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SECTION 2 FLIGHT INSTRUMENTS

2.1 PFD PAGE

The G5 PFD Page displays a horizon, airspeed, attitude, altitude, vertical speed, heading, and course deviation information. The following flight instruments and supplemental flight data are displayed on the PFD Page.





2.1.1 AIRSPEED INDICATOR



NOTE: The G5 Vspeed Reference values depend upon the aircraft's specific system configuration and may vary from the examples discussed in this section.

The Airspeed Indicator displays airspeed on a rolling number gauge using a moving tape. The numeric labels and major tick marks on the moving tape are marked at intervals of 10 knots. Speed indication starts at 30 knots, with 60 knots of airspeed viewable at any time. The actual airspeed is displayed inside the black pointer. The pointer remains black until reaching never-exceed speed (V_{NE}), at which point it turns red.

A color-coded (red, white, green, yellow, and red/white "barber pole") speed range strip is located on the moving tape. The colors denote flaps operating range, normal operating range, caution range, and never-exceed speed ($V_{_{NE}}$). A red range is also present for low speed awareness.

The Airspeed Trend Vector is a vertical, 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 6 seconds if the current rate of acceleration is maintained. If the trend vector crosses V_{NE} , the text of the actual airspeed display 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.



Figure 2-2 Airspeed Indicator

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2.1.1.1 VSPEED REFERENCE

When airspeed is present, the configured Vspeeds are displayed at their respective locations to the right of the airspeed scale, otherwise the Vspeeds are displayed at the bottom of the airspeed indicator.



Figure 2-3 Vspeed References

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2.1.2 ATTITUDE INDICATOR

Attitude information is displayed over a virtual blue sky and brown ground with a white horizon line. The Attitude Indicator displays the pitch (indicated by the yellow symbolic aircraft on the pitch scale), roll, and slip/skid information.

The horizon line is part of the pitch scale. Pitch markings occur at 2.5° intervals through all pitch ranges. Refer to the Installation Manual to configure the pitch scale.

The inverted white triangle indicates zero on the roll scale. Major tick marks at 30° and 60° and minor tick marks at 10°, 20°, and 45° 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.

Slip/skid is indicated by the location of the ball.



Figure 2-5 Attitude Indicator with Flight Director (Single Cue)

Figure 2-6 Attitude Indicator with Flight Director (Dual Cue)

2.1.2.1 ATTITUDE CONFIGURATION

The roll (bank angle) indication may be configured to be a Ground Pointer (default) or a Sky Pointer. Refer to the G5 Installation Manual for configuration information.

The Ground Pointer configuration displays both the roll arc and the pitch scale anchored to the horizon and the roll pointer beneath the roll arc pointing to the present roll angle.

The Sky Pointer configuration displays the pitch scale moving with the horizon, but the roll arc remains fixed and centered in the display. The roll pointer beneath the roll arc moves with the horizon and in the opposite direction of aircraft roll.

Ground Pointer-

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Figure 2-7 Ground Pointer Configuration



Figure 2-8 Sky Pointer

Configuration

Sky Pointer

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2.1.3 ALTIMETER

The Altimeter displays 400 feet of barometric altitude values at a time on a rolling number gauge using a moving tape. Numeric labels and major tick marks are shown at intervals of 100 feet. Minor tick marks are at intervals of 20 feet. The current altitude is displayed in the black pointer.

The Selected Altitude is displayed above the Altimeter in the box indicated by a selection bug symbol. A bug corresponding to this altitude is shown on the tape; if the Selected Altitude exceeds the range shown on the tape, the bug appears at the corresponding edge of the tape.

Setting the selected altitude:

Rotate the **ALT SEL** Knob on the GMC 507.

Or

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- 1) Press the Selection Knob to display the Menu.
- Select Altitude and use the Selection Knob to change the Selected 2) Altitude.

Syncing to the current altitude:

Press the **ALT SEL** Knob on the GMC 507.

Or

- 1) Press the Selection Knob to display the Menu.
- 2) Select Altitude and press and hold the Selection Knob to sync the Selected Altitude to the current altitude.



Figure 2-9 Altimeter

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2.1.3.1 BAROMETRIC PRESSURE

The barometric pressure setting is displayed below the Altimeter in inches of mercury (Hg), hectopascals (hPa), or millibars (mb) when metric units are selected.

Selecting the altimeter barometric pressure setting:

Turn the Selection Knob to set the barometric pressure.

2.1.3.2 ALTITUDE ALERTING

The Altitude Alerting function provides the pilot with a visual alert and tone (dependant on installation) when approaching the Selected Altitude. Whenever the Selected Altitude is changed, the Altitude Alerter is reset. The following will occur when approaching the Selected Altitude:

- Passing within 1,000 feet of the Selected Altitude, the Selected Altitude (shown above the Altimeter) flashes for 5 seconds.
- When the aircraft passes within 200 feet of the Selected Altitude, the Selected Altitude flashes for 5 seconds to indicate the aircraft is approaching the selected altitude.
- After reaching the Selected Altitude, if the pilot flies outside the deviation band (±200 Feet of the Selected Altitude), the Selected Altitude changes to yellow text on a black background, flashes for 5 seconds.



