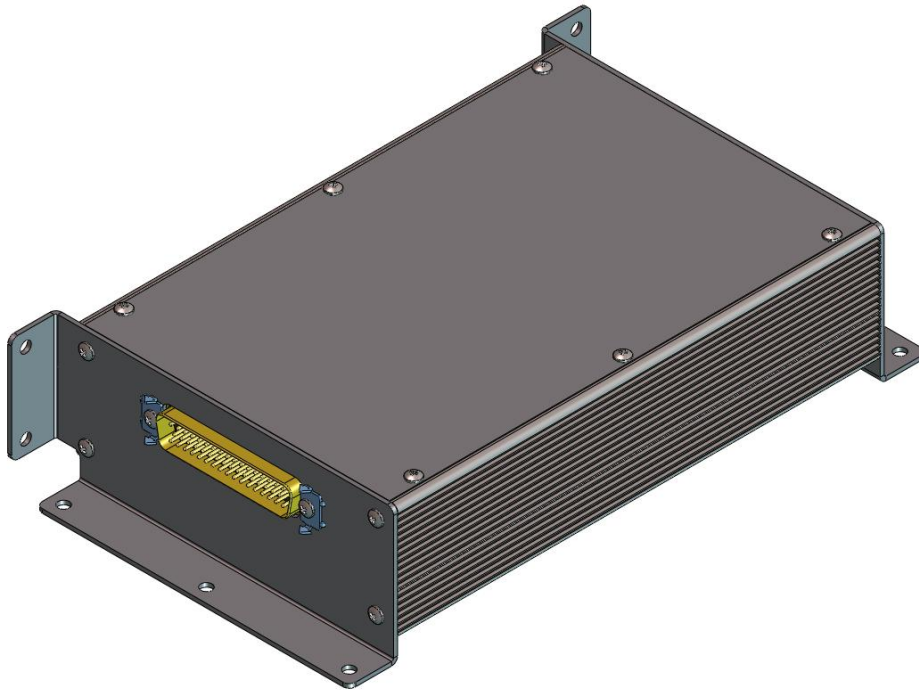




GAD 43 Installation Manual



© Copyright 2009
Garmin Ltd. or its subsidiaries
All Rights Reserved

Except as expressly provided herein, no part of this manual may be reproduced, copied, transmitted, disseminated, downloaded or stored in any storage medium, for any purpose without the express prior written consent of Garmin. Garmin hereby grants permission to download a single copy of this manual and of any revision to this manual onto a hard drive or other electronic storage medium to be viewed and to print one copy of this manual or of any revision hereto, provided that such electronic or printed copy of this manual or revision must contain the complete text of this copyright notice and provided further that any unauthorized commercial distribution of this manual or any revision hereto is strictly prohibited.

At Garmin, we value your opinion. For comments about this guide, please e-mail:
Techpubs.Salem@garmin.com.

Garmin International, Inc.
1200 E. 151st Street
Olathe, KS 66062 USA
Telephone: 913-397-8200
Aviation Dealer Technical Support Line (Toll Free): (888) 606 5482
<http://www.garmin.com>

Garmin (Europe) Ltd.
Liberty House
Bull Copse Road
Hounslow Business Park
Southampton, SO40 9RB, UK
Telephone: +44 (0) 870 850 1243

Garmin AT, Inc.
2345 Turner Rd., SE
Salem, OR 97302 USA
Telephone: 503.581.8101

RECORD OF REVISIONS

Revision	Revision Date	Description
A	4/30/09	Initial Release
B	5/7/09	Changed gyro emulation types listed in section 5.3.1.1 from a list to a table (5-1). Added reference of Table 5-1 to Section 1.2.1.

DOCUMENT PAGINATION

Section	Page Range
Table of Contents	i through vi
Section 1	1-1 through 1-8
Section 2	2-1 through 2-2
Section 3	3-1 through 3-8
Section 4	4-1 through 4-8
Section 5	5-1 through 5-4
Section 6	6-1 through 6-2
Section 7	7-1 through 7-2
Section 8	8-1 through 8-2
Appendix A	A-1 through A-2
Appendix B	B-1 through B-4
Appendix C	C-1 through C-8

This manual reflects the operation of software version 2.00. Some differences in operation may be observed when comparing the information in this manual to earlier or later software versions.

INFORMATION SUBJECT TO EXPORT CONTROL LAWS

This document may contain information which is subject to the Export Administration Regulations (“EAR”) issued by the United States Department of Commerce (15 CFR, Chapter VII Subchapter C) and which may not be exported, released or disclosed to foreign nationals inside or outside the United States without first obtaining an export license. The preceding statement is required to be included on any and all reproductions in whole or in part of this manual.

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/.

This Page Intentionally Left Blank

TABLE OF CONTENTS

1.	GENERAL DESCRIPTION.....	1-1
1.1	Introduction.....	1-1
1.2	Equipment Description	1-2
1.2.1	System Interface Functions	1-2
1.3	Interface Summary.....	1-2
1.3.1	ARINC 429 Interface	1-2
1.3.2	RS-232 Interface	1-2
1.3.3	Analog Interfaces	1-2
1.3.4	Discrete Inputs and Outputs	1-3
1.3.5	Relays.....	1-3
1.4	Technical Specifications	1-3
1.4.1	Environmental Qualification Form	1-3
1.4.2	Physical Characteristics.....	1-3
1.4.3	General Specifications.....	1-4
1.4.4	Power Consumption	1-4
1.5	Certification	1-5
1.5.1	TSO Compliance	1-5
1.5.2	TSO/ETSO Deviations.....	1-6
1.5.3	Non-TSO Functions	1-6
1.6	Limited Warranty.....	1-7
2.	INSTALLATION OVERVIEW	2-1
2.1	Introduction.....	2-1
2.2	Installation Materials	2-1
2.2.1	Configurations Available	2-1
2.2.2	Materials Required But Not Supplied	2-1
2.3	Optional Reference Material.....	2-1
2.4	Installation Considerations.....	2-1
2.4.1	Cabling and Wiring	2-2
2.4.2	Cooling Requirements.....	2-2
2.4.3	Mounting Requirements.....	2-2
3.	INSTALLATION PROCEDURE.....	3-1
3.1	Unpacking Unit.....	3-1
3.2	Special Tools Required.....	3-1
3.3	Equipment Mounting	3-1
3.4	Unit Replacement	3-1
3.5	Cabling and Wiring.....	3-1
3.5.1	Wiring Harness.....	3-2
3.6	Backshell Assemblies	3-3
3.6.1	Backshell Assembly and D-Subminiature Connectors	3-3
3.7	Unit Installation	3-7
3.8	Continued Airworthiness	3-7
4.	SYSTEM INTERCONNECTS.....	4-1
4.1	Pin Function List.....	4-1
4.1.1	P431 Connector.....	4-1
4.2	Functional Descriptions	4-3
4.2.1	Power.....	4-3
4.2.2	Power Supply Outputs.....	4-3
4.2.3	Serial Data.....	4-3
4.2.4	Gyro Emulation Interfaces	4-4
4.2.5	Baro Correction Outputs	4-6
4.2.6	Discretes.....	4-6

4.2.7	Relays.....	4-7
5.	SYSTEM CONFIGURATION AND CHECKOUT	5-1
5.1	Post Installation Power Check	5-1
5.2	GAD 43 Software Loading	5-1
5.3	Initial Configuration of the GAD 43.....	5-1
5.3.1	GAD Page Group	5-2
6.	RESERVED.....	6-1
7.	LIMITATIONS.....	7-1
7.1	Operation	7-1
7.2	Installation	7-1
7.2.1	Equipment Interfaced to the GAD 43	7-1
8.	PERIODIC MAINTENANCE.....	8-1
8.1	Continued Airworthiness	8-1
APPENDIX A ENVIRONMENTAL QUALIFICATION FORM.....		A-1
APPENDIX B OUTLINE AND INSTALLATION DRAWINGS		B-1
APPENDIX C INTERCONNECT DRAWINGS		C-1

LIST OF FIGURES

Figure 1-1.	GAD 43 Unit View	1-1
Figure 2-1.	Side and Flat Mounting of GAD 43	2-2
Figure 3-1.	Connector and Backshell Assembly.....	3-4
Figure 3-2.	Shielded Cable Preparation	3-4
Figure 3-3.	Shield Termination on Backshell Assembly	3-5
Figure B-1.	GAD 43 Unit and Connector	B-3
Figure B-2.	GAD 43 CG and Dimensions	B-4
Figure C-1.	GAD 43 Power Interconnect	C-3
Figure C-2.	GAD 43 Panel Mount Gyro Replacement Interconnect.....	C-4
Figure C-3.	GAD 43 Remote Mount Gyro Replacement Interconnect.....	C-5
Figure C-4.	GAD 43 Heading Interconnect.....	C-6
Figure C-5.	GAD 43 Yaw/Baro Correction Interconnect	C-7
Figure C-6.	GAD 43 WXR Stabilization Interconnect	C-8

LIST OF TABLES

Table 2-1.	Catalog Part Numbers.....	2-1
Table 2-2.	Installation Accessories	2-1
Table 3-1.	Socket Contact Part Numbers.....	3-2
Table 3-2.	Recommended Crimp Tools.....	3-2
Table 3-3.	Backshell Assembly	3-3
Table 4-1.	P431 Connector Pin-Out.....	4-1
Table 5-1.	Gyro Emulation Types.....	5-3

GAD 43 HARDWARE MOD LEVEL HISTORY

The following table identifies hardware modification (Mod) Levels for the GAD 43. Mod Levels are listed with the associated service bulletin number, service bulletin date, and the purpose of the modification. The table is current at the time of publication of this manual (see date on front cover) and is subject to change without notice. Authorized Garmin Sales and Service Centers are encouraged to access the most up-to-date bulletin and advisory information on the Garmin Dealer Resource web site at www.garmin.com using their Garmin-provided user name and password.

MOD LEVEL	SERVICE BULLETIN NUMBER	SERVICE BULLETIN DATE	PURPOSE OF MODIFICATION

This page intentionally left blank

1. GENERAL DESCRIPTION

1.1 Introduction

The GAD 43 Adapter is an optional adapter for the G500/G600 Integrated Flight Decks that provides analog attitude information for use with third-party autopilot systems. It interfaces with the GDU 620 Display for configuration and alerting, and with the GRS 77 for attitude, heading, and yaw input information. For attitude-based autopilots, the GAD 43 allows the existing ADI or attitude gyro to be removed when the G500/G600 system is installed.

