51	RS-232 GND 8	--
52	LATERAL +LEFT OUT	Out
53	LATERAL +RIGHT 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.

A.2 GRS 77H AHRS

A.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.

A.2.1.1 Power Function

Pin Name	Connector	Pin	I/O
AIRCRAFT POWER 1, GRS 77H	P771	18	In
AIRCRAFT POWER 2, GRS 77H	P771	20	In
MAGNETOMETER POWER OUT	P771	9	Out
MAGNETOMETER GROUND	P771	40	--
POWER GROUND, GRS 77H	P771	22	--
POWER GROUND, GRS 77H	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.

A.2.1.2 Serial Data

A.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.

A.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

A.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	--

A.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

A.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 77H is assigned a System ID. IDs identify a GRS 77H as an All Call, #1, #2, or #3 unit. For a single system, the pins are left open (All Call).

The GRS 77H 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 77H ARINC 429 labels in a system with more than one GRS 77H. The GRS 77H System ID is set as follows:

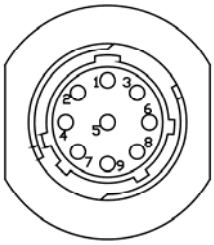
P771 Strapping to Achieve Desired System ID

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

A.3 GMU 44 Magnetometer

A.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

A.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	--

A.3.1.2 Serial Data

A.3.1.2.1 RS-232

Pin Name	Connector	Pin	I/O
GPS 1 RS-232 IN	P441	8	In

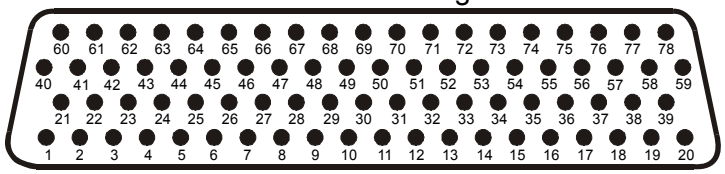
A.3.1.2.2 RS-485

Pin Name	Connector	Pin	I/O
RS-485 OUT A	P441	4	Out
RS-485 OUT B	P441	2	Out

A.4 GDC 74H

A.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

A.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.

A.4.1.2 Serial Data

A.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.

A.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.

A.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

A.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 ≤ Vin ≤ 33VDC or Rin ≥100kΩ
ACTIVE: Vin ≤ 1.9VDC with ≥ 75 uA sink current, or Rin ≤ 375Ω

Sink current is internally limited to 200 uA max for a grounded input
DISCRETE IN pins:
INACTIVE: Vin ≤ 3.5VDC
ACTIVE: 10 ≤ Vin ≤ 33VDC with ≥ 75 uA source current

Source current is internally limited to 1.5 mA max for a 10-33VDC input

A.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.

A.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 74H is assigned a System ID. IDs identify a GDC 74H as an All Call, #1, #2, or #3 unit. For a single system, the pins are left open (All Call). The GDC 74H 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 74H ARINC 429 labels in a system with more than one GDC 74H. The GDC 74H System ID is set as follows:

Table A-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 B Outline and Installation Drawings

B.1 Drawing List

- Figure B-1. GDU 620 Connector Locations
- Figure B-2. GDU 620 Dimensions and Center of Gravity
- Figure B-3. GMU 44 and Mounting Rack Dimensions and Center of Gravity
- Figure B-4. GMU 44 Mounting Rack P/N 115-00481-10
- Figure B-5. GRS 77H and Mounting Rack Dimensions and Center of Gravity
- Figure B-6. GDC 74H Dimensions and Center of Gravity

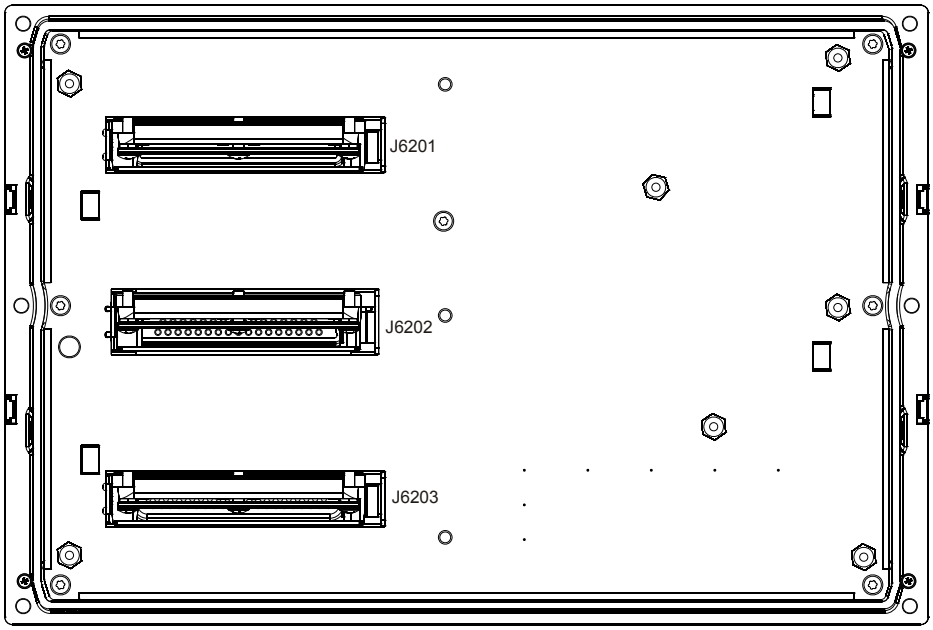



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**Figure B-1. GDU 620 Connector Locations**
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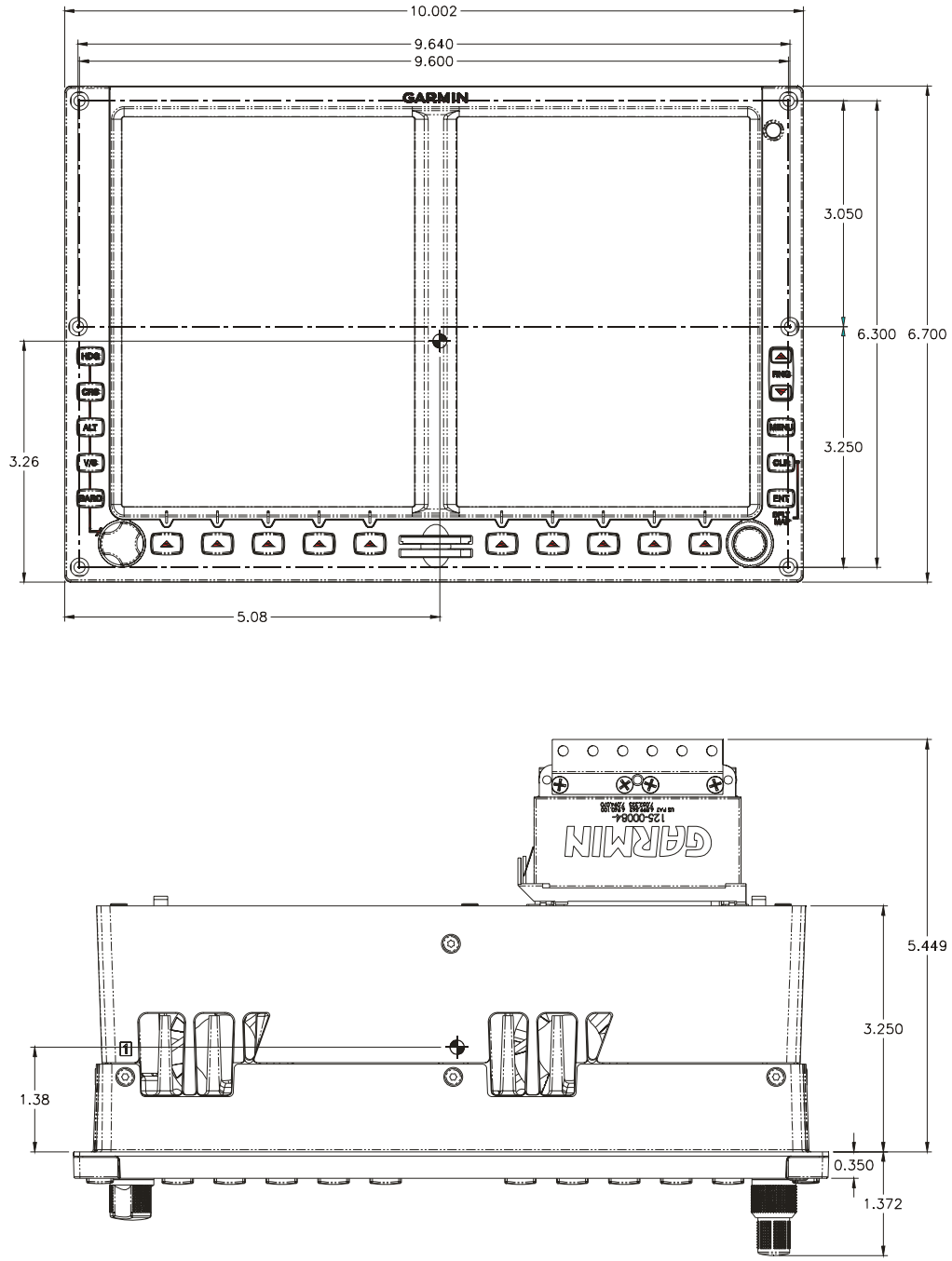


Figure B-2. GDU 620 Dimensions and Center of Gravity

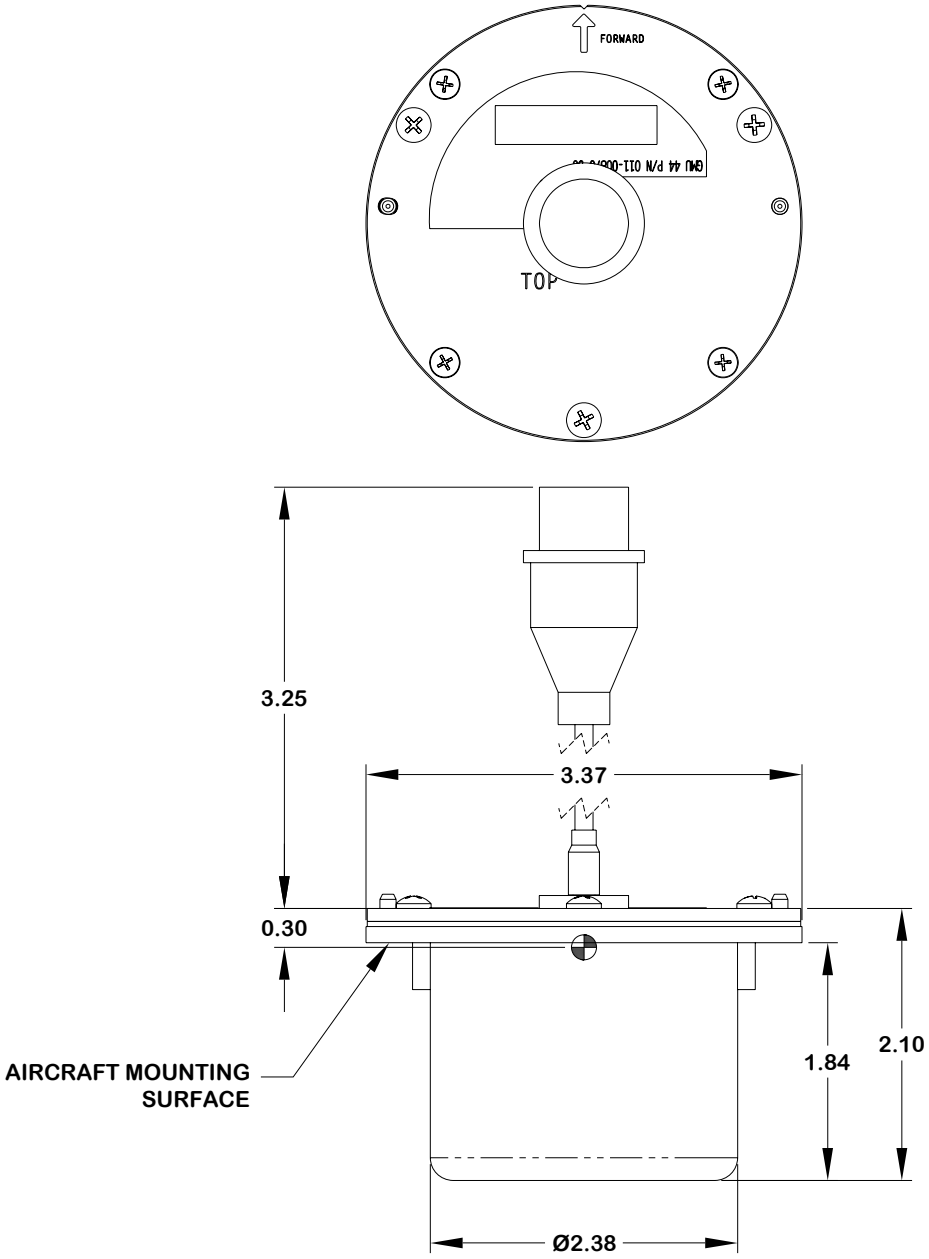
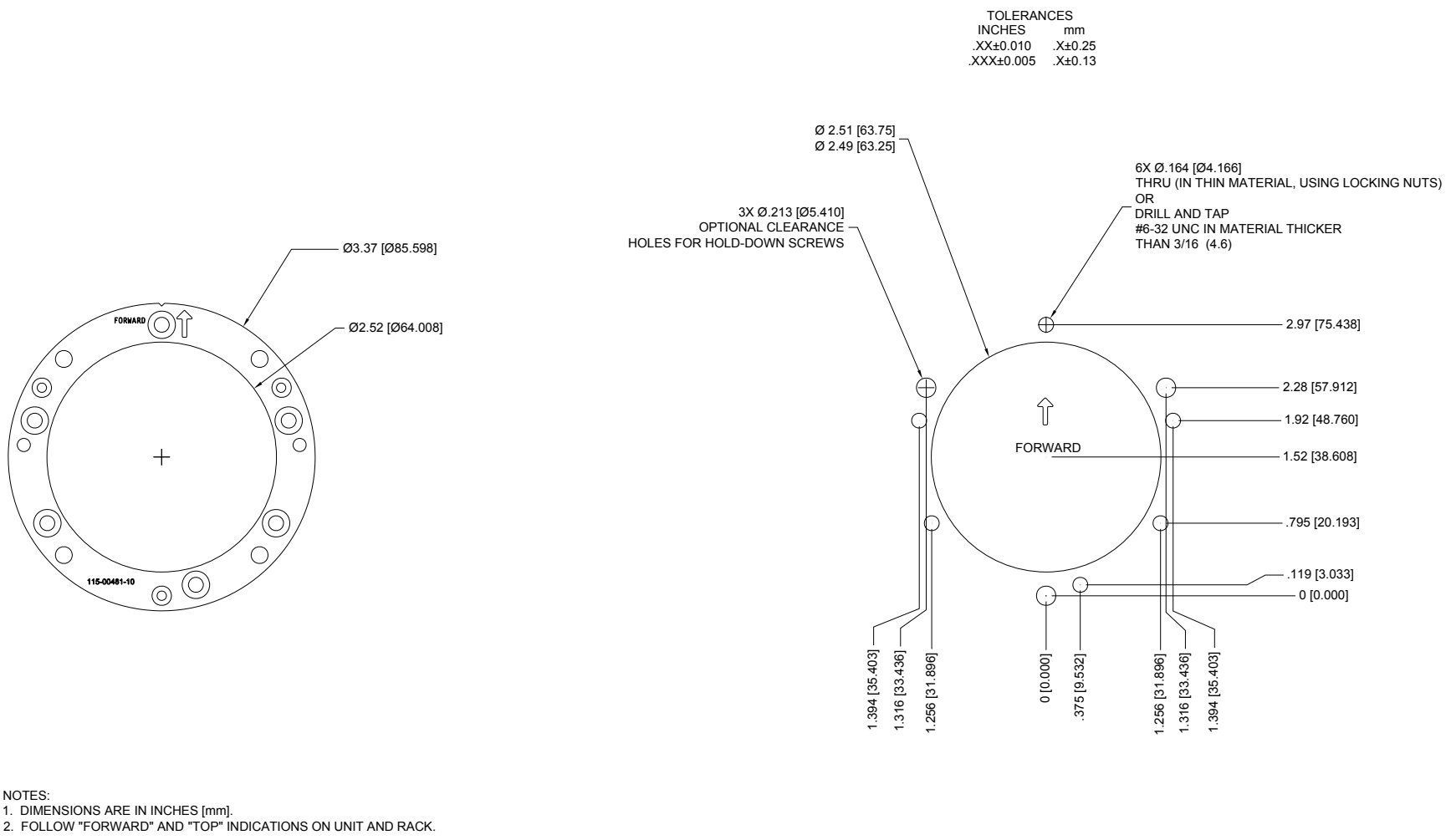


