

FAA APPROVED

AIRPLANE FLIGHT MANUAL SUPPLEMENT

or

SUPPLEMENTAL AIRPLANE FLIGHT MANUAL

for the

GARMIN GI 275 MULTIFUNCTION INSTRUMENT

as installed in

Beechcraft 35-C33

Make and Model Airplane

Registration Number: VH-FJF

Serial Number: CD-1073

This document serves as an Airplane Flight Manual Supplement or as a Supplemental Airplane Flight Manual when the aircraft is equipped in accordance with Supplemental Type Certificate SA02658SE for the installation and operation of the Garmin GI 275 Multifunction Instrument. This document must be carried in the airplane at all times.

The information contained herein supplements or supersedes the information made available to the operator by the aircraft manufacturer in the form of clearly stated placards or markings, or in the form of an FAA approved Airplane Flight Manual, only in those areas listed herein. For limitations, procedures and performance information not contained in this document, consult the basic placards or markings, or the basic FAA approved Airplane Flight Manual. FAA approved sections of the AFMS are labeled "FAA APPROVED". Sections labeled "NOT FAA APPROVED" are for guidance only.

FAA APPROVED BY: JR Brownell

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ODA-240087-CE

DATE: 6/13/2025

LOG OF REVISIONS			
Rev	Page	Description	FAA Approval
1	All	Initial issue.	<u>JR Brownell</u> ODA STC Unit Administrator Garmin International, Inc. ODA-240087-CE Date: 1/13/2020
2	7	Added hardware variant functionality information to Table 2	<u>Erik Frisk</u> ODA STC Unit Administrator Garmin International, Inc. ODA-240087-CE Date: 9/10/2020
	7	Added reference to -20 and -40 hardware variants	
	10	Updated software version number	
	11	Added clarification to Note.	
	12	Added missing installation option	
	14	Removed Section 2.19 "Type Ratings"	
	20	Changed "amber" to "yellow" for consistency throughout document	
	24	Changed "amber" to "yellow" for consistency throughout document	
	29	Corrected AHRS/ADC annunciation figures	
	31	Changed "amber" to "yellow" for consistency throughout document	
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	33	Changed "amber" to "yellow" for consistency throughout document	
	33	Added reference to GFC 500	
	38	Changed "amber" to "yellow" for consistency throughout document	
	39	Added reference to -20 and -40 hardware variants	
	39	Changed "amber" to "yellow" for consistency throughout document	
	41	Removed text requiring pilot to verify units match across systems.	
	42	Added reference to -20 and -40 hardware variants	
	45	Corrected typos	
3	10	Updated software version number	<u>JR Brownell</u> ODA STC Unit Administrator Garmin International, Inc. ODA-240087-CE Date: 11/30/2020
	56	Updated the Engine and Airframe Timer descriptions to reflect new Hobbs and Tach Timer functionality	

4	8	Corrected table formatting	<u>JR Brownell</u> ODA STC Unit Administrator Garmin International, Inc. ODA-240087-CE Date: 12/23/2020
	10	Added clarification of Standby Reversionary capabilities	
	11	Added clarification of EIS configuration to include all EIS capabilities and display parameters	
	12	Included VFR GPS antenna and Backup Battery Pack as GI 275 system components	
	13	Added clarifications for Standby instrument configurations with the GI 275; Clarified reversionary function when configured as a Standby instrument; Added Battery Charge Inhibited system message description	
	14	Added ADI to the Definitions	
	15	Added a table to identify AFMS section applicability based on specific system installation	
	16	Added tickbox for GI 275 primary heading installations; Clarified magnetic variation limits for configurations with GI 275 as primary heading source	
	17	Added GPS aiding system message description; Clarified limitations of aerobatic maneuvers for primary and standby ADI configurations; Added clarifications for battery capacity required for aircraft above 25,000ft service ceiling	
	18	Added clarification that QFE altimeter setting is incompatible with GI 275 instrument; Added tickbox selections to define specific system installation and configuration; clarified loss of control warning for IMC flight	
	19	Clarified sensor selection applicability to Garmin cross-comparison AHRS and ADC sensors	
	21	Clarified VFR GPS functionality and limitations; Removed powerplant gauge markings section	
	22	Added original flight instrument requirements for GI 275 system when installed with non GI 275 standby instruments	
	23	Added External EIS Annunciator requirements for GI 275 EIS systems; Added requirement to test any installed annunciator; Added section for recording placards that are removed or modified	
	25	Added a note to clarify that not all emergency procedures may apply to a specific installation	

26	Clarified procedures for AHRS failure; Added a Caution Note to describe Garmin cross-comparison for AHRS/ADC sensors with specific sensor selections enabled
27	Clarified procedures for ADC failure; Added a Caution Note to describe Garmin cross-comparison for AHRS/ADC sensors with specific sensor selections enabled
28	Added underline font to Note
29	Added underline font to Note and Caution; Added battery temp viewed in system menu
32	Added underline font to Note; Added system message description for display overtemperature; Clarified selection of VFR GPS source with the CDI button; Clarified GPS failure procedure to seek VFR conditions
33	Added underline font to Note and Caution
38	Added descriptions and images for Battery Fault and GPSS Invalid failure conditions
39	Added images for ALT and IAS advisories
40	Added steps to test any installed external annunciators and verify the Magnetic angle units to match across interfaced systems; Added clarification of 60 minutes battery for aircraft with ceilings above 25,000ft; Added clarification for checking Battery status
42	Added reference for Autopilot system description section; Clarified that AP Disconnect Test is not needed for Garmin GFC 500 and GFC 600 autopilot interfaces; Added underline font to Notes and Cautions
43	Added underline font to Notes Clarified GPSS modes
44	Clarified that GTN VNAV interface requires barometric altitude; Added clarification for EIS alert functionality
46	Added tickbox selections to define installed unit configurations
49	Added underline font to Caution
52	Added tickboxes to define what audio alerts the GI 275 will provide given the system installation and configuration; Added note to clarify failure of audio system interface results in no audio alerts from GI 275
53	Clarified that Baro Sync is required and not recommended when interfaced with TXi
56	Clarified that barometric altitude is required when interfaced with GTN to provide VNAV functionality
60	Removed typo

	61	Added a note to clarify traffic data availability based on services provided by local region/country; Removed typo	
	67	Added underline font to Note	
	68	Added underline font to Caution	
5	9	Added Transponder page to list of configurable MFD pages	<u>JR Brownell</u> ODA STC Unit Administrator Garmin International, Inc. ODA-240087-CE Date: 6/14/2021
	16	Updated software version number	
	43	Added procedure detail for AP HDG DATUM switch; Added a checkbox for delineating on-screen button versus external switch for the AP HDG DATUM switching function.	
	59	Added system description details for the AP HDG DATUM external switch.	
	70	Added system description for the Transponder Control functions	
6	12	Updated EIS description and image to reflect new EIS User Interface and new gauges.	<u>JR Brownell</u> ODA STC Unit Administrator Garmin International, Inc. ODA-240087-CE Date: 7/22/2021
	13	Updated with new EIS percent power gauge.	
	14	Updated wording to clarify GI 275 usability and familiarization info.	
	17	Fixed an incorrect section reference.	
	22	Updated Fuel Computer use to clarify visual fuel inspection as means of determining fuel.	
	23	Updated Fuel Computer use to clarify visual fuel inspection as means of determining fuel; Added clarification about controlling the GI 275 via knob when using gloves.	
	27	Added a table of contents for section 3.	
	41	Added an image of GLIDE annunciation.	
	43	Added a table of contents for section 4.	
	47	Added clarification of new EIS alerting acknowledge.	
	49	Added EIS pilot alerts as a White annunciation.	
	68	Updated with new EIS gauge requirements and availability.	
	69	Updated EIS caution/warning location; updated CHT/EGT page description; Updated Primary EGT/TIT description.	
	70	Updated mixture leaning procedure with new feature description updates and clarifications.	
	71	Updated with details for new Fuel page user interface and layout.	
	72	Updated with reference to new EIS summary page	
7	19	Updated limitations on using the GI 275 ADI in aerobatic maneuvers.	<u>JR Brownell</u> ODA STC Unit Administrator Garmin International, Inc.
	38	Updated Alert image and description with new EIS red warning triangle.	

	40	Updated Alert image and description with new EIS yellow caution triangle.	ODA-240087-CE Date: 10/7/2021
	47	Updated language to align with new EIS alert triangle.	
8	14	Removed incorrect reference to tablet trainer app.	<u>JR Brownell</u> ODA STC Unit Administrator Garmin International, Inc. ODA-240087-CE Date: 5/26/2022
	18	Updated software version number	
	31	Added a note about ALT miscompare with RVSM	
	56	Added clarification for airspeed trend bar behavior; added Mach number display to Primary ADI functions.	
	59	Added Mach number as part of airspeed display when configured.	
	63	Added normal mode flight director selection description.	
9	<i>Changes made for GI 275 Software v2.60 project updates:</i>		<u>JR Brownell</u> ODA STC Unit Administrator Garmin International, Inc. ODA-240087-CE Date: 1/18/2023
	2	Updated GI 275 applicable Software version to v2.60.	
	12	Added STBY INST circuit breaker label option.	
	19	Added procedure for Blank Screen with GDL 60 interface.	
	36	Clarified wording for Standby ADI pre-flight check of reversionary switch.	
	<i>Changes made for AFMS restructure based on recent FAA Guidance:</i>		
	Various	Added statement to cover sheet regarding FAA approved markings.	
		Moved acronym definitions into beginning of Section 1.	
		Moved applicable Software information into Section 1 and removed applicable Note.	
		Moved all installation-specific selections and checkboxes into Section 1.	
		Moved descriptive information out of Section 2 into Section 7 and moved procedural information out of Section 2 into Sections 3 and 4.	
		Removed Sensor Selection Section.	
		Removed Synthetic Vision Section.	
		Removed Autopilot Disconnect Section.	
		Removed Terrain/TAWS Alerts Section.	
		Removed Portable Electronic Devices Section.	
		Moved Placarding information into Section 1.	
		Moved descriptive information from Section 3 into Section 7.	

		Moved Terrain Alerts table into Section 3.1 Emergency Procedures.	
		Moved descriptive information from Section 4 into Section 7.	
		Removed EIS Operation Section.	
		Moved installation-specific checkboxes out of Section 7 into Section 1, moved limitations out of Section 7 into Section 2, and moved procedural information into Sections 3 and 4.	
10	All	Updated document margin formatting.	<i>JR Brownell</i> ODA STC Unit Administrator Garmin International, Inc. ODA-240087-CE Date: 8/16/2023
	1	Added Electronic Stability Protection (ESP) to list of acronyms.	
	2	Updated the GI 275 software version to the new v3.01 version.	
	8	Updated with guidance that knob rotation or reversionary switch can be used to revert a Standby unit.	
	9	Fixed section 4.1 references; Updated to state that reversionary switch check is only required when the switch is installed.	
	11	Updated wording to state reversionary switch labelling is only required when the switch is installed.	
	16	Removed the reversionary switch as required equipment for the GI 275 Standby ADI.	
	19	Updated to state that the outer knob rotation can also be used for manually reverting the Standby ADI.	
	20	Updated to state that the outer knob rotation can also be used to manually force reversion of the Standby ADI unit.	
	33	Added the ESP Disabled annunciation to Advisories table.	
	35	Updated to state that the reversionary switch check is only required if the switch is installed.	
	42	Updated to state that reversion backup switch is optional and not required for the Standby ADI unit.	
	46	Updated to add description of new configurable chevron range values.	
	48	Updated to add option of GTN controlled CDI selection	
	51-52	Added miscellaneous field section and added g value.	
	57	Added note about CHT and EGT bars not disappearing below indicating range.	

