



# GTN 625/635/650

Cockpit Reference Guide

Map



Traffic



Terrain



Weather



Default NAV



Flight Plan



Procedures



Nearest



Waypoint Info



Services



Utilities



System





**WARNING:** Navigation and terrain separation must NOT be predicated upon the use of the terrain function. The GTN 6XX Terrain and HTerrain Proximity features are NOT intended to be used as a primary reference for terrain avoidance and do not relieve the pilot from the responsibility of being aware of surroundings during flight. Terrain Proximity 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 GTN 6XX 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 6XX. 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**WARNING:** Do not use outdated database information.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 6XX 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 Pilots using an outdated database do so entirely at their own risk.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 6XX 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:** Do not use data link weather information for maneuvering in, near, or around areas of hazardous weather. Information contained within data link weather products may not accurately depict current weather conditions.



**WARNING:** Do not use the indicated data link weather product age to determine the age of the weather information shown by the data link weather product. Due to time delays inherent in gathering and processing weather data for data link transmission, the weather information shown by the data link weather product may be significantly older than the indicated weather product age.



**WARNING:** Never use 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."



**WARNING:** For safety reasons, GTN 6XX 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 6XX 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.



**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 6XX utilize GPS as a precision electronic NAVigation AID (NAVAID). Therefore, as with all NAVAIDs, information presented by the GTN 6XX can be misused or misinterpreted and, therefore, become unsafe.



**CAUTION:** The GTN 6XX 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 display lens has 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:** TFRs provided by datalink weather sources (i.e., FIS-B and SiriusXM) are only advisory and do not replace a thorough preflight briefing on TFR times and locations. Not all TFRs may be shown. To determine accurate TFR information, verify with official sources, i.e., preflight planning or flight service center.



**NOTE:** All visual depictions contained within this document, including screen images of the GTN bezel and displays, are subject to change and may not reflect the most current GTN 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:** 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 website at [www.garmin.com/prop65](http://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.



**NOTE:** Do not use the SafeTaxi function as the basis for ground maneuvering. SafeTaxi does not comply with the requirements of AC 120-76C and is not qualified to be used as an airport moving map display (AMMD). SafeTaxi should only be used by the flight crew to orient themselves on the airport surface.



**NOTE:** The FAA has asked Garmin to remind pilots who fly with Garmin database-dependent avionics of the following:

- It is the pilot's responsibility to remain familiar with all FAA regulatory and advisory guidance and information related to the use of databases in the National Airspace System.
- Garmin equipment will only recognize and use databases that are obtained from Garmin or Jeppesen. Databases obtained from Garmin or Jeppesen are assured compliance with all data quality requirements (DQRs) by virtue of a Type 2 Letter of Authorization (LOA) from the FAA. A copy of the Type 2 LOA is available for each database at [www.flyGarmin.com](http://www.flyGarmin.com).
- Use of a current Garmin or Jeppesen database in your Garmin equipment is required for compliance with established FAA regulatory guidance, but does not constitute authorization to fly any and all terminal procedures that may be presented by the system. It is the pilot's responsibility to operate in accordance with established AFM(S) and regulatory guidance or limitations as applicable to the pilot, the aircraft, and installed equipment.



**NOTE:** The pilot/operator must review and be familiar with Garmin's database exclusion list as discussed in SAIB CE-14-04 to determine what data may be incomplete. To see if an exclusion report exists for a specific database, visit [www.flyGarmin.com](http://www.flyGarmin.com).



**NOTE:** *The pilot/operator must have access to Garmin and Jeppesen database alerts and consider their impact on the intended aircraft operation. For a current list of aviation database alerts, visit [www.flyGarmin.com](http://www.flyGarmin.com).*



**NOTE:** *If the pilot/operator wants or needs to adjust the database, visit [www.flyGarmin.com](http://www.flyGarmin.com).*



**NOTE:** *Garmin requests the flight crew report any observed discrepancies related to database information. These discrepancies could come in the form of an incorrect procedure; incorrectly identified terrain, obstacles and fixes; or any other displayed item used for navigation or communication in the air or on the ground. To report an aviation database error, visit [www.flyGarmin.com](http://www.flyGarmin.com).*



**NOTE:** *The GTN touchscreen may not respond to touch commands if condensation or moisture accumulate on the touchscreen.*



**NOTE:** *Depending on software version and configuration, GTN features and screen images may differ from those shown in this manual. Refer to the GTN 625/635/650 Pilot's Guide (P/N 190-01004-03) for more information on specific GTN software versions.*

Record of Revisions			
Part Number	Revision	Date	Description
190-01004-04	A	2/2011	Initial Release.
	B	3/2011	Updated message list.
	C	3/2011	Updated part number on back cover only.
	D	11/2012	Added v3.00 functionality.
	E	2/2013	Added v4.00 functionality.
	F	10/2013	Added v5.00 functionality.
	G	8/2014	Added v5.11 functionality.
	H	7/2015	Added v6.00 functionality.
	J	1/2016	Added v6.10 functionality.
	K	9/2016	Added v6.20 functionality.
	L	8/2017	Added v6.30 functionality.

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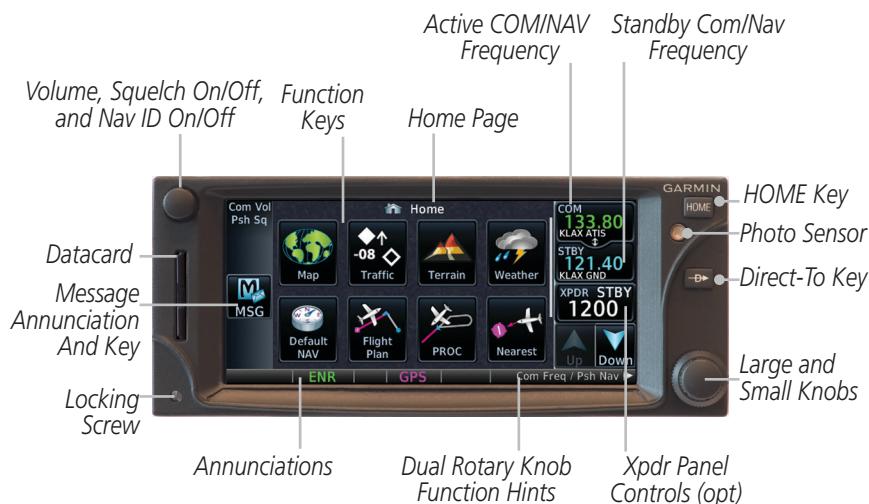
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## INTRODUCTION

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.flyGarmin.com](http://www.flyGarmin.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.

## Direct-To Navigation



Press the **Direct-To** key to quickly navigate from your present position directly to a selected waypoint, flight plan waypoint, or nearest airport.

### Direct-To a Waypoint

1. Press **Direct-To**.
2. Touch the Waypoint Identifier field and select the characters for the desired waypoint with the **large** and **small right** knobs or the touch keypad.
3. Touch **Activate** or press the **small right** knob. Text near the **small right** knob indicates its current function.

### Direct-To a Flight Plan Waypoint



1. Press **Direct-To**.
2. Touch the **FPL** tab and then the desired Flight Plan waypoint.
3. Touch **Activate** or press the **small right** knob.

### Direct-To a Nearest Airport



1. Press **Direct-To**.
2. Touch the **NRST APT** tab and then the desired airport from the Nearest Airport list. Touch the **Up** or **Down** keys as needed to show more of the list.
3. Touch **Activate** or press the **small right** knob.

### Direct-To a User-Defined Hold

1. Press **Direct-To** and then **Hold**.
2. Touch the **Course** key and use the keypad to select the course.
3. Touch the **Course Direction** key to select inbound/outbound direction and then the **Turn** key to select the turn direction.
4. Touch the **Leg Type** key to select time/distance and then touch the **Leg Time** or **Leg Distance** key and use the keypad to select the leg length.
5. Touch the **Expect Further Clearance** key and use the keypad to select the reminder time.
6. Touch the **Load Hold** key then the **Hold Activate** key.

# 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

## 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 Page

**Mon:** Monitors the standby COM frequency.

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

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



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

## Selecting a NAV/COM Frequency using Rotary Knobs

Press the center of the **small right knob** to change from the COM frequency display to the NAV frequency display.

1. Turn or momentarily press the **small right** 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 right** knob to the desired MHz value.
3. Turn the **small right** knob to the desired kHz value.
4. Press the **small right** knob to confirm entry.

## Frequency Flip/Flop

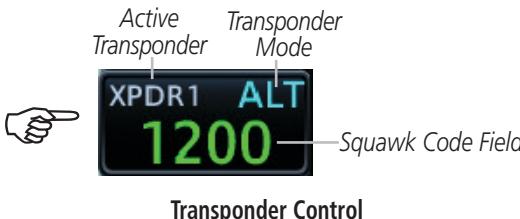
To flip/flop the active and standby NAV/COM frequencies, press and hold the **small** knob or touch the active NAV/COM frequency field. An annunciation, Hold for Flip-Flop, will be displayed near the knobs.

## Voice Commands

If a GMA 350 is connected to the GTN, voice commands may be available. Refer to *GTN 6XX/7XX Telligence Voice Command Guide*, P/N 190-01007-50.

# TRANSPOUNDER

## 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 (Non-GDL 88 Installations with Mode C Transponder)

**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. Refer to the documentation provided with your GTX transponder for specific information on this mode of operation.

**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.

**Enable ES:** Touch to toggle extended squitter.

## TCAS II Transponder Mode Controls

The GTN can also control the modes of a TCAS II system through a GTX 3000. The TA Only and TA/RA modes are added to the transponder control panel. Selecting TA Only or TA/RA will command the TCAS into the selected mode, but depending on the aircraft configuration (e.g., on ground), the TCAS may remain in a different mode.

## 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 Page

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

Touch to customize how the map, aviation, land, traffic, and weather information is displayed on the map page.



