

## SECTION 1 SYSTEM OVERVIEW

### 1.1 SYSTEM DESCRIPTION

This section is designed to provide an overview of the G1000 Integrated Flight Deck as installed in Cessna Nav III aircraft, which include the Cessna 172R, 172S, the normally aspirated Cessna 182 (182), the turbocharged Cessna 182 (T182), the normally aspirated Cessna 206 (206), and the turbocharged Cessna 206 (T206).

The G1000 system is an integrated flight control system that presents flight instrumentation, position, navigation, communication, and identification information to the pilot through large-format displays. The system consists of the following Line Replaceable Units (LRUs):

- **GDU 1040/1044B** Primary Flight Display (PFD)
- **GDU 1040/1044B** Multi Function Display (MFD)
- **GIA 63/63W** Integrated Avionics Unit (IAU)
- **GDC 74A** Air Data Computer (ADC)
- **GEA 71** Engine/Airframe Unit
- **GRS 77** Attitude and Heading Reference System (AHRS)
- **GMU 44** Magnetometer
- **GMA 1347** Audio System with Integrated Marker Beacon Receiver
- **GTX 33** Mode S Transponder
- **GDL 69A** Satellite Data Link Receiver
- **GTS 800** Traffic Avoidance System (optional)
- **GDL 90** ADS-B/FIS-B Data Link Transceiver (optional)
- **GSA 81** AFCS Servos
- **GSM 85** Servo Gearboxes

A top-level G1000 system block diagram is shown in Figure 1-1. See Figure 1-2 for optional/additional equipment.



**NOTE:** Refer to the AFCS section for details on the GFC 700 AFCS.

The GFC 700 Automated Flight Control System (AFCS) provides the flight director (FD) and autopilot (AP) functions of the G1000 system.

## 1.2 LINE REPLACEABLE UNITS (LRU)

- **GDU 1040/1044B** – The GDU 1044B features a 10.4-inch LCD display with 1024 x 768 resolution. The left display is configured as a PFD and the right display is configured as an MFD. Both GDU 1044Bs link and display all functions of the G1000 system during flight. The displays communicate with each other through a High-Speed Data Bus (HSDB) Ethernet connection. Each display is also paired via an Ethernet connection with a GIA 63 or 63W Integrated Avionics Unit. Systems that do not use the GFC 700 Automatic Flight Control System use the GDU 1040, which employs the same features as the GDU 1044B without the controls for the Garmin GFC 700 Automatic Flight Control System (AFCS).



- **GIA 63/63W (2)** – Functions as the main communication hub, linking all LRUs with the PFD. Each GIA 63/63W contains a GPS receiver, VHF COM/NAV/GS receivers, a flight director (FD) and system integration microprocessors. The GIA 63W contains a GPS SBAS receiver. Each GIA is paired with a respective GDU 1040/1044B display through Ethernet. The GIAs are not paired together and do not communicate with each other directly.



- **GDC 74A (1)** – Processes data from the pitot/static system as well as the OAT probe. This unit provides pressure altitude, airspeed, vertical speed and OAT information to the G1000 system, and it communicates with the GIA 63/63W, GDU 1040/1044B, and GRS 77, using an ARINC 429 digital interface. The GDC 74A also interfaces directly with the GTP 59.



- **GEA 71** (1) – Receives and processes signals from the engine and airframe sensors. This unit communicates with both GIA 63/63Ws using an RS-485 digital interface.



- **GRS 77** (1) – Provides aircraft attitude and heading information via ARINC 429 to both the GDU 1040/1044B and the GIA 63/63W. The GRS 77 contains advanced sensors (including accelerometers and rate sensors) and interfaces with the on-side GMU 44 to obtain magnetic field information, with the GDC 74A to obtain air data, and with both GIAs to obtain GPS information. AHRS modes of operation are discussed later in this document.



- **GMU 44** (1) – Measures local magnetic field. Data is sent to the GRS 77 for processing to determine aircraft magnetic heading. This unit receives power directly from the GRS 77 and communicates with the GRS 77 using an RS-485 digital interface.



- **GMA 1347** – The GMA 1347 Audio Panel integrates NAV/COM digital audio, intercom system and marker beacon controls. The GMA 1347 also controls manual display reversionary mode (red **DISPLAY BACKUP** button) and is installed between the MFD and the PFD. The GMA 1347 communicates with both GIA 63/63Ws using an RS-232 digital interface.



- **GTX 33** (1) – The GTX 33 is a solid-state, Mode-S transponder that provides Modes A, C and S operation. The GTX 33 is controlled through the PFD and communicates with both GIA 63/63Ws through an RS-232 digital interface.



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EIS

AUDIO PANEL & CNS

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- **GDL 69A** (1) – A satellite radio receiver that provides real-time weather information to the G1000 MFD (and, indirectly, to the inset map of the PFD) as well as digital audio entertainment. The GDL 69A communicates with the MFD via HSDB connection. A subscription to the SiriusXM Satellite Radio service is required to enable the GDL 69A capability.



- **GTS 800** – The GTS 800 Traffic Advisory System (TAS) uses active interrogations of Mode S and Mode C transponders to provide Traffic Advisories to the pilot independent of the air traffic control system.



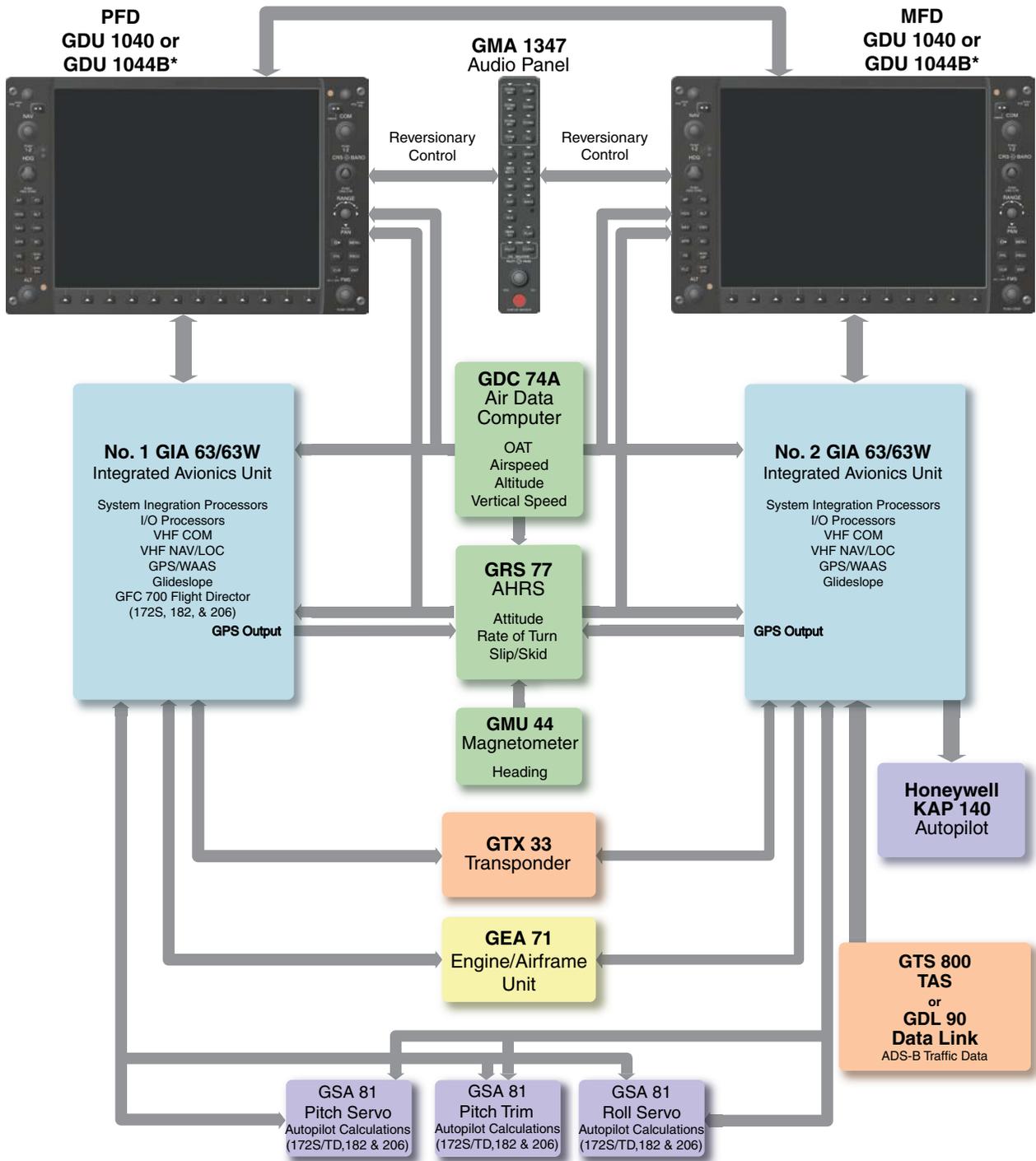
- **GDL 90** (1) – A digital data link transceiver designed to transmit, receive and decode ADS-B traffic information, as well as FIS-B weather information. It broadcasts aircraft position, velocity, projected track, altitude, and flight identification to other equipped aircraft in the vicinity, as well as to FAA ground stations. The GDL 90 receives FIS-B weather information which is displayed on the MFD as NEXRAD radar and METARs.



- **GSA 81** (3), and **GSM 85** (3) – The GSA 81 servos are used for the automatic control of roll, pitch, and pitch trim. These units interface with each GIA 63/63W.

The GSM 85 servo gearbox is responsible for transferring the output torque of the GSA 81 servo actuator to the mechanical flight-control surface linkage.





\* The GDU 1040 is available in systems not using the GFC 700 Automatic Flight Control System. The GDU 1044B is available in systems using the Garmin GFC 700 Automatic Flight Control System.

Figure 1-1 Basic G1000 System

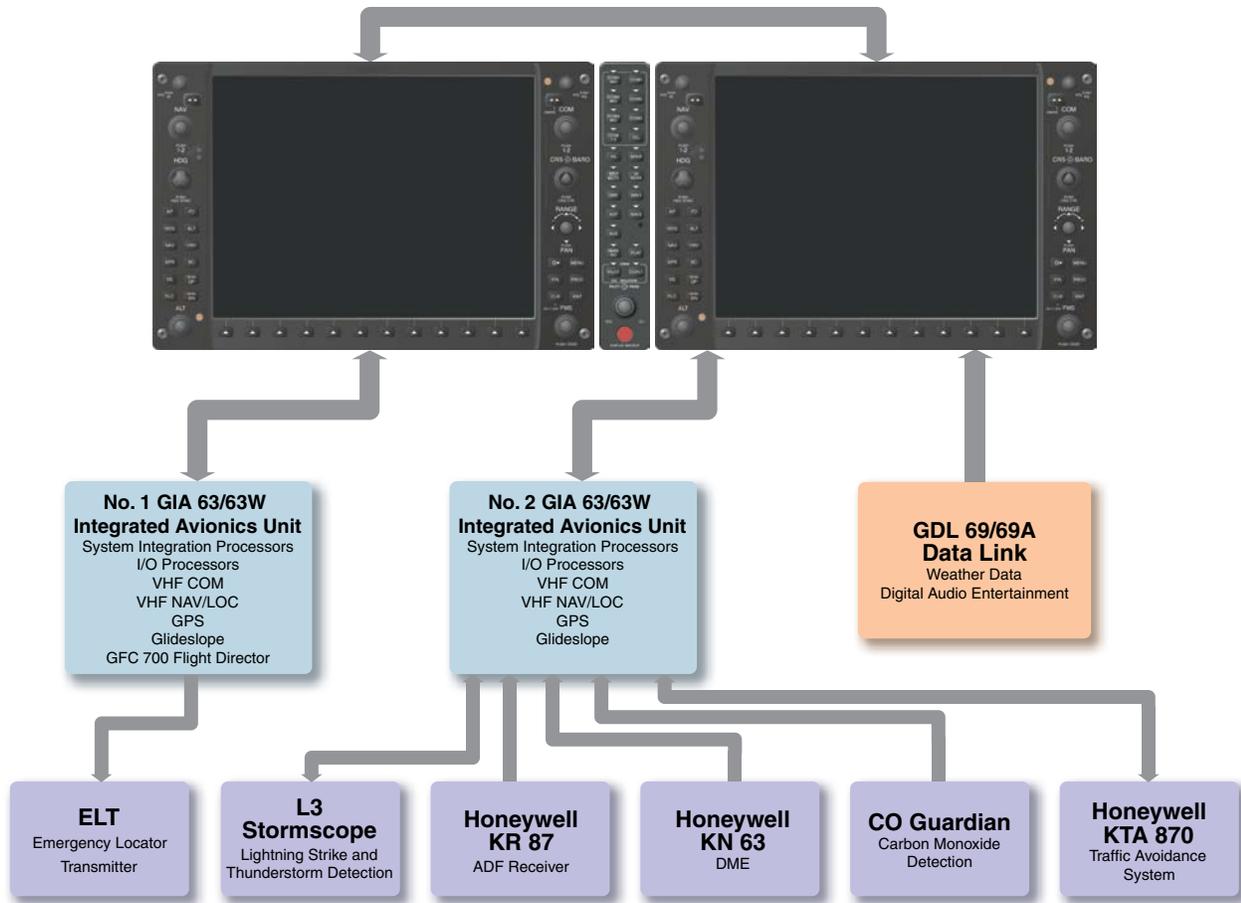


Figure 1-2 Additional Equipment Options

### 1.3 G1000 CONTROLS

**NOTE:** The Audio Panel (GMA 1347) and AFCS controls are described in the CNS & Audio Panel and AFCS sections respectively.

The G1000 system controls are located on the PFD and MFD bezels and audio panel. The controls for the PFD and MFD are discussed within the following pages of this section.

