

The Garmin GNS 430W

A Pilot-friendly Manual

by
 John Dittmer



DISCLAIMER

While great care was taken to verify the enclosed operations, they are not to be construed as official Garmin recommendations. Since the GPS world is a rapidly changing one, the contents contained within may become obsolete and/or unsuitable at any time. Any action taken by the user as a result of any item herein is solely at the risk of the reader. I make no warranty as to the accuracy of the information, safety or suitability for use by anyone or for any purpose.

My thanks to Kent for his generous expertise, Bob for his eagle-eye editing, and Kathy for her endless patience and understanding. Although this paper is designed to expedite the learning curve for those of you who are just starting to use the GNS 430W, the most recent version of Garmin's "Pilot's Guide and Reference for the GNS 430W" contains a wealth of information and it remains the final authority for operation.

The examples in this paper make a trip from Wichita Mid Continent airport in Kansas north to Salina Municipal Airport via STONS intersection. This trip was picked because it is a simple trip that still allows examples of most features contained herein.

The information that follows contains all the operational tasks. Remember that there are many ways to accomplish many tasks and we tried to outline the easiest one(s).



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As with any new friend it will take some quality time for you to understand and appreciate the tremendous capabilities of the GNS 430W. Garmin offers a free, downloadable trainer for PC's from their website. Lone Star Aviation makes a docking station called the **Commander 2000G**, which allows you to practice and explore operations with the unit removed from the aircraft (take-home mode). Either choice is a wonderful way to enhance your ability to perform the operations which are important to you without the noise, distractions, and outside vigilance that is a part of flying. We feel that with our manual combined with Garmin's trainer or the docking station from Lone Star Aviation is the best combination for learning the unit. They can be reached at: Lone Star Aviation, 604 South Wisteria Street, Mansfield, TX 76063-2423, (817) 633-6103.

I. Introduction

Background

With the advent of WAAS (Wide Area Augmentation System) in July, 2003, and a WAAS-certified GPS receiver, it is possible to follow a pseudo glideslope which is called a glide path because it is generated by the GPS Satellites. Precisely located ground stations along with geostationary satellites provide more precision to the GPS receiver. This has also changed the minima criteria on the approach charts to include LPV (Localizer-Precision with Vertical Guidance), LNAV/VNAV (Localizer and Vertical Navigation), and LNAV. See the next page to view the differences between the GNS 430 and the WAAS-Certified GNS 430W.

The database for the GNS 430W units is different from and incompatible with the database for the non-WAAS units. Should either charts or the database be out of date you may find that many waypoints have different names and locations.

The new certification for the GNS 430W means it can now be used as the primary means of navigation for domestic, oceanic and remote navigation. A remote area is defined as being further than 200 NM from an airport. Before using the unit in oceanic and remote navigation areas the pilot must perform the FDE, Fault Detection and Exclusion, preflight check. This is a verification of RAIM and Fault Detection and Exclusion capabilities. It can be done by running "FDE Prediction Program" that can be found on the Garmin website www.garmin.com.

This paper assumes your airplane is NOT equipped with EFIS, but instead with an HSI and/or VOR/ILS Head. Since the GNS 430W contains not only a GPS receiver, but also a communications radio and VOR/ILS receiver, you will find that all three functions are addressed in this paper.

WAAS provides differential corrections which improve position accuracy from about 50 feet to within 10 feet both horizontally and vertically. It also provides integrity information and alarm functions within 6 to 8 seconds verses 15 minutes for non-WAAS units. The WAAS receiver receives position updates 5 times per second verses once per second. All this means the WAAS-Certified GPS receiver can be used as the primary means of navigation from Takeoff to Landing.

I. Introduction

Background (cont'd)

So how do you know if your unit is WAAS certified?

1. The model number of the unit shown on the first start-up screen shows a letter “W” at the end of “GNS 430”.
2. The AUX Page 4 contains the “SBAS Selection”. (Satellite Based Augmentation System)
3. The Satellite Status Page, NAV 6, contains HFOM, VFOM and EPU.
HFOM - Horizontal Figure of Merit
VFOM - Vertical Figure of Merit
EPU - Estimated Position Uncertainty
See our page 47 for further explanation.

Differences included with an upgraded unit are:

- Glidepath information on most GPS approaches.
- The faster processor allows faster zooming and panning.
- The ability to provide guidance along curved flight paths which include DME Arcs, Procedure Turns and Holding Patterns in the NAV Mode of a roll-steering autopilot. You no longer have to change to HDG Mode during these maneuvers.
- Terrain is now standard with the unit and is shown with higher resolution. (NAV 3)
- The entire suite of XM Weather products is now available to include Textual and Graphical METARs, TAFs, TFRs and NEXRAD radar for the United States.
- XM Audio Entertainment is available with the GD 69A antenna.
- Annunciations of mode. (LNAV, LNAV/VNAV, LPV, TERM, ENR, APR, etc.)
- Vectors-To-Final, when selected for an approach, auto-suspend automatically occurs until inbound on the Final Approach Course. There is no need for the pilot to PRESS the OBS button.
- During the approach hold or course reversal there is no need to change to HDG mode on the autopilot. Auto-Suspend mode does not occur here. (PRESS the OBS button when inbound to the holding fix ONLY if additional turns in the holding pattern are desired. If selected, PRESS the OBS button to cancel the Auto-Suspend Mode after clearance for the approach has been received.)
- When the OBS button is pressed at the MAP, “MAPR” is annunciated and 0.3 NM sensitivity remains in effect. The WAAS unit will now provide guidance around the holding pattern.
- The Parallel Track function is added.
- The Dead Reckoning function has been added in case of a GPS failure. While in the DR Mode, the unit will continue to navigate based only on your last known position and speed on the active flight plan. Terrain, Traffic and Stormscope information will not be available on the Map page. The To/From flag is removed from the CDI and “DEAD RECKONING” message appears. The aircraft symbol changes color to yellow and the yellow “DR” annunciator appears on the Map Page. (See Garmin’s Pilot’s Guide & Reference for more information.)

Be sure to download and read Garmin’s “What’s New with the 400W / 500W Series” manual. Their new PC simulator for the 400W / 500W Series is also available from their web site at www.garmin.com. Garmin Product Support is also available at: 1-866-739-5687.

I. Introduction

B. GNS 430 GPS Terms

Waypoint - Any point you can navigate to. A waypoint can be defined as an airport, intersection, VOR, NDB, or even a user defined geographical point. Although you may specify a waypoint referencing a VOR, radial, and distance, all waypoints stored in the GNS 430W are defined by latitude and longitude.

Active Waypoint - The waypoint you will reach next. In the Direct-To mode it is identified with an " → ". In the Flight Plan mode it is identified with " [] → ".

Direct To Operation - The GNS 430W will give you track, ground speed, ETE, and all other functions.

Flight Plan Operation - This mode will also provide you with track, ground speed, and ETE. It will also sequence to the next waypoint automatically. The big advantage of operating in the Flight Plan mode is you can easily go to any waypoint in the flight plan even if it is behind you, such as returning to the originating airport.

Airport Identifiers - For airports in the contiguous U.S., when the identifier contains all letters it will begin with a "K". If the identifier contains a number the "K" prefix is not used. Two-letter prefixes are used in the noncontiguous U.S.: "PA", "PF", "PO" and "PP" are used in Alaska, "PH" in Hawaii, "TJ" in Puerto Rico and "TI" in the Virgin Islands. "C" is used in Canada. For all other airports the identifier in the GNS 430W database appears as it is charted. (Zurich-LSZH).

Leg Mode - Most operations are carried out in the Leg Mode where the GNS 430W determines the course to the active waypoint. If you are navigating on a flight plan in the Leg Mode, the GPS will automatically sequence to the next waypoint and go into the Terminal and Approach RAIM status (see below).

OBS Mode - The pilot determines the desired course by setting the CDI and the GNS 430W will not automatically sequence to the next waypoint. The Desired Track (DTK) is defined by the active waypoint and the CDI setting. The OBS Mode is required whenever executing a course reversal, getting radar vectors to the Final Approach Course, executing a missed approach that requires a holding pattern, or proceeding on a SID or STAR that uses a radial of a VOR or a bearing of an NDB as part of the procedure. The GNS 430W will not go into the Approach RAIM status (see below) unless it is in the Leg Mode.

Data Base - There are currently two data bases: Americas, International or Worldwide. The Americas include all of North and South America and some limited information for the rest of the world.

Waypoint alerting is the GNS 430W's way to tell you that the aircraft is getting close to the next active waypoint. Approximately 20 seconds before arrival at the point where a turn should be started, active waypoint identifier will start to flash. The arrow preceding the active waypoint will also begin flashing if on page FPL 0, any navigation page, or waypoint page displaying the active waypoint.

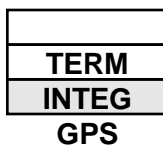
Oceanic Mode (OCN) - Full scale deflection of the CDI is ± 2.0 NM.

Remote Mode (RMT) - When the receiver is further than 200NM from the nearest airport.

B. GNS 430W GPS Terms (cont'd)

Turn Anticipation is a feature that allows a turn onto a new course to begin so the aircraft doesn't overshoot the new track. You should start the turn when the external waypoint annunciator stops flashing. (The flashing indications on the screen will go back to steady.) The GNS 430W will also display a message of the new desired setting on the HSI or CDI if the change is more than 5°.

RAIM - Stands for Receiver Autonomous Integrity Monitoring. This term means that the GPS receiver determines the integrity of navigation information using only GPS signals. It also has the ability to identify and automatically exclude a malfunctioning satellite. The receiver must predict that it has the appropriate RAIM not only at the FAF, but also at the MAP before it will automatically switch to the Approach Mode. The Mode status is displayed in the lower left corner of the screen. If sufficient RAIM does NOT exist, the annunciation "INTEG" on a yellow background appears immediately below the mode annunciation in the lower left corner of the screen.



Oceanic Mode (OCN) - Full scale deflection of the CDI is 2.0NM.

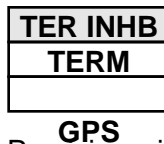
Remote Mode (RMT) - When the receiver is further than 200NM from the nearest airport.

Enroute Mode (ENR) - The GPS will be in Enroute Mode whenever it is beyond 30NM from the departure or arrival airport(s) as contained in the active flight plan or Direct-To operation.

Terminal Mode (TERM) - The GPS will automatically change into Terminal Mode status when it gets within 30 NM of the departure or arrival airport when their waypoints are part of the active flight plan. The CDI scale factor will change from ± 5 NM full scale deflection to ± 1.0 NM.

Approach Mode (APR) - The GPS will automatically go into the Approach Mode when it gets within 2 NM of the FAF if it has the integrity monitoring required. The CDI scale factor will change from ± 1.0 NM to ± 0.3 NM.

Terrain Inhibited - If "Inhibit Terrain" is selected (on NAV 3 Page) the "TER INHB" message appears on a white background above the RAIM annunciation as shown below.



LPV - Localizer-Precision with Vertical Guidance. Inside the FAF the unit changes to an angular-based course guidance much like an ILS.

LNAV/VNAV - Lateral Navigation with Vertical Guidance.

C. Using a GNS 430W for the First Time

Whenever you get into a strange airplane equipped with a GNS 430W or have the occasion to use a strange GNS 430W for the first time, take a moment to verify some settings to help alleviate any surprises.

After the unit has gone through its self test, with the Right knobs select:

A. (AUX 3) Setup 1 Page.

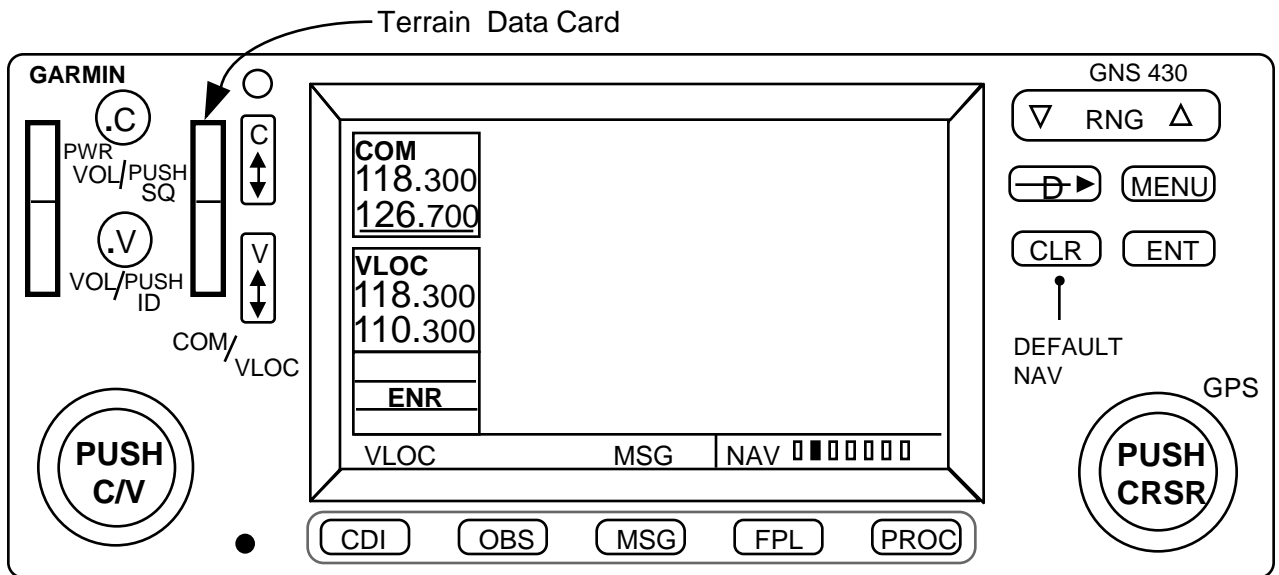
1. Verify or change the Airspace Alarms and Altitude Buffers.
2. Verify or change the CDI Scale and Alarms.
3. Verify or change the Units (standard or metric) and Variation to desired.
These units will affect Distance, Speed, Altitude, Vertical Speed, Altimeter Settings, Temperature and Fuel Measurements.
4. Verify or change the measurement units for Position Format (Latitude and Longitude displayed as degrees, minutes and decimal of minutes, or degrees, minutes, and seconds with decimal of seconds).
5. Verify the correct map datum (WGS-84 in the U.S.) or other datum if being used outside the U.S.
6. Verify or change the Date and Time to desired format.

B. (AUX 4) Setup 2 Page.

1. Verify or change the Display settings for backlight and contrast.
2. Verify or change the minimum runway length and type of runway surface of airports for the nine-nearest airports operation.
3. Verify SBAS Selection. This allows you to turn WAAS On or Off.
4. Verify or change the Communication Frequency spacing as desired (25.0 kHz or 8.33 kHz).

I. Introduction

D. Controls



The unit is turned ON by rotating the **PWR - VOL** knob at the upper left corner.

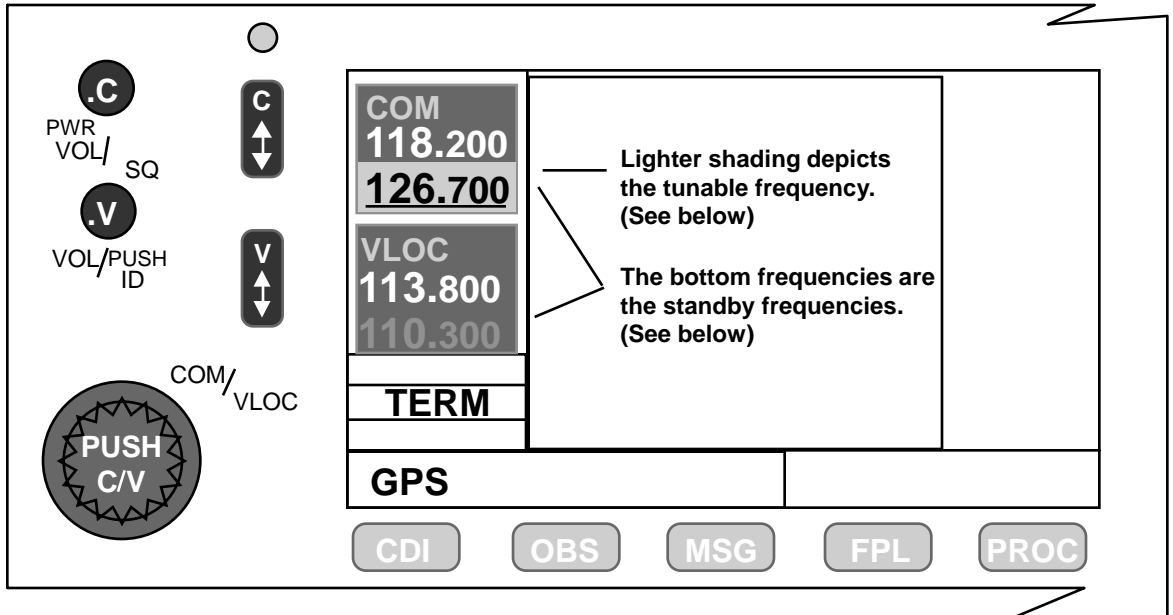
The controls to the left of the screen are used to change communications and navigation frequencies as well as adjust their volumes, squelch, and volume of navigation identification tone.

The five buttons on the bottom of the screen are used to select the navigation source to be displayed on the HSI, select or deselect the OBS mode, view messages, and load flight plans, SIDs, STARs, and instrument approaches.

The controls to the right of the screen change the scale of the map, initiate Direct-to operations, allow you to accept or refuse the last entry, and select chapters and pages in the GPS database, and turn the cursor ON or OFF.

See the following three pages for more detailed descriptions of these controls.

D. Controls - Frequency Controls



.C The top knob is both the On/Off control and the volume for the displayed communications frequency. Pressing momentarily will enable or disable the automatic squelch feature.

.V The next knob down controls the volume for the displayed navigation (VOR and Localizer) frequency. Pressing momentarily will enable or disable the ident tone.

