GARMIN

GTN 625/635/650

Cockpit Reference Guide (CRG)

Map 

Traffic 

Terrain 

Weather 

Default NAV 

Flight Plan 

Procedures 

Nearest 

Waypoint Info 

Music 

Utilities 

System 

WARNING: *Navigation and terrain separation must NOT be predicated upon the use of the terrain function. The GTN 625/635/650 Terrain Proximity feature is NOT intended to be used as a primary reference for terrain avoidance and does not relieve the pilot from the responsibility of being aware of surroundings during flight. The Terrain Proximity feature is only to be used as an aid for terrain avoidance and is not certified for use in applications requiring a certified terrain awareness system. Terrain data is obtained from third party sources. Garmin is not able to independently verify the accuracy of the terrain data.*

WARNING: *The displayed minimum safe altitudes (MSAs) are only advisory in nature and should not be relied upon as the sole source of obstacle and terrain avoidance information. Always refer to current aeronautical charts for appropriate minimum clearance altitudes.*

WARNING: *The Garmin GTN 625/635/650 has a very high degree of functional integrity. However, the pilot must recognize that providing monitoring and/or self-test capability for all conceivable system failures is not practical. Although unlikely, it may be possible for erroneous operation to occur without a fault indication shown by the GTN 625/635/650. It is thus the responsibility of the pilot to detect such an occurrence by means of cross-checking with all redundant or correlated information available in the cockpit.*

WARNING: *The altitude calculated by GPS receivers is geometric height above Mean Sea Level and could vary significantly from the altitude displayed by pressure altimeters, such as the output from the GDC 74A/B Air Data Computer, or other altimeters in aircraft. GPS altitude should never be used for vertical navigation. Always use pressure altitude displayed by pressure altimeters in the aircraft.*

WARNING: *Do not use outdated database information. Databases used in the GTN 625/635/650 must be updated regularly in order to ensure that the information remains current. Pilots using an outdated database do so entirely at their own risk.*

WARNING: *Do not use basemap (land and water data) information for primary navigation. Basemap data is intended only to supplement other approved navigation data sources and should be considered as an aid to enhance situational awareness.*

WARNING: *Traffic information shown on the GTN 625/635/650 is provided as an aid in visually acquiring traffic. Pilots must maneuver the aircraft based only upon ATC guidance or positive visual acquisition of conflicting traffic.*

WARNING: *XM Weather should not be used for hazardous weather penetration. Weather information provided by the GDL 69/69A is approved only for weather avoidance, not penetration.*

WARNING: *NEXRAD weather data is to be used for long-range planning purposes only. Due to inherent delays in data transmission and the relative age of the data, NEXRAD weather data should not be used for short-range weather avoidance.*

WARNING: *For safety reasons, GTN 625/635/650 operational procedures must be learned on the ground.*

WARNING: *To reduce the risk of unsafe operation, carefully review and understand all aspects of the GTN 625/635/650 Pilot's Guide as well as this guide. Thoroughly practice basic operation prior to actual use. During flight operations, carefully compare indications from the GTN to all available navigation sources, including the information from other NAVAIDs, visual sightings, charts, etc. For safety purposes, always resolve any discrepancies before continuing navigation.*

WARNING: *Never use the datalinked weather to attempt to penetrate a thunderstorm. Both the FAA Advisory Circular, Subject: Thunderstorms, and the Airman's Information Manual (AIM) recommend avoiding "by at least 20 miles any thunderstorm identified as severe or giving an intense radar echo."*

CAUTION: *The United States government operates the Global Positioning System and is solely responsible for its accuracy and maintenance. The GPS system is subject to changes which could affect the accuracy and performance of all GPS equipment. Portions of the GTN 625/635/650 utilize GPS as a precision electronic NAVigation AID (NAVAID). Therefore, as with all NAVAIDs, information presented by the GTN can be misused or misinterpreted and, therefore, become unsafe.*

CAUTION: *The GTN 625/635/650 does not contain any user-serviceable parts. Repairs should only be made by an authorized Garmin service center. Unauthorized repairs or modifications could void both the warranty and the pilot's authority to operate this device under FAA/FCC regulations.*

CAUTION: *The GTN 625/635/650 has a display that is coated with a special anti-reflective coating that is very sensitive to waxes and abrasive cleaners. CLEANERS CONTAINING AMMONIA WILL HARM THE ANTI-REFLECTIVE COATING. It is very important to clean the display using a clean, lint-free cloth and an eyeglass lens cleaner that is specified as safe for anti-reflective coatings.*

CAUTION: *Garmin would like to remind pilots flying with GDL 69/69A-equipped aircraft that TFRs are only advisory and Garmin would like to remind pilots flying with GDL 69/69A-equipped aircraft that TFRs are only advisory and are not a replacement for a thorough preflight briefing on TFR times and locations. Always confirm TFR data through official sources and contact your Flight Service Station for interpretation of TFR data.*

NOTE: *All visual depictions contained within this document, including screen images of the GTN 625/635/650 bezel and displays, are subject to change and may not reflect the most current GTN 625/635/650 software. Depictions of equipment may differ slightly from the actual equipment.*

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

NOTE: *Terrain data is not displayed when the aircraft latitude is greater than 75° North or 60° South.*

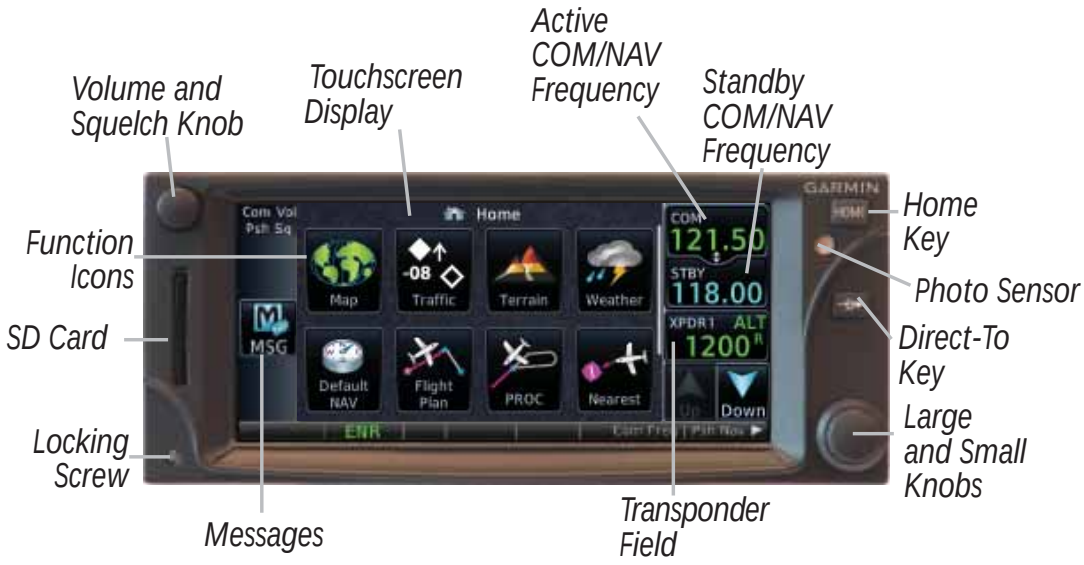
NOTE: *This product, its packaging, and its components contain chemicals known to the State of California to cause cancer, birth defects, or reproductive harm. This notice is being provided in accordance with California's Proposition 65. If you have any questions or would like additional information, please refer to our web site at www.garmin.com/prop65.*

NOTE: *Canadian Installations: In accordance with Canadian Radio Specifications Standard 102 (RSS 102), RF field strength exposure to persons from an antenna connected to this device should be limited to 60V/m for controlled environment and 28 V/m for uncontrolled environment.*

Record of Revisions			
Part Number	**Revision**	**Date**	**Description**
190-01004-04	A	Feb 2011	Initial Release
	B	Mar 2011	Updated message list.
	C	Mar 2011	Updated part number on back cover only.

