

# Cessna FITS Accepted Training Program



## Cessna/Garmin G1000 Integrated Cockpit System



# Welcome



- **Thank You** for flying a new Cessna Aircraft!
- You are now members of the Cessna Family!
  - Largest manufacturer of general aviation aircraft in the world
  - 80 years producing over 175,000 airplanes
  - Superior Product Support
  - We are committed to your total satisfaction!



# Introductions

- Name
- Home Airport
- Background and Experience



# Ground Training

## Module I Classroom



# Agenda

- **Classroom**
  - **Training Approach**
  - **Display Overview**
  - **Operational Basics**
  - **Flight Director/Autopilot Introduction**
- **Lab**
  - **System Configuration**
  - **Flight Scenario 1**

# Training Overview

- Ground Training: Modules I and II
  - Guided discussions in classroom environment
  - Interactive demonstrations and exercises in lab environment
- Flight Training:
  - VFR Flight
  - IFR Flight (appropriately rated)
  - Abnormal Procedures Flight
  - All flights will follow FITS philosophy

(Optional High Altitude training can be incorporated during the flight training for turbo-charged aircraft customers.)



# What is FITS?

- FAA/Industry Training Standards (FITS)
  - This program is a partnership between the FAA and the Industry.
  - FITS training is non-regulatory.
- FITS is focused on the redesign of general aviation training.
  - FITS prepares pilots to better use all of the airplane's capabilities in day-to-day operations.
  - Instead of training pilots to pass a practical test, FITS will use scenario-based training to expertly manage real-world challenges.
  - Accomplished without compromising basic stick and rudder skills.
    - There is still relevance to task-based training.





# FITS Course Certificate

*Presented to*

**Name Here**

*attended the TAA\* transition course for the CE-182 Skylane*

**CESSNA AIRCRAFT**



*15<sup>th</sup> day of June 2004*

\_\_\_\_\_  
Ground/Flight Instructors

\_\_\_\_\_  
Single Engine Pilot Training Supervisor

\*TAA - Technically Advanced Aircraft



# Agenda

- **Classroom**
  - Training Approach
  - **Display Overview**
    - **Flight Instruments**
    - **PFD**
    - **MFD**
  - Operational Basics
  - Flight Director/Autopilot Introduction
- **Lab**
  - System Configuration
  - Flight scenario 1



# Flight Instruments



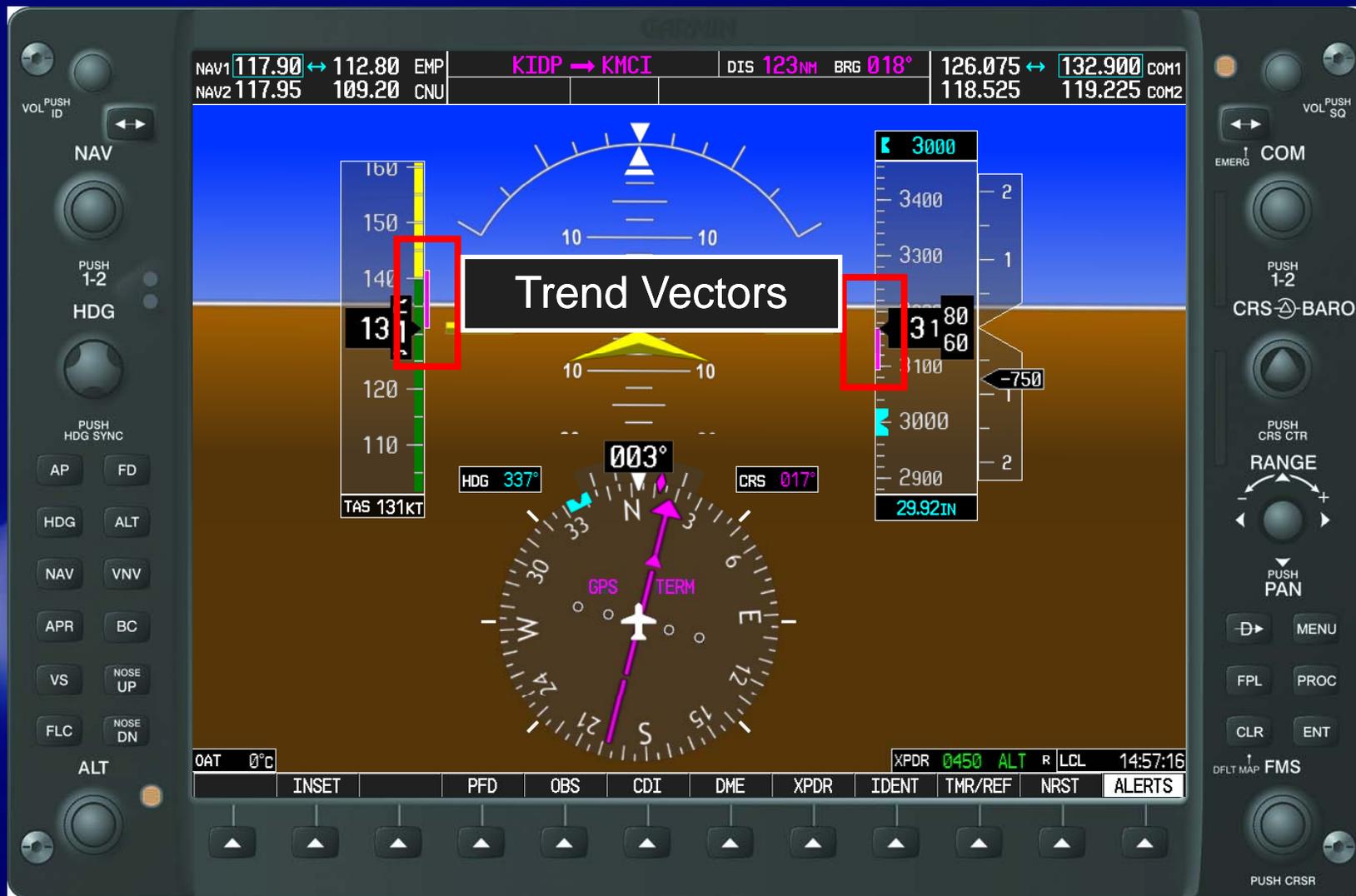
**Traditional Panel Layout vs. G1000 Display**



# Airspeed Display – Current Airspeed

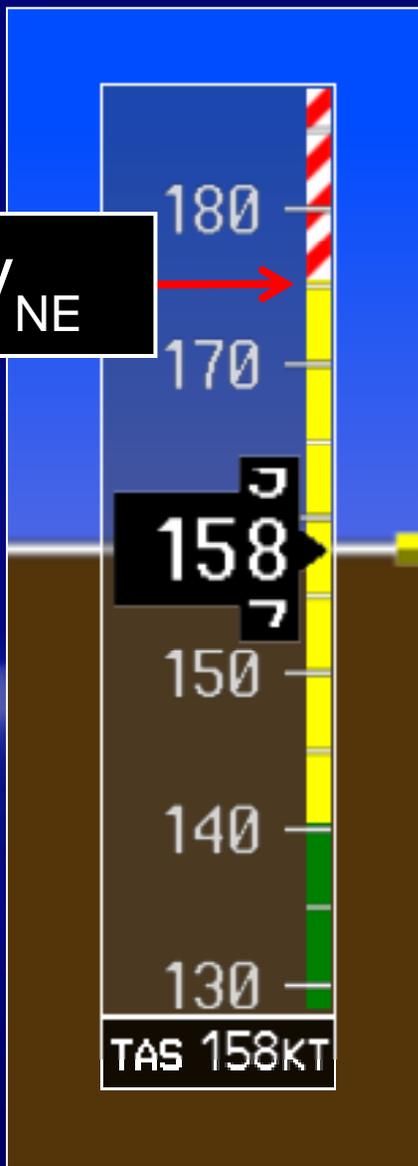


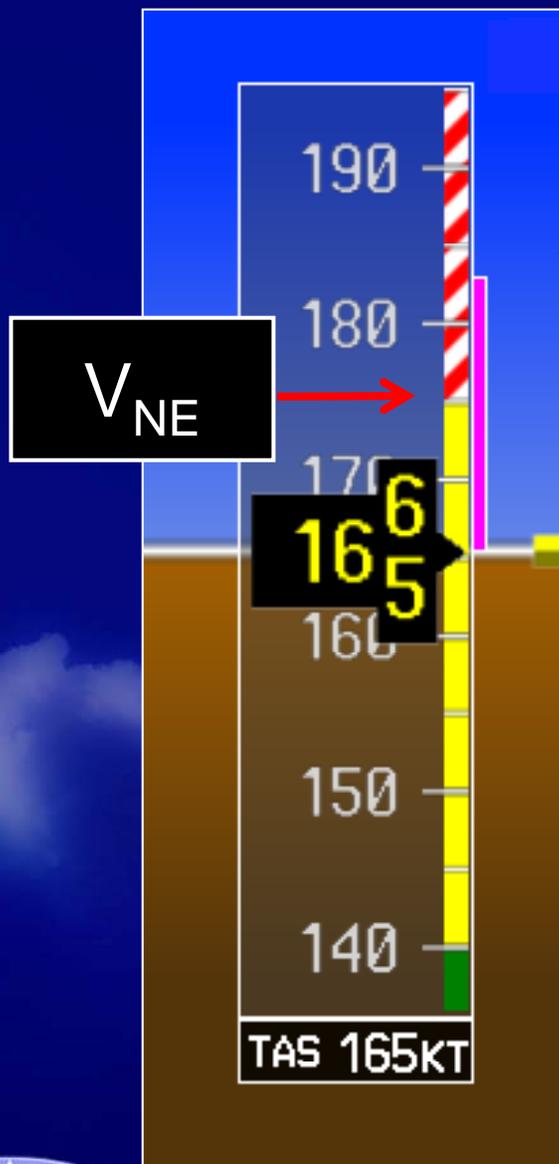
# Airspeed Display – Trend Vectors

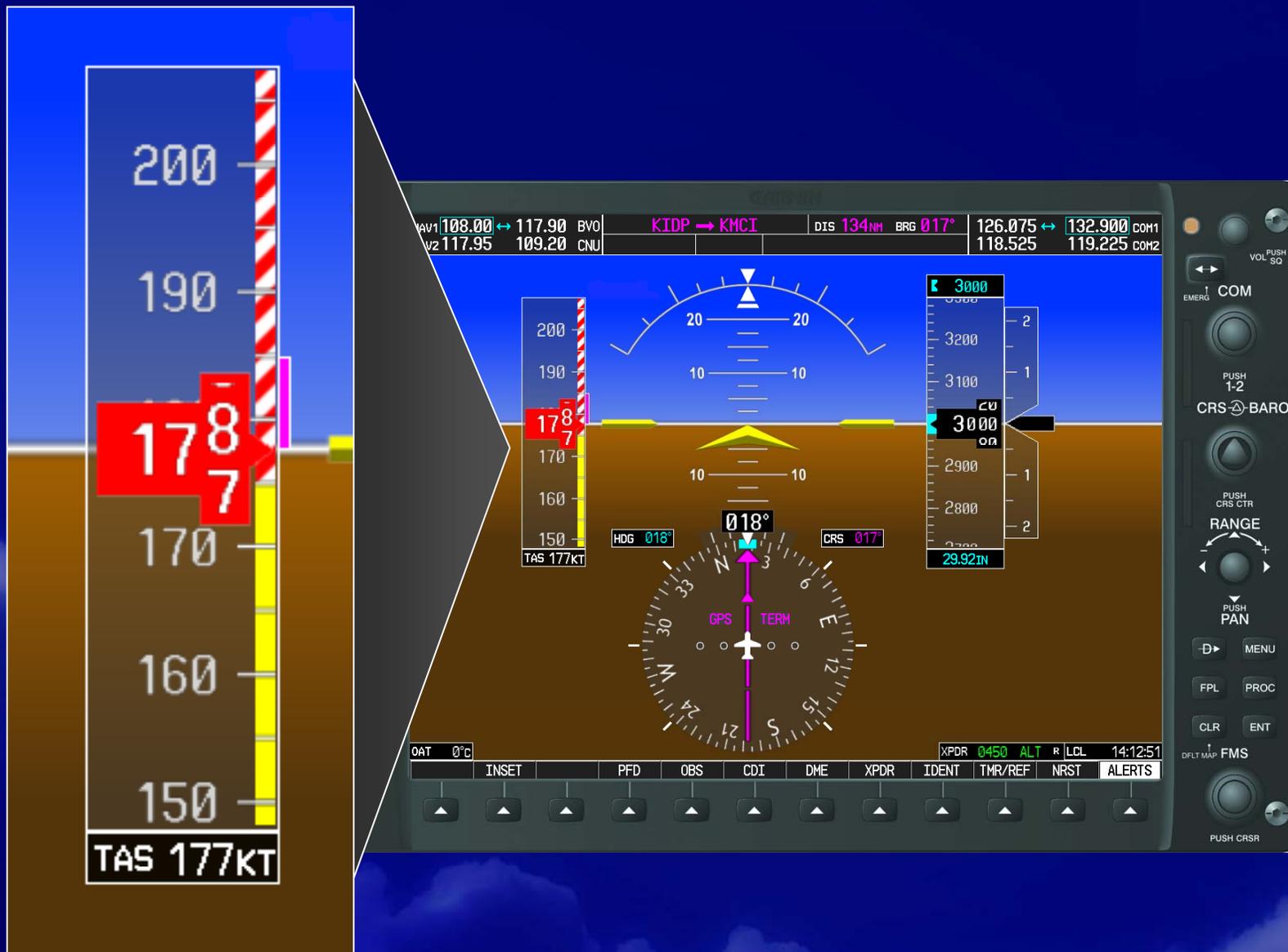




V<sub>NE</sub>







# Airspeed Display – Vspeed References

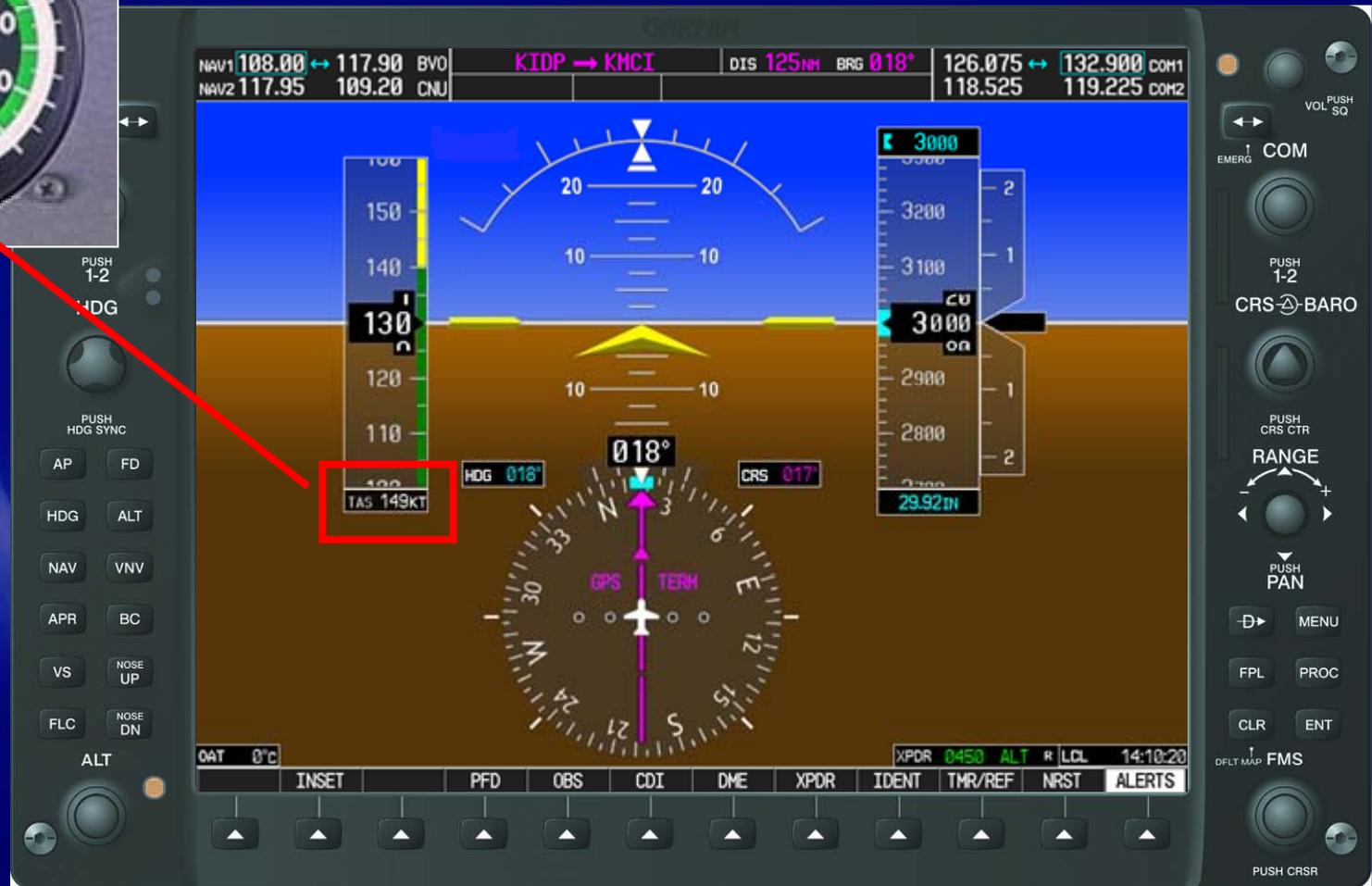


Vspeed References

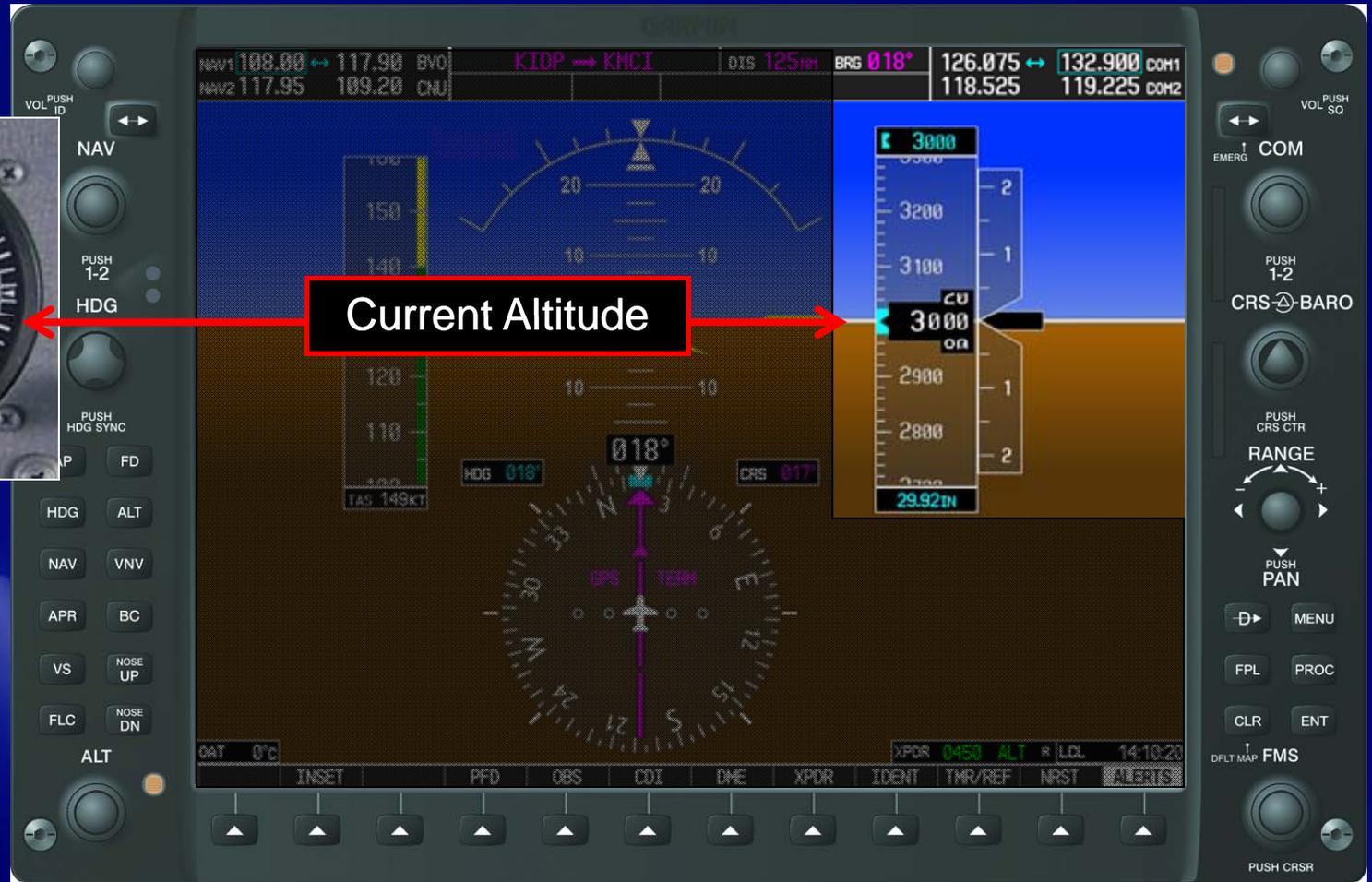
# Airspeed Display – Vspeed References



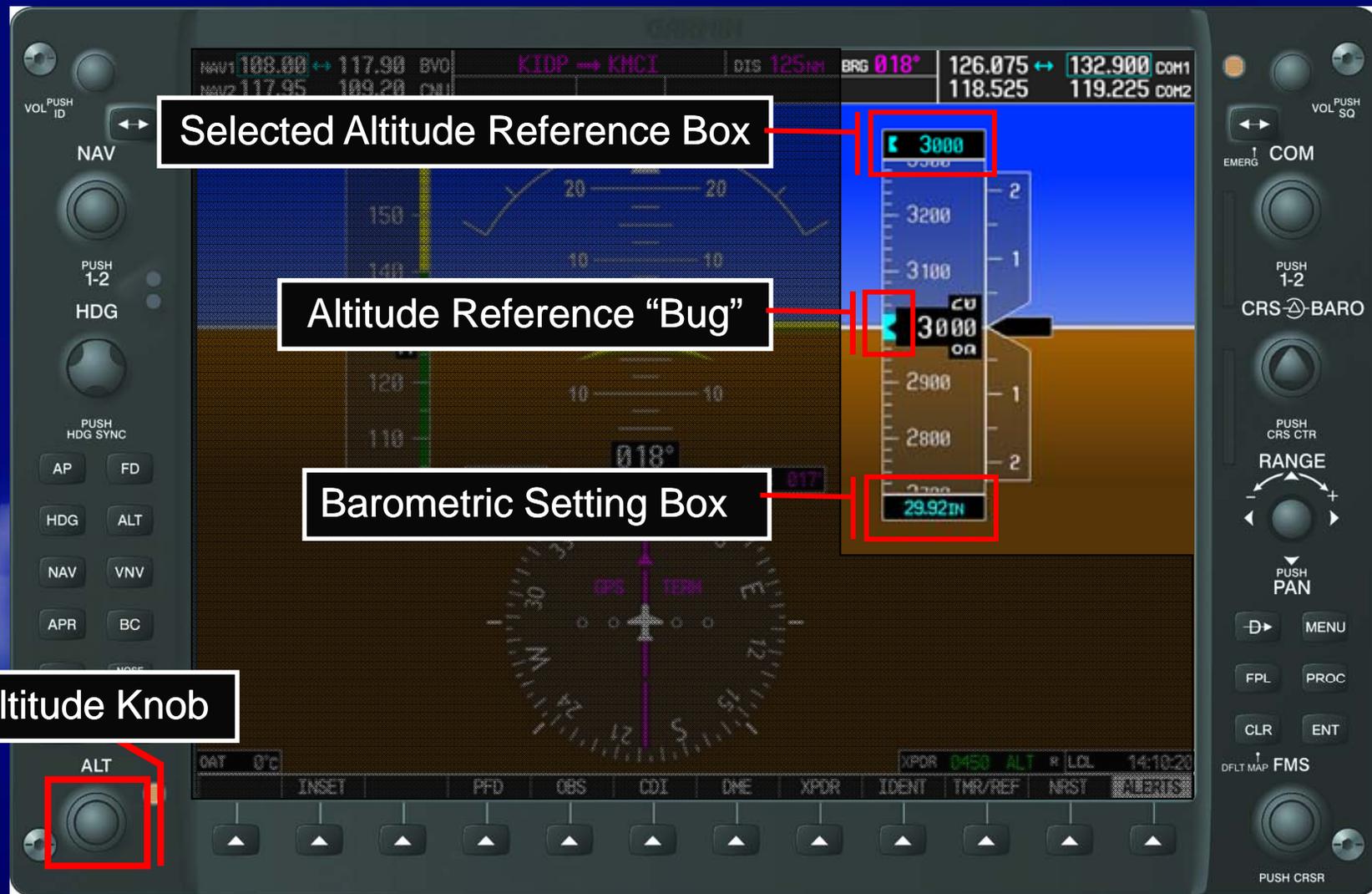
# Airspeed Display – TAS Indication



# Altitude Display



# Altitude Display



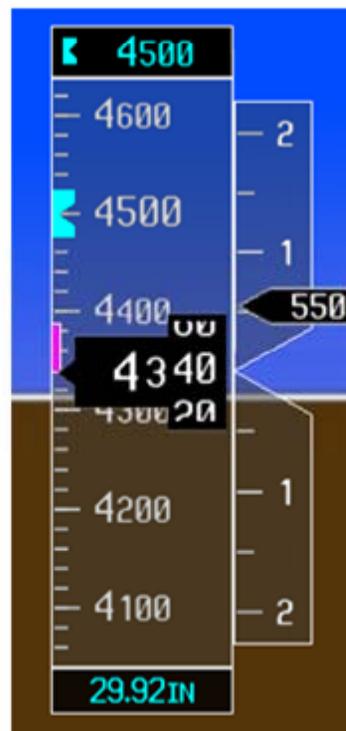
# Altitude Alerting

> 1,000' ft.

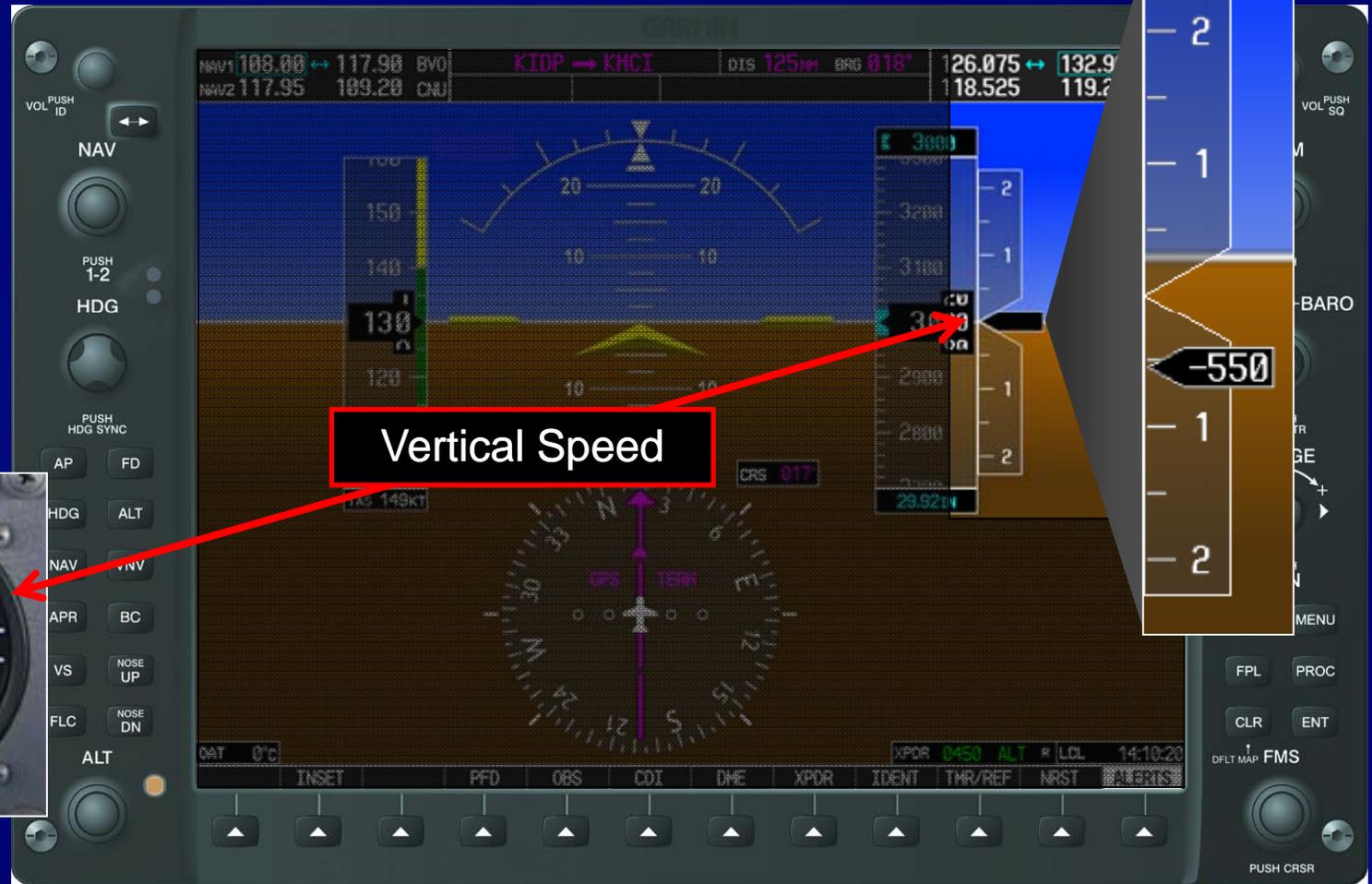
Within 1,000 ft.

Within 200 ft.

Deviation of  $\pm 200$  ft.



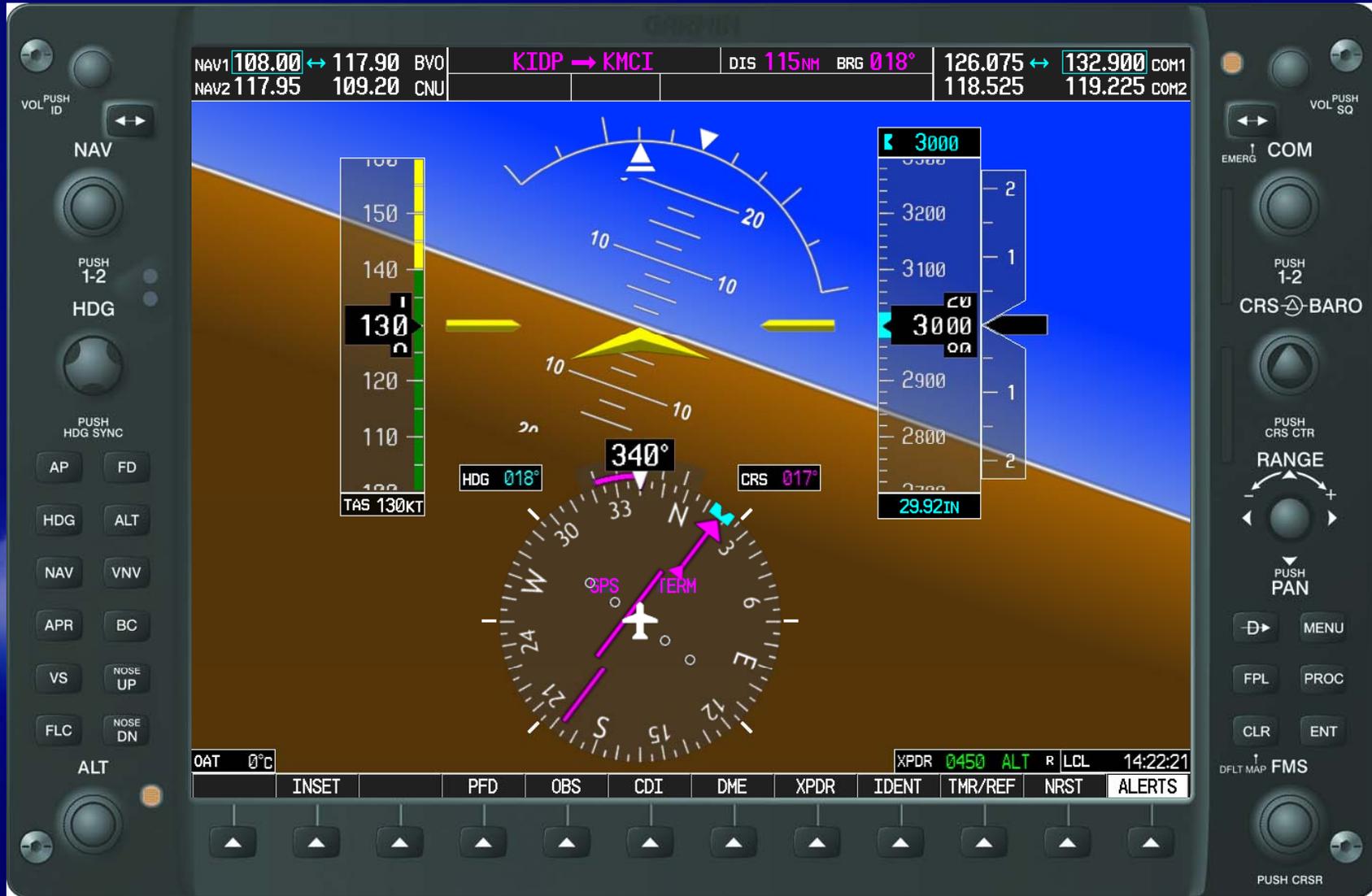
# Vertical Speed Display



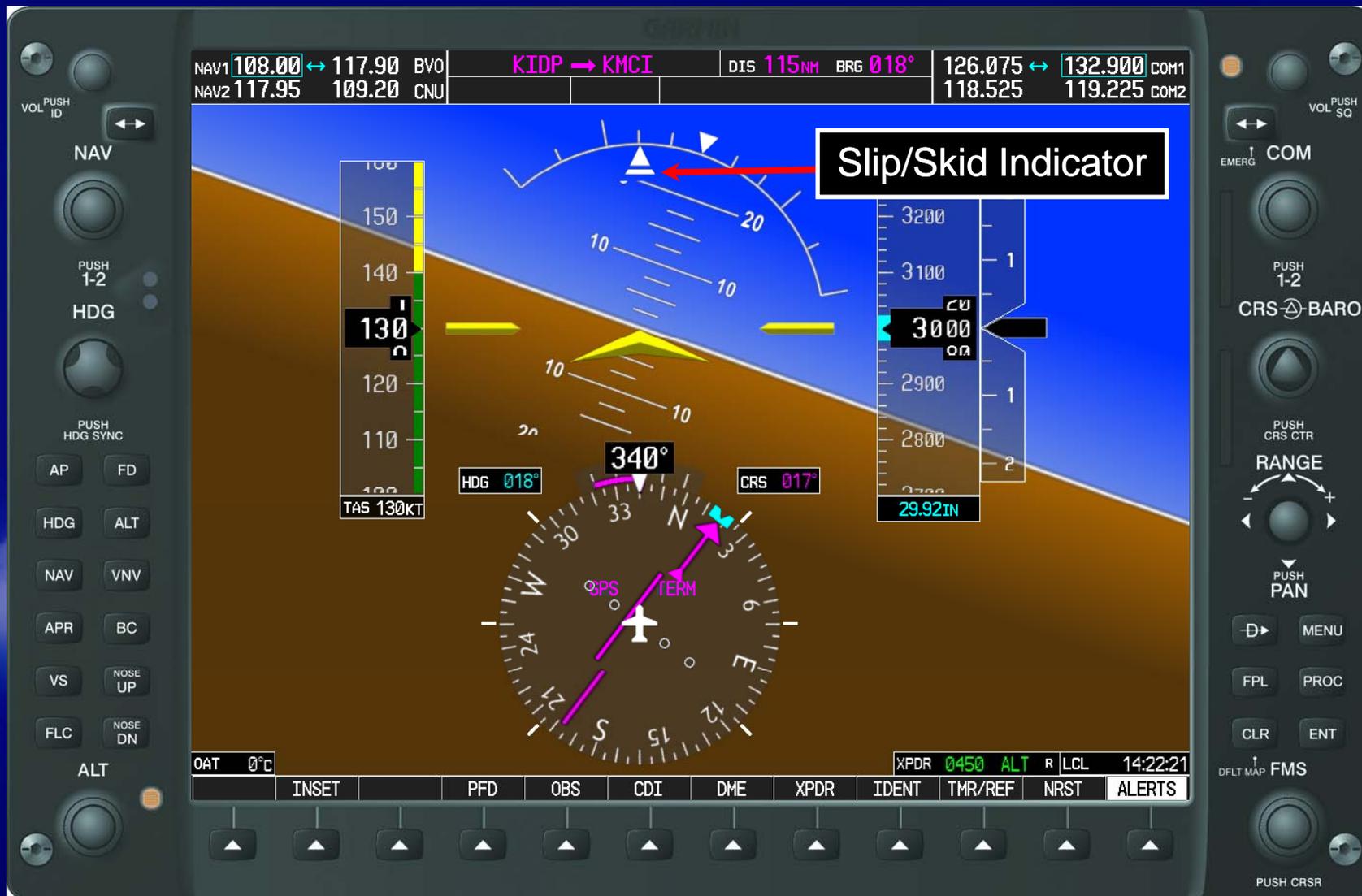
Vertical Speed

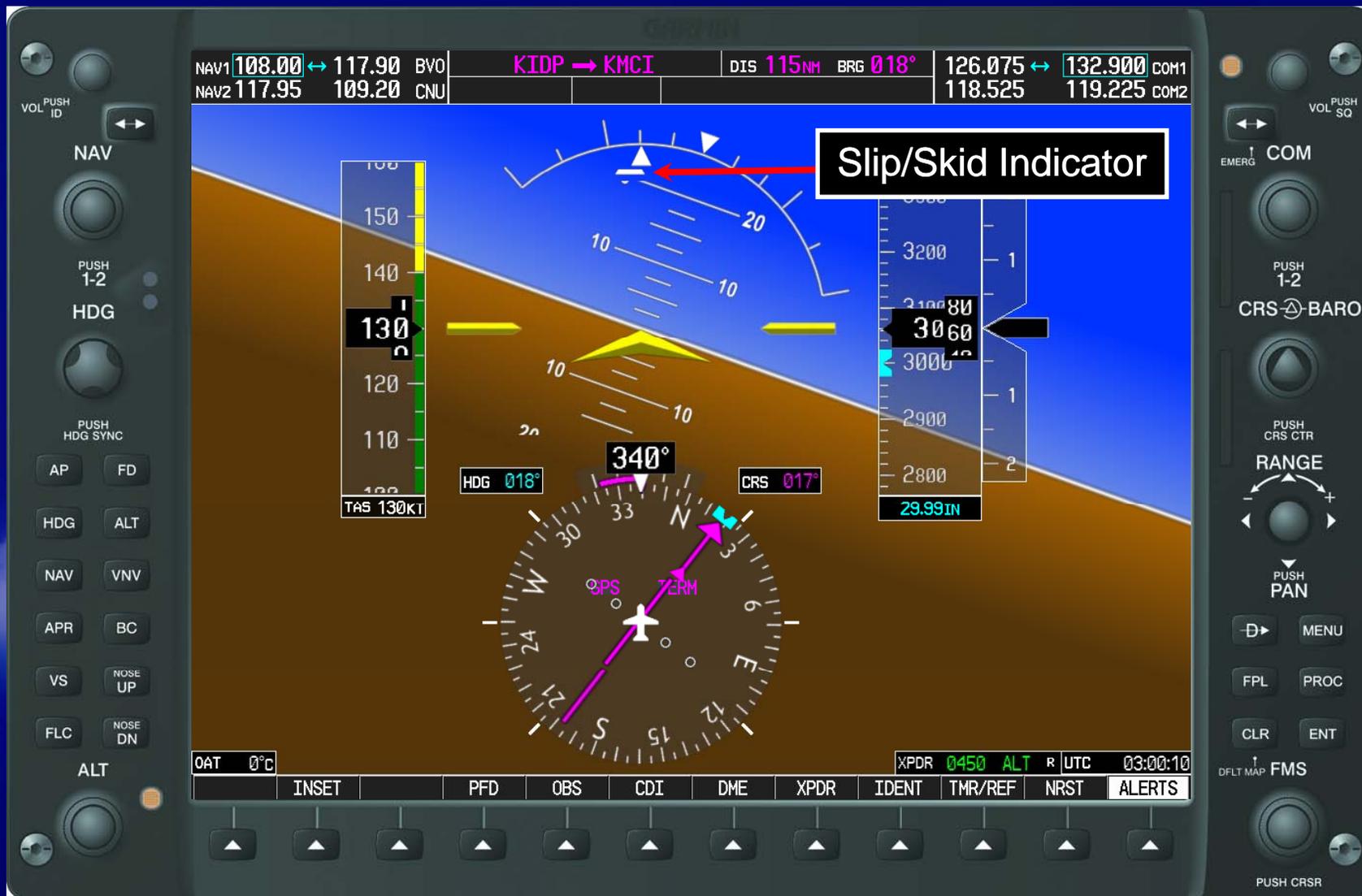


# Primary Attitude Display

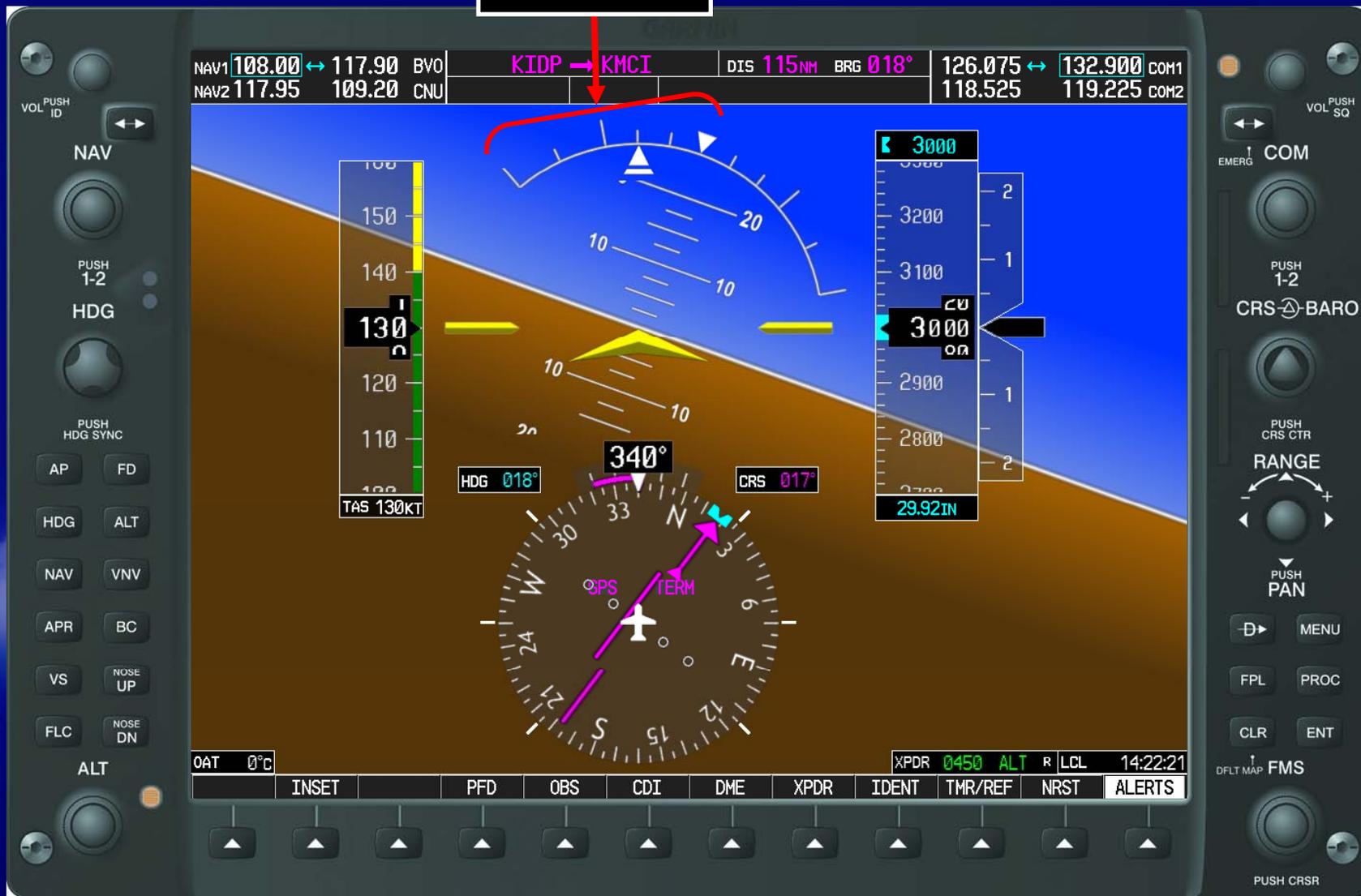




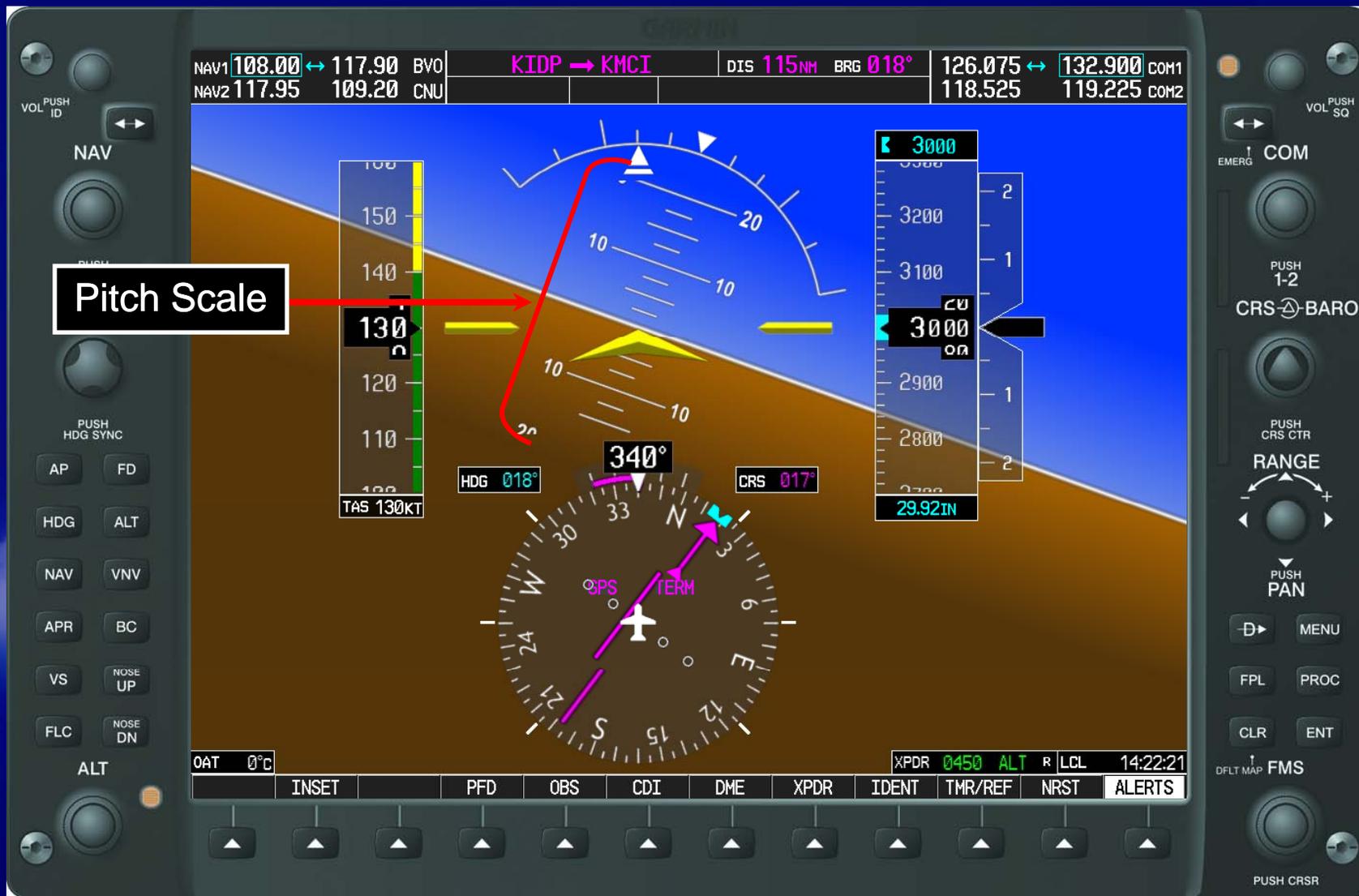


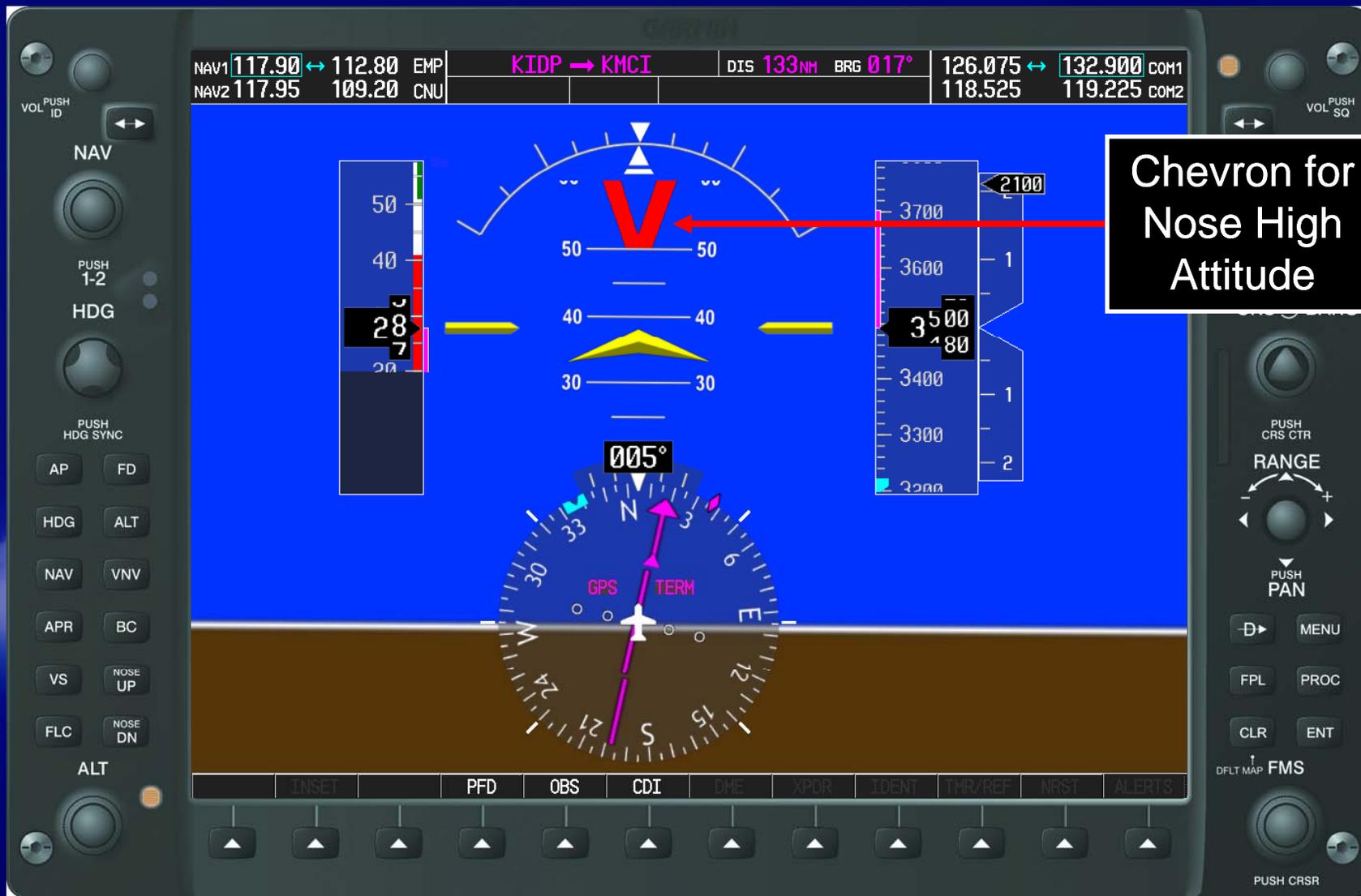


# Roll Scale





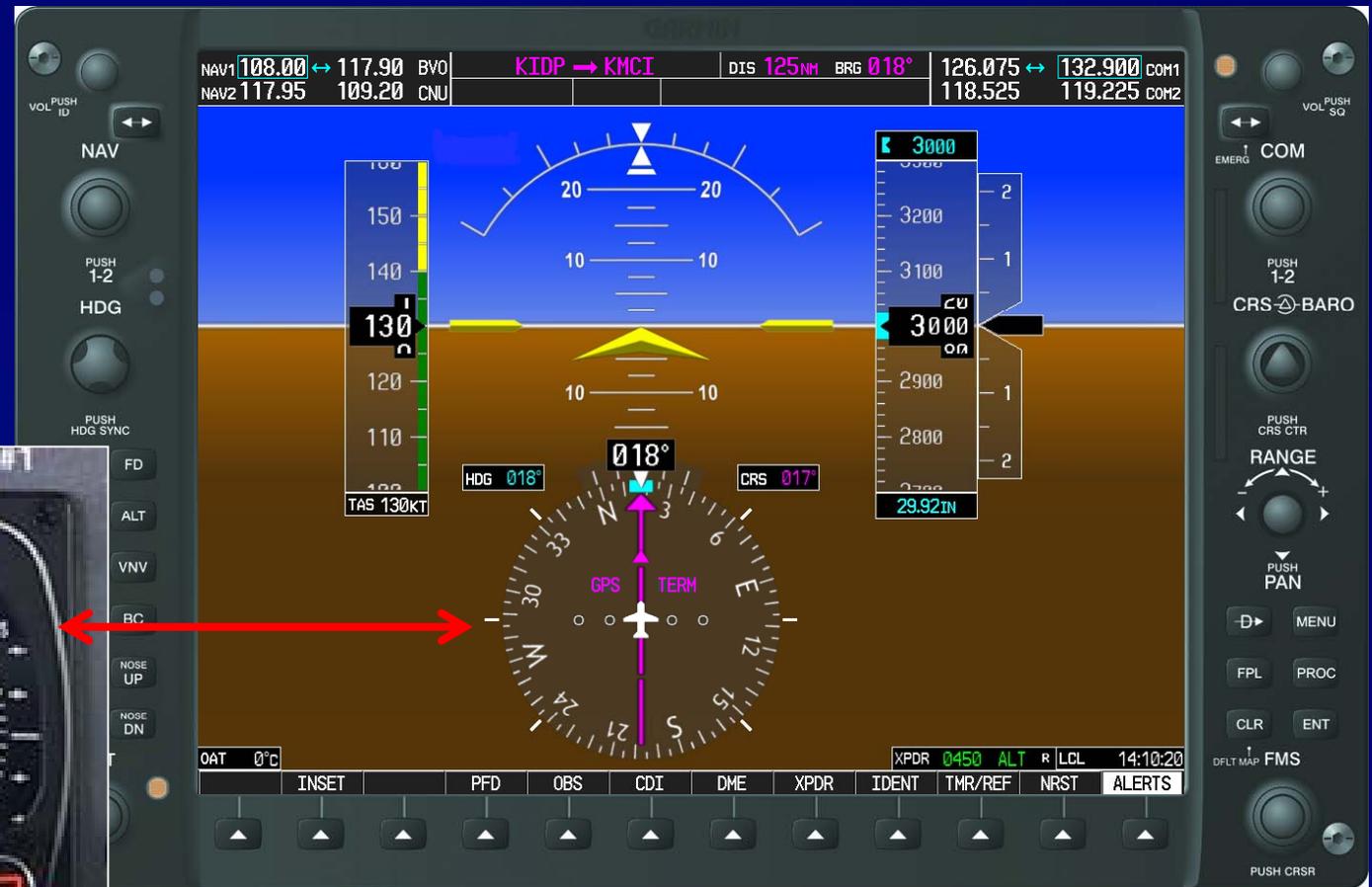






Chevron for  
Nose Low  
Attitude

# Horizontal Situation Indicator - HSI





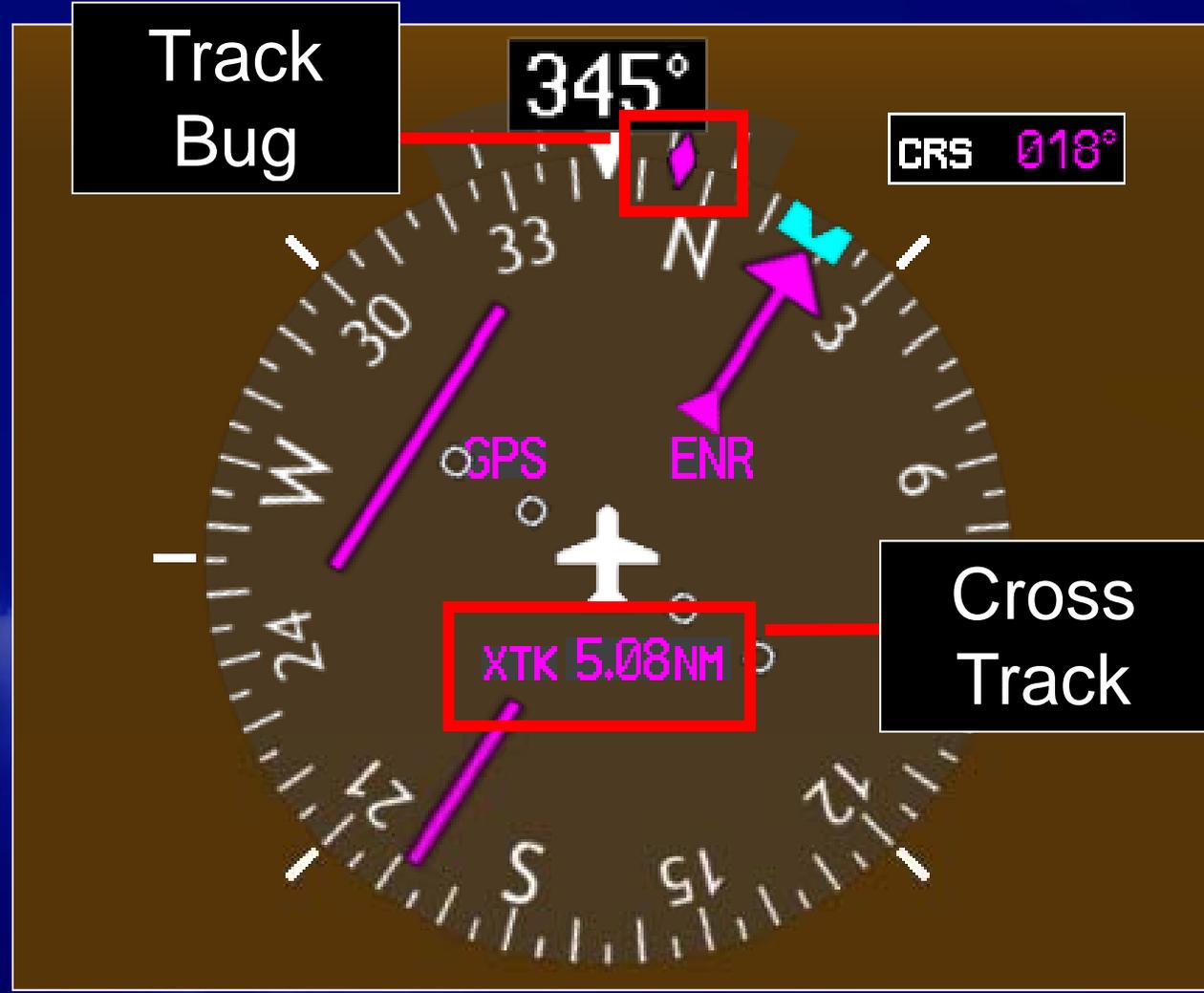


Bearing 1  
Information  
Window



Bearing 2  
Information  
Window

# Track Bug & Cross Track (XTK)





Standard Rate



1/2 Standard Rate

The circular segment scale below the heading window at the top of the HSI indicates:

1. A prediction of what the heading will be in 6 seconds at the present turn rate.
2. Half and Standard Rates-of-Turn - **based on the length of the magenta turn vector.**



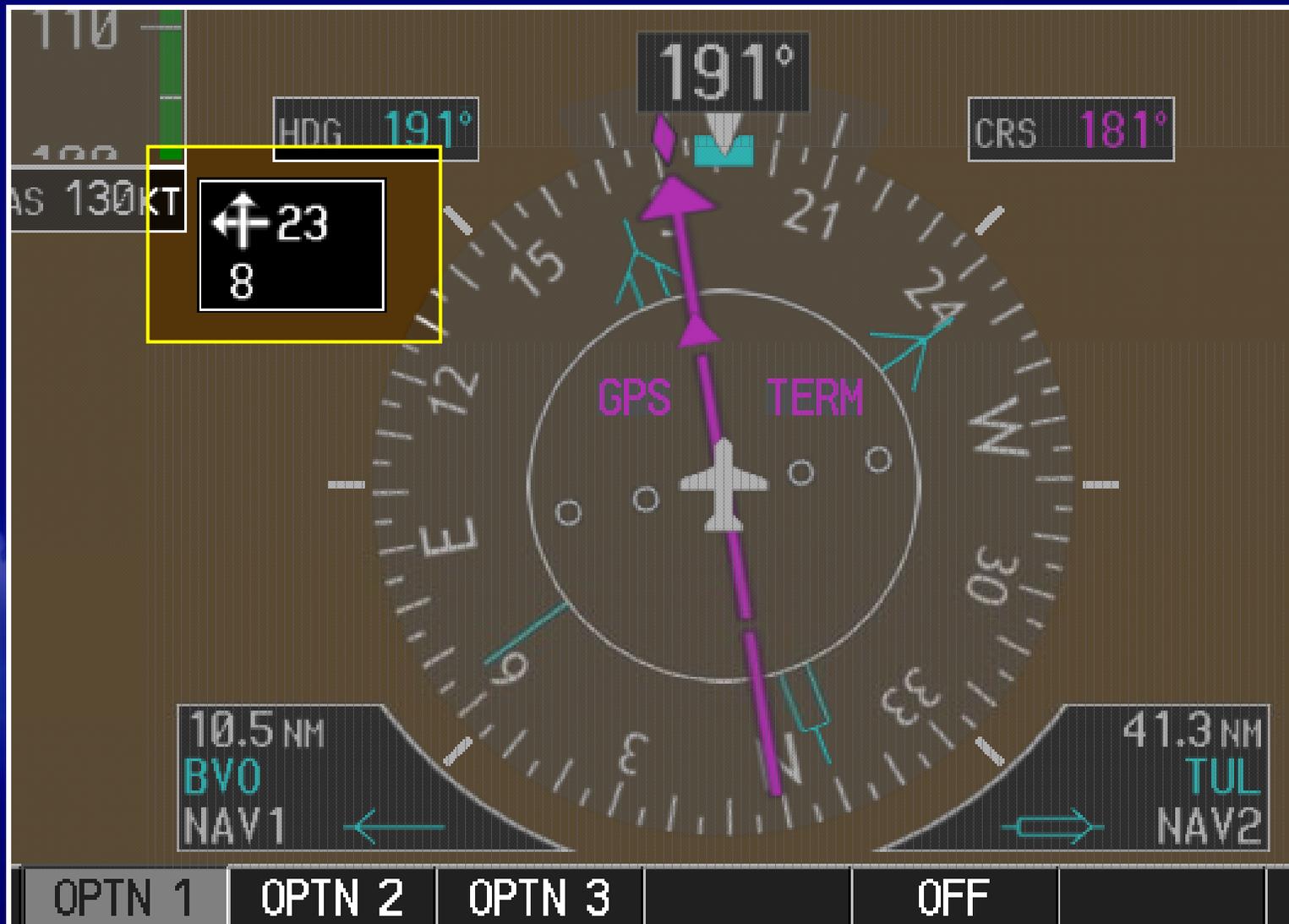
Turn Rate > 4°/sec

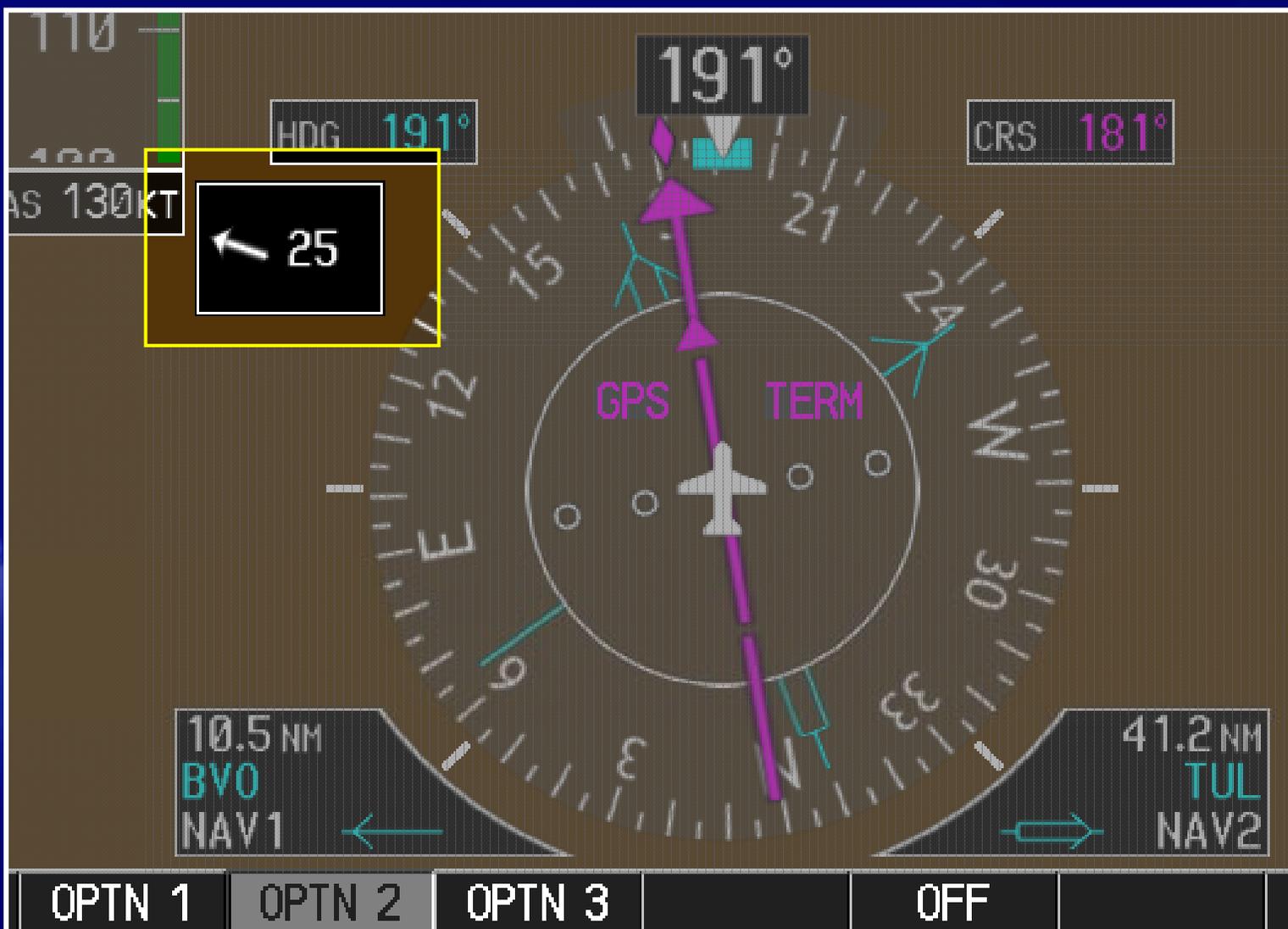


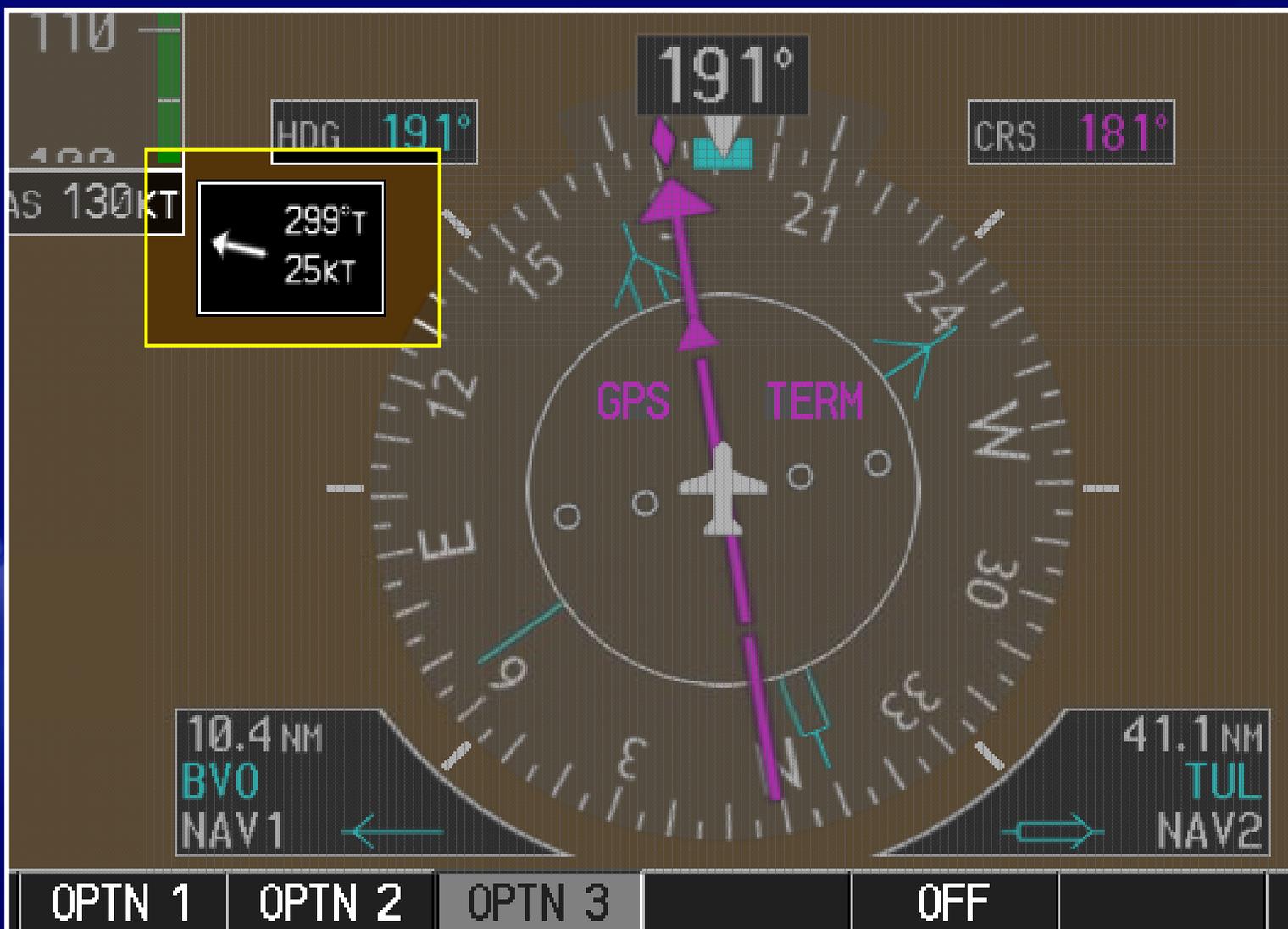
PFD during ILS approach



# Wind Data Box



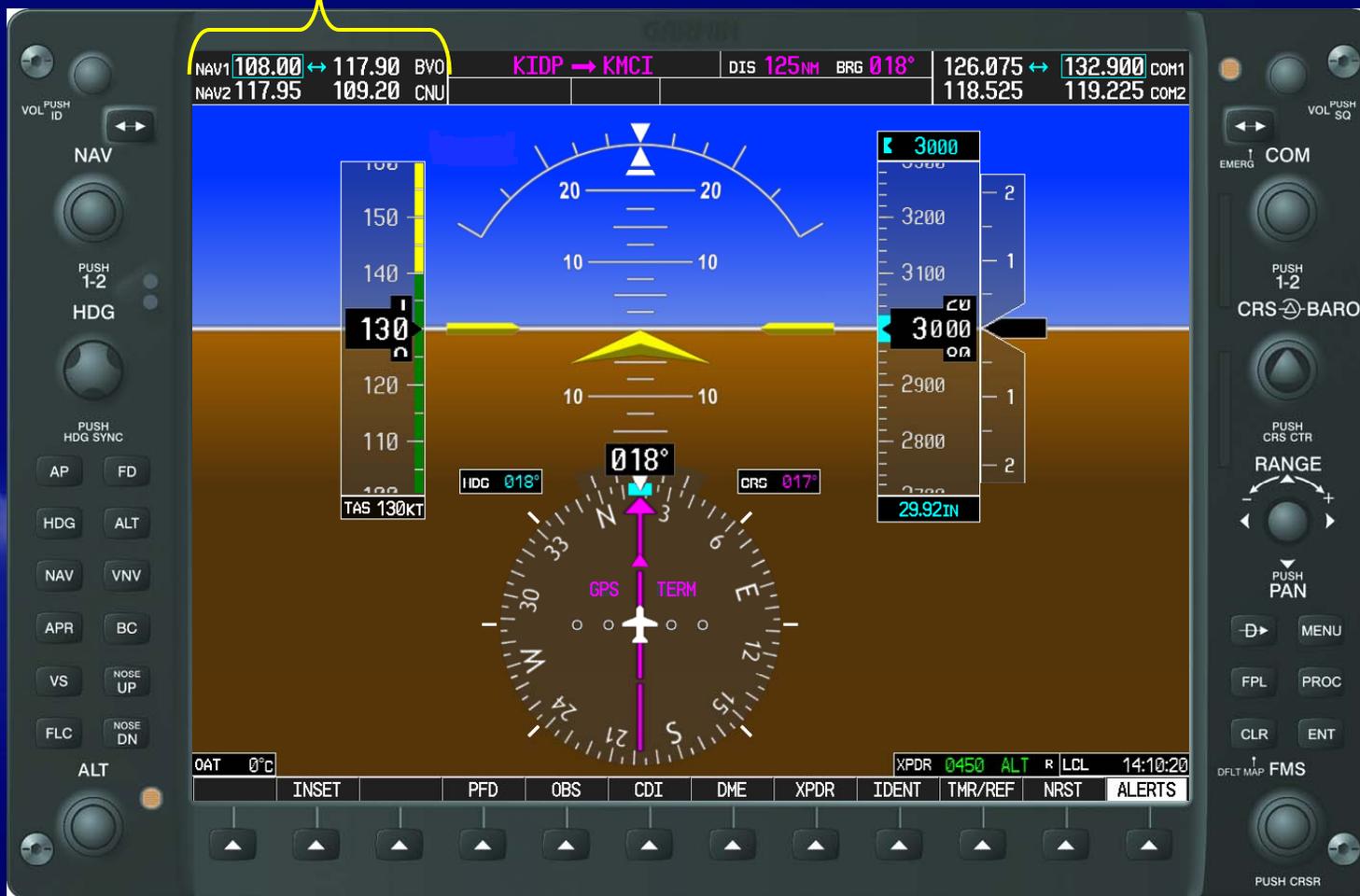




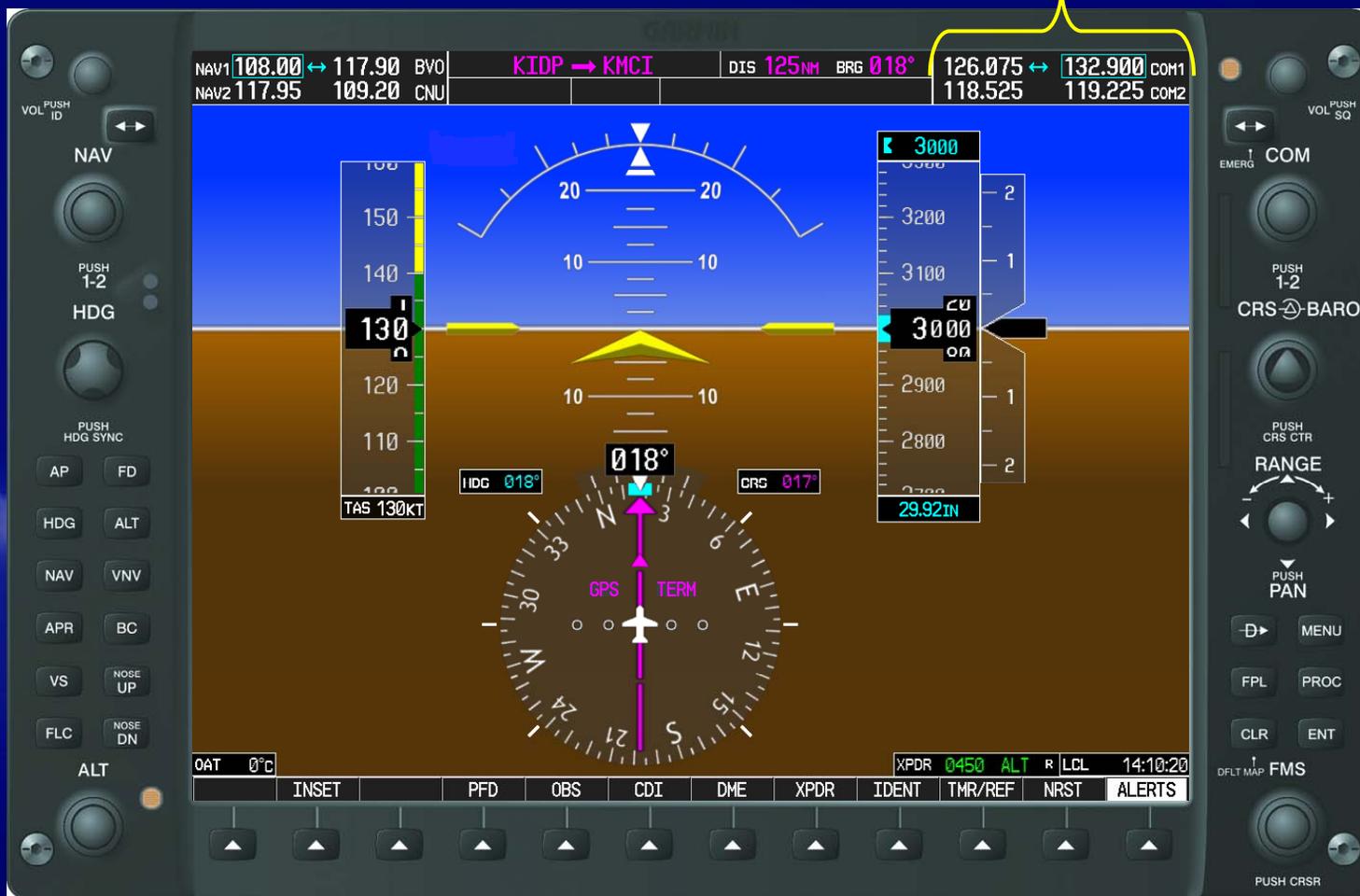
# Primary Flight Display



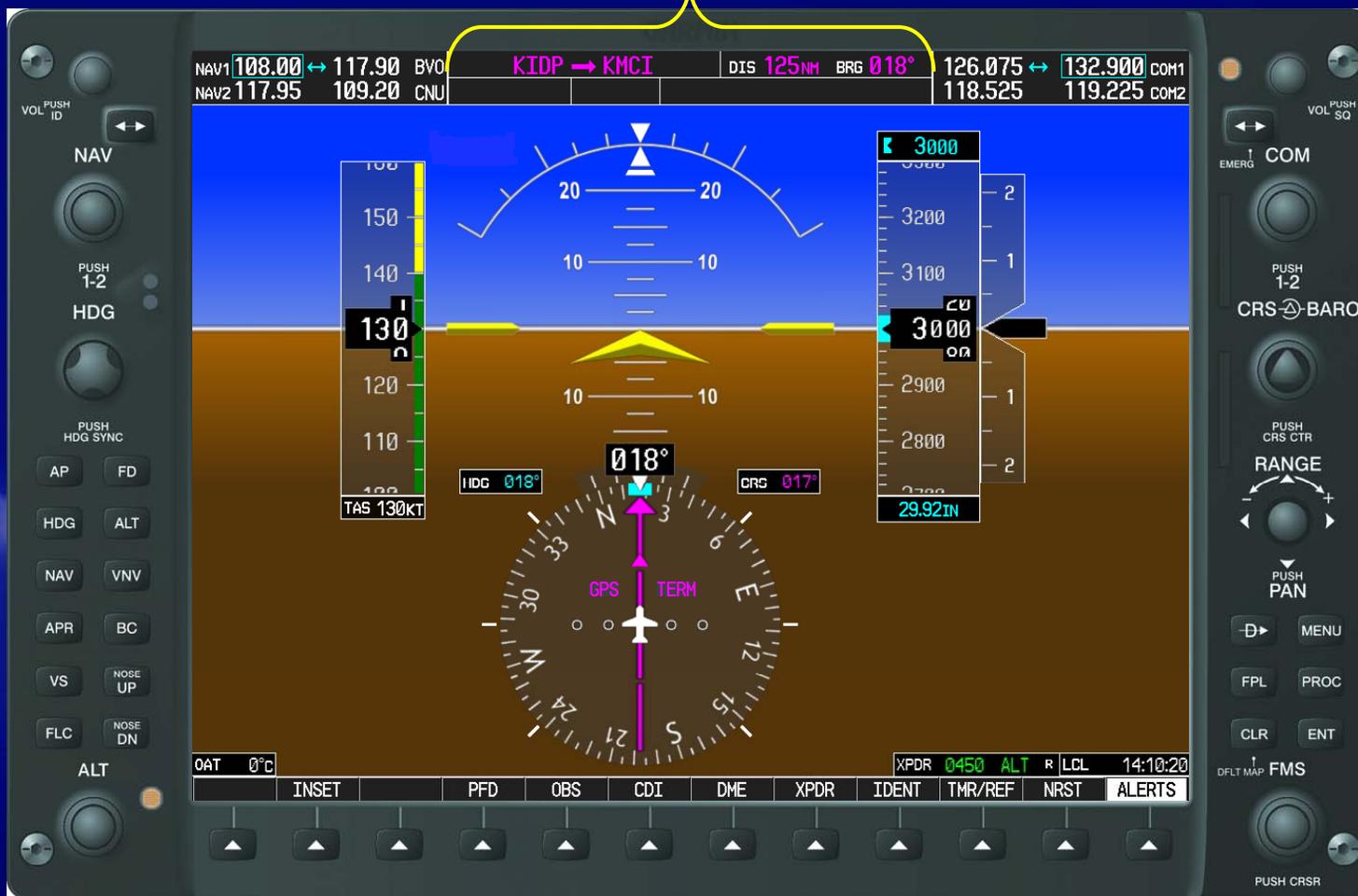
# NAV

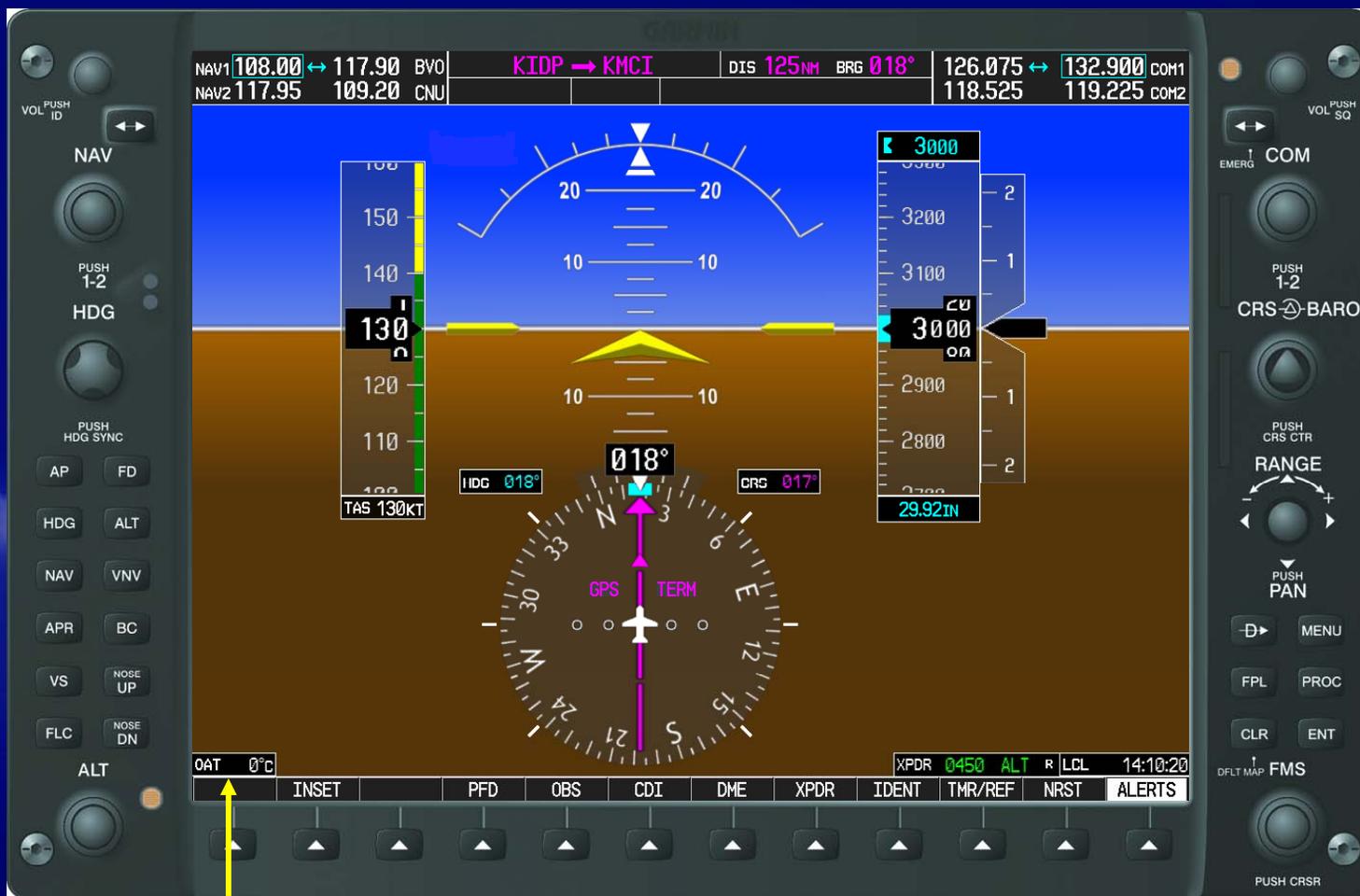


# COM

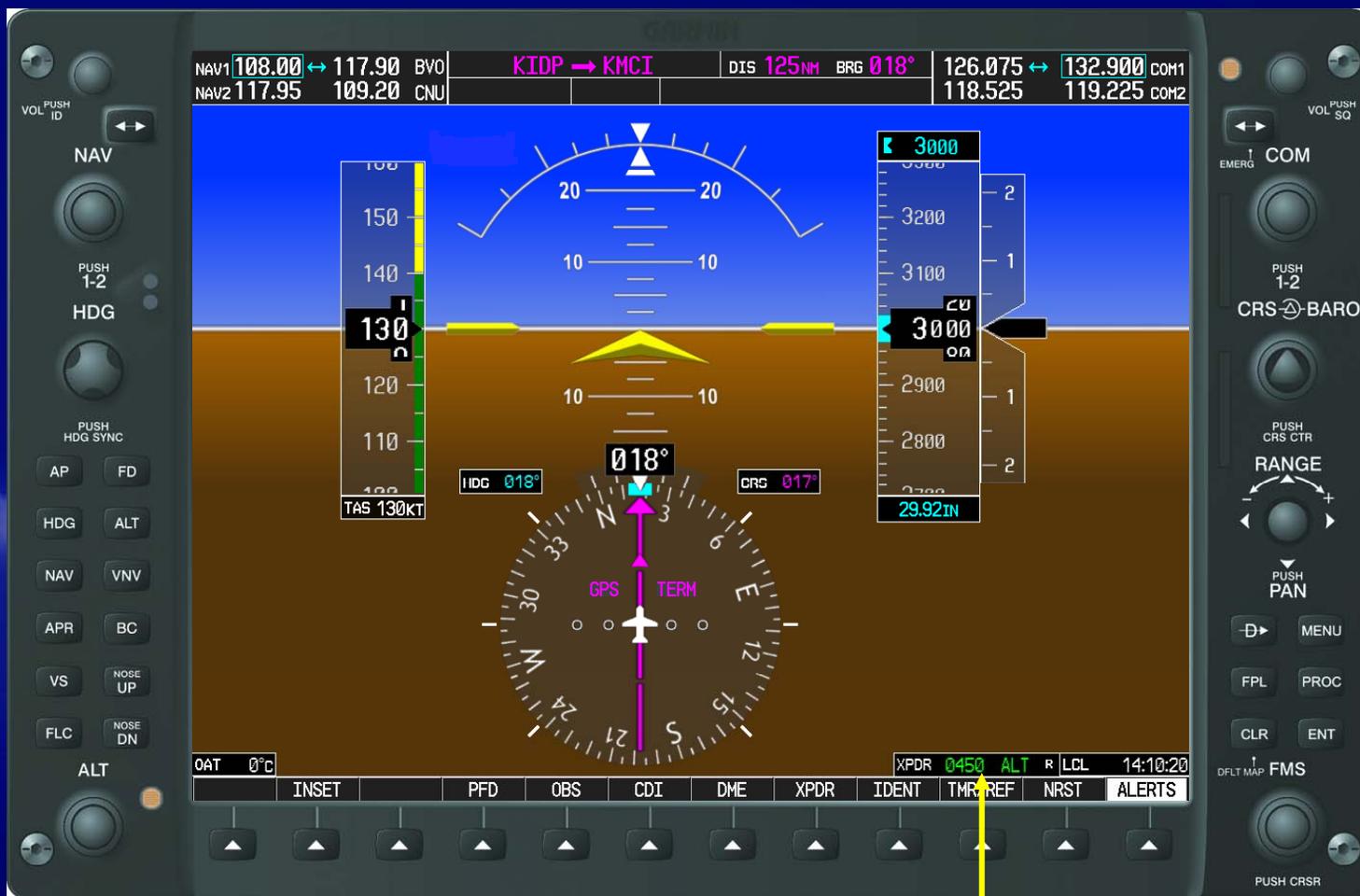


## Navigation Status Window

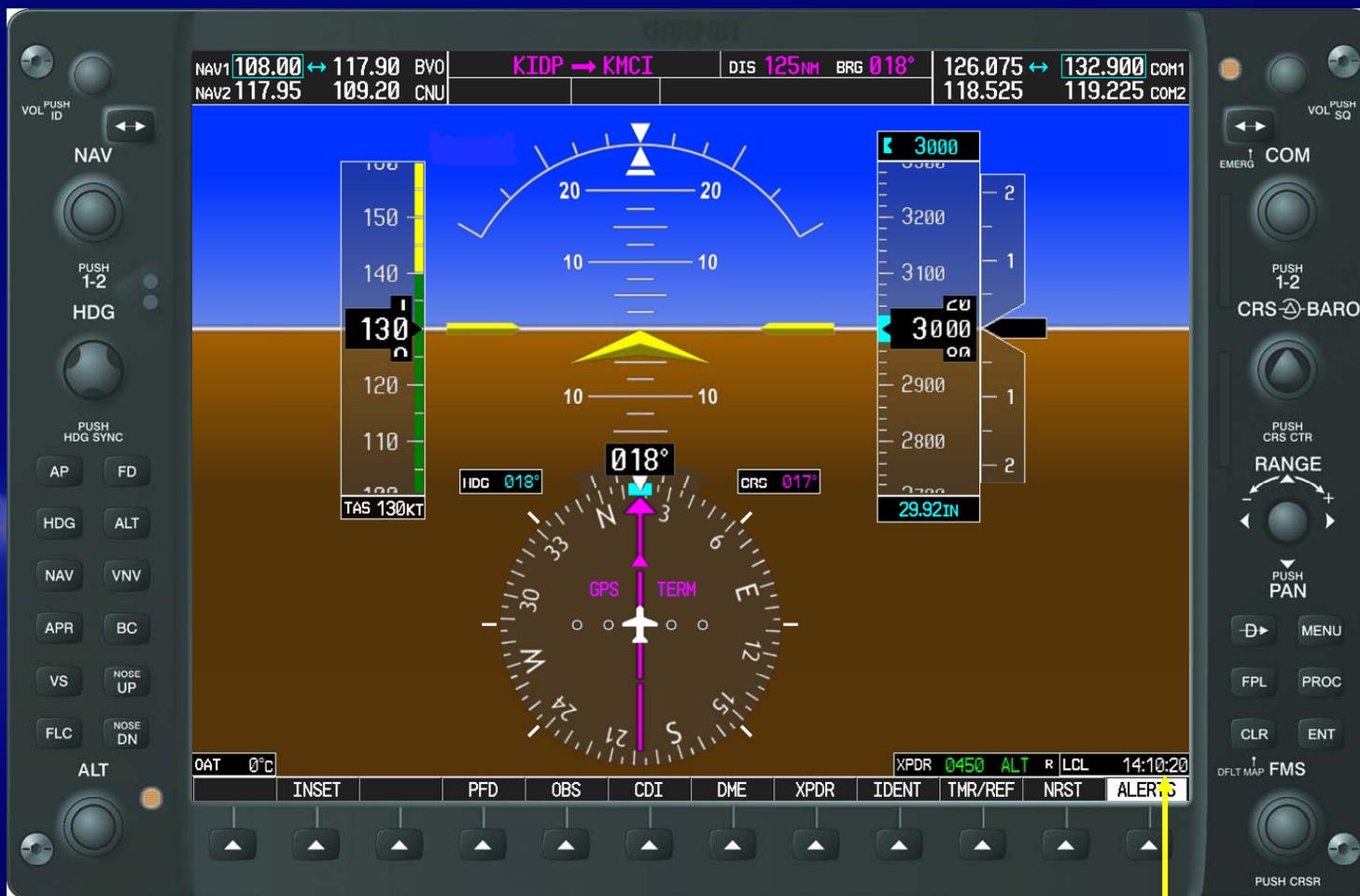




OAT

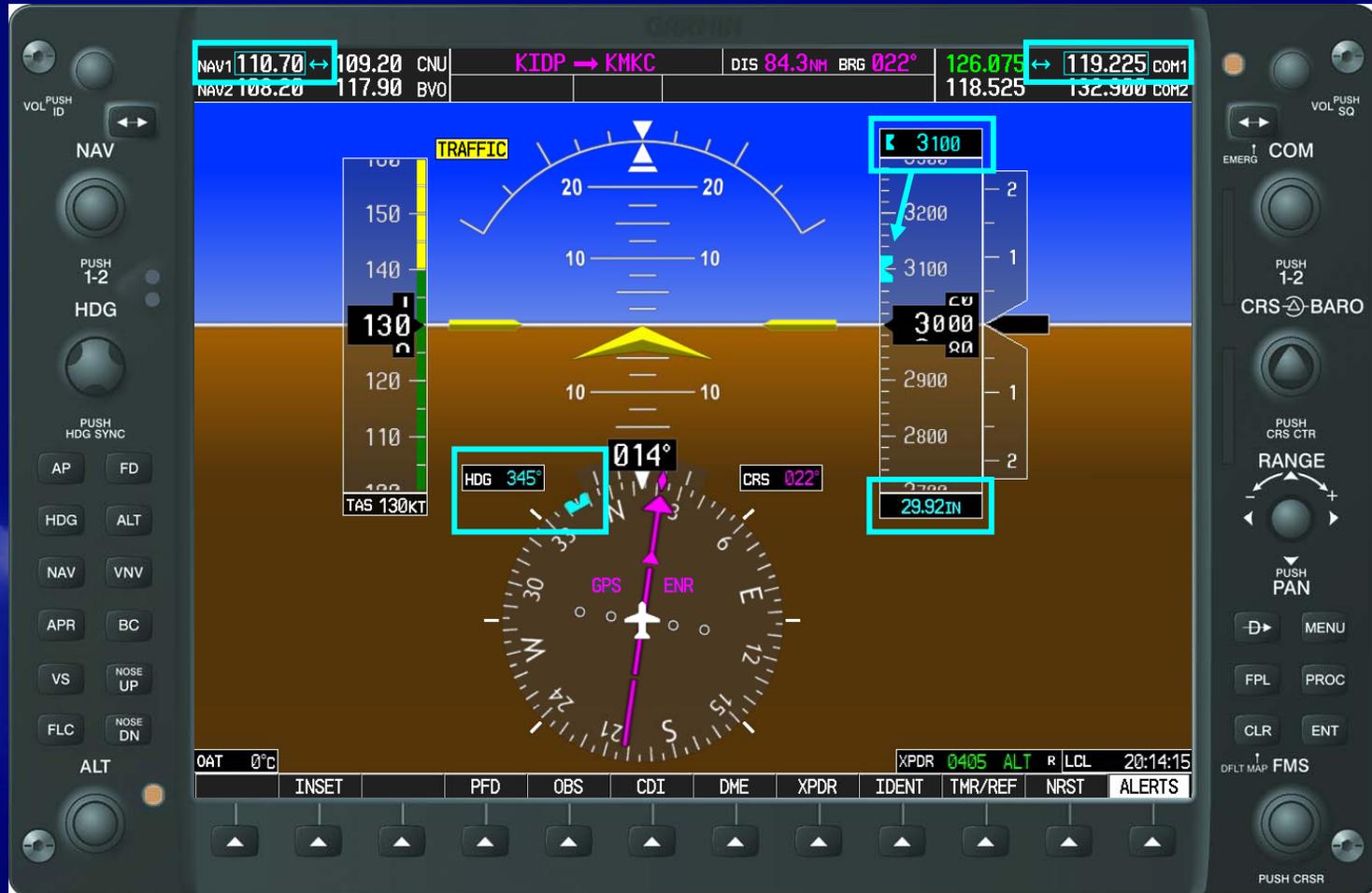


Transponder



System Time

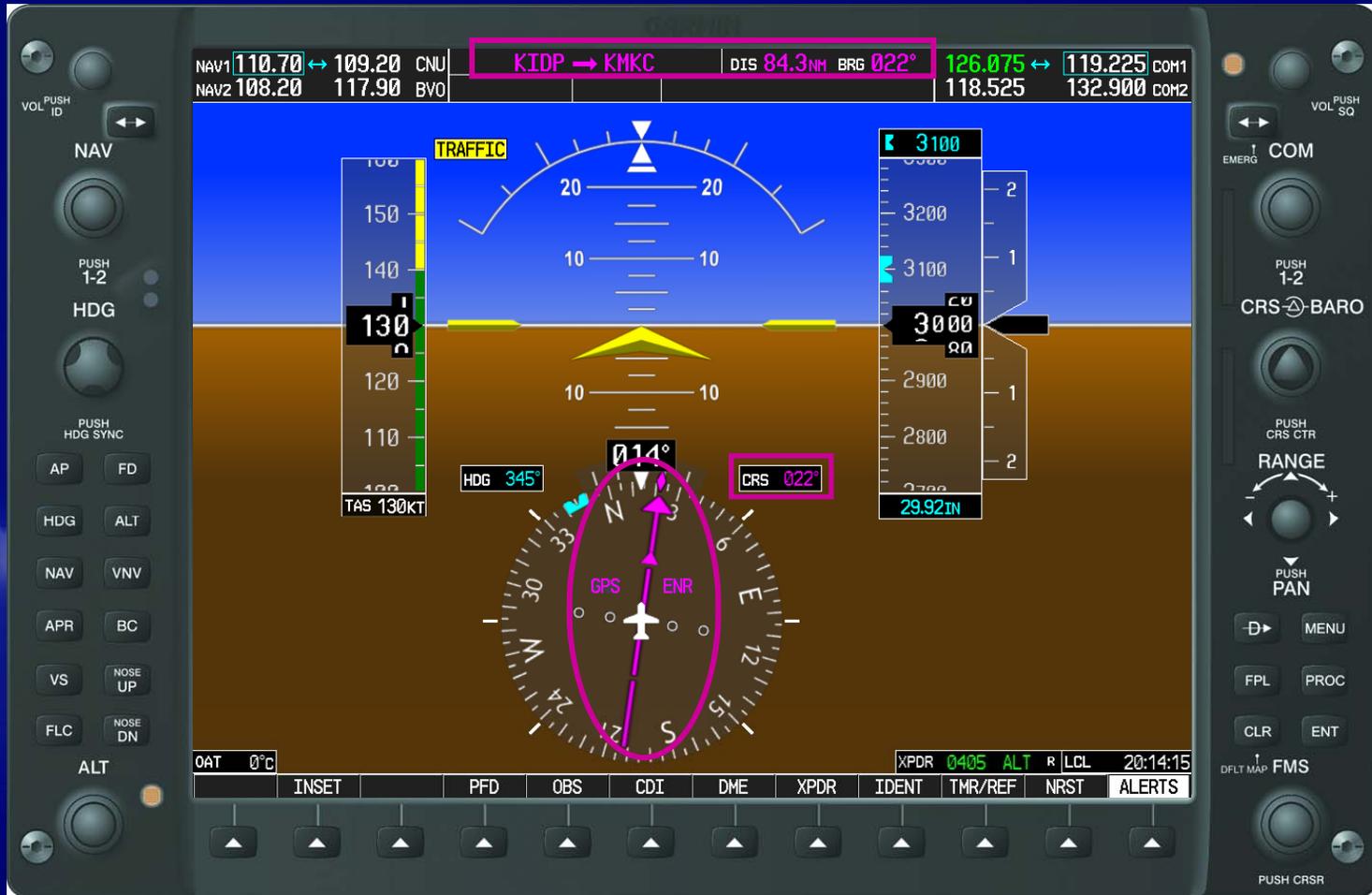
# LIGHT BLUE - Pilot Adjustable



# GREEN – Active/VHF



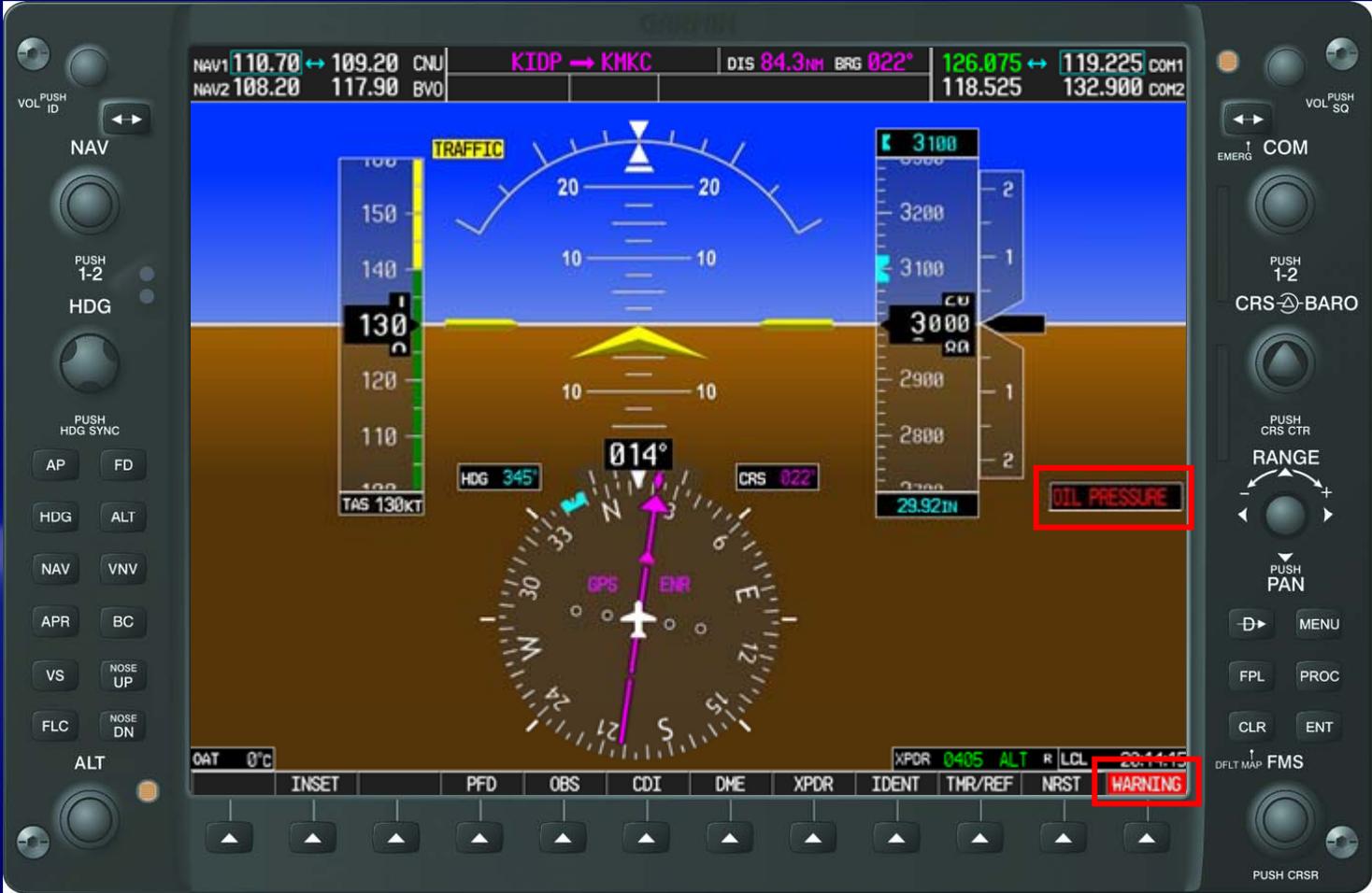
# MAGENTA – GPS



# YELLOW – Caution



# RED – Warning



# Primary Flight Display



**LIGHT BLUE** - Pilot Adjustable

**GREEN** – Active/VHF

**MAGENTA** – GPS

**YELLOW** – Caution

**RED** – Warning

# MFD Overview

## NAV

The MFD displays a navigation map centered on Tulsa, Oklahoma (KTUL). The map shows various airports, lakes, and terrain. A yellow bracket highlights the NAV section at the top of the display.

**NAV Section Data:**

- NAV1: 117.90 ↔ 110.70 IIDP GS 157KT ETE 20:04 XTK 0.00NM ESA 3700FT 119.100 ↔ 122.700 COM1
- NAV2: 111.10 114.40 TUL 124.900 121.900 COM2

**Engine Gauges (Left Side):**

- MAN IN: 27.3
- RPM: 2040
- FFLOW GPH: 0 to 22
- OIL PRES: 0 to 22
- OIL TEMP: 0 to 27.7
- CHT: 0 to 27.7
- EGT: 0 to 27.7
- FUEL QTY GAL: 0 to 30
- ELECTRICAL: M BUS E 27.7 VOLTS 27.7, M BATT S 0.0 AMPS 0.0

**Map Information (Bottom Right):**

- ELEV (FT): MAX 1955, MIN 508
- MAP WPT AUX NRST: 100NM
- MAP DCLTR: CHKLIST

**Control Panels:**

- Left Panel:** NAV, HDG, VNAV, APR, VS, FLC, ALT, VOL ID, PUSH 1-2, HDG SYNC, AP, FD, HDG, ALT, NAV, VNAV, APR, BC, VS, NOSE UP, FLC, NOSE DN, ALT.
- Right Panel:** COM, CRS BARO, RANGE, PAN, MENU, PROC, ENT, FMS, PUSH CRSR.



# COM

The display is divided into several functional areas:

- Navigation (NAV) - Top:** Shows NAV1 (117.90 ↔ 110.70 IIDP) and NAV2 (111.10 ↔ 114.40 TUL) frequencies. It also displays GS (157kt), ETE (20:04), XTK (0.00NM), and ESA (3700FT). The right side shows COM1 (119.100 ↔ 122.700) and COM2 (124.900 ↔ 121.900) frequencies. A yellow bracket labeled "COM" points to this section.
- Map - Navigation Map:** The central display area shows a topographic map with various airports (e.g., KTUL, KIDP, KGFV), lakes, and rivers. A 25NM radius circle is centered on the current position.
- Engine and Performance - Left Side:** Includes gauges for MAN IN (27.3), RPM (2040), FLOW GPH, OIL PRES, OIL TEMP, CHT, and EGT. It also shows FUEL QTY GAL and ELECTRICAL status (M BUS E: 27.7 VOLTS, M BATT S: 0.0 AMPS).
- Altitude and Range - Right Side:** Features an ELEV (FT) scale from -10 to 280, with MAX at 1955 and MIN at 508. Below it are controls for RANGE and PAN.
- Control Panel - Bottom:** Includes buttons for ENGINE, MAP, DCLTR, and CHKLIST, along with a central trackball and various function buttons (NAV, HDG, VNV, APR, VS, FLC, ALT, etc.).



# Navigation Status Window

The interface displays the following information:

- Navigation Data:** NAV1 117.90 ↔ 110.70 IIDP GS 157kt ETE 20:04 XTK 0.00NM ESA 3700FT 119.100 ↔ 122.700 COM1; NAV2 111.10 114.40 TUL 124.900 121.900 COM2
- Map:** MAP - NAVIGATION MAP showing a route around Tulsa, OK, with various airports and terrain elevation.
- Engine Gauges:**
  - MAN IN: 27.3
  - RPM: 2040
  - FFLOW GPH: 0 to 22
  - OIL PRES: 0 to 22
  - OIL TEMP: 0 to 27.7
  - CHT: 0 to 27.7
  - EGT: 0 to 27.7
  - FUEL QTY GAL: 0 to 30
  - ELECTRICAL: M BUS E 27.7 VOLTS 27.7; M BATT S 0.0 AMPS 0.0
- Map Controls:** 25KT TRACK UP, ELEV (FT) MAX 1955 MIN 508, MAP WPT AUX NRST, DCLTR, CHKLIST, FMS, PUSH CRSR.

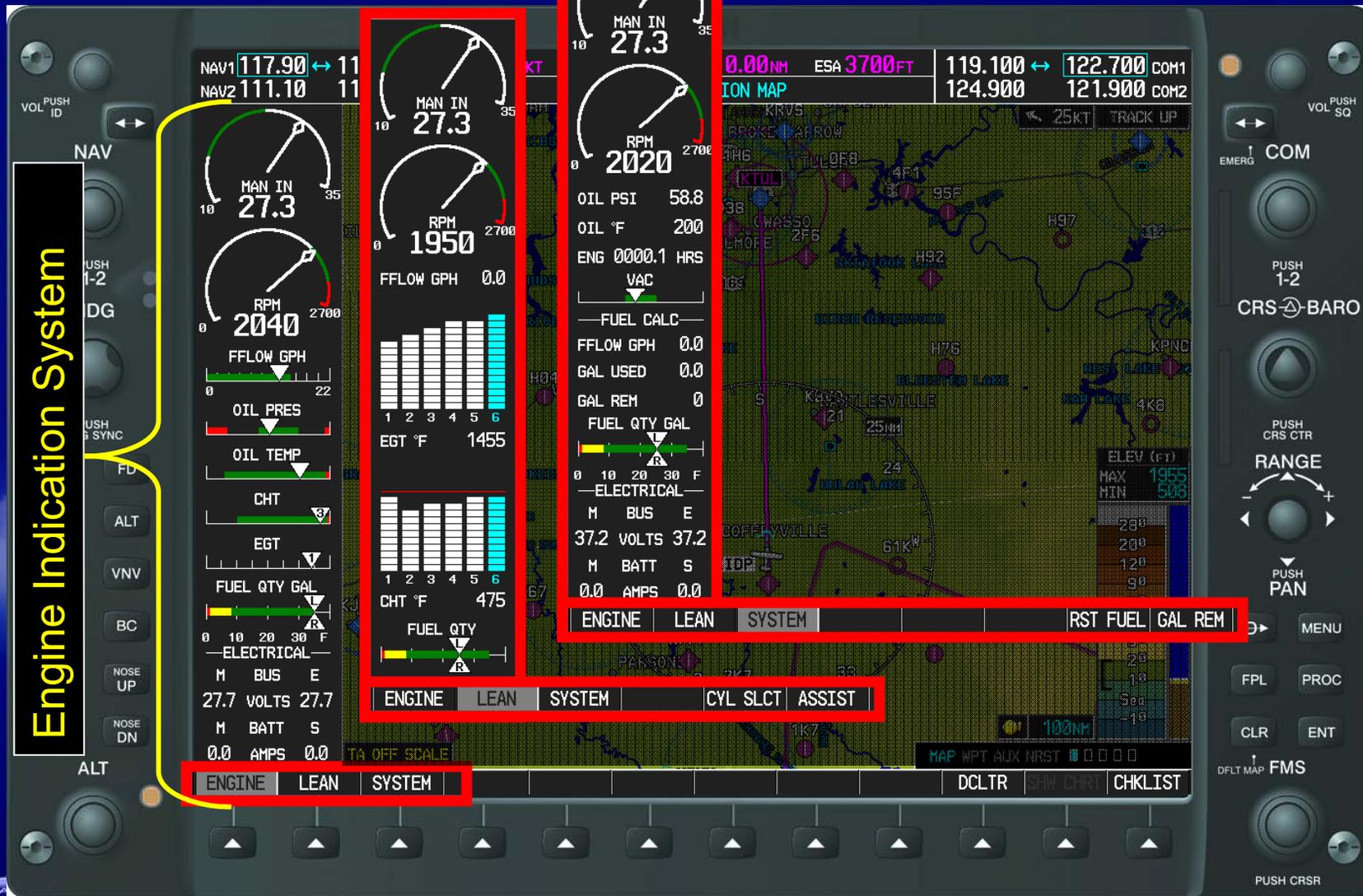


# Press the ENGINE Softkey to reveal additional Engine Pages

The image shows a Cessna avionics display with a navigation map and engine gauges. A yellow line highlights the 'ENGINE' softkey on the left side of the display. The display is divided into several sections:

- Top Section:** Navigation data including NAV1 (117.90), NAV2 (111.10), IIDP (110.70), GS (157kt), ETE (20:04), XTK (0.00NM), ESA (3700FT), COM1 (119.100), and COM2 (122.700).
- Left Section:** Engine gauges including MAN IN (27.3), RPM (2040), FLOW GPH, OIL PRES, OIL TEMP, CHT, EGT, FUEL QTY GAL, and ELECTRICAL (27.7 VOLTS).
- Center Section:** Navigation map showing a route through the Tulsa area, including airports like KTUL and KIDP, and various lakes and rivers.
- Right Section:** Elevation scale (ELEV (FT)) ranging from 280 to -10, with a current elevation of 1955 feet.
- Bottom Section:** Softkeys for ENGINE, MAP, DCLTR, and CHKLIST.