#### PFD/MFD CONTROLS

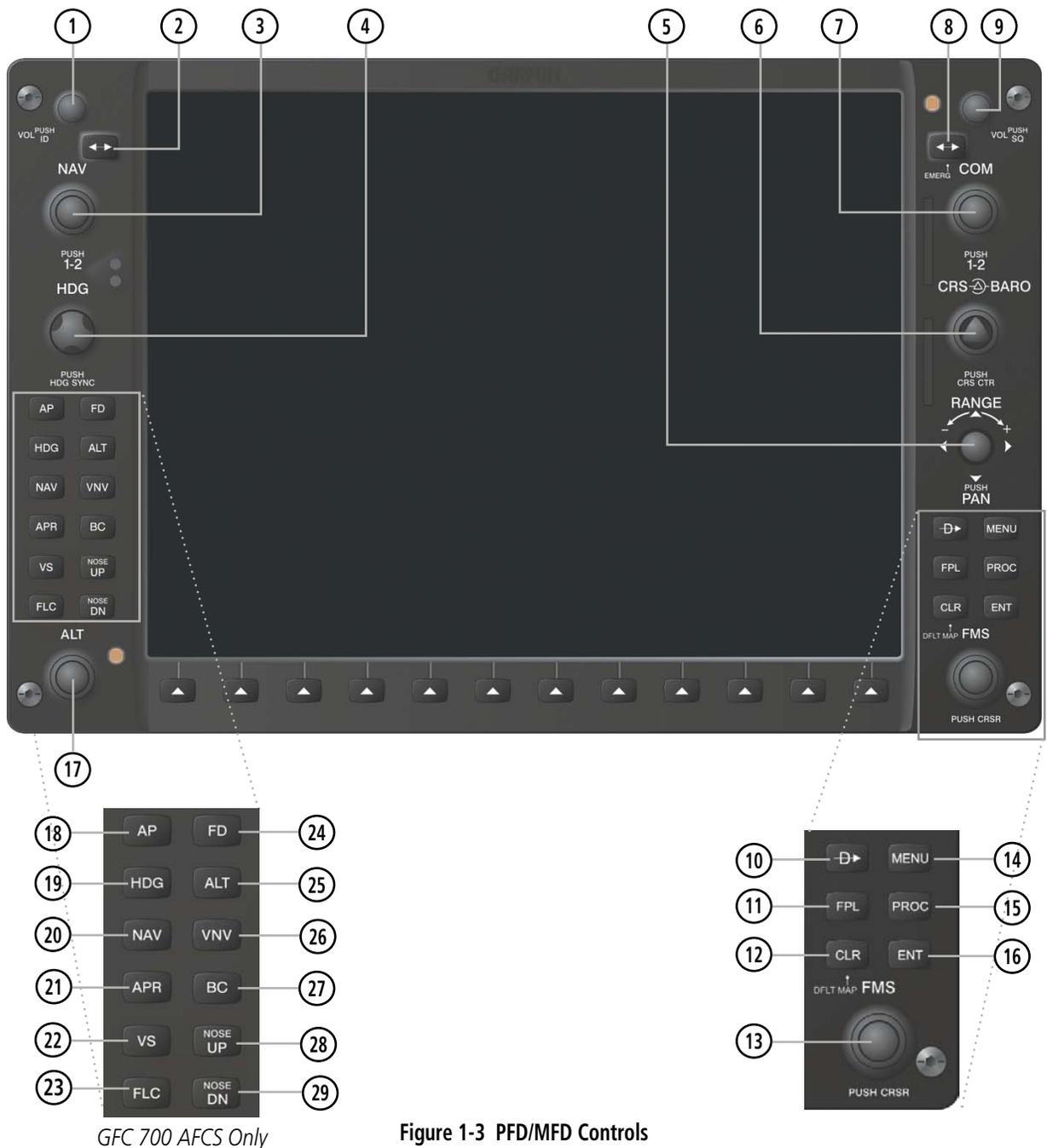
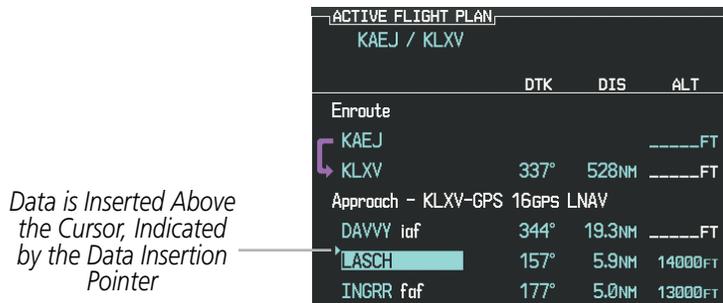


Figure 1-3 PFD/MFD Controls

PFD and MFD control functions are the same.

- ① **NAV VOL/ID Knob** – Controls the NAV audio level. Press to toggle the Morse code identifier ON and OFF. Volume level is shown in the field as a percentage.
- ② **NAV Frequency Transfer Key** – Transfers the standby and active NAV frequencies.
- ③ **Dual NAV Knob** – Tunes the MHz (large knob) and kHz (small knob) standby frequencies for the NAV receiver. Press to toggle the tuning cursor (light blue box) between the NAV1 and NAV2 fields.
- ④ **Heading Knob** – Turn to manually select a heading on the HSI. When pressed, it synchronizes the heading bug with the compass lubber line. Selected Heading provides the heading reference to the Flight Director while operating in Heading Select mode.
- ⑤ **Joystick** – Changes the map range (distance top to bottom of map display) when rotated. Activates the map pointer when pressed.
- ⑥ **CRS/BARO Knob** – The large knob sets the altimeter barometric pressure and the small knob adjusts the course. The course is only adjustable when the HSI is in VOR1, VOR2, or OBS/SUSP mode. Pressing this knob centers the CDI on the currently selected VOR. Selected Course provides course reference to the Flight Director when operating in Navigation and Approach modes.
- ⑦ **Dual COM Knob** – Tunes the MHz (large knob) and kHz (small knob) standby frequencies for the COM transceiver. Pressing this knob toggles the tuning cursor (light blue box) between the COM1 and COM2 fields.
- ⑧ **COM Frequency Transfer Key** – Transfers the standby and active COM frequencies. Pressing and holding this key for two seconds automatically tunes the emergency frequency (121.5 MHz) in the active frequency field.
- ⑨ **COM VOL/SQ Knob** – Controls COM audio level. Audio volume level is shown in the field as a percentage. Pressing this knob turns the COM automatic squelch ON and OFF.
- ⑩ **Direct-to Key** – Allows the user to enter a destination waypoint and establish a direct course to the selected destination (specified by the identifier, chosen from the active route, or taken from the map pointer position).
- ⑪ **FPL Key** – Displays the active Flight Plan Page for creating and editing the active flight plan, or for accessing stored flight plans.
- ⑫ **CLR Key (DFLT MAP)** – Erases information, cancels an entry, or removes page menus. To display the Navigation Map Page immediately, press and hold **CLR** (MFD only).
- ⑬ **Dual FMS Knob** – Press to turn the selection cursor ON/OFF.
  - Data Entry:** With the cursor ON, turn to enter data in the highlighted field (large knob moves cursor location; small knob selects character for highlighted cursor location). When the cursor is turned ON while viewing the Active Flight Plan Page, the cursor is placed on the line below the Data Insertion Pointer see Figure 1-4. The pointer indicates data entered at the cursor will be inserted above the line selected.
  - Scrolling:** When a list of information is too long for the window/box, a scroll bar appears, indicating more items to view. With cursor ON, turn large knob to scroll through the list.
  - Page Selection:** Turn knob on MFD to select the page to view (large knob selects a page group; small knob selects a specific page from the group)
- ⑭ **MENU Key** – Displays a context-sensitive list of options. This list allows the user to access additional features, or to make setting changes that relate to certain pages.



**Figure 1-4 Data Insertion Pointer**

- ⑮ **PROC Key** – Selects approaches, departures and arrivals from the flight plan. If a flight plan is used, available procedures for the departure and/or arrival airport are automatically suggested. If a flight plan is not used, the desired airport and the desired procedure may be selected. This key selects IFR departure procedures (DPs), arrival procedures (STARs) and approaches (IAPs) from the database and loads them into the active flight plan.
- ⑯ **ENT Key** – Accepts a menu selection or data entry. This key is used to approve an operation or complete data entry. It is also used to confirm selections and information entries.
- ⑰ **Dual ALT Knob** – Sets the selected altitude in the box located above the Altimeter. The large knob selects the thousands (500m for metric), while the small knob selects the hundreds (50m for metric). Altitude Select is used by the Automatic Flight Control System in certain modes, in addition to the standard G1000 Altitude Alerter function.

The following are only available with the GFC 700 AFCS.

- ⑱ **AP Key** – Engages/disengages the autopilot and flight director. Pressing the **AP** Key activates the flight director and engages the autopilot in the default pitch axis and roll axis modes. Pressing the **AP** Key again disengages the autopilot and deactivates the flight director.
- ⑲ **HDG Key** – Selects/deselects Heading Select Mode.
- ⑳ **NAV Key** – Selects/deselects Navigation Mode.
- ㉑ **APR Key** – Selects/deselects Approach Mode.
- ㉒ **VS Key** – Selects/deselects Vertical Speed Mode.
- ㉓ **FLC Key** – Selects/deselects Flight Level Change Mode.
- ㉔ **FD Key** – Activates/deactivates the flight director only. Pressing the **FD** Key turns on the flight director in the default pitch axis and roll axis modes. Pressing the **FD** Key again deactivates the flight director and removes the command bars, unless the autopilot is engaged. If the autopilot is engaged, the **FD** Key is disabled.
- ㉕ **ALT Key** – Selects/deselects Altitude Hold Mode.
- ㉖ **VNV Key** – Selects/deselects Vertical Navigation Mode.
- ㉗ **BC Key** – Selects/deselects Back Course Mode.
- ㉘ ㉙ **NOSE UP/NOSE DN Keys** – Controls the active pitch reference for the Pitch Hold, Vertical Speed, and Flight Level Change modes.

## AUDIO PANEL CONTROLS

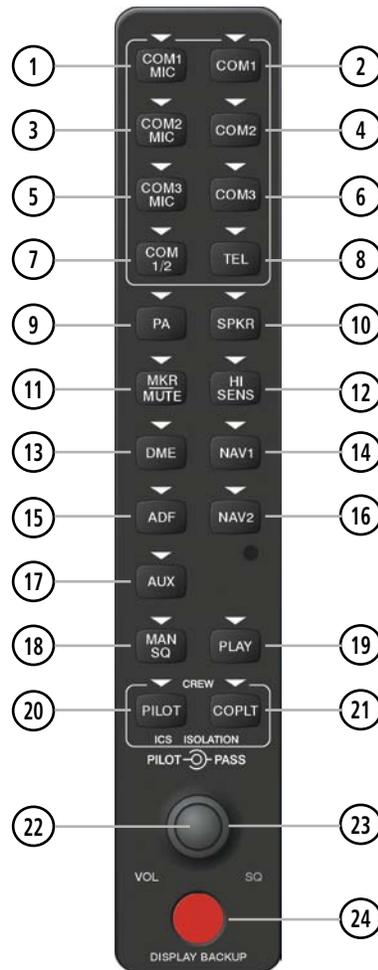


Figure 1-5 Audio Panel Controls (GMA 1347)

**NOTE:** When a key is selected, a triangular annunciator above the key is illuminated.

- ① **COM1 MIC** – Selects the #1 transmitter for transmitting. COM1 receive is simultaneously selected when this key is pressed allowing received audio from the #1 COM receiver to be heard. COM2 receiver audio can be added by pressing the **COM2** Key.
- ② **COM1** – When selected, audio from the #1 COM receiver can be heard.
- ③ **COM2 MIC** – Selects the #2 transmitter for transmitting. COM2 is simultaneously selected when this key is pressed allowing received audio from the #2 COM receiver to be heard. COM2 can be deselected by pressing the **COM2** Key, or COM1 can be added by pressing the **COM1** Key.
- ④ **COM2** – When selected, audio from the #2 COM receiver can be heard.
- ⑤ **COM3 MIC** – Not used on Cessna Nav III aircraft.

- ⑥ **COM3** – Not used on Cessna Nav III aircraft.
- ⑦ **COM 1/2** – Split COM is disabled on Cessna Nav III aircraft.
- ⑧ **TEL** – Not used on Cessna Nav III aircraft.
- ⑨ **PA** – Selects the Passenger Address system. The selected COM transmitter is deselected when the **PA** Key is pressed. The Passenger Address system is disabled on the Cessna 172R/S.
- ⑩ **SPKR** – Selects and deselects the cabin speaker. COM and NAV receiver audio can be heard on the speaker.
- ⑪ **MKR/MUTE** – Mutes the currently received marker beacon receiver audio. Unmutes when new marker beacon audio is received. Also, stops play of the clearance recorder.
- ⑫ **HI SENS** – Press to increase marker beacon receiver sensitivity. Press again to return to normal.
- ⑬ **DME** – Pressing turns DME audio on or off.
- ⑭ **NAV1** – When selected, audio from the #1 NAV receiver can be heard.
- ⑮ **ADF** – Pressing turns on or off the audio from the ADF receiver.
- ⑯ **NAV2** – When selected, audio from the #2 NAV receiver can be heard.
- ⑰ **AUX** – Not used on Cessna Nav III aircraft.
- ⑱ **MAN SQ** – Press to enable manual squelch for the intercom. When active, press the **PILOT** Knob to illuminate ‘SQ’. Turn the **PILOT/PASS** Knobs to adjust squelch.
- ⑲ **PLAY** – Press once to play the last recorded audio. Pressing the **PLAY** Key during play begins playing the previously recorded memory block. Each subsequent press of the **PLAY** Key begins playing the next previously recorded block. Press the **MKR/MUTE** Key to stop play.
- ⑳ **PILOT** – Pressing selects the pilot intercom isolation. Press again to deselect pilot isolation.
- ㉑ **COPLT** – Pressing selects the copilot intercom isolation. Press again to deselect copilot isolation.
- ㉒ **PILOT Knob** – Press to switch between volume and squelch control as indicated by the ‘VOL’ or ‘SQ’ being illuminated. Turn to adjust intercom volume or squelch. The **MAN SQ** Key must be selected to allow squelch adjustment.
- ㉓ **PASS Knob** – Turn to adjust Copilot/Passenger intercom volume or squelch. The **MAN SQ** Key must be selected to allow squelch adjustment.
- ㉔ **Reversionary Mode Button** – Pressing manually selects Reversionary Mode.

## 1.4 SECURE DIGITAL (SD) CARDS



**NOTE:** Ensure the G1000 System is powered off before inserting an SD card.



**NOTE:** Refer to Appendix B for instructions on loading database updates.

The PFD and MFD data card slots use Secure Digital (SD) cards and are located on the upper right side of the display bezels. SD cards are used for storing the various databases and system software updates. Each display bezel is equipped with two SD card slots. The top slot is used for importing and exporting flight plans, Flight Data Logging, and loading navigation database updates. The bottom slot of each display contains a Garmin Supplemental Data Card which is used for storing the various databases.