INTRODUCTION

This cockpit reference guide (CRG) is intended to serve as a quick reference covering the basic features and operating procedures for the GTN 625/635/650. For detailed descriptions of any information found in this guide, refer to the latest revision of the GTN 625/635/650 Pilot's Guide, P/N 190-01004-03 found at www.garmin.com.



GTN 650 Front Panel/Main Page

Direct-To Key - Press to provide a direct course to a selected waypoint.

Home Key - A single press of the Home Key returns the user to the main page to access features. Pressing and holding the HOME key while on any page will display the default NAV page.

Volume and Squelch Knob - Controls volume of the COM and NAV radios. Press to use the IDENT function of the NAV radio. Pressing and holding the volume knob will change the frequency to emergency frequency.

Large and Small Knobs - Both are rotary knobs. The small knob can be pressed and held in to flip-flop COM and NAV frequencies.

NAV/COM RADIO

NOTE: *The GTN 625/635/650 are all GPS/SBAS navigators. In addition, the GTN 635 has COM functionality and the GTN 650 has COM/NAV functionality.*

COM and NAV Radio Frequencies

Selecting a NAV/COM Frequency using Rotary Knobs

1. Turn or momentarily press the **small** knob once to highlight the STBY field of COM or NAV. The knob function defaults to COM after 30 seconds of inactivity.
2. Turn the **large** knob to the desired MHz value.
3. Turn the **small** knob to the desired kHz value.
4. Press the **small** knob to confirm entry.

Touchscreen Entry

NOTE: *designates functions that are accomplished by touching. Cyan colored keys represent fields that can be modified, white colored keys represent keys that change the state of operation for the related feature.*

The COM or NAV frequency is changed by touching the **STBY** window and using the keypad to enter the desired frequency. Touch **Enter** when finished or **Back** to exit without making changes. If an entry was started, touch **Cancel** to exit out of the screen without making changes.

COM Standby Screen

Mon: Monitors the standby COM frequency.

Find: Displays categories for User, Recent, Nearest, and Flight Plan frequencies.

Xfer: Automatically enters the frequency to the active COM or NAV frequency window.

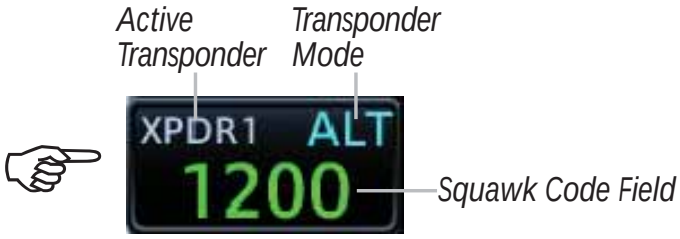
NOTE: The NAV Standby screen is identical to the COM Standby screen except that there is no MON key.

Frequency Flip/Flop

To flip/flop the active and standby NAV/COM frequencies, touch and hold the **small** knob or touch the active NAV/COM frequency field. An annunciation, Hold for Flip-Flop, will be displayed near the knobs.

TRANSPONDER

Transponder Control



Transponder ID

Touch the Squawk Code Field to enter frequency for either Transponder 1 (XPDR1) or Transponder 2 (XPDR2).

IDENT

Touch **IDENT** to activate the transponder's IDENT function. The key text remains gray and will change to green when IDENT mode is active.

Transponder Panel Page

Standby: Touch to place transponder in Standby mode. It is still powered, but will not transmit information. STBY displays in the squawk code field.

Ground: Touch to place transponder in Ground mode. Mode S interrogations will be allowed. GND displays in the squawk code field.

On: Touch to turn transponder On for Mode A operation. Will transmit the squawk code when interrogated. ON displays in the squawk code field.

Altitude Reporting: Touch for Mode C operation. The transponder will be on and will transmit its squawk code and altitude when interrogated. ALT displays in the squawk code field.

VFR: Touch to set the squawk code to 1200.

Special Squawk Codes

The selected squawk code will always be in use. As you change a squawk code, the original code will be sent until you are finished selecting the new code.

The table below lists special squawk codes:

Squawk Code	Description
1200	Default VFR code in the USA
7500	Hijacking
7600	Loss of Communications
7700	Emergency

Special Squawk Codes

NOTE: While 1200 is the default VFR squawk code, the installer can configure any code to the VFR key. This is to support international operations where 1200 may not be used.

MAP

Map

Map Page

Map Menu

Touch to select the overlays (Terrain, TOPO, Airways, NEXRAD, and Traffic) that are displayed on the map page.

Touch to select the map, aviation, land, traffic, and weather items that are displayed on the map page.

Touch, hold and slide to set how much detail is shown on the map page.

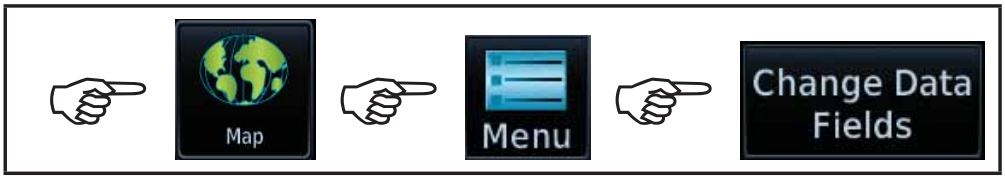
Touch to select the fields that are displayed in the four corners on the Map Screen.

Touch to restore the unit to Garmin factory defaults.

Map Menu Options

Changing Data Fields

The data fields located at each of the four corners of the Map page can be configured to display any combination of four different navigation parameters. To exit without changes to the Map page, touch **Cancel**.



Change NAV Data Fields

Selections Available for NAV Data Fields

BRG - Bearing to Current Waypoint
DIS - Distance to Current Waypoint
DIS to Dest - Distance to Destination
DTK - Desired Track
ESA - Enroute Safe Altitude
ETA - Estimated Time of Arrival
ETA at Dest - ETA at Destination
ETE - Estimated Time Enroute
ETE to Dest - ETE to Destination
Fuel Flow - Total Fuel Flow
Generic Timer - Timers (Utilities)
GS - GPS Ground Speed
GSL - GPS Altitude
MSA - Minimum Safe Altitude
OAT (static) - Static Air Temperature
OAT (total) - Total Air Temperature
Time - Current Time
TKE - Track Angle Error
Trip Timer - Timers (Utilities)
TRK - Track
VSR - Vertical Speed Required
Wind - Wind Speed and Direction
XTK - Cross Track Error
OFF - Do Not Display Data Field

Pan Mode

NOTE: Annunciations for TIS Traffic Coasting or Traffic Removed are not present while in pan mode. For more information refer to page 11.

To enter Pan Mode, touch the map anywhere on the Map page. Drag your finger across the map to move it as desired. In Pan Mode, touch any symbol on the map to highlight, then touch the information key to display any available information related to that symbol. Touch the **Next** key to cycle to other waypoints close to the cursor.

User Waypoints

Touch any location on the map that is not an existing waypoint to create a user waypoint. The **Waypoint Info** key will display, "Create Waypoint" and will display the "Create User Waypoint" page. See the "Waypoint Info, Creating User Waypoint" section.

To enter or edit a flight plan, touch the **Graphically Edit FPL** key. To leave Pan Mode, touch the **Back** key.

Creating (or Editing) a Flight Plan in Pan Mode

While in Pan Mode, touch the **Graphically Edit FPL** key to add/remove waypoints and/or alter a course line in an existing flight plan. You can also enter or edit an existing flight plan by touching the Flight Plan key on the home page. See the Flight Plan section of this guide.

Edit Flight Plan

On the Map page, enter Pan Mode by touching the screen. Touch the **Graphically Edit FPL** key. Touch any waypoint that you want to be part of your flight plan. Should you make an error, touch the **Undo** key. The **Undo** key will reverse up to the last nine consecutive edits. When finished, touch the **Done** key to save your changes. Touch **Cancel** to leave the page without making any changes to the flight plan.

Touch to leave the page without changes to the flight plan.