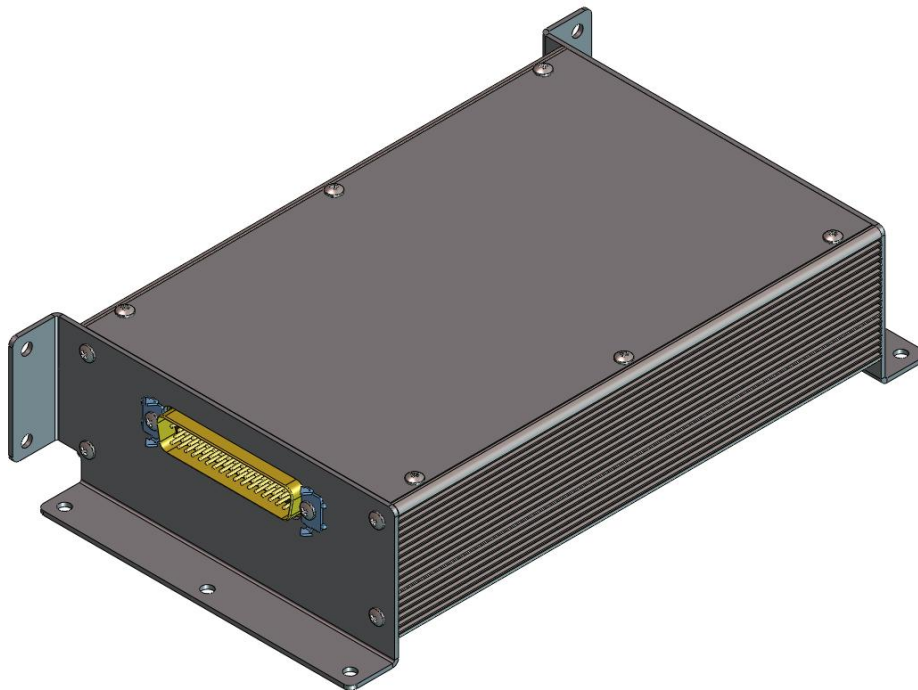


Figure 1-1. GAD 43 Unit View

1.2 Equipment Description

1.2.1 System Interface Functions

- Interfacing with the GRS 77 AHRS.
- Interfacing with the GDU 620 for GAD 43 configuration and display of GAD 43 alerts.
- Interfacing to autopilots that are compatible with the gyros identified in Table 5-1 to provide pitch and roll attitude (including valid relays), heading (including valid signal), yaw rate, and barometric correction information. For the system to completely meet TSO-C9c, the autopilot must claim TSO-C9c and be compatible with the gyros listed in Table 5-1.

1.3 Interface Summary

The GAD 43 is designed as an open architecture system that uses typical ARINC 429, and RS-232 communication interfaces. Various analog interfaces (including ARINC 407) are also supported. All interfaces are described in the following sections.

1.3.1 ARINC 429 Interface

The GAD 43 has one ARINC 429 input port to support input from the GRS 77 AHRS.

1.3.2 RS-232 Interface

The GAD 43 has one RS-232 serial port to support communication with the GDU 620.

1.3.3 Analog Interfaces

The GAD 43 is capable of emulating numerous gyro interfaces, as described in the following sections.

1.3.3.1 Power Supply Outputs

The GAD 43 can provide DC and AC power supply outputs when interfaced to a 115 VAC reference. Power supply outputs of +26 VDC, 26 VAC, and 5 VAC are provided. The AC supplies are in-phase with the 115 VAC reference; the +26 VDC supply may be used to provide validity information using the relays.

1.3.3.2 ARINC 407

The GAD 43 can provide three 3-wire ARINC 407 synchro outputs – one each for pitch, roll, and heading. The GAD 43 also provides two 2-wire isolated synchro outputs – one each for pitch and roll. An input for AC reference voltage is provided and is used for signal polarity.

1.3.3.3 Analog Pitch / Roll

The GAD 43 has one set of pitch and roll analog outputs. These outputs are provided for the emulation of panel mount gyros. An input for AC reference voltage is also provided and is used for signal polarity.

1.3.3.4 Yaw Rate/Baro Correction

The GAD 43 has one analog output that can be configured to provide either yaw rate or baro correction information.

1.3.3.4.1 Yaw Rate

The GAD 43 has an analog yaw rate output for autopilots that accept standard analog rate information.

1.3.3.4.2 Barometric Correction

For installations that do not utilize the yaw rate output, the same pins can be provided to supply analog barometric correction information to the autopilot computer. This correction information emulates the analog output (pickoff) of the standard King altimeter.

1.3.3.5 Radar Stabilization

The GAD 43 provides two 2-wire (one for pitch and one for roll) radar stabilization signals. Depending on the radar system, the isolated synchro outputs can also be used for radar stabilization.

1.3.4 Discrete Inputs and Outputs

The GAD 43 has one active-low discrete input and two active-low discrete outputs. The discrete input and one of the discrete outputs are available to support future functionality. The other discrete output provides a heading valid output for interface with various autopilot computers.

1.3.5 Relays

The GAD 43 has two relays which operate based on the validity of the attitude information. The relay common, normally-open, and normally-closed pins are available to support a wide-variety of configurations.

1.4 Technical Specifications

1.4.1 Environmental Qualification Form

It is the responsibility of the installing agency to obtain the latest revision of the GAD 43 Environmental Qualification Form. This form is available directly from Garmin under the following part number:

GAD 43 Environmental Qualification Form, EQF, Garmin part number 005-00496-07.

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

1.4.2 Physical Characteristics

Characteristics	Specifications
Width	2.11 inches (54 mm)
Height	5.31 inches (135 mm)
Depth with Connector Kit	10.5 inches (267 mm)
Unit Weight w/out Connector Kit	1.9 pounds (0.86 kg)
Unit Weight with Connector Kit	2.0 pounds (0.91 kg)

1.4.3 General Specifications

The table below contains general environmental specifications. For detailed specifications, see the Environmental Qualification Form.

Characteristics	Specifications
Operating Temperature Range	-55°C to +70°C
Humidity	240 Hours 65°C 95%
Altitude Range	55,000 ft maximum
Environmental Compliance	RTCA/DO-160E
Input Voltage Range	10 to 40 VDC

1.4.4 Power Consumption

Ambient temperature above -15°C:

	Typical	Maximum
14 VDC	0.41A	0.72A
28 VDC	0.21A	0.35A

1.5 Certification

The conditions and tests required for TSO approval of this article are minimum performance standards. It is the responsibility of those installing this article either on or within a specific type or class of aircraft to determine that the aircraft installation conditions are within the TSO standards. TSO articles must have separate approval for installation in an aircraft. The article may be installed only in compliance under 14 CFR Part 43 or the applicable airworthiness requirements. The Appliance Project Identifier for the for the GAD 43 is GMN-00724. Documents submitted to the FAA or other regulatory agencies on behalf of this project will be filed under and referred to by this number.

1.5.1 TSO Compliance

Function	TSO/SAE/RTCA/EURO CAE	Category	Applicable LRU SW P/Ns	Applicable Custom Logic Device P/Ns
Turn and Slip Instrument	TSO-C3e SAE AS8004 Incomplete System [1]	Type II	006-B0876-00 through 006-B0876-()	N/A
Bank and Pitch Instruments	TSO-C4c SAE AS8001 Incomplete System [1]	Turn Error, Category A	006-B0876-00 through 006-B0876-()	N/A
Direction (Heading) Instrument, Magnetic	TSO-C6e SAE AS8013A Incomplete System [1]		006-B0876-00 through 006-B0876-()	N/A
Automatic Pilots	TSO-C9c SAE AS402A Incomplete System [1]		006-B0876-00 through 006-B0876-()	N/A

Notes:

- [1] The TSOs identified in the table above are for an incomplete system and requires the GAD 43 to be installed and checked out according to this installation manual.

Software Design Assurance

Function	DO-178B Level
Output of pitch and roll information	A
Output of yaw information	A
Output of barometric correction information	A
Output of magnetic heading information	A

1.5.2 TSO/ETSO Deviations

TSO	Deviation
TSO-C4c	1. Garmin was granted a deviation from TSO-C4c to use SAE AS 8001 instead of SAE AS 396B for Minimum Performance Standards and Environmental Standards.
	2. Garmin was granted a deviation from SAE Aerospace Standard AS 8001 to use RTCA DO-160E instead of RTCA DO-138 as the standard for Environmental Conditions and Test Procedures for Airborne Equipment.
TSO-C9c	2. Garmin was granted a deviation from SAE Aerospace Standard SAE 402A to use environmental test conditions and procedures from RTCA DO-160E instead of the environmental test conditions and procedures specified by SAE 402A (performance and qualification test specifications in SAE 402A are not affected).

1.5.3 Non-TSO Functions

None.

1.6 Limited Warranty

This Garmin product is warranted to be free from defects in materials or workmanship for two years from the date of purchase. Within this period, Garmin will, at its sole option, repair or replace any components that fail in normal use. Such repairs or replacement will be made at no charge to the customer for parts or labor, provided that the customer shall be responsible for any transportation cost. This warranty does not cover failures due to abuse, misuse, accident or unauthorized alteration or repairs.

THE WARRANTIES AND REMEDIES CONTAINED HEREIN ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED OR STATUTORY, INCLUDING ANY LIABILITY ARISING UNDER ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, STATUTORY OR OTHERWISE. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, WHICH MAY VARY FROM STATE TO STATE.

IN NO EVENT SHALL GARMIN BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, WHETHER RESULTING FROM THE USE, MISUSE, OR INABILITY TO USE THIS PRODUCT OR FROM DEFECTS IN THE PRODUCT. Some states do not allow the exclusion of incidental or consequential damages, so the above limitations may not apply to you.

Garmin retains the exclusive right to repair or replace the unit or software or offer a full refund of the purchase price at its sole discretion. SUCH REMEDY SHALL BE YOUR SOLE AND EXCLUSIVE REMEDY FOR ANY BREACH OF WARRANTY.

To obtain warranty service, contact your local Garmin Authorized Service Center. For assistance in locating a Service Center near you, call Garmin Customer Service at one of the numbers shown below.

Products sold through online auctions are not eligible for rebates or other special offers from Garmin. Online auction confirmations are not accepted for warranty verification. To obtain warranty service, an original or copy of the sales receipt from the original retailer is required. Garmin will not replace missing components from any package purchased through an online auction.

Garmin International, Inc.
1200 E. 151st Street
Olathe, KS 66062 USA
Telephone: 913.397.8200

Aviation Panel-Mount Technical Support Line (Toll Free) 1.888.606.5482
www.garmin.com

Garmin (Europe) Ltd.
Liberty House
Bull Copse Road
Hounslow Business Park
Southampton, SO40 9RB, UK
Telephone: +44 (0) 870 850 1243

Garmin AT, Inc.
2345 Turner Rd., SE
Salem, OR 97302 USA
Telephone: 503.581.8101

This page intentionally left blank

2. INSTALLATION OVERVIEW

2.1 Introduction

This section provides hardware equipment information for installing the GAD 43 and related hardware. Installation of the GAD 43 should follow the aircraft TC or STC requirements. Cabling is fabricated by the installing agency to fit each particular aircraft. The guidance of FAA advisory circulars AC 43.13-1B and AC 43.13-2A, where applicable, may be found useful for making retro-fit installations that comply with FAA regulations.

2.2 Installation Materials

2.2.1 Configurations Available

The GAD 43 is available under the following part numbers. Catalog part numbers are shown with and without the installation kit.

Table 2-1. Catalog Part Numbers

Model	Unit P/N	Catalog P/N Without Installation Kit	Catalog P/N With Installation Kit (G600)	Catalog P/N With Installation Kit (G500)
GAD 43	011-01970-00	010-00724-00	010-00724-01	010-00724-02

Table 2-2. Installation Accessories

Item	Garmin P/N
GAD 43 Connector Kit	011-01990-00

2.2.2 Materials Required But Not Supplied

The GAD 43 is intended for use with the standard aviation accessories. The following items are required for installation, but not supplied:

- Wire (MIL-W-22759/16 or equivalent)
- Shielded Wire (MIL-C-27500 or equivalent)
- Circuit Breaker (2.5A)
- Tie Wraps or Lacing Cord
- Ring Terminals (for grounding)

2.3 Optional Reference Material

Item	Garmin P/N
G500 Pilot's Guide	190-01102-02
G500 Cockpit Reference Guide	190-01102-03
G600 Pilot's Guide	190-00601-02
G600 Cockpit Reference Guide	190-00601-03
GDU 620 Installation Manual	190-00601-04

2.4 Installation Considerations

The existing remote-mounted or panel-mounted gyro can be removed, and the GAD 43 will be installed to emulate the signals from the removed instrument.

The following sections describe issues that must be considered for each installation.

