



# Garmin G5

## Electronic Flight Instrument Part 23 AML STC Maintenance Manual Including Instructions for Continued Airworthiness





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## RECORD OF REVISIONS

Revision	Revision Date	Description
1	7/22/16	Initial Release
2	03/14/17	Revised to add G5 DG/HSI, supporting equipment and associated functions.
3	10/18/17	Revised to cover changes associated with the addition of the G5/GAD 29B third party autopilot interfaces.
4	12/15/17	Revised to cover changes associated with Software 5.00, support for GFC500
5	7/20/18	Miscellaneous minor updates to harmonize with STC Installation Manual 190-01112-10.
6	7/19/19	Added GAD13 and GTP59 information
7	05/08/20	Add Lightning Protection Module, alternative software loading procedures, added glareshield GPS antenna information, corrected non-Garmin OAT probe model in 2.4, updated Appendix A configuration tables, minor updates and clarification
8	12/07/20	Added clarifications to Altimeter System Test
9	09/28/21	Added GAD 29D
10	12/29/21	Added clarification to software loading procedure

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## DEFINITIONS OF WARNINGS, CAUTIONS, AND NOTES



### WARNING

*Warnings are used to bring to the installer's immediate attention not only damage to the equipment but personal injury may occur if the instruction is disregarded.*



### CAUTION

*Cautions are used to alert the individual damage to equipment may result if the procedural step is not followed to the letter.*



### NOTE

*Notes are used to expand and explain the preceding step and provide further understanding of the reason for the particular operation.*



### 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](http://www.garmin.com/prop65).*



### WARNING

*Perchlorate Material – special handling may apply, See [www.dtsc.ca.gov/hazardouswaste/perchlorate](http://www.dtsc.ca.gov/hazardouswaste/perchlorate).*



### **BATTERY WARNINGS:**

*If these guidelines are not followed, the lithium-ion battery may experience a shortened life span or may present a risk of damage to the device, fire, chemical burn, electrolyte leak, and/or injury.*

*Do not leave the battery exposed to a heat source or in a high temperature environment. To help prevent damage, store the battery out of direct sunlight.*

*The G5 has an operating temperature range of -4°F to 140°F (-20°C to +60°C). The G5 will prevent operation from the battery when the battery is outside of this temperature range.*

*For maximum battery longevity, store within a temperature range of 32° to 77°F (from 0° to 25°C).*

*Do not use a sharp object to remove the battery.*

*Do not disassemble, puncture, damage, or incinerate the device or battery.*

*Keep the battery away from children.*

*Only replace the battery with the approved replacement from Garmin. Using another battery presents a risk of fire or explosion. To purchase a replacement battery, see you Garmin dealer or the Garmin website.*

*Contact your local waste disposal department to dispose of the device and battery in accordance with applicable local laws and regulations.*



### **CAUTION:**

*The display uses a lens with a special coating that may be 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 a cleaner that is specified as safe for anti-reflective coatings. Avoid any chemical cleaners or solvents that can damage plastic components.*



### **CAUTION:**

*The G5 does not contain any user-serviceable parts. Repairs may only be made by an authorized Garmin service center. Unauthorized repairs or modifications could result in permanent damage to the equipment and void both the warranty and the authority to operate this device under FAA, FCC, and other applicable regulations.*



### **NOTE:**

*Use of polarized eyewear may cause the display to appear dim or blank.*



### **NOTE**

*All images used in this document are current at the time of publication but are subject to change and may not be up to date.*



## TABLE OF CONTENTS

<u>SECTION .....</u>	<u>PAGE</u>
1 INTRODUCTION .....	1
1.1 Introduction .....	1
1.2 Organization .....	1
1.3 Acronyms and Abbreviations .....	1
1.4 Publications .....	1
1.5 Revision and Distribution .....	2
2 SYSTEM DESCRIPTION.....	2
2.1 G5 Electronic Flight Instrument.....	2
2.2 GMU 11 Magnetometer.....	5
2.3 GAD 29/29B/29D .....	5
2.4 GAD 13.....	6
2.5 GTP 59 Temperature Probe .....	7
2.6 Glareshield Mounted antenna.....	7
3 BASIC CONTROL & OPERATION.....	8
4 INSTRUCTIONS FOR CONTINUED AIRWORTHINESS .....	9
4.1 Airworthiness Limitations .....	9
4.2 Servicing Information .....	9
4.3 Electrical Bonding Test .....	11
4.4 Special Inspection Requirements .....	12
5 TROUBLESHOOTING .....	13
5.1 G5 Electronic Flight Instrument.....	13
5.2 Outline and Installation Drawings .....	21
5.3 G5 Interconnect Drawings.....	22
6 EQUIPMENT REMOVAL & INSTALLATION.....	23
6.1 G5 Unit .....	23
6.2 G5 Battery .....	25
6.3 G5 Mounting Ring Replacement.....	25
6.4 GPS Antenna .....	26
6.5 GMU 11 .....	26
6.6 GAD 29/29B/29D .....	27
6.7 GAD 13.....	28
6.8 GTP 59.....	28
6.9 Lightning Protection Component Installation .....	29
7 EQUIPMENT CONFIGURATION & TESTING .....	36
7.1 Recommended Test Equipment .....	36
7.2 Pitot Static System Leak Check.....	36
7.3 G5 Software .....	36
7.4 G5 Configuration Mode.....	37
7.5 G5 Calibration Procedures.....	38
7.6 Compass Rose Swing.....	42
7.7 Altimeter System Test.....	43



7.8 GMU 11 .....	43
8 SYSTEM RETURN TO SERVICE PROCEDURE .....	45

## FIGURES

<u>FIGURE</u>	<u>PAGE</u>
Figure 2-1 G5 Electronic Flight Instrument (Attitude) .....	2
Figure 2-2 G5 Electronic Flight Instrument (DG/HSI) .....	4
Figure 2-3 G5 Battery.....	5
Figure 2-4 GMU 11 .....	5
Figure 2-5 GAD 29/29B/29D.....	6
Figure 2-6 GPS Antenna (011-04036-10 shown) .....	7
Figure 5-1 Incorrect CAN Wiring Example.....	19
Figure 5-2 Correct CAN Bus Terminator Example.....	20
Figure 5-3 G5 Outline Drawing (side view) .....	21
Figure 5-4 G5 Outline Drawing (back view) .....	21
Figure 5-5 G5 Exploded View .....	22
Figure 6-1 G5 Hex Driver .....	23
Figure 6-2 G5 Captive Mounting Screw.....	24
Figure 6-3 G5 Mounting Ring.....	25
Figure 6-4 GMU 11 Mounting Hardware.....	27
Figure 6-5 G5 Resistor Method A Buildup .....	30
Figure 6-6 Method A Placement of G5 CAN Bus Resistors .....	31
Figure 6-7 Method B G5 Resistor Preparation.....	31
Figure 6-8 Method B Placement of G5 CAN Bus Resistors (G5 not CAN bus terminator) .....	32
Figure 6-9 Method B Placement of CAN Bus Components (G5 as CAN bus terminator) .....	33
Figure 6-10 G5 Power Diode Buildup (Both Wire Types) .....	34
Figure 6-11 Placement of G5 Power Diode (Both Wire Types) .....	35
Figure 7-1, Attitude Calibration Example .....	40
Figure 7-2 Example of Calibration Equations .....	40

## TABLES

<u>TABLE</u>	<u>PAGE</u>
Table 1-1, Recommended Documents .....	1
Table 4-1, Maintenance Intervals.....	10
Table 4-2, Electrical Bonding Procedure .....	11
Table 5-1, GAD 29/29B/29D Status LED Indications .....	16
Table 5-2, GAD 29/29B/29D Status LED Indications .....	17
Table 5-3, Status LED Indications .....	19



Table 7-1, Calibration Procedure Summary.....	38
Table 7-2, Heading Verification.....	42





# 1 INTRODUCTION

## 1.1 Introduction

This document provides Instructions for Continued Airworthiness (ICA) for the Garmin G5 Electronic Flight Instrument as installed in Part 23 aircraft under STC SA01818WI. This document satisfies the requirements for continued airworthiness as defined by 14 CFR Part 23.1529 and Appendix G. Information in this document is required to maintain the continued airworthiness of the G5.

## 1.2 Organization

The following outline briefly describes the organization of this manual:

Section 2: System Description

Provides a complete description of the type design change associated with installing the G5. An overview of the system interface is also provided.

Section 3: Control & Operation

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

Section 4: Instructions for Continued Airworthiness

Provides maintenance instructions for continued airworthiness of the G5.

Section 5: Troubleshooting

Provides troubleshooting information to aid in diagnosing and resolving potential problems with the G5.

Section 6: Equipment Removal & Installation

Gives instructions for the removal and installation of the G5.

Section 7: Equipment Configuration & Testing

Gives instructions for loading software, configuring, and testing of G5.

Section 8: Return to Service Procedure

Specifies return-to-service procedures to be performed upon completion of maintenance of the G5.

## 1.3 Acronyms and Abbreviations

The following acronyms are used in this manual:

<b>AML</b>	Approved Model List	<b>GPS</b>	Global Positioning System
<b>AFMS</b>	Automatic Flight Control System	<b>HSI</b>	Horizontal Situation Indicator
<b>CAN</b>	Controller Area Network	<b>ICA</b>	Instructions for Continued Airworthiness
<b>CFR</b>	Code of Federal Regulations	<b>LPM</b>	Lightning Protection Module
<b>DG</b>	Directional Gyro	<b>OAT</b>	Outside Air Temperature
<b>FAA</b>	Federal Aviation Administration	<b>STC</b>	Supplemental Type Certificate
		<b>TAS</b>	True Airspeed

## 1.4 Publications

The following documents are recommended to be available when performing maintenance on the G5.

**Table 1-1, Recommended Documents**

<b>Part Number</b>	<b>Garmin Document</b>
190-01112-12	<i>G5 Electronic Flight Instrument, Pilot's Guide for Certified Aircraft</i>
190-01112-10	<i>Garmin G5 Part 23 AML STC Installation Manual</i>



## 1.5 Revision and Distribution

This document is required for maintaining the continued airworthiness of the aircraft. When this document is revised, every page will be revised to indicate current revision level.

Owner/operators may obtain the latest revision of this document from the Garmin website, [www.garmin.com](http://www.garmin.com).

## 2 SYSTEM DESCRIPTION

The G5 System equipment part numbers approved by STC SA01818WI-A are found in Table 1-2 of Garmin document 190-01112-10, *Garmin G5 Electronic Flight Instrument Part 23 AML STC Installation Manual*.

### 2.1 G5 Electronic Flight Instrument

#### 2.1.1 G5 Attitude Indicator

The G5 Electronic Flight Instrument configured as an attitude indicator is shown in Figure 2-1. The G5 is an electronic flight instrument display operating as a standalone flight display. It features a bright, sunlight readable, 3.5-inch color display which is sized to fit in a standard 3-1/8-inch instrument cutout. The G5 contains integrated attitude/air data sensors that provides display of attitude and secondary display of air data information. The G5 Attitude indicator configuration is determined at the time of installation as defined by the AML STC installation data and recorded in APPENDIX A of this document and maintained with the aircraft records.



Figure 2-1 G5 Electronic Flight Instrument (Attitude)

The G5 calculates aircraft attitude using information from its built-in inertial sensors. If the G5 senses that the attitude solution is valid, but not yet within the internal accuracy limits, "ALIGNING" is displayed. The G5 can align itself both while taxiing and during level flight.

The G5 will also use GPS and airspeed data to provide the most accurate attitude information. If none of these additional sources of information are available, attitude calculations will still be valid but accuracy may be slightly affected.



The G5 attitude functions are shown below:

- Pitch
- Roll

The G5 has a Turn Rate Indicator located at the bottom of the PFD Page. Tick marks to the left and right of the displayed heading denote standard turn rates (3 deg/sec). A magenta Turn Rate Trend Vector shows the current turn rate. A standard-rate turn is shown on the indicator by the trend vector stopping at the standard turn rate tick mark.

The G5 displays slip/skid information as indicated by the location of the ball at the lower center portion of the indicator.

The G5 receives a GPS input for attitude aiding via one of the following methods:

- GPS antenna
- GTN 6XX/7XX series navigator
- GNS 4XXW/5XXW series navigator
- GNS 480 series navigator
- GTX 3x5 transponder
- GPS 175/GNX 375 series navigators

The following functions are provided by the GPS input:

- Ground Track
- Ground Speed (GS)

When the G5 attitude is installed with a G5 HSI, the G5 attitude can also be interfaced to GPS NAV and/or VHF NAV for display of lateral and vertical guidance.

The G5 installation is connected to the aircraft Pitot / Static system. The GTP 59 temperature probe is optionally connected to the GAD 13 for Outside Air Temperature (OAT) information. The following functions are provided:

- Secondary Airspeed indicator
- Secondary Barometric altimeter
- Secondary Vertical speed
- Secondary Altimeter Barometric Setting
- Secondary Altimeter
- Secondary Altitude Display
- Selected altitude setting, bug and visual altitude alerting
- Secondary Vertical Speed Indicator
- Vspeed references
- True Airspeed (TAS)
- Crosswind speed and direction
- OAT

The GMU 11 magnetometer can be installed as an optional interface for a standalone G5 attitude display. This will allow the display of heading on the attitude display, but does not allow the removal of the existing DG.



## 2.1.2 G5 DG/HSI Indicator

The G5 Electronic Flight Instrument configured as a DG/HSI, is shown in Figure 2-2. The G5 is an electronic instrument display operating as a standalone flight display. It features a bright, sunlight readable, 3.5-inch color display which is sized to fit in a standard 3-1/8-inch instrument cutout. In this location the G5's primary function is the display of slaved compass, VHF NAV and/or GPS NAV, system #1 or #2. The G5 also contains integrated attitude/air data sensors that provide reversionary display of attitude and secondary display of air data information. In the event the G5 attitude display powers down, the G5 DG/HSI will automatically revert to displaying the attitude information. The G5 DG/HSI configuration is determined at the time of installation as defined by the AML STC installation data and recorded in APPENDIX A of this document and maintained with the aircraft records.



Figure 2-2 G5 Electronic Flight Instrument (DG/HSI)

### 2.1.2.1 G5 Lightning Protection Module (LPM)

The G5 CAN bus inputs require additional and external protection from the effects of lightning. Earlier installations used discrete components installed in the wiring harness (see Section 6.9.2). Later installations utilize a modified backshell called a Lightning Protection Module (LPM), this was introduced to replace the wire harness discrete component installation requirements.

### 2.1.3 Battery

The G5 has an external lithium-ion battery that provides up to 4 hours of emergency power. The battery is required for the G5 used as an attitude display, but optional for the G5 used in the DG and HSI position.



**Figure 2-3 G5 Battery**

## 2.1.4 Installation Location

The G5 is installed in the pilot’s instrument panel in the primary attitude indicator location, in the rate-of-turn indicator location, or in the DG/HSI location. The term “rate-of-turn indicator” refers to either a turn coordinator or turn and bank indicator.

## 2.2 GMU 11 Magnetometer

The Garmin GMU 11 Magnetometer is a remote mounted device that interfaces with a G5 to provide heading data to the G5 Attitude and/or G5 DG/HSI. The GMU 11 Magnetometer uses magnetic field measurements to create electronically stabilized heading data. The GMU 11 is required when a G5 is installed as a DG/HSI.



**Figure 2-4 GMU 11**

### 2.2.1 Installation Location

The GMU 11 installation location is determined at the time of installation as defined by the AML STC installation data and recorded in APPENDIX B of this document and maintained with the aircraft records. Installation is optional for the G5 as an attitude indicator and required for the G5 as a DG/HSI.