11	2	Updated the GI 275 software version to the new v3.10 version.	<u>JR Brownell</u> ODA STC Unit Administrator Garmin International, Inc. ODA-240087-CE Date: 2/2/2024
	9	Improved format and organization of checkbox items for installed placards.	
	14	Clarified the Stormscope interface as a Datalink weather product.	
	19-20	Removed unnecessary and excessive content from ADC/AHRS notes.	
	21	Removed a note about white no-compare message from the ADI caution message section where the note was not applicable. Appropriate content is included in section 3.3.3.	
	22	Added note about viewing the battery fault icon on ground during before takeoff checks.	
	28-29	Added note about in a more than two sensor configuration, this annunciation will only be viewed on the unit that is mis-comparing.	
	30	Updated section to include comment on the battery rundown test.	
	31	Added a note to view advisory messages to inhibit annunciations and added STBY ADC/AHRS sensor designation.	
	33	Updated procedure to refer to section 3.1.9 for battery checks.	
	46	Added section describing the Standby and Side SYNC settings with TXi.	
	49	Clarified G-Meter verbiage.	
12	55	Updated CHT/EGT display descriptions for Single CHT/EGT configuration.	<u>JR Brownell</u> ODA STC Unit Administrator Garmin International, Inc. ODA-240087-CE Date: 5/16/2024
	i	Updated NOT FAA APPROVED wording	
	2	Updated the GI 275 software version to the new v3.20 version.	
	12	Added option for gasket style CHT.	
	28	Removed CAUTION Annunciation that is not provided.	
13	55	Added system description of gasket style CHT probes.	See cover page
	1	Added Carbon Monoxide to definitions	
	2	Updated GI 275 software version	
	6	Added autopilot interface note for clarity	
	12	Added Carbon Monoxide alerting to aircraft audio interface	
	13	Added image for heading operational area	
		Added User Navigation Angle	
	14	Updated aerobatic maneuver limitation	
	15	Added Functional Backup Battery with sufficient charge as required for IFR flight	
	16	Added GCO 14 to Kinds of Operations List	

	17-30	Updated format and content of the Abnormal Procedures section to facilitate use in emergencies	
	31-35	Updated format and content of the Normal Procedures section to facilitate use in normal operations	
	40	Updated wording on sensor comparison for clarity	
	43-44	Added information about AHRS, ADC, and Heading failure and indications	
	48	Updated instructions for accessing autopilot heading reference selection (GPSS)	
	50	Added section addressing Backup ADI malfunctions	
	60	Added section addressing Carbon Monoxide monitoring	

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Section 1. General

1.1 Definitions

ADAHRS:	Air Data and Attitude Heading Reference System
ADC:	Air Data Computer
ADI:	Attitude Direction Indicator
ADS:	Automatic Dependent Surveillance
AHRS:	Attitude Heading Reference System
AMMD:	Airport Moving Map Display
CDI:	Course Deviation Indicator
CRS:	Course
CO:	Carbon Monoxide
EIS:	Engine Indication System
ESP:	Electronic Stability Protection
FD:	Flight Director
FLTA:	Forward-looking Terrain Alerting
GPSS:	GPS Steering
HDG:	Heading
HSI:	Horizontal Situation Indicator
IFR:	Instrument Flight Rules
IMC:	Instrument Meteorological Conditions
LOI:	Loss of Integrity
MFD:	Multi-Function Display
MFI:	Multi-Function Instrument
PED:	Portable Electronic Device
SBAS:	Space-based Augmentation System
SVT:	Synthetic Vision Technology
TAWS:	Terrain Awareness and Warning System (a TSO-C151b function)
TIS-A:	Traffic Information Service (Addressed)
TIS-B:	Traffic Information Service (Broadcast)
VFR:	Visual Flight Rules
VMC:	Visual Meteorological Conditions
VNAV:	Vertical Navigation
VS:	Vertical Speed

1.2 Applicable Software Version

The following or later software versions must be installed for this AFMS revision to be applicable to the installation:

Component	Software Version
GI 275	3.40


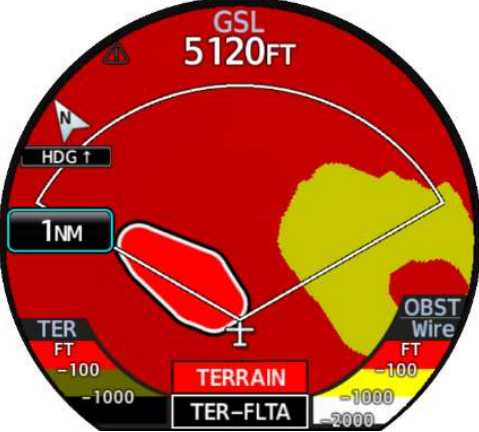
1.3 System Description

The GI 275 Multifunction Instrument (hereafter referred to as the “GI 275”) is a panel-mounted, multifunction instrument with a single touch display and virtual “Pages” within each instrument that may be configured as individual “instruments”. The GI 275 can be configured as an ADI, HSI, EIS or MFD with multiple hazard awareness pages, depending on the number and type of integrated navigation and hazard sensor sources. The GI 275 can be used as a primary Engine Indication System (EIS) for single and twin-engine aircraft. The ADI and HSI can be installed as stand-alone primary flight instruments as long as there are other equivalent source(s) of primary flight information that are independently powered. The ADI or HSI can also be installed as a backup instrument. Any GI 275 ADI, HSI, or MFD may be configured with an optional internal battery to provide an independent and automatic backup power source.

Individual GI 275s may be grouped or connected as follows to expand and enhance their capabilities and to provide redundancy. Groups of connected GI 275s are hereafter referred to as a “GI 275 system” in this document.

Table 1- GI 275 System Function

Attitude Direction Indicator (ADI)	
	<p>Units configured as an ADI will contain a single page that displays aircraft attitude.</p> <p>Altitude, airspeed, vertical speed and heading may also be displayed on the ADI page depending on the aircraft configuration.</p>

<p>Horizontal Situation Indicator (HSI)</p>  <p>The HSI display is a circular instrument. At the top, it shows a heading of 179°. Below this, a course of 160° is indicated. The CDI (Course Deviation Indicator) is shown as a vertical scale with a central needle. Navigation data includes 'GPS' and 'LPV' indicators. A distance of 10NM is displayed. The display also shows a heading of 160° and a course of 164°.</p>	<p>Units configured as an HSI will contain two pages; an HSI page and an HSI Map page.</p> <p>The HSI Page is a conventional HSI with CDI, VDI, heading indication and compass card. There are navigation annunciations and distance/time fields.</p> <p>The HSI MAP Page includes a top-down view, inset map, hazard awareness overlays (traffic, terrain, topo), along with traditional lateral and vertical navigation cues.</p>
<p>Multi-Function Display (MFD)</p>  <p>The MFD display is a circular instrument. It shows a top-down view of the terrain with a red area indicating a hazard. The display includes a heading of 179° and a course of 160°. Navigation data includes 'GPS' and 'LPV' indicators. A distance of 10NM is displayed. The display also shows a heading of 160° and a course of 164°.</p>	<p>Units configured as an MFD contain multiple installer configurable pages that may include HSI, HSI Map, CDI, Map, Terrain, Traffic, Weather, Radar Altimeter, Stormscope, Transponder, and Engine Indication System (EIS)</p>

Standby ADI



The HSI and MFD can be configured as a “Standby” instrument to preserve the display of primary flight data in the event the primary ADI fails or the pilot reverts the display either through the rotation of the outer knob counter-clockwise or engages the reversionary switch. An ADI page will be available during both normal operation and when reverted to preserve the display of primary flight data.

A stand-alone ADI may also be considered a Standby ADI since it provides full-time display of primary flight data.

Engine Indication System (EIS)



Units configured for EIS will always display Engine RPM, Main Tank Fuel Quantity, and Manifold Pressure (if applicable) on the screen.

Five configurable pages are available on the EIS unit:

- Gauges Main: Contains all gauges with red/yellow markings
- Auxiliary EIS: Contains any other engine gauges that have no markings, or pilot selectable data fields
- CHT/EGT: Includes three modes:
Monitor Mode
Lean Mode
Normalized Mode
- Fuel
- Summary: Includes three pages:
Timers
RPM and Temp Data
Fuel and Lean Data

Available gauges are as follows:

- Engine RPM
- Manifold Pressure
- Oil Pressure
- Oil Temperature
- EGT, Primary EGT
- CHT
- TIT (Single or Dual)
- CDT
- IAT
- CDT-IAT Diff
- Alternator Amps
- Battery Charge/Discharge
- Battery Volts
- Bus Volts
- Fuel Flow
- Fuel Pressure
- Fuel Quantity
- Carb Temp
- Outside Air Temp
- Engine Percent Power

Table 2- GI 275 Hardware Variant Functionality

Function	GI 275 Base (- 00)	GI 275 ADAHRS (-10/-30)	GI 275 ADAHRS + AP (-20/-40)
Primary ADI		✓	✓
MFD/Standby ADI		✓	✓
MFD	✓	✓	✓
EIS	✓	✓	✓
HSI	✓*	✓	✓
HSI/Standby ADI		✓	✓
Autopilot Interface**			✓

*Requires interface to another GI 275 with an internal ADAHRS configured.

**Only required when interfacing with non-Garmin autopilots

Table 3 - GI 275 System Components

GMU 11 and GMU 44B	Magnetometer Heading Sensors
GEA 24 or GEA 110	Engine Sensors
GTP 59	OAT temperature Probe
GSB 15	USB Port
Backup Battery (internal)	Battery Pack
VFR GPS Antenna	GPS Antenna

MFD functions are supported by GPS navigator interfaces and a variety of other optional interfaces such as traffic systems, Stormscope®, and satellite and ADS-B weather sources.

Although intuitive and user friendly, the system requires a reasonable degree of familiarity to become proficient in its use while flying. Pilot workload will be higher for pilots who are not familiar with the GI 275 system in an IFR environment, particularly without an autopilot. Garmin provides a detailed Pilot's Guide for the GI 275. Pilots should take full advantage of this guide to enhance their familiarity with the GI 275 system.

1.4 ADAHRS

The integral ADAHRS, included in the GI 275 -10, -20, -30, and -40 variants, senses aircraft attitude and air data for GI 275 display of primary flight data and can provide attitude and air data for use by other installed systems.

The ADAHRS requires GPS and airspeed inputs for aiding the system. GI 275 includes an optional GMU 11 or GMU 44B magnetometer interface to determine magnetic heading and an OAT probe for measuring outside air temperature.

1.5 Standby Instruments and the GI 275 ADI

GI 275 installations may provide standby attitude, altitude, and airspeed instruments. Several types of standby instruments might be installed, including a standby GI 275 ADI, other ADI, or individual analog instruments.

The GI 275 can be a standalone standby instrument without interfacing to other sensors and only using its internal sensors. In this configuration, the GI 275 is a full-time dedicated ADI.

GI 275 system has a configuration for redundancy which is satisfied by using a GI 275 MFD or HSI that is configured as a standby instrument. This configuration is only possible when the GI 275 is providing reversionary capabilities with multiple sensors interfaced to the GI 275. When configured as a standby instrument with reversionary capabilities, the GI 275 MFD and HSI include an ADI Page which is displayed automatically when faults are detected or when selected by the pilot through knob rotation or a reversionary switch.

Both the GI 275 primary and standby ADIs have their own integral ADAHRS and internal batteries for independence and redundancy.

1.6 Backup Battery

The GI 275 may be configured to include a backup battery to provide emergency power to a GI 275 ADI, HSI or MFD. The backup battery is mounted in an internal, partitioned aluminum chassis within the GI 275 to provide thermal security and automatic backup power when aircraft power is unavailable.

NOTE

Backup battery charging requires the battery temperature between 0°C and 60°C. A system message “Charge Inhibited – unable to charge the battery” will indicate that the battery is no longer charging.

1.7 Functions Included in this Installation

The following section identifies information relevant to this installation. This section is for the purpose of navigating the AFMS and to assist with identification of important system functions included with this installation.

The following units are installed in this aircraft:

- ☒ ADI
- ☐ Standby ADI
- ☐ HSI
- ☒ HSI Standby ADI
- ☐ MFD
- ☐ MFD Standby ADI
- ☒ EIS

1.7.1 Heading Operation

- ☒ This installation uses GI 275 as the primary heading source

1.7.2 Standby / Primary Instruments

- ☐ This installation does not have separate standby instruments or does not require standby instruments (aircraft limited to VFR).
- ☐ This installation uses the GI 275 as the primary flight display instrument and uses pneumatic instruments, the aircrafts original flight instruments, or a different electronic display as the standby flight display.
- ☒ This installation uses a connected GI 275 system with independent ADHARS and backup batteries for the primary and standby flight instruments. IFR flight must not be initiated unless the systems check in Section 4.1 is completed successfully to verify the following:
 - The backup battery is operational and sufficiently charged. Refer to Section 4.1.
 - Attitude, heading, altitude, and airspeed from AHRS/ADC 1 are operational on the pilot's primary GI 275 ADI with no warnings, cautions, or advisories present.
 - If installed, selecting the Reversion Backup Switch to the "ON" position causes the standby GI 275 to change and lock to the ADI page and displays primary flight information.
- ☐ This installation uses a GI 275 ADHARS and backup batteries for the standby flight instruments to a separate primary flight display. IFR flight must not be initiated unless the systems check in Section 4.1 is completed successfully to verify the following:
 - The GI 275 backup battery is operational and sufficiently charged. Refer to Section 4.1.