# Engine Indication System



The image shows a Cessna G1000 avionics display with a navigation map. The display is divided into several sections:

- Top Status Bar:** NAV1 117.90 ↔ 110.70 IIDP CS 157kt ETE 20:04 VTK 0.00NM FCA 3700FT 119.100 ↔ 122.700 COM1  
NAV2 111.10 114.40 TUL 124.900 121.900 COM2
- Map Area:** A navigation map showing terrain, airports, and navigation aids. A yellow bracket highlights the text "MAP - NAVIGATION MAP" at the top of the map area, which is also labeled as the "Page Title".
- Engine Gauges (Left Side):** MAN IN 27.3, RPM 2040, FLOW GPH, OIL PRES, OIL TEMP, CHT, EGT, FUEL QTY GAL, ELECTRICAL (M BUS E 27.7 VOLTS 27.7, M BATT S 0.0 AMPS 0.0).
- Bottom Status Bar:** ENGINE, MAP, DCLTR, MAP WPT AUX NRST 100NM, CHKLIST.
- Right Side Controls:** VOL PUSH SQ, COM, CRS BARO, RANGE, PAN, MENU, FPL, PROC, CLR, ENT, FMS, PUSH CRSR.

Page Title

Page Group Window

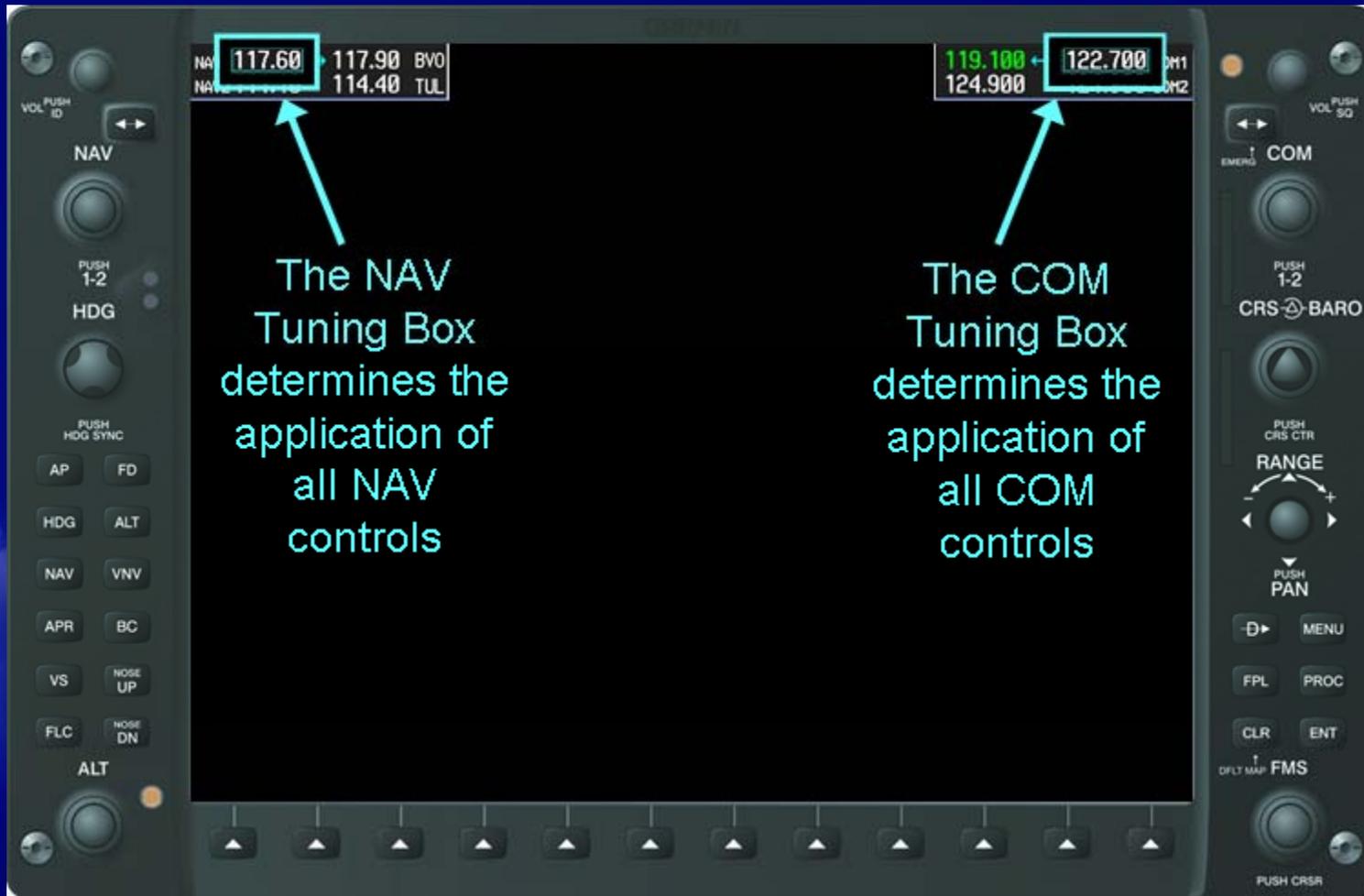
# Agenda

- **Classroom**
  - Training Approach
  - Display Overview
  - **Operational Basics**
    - Bezel Controls
    - NAV / COM Tuning
    - Data Entry
    - MFD Navigation
  - Flight Director/Autopilot Introduction
- **Lab**
  - System Configuration
  - Flight scenario 1

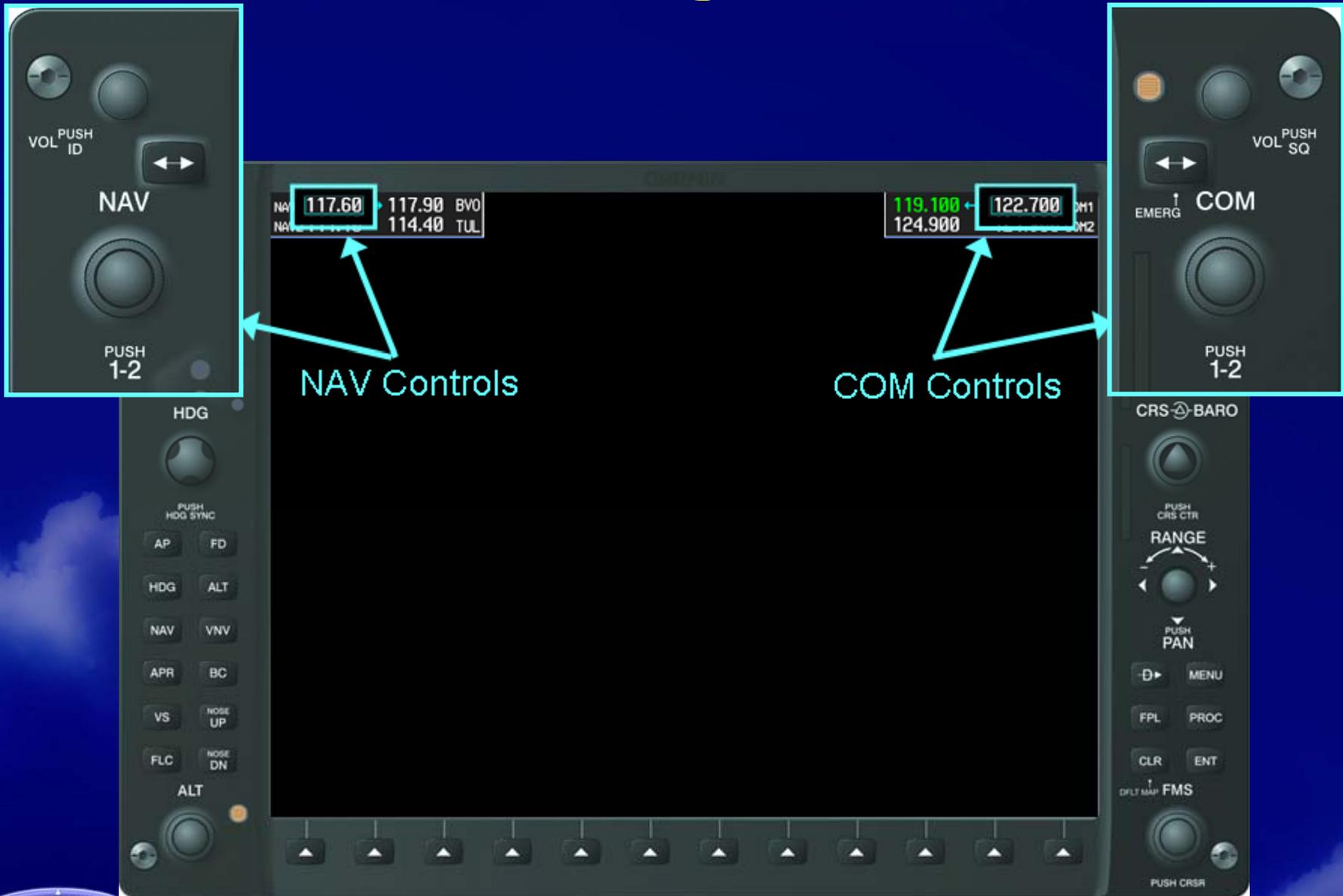
# Bezel Controls



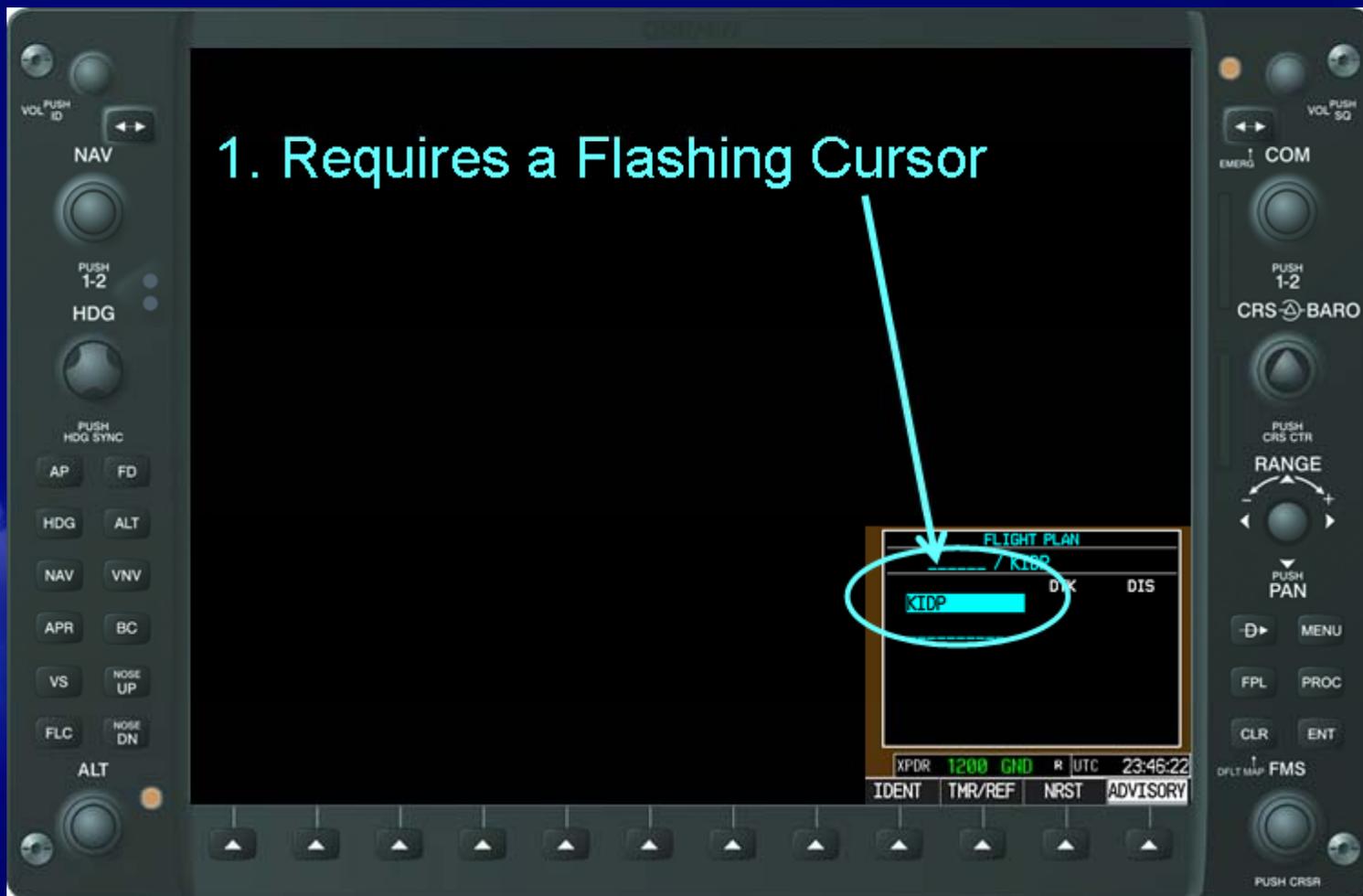
# NAV/COM Tuning



# NAV/COM Tuning



# Data Entry



# Data Entry

1. Requires a Flashing Cursor

2. If needed, press FMS Knob to activate cursor.

The image shows a Garmin G1000 cockpit display with a flight plan screen. The flight plan screen displays 'KIDP' with a flashing cursor. The FMS knob is circled in red. The display also shows 'FLIGHT PLAN / KIDP', 'DTK DIS', 'XPDR 1200 GND R UTC 23:46:22', and 'IDENT TMR/REF NRST ADVISORY'.

XPDR	1200	GND	R	UTC	23:46:22
IDENT	TMR/REF	NRST	ADVISORY		

# Data Entry

1. Requires a Flashing Cursor  
2. If needed, press FMS Knob to activate cursor.  
3. Large FMS Knob –  
**Changes Cursor Location**

The image shows a Garmin G1000 cockpit display with a central screen and various control knobs and buttons. The screen displays a flight plan for KIDP. A large white arrow points to the FMS knob on the right side of the display, which is used to change the cursor location. The flight plan data is as follows:

FLIGHT PLAN			
----- / KIDP			
	DTK	DIS	
KIDP			

At the bottom of the screen, there is a status bar with the following information:

XPDR	6104	GND	R	UTC	15:58:37
IDENT	TMR/REF	NRST	ADVISORY		

# Data Entry

1. Requires a Flashing Cursor  
2. If needed, press FMS Knob to activate cursor.  
3. Large FMS Knob –  
Changes Cursor Location  
4. Small FMS Knob –  
**Changes Data or Reveals Options**

**MAYPOINT INFORMATION**

BRG	---	---	---
DIS	---	NM	---

Press "ENT" to accept

XPDR	1200	GND	R	UTC	23:46:32
IDENT	TMR/REF	NRST	ADVISORY		

# Data Entry

1. Requires a Flashing Cursor  
2. If needed, press FMS Knob to activate cursor.  
3. Large FMS Knob –  
    Changes Cursor Location  
4. Small FMS Knob –  
    Changes Data or Reveals Options

**Waypoint Information:**  
SANTIAGO DE CUBA  
BRG 125° CUBA  
DIS 1462nm N 19°58.13' W075°56.12'  
Press "ENT" for dups

XPDR 1200 GND R UTC 23:46:33  
IDENT TMR/REF NRST ADVISORY

The image shows a Garmin G1000 cockpit display with a central screen and side panels of controls. The central screen displays a list of instructions for data entry and a window showing 'WAYPOINT INFORMATION' for 'SANTIAGO DE CUBA'. The side panels contain various knobs and buttons labeled with functions like NAV, HDG, VNAV, and FMS. The background of the slide is a blue sky with clouds.

# Data Entry

1. Requires a Flashing Cursor  
2. If needed, press FMS Knob to activate cursor.

### 3. Large FMS Knob – Changes Cursor Location

4. Small FMS Knob –  
Changes Data or Reveals  
Options

MAYPOINT INFORMATION  
K\_\_\_\_\_ SANTIAGO DE CUBA  
SANTIAGO DE CUBA  
BRG 125° CUBA  
DIS 1462NM N 19°58.13'  
W075°56.12'

Press "ENT" for dups

XPDR 1200 GND R UTC 23:46:48  
IDENT TMR/REF NRST ADVISORY

The image shows a Garmin G1000 cockpit display with a central screen and various control knobs and buttons on the left and right sides. The central screen displays a list of waypoints, with 'SANTIAGO DE CUBA' selected. A large white arrow points to the 'FMS' knob on the right side of the display, which is used to change the cursor location. The text on the screen provides instructions on how to use the FMS knob to change data or reveal options.

# Data Entry

1. Requires a Flashing Cursor

2. If needed, press FMS Knob to activate cursor.

3. Large FMS Knob –  
Changes Cursor Location

4. Small FMS Knob –  
Changes Data or Reveals Options

**5. Press ENTER to complete data entry.**

WAYPOINT INFORMATION			
KTU	TULSA OK		
TULSA INTL			
BRG	182°	S	CEN USA
DIS	57.8NM	N 36°11.90'	W095°53.29'
Press "ENT" to accept			
XPDR	1200 GND	UTC	23:50:18
IDENT	TMR/REF	NRST	ADVISORY

# Data Entry

1. Requires a Flashing Cursor

2. If needed, press FMS Knob to activate cursor.

3. Large FMS Knob –  
Changes Cursor Location

4. Small FMS Knob –  
Changes Data or Reveals Options

**5. Press ENTER to complete data entry.**

FLIGHT PLAN		
KIDP / KTUL		
KIDP	DTK	DIS
KTUL	181°	57.8NM

XPDR 1200 GND R UTC 23:50:24  
IDENT TMR/REF NRST ADVISORY

Buttons: NAV, HDG, AP, FD, HDG, ALT, NAV, VNV, APR, BC, VS, NOSE UP, FLC, NOSE DN, ALT, COM, CRS BARO, RANGE, PAN, MENU, PROC, ENT, FMS, PUSH CRSR

# Data Entry

1. Requires a Flashing Cursor

2. If needed, Press FMS Knob to activate cursor.

3. Large FMS knob –  
Changes Cursor Location

4. Small FMS knob –  
Changes Data or Reveals Options

5. Press ENTER to complete data entry.

**6. Press FMS knob to deactivate cursor.**

FLIGHT PLAN		
KIDP / KTUL		
	DTK	DIS
KIDP		
KTUL	181°	55.7NM

XPDR 1200 ALT R UTC 16:44:43  
IDENT TMR/REF NRST ADVISORY

MAP FMS  
PUSH CRSR

# Data Entry

1. Requires a Flashing Cursor.

2. If needed, Press FMS Knob to activate cursor.

3. Large FMS knob –  
Changes Cursor Location

4. Small FMS knob –  
Changes Data or Reveals Options

5. Press ENTER to complete data entry.

6. Press the FMS Knob to deactivate cursor.

FLIGHT PLAN			
KIDP / KTUL			
	DTK	DIS	
KIDP			
KTUL	181°	57.8NM	

XPDR 1200 GND R UTC 23:50:24  
IDENT TMR/REF NRST ADVISORY

# MFD Navigation

**Large FMS Knob -  
Changes PAGE GROUPS**

MAP WPT AUX NRST ■ □ □ □ □ □	Map
MAP WPT AUX NRST ■ □ □ □ □ □	Waypoint
MAP WPT AUX NRST ■ □ □ □ □ □	Auxiliary
MAP WPT AUX NRST ■ □ □ □ □ □	Nearest

MAP WPT AUX NRST

# MFD Navigation

Large FMS Knob -  
Changes PAGE GROUPS

**Small FMS Knob -  
Changes PAGES**

MAP	WPT	AUX	NRST	■	□	□	□	□
MAP	WPT	AUX	NRST	□	■	□	□	□
MAP	WPT	AUX	NRST	□	□	■	□	□
MAP	WPT	AUX	NRST	□	□	□	■	□
MAP	WPT	AUX	NRST	□	□	□	□	■

MAP WPT AUX NRST ■ □ □ □ □

MAP WPT AUX NRST □ ■ □ □ □

MAP WPT AUX NRST □ □ ■ □ □

MAP WPT AUX NRST □ □ □ ■ □

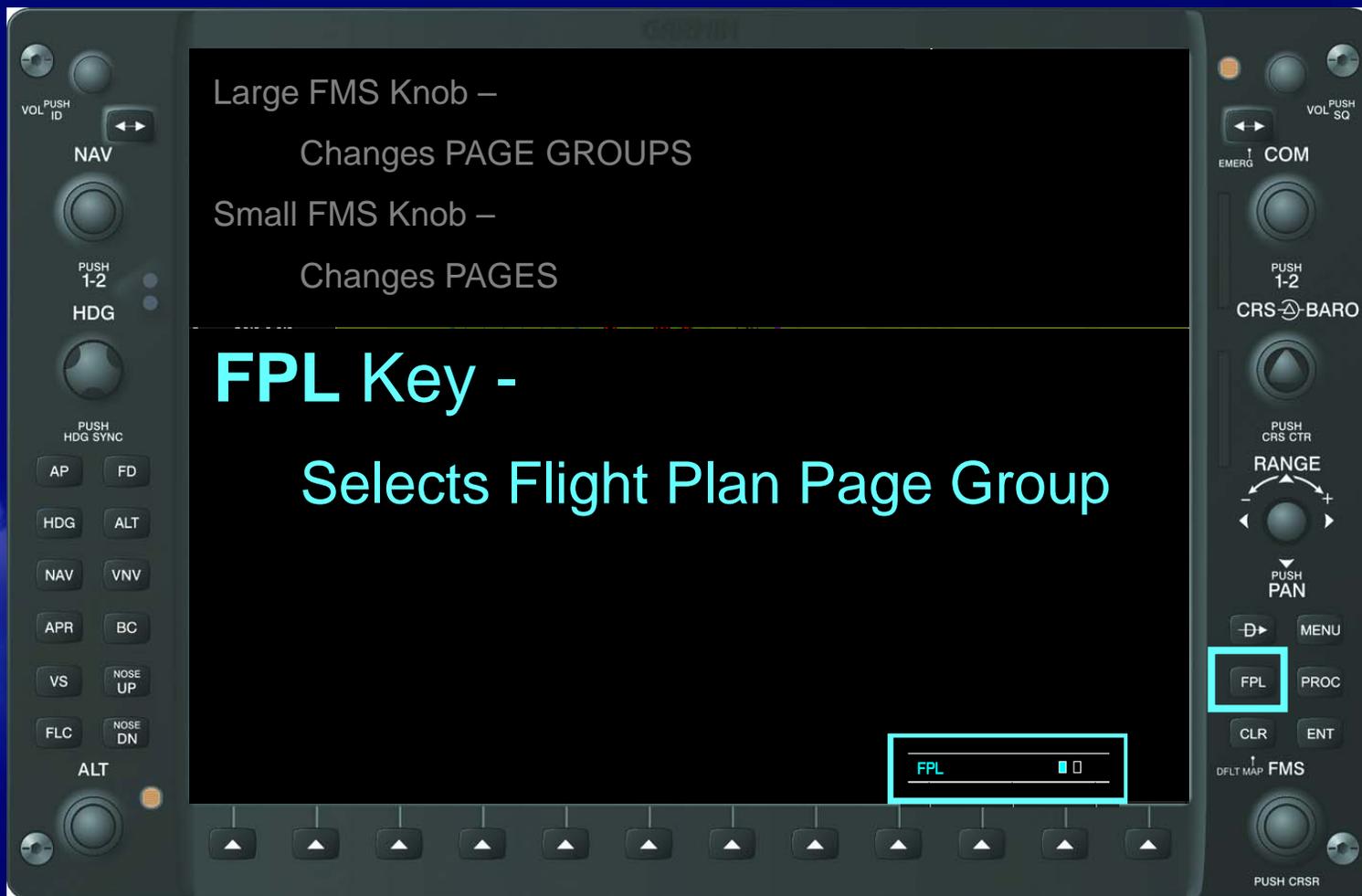
MAP WPT AUX NRST □ □ □ □ ■

MAP WPT AUX NRST ■ □ □ □ □

NAV, HDG, APR, VS, FLC, ALT, COM, CRS BARO, RANGE, PAN, MENU, PROC, ENT, FMS, PUSH CRSR



# MFD Navigation



# MFD Navigation

Large FMS Knob –  
Changes PAGE GROUPS

Small FMS Knob –  
Changes PAGES

FPL-Key –  
Selects Flight Plan Group

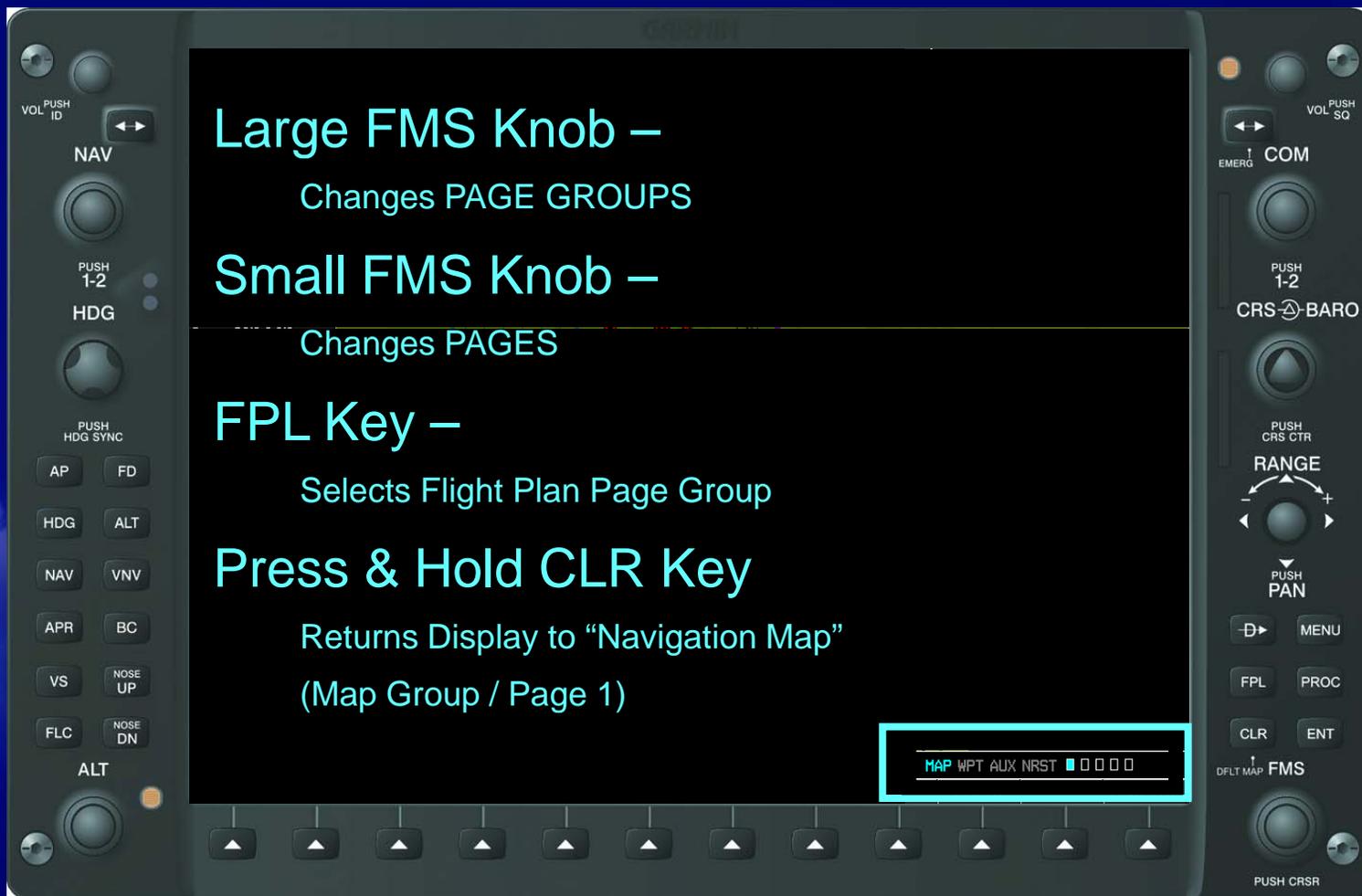
**Press & Hold CLR Key -  
Returns Display to “Navigation Map”  
(Map Group / Page 1)**

MAP WPT AUX NRST ■■■■■

Navigation screen showing flight plan data: MAP WPT AUX NRST ■■■■■

Navigation screen showing flight plan data: MAP WPT AUX NRST ■■■■■

# MFD Navigation



The image shows a Garmin G1000 Multifunction Display (MFD) with a central screen displaying navigation instructions. The screen is surrounded by various control knobs and buttons. A red box highlights the status bar at the bottom of the screen, which contains the text "MAP WPT AUX NRST" followed by five small square icons.

**Large FMS Knob –**  
Changes PAGE GROUPS

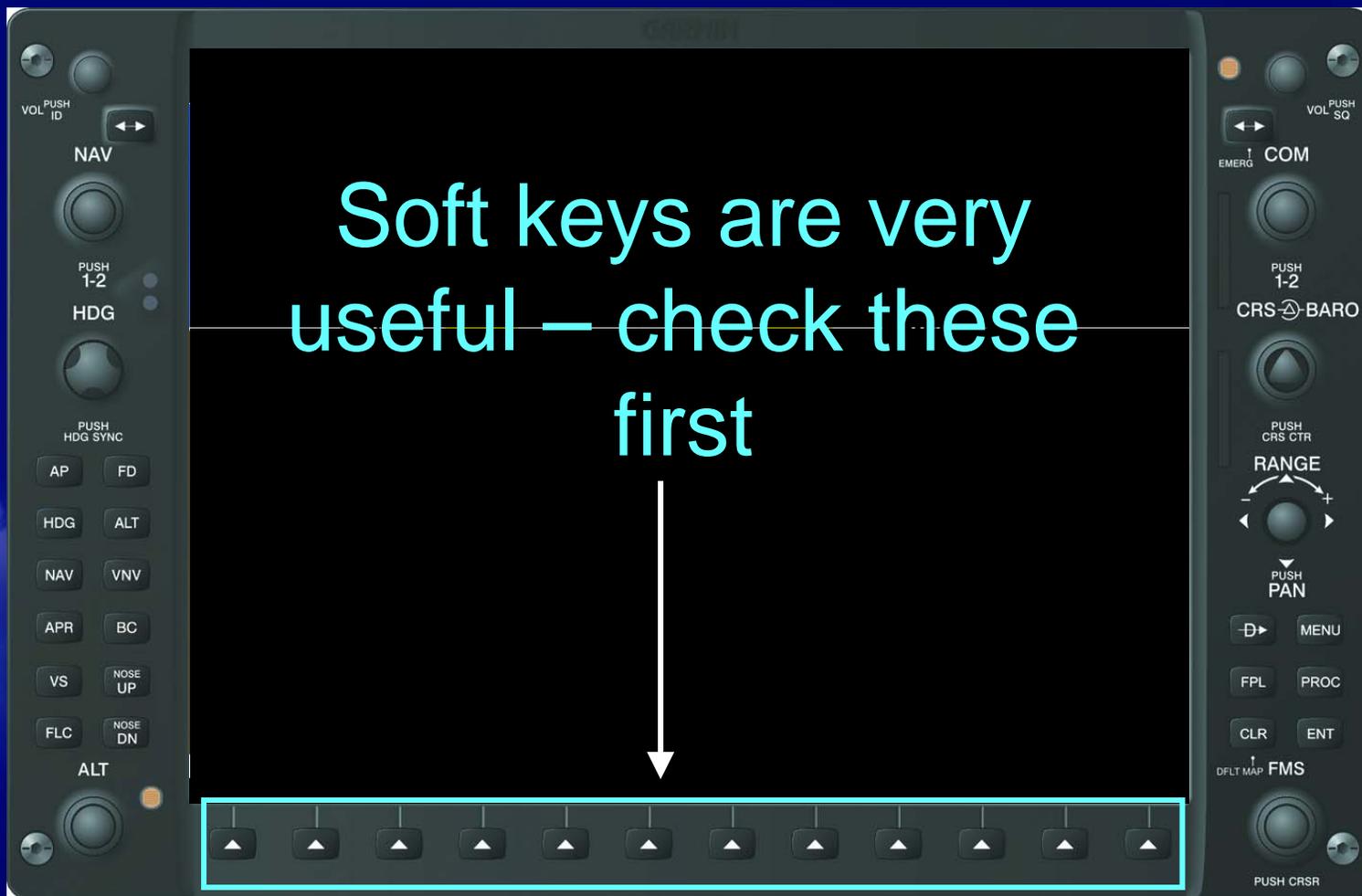
**Small FMS Knob –**  
Changes PAGES

**FPL Key –**  
Selects Flight Plan Page Group

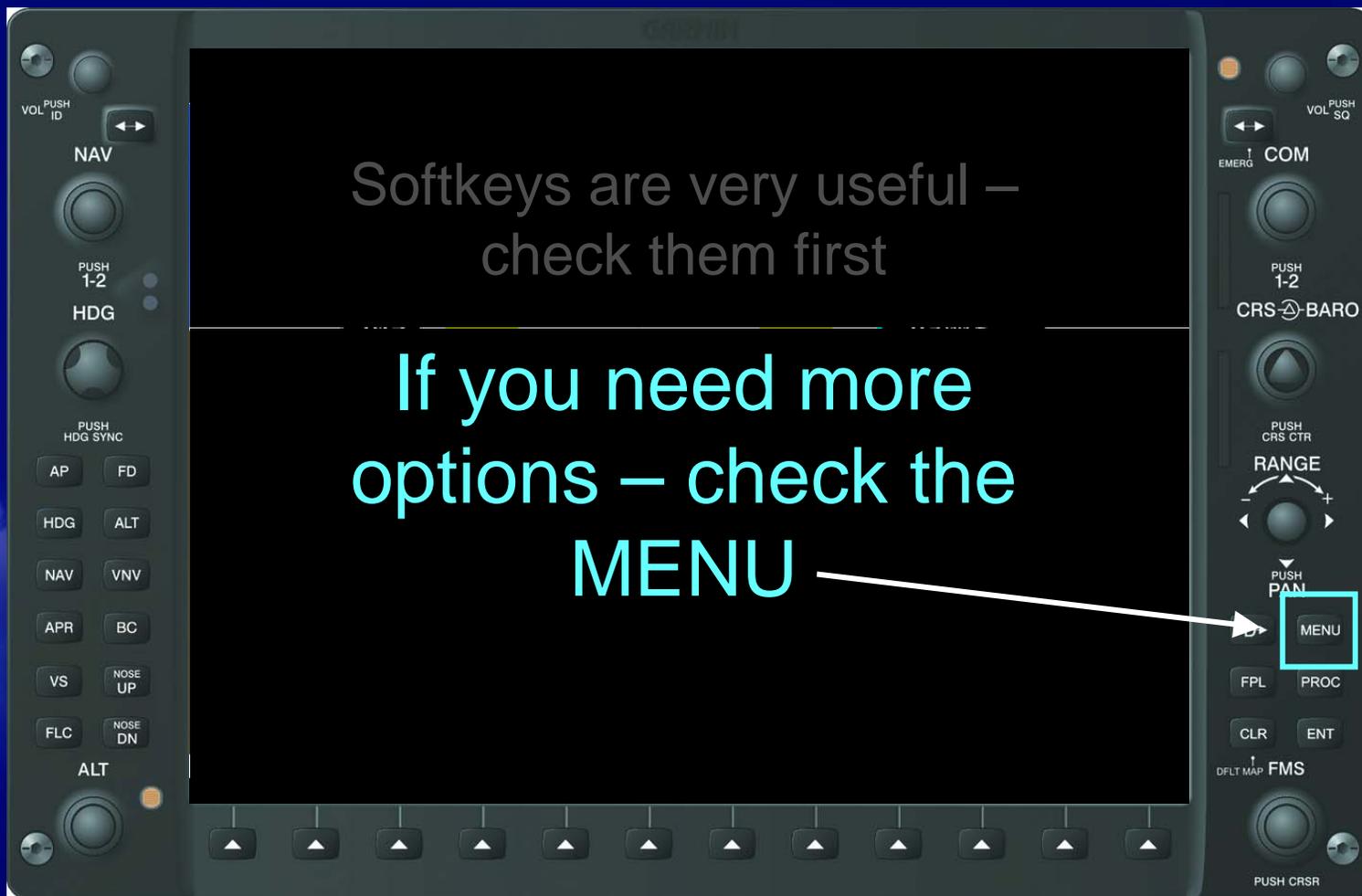
**Press & Hold CLR Key**  
Returns Display to “Navigation Map”  
(Map Group / Page 1)

MAP WPT AUX NRST ■■■■■

# MFD Navigation



# MFD Navigation



# Agenda

- **Classroom**
  - Training Approach
  - Display Overview
  - Operational Basics
  - **Flight Director/Autopilot Introduction**
- **Lab**
  - System Configuration
  - **Flight scenario 1**



# AFCS Functions

The Flight Director provides pitch and roll commands to the AFCS, and displays them on the PFD.



Or the autopilot may be engaged to respond to the commands from the flight director.

# Limitations

- The preflight test must be successfully completed prior to use of the autopilot, flight director, or manual electric trim.

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- The preflight test must be successfully completed prior to use of the autopilot, flight director, or manual electric trim.
- A pilot, with the seat belt fastened, must occupy the left pilot's seat during all autopilot operations.
- The autopilot must be off during all takeoffs and landings.
- Autopilot Maximum Engagement Speed - 165 KIAS (182/206)
- Autopilot Maximum Engagement Speed - 150 KIAS (172)

# GFC 700 AFCS Operation



Overspeed Protection

# Limitations

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- Autopilot Maximum Engagement Speed - 150 KIAS (172)
- Autopilot Minimum Engagement Speed - 70 KIAS (172/182)
- Autopilot Minimum Engagement Speed - 80 KIAS (206)



# Limitations

- The preflight test must be successfully completed prior to use of the autopilot, flight director, or manual electric trim.
- A pilot, with the seat belt fastened, must occupy the left pilot's seat during all autopilot operations.
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- Autopilot Maximum Engagement Speed - 150 KIAS (172)
- Autopilot Minimum Engagement Speed - 70 KIAS (172/182)
- Autopilot Minimum Engagement Speed - 80 KIAS (206)
- Electric Trim Maximum Operating Speed - 175 KIAS (182/206)
- Electric Trim Maximum Operating Speed – 163 KIAS (172)



# Limitations

- The preflight test must be successfully completed prior to use of the autopilot, flight director, or manual electric trim.
- A pilot, with the seat belt fastened, must occupy the left pilot's seat during all autopilot operations.
- The autopilot must be off during all takeoffs and landings.
- Autopilot Maximum Engagement Speed - 165 KIAS (182/206)
- Autopilot Maximum Engagement Speed - 150 KIAS (172)
- Autopilot Minimum Engagement Speed - 70 KIAS
- Autopilot Minimum Engagement Speed - 80 KIAS (206)
- Electric Trim Maximum Operating Speed - 175 KIAS (182/206)
- Electric Trim Maximum Operating Speed – 163 KIAS (172)
- **Maximum Fuel Imbalance with autopilot engaged - 90 pounds.**



# Limitations

- The autopilot must be disengaged below 200 feet AGL during approach operations and below 800 feet AGL during all other operations.

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- Use of the autopilot is prohibited when the audio panel is inoperative.

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- The autopilot must be disengaged below 200 feet AGL during approach operations and below 800 feet AGL during all other operations.
- ILS approaches using the autopilot flight director are limited to Category 1 approaches only.
- Use of the autopilot is prohibited when the audio panel is inoperative.
- Use of the autopilot is prohibited when conducting missed approach procedures until an established rate of climb that ensures all altitude requirements of the procedure will be met.

# GFC 700 AFCS Operation

The image shows a Garmin G1000 cockpit display. At the top, a 'System Status' window is highlighted with a white box and an arrow pointing to a 'PFT' (Preflight Test) indicator. Below this, the primary flight display (PFD) shows a pitch scale with a yellow bar indicating a failure. The heading scale shows a heading of 016° and a heading error of 014°. The terrain display shows a 20kt HDG UP. The map display shows the aircraft's position near Chanute, Kansas. The bottom of the display has buttons for INSET, PFD, OBS, CDI, and DME.

Condition	Annunciation
Pitch Failure	<b>PTCH</b>
Roll Failure	<b>ROLL</b>
MET Switch Stuck, or Pitch Trim Axis Control Failure	<b>PTRM</b>
System Failure	<b>AFCS</b>
Elevator Mistrim Up	<b>↑ELE</b>
Elevator Mistrim Down	<b>↓ELE</b>
Aileron Mistrim Left	<b>←AIL</b>
Aileron Mistrim Right	<b>AIL→</b>
Preflight Test	<b>PFT</b>
	<b>PFT</b>

The image shows a portion of the cockpit control panel. It includes buttons for NAV, HDG, AP, FD, HDG, ALT, NAV, VNV, APR, BC, VS, NOSE UP, FLC, NOSE DN, and ALT. There are also knobs for VOL PUSH ID, VOL PUSH SQ, COM, and FMS. A central knob is labeled RANGE and has a push button labeled PAN. Other buttons include MENU, PROC, ENT, and PUSH CRSR.

# GFC 700 AFCS Operation

## AFCS Status Box



**GPS AP VS ↓500 FPM ALTS**



**GPS** **AP** **VS** **↓500 FPM** **ALTS**

The display features several key components:

- Autopilot Status:** A callout box labeled "Autopilot Status" points to the "AP" indicator in the top header.
- Vertical Speed (VS):** Shows a descent rate of 500 FPM.
- Altitude (ALTS):** Displays 5420 feet with a 500-foot scale.
- Heading (HDG):** Shows 016°.
- Course (CRS):** Shows 021°.
- Attitude Indicator:** Shows a pitch of 014°.
- Map:** Shows a map with waypoints KIDP and KMKC, and a distance of 110 NM.
- Flight Plan:**

FLIGHT PLAN		
KIDP / KMKC		
	DTK	DIS
KIDP		
KMKC	022°	110NM
- Bottom Panel:** Includes buttons for INSET, PF, OBS, CDI, DME, XPDR, IDENT, TMR/REF, NRST, and ALERTS.





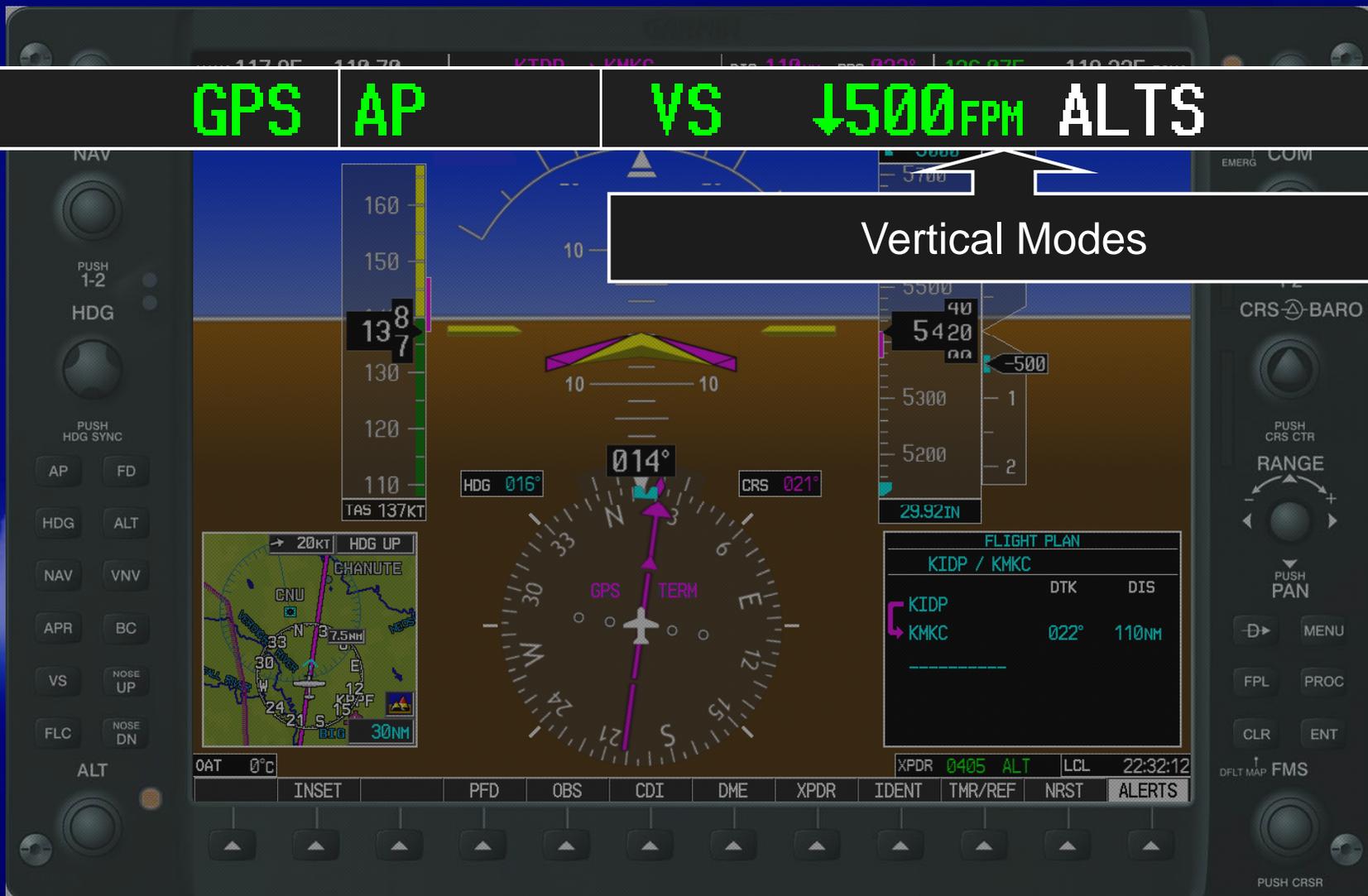
**GPS AP VS ↓500 FPM ALTS**

Lateral Modes



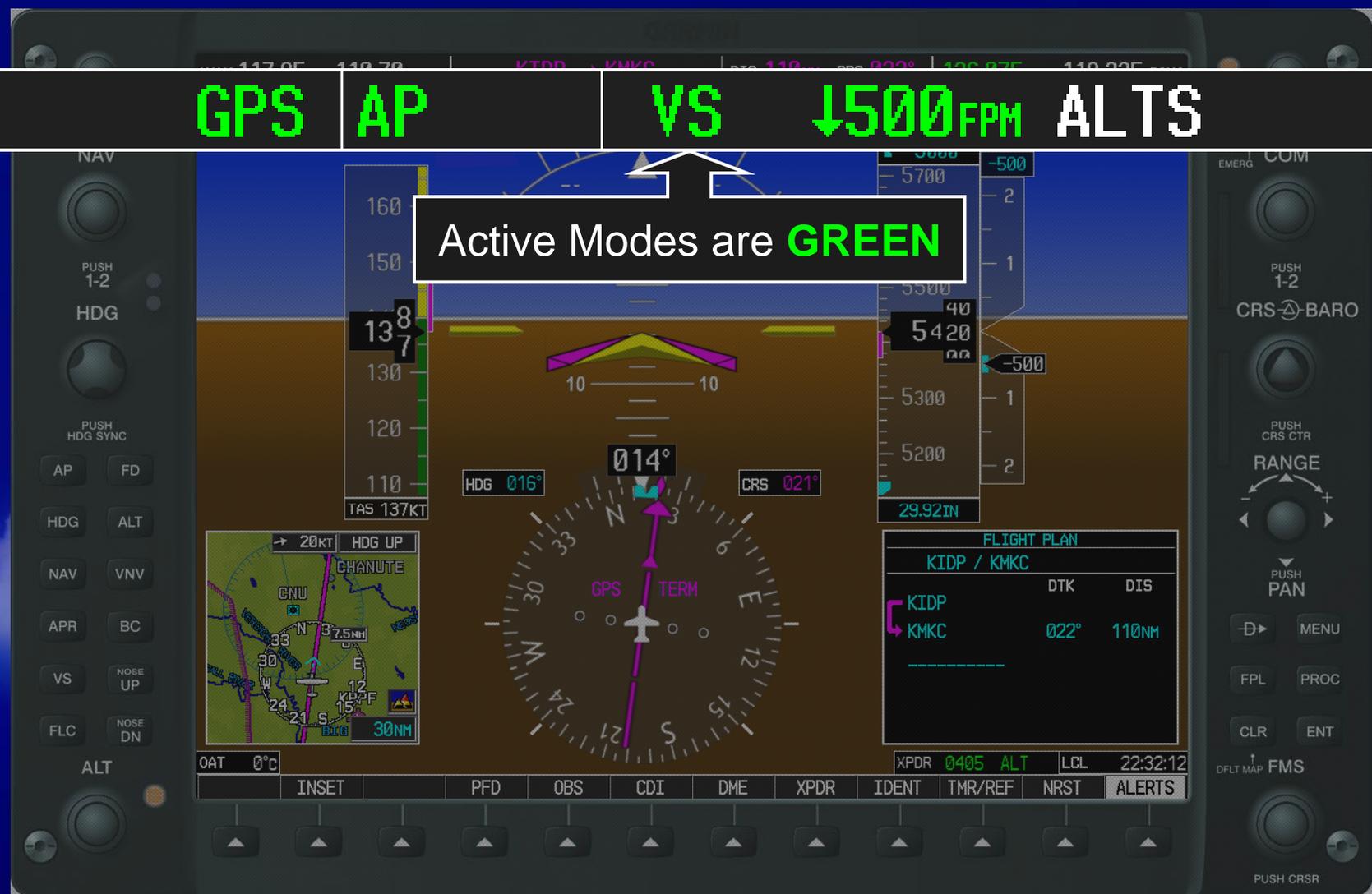
GPS AP VS ↓500 FPM ALTS

Vertical Modes



**GPS AP VS ↓500 FPM ALTS**

Active Modes are **GREEN**



**GPS AP VS ↓500 FPM ALTS**

Armed Modes are **WHITE**



# Lateral Modes

Lateral Mode	Control	Annunciation
Roll Hold	(default)	ROL
Heading Select	<b>HDG</b> Key	HDG
Navigation, GPS Arm/Capture/Track	<b>NAV</b> Key	GPS
Navigation, VOR Enroute Arm/Capture/Track		VOR
Navigation, LOC Arm/Capture/Track (No Glideslope)		LOC
Backcourse Arm/Capture/Track	<b>BC</b> Key	BC
Approach, GPS Arm/Capture/Track	<b>APR</b> Key	GPS
Approach, VOR Arm/Capture/Track		VAPP
Approach, ILS Arm/Capture/Track (Glideslope Mode automatically armed)		LOC
Go Around (in air)	<b>GA</b> Switch	GA

# Vertical Modes

Vertical Mode	Control	Annunciation
Pitch Hold	(default)	PIT
Selected Altitude Capture	*	ALTS
Altitude Hold	<b>ALT</b> Key	ALT    nnnnn FT
Vertical Speed	<b>VS</b> Key	VS    nnnn FPM
Flight Level Change, IAS Hold	<b>FLC</b> Key	FLC    nnn KT
Vertical Path Tracking	<b>VNV</b> Key	VPTH
VNAV Target Altitude Capture	**	ALTV
Glidepath	<b>APR</b> Key	GP
Glideslope		GS
Go Around (in air)	<b>GA</b> Switch	GA

# Sample Flight Scenario

Before Takeoff – KIDP to KJLN



# Press AP Key

800' AGL (minimum altitude for autopilot engagement)  
(Wings level and acceptable pitch attitude)



# Autopilot (and Flight Director) – ON (ROLL & PITCH modes)

## Altitude Select - ARMED

ROL	AP	PIT	ALTS
-----	----	-----	------

The main display shows the following information:

- NAV:** NAV1 115.70, NAV2 117.70, IIDP 110.70, KIDP → KJLN, DIS 61.5NM, BRG 089°, 119.225 COM1, 126.075 COM2, 119.325 COM2, 123.325 COM2
- Mode Indicators:** ROL, AP, PIT, ALTS
- Vertical Scale:** 80-130, HDG 106, TAS 109KT, HDG 353°, CRS 086°
- Horizontal Scale:** 100-2000, 1100, 1780, 29.92IN
- Heading Indicator:** 353°, GPS, TERM, XTK 2.78NM
- NEAREST AIRPORTS:**

KIDP	175°	2.8NM	ILS
TOWER	126.075	5501FT	
KCFV	120°	12.0NM	RNA
UNICOM	123.000	5872FT	
KPPF	056°	15.1NM	RNA
UNICOM	123.000	5000FT	
- Bottom Panel:** OAT 14°C, INSET, PFD, OBS, CDI, XPDR, IDENT, THR/REF, NRST, ALERTS, XPDR 1200 ALT, UTC 14:03:56, DFLT MAP, FMS, PUSH CRSR

The control panel includes the following controls:

- HDG** knob
- PUSH HDG SYNC** button
- AP** and **FD** buttons
- HDG** and **ALT** buttons
- NAV** and **VNV** buttons
- APR** and **BC** buttons
- VS** and **NOSE UP** buttons
- FLC** and **NOSE DN** buttons
- ALT** knob
- EMERG** button
- COM** knob
- PUSH 1-2** button
- CRS** and **BARO** buttons
- PUSH CRS CTR** button
- RANGE** knob
- PUSH PAN** button
- MENU** button
- FPL** and **PROC** buttons
- CLR** and **ENT** buttons
- DFLT MAP** and **FMS** buttons
- PUSH CRSR** button

# Roll Mode

Bank Angle	Flight Director Response
$< 6^\circ$	Commands Wings Level
$6^\circ$ to $22^\circ$	Commands Current Aircraft Roll Attitude
$> 22^\circ$	Limits Bank to $22^\circ$

# Push HDG Knob (sync HDG Bug); Press HDG Key

Autopilot (and Flight Director) – ON (ROLL & PITCH modes)

Altitude Select - ARMED



# Turn the HDG Knob to Select an Intercept Heading

## HDG Replaces ROL



# Autopilot begins to turn to the selected heading



# Press NAV Key

And rolls out when the heading is reached



# Press FLC Key

HDG remains active and GPS is armed

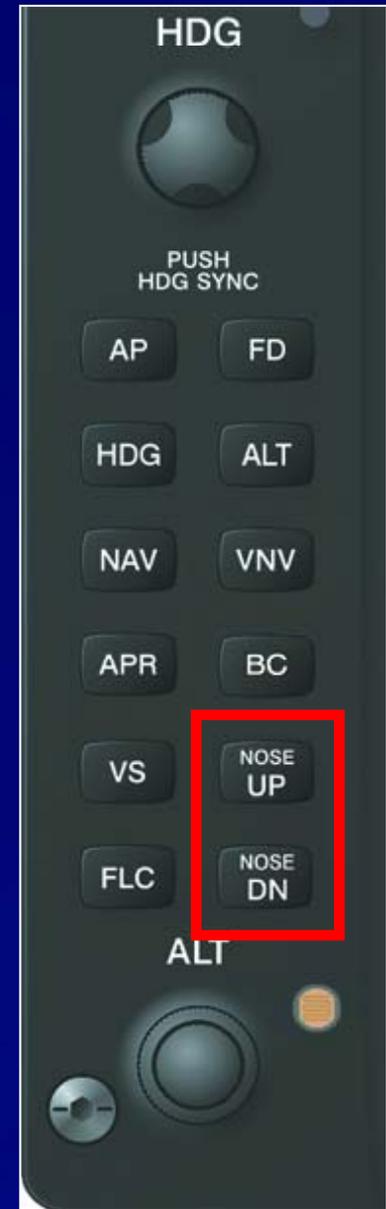


# Press NOSE DN (or NOSE UP) Key to adjust airspeed

## FLC Replaces PIT

Current airspeed is captured and annunciated in three places

**GPS** **HDG** **AP** **FLC** **92KT** **ALTS**



New airspeed is annunciated and maintained



As the nav course is intercepted, GPS replaces HDG and the aircraft turns to follow the nav course.



To begin an altitude change, first select the new altitude

As the selected altitude is reached, ALT replaces FLC and the captured altitude is annunciated three places.



Select the desired mode to begin the altitude change. Press the VS Key

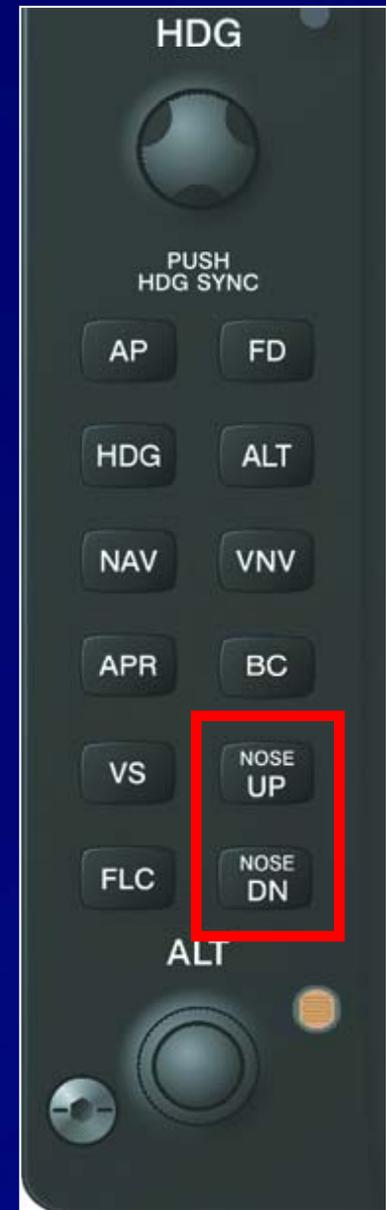


The new altitude (3500') is displayed in the Selected Altitude box but the autopilot is still maintaining 5500'



# Press NOSE DN (or NOSE UP) Key to adjust Vertical Speed

The current VS is captured and annunciated in three places.  
ALTS is armed.



The new VS is captured and annunciated in three places.  
 ALTS remains armed.

**GPS** **AP** **VS** **↓500 FPM** **ALTS**



As the Selected Altitude is reached, ALT replaces VS and the altitude being maintained is again annunciated.

