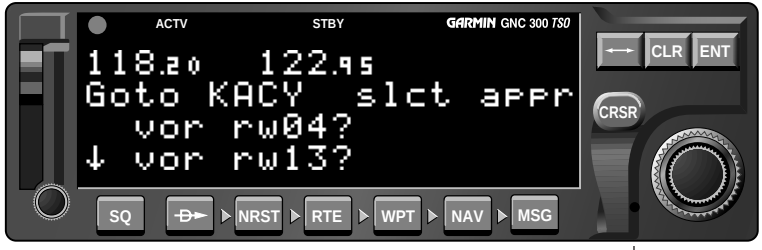
OWNER'S MANUAL
& REFERENCE



GNC 300™ Pilot's Guide

GARMIN®

Software Version 2.04 or above

1200 East 151st Street, Olathe, KS 66062, USA

GARMIN (Europe) LTD, Unit 5, The Quadrangle, Abbey Park Industrial Estate, Romsey, U.K. SO51 9AQ

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May 1996 190-00067-00 Rev. A Printed in USA

NOTE: *This device complies with Part 15 of the FCC limits for Class B digital devices. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Furthermore, there is no guarantee that interference will not occur in a particular installation.*

If this equipment does cause harmful interference, the user is encouraged to try to correct the interference by relocating the equipment or connecting the equipment to a different circuit than the affected equipment. Consult an authorized dealer or other qualified avionics technician for additional help if these remedies do not correct the problem.

Operation of this device is subject to the following conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The GARMIN GNC 300 does not contain any user-serviceable parts. Repairs should only be made by an authorized GARMIN service center. Unauthorized repairs or modifications could void your warranty and authority to operate this device under Part 15 regulations.

CAUTION

The Global Positioning System is operated by the United States government, which is solely responsible for its accuracy and maintenance. The system is subject to changes which could affect the accuracy and performance of all GPS equipment. Although the GARMIN GNC 300 is a precision electronic NAVigation AID (NAVAID), any NAVAID can be misused or misinterpreted and therefore, become unsafe.

Use the GNC 300 at your own risk. To reduce the risk of unsafe operation, carefully review and understand all aspects of this Owner's Manual and thoroughly practice using the simulator mode prior to actual use. When in actual use, carefully compare indications from the GNC 300 to all available navigation sources, including the information from other NAVAIDS, visual sightings, charts, etc. For safety, always resolve any discrepancies before continuing navigation.

The altitude calculated by the GNC 300 is geometric height above mean sea level and could vary significantly from altitude displayed by pressure altimeters in aircraft. **Never** use GPS altitude for vertical navigation.

The Jeppesen database incorporated in the GNC 300 must be updated regularly in order to ensure that its information is current. Updates are released every 28 days. A database information packet is included in your GNC 300 package.

Pilots using an out-of-date database do so entirely at their own risk.

Accessories & Packing List

Congratulations on choosing the finest, most full-featured panel mount IFR GPS COM available. The GNC 300 represents GARMIN's commitment to provide an accurate, easy-to-use GPS for all of your aviation needs.

Before installing and getting started with your unit, please check to see that your package includes the following items. If any parts are missing or damaged, please see your GARMIN dealer immediately.

Standard Package:

- GNC 300 unit & NavData® Card
- GPS Antenna
- Aviation Installation Kit
- Pilot's Guide & Quick Reference Guide
- Database Subscription Packet
- Warranty Registration Card

Optional Accessories

- AC Adapter
- Personal Computer Interface Kit
- User Data Card
- 28 to 14 volt DC converter
- MD-41 External Switch/Annunciator

To obtain accessories for your GNC 300, please contact your nearest GARMIN dealer.

Warranty

To obtain warranty service, see your local dealer or call the GARMIN Customer Service department for a returned merchandise tracking number. The unit should be securely packaged with the tracking number clearly marked on the outside of the package, and sent freight prepaid and insured to a GARMIN authorized warranty service facility.

Every GARMIN GPS is built to exacting standards to provide years of trouble-free service. GARMIN warrants this product to be free from defects in materials and workmanship for one year from the date of purchase.

GARMIN International, Inc. will at its sole option, repair or replace any components which fail in normal use. Such repairs or replacement will be made at no charge to the customer for parts or labor. The customer is, however, responsible for any transportation costs. This warranty does not cover failures due to abuse, misuse, accident or unauthorized alteration or repairs. GARMIN International, Inc. assumes no responsibility for special, incidental, punitive or consequential damages, or loss of use.

THE WARRANTIES AND REMEDIES CONTAINED HEREIN ARE EXCLUSIVE, AND IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, INCLUDING ANY LIABILITY ARISING UNDER WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, STATUTORY OR OTHERWISE. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, WHICH MAY VARY FROM STATE TO STATE.

PART ONE: INTRODUCTION

PART TWO: REFERENCE

To quickly and easily locate information on specific tasks, please refer to the Index on page 125.

Table of Contents

GARMIN is fully committed to your satisfaction as a customer. If you have any questions regarding the GNC 300, please contact our customer service department at:

GARMIN International, Inc.
1200 East 151st Street
Olathe, KS 66062
(913) 397-8200
FAX (913) 397-0836

Key and Knob Functions

The power/volume knob controls unit power and radio volume.

SQ

The squelch button activates automatic squelch control.

D▶

The direct-to key performs an instant direct-to, allows you to enter a waypoint, and sets a direct course to the destination.

NRST

The nearest key is used to obtain information on the 9 nearest airports, VORs, NDBs, intersections, user waypoints and 2 nearest FSSs. The nearest key also accesses any active SUA information. See Section 4 for more information on the nearest waypoints.

RTE

The route key enables you to create, edit, activate and invert routes. Approach, search-and-rescue, parallel offset and closest point of approach are also performed using the route key. (Sections 5 and 6 for more information on routes).

WPT

The waypoint key is used to view information such as runways, frequencies, position and comments on airports, VORs, NDBs, intersections and user waypoints. (See Section 2 for more information on the database).

NAV

The navigation key is used to view navigation and position information. Planning operations are also performed using the NAV key. (See Section 1 for more information on navigation and planning operations).

INTRODUCTION

Key and Knob Functions

This manual will describe entering data using the ◉ and ◯ knobs. Experiment with them and become efficient in entering data with the concentric knobs. This will greatly reduce the amount of time required to navigate with the GNC 300.

The GNC 300 is designed to minimize keystrokes when performing operations. There are typically several ways to perform the same operation. In general, using the knobs will decrease keystrokes and time spent using the GNC 300. Experiment to find the most effective way to use the GNC 300 to your advantage.

CRSR The cursor key is used to activate or deactivate the cursor in the separate areas of the GNC 300. Pressing CRSR once will activate the cursor in the comm 'window' and enable the pilot to change frequencies. Pressing CRSR again will activate the cursor in the nav window (indicated by flashing characters in a nav window field). It is used to highlight fields for data entry, changing information, or cycling through available options.

◄ ► The arrow key flip-flops the active and standby frequencies.

CLR The clear key is used to erase information or cancel an entry.

MSG The status key is used to view receiver and satellite status, as well as system messages. The MSG key is also used to access the GNC 300's settings.(See Appendix A for more information on receiver status).

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

The outer knob is used to advance through pages, advance the cursor, or move through data fields.

The inner knob us used to change data or scroll through information that cannot fit on the screen all at once.

TAKEOFF TOUR

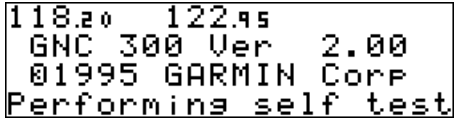
Power On

The GARMIN GNC 300 is a powerful navigational tool that provides pilots with accurate navigational data and communication capability, along with non-precision approach certification in the IFR environment. The Takeoff Tour is designed to familiarize you with the operation of the GNC 300, including powering up the unit, changing frequencies, entering data and performing a simple direct-to, and a limited introduction to the 'Nearest' functions. In addition, this section also briefly covers the position, CDI and frequency pages available from the NAV key. These pages will be used for most of your in-flight navigation.

The Takeoff Tour assumes that the GPSCOM and antennas have been properly installed and you have not changed any of the GNC 300's default settings. If you have changed any of the factory default settings (position format, units of measure, selectable fields, etc.), the pictures used may not match your configuration. Prior to using your GNC 300 for the first time, we recommend that you taxi to a location that is well away from buildings and other aircraft so the unit can collect satellite data without interruption.

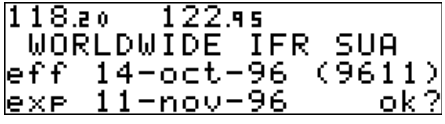
Powering up the GNC 300

The GNC 300's power and volume are controlled using the ◉ (power/volume) knob at the bottom left of the unit. Rotating it clockwise will turn the unit on and increase the radio volume. This knob also locks the NavData® card (included with your unit) in place so that it may not be removed during operation. After turning the unit on, a welcome page will be displayed while the unit performs a self test.



Welcome Page

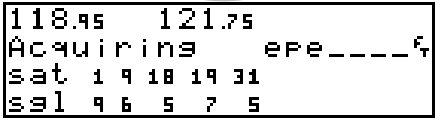
The database page will appear, showing the current database information on the NavData card, with the valid operating dates, cycle number and database type indicated. Databases are updated every 28 days and are available for one-time or subscription purchase.



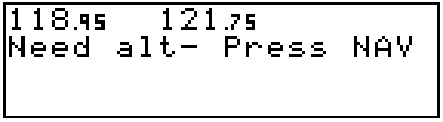
Database Confirmation Page

To acknowledge the database information:

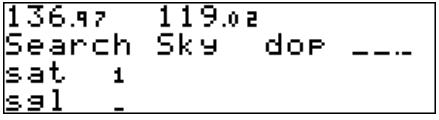
1. Press the ENT key.



Satellite Status Page



Enter the altitude manually if necessary.



Searching the Sky

Once the database has been acknowledged, the **satellite status page** will appear, and the GNC 300 will begin to collect satellite information. An 'Acquiring' status will be displayed on the Satellite Status page, and the signal values on the bottom line of the page will begin displaying numeric values. This is a good indication that you are receiving signals, and satellite lock will occur. Following the first-time use of your GNC 300, the time required for a position fix will vary- usually from 2 to 5 minutes.

If the unit can only obtain enough satellites for 2D navigation (no altitude), the unit will use the altitude provided by your altitude encoder (if one is connected and working). If not, you will be prompted to enter the altitude with a 'Need alt- Press NAV' message. If this message occurs, press the NAV key and use the ◉ and ◯ knobs to enter the altitude shown on your altimeter. Press ENT when finished.

If the GNC 300 has not been operated for a period of six months or has moved over 300 miles without actively tracking satellites, it may have to 'Search the Sky' to collect new data. This means the unit is acquiring satellite data to establish almanac and satellite orbit information, which can take 7 1/2 to 30 minutes. The Status page will display a 'Searching the Sky' status, and the message annunciator (▸), next to the MSG key, will also flash to alert you of a system message.

To view a system message:

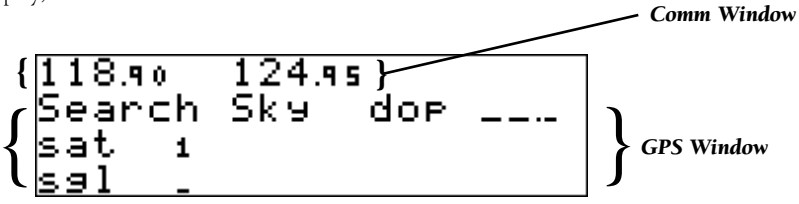
1. Press MSG.

The message page will appear and display the status or warning information applicable to the receiver's current operating condition.

To return to the previous page after viewing a message:

1. Press MSG.

While the GNC 300 is acquiring a position, let's take a minute to dial in the active and standby frequencies you'll be using for the first phase of your flight. The GNC 300's display can be broken down into two separate 'windows', the **comm window** (the top line of the display) and the **GPS window** (the bottom three lines of the display).



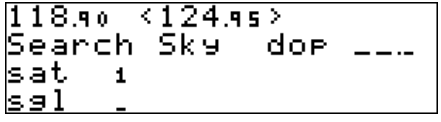
The CRSR key is used to activate the cursor in a particular window (see right) to provide access to various comm and navigation features. To select the active frequency, you must first enter the frequency in the standby field, and use the ◄ ► key to move it to the active field.

To change the standby communication frequency:

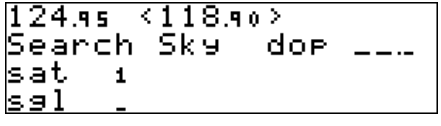
1. Press CRSR once to activate the cursor in the comm window.
2. Rotate the outer knob (◯) to select the MHz, and the inner knob (◉) to select the kHz of the desired frequency.

To place the standby frequency in the active field, press ◄ ►.

Once you've entered the active frequency, simply repeat steps 1 and 2 to enter the standby frequency. After both frequencies have been entered, you may elect to keep the comm window 'hot' by leaving the cursor on the standby frequency, or remove the cursor by pressing the CRSR key twice.



Status page with cursor active in comm window.

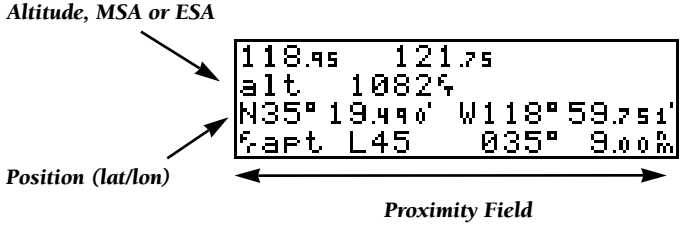


Switching the active and standby frequencies will not remove the cursor from the comm window.

TAKEOFF TOUR

Position Page

After the GNC 300 acquires satellites and computes a position, the **position page** will appear automatically, and you'll be informed with a 'Ready for navigation' message on the message page.



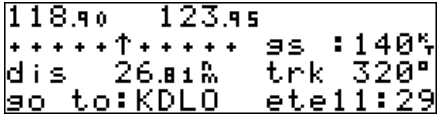
The position page displays your present latitude and longitude, altitude and a reference waypoint field; and is also used to enter the altimeter setting during approach operations. The altitude and reference waypoint fields are also selectable (see Section 1 for more information) to allow you to configure the unit to your own preferences. The default settings are:

- **Altitude—** Your present GPS altitude
- **Present Position—** Latitude and longitude displayed in degrees/minutes
- **Reference Waypoint—** The bearing and distance to the nearest airport

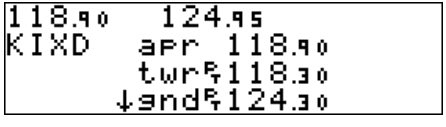
The position page is one of six pages available under the GNC 300's NAV key:

- **CDI page**
- **Position page**
- **NAV menu 1**
- **NAVCOM page**
- **Satellite status page**
- **NAV menu 2**

During most flights, the position, CDI (course deviation indicator) and NAVCOM pages will be the primary pages used for navigation. The pages available under each key are accessible by pressing the desired key and rotating the outer knob, or by pressing the NAV key repeatedly.



The CDI page with active destination.

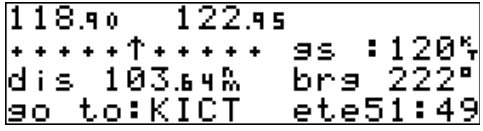


NAVCOM Page

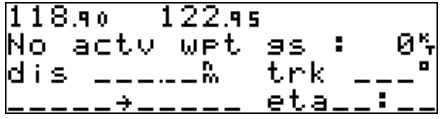
The GNC 300 uses direct point-to-point navigation to guide you from takeoff to touchdown in the IFR environment. Once a destination is selected, the unit will provide speed, course and distance data based upon a direct course from your present position to your destination. A destination can be selected from any page with the **direct-to (⇢) key**.

To select a direct-to destination:

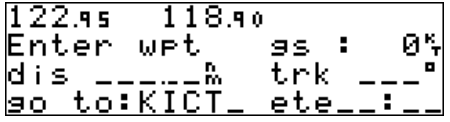
1. Press the ⇢ key. The CDI page will appear with the destination field flashing.
2. Rotate the ◉ knob to enter the first letter of the destination waypoint identifier. The destination waypoint may be an airport, VOR, NDB, intersection or user waypoint, as long as it is in the database or stored in memory as a user waypoint.
3. Rotate the ◯ knob to the right to move the cursor to the next character position.
4. Repeat steps 2 and 3 to spell out the rest of the waypoint identifier.
5. Press ENT to confirm the identifier. The direct-to confirmation page will appear (see right).
6. Press ENT to confirm the destination.



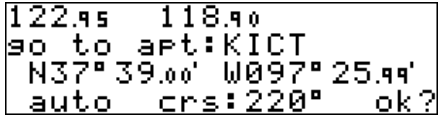
Once the direct-to destination is confirmed, the **CDI page** will appear with the destination indicated in the lower left hand corner of the screen. Your present speed and track over the ground, and the distance and estimated time enroute to your destination are also displayed. The graphical CDI, located at the top left of the screen, displays your position relative to the desired course and provides turn anticipation and waypoint messages during route navigation.



The CDI page without a direct-to destination.



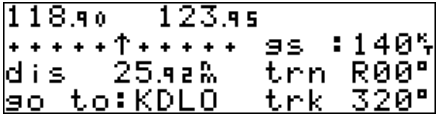
Entering the direct-to waypoint identifier.



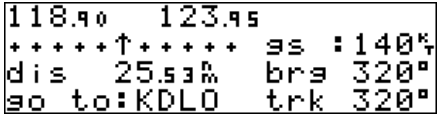
The direct-to confirmation page allows you to verify the destination's latitude/longitude, facility name or city/region by highlighting the position field and rotating the INNER knob.

TAKEOFF TOUR

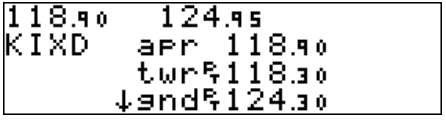
NAVCOM Page



CDI page with 'trn' and 'trk' displayed.



CDI page with 'brg' and 'trk' displayed.



NAVCOM Page

In addition to the destination field and graphical CDI, the GNC 300 CDI page features four selectable fields for various navigation data so that the page may be configured to your own preferences (see Section 1 for more information). The default settings for the CDI page are:

- **Ground Speed (gs)—** Your present speed over the ground in knots
- **Distance (dis)—** The distance to your destination in nautical miles
- **Track (trk)—** Your present course over the ground
- **Estimated Time Enroute (ete)—** The time to your destination based upon your present speed and course in hours and minutes

The next page available under the GNC 300's NAV key is the **navigation communications (NAVCOM) page**. It provides you with a complete list of airport frequencies at your departure and arrival airports, allowing convenient selection of every frequency you'll need along your flight path. If you do not have an active direct-to destination, the navigation communications page will display the frequencies for the airport nearest your present position.

To view the NAVCOM page from the CDI page, rotate ◯ one stop to the right.

The NAVCOM page lists your departure and arrival airports on the left side of the page, with all the database frequencies listed in a column down the right side of the page. To scroll through the list of frequencies, simply rotate the inner knob (◉) in the direction of the arrow prompts at the bottom left of the page.

To place a frequency from the list in the standby field:

1. Press the CRSR key twice to activate the cursor in the GPS window.
2. Use the ◯ knob to select the desired frequency. Press ENT to place the frequency in the standby field. The cursor will automatically advance to the next frequency on the list.

Once a direct-to is activated, the CDI page will provide navigation to the destination until the direct-to is cancelled or another direct-to destination is activated.

To cancel a direct-to from the CDI page:

1. Press the CRSR key twice to activate the cursor in the destination field.
2. Press CLR.
3. Press ENT.

The GNC 300's **NRST key** provides the nine nearest airports, VORs, NDBs, intersections and user waypoints, as well as the two closest FSSs (Flight Service Stations) and any SUA (special use airspace) alerts for your present position. The nearest waypoint feature is a handy safety feature that may be used to execute a quick direct-to in case of an in-flight emergency or to review the closest facilities to your present position. The nearest feature can also be used to quickly find the contact frequency of the nearest airport and enter it in the standby field.

To view the nine nearest airports:

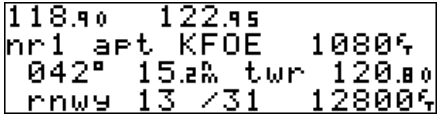
1. Press the NRST key. The nearest airport will be displayed, with elevation, frequency and runway data.
2. To review the rest of the nearest airport list, rotate the ◉ knob to the right.

To place a nearest airport frequency in the standby field:

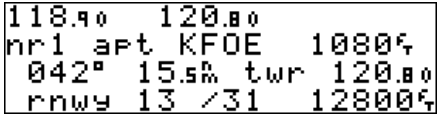
1. Press ENT. Press the ◄ ► key to place the frequency in the active field.

To view the nine nearest list for other waypoint categories (VOR, NDB, etc.):

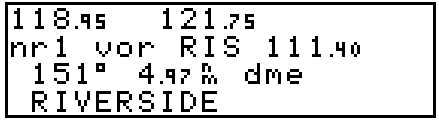
1. Rotate the ◯ knob to the right, or press the NRST key repeatedly.
2. Rotate ◉ to scroll through the list.



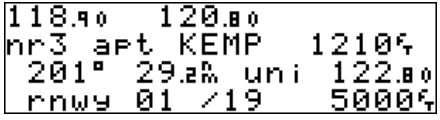
Nearest Airport Page



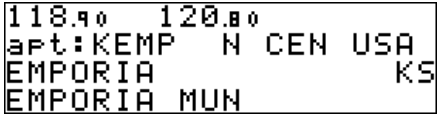
To place a nearest airport frequency in the standby field, press ENTER.



Nearest VOR Page



Third Nearest Airport Page



To review a nearest waypoint, highlight the identifier and press ENTER.

Once the nearest airport (or any other nearest waypoint) page is displayed, the selected waypoint can be quickly reviewed or selected as a direct-to destination.

To review the selected waypoint from the nearest waypoint list:

1. Press CRSR twice to activate the waypoint field.
2. Press ENT to display the waypoint identification page.
3. Rotate ◯ to view any additional waypoint information available.
4. Press NRST to return to the nearest waypoint page.

To select a nearest waypoint as a direct-to destination:

1. Press the D► key. The direct-to confirmation page for the selected waypoint will appear.
2. Press ENT to confirm.

Congratulations! You've now gone through the basic operation of the GNC 300. We encourage you to experiment with your new GPSCOM to get to know all the advanced navigation features it has to offer. If you'd like a little more practice, try using the built-in simulator described in Appendix C. An optional AC adapter will even let you plan and simulate flights in the comfort of your home or office.

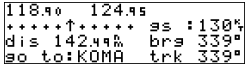
To turn the GNC 300 off:

1. Turn the ◉ knob to the left until the unit shuts off.

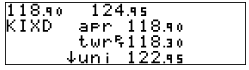
Section 1
Navigation Key

The GNC 300 features six navigation pages to provide various position, course, speed, status and planning information. The pages may be viewed by pressing the NAV key and rotating the outer knob, or by pressing the NAV key repeatedly.

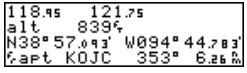
CDI page

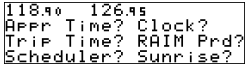


NAVCOM page

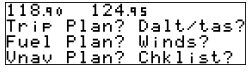


Position Page

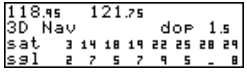




NAV Menu 2



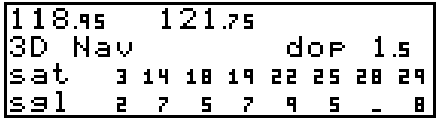
NAV Menu 1



Satellite Status Page

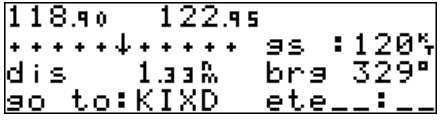
The **CDI**, **NAVCOM** and **position** pages are the primary pages used during in-flight navigation, while the nav menu and status pages offer access to planning, calculation and status functions. Note that rotating the outer knob clockwise will continuously cycle through all the nav pages, whereas turning the knob counterclockwise will stop the page selection sequence at the CDI page.

Whenever the NAV key pages are in use, the indicator light (▮) next to the NAV key will illuminate. If the GNC 300 requires you to enter data on a navigation page, the MSG indicator will flash and a message prompt with specific instructions will appear. If you leave the NAV page sequence for another set of pages, the last NAV page displayed will appear when you return to the nav sequence.

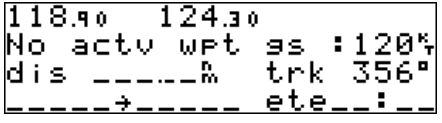


Remember! *The NAV pages will only display information* ***AFTER*** *the position and navigational information has been calculated from the satellites. If you are on the Position page before the unit has calculated a position, you will be able to enter an approximate position and altitude. This is helpful in speeding satellite acquisition if the unit has moved a great distance with the power off.*

If you are not sure the GPS is actively calculating position, check the receiver status field for '2D NAV' or '3D NAV' by pressing the NAV key and rotating the outer knob until the Satellite Status page appears. The current receiver status is displayed at the top left of the page.

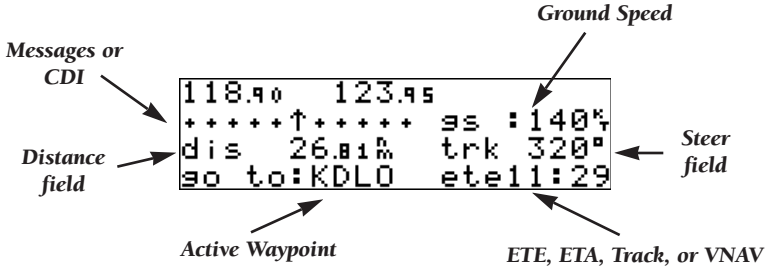


The TO/FROM arrow will indicate whether you are 'to' or 'from' the destination waypoint.



The CDI page will display 'No actv wpt" in the CDI field if there is no active-to destination.

The GNC 300's **CDI page** provides you with the important information needed to navigate directly to your destination. The destination field, located at the bottom left of the page, displays the current destination waypoint or active route leg being navigated. If no direct-to destination, route or approach is being navigated, the destination field will remain blank.



The **graphical CDI** at the top left of the page shows your position relative to the desired course (the moving D-bar) to the destination waypoint. The **TO/FROM arrow** in the center of the scale indicates whether you are heading to (an up arrow) the waypoint or if you have passed the waypoint (a down arrow). The default setting of the CDI scale is 5.0 nm. If you are not navigating to a destination, the CDI field will display a 'no actv wpt' message, and only speed and track data will be available. The CDI field is also used to display the GNC 300's turn anticipation and waypoint alert data during route operations (see Section 5).

In addition to displaying your active destination and the course deviation scale, the CDI page features four selectable fields for various distance, direction and time options. This allows you to configure the CDI page to your preferences. The default settings displayed are ground speed, distance, track and estimated time enroute.

The following functions may be displayed in the ground speed field:

- **gs—** Your present speed over the ground.
- **str—** Steer direction and distance, or digital crosstrack error. An 'L' or 'R' indicates which direction to steer, while the distance value indicates how far you are off course.

The following functions may be displayed in the distance field:

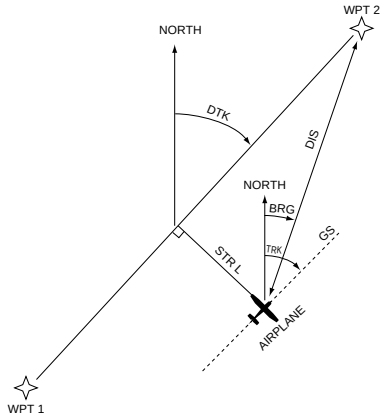
- **dis—** Distance from present position to the 'active to' waypoint.
- **str—** Steer direction and distance, or digital crosstrack error. An 'L' or 'R' indicates which direction to steer, while the distance value indicates how far you are off course.

The following steering functions may be displayed in the track field:

- **trk—** Track, the direction of movement relative to the ground.
- **brg—** Bearing, the direction from your present position to the waypoint.
- **cts—** Course to steer to reduce cross track error and re-intercept the dtk.
- **dtk—** Desired track, the course between the active from and to waypoints.
- **trn—** Turn, the direction and degrees to turn to get back on course.

The following information can be displayed in the ete field:

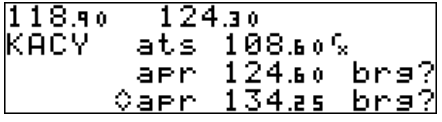
- **eta—** Estimated Time of Arrival (at the active to waypoint).
- **ete—** Estimated Time Enroute (to the active to waypoint).
- **trk—** Track, or the direction of movement relative to the ground.
- **vn—** Vertical Navigation, or VNAV. If VNAV has been activated, this field indicates either the elapsed time before the VNAV maneuver is to begin or the VNAV altitude (the suggested altitude you should be flying in order to complete the maneuver).



SECTION 1

NAV KEY

CDI & NAVCOM Pages



The NAVCOM page lists the frequencies for your departure (or nearest) and destination airports in the following order:

Departure

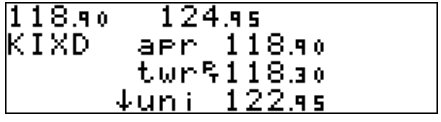
- *ATIS*
- *Clearance Delivery*
- *Clearance Pretaxi*
- *Ground*
- *Tower*
- *Other*
- *Multicom*
- *Unicom*
- *Departure*
- *Class B*
- *TMA*
- *CTA*
- *Class C*
- *TRSA*

Arrival

- *ATIS*
- *Approach*
- *Arrival*
- *Class B*
- *TMA*
- *CTA*
- *Class C*
- *TRSA*
- *Tower*
- *Other*
- *Multicom*
- *Ground*
- *Unicom*

To change any of the selectable fields on the CDI page:

1. Press CRSR twice to activate the cursor in the GPS window.
2. Rotate ◯ to highlight the field you would like to change.
3. Rotate ◉ to change the field to display the desired information.
4. Rotate ◯ to highlight another field, or CRSR to finish.