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

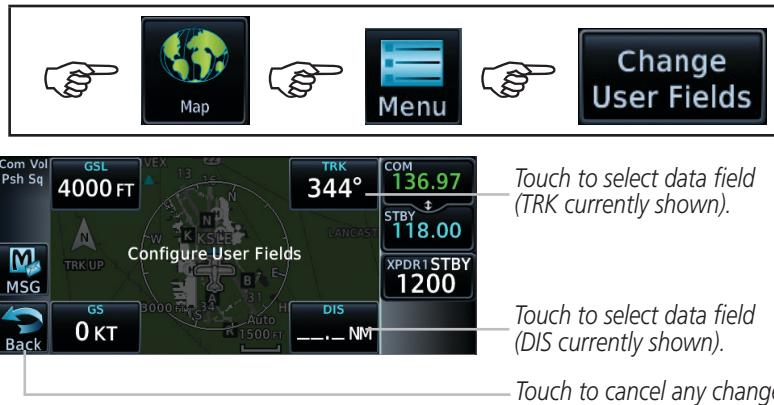
Touch to select the fields that are displayed in the four corners on the Map .

Touch to restore the user fields to Garmin factory defaults.

Map Menu

## Changing User 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 User Field Mode



Select User Fields Page

## Pan Mode



**NOTE:** Annunciations for TIS Traffic Coasting or Traffic Removed are not present while in pan mode. For more information refer to the TIS Traffic Status Annunciations section

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 Creating a User Waypoint on page 32.



### Pan Mode Controls

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



**NOTE:** It is not possible to graphically add an intermediate waypoint between the current position and a Direct-To waypoint unless that waypoint is in the flight plan. Garmin recommends deleting any flight plan prior to graphically editing a Direct-To waypoint.



**NOTE:** When graphically editing the active flight plan leg, the active leg course and TO waypoint will be added to the flight plan as a Direct-To.

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.



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. You also can touch and drag a flight plan line to a waypoint. 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 screen without making any changes to the flight plan.



Flight Plan on Map Page

# TRAFFIC



**NOTE:** Depending on which traffic device is installed and how it is configured, the pages may be different than what is shown. Refer to the GTN 625/635/650 Pilot's Guide, P/N 190-01004-03, for more information.

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

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

## Traffic System Status Annunciations

For annunciation symbols, refer to the “Symbols” section.

### TIS Failure 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.

### TIS Traffic Status Annunciations

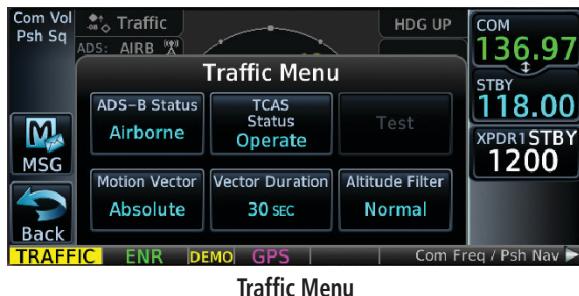
Traffic Status Banner Annunciation	Description
Traffic Coast 9 SEC	The displayed data is not current (6 to 12 seconds since last message). The quality of displayed traffic information is reduced when this message is displayed.
Traffic Removed	Traffic is removed because it is too old for coasting (12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

## TAS/TCAS Traffic Status Annunciations

Traffic Status Banner Annunciation	Description
RA 1.0 + 01 ↓	System cannot determine bearing of Resolution Advisory. Annunciation indicates distance in NM, altitude separation in hundreds of feet, and altitude trend arrow (climbing/descending).
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.

## TCAS

Touch the **Menu** key to view the Traffic menu.



Traffic Menu

Key	Description
<b>ADS-B Status</b>	Displays the status of the ADS-B.
<b>TCAS Status</b>	Touch to set TCAS into operating mode or standby mode.
<b>Test</b>	The <b>Test</b> key places the traffic system in test mode and also tests the communication between the GTN and the configured traffic device.
<b>Motion Vector</b>	Touch to set the type of motion vector. Selections: Absolute, Relative, Off.
<b>Vector Duration</b>	Touch to set the time used to calculate the motion vector length. Selections: 30 sec, 1 min, 2 min, 5 min.
<b>Altitude Filter</b>	Touch to select what traffic to display. Selections: Below, Normal, Above, Unrestricted.

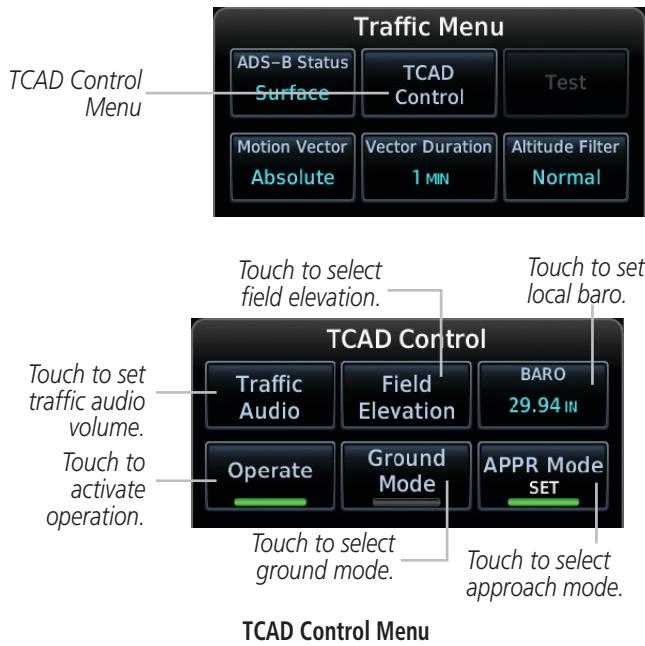
### Altitude Filter

The table below defines the displayed traffic ranges for each altitude filter setting.

Altitude Filter	Displayed Traffic Range
Below	-9,900 ft to 2,700 ft
Normal	-2,700 ft to 2,700 ft
Above	-2,700 ft to 9,900 ft
Unrestricted	All Traffic Shown

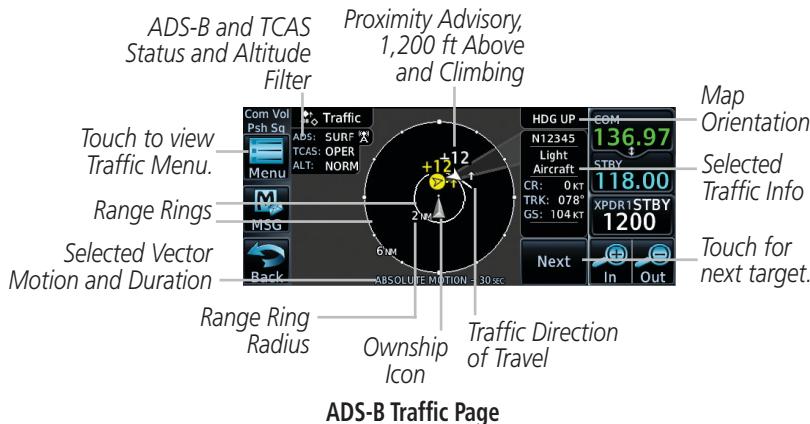
## TCAD

The TCAD Control Menu allows control over the settings for the TCAD Traffic display.



## ADS-B Traffic

Select a traffic target on the dedicated traffic page to obtain additional information about the traffic target or to view all targets in a grouped target. When a grouped target is selected, the **Next** key on the dedicated traffic page will cycle through all targets located in close proximity to where the screen has been touched.



## ADS-B Traffic Menu

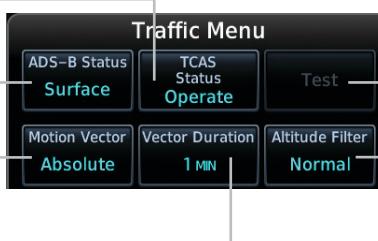
The Traffic Menu allows control of the traffic information display.



Select TCAS Status:  
Operate and Standby.

Select ADS-B Status:  
Off, Surface, or  
Airborne.

Select Motion Vector:  
Absolute, Relative,  
Off.



Touch to perform traffic test.

Select Altitude Filter:  
Normal, Above, Below,  
Unrestricted.

Select Vector Duration:  
30 sec, 1 min, 2 min,  
5 min.

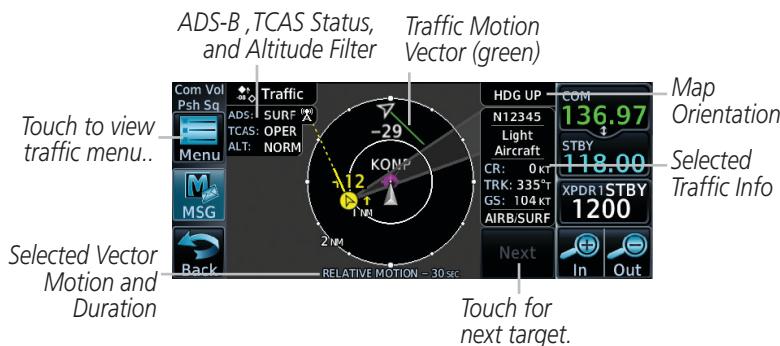
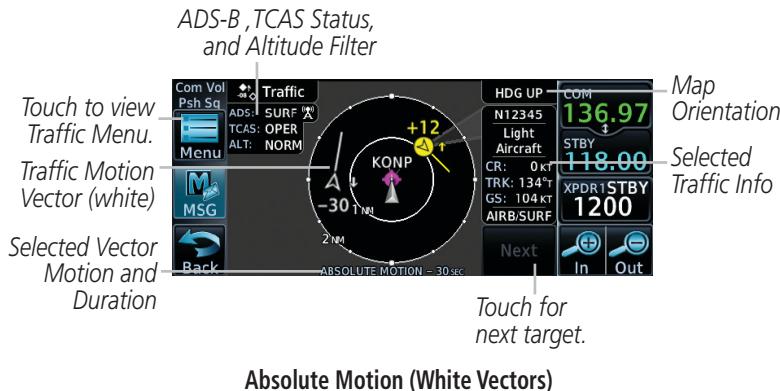
## ADS-B Traffic Menu

## Motion Vector

When Absolute Motion Vectors are selected, the vectors extending from the traffic targets depict the target reported track and speed over the ground. When Relative Motion Vectors are selected, the vectors extending from the traffic targets display how the traffic target is moving relative to your aircraft. The length of each Motion Vector depicts the projected distance its associated target will travel in the amount of time selected in “Vector Duration.”