- Attitude, heading, altitude, and airspeed from AHRS/ADC 1 are operational on the pilot's primary GI 275 ADI with no warnings, cautions, or advisories present

WARNING

Failure to observe these limitations may result in the loss of all attitude or air data or both, resulting in loss of aircraft control during flight in IMC.

1.7.3 Placards

- ☒ This installation has the GI 275 Reversion Backup Switch and the following labels are required:

On



Auto

- ☐ This installation is limited to VFR and the following placard is required:

“AIRCRAFT LIMITED TO VFR”

- ☒ No placards have been removed or modified.
 - ☐ The following placards have been removed or modified:
-

1.7.4 GPS Steering

- ☐ This installation provides GPSS capability to the autopilot through GPSS emulation. All GPSS/HDG mode switching is done via the GI275.
- ☒ This installation provides GPSS capability to the autopilot through GPSS emulation. GPSS/HDG mode switching is done via the external AP HDG DATUM switch.

1.7.5 VNAV

- ☐ This installation is equipped and configured to provide Enhanced Descent Only VNAV display and autopilot coupling.
- ☒ This installation is equipped and configured to provide Enhanced Descent Only VNAV *display only*.
- ☐ This installation *does not* support EDO VNAV display or coupling.

1.7.6 Autopilot Interfaces

The GI 275 installation in this aircraft provides the following autopilot functions (appropriate boxes will be checked):

- ☐ This installation *does not* interface with the autopilot.
- ☒ Course / NAV Selection coupling to the autopilot.
- ☒ Heading Bug steering to the autopilot.
- ☒ Roll Steering emulated via heading mode.
- ☐ Roll Steering capable autopilot.
- ☐ Altitude Pre-Selector integrated with the autopilot.
- ☐ Flight Director display driven from external autopilot or FD computer.
- ☐ GI 275 provides attitude / air data to autopilot.

1.7.7 Power Sources

The major components of the GI 275 are protected with resettable circuit breakers available to the pilot. These breakers are labeled as follows (appropriate boxes will be checked):

Installed	Circuit Breaker Label	Equipment
<input checked="" type="checkbox"/>	PFD	Primary ADI
<input checked="" type="checkbox"/>	EIS	GI 275 configured for Engine Monitoring – Single Engine
<input type="checkbox"/>	EIS L and EIS R or EIS F and EIS R	GI 275 configured for Engine Monitoring – Multi Engine
<input type="checkbox"/>	MFD	GI 275 configured as an MFD
<input type="checkbox"/>	MFD/STBY ADI	GI 275 configured as an MFD with standby ADI
<input type="checkbox"/>	ATT	GI 275 configured as an Attitude Indicator only
<input type="checkbox"/>	HSI	GI 275 configured as an HSI
<input checked="" type="checkbox"/>	HSI/STBY ADI	GI 275 configured as an HSI with standby ADI
<input checked="" type="checkbox"/>	ENG SNSR	GEA (24 or 110) Engine/Airframe Unit
<input type="checkbox"/>	STBY ADI or STBY INST	Standby ADI (Stand-alone)
<input checked="" type="checkbox"/>	USB	GSB 15 USB Interface
<input type="checkbox"/>	CNXT CNXT BATT	Wireless Access

1.7.8 Aircraft Audio Interface

The primary (pilot) ADI is interfaced to the aircraft audio system to provide aural alerts. If multiple ADIs are installed, only the primary ADI is interfaced to the audio system (to prevent duplicate aural alerts).

An MFD may be interfaced to the audio system for terrain alerts or touch clicks, but only if there is no primary ADI installed.

The following aural alerts are configured in this installation:

- ☒ Altitude Alerting
- ☒ Terrain Alerting
- ☐ Decision Height Aural
- ☒ Baro Minimums
- ☒ EIS alerting
- ☐ Carbon Monoxide Alerting

NOTE

If the GI 275 interface to the aircraft audio system fails, no aural alerts will be issued from the GI 275 system.

1.7.9 Gasket-style CHT Probe(s) are Installed

- ☒ This installation uses gasket-style CHT probes that were not previously installed.

See section 7.16.3.1 for details of operation with gasket CHT probes.

Section 2. LIMITATIONS

2.1 Heading Operational Area

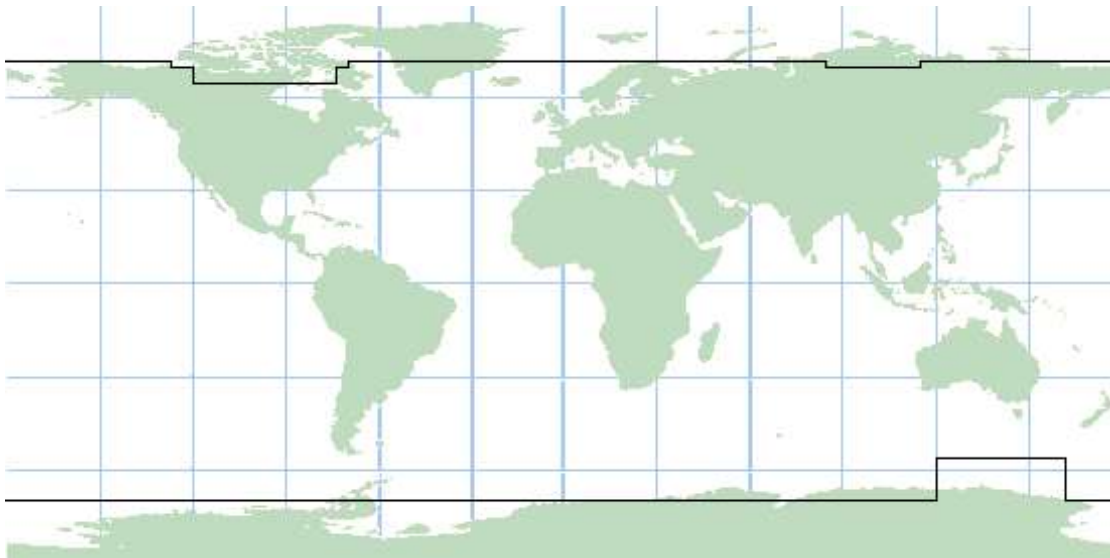


Figure 1- Heading Operational Area

If the GI 275 is used as the primary heading source, IFR Operations are prohibited north of 72°N and south of 70°S latitudes. In addition, IFR operations are prohibited in the following four regions:

- 1) North of 65° North latitude between longitude 75° W and 120° W
- 2) North of 70° North latitude between longitude 70° W and 128° W
- 3) North of 70° North latitude between longitude 85° E and 114° E
- 4) South of 55° South latitude between longitude 120° E and 165° E

Loss of heading may occur near the poles.

2.2 Magnetic Variation Operational Area

If the GI 275 is used as the primary heading source, IFR operations are prohibited in areas where the magnetic variation is greater than 99.9 degrees East or West.

2.3 Navigation Angle

The Magnetic/True/User Navigation Angle and Variation (as selected in the MENU → SYSTEM → UNITS Page) must match the navigation angle and variation selected on all interfaced GPS/SBAS navigators.

2.4 ADAHRS Normal Operating Mode

Dispatch into IFR flight is prohibited unless the Primary GI 275 ADAHRS is receiving valid GPS *and* air data.

2.5 Aerobatic Maneuvers

In installations with a GI 275 ADI, aerobatic maneuvers must not be conducted if uninterrupted attitude information is required.

2.6 Standby and/or Primary Flight Instruments

QFE altimeter operations are prohibited.

2.7 Moving Maps

The GI 275 Map page must not be used as the primary or sole means of navigation or course guidance.

2.8 Terrain Display

Maneuvers and navigation based solely on the display of terrain, obstacles, or wires on the moving map terrain displays is prohibited.

2.9 Datalink Products (SiriusXM, FIS-B, and Stormscope)

Use of datalink weather information as the sole means for maneuvering in, near, or around areas of hazardous weather is prohibited.

Use of datalink services as the primary means to provide Temporary Flight Restriction (TFR) or Notice to Airmen (NOTAM) information is prohibited.

The use of the Stormscope[®] lightning data on the display for hazardous weather (thunderstorm) penetration is prohibited.

2.10 Surface Operations

Use of the GI275 Map Page as the sole basis for ground maneuvering is prohibited.

2.11 Fuel Flow

Reliance on the fuel flow indication to determine fuel used, fuel remaining, or fuel reserves is prohibited.

2.12 Fuel Computer

The fuel computer functions must not be used as the primary means of determining the quantity of fuel in the tanks.

2.13 Database Updates

In-flight database transfers or updates are prohibited.

2.14 VFR GPS

Use of VFR GPS (VGPS) as primary means of navigation is prohibited in IMC.

2.15 Kinds of Operations

Unless placarded as limited to VFR only operations, equipment installed in a certified aircraft is approved for Day and Night / VFR and IFR operations in accordance with 14 Code of Federal Regulations Part 91, Part 121, and Part 135 when appropriately maintained.

The table below lists the minimum fully functional equipment required for operation of the GI 275.

Table 4- Minimum GI 275 Flight Instrument System when installed with a GI 275 Standby ADI

Equipment	Number installed	VFR	IFR
GI 275 ADI	1	1	1
GI 275 HSI/MFD as Standby ADI	1	0	1
GMU 11 or 44B Magnetometer	1*	0	1*
GPS/SBAS Navigator or VFR GPS antenna	1**	1	1**
Non-stabilized Magnetic Compass	1	1	1
Functional Backup Battery with Sufficient Charge in Standby GI 275*** (Ref. Section 4.1.1)	1	0	1

* Connected to GI 275 ADI

** Connected to GI 275 ADI or the GI 275 HSI/MFD as a Standby ADI

*** Not required if Standby is connected to a power source independent from the aircraft's primary power source

Table 5- Minimum GI 275 Instrument System when installed with non-GI 275 supporting Standby Instruments

Equipment	Number installed	VFR	IFR
GI 275 ADI	1	1	1
GMU 11 or 44B Magnetometer	1	0	1
GPS/SBAS Navigator or VFR GPS antenna	1	1	1
Non-stabilized Magnetic Compass	1	1	1
Original flight instruments w/ turn rate indicator*	0 or 1	0	0 or 1
Original flight instruments w/ third attitude source*	0 or 1	0	0 or 1

* Either the original flight instruments with a turn rate indicator or the original flight instruments with a third attitude source must be installed as standbys for IFR flight.

Table 6- Engine Indication System

Equipment	Number installed	Req'd
GI 275 EIS	1 or 2*	1 or 2*
Engine Adaptor Unit (GEA 24/110)	1 or 2*	1 or 2*
External EIS Annunciator	0, 1, 2, or 4**	0, 1, 2, or 4**

* One GI 275 EIS and GEA 24/110 are required per engine

** An external annunciator is installed when the GI 275 EIS is outside of the pilot's primary field of view.

Table 7- Optionally Installed Equipment

Equipment	Number installed	Req'd
GCO 14	0 or 1	0

2.16 Minimum Flight Crew

Installation of a GI 275 does not affect a Minimum Flight Crew determination.

Section 3. EMERGENCY PROCEDURES

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3.1 Emergency Procedures

3.1.1 Loss of Primary Flight Information

3.1.1.1 Red X on Primary Attitude, Airspeed, or Altitude



Standby Flight Instruments **REFERENCE**
Autopilot **VERIFY MODES**

Seek VFR conditions or land as soon as practicable.

If manual reversion of standby GI275 is required:

Outer knob **ROTATE LEFT RAPIDLY**

-or-

Reversionary Backup Switch **ON**

If multiple AHRS or ADC sources are installed:

Dual Concentric Knob **PRESS AND HOLD TO OPEN MENU**

Options → Sensors Menu Item **SELECT**

Sensors Menu **SELECT WORKING SENSORS**

“Back” Button **PRESS AND HOLD TO RETURN TO ADI**

CAUTION

In installations with a Garmin cross-comparison for AHRS/ADC sensors, changing the AHRS/ADC sensor source when a white ATTITUDE/IAS/ALT annunciation is displayed on the primary GI 275 ADI can result in the selection of an inoperative sensor source and subsequent loss of information.