## 2.3 GAD 29/29B/29D

The GAD 29/29B/29D is a remote-mount unit that allows interface to IFR navigators such as the GNS and GTN series. For installations with a G5 DG/HSI or a G5 DG/HSI and G5 attitude the GAD 29/29B/29D will receive ARINC 429 data from the navigator interfaced and transmit that information onto the CAN bus to be consumed by the G5. The GAD 29B/29D adds analog outputs and excitation pass through capability. Installation is optional based on configuration of the system.

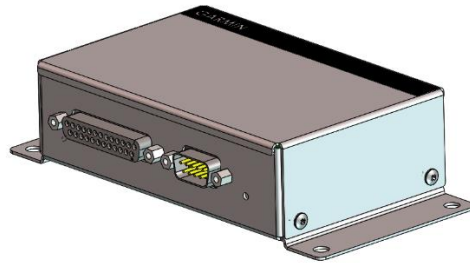


Figure 2-5 GAD 29/29B/29D

## 2.3.1 Installation Location

The GAD 29/29B/29D installation location is determined at the time of installation as defined by the AML STC installation data and recorded in APPENDIX B of this document and maintained with the aircraft records.

## 2.4 GAD 13

The GAD 13 is a small unit used to interface to OAT probes. The GAD 13 provides a standard three-wire or two-wire interface that can be connected to the following approved OAT probes:

- GTP 59
- Davtron C307PS

OAT analog information from the GAD 13 is converted to digital information, and passed to other G5 system LRUs using CAN communication. Connection to GAD 13 enables the G5 to display TAS, OAT, and crosswind information.

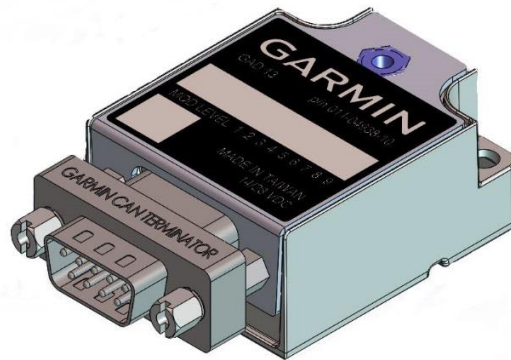


Figure 2-6 GAD 13



## 2.5 GTP 59 Temperature Probe

The Garmin GTP 59 is an externally mounted temperature probe that provides raw outside air temperature data. The device is a three-wire temperature probe interface with a pre-installed wire lead that is 10 feet long.



Figure 2-7 GTP 59 (Temperature Probe)

## 2.6 Glareshield Mounted antenna

The optional glareshield-mounted GPS antenna (Garmin part number 011-04036-10 or 011-04036-00) feeds a GPS receiver inside the G5 which provides position, velocity, and time data to support various instrument information.



### NOTE

*If GPS antenna 011-04036-00 is installed, which has a TNC connector, a TNC/BNC Adapter (p/n 330-01754-00) is required to connect the GPS antenna to the G5.*

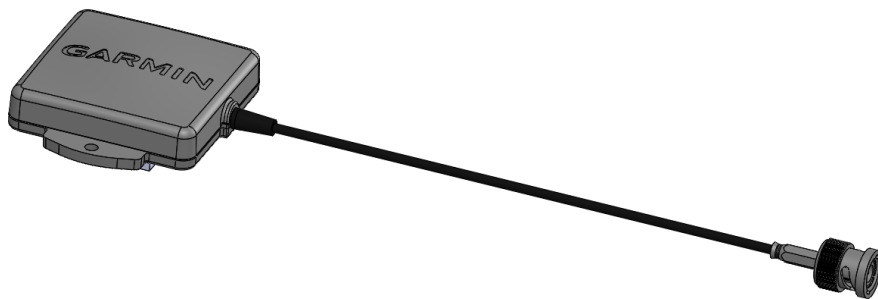


Figure 2-6 GPS Antenna (011-04036-10 shown)

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### 3 BASIC CONTROL & OPERATION

The G5 unit will turn on automatically when power is applied to the avionics bus. The unit will turn off automatically 45 seconds after power is removed. Alternatively, holding the button on the left lower corner of the unit for three seconds will turn the unit off.

The knob on the lower right corner of the unit is used for the following;

#### G5 Attitude

- adjust the barometric pressure setting.
- Set heading bug #
- Set altitude pre-select

# Only configurations utilizing a GMU 11

#### G5 DG/HSI

- Set heading bug
- Selected course \*
- Enable/Disable bearing pointer \*
- Set altitude pre-select
- Enter PFD reversion

\* Only configurations utilizing VHF NAV or GPS NAV

Pressing the power button brings up the backlight controls as well as the current battery status. The backlight level adjusts automatically via a photocell. Temporary adjustments to the backlight level can be made by turning the knob on the lower right corner of the unit to adjust. When power is cycled to the unit, the backlight level is reset to use the photocell.

The GMU 11, GAD 13 and GAD 29/29B/29D units are remote mounted units that have no independent control or operation. These units are supporting units for the G5 functions and their use is dependent on the configuration of the installation.

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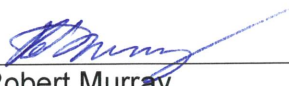
## 4 INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

### 4.1 Airworthiness Limitations

The Airworthiness Limitations section is FAA-approved and specifies maintenance required under §§ 43.16 and 91.403 of Title 14 of the Code of Federal Regulations, unless an alternative program has been FAA-approved.

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

FAA APPROVED

  
Robert Murray  
STC Unit Administrator  
ODA-240087-CE

12/29/2021  
Date

### 4.2 Servicing Information

This section addresses servicing information for the G5 Electronic Flight Display, Battery, GMU 11 magnetometer, and the GAD 29/29B/29D data bus converter.

#### 4.2.1 G5 Electronic Flight Instrument

The G5 unit maintenance is ‘on condition’ only. See section 6 for equipment removal and installation. No component-level overhaul is required. Reference Table 4-1 for necessary tests or checks and the specific intervals for the G5.

#### 4.2.2 GMU 11 Magnetometer

The GMU 11 unit maintenance is ‘on condition’ only. See section 6 for equipment removal and installation. No component-level overhaul is required. Reference Table 4-1 for necessary tests or checks and the specific intervals for the GMU 11.



#### NOTE

*After replacing or servicing electrical components near the GMU 11 magnetometer, the Magnetometer Interference Test (reference Section 7.8) and Magnetometer Calibration Procedure (reference Section 7.5.3) must be performed.*

#### 4.2.3 GAD 29/29B/29D Data Bus Converter

The GAD 29/29B/29D unit maintenance is ‘on condition’ only. See section 6 for equipment removal and installation. No component-level overhaul is required. Reference Table 4-1 for necessary tests or checks and the specific intervals for the GAD 29/29B/29D.

#### 4.2.4 GAD 13 Data Bus Converter

The GAD 13 unit maintenance is ‘on condition’ only. See section 6 for equipment removal and installation. No component-level overhaul is required. Reference Table 4-1 for necessary tests or checks and the specific intervals for the GAD 13.



#### 4.2.5 GTP 59 Temperature Probe

The GTP 59 unit maintenance is ‘on condition’ only. See section 6 for equipment removal and installation. No component-level overhaul is required. Reference Table 4-1 for necessary tests or checks and the specific intervals for the GTP 59.

#### 4.2.6 Glareshield GPS Antenna

The Glareshield GPS antenna unit maintenance is ‘on condition’ only. See section 6 for equipment removal and installation. No component-level overhaul is required. Reference Table 4-1 for necessary tests or checks and the specific intervals for the Glareshield GPS Antenna.

#### 4.2.7 Maintenance Intervals

Table 4-1 shows items installed by this STC which must undergo tests or checks at specific intervals.

**Table 4-1, Maintenance Intervals**

Item	Description/Procedure	Manual Section No.	Interval
G5 unit	Removal & Installation	6.1	On Condition
	Altimeter System Test	7.7	24 calendar months
G5 battery	Removal & Installation	6.2	On Condition
	Capacity Check	4.2.8	12 calendar months
G5 mounting ring	Removal & Installation	6.3	On Condition
GMU 11 unit	Removal & Installation	6.5	On Condition
GAD 29/29B/29D unit	Removal & Installation	6.6	On Condition
GAD 13 unit	Removal & Installation	6.7	On Condition
GTP 59 unit	Removal & Installation	6.8	On Condition
	Special Inspection Requirements	4.4	On Condition
GPS Antenna	Removal & Installation	6.4	On Condition

#### 4.2.8 Battery Capacity Check

1. Without power applied to the aircraft, turn on the G5 by pressing the power button in the lower left corner of the unit.
2. Note the remaining battery capacity (%) at the top left corner of the display.
3. After about a minute, the remaining capacity will change from (%) to time (hour:min).
4. If the remaining capacity is less than one hour (1:00), allow the battery to charge until the capacity shows greater than 95% and repeat the check.
5. If the remaining capacity is less than one hour (1:00) after charging, the battery must be replaced.



### 4.3 Electrical Bonding Test

LRU electrical bonding must be checked every 2,000 flight hours or 10 years, whichever occurs first.

#### 4.3.1 Requirements

- Disconnect any cables and connectors normally attached to the LRU.
- Resistance must be measured from a bare metal portion of the LRU (chassis or connector) to an airframe grounding location.
- The airframe grounding location should be as close to the LRU as possible, unless otherwise noted in Table 4-2.

#### 4.3.2 Test Equipment

Calibrated 4 wire Milliohm meter and Kelvin probes are required for this test.

#### 4.3.3 Electrical Bonding Test Procedures.

- Using a calibrated milliohm meter and Kelvin probes measure the resistance of each LRU between the locations noted in Table 4-2, and record the result of each installed LRU. Some equipment on the list are optional and may not be installed.
- Ensure the resistance does not exceed 10 milliohms except for the GTP that shall be less than 2.5 milliohms.
- If the measured resistance is greater 10 milliohms, bonding must be improved to meet applicable requirements for a new installation in accordance with Section 4 of *Garmin G5 Electronic Flight Instrument Part 23 AML STC Installation Manual* (190-01112-10).

**Table 4-2, Electrical Bonding Procedure**

Unit	Measurement Location (2)	Result (milliohm)
G5	J51 backshell to local structure adjacent to the ground stud (1)	mΩ
GMU 11	P111 backshell to local structure adjacent to the ground stud (1)	mΩ
GAD 29 / 29B / 29D	Chassis mounting screw to adjacent aircraft ground	mΩ
GAD 13	Chassis mounting screw to adjacent aircraft ground	mΩ
GTP 59	Probe and adjacent local metal structure for metal and tube and fabric aircraft. For composite aircraft no bonding requirement	mΩ

**Notes:**

- (1) This is the ground stud to which the LRU bonding strap is connected.
- (2) For remote LRUs bonded to the back of the instrument panel via an installed aluminum foil ground plane, the bonding measurement must be taken between the remote LRU and the instrument panel.



#### **4.4 Special Inspection Requirements**

After a suspected lightning strike, the following actions must be performed for the specific LRU.

##### **GTP 59 Temperature Probe**

Inspect the GTP 59 temperature probe for signs of lightning damage. Check the self-sealing washer (P/N 212-00026-00) used on the probe tip outside of the aircraft for any evidence of melting or lack of seal. Replace the washer if damaged. If there is evidence of lightning strike to the GTP 59 temperature probe or any lightning damage, replace the probe.

Tube-and-fabric aircraft must replace the GTP 59 bond strap (if installed) in accordance with Section 4 of the Garmin G5 Electronic Flight Instrument Part 23 AML STC Installation Manual (190-01112-10).

##### **Lightning Protection Module (LPM)**

The LPM shall be replaced. Reference *Garmin G5 Electronic Flight Instrument Part 23 AML STC Installation Manual*, 190-01112-10 section 4 and 5 for connector assembly and wiring requirements of LPM.

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## 5 TROUBLESHOOTING

### 5.1 G5 Electronic Flight Instrument

#### 5.1.1 General



#### NOTE

*The term 'Red-X' refers to a red "X" that appears on different areas of the display to indicate the failure of that particular function*

If a Red-X appears on the display or anywhere in the configuration mode menus, the following troubleshooting steps may be used to help identify the cause.

1. Review the airframe logbook to verify if any G5 or other avionics or electrical maintenance has been performed recently that may have contributed to the failure.
2. Check for loose wire terminals on the circuit breaker connections on the power wire(s) causing intermittent power connections. Also, check for intermittent circuit breakers.
3. Check that all connectors are fully seated, and that the jack screw connectors are fully tightened on both sides of all connectors.
4. Check for a loose wire harness that is able to move around during flight. This condition may cause the wire to pull on or vibrate the connector, making intermittent connections.
5. Ensure that the G5 is mounted securely.
6. Look for any heavy objects that may not be fastened tight to the aircraft structure that could be inducing vibration in the G5's attitude sensors.
7. Look for evidence of water or fluid contamination in the area around the G5.
8. Unplug the connector on the G5 or any affected LRU and check for bent pins.



#### NOTE

*If a Lightning Protection Module is installed, check for continuity between backshell leads per Garmin G5 Electronic Flight Instrument Part 23 AML STC Installation Manual, 190-01112-10 section 5.*

9. Inspect the wire harness clamp on the rear of all connectors to verify that it is not too tight and smashing/shorting the wires.

#### 5.1.2 Attitude

If the attitude is failed and shows a Red-X condition, follow the troubleshooting steps in the previous section. If this does not resolve the issue, gather answers to the following questions. This information may be helpful to the customer, the avionics dealer, or to Garmin Aviation Product Support in troubleshooting the failure.

- 1) What specifically was the nature of the failure? Was it a Red-X of only GPS track, only pitch/roll, or a combination?
- 2) If there was a Red-X of pitch or roll information, did the unit display an alignment message (which is indicative of a reset), or a failure message (which is indicative of an invalidated output)?



- 3) What exactly was the aircraft doing in the two minutes that preceded the failure (taxiing on the ground, flying straight-and-level flight, turning, climbing, etc)? If the problem occurred on the ground, was it within 100 feet of a hangar using GPS repeaters?
- 4) How long did the failure last? Was it brief or sustained? If it was repetitive, about how many times did it happen? Did it happen on more than one day?
- 5) Was the problem correlated with a specific maneuver or a specific geographic area?
- 6) Can the problem be repeated reliably?
- 7) Did the onset of the problem occur shortly after a software upload to the G5?
- 8) Was there a loss of the GPS position lock?

### **5.1.3 Air Data**

If the airspeed and/or altitude is failed and shows a Red-X condition:

- 1) Inspect the pitot/static plumbing integrity.
- 2) Inspect the pitot/static ports and all associated equipment.
- 3) If the problem persists, replace the G5 with a known good unit.

#### **5.1.3.1 Air Data (Installation with a GAD 13 and GTP 59 Installed)**

If the OAT, TAS and WINDS annunciations show a Red-X condition:

- 1) Inspect GTP 59 OAT probe and connections for faults.
- 2) Replace the GTP OAT probe.
- 3) If the problem persists, replace the GAD 13 with a known good unit.

### **5.1.4 Heading Information (Installations with a GMU 11 Installed)**

If a Red-X (steady or intermittent) is displayed in the heading field on the G5, check the following while the aircraft is on the ground:

- 1) When taxiing, heading performance is susceptible to the presence of magnetic anomalies (metal buildings, underground steel culverts, steel grates in the ramp, rebar). Localized sources of interference on the ground may consistently cause a Red-X to be displayed on the heading in the same spot while taxiing, and this is not caused by a failure of the GMU 11 or its calibration.
- 2) Check to see if any new equipment has been installed on the aircraft. If there has been, conduct the magnetic interference test in Section 7.8.1 to see if the new equipment is causing magnetic interference with the GMU 11.
- 3) On the G5 in configuration mode, select the Device Information page, select MAG and verify there is a Green Check by MAG. If there is a Red-X by MAG, proceed to the next step.
- 4) Inspect and verify the CAN Bus wiring between the G5 and GMU 11.
  - a. With power removed, remove a connector from one of the devices that is not located at either of the extreme ends of the CAN bus.