**GPS AP ALT 3500 FT**



Press the FPL Key on the MFD

# VNAV Planning



Press the FMS Knob to activate the cursor

The Active Flight Plan Page is displayed



# Press ENT to view Airport Information

## Turn the Large FMS Knob to highlight KJLN

The image shows a Garmin G1000 avionics display with various flight instruments and data. The central display shows a map with a flight path and a large FMS knob. The right side of the display shows the ACTIVE FLIGHT PLAN and CURRENT VNV PROFILE. The ENT button is highlighted in red.

**NAV DATA:**  
NAV1 110.70 ↔ 117.60 OSW GS 152KT ETE 12:58 XTK ←0.01NM VSR \_\_\_\_\_ FPM 126.075 119.225 COM1  
NAV2 117.70 109.10 FPL - ACTIVE FLIGHT PLAN 120.850 ↔ 123.325 COM2

**ACTIVE FLIGHT PLAN:**  
KIDP / KJLN

	DTK	DIS	ALT
KIDP			_____FT
KJLN	087°	32.9NM	_____FT

**CURRENT VNV PROFILE:**  
ACTIVE VNV WPT \_\_\_\_\_FT at \_\_\_\_\_  
VS TGT \_\_\_\_\_FPM FPA \_\_\_\_\_°  
VS REQ \_\_\_\_\_FPM TIME TO TOD \_\_\_\_\_  
V DEV \_\_\_\_\_FT

**ENT Button:** The ENT button is highlighted in red on the right side of the display.

# Press the GO BACK Softkey to return to the FPL Page

Note the Field Elevation of 981'



# Press the ATK OFST (Along Track Offset) Softkey

The image shows a Garmin G1000 avionics display with various flight instruments and data. The central display is a map showing a flight path from KIDP to KJLN. The top status bar displays flight parameters: NAV1 110.70, NAV2 117.70, GS 152KT, ETE 12:58, XTK 0.01NM, VSR, 126.075, 119.225 COM1, 120.850, 123.325 COM2. The left side of the display shows engine and fuel gauges: MAN IN 23.3, RPM 2300, FFLOW GPH, OIL PRES, OIL TEMP, CHT, EGT, FUEL QTY GAL, and ELECTRICAL. The right side shows the ACTIVE FLIGHT PLAN and CURRENT VNV PROFILE. The bottom of the display features a row of softkeys: ENGINE, MAP, LD WPT, VIEW, VNV PROF, CNCL VNV, **ATK OFST**, ACT LEG, SHW CHRT, and CHKLST. The 'ATK OFST' softkey is circled in red.

DTK	DIS	ALT
KIDP		___FT
KJLN	087° 32.9NM	___FT

ACTIVE VNV WPT	___FT at	___
VS TGT	___FPM	FPA ___°
VS REQ	___FPM	TIME TO TOD ___
V DEV	___FT	

Turn the Small FMS Knob to set the desired offset distance.

A distance field is highlighted to the right of KJLN



# Press ENT to accept this distance

The image shows a Garmin G1000 cockpit display with various flight instruments and navigation data. The display is divided into several sections:

- Top Status Bar:** NAV1 110.70 ↔ 117.60 OSW GS 149KT ETE 12:52 XTK ←0.01NM VSR \_\_\_\_\_ FPM 126.075 119.225 COM1  
NAV2 117.70 109.10 FPL - ACTIVE FLIGHT PLAN 120.850 ↔ 123.325 COM2
- Left Side Instruments:** MAN IN 23.3, RPM 2300, FLOW GPH, OIL PRES, OIL TEMP, CHT, EGT, FUEL QTY GAL, ELECTRICAL (M BUS E 28.0 VOLTS 28.0, M BATT S 0.0 AMPS 0.0).
- Center Map:** A map showing a flight path from KIDP to KJLN. A red box highlights the distance of 4NM between the two airports.
- Right Side Flight Plan:**

ACTIVE FLIGHT PLAN			
KIDP / KJLN			
	DTK	DIS	ALT
KIDP		4NM	_____FT
KJLN	087°	32.1NM	_____FT

CURRENT VNV PROFILE			
ACTIVE VNV WPT	_____FT	at	_____
VS TGT	_____FPM	FPA	_____°
VS REQ	_____FPM	TIME TO TOD	_____
V DEV	_____FT		
- Bottom Control Panel:** Includes buttons for ENGINE, MAP, LD WPT, VIEW, VNV PROF, CNCL VNV, VNV BY, ATK OFST, ACT LEG, SHW CHRT, and CHKLST. The ENT button is highlighted with a red box.

# Use the FMS Knobs to enter the desired altitude and Press ENT

A corresponding waypoint is added to the Flight Plan and displayed on the map

The image shows a Garmin G1000 avionics display with several key elements highlighted in red:

- Map:** A red circle highlights the KJLN airport waypoint on the map.
- Active Flight Plan Table:** A red box highlights the entry for KJLN -4NM at an altitude of 2000 FT.
- ENT Button:** A red box highlights the ENT button on the right-hand side of the display.
- ENT Knob:** A red circle highlights the ENT knob at the bottom right of the display.

**ACTIVE FLIGHT PLAN**

	DTK	DIS	ALT
KIDP			----FT
KJLN -4NM	087°	26.4NM	2000FT
KJLN	087°	4.0NM	----FT

**CURRENT VNV PROFILE**

ACTIVE VNV WPT	----FT	at	-----
VS TGT	----FPM	FPA	-----°
VS REQ	----FPM	TIME TO TOD	-----:
V DEV	----FT		

**NAV DATA:** NAV1 110.70 ↔ 117.60 OSW GS 148KT ETE 12:19 XTK <0.01NM VSR -140FPM 126.075 119.225 COM1  
NAV2 117.70 109.10 FPL - ACTIVE FLIGHT PLAN 120.850 ↔ 123.325 COM2

**ENGINE INSTRUMENTS:** MAN IN 23.3, RPM 2300, FFLOW GPH, OIL PRES, OIL TEMP, CHT, EGT, FUEL QTY GAL, ELECTRICAL (M BUS E 28.0 VOLTS 28.0, M BATT S 0.0 AMPS 0.0)

# The VNAV Profile is now active and TOD is displayed on the map



# Use the ALT Knob to select the new Altitude.

PFD Annunciations are provided one minute prior to TOD

KIDP → KJLN		TOD within 1 minute	
GPS	AP	ALT	3500FT



# Press the VNV Key to arm the Autopilot to capture the VPTH

Normally the Selected Altitude will match the VNAV Altitude displayed above the VSI



# VPTH is now Armed

**GPS AP ALT 3500FT VPTH**



As the Vertical Deviation Indicator centers, VPTH replaces ALT and the autopilot follows the Vertical Path set in the Flight Plan

**GPS** | **AP** | **VPTH** | **ALTS**



As the Selected Altitude is reached, ALT replaces VPTH and the autopilot maintains the Selected Altitude.

**GPS AP ALT 2000FT**



# Dedicated AFCS Controls

Annunciated as:

**ALT**



Altitude Hold Mode

# Dedicated AFCS Controls

Approach Mode



Annunciated as:

**GPS (GP)**

**LOC (GS)**

**VAPP**

# Dedicated AFCS Controls

Annunciated as:

**BC**



Backcourse Mode

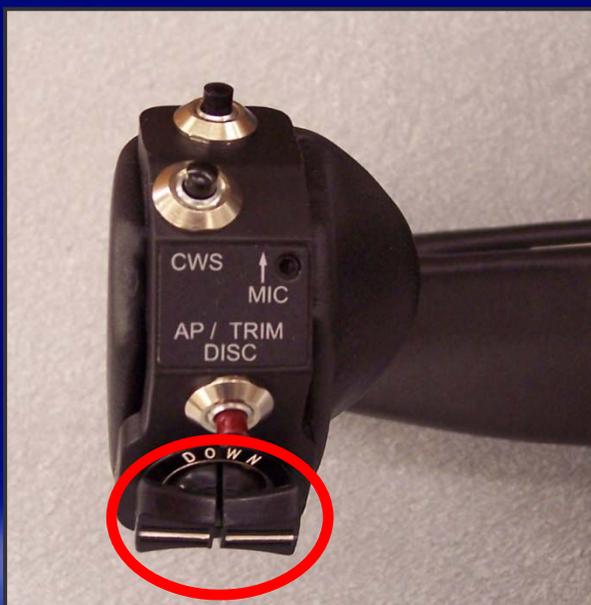
# AP DISC Switch (Autopilot Disconnect)



Pilot's Control Yoke – Left Side

- Disengages the autopilot and interrupts pitch trim operation
- May be used to mute the aural autopilot disconnect alert

# MET Switch (Manual Electric Trim)



Pilot's Control Yoke – Left Side

- Used to adjust pitch trim when autopilot is not on
- Will disconnect the autopilot if used when autopilot is on
- May be used to mute the aural autopilot disconnect alert

# Control Wheel Steering

GPS	CWS	ALT 8260FT
-----	-----	------------



Pilot's Control Yoke – Left Side

- Temporarily disengages autopilot servos while CWS button is depressed. CWS appears in A/P status box
- Resets commanded value in the following modes:
  - VS, FLC, PIT, ALT and ROL
- Resumes commanded value in the following modes:
  - HDG, NAV, APR and GS, GP, VPTH

# GA Switch (Go Around)

Disengages the Autopilot and Selects Flight Director to Go Around Mode



# Ground Training

## Module I Lab



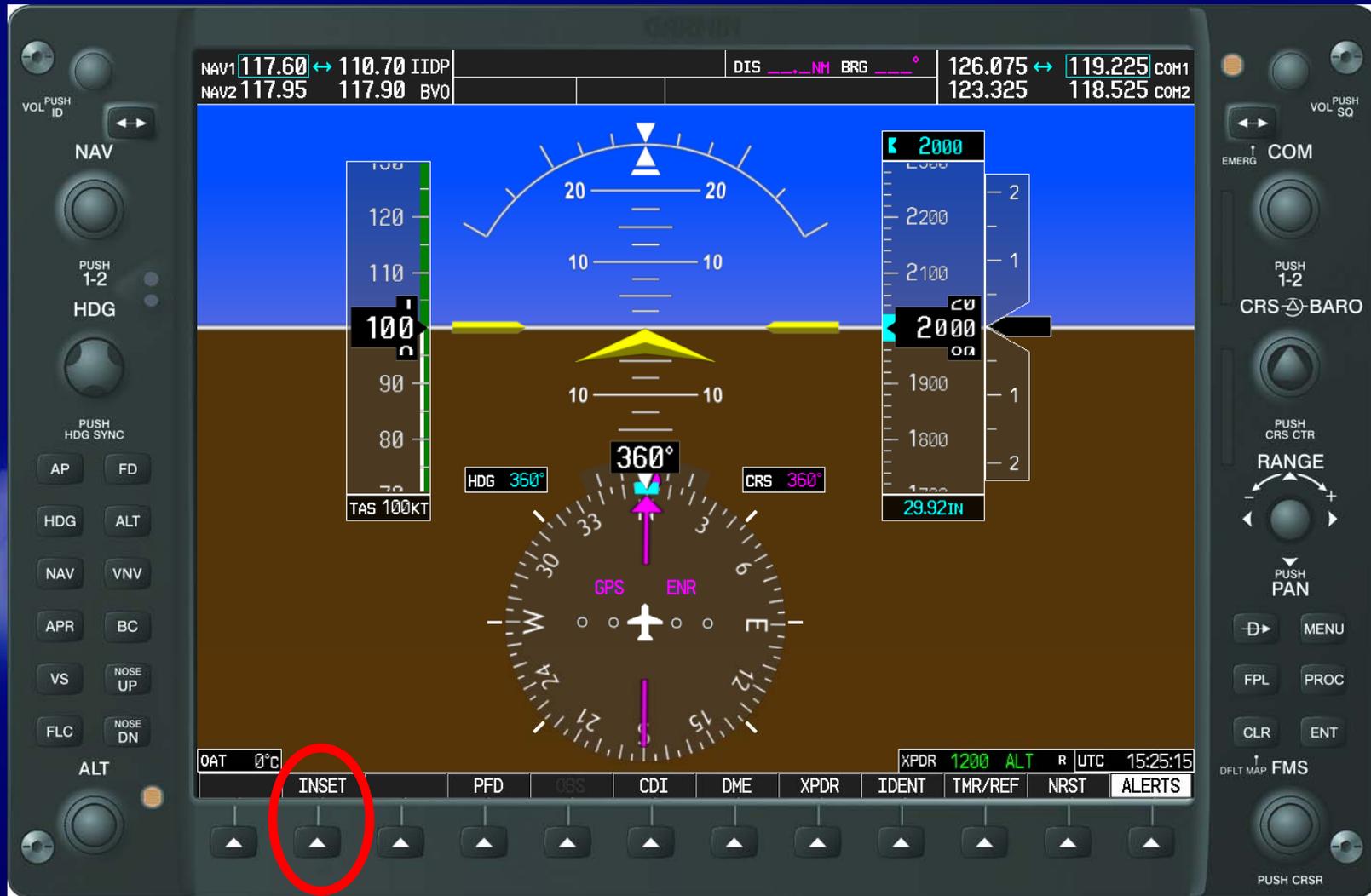
# Agenda

- **Classroom**
  - Training Approach
  - Display Overview
  - Operational Basics
  - Flight Director/Autopilot Introduction
- **Lab**
  - **System Configuration**
  - **Flight scenario 1**

# Suggested System Configuration - PFD



Press the **INSET** Softkey



# Suggested System Configuration - PFD



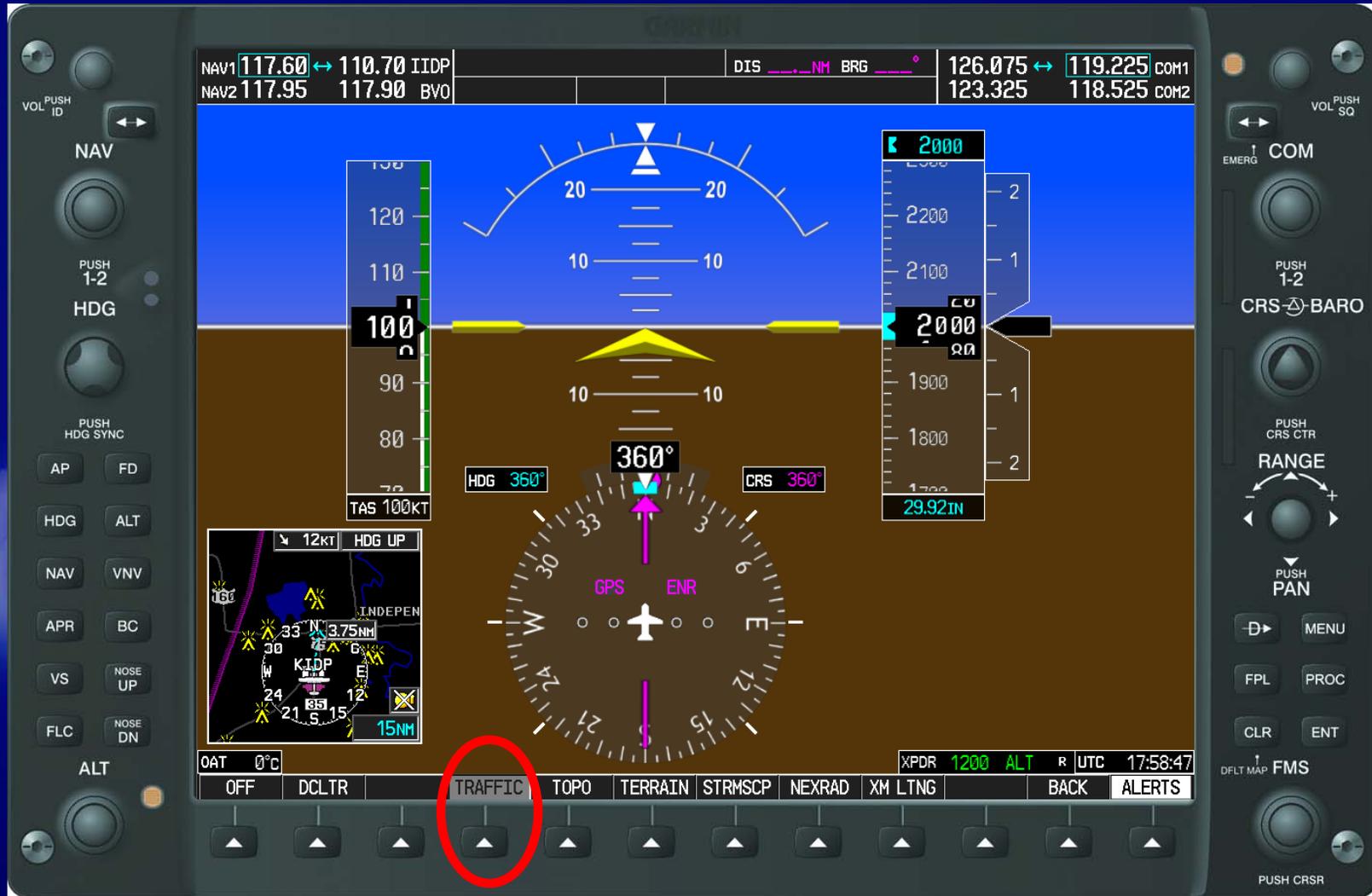
## To Display the INSET Map



# Suggested System Configuration - PFD

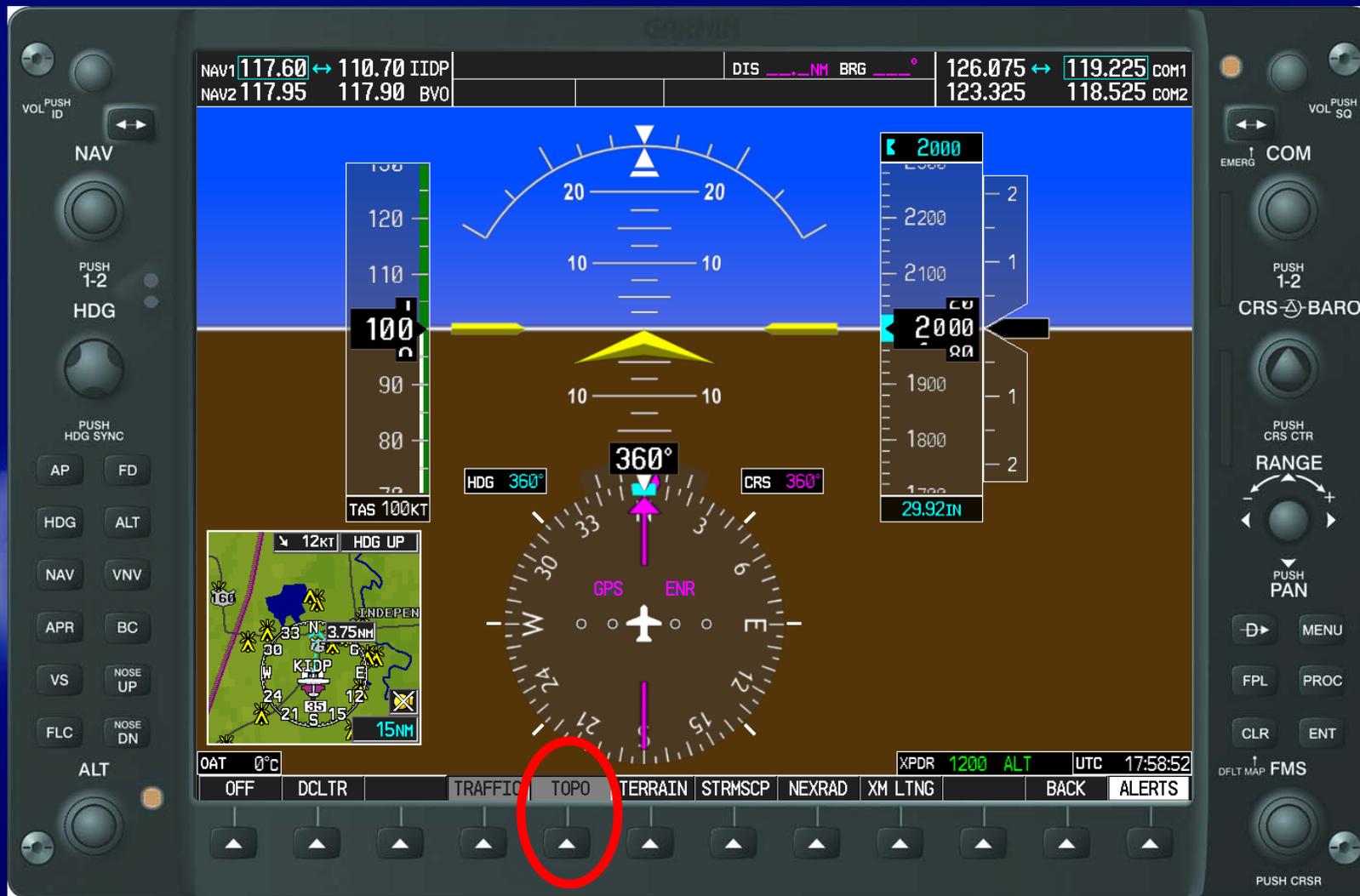


## Add TRAFFIC



# Suggested System Configuration - PFD

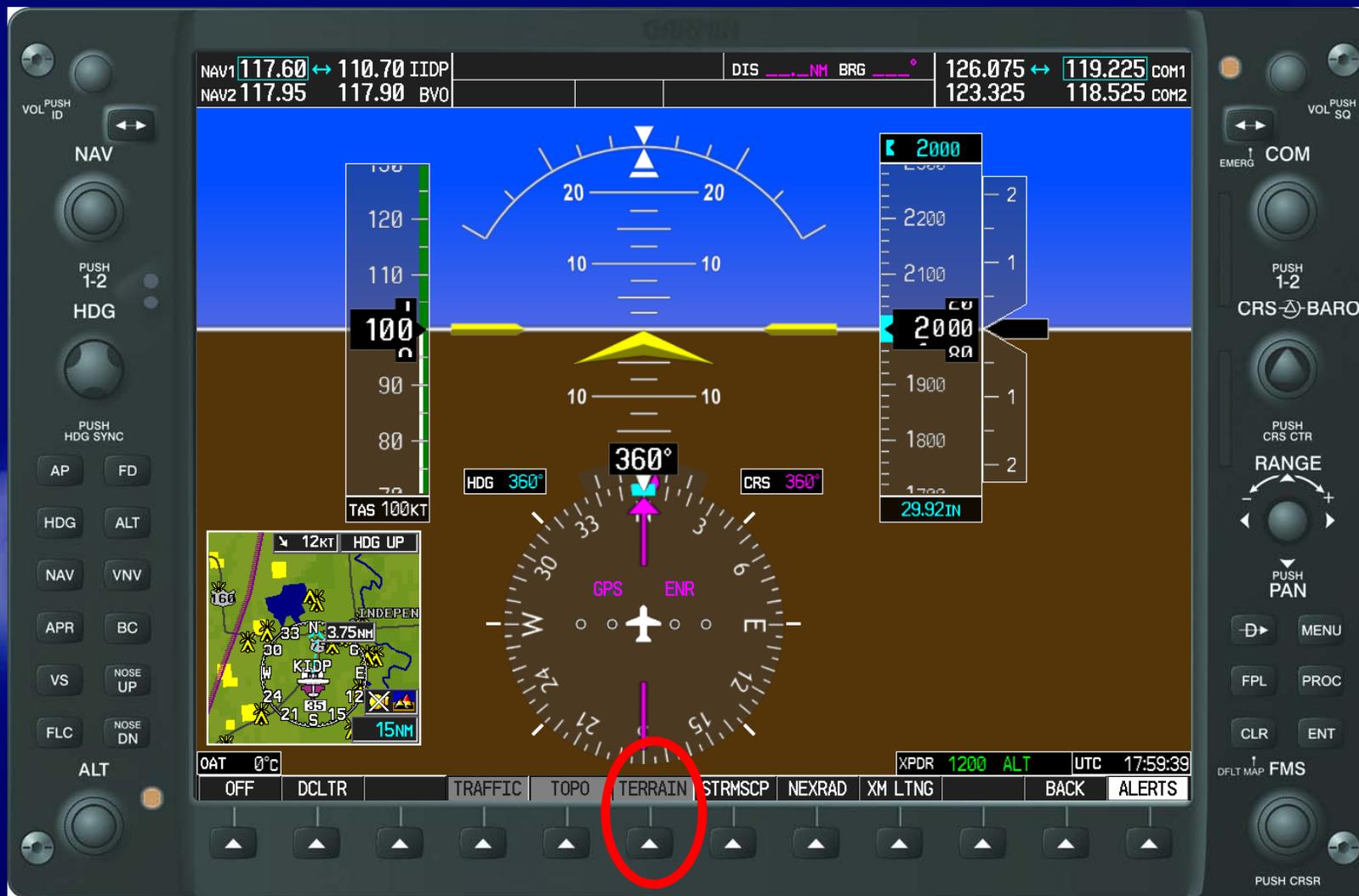
## Add TRAFFIC, TOPO



# Suggested System Configuration - PFD



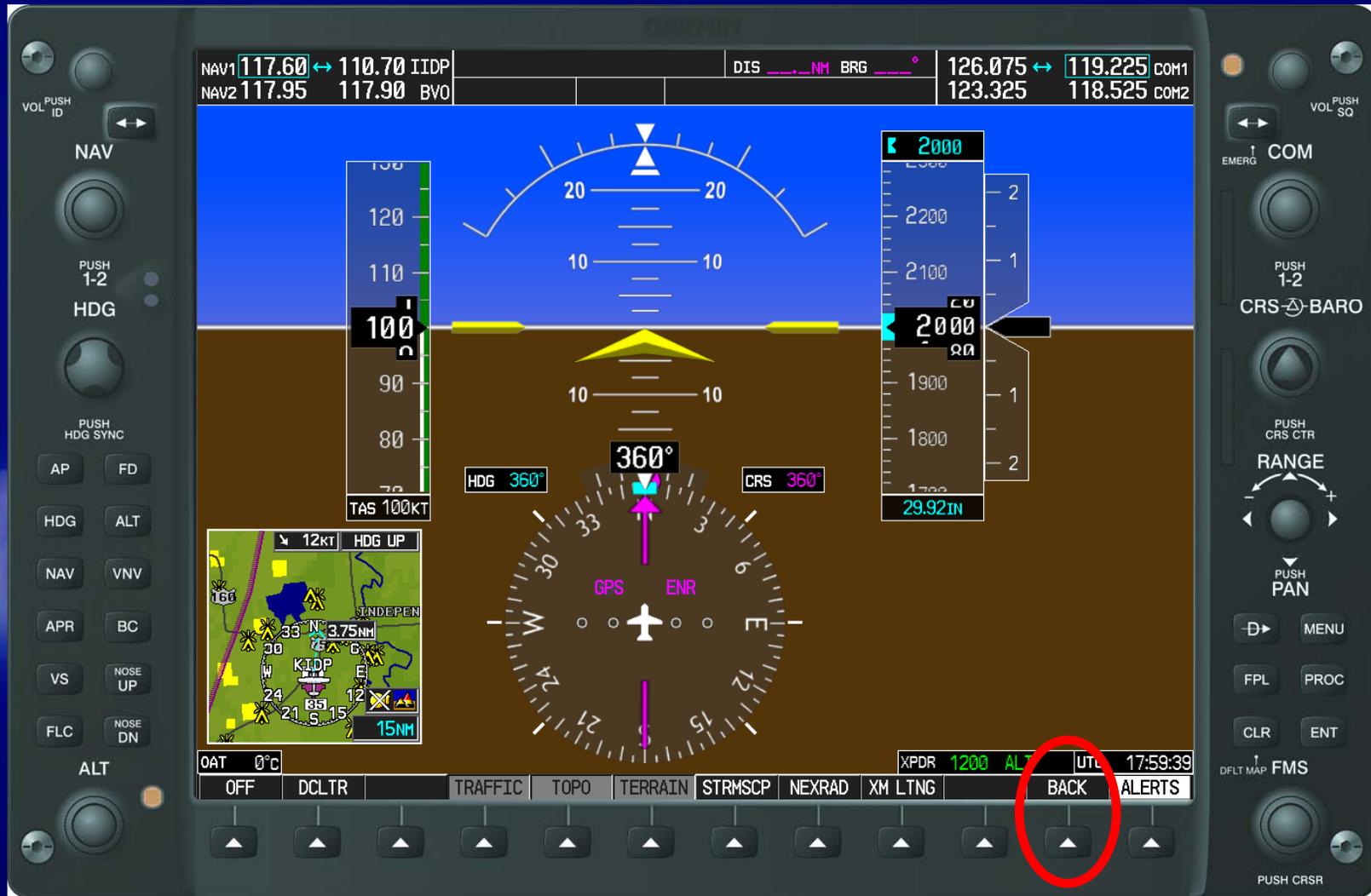
## Add, TRAFFIC, TOPO, and TERRAIN



# Suggested System Configuration - PFD

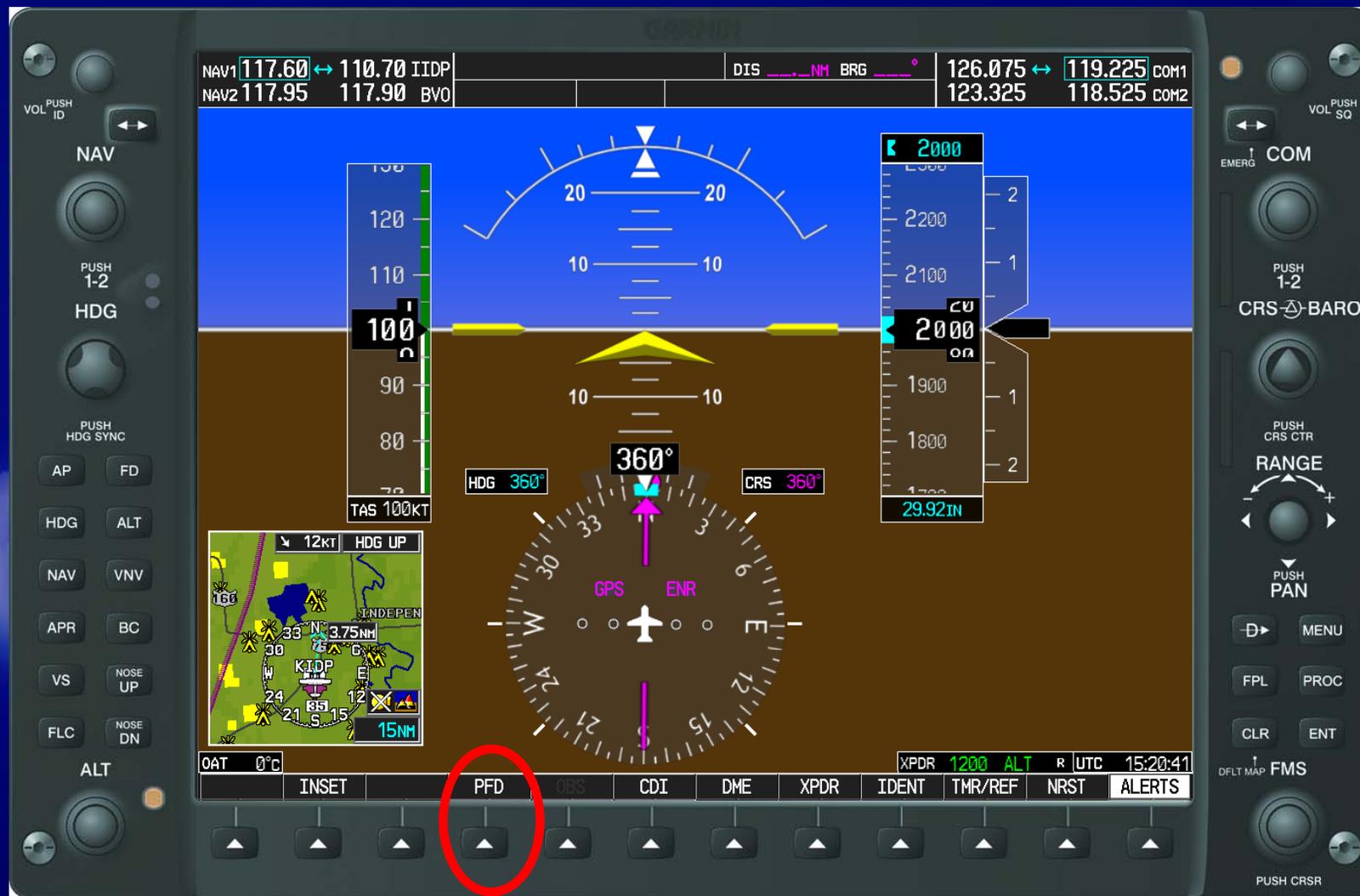


Press the BACK Softkey



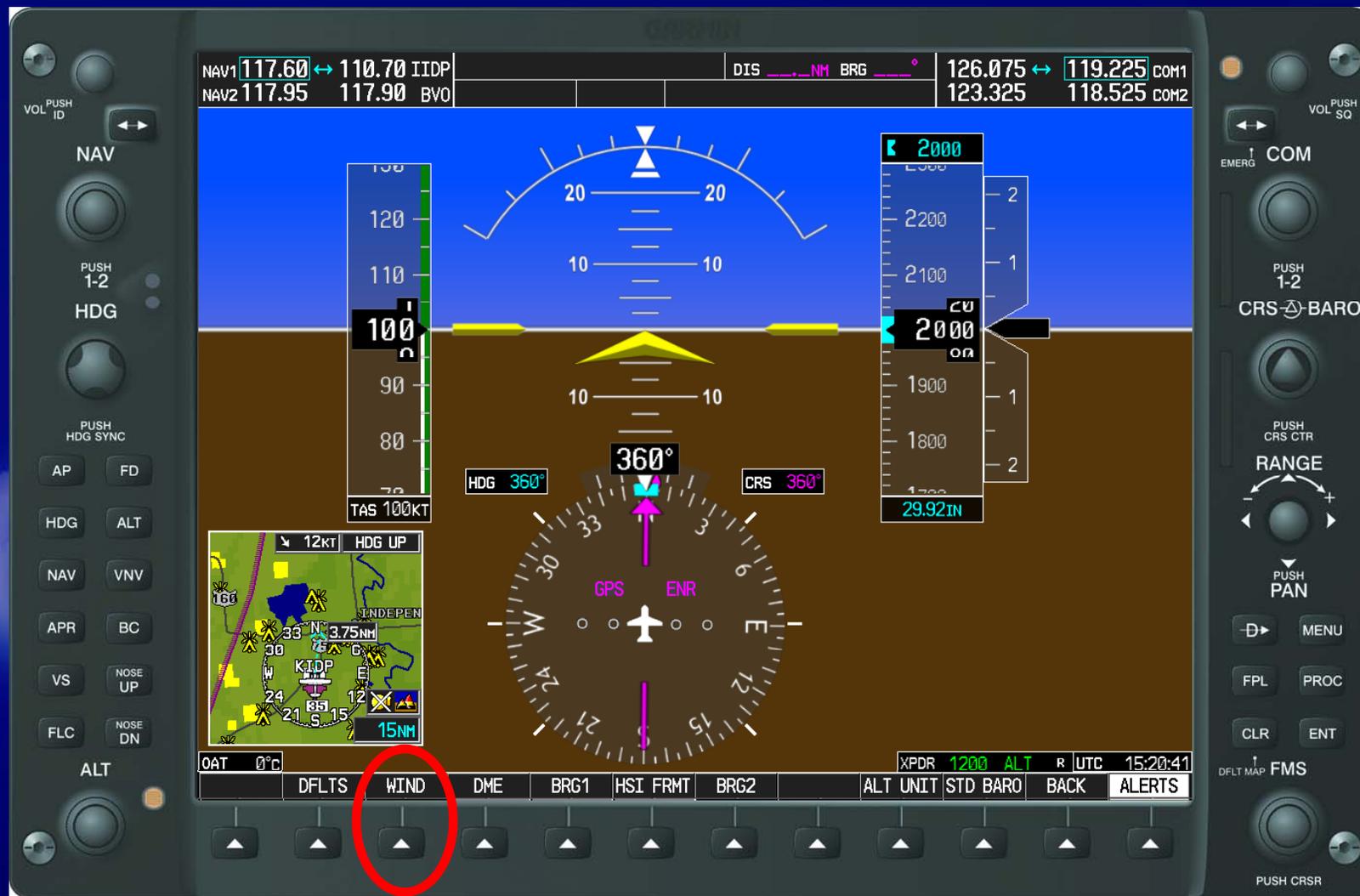
# Suggested System Configuration - PFD

Press the "PFD" Softkey



# Suggested System Configuration - PFD

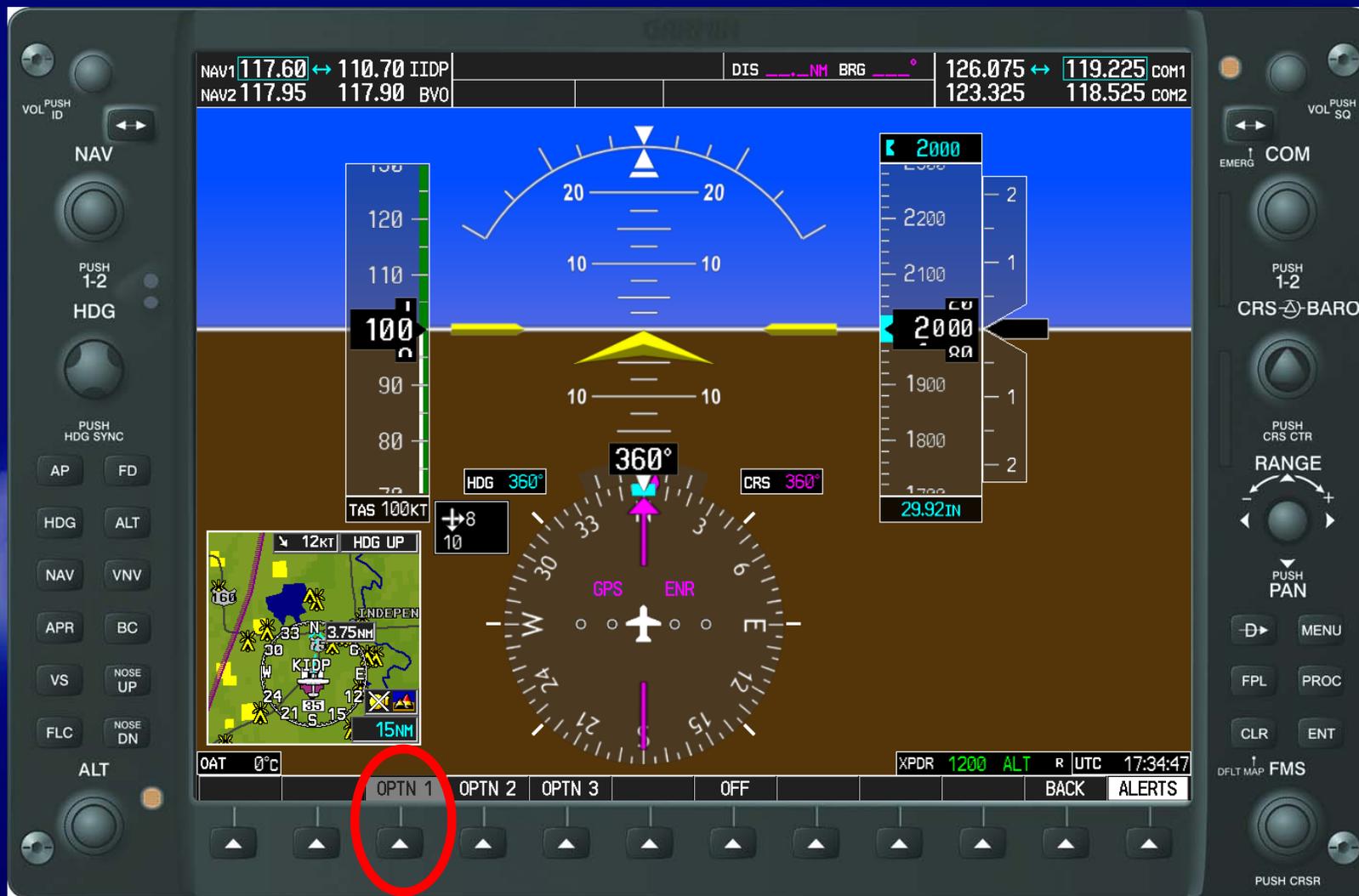
Press the "WIND" Softkey



# Suggested System Configuration - PFD



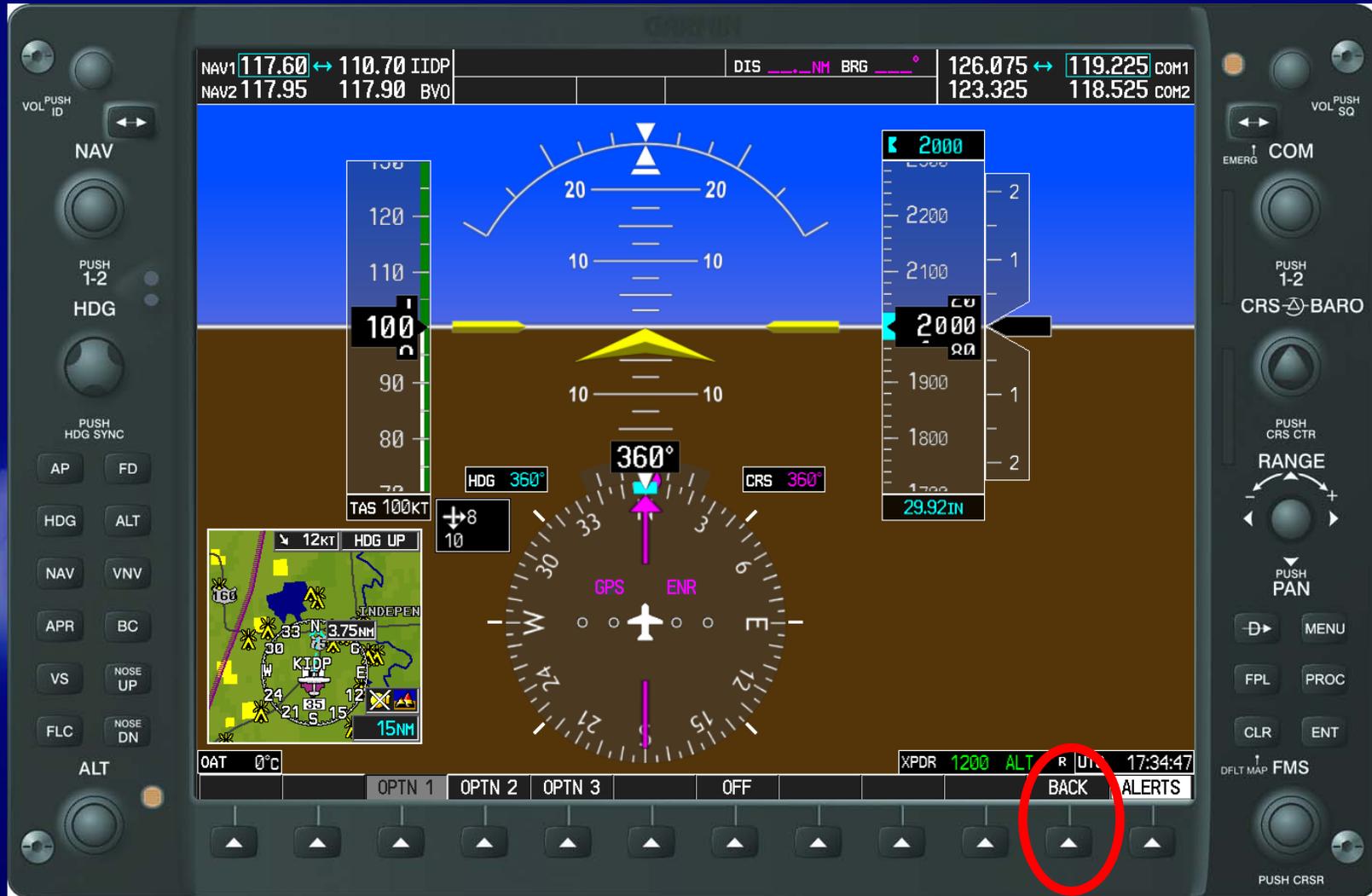
Select "OPTN 1"



# Suggested System Configuration - PFD

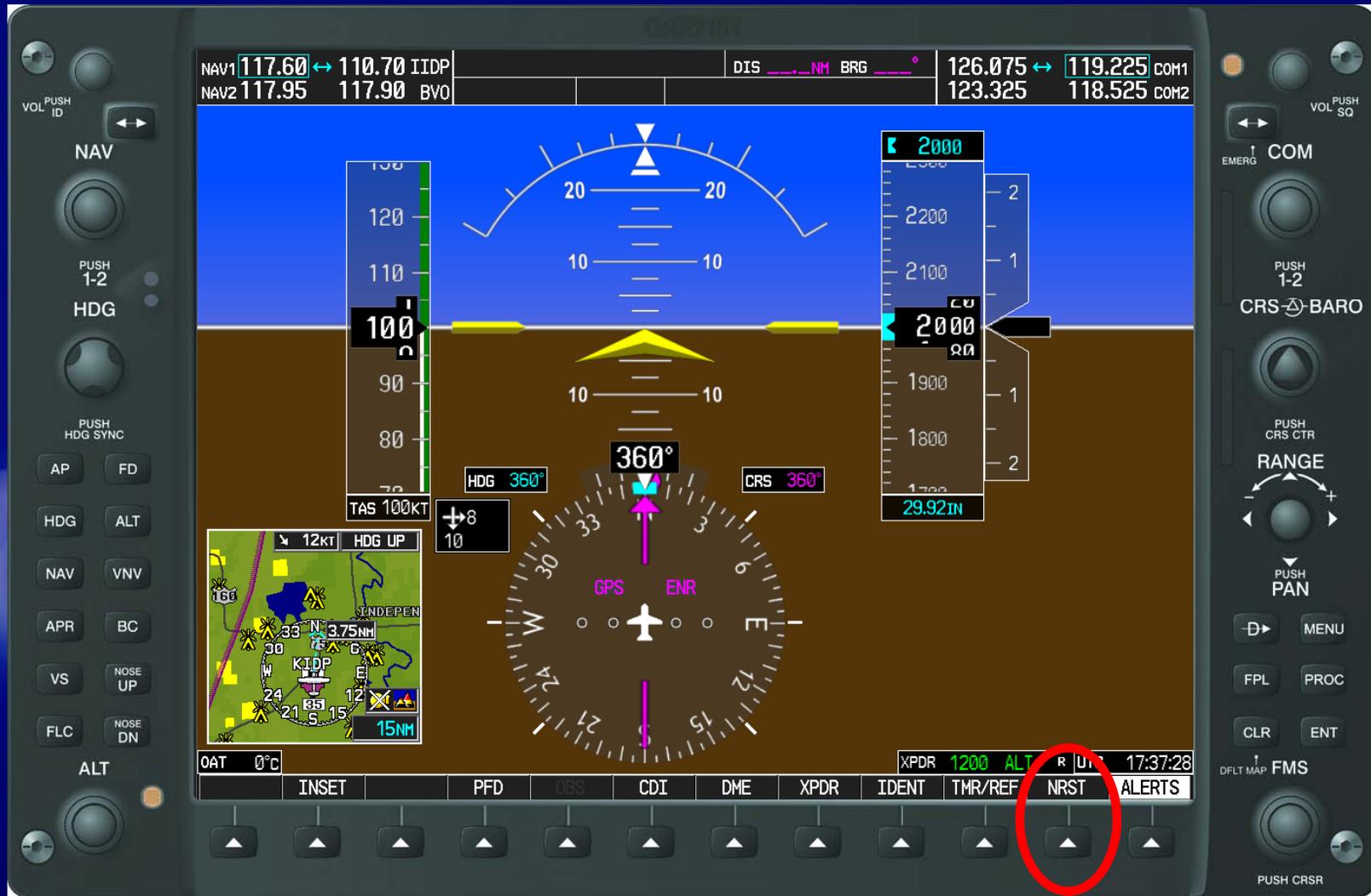


Press the BACK Softkey



# Suggested System Configuration - PFD

## Select "NRST"



# Suggested System Configuration - PFD

To Display the NEAREST AIRPORTS Window



# Suggested System Configuration - MFD



## Defaults - System Setup

The image shows a Garmin G1000 Multi-Function Display (MFD) in 'AUX - SYSTEM SETUP' mode. The display is divided into several sections:

- Top Status Bar:**
  - NAV1: 117.95 ↔ 109.50
  - NAV2: 117.95 109.50
  - GS: 0kt
  - DTK: \_\_\_°
  - TRK: 356°
  - ETE: \_\_\_:\_\_\_
  - 136.975 ↔ 118.000 COM1
  - 136.975 118.000 COM2
- Left Column (Instrument Readouts):**
  - MAN IN: 27.3
  - RPM: 2020
  - FFLOW GPH: 0 to 22
  - OIL PRES: 0 to 22
  - OIL TEMP: 0 to 22
  - CHT: 0 to 22
  - EGT: 0 to 22
  - FUEL QTY GAL: 0 to 30
  - ELECTRICAL: 37.4 VOLTS 37.4
  - M BUS E
  - M BATT S
  - 0.0 AMPS 0.0
- Middle Column (System Settings):**
  - DATE / TIME:**
    - DATE: 03-JAN-09
    - TIME: 20:14:19LCL
    - TIME FORMAT: LOCAL 24hr
    - TIME OFFSET: -00:00
  - DISPLAY UNITS:**
    - NAV ANGLE: MAGNETIC(°)
    - MAG VAR: 4°E
    - DIS. SPD: NAUTICAL(NM,KT)
    - ALT. VS: FEET(FT,FPM)
    - TEMP: CELSIUS(°C)
    - FUEL: GALLONS(GL,GL/HR)
    - WEIGHT: POUNDS(LB)
    - POSITION: HDDD°MM.MM'
  - BARO TRANSITION ALERT:**
    - OFF ALTITUDE: 18000FT
- Right Column (Alerts and Fields):**
  - AIRSPACE ALERTS:**
    - ALTITUDE BUFFER: 200FT
    - CLASS B/TMA: OFF
    - CLASS C/TCA: OFF
    - CLASS D: OFF
    - RESTRICTED: OFF
    - MOA (MILITARY): OFF
    - OTHER/ADIZ: OFF
  - MFD DATA BAR FIELDS:**
    - FIELD 1: GS
    - FIELD 2: DTK
    - FIELD 3: TRK
    - FIELD 4: ETE
  - GPS CDI:**
    - SELECTED: AUTO
    - SYSTEM CDI: 2.00NM
  - COM CONFIG:**
    - CHANNEL SPACING: 25.0 kHz
  - NEAREST APT:**
    - RNWX SURFACE: HARD/SOFT
    - MIN LENGTH: 0FT
  - AUDIO ALERT:**
    - VOICE: FEMALE
  - FLIGHT DIRECTOR:**
    - FORMAT ACTIVE: SNGL CUE
- Bottom Row (Buttons):**
  - ENGINE
  - DFLTS
  - CHKLIST



# Suggested System Configuration - MFD



## Defaults - System Setup

The image shows a Garmin Multifunction Display (MFD) in 'AUX - SYSTEM SETUP' mode. The display is divided into several sections:

- Top Status Bar:**
  - NAV1: 117.95 ↔ 109.50
  - NAV2: 117.95 109.50
  - GS: 0kt
  - DTK: \_\_\_°
  - TRK: 356°
  - ETE: \_\_\_:\_\_\_
  - 136.975 ↔ 118.000 COM1
  - 136.975 118.000 COM2
- Left Column (Instrument Readings):**
  - MAN IN: 27.3
  - RPM: 2020
  - FFLOW GPH: 0-22
  - OIL PRES: 0-22
  - OIL TEMP: 0-22
  - CHT: 0-22
  - EGT: 0-22
  - FUEL QTY GAL: 0-30
  - ELECTRICAL: M BUS E 37.4 VOLTS 37.4
  - M BATT S 0.0 AMPS 0.0
- DATE / TIME:**
  - DATE: 03-JAN-09
  - TIME: 20:14:19LCL
  - TIME FORMAT: LOCAL 24hr
  - TIME OFFSET: -00:00
- DISPLAY UNITS:**
  - NAV ANGLE: MAGNETIC(°)
  - MAG VAR: 4°E
  - DIS. SPD: NAUTICAL(NM,KT)
  - ALT. VS: FEET(FT,FPH)
  - TEMP: CELSIUS(°C)
  - FUEL: GALLONS(GL,GL/HR)
  - WEIGHT: POUNDS(LB)
  - POSITION: HDDD°MM.MM'
- AIRSPACE ALERTS:**
  - ALTITUDE BUFFER: 200FT
  - CLASS B/TMA: <OFF>
  - CLASS C/TCA: <OFF>
  - CLASS D: <OFF>
  - RESTRICTED: <OFF>
  - MOA (MILITARY): <OFF>
  - OTHER/ADIZ: <OFF>
- MFD DATA BAR FIELDS:**
  - FIELD 1: GS
  - FIELD 2: DTK
  - FIELD 3: TRK
  - FIELD 4: ETE
- GPS CDI:**
  - SELECTED: AUTO
  - SYSTEM CDI: 2.00NM
- COM CONFIG:**
  - CHANNEL SPACING: 25.0 kHz
- NEAREST APT:**
  - RNWX SURFACE: HARD/SOFT
  - MIN LENGTH: 0FT
- AUDIO ALERT:**
  - VOICE: FEMALE
- FLIGHT DIRECTOR:**
  - FORMAT ACTIVE: SNGL CUE
- BARO TRANSITION ALERT:**
  - <OFF> ALTITUDE 18000FT
- Bottom Panel:**
  - ENGINE: [Buttons]
  - DFLTS: [Buttons]
  - CHKLIST: [Buttons]

The right side of the display features physical controls: VOL PUSH ID, VOL PUSH SQ, EMERG, COM, PUSH 1-2, CRS BARO, PUSH CRS CTR, RANGE, PUSH PAN, MENU, FPL, PROC, CLR, ENT, DFLT MAP, FMS, and PUSH CRSR.