2.4.1 Cabling and Wiring

Use AWG #24 or larger wire for all connections unless otherwise specified by the aircraft manufacturer or Garmin. The standard-density socket contacts supplied in the connector kit are compatible with up to AWG #20 wire (P431). In cases where some installations have more than one unit sharing a common circuit breaker, sizing and wire gauge is based on aircraft circuit breaker layout, length of wiring, current draw of units, and internal unit protection characteristics. Do not attempt to combine more than one unit on the same circuit breaker unless it is specified on aircraft manufacturer approved drawings.

Ensure that routing of the wiring does not come in contact with sources of heat, RF or EMI interference. Check that there is ample space for the cabling and mating connectors. Avoid sharp bends in cabling and routing near aircraft control cables.

2.4.2 Cooling Requirements

The GAD 43 has no cooling requirements.

2.4.3 Mounting Requirements

NOTE



Installation of the GAD 43 is restricted to locations in the aircraft that are consistent with the DO-160E categories defined in the GAD 43 Environmental Qualification Form (EQF), P/N 005-00496-07. General environmental specifications can be found in Section 1.4.3.

The GAD 43 is designed to be mounted flat or on its side. If mounting the GAD 43 on its side, a minimum of four 6/32" screws must be used. If mounting the GAD 43 flat, a minimum of six 6/32" screws must be used.

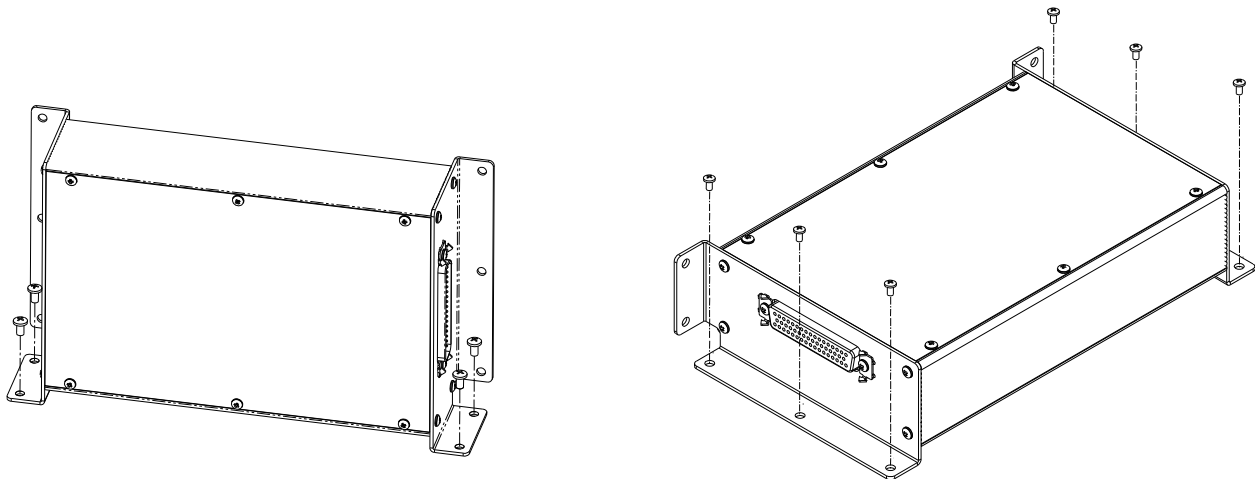


Figure 2-1. Side and Flat Mounting of GAD 43

3. INSTALLATION PROCEDURE

3.1 Unpacking Unit

Carefully unpack the equipment and make a visual inspection of the unit for evidence of damage incurred during shipment. If the unit is damaged, notify the carrier and file a claim. To justify a claim, save the original shipping container and all packing materials. Do not return the unit to Garmin until the carrier has authorized the claim.

Retain the original shipping containers for return shipments. If the original containers are not available, a separate cardboard container should be prepared that is large enough to accommodate sufficient packing material to prevent movement.

3.2 Special Tools Required

Crimp Tool

A crimp tool meeting MIL specification M22520/2-01 and a positioner/locator are required to ensure consistent, reliable crimp contact connections for the rear D-sub connectors. Refer to Table 3-2 for a list of recommended crimp tools.

3.3 Equipment Mounting

NOTE



Installation of the GAD 43 is restricted to locations in the aircraft that are consistent with the DO-160E categories defined in the GAD 43 Environmental Qualification Form (EQF), P/N 005-00496-07. General environmental specifications can be found in Section 1.4.3.

The GAD 43 should be mounted in a dry location, which may be pressurized or unpressurized. A location away from heating vents or other sources of heat generation is optimal. The unit should be mounted on a flat surface using the flanges provided on the GAD 43 unit. The mounting surface should provide sufficient electrical bond to the aircraft to minimize radiated electro-magnetic interference (EMI). Cabling must also be fabricated to fit each particular aircraft.

3.4 Unit Replacement

Whenever the GAD 43 is removed and reinstalled, verify that the slide-lock is engaged on both sides of the connector. The GDU 620 provides a configuration interface for the GAD 43. If the unit was serviced or if a new unit is being installed, verify that the configuration is correct by comparing the previously completed checkout log to the configuration settings shown on the GDU 620. After configuration, power up the system including GDU 620 and GAD 43 and verify that no failure or error messages are displayed.

NOTE



The installation configuration settings are stored in the GDU 620 configuration module and will be retained when the GAD 43 is replaced with a new unit. If a new GAD 43 is reinstalled in place of an existing unit, it will be required to enter configuration mode on the GDU 620 to verify that the GAD 43 configuration is correct for the installation.

3.5 Cabling and Wiring

The GAD 43 connector kit includes the connector and crimp contacts. Make the crimp connections with a crimp tool as specified in Table 3-2.

Refer to the interconnection diagrams in APPENDIX C for the appropriate interconnections. Use 22 or 24 AWG wire for all connections except for power. Use 22 AWG for power/ground. Once the cable assemblies have been made, position the cable so that there is sufficient length to allow for the installation of the GAD. Route the wiring bundle as appropriate. Avoid sharp bends.

3.5.1 Wiring Harness

Allow adequate space for installation of cables and connectors. The installer supplies and fabricates all of the cables. All electrical connections are made through a 50-pin D-subminiature connector provided by Garmin. Construct the wiring harness according to the information contained in this and the following sections. Cable lengths will vary depending upon installation. Strip all wires going to the connectors 0.17". Insert the wire into the pin and crimp with one of the recommended (or equivalent) crimping tools. Insert the pin into the connector housing location as specified by the interconnect drawings in APPENDIX C. Verify the pin is properly engaged into the connector by gently tugging on the wire. Route and secure the cable run from the GAD 43 to the other units away from sources of electrical noise.

Section 4 provides I/O definition of all input and output signals. Required connectors and associated hardware are supplied with the connector kit. See APPENDIX C for interconnect wiring diagrams.

CAUTION



Check wiring connections for errors before connecting the cables to the GAD 43. Incorrect wiring could cause component damage.

Table 3-1. Socket Contact Part Numbers

Wire Gauge	50-pin connector (P431)
	20-24 AWG
Garmin P/N	336-00022-00
Military P/N	M39029/63-368
AMP	N/A
Positronic	N/A
ITT Cannon	N/A

Table 3-2. Recommended Crimp Tools

Manufacturer	Hand Crimping Tool	20-24 AWG (P431)	
		Positioner	Insertion/ Extract Tool
Military P/N	M22520/2-01	M22520/2-08	M81969/14-02 M81969/1-02
Positronic	9507	9502-11	N/A
ITT Cannon	N/A	N/A	N/A
AMP	N/A	N/A	N/A
Daniels	AFM8	K13-1	N/A
Astro	615717	615724	N/A

Notes:

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

3.6 Backshell Assemblies

3.6.1 Backshell Assembly and D-Subminiature Connectors

The GAD 43 connector kit (P/N 011-01990-00) includes one Garmin backshell assembly and one Garmin ground adapter assembly. Backshell connectors give the installer the ability to terminate shield grounds at the backshell housing using the shield block ground kit. Table 3-3 lists Garmin part numbers for the GAD 43 D-sub connector and the backshell assembly.

Table 3-3. Backshell Assembly

Figure 3-1 thru Figure 3-3 Ref	Description	Garmin P/N	Notes
1	Cast Housing (P431)	125-00085-00	[2]
2	Shield block	117-00147-01	[3]
3	Screw, 4-40 x.250, FLHP100°, SS/P, Nylon	211-63234-08	[3]
4	Slide Lock Spring	N/A	[4]
5	Slide Lock Lever	N/A	[4]
6	Screw, 4-40x.375, PHP, SS/P, w/Nylon	211-60234-10	[2], [5]
7	Strain Relief	115-00499-03	[2]
8	Cover (P431)	115-00500-04	[2]
9	Screw, 4-40x.187, FLHP100, SS/P, w/Nylon	211-63234-06	[2]
10	Connector, D-Sub, 50 Socket (P431)	330-00502-50	[5]
11	Multiple Conductor Shielded Cable (See Interconnect Diagrams, APPENDIX C)	As Required	[6]
12	Shield Terminator	As Required	[6], [7]
13	Wire, Insulated, 20 – 22 AWG (3" max length)	As Required	[6], [7]
14	Socket Contacts, #20 (P431)	336-00022-00	
15	Ring terminal, #8, insulated, 18-22 AWG, 14-16 AWG	MS25036-149, MS25036-153, MS25036-156	[6]
16	Screw, PHP, 8-32x.312", Stainless or Cad Plated Steel	MS51957-42, MS35206-242	[6]
17	Split Washer, #8, (.045" compressed thickness) Stainless or Cad-plated steel	MS35338-137, MS35338-42	[6]
18	Flat Washer, #8, .032" thick, .174"ID, .375" OD, Stainless or Cad Plated Steel	NAS1149CN832R, NAS1149FN832P	[6]
19	Silicon Fusion Tape	249-00114-00	[6]

[1] All items are applicable to the P431 connector unless otherwise specified.

[2] Supplied as part of Backshell Kit P/N 011-00950-04 (P431).

[3] Supplied as part of Ground Adapter Kit P/N 011-01169-01.

[4] Supplied as part of Slide Lock Kit P/N 330-90006-04 (P431).

[5] Supplied as part of GAD 43 Connector Kit P/N 011-01990-00.

[6] Not supplied – must be purchased separately.

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

3.6.1.1 Shield Block Assembly Procedure

The parts for the connector and backshell assembly for the GAD 43 installations are listed in Table 3-3. The GAD 43 connector kit (P/N 011-01990-00) includes one Garmin backshell assembly and one Garmin ground adapter assembly. Backshell connectors give the installer the ability to terminate shield grounds at the backshell housing using the Shield Block ground kit.