Figure B-3. GMU 44 and Mounting Rack Dimensions and Center of Gravity

GMU 44 MOUNTING RACK
115-00481-10

AIRCRAFT MOUNTING HOLES
FOR
115-00481-10



NOTES:
1. DIMENSIONS ARE IN INCHES [mm].
2. FOLLOW "FORWARD" AND "TOP" INDICATIONS ON UNIT AND RACK.

Figure B-4. GMU 44 Mounting Rack P/N 115-00481-10

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.

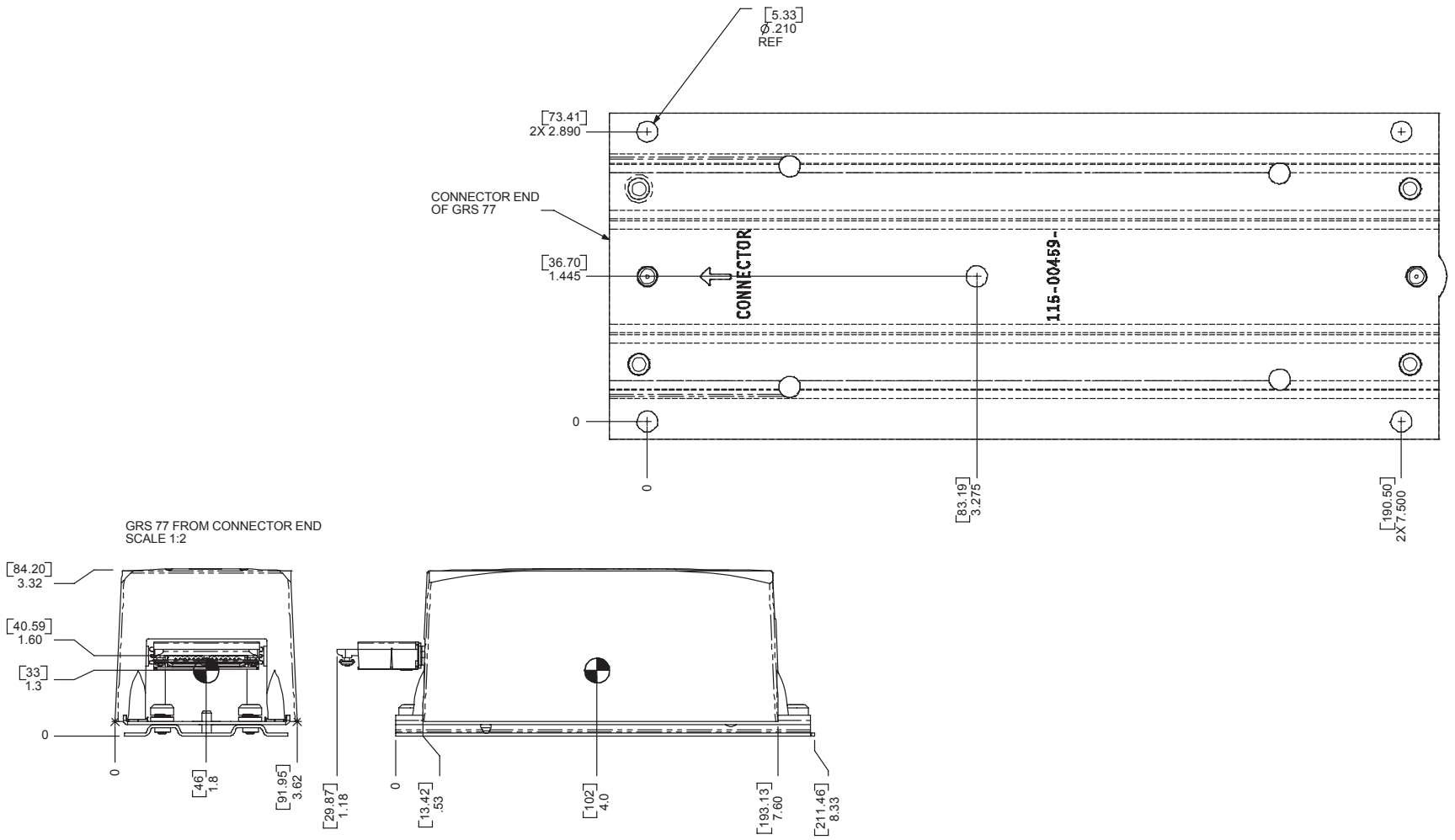


Figure B-5. GRS 77H and Mounting Rack Dimensions and Center of Gravity

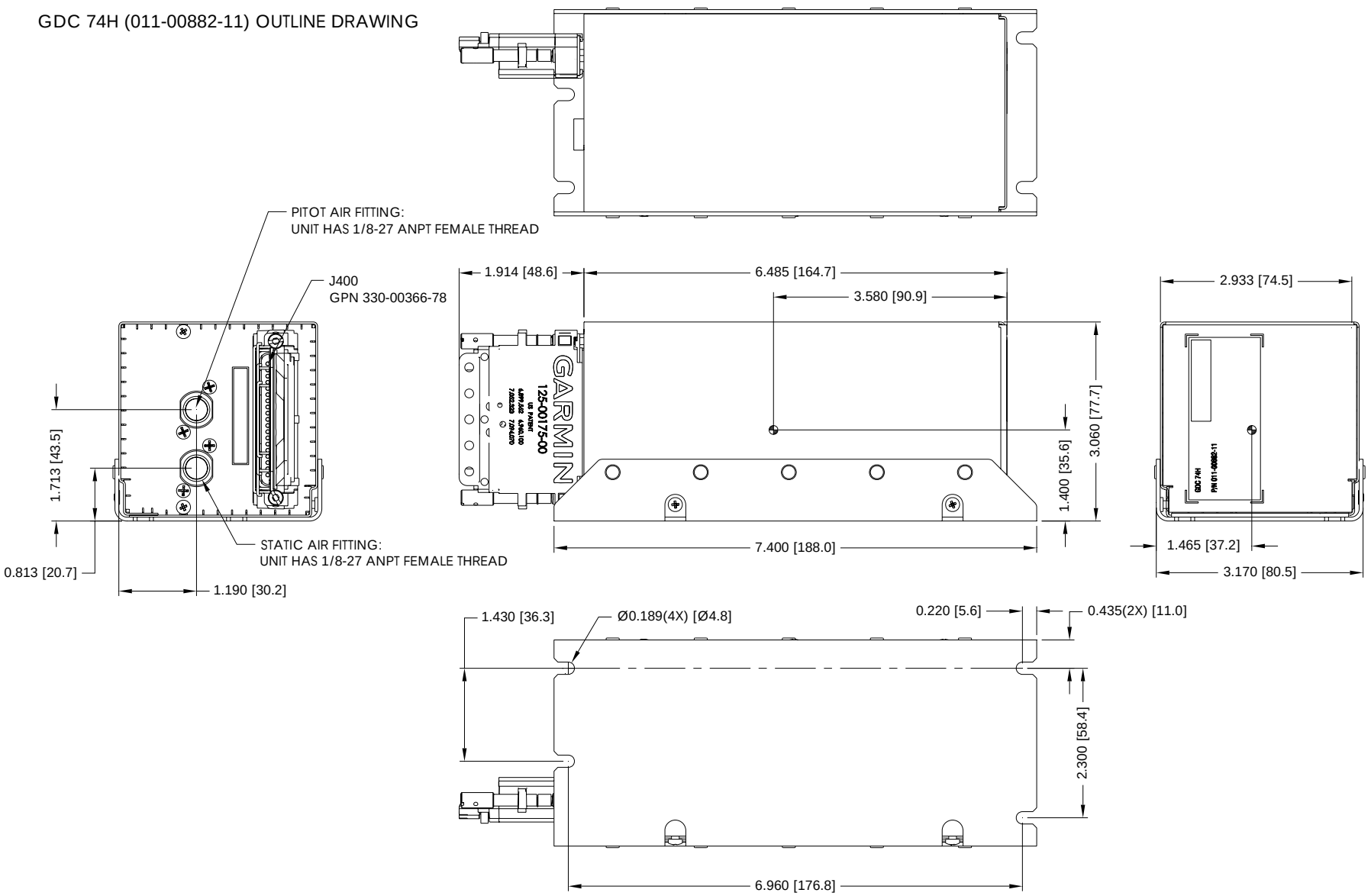


Figure B-6. GDC 74H Dimensions and Center of Gravity

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Appendix C Equipment Compatibility and Configuration

The following equipment listed in this appendix is compatible with the G500H system when configured as described herein. For G500H configuration information refer to Section 5.5.

C.1 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 HTAWS 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)
	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)

C.2 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	*With no external CDI connected to SL30:* • Indicator Head Type: Serial *With external "standard CDI" connected to SL30:* • Indicator Head Type: Resolver *With external "composite CDI" connected to SL30:* • Indicator Head Type: Serial
	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 2 OUT VOR/ILS Low, Sys 1 (for NAV 1) Sys 2 (for NAV 2)

C.3 Traffic Source

The following Traffic sources are compatible with the GDU 620:

Mfr	Model	Data Format	Notes	Interfacing Equipment Configuration Information
Garmin	GTS 800/820/850	ARINC 429	• TAS/TCAS I • The GDU can control the GTS state. • The GDU can configure the GTS	429 is used for traffic display HSDB is used for configuration
	GTX 33(ES)/330(ES)	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) *If the GTX 33/330 will receive ARINC 429 data from the GDU 620, set the GTX 33/330 input as follows:* • EFIS W/ALT, LOW speed
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.
L3 Communications (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 600/610/620 (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).

C.4 Data Link

The following data links are compatible with the GDU 620:

Mfr	Model	Data Format	Notes	Interfacing Equipment Configuration Information
Garmin	GSR 56	RS-232		Iridium must be enabled on the GDU
	GDL 69/69A	Ethernet	XM subscription is required. GDU 620 will also control GDL 69A audio functions.	Ethernet port that is connected to the GDU must be enabled.

C.5 External Video

The following video sources are compatible with the GDU 620:

Mfr	Model	Data Format	Notes	Interfacing Equipment Configuration Information
Max-Viz	EVS-1500	RS-170 Video		TBD

C.6 ADF Receiver

Not currently supported.

C.7 Lightning Source

Not currently supported.

C.8 External HTAWS Source

NOTE

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

C.9 GDU 620 Serial Altitude

The G500H can provide RS-232 serial altitude (Shadin altitude format, 9600 baud) to the following systems:

Mfr	Model	Data Format	Notes	Interfacing Equipment Configuration Information
Garmin	GTX 32 GTX 327	RS-232	• GDU 620 software version 3.00 or later is required. • GDU RS-232 Chnl 8 Output must be set to “Shadin-alt”.	The RS-232 input that is used to provide altitude to the transponder must be set to “SHADIN ALT“
	GTX 33 / 33D GTX 330(ES) / 330D (ES)	RS-232	• GDU 620 software version 3.00 or later is required. • GDU RS-232 Chnl 8 Output must be set to “Shadin-alt”.	The RS-232 input that is used to provide altitude to the transponder must be set to “SHDN ALT 25ft” (or “SHADIN ALT 25ft” if using the GNS 480 to configure the transponder)

C.10 Audio Panels

Audio panels not listed below can still be approved under G500H STC SR02295LA if all of the following conditions are met:

- The installation of the audio panel was previously FAA-approved;
- The VHF COM audio and VHF NAV audio (if applicable) must be verified as described in GNS 500W Installation Manual (190-00357-02) and the GNS 400W Installation Manual (190-00356-02).