# Suggested System Configuration - MFD



## Defaults - System Setup

The image shows a Garmin Multifunction Display (MFD) in 'AUX - SYSTEM SETUP' mode. The display is divided into several sections:

- Top Status Bar:**
  - NAV1: 117.95 ↔ 109.50
  - NAV2: 117.95 109.50
  - GS: 0kt
  - DTK: \_\_\_°
  - TRK: 356°
  - ETE: \_\_\_:\_\_\_
  - 136.975 ↔ 118.000 COM1
  - 136.975 118.000 COM2
- Left Column (Instrument Readings):**
  - MAN IN: 27.3
  - RPM: 2020
  - FFLOW GPH: 0-22
  - OIL PRES: [Bar Graph]
  - OIL TEMP: [Bar Graph]
  - CHT: [Bar Graph]
  - EGT: [Bar Graph]
  - FUEL QTY GAL: [Bar Graph]
  - ELECTRICAL: M BUS E 37.4 VOLTS 37.4; M BATT S 0.0 AMPS 0.0
- DATE / TIME:**
  - DATE: 03-JAN-09
  - TIME: 20:14:19LCL
  - TIME FORMAT: LOCAL 24hr
  - TIME OFFSET: -00:00
- AIRSPACE ALERTS:**
  - ALTITUDE BUFFER: 200FT
  - CLASS B/TMA: OFF
  - CLASS C/TCA: OFF
  - CLASS D: OFF
  - RESTRICTED: OFF
  - MOA (MILITARY): OFF
  - OTHER/ADIZ: OFF
- MFD DATA BAR FIELDS:**
  - FIELD 1: GS
  - FIELD 2: DTK
  - FIELD 3: TRK
  - FIELD 4: ETE
- DISPLAY UNITS:**
  - NAV ANGLE: MAGNETIC(°)
  - MAG VAR: 4°E
  - DIS. SPD: NAUTICAL(NH,KT)
  - ALT. VS: FEET(FT,FPH)
  - TEMP: CELSIUS(°C)
  - FUEL: GALLONS(GL,GL/HR)
  - WEIGHT: POUNDS(LB)
  - POSITION: HDDD°MM.MM'
- BARO TRANSITION ALERT:**
  - OFF ALTITUDE 18000FT
- AUDIO ALERT:**
  - VOICE: FEMALE
- FLIGHT DIRECTOR:**
  - FORMAT ACTIVE: SNGL CLUE
- GPS CDI:**
  - SELECTED: AUTO
  - SYSTEM CDI: 2.00NM
- COM CONFIG:**
  - CHANNEL SPACING: 25.0 kHz
- NEAREST APT:**
  - RNWX SURFACE: HARD/SOFT
  - MIN LENGTH: 0FT
- Bottom Panel:**
  - ENGINE: [Buttons]
  - DFLTS: [Buttons]
  - CHKLIST: [Buttons]



# Suggested System Configuration - MFD



## Suggested System Setup

The screenshot shows the 'AUX - SYSTEM SETUP' screen of a Garmin G1000 MFD. The interface is divided into several sections:

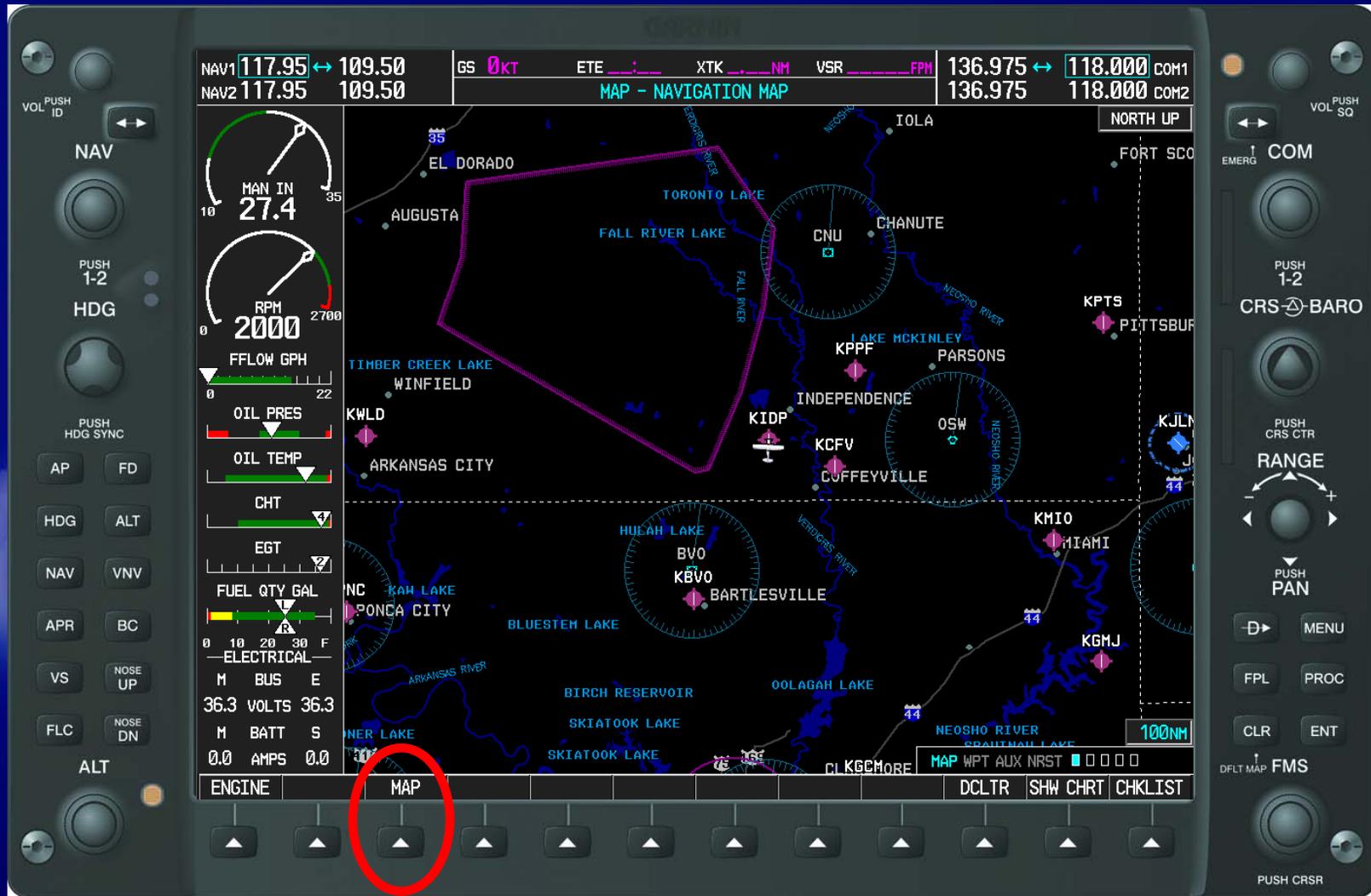
- NAVIGATION:** NAV1 117.95 ↔ 109.50, NAV2 117.95 109.50. GS 0kt, DTK \_\_\_\_, TRK 356°, ETE \_\_\_\_, 136.975 ↔ 118.000 COM1, 136.975 118.000 COM2.
- DATE / TIME:** DATE 03-JAN-09, TIME 20:14:19LCL, TIME FOR UTC LOCAL 24hr, TIME OFFSET -00:00.
- AIRSPACE ALERTS:** ALTITUDE BUFFER 200FT. CLASS B/TMA ON OFF, CLASS C/TCA ON OFF, CLASS D OFF OFF, RESTRICTED ON OFF, MOA (MILITARY) ON OFF, OTHER/ADIZ ON OFF.
- MFD DATA BAR FIELDS:** FIELD 1 GS, FIELD 2 ETE DTK, FIELD 3 XTK TRK, FIELD 4 VSR ETE.
- DISPLAY UNITS:** NAV ANGLE MAGNETIC(°), MAG VAR 4°E, DIS. SPD NAUTICAL(NH,KT), ALT. VS FEET(FT, FPM), TEMP CELSIUS(°C), FUEL GALLONS(GL, GL/HR), WEIGHT POUNDS(Lb), POSITION HDDD°MM.MM'.
- GPS CDI:** SELECTED AUTO, SYSTEM CDI 2.00NM.
- COM CONFIG:** CHANNEL SPACING 25.0 kHz.
- NEAREST APT:** RNWY SURFACE HARD/SOFT, MIN LENGTH 0FT.
- AUDIO ALERT:** VOICE FEMALE.
- FLIGHT DIRECTOR:** FORMAT ACTIVE SNGL CUE.
- BARO TRANSITION ALERT:** OFF ALTITUDE 18000FT.
- ENGINE:** MAN IN 27.3, RPM 2020, FLOW GPH, OIL PRES, OIL TEMP, CHT, EGT, FUEL QTY GAL, ELECTRICAL M BUS E 37.4 VOLTS 37.4, M BATT S 0.0 AMPS 0.0.
- Buttons:** NAV, HDG, AP, FD, HDG, ALT, NAV, VNV, APR, BC, VS, NOSE UP, FLC, NOSE DN, ALT, COM, CRS-BARO, RANGE, MENU, FPL, PROC, CLR, ENT, DFLT MAP, FMS, PUSH CRSR.



# Suggested System Configuration - MFD

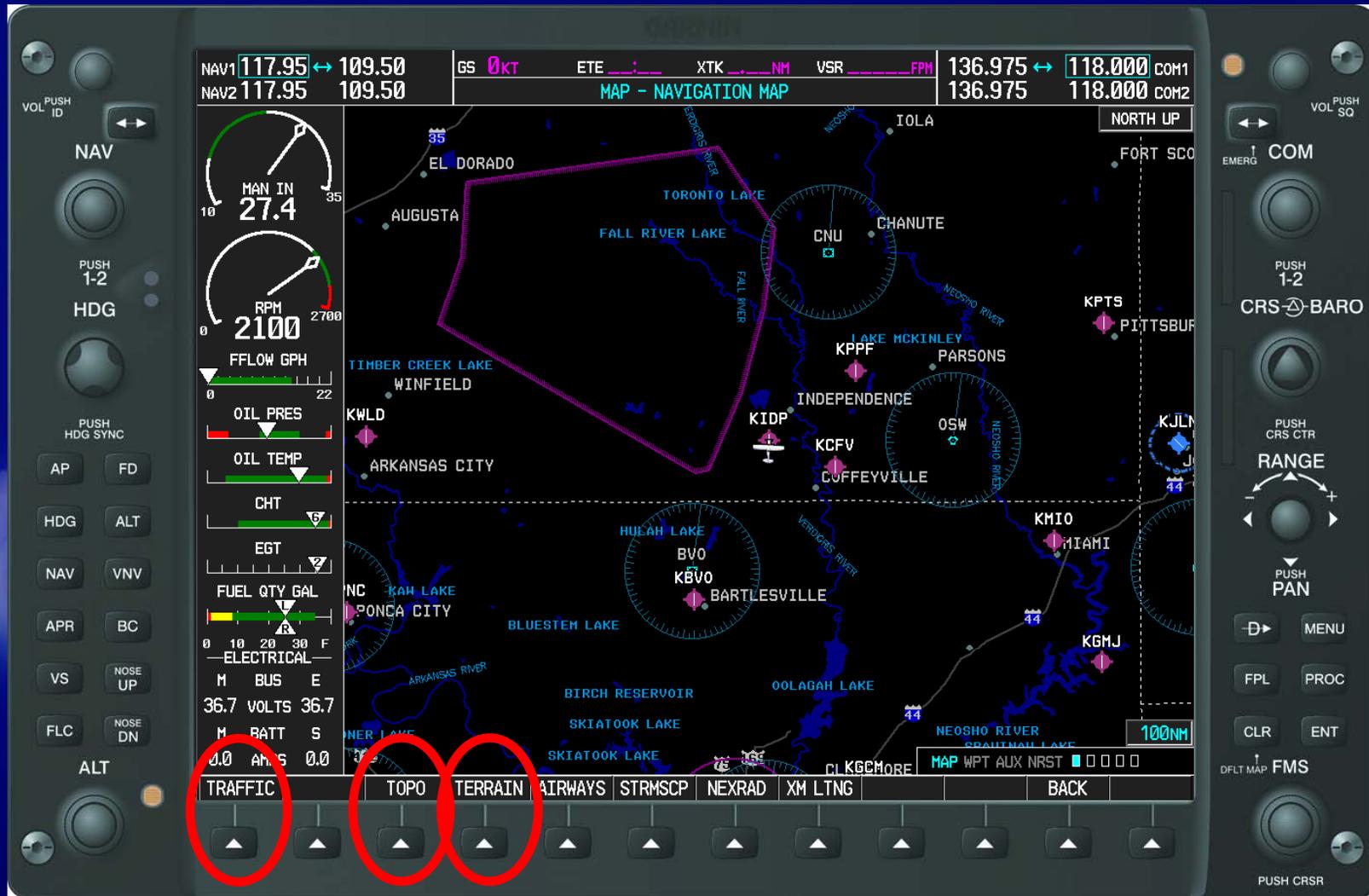


## Default Map MFD Configuration



# Suggested System Configuration - MFD

Press the TRAFFIC, TOPO, and TERRAIN Softkeys



# Suggested System Configuration - MFD



## Suggested Map Configuration



# Agenda

- **Classroom**
  - Training Approach
  - Display Overview
  - Operational Basics
  - Flight Director/Autopilot Introduction
- **Lab**
  - System Configuration
  - **Flight Scenario 1**

Leg 1

Before Taxi

Airport information – Waypoint Group, frequency selection – auto and manual

Before takeoff checklist

Altimeter setting, Selected Altitude Set, Fuel Calculator, Flight Plan – active (Leg 1: KIDP-KJLN) and catalog (Leg 2: KJLN-KFAM),  
GPS Status check, Transponder

Departure

Autopilot on – HDG, NAV, FLC

Nav capture – Altitude capture

Cruise

Enroute altitude change – VS mode

VNAV setup

Arrival airport information and frequency set – consider Data Link METARs

VNAV capture

Descent

Altitude capture at BOD

Safe taxi features – (KJLN taxiway designators and “hot spots” information)

Leg 2 (optional leg time permitting) – review and practice Leg 1 activities as applicable (route KJLN – KFAM)

Before departure

Activate stored flight plan from catalog

Enroute

Enroute diversion around airspace or weather – Direct to Map Pointer then add the MAPWPT to flight plan

Divert to alternate airport – press D key and enter Waypoint (or place Map Pointer on Waypoint then press D key (KSGF))

Descent

Direct to VNAV setup and capture



# Sample Scenario Flight Plan



**Departure: Palm Beach International,  
West Palm Beach, Florida**

**Destination: Lakeland Linder Regional,  
Lakeland, Florida**

**Reference: Normal Procedures, Section 4, POH/AFM**



## BEFORE TAKEOFF

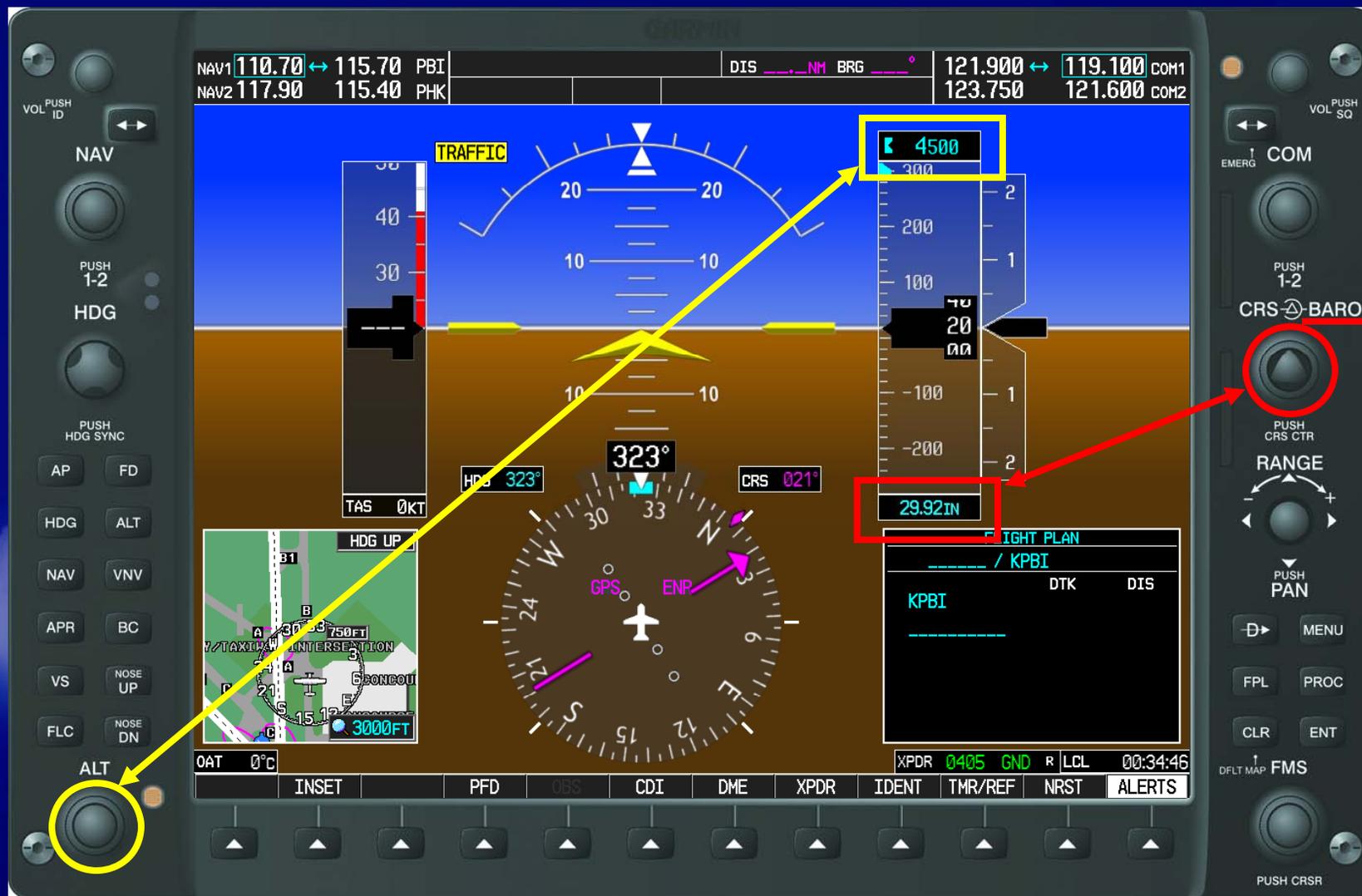
1. Parking Brake ..... SET
2. Pilot and Passenger Seat Backs ..... MOST UPRIGHT POSITION
3. Seats and Seat Belts ..... CHECK SECURE
4. Cabin Doors ..... CLOSED and LOCKED
5. Flight Controls ..... FREE and CORRECT
6. Flight Instruments (PFD) ..... CHECK (no red X's)
7. Altimeters:
  - a. PFD (BARO) ..... SET
  - b. Standby Altimeter ..... SET
8. ALT SEL ..... SET
9. Standby Flight Instruments ..... CHECK
10. Fuel Quantity ..... CHECK  
(verify level is correct)

### NOTE

Flight is not recommended when both fuel quantity indicators are in the yellow band range.

11. Mixture Control ..... RICH
12. FUEL SELECTOR Valve ..... SET BOTH
13. Autopilot ..... ENGAGE  
(push AP button on either PFD or MFD bezel)
14. Flight Controls ..... CHECK  
(verify autopilot can be overpowered in both pitch and roll axes)
15. A/P TRIM DISC Button ..... PRESS  
(verify autopilot disengages and aural alert is heard)
16. Flight Director ..... OFF  
(push FD button on either PFD or MFD bezel)
17. Elevator and Rudder Trim Controls ..... SET FOR TAKEOFF





## BEFORE TAKEOFF

1. Parking Brake ..... SET
2. Pilot and Passenger Seat Backs . . . MOST UPRIGHT POSITION
3. Seats and Seat Belts . . . . . CHECK SECURE
4. Cabin Doors . . . . . CLOSED and LOCKED
5. Flight Controls . . . . . FREE and CORRECT
6. Flight Instruments (PFD) . . . . . CHECK (no red X's)
7. Altimeters:
  - a. PFD (BARO) . . . . . SET
  - b. Standby Altimeter . . . . . SET
8. ALT SEL . . . . . SET
9. Standby Flight Instruments . . . . . CHECK
10. Fuel Quantity. . . . . CHECK  
(verify level is correct)

### NOTE

Flight is not recommended when both fuel quantity indicators are in the yellow band range.

11. Mixture Control . . . . . RICH
12. FUEL SELECTOR Valve . . . . . SET BOTH
13. Autopilot . . . . . ENGAGE  
(push AP button on either PFD or MFD bezel)
14. Flight Controls . . . . . CHECK  
(verify autopilot can be overpowered in both pitch and roll axes)
15. A/P TRIM DISC Button . . . . . PRESS  
(verify autopilot disengages and aural alert is heard)
16. Flight Director . . . . . OFF  
(push FD button on either PFD or MFD bezel)
17. Elevator and Rudder Trim Controls . . . . . SET FOR TAKEOFF



# Press "ENGINE" Softkey

The image shows a Garmin G1000 avionics display with a navigation map and engine parameters. The display is divided into several sections:

- Top Status Bar:** NAV1 110.70 115.70 PBI GS 0KT DTK \_\_\_° TRK 006° ETE \_\_\_:\_\_\_ 121.900 ↔ 119.100 COM1; NAV2 117.90 ↔ 115.40 PHK MAP - NAVIGATION MAP 123.750 121.600 COM2
- Left Column (Engine Parameters):** MAN IN 27.3, RPM 2080, FLOW GPH, OIL PRES, OIL TEMP, CHT, EGT, FUEL QTY GAL, ELECTRICAL (M BUS E 36.0 VOLTS 36.0, M BATT S 0.0 AMP 0.0).
- Center Map:** A navigation map showing the area around Palm Beach, Florida, with various airports and landmarks labeled.
- Right Column (Elevation and Controls):** ELEV (Ft) MAX 301 MIN 0, RANGE, PAN, MENU, PROC, ENT, FMS, PUSH CRSR.
- Bottom Row (Softkeys):** ENGINE, MAP, DCLTR, SHW CHRT, CHKLIST.

The "ENGINE" softkey is highlighted with a red circle.

# Press "SYSTEM" Softkey

The image shows a Garmin G1000 avionics display with various data fields and controls. The central display shows a navigation map of the Palm Beach area, including airports like KPBI and KNTS, and various landmarks. The left side of the display features several gauges: MAN IN (27.3), RPM (2030), FLOW GPH, OIL PRES, OIL TEMP, CHT, EGT, FUEL QTY GAL, and ELECTRICAL (M BUS E, M BATT S). The top of the display shows navigation data: NAV1 (110.70 ↔ 115.70), NAV2 (108.00 ↔ 115.40), GS (0KT), DTK, TRK (006°), ETE, COM1 (121.900 ↔ 119.100), and COM2 (123.750 ↔ 121.600). The bottom of the display has a row of softkeys: ENGINE, LEAN, SYSTEM (circled in red), and BACK. The right side of the display has a vertical stack of controls: VOL PUSH ID, VOL PUSH SQ, EMERG, COM, PUSH 1-2, CRS BARO, PUSH CRS CTR, RANGE, PUSH PAN, MENU, FPL, PROC, CLR, ENT, DFLT MAP, FMS, and PUSH CRSR.

# Press "GAL REM" Softkey



The image shows a Garmin G1000 avionics display with various data fields and controls. The display is divided into several sections:

- NAVIGATION MAP:** A central map showing the area around Palm Beach, Florida, with various airports and landmarks labeled. A red circle highlights the "GAL REM" softkey at the bottom of the map area.
- NAVIGATION DATA:** NAV1 110.70 ↔ 115.70 PBI GS 0KT DTK \_\_\_° TRK 006° ETE \_\_\_:\_\_\_ 121.900 ↔ 119.100 COM1  
NAV2 108.00 115.40 PHK MAP - NAVIGATION MAP 123.750 121.600 COM2
- ENGINE PARAMETERS:** MAN IN 27.3 RPM 2080 OIL PSI 60.4 OIL °F 215 ENG 0000.1 HRS VAC FUEL CALC FFLOW GPH 5.0 GAL USED 0.0 GAL REM 0 FUEL QTY GAL 0-30 F ELECTRICAL M BUS E 36.9 VOLTS 36.9 M BATT S 0.0 AMPS 0.0
- CONTROL PANEL:** Includes buttons for NAV, HDG, VNAV, APR, VS, FLC, ALT, COM, CRS, RANGE, PAN, MENU, PROC, ENT, FMS, and various softkeys like ENGINE, LEAN, SYSTEM, RST FUEL, GAL REM, and BACK.



# Press "64 GAL" Softkey

The image shows a Garmin G1000 avionics display with various data fields and controls. The display is divided into several sections:

- NAVIGATION MAP:** A central map showing the area around Palm Beach, Florida, with various airports and landmarks labeled. A red circle highlights the "64 GAL" softkey at the bottom of the map area.
- NAVIGATION DATA:** NAV1 110.70 ↔ 115.70 PBI GS 0KT DTK \_\_\_° TRK 006° ETE \_\_\_:\_\_\_ 121.900 ↔ 119.100 COM1  
NAV2 108.00 115.40 PHK MAP - NAVIGATION MAP 123.750 121.600 COM2
- ENGINE PARAMETERS:** MAN IN 27.3 RPM 2100 OIL PSI 60.6 OIL °F 210 ENG 0000.1 HRS VAC FUEL CALC FFLOW GPH 5.0 GAL USED 0.1 GAL REM 0 FUEL QTY GAL 0-30 F ELECTRICAL M BUS E 36.6 VOLTS 36.6 M BATT S 0.0 AMPS 0.0
- SOFTKEYS:** A row of softkeys at the bottom: ENGINE, LEAN, SYSTEM, -10 GAL, -1 GAL, +1 GAL, +10 GAL, 64 GAL (circled in red), 87 GAL, BACK.
- CONTROLS:** Various physical buttons and knobs on the left and right sides, including NAV, HDG, VNAV, APR, VS, FLC, ALT, COM, CRS, RANGE, PAN, MENU, PROC, ENT, FMS, and CRSR.

# Verify the GAL REM in the Fuel Calculator

The image shows a Garmin G1000 navigation display with the following data and controls:

- NAV Data:** NAV1 110.70 ↔ 115.70 PBI GS 0KT DTK \_\_\_° TRK 006° ETE \_\_\_:\_\_\_; NAV2 108.00 115.40 PHK MAP - NAVIGATION MAP; 121.900 ↔ 119.100 COM1; 123.750 121.600 COM2
- MAN IN:** 27.3
- RPM:** 2040
- Oil Pressure:** 57.4 PSI
- Oil Temp:** 200 °F
- Engine Time:** 0000.1 HRS
- Fuel Calc:** FFCAL 5.0 GPH, GAL USED 0.0, **GAL REM 64** (circled in red)
- Electrical:** 36.4 VOLTS, 0.0 AMPS
- Map:** Navigation map showing KPBI, Palm Beach, and surrounding areas. Elevation scale on the right shows 3010 FT MAX and 0 FT MIN.
- Bottom Panel:** ENGINE, LEAN, SYSTEM, -10 GAL, -1 GAL, +1 GAL, +10 GAL, 64 GAL, 87 GAL, BACK
- Controls:** NAV, HDG, VNAV, APR, VS, FLC, ALT, COM, CRS BARO, RANGE, PAN, MENU, PROC, ENT, FMS, CRSR



VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70	115.70	PBI GS	0KT	DTK	TRK 006°	ETE	121.900	119.100	COM1
NAV2 117.90	115.40	PHK					123.750	121.600	COM2

MAP - NAVIGATION MAP

MAN IN 27.3

RPM 1980

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E 36.6 VOLTS 36.6

M BATT S 0.0 AMPS 0.0

ELEV (FT)

MAX 164

MIN 26

280

200

120

90

70

50

30

20

10

Sea

-10

HDG UP

2NM

MAP WPT AUX NRST

VOL PUSH SQ

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

DFLT MAP FMS

PUSH CRSR

ENGINE

MAP

DCLTR

SHW CHRT

CHKLIST

VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70	115.70	PBI GS	0KT	DTK ___°	TRK 006°	ETE ___:	121.900 ↔ 119.100	COM1
NAV2 117.90	↔ 115.40	PHK		WPT - AIRPORT INFORMATION			123.750	121.600
NORTH UP								

MAN IN 27.3

RPM 1950

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E

36.9 VOLTS 36.9

M BATT S

0.0 AMPS 0.0

**AIRPORT**

KPBI PUBLIC

PALM BEACH INTL

WEST PALM BEACH FL

SE USA 19FT

N 26°40.99'

W 080°05.74'

AVGAS JET

UTC-5

**RUNWAYS**

09L-27R

10000FT x 150FT

HARD SURFACE

FULL TIME

**FREQUENCIES**

ATIS	RX	123.750
ASOS	RX	119.975
CLEARANCE		121.600
GROUND		121.900
TOWER		119.100
TOWER		118.750
UNICOM		122.950

VOL PUSH SQ

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

DFLT MAP FMS

PUSH CRSR

ENGINE

MAP

CHRT

INFO

DP

STAR

APR

WX

NOTAM

CHKLIST

**BEFORE TAKEOFF (Continued)**

- 18. Throttle Control ..... 1800 RPM
  - a. MAGNETOS Switch ..... CHECK  
(RPM drop should not exceed 175 RPM on either magneto or 50 RPM differential between magnetos)
  - b. Propeller Control ..... CYCLE  
(from high to low RPM; return to high RPM) (push full in)
  - c. VAC Indicator ..... CHECK
  - d. Engine Indicators ..... CHECK
  - e. Ammeters and Voltmeters ..... CHECK
- 19. Annunciators ..... CHECK  
(verify no annunciators are shown)
- 20. Throttle Control ..... CHECK IDLE
- 21. Throttle Control ..... 1000 RPM or LESS
- 22. Throttle Control Friction Lock ..... ADJUST
- 23. COM Frequency(s) ..... SET
- 24. NAV Frequency(s) ..... SET
- 25. FMS/GPS Flight Plan ..... AS DESIRED

**NOTE**

Check GPS availability on AUX-GPS STATUS page. No annunciation is provided for loss of GPS2.

- 26. XPDR ..... SET

(Continued Next Page)



VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70	115.70	PBI	GS 0KT	DTK ___°	TRK 006°	ETE ___:	121.900 ↔ 119.100	COM1	
NAV2 117.90	↔ 115.40	PHK	FPL - ACTIVE FLIGHT PLAN				123.750	121.600	COM2

MAN IN 27.3

RPM 2120

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E

37.5 VOLTS 37.5

M BATT S

0.0 AMPS 0.0

ACTIVE FLIGHT PLAN

----- / KPBI

	DTK	DIS	ALT
KPBI	-----		

CURRENT VNV PROFILE

ACTIVE VNV WPT -----FT at -----

VS TGT -----FPM FPA -----°

VS REQ -----FPM TIME TO TOD -----:

V DEV -----FT

VOL PUSH SQ

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

FMS

PUSH CRSR

ENGINE

MAP

LD WPT

VIEW

VNV PROF

CNCL VNV

VNV ⚙

ATK UPST

ACT LEG

SHW CHRT

CHKLIST

VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70	115.70	PBI GS	0KT	DTK ___°	TRK 006°	ETE ___:	121.900 ↔ 119.100	COM1
NAV2 117.90	↔ 115.40	PHK		FPL - ACTIVE FLIGHT PLAN			123.750	121.600 COM2

MAN IN 27.3

RPM 2050

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E 37.7 VOLTS 37.7

M BATT S 0.0 AMPS 0.0

ACTIVE FLIGHT PLAN

----- / KPBI

	DTK	DIS	ALT	FUEL REM	ETE	ETA	BRG
KPBI	-----						

HDG UP

CURRENT VNV PROFILE

ACTIVE VNV WPT -----FT at -----

VS TGT -----FPM FPA -----°

VS REQ -----FPM TIME TO TOD -----:

V DEV -----FT

VOL PUSH SQ

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

DFLT MAP FMS

PUSH CRSR

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VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70	115.70	PBI GS	0KT	DTK ___°	TRK 006°	ETE ___:	121.900 ↔ 119.100	COM1
NAV2 117.90	↔ 115.40	PHK		FPL - ACTIVE FLIGHT PLAN			123.750	121.600
COM2								

MAN IN 27.3

RPM 2100

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E

36.0 VOLTS 36.0

M BATT S

0.0 AMPS 0.0

ACTIVE FLIGHT PLAN

----- / KPBI

	DTK	DIS	ALT	FUEL REM	ETE	ETA	BRG
KPBI			-----FT				

CURRENT VNV PROFILE

ACTIVE VNV WPT -----FT at -----

VS TGT -----FPM FPA -----°

VS REQ -----FPM TIME TO TOD -----

V DEV -----FT

VOL PUSH SQ

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

FMS

PUSH CRSR

ENGINE

MAP

LD WPT

VIEW

VNV PROF

CNCL VNV

VNV ⚙

ATK OPST

ACT LEG

SHW CHRT

CHKLIST

VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70	115.70	PBI	GS 0KT	DTK ___°	TRK 006°	ETE ___:	121.900 ↔ 119.100	COM1	
NAV2 117.90	↔ 115.40	PHK	FPL - ACTIVE FLIGHT PLAN				123.750	121.600	COM2

MAN IN 27.3

RPM 1980

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E

39.3 VOLTS 39.3

M BATT S

0.0 AMPS 0.0

ACTIVE FLIGHT PLAN

----- / KPBI

DTK	DIS	ALT	FUEL REM	ETE	ETA	BRG
KPBI	[Progress Bar]					

CURRENT VNV PROFILE

ACTIVE VNV WPT \_\_\_\_\_FT at \_\_\_\_\_

VS TGT \_\_\_\_\_FPM FPA \_\_\_\_\_°

VS REQ \_\_\_\_\_FPM TIME TO TOD \_\_\_\_\_

V DEV \_\_\_\_\_FT

VOL PUSH SQ

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

FMS

PUSH CRSR

ENGINE

MAP

LD WPT

VIEW

VNV PROF

CNCL VNV

VNV ⚙

ATK OPST

ACT LEG

SHW CHRT

CHKLIST

VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70	115.70	PBI	GS 0KT	DTK ___°	TRK 006°	ETE ___:	121.900 ↔ 119.100	COM1	
NAV2 117.90	↔ 115.40	PHK	FPL - ACTIVE FLIGHT PLAN				123.750	121.600	COM2

MAN IN 27.3

RPM 1960

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E

39.1 VOLTS 39.1

M BATT S

0.0 AMPS 0.0

ACTIVE FLIGHT PLAN

----- / KPBI

	DTK	DIS	ALT	FUEL REM
KPBI	-----	-----	-----	-----

MAP

LOCATION

BRG \_\_\_°

DIS \_\_\_NM

Press "ENT" to accept

WAYPOINT INFORMATION

IDENT. FACILITY. CITY

-----

-----

-----

VOL PUSH SQ

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

FMS

PUSH CRSR

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VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70	115.70	PBI	GS 0KT	DTK ___°	TRK 006°	ETE ___:	121.900 ↔ 119.100	COM1	
NAV2 117.90	↔ 115.40	PHK	FPL - ACTIVE FLIGHT PLAN				123.750	121.600	COM2

MAN IN 27.3

RPM 2070

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E

38.8 VOLTS 38.8

M BATT S

0.0 AMPS 0.0

ACTIVE FLIGHT PLAN

----- / KPBI

	DTK	DIS	ALT	FUEL REM
KPBI	-----			

WAYPOINT INFORMATION

IDENT, FACILITY, CITY

-----

KHRABROVO

KALININGRAD

MAP

LOCATION

BRG 042° RUSS/BELRS

DIS 4465NM N 54°53.90' E 020°37.70'

Press "ENT" for dups

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

FMS

PUSH CRSR

VOL PUSH SQ

LD AIRWY

NAV VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70	115.70	PBI	GS 0KT	DTK ___°	TRK 006°	ETE ___:	121.900 ↔ 119.100	COM1	
NAV2 117.90	↔ 115.40	PHK	FPL - ACTIVE FLIGHT PLAN				123.750	121.600	COM2

MAN IN 27.3

RPM 2090

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

38.7 VOLTS 38.7

0.0 AMPS 0.0

ACTIVE FLIGHT PLAN

----- / KPBI

	DTK	DIS	ALT	FUEL REM
KPBI	-----			

WAYPOINT INFORMATION

IDENT, FACILITY, CITY

K-----

KHRABROVO

KALININGRAD

MAP NORTH UP

LOCATION

BRG 042° RUSS/BELRS

DIS 4465NM N 54°53.90' E 020°37.70'

Press "ENT" for dups

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

FMS

PUSH CRSR

LD AIRW

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NAV VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70	115.70	PBI	GS 0KT	DTK ___°	TRK 006°	ETE ___:	121.900 ↔ 119.100	COM1	
NAV2 117.90	↔ 115.40	PHK	FPL - ACTIVE FLIGHT PLAN				123.750	121.600	COM2

ACTIVE FLIGHT PLAN

----- / KPBI

	DTK	DIS	ALT	FUEL REM
KPBI	-----			

WAYPOINT INFORMATION

IDENT. FACILITY. CITY

KL-----

SCHEFFERVILLE

SCHEFFERVILLE QC

MAP NORTH UP

15NM

LOCATION

BRG 021° CANADA

DIS 1786NM N 54°50.97'

W066°51.73'

Press "ENT" for dups

CURRENT VNV P

ACTIVE VNV WPT

VS TGT

VS REQ

V DEV

MAN IN 27.3

RPM 2050

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E

37.5 VOLTS 37.5

M BATT S

0.0 AMPS 0.0

30NM

EMERG VOL PUSH SQ

COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

FMS

PUSH CRSR

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NAV1 110.70 115.70 PBI GS 0KT DTK \_\_\_° TRK 006° ETE \_\_\_:\_\_\_

NAV2 117.90 ↔ 115.40 PHK FPL - ACTIVE FLIGHT PLAN

121.900 ↔ 119.100 COM1

123.750 121.600 COM2

MAN IN 27.3

RPM 2090

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E 37.1 VOLTS 37.1

M BATT S 0.0 AMPS 0.0

ACTIVE FLIGHT PLAN

----- / KPBI

	DTK	DIS	ALT	FUEL REM
KPBI				

MAP

WAYPOINT INFORMATION

IDENT. FACILITY. CITY

KLAL  
LAKELAND LINDER REGL  
LAKELAND FL

LOCATION

BRG 314° SE USA

DIS 129NM N 27°59.33'  
W 082°01.11'

Press "ENT" to accept

EMERG COM

PUSH 1-2 CRS BARO

PUSH CRS CTR RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

FMS

PUSH CRSR

NAV VOL PUSH ID

NAV

PUSH 1-2 HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV VOL PUSH SQ

EMERG COM

PUSH 1-2 CRS BARO

PUSH CRS CTR RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

FMS

PUSH CRSR

VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70	115.70	PBI GS	0KT	DTK 314°	TRK 006°	ETE	121.900 ↔ 119.100	COM1
NAV2 117.90	115.40	PHK		FPL - ACTIVE FLIGHT PLAN			123.750	121.600 COM2

ACTIVE FLIGHT PLAN

KPBI / KLAL

	DTK	DIS	ALT	FUEL REM	ETE	ETA	BRG
KPBI			_____FT				
KLAL	314°	129NM	_____FT	_____GL/_____	_____	_____LCL	314°

MAN IN 27.3

RPM 1990

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E

36.7 VOLTS 36.7

M BATT S

0.0 AMPS 0.0

CURRENT VNV PROFILE

ACTIVE VNV WPT \_\_\_\_\_FT at \_\_\_\_\_

VS TGT \_\_\_\_\_FPM FPA \_\_\_\_\_°

VS REQ \_\_\_\_\_FPM TIME TO TOD \_\_\_\_\_

V DEV \_\_\_\_\_FT

ENGINE	MAP	LD WPT	VIEW	VNV PROF	CNCL VNV	VNV ⚙	ATK UPST	ACT LEG	SHW CHRT	CHKLIST
--------	-----	--------	------	----------	----------	-------	----------	---------	----------	---------

VOL PUSH SQ

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

DFLT MAP FMS

PUSH CRSR

NAV VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70	115.70	PBI GS	0KT	DTK 314°	TRK 006°	ETE	121.900 ↔ 119.100	COM1
NAV2 117.90	↔ 115.40	PHK		FPL - ACTIVE FLIGHT PLAN			123.750	121.600 COM2

MAN IN 27.3

RPM 2120

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E 38.8 VOLTS 38.8

M BATT S 0.0 AMPS 0.0

ACTIVE FLIGHT PLAN

KPBI / KLAL

	DTK	DIS	ALT	FUEL REM
KPBI			----FT	
KLAL	314°	129NM	----FT	----GL/----

PAGE MENU

OPTIONS

- Store Flight Plan
- Invert Flight Plan
- Delete Flight Plan
- Load Airway
- Collapse Airways
- Remove Departure
- Remove Arrival
- Remove Approach

Press the FMS CRSR knob to return to base page

CURRENT VNV

ACTIVE VNV WPT

VS TGT

VS REQ

V DEV

TIME TO TOD

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

FMS

PUSH CRSR

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VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70	115.70	PBI GS	0KT	DTK 314°	TRK 006°	ETE	121.900	119.100	COM1
NAV2 117.90	115.40	PHK		FPL - ACTIVE FLIGHT PLAN			123.750	121.600	COM2

ACTIVE FLIGHT PLAN

KPBI / KLAL

	DTK	DIS	ALT	FUEL REM	ETE	ETA	BRG
KPBI			_____FT				
KLAL	314°	129NM	_____FT	_____GL/_____	_____	_____LCL	314°

MAN IN 27.3

RPM 2010

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E 39.2 VOLTS 39.2

M BATT S 0.0 AMPS 0.0

Store to flight plan?

OK or  CANCEL

CURRENT VNV

ACTIVE VNV WPT

VS TGT

VS REQ

V DEV

VOL PUSH SQ

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

DFLT MAP FMS

PUSH CRSR

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NAV1 110.70 115.70 PBI GS 0KT DTK 314° TRK 006° ETE \_\_\_:\_\_\_  
 NAV2 117.90 ↔ 115.40 PHK FPL - FLIGHT PLAN CATALOG 121.900 ↔ 119.100 COM1  
 123.750 121.600 COM2

VOL PUSH ID  
 VOL PUSH SQ  
 EMERG COM  
 PUSH 1-2  
 CRS BARO  
 PUSH CRS CTR  
 RANGE  
 PUSH PAN  
 MENU  
 FPL PROC  
 CLR ENT  
 DFLT MAP FMS  
 PUSH CRSR

NAV  
 HDG  
 AP FD  
 HDG ALT  
 NAV VNV  
 APR BC  
 VS NOSE UP  
 FLC NOSE DN  
 ALT

MAN IN 27.3  
RPM 1960  
FFLOW GPH  
OIL PRES  
OIL TEMP  
CHT  
EGT  
FUEL QTY GAL  
ELECTRICAL  
M BUS E  
39.2 VOLTS 39.2  
M BATT S  
0.0 AMPS 0.0

FLIGHT PLAN CATALOG  
USED 1 EMPTY 98

FLIGHT PLAN LIST

1	KPBI / KLAL
2	----- / -----
3	----- / -----
4	----- / -----
5	----- / -----
6	----- / -----
7	----- / -----
8	----- / -----
9	----- / -----
10	----- / -----
11	----- / -----
12	----- / -----

FLIGHT PLAN INFO

DEPARTURE  
DESTINATION  
TOTAL DISTANCE  
ENROUTE SAFE ALT

ENGINE  
MAP  
NEW  
ACTIVE  
INVERT  
EDIT  
COPY  
DELETE  
CHKLIST

30NM FPL

PUSH CRSR



Model 182T

NAV III Avionics  
GFC 700 AFCS

Pilot's Checklist

## BEFORE TAKEOFF (Continued)

- |  |                  |
|--|------------------|
| 18. Throttle Control .....   | 1800 RPM         |
| a. MAGNETOS Switch .....   | CHECK            |
| (RPM drop should not exceed 175 RPM on either magneto or 50 RPM differential between magnetos) |                  |
| b. Propeller Control .....   | CYCLE            |
| (from high to low RPM; return to high RPM) (push full in)                                      |                  |
| c. VAC Indicator .....   | CHECK            |
| d. Engine Indicators .....   | CHECK            |
| e. Ammeters and Voltmeters .....   | CHECK            |
| 19. Annunciators .....   | CHECK            |
| (verify no annunciators are shown)   |                  |
| 20. Throttle Control .....   | CHECK IDLE       |
| 21. Throttle Control .....   | 1000 RPM or LESS |
| 22. Throttle Control Friction Lock .....   | ADJUST           |
| 23. COM Frequency(s) .....   | SET              |
| 24. NAV Frequency(s) .....   | SET              |
| 25. FMS/GPS Flight Plan .....  | AS DESIRED       |

### NOTE

Check GPS availability on AUX-GPS STATUS page. No annunciation is provided for loss of GPS2.

- |               |     |
|---------------|-----|
| 26. XPDR..... | SET |
|---------------|-----|

(Continued Next Page)



# Before takeoff – Transponder Set

The image shows a Garmin G1000 cockpit display with various flight instruments and controls. The display is divided into several sections:

- Top Panel:** NAV1 110.70 ↔ 115.70 PBI, NAV2 117.90 115.40 PHK, KPBI → KLAL, DIS 129NM BRG 314°, 121.900 ↔ 119.100 COM1, 123.750 121.600 COM2.
- Center Display:** Traffic display, HDG 323°, CRS 314°, TAS 0KT, and a heading scale.
- Right Display:** Altitude display showing 4500, 2000, and 29.92IN.
- Bottom Left:** A map display showing the current location and surrounding terrain.
- Bottom Right:** A flight plan display showing KPBI / KLAL, DTK, and DIS 129NM.
- Bottom Panel:** A row of buttons including INSET, PFD, OBS, CDI, XPDR (highlighted with a red box), IDENT, TMR/REF, NRST, and ALERTS.











VOL PUSH ID

VOL PUSH SQ

NAV1 110.70 115.70 PBI GS 140KT DTK 313° TRK 313° ETE 35:26 121.900 ↔ 119.100 COM1

NAV2 117.90 ↔ 115.40 PHK JLST - CHECKLIST 123.750 121.600 COM2

MAN IN 27.3

RPM 2110

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E 36.4 VOLTS 36.4

M BATT S 0.0 AMPS 0.0

GROUP ENROUTE

CHECKLIST CRUISE

- 1. Power. . . . . 15 - 23 in.hg. at 2000 - 2400 RPM (no more than 80% power recommended)
- 2. Elevator and Rudder Trim Controls. . . . . ADJUST
- 3. Mixture Control. . . . . LEAN (for desired performance or economy)
- 4. Cowl Flaps . . . . . CLOSE
- 5. FMS/GPS. . . . . REVIEW and BRIEF (OBS/SUSP SOFTKEY OPERATION for holding pattern procedure (IFR))

GO TO NEXT CHECKLIST?

EMERG COM

PUSH 1-2 CRS BARO

PUSH CRS CTR RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

DFLT MAP FMS

PUSH CRSR

ENGINE

RETURN

JLST

EXIT

EMERGCY

# Engine Indication System

## Skylane-182T



# Engine Indication System

## Skylane-182T



ENGINE LEAN SYSTEM CYL SLC ASSIST

# Engine Indication System

## Skylane-182T



# Engine Indication System

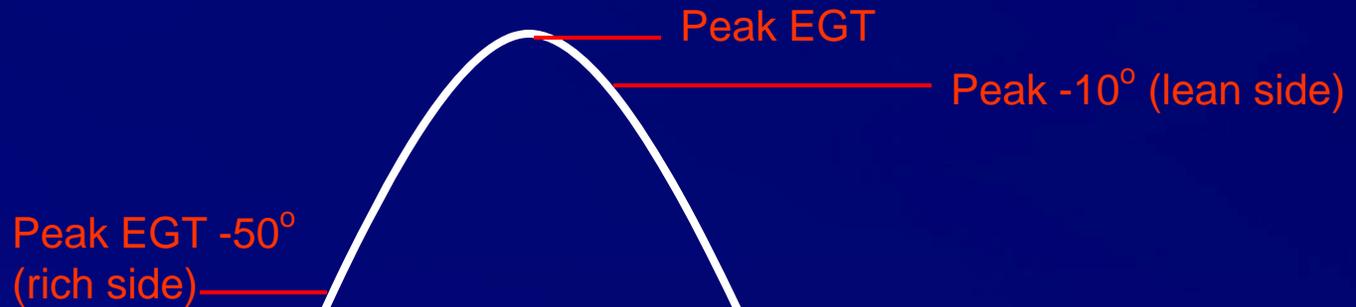
## Skylane-182T



ENGINE LEAN SYSTEM CYL SLCT ASSIST

# Engine Indication System

## Skylane-182T



ENGINE LEAN SYSTEM CYL SLCT ASSIST

# Engine Indication System

## StationAir-T206



ENGINE LEAN SYSTEM CYL SLCT ASSIST





VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70	115.70	PBI GS	83KT	DTK 313°	TRK 313°	ETE 01:15	121.900 ↔ 119.100 COM1
NAV2 117.90	↔ 115.40	PHK		MAP - TRAFFIC MAP			123.750 121.600 COM2

OPERATING

TNA MUTE OFF

20KT

HDG UP

MAP WPT AUX NRST
□ □ □ □

VOL PUSH SQ

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

→ MENU

FPL PROC

CLR ENT

DFLT MAP FMS

PUSH CRSR

ENGINE
STANDBY
OPERATE
TNA MUTE
CHKLIST

The display is divided into several sections:

- Top Status Bar:**
  - NAV1: 110.70, NAV2: 117.90
  - 115.70 PBI GS 83KT DTK 313° TRK 313° ETE 01:14
  - 121.900 ↔ 119.100 COM1
  - 123.750 121.600 COM2
  - MAP - STORMSCOPE®
- Left Column (Engine & Electrical):**
  - MAN IN: 27.3
  - RPM: 1930
  - FFLOW GPH: 0 to 22
  - OIL PRES: 0 to 22
  - OIL TEMP: 0 to 22
  - CHT: 0 to 22
  - EGT: 0 to 22
  - FUEL QTY GAL: 0 to 30
  - ELECTRICAL: M BUS E 39.2 VOLTS 39.2; M BATT S 0.0 AMPS 0.0
- Center Map:**
  - Stormscope Mode: CELL
  - Map showing KLAL and KPBI airports.
  - Range rings: 100NM, 200NM.
  - Strike Rate: 0
  - 20KT HDG UP
- Right Column (Navigation & Controls):**
  - NAV VOL PUSH ID
  - NAV
  - PUSH 1-2 HDG
  - PUSH HDG SYNC
  - AP, FD, HDG, ALT, NAV, VNV, APR, BC, VS, NOSE UP, FLC, NOSE DN, ALT
  - COM VOL PUSH SQ
  - EMERG COM
  - PUSH 1-2 CRS BARO
  - PUSH CRS CTR RANGE
  - PUSH PAN
  - MENU, FPL, PROC, CLR, ENT
  - FMS DFLT MAP
  - PUSH CRSR
- Bottom Row (Navigation & Mode):**
  - ENGINE, MODE, VIEW, CLEAR, MAP WPT AUX NRST, CHKLIST

VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70	115.70	PBI	GS 83KT	DTK 313°	TRK 313°	ETE 01:14	121.900 ↔ 119.100	COM1
NAV2 117.90	↔ 115.40	PHK	MAP - WEATHER DATA LINK				123.750	121.600
							→ 20KT	NORTH UP

MAN IN 27.3

RPM 1990

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E 38.0 VOLTS 38.0

M BATT S 0.0 AMPS 0.0

NEXRAD-US

AGE: 13min

RAIN

MIX

SNOW

CLD TOP

AGE: 13min

XM LTNG

AGE: 13min

CELL MOV

AGE: 13min

SIGMET

04/01 00:53

AIRMET

04/01 00:53

METAR-US

AGE: 43min

ENGINE	NEXRAD	ECHO TOP	CLD TOP	LTNG	CELL MOV	SIG/AIR	METAR	LEGEND	MORE WX	CHKLIST
--------	--------	----------	---------	------	----------	---------	-------	--------	---------	---------

VOL PUSH SQ

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

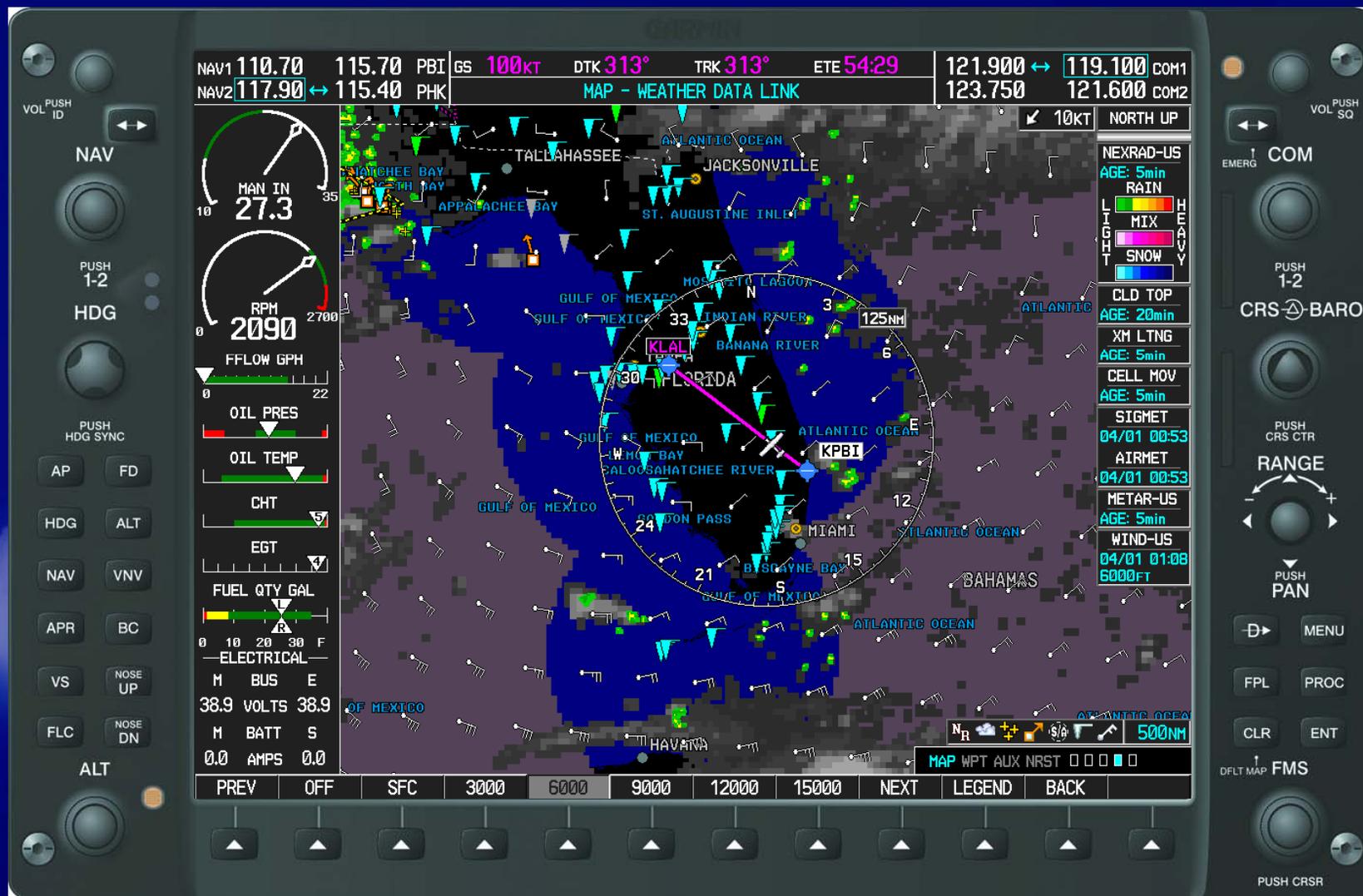
FPL PROC

CLR ENT

FMS

PUSH CRSR





VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70	115.70	PBI	GS 100KT	DTK 313°	TRK 313°	ETE 54:11	121.900 ↔ 119.100	COM1	
NAV2 117.90	↔ 115.40	PHK	WPT - AIRPORT INFORMATION				123.750	121.600	COM2

MAN IN 27.3

RPM 1940

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E

39.0 VOLTS 39.0

M BATT S

0.0 AMPS 0.0

NORTH UP

X58

500FT

AIRPORT

X58 PUBLIC

INDIANTOWN

INDIANTOWN FL

SE USA 30FT

N 27°02.19'

W 080°26.40'

AVGAS

UTC-5

RUNWAYS

13-31

6300FT x 75FT

TURF SURFACE

NO LIGHTS

FREQUENCIES

UNICOM 123.000

MAP WPT AUX NRST

VOL PUSH SQ

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

DFLT MAP FMS

PUSH CRSR

ENGINE

MAP

CHRT

INFO

DP

STAR

APR

WX

NOTAM

CHKLIST

VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70	115.70	PBI	GS 140KT	DTK 313°	TRK 313°	ETE 36:10	121.900 ↔ 119.100	COM1	
NAV2 117.90	↔ 115.40	PHK	AUX - TRIP PLANNING				123.750	121.600	COM2

MAN IN 27.3

RPM 1950

OIL PSI 58.0

OIL °F 200

ENG 0004.0 HRS

VAC

FUEL CALC

FFLOW GPH 15.0

GAL USED 0.5

GAL REM 50

FUEL QTY GAL

ELECTRICAL

M BUS E 38.3 VOLTS 38.3

M BATT S 0.0 AMPS 0.0

INPUT DATA

PAGE MODE - AUTOMATIC

FPL 00	LEG REM	CALIBRATED AS	140KT
P.POS	→ KLAL	IND ALTITUDE	18FT
DEP TIME	01:16LCL	PRESSURE	29.92IN
GS	140KT	TOTAL AIR TEMP	0°C
FUEL FLOW	15.0GL/HR		
FUEL ONBOARD	50GL		

TRIP STATS		FUEL STATS		OTHER STATS	
DTK	---	EFFICIENCY	9.3	DENSITY ALT	-----FT
DIS	84.3NM	TOTAL ENDUR	03:18	TRUE AIRSPEED	140KT
ETE	36:08	REM FUEL	40GL		
ETA	01:52LCL	REM ENDUR	02:41		
ESA	3100FT	FUEL REQ	9.0GL		
SUNRISE	11:18LCL	TOTAL RANGE	462NM		
SUNSET	23:45LCL				

VOL PUSH SQ

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

FMS

PUSH CRSR

ENGINE LEAN SYSTEM

RST FUEL GAL REM

MAP WPT AUX NRST

BACK

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NAV1 110.70 115.70 PBI GS 140KT DTK 313° TRK 313° ETE 35:48

NAV2 117.90 ↔ 115.40 PHK

**NRST - NEAREST FREQUENCIES**

121.900 ↔ 119.100 COM1

123.750 121.600 COM2

MAN IN 27.3

RPM 2030

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E 37.4 VOLTS 37.4

M BATT S 0.0 AMPS 0.0

NEAREST ARTCC

1 MIAMI

BRG 168° DIS 23NM

132.450

133.550

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

FMS

PUSH CRSR

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NEAREST FSS

1 MIAMI

BRG 174° DIS 22NM

122.100 TX

115.400 RX PHK

NEAREST WX

KOBE	AWOS	118.675
ZIS	AWOS	124.175
KSUA	ATIS	134.475
KSUA	AWOS	134.475
KFPR	ATIS	134.825
KVRB	ATIS	132.500
KVRB	ASOS	132.500
KSEF	AWOS	119.475

ENGINE

MAP

ARTCC

FSS

WX

MAP WPT AUX NRST

CHKLIST

VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70	115.70	PBI GS	140KT	DTK 313°	TRK 313°	ETE 37:24	121.900 ↔ 119.100	COM1	
NAV2 117.90	115.40	PHK		FPL - ACTIVE FLIGHT PLAN			123.750	121.600	COM2

ACTIVE FLIGHT PLAN

KLAL

	DTK	DIS	ALT	FUEL REM	ETE	ETA	BRG
KLAL	313°	87.3NM	-----FT	35GL/02:20	37:24	02:14LCL	313°

MAN IN 27.3

RPM 1970

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E

36.1 VOLTS 36.1

M BATT S

0.0 AMPS 0.0

CURRENT VNV PROFILE

ACTIVE VNV WPT -----FT at -----

VS TGT -----FPM FPA -----°

VS REQ -----FPM TIME TO TOD -----

V DEV -----FT

ENGINE

MAP

LD WPT

VIEW

VNV PROF

CNCL VNV

VNV ⚙

ATK OFST

ACT LEG

SHW CHRT

CHKLIST

VOL PUSH SQ

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

DFLT MAP FMS

PUSH CRSR

VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70	115.70	PBI GS	140KT	DTK 313°	TRK 313°	ETE 36:52	121.900 ↔ 119.100	COM1
NAV2 117.90	↔ 115.40	PHK		FPL - ACTIVE FLIGHT PLAN			123.750	121.600
COM2								

MAN IN 27.3

RPM 2010

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E 37.6 VOLTS 37.6

M BATT S 0.0 AMPS 0.0

ACTIVE FLIGHT PLAN

KLAL / KLAL

	DTK	DIS	ALT	FUEL REM	ETE	ETA	BRG
KLAL	313°	86.0NM	-----FT	35GL/02:20	36:51	02:14LCL	313°

CURRENT VNV PROFILE

ACTIVE VNV WPT -----FT at -----

VS TGT -----FPM FPA -----°

VS REQ -----FPM TIME TO TOD -----

V DEV -----FT

VOL PUSH SQ

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

FMS

PUSH CRSR

ENGINE

MAP

LD WPT

VIEW

VNV PROF

CNCL VNV

VNV D\*

ATK OFST

ACT LEG

SHW CHRT

CHKLIST

VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70	115.70	PBI	GS 146KT	DTK 304°	TRK 278°	ETE 12:55	121.900 ↔ 119.100	COM1	
NAV2 117.90	↔ 115.40	PHK	FPL - ACTIVE FLIGHT PLAN				123.750	121.600	COM2

