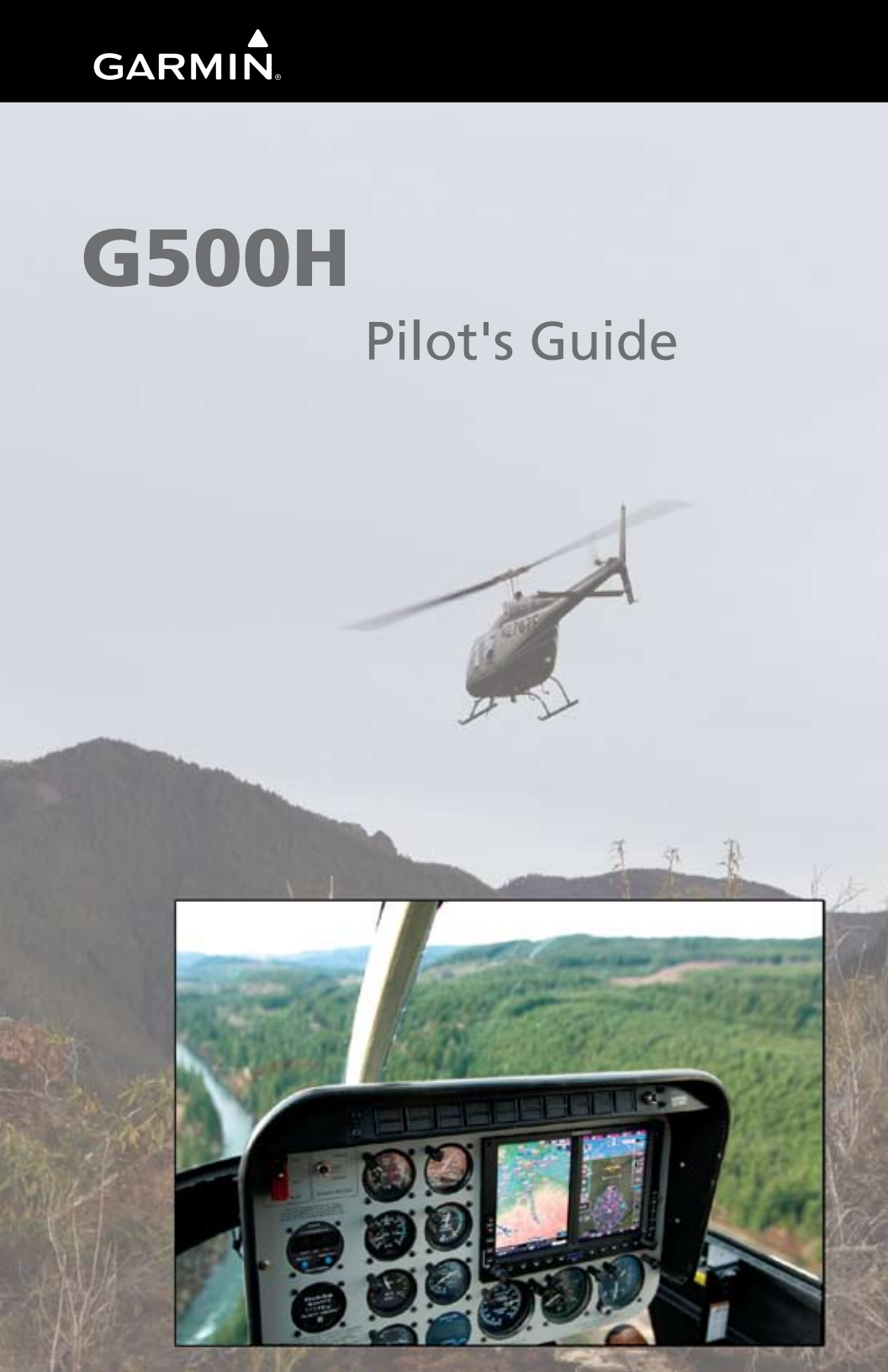
GARMIN

G500H

Pilot's Guide



This manual reflects the operation of System Software version 4.00, or later. Some differences in operation may be observed when comparing the information in this manual to later software versions.

Garmin International, Inc., 1200 East 151st Street, Olathe, KS 66062, U.S.A.
Tel: 913/397.8200 Fax: 913/397.8282

Garmin AT, Inc., 2345 Turner Road SE, Salem, OR 97302, U.S.A.
Tel: 503/391.3411 Fax 503/364.2138

Garmin (Europe) Ltd., Liberty House, Bulls Copse Road, Hounsdown Business Park, Southampton, SO40 9RB, U.K.
Tel. +44 (0) 870 850 1243 Fax +44 (0) 238 052 4004

Garmin Corporation, No. 68, Jangshu 2nd Road, Shijr, Taipei County, Taiwan
Tel: 886/02.2642.9199 Fax: 886/02.2642.9099

At Garmin, we value your opinion. For comments about this guide, please e-mail:
Techpubs.Salem@Garmin.com

www.garmin.com

April 2010 Printed in the U.S.A.

AVIATION LIMITED WARRANTY

All Garmin avionics products are warranted to be free from defects in materials or workmanship for: two years from the date of purchase for new Remote-Mount and Panel-Mount products; one year from the date of purchase for new portable products and any purchased newly-overhauled products; six months for newly-overhauled products exchanged through a Garmin Authorized Service Center; and 90 days for factory repaired or newly-overhauled products exchanged at Garmin in lieu of repair. Within the applicable period, Garmin will, at its sole option, repair or replace any components that fail in normal use. Such repairs or replacement will be made at no charge to the customer for parts or labor, provided that the customer shall be responsible for any transportation cost. This warranty does not apply to: (i) cosmetic damage, such as scratches, nicks and dents; (ii) consumable parts, such as batteries, unless product damage has occurred due to a defect in materials or workmanship; (iii) damage caused by accident, abuse, misuse, water, flood, fire, or other acts of nature or external causes; (iv) damage caused by service performed by anyone who is not an authorized service provider of Garmin; or (v) damage to a product that has been modified or altered without the written permission of Garmin. In addition, Garmin reserves the right to refuse warranty claims against products or services that are obtained and/or used in contravention of the laws of any country.

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

IN NO EVENT SHALL GARMIN BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, WHETHER RESULTING FROM THE USE, MISUSE OR INABILITY TO USE THE PRODUCT OR FROM DEFECTS IN THE PRODUCT. SOME STATES DO NOT ALLOW THE EXCLUSION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU.

Garmin retains the exclusive right to repair or replace (with a new or newly-overhauled replacement product) the product or software or offer a full refund of the purchase price at its sole discretion. SUCH REMEDY SHALL BE YOUR SOLE AND EXCLUSIVE REMEDY FOR ANY BREACH OF WARRANTY.

Online Auction Purchases: Products purchased through online auctions are not eligible for warranty coverage. Online auction confirmations are not accepted for warranty verification. To obtain warranty service, an original or copy of the sales receipt from the original retailer is required. Garmin will not replace missing components from any package purchased through an online auction.

International Purchases: A separate warranty may be provided by international distributors for devices purchased outside the United States depending on the country. If applicable, this warranty is provided by the local in-country distributor and this distributor provides local service for your device. Distributor warranties are only valid in the area of intended distribution. Devices purchased in the United States or Canada must be returned to the Garmin service center in the United Kingdom, the United States, Canada, or Taiwan for service.

To obtain warranty service, contact your local Garmin Authorized Service Center. For assistance in locating a Service Center near you, visit the Garmin web site at http://www.garmin.com or contact Garmin Customer Service at 800-800-1020.

WARNING: *Navigation and terrain separation must NOT be predicated upon the use of the terrain function. The G500H Terrain Proximity feature is NOT intended to be used as a primary reference for terrain avoidance and does not relieve the pilot from the responsibility of being aware of surroundings during flight. The Terrain Proximity feature is only to be used as an aid for terrain avoidance and is not certified for use in applications requiring a certified terrain awareness system. Terrain data is obtained from third party sources. Garmin is not able to independently verify the accuracy of the terrain data.*

WARNING: *The displayed minimum safe altitudes (MSAs) are only advisory in nature and should not be relied upon as the sole source of obstacle and terrain avoidance information. Always refer to current aeronautical charts for appropriate minimum clearance altitudes.*

WARNING: *The Garmin G500H has a very high degree of functional integrity. However, the pilot must recognize that providing monitoring and/or self-test capability for all conceivable system failures is not practical. Although unlikely, it may be possible for erroneous operation to occur without a fault indication shown by the G500H. It is thus the responsibility of the pilot to detect such an occurrence by means of cross-checking with all redundant or correlated information available in the cockpit.*

WARNING: *The altitude calculated by GPS receivers is geometric height above Mean Sea Level and could vary significantly from the altitude displayed by pressure altimeters, such as the output from the GDC 74H Air Data Computer, or other altimeters in aircraft. GPS altitude should never be used for vertical navigation. Always use pressure altitude displayed by the G500H PFD or other pressure altimeters in aircraft.*

WARNING: *Do not use outdated database information. Databases used in the G500H system must be updated regularly in order to ensure that the information remains current. Pilots using an outdated database do so entirely at their own risk.*

WARNING: *Do not use basemap (land and water data) information for primary navigation. Basemap data is intended only to supplement other approved navigation data sources and should be considered as an aid to enhance situational awareness.*

WARNING: *Traffic information shown on the G500H Multi Function Display is provided as an aid in visually acquiring traffic. Pilots must maneuver the aircraft based only upon ATC guidance or positive visual acquisition of conflicting traffic.*

WARNING: *XM Weather should not be used for hazardous weather penetration. Weather information provided by the GDL 69/69A is approved only for weather avoidance, not penetration.*

WARNING: *NEXRAD weather data is to be used for long-range planning purposes only. Due to inherent delays in data transmission and the relative age of the data, NEXRAD weather data should not be used for short-range weather avoidance.*

WARNING: *For safety reasons, G500H operational procedures must be learned on the ground.*

WARNING: *To reduce the risk of unsafe operation, carefully review and understand all aspects of the G500H Pilot's Guide. Thoroughly practice basic operation prior to actual use. During flight operations, carefully compare indications from the G500H to all available navigation sources, including the information from other NAVAIDs, visual sightings, charts, etc. For safety purposes, always resolve any discrepancies before continuing navigation.*

WARNING: *Never use the G500H to attempt to penetrate a thunderstorm. Both the FAA Advisory Circular, Subject: Thunderstorms, and the Airman's Information Manual (AIM) recommend avoiding "by at least 20 miles any thunderstorm identified as severe or giving an intense radar echo."*

WARNING: *Exceeding 200 deg/second in pitch or roll may invalidate AHRS attitude provided to the G500H.*

WARNING: *Because of anomalies in the earth's magnetic field, operating the G500H within the following areas could result in loss of reliable attitude and heading indications. North of 70° North latitude and south of 70° South latitude. An area north of 65° North latitude and between longitude 75° West and 120° West. An area north of 70° North latitude and between longitude 70° West and 128° West. An area north of 70° North latitude and between longitude 85° East and 114° West. An area south of 55° South latitude between longitude 120° East and 165° East.*

WARNING: *Do not use Terrain-HSVT information for primary terrain avoidance. Terrain-HSVT is intended only to enhance situational awareness.*

CAUTION*: The United States government operates the Global Positioning System and is solely responsible for its accuracy and maintenance. The GPS system is subject to changes which could affect the accuracy and performance of all GPS equipment. Portions of the Garmin G500H utilize GPS as a precision electronic NAVigation AID (NAVAID). Therefore, as with all NAVAIDs, information presented by the G500H can be misused or misinterpreted and, therefore, become unsafe.*

CAUTION*: The Garmin G500H does not contain any user-serviceable parts. Repairs should only be made by an authorized Garmin service center. Unauthorized repairs or modifications could void both the warranty and the pilot's authority to operate this device under FAA/FCC regulations.*

CAUTION*: The G500H PFD and MFD displays use a lens coated with a special anti-reflective coating that is very sensitive to skin oils, waxes, and abrasive cleaners. CLEANERS CONTAINING AMMONIA WILL HARM THE ANTI-REFLECTIVE COATING. It is very important to clean the lens using a clean, lint-free cloth and an eyeglass lens cleaner that is specified as safe for anti-reflective coatings.*

NOTE*: Interference from GPS repeaters operating inside nearby hangars can cause an intermittent loss of attitude and heading displays while the aircraft is on the ground. Moving the aircraft more than 100 feet away from the source of the interference should alleviate the condition.*

***NOTE**: All visual depictions contained within this document, including screen images of the G500H bezel and displays, are subject to change and may not reflect the most current GDU 620 system. Depictions of equipment may differ slightly from the actual equipment.*

***NOTE**: This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.*

***NOTE**: Terrain data is not displayed when the aircraft latitude is greater than 75° North or 60° South.*

***NOTE**: This product, its packaging, and its components contain chemicals known to the State of California to cause cancer, birth defects, or reproductive harm. This notice is being provided in accordance with California's Proposition 65. If you have any questions or would like additional information, please refer to our web site at www.garmin.com/prop65.*

***NOTE**: Terrain-HSVT is standard when the Garmin Synthetic Vision Technology™ (SVT) option is installed.*

Record of Revisions			
Part Number	**Revision**	**Date**	**Description**
190-01150-02	A	1/27/10	Production release
	B	4/1/10	Update Airspeed Tape markings.

GARMIN

Contents

This page intentionally left blank

1 SYSTEM OVERVIEW

1.1 System Description

This section provides an overview of the G500H Avionics Display System. The G500H system is an integrated display system that presents primary flight instrumentation, navigation, and a moving map to the pilot through large-format displays.

In normal operating mode, the Primary Flight Display (PFD) presents graphical flight instrumentation (attitude, heading, airspeed, altitude, vertical speed), replacing the traditional flight instrument cluster. The Multi-Function Display (MFD) normally displays a full-color moving map with navigation information.

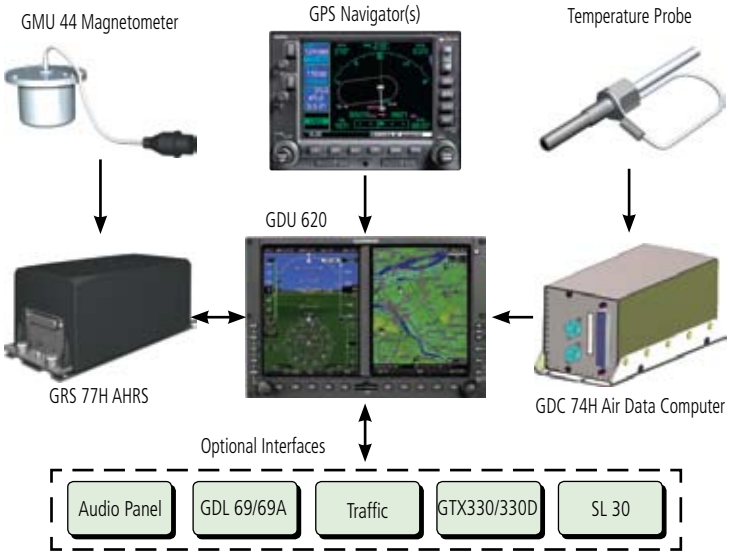


Figure 1-1 G500H System (LRU Configuration)

The system consists of the following Line Replaceable Units (LRUs):

- **GDU 620** Primary Flight Display (PFD) and Multi Function Display (MFD)
- **GDC 74H** Air Data Computer (ADC)
- **GRS 77H** Attitude and Heading Reference System (AHRS)
- **GNS 480, CNX80, GNS 400W series, or GNS 500W series** GPS Navigator

- **Temperature Probe** (such as the GTP 59)
- **GMU 44** Magnetometer
- **GTX 330/330D** TIS-B Traffic (optional)
- **GDL 69A** Satellite Data Link Receiver (optional)
- **SL30 NavCom** (optional)
- **ADF** (optional)
- **GTS 800 Series Traffic** (optional): (Similar functionality available in units from third party providers)
- **Audio Panel** (optional)

1.1.1 Line Replaceable Units (LRU)

This guide covers the operation of the GDU 620 as integrated in the G500H system. The G500H Avionics Display System is an advanced technology avionics suite designed to replace the traditional flight instrument cluster. The system combines primary flight instrumentation, navigational information, and a moving map all displayed on dual 6.5 inch color screens. The G500H system is composed of sub-units or Line Replaceable Units (LRUs). LRUs have a modular design, which greatly eases troubleshooting and maintenance of the G500H system. A failure or problem can be isolated to a particular LRU, which can be replaced quickly and easily. Each LRU has a particular function, or set of functions, that contributes to the system's operation.

1.1.2 GDU 620

The GDU 620 has dual VGA (640 x 480 pixels) 6.5 inch LCD displays. The right side of the GDU is a PFD and the left side is the MFD. In some models or installations, the PFD and MFD and their controls are switched to the other side. The MFD shows a moving map, flight plan, weather, and more. The PFD shows primary flight information, in place of traditional pitot-static and gyroscopic systems and also provides an HSI for navigation.

Figure 1-2 GDU 620 PFD and MFD

1.1.3 GDC 74H

The GDC 74H Air Data Computer (ADC) compiles information from the pitot/static system and an Outside Air Temperature (OAT) sensor. The GDC 74H provides pressure altitude, airspeed, vertical speed, and OAT information to the G500H system. The GDC 74H communicates with the GDU 620 and GRS 77H using an ARINC 429 digital interface.

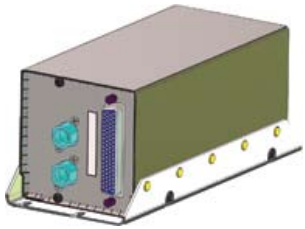


Figure 1-3 GDC 74H Air Data Computer

1.1.4 GRS 77H

The GRS 77H is an Attitude and Heading Reference System (AHRS) unit that provides aircraft attitude information to the G500H display. The unit contains advanced accelerometers and rate sensors. In addition, the GRS 77H interfaces with both the GDC 74H Air Data Computer and the GMU 44 magnetometer. The GRS 77H also utilizes GPS data forwarded from the GDU 620. Actual attitude and heading information is sent to the GDU 620 using an ARINC 429 digital interface.

Figure 1-4 GRS 77H AHRS

The IGRF (International Geomagnetic Reference Field) model is contained in the GRS 77H and is only updated once every five years. The IGRF model is part of the Navigation Database. At system power-up, the IGRF models in the GRS 77H and in the Navigation Database are compared, and if the IGRF model in the GRS 77H is out of date, the user is prompted to update the IGRF model in the GRS 77H. The prompt will appear after the G500H splash screen is acknowledged on the MFD.

1.1.5 GMU 44

The GMU 44 magnetometer senses the earth's magnetic field. Data is sent to the GRS 77H AHRS for processing to determine aircraft magnetic heading. This unit receives power directly from the GRS 77H and communicates with the GRS 77H using a RS-485 digital interface.

Figure 1-5 GMU 44 Magnetometer

1.1.6 GTX 330/330D (Optional)

Figure 1-6 GTX 330/330D Mode S Transponder

The GTX 330/330D is a solid-state transponder that provides Modes A, C, and S functions. The transponder provides traffic information to the display through an ARINC 429 digital interface.

NOTE: *GTX 33/33D can also be used to display traffic information on the GDU 620.*

1.1.7 GTP 59

A temperature probe provides Outside Air Temperature (OAT) data to the GDC 74H. The GTP 59 is an example of an appropriate temperature probe.

Figure 1-7 GTP 59 Temperature Probe

1.1.8 GSR 56

The GSR 56 supports the Position Reporting system which collects system variables and transmits them over the Iridium® Satellite Network at a given interval.

1.1.9 GDL 69/69A (Optional)

The GDL 69/69A is an XM Satellite Radio Data Link Receiver that receives broadcast weather data. The GDL 69A is the same as the GDL 69 with the addition of an XM Satellite Radio audio entertainment receiver. Weather data and control of audio channel and volume is displayed on the MFD, via a High-Speed Data Bus (HSDB) Ethernet connection. The GDL 69A is also interfaced to an audio panel for distribution of the audio signal. A subscription to the XM Satellite Radio service is required to enable the GDL 69/69A capability.

Figure 1-8 GDL 69/69A XM Satellite Radio Data Link Receiver

1.1.10 Garmin Navigator Interface

The G500H system requires connection to at least one external Garmin WAAS GPS navigator, such as the 400W/500W series or GNS 480.

1.1.11 Attitude Heading Reference System (AHRS)

NOTE: *Aggressive maneuvering while AHRS is not operating in normal mode may degrade AHRS accuracy.*

Attitude and heading information is displayed on the PFD when the AHRS receives appropriate combinations of information from the external sensor inputs.

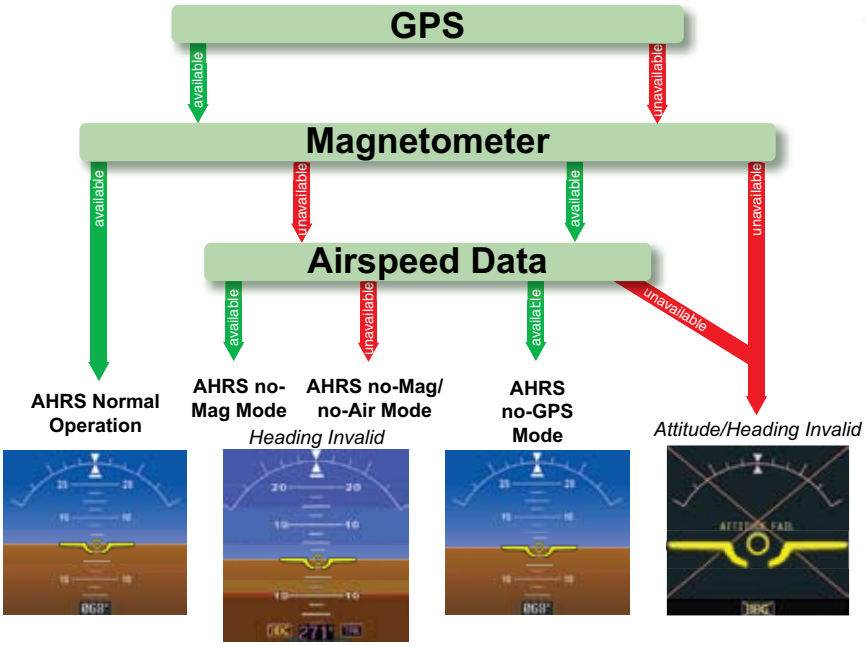


Figure 1-9 AHRS Operation

Loss of GPS, magnetometer, or air data inputs is communicated to the pilot by message advisory alerts (refer to Section 6 for specific AHRS alert information). Any failure of the internal AHRS inertial sensors results in loss of attitude and heading information (indicated by red "X" flags over the corresponding flight instruments).

A maximum of two GPS inputs are provided to the AHRS. If GPS information from one of the inputs fails, the AHRS uses the remaining GPS input and an alert message is issued to inform the pilot. If both GPS inputs fail, the AHRS will continue to provide attitude and heading information to the PFD as long as magnetometer and airspeed data are available and valid.

If the magnetometer input fails, the AHRS continues to output valid attitude information and GPS Track information is used; however, the heading output

on the PFD is flagged as invalid with a red "X," "TRK" in magenta is annunciated to the right of the Track value, and the Track value color is changed from white to magenta.

***NOTE:** In this case the magnetic standby compass and GPS ground track can be used to keep the aircraft on the desired heading.*

Failure of the air data input has no effect on the AHRS output while AHRS is receiving valid GPS information. Invalid or unavailable airspeed data in addition to complete GPS failure results in loss of all attitude and heading information.

1.1.12 Secure Data Cards

The G500H System uses Secure Digital (SD) cards to load and store various types of data. For basic flight operations, SD cards are required for Terrain, Obstacle, FliteChart, SafeTaxi, and ChartView database storage as well as Jeppesen aviation and ChartView database updates. The Navigation Database update card is inserted in the upper SD card slot for database updates and then removed. Other database cards are normally located in the lower SD card slot.

***NOTE:** Ensure the GDU 620 is powered off before inserting or removing an SD card.*

***NOTE:** Refer to A-1 for instructions on updating the aviation database.*

Inserting an SD Card

1) Insert the SD card in the SD card slot (the front of the card should be flush with the face of the display bezel).
2) To eject the card, gently press on the SD card to release the spring latch.

1.1.13 Pilot Controls

The GDU 620 controls have been designed to simplify operation of the system and minimize workload and the time required to access sophisticated functionality. Controls are located on the PFD and MFD bezels and are comprised of a PFD knob, MFD dual concentric knobs, bezel keys, and soft keys.

1.1.13.1 PFD Knob

Turning the **PFD** knob adjusts the values for the mode selected by the PFD bezel keys, such as, Heading (HDG), Course (CRS), Altitude (ALT), Vertical Speed (V/S), and Barometric Setting (BARO). The values are shown in a window to the left of the HSI. Pressing the **PFD** knob reverts to the default value of the selected mode.

Figure 1-10 Selection Modes Adjusted with the PFD Knob

NOTE: *After 10 seconds of inactivity in another mode, the **PFD** knob selected mode will revert to Heading mode.*

1. Press the desired PFD mode selection key (**HDG**, **CRS**, **ALT**, **V/S**, or **BARO**). A window will be displayed near the upper right corner of the HSI showing the current value for that mode.
2. Turn the **PFD** knob to select the desired value.

1.1.13.2 PFD Bezel Keys

Heading (HDG)

Selects Heading Select mode. Pressing the **PFD** knob in Heading mode will center the Heading Bug on the current Heading. This is the default mode for the **PFD** knob. If the Heading is invalid, the **PFD** knob will revert to Course mode. Set the heading on the HSI by turning the **PFD** knob after pressing the **HDG** key.

Course (CRS)

Selects Course Select mode. Pressing the **PFD** knob in Course mode will center the CDI for a VOR or OBS mode course.

Altimeter (ALT)

Selects Altitude Select mode. Pressing the **PFD** knob in Altimeter mode will enter the current altitude in the Altitude Select window. Set the Altitude Bug by turning the **PFD** knob after pressing the **ALT** key.

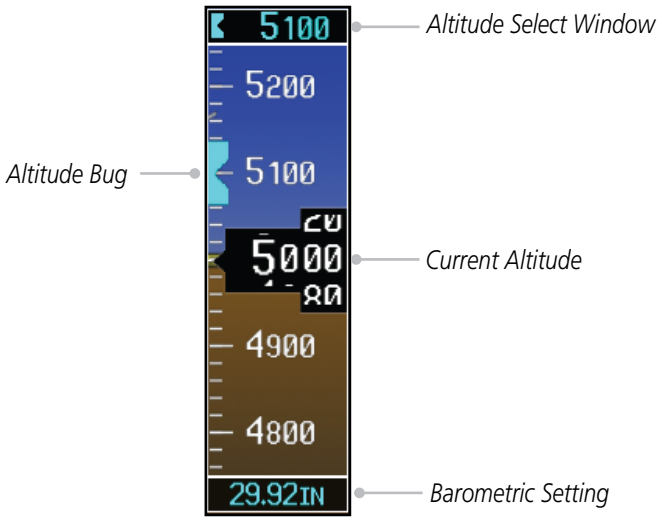


Figure 1-11 Pressing PFD Knob Sets Altitude Select to Current Altitude

Vertical Speed (V/S)

Selects Vertical Speed (V/S) mode. Pressing the **PFD** knob in V/S mode will synchronize the bug to the current vertical speed.

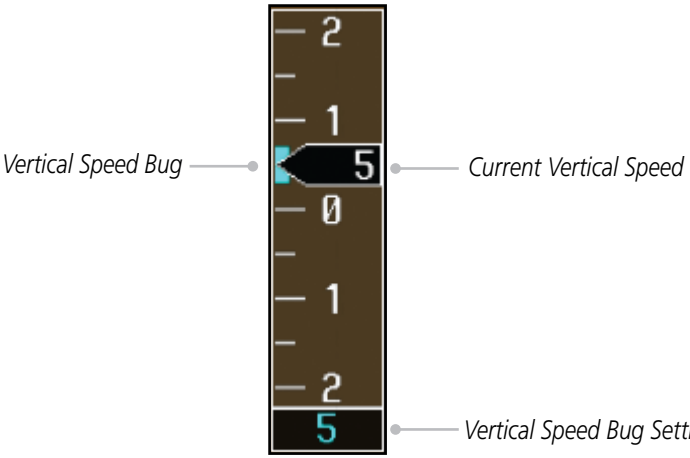


Figure 1-12 Pressing V/S Knob Sets Vertical Speed Bug to Current Vertical Speed

Barometer (BARO)

Selects Barometric Setting Select mode. Pressing the **PFD** knob in Baro mode will enter the standard pressure (29.92 in) value.

1.1.13.3 PFD Soft Keys

The soft keys are located along the bottoms of the displays below the soft key labels. The soft key labels shown depend on the soft key level or page being displayed. The soft keys can be used to select the appropriate soft key function.

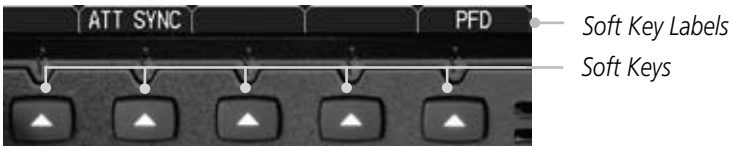


Figure 1-13 PFD Soft Key Layout

When a soft key is selected, its color changes to black text on gray background and remains this way until it is turned off, at which time it reverts to white text on black background. When a soft key function is disabled, the soft key label is subdued (dimmed). Soft keys revert to the previous level after 45 seconds of inactivity.

CDI

The **CDI** soft key toggles between the selection of GPS or VOR/LOC as the active navigation source. The GDU CDI soft key will change the source in the connected navigator and making a source change in the navigator will be reflected in the GDU 620.

1-2

The **1-2** soft key toggles between the available receivers for selected navigation source (i.e. GPS1 and GPS2 or VOR/LOC1 and VOR/LOC2). This soft key will only be present if the system is configured for a second GPS or VOR/LOC.

ATT SYNC

Pressing the **ATT SYNC** soft key will synchronize the aircraft symbol on the PFD to the horizon line during level flight. The **ATT SYNC** soft key will not be available for selection until the aircraft is near a level pitch attitude.

PFD

Pressing the **PFD** soft key displays the **BRG1**, **BRG2**, and **BACK** soft keys. The **BRG2** soft key will only be present if the system is configured for a second GPS or VOR/LOC receiver.

BRG1

The **BRG1** soft key cycles through the available bearing 1 indicator modes (NAV1, GPS1, ADF, or None).

BRG2

The **BRG2** soft key cycles through the available bearing 2 indicator modes (NAV2, GPS2, ADF, or None). This soft key will only be present if the system is configured for a second GPS or VOR/LOC.

SYN VIS

The **SYN VIS** soft key is available if Synthetic Vision Technology™ is installed. It enables Synthetic Vision and displays the associated soft keys.

SYN TERR

The **SYN TERR** soft key is available if Synthetic Vision Technology™ is installed and enables synthetic terrain depiction.

HRZN HDG

The **HRZN HDG** soft key is available if Synthetic Vision Technology™ is installed. Pressing this key enables horizon heading marks and digits.

APTSIGNS

The **APTSIGNS** soft key is available if Synthetic Vision Technology™ is installed and enables airport sign posts for airports. Heliports are not shown.

BACK

The **BACK** soft key returns to the pages default soft key options.

1.1.13.4 MFD Knobs

The MFD knobs are for navigating and selecting information on the MFD pages. More details are provided in the MFD section.

Small (Inner) MFD Knob

Selects a specific page within a page group. Pressing the small **MFD** knob turns the selection cursor ON and OFF. When the cursor is ON, data may be entered in the applicable window by turning the small and large **MFD** knobs. In this case, the large **MFD** knob moves the cursor on the page and the small **MFD** knob selects individual characters or values for the highlighted cursor location.

Large (Outer) MFD Knob

Selects the MFD page group. When the cursor is ON, the large **MFD** knob moves the cursor to highlight available fields.

1.1.13.5 MFD Bezel Keys

Range (RNG)

Pressing the Range arrow keys changes the range on the Map pages. The Up arrow zooms out. The Down arrow zooms in. The keys also aid in scrolling up and down text pages.

Menu

Displays a context-sensitive list of options. This list allows the user to access additional features or make setting changes that relate to particular pages.

Enter (ENT)

Validates or confirms a menu selection or data entry.

Clear (CLR)

Erases information, cancels entries, or removes page menus. Pressing and holding the **CLR** key displays the Navigation Map 1 page.

1.1.13.6 MFD Soft Keys

MFD functions indicated by the soft key labels vary depending on the page selected and are located at the bottom of the MFD display. Press the soft key located directly below the soft key label. To select the function indicated on the soft key label, press the soft key directly below the label.

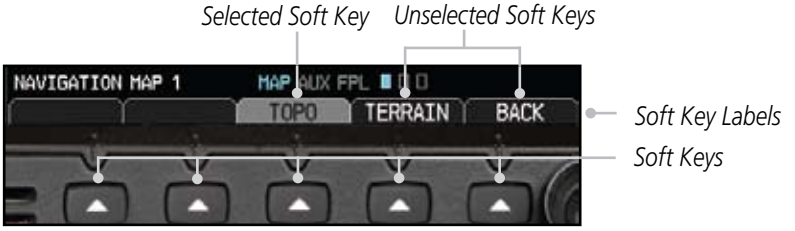


Figure 1-14 MFD Soft Key Layout

1.2 System Power Up

NOTE: *See the Aircraft Flight Manual (AFM) for specific procedures concerning avionics power application and emergency power supply operation.*

NOTE: *Refer to Section 6 for system-specific annunciations and alerts.*

The G500H System is integrated with the aircraft electrical system and receives power directly from electrical busses. The GDU 620 and supporting sub-systems include both power-on and continuous built-in test features that exercise the processor, memory, external inputs, and outputs to ensure safe operation.

During system initialization, test annunciations are displayed. All system annunciations should disappear typically within the first 30 seconds after power-up. Upon power-up, key annunciator lights also become momentarily illuminated on the GDU 620 display bezel.

On the PFD, the AHRS begins to initialize and "AHRS ALIGN: Keep Wings Level" is displayed. The AHRS should display valid attitude and heading fields typically within the first minute and a half after power-up. The AHRS can align itself during level flight.

When the MFD powers up, the splash screen displays the following information:

- System version
- Copyright
- Land database name and version
- Obstacle database name and version
- Terrain database name and version
- Aviation database name, version, and effective dates

Current database information includes valid operating dates, cycle number, and database type. When this information has been reviewed for currency (to ensure that no databases have expired), the pilot is prompted to continue.

Figure 1-15 System Startup Pages

1.2.1 International Geomagnetic Reference Field

The IGRF (International Geomagnetic Reference Field) model is contained in the GRS 77 and is only updated once every five years. The IGRF model is part of the Navigation Database. At system power-up, the IGRF models in the GRS 77 and in the Navigation Database are compared, and if the IGRF model in the GRS 77 is out of date, the user is prompted to update the IGRF model in the GRS 77. The following prompt will appear after the G500H splash screen is acknowledged on the MFD.

GRS MV DB UPDATE AVAILABLE.UPDATE FROM yyyy TO yyyy (e.g. 2005 to 2010)

Pressing the **ENT** key (or right-most soft key) acknowledges this information and displays the Navigation Map Page. When the interfaced GPS unit has acquired a sufficient number of satellites to determine a position, the aircraft's current position is shown on the Navigation Map Page.

1.3 System Operation

NOTE: *Refer to Section 6 for detailed descriptions of all alerts and annunciations.*

1.3.1 Using the Page Menus

The GDU 620 has a dedicated **MENU** key that when pressed displays a context-sensitive list of options for functions in the MFD. This options list allows the user to access additional features or make settings changes which specifically relate to the currently displayed window/page. There is no all-encompassing menu. Some menus provide access to additional submenus that are used to view, edit, select, and review options. Menus display "No Options" when there are no options for the window/page selected. Soft key presses do not display menus or submenus.

1.3.1.1 Navigating within a Menu

1) Press the **MENU** key to display the menu.
2) Turn the small or large **MFD** knob to scroll through a list of available options (a scroll bar always appears to the right of the window/box when the option list is longer than the window/box).
3) Press the **ENT** key to select the desired option.
4) Press the **CLR** key or **MFD** knob to remove the menu and cancel the operation.

No Options

Options for MAP Window

Figure 1-16 Page Menu Examples

1.3.2 Using the Soft Key Controls

The soft keys are located along the bottoms of the displays. The soft key labels shown depend on the soft key level or page being displayed. The bezel keys below the soft keys can be used to select the appropriate soft key.

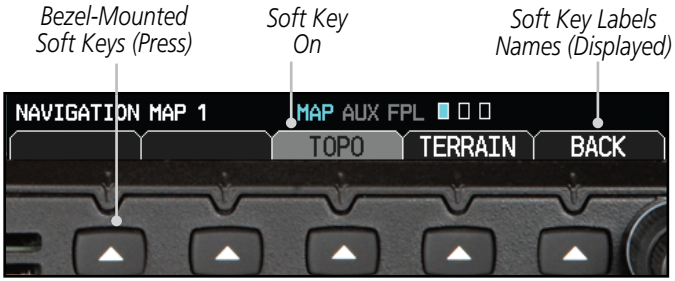


Figure 1-17 Soft Keys (MFD MAP Page Group)

1.3.3 System Settings

G500H system settings are managed from the Aux Mode System Setup Page. The following settings can be changed:

- Display Brightness (Mode and Level)
- Airspeed References (Glide and Vy)
- PFD Options (Wind Vector)
- Date/Time (Date, Time, Time Format, and Time Offset)
- MFD Display Units (Distance/Speed and Altitude/Vertical Speed)
- System Display Units (Navigation Angle Reference, Pressure Units, and Temperature Units)

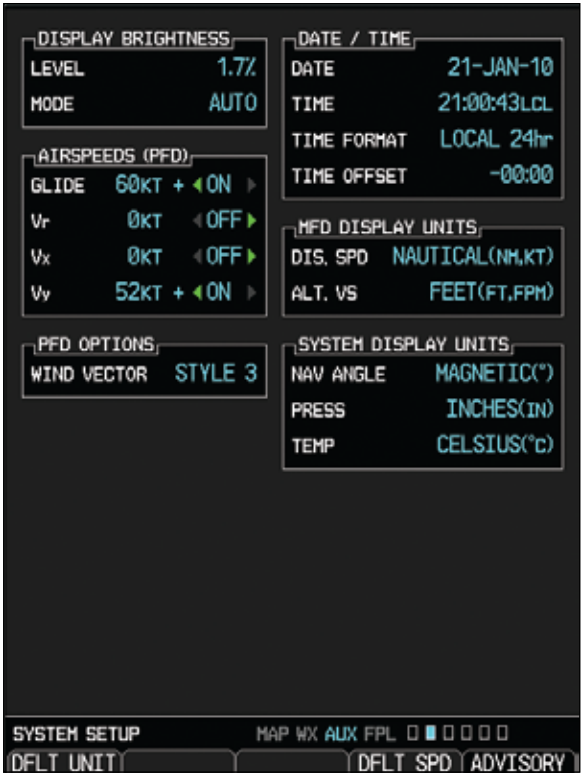


Figure 1-18 System Setup Page

System Settings Values

1) From the first AUX page, press the small **MFD** knob and turn the large **MFD** knob to highlight the desired value.
2) Turn the small **MFD** knob to select "ON" or "OFF."
3) Press **ENTER** to save the setting.

More detail on changing settings is in the Section 3 - MFD Aux pages System Settings section.

Category	Settings	Affected Quantities	Exceptions
Display Brightness	Level Mode	Brightness levels on the PFD and MFD	
Airspeeds	Glide V_R V_X V_Y	Reference markers on PFD airspeed tape	

Category	Settings	Affected Quantities	Exceptions
Synchronization	CDI - On/Off BARO - On/Off	Crossfill Nav information to GDU 620	
PFD Options (Wind Vector)	Style 1 - Style 4		
Date/Time	Date Time Time Format Time Offset		
Distance and Speed	Metric Nautical	Crosstrack error (HSI) Bearing distances (information windows) Distance (information window) Flight plan distances Map ranges DIS, GS, TAS, XTK fields (Navigation Status Box) All distances on MFD All speeds on MFD	Airspeed Indicator True Airspeed (PFD) Wind speed vector Map range (Traffic Page, Terrain Proximity Page) CDI scaling
Altitude and Vertical Speed	Feet Meters	All elevations on MFD	Altimeter Vertical Speed Indicator
Navigation Angle	Magnetic (North) True (North)	Heading Course Bearing Track Desired Track	
Barometric Setting	Inches (in) Hectopascals (hpa)	Barometric pressure on PFD	
Temperature	Celsius Fahrenheit	All temperatures on PFD	

Table 1-1 Display Units Settings (System Setup Page)

More detail on changing settings is in the Section 3 - MFD Aux pages System Settings section.