The next page available from the GNC 300's NAV key is the **navigation communications (NAVCOM) page**. The NAVCOM page provides a list of the airport frequencies at your departure and arrival airports, allowing convenient selection of every frequency you'll need along your flight path. To scroll through the list of frequencies, rotate the inner knob (◉) in the direction of the arrow prompts at the bottom left of the page.

The frequencies displayed for the departure and arrival airports are listed in the order you are most likely to use them (see left), with the available frequencies displayed to the right of the airport identifier. If you do not have an active direct-to or route, the NAVCOM page will display the frequencies for the airport nearest your present position.

If a frequency has sector or altitude restrictions, the frequency will be followed by a 'brg?'.

To view restrictions on a frequency:

1. Press CRSR twice to activate the cursor in the GPS window.
2. Rotate ◯ to highlight the 'brg?' next to the frequency you wish to view.
3. Press ENT to begin viewing restrictions.

Once you begin viewing restrictions, you can view any additional frequencies with restrictions by rotating ◉. You can also view the waypoint information pages by rotating ◯. Information contained on these pages is covered in Section 3. To return to the NAVCOM page, press NAV.

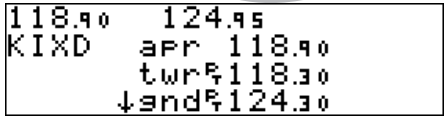
Some frequencies in the NAVCOM page are followed by tags which designate their usage:

'tx' – transmit only
'rx' – receive only
'pt' – part time frequency

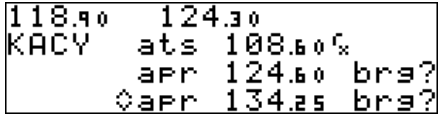
To make any of the frequencies on the NAVCOM page the standby frequency:

1. Press CRSR twice to activate the cursor in the GPS window.
2. Rotate ◯ until the desired frequency is highlighted.
3. Press ENT to transfer the highlighted frequency to the standby frequency. The cursor will automatically advance to the next frequency on the list.

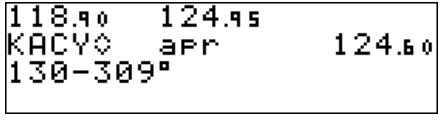
An arrow prompt is displayed on the bottom line of the display to indicate additional frequencies available on the list.



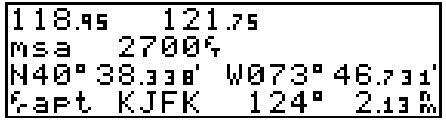
NAVCOM Page



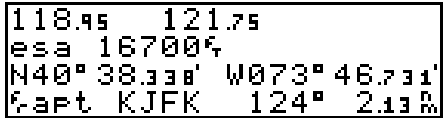
NAVCOM page with receive only (rx) frequencies and frequencies with restrictions (brg).



Frequency restrictions on 124.60.

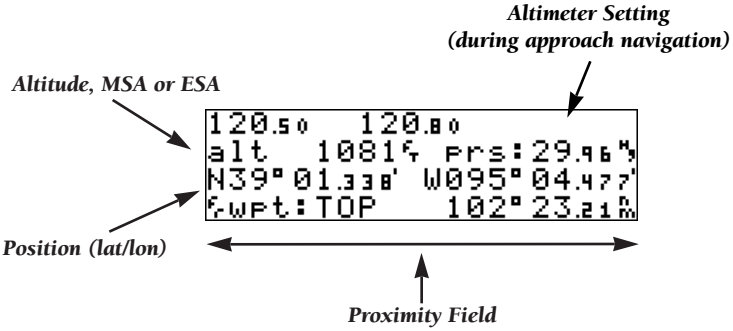


Position page displaying MSA.



The same position page displaying ESA. MSA and ESA are computed based on data stored in the NavData card. This information cannot be solely relied upon as an absolute measure of safe altitude in your area, particularly if the data card is out of date. Consult current charts and NOTAMS for more complete information.

The GNC 300 **position page** displays your present latitude and longitude, altitude and a reference waypoint field; and is also used to enter the altimeter setting during approach operations. The altitude and reference waypoint fields are selectable to configure the page to your own preferences and current navigation needs.



The altitude field can display either the present altitude, minimum safe altitude (MSA) or enroute safe altitude (ESA). MSA is the recommended minimum altitude within a ten mile radius of your present position. ESA is the recommended minimum altitude within a ten mile radius of your course on an active route or direct-to. MSA and ESA altitudes are calculated from information contained in the database and generally include mountains, buildings and other permanent features (see left).

To change the altitude field:

1. Press CRSR twice to obtain a flashing cursor in the GPS window.
2. Rotate ◯ until the 'alt/ESA/MSA' field is highlighted.
3. Rotate ◉ to display the desired data. Press CRSR to return to normal navigation.

The position page also features a **reference waypoint field**, located at the bottom of the page, to indicate your bearing and distance from a selected waypoint. The reference waypoint field can display the following:

- Range, bearing and identifier from the nearest airport, VOR, NDB, intersection, or user waypoint
- Range, bearing, and identifier from a user specified waypoint

The default setting is to display the nearest airport.

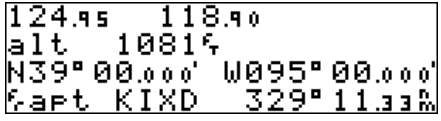
To change the reference waypoint field to display the nearest airport, VOR, NDB, intersection, user waypoint or the range and bearing from a user selected waypoint:

1. Press CRSR twice to activate the cursor in the GPS window.
2. Rotate ◯ to highlight the proximity field after the fr.
3. Use ◉ to choose which waypoint type you would like displayed. (Choose 'wpt' if you would like a specific waypoint range and bearing to be displayed.)
4. Press CRSR to remove the cursor, or:

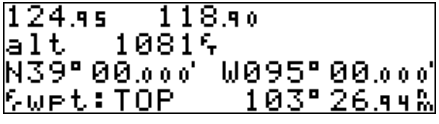
If you have selected 'wpt':

5. Rotate ◯ to advance the cursor to highlight the identifier field.
6. Use the ◉ and ◯ knobs to enter the identifier name. (This waypoint identifier can be an airport, VOR, NDB, intersection, or user waypoint.) Press ENT.
7. Press CRSR to finish.

This allows any waypoint's distance and bearing to be listed continuously on the position page, and is especially useful when trying to locate your position on a sectional or when an approach reference is not the closest navaid.

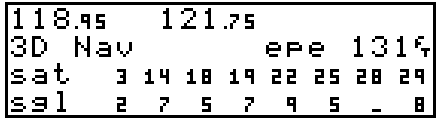


Position page displaying the nearest airport (KIXD) as the reference waypoint.

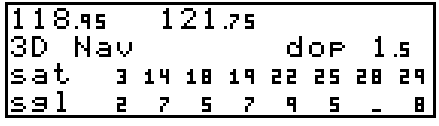


Position page displaying the TOP VOR as the reference waypoint. This configuration can be used to help monitor your distance and radial to a waypoint or DME arc reference (see Section 6).

Note the waypoint category is listed as 'wpt' rather than 'VOR' because the GNC 300 is not using the nearest VOR for the reference waypoint.



Status page with EPE displayed.

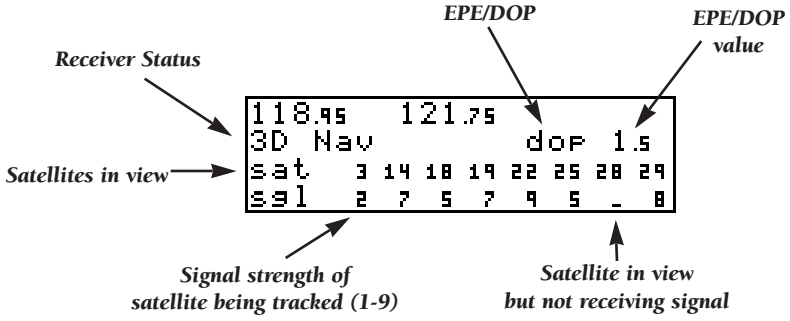


Status page with DOP displayed.

The GNC 300's **satellite status page** provides satellite information to monitor GPS coverage and receiver performance. This is helpful when you may be experiencing low signal levels due to poor coverage or installation problems.

To view the satellite status page:

1. Press NAV and rotate ◯ until the satellite status page appears.



The top line of the status page displays the receiver status and the current DOP or EPE. Dilution of precision (DOP) is a measure of the satellite geometry quality and relative accuracy of your position, with 1 meaning good geometry and 10 meaning poor. Estimated position error (EPE) is an overall measure of your positional accuracy in feet or meters using signal and data quality, receiver tracking status and DOP.

To view information on DOP/EPE:

1. Press NAV and rotate ◯ to display the satellite status page.
2. If the desired field (EPE or DOP) is not displayed, press CRSR twice.
3. Use ◉ to change between 'epe' and 'dop'. Press CRSR to finish.

The **receiver status field**, located at the top left of the page, can display the following messages under various conditions:

Search sky - The GNC 300 is searching the sky for visible satellites. You will be informed with the message 'Searching the Sky'.

Acquiring - The GNC 300 is acquiring satellites for navigation.

2D Nav - The GNC 300 is in 2D navigation mode. If your installation does not include an altitude serializer, you must enter the altitude manually (see page 2).

3D Nav - The GNC 300 is in 3D navigation mode and will compute altitude.

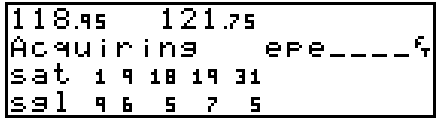
Simulator - The GNC 300 is in simulator mode, which should only be used for practice and trip planning. **Never** use simulator mode for actual navigation.

Poor cvrg - The GNC 300 can't acquire sufficient satellites for navigation.

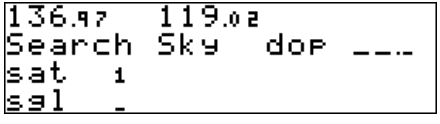
Need alt - The GNC 300 needs altitude in order to start/continue navigation. Select the position page and enter the altitude.

Need pres - The GNC 300 needs the current altimeter (barometric pressure) setting at the approach airport. Enter the altimeter setting on the position page.

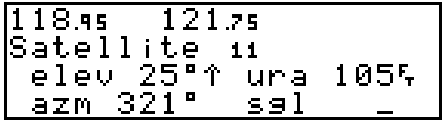
Not usable - The GNC 300 is unusable due to incorrect initialization or abnormal satellite conditions. Turn the unit off and on again. If this does not help, return the unit to an authorized GARMIN dealer for service.



Acquiring satellites for navigation.



Searching the Sky.



Viewing individual satellite information.

The second and third lines of the satellite status page provide the satellite number and signal strength of each satellite in view. Additional information regarding each satellite's azimuth, elevation and other data is also available.

To view individual satellite information:

1. Press NAV and use ◯ to display the satellite status page.
2. Press CRSR twice to activate the cursor in the GPS window.
3. Use ◯ to highlight the satellite number you wish to view and press ENT.

This will display the satellite data page, showing the selected satellite's number, elevation angle, rise or fall indication, user range accuracy (URA, or the range measurement accuracy as determined by the satellite), azimuth and signal strength. To view other satellites:

4. Rotate ◉ to view information for the next satellite.
5. Rotate ◯ to return to the satellite status page and press CRSR on the satellite status page when you are finished.

In addition to the other four pages, the GNC 300 features two menu pages to perform a host of planning and navigation functions. **NAV Menu 1** provides access to the following functions:

- **Trip Planning**
- **Fuel Planning**
- **VNAV Planning**
- **Density altitude/true air speed calc.**
- **Winds aloft calculations**
- **Checklists**

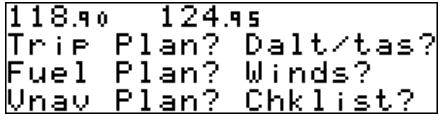
To display NAV Menu 1:

1. Press NAV.
2. Rotate ◯ until NAV Menu 1 is displayed.

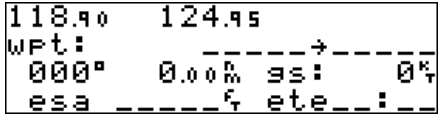
Trip Plan is the first function listed on NAV Menu 1 and allows the pilot to view distance, ESA, bearing and estimated time enroute (ETE) between any two waypoints, and for programmed route legs. The ground speed can be varied manually to calculate several possible ETEs.

To use the trip planning function:

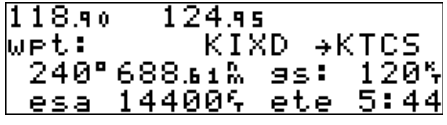
1. Press NAV and rotate ◯ until NAV Menu 1 is displayed.
2. Press CRSR twice, then ENT to access trip planning.
3. Rotate ◉ to select waypoint mode or desired route number, and press ENT.
4. For direct-to navigation, use ◉ and ◯ to enter the 'to' and 'from' waypoints. Press ENT to accept the waypoints. To use your present position as a waypoint, leave the waypoint field blank.
5. For route calculations, choose either 'cum' for cumulative data (from beginning to end) or the leg desired by rotating ◉.
6. Use ◉ and ◯ to enter the ground speed. Press ENT to calculate the values and CRSR to finish.



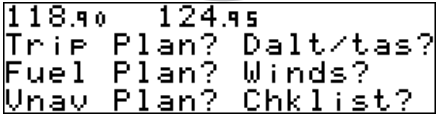
NAV Menu 1



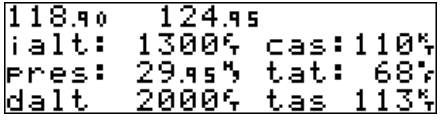
Trip Planning Page



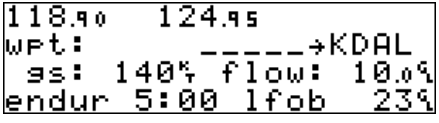
Trip planning with values calculated.



Nav Menu 1



Density Altitude/True Airspeed Page



Fuel Planning Page

The **density altitude/true airspeed** function is also accessed from NAV Menu 1. Density altitude is the altitude at which your aircraft will perform depending on several environmental conditions, including air pressure and total air temperature (the temperature including the effect of speed, read on a standard outside temperature gauge on most aircraft). True airspeed considers the same factors.

To calculate the density altitude and true air speed:

1. Press NAV and rotate ◯ until NAV Menu 1 is displayed.
2. Press CRSR twice and rotate ◯ to highlight 'Dalt/tas?'.
3. Press ENT to access the density altitude page.
4. Use ● and ◯ to enter the indicated altitude and press ENT.
5. Use ● and ◯ to enter the calibrated air speed (cas). Press ENT.
6. Use ● and ◯ to enter the air pressure ('pres') and press ENT.
7. Use ● and ◯ to enter the total air temperature.
8. Press ENT and the density altitude and true air speed will be calculated and displayed.
9. Press CRSR to remove the cursor.

If your installation includes components to provide any of the information required on the density altitude page, they will be used as the defaults.

The **fuel planning** page will display fuel requirements for both direct-to navigation and programmed routes. The fuel planning function requires the pilot to know the initial amount of fuel on board and the flow rate. You may also enter different ground speeds to view various information based on different travel times. If your installation is interfaced to a fuel flow sensor, the flow rate and other information will be used from the fuel flow sensor.

To perform fuel planning operations:

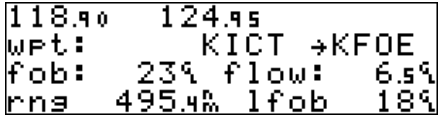
1. Press NAV and rotate ◯ until NAV Menu 1 is displayed.
2. Press CRSR twice and rotate ◯ until 'Fuel Plan?' is highlighted. Press ENT.
3. Rotate ◉ to select either 'wpt' for direct navigation or the desired route number. Press ENT.
4. For waypoint-waypoint navigation, use ◉ and ◯ to enter the 'to' and 'from' waypoints. Press ENT to accept the waypoints. To use the present position as a waypoint, leave the corresponding waypoint field blank.
5. For route calculations, choose either 'cum' for cumulative route fuel requirements (from beginning to end) or the leg desired by rotating ◉.

If leg is selected, it displays the amount of fuel required to fly until that leg is complete.

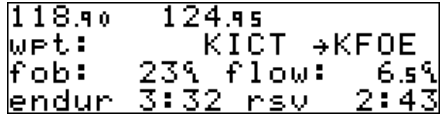
For example: The fuel required to complete leg 2 is leg 1 + leg 2.
Fuel required to complete leg 4 is leg 1 + leg 2 + leg 3 + leg 4.

6. Rotate ◯ to advance the cursor to 'fob:' or 'gs:' (depending on which is displayed).
7. Use ◉ and ◯ to enter the fuel on board or the ground speed. Press ENT.
8. Rotate ◯ back two positions to highlight the 'fob:' or 'gs:' field again.
9. Rotate ◉ to display the other information. Press ENT.
10. Use ◉ and ◯ to enter the remaining data. Press ENT.
11. Use ◉ and ◯ to enter the flow rate, in units per hour, if needed. Press ENT.

The GNC 300 will calculate the range and endurance (how long the fuel will last) of your aircraft. These are found in the first field on the bottom row of the page. The fuel left on board (lfob) and reserve after the selected direct-to, leg or route will also be displayed in the second field on the bottom row.



Fuel Planning Page

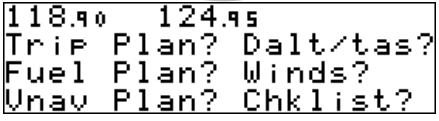


Fuel planning page with other information.

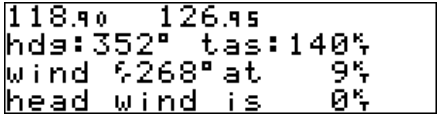
SECTION 1

NAV KEY

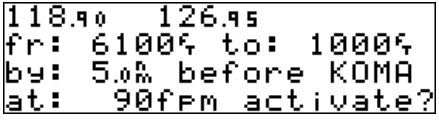
Winds Aloft & VNAV Functions



NAV Menu 1



Winds Aloft Page



Vertical Navigation Page

The GNC 300's **winds aloft** function is used to calculate the true direction and speed of the winds aloft, and indicates whether you are flying with a head wind or tail wind, and the wind speed.

To calculate winds aloft:

1. Press NAV and rotate ◯ until NAV Menu 1 is displayed.
2. Press CRSR twice and rotate ◯ until 'Winds?' is highlighted. Press ENT.
3. Use ◉ and ◯ to enter your present heading in the 'hdg:' field. If your installation includes a fuel/air data computer, this will be displayed automatically. Press ENT.
4. Use ◉ and ◯ to enter your true airspeed (TAS) in the 'tas:' field. If you have previously calculated it using the density altitude/true air speed function, it will be displayed as the default. Press ENT. The wind direction and speed and head/tail wind will be displayed.

The **VNAV function** calculates vertical speed requirements to reach a desired altitude before or after a specified distance from a waypoint. This is helpful when you'd like to descend to a certain altitude near an airport or climb to an altitude before reaching a waypoint.

To calculate vertical navigation parameters:

1. Press NAV and rotate ◯ until NAV Menu 1 is displayed.
2. Press CRSR twice and rotate ◯ until 'Vnav Plan?' is highlighted. Press ENT.
3. Use ◉ and ◯ to enter the initial (from) altitude. Your GPS altitude will be displayed as the default. Press ENT.
4. Use ◉ and ◯ to enter the desired final (to) altitude. Press ENT.
5. Use ◉ and ◯ to enter the distance from the waypoint. Press ENT.
6. Use ◉ to select 'before' or 'after' the waypoint. Press ENT.
7. Use ◉ and ◯ to select the waypoint identifier. If you are on a route or a direct-to, the 'active to' identifier will be displayed automatically. Press ENT.

You will now notice that the vertical speed field has been calculated, based on your present speed. **If you desire a more rapid climb or descent:**

8. Use ◉ and ◯ to enter the new desired vertical speed, or press ENT to accept the calculated value.

9. Press ENT to activate the vertical navigation function.

If you enter a greater value, the GNC 300 will display the elapsed time before the maneuver is to begin. When the countdown reaches 15 seconds, you will be informed with the message 'Start altitude chng'. The VNAV function will automatically be cancelled if the active direct-to or route is changed in any way, and you will be informed with a 'VNAV cancelled' message.

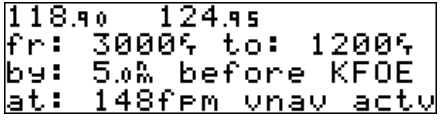
The GNC 300 will allow you to create up to nine **checklists** with 30 items each to remind you of repetitive tasks that can be called up at any time for review. The checklist feature is useful for creating pre-flight checklists, landing checklists, emergency procedures, etc. Each name or function can have up to 16 characters each.

To create a checklist:

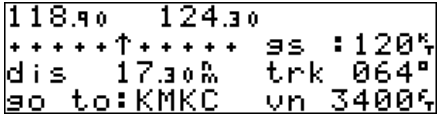
1. Press NAV and rotate ◯ until NAV Menu 1 is displayed.
2. Press CRSR twice and rotate ◯ until 'Chklist?' is highlighted. Press ENT.
3. Press CRSR and use ◯ to highlight the checklist number you would like to create or edit. Press ENT.
4. Use ◉ and ◯ to enter the title of the checklist. Press ENT.

This will display the checklist items page. On this page, you can enter each task, such as 'Check Fuel'.

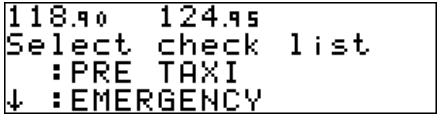
5. Use ◉ and ◯ to enter the checklist item. Press ENT.
6. You may repeat step 5 to enter additional items, or press CRSR to finish.



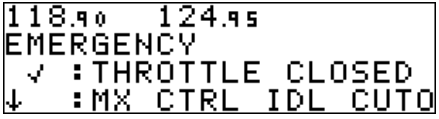
VNAV after a new descent rate has been entered.



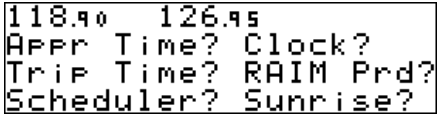
VNAV displayed on CDI page.



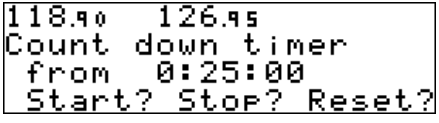
Checklist Catalog Page



Executing a checklist.



NAV Menu 2



Approach Timer

To execute a checklist:

1. Press NAV and rotate ◯ until NAV Menu 1 is displayed.
2. Press CRSR twice and rotate ◯ until 'Chklist?' is highlighted. Press ENT.
3. Scroll through available checklists using ●.
4. Press CRSR and use ◯ to highlight the checklist you would like to see. Press ENT.
5. Press ENT to check off list items.

To delete a checklist item or an entire checklist:

1. To delete a checklist item, highlight the desired item and press CLR, followed by ENT.
2. To delete an entire checklist, highlight the desired list and press CLR, followed by ENT.

The GNC 300's **NAV Menu 2** provides access to various timer and planning functions, including:

- **Approach timer**
- **Trip Timer**
- **Scheduler**
- **Clock (Date and time)**
- **RAIM Prediction**
- **Sunrise and sunset calculations**

The **approach timer** acts as either a count up or a count down timer that can be set or reset at any time.

To activate/change/view the approach timer:

1. Press NAV and rotate ◯ until NAV Menu 2 is displayed.
2. Press CRSR twice and rotate ◯ until 'Appr Time?' is highlighted. Press ENT.
3. Rotate ● to select either 'Count up' or 'Count down'. Press ENT.
4. Use ● and ◯ to set the time to begin counting from. Press ENT.
5. Rotate ◯ to select the desired function: 'Start', 'Stop', or 'Reset'. Press ENT to execute.

When the count down timer reaches zero, you will be informed with a 'Timer expired' message. The timer will then begin to count up, keeping track of how long it has been since it expired. The timers run, if not altered, anytime the GNC 300 is on.

The GNC 300 **clock function** keeps track of both UTC time (Greenwich Mean Time or Zulu Time calculated from the satellites) and local time, and allows you to designate which format is used for ETA calculations. The local time and date can be set without doing a UTC to local time conversion.

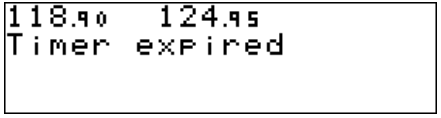
To set the local date/time:

1. Press NAV and rotate ◯ until NAV Menu 2 is displayed.
2. Press CRSR twice and rotate ◯ until 'Clock?' is highlighted. Press ENT.
3. Use ● to select either 'UTC' or 'local' time to be displayed in the time fields. Press ENT.
4. Use ● and ◯ to set the local date. Press ENT.
5. Use ● and ◯ to set the local time. Press ENT.
6. Press CRSR to complete.

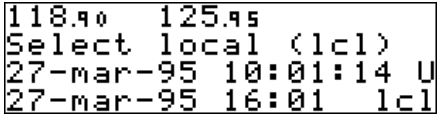
The GNC 300's **trip timer** will automatically keep track of the duration of your current trip and can be configured to run when the GNC 300 is on, or when your ground speed exceeds a specified value (see Section 7).

To view or reset the trip timer:

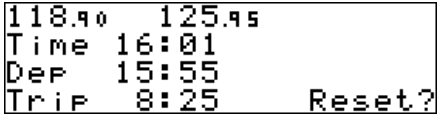
1. Press NAV and rotate ◯ until NAV Menu 2 is displayed.
2. Press CRSR twice and rotate ◯ until 'Trip time?' is highlighted. Press ENT. The current time of day, departure time, and time enroute will be displayed.
3. To reset the timer, press ENT. To skip resetting the timer, press CRSR.



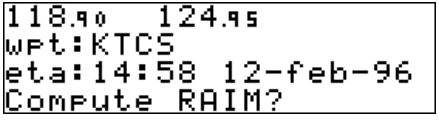
Timer expired message.



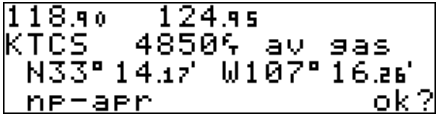
Entering a local time.



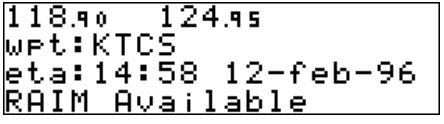
Resetting the trip timer.



Enter the time and date for RAIM prediction.



Confirm the selected waypoint.



RAIM available for the entered time and date.

The **RAIM Prediction** function allows you to confirm that GPS coverage is available for a specific location or waypoint any day of the year. **R**eceiver **A**utonomous **I**ntegrity **M**onitoring performs checks to ensure that the GNC 300 will have adequate satellite geometry to work with during your flight. RAIM availability will be near 100% in Oceanic, En route, and Terminal phases of flight. Because the FAA's TSO requirements for non-precision approaches specify significantly better satellite coverage than other flight phases, RAIM may not be available when flying some approaches. The GNC 300 will automatically monitor RAIM during approach operations and warn you if RAIM is not available. RAIM prediction will help you plan for a pending flight to confirm that the GNC 300 can be used for an approach, and should be calculated the night before or the day of the desired flight.

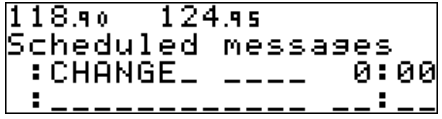
To predict RAIM availability:

1. Press CRSR twice and rotate ◯ to highlight 'RAIM prd?'. Press ENT.
2. Rotate ◯ to highlight the field which you would like to change.
3. Use ◉ and ◯ to enter the waypoint name, or leave it blank to use your current position. Press ENT to accept. **OR:**

   Use ◉ and ◯ to enter the day, month and year of the information desired. Current date will be displayed automatically. Press ENT to accept.
4. Rotate ◯ to highlight 'Compute RAIM?'.
5. Press ENT to compute information.

When the computations are complete, the GNC 300 will display whether or not RAIM is available for the specified waypoint at the specified date and time.

The **scheduler** function will display reminder messages after a certain elapsed time such as Change oil, Switch fuel tanks, Overhaul, etc. For example, if you enter 'Change Oil' to be displayed in 30 hours, the message 'Change Oil' will be displayed after the GNC 300 has been on in Normal operating mode for 30 hours. After appearing, the message will be displayed each time the GNC 300 is turned on until it is changed or deleted.

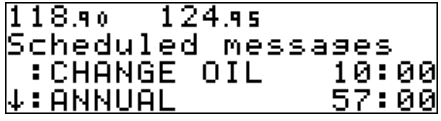


Entering a scheduled message.

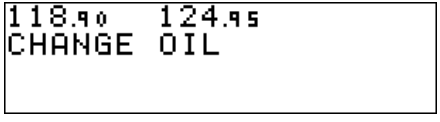
To enter a scheduled message:

1. Press NAV and rotate ◯ to display NAV Menu 2.
2. Press CRSR twice and rotate ◯ until 'Scheduler?' is highlighted. Press ENT.
3. Rotate ◉ to display the message you would like to edit. Press CRSR and rotate ◯ to highlight the message you would like to edit. To delete, press CLR, then ENT.
4. Use ◉ and ◯ to enter the message. Press ENT.
5. Use ◉ and ◯ to set the elapsed time until the message is displayed, in hours and minutes, up to 99 hours and 59 minutes (this time is cumulative and counts whenever the GNC 300 is on in normal operating mode). Press ENT.