MAN IN 27.3

RPM 1930

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

38.7 VOLTS 38.7

M BUS E

0.0 AMPS 0.0

M BATT S

ACTIVE FLIGHT PLAN

KPBI / KLAL

	DTK	DIS	ALT	FUEL REM	ETE	ETA	BRG
KPBI			_____FT				
USR001	304°	31.3NM	_____FT	41GL/02:44	12:53	01:50LCL	292°
KLAL	324°	57.0NM	_____FT	35GL/02:20	23:28	02:14LCL	313°

CURRENT VNV PROFILE

ACTIVE VNV WPT \_\_\_\_\_FT at \_\_\_\_\_

VS TGT \_\_\_\_\_FPM FPA \_\_\_\_\_°

VS REQ \_\_\_\_\_FPM TIME TO TOD \_\_\_\_\_

V DEV \_\_\_\_\_FT

VOL PUSH SQ

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

FMS

PUSH CRSR

ENGINE MAP LD WPT VIEW VNV PROF CNCL VNV VNV D+ ATK OFST ACT LEG SHW CHRT CHKLIST

VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70	115.70	PBI GS	115KT	DTK 324°	TRK 327°	ETE 17:25	121.900 ↔ 119.100	COM1	
NAV2 117.90	115.40	PHK		FPL - ACTIVE FLIGHT PLAN			123.750	121.600	COM2

MAN IN 27.3

RPM 1960

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E

38.3 VOLTS 38.3

M BATT S

0.0 AMPS 0.0

ACTIVE FLIGHT PLAN

KPBI / KLAL

	DTK	DIS	ALT	FUEL REM	ETE	ETA	BRG
KPBI	---	---	---FT	---	---	---	---
USR001	---	---	---FT	---	---	---	---
KLAL	324°	33.4NM	---FT	33GL/02:12	17:25	02:11LCL	324°

CURRENT VNV PROFILE

ACTIVE VNV WPT ---FT at ---

VS TGT ---FPM FPA ---°

VS REQ ---FPM TIME TO TOD ---

V DEV ---FT

VOL PUSH SQ

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

FMS

PUSH CRSR

ENGINE MAP LD WPT VIEW VNV PROF CNCL VNV VNV D+ ATK OFST ACT LEG SHW CHRT CHKLIST

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VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70	115.70	PBI GS	138KT	DTK 324°	TRK 323°	ETE 12:56	121.900 ↔ 119.100	COM1	
NAV2 117.90	115.40	PHK		FPL - ACTIVE FLIGHT PLAN			123.750	121.600	COM2

MAN IN 27.3

RPM 1980

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E

36.1 VOLTS 36.1

M BATT S

0.0 AMPS 0.0

ACTIVE FLIGHT PLAN

KPBI / KLAL

	DTK	DIS	ALT	FUEL REM	ETE	ETA	BRG
KPBI	---	---	---FT	---	---	---	---
USR001	---	---	---FT	---	---	---	---
KLAL	324°	29.8NM	---FT	37GL/02:26	12:57	02:08LCL	324°

CURRENT VNV PROFILE

ACTIVE VNV WPT ---FT at ---

VS TGT ---FPM FPA ---°

VS REQ ---FPM TIME TO TOD ---

V DEV ---FT

VOL PUSH SQ

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

FMS

PUSH CRSR

ENGINE MAP LD WPT VIEW VNV PROF CNCL VNV VNV D+ ATK OFST ACT LEG SHW CHRT CHKLIST

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VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70	115.70	PBI GS	138KT	DTK 324°	TRK 323°	ETE 12:38	121.900 ↔ 119.100	COM1	
NAV2 117.90	↔ 115.40	PHK		FPL - ACTIVE FLIGHT PLAN			123.750	121.600	COM2

MAN IN 27.3

RPM 2050

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E

35.9 VOLTS 35.9

M BATT S

0.0 AMPS 0.0

ACTIVE FLIGHT PLAN

KPBI / KLAL

	DTK	DIS	ALT	FUEL REM	ETE	ETA	BRG
KPBI	---	---	----FT	---	---	---	---
USR001	---	---	----FT	---GL/---	---	---LCL	---
KLAL	324°	29.1NM	01000FT	37GL/02:26	12:38	02:08LCL	324°

EMERG

COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

FMS

PUSH CRSR

CURRENT VNV PROFILE

ACTIVE VNV WPT ----FT at ----

VS TGT ----FPM FPA ----°

VS REQ ----FPM TIME TO TOD ---:

V DEV ----FT

VOL PUSH SQ

PUSH HDG SYNC

PUSH PAN

PUSH CRSR

ENGINE

MAP

LD WPT

VIEW

VNV PROF

CNCL VNV

VNV Ⓢ

ATK OFST

ACT LEG

SHW CHRT

CHKLIST

VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70	115.70	PBI	GS 138KT	DTK 324°	TRK 324°	ETE 12:32	121.900 ↔ 119.100	COM1	
NAV2 117.90	↔ 115.40	PHK	FPL - ACTIVE FLIGHT PLAN				123.750	121.600	COM2

MAN IN 27.3

RPM 1990

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E

36.1 VOLTS 36.1

M BATT S

0.0 AMPS 0.0

ACTIVE FLIGHT PLAN

KPBI / KLAL

	DTK	DIS	ALT	FUEL REM	ETE	ETA	BRG
KPBI	---	---	---FT	---	---	---	---
USR001	---	---	---FT	---GL/---	---	---LCL	---
KLAL	324°	28.9NM	MSL	37GL/02:26	12:32	02:08LCL	324°

CURRENT VNV PROFILE

ACTIVE VNV WPT ---FT at ---

VS TGT ---FPM FPA ---°

VS REQ ---FPM TIME TO TOD ---

V DEV ---FT

VOL PUSH SQ

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

FMS

PUSH CRSR

ENGINE

MAP

LD WPT

VIEW

VNV PROF

CNCL VNV

VNV Ⓢ

ATK OFST

ACT LEG

SHW CHRT

CHKLIST

VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70	115.70	PBI	GS 138KT	DTK 324°	TRK 324°	ETE 12:26	121.900 ↔ 119.100	COM1	
NAV2 117.90	↔ 115.40	PHK	FPL - ACTIVE FLIGHT PLAN				123.750	121.600	COM2

MAN IN 27.3

RPM 1930

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E

36.3 VOLTS 36.3

M BATT S

0.0 AMPS 0.0

ACTIVE FLIGHT PLAN

KPBI / KLAL

	DTK	DIS	ALT	FUEL REM	ETE	ETA	BRG
KPBI	---	---	---FT	---	---	---	---
USR001	---	---	---FT	---GL/---	---	---LCL	---
KLAL	324°	28.6NM	AGL	37GL/02:26	12:25	02:08LCL	324°

CURRENT VNV PROFILE

ACTIVE VNV WPT ---FT at ---

VS TGT ---FPM FPA ---°

VS REQ ---FPM TIME TO TOD ---

V DEV ---FT

VOL PUSH SQ

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

FMS

PUSH CRSR

ENGINE MAP LD WPT VIEW VNV PROF CNCL VNV VNV Ⓢ ATK OFST ACT LEG SHW CHRT CHKLIST

VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70	115.70	PBI GS	138KT	DTK 324°	TRK 324°	ETE 12:16	121.900 ↔ 119.100	COM1	
NAV2 117.90	↔ 115.40	PHK		FPL - ACTIVE FLIGHT PLAN			123.750	121.600	COM2

MAN IN 27.4

RPM 2020

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E  
36.7 VOLTS 36.7

M BATT S  
0.0 AMPS 0.0

ACTIVE FLIGHT PLAN

KPBI / KLAL

	DTK	DIS	ALT	FUEL REM	ETE	ETA	BRG
KPBI	---	---	----FT	---	---	---	---
USR001	---	---	----FT	---GL/---	---	---LCL	---
KLAL	324°	28.2NM	1100FT	37GL/02:26	12:15	02:08LCL	324°

CURRENT VNV PROFILE

ACTIVE VNV WPT 1100FT at KLAL

VS TGT -610FPM FPA -2.5°

VS REQ ----FPM TIME TO TOD 06:41

V DEV ----FT

VOL PUSH SQ

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

FMS

PUSH CRSR

ENGINE

MAP

LD WPT

VIEW

VNV PROF

CNCL VNV

VNV ↗

ATK OFST

ACT LEG

SHW CHRT

CHKLIST

VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70	115.70	PBI GS	138KT	DTK 324°	TRK 324°	ETE 12:04	121.900 ↔ 119.100	COM1
NAV2 117.90	↔ 115.40	PHK		FPL - ACTIVE FLIGHT PLAN			123.750	121.600
COM2								

MAN IN 27.4

RPM 2120

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E

37.0 VOLTS 37.0

M BATT S

0.0 AMPS 0.0

ACTIVE FLIGHT PLAN

KPBI / KLAL

	DTK	DIS	ALT	FUEL REM	ETE	ETA	BRG
KPBI	---	---	----FT	---	---	---	---
USR001	---	---	----FT	---	---	---	---
KLAL	324°	27.8NM	1100FT	37GL/02:26	12:04	02:08LCL	324°

CURRENT VNV PROFILE

ACTIVE VNV WPT 1100FT at KLAL

VS TGT -500FPM FPA -2.0°

VS REQ ----FPM TIME TO TOD 05:17

V DEV ----FT

VOL PUSH SQ

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

FMS

PUSH CRSR

ENGINE

MAP

LD WPT

VIEW

VNV PROF

CNCL VNV

VNV ↗

ATK OPST

ACT LEG

SHW CHRT

CHKLIST









VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70	115.70	GS 128KT	DTK 323°	TRK 323°	ETE 05:52	121.900 ↔ 119.100 COM1
NAV2 117.90	↔ 115.40	PHK	WPT - AIRPORT INFORMATION			123.750 121.600 COM2

MAN IN 27.4

RPM 2050

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E 38.0 VOLTS 38.0

M BATT S 0.0 AMPS 0.0

NORTH UP

2NM

AIRPORT

KLAL PUBLIC

LAKELAND LINDER REGL

LAKELAND FL

SE USA 142FT

N 27°59.33'

W 082°01.11'

AVGAS JET

UTC-5

---

RUNWAYS

05-23

5005FT x 150FT

HARD SURFACE

FULL TIME

---

FREQUENCIES

ATIS RX 118.025

GROUND 121.400

TOWER 124.500

UNICOM 122.950

DEPARTURE 120.650

DEPARTURE 119.900

APPROACH 120.650

VOL PUSH SQ

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

DFLT MAP FMS

PUSH CRSR

ENGINE

MAP

CHRT

INFO

DP

STAR

APR

WX

NOTAM

CHKLIST

# Ground Training

## Module II

### Lab



# Agenda – Module II



- **Lab**
  - **Map Setup**
  - **Flight Scenario 2**
    - **Expanded MFD**
    - **Instrument Approach**
- **Classroom**
  - **Expanded MFD**
  - **WAAS Instrument Approach Procedures**
  - **System Components**
  - **System Malfunctions**
  - **Questions**



Map setup – Map group, Aviation group

### Leg 1

Before Taxi – review from Module I as appropriate

Airport information – Waypoint Group, frequency selection – auto and manual

Before takeoff – review from Module I as appropriate

Altimeter setting, Selected Altitude, Fuel Calculator, Flight Plan with airways (KIDP – OSW – V190 – SGF – KSGF), Transponder

Departure

Autopilot on – HDG, NAV, FLC

NAV capture – Altitude capture

Enroute

Expanded MFD Page Groups and pages - (Tailor this section to the customers needs – address more commonly used pages (the **bold underlined** ones) in more detail and limit time spent on other pages to a brief overview)

MAP – **Traffic**, Stormscope, **Weather Data Link** (suggested item to cover: NEXRAD, SIG/AIR, METAR, WIND, FRZ LVL), Terrain

WPT – **Airport**, Intersection, NDB, VOR, **User**

NRST – **Airport**, Intersection, NDB, VOR, User, **Frequencies**, Airspace Alerts (point out Softkey function)

AUX - **Trip Planning**, Utility, GPS Status, System Setup, XM Information, System Status

Arrival

Approach selection and loading (KSGF- ILS 14), Approach briefing (Show Chart, BARO MIN), VNAV setup, VNAV capture, Activate approach

Approach

Approach mode of autopilot, Automatic NAV source change, Approach tracking (LOC & GS)

Missed approach

Go Around Switch, Autopilot – ON, NAV mode

Leg 2 (optional additional leg with GPS/RNAV approach if time permits)



# Suggested System Configuration - MFD



## Suggested MFD Menu Keyway



# Suggested System Configuration - MFD



## Map Setup Key

NAV1 117.95 ↔ 109.50  
NAV2 117.95 109.50

GS 0KT ETE XTK NM VSR FPM 136.975 ↔ 118.000 COM1  
136.975 118.000 COM2

MAP - NAVIGATION MAP

PAGE MENU  
OPTIONS  
Map Setup  
Declutter  
Measure Bearing/Distance  
Clear Stormscope Lightning  
Show Chart

Press the FMS CRSR knob to return to base page

ENT



# Suggested System Configuration - MFD



Turn the Small FMS Knob to Map Group Default Map Setup Groups

The image shows a Garmin G1000 Multi-Function Display (MFD) with a navigation map and a MAP SETUP menu. The display is divided into several sections:

- Top Panel:** Displays NAV1 (108.00), NAV2 (108.00), GS (0KT), DTK, TRK (356°), ETE, and COM1/COM2 frequencies (136.975 and 118.000).
- Left Panel:** Contains various gauges and indicators: MAN IN (27.3), RPM (2030), FLOW GPH, OIL PRES, OIL TEMP, CHT, EGT, FUEL QTY GAL, and ELECTRICAL (37.3 VOLTS).
- Center Panel:** Shows a navigation map with a highlighted area around Bartlesville, OK. Labels include EL DORADO, AUGUSTA, TORONTO LAKE, FALL RIVER LAKE, KIDP, KCFV, HULAH LAKE, BVO, KBO, BARTLESVILLE, and SKIATOOK LAKE.
- Right Panel (MAP SETUP):** A menu for configuring map settings.
 

GROUP	Map
ORIENTATION	North up
AUTO ZOOM	All On
MAX LOOK FWD	30min
MIN LOOK FWD	5min
TIME OUT	0min
LAND DATA	On
TRACK VECTOR	Off 60 sec
WIND VECTOR	Off
NAV RANGE RING	Off
TOPO DATA	On 1500NM
TOPO SCALE	Off
TERRAIN DATA	On 2000NM
OBSTACLE DATA	Off 20NM
FUEL RNG (RSV)	Off 00:45

At the bottom of the MAP SETUP menu, it says: "Press the FMS CRSR knob to return to base page".



# Suggested System Configuration - MFD



## Additional Map Setup Groups

NAV1 108.00 ↔ 117.95 GS 0KT DTK \_\_\_\_° TRK 356° ETE \_\_\_\_  
NAV2 108.00 117.95 MAP - NAVIGATION MAP 136.975 ↔ 118.000 COM1  
136.975 118.000 COM2

MAN IN 27.3  
RPM 2060  
FFLOW GPH  
OIL PRES  
OIL TEMP  
CHT  
EGT  
FUEL QTY GAL  
ELECTRICAL  
39.2 VOLTS 39.2  
M BATT S  
0.0 AMPS +38.2

MAP SETUP

GROUP  
Map

Map  
Weather  
Traffic  
Aviation  
Airways  
Land

North up  
All On  
FWD 30min  
FWD 5min  
FWD 0min

TIME OUT  
LAND DATA < On >  
TRACK VECTOR < Off > 60 sec  
WIND VECTOR < Off >  
NAV RANGE RING < Off >  
TOPO DATA < On > 1500NM  
TOPO SCALE < Off >  
TERRAIN DATA < On > 2000NM  
OBSTACLE DATA < Off > 20NM  
FUEL RNG (RSV) < Off > 00:45

Press the FMS CRSR knob to return to base page

NAV VOL PUSH ID  
NAV  
PUSH 1-2 HDG  
PUSH HDG SYNC  
AP FD  
HDG ALT  
NAV VNV  
APR BC  
VS NOSE UP  
FLC NOSE DN  
ALT

VOL PUSH SQ  
EMERG COM  
PUSH 1-2 CRS BARO  
PUSH CRS CTR  
RANGE  
PUSH PAN  
MENU  
FPL PROC  
CLR ENT  
DFLT MAP FMS  
PUSH CRSR



# Map Group

## Map Setup Groups



## Defaults

MAP SETUP

GROUP  
Map

ORIENTATION	North up	
AUTO ZOOM	All On	
MAX LOOK FWD		30min
MIN LOOK FWD		5min
TIME OUT		0min
LAND DATA	< On >	
TRACK VECTOR	Off >	60 sec
WIND VECTOR	< Off >	
NAV RANGE RING	< Off >	
TOPO DATA	Off >	1500NM
TOPO SCALE	< Off >	
TERRAIN DATA	< Off >	2000NM
OBSTACLE DATA	< Off >	20NM
FUEL RNG (RSV)	< Off >	00:45

Press the FMS CRSR knob to return to base page

## Suggestions

MAP SETUP

GROUP  
Map

ORIENTATION	HDG up	
AUTO ZOOM	Off	
MAX LOOK FWD		30min
MIN LOOK FWD		5min
TIME OUT		0min
LAND DATA	< On >	
TRACK VECTOR	< On >	2 min
WIND VECTOR	< On >	
NAV RANGE RING	< On >	
TOPO DATA	< On >	1500NM
TOPO SCALE	< Off >	
TERRAIN DATA	< On >	2000NM
OBSTACLE DATA	< On >	30NM
FUEL RNG (RSV)	< On >	01:00

Press the FMS CRSR knob to return to base page

# Aviation Group

## Defaults

MAP SETUP		
GROUP		
Aviation		
	TEXT	RNG
ACTIVE FPL		2000NM
ACTIVE FPL WPT	Med	2000NM
LARGE APT	Lrg	200NM
MEDIUM APT	Med	150NM
SMALL APT	Med	50NM
SAFETAXI		3NM
RWY EXTENSION		Off
INT WAYPOINT	Med	15NM
NDB WAYPOINT	Med	15NM
VOR WAYPOINT	Med	150NM
CLASS B/TMA		200NM
CLASS C/TCA		200NM
CLASS D		150NM
RESTRICTED		200NM
MOA (MILITARY)		200NM
OTHER/ADIZ		200NM
TFR		500NM

Press the FMS CRSR knob to return to base page

## Suggestions

MAP SETUP		
GROUP		
Aviation		
	TEXT	RNG
ACTIVE FPL		2000NM
ACTIVE FPL WPT	Med	2000NM
LARGE APT	Lrg	500NM
MEDIUM APT	Med	300NM
SMALL APT	Small	100NM
SAFETAXI		3NM
RWY EXTENSION		30NM
INT WAYPOINT	Med	15NM
NDB WAYPOINT	Med	15NM
VOR WAYPOINT	Med	150NM
CLASS B/TMA		200NM
CLASS C/TCA		200NM
CLASS D		150NM
RESTRICTED		200NM
MOA (MILITARY)		200NM
OTHER/ADIZ		200NM
TFR		500NM

Press the FMS CRSR knob to return to base page



# Sample Scenario Flight Plan



**Departure: Lakeland Linder Regional,  
Lakeland, Florida**

**Destination: Kissimmee Gateway,  
Orlando, Florida**

**Reference: Normal Procedures, Section 4, POH/AFM**



VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70 ↔ 115.70	GS 0KT	DTK 064°	TRK 005°	ETE ___:___	124.500 ↔ 120.650 COM1
NAV2 117.90 115.40 PHK		FPL - ACTIVE FLIGHT PLAN			118.025 121.400 COM2

MAN IN 27.3

RPM 1990

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E 37.5 VOLTS 37.5

M BATT S 0.0 AMPS 0.0

ACTIVE FLIGHT PLAN

KLAL / KISM

	DTK	DIS	ALT	FUEL REM	ETE	ETA	BRG
KLAL			___FT				
KISM	064°	35.7NM	___FT	___GL/___	___:___	___:___LCL	064°

CURRENT VNV PROFILE

ACTIVE VNV WPT \_\_\_FT at \_\_\_

VS TGT \_\_\_FPM FPA \_\_\_°

VS REQ \_\_\_FPM TIME TO TOD \_\_\_:\_\_\_

V DEV \_\_\_FT

HDG UP

1.5NM

VOL PUSH SQ

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

DFLT MAP FMS

PUSH CRSR

ENGINE

MAP

LD WPT

VIEW

VNV PROF

CNCL VNV

VNV ⌂

ATK UPST

ACT LEG

SHW CHRT

CHKLIST

VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70 ↔ 115.70	GS 121KT	DTK 065°	TRK 065°	ETE 06:00	124.500 ↔ 120.650 COM1
NAV2 117.90 115.40 PHK	FPL - ACTIVE FLIGHT PLAN			118.025	121.400 COM2

MAN IN 27.3

RPM 2110

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E  
39.2 VOLTS 39.2

M BATT S  
0.0 AMPS 0.0

ACTIVE FLIGHT PLAN

KLAL / KISM

	DTK	DIS	ALT	FUEL REM	ETE	ETA	BRG
KLAL			_____FT				
KISM	065°	12.0NM	_____FT	83GL/05:32	05:59	12:13LCL	065°

CURRENT VNV PROFILE

ACTIVE VNV WPT \_\_\_\_\_FT at \_\_\_\_\_

VS TGT \_\_\_\_\_FPM FPA \_\_\_\_\_°

VS REQ \_\_\_\_\_FPM TIME TO TOD \_\_\_\_\_

V DEV \_\_\_\_\_FT

VOL PUSH SQ

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

FMS

PUSH CRSR

ENGINE

MAP

LD WPT

VIEW

VNV PROF

CNCL VNV

VNV 0\*

ATK UPST

ACT LEG

SHW CHRT

CHKLIST

NAV1 110.70 ↔ 115.70  
NAV2 117.90 115.40 PHK

MAN IN 27.3

RPM 2090

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E  
39.1 VOLTS 39.1

M BATT S  
0.0 AMPS 0.0

GS 121KT DTK 065° TRK 065° ETE 05:54

124.500 ↔ 120.650 COM1  
118.025 121.400 COM2

FPL - ACTIVE FLIGHT PLAN

ACTIVE FLIGHT PLAN  
KLAL / KISM

	DTK	DIS	ALT	FUEL REM
KLAL			-----FT	
KISM	065°	11.9NM	-----FT	83GL/05:3

PROCEDURES

OPTIONS

ACTIVATE VECTOR-TO-FINAL  
ACTIVATE APPROACH  
ACTIVATE MISSED APPROACH  
**SELECT APPROACH**  
SELECT ARRIVAL  
SELECT DEPARTURE

LOADED

APPROACH:  
-----  
ARRIVAL:  
-----  
DEPARTURE:  
-----

CURRENT VNV P  
ACTIVE VNV WPT  
VS TGT  
VS REQ  
V DEV

Press the "PROC" key to view the previous page

EMERG COM

PUSH 1-2  
CRS BARO

PUSH CRS CTR  
RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

FMS

PUSH CRSR

NAV1 110.70 ↔ 115.70  
NAV2 117.90 115.40 PHK

GS 121KT DTK 065° TRK 065° ETE 05:47  
PROC - APPROACH LOADING

124.500 ↔ 120.650 COM1  
118.025 121.400 COM2

**NAV**

VOL PUSH ID

PUSH 1-2

**HDG**

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

**ALT**

MAN IN 27.3

RPM 2010

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E  
38.8 VOLTS 38.8

M BATT S  
0.0 AMPS 0.0

NORTH UP

VOL PUSH SQ

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

DFLT MAP FMS

PUSH CRSR

**AIRPORT**  
KISM PUBLIC  
KISSIMMEE GATEWAY  
ORLANDO FL

**APPROACH CHANNEL**  
CHANNEL ID

**APPROACH**  
ILS 15

**ILS 15**  
GPS 06GPS LNAV+V  
RNAV 15GPS LPV  
RNAV 33GPS LPV  
VOR/DME-AgPS LNAV  
NDB 15 109.75

**SEQUENCE**

WADSI fof	153°	30.0NM
RW15 map	153°	3.3NM
600FT	153°	0.9NM
INTRCPT	hdg 240°	2.3NM
TEMPE machp	200°	7.0NM
HOLD	020°	4.0NM

LOAD? OR ACTIVATE?

NAV1 110.70 ↔ 115.70  
NAV2 117.90 115.40 PHK

GS 121KT DTK 065° TRK 065° ETE 05:18  
PROC - APPROACH LOADING

124.500 ↔ 120.650 COM1  
118.025 121.400 COM2

**MAN IN**  
27.3

**RPM**  
2030

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E  
37.5 VOLTS 37.5

M BATT S  
0.0 AMPS 0.0

NORTH UP

**AIRPORT**  
KISM PUBLIC  
KISSIMMEE GATEWAY  
ORLANDO FL

**APPROACH CHANNEL**  
CHANNEL 42900 ID W33A

**APPROACH**  
RNAV 33Gps LPV

ILS 15  
GPS 06Gps LNAV+V  
RNAV 15Gps LPV  
RNAV 33Gps LPV  
VOR/DME-Agps LNAV  
NDB 15

**SEQUENCE**

LOJUF	faf	333°	30.0NM
RW33	map	333°	4.9NM
348FT		333°	0.5NM
WADSI			
CAMBE	map	263°	7.5NM
HOLD		047°	5.0NM

LOAD? OR ACTIVATE?

PROC

VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

VOL PUSH SQ

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

DFLT MAP FMS

PUSH CRSR



NAV VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70 ↔ 115.70 GS 121KT DTK 065° TRK 065° ETE 05:00 124.500 ↔ 120.650 COM1

NAV2 117.90 115.40 PHK PROC - APPROACH LOADING 118.025 121.400 COM2

NORTH UP

VECTOR	TYPE	BEARING	DISTANCE
AXMEB	063°	5.0NM	
LOJUF	f af	333°	6.0NM
RW33	map	333°	4.9NM
348FT		333°	0.5NM
WADSI			

AIRPORT: KISM PUBLIC, KISSIMMEE GATEWAY, ORLANDO FL

APPROACH CHANNEL: CHANNEL 42900 ID W33A

APPROACH: RNAV 33GPS LPV

TRANSITION: YONMA idf

VECTORS: UFRAJ idf, YONMA idf, CAMBE, PRESK

LOAD? OR ACTIVATE?

VOL PUSH SQ

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

DFLT MAP FMS

PUSH CRSR

NAV1 110.70 ↔ 115.70  
NAV2 117.90 115.40 PHK

GS 121KT DTK 065° TRK 065° ETE 04:52

124.500 ↔ 120.650 COM1  
118.025 121.400 COM2

NORTH UP

AIRPORT  
KISM PUBLIC  
KISSIMMEE GATEWAY  
ORLANDO FL

APPROACH CHANNEL  
CHANNEL 42900 ID W33A

APPROACH  
RNAV 33Gps LPV

TRANSITION  
YONMA iaf

PRIMARY FREQUENCY

SEQUENCE  
YONMA iaf  
AXMEB 063° 5.0NM  
LOJUF f af 333° 6.0NM  
RW33 map 333° 4.9NM  
348FT 333° 0.5NM  
WADSI

LOAD? OR ACTIVATE?

PROC

ENGINE DP STAR APR GO BACK CHKLIST

MAN IN 27.3

RPM 2120

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E  
36.5 VOLTS 36.5

M BATT S  
0.0 AMPS 0.0

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

EMERG COM

PUSH 1-2 CRS BARO

PUSH CRS CTR RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

DFLT MAP FMS

PUSH CRSR

VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70 ↔ 115.70	GS 121KT	DTK 065°	TRK 065°	ETE 04:47	124.500 ↔ 120.650 COM1
NAV2 117.90 115.40 PHK	PROC - APPROACH LOADING			118.025	121.400 COM2

MAN IN 27.3

RPM 2080

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E 36.3 VOLTS 36.3

M BATT S 0.0 AMPS 0.0

NORTH UP

AIRPORT

KISM PUBLIC

KISSIMMEE GATEWAY

ORLANDO FL

---

APPROACH CHANNEL

CHANNEL 42900 ID W33A

---

APPROACH

RNAV 33GPs LPV

---

TRANSITION

YONMA iaf

---

PRIMARY FREQUENCY

-----

---

SEQUENCE

YONMA	iaf	
AXMEB	063°	5.0NM
LOJUF	faf	333° 6.0NM
RW33	map	333° 4.9NM
348FT		333° 0.5NM
WADSI		

LOAD? OR **ACTIVATE?**

VOL PUSH SQ

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

DFLT MAP FMS

PUSH CRSR

ENGINE

DP

STAR

APR

GO BACK

CHKLIST

NAV1 110.70 ↔ 115.70  
NAV2 117.90 115.40 PHK

MAN IN 27.3

RPM 2080

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E  
39.0 VOLTS 39.0

M BATT S  
0.0 AMPS 0.0

ALT

GS 128KT DTK 139° TRK 141° ETE 05:14 124.500 ↔ 120.650 COM1  
118.025 121.400 COM2

FPL - ACTIVE FLIGHT PLAN

ACTIVE FLIGHT PLAN  
KLAL / KISM

	DTK	DIS	ALT	FUEL REM	ETE	ETA	BRG
KISM	---	---	---	---	---	---	---
Approach - KISM-RNAV 33GPS LPV							
YONMA iaf	139°	11.1NM	2000FT	82GL/05:27	05:11	12:15LCL	139°
AXMEB	063°	5.0NM	2000FT	81GL/05:24	02:20	12:17LCL	118°
LOJUF faf	333°	6.0NM	1700FT	80GL/05:19	02:48	12:20LCL	095°
RW33 map	333°	4.9NM		79GL/05:16	02:16	12:22LCL	062°

CURRENT VNV PROFILE  
ACTIVE VNV WPT 2000FT at YONMA iaf

VS TGT -574FPM FPA -2.5°  
VS REQ \_\_\_\_\_FPM TIME TO TOD 01:37  
V DEV \_\_\_\_\_FT

10KT HDG UP

30NM

FPL

COM

EMERG

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

FMS

PUSH CRSR

ENGINE

MAP

LD WPT

VIEW

VNV PROF

CNCL VNV

VNV ↗

ATK OFST

ACT LEG

SHW CHRT

CHKLIST

VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70 ↔ 115.70	GS 131KT	DTK 139°	TRK 141°	ETE 04:50	124.500 ↔ 120.650 COM1
NAV2 117.90 115.40 PHK	FPL - ACTIVE FLIGHT PLAN			118.025	121.400 COM2

MAN IN 27.3

RPM 1980

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E

39.0 VOLTS 39.0

M BATT S

0.0 AMPS 0.0

ACTIVE FLIGHT PLAN

KLAL / KISM

	DTK	DIS	ALT	FUEL REM	ETE	ETA	BRG
KISM	---	---	---	---	---	---	---
Approach - KISM-RNAV 33GPS LPV							
→ YONMA iaf	139°	10.6NM	2000FT	83GL/05:30	04:51	12:15LCL	139°
AXMEB	063°	5.0NM	2000FT	82GL/05:28	02:17	12:17LCL	117°
LOJUF faf	333°	6.0NM	1700FT	81GL/05:25	02:46	12:20LCL	092°
RW33 map	333°	4.9NM		81GL/05:23	02:14	12:22LCL	058°

CURRENT VNV PROFILE

ACTIVE VNV WPT \_\_\_\_FT at \_\_\_\_

VS TGT \_\_\_\_FPM FPA \_\_\_\_°

VS REQ \_\_\_\_FPM TIME TO TOD \_\_\_\_

V DEV \_\_\_\_FT

→ 10KT HDG UP

VOL PUSH SQ

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

FMS

PUSH CRSR

ENGINE

MAP

LD WPT

VIEW

VNV PROF

ENBL VNV

VNV ⚙

ATK OPST

ACT LEG

SHW CHRT

CHKLIST

VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70 ↔ 115.70	GS 110KT	DTK 047°	TRK 219°	ETE 00:35	124.500 ↔ 120.650 COM1
NAV2 117.90 115.40 PHK	WPT - APPROACH INFORMATION			118.025	121.400 COM2
AIRPORT KISM		APPROACH RNAV (GPS) RWY 33		NOT TO SCALE	

MAN IN 28.0

RPM 2000

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E  
36.8 VOLTS 36.8

M BATT S  
0.0 AMPS 0.0

ORLANDO, FLORIDA AL-5793 (FAA)

**RNAV (GPS) RWY 33**  
ORLANDO/KISSIMMEE GATEWAY (ISM)

WAAS CH 42900 W33A	APP CRS 333°	Rwy Idg 6000 TDZE 82 Apt Elev 82			
<small>If local altimeter setting not received, use Orlando International altimeter setting and increase all DAs 27 feet and all MDAs 40 feet. For uncompensated Baro-VNAV systems, LNAV/VNAV NA below -15° C (5° F) or above 48° C (119° F). Baro-VNAV NA when using Orlando International altimeter setting. DME/DME RNP-0.3 NA.</small>			<small>MISSED APPROACH: Climb to 2000 direct WADSI and via 262° track to CAMBE and hold.</small>		
AWOS-3 128.775	ORLANDO APP CON 119.4 351.9	KISSIMMEE TOWER* 124.45 (CTAF) 0	CLNC DEL 121.7 119.95* <small>*when twr closed</small>	GND CON 121.7	UNICOM 122.95

ELEV 82

MAP WPT AUX NRST

VOL PUSH SQ

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

FMS

PUSH CRSR

ENGINE

CHRT OPT

CHRT

INFO

DP

STAR

APR

WX

NOTAM

GO BACK

CHKLIST

VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70 ↔ 115.70	GS 110KT	DTK 047°	TRK 219°	ETE 00:35	124.500 ↔ 120.650 COM1
NAV2 117.90 115.40 PHK	WPT - APPROACH INFORMATION			118.025	121.400 COM2
AIRPORT KISM APPROACH RNAV (GPS) RWY 33			NOT TO SCALE		

MAN IN 28.0

RPM 2120

FFLOW GPH

OIL PRES

OIL TEMP

CHT

EGT

FUEL QTY GAL

ELECTRICAL

M BUS E 36.4 VOLTS 36.4

M BATT S 0.0 AMPS 0.0

ELEV 82			
2000	WADSI	CAMBE	AXMEB
TRK 262°			
MIRL Rwy 15-33 and 6-24			
ORLANDO, FLORIDA Orig 07242			
ORLANDO/KISSIMMEE GATEWAY (ISM) 28°17'N-81°26'W			
RNAV (GPS) RWY 33			

CATEGORY	A	B	C	D
LPY DA	348-1 266 (300-1)			
LNAV/VNAV DA	548-1 466 (500-1 1/4)			
LNAV MDA	460-1	378 (400-1)	460-1 1/4 378 (400-1 1/4)	
CIRCLING	620-1 1/4	538 (600-1 1/4)	640-2 558 (600-2)	

VOL PUSH SQ

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

FMS

PUSH CRSR

ENGINE

CHRT OPT

CHRT

INFO

DP

STAR

APR

WX

NOTAM

GO BACK

CHKLIST

MAP WPT AUX NRST

MAP WPT AUX NRST

VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70 ↔ 115.70 PBI	YONMA iaf → AXMEB	DIS 4.2NM	BRG 063°	124.500 ↔ 120.650 COM1
NAV2 117.90 115.40 PHK	GPS AP	ALT 4000FT		118.025 121.400 COM2

**TRAFFIC**

TAS 130KT

HDG 062°

CRS 063°

4000

4000

29.92IN

**FLIGHT PLAN**

KLAL / KISM

	DTK	DIS
KISM-RNAV 33Gps LPV		
YONMA iaf	---	---NM
AXMEB	063°	4.1NM
LOJUF faf	333°	6.0NM
RW33 map	333°	4.9NM

OAT 0°C

XPDR 0405 GND R LCL 04:52:10

VOL PUSH SQ

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

FMS

PUSH CRSR

INSET
PFD
OBS
CDI
DME
XPDR
IDENT
TMR/REF
NRST
ALERTS





VOL PUSH ID

NAV

PUSH 1-2

HDG

PUSH HDG SYNC

AP FD

HDG ALT

NAV VNV

APR BC

VS NOSE UP

FLC NOSE DN

ALT

NAV1 110.70 ↔ 115.70	AXMEB → LOJUF fof	DIS 4.4NM	BRG 334°	124.500 ↔ 120.650 COM1
NAV2 117.90 115.40 PHK	GPS AP	ALT 2000FT	GP	118.025 121.400 COM2

TRAFFIC

TAS 130KT

HDG 342°

336°

CRS 333°

2000

29.92IN

FLIGHT PLAN		
KLAL / KISM		
YONMA iaf	DTK	DIS
AXMEB	---	---
LOJUF fof	333°	4.4NM
RW33 map	333°	4.9NM
348FT	333°	0.5NM

VOL PUSH SQ

EMERG COM

PUSH 1-2

CRS BARO

PUSH CRS CTR

RANGE

PUSH PAN

MENU

FPL PROC

CLR ENT

DFLT MAP FMS

PUSH CRSR

OAT 0°C

INSET

PFD

OBS

CDI

DME

XPDR

IDENT

TMR/REF

NRST

ALERTS





NAV1 110.70 ↔ 115.70  
 NAV2 117.90 115.40 PHK

LOJUF fof → RW33 map  
 GPS AP GP

DIS 2.8NM BRG 333°  
 124.500 ↔ 120.650 COM1  
 118.025 121.400 COM2

TRAFFIC

1300

TAS 130KT

338°

HDG 342° CRS 333°

2000

1040

20

-650

29.92IN

BARO MIN 350FT

OAT 0°C

INSET PFD OBS CDI DME XPDR IDENT TMR/REF NRST ALERTS

XPDR 0405 GND LCL 05:02:45













# Ground Training

## Module II Classroom



# Agenda

- Lab
  - Map Setup
  - Flight Scenario 2
- **Classroom**
  - **Expanded MFD**
    - TIS
    - Stormscope
    - Terrain Awareness
  - WAAS Instrument Approach Procedures
  - System Components
  - System Malfunctions
  - Questions

# Traffic Information Service - TIS

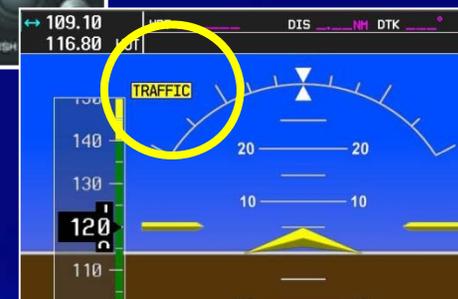


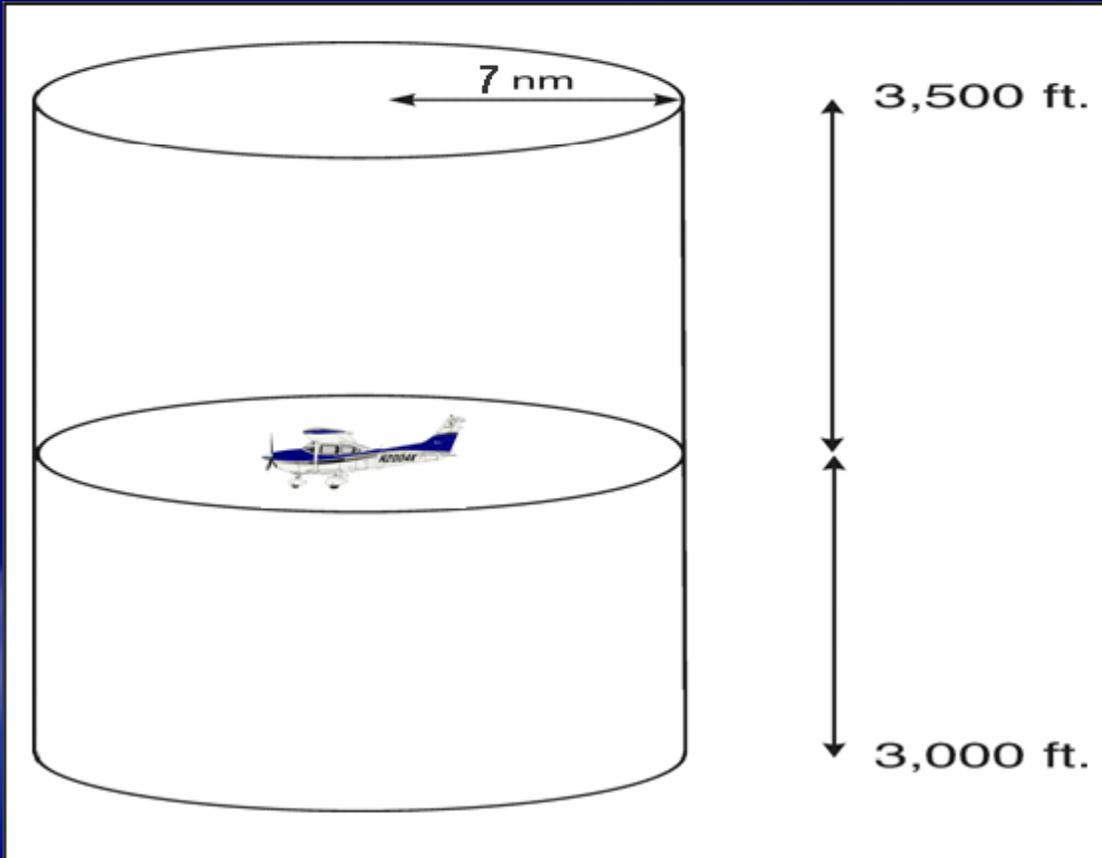
## Traffic Display

- Aircraft Location
- Aircraft altitude relative to you
- Anticipated Track

## Traffic Alert

- Within 30 sec. Projected to be
- Within ½ nm AND
- Within 500 feet



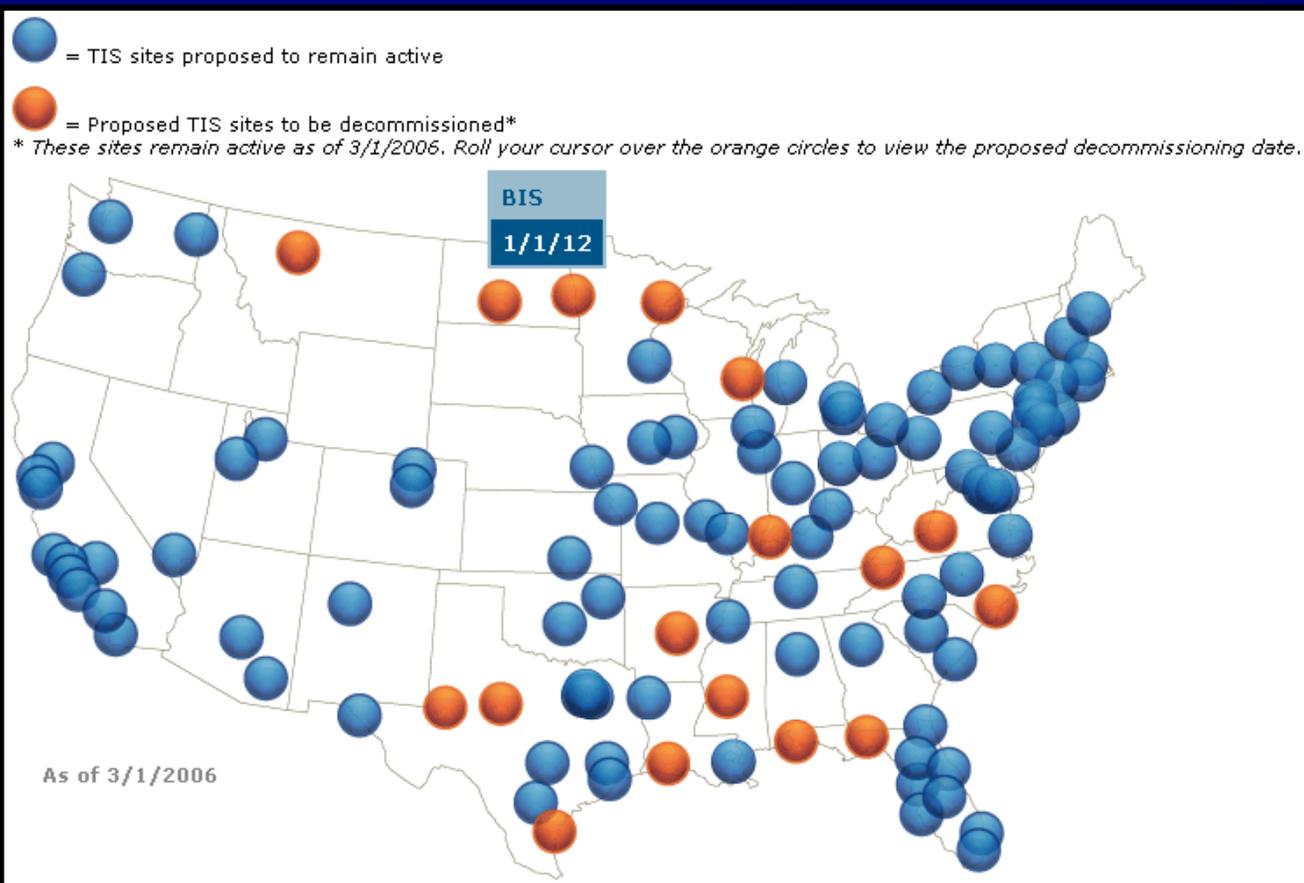


## Service Area

## Limitations

- Only available within  $\pm 55$  n.m. of designated locations (Center airspace not available)
- Up to 8 intruder aircraft, within service area
- Secondary radar targets only (Mode A, C and S transponder equipped)
- Traffic Alerts (TA), but no Resolution Advisories (RA)

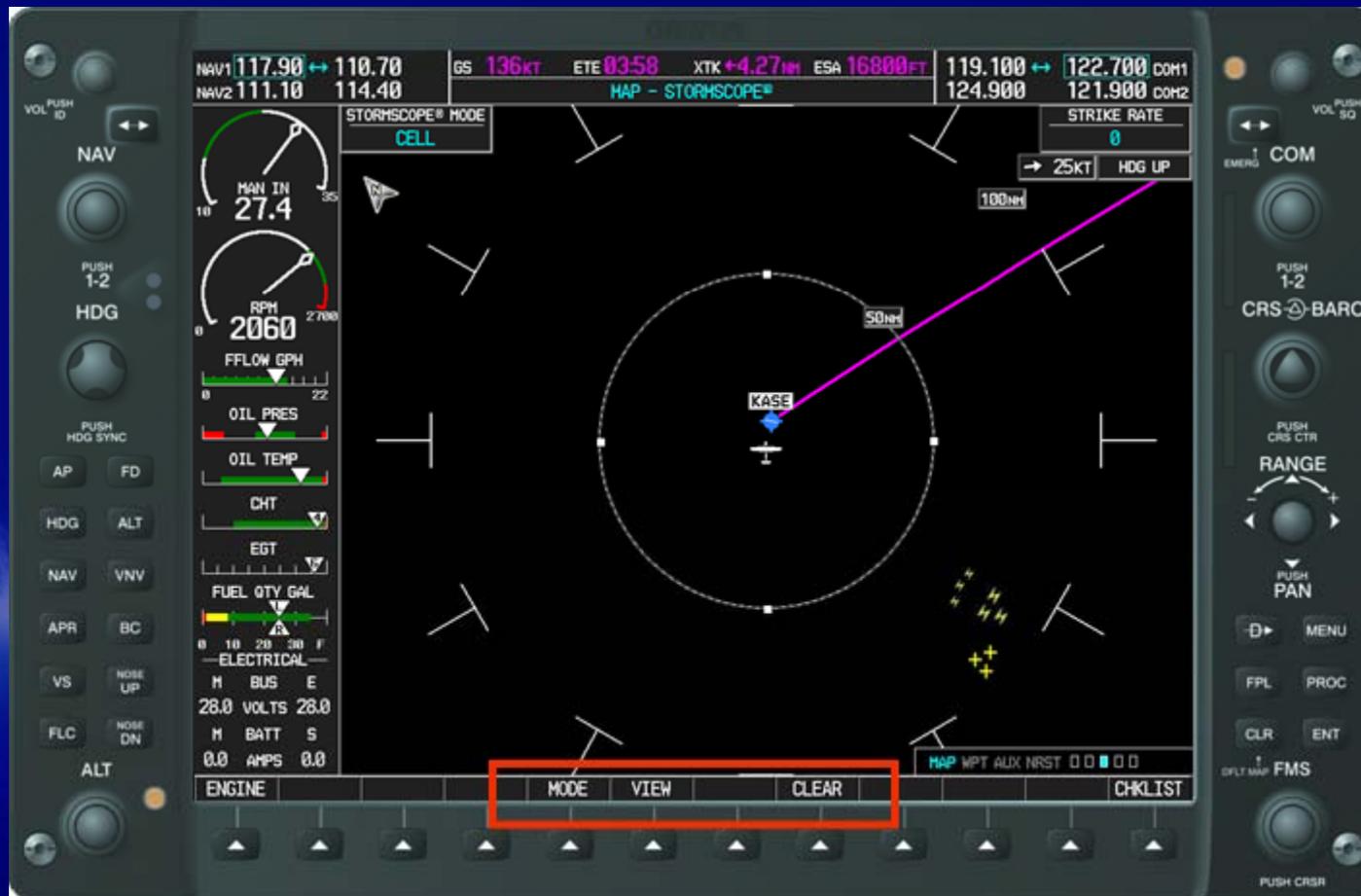
## View of Mode S Coverage Area



[www.garmin.com/aviation/tis.jsp](http://www.garmin.com/aviation/tis.jsp)



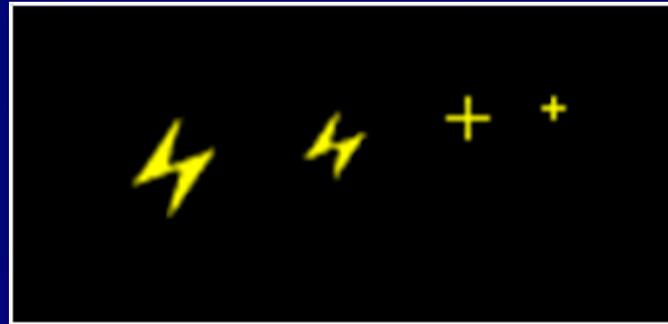
# WX 500 Stormscope



- WX-500 Stormscope Interface
- Cell and Strike Modes

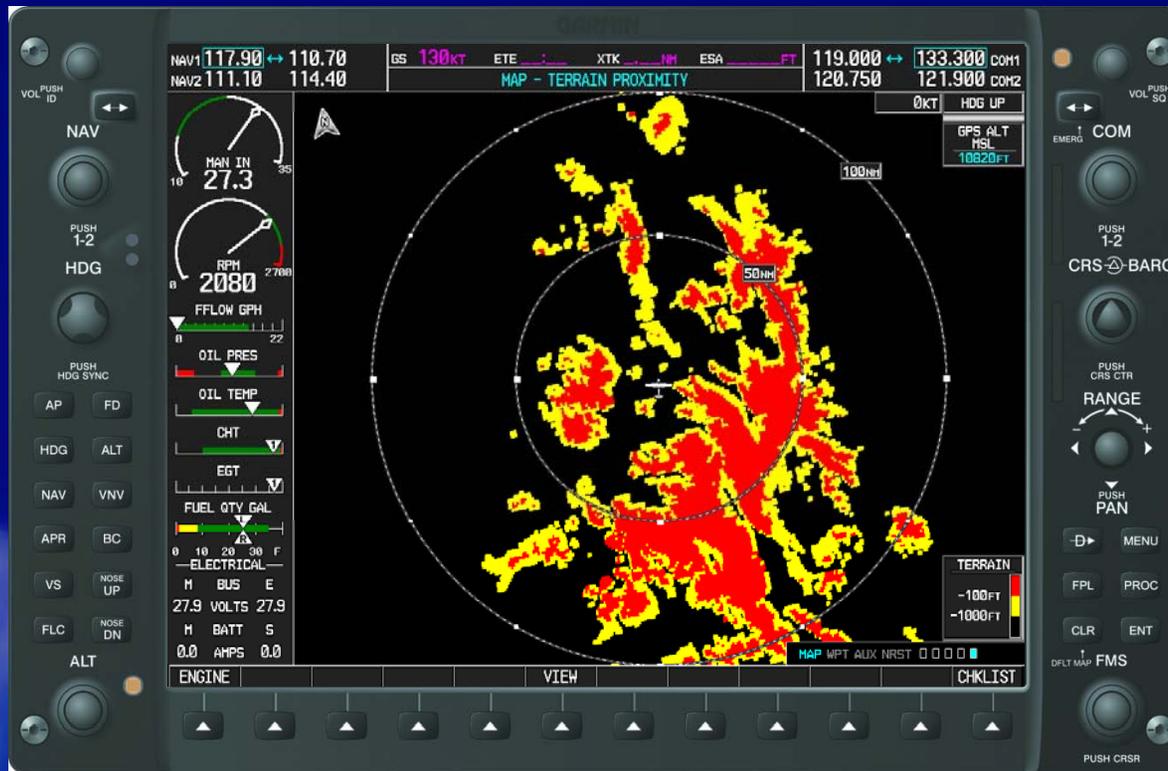
# Stormscope Display

## “Strike Aging”



- Bold lightning bolt for 6 Seconds after detection
- Normal lightning bolt from 6 seconds to 1 minute
- Bold “Plus Sign” after 1 minute
- Normal “Plus Sign” after 2 minutes

# Terrain Proximity



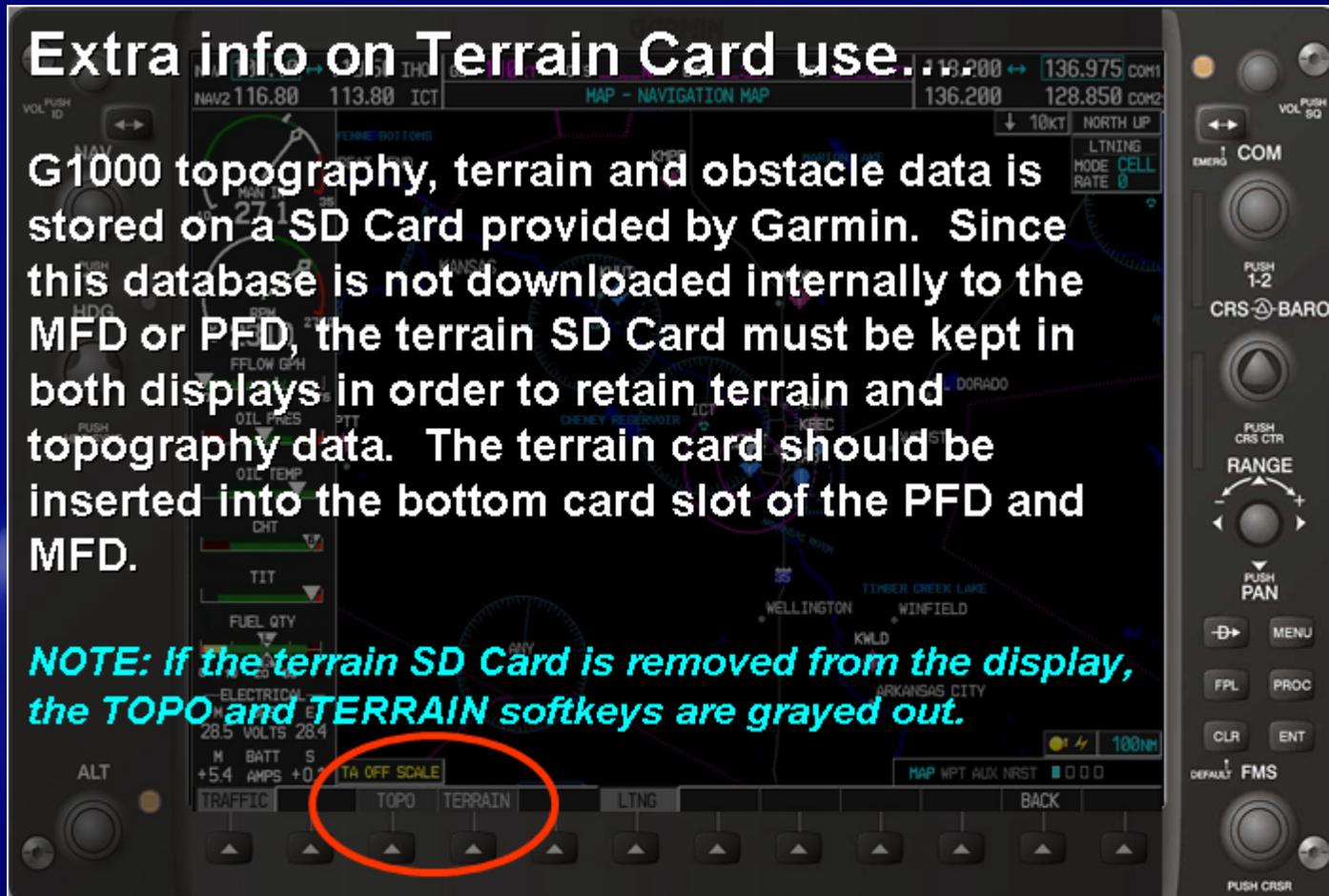
- For situational awareness only
- No voice callout
- Yellow = aircraft within 100'-1000' AGL of terrain
- Red = Aircraft within 100' above or below ground zero
- Remember, This is the “hard-deck” and does not account for trees or towers.