- b. Using an ohm meter, verify that the resistance between the CAN HI and CAN LO pins on the connector is 60 ohms. This will verify that the CAN backbone is properly terminated at each end (two 120 ohm terminating resistors in parallel).
- c. A resistance of 120 ohms indicates that one of the two required CAN terminations is missing.
- d. A resistance of 40 ohms or less indicates that too many terminations are installed.
- e. Verify that the CAN HI and CAN LO signals are not swapped, shorted together, or open-circuited at any LRU connector.
- f. Verify that the CAN HI and CAN LO signals are not shorted to ground (this can happen when shielded wire is installed incorrectly).



#### **NOTE**

*If a Lightning Protection Module is installed, check for continuity between backshell leads per Garmin G5 Electronic Flight Instrument Part 23 AML STC Installation Manual, 190-01112-10 section 5.*

- 5) If the problem persists, replace the GMU 11 with a known good unit.

### **5.1.5 VHF Navigation Information (Installations without a GAD 29/29B/29D Installed)**

If the VHF navigation information is removed from the G5 HSI display:

- 1) On the G5 in configuration mode, select the RS-232 configuration page, verify there is a Green Check by 'Input Format, Garmin VHF NAV Radio' and 'Output Format, Garmin VHF NAV Radio'. If there is a Red-X by either of these items, proceed to the next step.
- 2) Check the RS-232 wiring connected between the G5 and the VHF Navigator using the instructions in the General section above.
- 3) Verify the VHF Navigator configuration has not changed from the initial installation. Reference APPENDIX A .
- 4) If the problem persists, replace the G5 or VHF Navigator with a known good unit.

### **5.1.6 VHF Navigation Information (Installations with a GAD 29/29B/29D Installed)**

If the VHF navigation information is removed from the G5 HSI display:

- 1) On the G5 in configuration mode, select the Device Information page, select A429 and verify there is a Green Check by A429. If there is a Red-X by A429, proceed to the next step.
- 2) Check the ARINC 429 wiring connected between the G5 and the GAD 29/29B/29D using the instructions in the General section above.
- 3) The GAD 29/29B/29D has an LED on the outer case that indicates the LRUs current status. The status indications are:



**Table 5-1, GAD 29/29B/29D Status LED Indications**

LED Indication	Description
No Light	No Power
Steady Green	On, but not communicating via CAN Bus
Flashing Green	On and communicating via CAN Bus
Red	Hardware Fault
Alternating Red/Green	CAN bus network error two similar devices are configured with the same unit ID

- 4) If the LED indication is ‘No Light’, verify the circuit breaker, power and ground wiring between the GAD 29/29B/29D circuit breaker and GAD 29/29B/29D. If proper power is available to the GAD 29/29B/29D, replace the GAD 29/29B/29D with a known good unit.
- 5) If the LED indication is ‘Steady Green’, inspect and verify the CAN Bus wiring between the G5 and GAD 29/29B/29D.
  - a. With power removed, remove a connector from one of the devices that is not located at either of the extreme ends of the CAN bus.
  - b. Using an ohm meter, verify that the resistance between the CAN HI and CAN LO pins on the connector is 60 ohms. This will verify that the CAN backbone is properly terminated at each end (two 120 ohm terminating resistors in parallel).
  - c. A resistance of 120 ohms indicates that one of the two required CAN terminations is missing.



**NOTE**

*If a Lightning Protection Module is installed, check for continuity between backshell leads per Garmin G5 Electronic Flight Instrument Part 23 AML STC Installation Manual, 190-01112-10 section 5.*

- d. A resistance of 40 ohms or less indicates that too many terminations are installed.
- e. Verify that the CAN HI and CAN LO signals are not swapped, shorted together, or open-circuited at any LRU connector.
- f. Verify that the CAN HI and CAN LO signals are not shorted to ground (this can happen when shielded wire is installed incorrectly).
- 6) If the LED indication is ‘Red’, replace the GAD 29/29B/29D with a known good unit.
- 7) If the LED indication is ‘Alternating Red/Green’, verify the Unit ID strapping on the G5 units. Reference Section 5.3 wiring interconnects for the appropriate Unit ID strapping.
- 8) Verify the VHF Navigator configuration has not changed from the initial installation. Reference APPENDIX A .
- 9) If the problem persists, replace the GAD 29/29B/29D with a known good unit.





## 5.1.7 GPS Navigation Information (Installations with a GAD 29/29B/29D Installed)

### 5.1.7.1 GPS VFR Displayed on G5

If the GPS navigation information is removed from the G5 HSI display and GPS VFR is displayed:

- 1) On the G5 in configuration mode, select the Device Information page, select A429 and verify there is a Green Check by A429. If there is a Red-X by A429 proceed to the next step.
- 2) Check the ARINC 429 wiring connected between the G5 and the GAD 29/29B/29D using the instructions in the General section above.
- 3) The GAD 29/29B/29D has an LED on the outer case that indicates the LRUs current status. The status indications are:

**Table 5-2, GAD 29/29B/29D Status LED Indications**

LED Indication	Description
No Light	No Power
Steady Green	On, but not communicating via CAN Bus
Flashing Green	On and communicating via CAN Bus
Red	Hardware Fault
Alternating Red/Green	CAN bus network error two similar devices are configured with the same unit ID

- 4) If the LED indication is ‘No Light’ verify the circuit breaker, power and ground wiring between the GAD 29/29B/29D circuit breaker and GAD 29/29B/29D. If proper power is available to the GAD 29/29B/29D replace the GAD 29/29B/29D with a known good unit.
- 5) If the LED indication is Steady Green Inspect and verify the CAN Bus wiring between the G5 and GAD 29/29B/29D
  - a. With power removed, remove a connector from one of the devices that is not located at either of the extreme ends of the CAN bus.
  - b. Using an ohm meter, verify that the resistance between the CAN HI and CAN LO pins on the connector is 60 ohms. This will verify that the CAN backbone is properly terminated at each end (two 120 ohm terminating resistors in parallel).
  - c. A resistance of 120 ohms indicates that one of the two required CAN terminations is missing.
  - d. A resistance of 40 ohms or less indicates that too many terminations are installed.
  - e. Verify that the CAN HI and CAN LO signals are not swapped, shorted together, or open-circuited at any LRU connector.
  - f. Verify that the CAN HI and CAN LO signals are not shorted to ground (this can happen when shielded wire is installed incorrectly).



#### **NOTE**

*If a Lightning Protection Module is installed, check for continuity between backshell leads per Garmin G5 Electronic Flight Instrument Part 23 AML STC Installation Manual, 190-01112-10 section 5.*

- 6) If the LED indication is ‘Red’, replace the GAD 29/29B/29D with a known good unit.



- 7) If the LED indication is 'Alternating Red/Green', verify the Unit ID strapping on the G5 units. Reference Section 5.3 wiring interconnects for the appropriate Unit ID strapping.
- 8) Verify the GPS Navigator configuration has not changed from that set in the initial installation. Reference APPENDIX A .
- 9) If the problem persists, replace the GAD 29/29B/29D with a known good unit.

### **5.1.8 Loss of Non Garmin Autopilot Heading and/or Course Datum (Installations with GAD 29B/29D Installed)**

If the Non-Garmin autopilot loses the capability to couple and track Heading and/or Course Datum:

- 1) Complete troubleshooting as directed and applicable in Section 5.1.4 for loss of Heading Datum, Section 5.1.6 for loss of Course Datum and Section 5.1.7 for loss of GPSS Datum. If these all indicate there is no problem continue to the next step.
- 2) Inspect and verify the ARINC 429 Bus wiring between the GPS Navigator, GAD 29B/29D and autopilot computer.
- 3) Inspect and verify the Analog wiring between the GAD 29B/29D and the autopilot computer.
- 4) Verify the G5 and GPS Navigator configurations has not changed from that set in the initial installation. Reference APPENDIX A .
- 5) Verify the autopilot computer is functioning properly. Reference autopilot manufacturers troubleshooting procedures.
- 6) If the problem persists, replace the GAD 29B/29D with a known good unit.

### **5.1.9 GFC 500 Failure Messages**

During operation of the GFC 500 AFCS, the G5 may annunciate a failure or fault that is specific to the GFC 500 AFCS. Refer to the GFC 500 AFCS Maintenance Manual/ICA, 190-02291-01, for assistance in troubleshooting the problem.

### **5.1.10 GPS Position Information Removed (Units with no NAV Interface)**

If the GPS position information is removed from the G5 Attitude or HSI display (no GPS track or Ground Speed).

- 1) On the G5 in configuration mode, select the RS-232 Configuration page, select Input Format and verify there is a Green Check by MapMX. If there is a Red-X by MapMX, proceed to the next step.
- 2) Check the RS 232 wiring connected between the G5 and the GPS Navigator using the instructions in the General section above.
- 3) Verify the GPS Navigator configuration has not changed from the initial installation. Reference APPENDIX A .
- 4) If the problem persists, replace the G5 with a known good unit.

### 5.1.11 MicroSD Card

A stuck or sticking microSD™ card in the G5 can sometimes be caused by the card thickness variability (especially if there is more than one label on the card). This is usually caused by the card sticking in the overlay opening, not by the card sticking to the socket inside the unit. Try another card (without a label if possible) to confirm the problem. If the second card sticks, the microSD™ socket board inside the unit may be misaligned with the overlay and the G5 will require repair. Garmin recommends using SanDisk® brand cards.

### 5.1.12 Data Logging

Data logging on the G5 may be used to help troubleshoot issues. Operational data is gathered from the G5 during flight or on ground and is stored in \*.csv log files on the microSD™ card (if installed).

### 5.1.13 CAN Bus Troubleshooting

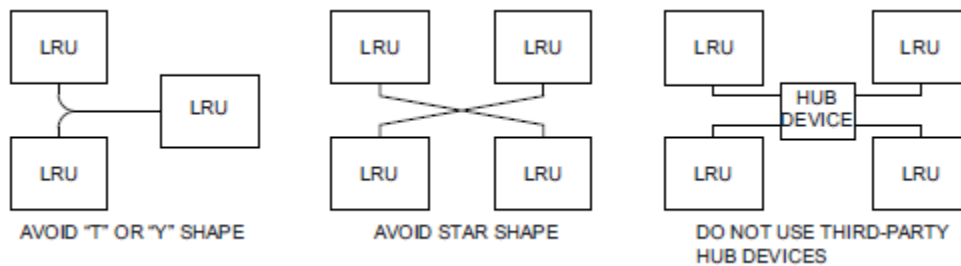
If problems are occurring within the CAN bus network, the following steps can help to identify the issue.

Review the status LED on the GAD29/29B/29D. the status LED indications are listed in Table 5-3.

**Table 5-3, Status LED Indications**

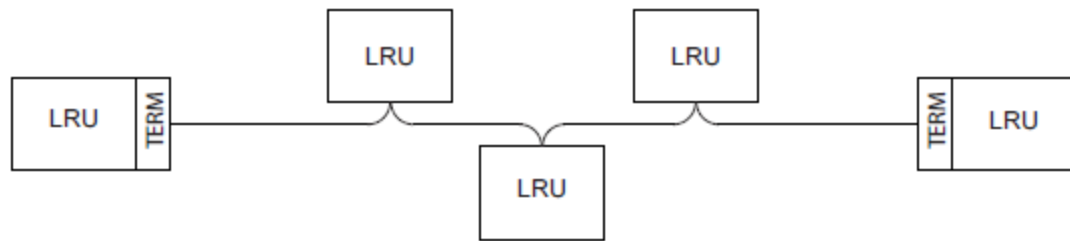
LED Indication	Description
No Light	No Power
Steady Green	On, but not communicating via CAN Bus
Flashing Green	On and communicating via CAN Bus
Red	Hardware Fault
Alternating Red/Green	CAN bus network error two similar devices are configured with the same unit ID

- 1) Ensure the CAN bus is daisy-chained between CAN devices around the system, and CAN devices are not connected via a single point or routed through a hub device (Figure 5-1). This can cause unwanted signal reflections and “orphan” some devices on the bus and prevent their communication.



**Figure 5-1 Incorrect CAN Wiring Example**

- 2) Ensure the CAN bus is terminated in only two locations, and only at the extreme ends of the CAN bus (Figure 5-2).



CORRECT - CAN BUS TERMINATED AT EACH END OF BACKBONE

**Figure 5-2 Correct CAN Bus Terminator Example**

- 3) With power removed, remove the CAN bus connector from one of the devices that is not located at either of the extreme ends of the CAN bus.
  - a. Using an Ohm meter, verify the resistance between the CAN-H and CAN-L pins on the connector is 60  $\Omega$ . This will verify the CAN backbone is properly terminated at each end (two 120  $\Omega$  terminating resistors in parallel).
  - b. A resistance of 120  $\Omega$  indicates one of the two required CAN terminations is missing.
  - c. A resistance of 40  $\Omega$  or less indicates too many terminations are installed.
- 4) Verify the CAN-H and CAN-L signals are not swapped, shorted together, or open-circuited at any LRU connector.
- 5) Verify the CAN-H and CAN-L signals are not shorted to ground.
- 6) Highlight each device on the configuration mode Device Information page on the #1 G5 unit and verify the value displayed for Network Error Rate is a steady 0%.
- 7) Power up the #1 G5 unit and one other CAN device at a time and verify the connection quality for each device. Sometimes a device will communicate only when it is the only powered device on the CAN bus if one or more of the above issues is present. Evaluating each CAN device in turn can help narrow down a problem.