You may edit another by repeating steps 3, 4 and 5, or if you are finished, press CRSR.



The scrolling arrow prompt indicates which direction to scroll to view additional listings.

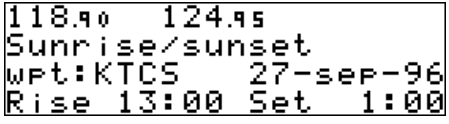


The scheduled message will appear after the timer expires and after the GNC 300 is powered up until the message is changed.

SECTION 1

NAV KEY

Sunrise/Sunset Calculations



Sunrise/Sunset Planning Page

The GNC 300 sunrise/sunset planner allows you to calculate the sunrise and sunset times for a specified date for your present position or any waypoint.

To calculate sunrise and sunset times at a waypoint or at your present location:

1. Press NAV and rotate ◯ until NAV Menu 2 is displayed.
2. Press CRSR twice and rotate ◯ to highlight 'Sunrise?'. Press ENT.
3. Use ● and ◯ to enter the waypoint identifier, or leave blank to use current position. Press ENT.
4. Press ENT to accept the waypoint information.
5. Use ● and ◯ to enter the date desired.
6. Press ENT and the sunrise and sunset times will be calculated and displayed.

Section 2
Communicating with the GNC 300

The GNC 300 features a digital VHF radio that provides a seamless transition from communication to navigation, bringing the two most important functions in flying together in one panel-mount unit. The GNC 300 operates in the aviation voice band, from 118 to 136.975 MHz, in 25 kHz steps.

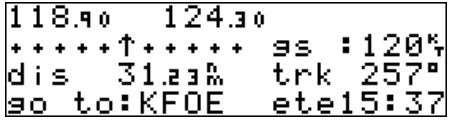
Communication frequencies are selected by activating the cursor in the **standby frequency field** and using the inner and outer knobs to dial in the desired frequency. A frequency may also be quickly selected from the navigation database by simply highlighting the frequency and pressing the ENT key. Once a desired frequency is displayed in the standby field, it may be made the active frequency by pressing the ◄► key. *Note that the active frequency may not by accessed directly*. Whenever the cursor is active in the comm window, the standby frequency will be highlighted (e.g., '<121.5>').

To access the standby frequency, press CRSR.

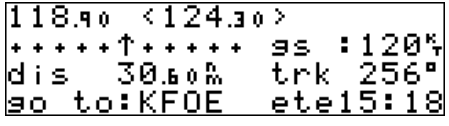
This allows you to change the megahertz (number to the left of the decimal) by rotating ◯ and the kilohertz (number to the right of the decimal) by rotating ◉. If you would like to keep the standby field 'hot' (ready for an immediate frequency change), leave the cursor active in the comm window. To remove the cursor, press CRSR twice after you have selected the desired frequency.

To make the standby frequency the active frequency, press ◄►.

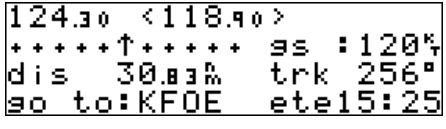
The frequencies will be flip-flopped and you'll be able to transmit and receive on the standby frequency previously entered. This can be done at any time, regardless of cursor or GPS status.



CDI page with cursor inactive.



CDI page with standby field active.

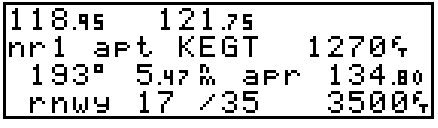


To flip-flop the frequencies, press ◄►.

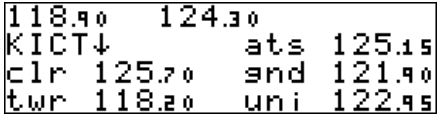
SECTION 2

COMM FEATURES

Overview/ Auto-Tuning

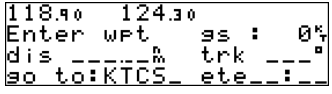


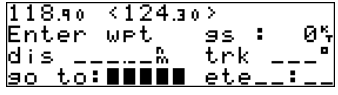
To auto-tune from the nearest airport page, press ENT.



To select a frequency from a list, highlight the desired frequency and press ENT.

During the course of navigating with the GNC 300, there may be times when you need to quickly select a comm frequency while you are in the middle of entering data in the GPS window. Whenever data entry in the GPS window is interrupted by activating the standby frequency field, the GPS field in use will become 'splatted', or blocked out.





Once the standby frequency has been entered, you may return to data entry by pressing the CRSR key. The flashing cursor will return you to the active GPS field at the point where you stopped data entry.

The GNC 300's **auto-tune feature** allows you to quickly select any database frequency in the GPS window as your standby frequency.

To auto-tune a single frequency displayed in the GPS window:

1. Press ENT with the cursor inactive.
2. To make the standby frequency the active frequency, press ◄ ►.

To auto-tune a frequency from a list displayed in the GPS window:

1. Press CRSR twice to activate the cursor in the GPS window.
2. Rotate ◯ to highlight the desired frequency.
3. Press ENT to make the selected frequency the standby frequency.

Another useful feature integrating the GNC 300's navigation and communication capabilities is the **Navigation Communications (NAVCOM)** page, which is accessed using the NAV key. See pages 12-13 for more on the NAVCOM page.

The GNC 300's **automatic squelch** and **volume controls** are located at the bottom left of the unit, near the NavData card slot.

To adjust the radio volume:

1. Rotate the knob.

Whenever the GNC 300 is powered up, the automatic squelch will be in the 'on' position, allowing only transmissions which are powerful enough for clear broadcast to be received. Manual squelch control is not available.

To override the automatic squelch control:

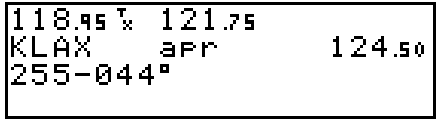
1. Press the SQ key. Press SQ again to return to automatic squelch.

Whenever the GNC 300 is transmitting, a 'tx' icon will appear between the active and standby frequency fields. If the microphone is stuck or accidentally left in the keyed position, or if the headsets continue to transmit after the key is released, the radio will timeout after 35 seconds of continuous broadcasting. You'll also receive a 'Stuck mic/Tx disabled' message as long as the stuck condition exists.

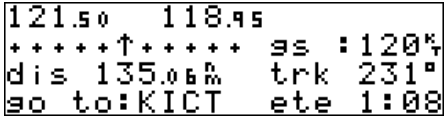
The GNC 300's **emergency channel select** feature provides a quick method of selecting the 121.5 MHz frequency as the active frequency in the event of an in-flight emergency. The emergency channel select is available whenever the unit is on, regardless of GPS or cursor status, or loss of the display.

To automatically tune for emergency transmission:

1. Press and hold the ◄ ► key for more than two seconds.



'TX' indicating radio transmission.



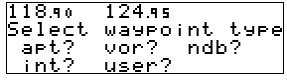
The emergency channel will appear in the active field.

***Please note** that your GNC 300 uses ICAO identifiers for all airports. All U.S. airport identifiers which contain only letters use the prefix 'K'. For example, Los Angeles International is KLAX under the ICAO standard. Other airports, such as Otten Memorial (3VS), that contain numbers in the identifier, do not require the 'K' prefix. Many foreign countries use two letter prefixes. For more information on ICAO identifiers, contact:*

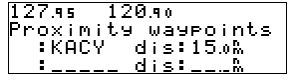
Document Sales Unit
International Civil Aviation Organization
1000 Sherbrooke, Suite 400
Montreal, Quebec
Canada H3A 2R2

Section 3
Waypoint and Database Information

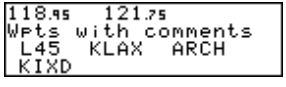
The GNC 300 uses a Jeppesen NavData® card to provide position and facility information for thousands of airports, VORs, NDBs and intersections. Each facility in the database is stored as a waypoint with its own latitude/longitude, identifier (up to five letters and/or numbers), and other pertinent information. Up to 1,000 user waypoints may also be created and stored in the GNC 300's internal memory.



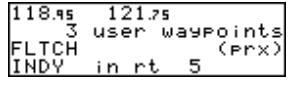
Waypoint Menu Page



Proximity Waypoints Page



Waypoint Comments List



User Waypoint List

Waypoint information is available through four primary waypoint pages accessible from the GNC 300's WPT key. The waypoint pages may be scrolled through by pressing the WPT key and rotating the outer knob until the desired page is displayed, or by pressing the WPT key repeatedly.

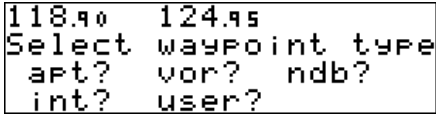
The GNC 300 organizes waypoints into one of five waypoint categories for your convenience. Each waypoint category provides different types of detailed information for a selected facility:

- **Airports -** Identifier, city/state, country, facility name, position (lat/lon), elevation, fuel services and communications frequencies.
- **VORs -** Identifier, city/state, country, facility name, position (lat/lon), frequency, magnetic variation, co-located DME or TACAN and weather broadcast indication.
- **NDBs -** Identifier, city/state, country, facility name, position (lat/lon), frequency and weather broadcast indication.
- **Intersections -** Identifier, country, position (lat/lon), nearest VOR.
- **User -** Identifier (name), position (lat/lon), reference waypoint.

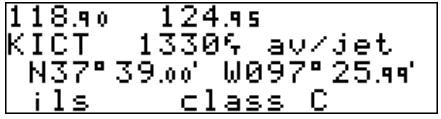
To view the waypoint information for a desired waypoint, select the waypoint category from the waypoint menu page.

To choose a waypoint category (for viewing information):

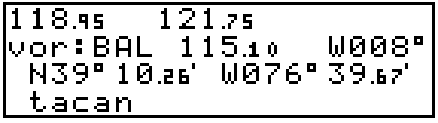
1. Press WPT and rotate ◯ to display the waypoint menu page.
2. Press CRSR twice and rotate ◯ to highlight the desired waypoint category.
3. Press ENT to accept the waypoint category. The waypoint identification or position page for the selected category will appear with the waypoint identifier field ready for entry.



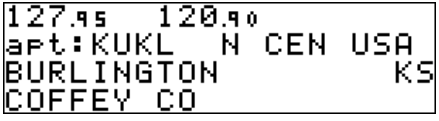
Waypoint Menu Page



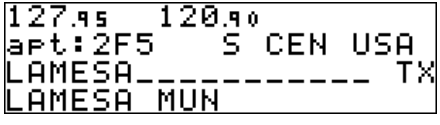
Airport Position Page



VOR Position Page



Entering a waypoint by identifier.



Entering a waypoint by city. Note that punctuation marks are not used when entering locations or names. Use spaces, where appropriate, to identify these marks. For example, St. Louis would be entered as "ST LOUIS" without a period.

After a waypoint category is selected, information for a waypoint may be viewed by entering the identifier or name of the desired waypoint. Airports, VORs, and NDBs may be entered by either the identifier, name, or the location (city) of the facility. Intersections and user waypoints must be entered by the identifier.

To enter a waypoint identifier:

1. With the flashing cursor over the waypoint field, use ◉ and ◯ to enter the waypoint identifier.

As the identifier is entered, the GNC 300's Spell'N'Find feature will scroll through the available database, displaying any waypoints with the same identifier letters you have entered to that point. When the desired waypoint is displayed, press CRSR to remove the cursor.

To obtain waypoint information by entering the facility name of the airport, the name of the VOR or NDB, or its location:

1. Press WPT and rotate ◯ to display the waypoint menu page.
2. Press CRSR twice and rotate ◯ to highlight the desired waypoint category.
3. Press ENT to accept the waypoint category.
4. Rotate ◯ to highlight the middle field to enter location (city) **OR:**

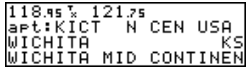
   Rotate ◯ to highlight the bottom field to enter facility name or VOR/NDB name.
5. Use ◉ and ◯ to enter the location or the name, and press CRSR to finish.

As the information is entered, the GNC 300 will display any entries in its database that match the letters you have entered. If duplicate entries exist for the entered identifier, name or location, additional entries may be viewed by rotating ◉. Once the desired waypoint is displayed, press CRSR to continue.

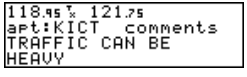
Once a waypoint category and identifier have been selected, the GNC 300 will provide extensive information through a set of waypoint pages for the selected category. We'll now go through the pages available for each waypoint category in the order they appear on the waypoint menu page: airports, VORs, NDBs, intersections and user waypoints.

Airport Information

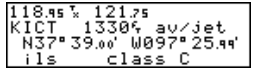
Airport Identification Page

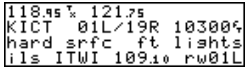


Airport Comments Page

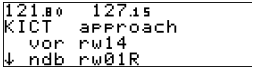


Airport Position Page

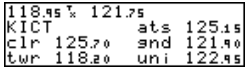




Airport Runway Page



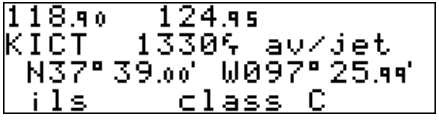
Airport Procedures Page



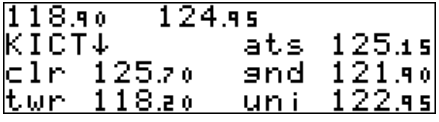
Airport Communication Page

To scroll through the airport pages:

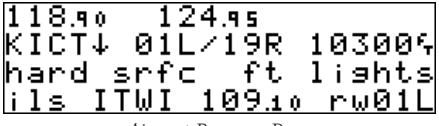
1. Make sure the cursor is not flashing. If it is, press CRSR.
2. Rotate ◯ in either direction to scroll through the available pages.



Airport Position Page



Airport Communication Page



Airport Runway Page

The GNC 300 features six airport pages:

airport identification— allows entry of desired airport by identifier, facility name or city; displays region and/or country of facility.

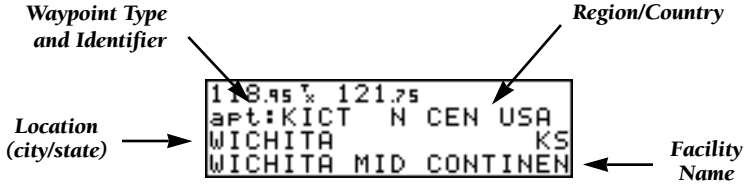
airport position— allows entry of desired airport by identifier; displays latitude, longitude and elevation; indicates usage and fuel availability; displays approach availability and airport control/radar capability.

airport procedures— allows entry of desired airport by identifier; displays all available approaches, SIDs and STARs for the selected airport.

airport communication— allows entry of desired airport by identifier; displays radio frequencies/usage, and sector and altitude restrictions.

airport runway— allows entry of desired airport by identifier; indicates runway designations, length, surface and lighting information; displays ILS/localizer and/or pilot-controlled lighting frequencies.

airport comments— allows entry of desired airport by identifier; displays user comments for the selected airport.



The **airport identification page** displays a selected airport's identifier, region and country, city/state and facility name. The identification page is always the first airport page available, allowing you to quickly review an airport facility or select another facility by entering the identifier, facility name or city of the desired airport.

The **airport position page** displays the latitude, longitude and elevation of the selected airport, as well as usage or fuel availability, available approaches and airport control/radar capability. The following descriptions and abbreviations are used on the airport position page:

Elevation— In feet or meters

Usage/Fuel— If the airport is for military use, it will display 'military'. If it is private, the GNC 300 will display 'private'. If it is a public airport, it will display the fuel type(s) available:

- **av gas—** 80-87 octane, 100 LL, 100-130 octane, or mogas is available
- **jet—** Jet A, Jet A-1 or Jet A+ fuel is available
- **av/jet—** Both av gas and jet fuel are available

Position— In degrees/minutes or degrees/minutes/seconds of latitude and longitude.

Approach Information— displays the airport approaches available

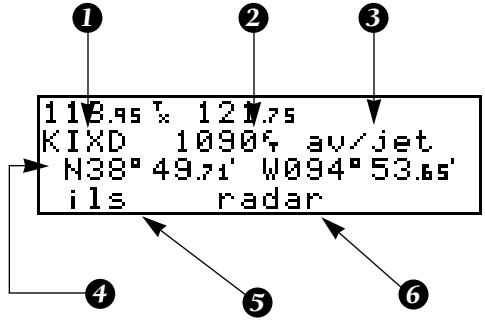
- **no apr—** No approach is available
- **np-apr—** Non-precision approach is available
- **loc—** Localizer approach is available
- **ils—** ILS approach is available

Controlled Airspace Information— displays controlled airspace type

- **class B**
- **class C**
- **cta**
- **tma**

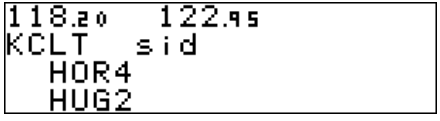
Radar— displays approach/departure radar capability

- **radar—** indicates radar is present

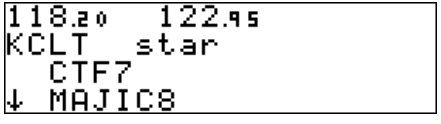


Airport Position Page

1. Identifier (selectable)
2. Elevation
3. Fuel Availability
4. Airport Position
5. Approach Information
6. Controlled Airspace/Radar Capability

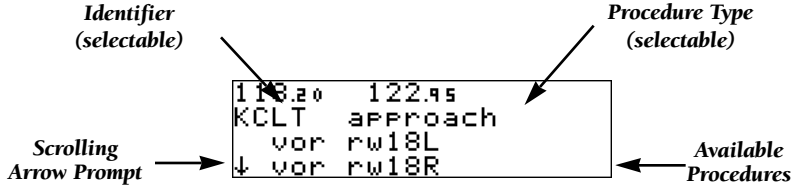


SID procedures displayed.



STAR procedures displayed.

The **airport procedures page** displays all the available approaches, SIDs and STARs at any selected airport in the database, without placing a specific approach, SID or STAR in the active route. This allows the pilot to quickly scan the procedures of any nearby airport in case of an emergency or help plan future flights. You may view the available non-precision approaches, SIDs and STARs by selecting the desired list from the procedure type field.



To view the available procedures for a selected airport:

1. Press WPT and rotate ◯ to display the procedures page.
2. Press CRSR twice and rotate ◯ to highlight the procedure type field.
3. Rotate ◉ to select the approach, SID or STAR list.
4. Press CRSR to remove the cursor.

Whenever there are more than two available procedures for a selected category, the GNC 300 will display a scrolling arrow prompt on the left side of the list. To view additional procedures, simply rotate ◉ with the cursor removed. As you scroll through the list, the arrow prompt will point 'down' to indicate additional listings below the displayed procedures, or 'up' to indicate additional listings above. If you're in the middle of a list, a double arrow will be displayed to indicate the list may be scrolled up or down.

The **airport communication page** displays the radio frequencies and usage for the selected airport, as well as sector and altitude restrictions.

To view the communication page from any of the airport information pages:

1. Rotate ◯ with the flashing cursor removed to display the communication page.
2. Rotate ◉ in the direction of the arrow prompt to view additional frequencies. You may also view additional frequencies with the cursor on by rotating the ◯ knob.

The following descriptions and abbreviations are used on the communication page:

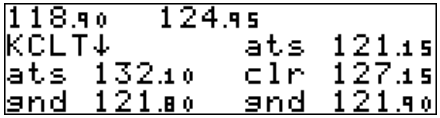
Frequencies without restriction information:

- **ats -** Automatic terminal information service (ATIS)
- **ptx -** Pre-taxi
- **clr -** Clearance delivery
- **gnd -** Ground
- **twr -** Tower
- **uni -** Unicom
- **mul -** Multicom
- **atf -** Aerodrome traffic frequency
- **ctf -** Common traffic advisory frequency (CTAF)
- **mf -** Mandatory frequency
- **oth -** Other frequencies

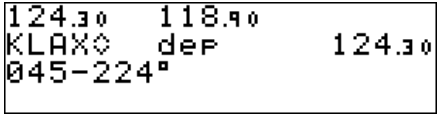
Frequencies with restriction information:

- **dep -** Departure
- **arv -** Arrival
- **cta -** ICAO control area
- **class C**
- **apr -** Approach
- **class B**
- **tma -** ICAO terminal control area
- **trsa -** Terminal radar service area

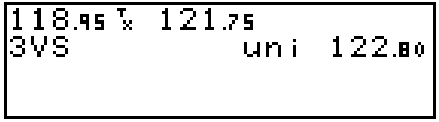
'Receive only' frequencies will display an 'rx' indicator, while 'transmit only' frequencies will display a 'tx'. If a frequency has sector and/or altitude restrictions, they will also be displayed. Sector restrictions define a range of radials from the facility, while altitude restrictions may describe an area above, below or between altitudes. Additional instructions, if available, will be displayed on the bottom line.



Airport Communications Page for KCLT.



Frequency Page with Sector Restrictions.

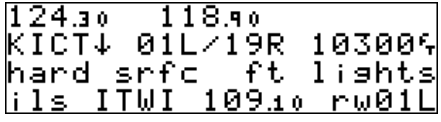


Airport Communication Page for 3VS.

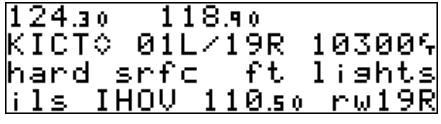
SECTION 3

WPT KEY

Airport Runway Page



Airport Runway Page for KICT.



To view additional runways, rotate the inner knob in the direction of the arrow prompts.

The **airport runway page** displays runway designations, length, surface and lighting for the selected airport, as well as ILS/localizer and/or pilot-controlled lighting frequencies.

To view the runway page from any of the airport information pages:

1. Rotate ◯ with the flashing cursor removed to display the runway page.
2. To view additional runway information, rotate ◉ with the flashing cursor removed. The scrolling arrow prompt, located beside the identifier field, indicates which direction to scroll for additional runway information.

If a localizer and ILS are used on the same runway, rotating ◉ will display both sets of information.

The following descriptions and abbreviations are used on the airport runway page:

Runway surfaces:

- **hard -** Hard (concrete, asphalt, etc.)
- **seal -** Sealed surface
- **dirt -** Dirt surface
- **unkn -** Unknown surface
- **turf -** Turf (grass)
- **grav -** Gravel surface
- **soft -** Unknown soft surface
- **watr -** Water landing site

Runway lighting:

- **pt lights -** Part time lights
- **ft lights -** Full time lights
- **pc -** Pilot controlled (with frequency)
- **no lights -** No runway lighting

VOR Information

The GNC 300 features three VOR waypoint pages:

VOR identification— allows entry of desired VOR by identifier, facility name or city; displays region and/or country of facility.

VOR position— allows entry of desired VOR by identifier; displays latitude, longitude and frequency; provides magnetic variation, weather broadcasts and DME/TACAN information.

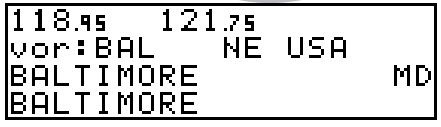
VOR comments— allows entry of desired VOR by identifier; displays user comments for the selected facility.

VOR information is accessed by entering the desired facility by identifier, city or facility name (see page 34) on any VOR waypoint page. The VOR identification and comments pages are identical in form and function to their airport page counterparts.

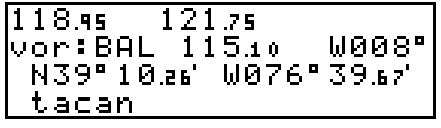
To scroll through the VOR pages:

1. Make sure the cursor is not flashing. If it is, press CRSR.
2. Rotate ◯ in either direction to scroll through the available pages.

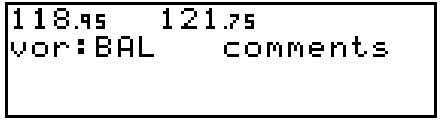
In addition to displaying the VOR frequency, magnetic variation and position, the VOR position page indicates if a DME or TACAN is co-located at the facility. The 'wx bdcst' field indicates that the VOR also transmits weather information.



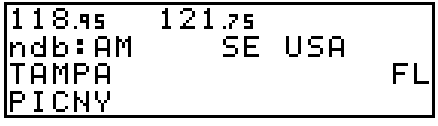
VOR Identification Page



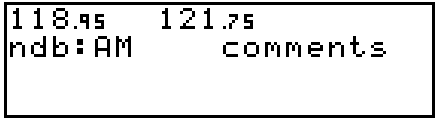
VOR Position Page



VOR Comments Page

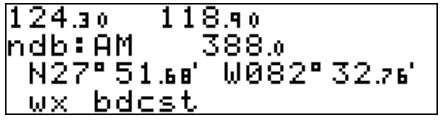


NDB Identification Page



NDB Comments Page

NDB Information



NDB Position Page

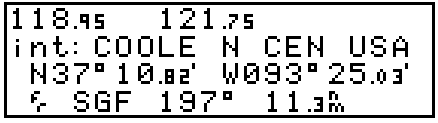
The GNC 300 also uses identification, position and comments pages for NDB information. The NDB waypoint pages are used in the same manner as VOR pages: NDB information is accessed by entering the desired facility's identifier, city or name on the NDB identification page (see page 34).

To scroll through the NDB pages:

1. Make sure the cursor is not flashing. If it is, press CRSR.
2. Rotate ◯ in either direction to scroll through the available pages.

The NDB position page (see above) displays the selected facility's identifier, frequency and position, as well as any weather broadcasts available. The NDB comment page will display any user comments for the selected NDB (see page 50 for instructions on entering user comments).

Intersection Information



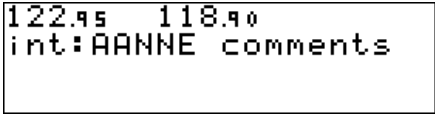
Intersection Position Page

The last database waypoint category available is intersections. Two intersection pages are available: intersection position and intersection comments. Intersections may be entered by identifier only (not city or name) on either intersection page.

To scroll through the Intersection pages:

1. Make sure the cursor is not flashing. If it is, press CRSR.
2. Rotate ◯ to toggle between the available pages.

The intersection position page displays the selected facility's identifier, region and/or country, latitude and longitude; and the identifier, distance and bearing to the nearest VOR (not necessarily the VOR used to define the intersection). The intersection comment page will display any user comments for the selected intersection (see page 50).

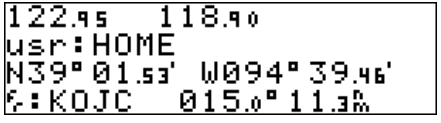


Intersection Comments Page

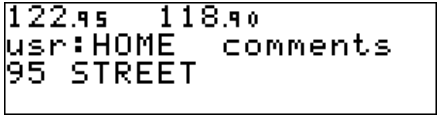
SECTION 3

WPT KEY

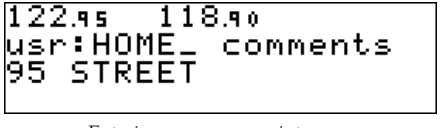
User Waypoints



User Waypoint Page



User Waypoint Comments Page



Entering a user waypoint name.

User Waypoint Information

In addition to the airport, VOR, NDB and intersection waypoints contained in your NavData® card, the GNC 300 allows you to store up to 1,000 user-defined waypoints. Once a user waypoint is created, two user waypoint pages will display the following information:

- Waypoint identifier
- Position in latitude and longitude
- Identifier, range and bearing from a reference waypoint
- User comments

To scroll between the user waypoint position page and the user comments page, rotate ◯. User waypoints may be created or modified using the WPT key. After selecting the waypoint identifier, as shown on page 34, you will be prompted to enter information if the waypoint is new. There are three ways to create a user waypoint's position from the WPT key:

1. Enter the exact position of the new waypoint.
2. Reference a known waypoint.
3. Enter a range and bearing from your current position.

To create or edit a user waypoint:

1. Press WPT.
2. Press CRSR twice and use ◯ to highlight the 'user?' field. Press ENT.
3. Use ● and ◯ to enter the waypoint identifier. Press ENT.

If the waypoint identifier entered does not exist in the database, you will be prompted to select a method to enter the new waypoint's position into the database. If the waypoint exists (you're just reviewing or editing a user waypoint), skip step 4 and move on to the next set of instructions.

4. Select the desired waypoint entry method using ◯ and press ENT.

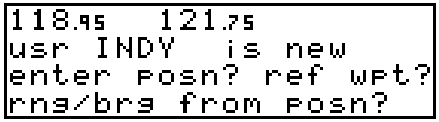
You will automatically be placed on the latitude and longitude field (if you selected 'enter posn?'), the 'from' field (if you select 'ref wpt?') or the 'bearing' field (if you select 'rng/brg from posn?').

To enter/edit the position of the user waypoint:

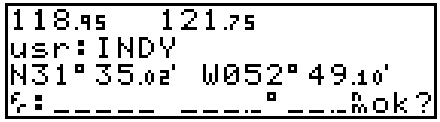
1. Use ◉ and ◯ to enter the latitude. You may select either north or south and enter a latitude up to (but not including) 90°.
2. Press ENT.
3. Use ◉ and ◯ to enter the longitude. You may select either east or west and enter a longitude up to (but not including) 180°.
4. Press ENT.

Once the latitude and longitude have been entered, the flashing cursor will move to the reference waypoint field,where you may enter a reference waypoint to calculate a bearing and distance to the new waypoint position. If you are not entering a reference waypoint:

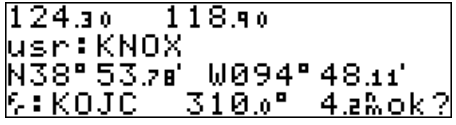
5. Press ENT to advance the flashing cursor to the 'ok?' prompt and press ENT to save the new waypoint in internal memory.