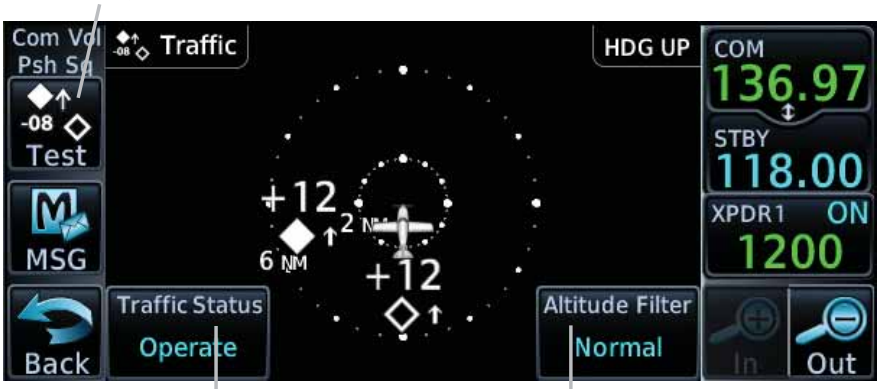
Undo Key

Touch to confirm the entries into the flight plan.

Flight Plan on Map Page

TRAFFIC

Traffic



Touch to activate testing mode.

Touch to select Traffic Mode. Selections are: Operate and Standby.

Touch to select the altitude filter. Selections are: Normal, Above, Below, or Unrestricted.

Traffic Page Options

Altitude Mode	Displayed Traffic Range
Below	-9900 ft to 2700 ft
Normal	-2700 ft to 2700 ft
Above	-2700 ft to 9900 ft
Unrestricted	All Traffic Shown

The **Test** key places the traffic system in test mode. Not all traffic systems support Test mode. There are no menu options for the traffic page.

Traffic System Status Annunciations

Traffic Page Annunciation	Description
No Data	Data is not being received from the transponder
Failed	The transponder has failed
Unavailable	TIS is unavailable or out of range

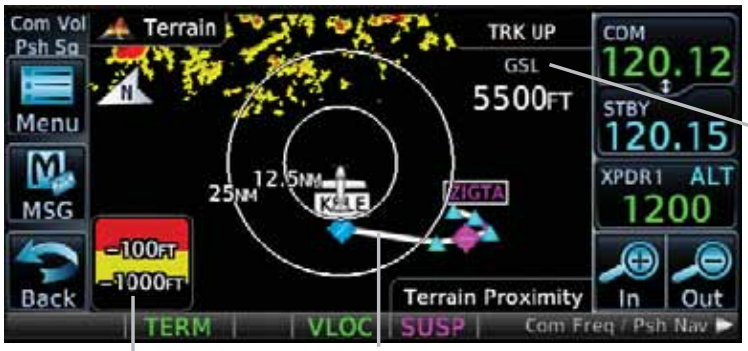
Traffic Status Banner Annunciation	Description
Traffic Coast 9 SEC	The displayed data is not current (6 to 12 seconds since last message). The quality of displayed traffic information is reduced when this message is displayed.
Traffic Removed	Traffic is removed because it is too old for coasting (12 to 60 seconds since last message). Traffic may exist within the selected display range, but it is not displayed.

Traffic Status Banner Annunciation	Description
TA 6.0 + 03 ↓	System cannot determine bearing of Traffic Advisory. Annunciation indicates distance in NM, altitude separation in hundreds of feet, and altitude trend arrow (climbing/descending).
Failed	Traffic data has failed.
Data Fail	Data is being received from the transponder, but a failure is detected in the data stream
No Data	Traffic has not been detected.

TERRAIN

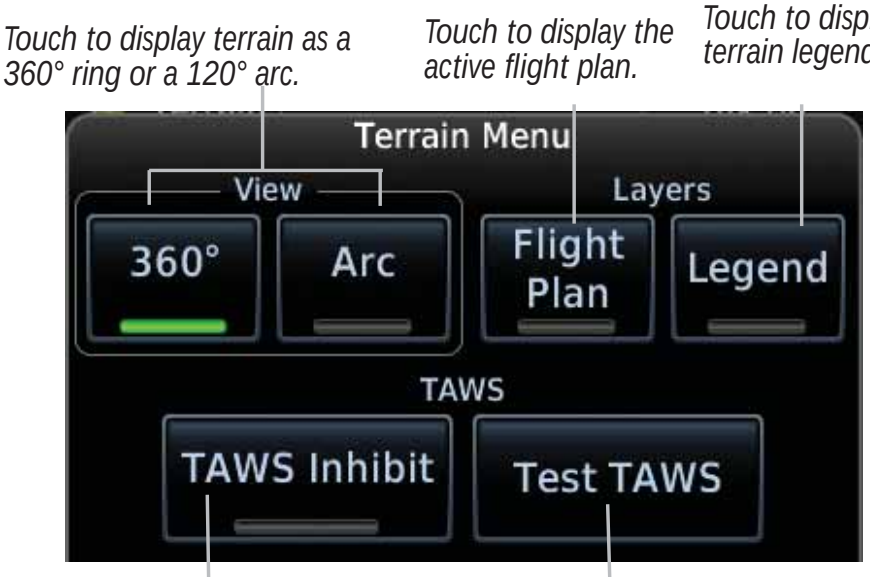
NOTE: Features may vary, depending on your configuration.

Terrain



Terrain Page

Terrain Menu



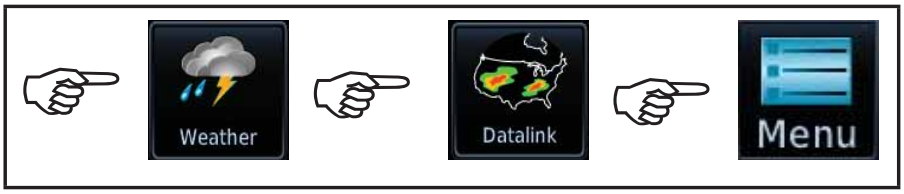
Terrain Menu Options

WEATHER

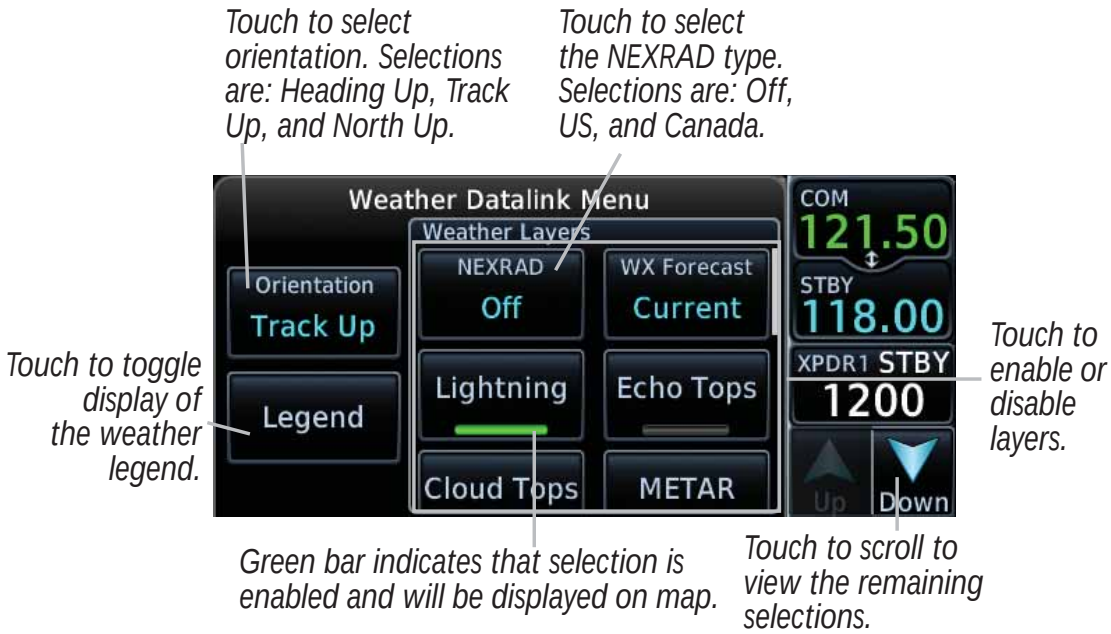
NOTE: *Features may vary, depending on your configuration. The Datalink key or the Stormscope key will not be displayed or used if only one weather system is installed.*