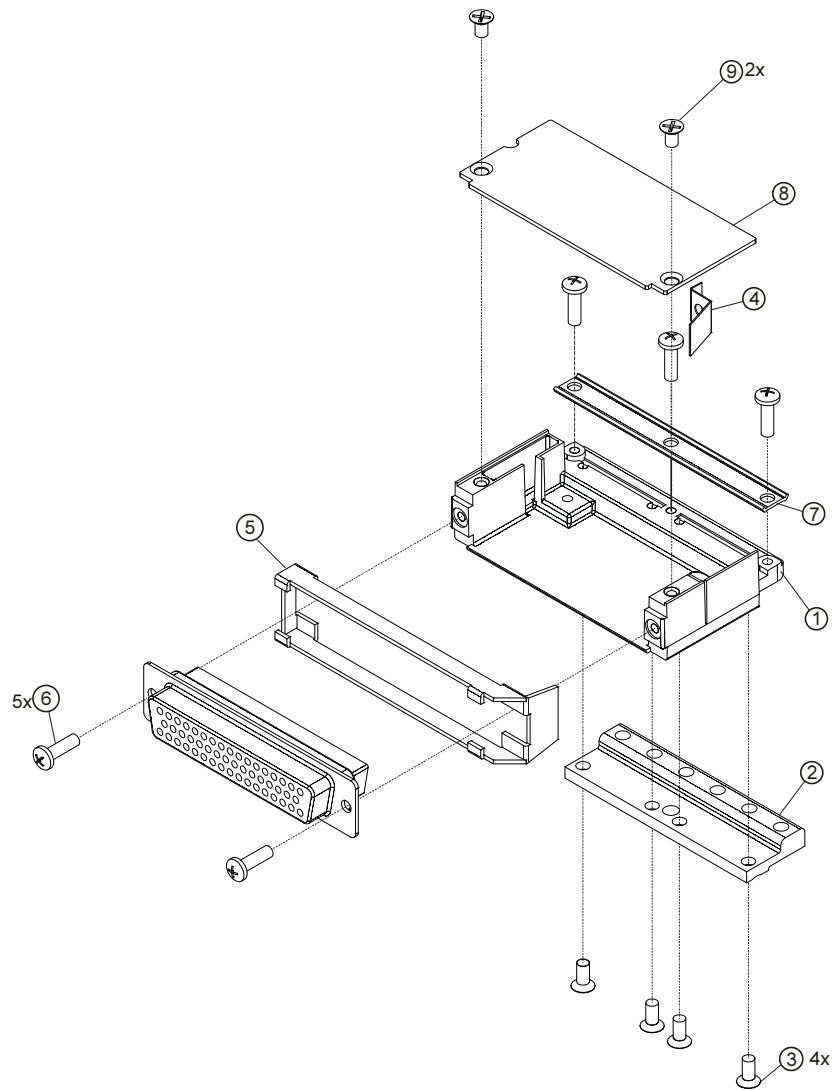


Figure 3-1. Connector and Backshell Assembly

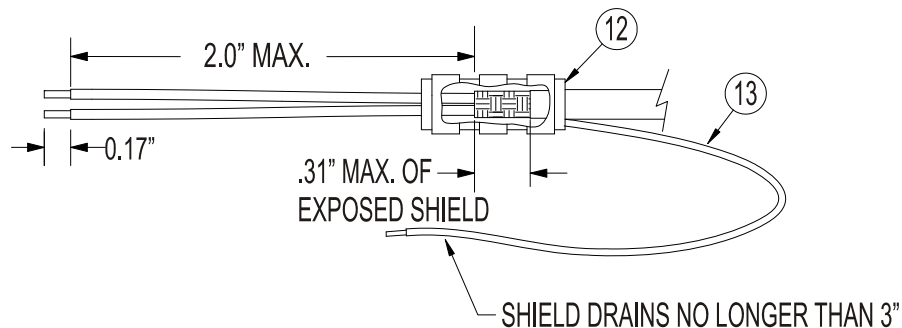


Figure 3-2. Shielded Cable Preparation

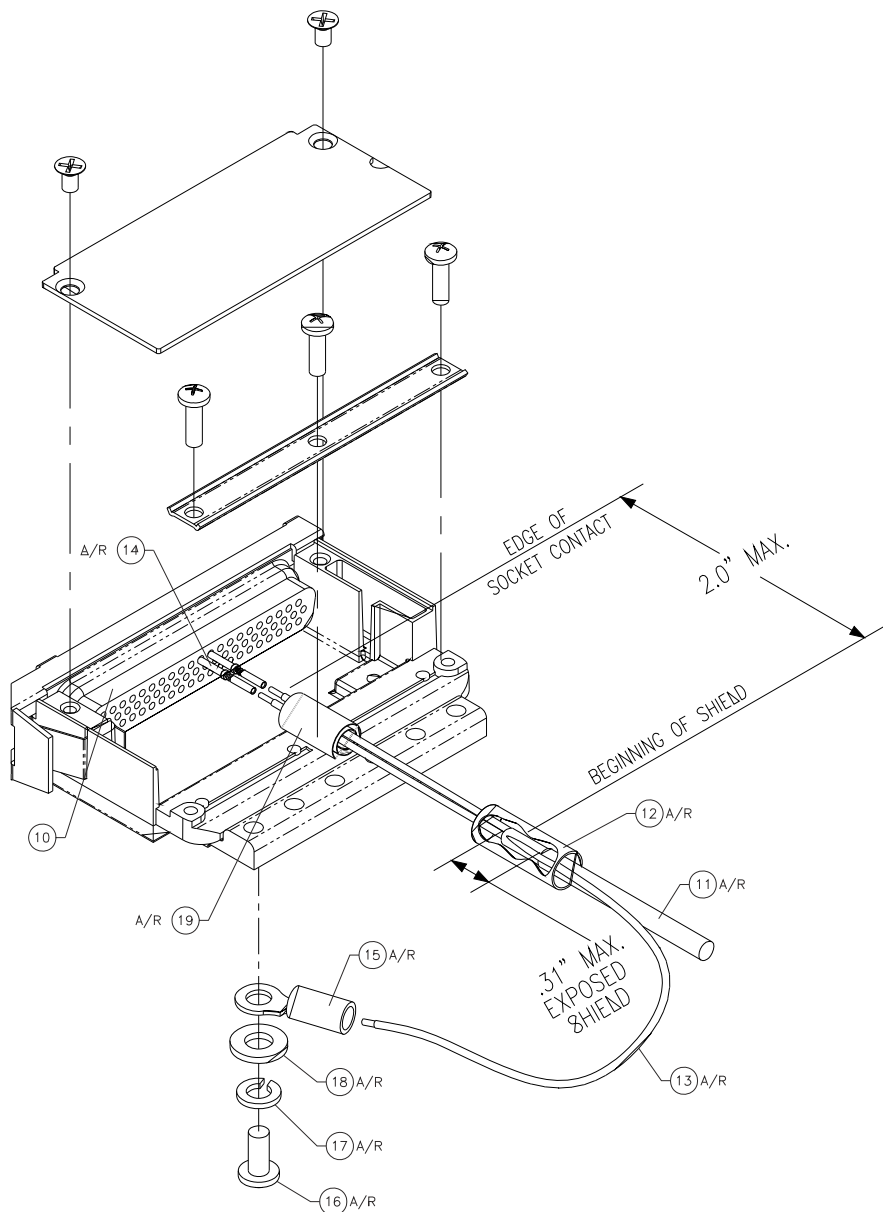


Figure 3-3. Shield Termination on Backshell Assembly

Prepare all of the shielded cables as shown in Figure 3-2. Refer to Figure 3-3 for details of the shield termination to the connector backshell.

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

NOTE



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

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

NOTE



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

3. Slide a shield terminator (12) onto the prepared cable assembly (11) and connect the wire (13) to the shield using a heat gun approved for use with solder sleeves. The chosen size of solder sleeve must accommodate both the number of conductors present in the cable and the wire (13) to be attached.
4. Repeat steps 1 through 3 as needed for the remaining shielded cables.
5. Crimp contacts (14) onto the wires and terminate in the connector (10) in accordance with the aircraft wiring drawings.

Assemble the backshell onto the connector:

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

CAUTION



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

2. Place the slide lock (5) over the connector (10). While holding the slide lock in place, attach the connector / slide lock to the backshell (1) by inserting two screws (6) through the holes on the connector and threading into the tapped holes on the backshell (1). (See Figure 3-1)
3. Wrap the cable bundle with Silicone Fusion Tape (19 or a similar version) at the point where the backshell strain relief and cast housing will contact the cable bundle.

CAUTION



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

4. Place the smooth side of the backshell strain relief (7) across the cable bundle and secure using the three screws (6).
5. Insert the slide lock spring (4) into the connector backshell (1). Attach the cover (8) to the backshell using two screws (9).

NOTE



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

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

3.7 Unit Installation

The GAD 43 is mounted with four or six 6/32” screws and self-locking nuts depending on the type of installation. APPENDIX B contains information on the outline and dimensions for the unit.

If mounting the GAD 43 on its side, a minimum of four screws must be used. If mounting the GAD 43 flat, a minimum of six screws must be used. See Figure 2-1 for depictions of side and flat mounting.

3.8 Continued Airworthiness

Maintenance of the GAD 43 is “on condition” only. For regulatory periodic functional checks, refer to approved aircraft maintenance manuals or manual supplements for actual aircraft maintenance requirements.

This page intentionally left blank

4. SYSTEM INTERCONNECTS

4.1 Pin Function List

4.1.1 P431 Connector

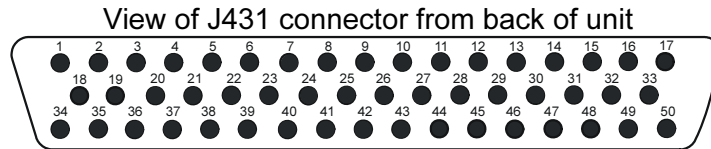


Table 4-1. P431 Connector Pin-Out

Pin	Pin Name	I/O
1	RESERVED	--
2	HEADING VALID OUT*	Out
3	ATTITUDE VALID RELAY NO	--
4	ATTITUDE VALID RELAY NC	--
5	AP INTERLOCK RELAY COMMON	--
6	+26 VDC OUT	Out
7	HDG SYNCHRO OUT Y	Out
8	HDG SYNCHRO OUT X	Out
9	10VAC REF IN HI	In
10	10VAC REF IN LO	In
11	SPARE DISC OUT* 2	Out
12	WXR PITCH OUT HI (50 mV/deg)	Out
13	PITCH DC OUT	Out
14	ROLL SYNCHRO OUT Y	Out
15	PITCH SYNCHRO OUT Y	Out
16	ARINC 429 IN A	In
17	RS-232 IN	In
18	26VAC OUT HI	Out
19	YAW RATE / BARO CORRECTION OUT	Out
20	ATTITUDE VALID RELAY COMMON	--
21	AP INTERLOCK RELAY VALID NC	--
22	AP INTERLOCK RELAY VALID NO	--
23	ROLL AC OUT HI (54 mV/deg or 200 mV/deg)	Out
24	PITCH AC OUT HI (60 mV/deg or 200 mV/deg)	Out
25	ROLL AC OUT LO (54 mV/deg or 200 mV/deg)	--
26	WXR ROLL OUT LO (50 mV/deg)	--
27	SPARE DISC IN* 2	In
28	WXR ROLL OUT HI (50 mV/deg)	Out
29	ROLL DC OUT	Out
30	ROLL SYNCHRO OUT X	Out
31	PITCH SYNCHRO OUT X	Out
32	ARINC 429 IN B	In
33	RS-232 OUT	Out
34	26VAC LO	--
35	5VAC OUT LO	--
36	5VAC OUT HI	Out
37	115VAC REF IN LO	In
38	115VAC REF IN HI	In

Pin	Pin Name	I/O
39	26VAC REF IN HI	In
40	YAW RATE / BARO CORRECTION GND	--
41	HDG SYNCHRO OUT Z	Out
42	PITCH AC OUT LO (60 mV/deg or 200 mV/deg)	--
43	WXR PITCH OUT LO (50 mV/deg)	--
44	ROLL SYNCHRO OUT Z	Out
45	PITCH SYNCHRO OUT Z	Out
46	RS-232 GND	--
47	AIRCRAFT GROUND	--
48	AIRCRAFT GROUND	--
49	AIRCRAFT POWER 1	In
50	AIRCRAFT POWER 2	In

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

4.2 Functional Descriptions

4.2.1 Power

Pin Name	Pin	I/O
AIRCRAFT POWER 1	49	In
AIRCRAFT POWER 2	50	In
AIRCRAFT GROUND	47	--
AIRCRAFT GROUND	48	--

The GAD 43 will accept input power from 9 to 33 VDC. At least one of the power inputs must be connected. Power inputs are diode-isolated to support power from multiple busses.