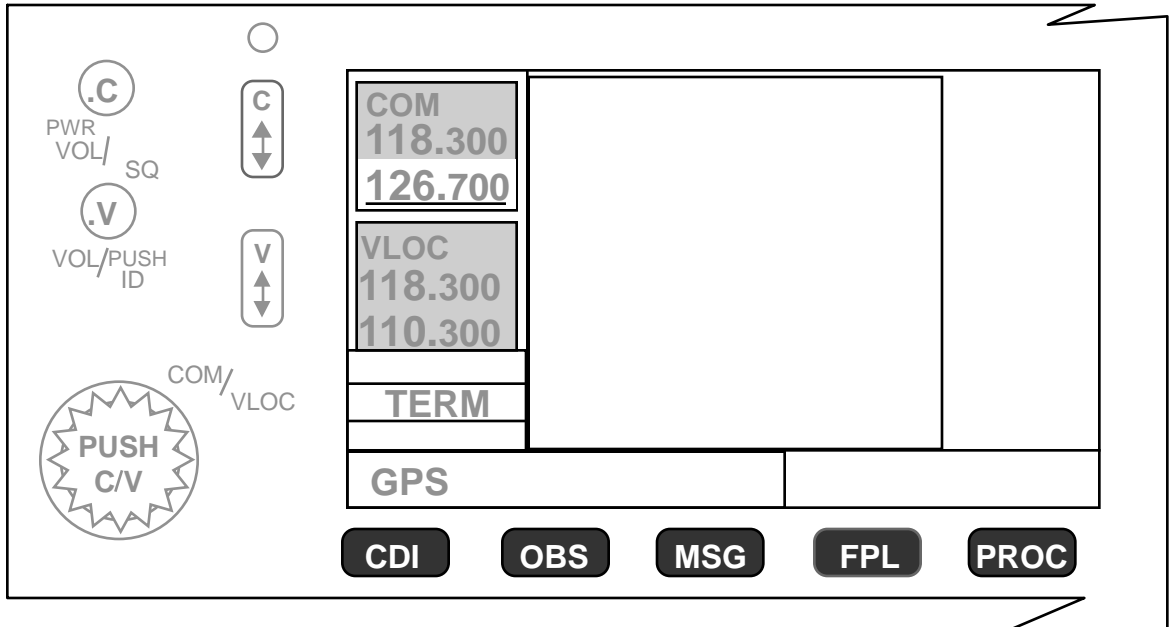


Rotating the small knob will change the kilohertz value of the tunable frequency while rotating the large knob will change the megahertz value of the tunable frequency. Normally the tunable frequency is the bottom communications frequency (lighter background color). PRESSing the small knob will change the tuning feature to the bottom navigation frequency so it can be changed. After approximately 30 seconds of inactivity the tuning feature will automatically revert to the bottom communications frequency.

C This button is used to swap the active and standby communications frequencies. Also, 121.500 MHz may be selected by Pressing and Holding this button.

V This button is used to swap the active and standby navigation frequencies (VOR or Localizer).

D. Controls - Bottom Buttons



CDI

The CDI key is used to select which navigation facility (GPS or VOR/LOC) is providing information to the HSI or CDI and is annunciated immediately above the key.

OBS

The OBS key is used to select the OBS Mode. When in the OBS Mode (as evidenced with the annunciation "OBS" immediately above the Button) automatic waypoint sequencing does not occur and the CDI on your HSI determines the desired course. This is further explained in the "Holding" section of this manual.

MSG

Pressing the MSG Key will allow you to view system messages that are announced by displaying "MSG" immediately above the Key.

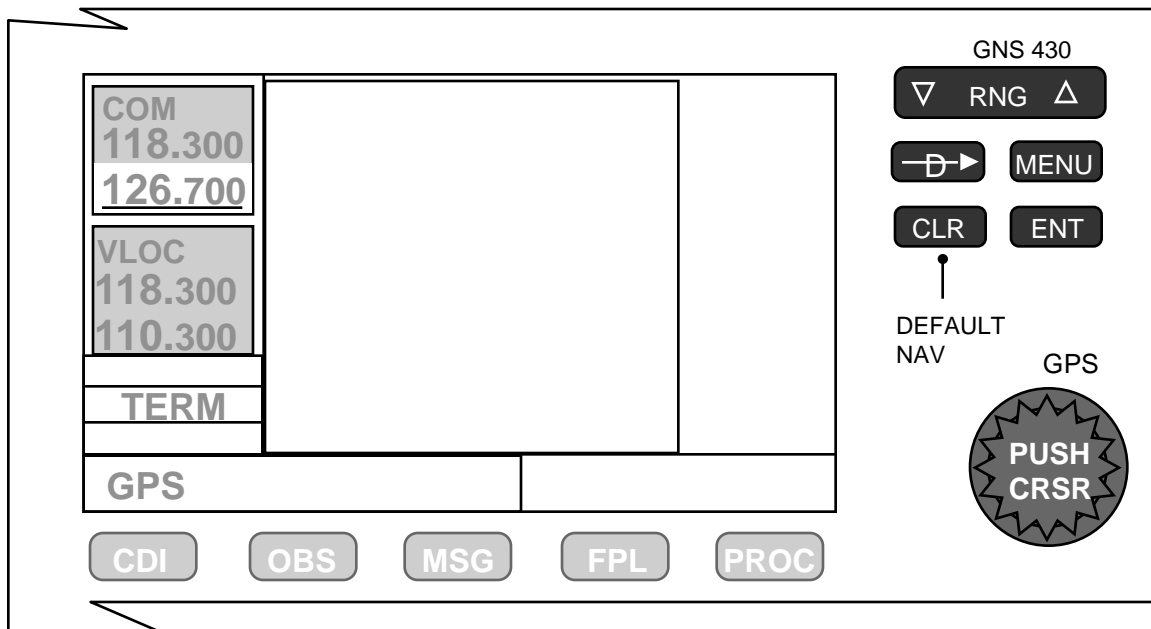
FPL

Pressing the FPL Key takes you to the Flight Plan Page 1 (Active Flight Plan). If you are going Direct-To or on an Active Flight Plan, this page will display each waypoint, the desired track, and distance for each leg. Pressing this key again will return you to the previous page.

PROC

Pressing the PROC Key takes you to the Procedures Page where you may choose to Activate Vector-To-Final, Activate Approach, or Select an Approach, Arrival, or Departure. Pressing this key again will return you to the previous page.

D. Controls - GPS CONTROLS



The RNG (Range) key is used to change the scale on the map. PRESSing on the left side gives a smaller area with more detail. PRESSing on the right side gives a larger area with less detail.



When the Direct Key is PRESSed it allows you to enter an identifier and establish a direct course to that waypoint.



The MENU Key is used on certain pages to present a list of options which allows you to access additional features to the displayed page.



The ENT (Enter) Key (aka the YES Key) is used to accept the chosen operation or approve an identifier for a waypoint.

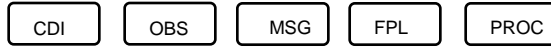
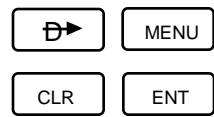


The CLR (Clear) Key (aka the NO Key) is used to cancel an entry. Also, if this button is PRESSed and held for a second the screen will return to the Default Nav Page (NAV 1).



PRESSing the Small Knob turns the cursor ON or OFF. If the cursor is OFF, Rotating the Large Knob will select different page groups (NAV, WPT, AUX or NRST) and Rotating the Small Knob will select different pages within the groups. If the Cursor is ON, the Large Knob is used to move the cursor between fields and rotating the Small Knob will change the value in the highlighted field.

II. Basic Operations



A. Tuning Frequencies


Communications


1. Direct tuning.

If necessary, PRESS the Small Knob to move the tuning cursor to the "COM" window.

Use Large Knob to select the MegaHertz

Use Small Knob to select the KiloHertz

PRESS  to move the standby frequency to the active field if desired.

2. Anytime you can highlight a frequency on one of the below pages PRESS  to transfer the frequency to the standby field in the communications window.

NAVCOM Page (NAV 4) - for any airport in the active flight plan.

(WPT 3) - For any airport in the database

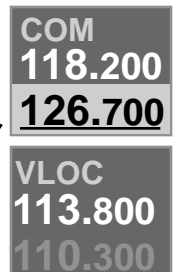
NEAREST AIRPORT Page (NRST 1) (CTAF only)

NEAREST ARTCC Page (NRST 6)

NEAREST FSS Page (NRST 7)

Lighter shading depicts the tuning cursor (can be changed with knobs).

The bottom frequencies are the standby frequencies.




Navigation


1. Direct tuning.

If necessary, PRESS the Small Knob to move the tuning cursor to the "VLOC" window.

Use Large Knob to select the MegaHertz

Use Small Knob to select the KiloHertz

PRESS  to move the frequency to the active field if desired.

2. Anytime you can highlight a frequency on the below pages PRESS  to transfer the frequency to the standby field in the "VLOC" window.

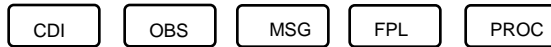
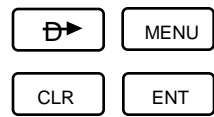
(WPT 3) - ILS and LOC

(WPT 9) - VOR

(NRST 4) - NEAREST VOR Page


NOTE: Additionally, whenever a VOR, LOC, or ILS approach is selected and activated, that navigation frequency is automatically loaded into the standby field of the VLOC window.

II. Basic Operations




B. Direct To a waypoint (From any page.)



NOTE: Since the GPS knows where it is, a Direct-To operation does not require you to enter a starting point but only the desired destination. Lets go direct to the Salina, KS Municipal Airport.

1. PRESS  (This opens the DRCT Page 1) The waypoint field is highlighted.
2. ROTATE the Right Small Knob one click clockwise to begin the spelling process.



NOTE: Turning the Right Small Knob one click clockwise makes the letter "K" appear in the first letter's position. Since most U.S. airport identifiers begin with "K" Garmin thought this would help.

3. If "K" is the first letter of your identifier, ROTATE the Right Large Knob one click clockwise to move the cursor to the next position in the identifier.
4. ROTATE the Right Small Knob until the desired character appears.
5. Continue with the Large and Small Knobs until the entire identifier for the desired waypoint is entered. (KSLN).

As the last letter is chosen, an airport symbol "  " with the geographical location for the waypoint "N CEN USA", the airport name "SALINA MUN", city and state "SALINA KS", latitude and longitude "N 38°47.46' W097°39.13' ", and course "347⁰_M" appear. (It is important that the operator verify the waypoint description and location before activating the waypoint.)

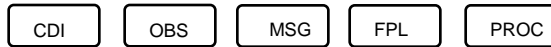
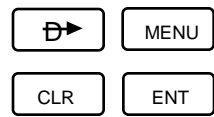
6. PRESS  . "Activate?" in the bottom right corner is now highlighted with a flashing cursor.
7. PRESS  again to activate the waypoint and the unit defaults to NAV 1 or NAV 2 page.

NOTE: The selected waypoint is now called the active Direct-To waypoint.

NOTE: You may also define the course TO or FROM the waypoint by ROTATING the Large Knob to highlight the "CRS" field prior to doing Step #7 above. ROTATE Small and Large Knobs to select the desired course TO and PRESS  . If you wanted a course FROM, select the reciprocal course. PRESS  again to activate your selection. This method is also useful to define holding at an enroute fix.







(See Appendix A, page 37 and 38, for NAV 1 Page.)

III. Flight Plans





The GNS 430W can store up to 19 numbered flight plans and allows you to display and fly an active flight plan (FPL 0). Additionally each of the stored Flight Plans can be used in reverse. Each Flight Plan can contain up to 31 waypoints. Unlike the Direct-To mode, the Flight Plan Mode requires you to enter an identifier for the starting point.

A. Creating a Flight Plan (Wichita, KS north to STONS intersection and continuing to Salina, KS). (See our Page 59 for area map.)

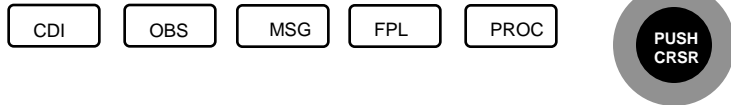
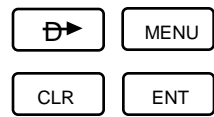
1. PRESS  to select the flight plan pages.
2. ROTATE the Small Knob one click clockwise to display the Flight Plan Catalog (FPL 2)
3. PRESS  to display catalog options.
4. If necessary ROTATE the Large Knob to highlight "**Create New Flight Plan?**".
5. PRESS  . The screen changes to FLIGHT PLAN with the number of the first unused flight plan in the upper left corner and the flashing cursor is over the first blank identifier.
6. ROTATE the Small Knob to enter the first character of KICT.
7. ROTATE the Large Knob to move the cursor to the second character.
8. With the Small and Large Knob, continue entering characters until the entire identifier of the starting waypoint is complete. As the last character is entered, the symbol for an airport appears  , the geographical location "**N CEN USA**", the airport name "**WICHITA MID CONTINENT**", along with its city and state "**WICHITA KS**". The latitude and longitude is also displayed.
9. PRESS  . The cursor moves to the next waypoint identifier field.
10. Using the Small and Large knobs, DIAL in the identifier of the next waypoint and PRESS  . Continue entering waypoints until the identifier for the destination airport is complete. When finished, PRESS the Small Knob to turn the cursor off, store the flight plan, and return to the Flight Plan Catalog (FPL 2).

NOTE: The Flight Plan you just entered is now stored in the catalog alphabetically and can be edited, activated, deleted or copied to another numbered position or copied to another GNS 430W (Crossfill) in a dual installation, from this catalog page (FPL 2).

PRESS  to return to the original page or PRESS and HOLD  to go to the Default Nav Page (NAV 1).

NOTE: To activate a stored Flight Plan see next page.

III. Flight Plans



B. Activating a Stored (Numbered) Flight Plan

1. PRESS to display the flight plan pages. (FPL 1)
2. ROTATE the Small Right Knob one click clockwise to display the catalog page. (FPL 2).
3. PRESS the Small Right Knob to activate the cursor.
4. If necessary ROTATE the Large Right Knob to highlight desired flight plan.
5. PRESS to display catalog options.
6. If necessary ROTATE Large Knob to highlight "**Activate Flight Plan?**".
7. PRESS .

NOTE: The screen returns to FPL 1 Active Flight Plan page and the symbol "" appears between the first two waypoints.

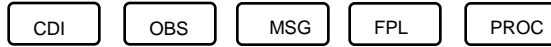
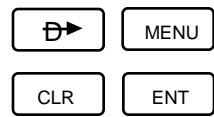
Activating a Stored Flight Plan in Reverse

In order to use a stored flight plan in reverse (Inverted) it must first be activated using steps 1 through 7 above. Then with the Active Flight Plan page displayed (FPL 1):

1. PRESS .
2. ROTATE Large Knob to highlight "**Invert Flight Plan?**".
3. PRESS . The screen returns to FPL 1, Active Flight Plan Page, with the waypoints reversed from its stored order. The distance and desired track that is displayed is from your present position.

NOTE: The stored flight plan remains intact at the originally numbered location.

III. Flight Plans



C. Deleting a Stored Flight Plan

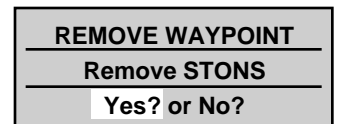
1. PRESS **FPL** .
2. ROTATE Small Knob clockwise one click to view the catalog page (FPL 2).
3. PRESS Small Knob to activate cursor.
4. If necessary ROTATE Large Knob to highlight the flight plan to be deleted.
5. PRESS **MENU** .
6. If necessary ROTATE Large Knob to highlight "Delete Flight Plan?".
7. PRESS **ENT** .
A dialog box appears to ask if you really want to delete this numbered flight plan.
8. PRESS **ENT** . The screen returns to (FPL 2).
9. PRESS **FPL** to return to original page.



NOTE: PRESS **CLR** at step 7 or 8 if you don't want to delete it.

D. Deleting a waypoint (Delete STONS)

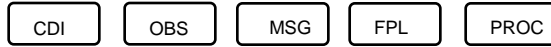
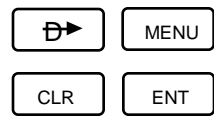
1. PRESS **FPL** .
2. ROTATE Small Knob one click clockwise to catalog page (FPL 2).
3. PRESS Small Knob to activate cursor.
4. If necessary ROTATE Large Knob to highlight the flight plan that contains the waypoint to be deleted.
5. PRESS **ENT** .
6. ROTATE Large Knob to highlight the waypoint to be deleted.
7. PRESS **CLR** . A dialog box appears to ask if you really want to remove this waypoint.
8. PRESS **ENT** .



NOTE: PRESS **CLR** again instead of **ENT** if you don't want to delete the waypoint.

NOTE: Deleting a waypoint from the Active Flight Plan page (FPL 0) will not change how the flight plan is stored. It is necessary to go to the Flight Plan Catalog Page (FPL 2).

III. Flight Plans



E. Adding a waypoint (Adding Wichita VOR)

Assume we already have a stored flight plan KICT, STONS, KSLN.

1. PRESS .
2. ROTATE Small Knob one click clockwise to catalog page (FPL 2).
3. PRESS Small Knob to activate cursor.
4. If necessary ROTATE Large Knob to highlight the flight plan to be modified.
5. PRESS .
6. ROTATE Large Knob to highlight the waypoint which will follow the to-be-added waypoint (STONS).
7. ROTATE the Small Knob to enter the first digit of the new waypoint (I).

As you turn the Small Knob one click, the screen changes to the Waypoint Information screen which describes the waypoint as the identifier letters are entered with the Small and Large Knobs. Continue to use the Large and Small Knobs in the normal manner to DIAL IN the remainder of the waypoint identifier. (ICT for the Wichita VOR)

If there is more than one waypoint in the database with that identifier, ROTATE Large Knob until the desired waypoint is highlighted. PRESS to display the Waypoint Information screen with **“Accept?”** highlighted. PRESS .

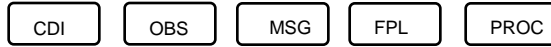
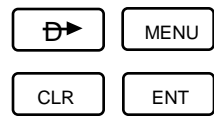
8. PRESS . The screen changes to show the new waypoint order of this flight plan.

KICT		
ICT	304^o_M	9.2_mⁿ
STONS	009^o_M	28.9_mⁿ
KSLN	339^o_M	36.1_mⁿ


9. PRESS Small Knob to turn the cursor off and the screen returns to the Flight Plan Catalog.
10. PRESS to return to the original screen.

NOTE: Adding a waypoint to the Active Flight Plan (FPL 0) will not change how the flight plan is stored unless it is saved again. See our Page 18.