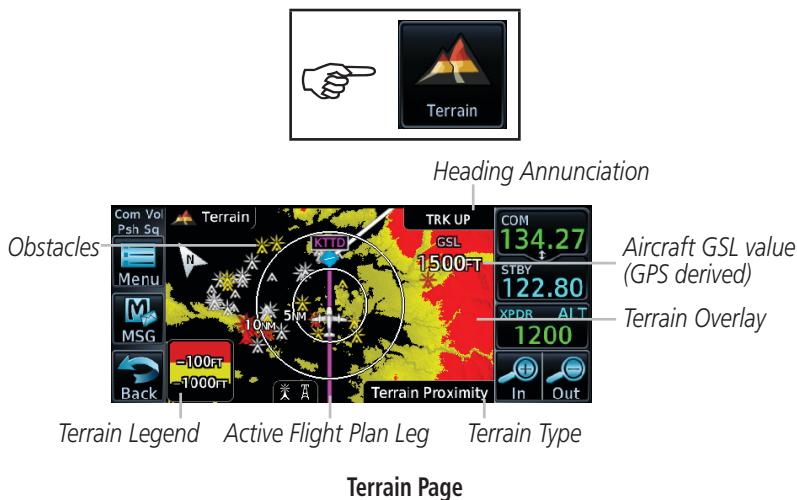
**NOTE:** Absolute motion vectors are colored either white or cyan. Relative motion vectors are always green. The annunciation on the bottom of the traffic page indicates vector type and length.



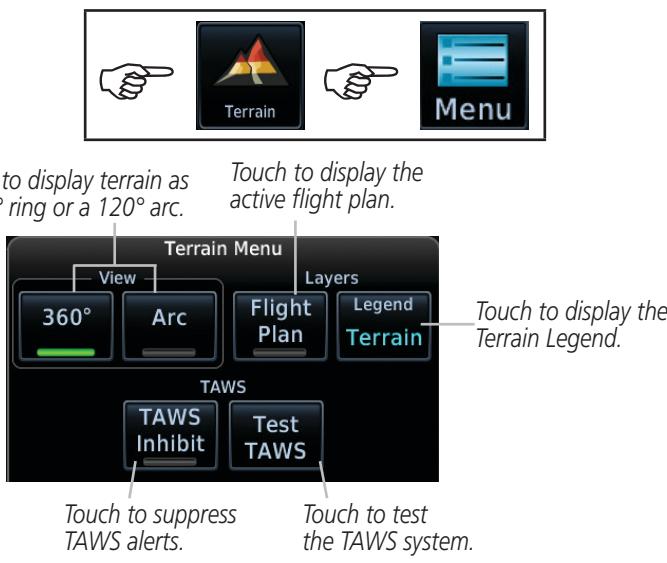
# TERRAIN



**NOTE:** Features may vary, depending on your configuration. For the terrain scale, refer to the "Symbols" section.



## TAWS



## HTAWS

Touch to display terrain as a 360° ring or a 120° arc.

Touch to display the active flight plan.

Touch to display the terrain legend.



Touch to toggle Reduce Protection (RP) mode on and off.

Touch to deactivate aural and visual alerts.

Touch to test HNTAWS system.

HTAWS Terrain Menu

Terrain

# WEATHER



**NOTE:** Features may vary, depending on your configuration. Refer to the GTN 625/635/650 Pilot's Guide, P/N 190-01004-03 for more information.



## SiriusXM® Weather (Optional)



### Weather

Touch to select the weather overlay map orientation.

Touch NEXRAD key to select Off, US, or Canada NEXRAD.

Touch to display the legend.

Touch keys to select weather product. Green bar indicates selected product.

Touch to scroll to view the remaining selections.

**SiriusXM Weather Menu**

Com Vol Psh Sq  
NXRD  
Orientation  
Track Up  
Legend  
Back

NEXRAD  
US  
Forecast Period  
Current  
City Forecast  
Surface Analysis  
Lightning  
Echo Tops

COM 136.97  
STBY 118.00  
ETE  
Up Down

**SiriusXM Weather Menu**

## FIS-B Weather



*Touch to select the weather overlay map orientation.*

*Touch NEXRAD key to select: Off, US, or Canada NEXRAD.*



*Touch to display the legend.*

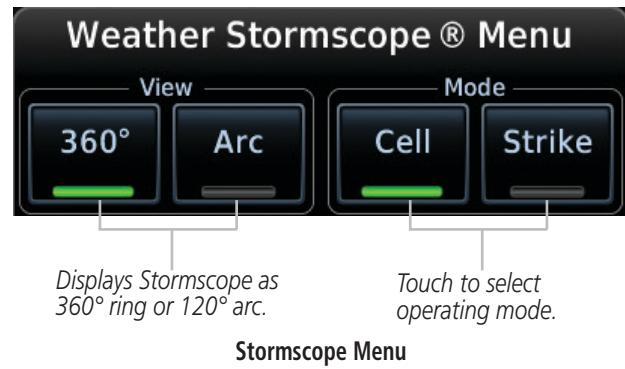
*Touch keys to select weather product.  
Green bar indicates selected product.*

**FIS-B Weather Menu**

Weather

## Stormscope® Weather (Optional)

**NOTE:** Refer to the *WX-500 Pilot's Guide* for a detailed description of the *WX-500 Stormscope*.



## Connxxt Weather (Optional)

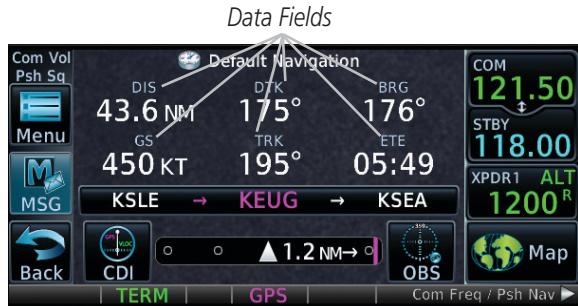


Connxxt Weather Menu

Key	Description
<b>PRECIP</b>	Touch to toggle the display of precipitation.
<b>Lightning</b>	Touch to toggle the display of lightning.
<b>IR Satellite</b>	Touch to toggle the display of IR satellite information.
<b>METAR</b>	Touch to toggle the display of METARS.
<b>PIREP</b>	Touch to toggle the display of PIREPs, Winds Aloft, and SIGMETs/AIRMETs.
<b>Winds Aloft</b>	Touch to toggle the display of PIREPs, Winds Aloft, and SIGMETs/AIRMETs.
<b>SIGMET/AIRMET</b>	Touch to toggle the display of PIREPs, Winds Aloft, and SIGMETs/AIRMETs.
<b>Connxxt Settings</b>	Touch to set region of coverage, data request and to view the status of the datalink.
<b>Orientation</b>	Touch to display map orientation options. North Up, Track Up, or Heading Up.
<b>Legend</b>	Touch to display the legend of weather information.

## Default NAV

# DEFAULT NAV



Default Navigation Page



Touch to configure the user fields.      Touch to restore the default user fields.



Default Navigation Menu

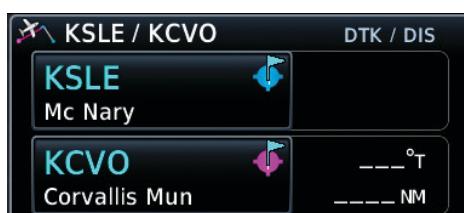
Data field selections are the same as the “Changing User Fields” selections listed in the Map section.

# 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.



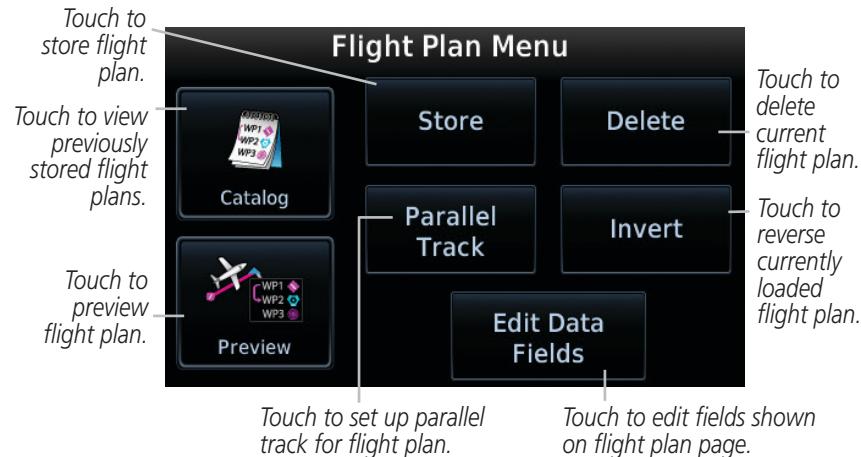
**Sample Flight Plan**



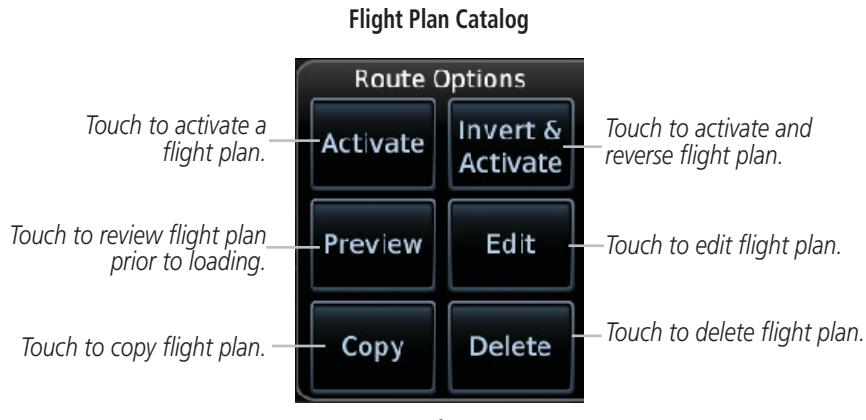
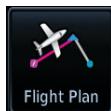
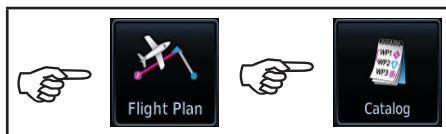
**NOTE:** Do not save flight plans that have modified procedures as this may produce undesirable results.