Weather

Datalink Weather (Optional)



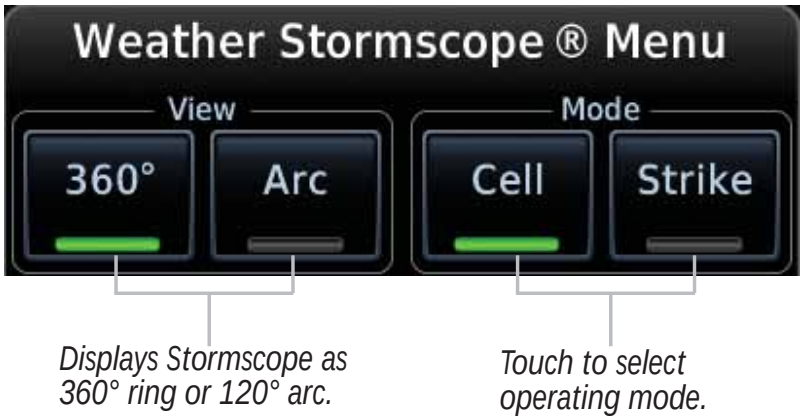
Datalink Weather Menu



Weather Datalink Menu Options

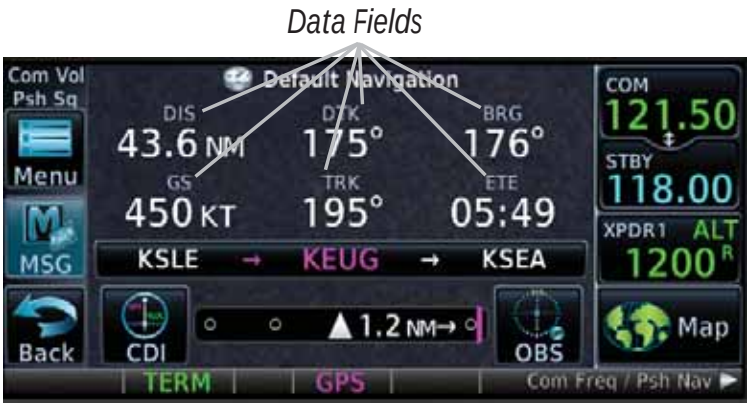
Stormscope® Weather (Optional)

Stormscope Weather Menu

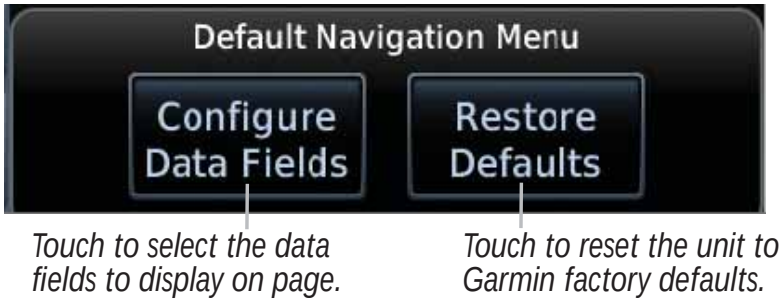


DEFAULT NAV

Default NAV



Default Navigation Page



Default Navigation Menu

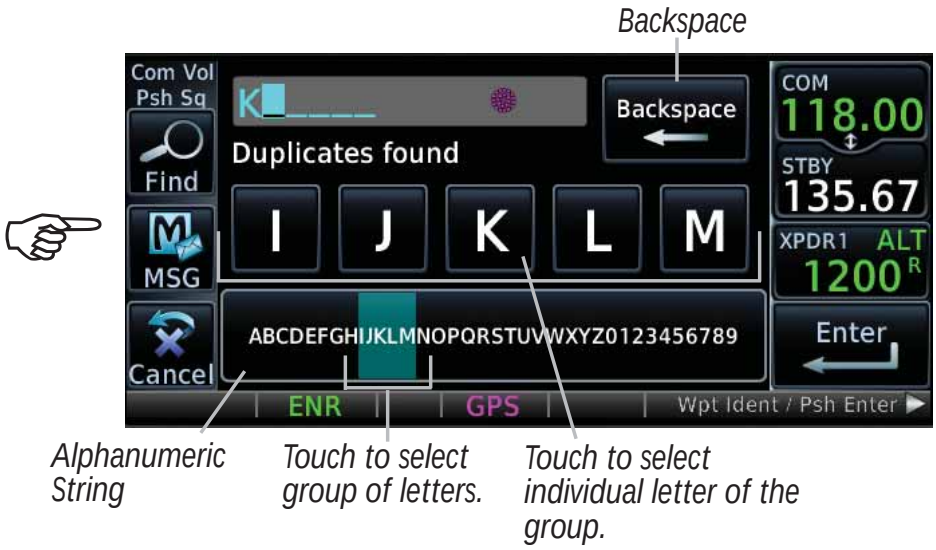
The data field selections are the same as listed in the “Changing Data Fields” section in the Map section.

FLIGHT PLAN

Flight Plan

Creating a Flight Plan

On the Flight Plan page, touch "Add Waypoint" to display an alphanumeric keypad. Type in the airport identifier and touch **Enter.** If unknown, touch the **Find** key to search. To exit without making changes to the flight plan, touch the **Cancel** key.



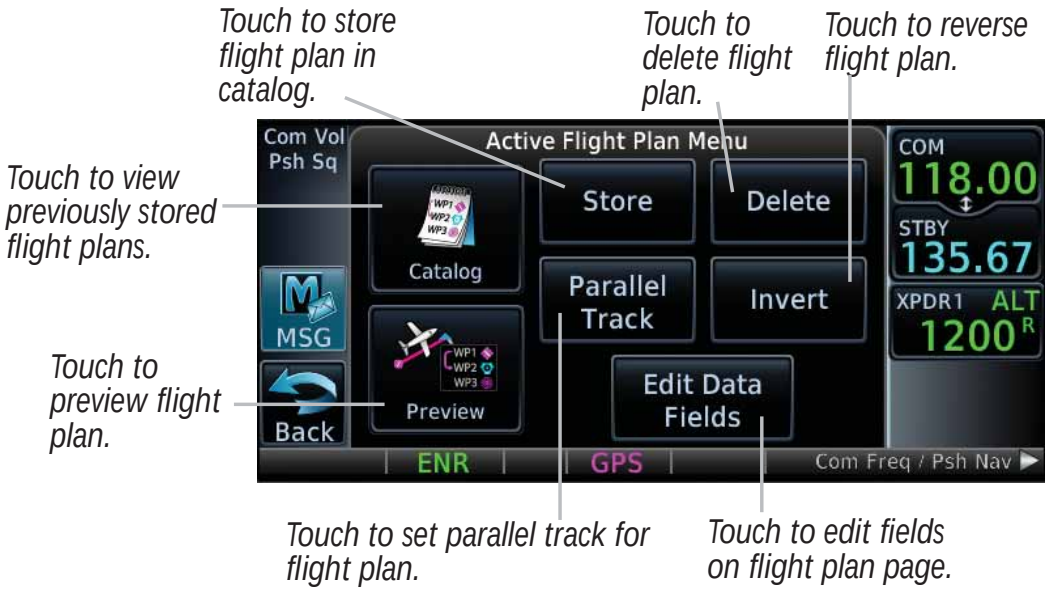
Keypad Entry

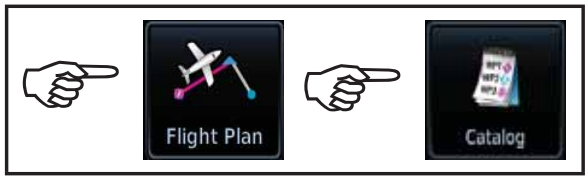
Sample Flight Plan

Flight Plan Menu

The Flight Plan Menu allows you to preview, store, invert, and edit flight plans.

