8 MAP

The Map page is used to provide situational awareness in flight. The Map page can display the following information:

- Airports, NAVAIDs, airspace, airways, land data (highways, cities, lakes, rivers, borders, etc.) with names
- Wind direction and speed
- Icons for enabled map features
- Aircraft icon (with the nose representing present position)
- Nav range ring
- Flight plan legs
- Topography scale
- Topography data
- NEXRAD (or Precip) Weather (Opt.)
- Terrain Overlay
- Traffic Overlay
- Fuel range ring (software v6.00 or later)
- Track vector (SW v6.20 or later)

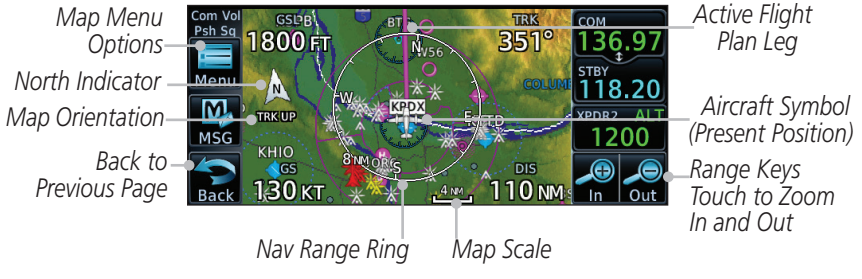


Figure 8-1 Map Page Description

NOTE: *The electronic map is an aid to navigation and is designed to facilitate the use of authorized government charts, not replace them. Land and water data is provided only as a general reference. The accuracy of the land and water data is not suitable for use as a primary source of navigation and should only be used to supplement official government charts and notices.*

The following information describes the ownship symbol behavior in a helicopter that does not have a source of magnetic heading information connected to the GTN. When greater than 15 knots groundspeed the map is oriented either north up with ownship oriented to its current track or track up. When less than 15 kts groundspeed, the directional ownship icon is replaced with a non-directional icon because it can't be determined if the rotorcraft is going sideways or backwards. The map will continue to orient to the current track if the map is selected

for Track Up. If the map is oriented to track up, then below 5 kts groundspeed the map orientation will "latch" to the last valid track prior to the groudspeed going below 5 kts. The map will reorient when the groundspeed again exceeds 5 kts. The position of the ownship icon over the map is always the current GPS position of the aircraft.

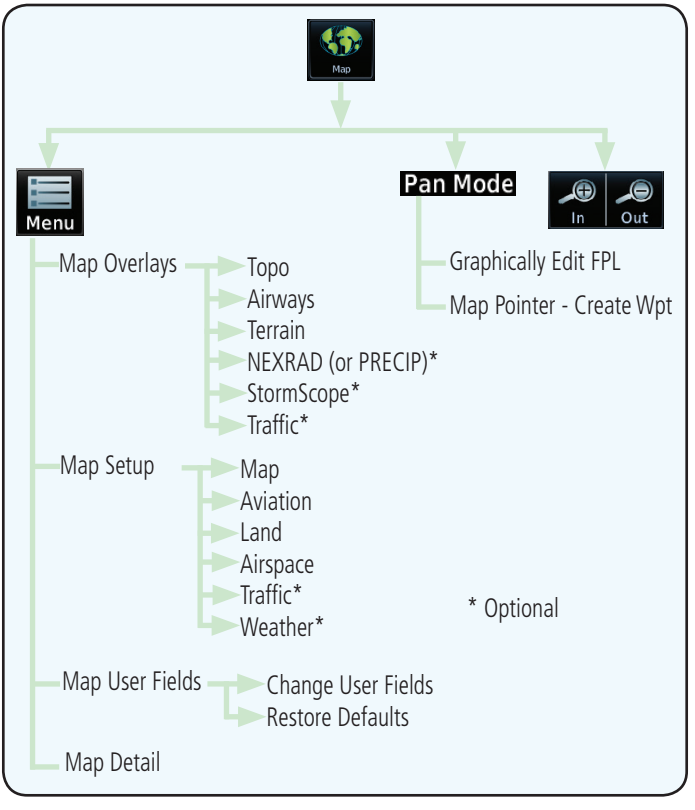


Figure 8-2 Map Page Functional Diagram

8.1 Map Menu

The Map Menu provides the ability to modify and control the information displayed on the Map page.

- Map Overlays are selected to overlay various types of information over the base map.
- Map Setup modifies the display of other map features.
- Map User Fields determines whether or not the fields in the corners of the Map page are displayed and the data shown in each corner.

- Map Detail lets you control the amount of information displayed at different map ranges.
- Restore Defaults lets you start all over again with the default values for Map User Fields.

***NOTE:** Changes made in the Map Menu take effect immediately on the map display.*

1. From the Home page, touch **Map** to reach the Map page, and then touch the **Menu** key.

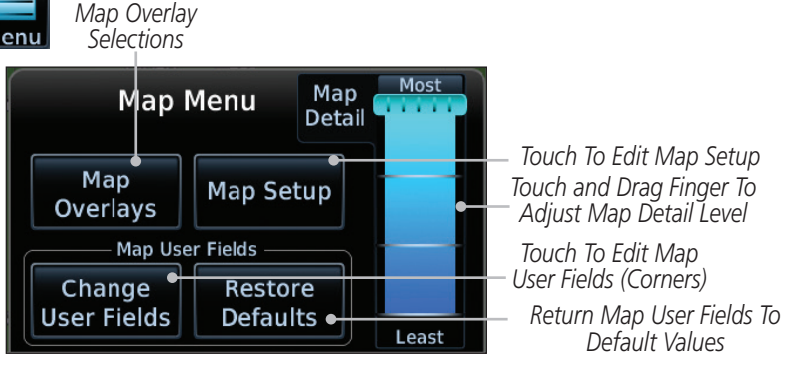
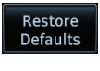


Figure 8-3 Map Menu

2. Touch the key for the desired option to access its settings.
3. Touch the **Back** key to return to the Map page. Any changes made will be retained until changed.



8.1.1 Map Overlays

Map Overlays are layers of information that are referenced to geographic location and are overlayed on the base map. A green bar will appear below the Map Overlay key text when the overlay is selected, except for Airways and NEXRAD.

***NOTE:** Map overlay keys do not turn on or activate equipment necessary for the overlay to function. Map overlay keys may remain available even if the information necessary for the overlay is not available. For example: the Radar overlay key is available even if the radar is turned off.*

NOTE: *Map overlays for StormScope or Traffic are prevented from being overlaid on the main map without a heading source or while User Navigation Angles are selected.*

8.1.1.1 Overlay Priority

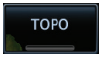
The data overlayed on the map is displayed according the following priorities (from highest to lowest):

1 - Traffic	10 - Cell Movement	19 - AIREPS	28 - NEXRAD
2 - Ownship	11 - Lightning	20 - City Forecast	29- Cloud Tops
3 - Flight Plan	12 - METARs	21 - Surface Analysis	30 - IR Satellite
4 - TAWS Alerts	13 - Winds Aloft	22 - Airspace	31 - SafeTaxi
5 - Stormscope	14 - SIGMETs	23 - Waypoints	32 - Terrain
6 - Obstacles	15 - AIRMETs	24 - Airways	33 - Base Map
7 - Fuel Range Ring	16 - Cyclone Warning	25 - Turbulence	34 - Topo
8 - TFRs	17 - County Warning	26 - Icing Potential	
9 - Freezing Levels	18 - PIREPs	27 - Echo Tops	

Table 8-1 Data Overlay Priority

8.1.1.2 Topo

The Topo Data option selects whether the colored topographical features are displayed. Traffic, Land Data, Terrain, and Obstacles will still be displayed even with Topo Data turned off.



1. While viewing the Map Menu, touch **Map Overlays** key, and then the **TOPO** Map Overlay key to toggle the Topo setting.

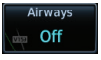
Topo Map Overlay Off **Topo Map Overlay On**

Figure 8-4 Topo Map Overlay Selections

2. When the Topo Map Overlay is toggled off, all topographic color features are removed.

8.1.1.3 Airways

The Airways option allows you to select the airways that are shown on the Map page. All, Low only, and High only Airways may be selected. When Off is selected, airways will not be shown.



1. While viewing the Map Menu, touch **Map Overlays** key, and then the **Airways** Map Overlay key to select the Airways viewed. Selections are: Off, Low, High, and All.