For installations using 500W Series TAWS units,

- The audio panel must have an unswitched audio input that is used for the TAWS audio.
- The TAWS audio must be verified as described in the GNS 500W Installation Manual (190-00357-02) and the GNS 400W Installation Manual (190-00356-02):

Mfr	Model	Data Format	Notes	Interfacing Equipment Configuration Information
Honeywell (Bendix/King)	KMA 24 KMA 24H-70/71 KMA 26 KMA 28	Analog	•	
Garmin	GMA 340 GMA347	Analog	•	
Garmin AT	SL 15 SL 15M SL 10S SL 10MS SL 10 SL 10M	Analog	•	
PS Engineering	PMA 6000 PMA 7000 Series PMA 8000 Series	Analog	•	

Appendix D Interconnect Diagrams

D.1 Drawing List

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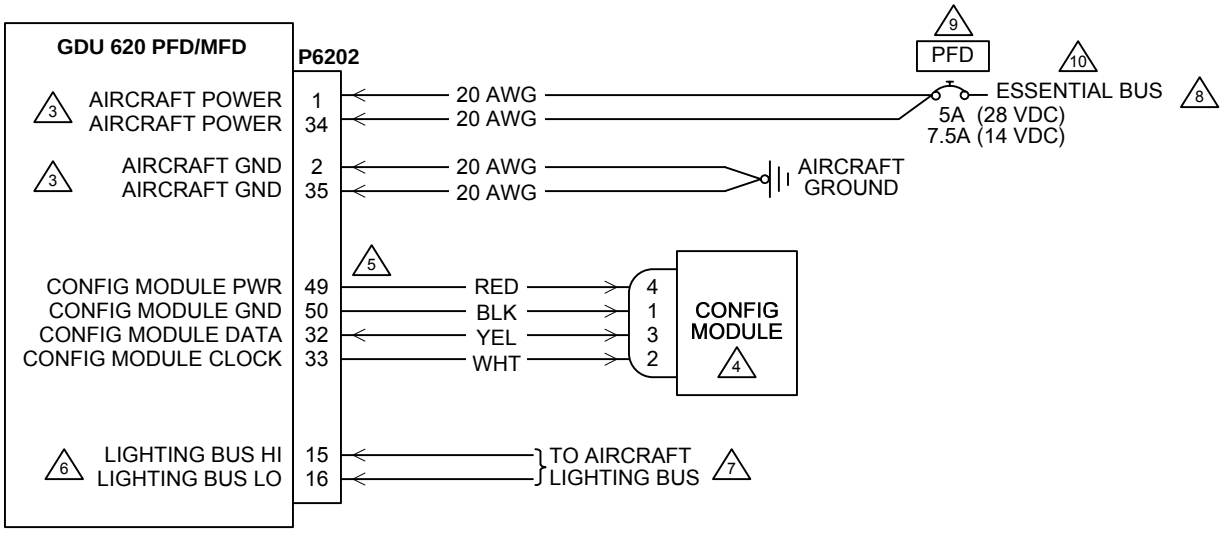


NOTES:

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 74H. 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.
11. REFER TO THE MDL (005-C0577-00) FOR THE WIRING DIAGRAMS FOR THE SPECIFIC ROTORCRAFT MODEL.

Figure D-1. Power, Lighting and Configuration Module Interconnect
Sheet 1 of 1

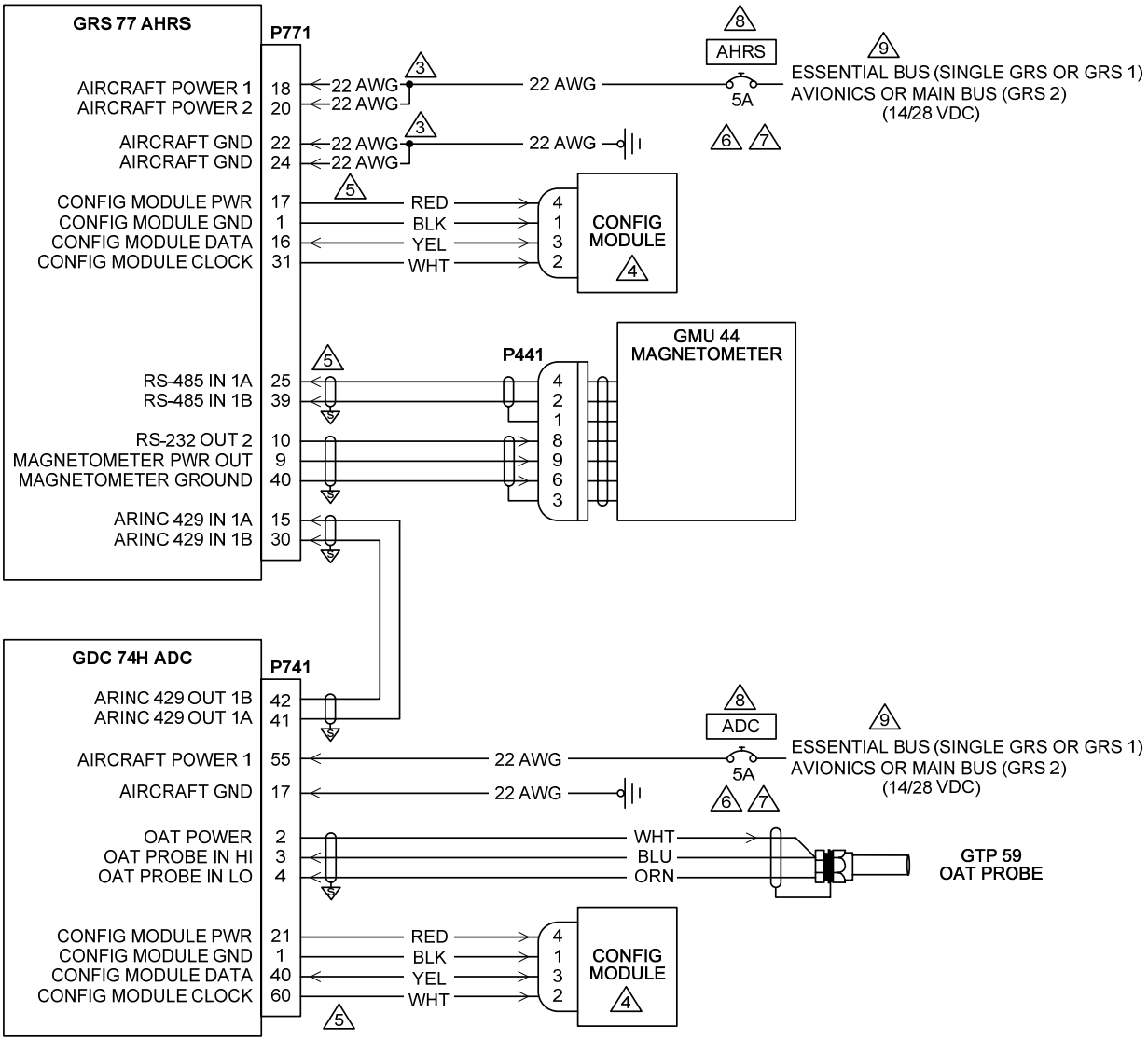
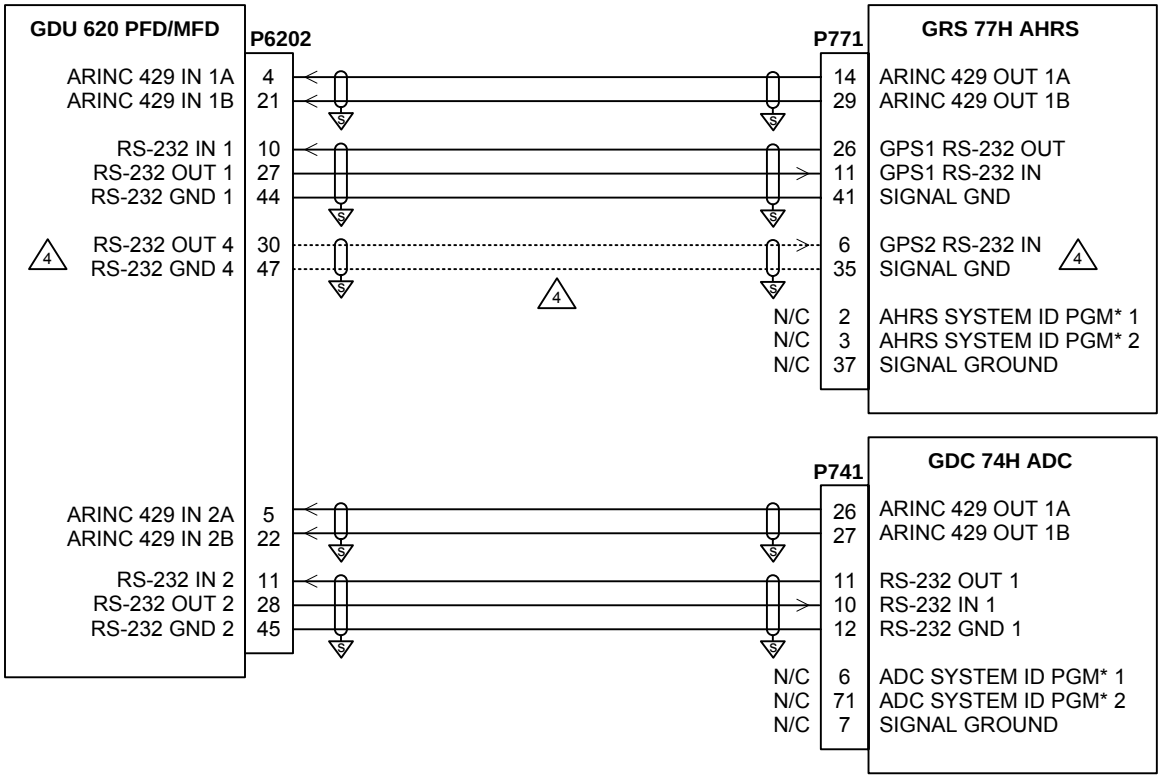


Figure D-2. Power/Config Module/OAT – GDC 74H/GRS 77H/GMU 44 Interconnect
Sheet 1 of 2

NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. GROUND DESIGNATIONS: ⏚ SHIELD BLOCK GROUND ⏚ AIRFRAME GROUND
3. 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. (I.E. "AHRS" OR "ADC").
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 77H AND GDC 74H, CONNECT SHIELD GROUNDS TO THE CONNECTOR BACKSHELL -- THE SHIELD LEADS MUST BE LESS THAN 3.0 ".
11. REFER TO THE MDL (005-C0577-00) FOR THE WIRING DIAGRAMS FOR THE SPECIFIC ROTORCRAFT MODEL.

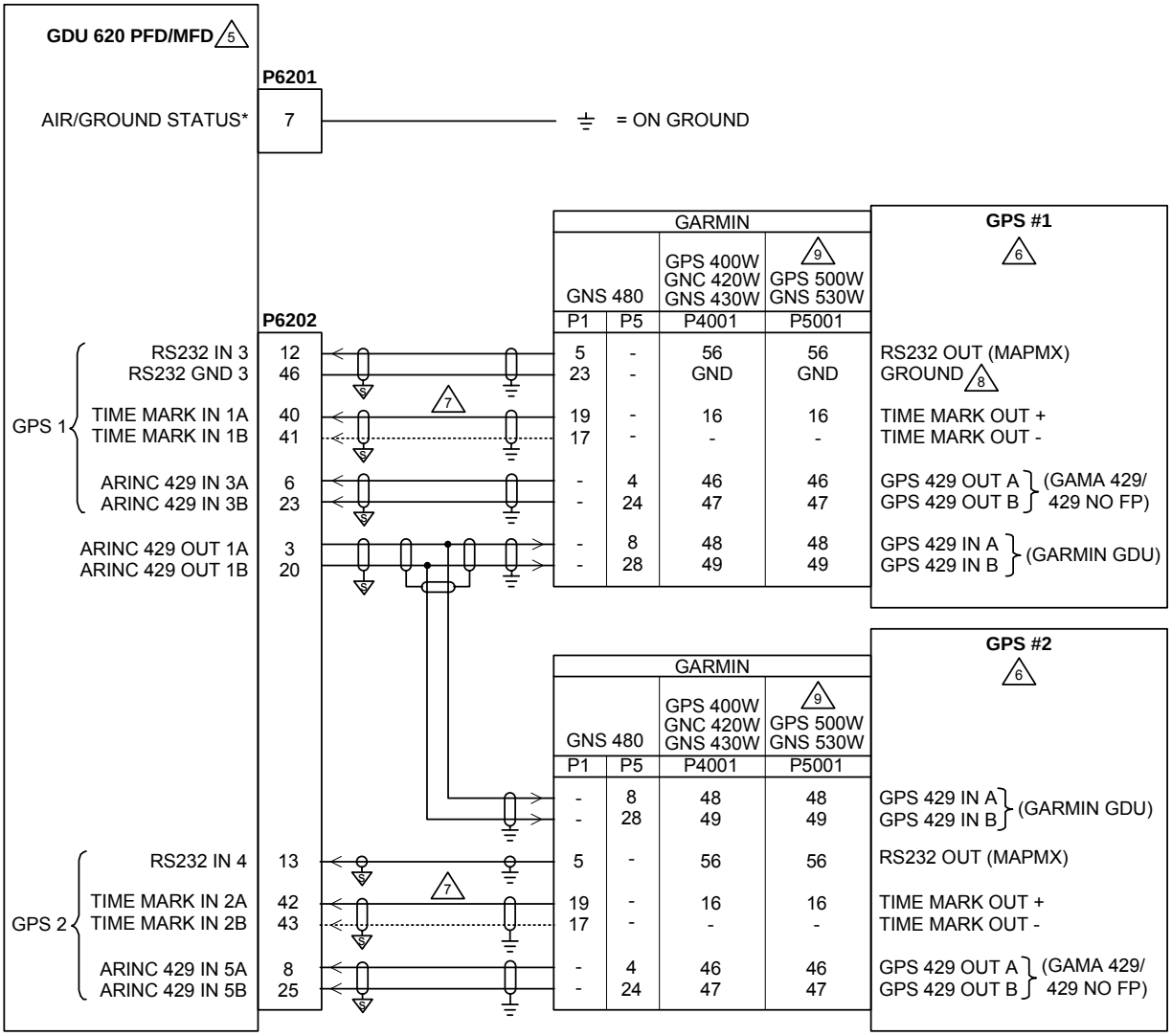
Figure D-2. Power/Config Module/OAT – GDC 74H/GRS 77H/GMU 44 Interconnect
Sheet 2 of 2



NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. GROUND DESIGNATIONS: ⏚ SHIELD BLOCK GROUND ⏚ AIRFRAME GROUND
3. AT GDU 620, GRS 77H AND GDC 74H, 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.
5. REFER TO THE MDL (005-C0577-00) FOR THE WIRING DIAGRAMS FOR THE SPECIFIC ROTORCRAFT MODEL.

Figure D-3. 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, 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 D.

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.

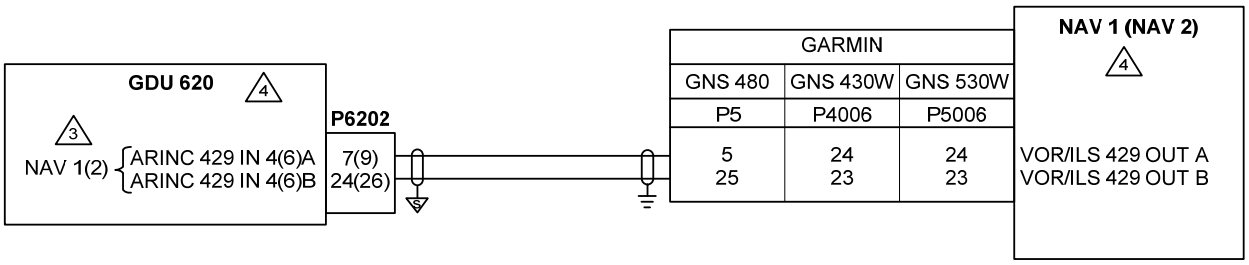
8. FOR PINS IDENTIFIED WITH “GND”, CONNECT WIRE TO GROUND AT THE REAR OF THE UNIT.