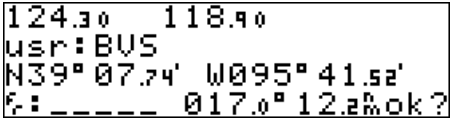
Selecting a method to enter a new user waypoint.



Entering the user waypoint's exact position.



Entering a user waypoint by referencing a wpt.



To create a user waypoint from your present position, leave the reference waypoint field blank and enter a bearing and distance from your present position. The GNC 300 will calculate the new waypoint's coordinates automatically.

To enter/edit a user waypoint position from a reference waypoint:

1. Use ◉ and ◯ to enter the reference waypoint's identifier.
2. Press ENT. The waypoint's position will appear.
3. Use ◉ and ◯ to enter the bearing from the reference waypoint.
4. Press ENT.
5. Use ◉ and ◯ to enter the distance from the reference waypoint.
6. Press ENT. The latitude and longitude will be calculated for the waypoint.
7. Press ENT to confirm the 'ok?' prompt and save the waypoint position.

If you have chosen to create a waypoint at a certain bearing and distance from your current position, your current position will be displayed and you will enter the bearing and distance at which you would like the new waypoint to be located.

To create a user waypoint offset from your present position:

1. Use ◉ and ◯ to enter the bearing from your position.
2. Press ENT.
3. Use ◉ and ◯ to enter the distance from your position.
4. Press ENT. The latitude and longitude will be calculated for the new waypoint.
5. Press ENT to confirm the 'ok?' prompt and save the waypoint position.

The GNC 300's **AutoStore™ function** provides another method of creating user waypoints. AutoStore is used to instantly capture your present position as a user waypoint with a touch of a button and add the new waypoint to the end of a specified route if desired.

To perform an AutoStore:

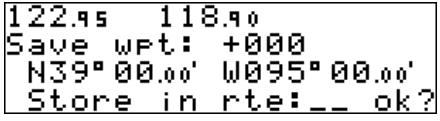
1. Press NAV and rotate ◯ to display the position page.
2. Press ENT.

This will display the 'Save' waypoint screen, which will allow you to rename the waypoint and choose the route for it to be added to. The GNC 300 will assign the next available three-digit number as the default waypoint name, preceded by a '+' sign. This will help you differentiate AutoStore waypoints from other user waypoints.

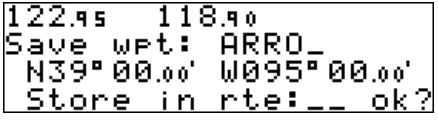
To change the name or the route of an AutoStore waypoint:

1. Rotate ◯ to select the name or route number field.
2. Use ◉ and ◯ to enter the name or route number. If you do not want to add the waypoint to a route, be sure to keep the route field blank.
3. Press ENT to accept.
4. Press ENT to confirm the 'ok?' prompt.

If the waypoint name is already used for another waypoint, you will be informed with the message 'WPT exists _____'. The default waypoint number will be redisplayed, and you may enter a different name.



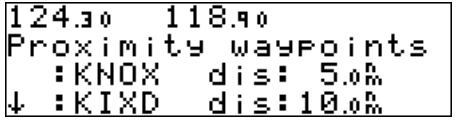
AutoStore waypoint with default name.



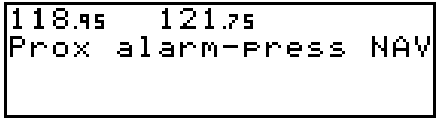
The default waypoint name may be changed before saving the waypoint.

WPT KEY

Proximity Waypoints



Proximity Waypoints Page



Proximity Alarm

The second page available from the GNC 300's WPT key is the **proximity waypoints page**. This page allows you to define an alarm circle around a selected waypoint and is useful in defining alarm circles around towers or obstructions. Up to nine proximity waypoints can be entered, with an alarm radius of up to 99.9 nm.

To create or edit a proximity waypoint:

1. Press WPT and use ◯ to display the proximity waypoints page.
2. Press CRSR twice and use ◯ to highlight the first available field.
3. Use ◉ and ◯ to enter the identifier. It may be an airport, VOR, NDB, INT or user waypoint. Press ENT.
4. Use ◉ and ◯ to enter the radius of the alarm circle. Press ENT.

If two proximity waypoints are entered and their regions overlap, you will be informed with the message 'Proximity overlap'. This message will be displayed each time you turn on the GNC 300 for as long as the overlap remains. **Warning:** If you enter the overlap area you will only be informed of the *nearest* proximity waypoint.

To remove a waypoint from the proximity waypoints page:

1. Press CRSR twice, if necessary, to obtain a cursor in the GPS window.
2. Press CLR to erase the name, and then ENT to delete.

To scroll through the proximity waypoints list:

1. Rotate ◉ with the flashing cursor inactive (or use ◯ with the flashing cursor active) to scroll through the available proximity waypoints. The scrolling arrow prompt will indicate the direction to scroll to view additional waypoints, if available.

The third page available from the GNC 300's WPT key is the **user waypoint list**, which can be used to quickly scan, review, rename or delete user waypoints.

To display the user waypoint list:

1. Press WPT and use ◯ to display the user waypoint list.
2. To scroll through the list, rotate ◉.

The total number of user waypoints is displayed at the top of the page, with user waypoints listed two at a time in alphabetical order. The scrolling arrow prompt, located at the top left of the page, will indicate which direction to scroll to view additional waypoints. The status of each waypoint, if applicable, will be displayed to the right of the identifier. A status will appear when it is the active-to waypoint, part of an active or stored route, or a proximity waypoint. To edit, rename or delete waypoints, the cursor must highlight the desired waypoint.

To highlight a waypoint:

1. Press CRSR twice and use ◯ to highlight the desired waypoint.

To edit a highlighted waypoint:

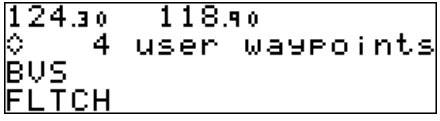
1. Press ENT to obtain the waypoint position page. Edit the waypoint as described on pages 45-46. **Note**: The active-to waypoint cannot be edited.

To delete a waypoint from the list:

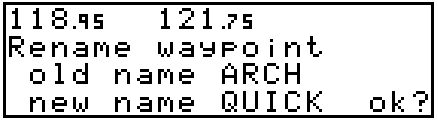
1. Highlight the desired waypoint and press CLR. Press ENT to confirm the deletion.

To rename a waypoint from the list:

1. Highlight the desired waypoint. Use ◉ and ◯ to enter a new identifier for the waypoint.
2. Press ENT on the confirmation page to change the name, or press CLR to cancel.



User Waypoint List

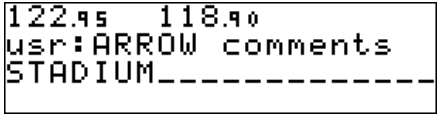


Renaming a user waypoint.

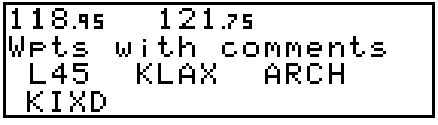
SECTION 3

WPT KEY

Waypoint Comments



Entering waypoint comments.



Waypoints with Comments List

The last page available through the GNC 300's WPT key is the **waypoint comments page**, which lists all waypoints that have a user comment. User comments may be added to 250 waypoints stored in the user or NavData® database, and allow you to note two lines of special information concerning a particular waypoint.

To enter user comments:

1. Enter the waypoint identifier from any waypoint page (see page 34), and press CRSR to remove the flashing cursor.
2. Rotate ◯ to display the 'comments' page.
3. Press CRSR and use ◯ to highlight either the second or third line.
4. Use ● and ◯ to enter the comment.
5. Press ENT to accept, and repeat steps 4 and 5, if necessary, to enter information on another line.
6. Press CRSR to remove the cursor.

To view the 'waypoints with comments' list:

1. Press WPT and use ◯ to display the 'Wpts with comments' page.
2. Use ● to scroll through the list.

The GNC 300 will display the waypoints with comments in alphabetical order, up to six waypoints at a time. The scrolling arrow prompt will indicate which direction to scroll to view additional waypoints.

To view comments for a selected waypoint:

1. Highlight the desired waypoint and press ENT.
2. Rotate ◯ to display any other available pages for the selected waypoint.

The GNC 300's extensive waypoint database makes it possible for several waypoints to share the same identifier. To ensure that you are selecting the waypoint desired, the GNC 300 will always offer the **waypoint confirmation page** (which shows the waypoint's position) when an identifier is entered for a particular function.

To accept the waypoint position:

1. Press ENT with the cursor over the 'ok?' prompt.

To reject the waypoint position:

1. Press CLR with the cursor over the 'ok?' prompt.

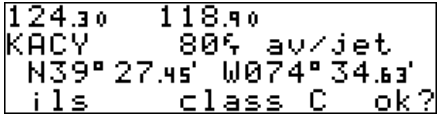
Once a waypoint has been accepted or rejected, the previous page will be displayed. If there is more than one waypoint available for a selected identifier, the GNC 300 will display a duplicate waypoint page for you to choose the desired waypoint. The waypoint identifier and number of duplicates will be shown at the top of the page, with the waypoint type and region of each duplicate indicated below. The waypoints listed are sorted by the distance from your present position.

To scroll through additional duplicate waypoints:

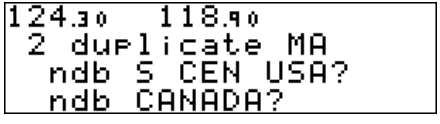
1. Rotate ◯ with the flashing cursor active, or ◉ with the flashing cursor inactive.

To select the desired waypoint from the duplicates list:

1. Activate the flashing cursor and rotate ◯ to highlight the desired waypoint.
2. Press ENT. The waypoint confirmation page will appear.
3. Press ENT over the 'ok?' prompt to accept the waypoint or CLR to reject the waypoint and return to the duplicate waypoints list.



Waypoint Confirmation Page

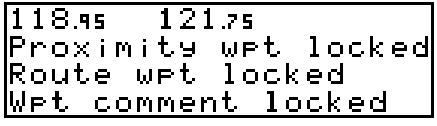


Duplicate Waypoints Page

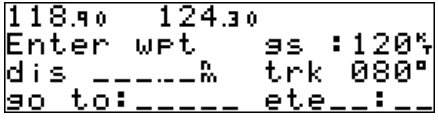
SECTION 3

WPT KEY

Locked Waypoints
Waypoint Scanning



Alarms possible for locked waypoints.



To clear a waypoint field, highlight the field and press the CLR key.

Because the GNC 300 relies on a NavData card for most waypoint information, there may be instances when waypoint information is not available for use. **Locked waypoints** exist when a waypoint contained in a route or used as a proximity waypoint is not contained on the NavData card, or no card is inserted in the unit. If this condition exists, you'll be alerted with a 'Proximity wpt locked', 'Route wpt locked' or 'Wpt comment locked' message when the unit is powered up. The identifier of a locked waypoint will be replaced with a 'lockd' message, which indicates you cannot obtain waypoint information or navigate to the waypoint. The identifier of a locked waypoint may be displayed by highlighting 'lockd' and pressing ENT. Locked waypoints may be deleted from routes, the user waypoint list or the proximity waypoints list by following the instructions in the appropriate section.

The **waypoint scanning feature** provides a fast way to scan through airports, VORs, NDBs and intersections in the database by identifier, facility name or city. Waypoint scanning may be used from any blank identifier field in the GPS window.

To enter a waypoint by scanning the identifier, facility name or city:

1. With the flashing cursor over a blank identifier field, press WPT. If the identifier field is not blank, highlight the field with the cursor and press CLR before pressing WPT.
2. Use ◯ to highlight the waypoint category you wish to scan.
3. Press ENT to activate the scanning mode.
4. Rotate ◯ to place the flashing cursor over the field you want to scan (identifier, facility or city name).
5. Use ● and ◯ to enter the letters of the identifier, city or facility name. The GNC 300 will scan the database and display the first waypoint that matches your entry.
6. Press ENT to accept the waypoint, and ENT again to confirm the waypoint for the function being used.

The GNC 300's **NRST key** provides detailed information on the nine nearest airports, VORs, NDBs, intersections and user waypoints within 200 nm of your current position. In addition, it will display the two nearest Flight Service Station (FSS) points of communication and alert you to any Special Use Airspace (SUA) you may be in or near. The NRST key can be used in conjunction with the GNC 300's direct-to function to quickly set a course to a nearby facility in case of an in-flight emergency.

To view the nearest waypoint information:

1. Press NRST.

This will display the nearest airport to your present position, subject to the runway surface type and minimum runway length selected (see Section 7).

To scroll through the next eight nearest airports, rotate ◉.

You may examine both the communication frequencies and the runway information directly from the nearest airport page. You may also place the displayed frequency into the standby field by pressing ENT from the nearest airport page.

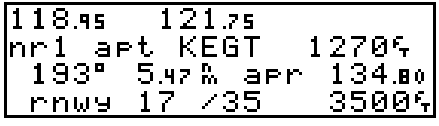
To view more comm/runway information:

1. Press CRSR twice and rotate ◯ to highlight the comm field or the runway field.
2. Rotate ◉ to scroll through more information, if available.

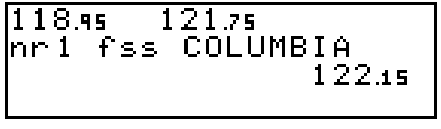
To perform a direct-to from any of the nearest waypoint pages:

1. Press D▶. The waypoint confirmation page will appear.
2. Press ENT to accept the waypoint or CLR to cancel.

The nearest waypoints for other categories (VORs, NDBs, etc.) may be viewed by rotating ◯. Rotating ◯ continuously to the left will stop page selection on the nearest airport category.



Nearest airport with other frequency information. If an airport has multiple frequencies available, they may be quickly viewed without activating the cursor by pressing the CLR key repeatedly.

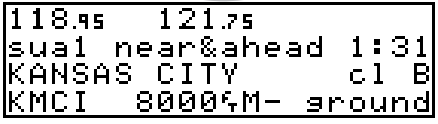


Nearest FSS page. To view additional frequencies (if available), highlight the frequency and rotate the outer knob.

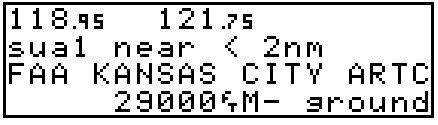
SECTION 4

NRST KEY

Special Use Airspace



Nearest SUA



Nearest SUA with controlling agency displayed.

NOTE: *The GNC 300 will flash the ▸ next to the* MSG *key to inform you of SUA alerts. You do not have to repeatedly check the nearest waypoint page for SUA information. It is provided to supply more information on the SUA and its boundaries. The GNC 300 will not flash alerts, however, if it has been turned off or if your altitude is such that you will not enter the buffered airspace. Turning off SUA alerts and setting the altitude buffer is covered in Section 7.* ***Any*** *SUA that meets the above conditions will be displayed on the nearest pages.*

The next page available under the GNC 300's NRST key is the **SUA alert page**. The SUA alert page will alert you with up to nine controlled or restricted airspaces near or in your flight path, according to the following conditions:

- If your projected course will take you inside an SUA within the next 10 minutes, the message '**SUA ahead < 10 min**' will be displayed.
- If you are within two nautical miles of an SUA and your current course will take you inside, the message '**SUA Near & Ahead**' will be displayed.
- If you are within two nautical miles of an SUA and your current course will **not** take you inside, the message '**Near SUA < 2nm**' will be displayed.
- If you have entered an SUA, the message '**Inside SUA**' will be displayed.

Note that the GNC 300's SUA alerts are based on three-dimensional data (latitude, longitude and altitude) to avoid nuisance alerts. The alert boundaries for controlled airspace are also sectorized to provide complete information on any nearby airspace. Once you have met one of the described conditions, the message annunciator will flash, alerting you of an SUA message.

To view an SUA message:

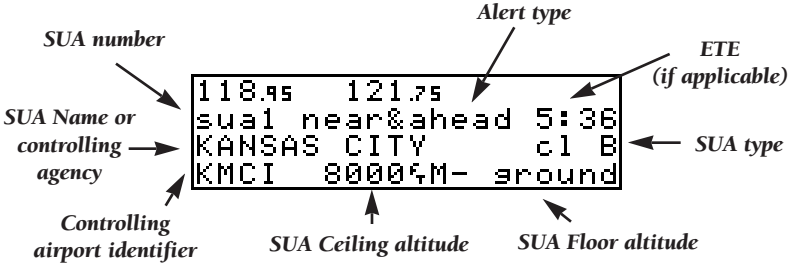
1. Press the MSG key.
2. Press MSG again to return to the previous page.

Once you are notified of an SUA alert, detailed information concerning the specific SUA is provided by the NRST key.

To view the SUA alert page:

1. Press the NRST key.
2. Rotate ◯ one stop to the right to view the SUA alert page.

The SUA alert page contains the following information:



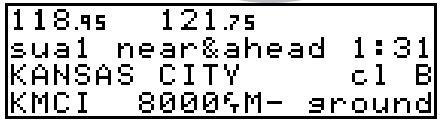
The 'SUA number' field displays which SUA you are viewing (you may be alerted with up to nine SUAs). SUAs are ranked with 'sua1' being the highest priority, and 'sua9' being the lowest priority from your current position. The 'SUA alert' field displays the corresponding alert message for this SUA, such as near, near and ahead, etc. (see page 54). The ETE (estimated time enroute), located at the top right of the page, will only be displayed if you are projected to enter the airspace.

The second line of the SUA alert page displays the name or controlling agency of the SUA, along with the SUA type to which you are being alerted.

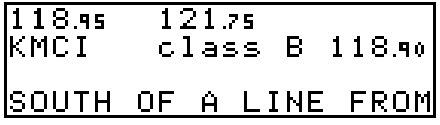
To toggle between the SUA name and controlling agency display:

1. Rotate ◉ one stop in either direction.

If the SUA name or controlling agency is too long to fit on the display, the GNC 300 will automatically scroll to display the rest of the information.



SUA Alert Page



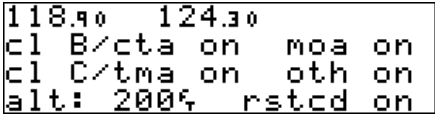
Frequency information for SUA.

The following SUA types can appear in the SUA type field:

Message	Airspace Type
alrt	- Alert
caut	- Caution
cl B	- Class B
cl C	- Class C
cta	- ICAO Control Area
dngr	- Danger
moa	- Military Operations Area
proh	- Prohibited
rstc	- Restricted
tma	- ICAO Terminal Control Area
trng	- Training
trsa	- Terminal Radar Service Area
unsp	- Unspecified
warn	- Warning

The last line on the SUA alert page displays the SUA's controlling airport identifier and the ceiling and floor altitudes for the SUA alert. Controlling agency frequencies may be viewed by highlighting the controlling airport identifier with the cursor and pressing ENT. The following are examples of what can appear in the altitude fields:

Message	Meaning
8000^{f}tM	- 8000 feet mean sea level (MSL)
3000^{f}tA	- 3000 feet above ground level (AGL)
ground	- Ground level
msl	- Mean sea level
notam	- See Notice to Airmen (NOTAM) for altitude restrictions
not sp	- Altitude is not specified
unlmtd	- Altitude is unlimited

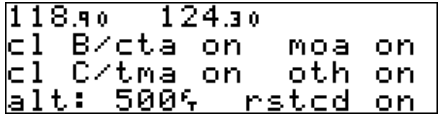


SUA Settings Page

All SUA alert messages except for prohibited areas may be turned on or off through the GNC 300's unit settings options, found under the MSG key (see Section 7). The GNC 300 will also automatically turn off SUA alerts during approach operations (see Section 6). Alerts for prohibited areas will always be displayed, regardless of unit settings or operating mode. SUA alerts may be turned off so the pilot can avoid continuous alerts in areas with extensive special use airspace.

Important: Turning off the SUA alerts only stops the display of SUA messages. Any applicable SUA alert pages will still be available from the NRST key.

The GNC 300 also features an altitude buffer which may be set to provide a greater level of protection from penetrating an SUA. By specifying an altitude in the buffer, you can effectively stretch an SUA's altitude boundaries in both directions. This allows the pilot to add an extra margin of prevention around controlled or restricted airspace. For instructions on setting the altitude buffer, see Section 7.



Altitude buffer set at 500 feet.

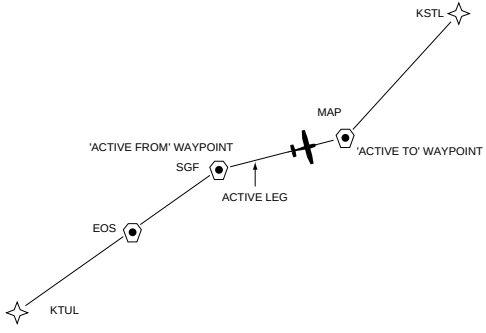
Section 5
Direct-to & Route Navigation

One of the many benefits of GPS navigation is the ability to fly directly to a waypoint or fly a chain of waypoints without using ground-based navigation aids. To take advantage of the convenience and efficiency provided by point-to-point GPS navigation, the GNC 300 provides two basic methods of selecting a destination for your flight: **direct-to** and **route navigation**. The direct-to function provides a fast way to set a course to a destination waypoint from your present position. The route function allows the pilot to create a chain of waypoints to fly in sequence.

ROUTE TERMINOLOGY

The diagram at the right shows a basic route consisting of five waypoints and four legs.

The waypoint you are travelling to is called the ***'active-to'*** *waypoint, and the waypoint immediately behind you is called the* ***'active-from'*** *waypoint. The course line between the active from and the active to waypoint is called the* ***'active leg'****.*



As you pass each waypoint in the route, the GNC 300's automatic leg sequencing and turn anticipation features will automatically select the next waypoint as the 'active to' waypoint and provide smooth steering guidance around the turn. If you are not currently navigating a particular route leg (e.g., your starting position is not a route waypoint), the automatic leg selection feature will select the leg closest to your present position as the active leg.

The GNC 300's **direct-to function** provides a quick method of setting a course to a destination waypoint. Once a direct-to destination is activated, the GNC 300 will establish a point-to-point route line along the great circle from your present position to the destination, and provide steering guidance and navigation data to the waypoint until it is cancelled. If you are navigating to a waypoint and get off course, the direct-to function may also be used to recenter the d-bar to proceed to the same waypoint.

To select a direct-to destination:

1. Press the D▶ key. The CDI page will appear with the destination field flashing.
2. Use ◉ and ◯ to enter the identifier of the desired waypoint.
3. Press ENT to confirm the identifier, and ENT to accept the direct-to confirmation page.

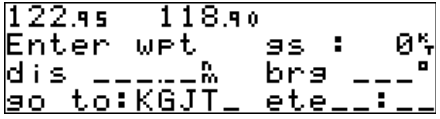
To recenter the d-bar to the same active-to waypoint:

1. Press the D▶ key, followed by ENT twice.

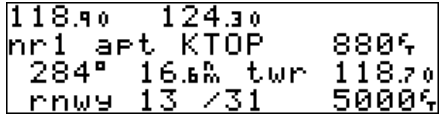
A direct-to may also be quickly activated from many pages that display a single waypoint identifier (e.g., the nearest airport page) by simply pressing D▶ and ENT. For pages that display a list of waypoints (e.g., the user waypoint list page), you must highlight the desired waypoint with the flashing cursor before pressing the D▶ key. Once a direct-to is activated, the GNC 300 will provide navigation guidance until the direct-to is cancelled or the unit is turned off.

To cancel a direct-to destination:

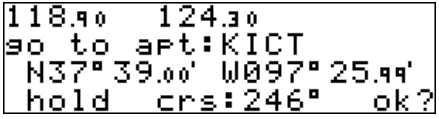
1. Place the flashing cursor over the destination field on the CDI page.
2. Press CLR. The destination field will go blank.
3. Press ENT. The GNC 300 will resume navigating Route 0 (the active route) if available.



To select a direct-to destination, press the D▶ key and enter the waypoint identifier.



To quickly select a direct-to from any page that displays a single waypoint identifier (e.g., the nearest airports page), press D▶, followed by ENTER.

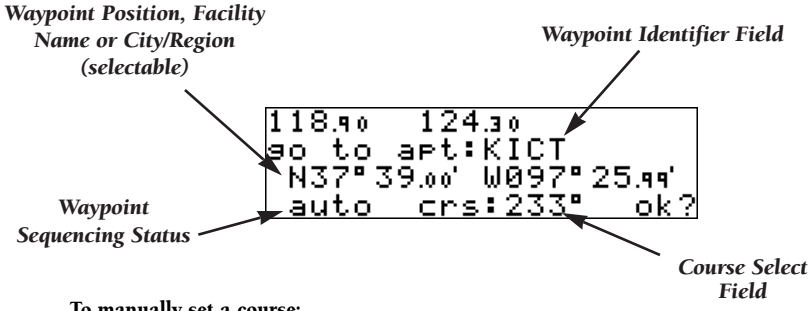


The waypoint sequencing indicator, located at the bottom left of the direct-to confirmation page, displays the current status of the external GPS SEQ switch.

To manually set your course from the course select field, set the GPS SEQ switch to the 'AUTO' position and enter the selected course in the course select field. NOTE: Whenever the GPS SEQ switch is set to the 'HOLD' position, the selected course will be determined by the external OBS/HSI.

***NOTE:** Whenever you have used the course select feature on the direct-to confirmation page or the GPS SEQ switch is set to the 'HOLD' position and external course input is not present, you may also enter the desired course from the CDI page using the course field at the bottom left of the page.*

Whenever you perform a direct-to, the GNC 300 will set a point-to-point great circle course to your destination. You can also manually define the magnetic course to your destination with the GNC 300's **Course Select** feature. The course select feature is available on the bottom line of the **direct-to confirmation page** whenever the external GPS SEQ switch is in the 'AUTO' position.

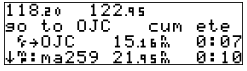


To manually set a course:

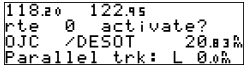
1. Set/confirm that the external GPS SEQ switch is in the 'AUTO' position.
2. With the flashing cursor over the desired destination waypoint, press the ⇢ key. The direct-to confirmation page will appear.
3. Rotate ◯ to place the flashing cursor on the course select field.
4. Use ● to begin entry of the selected course (the ◯ and ● knobs may be used once you have started editing the course select field).
5. Press ENT to accept the course, and ENT again to acknowledge the 'ok?' prompt.

The GNC 300 will now use the selected course for your CDI and DTK steering guidance. To reset the course to a GPS-calculated direct course from your present position, simply press ⇢, followed by ENT.

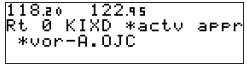
The GNC 300 lets you create up to 20 routes (numbered 0 through 19), with up to 31 waypoints each. Routes are created, copied and edited through the RTE key, which features five route pages selectable using the GNC 300's outer knob. The approach select, SID select and STAR select pages, used for approach navigation, are discussed in Section 6.



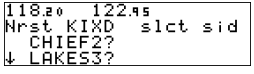
Active Route Page



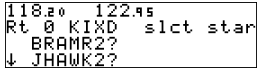
Route Catalog Page



Approach Select Page



SID Select Page



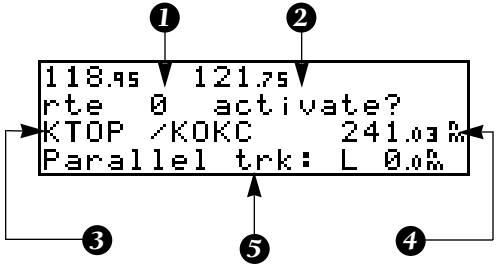
STAR Select Page

The five route pages can be divided into two types: **active route pages** and a **route catalog page**. Active route pages provide information and editing functions for Route 0, which serves as the route you are currently navigating. The route catalog page serves as the main page for creating, editing, activating, deleting and copying all routes. Routes 1-19 are storage routes, which are stored in the GNC 300's internal memory. Once a storage route is 'activated', it is placed into Route 0 for navigation until it is cancelled, overwritten by activating another route or erased when the GPS receiver is turned off. If you want to save a route currently in Route 0, be sure to copy it to an open storage route (routes 1-19) before it is cancelled, overwritten or erased.

SECTION 5

ROUTES

Route Catalog Page



Route Catalog Page

1. Route selection field
2. Route action field
3. Departure/Arrival waypoints
4. Cumulative distance of route
5. Comments/Parallel track offset field

The GNC 300's **route catalog page** is used to create, edit, delete or copy routes, and serves as the main page for a host of functions. These include route activation, determining the closest point of approach and search and rescue operations. It also displays a summary of routes currently stored in memory, with the departure and arrival route waypoints and total distance for the selected route. To scroll through the available routes, rotate ◉. A one-line user comment may be added to any storage route and displayed on the route catalog page.

To add user comments to any route (except route 0):

1. Rotate ◉ to display the route to which you would like to add a comment.
2. Press CRSR twice and use ◯ to highlight the bottom row.
3. Use ◉ and ◯ to enter comments, and press ENT. To erase, press CLR, then ENT.

The **route action field**, located at the top right of the page, is used to select the desired route operation. The following functions are available:

- **Activate -** activate the route for navigation
- **Reverse -** activate a route in reverse order
- **Edit -** create a new route, or edit an existing route
- **Approach -** select an approach for the route (see Section 6)
- **Star -** select a STAR for the route (see Section 6)
- **Sid -** select a SID for the route (see Section 6)
- **Delete -** delete a route
- **Copy -** copy the current route to an empty route
- **CPA -** calculate the closest point of approach
- **Search -** Perform search and rescue ladder operations

The **route editing function** allows you to create new routes and edit existing routes. Creating routes before takeoff can help make route operations easier during your flight.