1.3.4 Display Backlighting

The backlighting of the PFD and MFD displays and bezel keys can be adjusted automatically or manually. The default setting (automatic backlighting adjustment) uses photocell technology to automatically adjust for ambient lighting conditions. Photocell calibration curves are pre-configured to optimize display appearance through a broad range of cockpit lighting conditions. Manual backlighting adjustment can be accomplished using the existing instrument panel dimmer bus or the following procedures.

Backlighting Adjustment

1) From the first AUX page, press the small **MFD** knob to highlight the "DISPLAY BRIGHTNESS" "MODE" box.

2) Turn the small **MFD** knob to select the desired brightness Level and then press **ENTER**.

Figure 1-19 Display Brightness Adjustment

3) Turn the large **MFD** knob to highlight the MODE field. Turn the small **MFD** knob to select "AUTO" or "MANUAL."

4) Press **ENT**.

This page intentionally left blank

2 PRIMARY FLIGHT DISPLAY (PFD)

The Primary Flight Display (PFD) provides aircraft information in the display on the left side of the GDU 620 or right side of the GDU 620R. Functions on the PFD are accessed by using the bezel keys to the left of the PFD and the soft keys below the PFD.

Figure 2-1 PFD Description (Ground Pointer Mode)

Figure 2-2 PFD Nav Status Bar Description

NOTE: *When navigating to a waypoint very far away the DTK, CRS, and TRK values displayed on the GDU 620 may differ from those displayed on the navigator, however the CDI is correct and is the primary means of navigation. This is because the GDU 620 applies magnetic variation corrections for the current aircraft location, but some navigators apply magnetic variation correction for the waypoint location.*

2.1 PFD Soft Key Map

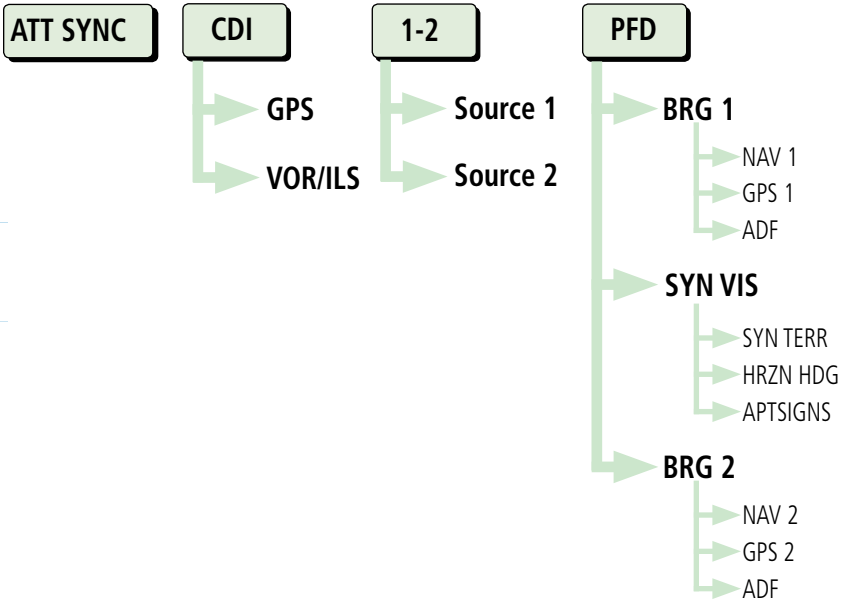


Figure 2-3 PFD Soft Key Diagram

2.2 Airspeed Indicator

The Airspeed Indicator displays airspeed on a rolling number gauge using a moving tape. The true airspeed is displayed in knots below the Airspeed Indicator. The numeric labels and major tick marks on the moving tape are marked at intervals of 10 knots, while minor tick marks on the moving tape are indicated at intervals of five knots. The airspeed tape will starts moving immediately upon obtaining positive forward airspeed. Digital airspeed values are presented upon reaching 20 knots.

The Airspeed Indicator provides Indicated Airspeed, True Airspeed, and Ground Speed. The Airspeed Trend Indicator shows what the airspeed will be in six seconds, if the current rate of acceleration is maintained. The actual airspeed is displayed inside the black pointer.

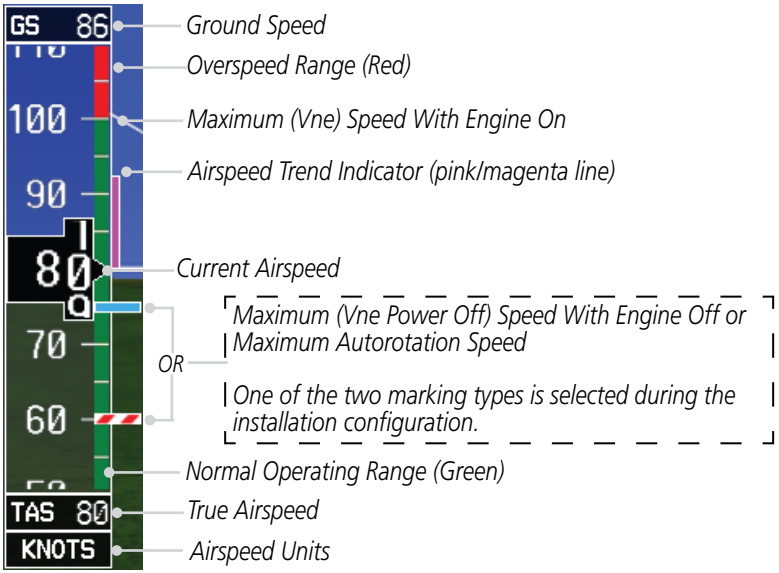


Figure 2-4 Airspeed Tape

2.2.1 Markings

A color-coded speed range strip is located on the moving tape. The colors denote operating range, normal operating range, and never-exceed speed (V_{NE}).

The Airspeed Trend Vector is a vertical, pink/magenta line, extending up or down on the airspeed scale, shown to the right of the color-coded speed range strip. The end of the trend vector corresponds to the predicted airspeed in six seconds if the current acceleration is maintained. If the trend vector crosses V_{NE}, the text of the actual airspeed readout changes to yellow. The trend vector is absent if the speed remains constant or if any data needed to calculate airspeed is not available due to a system failure.

2.2.2 Reference Speeds

Vspeeds (Glide and V_Y) default values are set during the installation process, but can be changed and turned on/off from the System Setup page on the first page of the Aux page group. When active (on), the Vspeeds are displayed at their respective locations to the right of the airspeed scale. The values you set are retained when the unit power is cycled.

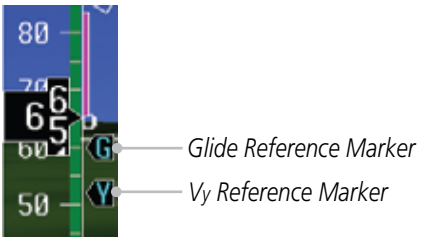


Figure 2-5 Reference Speeds

2.3 Attitude Indicator

Attitude information is displayed over a virtual blue sky and brown ground with a white horizon line. The Attitude Indicator displays pitch, roll, and slip/skid information.

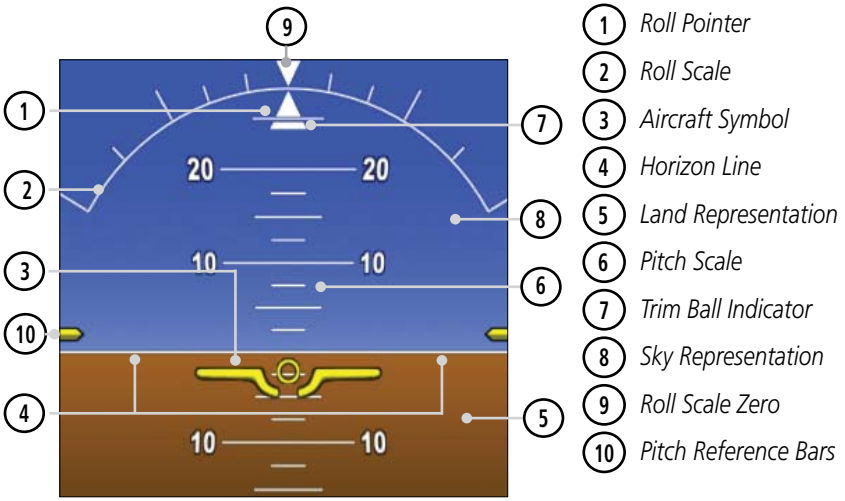


Figure 2-6 Attitude Indicator

The horizon line is part of the pitch scale. Above and below the horizon line, major pitch marks and numeric labels are shown for every 10º, up to 80º. Minor pitch marks are shown for intervening 5º increments, up to 25º below and 45º above the horizon line. Between 20º below to 20º above the horizon line, minor pitch marks occur every 2.5º.

Major tick marks at 30º and 60º and minor tick marks at 10º, 20º, and 45º are shown to the left and right of the zero. Angle of bank is indicated by the position of the pointer on the roll scale.

The Trim Ball Indicator is the bar beneath the roll pointer. The indicator moves with the roll pointer and moves laterally away from the pointer to indicate lateral acceleration. Trim is indicated by the location of the bar relative to the pointer. One bar displacement (as shown below) is equal to one ball displacement on a traditional Trim Ball Indicator.

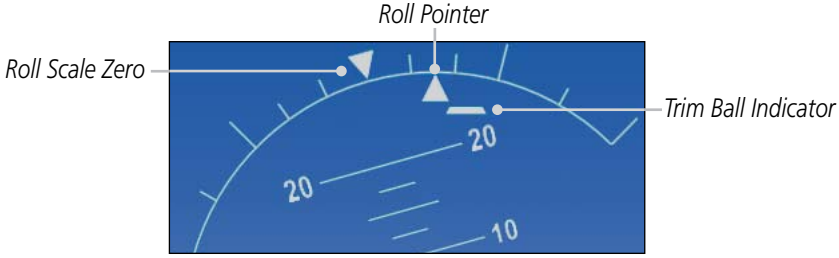


Figure 2-7 Trim Indication

Ground/Sky Pointer mode is configured during installation and can not be changed by the pilot.

In an aircraft with an Attitude Indicator that has a Ground Pointer, the pointer above the Roll Scale shifts with the roll or bank angle of the aircraft to keep the Roll Scale Zero Pointer pointing towards the ground.

Figure 2-8 Attitude Indicator with a Ground Pointer configuration in a left turn

In an aircraft with an Attitude Indicator that has a Sky Pointer, the pointer below the roll scale shifts with the roll or bank angle of the aircraft to keep the Roll Pointer pointing towards the sky.

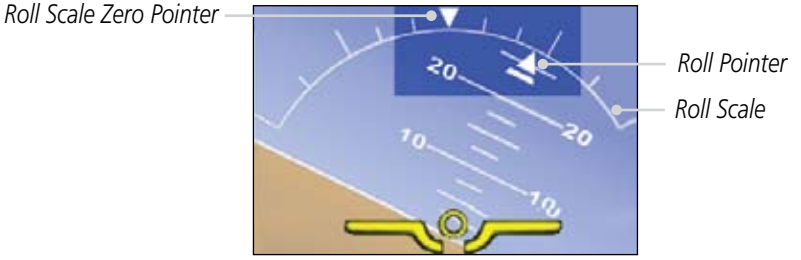


Figure 2-9 Attitude Indicator with a Sky Pointer configuration in a left turn

2.3.1 Extreme Attitude

Extreme attitude is defined as a roll greater than 65º left or right, 30º pitch up, or 20º pitch down. Red chevrons are displayed at greater than 50º pitch up and 30º pitch down. The PFD will "declutter" when the aircraft enters an extreme attitude. Only the primary functions will be displayed in these situations.

The following information is removed from the PFD (and corresponding soft keys are disabled) when the aircraft is in an unusual attitude:

- PFD Knob Mode Annunciations
- Ground Speed, True Airspeed, and Airspeed Units
- Selected Altitude, Barometer Settings, and Selected Vertical Speed
- Vertical Course Deviation Indicator
- Traffic and Terrain Annunciations

Figure 2-10 Extreme Pitch Indication

Figure 2-11 Extreme Pitch Indication Nose Down

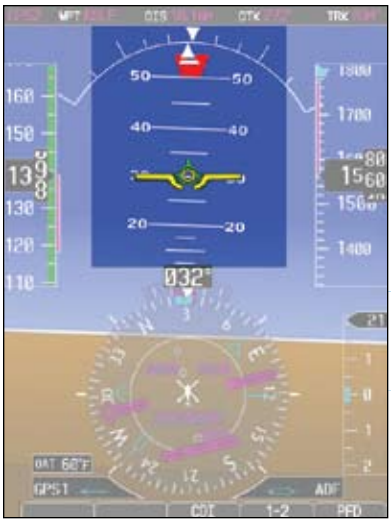


Figure 2-12 Extreme Pitch Indication Nose Up

Figure 2-13 Extreme Roll Indication with Display Declutter

2.4 Altimeter

The altimeter displays the current altitude, altitude trend, altitude bug setting, altitude bug, and the current BARO setting.

The Altitude Trend Vector is a vertical, magenta line, extending up or down on the left side of the Altitude scale. The end of the trend vector corresponds to the predicted altitude in six seconds if the current vertical speed is maintained.

The Altitude Bug is displayed at the selected Altitude Bug setting. A portion of the Altitude Bug will be displayed at the top or the bottom of the altitude tape if the selected Altitude Bug is off of the tape.

2.4.1 Setting the Altitude Bug and Alerter

1) Press the **ALT** key to activate Altitude mode.
2) Turn the **PFD** knob to move the Altitude Bug to a desired altitude.

OR

3) Press the center of the **PFD** knob to set the selected altitude to the current altitude.

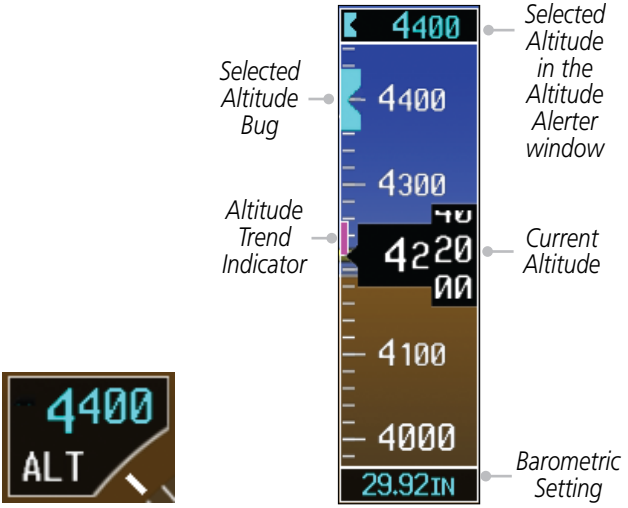


Figure 2-14 Altimeter

2.4.2 Altitude Alerting

The Altitude Alerting function provides the pilot with visual and aural alerts (if interfaced to an audio panel) when approaching the Selected Altitude. Whenever the Selected Altitude is changed, the Altitude Alerter is reset. The Altitude Alerter is independent of any autopilot installed in the aircraft. The following occur when approaching the Selected Altitude:

- Upon passing through 1000 feet of the Selected Altitude, the Selected Altitude (shown above the Altimeter) changes to black text on a light blue background, flashes for five seconds.
- When the aircraft passes within 200 feet of the Selected Altitude, the Selected Altitude changes to light blue text on a black background and flashes for five seconds and an aural tone is generated.
- After reaching the Selected Altitude, if the pilot flies outside the deviation band (beyond ±200 feet of the Selected Altitude), the Selected Altitude changes to yellow text on a black background, flashes for five seconds, and an aural tone is generated.

Figure 2-15 Altitude Alerting Visual Annunciations

2.4.3 Changing Barometric Setting

The Barometric Setting affects the altitude values shown on the unit. Barometric pressure units may be displayed as either inches (in) or hectopascals (hpa). See *System Display Units* in Section 3 for more detail.

1) Press the **BARO** key to activate Baro mode.
2) Turn the **PFD** knob to increase or decrease the altimeter setting. OR

Figure 2-16 Barometric Setting

3) Press the **PFD** knob while in Baro mode to toggle between Standard Pressure (29.92 in) and the currently selected barometric setting.

2.4.4 Minimum Descent Altitude/Decision Height Alerting

For altitude awareness, a Barometric Minimum Descent Altitude (MDA) or Decision Height (DH) alert can be displayed on the PFD. The values are set in the Active Flight Plan page. When active, the minimum descent altitude setting is displayed in the minimums window at the bottom left of the Altitude Tape when you are within 2500 feet of the selected minimum altitude.

NOTE: *The Altitude Minimums Alerting Bug appears parked at the bottom of the altitude tape as soon as a value is set in the minimums alerter. The bug will unpark and start to move up the tape as soon as the altitude is within the range of the tape. The bug is reset when power is cycled.*

The following visual annunciations occur when approaching the MDA/DH:

- When the aircraft altitude descends to within 2500 feet of the selected altitude setting, the BARO MIN box appears with the altitude value in cyan text.
- When the aircraft is within 100 feet of the selected altitude setting, the bug and text turn white.
- Once the aircraft reaches the selected altitude minimums setting, the bug and the altitude text turn yellow and the aural alert "Minimums, minimums," is heard one time. The text remains in yellow until the aircraft altitude is more than 50 feet above the set altitude minimum value.

Figure 2-17 Barometric MDA/DH Alerting Visual Annunciations

Setting the Barometric Minimum Descent Altitude/Decision Height and Bug:

1) While viewing the Active Flight Plan Page of the FPL page group, press the small **MFD** knob. Turn the large **MFD** knob to activate the Baro Minimums Altitude.

2) Turn the large and small **MFD** knobs to change the Baro Minimums Altitude value. Resolution is ten feet.

Figure 2-18 Barometric Minimums Altitude Selection

3) Press **ENT** to activate the selected value.

Alerting is inhibited while the aircraft is on the ground and until the aircraft reaches 150 feet above the selected Minimum Altitude. Normally the altitude alerter only allows selection of altitudes in 100 foot increments. When a value other than 100 feet is set for Baro Mins, it becomes a selectable value in the altitude alerter.

To set the descent altitude and enable the Altitude Minimums Bug, refer to Section 3, MFD, Flight Plan Pages.

NOTE: *If you highlight the minimums Altitude field on the FPL page and hit the* ***CLR*** *key, it will turn the minimums alerting functionality off.*

2.5 Vertical Speed (V/S) Indicator

Vertical speed data is presented on the bottom right of the PFD. A Vertical Speed bug and a bug setting are also available.

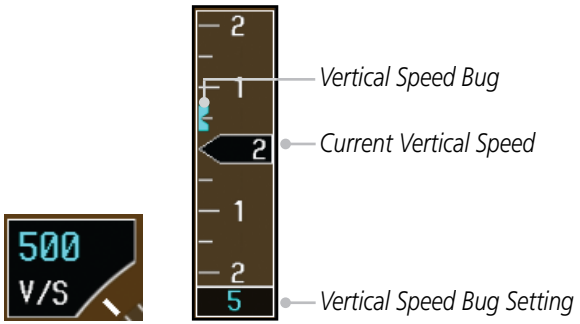


Figure 2-19 Vertical Speed (V/S) Tape and Window

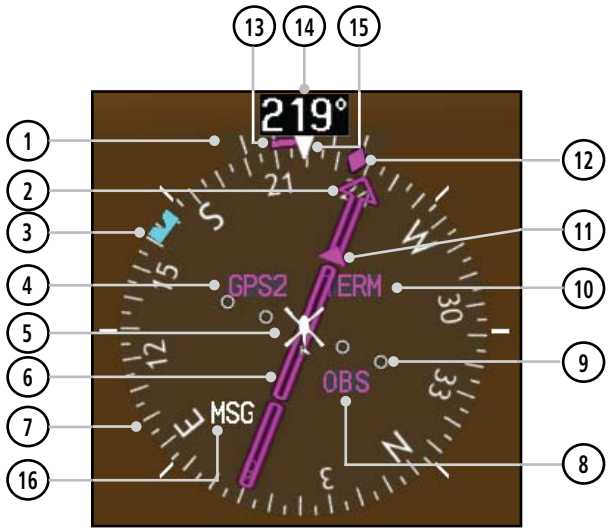
The Vertical Speed Indicator displays the aircraft vertical speed using a non-moving tape. The tape can be scaled at ±2000, ±3000, or ±4000 fpm as set by the installer. Major gradations are every 1000 fpm and minor gradations every 500 fpm. The current vertical speed is displayed in the pointer along the tape. Digits appear in the pointer when the climb or descent rate is greater than 100 fpm. If the rate of ascent/descent exceeds the vertical speed displayed on the tape, the pointer appears at the corresponding edge of the tape and the rate appears inside the pointer.

Setting the Vertical Speed Indicator Bug

1) Press the **V/S** key to activate Vertical Speed mode.
2) Turn the **PFD** knob to change the Vertical Speed Bug.
3) Press the center of the **PFD** knob to set the Vertical Speed value to the current vertical speed.

2.6 Horizontal Situation Indicator

The Horizontal Situation Indicator (HSI) displays a rotating compass card in a heading-up orientation. Letters indicate the cardinal points and numeric labels occur every 30º. Major tick marks are at 10º intervals and minor tick marks at 5º intervals. A digital reading of the current heading appears on top of the HSI, and the current ground track is represented on the HSI by a magenta diamond. The HSI also presents turn rate, course deviation, bearing, and navigation source information. The "MSG" annunciation will be shown in the HSI when an unacknowledged message is present on the selected navigator. When the message is acknowledged, the "MSG" annunciation will clear.



1. *Turn Rate Indicator*
2. *Course Pointer*
3. *Heading Bug*
4. *Navigation Source*
5. *Aircraft Symbol*
6. *Course Deviation Indicator (CDI)*
7. *Rotating Compass Card*
8. *OBS Mode Active*
9. *Lateral Deviation Scale*
10. *GPS Level of Service*
11. *To/From Indicator*
12. *Current Track Indicator*
13. *Turn Rate/Heading Trend Vector*
14. *Current Heading*
15. *Lubber Line*
16. *MSG (Message) on Navigator*

Figure 2-20 Horizontal Situation Indicator (HSI)

The 360º HSI contains a Course Deviation Indicator (CDI), with a Course Pointer, To/From Indicator, and a sliding deviation bar and scale. The course pointer is a single line arrow (GPS1, VOR1, and LOC1) or a double line arrow (GPS2, VOR2, and LOC2) which points in the direction of the set course. "LOC" will automatically be displayed if a localizer frequency is tuned. The To/From arrow rotates with the course pointer and is displayed when the active NAVAID is received.

2.6.1 Setting the Heading Bug

The Selected Heading is shown to the upper left of the HSI for 10 seconds after being adjusted. The light blue bug on the compass rose corresponds to the Selected Heading.

NOTE: The current heading will have a "T" to the right of the heading value when the Nav Angle is set to True in the System Setup page of the Aux page group.

Figure 2-21 Heading Bug Setting

1) Press the **HDG** key to activate HDG mode.
2) Turn the **PFD** knob to change the Heading Bug.

OR

3) Press the **PFD** knob in HDG mode to set the Heading Bug to the current heading.

2.6.2 Turn Rate Indicator

The Turn Rate Indicator is located directly above the rotating compass card. Tick marks to the left and right of the lubber line denote half-standard and standard turn rates. A magenta Turn Rate Trend Vector shows the current turn rate. The end of the trend vector gives the heading predicted in six seconds, based on the present turn rate. A standard-rate turn is shown on the indicator by the trend vector stopping at the standard turn rate tick mark, corresponding to a predicted heading of 18º from the current heading. At rates greater than four deg/sec, an arrowhead appears at the end of the magenta trend vector and the prediction is no longer valid.

Figure 2-22 Turn Rate Indicator and Trend Vector

2.7 Course Deviation Indicator

The Course Deviation Indicator (CDI) moves left or right from the course pointer along a lateral deviation scale to display aircraft position relative to the course. If the course deviation data is not valid, the CDI is not displayed.

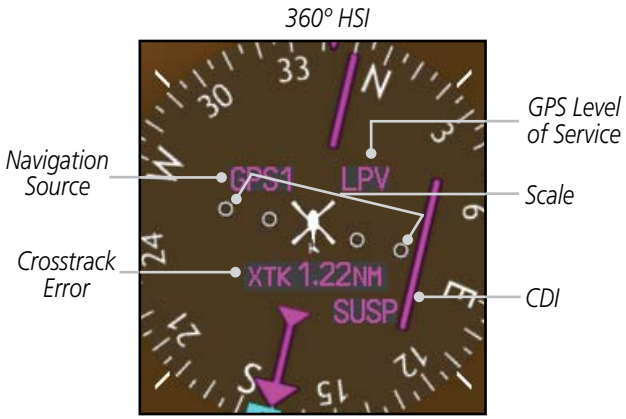


Figure 2-23 Course Deviation Indicator

NOTE: *The ILS Localizer and Glideslope deviation indicators will indicate full-scale deflection for the GNS 480 navigator at the second dot. The GNS 400W/500W series navigators will indicate full-scale deflection at the edge of the display.*

2.7.1 Changing CDI Sources

The CDI can display two sources of navigation: GPS or NAV (VOR, and LOC). Color indicates the current navigation source: magenta (for GPS) or green (for VOR and LOC). The full-scale limits for the CDI are defined by a GPS-derived distance when coupled to GPS. When coupled to a VOR or localizer (LOC), the CDI has the same angular limits as a mechanical CDI. If the CDI exceeds the maximum deviation on the scale (two dots) while coupled to GPS, the crosstrack error (XTK) is displayed below the white aircraft symbol.

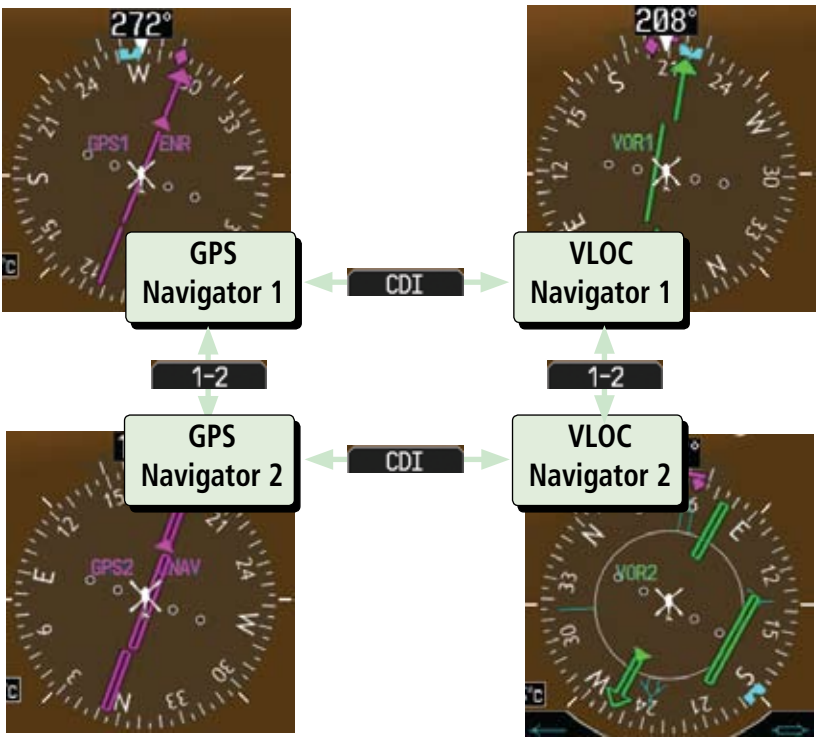


Figure 2-24 CDI Navigation Sources

1) Press the **CDI** soft key to toggle between GPS and VOR/LOC source type.
2) Press **1-2** soft key to toggle between the 1 and 2 navigators of the GPS or VOR/LOC sources.
3) Verify the navigation source by the indication on the HSI and in the upper left corner of the PFD.

***NOTE:** The selected navigator is the active navigator for all PFD and MFD operations, except for the supplemental bearing pointers.*

2.7.2 Changing CDI Course

The Selected Course is shown to the upper left of the HSI for 10 seconds after being adjusted.

Figure 2-25 Course Setting

1) Press the **CRS** key to activate Course mode.
2) Turn the **PFD** knob to change the Course values.

   OR

3) Press the **PFD** knob to set a Course that will center the CDI to the VOR station or waypoint if in GPS OBS mode.

2.7.3 Vertical Deviation Indicator (VDI)

The Vertical Deviation (Glideslope) Indicator (VDI) appears to the left of the VSI whenever an ILS frequency is tuned in the active NAV field. A green diamond acts as the VDI Indicator, like a glideslope needle on a conventional indicator. If a localizer frequency is tuned and there is no glideslope signal, "NO GS" is annunciated. The glideslope on an ILS approach is only shown if the current heading is within 90° of the selected course. This prevents the glideslope from being displayed during localizer backcourse approaches.

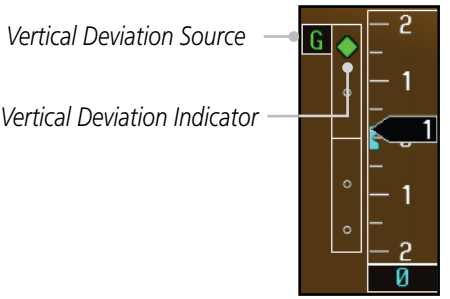


Figure 2-26 Vertical Deviation Indicator (ILS Source)

The vertical deviation is similar to the glideslope for GPS approaches supporting WAAS vertical guidance (LNAV+V, L/VNAV, LPV) and is generated by the system to reduce pilot workload during approach. When an approach of this type is loaded into the flight plan and GPS is the selected navigation source, the Vertical Deviation Indicator appears as a magenta diamond. If the approach type downgrades to LNAV past the final approach fix (FAF), or the approach only supports LNAV service, "NO GP" is annunciated.

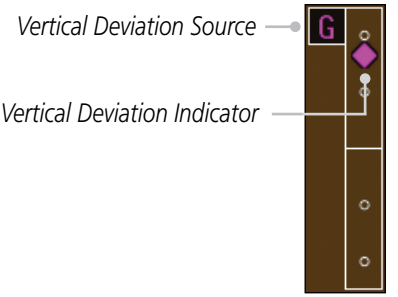


Figure 2-27 Vertical Deviation Indicator (GPS Source)

2.7.4 Auto-Slewing

The G500H system is designed to interface with GNS navigator units and also manage up to four different CDI course pointers (GPS1, NAV1, GPS2, NAV2) independently. The G500H will automatically slew the NAV course pointer to the correct final approach course when a ILS, LOC, LOC BC, LDA or SDF approach is active in the GNS navigator and the appropriate frequency is in the active window in the navigator. The G500H will Auto-Slew the HSI course pointer for an ILS, LOC, LOC BC, LDA, or SDF approach when the steps below are completed in the following order:

1) The desired approach is selected and activated in the navigator (this can be verified by the approach waypoints appearing on the GDU620 MFD Nav Map Page or FPL Page).
2) The appropriate frequency is the active frequency in the navigator.
3) The CDI selection on the GDU 620 is changed to NAV course pointer for the active navigator.

NOTE: *If the NAV course pointer is displayed for the active navigator when the approach is activated and the localizer frequency is tuned, the pilot will need to switch to another CDI source and then back to NAV for the course pointer to Auto-Slew.*

For example, if NAV1 is currently selected, the pilot must:
press the CDI soft key twice: NAV1>GPS1>NAV1
OR
press the 1-2 soft key twice: NAV1>NAV2>NAV1

NOTE: *For LOC BC approaches, the course pointer will slew 180 degrees from the inbound course.*

Example of activating Auto-Slewing in the G500H:

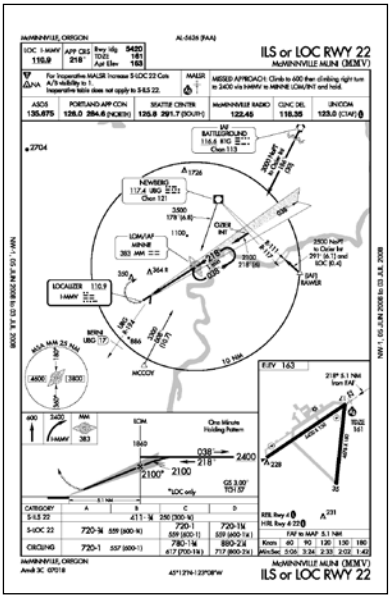


Figure 2-28 Auto-Slewing HSI with ILS Loaded and Shown with the Corresponding Approach Plate

1) The aircraft is flying vectors to final on an active ILS approach, with the appropriate approach in the GNS navigator.
2) The appropriate ILS frequency must be activate in the navigator.
3) Verify that the waypoints for the approach are displayed on the Nav Map Page or the FPL Page of the MFD.
4) Upon approaching the final course, select LOC on the HSI.

NOTE: *If auto CDI switching is active on the GNS unit, the GNS will force the GNS/GDU 620 to NAV when the aircraft is close to the LOC course.*

5) The CDI and course pointer will change from magenta to green and the pointer will move, or slew, to the final approach course (or 180° from the final approach course for LOC BC approaches).

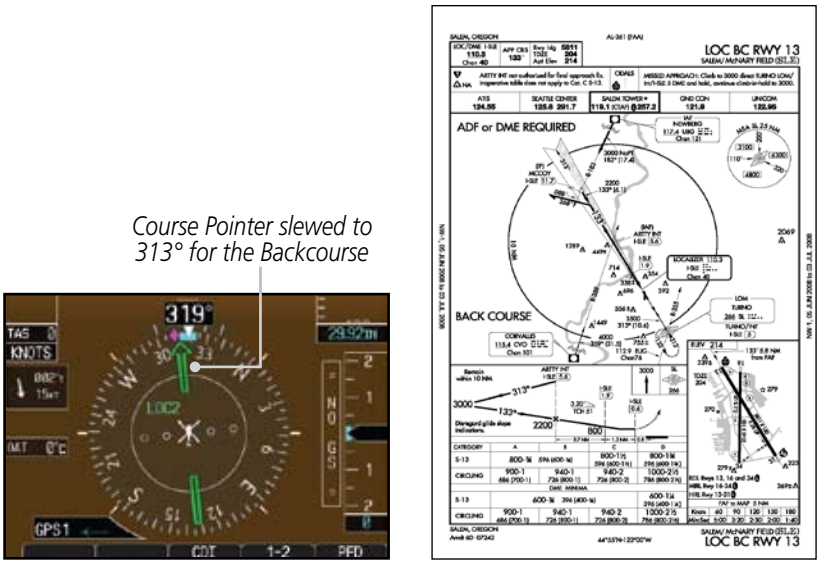


Figure 2-29 Auto-Slewing HSI with Localizer Backcourse Loaded and Shown with the Corresponding Approach Plate

2.8 Supplemental Flight Data

2.8.1 Bearing Pointers

Two Bearing Pointers can be displayed on the HSI for NAV and GPS sources. The pointers are light blue and are single- (BRG1) or double-lined (BRG2); an icon is shown in the respective information window to indicate the pointer type. The system must be configured for a second navigation source to show the BRG2 selection.

When a Bearing Pointer is displayed, its associated information window is also displayed.

The Bearing Information windows are displayed to the lower sides of the HSI and show:

- Bearing source (GPS, NAV, or ADF)
- Pointer icon (BRG1 = single line, BRG2 = double line)

The Bearing Pointer is removed from the HSI if:

- The NAV radio is not receiving the tuned VOR station
- The NAV radio is tuned to a Localizer frequency

- GPS is the bearing source and an active waypoint is not selected
- ADF is selected and a signal is not received (if you have an ADF that supports a valid flag then the bearing pointer will be removed. If your ADF system does not include a valid flag then the bearing pointer will still be displayed, regardless of ADF signal validity.)

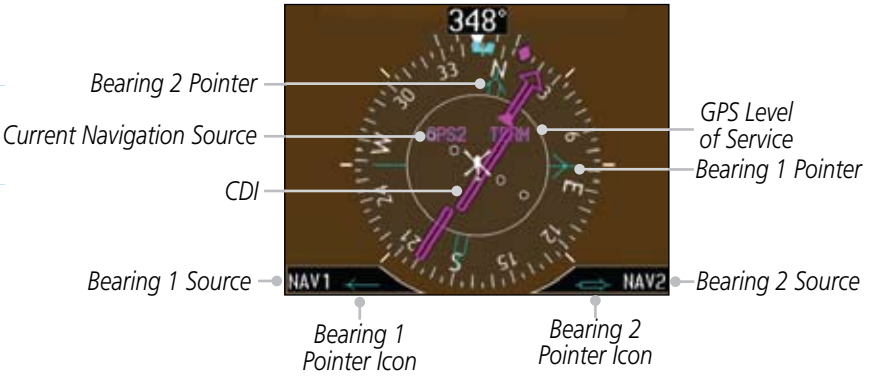


Figure 2-30 HSI with Bearing Information

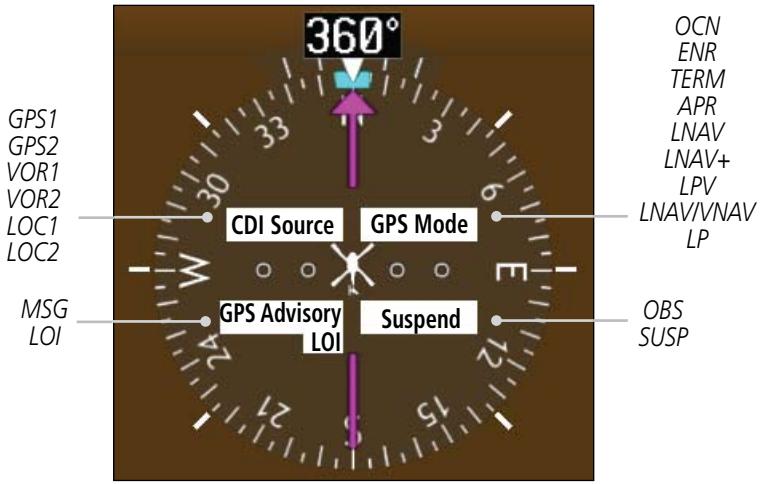


Figure 2-31 PFD HSI Annunciations

1) Press the **PFD** soft key to display the navigation source keys.
2) Press the **BRG 1** or **BRG 2** soft keys to toggle between the available Nav receivers of the selected source (such as: GPS, NAV, or ADF).

***NOTE**: The Bearing Line for navigation source 1 (BRG1) will be a single line. The Bearing Line for navigation source 2 (BRG2) will be a double line.*

2.8.2 Temperature Display

The Outside Air Temperature (OAT) is displayed to the left of the HSI. The OAT can be displayed in ºF or ºC, which is configured in the Aux System Setup Page. The temperature is derived from the Temperature Probe on the aircraft. The displayed temperature is the Static Air Temperature reported by the Air Data Computer. This temperature value is corrected for ram air heating effects.

Figure 2-32 HSI Outside Air Temperature

2.9 Wind Vectors

When selected, wind vector information is displayed in a window on the PFD to the left of the HSI. The Wind Vector style is configured in the Aux Mode System Setup page. When the airspeed is less than 20 knots, the Wind Vector window will indicate "No Wind Data."

Figure 2-33 Wind Vector with No Wind Data

Four styles are available as shown below.

Figure 2-34 Wind Vector Style

2.10 Attitude (ATT) Sync

The ATT SYNC soft key toggles the miniature aircraft symbol between the "absolute" pitch reference and the horizon line at the time the soft key is pressed. The use of ATT SYNC function moves the miniature aircraft to the horizon line and allows aircraft attitude to be controlled with more precision and less effort. When the ATT SYNC function is active small reference marks are shown on the sides of the attitude indicator that show the absolute pitch reference. The miniature aircraft symbol cannot be synchronized to the horizon line if the pitch attitude is greater than ±8º.

Pressing the **ATT SYNC** soft key will synchronize the aircraft symbol on the PFD to the horizon line during level flight. The **ATT SYNC** soft key will not be available for selection until the aircraft is near a level pitch attitude.

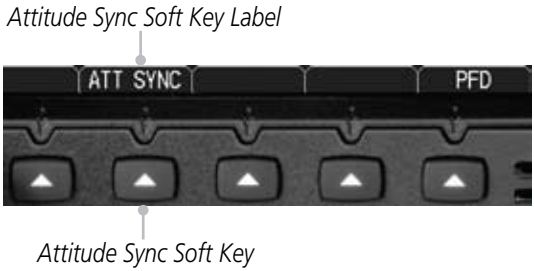


Figure 2-35 Before Attitude Sync Selected

Figure 2-36 Before Attitude Sync Selected

Figure 2-37 After Attitude Sync Selected

3 MULTI-FUNCTION DISPLAY (MFD)

The MFD displays a full-color moving map with navigation information. Moving map information is shown on the two Navigation Map pages and the optional Weather (WX) pages (requires GDL 69/69A and XM weather subscription. The Navigation Map displays aviation data (e.g., airports, VORs, airways, airspaces), geographic data (e.g., cities, lake, highways, borders), topographic data (map shading indicating elevation), and hazard data (e.g., traffic, terrain, weather). The map options set for Navigation Map page 1 are used as the default settings for the optional Weather (WX) pages. The amount of displayed data can be reduced by pressing the **DCLTR** soft key. The Navigation Map can be oriented four different ways: North Up (NORTH UP), Track Up (TRACK UP), Desired Track Up (DTK UP), or Heading Up (HDG UP).