Figure 2-10 Altitude Alerting Visual Annunciation



2.1.4 TURN RATE INDICATOR

The Turn Rate Indicator is located at the bottom of the PFD Page. Tick marks to the left and right of the displayed heading denote standard turn rates (3 deg/sec). A magenta Turn Rate Trend Vector shows the current turn rate. A standard-rate turn is shown on the indicator by the trend vector stopping at the standard turn rate tick mark.



Turn Rate Indicator (Standard Rate Tick Marks) Figure 2-11 Turn Rate Indicator

2.1.5 HEADING/GROUND TRACK (PFD PAGE)

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NOTE: Heading is displayed if magnetometer data is available from a magnetometer via the CAN network. Otherwise, Ground Track is displayed.

A Heading/Ground Track Tape is displayed at the top of the PFD Page and displays numeric labels every 10°. Major tick marks are at 5° intervals and minor tick marks at 1° intervals. The current track is represented by a magenta triangle. The Heading/Ground Track Tape also displays the navigation course.

When displaying the Selected Heading, a cyan bug on the tape corresponds to the Selected Heading. When displaying Ground Track, a magenta bug is displayed on the tape. The heading bug turns hollow when GPSS is selected.

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Adjusting the selected heading or ground track:

Use the **HDG** Knob on the GMC 507.

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- 1) Press the Selection Knob to display the Menu.
- 2) Select **Heading** or **Track** and use the Selection Knob to change the Selected Heading or Track.

Syncing to the current heading or ground track:

Press the **HDG** Knob on the GMC 507.

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- 1) Press the Selection Knob to display the Menu.
- 2) Select **Heading** or **Track** and press and hold the Selection Knob to sync the selected heading or ground track to the current heading or ground track.



Figure 2-12 PFD Page - Selected Heading







Figure 2-13 PFD Page - Selected Ground Track

2.1.6 VERTICAL SPEED INDICATOR (VSI)

The Vertical Speed Indicator displays the aircraft vertical speed using a non-moving tape with minor tick marks every 100 feet. The current vertical speed is displayed using a white arrow along the tape.



Figure 2-14 Vertical Speed Indicator

2.1.7 BATTERY STATUS INDICATOR

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When the G5 is powered by the aircraft electrical bus, the battery status indicator can be displayed by pressing the G5 Power Button. When the G5 is powered by the battery, the battery status indicator is displayed automatically. This indicator shows the estimated percent charge of the battery. After about one minute on battery power, the indicator shows the estimated time (in hours and minutes) until the battery is empty. The current charge level of the battery is indicated by the filled-in portion of the battery icon. The battery icon turns yellow or red to indicate a low-battery condition



The battery is required for the G5 unit installed as an attitude display indicator (ADI) and is optional for the G5 unit installed as a horizontal situation indicator (HSI)

When the G5 is connected to external power and the battery is being charged, a lightning bolt symbol appears over the battery icon.



Other battery indications:



Battery charger hardware fault, or temperature too high/low to safely charge the battery. The system is running on external power but cannot charge the battery.



Battery fault.



Battery is not present (appears only when the battery status field has been configured to always appear).

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2.2 HSI PAGE

System Overview

NOTE: The HSI Page can be configured as disabled in configuration mode.

The G5 HSI Page displays a rotating compass card in a heading-up orientation. Letters indicate the cardinal points and numeric labels occur every 30°. Major tick marks are at 10° intervals and minor tick marks at 5° intervals. The current ground track is represented on the HSI by magenta triangle and a dashed line. The HSI also presents course deviation, bearing, and navigation source information. The following items are displayed on the HSI Page:



Figure 2-15 Horizontal Situation Indicator (HSI) - Normal

3 Nav Source Annunciations				(1) GPS CDI Scale Annunciations		
			10.04	LP	LPV	LNAV
GPS/ GPS1/ GPS2	VLOC/ VLOC1/ VLOC2	VOR/ VOR1/ VOR2	LOC/ LOC1/ LOC2	LNAV/VNAV	LNAV+V	APR
				TERM	ENR	OCN
				VFR (0.25nm, 1.25nm, 5.00nm)		
5 Navigator Messages Annunciations						
LOI	Loss of GPS Integrity			MSG	Pending Nav Message	
DR	GPS Dead-Reckoning Mode			WPT	Waypoint Arrival	

Table 2-1 Annunciations



NOTE: The VFR CDI Scale is displayed when the G5 is connected to a GPS navigator via RS-232 only, or if ARINC 429 GPS navigation data is unavailable.

2.2.1 HORIZONTAL SITUATION INDICATOR (HSI)

The Horizontal Situation Indicator (HSI) on the HSI Page displays a rotating compass card in a heading-up orientation. Letters indicate the cardinal points and numeric labels occur every 30°. Major tick marks are at 10° intervals and minor tick marks at 5° intervals. The current track is represented on the HSI by magenta triangle and a dashed line. The HSI also presents course deviation, bearing, and navigation source information.