Flight Plan Menu





Flight Plan Catalog

Route Options for Flight Plans

Airways

On the Active Flight Plan page, touch **Add Waypoint** and select a VOR. For example, UBG.

Touch the waypoint and the Waypoint Options menu is displayed.

Load Airway: Touch entry waypoint to select available airways and exit waypoints.

Load: Touch to load selected airway into flight plan.

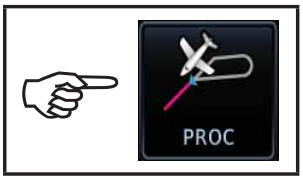
Cancel: Touch to exit without changes to flight plan.

Remove Airway: Touch to remove airway from flight plan. Touch **Preview** (if desired) to review selected airways.

Touch to load selected airway to flight plan.

Airway Selection for Waypoint

PROCEDURES



Procedures

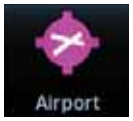
Departures, Arrivals, and Approaches

On the Procedures (PROC) page, you are able to select approach, arrival, and departure procedures.

Procedures (PROC) Page

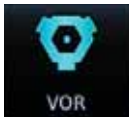
NEAREST

Nearest Page



Touch to display the bearing, distance, approach/runway information of the nearest airport.

Touch to display the bearing and distance to the nearest intersection.



Touch to display the bearing, distance, and frequency of the nearest VOR.

Touch to display the bearing, distance, and frequency of the nearest NDB.

Touch to display the bearing and distance of a user created waypoint.

Touch to display the bearing and distance of the nearest airspace.

Touch to display the bearing, distance, and frequency of the nearest ARTCC.

Touch to display the bearing, distance, and frequency of the nearest Flight Service Station.

Touch to display the bearing, distance, and frequency of the nearest weather station.

WAYPOINT INFO

Waypoint Info Page

Touch to display map of the airport, procedures, runways, frequencies, weather, and any NOTAMs.

Touch to display distance and bearing, latitude and longitude, location and the nearest VOR.

Touch to display distance and bearing, latitude and longitude, location, frequency, nearest airport, VOR Class, and magnetic variation.

Touch to display distance and bearing, latitude and longitude, location, frequency, nearest airport, and marker description.

Touch to display distance, bearing, and reference waypoint information for created waypoints.

Touch to create permanent or temporary waypoints. Items such as user identifier, comments, position type, reference waypoint, radial, and distance can be configured.

Creating a User Waypoint

Create Waypoint

1. Touch the **Create Waypoint** icon. If there are no user waypoints defined, the prompt, "No User Waypoints exist. Create User Waypoint?" will be displayed. Touch **OK** to continue.
2. Enter the desired name (identifier) and position, or reference another waypoint by radial and distance. The identifier can be a maximum of 6 characters and the comment can be a maximum of 24 characters.
3. Touch **Create** to confirm your entry.

Create User Waypoint Screen

MUSIC

Music

Music Page

Selecting a Channel

1. Touch the **CH Number** key to display a numeric keypad.
2. Touch numbers of the channel number.
3. Touch **Enter** to accept channel.

Adding Channels to Presets

There are three groups of five channels each available for entry of channels. This allows the storage of up to 15 different channels. To store a channel:

1. Touch the **Presets** key. The choices are XM 1, XM 2, and XM 3.
2. Touch the **CH Number** key and enter in the channel.
3. Touch and hold the key of the preset where you want to store the channel for three seconds. The key in the Preset Channel Bar will store the channel.
4. Follow the same steps to override a currently stored channel. To clear presets, change Channel to 0 and touch all presets until all read 0.

UTILITIES

Utilities

Utilities Page

Touch to enter VCALC profile. See, "VCALC Profile" for more information.

Touch to view trip information about the currently loaded flight plan.

Touch to view fuel information about the currently loaded flight plan.

Touch to access timers. Generic Timer (count up or down), Flight Timer (set trigger to In Air or Power On), and Departure Time.

Touch to view calculations of density altitude, true airspeed, and wind.

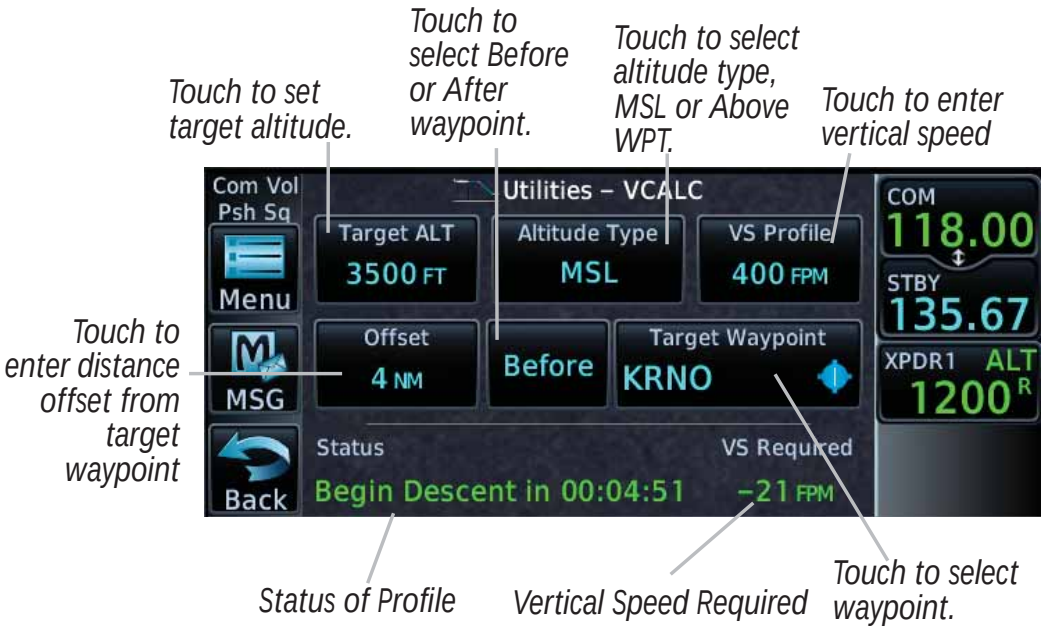
Touch to see the integrity of GPS satellite coverage at a particular waypoint at a particular time.

Touch to safely clean the screen. Press the HOME key to exit cleaning mode.

VERTICAL CALCULATOR (VCALC) PROFILE

The VCALC page uses GPS position, GPS computed altitude, and pilot-selected parameters to calculate and display the time to begin descent and vertical speed required to reach a desired altitude above a designated waypoint offset. The screenshot below is a sample profile for an aircraft to be at 2500 feet MSL 4 NM before KRNO. Since the vertical speed is set to 400 feet per minute, the descent needs to begin in 4 minutes and 51 seconds. At the present location, a vertical speed rate of -21 feet per minute is required to reach the target. There are no menu options for the VCALC Profile page.

VCALC Key



VCALC Page

NOTE: *The Altitude Type key will not be available when the VCALC target waypoint does not have valid altitude data.*

VCALC Profile Menu Options

SYSTEM

System

System Page

Touch to display serial number, system ID, version information, and database information.

Touch to display the status of GPS reception.

Touch to view the status of any external LRUs that are connected to the GTN.

Touch to view the setup of the CDI, Date/Time, Nearest Airport Criteria, and COM Channel Spacing.

Touch to customize alerts of arrival, destination proximity, airspace altitude buffer, and entry into selected airspaces.

Touch to customize the units of measurement for NAV Angle, Temperature, and Fuel.

Touch to customize the volume of the response sound when touching the screen.

Touch to customize the ownship symbol.

Touch to customize the level of backlighting.

