GPS 400

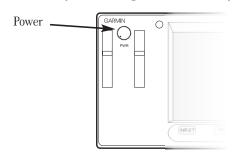


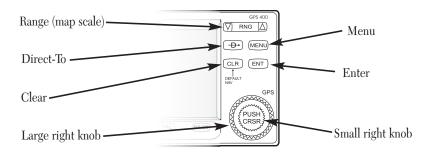
Quick Reference



KEYS AND KNOBS

Unit Keys and Knobs (excluding bottom row)





The Power knob () controls unit power. Rotate clockwise to turn the unit on.

The range key (RNG) allows you to select the desired map scale. Use the up arrow side of the key to zoom out or the down arrow side to zoom in.

The direct-to key () allows you to enter a destination waypoint and establish a direct course to the selected destination.

The menu key (MENU) displays a context-sensitive options list. The options list allows you to make settings changes which relate to the currently displayed page.

The clear key (CLR) is used to erase information or cancel an entry. Press and hold this key to immediately display the Default Navigation Page.

The enter key (ENT) is used to approve an operation or complete data entry. It is also used to confirm information, such as during power on.

The large right knob () is used to select between the various page groups: NAV, WPT, AUX or NRST. With the on-screen cursor enabled, the large right knob allows you to move the cursor about the page.

The small right knob (a) is used to select between the various pages within one of the groups listed above. Press this knob momentarily to display the on-screen cursor. The cursor allows you to enter data and/or make a selection from a list of options.

KEYS / POWER ON

Bottom Row Keys



The NRST key (NRST) displays the nearest airports page. Then, rotating the small right knob (ⓐ) steps through the NRST pages.

The OBS key (OBS) is used to select manual or automatic sequencing of waypoints. Pressing the OBS key selects OBS mode, which will retain the current "active to" waypoint as your navigation reference even after passing the waypoint (i.e., prevents sequencing to the next waypoint). Pressing the OBS key again will return to normal operation, with automatic sequencing of waypoints. Whenever OBS mode is selected, you may select the desired course to/from a waypoint using the external OBS selector on your HSI or CDI.

The message key (MSG) is used to view system messages and to alert you to important warnings and requirements.

The flight plan key (FPL) allows you to create, edit, activate and invert flight plans, as well as access approaches, departures and arrivals. A closest point to flight plan feature is also available from the flight plan key.

The procedures key (PROC) allows you to select and remove approaches, departures and arrivals from your active flight plan. When using a flight plan, available procedures for your departure and/or arrival airport are offered automatically. Otherwise, you may select the desired airport, then the desired procedure.

Powering on the GPS 400

- 1. Rotate the power knob () clockwise to turn the unit on.
- A welcome page appears briefly, followed by the land data page, as the unit conducts a self-test to ensure proper operation.
- 3. Once the self-test concludes, the database confirmation page is displayed, showing the effective and expiration dates of the Jeppesen database on the NavData® card. Press to acknowledge the database page and proceed to the instrument panel self-test page.
- 4. The instrument panel self-test page allows you to verify that the GPS 400 is communicating properly with inpanel instruments. Compare onscreen indications with the information depicted on the connected instruments, such as the CDI, HSI, RMI and/or external annunciators. Once you have verified proper operation, press to display the Satellite Status Page.









SCREEN LAYOUT / DATA ENTRY

Screen Layout (windows)



The GPS 400's display is divided into three separate "windows" (or screen areas). The left 1/4 of the display provides three user-defined data field windows. The right 3/4 of the display consists of a GPS window, which is where you'll find the various navigation, waypoint information and settings pages. The bottom of the display is used for annunciators.

Each unique screen of information is referred to as a "page". Pages are typically selected using the small (ⓐ) and large (⑥) right knobs—with the cursor removed from the GPS window. See the following page for details on arrangement of the GPS 400's main pages.

Cursor

The GPS window cursor is used to select the desired fields. Press the small right knob () to activate the cursor. Press again to deactivate it. Use the small () and large () right knobs to move the cursor around the data fields to select options and enter data.

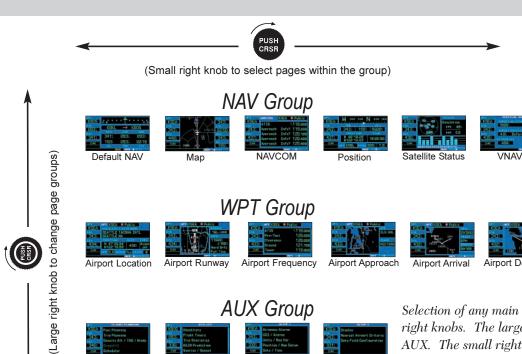
Data Entry

Data is entered in the GPS window using the large () and small () right knobs. The large right knob () is used to move the cursor about the page. The small right knob () is used to select individual characters for the highlighted cursor location (see illustration).