III. Flight Plans



F. Nearest Airport. (From any page)


Should it be necessary to divert to the nearest airport, the 25 nearest airports within 200 NM of your present position (that meet the criteria on Aux page 4) are easily available. If necessary PRESS and HOLD  to go to the default nav page.


1. ROTATE the Large Knob three clicks clockwise to NRST 1 page.


NOTE: The screen can only display 3 airports at a time so it may be necessary to turn the cursor on and scroll through the list. Note the scroll bar along the right side of the screen to indicate which part of the list is being viewed.

2. PRESS Small Knob to activate the cursor.

3. If Necessary, ROTATE Large Knob to highlight the desired airport.

4. PRESS  to view the Direct-To airport page. The description of the waypoint, latitude/longitude, and course to it are displayed.

5. PRESS  . The cursor will highlight “**Activate?**” and be flashing.

6. PRESS  . The screen returns to NAV 1 page showing the new airport as the active waypoint.

(See Appendix I, page 51 for Nearest Airport Page.)

NOTE: You can also use the panning arrow on the NAV 2 page as described on the following page.


G. Direct to a waypoint in the Active Flight Plan.


1. PRESS  . This displays the Active Flight Plan.

2. PRESS Small Knob to activate cursor.



3. ROTATE Large Knob to highlight the desired waypoint.


4. PRESS  .

5. PRESS  to verify the waypoint.

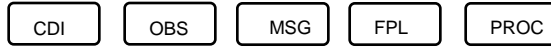
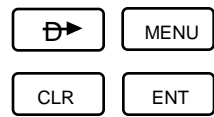
6. PRESS  to activate the waypoint.

The screen returns to the original page.

NOTE: After performing the above operations, the "  " symbol will change to "  " depicting that you are in the direct-to mode.

After passing the active waypoint it will change back to "  " indicating you are back in the flight plan mode.

III. Flight Plans



G. (1) Direct-To a New Destination Using City Name.

We will use the Cessna Aircraft Airport at Wichita, Kansas and can't remember the identifier.

1. PRESS . The Direct-To Page appears (DRCT 1) with the active waypoint being the default waypoint.
2. ROTATE the Large Knob to highlight the city field in the window which is the bottom line as shown.
3. ROTATE the Small Knob to highlight only the first character of the city name (H). Continue ROTATING Small Knob until the first character is W.
4. ROTATE the Large Knob one click to move the cursor to second character.
5. Continue with steps #3 and #4 until the city name appears.



CAUTION: Verify that the displayed waypoint is the one you Want. At Wichita there are 14 waypoints. If necessary, ROTATE Small Knob to view the next waypoint (KCEA).

- KBEC Beech Factory
- KCEA Cessna Aircraft
- KICT Wichita Mid Continent
- K32 Riverside
- 70K Maize
- 71K Westport
- 72K Westport Auxiliary

5. PRESS . (The flashing cursor will highlight "Activate?").
6. PRESS to activate Direct-To operation to the new waypoint. The screen returns to the original screen.

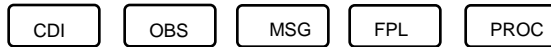
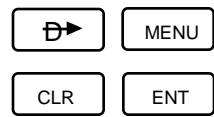
NOTE: It is also possible to define a particular course to this waypoint and operate in a manner similar to the OBS Mode. Before PRESSing the button (Step 6 above), you may ROTATE the Large Knob one click counterclockwise to highlight the CRS Field. Then ROTATE the Small Knob to move the cursor to the first two digits of this field. ROTATE the Small Knob more to change this value. ROTATE the Large Knob to move the cursor to the last digit of the field and use the Small Knob to select the desired number. When finished, PRESS . The cursor moves to the "Activate?" field. PRESS again to accept the defined course to this waypoint.

G. (2) Using the panning arrow on NAV 2 page.



1. PRESS the Small Right Knob to activate the panning arrow.
2. ROTATE the Small and Large Knobs until the arrow is over a waypoint or geographical feature and that point is highlighted.
3. PRESS . (The description of the Direct-To Waypoint page appears on the screen) (DRCT 1)
4. PRESS to confirm the new waypoint.
5. PRESS to activate the new waypoint. The new Desired Track is now depicted on the screen. See Appendix B, page 39 for more information on panning.

III. Flight Plans



H. Storing the Active Flight Plan as a Numbered Flight Plan

NOTE: This procedure is necessary only if you have added or deleted waypoints, SID's, STAR's, or Approaches since activating the flight plan. It may be useful to have a flight plan with and one without an approach to the same airport.

1. PRESS **FPL** to display the active flight plan.
2. PRESS **MENU** .
3. ROTATE Large Knob to highlight "**Copy Flight Plan?**".
4. PRESS **ENT** .

The dialog box that appears will offer to copy the flight plan at the first empty number (04).

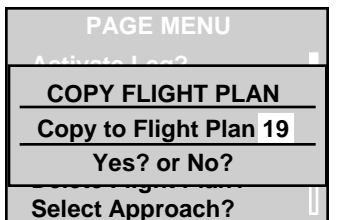
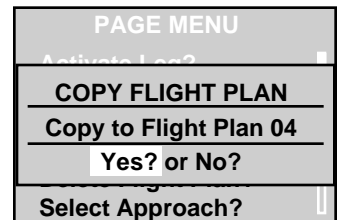
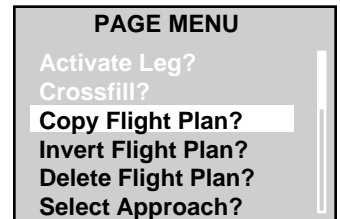
5. If that is okay, PRESS **ENT** .

OR

If you desire to store it at a different location:

5. ROTATE Large Knob one click counterclockwise to highlight the flight plan number.
6. ROTATE Small Knob to select desired number (19).
7. PRESS **ENT** twice.

NOTE: Any Departure, Arrival or Approach will also be saved.



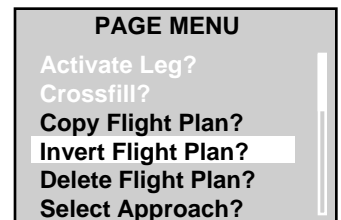
H₁. Resuming the Active Flight Plan

1. After restarting the engine and turning the unit back on, make the previous flight plan active again.
2. PRESS **FPL** , PRESS Small Knob.
3. ROTATE Large Knob to highlight the next desired waypoint, and PRESS **MENU** .
4. With "Activate Leg?" highlighted, PRESS **ENT** twice. The desired leg will be colored magenta on the moving map although it is necessary to manually intercept the leg.

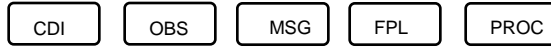
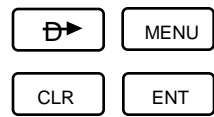
I. Inverting a Flight Plan

1. PRESS **FPL** .
2. PRESS **MENU** .
3. ROTATE Large Knob to highlight "**Invert Flight Plan?**".
4. PRESS **ENT** . The Active Flight Plan appears with the waypoints reversed.

NOTE: It is possible to stop on the airport prior to reaching the airport waypoint identifier, turn around and takeoff in the opposite direction. After inverting the flight plan, it will be necessary to highlight the first waypoint, PRESS **→** then **ENT** .



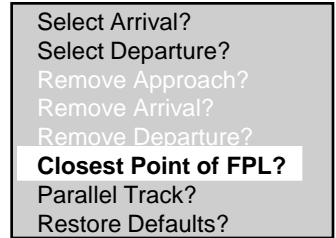
III. Flight Plans



J. Closest Point of FPL.

This option is available so you can identify the point on your flight plan that will be closest to another waypoint of your choice.

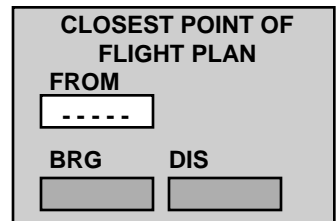
1. From the Active Flight Plan Page, PRESS **MENU** .
2. ROTATE Large Knob to highlight “**Closest Point of FPL?**”



3. PRESS **ENT** .

The window appears to allow you to enter the waypoint identifier of your choice. The “FROM” field is highlighted.

4. ROTATE Small Knob to begin spelling the identifier.
5. When waypoint is entered PRESS **ENT** .



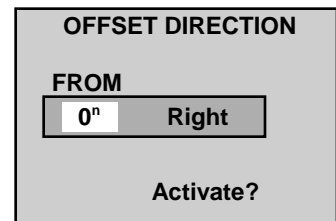
The “Load?” option appears and is highlighted. The BRG and DIS fields filled out. These values are the bearing and distance FROM the selected waypoint.

6. PRESS **ENT** . A user waypoint with a number after it is inserted into the flight plan.

K. Parallel Track

This option allows you to select a parallel track to your active flight plan, left or right, up to 99 NM.

1. From the Active Flight Plan Page, PRESS **MENU** .
2. ROTATE Large Knob to highlight “**Parallel Track?**”.
3. PRESS **ENT** .

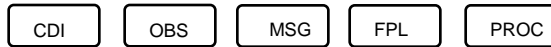
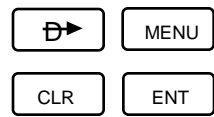


The distance/direction window appears with the distance field highlighted.

4. ROTATE Small Knob to enter the desired distance and PRESS **ENT** .
5. ROTATE Small Knob to change direction if desired. PRESS **ENT** .
6. PRESS **ENT** to Activate the offset.

NOTE: The original course line is now white, the offset course is magenta and the offset waypoints are a solid orange circle with a black dot center. All the waypoints will have a “-P” after them to show they are parallel to the original track. The GPS will navigate the new magenta line. As you approach the end of the flight plan a message will announce “**PTK END**” so you can revert to original track.

III. Flight Plans



L. Standard Instrument Departures (SIDs)

Let's assume we are at the Dallas-Ft Worth airport and want to load the Texoma Six Departure with the Ardmore Transition.

To select and load the SID into the Active Flight Plan:

1. PRESS **PROC** .

2. ROTATE Large Knob to highlight "**Select Departure?**".

3. PRESS **ENT** .

A window appears for you to select the desired SID.

4. ROTATE Large Knob to highlight "**TEX6**".

5. PRESS **ENT** .

Another window opens for you to select desired transition.

6. If necessary ROTATE Large Knob to highlight "**ADM**".

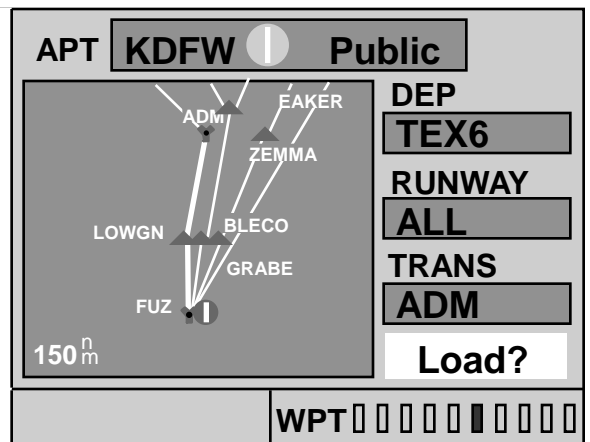
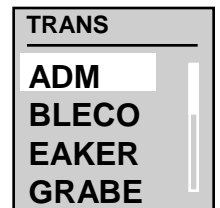
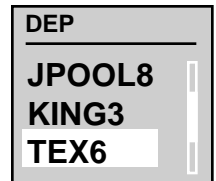
7. PRESS **ENT** . Cursor highlights "Load?"

and the SID waypoints are shown on the map of WPT 6.

8. PRESS **ENT** to enter the SID into the Active Flight Plan.

The screen reverts to FPL 1 and shows the waypoints, desired tracks and distances.

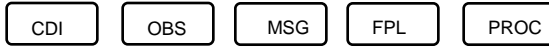
9. PRESS **FPL** to return the display to the starting NAV page.



NOTE: The above SID applies to all runways. It may be necessary to select the appropriate runway also.

NOTE: All the SID's, available runways, and transitions are also available from the WPT 6 page. (p 97) After selecting the SID, Runway, and Transition using the procedures outlined above, the SID may be loaded into the Active Flight Plan by pressing the **MENU** button. A dialog box opens and asks "**Load into Active FPL?**". PRESS **ENT** .

III. Flight Plans



M. Standard Terminal Arrivals (STARs)

Let's assume we are on a flight to the Dallas-Ft Worth airport and want to load the Bonham Three Arrival with the Tulsa Transition and landing to the south. To load the STAR into the Active Flight Plan:

1. PRESS **PROC** .

2. ROTATE Large Knob to highlight "**Select Arrival?**".

3. PRESS **ENT** .

A window appears for you to select the desired STAR.

The cursor is already highlighting "**BYP3**".

4. PRESS **ENT** .

Another window opens for you to select desired transition.

5. ROTATE Large Knob to highlight "**TUL**".

6. PRESS **ENT** .

Another window opens for you to select runway.

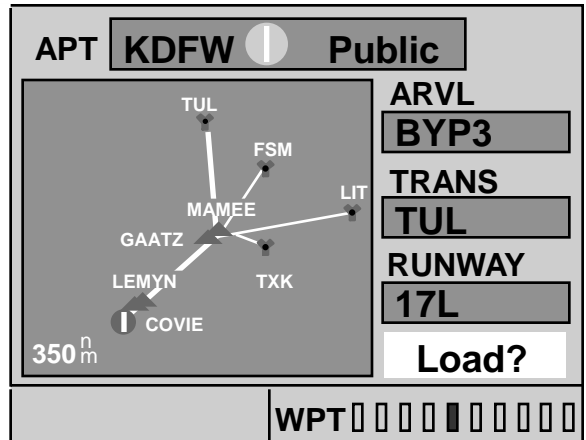
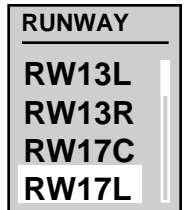
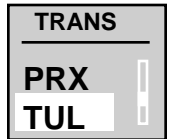
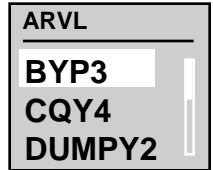
7. ROTATE Large Knob to highlight "**17C**", "**17L**", or "**17R**".

8. PRESS **ENT** . Cursor highlights "Load?"

and the STAR waypoints are shown on the map of WPT 5.

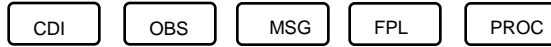
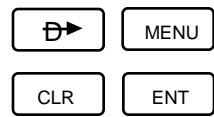
9. PRESS **ENT** to enter the STAR into the Active Flight Plan. The screen reverts to FPL 1 and shows the waypoints, desired tracks and distances.

10. PRESS **FPL** to return the display to the starting NAV page.



NOTE: All the STAR's, transitions and available runways, are also available from the WPT 5 page. (p 97) After selecting the STAR, Transition and Runway using the procedures outlined above, the STAR may be loaded into the Active Flight Plan by pressing the **MENU** button. A dialog box opens and asks "**Load into Active FPL?**". PRESS **ENT** .

III. Flight Plans



N. RAIM Prediction

To perform a RAIM prediction:

If necessary PRESS and HOLD **CLR** to display the Default Nav Page.

1. ROTATE Large Knob two clicks clockwise to display AUX pages.
2. ROTATE Small Knob to view AUX 2 page.
3. PRESS Small Knob to activate the cursor.
4. ROTATE Large Knob to position cursor over "**RAIM Prediction**".

5. PRESS **ENT**. The RAIM Prediction screen of AUX 2 is now displayed with the cursor flashing in the Waypoint Field.

6. Use the Small and Large Knobs to enter the identifier of the waypoint at which you desire to determine RAIM availability.

7. PRESS **ENT**. The cursor moves to the "**ARRIVAL DATE**" field. You may now select a different date if desired.

8. PRESS **ENT**. The cursor moves to the "**ARRIVAL TIME**" field. You may now select a different time if desired.

9. PRESS **ENT**. The flashing cursor moves to the Arrival Time Field.

10. If necessary use the Small and Large Knobs to enter the time for which you desire to determine RAIM availability.

11. PRESS **ENT**. The flashing cursor moves to "**Compute RAIM?**".

12. PRESS **ENT** to have the GNS 430W calculate RAIM Prediction.

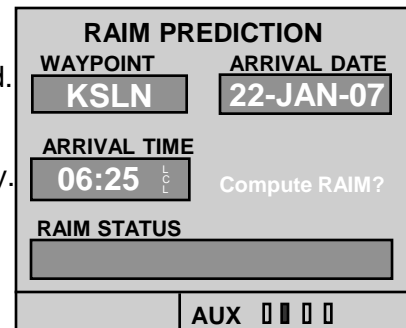
Once the RAIM calculation is complete, one of the following messages will be displayed in the RAIM STATUS Field:

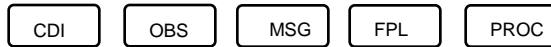
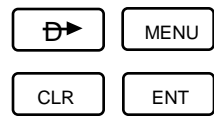
RAIM Not Available - Sufficient satellite coverage is calculated to NOT exist for reliable operation during non-precision, GPS approaches.

RAIM Available - Satellite coverage is calculated to be sufficient for operation during all flight phases, including non-precision, GPS approaches.

13. PRESS and HOLD **CLR** to return to the Default NAV Page.

NOTE: If RAIM is predicted to NOT BE available for the final approach course, the approach will not become active as indicated by "**INTEG**" on a yellow background displayed below the RAIM status field. Also the messages "**Approach is not active**" and "**RAIM not available from FAF to MAP**" will appear.





O. Vertical Navigation (cont'd)

Now that the profile has been defined, the VSR Field (Vertical Speed Required) will show the required descent rate at your present position.



In order for the Vertical Speed Required to be viewed from the Default Nav Page or Map Page, one of the user-defined fields must be "VSR". (See Appendix A, page 40)

The following sequence will occur when using the vertical navigation.



- One minute before reaching the descent (or climb) point, the message: "**Approaching VNAV Profile**" appears.
- If selected, the Vertical Speed Readout on the Default Nav and Map Pages will show the required vertical speed to maintain the angle.
- 500 feet prior to reaching the selected altitude the message "**Approaching Target Altitude**" appears. The VSR field on the Default Nav and Map pages will now be blanked out.

NOTE: The vertical navigation messages are off by default. This allows you to keep the profile settings without generating messages when not using the feature. (If the messages are left on, the GNS 430W will generate a message each time you climb or descend to within 500' of the selected altitude at the selected waypoint.)