Not all SD cards are compatible with the G1000. Use only SD cards supplied by Garmin or the aircraft manufacturer.

### Installing an SD card:

- 1) Insert the SD card in the SD card slot, pushing the card in until the spring latch engages. The front of the card should remain flush with the face of the display bezel.
- 2) To eject the card, gently press on the SD card to release the spring latch.



Figure 1-6 Display Bezel SD Card Slots

## 1.5 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 Appendix A for system-specific annunciations and alerts.

The G1000 System is integrated with the aircraft electrical system and receives power directly from electrical busses. The G1000 PFD, MFD, and supporting sub-systems include both power-on and continuous built-in test features that exercise the processor, RAM, ROM, external inputs, and outputs to provide safe operation.

During system initialization, test annunciations are displayed, as shown in Figure 1-7. All system annunciations should disappear typically within the first minute of power-up. Upon power-up, key annunciator lights also become momentarily illuminated on the Audio Panel.

On the PFD, the AHRS begins to initialize and displays “AHRS ALIGN: Keep Wings Level”. The AHRS should display valid attitude and heading fields typically within the first minute of power-up. The AHRS can align itself both while taxiing and during level flight.

When the MFD powers up, the power-up screen (Figure 1-8) displays the following information:

- System version
- Copyright
- Land database name and version
- Safe Taxi database information
- Terrain database name and version
- Obstacle database name and version
- Navigation database name, version, and effective dates
- Airport Directory name, version and effective dates
- FliteCharts/ChartView database information

Current database information includes database type, cycle number, or valid operating dates. Review the listed information for currency (to ensure that no databases have expired).

Pressing the **ENT** Key (or right-most softkey) acknowledges this information, and the Navigation Map Page is displayed upon pressing the key a second time. When the system has acquired a sufficient number of satellites to determine a position, the aircraft's current position is shown on the Navigation Map Page.



Figure 1-7 PFD Initialization

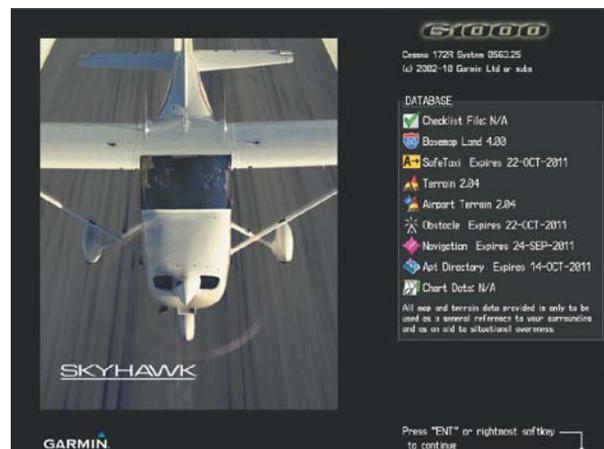


Figure 1-8 MFD Power-Up Screen (172R shown)

## 1.6 SYSTEM OPERATION



**NOTE:** In normal operating mode, backlighting can only be adjusted from the PFD. In reversionary mode, it can be adjusted from the remaining display.

The displays are connected together via a single Ethernet bus for high-speed communication. Each IAU is connected to a single display, as shown in Figure 1-1. This allows the units to share information, enabling true system integration.. This section discusses normal and reversionary G1000 display operation, as well as the various AHRS modes and G1000 System Annunciations.

### NORMAL DISPLAY OPERATION

In normal operating mode, the PFD presents graphical flight instrumentation (attitude, heading, airspeed, altitude, vertical speed), replacing the traditional flight instrument cluster (see the Flight Instruments Section for more information).

The MFD normally displays a full-color moving map with navigation information (see the Flight Management Section), while the left portion of the MFD is dedicated to the Engine Indication System (EIS; see the EIS Section).

Both displays offer control for COM and NAV frequency selection.



Figure 1-9 Normal Mode

### REVERSIONARY DISPLAY OPERATION



**NOTE:** The G1000 System alerts the pilot when backup paths are utilized by the LRUs. Refer to Appendix A for further information regarding system-specific alerts.

In the event of a display failure, the G1000 System automatically switches to reversionary (backup) mode. In reversionary mode, all important flight information is presented on the remaining display in the same format as in normal operating mode.

If a display fails, the appropriate IAU Ethernet interface to the display is cut off. Thus, the IAU can no longer communicate with the remaining display (refer to Figure 1-1), and the NAV and COM functions provided to the failed display by the IAU are flagged as invalid on the remaining display. The system reverts to backup paths for the AHRS, ADC, Engine/Airframe Unit, and Transponder, as required. The change to backup paths is completely automated for all LRUs and no pilot action is required.



Figure 1-10 Reversionary Mode (Failed PFD)

If the system fails to detect a display problem, reversionary mode may be manually activated by pressing the Audio Panel's red **DISPLAY BACKUP** button (refer to the Audio Panel and CNS Section for further details). Pressing this button again deactivates reversionary mode.



Figure 1-11 DISPLAY BACKUP Button

## AHRS OPERATION



**NOTE:** Refer to Appendix A for specific AHRS alert information.



**NOTE:** Aggressive maneuvering while AHRS is not operating normally may degrade AHRS accuracy.

The Attitude and Heading Reference System (AHRS) performs attitude, heading, and vertical acceleration calculations for the G1000 System, utilizing GPS, magnetometer, and air data in addition to information from its internal sensors. Attitude and heading information are updated on the PFD while the AHRS receives appropriate combinations of information from the external sensor inputs.

Loss of GPS, magnetometer, or air data inputs is communicated to the pilot by message advisory alerts. 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).

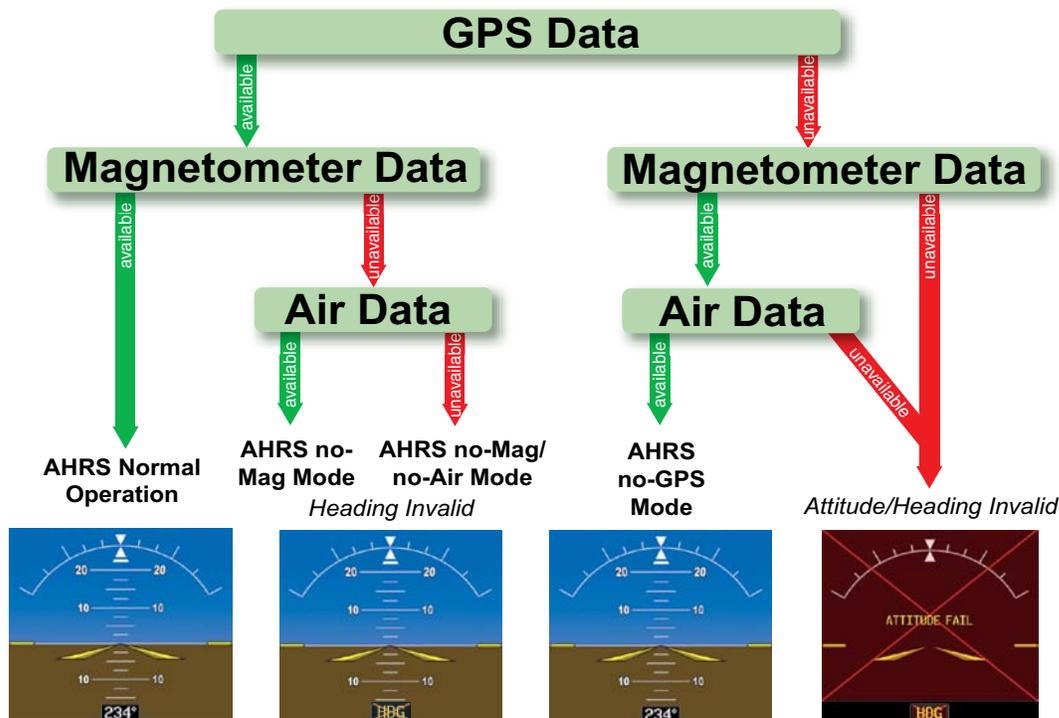


Figure 1-12 AHRS Operation

## GPS INPUT FAILURE



**NOTE:** In-flight initialization of AHRS, when operating without any valid source of GPS data and at true air speed values greater than approximately 200 knots, is not guaranteed. Under these rare conditions, it is possible for in-flight AHRS initialization to take an indefinite amount of time which would result in an extended period of time where valid AHRS outputs are unavailable.

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 can continue to provide attitude and heading information to the PFD as long as magnetometer and airspeed data are available and valid.

## MAGNETOMETER FAILURE

If the magnetometer input fails, the AHRS continues to output valid attitude information; however, the heading output on the PFD is flagged as invalid with a red 'X'.

## AIR DATA INPUT FAILURE

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

G1000 SYSTEM ANNUNCIATIONS

**NOTE:** For a detailed description of all annunciations and alerts, refer to Appendix A. Refer to the Pilot's Operating Handbook (POH) for additional information regarding pilot responses to these annunciations.

When an LRU or an LRU function fails, a large red "X" is typically displayed on windows associated with the failed data (Figure 1-13 displays all possible flags and responsible LRUs). Upon G1000 power-up, certain windows remain invalid as equipment begins to initialize. All windows should be operational within one minute of power-up. If any window remains flagged, the G1000 system should be serviced by a Garmin-authorized repair facility.

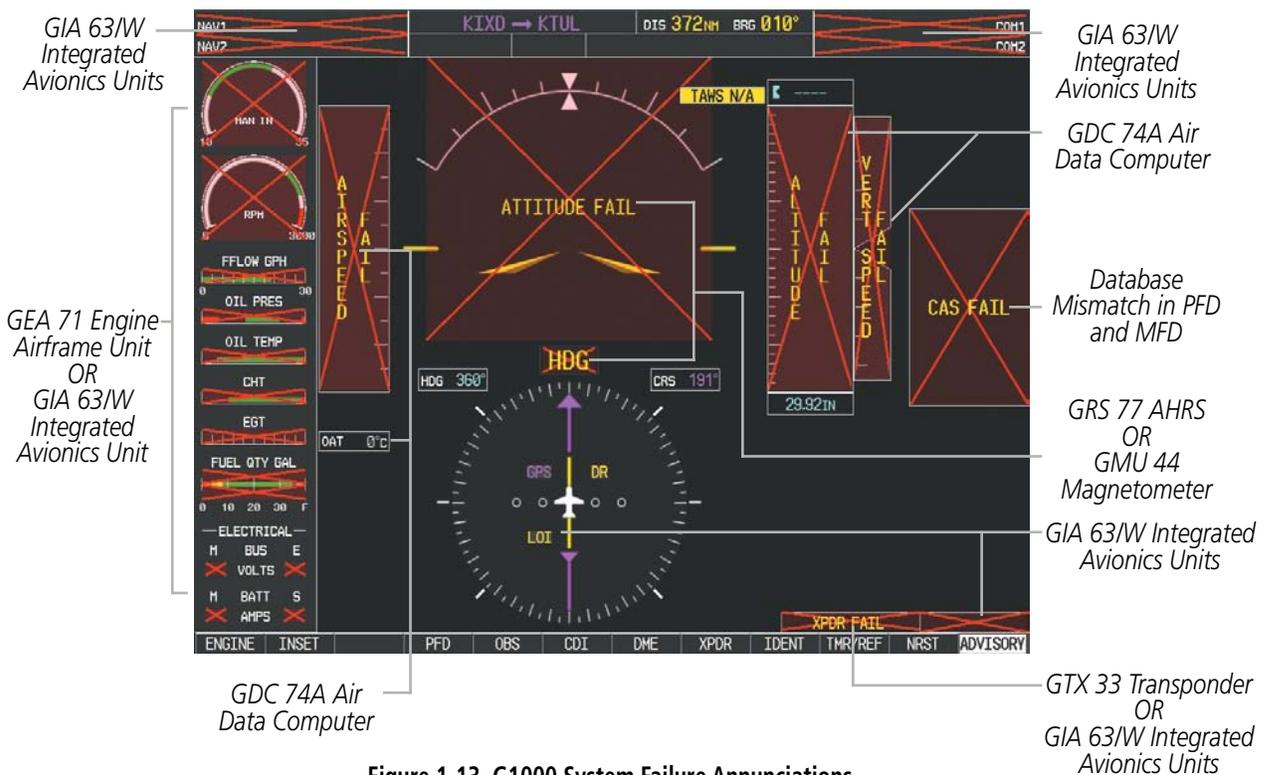


Figure 1-13 G1000 System Failure Annunciations

SOFTKEY FUNCTION

The softkeys are located along the bottoms of the displays. The softkeys shown depend on the softkey level or page being displayed. The bezel keys below the softkeys can be used to select the appropriate softkey. When a softkey 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.



Figure 1-14 Softkeys (Second-Level PFD Configuration)

## PFD SOFTKEYS

The **CDI**, **IDENT**, **TMR/REF**, **NRST**, and **ALERTS** softkeys undergo a momentary change to black text on gray background and automatically switch back to white text on black background when selected.

The PFD softkeys provide control over flight management functions, including GPS, NAV, terrain, traffic, and lightning (optional). Each softkey sublevel has a **BACK** Softkey which can be selected to return to the previous level. The **ALERTS** Softkey is visible at all softkey levels (label changes if messages are issued).