## Active Flight Plan

### Flight Plan Menu



### Flight Plan Catalog



## 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.



Waypoint Options Menu

**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.



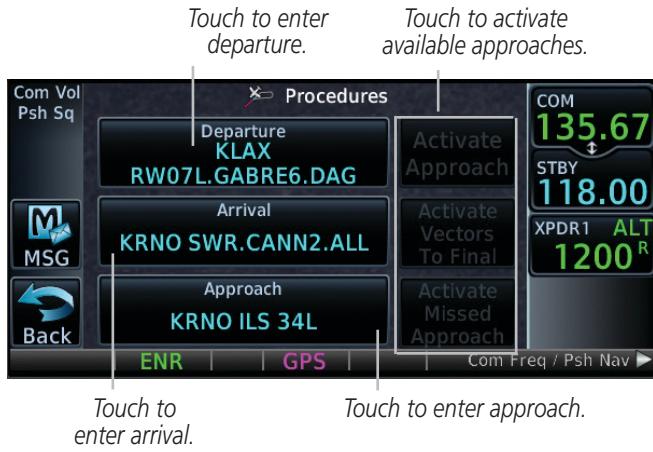
Airway Selection for Waypoint

## PROCEDURES



### Departures, Arrivals, and Approaches

On the Procedures (PROC) page, select approach, arrival, and departure procedures.



## Flying the Missed Approach

In event of a missed approach, the GTN 6XX unit continues to give guidance along an extension of the final course segment (FAF to MAP) until you manually initiate the missed approach procedure (as mentioned in reference to the “SUSP” advisory).



**NOTE:** If the unit is not configured for a CDI key, then the “Activate GPS Missed Approach” will only resume automatic waypoint sequencing. The user must switch to GPS navigation, if desired, by using their external source selection method (this is typical an EFIS system).

- When the MAP is reached, a pop-up will appear.



Pop-Up Upon Reaching the MAP

- Touch the **Remain Suspended** key to continue with sequencing suspended or touch **Activate GPS Missed Approach** for guidance to the Missed Approach Hold Point.

## Flying an Approach with a Hold

The Flight Plan Page displays a timer or distance, as appropriate, during the holding pattern. Use this timer or distance to fly the outbound portion of the holding pattern. The holding pattern is displayed on the Map Page and indicated as the active leg on the Active Flight Plan pages.



**NOTE:** If you need to lose extra altitude or speed by going around the holding pattern again, touch **SUSP** to manually suspend waypoint sequencing BEFORE crossing the holding waypoint the second time. If you've already passed this waypoint, re-activate the holding pattern leg.

# NEAREST



## Nearest Page

- |  |   |
|--|---|
|  | <p>Touch to display the bearing, distance, approach/runway information of the nearest airport.</p>  |
|  | <p>Touch to display the bearing and distance to the nearest intersection.</p>                       |
|  | <p>Touch to display the bearing, distance, and frequency of the nearest VOR.</p>                    |
|  | <p>Touch to display the bearing and distance to the nearest visual reporting point.</p>             |
|  | <p>Touch to display the bearing, distance, and frequency of the nearest NDB.</p>                    |
|  | <p>Touch to display the bearing and distance of a user created waypoint.</p>                        |
|  | <p>Touch to display the bearing and distance of the nearest airspace.</p>                           |
|  | <p>Touch to display the bearing, distance, and frequency of the nearest ARTCC.</p>                  |
|  | <p>Touch to display the bearing, distance, and frequency of the nearest Flight Service Station.</p> |
|  | <p>Touch to display the bearing, distance, and frequency of the nearest weather station.</p>        |

# 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 the distance and bearing, latitude and longitude, location, and the nearest airport.*



*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.*



*Touch to import user waypoints from the datacard.*

## Creating a User 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 Page**

# SERVICES



## Phone



### Phone Page

#### Placing a Call

1. Touch the **Phone** key to display the phone page.
2. Touch the **Phone Number** key to display a phone keypad.
3. Touch the **Contacts** key to enter a saved phone number or enter the phone number using the keypad. Touch **Enter**.
4. Touch the **Call** key.
5. Touch the **End Call** key when finished.

#### SMS Text

##### Sending an SMS Text

1. Touch the **SMS Text** key to display the SMS text page.
2. Touch the **To** window to select recipient's email address or phone number.
3. Touch the **Compose** key to bring up the keypad.
4. When finished, touch the **Send** key to send the message.

## Music



**Music Page**

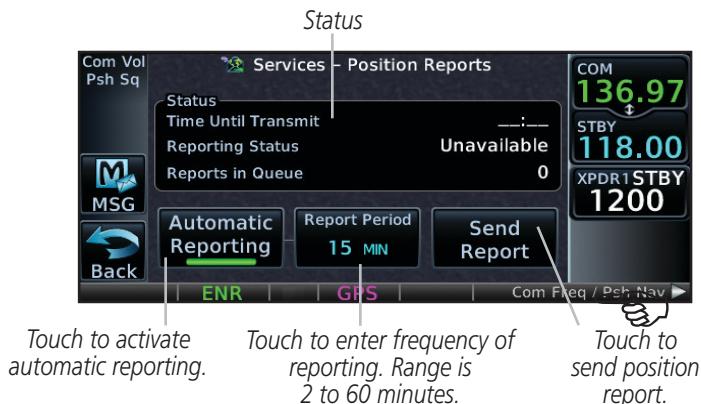
### Selecting a Channel

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

1. Touch the **Presets** key. The choices are XM1, XM2, and XM3.
2. Touch the **Channel** key and enter in the desired 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.

## Position Reports



Position Reports Page

### Position Reporting

1. Touch the **Position Reports** key.
2. Touch the **Automatic Reporting** key to enable reporting of position automatically.
3. After automatic reporting is enabled, touch the **Report Period** key to display the keypad and enter the frequency of reporting.
4. Touch the **Enter** key to confirm your selection.

## Contacts

*Touch to add name,  
phone number, and email  
address of a contact.*



Contacts Page

### Adding a Contact

1. Touch the **Add** key to display the Add Contact menu.
2. Touch the **Name** key to enter the contact name (required).
3. Touch the **Phone Number** key to enter the contact phone number (optional).
4. Touch the **Email Address** key to enter the contact email address (optional).
5. Touch the **Save Contact** key to save entry to list. The list can hold 250 entries.

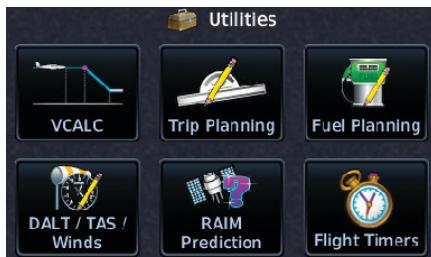
### Editing a Contact

1. In the contact list, touch the contact that you wish to edit.
2. Touch the **Edit** key to display the current contact formation.
3. Touch the information that you want to edit. When you're finished, touch **Save Contact** key. Touch the **Back** key at any time to leave the contact unchanged.

### Deleting a Contact

1. In the contact list, touch the contact that you wish to delete.
2. Touch the **Delete** key.
3. Touch the **OK** key to delete contact. Touch the **Cancel** key to not make any changes to contact in list.

# UTILITIES



## Utilities Page



Touch to enter VCALC profile.  
See "Vertical Calculator  
(VCALC)" for information.



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 create or manage  
scheduled messages  
(e.g., "Change oil,"  
"Switch fuel tanks").



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



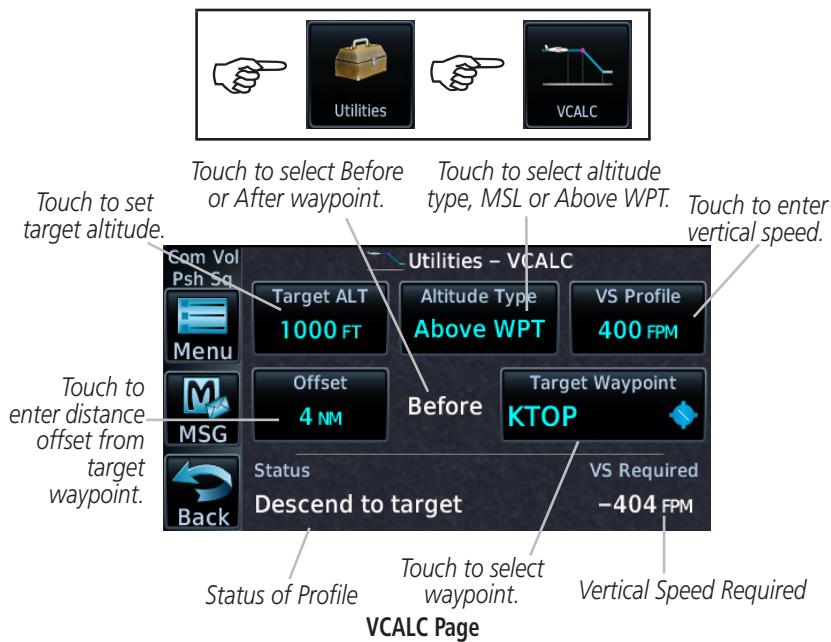
Touch to safely clean the  
screen. Press the HOME key  
to exit cleaning mode.



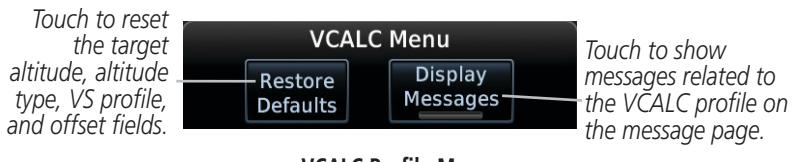
Touch to view and use  
checklist information.

## Vertical Calculator (VCALC)

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 1,000 feet above KTOP at 4 NM from the airport. Since the vertical speed is set to 400 feet per minute, the descent needs to begin now. At the present location, a vertical speed rate of -404 feet per minute is required to reach the target. There are no menu options for the VCALC Profile page.



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



# SYSTEM

**System Page**


**System Status**

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

**GPS Status**

Touch to display the status of GPS reception.

**External LRUs**

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

**Setup**

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

**Alerts**

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

**User Fields**

Touch to customize the data fields.

**Units**

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

**Audio**

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

**Backlight**

Touch to customize the level of backlighting.

**Connex Setup**

Touch to setup Connex devices, including Bluetooth pairing.

**Voice CMDs**

Touch to setup Voice Commands.

