Garmin GTN 650

A Pilot-Friendly® Manual

Master the GTN 650 with this Simple Guide

GTN Background Information and Basics

GTN Navigation and Control

Disclaimer

This manual is based on the Garmin Touch-Screen Navigator GTN 650 GPS/SBAS Navigation System using Garmin system software versions 6.50 and 6.51, released in 2018. It covers GNSS (i.e., GPS) operations, including departures, arrivals, and approaches based on GNSS, VOR, and ILS procedures. The manual also includes descriptions of holding, vertical navigation, and some of the utilities available in the GTN series avionics.

This manual is designed to help pilots learn the key features of the GTN, but the most recent version of the Garmin GTN 625/635/650 Pilot's Guide and the FAA-Approved Airplane Flight Manual Supplement or Supplemental Airplane Flight Manual remain the final authorities as to the operation and limitations of the GTN series as installed in specific aircraft.

While great care was taken to verify the procedures, this manual does not replace official Garmin documentation and FAA guidance. The GNSS and avionics worlds are constantly changing, and the contents of this manual may become outdated as Garmin updates the GTN system software and the FAA changes its policies and guidance for the use of GNSS. Any action taken by the user as a result of the contents of this manual is solely at the risk of the reader. We make no warranty as to the accuracy of the information, safety, or suitability for use by anyone or for any purpose.

Overview

The Garmin GTN 650 (GTN = Garmin Touch-Screen Navigator) includes:

- A multi-function, touch-screen display including a moving map and other graphical displays, depending on optional equipment (ADS-B receivers, in-flight weather and traffic receivers, weather radar, etc.).
- The touch-screen display also serves as the primary method of controlling the GTN 650, such as tuning frequencies, entering flight plans, loading procedures, and using the utilities.
- Buttons and knobs on the bezel surrounding the screen provide an alternate way to control features of the GTN, such as tuning frequencies and entering waypoint identifiers.

The GTN-series avionics are GNSS with WAAS that meet the standards for TSO C146c and AC 90-100A. They are approved for:

- GPS (RNAV) approaches with both approved and advisory vertical guidance.
- RNAV and conventional departures and arrivals (charted ODPs, SIDs, and STARs).
- RNAV and conventional enroute navigation.

The GTN 650 also includes:

- A 200-channel VOR/ILS receiver with localizer and glideslope.
- A 2280-channel VHF communications transceiver.
- The GTN 625 has no com or nav radio. The GTN 635 has no nav.

> **TIP**
>
> The GTN 625/635/650 series cannot display instrument procedure charts like its larger-screen sibling, the GTN 725/750.

The GTN 650 effectively replaces several individual components of legacy avionics stacks, including:

- DME.
- ADF (when required as part of a conventional approach or departure procedure).
- Controls for a transponder and audio panel/intercom when optional Garmin components are installed.
- Displays for weather radar and traffic when optional components from Garmin and other manufacturers are installed.

This manual focuses on the features available within the GTN itself. To learn more about how the GTN controls optional equipment, see the detailed Garmin guides for those components.

> **TIP**
>
> Garmin provides several free GTN trainers that run on Windows PCs and a free GTN trainer available in the iOS App Store. These simulations are invaluable tools that give you hands-on practice as you use this guide, and learn more about the GTN series and other Garmin avionics.
>
> You can learn more about and download these trainers from the Garmin website at: https://www8.garmin.com/support/download_details.jsp?id=12373

Using the GTN 650 Physical Controls (a.k.a. "Real Buttons and Knobs")

The Garmin GTN 650 features an interactive display and physical controls located on the bezel surrounding the screen. It's usually easiest to use the touch screen to control the features of the GTN. However, you can also tune frequencies, enter waypoint names, and perform other functions with the knobs and buttons on the bezel. These physical controls include:

    A. The Volume/Squelch knob in the upper-left corner.

    B. The Home (HOME)button in the upper-right corner.

    C. The Direct-To (⎯D►) button on the right side.

    D. The Large and Small concentric knobs in the lower-right corner.

These knobs and buttons are useful, for example, when flying in turbulence, and sometimes they're the quickest way to control specific features, such as the radio volume. The Home and Direct-To buttons are especially useful as shortcuts.

You can use the Large and Small concentric knobs instead of the touch screen to enter letters and numbers and to confirm or complete actions.

For example, when entering a waypoint name:

1. ROTATE the Large knob left and right to move the cursor (red arrows).
2. ROTATE the Small knob to select letters and numbers (magenta arrows).
3. To complete or confirm, PRESS the Small knob (blue arrow), just like pressing Enter on a keyboard.
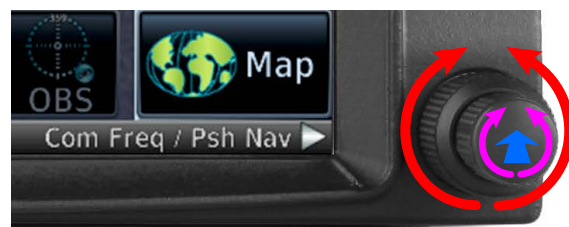
The com and nav radios each have active and standby (STBY) frequency windows. The active frequency appears in the top position of each frequency pair, and the numerals are illuminated in green. The standby frequencies appear in the windows below the active frequencies, and the numerals are illuminated in cyan (blue) when the frequency is available for tuning or white when the frequency is not available for tuning.

With GTN system software 5.12 and later, Reverse Frequency Look-Up

(RFL) uses the GTN database to show information about the nearest facilities for the active and standby com or nav frequencies. For example, if you are flying in the Seattle area, the com frequency 120.6 is labeled KBFI TWR and the nav frequency 116.8 is identified as SEA and labeled SEA VOR.

The STBY window of the com radio is normally available for tuning. If you select the nav radio, the com radio automatically becomes available again approximately 30 seconds after you finish tuning a nav frequency.

Switch control between the com and nav radio
1. PRESS the Small knob (as shown on page ii).

Adjust the volume of the active com radio
1. Confirm that the com radio is active.
2. ROTATE the Volume/Squelch knob.

Adjust the com squelch
1. Confirm that the com radio is active.
2. PRESS the Volume/Squelch knob to toggle manual squelch ON.
3. ROTATE the knob to the adjust the squelch.
4. PRESS the Volume/Squelch knob again to toggle manual squelch OFF.

> **TIP**
>
> If the GTN also controls a transponder, pressing and holding the Volume/Squelch knob also sets the emergency squawk code 7700.

Tune a STBY com frequency with the knobs
1. Confirm that the com radio is active. If necessary, PRESS the Small knob to make the com radio active.
2. ROTATE the Large knob to change the MHz value.
3. ROTATE the Small knob to change the kHz value.

Swap the STBY com frequency to the active window
1. Confirm that the com radio is active.
2. PRESS and HOLD the Small knob.

Quickly tune the emergency frequency 121.5
1. PRESS and HOLD the Volume/Squelch knob until the active com frequency indicates 121.5.

Adjust the volume of the nav radio
1. PRESS the Small knob to make the nav radio active.
2. ROTATE the Volume/Squelch knob.

Listen to the Morse Code identifier for a VOR or localizer
1. PRESS the Small knob to make the nav radio active.
2. PRESS the Volume/Squelch knob to enable nav ident.
3. ROTATE the Volume/Squelch knob to adjust the nav radio volume.
4. PRESS the Volume/Squelch knob to cancel nav ident.

Tune a STBY nav frequency with the knobs
1. PRESS the Small knob to make the nav radio active.
2. ROTATE the Large knob to change the MHz value.
3. ROTATE the Small knob to change the kHz value.

Swap the STBY nav frequency to the active window
1. Confirm that the nav radio is active.
2. PRESS and HOLD the Small knob.

> **TIP**
>
> The GTN automatically decodes Morse Code identifiers for VOR and ILS frequencies, and it displays the letters of the navaid identifier above the frequency digits. The navaid name appears below the frequency digits. AIM 1-1-3 states: "If your equipment automatically decodes the identifier, it is not necessary to listen to the audio identification."

The Home **HOME** button is a shortcut to the Home page, a graphical menu that provides quick access to the features of the GTN. You can also use the Home **HOME** button to return to the Default Navigation page.

Return to the Home page from any page
1. PRESS the **HOME** button on the bezel.

Return to the Default Navigation page from any page
1. PRESS and HOLD the **HOME** button on the bezel.

You can use the **-D►** button to:
- Quickly display the Select Waypoint screen and then enter a waypoint name.
- Quickly choose to proceed direct-to any waypoint in a flight plan.

Navigate direct-to any waypoint with the buttons and knobs only

1. PRESS the ⇥ button.
2. ROTATE the Large knob to display the Waypoint Identifier window and the keypad.
3. In the Waypoint Identifier window, use the Large and Small knobs to enter the waypoint name:
   a. ROTATE the Large knob to move the cursor left or right.
   b. ROTATE the Small knob to select letters or numerals.
4. When you finish entering the waypoint name, PRESS the Small knob.
5. In the Direct-To window, confirm the waypoint name and details, and then PRESS the Small knob again to activate direct-to navigation.

Using the Touch-Screen Controls

The GTN touch screen works much like the interactive screen on a smart phone. You control the GTN by touching the appropriate window, button, icon, label, or letters and numbers on the keypad. The specific controls that appear depend on the selections that you make.

The top of the main display always shows the active and standby frequency windows of the com and nav radios. Other items, such as transponder controls and audio panel/intercom controls, may also appear on the main display, depending on the optional equipment installed in your aircraft.

You can drag your finger across most windows to scroll vertically or horizontally, and you can pinch-to-zoom the map and some other displays, such as optional charts, just as you do when using a smart phone.

Some windows, such as the Active Flight Plan window, also include up and down arrows. TOUCH the arrows to scroll vertically to see all the information available in the window.
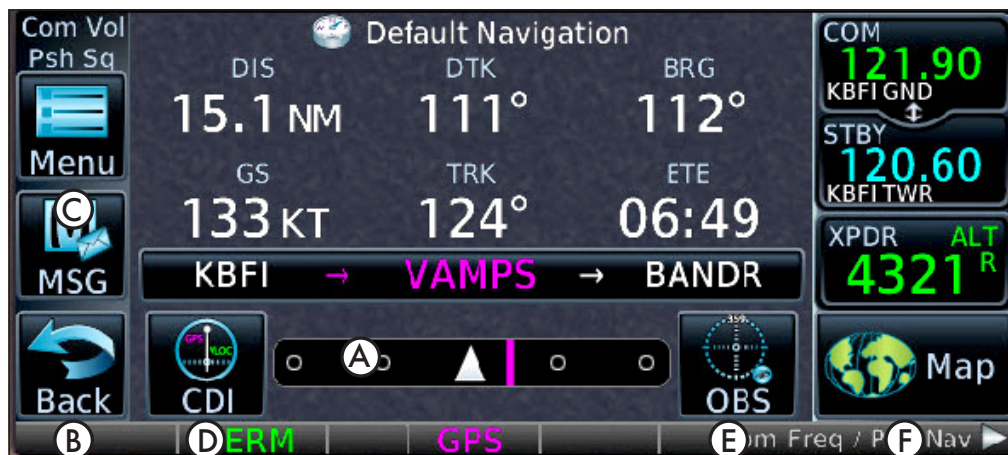
The Default Navigation page includes important items such as:

A. A course deviation indicator (CDI) with a horizontal scale. The CDI includes information about the active waypoint or flight plan leg.
B. A Back button to return to the previous display.
C. A Menu button for quick access to the Map menu.
D. A CDI button to select the navigation source (GPS or VLOC) that will appear on a separate primary flight display, horizontal situation indicator, or other connected navigation indicator.
E. An OBS button to select specific courses, much like the OBS selector on a traditional HSI or VOR indicator.
F. Quick access to the Map Page.

Those are not the only buttons, however. The specific buttons appearing at the bottom of the display depend on the page that you are viewing, much like the buttons on a smart phone or ATM.

> **TIP**
>
> If you wear gloves while using the GTN, see "19.4 Glove Qualification Procedure" in the GTN 625/635/650 Pilot's Guide.

An alpha-numeric keypad or numeric keypad appears when you touch a window that requires entry of data, such a waypoint name or a frequency.
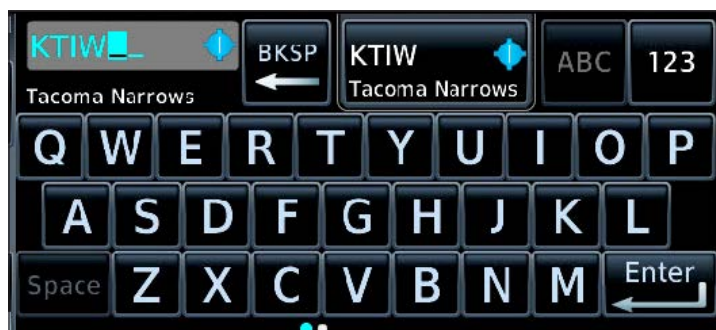
General tips for the alpha-numeric keypad (on-screen keys)

- TOUCH the letters and numbers in sequence, pausing briefly between each letter or number.
- If you enter the wrong letter or number, TOUCH BKSP (backspace).
- To enter a space, TOUCH Space.
- To complete entry of a waypoint name, TOUCH Enter.