<b>INSET</b>		Displays Inset Map in PFD lower left corner
	<b>OFF</b>	Removes Inset Map
	<b>DCLTR (3)</b>	Selects desired amount of map detail; cycles through declutter levels: <b>DCLTR</b> (No Declutter): All map features visible <b>DCLTR-1</b> : Declutters land data <b>DCLTR-2</b> : Declutters land and SUA data <b>DCLTR-3</b> : Removes everything except for the active flight plan
	<b>WX LGND</b>	Displays icon and age on the Inset Map for the selected weather products (optional)
	<b>TRAFFIC</b>	Cycles through traffic display options: <b>TRFC-1</b> : Traffic displayed on inset map <b>TRFC-2</b> : Traffic Map Page is displayed in the inset map window
	<b>TOPO</b>	Displays topographical data (e.g., coastlines, terrain, rivers, lakes) and elevation scale on Inset Map
	<b>TERRAIN</b>	Displays terrain information on Inset Map
	<b>STRMSCP</b>	Displays Stormscope® information on Inset Map
	<b>NEXRAD</b> or <b>PRECIP</b>	Displays NEXRAD weather and coverage information on Inset Map (optional)  Displays GFDS or FIS-B precipitation on Inset Map (optional)
	<b>XM LTNG</b> or <b>DL LTNG</b>	Displays XM WX lightning information on Inset Map (optional)  Displays GFDS Worldwide Weather lightning information on Inset Map (optional)
	<b>METAR</b>	Displays METAR flags on airport symbols shown on the Inset Map (optional)
<b>PFD</b>		Displays second-level softkeys for additional PFD configurations
	<b>SYN VIS</b>	Displays the softkeys for enabling or disabling Synthetic Vision features
	<b>PATHWAY</b>	Displays rectangular boxes representing the horizontal and vertical flight path of the active flight plan
	<b>SYN TERR</b>	Enables synthetic terrain depiction
	<b>HRZN HDG</b>	Displays compass heading along the Zero-Pitch line
	<b>APTSIGNS</b>	Displays position markers for airports within approximately 15 nm of the current aircraft position. Airport identifiers are displayed when the airport is within approximately 9 nm.
	<b>DFLT5</b>	Resets PFD to default settings, including changing units to standard

	<b>WIND</b>		Displays softkeys to select wind data parameters
		<b>OPTN 1</b>	Wind direction arrows with headwind and crosswind components
		<b>OPTN 2</b>	Wind direction arrow and speed
		<b>OPTN 3</b>	Wind direction arrow with direction and speed
		<b>OFF</b>	Information not displayed
	<b>DME</b>		Displays the DME Information Window
	<b>BRG1</b>		Cycles the Bearing 1 Information Window through NAV1, GPS/ waypoint identifier and GPS-derived distance information, and ADF/frequency
	<b>HSI FRMT</b>		Provides access to the HSI formatting softkeys
		<b>360 HSI</b>	Displays the HSI in a 360 degree view
		<b>ARC HSI</b>	Displays the HSI as an arc
	<b>BRG2</b>		Cycles the Bearing 2 Information Window through NAV2 or GPS waypoint identifier and GPS-derived distance information, and ADF/frequency.
	<b>ALT UNIT</b>		Displays softkeys for setting the altimeter and BARO settings to metric units
		<b>METERS</b>	When enabled, displays altimeter in meters
		<b>IN</b>	Press to display the BARO setting as inches of mercury
		<b>HPA</b>	Press to display the BARO setting as hectopacals
	<b>STD BARO</b>		Sets barometric pressure to 29.92 in Hg (1013 hPa if <b>METRIC</b> Softkey is selected)
<b>OBS</b>			Selects OBS mode on the CDI when navigating by GPS (only available with active leg)
<b>CDI</b>			Cycles through GPS, VOR1, and VOR2 navigation modes on the CDI
<b>DME</b>			Displays the DME Tuning Window, allowing selection of the DME
<b>XPDR</b>			Displays transponder mode selection softkeys
	<b>STBY</b>		Selects standby mode (transponder does not reply to any interrogations)
	<b>ON</b>		Selects Mode A (transponder replies to interrogations)
	<b>ALT</b>		Selects Mode C – altitude reporting mode (transponder replies to identification and altitude interrogations)
	<b>GND</b>		Allows manual selection of ground mode in certain conditions
	<b>VFR</b>		Automatically enters the VFR code (1200 in the U.S.A. only)
	<b>CODE</b>		Displays transponder code selection softkeys 0-7
		<b>0 — 7</b>	Use numbers to enter code
	<b>IDENT</b>		Activates the Special Position Identification (SPI) pulse for 18 seconds, identifying the transponder return on the ATC screen
	<b>BKSP</b>		Removes numbers entered, one at a time
<b>IDENT</b>			Activates the Special Position Identification (SPI) pulse for 18 seconds, identifying the transponder return on the ATC screen
<b>TMR/REF</b>			Displays Timer/References Window
<b>NRST</b>			Displays Nearest Airports Window
<b>ALERTS</b>			Displays Alerts Window

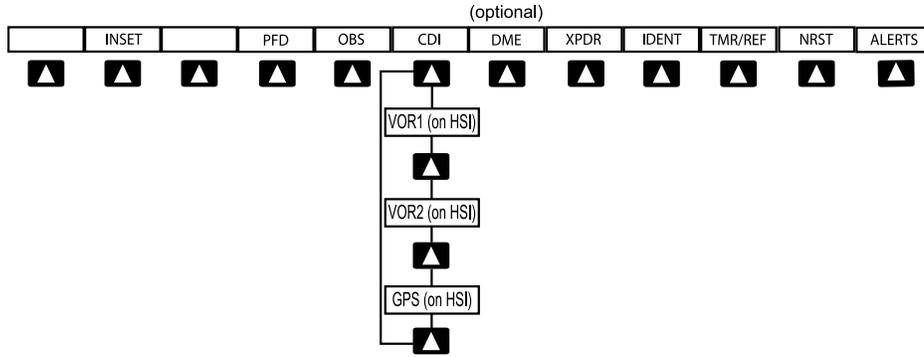


Figure 1-15 Top Level PFD Softkeys

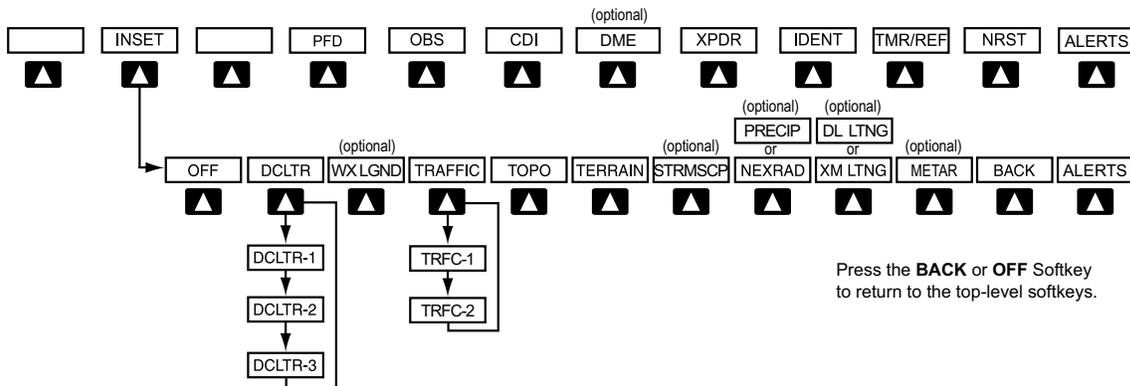


Figure 1-16 INSET Softkeys

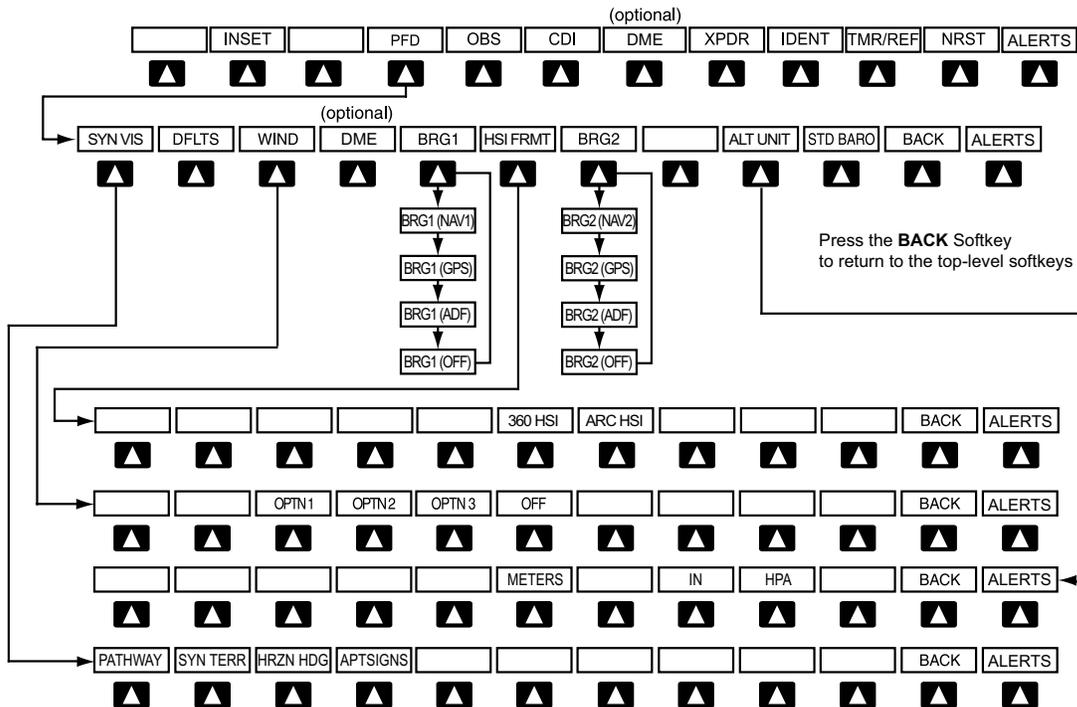


Figure 1-17 PFD Configuration Softkeys

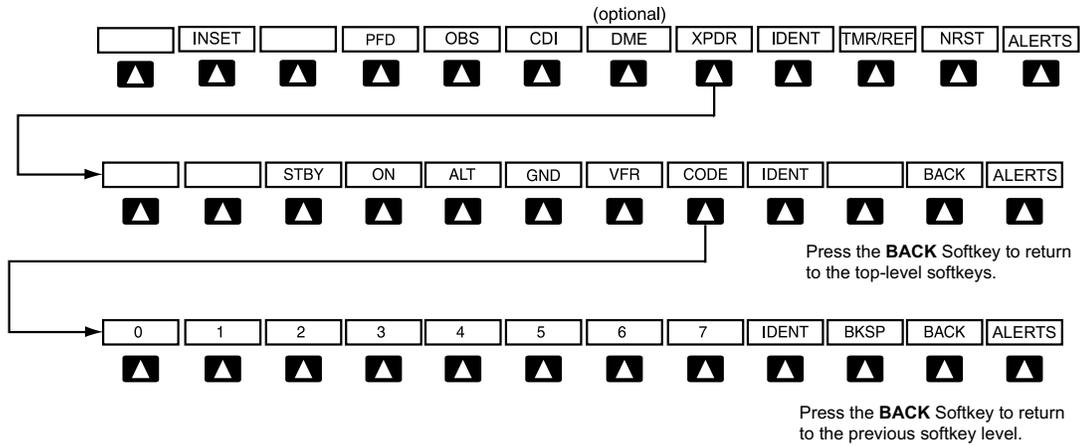


Figure 1-18 XPDR (Transponder) Softkeys

MFD SOFTKEYS

ENGINE				Pressing this softkey makes available the <b>LEAN</b> and <b>SYSTEM</b> Softkeys
	<b>LEAN</b>			Pressing makes available the <b>CYL SLCT</b> and <b>ASSIST</b> Softkeys to facilitate engine leaning
		<b>CYL SLCT</b>		The Cylinder Select Softkey cycles through selection of each cylinder indicated by changing the cylinder display to light blue
		<b>ASSIST</b>		Pressing the <b>ASSIST</b> Softkey causes the first cylinder that peaks to become highlighted and information for that cylinder to be displayed
		<b>BACK</b>		Returns to the previous level softkeys
	<b>SYSTEM</b>			Press this softkey to make available the <b>RST FUEL</b> and <b>GAL REM</b> Softkeys
		<b>RST FUEL</b>		Pressing the Rest Fuel Softkey resets fuel used and gallons remaining to zero
		<b>GAL REM</b>		Press this softkey (Gallons Remaining) to display the quantity adjustment softkeys
			<b>-10 GAL</b>	Pressing decreases the fuel remaining quantity in 10 gallon increments
			<b>-1 GAL</b>	Pressing decreases the fuel remaining quantity in 1 gallon increments
			<b>+1GAL</b>	Pressing increases the fuel remaining quantity in 1 gallon increments
			<b>+10 GAL</b>	Pressing decreases the fuel remaining quantity in 10 gallon increments
			<b>XX GAL</b>	Pressing this softkey sets the fuel remaining to the quantity at the filler neck tab where XX is an airframe specific quantity
			<b>XX GAL</b>	Pressing this softkey sets the fuel remaining to the full tank quantity where XX as an airframe specific quantity

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MAP			Enables second-level Navigation Map softkeys
	<b>TRAFFIC</b>		Displays traffic information on Navigation Map
	<b>PROFILE</b>		Displays/removes Profile View on Navigation Map Page
	<b>TOPO</b>		Displays topographical data (e.g., coastlines, terrain, rivers, lakes) and elevation scale on Navigation Map
	<b>TERRAIN</b>		Displays terrain information on Navigation Map
	<b>AIRWAYS</b> (Default label is dependant on map setup option selected)		Displays airways on the map; cycles through the following: <b>AIRWAYS</b> : No airways are displayed <b>AIRWY ON</b> : All airways are displayed <b>AIRWY LO</b> : Only low altitude airways are displayed <b>AIRWY HI</b> : Only high altitude airways are displayed
	<b>STRMSCP</b>		Pressing this softkey displays/removes Stormscope lightning data on the Navigation Map.
	<b>NEXRAD</b> or <b>PRECIP</b>		Displays NEXRAD weather and coverage information on the Navigation Map (optional)  Displays GFDS or FIS-B precipitation on Navigation Map (optional)
	<b>XM LTNG</b> or <b>DL LTNG</b>		Displays XM WX lightning information on the Navigation Map (optional)  Displays GFDS Worldwide Weather lightning information on the Navigation Map (optional)
	<b>METAR</b>		Displays METAR flags on airport symbols shown on the Navigation Map
	<b>LEGEND</b>		Displays the legend for the selected weather products. Available only when <b>NEXRAD</b> , <b>XM LTNG</b> , <b>METAR</b> and/or <b>PROFILE</b> softkeys are selected.
	<b>BACK</b>		Returns to top-level softkeys
<b>DCLTR (3)</b>			Selects desired amount of map detail; cycles through declutter levels: <b>DCLTR</b> (No Declutter): All map features visible <b>DCLTR-1</b> : Declutters land data <b>DCLTR-2</b> : Declutters land and SUA data <b>DCLTR-3</b> : Removes everything except for the active flight plan
<b>SHW CHRT</b>			Displays the appropriate chart
<b>CHKLIST</b>			Displays the Checklist Page