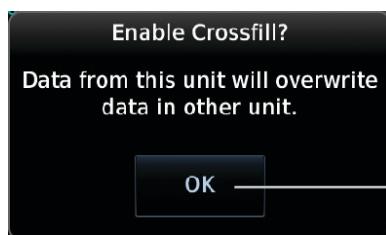
## GTN-GTN Crossfilling

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, Fuel, and Temperature)
  - Favorite COM frequencies
  - 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.

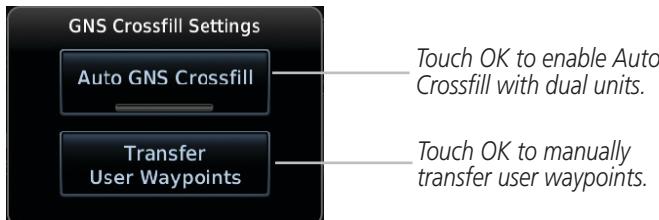


Confirming Crossfill Selection

## GTN-GNS Crossfilling

- GTN to GNS – Active flight plans, active Direct-to, User waypoints
- GNS to GTN – User waypoints

1. While viewing the System Setup page, touch the **GNS Crossfill Settings** key to reach the GNS Crossfill settings.



**GTN-GNS Crossfill Selection**

2. Touch **Auto GNS Crossfill** to enable Crossfill and send the Active Flight Plans and the active Direct-To course to the GNS unit.
3. Touch the Transfer User Waypoints key to transfer the User Waypoints from the GTN unit to the connected GNS unit.



**GTN-GNS Crossfill**

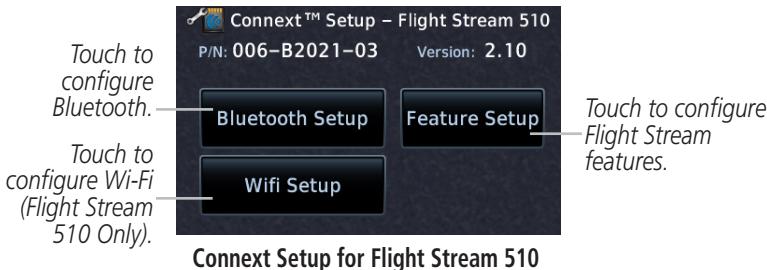


**NOTE:** When the active flight plan on the GTN contains legs or features that are not supported by the GNS, those legs will not be crossfilled and will not be present in the active flight plan on the GNS.

## Connext Setup - Flight Stream 210 and 510

The GTN interfaces with the Flight Stream 210 Bluetooth transceiver and Flight Stream 510 wireless datacard. Using a Flight Stream and the GTN, flight plans are sent and received over Bluetooth. In addition, GPS position is provided from the GTN and attitude is forwarded from a connected GDU. The GTN can also configure the Flight Stream's Bluetooth.

The Flight Stream 510 also includes a Wi-Fi transceiver for updating databases. Refer to *GTN 625/635/650 Pilot's Guide*, P/N 190-01004-03, for more information on updating databases with a Flight Stream 510. The GTN can configure the Flight Stream 510's Wi-Fi.



Connexx Setup for Flight Stream 510



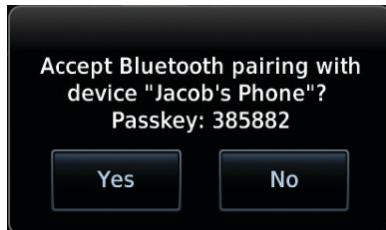
**NOTE:** Turning Flight Plan imports off will remove the ability of the GTN to receive flight plans from the Flight Stream. This could be used if there are repeated erroneous attempts by a portable electronic device application to send flight plans to the GTN.



Bluetooth Setup for Flight Stream 210

## Pairing a Device

New devices can only be paired with the Flight Stream when it is in “Pairing Mode.” The Flight Stream will be in pairing mode when the GTN is navigated to the Connexx Setup page and/or the Manage Paired Devices page. The pairing must be initiated by the portable device. Pop-ups, requesting confirmation of the pairing, display on both the GTN and the portable device.



**Pairing Confirmation Pop-up**

Selecting “Manage Paired Devices” opens a page that lists all of devices paired to the Flight Stream.

## Connexx Operation with Flight Stream 210 and 510

Data output from the GTN and Flight Stream occurs automatically and requires no pilot action (such as, flight plan, GPS position, and attitude). Additionally, ADS-B traffic and weather can be output from the Flight Stream when connected to a GDL 88 or GTX 345 and XM WX and SiriusXM satellite radio information can output when connected a GDL 69. From the Connexx Setup page, the pilot can enable/disable flight plan importing, change the Flight Stream Bluetooth name, and manage paired devices. The Flight Stream 210 and 510 also support sending and receiving GSR 56 SMS messages and controlling the GSR 56 Iridium phone when used with a compatible portable application.

From the Connexx Setup page, the pilot can enable/disable Flight Stream features (flight plan importing, phone/SMS, and Database transfers), setup Flight Stream Bluetooth and Wi-Fi, and manage paired Bluetooth devices.

On the GTN’s Paired Devices page, the device status indicates if the portable device is connected and communicating with the Flight Stream. The “Auto- Reconnect” setting determines if the Flight Stream will automatically connect to up to four devices when in range. When this setting is disabled, the pilot must initiate the connection from the device. For devices that always reconnect automatically, this setting will not be shown. Removing a device from this page by pressing “Remove” will require the device to be paired again before transferring data.



**NOTE:** If the pairing is removed from either device (portable device or GTN) it must be removed on the other device before a new pairing to that same device is established again. Essentially, pairing must be removed on both devices before repairing.

Touch to automatically connect to the device when in range.

Touch to remove the device.



Device is connected and communicating.

Managing Paired Devices

## Connexx Setup - Other Bluetooth Devices

The GTN can also configure the Bluetooth transceiver in other units, such as the GTX 345.



Connexx Setup for GTX 345

From the Connexx Setup page, the pilot can enable/disable Bluetooth, change the Bluetooth name, and manage paired devices. On the Paired Devices page, the device status indicates if the portable device is paired and connected. To connect a different device when the maximum number are already connected, the existing connection must be ended by removing the portable device pairing or by disconnecting or disabling Bluetooth on the portable device. Removing a device from this page by pressing “Remove” will require the device to be paired again before reconnecting.



**NOTE:** *If the pairing is removed from either device (portable device or installed avionics) it must be removed on the other device before a new pairing to that same device is established again. Essentially, the pairing must be removed on both devices before re-pairing.*

New devices can only be paired while the unit is in “Pairing Mode.” Pairing mode is active while on the Connexx Setup page or the Manage Paired Devices page. The pairing must be initiated by the portable device. A pop-up will be displayed on the portable device to confirm the pairing.

# SYMBOLS

## Map Symbols

Symbol	Description
	Airport with hard surface runway(s); Serviced, Primary runway shown
	Airport with hard surface runway(s); Non-Serviced, Primary runway shown
	Airport with soft surface runway(s) only, Serviced
	Airport with soft surface runway(s) only, Non-Serviced
	Unknown Airport
	Restricted (Private) Airfield
	Intersection
	VOR
	VORTAC
	VOR/DME
	TACAN
	DME
	NDB
	Locator Outer Marker
	Heliport
	User Waypoint
	VRP

## SafeTaxi™ Symbols

Symbol	Description
	Helipad
	Airport Beacon
	Under Construction Zones
	Unpaved Parking Areas
	Hot Spot

## Traffic Symbols

### TIS

Symbol	Description
	Non-Threat Traffic
	Traffic Advisory (TA)
	Traffic Advisory Off Scale

### TAS

Symbol	Description
	Non-Threat Traffic (intruder is beyond 5 NM and greater than 1,200 ft vertical separation)
	Proximity Advisory (intruder is within 5 NM and less than 1,200 ft vertical separation)
	Traffic Advisory (closing rate, distance, and vertical separation meet TA criteria)
	Traffic Advisory Off Scale

## TCAS II

Symbol	Description
	Other Non-Threat Traffic
	Proximity Advisory (PA)
	Traffic Advisory (TA)
	Traffic Advisory Off Scale
	Resolution Advisory (RA)
	Resolution Advisory Off Scale

## ADS-B

Symbol	Description
	Basic Non-Directional Traffic
	Basic Directional Traffic
	Basic Off-scale Selected Traffic
	Proximate Non-Directional Traffic
	Proximate Directional Traffic
	Proximate Off-scale Selected Traffic
	Non-Directional Alerted Traffic
	Off-Scale Non-Directional Alerted Traffic
	Directional Alerted Traffic
	Off-Scale Directional Alerted Traffic
	Non-Directional Surface Vehicle
	Directional Surface Vehicle

## TCAD

Symbol		Description
Imminent Traffic (Traffic within $\pm 500$ feet AND 1.0 NM; OR no altitude AND within 1.0 NM)	Non-Imminent Traffic	
		Traffic Closing Vertically
		Traffic Diverging Vertically
		Traffic not Closing or Diverging Vertically

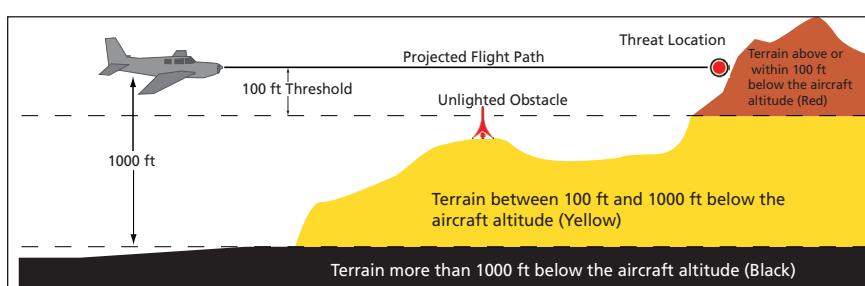
## Terrain Obstacle Symbols

Unlighted Obstacle (Height is less than 1,000 ft AGL)	Lighted Obstacle (Height is less than 1,000 ft AGL)	Unlighted Obstacle (Height is greater than 1,000 ft AGL)	Lighted Obstacle (Height is greater than 1,000 ft AGL)