To enable or disable the VNAV messages:

1. Select the NAV 7 page.
2. PRESS  to display the Vertical Navigation Page Options. Since the messages are off, the menu will display "**VNAV Messages On?**".
3. PRESS  to turn the messages on.

NOTE: If the messages are on, the menu will display "**VNAV Messages Off?**".

4. PRESS  to disable messages.)
5. PRESS and HOLD  to return to the Default NAV 1 page.

III. Flight Plans



P. User Waypoints

The GNS 430W allows you to create and store up to 1,000 user-defined waypoints in addition to the airport, VOR, NDB and intersection information furnished in the Jeppesen Database. They are stored on Page 10 of the Waypoint Group. The identifier may contain up to five characters. They may be created from the Map Page (NAV 2) or Waypoint Page (WPT 10).

NOTE: Waypoints may be created at Present Position, by latitude and longitude, or with reference to an existing waypoint. The method is basically the same as you will see.

To Create User Waypoint at Present Position (method 1)

1. With the map page displayed, PRESS Small Knob to activate the cursor.
2. PRESS to use the present position. The User Waypoint page appears with the next available four-digit number assigned. This name may be changed later. **“Create?”** is highlighted.
3. PRESS to accept the waypoint.
4. PRESS Small Knob to turn the cursor off.

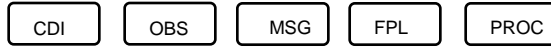
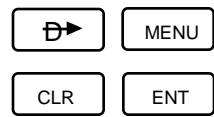
Symbol for User Waypoint

USR	0001		
REF WPT	RAD	DIST	
ICT	076.8 _M	2.3 _{n m}	
HUT	118.9 _M		
POSITION			
N 38° 04.29'		Create?	
W097° 26.35'			
			WPT <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

To Create User Waypoint at Present Position (method 2)

1. PRESS and HOLD to select the Default NAV Page if necessary.
2. ROTATE Large Knob one click clockwise to select the Waypoint Page Group.
3. ROTATE Small Knob to Page 10 (last one).
4. PRESS Small Knob to activate cursor.
5. Using the Small and Large Knobs, DIAL IN the desired identifier. (RANCH)
6. PRESS to view the description page.
7. ROTATE the Large Knob to highlight **“Create?”** and PRESS .
8. PRESS the Small Knob to deactivate the cursor.

III. Flight Plans



P. User Waypoints (Cont'd)

To Create a User Waypoint using Latitude and Longitude

1. ROTATE the Large and Small Knobs to select WPT 10 Page.
2. PRESS Small Knob to activate the cursor in the identifier field.
3. ROTATE Small and Large Knobs to spell the identifier.
4. ROTATE Large Knob to highlight the "Position" field.
5. ROTATE Small and Large Knobs to enter the selected Coordinates of the new waypoint.
6. PRESS to accept the new position. The cursor moves to "Create?".
7. PRESS to save the new waypoint.
8. PRESS Small Knob to turn cursor off.

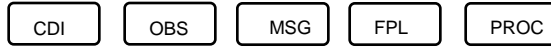
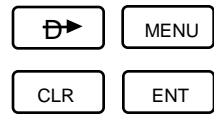
USR	MINE	
REF WPT	RAD	DIST
ICT	076.8 ^o _M	2.3 ⁿ _m
HUT	118.9 ^o _M	
POSITION		
N 38° 04.29'		Create?
W097° 26.35'		
WPT <input type="text"/>		

To Create a User Waypoint using an Existing Waypoint

After performing steps 1 through 6 of the "Present Position Method 2" example on the previous page, continue with the following :

7. ROTATE the Large Knob to highlight the "REF WPT" Field.
8. DIAL IN the identifier of any existing waypoint in the database. This will be the waypoint from which you are defining the location of the new user waypoint.
9. PRESS . The cursor moves to the "RAD" Field.
10. With the Small and Large Knobs, DIAL IN the radial from the existing waypoint to this new user waypoint.
11. PRESS . The cursor moves to the "DIS" Field.
12. With the Small and Large Knobs DIAL IN the distance from the existing waypoint to this new user waypoint.
13. PRESS .
14. ROTATE the Large Knob to highlight "Modify?"
15. PRESS to store the waypoint.
16. PRESS the Small Knob to deactivate the cursor.

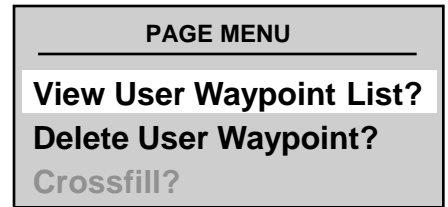
III. Flight Plans



P. User Waypoints (Cont'd)

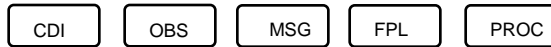
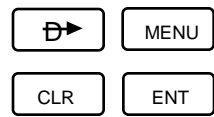
To View List of User Waypoints

1. PRESS and HOLD **CLR** to select the Default NAV page if necessary.
2. ROTATE Large Knob one click to select the Waypoint Page Group.
3. ROTATE Small Knob to Page 10 (last one).
4. PRESS **MENU** to view options.
5. If necessary ROTATE Large Knob to highlight "View User Waypoint List?".
6. PRESS **ENT** .



USER WAYPOINT LIST		
USED	6	AVAIL 994
JD	KZ	RANCH
RC	0001	0002
.....
.....

NOTE: At the top of the list page, the number of user waypoints stored, and the number of available locations is displayed. The User Waypoints are stored alphabetically first and then numerically. The List Page displays the first 12 waypoints (due to space). If more waypoints are stored than can be displayed on one screen, ROTATE the Large Knob to scroll through the user waypoint list.



P. User Waypoints (Cont'd)

To Modify Existing User Waypoints

Existing user waypoints may be modified by changing its latitude/longitude information, its reference waypoint information, and/or name. A user waypoint may be deleted from the user waypoint list if it is not the active waypoint or "from" waypoint in a flight plan. The entire list also may be deleted.

NOTE: A waypoint that is the active waypoint or a waypoint in a stored flight plan may not be deleted. It may only be deleted by deleting the flight plan. If the entire list of user waypoints is selected to be deleted, all waypoints except it would be deleted.

Modifying Existing User Waypoints by changing Latitude/Longitude or Reference Waypoint Information.

1. If necessary select Page 10 of the Waypoint Group. (User Waypoint Page)
2. PRESS **MENU** to display available options.
3. ROTATE Large Knob to highlight "**View User Waypoint List?**".
4. PRESS **ENT** .

At the top of the List, the number of used and number of available waypoints is displayed. The main part of the screen can display up to 12 user waypoints. If there are more than 12, ROTATE the Large Knob to scroll through the list which is in alphabetical order.

5. ROTATE the Large Knob to highlight the desired user waypoint
6. PRESS **ENT** . The User Waypoint Page for the selected waypoint appears with the cursor flashing over the "**Done?**" field.
7. ROTATE Large Knob to highlight the field to be changed.
8. Use the Small and Large Knobs to enter desired data.
Repeat Steps #8 and #9 as necessary.
9. PRESS **ENT** when the change is complete in that field. The cursor moves to the next field.
10. When finished ROTATE Large Knob to highlight "**Modify?**".
11. PRESS **ENT** to record the changes.
12. PRESS Small Knob to turn cursor off.
13. PRESS and HOLD **CLR** to return to the Default NAV page.

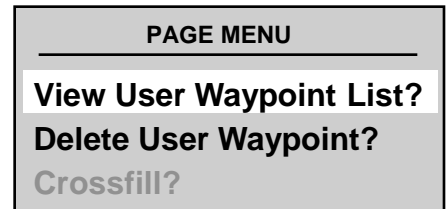
III. Flight Plans



P. User Waypoints (Cont'd)

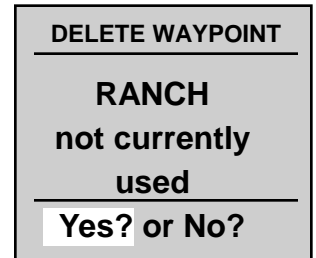
To Rename an Existing User Waypoint

1. If necessary select Page 10 of the Waypoint Group. (User Waypoint Page)
2. PRESS to display available options.
3. If necessary ROTATE Large Knob to highlight "**View User Waypoint List?**".
4. PRESS .
5. ROTATE the Large Knob to highlight the desired user waypoint.
6. ROTATE Small and Large Knobs to enter the new identifier over the old one.
7. PRESS . A "**RENAME WAYPOINT**" confirmation window appears.
8. With "**Yes**" highlighted PRESS .
9. PRESS and HOLD to return to Default NAV page.



To Delete an Existing User Waypoint

1. If necessary select Page 10 of the Waypoint Group.
2. PRESS to display available options.
3. ROTATE Large Knob to highlight "**View User Waypoint List?**".
4. PRESS . The list of User Waypoints is displayed.
5. If necessary ROTATE Large Knob to highlight desired waypoint.
6. PRESS to view the waypoint description.
7. PRESS to display options.
8. ROTATE Large Knob to highlight "**Delete User Waypoint?**".
9. PRESS . The Delete Waypoint dialog box appears which allows you to change your mind.
10. PRESS . The screen returns to WPT Page 10.
11. PRESS and HOLD to return to Default NAV page.



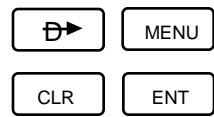
To Delete All User Waypoints From Memory

From the User Waypoint Page (WPT 10)

1. PRESS to display page options.
2. ROTATE Large Knob to highlight "**View User Waypoint List?**".
3. PRESS .
4. PRESS to display "**Delete All User Waypoints**".
5. PRESS . A "Delete all waypoints in user waypoint list " window is displayed with "YES?" highlighted.
6. PRESS .



III. Flight Plans



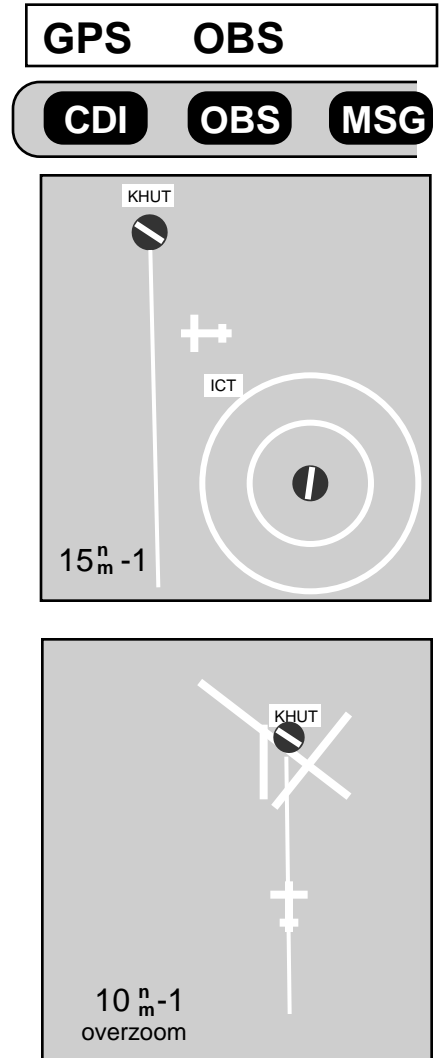
Q. OBS Mode

The OBS mode is a most useful feature. It allows you to select a specific course to fly TO or FROM the active waypoint. When selected, the OBS mode also stops automatically sequencing waypoints. Besides holding, another use is to approach an airport on a course that is very close to the extended centerline of any runway. This can be extremely useful when flying in reduced visibility. It won't be the exact centerline because the course line is drawn from the airport reference point.

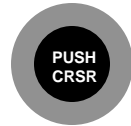
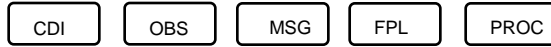
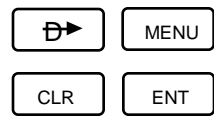
For our example, we are on a flight plan from KICT to KHUT and the surface wind is 360 at 25 knots. It would be to our advantage to land on runway 35 in Hutchinson which does not have a published approach.

With KHUT as the active waypoint, if necessary, move the heading bug to the present heading and change the autopilot to Heading Mode.

1. PRESS **OBS**. The annunciator "OBS", directly above the OBS button will illuminate.
2. On your HSI or VOR head, change the OBS or Course Needle to 350° which is the runway heading. This will change the magenta course line on the map to 350°. It will be necessary to turn the airplane further west, as shown, to manually intercept the selected course. Once the course is intercepted you may return to NAV Mode.
3. With the map scale at 15 nautical miles, the chosen runway is not yet evident. Once the course is intercepted, manually turn the heading back to 350° to fly along the selected course.
4. By the time you scale the map to 10 nautical miles the runway is depicted. It also becomes apparent your selected course line is from the airport reference point and NOT the extended centerline of the runway. The distance to the waypoint is also from the airport reference point.
5. PRESS **OBS** anytime to cancel the OBS function.



IV. Approaches

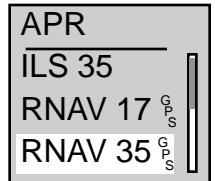


A. Approaches

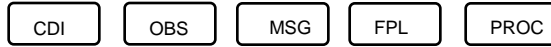
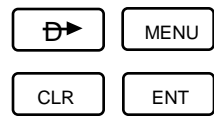
The GNS 430W provides guidance for both precision and non-precision approaches.

Regardless of the approach type, loading the approach requires the same steps. (The airport where you wish to do an approach will normally be either the active waypoint or the last waypoint in the active flight plan.) Lets assume we are on a flight plan from Hutchinson, KS to Salina, KS and wish to do the GPS approach to runway 35 because the ILS is out of service. (See our Page 59 for the approach.)

1. PRESS **PROC**.
2. If necessary ROTATE Large Knob to highlight "**Select Approach?**".
3. PRESS **ENT**. The first three available instrument approaches are displayed. If necessary, ROTATE Large Knob to scroll through all the available approaches until the desired approach is highlighted (RNAV 35 GPS).
4. PRESS **ENT**. The available transitions are now displayed.
5. ROTATE either Right Knob to highlight the desired Initial Approach Fix (HEVTI).
6. PRESS **ENT**. The approach waypoints are displayed in the map area of the WPT 4 page and the cursor is flashing over "Load?". (See next page for differences.)
7. PRESS **ENT**. This loads the approach but it is not active yet. The active waypoint is still the airport at Salina, KSLN.
8. When ATC clears you for the approach PRESS **PROC**.
9. PRESS **ENT**. The active waypoint is now the IAF (HEVTI). As the aircraft progresses through the waypoints and turns inbound on the final approach course, the unit changes to LPV Mode. That means the minimums are 250' above the touchdown zone as shown on the approach chart. As the FAF is approached, the glideslope needle becomes active and the CDI full-scale deflection ramps down to 0.2 NM. Inside the FAF the max deflection reduces further. When the MAP is reached, SUSP appears above the OBS button which means automatic sequencing of waypoints has been suspended.
10. To begin the missed approach, PRESS **OBS** to begin guidance to the missed approach holding fix (KOWDU). The mode changes to "MAPR" so full scale deflection returns to 0.3 NM. When the MAP holding fix is reached, the mode changes back to "TERM" and the GNS 430W now provides holding entry and gives roll-steering guidance so you can remain in the Navigation Mode of the Autopilot. The aircraft will continue in the holding pattern until you select another waypoint. "SUSP" reappears once the aircraft turns back inbound in the holding pattern. To re-fly the approach or select a different approach, PRESS **PROC** and make your selection from the menu that appears.



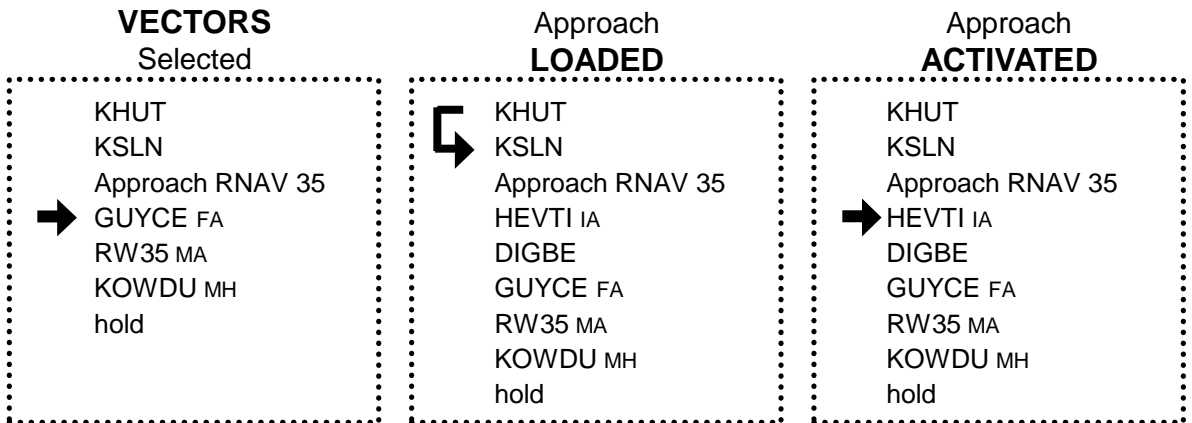
IV. Approaches



A. Approaches (cont'd)

So what is the difference between Vectors-To-Final, Loading and Activating an approach? The three examples below show the waypoints that remain if each of the actions were selected.

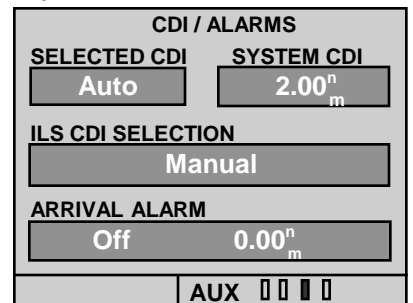
- Vectors-to-Final deletes all the waypoints prior to the Final Approach Fix. A magenta line on the map extends from the Missed Approach Point through the Final Approach Fix. The Final Approach Fix is the new active waypoint.
- Loading an approach places the appropriate waypoints in the flight plan but does NOT change the active waypoint.
- Activating the approach changes the active waypoint to the Initial Approach Fix.



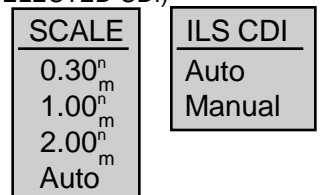
NOTE: During an ILS approach, the CDI Mode **MUST** be switched to "VLOC" instead of "GPS". The factory default setting makes this happen automatically when inbound to the FAF. It may have been changed to Manual on the AUX 3 Page.