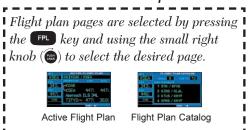




PAGE SELECTION



FPL Group



WPT Group



Airport Runway



















AUX Group



Utility





Selection of any main page is performed using the large (and small (a) right knobs. The large right knob () selects the page group: NAV, WPT or AUX. The small right knob (a) selects the desired page within a group. To quickly select the default NAV page, press and hold CLR

NRST Group



















Nearest Center

DIRECT-TO NAVIGATION

To Select a Direct-To Destination

- 1. Press the key. A select directto waypoint page will appear, with the waypoint identifier field highlighted.
- 2. Use the small () and large () right knobs to enter the identifier of the desired destination waypoint.



3. Press to confirm the selected waypoint, and to activate the direct-to function.

To Select a Direct-To Destination from the Map Page

- 1. Select the map page from the main page group. (See page 5.)
- 2. Press the small right knob () to display a panning pointer.
- 3. Rotate the small () and large () right knobs to place the panning pointer at the desired destination location.
- 4. If the panning pointer is placed on an existing airport, navaid or user waypoint, the waypoint name will be highlighted. Press and twice to navigate to the waypoint.
- 5. If the panning pointer is placed on an open location, press and twice to create a "+MAP" waypoint and navigate to it.

<u>To Select a Direct-To Destination by Facility Name or City</u>

1. Press the key. The select direct-to waypoint page will appear, with the waypoint identifier field highlighted.

- 2. Rotate the large () right knob to highlight the facility name (second line) or the city (third line) field.
- 3. Use the small () and large () right knobs to enter the facility name or city location of the desired destination waypoint. As you spell the facili-



- ty name or city, the GPS 400's Spell'N'Find feature will select the first entry in the database based upon the characters you have entered up to that point.
- 4. Continue rotating the small right knob () to scroll through any additional database listings for the selected facility name or city. You can also scroll backwards with the small right knob () if you scroll past the desired waypoint.
- 5. Press ENT to confirm the selected waypoint, and ENT to activate the direct-to function.

<u>To Select a Nearby Airport or a Flight Plan Waypoint as</u> a Direct-To Destination

- 1. Press the 🗪 key.
- 2. Rotate the large right knob () to highlight the nearest airport (NRST) or flight plan (FPL) field.
- 3. Rotate the small right knob () to display a window listing nearby airports or all waypoints in the active flight plan.
- 4. Continue rotating the small right knob () to scroll through the list and highlight the desired waypoint.
- 5. Press ENT to confirm the selected waypoint, and ENT to activate the direct-to function.

AIRPORT INFORMATION

Viewing Airport Information

- From any page, press and hold to select the default NAV page. (You may skip this step if you are already viewing any of the main GPS pages.)
- 2. Rotate the large right knob ((a)) to select the WPT page group. "WPT" will appear in the lower right corner of the screen.



- 3. Rotate the small right knob () to select the desired WPT page. Airport information is displayed on the first six WPT pages: airport location, airport runway, airport frequency, airport approach, airport arrival and airport departure.
- 4. Press the small right knob (a) to activate the cursor.
- 5. Use the small (ⓐ) and large (ⓐ) right knobs to enter the identifier of the desired airport.
- 6. Once the identifier is entered, the information for that airport will appear on the page.

 Press to accept the selected identifier.
- 7. To view the other airport information pages, press the small right knob () to remove the flashing cursor and rotate the small right knob () to select the desired page.

Viewing Airport Information by Facility Name or City

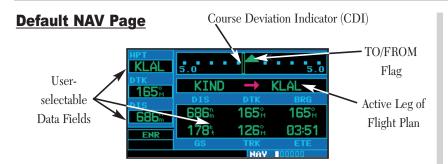
- 1. Select the airport location page. (See page 5.)
- 2. Press the small right knob () to activate the cursor.
- 3. Rotate the large right knob () to highlight the facility name (second line) or the city (third line) field.



- 4. Use the small () and large () right knobs to enter the facility name or city location of the desired destination waypoint. As you spell the facility name or city, the GPS 400's Spell'N'Find feature will select the first entry in the database based upon the characters you have entered up to that point.
- 5. Once the identifier is entered, the information for that airport will appear on the page.

 Press to accept the selected identifier.
- 6. To view the other airport information pages, press the small right knob () to remove the flashing cursor and rotate the small right knob () to select the desired page.