CAUTION

Manually selecting duplicate AHRS sources for multiple displays reduces the redundancy of the system.

PROCEDURE CONTINUED ON NEXT PAGE

NOTE

If airborne AHRS alignment is necessary, minimize maneuvering and turbulence during and after the restart process. If maneuvering or turbulence cannot be avoided, carefully cross-check the AHRS for accuracy against other flight instruments until the alignment has completed and becomes stable.

NOTE

If valid GPS data is available, the GI 275 will automatically revert to display GPS-calculated altitude relative to mean sea level. GPS altitude is displayed in magenta, in the same location as normal operation.

3.1.1.2 Blank Screen on Primary ADI

Standby Flight Instruments **REFERENCE**
Autopilot.....**VERIFY MODES**
Lighting Bus**SET MAX BRIGHTNESS**
Dual Concentric Knob**ROTATE**
Touchscreen..... **TAP**

If manual reversion of standby GI275 is required:

Outer knob **ROTATE LEFT RAPIDLY**

-or-

Reversionary Backup Switch **ON**

If the screen is still blank:

Seek VFR conditions or land as soon as practicable

NOTE

If the display returns after rotating the knob or tapping on the screen and a GDL 60 Wireless Access unit is installed in the aircraft, open the CNXT and CNXT BATT circuit breakers. This will disable the GDL 60.

3.1.2 Operation on Backup Battery (if installed) including Aircraft Electrical System Failure






Battery Operated Instruments **REFERENCE**
Aircraft Electrical System.....**CHECK**
GI 275 Circuit Breakers.....**CHECK**

Seek VFR conditions and land as soon as practicable

PROCEDURE CONTINUED ON NEXT PAGE

NOTE

Table 8. Battery Capacity Icons

Annunciation	Color	Battery remaining
	Green	> 60 min
	Yellow	15 – 59 min
	Red	< 15 min

NOTE

Backup battery operation is inhibited if the battery temperature drops below -20° C or exceeds 80° C.

3.1.3 Backup Battery Malfunction



Seek VFR conditions or land as soon as practicable.

3.1.4 Terrain Warning

All Pages	TER
Terrain Page	PULL UP TERRAIN OBSTACLE WIRE
Aural Alerts	“Warning, Terrain, Terrain” -OR- “Warning, Obstacle, Obstacle” -OR- “Warning, Wire, Wire”

Red annunciator and aural:

Autopilot **DISCONNECT**
Aircraft Controls **INITIATE MAXIMUM POWER CLIMB**
Airspeed **BEST ANGLE OF CLIMB SPEED**

After Warning Ceases:

Altitude **CLIMB AND MAINTAIN SAFE ALTITUDE**
Advise ATC of Altitude Deviation, if appropriate.

3.2 Abnormal Procedures

3.2.1 ATTITUDE, ALT, or IAS monitor CAUTION



If an ATTITUDE, ALT, or IAS miscompare CAUTION is displayed in yellow on the attitude display or airspeed/altitude tape:

Primary & Standby Flight Instruments **CROSSCHECK FOR ERRORS**
Any Erroneous Instruments **COVER OR CHANGE SENSOR SOURCE**

If valid secondary or standby AHRS/ADC is available:

Dual Concentric Knob **PRESS AND HOLD TO OPEN MENU**
Options → Sensors Menu **Item** **SELECT**
Sensors Menu **SELECT WORKING SENSORS**
“Back” Button **PRESS AND HOLD TO RETURN TO ADI**

Seek VFR conditions or land as soon as practical

NOTE

With loss of redundancy of primary altimetry systems, perform appropriate RVSM contingency procedures for the loss of primary altimetry systems.

3.2.2 Heading Failure



GPS Track or Magnetic Compass **REFERENCE**

NOTE

Without magnetic heading or GPS track, the HSI acts like a CDI

3.2.3 Display Overtemperature

System message: “Display Overtemperature”

Affected Display **PREPARE FOR IMMINENT DISPLAY LOSS**

3.2.4 GPS Data Failure



GPS data failure may be indicated by any or all of the following:

- Loss of GPS course deviation information on HSI
- Yellow “LOI” text on the ADI
- Yellow “DR” text on the moving map
- Yellow “NO GPS POSITION” text on the moving map
- Loss of waypoint bearing/distance information

If alternate NAV or GPS source is available

CDI Key **PRESS**

Working NAV/GPS Source **SELECT FOR DISPLAY**

NOTE

If the VFR GPS is configured in the system, while cycling the CDI button the VGPS will become a selectable source. This is limited to Direct-to capability, if configured. The Direct-to function can be accessed at the bottom of the main menu.

If alternate NAV or GPS source is not available.

ATC Radar Vectors **REQUEST AS NEEDED**

VFR Conditions **SEEK IMMEDIATELY**

3.2.5 Navigation Data Failure (VOR/LOC/GS)

Navigation data failure may be indicated by any or all of the following:

- Loss of course deviation information on ADI
- Loss of glideslope/glidepath information on ADI
- Loss of bearing pointer on HSI

CDI Key **PRESS**

Working NAV/GPS Source **SELECT FOR DISPLAY**

-OR-

External Navigation Information **REFERENCE**

3.2.6 Terrain Caution

All Pages	TER
Terrain Page	TERRAIN OBSTACLE WIRE
Aural Alerts	“CAUTION, Terrain, Terrain” -OR- “CAUTION, Obstacle, Obstacle” -OR- “CAUTION, Wire, Wire”

Autopilot **DISCONNECT**
Aircraft Controls **INITIATE MAXIMUM POWER CLIMB**
Airspeed **BEST ANGLE OF CLIMB SPEED**

After Warning Ceases:

Altitude **CLIMB AND MAINTAIN SAFE ALTITUDE**
Advise ATC of Altitude Deviation, if appropriate.

NOTE

External TAWS annunciators may not indicate the exact threat causing the alert. Example: WIRE alerts may be annunciated as TERR or OBSTACLE on external devices.

3.2.7 Synthetic Vision Malfunction

If the synthetic vision depiction is known or suspected to be inaccurate or malfunctioning on the ADI:

Disable SVT **MENU → OPTIONS → TERRAIN SVT**

3.2.8 EIS Failure

EIS failure is indicated by the loss of displayed information on the EIS, including a blank, frozen, or unresponsive display of EIS parameters.

Engine Controls **POSITION FOR OPERATION WITHIN LIMITS**

3.2.9 Blank Screen other than Primary ADI

Lighting BusSET MAX BRIGHTNESS
Dual Concentric KnobROTATE
Touchscreen TAP

NOTE

If the display returns after rotating the knob or tapping on the screen and a GDL 60 Wireless Access unit is installed in the aircraft, open the CNXT and CNXT BATT circuit breakers. This will disable the GDL 60.

3.2.10 Electrical Load Shedding

When required to reduce electrical load:

Circuit breaker(s) labeled “MFD”PULL

CAUTION

Do not pull circuit breakers labeled “MFD/STBY ADI”

NOTE

Any non-required displays on the co-pilot side may also be powered off by pulling the associated circuit breakers.

3.2.11 AHRS ALIGN



Limit aircraft operation to:

- $\pm 10^\circ$ bank
- $\pm 5^\circ$ pitch
- 200 KTAS or less

CAUTION

Exceeding these values may delay or prevent AHRS alignment.

3.2.12 EIS Display Parameter Failure

Indicated by individual parameters having a red or yellow X drawn through the gauge and data removed (see EIS failure procedure for loss of entire EIS function).

Engine ControlsPOSITION FOR OPERATION WITHIN LIMITS

Remaining Engine IndicationsMONITOR

3.2.13 Carbon Monoxide (CO) Caution

	CO	
--	-----------	--

The carbon monoxide level within the aircraft is unsafe.






Possible Sources of CO..... **OFF**

Cabin Ventilation..... **MAXIMIZE AIRFLOW**







Oxygen Mask (if equipped)**DON**




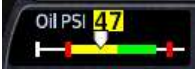




3.3 WARNINGS, CAUTIONS, and Advisories




The following tables show the color and significance of the warning, caution, and advisory messages which may appear on the GI 275 displays.

3.3.1 WARNING Annunciations – Red		
<i>Annunciation</i>	<i>Pilot Action</i>	<i>Cause</i>
HDG Fail 	Use Standby Magnetic Compass or GPS track information	Display system is not receiving valid heading input from the ADAHRS or AHRS.
Red X 	Reference the data source or alternate equipment.	A red X through any display field, indicates that display field is not receiving data or is corrupted.
Red EIS Alert Triangle 	Observe the warning indication on the EIS display and take appropriate action.	One or more engine parameters have exceeded a warning threshold.
Red Engine Parameter 	Take appropriate action to correct condition causing engine parameter exceedance	The engine parameter has exceeded the warning threshold.
Terrain warning 	Take appropriate action to maneuver the aircraft away from the conflicting terrain	Terrain warning due to aircraft proximity to surrounding terrain








3.3.2 CAUTION Annunciations – Yellow

<i>Annunciation</i>	<i>Pilot Action</i>	<i>Cause</i>
AHRS ALIGN – Keep Wings Level 	Limit aircraft attitude to $\pm 10^\circ$ bank and $\pm 5^\circ$ pitch as AHRS Aligns - OK to taxi.	Attitude and Heading Reference System is aligning. AHRS may not align with excessive pitch/bank angles.
LOI 	Loss of Integrity Monitoring	GPS integrity is insufficient for the current phase of flight.
No GPS Position 	Use alternate information for positional and situational awareness	GPS data is unavailable.
Yellow X 	Reference the data source or alternate equipment.	A yellow X through any display field, indicates that display field is not receiving data or is corrupted.
ATTITUDE 	Fly aircraft manually and crosscheck attitude indication with standby attitude indicator and other sources of attitude information (airspeed, heading, altitude, etc.)	The ADI attitude monitors have detected an AHRS malfunction or an error between AHRS sources (if multiple sources installed). Autopilot may disconnect if AHRS is being used to drive the autopilot. If more than two sensors are installed, only the sensor that miscompares from the others will annunciate. Autopilot may disconnect if AHRS is being used to drive the autopilot.
ALT and/or IAS (text on ADI) 	Cross-check the flagged information against other sources to identify erroneous information.	Differences detected between displayed airspeed and/or altitude (multiple ADC installations only). If more than two sensors are installed, only the sensor that miscompares from the others will annunciate.

AHRS 1/2/3 	Confirm intended AHRS source selection	The ADI is using the cross-side AHRS sensor and AHRS monitor is indicating a miscompare or no-compare (multiple ADI and AHRS installations only).
ADC 1/2/3 	Confirm intended ADC source selection	The ADI is using the cross-side ADC sensor and ADC monitor is indicating a miscompare or no-compare (multiple ADI and ADC installations only).
Yellow EIS Alert Triangle 	Observe the caution indication on the EIS display and take appropriate action.	One or more engine parameters have exceeded a caution threshold.
Yellow EIS Parameter 	Take appropriate action to correct condition causing engine parameter exceedance.	The engine parameter has exceeded the caution threshold.
Traffic Caution 	Visually acquire the traffic to see and avoid.	The interfaced traffic system has determined that nearby traffic may be a threat to the aircraft.
Terrain Caution 	Take appropriate action to maneuver the aircraft away from the conflicting terrain	Terrain caution due to aircraft proximity to surrounding terrain
TAWS N/A, TAWS FAIL 	Use vigilance, terrain depiction and TAWS alerting are no longer provided.	External system that is providing TAWS alerting has failed, or the GI 275 cannot communicate with the system.
Battery Fault 	Observe the fault condition on the GI 275 by entering the system messages for further details. Seek VFR flight conditions or land as practical.	The Internal battery has detected an issue which may not allow the battery to charge or discharge properly. Such as “Charge Inhibited - unable to charge the battery” or the battery rundown test is out of date.

GPSS Invalid 	Set an active GPS leg to engage GPSS mode or select HDG as the function.	GPSS mode invalid, wings level command sent to autopilot, no active GPS leg, GPS not selected on HSI/ADI 1.
GLIDE 	Smart Glide is active on the GTN.	Reference the GTN Xi AFMS for Smart Glide details and pilot actions.
Carbon Monoxide (CO) Caution 	The carbon monoxide level within the aircraft is unsafe.	Turn off possible sources of CO, maximize cabin ventilation, and don oxygen mask if equipped.