Obstacle Altitude/Color Correlation

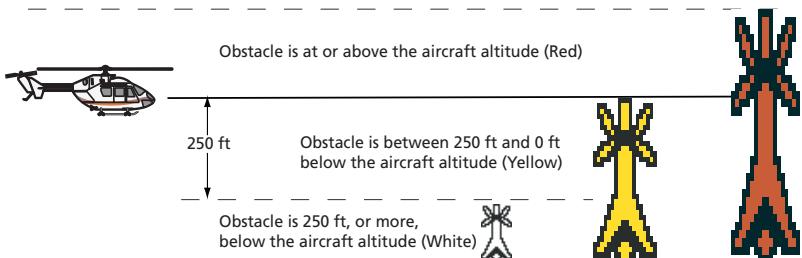
Tower	Windmill	Windmill in Group	Power Line

Obstacle Icon Types

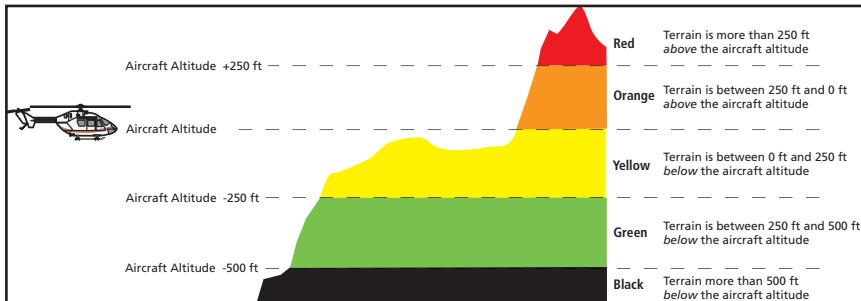


Terrain Altitude/Color Correlation

## HTAWS Obstacle Symbols



**HTAWS Obstacle/Altitude Correlation**



**HTAWS 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
	Terrain Proximity Enabled and Available Indicator
	Terrain Proximity Enabled and Not Available Indicator
	Point Obstacle Enabled and Available Indicator (software v5.12 and later)
	Point Obstacle Enabled and Not Available Indicator (software v5.12 and later)
	Wire Obstacles Enabled and Available Indicator (software v5.12 and later)
	Wire Obstacles Enabled and Not Available Indicator (software v5.12 and later)
	StormScope Enabled
	Ownship is receiving TIS-B and ADS-R services (software v5.11 or earlier)
	Possible incomplete traffic picture – ownship is not receiving one (or both) of the TIS-B or ADS-R services (software v5.11 or earlier)
	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
	Twin-Engine Prop
	Single-Engine Jet
	Business Jet
	2-Blade Rotorcraft
	3-Blade Rotorcraft
	4-Blade Rotorcraft
	High Visibility Arrow
	Basic Aircraft
	Non-Directional Ownship Signal
	Parallel TrackWaypoint
	Restricted/Prohibited/Warning/Alert
	TFR (Temporary Flight Restrictions)

Symbol	Description
	MOA
	Class B Airspace
	Class C Airspace
	Class D Airspace
	User Waypoint

## Stormscope® Symbols

Symbol	Time Since Strike (Seconds)
	6
	60
	120
	180

# MESSAGES

Message	Description	Action
<b>ABORT</b> <b>APPROACH -</b> 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.
<b>AIRSPACE ALERT -</b> 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.
<b>AIRSPACE ALERT -</b> 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.
<b>AIRSPACE ALERT -</b> Inside airspace.	The aircraft inside an airspace type for which alerts are configured.	No action is necessary; message is informational only.
<b>AIRSPACE ALERT -</b> Within 2 nm of airspace.	The aircraft is within 2nm of an airspace type for which alerts are configured.	No action is necessary; message is informational only.

## Messages

Message	Description	Action
<b>APPROACH DOWNGRADE -</b> 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.
<b>APPROACH NOT ACTIVE -</b> 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.
<b>APR GUIDANCE AVAILABLE -</b> Press "Enable APR Output" before selecting APR on autopilot.	The GTN is configured for KAP140/KFC225 autopilot, and approach guidance is now available.	Press the "Enable APR Output" key on the GTN, this will cause the autopilot to go into ROL mode. Engage the autopilot into approach mode.
<b>CDI/HSI FLAG -</b> 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.
<b>CDI SOURCE -</b> 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.

Message	Description	Action
<b>COM RADIO -</b> 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.
<b>COM RADIO -</b> 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.
<b>COM RADIO -</b> 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.
<b>COM RADIO -</b> COM radio needs service.	The COM radio is reporting that it needs service. The COM radio may continue to function.	Cycle the power to the COM radio. Contact dealer for service.
<b>CONFIGURATION</b> - 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.

## Messages

Message	Description	Action
<b>CONFIGURATION MODULE -</b> 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.
<b>COOLING -</b> 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.
<b>COOLING FAN -</b> 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.
<b>CROSSFILL ERROR -</b> Crossfill is inoperative. See CRG for crossfilled items.	Crossfill is not working due to loss of communication with other GTN or due to one GTN needing service.	See Pilot's Guide for a list of crossfilled items that will no longer be crossfilled. Contact dealer for service.
<b>CROSSFILL ERROR - GTN</b> Navigation DB mismatch. See CRG for crossfilled items.	The navigation databases do not match between GTNs resulting in a loss of communication between two units.	Check the specified database version of both GTNs and ensure it is up-to-date. Update the specified database if needed.

Message	Description	Action
<b>CROSSFILL ERROR -</b> GTN software mismatch. See CRG for crossfilled items.	Crossfill is configured "on" but is not working due to software mismatch.	See Pilot's Guide for a list of crossfilled items that will no longer be crossfilled. Contact dealer to have software versions updated.
<b>CROSSFILL STATUS -</b> Crossfill is turned off.	Crossfill is turned off.	No action.
<b>DATABASE -</b> A procedure has been modified in a catalogued 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 catalogued 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.
<b>DATABASE -</b> Terrain display unavailable for current location.	The aircraft is outside the terrain database coverage area.	Terrain and TAWS functions will be unavailable. If terrain coverage is desired in the area, load appropriate coverage area on the external datacard.
<b>DATABASE -</b> Terrain or Obstacle database not available.	The terrain or obstacle database is missing or corrupt.	Re-load these databases on the external datacard.
<b>DATABASE -</b> 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.

## Messages

Message	Description	Action
<b>DATABASE -</b> 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.
<b>DATABASE -</b> Terrain database is not installed, is corrupt, or is not valid for this system.	Terrain database is not available. Terrain information and alerts do not display.	Re-load this database on the external datacard.
<b>DATACARD ERROR -</b> SD card is invalid or failed.	External datacard has an error and the unit is not able to read the databases.	ChartView, FlightCharts, and Terrain databases will not be accessible by the unit. Contact dealer for service.
<b>DATACARD REMOVED -</b> Reinsert SD card.	External datacard was removed.	Reinsert datacard.
<b>DATALINK -</b> ADS-B In fault: UAT receiver.	The ADS-B In source has detected a UAT receiver fault.	Contact dealer for service.
<b>DATALINK -</b> ADS-B In fault: 1090 receiver.	The ADS-B In source has detected a 1090 receiver fault.	Contact dealer for service.
<b>DATALINK -</b> FIS-B weather has failed.	The FIS-B receiver is reporting that it has failed. The display of FIS-B products may be unavailable.	Contact dealer for service.

Message	Description	Action
<b>DATALINK -</b> 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.
<b>DATALINK -</b> GDL 88 ADS-B failure. Unable to transmit ADS-B messages.	GDL 88 is not able to transmit an ADS-B message due to a failure with the GDL 88 system or antenna(s).	Contact dealer for service.
<b>DATALINK -</b> GDL 88 ADS-B fault.	The GDL 88 has detected a fault with one of the GDL 88 UAT/1090 antennas.	Contact dealer for service.
<b>DATALINK -</b> GDL 88 ADS-B fault. Pressure altitude input is invalid.	The GDL 88 has lost communication with the pressure altitude source.	Contact dealer for service.
<b>DATALINK -</b> GDL 88 ADS-B is not transmitting position. Check GPS devices.	The GDL 88 has detected a position input fault.	Contact dealer for service.
<b>DATALINK -</b> GDL 88 configuration module needs service.	The GDL 88 has detected a configuration module fault.	Contact dealer for service.

## Messages

Message	Description	Action
<b>DATALINK -</b> GDL 88 control input fault. Check transponder is in correct mode.	The GDL 88 has lost communication with the transponder.	Contact dealer for service.
<b>DATALINK -</b> GDL 88 is inoperative or connection to GTN is lost.	The GTN is configured for a Garmin datalink (GDL 88) and the GTN cannot communicate with the datalink. Data from the datalink will not be available.	Contact dealer for service.
<b>DATALINK -</b> GDL 88 needs service.	GDL 88 has detected an internal fault.	Contact dealer for service.
<b>DATALINK -</b> GSR 56 data services inoperative; registration required.	The GSR 56 is not registered. GSR Weather, Position Reporting, and Phone Services will be unavailable.	Contact dealer for service.
<b>DATALINK -</b> GSR 56 is inoperative or connection to GTN is lost.	The GTN is configured for a Garmin GSR 56 and the GTN cannot communicate with the GSR 56. GSR Weather, Position Reporting, and Phone Services will be unavailable.	Close the GSR 56 circuit breaker and ensure the GSR 56 is receiving power. Contact dealer for service.
<b>DATA LOST -</b> 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.

Message	Description	Action
<b>DATA SOURCE -</b> 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.
<b>DATA SOURCE -</b> 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.	If the GTN is being used to forward pressure altitude to a transponder, the transponder will not be receiving pressure altitude from the GTN while that message is present. Contact dealer for service.
<b>DATA SOURCE -</b> Radar Altimeter source inoperative or connection to GTN lost.	The GTN is configured to receive radio altitude information but is not receiving it from any source.	50 foot aural annunciation is unavailable for HTAWS installations. Contact dealer for service.
<b>DEMO MODE -</b> Demo mode is active. Do not use for navigation.	The GTN is in Demo Mode and must not be used for actual navigation.	Do not use for navigation. Power cycle the GTN to exit demo mode. Also ensure that the Direct-To key is not stuck.
<b>FLIGHT PLAN IMPORT</b> - Flight plan import failed.	The requested flight plan could not be imported because the GTN was unable to decode the contents of the flight plan.	Check for proper operation of the needed components. If the problem persists. Contact dealer for service.
<b>FLIGHT PLAN IMPORT</b> - Flight plan import failed. Catalog is full.	The flight plan catalog is full and the requested flight plan could not be imported.	Edit the flight plan catalog to remove unneeded flight plans.