DEFAULT NAV PAGE



The following symbols are used (directly below the CDI) to depict the active leg of a flight plan or direct-to:

Course to a Waypoint, or Desired Course between Two Waypoints

Direct-To a Waypoint

Vectors-To-Final

Left-hand Holding Pattern

Procedure Turn

Right-hand Holding Pattern

Procedure Turn

DME Arc to the left

DME Arc to the right

To Quickly Display the Default NAV Page

1. From any page, press and hold for approximately two seconds.

To Select a Different Data Item for any Data Field

- 1. With the default NAV page displayed, press the key to display an options menu.
- 2. The "Change Fields?" option is already highlighted, so press to select this option.
- 3. Use the large right knob () to highlight the data field you wish to change.
- 4. Rotate the small right knob () to display the list of available data items. Continue rotating the small right knob () to select the desired data item from the list.
- 5. Press to select the desired data item and return to the default NAV page.
- Press the small right knob () momentarily to remove the cursor from the page.







MAP PAGE

Map Page



The following symbols are used to depict the various airports and navaids on the map page:

- Airport with hard surface runway(s); Primary runway shown
- Airport with soft surface runway(s) only
- **F** Private Airfield

Intersection

 \bigcirc VOR

VORTAC

VOR/DME

TACAN

 $lue{}$ DME

NDB

Localizer

Locator Outer Marker

To Select a Map Scale

- 1. Press the up arrow side of the A key to zoom out to a larger map area.
- 2. Press the down arrow side of the key to zoom in to a smaller map area and more detail.

To Quickly Declutter the Map Display

1. Press the CLR key momentarily (as often as needed) to select the desired amount of map detail. The declutter level will appear adjacent to the map scale.



To Turn the Data Fields Off and Display a Full Screen
Map

- 1. With the map page displayed, press to display an options menu.
- 2. Rotate the large right knob ((ⓐ)) to highlight "Data Fields Off?" and press



3. To re-display the data fields, follow steps 1 and 2, but instead select "Data Fields On?" from the options menu.

To Select a Different Data Item for any Data Field:

- 1. With the map page displayed, press the key to display an options menu.
- 2. The "Change Fields?" option is already highlighted. Press to select this option.
- 3. Use the large right knob () to highlight the data field you wish to change.
- 4. Rotate the small right knob () to display the list of available data items. Continue rotating the small right knob () to select the desired data item from the list.
- 5. Press **ENT** to select the desired data item and return to the map page.
- 6. Press the small right knob () momentarily to remove the cursor from the page.

NAVCOM PAGE / ANNUNCIATORS & MESSAGES



The *NAVCOM page* provides a list of the airport communication and navigation frequencies at your departure, enroute and arrival airports.

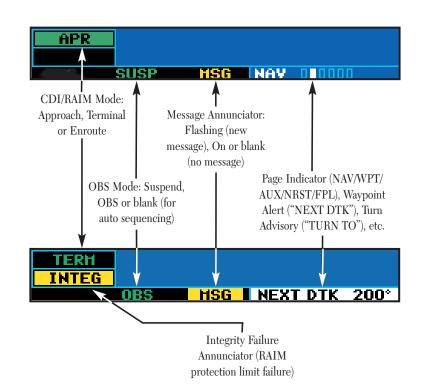
<u>To Select a Frequency List for a Departure, Enroute or Arrival Airport</u>

- 1. Press the small right knob () to activate the cursor.
- 2. Rotate the large right knob (ⓐ) to place the cursor on the airport identifier field (top line on the NAVCOM page).
- 3. Rotate the small right knob () to select the desired airport and press

To Scroll Through the List of Frequencies

- 1. Activate the cursor, if not already active, by pressing the small right knob (a).
- 2. Rotate the large right knob (ⓐ) to move the cursor through the list of frequencies. If there are more frequencies in the list that can be displayed on the screen, a scroll bar along the right-hand side of the screen will indicate which part of the list is currently being displayed. (COM and NAV frequencies are shown for reference only.)
- 3. Highlight "Done?" and press to return to the previous page.

Bottom Row Annunciators and Messages



NEAREST AIRPORTS

To View a List of the Nearest Airports

A list of the nearest airports can be selected by pressing the (NRST) key or by scrolling through the pages using the large and small right knobs. (See page 5.)

- 1. Rotate the large right knob () to select the NRST page group. "NRST" will appear in the lower right corner of the screen.
- 2. If necessary, rotate the small right knob () to select the nearest airport page.