# Secure Digital Cards

## Extra info on Terrain Card use.

G1000 topography, terrain and obstacle data is stored on a SD Card provided by Garmin. Since this database is not downloaded internally to the MFD or PFD, the terrain SD Card must be kept in both displays in order to retain terrain and topography data. The terrain card should be inserted into the bottom card slot of the PFD and MFD.

**NOTE:** If the terrain SD Card is removed from the display, the **TOPO** and **TERRAIN** softkeys are grayed out.



# Agenda

- Lab
  - Map Setup
  - Flight Scenario 2
- Classroom
  - Expanded MFD
  - **WAAS Instrument Approach Procedures**
  - System Components
  - System Malfunctions
  - Questions

# What Is WAAS?



# What Is WAAS?

# Wide Area Augmentation System



WAAS is a GPS-based navigation and landing system that provides enhanced **accuracy** and **integrity** to the basic GPS signal.



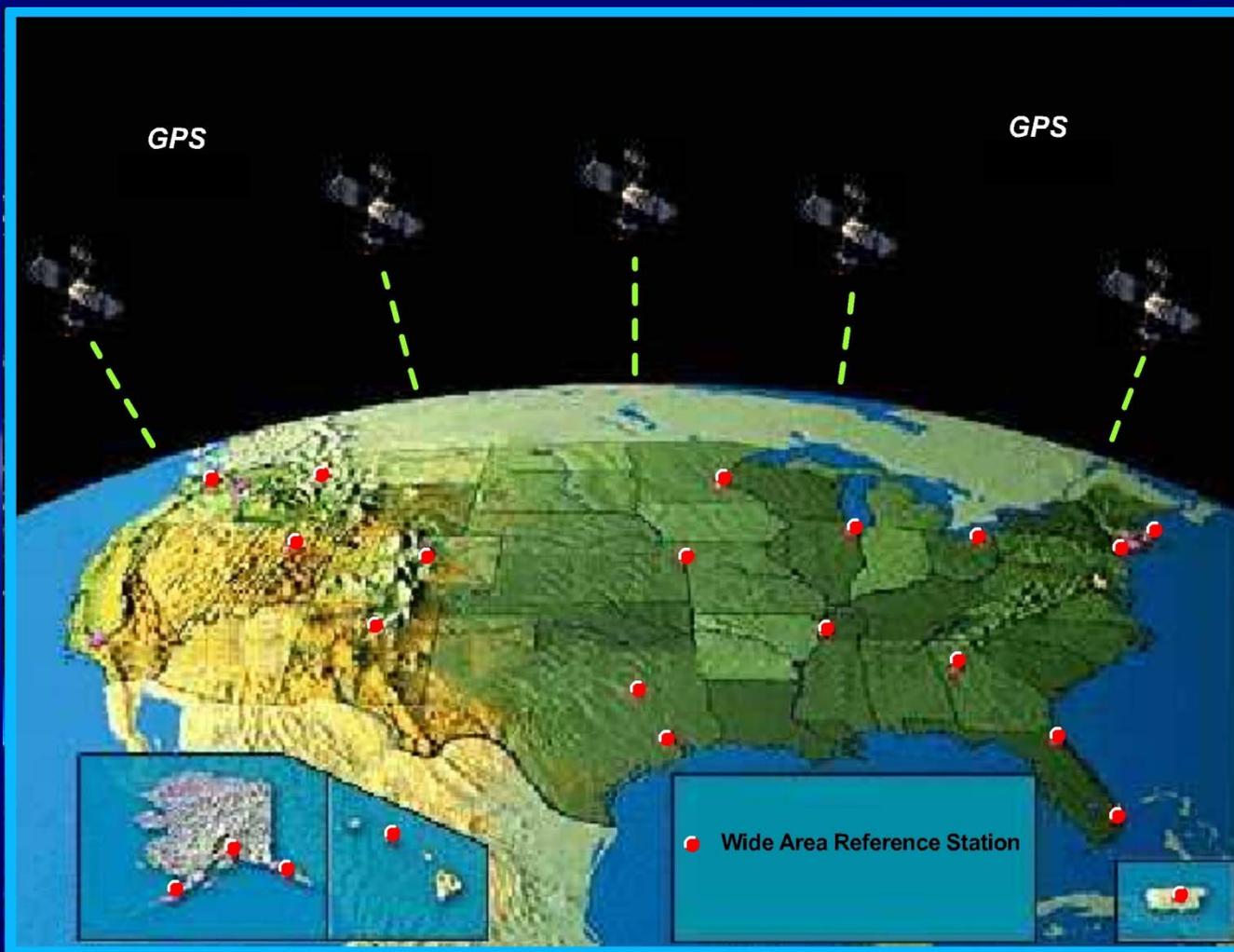
# WAAS Accuracy

The WAAS broadcast message improves the GPS signal accuracy from 20 meters to approximately 2 meters in both the horizontal and vertical dimensions.

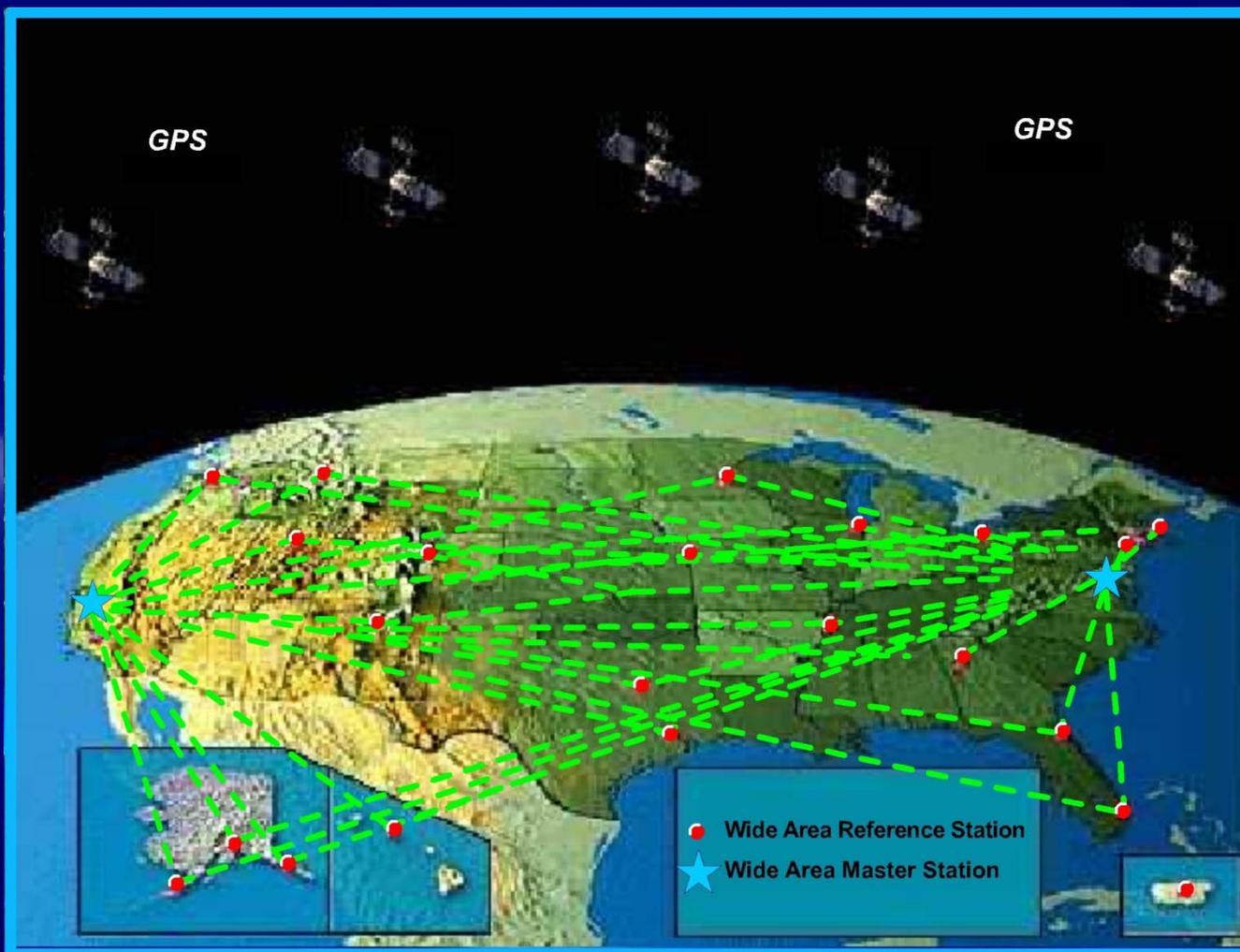
# WAAS Integrity

WAAS improves the integrity of the basic GPS signal by quickly detecting smaller accuracy errors. Within six seconds of detecting accuracy errors the WAAS receiver will either correct the errors or shut-off connections and notify the pilot.

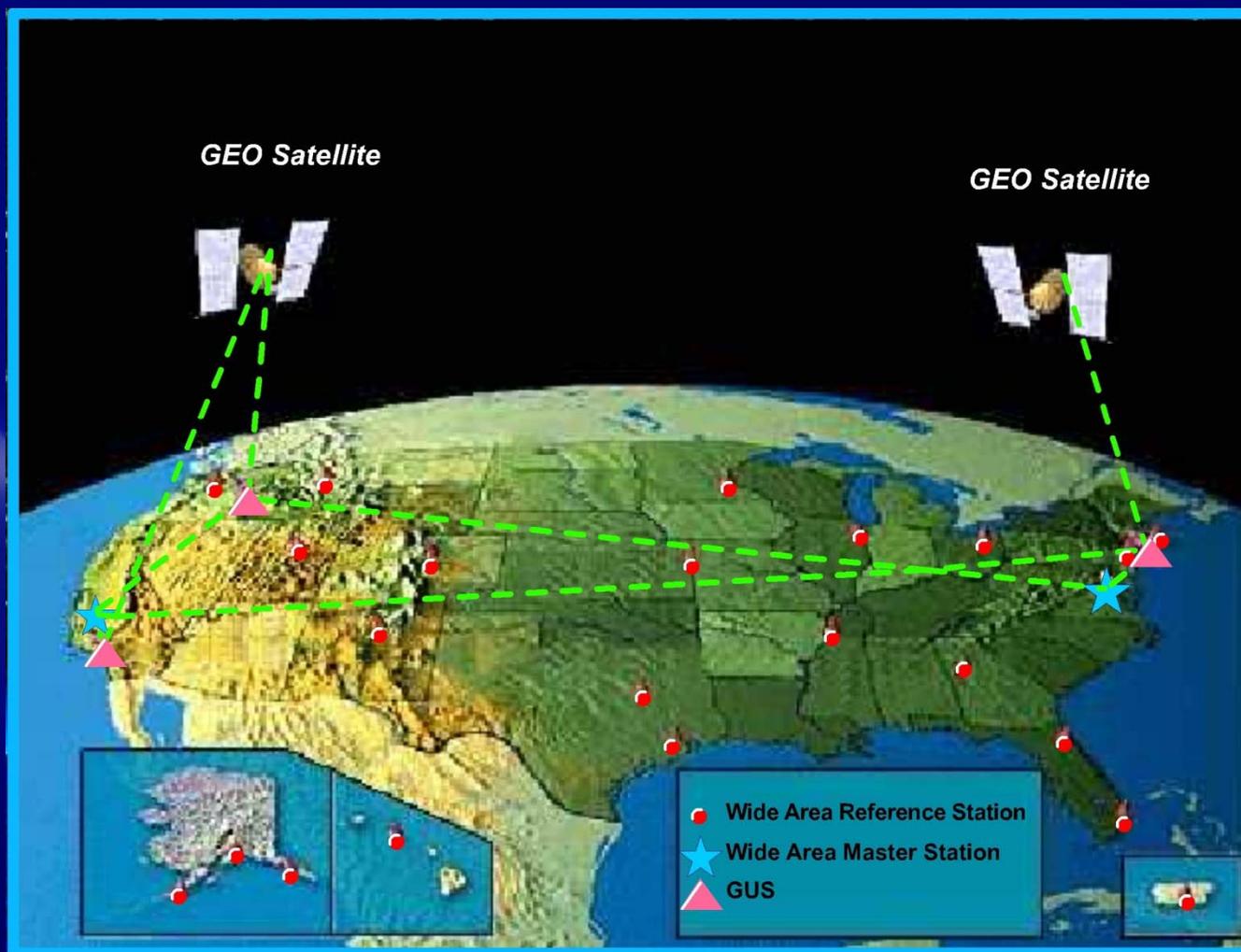
# Several Wide Area Reference Stations monitor the GPS satellites.



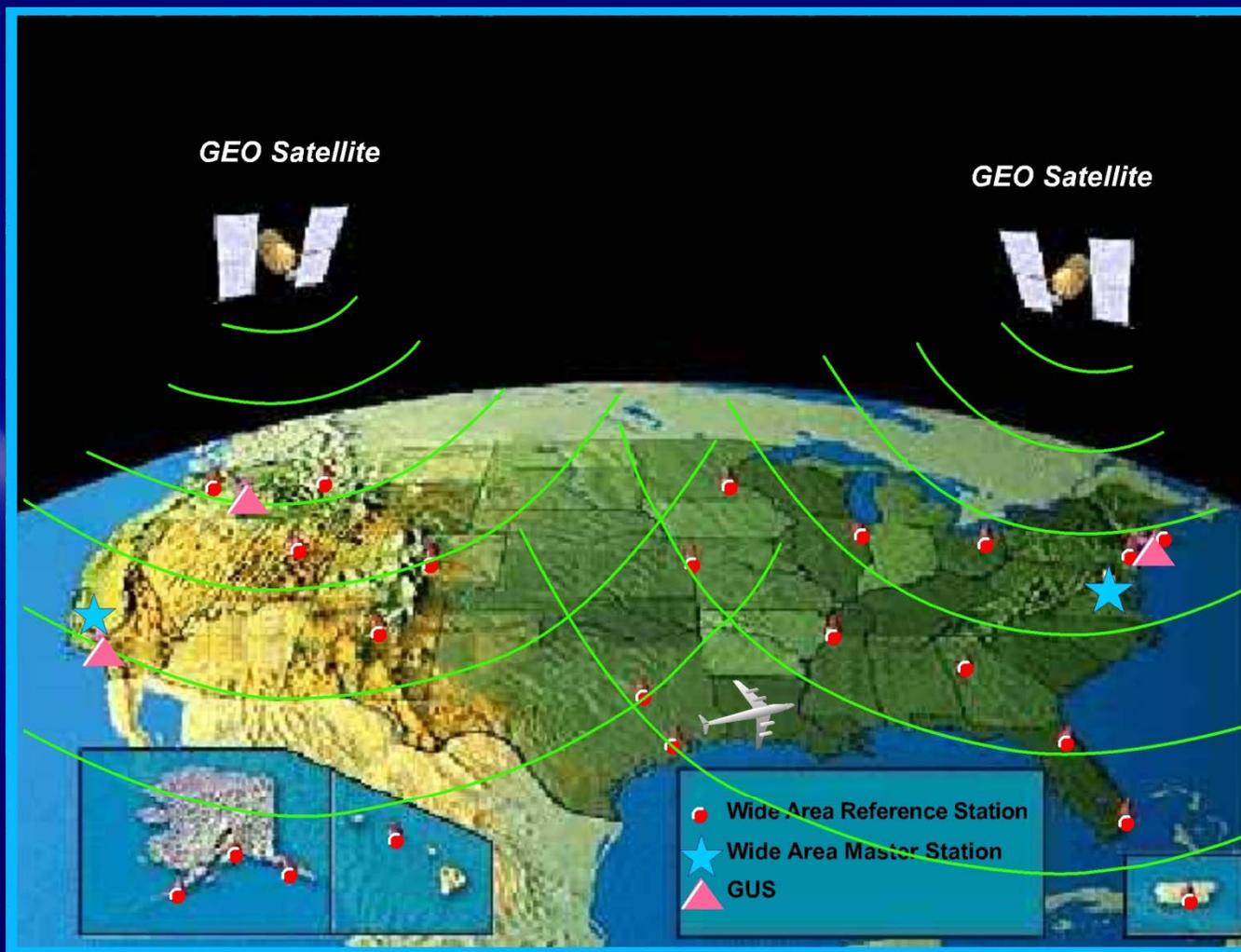
The information collected by the Wide Area Reference Stations is sent to two Wide Area Master Stations where the correction message is calculated.



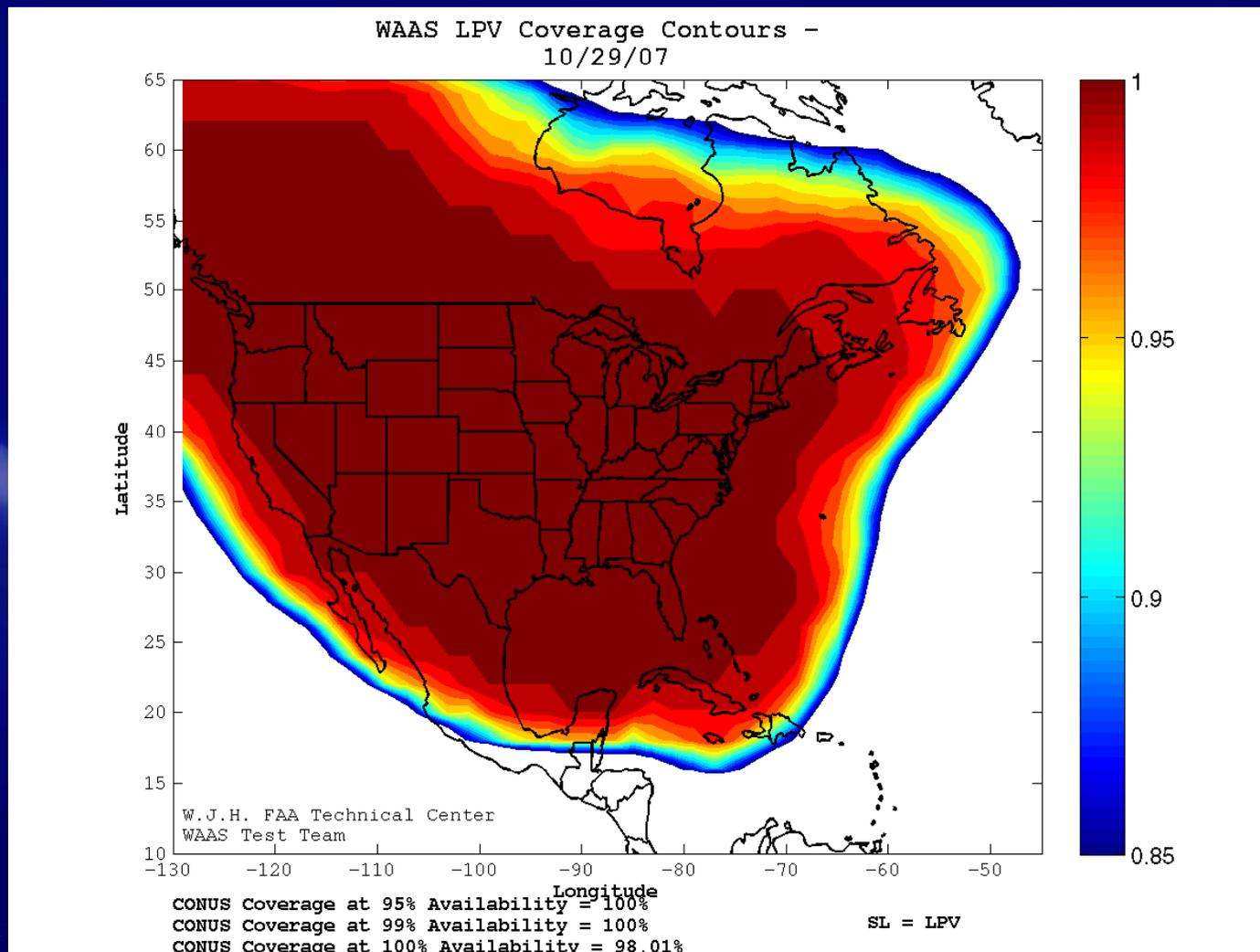
The Wide Area Master Station sends the correction message to the WAAS GEO satellites via three ground uplink stations.



The two WAAS GEO satellites broadcast the WAAS-corrected signal to aircraft.



# WAAS is now available for IFR approach operations throughout most of North America.



# RNAV Approach Minima



LNAV

LNAV + V

LNAV / VNAV

LPV



# RNAV Approach Minima

CATEGORY	A	B	C	D
LPV DA	1346-1 250 (300-1)			NA
LNAV/ VNAV DA	1462-1¼ 366 (400-1¼)			NA
LNAV MDA	1500-1 404 (500-1)		1500-1¼ 404 (500-1¼)	NA
CIRCLING	1540-1¼ 444 (500-1¼)	1560-1¼ 464 (500-1¼)	1560-1½ 464 (500-1½)	NA

OLATHE/JOHNSON COUNTY EXECUTIVE (OJC)  
 38° 51' N-94° 44' W      **RNAV (GPS) RWY 18**



# LNAV (Lateral Navigation)

- Non-Precision Approach
- Descend at desired rate to an MDA
- Fly level at MDA
  - Until runway environment in sight – Land
    - or
  - To MAP – Begin missed approach





# LNAV



# LNAV + V (Lateral Navigation Plus Advisory Vertical Guidance)

- Non-Precision Approach
- Descend along WAAS **Advisory GP** to an MDA
- Fly level at MDA
  - Until runway environment in sight – Land
    - or
  - To MAP – Begin Missed Approach





# LNAV + V

# LNAV / VNAV (Lateral Navigation with Vertical Navigation)

- Approach with Vertical Guidance (APV)
- Descend along WAAS GP to a DA
- At DA – Make a decision
  - If runway environment in sight – Land
    - or
  - If runway environment not in sight – Missed Approach





# LNAV / VNAV



# LPV (Localizer Performance with Vertical Guidance)

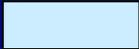
- Approach with Vertical Guidance (APV)
- Descend along WAAS GP to a DA
- At DA – Make a decision
  - If runway environment in sight – Land
    - or
  - If runway not in sight – Missed Approach

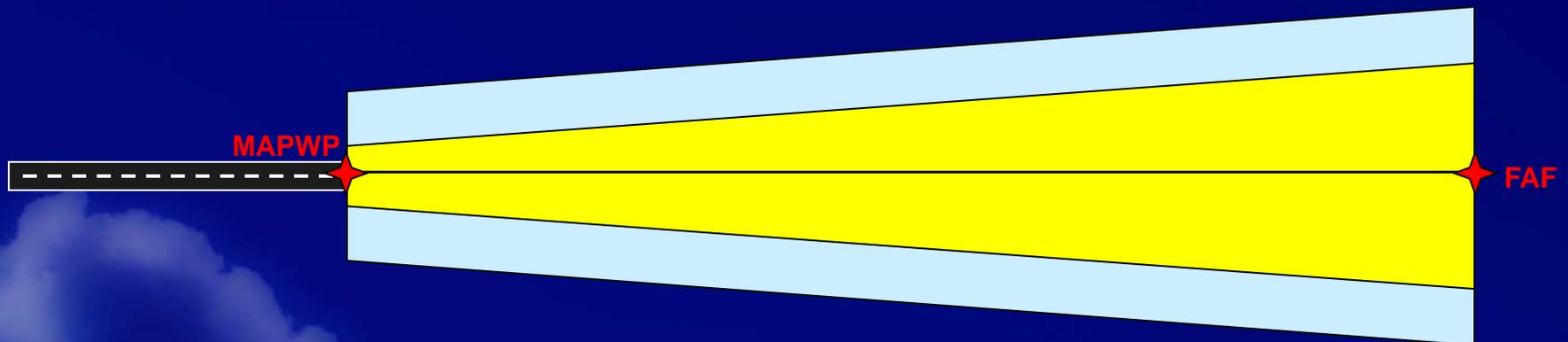




LPV

# Comparison of Obstacle Evaluation Area

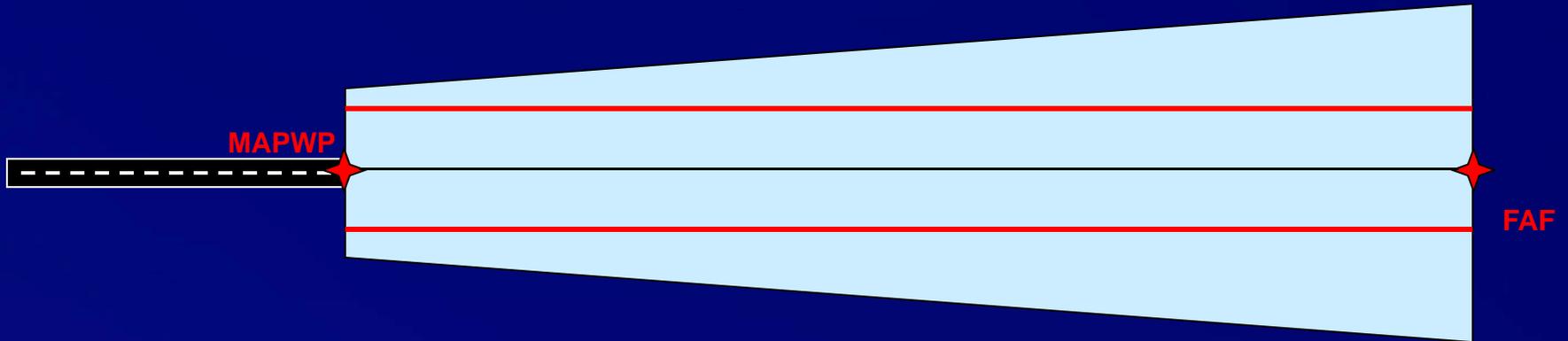
 LNAV, LNAV+V and LNAV/VNAV obstacle evaluation area



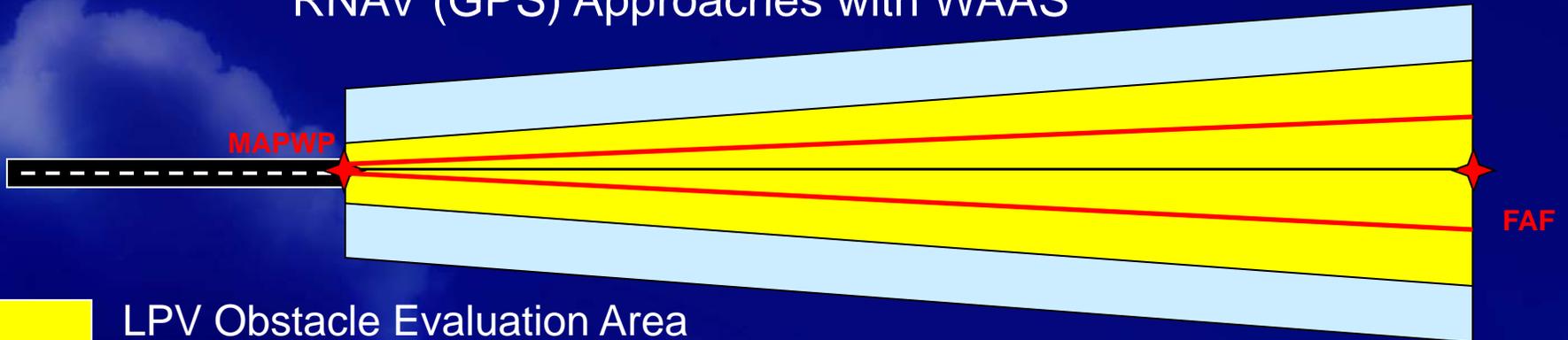
 LPV obstacle evaluation area

# Comparison of Full Scale CDI Deflection

## RNAV (GPS) Approaches without WAAS



## RNAV (GPS) Approaches with WAAS



LPV Obstacle Evaluation Area



LNAV, LNAV+V, and LNAV/VNAV Obstacle Evaluation Area

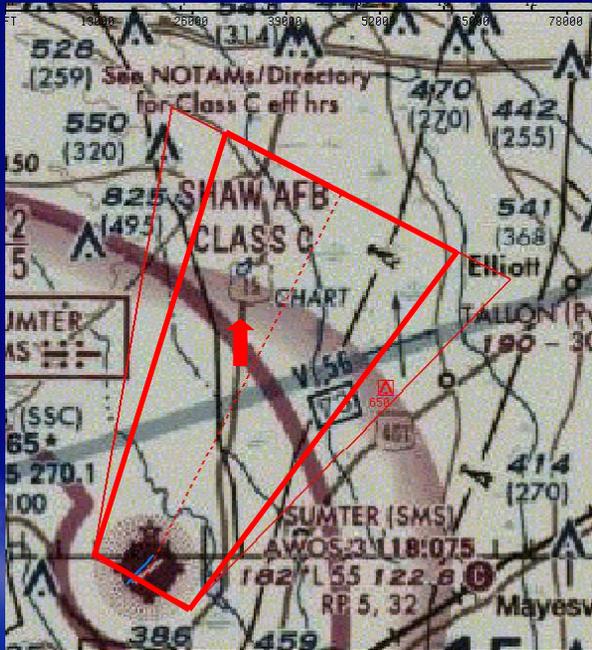


# Obstacle Evaluation Area

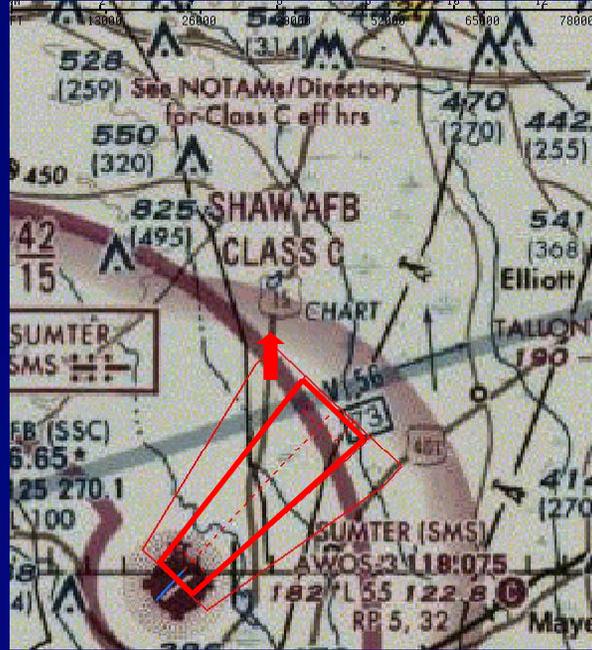
**NDB**

**LNAV**

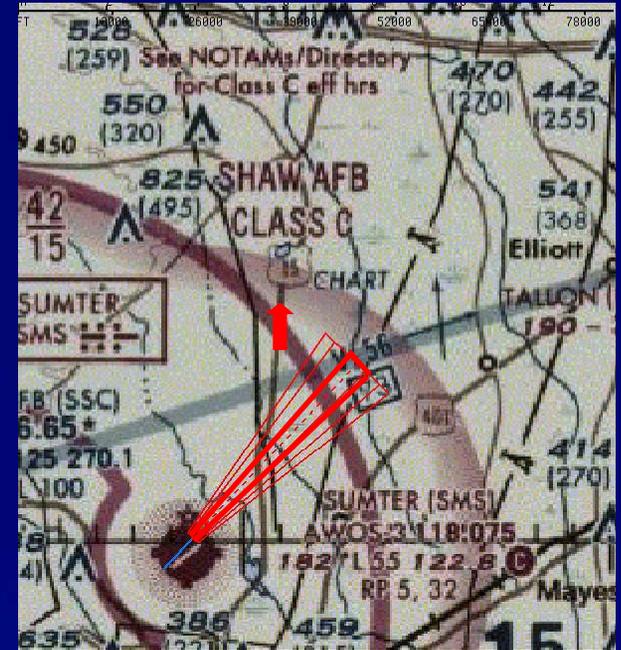
**LPV**



**ROC = 350'**



**ROC = 250'**



**ROC = 250' or 200'**

# Loss of WAAS Signal

- LNAV + V
- LNAV / VNAV
- LPV



# RNAV Approach Minima

- LNAV

No Glidepath (GP)

- LNAV + V

- LNAV / VNAV

WAAS-derived Glidepath

Downgraded to LNAV with loss of WAAS signal

- LPV

# RNAV Approach Minima

- LNAV
- LNAV + V
- LNAV / VNAV
- LPV

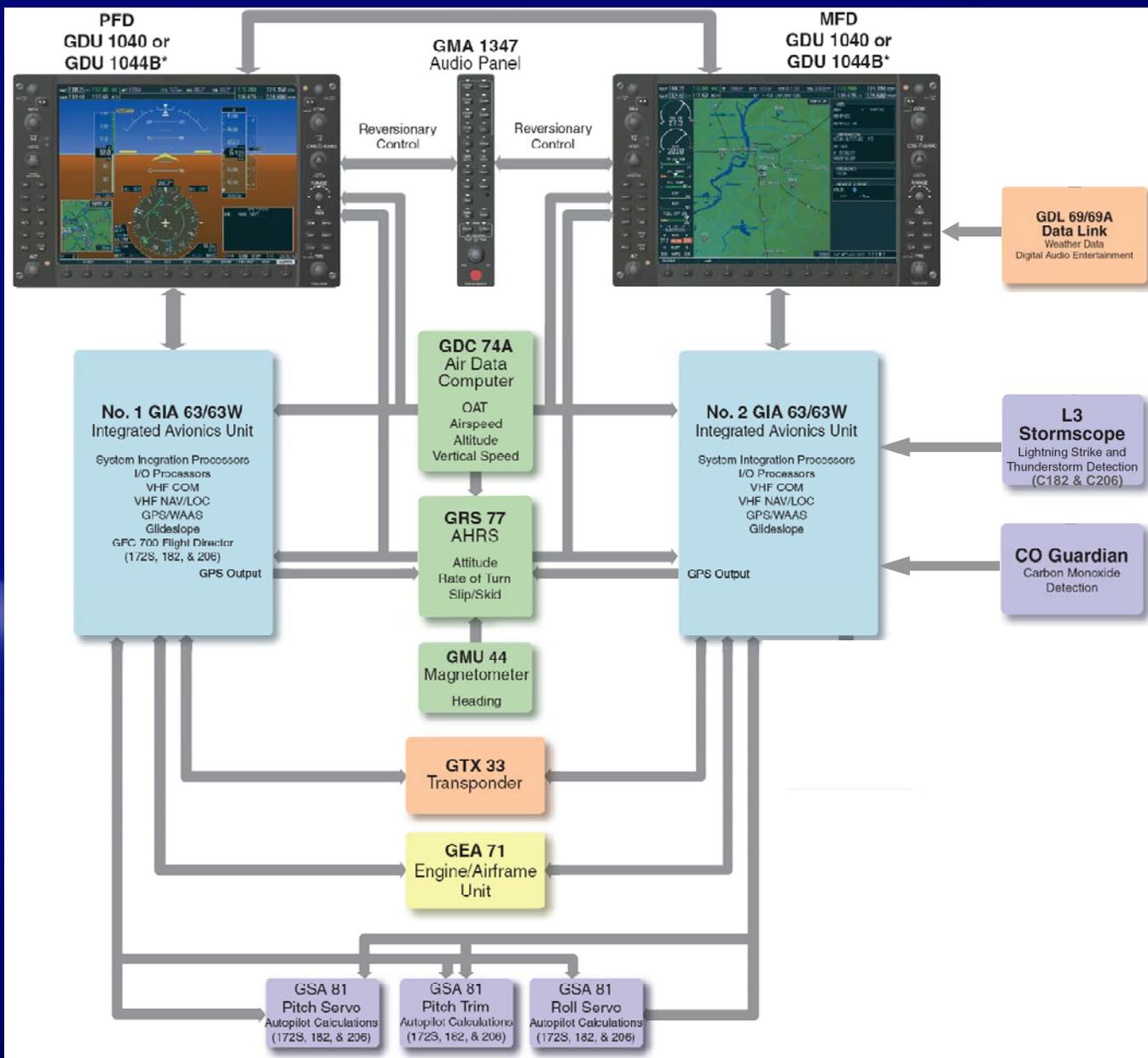
Wider Obstacle Evaluation Area  
Angular Course Guidance

Narrower Obstacle Evaluation Area  
Angular Course Guidance

# Agenda

- Lab
  - Map Setup
  - Flight Scenario 2
- Classroom
  - Expanded MFD
  - WAAS Instrument Approach Procedures
  - **System Components**
  - **System Malfunctions**
  - **Questions**

# G1000 Block Diagram



# System Components

- Two Control Display Units
- Audio Panel
- Attitude and Heading Reference System
- Air Data Computer
- Engine/Airframe Unit
- Two Integrated Avionics Units
- Data Link
- Mode S Transponder
- Magnetometer

# G1000 System Message Advisories



# Auxiliary – System Status



NAV1 111.70 ↔ 117.90 BVO GS 144kt ETE 47:56 XTK +0.12nm VSR \_\_\_\_\_ FPH 122.700 ↔ 132.900 COM1  
 NAV2 117.30 117.60 OSW AUX - SYSTEM STATUS 118.525 121.650 COM2

MAN IN 27.3  
 RPM 2090  
 FLOW GPH  
 OIL PRES  
 OIL TEMP  
 CHT  
 EGT  
 FUEL QTY GAL  
 ELECTRICAL  
 M BUS E 28.2 VOLTS 28.2  
 M BATT S 0.0 AMPS 0.0

LRU INFO	STATUS	SERIAL NUMBER	VERSION
CO GUARDIAN	✓	-----	-----
COM1	✓	-----	-----
COM2	✓	-----	-----
GDC1	✗	-----	-----
GDL69	✓	-----	-----
GEA1	✓	-----	-----
GIA1	✓	0000001	0.50
GIA2	✓	0000002	0.50
GMA1	✓	-----	-----
GMU1	✓	-----	-----
GPS1	✓	0000001	2.3
GPS2	✓	0000002	2.3
GRS1	✓	-----	-----
GS1	✓	-----	-----
GS2	✓	-----	-----
GSA PTDH CTL	✓	-----	-----

AIRFRAME:  
 AIRFRAME Cessna 182T  
 SYSTEM SOFTWARE VERSION 0563.00  
 CRG PART NUMBER GPN 190-00384-06  
 SYSTEM ID 000000000  
 CHECKLIST 182CLAUSGSW-02

DATABASE:  
 BASEMAP REGION WORLDWIDE  
 BASEMAP VERSION 2.00  
 SAFETAXI REGION US  
 SAFETAXI VERSION 2.04  
 SAFETAXI CYCLE 06S4  
 SAFETAXI REVISION 03-AUG-06  
 SAFETAXI NEXT REV 28-SEP-06  
 AVIATION REGION WORLDWIDE  
 AVIATION CYCLE 0609  
 AVIATION EFFECTIVE 31-AUG-06  
 AVIATION EXPIRES 28-SEP-06

MAP WPT AUX NRST 00000

ENGINE LRU AIRFRM DBASE ANN TEST CHKLST



# G1000 Components

- Two Control Display Units
- Marker/Audio Panel
- Attitude and Heading Reference System
- Air Data Computer
- Engine/Airframe Unit
- Two Integrated Avionics Units
- Data Link
- Mode S Transponder
- Magnetometer



# G1000 Components

- Two Control Display Units = GDU
- Marker/Audio Panel
- Attitude and Heading Reference System
- Air Data Computer
- Engine/Airframe Unit
- Two Integrated Avionics Units
- Data Link
- Mode S Transponder
- Magnetometer



# G1000 Components

- Two Control Display Units = **GDU**
- **M**arker/**A**udio Panel = **GMA**
- Attitude and Heading Reference System
- Air Data Computer
- Engine/Airframe Unit
- Two Integrated Avionics Units
- Data Link
- Mode S Transponder
- Magnetometer



# G1000 Components

- Two Control Display Units = **GDU**
- Marker/Audio Panel = **GMA**
- Attitude and Heading **R**eference **S**ystem = **GRS**
- Air Data Computer
- Engine/Airframe Unit
- Two Integrated Avionics Units
- Data Link
- Mode S Transponder
- Magnetometer



# G1000 Components

- Two Control Display Units = **GDU**
- Marker/Audio Panel = **GMA**
- Attitude and Heading Reference System = **GRS**
- Air **D**ata **C**omputer = **GDC**
- Engine/Airframe Unit
- Two Integrated Avionics Units
- Data Link
- Mode S Transponder
- Magnetometer



# G1000 Components

- Two Control Display Units = **GDU**
- Marker/Audio Panel = **GMA**
- Attitude and Heading Reference System = **GRS**
- Air Data Computer = **GDC**
- **E**ngine/**A**irframe Unit = **GEA**
- Two Integrated Avionics Units
- Data Link
- Mode S Transponder
- Magnetometer



# G1000 Components

- Two Control Display Units = **GDU**
- Marker/Audio Panel = **GMA**
- Attitude and Heading Reference System = **GRS**
- Air Data Computer = **GDC**
- Engine/Airframe Unit = **GEA**
- Two **I**ntegrated **A**vionics Units = **GIA**
- Data Link
- Mode S Transponder
- Magnetometer



# G1000 Components

- Two Control Display Units = **GDU**
- Marker/Audio Panel = **GMA**
- Attitude and Heading Reference System = **GRS**
- Air Data Computer = **GDC**
- Engine/Airframe Unit = **GEA**
- Two Integrated Avionics Units = **GIA**
- **Data Link = GDL**
- Mode S Transponder
- Magnetometer



# G1000 Components



- Two Control Display Units = **GDU**
- Marker/Audio Panel = **GMA**
- Attitude and Heading Reference System = **GRS**
- Air Data Computer = **GDC**
- Engine/Airframe Unit = **GEA**
- Two Integrated Avionics Units = **GIA**
- Data Link = **GDL**
- Mode S **T**ransponder **X** = **GTX**
- Magnetometer



# G1000 Components

- Two Control Display Units = **GDU**
- Marker/Audio Panel = **GMA**
- Attitude and Heading Reference System = **GRS**
- Air Data Computer = **GDC**
- Engine/Airframe Unit = **GEA**
- Two Integrated Avionics Units = **GIA**
- Data Link = **GDL**
- Mode S Transponder X = **GTX**
- **Magnetometer Unit = GMU**



# G1000 Components

- Two Control Display Units = **GDU**
- Marker/Audio Panel = **GMA**
- Attitude and Heading Reference System = **GRS**
- Air Data Computer = **GDC**
- Engine/Airframe Unit = **GEA**
- Two Integrated Avionics Units = **GIA**
- Data Link = **GDL**
- Mode S Transponder X = **GTX**
- Magnetometer Unit = **GMU**



# Control Display Units



- **Garmin Control Display Unit**
  - Best resolution on the market
  - 1044B contains AFCS mode select buttons
  - Reversionary capabilities

# Automatic Reversion



# Automatic Reversion



# Attitude and Heading Reference System-AHRS



## GRS 77



- Source for:
  - Attitude
  - Heading
  - Rate of Turn
  - Slip/Skid
- Solid State
  - More reliable than conventional vacuum gyros
- “On-the-Run” Initialization
- Tail Cone Avionics Bay



# Air Data Computer - ADC

## GDC 74A



- Source for:
  - Altitude
  - Indicated Airspeed
  - Vertical Speed
  - Outside Air Temperature
  - True Airspeed
  - Wind Vector
- Located:
  - Behind Instrument Panel (182/206)
  - Tailcone Avionics Bay(172)

# Engine/Airframe Unit



## GEA 71

- Receives data from airframe and engine systems
  - Presents the information on the Engine Indication System (EIS)
- Provides System Integrity Monitoring
- Behind Instrument Panel

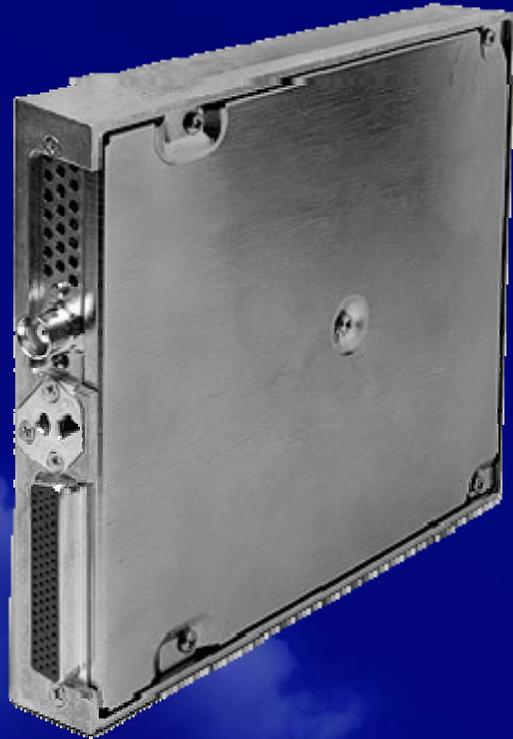
# Integrated Avionics Unit



## GIA 63W

- WAAS-Enabled
- Similar to a Garmin 530A without the display interface
- Dual **GPS**, **NAV**, and **COM** Radios
  - Redundancy
  - Reliability
  - 16 watts
  - 8.33 kHz spacing
- Tail Cone Avionics Bay

# Garmin Data Link



## GDL 69A

- XM Satellite Radio Receiver
  - Near, Real-time Weather
  - Digital Audio Entertainment
- Subscription Service

# Transponder



## GTX 33

- Mode S Transponder
- Automatic activation feature at approximately 30 knots
- Traffic Information Service -TIS
- Tail Cone Avionics Bay

# Magnetometer



## GMU 44

- 3 Axis Magnetic Sensor
  - Replaces traditional Flux Valve
- Located in Left Wing

# Audio Panel – GMA 1347



- Powered ON and OFF by Avionics Master Switch
- All annunciators illuminate for approximately two seconds after avionics power-up. This time allows for an operational check of the lights within the audio panel.
- Selected items on the audio panel will be annunciated by an illuminated light directly above the respective key.
- Selecting **COM1** or **COM2** selects the audio source. The audio source can be selected independently of the active microphone source.

# Audio Panel



**NOTE:** The Cessna NAV III is not equipped with **COM3 MIC**, **COM3** and **TEL**. In the Cessna Nav III G1000 configuration, pressing the **COM3 MIC**, **COM3** or **TEL** key does not illuminate the respective annunciator light.

**THE COM 1/2 (SPLIT COM) FUNCTION OF AUDIO PANEL IS NOT APPROVED FOR USE.**

**LIMITATION - Section 2**

During COM 1/2 operation, transmission by one crew member inhibits reception by the other crew member.

# Audio Panel



- **PA** – Passenger Address, allows pilot to transmit to passengers over cabin speaker. **Not Supported on Cessna 172 SkyHawk.**
- **SPKR** – Allows selected aircraft radios to be heard over the cabin speaker

# Audio Panel



- When **MKR/MUTE** is selected, the audio signal can be heard over the headsets
- While receiving a tone on approach, **pressing the MKR/MUTE key mutes the audio** but keeps the marker annunciator light illuminated (PFD)
- The **HI SENS** key can be pressed to augment marker beacon reception sensitivity. It is generally used either over airway markers or to receive an early indication of nearing outer marker during an approach

# Audio Panel



- Pressing **NAV1** or **NAV2** selects the corresponding audio source and activates the annunciator

# Audio Panel



- **NOTE:** The Cessna NAV III is NOT equipped standard with **DME**, **ADF**, or **AUX** radios.
- In the Cessna Nav III G1000 configuration, pressing the **DME**, **ADF** or **AUX** key does not illuminate the respective annunciator light.

# Audio Panel



- **PLAY**- Clearance Recorder
  - Records COM signal blocks of up to 2 ½ minutes
  - Press MKR/Mute key to end playback

# Audio Panel

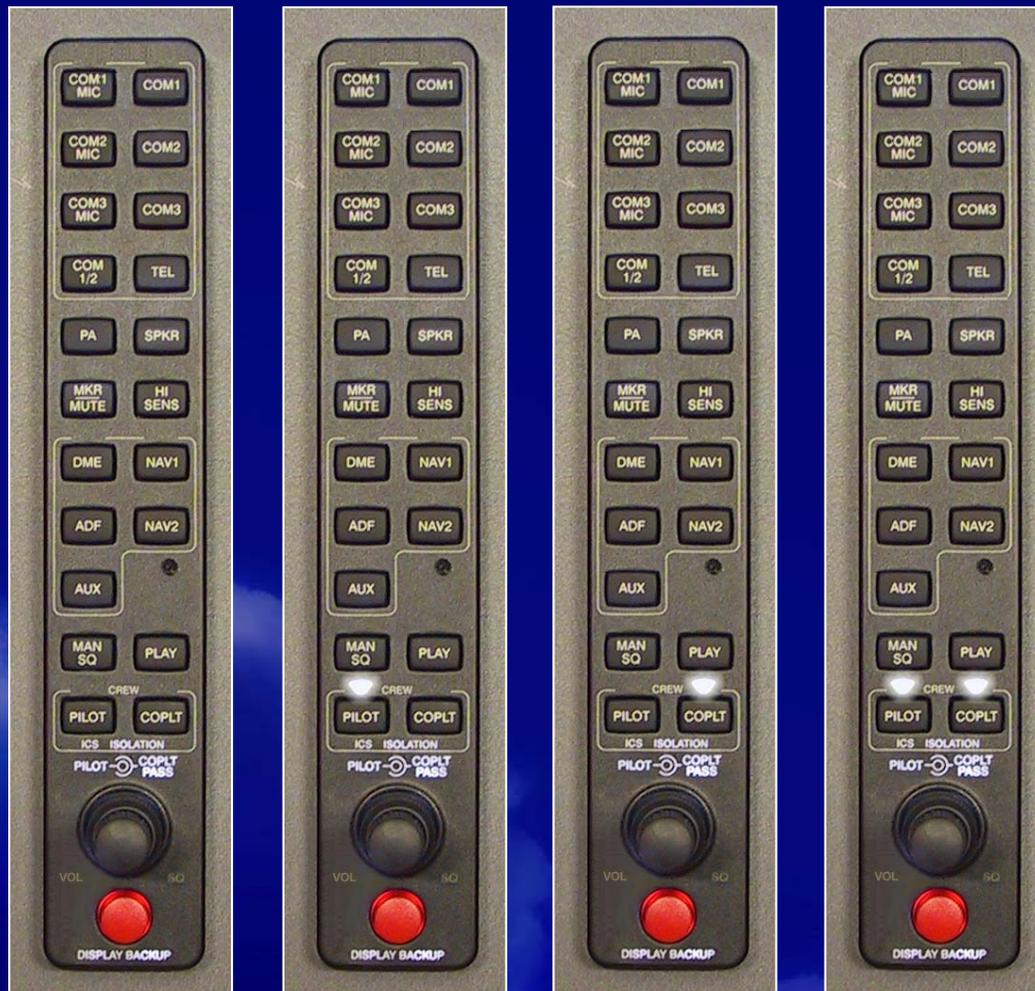


Annunciation



- When the MAN SQ key is selected, **“PRESSING”** the **VOL/SQ knob** toggles between volume and squelch adjustment modes.
- Intercom squelch can be controlled via the VOL/SQ knob. **The “Inner Knob” controls the pilot ICS squelch**, while the **“Outer Knob”** controls the copilot/passenger ICS squelch.

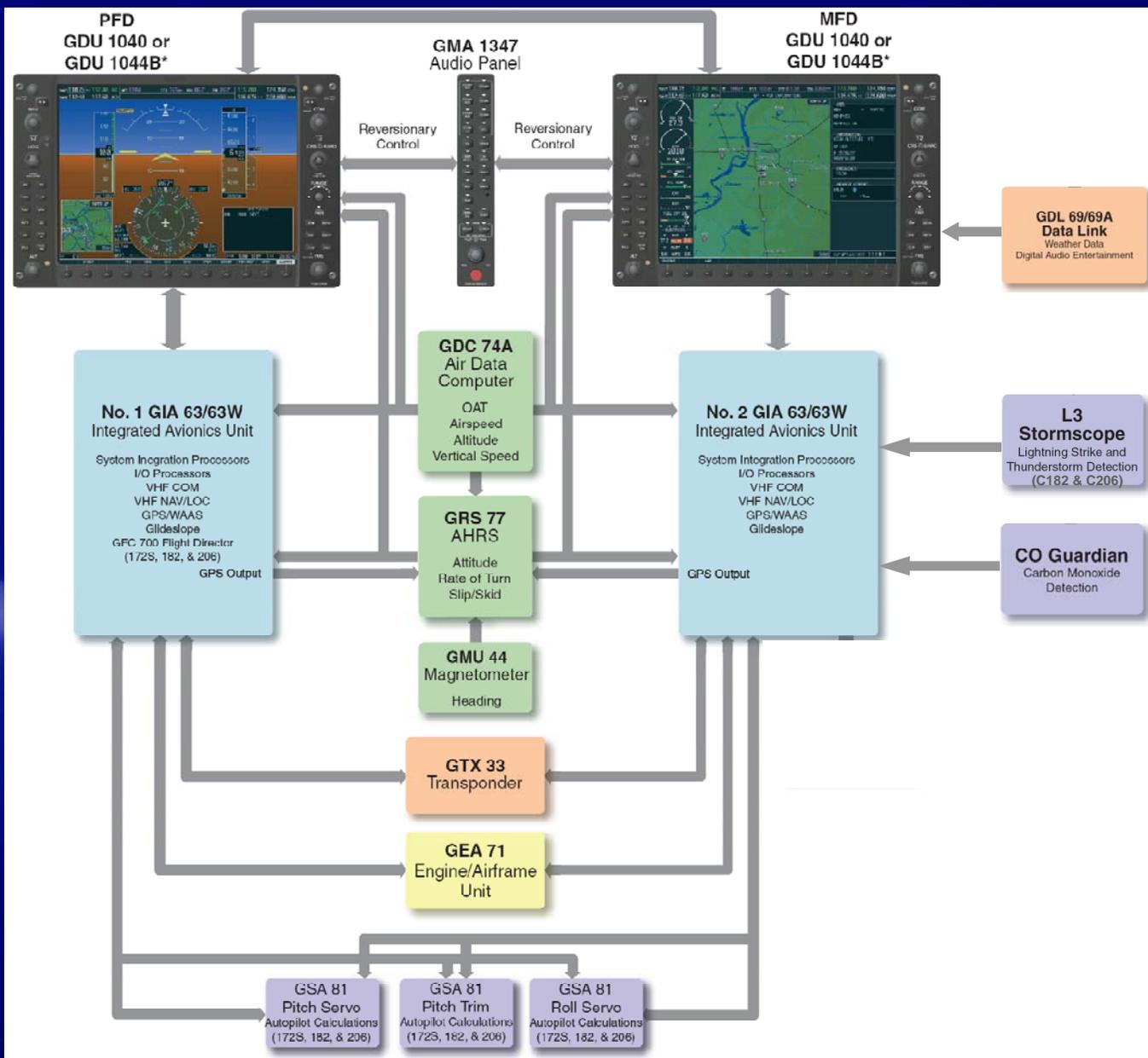
# Audio Panel



## ICS Isolation

- **PILOT Mode** – the pilot can hear the selected radios, co-pilot and passengers only communicate with each other
- **COPLT Mode** – the co-pilot is isolated from everyone
- **CREW mode** – Both Pilot and Co-pilot can hear selected radios

# G1000 Block Diagram



# Agenda

- Lab
  - Map Setup
  - Flight Scenario 2
- Classroom
  - Expanded MFD
  - WAAS Instrument Approach Procedures
  - System Components
  - **System Malfunctions**
  - Questions

# Systems Malfunctions

Items to be covered:

- ALERT Messages: 3 Categories
  - ADVISORY
  - CAUTION
  - WARNING
- System Annunciators
- Electrical Failure
- Component Failures

# Message Advisory



Flashing Advisory  
Annunciation

No Chime

Must PRESS Softkey  
to acknowledge  
and to display  
Alerts Window

This level of alert  
provides general  
information to the pilot

Acknowledge by pressing ALERTS Softkey

# Message Advisory



Alerts Window



**Annunciation Window**

**Flashing Caution Annunciation**

**One Chime**

**Must PRESS Softkey to acknowledge**

**This level of alert indicates the existence of abnormal conditions on the aircraft that may require pilot intervention.**



**Annunciation Window**

**Flashing Warning Annunciation**

**Continual Chime (every 2 sec.)**

**Must PRESS Softkey to acknowledge and to silence tone**

**This level of alert requires immediate pilot attention**

# System Annunciators

**OIL PRESSURE**  
**LOW VOLTS**  
**HIGH VOLTS**  
**CO LVL HIGH**  
**LOW VACUUM**  
**LOW FUEL L**  
**LOW FUEL R**  
**STBY BATT**  
**PROP HEAT**  
**PROP HEAT**

Oil Pressure -  $< 20$  psi

Low Volts -  $< 24$  Volts

High Volts -  $> 32$  Volts

CO Level High -  $> 50$  ppm

Low Vacuum -  $< 3.5$  in. Hg

Low Fuel Left/Right –

172 -  $< 5$  gals. After 60 seconds

182/206 -  $< 8$  gals. After 60 seconds

Standby Battery - Drawing  $> 0.5$  amps

Prop Heat Yellow - Detect Failure

Prop Heat Green - System ON

# Electrical Failure

## LOW VOLTS

- **LOW VOLTS**

- Reference the appropriate checklist.
- Ensure the standby battery is in the ARM position.
- If the annunciation does not extinguish, begin load shedding on the Main Battery.

# Electrical Distribution

**Essential Bus:** The Standby Battery powers the equipment on the essential bus for at least 30 minutes of continued operation if the alternator or aircraft battery fail to keep main bus above 20 VDC.

