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# 1 GENERAL DESCRIPTION

## 1.1 Scope

The information in this manual is STC approved (STC #SA01487SE). Only the equipment interfaces covered in this manual are within the scope of this STC. Other equipment may be suitable for use with the GDL 69/69A, but use of such equipment is beyond the scope of this STC. Additional FAA approval may be required if equipment not covered in this manual is used to interface to the GDL 69/69A.

This document describes the GDL 69/69A operating with software version 2.13 or later, and the optional GRT 10/GRC 10 wireless remote system.

Refer to Section 6, Limitations for additional information.

It is possible for installers to seek evaluation and approval of an alternate installation by means of the field approval process. This manual and all the data contained within may be used by the installer in pursuit of a field approval.

## 1.2 Introduction

This manual presents mechanical and electrical installation requirements for installing the datalink equipment used to deliver XM WX Satellite Weather™ to a variety of Garmin navigation systems. For audio entertainment in the cockpit, the GDL 69A also provides XM Satellite Radio. If equipped with the optional GRT 10/GRC 10 wireless remote system, passengers are able to remotely control the audio functions of the GDL 69A datalink receiver using the GRC 10 wireless remote.

Equipment needed for receiving XM weather and radio:

- GDL 69/69A – (datalink receiver)
- GA37, GA 55, or GA55A (XM antenna)
- GRT 10 (transceiver) –optional
- GRC 10 (remote control) – optional

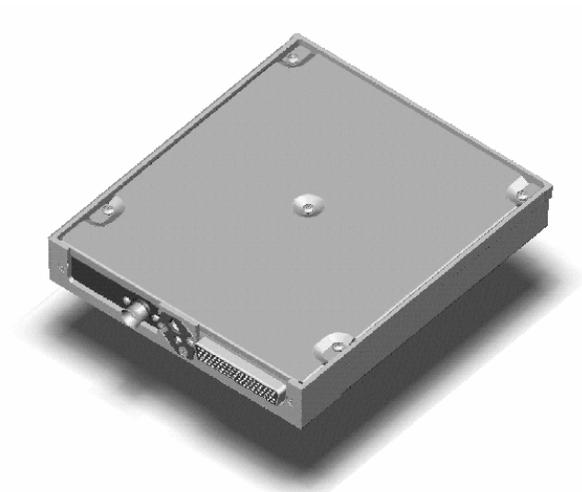
The datalink equipment will operate with any of the following systems or displays. For a complete list of equipment see Table 1-1.

- 400W/500W series displays
- 400/500 series displays
- MX20 Multi-Function Display (MFD)
- GMX 200 MFD
- G1000 Integrated Cockpit System (GDU 104x)

The GDL 69/69A can be integrated into a variety of airframes under an appropriate TC or STC. Each airframe installation may vary. Interconnect drawings and procedures that are approved by the aircraft-manufacturer should be used during actual installation.

## 1.3 Equipment Description

The GDL 69/69A is an XM Satellite Radio data link receiver. The XM Satellite Radio antenna receives the XM satellite signal and passes it to the GDL 69/69A. The GDL 69 is a weather data receiver and the GDL 69A is a weather receiver with the addition of XM Satellite Radio audio entertainment. For display of weather information and control of audio channel and volume, the GDL 69/69A may be interfaced to the GMX 200 or MX20 MFD or 400/500, 400W/500W series units via an RS-232 bus or the GDU104x via an Ethernet link. Audio volume and channel changes may also be controlled with mounted optional switches located in the cabin or by remotely using the GRC 10 wireless remote. The GDL 69A may also be interfaced to a Garmin audio panel for amplification and distribution of the audio signal.



**Figure 1-1. GDL 69/69A Unit View**

The optional GRT 10/GRC 10 wireless remote system is for use by passengers in the aircraft to control the audio functions of the Garmin GDL 69A Datalink Receiver. The system consists of two components: (1) The GRT 10 Wireless Transceiver installed in the aircraft and connected to the GDL 69A serial port, and (2) the GRC 10 Wireless Remote with an LCD display.

**CAUTION**

 **Other transmitting systems which may exist in the aircraft:** Bluetooth and other non-aviation transmitters require separate authorization for use in an aircraft. If they are present, note that interference from such devices may degrade the performance of the GRT 10/GRC 10 wireless remote system.