	<b>ENGINE</b>			Displays the engine checklist
	<b>CHECK</b>			Pressing this softkey checks off a checklist item. If an item is already checked, an <b>UNCHECK</b> Softkey is displayed.
	<b>EXIT</b>			Press to exit the checklist
	<b>EMERGENCY</b>			Displays the emergency checklist

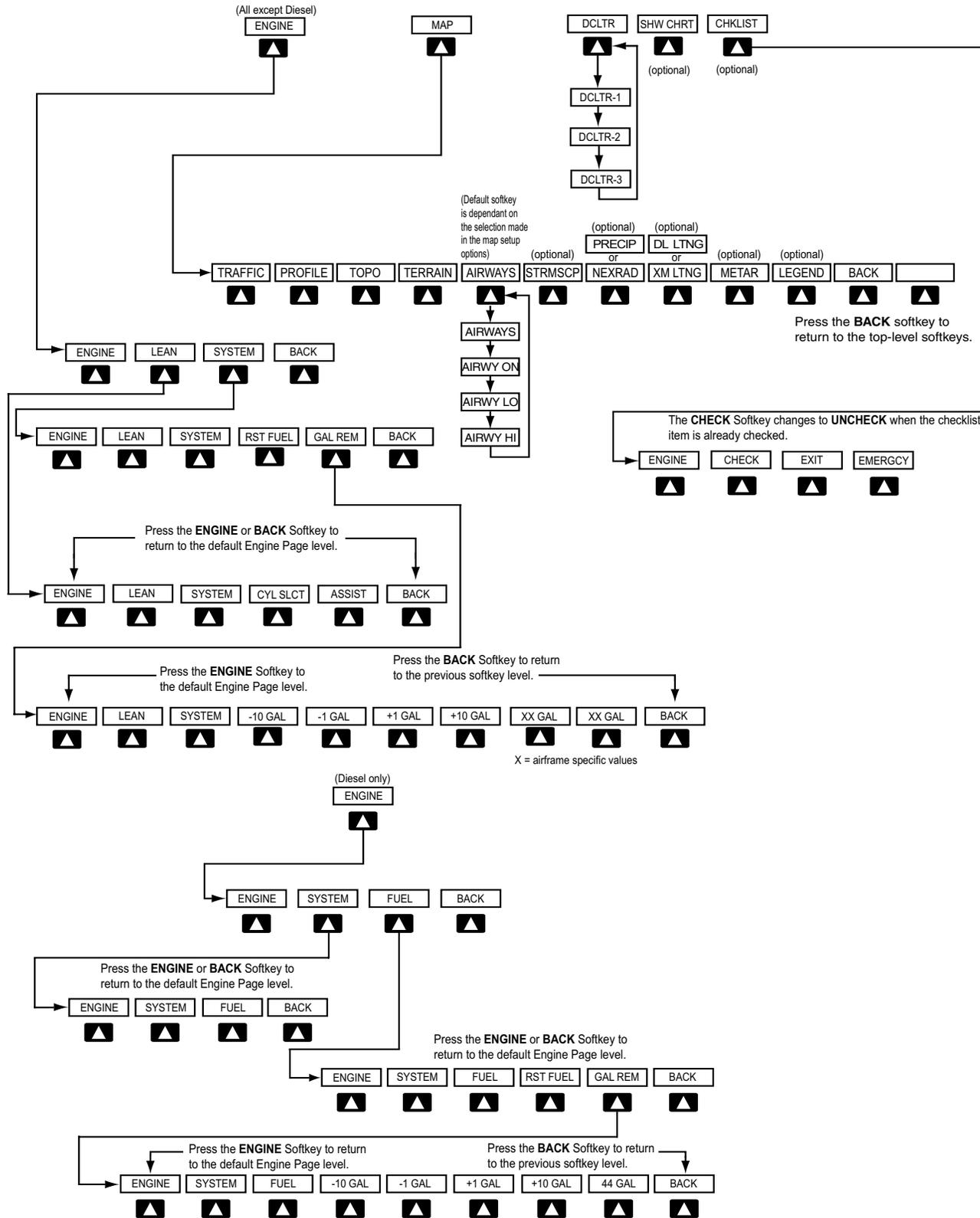


Figure 1-19 MFD Softkeys

## GPS RECEIVER OPERATION

Each GIA 63/63W Integrated Avionics Unit (IAU) contains a GPS receiver. Information collected by the specified receiver (GPS1 for the #1 IAU or GPS2 for the #2 IAU) may be viewed on the AUX - GPS Status Page.

These GPS sensor annunciations are most often seen after system power-up when one GPS receiver has acquired satellites before the other, or in SBAS (Satellite Based Augmentation System) capable systems, one of the GPS receivers has not yet acquired an SBAS signal. While the aircraft is on the ground, the SBAS signal may be blocked by obstructions causing one GPS receiver to have difficulty acquiring a good signal. Also, while airborne, turning the aircraft may result in one of the GPS receivers temporarily losing the SBAS signal.

If the sensor annunciation persists, check for a system failure message in the Messages Window on the PFD. If no failure message exists, check the GPS Status Page and compare the information for GPS1 and GPS2. Discrepancies may indicate a problem.

### Viewing GPS receiver status information

- 1) Use the large **FMS** Knob on the MFD to select the Auxiliary Page Group (see Section 1.7 for information on navigating MFD page groups).
- 2) Use the small **FMS** Knob to select GPS Status Page.

### Selecting the GPS receiver for which data may be reviewed

- 1) Use the **FMS** Knob to select the AUX - GPS Status Page.
- 2) To change the selected GPS receiver:
  - a) Press the desired **GPS** Softkey.  
**Or:**
  - a) Press the **MENU** Key.
  - b) Use the **FMS** Knob to highlight the receiver which is not selected and press the **ENT** Key.

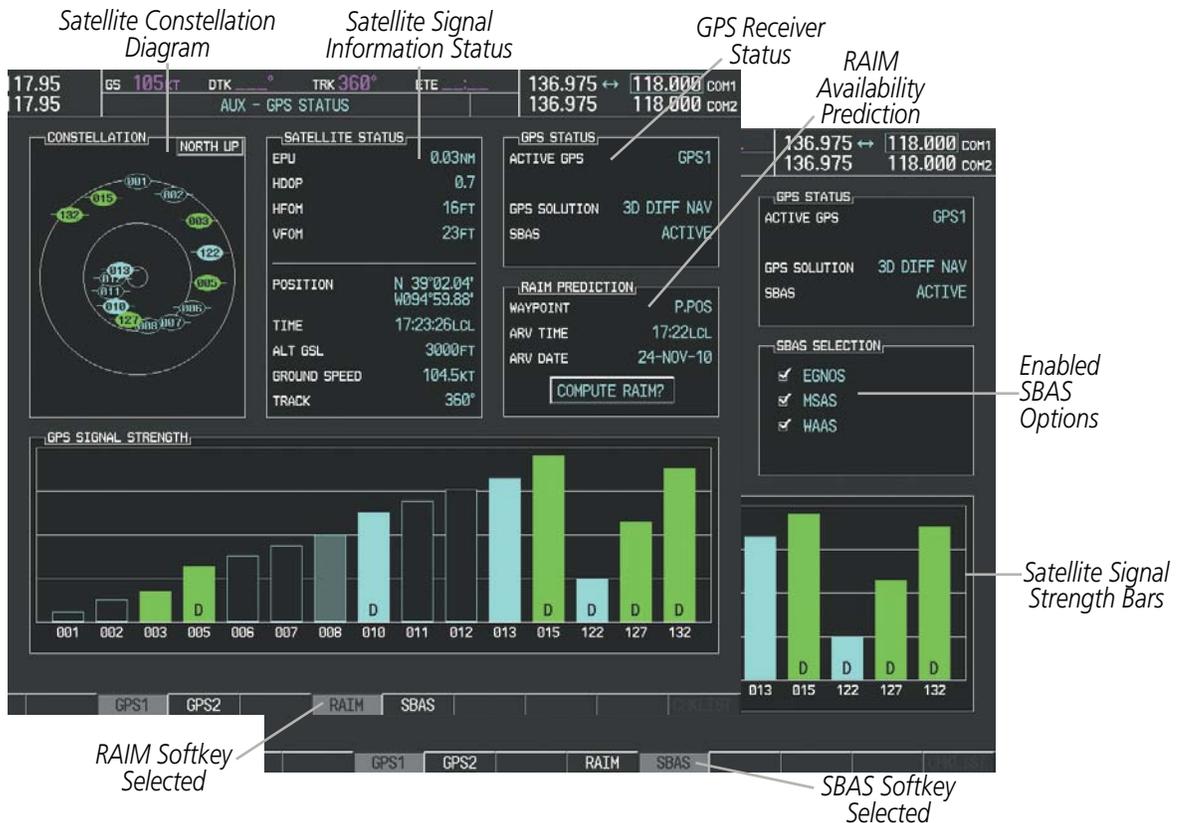


Figure 1-20 GPS Status Page (RAIM or SBAS Selected)

The GPS Status Page provides the following information:

- Satellite constellation diagram
 

Satellites currently in view are shown at their respective positions on a sky view diagram. The sky view is always in a north-up orientation, with the outer circle representing the horizon, the inner circle representing 45° above the horizon, and the center point showing the position directly overhead.

Each satellite is represented by an oval containing the Pseudo-random noise (PRN) number (i.e., satellite identification number). Satellites whose signals are currently being used are represented by solid ovals.
- Satellite signal information status
 

The accuracy of the aircraft's GPS fix is calculated using Estimated Position Uncertainty (EPU), Dilution of Precision (DOP), and horizontal and vertical figures of merit (HFOM and VFOM). EPU is the radius of a circle centered on an estimated horizontal position in which actual position has 95% probability of laying. EPU is a statistical error indication and not an actual error measurement.

DOP measures satellite geometry quality (i.e., number of satellites received and where they are relative to each other) on a range from 0.0 to 9.9, with lower numbers denoting better accuracy. HFOM and VFOM, measures of horizontal and vertical position uncertainty, are the current 95% confidence horizontal and vertical accuracy values reported by the GPS receiver.

The current calculated GPS position, time, altitude, ground speed, and track for the aircraft are displayed below the satellite signal accuracy measurements.
- GPS receiver status

The GPS solution type (ACQUIRING, 2D NAV, 2D DIFF NAV, 3D NAV, 3D DIFF NAV) for the active GPS receiver (GPS1 or GPS2) is shown in the upper right of the GPS Status Page. When the receiver is in the process of acquiring enough satellite signals for navigation, the receiver uses satellite orbital data (collected continuously from the satellites) and last known position to determine the satellites that should be in view. ACQUIRING is indicated as the solution until a sufficient number of satellites have been acquired for computing a solution.

When the receiver is in the process of acquiring a 3D navigational GPS solution, 3D NAV is indicated as the solution until the 3D differential fix has finished acquisition. SBAS (Satellite-Based Augmentation System) indicates INACTIVE. When acquisition is complete, the solution status indicates 3D DIFF NAV and SBAS indicates ACTIVE.

- RAIM (Receiver Autonomous Integrity Monitoring) Prediction (**RAIM** Softkey is selected)

In most cases performing a RAIM prediction is not necessary. However, in some cases, the selected approach may be outside the SBAS coverage area and it may be necessary to perform a RAIM prediction for the intended approach.

Receiver Autonomous Integrity Monitoring (RAIM) is a GPS receiver function that performs a consistency check on all tracked satellites. RAIM ensures that the available satellite geometry allows the receiver to calculate a position within a specified RAIM protection limit (2.0 nautical miles for oceanic and enroute, 1.0 nm for terminal, and 0.3 nm for non-precision approaches). During oceanic, enroute, and terminal phases of flight, RAIM is available nearly 100% of the time.

The RAIM prediction function also indicates whether RAIM is available at a specified date and time. RAIM computations predict satellite coverage within  $\pm 15$  min of the specified arrival date and time.

Because of the tighter protection limit on approaches, there may be times when RAIM is not available. The G1000 automatically monitors RAIM and warns with an alert message when it is not available. If RAIM is not predicted to be available for the final approach course, the approach does not become active, as indicated by the messages “Approach is not active” and “RAIM not available from FAF to MAP”. If RAIM is not available when crossing the FAF, the missed approach procedure must be flown.

### Predicting RAIM availability

- 1) Select the GPS Status Page.
- 2) If necessary, press the **RAIM** Softkey.
- 3) Press the **FMS** Knob. The ‘WAYPOINT’ field is highlighted.
- 4) Turn the small **FMS** Knob to display the Waypoint Information Window.
- 5) Enter the desired waypoint:
  - a) Use the **FMS** Knob to enter the desired waypoint by identifier, facility, or city name and press the **ENT** Key. Refer to Section 1.7 for instructions on entering alphanumeric data into the G1000.

**Or:**

  - a) Use the large **FMS** Knob to scroll to the Most Recent Waypoints List.
  - b) Use the small **FMS** Knob to highlight the desired waypoint in the list and press the **ENT** Key. The G1000 automatically fills in the identifier, facility, and city fields with the information for the selected waypoint.
  - c) Press the **ENT** Key to accept the waypoint entry.

Or:

- a) To use the present position, press the **MENU** Key.
  - b) With 'Set WPT to Present Position' highlighted, press the **ENT** Key.
  - c) Press the **ENT** Key to accept the waypoint entry.
- 6) Use the **FMS** Knob to enter an arrival time and press the **ENT** Key.
  - 7) Use the **FMS** Knob to enter an arrival date and press the **ENT** Key.
  - 8) With the cursor highlighting 'COMPUTE RAIM?', press the **ENT** Key. Once RAIM availability is computed, one of the following is displayed:
    - 'COMPUTE RAIM?'—RAIM has not been computed for the current waypoint, time, and date combination
    - 'COMPUTING AVAILABILITY'—RAIM calculation in progress
    - 'RAIM AVAILABLE'—RAIM is predicted to be available for the specified waypoint, time, and date
    - 'RAIM NOT AVAILABLE'—RAIM is predicted to be unavailable for the specified waypoint, time, and date
- SBAS Selection (**SBAS** Softkey is pressed)(WAAS, EGNOS, or MSAS capable systems only)
 

In certain situations, such as when the aircraft is outside or on the fringe of the WAAS, EGNOS, or MSAS coverage area, it may be desirable to disable the reception of the applicable SBAS signal (although it is not recommended). When disabled, the SBAS field in the GPS Status box indicates DISABLED. There may be a small delay for the GPS Status box to be updated upon WAAS, EGNOS, and MSAS enabling/disabling.