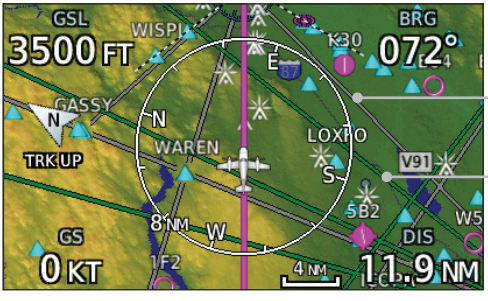
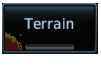


Figure 8-5 Airways Map Overlay

2. Low Airways are shown as gray lines. High Airways are shown as green lines.

8.1.1.4 Terrain

The Terrain Data option selects whether Terrain Data is shown on the Map page. Terrain and NEXRAD weather may not be displayed at the same time. Selecting one will disable the other. A Terrain icon will indicate that the Terrain overlay has been selected. Terrain overlay colors may or may not be shown depending on the altitude of the aircraft.



1. While viewing the Map Menu, touch **Map Overlays** key, and then the **Terrain** Map Overlay key to toggle the view of Terrain data.

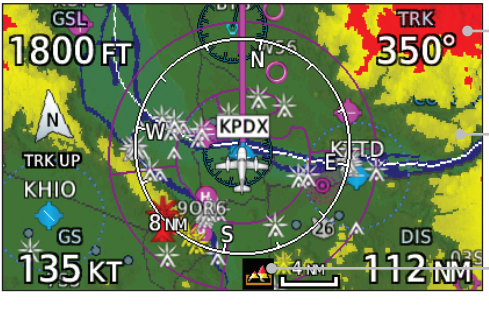
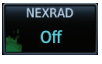


Figure 8-6 Terrain Map Overlay

2. The colors of the terrain are referenced to your aircraft altitude.

8.1.1.5 NEXRAD (Optional)

The NEXRAD menu option allows the display of NEXRAD Precip weather information overlayed on the Map page. Terrain and NEXRAD Precip weather may not be displayed at the same time. Selecting one will disable the other. NEXRAD Precip weather is an optional feature that requires the installation of a GDL 69/69A, GDL 88, GTX 345, or GSR 56 and an appropriate Weather subscription. Only one weather source can be displayed at a time (i.e., FIS-B and XM cannot be displayed on the map simultaneously. See the Weather section for more detail.



While viewing the Map Menu, touch the **NEXRAD** Map Overlay key to toggle the view of NEXRAD weather data.

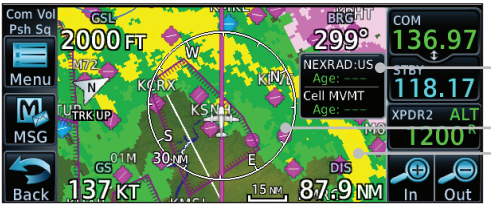
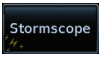


Figure 8-7 NEXRAD Map Overlay

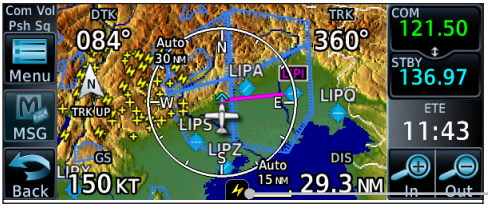
8.1.1.6 StormScope® (Optional)

The WX-500 StormScope Weather Mapping Sensor is a passive weather avoidance system that detects electrical discharges associated with thunderstorms within a 200 NM radius of the aircraft. The StormScope measures relative bearing and distance of thunderstorm-related electrical activity and reports the information to the display. Stormscope and XM Lightning are mutually exclusive.

***NOTE**: The StormScope map overlay is only displayed if valid aircraft heading information is available. Refer to the WX-500 Pilot's Guide for a detailed description of the WX-500 StormScope.*



1. While viewing the Map Menu, touch the **StormScope** Map Overlay key to show the menu for selecting a StormScope radar weather data display mode: Cell, Strike, Off, or Clear Strikes. Touch the desired function.
2. StormScope data displays on the Map page. See section 11.2 for more details.



Icon Shows StormScope Overlay Is Active

Figure 8-8 StormScope Map Overlay

8.1.1.7 Traffic (Optional)

The Traffic Map Overlay option selects whether Traffic data is shown on the Map page. A Traffic icon will indicate that the Traffic overlay has been selected. Traffic may or may not be shown depending on the other aircraft's location and equipment. See section 9 for more detail.

While viewing the Map Menu, touch the **Traffic** Map Overlay key to toggle the view of Traffic data.

Icon Shows Traffic Overlay Is Active

Non-Threat Traffic Indication. Currently 1200 Ft Above And Rising

Icon Shows Aircraft Is Receiving TIS Traffic From Ground Stations When A GDL 88 Is Connected (GTN software v5.11 or earlier)

Figure 8-9 Traffic Map Overlay

8.1.2 Map Setup

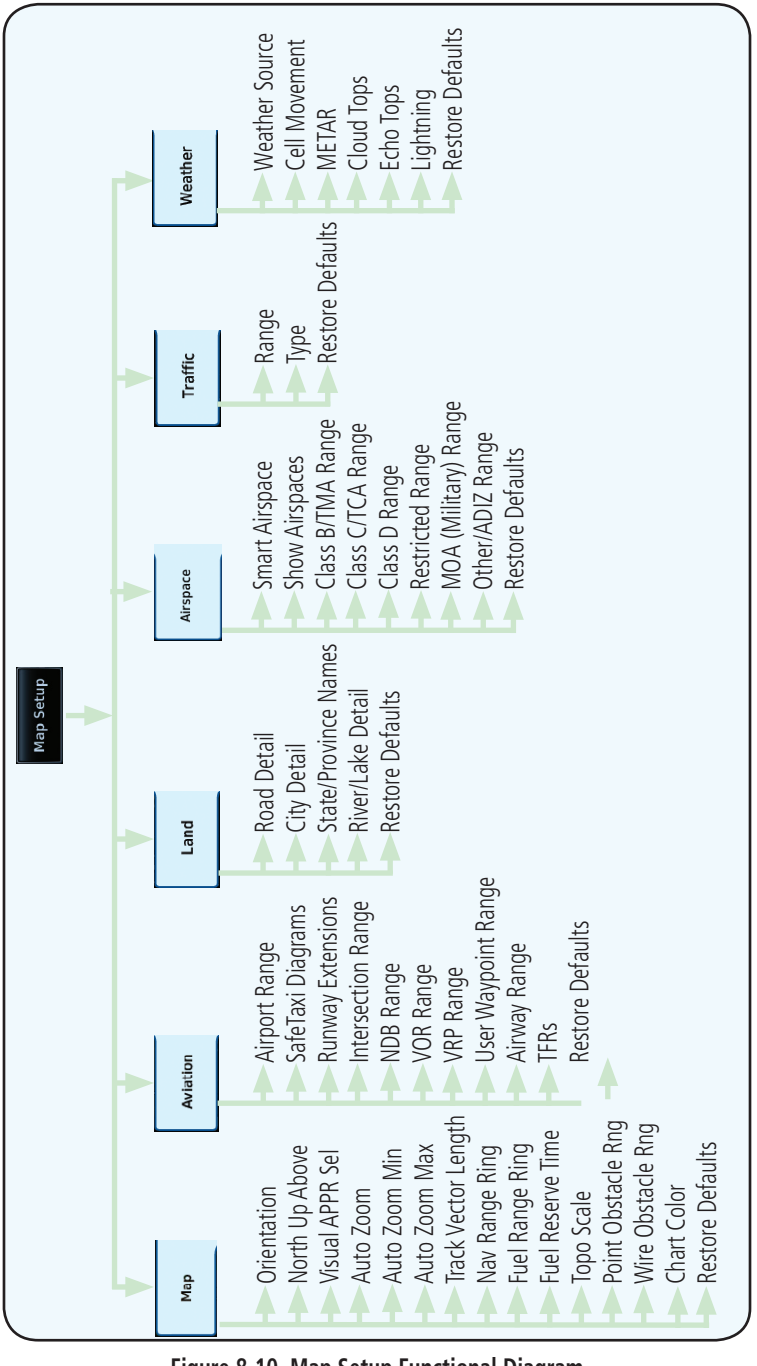
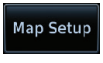


Figure 8-10 Map Setup Functional Diagram

The Map page is customized by selecting groups from the Map Menu. The Map Menu groups include choices for Map, Aviation, Land, Airspace, Traffic, and Weather groups depending on the installed equipment of a given aircraft. Each group has a list of options that vary with the group.



1. While viewing the Map page, touch the **Menu** key. Then, touch the **Map Setup** key. The Map Setup page will be displayed.