**Figure 1-2. GRT 10 Transceiver Unit View**



**Figure 1-3. GRC 10 Remote Control Unit View**

**CAUTION**

- ⚠ Stow the GRC 10 in a secure location (i.e. glove box, seat back pocket, etc.) when not in use to prevent damage to the aircraft interior or injury to occupants caused by aircraft maneuvers.

**WARNING**

- ⚠ Do not use lithium batteries in the GRC 10.

**CAUTION**

- ⚠ When replacing batteries, use only new or fully charged batteries. Do not mix new and old batteries as this can cause battery leakage and damage to the unit. Do not mix battery types (i.e. rechargeable with non-rechargeable).

**CAUTION**

- ⚠ Remove batteries if the unit will not be in use for several months. Storing batteries in the unit for prolonged periods may result in leakage and damage to the battery compartment.

**NOTE**

- ✔ Failure of the GRC 10 (i.e. dead batteries) has no impact on normal aircraft operations and is only used for passengers to control audio entertainment.

**NOTE**

- ✔ The USB Port on the GRC 10 is for factory use only.

**NOTE**

- ✔ The GRC 10 is paired to the aircraft's GRT 10 at installation. The GRC 10 will not control the XM audio functions of another aircraft.

### 1.4 Interfaced Equipment

Accomplishment of installation of the GDL 69/69A under this STC requires previous or concurrent installation of the following equipment. If installing the model GDL 69, a control display unit is required. If installing a GDL 69A, a control display unit and audio panel is required; the GRT 10/GRC 10 wireless remote system is optional.

**Table 1-1. GDL 69/69A Interfaced Equipment List**

	Description	Software Version (Or later FAA approved version)
OR	GMX 200 MFD Control Display Unit	Ver. 2.0
	MX20 MFD Control Display Unit	5.5
	GDU 1040 MFD Control Display Unit	4.01
	GDU 1042 MFD Control Display Unit	5.00
	GDU 1043 MFD Control Display Unit	5.00
	GPS 400*	4.04
	GPS 400W	2.00
	GNC 420*	4.04
	GNC 420W	2.00
	GNC 420A*	4.04
	GNC 420AW	2.00
	GNS 430*	4.04
	GNS 430W	2.00
	GNS 430A*	4.04
	GNS 430AW	2.00
	GPS 500*	5.04
	GPS 500W	2.00
	GPS 500W with TAWS	2.00
	GNS 530*	5.04
	GNS 530W	2.00
GNS 530W with TAWS	2.00	
GNS 530A*	5.04	
GNS 530AW	2.00	
GNS 530AW with TAWS	2.00	
OR	SL15 Audio Panel Unit	N/A
	SL15M Audio Panel Unit	N/A
	SL10 Audio Panel Unit	N/A
	SL10S Audio Panel Unit	N/A
	SL10MS Audio Panel Unit	N/A
	GMA 340 Audio Panel Unit	N/A
	GMA 1347 Audio Panel Unit	N/A
OR	GRC 10 Remote	2.00
	GRT 10 Transceiver	2.00

\*400/500 series units must use Pilot Guide Addendum 190-00140-13 Revision D, or later. 400/500 series units may be connected to a GDL 69A. The 400/500 series units do not have audio control capabilities, but the aircraft may be provisioned with a GDL 69A and wiring for future 400W/500W series upgrade that will provide audio control and display.

## 1.5 Audio Entertainment Installation Limitations

The GDL 69A XM Satellite Radio audio entertainment and optional GRT 10/GRC 10 wireless remote system may be installed to all passenger locations for all aircraft on the STC Approved Model List (AML). XM audio entertainment to crew locations depends on aircraft installation, which must meet requirements of 14 CFR §23.1431(e).

For purpose of this STC, 14 CFR §23.1431(e) requires that each pilot station must be able to hear the aircraft's stall warning horn with the entertainment system audio set to the maximum pilot controllable setting. This also applies to aircraft with a gear extension warning horn. Aircraft which have electric stall/gear warning may utilize the GDL 69A audio suppression discrete input to turn off the music during an event. For these installations, the XM audio may be provided to the crew locations.