9. IF AN HTAWS-EQUIPPED 500W SERIES UNIT IS INSTALLED, IT **MUST** BE CONNECTED AS GPS1 – ONLY HTAWS ANNUNCIATIONS FROM GPS1 ARE DISPLAYED ON THE PFD. IF TWO HTAWS-EQUIPPED UNITS ARE INSTALLED, THE HTAWS-EQUIPPED UNIT THAT IS CONNECTED TO THE AUDIO PANEL **MUST** BE CONNECTED AS GPS1.

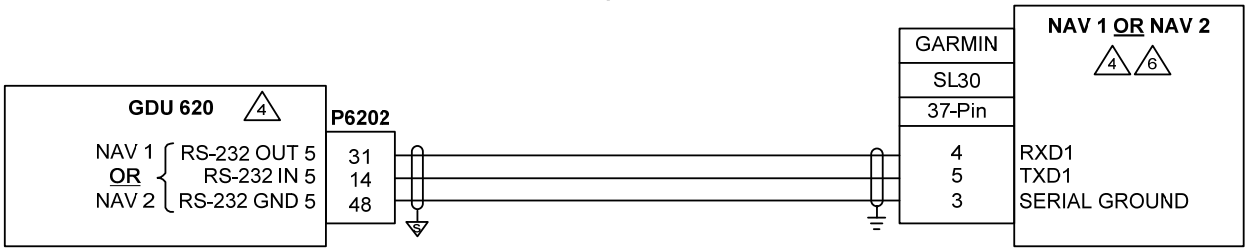
10. REFER TO MANUFACTURER’S DOCUMENTATION FOR COMPLETE PIN-OUT AND INTERCONNECT INFORMATION. PIN-OUTS OF OTHER UNITS SHOWN FOR REFERENCE ONLY.
11. REFER TO THE MDL (005-C0577-00) FOR THE WIRING DIAGRAMS FOR THE SPECIFIC ROTORCRAFT MODEL.

Figure D-4. GPS Source Interconnect

ARINC 429



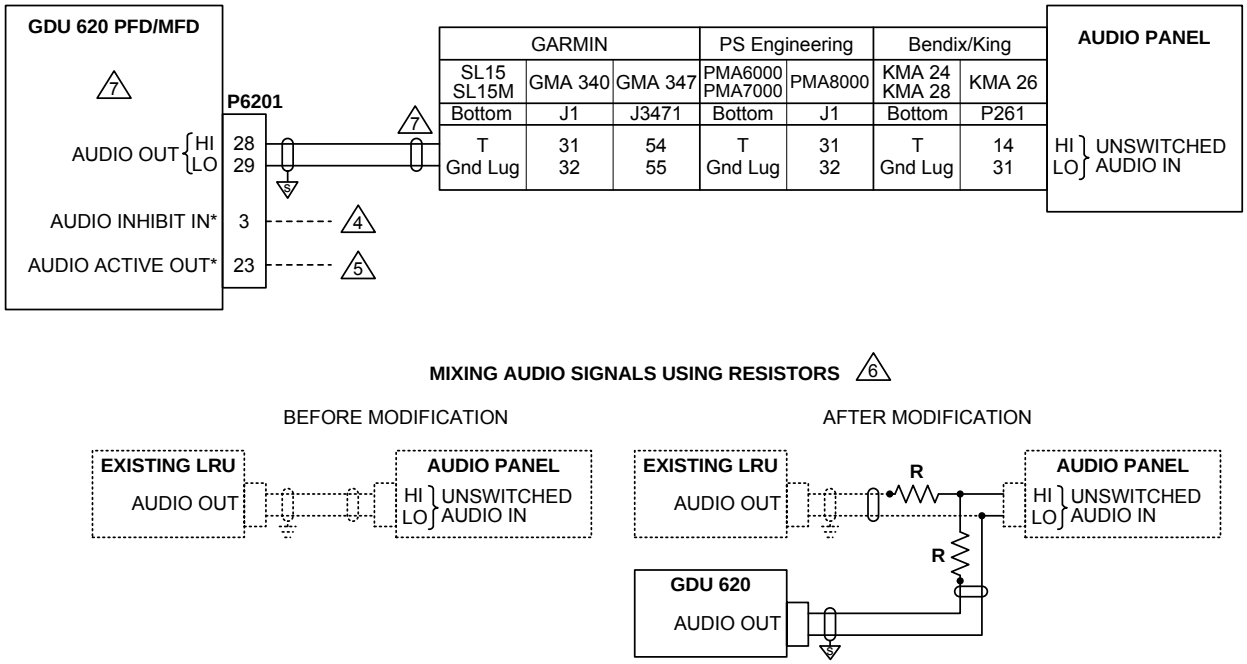
RS-232



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 D.
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
8. REFER TO THE MDL (005-C0577-00) FOR THE WIRING DIAGRAMS FOR THE SPECIFIC ROTORCRAFT MODEL.

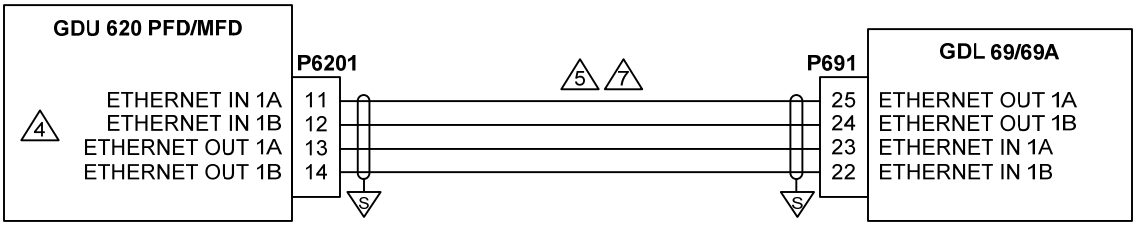
Figure D-5. Navigation Receiver Interconnect



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".
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. 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.
7. IF THE HTAWS FEATURE IN THE GDU 620 IS ENABLED, THE AUDIO INPUT MUST BE UNSWITCHED AND UNMUTED.
8. REFER TO THE MDL (005-C0577-00) FOR THE WIRING DIAGRAMS FOR THE SPECIFIC ROTORCRAFT MODEL.

Figure D-6. Audio Interconnect



NOTES:

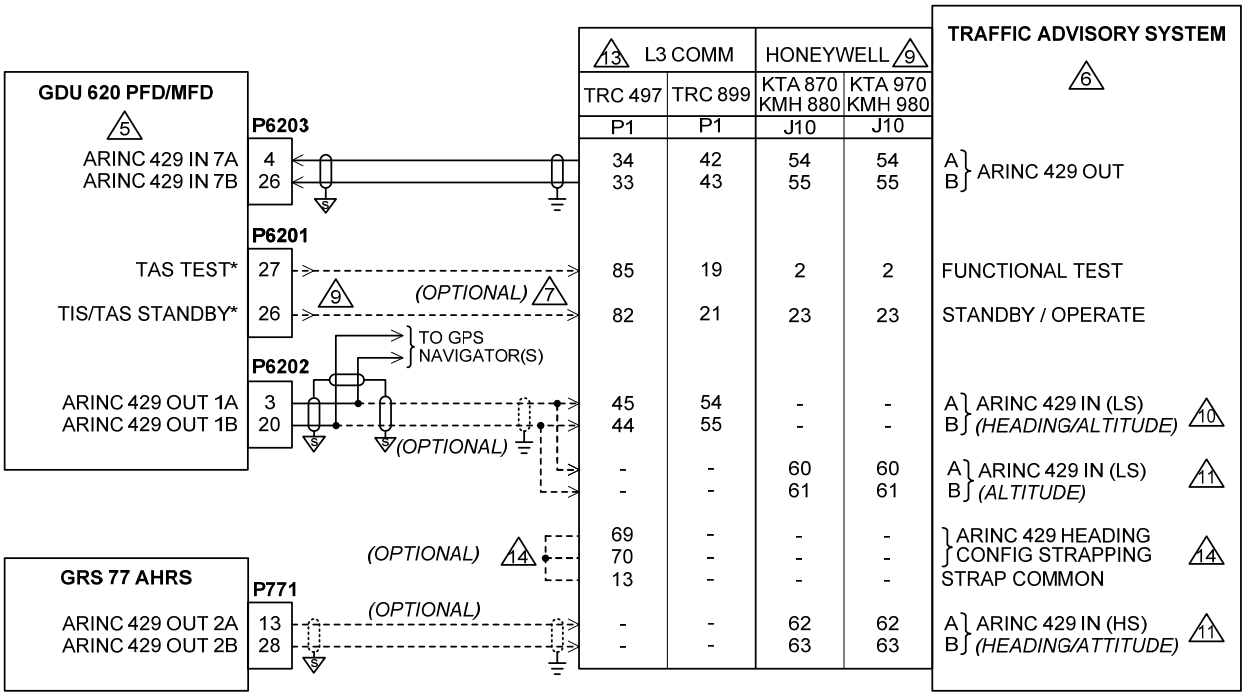
1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. GROUND DESIGNATIONS: ⏚ SHIELD BLOCK GROUND ⏚ AIRFRAME GROUND
3. AT GDU 620, CONNECT SHIELD GROUNDS TO THE CONNECTOR BACKSHELL -- THE SHIELD LEADS MUST BE LESS THAN 3.0 ". CONNECT THE SHIELD GROUNDS AT THE GDL 69/69A TO ITS CONNECTOR BACKSHELL 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	E10424 (24 AWG)
ELECTRONIC CABLE SPECIALIST	392404 (24 AWG)

6. REFER TO THE MDL (005-C0577-00) FOR THE WIRING DIAGRAMS FOR THE SPECIFIC ROTORCRAFT MODEL.

Figure D-7. GDL 69/69A Interconnect

CONNECTIONS TO TAS / TCAS I



CONNECTIONS TO TIS

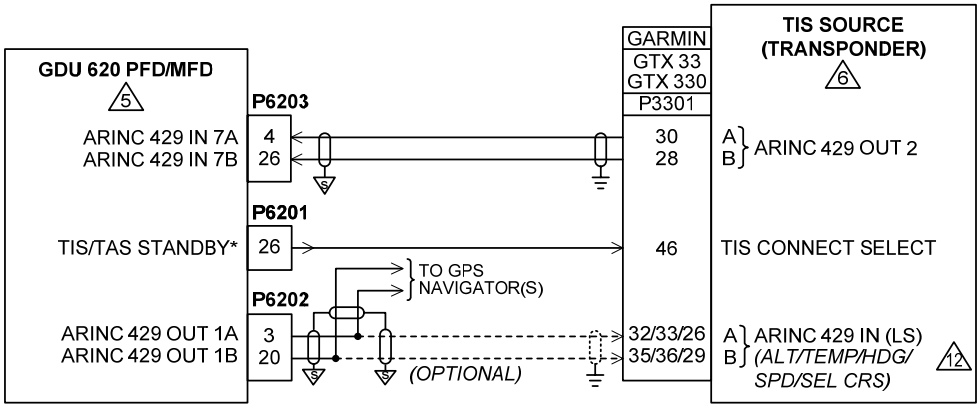


Figure D-8. Traffic Advisory System Interconnect
Sheet 1 of 3

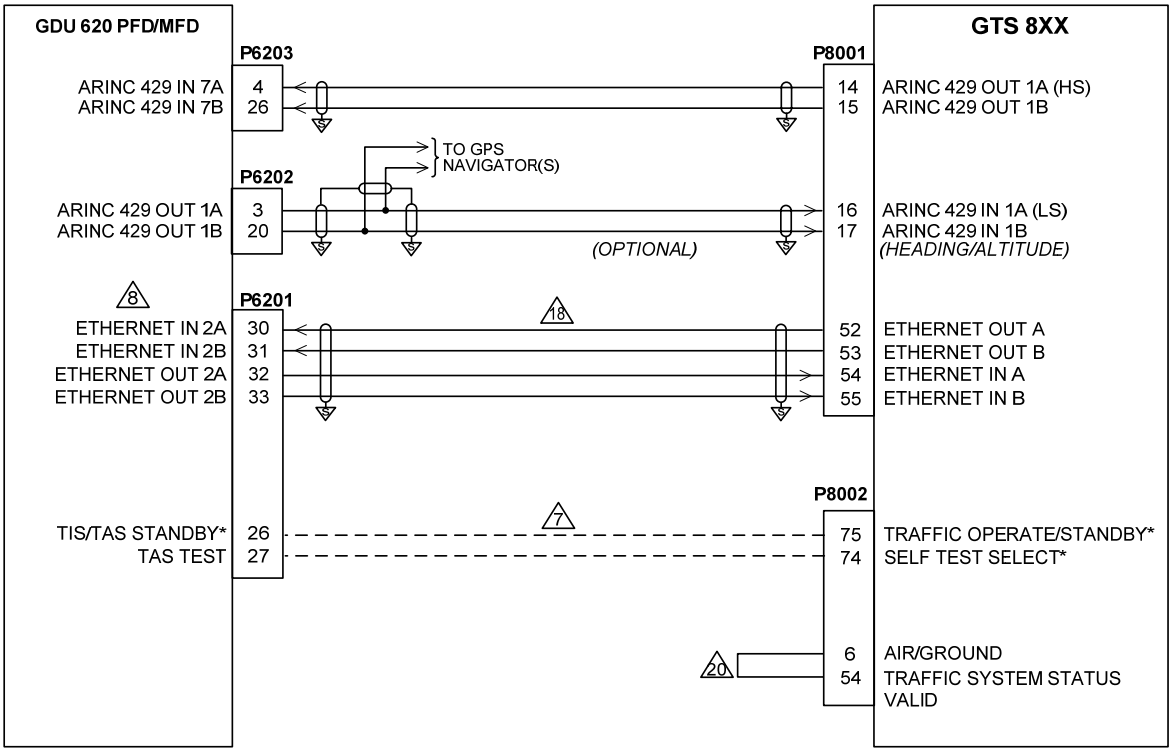
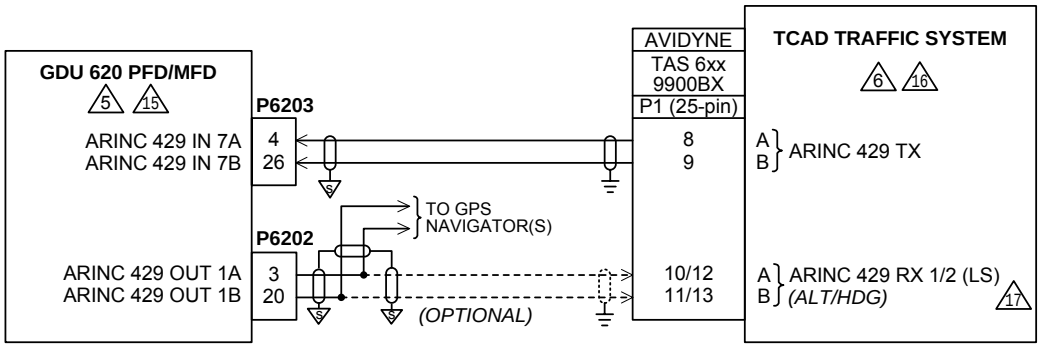


Figure D-8. Traffic Advisory System Interconnect
Sheet 2 of 3

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 D.