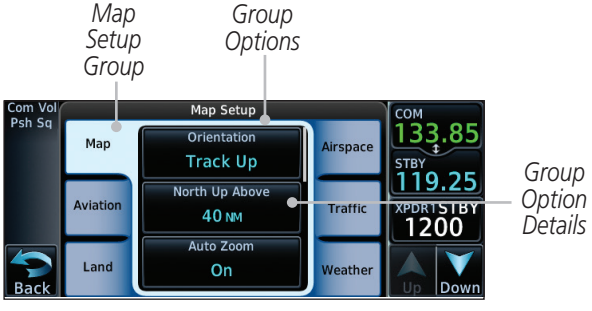
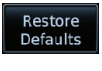


Figure 8-11 Map Setup Page

2. Touch the desired Map Setup Group tab (Map, Aviation, Land, Airspace, Traffic, or Weather) to display the set of group options.

3. Touch the desired group key. A list of options for the selected group will be shown. (i.e., Map - Orientation, North Up Above, Auto Zoom, etc.) Touch the **Up** or **Down** keys as needed to scroll through the list.
4. Touch the key for the selected option.



5. Touch the **Restore Defaults** key to return to the original default values for the selected option.

8.1.2.1 Map

The Map option defines the behavior and display of information on the Map page such as: Orientation, North Up Above, Auto Zoom, Nav Range Ring, Topo Scale, Obstacle Range, and Restore Defaults. The default values are shown in **bold** type.

Feature	Selection
Orientation	North Up, **Track Up**, Heading Up
North Up Above	Off, 10 NM, 15 NM, 25 NM, **40 NM**, 50 NM, 75 NM, 100 NM, 150 NM, 250 NM
Visual APPR Selector	Off, 2.5 NM, 4 NM, 5 NM, 7.5 NM,**10 NM**, 15 NM,25 NM
Auto Zoom	Off, **On**
Auto Zoom Min	250 ft, 400 ft, 500 ft, 750 ft, 1000 ft, 1500 ft, 2500 ft, 0.5 NM, 0.75 NM, 1 NM, **1.5 NM**, 2.5 NM, 4 NM, 5 NM, 7.5 NM, 10 NM, 15 NM, 25 NM, 40 NM, 50 NM, 75 NM, 100 NM, 150 NM, 250 NM, 400 NM
Auto Zoom Max	250 ft, 400 ft, 500 ft, 750 ft, 1000 ft, 1500 ft, 2500 ft, 0.5 NM, 0.75 NM, 1 NM, 1.5 NM, 2.5 NM, 4 NM, 5 NM, 7.5 NM, 10 NM, 15 NM, **25 NM**, 40 NM, 50 NM, 75 NM, 100 NM, 150 NM, 250 NM, 400 NM
Track Vector Length	OFF, 30 SEC, **60 SEC**, 2 MIN, 5 MIN, 10 MIN, 20 MIN
Nav Range Ring	Off, **On**
Fuel Range Ring	**Off**, On
Fuel Reserve Time	30 MIN, **45 MIN**, 60 MIN, 90 MIN
Topo Scale	**Off**, On
Point Obstacle Range	Off, 4 NM, **5 NM**, 7.5 NM, 10 NM, 15 NM
Wire Obstacle Range	Off, 1 NM, **1.5 NM**, 2.5 NM
Restore Defaults	Returns values to original factory settings

Table 8-2 Map Setup Map Options

Map Orientation

The Map Orientation selection sets the orientation of the Map page. Selections are North Up, Track Up, and Heading Up. A Map Orientation label is shown below the North indicator (reference to True North) in the top left corner of the Map page.

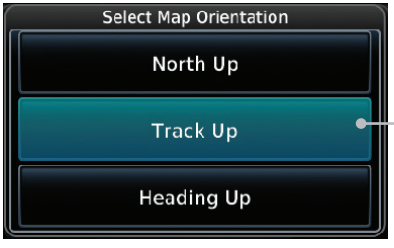


Figure 8-12 Map Setup Map Orientation

North Up Above

The North Up Above option allows you to select the map range where at and above the selected value the Map Orientation will automatically change to North Up as a default. For example, with the 500 NM value selected in the figure below, when the map range is 500 NM or more, the map orientation will automatically become North Up.

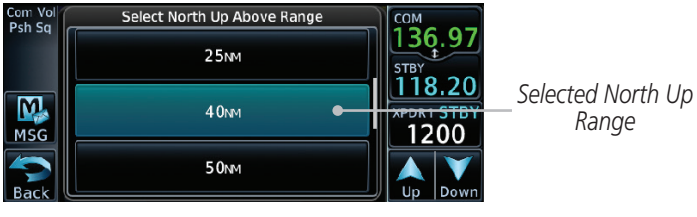


Figure 8-13 North Up Above Range Selection

Visual Approach Selector

This option allows you to select the range at which the Visual Approach Selector becomes active. When the aircraft is within a specified distance of the destination airport, the **Visual** key automatically appears in the bottom left corner of the map. Any values displaying in this area are obscured while the key is active. To disable this feature, select OFF.

For visual approach procedures, refer to section 6.13.

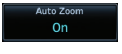
Figure 8-14 Visual Approach Key

Auto Zoom

With a valid flight plan, the Auto Zoom feature will automatically change the Map page range depending on the distance to the next waypoint in the flight plan. If enabled, it will also automatically zoom to the SafeTaxi zoom range when the aircraft is on the ground. Auto Zoom can be overridden at any time by manually zooming with the **In** and **Out** keys. The Auto Zoom Min selection sets the minimum range that the display will Zoom in. The Auto Zoom Max value sets the maximum range the display will Zoom out.

Auto Zoom is re-enabled once one of the following conditions is met:

- A waypoint is sequenced
- The aircraft transitions from "on ground" to "in air"
- A point is reached where the Auto Zoom range matches the manual override range (known as auto-sync) and will be noted as "Auto" above the map range value on the map page
- Auto Zoom is toggled off and back on in the Map Setup page



1. While viewing the Map Setup - Map selection, touch the Auto Zoom key to toggle it On or Off.
2. When Auto Zoom is On the Auto Zoom Min and Max values will be used.

NOTE: *Rotorcraft use a Local Auto Zoom function where Auto Zoom will remain at the 1500 ft zoom scale until the rotorcraft is above 400 ft GSL or 40 kts.*

Auto Zoom Min

Set the limit that the display will zoom in automatically.

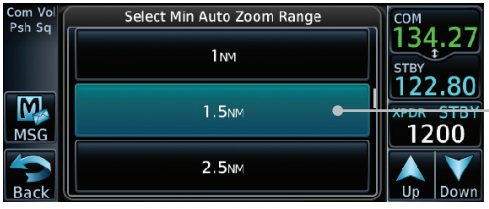


Figure 8-15 Map Setup Minimum Auto Zoom Range

Auto Zoom Max

Set the limit that the display will zoom out automatically.

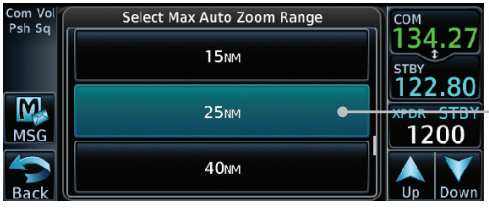


Figure 8-16 Map Setup Maximum Auto Zoom Range

Track Vector

NOTE: *This feature is available in software v6.20 and later.*

When turned on, the track vector is depicted as a cyan line extending from the nose of the aircraft in the direction of movement. The length of the track vector represents the path the aircraft will follow if the present speed and direction are maintained for the time configured in the Track Vector Length setting.

Figure 8-17 Track Vector

Nav Range Ring

When turned on, the Nav Range Ring option will show a ring with a compass rose oriented to magnetic north around your present position on the Map page.

Figure 8-18 Nav Range Ring

Fuel Range Ring

NOTE: *This feature is available in software v6.00 and later.*

When interfaced with a fuel computer, the GTN can display a fuel range ring which shows an estimate of the remaining flight distance at the current fuel consumption rate and groundspeed. If either fuel quantity or fuel flow sensor data is not received, the GTN will use the Fuel on Board or Fuel Flow values on the Utilities – Fuel Planning page. If both fuel quantity and fuel flow are not received by the GTN, the Fuel Range Ring will be removed. A dashed green circle indicates the selected range to reserve fuel. A solid yellow circle indicates the total endurance range.