For aircraft installations with non-electric stall/gear warning horns, this STC does not provide data for installation of audio entertainment to crew locations. The GDL 69A audio entertainment may not be wired to crew locations without a separate evaluation that is beyond the scope of this STC. It is possible for installers to seek evaluation and approval of an alternate installation by means of the field approval process. Each installation or aircraft type must be evaluated for compliance with 14 CFR §23.1431(e). This evaluation may determine that the required horns can be heard satisfactorily without disabling the GDL 69A audio entertainment to the crew.

The optional GRT 10/GRC 10 wireless remote system has been tested for interference as part of the STC. Its operation must not interfere with the proper operation of any required aircraft equipment or systems. STC installation requires that the installer verify that there is no interference using the post-installation check-out procedure detailed in Section 4. Operators may use the STC qualification of the device as a basis for showing compliance with 14 CFR Part 91.21.

## 1.6 XM Satellite Radio

Welcome to the Next Generation of Radio. America's most popular satellite radio service gives you the power to choose what you want to hear - wherever and whenever you want it around the Continental United States.

XM Satellite Radio provides commercial-free music channels, channels of news, sports, talk and entertainment, dedicated channels of instant traffic and weather, the deepest play list in the industry with access to over 2 million titles, and coast-to-coast coverage. XM features digital quality audio.

Subscriptions to XM Satellite Radio weather and audio entertainment services are required before the GDL 69/69A can be activated for the first use. Refer to Section 4.8 for instructions for activating your unit.

### NOTE



It is prohibited to copy, decompile, disassemble, reverse engineer, or manipulate any technology incorporated in receivers compatible with the XM Satellite Radio system. Furthermore, the AMBE(R) voice compression software included in this product is protected by intellectual property rights including patent rights, copyrights, and trade secrets of Digital Voice Systems, Inc. The user of this or any other software contained in an XM Satellite Radio is explicitly prohibited from attempting to copy, decompile, reverse engineer, or disassemble the object code, or in any other way convert the object code into human-readable form. The software is licensed solely for use within this product.

## 1.7 Interface Summary

The following list is an interface summary for the GDL 69/69A units. Note that the GDL 69 does not have the audio interface.

- 3 RS-232 Inputs/Outputs
- 4 Ethernet Inputs/Outputs
- 5 Audio Discrete Control Inputs (Volume Up, Volume Down, Channel/Preset Up, Channel/Preset Down, Mute)
- 6 Audio Suppression Inputs (3 Active High, 3 Active Low)
- 1 Stereo Audio Output (Left Audio, Right Audio with internal volume control and audio suppression)
- 1 Stereo Monitor Output (Line Out Left, Line Out Right with fixed volume level and no audio suppression)
- 1 Remote Power On/Off Discrete Input
- 2 Discrete Inputs (Reserved for Manufacturing Use – Test, Debug Port Enable)
- 1 Discrete Input (Configures audio channel control inputs)
- Configuration Module (for storing aircraft configuration data)
- Aircraft Power Input (Power-on controlled by aircraft avionics power bus)

The following list is an interface summary for the GRT 10 Wireless Transceiver:

- 1 RS-232 Input/Output
- 1 Discrete Input (Volume Lock Enable)
- Aircraft Power Input (Power-on controlled by aircraft avionics power bus)

## 1.8 Technical Specifications

The GDL 69/69A, GA 55, and GA55A antenna, and optional GRT 10/GRC 10 wireless remote system are PMA approved and there is no applicable TSO. The GA 37 and GA 57 GPS/WAAS – XM antennas are TSO authorized under TSO-C144, but the GA 57 is not recommended for new installations. It is the responsibility of those desiring to install this equipment either on or within a specific type of class of aircraft to determine that the aircraft installation standards are within the prescribed standards. The following table presents general environmental specifications. For detailed specifications, see the Environmental Qualification form in Appendix B.