### Disabling WAAS, EGNOS or MSAS

- 1) Select the GPS Status Page.
  - 2) If necessary, press the **SBAS** Softkey.
  - 3) Press the **FMS** Knob, and turn the large FMS Knob to highlight the desired SBAS system.
  - 4) Press the **ENT** Key to uncheck the box.
  - 5) Press the **FMS** Knob to remove the cursor.
- GPS Satellite Signal Strengths
 

The GPS Status Page can be helpful in troubleshooting weak (or missing) signal levels due to poor satellite coverage or installation problems. As the GPS receiver locks onto satellites, a signal strength bar is displayed for each satellite in view, with the appropriate satellite PRN number (01-32 or 120-138 for WAAS) below each bar. The progress of satellite acquisition is shown in three stages, as indicated by signal bar appearance:

    - No bar—Receiver is looking for the indicated satellite
    - Hollow bar—Receiver has found the satellite and is collecting data
    - Light blue bar—Receiver has collected the necessary data and the satellite signal can be used
    - Green bar—Satellite is being used for the GPS solution
    - Checkered bar—Receiver has excluded the satellite (Fault Detection and Exclusion)
    - "D" indication—Denotes the satellite is being used as part of the differential computations

Each satellite has a 30-second data transmission that must be collected (signal strength bar is hollow) before the satellite may be used for navigation (signal strength bar becomes solid).

## 1.7 ACCESSING G1000 FUNCTIONALITY

### MENUS

The G1000 has a **MENU** Key that, when pressed, displays a context-sensitive list of options. 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. Menu display 'NO OPTIONS' when there are no options for the window/page selected. The main controls used in association with all window/page group operations are described in section 1.3. Softkey selection does not display menus or submenus.

#### Navigating the Page Menu Window:

- 1) Press the **MENU** Key to display the Page Menu Window.
- 2) Turn the **FMS** Knob to scroll through a list of available options (a scroll bar appears to the right of the window when the option list is longer than the window).
- 3) Press the **ENT** Key to select the desired option.
- 4) The **CLR** Key may be pressed to remove the menu and cancel the operation. Pressing the **FMS** Knob also removes the displayed menu.

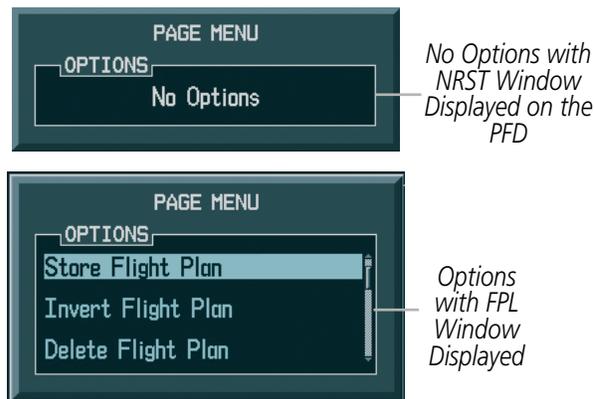


Figure 1-21 Page Menu Examples

## MFD PAGE GROUPS



**NOTE:** Refer to the *Flight Management*, *Hazard Avoidance*, and *Additional Features* sections for details on specific pages.

Information on the MFD is presented on pages which are grouped according to function. The page group and active page title are displayed in the upper center of the screen, below the Navigation Status Box. In the bottom right corner of the screen, the page group tabs are displayed along the bottom. Available pages in the group are displayed in a list above the page groups. The current page group and current page within the group are shown in cyan. For some of these pages (Airport/Procedures/Weather Information, XM WX Satellite Weather, Procedure Loading), the active title of the page changes while the page name in the list remains the same.

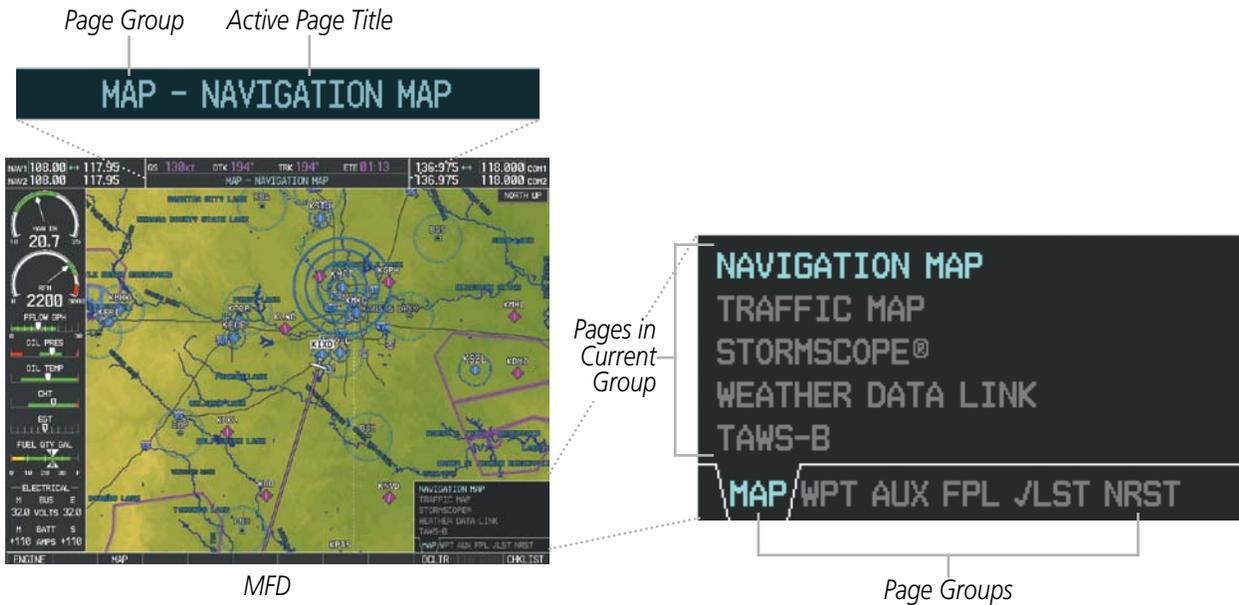


Figure 1-22 Page Title and Page Groups

### Selecting a page using the FMS Knob:

- 1) Turn either **FMS** Knob one click to display the pop-up page selection window.
- 2) Turn the large **FMS** Knob until the desired page group is selected. For example, the MAP page group is selected in Figure 1-22.
- 3) Turn the small **FMS** Knob until the desired page is selected.

There are also several pages (Airport Information and XM Information pages) which are selected first from within a main page group with the **FMS** Knobs, then with the appropriate softkey at the bottom of the page. In this case, the page remains set to the selected screen until a different screen softkey is pressed.

**Map Pages (MAP)**

- Navigation Map
- Traffic Map
- Stormscope®
- Weather Data Link (*service optional*)
  - XM WX Satellite Weather
  - FIS-B Weather
  - GFDS Worldwide Weather
- Terrain Proximity/Terrain-SVS/  
TAWS-B

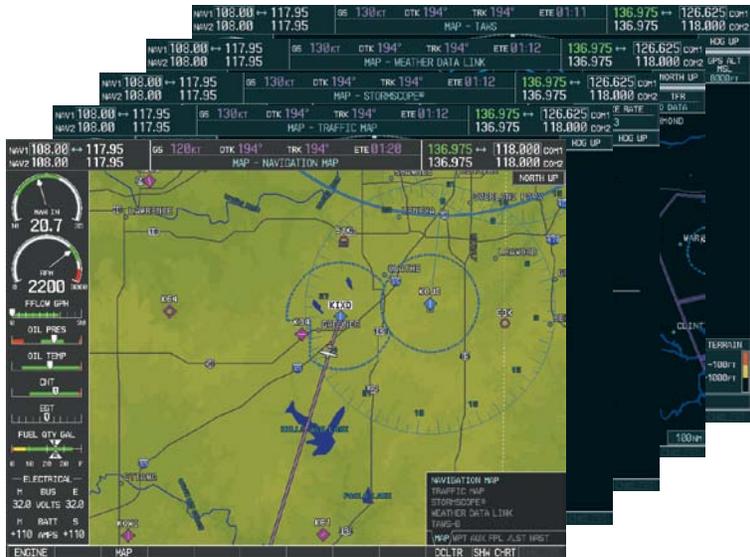


Figure 1-23 Map Pages

**Waypoint Pages (WPT)**

- Airport Information pages
  - Airport Information (**INFO-1** Softkey)
  - Airport Directory (**INFO-2** Softkey)
  - Departure Information (**DP** Softkey)
  - Arrival Information (**STAR** Softkey)
  - Approach Information (**APR** Softkey)
  - Weather Information (**WX** Softkey)
- Intersection Information
- NDB Information
- VOR Information
- User Waypoint Information

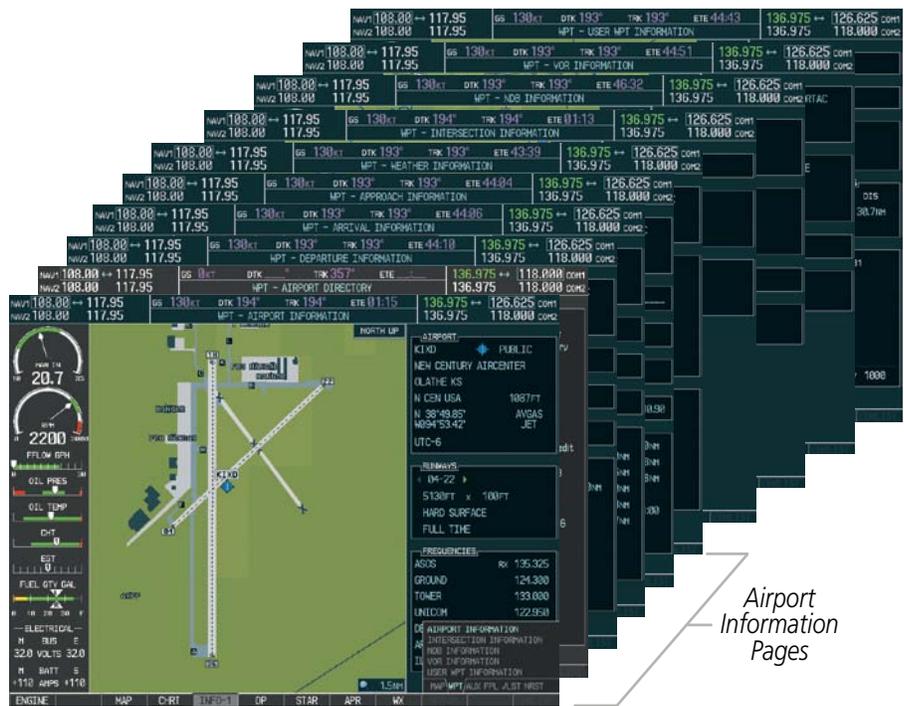


Figure 1-24 Waypoint Pages

Airport Information Pages

**Auxiliary Pages (AUX)**

- Trip Planning
- Utility
- GPS Status
- System Setup
- SiriusXM Satellite pages
  - XM Information (**INFO** Softkey)
  - XM Radio (**RADIO** Softkey)
- System Status
- Video (Optional)



SiriusXM Satellite Pages

Figure 1-25 Auxiliary Pages

**Flight Plan Pages (FPL)**

- Active Flight Plan
  - Wide View, Narrow View (**VIEW** Softkey)
- Flight Plan Catalog
- or
- Stored Flight Plan (**NEW** Softkey)



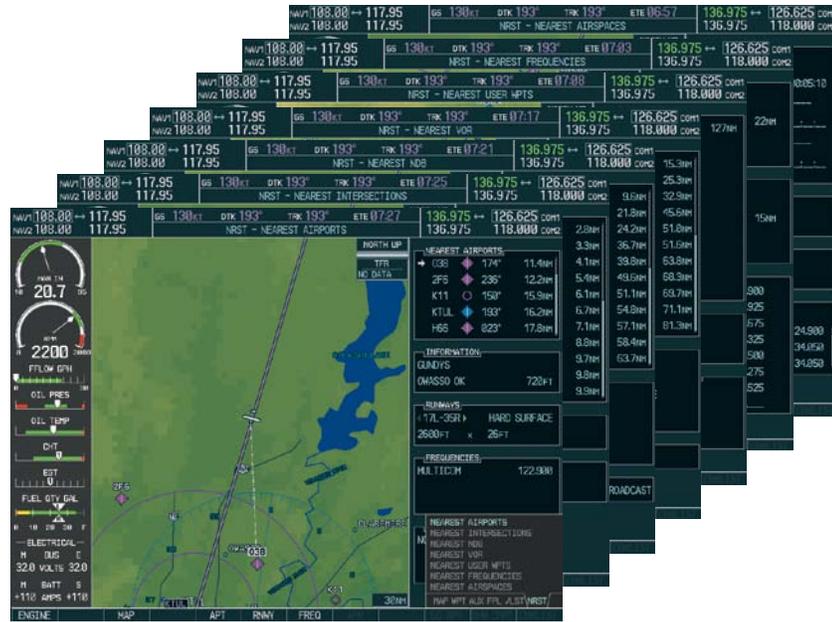
Figure 1-26 Flight Plan Pages

The Flight Plan Pages may also be accessed using the **FPL** Key. Main pages within this group are selected by turning the small **FMS** Knob.

The Checklist Page may be accessed from the page group tab or the **CHKLST** Softkey. See the Additional Features section for a discussion on checklists.