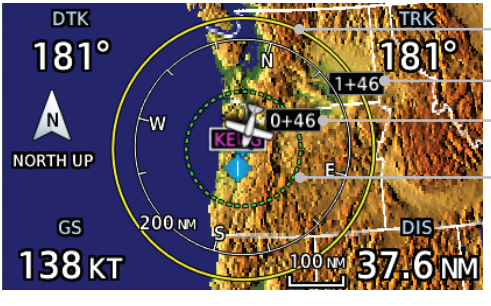


Figure 8-19 Fuel Range Ring

TOPO Scale

The Topo Scale option selects whether the elevation scale for topographical features on the Map page is displayed. The scale will be located on the left side of the display.

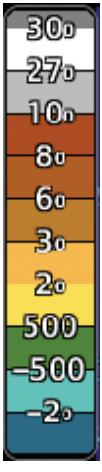


Figure 8-20 Map Page Topo Scale

Point Obstacle Range

The Point Obstacle Range option selects whether the Point Obstacle Data is shown on the Map page at and below the selected Point Obstacle range. Map ranges above this value will not show the Point Obstacle Data. An obstacle with an asterisk indicates a group of the same obstacle type.

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

Table 8-3 Navigation Map Point Obstacle Icons by Elevation

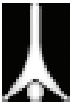
Tower	Windmill	Windmill in Group	Power Line
			

Table 8-4 Obstacle Icon Types

Color	Description
None	Lines are removed when they are more than 2000 ft below the aircraft.
White	Lines are white when they are within 2000 ft below the aircraft.
Amber	Lines are amber when they are within 1000 ft below the aircraft.
Red	Lines are red when they are within 100 ft below or above the altitude of the airplane.

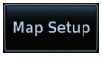
Table 8-5 Fixed Wing Color Scheme for Obstacles and Wires

Color	Description
None	Lines are removed when they are more than 500 ft below the rotorcraft.
White	Lines are white when they are within 500 ft below the rotorcraft.
Amber	Lines are amber when they are within 250 ft below the rotorcraft.
Red	Lines are red when they are at or above the altitude of the rotorcraft.

Table 8-6 Rotorcraft Color Scheme for Obstacles and Wires

Grouped obstacles are shown with an asterisk. The color of the asterisks is tied to the relative altitude of the highest obstacle in the group, not other obstacles within that group. Obstacles are grouped when they would otherwise overlap.

1. While viewing the Map function, touch the **Menu** key.



2. Touch the **Map Setup** key and then with the **Map** tab highlighted drag the list down or use the Down key to show the Obstacle Range.

Figure 8-21 Map Setup For Obstacle Range

3. Touch the **Point Obstacle Range** key and select the maximum range where obstacles will be displayed.

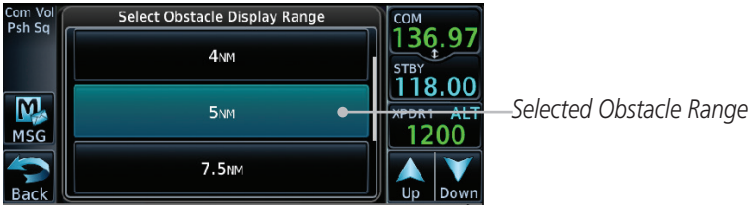
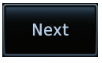


Figure 8-22 Select Obstacle Display Range

Figure 8-23 Navigation Map Point Obstacles

* The icon on the left shows that the point obstacle overlay is active. The icon on the right shows that the wire obstacle overlay is active. These icons are available in software v5.12 or later.



4. Touch an obstacle on the map and the elevation will be shown. If there are nearby or overlayed objects (obstacle, airspace, airport, etc), touch the **Next** key to step through the nearby objects.

Figure 8-24 Point Obstacle Detail

5. Touch the **Back** key to return to the normal map view.

Wire Obstacle Range

The Wire Obstacle Range option selects whether the power lines are shown on the Map page at and below the selected Wire Obstacle range. Map ranges above this value will not show the Wire Obstacle Data.

***NOTE:** This feature is available in software v5.10 and later and requires the use of obstacle databases that contain wire obstacle data.*

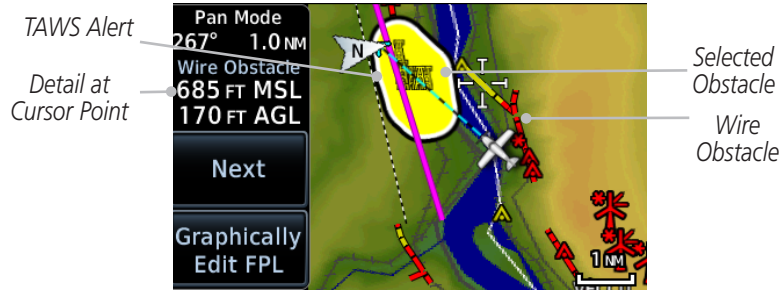


Figure 8-25 Wire Obstacles

Restore Defaults

Returns values to the original factory settings.

8.1.2.2 Aviation

The Aviation group selection from the Map Setup Page Menu allows you to customize the display of Active Flight Plan, Active Flight Plan Waypoints, Airport size range, SafeTaxi information, Runway Extensions, Intersection/NDB locations, VOR locations, Airspace Detail, and TFR icons on the Map page. The feature will be shown at map ranges of the selected value and lower. The options for each feature are shown in the following table. The default values are shown in **bold** type.

Feature	Selection
Airport Range	Off, 7.5 NM, 10 NM, 15 NM, **25 NM**, 40 NM, 50 NM, 75 NM, 100 NM, 150 NM
Heliports (Optional)	Off, **On**
SafeTaxi Diagrams	Off, 1000 ft, 1500 ft, 2500 ft, 0.5 NM, 0.75 NM, **1 NM**, 1.5 NM
Runway Extensions	Off, 1 NM, 1.5 NM, 2.5 NM, 4 NM, **5 NM**
Intersection Range	Off, 0.75 NM, 1 NM, 1.5 NM, 2.5 NM, **4 NM**, 5 NM, 7.5 NM, 10 NM
NDB Range	Off, 0.75 NM, 1 NM, 1.5 NM, 2.5 NM, 4 NM, **5 NM**, 7.5 NM, 10 NM
VOR Range	Off, **10 NM**, 15 NM, 25 NM, 40 NM, 50 NM, 75 NM, 100 NM
VRP Range	Off, 0.75 NM, 1 NM, 1.5 NM, 2.5 NM, **4 NM**, 5 NM, 7.5 NM, 10 NM
User Wpt Range	Off, 0.75 NM, 1 NM, 1.5 NM, 2.5 NM, 4 NM, **5 NM**, 7.5 NM, 10 NM, 15 NM, 25 NM, 40 NM, 50 NM, 75 NM, 100 NM
Airspace Detail	None, Least, Less, **Normal**, More, Most
Airway Range	2.5 NM, 4 NM, 5 NM, 7.5 NM, 10 NM, 15 NM, **25 NM**
TFR	**Off**, On
Restore Defaults	Returns values to original factory settings

Table 8-7 Map Setup Aviation Options

NOTE: *The term "intersection range" means any GPS waypoint included in the navigation database, and includes waypoints that may not be intersections of two VOR radials.*

Airport Size	Size Criteria	Display Criteria
Small	Longest runway length is less than 5000 feet, unless it has a tower frequency, in which case it is a Medium Airport.	Small airports and heliports are displayed on the map when the Map Range is less than or equal to 1/4 times the Airport Range Setting.
Medium	Longest runway length is less than 8100 feet but greater than or equal to 5000 feet or less than 8100 feet and has a tower frequency.	Medium airports are displayed on the map when the Map Range is less than or equal to 1/2 times the Airport Range Setting.
Large	Longest runway length is greater than or equal to 8100 feet.	Large airports are displayed on the map when the Map Range is less than or equal to the Airport Range Setting.

Table 8-8 Airport Display Range Setting

***NOTE**: The Airport Range Setting of "Off" means airports are never displayed. Heliports are displayed on the map page if the Heliport Display Setting is "On" and the Map Range is less than or equal to 1/4 times the Airport Range Setting.*

8.1.2.3 Land

The Land Data option selects whether detailed land features, such as Freeways, National Highways, Local Roads, Cities, States/Provinces, and Rivers/Lakes are displayed. Topo features, traffic, terrain, and obstacles will still be displayed, even with Land Data turned off. The options for each feature are shown in the following table. The default values are shown in **bold** type.

Feature	Selection
Road Detail	None, Least, Less, **Normal**, More, Most
City Detail	None, Least, Less, **Normal**, More, Most
State/Province Names	Off, **On**
River/Lake Detail	None, Least, Less, **Normal**, More, Most
Restore Defaults	Returns values to original factory settings

Table 8-9 Map Setup Land Options

8.1.2.4 Airspace

The Airspace viewing range options select whether the Airspaces are shown on the Map and at and below the selected map ranges. Smart Airspace selection filters the display of airspace appropriate for aircraft altitude. The following table depicts airspace features and map ranges. Default values are shown in **bold** type.