**NOTE**

*If a Lightning Protection Module is installed, check for continuity between backshell leads per Garmin G5 Electronic Flight Instrument Part 23 AML STC Installation Manual, 190-01112-10 section 5.*

## 5.2 Outline and Installation Drawings

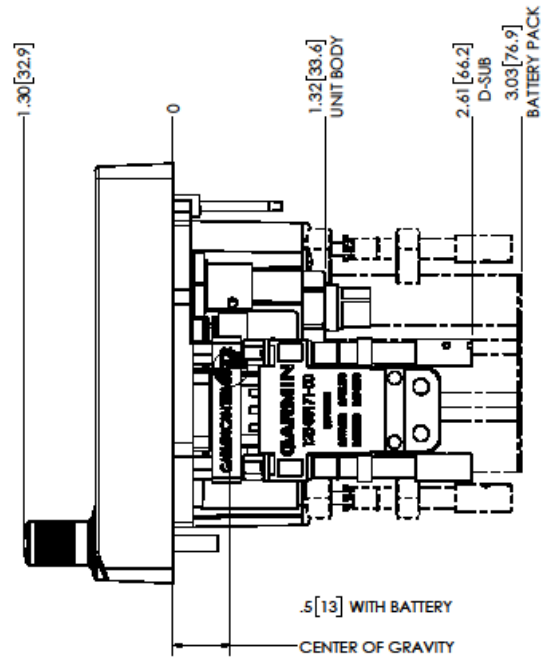


Figure 5-3 G5 Outline Drawing (side view)

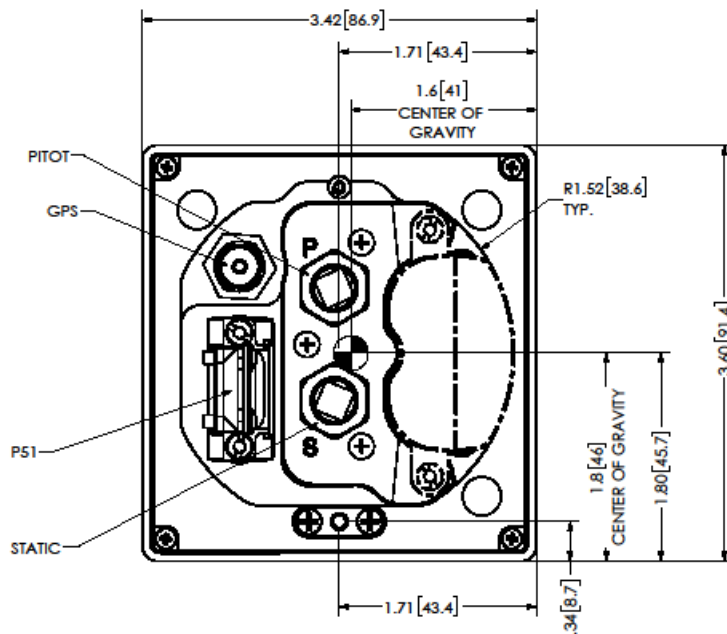
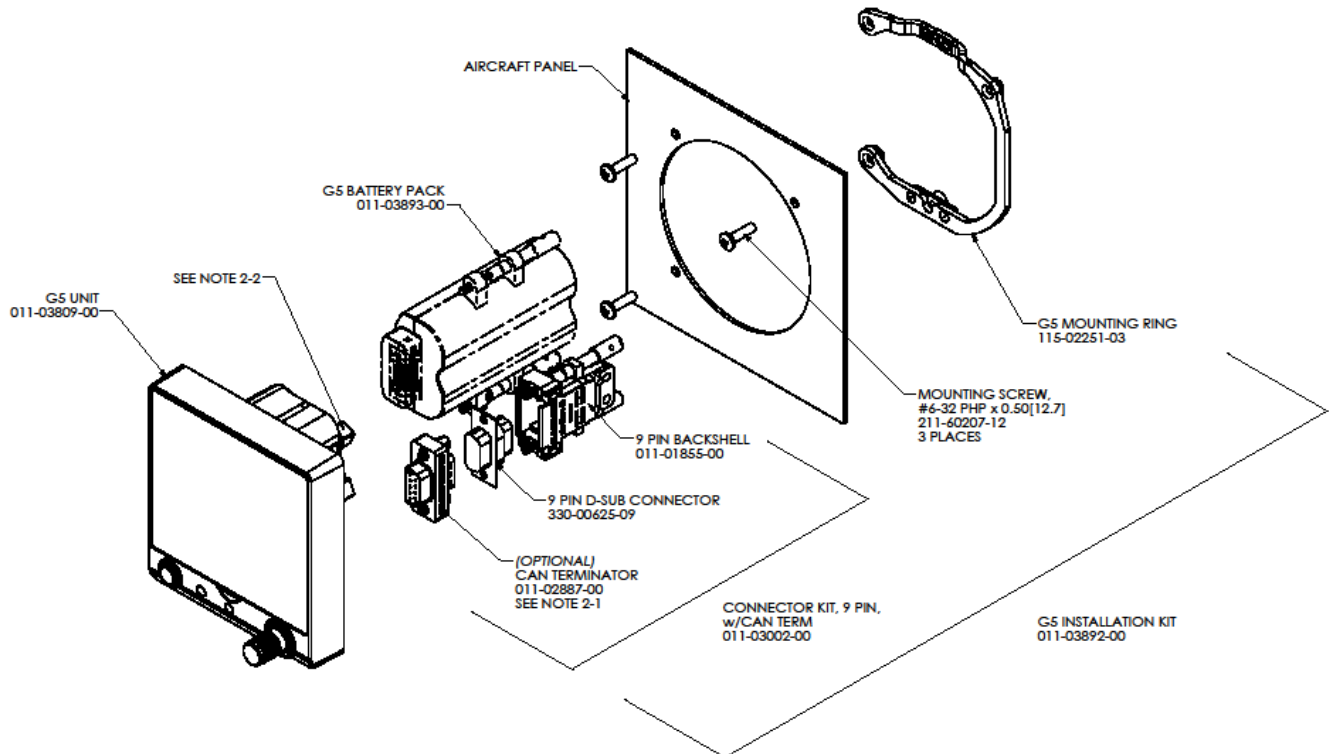


Figure 5-4 G5 Outline Drawing (back view)



**Figure 5-5 G5 Exploded View**

## 5.3 G5 Interconnect Drawings

For G5 system interconnect drawings reference Garmin Document 190-01112-10.

### 5.3.1 Connector Layout

For G5 system connector layout reference Garmin Document 190-01112-10.

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## 6 EQUIPMENT REMOVAL & INSTALLATION

This section describes how to remove and install the equipment associated with this STC.

The G5 System equipment part numbers approved by STC SA01818WI-A are found in Table 1-2 of Garmin document 190-01112-10, *Garmin G5 Part 23 AML STC Installation Manual*.

### 6.1 G5 Unit



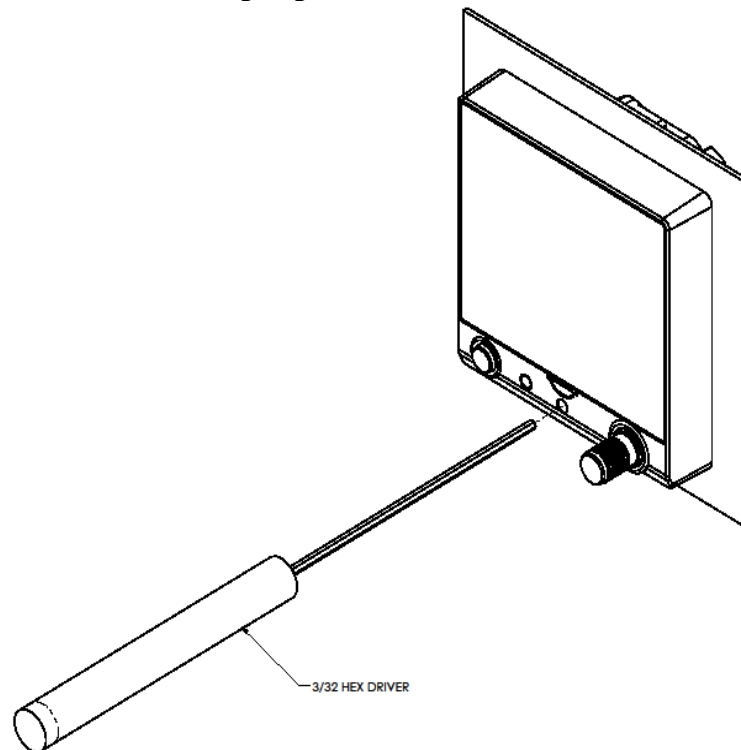
#### CAUTION:

*When removing and/or installing the G5, always ensure that aircraft power is off. Unplug any auxiliary power supplies.*

#### Removal

Removal and reinstallation procedure for a standard G5 installation or a G5 recessed into the panel is identical.

1. Insert a hex drive tool through the access hole in the front cover of the G5 as shown in Figure 6-1 loosen the unit from the mounting ring.



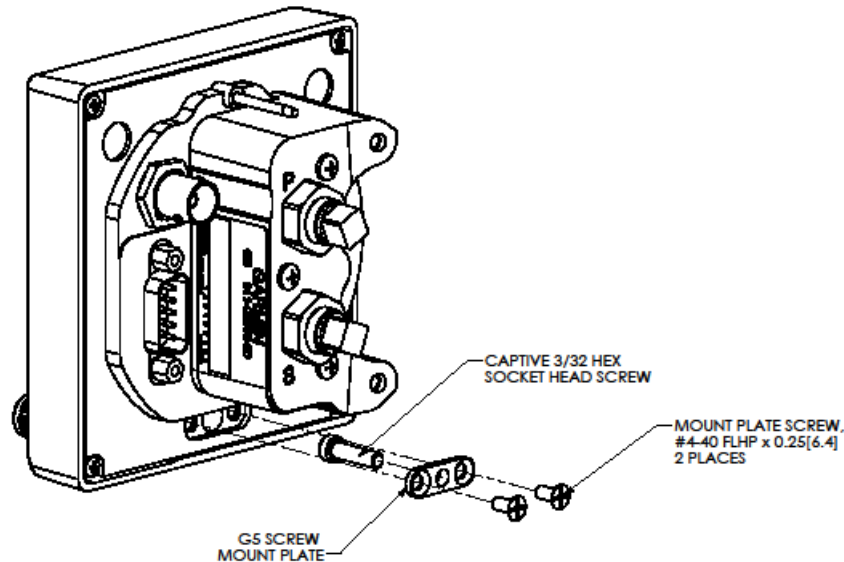
**Figure 6-1 G5 Hex Driver**

2. Disconnect the pitot and static lines from the G5 unit.
3. Disconnect the electrical connector and GPS coaxial cable connector (if installed) from the G5 unit.
4. Remove the G5 unit.

## Reinstallation

1. Inspect the electrical and coaxial connectors and pins for signs of damage. Repair any damage.
2. Reconnect the electrical connector and GPS coaxial connector (if installed) to the G5 unit.
3. Reconnect the pitot and static lines to the G5 unit. The ports are labeled on the unit using the abbreviations “P” and “S” respectively.
4. Insert the alignment pin located at the top of the unit into the mating hole in the mounting ring, pushing the unit flush with the instrument panel.
5. Insert a hex drive tool through the access hole in the front cover of the G5 as shown in Figure 6-1 and tighten the unit to the instrument panel using 10-12 in-lbs torque.
6. Proceed to Section 7 for configuration and testing.

If a replacement G5 unit is being installed in an instrument panel greater than 0.150 inch thick, the captive mounting screw must be replaced with a longer #6-32 hex socket head screw. To replace the captive mounting screw, remove the two #4-40 flat head Phillips mount plate screws, the G5 screw mount plate, and the captive screw as shown in Figure 6-2. Install a longer #6-32 hex socket head screw and reinstall the screw mount plate. Ensure correct orientation of the screw mount plate before applying 6-8 in-lb. of torque to the #4-40 mount plate screws.



**Figure 6-2 G5 Captive Mounting Screw**



## 6.2 G5 Battery

### Removal

1. Loosen the G5 unit per Section 6.1. Do not remove the pitot and static lines or the electrical and GPS coaxial cable connectors from the G5 unit if access to the battery can be gained while these items remain connected.
2. Use a screwdriver to loosen the battery jackscrews on the back of the unit (reference Figure 5-5.)
3. Remove the battery from the G5 unit.

### Reinstallation

1. Locate the battery on the back of the G5 unit.
2. Use a screwdriver to tighten the battery jackscrews to back of the G5 unit.
3. Reinstall the G5 unit per Section 6.1.

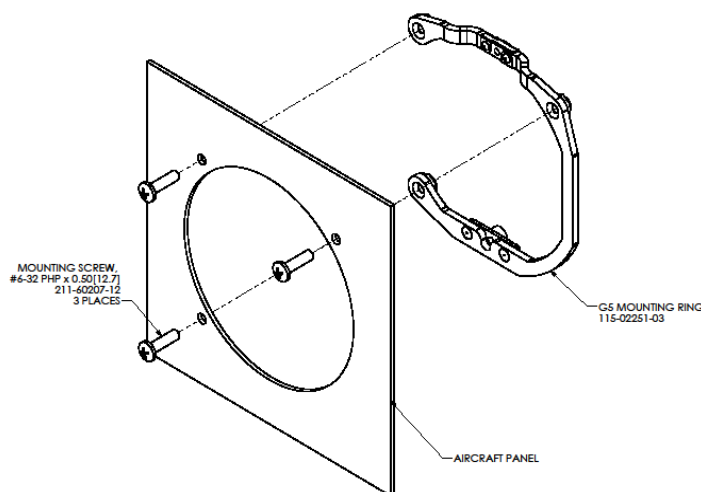
## 6.3 G5 Mounting Ring Replacement

### Removal

1. Loosen the G5 unit per Section 6.1. Do not remove the pitot and static lines or the electrical and GPS coaxial cable connectors from the G5 unit if access to the mounting ring can be gained while these items remain connected.
2. Remove the three #6-32 screws that secure the mounting ring to the instrument panel.
3. Remove the G5 mounting ring.

### Reinstallation

1. Locate the new mounting ring, and secure to the instrument panel using the three #6-32 screws.
2. Evenly torque the screws to 10-12 in-lbs.
3. Reinstall the G5 unit per Section 6.1.



**Figure 6-3 G5 Mounting Ring**

## 6.4 GPS Antenna

Refer to the data which installed the GPS antenna for removal and installation of the GPS antenna. If a glareshield antenna is installed, refer to the *Garmin G5 Electronic Flight Instrument Part 23 AML STC Installation Manual*, 190-01112-10 section 4.

## 6.5 GMU 11



### CAUTION:

*When removing and/or installing the GMU11, always ensure that aircraft power is off. Unplug any auxiliary power supplies.*

### Removal

1. Gain access to the GMU 11. Refer to the location information recorded in APPENDIX B of this document and maintained with the aircraft records.
2. Disconnect the GMU 11 connector.
3. Unscrew the 4 fasteners that hold the GMU 11 to the mounting location.



### NOTE

*Make sure the hardware removed from the GMU 11 mounting is retained for reinstallation. If hardware needs to be replaced, reference Figure 6-4 for appropriate Hardware part numbers.*

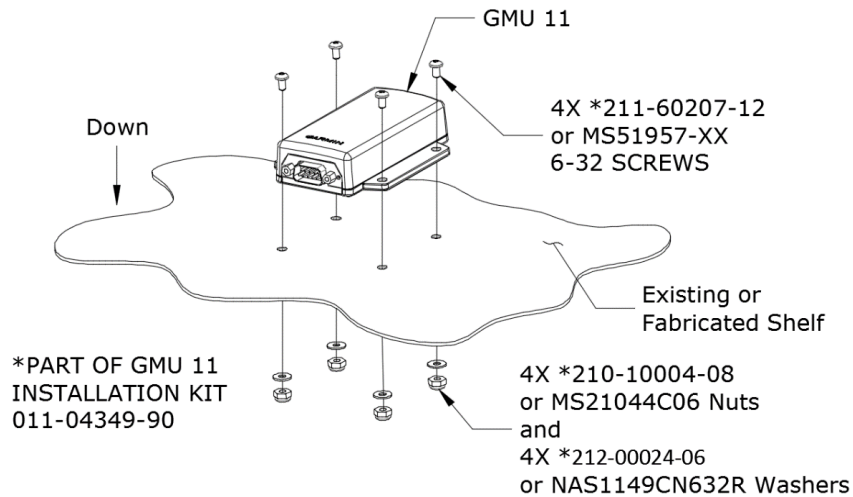


### NOTE

*Be sure to use non-magnetic tools to avoid harming the GMU.*

### Reinstallation

1. Place the GMU 11 in its mounting location and align its holes with the mounting holes.
2. Insert the 4 mounting screws and secure the GMU 11 in place with washers and nuts. Tighten screws until snug, plus 1/4 turn.
3. Inspect the electrical connector and pins for signs of damage. Repair any damage.
4. Connect the wiring harness to the GMU 11.
5. Conduct the Magnetometer calibration procedure (Section 7.5.3), the Compass Rose Swing (Section 7.6 ) and the Magnetic interference check (Section 7.8.1).



**Figure 6-4 GMU 11 Mounting Hardware**

## 6.6 GAD 29/29B/29D



### CAUTION:

*When removing and/or installing the GAD 29/29B/29D, always ensure that aircraft power is off. Unplug any auxiliary power supplies.*

### Removal

1. Gain access to the GAD 29/29B/29D. Refer to the location information recorded in APPENDIX B of this document and maintained with the aircraft records.
2. Disconnect the GAD 29/29B/29D connectors.
3. Unscrew the 4 fasteners that hold the GAD 29/29B/29D to the mounting location.