Crossfill

Dual units may be interfaced to crossfill information between the two units. This option will not be available unless dual units are configured. The following data is always crossfilled:

- User waypoints
- Flight plan catalog
- Alerts (Pop-up acknowledgement for traffic, missed approach waypoint, and altitude leg)
- External sensors (transponder status and commands, synchro heading)
- System setup

  Favorite NAV frequencies
  Date/Time convention
  Nearest airport criteria
  Units (NAV angle, Distance/Speed, etc.)
  Favorite COM frequencies
  Ownship icon
  CDI Scale setting
  ILS CDI Capture setting

This data is crossfilled only if crossfill is turned on by the pilot:

- Active navigation (flight plan)

1. While viewing the System Setup page, touch the **Crossfill** key to toggle between Enabled and Disabled Crossfill.
2. When Crossfill is about to be enabled, you will be prompted to note that data will be overwritten in the other unit. Touch **OK** to enable Crossfill or touch **Cancel** to return to the System Setup page without enabling Crossfill.

Confirming Crossfill Selection

SYMBOLS

Map Symbols

Symbol	Description
	Unknown Airport
	Non-towered, Non-serviced Airport
	Towered, Non-serviced Airport
	Non-towered, Serviced Airport
	Towered, Serviced Airport
	Soft Surface, Serviced Airport
	Soft Surface, Non-serviced Airport
	Private Airport
	Heliport
	Intersection
	LOM (compass locator at outer marker)
	NDB (Non-directional Radio Beacon)
	VOR
	VOR/DME
	ILS/DME or DME-only
	VORTAC
	TACAN

SafeTaxi™ Symbols

Symbol	Description
	Helipad
	Airport Beacon
	Under Construction Zones
	Unpaved Parking Areas

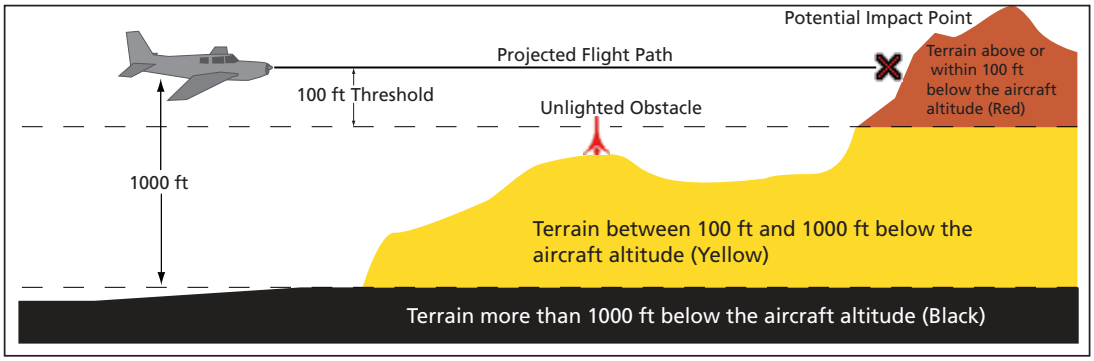
Traffic Symbols

Symbol	Description (Highest to Lowest Priority)
	Traffic Advisory (TA), In Range
	Traffic Advisory (TA), Out of Range
	Proximate Advisory (PA)
	Other Traffic

Terrain Obstacle Symbols

Unlighted Obstacle (Height is less than 1000 ft AGL)	Lighted Obstacle (Height is less than 1000 ft AGL)	Unlighted Obstacle (Height is greater than 1000 ft AGL)	Lighted Obstacle (Height is greater than 1000 ft AGL)
			

Obstacle Altitude/Color Correlation



Terrain Altitude/Color Correlation

Basemap Symbols

Symbol	Description
	Interstate Highway
	State Highway
	US Highway
	National Highway - 2-digit drawn inside
	Small City or Town
	Medium City
	Large City

Map Tool Bar Symbols

Symbol	Description
	Stormscope Enabled
	Terrain Proximity Enabled and Available Indicator
	Terrain Proximity Enabled and Not Available Indicator
	Traffic Enabled and Available Indicator
	Traffic Enabled and Not Available Indicator

Miscellaneous Symbols

Symbol	Description
	Default Aircraft (ownship) (Low-Wing Prop)
	High-Wing Prop
	Kit Plane
	Single-Engine Jet
	Non-Directional Ownship Signal
	Parallel TrackWaypoint
	Restricted/Prohibited/Warning/Alert
	TFR (Temporary Flight Restrictions)
	MOA
	Class B Airspace
	Class C Airspace
	Class D Airspace
	User Waypoint

MESSAGES

Message	Description	Action
ABORT APPROACH-GPS approach no longer available.	This message is triggered outside the MAP if the GTN system can no longer provide approach level of service. Vertical guidance will be removed from the external CDI/HSI display.	Initiate a climb to the MSA or other published safe altitude, abort the approach, and execute a non-GPS based approach.
AIRSPACE ALERT-Inside airspace.	The aircraft inside an airspace type for which alerts are configured.	No action is necessary; message is informational only.
AIRSPACE ALERT-Airspace within 2 nm and entry in less than 10 minutes.	The aircraft is within 2 nm and predicted to enter an airspace type, within 10 minutes, for which alerts are configured.	No action is necessary; message is informational only.
AIRSPACE ALERT-Airspace entry in less than 10 minutes.	The aircraft is predicted to enter an airspace type, within 10 minutes, for which alerts are configured.	No action is necessary; message is informational only.
AIRSPACE ALERT-Within 2 nm of airspace.	The aircraft is within 2 nm of an airspace type for which alerts are configured.	No action is necessary; message is informational only.

Message	Description	Action
APPROACH NOT ACTIVE-Do not continue GPS approach.	GPS approach could not transition to active (e.g., the GTN is on an approach and did not have the required HPL/VPL to get into at least LNAV, so is still in TERM).	Abort the approach, and execute a non-GPS based approach.
APPROACH DOWNGRADE-Approach downgraded. Use LNAV minima.	Approach has been downgraded from LPV or LNAV/VNAV, to an LNAV approach. Vertical guidance will be removed from the external CDI/HSI display.	Continue to fly the approach using published LNAV minimums.
APR GUIDANCE AVAILABLE-Touch "Enable APR Output" before selecting APR on autopilot.	The GTN is configured for KAP140/KFC225 autopilot, and approach guidance is now available.	Touch the "Enable APR Output" button on the GTN, this will cause the autopilot to go into ROL mode. Engage the autopilot into approach mode.
CDI SOURCE-Select appropriate CDI source for approach.	Aircraft is on a GPS approach but CDI is set to VLOC, or aircraft is on VLOC approach and CDI is set to GPS and aircraft is less than 2 nm from the FAF.	Select the appropriate CDI source for approach.
CDI/HSI FLAG-Main lateral/vertical flag on CDI/HSI is inoperative.	The Main Lateral Superflag or Main Vertical Superflag output has been turned off due to an over-current condition.	Verify course guidance is valid and correct by crosschecking with the GTN on-screen CDI and other navigational equipment. Contact dealer for service.

Message	Description	Action
COM RADIO- COM radio needs service.	The COM radio is reporting that it needs service. The COM radio may continue to function.	Contact dealer for service.
COM RADIO- COM radio may be inoperative.	The COM radio is not communicating properly with the system.	Press and hold the volume knob or the external COM remote transfer (COM RMT XFR) switch, if installed – this will force the COM radio to 121.5 MHz. Contact dealer for service.
COM RADIO- COM overtemp or undervoltage. Reducing transmitter power.	COM radio is in overtemp or undervoltage mode and transmitting power has been reduced to prevent damage to the COM radio. Radio range will be reduced.	Decrease length of COM transmissions, decrease cabin temperature and increase cabin airflow (especially near the GTN). Check aircraft voltage and reduce electrical load as necessary. Contact dealer for service if this message persists.
COM RADIO- COM locked to 121.5 MHz. Hold remote COM transfer key to exit.	COM radio is locked to 121.5 MHz.	The external COM remote transfer (COM RMT XFR) switch has been held and the COM radio is tuned to 121.5. To exit this mode, hold the COM remote transfer (COM RMT XFR) switch for two seconds.