When the alpha-numeric keypad is visible, you can also rotate the Large and Small knobs at the lower-right corner of the bezel to move the cursor and select letters and numbers. To complete entry of a waypoint name or other information, press the Small knob.

Beginning with GTN system software 6.5, you can choose from three keyboard layouts: a QWERTY layout, an ABC layout with the letters arranged alphabetically, or the slider from earlier versions of the GTN 6.xx software. Most pilots choose the QWERTY layout, but you can switch to alphabetical or slider on the System Setup page.

Tuning Com and Nav Frequencies

Tune a STBY com frequency

1. TOUCH the COM STBY window.
2. On the COM Standby keyboard, TOUCH the numerals in sequence to enter the standby frequency.
3. To load the frequency into the COM STBY window, TOUCH Enter (or PRESS the Small knob).
4. To load the frequency into COM STBY *and swap that frequency into the com Active window in one step,* TOUCH XFER instead of Enter.

With GTN system software 5.12 and later, you may omit the leading 1 for com frequencies. To enter 120.6, TOUCH "2" "0" "6."

Monitor both the active and STBY frequencies

Monitor allows you to listen to transmissions on the standby frequency while the active is quiet. Any transmission on the active frequency mutes the standby.

1. TOUCH the STBY window.
2. In the COM STBY window, touch Monitor.

> **TIP**
> A green virtual "light" indicates functions that are in use.

You can use the Find button to quickly look up and load a com frequency. The GTN stores recently used frequencies in a handy list, and you can also select frequencies from lists that display com frequencies at the nearest airports, airports in the current flight plan, and frequencies that you have stored in a User list.

Find a com frequency
1. TOUCH the COM STBY window.
2. On the COM STBY keypad, TOUCH Find. The Find Recent COM Frequencies window appears.
   a. For a recently used frequency, TOUCH Recent. TOUCH the Up and Down arrows to scroll through the list.
   b. For a frequency at a nearby airport, TOUCH Nearest. If the airport has several com frequencies, touch Multiple FREQ to select one from a list (ATIS, Tower, Ground, etc.).
   c. For a com frequency for an airport or facility in the active flight plan, TOUCH Flight Plan.
   d. For a frequency stored in the User list, TOUCH User.
3. To load any frequency from any list into the com STBY window, TOUCH the frequency.
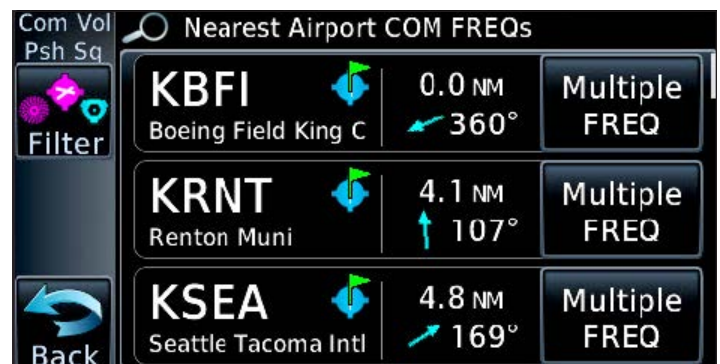
Add a frequency to the User list
You can save up to 15 User frequencies.
   1. TOUCH the COM STBY window.
   2. On the COM STBY keypad, TOUCH Find. The Find Recent COM Frequencies window appears.
   3. TOUCH User.
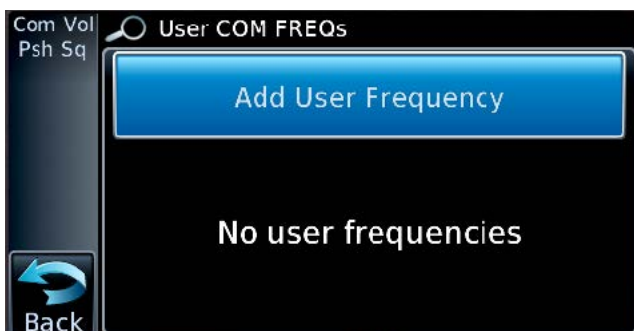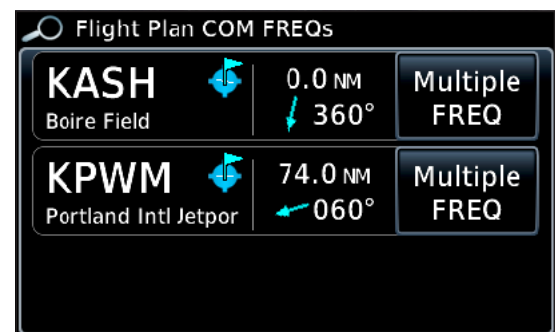
4. In the User COM Frequencies window, TOUCH Add User Frequency.
5. TOUCH Name on the User Frequency Name keypad, enter a name for the frequency you want to save and then TOUCH Enter.
6. On the Add User Frequency window, TOUCH Frequency.
7. On the User Frequency keypad, enter the frequency digits and then TOUCH Enter.

Delete a User frequency

1. TOUCH the COM STBY window.
2. On the COM STBY keypad, TOUCH Find. The Find Recent COM Frequencies window appears.
3. TOUCH the User tab.
4. In the Add User Frequency window, locate the frequency you want to delete and then TOUCH Edit.
5. In the Edit User Frequency window, TOUCH Delete.
6. In the "Delete this User frequency?" window, TOUCH OK.

Tune a STBY nav frequency

1. PRESS the Small concentric knob to display the active and standby nav frequencies,
2. TOUCH the NAV STBY window.
3. On the NAV Standby keyboard, TOUCH the numerals in sequence to enter the frequency.
4. To load the new nav frequency into the NAV STBY window, TOUCH Enter (or PRESS the Small knob).

Swap active and STBY com or nav frequencies

1. TOUCH the active COM or NAV window.

The STBY frequency moves into the active com or nav window, and the previously active com or nav frequency swaps to the corresponding STBY window.

Find a nav frequency

1. TOUCH the NAV STBY window.
2. On the NAV STBY keypad, TOUCH Find. The Find Recent NAV Frequencies window appears.
   a. For a recently used frequency, TOUCH Recent.
   b. For a complete list of recently used frequencies, TOUCH the Up and Down arrows.
   c. For the frequency of a nearby navaid, TOUCH Nearest.
      The list shows navaid frequencies associated with airports. If a nearby airport has several available ILS frequencies, TOUCH Multiple FREQ to select the frequency for a specific runway. For a nearby VOR frequency, TOUCH Filter at the left of the display, and in Select Nearest List, TOUCH VOR.
   d. For the frequency of a navaid in the active flight plan, TOUCH Flight Plan.
   e. For a frequency that you have stored in the User list, TOUCH User.
3. To load a frequency from a list into the NAV STBY window, TOUCH the frequency.

> **TIP**
>
> Just as with coms, to load the new nav frequency directly into the active nav window and move the active nav frequency to the STBY window, TOUCH XFER.

> **TIP**
>
> Instead of the Up and Down arrows, you can swipe with your finger on any list (including a flight plan) up and down as with a smart phone.

When connected to a compatible Garmin transponder, the GTN can enter codes and change transponder modes from the touch screen or knobs. This is true even if the compatible transponder has its own physical buttons.

Set a transponder code

1. TOUCH the transponder code shown below the frequency windows.
2. On the transponder keypad, TOUCH the numerals in sequence of the transponder code, or TOUCH VFR to enter 1200.
3. TOUCH Enter to make the new code active.

> **TIP**
> Transponder numerals can be entered with the Large and Small concentric knobs when the transponder keypad is visible.

Transponder modes are available using the buttons on the transponder keypad screen. Available modes may vary with your specific equipment. Most compatible transponders automatically turn on when the aircraft reaches a certain GPS-derived speed, so manually changing these modes is rarely necessary.

Check the status screens on startup

1. When the GTN powers up, TOUCH the Garmin logo screen.
2. When the Currently Installed Software and Currently Installed Databases screen appears, confirm the information and then TOUCH Continue.
3. When the Instrument Panel Self-Test screen appears, confirm the proper operation of the CDI and flags on the external CDI connected to the GTN.
4. If your GTN is not connected to external fuel sensors, you can enter the current fuel on board and specify a fuel flow for flight planning.

When you finish checking the startup status screens, TOUCH Continue to return to the Home page.

Check the system status after startup

1. If the Home page is not displayed, PRESS the HOME button.
2. On the Home page, scroll down and TOUCH System.
3. On the System page, TOUCH System Status.

On the System Status page, you can find the current databases by touching Active and the next databases by touching Standby. To review all the databases, TOUCH the Up and Down controls at the bottom-right of the System Status page.
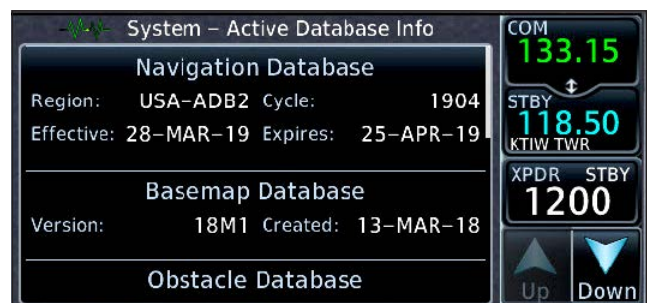
Check the GPS status

1. If the Home page is not displayed, PRESS the HOME button.
2. On the Home page, scroll down and TOUCH System.
3. On the System page, TOUCH GPS Status.

Navigating Direct-To Anywhere

You can navigate directly from your present position to any waypoint, or you can create a flight plan and then fly in sequence from one waypoint to the next. The GTN supports flight plans that include airways when you specify airway entry and exit waypoints. Procedures such as departure procedures, arrivals, and instrument approaches (as well as visual approaches with system software 6.50 or later) also become part of the active flight plan.

Direct-To is the most basic navigation method. You can proceed direct-to any waypoint or to a waypoint that is part of a flight plan, including a waypoint that is part of an instrument procedure, such as a departure, arrival, or approach.

Navigate from the present position direct-to a new waypoint

1. PRESS the 🕩 button on the bezel. The Direct-To window appears, with the Waypoint tab active.
2. TOUCH Select Waypoint
3. TOUCH the letters and numbers to enter the name in the Waypoint Identifier window. Or use the Large and Small knobs to move the cursor, and select letters and numbers.
4. TOUCH Enter, and review the waypoint name and details.

The full waypoint name appears with bearing and distance information. If you made a mistake and need to re-enter the waypoint, TOUCH the waypoint name again and follow the procedure above, or TOUCH Cancel and start over.

5. If the waypoint is correct, TOUCH the Activate control in the lower-right of the display (or PRESS the Small knob).

The Map page appears with a magenta line drawn from your present position to the waypoint you chose.

> **TIP**
>
> If the GTN is already navigating to a waypoint, that waypoint appears by default in the Direct-To window. To change it, TOUCH that waypoint, and then use the keypad to enter a new direct-to waypoint.

Navigate direct-to a waypoint in the current flight plan

1. PRESS the 🕩 button on the bezel.
2. The Direct-To window appears, with the Waypoint tab active.
3. TOUCH the FPL tab.

4. In the list of flight plan waypoints, TOUCH the name of the new target waypoint. If you made a mistake, TOUCH Cancel.
5. Review the waypoint information and details.
6. To navigate to the waypoint, TOUCH the Activate button in the lower-right of the display (or PRESS the Small knob).

The Map page appears with a magenta line drawn from your present position to the waypoint you chose.

Navigate direct-to a nearby airport
1. PRESS the ⟿ button on the bezel.
2. The Direct-To window appears, with the Waypoint tab active.
3. TOUCH the NRST APT tab.
4. In the list of nearest airports, TOUCH the name of the new target airport. To see all the airports in the list, TOUCH the Up and Down controls in the lower-right of the display.
5. Review and confirm the airport details. TOUCH Cancel if you made any mistakes.
6. To navigate to the airport you selected, TOUCH the Activate button in the lower-right of the display (or press the Small knob).

The Map page appears with a magenta line drawn from your present position to the airport you chose.

Find a waypoint identifier you don't know
If you don't know the waypoint identifier or name, you can use the Find feature to locate and enter a direct-to waypoint.
1. PRESS the ⟿ button on the bezel.
2. TOUCH the name of the current waypoint in the Direct-To window (or Select Waypoint if that appears).
3. TOUCH Find, in the Waypoint Identifier window.
   a. TOUCH Recent, Nearest, Flight Plan, or User. You can scroll through the list as needed.
   b. TOUCH Search Name or Search City tabs to focus the search for a waypoint by either of those criteria.

If you touch Search Name or Search City, a new window appears with either a Search Facility Name or Search City Name control.

After touching it, you can enter the name associated with a facility, such as "Kennedy" for the Kennedy VOR (JFK) in New York, or enter a city name, such as "New York" to see a list of facilities in that city.

You can also use the Large and Small knobs to move the cursor, and select letters and numbers. Scroll through

the search results to find the way-point and touch it to select it.