### Reinstallation

1. Place the GAD 29/29B/29D in its mounting location and align its holes with the mounting holes.
2. Insert the 4 mounting screws and secure the GAD 29/29B/29D in place.
3. Inspect the electrical connectors and pins for signs of damage. Repair any damage.
4. Connect the wiring harness to the GAD 29/29B/29D.
5. Conduct the system return to service procedure in Section 8.

## 6.7 GAD 13



### CAUTION:

*When removing and/or installing the GAD 13, always ensure that aircraft power is off. Unplug any auxiliary power supplies.*

#### Removal

1. Gain access to the GAD 13. Refer to the location information recorded in APPENDIX B of this document and maintained with the aircraft records.
2. Disconnect the GAD 13 connectors.
3. Unscrew the 2 fasteners that hold the GAD 13 to the mounting location.

#### Reinstallation

1. Place the GAD 13 in its mounting location and align its holes with the mounting holes.
2. Insert the 2 mounting screws and secure the GAD 13 in place.
3. Inspect the electrical connectors and pins for signs of damage. Repair any damage.
4. Connect the wiring harness to the GAD 13.
5. Conduct the system return to service procedure in Section 8.

## 6.8 GTP 59



### CAUTION:

*When removing and/or installing the GTP 59, always ensure that aircraft power is off. Unplug any auxiliary power supplies.*

#### Removal

1. Ensure power is removed from the GAD 13.
2. Remove the mounting nut and washer from the GTP 59 probe.
3. Pull the GTP 59 from the mounting hole.

#### Reinstallation

1. Place the GTP 59 on the previous installation location.
2. Install the washer and nut.
3. Torque nut to 100 +/- 20 in-lbs.
4. Conduct the system return to service procedure in Section 8.



## 6.9 Lightning Protection Component Installation

This section applies to G5 system installations that were installed under MDL revision 14 or later (STC IM revision 16 or later).

If the LPM is installed, refer to section 6.9.1 for removal/re-installation method.

If the LPM is not installed, refer to sections 6.9.2 through 6.9.4 for resistor/diode removal/re-installation methods.

### 6.9.1 LPM installation



#### CAUTION:

*When removing and/or installing the LPM, always ensure that aircraft power is off. Unplug any auxiliary power supplies.*

#### Removal

1. Gain access to the back of the G5 unit.
2. Disconnect the G5 electrical connector from the back of the G5 unit.

#### Reinstallation

1. Inspect the electrical connector and pins for signs of damage. Repair any damage.
2. Connect the G5 electrical connector to the back of the G5 unit.
3. Conduct the system return to service procedure in Section 8.

### 6.9.2 G5 Resistor and Diode maintenance

If during the course of troubleshooting it is determined that a discrete component connected to the G5 is faulty, there are two choices for repair:

1. Remove all discrete components from wire harness, and install a LPM per the latest revision of 190-01112-10, *Garmin G5 Electronic Flight Instrument Part 23 AML STC Installation Manual*.
2. Remove the faulted component and reinstall a new component in accordance with the instructions detailed below.



#### CAUTION:

*When removing and/or installing the Lightning Protection Components, always ensure that aircraft power is off. Unplug any auxiliary power supplies.*

There are two methods of resistor installation on the CAN bus wires:

- **Method A:** Used for resistor installations utilizing 120Ω CAN cable, see Figure 6-5 and Figure 6-6.
- **Method B:** Used for resistor installations that are utilizing shielded twisted-pair cable MIL-C-27500, see Figure 6-7, Figure 6-8 (G5 as CAN bus terminator), and Figure 6-9 (G5 not CAN bus terminator).

Figure 6-10 and Figure 6-11 show the buildup and installation requirements for the G5 power diode.

See Section 5 of the Garmin document 190-01112-10, *Garmin G5 Electronic Flight Instrument Part 23 AML STC Installation Manual* for complete wiring interconnect details.

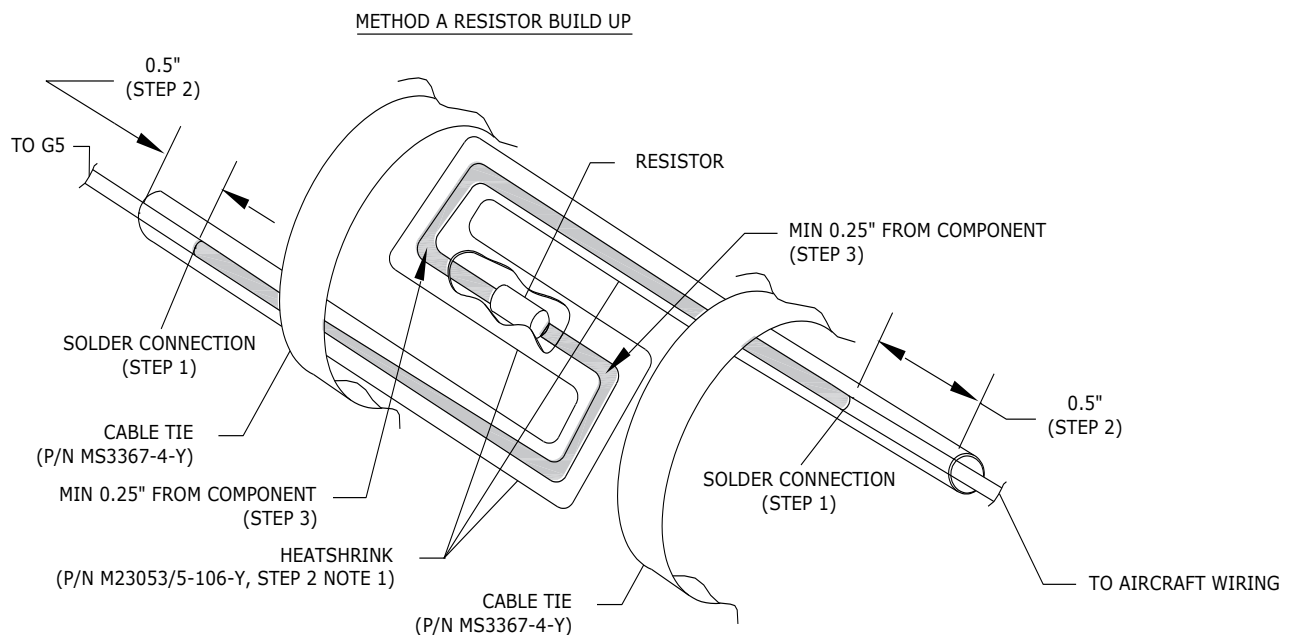
## 6.9.2.1 Discrete component part numbers

Part numbers are provided in the case of finding a faulted component that needs to be replaced.

- 15Ω (±1% or better), 0.5W resistors qualified to MIL-R-10509 or MIL-PRF-26 (i.e. RN65D15R0FB14, RN65C15R0BB14).  
**Note:** The ±1% tolerance is a minimum requirement and any resistor with a better tolerance may be used.
- 120Ω (±5% or better), 0.25W resistors qualified to MIL-R-10509 or MIL-PRF-26 (i.e. RN60D1200FB14).  
**Note:** The ±5% tolerance stated is a minimum requirement and any resistor with a better tolerance may be used.
- Diode, 1000V, 1A, P/N 1N4007 (Note: The diode P/N may be amended with a suffix, this is packaging-only information and does not affect function of the diode)

## 6.9.3 G5 Resistor Buildup Method A

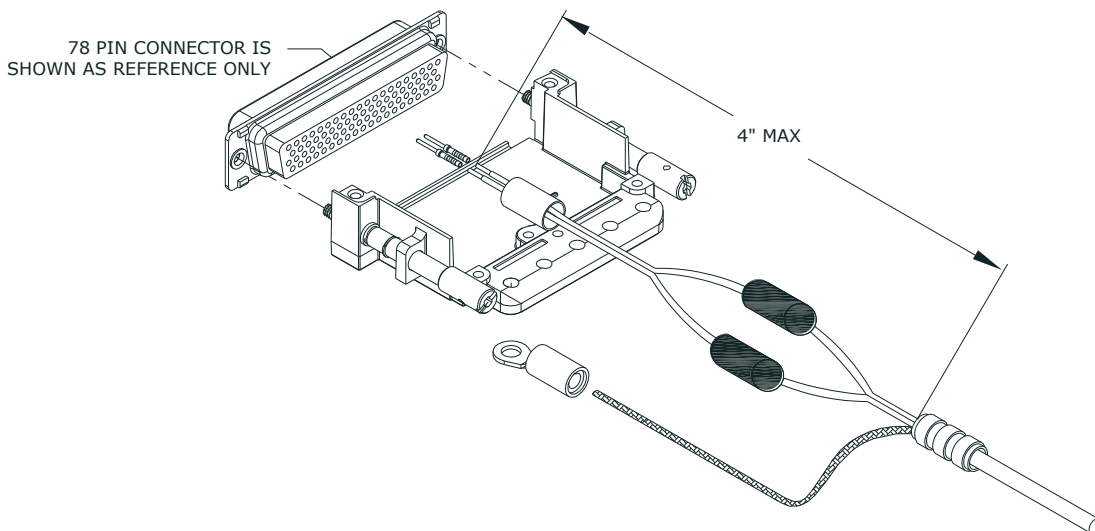
Figure 6-5 shows the installation procedure for the resistors into the wiring harness. Figure 6-6 shows the placement requirements of the resistors on the CAN bus wiring.



### STEPS FOR COMPONENT BUILDUP:

1. SOLDER COMPONENT TO WIRE PER SAE AS4461.  
**NOTE:** ACCEPTABLE SOLDER TYPES ARE SN60 OR SN63. CLEAN FLUX RESIDUES USING AN APPROPRIATE FLUX CLEANER.
2. COVER COMPONENT AND AT LEAST 0.5 INCH OF WIRE ON EACH SIDE OF COMPONENT LEADS WITH HEAT SHRINK AS SHOWN ABOVE. SHRINK IN PLACE.  
**NOTE:** THE "-Y" CHARACTER IS FOR COLOR OF HEATSHRINK, COLOR OF HEAT SHRINK IS THE INSTALLERS CHOICE.
3. BEND COMPONENT LEADS BACK OVER THE COMPONENT, BEND MUST BEGIN A MINIMUM OF 0.25 INCH FROM THE COMPONENT.
4. SECURE TO BUNDLE WITH CABLE TIES ON EITHER SIDE OF THE COMPONENT.  
**NOTE:** THE "-Y" CHARACTER IN THE CABLE TIE P/N IS FOR COLOR, COLOR OF CABLE TIE IS THE INSTALLERS CHOICE.

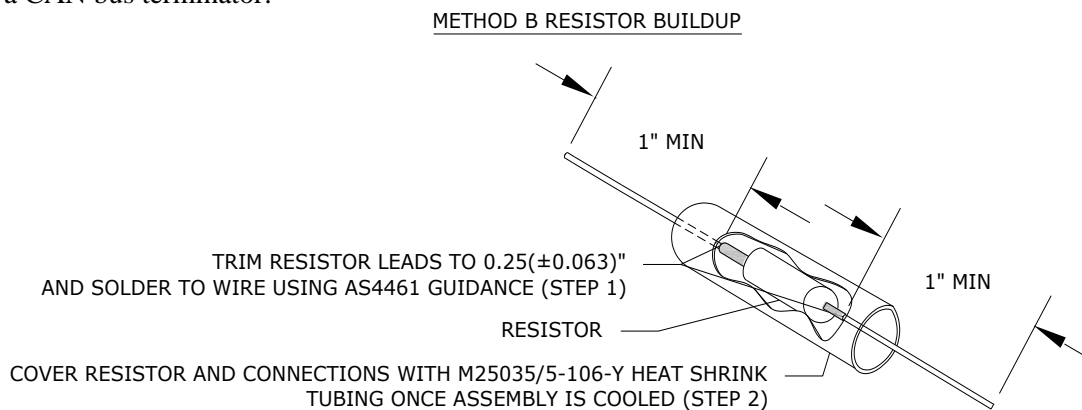
**Figure 6-5 G5 Resistor Method A Buildup**



**Figure 6-6 Method A Placement of G5 CAN Bus Resistors**

### 6.9.3.1 G5 Resistor Buildup Method B

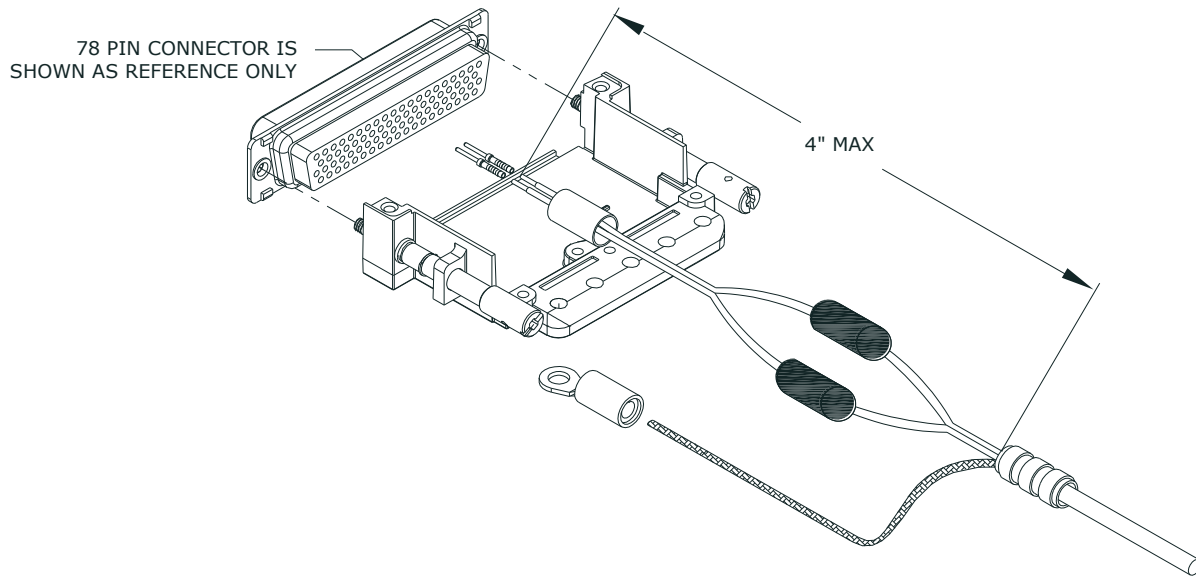
Figure 6-7 shows the preparation procedure for the components into the wiring harness. Figure 6-8 shows the placement requirements of the resistors on the CAN bus wiring if the G5 is in the middle of the CAN bus. Figure 6-9 shows the placement requirements of the resistors on the CAN bus wiring if the G5 is used as a CAN bus terminator.