To create or edit a route from the route catalog page:

1. Use ◉ to display the route number you would like to edit.
2. Press CRSR twice.
3. Use ◉ to select 'edit?'. Press ENT. The route review page will appear.

To add a waypoint:

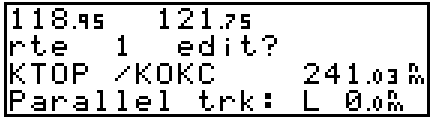
4. Rotate ◯ to highlight the first blank waypoint field or the point where you want to enter the new waypoint. The first waypoint field will flash if you're creating a new route.
5. Use ◉ and ◯ to enter the waypoint's identifier. Press ENT.
6. Press ENT to confirm the 'ok?' prompt on the waypoint confirmation page.
7. Repeat steps 4 through 6 to add the next waypoint, or press CRSR to finish.

To delete a waypoint:

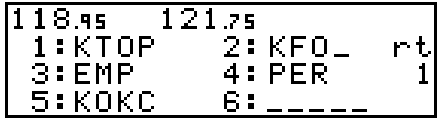
1. Rotate ◯ to highlight the waypoint you wish to delete.
2. Press CLR to remove the name, then press ENT to delete.
3. Repeat steps 1 and 2 to delete additional waypoints, or press CRSR to finish.

To delete an entire route:

1. Use ◉ to display the route number you would like to delete (route 0 for the active route).
2. Press CRSR twice and use ◯ to highlight the action field.
3. Use ◉ to select 'delete?'. Press ENT to delete.



Selecting the route edit function.

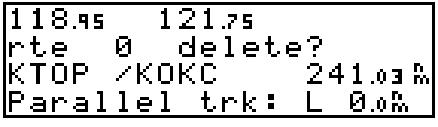


Adding a waypoint to route 1.

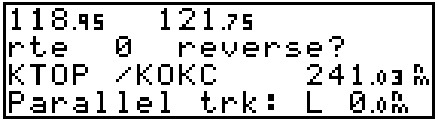
SECTION 5

ROUTES

Activating & Copying Routes



Deleting route 0.



Reversing route 0.

Once a route is defined through the route catalog page, it may be activated from the route catalog page. Activating or inverting a route places the selected route into route 0 and overwrites the existing active route.

To activate a route:

1. Press RTE and use ◯ to display the route catalog page.
2. Rotate ● to display the route you would like to activate.
3. Press CRSR twice and use ● to display 'activate?'. Press ENT.

After travelling a route or creating a route with the GNC 300's AutoStore™ feature, the route activation field may be used to activate the route in reverse order.

To activate a route in reverse order:

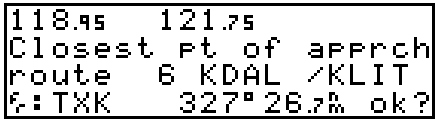
1. Press RTE and use ◯ to display the route catalog page.
2. Use ● to display the route number you would like to reverse.
3. Press CRSR twice and use ● to display 'reverse?'. Press ENT.

The route action field also features a **copy function** that permits you to copy any route to another open storage route. The copy function can be used to save the contents of the active route (route 0) to an open storage route.

To copy a route:

1. Press RTE and use ◯ to display the route catalog page.
2. Use ● to display the route to which you would like to copy. The route must be empty.
3. Press CRSR twice and rotate ● to select 'copy?'. Press ENT.
4. Use ● to enter the route from which you would like to copy. The departure/arrival identifiers will be displayed for your reference. Press ENT to copy the route.

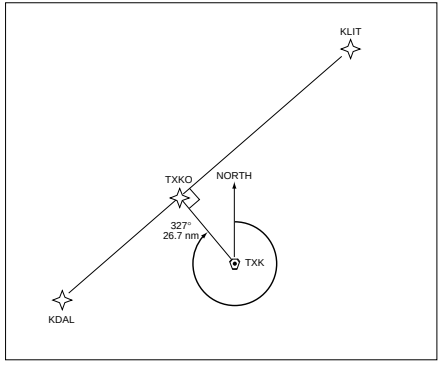
The **CPA function** calculates the closest distance that a route will pass to a reference waypoint, and helps you create new route waypoints referencing a NAVAID.



Calculating Closest Point of Approach.

To calculate the closest point of approach (CPA) from the route catalog page:

1. Use ◉ to display the route you would like to use for the CPA function. The route must consist of at least two waypoints, and the reference facility must fall between the waypoints of a route leg.
2. Press CRSR twice and rotate ◉ to select 'cpa?'. Press ENT.
3. Use ◉ and ◯ to enter the identifier of the reference waypoint.
4. Press ENT. The bearing and distance of the closest point on the route will be displayed.
5. Press ENT to add the cpa waypoint to the route, or CLR to finish. If you do add the cpa waypoint to the route, it will be named based on the reference waypoint plus a number (0-9) appended to the end (e.g., KMCI3 for KMCI). If the waypoint does not fall between waypoints on the route, the reference waypoint does not exist or a unique name cannot be assigned to the CPA waypoint, you'll be informed with an 'Invald CPA wpt ____' message.



Closest Point of Approach

SECTION 5

ROUTES

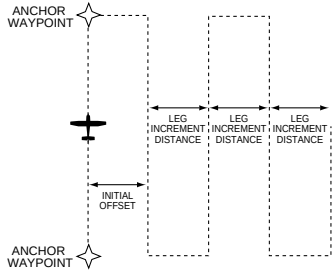
Search & Rescue Operations

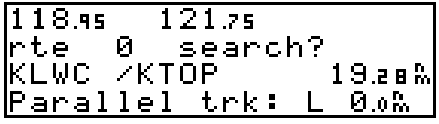
The GNC 300's **search and rescue** function provides navigation guidance for search and rescue operations, navigating in a ladder pattern to maximize coverage and efficiency. This is done in reference to two waypoints called 'anchor waypoints'. The first leg will be a specified distance from the line connecting the anchor waypoints. This is called the 'offset distance'. The 'increment distance' is the distance between each subsequent leg. Note that bearing and distance information are referenced to the anchor waypoints. The ladder can be created on either side of the waypoints.

To perform a search and rescue operation:

1. Create a route of **only** two waypoints.
2. Press RTE and use ◯ to display the route catalog page.
3. Use ● to select the 2-waypoint route.
4. Press CRSR twice and use ● to display 'search?'. Press ENT.
5. Use ● and ◯ to enter the leg increment value and R or L. Press ENT.
6. Rotate ◯ to highlight the initial offset, and use ● and ◯ to enter the initial offset value, and R or L.
7. Press ENT three times to accept the operation values and begin navigation.

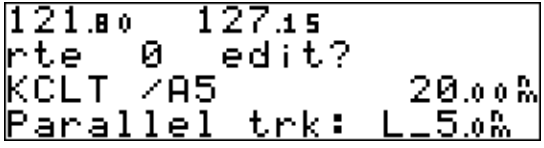
After activating a search and rescue, you will be informed with an 'Offset nav in effect' message each time you traverse the route offset from the anchor waypoints. Each time you pass the destination waypoint or one of its subsequent offsets, the leg increment will be added to your present offset, and the route will be automatically reversed. If a search and rescue is interrupted, note the parallel track direction (R or L) and distance on the activation page for route 0. When you resume search and rescue operations, use this as the initial offset.





Performing a search and rescue operation.

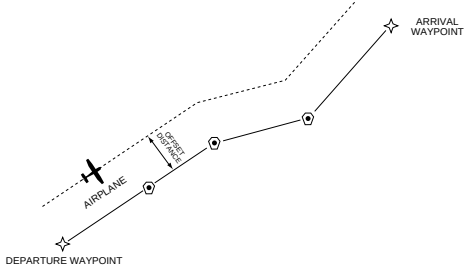
During route navigation, it is sometimes desirable to navigate a specified distance away from the 'active leg' to help avoid certain airspaces or regions or bad weather. The GNC 300's **parallel track feature** will automatically guide you along a selected offset from the active leg (bearing and distance information will be to the waypoints along the original course).



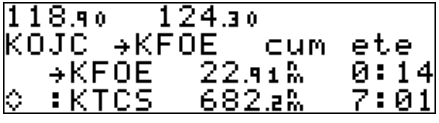
To use offset navigation, or parallel track:

1. Press RTE and use ◯ to display the route catalog page.
2. Use ◉ to display route 0 (parallel track can only be used on the active route).
3. Press CRSR twice and use ◯ to highlight the parallel track value field.
4. Use ◉ and ◯ to enter the desired distance and direction (R or L) from the course.
5. Press ENT to accept.

It is important to note that offset navigation is only available on route navigation, not direct-to navigation. When offset navigation is activated, an 'Offset nav in effect' message will be displayed with the distance and direction noted on the route activation page for route 0. If you enter an offset which causes a leg to be reversed, you'll be informed with an 'Ofst too big for rte' message. If you change the active route in any way or perform a direct-to, you'll be informed with an 'Offset nav cancelled' message.



Parallel Track



USING THE ACTIVE ROUTE PAGE

The GNC 300's active route page provides a working list of the route you are navigating, allowing you to view all route waypoints, along with distance, timing or desired track information. The scrolling arrow prompt to the left of the route waypoint list indicates which way to scroll to view additional route waypoints.

The active route page can also be used to manually select your next 'active to' destination, which allows you to fly the route out of sequence without modifying it. The GNC 300 will resume navigation of the remainder of the route in sequence once you arrive at the selected waypoint.

Flying and Modifying the Active Route

Once a route has been created and activated, the GNC 300 will provide navigation to each route waypoint through the active route and CDI pages. From the active route pages, you may also create and modify the active route, and insert an approach, SID or STAR for your flight. The CDI page will display detailed navigation data on your progress to each route waypoint and provide turn anticipation, waypoint arrival and next desired track information. By understanding the relationship between the active route and CDI pages and the role of the external GPS SEQ switch, you'll be able to get the most out of the GNC 300's advanced route and approach features.

Whenever the GNC 300 is navigating a direct-to, route or approach, the **active route page** will provide a list of the route waypoints in sequence, along with distance, time and course information. You may also create and edit a route directly from the active route page. If you want to save a route created from the active route page (route 0), you must copy it to an open storage route (see page 64) before turning the unit off or activating another route. The active route page may be displayed by pressing the RTE key and rotating ◯ left continuously. It will automatically appear whenever a route, approach, SID or STAR is activated.

To scroll through the active route waypoints:

1. Rotate ◉ with the flashing cursor inactive (or ◯ with the cursor active).

The active leg identifiers field, located at the top left of the page, displays the waypoint identifiers of the leg of the route you are currently navigating. The first waypoint identifier displayed is the **'active from'** waypoint. The second waypoint is the **'active to'** waypoint. The straight line course connecting these waypoints is known as the **'active leg'**. If you are navigating a direct-to (instead of a defined route), the active leg field will display the destination with a 'goto' designation.

The 'cum or leg' field can be selected to display cumulative distance and ete/eta or the distance and ete/eta for each individual route leg. If cumulative is selected, the first leg's distance will be displayed. The second leg will represent the first leg's distance plus the second leg, and so on. This also applies to the ete/eta field, which may also be configured to display the desired track (dtk) for each leg, regardless of the cumulative or leg selection.

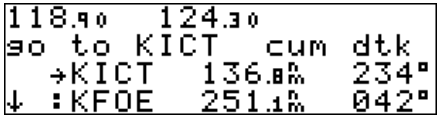
To change the leg and ete/eta fields:

1. With the flashing cursor active, rotate ◯ to highlight the field you want to change.
2. Rotate ◉ to select the desired setting and press CRSR.

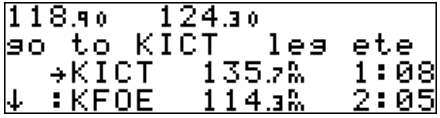
The active route page may also be used to create a new route or edit the route you are currently navigating, and provides a fast method of selecting any route waypoint as your next destination waypoint without modifying the active route. If you are editing the active route and want to save it in its original form, copy it to an open storage route before editing.

To add waypoints to the active route:

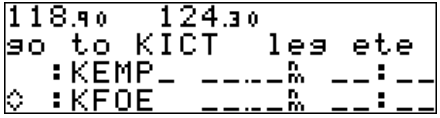
1. Press CRSR twice, if necessary, to activate the cursor.
2. Use ◯ to highlight the first blank waypoint field, ***or*** highlight the waypoint before which you would like to add the new waypoint.
3. Use ◉ and ◯ to enter the new waypoint identifier. Press ENT.
4. Press ENT to accept or CLR to cancel. The cursor will automatically move to the next waypoint field, and the remaining route waypoints (if any are present) will re-sequence the list accordingly.



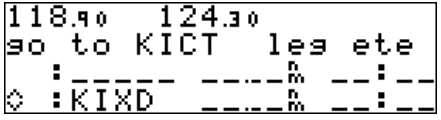
Active route page with cumulative distance and desired track displayed.



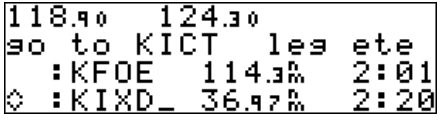
Active route page with leg distance and estimated time enroute displayed.



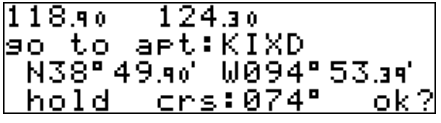
Adding KEMP waypoint to the active route.



Deleting a route waypoint.



Highlight the desired waypoint and press D▸.



Waypoint sequencing set to 'hold'.

To delete a waypoint from the active route:

1. Press CRSR twice, if necessary, to activate the cursor.
2. Use ◯ to highlight the waypoint you would like to delete from the active route.
3. Press CLR, followed by ENT. The next route waypoint (if available) will move up to take the position of the deleted waypoint.

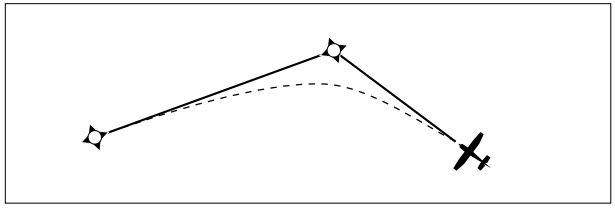
The active route page also allows you to select your next destination waypoint manually from the active route waypoint list and resume the remainder of the route in sequence. This procedure, referred to as an **'on-route' direct-to**, allows the pilot to fly the active route in a different sequence without editing the active route itself.

To perform an on-route direct-to from the active route page:

1. Press CRSR twice and rotate ◯ to highlight the desired waypoint.
2. Press D▸, followed by ENT to confirm the 'ok?' prompt on the waypoint confirmation page.

The GNC 300 will now provide guidance to the selected waypoint and resume navigating the remainder of the route in sequence once you arrive at the next destination waypoint. The **waypoint sequencing field**, located at the bottom left of the direct-to confirmation page, indicates the current setting of the external GPS SEQ switch. Whenever the switch displays a 'HOLD' status, the GNC 300 will hold on the current 'active-to' waypoint as your navigation reference and prevents the GPS receiver from sequencing to the next waypoint in the route. For more information on holding at a waypoint and the GPS SEQ switch, see Section 6.

While the active route page offers the necessary functions for creating, monitoring and modifying the active route, the CDI page is used to provide turn anticipation, next desired track and waypoint arrival information to the pilot. During route navigation, the GNC 300's **turn anticipation feature** will smooth out the transition between adjacent route legs by providing navigation along a curved path segment.



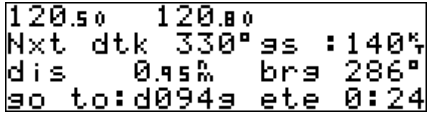
Turn Anticipation

This leg transition is based on the aircraft's actual ground speed and the difference between the course angle of the two legs. The GNC 300 will automatically sequence to the next leg when you are abeam the 'active to' waypoint and on the curved transition segment (the to/from indicator on the CDI will flip momentarily). During the transition, the CDI will be referenced to the dotted line illustrated above. Turn anticipation will not be provided if: (1) waypoint/fix crossing is a requirement of the approach; (2) The GPS SEQ switch is set to HOLD; or (3) your current ground speed and the course angle between the two legs would require a bank angle greater than 25º.

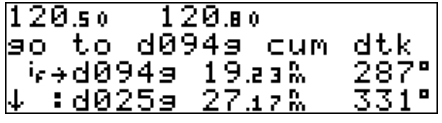
To use the turn anticipation feature, note the 'Nxt dtk' heading when the external waypoint annunciator begins to flash, and start the turn when the annunciator glows steadily (approx. 2 seconds before the turn anticipation point). Once you've reached the turn anticipation point, the 'dtk' field on the CDI page will change to display the course value for the next leg. If you have not adjusted your OBS/HSI before the turn, the 'Nxt dtk' will continue to flash until you have reached the midpoint of the turn.

GPS WPT

The waypoint annunciator will glow steadily 2 seconds before the turn anticipation point.



The desired track for the next leg will appear in the CDI field 15 seconds before the turn anticipation point.



Once an approach is selected, the GNC 300 will replace the destination airport with the appropriate approach waypoints. The initial approach fix, final approach fix and missed approach point waypoints are indicated by 'if', 'ff' and 'mp' designators to the immediate left of the waypoints.

In many instances, there may be approach waypoints in the GPS approach that are not shown on the approach plate. These waypoints are usually intermediate fixes designed to help the GPS provide smooth navigation along the approach path.

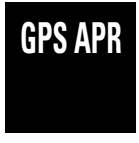
Section 6
Approaches, SIDs and STARs

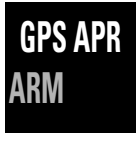
The GNC 300's approach navigation mode allows you to fly non-precision approaches to airports with GPS and overlay procedures using information contained on your Jeppesen NavData® card. GPS approaches are similar to existing IFR approach procedures, but provide additional course and distance information for a higher level of accuracy, efficiency and safety. The non-precision approaches available in the GNC 300 are executed using the GPS route features covered in Section 5, so it's important to understand routes before attempting approach navigation. A **GPS approach** is a sequence of waypoints linked together as a subroute which replaces your destination airport waypoint when selected. It may be based on an existing RNAV, VOR or NDB approach procedure, or be an entirely new approach created specifically for GPS. Regardless of the type of approach on which a GPS procedure is based, the procedure is flown as a sequence of route legs in the active route.

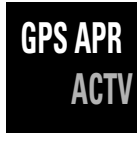
The GNC 300's **auto-arming** feature provides automatic control of the two phases of approach operations: **arm approach** and **active approach**. The arm approach phase consists of selecting an approach from the database and ensuring that the receiver is ready to begin the tighter integrity monitoring and CDI adjustment required for approach navigation. The active approach phase tightens the accuracy requirements and sensitivity one step further to meet TSO standards for the non-precision approach. Auto-arming of the approach will occur once you are within 30 nm of the destination airport, and will be indicated by an 'ARM' message on the external GPS APPR switch. The approach will then transition to the active phase when the aircraft is within 2 nm of the FAF along the inbound course to the final approach fix.

The GNC 300 works in conjunction with a set of external switches and your OBS/HSI to fly GPS approaches. The external switches are used to control GPS functions, and contain illuminated annunciators to indicate when functions are active. Your installation must also have annunciators for waypoint arrival and GPS messages.

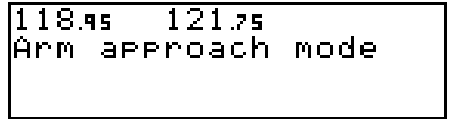
The **NAV/GPS switch** determines which data (GPS or NAV1) will be displayed on the HSI and used by the autopilot/flight director. The current selection will be indicated by an annunciator light. If power to the GNC 300 is lost, the system will automatically revert to NAV1.





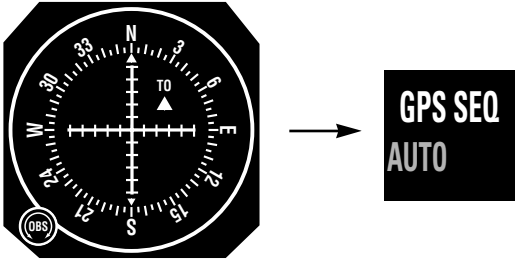


The **GPS APR switch** is used to arm or deactivate an approach, and indicates the current approach phase status ('ARM' or 'ACTV'). The GNC 300 will automatically arm a selected approach 30 nm from the airport. If the pilot wishes to terminate the approach or fly the missed approach, the GPS APR switch may be pressed to disarm/deactivate the approach at any time and return the CDI scale sensitivity to the 1.0 nm setting. The GPS APR switch may also be used to rearm the approach at any time before reaching the FAF. If the selected approach is disarmed before the FAF, the unit will prompt you to re-arm the approach 3 nm before the final approach fix.



Arm Approach Mode

The external GPS APR switch will automatically be set to the ARM position 30 nm from the destination airport. Once the approach is armed, the unit will provide a smooth transition from the 5.0 to 1.0 nautical mile scale, and down to 0.3 nm within 2 nm inbound to the FAF. If the approach is manually disarmed, it may be re-armed at any time (before reaching the FAF) by pressing the GPS APR switch.



Always set the desired course on the OBS/HSI BEFORE returning the GPS SEQ switch to the 'AUTO' position.

The **GPS SEQ switch** is used to select manual or automatic waypoint sequencing of waypoints. Setting the GPS SEQ switch to the HOLD position holds your current 'active to' waypoint as your navigation reference and prevents the GPS from sequencing to the next waypoint. When the GPS SEQ switch is set to the AUTO position, automatic waypoint sequencing is selected. Whenever the GPS SEQ switch is engaged, the HOLD annunciator will illuminate and the GPS will continue navigating to the active-to waypoint regardless of your position relative to other waypoints.

The GPS SEQ switch must be set to the HOLD position any time you are deviating from the flight sequence of an approach (e.g., when you are flying radar vectors) or when you must cross the same waypoint twice in succession (e.g., procedure turn, IAF and FAF at the same waypoint). Whenever the GPS SEQ switch is set to the HOLD position, the GNC 300 allows you to select the desired course to/from a waypoint using the HSI, much like a VOR.

Whenever the GPS SEQ switch is released from the HOLD position, the GNC 300 will 'capture' the present HSI setting as your desired course. Always dial in your next desired course before returning the GPS SEQ switch to the AUTO position. The GPS SEQ switch may be released from the HOLD position 2 seconds after the inbound course has been set. The GNC 300 will continue navigation on the last selected course through the active-to waypoint and sequence to the next approach waypoint.

Basic Rules of GPS Approaches

The GNC 300 is the first GPS/COM certified to meet the requirements of TSO C-129 Category A1. When using the GNC 300 for non-precision approaches, you'll encounter two types of approaches: overlay approaches (based on existing procedures) and GPS approaches (new approaches designed specifically for GPS). The FAA has approved a large number of overlay approaches, with plans to add as many GPS approaches as possible to take advantage of the safety and convenience of GPS.

Flying a GPS approach is not difficult, and varies from conventional approaches only in the operation of the equipment being used. Although you'll often be following the same flight path used in conventional approaches, the equipment operation procedures will be different from typical NDB or VOR approaches.

The following definitions, guidelines and examples that follow will help you understand the basic rules of GPS approaches, and guide you through some typical approaches. Think through the approach examples— this will assist you in getting the greatest benefit from the GNC 300. There are a few basic rules that apply to all GPS approaches. Remembering these rules will assist you in understanding the approach procedures and ensure the greatest margin of safety for your flight.

- The approach to be flown must be in the aviation database, and the database must be current.
- You may select an approach any time after the destination airport is selected. If the GPS APR switch does not indicate an 'ARM' status within 2 nm inbound to the final approach fix, you run the risk of flying a non-approved approach.
- When performing an approach, the GPS SEQ switch must be set to the AUTO position with the FAF as the active to waypoint for the approach to go active. If the switch has not been set to the AUTO position 2 nm before the FAF, the CDI scale transition will be compressed, making the CDI change more abrupt.

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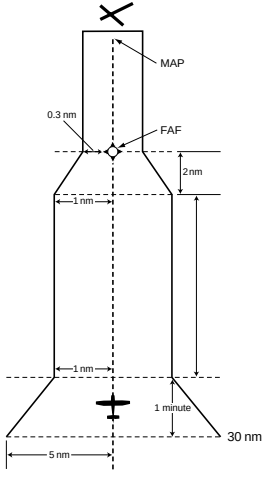
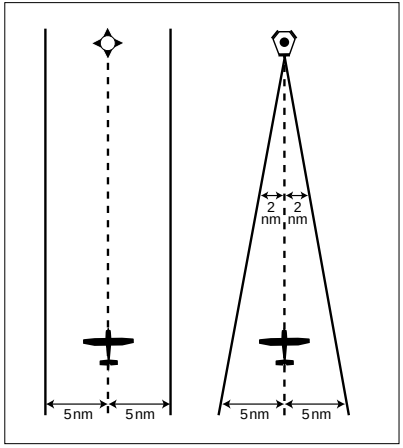


CDI scale ramping during approach.

SECTION 6

APPROACH NAV

Basic Rules of GPS Approaches



Unlike a VOR, GPS CDI deflection is based on the actual distance from the desired course, regardless of how far away you are from the destination.

- If you cross the same waypoint twice in succession during an approach (e.g., the IAF and FAF at the same waypoint, or radar vectors to the FAF), you must set the GPS SEQ switch to the HOLD position PRIOR to crossing the fix the first time to prevent the GPS from sequencing to the next waypoint.
- During a GPS approach, keep in mind that your external HSI will display the same CDI needle deflection and scale as the CDI on the GNC 300, which will transition from 5.0 to 0.3 nm through the approach. Also note that unlike a VOR CDI, the GPS CDI scale is based on the *cross-track distance* to the desired course (the distance to the reference waypoint does not have an effect on the CDI scale).
- The HSI course select should always be set 2 seconds BEFORE changing the GPS SEQ from HOLD to AUTO to ensure the desired course to the next waypoint is settled prior to use by the GPS and give the autopilot sufficient time to react to the heading change.
- GPS always displays distance from the currently active waypoint. When determining distance along the approach, use caution to determine the correct distance from the approach chart.
- RAIM must be available (the GNC 300 automatically monitors RAIM, and will display a message if it is not available) from the FAF to the MAP. If RAIM is not available or becomes unavailable during this leg, the HSI NAV flag will appear, and you must fly the missed approach procedure.
- When flying a missed approach, SID or STAR, you must fly all published procedures and ensure that all printed course and altitude restraints are achieved.
- If you are off course to the MAP waypoint and use a direct-to to re-center the d-bar, the active approach will be cancelled.
- SUA alerts are disabled when an approach is selected and armed and the aircraft is less than 30 nm from the destination airport. SUA information is still available from the NRST key at all times.

Flying A Typical Approach

The non-precision approaches available from the GNC 300 will all follow the same general flow of events described below. Specific details and instructions relating to each step, along with several approach examples are provided later in this chapter.

1. Create a direct-to or route with an airport as the final destination

To save time during your flight, you may wish to create a route and select an approach before takeoff using the route catalog page.

2. Select an approach for the destination airport

An approach may be selected at any time, but must be loaded before reaching the final approach fix. Once an approach is selected, the approach waypoints will replace the destination airport and the GNC 300 will provide navigation to the Initial Approach Fix.

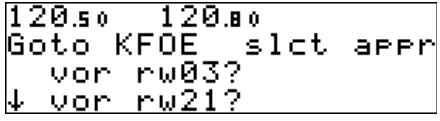
3. Transition to the Arm Approach Phase

The GNC 300 will automatically arm the approach 30 nm from the destination airport. The CDI scale will begin to ramp down from the 5.0 nm to the 1.0 nm scale, and the GPS APR annunciator will indicate an 'ARM' status. You'll be prompted to enter the altimeter setting of the arrival airport.

4. Establish yourself on the final approach course

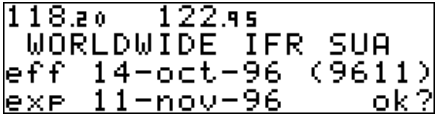
a. No procedure turn approach- no special requirements
b. Radar vectors- requires use of GPS SEQ switch to hold on designated approach waypoint
c. Procedure turn- requires use of GPS SEQ switch to hold on active waypoint
d. DME arc- requires use of position page to monitor distance from reference waypoint

(continued on the next page...)

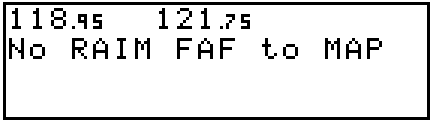


Select the approach.

The GNC 300 will automatically arm the approach 30 nm from the destination airport.



GPS approaches must be in the current aviation database to be approved.



TSO C-129 requires that satellite coverage and navigational accuracy provided by the GPS system meet minimum standards.

A 'No RAIM from FAF to MAP' message will appear if RAIM is predicted to be unavailable for an approach. If you receive a RAIM message, continue the approach ONLY if the ACTV annunciator remains illuminated to the MAP. If the ACTV annunciator does not stay illuminated, your HSI NAV flag will appear, and you must fly the missed approach procedure.

5. Transition to Active Approach Phase

The approach will automatically transition to the active approach stage and the GPS APPR annunciator will indicate an 'ACTV' status if the following conditions are met:

a. The approach is armed
b. The aircraft is 2 nm from the FAF on an inbound course
c. The GPS SEQ switch is set to the 'AUTO' position
d. The FAF is the active-to waypoint
e. The GNC 300 confirms that integrity monitoring will be available to complete the approach

Once the active approach phase begins, the CDI scale will begin to gradually transition from the 1.0 nm scale to the 0.3 nm scale, and remain at the 0.3 nm scale from the FAF to the MAP unless the approach is cancelled by pressing the external GPS APR switch, setting the GPS SEQ switch to 'HOLD' or by initiating a direct-to operation.

WARNING: You are not authorized to fly the final portion of the approach unless the external GPS APR annunciator indicates an 'ACTV' status.