**Nearest Pages (NRST)**

- Nearest Airports
- Nearest Intersections
- Nearest NDB
- Nearest VOR
- Nearest User Waypoints
- Nearest Frequencies
- Nearest Airspaces



**Figure 1-27 Nearest Pages**

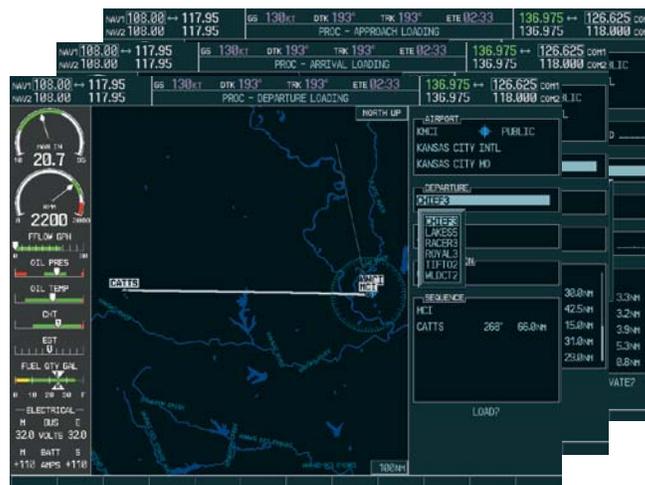
In addition to the main page groups accessed exclusively using the **FMS** Knobs, there are pages for flight planning (FPL) and loading procedures (PROC) which are accessed by bezel key. In some instances, softkeys may be used to access the Procedure Pages.

The Flight Plan Pages are accessed using the **FPL** Key on the MFD. Main pages within this group are selected by turning the small **FMS** Knob.

The Procedure pages may be accessed at any time on the MFD by pressing the **PROC** Key. A menu is initialized, and when a departure, approach, or arrival is selected, the appropriate Procedure Loading Page is opened. Turning the **FMS** Knob does not scroll through the Procedure pages (note the single page icon in the lower right corner).

**Procedure Pages (PROC)**

- Departure Loading
- Arrival Loading
- Approach Loading



**Figure 1-28 Procedure Pages**

For some of these pages (Airport Information pages, SiriusXM Satellite pages, Procedure pages), the title of the page may change while the page icon remains the same.

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## MFD SYSTEM PAGES

In the Auxiliary (AUX) Page Group, there are two system pages: System Setup and System Status. The System Setup Page allows management of various system parameters, while the System Status Page displays the status of all G1000 system LRUs.

### SYSTEM SETUP PAGE

The System Setup Page allows management of the following system parameters:

- Time display format (local or UTC)
- Displayed measurement units
- Baro transition alert (see Flight Instruments Section)
- Arrival Alerts
- Airspace alerts
- Audio alert voice
- Flight director format (only the single que option is available in the Cessna Nav III)
- Page Navigation
- MFD Data Bar (Navigation Status Box) fields
- GPS Course Deviation Indicator (CDI) range
- COM transceiver channel spacing
- Displayed nearest airports

#### Selecting the System Setup Page:

- 1) Turn the large **FMS** Knob to select the AUX Page group.
- 2) Turn the small **FMS** Knob to display the System Setup Page.

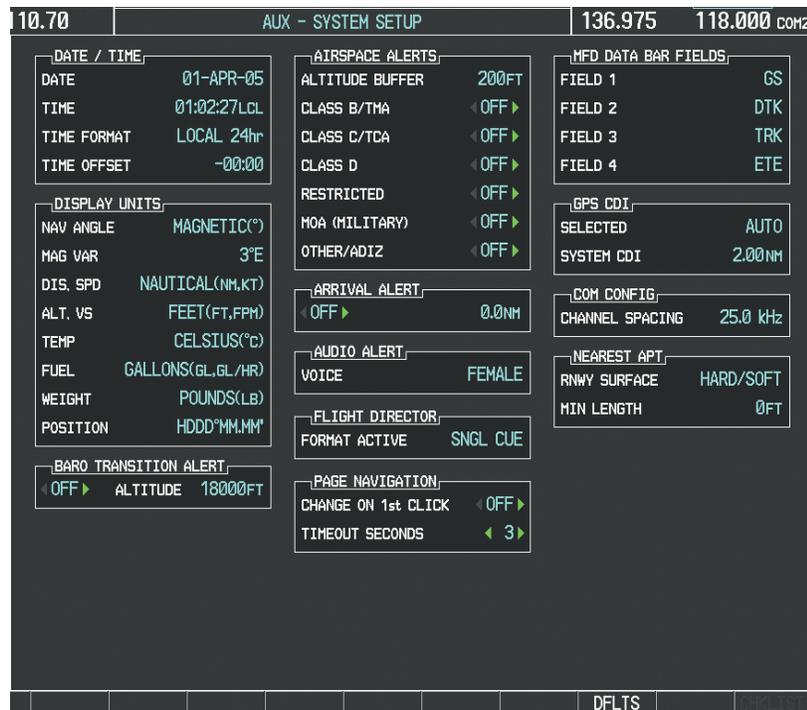


Figure 1-29 System Setup Page

## DATE/TIME

The Date/Time Box on the System Setup Page displays the current date and time and allows the pilot to set the time format (local 12-hr, local 24-hr, or UTC) and offset. The time offset is used to define current local time. UTC (also called GMT or Zulu) date and time are calculated directly from the GPS satellites signals and cannot be changed. When using a local time format, designate the offset by adding or subtracting the desired number of hours.

### Set the system time format:

- 1) While on the System Setup Page, press the **FMS** Knob momentarily to activate the flashing cursor.
- 2) Turn the large **FMS** Knob to highlight the time format field in the Date/Time Box.
- 3) Turn the small **FMS** Knob to select the desired system time format (local 12hr, local 24hr, UTC) and press the **ENT** Key.

### Set the current time offset:

- 1) While on the System Setup Page, press the **FMS** Knob momentarily to activate the flashing cursor.
- 2) Turn the large **FMS** Knob to highlight the time offset field in the Date/Time Box.
- 3) Turn the **FMS** Knobs to enter the time offset and press the **ENT** Key.

## DISPLAY UNITS

The Display Units Box on the System Setup Page allows configuration of the measurement units used for the following displayed data:

- Nav angle (magnetic, true)
  - When set to 'MAGNETIC', magnetic variation is figured into the displayed value. When 'TRUE' is selected, no magnetic variation is calculated and a 'T' is displayed next to the value.
  - Affects the BRG field in the PFD Navigation Status Box.
  - Affects Current Heading, Selected Heading, and Selected Course boxes on the PFD.
  - Affects the BRG, DTK, TKE, TRK, and XTK fields in the MFD Navigation Status Box.
- Distance and speed (metric, nautical)
  - Affects the DIS field in the PFD Navigation Status Box and the range setting of the Inset Map.
  - Affects all distance and speed displays on the MFD with the exception of the displayed wind speed displayed on the Navigation Map Page. Wind speed is affected on the Trip Planning Page.
- Altitude and vertical speed (feet, meters)
  - Affects all altitude and elevation displays on the MFD, with the exception of VNAV altitudes on the Active Flight Plan Page.
- Temperature (Celsius, Fahrenheit)
  - Affects all temperature displays on the PFD.
  - Affects the temperature display on the Trip Planning Page. Does not affect the Engine Indicating System display.

- Fuel and fuel flow (gallons, gallons/hour)  
Indicates fuel quantities are measured in gallons and fuel flow is measured in gallons per hour.
- Weight (pounds, kilograms)  
The weight setting is not applicable to the Nav III.
- Position (HDDD°MM.MM', HDDD°MM'SS.S", MGRS)  
Affects all position displays.

### Change a Display Units setting:

- 1) While on the System Setup Page, press the **FMS** Knob momentarily to activate the flashing cursor.
- 2) Turn the large **FMS** Knob to highlight the desired field in the Display Units Box.
- 3) Turn the small **FMS** Knob to select from a list of measurement units and press the **ENT** Key when the desired unit is highlighted. Press the **CLR** Key to cancel the action without changing the units.

### BARO TRANSITION ALERT

See the Flight Instruments section for a discussion on setting the Baro Transition Alert.

### AIRSPACE ALERTS

The Airspace Alerts Box allows the pilot to turn the controlled/special-use airspace message alerts on or off. This does not affect the alerts listed on the Nearest Airspaces Page or the airspace boundaries depicted on the MFD Navigation Map Page. It simply turns on/off the warning provided when the aircraft is approaching or near an airspace.

Alerts for the following airspaces can be turned on/off in the Airspace Alerts Box:

- Class B/TMA
- Class C/TCA
- Class D
- Restricted
- MOA (Military)
- Other airspaces

An altitude buffer is also provided which “expands” the vertical range above or below an airspace. For example, if the buffer is set at 500 feet, and the aircraft is more than 500 feet above/below an airspace, an alert message is not generated, but if the aircraft is less than 500 feet above/below an airspace and projected to enter it, the pilot is notified with an alert message. The default setting for the altitude buffer is 200 feet.

### Change the altitude buffer distance setting:

- 1) While on the System Setup Page, press the **FMS** Knob momentarily to activate the flashing cursor.
- 2) Turn the large **FMS** Knob to highlight the altitude buffer field in the Airspace Alerts Box.
- 3) Turn the **FMS** Knobs to enter an altitude buffer value and press the **ENT** Key.

**To turn an airspace alert on or off:**

- 1) While on the System Setup Page, press the **FMS** Knob momentarily to activate the flashing cursor.
- 2) Turn the large **FMS** Knob to highlight the desired field in the Airspace Alerts Box.
- 3) Turn the small **FMS** Knob clockwise to turn the airspace alert ON or counterclockwise to turn the alert OFF.

**ARRIVAL ALERTS**

The Arrival Alert Box on the System Setup Page allows the Alerts Window arrival alerts to be turned ON/OFF, and the alert trigger distance (up to 99.9 units) set for alerts in the Alerts Window and the PFD Navigation Status Box. An arrival alert can be set to notify the pilot with a message upon reaching a user-specified distance from the final destination (the direct-to waypoint or the last waypoint in a flight plan). When Arrival Alerts is set to ON, and the set distance is reached, an “Arrival at waypoint” message is displayed in the PFD Navigation Status Box, and a “WPT ARRIVAL - Arriving at waypoint - [xxxx]” is displayed in the Alerts Window. When Arrival Alerts is set to OFF, only the PFD Navigation Status Box message “Arriving at waypoint” is displayed, and it is displayed when the time to the final destination is approximately ten seconds.

**Enabling/disabling the Alerts Window arrival alert:**

- 1) Use the **FMS** Knob to select the AUX - System Setup Page.
- 2) Press the **FMS** Knob momentarily to activate the flashing cursor.
- 3) Turn the large **FMS** Knob to select the ON/OFF field in the Arrival Alert Box.
- 4) Turn the small **FMS** Knob clockwise to turn the airspace alert ON or counterclockwise to turn the alert OFF.

**Changing the arrival alert trigger distance:**

- 1) Use the **FMS** Knob to select the AUX - System Setup Page.
- 2) Press the **FMS** Knob momentarily to activate the flashing cursor.
- 3) Turn the large **FMS** Knob to highlight the distance field in the Arrival Alert Box.
- 4) Use the **FMS** Knob to enter a trigger distance and press the **ENT** Key.

**AUDIO ALERTS**

The Audio Alert Box on the System Setup Page allows the audio alert voice to be set to male or female.

**To change the audio alert voice:**

- 1) While on the System Setup Page, press the **FMS** Knob momentarily to activate the flashing cursor.
- 2) Turn the large **FMS** Knob to highlight the voice in the Audio Alert Box.
- 3) Turn the small **FMS** Knob to display and highlight the desired voice and press the **ENT** Key.

**FLIGHT DIRECTOR**

Not pilot selectable.

## PAGE NAVIGATION

The large **FMS** Knob displays the Page Group Tabs and navigates through the tabs. The small **FMS** Knob navigates through the pages listed within a specific group. The number of clicks it takes to display the Page Group Tabs and change to the next tab can be controlled from the Page Navigation box on the AUX - System Setup Page.

OFF – Displays the Page Group Tabs with one click of either **FMS** Knob.

ON – Displays the Page Group Tabs and navigates to the next tab with one click of either **FMS** Knob.

The pilot can select, from the AUX - System Setup Page, the amount of time the Page Group Tabs are displayed (in the lower right corner of the MFD). The timeout can range from two to ten seconds.

### Selecting page navigation settings:

- 1) Use the **FMS** Knob to select the AUX - System Setup Page.
- 2) Press the **FMS** Knob momentarily to activate the flashing cursor.
- 3) Turn the large **FMS** Knob to highlight the 'Change On 1st Click' field in the Page Navigation Box.
- 4) Turn the small **FMS** Knob to select 'OFF' or 'ON'.
- 5) Turn the large **FMS** Knob to highlight the 'Timeout Seconds' field in the Page navigation Box.
- 6) Turn the small **FMS** Knob to select the desired number of seconds
- 7) Press the **FMS** Knob momentarily to remove the flashing cursor.

## MFD DATA BAR FIELDS

The MFD Data Bar Fields Box on the System Setup Page displays the current configuration of the MFD Navigation Status Box. By default, the Navigation Status Bar is set to display ground speed (GS), distance to next waypoint (DIS), estimated time enroute (ETE), and enroute safe altitude (ESA).

### Change the information shown in an MFD Navigation Status Bar field:

- 1) While on the System Setup Page, press the **FMS** Knob momentarily to activate the flashing cursor.
- 2) Turn the large **FMS** Knob to highlight the desired field number in the MFD Data Bar Fields Box.
- 3) Turn the small **FMS** Knob to display and scroll through the data options list and press the **ENT** Key when the desired data selection is highlighted.

The following data may be selected for display in each of the four fields of the Navigation Status Box.

- Bearing (BRG)
- Crosstrack Error (XTK)
- Distance (DIS)
- Desired Track (DTK)
- Endurance (END)
- En Route Safe Altitude (ESA)
- Estimated Time of Arrival (ETA)
- Estimated Time En Route (ETE)
- Fuel Over Destination (FOD)
- Fuel On Board (FOB)
- Ground Speed (GS)
- Minimum Safe Altitude (MSA)
- True Air Speed (TAS)
- Track Angle Error (TKE)
- Track (TRK)
- Vertical Speed Required (VSR)

## GPS CDI

The GPS CDI Box on the System Setup Page allows the pilot to define the range for the on-screen course deviation indicator (CDI). The range values represent full range deflection for the CDI to either side. The default setting is 'AUTO'. At this setting, leaving the departure airport the CDI range is set to 1.0 nm and gradually ramps up to 2 nm beyond 30 nm from the departure airport. The CDI range is set to 2.0 nautical miles during the en route phase of flight. Within 30 nm of the destination airport, the CDI range gradually ramps down to 1.0 nm (terminal area). During approach operations, the CDI range ramps down even further to 0.3 nm. This transition normally occurs within 2.0 nm of the final approach fix (FAF).