STEPS FOR COMPONENT BUILDUP:

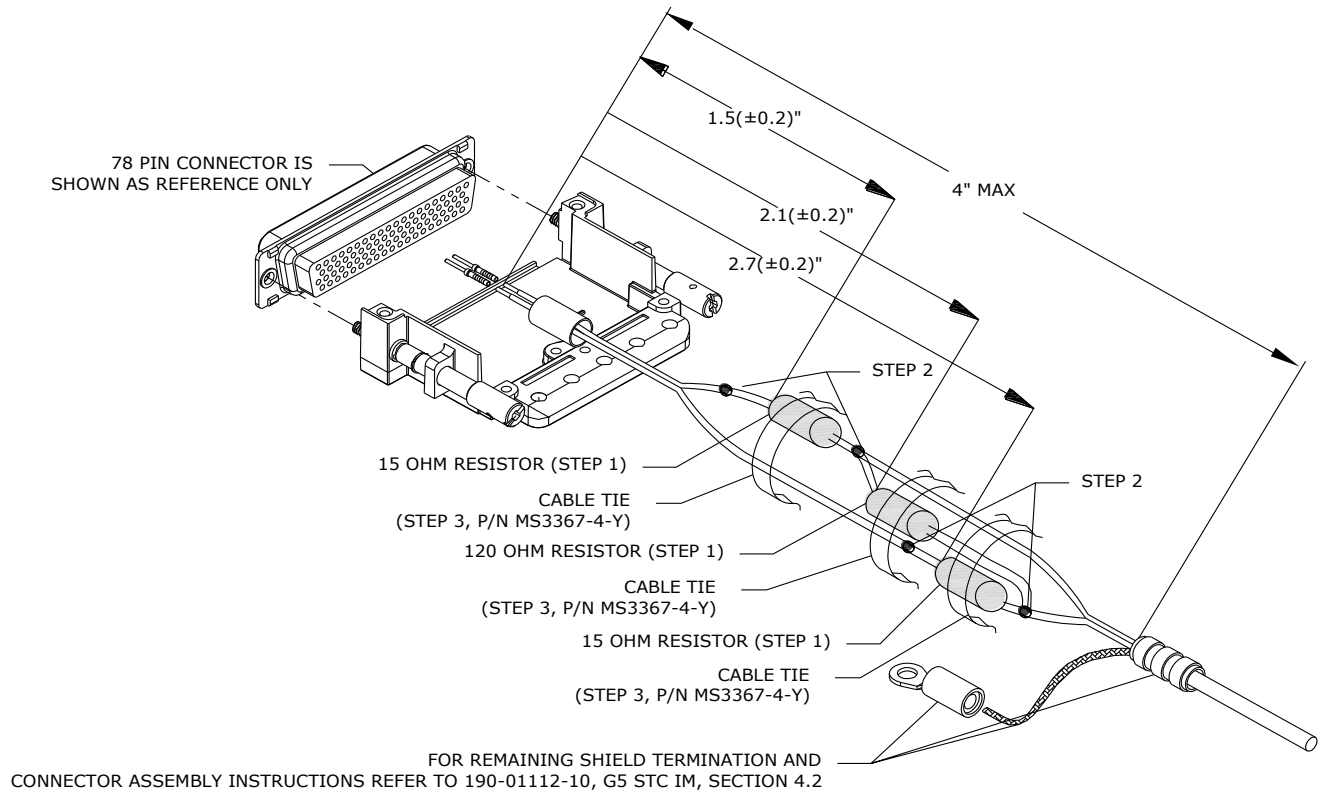
1. SOLDER COMPONENT TO AT LEAST 1" OF STRANDED M22759 WIRE PER SAE AS4461.  
NOTE: ACCEPTABLE SOLDER TYPES ARE SN60 OR SN63. CLEAN FLUX RESIDUES USING AN APPROPRIATE FLUX CLEANER.
2. COVER COMPONENT AND AT LEAST 0.5 INCH OF WIRE ON EACH SIDE OF COMPONENT LEADS WITH HEATSHRINK AS SHOWN ABOVE. SHRINK IN PLACE.  
NOTE: THE "-Y" CHARACTER IS FOR COLOR OF HEAT SHRINK, COLOR OF HEAT SHRINK IS THE INSTALLERS CHOICE.
3. MARK HEAT SHRINK WITH RESISTOR VALUE IN PERMANENT INK.

**Figure 6-7 Method B G5 Resistor Preparation**



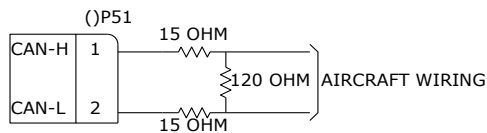
**Figure 6-8 Method B Placement of G5 CAN Bus Resistors (G5 not CAN bus terminator)**





**STEPS FOR COMPONENT INSTALLATION:**

1. CREATE COMPONENT BUILDUPS AS SHOWN IN FIGURE 6-7.
  2. SOLDER RESISTOR BUILDUPS TOGETHER AS SHOWN IN THE ABOVE FIGURE PER AS4461. A SIMPLIFIED CIRCUIT IS SHOWN BELOW.
- NOTE: ACCEPTABLE SOLDER TYPES ARE SN60 OR SN63. CLEAN FLUX RESIDUES USING AN APPROPRIATE FLUX CLEANER.

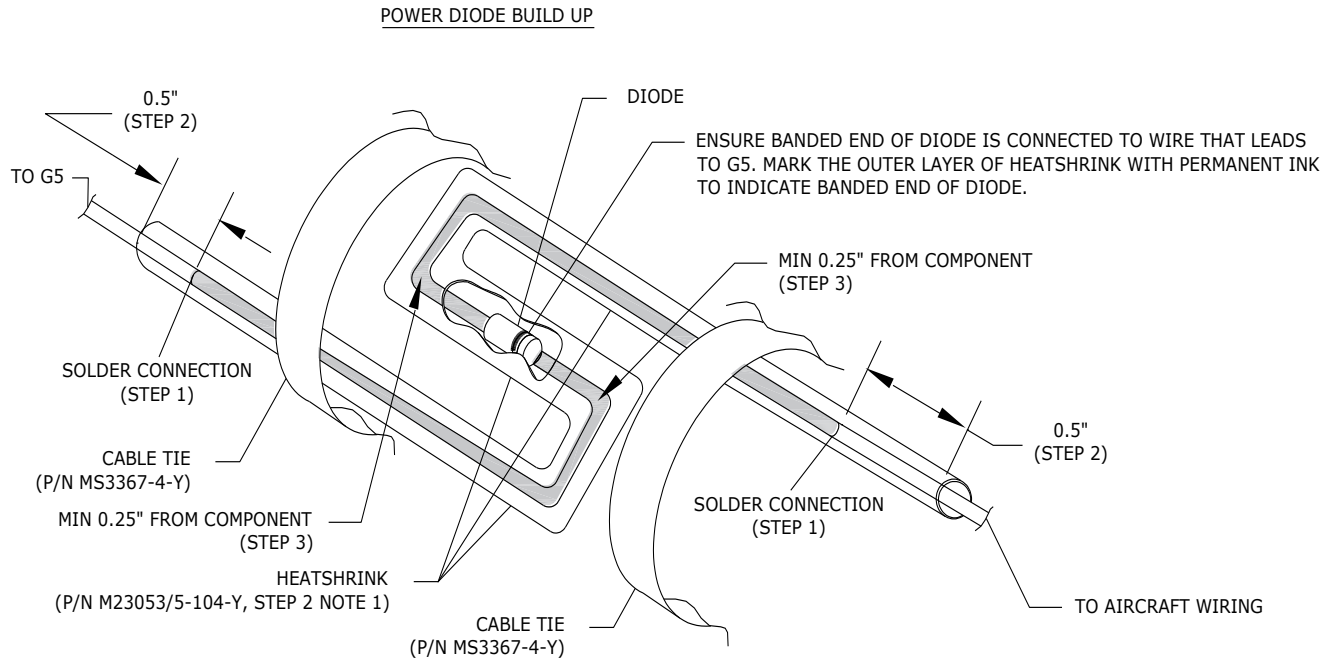


3. SECURE THE COMPONENTS TOGETHER IN THE WIRE BUNDLE AS SHOWN ABOVE.
- NOTE: THE "-Y" CHARACTER IN THE CABLE TIE P/N IS FOR COLOR, COLOR OF CABLE TIE IS THE INSTALLERS CHOICE.

**Figure 6-9 Method B Placement of CAN Bus Components (G5 as CAN bus terminator)**

## 6.9.4 G5 Diode Installation (Both Wire types)

Figure 6-10 shows the installation procedure for the diode into the wiring harness. Figure 6-11 shows the placement of the diode on the power input for the G5.

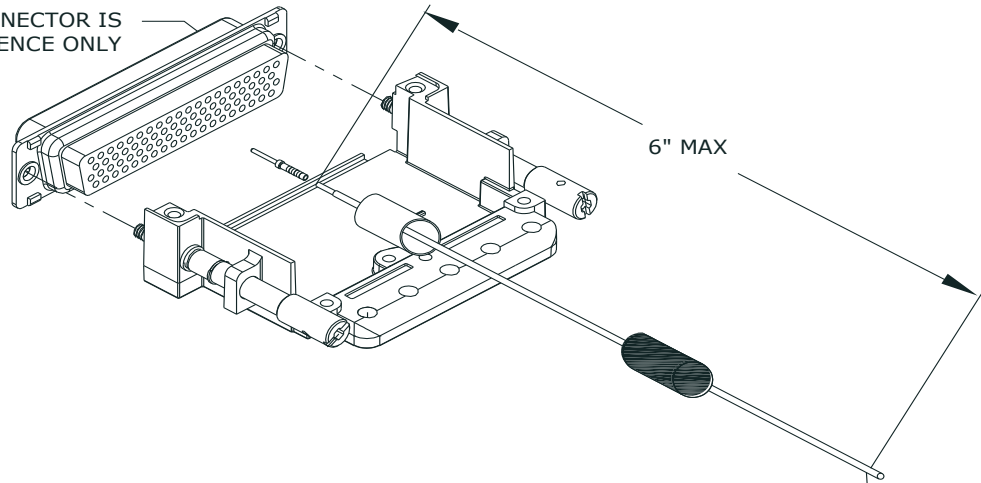


STEPS FOR COMPONENT BUILDUP:

1. SOLDER COMPONENT TO WIRE PER SAE AS4461.  
NOTE: ACCEPTABLE SOLDER TYPES ARE SN60 OR SN63. CLEAN FLUX RESIDUES USING AN APPROPRIATE FLUX CLEANER.
2. COVER COMPONENT AND AT LEAST 0.5 INCH OF WIRE ON EACH SIDE OF COMPONENT LEADS WITH HEATSHRINK AS SHOWN ABOVE. SHRINK IN PLACE.  
NOTE 1: THE "-Y" CHARACTER IS FOR COLOR OF HEATSHRINK, COLOR OF HEATSHRINK IS THE INSTALLERS CHOICE.  
NOTE 2: FOR THE DIODE, MARK THE BANDED END OF THE DIODE ON THE HEATSHRINK WITH PERMANENT INK.
3. BEND COMPONENT LEADS BACK OVER THE COMPONENT, BEND MUST BEGIN A MINIMUM OF 0.25 INCH FROM THE COMPONENT.
4. SECURE TO BUNDLE WITH CABLE TIES ON EITHER SIDE OF THE COMPONENT.  
NOTE: THE "-Y" CHARACTER IN THE CABLE TIE P/N IS FOR COLOR, COLOR OF CABLE TIE IS THE INSTALLERS CHOICE.

**Figure 6-10 G5 Power Diode Buildup (Both Wire Types)**

78 PIN CONNECTOR IS SHOWN AS REFERENCE ONLY



DIODE ASSMEBLY, INCLUDING HEATSHRINK, MUST BE INSTALLED WITHIN 6 INCHES OF THE G5 CONNECTOR

**Figure 6-11 Placement of G5 Power Diode (Both Wire Types)**

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## 7 EQUIPMENT CONFIGURATION & TESTING

This section contains instructions for configuration and checkout of the G5(s) and supporting equipment after reinstallation or replacement. The steps which are not applicable to a particular installation may be skipped.

The person performing these procedures must be familiar with the aircraft, have a working knowledge of typical avionics systems, and has experience using the test equipment defined in this section.

### 7.1 Recommended Test Equipment

The following test equipment is recommended to conduct the procedures in this section:

- Air data test set (pitot/static ramp tester)
- Digital Multi-Meter
- Ground power unit capable of supplying 14/28 Vdc power to the aircraft systems and avionics
- Digital Level or equivalent
- VHF NAV Test Set



#### NOTE

*All test equipment must have current calibration records.*

### 7.2 Pitot Static System Leak Check

If the pitot and/or static system lines were removed from any G5 unit, perform a pitot static system leak check in accordance with the aircraft manufacturer's approved data.



#### CAUTION

*To avoid damaging the G5 pressure sensors, both the pitot and static ports must be connected to the air data test set.*

### 7.3 G5 Software

This section contains procedures for loading software to the G5 unit.

#### 7.3.1 Loader Card Creation

To create a software loader card, follow the procedures outlined below.

1. To obtain the latest software version approved for this STC, visit [www.Garmin.com](http://www.Garmin.com) and navigate to the Aviation Product/General Aviation/Indicators/G5 page. Do not download software from the Experimental Aircraft web page.
2. Download the self-extracting update file onto your hard drive.
3. Insert a FAT32-formatted microSD™ card with at least 20 MB of free space into your card reader.
4. Open the self-extracting update file and follow the instructions provided by the installer application. You will be prompted to specify the drive letter of the microSD card you wish to use for the update. When the transfer is complete, safely eject the microSD card.

### 7.3.2 Software Loading Procedure



#### NOTE

*If the G5 is installed as part of the G3X STC, the software for the G5 is included with the G3X software. Refer to the G3X STC for procedures to install the latest G5 software. If there is a newer version of G5 software on the Garmin website than what is included with the G3X software, the newer version can be directly loaded into the G5.*



#### NOTE

*If two G5's are installed, this procedure must be completed on both G5's. If both G5 units software do not match, the G5 will post a "Software Version Mismatch" message on the display. This message will be removed when both units have been loaded with matching software.*

1. Power on the G5, then insert the software loader card created in Section 7.3.1 into the microSD™ card slot.
2. If the version of software on the card is newer than the version currently on the unit, a software update pop-up will appear on the screen. Select OK to begin the update.
3. The unit will reboot to the software update screen and the software update will begin automatically. This screen will show the progress of the software update.
4. Ensure power is not removed while the update is being performed.
5. The unit will reboot after the update is complete.
6. The new software version will be displayed while the unit powers on or in the configuration mode menu.

### 7.3.3 Alternate Software Loading Procedure



#### NOTE

*The following procedures should be followed if a later version of experimental G5 software has been loaded to the G5 Certified unit.*

1. With the G5 powered off, insert the software loader card created in Section 7.3.1 into the microSD™ card slot.
2. Enter configuration mode as stated in Section 7.4
3. Navigate to the Device Information page and select SFD1 for G5 #1 or SFD2 for G5 #2.
4. Scroll to Software Version and select Update.

### 7.4 G5 Configuration Mode

To enter configuration mode, hold down the knob while powering on the G5. Configuration selections are made by rotating and pressing the knob on the face of the G5 as necessary to select the correct configurations.

#### 7.4.1 Configuration Pages Summary

When in configuration mode, the G5 displays the following configurations pages:

- Device Information – used to display device specific information such as the software version and basic indicator configuration.
- Attitude – used to configure Indicator Type, Pitch Display preferences, and User Pitch offset.
- Air Data – used to enable/ disable the G5 Air Data Sensors and configure the Vertical Speed rate.



- Magnetometer – allows configuration of magnetometer and magnetometer positioning.
- Airspeed – allows for configuration of the reference speeds.
- Flight Controls – used to configure the system for Garmin and Non-Garmin autopilots if installed.
- Backlight – used to configure backlight configuration parameters.
- Display – used to configure the display format of the G5.
- Battery – used to set backup battery status and power off modes.
- GPS – used to configure the internal GPS receiver.
- Navigation – used to configure the display of navigation information
- Units – This page is used to configure the units type to display altitude, airspeed, ground speed, vertical speed and pressure displays.
- RS-232 – used to configure the RS-232 input and output ports used of the G5.
- ARINC 429 - used to configure the ARINC 429 input and output ports used of the G5.
- Exit Configuration Mode – used to exit configuration mode.

## 7.4.2 G5 Configuration

Before replacing a G5 unit, the technician should obtain the most current G5 configuration settings which are typically kept with the aircraft records (reference APPENDIX A ). If the existing configuration setting record is not available, set the configuration to match the values and units indicated in the aircraft’s AFM or other operational information. If any changes are made to the configuration settings, record the new settings in APPENDIX A and keep in the aircraft records for future reference.

## 7.5 G5 Calibration Procedures

Table 7-1 describes the calibration procedures to be performed for the G5 unit after maintenance is performed.