6. Missed Approach Procedure

The GNC 300's automatic waypoint sequencing stops at the missed approach point. Once you have crossed the MAP, the GNC 300 will give you the option of flying direct to the missed approach holding point:

a. Press the GPS APR switch to return the CDI to the 1.0 nm scale.
b. AFTER crossing the MAP, press ⇻, followed by ENT to fly directly to the missed approach holding point.

WARNING! A direct course to the missed approach holding point may not correspond to the published missed approach procedure. Always fly all published procedures before selecting the holding fix on the GPS.

Selecting and Loading an Approach

When an arrival airport is selected with the direct-to key (or created and activated in a route to the arrival airport), the approaches for your arrival airport become available through the approach select page, which can be viewed by pressing RTE and rotating the outer knob. Remember that an airport must be the last waypoint in a route to select an approach.

To select an approach:

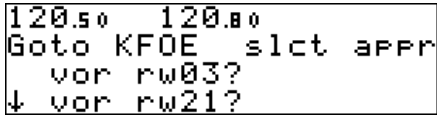
1. Select the destination airport using the -D▸ key, or create and activate a route to the destination airport (see Section 5).
2. Press RTE and rotate ◯ to display the approach select page.
3. Rotate ◉ (or ◯ with the cursor active) to display the desired approach procedure.
4. Press CRSR twice (if necessary) and rotate ◯ until the desired approach flashes.
5. Press ENT to select the approach.

If an approach procedure has more than one Initial Approach Fix (IAF), you'll need to select the desired IAF identifier for your approach.

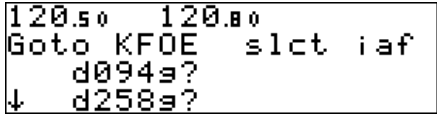
To select an IAF:

1. Rotate ◯ until the desired IAF flashes.
2. Press ENT.

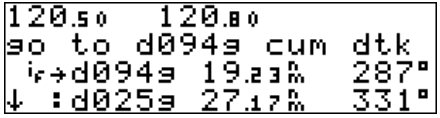
Once the IAF is selected, the approach waypoints will be inserted into Route 0, replacing the destination airport, and the active route page will be displayed. To review the active route, rotate the ◉ knob. The scrolling arrow prompt will indicate which direction to scroll to view additional waypoints, while the 'if', 'ff' and 'mp' designators will indicate the IAF, FAF and MAP respectively.



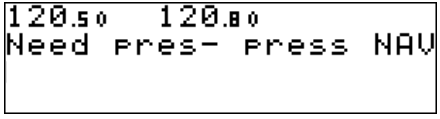
Select the approach.



Select the Initial Approach Fix.



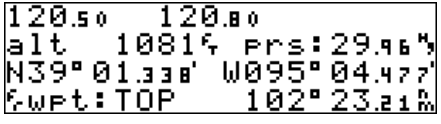
Once the approach is loaded, the active route page will appear.



NEED PRES - PRESS NAV

The altimeter setting of the destination airport needs to be entered on the position page.

IMPORTANT! *Entering an incorrect altimeter setting will directly affect the GNC 300's ability to provide accurate navigation guidance.*



Enter the altimeter setting on the position page.

When the aircraft is within 30 nautical miles of the destination airport, the GNC 300 will automatically arm the approach, and the GPS APR switch will indicate an 'ARM' status. The 'Need pres- press NAV' message will also appear.

To fly the GPS approach (without radar vectors):

1. Confirm that the GPS APPR switch indicates an 'ARM' status. The CDI scale will begin a steady transition from the 5.0 nm to the 1.0 nm scale as you make your way to the FAF. If the approach has been disarmed and the aircraft is within 3 nm of the FAF, the GNC 300 will prompt you to rearm the approach.

2. Enter the altimeter setting at the destination airport on the position page when the 'Need pres- press NAV' message appears.

3. The GNC 300 will automatically sequence to each waypoint in the approach, with CDI, course and timing guidance to each waypoint. For each waypoint in the approach, the GNC 300's turn anticipation and waypoint alerting features will provide three pilot cues:
   a. The waypoint annunciator will flash approximately 15 seconds before reaching the turning point for each approach waypoint, and glow steadily approximately 2 seconds prior to the turn anticipation point.
   b. The 'Next dtk' prompt will flash in the CDI field when the 'WPT' annunciator begins flashing. Set the HSI course select to the next dtk value when the waypoint annunciator starts flashing. Start the turn when the annunciator glows steadily.
   c. The To/From indicator flag on the GPS CDI will flip momentarily to indicate you have transitioned to the next approach leg.

   For more information on turn anticipation and waypoint alerting, please refer to Section 5.

4. If a procedure turn is required:
   a. 2 miles prior to crossing the waypoint outbound, set the GPS SEQ switch to HOLD.
   b. At the waypoint, set the outbound course on the HSI.

(continued on next page)

c. Fly the procedure turn. After the procedure turn outbound, set the inbound course on the HSI.
d. On the inbound intercept to the final course, fly to center the CDI.
e. Set the GPS SEQ switch to the AUTO position. The GNC 300 will resume automatic waypoint sequencing for the remaining approach waypoints.

6. Once the aircraft is within 2 nm of the FAF (and the approach is armed), the 'ACTV' annunciator will illuminate and the CDI scale will ramp down to 0.3 nm.

   NOTE: If the ACTV annunciator does not illuminate, do not descend after crossing the FAF and fly all published missed approach procedures.

7. Upon reaching the FAF, the GNC 300 will automatically sequence to the MAP waypoint.

To fly a missed approach procedure:

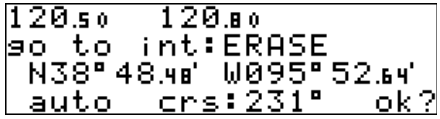
If an approach is terminated, the GNC 300 may be used to navigate to the missed approach holding point using one of the following procedures.

NOTE: To comply with TSO specifications, the GNC 300 will not automatically sequence to the missed approach holding point. The missed approach holding point will be displayed as the next available waypoint, which the pilot may activate when authorized. You must fly all published missed approach procedures before selecting the missed approach holding point on the GPS. If you want to disarm the approach and return the CDI scale to the 1 nm sensitivity, press the GPS APR switch.

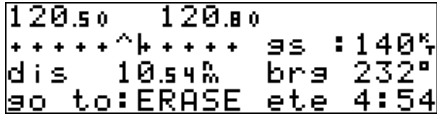
If the approach procedure permits navigation direct from the MAP to the missed approach holding point:

1. After the MAP has been crossed, press the [-D▸] key. The GNC 300 will automatically display the first waypoint of the missed approach as the next approach waypoint.

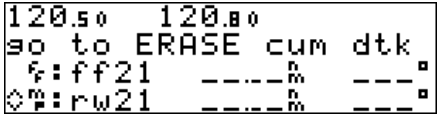
2. Press [ENT] to confirm the destination. The GNC 300 will provide a direct navigation course to the waypoint.



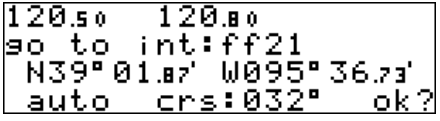
After crossing the MAP, press the [-D▸] key to display the missed approach holding point.



If you have clearance directly to the holding point, press ENTER. You must fly all published missed approach procedures before navigating to the holding point.



Select the waypoint you have clearance to from the active route page and press DIRECT-TO.



Confirm the starting waypoint for the next attempt by pressing ENTER.

If you're not authorized to fly direct-to the missed approach holding point:

1. After the MAP has been crossed, press the D▶ key. The GNC 300 will automatically display the first waypoint of the missed approach procedure as the next approach waypoint.
2. Press ENT to confirm the destination.
3. Stop automatic waypoint sequencing by setting the GPS SEQ switch to the HOLD position.
4. Fly the missed approach procedure. Remember to select the desired inbound course to the missed approach holding point before setting the GPS SEQ switch to the AUTO position.
5. Set the GPS SEQ switch to the AUTO position for navigation to the missed approach holding point.

After a missed approach, the GNC 300 will allow you to repeat the same approach procedure and select the approach waypoint to which you have been cleared as the next active to waypoint. Before reactivating the approach, make sure you fly all published missed approach procedures.

To reactivate the same approach for another attempt:

1. Press the RTE key and rotate ◯ to select the active route page.
2. Press CRSR twice and rotate ◯ to place the flashing cursor over the identifier of the approach waypoint to which you have been given clearance.
3. Press the D▶ key, followed by ENT. The GNC 300 will provide navigation for the repeat approach, starting with the approach waypoint you have selected.

The GNC 300's **approach select page** allows you to review the available approach procedures at the destination airport. From the procedures list, you may select and activate a new procedure on the fly. The active approach is indicated by an on-screen asterisk, and the scrolling arrow prompt indicates which direction to scroll to view additional procedures.

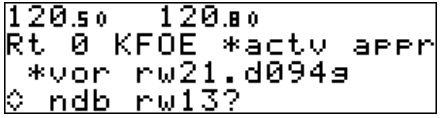
To select or replace a procedure from the approach select page...

1. Press the RTE key and rotate ◯ until the approach select page appears.
2. To review all available procedures, rotate ◉.
3. To select a procedure, press CRSR twice and rotate ◯ to highlight the desired procedure.
4. Press ENT. If there are multiple IAFs for the selected approach, rotate ◯ to select the desired IAF and press ENT.

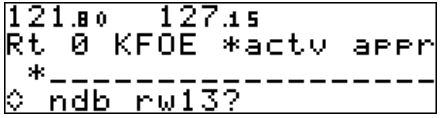
You may also replace or delete the active approach from the route catalog page.

To replace or delete an approach from the route catalog page...

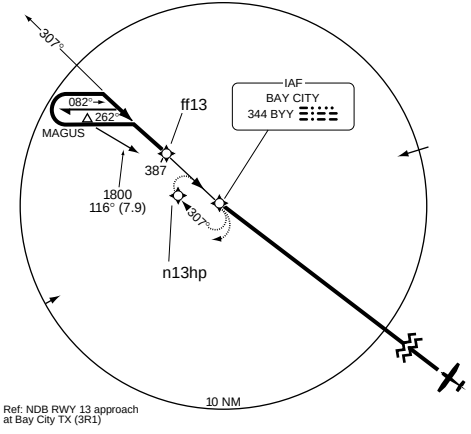
1. Press the RTE key and rotate ◯ until the route catalog page appears.
2. Press CRSR twice and rotate ◉ until the 'approach?' prompt appears. Press ENT.
3. To replace the active approach procedure, rotate ◯ to highlight the desired procedure and press ENT. If there are multiple IAFs for the selected approach, rotate ◯ to select the desired IAF and press ENT.
4. To delete the active approach (denoted by an asterisk), highlight the approach and press CLR, followed by ENT.



Approach Select Page



Clearing the active approach.



Ref: NDB RWY 13 approach at Bay City TX (3R1)

GPS APPROACH EXAMPLES

In the examples that follow, the GPS waypoints are shown along the approach path. In some cases, intermediate database waypoints have been added to approaches. These waypoints are named using lower case letters using the following convention (the most common database waypoints are defined below). Note that these waypoints are not charted on NOS approach plates. They do appear on current Jeppesen approach charts.

- **dyyyj—** DME arc waypoint where yyy is the radial from the reference facility (VOR) and j represents the arc radius (e.g., "a"= 1 nm, "b"= 2 nm)
- **cfxx or cfxxx—** course fix for runway xx or radial xxx
- **ffxx or ffxxx—** final approach fix for runway xx or radial xxx
- **rwxx—** runway xx threshold
- **nxxhp—** NDB approach runway xx intermediate holding pattern waypoint
- **maxx or maxxx—** missed approach point for runway xx or radial xxx
- **vxxhp—** VOR approach runway xx intermediate holding pattern waypoint

EXAMPLE 1— GPS ONLY APPROACH

Example 1 uses the GPS approach into Frederick Municipal Airport (KFDK) and illustrates the basic sequence of selecting and flying a GPS approach, and flying directly to a missed approach holding point. Please refer to the previous sections of this chapter for expanded keystroke instructions.

1. Select the destination airport (KFDK) using the -D▸ key, or create and activate a route to the destination airport.

2. Select the desired approach (gps rw05) from the approach select page. The GNC 300 will automatically select MRB as the IAF since it is the only IAF available.

3. Confirm that the GPS APR switch indicates an 'ARM' status 30 nm from the airport. The CDI will automatically begin a smooth transition from the 5.0 nm to the 1.0 nm scale.

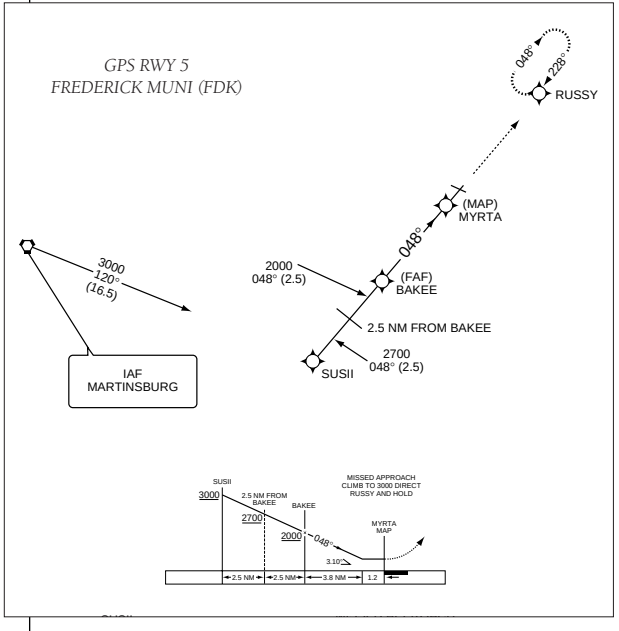
4. Enter the current altimeter setting of KFDK on the position page when prompted with the 'Need pres- press NAV' message.

5. Fly the approach. The GPS will provide navigation to each approach waypoint in sequence:
   - MRB (Initial Approach Fix)
   - SUSII
   - BAKEE (Final Approach Fix)
   - MYRTA (Missed Approach Point)
   - RUSSY (Missed Approach Holding Point)

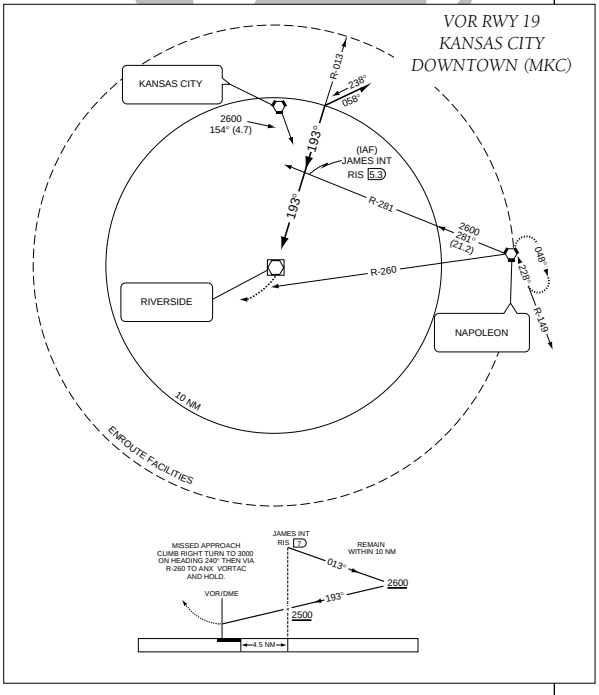
6. Set the HSI course to DTK at each waypoint. Confirm that the GPS APR switch indicates an 'ACTV' status within 2 nm of the FAF. The CDI will automatically transition from the 1.0 nm to 0.3 nm scale as you approach the FAF, and the unit will warn you if RAIM is not available for your approach.

7. Complete the approach by landing or perform the missed approach procedure.

8. For direct navigation guidance to the missed approach holding point, press -D▸ followed by ENT after crossing the MAP.



DO NOT USE FOR NAVIGATION



DO NOT USE FOR NAVIGATION

EXAMPLE 2— VOR/GPS OVERLAY

Example 2 uses the VOR/GPS RWY 19 approach into Kansas City Downtown Airport (KMKC) from the south and illustrates an approach with a procedure turn, which requires the pilot to set the GPS SEQ switch to the HOLD position prior to crossing the IAF the first time. This example also illustrates the procedures required when direct navigation to the missed approach holding point is not available.

1. Select the VOR/GPS RW19 approach and confirm that the GPS APR switch indicates an 'ARM' approach status. Enter the current altimeter setting of KMKC when the 'Need press-press NAV' message appears.

2. Fly towards the IAF of the approach (the JAMES intersection).

3. Two nm BEFORE crossing the IAF, set the GPS SEQ switch to the HOLD position. This prevents the GNC 300 from automatically sequencing to the missed approach point before the required procedure turn is completed.

4. After crossing the IAF, set the 013° outbound course on the HSI.

5. Initiate the procedure turn and set the 193° inbound course on the HSI. As you turn to the inbound intercept heading, set the GPS SEQ switch to the AUTO position. The GPS SEQ switch must be set to the AUTO position for the approach to go active.

6. Confirm that the GPS APR switch indicates an 'ACTV' approach status within 2 nm of the FAF. Complete the approach by landing, or follow the missed approach procedure.

7. To fly the missed approach procedure, cross the MAP and press -D→, followed by ENT. This will select the missed approach holding point as your active to waypoint.

8. Since direct navigation to the holding waypoint is not authorized, set the GPS SEQ switch to the HOLD position to prevent automatic waypoint sequencing.

9. Set the HSI to the 080° heading and turn left to intercept the inbound course to the holding point.

EXAMPLE 3— VOR/DME ARC OVERLAY

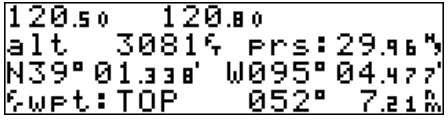
Example 3 uses the VOR/DME RWY 21 approach into Topeka/Forbes Field Airport (KFOE) and illustrates an approach based on a DME arc. Although DME arc approaches are not based on a direct course, the GNC 300 will still provide approach navigation guidance through the arc by constantly displaying your distance and bearing from the DME reference navaid on the position page. To fly the arc, monitor the distance displayed on the position page and manually adjust your heading to maintain the course along the arc. When flying a DME arc, the GPS SEQ switch must be set to the HOLD position to ensure proper CDI operation.

1. Select the VOR RW21 approach and select the d094g initial approach fix to fly the left hand arc from the 094° radial. 30 nm from the airport, confirm that the GPS APR switch indicates an 'ARM' status and enter the current altimeter setting of KFOE when the 'Need pres- press NAV' message appears.

2. Fly to the IAF of the DME arc (d094g). The GPS WPT annunciator will flash 15 seconds before you reach the waypoint.

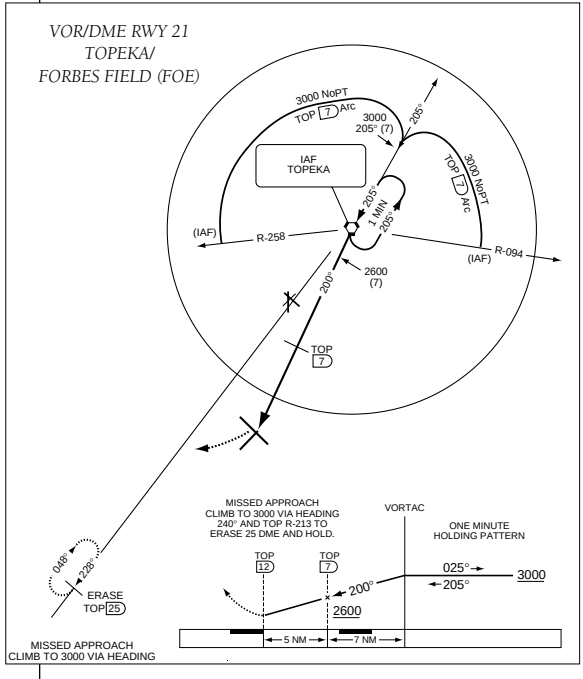
3. After crossing the IAF, set the GPS SEQ switch to the HOLD position.

4. Set the desired inbound course (205°) on the CDI/HSI.

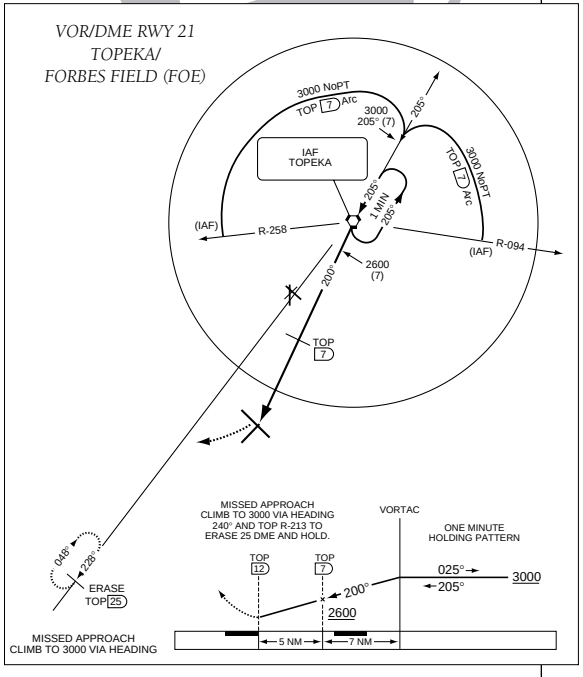


5. Press NAV and rotate ◯ to display the position page. The position page will display the DME navaid as the reference waypoint (on the bottom line) as long as your active to waypoint is part of the DME arc you are flying.

(continued on next page...)



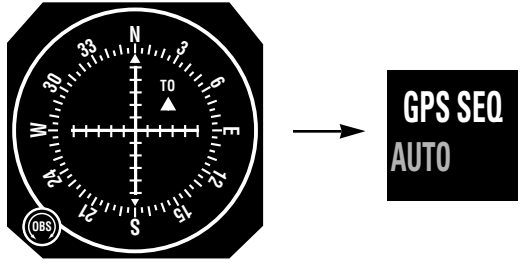
DO NOT USE FOR NAVIGATION



DO NOT USE FOR NAVIGATION

6. Monitor your distance and bearing from the DME navaid along the arc.

7. The external CDI needle will begin to center as you approach the inbound course. The GPS WPT annunciator will flash 15 seconds before reaching the course fix, and the desired track for the final approach will flash over the CDI display.



8. Dial in the final course (200°) on the HSI and set the GPS SEQ switch to the AUTO position. Automatic waypoint sequencing will resume for the rest of the approach. Locate the step down fix by monitoring the distance to the MAP as shown on the profile view of the approach plate. Confirm that the GPS APR switch indicates an 'ACTV' status 2 nm from the FAF.

9. To fly the missed approach procedure, cross the MAP and climb to 3000 feet via heading 240°.

10. Press ⇾, followed by ENT. This will select the missed approach holding point (the ERASE intersection) as your active to waypoint.

11. Place the procedure on HOLD by pressing the GPS SEQ switch.

12. Set the HSI to the 213° course and fly until the CDI is centered, and enter the holding pattern.

EXAMPLE 4— RADAR VECTORS TO FINAL APPROACH COURSE

Example 4 uses the same VOR/DME RWY 21 approach into Topeka/Forbes Field Airport (KFOE) used in example 3 and illustrates an approach using radar vectors to a point 3 miles out from the final approach fix. To fly a radar vector approach, you must still select a desired approach and IAF from the database and set the GPS SEQ switch to HOLD while you fly the vectors to the active approach waypoint. To accommodate radar vectors, the GNC 300 allows manual selection of any approach waypoint as the destination waypoint.

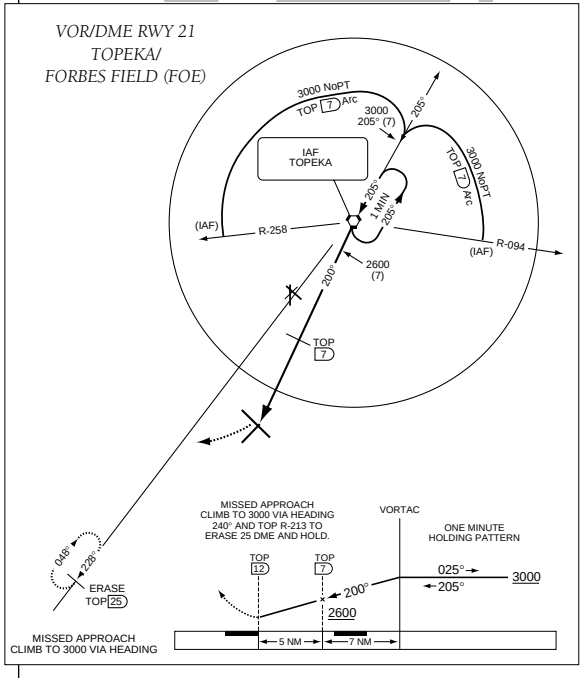
1. Select the desired approach and initial approach fix. 30 nm from the airport, confirm that the GPS APR switch indicates an 'ARM' status and enter the current altimeter setting of the destination airport when the 'Need pres- press NAV' message appears.

2. When you are advised by the controller that you will be receiving radar vectors to the final approach course:

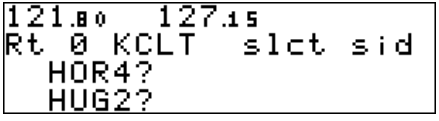
   - Activate the final approach fix waypoint from the active route page:
     a. Press the RTE key and rotate ◯ until the active route page appears.
     b. Rotate ◉ until 'ff21' is displayed.
     c. Press CRSR twice to activate the flashing cursor.
     d. Rotate ◯ until 'ff21' flashes.
     e. Press -D►, followed by ENT.
   - Set the GPS SEQ switch to the HOLD position.

3. Set the 200º inbound course on the HSI. As the CDI needle begins to center to the final approach course, set the GPS SEQ switch to the AUTO position.

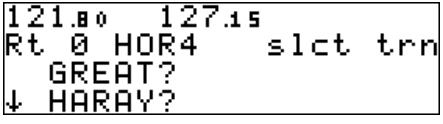
4. Confirm that the GPS APR switch indicates an "ACTV' status 2 nm from the FAF. Complete the approach by landing or perform the missed approach procedure.



DO NOT USE FOR NAVIGATION



Selecting a SID.



Selecting a SID transition.

The Jeppesen database used in the GNC 300 features Standard Terminal Arrival Routes (STARs) and Standard Instrument Departures (SIDs) that may be placed into any active or stored route.

Available SIDs may be selected for the departure airport at any time in the active route as long as the departure airport is the first route waypoint and the route contains more than one waypoint. SIDs may be selected for the nearest airport when the first route waypoint is not an airport or the route contains less than two waypoints. Activating a SID will modify the waypoint sequence of Route 0. If you'd like to save the contents of Route 0, be sure to copy it to an empty storage route first.

To select and activate a SID...

1. Press RTE and rotate ◯ until the SID select page appears.
2. With the flashing cursor inactive, rotate ◉ until the desired SID name appears.
3. Press CRSR twice and rotate ◯ until the SID name flashes.
4. Press ENT. The SID waypoints will be inserted in the route.

If a SID has more than one runway or transition, the SID select page will display the available runway designations and/or transitions.

To select a transition...

1. Rotate ◯ until the transition name flashes and press ENT.

To select a runway...

1. Rotate ◯ until the runway designation name flashes and press ENT.

The SID select page also allows you to review all the available SIDs for the departure airport and select, delete or change the active SID.

To replace/delete the active SID...

1. Press RTE and rotate ◯ until the SID select page appears.
2. Press CRSR twice. The active SID (denoted by an asterisk) will flash.
3. To replace the active SID with another available SID, rotate ◯ to highlight the desired SID. Complete the selection by pressing ENT.
4. To delete the active SID, press CLR, followed by ENT. The SID waypoints will be removed from the active route.

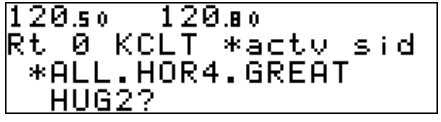
SIDs can also be selected and deleted from storage routes through the Route Catalog page.

To select a SID from the route catalog page...

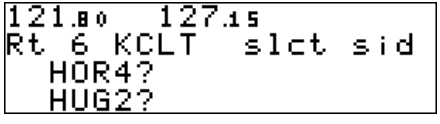
1. Display the desired route on the route catalog page.
2. Select 'sid?' in the route operations field and press ENT.
3. Select the desired SID and transitions.
4. The SID waypoints will be inserted into the route and the route review page will be displayed.

To delete a SID from the route catalog page...

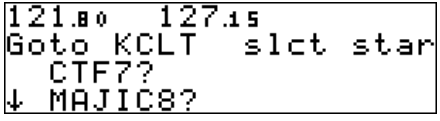
1. Display the desired route on the route catalog page.
2. Select 'sid?' in the route operations field and press ENT.
3. Rotate ◯ to highlight the selected SID (denoted by an asterisk). Press CLR, then ENT.



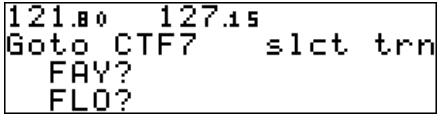
The SID select page allows you to select a new SID on the fly.



SIDs may be saved with any stored route.



Selecting a STAR.



Selecting a STAR transition.

Standard Terminal Arrival Routes (STARs) used in the GNC 300 are selected and activated with the same procedures as SIDs. Available STARs may be selected for the destination airport at any time in the active route as long as the destination airport is the last waypoint in the active route or the direct-to waypoint. Activating a STAR will modify the sequence of waypoints in Route 0. If you'd like to save the contents of Route 0, be sure to copy it to an empty storage route first.

To select and activate a STAR...