Message	Description	Action
CONFIGURATION - Terrain/TAWS configuration is invalid. GTN needs service.	TAWS is inoperative due to a configuration problem with the GTN. This message will be accompanied by a TER FAIL annunciation.	Contact dealer for service.
CONFIGURATION MODULE- GTN configuration module needs service.	The GTN cannot communicate with its configuration module. The GTN may still have a valid configuration.	Contact dealer for service.
COOLING- GTN overtemp. Reducing backlight brightness.	Backlight brightness has been reduced due to high display temperatures. The backlight level will remain high enough to be visible in daylight conditions.	Decrease cabin temperature and increase cabin airflow (especially near the GTN). Contact dealer for service if this message persists.
COOLING FAN- The cooling fan has failed.	The GTN cooling fan is powered, but it is not turning at the desired RPM.	Decrease cabin temperature and increase cabin airflow (especially near the GTN) to prevent damage to the unit. Contact dealer for service.
CROSSFILL ERROR- Crossfill is inoperative	Crossfill is not working due to loss of communication with other GTN or due to one GTN needing service.	Contact dealer for service.
CROSSFILL ERROR- GTN software mismatch. See CRG for crossfilled items.	Crossfill is configured “on” but is not working due to software mismatch.	Contact dealer to have software versions updated.

Message	Description	Action
DATABASE- A procedure has been modified in a cataloged flight plan.	A new database update caused a procedure to be truncated because the flight plan now has too many waypoints or removed a procedure because it no longer exists in the database.	Verify stored cataloged flight plans and procedures. Modify stored flight plans and procedures as necessary to include the current procedures by re-loading those procedures to the stored flight plan routes.
DATABASE- Verify user-modified procedures in stored flight plans are correct.	A stored flight plan contains procedures that have been manually updated, and a navigation database update has occurred.	Verify that the user-modified procedures in stored flight plans are correct.
DATABASE- Verify airways in stored flight plans are correct.	A stored flight plan contains an airway that is no longer consistent with the current navigation database.	Verify that the airways in stored flight plans are correct. Modify stored flight plans as necessary to include the current airways by re-loading those airways to the stored flight plan routes.
DATABASE- Terrain or Obstacle database not available.	The terrain or obstacle database is missing or corrupt.	Re-load these databases on the external SD card.
DATACARD ERROR- SD card is invalid or failed.	External SD card has an error and the unit is not able to read the databases.	FliteCharts and Terrain databases will not be accessible by the unit. Contact dealer for service.
DATACARD REMOVED- Reinsert SD card.	External SD card was removed.	Reinsert SD card.

Message	Description	Action
DATALINK- GDL 69 is inoperative or connection to GTN is lost.	The GTN is configured for a Garmin datalink (GDL 69 or 69A) and the GTN cannot communicate with the datalink. Data from the datalink will not be available.	Contact dealer for service.
DATA LOST- Pilot stored data was lost. Recheck settings.	User settings such as map detail level, NAV range ring on/off, traffic overlay on/off, and alert settings have been lost.	Recheck settings.
DATA SOURCE- Pressure altitude source inoperative or connection to GTN lost.	The GTN is configured to receive pressure altitude but is not receiving it from any source.	Leg types requiring an altitude source will no longer automatically sequence. Contact dealer for service.
DATA SOURCE- Heading source inoperative or connection to GTN lost.	The GTN is configured to receive heading information but is not receiving it from any source.	Heading up map displays will not be available. Contact dealer for service.
DEMO MODE- Demo mode is active. Do not use for navigation.	Demo mode is in operation.	Do not use for navigation. Power cycle the GTN to exit demo mode.
FPL WAYPOINT LOCKED- Stored flight plan waypoint is not in current navigation database.	A stored flight plan waypoint is no longer in the current navigation database.	Verify stored cataloged flight plans and procedures. Modify stored flight plans as necessary to include waypoints that are in the current navigation database.

Message	Description	Action
FPL WPT MOVED- Stored flight plan waypoint has changed location.	A stored flight plan waypoint has moved by more than 0.33 arc minutes from where previously positioned.	Verify stored cataloged flight plans and procedures. Modify stored flight plans as necessary to include waypoints that are in the current navigation database.
GAD 42- GAD 42 configuration needs service.	GAD 42 indicates a configuration error.	Verify all input/output data from/to the GAD 42 Interface Adapter. Contact dealer for service.
GAD 42- GAD 42 needs service.	GAD 42 indicates it needs service. The GAD 42 may continue to function.	Verify all input/output data from/to the GAD 42 Interface Adapter. Contact dealer for service.
GLIDESLOPE- Glideslope receiver needs service.	The glideslope module is indicating that it needs service. The glideslope module may continue to function.	Verify glideslope deviation indications with another source and crosscheck final approach fix crossing altitude. If another glideslope source is not available for verification, fly a GPS based approach. Contact dealer for service.
GLIDESLOPE- Glideslope receiver has failed.	The glideslope board is not communicating properly with the system.	Fly an approach that does not use the glideslope receiver (VOR, LOC, GPS). Contact dealer for service.
GPS NAVIGATION LOST- Insufficient satellites. Use other navigation source.	GPS position has been lost due to lack of satellites.	Use a different GPS receiver or a non-GPS based source of navigation. Contact dealer for service.
GPS NAVIGATION LOST- Erroneous position. Use other navigation source.	GPS position has been lost due to erroneous position.	Use a different GPS receiver or a non-GPS based source of navigation. Contact dealer for service.

Message	Description	Action
GPS RECEIVER- GPS receiver has failed. Check GPS coax for electrical short.	Internal communication to the GPS module is inoperative.	Use a different GPS receiver or a non-GPS based source of navigation. Contact dealer for service.
GPS RECEIVER- Low internal clock battery.	The GPS module indicates that its clock battery is low. The unit will function normally, but may take a longer than normal period to acquire a GPS position.	Contact dealer for service.
GPS RECEIVER- GPS receiver needs service.	The GPS module is reporting that it needs service. The GPS module may continue to function.	Use a different GPS receiver or a non-GPS based source of navigation. Contact dealer for service.
GPS SEARCHING SKY- Ensure GPS antenna has an unobstructed view of the sky.	The GPS module is acquiring position and may take longer than normal. This message normally occurs after initial installation or if the unit has not been powered for several weeks.	No action is necessary; message is informational only.
GTN- GTN needs service.	The GTN has lost calibration data that was set by Garmin during manufacturing.	Contact dealer for service.
INTERNAL SD CARD ERROR- GTN needs service.	Internal SD card has an error. This card is not accessible by the user.	Contact dealer for service.

Message	Description	Action
INTERNAL SD CARD REMOVED- GTN needs service.	Internal SD card was removed. This card is not accessible by the user.	Contact dealer for service.
KEY STUCK- HOME key is stuck.	The HOME key has been in pressed position for at least 30 seconds. This key will now be ignored.	Verify the HOME key is not pressed. Contact dealer for service if this message persists.
KEY STUCK- Direct-To key is stuck.	The Direct-To key has been in pressed position for at least 30 seconds. This key will now be ignored.	Verify the Direct-To key is not pressed. Contact dealer for service if this message persists.
KNOB STUCK- Volume knob is stuck in the pressed position.	The Volume knob has been in pressed position for at least 30 seconds. This knob press will now be ignored.	Verify the volume knob is not pressed. Contact dealer for service if this message persists.
KNOB STUCK- Dual concentric inner knob is stuck in the pressed position.	The dual concentric inner knob has been in pressed position for at least 30 seconds. This knob press will now be ignored.	Verify the dual concentric knob is not pressed. Contact dealer for service if this message persists.
LOCKED FLIGHT PLAN- Cannot activate a flight plan containing a locked waypoint.	The user is trying to activate a flight plan that contains a locked waypoint.	Unlock the flight plan by modifying stored flight plans as necessary to include waypoints, procedures, and airways that are in the current navigation database.
LOSS OF INTEGRITY (LOI)- Verify GPS position with other navigation equipment.	The GPS module has reported a loss of integrity.	Use a different GPS receiver or a non-GPS based source of navigation. Contact dealer for service if this message persists.