**Table 7-1, Calibration Procedure Summary**

Calibration Procedure	Procedure Name	Procedure Description	Requirement
A	Pitch/Roll Offset Compensation	Level aircraft	Procedure A is required if a new G5 unit is installed
C	Air Data Static Pressure Calibration	Altitude calibration	Procedure C is recommended if the G5 altimeter does not match primary altimeter
D	GMU 11 Magnetometer Calibration	Magnetometer Calibration	Procedure D is only required if a GMU 11 was installed and interfaced to either G5.

### 7.5.1 Calibration Procedure A: Pitch/Roll Offset Compensation



**NOTE**

*If two G5’s are installed, this procedure must be done on both and can be done concurrently.*

See Section 7.5.1.1 for example of this calibration procedure.

Using the following procedure, complete these equations.



$$\begin{array}{ccc} \text{New Pitch Offset} & \text{A/C Pitch Offset} & \text{Pitch Calibration} \\ \text{(From Step 9)} & \text{(From Step 2)} & \text{(For Step 10)} \\ \boxed{\phantom{000}} & - \boxed{\phantom{000}} & = \boxed{\phantom{000}} \end{array}$$
  
$$\begin{array}{ccc} \text{New Roll Offset} & \text{A/C Roll Offset} & \text{Roll Calibration} \\ \text{(From Step 9)} & \text{(From Step 2)} & \text{(For Step 10)} \\ \boxed{\phantom{000}} & - \boxed{\phantom{000}} & = \boxed{\phantom{000}} \end{array}$$

1. \*Consult the aircraft's maintenance manual and locate the longitudinal (ROLL) and lateral (PITCH) leveling points.
2. Using a digital level, document the Aircraft Roll and Pitch offsets. (Do not enter, exit, or move the aircraft at this point.) Use a negative number for left wing up or nose up readings. Use a positive number for left wing down or nose down readings.
3. Select the Attitude Configuration Page.
4. Select Calibrate Pitch/Roll.
5. Ensure that aircraft and the unit comply with all on-screen instructions then select Start.  
-Disregard item 1, leveling the aircraft is not necessary.
6. A progress screen will then be displayed. There is a 30 second countdown timer for the procedure that resets if the aircraft moves.
7. When the calibration is complete, a successful status message will be displayed along with the new pitch and roll offsets.
8. If the leveling offsets documented from Step 2 were both 0.0, the calibration is complete. If either new offset were other than 0.0, continue to step 9.
9. Document the "New Roll Offset" and "New Pitch Offset" numbers and complete the equation.
10. Press "Done" and adjust the values of the "Roll Calibration" and the "Pitch Calibration" values to the answers from the equations.



#### NOTE

It is recommended that the adjusted "Roll Calibration" and the "Pitch Calibration" values from step 10 be recorded in Appendix A and retained with the aircraft permanent records.

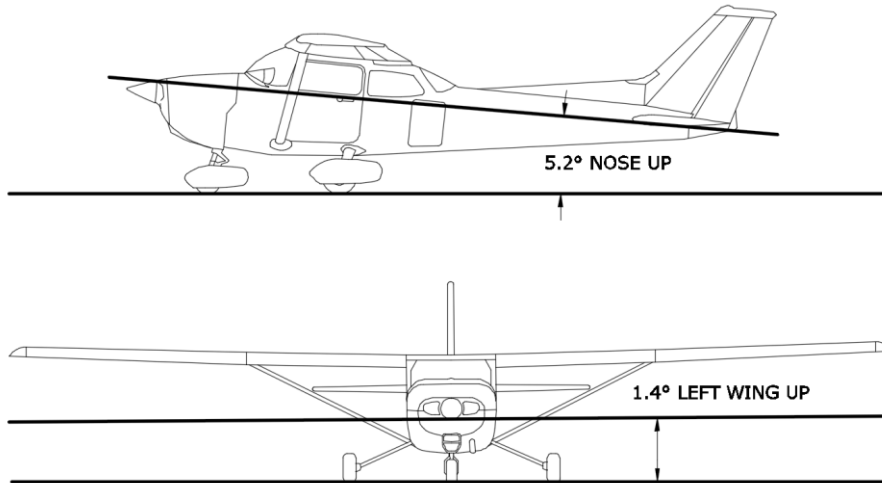
11. Exit Configuration Mode.
12. This completes the Attitude Calibration Procedure.

\*In flight level cruise attitude is not necessarily the same as the leveling points provided by the manufacturer. Adjustments to the pitch and roll offsets can be made to compensate for the aircraft flight characteristics.

### 7.5.1.1 Attitude Calibration Example

In Figure 7-1, the aircraft is sitting 5.2° nose up and 1.4° left wing up, (both negative number). Also, the G5 is mounted in the pilot's panel, which has an 8° forward tilt. After completing the Calibration Procedure in Step 7, the value in the Pitch Calibration field on the G5 is 2.8° and -1.4° in the Roll

Calibration field. See Figure 7-2 for the completed equations.



**Figure 7-1, Attitude Calibration Example**

New Pitch Offset (From Step 9)	A/C Pitch Offset (From Step 2)	Pitch Calibration (For Step 10)
2.8	-5.2	8.0
-		
New Roll Offset (From Step 9)	A/C Roll Offset (From Step 2)	Roll Calibration (For Step 10)
-1.4	-1.4	0.0
-		

**Figure 7-2 Example of Calibration Equations**

## 7.5.2 Calibration Procedure C: Air Data Static Pressure Calibration



### NOTE

All selections made in configuration mode in this section are made on the G5 ID strapped as #1. In a single G5 installation, Unit ID #1 is always the single G5 unit. In a Dual G5 installation, Unit ID #1 is the G5 in the Attitude or Turn Coordinator position.

The Air Data configuration page has a selection for static pressure calibration. This procedure is used to perform an altimeter re-calibration. The altitude pressure sensor used in the G5 is very low drift and does not typically require re-calibration.

The static pressure calibration requires the use of a pressure control system (test set) with an altitude accuracy of at least  $\pm 5$  ft. at sea level and  $\pm 20$  ft. at 30,000 ft. It is necessary to re-calibrate to sea level (0 ft.), 10,000 ft., 20,000 ft., and optionally to 30,000 ft. The operator is allowed to finish the calibration at the end of the 20,000 ft. calibration if the aircraft operational ceiling is below 20,000 ft.



### CAUTION

To avoid damaging the G5 pressure sensors, both the pitot and static ports must be connected to the test set.



1. Select the Air Data configuration page.
2. Select Calibrate Static Pressure.
3. Ensure all on-screen instructions have been complied with, then press Start.
4. At each calibration point the display will present a screen indicating the pressure altitude to set. Once the altitude is set, select Ready to calibrate this pressure.
5. During the calibration at each pressure, the pressure must be held constant for 30 seconds for the calibration step to be successful. The calibration may be cancelled at any point should the test setup require adjustment before repeating. A progress screen will be displayed showing the status of the test.
6. Select Done when the static pressure calibration is successfully completed.

### 7.5.3 Calibration Procedure D: GMU 11 Magnetometer Calibration



#### NOTE

*All selections made in configuration mode in this section are made on the G5 ID strapped as #1. In a single G5 installation, Unit ID #1 is always the single G5 unit. In a Dual G5 installation, Unit ID #1 is the G5 in the Attitude or Turn Coordinator position.*



#### CAUTION

*This magnetometer calibration procedure should be carried out on a compass rose to guarantee measurements free of environmental magnetic disturbances. If a compass rose is not available a sight compass can be used. Attempting to carry out this procedure on a typical ramp area may not yield a successful calibration. The accuracy of the heading display on the G5 cannot be guaranteed if this calibration is not performed on a magnetically clean and level surface.*



#### NOTE

*A magnetometer calibration failure is indicated by a “Magnetometer not Calibrated” message on the G5 on power up. If necessary, move the aircraft to a different location and attempt the magnetic calibration again.*

1. Start the aircraft engine in accordance with the aircraft AFM or POH.
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 (+/- 10°).
4. Restart the G5 in configuration mode.
5. Go to the “Magnetometer” page Group on the G5 unit.
6. Select the “Calibrate Magnetometer...” page.
7. The G5 will display instructions. Follow the on-screen instructions and select “Next” to cycle through each page of instructions.
8. On the final page, select “Start” to begin the calibration.
9. The G5 display advises the operator when to turn the aircraft, when to stop, and when to turn again.
10. Upon instruction to turn, taxi the aircraft in a right turn. After approximately 25° to 30° of turn from the last heading, the G5 display advises the operator when to stop the aircraft.



#### NOTE

*If smooth accurate turns are not made, the G5 may incorrectly interpret a station and instruct to “Hold current position...” prior to or after completion of the heading change. If this scenario is encountered, it is best for the operator to temporarily ignore the “Hold current position...”*



*command and instead use compass rose references to complete the heading change. Dwelling at these 30° increments for the time recommended by the G5 should result in successful calibration.*

11. The G5 instructs the operator to dwell at multiple headings around a complete circle.
12. Repeat the turn-and-stop process until the G5 advises that a successful calibration is complete and “Calibration: Success” is displayed on the G5.
13. Select “Done” on the G5 to conclude this procedure
14. Exit configuration mode.
15. Continue to Section 7.6.

## 7.6 Compass Rose Swing

After the Magnetic Calibration Procedure is successfully completed, a compass swing must be performed to verify the GMU 11 heading accuracy. If each heading displayed on the G5 (or G5 #1 and G5 #2) is within  $\pm 10^\circ$  of the actual heading no further adjustments are necessary.

1. With the G5(or G5 #1 and G5 #2 for a dual G5 installation) in normal mode, 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 G5 (or G5 #1 and G5 #2 for a dual G5 installation) in Table 7-2. 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 7-2.
4. Calculate the heading errors by subtracting the displayed (B) value from the actual (A) value for each of the headings in Table 7-2.

**Table 7-2, Heading Verification**

Heading (A)	Displayed G5 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°			

5. If all calculated heading errors for the G5 are  $\pm 6^\circ$  from the surveyed heading, the installation is acceptable and no further action is required. Proceed to Section 8.
6. If a Heading Error (A-B) is greater than  $\pm 6^\circ$ , calculate the average error by adding all errors and dividing by 12. This is the angle by which the GMU 11 must be physically rotated to correct



the installation or before changing the physical location, perform a Magnetometer Interference Check in Section 7.5.3 to verify interference is not causing the error.

7. If necessary, modify the installation to rotate the GMU 11 by the amount calculated in the previous step. When looking down at the GMU 11, rotate clockwise for positive values, and counterclockwise for negative values.

After physically correcting the GMU 11 installation, repeat the procedures in Section 7.8.1 and Section 7.5.3 and this section.

## 7.7 Altimeter System Test

If the G5 unit is replaced, in aircraft that are IFR certified, perform an altimeter system test of the G5 in accordance with 14 CFR Part 43 Appendix E.

- Do not perform paragraph (b)(1)(iv) Friction
- Do not perform paragraph (b)(1)(vi) Barometric Scale Error

## 7.8 GMU 11

If the GMU 11 is removed and reinstalled or removed and replaced, the procedure in 7.5.3 must be conducted.

### 7.8.1 Magnetometer Interference Check

This check is to be used as necessary to help troubleshoot GMU 11 discrepancies that may be related to interference or when a GMU 11 is moved and the new mounting location needs to be verified for acceptable interference levels.

With the G5 in configuration mode, initiate the magnetometer interference test procedure by performing the following steps:



#### NOTE

*All selections made in configuration mode in this section are made on the G5 ID strapped as #1. In a single G5 installation, Unit ID #1 is always the single G5 unit. In a Dual G5 installation, Unit ID #1 is the G5 in the Attitude or Turn Coordinator position.*

1. Select the “Magnetometer” page group on the G5 #1
2. Select the “Interference Test...” page.
3. Follow the instructions on each page displayed on the G5. Select “Next” to cycle through the pages and “Back” to go to the previous page.



#### NOTE

*The last page 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 11 magnetometer need be included in the test sequence. The list of relevant electronic devices varies from aircraft to aircraft. An example survey sequence form is located in APPENDIX D .*

4. Select “Start” to begin the test procedure.

5. 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.*

6. After the “Begin test sequence” appears, wait approximately five seconds and perform each of the actions listed in the test sequence table. Refer to APPENDIX D for an example of a test sequence.
7. When the test sequence is completed, wait approximately five seconds and then select “Done” to complete the test.

The G5 informs the operator if the installation has passed or failed the magnetometer interference test. The results displayed indicate the worst case percentage of limit and the time at which it occurred. If the test passes, no further action is required.

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 magnetometer maximum deviation value and its corresponding timestamp. Compare the corresponding timestamp with the prepared test sequence to identify which action produced the problem.

Two common reasons for a failed magnetometer interference test are:

1. New equipment is installed in close proximity to the GMU 11 magnetometer.
2. 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 11.

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## 8 SYSTEM RETURN TO SERVICE PROCEDURE

After all G5 configuration and testing is completed per Section 7, complete the following steps:

1. Position the aircraft to allow a GPS signal to be received.
2. Apply power to the aircraft and aircraft systems and allow the aircraft systems to initialize.
3. If new software was updated, verify the correct software part number is displayed. To verify the latest software version approved for this STC, visit [www.Garmin.com](http://www.Garmin.com) and navigate to the Aviation Product/General Aviation/Indicators/G5 page.
4. On the G5 Attitude display, verify the following;
  - No Red-X's displayed
  - Attitude display
  - Heading display (if interfaced to a GMU 11) Ground Track display (if not interfaced to a GMU 11)
  - Airspeed Tape (Digital read out will be dashes)
  - Altitude Tape (Digital readout should be reasonable to field elevation)
  - Ground speed field
  - Slip skid display
  - Current track bug
  - Barometric Pressure setting field
  - TAS display (if interfaced to a GAD 13)
  - OAT display (if interfaced to a GAD 13)
5. On the G5 HSI display, verify the following;
  - No Red-X's displayed
  - Heading/Ground Track display
    - Heading Display - if interfaced to a GMU 11, indicated by white numbers indicating magnetic heading.
    - Ground Track display (if not interfaced to a GMU 11, indicated by magenta numbers indicating GPS ground track.
  - Ground speed field (configurations without a GPS input will not display Ground Speed)
  - Current track bug (configurations without a GPS input will not display Current Track bug)
  - Rotating compass rose.
  - Crosswinds display (if interfaced to a GAD 13)

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## APPENDIX A G5 AND GPS/VHF NAVIGATOR CONFIGURATION DOCUMENTATION

Appendix A contains the following:

- A G5 configuration recording sheet (A1), in the case of a dual G5 installation a configuration sheet should be completed for each G5 installed.
- A section to record the manually calculated Pitch and Roll Calibration settings (A2).

The documentation will be completed during the initial installation and maintained with the aircraft records.