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 THERE ARE NO FREE ETHERNET PORTS ON THE GDU 620, THE GTS 8XX CAN BE CONNECTED TO THE GDL 69 INSTEAD. THE LRU THAT IS CONNECTED TO THE GDU 620 MUST BE DISCONNECTED AND THE GDL 69 CONNECTED IN ITS PLACE. RECONNECT THE OTHER LRU TO THE GDL 69.

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 GDU 620 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 GDU 620 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 GDU 620 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. THE GDU 620 MUST BE SET TO "SKYWATCH" AND "+EXTERNAL CONTROL" MUST BE SELECTED.

16. 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).

17. FOR THE TCAD TO ACCEPT ARINC 429 HEADING AND ALTITUDE, PROCESSOR P/N 70-2420-5 OR LATER IS REQUIRED.

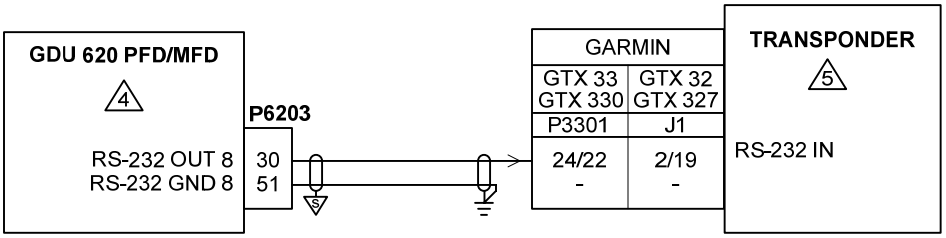
18. USE ONLY AIRCRAFT-GRADE CATEGORY 5 ETHERNET CABLE. THESE INCLUDE THE FOLLOWING:

MANUFACTURER	P/N
PIC WIRE AND CABLE	E10424 (24 AWG)
ELECTRONIC CABLE SPECIALIST	392404 (24 AWG)

19 REFER TO THE MDL (005-C0577-00) FOR THE WIRING DIAGRAMS FOR THE SPECIFIC ROTORCRAFT MODEL.

20. CAN BE USED TO TRANSITION TO OPERATE IF NO OTHER "ON GROUND" INDICATION IS AVAILABLE.

Figure D-8. Traffic Advisory System Interconnect
Sheet 3 of 3



NOTES:

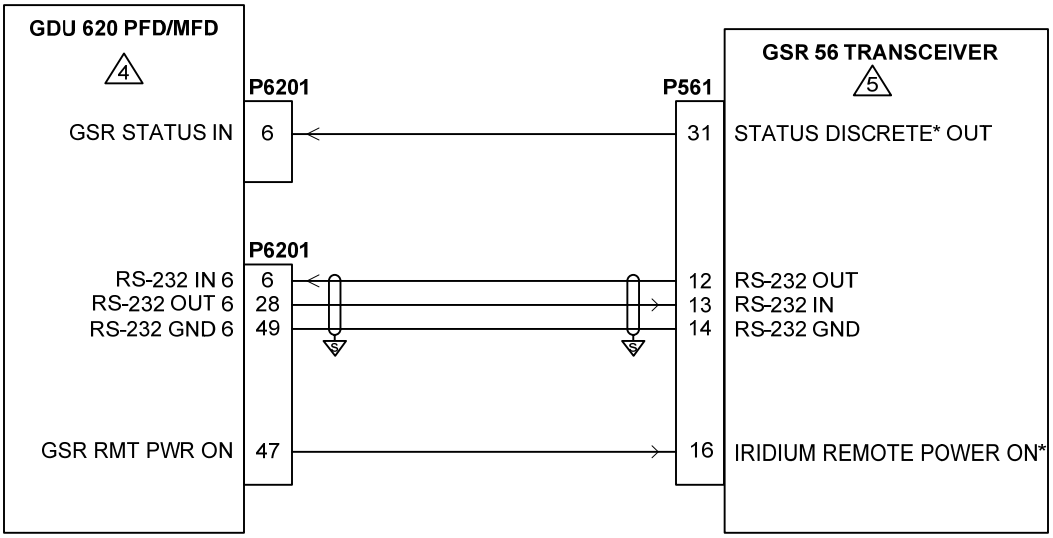
1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. GROUND DESIGNATIONS: SHIELD BLOCK GROUND AIRFRAME GROUND
3. AT GDU 620, CONNECT SHIELD GROUNDS TO THE CONNECTOR BACKSHELL -- THE SHIELD LEADS MUST BE LESS THAN 3.0 ".

4. FOR GDU 620 SETUP ITEMS REFER TO SECTION 5.5

5. FOR TRANSPONDER SETUP ITEMS REFER TO APPENDIX D.

6. REFER TO MANUFACTURER'S DOCUMENTATION FOR COMPLETE PIN-OUT AND INTERCONNECT INFORMATION. PIN-OUTS OF OTHER UNITS SHOWN FOR REFERENCE ONLY.
7. REFER TO THE MDL (005-C0577-00) FOR THE WIRING DIAGRAMS FOR THE SPECIFIC ROTORCRAFT MODEL.

Figure D-9. Serial Altitude Output Interconnect



NOTES:

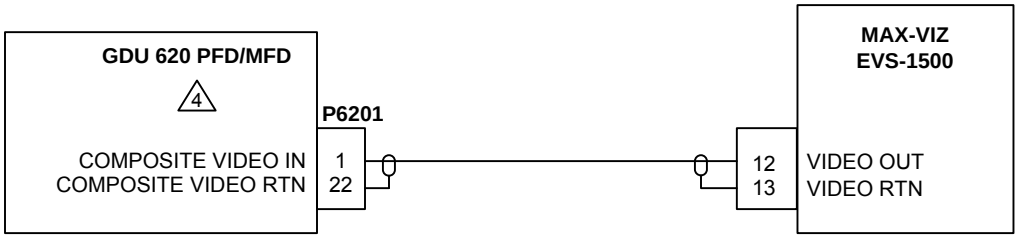
1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. GROUND DESIGNATIONS: SHIELD BLOCK GROUND AIRFRAME GROUND
3. AT GDU 620, CONNECT SHIELD GROUNDS TO THE CONNECTOR BACKSHELL -- THE SHIELD LEADS MUST BE LESS THAN 3.0 ".

4. FOR GDU 620 SETUP ITEMS REFER TO SECTION 5.5

5. REFER TO MANUFACTURER'S DOCUMENTATION FOR COMPLETE PIN-OUT AND INTERCONNECT INFORMATION. PIN-OUTS OF OTHER UNITS SHOWN FOR REFERENCE ONLY.

6. REFER TO THE MDL (005-C0577-00) FOR THE WIRING DIAGRAMS FOR THE SPECIFIC ROTORCRAFT MODEL.

Figure D-10. Iridium Satellite 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 ".
4. FOR GDU 620 SETUP ITEMS REFER TO SECTION 5.5
5. REFER TO MANUFACTURER'S DOCUMENTATION FOR COMPLETE PIN-OUT AND INTERCONNECT INFORMATION. PIN-OUTS OF OTHER UNITS SHOWN FOR REFERENCE ONLY.
6. REFER TO THE MDL (005-C0577-00) FOR THE WIRING DIAGRAMS FOR THE SPECIFIC ROTORCRAFT MODEL.

Figure D-11. Video Interconnect

Appendix E Magnetic Interference Survey PC Software

E.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 E.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 E.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)*

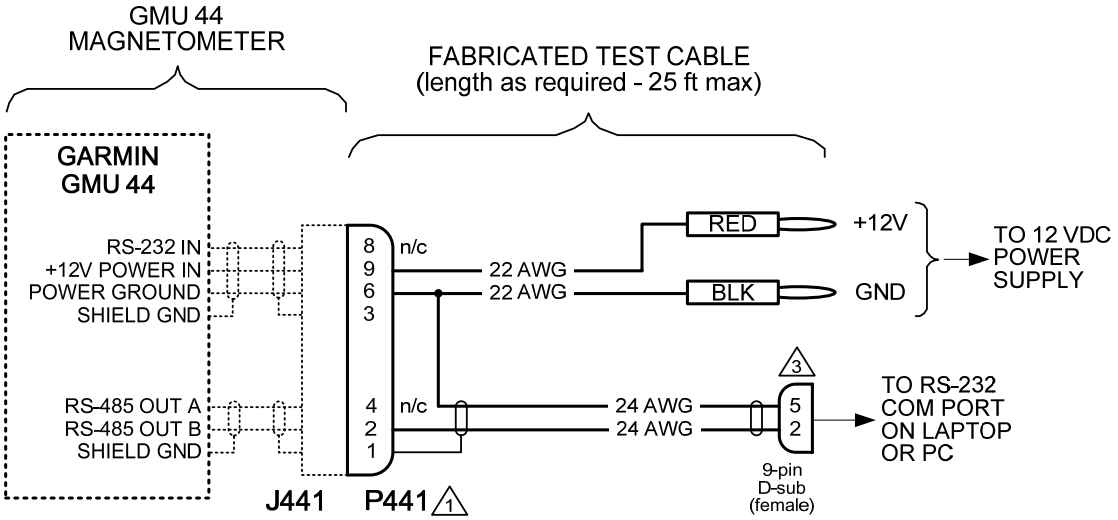
An RS-485 to RS-232 converter may be required to connect the magnetometer to the laptop or PC. Usually a converter is not required, but may be needed if using older laptops or PCs. A suitable converter is B&B Electronics Model 422LP9R (or equivalent).

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.

E.2 Test Cable Requirements

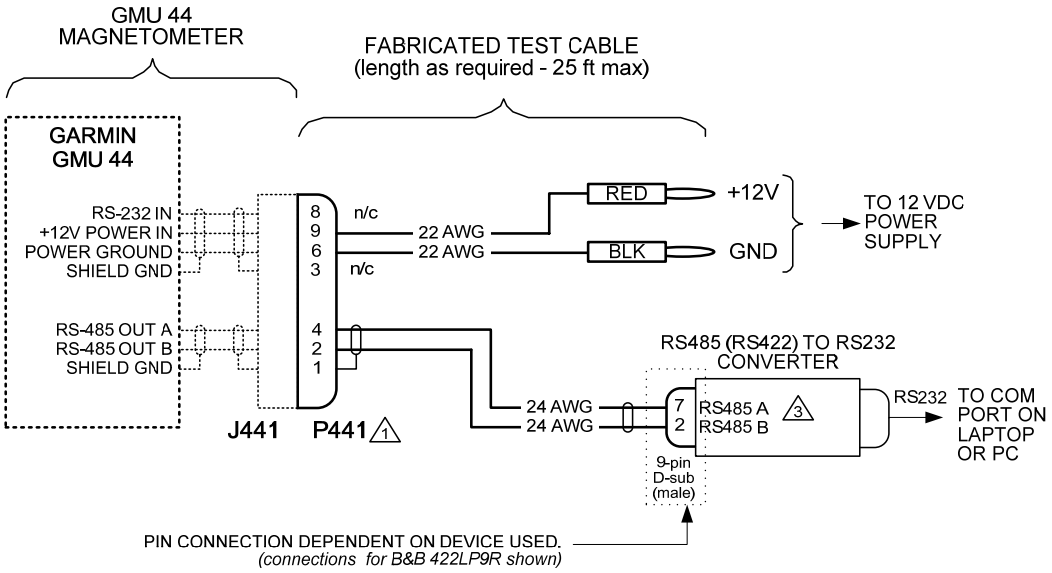
Fabricate a test cable in accordance with one of the following drawings. The cable shown in Figure E-1 should work in most cases; however, if the laptop or PC is not able to communicate with the GMU 44 an RS-485 to RS-232 converter will be required and the cable shown in Figure E-2 should be fabricated.



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 E-1. Magnetic Interference Survey Setup with Direct Connection to PC



NOTES:

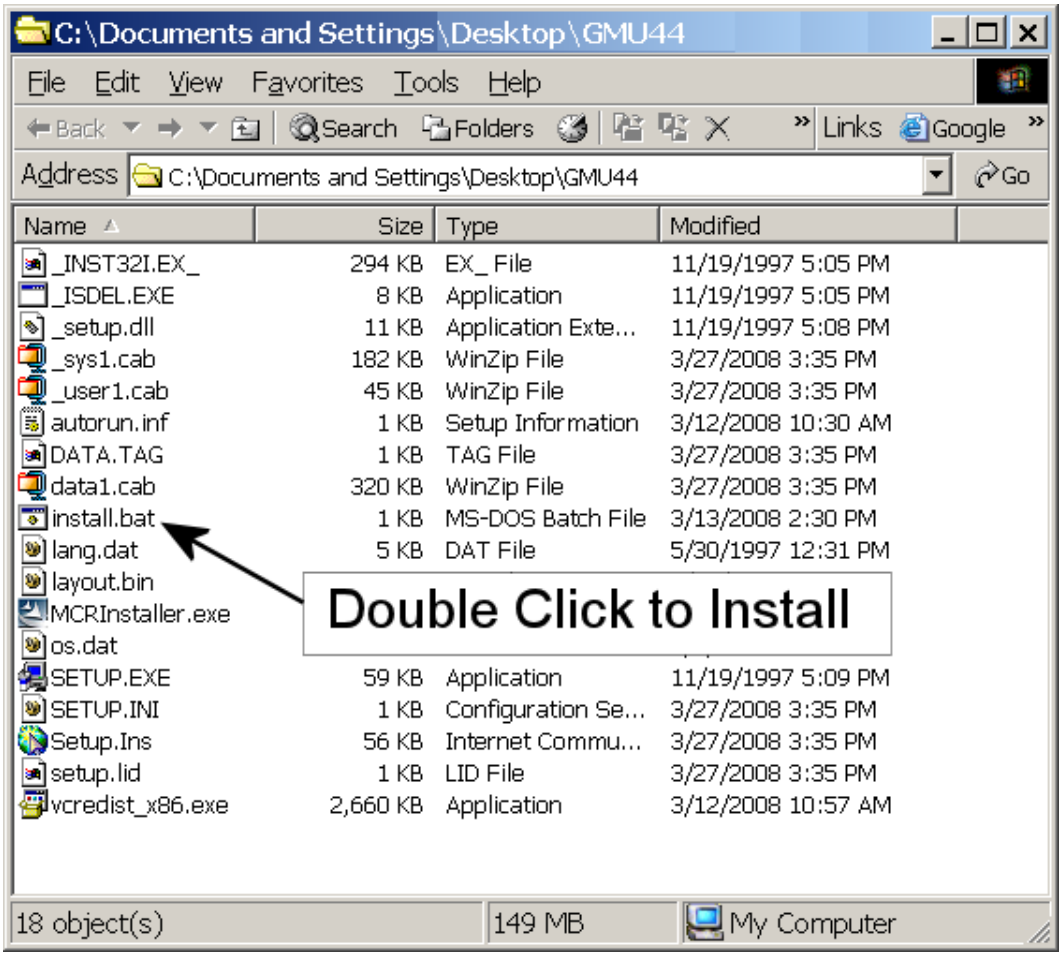
1. P441 IS GARMIN CONNECTOR KIT P/N 011-00871-00. ALTERNATELY, P441 CAN BE MADE USING AN AMP CONNECTOR P/N 206485-1.
2. WIRE AWG SHOWN IS MINIMUM WIRE AWG. CONNECTORS WILL ACCOMMODATE UP TO 20 AWG WIRE.
3. A SUITABLE CONVERTER IS B&B ELECTRONICS MODEL 422LP9R.