3.3.3 Advisories – White

<i>Annunciation</i>	<i>Pilot Action</i>	<i>Cause</i>
ATTITUDE, ALT, or IAS (text on ADI) 	View advisory messages to inhibit the annunciation. Be aware that the other (unselected) AHRS/ADC source is not available	Another (unselected) AHRS/ADC source is unavailable.
AHRS 1/2/3/STBY 	Confirm intended AHRS source selection	The ADI is using the cross-side AHRS sensor (multiple ADI and ADC installations only).
ADC 1/2/3/STBY 	Confirm intended ADC source selection	The ADI is using the cross-side ADC sensor (multiple ADI and ADC installations only).
Messages Icon 	View and consider advisory messages. Refer to the GI 275 Pilot Guide for appropriate pilot or service action.	Typically, these indicate system or database status, or data communication issues within the GI 275 System.
Terrain Inhibited 	Use vigilance, traffic system will not provide alerting.	Terrain is inhibited or a terrain test is in progress
External Navigator Message Icon 	View and consider advisory messages on interfaced navigator. Refer to Pilot Guide for the external navigator for appropriate pilot of service action.	Typically, these indicate system or database status.
Electronic Stability Protection Disabled (GFC 500 only) 	Be aware that ESP is disabled on the interfaced GFC 500 autopilot.	The GFC 500 ESP function has been disabled.

Section 4. NORMAL PROCEDURES

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4.1 Before Takeoff

During Exterior Inspection:

Fuel Quantity **VISUALLY VERIFY**

After Master Switch On:

TAWS/Terrain self check aural alert **VERIFY AUDIBLE**

After Engine Start:

External Annunciator Lights **PRESS TO TEST**

Nav Angle Units **SET TO MATCH NAVIGATOR**

Engine Indications **VERIFY FUNCTIONAL**

Any warning, caution, or advisory indications **REVIEW**

CAUTION

Do not fly the aircraft if a required GI 275 presents any persistent warning, caution, or advisory indications relating to equipment requiring service, internal faults, or failures. Reference section 2.15 Kinds of Operations to assist in determining if equipment is required.

4.1.1 ADI System Check

For IFR Capable Aircraft with a Primary or Standby ADI GI 275:

Primary Attitude and Heading Display **VERIFY FUNCTIONAL**

Primary Altitude, and Airspeed Display **VERIFY FUNCTIONAL**

Warnings, Cautions, & Advisories on Primary ADI **VERIFY NONE**

Battery Status Indication **VERIFY NONE or CHARGING**

If a charging icon is present during the Before Takeoff ADI system check:

Verify the battery's remaining capacity is sufficient by referencing the battery status and information found in the battery menu (Menu → System → Battery) and compare it to the following tables:

Table 9. Battery Charging Indications

Annunciation	Color	Battery remaining
	Yellow	15 – 59 min
	Red	< 15 min

Table 10. Minimum battery capacity for takeoff

Aircraft Service Ceiling	Minimum battery capacity
< 25,000 ft	> 30 min
>25,000 ft	> 60 min

If the yellow battery malfunction icon is present:

Do not depart into IMC. A Battery Rundown test may be required.



Figure 2. Battery Malfunction Icon

4.1.1.1 If Reversion Backup Switch is installed:

Reversion Backup Switch	ON
ADI Appears on Standby Instrument.....	VERIFY
<u>Standby</u> Attitude and Heading Display.....	VERIFY FUNCTIONAL
<u>Standby</u> Altitude, and Airspeed Display.....	VERIFY FUNCTIONAL
Warnings, Cautions, &Advisories on <u>Standby</u> ADI	VERIFY NONE
Reversion Backup Switch	AUTO
Standby instrument returns to previous function	VERIFY

4.2 Autopilot Operation

Refer to Section 1.7.6 for the applicable autopilot interface capability and installation details.

4.2.1 Autopilot Disconnect Test (Non-Garmin Autopilots)

Before takeoff:

Autopilot..... **ENGAGE**
ADI Menu → Options → AP DISC **PRESS**
Autopilot Disconnects..... **VERIFY**

CAUTION

Do not use the autopilot if the AP DISC button fails to disengage the autopilot normally.

4.2.2 Autopilot NAV / APR mode coupling

To couple the autopilot NAV / APR mode:

Desired Navigation Source **SELECT**
Autopilot NAV/APR mode..... **ENGAGE**

NOTE

The navigation source can be selected on the Pilot's ADI via the NAV Options Menu or on the Pilot's HSI by pressing the CDI button.

NOTE

The autopilot will use the source that is displayed on the Pilot's ADI or HSI.

4.2.3 GPSS Emulation

If enabled, to use GPSS:

GPS Navigation Source**SELECT**
GPSS Emulation **ENABLE**

NOTE

Enable GPSS emulation via the AP REF button in the ADI Menu or with the optional AP HDG DATUM switch if installed.

Autopilot HDG mode..... **ENGAGE**

NOTE

When GPSS emulation is enabled, the GI 275 ADI's heading bug function will be disabled. This is indicated by a hollowed-out heading bug, and the ADI/HSI heading button will display "GPSS" near the crossed-out heading bug. The "GPSS" text will be white when GPSS commands are available, and it will be yellow when there is no GPSS command available.

The following images show GPSS mode active, but no signals are sent.



The following images show GPSS mode active and sending signals.



NOTE

The GPSS commands to the autopilot are based on the GPS source displayed on the pilot's side ADI (typically the primary ADI or ADI #1).

4.3 EIS Operation

Periodically review the engine indications on the Main EIS page if the GI 275 is displaying any other EIS page.

Section 5. PERFORMANCE

No change.

Section 6. WEIGHT AND BALANCE

See current weight and balance data.

Section 7. SYSTEM DESCRIPTION

A detailed GI 275 Pilot's Guide is available through the Garmin website or your Garmin dealer.

If a GSB 15 is installed it provides a USB port for loading software and databases. This can also power portable electronic devices but does not provide any data connection to the GI 275 for those devices.

Wireless connectivity is provided for ground database updates. Database updates cannot be performed in-flight. Additionally, the GI 275 supports a Bluetooth connection to personal electronic devices running Garmin Pilot for the supplemental display of traffic, attitude and GPS position. This connection will work in-flight however the personal electronic device must be paired with GI 275 while on the ground.

The following colors are used consistently within the GI 275 system:

Color	Functions
Red	Warning conditions Operating Limits
Yellow	Caution conditions Conditional operating ranges
Green	Safe operating conditions Normal operating ranges VOR/Localizer Data
White	Scales and Markings Current data and values, status EIS pilot set alerts
Magenta	GPS Data Active flight plan legs
Cyan	Pilot-selectable references

7.1 Controls Overview

A dual concentric knob with a center push-button provides the primary means with which to navigate between screens and access menus and functions of the GI 275. The outer knob will always change from Page-to-Page on GI 275s that have multiple pages. A display touch is required in most cases to select the display field of a Page that will be changed by inner knob rotation or press. The inner knob changes the value of the selected field. For primary, stand-alone

ADIs the outer knob does not provide any control since there is no other page available for selection. When the outer knob is rotated, a momentary display of knob function is provided at the top of each page.

To access the Menu, press and hold the inner knob. To access the Menu via touchscreen, swipe up from the bottom of the GI 275 display.

7.2 Display Brightness

Display brightness is controlled automatically based on input to a bezel-mounted photocell. The brightness level can be manually adjusted using controls in the Menu → Backlight selection. Optionally, brightness can be controlled using the aircraft's cockpit lighting dimmer control.

7.3 System Power Sources

The GI 275 primarily depends on aircraft power to function. The GI 275 system is directly connected to the aircraft's main or essential bus and energized when the aircraft master switch is turned on. Other systems, like the navigation equipment, weather datalink, and autopilot are typically located on the avionics bus and may not be functional when this bus is powered off.

7.4 System Status

The GI 275 status can be viewed via the Menu → System → Info menu. This includes the serial number and system ID of the unit, the software version loaded on the unit, and the AHRS and ADC software versions.

An External LRUs list displays information and status of various units that are interfaced to the GI 275 system. This list only includes LRUs that can report status information, which is typically limited to other Garmin LRUs. Software versions, serial numbers, and LRU status is typically provided. A green checkmark indicates normal online status, and a red X indicates offline or failed status. Some LRUs, like the GDL 69, GSR 56, and GTX 345, provide a button to see more detailed information about the status of that unit.

7.5 Databases

The GI 275 utilizes databases to provide some system functions.

Database status information is available to the pilot at system startup on the MFD splash screen and during normal operations on the Menu → System → Databases (or DB) menu. Controls are provided for manually initiating a database update. EIS units only use a Nav database. System time (as received from an interfaced GPS navigator or the internal VFR GPS) is used to determine if a database is within its effective period. Databases are displayed in yellow if they are expired, not yet effective, or if the current date/time is unknown. Databases are displayed in white if they are within their effective date range. All database status information is depicted in white on the System Status page.

Databases can be updated using the USB port, by syncing with other compatible units, or using database concierge through a PED. Databases are stored internally on the GI 275s.

The terrain and basemap databases are updated periodically and do not expire.

The Garmin or Jeppesen navigation database contains data associated with navigation including airports, navigation aids, airways, airspaces, and other data. This database is updated on a 28-day cycle.

The obstacle database contains data for obstacles and wires that pose a potential hazard to aircraft. Obstacles 200 feet and higher are included in the obstacle database. Wires which have been identified as a hazard to fixed wing aircraft are included in the database. Coverage of the obstacle database includes the United States and Europe. Wire coverage is limited to the United States. This database is updated on a 56-day cycle.

CAUTION

Not all obstacles or wires are included in the databases.

The Garmin SafeTaxi™ database contains airport diagrams for selected airports. This database is updated on a 56-day cycle.

The magnetic variation model contains data about variations in the earth's magnetic field based on location. This database is included with the navigation database and is updated on a five-year cycle.

7.6 Crew Profiles

The crew profile function is provided for all units to allow the retention of pilot-selectable configurations and settings. If the aircraft is operated by multiple pilots, each pilot can recall their individual settings for use. These profiles include settings from all displays in the system.

If an MFD is installed, the splash screen provides the option for the pilot to select a crew profile upon power up. Otherwise, the crew profile can be set in the System → Crew Profile Menu. If no selection is made, the GI 275 will

default to the last crew profile used. Only one profile may be selected as active at a time. New profiles are created with the settings currently in use.

7.7 Integrated Standby System

Standby instruments (attitude, altitude, airspeed) may be provided by a second GI 275 display. The GI 275 can be a standby to itself, consisting of two GI 275 displays installed adjacent to each other, with one display configured as the ADI and the second display configured as either an HSI or an MFD.

The standby ADI needs to be of the -10, -20, -30, or -40 type with its own integral ADAHRS. An optional Reversion Backup Switch may be installed which will force the standby ADI into the display backup mode of operation when moved to the “ON” position.

A backup battery will provide power to the ADI, MFD, HSI, or standby ADI in the event of aircraft power failure. This configuration will provide the following functionality:

- If the ADI fails or communication with the primary ADI is lost, the MFD with a standby ADI or standby HSI will automatically display its backup primary flight information (attitude, altitude, airspeed).
- Two GI 275 units with internal AHRS will monitor and compare their independent attitude, altitude, and airspeed data. If either GI 275 detects a difference between any of the parameters (attitude, altitude, or airspeed), the MFD or HSI will automatically revert to display the standby ADI to restore primary flight information. Yellow miscompare annunciations will appear to indicate the discrepancy.

7.8 GPS Approach Mode Annunciations

When interfaced with a certified GPS navigator and the GPS navigator is the selected source, the GI 275 HSI and HSI Map display the current GPS operational mode. The GI 275 abbreviates the approach modes as defined in the table below.