Navigate direct-to a map waypoint
1. On the Map page:
    a. TOUCH the symbol for an airport, VOR, intersection, or other labeled waypoint, or
    b. TOUCH any place on the map where you want to create a map waypoint (MAPWPT).
2. PRESS the ⇥ button on the bezel.
    The Direct-To window appears, with the Waypoint tab active. If you touched a labeled waypoint, its name appears in the Waypoint name control. If you touched a place on the map not associated with a labeled waypoint, the name MAP-WPT and the latitude/longitude coordinates appear in the Waypoint name control. To give the map waypoint a unique name, TOUCH MAPWPT and then enter a new name.
3. Review the waypoint name and details. If you made a mistake,
    a. TOUCH the waypoint name again and re-enter the waypoint name, or
    b. TOUCH Cancel.
4. TOUCH the Activate button in the lower-right of the display (or PRESS the Small knob).
    The Map page appears with a magenta line drawn from your present position to the waypoint you chose.
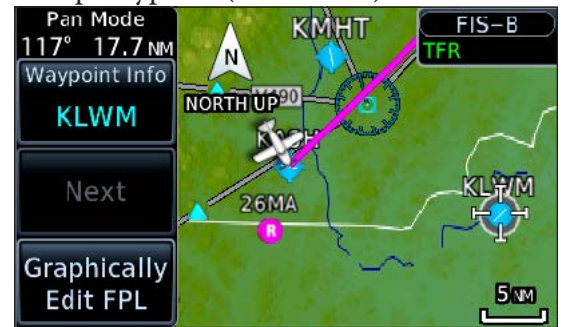
Navigate direct-to a waypoint on a specific course
You can use the Course To control in the Direct-To window to specify a course to fly to a waypoint, for example, when cleared to intercept and track a specific VOR radial.
1. PRESS the ⇥ button on the bezel. The Direct-To window appears with the Waypoint tab active.
2. TOUCH the Waypoint, FPL, or NRST APT tab.
3. TOUCH the waypoint that you want navigation toward.
4. Review and confirm the waypoint information.
5. TOUCH the Course To button.
6. In Course To, TOUCH the numerals in sequence to enter the course you want to fly. You can also use the Large and Small knobs to move the cursor and enter a course.
7. TOUCH Enter.
8. TOUCH the Activate button in the lower-right of the display (or PRESS the Small knob).
    The Map page appears with a magenta line drawn along the specified course to the waypoint you chose.
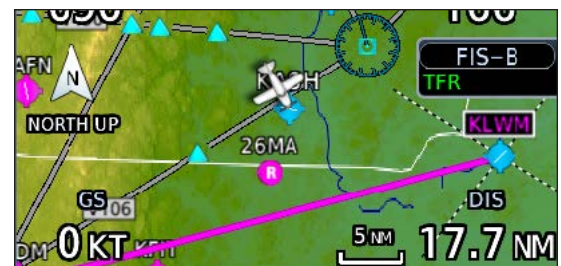
TIP

To track inbound on a specific radial to a VOR, enter the reciprocal of the radial. For example, to fly inbound on the 090 radial, enter 270 in the Course To window.

Using a Flight Plan to Navigate

For anything other than a short flight to a nearby airport, creating a flight plan improves your situational awareness and lets you take full advantage of the GTN's features. When you create a new flight plan, it's best to save it in the catalog. Flight plans in the catalog are available the next time you power up the GTN. You can store 99 flight plans with up to 100 waypoints each.

Create a new flight plan and save it in the catalog

1. On the Home page, TOUCH Flight Plan.
2. On the Active Flight Plan page, TOUCH Add Waypoint.
3. Use the keypad or the Large and Small knobs to enter the first waypoint (usually the departure airport)
4. TOUCH Enter or PRESS the Small knob.
5. Repeat steps 2–4 to add more waypoints.
6. After adding the last waypoint (usually the destination airport), TOUCH Menu at the left of the screen.
7. On the Active Flight Plan Menu page, TOUCH Store.

Activate a stored flight plan

1. On the Home page, TOUCH Flight Plan.
2. On the Active Flight Plan page, TOUCH Menu at the left of the screen.

3. On the Active Flight Plan Menu page, TOUCH Catalog.
4. On the Flight Plan Catalog page, TOUCH the name of the flight plan that you want to fly. To see all the flight plans stored in the catalog, TOUCH the Up and Down arrows in the lower-right.
5. In Route Options, TOUCH Activate. If another flight plan is active, the message "Replace current active route?" appears.
6. TOUCH OK.

Show the active flight plan

1. PRESS the HOME button.
2. On the Home page, TOUCH Flight Plan.

> **TIP**
> On the Default Navigation page, TOUCH the past active and subsequent waypoints bar to view the flight plan.
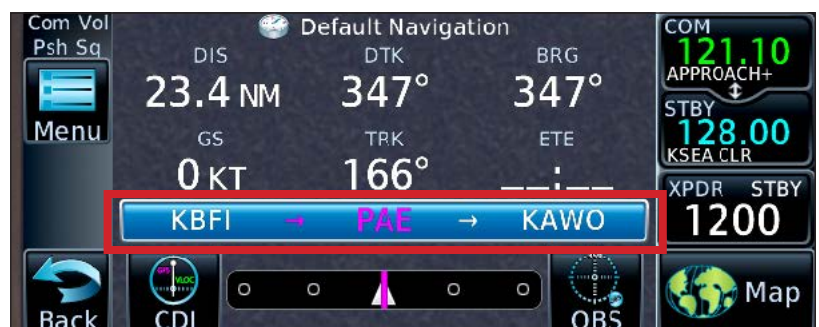
Delete the active flight plan

1. On the Active Flight Plan page, TOUCH Menu.
2. On the Active Flight Plan Menu page, TOUCH Delete.
3. At the "Delete all waypoints in flight plan?" prompt, TOUCH OK.

Note: If this flight plan was stored in the catalog, a copy remains in the catalog.

Invert the active flight plan

1. On the Active Flight Plan page, TOUCH Menu.
2. In the Active Flight Plan Menu, TOUCH Invert and then TOUCH OK.

Invert and activate a stored flight plan

1. On the Active Flight Plan page, TOUCH Menu.
2. In the Active Flight Plan Menu, TOUCH Catalog.
3. TOUCH the name of the flight plan you want to use.
4. In Route Options, TOUCH Invert & Activate.
5. If another flight plan is active the message "Replace current active route?" appears.
6. TOUCH OK. The inverted flight plan appears on the Active Flight Plan page.

Preview a stored flight plan

1. On the Active Flight Plan page, TOUCH Menu.
2. In the Active Flight Plan Menu, TOUCH Catalog.
3. TOUCH the name of the flight plan you want to preview.
4. In Route Options, TOUCH Preview.
5. The Flight Plan Preview page appears with the waypoints in a list on the left and map on the right.
6. To activate the flight plan, TOUCH Activate.
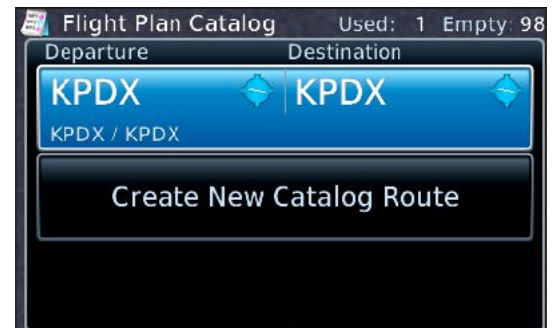
Delete a stored flight plan

1. On the Active Flight Plan page, TOUCH Menu.
2. In the Active Flight Plan Menu, TOUCH Catalog.
3. TOUCH the name of the flight plan you want to delete.
4. The message "Delete Flight Plan…?" appears.
5. If no, TOUCH Cancel. If yes, TOUCH OK.

Add a waypoint to the active flight plan

1. On the Active Flight Plan page, TOUCH the name of the waypoint that marks the point where you want to add a waypoint.
2. In Waypoint Options, TOUCH Insert Before or Insert After. Insert Before adds a waypoint preceding the one you selected. Insert After adds a waypoint following the one you selected.
3. The Waypoint Identifier window appears with the alpha-numeric keypad.
4. Use the keypad, or the Large and Small knobs, to enter the name of the waypoint you want to add.
5. TOUCH Enter (or PRESS the Small knob).

Remove a waypoint from the active flight plan

1. On the Active Flight Plan page, TOUCH the name of the waypoint you want to delete.
2. In Waypoint Options, TOUCH Remove.
3. In the "Remove …?" confirm screen, verify the name of the waypoint you want to remove and TOUCH OK.

Activate a leg in the active flight plan

1. On the Active Flight Plan page, TOUCH the name of the waypoint that marks the end of the leg you want to activate. For example, if you want to activate the leg between SUNED and YKM (below), TOUCH YKM. If necessary, TOUCH the Up and Down arrows to scroll through the list of waypoints.
2. In Waypoint Options, TOUCH Activate Leg.
3. TOUCH OK.

> ### TIP
> A magenta bracketed arrow connects the two waypoints in the active leg. This arrow may reach around a header for an airway or a procedure.

Graphically edit the active flight plan

You can drag course lines on the map to edit the active flight plan. For example, you can deviate off the planned route to avoid weather or adjust the flight plan to proceed direct-to a specific fix.

1. On the Map page, TOUCH the In or Out button to show the portion of the route that you want to change.
2. TOUCH the map.
3. In the lower-left area of the display, TOUCH Graphically Edit FPL. All flight plan legs turn white.
4. TOUCH and HOLD the leg you want to change.
5. DRAG the white course line to a waypoint on the map. The point must be a named fix.
6. To include that waypoint in the edited flight plan, TOUCH Done. Otherwise, TOUCH Undo.
7. Review the sequence of waypoints on the Active Flight Plan page to confirm your edits appear correctly in the flight plan.
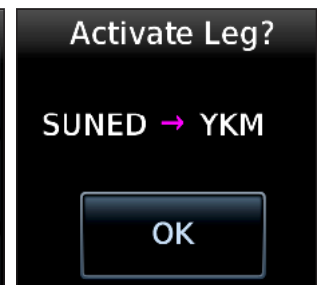
Load an airway

You can add low-altitude (V) airways, high-altitude (J) routes, and RNAV (T and Q) routes to a flight plan.

1. On the Active Flight Plan page, TOUCH the name of a VOR, intersection, or RNAV waypoint that marks an entry point for the airway you want include in the flight plan.
2. In Waypoint Options, TOUCH Load Airway.
3. The Select Airway window appears with the airways associated with the entry waypoint you chose. TOUCH the desired airway.
4. The Select Exit window opens. Use the Up and Down arrows to scroll through the list of exit waypoints. TOUCH the waypoint where you will exit the airway.
5. The Load Airway page appears with the waypoints on the left and a map view on the right. TOUCH Load to add the airway segment to the flight plan.

> **TIP**
>
> Airway waypoints appear in their order on the airway. This means your exit could be above or below, depending on where you entered the airway. To sort the list of waypoints alphabetically, TOUCH Sort Alpha. TOUCH Sort Alpha again to restore airway ordering.

Collapse the waypoints in airways

An airway segment typically contains many intersections or waypoints. If you want to see only the airway entry and exit waypoints in your flight plan, you can collapse the airway.

1. On the Active Flight Plan page, TOUCH the name of an airway.
2. In Airway Options, TOUCH Collapse All Airways. The green virtual light appears below the label.
3. Waypoints as part of an airway appear as an airway name plus the text "(collapsed)" on the airway button. Only the name of the waypoint marking the airway exit appears in the flight plan.

Expand collapsed airways

1. On the Active Flight Plan page, TOUCH the name of a collapsed airway.
2. In Airway Options, TOUCH Collapse All Airways. The green virtual light disappears.
3. The names of all the waypoints along the airway in the flight plan return to the list in the flight plan.

Remove an airway

1. On the Active Flight Plan page, TOUCH the name of an airway.
2. In the Airway Options window, TOUCH Remove Airway.
3. In "Remove Airway -…?", confirm screen, verify the name of the airway and TOUCH OK.

Using OBS Mode

With OBS mode, you can set a specific course to fly to or from a waypoint. For example, if you are cleared to intercept a specific VOR radial that is not part of an airway or procedure, you can use OBS mode to create a course to intercept and track inbound to, or outbound from, the waypoint.

OBS mode also stops automatic sequencing of waypoints and cancels vertical navigation (VNAV).

> **TIP**
>
> Note that GPS navigation is always to a waypoint. For example, if you want to fly inbound from the north on the 360-degree radial to a waypoint, you should select the 180-degree course to the waypoint.

Set a course with OBS mode and an external HSI

If you are navigating to a waypoint and have an external HSI (or other external course selector) you can use those controls to set a course.
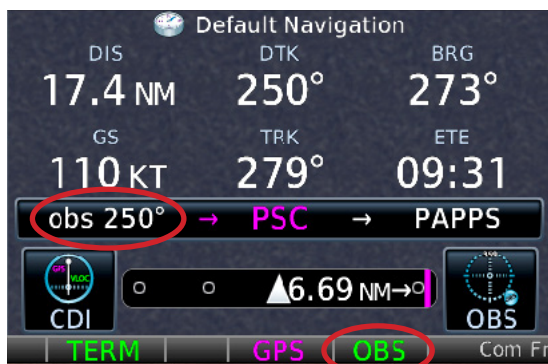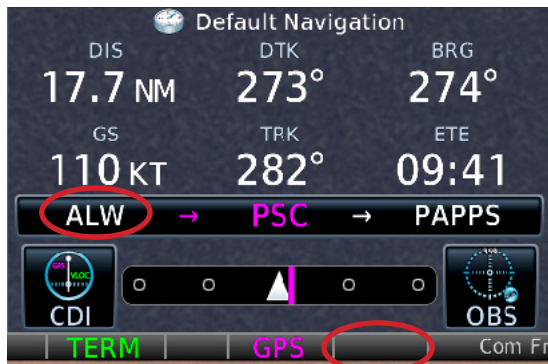
1. TOUCH the OBS button at the bottom of the Default Navigation page.
2. ROTATE the course selector on the external HSI to the course you want to fly to the waypoint.
3. The GTN draws a magenta line on the map extending along your specified course to the waypoint.