To Scroll Through the List of Nearest Airports

- 1. Press the small right knob () to activate the cursor.
- 2. Rotate the large right knob () to scroll through the list. The scroll bar along the right-hand side of the page will indicate which part of the list is currently being viewed.
- 3. To remove the flashing cursor, press the small right knob (a).

To View Additional Information for a Nearby Airport

- 1. Highlight the identifier of the desired airport by scrolling through the list, as described in the procedure above.
- 2. Press to display the airport location page for the selected airport.



3. To view additional WPT pages for the selected airport (including the airport runway and airport frequency pages) press the small right knob () to remove the flashing cursor. Rotate the small right knob () to display the additional WPT pages. When finished, press the small right knob () to return the flashing cursor to the screen.



4. To return to the nearest airport page, verify that "Done?" is highlighted by the flashing cursor and press ENT (or press CLR)

To Select a Nearby Airport as a Direct-To Destination

- 1. Press to display the select direct-to waypoint page.
- 2. Rotate the large right knob () to place the flashing cursor on the nearest airport (NRST) field.
- 3. Rotate the small right knob () to display a window, listing up to nine nearest airports.



- 4. Continue rotating the small right knob (a) to highlight the desired airport.
- 5. Press ENT to accept the selected waypoint's identifier and press ENT a second time (with "Activate?" highlighted) to begin navigating to the selected wavpoint.

FLIGHT PLANS

To Create a New Flight Plan

- 1. Press FPL and rotate the small right knob () to display the flight plan catalog.
- 2. Press MENU to display the flight plan catalog options.

3. Rotate the large right knob ((a)) to highlight "Create New Flight Plan?" and press ENT.

KTUS

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939%

ENR

4. A blank flight plan page will appear for the first empty storage location. Use the small () and large () right knobs to enter the identifier of the departure waypoint and press ENT.



Activate Flight Plan?

Delete Flight Plan?

Invert Flight Plan? Select Approach?

Copy Flight Plan?

Create New Flight Plan?

5. Repeat step #4 above to enter the identifier for each additional flight plan waypoint. Once all waypoints have been entered, press the small right knob () to return to the flight plan catalog.

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ENR

To Navigate a Flight Plan

- 1. Press PPL and rotate the small right knob (a) to display the flight plan catalog.
- 2. Press the small right knob () to activate the cursor and rotate the large right knob () to highlight the desired flight plan.
- 3. Press MENU to display the flight plan catalog options.
- 4. Rotate the large right knob () to highlight "Activate Flight Plan?" and press

To Stop Navigating a Flight Plan

- 1. Press and rotate the small right knob (ⓐ), if necessary, to display the active flight plan page.
- 2. Press MENU to display the active flight plan options.





To Edit a Flight Plan

- 1. Press FPL and rotate the small right knob () to display the flight plan catalog.
- 2. Press the small right knob () to activate the cursor.
- 3. Rotate the large right knob () to highlight the desired flight plan and press
- 4. To add a waypoint to the flight plan: Rotate the large right knob () to select the point where you wish to add the new waypoint. (If an existing waypoint is highlighted, the new waypoint will be placed directly in front of this waypoint.) Use the small () and large () right knobs to enter the identifier of the new waypoint and press
- 5. To delete a waypoint from the flight plan: Rotate the large right knob ((a)) to select the waypoint you wish to delete and press to display a "remove waypoint" confirmation window. With "Yes" highlighted, press to remove the waypoint.
- 6. Once all changes have been made, press the small right knob () to return to the flight plan catalog.

APPROACHES

Selecting Approaches

- 1. Press the PROC key to display the procedures page.
- 2. Rotate the large right knob (to highlight "Select Approach?" and press ENT.
- 3. A window will appear listing the available procedures. Rotate the large right knob () to highlight the desired procedure and press ENT.
- 4. A second window will appear listing the available transitions. Rotate the large right knob () to highlight the desired transition waypoint and press option assumes you will receive vectors to the final course segment of the approach and will provide navigation guidance relative to the final approach course.)







5. Rotate the large right knob ((a)) to highlight "Load?" or "Activate?" and press ("Load?" will add the procedure to the flight plan without immediately using it for navigation guidance. This allows you to continue navigating the original flight plan, but keeps the procedure available on the active flight plan page for quick activation when needed.)

 For precision approaches and some non-precision approaches, a reminder window will appear indicating that GPS guidance on such approaches is strictly for monitoring only—use the external navigation receivers and CDI (or HSI) for prima-



ry navigation. To confirm this reminder, highlight "Yes?" and press

Not all approaches in the database are approved for GPS use. As you select an approach, a " GP_S " designation to the right of the procedure name indicates the procedure can be flown using the GPS receiver. Some procedures will not have this designation, meaning the GPS receiver may be used for supplemental navigation guidance only.