Description	Annunciation
Lateral Navigation	LNAV
Localizer Performance with Vertical Guidance	LPV
Localizer Performance without Vertical Guidance	LP
Localizer performance approach with advisory vertical guidance	LP+V
Lateral and vertical navigation approach	L/VNAV
Lateral navigation approach with advisory vertical guidance	LNAV+V

7.9 VFR GPS

A Garmin GI 275 may be interfaced with its own optional VFR GPS antenna. In the event that the certified GPS navigation information becomes unavailable, the GI 275 VFR GPS (VGPS) provides 2D GPS position information and Direct To navigation capability. Aside from selecting VGPS as the CDI source and then selecting a Direct To waypoint, airport, or navigational aid within the GI 275 Direct To Menu, there is no pilot action required to enable or use the VFR GPS. When VGPS data is in use, "VGPS" is annunciated as the selected navigation source.

Synthetic Vision and Terrain alerting functionality is available with the VGPS.

7.10 Messages

Messages are available on all installed GI 275s. A Message annunciation flashes in the upper left corner of each display to notify the pilot when a new advisory is available. The pilot may select Messages in the Menu to display a list of active Messages.

Not all Messages are common to all interfaced GI 275s, meaning unit specific issues will not be shown on all the other GI 275s.

7.11 System Settings

The Menu → System → Setup page provides pilot controls for clock volume, time format, and local time offset. Controls are provided to set the nearest airport criteria so that airports not usable by the aircraft type do not appear in waypoint searches.

Units of Measure for temperature, barometric pressure, and nav angle are pilot controllable via the Menu → System → Units page. These units are propagated throughout the GI 275 system. Adjustments to temperature units will not affect EIS temperature gauges.

The units and markings on the ADI are not user configurable. They match the units as specified in the aircraft's FAA approved Airplane Flight Manual and standby instruments.

If pilot-selected navigation angle settings differ on the navigator and the GI 275, the display aspects will be inaccurate.

7.12 System Data Logging

The GI 275 system incorporates a data logging feature that can record parameters related to the aircraft's primary flight instruments, engine indications, and aircraft configuration. Recorded data is stored in internal memory and can be exported via a USB drive.

7.13 Primary ADI

ADI functions are selected by touching the desired adjustable field on the display. Once selected, the inner knob changes the value (Altitude, IAS, Baro, or Heading). An inner knob press will sync the altitude, IAS, or heading to the current value. Baro sync toggles the ADI in and out of standard altimeter setting (29.92"hg and labeled "STD"). The selectable field defaults to Baro when the knob is idle for a period of time. The default timeout is 10 seconds and may be changed in the Menu.

When interfaced to a Garmin G500/600 TXi, the GI 275 will sync barometer (if Baro Sync is enabled), selected heading, selected altitude, and selected airspeed bugs with the TXi. It is required that BARO SYNC be enabled when using VNAV functionality as the GTN will only use the pilot-side BARO unless there is a failure.

7.13.1 Primary Flight Data

The ADI can display the following parameters depending on the unit configuration; attitude, heading, airspeed, barometric altitude, Mach number, and vertical speed data. Airspeed and altitude displays include a six second trend indicator.

Airspeed trend indication bars are only visible when the speed trend is greater than 5 knots for over 6 seconds.

Pilot selectable bugs may be configured for airspeed, altitude, and heading.

The GI 275 requires at least one GPS source to ensure the integrity of the AHRS.

When dual GI 275 units with internal ADAHRS variants are installed and configured, the pilot is provided with AHRS/ADC source selection controls via the ADI Menu → Options → Sensors menu.

The default ADC and AHRS source on power up is ADC 1 and AHRS 1 for the pilot side ADI and ADC 2 and AHRS 2 for the co-pilot or standby ADI and if a third sensor is installed, it is configured as the standby.

Selection of the non-default sensor source will cause a “ADC [Sensor Number]” or “AHRS [Sensor Number]”, respectively, to be displayed with black text on a white background. If there is an AHRS or ADC miscompare or no-compare while on the off-side sensor “ADC [Sensor Number]” or “AHRS [Sensor Number]” will be displayed with black text on a yellow background.

When dual GI 275 units with internal ADAHRS are installed and configured, software monitors provide detection of sensor miscompares. If a monitor detects a difference between sources exceeding the allowable limit, a visual attitude, altitude, heading, or airspeed miscompare annunciation will be shown on the ADI.

Miscompares are annunciated using black text on a yellow background as follows: airspeed miscompare is “IAS” shown near the airspeed pointer, barometric altitude miscompare is “ALT” near the barometric altitude pointer, the near the digital heading readout, and attitude miscompare is “ATTITUDE” on the attitude indicator. The ADI inhibits the “IAS”, “ALT”, and “ATTITUDE” annunciations in dual GI 275 ADI installations when both ADIs are displaying the same sensor source.

A no compare monitor is used to determine when data between GI 275s cannot be compared. No compares are annunciated the same as miscompares, except for the black text on a white background.

AHRS failure is indicated by the removal of the attitude/heading information and a red X on the GI 275 ADI. Standard rate turn indications will also be removed. A heading failure may also occur.

ADC failure is indicated by a red X over the airspeed and altitude tapes and a yellow X over the digital vertical speed value.

In the event of a heading failure, if the GI 275 is configured with a VFR GPS or interfaced to a certified GPS source, the HDG indications will be replaced with track (TRK) indications in magenta. The heading bug and course pointer will continue to function normally, using GPS ground track as a reference instead of magnetic heading. If there is no GPS in the GI 275 system or if the GPS has failed, the heading failure will be indicated by a red “X” in place of the heading readout on the ADI or HSIs.

7.13.2 Attitude

The attitude display has a blue over brown presentation and may be configured in either a Fixed or Sky Pointer orientation by the installer. The ADI can also display Synthetic Vision data (SVT), available as an option.

Standard rate turn marks are provided on the roll scale for bank angles less than 30 degrees when the GI 275 ADI is configured with an OAT sensor.

The Sky Pointer orientation will automatically declutter the IAS and Altitude selectable fields when bank angles exceed 45°. Red chevrons, which indicate the direction to level pitch to assist recovery, are displayed at a nose up angle of 40° or 50°, and nose down angle of 20° or 30°, depending on configuration.

Slip/skid information is shown using a white trapezoid below the roll angle indicator.

7.13.3 Synthetic Vision Technology

SVT may optionally be provided to assist the pilot in maintaining situational awareness with terrain, obstacles, and airborne traffic.

SVT controls are provided via Menu → Options → Terrain/SVT. Synthetic terrain, horizon headings, and airport signs can be enabled or disabled from this menu.

SVT provides additional information on the ADI:

- **Synthetic Terrain:** an artificial, database-derived, three-dimensional view of the terrain ahead of the aircraft within a field of view of approximately 25 degrees left and 25 degrees right of the aircraft heading.
- **Obstacles:** obstacles such as towers, including buildings over 200 AGL that are within the depicted synthetic terrain field of view. Powerlines are not depicted in synthetic vision.
- **Flight Path Marker (FPM):** an indication of the current lateral and vertical path of the aircraft. The FPM is always displayed when SVT is

enabled. The FPM will be dashed when it hits the vertical or lateral display limit.

- **Traffic:** a display on the ADI indicating the position of other aircraft detected by an interfaced traffic system.
- **Horizon Line:** a white line indicating the true horizon is always displayed on the SVT display.
- **Horizon Headings:** Headings may be overlaid just above the horizon line on the ADI.
- **Airport Signs:** pilot-selectable “signposts” displayed on the synthetic terrain display indicating the position of nearby airports that are in the navigation database.
- **Runway Highlight:** a highlighted presentation of the location and orientation of the runway(s) at the destination airport.

The synthetic terrain display is intended to aid the pilot awareness of the terrain and obstacles ahead of the airplane. It may not provide either the accuracy or fidelity, or both, on which to solely base decisions and plan maneuvers to avoid terrain or obstacles. The synthetic vision elements are not intended to be used for primary aircraft control in place of the primary flight instruments.

7.13.4 Airspeed

If configured, the airspeed tape on the left side of the ADI displays red/white striping to indicate the maximum allowable airspeed (V_{NE}/V_{MO}). This maximum allowable airspeed display is configured to indicate the appropriate maximum allowable airspeed for the airplane.

The airspeed tape displays a red low-speed awareness band at the lower range of the airspeed tape. This low-speed awareness band is displayed at airspeed values below V_{S0} . It does not indicate an actual or calculated stall speed and does not adjust with variations in aircraft weight or other factors.

All other airspeed tape indications are configured to indicate the type design limitations. The airspeed tape does not adjust these additional markings for variations with aircraft weight, altitude, or other factors.

Airspeed references (“V speeds”) are shown on the airspeed tape when enabled for display by the pilot via Menu → Options → Airspeeds.

When configured, Indicated Mach Number will be displayed adjacent to the airspeed tape.

7.13.5 Barometric Altitude and Vertical Speed

If configured, barometric altitude is displayed on a tape on the right side of the display. The vertical speed is displayed via an inset window adjacent to the altitude numerical value. The Baro setting may be adjusted by touching the field

and rotating the inner knob or simply rotating the knob when the active field reverts to the Baro field home state. Altitude, airspeed, and heading bugs may be configured and synchronized across all GI 275 ADIs and configured G500 TXi displays. The Altitude bug may be removed by adjusting the value to -1,000 ft.

If a GTN is interfaced to provide Vertical Navigation (VNAV) functionality, then barometric altitude is required. Baro sync should be enabled on GI 275 units. VNAV uses the pilot-side baro setting unless that GI 275 fails, in which case the co-pilot side baro setting will be used (if installed).

7.13.6 Navigation

Navigation information is presented on the ADI using an optional lateral deviation indicator (LDI) above the heading display and a VDI to the left of the altitude readout. For MFD installations, the CDI/VDI are shown on CDI, HSI, and HSI map pages. Additionally, the CDI/VDI are displayed on the HSI and HSI map page on HSI installations. Bearing Pointers may be displayed on the HSI Page.

Navigation information can be cycled through up to four independent sources in normal operation by pressing the “CDI” button at the bottom of the HSI, HSI Map, or CDI pages, or on a GTN Xi. The navigation source can also be changed using the NAV Option Menu on the ADI (Menu → Options) or a configured GTN 750/650 Xi. VGPS will be displayed as an additional navigation source if all certified navigators fail or will be the only navigation source in installations without a certified GPS source. The selected navigation source is shown on the left side of the HSI or LDI. CDI source selection can be synchronized across multiple GI 275 and G500 TXi’s if enabled by the pilot.

The GI 275 can sync both the baro setting and the CDI source selection to a TXi display (if the GI275 is acting as a standby) and to the co-pilot side displays on the aircraft.

If configured, these syncing options are available in a pilot-accessible menu. Turning off Standby SYNC will decouple the GI 275 from a primary TXi display, if the GI275 is configured as the standby.

7.13.7 HSI

The course pointer and deviation indicator are shown as a single, solid line for GPS 1 and VLOC 1, and as an outline with no fill for GPS 2 and VLOC 2. GPS and VLOC sources are further differentiated with color.

The selected course is displayed above and to the right of the HSI. The selected course is set via touchscreen keyboard entry or dual-concentric knob.

In addition, the HSI can display two simultaneous bearing pointers sourced from GPS or VHF NAV.

The bearing pointer display and navigation source are pilot controlled under the Menu → HSI Options → Bearing sub menus.

The HSI Map includes an integral moving map within the HSI depiction. HSI map data is a subset of the data on the MFD map page. Traffic, terrain, obstacle, topographic, and weather overlays are also available for the HSI map. Flight plan, runways, TAWS FLTAs, and TFRs are always displayed. Overlays are controlled on the Menu → HSI Options → HSI Map Options → Map Options menu.

7.13.8 Lateral Deviation Indicator (LDI)

A Lateral Deviation Indicator (LDI) is displayed on the ADI above the heading display when selected in the Menu. This LDI shows course deviation, navigation source, and VLOC station identifier or GPS phase of flight. The LDI uses the same color convention as the HSI .

The LDI incorporates automatic reverse sensing correction into the deviation display. When the difference between the heading and the selected course is greater than 107°, the LDI will enable reverse sensing correction. Reverse sensing correction inverts the course deviation needle and to/from indicator so that they correctly indicate the direction of the course and waypoint. The course deviation needle will be deflected in the direction of the desired course, and the to/from indicator will point in the direction of the waypoint (similar to how the HSI depiction inverts with heading changes).

Message, waypoint, phase of flight, LOI, and DR annunciations from a GTN or GNS interfaced to the GI 275 are annunciated on the LDI.

7.13.9 Vertical Deviation Indication (VDI)

Vertical guidance is shown by a vertical deviation indicator (VDI) adjacent to the altitude tape. The VDI displays glideslope (GS) information from an ILS source, glidepath (GP) information for a GPS approach, or barometric VNAV guidance from a GTN navigator.