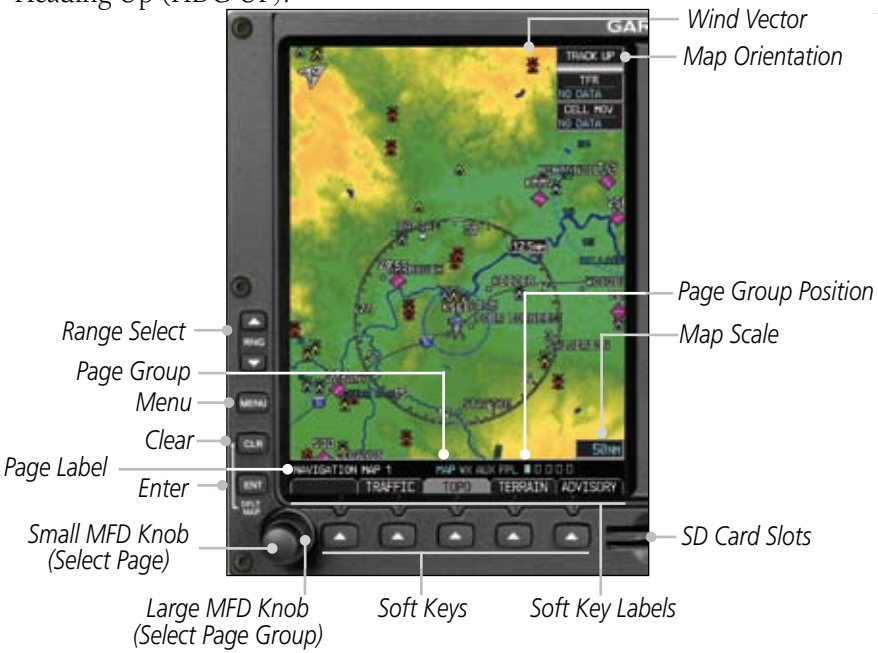


Figure 3-1 MFD Description

The nose of the aircraft icon is placed on the Navigation Map at the location corresponding to the calculated present position. The aircraft position and the flight plan legs are based on information received from the currently selected GPS navigator. The leg of the active flight plan currently being flown is shown as a magenta line on the navigation map. The other legs are shown in white.

There are 28 different map ranges available, from 500 feet to 2000 NM. The current range is indicated in the lower right corner of the map and represents the top-to-bottom distance covered by the map. To change the map range on any map, press the **RNG** keys on the right side of the bezel.

3.1 Functional Display Map

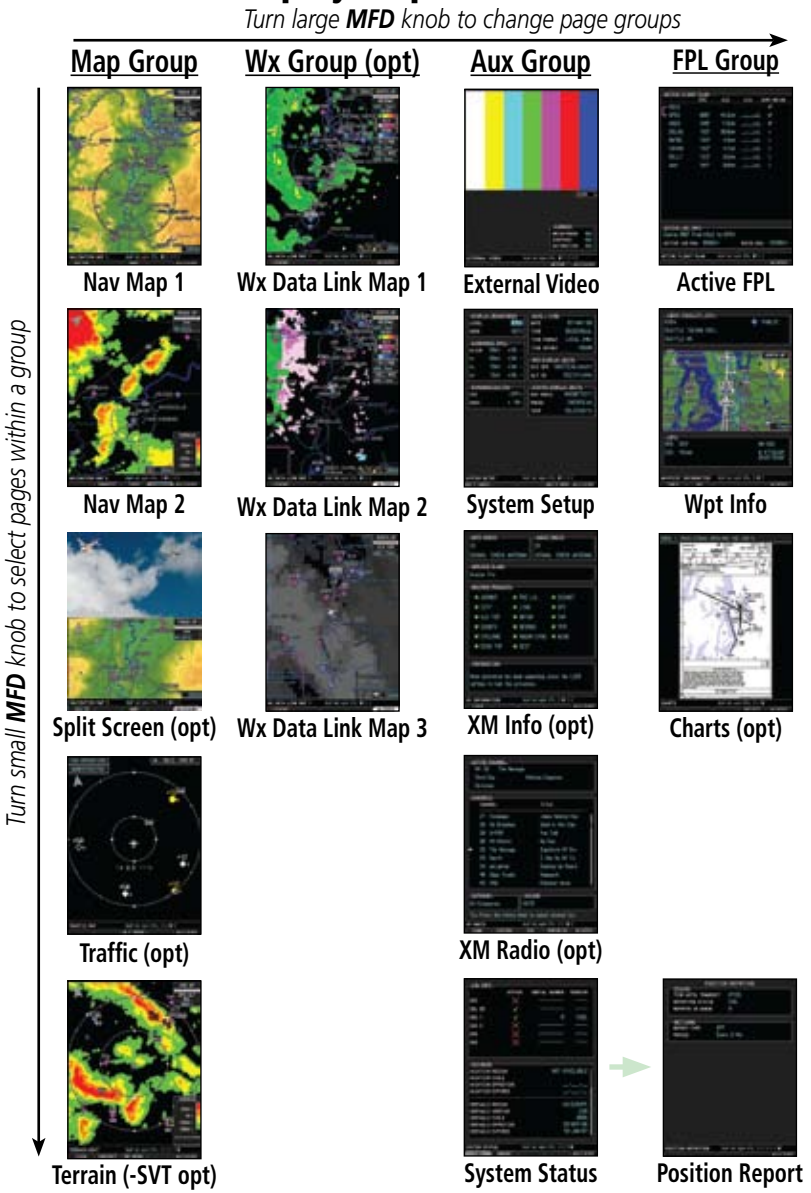


Figure 3-2 MFD Page Groups

3.2 MFD Soft Key Map

The soft keys available depend on the page displayed and the features available. The soft key "Alerts" is present on the far right position in all MFD displays.

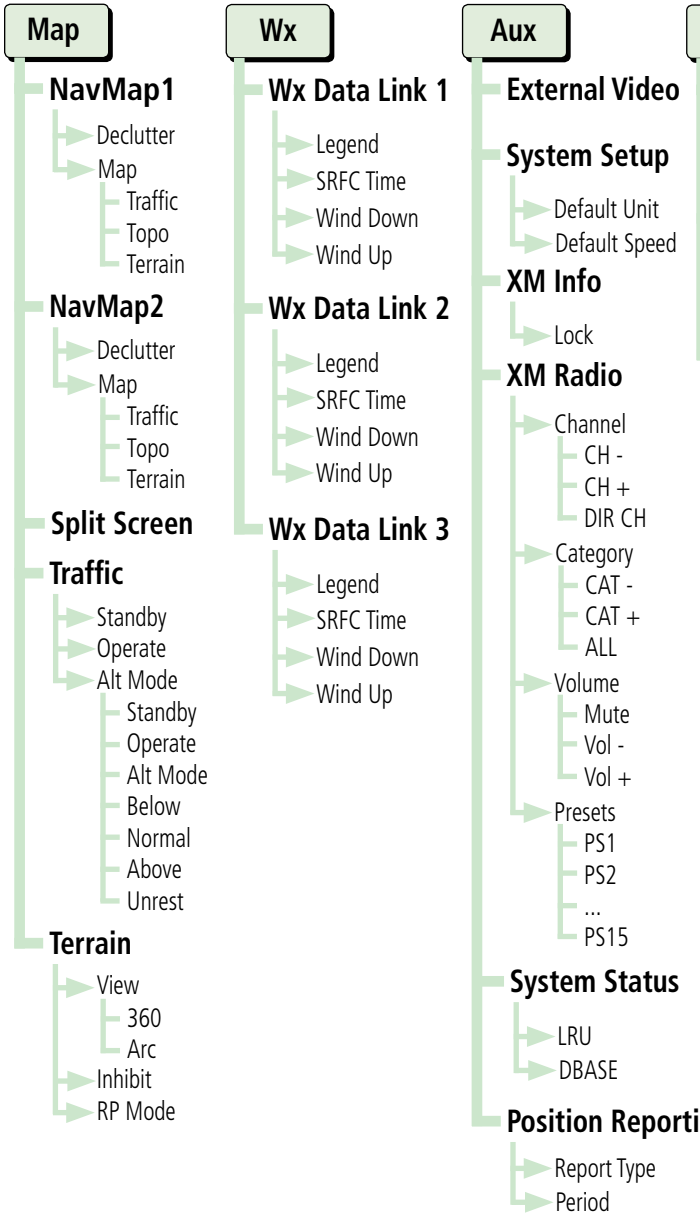


Figure 3-3 MFD Soft Keys

3.3 Navigation Map Pages

Map displays are used extensively in the GDU 620 to provide situational awareness in flight. The two Navigation map pages can display the following information:

- Airports, NAVAIDs, airspace, airways, land data (highways, cities, lakes, rivers, borders, etc.) with names
- Map Pointer information (distance and bearing to pointer, location of pointer, name, and other pertinent information)
- Map range
- Wind direction and speed
- Map orientation
- Icons for enabled map features
- Aircraft icon (representing present position)
- Nav range ring
- Flight plan legs
- Track vector
- Topography scale
- Topography data
- XM NEXRAD Weather
- XM Lightning
- XM Storm Cells

Symbols used on the MFD are detailed in Section 7.

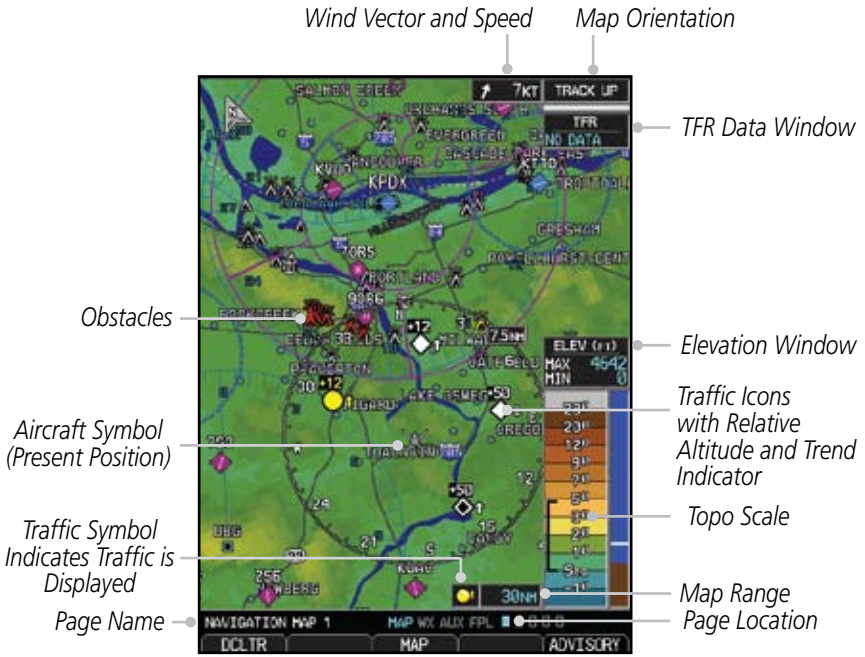


Figure 3-4 MFD Map Description

3.3.1 Default Navigation Map Page

While on any page of the MFD, you may easily return to the first Navigation Map page of the Map group by pressing and holding the **CLR** key to return to the first page (Home Page) of the Map group.

3.3.2 Editing Information

1) Press the small **MFD** knob to activate editing.
2) Turn the large **MFD** knob to select desired item.
3) Turn the small **MFD** knob to change the highlighted value.
4) Press **ENT** to accept the displayed value.
5) Press the small **MFD** knob to cancel selection or to end editing.

NOTE: *Page Group and Page are shown at the bottom of the MFD.*

Figure 3-5 Page Group and Page Locator

3.3.3 Selecting Page Options

1) Change the fields or the setup of a page by pressing the **MENU** key and make the necessary adjustments with the **MFD** knobs.
2) Press **ENT** to accept the displayed value. Press the small **MFD** knob to cancel selection or to end editing.

3.3.4 Changing the Navigation Map Range

The Range (RNG) keys on the right side of the bezel are used to change the map display range. Pressing the **RNG** key will zoom out (increasing the displayed map range) and pressing the **RNG** key will zoom in (decreasing the displayed map range). The Map Range is shown in the lower right corner of the MFD and represents the top-to-bottom distance covered by the map. The map ranges available are from 500 feet to 2000 NM. When the map range is decreased to a point that exceeds the capability of the GDU 620 to accurately represent the map, a magnifying glass icon is shown to the left of the map range.

Figure 3-6 Map Range

3.3.5 Decluttering Map Pages

The Map Declutter feature allows the pilot to progressively step through four levels of decluttering to remove map information. The declutter level is displayed in the **DCLTR** soft key.

Figure 3-7 Map Declutter Soft Key

1) There are four levels of decluttering. DCLTR (0) shows the most detail. DCLTR-3 removes the most detail.
2) While viewing one of the Navigation Map pages, press the **DCLTR** soft key. Each successive press of the **DCLTR** soft key will toggle through the declutter levels. Features marked with a "•" are shown at the indicated Declutter Level.

NOTE: *Traffic is automatically decluttered from Nav Map pages when the map scale is above 150 NM.*

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

Table 3-1 Features Shown at Each Decluttering Level

3.3.6 Panning

The Panning Map Page function allows you to move the map beyond its current limits without adjusting the map scale and to examine information at the pointer location. When you select the panning function — by pressing the small **MFD** knob — a target pointer flashes on the map display. A window also appears at the top of the map display showing the latitude/longitude position of the pointer, the ETE from your present position to the pointer, elevation at the pointer, and bearing and distance to the pointer from your present position.

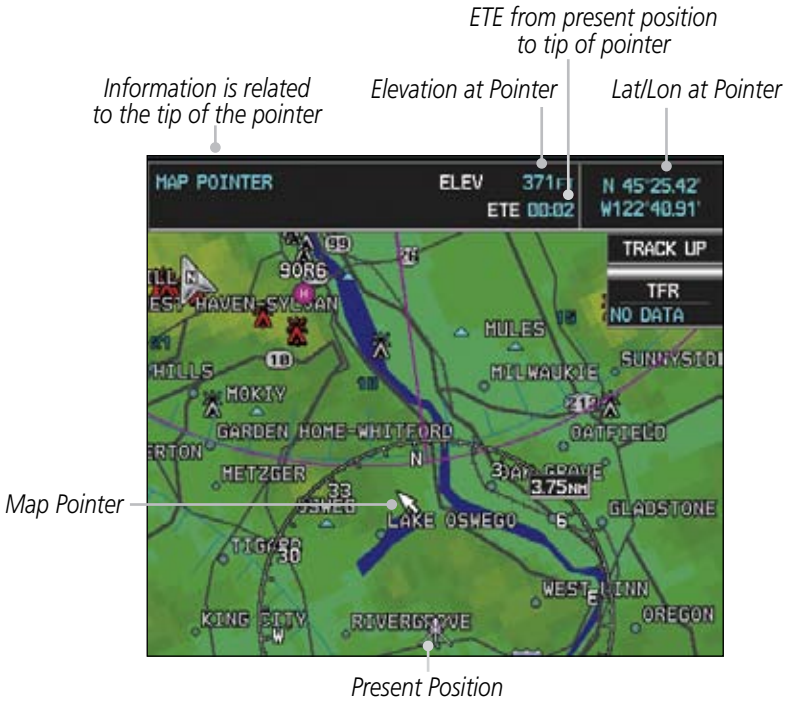


Figure 3-8 Navigation Map Pointer Location Information

1) While viewing a Map or Chart page, press the small **MFD** knob. A flashing pointer will appear in the tip of the ownship symbol. The measured information is referenced to the tip of the arrow.

Figure 3-9 Navigation Map Initial Pointer Location

2) Turn the large **MFD** knob to move the cursor horizontally. Turn the small **MFD** knob to move the cursor vertically.

3) Press the small **MFD** knob again to cancel panning. The display will return to the previous map view.

3.3.7 Selecting Items on the Map

When the target pointer is placed on an object, the name of that object is highlighted (even if the name wasn't originally displayed on the map). This feature applies to airports, NAVAIDs, user-created waypoints, roads, lakes, rivers — just about everything displayed on the map except route lines. When an airport, NAVAID, or user waypoint is selected on the map display, you can review information about the item.

1) While viewing the Navigation Map pages of the Map page group, press the small **MFD** knob to activate panning.
2) Move the cursor with the small and large **MFD** knobs to highlight a feature.
2) Press **ENT** to display information about the highlighted feature.
3) Press the **INFO** soft key (if available) to view more information about the highlighted feature.
4) Press the **WX** soft key (if available) to view TAF and METAR information.
5) Press the small **MFD** knob again to return to panning.

3.3.8 Measuring Distances

The "Measure Bearing/Distance" function provides a quick and easy method to determine the bearing and distance between any two points on the Navigation Map.

1) While viewing one of the Navigation Map pages of the Map page group, press **MENU.**
2) Turn the large or small **MFD** knobs to highlight "Measure Bearing/Distance" and then press **ENT**.

Figure 3-10 Navigation Map Measure Distance Function

3) Your present position will be marked as the starting reference point. To choose a different starting reference point, turn the large or small **MFD** knobs to desired point and press **ENT**.

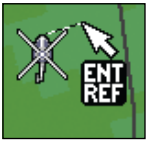


Figure 3-11 Measure Distance Starting Reference Point

4) Turn the large or small **MFD** knobs to move the cursor to a reference point. The distance and bearing is displayed at the top of the display.

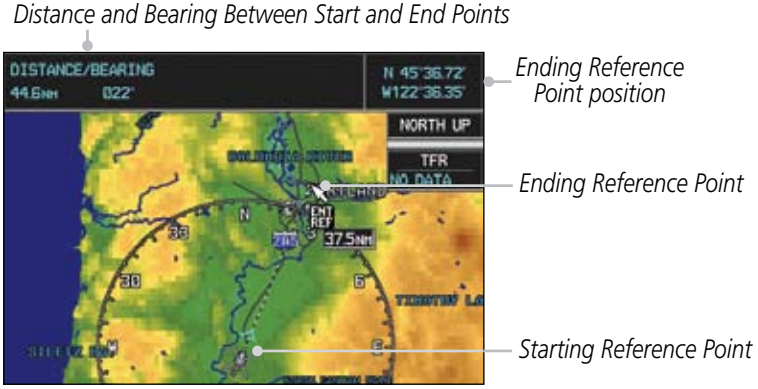


Figure 3-12 Bearing/Distance Measurement

5) Press the small **MFD** knob to stop measuring.

3.3.9 Customizing Navigation Map Pages

The Navigation Map pages are customized by selecting options from the Page Menu. The Page Menu options include choices for Map Setup and Measure Bearing/Distance. The Map Setup choice covers selections for Map, Weather, Traffic, and Aviation depending on the installed equipment of a given aircraft. The Measure Bearing/Distance selection allows you to determine the Bearing, Distance, and Lat/Lon position for points selected on the Navigation Map page.

3.3.10 Map Setup

The Map Setup selection from the Page Menu allows you to customize the displayed items.

1) While viewing one of the Navigation Map pages of the Map page group, press the **MENU** key to display the Navigation Map Page Menu.

Figure 3-13 Navigation Map Page Menu

2) With the cursor flashing on the "Map Setup" option. Press the **ENT** key to display the Map Setup Menu.

3) Use the large and small **MFD** knobs to select the Group (Map, Weather, Traffic, or Aviation) and press **ENT** to allow editing of the selected group. The groups shown depend on the features available for equipment installed in your aircraft.

Figure 3-14 Navigation Map Page Menu Map Group Selection

4) Press the small **MFD** knob to return to the Navigation Map Page.

Map Group		Weather Group (optional)		Traffic Group (optional)		Aviation Group	
Menu Item	**Adjustment**	**Menu Item**	**Adjustment**	**Menu Item**	**Adjustment**	**Menu Item**	**Adjustment**
Orientation	Direction	NEXRD Viewing Range	Off/Range	Traffic	Off/Modes	Safe Taxi Viewing Range	Off/Range
North Up At	Off/Range	NEXRD Cell Mov	Off/Range			Rwy Extension Range	Off/Range
Auto Zoom	On/Off	NEXRAD Legend	On/Off			INT/NDB Viewing Range *	Off/Range
Land Data	On/Off	XM Ltng	Off/Range			VOR Viewing Range*	Off/Range
Track Vector Length	Off/Time					Class B/ TMA *	Off/Range
Wind Vector	On/Off					Class C/ TCA *	Off/Range
Nav Range Ring	On/Off					Class D *	Off/Range
Topo Data	On/Off					Restricted*	Off/Range
Topo Scale	On/Off					MOA (Military)*	Off/Range
Terrain Data	On/Off					Other/ ADIZ *	Off/Range
Terrain Scale	On/Off					TFR *	Off/Range
Obstacle Viewing Range	Off/Range					Airways	Off/Modes
Lat/Lon Viewing Range	Off/Range						
Field of View**	On/Off						

* - shown if the Aviation database is current. ** - shown if Synthetic Vision is available.

Table 3-2 Navigation Map Page Menu Selections

3.3.10.1 Map Feature Options

Choose the options to determine the values for display on each Navigation Map. The options you save will be retained until changed. The options may be selecting by using the following procedure:

1) While viewing one of the Navigation Map pages of the Map page group, press the **MENU** key. With "Map Setup" highlighted, press **ENT**.

Figure 3-15 Navigation Map Page Menu

With the Map Group active, turn the large **MFD** knob to highlight the desired option.

Figure 3-16 Navigation Map Page Menu Map Group Selection

2) Turn the small **MFD** knob to change the highlighted value.

3) Press **ENT** to accept the displayed value. The next option will be highlighted.

4) Press the small **MFD** knob to cancel selection or to end editing and return to the Navigation Map page or turn the large **MFD** knob to the next option.

Map Orientation

The Orientation option sets the orientation of the Navigation Map.

Figure 3-17 Navigation Map Orientation

North Up At

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

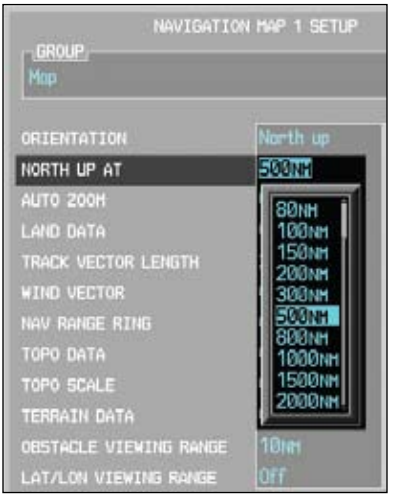


Figure 3-18 Navigation Map "North Up At" Orientation Range Selection

Auto Zoom

With a valid flight plan, the Auto Zoom feature will automatically change the Navigation Map range depending on the distance to the next waypoint in the flight plan. If enabled, it will also automatically zoom to 1 NM when the aircraft is on the ground or when GPS altitude is less than 400 ft AGL and groundspeed is less than 40 knots. Auto Zoom can be overridden at any time by manually zooming with the **RNG** keys or enabling OBS mode. Auto Zoom is re-enabled once one of the following conditions is met:

1) A waypoint is sequenced,
2) the aircraft transitions from "on ground" to "in air,"
3) a point is reached where the Auto Zoom range matches the manual override range (known as auto-sync),
4) Auto Zoom is toggled of and back on in the Navigation Map Setup page,

   OR

5) OBS mode is turned off.

Figure 3-19 Navigation Map Auto Zoom

Land Data

The Land Data option selects whether detailed land features, such as rivers, roads, cities, are displayed. Topo features, traffic, terrain, and obstacles will still be displayed, even with Land Data turned off.

Figure 3-20 Navigation Map Land Data

Track Vector Length

When turned on, the Track Vector Length option will show a dashed line and arrow extending from the aircraft icon illustrating the current Track and the distance the aircraft will travel in the selected time.

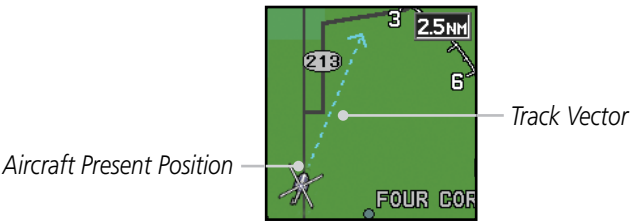


Figure 3-21 Navigation Map Track Vector

Figure 3-22 Navigation Map Track Vector Length Selection

Wind Vector

The Wind Vector option when turned on will show a box in the top right corner of the MFD indicating the wind direction and speed.

Figure 3-23 Navigation Map Wind Vector Display

Figure 3-24 Navigation Map Wind Vector Selection

Nav Range Ring

When turned on, the Nav Range Ring option will show a ring with a compass rose around your present position on the Navigation Map. The relative size shown on the map will remain the same (25% of the map range).

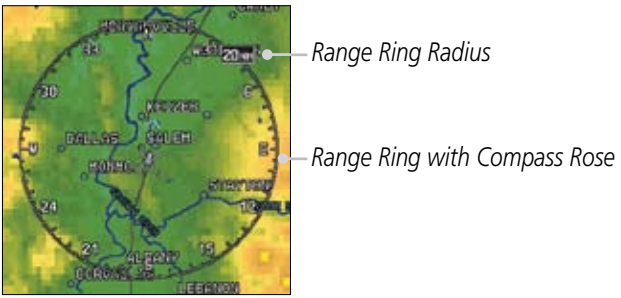


Figure 3-25 Navigation Map Range Ring

Figure 3-26 Navigation Map Range Ring Selection

Topo Data

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

Topo Data Off *Topo Data On*

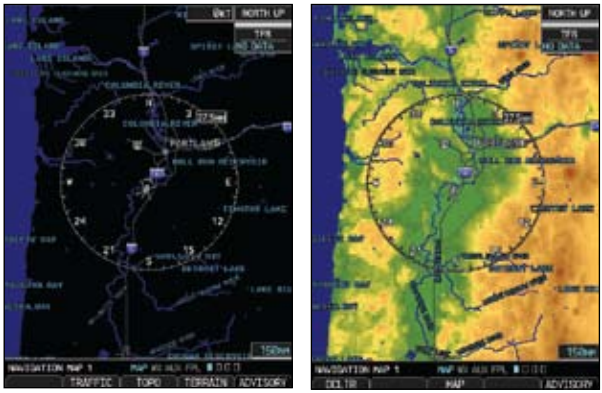


Figure 3-27 Navigation Map Topo Data

Figure 3-28 Navigation Map Topo Data Selection

Topo Scale

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

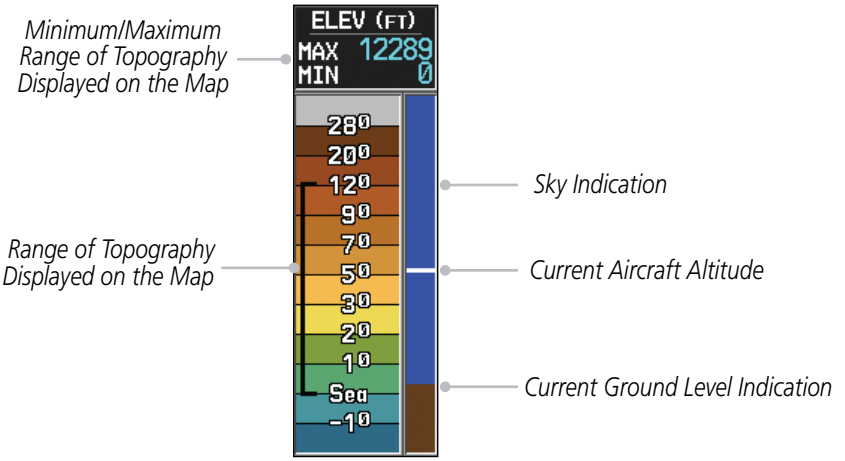


Figure 3-29 Navigation Map Topo Scale

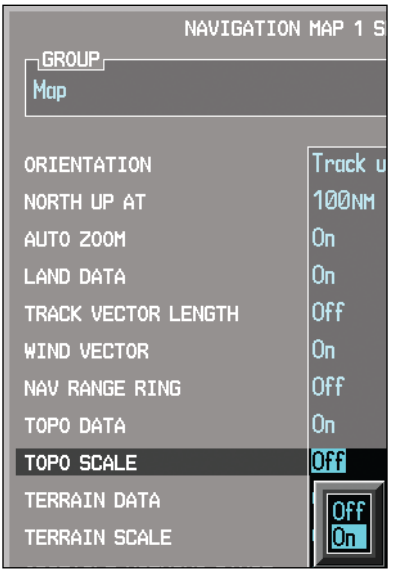


Figure 3-30 Navigation Map Topo Scale Selection

Terrain Data

The Terrain Data option selects whether Terrain Data is shown on the Navigation Map. The Terrain Data Icon will be shown when Terrain has been selected. Terrain and Topo data displays are mutually exclusive.

Figure 3-31 Navigation Map Terrain Data

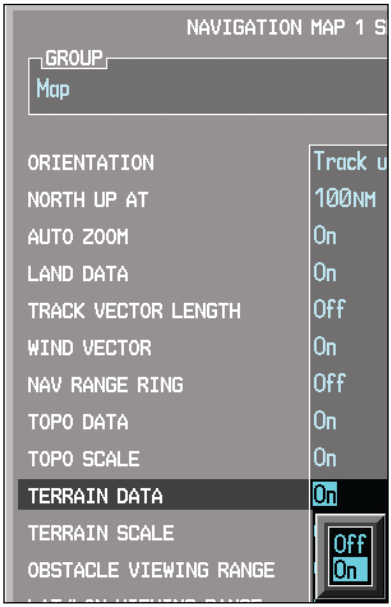


Figure 3-32 Navigation Map Terrain Data Selection

Terrain Scale

The Terrain Scale option selects whether the Terrain Scale is shown on the Navigation Map. The Terrain scale will be located on the right side of the display.

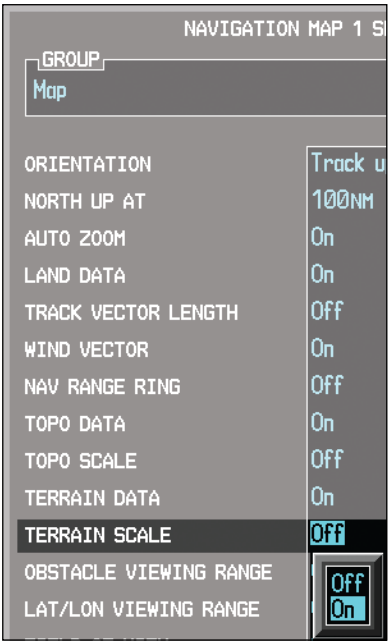


Figure 3-33 Navigation Map Terrain Scale Selection

Obstacle Data Viewing Range

The Obstacle Data Viewing Range option selects whether the Obstacle Data is shown on the Navigation Map. Obstacles will be shown at and below the selected map range. Map ranges above this value will not show the Obstacle Data. In the range selection example below where 30 NM is selected, obstacles will be shown at map ranges of 30 NM and lower.

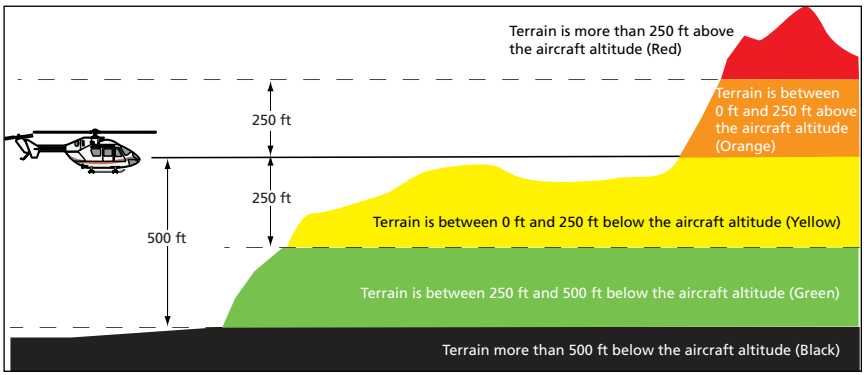


Figure 3-34 TERRAIN Altitude/Color Correlation

	Unlighted Obstacle		Lighted Obstacle		Potential Impact Points	Terrain Color	Terrain/ Obstacle Location	Alert Level
	< 1000 ft AGL	> 1000 ft AGL	< 1000 ft AGL	> 1000 ft AGL				
Obstacle Symbol						Red	Terrain/Obstacle at or above current aircraft altitude	WARNING (Red)
						Yellow	Terrain/Obstacle between 250 ft and 0 ft below current aircraft altitude	CAUTION (Yellow)
						Grey	Terrain/Obstacle 250 ft, or more, below current aircraft altitude	(Gray)

Figure 3-35 HSVT Terrain Obstacle Colors and Symbology

Figure 3-36 Navigation Map Obstacle Data

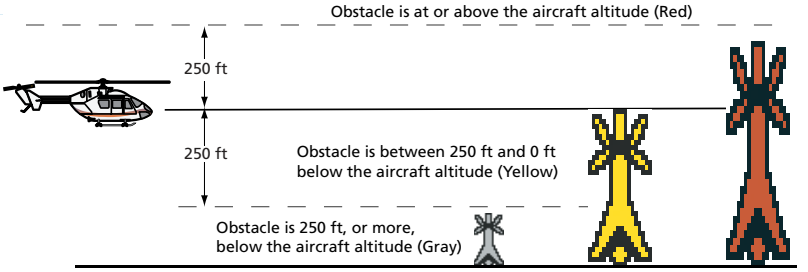


Figure 3-37 HTAWS Obstacle Altitude Colors and Symbology

Figure 3-38 Navigation Map Obstacle Data Selection

Lat/Lon Viewing Range

The Lat/Lon Viewing Range option selects whether Lat/Lon line is shown on the MFD. Lat/Lon lines will be shown at and below the selected map range. Map ranges above the selected value will not show the Lat/Lon lines. When Off is selected, Lat/Lon lines will not be shown. In the figure below where 200 NM is selected, Lat/Lon lines will be shown at map ranges of 200 NM and lower.

Figure 3-39 Navigation Map Lat/Lon Selection

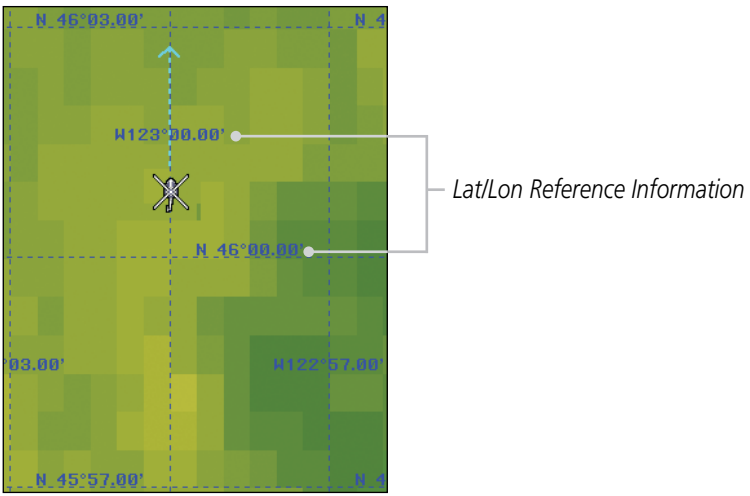


Figure 3-40 Navigation Map Lat/Lon Information

Field of View

The PFD Field of View used for the Garmin Synthetic Vision Technology (SVT™) option (when enabled) can be represented on the MFD Navigation Map Page lateral image. Two dashed lines forming a V-shape in front of the aircraft symbol on the MFD, represent the forward viewing area shown on the PFD.

Figure 3-41 Navigation Map Field of View Selection

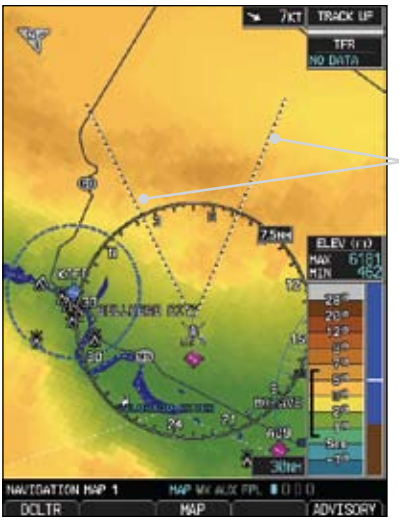


Figure 3-42 Navigation Map Field of View on the MFD

3.3.10.2 Weather Feature Options (Optional)

The Weather group selection from the Map Setup Page Menu allows you to customize the NEXRAD Viewing Range, NEXRAD Cell Movement, and Lightning Viewing range. Weather is an optional feature that requires a GDL 69/69A and an XM Weather subscription.

Figure 3-43 Navigation Map Page Menu

Figure 3-44 Navigation Map Page Menu Weather Group Selection

NEXRAD Viewing Range

The NEXRAD Viewing Range option selects whether the NEXRAD weather products is shown on the MFD. NEXRAD weather products will be shown at and below the selected map range. When Off is selected, NEXRAD weather will not be shown. Map ranges above the selected value will not show the NEXRAD weather products. In the example below where 200 NM is selected, the NEXRAD weather products will be shown at map ranges of 200 NM and lower.

Figure 3-45 NEXRAD Viewing Range Selection

NEXRAD Cell Movement

The NEXRAD Cell Movement option selects whether NEXRAD Cell Movement is shown on the Navigation Map. NEXRAD Cell Movement will be shown at and below the selected map range. When Off is selected, NEXRAD Cell Movement will not be shown. In the example below where 150 NM is selected, the NEXRAD Cell Movement will be shown at map ranges of 150 NM and lower.

Figure 3-46 NEXRAD Cell Movement Selection

NEXRAD Legend

The NEXRAD Legend selection provides the option of displaying an abbreviated version of the NEXRAD legend in the top right region of the MFD.

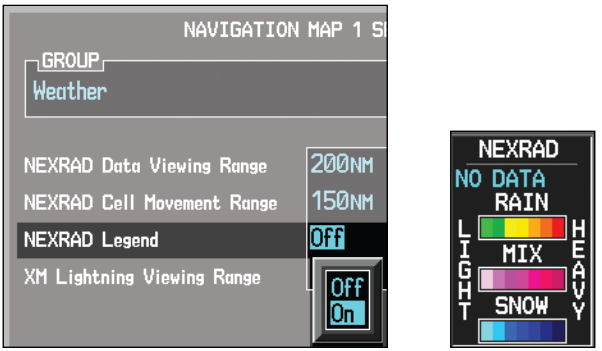


Figure 3-47 NEXRAD Legend Selection

Lightning Viewing Range

The Lightning Viewing Range option selects whether the Lightning weather products is shown on the Navigation Map. Lightning weather products will be shown at and below the selected map range. When Off is selected, Lightning weather will not be shown. In the figure below where 200 NM is selected, Lightning symbols will be shown at map ranges of 200 NM and lower.

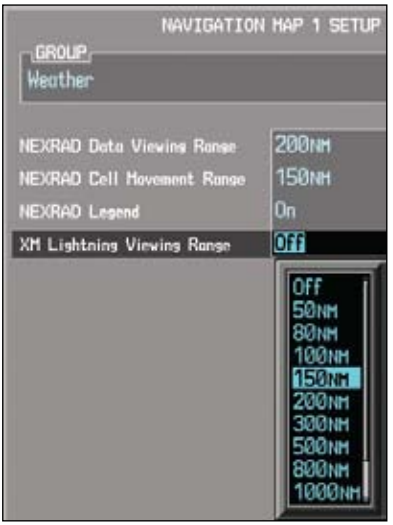


Figure 3-48 Lightning Viewing Range Selection

3.3.10.3 Traffic Feature Options (Optional)

The Traffic group selection from the Map Setup Page Menu allows you to customize the display of traffic on the Navigation Map. The Traffic function requires the installation of the appropriate traffic device. TIS and TAS cannot be displayed at the same time. If the aircraft has a TAS unit installed, the GDU 620 will be configured for TAS. If no TAS unit is installed and a GTX Mode-S transponder is installed then the GDU 620 will be configured for TIS. A pilot can tell which data is being displayed by the label in the top left corner (TAS OPERATING vs TIS OPERATING). TIS data comes from a GTX transponder. Coverage is limited to specific areas as shown in the AIM. TAS data comes from a TAS unit such as a Garmin GTS 800 or 820, Skywatch 497, KTA 810, or other unit. Coverage follows the aircraft. In the Navigation Map page setup you can select the maximum range at which traffic symbols are shown. Once outside of the selected range, traffic will be decluttered. The Traffic soft key will still be available.

NOTE: *Traffic is automatically decluttered from Nav Map 1 and 2 when the map scale is above 150 NM.*

Traffic Selection	Display Result
Off	No traffic displayed
All Traffic	All types of traffic displayed
TA/PA	Traffic Alerts and Proximity Alerts displayed
TA Only	Traffic Alerts Only displayed

Table 3-3 Navigation Map Traffic Display Options

Figure 3-49 Navigation Map Page Menu Traffic Group Selection

1) While viewing the Navigation Map Setup page and the Traffic Group active, turn the large **MFD** knob to highlight the "Traffic" options.