Feature	Selection
Airspace Label Range	Off, 7.5 NM, 10 NM, 15 NM, **25 NM**, 40 NM, 50 NM
Smart Airspace	**Off**, On
Show Airspaces	**All**, Below 18000 ft, Below 15000 ft, Below 12000 ft, Below 9000 ft, Below 6000 ft, Below 3000 ft
Class B/TMA Range	Off, 5 NM, 7.5 NM, 10 NM, 15 NM, 25 NM, 40 NM, 50 NM, **75** NM, 100 NM
Class C/TCA Range	Off, 5 NM, 7.5 NM, 10 NM, **15 NM**, 25 NM, 40 NM, 50 NM, 75 NM, 100 NM
Class A/D Range	Off, 5 NM, 7.5 NM, **10 NM**, 15 NM, 25 NM, 40 NM, 50 NM, 75 NM, 100 NM
Restricted Range	Off, 5 NM, 7.5 NM, 10 NM, 15 NM, 25 NM, 40 NM, 50 NM, 75 NM, **100 NM**
MOA (Military) Range	Off, 5 NM, 7.5 NM, 10 NM, **15 NM**, 25 NM, 40 NM, 50 NM, 75 NM, 100 NM
Other/ADIZ Range	Off, 5 NM, 7.5 NM, 10 NM, 15 NM, 25 NM, 40 NM, 50 NM, 75 NM, **100 NM**
Restore Defaults	Returns values to original factory settings

Table 8-10 Map Setup Airspace Options

Airspace Labels

The Airspace Label feature shows the United States airspace system altitude limits up to a selected range.

***NOTE:** This feature is available in software v5.10 and later when configured by the installer.*

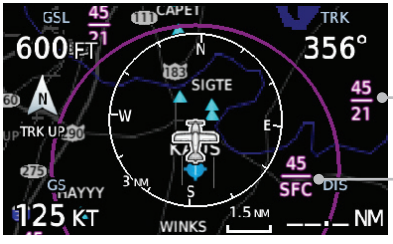


Figure 8-26 Display of Airspace Labels

Smart Airspaces

Garmin's Smart Airspace™ feature aids visual clarity on-screen by de-emphasizing airspace that's well above or below the aircraft's current altitude. The vertical separation is 1,000 feet at sea level and the vertical separation will gradually increase to 2,000 feet until the aircraft reaches 10,000 feet. Anything above 10,000 feet keeps the 2,000 feet vertical separation.

***NOTE:** Smart Airspace only changes the depiction of the airspace on the moving map display. It does not alter the Airspace Alerts that can be set on the System-Alerts portion of the system.*

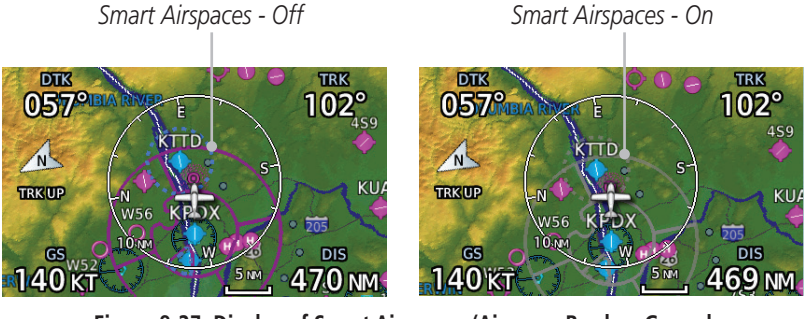
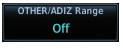


Figure 8-27 Display of Smart Airspaces (Airspace Borders Grayed

To control the display of European airway airspaces

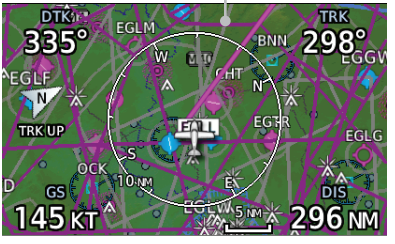
1. While viewing the Map Setup Airspaces option, touch the **Other/ADIZ Range** key and select a value.



2. Select **Off** for the Other/ADIZ Range to turn off the display of airway airspaces.

Airway Airspaces - On

Airway Airspaces - Off



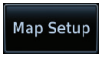
Airway Airspaces - On

Figure 8-28 Selecting the Display of European Airway Airspaces

8.1.2.5 Airway Range

The Airways viewing range option selects whether the Airways are shown on the Map and at and below the selected map ranges for Low and High Airways. When Off is selected, the information will not be shown.

1. While viewing the Map function, touch the **Menu** key.



2. Touch the **Map Setup** key and then with the **Aviation** tab highlighted drag the list down or use the Down key to show the Airway Range.

Figure 8-29 Map Setup For Airway Range

3. Touch the **Airway Range** key and select a range.

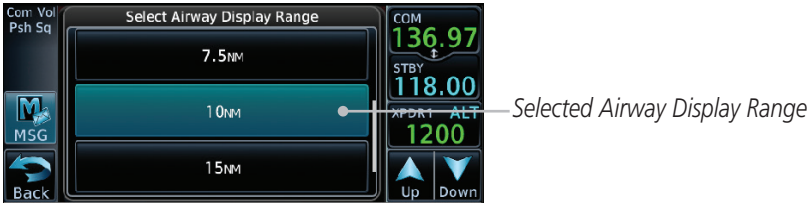
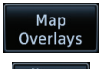
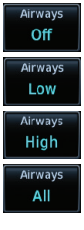


Figure 8-30 Select Airway Display Range





4. Touch the **Airways** key to select the desired Airways (Off, Low, High, or All).

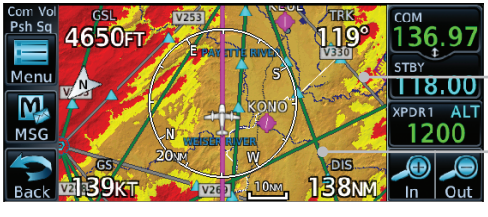


Figure 8-31 Navigation Map Airways

8.1.2.6 Traffic (Optional)

The Traffic group selection from the Map Setup Page Menu allows you to customize the display of traffic on the Map page. The Traffic function requires the installation of the appropriate traffic device. Only one traffic source can be configured for the GTN and this traffic source will be overlaid on the main map. Coverage follows the airplane. In the Navigation Map page setup you can select the maximum range at which traffic symbols are shown. Once outside of the selected range, traffic will be decluttered. The default values are shown in **bold** type.

Traffic Selection	Display Result
Range	1 NM, 1.5 NM, 2.5 NM, 4 NM, 5 NM, 7.5 NM, 10 NM, 15 NM, **25 NM**
Traffic	**All Traffic**, Alerts & Advisories, Alerts Only
Restore Defaults	Returns values to original factory settings

Table 8-11 Map Page Traffic Display Options

8.1.2.7 Weather (Optional)

The Weather group selection from the Map Setup Page Menu allows you to customize the overlay of the available weather information on the Map page. Weather is an optional feature that requires an external weather source, which must be selected to allow the overlay.

Feature	Selection
Weather Source	SiriusXM, Connext, or FIS-B
Cell Movement	**Off**, On
METAR	**Off**, On
Cloud Tops	**Off**, On
Echo Tops	**Off**, On
Lightning	**Off**, On
Restore Defaults	Returns values to original factory settings

Table 8-12 Map Setup SiriusXM Weather Options

NOTE: *Map overlay keys may remain available even if the information necessary for the overlay is not available. For example: the Radar overlay key is available even if the radar is turned off.*

Feature	Selection
Weather Source	SiriusXM, Connext, or FIS-B
METAR	**Off**, On
IR Satellite	**Off**, On
Lightning	**Off**, On
Restore Defaults	Returns values to original factory settings
Connext Settings	Selectable Connext Settings

Table 8-13 Map Setup Connext Weather Options

Feature	Selection
Weather Source	SiriusXM, Connext, or FIS-B
METAR	**Off**, On
Restore Defaults	Returns values to original factory settings

Table 8-14 Map Setup FIS-B Weather Options

8.1.3 Change User Fields

The Change User Fields selection allows you to configure the Data, Function, and Page field type shown in each of the four corners of the Map page. The information shown in each field may be selected from a list after *Change User Fields* is selected.