## Messages

Message	Description	Action
<b>FLIGHT PLAN IMPORT</b> - New imported flight plan(s) available for preview.	The GTN has received a new flight plan that is available for preview by the pilot.	No action is necessary; message is informational only.
<b>FPL WAYPOINT LOCKED</b> - 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.
<b>FPL WPT MOVED</b> - 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.
<b>GLIDESLOPE</b> - 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.
<b>GLIDESLOPE</b> - Glideslope receiver needs service.	The glideslope board is indicating that it needs service. The glideslope board 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.
<b>GNS CROSSFILL</b> - Catalog full; not all GNS waypoint(s) transferred.	A user waypoint from the GNS could not be created because the user waypoint catalog is full.	Remove some of the waypoints from the catalog to make room for the waypoints from the GNS.

Message	Description	Action
<b>GNS CROSSFILL -</b> GTN user waypoint(s) replaced with GNS user waypoints.	A user waypoint from the GNS replaced one or more existing waypoints on the GTN.	Ensure that the waypoints on the GNS have unique names before transferring to the GTN to avoid overwriting existing waypoints.
<b>GNS CROSSFILL -</b> Waypoint transfer failed.	Waypoint transfer failed/incomplete.	The data transfer should be reattempted.
<b>GPS NAVIGATION LOST -</b> 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.
<b>GPS NAVIGATION LOST -</b> Insufficient satellites. Use other navigation source.	GPS position has been lost due to lack of satellites.	Wait for GPS satellite geometry to improve. Ensure the aircraft has a clear view of the sky. Use a different GPS receiver or a non-GPS based source of navigation. Contact dealer for service.
<b>GPS RECEIVER -</b> GPS receiver has failed. Check GPS coax for electrical short.	Internal communication to the SBAS board is inoperative.	Use a different GPS receiver or a non-GPS based source of navigation. Contact dealer for service.
<b>GPS RECEIVER -</b> 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.

## Messages

Message	Description	Action
<b>GPS RECEIVER -</b> Low internal clock battery.	The GPS module indicates that its clock battery is low. Almanac data may have been lost. The unit will function normally, but may take a longer than normal period to acquire a GPS position.	Contact dealer for service.
<b>GPS SEARCHING SKY -</b> 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.
<b>GTN -</b> GTN needs service.	The GTN has lost calibration data that was set by Garmin during manufacturing.	Contact dealer for service.
<b>HOLD EXPIRED -</b> Holding EFC time has expired.	The selected Expect Further Clearance (EFC) time for a user-defined hold has passed.	No action is necessary; message is information only.
<b>HTAWS -</b> Invalid Terrain Database.	The terrain database is of insufficient resolution for use with HTAWS.	Load HTAWS specific terrain database on the external SD card.
<b>INTERFACE ADAPTER -</b> 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.

Message	Description	Action
<b>INTERFACE ADAPTER -</b> 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.
<b>INTERNAL SD CARD ERROR -</b> GTN needs service.	Internal SD card has an error. This card is not accessible by the user.	Contact dealer for service.
<b>INTERNAL SD CARD REMOVED -</b> GTN needs service.	Internal SD card was removed or failed. This card is not accessible by the user.	Contact dealer for service.
<b>KEY STUCK -</b> 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.
<b>KEY STUCK -</b> 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. Press the Home key again to cycle its operation. Contact dealer for service if this message persists.
<b>KNOB STUCK -</b> 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.
<b>KNOB STUCK -</b> 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.

## Messages

Message	Description	Action
<b>LOCKED FLIGHT PLAN</b> 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.
<b>LOSS OF INTEGRITY (LOI)-</b> Verify GPS position with other navigation equipment.	Antenna may be shaded from satellites. The GPS module has reported a loss of integrity.	Make sure the aircraft is clear of hangars, buildings, trees, etc. Use a different GPS receiver or a non-GPS based source of navigation. Contact dealer for service if this message persists.
<b>MAGNETIC NORTH APPROACH -</b> Verify NAV angles are referenced to magnetic north (magnetic variation).	The NAV angle is not set to Magnetic and a magnetic approach is loaded.	Change NAV angle setting to Magnetic.
<b>MAGNETIC VARIATION -</b> 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.
<b>MARK ON TARGET -</b> Waypoint creation has failed. MOT requires GPS position.	Mark on target waypoint creation has failed because of missing GPS position.	Wait for GPS satellite geometry to improve. Ensure the aircraft has a clear view of the sky. Reattempt waypoint creation. Contact dealer for service.

Message	Description	Action
<b>NAV ANGLE -</b> NAV Angles are referenced to a User set value (U).	NAV angle is set to User.	No action is necessary; message is informational only.
<b>NAV ANGLE -</b> NAV Angles are referenced to True North (T).	NAV angle is set to True.	No action is necessary; message is informational only.
<b>NON-WGS84 WAYPOINT -</b> See CRG. Location may be different than where surveyed for [WPT].	The active waypoint is not referenced to the WGS84 datum. See Note 1, page 79 , at the end of this table.	No action is necessary; message is informational only.
<b>OBS -</b> 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.
<b>PARALLEL TRACK -</b> Parallel track not supported for leg type.	Parallel track is not supported on current leg type.	No action is necessary; message is informational only.
<b>PARALLEL TRACK -</b> 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.
<b>PARALLEL TRACK -</b> Parallel track not supported past IAF.	Parallel track is not supported on approaches.	No action is necessary; message is informational only.

**Messages**

Message	Description	Action
<b>REMOTE KEY STUCK -</b> Alert Acknowledge key is stuck.	The remote TAWS alert acknowledge (ALRT ACK) key/switch has been in pressed position for at least 30 seconds. This input will now be ignored. This input is not available in all installations.	Verify the ALRT ACK key/switch is not stuck. Contact dealer for service if this message persists.
<b>REMOTE KEY STUCK -</b> COM push-to-talk key is stuck.	The Push To Talk key/switch has been in 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.
<b>REMOTE KEY STUCK -</b> COM remote frequency decrement key is stuck.	The remote COM frequency decrement (COM CHAN DN) key/switch has been in 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
<b>REMOTE KEY STUCK -</b> COM remote frequency increment key is stuck.	The remote COM frequency increment (COM CHAN UP) key/switch has been in 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.
<b>REMOTE KEY STUCK -</b> COM remote transfer key is stuck.	The remote COM transfer (COM RMT XFR) key/switch has been in 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.
<b>REMOTE KEY STUCK -</b> NAV remote transfer key is stuck.	The remote NAV transfer (NAV RMT XFR) key/switch has been in 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.

## Messages

Message	Description	Action
<b>REMOTE KEY STUCK -</b> Pilot/Co-Pilot voice command push-to-command key is stuck.	The remote push-to-command key/switch has been in pressed position for at least 30 seconds. This input will now be ignored. This input is not available in all installations.	Verify the push-to-command key/switch is not stuck. Contact dealer for service if this message persists.
<b>REMOTE KEY STUCK -</b> Remote CDI key is stuck.	The remote CDI (CDI SRC SEL) key/switch has been in 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.
<b>REMOTE KEY STUCK -</b> Remote go around key is stuck.	The remote go around (RMT GO ARND) key/switch has been in pressed position for at least 30 seconds. This input will now be ignored. This input is not available in all installations.	Verify the RMT GO ARND key/switch is not stuck. Contact dealer for service if this message persists.
<b>REMOTE KEY STUCK -</b> Remote OBS key is stuck.	The remote OBS (OBS MODE SEL) key/switch has been in 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.

Message	Description	Action
<b>REMOTE KEY STUCK -</b> RP Mode key is stuck.	The remote RP MODE key/switch has been in pressed position for at least 30 seconds. This input will now be ignored. This input is not available in all installations.	Verify the RP MODE key/switch is not stuck. Contact dealer for service if this message persists.
<b>REMOTE KEY STUCK -</b> TAWS inhibit key is stuck.	The TAWS INHIBIT discrete input has been in 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.
<b>SELECT FREQUENCY -</b> 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.
<b>SET COURSE -</b> 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/HSI selected course to the current desired track.

## Messages

Message	Description	Action
<b>STEEP TURN -</b> 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.
<b>STORMSCOPE -</b> 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.
<b>STORMSCOPE -</b> 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.	Close the Stormscope circuit breaker and ensure Stormscope is receiving power. Contact dealer for service.
<b>TAWS AUDIO INHIBITED -</b> 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.
<b>TIMER -</b> Timer has expired.	A user-configured timer has expired.	No action is necessary; message is informational only.

Message	Description	Action
<b>TRAFFIC -</b> ADS-B In traffic alerting has failed.	The ADS-B traffic system is reporting to the GTN that the CSA application has failed. Traffic alerting on ADS-B traffic is unavailable.	Ensure the aircraft has a clear view of the sky. If the problem persists. Contact dealer for service.
<b>TRAFFIC -</b> ADS-B In traffic has failed.	The ADS-B traffic system may have lost GPS position or detected an internal fault.	Contact dealer for service.
<b>TRAFFIC -</b> TCAD has a low battery.	The GDL 88 is reporting that the external traffic system has a low battery.	Contact dealer for service.
<b>TRAFFIC -</b> Traffic device battery low. Traffic device user config settings not saved.	The TCAD system has indicated that its battery is low.	Contact dealer for service.
<b>TRAFFIC -</b> 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.
<b>TRAFFIC -</b> 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.

## Messages

Message	Description	Action
<b>TRANSPONDER -</b> 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.
<b>TRANSPONDER 1 OR 2 -</b> ADS-B is not transmitting position.	The transponder has insufficient data to support ADS-B.	Ensure the aircraft has a clear view of the sky. Contact dealer for service.
<b>TRANSPONDER 1 OR 2 -</b> ADS-B Out system fault. Pressure altitude source inoperative or connection lost.	The transponder has lost communication with the pressure altitude source.	Contact dealer for service.
<b>TRANSPONDER 1 OR 2 -</b> 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.
<b>TRANSPONDER 1 OR 2 -</b> 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.