4.2.2 Power Supply Outputs

Pin Name	Pin	I/O
+26 VDC OUT	6	Out
26VAC OUT HI	18	Out
26VAC LO	34	--
5VAC OUT HI	36	Out
5VAC OUT LO	35	--
115VAC REF IN HI	38	In
115VAC REF IN LO	37	In

The GAD 43 will always provide a +26 VDC supply. The intent of this supply is for use with the GAD 43 relays (to provide attitude validity information). When a 115 VAC reference input is provided, the GAD 43 will provide a 26 VAC and 5 VAC output supply that will be in-phase with the provided reference.

4.2.3 Serial Data

4.2.3.1 RS-232

Pin Name	Function	Pin	I/O
RS-232 IN	GDU	17	In
RS-232 OUT	GDU	33	Out
RS-232 GND	--	46	--

The RS-232 outputs have an output voltage swing of at least $\pm 5V$ when driving a standard RS-232 load.

The serial port can receive/transmit serial data from/to the GDU 620.

4.2.3.2 ARINC 429

Pin Name	Function	Pin	I/O
ARINC 429 IN A	AHRS	16	In
ARINC 429 IN B	AHRS	32	In

4.2.4 Gyro Emulation Interfaces

The GAD 43 is capable of emulating numerous standard attitude gyro interfaces described below.

Refer to Section 5.3.1.1 for configuration information.

4.2.4.1 Analog Pitch/Roll Outputs

Pin Name	Pin	I/O
PITCH AC OUT HI (60 mV/deg or 200 mV/deg) [1]	24	Out
ROLL AC OUT HI (54 mV/deg or 200 mV/deg) [1]	23	Out
PITCH DC OUT	13	Out
ROLL DC OUT	29	Out
PITCH AC OUT LO (60 mV/deg or 200 mV/deg) [1]	42	--
ROLL AC OUT LO (54 mV/deg or 200 mV/deg) [1]	25	--
10VAC REF IN HI	9	In
10VAC REF IN LO	10	In

Notes:

- [1] Multi-function pins used for analog pitch / roll outputs (60 mV/deg and 54 mV/deg) and isolated synchro AC outputs (200 mV/deg). Configuration determines the function of these pins. The analog pitch/roll outputs each are capable of driving a 1 k Ω load. See Section 4.2.4.3 for details on the isolated synchro outputs.

The GAD 43 provides AC pitch and roll outputs intended for emulating gyros such as the King KI-256 and the Cessna/ARC G519. An input for 10 VAC reference voltage is also provided.

The GAD 43 provides DC pitch and roll outputs intended for emulating gyros such as those used in Century autopilots. DC pitch and roll outputs are referenced to GAD 43 ground.

Refer to Section 5.3.1.1 for configuration information.

4.2.4.2 Synchro (ARINC 407) Outputs

Pin Name	Pin	I/O
HDG SYNCHRO OUT X	8	Out
HDG SYNCHRO OUT Y	7	Out
HDG SYNCHRO OUT Z	41	Out
PITCH SYNCHRO OUT X	31	Out
PITCH SYNCHRO OUT Y	15	Out
PITCH SYNCHRO OUT Z	45	Out
ROLL SYNCHRO OUT X	30	Out
ROLL SYNCHRO OUT Y	14	Out
ROLL SYNCHRO OUT Z	44	Out
115VAC REF IN HI	38	In
115VAC REF IN LO	37	In
26VAC OUT HI	18	Out
26VAC REF IN HI	39	In
26VAC LO	34	--

The GAD 43 provides synchro pitch, roll and heading outputs. An input for 26 VAC reference voltage is also provided. The GAD 43 can convert an 115 VAC signal to a 26 VAC reference if desired. See APPENDIX C for wiring interconnect information to support this conversion.

Refer to Section 5.3.1.1 for configuration information.

4.2.4.3 Isolated Synchro Outputs

Pin Name	Pin	I/O
PITCH AC OUT HI (60 mV/deg or 200 mV/deg) [1]	24	Out
ROLL AC OUT HI (54 mV/deg or 200 mV/deg) [1]	23	Out
PITCH AC OUT LO (60 mV/deg or 200 mV/deg) [1]	42	--
ROLL AC OUT LO (54 mV/deg or 200 mV/deg) [1]	25	--
115VAC REF IN HI	38	In
115VAC REF IN LO	37	In
26VAC OUT HI	18	Out
26VAC REF IN HI	39	In
26VAC LO	34	--

Notes:

- [1] Multi-function pins used for analog pitch / roll outputs (60 mV/deg and 54 mV/deg) and isolated synchro AC outputs (200 mV/deg). Configuration determines the function of these pins. See Section 4.2.4.1 for details on the analog pitch/roll outputs.

The GAD 43 provides isolated synchro pitch and roll outputs. When the GAD 43 is configured to emulate a remote-mount ARINC 407 gyro (such as the King KVG-350, Collins 332D-11, or the Sperry VG-14A), the isolated synchro outputs are active. An input for 26 VAC reference voltage is also provided. The GAD 43 can convert an 115 VAC signal to a 26 VAC reference if desired. See APPENDIX C for wiring interconnect information to support this conversion.

Refer to Section 5.3.1.1 for configuration information.

4.2.4.4 Weather Radar (Stabilization) Outputs

Pin Name	Pin	I/O
WXR PITCH OUT HI (50 mV/deg)	12	Out
WXR ROLL OUT HI (50 mV/deg)	28	Out
WXR PITCH OUT LO (50 mV/deg)	43	--
WXR ROLL OUT LO (50 mV/deg)	26	--
115VAC REF IN HI	38	In
115VAC REF IN LO	37	In
26VAC OUT HI	18	Out
26VAC REF IN HI	39	In
26VAC LO	34	--

The GAD 43 provides weather radar pitch and roll stabilization outputs. When the GAD 43 is configured to emulate a remote-mount ARINC 407 gyro (such as the King KVG-350, Collins 332D-11, or the Sperry VG-14A), the weather radar pitch and roll stabilization outputs are active. An input for 26 VAC reference voltage is also provided. The GAD 43 can convert an 115 VAC signal to a 26 VAC reference if desired. See APPENDIX C for wiring interconnect information to support this conversion. The weather radar (stabilization) outputs are capable of driving a 10 k Ω load.

Refer to Section 5.3.1.1 for configuration information.

4.2.4.5 Yaw Rate Outputs

Pin Name	Pin	I/O
YAW RATE / BARO CORRECTION OUT [1]	19	Out
YAW RATE / BARO CORRECTION GND [1]	40	--

Notes:

- [1] Multi-function pins used for yaw rate output and baro correction output. Configuration determines the function of these pins.

The GAD 43 provides one analog yaw rate output with configurable values of 100, 200, 333, and 666 mVDC/deg/sec. The output saturates at +4 VDC; polarity is positive voltage for clockwise yaw as viewed from above the aircraft. A configuration of “None” implies that these output pins will be used for barometric correction as described in the following section.

Refer to Section 5.3.1.1 for configuration information.

4.2.5 Baro Correction Outputs

Pin Name	Pin	I/O
YAW RATE / BARO CORRECTION OUT [1]	19	Out
YAW RATE / BARO CORRECTION GND [1]	40	--

Notes:

- [1] Multi-function pins used for yaw rate output and baro correction output. Configuration determines the function of these pins.

The GAD 43 provides one analog barometric output for emulation of the King KEA-130 altimeter barometric pickoff. The output varies from 0 to 5 VDC based on the barometric setting displayed on the GDU 620. This interface is intended to be used in installations with the King KFC-225 autopilot. See APPENDIX C for wiring interconnect information. In order for the barometric correction outputs to be active, this output must not be configured to output yaw rate information.

Refer to Section 5.3.1.1 for configuration information.

4.2.6 Discretes

4.2.6.1 Discrete Input

Pin Name	Pin	I/O
SPARE DISC IN* 2 (<i>function not currently implemented</i>)	27	In

An asterisk (*) following a signal name denotes that the signal is Active-Low, producing a low (ground) on the output when active.

Active-low discrete inputs are considered active if either the voltage to ground is <3.5 VDC or the resistance to ground is <375Ω. These inputs are considered inactive if the voltage to ground is 6.5-33 VDC or the resistance to ground is >100 kΩ.

4.2.6.2 Discrete Outputs

Pin Name	Pin	I/O
HEADING VALID OUT*	2	Out
SPARE DISC OUT* 2 (<i>function not currently implemented</i>)	11	Out

An asterisk (*) following a signal name denotes that the signal is Active-Low, producing a low (ground) on the output when active.

All discrete outputs from the GAD 43 are Active-Low. Each is an “open drain” output capable of sinking 250 mA when active.

4.2.6.3 Heading Valid Out*

If magnetic heading information from the AHRS is invalid or not present, this discrete goes inactive; otherwise this discrete output is active.

4.2.6.4 Spare Disc Out* 2 (function not currently implemented)

Reserved for future functionality.

4.2.7 Relays

Pin Name	Pin	I/O
ATTITUDE VALID RELAY NO	3	--
ATTITUDE VALID RELAY NC	4	--
ATTITUDE VALID RELAY COMMON	20	--
AP INTERLOCK RELAY VALID NO	22	--
AP INTERLOCK RELAY VALID NC	21	--
AP INTERLOCK RELAY COMMON	5	--

The GAD 43 provides two relays that switch based on the validity of the attitude information provided by the GRS 77. The normally-open (NO) contact on each relay is electrically connected to the common (COMMON) contact when the attitude solution is valid. The normally-closed (NC) contact on each relay is electrically connected to the common (COMMON) contact when the attitude solution is invalid.

See APPENDIX C for wiring interconnect information.

This page intentionally left blank

5. SYSTEM CONFIGURATION AND CHECKOUT

5.1 Post Installation Power Check

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

5.2 GAD 43 Software Loading

Prior to using the GAD 43, the required GAD 43 software should be loaded as specified in Section 5 of the GDU 620 Installation Manual (190-00601-04).

5.3 Initial Configuration of the GAD 43

NOTE



To access and modify the GAD 43 configuration page, an Installer Unlock Card P/N 010-00769-60 must be inserted in the bottom card slot prior to applying power to the GDU 620.

As part of the initial configuration, the GAD 43 functions must be enabled/disabled as desired, external data sources must be configured, and miscellaneous options must be set up. To do this an Installer Unlock Card (P/N 010-00769-60) must be inserted into the GDU 620, and the GDU 620 must be started in configuration mode by pressing and holding the ENT button while applying power.

When the GDU 620 is in configuration mode, the left display has only one page that is used to display status and product information of the various LRUs. The right display has multiple pages that are used to configure and checkout the installation of the various LRUs including the GAD 43.

5.3.1 GAD Page Group

Once the GAD 43 is installed and enabled using the GDU 620, an additional page group titled “GAD” appears in the configuration mode.