**Table 1-2. GDL 69/69A Specifications**

GDL 69/69A Characteristics	Specification
Operating Temperature Range	-45° C to +70° C
Input Voltage Range	9.0 to 33.0 VDC
Software Compliance	RTCA DO-178B Level D
Environmental Compliance	RTCA DO-160D

**Table 1-3. GA 37, GA 55, GA 55A, and GA 57 Specifications**

GA 37, GA 55, GA 55A Characteristics	Specification
Operating Temperature Range	-55° C to +85° C
Input Voltage Range	Power provided by GDL 69/69A.
Software Compliance	None
Environmental Compliance	RTCA DO-160D

**Table 1-4. GRC 10 Remote Control Specifications**

GRC 10 Remote Control Characteristics	Specification
Operating Temperature Range	-20° C to +55° C
Input Voltage Range	Power provided by 2 AA batteries
Software Compliance	RTCA DO-178B Level D
Environmental Compliance	RTCA DO-160E

**Table 1-5. GRT 10 Transceiver Specifications**

GRT 10 Transceiver Characteristics	Specification
Operating Temperature Range	-30° C to +70° C
Input Voltage Range	9.0 to 33.0 VDC
Software Compliance	RTCA DO-178B Level D
Environmental Compliance	RTCA DO-160E

**NOTE**



See Table 2-12 outlining weights for the GDL 69, GDL 69A, remote rack, modular rack, GRT 10 transceiver, and GRC 10 remote control.

**Table 1-6. GDL 69/69A Unit Dimensions**

Characteristic	Specification
Width	1.05 inches (2.66 cm)
Height	6.15 inches (15.62 cm)
Depth (Rack w/ Connectors)	7.20 inches (18.26 cm)
Unit Weight (GDL 69A)	1.86 lbs (0.84 kg)
Unit (GDL 69A) and Remote Rack Weight	2.83 lbs (1.27 kg)

**Table 1-7. GRT 10 Transceiver Dimensions**

Characteristic	Specification
Width	2.74 inches (7.0 cm)
Height	0.92 inches (2.3 cm)
Length	3.93 inches (10.0 cm)
Unit Weight (excluding connector kit)	0.15 lbs (0.07 kg)
Unit Weight (including connector kit)	0.27 lbs (0.12 kg)

**Table 1-8. GRC 10 Remote Control Dimensions**

Characteristic	Specification
Width	2.46 inches (6.2 cm)
Height	1.16 inches (2.9 cm)
Length	5.00 inches (12.7 cm)
Unit Weight (with batteries)	0.34 lbs (0.15 kg)
Unit Weight (without batteries)	0.23 lbs (0.11 kg)