Message	Description	Action
MAGNETIC VARIATION- Aircraft in area with large mag var. Verify all course angles.	MagVar is flagged as unreliable in the MagVar database. This normally occurs when operating at high latitudes that do not support a NAV Angle of Magnetic.	Verify that the geographical region supports navigation based on magnetic variation.
NAV ANGLE- NAV Angles are referenced to True North (T).	NAV angle is set to True.	No action is necessary; message is informational only.
NAV ANGLE- NAV Angles are referenced to a User set value (U).	NAV angle is set to User.	No action is necessary; message is informational only.
NON-WGS84 WAYPOINT- See CRG. Location may be different than where surveyed for [WPT].	The active waypoint is not referenced to the WGS84 datum. See Note 1 following this table.	No action is necessary; message is informational only.
OBS- OBS is not available due to dead reckoning or no active waypoint.	OBS requires an active waypoint and is not supported in dead reckoning mode.	No action is necessary; message is informational only.
PARALLEL TRACK- Parallel track not supported past IAF.	Parallel track is not supported on approaches.	No action is necessary; message is informational only.
PARALLEL TRACK- Parallel track not supported for turns greater than 120 degrees.	Parallel track is not supported for turns greater than 120 degrees due to the acute angle.	No action is necessary; message is informational only.

Message	Description	Action
PARALLEL TRACK-Parallel track not supported for leg type.	Parallel track is not supported on current leg type.	No action is necessary; message is informational only.
REMOTE KEY STUCK-Remote OBS key is stuck.	The remote OBS (OBS MODE SEL) key/switch has been in a pressed position for at least 30 seconds. This input will now be ignored. This input is not available in all installations.	Verify the OBS MODE SEL key/switch is not stuck. Contact dealer for service if this message persists.
REMOTE KEY STUCK-Remote CDI key is stuck.	The remote CDI (CDI SRC SEL) key/switch has been in a pressed position for at least 30 seconds. This input will now be ignored. This input is not available in all installations.	Verify the CDI SRC SEL key/switch is not stuck. Contact dealer for service if this message persists.
REMOTE KEY STUCK-COM push-to-talk key is stuck.	The Push To Talk key/switch has been in a pressed position for at least 30 seconds. This input will now be ignored and the COM radio will no longer transmit.	Verify the Push To Talk key/switch is not stuck. Contact dealer for service if this message persists.

Message	Description	Action
REMOTE KEY STUCK-COM remote transfer key is stuck.	The remote COM transfer (COM RMT XFR) key/switch has been in a pressed position for at least 30 seconds. This input will now be ignored. This input is not available in all installations.	Verify the COM RMT XFR key/switch is not stuck. Contact dealer for service if this message persists.
REMOTE KEY STUCK-COM remote frequency increment key is stuck.	The remote COM frequency increment (COM CHAN UP) key/switch has been in a pressed position for at least 30 seconds. This input will now be ignored. This input is not available in all installations.	Verify the COM CHAN UP key/switch is not stuck. Contact dealer for service if this message persists.
REMOTE KEY STUCK-COM remote frequency decrement key is stuck.	The remote COM frequency decrement (COM CHAN DN) key/switch has been in a pressed position for at least 30 seconds. This input will now be ignored. This input is not available in all installations.	Verify the COM CHAN DN key/switch is not stuck. Contact dealer for service if this message persists.

Message	Description	Action
REMOTE KEY STUCK- NAV remote transfer key is stuck.	The remote NAV transfer (NAV RMT XFR) key/switch has been in a pressed position for at least 30 seconds. This input will now be ignored. This input is not available in all installations.	Verify the NAV RMT XFR key/switch is not stuck. Contact dealer for service if this message persists.
REMOTE KEY STUCK- TAWS inhibit key is stuck.	The TAWS INHIBIT discrete input has been in a pressed position for at least 30 seconds. This input will now be ignored. This input is not available in all installations.	Verify the TAWS INHIBIT key/switch is not stuck. Contact dealer for service if this message persists.
SELECT FREQUENCY- Select appropriate NAV frequency for approach.	Correct NAV frequency is not set in the active NAV frequency for the approach procedure.	Insert the correct frequency into the active navigation frequency window.
SET COURSE- Set course on CDI/HSI to [current DTK].	The selected course on the CDI/HSI does not match the current desired track.	Set the CDI/HIS selected course to the current desired track.

Message	Description	Action
STEEP TURN- Aircraft may overshoot course during turn.	Flight plan contains an acute course change ahead which will require a bank in excess of normal to follow the guidance. If coupled to the autopilot, the autopilot may not be able to execute the steep turn needed to follow the course guidance.	No action is necessary; message is informational only. If desired, slow the aircraft to shallow the turn.
STORMSCOPE- Stormscope is inoperative or connection to GTN is lost.	The GTN is configured for a WX-500 Stormscope but is not receiving data from it.	Contact dealer for service.
STORMSCOPE- Invalid heading received from Stormscope.	The WX-500 Stormscope reports that it has an invalid heading source.	GTN StormScope data is correct and may be used. Contact dealer for service.
TAWS AUDIO INHIBITED- TAWS audio inhibit input is stuck.	The TAWS Audio Inhibit discrete input has been active for at least 30 seconds. This input is active in all installations. TAWS audio may be heard at the same time as other audio alerts.	Contact dealer for service.
TIMER- Timer has expired.	A user-configured timer has expired.	No action is necessary; message is informational only.

Message	Description	Action
TRAFFIC- Traffic device is inoperative or connection to GTN is lost.	The GTN is configured for a traffic device but is not receiving data from it. Traffic will not be displayed on the GTN.	Contact dealer for service.
TRAFFIC- Traffic device has been in standby for more than 60 seconds.	The GTN is airborne and the traffic device has been in standby for more than 60 seconds.	Set the traffic device to "operate" on the traffic page if traffic alerts are desired.
TRANSPONDER- Transponder 1 and 2 Mode S addresses do not match.	The GTN is configured for two transponders and their Mode S addresses do not match. This message is intended to assist installers and will not occur in a properly configured system.	Contact dealer for service.
TRANSPONDER 1 OR 2- Transponder 1 or 2 needs service.	The transponder is reporting to the GTN that it needs service. The transponder may continue to function.	Verify squawk code and altitude with ATC. Contact dealer for service.
TRANSPONDER 1 OR 2- Transponder 1 or 2 is inoperative or connection to GTN is lost.	The GTN is configured for transponder 1 or 2 but is not able to communicate with the transponder.	Verify squawk code and altitude with ATC. Contact dealer for service.
TRUE NORTH APPROACH- Verify NAV Angles are referenced to True North (T).	A procedure is loaded that is referenced to true north and the active leg has a published true north reference.	Verify the NAV Angle is set to True North.

Message	Description	Action
VERTICAL CALCULATOR- Approaching target altitude. Start descent.	User has configured a vertical descent calculation, and the aircraft is within 60 seconds of the calculated top of descent.	No action is necessary; message is informational only.
VERTICAL CALCULATOR - Approaching target altitude.	User has configured a vertical descent calculation, and the aircraft is approaching the target altitude.	No action is necessary; message is informational only.
VLOC RECEIVER- Navigation receiver needs service.	The NAV radio is reporting that it needs service. The NAV radio may continue to function.	Use GPS based navigation. Contact dealer for service.
VLOC RECEIVER- Navigation receiver has failed.	The NAV radio is not communicating property with the system.	Use GPS based navigation. Contact dealer for service.
WAYPOINT- Arriving at [wpt name].	User has configured the arrival alarm and is within the specified distance.	No action is necessary; message is informational only.

NOTE 1: There are several reference datums that waypoints can be surveyed against. TSO-C146 normally requires that all waypoints be referenced to the WGS84 datum, but allows for navigation to waypoints that are not referenced to the WGS84 datum so long as the pilot is notified. Certain waypoints in the navigation database are not referenced to the WGS84 datum, or their reference datum is.

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

To obtain accessories for your unit, please contact your Garmin dealer.

AC 90-100A Statement of Compliance: The Garmin navigational unit meets the performance and functional requirements of AC 90-100A.

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