Figure 2-16 Horizontal Situation Indicator (HSI) - Expanded

Displaying the HSI page from the PFD page:

- 1) From the PFD Page press the Selection Knob to display the Menu.
- 2) Select HSI.

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2.2.1.1 BEARING POINTERS

One or two bearing pointers can be displayed on the HSI for NAV (VOR) and GPS sources. The bearing pointers are cyan. The bearing pointers never override the CDI and are visually separated from the CDI by a white ring (shown when the bearing pointers are selected but not necessarily visible due to data unavailability). If there are two navigation inputs configured, two bearing pointers will be displayed.



Figure 2-17 GPS Source Bearing Pointer

Figure 2-18 VOR Source Bearing Pointer

Enabling/disabling the bearing pointer(s):

- **1)** From the HSI Page, press the Selection Knob to display the Menu.
- 2) Turn the Selection Knob to highlight **Setup**.
- **3)** Press the Selection Knob and turn to highlight the **Bearing Pointer 1** setting.



Figure 2-19 Setup Menu

Figure 2-20 Bearing Pointer Setting

Press the Selection Knob and turn to select bearing pointer source (None, GPS, VLOC).

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5) Repeat steps 1-4 to enable/disable the **Bearing Pointer 2** setting.



Figure 2-21 Bearing Pointer Source Options

2.2.2 HEADING/GROUND TRACK (HSI PAGE)

The Selected Heading or Ground Track is shown to the right of the HSI. The cyan bug (heading) or magenta bug (ground track) on the compass rose corresponds to the Selected Heading or Ground Track.

NOTE: Heading is displayed if magnetometer data is available from a magnetometer via the CAN network. Otherwise, Ground Track is displayed.

Adjusting the selected heading or ground track from the HSI page:

Use the **HDG** Knob on the GMC 507.

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From the HSI Page, turn the Selection Knob to adjust the selected heading or ground track.

Syncing to the current heading or ground track from the HSI page:

Press the **HDG** Knob on the GMC 507.

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From the HSI Page, press and hold the Selection Knob to sync to the current heading or ground track.

2.3 NAVIGATION

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When properly configured, the G5 can display data from either the #1 or #2 navigation source. If the navigation source is a GNS/GTN unit, both GPS and VLOC data can be displayed

2.3.1 COURSE DEVIATION INDICATOR (CDI)

The PFD Page displays the Course Deviation Indicator (CDI) below the slip/skid indicator. The HSI Page displays the CDI on the Horizontal Situation Indicator.

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

The CDI is capable of displaying multiple sources of navigation (GPS, VLOC, or both) depending on the external navigator(s) configured (refer to the G5 Installation Manual for more information). 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.





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Figure 2-23 Course Deviation Indicator - HSI

Changing the navigation source (GPS, VOR, LOC, or VLOC):

Use either the #1 or #2 external navigator to toggle between GPS and VOR/LOC source types.

2.3.2 VERTICAL DEVIATION (GLIDESLOPE) INDICATOR - ILS SOURCE

The Vertical Deviation (Glideslope) Indicator (VDI) appears to the left of the altimeter (PFD page) and to the right of the compass rose (HSI page) whenever an ILS frequency is tuned in the active NAV field of an external navigator. A green diamond acts as the VDI, like a glideslope needle on a conventional indicator. If a localizer frequency is tuned and there is no glideslope signal, "NO GS" is annunciated.



Figure 2-24 Vertical Deviation Indicator (Glideslope ILS Source) - PFD



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2.3.3 VERTICAL DEVIATION (GLIDEPATH) INDICATOR - GPS SOURCE

The Vertical Deviation (Glidepath) Indicator (VDI) also appears to the left of the altimeter (PFD page) and to the right of the compass rose (HSI page) during a GPS approach. The glidepath is analogous to the glideslope for GPS approaches supporting WAAS vertical guidance (LNAV+V, L/VNAV, LPV). The Glidepath Indicator appears on the G5 as a magenta diamond. If the approach type downgrades past the final approach fix (FAF), "NO GP" is annunciated.



Figure 2-26 Vertical Deviation Indicator (Glidepath GPS Source) - PFD

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Figure 2-27 Vertical Deviation Indicator Position - HSI

2.3.4 VNAV INDICATOR

The magenta chevron (VNAV Indicator) to the left of the altimeter on the Vertical Deviation Scale displays the VNAV profile.





Indicator - HSI

2.3.5 COURSE SELECTION (OPTIONAL)

Indicator - PFD

When the G5 is receiving VOR or LOC data, a **Course** menu option is displayed.

Setting the course for a VOR or localizer:

- 1) From the HSI Page, press the Selection Knob to display the Menu.
- 2) Select **Course** and use the Selection Knob to adjust the course.



Figure 2-30 Course - HSI

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When OBS is activated on the navigator, an OBS menu option is displayed.

Setting the OBS:

- **1)** From the HSI Page, press the Selection Knob to display the Menu.
- 2) Select **OBS** and use the Selection Knob to adjust the course.



Figure 2-31 OBS - HSI

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