ROTATE Large Knob to select AUX pages and the Small Knob to select page 3. After the AUX 3 page has been selected:

1. PRESS Small Knob to activate cursor.
2. ROTATE Large Knob to highlight "CDI / Alarms".
3. PRESS **ENT** to view the CDI / ALARMS screen shown to the right. The available choices for the "Selected CDI" and "ILS CDI SELECTION" values are shown below it.

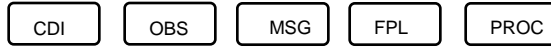


(SELECTED CDI)



If "Auto" is selected for the CDI, the "System CDI" field will display the appropriate setting according to the phase and location of flight. If a specific value is selected, that value always shows in the "System CDI" field.

IV. Approaches



A. Approaches (cont'd)

ILS Approaches.

- When you either LOAD or ACTIVATE an ILS approach:
- The “Not Approved For GPS” message appears
 - The Localizer frequency is automatically placed in the standby VLOC field, and
 - The external CDI is automatically switched from GPS to VLOC when you are inbound to the FAF if the approach has been activated and the localizer frequency is in the active VLOC field. If not PRESS **CDI** to change to VLOC operation.

NOTE: If you forget to change the navigation frequency to the ILS a message appears to remind you.

If you don't respond, another message appears:

- As you approach the FAF, “LNAV” replaces “TERM” as the GPS Mode annunciator. This applies only to the CDI on the NAV 1 page since the external CDI is now coupled to the VLOC receiver.
- Normal waypoint alerting occurs.
- The GNS 430W will provide roll-steering guidance through the procedure turn if any.
- To fly the missed approach procedure, after passing the Missed Approach Point you MUST PRESS the OBS button AND the CDI button. This returns the unit to the GPS mode to resume automatic waypoint sequencing and GPS operation. The 430W will provide guidance throughout the missed approach procedure until another operation is initiated.

LPV Approaches.

Most everything with an LPV approach is the same as an ILS approach. Since this is a GPS approach you won't get the above messages and “LPV” replaces “TERM” as the mode. As you approach the FAF, the guidance in the 430W begins to scale in an angular fashion so the approach is flown just like an ILS. The unit will also check the required Horizontal and Vertical Alarm Limits for integrity. If either of them is exceeded the approach is automatically downgraded and:

- “LPV” is replaced with “LNAV”
- A message appears to alert you to the new minimum, and
- The glideslope indicator is flagged.

NOT APPROVED FOR GPS

GPS guidance is for monitoring only.
Activate approach?

Yes? or No?

MESSAGES

Select appropriate frequency for approach
Do not use for navigation

Select VLOC on CDI for approach

MESSAGES

Approach downgraded -
Use LNAV minima

IV. Approaches



A. Approaches (cont'd)


LNAV / VNAV and LNAV Approaches with Advisory Vertical Guidance

When you perform other GPS approaches they are always governed by the minima that is shown on the bottom of the approach chart.


LNAV/VNAV - Approaches with LNAV/VNAV minimums listed are annunciated on the 430W as L/VNAV or LNAV+V.

LNAV - Only approaches that have advisory vertical guidance have only LNAV minima listed. The vertical guidance should be ignored. The descent should be accomplished as any non-precision approach with step-down altitudes and MDA. On the Jeppesen charts the glide path is normally denoted by a dashed line in the profile view.

VOR and Backcourse Approaches

When you fly these approaches automatic switching of the CDI output from GPS to VLOC does **NOT** occur. You must PRESS  much like an ILS approach outlined on the previous page.


Localizer, SDF and LDA Approaches

When you fly these approaches automatic switching of the CDI output from GPS to VLOC should occur. Always check the Mode Annunciation. If it does not occur you must PRESS  button much like an ILS approach outlined on the previous page.

Approach Notes

Certain approaches contain a “**course from fix to distance**” leg. These appear as a normal waypoint except the destination name always begins with the letter “D” which is followed by a distance in tenths of nautical miles from the waypoint fix. (D12.6)

Some missed approach procedures specify a “**course from fix to altitude**” The specified altitude will appear as a waypoint in the Active Flight Plan (FPL 1) and Default NAV (NAV 1) pages.

Some procedures, usually a SID, contain a “**course from fix to manual sequence leg**”. The term “man seq” appears as the waypoint on the Default NAV (NAV 1) and Active Flight Plan (FPL 1) pages. You will know you are flying this type of leg when you receive a message “NEXT DTK XXX^o” and “SUSP” appears above the OBS button. When cleared to sequence to the next leg, PRESS  to activate the auto-sequencing mode.

IV. Approaches



MENU



ENT

Pg. 35



B. HOLDING When pattern is part of the procedure.

NOTE: If the map orientation is "DTK UP", the map will be oriented so that when the airplane is on the inbound course it will be moving towards the top of the map. The airplane symbol will rotate to stay aligned with the course leg.

In "NORTH UP" the map is stationary and the aircraft symbol rotates to align with the course leg.

If in "TK UP" the map will rotate and the aircraft symbol remains stationary. (See NOTES for Map Orientation on bottom of our page 42.)

When the holding pattern is part of the procedure, it is displayed on the screen and is easy to visualize the entry. The GNS 430W helps by flashing the message "**HOLD DIRECT**", "**HOLD TEARDROP**", or "**HOLD PARALLEL**", in the bottom right corner about 10 seconds before reaching the waypoint. (It will also display the next heading as you would expect in normal waypoint alerting.)

Once the holding waypoint is passed, the ETE field (if it is showing) becomes a timer and begins running. When you are turned back inbound in the holding pattern, the timer starts counting down as you would expect.

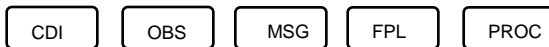
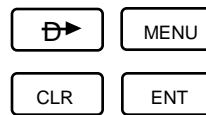
If the holding pattern is part of the approach, if additional turns in the holding pattern are desired, it is necessary to PRESS **OBS** . This will also cause the entire holding pattern to be colored magenta instead of just the active leg. When you are ready to continue the approach, PRESS **OBS** to allow auto-sequencing again.

If the holding pattern is part of the missed approach procedure, "**SUSP**" will appear when you cross the holding fix the first time. It will remain displayed until you select another approach or proceed to another waypoint. You need not PRESS **OBS** each time you are inbound to that fix. If you wish to do the approach again, PRESS **PROC** and you will have the choice to activate the approach again or select another approach.

B. HOLDING When pattern is NOT part of the procedure

You may define the inbound or outbound holding course at ANY fix by performing a Direct-To operation to the fix as explained on our page 17, Direct-To a New Destination Using City Name. It will be necessary to change to Heading Mode on the Autopilot and manually select the desired headings as you fly the holding pattern. If desired, PRESS **OBS** to suspend Auto-sequencing prior to reaching the fix.

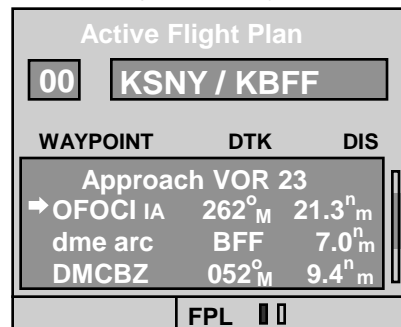
IV. Approaches



C. DME ARC Approach

Assume we are approaching Scottsbluff, Nebraska on a heading of 310 degrees. (See our Page 59.) Selecting the VOR or TACAN or GPS RWY 23 approach at KBFF presents you with Vectors, or three Initial Approach Fixes labeled: BFF, OFOCI, and OFOWY. You probably recognize BFF as the VOR. The other two IAFs are the waypoints at either end of the arc. You choose OFOCI as the IAF because it is closest to you. (With the advent of the "T" arrangement for GPS approaches, the DME Arc approaches are being phased out.)

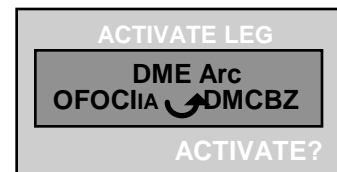
1. With the destination airport (KBFF) as the active waypoint PRESS **PROC** to bring up the PROC 1 Page.
2. If necessary, ROTATE the Large Knob to highlight "**Select Approach?**"
3. PRESS **ENT** to bring up the available approaches.
4. If necessary, ROTATE the Large Knob to highlight the desired approach. (VOR 23^{GS})
5. PRESS **ENT** to bring up the available transitions.
6. If necessary, ROTATE the Large Knob to highlight the desired initial fix. (OFOCI IA)
7. PRESS **ENT** to display the approach.
8. If desired, ROTATE the Large Knob to highlight "**Activate?**"
9. PRESS **ENT**. The screen changes to FPL 1 page.
10. PRESS **FPL** to return to original screen.



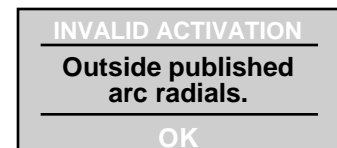
NOTE: If your original track would have intercepted the DME Arc somewhere between the IAF and the turning fix, it is possible to activate the arc and intercept it on your present course **if ATC allows** by performing the following steps:

After the approach has been activated **FIRST** change the autopilot to the Heading Mode:

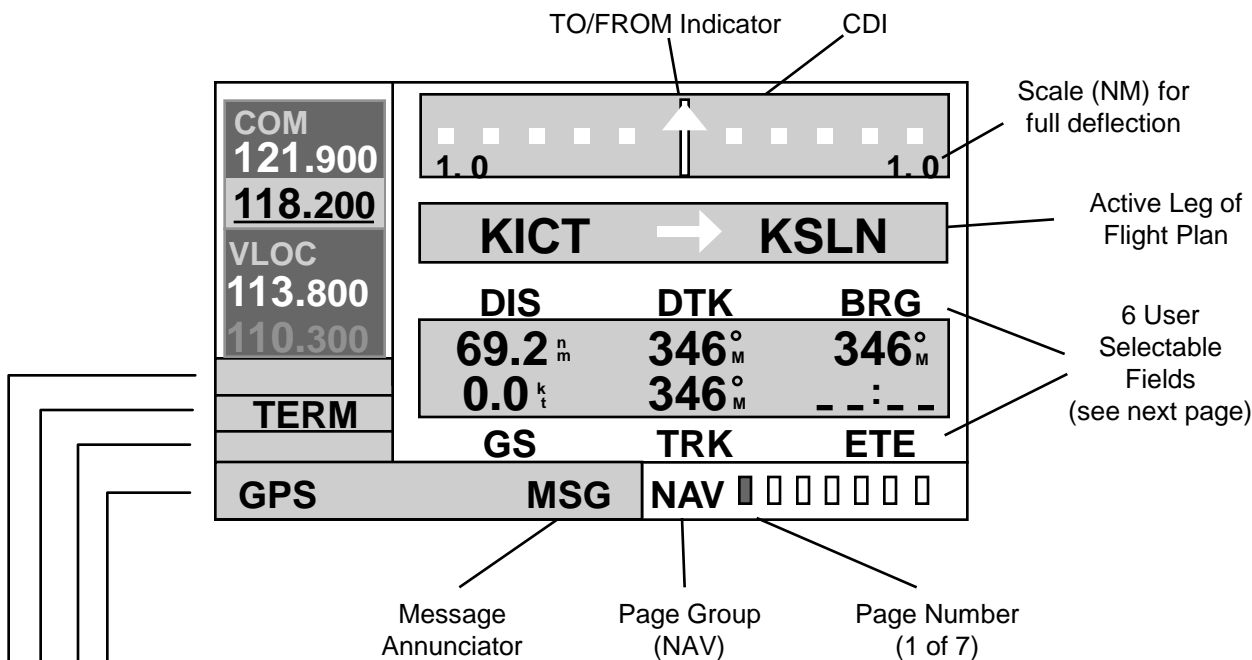
1. PRESS **FPL** to view the approach waypoints.
2. PRESS Small Knob to activate the cursor.
3. ROTATE Large Knob to highlight "dme arc".
4. PRESS **→**. The message box at right appears with the cursor flashing over "ACTIVATE?".
5. PRESS **ENT**. The screen returns to the NAV 2 page and the arc segment is now magenta (active) and the active waypoint is the turning fix (DMCBZ). (There is no guidance to intercept the arc.) Continue on your intercept heading until the turn message is displayed. You may now change back to NAV Mode to fly the rest of the approach.



NOTE: Should you be outside the design parameters for the above operation, the message box at right will appear instead and it will be necessary to fly to the IAF.



Default NAV Page or NAV Page 1



Annunciator to indicate which receiver is driving an external CDI or HSI. It is changed by pressing the **CDI** button immediately below it.
GPS or **VLOC**

If CDI is full scale deflection, the number on that side shows miles off course.

INTEG = On a yellow background, indicates satellite coverage is insufficient and the GPS receiver cannot be used because it does not have the required internal monitoring called RAIM.

GPS Mode (automatic indication). Relates to Scale at top. During approach phase it shows the lowest approach minimums that is presently supported by the satellites. They correspond with the approach minimums shown on the charts.

LPV = Localizer Performance with Vertical Guidance.

LNAV + V = Non-precision approach with advanced vertical guidance.

LNAV = Non-precision GPS approach or non-GPS approach.

ENR = Enroute. 2.0 NM to get full scale deflection of CDI.

TERM = Terminal. 1.0 NM to get full scale deflection of CDI.

APR = Approach Active. 0.3 NM to get full scale deflection of CDI.

MAPR = Missed approach. 0.3 NM for full scale deflection of CDI.

DPRT = Departure. 0.3 NM for full scale deflection of CDI.

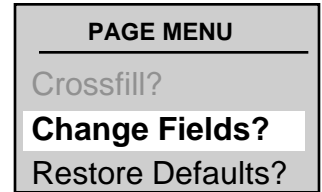
OCN = Oceanic. 2.0 NM gives full scale deflection of CDI.

This field is used to annunciate **TERRAIN** or **OBSTACLE** if the unit detects a conflict or **TER INHB** if "Inhibit Terrain" is selected from the MENU on the Terrain Page, NAV 3 Page. (See our Page 44)

Default NAV Page or NAV Page 1 (cont'd)

Change Fields on NAV 1 Page

1. PRESS and HOLD **CLR** to display the Default NAV Page (NAV 1 Page).
2. PRESS **MENU** to display the Page Menu.
3. PRESS **ENT** to select the "**Change Fields?**" option
(already highlighted). The screen reverts to the NAV 1 Page with a label for one of the 6 fields already highlighted.
4. ROTATE Large Knob to highlight the field you desire to change.
5. ROTATE Small Knob to display available options (see below).
6. Continue ROTATING Small or Large Knob until the desired selection is highlighted.
7. PRESS **ENT** to change the highlighted field.
NOTE: You may continue to change other fields by repeating steps #4 thru #7 above until you are finished.
8. When finished changing the fields, PRESS Small Knob to turn cursor off.



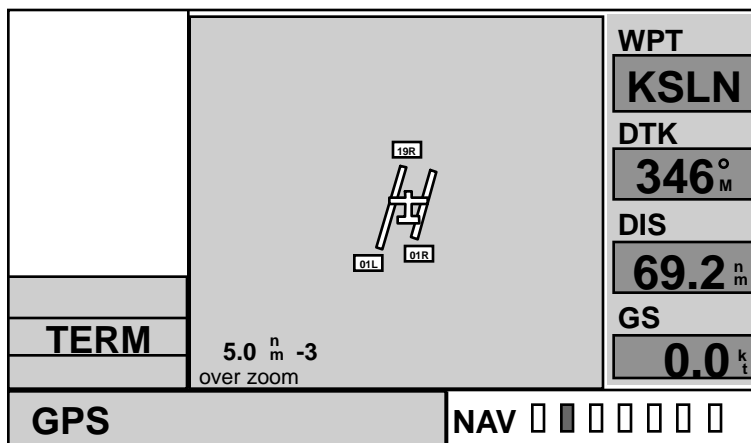
User Selectable Fields

The default setting of these six fields are shown on the previous page. All six may be changed to any of the following selections:

- | | |
|--|--------------------------------------|
| BRG - Bearing to Destination | GS - Ground Speed |
| DIS - Distance to Destination | MSA - Minimum Safe Altitude |
| DTK - Desired Track | TKE - Track Angle Error |
| ESA - Enroute Safe Altitude | TRK - Track |
| ETA - Estimated Time of Arrival | VSR - Vertical Speed Required |
| ETE - Estimated Time Enroute | XTK - Cross Track Error |
| FLOW - Total Fuel Flow(if equipped) | |

Restoring Fields to Default Values

1. PRESS and HOLD **CLR** to display the Default NAV Page (NAV 1 Page).
2. PRESS **MENU** to display the options menu.
3. ROTATE Large Knob to highlight "**Restore Defaults?**".
4. PRESS **ENT** .
5. PRESS Small Knob to turn cursor off.

(Map Page) NAV Page 2

These fields may be turned ON or OFF. All four fields are user-selectable. (See next page)

The NAV 2 Page uses an airplane symbol to depict your present position. It also displays nearby airports, nav aids, waypoints, airspace boundaries, cities, highways, lakes, railroad tracks and rivers.

The Map Scale, Data Fields, Panning, Measuring Distances, and Map Setup are explained below and on the following pages.

Map Scale

The scale, displayed in the lower left corner, can be changed by pressing either end of **▽ RNG △**. There are 23 scales ranging from 500' to 2,000 NM available. Depicted scale is 5.0 NM (Top to Bottom of screen), OVER ZOOM indicates map detail may not display actual conditions accurately. If you zoom in more, "OVER ZOOM" may be replaced with "NO MAP". In either case, the airport and navaid detail will remain. The "-3" following the scale, depicts the amount of map detail. These amounts are depicted by -1, -2, -3 and -A. The first three are selected by pressing the **CLR** key repeatedly. A "-3" indicates the least amount of detail (or the most amount of declutter) that shows airport and nav aids only. "-A" occurs automatically during a GPS approach when the aircraft reaches 2.0 NM from the Final Approach Fix if it is the active waypoint. (At the same time, the RAIM status will change from TERM to the minima the approach supports such as LNAV.)