### A.1 G5 ELECTRONIC FLIGHT INSTRUMENT

Date:	Aircraft Make/Model:	Aircraft Reg #/Serial #:
G5 Part #:	G5 Serial #:	G5 software version:
CONFIGURATION PAGE	CONFIGURATION OPTION	CONFIGURATION SETTING
<b>Device Information</b>	Installation Type	Certified Instrument
	Diagnostics/Data Log	Enabled
<b>Attitude Configuration</b>	Indicator Type	Normal
	Pitch Display	Normal
	Roll Display	
	Standard Turn Roll Reference	Hide
	Automatic Declutter	
<b>Air Data</b>	Air Data Sensors	Enabled
	Outside Air Temperature Sensor	
	Vertical Speed Indicator	
<b>Airspeed</b> <small>Note: Configure Units prior to setting airspeeds</small>	VNE	
	VNO	
	VSO	
	VS1	
	VFE	
	VA	
	VX	
	VY	
	VG	
	VR	
	VMC	
	VYSE	
	<b>Magnetometer</b>	Magnetometer
Orientation		
<b>Flight Controls</b>	Garmin Autopilot Servos	
	Analog Autopilot Interface	
<b>Backlight</b>	Current Mode	Automatic
	Default Mode	Automatic
	Minimum Photocell Input	Default
	Minimum Display Brightness	Default
	Maximum Photocell Input	Default
	Maximum Display Brightness	Default
	Filter Time Constant	Default
<b>Display</b>	HSI Page	
	Power Up Page	



<b>Date:</b>	<b>Aircraft Make/Model:</b>	<b>Aircraft Reg #/Serial #:</b>
<b>G5 Part #:</b>	<b>G5 Serial #:</b>	<b>G5 software version:</b>
<b>CONFIGURATION PAGE</b>	<b>CONFIGURATION OPTION</b>	<b>CONFIGURATION SETTING</b>
<b>Battery</b>	Show Battery Status	When Using Battery
	Automatic Power Off	On Ground Only
<b>GPS</b>	Internal GPS Receiver	
	GPS Data Fields	
<b>Navigation</b>	Navigation Data	
	Selected Course	
	VNAV Deviation Scale	
<b>Units</b>	Altitude	
	Distance	
	Airspeed	
	Ground Speed	
	Ground Track	Magnetic
	Vertical Speed	
	Pressure	
	Temperature	
<b>RS-232</b>	Input Format	
	Output Format	
<b>ARINC 429</b>	Output 1	
	Output 2	
	Input 1	
	Input 2	
	Input 3	
	Input 4	

## A.2 ADJUSTED “ROLL CALIBRATION” AND “PITCH CALIBRATION” VALUES

If the method to manually calculate the adjusted “Roll Calibration” and “Pitch Calibration” values was used, record the values here.

Axis	Value
Pitch	
Roll	



### A.3 GTN 6XX/7XX (XI) CONFIGURATION (IF USED)

Config Page	Config Option	Configuration Setting
ARINC 429	ARINC 429 In (x) (x represents any available ARINC 429 Port )	Speed = Data =
	ARINC 429 In (x) (x represents any available ARINC 429 Port )	Speed = Data =
	ARINC 429 Out (x) (x represents any available ARINC 429 Port )	Speed = Data =
	SDI	
RS-232	RS-232 (x) (x represents any available RS-232 Port )	Input = Output =
Main Indicator (Analog) Configuration	CDI Key	
	Selected Course for GPS	
	Selected Course for VLOC	
	V-Flag State	
VOR/LOC/GS Configuration	Nav Radio	
	ARINC 429 Configuration	Tx Speed = SDI =
Vertical Navigation Configuration	VNAV	
	Transition to Approach	
	VDI Scale	
Main System	Heading Source Input	Not Connected This selection is made only if the GTN being interfaced to has no other Heading input.
	Altitude Source Input	Connected This selection is made only if the GTN being interfaced to has no other Altitude input.

### A.4 GNS 4XX(W) / 5XX(W) CONFIGURATION (IF USED)

Config Page	Config Option	Configuration Setting
MAIN ARINC 429 CONFIG Page	IN (x) (x represents any available ARINC 429 Port )	Speed = Data =
	IN (x) (x represents any available ARINC 429 Port )	Speed = Data =
	OUT	Speed = Data =
	VNAV	
MAIN RS232 CONFIG Page	RS-232 (x) (x represents any available RS-232 Channel )	Input = Output =
MAIN CDI/OBS CONFIG Page		Press Menu and then select "IGNORE SEL CRS FOR VLOC?" Menu will display "ALLOW SEL COURSE FOR VLOC?" when set properly.
VOR/LOC/GS ARINC 429 CONFIG Page	SPEED	RX = TX =
	SDI	





### A.5 GNS 480 CONFIGURATION (IF USED)

Config Page	Config Option	Configuration Setting
<b>GND Maint Serial Setup</b>	CH (x) (x represents any available Serial Channel )	Output =
<b>GND Maint ARINC 429 Setup</b>	CH In (2) (or any available 429 Port )	SEL = SPEED = SDI =
	CH Out (1) (or any available 429 Port )	SEL = SPEED = SDI =
	CH Out (2) (or any available 429 Port )	SEL = SPEED = SDI =
<b>GND Maint Resolver Interface Setup</b>	Resolver	
<b>GND Maint Miscellaneous Setup</b>	CDI Select	

### A.6 GNC 255 CONFIGURATION (IF USED)

Config Page	Config Option	Configuration Setting
<b>Sys Configuration</b>	RS 232 Serial Port	
<b>NAV Configuration</b>	CDI Indicator	
	ARINC 429	TX =
		SDI =

### A.7 SL30 CONFIGURATION (IF USED)

Config Page	Config Option	Configuration Setting
<b>Sys Configuration</b>	RS 232 Serial Port	
<b>Attitude Configuration</b>	Indicator Type	

### A.8 GPS 175/ GNC 355/ GNX 375 (IF USED)

Config Page	Config Option	Configuration Setting
<b>Interfaces - ARINC 429</b>	ARINC RX Port (x) (x represents any available ARINC 429 Port )	Speed = Format =
	ARINC TX Port 1	Speed = Format =
	SDI	
<b>Interfaced Equipment - RS-232</b>	Port (x) (x represents interfaced RS-232 Port )	
<b>Main System</b>	Composite CDI	
<b>Main Indicator (Analog)</b>	Selected Course	



### A.9 GNC300XL/GPS155XL CONFIGURATION (IF USED)

Config Page	Config Option	Configuration Setting
RS-232 Configuration	CHANNEL 1 IN	Input =
	CHANNEL 1 OUT	Output =
ARINC 429 Configuration	ARINC 429 In 1	Input =
	ARINC 429 Out 1	Output =



## APPENDIX B EQUIPMENT LOCATIONS

Appendix B contains a documentation sheet for recording LRU's included in the installation and its location on the aircraft. The document will be completed during the initial installation and maintained with the aircraft records.

### B.1 Equipment Locations

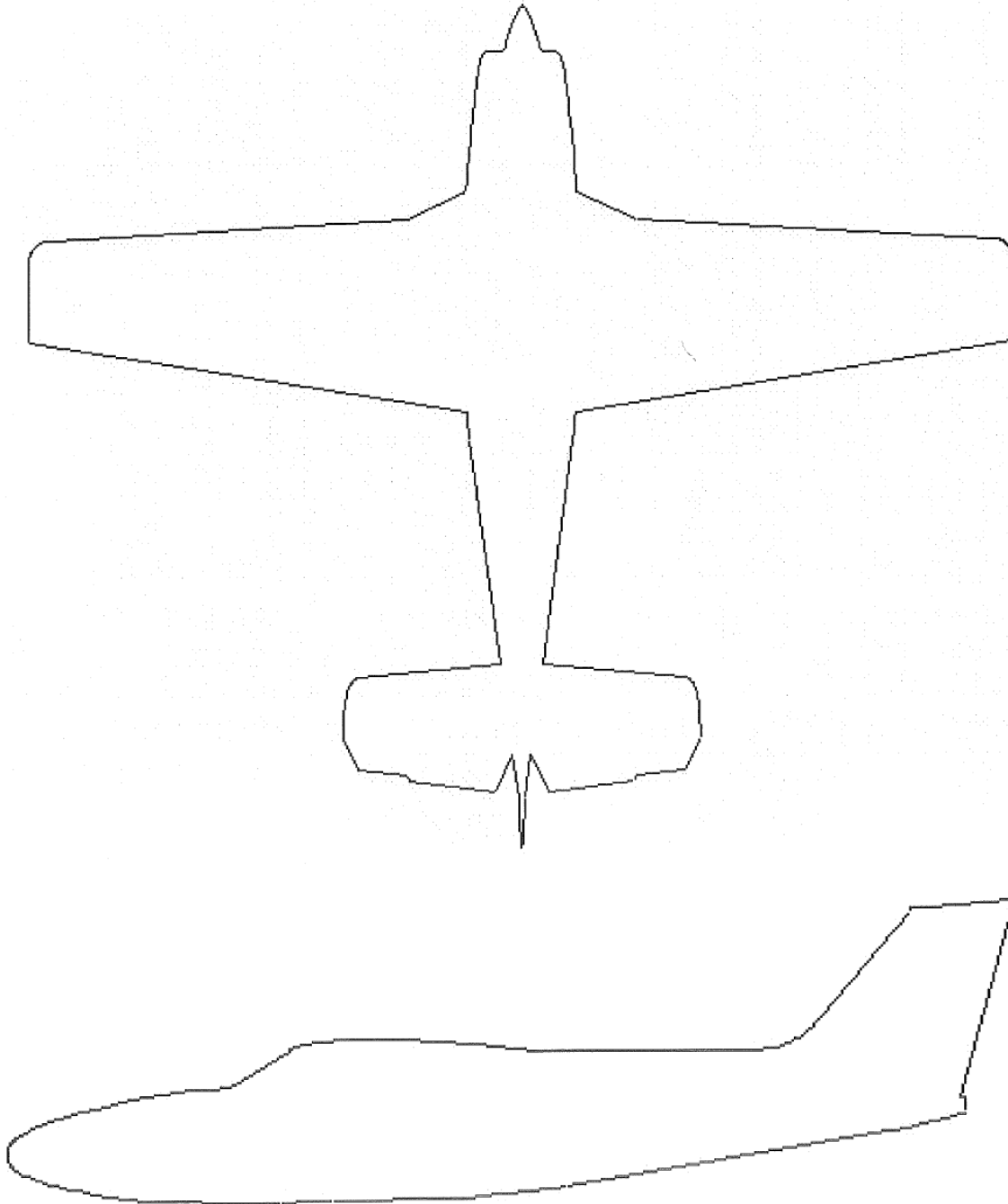
Date:	Aircraft Make/Model:	Aircraft Reg #/Serial #:
LRU	LRU included in this installation?	Description of Location
G5 #1		
G5 #2		
GMU 11		
GAD 29/29B/29D		
GAD 13		
Glareshield GPS Antenna		

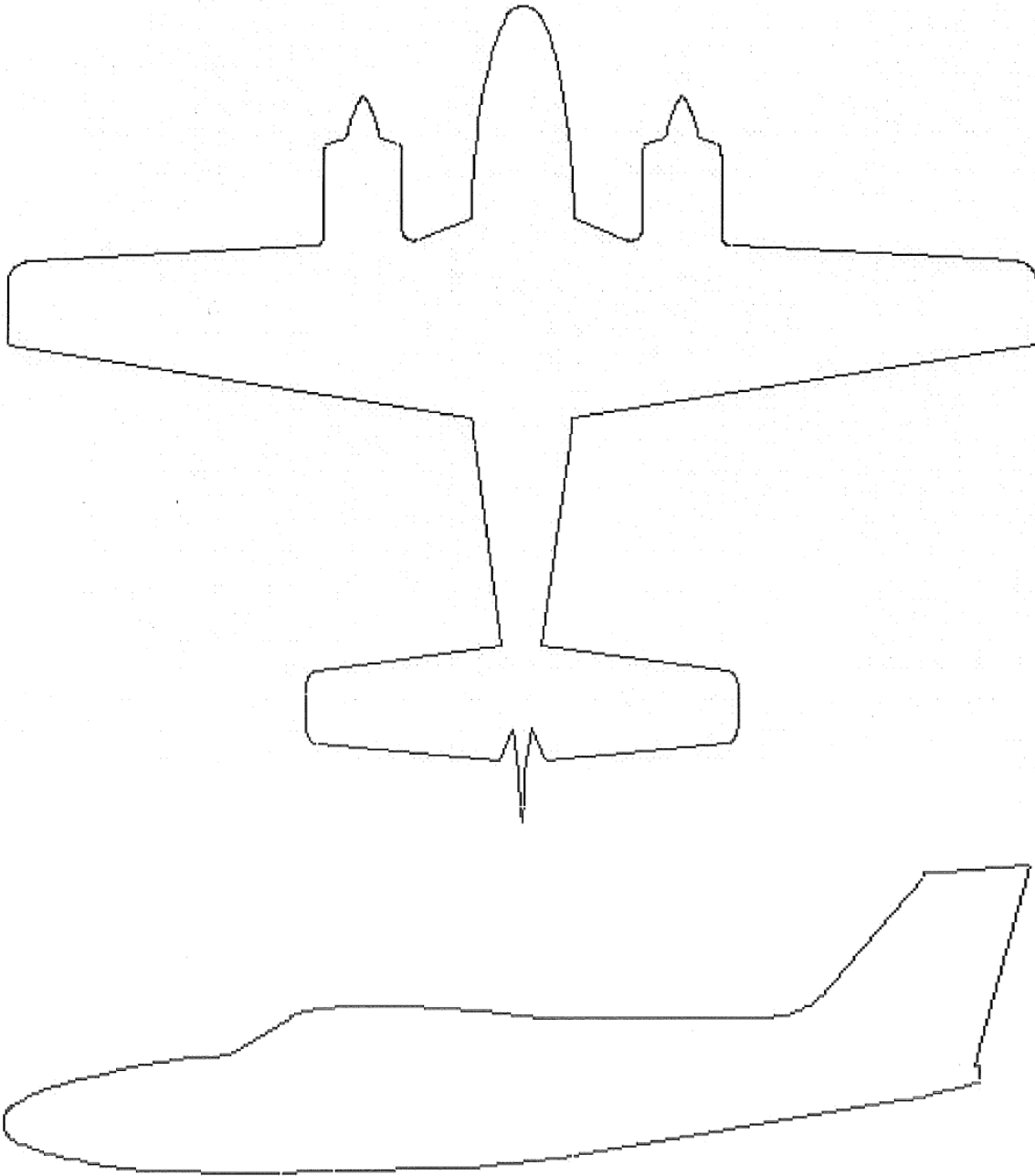
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## APPENDIX C WIRE ROUTING

Appendix C contains a generic aircraft drawing to be used for documenting the wire routing for the installation of the G5, GMU 11, GAD 29/29B/29D, GAD 13, and glareshield GPS antenna. The drawing will be completed during the initial installation and maintained with the aircraft records.

### C.1 Wire Routing Single Engine







## APPENDIX D EXAMPLE MAGNETOMETER INTERFERENCE SURVEY SEQUENCE

### Example Survey Sequence

A/C Reg.:		Survey data file name:
Elapsed Time (sec)	Elapsed Time (min:sec)	Action
0	0:00	Test begins (calibration period – no activity permitted)
20	0:20	Calibration period ends
30	0:30	Aileron full right
40	0:40	Aileron full left
50	0:50	Aileron level
60	1:00	Rudder full right
70	1:10	Rudder full left
80	1:20	Rudder neutral
90	1:30	Elevators full up
100	1:40	Elevators full down
110	1:50	Elevators neutral
120	2:00	Flaps down
140	2:20	Flaps up
160	2:40	Landing gear up
180	3:00	Landing gear down
190	3:10	Speed brake up
200	3:20	Speed brake down
210	3:30	Navigation lights on
220	3:40	Navigation lights off
230	3:50	Landing lights on
240	4:00	Landing lights off
250	4:10	Taxi lights on
260	4:20	Taxi lights off
270	4:30	Air conditioning on
280	4:40	Air conditioning off
290	4:50	Landing lights and taxi lights on
300	5:00	Landing lights and taxi lights off
310	5:10	Strobes on
320	5:20	Strobes off
330	5:30	Recognition lights on
340	5:40	Recognition lights off
350	5:50	Turn on all wingtip lights simultaneously
360	6:00	Turn off all wingtip lights simultaneously
370	6:10	Beacon on
380	6:20	Beacon off
390	6:30	Autopilot engaged in a pitch and roll mode (to engage servo clutches)
400	6:40	Autopilot disengaged
410	6:50	Pitot heat on
420	7:00	Pitot heat off
430	7:10	End of test