7.13.10 Minimum Altitude Display and Alerting

When enabled by the pilot, an altitude minimums bug will be displayed in cyan on the altitude tape. If a radar altimeter is installed, the pilot can select between

barometric or radar-altitude minimums. If installed with a G500 TXi, the minimums set on the TXi will crossfill to the GI 275.

Altitude minimums are accessed under the Menu → Options → Minimums sub menu.

Both visual and aural altitude minimums alerts are provided. During a descent to minimums, the minimums bug will change from cyan to white when the aircraft descends to within 100 ft of minimums. An aural “Minimums, Minimums” alert will be triggered when the aircraft’s altitude descends through minimums and the minimums bug will change to yellow. As the aircraft altitude climbs back above minimums, the minimums bug will change to white 50 ft above minimums and cyan 150 ft above minimums. Alerting is rearmed once the aircraft is 150 ft or more above the minimums altitude.

7.13.11 Navigation Data for Autopilots

The GI 275 can provide course and heading data to the autopilot based on the data selected for display on the HSI. For aircraft equipped with multiple GPS/NAV systems, the HSI can act as a selection hub for the autopilot’s NAV mode. Alternatively, the NAV mode can be selected using the NAV Options menu on the ADI. The GI 275 may also provide GPS Steering (GPSS) data.

Not all autopilot systems are approved for providing vertical guidance on GPS-based approaches; consult the AFMS for the autopilot and/or GPS system.

If the installation has pilot and copilot HSIs, control of navigation course, heading, or altitude data affecting the autopilot from the co-pilot side can only be made if the systems are synchronized with each other.

If the autopilot can receive GPSS Roll Steering, the data is transmitted via a digital communications bus from the GI 275 to the autopilot. The HSI receives this data from the GPS. In dual GPS installations, the HSI sends Roll Steering information from the selected GPS source.

When enabled by the installer for autopilots that do not support GPSS roll steering, GPSS allows a configured legacy autopilot to fly GPS curved plan legs (e.g., arcs, procedure turns, etc.) as well as straight legs.

For autopilots which are not GPSS Roll Steering capable, the GI 275 can convert GPSS turn commands into a heading error signal for the autopilot. When the autopilot is operated in HDG mode and GPSS is selected as the GI 275’s heading source, the autopilot will fly the turn commands from the GPS navigator selected on the GI 275, allowing a configured legacy autopilot to fly GPS curved plan legs (e.g., arcs, procedure turns, etc.) as well as straight legs.

If an autopilot is interfaced to the GI 275 which supports GPS steering (GPSS), a menu selection is provided in the ADI Menu → AP REF to change the autopilot heading reference between GPSS and selected heading. Additionally, an external AP HDG DATUM switch may be installed to allow external switching between HDG mode and GPSS mode. When GPSS is

selected, the heading bug will become hollow and the selected heading display will annunciate “GPSS” with an icon of a crossed out heading bug. The heading bug may still be adjusted by the pilot as a visual reference without affecting GPSS or its steering commands to the autopilot.

If the GPSS data is invalid (for example, if there is no active GPS leg) or the selected HSI source on HSI / ADI 1 is not GPS, the annunciated GPSS text will be yellow and a wings level command will be sent to the autopilot.

GPSS commands are not available when the CDI source is a VOR or LOC.

7.13.12 Flight Director Display

If autopilot flight director commands are interfaced to the GI 275, they will be presented as a single cue flight director on the ADI. Control of the flight director is accomplished via the autopilot/flight director controller. The flight director type may be changed between Single and Dual Cue styles through the GI 275 Main menu. (Menu → ADI Options → FD Format)

The GI 275 limits the distance the flight director pitch commands may deviate from the Aircraft Reference Symbol. If the pitch command provided by the autopilot flight director is greater than the position allowed by the GI 275, the command bars will be displayed at the maximum offset position allowed by the GI 275. As the aircraft pitch changes to satisfy the command bars, the bars will continue to be displayed at the maximum offset from the Aircraft Reference Symbol until the aircraft pitch deviation is within the command display limit.

7.13.13 Attitude and Rate Data Sources for Autopilots

Attitude-based autopilots may be interfaced to the GI 275 ADI, -20/-40 variant. If the GI 275 system is providing attitude to the autopilot, it will be noted in Section 1.7.6 above. Otherwise, the autopilot is receiving attitude or rate information from the standby or a remote gyro and the autopilot attitude input is independent of the attitude displayed on the GI 275 ADI.

It is recommended that pilots thoroughly familiarize themselves with the autopilot system and how it is interfaced with the GI 275 and other installed avionics to enhance operational efficiency and troubleshooting. Refer to the autopilot flight manual for more specific information.

7.13.14 Miscellaneous field

On the ADI, HSI, and HSI map page, the user can configure a Misc. Field to display some data in this location. The following data points can be displayed, as available:

- TAS: True airspeed
- GS: Ground speed
- OAT: Outside air temperature.
- TAT: Total air temperature.

- ISA: Temperature delta from the International Standard Air Temperature (ISA).
- Wind: Wind speed/direction
 - 3 different formats:
 - Headwind/crosswind component
 - Deg/Speed readout
 - Single vector
- G-meter: Current aircraft G loading.

Note

When operating with ice accumulation on the temperature probe, the displayed air temperature may be in error by as much as 4°C.

7.13.15 Backup ADI Malfunctions

In the event of a display backup malfunction, the standby unit will be locked on the ADI page. All other configured pages will not be accessible on the standby ADI or HSI.

7.14 MFD

On all MFD pages, the *nose* of the ownship symbol represents the actual location of your aircraft.

7.14.1 Map Page

A 2D moving map function is provided on the MFD. The appearance and determination of data displayed on the moving map is controlled by pilot selections made in the Menu. The Menu provides on/off controls for map overlays, a map detail selector, and a map setup button which accesses additional map controls.

The map range can be altered by “pinch zooming” the touchscreen or rotating the inner knob when the Range field is active. The range scale of the map is indicated by a range ring, centered on the ownship, with the current selected range shown at the 9 o’clock position on the ring. In addition to range adjustment, a panning function is provided to allow the position of the map to be centered on a location other than that of the ownship. The Panning mode is entered by dragging a single finger on the display and exited by touching the BACK softkey. The map orientation is continuously displayed in the top left corner of the Map Page.

The active flight plan of an interfaced navigator is shown in magenta on the Map. Traffic, Terrain, Weather, Land, and Aviation data can be selected for overlay on the Map as well.

The zoomed-in Map page does not comply with the FAA requirements and is not certified as an airport moving map display (AMMD).

7.14.2 Traffic Display

The MFD can display traffic data from interfaced traffic systems. Sources of traffic data include TIS-A, TAS/TCAS, and ADS-B TIS-B. The information from these systems is displayed on and may be controlled within the GI 275 MFD's Traffic Page.

NOTE

Traffic data availability depends on the services provided in the local region/country as well as the interfaced equipment.

The Traffic Page displays traffic according to selected range, relative to the aircraft ownship. It also shows the traffic system status and allows ADS targets to be selected for more information. Traffic controls and options are contained within the Traffic Page Menu, depending on the interfaced traffic system type. A display altitude filter is also provided via Menu selection. Filtering of targets based on relative altitude is accomplished by the display and affects the traffic displayed on the Traffic, HSI Map, and Map Pages. When interfaced to a TIS-A traffic system, altitude filtering is not available.

The *center* of the traffic target icon serves as the reported location for the target aircraft.

Additional functions are provided on the dedicated traffic page when an ADS-B traffic system is interfaced, including the depiction of motion vectors.

Absolute motion vectors are white and show the reported track of the traffic target referenced to the ground. An absolute motion vector pointed towards your ownship symbol *does not* necessarily mean the traffic target is getting closer to your aircraft.

Relative motion vectors are green and depict the motion of the traffic target relative to the ownship. The direction the traffic target is pointed may vary greatly from the motion vector and a target may be getting closer to your aircraft independent of the direction the target is pointed. A green relative motion vector pointed towards the ownship indicates that the traffic target *is* converging with your aircraft.

For ADS-B traffic systems - if while on ground without valid magnetic heading and the aircraft stops the traffic page orientation will change from TRACK UP to LATCHED. In this mode the display remains oriented to the last valid track until a new valid track is obtained.

Traffic can be displayed on the moving map as an overlay. Additional filtering based on traffic type (all, advisories, alerts) can be selected using the Menu Traffic selection. For TIS-A traffic selection of the advisories and alerts will result in display of alerted targets only.

Traffic page units are always in nautical miles and feet. If systems units for altitude are selected to meters, then an annunciation is provided on the traffic page indicating that traffic altitudes are depicted in feet and the traffic overlay icon for the map includes a “FT” indication.

If a traffic alert occurs and the MFD is not selected to the dedicated traffic page, then a traffic “popup window” is provided which depicts the traffic and provides controls to either go to the dedicated traffic page or close the popup window. All other pages on an ADI, HSI or MFD will display a yellow TFC annunciator in the upper right corner of the screen when alerts are present.

7.15 Terrain Awareness and Alerting

The following terrain awareness and alerting functions may be provided by the GI 275 system: Terrain Proximity, Terrain FLTA, or TAWS-B. If the GI 275 system is interfaced to a GNS or GTN navigator equipped with TAWS-B, then the GI 275 will display TAWS-B parameters provided by the GNS or GTN. The Terrain or TAWS function provided by the GI 275 system is indicated by a text box on the bottom of the Terrain Page.

Terrain Proximity function is a 2D depiction of terrain, obstacle, and powerlines with no alerting. A dedicated terrain page is provided on the MFD on which the relative height of terrain, obstacles, and powerlines are depicted using color to convey the height of the obstruction relative to aircraft altitude based on database data. Obstacle and wires are displayed on the terrain page at certain zoom scales. Obstacle data is displayed at zoom settings of 10nm or less and wire data is displayed at zoom settings of 5nm or less. The Terrain Proximity function is present on the system regardless of other higher level terrain functions that may be selected.

If SVT is enabled in the GI 275 system, then the Terrain - FLTA function is provided. Forward Looking Terrain Alerts and Reduced Terrain Clearance Alerts are provided for terrain, obstacles, and wires.

If the GI 275 is interfaced to a GNS or GTN with TAWS-B enabled, then TAWS alerts are only displayed from the GPS/TAWS navigator interfaced as GPS 1 and are displayed regardless of the CDI 1-2 setting.

Visual indications are provided for terrain, obstacle, and wire alerts as follows:

- For all GI 275 configurations which provide alerts and all configurations where the GI 275 is interfaced to GNS or GTN with TAWS-B enabled:
 - An annunciator located in the upper right corner of all configured pages on ADI, HSI and MFD units provides text annunciations of alert conditions.
- For all GI 275 configurations which provide alerts and all configurations where the GI 275 is interfaced to a GTN with TAWS-B enabled:

- If a terrain alert occurs and the MFD is not selected to the dedicated terrain page, then a terrain “popup window” is provided, which depicts the obstruction generating the alert with controls provided to either go to the dedicated terrain page, inhibit the terrain alert, or close the popup window. On a primary ADI GI 275, if a terrain alert occurs, an annunciation will illuminate in the top right corner of the display.
- The terrain page and map page, if the terrain overlay is enabled, will depict the area or obstruction causing the alert as an area of color corresponding to the alert severity and encircling the obstruction.
- If Synthetic Vision depiction is turned on, an area corresponding to the alert area on the map/terrain page is shaded in the corresponding color for terrain alerts. Obstacle alerts will cause the relevant obstacle to be depicted in the alert color in SVT. Powerline alerts do not have a corresponding indication in SVT.
- In Dual ADI installations, GI 275 generated alert audio is only provided by the Pilot side GDU. If the Pilot side GDU becomes inoperative, the Co-Pilot side GDU visual annunciations may still function, but the aural alerts will not be heard.

Controls are provided for terrain, obstacle, and wire alerts as follows:

- For all GI 275 configurations in which the GI 275 system provides alerts:
 - Controls are provided in the Terrain Page menu. A “Terrain Inhibit” button inhibits terrain, obstacle, and powerline alerts when pressed. An annunciation is provided on all configured pages to indicate that alerts are inhibited. A “Terrain Test” button initiates a self-test sequence which results in aural and visual self-test annunciations.