Figure E-2. Magnetic Interference Survey Setup using RS-485 to RS-232 Converter

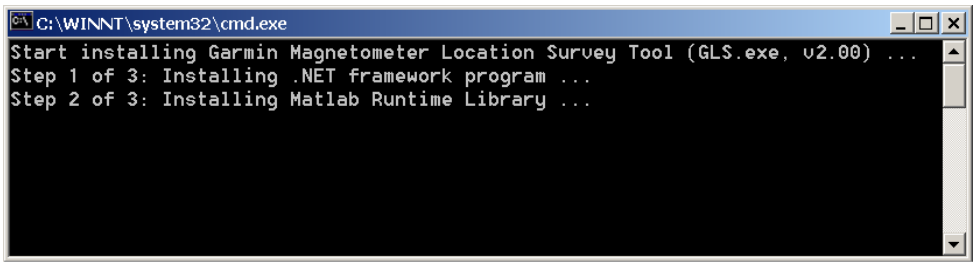
E.3 GMU 44 Location Survey Tool Software Installation Instructions

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:



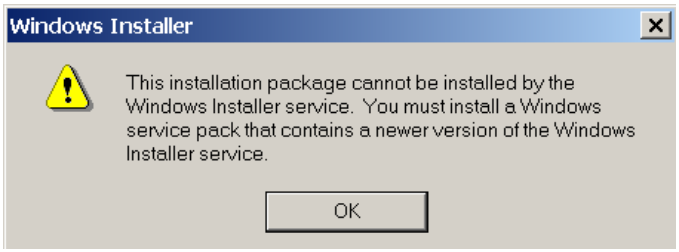
In the newly opened Explorer window, double-click in the "install.bat" file to begin the setup process. The following window will open and indicate the progress of the installation.



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.

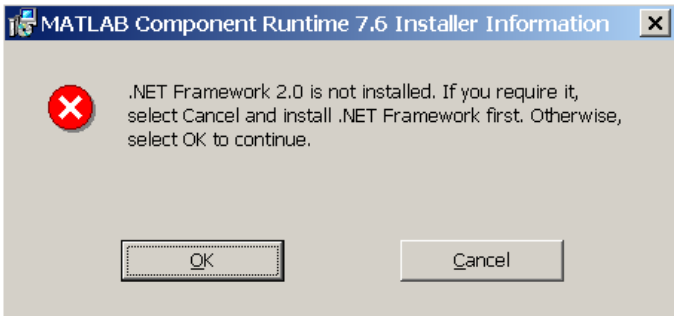
E.3.1 For New MATLAB Installations:

NOTE

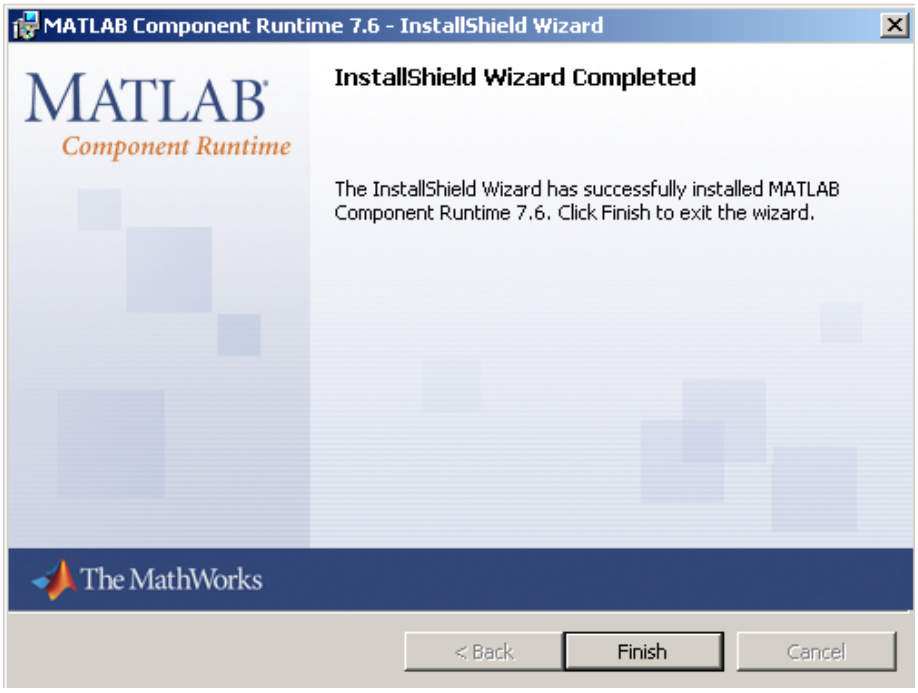
The window below only appears if the MATLAB Runtime environment has not previously been installed. If MATLAB was previously installed, proceed to Existing MATLAB Installations.

Click 'Next: and follow the setup instructions.

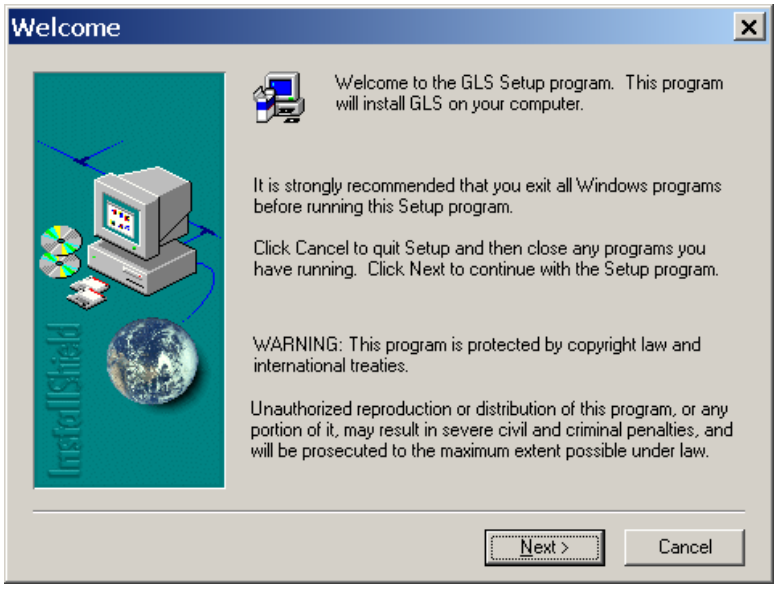
For some installations a MATLAB Runtime error message may appear as shown in the following figure.



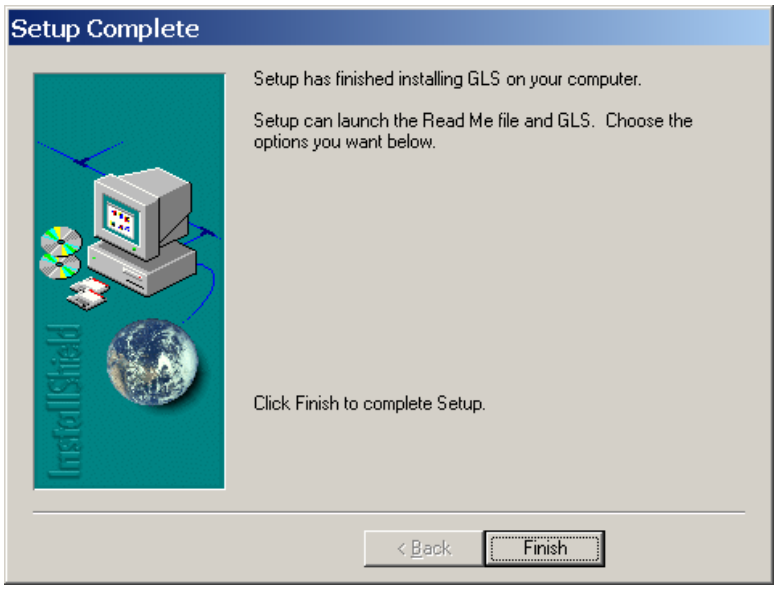
The Garmin GLS tool does not require the software listed in the error message. Click 'OK' to continue installation. The Install Wizard will complete the setup of the MATLAB Runtime and the following screen will appear.



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.



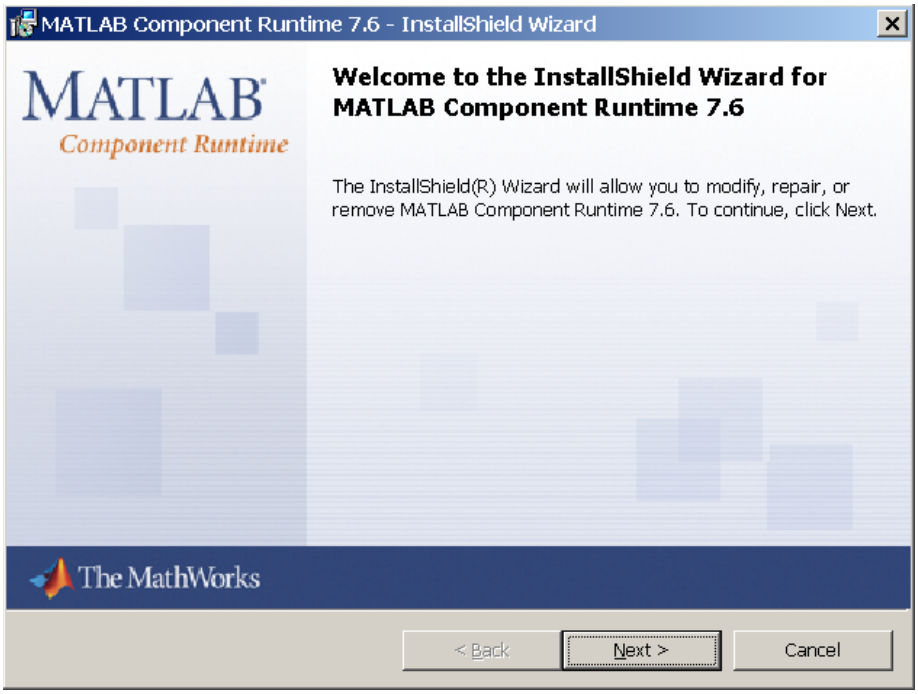
Select 'Finish' to complete the installation. A shortcut for the GLS Tool software will be created on the desktop.

The GLS Tool software is now ready to use. Proceed to Section E.4.

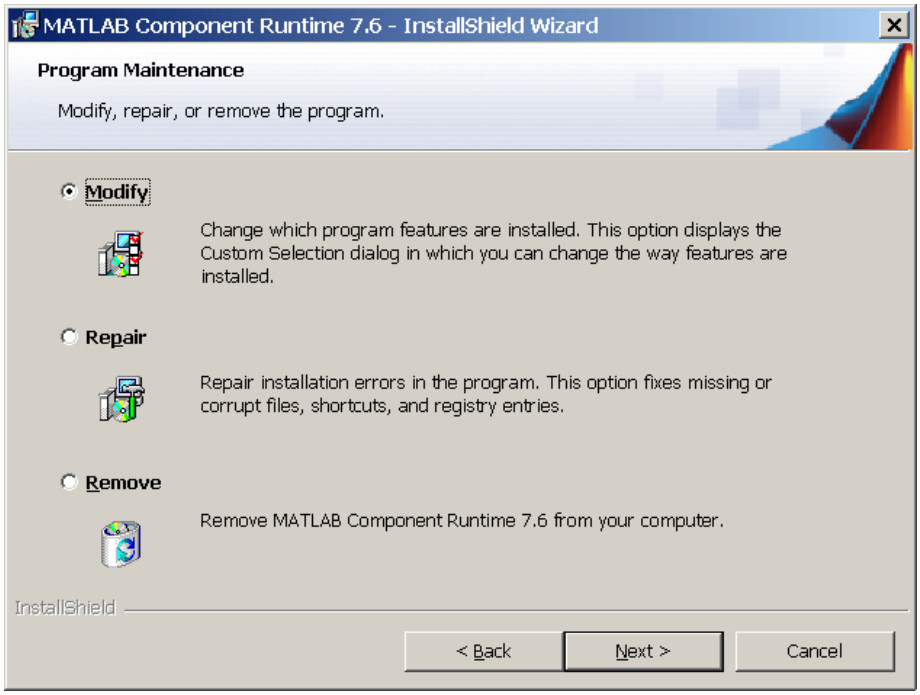
E.3.2 For Existing MATLAB Installations:

NOTE

Follow the instructions below if the MATLAB Runtime environment has previously been installed.