Figure 3-50 Navigation Map Page Menu Traffic Options

2) Turn the small **MFD** knob to change the highlighted value.

3) Press **ENT** to accept the displayed value.

4) Press the small **MFD** knob to cancel selection or to end editing and return to the Navigation Map page or turn the large **MFD** knob to the next option.

3.3.10.4 Aviation Feature Options

The Aviation group selection from the Map Setup Page Menu allows you to customize the display of SafeTaxi information, Runway Extensions, Intersection/ NDB locations, VOR locations, and TFR icons on the Navigation Map.

Figure 3-51 Navigation Map Page Menu Aviation Group Selection

SafeTaxi™ Viewing Range

The SafeTaxi™ viewing range option selects whether SafeTaxi information is shown on the Navigation Map. SafeTaxi will be shown at and below the selected map range. When Off is selected, SafeTaxi information will not be shown. In the example below where 3 NM is selected, the SafeTaxi information will be shown at map ranges of 3 NM and lower.

Figure 3-52 Navigation Map Safe Taxi Viewing Range Selection

Runway Extension Range

The Runway Extension Range option selects the whether Runway Extensions is shown for the destination airport runway. Runway Extensions will be shown at and below the selected map range. When Off is selected, Runway Extensions will be shown.

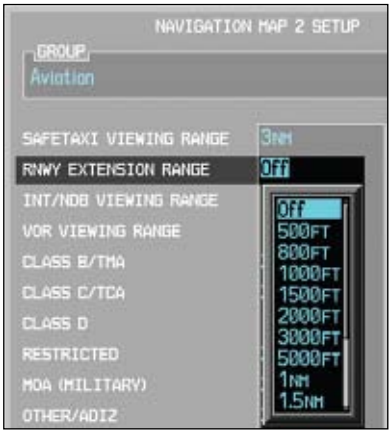


Figure 3-53 Navigation Map Runway Extension Selection

INT/NDB Viewing Range

The INT/NDB viewing range option selects whether Intersection and NDB information is shown on the Navigation Map. Intersection and NDB information will be shown at and below the selected map range. When Off is selected, the information will not be shown. In the example below where 15 NM is selected, INT/NDBs will be shown at map ranges of 15 NM and lower.

Figure 3-54 Navigation Map INT/NDB Viewing Range Selection

VOR Viewing Range

The VOR viewing range option selects whether VOR information is shown on the Navigation Map. VOR information will be shown at and below the selected map range. When Off is selected, the information will not be shown. In the example below where 150 NM is selected, VOR information will be shown at map ranges of 150 NM and lower.

Figure 3-55 Navigation Map VOR Viewing Range Selection

Class B/TMA Airspace Viewing Range

The Class B/TMA airspace viewing range option selects whether Class B/TMA airspace information is shown on the Navigation Map. Class B/TMA airspace information will be shown at and below the selected map range. When Off is selected, the information will not be shown. In the example below where 200 NM is selected, Class B/TMA airspace information will be shown at map ranges of 200 NM and lower.

Figure 3-56 Navigation Map Class B/TMA Viewing Range Selection

Class C/TCA Airspace Viewing Range

The Class C/TCA airspace viewing range option selects whether Class C/TCA airspace information is shown on the Navigation Map. Class C/TCA airspace information will be shown at and below the selected map range. When Off is selected, the information will not be shown. In the example below where 200 NM is selected, Class C/TCA airspace information will be shown at map ranges of 200 NM and lower.

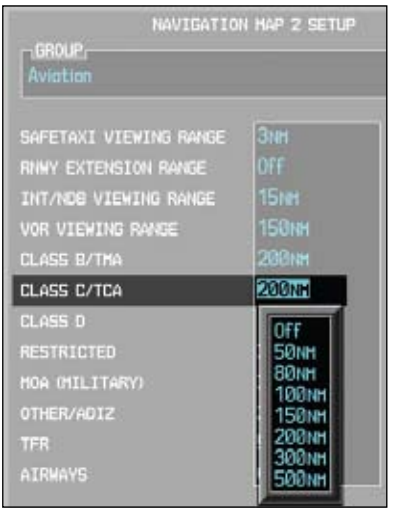


Figure 3-57 Navigation Map Class C/TCA Viewing Range Selection

Class D Airspace Viewing Range

The Class D airspace viewing range option selects whether Class D airspace information is shown on the Navigation Map. Class D airspace information will be shown at and below the selected map range. When Off is selected, the information will not be shown. In the example below where 150 NM is selected, Class D airspace information will be shown at map ranges of 150 NM and lower.

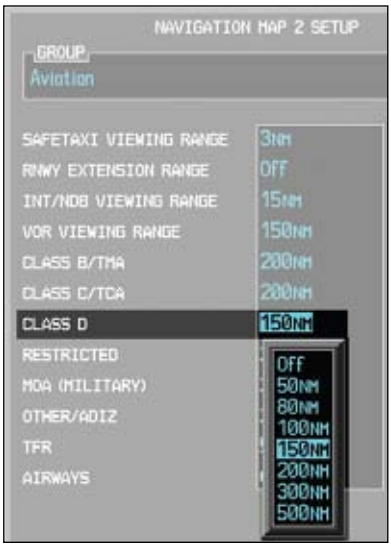


Figure 3-58 Navigation Map Class D Viewing Range Selection

Restricted Airspace Viewing Range

The Restricted airspace viewing range option selects whether the map range is shown on the Navigation Map. Restricted airspace information will be shown at and below the selected map range. When Off is selected, the information will not be shown. In the example below where 200 NM is selected, Restricted airspace information will be shown at map ranges of 200 NM and lower.

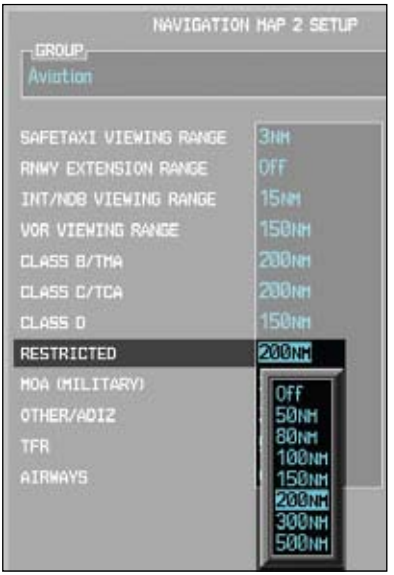


Figure 3-59 Navigation Map Restricted Airspace Viewing Range Selection

MOA (Military) Viewing Range

The MOA (Military) viewing range option selects whether MOA (Military) information is shown on the Navigation Map. MOA airspace information will be shown at and below the selected map range. When Off is selected, the information will not be shown. In the example below where 200 NM is selected, MOA airspace information will be shown at map ranges of 200 NM and lower.

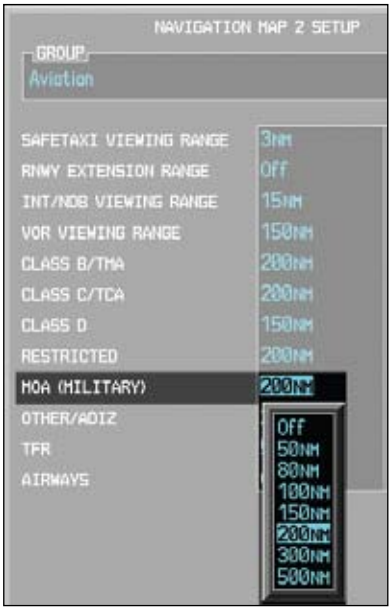


Figure 3-60 Navigation Map MOA (Military) Viewing Range Selection

Other/ADIZ Airspace Viewing Range

The Other/ADIZ airspace viewing range option selects whether Other/ADIZ airspace information is shown on the Navigation Map. Other/ADIZ airspace information will be shown at and below the selected map range. When Off is selected, the information will not be shown. In the example below where 200 NM is selected, Other/ADIZ airspace information will be shown at map ranges of 200 NM and lower.

Figure 3-61 Navigation Map Other/ADIZ Viewing Range Selection

TFR Viewing Range

The Temporary Flight Restriction (TFR) viewing range option selects whether TFR information is shown on the Navigation Map. TFR information will be shown at and below the selected map range. When Off is selected, the information will not be shown. In the example below where 500 NM is selected, TFR information will be shown at map ranges of 500 NM and lower.

Figure 3-62 Navigation Map TFR Viewing Range Selection

Airways

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

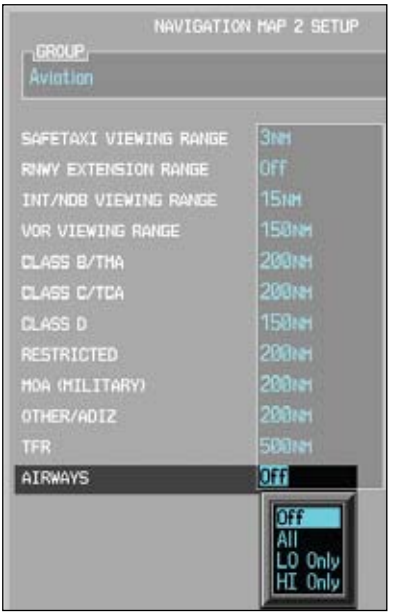


Figure 3-63 Airways Selection

3.3.11 Split Screen (Optional)

External Video is an optional function that displays video provided by an externally mounted video source on the aircraft. The Map Display setup will reflect the setup for MAP PAGE 1 except that TERRAIN, TOPO, and TRAFFIC can be turned on and off separately on this page.

1) While viewing the Map function, turn the small **MFD** knob to the third Navigation Map page.

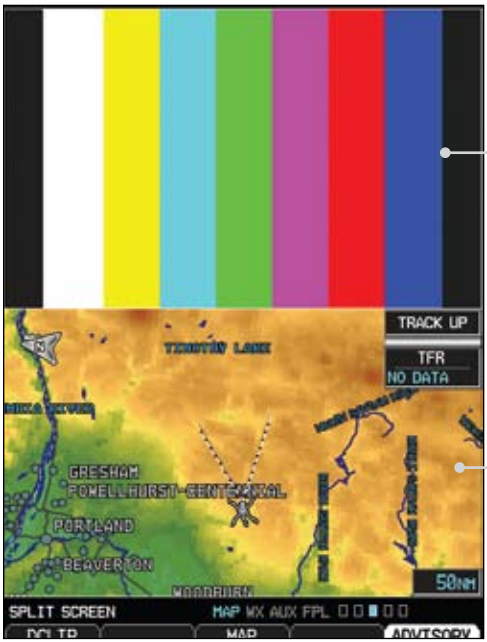


Figure 3-64 External Video

2) The External Video page will show the external video on the top half of the MFD and a Navigation Map will be shown on the lower half.

3.4 Aux Mode Pages

The Aux mode provides pages for System Setup, XM Information (if installed), and system Status.

3.4.1 System Settings

G500H system settings are managed from the Aux Mode System Setup Page. The following settings can be changed:

- Display Brightness (Mode and Level)
- Airspeeds (Glide, V_R, V_X, and V_Y)
- PFD Options (Wind Vector)
- Date/Time (Date, Time, Time Format, and Time Offset)
- MFD Display Units (Distance/Speed and Altitude/Vertical Speed)
- System Display Units (Navigation Angle Reference, Pressure Units, and Temperature Units)

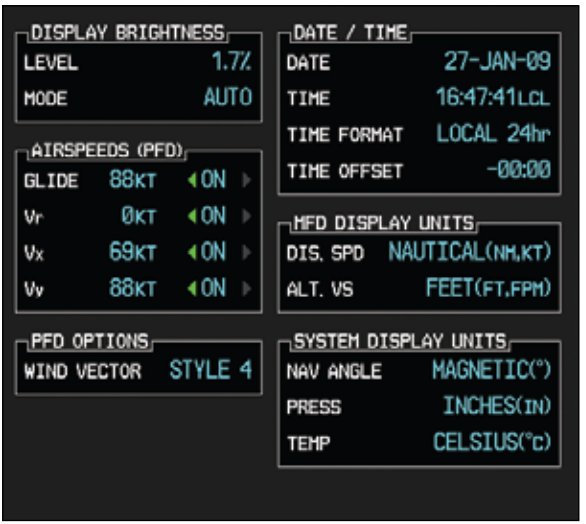


Figure 3-65 Aux Mode System Setup Page

The default values set by the installer during installation are restored by using the Page Menu options. The "Restore Unit Defaults" selection restores all default settings. Pressing the **DFLT UNIT** soft key will also restore the Default Unit settings. The "Restore Airspeed Defaults" selection restores only the Airspeed Reference default settings.

1) While viewing the Aux mode System Setup page, press the **MENU** key.

Figure 3-66 Aux Mode System Setup Page Menu

2) Turn the large or small **MFD** knobs to highlight the desired selection and then press **ENT**.

3.4.1.1 Display Brightness

Display brightness mode may be set to manual or automatic. The automatic mode will set the display brightness based on the ambient light. The manual mode allows the setting of display brightness between 0 and 100%.

1) Turn the large **MFD** knob to reach the AUX page group. Press the small **MFD** knob to activate the cursor.

2) The Level will be highlighted. Turn the small **MFD** knob to select the Display Brightness Level and then press **ENT.**

Figure 3-67 Aux Mode Display Brightness Level Selection

3) If the Level was changed, Manual will be selected. Press the cursor to save the settings. If you press **ENT** the Mode setting will be highlighted.

4) With the Mode value highlighted, turn the small **MFD** knob to select Auto or Manual and then press **ENT.**

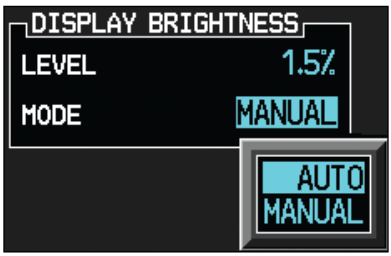


Figure 3-68 Aux Mode Display Brightness Mode Selection

3.4.1.2 Airspeed Reference Marks

The airspeed reference marks for the PFD are adjusted with this function. A marker will appear on the PFD Airspeed tape at the selected speed when the value is set to "On." Default reference airspeeds are set during installation. When power is cycled, the values you set will be reset.

NOTE: *When power is cycled, the Airspeed Reference values are reset. During preflight, the Airspeed Reference values should be checked and set appropriately for the current aircraft configuration and performance.*

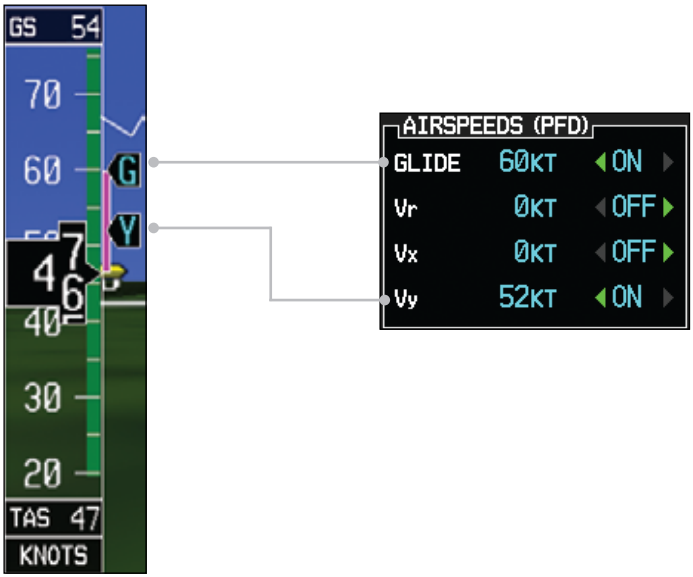


Figure 3-69 Airspeed References shown on PFD when activated

1) While viewing the System Setup page of the AUX page group, press the small **MFD** knob to activate the cursor. Turn the large **MFD** knob to highlight the desired Airspeeds value.
2) Turn the small **MFD** knob to select the value and press **ENT**.
3) The On/Off setting will now be highlighted. Turn the small **MFD** knob to select On or Off and press **ENT**. The next value will be highlighted.

3.4.1.3 PFD Options - Wind Vector

When selected, wind vector information is displayed on the PFD to the left of the HSI. Four styles are available.

1) While viewing the System Setup page of the AUX page group, press the small **MFD** knob to activate the cursor. Turn the large **MFD** knob to highlight the desired Wind Vector value.

2) Turn the small **MFD** knob to select the style and press **ENT**.

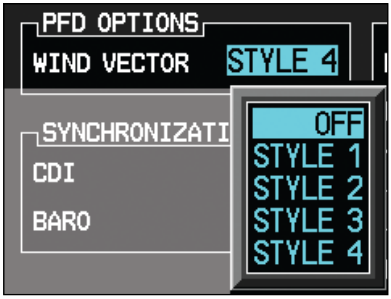


Figure 3-70 Wind Vector Style

3) When a Wind Vector style is selected, a Wind Vector box with the chosen style will be displayed to the left of the HSI on the PFD. When OFF is selected, the Wind Vector box will not be displayed.

3.4.1.4 Date and Time

The Date and Time options allow you to select the time to change UTC time to local time with a time offset.

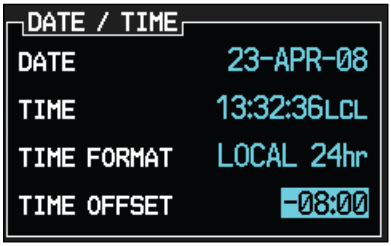


Figure 3-71 Time Format and Offset

Time Zone	Local Standard Time Offset	Local Daylight Savings Time Offset
Atlantic	-4 hours	-3 hours
Eastern	-5 hours	-4 hours
Central	-6 hours	-5 hours
Mountain	-7 hours	-6 hours
Pacific	-8 hours	-7 hours
Alaskan	-9 hours	-8 hours
Hawaiian	-10 hours	-9 hours

Table 3-4 U.S. Time Zone Offsets

1) While viewing the System Setup page of the AUX page group, press the small **MFD** knob to activate the cursor. Turn the large **MFD** knob to highlight "Time Format."
2) Turn the small **MFD** knob to select Local 12hr, Local 24hr, or UTC and then press **ENT**. When Local 12 or 24 hr mode is selected, the Time Offset value will then be highlighted.
3) Turn the small **MFD** knob to select the desired offset and then press **ENT**.

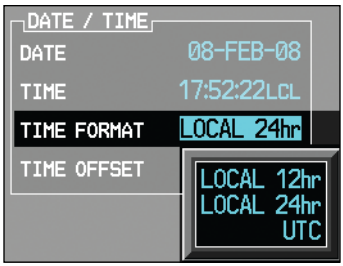


Figure 3-72 Date and Time Values

4) A Time Offset may be entered by using the large and small **MFD** knobs to change the values. Press **ENT** after completing any changes.

5) Press the small **MFD** knob to exit adjustments.

3.4.1.5 MFD Display Units

The MFD Display Units options allow you to select the units of measurement conventions displayed on the MFD. Distance and Speed selections are Imperial, Metric, or Nautical. Altitude and Vertical speed selections are Feet or Meters.

1) While viewing the System Setup page of the AUX page group, press the small **MFD** knob to activate the cursor. Turn the large **MFD** knob to highlight the Distance and Speed (DIS, SPD) units of measurement.

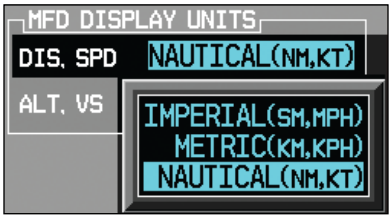


Figure 3-73 Distance and Speed MFD Display Units

2) Turn the small **MFD** knob to select Imperial, Metric, or Nautical and then press **ENT**. The Altitude and Vertical Speed units selection will now be highlighted.

3) Turn the small **MFD** knob to select Feet or Meters and then press **ENT**.

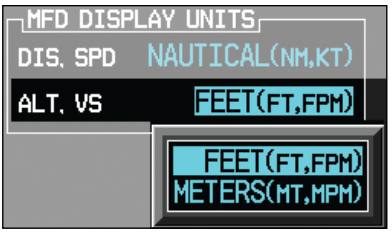


Figure 3-74 Altitude and Vertical Speed MFD Display Units

3.4.1.6 System Display Units

The System Display Units options allows the selection of units to display values for Navigation Angle (Magnetic or True), Barometric Setting (inches or Hectopascals), and Temperature (Fahrenheit or Celsius). Pressing the **DFLT UNIT** soft key will restore the Default Unit settings.

1) While viewing the System Setup page of the AUX page group, press the small **MFD** knob to activate the cursor. Turn the large **MFD** knob to highlight the System Display Units selection titled "Nav Angle."

CAUTION: *The Nav Angle display units (Magnetic or True) must be set to the same type in both the GDU 620 and GNS navigators.*

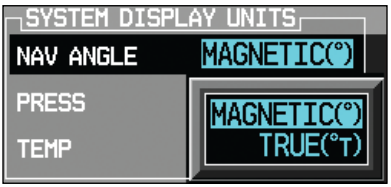


Figure 3-75 Nav Angle System Display Units

2) Turn the small **MFD** knob to select Magnetic or True and then press **ENT**. The Barometric Pressure Setting value will now be highlighted. When True is selected, a "T" will appear to the right of the heading value on the PFD.

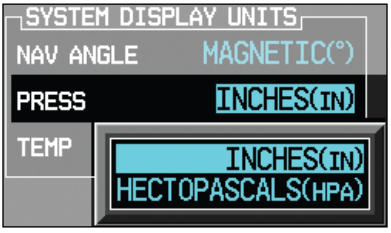


Figure 3-76 Barometric Setting System Display Units

3) Turn the small **MFD** knob to select the Barometric Setting units and then press **ENT**. The Temperature value will now be highlighted.

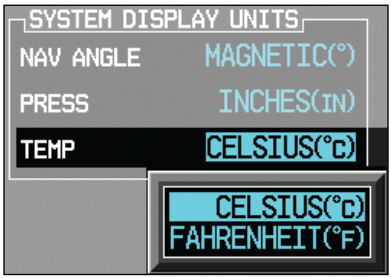


Figure 3-77 Temperature System Display Units

4) Turn the small **MFD** knob to select the Temperature units and then press **ENT**.

3.4.2 XM Information (Optional)

The Aux mode XM Information page displays information about the XM radios, service, and products when the GDL 69/69A is installed and the XM Radio service is activated.

Figure 3-78 XM Information

3.4.3 XM Entertainment Radio (Optional)

Audio entertainment is available through the XM Satellite Radio Service when activated in the optional installation of the GDL 69A. The GDU 620 serves as the display and control head for your remotely mounted GDL 69A. XM Satellite Radio allows you to enjoy a variety of radio programming over long distances without having to constantly search for new stations. Based on signal from satellites, coverage far exceeds land-based transmissions. When enabled, the XM Satellite Radio audio entertainment is accessible in Aux Mode.

The information on the XM Satellite Radio display is composed of four areas: the Active Channel, Available Channels, Category of the highlighted Channel, and the Volume setting. The Active Channel window shows the Channel Name and Number, Artist, Song Title, and Category.

1) Turn the large **MFD** knob to the AUX page group.
2) Turn the small **MFD** knob to the XM Radio page.

Figure 3-79 XM Entertainment Radio

A description of XM Entertainment Radio is provided in Section 5 - Additional Features.

3.4.4 System Status

The System Status Page displays the statuses, serial numbers, and software version numbers for all detected system LRUs. Pertinent information on all system databases is also displayed. Active LRUs are indicated by green check marks; failed LRUs by red "X's." Failed LRUs should be noted and a service center or Garmin-authorized dealer informed.

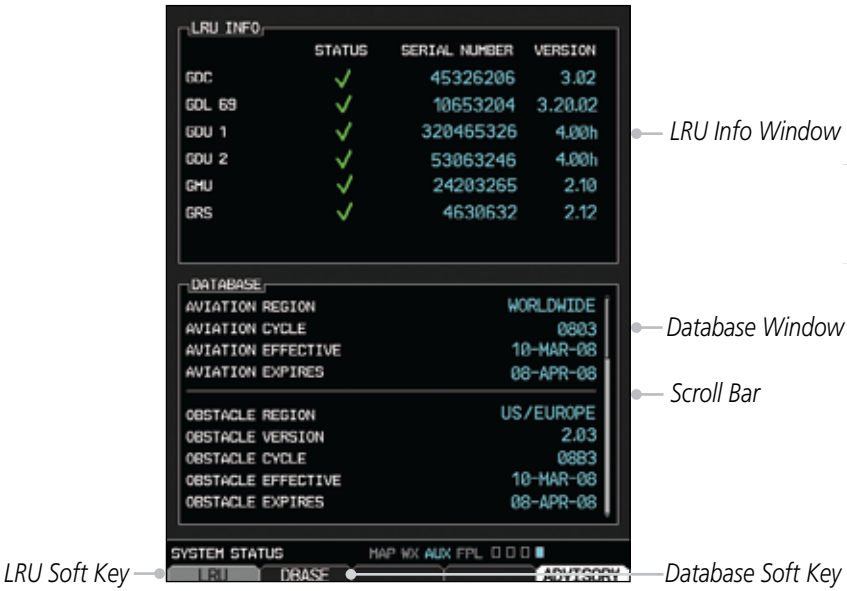


Figure 3-80 LRU and Database Information

1) Turn the large **MFD** knob to the AUX page group.
2) Turn the small **MFD** knob to the System Status page.
3) Press the **LRU** soft key to highlight the first item in the LRU Info window.
4) Turn the small **MFD** knob to scroll through the items in the LRU Info window in case more items are available than are displayed. If more items are available than can be displayed in the window, a scroll bar will show on the right side of the window.
5) Press the **DBASE** soft key to highlight the first item in the Database window.
6) Turn the small or large **MFD** knobs to scroll through the items in the Database window in case more items are available than are displayed. If more items are available than can be displayed in the window, a scroll bar will show on the right side of the window.

3.4.5 External Video (optional)

External Video is an optional function that displays video provided by an externally mounted video source on the aircraft.

1) Turn the large **MFD** knob to the Aux page group.
2) The External Video page is the first page in the Aux page group.

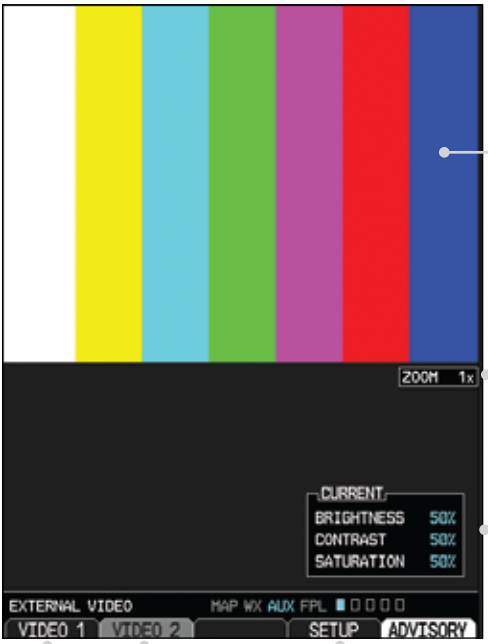


Figure 3-81 External Video

3.4.5.1 Select Video Source

If more than one video source is available, the **Video 1** and **Video 2** soft keys will be available at the bottom of the display.

1) Touch the **Video 1** soft key to select Video 1 source for viewing and setup.
2) Touch the **Video 2** soft key to select Video 2 source for viewing and setup.

3.4.5.2 Zoom

1) While viewing the External Video function, press the **Up Rng Arrow** key to increase the zoom up to 10x magnification. Zoom level is made through digital magnification.
2) Press the **Down Rng Arrow** key to decrease the zoom level down to a minimum of 1x.

3.4.5.3 Panning

1) While viewing the External Video function, press the small **MFD** knob to activate panning.
2) Turn the small **MFD** knob clockwise to pan up (the map will move down).
3) Turn the small **MFD** knob counterclockwise to pan down (the map will move up).
4) Turn the large **MFD** knob clockwise to pan to the right (the map will move left).
5) Turn the large **MFD** knob counterclockwise to pan to the left (the map will move right).
6) Press the small **MFD** knob to exit panning.

3.4.5.4 Setup

The display of each video source is set up individually.

1) While viewing the External Video page, press the soft key for the desired Video source (**Video 1** or **Video 2**).
2) Press the **Setup** soft key.
3) The Current value for Brightness will be selected. Use the following directions for each value.

Figure 3-82 External Video Setup

4) After selecting the desired settings, press the small **MFD** knob or the **Setup** soft key to exit editing.

Brightness Adjustment

1) While viewing the External Video page and the desired Video source, press the **Setup** soft key.

2) The Current value for Brightness will be selected. Turn the small **MFD** knob to adjust the Brightness value.

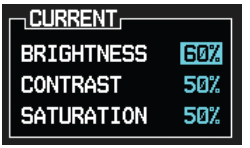


Figure 3-83 External Video Brightness Adjustment

3) After selecting the desired setting, turn the large **MFD** knob to highlight the next value or press the small **MFD** knob to exit editing.

Contrast Adjustment

1) While viewing the External Video page and the desired Video source, press the **Setup** soft key.

2) The Current value for Brightness will be selected. Turn the large **MFD** knob to highlight the Contrast value. Turn the small **MFD** knob to adjust the Contrast value.

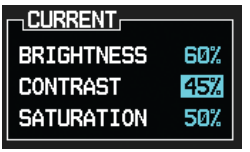


Figure 3-84 External Video Contrast Adjustment

3) After selecting the desired setting, turn the large **MFD** knob to highlight the next value or press the small **MFD** knob to exit editing.

Saturation Adjustment

1) While viewing the External Video page and the desired Video source, press the **Setup** soft key.

2) The Current value for Brightness will be selected. Turn the large **MFD** knob to highlight the Saturation value. Turn the small **MFD** knob to adjust the Saturation value.

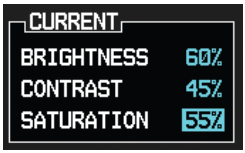


Figure 3-85 External Video Saturation Adjustment

3) After selecting the desired setting, press the small **MFD** knob to exit editing.

3.4.5.5 Restore Defaults

The Restore Defaults selection will return the Brightness, Contrast, and Saturation values to their original settings.

1) While viewing the External Video page, press the **MENU** key.

Figure 3-86 Restore Video Defaults Menu Selection

2) "Restore Defaults" will be highlighted. Press the **ENT** key.

3.4.6 Position Reporting (optional)

Position Reporting is a system which collects system variables and transmits them over the Iridium® Satellite Network at a given interval through the GSR 56.

3.4.6.1 Status

The Status window shows the time until the next data transmission and the status of the reporting system.

NOTE: *Waypoint The GSR 56 does not report its serial number until 90 seconds after power up of the GDU. As a result, for that period, the product info for the GSR 56 will show "Waiting."*

Time Until Transmit

The Time Until Transmit field is a countdown timer that shows the time until the next data transmission. This field is blank when the aircraft is on the ground.

Figure 3-87 Position Reporting Time Until Transmit

Position Reporting Status

Position Reporting will be enabled when the aircraft is in the air.

Status	Description
Idle	The reporting system is not using the GSR 56 for reporting at this time.
Initializing	The GSR 56 and its driver are currently initializing.
Transferring	A position report is currently being transmitted.
Unavailable	The GSR 56 is currently not usable by the reporting system.

Table 3-5 Position Reporting Status

3.4.6.2 Report Type

Standard

When the Standard reporting type is used, the Position Reporting Period may be set to Off or intervals of 2 to 60 minutes. The Automatic Position Reporting Period can be set to Off or periods of 2 minutes.

1) Turn the large **MFD** knob to reach the Aux page group. Turn the small **MFD** knob to reach the Position Reporting page.

2) Press the small **MFD** knob to select the Report Type.

3) Turn the small **MFD** knob to highlight Standard and then press the **ENT** key.

Figure 3-88 Select Standard Reporting

4) The Position Reporting Period type will now be selected. Turn the small **MFD** knob to highlight "Off" or "Automatic" and then press the **ENT.** The Position Reporting Period interval will now be selected.

5) Turn the small **MFD** knob to select the reporting frequency.

Figure 3-89 Select Standard Reporting Period Frequency

6) Press the small **MFD** knob to exit editing.

7) With the Standard Reporting Type, the reporting period may be manually overridden by pressing the **SEND** soft key to send data.

Figure 3-90 Press SEND to Override the Reporting Period

1) While viewing the Position Reporting function, press the small **MFD** knob to select the Report Type.
2) Turn the small **MFD** knob to highlight "AFF" and then press the **ENT.**

Figure 3-91 Select Automatic Flight Following (AFF) Reporting Type

3) Turn the small **MFD** knob to select "OFF" or the default "Every 2 Min" value.

Figure 3-92 Select AFF Reporting Period Frequency

3.5 Flight Plan Pages

Use the Flight Plan page group to view details about your flight plan route. The Flight Plan Function shows the Current Flight Plan that is active in the navigation source displayed on the CDI.

3.5.1 Active Flight Plan Page

The Active Flight Plan box shows all of the legs of your flight plan with the current leg indicated in magenta. Listed are each leg with the Desired Track (DTK), Distance (DIS), and Estimated Time of Arrival (ETA) for the legs. METARs are shown for waypoints in the flight plan. In the Minimums window, the source and selected value are shown. See section 2.4.4 on Minimum Descent Altitude (MDA) or Decision Height (DH) in the PFD section and section 3.5.1.3 for more detail. In the Active Leg Info box in the lower part of the display, the Course with beginning and ending waypoints, Active Leg En Route Safe Altitude (ESA), and Route ESA are shown.

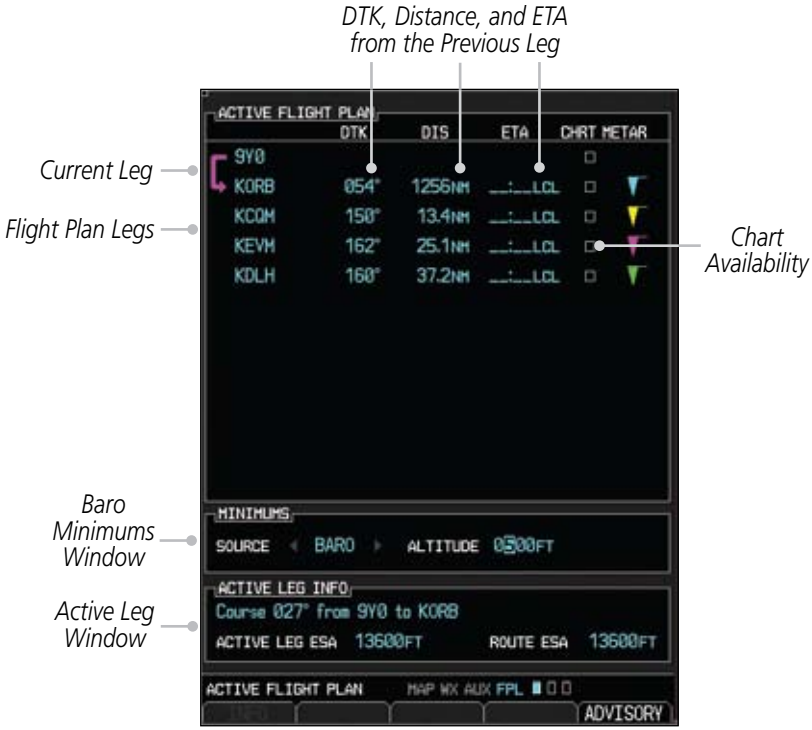


Figure 3-93 Flight Page 1 (Active Flight Plan)

3.5.1.1 Active Flight Plan Detail

The active flight plan is shown on the first page of the Flight Plan page group. Further information may be available for each waypoint as shown by the **INFO** or **WX** soft keys. The **WX** soft key will only appear if a GDL 69/69A is installed and there is an XM Weather subscription.

1) Press the **MFD** knob and then use the large and small **MFD** knobs to highlight waypoints in the flight plan.
2) Press the **INFO** soft key, if available, to view information about the highlighted waypoint.
3) Press the **WX** soft key, if available, to view XM weather information about the highlighted waypoint.
4) Press the small **MFD** knob to return to the Active Flight Plan page.

3.5.1.2 Active Flight Plan Options

The Active Flight Plan page provides information for the flight plan currently in use for navigation.

To change data fields on the Active Flight Plan Page:

1) While viewing the Active Flight Plan Page of the FPL page group, press **MENU** to display the Active Flight Plan Page Options window.
2. Turn the large **MFD** knob to highlight "Change Fields?" and then press **ENT**.

Figure 3-94 Active Flight Plan Page Menu Option Selection

3) Turn the large **MFD** knob to highlight the field you wish to change.

Figure 3-95 Active Flight Plan Page Menu Change Fields Option Selection

4) Turn the small **MFD** knob to select the desired data item and press **ENT**.

5) Press the small **MFD** knob to remove the cursor.

To restore factory default settings for data fields on the Active Flight Plan Page:

1) While viewing the Active Flight Plan Page of the FPL page group, press **MENU** to display the Active Flight Plan Page Options window.

2) Turn the large **MFD** knob to highlight "Restore Defaults?" and then press **ENT**.

Figure 3-96 Active Flight Plan Page Menu Option Selection to Restore Defaults

3.5.1.3 Setting the Altitude Minimums Alerter

1) While viewing the Active Flight Plan Page of the FPL page group, press the small **MFD** knob. Turn the large **MFD** knob to activate the Altitude Minimums Alerter.

2) Turn the large and small **MFD** knobs to change the Altitude Minimums value. Resolution is ten feet.

Figure 3-97 Barometric Minimums Altitude Selection

3) Press **ENT** to activate the selected value.

Alerting is inhibited while the aircraft is on the ground and until the aircraft reaches 150 feet above the MDA. The Minimum altitude will be available in the Altitude Alerter.

In dual installations, the minimums alerting altitude value may be set from either GDU 620 and will be synchronized on both units.

NOTE: *If you highlight the Minimums Altitude field on the FPL page and press the* ***CLR*** *key, it will turn the minimums functionality off.*

3.5.2 Waypoint Information Page

The Waypoint Information page provides details about a particular waypoint. You can show a waypoint by selecting it by Ident, Facility Name, or by City. The Map window shows the selected waypoint in the center of the map. The Range keys zoom in and out on the map. The Info window at the bottom of the display shows the Bearing and Distance from your present position to the selected waypoint as well as its region and Lat/Lon coordinates. The map window is set up with the same parameters as were selected for Navigation Map Page 1.

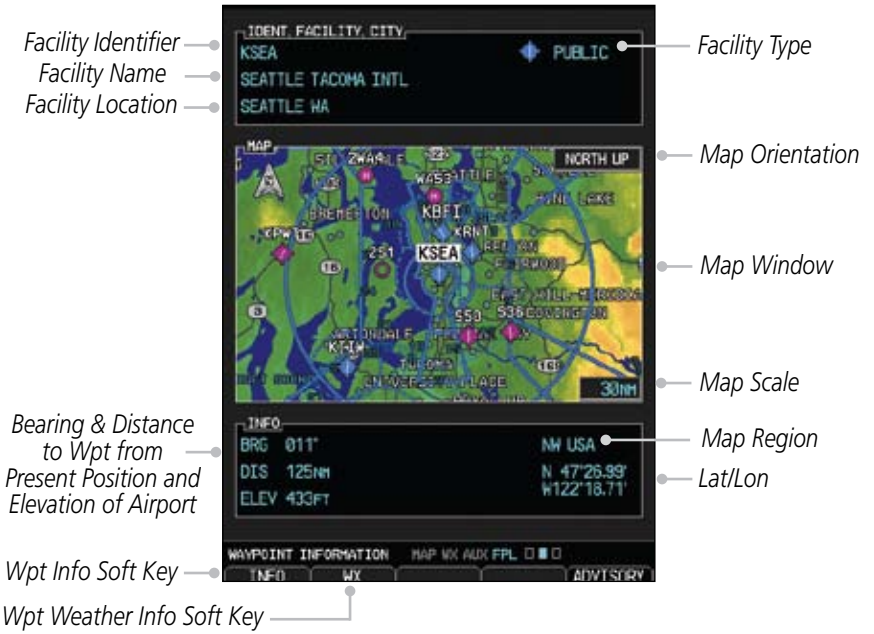


Figure 3-98 Flight Plan Waypoint Information Page

NOTE: *Waypoint information is shown on the second page of the Flight Plan page group.*

3.5.2.1 Selecting a Waypoint

1) While viewing the Waypoint Information page of the FPL page group, press the **MFD** knob and use the large and small **MFD** knobs to move the cursor select the identifier for the waypoint.

Figure 3-99 Waypoint Selection

2) Press the **ENT** key to select the waypoint.

OR

1) While viewing the Waypoint Information page of the FPL page group, press the small **MFD** knob.

2) Turn the small **MFD** knob counterclockwise.

Figure 3-109 Chart Category Selection

3) Turn the small **MFD** knob to show FPL, NRST, or RECENT.