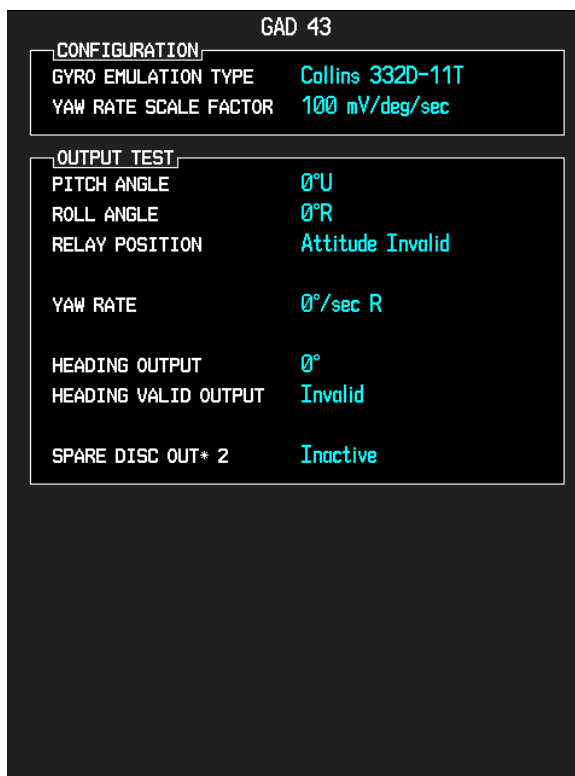
NOTE



The GAD 43 settings are configured using the GDU 620 display. The information presented below is accurate as of Revision D of the GDU 620 Installation Manual (190-00601-04). Please see Section 5 of the GDU 620 Installation Manual (190-00601-04) for the latest information.

5.3.1.1 GAD 43 Page

This page allows the GAD 43 to be configured to provide data in formats suitable for interfacing to many different systems.



CONFIGURATION Window:

1. **GYRO EMULATION TYPE**, specifies the type of attitude gyro that the GAD 43 outputs will emulate. Table 5-1 lists the gyros currently supported.

NOTE



Table 5-1 may not be the most current list of supported gyros. Refer to the “Gyro Emulation Type” list on the GAD 43 Page of the GDU 620 for the gyros currently supported.

Table 5-1. Gyro Emulation Types

Manufacturer	Model(s)
Collins	332D-11T
Cessna/ARC	G519
King	KI 256
	KVG 350
Sperry	VG-14A
Century	52C77-4 (Triden), 52D67/M, 52D77-4, 52D167/M, 52D188(), 52D254, 52D267/M (Triden), 52D267/M (2000)

2. **YAW RATE SCALE FACTOR**, specifies the scaling in mV/deg/sec used on the YAW RATE/BARO CORRECTION output. *Selections: None, 100, 200, 333, 666 (mV/deg/sec)*

OUTPUT TEST Window:

1. **PITCH ANGLE**, specifies the pitch angle on all of the analog pitch outputs from the GAD 43. *Selections: 89°U to 90°D in 1° increments.*
2. **ROLL ANGLE**, specifies the roll angle on all of the analog roll outputs from the GAD 43. *Selections: 179°R to 180°L in 1° increments.*
3. **RELAY POSITION**, specifies the position of the Attitude Valid and AP Interlock Relay contacts. *Selections: Attitude Invalid or Attitude Valid.*
4. **YAW RATE**, specifies the yaw rate on the Yaw Rate/Baro Correction output from the GAD 43. *Selections: 127%/sec R to 128%/sec L in 1%/sec increments*
5. **HEADING**, specifies the heading angle on the synchro heading output from the GAD 43. *Selections: 0° to 359° in 1° increments.*
6. **HEADING VALID**, specifies the state of the Heading Valid discrete output. *Selections: Invalid or Valid.*
7. **SPARE DISC OUT 2***, specifies the state of the Spare Disc Out 2 discrete output. *Selections: Active or Inactive.*

This page intentionally left blank

6. RESERVED

This page intentionally left blank

7. LIMITATIONS

7.1 Operation

There are no Part 23 aircraft type limitations. All functions of the GAD 43 meet the appropriate design assurance qualifications for a secondary system for aircraft in Class I, Class II, and Class III in accordance with AC 23.1309-1C, Figure 2. The TSO authorizations with the RTCA/DO178B software levels by function are listed in Section 1.5.

7.2 Installation

Installation of the GAD 43 is restricted to locations in the aircraft that are consistent with the DO-160E categories defined in the GAD 43 Environmental Qualification Form (EQF), P/N 005-00496-07.

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

7.2.1 Equipment Interfaced to the GAD 43

GAD 43 interfaces to aircraft systems other than those shown in this installation manual are outside the scope of this manual and may require further evaluation and/or certification approval.

This page intentionally left blank

8. PERIODIC MAINTENANCE

8.1 Continued Airworthiness

Maintenance of the GAD 43 is “on condition” only. For regulatory periodic functional checks, refer to approved aircraft maintenance manuals or manual supplements for actual aircraft maintenance requirements.

This page intentionally left blank

APPENDIX A ENVIRONMENTAL QUALIFICATION FORM

Go to the Dealers Only site at <http://www.garmin.com> for the latest Environmental Qualification Form, document number 005-00496-07.