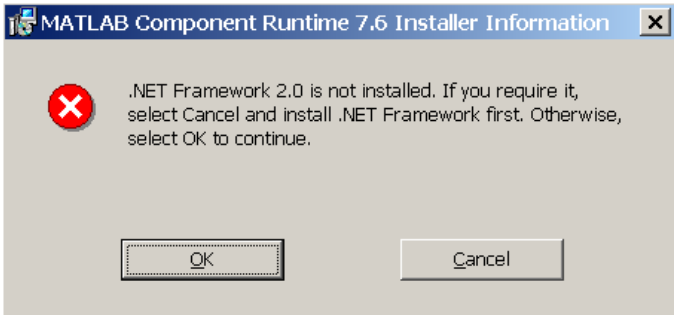


Click 'Next' and the following window will appear:

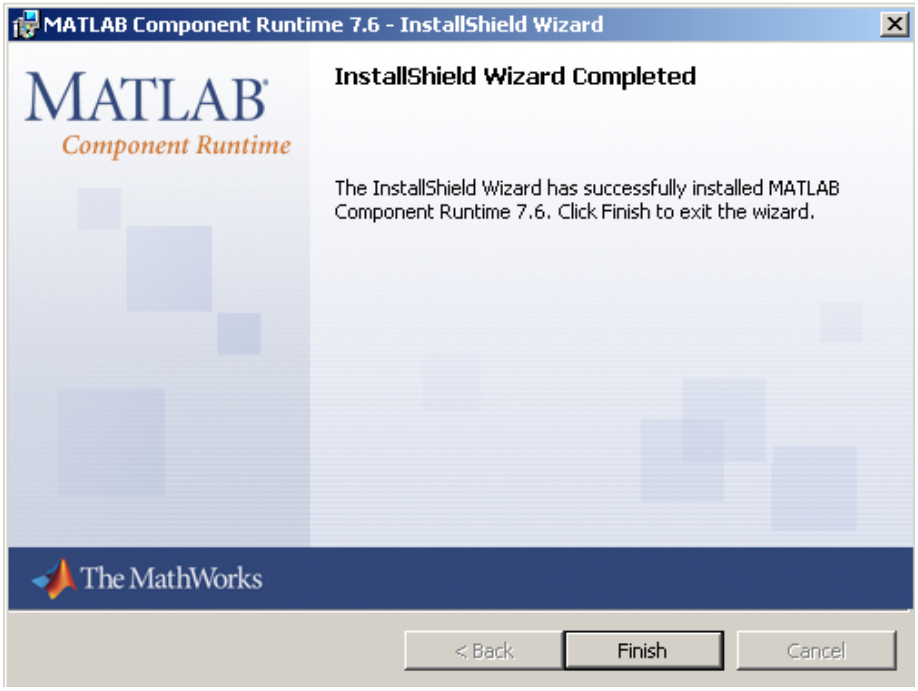


Leave Modify selected and click 'Next', 'Next' and 'Install' to install the required components.

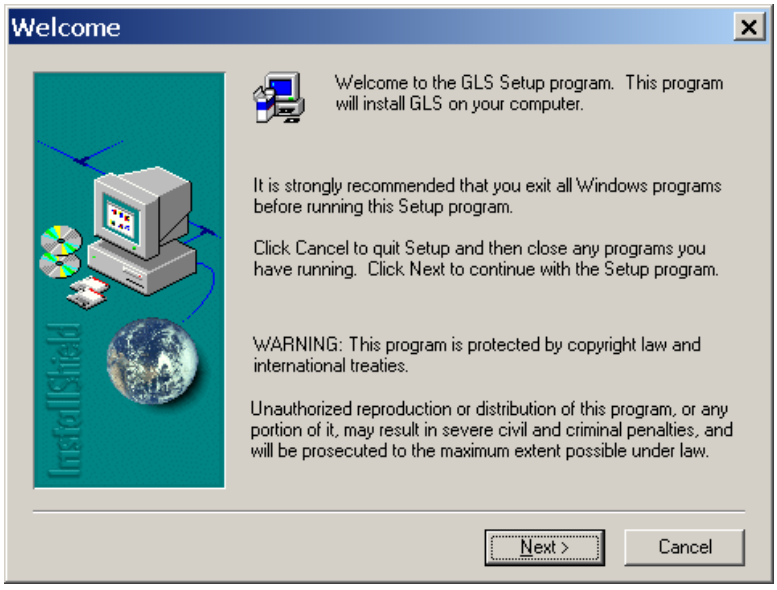
For some installations a MATLAB Component Runtime error message may appear as shown in the following figure.



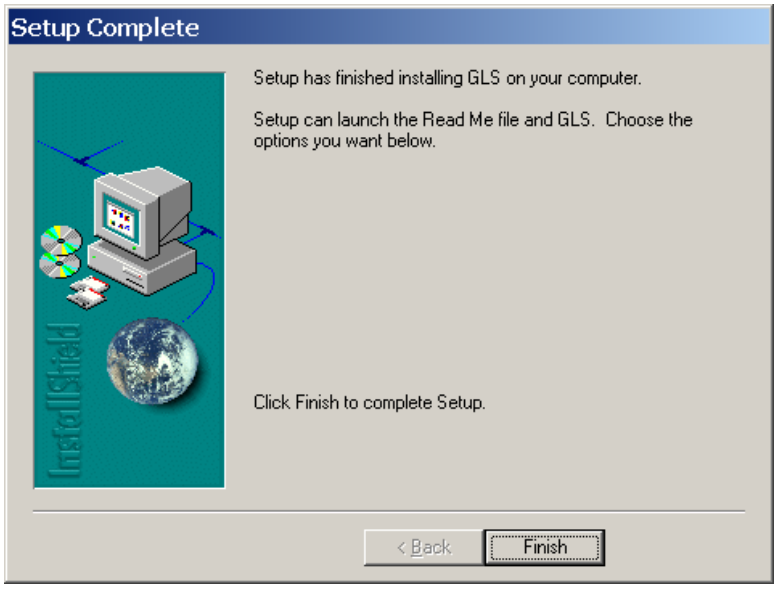
The Garmin GLS tool does not require the software listed in the error message. Click 'OK' to continue installation. The Install Wizard will complete the setup of the MATLAB Runtime and the following screen will appear.



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 the desktop.

The GLS Tool software is now ready to use. Proceed to Section E.4.

E.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 different 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 rotorcraft (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 rotorcraft 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 rotorcraft which are likely to affect the operation of the GMU 44 magnetometer. The list of relevant items varies from rotorcraft to rotorcraft. An example of a test sequence is given in Table E-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 E-1.

Table E-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
160	2:40	Landing gear up (if applicable)
180	3:00	Landing gear down (if applicable)
190	3:10	Navigation lights on
200	3:20	Navigation lights off
210	3:30	Landing lights on
220	3:40	Landing lights off
230	3:50	Taxi lights on
240	4:00	Taxi lights off
250	4:10	Air conditioning on
260	4:20	Air conditioning off
270	4:30	Landing + Taxi lights on
280	4:40	Landing + Taxi lights off
290	4:50	Strobes on
300	5:00	Strobes off
310	5:10	Recognition lights on
320	5:20	Recognition lights off
330	5:30	Turn on all lights simultaneously (typically will include navigation lights, recognition lights and strobe)
340	5:40	Turn off all lights simultaneously
350	5:50	Beacon on
360	6:00	Beacon off
370	6:10	Pitot heat on
380	6:20	Pitot heat off
390	6:30	End of test

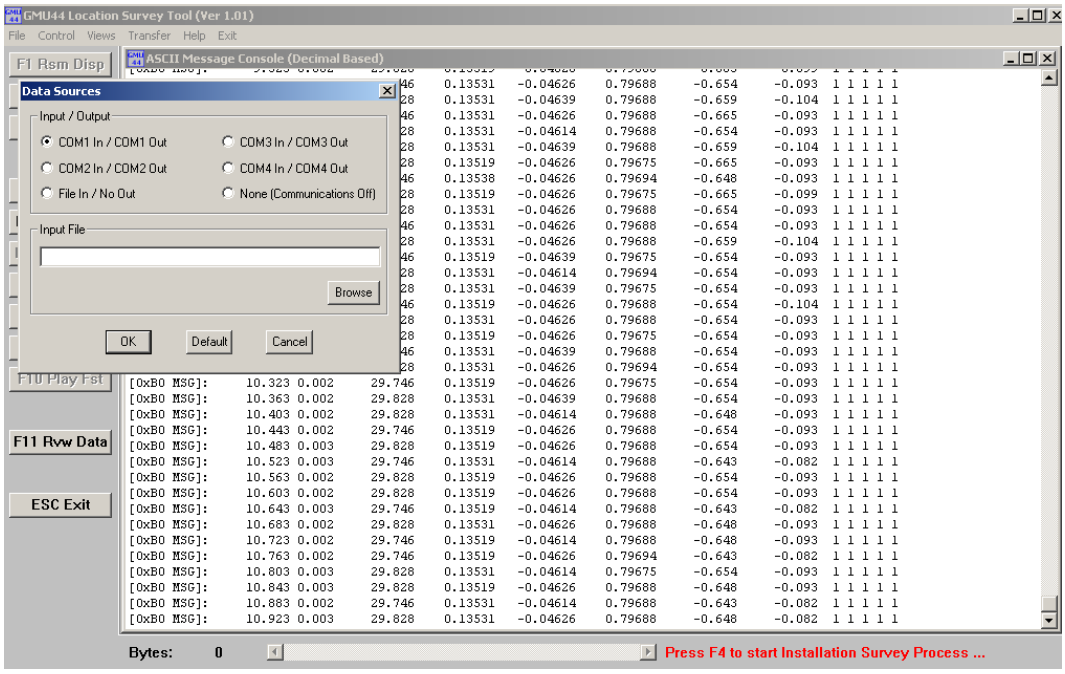
E.4.1 Data Collection

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.

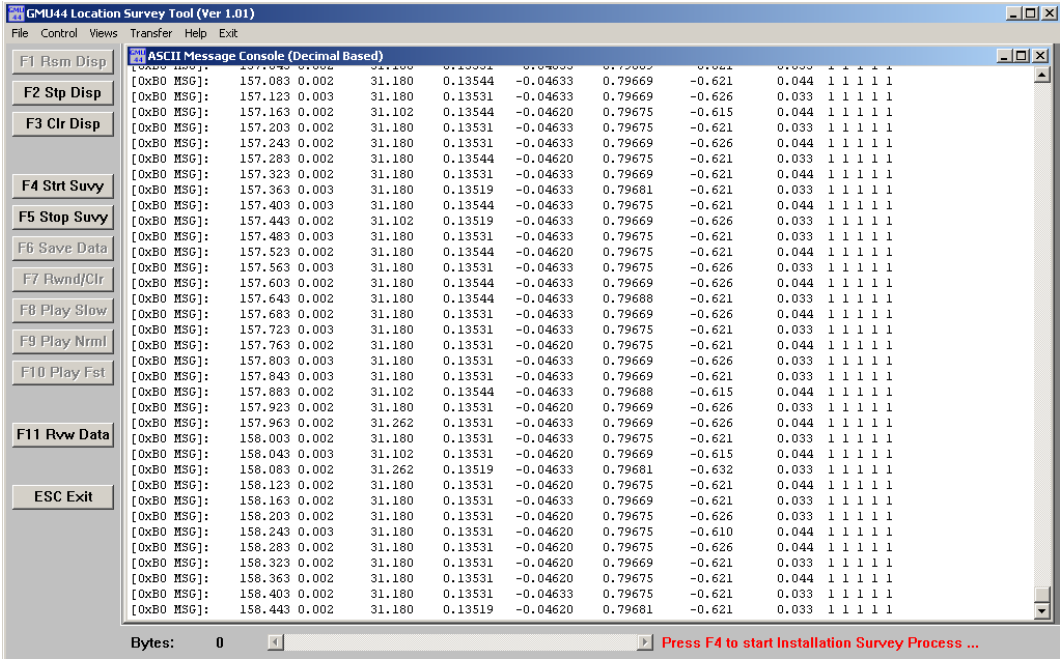
Once the test software is open, pull down the File menu and select ‘Sources’. Select the appropriate COM port and select ‘OK’. This step is only required for the initial setup and does not need to be completed for subsequent use of the GLS Tool software.



NOTE

The Garmin GLS tool will start displaying received data from the GMU 44 as soon as power is applied to the GMU 44 (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 44.

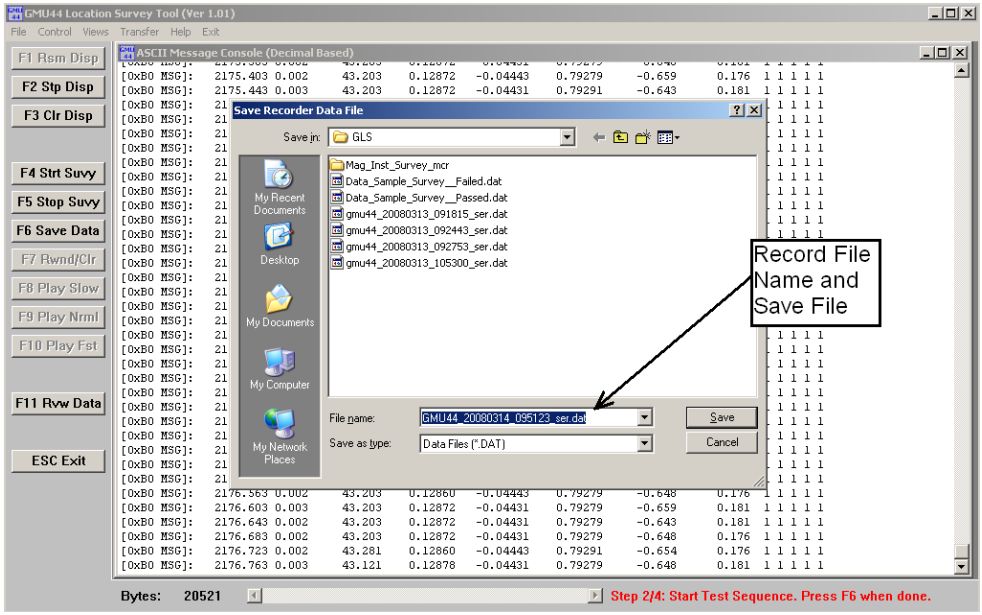


NOTE

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.

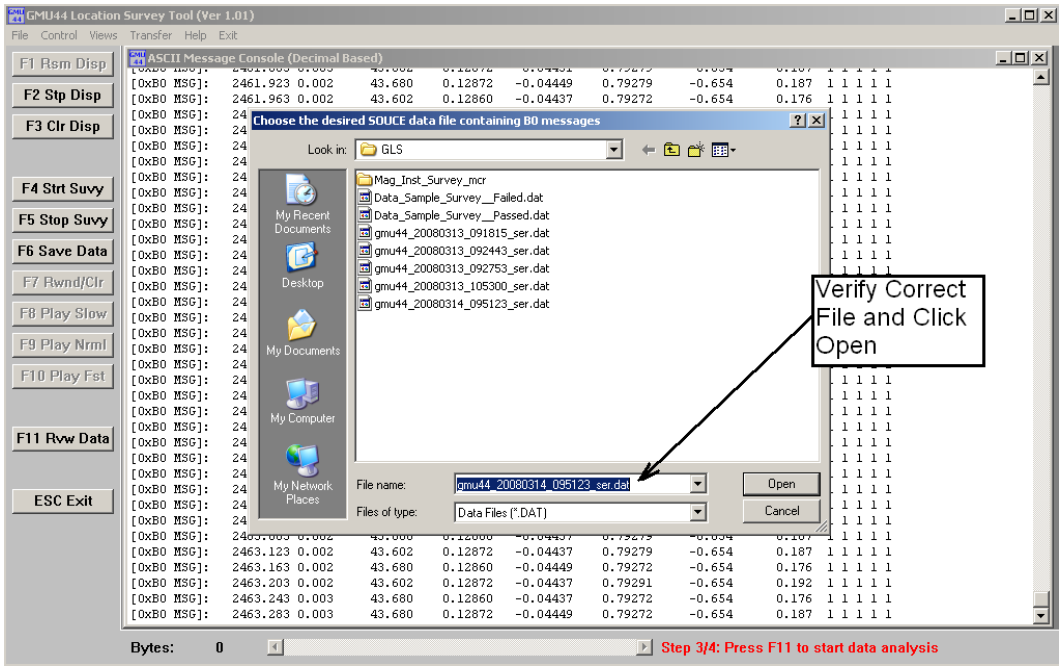
When the operator has completed the actions specified in the test sequence, stop the test software by selecting 'F5 Stop Suvy' or pressing the F5 key. Select 'F6 Save Data' or press the F6 key on the keyboard to save the file. Record file name on the test sequence sheet.