4) Turn the large **MFD** knob to highlight the desired airport, and then press **ENT**.

Figure 3-100 Heliport Waypoint Information Page

OR

1) While viewing the Nav Map 1 or 2 pages of the MAP page group, press the **MFD** knob and use the large and small **MFD** knobs to move the cursor to highlight the identifier for a waypoint.

Figure 3-99 Waypoint Selection

2) Press the **ENT** key to select the waypoint.

3.5.2.2 Waypoint Information Detail

More detailed information about a selected waypoint is available by pressing the **INFO** soft key on the Waypoint Information page. The current destination waypoint is the default item shown. You may select a different Ident, Facility, or Location. In the Runway window, you may view information about the runways available if a highlighted arrow is shown. In the Frequency window, a scroll bar is shown on the right side of the window when more frequencies are available.

Figure 3-101 Flight Plan Waypoint Info Detail

Ident/Facility/City Selection

The current destination Identifier, Facility Type with icon, Facility Name, and City (location) are shown in the top window of the Flight Plan mode Waypoint Information page. The default is the Nearest airport if there is no active flight plan. New Identifiers may also be selected as shown in section 3.5.3.3.

Figure 3-102 Flight Plan Ident/Facility/City Detail

1) While viewing the Waypoint Information page of the FPL page group, press the **INFO** soft key to view Runway and Frequency information about the waypoint.
2) Press the **INFO** soft key again to return to the Map view.

Runway Information Selection

Information is provided for each runway showing the following detail: runway number, runway length, surface type, and the frequency for Pilot-Controlled Lighting (PCL).

Figure 3-103 Waypoint Runway Information

1) While viewing the Waypoint Information page of the FPL page group, press the **INFO** soft key to view information about the waypoint and press the small **MFD** knob to activate the cursor.
2) Use the large **MFD** knob to highlight the Runway and use the small **MFD** knob to display the available runways.
3) Press the small **MFD** knob to cancel editing.

Facility Frequency Selection

The Frequency window at the bottom of the Waypoint Information page shows the frequencies available for the selected waypoint. A scroll bar is shown on the right side of the Frequency window if more frequencies are available.

Figure 3-104 Waypoint Frequency Information

1) While viewing the Waypoint Information page of the FPL page group, press the **INFO** soft key to view information about the waypoint and then press the small **MFD** knob to activate the cursor.
2) Turn the small **MFD** knob to scroll through the available frequencies.
3) Press the small **MFD** knob to exit.

3.5.2.3 Waypoint Weather Information (Optional)

The Weather information function is available if a GDL 69/69A is installed, an XM weather subscription is current, and weather information is available for the selected waypoint. METAR and TAF text are displayed on the Waypoint Weather Information Page. Pressing the **WX** soft key will show the weather information page. METAR data is displayed first in a decoded fashion, then as raw text. TAF information is displayed only in its raw form.

TAF (Terminal Aerodrome Forecast) is the standard format for 24-hour weather forecasts. A TAF typically forecasts significant weather changes, temporary changes, probable changes, and expected changes in weather conditions.

Figure 3-105 Waypoint Weather Information (Textual METARs and TAFs)

1) While viewing the Waypoint Information page of the FPL page group, press the **WX** soft key to view weather information for the waypoint.
2) Use the small **MFD** knob or the large **MFD** knob to scroll through the available information.
3) Press the small **MFD** knob to return to the main Flight Plan page.

3.5.3 Charts Page (Optional)

Charts, when installed, are available in the Flight Plan page group.

1) Turn the large **MFD** knob to the Flight Plan page group.
2) Turn the small **MFD** knob to the Charts page.

NOTE: *There are two options for chart services: FliteCharts or ChartView. FliteCharts displays charts published by the National Aeronautical Charting Office (NACO). ChartView displays charts published by Jeppesen. ChartView charts are geo-referenced, which allows a pink ownship icon to be overlayed on the chart indicating the aircraft location.*

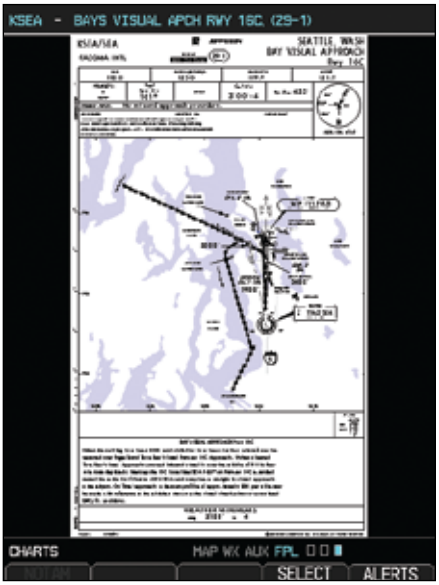


Figure 3-106 Flight Page 3 (Charts)

3.5.3.1 Viewing Charts

The chart for the selected destination airport or approach is automatically loaded.

1) While viewing the Charts page of the FPL page group, press the **RNG** (Range) keys to zoom in and out.

2) After zooming in, you may only see part of the chart. Press the **Small** MFD knob to enter Pan mode and activate scroll bars on the edges of the chart. Turn the large and small **MFD** knobs to move around the chart.

NOTE: *When Panning mode is active, scroll bars will be shown on the right side and bottom of the display.*

3) Press the small **MFD** knob to cancel the scroll bars and exit panning.

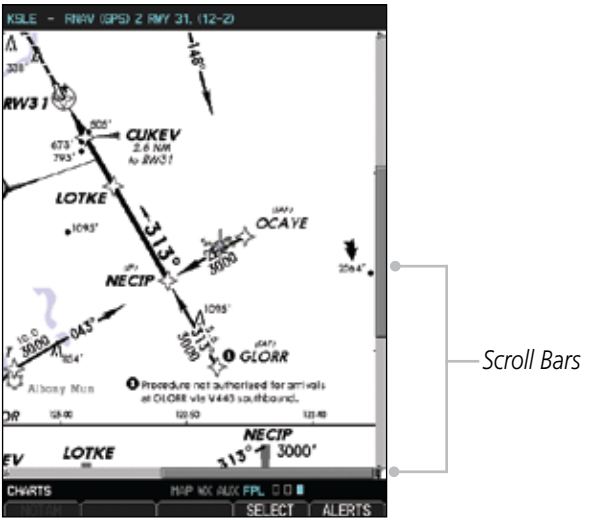


Figure 3-107 Chart Scroll Bars (Charts)

3.5.3.2 Selecting a New Chart by Airport

A chart for a different airport may be chosen by selecting the identifier for the desired airport.

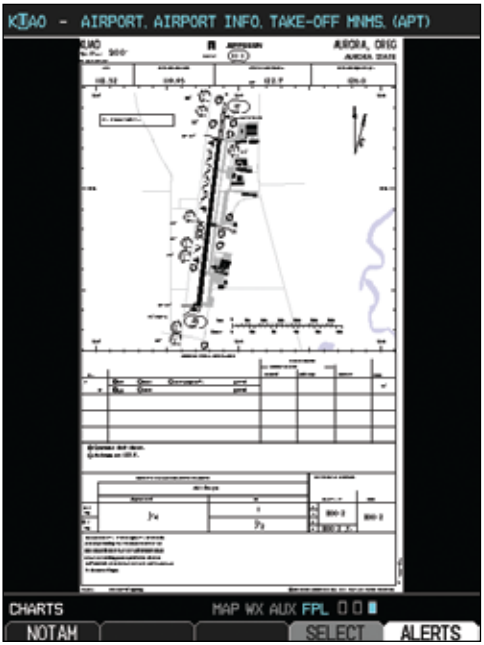


Figure 3-108 Airport Identifier Selection

1) While viewing the Charts page of the FPL page group, press the **SELECT** soft key to change the airport.
2) Use the large **MFD** knob to move the cursor to highlight a character.
3) Use the small **MFD** knob to change the character.
4) Press **ENT** to accept the selected airport.
5) Use the large and small **MFD** knobs to select the desired chart.
6) Press **ENT** to display the desired chart.

3.5.3.3 Selecting a New Chart by FPL, NRST, or RECENT

You may select other charts to display based on your flight plan (FPL), charts of the nearest airport (NRST), or your most recently selected airport (RECENT).

Figure 3-109 Chart Category Selection

1) While viewing the Charts page of the FPL page group, press the **SELECT** soft key.
2) Turn the small **MFD** knob counterclockwise.
3) Turn the small **MFD** knob to show FPL, NRST, or RECENT.
4) Turn the large **MFD** knob to highlight the desired airport, and then press **ENT**.

3.5.3.4 Change Day/Night View

The Chart pages can be displayed on a white or black background for day or night viewing. The Day View offers a better presentation in a bright environment. The Night View gives a better presentation for viewing in a dark environment. The "auto" setting allows the user to set a percentage. This percentage is the backlight value where the charts page will automatically switch between day and night mode. If you set the unit to AUTO 10%, then if the backlight is below 10% it will be in night mode, if above 10% it will be in day mode.

1) While viewing the Charts page of the FPL page group, turn the small **MFD** knob to reach the Charts page.
2) Press **MENU** to display the Options menu.
3) Press **ENT** to display the Chart Setup menu. The Color Scheme option will be highlighted.
4) Turn the small **MFD** knob to select Day - Auto - Night.
5) Press the small **MFD** knob or the **ENT** key to save the selected setting and return to the Charts page.
6) If "Auto" is selected, turn the large **MFD** knob to highlight the Display Level Brightness value. Turn the small **MFD** knob to change the value and then the **ENT** key to save the selected value.

4 HAZARD AVOIDANCE

The G500H hazard avoidance features are designed to provide advisory information of potential hazards to flight safety associated with weather, terrain, and air traffic.

This section is divided into the following groups:

Terrain Avoidance

- Terrain Proximity
- Garmin Terrain-HSVT™ (Optional)

Traffic Avoidance

- Traffic Advisory System (Optional)
- Traffic Information Service (TIS)
  (Optional - GTX 33/330 Transponder required)

Weather

- GDL 69/69A XM® Satellite Weather (Optional)

4.1 Terrain Configurations

During power-up of the G500H, the terrain/obstacle database versions are displayed along with a disclaimer. At the same time, the Terrain system self-test begins. A failure message is issued if the terrain test fails.

Garmin provides the following terrain awareness solutions within the G500H environment:

- TERRAIN-HSVT - Refers to a subset of HTAWS that meets the terrain alerting requirements outlined in Section 7.b of AC 23-26. Terrain-HSVT is a subset of HTAWS that provides a FLTA functionality, including visual alerting and aural alerting. Terrain-HSVT is provided with the Synthetic Vision functionality and not marketed separately.

NOTE: *Terrain-HSVT is not a fully functional HSVT and does not meet the TAWS TSO-C194 requirements.*

- TERRAIN-PROXIMITY - Refers to the display of the relative terrain elevations on the moving map. No aural alerts of any type are provided by a TERRAIN-PROXIMITY configuration.

Terrain Configurations	PFD/MFD Visual Annunciations	MFD Pop-up Alert	Aural Alerting
G500H Terrain Proximity	None	None	None
G500H Terrain Proximity w/ External H-TAWS Unit Installed (500W-series)	PFD annunciations are generated from the External H-TAWS Unit. No MFD Annunciations.	None	Aural alerts are generated from the external HTAWS unit.
G500H w/Terrain-HSVT	Annunciations generated from the G500H.	Generated from the G500H.	Generated from the G500H.
G500H w/ Terrain-HSVT and External H-TAWS Unit Installed (500W-series)	PFD annunciations are generated from the External H-TAWS Unit. MFD Annunciations are generated from the G500H.	Generated from the G500H.	Aural alerts are generated from the external HTAWS unit.

Table 4-1 G500H Terrain Annunciations

NOTE: *Obstacles are removed from the Terrain pages at ranges greater than 10 NM.*

Each of the terrain awareness configurations are detailed in the following sub-sections.

4.2 Terrain Proximity

Garmin TERRAIN Proximity is a non-TSO-C194-certified terrain awareness system provided as a standard feature of GDU 620 to increase situational awareness and help reduce controlled flight into terrain (CFIT). Terrain may be displayed on the Map page group Navigation Map and Terrain pages.

TERRAIN Proximity uses information provided from the GPS receiver to provide a horizontal position and altitude. GPS altitude is derived from satellite measurements. GPS altitude is converted to a Mean Sea Level (MSL)-based altitude (GPS-MSL altitude) and is used to determine TERRAIN alerts. GPS-MSL altitude accuracy is affected by factors such as satellite geometry, but it is not subject to variations in pressure and temperature that normally affect pressure altitude devices. GPS-MSL altitude does not require local altimeter settings to determine MSL altitude. Therefore, GPS altitude provides a highly accurate and reliable MSL altitude source to calculate terrain and obstacle alerts.

TERRAIN Proximity utilizes terrain and obstacle databases that are referenced to mean sea level (MSL). Using the GPS position and GPS-MSL altitude, TERRAIN Proximity displays a 2-D picture of the surrounding terrain and obstacles relative to the position and altitude of the aircraft. In this manner, TERRAIN Proximity provides awareness of terrain and obstacles in the proximity of the aircraft.

TERRAIN-PROXIMITY - is a non-TSO-C194 certified terrain awareness system. Do not confuse Terrain Proximity with HTAWS. HTAWS is TSO-C194 certified and Terrain Proximity is not. Terrain Proximity does not provide warning annunciations or voice alerts, it only provides color indications on map displays when terrain and obstacles are within a certain altitude threshold from the aircraft.

TERRAIN-HSVT is a non-TSO-C194 certified terrain awareness system. Do not confuse TERRAIN-HSVT with HTAWS. HTAWS is TSO-C194 certified and TERRAIN-HSVT is not. TERRAIN-HSVT provides terrain alerting functionality, including visual alerting and aural alerting. TERRAIN-HSVT is provided with the Synthetic Vision functionality and not marketed separately. Garmin TERRAIN-HSVT is available in GDU 620 v4.00 or later, when configured for Rotary Wing and Synthetic Vision enabled.

TERRAIN Proximity requires the following to operate properly:

- The system must have a valid 3-D GPS position solution.
- The system must have a valid terrain/obstacle database.

4.2.1 Displaying Terrain Proximity

The Terrain Proximity page is in the Map page group. Terrain is also selectable on the Navigation Map pages.

1) Turn the Large **MFD** knob to the MAP page group.
2) Turn the small **MFD** knob to the Terrain page.
3) Press the **VIEW** soft key to show the 360 and ARC soft keys.

Figure 4-1 Terrain Page with VIEW Soft Key to reach 360° and 120° Arc Soft Keys

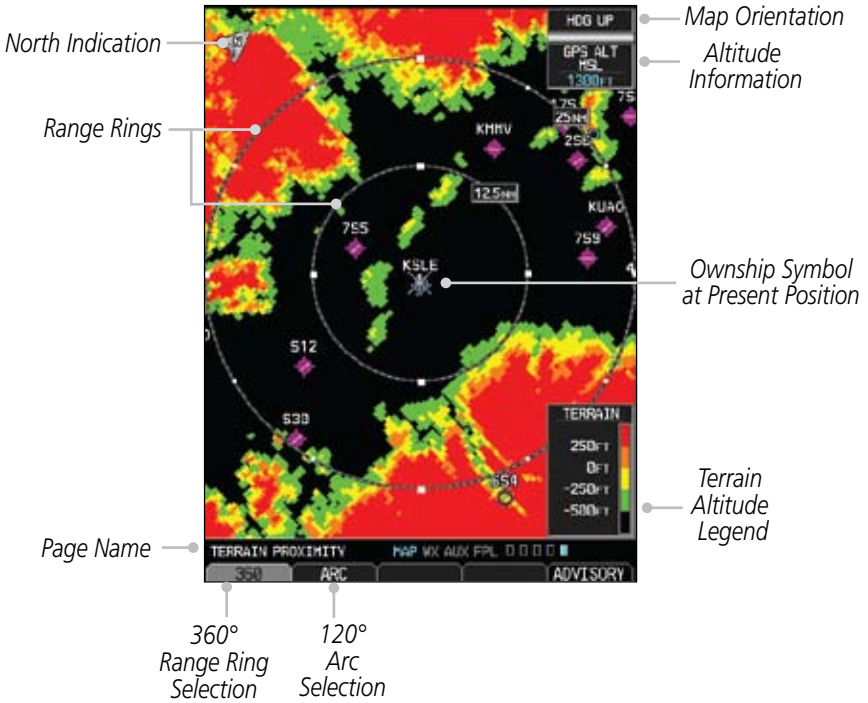


Figure 4-2 Terrain Page with Aviation Data Displayed and 360° View

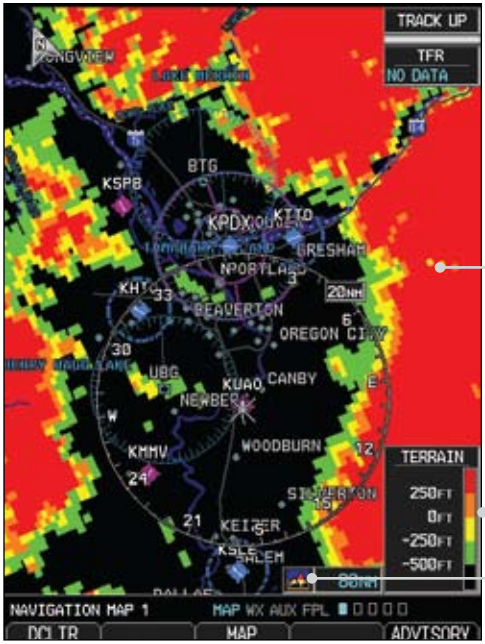


Figure 4-3 Terrain on Navigation Map Page

4.2.1.1 Terrain Proximity Page 120° Arc or 360° Rings

Select the 120º Arc or 360º rings overlay for the Terrain page with either the 360/Arc soft keys or from the Page Menu.

1) Press the **VIEW** soft key to show the 360 and ARC soft keys.
2) Press the **360** or **Arc** soft key.

   OR

   Press **MENU** and the with the View Arc or View 360° selection highlighted press **ENT**.

Figure 4-4 Terrain Page Menu Viewing Selections

Figure 4-5 Terrain Page with 360° Rings

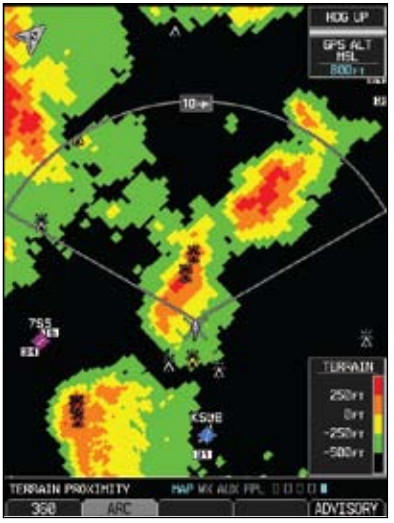


Figure 4-6 Terrain Page with 120° Arc

4.2.1.2 Terrain Proximity Page Aviation Data

Select the display of Aviation data on the Terrain page. The Page Menu selections allow you to hide or show aviation data overlay on the Terrain or the Map Setup options for the Navigation Map pages.

1) While viewing the Terrain page of the MAP page group, press **MENU** for Map selections to hide or show aviation data overlay on the Terrain or the Map Setup options for the Navigation Map pages.

Figure 4-7 Show/Hide Aviation Data on the Terrain Page

2) Press **ENT** to save the highlighted value.

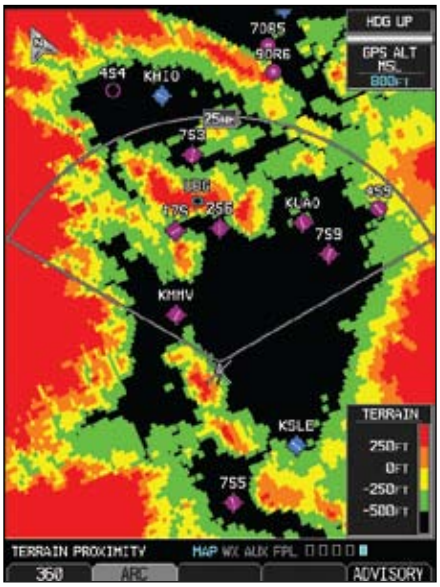


Figure 4-8 Terrain Page with Aviation Data Displayed and 120° Arc View

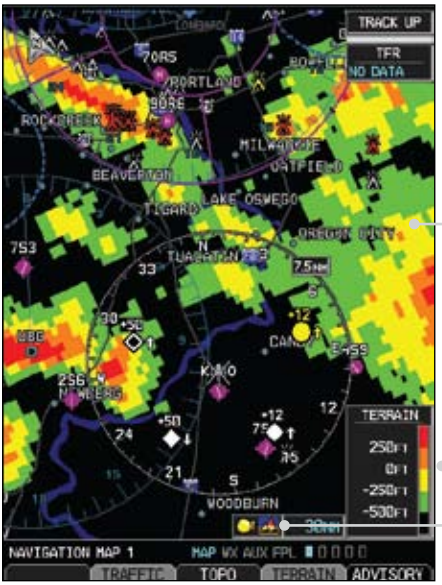


Figure 4-9 Navigation Map Page with Terrain Data Displayed

4.2.2 Terrain Proximity Limitations

TERRAIN Proximity displays terrain and obstructions relative to the altitude of the aircraft. Individual obstructions may be shown if available in the database. However, all obstructions may not be available in the database and data may be inaccurate. Never use this information for navigation or to maneuver to avoid obstacles.

Terrain information is based on terrain elevation information in a database that may contain inaccuracies. Terrain information should be used as an aid to situational awareness. Never use it for navigation or to maneuver to avoid terrain.

TERRAIN uses terrain and obstacle information supplied by government sources. The displayed information should never be understood as being all-inclusive.

NOTE: *The data contained in the TERRAIN databases comes from government agencies. Garmin accurately processes and cross-validates the data but cannot guarantee the accuracy and completeness of the data.*

4.2.3 System Status

The TERRAIN system continually monitors several system-critical items, such as database validity, hardware status, and GPS status. Should the system detect a failure, a failure message will be displayed.

4.3 External H-TAWS

If an external 400W or 500W-series TAWS or H-TAWS unit is installed and interfaced to the G500H, the alerts generated by the external unit will be displayed on the PFD. Refer to the 500W-series Pilot's Guides and/or Addendums for more information regarding these alerts.

An H-TAWS warning received from the GNS 500W Series H-TAWS unit will be displayed to the left and aligned with the top of the Altitude Tape on the G500H PFD. A new warning will flash for approximately five seconds.

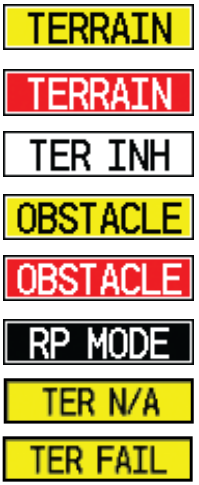


Figure 4-10 H-TAWS Annunciations from a 500W-series Unit

NOTE: *H-TAWS Caution Alerts are displayed as black text on a yellow background; H-TAWS Warning Alerts are displayed as white text on a red background.*

4.4 Garmin Terrain-HSVT™ (Optional)

Garmin Terrain-HSVT™ refers to a subset of HTAWS that meets the terrain alerting requirements outlined in Section 7.b of AC 23-26. Terrain-HSVT is a subset of HTAWS that provides a FLTA functionality with visual alerting and aural alerting. Terrain-HSVT is provided with Garmin Synthetic Vision Technology (SVT™) functionality and not provided separately.

Terrain-HSVT alerting consists of the following alert types:

- Forward Looking Terrain Avoidance (FLTA) Alerting which consists of:
- Required Terrain Clearance (RTC) / Required Obstacle Clearance (ROC) Alerting
- Imminent Terrain Impact (ITI) / Imminent Obstacle Impact (IOI) Alerting

Terrain-HSVT is available in G500H GDU 620 SW version 4.00, and later.

Terrain-HSVT utilizes terrain and obstacle databases that are referenced to mean sea level (MSL). Using the GPS position and GPS-MSL altitude, Terrain-HSVT displays a 2-D picture of the surrounding terrain and obstacles relative to the position and altitude of the aircraft. The GPS position and GPS-MSL altitude are used to calculate and "predict" the aircraft's flight path in relation to the surrounding terrain and obstacles. In this manner, Terrain-HSVT can provide advanced alerts of predicted dangerous terrain conditions. Detailed alert modes are described later in this section.

To function properly Terrain-HSVT requires the use of databases specific to helicopters and Terrain-HSVT. The databases required are:

1) 6 arc-second Terrain Databases
2) Helicopter Obstacle Database
3) Aviation Database including Heliports

4.4.1.1 Garmin Terrain-HSVT™ Page 120° Arc or 360° Rings

Select the 120º Arc or 360º rings overlay for the Terrain page with either the 360/Arc soft keys or from the Page Menu.

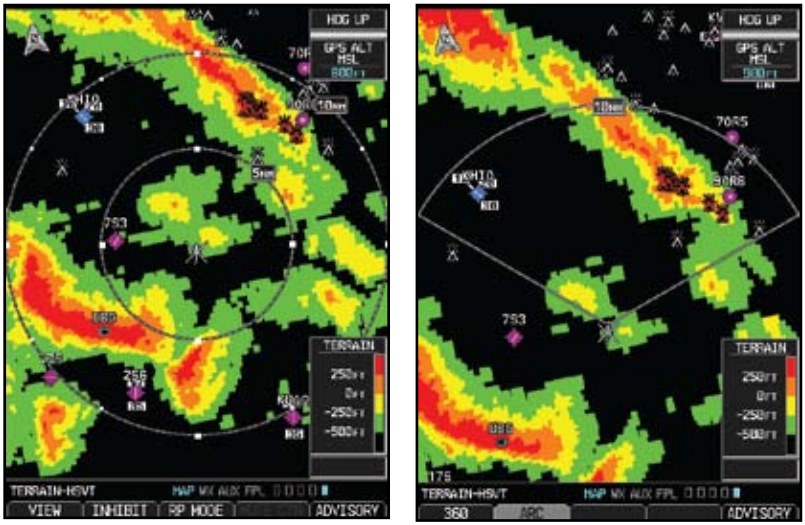


Figure 4-11 Terrain-HSVT 360 and Arc Views

1. Press the **VIEW** soft key and then the **360** or **Arc** soft key.
   OR
2. Press **MENU** and the with the "View Arc" or "View 360°" selection highlighted press **ENT**.

Figure 4-12 Terrain-SVT Page Menu Viewing Selections

4.4.1.2 Garmin Terrain-HSVT™ Page Aviation Data

Select the display of Aviation data on the Garmin Terrain-HSVT page. The Page Menu selections allow you to hide or show aviation data overlay on the Terrain or the Map Setup options for the Navigation Map pages.

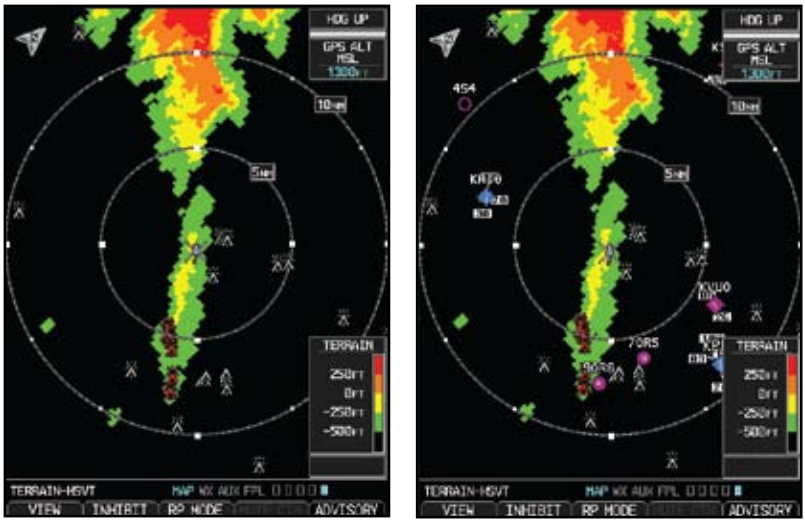


Figure 4-13 Terrain-HSVT Hide and Show Aviation Data

1) While viewing the Terrain page of the MAP page group, press **MENU** for Map selections to hide or show aviation data overlay on the Terrain or the Map Setup options for the Navigation Map pages.

Figure 4-14 Show/Hide Aviation Data on the Terrain-HSVT Page

2) Press **ENT** to save the highlighted value.

4.4.1.3 Inhibiting/Enabling Garmin Terrain-HSVT™ Alerting

Terrain-HSVT also has an inhibit mode that deactivates the aural and visual alerts. Pilots should use discretion when inhibiting Terrain-HSVT and always remember to enable the system when appropriate.

When Terrain HSVT is inhibited the following terrain alerts functions are inhibited

- Aural Alerts
- Pop up alert on MFD
- Annunciator on PFD
- Terrain warning and caution shading on PFD synthetic terrain

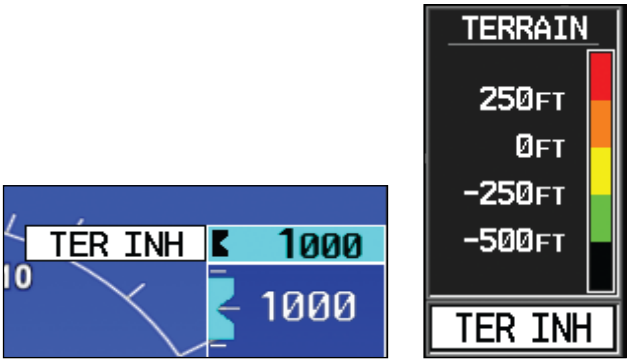


Figure 4-15 Terrain-HSVT Alerting Disabled (Alerts Inhibited) Annunciation (PFD & MFD)

Color	Description
Black	Terrain is more than 500 ft below the aircraft.
Green	Terrain is between 250 ft below and 500 ft below the aircraft.
Yellow	Terrain is between 250 ft below and 0 ft above the aircraft.
Orange	Terrain is between 0 ft above and 250 ft above the aircraft.
Red	Terrain is more than 500 ft above the aircraft.

Table 4-2 Terrain-HSVT Color Codes

1) In MAP page group, turn the small **MFD** knob to reach the HTerrain SVT Page.
2) Press the **INHIBIT** soft key to inhibit or enable Terrain SVT (choice dependent on current state).

   OR

1) Press the **MENU** key.

Figure 4-16 Select Inhibit Terrain-HSVT Alerting (Alerts Will Be Inhibited)

2) Use the large or small **MFD** knob to highlight "Inhibit Terrain" or "Enable Terrain" (choice dependent on current state) and press the **ENT** key.

4.4.1.4 Garmin Terrain-HSVT™ Reduce Protection (RP) Mode

The reduced protection mode functionality allows operating with a reduction in the alerting thresholds, and suppresses visual and aural annunciation of caution alerts. Reduced protection allows low level operations and landings off airport with a minimum number of alerts while continuing to provide protection from terrain and obstacles. Reduced Protection should only be selected when operating in visual contact with the terrain as alerting times are significantly less than in normal mode.

Enable or disable Reduce Protection (RP) Mode on the Garmin Terrain-HSVT page. The Page Menu selections allow you to hide or show aviation data overlay on the Terrain Map page.

The MFD Terrain Scale will show a "RP" annunciation when RP Mode is enabled. The "RP" annunciation will also be shown in the upper right corner of the PFD.

Figure 4-17 MFD and PFD RP Mode Annunciation

1) While viewing the Terrain page of the MAP page group, press **MENU** for Map selections to enable or disable RP Mode on the Terrain page.

Figure 4-18 Enable or Disable RP Mode on the Terrain-HSVT Page

2) Press **ENT** to save the highlighted value.

OR

1) While viewing the Terrain page of the MAP page group, press the **RP** soft key to enable or disable RP Mode on the Terrain page.

Figure 4-19 Enable or Disable RP Mode on the Terrain-HSVT Page

2) Press the **RP** soft key to toggle RP Mode on and off.

4.4.1.5 Synthetic Vision Alerts and Annunciations

Terrain-HSVT alerts employ a CAUTION or a WARNING alert severity level, or both. When an alert is issued, visual annunciations are displayed and aural alerts are simultaneously issued.

When an alert is issued, annunciations appear on the PFD and MFD (Terrain-HSVT page only). The TERRAIN Alert Annunciation is shown to the upper left of the Altimeter on the PFD and below the Terrain Legend on the MFD. If the Terrain-HSVT page is not displayed at the time, a pop-up alert appears on the MFD.

To acknowledge the pop-up alert:

Press the **CLR** key (returns to the currently viewed page)

OR

Press the **ENT** key (accesses the Terrain-HSVT Page)

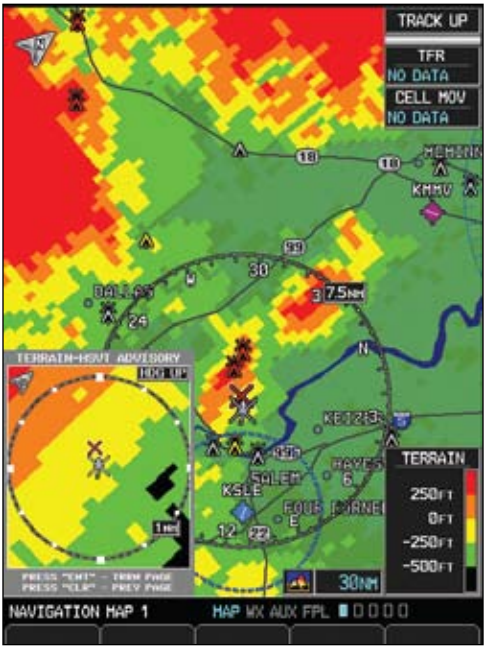


Figure 4-20 Terrain-SVT Advisory Pop-Up on the MFD

Alert Type	PFD/MFD Alert Annunciation	Aural Message
GPS signal re-established	None	"Terrain System Available"
Terrain System Test Successful	None	"Terrain System test OK"
Terrain System Test in Progress	TER TEST	None
Terrain Alerting is disabled	TER INH	None
No GPS position Excessively degraded GPS signal	TER N/A	"Terrain System Not Available"
Terrain SVT System Test Fail	TER FAIL	"Terrain System Failure"

Table 4-3 Terrain-SVT System Test Status Annunciations

Alert Type	PFD/MFD Alert Annunciation	Aural Message
FLTA Terrain Caution (RTC-C, ITI-C)	TERRAIN	"Caution, Terrain, Terrain"
FLTA Terrain Warning (RTC-W, ITI-W)	TERRAIN	"Warning, Terrain, Terrain"
FLTA Obstacle Caution (ROC-C, IOI-C)	OBSTACLE	"Caution, Obstacle, Obstacle"
FLTA Obstacle Warning (ROC-W, IOI-W)	OBSTACLE	"Warning, Obstacle, Obstacle"

Table 4-4 Terrain-HSVT Alerts Summary

4.4.1.6 Mute Caution Alerts

Aural Caution Alert, when present, may be suppressed by pressing the **MUTE CTN** soft key or selecting Mute Caution Alerts from the Menu.

To Mute or Unmute Caution Alerts:

1) When the MUTE CTN soft key label is present, press the **MUTE CTN** key (Aural Caution Alerts will be muted).

OR

2) Press the **MENU** key, select Mute Caution Alerts, and press **ENT**.

Figure 4-21 Mute and Unmute Caution Alerts

4.4.1.7 SVT Alerts When Terrain Inhibited

If the pilot desires to retain the Terrain warning shading on PFD synthetic terrain even when Terrain HSVT is inhibited then select the Enable SVT Terrain Alerts When Inhibited menu option.

To Enable or Disable SVT Terrain Alerts When Terrain Is Inhibited:

1) While viewing the Terrain-HSVT page of the MAP page group, press the **MENU** key.
2) Highlight Disable SVT Terrain Alerts When Inhibited and press **ENT**.

Figure 4-22 Enable/Disable SVT Terrain Alerts When Inhibited

4.5 TAS Traffic (Optional)

NOTE: *TIS and TAS are mutually exclusive.*

Refer to the appropriate Traffic Advisory System's Pilot's Guides for a detailed discussion of the respective traffic advisory system.

The type of traffic systems that is installed is described by the Traffic Page soft keys. If a Traffic Advisory System (TAS) is configured, a **STANDBY**, **OPERATE**, **TEST**, and **ALT MODE** soft key will be displayed.

NOTE: *Aircraft without an operating transponder are invisible to both Traffic Advisory Systems (TAS) and TIS. Aircraft without altitude reporting capability are shown without altitude separation data or climb descent indication.*

NOTE: *Traffic is also displayed in the SVT feature on the PFD.*

4.5.1 Displaying and Operating Traffic (TAS Systems)

The unit must be in operating mode for traffic to be displayed. The ability to switch from standby to operating mode on the ground is especially useful for scanning the airspace around the airport before takeoff.

4.5.1.1 Switching from Standby Mode to Operating Mode

1) While viewing the Traffic page of the MAP page group, select the **OPERATE** soft key or press the **MENU** key and turn the small **MFD** knob to select Operating Mode.
2) To switch to Standby Mode from the Traffic Page, select the **STANDBY** soft key.
3) Select the **ALT MODE** soft key to change the altitude volume.
4) Select the **STANDBY** soft key to place the system in the Standby mode. STANDBY is displayed in the Traffic mode field.

NOTE: *Not all TAS systems can be set to "Standby" mode while in the air.*

The Traffic Map Page shows surrounding TAS traffic data in relation to the aircraft's current position and altitude without basemap clutter. Aircraft orientation is always heading up unless no valid heading is received. The traffic mode and altitude display mode are annunciated in the upper left corner.

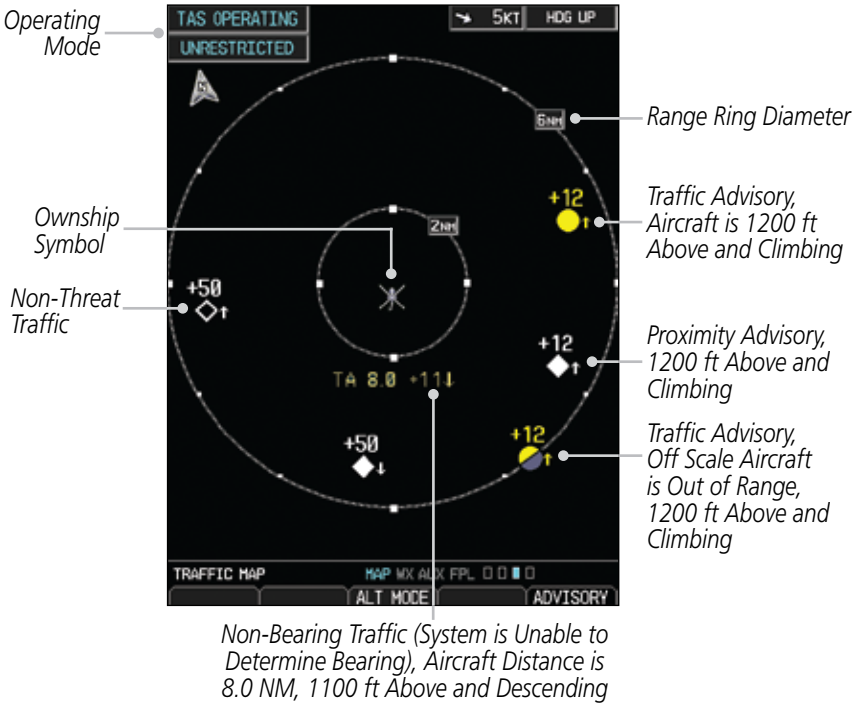


Figure 4-23 Traffic Map Page - TAS

4.5.1.2 Range Ring

Pressing the **RNG** keys will zoom in and out in preset steps depending on the installed equipment as shown in the following table.

Traffic Device	Map Ranges
Garmin GTS 800, Skywatch (SKY497/ SKY889)	2 NM, 6 NM, 12 NM
Garmin GTS 820 and 850, Honeywell KTA 810 TAS, KTA 910 TAS, KMH 820 IHAS, KMH 920 IHAS, and Avidyne TAS 620 (Ryan 9900BX)	2 NM, 6 NM, 12 NM, 24 NM, 40 NM

Table 4-5 Available Traffic Range Ring Steps

4.5.2 Altitude Display

Changing the altitude display mode

1) While viewing the Traffic page of the MAP page group, press the **OPERATE** soft key to begin displaying traffic. "TAS OPERATING" is displayed in the Traffic mode field.

2) Press the **ALT MODE** soft key to change the altitude volume. Select the desired altitude volume by pressing the **BELOW**, **NORMAL**, **ABOVE**, or **UNREST** (unrestricted) soft keys. The selection is displayed in the Altitude mode field.

Altitude Mode	Displayed Traffic Range
Below	-9700 ft to 2700 ft
Normal	-2700 ft to 2700 ft
Above	-2700 ft to 9700 ft
Unrestricted	All Traffic Shown

Table 4-6 Displayed Traffic Range

3) Press the **STANDBY** soft key to place the system in the Standby mode.