If you don't have an external HSI connected, or you have an electronic HSI that supports it, you can enter the OBS course manually, similar to a direct-to on a specific course.

Suspend automatic waypoint sequencing

You can use OBS mode to suspend automatic sequencing. For example, you might need a few turns in a hold in lieu of a procedure turn (HILPT) to lose altitude.

1. TOUCH the OBS button at the bottom of the Default Navigation page.

Resume automatic waypoint sequencing

1. TOUCH the OBS button at the bottom of the Default Navigation page.

Using User Waypoints

You can create a User waypoint to navigate to a location that is not a waypoint in the navigation database. This is helpful for a remote location such as a private airstrip, or for an IFR clearance including a radial and distance from a waypoint.

You can define a user waypoint by its:

1. Latitude/Longitude coordinates.
2. A radial and distance from a navaid, intersection, airport, or other waypoint in the navigation database.
3. The intersection of two radials from two navaids.

Create a User waypoint

1. PRESS the **HOME** button.
2. Scroll down and TOUCH Waypoint Info.
3. On the Waypoint Info page, TOUCH Create Waypoint.

4. TOUCH User Identifier to enter the name of the waypoint.
5. TOUCH Comment to enter more information about the waypoint.

The waypoint is set for your current position by default. If that is correct, skip these three sub-steps. Otherwise, change it to another location:

a. TOUCH Position.
b. TOUCH Lat/Lon, Radial/Radial, or Radial/Distance, depending on how you want to define the waypoint.
c. TOUCH any window in the definition area—Ref Wpt, Radial, Distance, or Lat/Lon—to change that value as necessary.
6. If you don't want the user waypoint saved after you power down the GTN, TOUCH Temporary.
7. TOUCH Create.

> **TIP**
> User waypoints, including temporary ones, can be used in flight plans just like any other waypoint.
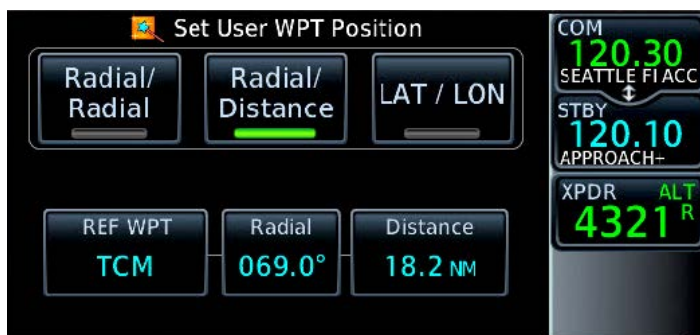
> **TIP**
> If the waypoint you created is an airport or landing place not in the database, TOUCH Airport. This choice inhibits nuisance terrain alerts as you descend for landing.

Adding IFR Procedures (DP, SID, STAR, IAP)

Loading instrument departure procedures (DPs and SIDs), arrivals (STARs), and approaches (IAPs) into the flight plan involve the same basic sequence of steps:

1. Display the Active Flight Plan page.
2. TOUCH the airport waypoint for the procedure.
3. TOUCH Load PROC.
4. TOUCH the type of procedure you want to load: Departure, Arrival, or Approach.
5. TOUCH the name of the procedure to add.
6. TOUCH the default Transition to select a different one.
7. TOUCH to select a runway in some cases.
8. TOUCH the "Load ..." button to add it into the flight plan.

You can load RNAV and conventional charted departure procedures (Obstacle or SIDs) into the active flight plan. Departures based only on ATC vectors are not included the GTN database.
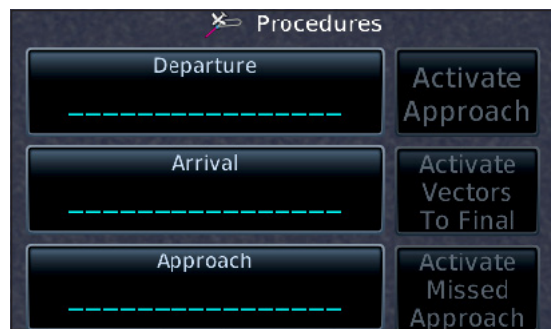
> **TIP**
> See "6.14 Points to Remember for All Procedures" in the GTN 625/635/650 Pilot's Guide for more about procedures and their use with autopilots.

To load a departure procedure, the departure airport must be the first waypoint in the active flight plan.

Add a departure procedure to the active flight plan
1. On the Active Flight Plan page, TOUCH the departure airport.
2. In Waypoint Options, TOUCH Load PROC.
3. On the Procedures page, TOUCH Departure.
4. The Select Departure window shows the list of departure procedures available at the departure airport.
5. TOUCH the name of the departure you want to include in the flight plan. If necessary, TOUCH the Up and Down arrows to see the entire list of departures.
6. If the selected departure serves more than one runway, the Select Runway window appears. TOUCH the name of the runway you plan for takeoff.
7. The PROC–Departure window appears.If the DP includes more than one transition, TOUCH Transition and then TOUCH the name of the waypoint that defines the transition (the last waypoint in the procedure) corresponding to your clearance.
8. If you selected the wrong departure, TOUCH Cancel and repeat steps 3 through 8. To preview the departure on a map, TOUCH Preview.
9. To add the departure to the active flight plan, TOUCH Load Departure.
10. The Active Flight Plan page appears with the departure name and waypoints above the Enroute section of the flight plan.

Activate a departure procedure
When you load a departure procedure, the first leg of the procedure from the departure runway is the active leg. After you take off, the GTN provides guidance to the first waypoint and then sequences through the remaining waypoints in the procedure.

Note, however, the first leg of a departure procedure may be a heading leg or a climbing turn to a specified altitude. The GTN cannot provide lateral guidance along such legs, and if your GTN is not connected to an external baro (altitude) input, you may need to manually activate a waypoint or leg at the appropriate altitude to begin automatic sequencing through the departure waypoints.

When a departure procedure includes a heading leg, the GTN will show the label Vectors or MANSEQ. A heading leg labeled MANSEQ is complete when you join that leg. To continue fly-

---

TIP

Departure procedures often contain heading legs (specific courses to or from a waypoint) and legs that end at an altitude, not a specific waypoint. These may require extra touches to unsuspend the GPS. To learn more about these different leg types, see "6.14 Points to Remember for All Procedures and 9.7 Flight Plan Depiction" in the GTN 625/635/650 Pilot's Guide. Additional details are available in GNS 400(W)/500(W) Series and GTN 6XX/7XX Series Instrument Procedure Leg Awareness (available from Garmin). Also review how your autopilot and other equipment handles these leg types.

ing the sequence of waypoints in the procedure, you must proceed direct-to another waypoint, or activate another leg, within the procedure as appropriate for your clearance.

Delete a departure procedure from the active flight plan
1. On the Active Flight Plan page, TOUCH the procedure name.
2. TOUCH Remove Departure in the Departure Options.
3. Confirm your choice and TOUCH OK.

The GTN navigation database includes conventional and RNAV arrivals. To add a STAR to a flight plan, the destination airport must be the last waypoint in the flight plan.

Add an arrival procedure to the active flight plan
1. On the Active Flight Plan page, TOUCH the destination airport.
2. TOUCH Load PROC in Waypoint Options.
3. TOUCH Arrival.
4. In the Select Arrival window, TOUCH the name of the desired arrival. If necessary, TOUCH the Up and Down arrows to view the entire list of arrivals.
5. If the arrival has multiple entry points, TOUCH the waypoint in the Select Transition window that marks the beginning of the arrival according to your clearance. If your clearance does not include one of the charted transitions and you will join the arrival at another fix along the arrival or a leg between two fixes, TOUCH the charted transition best aligned with your current route.
6. If the arrival serves more than one runway, in the Select Runway window, TOUCH the runway in use at the destination airport.
7. The PROC–Arrival page appears so that you can preview the arrival and confirm your choices. To add the arrival to the flight plan, TOUCH Load Arrival.
8. The Active Flight Plan page appears. The arrival name and the waypoints that comprise the procedure appear above the destination airport. If the procedure includes altitude constraints in the navigation database, the constraints appear next to the corresponding waypoints.

Delete an arrival procedure
1. On the Active Flight Plan page, TOUCH the procedure name.
2. TOUCH Remove Arrival in Arrival Options.
3. Confirm your choice and TOUCH OK.

Loading and Activating Approaches
The basic steps for flying different types of approaches are the same for both RNAV (GPS) and conventional (VLOC) approaches (e.g. ILS, localizer, or VOR). The few key differences are discussed later in this manual.

It is rarely necessary to activate an approach. Once an approach is loaded, proceeding direct-to a waypoint within the approach, or activating a leg between two fixes in the approach, activates the approach automatically. Explicitly activating an approach is identical to activating direct-to the first waypoint of the approach in the flight plan.

If ATC is vectoring you to join the approach, you should not fly direct-to the transition waypoint unless or until ATC clears you direct-to a specific waypoint. ATC also may vector you to join a leg between two waypoints within the approach.

> **TIP**
>
> Selecting "Vectors" or "Vectors-to-final" (VTF) for an instrument approach is not recommended most of the time. VTF may prevent approach waypoints outside of the FAF from being loaded into the flight plan. ATC can clear an RNAV-capable aircraft direct-to an IF/IAF, even on a conventional approach, such as an ILS. If you select VTF as the transition for an approach, you may be unprepared if ATC issues such a clearance.

If you are being vectored to join the final approach, the best technique is to activate a leg between two waypoints along the final approach course. If vectors are setting you up to join the final approach course just outside the FAF, activate the leg from a waypoint that ends at the FAF. If you are being vectored to join the final approach course outside an IF that begins a leg to the FAF, activate the leg that ends at the IF.

Load an instrument approach

1. On the Active Flight Plan page, TOUCH the name of the destination airport.
2. TOUCH Load Procedure in Waypoint Options.
3. On the Procedures page, TOUCH Approach.
4. In the Select Approach window, TOUCH the name of the approach that you want to load. If necessary, TOUCH the Up and Down arrows to view the entire list of available approaches.
5. To select the waypoint where you will join the procedure, TOUCH Transition. (The default is Vectors.)
6. In the Select Transition window, TOUCH the name of the waypoint where you plan to join the procedure. If your clearance does not yet include one of the charted transitions or you anticipate joining the approach on a leg between two fixes, TOUCH the name of the charted transition best aligned with your current route.
7. TOUCH Preview. Under Sequence, review the list of waypoints that defines the approach. The map next to the waypoint list shows a graphical depiction of the approach.
8. To add the approach to the active flight plan, TOUCH Load Approach.

Once loaded, you can proceed direct-to any waypoint in the approach (outside the final approach fix) or activate a leg between two waypoints in the approach. Either choice activates the approach.

Delete an approach from the flight plan

1. On the Active Flight Plan page, TOUCH the name of the currently loaded approach.
2. TOUCH Remove APPR in Approach Options.
3. TOUCH OK to confirm the action.

Change to a different approach to the same airport
1. On the Active Flight Plan page, TOUCH the name of the currently loaded approach.
2. TOUCH Select Approach in Approach Options.
3. In the PROC–Approach window, TOUCH Approach.
4. In the Select Approach window, TOUCH the name of the desired approach. If necessary, TOUCH the Up and Down arrows to view the complete list of approaches.
5. In the PROC–Approach window, review the details of the new approach.
6. TOUCH Transition, and in the Select Transition window, TOUCH the name of the waypoint where you will begin the approach.
7. In the PROC–Approach window, TOUCH Load Approach or Load APPR & Activate.

Activate a leg of an approach
1. TOUCH the waypoint at the end of the leg you want to activate.
2. TOUCH Activate Leg in Waypoint Options.
3. TOUCH OK to confirm the action.

> **TIP**
>
> If you're on vectors and not sure which leg to activate, choose the leg ending at the FAF. Even if you intercept on the previous leg, the approach will still activate.

Proceed direct-to an intermediate fix
1. On the Active Flight Plan page, TOUCH the fix you want to proceed direct-to.
2. PRESS the ⟶Ð▸ button on the bezel.
3. TOUCH Activate.

> **TIP**
>
> Do not proceed direct-to the FAF (unless the FAF also serves as an IAF). Instead, choose an intermediate fix, or activate the leg that ends at the FAF. If you proceed direct-to the FAF, the GTN runs a series of required internal checks for the appropriate approach mode (e.g., LPV, LNAV, etc.), and the approach will not activate. For more information, see "6.14 Points to Remember for All Procedures" in the GTN 625/635/650 Pilot's Guide.