Available Map Scales

2000 nm
1500 nm
1000 nm
500 nm
350 nm
200 nm
150 nm
100 nm
50 nm
35 nm
20 nm
15 nm
10 nm
5 nm
3.5 nm
2 nm
1.5 nm
1 nm
3500 ft
2000 ft
1500 ft
1000 ft
500 ft

NOTE: An autozoom feature is also available which may be turned on/off from the map setup page (See page 42 of this manual). You will probably prefer to leave this feature off since it never goes beyond the active waypoint i.e. it can scale all the way down to 1000' before crossing a waypoint and conceivably go to 2,000 NM for the next waypoint. If autoscale is operating, it may be temporarily disabled by PRESSING the right side of the range button. Autoscale will begin again after passing the active waypoint or you scale down enough to place the active waypoint off the visible map.

NAV Page 2 (continued) (Map Page)

The Four Data Fields

The four data fields may be turned on or off. Although the default values are shown on the preceding page they are user-selectable from the following 15 possible choices:

(See below for the selection of available fields.)

BRG - Bearing

MSA - Minimum Safe Altitude

DIS - Distance

TKE - Track Angle Error

DTK - Desired Track

TRFC - Traffic Data

ESA - Enroute Safe Altitude

TRK - Track

ETA - Estimated Time of Arrival

VSR - Vertical Speed Required

ETE - Estimated Time Enroute

WPT - Active Waypoint

FLOW - Total Fuel Flow

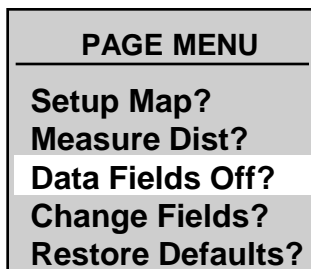
XTK - Cross Track Error

GS - Ground speed

NOTE: The values "FLOW" and "TRFC" are dimmed if optional equipment is not installed.

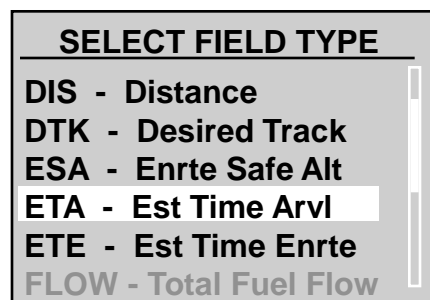
To turn the Data Fields ON or OFF:

1. PRESS .
2. ROTATE Large Knob to highlight "Data Fields ON?" or "Data Fields OFF?". and PRESS .



To change one or more of the Data Fields:

1. PRESS .
2. ROTATE Large Knob to highlight "Change Fields?".
3. PRESS .
4. ROTATE Large Knob to highlight the Data Field to be changed.
5. ROTATE Small knob to select the desired Data Field and PRESS .

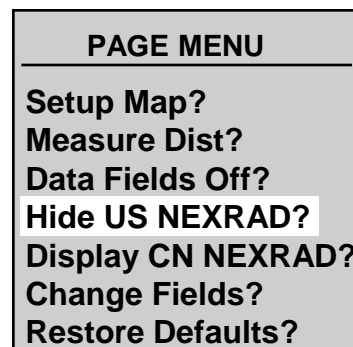


Continue with steps 3 and 4 until the Data Fields are as desired.

6. PRESS Small Knob to turn the cursor off.

NOTE: To restore the Data Fields to the default values utilize the "Restore Defaults?" selection of the page menu.

NOTE: If either XM antenna is installed, the menu for the Map Page includes the option to display or hide U.S. and Canadian NEXRAD information as shown to the right. See our page 60.



NAV Page 2 (continued) (Map Page)

Map Panning




Pressing the Small Knob will make a "Target Pointer" appear on the airplane symbol and open a window at the top of the map. This window displays the latitude/longitude and the bearing and distance from your present position to the pointer.

MAP POINTER	N	37°39.00'
000°	0 ^F _T	W097°25.99'

The cursor may be moved up or down by rotating the Small Knob clockwise or counterclockwise respectively. It may be moved right or left by rotating the Large Knob clockwise or counterclockwise respectively. When the "Target Pointer" is placed over an object (intersection, airport, special use airspace, nav aids, etc.), the object will be highlighted. To obtain information about this highlighted object, PRESS which brings up the appropriate Waypoint Page. When finished PRESS again. To designate this waypoint as the Direct-To waypoint. PRESS then twice. PRESS , to exit the page.

To Measure Distances

1. PRESS .
2. ROTATE Large Knob to highlight "**Measure Dist?**" and PRESS . 

A Target Pointer will appear on the map at your present position. A window also appears at the top of the screen to show position.

MEASURE POINTER	N	37°39.00'
000°	0 ^F _T	W097°25.99'
3. By ROTATING the Small and Large knobs, place the pointer over the position you wish to measure FROM and PRESS . (Initially, when the pointer is moved, a dashed line will be drawn from the aircraft position to the pointer. When is pressed this dashed line disappears and the position of the pointer becomes the point you will measure from.)
4. With the Small and Large knobs place the pointer over the position you wish to measure TO. As the pointer is moved a dashed line will be displayed between the FROM Point to the Pointer. The bearing and distance from the first position to the present position of the pointer will be displayed at the top of the map.
5. When finished, PRESS Small Knob to turn cursor off.

NOTE: If you wish to go Direct-To the position of the pointer, PRESS to bring up the description page. If it is the waypoint you want, PRESS to accept the waypoint. PRESS again to Activate the new waypoint.

NAV Page 2 (continued) (Map Page)

Map Setup

To access the map setup feature, first select the NAV 2 page and PRESS to open the "**PAGE MENU**". If necessary ROTATE Large Knob to highlight "**Setup Map?**" and PRESS . This opens the "MAP SETUP" window and the flashing cursor will be highlighting one of 10 different Groups which appear in the left column below (Weather and Traffic are not shown).

TO CHANGE GROUPS: First ROTATE Large Knob to highlight the "Group Window" then ROTATE Small Knob to open appropriate sub menu that has a scroll bar down the right side. ROTATE Either Knob to select desired the new desired Group and PRESS .

TO CHANGE SUBJECT: ROTATE Large Knob until it is highlighted. Then ROTATE Small Knob to view other available choices. ROTATE Either Knob to highlight the desired Choice and PRESS .

WHEN FINISHED: PRESS Small Knob to turn cursor OFF and return to the NAV 2 page.

<u>GROUP</u>	<u>SUBJECT</u>	<u>CHOICES</u> (See Notes on next page.)
Map	Orientation AutoZoom Land Data Avtn Data	DTK up, North up, Track up On/Off On/Off On/Off
Airport	Large Medium Small	Text Size and Max Scale Choices Text Size and Max Scale Choices Text Size and Max Scale Choices
NAVAID	VOR's NDB's Intersections	Text Size and Max Scale Choices Text Size and Max Scale Choices Text Size and Max Scale Choices
Waypoint	User Waypoints Active FLT Plan	Text Size and Max Scale Choices Text Size and Max Scale Choices
Line	Actv Flt Plan Lat/Long	Max Scale Choices On/Off

NOTE: Weather and Traffic options fall between Map and Airport Groups if they are installed.

NAV Page 2 (continued) (Map Page)

<u>GROUP</u>	<u>SUBJECT</u>	<u>CHOICES</u>
Control	Class B Class C Class D	Max Scale Choices Max Scale Choices Max Scale Choices
Airspace	Restricted MOA Other / ADIZ TFR	Max Scale Choices Max Scale Choices Max Scale Choices Max Scale Choices (GDL 69 antenna is required.)
City	Large Medium Small	Text Size and Max Scale Choices Text Size and Max Scale Choices Text Size and Max Scale Choices
Road	Freeway National HWY Local HWY Local Road	Max Scale Choices Max Scale Choices Max Scale Choices Max Scale Choices
Other	State/Prov River/Lake Railroad Wind Vector	Text Size and Max Scale Choices Text Size and Max Scale Choices Max Scale Choices On/Off

NOTES:**Map Orientation**

North UP - The aircraft symbol is in the center of the map.

TK UP or DTK UP - The aircraft symbol is at the bottom center of map and is a symbol depicting north in the upper left corner of the screen.

**Airports and Cities**

Large Airports have a runway longer than 8,100 feet.

Medium Airports have a runway greater than 5,000 feet or have a control tower.

Large cities have populations greater than 200,000.

Medium cities have populations greater than 50,000.

Text Size

Choices are Large, Medium, Small or None.

Range Settings

Can be any of the 23 available (from 500' to 2,000 NM) to select the maximum scale at which the feature will appear on the screen, or OFF to never display the feature.

NAV Page 3 (Terrain Page)

The information that makes up the terrain and obstacle databases comes from government agencies and Garmin cannot guarantee the accuracy or completeness of the data. The data card is inserted in the right slot of the GNS 430W. The databases may be updated periodically so check the Garmin website for the latest versions. Your version and cycle number can be seen on the AUX 2 Utility page under “Terrain Database Versions”.

The terrain and airport terrain databases include worldwide coverage between Latitudes North 75° and South 60°. The obstacle database provides coverage for the USA and Europe that includes some areas of Canada, Mexico the Caribbean and the Pacific. Check with Garmin when a new database is installed as the area may be expanded.

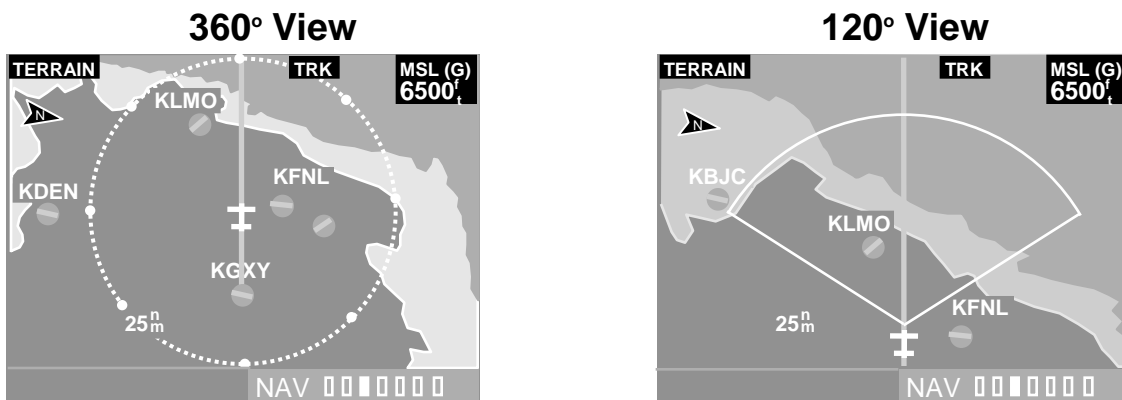
Terrain and Obstacles are depicted in three colors:

Black - More than 1,000' below the aircraft altitude.

Yellow - Between 100' and 1,000' below the aircraft altitude.

Red - Above or less than 100' below the aircraft altitude.

The obstacle symbols are shown only on display ranges up to 10 NM.



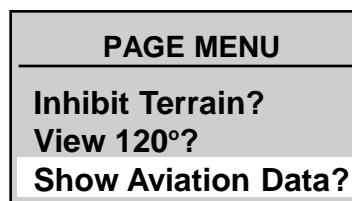
The NAV 3, or Terrain Page, has two views as shown above: The 360° and 120° view. PRESS to open the Page Menu window.

Inhibit Terrain? - This option deactivates the visual alerts and messages. It is primarily intended to be used when flying VFR in unique terrain. Replaced by **Enable Terrain?** when selected.

When the Terrain system is inhibited, the annunciation “**TER INHB**” is displayed in the terrain annunciator field immediately below the navigation frequencies.

VIEW 120°? - Places the aircraft at the bottom of the screen so more emphasis is placed on the terrain ahead of the aircraft. Replaced by **View 360°?** when selected.

Show Aviation Data? - Toggles the aviation information such as airports, NDBs, VORs on and off. When the Terrain Page is being displayed, PRESS button to achieve the same results. Replaced by **Hide Aviation Data?** when selected.



Either view only has the “Track Up” orientation.

Either view has range scales of 1, 2, 5, 10, 25, 50 and 100 NM.

NAV Page 4 (NavCom Page)

Com Freqs (Active) — 121.900
(Standby) — 118.200

Nav Freqs (Active) — 113.800
(Standby) — 110.300

DEPARTURE **KICT** **Public**

ATIS	R _X 125.150
Clearance	125.700
Ground	121.900
Tower	118.200
Unicom	122.950

Scroll bar indicates more frequencies are available. (see below)

GPS NAV

NOTE: The NavCom Page displays the Communications and the Navigation Frequencies at the departure, enroute and arrival airports contained in the active flight plan. In the example above, the scroll bar indicates there are more frequencies following Unicom.

To place any of the frequencies in the Standby Window of the frequency box (Autotune):

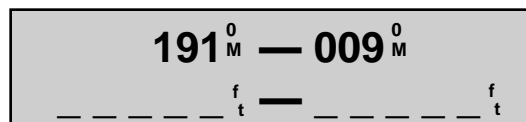
1. PRESS Small Knob to turn the cursor on.
2. ROTATE Large Knob to highlight the Airport Identifier Field.
3. ROTATE Small Knob to select the desired airport in the flight plan and PRESS .
4. Rotate the Large Knob to highlight the desired frequency and PRESS .
5. PRESS the Com Flip-Flop Button to make the frequency active.
6. Repeat steps 2 and 3 above if desired.
7. When finished PRESS Small Knob to turn cursor off.

The remaining frequencies at KICT follow:

FSS	122.200
FSS	122.650
Departure	120.600
Departure Info?	126.700
Departure Info?	134.850
Approach Info?	125.500
Approach Info?	126.700
Approach Info?	134.850
Class C Info?	126.700
Class C Info?	134.800
Class C Info?	134.850
ILS 19R	110.500
ILS 01R	110.300
ILS 19L	111.550
ILS 01L	109.100

For more information on the frequencies with an "Info?":

1. Turn the cursor on:
2. ROTATE Large Knob to highlight "Info?".
3. PRESS .



This depicts the Departure frequency of 126.700 is used on the west side of the airport and there are no altitude limits.

NAV Page 5 (Position Page)

W 300 330 N 030 060		
TRK	GS	ALT
353 ^o _M	0.0 ^k _t	1330 ^f _t
POSITION		TIME
N 37° 39.00'		13:23:47 ^L _C
W097° 25.99'		
TERM	APT	KICT
	FROM	172.3 ^o _M
		1.3 ^N _M
GPS	NAV <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	

All three fields are user-selectable. (See below)

Both fields are user-selectable. (See below)

The NAV 4 Page is the Position Page. It displays your position in Latitude and Longitude, and at the top, displays (in DG format) your heading, or track if you're moving. Directly beneath the track indicator are three, user-selectable data fields which are displaying the default values of **TRK**, **GS**, and **ALT**.

Also available is:

MSA - Minimum Safe Altitude

The default values for the reference fields, **APT** and **FROM** at the bottom can be changed:

APT may be changed to:

INT - Intersection

NDB - Non-Directional Beacon

VOR - Very High Frequency Omnidirectional Radiobeacon

USR - User-Defined Waypoint

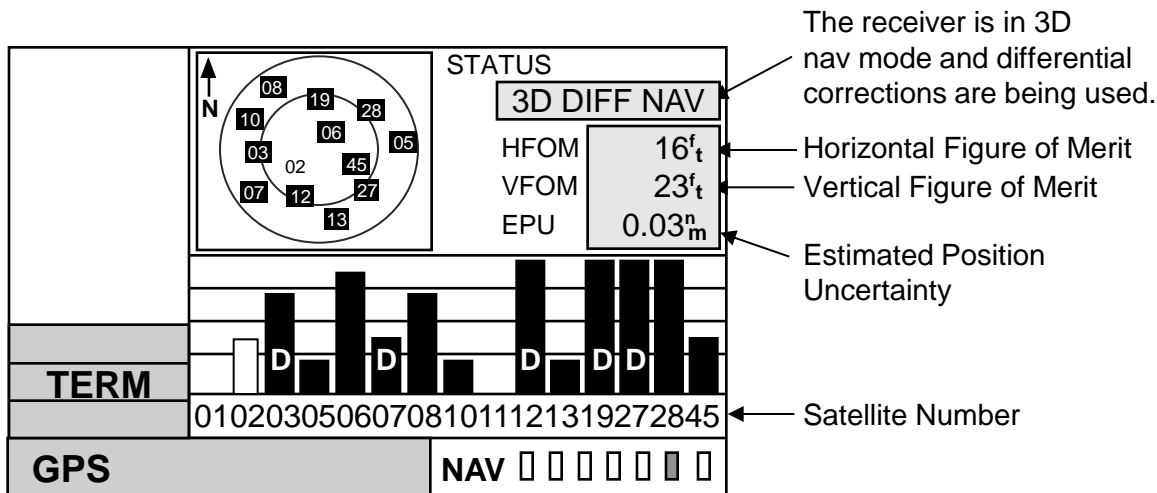
WPT - Waypoint (user selectable)

FROM may be changed to: **TO**.

To change any of the data fields:

1. PRESS to display the Page Menu.
2. ROTATE Large Knob to highlight "**Change Fields?**".
3. PRESS . The cursor will now be flashing over the first data field name.
4. ROTATE Large Knob to highlight field name to be changed.
5. ROTATE Small Knob to display available values.
6. ROTATE Large Knob to highlight desired value and PRESS .
7. Continue with steps 4 through 6 until all fields display the desired values.
8. PRESS Small Knob to turn cursor OFF.

NAV Page 6 Satellite Status Page



- STATUS field
 - SEARCHING SKY - the receiver is looking for any visible satellites.
 - ACQUIRING SAT - the receiver is acquiring satellites for navigation.
 - 3D NAVIGATION - the receiver is computing altitude using satellite data.
 - 3D DIFF NAV - the receiver is using differential corrections.
 - SIMULATING - displayed when the receiver is in simulator mode.
- Hollow signal strength bar means the receiver has found the satellite and is collecting data.
- Cross-hatched cyan filled bar means the receiver has found the satellite but it has been excluded by the FDE program.
- Solid cyan bar means the receiver has necessary data but the satellite is not being used for position.
- Solid green bar means the satellite is being used for position.
- The letter "D" inside the signal strength bar indicates differential corrections are being used for that satellite. (WAAS)
- The HFOM, VFOM and EPU terms are used only in a WAAS-capable unit. Lower numbers are the best accuracy and the higher numbers are worse.
- The HFOM and VFOM numbers indicate the 95% confidence levels in accuracy. EPU is the horizontal position error which is estimated by the Fault Detection and Exclusion (FDE) feature.