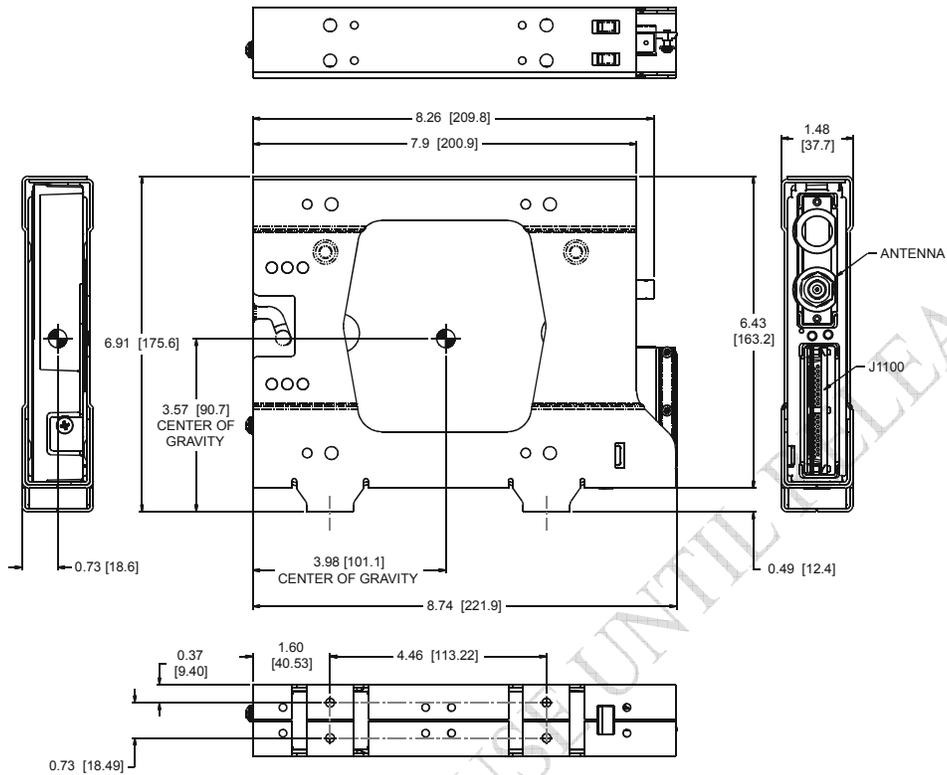


Figure 1-4. GDL 69/69A Remote Rack Unit Dimensions

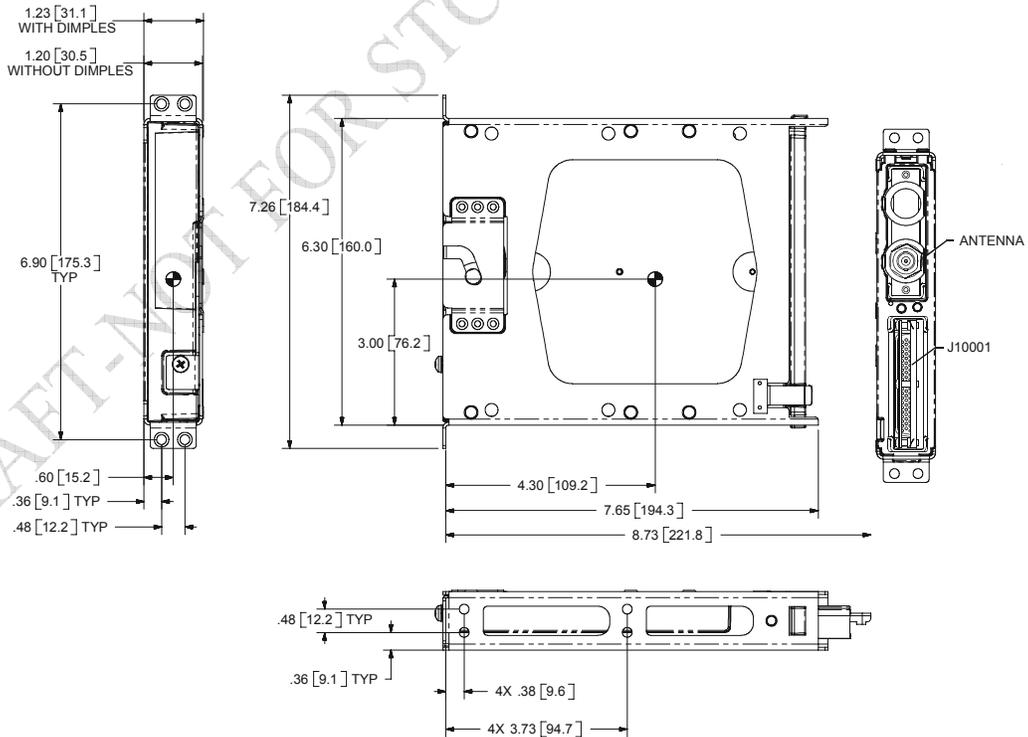


Figure 1-5. GDL 69/69A Modular Rack Unit Dimensions

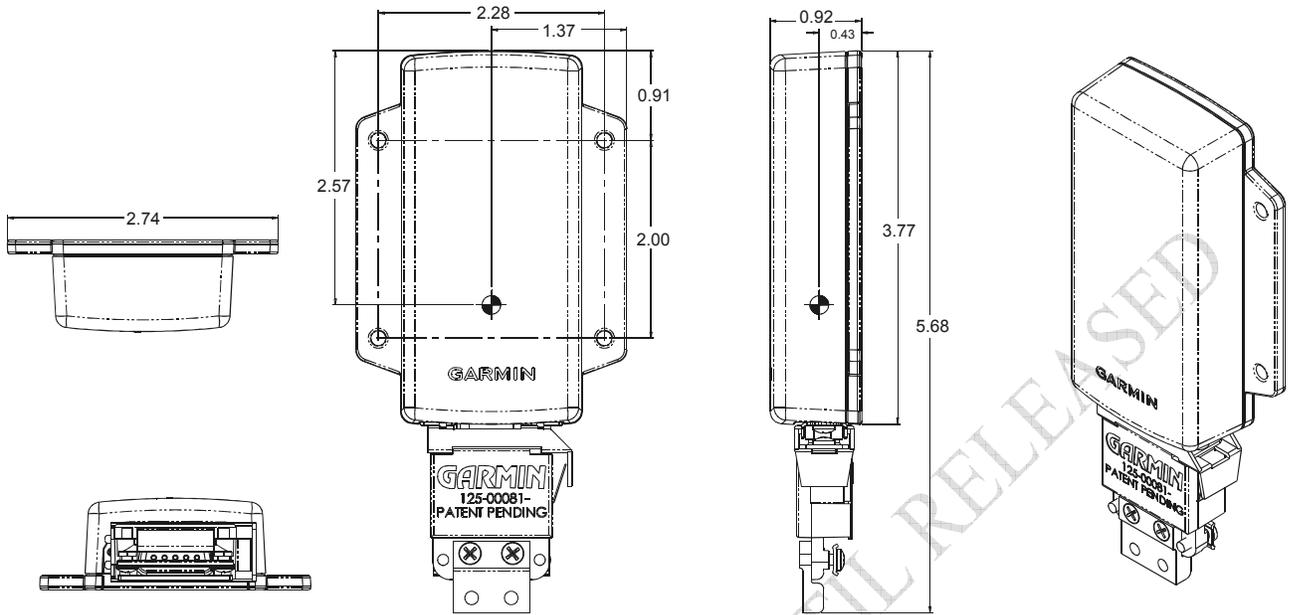


Figure 1-6. GRT 10 Transceiver Dimensions

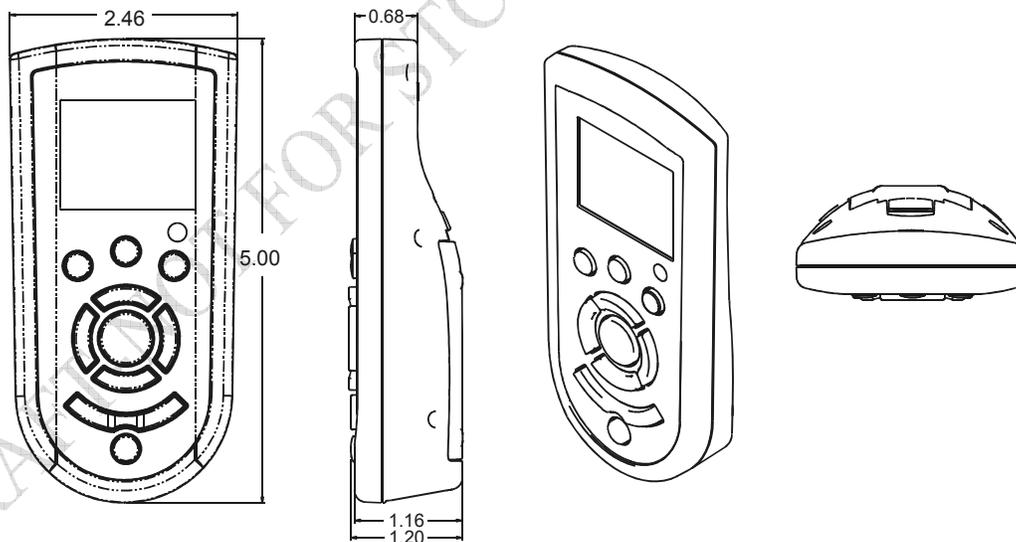


Figure 1-7. GRC 10 Remote Control Dimensions

### 1.8.1 General Antenna Requirements

Garmin recommends the Garmin XM antenna shown in the Table 1-9 below. These antennas are approved with the certification of the GDL 69/69A. However, any equivalent XM antenna with specifications listed in Table 1-10 should work with the GDL 69/69A. Antennas must provide protection from direct lightning strikes. This STC does not support installations of equivalent antennas.