This page intentionally left blank

APPENDIX B OUTLINE AND INSTALLATION DRAWINGS

- Figure B-1. GAD 43 Unit and Connector
- Figure B-2. GAD 43 CG and Dimensions

This page intentionally left blank

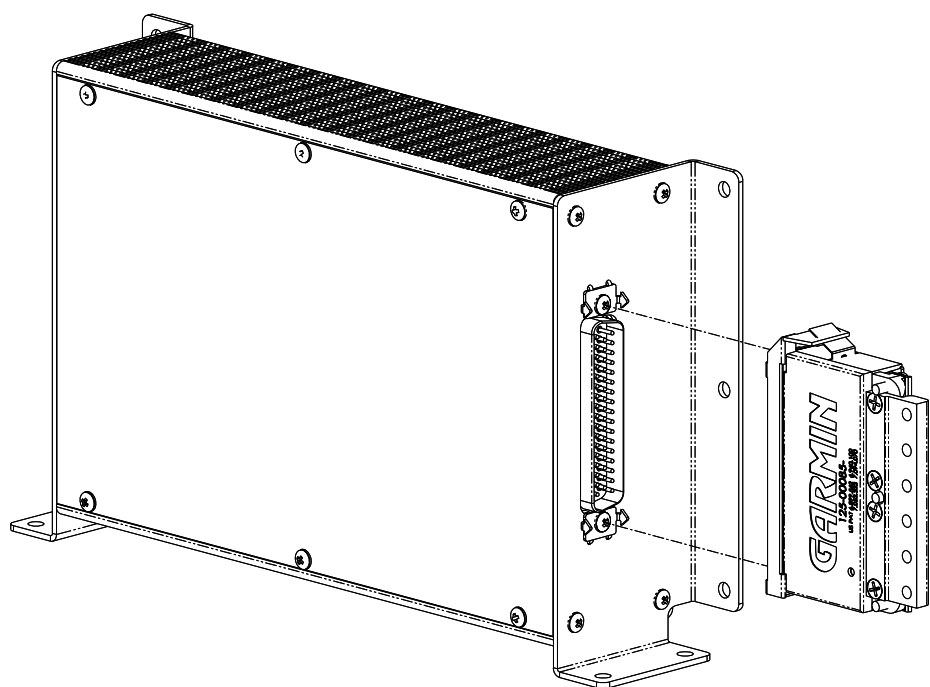


Figure B-1. GAD 43 Unit and Connector

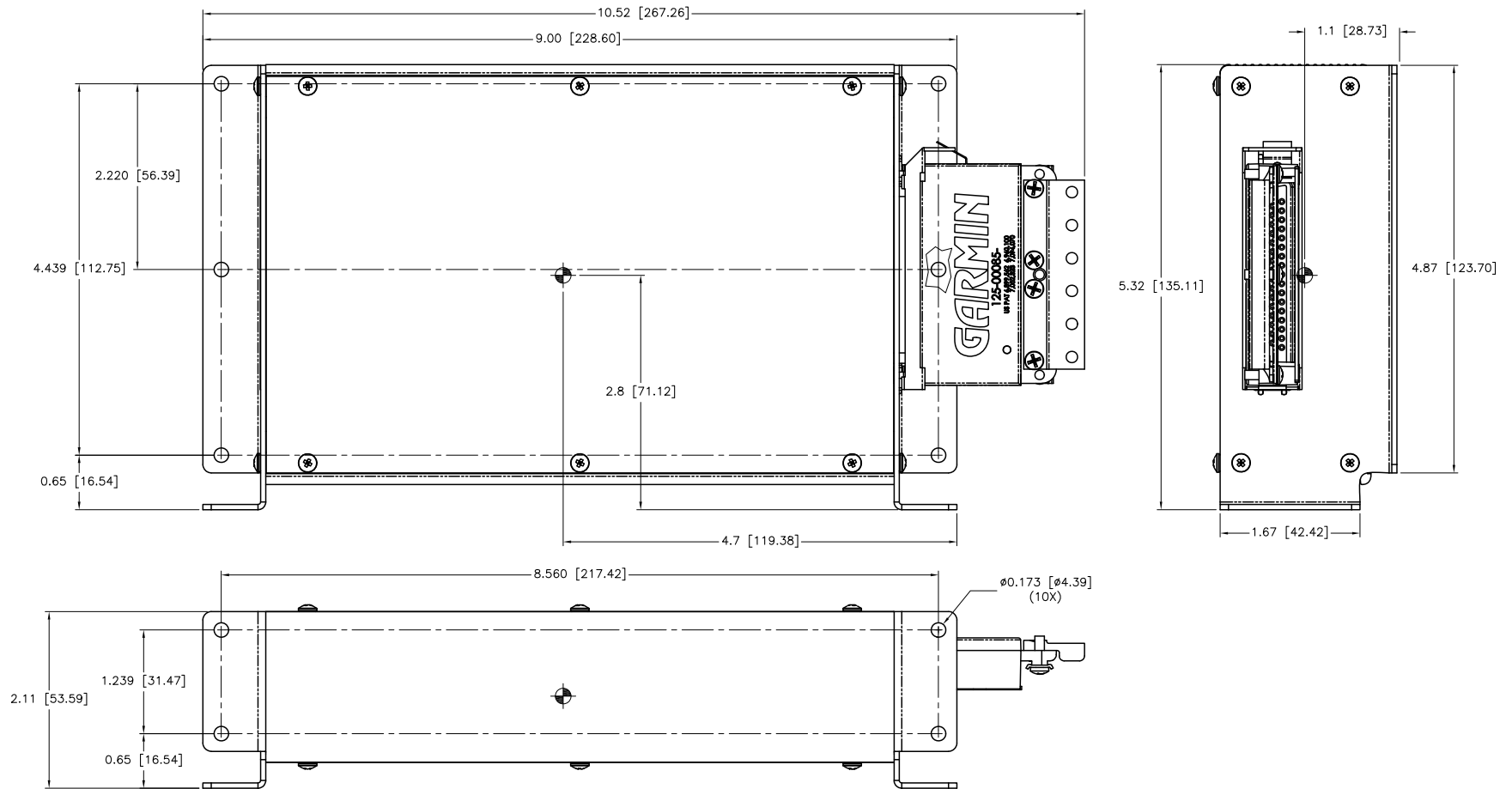


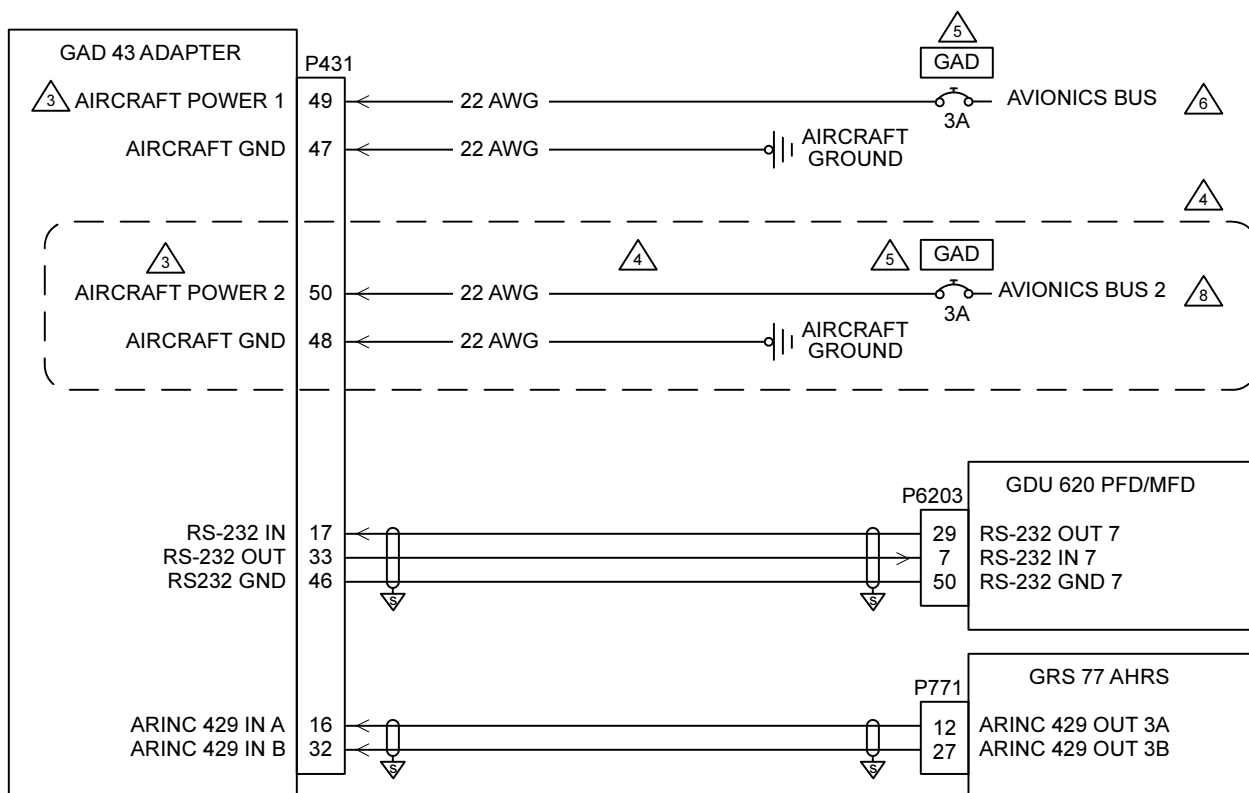
Figure B-2. GAD 43 CG and Dimensions

APPENDIX C INTERCONNECT DRAWINGS

The following drawings are included in this section:

- ❑ Figure C-1. GAD 43 Power Interconnect
- ❑ Figure C-2. GAD 43 Panel Mount Gyro Replacement Interconnect
- ❑ Figure C-3. GAD 43 Remote Mount Gyro Replacement Interconnect
- ❑ Figure C-4. GAD 43 Heading Interconnect
- ❑ Figure C-5. GAD 43 Yaw/Baro Correction Interconnect
- ❑ Figure C-6. GAD 43 WXR Stabilization Interconnect

This page intentionally left blank

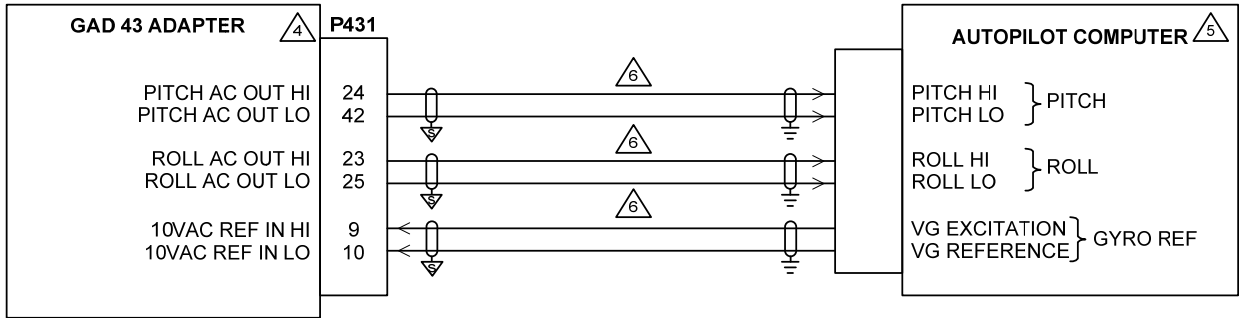


NOTES:

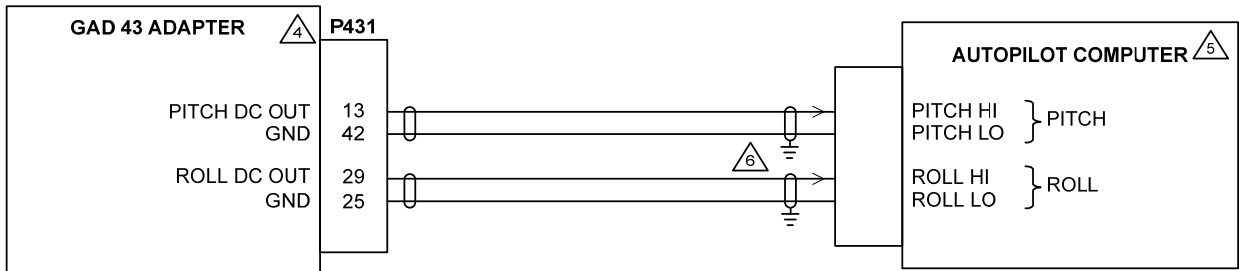
1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. GROUND DESIGNATIONS: SHIELD BLOCK GROUND AIRFRAME GROUND
3. 'AIRCRAFT POWER 1' IS INTERNALLY DIODE ISOLATED FROM 'AIRCRAFT POWER 2'.
4. CONNECTING A SECOND POWER INPUT IS OPTIONAL.
5. CIRCUIT BREAKER SHOULD BE LABELED AS SHOWN.
6. THE GAD 43 SHOULD BE ON THE SAME POWER BUS AS THE AUTOPILOT.

Figure C-1. GAD 43 Power Interconnect

AC INTERFACE



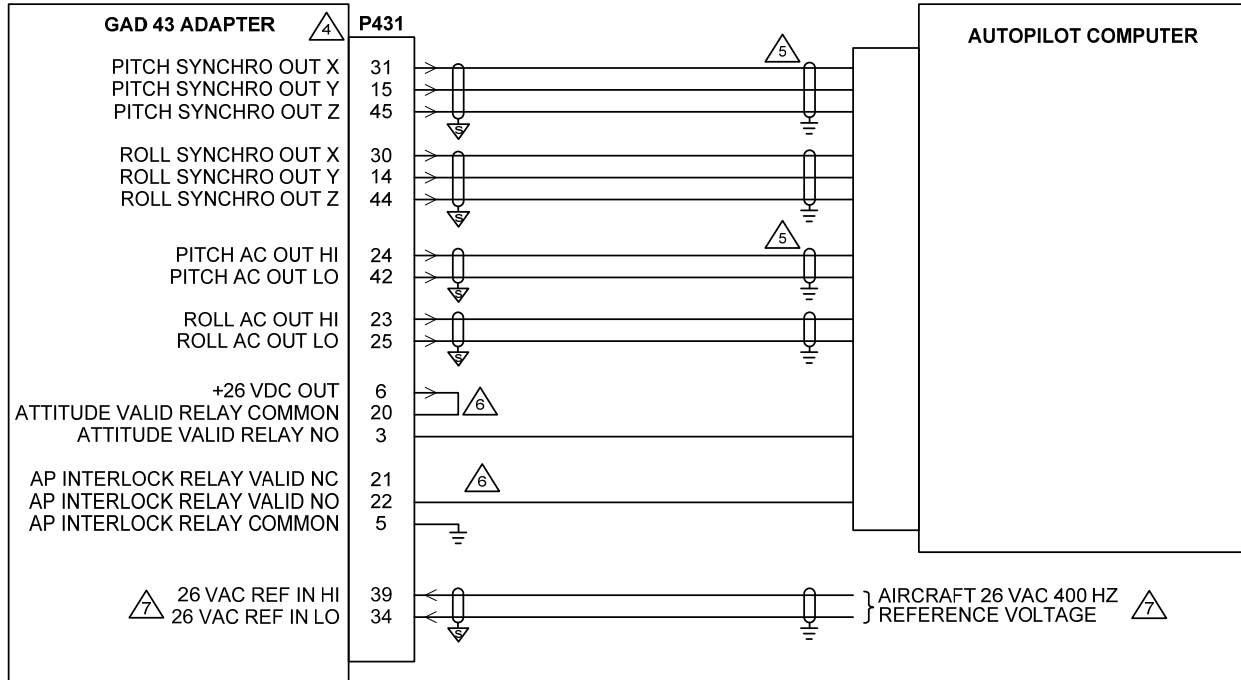
DC INTERFACE ⁷



NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. GROUND DESIGNATIONS: SHIELD BLOCK GROUND AIRFRAME GROUND
3. AT GAD 43, GDU 620, AND GRS 77, CONNECT SHIELD GROUNDS TO THE CONNECTOR BACKSHELL -- THE SHIELD LEADS MUST BE LESS THAN 3.0". CONNECT OTHER SHIELD GROUNDS TO AIRCRAFT CHASSIS WITH AS SHORT A CONDUCTOR AS PRACTICAL.
- ⁴ FOR GAD 43 SETUP ITEMS REFER TO SECTION 5.
- ⁵ DEVICES THAT CONNECT TO THE EXISTING PANEL-MOUNT GYRO CAN BE CONNECTED TO THE GAD 43 PITCH AND ROLL ANALOG OUTPUTS.
- ⁶ SHIELDED TWISTED PAIR IS RECOMMENDED, BUT EXISTING GYRO WIRING MAY BE USED.
- ⁷ DC INTERFACE TO BE USED WITH AUTOPILOT COMPUTERS THAT RECTIFY GYRO ATTITUDE SIGNALS (SUCH AS THE CENTURY AUTOPILOT SYSTEMS)

Figure C-2. GAD 43 Panel Mount Gyro Replacement Interconnect



NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
 2. GROUND DESIGNATIONS: ▽ SHIELD BLOCK GROUND ≡ AIRFRAME GROUND
 3. AT GAD 43, GDU 620, AND GRS 77, CONNECT SHIELD GROUNDS TO THE CONNECTOR BACKSHELL -- THE SHIELD LEADS MUST BE LESS THAN 3.0". CONNECT OTHER SHIELD GROUNDS TO AIRCRAFT CHASSIS WITH AS SHORT A CONDUCTOR AS PRACTICAL.
- △4 FOR GAD 43 SETUP ITEMS REFER TO SECTION 5
- △5 DEVICES THAT CONNECT TO THE EXISTING REMOTE-MOUNT GYRO SHALL BE CONNECTED TO THE GAD 43 PITCH AND ROLL SYNCHRO OUTPUTS. SHIELDED TWISTED TRIPLE/PAIR IS RECOMMENDED, BUT EXISTING GYRO WIRING MAY BE USED.
- △6 TWO RELAY INTERFACES ARE PROVIDED – DIAGRAM SHOWS ACTIVE-HIGH RELAY WIRING FOR THE ATTITUDE VALID RELAY AND ACTIVE-LOW RELAY WIRING FOR THE AP INTERLOCK RELAY. CONNECT RELAYS IN ACCORDANCE WITH THE AUTOPILOT INSTALLATION MANUAL.
- △7 IF A 26VAC 400 HZ REFERENCE IS NOT AVAILABLE, THE GAD 43 CAN BE USED AS THE 26 VAC 400HZ REFERENCE, AS FOLLOWS:

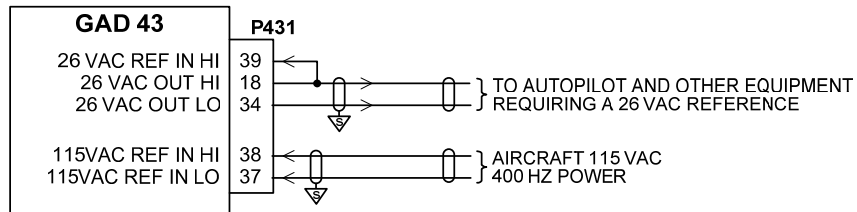
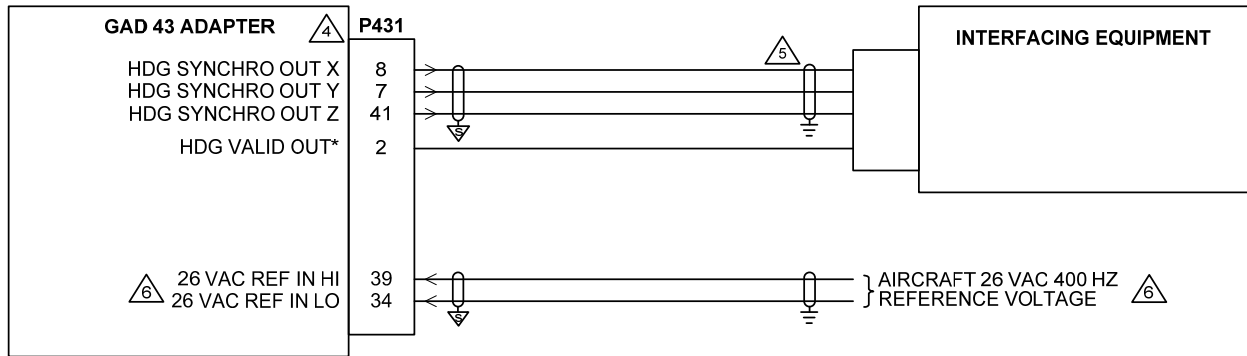


Figure C-3. GAD 43 Remote Mount Gyro Replacement Interconnect



NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
 2. GROUND DESIGNATIONS: ▽ SHIELD BLOCK GROUND ≡ AIRFRAME GROUND
 3. AT GAD 43, GDU 620, AND GRS 77, CONNECT SHIELD GROUNDS TO THE CONNECTOR BACKSHELL -- THE SHIELD LEADS MUST BE LESS THAN 3.0". CONNECT OTHER SHIELD GROUNDS TO AIRCRAFT CHASSIS WITH AS SHORT A CONDUCTOR AS PRACTICAL.
- ⚠️ FOR GAD 43 SETUP ITEMS REFER TO SECTION 5.
- ⚠️ DEVICES THAT CONNECT TO THE EXISTING HEADING SYNCHRO CAN BE CONNECTED TO THE GAD 43 HEADING SYNCHRO OUTPUTS. TWISTED SHIELDED WIRING IS RECOMMENDED, BUT EXISTING WIRING MAY BE USED.
- ⚠️ IF A 26VAC 400 HZ REFERENCE IS NOT AVAILABLE, THE GAD 43 CAN BE USED AS THE 26 VAC 400HZ REFERENCE, AS FOLLOWS:

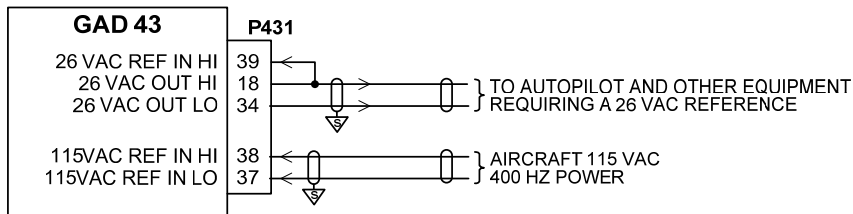
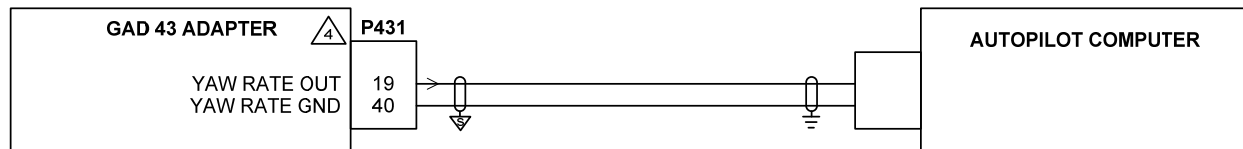


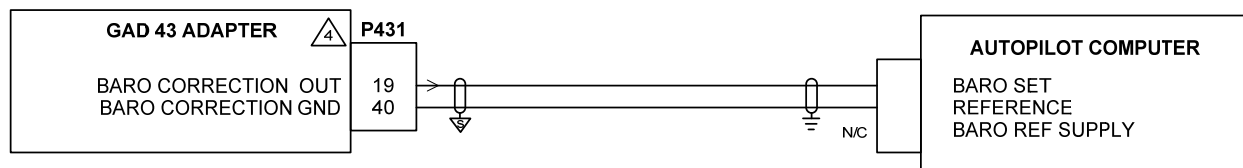
Figure C-4. GAD 43 Heading Interconnect

YAW RATE



OR

BARO CORRECTION

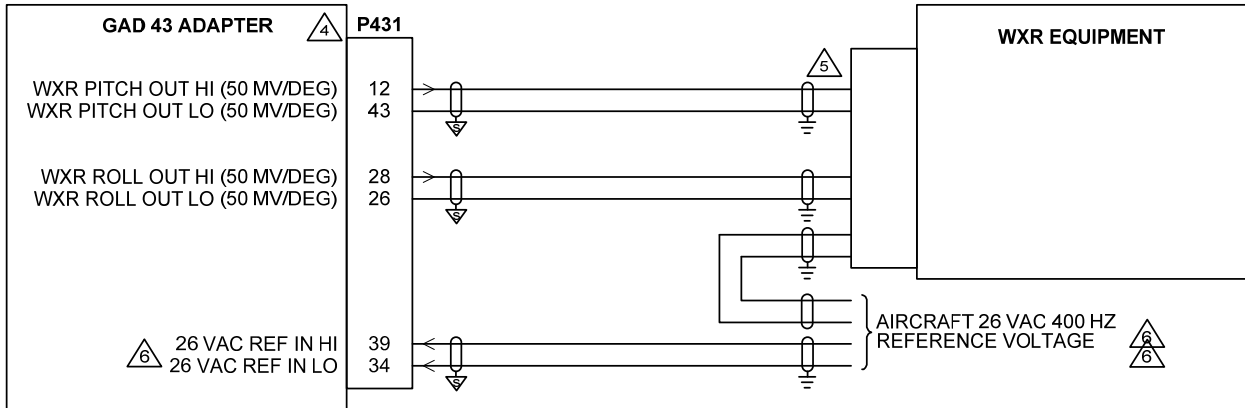


NOTES:

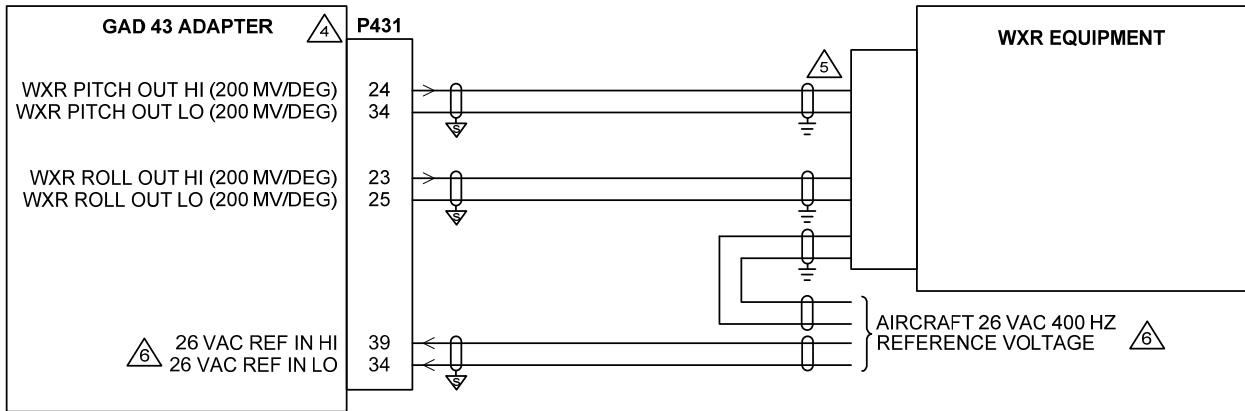
1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. GROUND DESIGNATIONS: SHIELD BLOCK GROUND AIRFRAME GROUND
3. AT GAD 43, GDU 620, AND GRS 77, CONNECT SHIELD GROUNDS TO THE CONNECTOR BACKSHELL -- THE SHIELD LEADS MUST BE LESS THAN 3.0". CONNECT OTHER SHIELD GROUNDS TO AIRCRAFT CHASSIS WITH AS SHORT A CONDUCTOR AS PRACTICAL.
- FOR GAD 43 SETUP ITEMS REFER TO SECTION 5
5. IF BAROMETRIC CORRECTION OUTPUT IS DESIRED, THE YAW RATE / BARO CORRECTION PINS MAY BE USED. REFER TO SECTION 5 FOR CONFIGURING THESE OUTPUTS TO BE USED AS BAROMETRIC CORRECTION OUTPUTS.

Figure C-5. GAD 43 Yaw/Baro Correction Interconnect

50 mV/deg Stabilization



200 mV/deg Stabilization



NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. GROUND DESIGNATIONS: SHIELD BLOCK GROUND AIRFRAME GROUND
3. AT GAD 43, GDU 620, AND GRS 77, CONNECT SHIELD GROUNDS TO THE CONNECTOR BACKSHELL -- THE SHIELD LEADS MUST BE LESS THAN 3.0". CONNECT OTHER SHIELD GROUNDS TO AIRCRAFT CHASSIS WITH AS SHORT A CONDUCTOR AS PRACTICAL.
4. FOR GAD 43 SETUP ITEMS REFER TO SECTION 5
5. DEVICES THAT CONNECT TO THE EXISTING RADAR STABILIZATION SIGNALS CAN BE CONNECTED TO THE GAD 43 WXR OUTPUTS. TWISTED SHIELDED PAIR IS RECOMMENDED, BUT EXISTING WIRING MAY BE USED.
6. IF A 26VAC 400 HZ REFERENCE IS NOT AVAILABLE, THE GAD 43 CAN BE USED AS THE 26 VAC 400HZ REFERENCE, AS FOLLOWS:

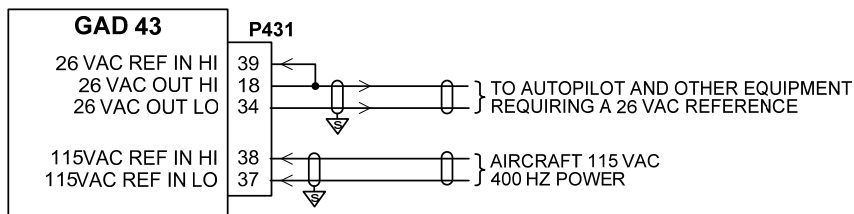


Figure C-6. GAD 43 WXR Stabilization Interconnect

GARMIN[®]