NOTE: NAV Page 7, Vertical Navigation, is described in the Flight Plan Section of this manual on Page 23.

Waypoint Pages

There are ten Waypoint Pages which display the following:

- WPT 1: Airport Location
- WPT 2: Airport Runways
- WPT 3: Airport Frequencies
- WPT 4: Airport Approaches
- WPT 5: Airport Arrivals
- WPT 6: Airport Departures
- WPT 7: Intersections
- WPT 8: NDBs
- WPT 9: VORs
- WPT 10: User Waypoints

The Waypoint Page group is accessed easiest by: PRESS and HOLD **CLR** first to go to the default NAV page, ROTATE the Large Knob one click. The Small Knob is now used to select the desired page. WPT 1 Page is shown below.

It is possible to view the description of any waypoint. Once you are on the desired Waypoint Page:

1. PRESS Small Knob to activate the cursor.
2. If necessary ROTATE Large knob to highlight the identifier field.
3. ROTATE Small Knob to begin spelling the identifier or view the available choices if there are any.
4. ROTATE Large and Small knobs to spell out the identifier. When the identifier is complete the waypoint description appears.
5. If desired, PRESS **ENT** to move the cursor to the next field.
6. PRESS Small Knob to turn cursor off.

WPT 1 Page: Airport Location

	APT KICT Public									
	FACILITY & CITY NAME WICHITA MID CONTINENT WICHITA KS									
	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">POSITION</th> <th style="width: 33%;">ELEV</th> <th style="width: 33%;">FUEL</th> </tr> </thead> <tbody> <tr> <td>N 37°_M 39.00'</td> <td>1333_t</td> <td>Avgas</td> </tr> <tr> <td>W097°_M 25.98'</td> <td></td> <td>Jet</td> </tr> </tbody> </table>	POSITION	ELEV	FUEL	N 37°_M 39.00'	1333_t	Avgas	W097°_M 25.98'		Jet
POSITION	ELEV	FUEL								
N 37°_M 39.00'	1333_t	Avgas								
W097°_M 25.98'		Jet								
Best Available Approach →	APR ILS RADAR Yes ARSPC C									
	WPT 									

Available Fuels

WPT Pages 2, 3 and 4

WPT 2 Page: Airport Runways

NOTE: "over zoom" indicates the detail at this scale may not be accurate. With lower scale settings "overzoom" may be replaced with "no map" and geographic detail is removed, but the airport and navaid detail will remain.

WPT 3 Page: Airport Frequencies

This page is similar to the NAV 4 Page as described on our page 45.

WPT 4 Page: Airport Approaches

Once an approach, arrival or departure along with the transition has been selected, it may be loaded into the active flight plan by:

PAGE MENU

Load into Active FPL?

Load and Activate?

1. PRESS **MENU** .
2. If necessary ROTATE Large Knob to highlight the appropriate field.
3. PRESS **ENT** . The screen will display the active flight plan page.

NOTE: If **Load and Activate FPL?** is chosen, the selected approach and transition will not only be loaded into the active flight plan, but the active waypoint will also be changed to the initial approach fix (IA). Choosing **Load into Active FPL?** will load the approach and transition but will not change the active waypoint.

Waypoint Pages 5, 6, 7, 8, 9 and 10

The Waypoint 5 and 6 pages for Arrival and Departure Waypoints all operate and look similar to the Waypoint 4 page for Approaches.

COM
121.900
118.200
VLOC
113.800
110.300
ENR
GPS

APT **KDFW / Public**

ARRIVAL
BYP5

TRANS
FSM

RUNWAY
RW13L

WPT □ □ □ □ □ □ □ □

Diagram labels: FSM, BIRLE, LEMYN, KDFW, GAATZ, 350ⁿ_m, KOMMA

Annotations:
- Approach Procedure Name Field: **BYP5**
- Transition Field: **FSM**

If the departure or destination airport has an approach, arrival or departure, the waypoints may be viewed by selecting the Waypoint 4, 5, or 6 pages. The Bonham 5 arrival at Dallas Fort Worth is shown. Each Arrival, Transition and Runway affected may be viewed by first activating the cursor, ROTATING Large Knob to highlight the applicable field and ROTATING the Small Knob to view choices. PRESS **ENT** to view the procedure.

WPT 7 Page: Intersections

INT **CHITO** ▲

REGION
N CEN USA

NEAREST VOR
ICT

POSITION
N 37°33.56'
W 097°28.83'

RAD 149_M **DIS** 12.2_M

WPT □ □ □ □ □ □ □ □

DUPLICATE WAYPOINTS

WPT AB
NDB
S CEN USA
NDB
N CEN USA
NDB
SE USA
NDB
NE USA
NDB
DENMARK
NDB
SWEDEN
NDB
FRANCE
NDB
AUSTRIA
NDB
RUSSIA
NDB
ETHIOPIA
NDB
S AFR REP

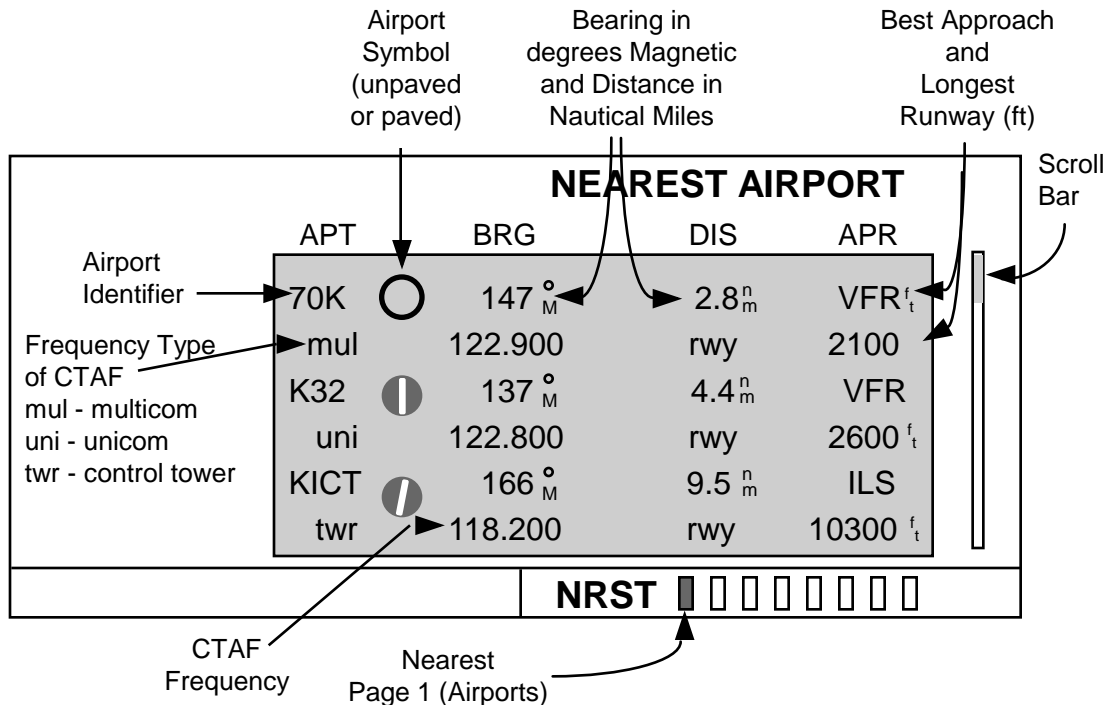
The **Waypoint 7, 8, 9 and 10 pages** for Intersections, NDBs, VOR's and User Waypoints all operate and look similar to the Intersections page shown. If you should select a waypoint identifier that is assigned to more than one facility, such as "AB" for an NDB, when you PRESS **ENT** the "Duplicate Waypoints" window (shown to the right) opens. ROTATE either knob to scroll through available choices. When highlighted, PRESS **ENT** to view its description. The NDB in south-central USA, shown highlighted in the list, is the TOMHI beacon in Abilene, TX.

Appendix I Nearest Pages

There are eight Nearest Pages which display the following:

- | | |
|----------------------|------------------------|
| NRST 1: Airport | NRST 5: User |
| NRST 2: Intersection | NRST 6: Center |
| NRST 3: NDB | NRST 7: Flight Service |
| NRST 4: VOR | NRST 8: Airspace |

NRST 1 Page: Airports



Although there is only room to display 3 of the 25 nearest airports (within 200 NM) on the screen, the remaining airports can be viewed by:
 PRESS Small Knob to turn the cursor ON. ROTATE Large Knob to move the cursor. Only the airport identifier and CTAF (Common Traffic Advisory Frequency) can be highlighted with the cursor. Moving the large knob one more click with the CTAF highlighted will highlight the next airport identifier. The (CTAF) for the desired airport can be quickly loaded into the communications standby window when it is highlighted. PRESS **ENT** . PRESS and HOLD **CLR** to return to the NAV Page 1.

NOTE: Additional information on the airport highlighted by the cursor may be obtained by: PRESS **ENT** to display the airport location page (Waypoint Page 1) which provides: The Airport Name, City Name, Latitude / Longitude, Elevation, Fuel available, Best Instrument Approach, if in a Radar Environment, and any Special Use Airspace. PRESS **ENT** again to return to the original page. All eight of the Nearest Waypoint Pages are available by first PRESSING the Small Knob to turn the cursor OFF and rotating the Small Knob. (See Page 48-50 for Waypoint Pages.)

Nearest Pages (cont'd)

NRST 2 Page: Intersections

NRST 3 Page: NDB's

NRST 4 Page: VOR's

NRST 5 Page: User

The above Nearest pages all operate and look similar to the Airports page shown on the preceding page. Each page displays five facilities at a time and provides detailed information for the 25 nearest facilities from your current position.

NRST 2 Page: Intersections

INT		BRG	DIS
MAPCT	▲	140° _M	0.5 ⁿ _m
MAPCN	▲	337° _M	0.7 ⁿ _m
SPOIL	▲	007° _M	2.0 ⁿ _m
HOLUS	▲	147° _M	2.5 ⁿ _m
HAGEK	▲	201° _M	2.8 ⁿ _m

NRST

To view further details of any facility:

1. PRESS Small Knob to activate the cursor.
2. If necessary ROTATE Large Knob to highlight the desired identifier.
3. PRESS to view the Waypoint Page for that facility.
4. When finished PRESS to return to the NRST page.

INT	MAPCT ▲	DONE?	
REGION	N CEN USA		NEAREST VOR
			ICT 🔑
POSITION		RAD	DIS
	N 37°38.55'	122° _M	9.7 ⁿ _m
	W097°25.59'		

WPT

NRST 6 Page: ARTCC

NRST 7 Page: FSS

The Nearest pages 6 and 7 provide information for the five nearest Flight Service Stations and ARTCC points of communications one at a time. The pages include the available frequencies, the bearing and distance from your present location. To view the remaining facilities PRESS Small Knob to activate the cursor and ROTATE Small Knob one click at a time. ROTATING the Large Knob will highlight the first Frequency so it can be easily entered into the Standby Communications Frequency position by PRESSing .

NRST 8 Page: AIRSPACE

The Nearest page 8 will show any Special Use or Controlled Airspace you are in or near. Again, to view further details, PRESS Small Knob to turn the cursor on, ROTATE Large Knob to highlight desired airspace and PRESS .

VI. Page Descriptions

NAV PAGES

<u>Page</u>	<u>USAGE</u>
NAV 1	Default Nav Page. Displays CDI, Active Leg of Flight Plan, six user-selectable Data Fields, and Full Scale Limits for CDI.
NAV 2	Map Page. Displays your present position with an airplane symbol, along with nearby airports, nav aids and waypoints. Also able to display various geographical features. The map scale is selectable and four user-selectable Data Fields may or may not be displayed.
NAV 3	Terrain Page. Displays obstacles and terrain relative to the aircraft position and altitude according to a government furnished database. Coverage is provided for the USA and parts of Canada, Mexico and Europe. It is not world-wide. Check Garmin's Pilot Guide for additional information on areas of coverage. The database will have updates from time to time. Check the Garmin website to view latest version.
NAV 4	NAVCOM Page. Provides a list of the airport communication and navigation frequencies for the airports in your flight plan or for the airport nearest your departure position.
NAV 5	Position Page. Displays a Track Indicator (in DG format), three user-definable Data Fields, Present Position in Latitude/Longitude, along with bearing and distance from a waypoint.
NAV 6	Satellite Status Page. Displays a "sky view" of which satellites are currently in view. It also provides a reference of GPS receiver functions to include satellite coverage, GPS receiver status and position accuracy.
NAV 7	Vertical Navigation Page. This page allows you to define a three-dimensional profile from your present position and altitude to a target altitude at a specified location. After the profile is defined, message alerts on the Default NAV and Map Pages will define your progress in the data field "VSR".

VI. Page Descriptions

WAYPOINT PAGES

<u>Page</u>	<u>USAGE</u>
WPT 1	Airport Location Page. With an airport selected, this page displays the facility name and city location, latitude/longitude, elevation, fuel available, the best available approach, if radar coverage is available, and airspace type.
WPT 2	Airport Runway Page. For the selected airport this page presents a map image with a selectable scale, to portray the runway layout and surrounding area. Each runway's designation along with it's length, width, surface type and lighting can also be displayed.
WPT 3	Airport Frequency Page. For the selected airport, this page displays the radio frequencies and type (by sector and altitude) and the localizer frequency if applicable.
WPT 4	Airport Approach Page. For the selected airport, this page displays a map image, with a selectable scale, to portray each instrument approach including the procedure name, transitions and missed approach.
WPT 5	Airport Arrival Page. For the selected airport, this page provides a map image of each Standard Terminal Arrival (STAR) to include the procedure name, transition and associated runways.
WPT 6	Airport Departure Page. Same information as above for each Standard Instrument Departure (SID).
WPT 7	Intersection Page. For the intersection selected, displays the region and country, latitude and longitude, along with the identifier, radial and distance from the nearest VOR, VORTAC, or VOR/DME.
WPT 8	NDB Page. For the NDB selected, displays the facility name, city name, region and country, latitude and longitude, frequency, and weather broadcast indication (if applicable).
WPT 9	VOR Page. Same information for VOR's as the NDB Page above plus the variation and class (High, Low, or Terminal).
WPT 10	User Waypoint Page. Displays location in terms of radials from two reference waypoints along with distance from one of them. The latitude and longitude are also shown.

VI. Page Descriptions

AUX PAGES

<u>Page</u>	<u>USAGE</u>
AUX 1	Flight Planning Page. This page, via "menu options", provides the E6B functions for fuel and trip planning, density altitude/true airspeed/winds aloft calculations. If a second GNS 430W is installed, it also provides a "Crossfill" function to transfer flight plans and user waypoints between the receivers. The Scheduler allows the unit to remind you of up to nine events of your choice.
AUX 2	Utility Page. This page, via "menu options", provides access to up to nine checklists, the flight timer, trip statistics, RAIM prediction, sunrise/sunset times and software versions, database versions and Terrain Database Versions.
AUX 3	Setup 1 Page. This page, via "menu options", provides access to airspace alarms, CDI scale adjustment and arrival alarm, units of measure settings and magnetic variation, position formats and map datum and settings for date and time.
AUX 4	Setup 2 Page. This page, via "menu options", provides access to settings for the display, nearest airport criteria, manually turn WAAS off (SBAS Selection) and channel spacing for the communications transceiver. SBAS stands for Satellite Based Augmentation System.

VI. Page Descriptions

NEAREST PAGES

<u>Page</u>	<u>USAGE</u>
NRST 1	Nearest Airport Page. This page displays three (of the twenty five) nearest airports (within 200 NM) by identifier. It also shows the airport symbol, bearing TO, distance FROM, best available approach, the CTAF and longest runway length.
NRST 2	Nearest Intersection Page. This page displays five (of the twenty five) nearest intersections (within 200 NM) by identifier. It also shows the symbol, bearing TO, and distance FROM.
NRST 3	Nearest NDB Page. This page displays five (of the twenty five) nearest NDBs (within 200 NM) by identifier. It also shows the symbol, bearing TO, distance FROM, and frequency.
NRST 4	Nearest VOR Page. This page displays five (of the twenty five) nearest VORs (within 200 NM) by identifier. It also shows the symbol, bearing TO, distance FROM, and frequency.
NRST 5	Nearest User Page. This page displays five (of the twenty five) nearest user waypoints (within 200 NM) by identifier. It also shows the symbol, bearing TO, distance FROM, and frequency.
NRST 6	Nearest Center Page. This page displays up to five names of the nearest ARTCC transmitters (within 200 NM). It also shows the bearing TO the transmitter, distance FROM, and frequency.
NRST 7	Nearest Flight Service Page. This page displays up to five names of the nearest Flight Service Station transmitters (within 200 NM). It also shows the bearing TO, distance FROM, and frequency. If duplex operation is available the VOR frequency is also shown.
NRST 8	Nearest Airspace Page. This page will alert you to as many as nine special use or controlled airspaces near your flight path. These are based on latitude, longitude and altitude.

VII. Miscellaneous Checklists

Checklists Up to nine checklists may be created and stored in the GNS430W.

Creating a Checklist

1. ROTATE Large Knob to select AUX pages.
2. ROTATE Small Knob to select AUX page 2.
3. PRESS Small Knob to activate the cursor.
4. If necessary, ROTATE Large Knob to highlight **“Checklists”**.
5. PRESS to display the checklists.
6. PRESS to view your options.
7. If necessary ROTATE Large Knob to highlight **“Create New Checklist?”**.
8. PRESS .
9. ROTATE Small Knob until the first character of the “Checklist Name” is highlighted.
10. ROTATE Large Knob to move the cursor to next character.
11. Continue steps #9 and #10 to spell out name of checklist.
12. PRESS to highlight first item of checklist.
13. ROTATE Small Knob until the first character is as desired.
14. ROTATE Large Knob to move the cursor to next character.
15. Continue with steps #13 and #14 until checklist item is complete.
16. PRESS to move the cursor to the second item of checklist
17. Continue with steps #13 and #14 until checklist is complete.
18. PRESS Small Knob to turn cursor off and view the checklist name.
19. PRESS to view the Page Menu as in step #6 above and start the process over to create another checklist.