OR

1) Press the **MENU** key.

2) Turn the small **MFD** knob to select one of the following:

- BELOW
- NORMAL
- ABOVE
- UNREST (unrestricted)

3) Select the **ENT** key.

4.5.3 TAS Symbology

Traffic Advisory System (TAS) is designed to help in detection and avoidance of other aircraft. TAS uses an on-board interrogator-processor to detect traffic. Only aircraft with operating transponders will be detected. Traffic is displayed according to TCAS symbology using four different symbols.

TAS Symbol	Description
	Non-Threat Traffic (intruder is beyond 5 NM and greater than 1200 ft vertical separation)
	Proximity Advisory (PA) (intruder is within 5 NM and less than 1200 ft vertical separation)
	Traffic Advisory (TA) (closing rate, distance, and vertical separation meet TA criteria)
	Traffic Advisory Off Scale

Table 4-7 Traffic Symbol Description

A Non-Threat Advisory, shown as an open white diamond, indicates that an intruding aircraft is at greater than ±1200 feet relative altitude or the distance is beyond five NM.

A Proximity Advisory indicates that the intruding aircraft is within ±1200 feet and is within five NM range, but is still not considered a threat.

A Traffic Advisory (TA) alerts the crew to a potentially hazardous intruding aircraft. Closing rate, distance, and vertical separation meet TA criteria. A Traffic Advisory that is beyond the selected display range is indicated by a half TA symbol at the edge of the screen at the relative bearing of the intruder.

4.5.4 Traffic System Status

NOTE: *Refer to the equipment documentation for information on the self-test and operating modes.*

The traffic mode is indicated in the upper left corner of the Traffic Map Page.

Mode	Traffic Mode Annunciation (Traffic Map Page)	Traffic Display Enabled Icon (Other Maps)
TAS Self-test Initiated	TEST	
TAS Operating	OPERATING	
TAS Standby	STANDBY (also shown in white in center of page)	
TAS Failed*	FAIL	

Table 4-8 TAS Modes

If the unit fails, an annunciation as to the cause of the failure is shown in the center of the Traffic Map Page.

Traffic Map Page Annunciation	Description
NO DATA	Data is not being received from the TAS unit
DATA FAILED	Data is being received from the TAS unit, but the unit is self-reporting a failure
FAILED	Incorrect data format received from the TAS unit

Table 4-9 TAS Failure Annunciations

The annunciations to indicate the status of traffic information appear in a banner at the lower left corner of maps on which traffic can be displayed.

Traffic Status Banner Annunciation	Description
TA OFF SCALE*	A Traffic Advisory is outside the selected display range Annunciation is removed when traffic comes within the selected display range
TA X.X ± XX ↕**	System cannot determine bearing of Traffic Advisory Annunciation indicates distance in NM, altitude separation in hundreds of feet, and altitude trend arrow (climbing/descending)
TRFC FAIL	TAS unit has failed (unit is self-reporting a failure or sending incorrectly formatted data)
NO TRFC DATA	Data is not being received from the TAS unit

**Shown as symbol on Traffic Map Page*
***Shown in center of Traffic Map Page*

Table 4-10 TAS Traffic Status Annunciations

4.5.5 Traffic Pop-Up

When the GDU 620 MFD is displaying any page (other than the NAV Traffic page) and a traffic alert becomes active, the Traffic Warning pop-up will be displayed.

NOTE: *The traffic pop-up will not appear when your aircraft is on the ground.*

Press **ENT** to go directly to the Traffic page.

OR

Press **CLR** to return to the previously viewed page.

Traffic Pop-Up

Figure 4-24 Traffic Pop-Up

4.6 TIS Traffic (Optional)

WARNING: *The Traffic Information Service (TIS) is intended for advisory use only. TIS is intended to help the pilot locate traffic visually. It is the responsibility of the pilot to see and maneuver to avoid traffic.*

NOTE: *TIS is available only when the aircraft is within the service volume of a TIS-capable terminal radar site. Aircraft without an operating transponder are invisible to both Traffic Advisory Systems (TAS) and TIS. Aircraft without altitude reporting capability are shown without altitude separation data or climb descent indication.*

NOTE: *TIS and TAS are mutually exclusive.*

NOTE: *Traffic is also displayed in the SVT feature on the PFD.*

The type of traffic systems that is installed is determined by the traffic page soft keys.

- If Traffic Information Service (TIS) is configured, a **STANDBY** and **OPERATE**, soft key will be displayed.

Traffic Information Service (TIS) is designed to help in detection and avoidance of other aircraft. TIS uses the Mode S transponder for the traffic data link. TIS receives traffic information from ground stations, and is updated every five seconds. The GDU 620 displays up to eight traffic targets within a 7.5 NM radius, from 3000 feet below to 3500 feet above the requesting aircraft. Traffic is displayed according to TCAS symbology using three different symbols.

4.6.1 Traffic Map Page

The Traffic Map Page is configured to show surrounding TIS traffic data in relation to the aircraft's current position and altitude, without clutter from the basemap. Aircraft orientation on this map is always heading up unless there is no valid heading.

The traffic mode is annunciated in the upper left corner of the Traffic Map Page. When the aircraft is on the ground, TIS automatically enters Standby Mode. Once the aircraft is airborne, TIS switches from Standby to Operating Mode and the GDU 620 begins to display traffic information.

Displaying traffic on the Traffic Map Page

1) Turn the large **MFD** knob to select the Map Page Group.
2) Turn the small **MFD** knob to select the Traffic Map Page.
3) Confirm TIS is in Operating Mode:

   Select the **OPERATE** soft key to begin displaying traffic.

   OR

1) Press the **MENU** key.
2) Select Operate Mode (shown if TIS is in Standby Mode) and then press the **ENT** key.

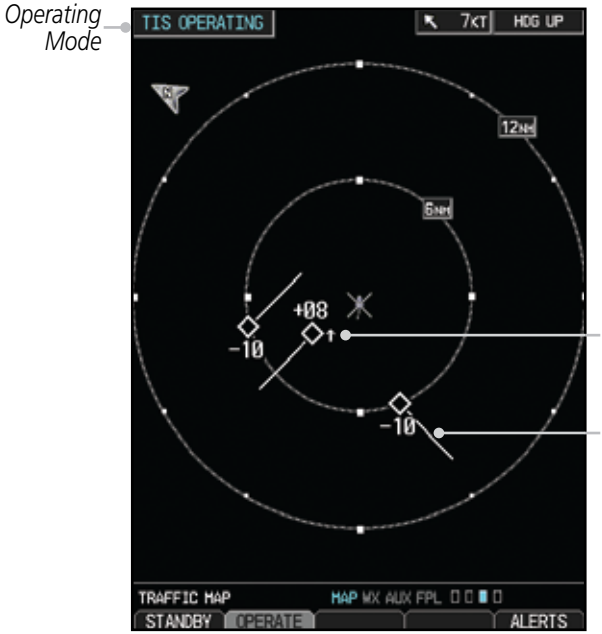


Figure 4-25 Traffic Map Page - TIS

4.6.2 TIS Symbology

TIS Symbol	Description
	Non-Threat Traffic
	Traffic Advisory (TA)
	Traffic Advisory Off Scale

Table 4-11 TIS Traffic Symbols

A Non-threat Advisory, shown as an open white diamond, indicates that an intruding aircraft is at greater than ±1200 feet relative altitude or the distance is beyond five NM.

A Traffic Advisory (TA) alerts the crew to a potentially hazardous intruding aircraft. Closing rate, distance, and vertical separation meet TA criteria. A Traffic Advisory that is beyond the selected display range is indicated by a half TA symbol at the edge of the screen at the relative bearing of the intruder.

TIS also provides a vector line showing the direction in which the traffic is moving, to the nearest 45º. Traffic information for which TIS is unable to determine the bearing (non-bearing traffic) is displayed in the center of the Traffic Map Page or in a banner at the lower left corner of maps other than the Traffic Map Page on which traffic can be displayed.

The altitude difference between the requesting aircraft and other intruder aircraft is displayed above/below the traffic symbol in hundreds of feet. If the other aircraft is above the requesting aircraft, the altitude separation appears above the traffic symbol; if below, the altitude separation appears below. Altitude trend is displayed as an up/down arrow (for speeds greater than 500 fpm in either direction) to the right of the target symbol. Traffic symbols for aircraft without altitude reporting capability appear without altitude separation or climb/descent information.

4.6.3 TIS Limitations

NOTE: *This section on TIS Limitations is not comprehensive. Garmin recommends the user review the TIS Limitations section of the Aeronautical Information Manual, Section 1-3-5.*

TIS is NOT intended to be used as a collision avoidance system and does not relieve the pilot of responsibility to "see and avoid" other aircraft. TIS should not be used for avoidance maneuvers during IMC or other times when there is no visual contact with the intruder aircraft. TIS is intended only to assist in visual acquisition of other aircraft in VMC. No recommended avoidance maneuvers are provided for, nor authorized, as a direct result of a TIS intruder display or TIS advisory.

While TIS is a useful aid to visual traffic avoidance, it has some system limitations that must be fully understood to ensure proper use. Many of these limitations are inherent in secondary radar surveillance. In other words, the information provided by TIS will be no better than that provided to ATC. TIS will only display aircraft with operating transponders installed.

TIS relies on surveillance of the Mode S radar, which is a "secondary surveillance" radar similar to the ATCRBS. TIS operation may be intermittent during turns or other maneuvering. TIS is dependent on two-way, "line-of-sight" communication between the aircraft and the Mode S radar. Whenever the structure of the client aircraft comes between the transponder antenna (usually located on the underside of the aircraft) and the ground-based radar antenna, the signal may be temporarily interrupted. Other limitations and anomalies associated with TIS are described in the AIM, Section 1-3-5.

Garmin is not responsible for Mode S geographical coverage. Operation of the ground stations is the responsibility of the FAA. Refer to the Aeronautical Information Manual for a Terminal Mode S Radar Site Map covering the U.S.

NOTE: *TIS will be unavailable at low altitudes in many areas of the U.S., particularly in mountainous regions. Also, when flying near the "floor" of radar coverage in a particular area, intruders below the client aircraft may not be detected by TIS.*

TIS information is collected one radar scan prior to the scan during which the uplink occurs. Therefore, the surveillance information is approximately five seconds old. In order to present the intruders in a "real time" position, the TIS ground station uses a "predictive algorithm" in its tracking software. This algorithm uses track history data to extrapolate intruders to their expected positions consistent with the time of display in the cockpit. Occasionally, aircraft maneuvering will cause this algorithm to induce errors in the display. These errors primarily affect relative bearing information and traffic target track vector (it will lag); intruder distance and altitude will remain relatively accurate and may be used to assist in "see and avoid." Some of the more common examples of these errors follow:

- When client or intruder aircraft maneuvers excessively or abruptly, the tracking algorithm may report incorrect horizontal position until the maneuvering aircraft stabilizes.
- When a rapidly closing intruder is on a course that crosses the client aircraft course at a shallow angle (either overtaking or head on) and either aircraft abruptly changes course within 0.25 NM, TIS may display the intruder on the opposite side of the client than it actually is.

These are relatively rare occurrences and will be corrected in a few radar scans once the course has stabilized.

4.6.4 TIS Alerts

When the number of Traffic Advisories (TAs) on the Traffic Map Page increases from one scan to the next, the following occur:

- A single "Traffic" voice alert is generated.
- A TRAFFIC Annunciation appears to the top left of the Attitude Indicator on the PFD, flashing for 5 seconds and remaining displayed until no TAs are detected in the area.

To reduce the number of nuisance alerts due to proximate aircraft, the "Traffic" voice alert is generated only when the number of TAs increases. For example, when the first TA is displayed, a voice and visual annunciation are generated. As long as a single TA remains on the display, no additional voice alerts are generated. If a second TA appears on the display or if the number of TAs initially decreases and then subsequently increases, another voice alert is generated.

A "Traffic Not Available" (TNA) voice alert is generated when the TIS service becomes unavailable or is out of range.

Traffic may not be displayed in the radar coverage area due to the following:

- Radar site TIS Mode S sensor is not operational or is out of service.
- Traffic or requesting aircraft is beyond the maximum range of the TIS-capable Mode S radar site.
- Traffic or requesting aircraft is above the radar site in the cone of silence and out of range of an adjacent site.
- Traffic or requesting aircraft is below radar coverage. In flat terrain, the coverage extends from about 3000 feet upward at 55 miles. Terrain and obstacles around the radar site can further decrease radar coverage in all directions.
- Traffic does not have an operating transponder.

4.6.5 Traffic Pop-Up

When the GDU 620 MFD is displaying any page (other than the NAV Traffic page) and a traffic alert becomes active, the Traffic Warning pop-up will be displayed.

NOTE: *The traffic pop-up will not appear when your aircraft is on the ground.*

Press **ENT** to go directly to the Traffic page.

OR

Press **CLR** to return to the previously viewed page.

Traffic Pop-Up

Figure 4-26 Traffic Pop-Up

4.6.6 TIS System Status

The GDU 620 performs an automatic test of TIS during power-up. If TIS passes the test, TIS enters Standby Mode on the ground or Operating Mode in the air. If TIS fails the power up test, an annunciation is shown in the center of the Traffic Map Page.

Traffic Map Page Annunciation	Description
NO DATA*	Data is not being received from the transponder
DATA FAILED*	Data is being received from the transponder, but a failure is detected in the data stream
FAILED*	The transponder has failed
UNAVAILABLE	TIS is unavailable or out of range

** Contact a service center or Garmin dealer for corrective action*

Table 4-12 TIS Failure Annunciations

The traffic mode is annunciated in the upper left corner of the Traffic Map Page. When the aircraft is on the ground, TIS automatically enters Standby Mode. If traffic is selected for display on another map while Standby Mode is selected, the traffic display enabled icon is crossed out (also the case when TIS has failed). Once the aircraft is airborne, TIS switches to Operating Mode and traffic information is displayed. The mode can be changed manually using soft keys or the page menu.

Mode	Traffic Mode Annunciation (Traffic Map Page)	Traffic Display Enabled Icon (Other Maps)
TIS Operating	OPERATING	
TIS Standby	STANDBY (Also shown in white in center of page)	
TIS Failed*	FAIL	

Table 4-13 TIS Modes

Switching Between TIS Operating Modes

1) Turn the large **MFD** knob to the MAP page group and then turn the small **MFD** knob to the Traffic Map Page.
2) Select the **STANDBY** or **OPERATE** soft key to switch between modes. The mode is displayed in the upper left corner of the Traffic Map Page.

OR

1) Press the **MENU** key.
2) Select Operate mode or Standby mode whether airborne or on the ground.
3) Press the **ENT** key.

The annunciations indicate the status of traffic information appear in a banner at the lower left corner of maps on which traffic can be displayed.

Traffic Status Banner Annunciation	Description
TA OFF SCALE*	A Traffic Advisory is outside the selected display range Annunciation is removed when traffic comes within the selected display range
TA X.X ± XX ↕**	System cannot determine bearing of Traffic Advisory Annunciation indicates distance in NM, altitude separation in hundreds of feet, and altitude trend arrow (climbing/descending)
AGE MM:SS	Appears if traffic data is not refreshed within 6 seconds If after another 6 seconds data is not received, traffic is removed from the display The quality of displayed traffic information is reduced as the age increases
TRFC COAST	The displayed data is not current (6 to 12 seconds since last message) The quality of displayed traffic information is reduced when this message is displayed

TRFC RMVD	Traffic is removed because it is too old for coasting (12 to 60 seconds since last message) Traffic may exist within the selected display range, but it is not displayed
TRFC FAIL	Traffic data has failed
NO TRFC DATA	Traffic has not been detected
TRFC UNAVAIL	The traffic service is unavailable or out of range

**Shown as symbol on Traffic Map Page*
***Shown in center of Traffic Map Page*

Table 4-14 TIS Traffic Status Annunciations

4.7 XM Weather (Optional)

The primary map for viewing XM Weather data are the Weather Data Link Pages in the Map Page Group. These are the only GDU 620 map displays capable of all available XM weather products. The Wx Weather pages may be oriented to either Track Up or North Up.

4.7.1 Using XM Satellite Weather Products

When a weather product is active on the Weather Data Link Page or the Navigation Map Page, the age of the data is displayed on the screen. The age of the product is based on the time difference between when the data was assembled on the ground and the current GPS time. Weather products are refreshed at specific intervals (defined in the Refresh Rate column).

If for any reason, a weather product is not refreshed within the 30, 60, 90, or 120 minute Expiration Time intervals, the data is considered expired and is removed from the display. This ensures that the displayed data is consistent with what is currently being broadcast by XM Satellite Radio services. If more than half of the expiration time has elapsed from the time the data is received, the color of the product age displayed changes to yellow.

4.7.2 Customizing the XM Weather Map

Each Wx Data Link Map page may be customized individually. The Wx Data Link Map pages are customized by selecting options from the Page Menu. The Page Menu options include choices for Weather Setup and displaying the Weather Legends. The Weather Setup choice covers selections for adjusting the viewing ranges of the weather products.

1) While viewing a WX Data Link Map page of the WX page group, press the **MENU** key to display the Page Menu Options. The cursor flashes on the "Weather Setup" option. Press **ENT.**

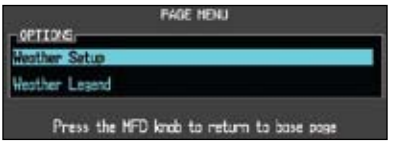


Figure 4-27 Weather Page Menu Options

2) With the Data Link Setup Menu displayed, turn the Large **MFD** knob to select the desired item and press **ENT**.

Figure 4-28 Weather Data Link Setup Menu Options

3) Turn the small **MFD** knob to select the desired weather feature option.

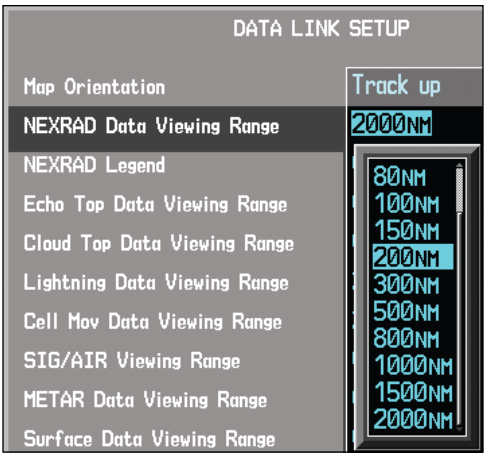


Figure 4-29 Weather Data Link Setup Menu Option Selection

4) Press **ENT** to save a selection.

5) Turn the large **MFD** knob to the next desired option or press the small **MFD** knob to cancel and return to the XM Weather Data Link Map Page.

WX Page Menu - Weather Setup	
Menu Item	**Adjustment**
Map Orientation	North Up, Track Up
NEXRAD Data Viewing Range	Off, 50 NM to 2000 NM
NEXRAD Legend	On/Off
Echo Top Data Viewing Range	Off, 50 NM to 2000 NM
Cloud Top Data Viewing Range	Off, 50 NM to 2000 NM
Lightning Data Viewing Range	Off, 50 NM to 2000 NM
Cell Mov Data Viewing Range	Off, 50 NM to 2000 NM
SIG/Air Viewing Range	Off, 50 NM to 2000 NM
METAR Data Viewing Range	Off, 50 NM to 2000 NM
Surface Data Viewing Range	Off, 50 NM to 2000 NM
Surface Data Time	Current, 12 Hr, 24 Hr, 36 Hr, and 48 Hr
Frz Lvl Data Viewing Range	Off, 50 NM to 2000 NM
Wnd Aloft Data Viewing Range	Off, 50 NM to 2000 NM
Wnd Aloft Altitude	Surface, 3000 feet to 42000 feet
County Data Viewing Range	Off, 50 NM to 2000 NM
Cyclone Data Viewing Range	Off, 50 NM to 2000 NM

Table 4-15 Weather Page Menu Setup Options

4.7.3 XM Weather Symbols and Product Age

The weather product symbols, the expiration time and the refresh rate are shown in the following table. The refresh rate represents the interval at which XM Satellite Radio broadcasts new signals that may or may not contain new weather data. It does not represent the rate at which weather data is updated or new content is received by the Data Link Receiver. Weather data is refreshed at intervals that are defined and controlled by XM Satellite Radio and its data vendors.

Symbol	Weather Product	Expiration Time (Minutes)	Refresh Rate (Minutes)
	NEXRAD (NEXRAD and Echo Top are Mutually Exclusive)	30	5
	Echo Top (Cloud Top and Echo Top Mutually Exclusive) (NEXRAD and Echo Top Mutually Exclusive)	30	7.5
	Cloud Top (Cloud Top and Echo Top Mutually Exclusive)	60	15
	XM Lightning	30	5
	Cell Movement	30	1.25
	SIGMETs / AIRMETs	60	12
	METARs	90	12
	City Forecast	90	12
	Surface Analysis	60	12
	Freezing Levels	120	12
	Winds Aloft	90	12
	County Warnings	60	5
	Cyclone Warnings	60	12

Table 4-16 Weather Product Symbols and Aging Times

Symbol	Description
	Flood
	Severe Thunderstorm
	Tornado
	Sunny
	Part Sun
	Cloudy
	Rainy
	T-Storm
	Snow
	Windy
	Foggy
	Haze
	High/Low Temp

Table 4-17 Weather Symbols

4.7.4 Weather Legends

The **LEGEND** soft key displays a pop-up legend of the currently used weather products. Pressing the **LEGEND** soft key again, the **MFD** knob, the **ENT**, or **CLR** keys will remove the legend.

1) A full page legend can be selected by selecting the Weather Legend option in the XM Weather Map Menu or pressing the **LEGEND** soft key on the Weather Map Page. The legend displayed will match the selected weather products. Turn the large or small **MFD** knobs to scroll through the legend, if necessary.

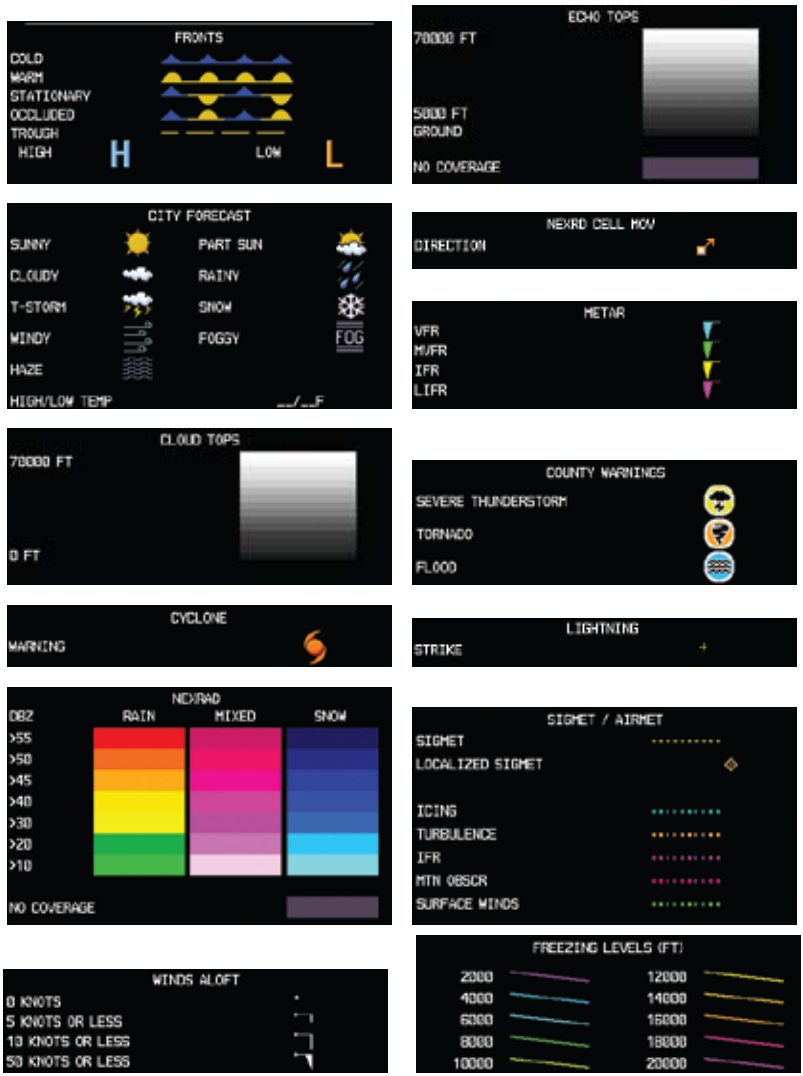


Figure 4-30 Weather Legends

2) An abbreviated legend may be displayed on the upper right side of a WX Data Link Map page for the applicable weather products when selected in the Page Menu options for Weather.

4.7.5 NEXRAD

WSR-88D, or NEXRAD (NEXt-generation RADar), is a network of 158 high-resolution Doppler radar systems that are operated by the National Weather Service (NWS). NEXRAD data provides centralized meteorological information for the continental United States and selected overseas locations. The maximum range of a single NEXRAD radar site is 250 NM. The NEXRAD network provides important information about severe weather for air traffic safety.

NEXRAD data is not real-time. The lapsed time between collection, processing, and dissemination of NEXRAD images can be significant and may not reflect the current radar synopsis. Due to the inherent delays and the relative age of the data, it should be used for long-range planning purposes only. Never use NEXRAD data or any radar data to penetrate hazardous weather. Instead, use it in an early-warning capacity of pre-departure and en route evaluation.

Figure 4-31 XM Weather - NEXRAD

Composite data from all the NEXRAD radar sites in the United States is shown. This data is composed of the maximum reflectivity from the individual radar sweeps. The display of the information is color-coded to indicate the weather severity level. All weather product legends can be viewed on the Weather Data

Link Page. For the NEXRAD legend, select the **LEGEND** soft key when NEXRAD is selected for display.

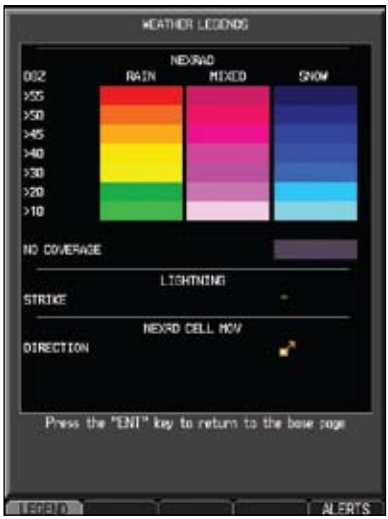


Figure 4-32 NEXRAD Weather Legend

The display of radar coverage is always active when either NEXRAD or ECHO TOPS is selected. Areas where NEXRAD radar coverage and Echo Tops information is not currently available or is not being collected are indicated in grayish-purple.

4.7.5.1 Reflectivity

Reflectivity is the amount of transmitted power returned to the radar receiver. Colors on the NEXRAD display directly correlate to the level of detected reflectivity. Reflectivity as it relates to hazardous weather can be very complex.

The role of radar is essentially to detect moisture in the atmosphere. Simply put, certain types of weather reflect radar better than others. The intensity of a radar reflection is not necessarily an indication of the weather hazard level. For instance, wet hail returns a strong radar reflection, while dry hail does not. Both wet and dry hail can be extremely hazardous.

The different NEXRAD echo intensities are measured in decibels (dB) relative to reflectivity (Z). NEXRAD measures the radar reflectivity ratio, or the energy reflected back to the radar receiver (designated by the letter Z). The value of Z increases as the returned signal strength increases.

4.7.5.2 NEXRAD Limitations

NEXRAD radar images may have certain limitations:

- NEXRAD base reflectivity does not provide sufficient information to determine cloud layers or precipitation characteristics. For example, it is not possible to distinguish between wet snow, wet hail, and rain.
- NEXRAD base reflectivity is sampled at the minimum antenna elevation angle. An individual NEXRAD site cannot depict high altitude storms at close ranges. It has no information about storms directly over the site.
- When zoomed in to a range of 30 NM, each square block on the display represents an area of four square kilometers. The intensity level reflected by each square represents the highest level of NEXRAD data sampled within the area.

The following may cause abnormalities in displayed NEXRAD radar images:

- Ground clutter
- Strobes and spurious radar data
- Sun strobes (when the radar antenna points directly at the sun)
- Interference from buildings or mountains, which may cause shadows
- Metallic dust from military aircraft, which can cause alterations in radar scans

4.7.6 Weather Page Map Orientation

The Orientation option sets the orientation of the Wx Data Link Map pages.

1) While viewing the Wx Data Link Map 1, 2, or 3 of the Wx page group, press the **MENU** key. With "Weather Setup" highlighted, press **ENT**.

2) With the "Map Orientation" option active, turn the small **MFD** knob to change the highlighted value.

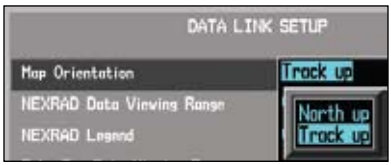


Figure 4-33 Weather Page Map Orientation

3) Press **ENT** to accept the displayed value. The next option will be highlighted.

4) Press the small **MFD** knob to cancel selection or to end editing and return to the Navigation Map page or turn the large **MFD** knob to the next option.

4.7.7 NEXRAD Data Viewing Range

The NEXRAD Viewing Range option allows you to select the map range where at and below the selected value NEXRAD weather products will be shown on the selected MFD Wx Data Link Map page (1, 2, or 3). When Off is selected, NEXRAD weather data will not be shown. In the figure below where 300 NM is selected, NEXRAD data will be shown at map ranges of 300 NM and lower.

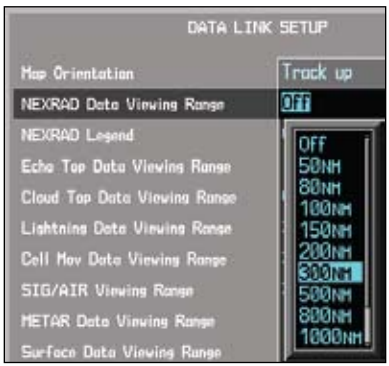


Figure 4-34 NEXRAD Viewing Range Selection

1) While viewing a WX Data Link Map page of the WX page group, press the **MENU** key to display the Page Menu Options. The cursor flashes on the "Weather Setup" option. Press **ENT.**

2) The NEXRAD Data Viewing Range value will be highlighted. Turn the small **MFD** knob to highlight the desired value.

3) Press **ENT** to accept the displayed value. The next option will be highlighted.

4) Press the small **MFD** knob to cancel selection or to end editing and return to the Navigation Map page or turn the large **MFD** knob to the next option.

4.7.8 NEXRAD Legend

The NEXRAD Legend selection provides the option of displaying an abbreviated version of the NEXRAD legend in the top right region of the MFD. The full legend is available by pressing the **LEGEND** soft key.

Figure 4-35 NEXRAD Legend Selection

1) While viewing a WX Data Link Map page of the WX page group, press the **MENU** key to display the Page Menu Options. The cursor flashes on the "Weather Setup" option. Press **ENT.**

2) Turn the large **MFD** knob to highlight the NEXRAD Legend value.

3) Turn the small **MFD** knob to highlight Off or On. Press **ENT** to accept the displayed value. The next option will be highlighted.

4) Press the small **MFD** knob to cancel selection or to end editing and return to the Navigation Map page or turn the large **MFD** knob to the next option.

4.7.9 Echo Tops

NOTE: *Due to similarities in color schemes, the display of Echo Tops is mutually exclusive with Cloud Tops and NEXRAD.*

Echo Tops data shows the location, elevation, and direction of the highest radar echo. The highest radar echo does not indicate the top of a storm or clouds; rather it indicates the highest altitude at which precipitation is detected. Information is derived from NEXRAD data.

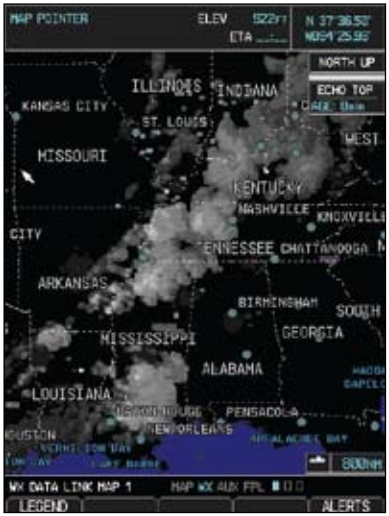


Figure 4-36 XM Weather - Echo Tops

The display of radar coverage is always active when either NEXRAD or ECHO TOPS is selected. Areas where NEXRAD radar coverage and Echo Tops information is not currently available or is not being collected are indicated in grayish-purple. Radar capability exists in these areas, but it is not active or is off-line.

Echo Top Data Viewing Range

The Echo Top Data Viewing Range option allows you to select the map range where at and below that value Echo Top weather products will be shown on the selected MFD Wx Data Link Map page (1, 2, or 3). When Off is selected, Echo Tops will not be shown. In the figure below where 200 NM is selected, Echo Top data will be shown at map ranges of 200 NM and lower.

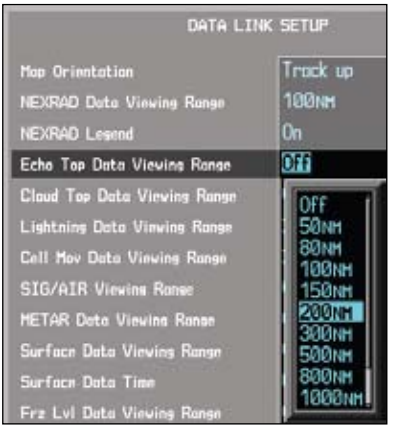


Figure 4-37 Echo Top Viewing Range Selection

1) While viewing a WX Data Link Map page of the WX page group, press the **MENU** key to display the Page Menu Options. The cursor flashes on the "Weather Setup" option. Press **ENT.**
2) Turn the large **MFD** knob to highlight the Echo Top Data Viewing Range value.
3) Turn the small **MFD** knob to highlight the desired value. Press **ENT** to accept the displayed value. The next option will be highlighted.
4) Press the small **MFD** knob to cancel selection or to end editing and return to the Navigation Map page or turn the large **MFD** knob to the next option.

4.7.10 Cloud Tops

NOTE: *Due to similarities in color schemes, the display of Cloud Tops is mutually exclusive with Echo Tops and NEXRAD.*

Cloud Tops data depicts cloud top altitudes as determined from satellite imagery.

Figure 4-38 XM Weather - Cloud Tops

To display the Cloud Tops legend, select the **LEGEND** soft key when Cloud Tops is selected for display. Since Cloud Tops and Echo Tops use the same color scaling to represent altitude, display of these weather products is mutually exclusive. When Cloud Tops is activated, Echo Tops or NEXRAD data is not shown.

Cloud Top Data Viewing Range

The Cloud Top Data Viewing Range option allows you to select the map range where at and below that value Cloud Top weather products will be shown on the selected MFD Wx Data Link Map page (1, 2, or 3). When Off is selected, Cloud Tops will not be shown. In the figure below where 150 NM is selected, Cloud Top data will be shown at map ranges of 150 NM and lower.

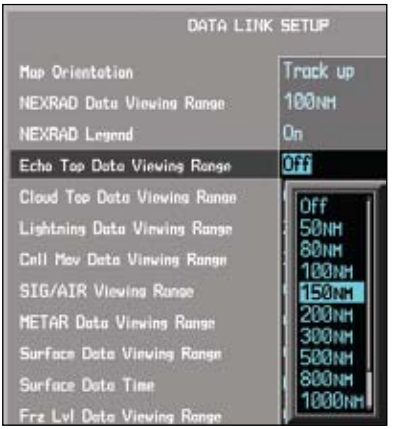


Figure 4-39 Cloud Top Viewing Range Selection

4.7.11 XM Lightning

Lightning data shows the approximate location of cloud-to-ground lightning strikes. A strike icon represents a strike that has occurred within a two-kilometer region. The exact location of the lightning strike is not displayed.

Figure 4-40 XM Weather - Lightning

Figure 4-41
Lightning Viewing Range Selection

Lightning Data Viewing Range

The Lightning Data Viewing Range option allows you to select the map range where at and below that value Lightning weather products will be shown on the selected MFD Wx Data Link Map page (1, 2, or 3). When Off is selected, Lightning will not be shown. In the figure above where 300 NM is selected, NEXRAD data will be shown at map ranges of 300 NM and lower.

4.7.12 Cell Movement

Cell Movement data shows the location and movement of storm cells as identified by a ground-based system. Cells are represented by yellow squares, with direction of movement indicated with short, orange arrows.

Figure 4-42 XM Weather - Cell Movement

On most applicable maps, Cell Movement data is selected for display along with NEXRAD. On the Weather Data Link Page, Cell Movement data can be selected independently.

Cell Movement Data Viewing Range

The Cell Movement Data Viewing Range option allows you to select the map range and below where Cell Movement weather products will appear on the selected MFD Wx Data Link Map page (1, 2, or 3). When Off is selected, Cell Movement will not be shown. In the figure below where 300 NM is selected, Cell Movement data will be shown at map ranges of 300 NM and lower.

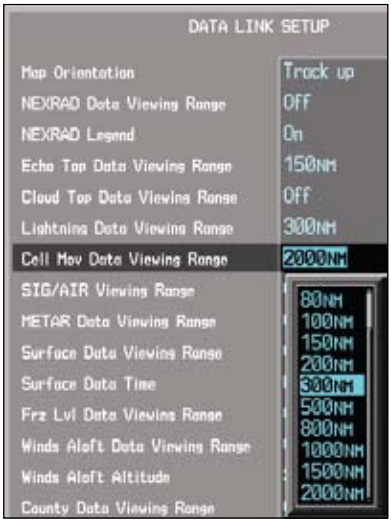


Figure 4-43 Cell Movement Viewing Range Selection

4.7.13 SIGMETs and AIRMETs

SIGMETs (SIGnificant METeorological Information) and AIRMETs (AIRmen's METeorological Information) are broadcast for potentially hazardous weather considered of importance to aircraft. A Convective SIGMET is issued for hazardous convective weather. A localized SIGMET is a significant weather condition occurring at a localized geographical position.

When enabled, SIGMET/AIRMETs advise the pilot of potentially hazardous weather, other than convective activity, to all aircraft. The advisory covers an area of at least 3,000 square miles at any one time. SIGMET/AIRMET data covers icing, turbulence, dust, and volcanic ash as issued by the National Weather Service. The update rate is every 12 minutes.

Figure 4-44 XM Weather - AIRMETs

When enabled, the following AIRMETs are available for display:

- Icing
- Turbulence
- IFR conditions
- Mountain obscuration
- Surface winds

SIGMET/AIRMET Viewing Range

The SIGMET/AIRMET Viewing Range option allows you to select the map range where at and below that value SIGMET/AIRMET products will be shown on the selected MFD Wx Data Link Map page (1, 2, or 3). When Off is selected, SIGMET/AIRMET will not be shown. In the figure below where 300 NM is selected, SIGMET/AIRMET data will be shown at map ranges of 300 NM and lower.

Figure 4-45 SIGMET/AIRMET Viewing Range Selection

4.7.14 METARs

NOTE: *Atmospheric pressure reported for METARs is given in hectopascals (hPa), except in the United States, where it is reported in inches of mercury (in Hg). Temperatures are reported in Celsius.*

NOTE: *METAR information is only displayed within the installed aviation database service area.*

METAR (METeorological Aerodrome Report), known as an Aviation Routine Weather Report, is the standard format for current weather observations. METARs are updated hourly and are considered current. METARs typically contain information about the temperature, dew point, wind, precipitation, cloud cover, cloud heights, visibility, and barometric pressure. They can also contain information on precipitation amounts, lightning, and other critical data. METARs are shown as colored flags at airports that provide them.

Figure 4-46 XM Weather - Graphic METARs

METAR Viewing Range

The METAR Viewing Range option allows you to select the map range where at and below that value METAR weather products will be shown on the selected MFD Wx Data Link Map page (1, 2, or 3). When Off is selected, METARs will not be shown. In the figure below where 150 NM is selected, METAR data will be shown at map ranges of 150 NM and lower.

Figure 4-47 METAR Viewing Range Selection

4.7.15 Surface Analysis and City Forecast

NOTE: *Surface Analysis and City Forecast data are displayed only within the installed Aviation Database service area.*

Surface Analysis and City Forecast information is available for current and forecast weather conditions. Forecasts are available for intervals of 12, 24, 36, and 48 hours by pressing the **SRFC TIME** soft key or in the Page Menu Weather Setup options.

When enabled, the Surface Analysis forecast shows frontal lines indicating weather fronts and the direction they are moving. High and Low pressure centers are noted with a large H or L. The Forecast Time menu item will step through the intervals manually.

Figure 4-48 XM Weather - Surface Analysis and City Forecast

A Cold Front is a front where cold air replaces warm air. A blue line with blue triangles that point in the direction of the cold air flow.

Figure 4-49 XM Weather - Cold Front

A Warm Front is where warm air replaces cold air. An orange line with orange half moons that point in the direction of the warm air flow.