Primary Flight Display (PFD)

Air Data Computer (ADC)

Attitude / Heading Reference System (AHRS)

Navigation 1

Engine / Airframe Unit (GEA)

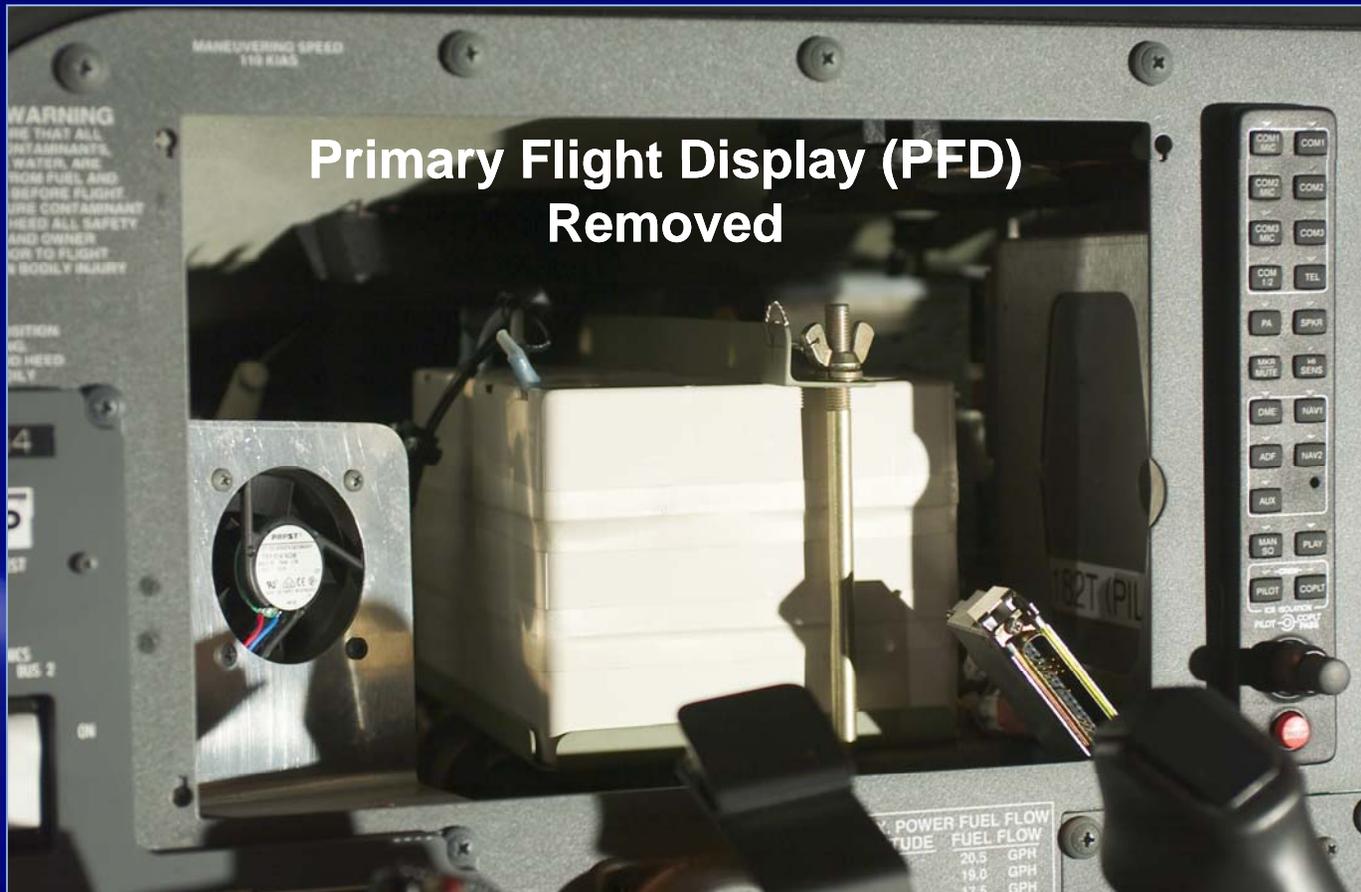
Communication 1

Standby Instruments Internal Lighting (Compass, O2 Light)

Standby Battery (Charged when Essential Bus above 26 VDC)



# Electrical Distribution



## Standby Battery Installation

# Component Failures

- Display Unit
- AHRS
- ADC
- Magnetometer
- Audio Panel

# Display Failure



- In the event of a display failure, the system automatically switches to reversionary mode.
- All critical flight information is displayed, including flight indications and engine instruments.
  - One NAV/COM is lost.

# Display Failure



Pressing the Display Backup button manually selects the reversionary mode for all operational displays in the event the display problem is not detected by the system.

# MFD Failure



- Check Circuit Breakers
  - Do Not Enter IMC
- GFC 700: Not Affected

# PFD Failure



- Check Circuit Breakers
  - Do Not Enter IMC
- GFC 700: Loss of AP and FD

# AHRS Failure



- Check Circuit Breakers.
- Refer to standby Attitude Indicator and Magnetic Compass.
- Do Not Enter IMC.

**GFC 700: Loss of AP and FD**

# ADC Failure



- Check Circuit Breakers.
- Refer to standby Airspeed and Altitude Indicators.
- Do Not Enter IMC.

**GFC 700: Loss of AP, FD functions in PIT mode**

# ADC Failure



- Check Circuit Breakers.
- Refer to standby Airspeed and Altitude Indicators.
- **Do Not Enter IMC.**

**GFC 700: Loss of AP, FD functions in PIT mode**

# AHRS/ADC Failure



- Check Circuit Breakers.
- Refer to Standby Instruments.
- Do Not Enter IMC.

**GFC 700: Loss of AP and FD**

# AHRS/ADC Failure



- Check Circuit Breakers.
- Refer to Standby Instruments.
- Do Not Enter IMC.

(ILS with AHRS/ADC Failure)

# Magnetometer Failure



- Use Magnetic Compass for heading information.
- Do Not Enter IMC.

**GFC 700: Loss of HDG mode**

# Standby Instruments



**Non-electrical systems  
in the event of an  
electrical failure:**

- Airspeed Indicator and Altimeter
  - Conventional Pitot Static System
  - Alternate Static Air
- Attitude Indicator
- Magnetic Compass



# Audio Panel Failure



- Backup analog mode connects directly to Com 1 radio, without intercom functions
- Use of the autopilot is prohibited when the audio panel is inoperative

# Agenda

- Lab
  - Map Setup
  - Flight Scenario 2
- Classroom
  - Expanded MFD
  - WAAS Instrument Approach Procedures
  - System Components
  - System Malfunctions
  - Questions

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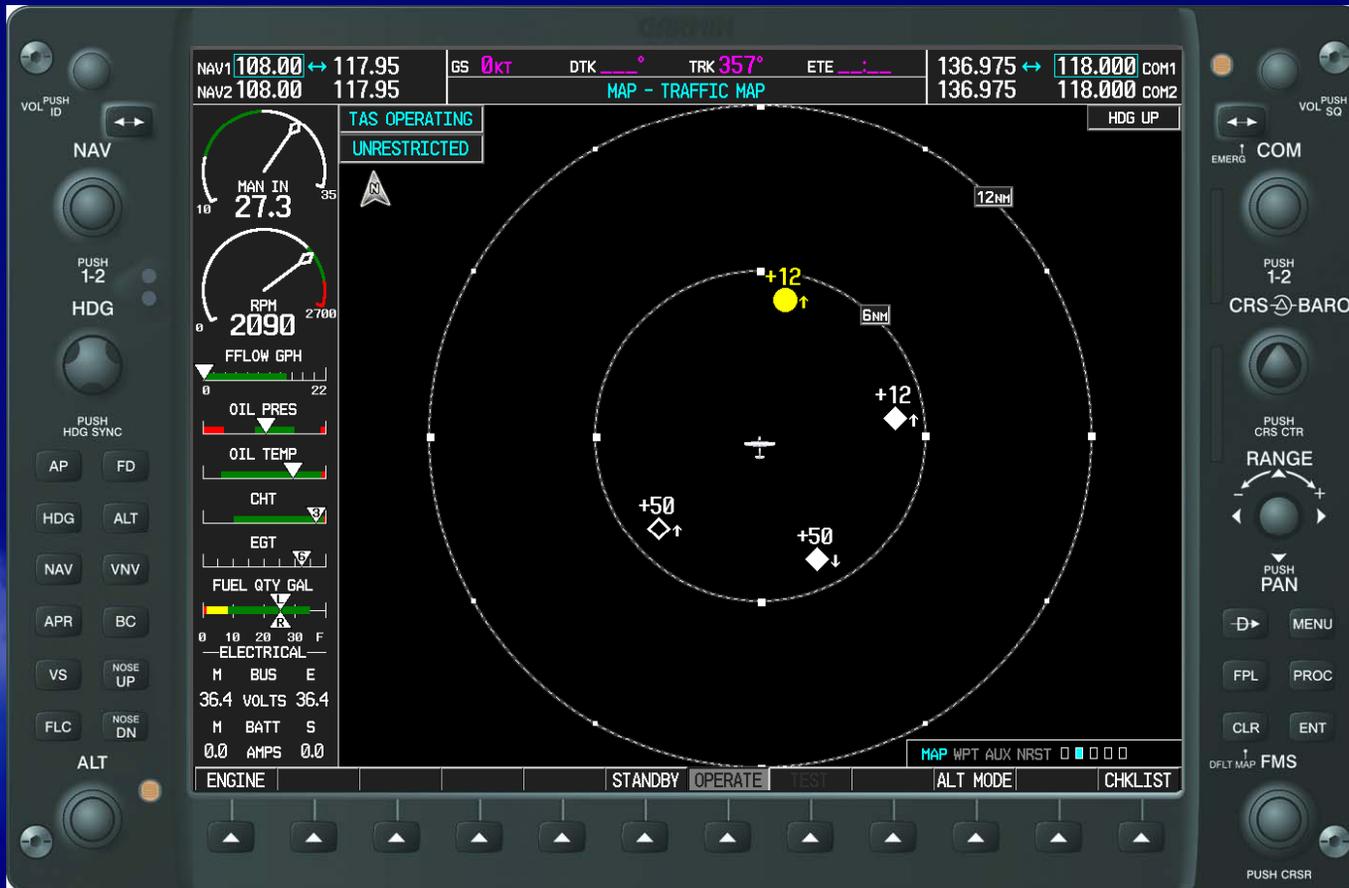


# Agenda

- Lab
  - Map Setup
  - Flight Scenario 2
- Classroom
  - Expanded MFD
  - WAAS Instrument Approach Procedures
  - System Components
  - System Malfunctions
  - Questions
  - **Optional Systems**
    - **G1000 Systems**
      - TAS
      - TAWS
    - **Other Aircraft Systems**
      - Amsafe Aviation Inflatable Restraints
      - Turbo charging
      - Oxygen
      - McCauley Constant Speed Propeller



# Traffic Advisory System - TAS

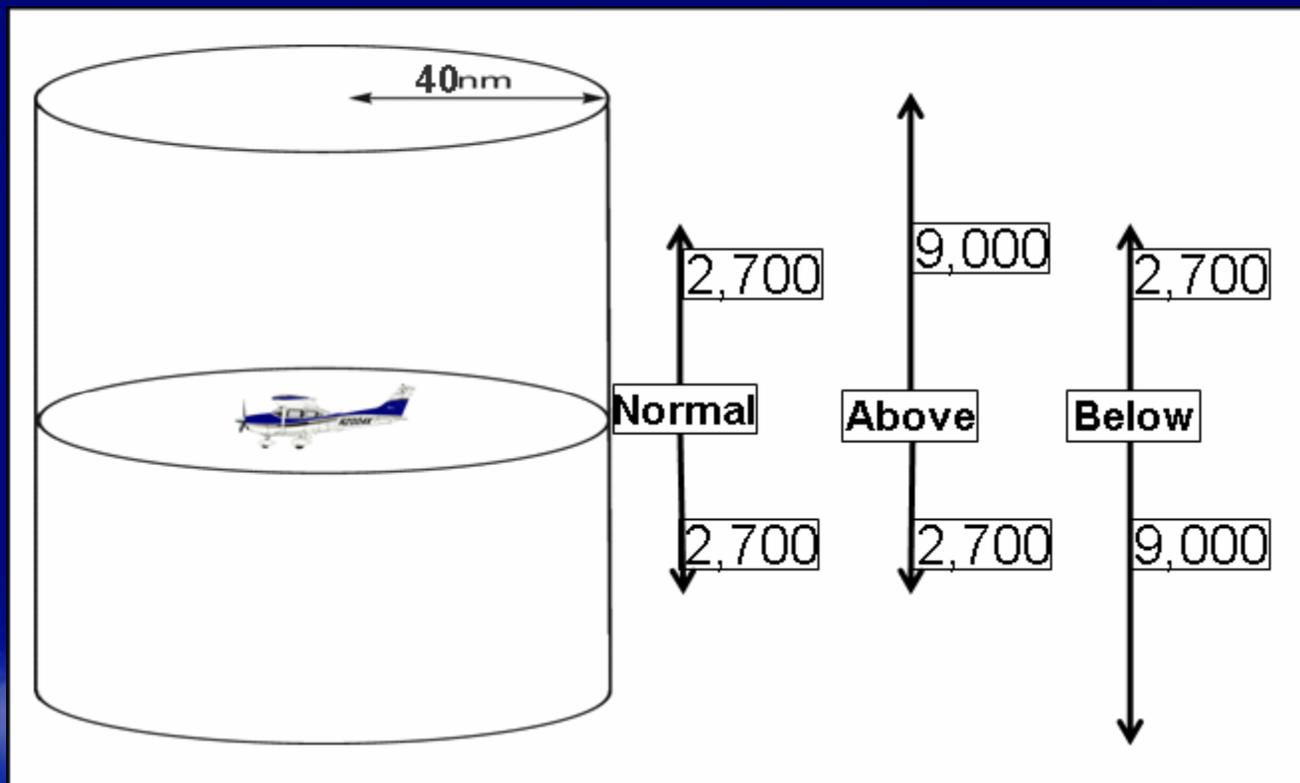


## Traffic Display

- Aircraft Location
- Aircraft altitude relative to you

## Traffic Alert

- Within 30 sec. Projected to be
- Within ½ nm AND
- Within 800 feet

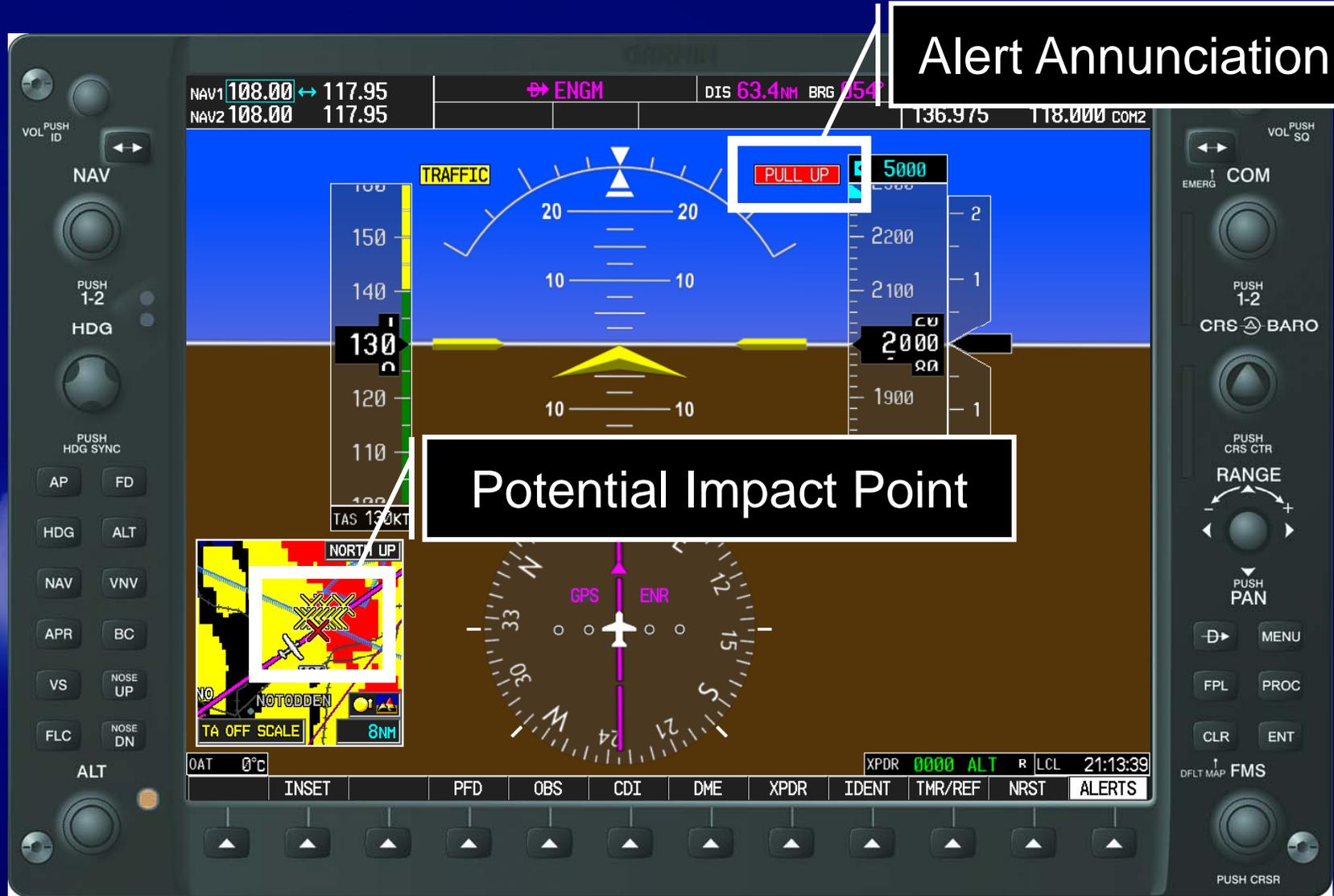


## Service Area

### Limitations

- Displays up to 30 aircraft
- Secondary radar targets only (Mode A, C and S transponder equipped)
- Traffic Alerts (TA), but no Resolution Advisories (RA)

# Terrain Awareness Warning System



Alert Annunciation

Potential Impact Point

# Amsafe Aviation Inflatable Restraints



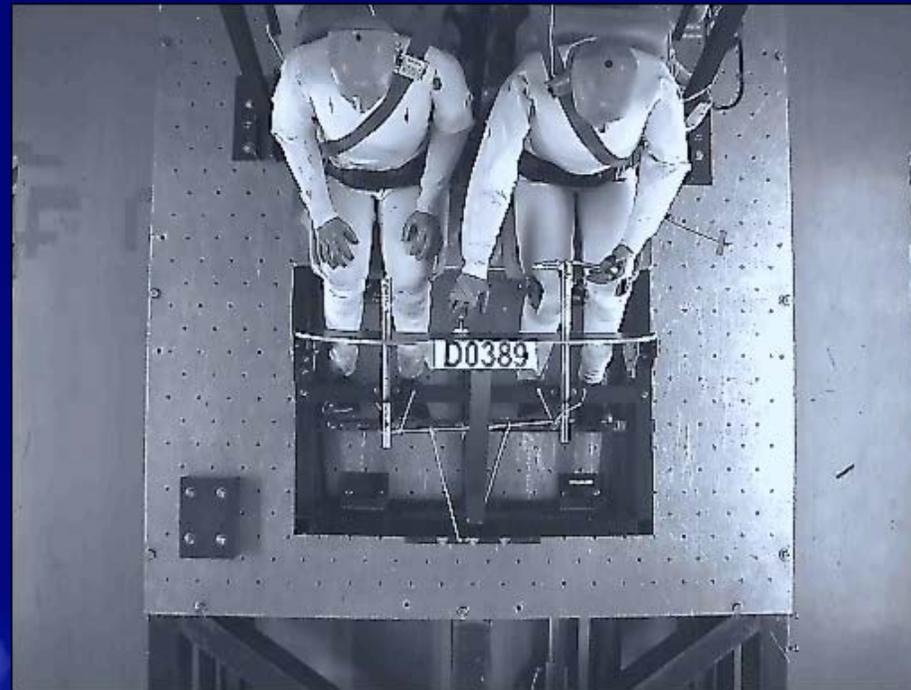
# Inflatable Restraint

- **AAIR**
  - Amsafe Aviation Inflatable Restraint
  - Self-contained, modular design
  - Designed to improve occupant protection from serious head injury during a survivable crash.

# Inflatable Restraint

- **Limitations:** Supplement, Section 9
  - The standard inflatable restraint buckle can not be used to secure a child safety seat
  - The restraint in an empty co-pilot or passenger seat must not be buckled so as to prevent inflation of the lapbelt airbag in the unoccupied seat.
  - Service Life:
    - Return for refurbishment at **seven (7) years**

# Inflatable Restraint



3-pt pilot restraint, airbag Top View.avi

Click to animate

# Turbocharging



# Turbocharging

## Turbocharged Engines:

- Maintain a higher manifold pressure at a given throttle setting, regardless of air temperature and pressure.
- Maintain sea level atmospheric manifold pressure with altitude gain.
- Will not lose horsepower with altitude gain.
- Provides pressurized air which permits more air, and therefore more fuel, to be introduced into the cylinder.
  - The result is more power and higher combustion efficiency.

**Normally aspirated engine will lose horsepower with altitude gain**



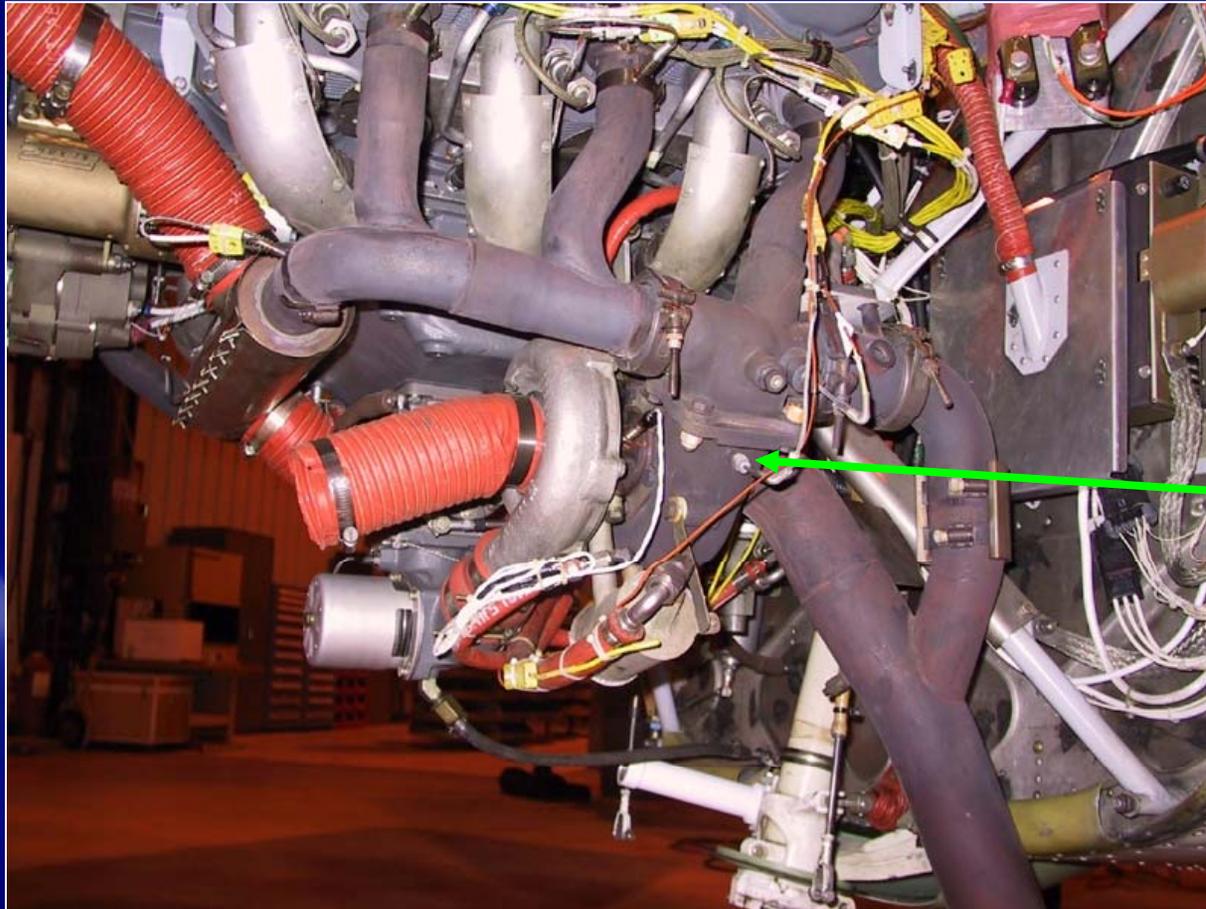
# Turbocharging



Waste Gate

View of turbocharger installed on T182 engine

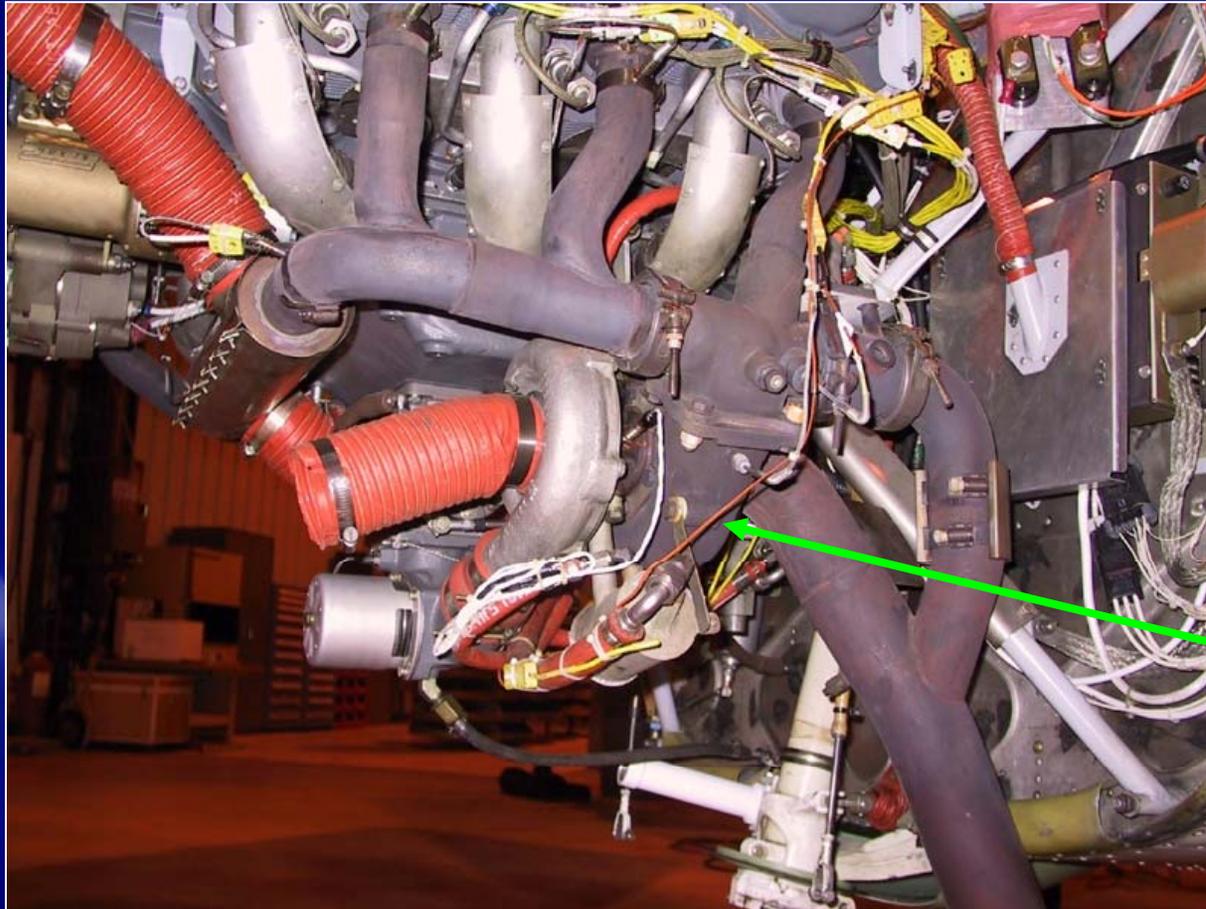
# Turbocharging



T.I.T. Probe

View of turbocharger installed on T182 engine

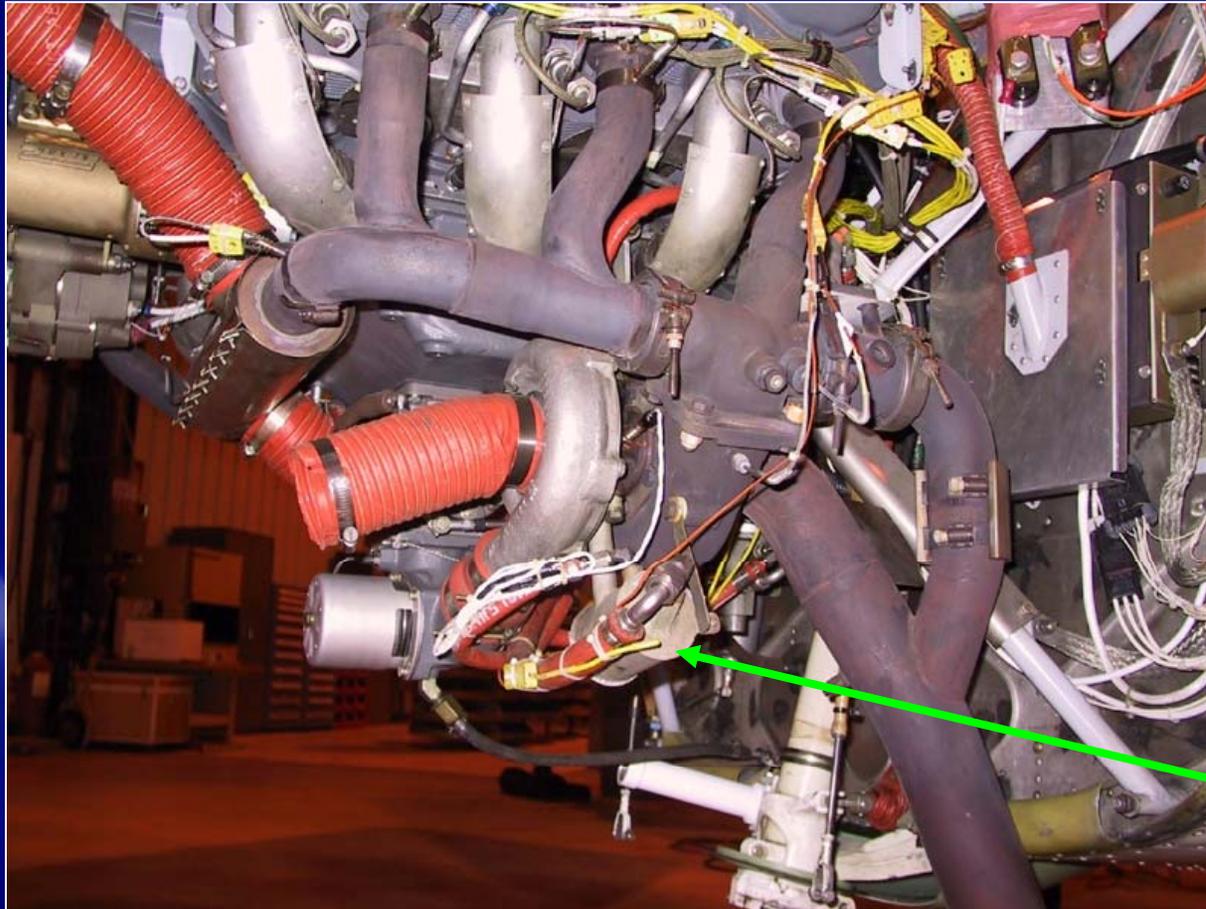
# Turbocharging



Turbine

View of turbocharger installed on T182 engine

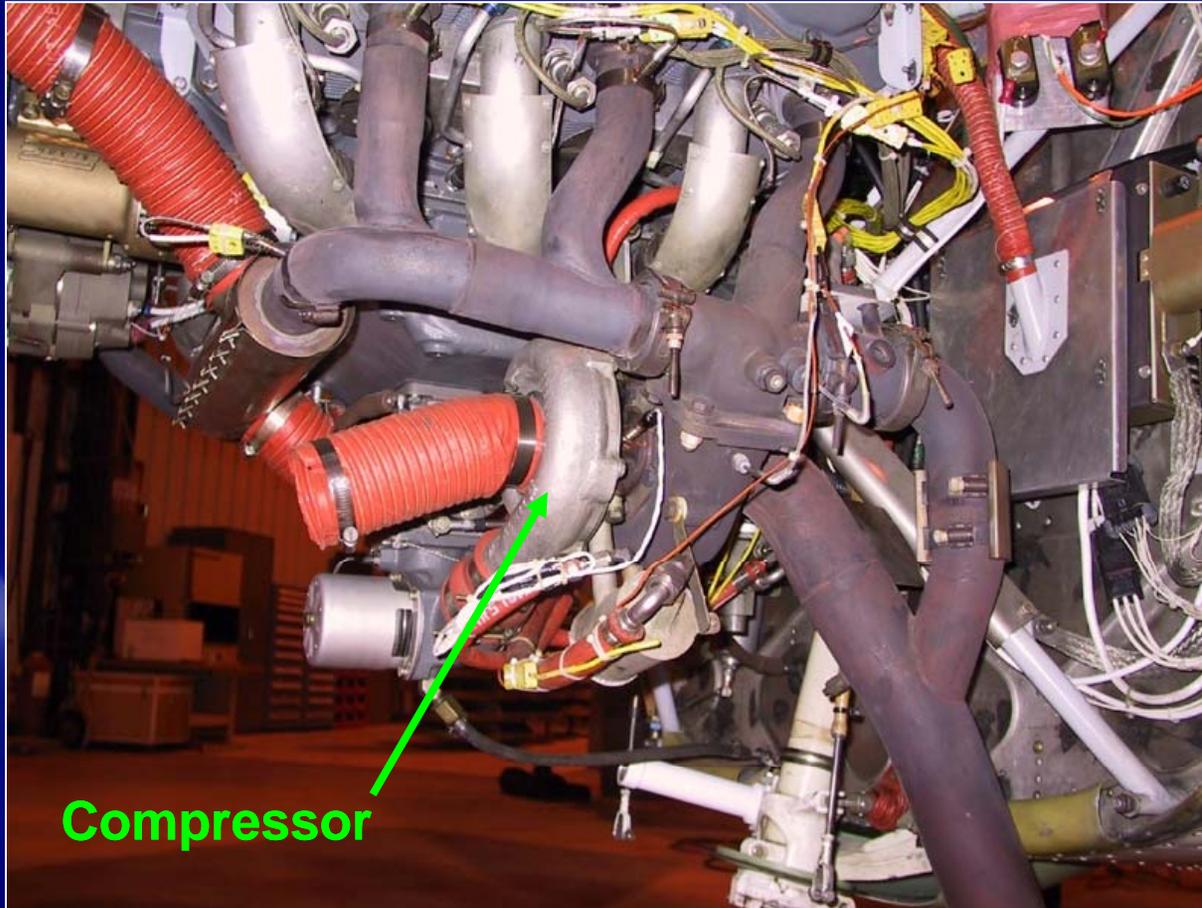
# Turbocharging



Oil  
Accumulator

View of turbocharger installed on T182 engine

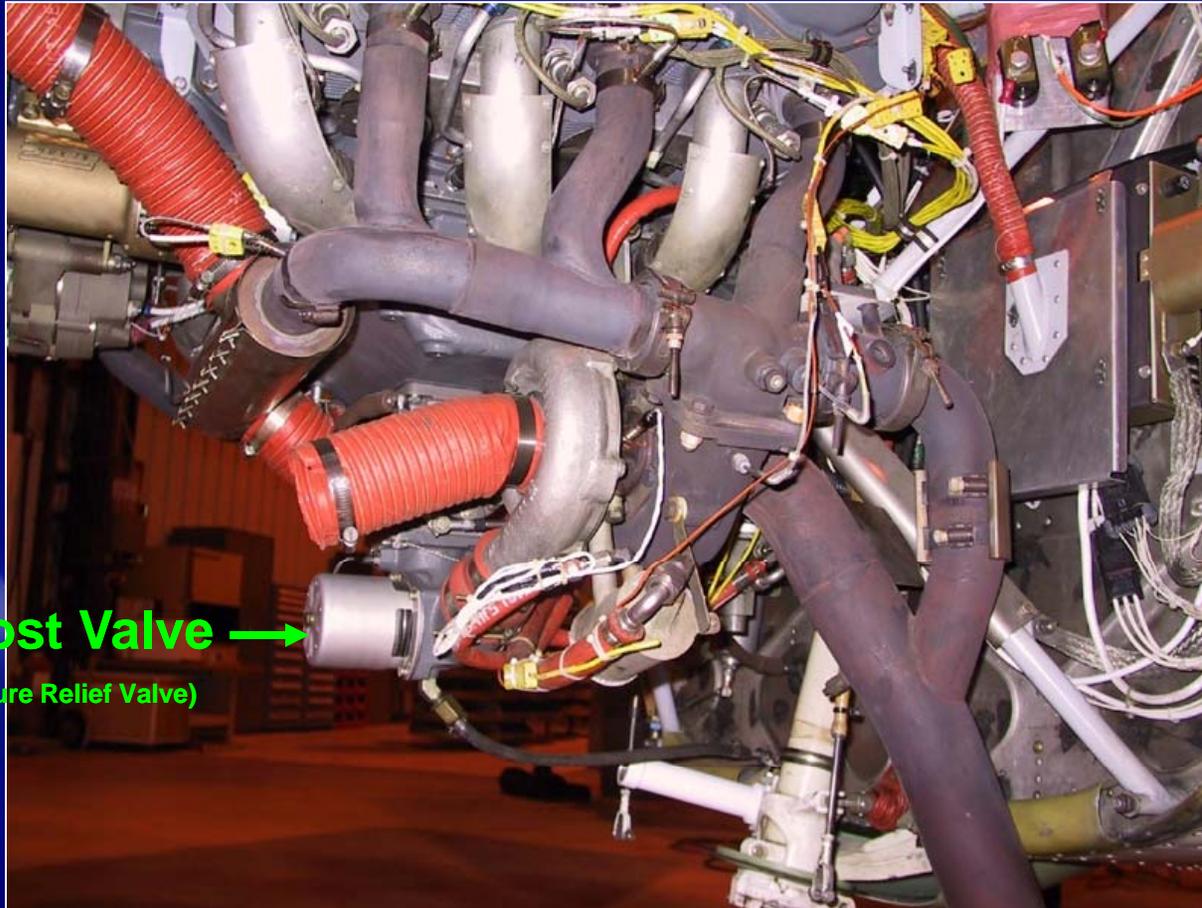
# Turbocharging



Compressor

View of turbocharger installed on T182 engine

# Turbocharging



**Over Boost Valve** →  
(Manifold Pressure Relief Valve)

View of turbocharger installed on T182 engine

# Turbo Skylane

## Powerplant Instrument Markings

**Instrument      Normal      Max Limit**

Instrument	Normal	Max Limit
Tachometer (RPM)	2000 - 2400	2400
Manifold Pressure (in. Hg.)	15 - 28	32
Cylinder Head Temperature (°F)	200 - 500	500
Oil Temperature (°F)	100 - 245	245
Oil Pressure (PSI)	50 - 90	115
Turbine Inlet Temperature (T.I.T.) (°F)	1350 - 1685	1685

**Normal  
Operating  
Range**

**Maximum  
Operating  
Range**



# Turbo StationAir

## Powerplant Instrument Markings

**Instrument      Normal      Max Limit**

Tachometer (RPM)	2000 - 2400	2500
Manifold Pressure (in. Hg.)	15 - 30	39
Cylinder Head Temperature (°F)	200 - 480	480
Oil Temperature (°F)	100 - 245	245
Oil Pressure (PSI)	50 - 90	115
Turbine Inlet Temperature (T.I.T.) (°F)	1350 - 1675	1675

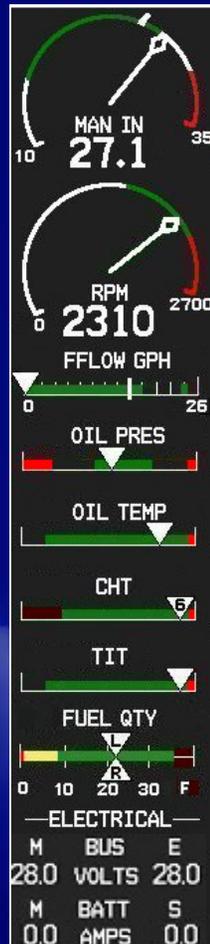
**Normal  
Operating  
Range**

**Maximum  
Operating  
Range**



# MFD Details

## Engine Indication System



### *Turbo Skylane*

- **Manifold Pressure**
  - **White Tick Mark (25 in. Hg)**
    - Normal Enroute Climb
- **Fuel Flow**
  - **White Tick Mark (16 GPH)**
    - Normal Enroute Climb
  - **Green Tick Mark (24 GPH)**
    - Maximum Performance Climb

# MFD Details

## Engine Indication System



### *Turbo StationAir*

- **Manifold Pressure**
  - Top of the Green Arc (30 in. Hg)
    - Normal Enroute Climb
- **Fuel Flow**
  - Top of the Green Range (20 GPH)
    - Normal Enroute Climb
  - Green Tick Mark (34 GPH)
    - Maximum Performance Climb

# Turbocharging

## MOMENTARY OVERTHROOT OF MANIFOLD PRESSURE

- Rapid throttle movement, especially with cold oil makes it possible that the engine can be overboosted slightly above the maximum manifold pressure.
- Most likely be experienced during the takeoff roll or during a change to full throttle operation in flight.
- A slight overboost of 2 to 3 inches of manifold pressure is not considered detrimental to the engine as long as it is momentary.
- IF overboosting persists when oil temperature is normal or if the amount of overboost tends to exceed 3 inches or more, the throttle should be retarded to eliminate the overboost and the controller system, including the waste gate and relief valve, should be checked for adjustment or replacement of components.

# Turbocharging

## Maximum Continuous Power – (MCP) Manifold Pressure Limitations

### Minimum Fuel Flows Maximum Continuous Power 2500 RPM

ALT (FT)	M.P. (IN. Hg)	FUEL FLOW (GPH)
SL - 17,000	39	34.0
18,000	37	30.5
20,000	35	28.5
22,000	33	26.5
24,000	31	24.5
26,000	29	23.0
28,000	27	21.0
30,000	25	19.0

T206



# Turbocharging

Section 2, Limitations:

**Maximum Operating Altitude**

(T182 ONLY)

20,000 Feet MSL



# Oxygen System



# Oxygen



**OXYGEN SYSTEM-** provides the supplementary oxygen necessary for continuous flight at high altitude

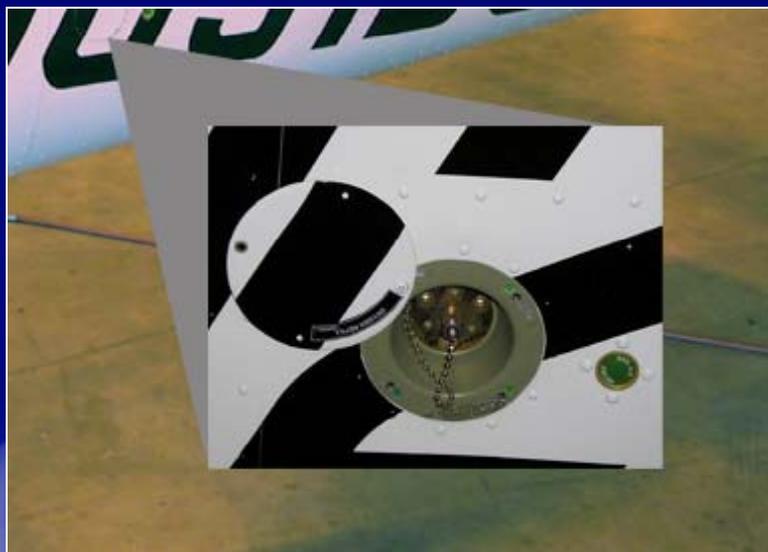
## T182

- Four-Place Oxygen System
- 50 cubic foot oxygen cylinder, located in aircraft tailcone

## T206

- Six-Place Oxygen System
- 76 cubic foot oxygen cylinder

# Oxygen



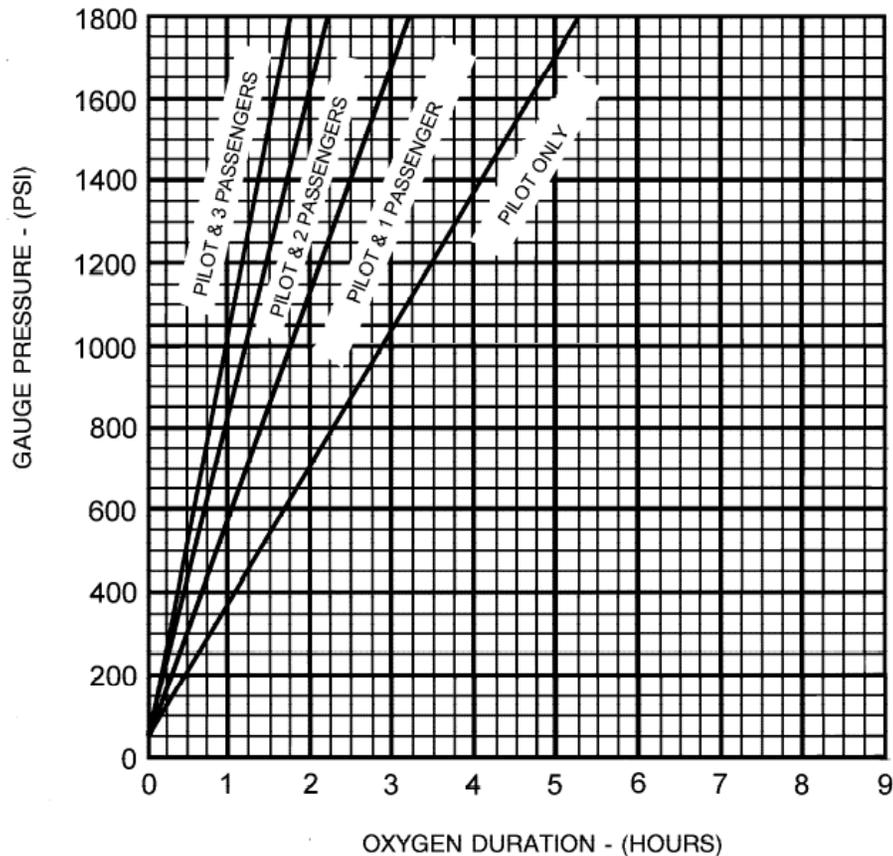
The oxygen cylinder filler valve is located on the left side fuselage tailcone under a cover plate

# Oxygen



Four oxygen outlets (T182) or six outlets (T206) are provided; two in the overhead oxygen console and two (T182) or four (T206) in the cabin ceiling just above the side windows.

# Oxygen



The Oxygen Duration Chart for **your appropriate airplane** should be used in determining the usable duration (in hours) of the oxygen supply in your specific airplane. The procedure outlined in the POH can be used to find the duration from the chart.

This chart is based on the following mask configuration.

**T182-Example**



# Oxygen



ONE microphone-equipped mask is provided for the pilot, and THREE or FIVE masks are provided for the passengers. All masks are the partial-breathing type, equipped with vinyl plastic hoses and flow indicators.

The hose provided for the pilot is of a higher flow rate than those for the passengers; it is color-coded with a **RED** band adjacent to the plug-in fitting.

The passenger hoses are color-coded with an **ORANGE** band. If the airplane owner prefers, he may provide higher flow hoses for all passengers, however, this **WILL** lower oxygen duration.

# Oxygen

When ready to use the oxygen system, proceed as follows:

1. Mask and Hose -- SELECT. Adjust mask to face and adjust metallic nose strap for snug mask fit.

**PERMIT NO SMOKING WHEN USING OXYGEN. OIL, GREASE, SOAP, LIPSTICK, LIB BALM, AND OTHER FATTY MATERIALS CONSTITUTE A SERIOUS FIRE HAZARD WHEN IN CONTACT WITH OXYGEN. BE SURE HANDS AND CLOTHING ARE OIL FREE BEFORE HANDLING OXYGEN EQUIPMENT.**

2. Delivery Hose -- PLUG INTO OUTLET nearest to the seat you are occupying.

## NOTE

When the oxygen system is turned on, oxygen will flow continuously at the proper rate of flow for any altitude without any manual adjustments.

3. Oxygen Supply Control Knob -- ON.
4. Face Mask Hose Flow Indicator -- CHECK. Oxygen is flowing if the indicator is being forced toward the mask.
5. Delivery Hose -- UNPLUG from outlet when discontinuing use of oxygen. This automatically stops the flow of oxygen.
6. Oxygen Supply Control Knob -- OFF when oxygen is no longer required.

For FAA requirements concerning supplemental oxygen, refer to FAR 91.211. Supplemental oxygen should be used by the pilot when cruising above 12,500 feet for greater than 30 minutes. Above 14,000 feet, oxygen use is required by the crew. Above 15,000 feet, oxygen must be provided to all occupants. It is often advisable to use oxygen under conditions of night flying, fatigue, or periods of physiological or emotional disturbances at lower altitudes.



# McCaughey Constant-Speed Propeller



# Propeller

The airplane has an all-metal, three-bladed, constant speed, governor regulated propeller.

A blue control knob on the center area of the switch and control panel is used to set the propeller and control engine RPM as desired for various flight conditions.

The knob is labeled **PROPELLER, PUSH INCR RPM**. When the control knob is pushed in, blade pitch will decrease, giving a higher RPM. When the control knob is pulled out, the blade pitch increases, thereby decreasing RPM.

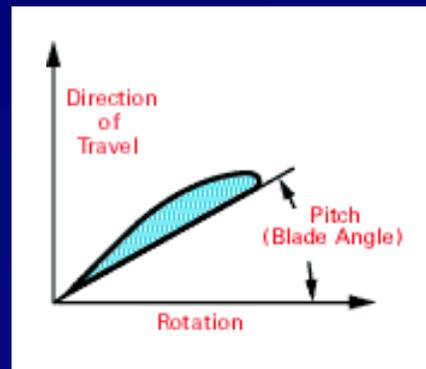
The propeller control knob is equipped with a vernier feature which allows slow or fine RPM adjustments by rotating the knob.

To make rapid or large adjustments, depress the button on the end of the control knob and reposition the control as desired.



# Propeller

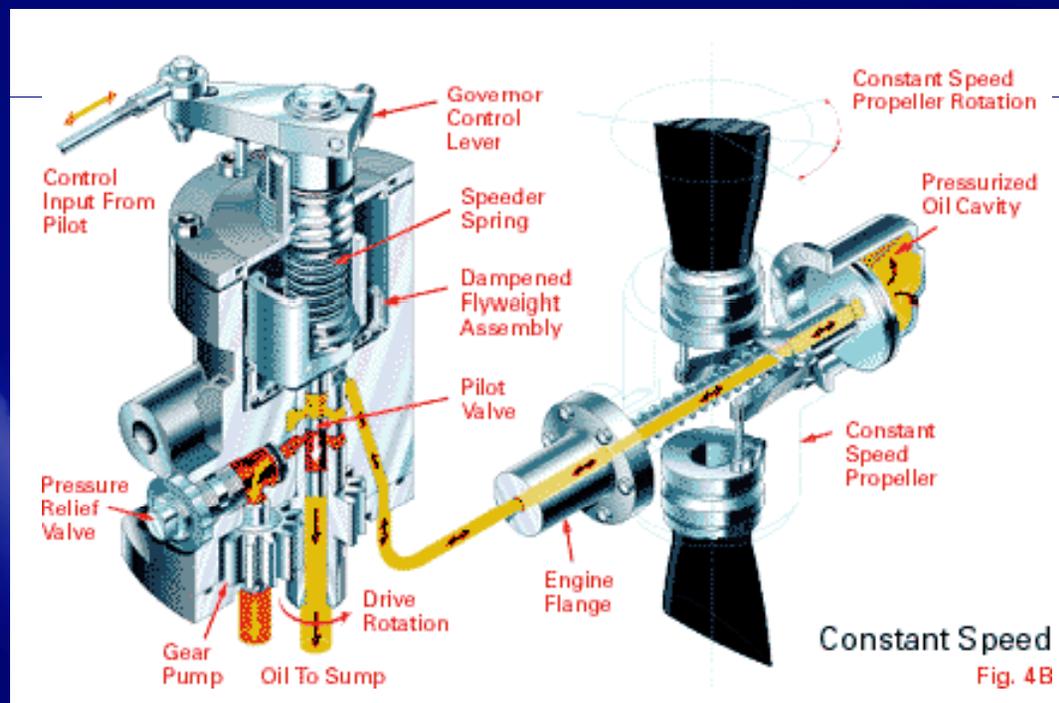
- A constant-speed (RPM) system permits the pilot to select the propeller and engine speed and maintain that RPM under varying conditions of aircraft attitude and engine power.
- With a fixed RPM and power setting, the blade angle automatically changes as airspeed increases or decreases.



- In a single-acting propeller system, oil pressure supplied by the **governor**, acting on the piston produces a force that is opposed by the natural centrifugal twisting moment of the blades in constant speed models.

# Propeller Governor

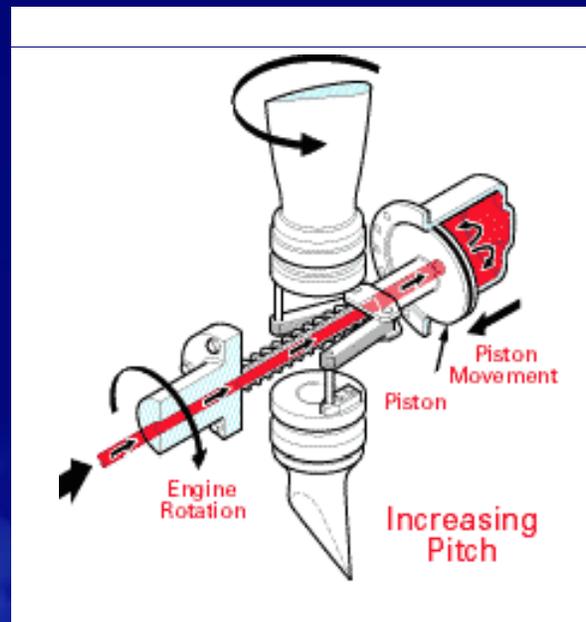
The Cockpit Propeller Control Lever is connected to the Propeller Governor Control Lever in the engine compartment. Depending on the selected RPM by the pilot, the governor will regulate oil into or out of the Propeller Oil Dome to change blade pitch or blade angle to maintain a selected RPM.



**Governor Regulates Oil to or from the Propeller**

# Propeller

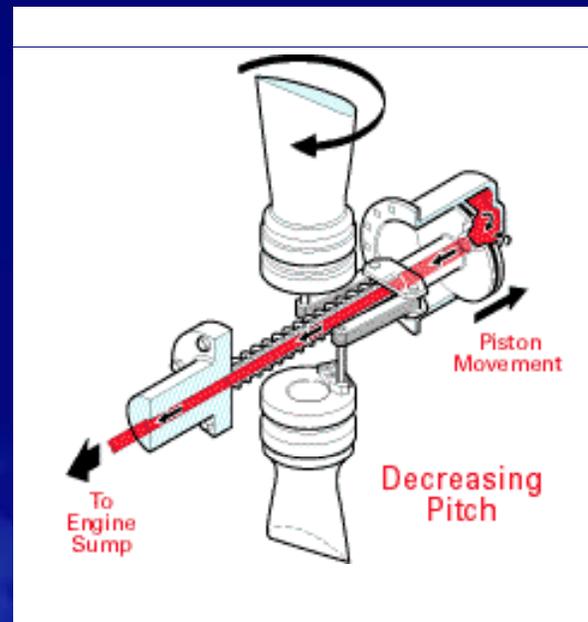
To increase the blade pitch, high pressure engine oil is directed to the propeller, which moves the piston back. The motion of the piston is transmitted to the blades through actuating pins and links, moving the blades toward high pitch for constant-speed systems.



**Oil IN – Increases Pitch**

# Propeller

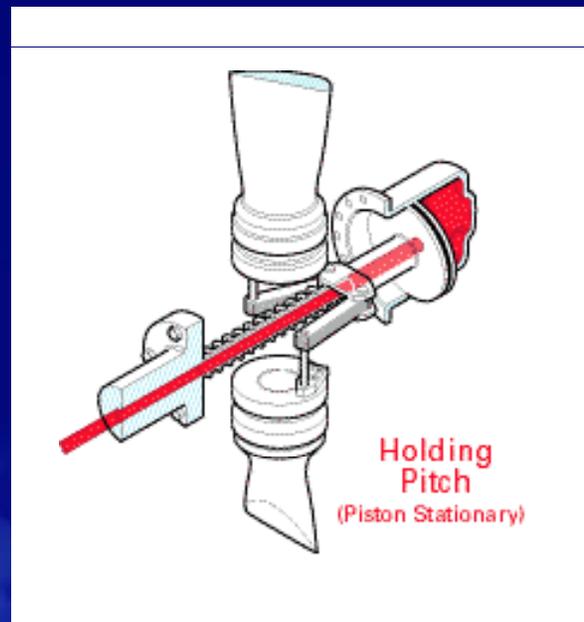
From this position, pitch is decreased for constant-speed systems by allowing oil to flow out of the propeller and return to the engine sump.



**Oil OUT – Decreases Pitch**

# Propeller

When the opposing forces are equal, oil flow to the propeller stops and the piston also stops. The piston will remain in this position, maintaining the pitch of the blades until oil flow to or from the propeller is again established by the governor.



**Oil Stationary – Holding Pitch**

# Propeller Operations

## Before Takeoff Check



**Propeller Control Lever in Cockpit**

### PROP Control – CYCLE

Cycle the prop control through its full range of travel to make sure the prop control works properly and it functions to reduce RPM.

A drop of 200 - 400 RPM should be adequate, it is recommended not to let the RPM drop more than 500 R.P.M.

Please refer to the Pilot's Operating Handbook/Airplane Flight Manual for all of the operating limitations for your aircraft.