Types of RNAV approaches supported by the GTN
The GTN supports RNAV (GPS) approaches of the following types:
- LPV (localizer performance with approved vertical guidance) to a DA.
- LNAV/VNAV (lateral and vertical navigation with approved vertical guidance) to a DA. (The GTN annunciates these minimums as L/VNAV).
- LP (localizer performance) to an MDA.
- LP+V (localizer performance with an advisory glidepath) to an MDA.
- LNAV (lateral navigation) to an MDA.
- LNAV+V (lateral navigation with an advisory glidepath) to an MDA.

Flying an RNAV (GPS) approach is straightforward. Load the approach as described in "Loading and Activating Approaches" earlier in this manual. There are no frequencies to load and identify, and you don't need to switch CDI sources during the procedure. The entire approach is flown with GPS guidance, from joining a feeder route or transition, through the missed approach procedure and hold.

Specifics for ILS, LOC, and VOR approaches

The GTN supports ILS, localizer, and VOR approaches. To load one use the procedures described in "Loading and Activating Approaches" earlier in this manual, keeping the following points in mind:

- You can fly feeder routes, transitions, course reversals, and missed approach procedures, including the missed approach hold, using only GPS guidance.
- When you load an ILS or localizer approach, you must confirm you know the GPS is advisory only.
- When you load an ILS, localizer, or VOR approach, the GTN loads the frequency for the primary navaid (ILS or VOR) in the nav STBY window.
- As you prepare to join the final approach course, confirm the navaid frequency, swap it into the active nav frequency window, and confirm the ID, either by verifying the displayed ID or listening to the Morse Code identifier.
- If you are flying an ILS or localizer approach, the CDI on your external PFD or HSI must switch to VLOC (usually shown in green) to intercept and fly the final approach course. Some GTN/PFD/autopilot combinations support automatic CDI switching. See "6.15 Points to remember about Localizer Approaches" in the GTN 625/635/650 Pilot's Guide.
- If you are flying a VOR approach, you can fly the entire procedure, including the final approach course, with the CDI set to GPS (magenta), if:
  a. The primary navaid is in service and the procedure available—that is, it has not been canceled permanently or temporarily by NOTAM.
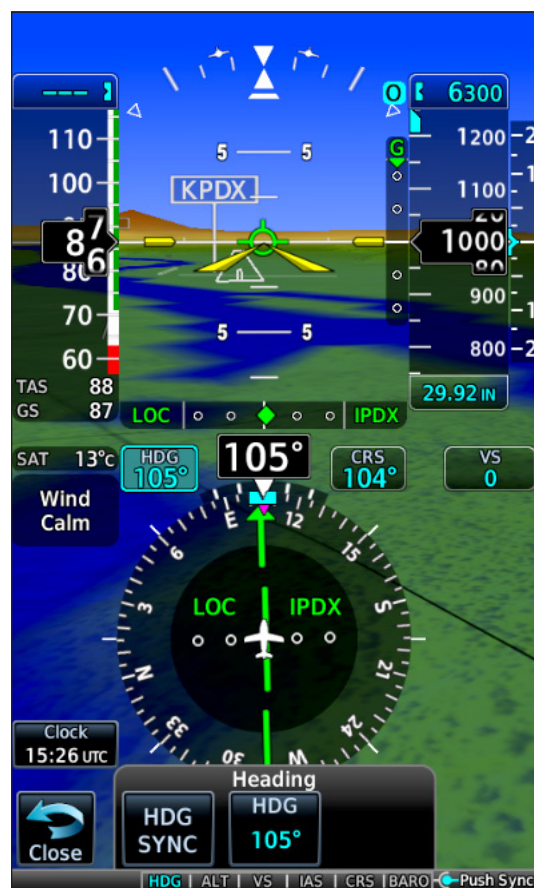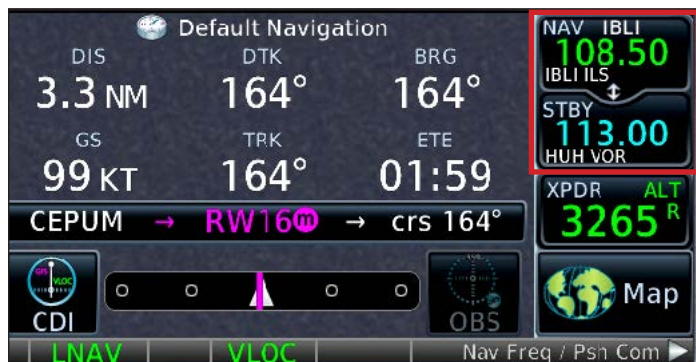
b. You can display the VOR final approach course on an external CDI or bearing pointer to confirm that the GPS guidance corresponds to the published final approach course.

Switch the CDI source sent to an external CDI

1. To switch the CDI from GPS (magenta) to VLOC (green), or back again, TOUCH the CDI button at the bottom of the Default Navigation page.

TIP

The GTN supports automatic switching of GPS to VLOC for certain approaches, and automatic switching back to GPS for missed approaches, with some configurations.

Fly the published missed approach procedure

You can fly the missed approach procedure, even for a conventional approach, such as an ILS, using GNSS (GPS) guidance.

1. At the missed approach point, the GTN suspends waypoint sequencing and displays the Missed Approach Waypoint Reached window.
2. *After you are climbing and ready for guidance to the first waypoint on the missed approach procedure,* TOUCH Activate GPS Missed Approach.
3. If you are flying an ILS, localizer, or VOR approach, you may need to switch the CDI on the external HSI (or other course indicator) to GPS to fly the missed approach procedure with GNSS guidance.
   a. To switch the CDI from VLOC (green) to GPS (magenta), TOUCH the CDI button at the bottom of the GTN display.

The GTN guides you through the legs of the missed approach procedure to the missed approach holding point and hold.

Flying Visual (VFR) Approaches

With GTN system software 6.3 and later, you can fly visual approaches to most airports. Based on data in the navigation database, the GTN creates advisory horizontal guidance and, when terrain and obstacles permit, advisory vertical guidance to a specific runway. The guidance is typically based on a three-degree glidepath that crosses the runway threshold at 50 feet AGL.

Visual approaches may be helpful when approaching an unfamiliar airport, especially at night. However, they are strictly VFR operations to help you align with a specific runway and fly a stable descent to touchdown. Visual approaches are not to be confused with charted visual approach procedures used under IFR, and they are not available to all airports or runways.

The availability of visual approaches is subject to several require-ments:

- The GTN must have a valid terrain database to provide advisory vertical guidance.
- To follow the advisory horizontal and vertical guidance, you must have an external CDI and glidepath display connected to the GTN.
- If no known obstructions are within the approach path, the GTN provides advisory vertical guidance up to 28 NM from the runway.
- If known obstructions are located between 3 NM and 28 NM from the runway, advisory vertical guidance is limited to the distance between the runway and the known obstacles.
- If obstructions are located within 3 NM of the runway, the GTN does not provide advisory vertical guidance.

> **TIP**
>
> The advisory horizontal and vertical guidance provided by the GTN during a VFR approach does not ensure that you will clear all obstacles in the calculated path to the runway. You must be able to see and avoid obstacles as you descend and land.
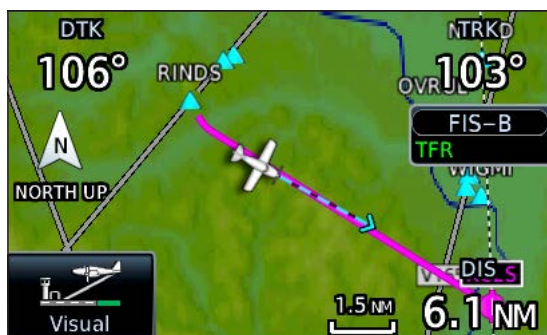
Load and activate a visual approach

There are three methods to load and activate a visual approach:

A. When you are within 10 NM of the destination airport, the Visual button appears in the lower-left corner of the Map.
   1. To activate a visual approach, TOUCH the Visual button.
   2. In the Activate Visual Approach window, TOUCH the name of the visual approach you want to fly.
   3. In the Visual Approach Only window, confirm the information about the approach, and then TOUCH Load.
B. On the Map, TOUCH an airport to which you want to fly a visual approach.
   1. At the bottom of the display, TOUCH the Visual button.
   2. In the Activate Visual Approach window, TOUCH the name of the visual approach you want to fly.
   3. In the Visual Approach Only window, confirm the information about the approach, and then TOUCH Load.
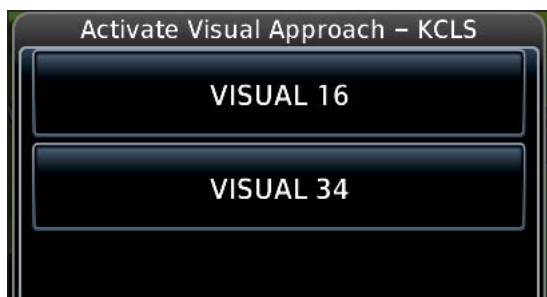
C. Load a visual approach from the Procedures page associated with an airport.
1. On the Active Flight Plan page or the Waypoint Info-Airport page, TOUCH Load PROC or PROC.
2. From the list of procedures, TOUCH the name of the visual approach to the runway you want use.
3. TOUCH Load Approach or Load APPR & Activate.

Customize when the Visual button appears
1. PRESS the HOME button in the upper-right corner of the bezel and TOUCH the Map button.
2. On the Map page, TOUCH Menu.
3. In the Map Menu, TOUCH Map Setup.
4. TOUCH the Map tab.
5. TOUCH Visual APPR Selector.
6. In the Select Visual APPR Selector Distance window, TOUCH the distance (from Off to 25 NM) that you want. The default distance is 10 NM.

Flying Holds

The GTN supports charted holds that are part of procedures, such as charted ODPs, SIDs, STARs, and approaches. You can also create a custom hold at any waypoint in the navigation database. You can treat a hold like any other waypoint in the active flight plan. You can proceed direct-to a hold, activate a leg from a hold to another waypoint, and delete a hold, just as you could with any other waypoint.

Fly a charted hold in a procedure
No special procedures are required to fly a charted hold that is part of a procedure. If the procedure requires you to fly a charted hold, the GTN provides guidance to enter and then fly the hold as published.

When you enter a hold, the GTN switches to suspend mode (SUSP) and—with one exception—it will not sequence to the next waypoint until you manually resume normal sequencing to the next waypoint.

If a charted hold is used for a course reversal (a hold-in-lieu-of-procedure turn, or HILPT), then the GTN resumes sequencing to the next waypoint when you cross the holding fix inbound after entering the hold. If you are instructed to remain in the hold, you must manually suspend waypoint sequencing (see "Using OBS Mode" earlier in this manual).

Delete a hold (or course reversal) in a procedure
If you are cleared straight-in for an approach or if your clearance during a departure procedure (or arrival) skips a charted hold, you can remove a charted hold from the active flight plan.
1. On the Active Flight Plan page, within the procedure, TOUCH the name of the hold (or course reversal) that you want to delete.
2. TOUCH Remove in the Waypoint Options.
3. In the "Remove …" confirm screen, TOUCH OK.
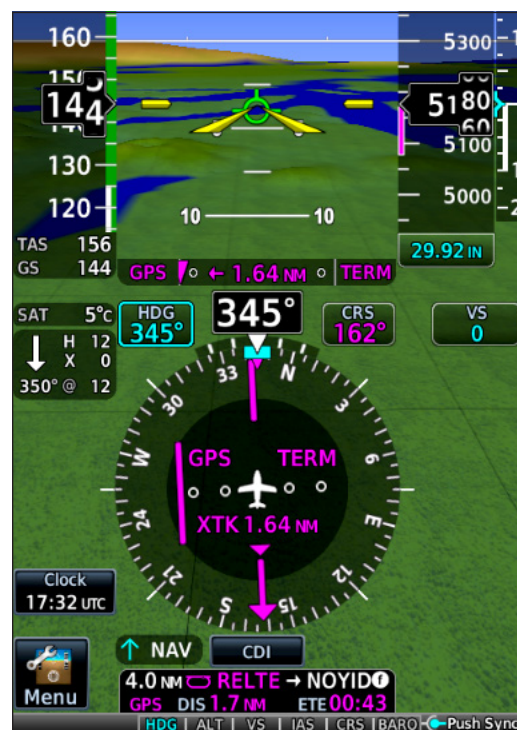
Activate a leg from a charted hold to the next waypoint

If your clearance includes a waypoint that is also a charted hold, you can skip the hold by activating the leg from the holding fix that extends to the next waypoint. For example, if ATC vectors you to join the final approach course outside an IAF that is a waypoint for a HILPT, you can activate the leg from the holding fix to the final approach fix.

1. On the Active Flight Plan page, within the procedure, TOUCH the name of the waypoint after the hold.
2. TOUCH Activate Leg, in the Waypoint Options.
3. In the "Activate Leg? ..." confirm screen, verify the leg and TOUCH OK.