1. Press RTE and rotate ◯ until the STAR select page appears.
2. Press CRSR and rotate ◯ until the desired STAR flashes.
3. Press ENT. The STAR waypoints will be inserted in the route.

If a STAR has more than one transition or runway, the STAR select page will display the transitions and/or runway designations available.

To select a transition...

1. Rotate ◯ until the desired transition flashes and press ENT.

To select a runway...

1. Rotate ◯ until the runway designation flashes and press ENT.

The STAR select page also allows you to review all available STARs for the destination airport and select, delete or change the active STAR.

To replace/delete a STAR...

1. Press RTE and rotate ◯ until the STAR select page appears.
2. Press CRSR twice. The active STAR (denoted by an asterisk) will flash.
3. To replace the active STAR with another available STAR, rotate ◯ to highlight the desired STAR. Complete the selection by pressing ENT.
4. To delete the active STAR, press CLR, followed by ENT. The STAR waypoints will be removed from the active route.

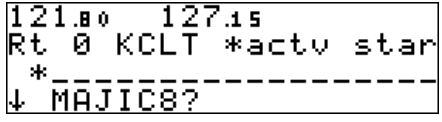
STARs can also be selected and deleted from storage routes through the route catalog page.

To select a STAR from the route catalog page...

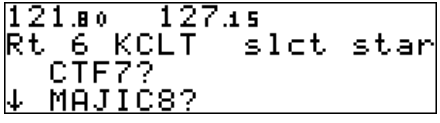
1. Display the desired route on the route catalog page.
2. Select 'star?' in the route operations field and press ENT.
3. Select the desired STAR and transitions.
4. The STAR waypoints will be inserted into the route and the route review page will be displayed.

To delete a STAR from the route catalog page...

1. Display the desired route on the route catalog page.
2. Select 'star?' in the route operations field and press ENT.
3. Rotate ◯ to highlight the selected STAR (denoted by an asterisk). Press CLR followed by ENT. The STAR waypoints will be deleted from the route.



Deleting the active STAR.



STARs may be saved in any storage route.

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Section 7
Messages and Unit Settings

The GNC 300's MSG key provides access to system messages and allows you to customize your GPSCOM to your own preferences through a settings submenu. Whenever the GNC 300 needs to alert you to a navigation, communication or system message, the annunciator light next to the MSG key will flash. Some messages are advisory in nature (e.g., the arrival and countdown alarms), while others may require your immediate attention (e.g., a stuck microphone message). For a complete list of GNC 300 messages, please see Appendix D.

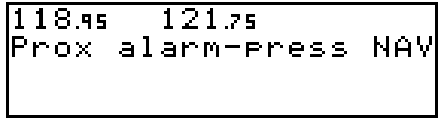
To view a message, press MSG. Press MSG again to return to the previous page.

The GNC 300's settings submenu is also accessed from the MSG key.

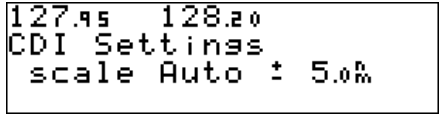
To view the settings submenu, press and hold the MSG key for more than 2 seconds.

Once the settings submenu has been accessed, the following setup pages are available by rotating ◎ with the flashing cursor inactive:

- **CDI scale settings**
- **Nearest airport search**
- **Display intensity settings**
- **Navigation units**
- **Map datums**
- **Mag. var./arrival alarm settings**
- **Battery saver**
- **Trip timer settings**
- **SUA settings**
- **I/O Settings (channel 2 only)**



To view a message, press MSG.

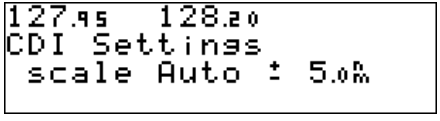


To access the settings submenu pages, press and hold the MSG key for two seconds. The GNC 300 will return to the last submenu viewed the next time you access the unit settings.

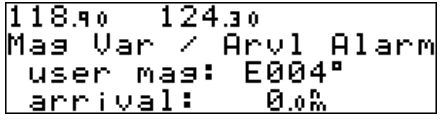
SECTION 7

UNIT SETTINGS

CDI Settings
Magnetic Variation



When the 'Auto' CDI setting is selected, the GNC 300 will automatically change the CDI scale when you are within 30 nm of a departure or arrival airport. During approach operations, the 'Auto' setting will be automatically selected to provide a smooth CDI transition from the 5.0 nm to the 0.3 nm scale.



Entering a user magnetic variation.

The first available page under the settings submenu is the **CDI settings page**, which allows you to define the scale of the GNC 300's course deviation indicator.

To change the CDI scale:

1. Press and hold MSG, and rotate ◯ to select the CDI settings page.
2. Press CRSR twice and rotate ● to select 'Auto', '±5.0 nm', '±1.0 nm' or '±0.3 nm'.
3. Rotate ◯ to highlight 'ok?' and press ENT to approve.
   Note: the selected CDI scale will not take effect until approved.

The scale values represent full scale deflection of the CDI to either side. The default setting is ±5.0 nm. The 'Auto' setting will start the CDI scale at 5 nm, and gradually ramp down the scale to the 1 nm range once you are within 30 nm of a departure or arrival airport. You must have an active direct-to or route with an airport as your final destination waypoint, or be within 30 nm of a departure airport. If you have an active approach, the scale will gradually ramp down to the 0.3 nm range once you are within 2 nm of the final approach fix.

Note that the GNC 300 uses **Receiver Autonomous Integrity Monitoring (RAIM)** to cross-check its position. The RAIM protection limits listed below follow the selected CDI scale, changing automatically with the 'Auto' setting:

CDI Scale	RAIM Protection
+/-5.0 nm or Auto (en route)	2.0 nm
+/- 1.0 nm or Auto (terminal)	1.0 nm
+/- 0.3 nm or Auto (approach)	0.3 nm

The GNC 300 has three **magnetic variation options:** true, auto, or user-defined.

To set the magnetic variation:

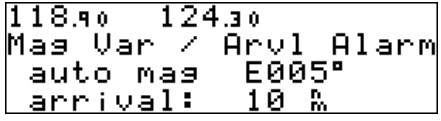
1. Press and hold MSG and use ◯ to display the 'Mag Var/Arvl Alarm' page.
2. Press CRSR twice and use ● to select auto, true or user.
3. If user is selected, use ◯ to highlight the magnetic variation value, and use ● and ◯ to enter the value and E or W. Press CRSR to finish.

If 'auto' mag var is selected, all track, course and heading information will be corrected with the variation computed by the GPS. The 'true' setting will reference all information to true north, and the 'user' setting will correct information to an entered value.

The GNC 300's **arrival alarm** can be set to notify the pilot with a message when you have reached a user defined distance to a final destination waypoint (the direct-to waypoint or the last waypoint in a route). Once you have reached the set distance (up to 99.9 units), an 'Arrival at _____' message will be displayed.

To set the arrival alarm distance:

1. Press and hold MSG and use ◯ to display the 'Mag Var/Arvl Alarm' page.
2. Press CRSR twice and use ◯ to select the arrival distance field.
3. Use ◉ and ◯ to enter the desired distance. Press CRSR to finish.

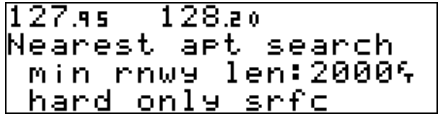


Setting the arrival alarm.

The **nearest airport search** settings allow you to define the runway length and surface type used in determining the nine nearest airports that are displayed. A minimum runway distance and surface may be entered to prevent airports with small runways, or runways that are not of appropriate surface, from being displayed. The default settings are '0 ft/mt' for runway length and 'any' for runway surface.

To set the minimum runway length and runway surface:

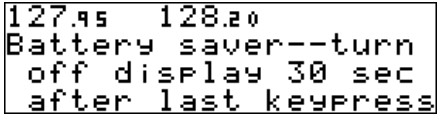
1. Press and hold MSG and use ◯ to display the nearest airport search page.
2. Press CRSR twice and use ◉ and ◯ to enter the minimum runway length upon which your aircraft can land (up to 9999 units). Press ENT to accept the distance.
3. Rotate ◉ to display the surface selection you desire. Choices include:
   - any surface
   - hard only surface
   - soft/hard surface
   - water only surface
4. Use ◯ to select 'ok?' and press ENT to confirm and CRSR to complete.



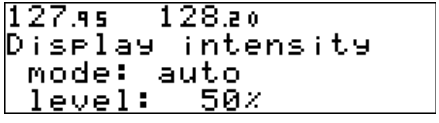
Runway length and surface type settings.

SECTION 7 UNIT SETTINGS

Battery Saver
Display Intensity



Display timeout settings.



Automatic display intensity.

The GNC 300's **battery saver feature** can be programmed to automatically turn off the display when using the optional remote battery pack. This will increase the remote battery life in event of power failure. During this time, the GNC 300 will continue to navigate and track satellites, but will not display information until a key is pressed or a knob is turned.

To set the display timeout:

1. Press and hold MSG and rotate ◯ to display the battery saver page.
2. Press CRSR twice to activate the cursor.
3. Rotate ◉ until the desired value is displayed (0, 30, 60 or 90 seconds). Entering 0 will leave the display on at all times. Press CRSR to finish.

The GNC 300 features automatic brightness control to adjust the display for optimum viewing in any condition. This is done using a photocell at the top left corner of the display bezel. It is important that this photocell not be covered to ensure proper display adjustment. You may also select manual control of the display brightness to tailor the GNC 300 to your needs.

To change the display intensity settings:

1. Press and hold MSG and rotate ◯ to view the display intensity page.
2. Press CRSR twice and use ◉ to select 'auto' or 'manual' control.
3. Press ENT.
4. If manual is selected, use ◉ to set the display intensity.
5. Press CRSR to complete.

The **trip timer** provides a running clock on NAV Menu 2 (see page 25), and can be configured to run when power is on or when your ground speed exceeds a user-defined minimum.

To change the trip timer settings:

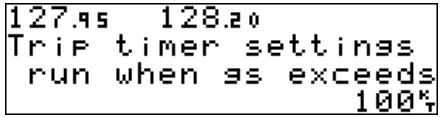
1. Press and hold MSG, and use ◯ to display the trip timer settings page.
2. Press CRSR twice to activate the cursor.
3. Use ● to select either 'pwr is on' or 'gs exceeds'.
4. If you choose 'pwr is on', press CRSR to complete.
5. If you choose 'gs exceeds', use ◯ to highlight the speed field.
6. Enter the speed using ● and ◯.
7. Press ENT to accept, and press CRSR to complete.

The GNC 300 can be configured to display data in standard or metric **units of measure**. These apply to: distance, position, speed, altitude, fuel, pressure and temperature.

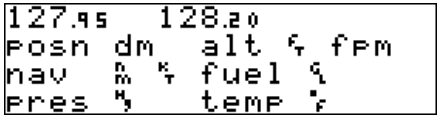
To change the units of measure:

1. Press and hold MSG and rotate ◯ to display the nav units page.
2. Press CRSR twice and rotate ◯ to highlight the field you would like to change.
3. Use ● to change the unit of measure.
4. Rotate ◯ to advance to the next field, or press CRSR when finished.

(Continued on the next page...)



Trip Timer Settings Page

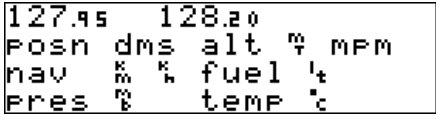


Default units of measure settings.

SECTION 7

UNIT SETTINGS

Units of Measure



Units of measure settings (metric).

The available units of measure are:

position :
- degrees, minutes and seconds (dms) [hddd° mm' ss.s"]
- degrees and minutes (dm) [hddd° mm.mmm']

altitude :
- feet (ft)
- meters (mt)

vertical speed :
- feet per minute (fpm)
- meters per minute (mpm)
- meters per second (mps)

nav units :
- nautical miles and knots (nm, kt)
- statute miles and miles per hour (mi and mh)
- kilometers and kilometers per hour (km and kh)

fuel :
- gallons (gl)
- imperial gallons (ig)
- kilograms (kg)
- pounds (lb)
- liters (lt)

pressure :
- inches of mercury (hg)
- millibars (mb)

temperature :
- degrees Fahrenheit (°f)
- degrees Celsius (°c)

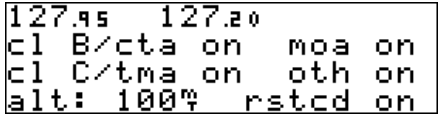
The **Special Use Airspace settings** page will allow you turn the controlled/restricted airspace message alerts on or off. This will not affect the alerts being listed on the nearest page. It will simply turn off the warning when you are approaching or near an SUA. Warnings can be turned off for the following airspaces:

class B/cta :	ICAO control area	**moa:**	Military operations area
class C/tma :	ICAO Terminal Control Area	**other:**	Other areas
rstc:	Restricted areas		

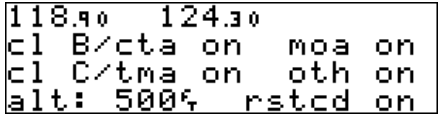
SUA warnings for prohibited airspace cannot be turned off. The 'alt' field, located at the bottom of the SUA settings page, is an altitude buffer which 'expands' the vertical range of the SUA, so you will be notified if you are within a certain range of an SUA. For example, if the buffer is set at 500 feet, and you are less than 500 feet above or below an SUA, you will not be notified with an alert message; if you are less than 500 feet above or below an SUA and projected to enter it, you will be notified with an alert message. The default setting for the altitude buffer is 200 feet.

To set the warnings or change the altitude buffer:

1. Press and hold MSG, and use ◯ to display the SUA settings page.
2. Press CRSR twice.
3. Rotate ◯ to highlight the field you would like to change.
4. Use ◉ to change to 'on' or 'off'.
5. To change the altitude buffer, highlight the buffer value, and use ◉ and ◯ to change the data. Press ENT to accept.
6. Press CRSR to complete.



SUA Settings

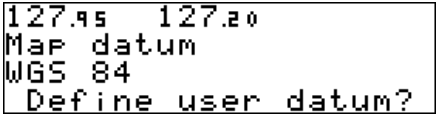


Altitude Buffer set at 500 feet.

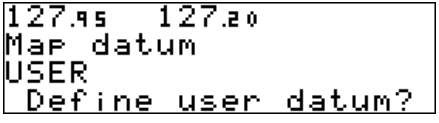
SECTION 7

UNIT SETTINGS

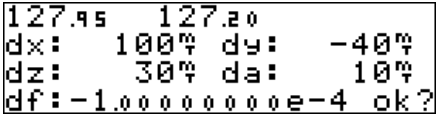
Map Datums



Map Datum Page



Map Datum Page with 'USER' selected.



User Datum Page

The GNC 300 NavData® card contains over 100 map datums for you to use when navigating. By default, your unit calculates positions using the WGS-84 map datum. If you are using charts based on another datum, you must set the GNC 300 to use the same datum. Using a map datum that does not match the sectionals you are using can result in significant differences in position information. If you are using maps for reference only, the GNC 300 will provide correct navigation guidance to the waypoints contained in the database, regardless of the datum selected.

To change the map datum to one listed in Appendix F:

1. Press and hold MSG, and use ◯ to display the map datum page.
2. Press CRSR twice.
3. Use ◯ to highlight the current map datum.
4. Use ◉ to change the datum.
5. Press CRSR to complete.

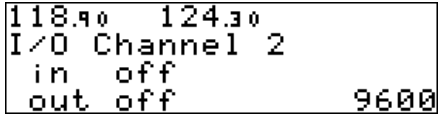
To create a user datum:

1. Press and hold MSG, and use ◯ to display the map datum page.
2. Press CRSR twice.
3. Use ◯ to highlight 'Define user datum?'. Press ENT.
4. Enter the five parameters of the map datum using ◉ and ◯. Press ENT to accept a field. The signs of each value (+/-) should follow the convention: WGS84-local geodetic system.
5. Use ◯ to highlight 'ok?', and press ENT.
6. To activate the user datum, select 'USER' on the map datum page as described above.

The last page available under the GNC 300's setup menu is the **I/O setup** page. The I/O setup page lets you configure the GNC 300 to output to an RS-232 mapping device or a PC (with the optional GARMIN PC Kit or other mapping software) and select the appropriate baud rate. The I/O setup page only provides access to I/O channel 2 output. For information on using I/O channel 1, please see your GNC 300 installation manual. The input option for channel 2 is intended for future interfacing capabilities and is not a selectable option at this time.

To change the output settings for I/O channel 2:

1. Press and hold MSG, and rotate ◯ until the I/O setup page is displayed.
2. Press CRSR twice, and rotate ◉ to select 'off' or 'plotting' for output to an RS-232 device.
3. Rotate ◯ to advance the cursor to the baud rate field.
4. Use ◉ to select the desired baud rate (300,1200, 2400, 4800 or 9600).
5. Press CRSR to finish.

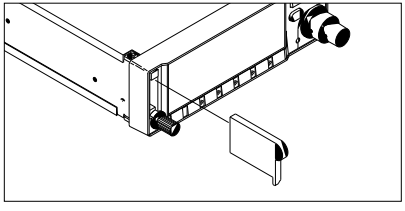


I/O Page Settings

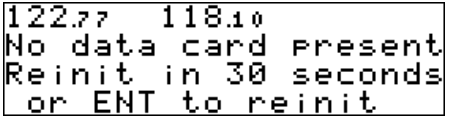
SECTION A

NAVDATA CARD

Saving User Data



Insert the card with the thumb tab at the top, and the beveled corner on the bottom right.



Data Card Warning

Appendix A
NavData® and User Data Installation and Operation

The NavData card supplied with your GNC 300 can be installed or removed when the GNC 300 is on or off. Insert the card with the thumb tab at the top, and the beveled corner at the bottom. If the NavData card is not present when the unit is powered on, you will receive a 'No Jeppesen database' message on the database confirmation page, and you will only be able to use user waypoints for navigation. If the NavData card is removed during operation, a 'No data card present' warning will appear, asking you to reinsert the data card within 30 seconds. If the card is not replaced within 30 seconds, the GNC 300 will automatically reinitialize. You may also reinitialize the unit manually by pressing ENT.

An optional **user data card** can be used to make a backup of user waypoints, routes, etc. and transfer information to another GNC 300.

To save user data to the user data card:

1. Install the user data card.
2. Rotate ◯ to highlight 'Save user data?'. Press ENT to confirm.

The message 'Saving to card' is displayed while the GNC 300 transfers all user data to the User Data card. It may take a few minutes to complete the transfer. When all user data is transferred, the GNC 300 will instruct you to turn the unit off, remove the user card and insert the Jeppesen NavData card. After this is complete, the GNC 300 is ready for normal operation.

To restore user data from a user data card to the GNC 300:

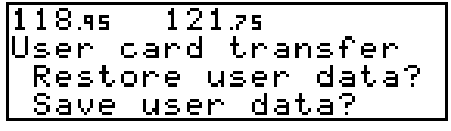
1. Install the user data card.
2. Rotate ◯ to highlight 'Restore user data?'.
3. Press ENT.

The GNC 300 will ask you which type of data to replace. You may choose checklists, scheduler messages, user waypoints, proximity waypoints, routes, waypoint comments, or all data.

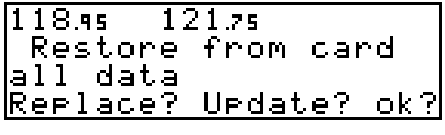
4. Rotate ◉ to select the type of data to replace.

You may either replace or update the information in the database. Replacing the data will replace **ALL** user data with the data from the card. Updating the data will not delete unrelated material, but will only change what is necessary to use the data received from the user data card.

5. Rotate ◯ to select either 'Replace?' or 'Update?'.
6. Press ENT to begin transferring data to the GNC 300. The GNC 300 will now transfer all of the data requested. This may take a few minutes.
7. To continue with more data transfer types, repeat steps 4, 5 and 6. Otherwise, press ENT when 'ok?' is highlighted.
8. Turn the GNC 300 off and replace the user data card with a NavData card. The GNC 300 is now ready for normal operation.



Data Transfer Page



Restore Data Page

SECTION B

INSTALLATION & REMOVAL

The GNC 300 is built to exacting standards and does not require user maintenance. If the faceplate and lens require cleaning, use a soft cloth and non-abrasive cleaner.

The user data is maintained by an internal battery with a projected life of 3 to 5 years. If the GNC 300 detects a low memory battery, you will be informed with the message 'Memory battery low'. Failure to have the battery replaced may result in loss of data each time you turn your unit off. This will ***greatly*** *increase satellite acquisition time and no user data will be saved. This condition will be accompanied by the message 'Stored data lost'.*

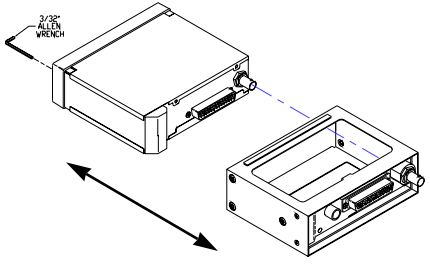
The GNC 300 contains a crystal oscillator which may drift after many years of operation. If the unit detects excessive oscillator drift, you will be informed with the message 'Osc needs adjustment'. When this occurs, contact an authorized GARMIN service center for service. Failure to do so may result in severely degraded acquisition performance.

Appendix B
Installation, Removal and Maintenance of the GNC 300

The aviation rack is designed to allow easy removal of the GNC 300. This enables you to use the unit at home using an optional AC adapter.

To install the GNC 300 into the aviation rack:

1. Insert a 3/32" allen wrench in the small hole adjacent to the dual knob.
2. Rotate the wrench counterclockwise until it stops to ensure the pawl latch is in the proper position.
3. Insert the GNC 300 into the aviation rack and rotate the wrench clockwise to secure the unit. To ensure proper connector seating, gently press on the left side of the unit until tightened.



To remove the GNC 300 from the aviation rack:

1. Insert a 3/32" allen wrench in the small hole adjacent to the dual knob.
2. Rotate the wrench counterclockwise until the GNC 300 can be removed from the rack.

Appendix C
Simulating Navigation with the GNC 300

The GNC 300's simulator mode allows you to plan and practice flights and non-precision approaches in your home and office using an optional remote battery pack or AC adapter. The simulator is not accessible when the GNC 300 is running off the master avionics switch. All waypoint and route planning done in simulator mode will be saved in the unit's internal memory.

To operate the GNC 300 in simulator mode:

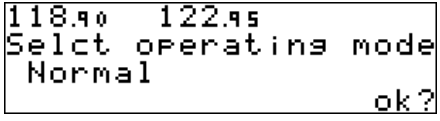
1. Turn the unit on by rotating the knob. The welcome page will appear while the unit conducts a self test. Once the self test is complete, the welcome page will be replaced by the operating mode page.
2. Rotate to move the flashing cursor over the operating mode field ('Normal') .
3. Rotate to select 'Simulator' and press the ENT key. The cursor will advance to the 'ok?' prompt.
4. Press ENT to confirm.

Once the GNC 300 has been placed in simulator mode, the database confirmation page will appear, showing the operating dates, cycle number and database type available.

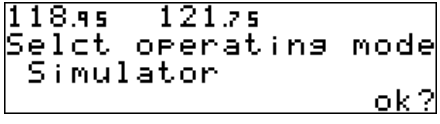
To acknowledge the database information:

1. Press ENT.

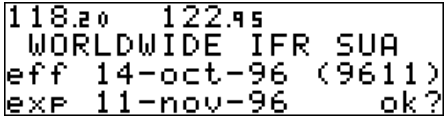
After the database has been acknowledged, the initial position reference page will appear, where you may specify the starting position for your simulated trip. You can define the initial position by entering a waypoint identifier in the reference field, or by manually entering coordinates in the lat/lon field.



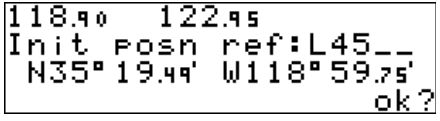
Operating Mode Page

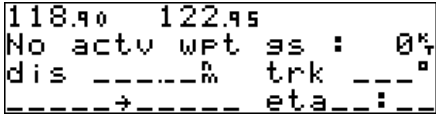


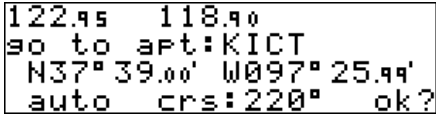
Selecting the simulator mode.



Database Confirmation Page







Enter a simulated course from the direct-to confirmation page. The GNC 300 will set the course between route legs automatically when simulating navigation.

To enter an initial position reference by waypoint identifier:

1. Rotate ◯ to highlight the waypoint identifier field.
2. Use ● and ◯ to spell out the identifier of the desired airport, navaid or user waypoint.
3. Press ENT to confirm the identifier. The waypoint confirmation page will appear, displaying the waypoint's position.
4. Press ENT to confirm the 'ok?' prompt.

The position page will now appear, and you may now use most of the GNC 300 navigation features for practice and planning. If you are practicing non-precision approaches, you may not have altitude, OBS input or the external switches necessary to simulate all aspects of actual navigation. You'll also receive a 'Do not use for nav' message to remind you that the simulator mode should never be used for actual navigation. During simulator operation, you will be able to enter a ground speed from the CDI page, and define a course to a destination from the direct-to confirmation page. Altitude may only be entered by using the VNAV function available from the NAV menu 1 page (see page 22).

To enter a ground speed from the CDI page:

1. Press NAV and rotate ◯ to display the CDI page.
2. Press CRSR twice to activate the cursor in the GPS window.
3. Rotate ◯ to highlight the ground speed field.
4. Use ● and ◯ to enter the desired speed. Press ENT to accept, and CRSR to finish.

To exit the simulator mode, the GNC 300 must be turned off by rotating the ◉ knob counter-clockwise until the unit shuts down. All waypoints and routes created in simulator mode will be retained in the GNC 300's internal memory.

Appendix D
GNC 300 Messages and Abbreviations

The GNC 300 uses the message page to communicate important information to you. Some messages are advisory in nature, others are warnings that may require your intervention. This appendix provides a complete list of GNC 300 messages and their meanings.

Altitude input fail - The altitude serializer input is not available for the GNC 300. Check the I/O settings and/or the serializer installation. If enough satellites are available for a 3D position fix, no pilot action is required, providing no RAIM warnings are present. If only a 2D fix is possible, the pilot should maintain the GPS altitude within 1,000 feet of the pressure altitude from the position page.

Appr switch stuck - The GPS APR switch is stuck in the 'pressed' position. Check the installation.

Approach deleted - The selected approach was deleted from the route because not enough room existed to insert a SID or STAR.

Approach not active - The approach could not transition to the active phase because the GPS SEQ switch is set to the HOLD position, the approach has been manually disarmed using the GPS APR switch, the automatic CDI scale is not selected or offset navigation is in effect. Do not descend at the FAF.

Arm approach - Approach navigation is available. Press the GPS APR switch to re-arm the approach.

Arrival at _____ - Your craft has entered the arrival alarm circle for the indicated waypoint.

Arrvl at offst _____ - Your craft has entered the arrival alarm circle for the indicated waypoint offset by the parallel track distance.

Auto CDI slctd - The GNC 300 has reset the CDI scale to the AUTO setting to permit approach navigation.

Auto leg seq slctd - The GNC 300 has reset the automatic leg sequencing option to the ON setting to permit approach navigation.

Battery low - The optional remote battery pack is low on power and limited operating time remains. The battery should be recharged for continued operation.

Battery rqrs service - A problem has been detected in the optional remote battery pack. The battery should be serviced at an authorized GARMIN service center.

Cannot chng actv wpt - An attempt has been made to modify the position of the 'active to' or 'active from' waypoint. The GNC 300 will not allow the modifications.

SECTION D MESSAGES & ABBREVIATIONS

Cannot chng wpt sqnc - An attempt has been made to modify an approach, SID or STAR. The waypoint sequence of approaches, SIDs and STARs may not be modified.

Cannot nav lockd rte - An attempt has been made to activate a route containing a locked waypoint. The GNC 300 cannot perform navigation in this situation.

Cannot ofst goto rte - An attempt has been made to engage the offset navigation feature while the GNC 300 is navigating using a single waypoint route. The GNC 300 will not allow offset navigation in this situation.

Checklist is full - The selected checklist is full. No new items can be added until existing items are deleted.

Collecting data - The GNC 300 is collecting orbital data while searching the sky. The antenna should have a good view of the sky and the GNC 300 should be allowed to finish data collection before turning the unit off.

COM failed - The comm in the GNC 300 has failed. Take the unit to an authorized GARMIN service center.

Comment memory full - The waypoint comment memory is full. You must delete existing waypoint comments before adding new ones.

Configuration reset - The GNC 300 has detected a failure in its installation configuration memory. Data from the user memory has been used to reset the configuration. Check the installation settings for corrections. If the message persists, the unit is not usable and should be taken to an authorized service center.

Course input fail - The course input from RS-422 or ARINC 429 is not available to the GNC 300. Check the I/O settings and/or have the installation checked by a certified technician.

Data card failed - The GNC 300 has detected a problem with the data card. The data is not usable and the card should be returned to Jeppesen or an authorized GARMIN service center.

Data card write fail - The user data card failed to program. The card should be returned to an authorized GARMIN service center.

Degraded accuracy - The GNC 300 has detected poor satellite geometry while in approach mode while RAIM is not available. Additional cross-checking with a secondary navigation source should be performed to verify the integrity of the GPS position.

Do not use for nav - The GNC 300 is in the simulator mode and must not be used for actual navigation.

EEPROM write fail - The GNC 300 has detected a failure while programming its installation configuration memory. The unit is not usable and should be taken to an authorized service center.

Final altitude alert - The suggested altitude is within 1000 feet of the final altitude entered on the VNAV planning page.