Message	Description	Action
<b>TRANSPONDER 1 OR 2 -</b> Transponder has failed.	The transponder has detected an internal fault and transponder functionality may be unavailable.	Contact dealer for service.
<b>TRANSPONDER 1 OR 2 -</b> Transponder is in ground test mode.	The transponder is operating in a mode intended for ground testing.	Cycle the power to the transponder.
<b>TRANSPONDER 1 OR 2 -</b> Transponder overtemp.	The transponder is reporting that its internal temperature has exceeded upper operating limits.	Decrease temperature and increase airflow near the transponder, if possible. Monitor aircraft electrical indications. Contact dealer for service if this message persists.
<b>TRANSPONDER 1 OR 2 -</b> Transponder undertemp.	The transponder is reporting that its internal temperature has exceeded lower operating limits.	Contact dealer for service if this message persists.
<b>TRUE NORTH APPROACH -</b> 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.
<b>USER WAYPOINT IMPORT</b> - User waypoints were imported successfully.	All user waypoints were imported successfully.	No action is necessary; message is informational only.

## Messages

Message	Description	Action
<b>USER WAYPOINT IMPORT</b> - User waypoint import failed.	User Waypoint import failed due to improper file format.	Ensure the media has the correct file format. If the problem persists. Contact dealer for service.
<b>USER WAYPOINT IMPORT</b> - User waypoint import failed. User waypoint database is full.	User Waypoint catalog is full and the requested user waypoints could not be imported.	Edit the User Waypoint catalog to remove unneeded user waypoints.
<b>USER WAYPOINT IMPORT</b> - User waypoints imported successfully - existing waypoints reused.	User waypoints imported and existing waypoints are used instead of creating duplicate waypoints.	No action is necessary; message is informational only.
<b>VCALC</b> - Approaching top of 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.
<b>VCALC</b> - Arriving at VCALC 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.

Message	Description	Action
<b>VISUAL APPROACH NOT ACTIVE -</b> Approach guidance not available when requesting Direct-To runway.	Visual approach could not transition to active. Guidance is not available.	Reactivate the approach or cancel the Direct-To course.
<b>VLOC RECEIVER -</b> Navigation receiver has failed.	The NAV radio is not communicating properly with the system.	Use GPS based navigation. Contact dealer for service.
<b>VLOC RECEIVER -</b> Navigation receiver needs service.	The NAV radio is reporting to the GTN that it needs service. The NAV radio may continue to function.	Use GPS based navigation. Contact dealer for service.
<b>WAYPOINT -</b> 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 unknown. If this is the case, this message is displayed. Garmin cannot determine exactly how close the non-WGS84 referenced waypoint will be to the WGS84 datum that the GTN uses. Typically, the distance is within two nautical miles. The majority of non-WGS84 waypoints are located outside of the United States.

## GLOVE QUALIFICATION PROCEDURE

This procedure is used to qualify a specific glove for use with the GTN system by guiding the user through a variety of tasks that use the touchscreen. Due to differences in finger size, glove size, and touchscreens between the 6XX or 7XX unit, the qualification granted by this procedure is specific to the pilot/glove and 6XX or 7XX combination. GTN 7XX and 6XX units must be evaluated separately.

The GTN touchscreen uses capacitive touch technology to sense the proximity of skin to the display. A glove increases the distance between skin and the display glass and may reduce the ability of the GTN to detect touches. Therefore, when selecting a glove for use with the GTN, thinner gloves tend to work better than thicker gloves. Leather gloves and gloves designed to work specifically with capacitive touchscreen devices are often found to be acceptable. Additionally, altering your touch technique to use the pad of your finger to touch the unit rather than the tip will increase the touchscreen sensitivity while using gloves.

This qualification must be completed on the ground. Performing this procedure in flight is not authorized. “Tests Required for Glove Qualification” table contains tasks that are required to qualify a glove. “Test Not Required for Glove Qualification” table contains tasks that are not required to qualify a glove, but may limit the manner in which some functions are accessed while a glove is worn.

1. Sit in the pilot's seat.
2. Start the GTN in Demo mode by pressing and holding the Direct To key during power up.
3. Perform the tasks listed in the following sections with an ungloved hand. You do not need to record any results for this step.
4. Perform the tasks listed in the following sections with a gloved hand. For each task, determine whether the operation is the same or worse as it was without the glove. Record the results in the applicable table. Items that may cause the operation to be worse include, but are not limited to:
  - a. Multiple attempts to select a key
  - b. Unintentional selection of adjacent keys
  - c. Excessive force on the touchscreen to select a key
5. If all applicable tasks in following sections respond in the same way with and without a glove then the glove used to complete these tasks may be used by the pilot who performed this evaluation on the unit (6XX or 7XX) that was used during this procedure.

Pilot: \_\_\_\_\_

Glove Description: \_\_\_\_\_

GTN (circle one): 6XX or 7XX

## Tests Required for Glove Qualification

Task	Operation With Glove (circle one)	
Navigate to the Home Screen .	NA	
Touch the <b>Demo</b> key.	Same	Worse
Touch the <b>GPS</b> key.	Same	Worse
Touch the <b>Waypoint</b> key.	Same	Worse
Type "KSLE" using the touchscreen, then touch <b>Enter</b> .	Same	Worse
Navigate to the Home Screen (Press <b>HOME</b> ).	NA	
Touch the <b>Flight Plan</b> key.	Same	Worse
Enter the following waypoints using the <b>Add Waypoint</b> key at the bottom of the list of flight plan waypoints:  KSLE KMMV KONP BTG	Same	Worse
Select BTG, then touch the <b>Load Airway</b> key to load the following airway: V23 ALFOR.	Same	Worse
While viewing the flight plan page, touch the <b>Up/Down</b> arrow keys to scroll up and down to view the flight plan waypoints.	Same	Worse
Touch the <b>Back</b> key to return to the Home Screen.	Same	Worse
Touch the COM standby frequency to activate the COM frequency entry keypad (Task applicable to 635/650/750 only).	Same	Worse
Enter a valid COM frequency and touch the <b>Enter</b> key (635/650/750 only).	Same	Worse

Task	Operation With Glove (circle one)	
Touch the active COM frequency to flip/flop the COM frequencies. (635/650/750 only).	Same	Worse
Touch the active NAV frequency to flip/flop the NAV frequencies (750 only).	Same	Worse
Touch the <b>Menu</b> key (650 only).	Same	Worse

## Tests Not Required for Glove Qualification

Task	Operation With Glove (circle one)	
Navigate to the flight plan page.	NA	
While viewing the flight plan page, touch the list and drag up/down to view the flight plan waypoints.	Same	Worse
While viewing the flight plan page, touch and flick the list to view the flight plan waypoints.	Same	Worse
Navigate to the map page.	NA	
Touch the Map to enter Pan mode, then touch the <b>Graphically Edit FPL</b> key.	Same	Worse
Remove KONP from the flight plan graphically by touching KONP and dragging it to an area without any waypoints (Pan and zoom in/out as necessary to accomplish the task).	Same	Worse
Insert KSPB between KMMV and BTG by dragging the leg between KMMV and BTG to KSPB.	Same	Worse

# TELLIGENCE VOICE COMMAND QUALIFICATION PROCEDURE

In order to enable voice command functionality crew members must successfully perform and complete 17/20 (85%) voice commands in the Telligence aircraft qualification procedure. Crew members must be comfortable speaking into an aviation headset and proficient in English.

## Voice Command Guidelines



**NOTE:** *If a voice command is uninterpretable, verify the system is performing the intended action or displaying the desired data. If the system does not recognize a command, use the touchscreen to execute the function. The GTN Voice Command History details all commands performed.*

- Position the headset MIC approximately 1/8-inch from mouth, align with bottom lip to avoid breath sounds in the microphone.
- Speak conversationally.
- Enunciate.
- Speak in a normal tone and volume.
- Speak at a normal cadence (not too quickly or slowly).
- Pause briefly between activation of the **Push to Command (PTC)** switch and when speaking the voice command.
- Review the commands prior to performing the qualification.

## Voice Command Instructions

1. Press and hold the **PTC** switch.
2. Speak the entire command into the headset MIC.
3. Release the **PTC** switch.
  - A positive tone (low-to-high) indicates the command has been recognized and executed. (i.e., page changed, radio tuned, MIC selected, etc.)
  - A negative tone (high-to-low) indicates the command is either unrecognizable or invalid.

### Successful Command Example

“Show approaches page” is spoken, the approach selection page displays immediately, and a positive tone sounds.

### Unsuccessful Command Example

“Show map page” is spoken and the traffic page displays.

“Show map page” is spoken and a negative tone sounds.

## Qualification Procedure

Speak the unbold phrase if the voice command in this procedure is not applicable to the aircraft's configuration. If the total number of successful commands is less than 17, the voice commands must be disabled. For instructions on how to activate and deactivate voice commands, refer to the GTN 625/635/650 Pilot's Guide, P/N 190-01004-03.

Example: If the requirement states a COM radio is required, but your GTN does not have a COM radio, use the unbold command.

1. Start the GTN and acquire a GPS position.
2. Conduct the voice commands in sequential order while wearing an aviation headset. If necessary, a command can be attempted twice.
3. When the command is successful check the box next to the command.

**SHOW Flight Plan PAGE**

\*\*\* Manually enter a flight plan with a towered airport as the destination \*\*\*

 **SHOW Trip Planning PAGE** \* **TUNE Nearest Ground** or SHOW Nearest Airport PAGE \* **TUNE Nearest ATIS** or SHOW Nearest Weather Frequency PAGE † **TOGGLE COM 2** or SAY Distance **SHOW Map PAGE** **ZOOM OUT** **SAY Distance to Destination** **SHOW Flight Timers PAGE** † **SELECT COM 2** or SAY ETA at Destination **SAY Active Waypoint** **CREATE Waypoint Here** \* **TUNE Destination Tower** or SHOW Destination Runways PAGE ‡ **SHOW Traffic PAGE** or SHOW Nearest PAGE **SHOW Procedures PAGE** **SHOW V-CALC PAGE** **SHOW Current Time** **SAY Desired Track** **BACK** **SHOW Voice Command History Page**

\* A GTN COM radio is required.

† Two COM radios connected to the GMA are required.

‡ Traffic capability is required on the GTN.

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