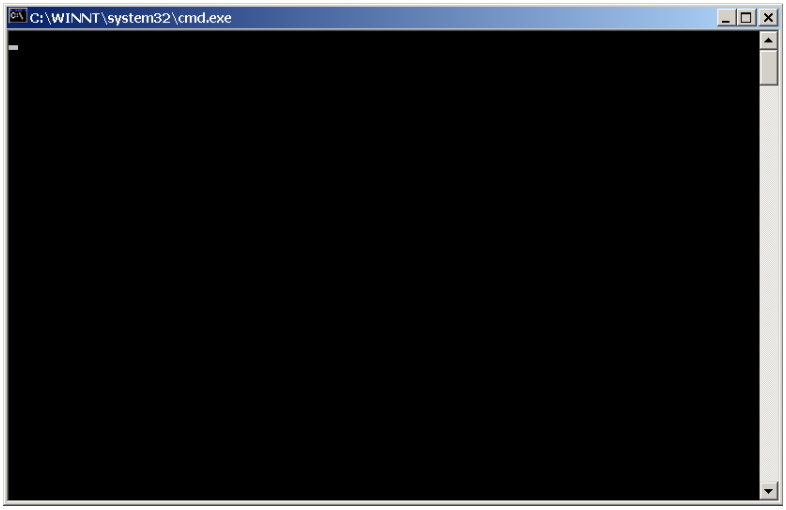
E.4.2 Data Analysis

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'.

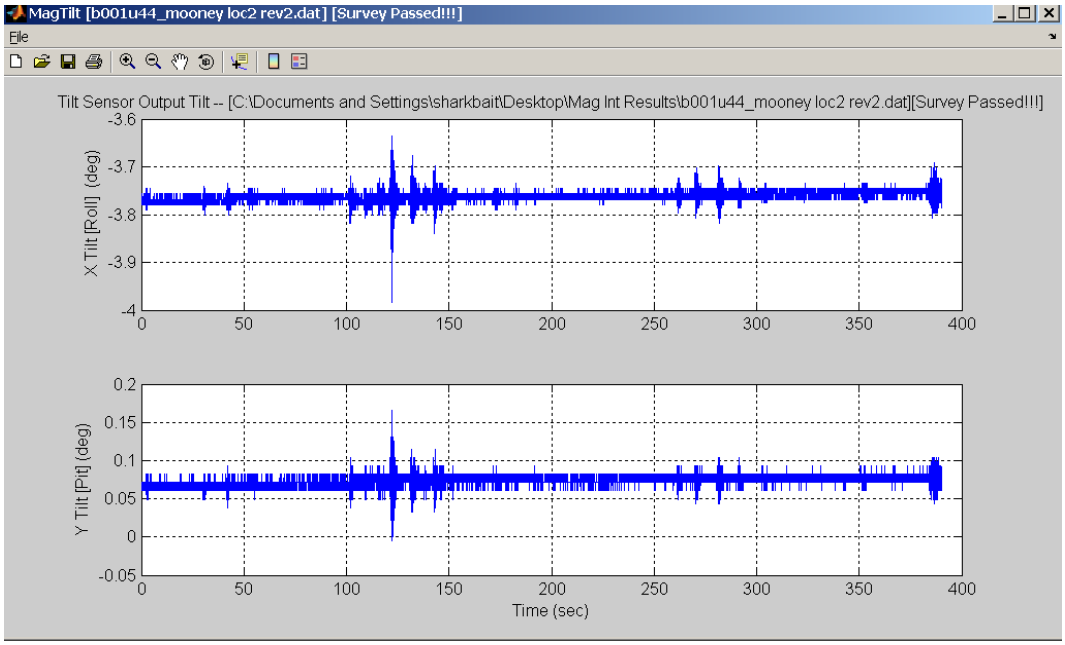


After selecting 'Open' the following DOS window will appear while the data is being analyzed. The analysis may take several minutes, depending upon how much data was recorded.



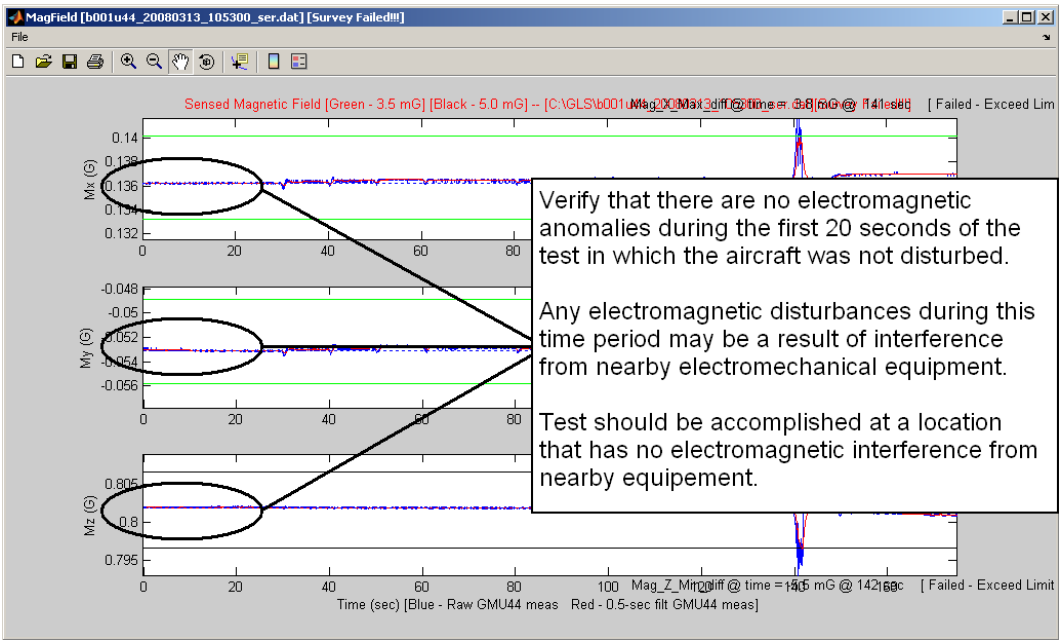
When the analysis is complete, the test results will be displayed in a graph format. Two plots will be displayed – the magnetic survey field results and the magnetometer tilt measurements. The plots of the magnetic interference results and magnetometer tilt will be automatically saved as bitmap (.bmp) 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).

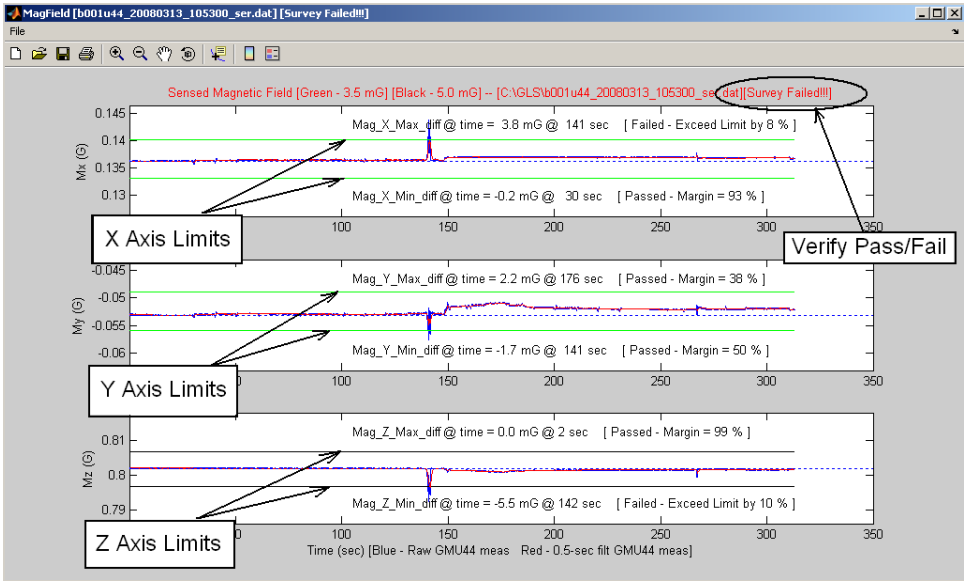


Verify that the X Tilt (Roll) and Y Tilt (Pit) are within the range -5° < X/Y Tilt < 5°. If the tilt is not within 5° of level the temporary GMU 44 installation must be corrected to level the GMU 44, and the survey must be repeated before proceeding.

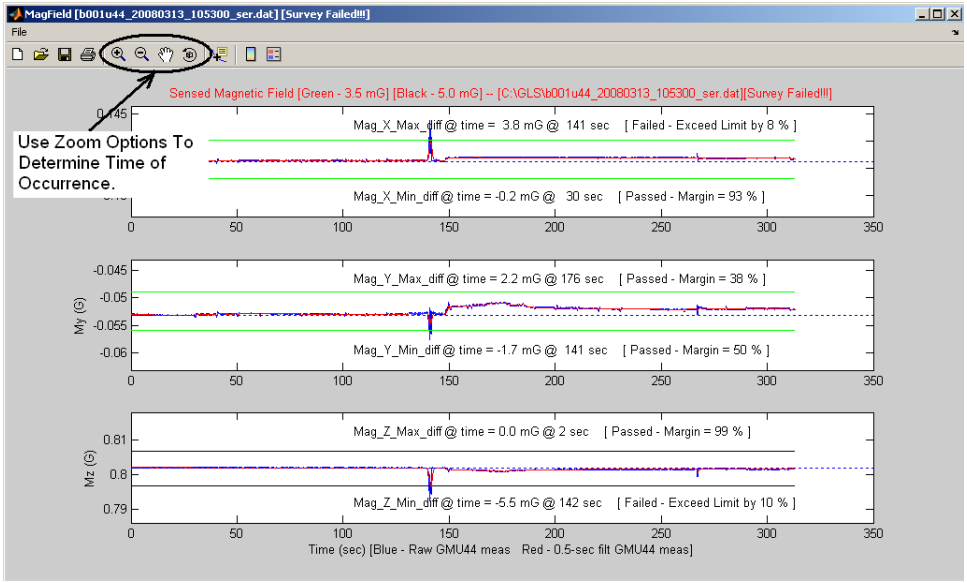
If the tilt is within the acceptable range, select the magnetic survey field results (MagField) window. Verify that there are no electromagnetic anomalies during the first 20 seconds of the test in which the aircraft was not disturbed.



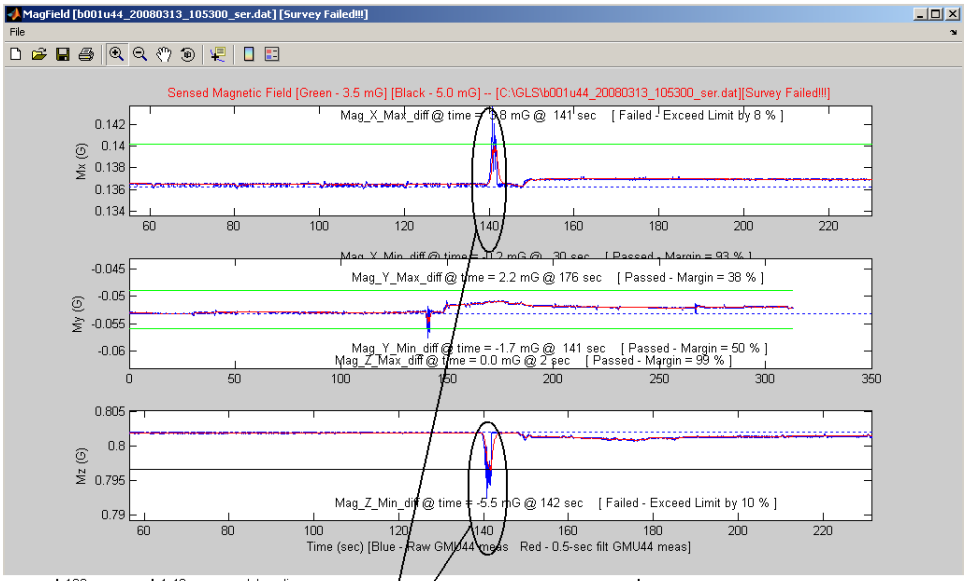
The Graph will show the electromagnetic boundary limits for each axis (X, Y and Z) for information only. The message on top right of the screen will show if the survey has 'Passed' or 'Failed'.



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.

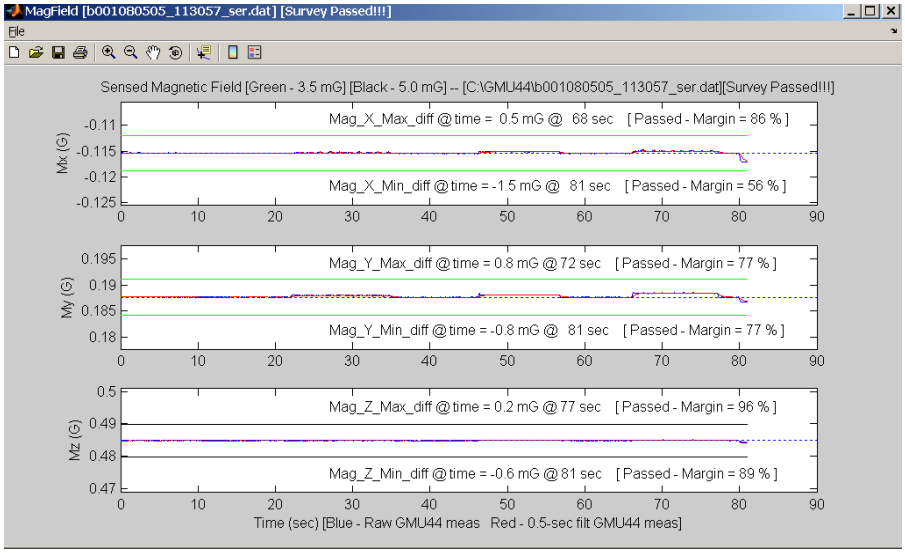


100	1:40	Landing gear up
110	1:50	Landing gear down
120	2:00	Speed brake up
130	2:10	Speed brake down
140	2:20	Navigation lights on
150	2:30	Navigation lights off
160	2:40	Landing lights on

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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