A selected approach may be *activated* or *loaded*. Activating the approach overrides the "enroute" portion of the active flight plan, proceeding directly to the "approach" portion (for a full approach, directly to the initial approach fix). Activating the approach also initiates automatic CDI scaling transitions as the approach progresses.

In many cases, it may be easiest to "Load" the full approach while still some distance away, enroute to the destination airport. Later, if vectored to final, use the following steps to select "Activate Vector-To-Final"— which makes the inbound course to the FAF waypoint active. Otherwise, activate the full approach using the "Activate Approach?" option.

APPROACHES

Activating an Approach

- 1. With the procedures page displayed, rotate the large right knob ((a)) to highlight "Activate Approach?" and press
- 2. A confirmation window will appear.
 With "Yes?" highlighted, press ENT.



Another procedures page option allows you to activate the final course segment of the approach. This option assumes you will receive vectors to the final approach fix (FAF) and guides you to intercept the final course, before reaching the FAF.

Activating an Approach with Vectors-To-Final

- With the procedures page displayed, rotate the large right knob ((a)) to highlight "Activate Vector-To-Final?" and press [ENT].
- 2. A confirmation window will appear.
 With "Yes?" highlighted, press



Flying an Approach

Due to the variety of available approach procedures, the specific steps required will vary according to the approach selected. Keep the following general guidelines in mind while flying the approach:

- You will typically select the destination airport as the last waypoint in the active flight plan or using the key. Doing so ensures that the desired waypoint will automatically appear when choosing the "Select Approach?" option from the *procedures page*. (Otherwise, you must first choose the airport, then the approach procedure.)
- As you progress to each approach waypoint, a waypoint alert message ("NEXT DTK ###°") will appear in the lower right corner of the display. (See page 10.)
- When you should begin a course change (via a standard rate turn), turn advisories ("TURN TO ###°") will appear in the lower right corner of the display. (See page 10.)

APPROACHES / MISSED APPROACH

- For GPS-based approaches, receiver autonomous integrity monitoring (RAIM) will monitor satellite conditions and alert you—using an "INTEG" annunciation at the bottom left corner of the display (see page 10)—if protection limits cannot be maintained. If this occurs, the GPS receiver cannot be used for primary navigation guidance, a missed approach should be initiated and select either 1) an alternate navigation source for another approach to the same airport, or 2) an alternate airport.
- Within 30 nautical miles of the destination airport, CDI scaling will transition from 5.0 nautical miles (enroute mode; or "ENR") to 1.0 nautical mile (terminal mode; or "TERM")—or when leaving the departure airport, from 1.0 nm to 5.0 nm. Within 2.0 nautical miles of the final approach fix, GPS-based approaches will see a second transition from 1.0 nautical mile to 0.3 nautical mile (approach mode; or "APR")
- A "PROC TURN OK" prompt will appear in the lower right corner of the display to advise you when you are at a safe distance to initiate a procedure turn. The procedure turn is displayed on the map page, but guidance through the turn itself is not provided.
- Alerts for proper holding pattern entry (e.g. "HOLD DIRECT") are displayed in the lower right corner of the display. Waypoint sequencing is automatically suspended (indicated by "SUSP" directly above the best key) at the holding waypoint. Press the best key again to return to automatic waypoint sequencing. For course reversals, waypoint sequencing is suspended for one trip around the holding pattern only (after which it will return to automatic waypoint sequencing).

• The CDI will guide you through a DME arc. Just keep the needle centered as you fly along the arc. When using an autopilot, the course select on the CDI (or HSI) must be periodically updated with the desired track (DTK).

• As you cross the missed approach point, "SUSP" will appear above the OBS key, indicating that automatic sequencing of waypoints is suspended at the missed approach.

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suspended at the missed approach point, and a "from" indication will appear on the CDI (or HSI).

Flying the Missed Approach

1. Press the OBS key. The next waypoint in the approach is automatically offered as the destination waypoint.



- 2. Follow the missed approach procedures, as published on your approach plate, for proper climb and heading instructions.
- 3. An alert message in the lower right hand corner of the screen will recommend entry procedures for the holding pattern (e.g., "HOLD DIRECT"). As you fly the holding pattern, a timer appears on the default NAV page. The timer automatically resets on the outbound side of the hold when you are abeam the hold waypoint. The timer again resets as you turn inbound (within approximately 30° of the inbound course).
- 4. When leaving the holding pattern to re-fly the approach (or another approach) press the PROC key to "Select Approach?" or "Activate Approach?" as previously described. (Or, use the key to select another destination.)





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