Fuel/Air input fail - The fuel and/or air data input is not available to the GNC 300. Check the I/O settings and/or have the installation checked by a certified technician.

Heading input fail - The heading input from ARINC 429 is not available to the GNC 300. Check the I/O settings and/or have the installation checked by a certified technician.

Inside SUA - You have entered a Special Use Airspace.

Invald CPA wpt _____ - The closest point of approach cannot be created from the waypoint entered on the CPA page. This occurs when the computed point does not fall on one of the route legs, or when a unique waypoint name for the CPA cannot be found.

Invalid copy route - A non-empty route was selected for a copy operation. A route must be empty before another route can be copied to it.

Invalid CPA route - The selected route contains less than two waypoints and cannot be used for CPA operations.

Invalid SAR route - The selected route doesn't contain exactly two wpts. and cannot be used for SAR operations.

Leg not smoothed - The upcoming leg is too short for smooth waypoint transitions. Expect a rapid CDI change.

Memory battery low - The battery that sustains user memory is low and should be replaced by an authorized service center as soon as possible. Failure to do so may result in loss of stored data, including all user waypoints and routes.

Near SUA < 2 nm - You are within 2 nm of an SUA, and your current course will **not** take you inside.

Need alt - press NAV - The GNC 300 needs altitude input in order to start and/or continue 2D navigation. Press the NAV key and enter your antenna altitude on the position page. The altitude should be as accurate as possible. An inaccurate altitude will directly translate into an inaccurate position fix.

Need pres - press NAV - The GNC 300 needs the altimeter setting at the arrival airport to navigate an approach. Press NAV and enter the altimeter setting on the position page.

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No altitude input - The GNC 300 has failed to receive altitude data from the parallel input. Check the I/O settings and/or the installation. If enough satellites are available for a 3D position fix, no pilot action is required, providing no RAIM warnings are present. If only a 2D fix is possible, the pilot should maintain the GPS altitude within 1,000 feet of the pressure altitude from the position page.

No course input - The GPS SEQ switch is set to the HOLD position and has no selected course input from the CDI/HSI. Check the state of configuration switches if installed, or check the CDI/HSI unit.

No RAIM FAF to MAP - RAIM may not be available from the final approach fix to the missed approach point. Continue to fly the approach, but be prepared to cross-check GPS navigation with other navigation sources if RAIM is not available.

Offset nav cancelled - Offset nav has been cancelled due to a direct-to operation or modification of the active route.

Offset nav in effect - Offset navigation mode is in effect.

Ofst too big for rte - The parallel track distance is too large for the active route.

Osc needs adjustment - The GNC 300 has detected excessive drift in its internal crystal oscillator which may result in longer acquisition time. The unit should be taken to an authorized GARMIN service center immediately.

Poor GPS coverage - The GNC 300 cannot acquire sufficient satellites necessary to provide navigation.

Prox alarm-press NAV - Your craft has penetrated the alarm circle of a proximity waypoint. Pres NAV to see the bearing and distance to the proximity waypoint.

Proximity overlap - The circles defined by two proximity waypoints overlap. When entering the area of the overlap, the GNC 300 will warn you of the closest proximity waypoint, but not both. You should be certain this condition is desirable.

Proximity wpt locked - At least one proximity waypoint is locked because the waypoint has been removed from the Jeppesen NavData®, the data card is missing, or the data card has failed.

Proximity wpt moved - One or more prox. waypoints were moved at least 0.33 arc minutes due to a database change.

Proximity wpt deleted - One or more proximity waypoints were deleted while receiving data from the PC Interface Kit.

Pwr down and re-init - The GNC 300 is unusable until power has been cycled and the unit re-initialized. Abnormal satellite conditions may exist.

RAIM not available - The GNC 300 is unable to cross-check its position using RAIM. You may continue to navigate, cross-checking your position every 15 minutes using other navigation sources. If approach mode is ACTV at the time of warning, navigation may be continued for up to 5 minutes to complete the approach procedure.

RAIM position warn - RAIM has detected position errors exceeding those allowed for a given phase of flight. Revert to an alternate source of navigation. If the warning occurs during the final approach segment (FAF to MAP), execute the published missed approach procedure.

RAM failed - The GNC 300 has detected a failure in its internal memory. If the message persists, the GNC 300 is unusable and should be taken to an authorized GARMIN service center.

Rcvr needs service - The GNC 300 has detected a condition requiring service in the receiver hardware, and should be taken to an authorized service center.

Ready for navigation - The GNC 300 is ready for navigation.

Received invalid wpt - A waypoint was received in an upload operation that has an invalid identifier or position.

Receiver failed - The GNC 300 has detected a failure in the receiver hardware. If the message persists, the GNC 300 is unusable and should be taken to an authorized GARMIN service center.

Remote ENT key stuck - The remote ENT key is stuck in the 'pressed' position. Check the installation.

Remote XFR key stuck - The remote XFR key is stuck in the 'pressed' position. Check the installation.

ROM failed - The GNC 300 has detected a failure in its permanent memory. If this message occurs, the unit is unusable and should be taken to an authorized GARMIN service center.

Route is empty - An attempt has been made to activate an empty route.

Route is full - An attempt has been made to add more than 31 waypoints to a route. The GNC 300 will not allow more than 31 waypoints per route.

Route truncated - The route was truncated because not enough room existed to insert a SID, STAR or approach.

Route wpt deleted - One or more route waypoints were deleted while receiving data from the optional PC Interface Kit.

Route wpt locked - At least one route waypoint is locked because the waypoint has been removed from the Jeppesen NavData®, the data card is missing, or the data card has failed.

SECTION D MESSAGES & ABBREVIATIONS

Route wpt moved - One or more route waypoints were moved at least 0.33 arc minutes due to a database change.

Searching the sky - The GNC 300 is in the search-the-sky mode. Allow the unit to complete data collection before turning it off.

Select auto seq mode - The GPS SEQ switch should be set to the AUTO position to continue navigation.

Set course to ____° - The CDI/HSI should be set to the specified course.

SID deleted - The SID was deleted from the route because of insufficient space in the route.

STAR deleted - The STAR was deleted from the route because of insufficient space in the route.

Start altitude chng - The altitude change entered on the VNAV Planning page is about to begin.

Steep turn ahead - This message appears approximately 90 seconds prior to a turn that requires a bank angle in excess of 25 degrees in order to stay on course. Turn anticipation will not be provided.

Stored data lost - Stored user data, including waypoints, routes and satellite orbital data have been lost due to a low memory battery or inadvertent master reset.

Stuck mic/tx disabled - The microphone/headsets have been transmitting continuously for 35 seconds, and the transmitter has been disabled. Releasing the transmit key will allow you to transmit again. If this message permits, check the installation.

SUA ahead < 10 min - The projected course and current speed will take you inside an SUA within the next 10 minutes.

SUA near & ahead - Your position is within two nautical miles of an SUA and its current course will take you inside.

Timer expired - The approach timer has expired.

User data RX started - Data receive operations have started.

Usr data TX complete - Data transmit operations are complete.

VNAV cancelled - The VNAV function has been cancelled due to a change in the active route.

WGS 84 datum selectd - The system map datum was changed to WGS 84 because the selected map datum has been removed from the NavData card, the data card is missing, or the data card has failed.

Wpt comment locked - At least one waypoint comment is locked because the waypoint has been removed from the Jeppesen NavData®, the data card is missing, or the data card has failed.

Wpt exists _____ - You have entered a waypoint name on the AutoStore™ page or user waypoint catalog page that already exists in memory. Enter a waypoint name that does not exist.

Wpt memory full - The waypoint memory is full. You should delete unused waypoints to make room for new waypoints.

SECTION D MESSAGES & ABBREVIATIONS

This section of Appendix C provides a complete list of GNC 300 abbreviations and their meanings.

ALT-	Altitude
APP-	Approach
APR-	Approach
APT-	Airport Waypoint
ARV-	Arrival
ATF-	Aerodrome Traffic Frequency
ATS-	Automatic Terminal Information Service (ATIS)
AVGS-	Aviation Gas
AZM-	Azimuth (bearing)
BRG-	Bearing
CAS-	Calibrated Airspeed
CDI-	Course Deviation Indicator
CL B-	Class B
CL C-	Class C
CLR-	Clearance Delivery
CPA-	Closest Point of Approach
CTA-	ICAO Control Area
CTAF-	Common Traffic Advisory Frequency
CTF-	Common Traffic Advisory Frequency
CTS-	Course To Steer
CUM-	Cumulative
DALT-	Density Altitude
DEG-	Degrees
DEP-	Departure
DIS-	Distance To Waypoint
DME -	Distance Measuring Equipment
DOP-	Dilution of Precision
DTK-	Desired Track
ELEV-	Elevation
ENDUR-	Endurance
EPE-	Estimated Position Error
ESA-	Enroute Safe Altitude
ETA-	Estimated Time of Arrival
ETE-	Estimated Time Enroute
FLOW-	Fuel Flow Rate
FOB-	Fuel On Board
FPM-	Feet Per Minute
FR-	From
FSS-	Flight Service Station
FT-	Feet
FT-	Full Time
GL-	Gallons
GND-	Ground
GPS-	Global Positioning System
GS-	Ground Speed
HDG-	Heading
HG-	Inches of Mercury
IALT-	Indicated Altitude
ILS-	Instrument Landing System
IG-	Imperial Gallons
INT-	Intersection Waypoint

JET A- Jet Fuel - Type A
JET B- Jet Fuel - Type B
KH- Kilometers Per Hour
KM- Kilometers
KT- Knots
LB- Pounds
LCL- Local
LEN- Length
LFOB- Leftover Fuel On Board
LFLOW- Left Fuel Flow
LOC- Localizer
LT- Liters
MAG VAR- Magnetic Variation
MB- Millibars Of Pressure
MF- Mandatory Frequency
MH- Statute Miles Per Hour
MI- Statute Miles
MIN- Minimum
MIN - Minutes
MOA- Military Operations Area
MPM- Meters Per Minute
MPS- Meters Per Second
MSA- Minimum Safe Altitude
MT- Meters
MUL- Multicom
NDB- NDB Waypoint
NM- Nautical Miles
NP- Non-Precision
NR- Nearest
OBS- Omni-directional Bearing Select (Inbound Course Select)
OTH- Other
ºC- Degrees Celsius
ºF- Degrees Fahrenheit
PC- Pilot Controlled
POSN- Position
PRES- Barometric Pressure (Altimeter Setting)
PROX- Proximity
PRX- Proximity
PT- Part Time
PTX- Pre-Taxi
PWR- Power
RDR- Radar
REQ- Required
RF- Reference
RFLOW- Right Fuel Flow
RNG- Range
RNWY- Runway
RSTCD- Restricted
RSV- Reserves
RTE- Route

SECTION D MESSAGES & ABBREVIATIONS

RX- Receive Only
SAR- Search And Rescue
SEC- Seconds
SEQ- Sequence
SGL- Signal
SID- Standard Instrument Departure
SLCT- Select
SRFC- Surface
STAR- Standard Terminal Arrival Route
STR- Steer To
TACAN- TACtical Air Navigational Aid
TAS- True Airspeed
TAT - Total Air Temperature
TEMP- Temperature
TMA- ICAO Terminal Control Area
TRK- Track Angle
TRN- Transition
TRN- Turn Angle
TRSA- Terminal Radar Service Area
TWR- Tower
TX- Transmit Only
U- UTC Time
UNI- Unicom
URA- User Range Accuracy
USER- User Waypoint
USR- User Waypoint
UTC- Universal Time Coordinated (GMT/ Zulu)
VN- VNAV or Vertical Navigation
VNAV- Vertical Navigation
VOR- VOR Waypoint
WPT- Waypoint
WX- Weather

Appendix E
Specifications

PHYSICAL

Size:	6.25"W x 5.8"D x 2"H (159mm x 147mm x 51mm)
Weight:	39 ounces (1.11 kg)
Rack Size:	6.32"W x 5.64"D x 2"H (161mm x 143mm x 51mm)
Rack Weight:	11 ounces (0.31kg)

POWER

Input:	10-15V DC with power cable (aircraft power) 115V or 230V AC w/ optional adapter

ENVIRONMENTAL

Temperature:	-4° F to 158° F (-20°C to 70°C) Operating -67°F to 185°F (-55°C to 85°C) Storage

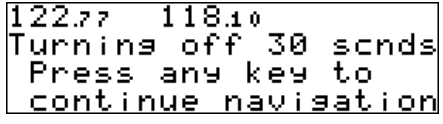
PERFORMANCE

Comm:	760 channel, aviation band 118-136.975 MHz 5-watt minimum transmit power
Receiver:	MultiTrac 8™
Acquisition Time:	2-2.5 minutes (typical) 15 seconds (warm start, with ephemeris)
Update Rate:	1 per second, continuously
Accuracy:	15 meters (49ft.) RMS**
Dynamics:	999 knots velocity, 3g acceleration

INTERFACES

ARINC 429, Plotting (NMEA 0183 V2.0), Aviation, PC Interface, Altitude Serializer, Fuel Sensor, Fuel/Air Data Computer

*** Subject to accuracy degradation to 100m 2DRMS under the US DOD-imposed Selective Availability Program.*



Whenever the GNC 300 is connected to the optional remote battery pack and power from the master switch is lost, the unit will revert to battery power. To continue navigation, press any key when the power down page appears.

Appendix F
Map Datums

ADINDAN	Ethiopia, Mali, Senegal, Sudan
AFGOOYE	Somalia
AIN EL ABD 1970	Bahrain Island, Saudi Arabia
ANNA 1 ASTRO 1965	Cocos Islands
ARC 1950	Botswana, Lesotho, Malawi, Swaziland, Zaire, Zambia, Zimbabwe
ARC 1960	Kenya, Tanzania
ASCENSION IS 1958	Ascension Island
ASTRO B4 SOROL ATOLL	Tern Island
ASTRO BEACON "E"	Iwo Jima Island
ASTRO DOS 71/4	St. Helena Island
ASTRONOMIC STN 1952	Marcus Island
AUSTRALIAN GEOD 1966	Australia, Tasmania Island
AUSTRALIAN GEOD 1984	Australia, Tasmania Island
AUSTRIA NS	Austria
BELGIUM 1950	Belgium
BELLEVUE (IGN)	Efate and Erromango Islands
BERMUDA 1957	Bermuda Islands
BOGOTA OBSERVATORY	Colombia
BUKIT RIMPAH	Indonesia
CAMP AREA ASTRO	Antarctica
CAMPO INCHAUSPE	Argentina
CANTON ASTRO 1966	Phoenix Islands
CAPE	South Africa
CAPE CANAVERAL	Florida, Bahama Islands
CARTHAGE	Tunisia
CH-1903	Switzerland
CHATHAM 1971	Chatham Island (New Zealand)
CHUA ASTRO	Paraguay
CORREGO ALEGRE	Brazil
DANISH GI 1934	Denmark
DJAKARTA (BATAVIA)	Sumatra Island (Indonesia)
DOS 1968	Gizo Island (New Georgia Islands)
EASTER ISLAND 1967	Easter Island
EUROPEAN 1950	Austria, Belgium, Denmark, Finland, France, Germany, Gibraltar, Greece, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland
EUROPEAN 1979	Austria, Finland, Netherlands, Norway, Spain, Sweden, Switzerland
FINLAND HAYFORD 1910	Finland
G. SEGARA	Borneo
GANDAJIKA BASE	Republic of Maldives
GEODETIC DATUM 1949	New Zealand
GGRS 87	Greece
GUAM 1963	Guam Island
GUX 1 ASTRO	Guadalcanal Island
HERAT NORTH	Afghanistan
HJORSEY 1955	Iceland
HONG KONG 1963	Hong Kong
HU-TZU-SHAN	Taiwan
INDIAN BNGLDSH NEPAL	Bangladesh, India, Nepal
INDIAN MEAN VALUE	India
INDIAN THAILAND VIETN	Thailand, Vietnam
INDONESIA 74	Indonesia
IRELAND 1965	Ireland
ISTS 073 ASTRO 1969	Diego Garcia
JOHNSTON ISLAND 1961	Johnston Island
KANDAWALA	Sri Lanka
KERGUELEN ISLAND	Kerguelen Island
KERTAU 1948	West Malaysia, Singapore
L.C. 5 ASTRO	Cayman Brac Island
LIBERIA 1964	Liberia
LUZON MEAN VALUE	Philippines
LUZON MINDANAO IS	Mindanao Island

MAP DATUMS

SECTION F

LUZON PHILIPPINES	Philippines (excluding Mindanao Isl.)
MAHE 1971	Mahe Island
MARCO ASTRO	Salvage Islands
MASSAWA	Eritrea (Ethiopia)
MERCHICH	Morocco
MIDWAY ASTRO 1961	Midway Island
MINNA	Nigeria
NAD27 ALASKA	North American 1927- Alaska
NAD27 BAHAMAS	Bahamas (excluding San Salvador Island)
NAD27 CANADA	Canada (including Newfoundland Island)
NAD27 CANAL ZONE	Canal Zone
NAD27 CARIBBEAN	Caribbean (Barbados, Caicos Islands, Cuba, Dom. Rep., Grd. Cayman, Jamaica, Leeward and Turks Islands)
NAD27 CENTRL AMERICA	Central America (Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua)
NAD27 CONUS	Mean Value (CONUS)
NAD27 CUBA	Cuba
NAD27 GREENLAND	Greenland (Hayes Peninsula)
NAD27 MEXICO	Mexico
NAD27 SAN SALVADR IS	San Salvador Island
NAD83	North American 1983- Alaska, Canada, Central America, CONUS, Mexico
NAHRWAN MASIRAH IS	Masirah Island (Oman)
NAHRWAN SAUDI ARABIA	Saudi Arabia
NAHRWAN UNITD ARAB E	United Arab Emirates
NAPARIMA BWI	Trinidad and Tobago
NETHERLAND TRIAG '21	Netherlands
NOU TRIAG FRANCE	France
NOU TRIAG LUXEMBOURG	Luxembourg
OBSERVATORIO 1966	Corvo and Flores Islands (Azores)
OLD EGYPTIAN	Egypt
OLD HAWAIIAN KAUAI	Kauai
OLD HAWAIIAN MAUI	Maui
OLD HAWAIIAN MEAN	Mean Value
OLD HAWAIIAN OAHU	Oahu
OMAN	Oman
ORD SRV GRT BRITAIN	England, Isle of Man, Scotland, Shetland Islands, Wales
PICO DE LAS NIEVES	Canary Islands
PITCAIRN ASTRO 1967	Pitcairn Island
PORTUGUESE 1973	Portugal
POTSDAM	Germany
PROV SO AMERICAN '56	Bolivia, Chile,Colombia, Ecuador, Guyana, Peru, Venezuela
PROV SO CHILEAN 1963	South Chile
PUERTO RICO	Puerto Rico & Virgin Isl.
QATAR NATIONAL	Qatar
QORNOQ	South Greenland
REUNION	Mascarene Island
ROME 1940	Sardinia Island
RT 90	Sweden
SANTO (DOS)	Espirito Santo Island
SAO BRAZ	Sao Miguel, Santa Maria Islands (Azores)
SAPPER HILL 1943	East Falkland Island
SCHWARZECK	Namibia
SOUTH AMERICAN 1969	Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Venezuela, Trinidad/Tobago
SOUTH ASIA	Singapore
SOUTHEAST BASE	Porto Santo and Madeira Islands
SOUTHWEST BASE	Faial, Graciosa, Pico, Sao Jorge and Terceira Islands (Azores)
TANANARIVE OBSV 1925	Madagascar
TIMBALAI 1948	Brunei and East Malaysia (Sarawak and Sabah)
TOKYO	Japan, Korea, Okinawa
TRISTAN ASTRO 1968	Tristan da Cunha
USER	User datum
VITI LEVU 1916	Viti Levu Island/Fiji Islands
WAKE-ENIWETOK 1960	Marshall Islands
WGS 72	World Geodetic System 1972
WGS 84	World Geodetic System 1984
YACARE	Uruguay

SECTION G Q & A

Appendix G
Troubleshooting Q & A

The GNC 300 is a precision navigation instrument that offers a wide array of performance navigation features. The 'Q & A' section is designed to answer some of the common questions regarding the GNC 300's capabilities and operation. If you have a problem operating your unit, go through the troubleshooting section and refer to the reference section noted. If your problem is not listed in the Q & A section, use the index to find the appropriate reference in the manual. If you still encounter a problem, please see your authorized dealer or call or fax our customer support staff.

What is RAIM, and how does it affect approach operations?

RAIM is an acronym for Receiver Autonomous Integrity Monitoring, a receiver function that performs a consistency check on all tracked satellites. RAIM ensures that the available satellite geometry will allow the receiver to calculate a position within a specified protection limit (2 nm for oceanic and en route, 1 nm for terminal and 0.3 nm for non-precision approaches).

During oceanic, enroute and terminal phases of flight, RAIM will be nearly 100%. Because of the tighter protection limit on approaches, there may be times when RAIM is not available. The GNC 300 automatically monitors RAIM and will warn you with an alert message (see Appendix D) when it is not available. If RAIM is not available when crossing the FAF, the ACTV annunciator will not illuminate and the pilot must fly the missed approach procedure. The GNC 300's RAIM prediction function (see Section 1) will also allow you to see whether RAIM will be available for a specified date and time.

Why aren't there any approaches available for my route?

Approaches are only available when the final route waypoint or direct-to destination is an airport (some VOR/VORTAC identifiers are similar to airport identifiers). If a destination airport does not have a GPS approach, the GNC 300 will display a 'no approach in database for arrival waypoint' message. For more on selecting an approach, see Section 6.

What happens when I select an approach? Can a route be stored with an approach, SID or STAR?

Whenever you load an approach or STAR into the active route, the arrival airport is moved, and a set of approach or arrival waypoints is inserted. If a SID is loaded into the active route, the SID waypoints will be inserted following the departure airport in the active route. Note: these modifications only apply to the active route, and will not affect the corresponding stored route (if you have activated one). Routes can be stored with an approach, SID or STAR. Keep in mind that the active route is erased when the unit is turned off and overwritten when another route is activated.

When storing routes with an approach, SID or STAR, the GPS will use the waypoint information from the current database to define the waypoints. If the database is changed or updated, the GNC 300 will automatically update the information if the procedure name has not changed. If an approach, SID or STAR procedure is no longer available, the route will become locked until the procedure is deleted from the route or the correct database is installed.

Can I file slant Romeo '/R' using my GPS?

Yes, you may file your flight plan as /R if your GNC 300 is a certified A1 or A2 installation. If you are flying enroute, you may fly /R with an expired database **only** after you have verified all route waypoints. Non-precision approaches **may not** be flown with an expired database. See your approved Airplane Flight Manual Supplement for more information.

How do I fly the GPS with an autopilot and DG heading bug?

If you don't have an HSI, make your course selections on the OBS and the DG heading bug.

What does the GPS APR switch do? What is 'arming' an approach?

The GNC 300 will automatically arm the selected approach when you are 30 nm from the arrival airport. The GPS APR switch is used to manually disarm and re-arm the approach. The GPS APR switch also provides you with the capability to quickly deactivate the approach and return the CDI scaling to the 1 nm scale in the event of a missed approach. For more on the GPS APR switch, see Section 6.

What does the GPS SEQ switch do and when do I use it?

The GPS SEQ switch is used to select manual or automatic waypoint sequencing of waypoints. Setting the GPS SEQ switch to the HOLD position holds your current 'active to' waypoint as your navigation reference and prevents the GPS from sequencing to the next waypoint. When the GPS SEQ switch is set to the AUTO position, automatic waypoint sequencing is selected, and the GPS will automatically select the next waypoint in the route once the aircraft has crossed the present active-to waypoint.

AUTO	**HOLD**
Automatic sequencing of waypoints	Manual sequencing- 'HOLDs' on selected waypoint
Change in HSI does not affect CDI deflection	Manually select course to next waypoint from HSI
Always navigates 'TO' the active waypoint	Will indicate 'TO' or 'FROM' the active waypoint
Must be set to AUTO for approach to go active	Approach will not go active

The GPS SEQ switch must be set to the HOLD position any time you are deviating from the flight sequence of an approach (e.g., when you are flying radar vectors) or when you must cross the same waypoint twice in succession (e.g., a procedure turn or holding pattern). Whenever the GPS SEQ switch is set to the HOLD position, the GNC 300 allows you to select the desired course to/from a waypoint using the HSI, much like a VOR, and display a to/from flag for the active-to waypoint. In the AUTO position, the CDI will always display a 'TO' indication for the next waypoint once you've crossed the active waypoint. Refer to Section 6 for an approach example using a HOLD.

When should I switch from HOLD to AUTO, and what happens when I do?

Once you are ready to resume automatic waypoint sequencing, you must set the desired course on your HSI two seconds before changing the GPS SEQ switch to the AUTO position. This allows the the desired course to 'settle' prior to the GNC 300 using it. Once the GPS SEQ switch is set back to the AUTO position, the GNC 300 will use the HSI course until you have crossed the active-to waypoint and sequenced to the next route waypoint. See Section 6 for more on the GPS SEQ switch.

Why won't my unit automatically sequence to the next waypoint?

The GNC 300 will only sequence approach, SID or STAR waypoints when the GPS SEQ switch is in the AUTO position. For automatic sequencing to occur, you must also cross the bisector of the turn you are navigating. See Sections 5 and 6 for more on automatic waypoint sequencing.

How do I skip a waypoint in an approach, SID or STAR?

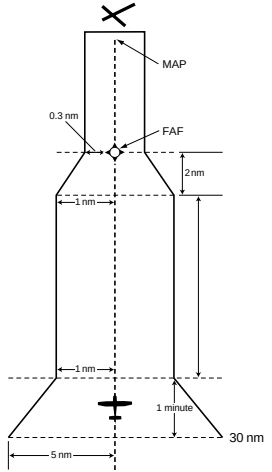
The GNC 300 allows you to manually select any approach, SID or STAR waypoint as your next 'active to' destination. This procedure, called an on-route direct-to, is performed from the active route page by highlighting the desired waypoint and pressing [-D▸], then [ENT] to approve the selection. The GPS will provide navigation directly to the waypoint, so be sure you have direct clearance. See Sections 5 and 6 for more information.

When does turn anticipation begin, and what bank angle is expected?

The GNC 300 will smooth adjacent leg transitions based upon a nominal 15º bank angle (with the ability to roll up to 25º) and provide three pilot cues for turn anticipation: 1) The waypoint annunciator will flash 15 seconds before the turn point and glow steadily 2 seconds prior to the turn anticipation point. Begin the turn when the annunciator goes steady. 2) A flashing 'next dtk' prompt will appear on the GNC 300's CDI field. Set the HSI to the next dtk value when the waypoint annunciator starts flashing. 3) The To/From indicator on the GPS CDI will flip momentarily to indicate that you have crossed the midpoint of the turn. For more on turn anticipation, see Section 5.

When does the CDI scale change, and what does it change to?

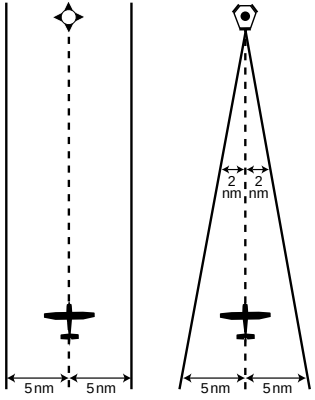
Whenever an approach is selected, the GNC 300 will begin a smooth CDI scale transition from the 5.0 nm to the 0.3 nm scale 30 nm from the destination airport (see right). The CDI scale will remain at the 0.3 nm scale from the FAF to the MAP during the active approach. If you are in a missed approach situation, and would like to return the CDI to the 1 nm scale, you may deactivate the approach by pressing the GPS APR switch.



CDI scale ramping during approach.

SECTION G

Q & A



Unlike a VOR, GPS CDI deflection is based on the actual distance from the desired course, regardless of how far away you are from the destination.

Why does my CDI not respond like a VOR when the GPS SEQ switch is set to HOLD?

Unlike a VOR, the CDI scale used on GPS equipment is based on the cross-track distance to the desired course, not an angular relationship to the destination. Therefore, the CDI deflection on the GPS will be consistent regardless of the distance to the destination, and will not become less sensitive when you are further away from the destination.

What is the correct missed approach procedure? How do I select the MAHP?

To comply with TSO specifications, the GNC 300 will not automatically sequence to the missed approach holding point. The first waypoint in the missed approach procedure will be displayed as the next approach waypoint when the pilot performs a direct-to AFTER crossing the MAP, which the pilot may activate when authorized. All published missed approach procedures (including all course and altitude restrictions) must be flown before activating navigation to the holding point. To begin the missed approach procedure prior to the MAP, the GPS APR switch must be released from the 'ARM' position to disarm the approach and begin transition of the CDI to the 1.0 nm scale.

To activate navigation to the first missed approach waypoint after crossing the MAP, press -D▸, then ENT. The GNC 300 will provide direct navigation to the holding point. If you do not have direct clearance to the holding point, set the GPS SEQ switch to the HOLD position until you have intercepted the inbound course to the holding point.

How do I re-select the same approach or activate a new approach after a missed approach?

After flying all missed approach procedures, you may reactivate the same approach for another attempt from the active route page. Once you have been given clearance for another attempt, select the starting waypoint from the active route list by highlighting the waypoint identifier and pressing -D▸, followed by ENT. The GNC 300 will provide direct navigation to the selected waypoint and rejoin the approach in sequence from that point on. If you have disarmed the previous approach, remember to set the GPS APR switch to the 'ARM' position.

To activate a new approach, you must select the new procedure from the approach select page. To view the approach select page, press RTE and rotate ◯ until the approach select page appears. Press CRSR twice and rotate ◯ to highlight the new approach you want to fly. To activate the new approach, press ENT and select the IAF, if necessary.

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Part No. 190-00067-00 Rev. A