Create a hold at a waypoint in the active flight plan

1. On the Active Flight Plan page, TOUCH the waypoint at which you want to create a hold.
2. TOUCH Hold At WPT in the Waypoint Options.
3. In the Hold At Waypoint window:
   a. To specify the holding course, TOUCH Course and use the keypad to enter the course.
   b. By default, the holding course is inbound to the holding fix. To define the course as the outbound track, TOUCH Direction.
   c. Right turns are standard. To specify left turns, TOUCH Turn.
   d. Timed legs are standard. To specify a distance hold, TOUCH Leg Type.
   e. If you specified a timed leg, the standard is one minute. To specify a different inbound time, TOUCH Leg Time and use the keypad to enter a time in minutes and seconds.
   f. If you specified a distance, TOUCH Leg Distance and use the keypad to enter a distance in nautical miles.
   g. To enter the expect further clearance time, TOUCH EFC Time and use the keypad to enter the time.
4. When done defining the hold, TOUCH Load Hold.
5. The GTN inserts the hold in the active flight plan below the waypoint originally selected.

Leave a hold and resume waypoint sequencing

Once you're in a hold and the GTN is in SUSP mode, you must manually switch the GTN back to automatic waypoint sequencing to leave the hold.

A. On the Default Navigation page, TOUCH the UNSUSP button at the bottom of the display; or
B. On the Active Flight Plan page,
   1. TOUCH the waypoint below the hold.
   2. TOUCH Activate Leg.
   3. TOUCH OK.
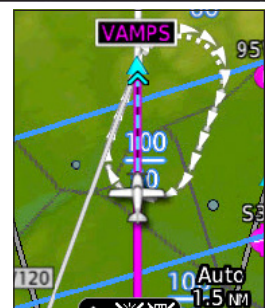
Leave a hold and proceed direct-to a flight plan waypoint
1. On the Active Flight Plan page, TOUCH the waypoint to which you were cleared.
2. PRESS the ⟶Ð⟶ button, confirm the waypoint, and TOUCH Activate.

If you fly a missed approach procedure, the GTN guides you to the missed approach holding point and into the published hold.

Fly a published missed approach hold
At the missed approach point, the GTN switches to suspend mode and the Missed Approach Waypoint Reached window appears. Confirm that you are climbing and ready to fly the published missed approach procedure.
1. TOUCH Activate GPS Missed Approach.
2. If necessary, switch the CDI from VLOC (green) to GPS (magenta). (For more information, see "Fly the published missed approach procedure," earlier in this manual.)

The GTN guides you through the legs of the missed approach procedure to the missed approach holding point and into the hold.

Leave the missed approach hold
When you are cleared to leave the missed approach hold:
1. On the Default Navigation page, TOUCH UNSUSP or;
2. On the Active Flight Plan page
   a. TOUCH a waypoint and then proceed direct-to that waypoint or;
   b. Activate a leg between waypoints or;
   c. PRESS the ⟶Ð⟶ button and proceed direct to any waypoint.

Flying DME Arcs and Radius-to-Fix (RF) Legs

DME arcs are most commonly included in approaches to act as transitions from the enroute structure to the approach. DME arcs are also used in some departure procedures to provide paths from the airport environment to the enroute structure.

You can think of a DME arc in the GTN as a leg in the active flight plan. You can proceed direct-to a waypoint on the arc, proceed from a point on the arc to another waypoint, or delete an arc; just as with any other waypoint. For more information, see "Navigating Direct-To Anywhere," earlier in this manual.

Fly a DME arc in a published procedure
No special procedures are required to fly a charted DME arc that is part of a procedure. If the transition you load includes an arc, the GTN provides guidance to enter and then fly the arc.
1. Load the procedure as described earlier in this manual.
2. Select a transition beginning with a waypoint on the arc.

Fly an RF leg that is part of a published procedure

With GTN system software 6.5 and later, you can fly some procedures that include radius-to-fix (RF) legs. The AIM defines an RF leg as "a constant radius circular path around a defined turn center that terminates at a fix."

RF legs (which resemble DME arcs) were formerly included only in Authorization Required (AR) approaches with RNP in the procedure title.

However, RF legs are now being used as transitions or feeder routes in other approaches, including RNAV and ILS approaches, such as the ILS Z or LOC Z RWY 16 at Reno/Tahoe Intl (KRNO). Note that even with the GTN, you cannot fly an Authorization Required (AR) approach with RNP in the procedure title.

The following limitations, outlined in the AFM Supplement for the GTN, apply to flying procedures that include RF legs:

- The aircraft is limited to 180 KIAS while on the RF leg.
- RF legs are limited to RNP 1 procedures. (RNP AR and RNP <1 are not approved.) This means the GTN must be in terminal mode while flying an RF leg (just as it is while flying any feeder route) and the lateral tolerances for the RF leg are 1 NM (just as on a DME arc).
- Primary navigation guidance on RF legs must be shown on an electronic HSI (EHSI) with

auto-slew capability active. You can't fly an RF leg if your aircraft has only a mechanical HSI or any CDI that requires you to manually select courses as you fly the curved path.

> **TIP**
>
> The GTN issues alerts for joining DME and RF arcs in the lower right of the screen. Once on the arc, the GTN shows whether you are arcing left or right, and the heading that is tangent to the arc at your location. Turn anticipation onto and off of the arc factors in your groundspeed but desired track (DTK) doesn't.

- The GTN Map, EHSI Map, or distance-to-next-waypoint information must be displayed during the RF leg when flying without the aid of an autopilot or flight director.
- The active waypoint must be displayed within the pilot's primary field of view.

For more information about flying RF legs with a GTN, see "6.9 Radius-to-Fix (RF) Approaches" in the GTN 625/635/650 Pilot's Guide.

When an RF leg is included in an approach, it is part of a transition or feeder route. Although you must observe the limitations outlined above when flying an RF leg, no special techniques or procedures are required. Load the procedure and transition as described in "Load an instrument approach" earlier in this manual.

> **TIP**
>
> When a procedure is part of the active flight plan, you can proceed direct-to any waypoint in the procedure; activate a leg of the procedure; or delete a waypoint, hold, or course reversal in the procedure; just as you can modify flight plan waypoints when flying enroute. Note that when you proceed direct-to a waypoint or activate a leg within a procedure, you effectively activate that procedure.

Using Vertical Navigation (VNAV) and Along-Track Offsets

With GTN system software 6.5 or later, and a separate baro-corrected altitude source, the GTN supports vertical navigation (VNAV) to help manage descents and meet crossing restrictions (along-track offsets).

> **TIP**
> The VNAV feature replaces the former VCALC utility unless you tell the avionics shop that installed or maintains your GTN that you prefer to retain the VCALC function.

If your GTN is connected to some PFDs, including the Garmin G5, G500/600 or Dynon Skyview, the GTN can send VNAV cues to the PFD. You can set a vertical speed to match the VNAV cue or use the VNAV feature of some autopilots to track the descent profile. Older autopilots with an approach (APR) function usually can't follow VNAV guidance, so you must do that manually. If you have questions about the compatibility of your PFD and autopilot with the VNAV feature, check with a Garmin dealer or avionics technician.

VNAV is available for descent planning and guidance:
- During enroute navigation, except on heading legs.
- While flying an IFR arrival.
- While flying the initial stages, such as feeder routes and transitions, of an instrument approach prior to the final approach fix.

VNAV is not available if:
- You must climb to meet an altitude constraint.
- The descent path angle will exceed -6 degrees or -4000 fpm.
- The top-of-descent point is behind your present position.
- The descent path includes a leg type that does not support altitude constraints.
- The descent path ends at a waypoint past the final approach fix of an approach.

The GTN shows altitude restrictions for waypoints when:
- The navigation database includes an altitude restriction for a waypoint.
- You delete an altitude constraint that you entered.

When VNAV is enabled, the GTN adds an ALT column adjacent to waypoints on the Active Flight Plan page. The altitude constraints for procedures loaded from the navigation database are for turbine aircraft. If you request or are assigned a different altitude, you can modify the default altitude constraint on the Active Flight Plan page.

You set up VNAV-guided descents on the Active Flight Plan page.

Enable VNAV guidance

1. PRESS the **HOME** button.
2. TOUCH Flight Plan.
3. On the Active Flight Plan page, TOUCH Menu.
4. On the Active Flight Plan Menu, TOUCH VNAV.
5. Confirm that the green virtual light appears on the button.

Disable VNAV guidance

1. On the Active Flight Plan page, TOUCH Menu.
2. On the Active Flight Plan Menu, TOUCH VNAV Enabled button.
3. Confirm that the green virtual light is extinguished.

Set up a VNAV altitude constraint (crossing restriction)

1. On the Active Flight Plan page, TOUCH the altitude button to the right of the waypoint where you must arrive at a specific altitude. The VNAV Options window appears.
2. To set an altitude constraint *at* the waypoint, confirm that 0 NM appears in the Along Track control.
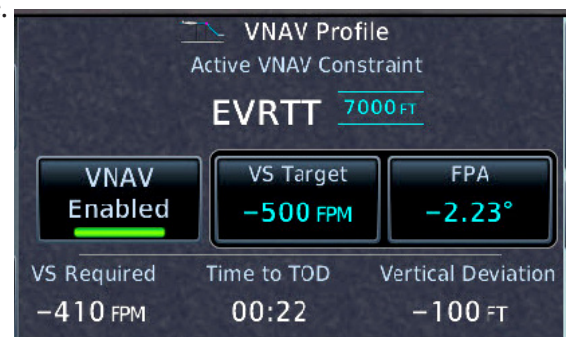
3. To set an offset before or after the waypoint,
    a. TOUCH Along Track.
    b. TOUCH Before or After.
    c. Use the keypad to enter a distance in NM.
    d. TOUCH Enter.
4. To specify the type of altitude constraint,
    a. TOUCH Type.
    b. TOUCH At, At or Above, At or Below, or Between.
5. To enter the altitude:
    a. TOUCH the altitude button.
    b. TOUCH Flight Level or MSL.
    c. Use the keypad to enter the altitude.
    d. TOUCH Enter.
6. To continue navigating on the active flight plan with the altitude constraint, TOUCH Save, or
7. To proceed direct-to the waypoint with the altitude constraint, TOUCH VNAV Direct-To, and then in the "Activate Vertical Direct-to… at…?" window, TOUCH OK.

The altitude constraint you entered appears next to the waypoint you chose. A pencil icon in the altitude button indicates that the altitude constraint is not a default altitude restriction loaded from the navigation database.

Modify an altitude constraint

1. On the Active Flight Plan page, TOUCH the altitude button next to the waypoint with the altitude constraint.
2. In the VNAV Options window, TOUCH the altitude button.
3. In the At Constraint window, use the keypad to enter the new altitude and then TOUCH Enter.

Remove a VNAV altitude constraint (crossing restriction)

1. On the Active Flight Plan page, TOUCH the altitude button next to the waypoint with the altitude constraint.
2. In the VNAV Options window, TOUCH Remove Constraint.
3. In the Remove Altitude Constraint window, TOUCH OK.

You can also revert a constraint back to its original value.

View or adjust the current VNAV profile or Flight Path Angle

The default VNAV Flight Path Angle (FPA, which is also the angle of descent) is three degrees. You can set a different angle with the VNAV option on the Utilities page.

1. PRESS the **HOME** button in the upper-right corner of the bezel.
2. On the Home page, TOUCH the Utilities button.
3. On the Utilities page, TOUCH the VNAV button.

The VNAV Profile window shows the desired FPA and the rate of descent that would achieve that angle given your current groundspeed. These can be adjusted.

1. To change the VS target:

a. TOUCH VS Target.
b. Use the keypad to enter a new VS target.
2. To change the FPA:
a. TOUCH Flight Path Angle.
b. Use the keypad to enter a new angle for your descent.

Whenever you change the VS target, the FPA will also change, because descending less rapidly for a given groundspeed requires descending less steeply. The same is true if you change the flight path angle; the VS target will change. The VS Required, Time to TOD (top of descent), and Vertical Deviation will also change accordingly.
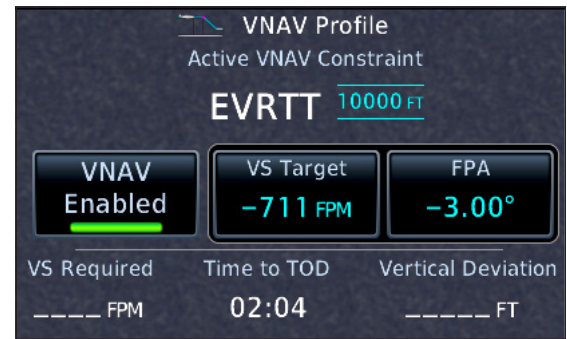
Change the default Flight Path Angle
1. While the VNAV Profile window is in view, TOUCH Menu.
2. TOUCH Default FPA in the VNAV Profile Menu.
3. Use the keypad to enter a new FPA.
4. TOUCH Enter.

You can create a parallel track PTK in the active flight plan to fly a course offset from each leg. However:
1. Parallel tracks are not available when flying an approach procedure.
2. VNAV guidance is not available when you are flying a parallel track.

Create a parallel track
1. On the Active Flight Plan page, TOUCH Menu.
2. TOUCH Parallel Track.
3. In the Parallel Track window, TOUCH Direction (to specify Left or Right of the default track) and then TOUCH Offset (to specify the offset distance 1-99 NM).
4. Confirm the information you entered, and then TOUCH Activate.
5. On the Active Flight Plan page, "–P" appears next to the waypoints in the flight plan.