1. While viewing the Map page, touch the **Menu** key.

Figure 8-32 Map Menu

Change User Fields

2. From the Map Menu screen, touch the **Change User Fields** key.

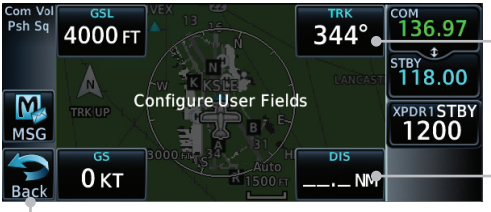


Figure 8-33 Map Data Fields Selection

NOTE: *Map Data Field Types that use the term "Destination" refer to the missed approach point (if an approach is loaded) or the final airport in the flight plan.*

NOTE: *In software v5.13 and earlier, ETE to Destination is not available when a procedure is loaded and there are waypoints in the Enroute section of the flightplan.*

NOTE: *Only the bottom right corner data field on the map page can be configured for a Page or Function. The other three corner data fields are for Data items only.*

3. Touch the corner data field key you want to select. Touch the **Data, Function,** or **Page** keys to select the User Field type. A list of information types will be displayed.

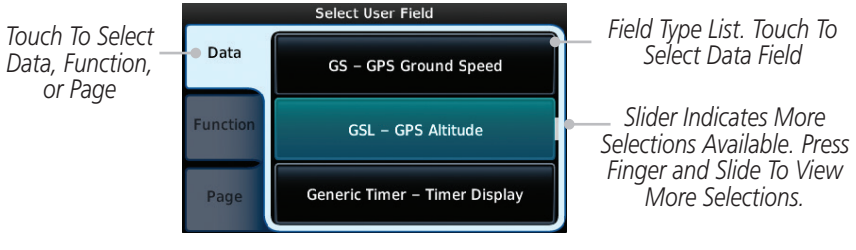


Figure 8-34 Map Data Field Type Selections

Up Down

4. Touch the **Up** or **Down** keys or touch the display and drag your finger to scroll through the list. Touch the desired item to select it or touch the **Back** key to cancel selection.

Map Data Field Type	
ACTV WPT - Active Waypoint	MSA - Minimum Safe Altitude
B/D APT - BRG/DIS from Dest APT [1]	NAV/COM - Active NAV/COM FREQ
BRG - Bearing to Current Waypoint	OAT (static) - Static Air Temperature
DIS - Distance to Current Waypoint	OAT (total) - Total Air Temperature
DIS to Dest - Distance to Destination [2]	RAD ALT - Radar Altimeter
DTK - Desired Track	Time - Current Time
ESA - Enroute Safe Altitude	Time to TOD - Time to Top of Descent
ETA - Estimated Time of Arrival	TKE - Track Angle Error
ETA at Dest - ETA at Destination	TRK - Track
ETE - Estimated Time Enroute	Trip Timer - Timer Display
ETE to Dest - ETE to Destination	VOR/LOC - Tuned VOR/LOC Info
Fuel Flow - Total Fuel Flow	VSR - Vertical Speed Required
GS - GPS Ground Speed	Wind - Wind Speed and Direction
GSL - GPS Altitude	XTK - Cross Track Error
Generic Timer - Timer Display	OFF - Do Not Display Data Field

Table 8-15 Map Data Field Types of Information

Note 1: B/D APT is the straight line distance.

Note 2: Dist to DEST is the distance along the flight plan.

Function Field Type	
CDI - Course Deviation Indicator	OBS/Suspend/Unsuspend Button
Flap Override - Flap Override [1]	On Scene - "On Scene" Mode Toggle
GPWS Inhibit - GPWS Inhibit [1]	TAWS Inhibit - TAWS Inhibit
G/S Inhibit - G/S Inhibit [1]	Gen Timer - Generic Timer Control
HTAWS RP Mode - HTAWS RP Mode [2]	OFF - Do Not Display Data Field

Table 8-16 Map Function Field Types of Information

Note 1: With TAWS-A enabled

Note 2: With HTAWS enabled

Map Page Field Type	
Blackout Mode	Utilities - Utilities Page
DFLT NAV - Default Navigation	Checklist - Checklist Page
Flight Plan - Flight Plan Page	Fuel PLAN - Fuel Planning Page
Map - Map Page	SCHED MSG - Scheduled Messages
Nearest - Nearest Page	Trip PLAN - Trip Planning Page
NEAR APT - Nearest Airport Page	VCALC - VCALC Page
PROC - Procedures Page	User FREQ - User Frequencies
Approach - Approach Page	WPT INFO - Waypoint Information
Arrival - Arrival Page	Weather - Weather Page
Departure - Departure Page	CNXT WX - Connext WX Page
Backlight - Backlight Page	FIS-B WX - FIS-B Weather Page
Services - Services Page	Stormscope - Stormscope Page
Traffic - Traffic Page	SiriusXM WX - Sirius XM WX Page
Terrain - Terrain Page	OFF - Do Not Display Page Field

Table 8-17 Map Page Field Types of Information

8.1.4 Map Detail

The Map Detail feature allows four levels of decluttering to remove map information. Level 0 shows the most detail and level 3 shows the least detail.

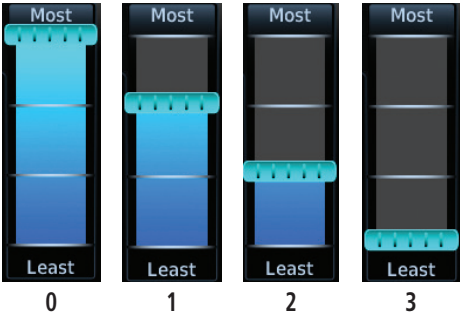


Figure 8-35 Map Detail (Declutter) Levels

1. While viewing the Map page, touch the **Menu** key.
2. While viewing the Map Menu, touch the **Map Detail** scale and slide your finger to adjust the level. Features marked with a • are shown at the indicated Map Detail (Declutter) Level.

Feature	0	1	2	3	Feature	0	1	2	3
River/Lake Names	•				TRSA	•	•		
Land/Country Text	•				ADIZ	•	•		
Large City	•				Alert Areas	•	•		
Medium City	•				Caution Areas	•	•		
Small City	•				Danger Areas	•	•		
Small Town	•				Warning Areas	•	•		
Freeways	•				Large Airports	•	•	•	
Highways	•				Medium Airports	•	•	•	
Roads	•				Restricted Areas	•	•	•	
Railroads	•				Prohibited Areas	•	•	•	
Political Boundaries	•				MOAs	•	•	•	
User Waypoints	•	•			Runway Labels	•	•	•	
VORs	•	•			Lightning Strike Data	•	•	•	
NDBs	•	•			NEXRAD Data	•	•	•	
Intersections	•	•			Traffic Symbols	•	•	•	
Class B Airspace	•	•			Traffic Labels	•	•	•	
Class C Airspace	•	•			Water Detail	•	•	•	•
Class D Airspace	•	•			Active FPL Legs	•	•	•	•
Tower	•	•			Airways	•	•	•	•

Table 8-18 Features Shown at Each Map Detail Level

8.2 Map Panning

In the Map Page function, panning allows you to move the map beyond its current limits without adjusting the map scale. The panning function is selected by simply touching the Map display. The **In** and **Out** keys at the lower right corner of the page control the map range. Touching the display momentarily switches the display to Map Pan Mode. While in Map Pan Mode, touch the display gently and drag your finger to pan around the map.

1. Touch the Map page display.

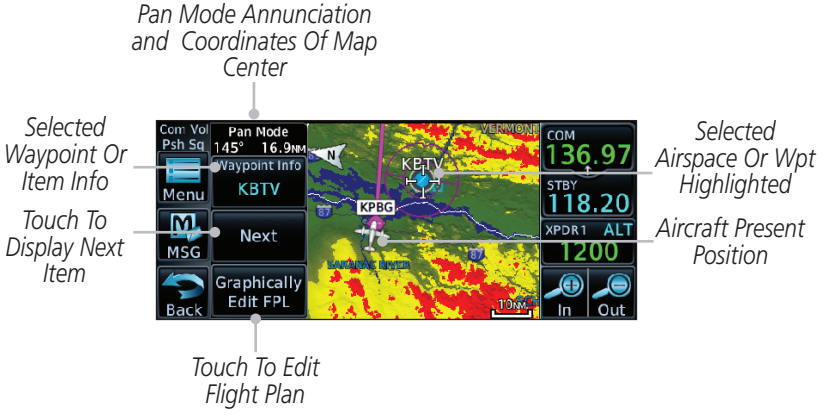


Figure 8-36 Map Panning With Airspace Highlighted

Next

2. If you touch an item on the display (waypoint, airspace, obstacle) there may be other items very close that are difficult to see at a given zoom level. Touch the **Next** key to annunciate and highlight the next item. Each touch of the **Next** key steps to another item near the Map Pointer.