Figure 4-50 XM Weather - Warm Front

A Stationary Front is a front with very little horizontal movement. The line alternates with orange and blue sections which point in opposite directions to symbolize little movement.

Figure 4-51 XM Weather - Stationary Front

An Occluded Front is where a cold front has overtaken and merged with a warm front. The line alternates with the blue triangle and orange half moon symbols on the same side of the line pointing in the direction the front is moving.

Figure 4-52 XM Weather - Occluded Front

Surface Data Viewing Range

The Surface Data Viewing Range option allows you to select the map range where at and below that value Surface Data weather products will be shown on the selected MFD Wx Data Link Map page (1, 2, or 3). When Off is selected, Surface Data will not be shown. In the figure below where 150 NM is selected, Surface data will be shown at map ranges of 150 NM and lower.

Figure 4-53 Surface data Viewing Range Selection

Surface Data Time

The Surface Data Time option allows you to select the forecast time when the Surface and City Forecast weather products will appear on the selected MFD Wx Data Link Map page (1, 2, or 3). Forecasts are available for intervals of current, 12, 24, 36, and 48 hours. You may also select an interval by pressing the **SRFC TIME** soft key on the Wx Data Link Map page.

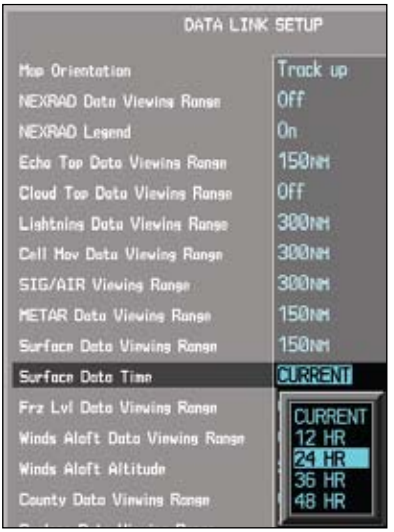


Figure 4-54 Surface Data Time Selection

4.7.16 Freezing Level

Freezing Level data shows the color-coded contour lines for the altitude and location at which the Freezing Level is found. When no data is displayed for a given altitude, the data for that altitude has not been received, or is out of date and has been removed from the display. New data appears at the next update.

Figure 4-55 XM Weather - Freezing Levels

Freezing Level Viewing Range

The Freezing Level Viewing Range option allows you to select the map range where at and below that value Freezing Level weather products will be shown on the selected MFD Wx Data Link Map page (1, 2, or 3). When Off is selected, Freezing Level Data will not be shown. In the figure below where 200 NM is selected, Freezing Level data will be shown at map ranges of 200 NM and lower.

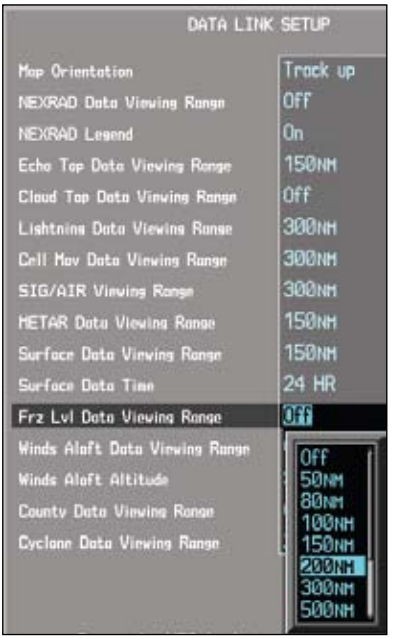


Figure 4-56 Freezing Level Viewing Range Selection

4.7.17 Winds Aloft

Winds Aloft data shows the forecast wind speed and direction at the surface and at selected altitudes. Altitudes can be selected in 3000 foot increments from the surface up to 42,000 feet MSL. Pressing the **WIND DOWN** or **WIND UP** soft keys steps down or up in 3,000 foot increments.

Figure 4-57 XM Weather - Winds Aloft

Figure 4-58 XM Weather - Winds Aloft Legend

Winds Aloft Data Viewing Range

The Winds Aloft Data Viewing Range option allows you to select the map range where at and below that value Winds Aloft weather products will appear on the selected MFD Wx Data Link Map page (1, 2, or 3). When Off is selected, Winds Aloft will not be shown. In the figure below where 150 NM is selected, Winds Aloft data will be shown at map ranges of 150 NM and lower.

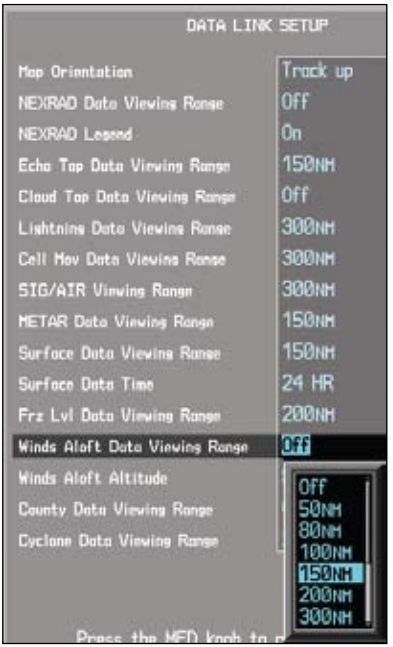


Figure 4-59 Winds Aloft Data Viewing Range Selection

Winds Aloft Altitude

The Winds Aloft Altitude option allows you to select the altitude where at and below that value Winds Aloft weather products will be shown on the selected MFD Wx Data Link Map page (1, 2, or 3). Altitude can be selected in 3000 foot increments from the surface up to 42,000 feet MSL.

Pressing the **WIND DOWN** or **WIND UP** soft keys steps down or up in the 3,000 foot increments. In the figure below where 6000 feet is selected, Winds Aloft data will be shown at 6000 feet and lower.

Figure 4-59 Winds Aloft Altitude Selection

4.7.18 County Warnings

County data provides specific public awareness and protection weather warnings from the National Weather Service (NWS). This can include information on fires, tornadoes, severe thunderstorms, flood conditions, and other natural disasters.

Figure 4-60 XM Weather - County Warnings

County Data Viewing Range

The County Data Viewing Range option allows you to select the map range where at and below that value County weather products will be shown on the selected MFD Wx Data Link Map pages (1, 2, or 3). When Off is selected, County Data will not be shown. In the figure below where 100 NM is selected, County data will be shown at map ranges of 100 NM and lower.

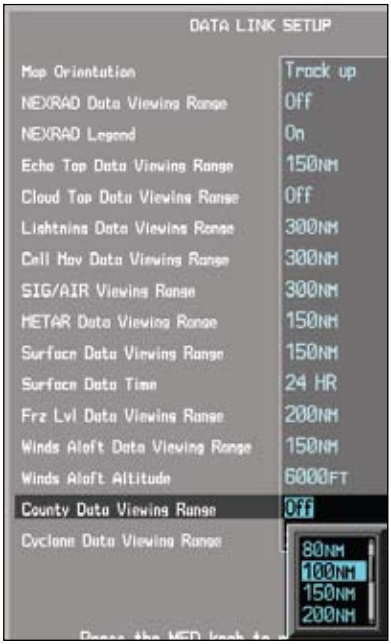


Figure 4-61 County Data Viewing Range Selection

This page intentionally left blank

5 ADDITIONAL FEATURES (OPTIONAL)

NOTE: *The availability of SafeTaxi, ChartView, or FliteCharts in electronic form may not preclude the requirement to carry paper charts aboard the aircraft. See the AFMS for more information.*

Additional features of the GDU 620 include the following:

- ChartView and FliteCharts® electronic charts
- SafeTaxi® diagrams
- XM® Radio entertainment
- XM Weather (covered in Section 4.7)
- Traffic (covered in Sections 4.5 and 4.6)
- Garmin Synthetic Vision Technology (SVT™)

The optional ChartView and FliteCharts provide on-board electronic terminal procedures charts. Electronic charts offer the convenience of rapid access to essential information. Either ChartView or FliteCharts may be configured in the system, but not both.

SafeTaxi diagrams provide detailed taxiway, runway, and ramp information at more than 700 airports in the United States. By decreasing the range on an airport that has a SafeTaxi diagram available, a close up view of the airport layout can be seen.

The optional XM Radio entertainment audio feature of the GDL 69A Data Link Receiver handles more than 170 channels of music, news, and sports. XM Radio offers more entertainment choices and longer range coverage than commercial broadcast stations.

XM Weather is an optional service that provides the ability to display graphic weather data overlaid on the MFD Nav Map and Weather Data Link pages.

The Traffic Map Page shows surrounding TAS or TIS traffic data in relation to the aircraft's current position and altitude. The Traffic option is designed to assist in detection and avoidance of other aircraft.

The optional Garmin Synthetic Vision Technology (SVT™) is a visual enhancement to the G500H. SVT is displayed as a forward-looking display of the topography immediately in front of the aircraft. SVT information is shown on the primary flight display (PFD).

5.1 Viewing Charts

When the Chart function is available, charts will be shown on the third page of the Flight Plan page group. The chart page will default to the nearest airport if no flight plan or destination airport is present. While you are on the ground, the displayed charts will default to the current airport location regardless of flight plan.

***NOTE:** The chart for the destination airport or loaded approach will automatically be selected.*

Figure 5-1 ChartView Chart Page

Figure 5-2 FliteChart Chart Page

1) Turn the large **MFD** knob to the Flight Plan (FPL) page group.
2) Turn the small **MFD** knob to the Charts page.

5.1.1 Chart Panning

More detail on the displayed chart can be viewed by zooming in with the Range keys and moving the chart around with pan mode.

***NOTE:** Panning mode is indicated by the presence of scroll bars.*

Figure 5-3 Zooming and Scrolling Around a Chart

1) While viewing the Charts page of the FPL page group, press the **RNG** (Range) keys to zoom in and out.
2) After zooming in, you may only see part of the chart. Press the small **MFD** knob to enter Pan mode and activate scroll bars on the edges of the chart. Turn the large and small **MFD** knobs to move around the chart.
3) Press the small **MFD** knob to cancel the scroll bars and exit panning.

5.1.2 Choosing a Chart for the Current Airport

NOTE: *The chart for the destination airport or loaded approach will automatically be selected.*

1) While viewing the Charts page of the FPL page group, press the **SELECT** soft key to activate chart selection.

2) Turn the large **MFD** knob to highlight the field to the right of the airport identifier.

Figure 5-4 Activate Chart Selection for the Current Airport

3) Turn the small **MFD** knob to highlight the desired chart.

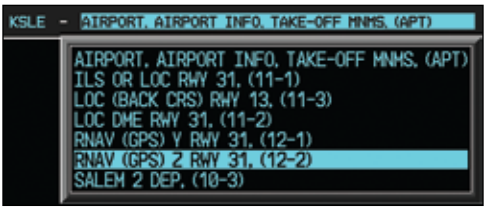


Figure 5-5 Choose Chart for the Current Airport

4) Press **ENT** to accept and view the selected chart.

5.1.3 Selecting a Chart by Identifier

A chart for a different airport may be chosen by selecting the identifier for the desired airport.

Airport Identifier Selection

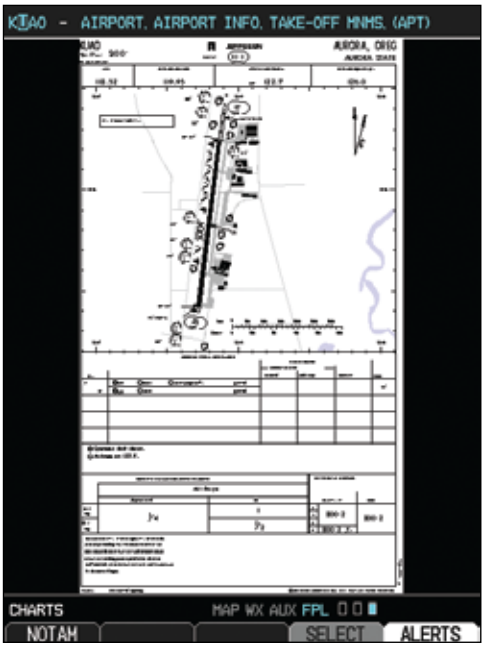


Figure 5-6 Airport Identifier Selection

1) While viewing the Charts page of the FPL page group, press the **SELECT** soft key to change the airport.
2) Use the large **MFD** knob to move the cursor to highlight a character.
3) Use the small **MFD** knob to change the character.
4) Press **ENT** to accept the selected airport.

5.1.4 Selecting a New Chart by FPL, NRST, or RECENT

You may select other charts to display based on your flight plan (FPL), charts of the nearest airport (NRST), or your most recently selected airports (RECENT).

Figure 5-7 Chart Category Selection

1) While viewing the Charts page of the FPL page group, press the **SELECT** soft key.
2) Turn the small **MFD** knob counterclockwise.
3) Turn the small **MFD** knob counterclockwise to show FPL, NRST, or RECENT.
4) Turn the large **MFD** knob to select the desired identifier and then press **ENT**.

5.1.5 Viewing Chart NOTAMs

If an active NOTAM (Notice to Airmen) exists for the selected chart, the **NOTAM** soft key will be available. Press the **NOTAM** soft key to view the NOTAM.

Figure 5-8 Chart NOTAM

5.1.6 Day/Night View

The Chart pages can be displayed on a white or black background for day or night viewing. The Day View offers a better presentation in a bright environment. The Night View gives a better presentation for viewing in a dark environment. When the CHART SETUP Box is selected the GDU 620 soft keys are blank.

1) In the FPL page group, turn the small **MFD** knob to reach the Charts page.
2) Press **MENU** to display the Options menu.
3) Press **ENT** to go to Chart Setup. The Color Scheme option will be highlighted.
4) Turn the small **MFD** knob to select Day - Auto - Night.
5) Press the small **MFD** knob or the **ENT** key to save the selected value and return to the Charts page.

NOTE: *Once an adjustment is made to the percentage field in Auto mode, the chart must be redrawn (zoomed in or out, or another chart selected) before the switch from Day to Night is seen.*

5.2 ChartView

ChartView resembles the paper version of Jeppesen terminal procedures charts. The charts are displayed in full color with high-resolution. The MFD depiction shows the aircraft position on the moving map in the plan view of approach charts and on airport diagrams.

The ChartView database subscription is available from Jeppesen, Inc. Available data includes:

- Arrivals (STAR)
- Departure Procedures (DP)
- Approaches
- Airport Diagrams
- Chart NOTAMs

5.2.1 Cycle Number and Revision

The ChartView database is revised every 14 days. Charts are still viewable during a period that extends from the cycle expiration date to the disables date. ChartView is disabled 70 days after the expiration date and is no longer available for viewing upon reaching the disable date. When turning on the GDU 620, the Power-up Page indicates any of nine different possible criteria for ChartView availability. See the table below for the various ChartView Power-up Page displays and the definition of each.

Power-up Page Display	Definition
[redacted]	Blank Line. GDU 620 system is not configured for ChartView. Contact a Garmin-authorized service center for configuration.

Power-up Page Display	Definition
	System is configured for ChartView but no chart database is installed. Contact Jeppesen for a ChartView database.
	Normal operation. ChartView database is valid and within current cycle.
	ChartView database is within 1 week after expiration date. A new cycle is available for update.
	ChartView database is beyond 1 week after expiration date, but still within the 70 day viewing period.
	ChartView database has timed out. Database is beyond 70 days after expiration date. ChartView database is no longer available for viewing.
	System time is not available. GPS satellite data is unknown or the GPS navigator has not yet locked onto satellites. Check database cycle number for effectivity.
	System is verifying chart database when new cycle is installed for the first time.
	After verifying, chart database is found to be corrupt. ChartView will not be available.

Table 5-1 Power-up Page Annunciations and Definitions

The ChartView time critical information can also be found on the AUX - System Status page. The database CYCLE number, EXPIRES, and DISABLES dates of the ChartView database appear in either blue or yellow text. When the ChartView EXPIRES date is reached, ChartView becomes inoperative 70 days later. This is shown as the DISABLES date. When the DISABLES date is reached, charts are no longer available for viewing.

Select the **DBASE** soft key for scrolling through the database information. Scroll through the database with the **MFD** knob or **ENT** key.

The ChartView database is provided directly from Jeppesen. Refer to Jeppesen Databases in Appendix A for instructions on revising the ChartView database.

5.3 FliteCharts®

FliteCharts® resemble the paper version of National Aeronautical Charting Office (NACO) terminal procedures charts. The charts are displayed with high-resolution and in color for applicable charts.

FliteCharts database subscription is available from Garmin. Available data includes:

- Arrivals (STAR)
- Departure Procedures (DP)
- Approaches
- Airport Diagrams

5.3.1 Cycle Number and Revision

FliteCharts data is revised every 28 days. Charts are still viewable during a period that extends from the cycle expiration date to the disables date. FliteCharts is disabled 180 days after the expiration date and are no longer available for viewing upon reaching the disables date. When turning on the GDU 620, the Power-up page indicates any of five different possible criteria for chart availability. These indications are whether the databases are not configured, not available, current, out of date, or disabled. See the table below for the various FliteCharts Power-up page displays and the definition of each.

Power-up Page Display	Definition
	Blank Line. G500H system is not configured for FliteCharts. Contact a Garmin-authorized service center for configuration.
	System is configured for FliteCharts but no chart database is installed. Refer to Updating Garmin Databases in Appendix A for the FliteCharts database.

Power-up Page Display	Definition
	Normal operation. FliteCharts database is valid and within current cycle.
	FliteCharts database is beyond the expiration date, but still within the 180 day viewing period.
	FliteCharts database has timed out. Database is beyond 180 days after expiration date. FliteCharts database is no longer available for viewing.

Table 5-2 FliteCharts Power-up Page Annunciations and Definitions

5.4 SafeTaxi®

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

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

Figure 5-9 SafeTaxi Depiction on the Navigation Map Page

5.4.1 Using SafeTaxi®

Any map page that displays the navigation view can also show the SafeTaxi® airport layout within the maximum configured range. The following is a list of pages where the SafeTaxi feature can be seen:

- Navigation Map Page
- Weather Datalink Page
- Airport Information Page
- Intersection Information Page
- NDB Information Page
- VOR Information Page
- User Waypoint Information Page

During ground operations the aircraft's position is displayed in reference to taxiways, runways, and airport features. When panning over the airport, features such as runway holding lines and taxiways are shown.

5.4.1.1 Decluttering

The **DCLTR** soft key (declutter) label advances to DCLTR-1, DCLTR -2, and DCLTR-3 each time the soft key is selected for easy recognition of decluttering level. Selecting the **DCLTR** soft key removes the taxiway markings and airport feature labels. Selecting the **DCLTR-1** soft key removes VOR station ID, the VOR symbol, and intersection names if within the airport plan view. Selecting the **DCLTR-2** soft key removes the airport runway layout, unless the airport in view is part of an active route structure. Pressing the **DCLTR-3** soft key cycles back to the original map detail. With Auto-Zoom enabled, the map will automatically zoom to 1 NM and DCLTR-0 upon landing so SafeTaxi can be viewed. Refer to Map Declutter Levels in the Navigation Map Section.

5.4.1.2 Hot Spot Information

Hot Spots can contain more information about the area that can be displayed when selected.

1. While viewing the Hot Spot area on the Navigation Map page, press the small **MFD** knob to activate the cursor.
2. Turn the **MFD** knobs to move the cursor on the Hot Spot border or into the Hot Spot area and then press the **ENT** key.

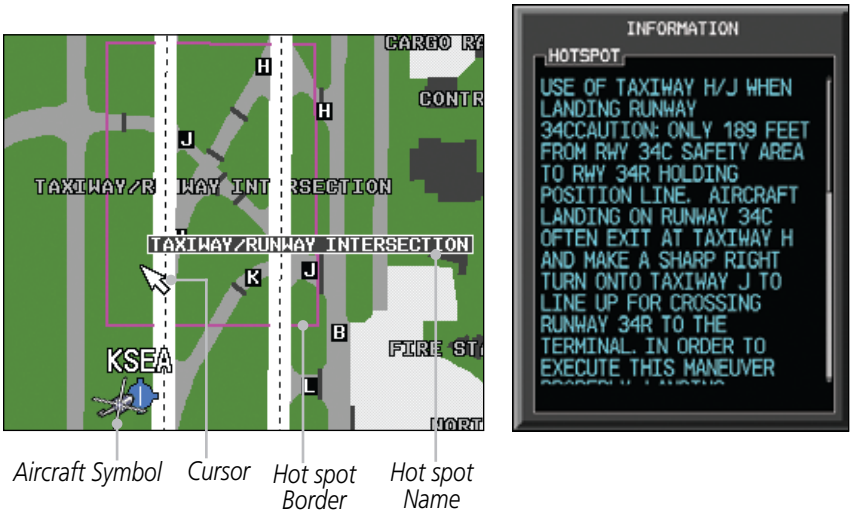
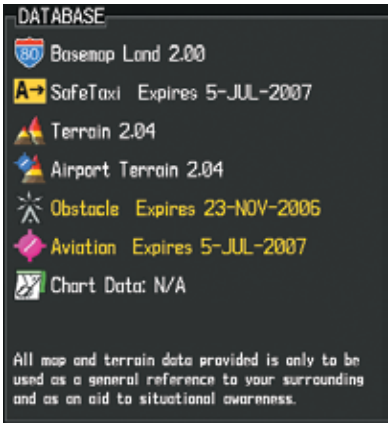


Figure 5-10 SafeTaxi Hot Spot Information

3. An information window will be shown on the MFD. After viewing, press the small **MFD** knob, **CLR**, or **ENT** keys to remove the information window. Press the small **MFD** knob again to cancel the cursor.

5.4.2 SafeTaxi® Cycle Number and Revision

The SafeTaxi database is revised every 56 days. SafeTaxi is always available for use after the expiration date. When turning on the GDU 620, the Power-up Page indicates whether the databases are current, out of date, or not available. The Power-up Page shows the SafeTaxi database is current when the "SafeTaxi Expires" date is shown in white. When the SafeTaxi cycle has expired, the "SafeTaxi Expires" date appears in yellow. The message "SafeTaxi: N/A" appears in white if no SafeTaxi data is available on the database card.



SafeTaxi Database is Current

SafeTaxi Database has Expired

SafeTaxi Database Not Available

Figure 5-11 Power-up Page, SafeTaxi Database

The SafeTaxi Region, Version, Cycle, Effective date and Expires date of the database cycle can also be found on the AUX - System Status page. SafeTaxi information appears in white and yellow text. The EFFECTIVE date appears in white when data is current and in yellow when the current date is before the effective date. The EXPIRES date appears in white when data is current and in yellow when expired. SafeTaxi REGION NOT AVAILABLE appears in white if SafeTaxi data is not available on the database card. Expired SafeTaxi data is never disabled.

5.5 XM® Radio Entertainment

NOTE: *Refer to the Hazard Avoidance Section for information about XM Weather products.*

The optional XM® Radio entertainment feature of the GDL 69A Data Link Receiver is available for the pilot's and passengers' enjoyment. The GDL 69A can receive XM Satellite Radio entertainment services at any altitude throughout the Continental U.S. Entertainment audio is not available on the GDL 69 Data Link Receiver.

XM Satellite Radio offers a variety of radio programming over long distances without having to constantly search for new stations. Based on signals from satellites, coverage far exceeds land-based transmissions. XM Satellite Radio services are subscription-based. For more information on specific service packages, visit www.xmradio.com.

5.5.1 Activating XM® Satellite Radio Services

The service is activated by providing XM Satellite Radio with either one or two coded IDs, depending on the equipment. Either the Audio Radio ID or the Data Radio ID, or both, must be provided to XM Satellite Radio to activate the entertainment subscription. The XM Satellite Radio Activation Instructions are included with the unit (also available at www.garmin.com, P/N 190-00355-04).

It is not required to activate both the entertainment and weather service subscriptions with the GDL 69A. Either or both services can be activated. XM Satellite Radio uses one or both of the coded IDs to send an activation signal that, when received by the GDL 69A, allows it to play entertainment programming.

These IDs are located:

- On the label on the back of the Data Link Receiver
- On the XM Information Page on the MFD

Contact the installer if the Data Radio ID and the Audio Radio ID cannot be located.

NOTE: *The **LOCK** soft key on the XM Information Page (Auxiliary Page Group) is used to save GDL 69A activation data when the XM services are initially set up. It is not used during normal XM Radio operation, but there should be no adverse effects if inadvertently selected during flight. Refer to the GDL 69/69A XM Satellite Radio Activation Instructions (190-00355-04, Rev G, or later) for further information.*

1) Contact XM WX Satellite Radio through the e-mail address listed on their web site (www.xmradio.com) or by the customer service phone number listed on the web site (1-800-985-9200). Follow the instructions provided by XM Satellite Radio services.
2) Turn the large **MFD** knob to the AUX page group.
3) Turn the small **MFD** knob to the XM Information Page.
4) Verify that the desired services are activated.
5) Select the **LOCK** soft key.
6) Turn the large **MFD** knob to highlight "YES."
7) To complete activation, press the **ENT** key.

If XM weather services have not been activated, all the weather product boxes are cleared on the XM Information Page and a yellow Activation Required message is displayed in the center of the Weather Data Link Page (Map Page Group). The Service Class refers to the groupings of weather products available for subscription.

5.5.2 XM® Information

The Aux mode XM Information page displays information about the XM radios, service class, and products when the GDL 69/69A is installed and the XM Radio service is activated. The Data and Audio radios have separate Identification Numbers. The Service Class determines the features that are available. The Weather Products window shows the products with a solid box to the left of the product active with your subscription. The boxes for products not in your subscription will be hollow.

Figure 5-12 XM Information

1) In the AUX page group, turn the small **MFD** knob to display XM Information.
2) The **LOCK** soft key is used to "lock" your XM subscription activation. This is only used for the initial subscription or to make a change.

5.5.3 XM® Entertainment Radio

Audio entertainment is available through the XM Satellite Radio Service when activated in the optional installation of the GDL 69A. The GDU 620 serves as the display and control head for your remotely mounted GDL 69A. XM Satellite Radio allows you to enjoy a variety of radio programming over long distances without having to constantly search for new stations. Based on signal from satellites, coverage far exceeds land-based transmissions. When enabled, the XM Satellite Radio audio entertainment is accessible in Aux page group.

The information on the XM Satellite Radio display is composed of four areas: the Active Channel, Available Channels, Category of the highlighted channel, and the Volume setting. The Active Channel window shows the Channel Name and Number, Artist, Song Title, and Category.

1) Turn the large **MFD** knob to Aux Mode.
2) Turn the small **MFD** knob to the XM Radio page.

Figure 5-13 XM Radio

5.5.3.1 Channel Categories

The Category window displays the currently selected category of audio. Categories of channels, such as Jazz, Rock, or News, can be selected to list the available channels for a type of music or other contents.

1) While viewing the XM Radio page of the AUX page group, press the **CATGRY** soft key to activate Category selection.

2) Turn the small **MFD** knob to select the desired category. When the MFD knob is turned to select a category, the soft keys will not be shown.

Figure 5-14 XM Category List

Figure 5-15 XM Category Soft Keys

3) Press **ENT** to display the list of channels for the highlighted category in the Channels window.

4) Press the small **MFD** knob to cancel selection or to end editing.

OR

1) Press **CATGRY** and then the **CAT +** or **CAT –** soft keys to increment up or down one category at a time.

2) Press **ALL** to show the channels for all categories. Use the large and small **MFD** knobs to select desired channel.

3) Press **ENT** to save the selection or press the small **MFD** knob to cancel selection.

5.5.3.2 Selecting an XM® Radio Channel

The Channel feature is used to navigate through the channels in the selected category.

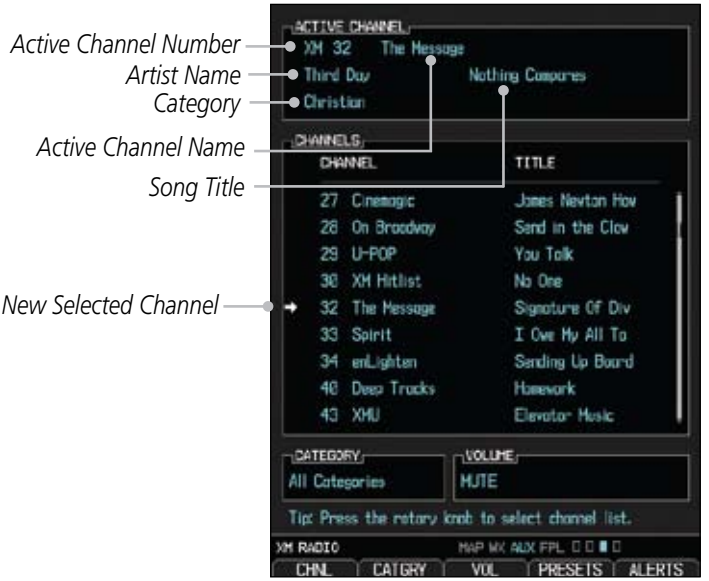


Figure 5-16 XM Channel Selection

1) While viewing the XM Radio page of the AUX page group, press the small **MFD** knob and then turn the small **MFD** knob to select the desired channel.
2) Press **ENT** to make the highlighted channel the Active Channel.

NOTE: *A delay of several seconds may occur when selecting a channel. The listed title may end before the radio begins playing the current Active Channel material.*

3) Press the small **MFD** knob to cancel selection or to end editing.

OR

4) Press **CHNL** and then the **CH +** or **CH –** soft keys to increment up or down one channel at a time in the active category.

OR

5) Press **CHNL** and then the **DIR CH** soft key to directly select a channel in the active category. Use the large and small **MFD** knobs to select desired channel.

6) Press **ENT** to save the selection or press the small **MFD** knob to cancel selection.

5.5.3.3 XM® Radio Volume

The Volume control allows you to set the audio volume level, as well as mute the audio.

Figure 5-17 XM Radio Volume Setting

1. While viewing the XM Radio page of the AUX page group, press the **VOL** soft key.
2. Press the **VOL +** or **VOL –** soft keys, or turn the small **MFD** knob, to adjust the radio volume.

Figure 5-18 XM Radio Volume Controls

3) Press **MUTE** to mute the radio volume.
4) Press **MUTE** again or the **VOL +** or **VOL –** soft keys to unmute the radio volume.

5.5.3.4 XM® Radio Channel Presets

The **PRESET** soft key allows you to store the Active Channel into a selected preset position for easy later recall. A delay of several seconds can occur when setting or recalling a preset.

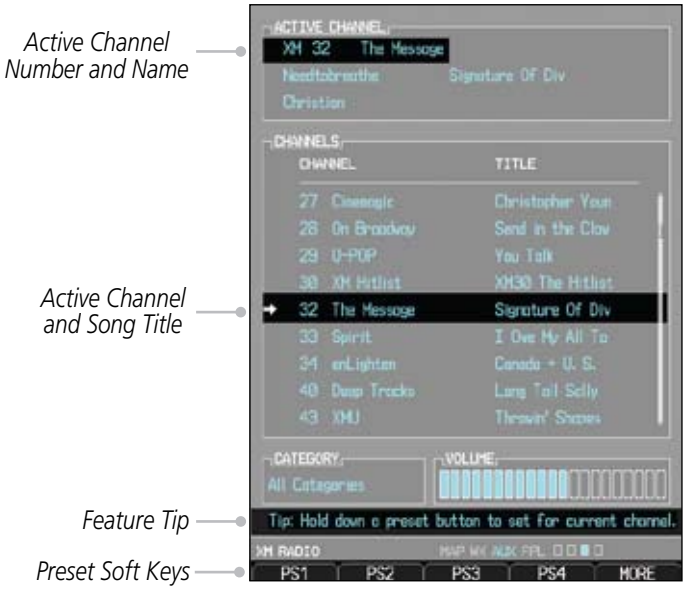


Figure 5-19 XM Radio Presets

Setting a Preset

1) While viewing the XM Radio page of the AUX page group, you may set a preset for the Active Channel. Press the **PRESETS** soft key.
2) Press and hold a preset soft key, such as **PS1**.
3) Press the **MORE** soft key to display the next series of presets.

Recalling a Preset

1) While viewing the XM Radio page of the AUX page group, press the **PRESETS** soft key.
2) Press the preset soft key for the desired stored channel, such as **PS1**.
3) Press the **MORE** soft key to display the next series of presets.

5.5.4 GDL 69/69A Data Link Receiver Troubleshooting

Some quick troubleshooting steps listed below can be performed to find the possible cause of a failure.

- Ensure the owner/operator of the aircraft in which the Data Link Receiver is installed has subscribed to XM
- Ensure the XM subscription has been activated
- Perform a quick check of the circuit breakers to ensure that power is applied to the Data Link Receiver

For troubleshooting purposes, check the LRU Information Box on the AUX - System Status Page for Data Link Receiver (GDL 69/69A) status, serial number, and software version number. If a failure has been detected in the GDL 69/69A the status will be marked with a red "X."

1) Turn the large **MFD** knob to select the AUX Page Group.
2) Turn the small **MFD** knob to select the System Status Page (the last page in the AUX Page Group).

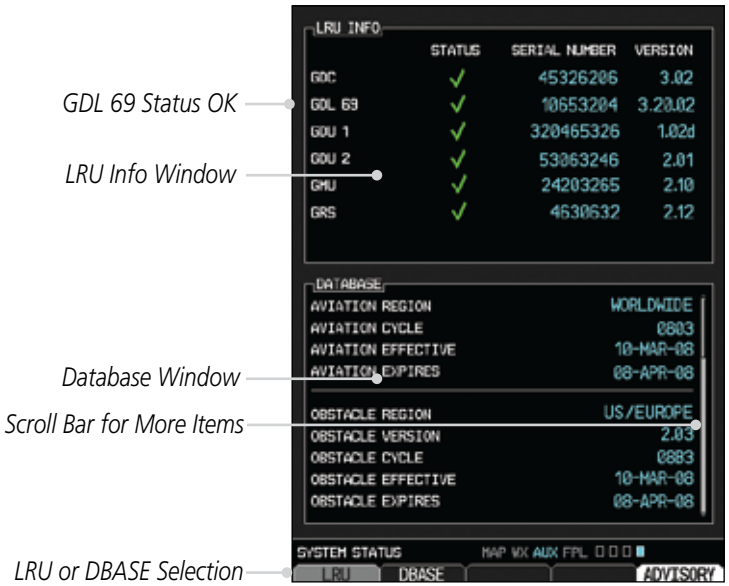


Figure 5-20 LRU Status Window

5.6 Garmin Synthetic Vision Technology (SVT™) (Optional)

The optional Garmin Synthetic Vision Technology (SVT™) is a visual enhancement to the G500H. SVT is displayed as a forward-looking display of the topography immediately in front of the aircraft. SVT information is shown on the primary flight display (PFD). The depicted imagery is derived from the aircraft attitude, heading, GPS three-dimensional position, and a database of terrain, obstacles, and other relevant features.

NOTE: *Not all flight directors are supported with SVT enabled. Check your AFMS to determine if your flight director is supported with SVT enabled.*

The following SVT enhancements appear on the PFD:

- Flight Path Marker
- Horizon Heading Marks
- Traffic Display
- Airport Signs
- Runway Display
- Terrain Alerting
- Obstacle Alerting
- Water
- Zero-Pitch Line

Standard Terrain - SVT is integrated within SVT to provide visual and audible alerts to indicate the presence of terrain threats relative to the projected flight path. In addition to the Terrain - SVT alerts, SVT offers a three-dimensional view of terrain and obstacles. Terrain and/or obstacles that pose a threat to the aircraft in flight are shaded yellow or red.

***NOTE**: SVT will become disabled if the databases necessary to display SVT are unavailable (generating a GDU DB ERR or SVT DISABLED alert) or AHRS or GPS data is unavailable. SVT may be restored once the fail conditions are removed by reactivating SVT as explained in the SVT Operation section.*

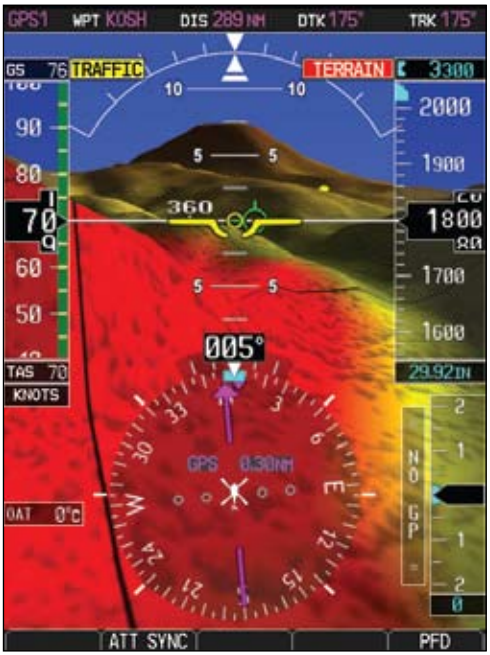


Figure 5-24 Synthetic Vision Imagery - PFD

5.6.1 Garmin SVT™ Operation

Garmin SVT™ is activated from the PFD using the soft keys located along the bottom edge of the display. Pressing the soft keys turn the related function on or off.

SVT functions are displayed on three levels of soft keys. The **PFD** soft key leads into the PFD function soft keys, including synthetic vision. Pressing the **SYN VIS** soft key enables synthetic vision and displays the **SYN TERR**, **HRZN HDG**, and **APTSIGNS** soft keys. The **BACK** soft key returns to the previous level of soft keys.

HRZN and **APTSIGNS** soft keys are dependent upon the state of the **SYN TERR** soft key. When Synthetic Terrain is deactivated, the **SYN TERR** soft key appears illuminated while the remaining SVT soft keys are unavailable for selection and subdued (black with dark-gray characters). If Synthetic Terrain is deactivated, all other SVT features are also deactivated. With Synthetic Terrain activated, all other SVT features may be turned on or off at the pilot's discretion.

- SYN TERR soft key enables synthetic terrain depiction.
- HRZN HDG soft key enable horizon heading marks and digits.
- APTSIGNS soft key enables airport signposts.

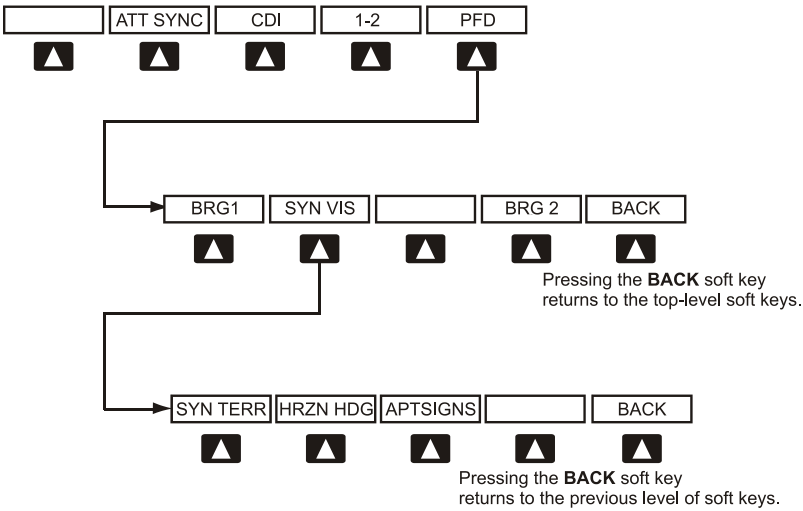


Figure 5-25 SVT Soft Keys

5.6.2 Activating and Deactivating Garmin SVT™

NOTE: *In some instances, such as temporary loss of GPS signal, the SVT functionality will be disabled.*

To enable SVT:

1) Press the **PFD** soft key.
2) Press the **SYN VIS** soft key.
3) Press the **SYN TERR** soft key to view the SVT display.

When SVT is enabled, the pitch ladder will display a different pitch scale.