Cancel a parallel track
1. On the Active Flight Plan page, TOUCH Menu.
2. In the Active Flight Plan Menu page, TOUCH Remove PTK.

Use VNAV while flying approaches
The VNAV feature, described in "Using Vertical Navigation (VNAV) and Along-Track Offsets" earlier in this manual, is available with GTN system software 6.5 and later. VNAV can help you manage descents.

Key points for using VNAV
- When you load an approach, the GTN retrieves published altitude constraints for legs along transitions and feeder routes up to the FAF. These altitudes appear on the Active Flight Plan page in the ALT column next to waypoint names.
- If you have a PFD (next page) connected to a GTN configured for VNAV, the VNAV cues help you meet altitude constraints outside the FAF. For more information about the VNAV cues that appear on external PFDs, see the guides for your PFD.
- VNAV is not available after the FAF.
- If you are flying an approach with approved or advisory vertical guidance, the appropriate RNAV glidepath or ILS glideslope vertical deviation indicator appears on your PFD or HSI as you intercept the vertical path at or near the FAF.
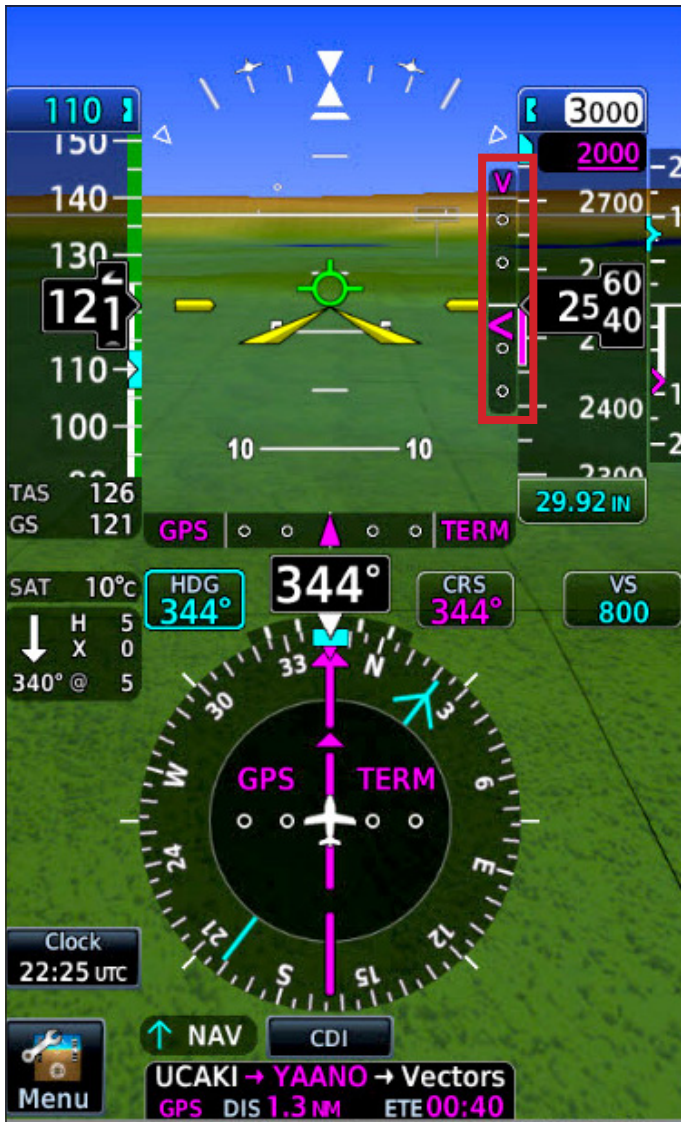
VNAV with the vertical glidepath deviation indicators (above left) is different than glidepath indicators you see when flying approaches (above right). Globally speaking, VNAV is for guidance before final approach and glidepaths are for final approach, although they appear before the final approach fix. Different PFDs will indicate this differently. Study the differences for your system.

Other GTN Features and Customization

The GTN includes several "bonus" features. For example, depending on the optional equipment connected to the GTN in your aircraft, you can overlay weather and traffic on the Map page. You can also use the utilities in the GTN to:

- Perform basic navigation and aviation-related calculations.
- Estimate the fuel required for a flight and monitor fuel use during a flight.
- Schedule reminder messages, for example, to switch fuel tanks.

The GTN Home page is the top-level menu.

Display the Home page and select a feature

1. PRESS the HOME button in the upper-right corner of the bezel.
2. TOUCH the icon for the feature you want to use. Scroll down to see all the buttons.

You use the Map Menu to control the types of information that appear on the Map page and customize the User data fields in the four corners of the display.

Customize the Map page
1. On the Home page, TOUCH the Map icon.
2. On the Map page, TOUCH Menu.
3. In the Map Menu, TOUCH the labels to turn on or off the types of information you want overlaid on the Map.
   a. TOPO displays or hides topographical data, such as populated areas, bodies of water, and highways.
   b. Terrain displays or hides color-coded elevation data. You cannot display terrain and NEXRAD data simultaneously.
   c. Airways displays or hides low- and high-altitude airways. TOUCH Airways, and in the Select Airway Levels window, TOUCH the types of airways you want to show on the Map, or TOUCH Off to remove all airways.
   d. Stormscope overlays lightning data if one is connected.
   e. Traffic overlays traffic data if a traffic system is connected

Quickly control detail shown on the map (declutter)
1. On the Map page, TOUCH Menu.
2. In the Map Menu, beside Map Detail, DRAG the vertical slider up or down to select the level of detail from Most to Least.

Configure the orientation and zoom levels on the map
1. On the Map page, TOUCH Menu.
2. In the Map Menu, TOUCH Map Setup,
3. In the Map Setup window:
   a. TOUCH the Map tab to set map features, such as the orientation (Track Up or North Up) and auto-zoom controls.
   b. TOUCH the Aviation tab to set how types of airport and other aviation data (such as intersections, navaids, and TFRs) appear on the map.
   c. TOUCH the Land tab to set the detail of topographic data shown on the map, such as the types of roads, state names, and information about lakes and rivers.
   d. TOUCH Airspace to set the types of airspace boundaries that appear on the map. The Smart Airspace feature, available with GTN system software 5.1 and later, dims the boundaries of airspace well above or below your current altitude.
   e. TOUCH Traffic to set the features of the optional traffic overlays on the map.
   f. TOUCH Weather to set the source of optional weather overlays on the map.
      For all features, TOUCH the Up and Down arrows to see all the options. To restore the default display of aviation data, TOUCH Restore Defaults.

Customize the User fields on the Map page
You can customize the User fields in the four corners of the map. This gives you the data you want, or quick access to specific functions or screens.

TIP
For a complete list of the details associated with each level, see "9.1.4 Map Detail" in the GTN 625/635/650 Pilot's Guide.
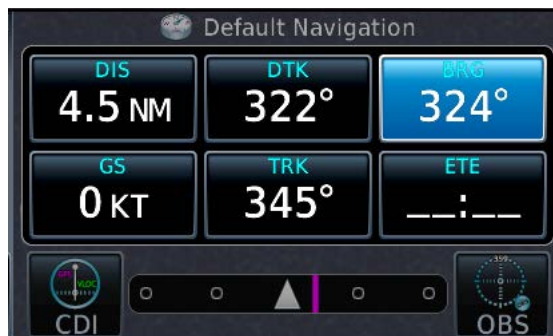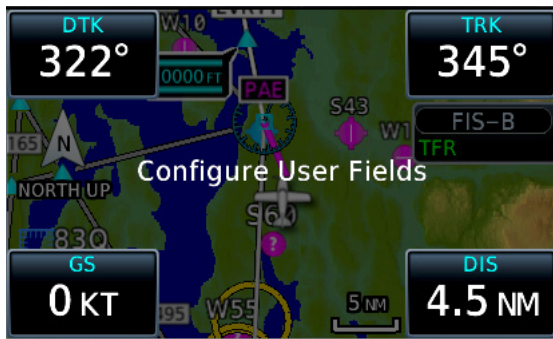
1. On the Map page, TOUCH Menu.
2. In the Map Menu, TOUCH Change User Fields.
3. TOUCH the map corner containing the field you want changed.
4. In the Select User Field window:
    a. To display a type of information in the field, TOUCH the Data tab, and then TOUCH the type of information you want to appear in the field.
    b. To display a GTN function for quick access, TOUCH the Function tab, and then TOUCH the feature or control that you want to appear in the field.
    c. To use the field for quick access to a page, such as traffic or waypoint information, TOUCH Page, and then TOUCH the page you want quick access to from the map.
5. TOUCH Back and repeat steps 3–4 for each field that you want to customize.
6. TOUCH Back twice to return to the map.

Customize the User fields on the Default Navigation page

You can customize the six User fields on the Default Navigation page.
1. On the Default Navigation page, TOUCH Menu.
2. In the Default Navigation Menu, TOUCH Configure User Fields.
3. TOUCH the field you want changed.
4. In the Select User Field window:
    a. To display a type of information in the field, TOUCH the Data tab, and then TOUCH the type of information you want in the field.
    b. TOUCH the desired data type.
    c. To display a GTN function for quick access, TOUCH the Function tab, and then TOUCH the feature or control that you want to appear in the User field.
    d. To use the field for quick access to a page, such as traffic or waypoint information, TOUCH the Page tab, and then TOUCH the page you want quick access to.
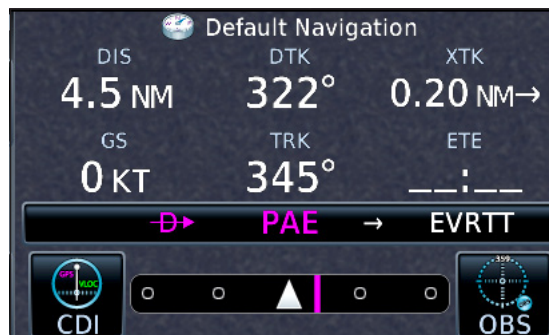
> **TIP**
> User fields can be replaced with shortcuts to other GTN functions or pages.

5. TOUCH Back and rRepeat steps 3–4 for each field that you want to customize.
6. TOUCH Back to return to the map.

Adjust traffic options

If you have a source of traffic information, such as ADS-B or TCAS, connected to the GTN, you can control the traffic display in the Traffic Menu. For a complete list of the details associated with various traffic systems and the GTN, see "9.3.2 Traffic Page" in the GTN 625/635/650 Pilot's Guide.

1. PRESS the [HOME] button in the upper-right corner of the bezel.
2. On the Home page, TOUCH Traffic.
3. On the Traffic page, TOUCH Menu.
4. In the Traffic Menu, TOUCH the options available with your traffic system.

Adjust terrain options

The GTN includes a core terrain/obstacle database. A variety of optional databases and features are available, depending on the equipment connected to your GTN and the type of aircraft you fly. For a complete list of the terrain databases and features available with the GTN, see "10 Terrain" in the GTN 625/635/650 Pilot's Guide.

1. PRESS the [HOME] button in the upper-right corner of the bezel.
2. On the Home page, TOUCH Terrain.
3. On the Terrain page, TOUCH Menu.
4. In the Terrain Menu, TOUCH the options available for your terrain system.

Adjust weather display and options

The GTN can display weather information from a variety of sources, including ADS-B, SiriusXM, and Stormscope. The types of data you can overlay on the map or display on separate weather pages depends on the optional equipment connected to your GTN. For a complete list of weather information and features available with the GTN, see "12 Weather" in the GTN 625/635/650 Pilot's Guide.

1. PRESS the [HOME] button in the upper-right corner of the bezel.
2. On the Home page, TOUCH the Weather icon.
3. On the Weather page, TOUCH the icon for the type of weather information available on your GTN.
4. In the window associated with the type of weather information that you selected, TOUCH menu and then TOUCH the available options and controls.

The nearest feature can display information about the nearest airport, waypoint, airspace, or frequencies.

View nearest airports, intersections, VORs, and more

1. PRESS the [HOME] button in the upper-right corner of the bezel.
2. On the Home page, TOUCH Nearest.
3. On the Nearest page, TOUCH the button for the type of information you want to review. Scroll to see the entire list.
4. Information about the nearest airport, navaid, etc., appears in a list for that type of waypoint or facility.
   a. To navigate direct-to a waypoint in the list, TOUCH its name and then PRESS the [-D-] button, and then TOUCH Activate.
   b. To load a frequency for a VOR, ARTCC, FSS, ATIS, or ASOS, TOUCH the frequency in the list. The GTN loads the frequency into the com or nav STBY window.

> **TIP**
>
> For more information about controlling the information on the map, see "8.1.2 Map Setup" in the GTN 625/635/650 Pilot's Guide.

The Waypoint Info page can display information about any waypoint in the navigation database.