**Table 1-9. XM Antennas**

Model	Part Number	Description	Mounting Configuration
GA 37	013-00245-00	GPS/WAAS	Tear-drop
GA 55	011-01033-00	XM Antenna	Stud mount Tear-drop form factor
GA 55A	011-01153-00	XM Antenna	Thru-mount (ARINC 743 style mount)
GA 57*	011-01032-00	GPS/WAAS + XM Antenna	Thru-mount (ARINC 743 style mount)

\* Not recommended for new installations

**Table 1-10. XM Satellite Radio Antenna Minimum Requirements**

Frequency Range	2332.5 to 2345 MHz
Gain (Typical)	24 dB $\pm$ 1 dB**
Noise Figure	<1.2 dB
Nominal Output Impedance	50 ohms
Supply Voltage	3.6 to 5.5 VDC
Supply Current (maximum)	55 mA
Operating Temperature Gain	-50 to +85°C

\*\* For each 1 dB gain over 24 dB, add 1 dB of attenuation into the antenna cable path between the antenna and the GDL 69/69A.

**Table 1-11. GA 37, GA 55, and GA 55A XM Antenna Specifications**

Frequency Range	2332.5 to 2345 MHz
Gain	25 $\pm$ 2 dB
Noise Figure	<1.2 dB
Nominal Output Impedance	50 ohms
Supply Voltage	3.6 to 5.5 VDC
Supply Current	40 to 55 mA
Operating Temperature Range	-50 to +85 ° C
Output Connector	TNC

## 1.9 Reference Documents

The following publications are sources of additional information for installing the GDL 69/69A and optional GRT 10/GRC 10 wireless remote system. Before installing the GDL 69/69A, the technician should read all referenced materials applicable to the installation along with this manual.

**Table 1-12. Referenced Publications**

Part Number	Document
190-00149-01	GMA 340 Audio Panel Installation Manual
190-00303-20	GMA 1347 Audio Panel Installation Manual
190-00181-02	500 Series Installation Manual
190-00140-02	400 Series Installation Manual
190-00140-13	400/500 Series Garmin Optional Displays
190-00356-02	400W Series Installation Manual
190-00357-02	500W Series Installation Manual
190-00303-01	GDU 1040 Installation Manual
190-00522-01	GA 55A, GA 56A and GA 57 Antenna Installation Manual
190-00848-00	GA 35, GA 36, and GA 37 Antenna Installation Manual
190-00355-04	XM™ Satellite Radio Activation Instructions
190-00607-04	GMX 200 Installation Manual
560-1025-( )	MX20 Installation Manual
560-0979-( )	SL15 Audio Panel Installation Manual
560-0978-( )	SL10 Audio Panel Installation Manual

## 1.10 Certification

The GDL 69/69A XM Satellite Radios, XM Satellite Radio Antenna and optional GRT 10/GRC 10 wireless remote system have Parts Manufacturing Approval (PMA) for the aircraft listed on the STC Approved Mode List (AML).

### 1.10.1 TSO/ETSO Compliance

The GA 37 and GA 57 are TSO-C144 authorized. The GA 57 is not recommended for new installations. There are no other applicable TSO standards.

### 1.10.2 Other Regulatory Criteria

#### 1.10.2.1 FCC Compliance Information

The GRT 10 complies with Part 15 of the FCC regulations and with Canada RSS-210.

#### NOTE



The GRT 10 and GRC 10 have been approved for use in the United States and Canada.

### 1.10.2.2 FCC Grant of Equipment Authorization

GRT 10: FCC ID: IPH-01179  
IC: 1792A-01179

#### NOTE



This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

#### NOTE



This device does not contain any user-serviceable parts. Repairs should only be made by an authorized Garmin service center. Unauthorized repairs or modifications could result in permanent damage to the equipment, and void your warranty and your authority to operate this device under Part 15 regulations.

GRC 10: FCC ID: IPH-01178  
IC: 1792A-01178

#### NOTE



This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

#### NOTE



This device does not contain any user-serviceable parts. Repairs should only be made by an authorized Garmin service center. Unauthorized repairs or modifications could result in permanent damage to the equipment, and void your warranty and your authority to operate this device under Part 15 regulations.

### 1.11 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.

#### NOTE



For GRC 10 Users: Record the GRC 10 serial number for installation purposes. See Section 4.5.

## 1.12 Warranty Statement

### Limited Warranty

This Garmin product is warranted to be free from defects in materials or workmanship for two years (one year for GRC 10) 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.

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