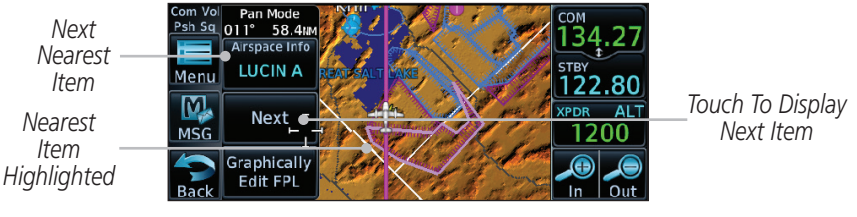
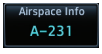


Figure 8-37 Map Panning With Next Airspace Shown

***NOTE:** It is possible that multiple airspaces can be stacked vertically and be difficult to visually identify them. Touching the **Next** key will step through the airpaces.*



3. Touch the **Airspace Info** (Item) key for more information about the selected item. Touch the **Back** key to return to the Map Panning display.

4. While pressing your finger gently against the display, drag your finger across the display to scroll the display in the direction of your finger movement. The Map Pointer cross hair location is based on where your finger touches the display, but after dragging your finger the Map Pointer will be centered on the map when your finger is lifted from the display.

Figure 8-38 Map Panning With Map Pointer

NOTE: *Pressing the Direct-To key will use the Map Pointer location as the destination.*

5. Touch the **Back** key to return to the normal map display.

8.3 Map Controls

While in the Map page function, several controls are available to manage the view and display of information. The **In** and **Out** keys at the lower right corner of the page control the map range. Touching the display momentarily switches the display to Map Pan Mode.

While in any of the Map function pages, touching the display starts **Pan Mode.** Options are available to Create a waypoint at the Map Pointer position and to Graphically Edit Flight Plan.

8.3.1 Pan Map Mode

The Pan Map mode allows you to move the map display to view the surrounding area.

1. Touch the Map page display.

2. See the description in section 8.2 for details on using this feature. Touch the **Back** key to return to the normal Map display.

8.3.2 Create Waypoint

The Create Waypoint function will create a User Waypoint at the Map Pointer location when that location is not an already named object, such as an airport or airspace.

1. In Pan Mode, touch the **Create Waypoint** key.

2. Follow the directions in section 7.8 for Creating User Waypoints.

Figure 8-39 Create User Waypoint While Map Panning

8.3.3 Graphically Edit Flight Plan Mode

The Edit Flight Plan Mode allows making quick changes to the active flight plan directly on the display. The process is simply touching the display to start Map Pan Mode, touching the **Graphically Edit FPL** key, dragging the desired leg to a new waypoint or airway, and touching the **Done** key. 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. At any point, a step may be removed by touching the **Undo** key or the whole process ended by touching the **Cancel** key. The **Undo** key will remove up to nine steps.

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.*

8.3.3.1 Adding a Waypoint Within an Existing Flight Plan

Graphically Edit FPL

1. Touch the Map page display. The Map Mode selection keys will appear. Touch the **Graphically Edit FPL** key.

Figure 8-40 Edit Flight Plan Mode

2. Touch and hold the desired leg of the flight plan and drag the flight plan leg to a new waypoint to add a waypoint to the active flight plan. The leg may also be dragged to an airway. The leg being edited will turn cyan.

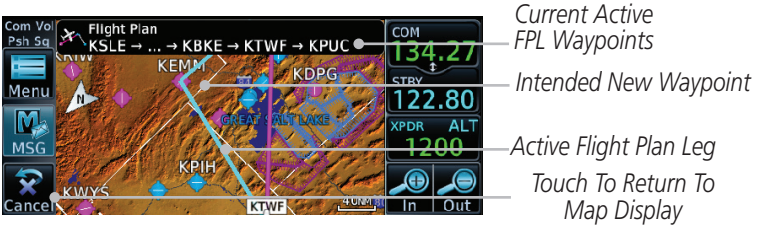
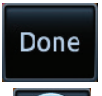


Figure 8-41 Drag Selected Leg to New Waypoint



3. Touch the **Done** key to accept the new flight plan leg or **Undo** to maintain the existing flight plan.

Figure 8-42 Completed Flight Plan with New Waypoint

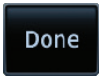
4. The aircraft will now navigate according to the new flight plan.

Figure 8-43 Aircraft Navigates on Edited Flight Plan to New Waypoint

NOTE: *In software v6.21 and earlier, graphically editing a flight plan cancels the parallel track function.*

8.3.3.2 Adding a Waypoint to the End of an Existing Flight Plan

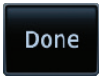
1. Touch the Map page display. The Map Mode selection keys will appear. Touch the **Graphically Edit FPL** key.
2. Touch a waypoint that you want to add to the end of the flight plan.



3. Touch the **Done** key to accept the changes and return to the Map page.

8.3.3.3 Removing a Waypoint from an Existing Flight Plan

1. Touch the Map page display. The Map Mode selection keys will appear. Touch the **Graphically Edit FPL** key.
2. Touch waypoint, or airway, on the flight plan that you want to remove.
3. Drag the flight plan line away from the waypoint, or airway, and release the line. The waypoint will be removed from the flight plan.



4. Touch the **Done** key to accept the changes and return to the Map page.

8.3.3.4 Creating a Flight Plan Without an Existing Flight Plan

1. Touch the Map page display. The Map Mode selection keys will appear. Touch the **Graphically Edit FPL** key.
2. Touch a waypoint on the map to set the first waypoint in the flight plan. If there are several nearby waypoints, touch the desired waypoint to select it.

Figure 8-44 Select the Desired Waypoint From Multiple Waypoints

3. Touch a waypoint, or airway, on the map for the next waypoint, or airway, in the flight plan. Continue adding waypoints, or airways, as needed.

4. Touch the **Done** key to accept the changes and return to the Map page.

8.4 CDI (GTN 650 only)

The GTN 650's **CDI** key is used to select data that is sent from the GPS or VLOC receiver to the external CDI (or HSI). CDI selection is available on the Default Navigation page. When the external CDI (or HSI) is connected to the GPS receiver, "GPS" is shown on the annunciation bar. When the external CDI (or HSI) is being driven by the VLOC receiver, "VLOC" appears instead.

NOTE: *The VLOC receiver must be selected for display on the external CDI/HSI for approaches which are not approved for GPS. See the ILS example "ILS Approaches (GTN 650 Only)" for more information.*

NOTE: *GPS phase of flight annunciations (LPV, ENR, etc.) are not applicable to the external CDI (or HSI) when VLOC is active.*

NOTE: *The internal on-screen CDI information is based on GPS data and cannot be used for primary navigation.*

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).*

1. The navigation source is shown in the center of the annunciation bar at the lower part of the display.

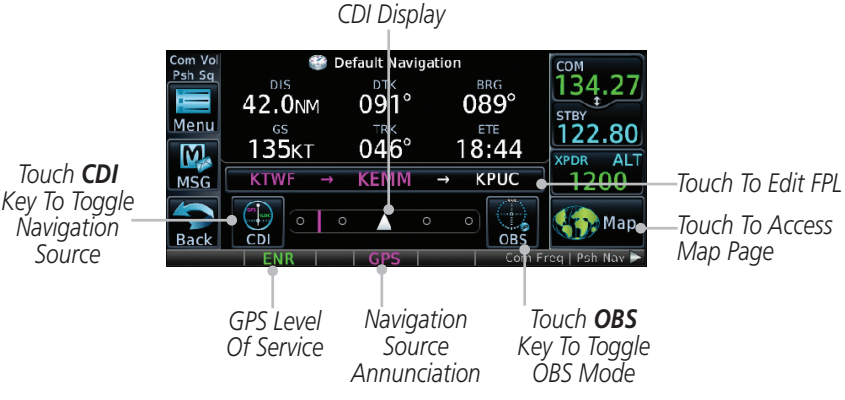


Figure 8-45 Navigation Source Selection

2. Touch the **CDI** key to toggle between sources.

8.5 OBS

The **OBS** key is used to select manual or automatic sequencing of waypoints. OBS selection is available on the Default Navigation page. Touching this key selects OBS mode, which retains the current "active to" waypoint as your navigation reference even after passing the waypoint (i.e., prevents sequencing to the next waypoint). Touching the **OBS** key again returns to normal operation, with automatic sequencing of waypoints. Whenever OBS mode is selected, you may set the desired course To/From a waypoint using the pop-up window on the GTN 6XX or with the external OBS selector on your HSI or CDI.