Find waypoint information
1. To display the Waypoint Info page, PRESS the `HOME` button in the upper-right corner of the bezel.
2. On the Home page, TOUCH Waypoint.
3. On the Waypoint Info page, TOUCH the icon for the type of waypoint you're interested in.
   a. TOUCH Airport, for the Airport window. TOUCH the tab corresponding to the type of information you want see.
   b. TOUCH Intersection, VOR, or NDB, or User Waypoint, to view information about that type of waypoint.
   c. To find information about any waypoint of that type, in the Waypoint Info window, TOUCH the name of the displayed waypoint.
   d. In the Waypoint Identifier window, use the keypad or TOUCH Find to enter the name of a new way-point and TOUCH Enter.
4. To create a new user waypoint, TOUCH Create Waypoint. For more information about creating user waypoints, see "Using User Waypoints" earlier in this manual.

Use optional services
You can connect a GTN to many optional services, such as a telephone and satellite music channels. The choices available on the Services page depend on the equipment and services that are connected to your GTN. For more information about these features, see "13 Services/Music" in the GTN 625/635/650 Pilot's Guide.

Using the GTN Utilities
The GTN includes a variety of utilities to help you plan trips, estimate fuel burn, perform E6B calculations, check RAIM, set up flight timers and messages, and record electronic logs onto SD cards. You can also use the Clean Screen utility to temporarily turn off the touch screen so that you can clean it.

View the Utilities page
1. PRESS the `HOME` button in the upper right corner of the bezel.
2. On the Home page, TOUCH Utilities.

VNAV and VCALC Options
If your GTN has system software 6.5 or later, you can view information about the current VNAV Profile and constraints. See "Using Vertical Navigation (VNAV) and Along-Track Offsets" earlier in this manual.

If your GTN is using system software prior to 6.5, or if you chose to retain the legacy VCALC (vertical calculator), VCALC appears on the Utilities page.

When flying an active flight plan or proceeding direct-to a waypoint, VCALC computes the required vertical speed and displays the time when you should start a descent to reach a specified altitude at or

near a waypoint location. VCALC is not available when ground-speed is less than 35 knots or after the FAF on an approach. When VCALC is active, the GTN displays messages on the navigation pages to alert you to begin a descent.

Use VCALC instead of VNAV
1. To display the Utilities page, PRESS the `HOME` button in the upper-right corner of the bezel.
2. On the Home page, TOUCH Utilities.
3. On the Utilities page, TOUCH VCALC.
4. In the Utilities–VCALC window, TOUCH Target ALT to specify an altitude, such as the traffic pattern altitude at the destination airport.
5. To specify an MSL or AGL (above WPT) altitude, TOUCH Altitude Type.
6. To set a preferred vertical speed, TOUCH VS Profile.
7. To specify an offset in nautical miles prior to or after the target waypoint, TOUCH Offset.
8. To change the waypoint, TOUCH Target Waypoint.
9. To return to the default settings for VCALC, TOUCH Menu and TOUCH Restore.
10. To enable or cancel VCALC messages, TOUCH Menu and TOUCH Display Messages.

View trip planning information
The Trip Planning page provides information about the active flight plan or direct-to flight, such as the distance remaining, ETE, and ETA.
1. To display the Utilities page, PRESS the `HOME` button in the upper-right corner of the bezel.
2. On the Home page, TOUCH Utilities.
3. On the Utilities page, TOUCH Trip Planning.
4. To view information about the current flight, TOUCH Mode to select either Flight Plan or Point to Point. (To view data only from the present position to the destination, TOUCH P.POS.)
5. To view trip planning data to waypoints other than the departure airport or destination, TOUCH From or To and use the keypad to enter a new waypoint name or names.
6. For more information, see "14.4 Trip Planning" in the GTN 625/635/650 Pilot's Guide.

View fuel planning information
If your GTN is connected to external fuel flow and fuel quantity sensors, the GTN can display information about the estimated fuel on board and the fuel required to reach the destination or a waypoint you specify. You can also review estimated fuel required for another flight plan stored in the catalog, a specific leg in the active flight, or from the present position to a waypoint you specify.
1. To display the Utilities page, PRESS the `HOME` button in the upper-right corner of the bezel.
2. On the Home page, TOUCH Utilities.
3. On the Utilities page, TOUCH Fuel Planning.
4. To use data from connected fuel sensors, TOUCH Use Sensor Data.
   a. If your GTN is connected to both fuel quantity and fuel flow sensors, it displays the estimated current fuel on board and fuel flow.
   b. If your GTN is connected to only a fuel flow sensor, you must enter the estimated fuel on board.
   c. If your GTN is not connected to fuel sensors, you must enter both the estimated fuel on board and fuel flow.

For more information, see "14.6 Fuel Planning" in the GTN 625/635/650 Pilot's Guide.

Use the DALT/TAS/Winds calculator

The GTN can calculate density altitude (DALT), true airspeed (TAS), and winds aloft, based on sensor data (if your GTN is connected to an external air data computer and a heading source) or information that you provide. For more information, see "14.6 DALT/TAS/Winds" in the GTN 625/635/650 Pilot's Guide.

1. PRESS the `HOME` button on the upper right of the bezel.
2. On the Home page, TOUCH Utilities.
3. On the Utilities page, TOUCH DALT/TAS/Winds.
   a. If your GTN is connected to the required external sensors, in the DALT/TAS/Winds window, TOUCH Use Sensor Data.
   b. If your GTN is not connected to the required external sensors, in the DALT/TAS/Winds window, TOUCH each item that requires data and use the keypad to enter the appropriate information.
4. The GTN shows the calculated information below the data.

Check RAIM

The GTN is a WAAS-capable navigator, and checking RAIM is not required if you are operating within the WAAS service area. Outside of WAAS coverage, you can verify that RAIM will be available for a trip.

1. To display the Utilities page, PRESS the `HOME` button in the upper-right corner of the bezel.
2. On the Home page, TOUCH Utilities.
3. On the Utilities page, TOUCH RAIM Prediction.
4. To specify the arrival waypoint, TOUCH Waypoint and use the keypad to enter a waypoint name.
5. To specify the arrival date and time, TOUCH Arrival Date and then Arrival Time to enter the details.
6. To compute RAIM, TOUCH Compute RAIM.

Set a generic timer to count up or down

You can set a generic timer and a trip timer, with various options. You can also set the criteria for the departure time to track flight time.

1. PRESS the `HOME` button on the bezel.
2. On the Home page, TOUCH Utilities.
3. On the Utilities page, TOUCH Flight Timers.
4. To set a generic count-up or count-down timer, TOUCH Direction.
   a. If you specified a count-down timer, TOUCH Preset and use the keypad to enter the duration of the timer.
   b. To start the timer, TOUCH Start.
   c. To stop a running timer, TOUCH Stop.

Set a Trip Timer

1. PRESS the `HOME` button on the bezel.
2. On the Home page, TOUCH the Utilities icon.
3. On the Utilities page, TOUCH the Flight Timers icon.
4. TOUCH Criteria to select either Power On or In Air (groundspeed greater than 35 knots) as the starting condition.
5. To reset a Trip Timer, TOUCH Reset Timer.

> **TIP**
>
> The requirements for non-precision approaches specify significantly better satellite coverage than other phases of flight. The GTN automatically monitors RAIM during approach operations. If RAIM is not available, the GTN warns you, and you must fly a conventional approach. RAIM cannot predict the WAAS availability. The FAA publishes NOTAMs if approaches that require vertical guidance may not be available. For more information about RAIM and WAAS availability, see AIM 1–1–17 Global Positioning System (GPS) and AIM 1–1–18. Wide Area Augmentation System (WAAS).

Set a Departure Time clock
1. PRESS the [HOME] button on the bezel.
2. On the Home page, TOUCH Utilities.
3. On the Utilities page, TOUCH Flight Timers.
4. TOUCH Criteria to select either Power On or In Air (groundspeed greater than 35 knots) as the starting condition.
5. To reset the Departure Time clock, TOUCH Reset Time.

Create or edit a scheduled message
You can use the Scheduled Messages utility to create messages, such as reminders to switch fuel tanks.
1. PRESS the [HOME] button in the upper-right corner of the bezel.
2. On the Home page, TOUCH Utilities.
3. On the Utilities page, TOUCH Scheduled Messages.
4. In the Utilities–Scheduled Messages window, TOUCH Create Scheduled Message.
5. To enter the message text, TOUCH Message, and use the keypad to enter the text and then TOUCH Enter.
6. To specify the message type, TOUCH Type in the Select Message Type window, TOUCH Event, One Time, or Periodic.
   a. If you TOUCH Event, TOUCH Time and Date to enter the time and date to trigger the message.
   b. If you TOUCH One Time or Periodic, TOUCH Timer and enter the countdown time to trigger the message.

**Use the Clean Screen utility**
This utility temporarily makes the touchscreen inactive so that you can clean it without changing data or settings.
1. PRESS the [HOME] button on the bezel.
2. On the Home page, TOUCH Utilities.
3. On the Utilities page, TOUCH Clean Screen.
4. To exit the Screen Cleaning Mode, PRESS the [HOME] button

Configuring the GTN
You can use the System page to check the status of the GTN and its connected components, verify information about the GPS receiver, and change some system settings.

For more information about the options on the System page, see "15 System" in the GTN 625/635/650 Pilot's Guide.
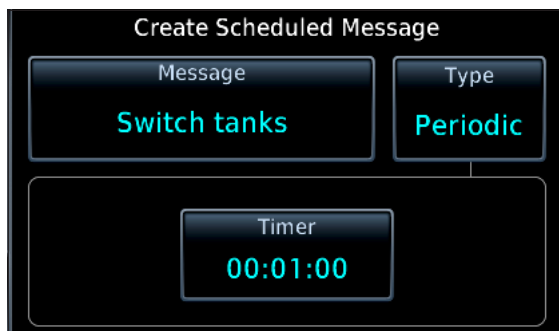
Check the GTN system status
1. PRESS the [HOME] button in the upper-right corner of the bezel.
2. On the Home page, TOUCH System.
3. On the System page, TOUCH System Status.

In the System-System Status window, you can review the GTN serial number and system ID, the current software versions, and information about the databases.

Check the GPS status and position accuracy
1. To display the Utilities page, PRESS the [HOME] button in the upper-right corner of the bezel.
2. On the Home page, TOUCH System.
3. On the System page, TOUCH GPS Status.

Check the status of external devices connected to the GTN

1. PRESS the `HOME` button in the upper-right corner of the bezel.
2. On the Home page, TOUCH System.
3. On the System page, TOUCH External LRUs.

Configure the CDI scale, date/time format, keyboard type, and other settings

1. PRESS the `HOME` button in the upper-right corner of the bezel.
2. On the Home page, TOUCH System.
3. On the System page, TOUCH Setup
   a. CDI: TOUCH CDI Scale (normally Auto) and TOUCH 0.30 NM, 1.00 NM, 2.00 NM, or Auto.
   b. CDI: TOUCH ILS CDI Capture. TOUCH to toggle between Auto Switch and Manual Selection. (This setting is not available with all external PFDs and autopilots. Check with an avionics technician before changing the default setting for your installation.)
   c. Date/Time: TOUCH Time Format to select Local 12 hour, Local 24 hour, or UTC (no offset).
   d. Nearest Airport: TOUCH to specify the criteria used to display nearest airports. You can specify the runway surface (Any, Hard Only, Hard/Soft, and Water); a minimum runway length between 0 and 25,000 feet.
   e. Com/Nav: TOUCH COM Channel Spacing. TOUCH to toggle between 8.33 kHz (used in Europe) and 25.0 kHz.
   f. Com/Nav: TOUCH Reverse Frequency Lookup. Select On or Off. The identifier and frequency type are shown for the nearest stations in the database. Identifiers with a "+" sign have multiple stations associated with a frequency.
   g. Keyboard: TOUCH to toggle between the QWERTY and ABC keyboard.
   h. Crossfill: TOUCH to toggle between On or Off (if dual GTN units are installed).

Configure airspace and waypoint arrival alerts

1. PRESS the `HOME` button in the upper-right corner of the bezel.
2. On the Home page, TOUCH System.
3. On the System page, TOUCH Alerts.
4. In the System-Alerts window, TOUCH Airspace Alerts:
   a. TOUCH the labels for types of airspace for which you want to receive alerts.
   b. TOUCH Altitude Buffer to change the altitude buffer for airspace alerts.
   c. TOUCH Back to return to the System–Alerts window.
5. In the System-Alerts window:
   a. TOUCH Arrival to toggle the arrival alerts on or off.
   b. TOUCH Proximity to set the distance from the waypoint that triggers the alert.

Change the default units

1. PRESS the `HOME` button in the upper-right corner of the bezel.
2. On the Home page, TOUCH System.
3. On the System page, TOUCH Units.
4. In the System-Units window, TOUCH the type of unit, and TOUCH the option you prefer.

Change system audio volume

1. PRESS the `HOME` button in the upper-right corner of the bezel.
2. On the Home page, TOUCH System.
3. On the System page, TOUCH Audio.
4. In the System-Audio window, TOUCH the left and right arrows to decrease or increase the system volume.

Adjust the GTN backlight level

1. PRESS the `HOME` button in the upper-right corner of the bezel.
2. On the Home page, TOUCH System.
3. On the System page, TOUCH Backlight.
4. In the Backlight window, TOUCH the left or right arrows to adjust the manual offset from the normal 100-percent level.

> **TIP**
>
> Other options, such as Connext Setup and Voice Commands, that appear on the System page depend on optional equipment connected to your GTN. For more information about these options, see the guides provided by your avionics shop or avionics technician.

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