7.15.1 Weather Data

The MFD can display weather data from interfaced datalink systems. Sources of weather data include the Garmin “GDL 69(A)” and “GDL 69(A) SXM” Sirius XM receivers and Garmin ADS-B transceivers. If one of these optional weather datalink receivers is installed, the pilot will be able to access graphical and text weather products using the MFD. Datalink weather products use color and/or timestamps to indicate the recency with which the data was received.

Selected weather products from each receiver can be overlaid on the map page as well as the enhanced HSI map while all received products can be displayed on the dedicated weather pages. The products available on the map page and HSI are different for each weather receiver. The map page and HSI provide

controls to select the desired weather receiver; only one weather receiver can be selected at a time.

Text and graphical datalink weather associated with a facility can only be viewed when a database which includes that facility is installed.

The MFD can optionally display data from Stormscope® lightning detection systems. Stormscope data can be depicted on the map page, dedicated Stormscope page, and HSI map. For detailed information about the capabilities and limitations of the Stormscope system, refer to the documentation provided with that system.

7.15.2 Waypoint Information

The MFD provides pages that display information about the different waypoint types. These pages can be accessed by touching one of the supported waypoint types on the map and then pressing the provided Waypoint Info button.

7.16 Engine Indication System

Engine gauges are optionally provided for single and twin engine aircraft with four and six-cylinder reciprocating engines.

The following indications are provided in all EIS installations:

- Tachometer
- Manifold Pressure (If required)
- Oil Pressure
- Oil Temperature
- Cylinder Head Temperature (CHT)
- Exhaust Gas Temperature (EGT)

Other engine gauges may be provided by either the EIS display or previously installed indicators in their original locations. The following gauges may be provided on the GI 275 EIS display:

- Fuel Flow
- Fuel Pressure
- Electrical gauges (Amps / Volts)
- Main and Auxiliary Fuel Quantity
- Carburetor Air Temperature (CAT)
- Turbine Inlet Temperature (TIT)
- Inlet Air Temperature (IAT)
- Compressor Discharge Temperature (CDT)
- IAT/CDT Differential
- Outside Air Temperature (OAT)
- Engine Percent Power

Additional functions provided by the EIS system include a fuel computer, hour meters, and pilot-selectable engine advisories.

The layout of EIS gauges is dependent on the GI 275 display type and number of engines. The determination of which data is presented in which slot is set by the installer in configuration mode based on data in the STC which specifies the data located in each position. The markings on the EIS gauges are the same as those markings provided by the previously installed gauges and depict the operating ranges and limitations provided in the Airplane Flight Manual and Type Certificate Datasheet.

Some previously installed aircraft gauges include non-required markings such as advisory marks for certain altitude and power combinations. EIS gauges will include all markings required to comply with operating limitations associated with that gauge. Markings not required by regulation and which do not convey limitations or operating ranges are provided to the pilot by means of a placard.

EIS gauges include display characteristics to attract the pilot's attention when outside normal operating ranges. Gauge alerting behavior in caution or warning ranges is suppressed when the engine is OFF and the aircraft is on the ground.

All gauges will highlight the digital readout in yellow or red when entering a non-safe range and cause the colorized CAUTION or WARNING annunciator to flash at the top-left of the EIS screens.

7.16.1 Tachometer

For aircraft in which a starting vibrator is installed the RPM indication is not accurate during engine cranking.

For aircraft equipped with P lead sensors to measure engine RPM, the RPM indication may momentarily fluctuate when selecting operation on a single magneto.

7.16.2 Carburetor Air Temperature

The Carburetor Air Temperature gauge (if installed) is marked with a blue arc from -15 to 5 °C which indicates a range of temperatures where carburetor icing is likely to occur. Operation in this temperature range should be avoided in conditions where carburetor icing is possible (humid air or visible moisture).

7.16.3 CHT/EGT

CHT and EGT are displayed on a graph or as a single EGT/CHT strip gauge on the Main page and the CHT/EGT page. On the CHT/EGT page, each cylinder will numerically display its respective CHT below the indicated bar, and respective EGT above the indicated bar. On the Main page, the selected or hottest CHT/EGT is displayed above the graph. On the CHT/EGT monitor page, the hottest CHT/EGT and TIT values are in reverse video for easy reference.

The CHT/EGT graphs will show the temperature bars of the graph at the bottom, even when temperatures are below the minimum indicating range.

7.16.3.1 Gasket-style CHT probes

If the box is checked in section 1.7.9, CHT can read 50-100 degrees F higher than the bayonet-style probes used by most aircraft and engine manufacturers.

7.16.4 Primary EGT and TIT

Primary EGT (if installed) will be displayed by a bar gauge on the right side of the CHT/EGT graph, with the Primary EGT value displayed above.

TIT (if installed) will be displayed by a bar gauge on the right side of the CHT/EGT graph, with the TIT value displayed.

This is unavailable when configured as a single EGT/CHT.

7.16.5 Mixture Leaning

When interfaced with a fuel flow sensor, the GI 275 EIS provides two different lean assist methods, rich of peak or lean of peak.

Lean assist mode is initiated by navigating to the CHT/EGT page and turning the inner knob to activate Lean mode. As the mixture is leaned, Lean mode automatically detects the first and last EGT (or TIT if installed and configured) peak and indicates peak by using a bar above the EGT indicator for the cylinder.

If fuel flow indication is not installed, then the system will only provide “Rich of Peak”.

Rich of peak leaning detects and indicates the first engine cylinder to peak during the leaning process. Once the first peak in EGT is detected, the temperature differential from the recorded maximum EGT of the first cylinder to peak is displayed and the pilot can enrichen the mixture to reach the proper operating temperature from peak using that value.

Lean of peak leaning detects and indicates the last engine cylinder to peak during the leaning process. Once the last cylinder peak EGT is detected, the system will display the temperature differential from the recorded maximum EGT of the last cylinder to peak and the pilot can continue to lean the mixture to reach the proper operating temperature from peak using that value.

NOTE

The Lean Assist is meant to aid the pilot in detecting the peak temperatures. Smooth leaning technique is required for the system to be able to accurately detect the peak temperature.

Caution should be used to ensure that, during the leaning procedure, the engine is not leaned beyond the engine or aircraft limitations and that the engine continues to operate smoothly after

setting the mixture. Should any engine roughness occur during leaning, consult the aircraft POH or AFM for appropriate leaning of the engine.

The Lean Assist functions are calculated using the relationship between fuel flow and EGTs (or TIT). If a false EGT peak is observed and does not automatically reset, disable the Lean Assist function, reset throttle and mixture controls, and reattempt.

It is recommended to set the aircraft power settings for cruise flight and to let the engine temperatures settle prior to beginning the lean find process.

7.16.6 Fuel Quantity

Usable fuel may be displayed on the EIS display. Main fuel quantities and aux/tip fuel quantities are grouped together at the bottom of the display.

Previously installed aircraft low fuel quantity annunciators will be deactivated as part of the fuel quantity installation in some aircraft. In this case, the low fuel annunciators will be placarded as deactivated, and a red or yellow arc must be added to the fuel quantity gauge to indicate the fuel level that corresponds to the low fuel annunciation.

The aircraft fuel quantity gauge(s), or visual inspection of the fuel tanks are the primary means of determining fuel quantity.

NOTE

Do not use the unverified fuel quantity indication provided by the GI 275 as the sole means of complying with the requirements of CFR 14 91.103, 91.151, or 91.167.

7.16.7 Fuel Computer

A Fuel Computer/Totalizer is provided on the Fuel page. The fuel computer function provides computation and display of estimated fuel remaining, endurance, and fuel used. When interfaced with a GPS source, the fuel computer also provides range and efficiency. The fuel computer calculates these values using the engine fuel flow sensor, ground speed, flight plan, and estimated fuel remaining. Estimated fuel remaining is independent of the measured fuel quantity shown on the fuel quantity gauges.

Fuel flow values may be in error by as much as 15% if the K factor calibration is improperly set.

CAUTION

The pilot must ensure that the initial estimated fuel quantity value is accurate. The fuel computer calculates the remaining fuel based on the initial fuel value entered by the pilot. The estimated fuel remaining is derived by the fuel computer by subtracting the measured fuel flow

from the initial fuel entry. Fuel quantity indications shown on the fuel gauges may not provide the accuracy required for determination of estimated fuel remaining values. “Fuel Est” and “Act Used” buttons are available to aid the pilot in entering the initial estimated fuel.

CAUTION

The fuel computer functions must not be used as the primary means of determining the quantity of fuel in the tanks. The aircraft fuel quantity gauge(s) or visual inspection of the fuel tanks are the primary means of determining fuel quantity.

7.16.8 Engine Advisories

Engine advisories can be configured by the pilot from the Menu → [EIS] Main Opts to provide supplemental advisory notifications when a pilot-configured threshold has been exceeded. These thresholds are determined solely by the pilot and do not affect the EIS Page presentation, EIS operating ranges, or gauge alerting thresholds.

The following parameters may be configured by the pilot to provide advisories: High CHT, Low Oil TEMP, High Oil TEMP, CHT Cooling Rate, EGT DIFF, Low Endurance, Low EST Fuel Remaining, Low Bus Voltage, High Bus Voltage, Low Voltage, High Battery Voltage, and High TIT.

7.16.9 Engine and Airframe Timers

The Timers can be accessed from the Summary page.

Timer Label	Timer Function
FLIGHT	Flight timer increments in tenths of an hour whenever the aircraft is in an airborne state. This can be triggered via a weight on wheels switch, GPS ground speed, airspeed, or engine RPM depending on the aircraft installation.
HOBBS	Similar to an analog HOBBS meter that increments in tenths of an hour whenever one engine is registering >5 PSI of engine oil pressure
TACH	Similar to analog tachometers such that the timer increments in tenths of an hour based on the current engine RPM compared to the cruise power setting for that engine as determined by the installer.

On multi-engine aircraft, the TACH hour meter for each engine will start incrementing when the respective engine is running, and those TACH timers are tracked separately from one another. The HOBBS hour meter will start incrementing when either engine is running, and the HOBBS timer is synchronized for both engines.

7.17 Wireless Functions

The GI 275 has a wireless transceiver to provide data to personal electronic devices (PEDs) and includes a Bluetooth and Wi-Fi transceiver.

Data such as traffic, datalink weather, entertainment audio information, and attitude information is sent from the GI 275 to the PED. Limitations regarding database operations are found in Section 2.13.

Garmin provides a list of tested and compatible devices that can be used with the Connex platform. Connection to the GI 275 may be possible with devices other than those on the supported device list, but Bluetooth® and/or Wi-Fi stability and wireless data integrity cannot be guaranteed.

For details about the Garmin supported devices and apps for use with the Flight Stream product line, please visit: http://garmin.com/connex/supported_devices

7.18 Transponder Control

The GI 275 can be interfaced to a Garmin GTX 345 series transponder for the control and display of the transponder squawk code, mode of operation, and additional transponder functions.

7.19 Carbon Monoxide Monitoring

The GI 275 can be interfaced to a Garmin GCO 14 carbon monoxide (CO) monitor. When a GCO 14 is installed on the GI 275 or other interfaced LRU, the GI 275 can provide a readout of CO concentration in parts per million (PPM), CO alerts, and a separate customizable advisory message to alert the pilot to levels of CO below the alerting threshold. The readout of CO concentration can be selected as a data field on the GI 275 MFD data page or on the EIS aux page.

CO alerts will be provided when the CO level meets or exceeds the concentration and duration thresholds shown in Table 11. The CO alert includes both an amber visual and aural annunciation “Carbon Monoxide”.

A customizable advisory message can be set via the GCO settings menu to advise the pilot of CO levels below the alerting threshold. The pilot must select a concentration in PPM as well as a duration for the desired advisory. Once the CO concentration has been above the selected concentration threshold for the selected duration, a system message will be presented alerting the pilot to high CO levels.

Settings and information for the GCO can be found in the Menu under System > External LRUs > GCO 14. The GCO 14 sensor has an expiry date. It is recommended to replace the sensor prior to expiration. If the sensor is not replaced prior to expiration, a system message will be issued to notify the pilot that the sensor has expired.

Table 11- CO (carbon monoxide) Alert Thresholds

Concentration (PPM)	Alert After (minutes)
≤ 30	No Alert
> 30	120
> 50	60
> 100	10
> 300	<i>No delay</i>