UTILITY

Checklists
Flight Timers
Trip Statistics
RAIM Prediction
Sunrise / Sunset

PAGE MENU

Copy Checklist?
Create New Checklist?
Delete Checklist?
Delete All Checklists?
Sort List By Entry?

CHECKLIST

<input type="checkbox"/> _____
<input type="checkbox"/> _____
<input type="checkbox"/> _____
<input type="checkbox"/> _____

CHECKLISTS

USED	<input type="text" value="1"/>	EMPTY	<input type="text" value="8"/>
PREFLIGHT			

Running a Checklist

1. After step #5 above, ROTATE Large Knob to highlight the desired checklist. PRESS to view the first item in the selected checklist.
2. After the item is complete, PRESS . A check appears in the box preceding the item and the cursor moves to next item.
3. When the checklist is complete, PRESS Small Knob to return to the Checklists box.
4. If desired, ROTATE Large Knob to highlight next checklist and continue.

CHECKLIST

PREFLIGHT
<input checked="" type="checkbox"/> Check Fuel
<input type="checkbox"/> Extend Flaps
<input type="checkbox"/> Battery Switch OFF
<input type="checkbox"/> External Preflight

VII. Miscellaneous Scheduler

Scheduler Up to nine scheduled events may be stored in the GNS430W.

Creating a Scheduled Message

1. ROTATE Large Knob to select AUX pages.
2. If necessary ROTATE Small Knob to select AUX page 1.
3. PRESS Small Knob to activate the cursor.
4. If necessary, ROTATE Large Knob to highlight **“Scheduler”**.
5. PRESS to display the scheduler window.
6. ROTATE Small Knob to select first character of name.
7. ROTATE Large Knob to move cursor to next character.
8. Continue with steps #6 and #7 above to spell the schedule.
9. PRESS and the cursor moves to the “Type” field.
10. If necessary, ROTATE Small Knob to show options.
11. If necessary, ROTATE Large Knob to select option.
12. PRESS . Cursor moves to the Time Date field.
13. ROTATE the Small and Large Knobs to make desired entries.
14. PRESS when finished. Cursor will move to the next schedule field.

FLIGHT PLANNING

Fuel Planning
Trip Planning
Density Alt / TAS / Winds
Crossfill
Scheduler

SCHEDULER

DATA		
TYPE	TIME	REMAINING
One Time	000:10	000:00:00

TYPE	TIME	REMAINING
One Time	____	____:____

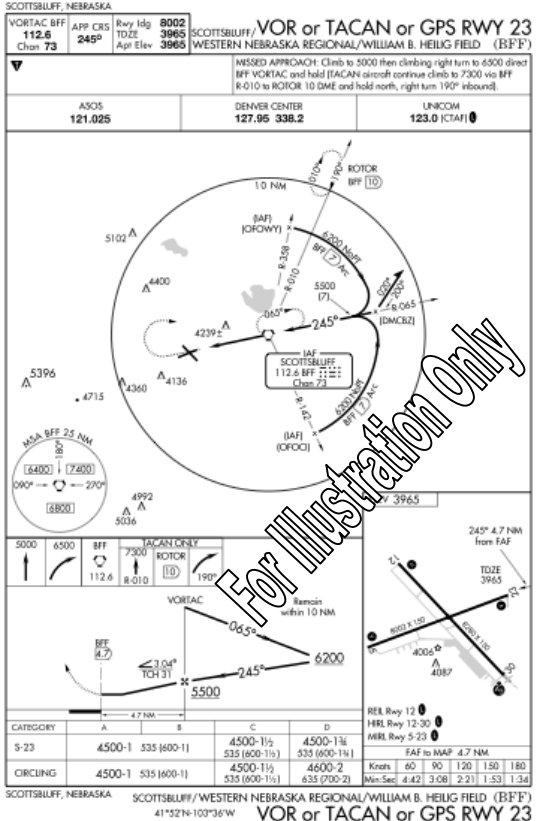
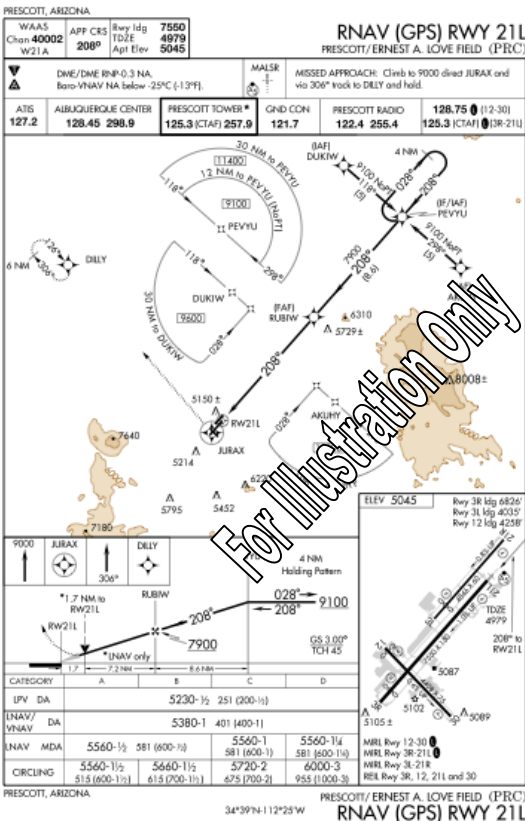
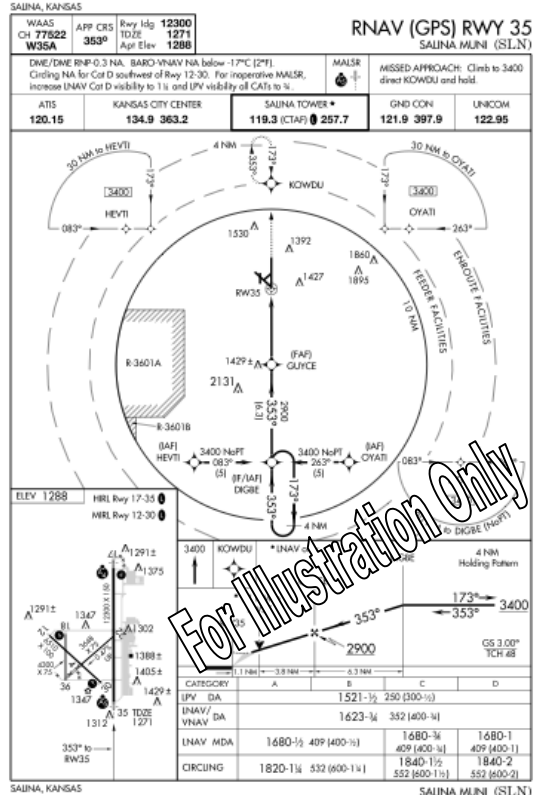
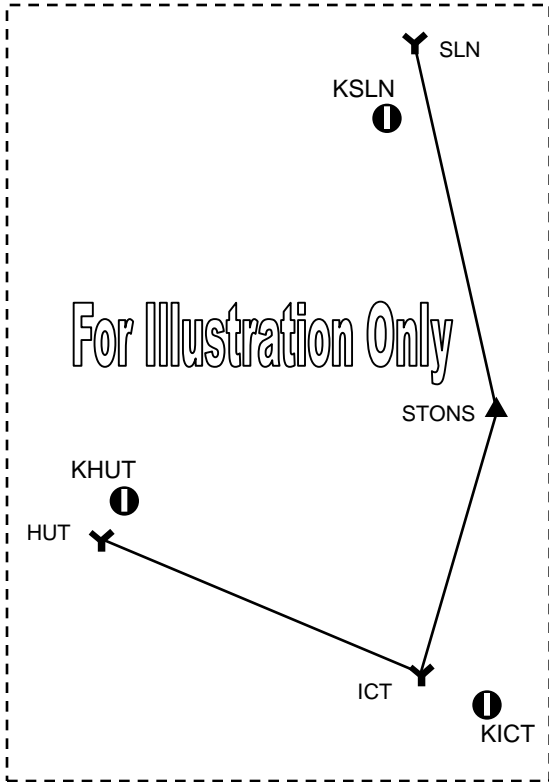
TYPE
Event
One Time
Periodic

NOTE: If a One Time schedule is selected, when ENTER is pressed, the time countdown begins immediately and the cursor moves to the next line. If “EVENT” is chosen the “TIME” field changes to “DATE” and “REMAINING” changes to “TIME”. It will expire on the date and time selected. If a Periodic schedule is selected, when ENTER is pressed, the time countdown begins immediately and the cursor moves to the next line. A message will be generated repeatedly until the schedule is cleared.

Deleting a Scheduled Message

1. ROTATE Large Knob to select AUX pages.
2. If necessary ROTATE Small Knob to select AUX page 1.
3. PRESS Small Knob to activate the cursor.
4. If necessary, ROTATE Large Knob to highlight **“Scheduler”**.
5. PRESS .
6. ROTATE Large Knob to highlight the name of the schedule to be deleted.
7. PRESS then PRESS .

VII. Miscellaneous Charts



VIII XM Weather

Whenever an antenna that receives XM broadcast weather data (GDL 69 or GDL 69A) is installed the following changes in the 430W receiver apply.

NAV Pages:

- The XM Weather Page (NAV Page 3) is inserted before the Terrain Page (NAV 2 Page) and appears as the third page in the NAV group.
- Temporary Flight Restrictions (TFRs) are displayed on the Map and XM Weather Pages.
- **“Display US NEXRAD”** and **“Display CN NEXRAD”** are added to the Map Page Menu.

PAGE MENU
Setup Map?
Measure Dist?
Data Fields Off?
Display US NEXRAD?
Display CN NEXRAD?
Change Fields?
Restore Defaults?

WPT, Airport Pages:

- Textual METAR Page (WPT Page 7)
- TAF Page (WPT Page 8)

These 2 pages are inserted before the previous WPT Page 7 (Intersections Page). (WPT Pages 7 and 8 become WPT Pages 9 and 10).

AUX Pages: The following pages are added to the AUX Page group:

- XM Audio Page (AUX Page 5)
- XM Information Page (AUX Page 6)
- XM Weather Timestamp Pages (AUX Pages 7 and 8)

FIRST THINGS FIRST - In order for the Weather or XM Radio services to operate you must first set up an account with XM Satellite Radio and have it activated (a one-time fee applies). There are 2 levels of service for the aviation application for the 400W/500W series. After that, a monthly subscription fee is required to keep receiving the products. See the GARMIN GXM 30 XM Radio Smart Antenna owners manual or visit Garmin’s web site for specific directions. The Garmin GNS 400 series is capable of displaying the following products:

METAR	Cell Movement
TAF	Winds Aloft
TFR	Each 3000 ft above the surface
NEXRAD US	from 3000 to 42,000 ft.
NEXRAD CN	Lightning
Radar Coverage	Storm Cells
Lightning	

The timestamp for each product is available on the AUX Page 7 and 8.

Display Radar Coverage

Whenever NEXRAD is being displayed, a cross-hatched pattern indicates where NEXRAD information is not available.

Display “NEXRAD” on the Map Page (NAV Page 2)

When the NAV 2 Page is being displayed,

1. PRESS **MENU** to view choices shown above.
2. ROTATE Large Right Knob to highlight the desired choice (US or CN NEXRAD).
3. PRESS **ENT**. **NOTE:** Both choices cannot be displayed simultaneously.

If either choice is “HIDE” instead of “Display” that function is already enabled. Just PRESS **MENU** again to exit the Page Menu.

Selecting a Product on the XM Weather Page (NAV Page 3) (NEXRAD)

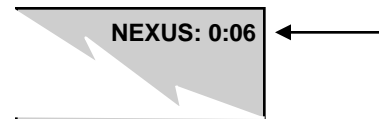
When the NAV 3 Page is being displayed look in the upper left corner to see which product is being displayed.

1. PRESS Small Right Knob to activate cursor and highlight the product name.



2. ROTATE Small Right Knob until the desired product (NEXRAD) appears.
3. PRESS Small Right Knob to de-activate the cursor.

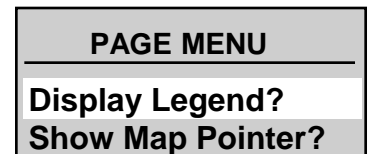
NOTE: The age of the product is displayed in the upper right corner of the screen.



Display Product Legend

When the NAV 3 Page is being displayed,

1. PRESS **MENU** to view the two choices at right.
2. ROTATE either right knob to select “DISPLAY legend”?
3. PRESS **ENT**.



The NEXRAD Intensity Legend consists of colors and patterns that depict intensity of the precipitation (Rain, Mixed, or Snow.)

The METAR Legend consists of colored flags

Cyan - VFR (Ceiling >3000' and visibility > 5 sm.)

Green - Marginal VFR (Ceiling 1000 to 3000' and/or visibility 3 to 5 sm.)

Yellow - IFR (Ceiling 500 to 3000' and/or visibility 1 to 3 sm.)

Magenta - Low IFR (Ceiling < 500' and/or visibility < 1 sm.)

When finished, PRESS **CLR** to remove the METAR Symbols legend.

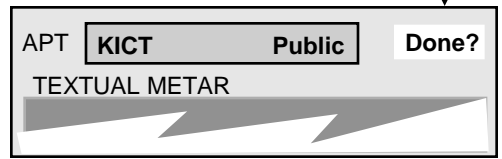
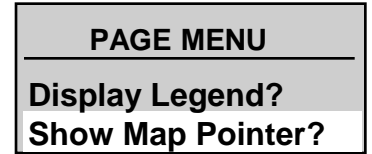
Display Textual METARs

NOTE: There is no option to display plain text METARs.

There are two methods to view the textual METARs.

Method A: When the NAV 3 Page is being displayed,

1. PRESS to view the two choices at right.
2. ROTATE either right knob to select "Show Map Pointer"?
3. PRESS .
4. ROTATE Large and Small right knobs to move the Map Pointer to highlight the desired airport with a METAR flag. (The coordinates of the map pointer are displayed in the upper right corner of the screen and the airport identifier, its direction and distance-to are displayed in the upper left corner.)
5. PRESS to display the METAR text. (This is actually the Waypoint 7 Page.)
6. When finished, with "Done?" highlighted, PRESS to return to the map page.



Method B:

1. ROTATE Large and Small right knobs to select the Textual METAR Page (WPT Page 7).
2. PRESS Small Right Knob to highlight the airport identifier.
3. ROTATE Small and Right Knobs to spell out the identifier for the desired airport.
4. PRESS to confirm the airport.
5. When finished, PRESS Small Knob to turn the cursor OFF.

Display Textual TAFs

NOTE: There is no option to display plain text TAFs.

1. ROTATE Large and Small Knobs to select the TAF page (WPT Page 8).
2. PRESS Small Right Knob to activate the cursor on the airport identifier.
3. If necessary, ROTATE Small and Right Knobs to spell out the identifier for the desired airport.
4. PRESS to view the TAF for the selected airport.
5. When finished, PRESS to return to the map page.

Display Winds Aloft

NOTE: Forecasted Winds Aloft are updated every hour. They are depicted as Wind Barsbs which indicate both speed and direction and can be likened to an arrow. The "feathers" depict speed with the other end of the "shaft" terminating in a small circle which is the "tip". Each small barb depicts 5 knots and each long barb 10 knots. 50 knots is shown as a filled-in triangle. This example means the wind is from the west at 75 knots.

1. From the XM Weather Page (NAV 3 page) look in the upper left ~~Done~~ to see which product is being displayed.
2. If necessary, PRESS the Small Right Knob to activate the cursor.
3. ROTATE the Small Right Knob until "WINDS" are displayed. NOTE that the altitude for the displayed winds is immediately below "WINDS".
4. ROTATE the Large Right Knob to move the cursor to the Altitude field.
5. ROTATE the Small Right Knob to select the desired altitude. →
6. When finished PRESS the Small Right Knob to turn the cursor OFF.







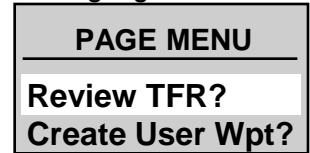
Display TFR Information


TFRs are depicted by a yellow circle on both the Map Page (NAV 2 Page) and the XM Weather Page (NAV 3 Page). Follow the steps below to view the details (Type, NOTAM, Active Time and Vertical Limits) about a particular TFR. This feature can be activated or deactivated on the Map Setup under Airspace. (See our page 43.)

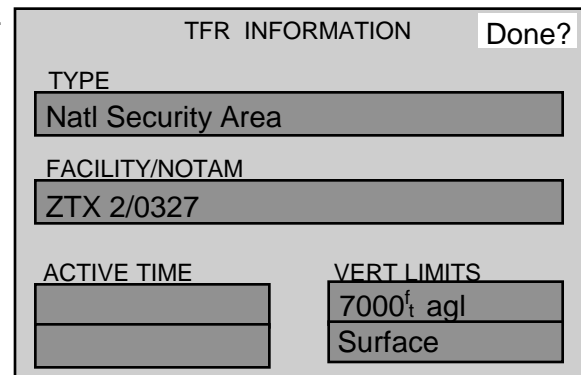
1. From the NAV 2 Page, Press the Small Right Knob to activate the map pointer. 

OR

1. From the NAV 3 Page, PRESS , ROTATE Large Right Knob to highlight “Show Map Pointer” and PRESS .
2. ROTATE Large and Small Right Knobs to position the pointer over the TFR.
3. PRESS  to view the Page Menu.
4. With “Review TFR?” highlighted, PRESS .

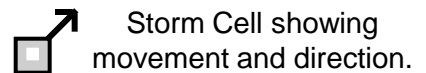
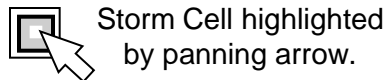


5. When finished, with “Done?” highlighted, PRESS .



Display Cells and Movement

When the XM Weather Page (NAV 3 Page) is being displayed ensure that “CELL MOVE” is being displayed in the upper left corner. The tip of the arrow shows where the cell is expected to be in 10 minutes.



With a cell highlighted with the map pointer, its coordinates are displayed in the upper right corner of the screen and the movement direction and speed along with the base and top of the cell are displayed in the upper left corner of the screen.

Display Lightning

When the XM Weather Page (NAV 3 Page) is being displayed ensure that “LTNG” is being displayed in the upper left corner. Cloud-to-ground lightning strikes are displayed as yellow plus (+) signs.

NOTE: Visit XM WX Weather web page to view the subscriptions available for the GNS 430W along with their pricing. There also is a \$75 one-time activation fee.