If a lower CDI range setting is selected (i.e., 1.0 or 0.3 nm), the higher range settings are not selected during any phase of flight. For example, if 1.0 nm is selected, the system uses this for en route and terminal phases and ramps down to 0.3 nm during an approach. Note that the Receiver Autonomous Integrity Monitoring (RAIM) protection limits follow the selected CDI range and corresponding flight phases.

The GPS CDI Box on the System Setup Page displays the following:

- Selected CDI range (auto, 2 nm, 1 nm, 0.3 nm)
- Current system CDI range (2 nm, 1 nm, 0.3 nm)

### Changing the CDI range:

- 1) While on the System Setup Page, press the **FMS** Knob momentarily to activate the flashing cursor.
- 2) Turn the large **FMS** Knob to highlight the selected field in the GPS CDI Box.
- 3) Turn the small **FMS** Knob to display and scroll through the range list and press the **ENT** Key when the desired selection is highlighted.
- 4) Press the **FMS** Knob to deactivate the cursor.

## COM CONFIGURATION



**NOTE:** 8.33 kHz VHF communication frequency channel spacing is not approved for use in the United States. Select the 25.0 kHz channel spacing option for use in the United States.

The COM Configuration Box on the System Setup Page allows the pilot to select 8.33 kHz or 25.0 kHz COM frequency channel spacing.

### Change COM channel spacing:

- 1) While on the System Setup Page, press the **FMS** Knob momentarily to activate the flashing cursor.
- 2) Turn the large **FMS** Knob to highlight the channel spacing field in the COM Configuration Box.
- 3) Turn the small **FMS** Knob to select the desired spacing and press the **ENT** Key.

## NEAREST AIRPORTS

The Nearest Airports Box on the System Setup Page defines the minimum runway length and surface type used when determining the nine nearest airports to display on the MFD Nearest Airports Page. A minimum runway length and/or surface type can be entered to prevent airports with small runways or runways that

are not of appropriate surface from being displayed. Default settings are zero feet (or meters) for runway length and “HARD/SOFT” for runway surface type.

**Select nearest airport surface matching criteria (any, hard only, hard/soft, water):**

- 1) While on the System Setup Page, press the **FMS** Knob momentarily to activate the flashing cursor.
- 2) Turn the large **FMS** Knob to highlight the runway surface field in the Nearest Airports Box.
- 3) Turn the small **FMS** Knob to display and scroll through the runway options (any, hard only, hard/soft, water) and press the **ENT** Key when the desired selection is highlighted.

**Select nearest airport minimum runway length matching criteria:**

- 1) While on the System Setup Page, press the **FMS** Knob momentarily to activate the flashing cursor.
- 2) Turn the large **FMS** Knob to highlight the minimum length field in the Nearest Airport Box.
- 3) Turn the **FMS** Knobs to enter the minimum runway length (zero to 99,999 feet) and press the **ENT** Key.

**SYSTEM STATUS PAGE**

The System Status Page displays the status 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 and failed LRUs are indicated by red “X”s. Failed LRUs should be noted and a Cessna service center or Garmin dealer informed.

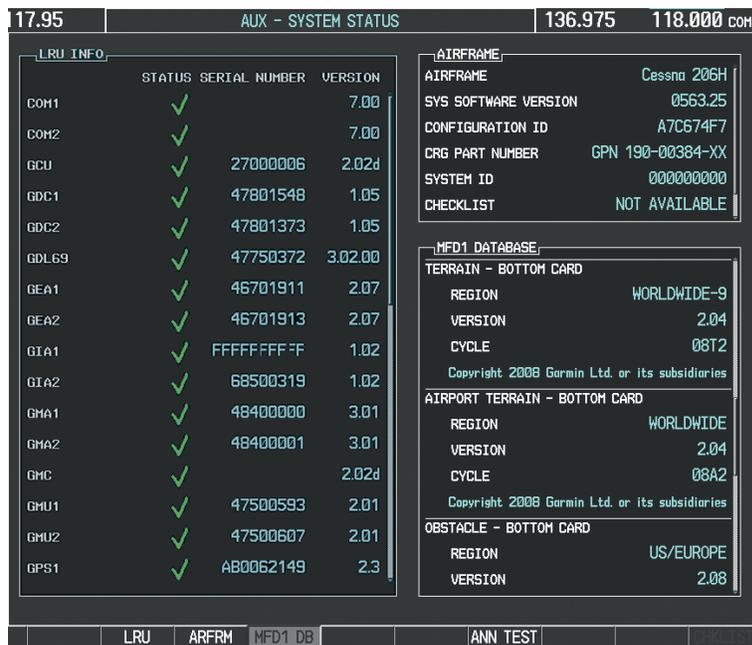


Figure 1-30 Example System Status Page

The **LRU** and **ARFRM** softkeys on the System Status Page select the applicable list (LRU INFO or AIRFRAME window) through which the **FMS** Knob can be used to scroll information within the selected window.

Pressing the Display Database Selection Softkey (background changes to grey indicating the softkey is selected) places the cursor in the DATABASE window. Use the **FMS** Knob to scroll through database information for the database information. Each press of the Display Database Selection Softkey will change the softkey label (**PFD1 DB**, etc) to indicate the display for which database information is displayed.

The **ANN TEST** Softkey, when pressed, causes an annunciation test tone to be played.

**SYSTEM UTILITIES**

For flight planning purposes, timers, trip statistics, and a scheduler feature are provided on the AUX - Utility Page. The timers available include a stopwatch-like generic timer, a total time in flight timer, and a record of the time of departure. Trip statistics—odometer, trip odometer, and average trip and maximum groundspeeds—are displayed from the time of the last reset. A scheduler feature is also provided so the pilot can enter reminder messages to be displayed at specified intervals in the Alerts Window on the PFD (see the Additional Features Section).

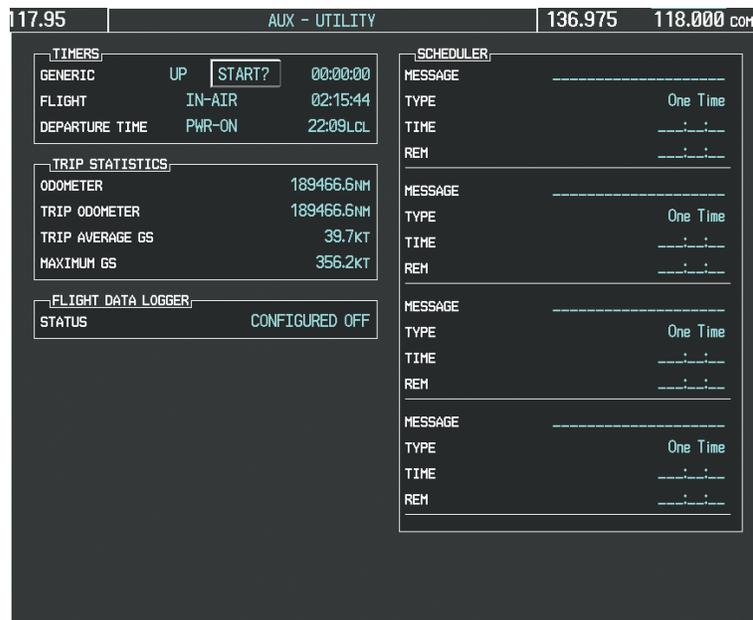


Figure 1-31 Utility Page

**TIMERS**

The generic timer can be set to count up or down from a specified time (HH:MM:SS). When the countdown on the timer reaches zero the digits begin to count up from zero. If the timer is reset before reaching zero on a countdown, the digits are reset to the initial value. If the timer is counting up when reset, the digits are zeroed.

**Setting the generic timer:**

- 1) Use the **FMS** Knob to select the AUX - Utility Page.
- 2) Press the **FMS** Knob momentarily to activate the flashing cursor.

- 3) Turn the small **FMS** Knob to select the timer counting direction (UP/DN) and press the **ENT** Key.
- 4) If a desired starting time is desired:
  - a) Use the large **FMS** Knob to highlight the HH:MM:SS field.
  - b) Use the **FMS** Knob to enter the desired time and press the **ENT** Key.
- 5) Turn the large **FMS** Knob to highlight 'START?' and press the **ENT** Key to start the timer. The field changes to 'STOP?'
- 6) To stop the timer, press the **ENT** Key with 'STOP?' highlighted. The field changes to 'RESET?'
- 7) To reset the timer, press the **ENT** Key with 'RESET?' highlighted. The field changes back to 'START?' and the digits are reset.

The flight timer can be set to count up from zero starting at system power-up or from the time that the aircraft lifts off; the timer can also be reset to zero at any time.

#### Setting the flight timer starting criterion:

- 1) Use the **FMS** Knob to select the AUX - Utility Page.
- 2) Press the **FMS** Knob momentarily to activate the flashing cursor.
- 3) Turn the large **FMS** Knob to highlight the field next to the flight timer.
- 4) Turn the small **FMS** Knob to select the starting criterion (PWR-ON or IN-AIR) and press the **ENT** Key.

#### Resetting the flight timer:

- 1) Use the **FMS** Knob to select the AUX - Utility Page.
- 2) Press the **MENU** Key.
- 3) With 'Reset Flight Timer' highlighted, press the **ENT** Key.

The G1000 records the time at which departure occurs, depending on whether the pilot prefers the time to be recorded from system power-up or from aircraft lift off. The displayed departure time can also be reset to display the current time at the point of reset. The format in which the time is displayed is controlled from the System Setup Page.

#### Setting the departure timer starting criterion:

- 1) Use the **FMS** Knob to select the AUX - Utility Page.
- 2) Press the **FMS** Knob momentarily to activate the flashing cursor.
- 3) Turn the large **FMS** Knob to highlight the field next to the departure time.
- 4) Turn the small **FMS** Knob to select the starting criterion (PWR-ON or IN-AIR) and press the **ENT** Key.

#### Resetting the departure time:

- 1) Use the **FMS** Knob to select the AUX - Utility Page.
- 2) Press the **MENU** Key.
- 3) Use the **FMS** Knob to highlight 'Reset Departure Time' and press the **ENT** Key.

## TRIP STATISTICS

The odometer and trip odometer record the total mileage traveled from the last reset; these odometers can be reset independently. Resetting the trip odometer also resets the average trip groundspeed. Maximum groundspeed for the period of time since the last reset is also displayed.

### Resetting trip statistics readouts:

- 1) Use the **FMS** Knob to select the AUX - Utility Page.
- 2) Press the **MENU** Key. The following reset options for trip statistics are displayed:
  - Reset Trip ODOM/AVG GS—Resets trip average ground speed readout and odometer
  - Reset Odometer—Resets odometer readout only
  - Reset Maximum Speed—Resets maximum speed readout only
  - Reset All—Resets flight timer, departure timer, odometers, and groundspeed readouts
- 2) Use the **FMS** Knob to highlight the desired reset option and press the **ENT** Key. The selected parameters are reset to zero and begin to display data from the point of reset.

## FLIGHT DATA LOGGER

Shows Flight Data Logging status.

## SCHEDULER

The Scheduler feature is discussed in the Additional Features section.

## 1.8 DISPLAY BACKLIGHTING

The G1000 display and control backlighting can be adjusted either automatically or manually.

### AUTOMATIC ADJUSTMENT

The existing instrument panel dimmer bus normally controls the PFD and MFD backlighting as well as the PFD and MFD bezels, MFD Control Unit, AFCS Control Unit and audio panel key annunciator lighting. When the dimmer bus is not used by the G1000 system, photocell technology automatically controls backlighting adjustments. Photocell calibration curves are pre-configured to optimize display appearance through a broad range of cockpit lighting conditions.

### MANUAL ADJUSTMENT



**NOTE:** The avionics dimming knob may also be used to adjust backlighting. Refer to the POH for details.



**NOTE:** In normal mode, backlighting can only be adjusted from the PFD. In reversionary mode, it can also be adjusted from the MFD.



**NOTE:** No other window can be displayed on the PFD while the PFD Setup Menu Window is displayed.

Backlighting may also be adjusted manually for all of the displays and the associated bezels. The audio panel key backlighting is directly tied to the PFD key backlighting setting.

#### Adjust display backlighting manually:

- 1) Press the **MENU** Key on the PFD to display the PFD Setup Menu Window. 'AUTO' becomes highlighted to the right of 'PFD DSPL'.

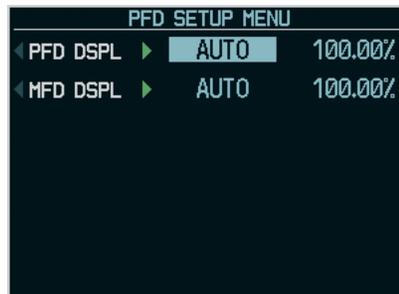


Figure 1-32 Manual Display Backlighting Adjustment

- 2) Turn the small **FMS** Knob to display the selection box. Turn the **FMS** Knob to select 'MANUAL', then press the **ENT** Key. The intensity value becomes highlighted.
- 3) Turn the small **FMS** Knob to select the desired backlighting, then press the **ENT** Key.
- 4) Turn the large **FMS** Knob to highlight 'AUTO' to the right of 'MFD DSPL' and repeat steps 2 and 3.
- 5) Press the **CLR** or **MENU** Key to remove the PFD Setup Menu Window from the display.

**Adjust key backlighting manually:**

- 1) Press the **MENU** Key on the PFD to display the PFD Setup Menu Window. 'AUTO' becomes highlighted to the right of 'PFD DSPL'.



**Figure 1-33 Manual Key Lighting Adjustment**

- 2) Turn the large **FMS** Knob to highlight 'PFD DSPL'. Turn the small **FMS** Knob in the direction of the green arrowhead to display 'PFD KEY'.
- 3) Turn the large **FMS** Knob to highlight 'AUTO' and turn the small **FMS** Knob to display the selection box.
- 4) Turn the **FMS** Knob to select 'MANUAL', then press the **ENT** Key. The intensity value becomes highlighted.
- 5) Turn the small **FMS** Knob to select the desired backlighting, then press the **ENT** Key.
- 6) Turn the large **FMS** Knob to highlight 'MFD DSPL' and turn the small **FMS** Knob in the direction of the green arrowhead to display 'MFD KEY'.
- 7) Repeat steps 3 to 5.
- 8) Press the **CLR** or **MENU** Key to remove the PFD Setup Menu Window from the display.