For leg types that do not support OBS, this key will be shown as a SUSP key. This key will then also function as an Unsuspend key for legs that auto-suspend, such as holds, missed approaches, etc.

NOTE: *In dual GTN installations with crossfill on, the OBS course will only be updated real time on the GTN that is receiving the new OBS course. The course will be transferred to the other GTN when OBS is exited.*

1. Touch the **OBS** key to enable the OBS function.

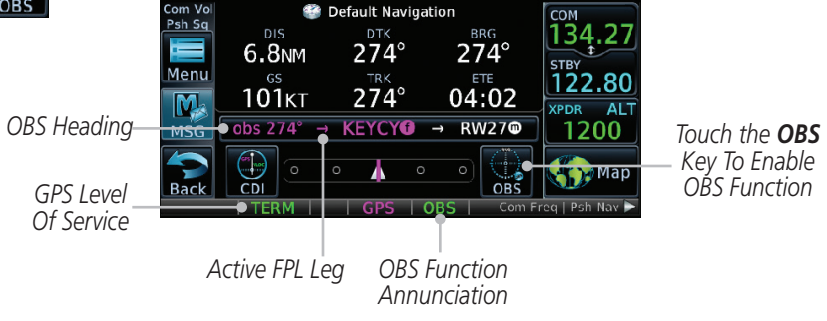


Figure 8-46 OBS Course Selection

2. Enter the desired OBS heading using the keypad and touch **Enter**.
3. The OBS heading will be shown in the flight plan annunciation above the CDI in the lower portion of the display. The OBS function annunciation will show.

8.6 Map Symbols

Various symbols are used to distinguish between waypoint types. The identifiers for any on-screen waypoints can also be displayed. Special-use and controlled airspace boundaries appear on the map, showing the individual sectors in the case of Class B, Class C, or Class D airspace. The following symbols are used to depict the various airports and navaids on the Map Page:

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

Table 8-19 Map Symbols

8.7 SafeTaxi®

SafeTaxi® is an enhanced feature that gives greater map detail when zooming in on airports. The airport display on the map reveals runways with numbers, taxiways with identifying letters/numbers, airport Hot Spots, and airport landmarks including ramps, buildings, control towers, and other prominent features. Resolution is greater at lower map ranges (zooming in). When the aircraft location is within the screen boundary, including within SafeTaxi ranges, an airplane symbol is shown on any of the navigation map views for enhanced position awareness.

Designated Hot Spots are recognized at airports with many intersecting taxiways and runways, and/or complex ramp areas. Airport Hot Spots are outlined to caution pilots of areas on an airport surface where positional awareness confusion or runway incursions happen most often. Hot Spots are defined with a magenta circle or outline around the region of possible confusion.

Figure 8-47 SafeTaxi Depiction on the Navigation Map Page

8.7.1 Using SafeTaxi®

Any map page that displays the navigation view can also show the SafeTaxi® airport layout within the maximum configured range.

During ground operations the aircraft's position is displayed in reference to taxiways, runways, and airport features. The nose of the ownship symbol, not the center, depicts the current location of the aircraft.

NOTE: *Do not use SafeTaxi functions as the basis for ground maneuvering. SafeTaxi adoes not comply with the requirements of AC 120-76C and is not qualified to be used as an airport moving map display (AMMD). SafeTaxi is to be used by the flight crew to orient themselves on the airport surface to improve pilot situational awareness during ground operations.*

8.7.2 Hot Spot Information

Hot Spots can contain more information about the area that can be displayed when shown. To view more information touch the Hot Spot on the moving map.

Figure 8-48 SafeTaxi Hot Spot Detail and Outline

8.7.3 SafeTaxi® Cycle Number and Revision

The SafeTaxi database is revised every 56 days. SafeTaxi is always available for use after the expiration date. When turning on the GTN 6XX, the Power-up Page indicates whether the databases are current, out of date, or not available. The Power-up Page shows the SafeTaxi database is current when the "SafeTaxi Expires" date is shown in white. When the SafeTaxi cycle has expired, the "SafeTaxi Expires" date appears in yellow. The message "unknown" appears in white if no SafeTaxi data is available on the database card.

The SafeTaxi Region, Version, Cycle, Effective date and Expires date of the database cycle can also be found on the System - System Status page. SafeTaxi information appears in white and yellow text. The EFFECTIVE date appears in white when data is current and in yellow when the current date is before the effective date. The EXPIRES date appears in white when data is current and in yellow when expired. SafeTaxi REGION NOT AVAILABLE appears in white if SafeTaxi data is not available on the database card.

8.8 Flight Plan Depiction

When a flight plan is present, it will be depicted on the GTN maps.

Flight plan leg colors are used to indicate past, active, or future flight plan segments. A thin light gray line indicates a previous flight plan segment. A bold magenta line indicates an active flight plan segment for which the navigator is providing guidance. A bold white line indicates future flight plan segments. Missed approach procedures are depicted with a thin white line to indicate that they are an upcoming segment of the flight plan, but will not become navigable without the pilot specifically activating the missed approach procedure.

Flight plan labels are white boxes with black borders and black text to indicate they are fixes in the flight plan. If the waypoint is the ative waypoint in the flight plan, the border and text are magenta.

All holding patterns and procedure turns are depicted with the same coloration as all other flight plan segments. Entries are depicted with segmented arrows to indicate which direction in which the course guidance will be given. This is used for both hold entry and procedure turn course reversals. Once a hold becomes active the entry guidance is removed from the map and only the active hold is depicted.

Headings to fly are depicted as directional arrows with spaces between them and the label "Vectors" or "MANSEQ" to indicate what the pilot might expect while flying the heading depicted. "MANSEQ" is "Manual Sequencing" abbreviated and denotes that the procedure is complete upon reaching that heading and that no other guidance will be given from the navigator without pilot interaction.

The following illustrates the flight plan segments as presented on the GTN maps.

GTN provides guidance in the hold at WIGAN intersection.

Figure 8-49 Active Hold

In this case the teardrop entry for the hold at WIGAN is being depicted. Upon reaching the holding fix inbound, the entry arrows will be removed from the map and the dotted holding pattern will become active with magenta arrows.

Figure 8-50 Holding Pattern Entry

The active flight plan leg is WARIC to WHATE as indicated by the magenta line to the magenta labeled waypoint.

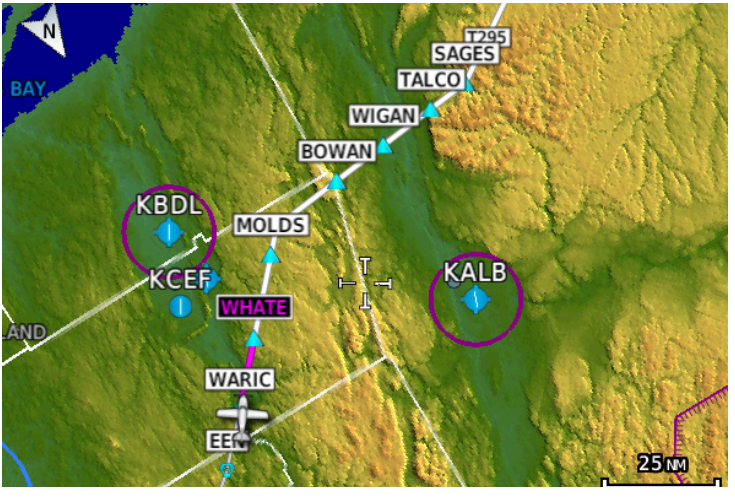


Figure 8-51 Active and Future Flight Plan Segments

The active leg is the course to OCITY intersection. After OCITY the flight plan depicts a turn to 100° for vectors.

Figure 8-52 Active Leg to Vectors

Previous legs are light gray, active leg is magenta.

Figure 8-53 Exiting the Hold

The leg outbound from LOS is active and indicates a procedure turn. When inbound from the procedure turn the inbound segment will become active and LSO will still be the active waypoint.

Figure 8-54 Active Procedure Turn

A flight plan along T295 with previous, the active leg, and the future legs depicted.

Figure 8-55 Past, Active, and Future Flight Plan Segments

Active Heading Leg

Figure 8-56 Active Heading Leg (Vectors)

Active Flight Plan Leg

Figure 8-57 Active Flight Plan Leg

The active flight plan leg inbound to a holding pattern at WIGAN intersection.

Figure 8-58 Active Flight Plan Leg Prior to Holding Pattern

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