Figure 5-26 Pitch Scale with SVT Enabled

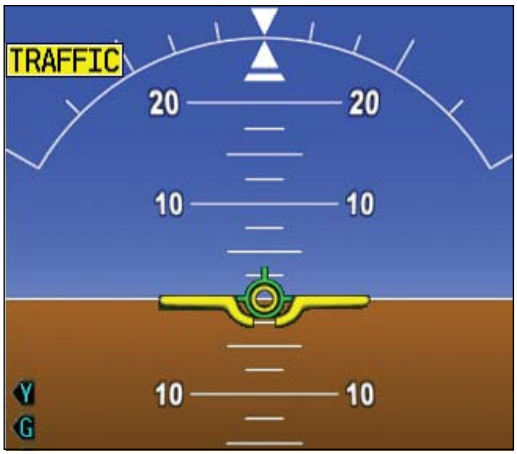


Figure 5-27 Pitch Scale with SVT Disabled

5.6.3 Garmin SVT™ Features

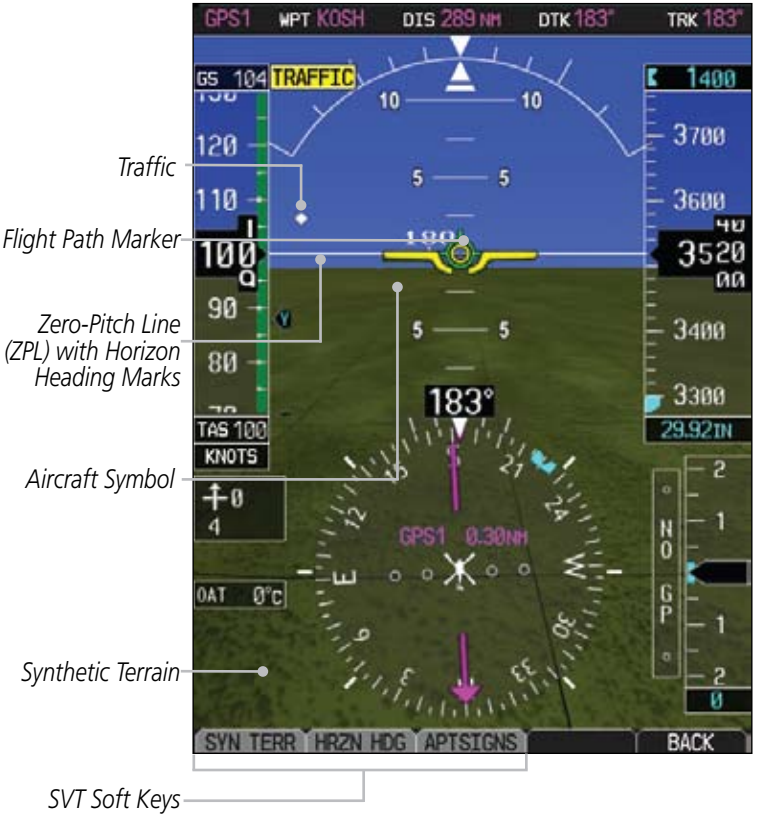


Figure 5-28 SVT on Primary Flight Display

NOTE: *SVT features are not a substitute for standard course and altitude deviation information using the CDI, VSI, and VDI presentations.*

5.6.3.1 Flight Path Marker (FPM)

The Flight Path Marker is also known as a Velocity Vector. It is displayed on the PFD at ground speeds above 30 knots. The FPM depicts approximate projected path of the aircraft accounting for wind speed and direction relative to the three-dimensional display.

5.6.3.2 Zero-Pitch Line

The Zero-Pitch Line is drawn completely across the display and represents the aircraft attitude with respect to the horizon. It is not necessarily aligned with the terrain horizon, particularly when the terrain is sloped or mountainous.

5.6.2.3 Horizon Heading

The Horizon Heading is synchronized with the HSI and shows compass headings in 30-degree increments on the Zero-Pitch Line. Horizon heading tick marks and digits appearing on the zero-pitch line are not visible when they are behind either the airspeed or altitude display. Horizon Heading is activated and deactivated by pressing the **HRZN HDG** soft key.

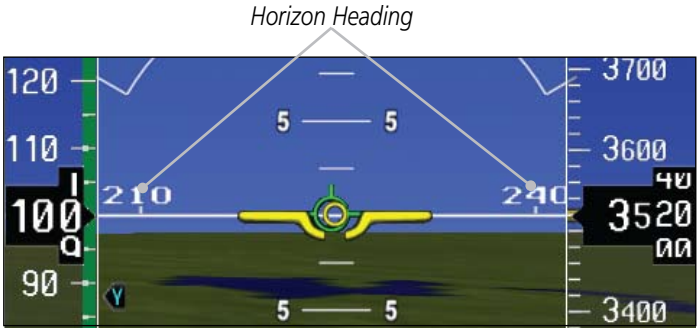


Figure 5-29 Horizon Heading

5.6.2.4 Airport Signs

Airports Signs provide a visual representation of airport location and identification on the synthetic terrain display. When activated, the signs appear on the display when the aircraft is approximately 15 NM from an airport and disappear at approximately 4.5 NM. Airport signs are shown without the identifier until the aircraft is approximately 9 NM from the airport. Airport signs are shown behind the airspeed or altitude display. Airport signs are activated and deactivated by pressing the **APT SIGNS** soft key.

NOTE: *Heliport signs will not appear on the synthetic terrain display.*

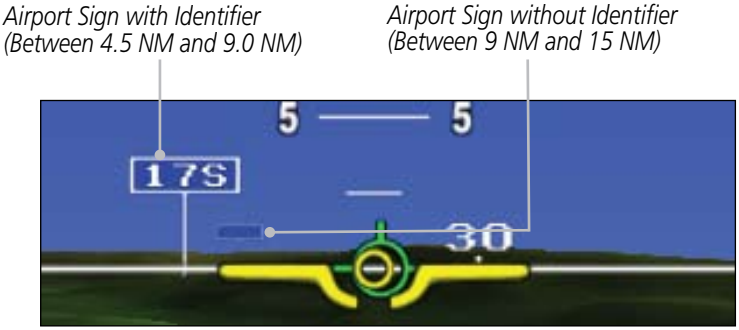


Figure 5-30 Airport Signs

5.6.2.5 Runway Depiction

Runways are shown on the PFD in various ways. Soft surface runways, such as grass runways, are depicted in green. Hard surface runways, such as asphalt, are depicted in gray. Your flightplan will determine how the runway is displayed on the PFD.

Without a loaded flightplan, a runway is shown as dark gray with the boundaries of the runway in light gray. See Figure 5-31.

Figure 5-31 Depiction of Runway with a Loaded Flightplan

A runway that is not in a loaded flightplan is shown as dark gray with no other colors. See Figure 5-32.

Figure 5-32 Depiction of Runway Not in Loaded Flightplan

A runway that is associated with an approach in the loaded flightplan is outlined with a white rectangle, with the actual runway, in that rectangle. See Figure 5-33.

Figure 5-33 Depiction of Runway with Loaded Approach

5.6.2.6 Traffic

Traffic symbols are displayed in their approximate respective location as determined by the related traffic systems, either TIS or TAS. Traffic is displayed in three dimensions, appearing larger as they are getting closer, and smaller when they are further away. Traffic symbol coloring and shaping is the same as that used for traffic displayed in the inset moving map or MFD traffic page.

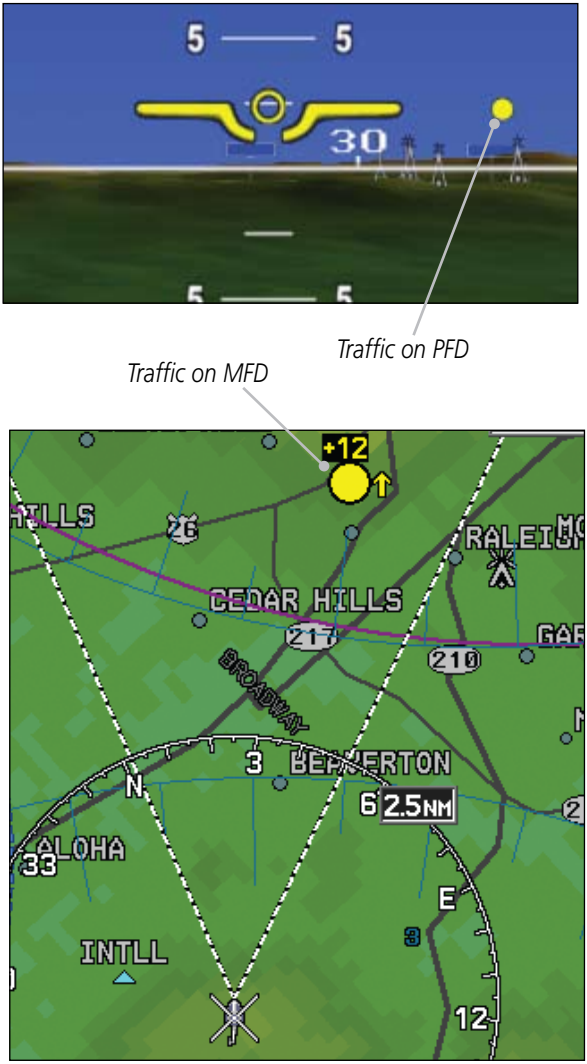


Figure 5-34 Traffic Depiction on PFD and MFD

5.6.2.7 Obstacles

Obstacles are represented on the synthetic display by standard two-dimensional tower symbols found on the MFD maps and charts. Obstacle symbols appear in the perspective view with relative height above terrain and distance from the aircraft.

Figure 5-35 Obstacle Depiction on PFD

Unlike the MFD moving map display, obstacles on the synthetic terrain display do not change colors to warn of potential conflict with the aircraft's flight path until the obstacle is associated with an actual FLTA alert. Obstacles greater than 1000 feet below the aircraft's altitude are not shown. Obstacles are shown behind the airspeed and altitude displays.

5.6.2.8 Field of View

The PFD Field of View can be represented on the MFD Navigation Map Page lateral image. Two dashed lines forming a V-shape in front of the aircraft symbol on the MFD with an angle of approximately 50° represent the forward horizontal field of view shown on the PFD.

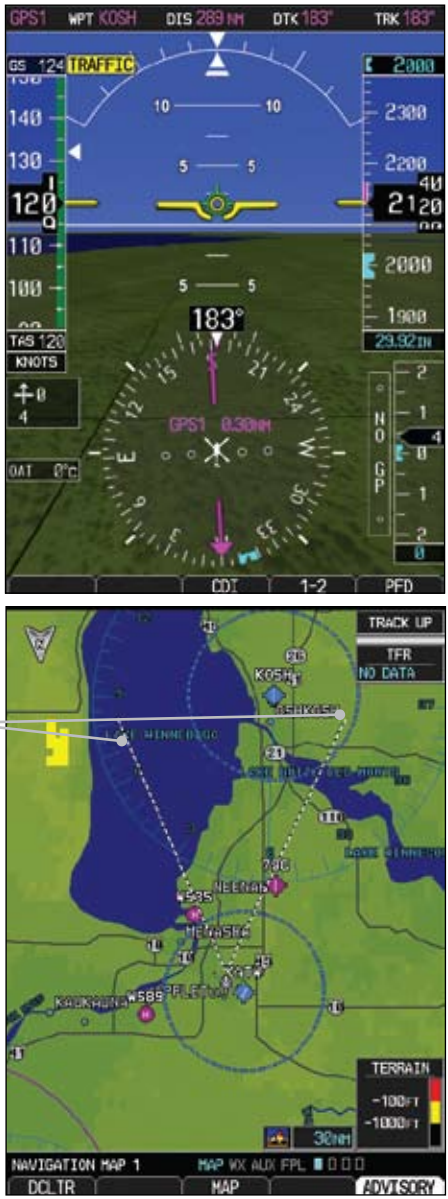


Figure 5-36 MFD and PFD Field of View Comparison

To configure the Field of View:

1) While viewing the Navigation Map 1 or 2 of the Map Page Group, press the **MENU** key to display the **PAGE MENU**.

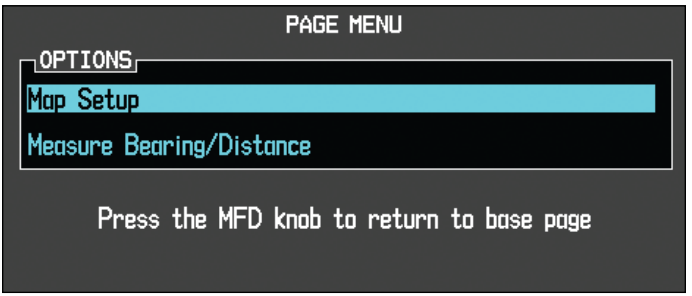


Figure 5-37 Page Menu

2) Press the **ENT** key to bring up the setup page.

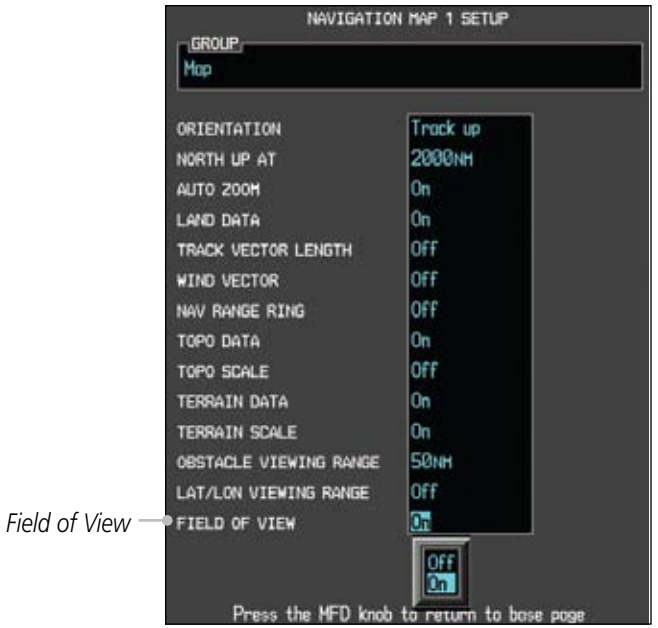


Figure 5-38 Map Setup Items

3) Turn the large **MFD** knob to scroll through the options to FIELD OF VIEW.

4) Turn the small **MFD** knob to select On or Off. Press the **ENT** key to confirm your selection.

5) Press the small **MFD** knob to return to the Navigation Map Page.

5.6.2.9 Unusual Attitudes

Unusual attitudes are displayed with red chevrons overlaid on the display, pointing to the direction to fly to correct the unusual attitude condition. The display shows either a brown or blue band of color at the top or bottom of the screen to represent earth or sky. This is intended to prevent losing sight of the horizon during extreme pitch attitudes.

Two conditions that inhibit SVT and generate alerts on the PFD:

- The position of the aircraft exceeds the range of the terrain database.
- The terrain database is out of date using an older terrain database card.

Figure 5-39 Unusual Attitude Display - Blue Band

Figure 5-40 Unusual Attitude Display - Brown Band

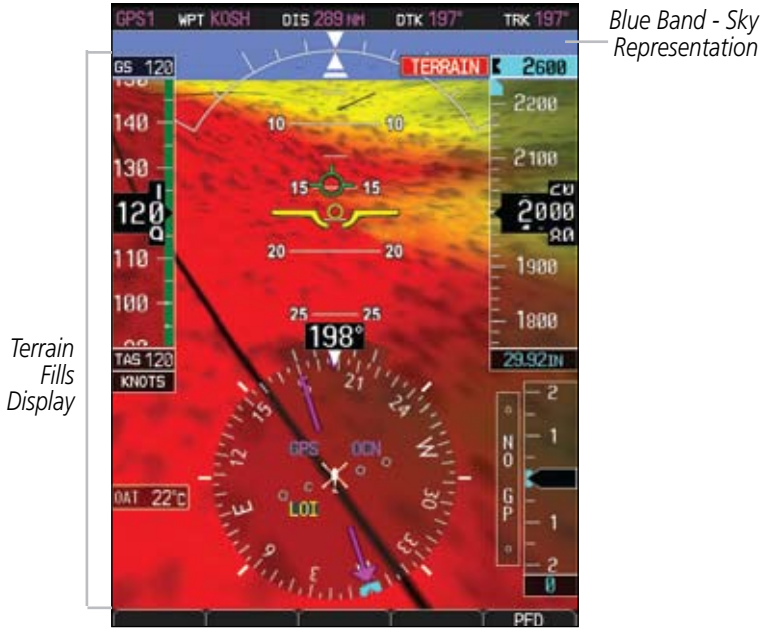


Figure 5-41 Blue Sky Bar with Full Display Terrain

6 ANNUNCIATIONS AND ALERTS

6.1 Alerts

Alert Message	Description	Action
ADC1 ALT EC	• ADC Altitude Error Correction is unavailable. • The alert is enabled and the GDC is reporting that altitude correction is unavailable.	• Contact your Garmin dealer for service.
AHRS1/2 GPS	• AHRS1/2 not receiving any GPS information. • AHRS1/2 operating exclusively in no-GPS reversionary mode. • AHRS1/2 using backup GPS source. • AHRS1/2 not receiving backup GPS information. • Two GPS devices are configured as present and AHRS1 is not receiving GPS data from the backup (2nd) device.	• Verify navigators are on and have a GPS signal and are not in self-test mode. • Check AFMS for limitations. • Contact your Garmin dealer for service.

Alert Message	Description	Action
AHRS1/2 SRVC	• AHRS1/2 magnetic-field model needs update. • Appears on ground only.	• AHRS magnetic field model should be upgraded. • Contact your Garmin dealer for service.
AHRS1/2 TAS	• AHRS1/2 not receiving true airspeed from ADC. • Displayed heading and attitude data is still valid. • Additional loss of GPS data will cause loss of heading and attitude data.	• Check ADC cable. • Contact your Garmin dealer for service.
AUD NOT AVAIL	• Audio system not available.	• Contact your Garmin dealer for service.
AUD SYS FAIL	• Audio system failure.	• Contact your Garmin dealer for service.
CAL LOST	• Calibration Data Lost.	• Contact your Garmin dealer for service.
CNFG MISMATCH	• GDU 1-2 airframe configuration settings disagree.	• Contact your Garmin dealer for service.
CNFG MODULE	• GDU configuration module is inoperative.	• Contact your Garmin dealer for service.
DATA LOST	• Pilot stored data was lost. Recheck data and settings.	• Reset your settings. • G500H pilot configurable items have been returned to default settings.
DIAG MODE	• System is in Diagnostic Mode.	

Alert Message	Description	Action
EXTERNAL TAWS FAIL	• External TAWS device has failed.	• Contact your Garmin dealer for service.
FAN 1/2 FAIL	• Cooling fan 1/2 has failed. • Unit may operate at extreme temperatures • Extended operation at high temperatures is not recommended as damage to the GDU may occur. • PFD/MFD coloration may be incorrect. • Backlight may dim to reduce power and heat.	• Contact your Garmin dealer for service.
GATE MODE	• Automated testing is on.	
GDL69	• GDL 69 has failed.	• Contact your Garmin dealer for service.
GEO LIMITS	• AHRS1 too far North/South, no magnetic heading provided. • Operating in extreme north latitudes has rendered heading data unreliable.	• Use alternate means of navigation. • Check AFMS for limitations.
GPS1/2 FAIL	• Communication lost with GPS1/2.	• Use an alternate navigation source.

Alert Message	Description	Action
GPS(1/2) PPS FAIL	• Timing data from GPS 1/2 is lost.	• Contact your Garmin dealer for service.
GSR FAIL	• GSR has failed.	• Contact your Garmin dealer for service.
HDG FAULT	• AHRS1/2 in no-magnetometer reversionary mode. • Heading fault state on AHRS. • Heading data is unreliable.	• Check AFMS for limitations. • Use Compass or other course information. • Contact your Garmin dealer for service.
HDG LOST	• HDG features disabled or defaulted to GPS1 TRK. • GDU is in the reversionary track-based mode.	
<LRU> CONFIG	• Error in the configuration of a specific LRU, where <LRU> denotes a specific LRU, such as GDL69 or GWX.	• Config service required. Contact your Garmin dealer for service.
<LRU> COOLING	• <LRU> has poor cooling. Reducing power usage by dimming display.	• Specific LRU has poor cooling, where <LRU> denotes the specific LRU and power is being reduced. • Contact your Garmin dealer for service.

Alert Message	Description	Action
<LRU> DB ERR	• <LRU> database error exists, where "<LRU> database" denotes the specific unit database.	• Replace or update database.
<LRU> KEYSTK	• <LRU> <KEY> is stuck. The <LRU> has detected the <KEY> key as stuck, where <LRU> and <KEY> denote a specific LRU and key.	
<LRU> SERVICE	• <LRU> needs service. Return unit for repair.	• Contact your Garmin dealer for service. Specific LRU should be serviced, where <LRU> denotes the specific LRU.
<LRU> VOLTAGE	• <LRU> has low voltage. Reducing power usage by dimming display, where <LRU> denotes the specific LRU and power is being reduced.	• Contact your Garmin dealer for service.
MANIFEST	• <LRU> software mismatch, communication halted.	• Contact your Garmin dealer for service.
NAV1/2	• Communication with NAV1/2 is lost. • No navigation receiver 1/2 data.	• Switch to alternate navigation (GPS or otherwise) if available.

Alert Message	Description	Action
SIMULATOR	• Simulator mode is active. Do not use for navigation.	• Simulator mode is active.
SVT DISABLED	• Outside of terrain database coverage area. • Terrain database resolution is too low.	• Repeat steps to reactivate SVT with the appropriate PFD soft keys. • Install 9 arc-second database.
SW MISMATCH	• GDU software version mismatch. No GDU crossfill.	• Contact your Garmin dealer for service.
TDB	• Airframe does not support Terrain database.	
TERRAIN DSP	• Terrain, airport terrain, or obstacle database error in TAWS B or TERRAIN-SVT only.	• Update database.
TRAFFIC FAIL	• Traffic device has failed. • Traffic data will no longer be displayed.	• Contact your Garmin dealer for service.
TRK LOST	• Heading and track from active GPS lost. HSI is using secondary GPS track.	
TRK TRAFFIC	• Heading Lost. Traffic is now based on track.	

Table 6-1 Alert Messages

6.2 System Status

The System Status page of Aux mode shows the status, serial number, and software version of LRUs and the date of databases. There are no menu pages. In the LRU Status column, a green check means the unit is present and operating properly, while a red "X" indicates an absence or failure.

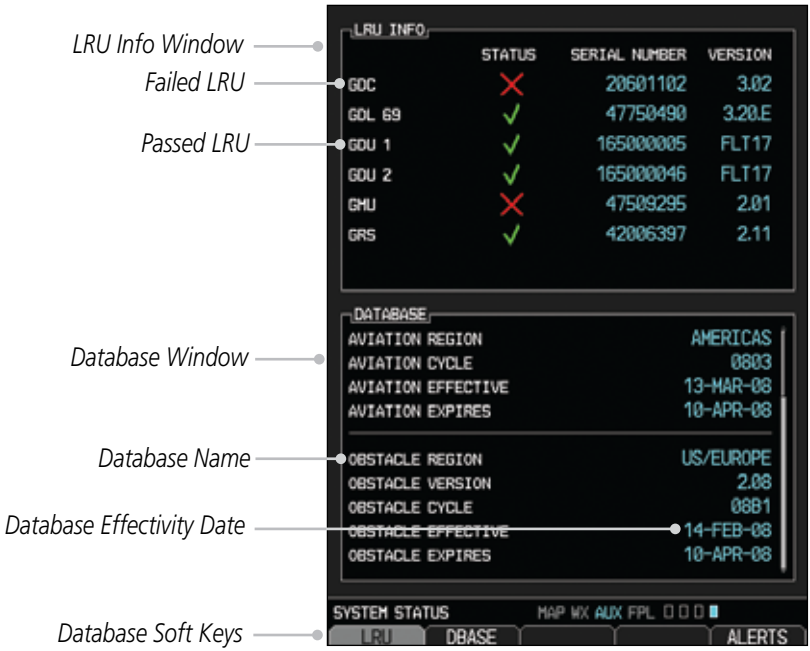


Figure 6-1 System Status

This page intentionally left blank

7 SYMBOLS

The following tables describe the symbols that are found on the MFD Map displays.

7.1 Map Page Symbols

Symbol	Description
	Unknown Airport
	Non-towered, Non-serviced Airport
	Towered, Non-serviced Airport
	Non-towered, Serviced Airport
	Towered, Serviced Airport
	Soft Surface, Serviced Airport
	Soft Surface, Non-serviced Airport
	Private Airport
	Heliport
	Intersection
	LOM (compass locator at outer marker)
	NDB (Non-directional Radio Beacon)
	VOR
	VOR/DME
	ILS/DME or DME-only
	VORTAC
	TACAN

Table 7-1 Map Page Symbols

7.2 SafeTaxi™ Symbols

Symbol	Description
	Helipad
	Airport Beacon
	Under Construction Zones
	Unpaved Parking Areas

Table 7-2 SafeTaxi Symbols

7.3 Traffic Symbols

Symbol	Description (Highest to Lowest Priority)
	Traffic Advisory (TA), In Range
	Traffic Advisory (TA), Out of Range
	Proximate Advisory (PA)
	Other Traffic
	On-Ground Aircraft
	Ground Non-Aircraft Vehicle

Table 7-3 Traffic Symbols

7.4 Terrain Obstacle Symbols

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

Figure 7-1 Obstacle Altitude/Color Correlation

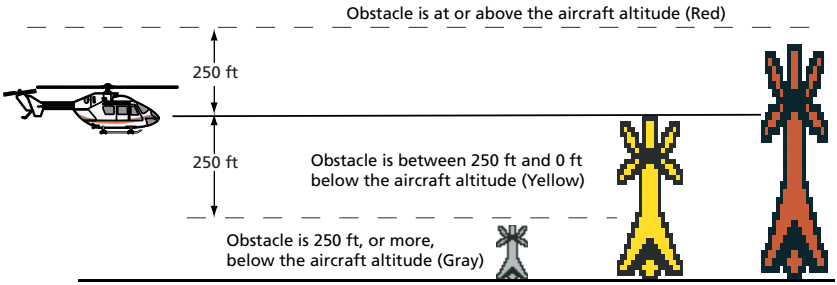


Figure 7-2 Obstacle Altitude Correlation

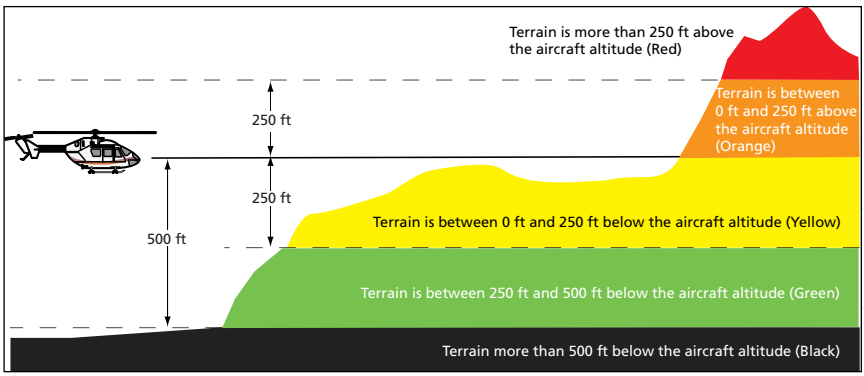


Figure 7-3 TERRAIN Altitude/Color Correlation

S

7.5 Basemap Symbols

Symbol	Description
	Interstate Highway
	State Highway
	US Highway
	National Highway - 2-digit drawn inside
	Small City or Town
	Medium City
	Large City

Table 7-4 Basemap Symbols

7.6 Map Tool Bar Symbols

Symbol	Description
	Overzoom Indicator
	Terrain Proximity Enabled and Available Indicator
	Terrain Proximity Enabled and Not Available Indicator
	Traffic Enabled and Available Indicator
	Traffic Enabled and Not Available Indicator

Table 7-5 Map Tool Bar Symbols

7.7 XM Weather Tool Bar Symbols

Symbol	Description
	NEXRAD
	Cloud Top (Cloud Top and Echo Top Mutually Exclusive)
	Echo Top (Cloud Top and Echo Top Mutually Exclusive)
	XM Lightning
	Cell Movement
	SIGMETs / AIRMETs
	METARs
	City Forecast
	Surface Analysis
	Freezing Levels
	Winds Aloft
	County Warnings
	Cyclone Warnings

Table 7-6 XM Weather Tool Bar Symbols

7.8 Miscellaneous Symbols

Symbol	Description
	Rotary Wing, Piston
	Rotary Wing, Turbine
	Default Map Cursor
	Measuring Cursor
	MFD Wind Vector (w/ valid GPS solution)
	PFD Wind Vector styles
	Parallel Track Waypoint
	Restricted/Prohibited/Warning/Alert
	TFR (Temporary Flight Restrictions)
	MOA
	Class B Airspace
	Class C Airspace
	Class D Airspace
	User Waypoint

Table 7-7 Miscellaneous Symbols

8 GLOSSARY

ACT, ACTV	active, activate
ADC	Air Data Computer
ADF	Automatic Direction Finder
ADI	Attitude Direction Indicator
AFF	Automatic Flight Following
AFM	Airplane Flight Manual
AFMS	Airplane Flight Manual Supplement
AGL	Above Ground Level
AHRS	Attitude and Heading Reference System
AIM	Airman's Information Manual
AIRMET	Airman's Meteorological Information
ALT	altitude
AP	autopilot
APR	approach
APT	airport, aerodrome
ARINC	Aeronautical Radio Incorporated
ARSPC	airspace
ARTCC	Air Route Traffic Control Center
AS	airspeed
ASOS	Automated Surface Observing System
ATC	Air Traffic Control
ATCRBS	ATC Radar Beacon System
ATIS	Automatic Terminal Information Service
AUX	auxiliary
AWOS	Automated Weather Observing System
BARO	barometric setting
BC	backcourse
Bearing	The compass direction from the present position to a destination waypoint
BRG	bearing
C	center runway
°C	degrees Celsius
CDI	Course Deviation Indicator
CHNL	channel
CLD	cloud
CLR	clear
CONFIG	configuration

Course	The line between two points to be followed by the aircraft
Crosstrack Error	The distance the aircraft is off a desired course in either direction, left or right
CRS	course
CRSR	cursor
CTA	Control Area
CTRL	control
CUM	The total of all legs in a flight plan.
D ALT	density altitude
DB, DBASE	database
DCLTR, DECLTR	declutter
deg	degree
DEP	departure
Desired Track (DTK)	The desired course between the active "from" and "to" waypoints
DEST	destination
DFLT	default
DIS	distance
Distance	The 'great circle' distance from the present position to a destination waypoint
DME	Distance Measuring Equipment
DP	Departure Procedure
DPRT	departure
DSBL	disabled
DTK	Desired Track
EDR	Excessive Descent Rate
ELEV	elevation
EMI	Electromagnetic Interference
ENR	en route
En Route Safe Altitude	The recommended minimum altitude within ten miles left or right of the desired course on an active flight plan or direct-to
ENT	enter
ERR	error
ESA	En route Safe Altitude
ETA	Estimated Time of Arrival
ETE	Estimated Time En Route

ºF	degrees Fahrenheit
FAA	Federal Aviation Administration
FCC	Federal Communication Commission
FCST	forecast
FD	flight director
FIS-B	Flight Information Services-Broadcast
FISDL	Flight Information Service Data Link
FLTA	Forward Looking Terrain Avoidance
FPL	flight plan
FREQ	frequency
FRZ	freezing
FSS	Flight Service Station
ft	foot/feet
G/S, GS	glideslope
GDC	Garmin Air Data Computer
GDL	Garmin Satellite Data Link
GDU	Garmin Display Unit
GEO	geographic
GLS	Global Navigation Satellite Landing System
GMA	Garmin Audio Panel System
GMT	Greenwich Mean Time
GMU	Garmin Magnetometer Unit
GPS	Global Positioning System
GPSS	GPS Roll Steering
Ground Speed	The velocity that the aircraft is travelling relative to a ground position
Ground Track	*see Track*
GRS	Garmin Reference System
GS	Ground Speed
GTX	Garmin Transponder
HDG	heading
Heading	The direction an aircraft is pointed, based upon indications from a magnetic compass or a properly set directional gyro
HFOM	Horizontal Figure of Merit
Hg	mercury
hPa	hectopascal
HPL	Horizontal Protection Level

HSDB	High-Speed Data Bus
HSI	Horizontal Situation Indicator
Hz	Hertz
IAF	Initial Approach Fix
ICAO	International Civil Aviation Organization
IFR	Instrument Flight Rules
IGRF	International Geomagnetic Reference Field
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
IOI	Imminent Obstacle Impact
INFO	information
in HG	inches of mercury
INT	intersection(s)
INTEG	integrity (RAIM unavailable)
ITI	Imminent Terrain Impact
L	left, left runway
LAT	latitude
LCD	Liquid Crystal Display
LCL	local
LED	Light Emitting Diode
Leg	The portion of a flight plan between two waypoints
LIFR	Low Instrument Flight Rules
LNAV	Lateral Navigation
LOC	localizer
LOI	loss of integrity (GPS)
LON	longitude
LPV	Localizer Performance with Vertical guidance
LRU	Line Replacement Unit
LT	left
LTNG	lightning
MAG	Magnetic
MAG VAR	Magnetic Variation
MapMX	A proprietary data format used to forward navigation information from the GNS units to the GDU 620
MAX	maximum
MAXSPD	maximum speed (overspeed)

MDA	barometric minimum descent altitude
METAR	Aviation Routine Weather Report
MFD	Multi Function Display
MIN	minimum
Minimum Safe Altitude	Uses Grid MORAs to determine a safe altitude within ten miles of the aircraft present position
MKR	marker beacon
MOA	Military Operations Area
MOV	movement
mpm	meters per minute
MSA	Minimum Safe Altitude
MSG	message
MSL	Mean Sea Level
MT	meter
mV	millivolt(s)
MVFR	Marginal Visual Flight Rules
NAV	navigation
NAVAID	NAVigation AID
NCR	Negative Climb Rate
NDB	Non-Directional Beacon
NEXRAD	Next Generation Radar
OAT	Outside Air Temperature
OBS	Omni Bearing Selector
PA	Proximity Advisory
PC	personal computer
PDA	Premature Descent Alert
PFD	Primary Flight Display
P. POS	Present Position
PTK	parallel track
QTY	quantity

R	right, right runway
RAIM	Receiver Autonomous Integrity Monitoring
RAM	random access memory
REF	reference
REQ	required
REV	reverse, revision, revise
RMI	Radio Magnetic Indicator
RNG	range
RNWY	runway
ROC	Reduced Required Obstacle Clearance
RT	right
RTC	Reduced Required Terrain Clearance
SBAS	Satellite-Based Augmentation System
SCIT	Storm Cell Identification and Tracking
SD	Secure Digital
SFC	surface
SIAP	Standard Instrument Approach Procedures
SID	Standard Instrument Departure
SIGMET	Significant Meteorological Information
SLP/SKD	slip/skid
SMBL	symbol
SPD	speed
SRVC, SVC	service
STAR	Standard Terminal Arrival Route
STATS	statistics
STBY	standby
STD	standard
SUA	Special Use Airspace
SUSP	suspend
SVT	Synthetic Vision
SW	software
SYS	system
T	true
TA	Traffic Advisory
TACAN	Tactical Air Navigation System
TAF	Terminal Aerodrome Forecast
TAS	True Airspeed
TAS	Traffic Advisory System

TAT	Total Air Temperature
TAWS	Terrain Awareness and Warning System
TCA	Terminal Control Area
TCAS	Traffic Collision Avoidance System
TEMP	temperature
TERM	terminal
TFR	Temporary Flight Restriction
T HDG	True Heading
TIS	Traffic Information System
TMA	Terminal Maneuvering Area
Topo	topographic
Track	Direction of aircraft movement relative to a ground position; also 'Ground Track'
TRK	track
TRSA	Terminal Radar Service Area
UNAVAIL	unavailable
USR	user
UTC	Coordinated Universal Time
UTM/UPS	Universal Transverse Mercator/ Universal Polar Stereographic Grid
V, Vspeed	velocity (airspeed)
VAR	variation
VFR	Visual Flight Rules
VHF	Very High Frequency
VLOC	VOR/Localizer Receiver
VMC	Visual Meteorological Conditions
VNAV, VNV	vertical navigation
VOR	VHF Omni-directional Range
VORTAC	very high frequency omnidirectional range station and tactical air navigation
VS	Vertical speed
VSI	Vertical Speed Indicator
WAAS	Wide Area Augmentation System
WGS-84	World Geodetic System - 1984
WPT	waypoint(s)
WX	weather

XPDR	transponder
XTK	cross-track

APPENDIX A

SD Card Use and Databases

The G500H System uses Secure Digital (SD) cards to load and store various types of data. For basic flight operations, SD cards are required for database storage as well as database updates.

Jeppesen Databases

The navigation database is updated on a 28 day cycle. Navigation database updates are provided by Garmin and may be downloaded from the Garmin web site "fly.garmin.com" onto a Garmin provided Supplemental Datacard. Contact Garmin at fly.garmin.com for navigation database updates and update kits. The Navigation database is stored internally and the Datacard is only used to transfer the database into the unit.

The optional ChartView database is updated on a 14 day cycle. The ChartView database is provided directly from Jeppesen. Contact Jeppesen (www.jeppesen.com) for ChartView subscription and update information.

Updating the Jeppesen navigation database

1) With the G500H System OFF, insert the SD card containing the navigation database update into the upper card slot of the GDU 620 to be updated (label of SD card should face up).
2) Turn the G500H System ON.
3) Verify the correct update cycle is loaded during power-up.

Garmin Databases

***NOTE:** The data contained in the terrain and obstacle databases comes from government agencies. Garmin accurately processes and cross-validates the data, but cannot guarantee the accuracy and completeness of the data.*

The following GDU 620 databases are stored on Supplemental Data Cards provided by Garmin:

- Terrain – The terrain database contains terrain mapping data. It is updated periodically and has no expiration date.
- Airport terrain – The airport terrain database contains detailed airport terrain data. It is updated periodically and has no expiration date.
- Obstacle – The obstacle database contains data for obstacles, such as towers, that pose a potential hazard to aircraft. Obstacles 200 feet and higher are included in the obstacle database. It is very important to note that not all obstacles are necessarily charted and therefore may not be contained in the obstacle database. This database is updated on a 56-day cycle. Obstacles will still be shown after the database has expired.
- SafeTaxi – The SafeTaxi database contains detailed airport diagrams for selected airports. These diagrams aid in following ground control instructions by accurately displaying the aircraft position on the map in relation to taxiways, ramps, runways, terminals, and services. This database is updated on a 56-day cycle. SafeTaxi will still be shown after it has expired.
- FliteCharts – The FliteCharts database contains procedure charts for the United States only. This database is updated on a 28-day cycle. If not updated within 180 days of the expiration date, FliteCharts no longer functions.

After subscribing to the desired database product, the database product will need to be downloaded to a Supplemental Data Card. Insert the Supplemental Data Card into the card slot shown in Figure A-1. The upper slot is typically used for updating the navigation database and is then normally left open. The card may be inserted in either slot. The Supplemental Data Card should not be removed except to update the databases stored on the card.

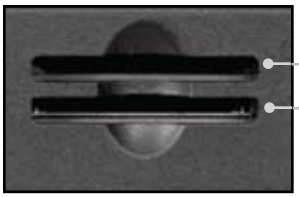


Figure A-1 SD Card Database Location

The Garmin databases can be updated by following the instructions detailed in the "Navigation Databases" section of the Garmin web site (*fly.garmin.com*). Once the updated files have been downloaded from the web site, a PC equipped with an appropriate SD card reader is used to unpack and program the new databases onto the existing Supplemental Data Cards. The following equipment is required to perform the update:

- Windows-compatible PC computer (Windows 2000 or XP recommended)
- SanDisk SD Card Reader, P/Ns SDDR-93 or SDDR-99 or equivalent card reader
- Updated database obtained from the Garmin web site
- Existing Supplemental Database SD Card (P/N 010-00769-42)

It may be necessary to have the system configured by a Garmin authorized service facility in order to use certain database features.

Updating Garmin databases

1) Download the data to the data cards from the appropriate web site.
2) Insert Navigation Database SD card in an empty card slot of the GDU 620. The SD card containing the ChartView, FliteCharts, SafeTaxi, or any other database (except for the Jeppesen Navigation Database) is typically inserted into the lower slot on the GDU 620.
3) Apply power to the G500H System. View the MFD power-up splash screen. Check that the databases are initialized and displayed on the splash screen. When updating the terrain and FliteCharts databases, an "in progress" message may be seen. If this message is present, wait for the system to finish loading before proceeding. Some databases can take up to 15 minutes to update.

Figure A-2 Database Information on the Splash Screen

4) Acknowledge the Power-up Page agreement by pressing the **ENT** key or the right-most soft key.

5) Use the large **MFD** knob to select the AUX page group and then small **MFD** knob to reach the System Status Page.

6) Press the **DBASE** soft key to place the cursor in the "DATABASE" window.

7) Turn the small **MFD** knob to scroll through the list and check that all databases are current and there are no errors. If a database is highlighted in yellow, it is either expired or the G500H can not determine the date.

8) Power down the GDU 620.

INDEX

Symbols

A

B

C

D

E

F

G

H

I

J

L

M

N

O

P

R

S

T

U

V

W

X

Z

This page intentionally left blank

GARMIN International, Inc.
1200 East 151st Street, Olathe, Kansas 66062, U.S.A.
Tel. 913/397.8200 or 800/800.1020
Fax 913/397.8282

Garmin AT, Inc.
2345 Turner Rd., S.E., Salem, Oregon 97302, U.S.A.
Tel. 503/581.8101 or 800/525.6726
Fax. 503/364.2138

Garmin (Europe) Ltd.
Liberty House, Bulls Copse Road, Hounsdown Business Park,
Southampton, SO40 9RB, U.K.
Tel. +44 (0) 870 850 1243
Fax +44 (0) 238 052 4004

GARMIN Corporation
No. 68, Jangshu 2nd Road, Shijr, Taipei County, Taiwan
Tel. 886/2.2642.9199
Fax 886/2.2642.9099

www.garmin.com

Part Number 190-01150-02 Rev. B