Garmin GNS 430W

IFR Certified – TSO C146a

WAAS, TIS-B Traffic, FIS-B Weather, TAWS

Huge Jeppesen Database – Most Airports, VOR, NDB, Intersections, FSS/ATC Frequencies, SUAs, Approaches, STARs, DPs, etc.

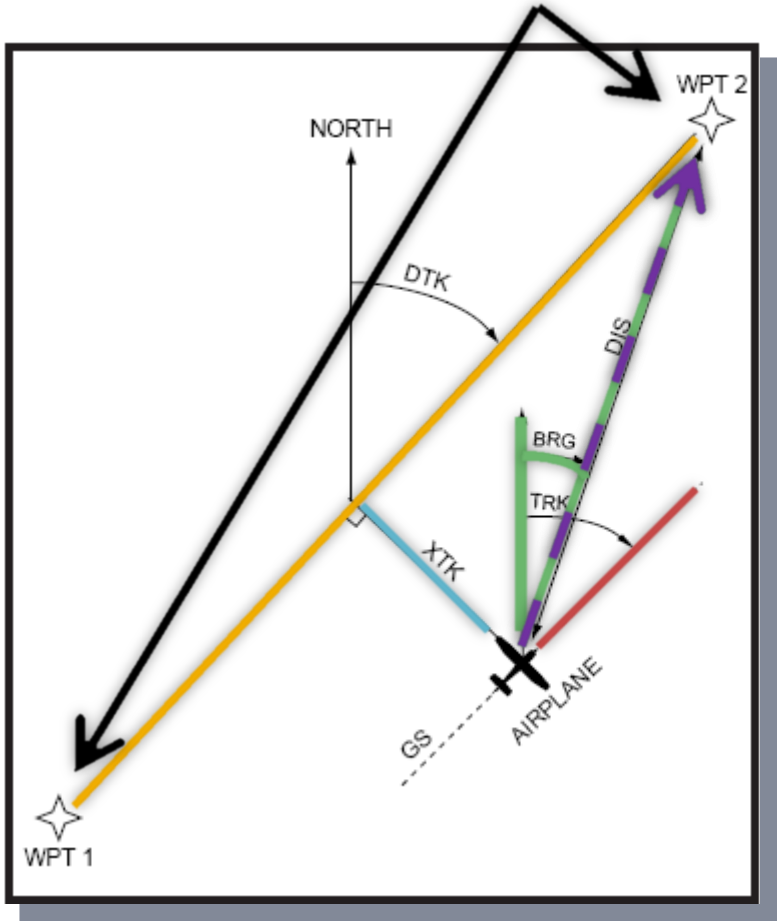
Weather – Couples with GDL 69/69A (XM WX), GDL 88 (ADS-B), GTX 330 (TIS), GTS 8XX-series TAS, Connext, StormScope, and others

Advanced Technology Offering Enhanced Situational Awareness and Safety

GPS Navigation Concepts

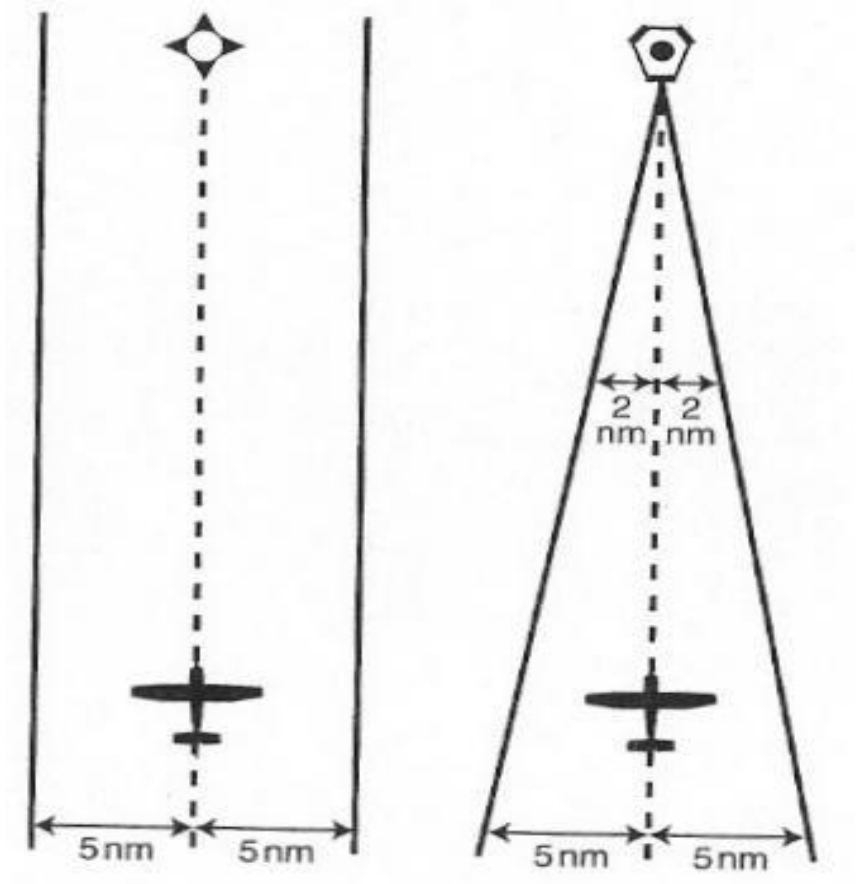
A course is always defined by two waypoints!

DTK	Desired Track
TRK	Track
BRG	Bearing
CTS	Course To Steer
XTK	Cross-Track
DIS	Distance (nm)
GS	Groundspeed (kts)



GPS Accuracy vs. VOR

- GNS 430 – "Resolver-Type" Design
  - Resolver Course Indicator Coupled to CDI
  - OBS Course Selector Must Be Set To DTK
- CDI Comparison
  - GPS: Fixed-width accuracy
  - VOR: Accuracy varies with distance
    - Becomes more sensitive as you get closer
    - "Cone of confusion"



CDI Comparison: GPS vs. VOR

GNS 430 Key Functions

COM Power / Volume / Squelch

Frequency / Annuciator Windows

Map

Function / Data Fields

RANGE Zoom In/Out

Direct-To Navigation

COM Toggle / HOLD 121.5

Context-Sensitive MENU

VLOC Volume / Identification

CLEAR / Default NAV

VLOC Toggle

Enter / Confirm

LARGE KNOB MHz / SMALL KNOB KHz

LARGE KNOB Page Groups

PUSH Toggle COM/VLOC

SMALL KNOB Pages / PUSH Toggle Cursor

CDI - Toggle Nav Source GPS/VLOC

OBS Mode / Waypoint Sequencing

MSG – View System Messages

FPL – Flight Plan

PROC – IFR Procedures

Instrument Panel Self-Test

- Verify CDI / GS displacement is correct
  - CDI half left
  - G/S half up
  - To/From is TO
  - No flags
- Verify OBS course
  - Garmin "OBS" value and selected OBS course should match
    - Within 4 degrees (standard VOR accuracy check) is a good reference point for minimum accuracy

Default Nav Page

- The "home" page
- Press and hold CLR to jump to it from any other page

Active leg of flight plan

Course deviation indicator (CDI)

TO/FROM flag*

Position of current page within current page group

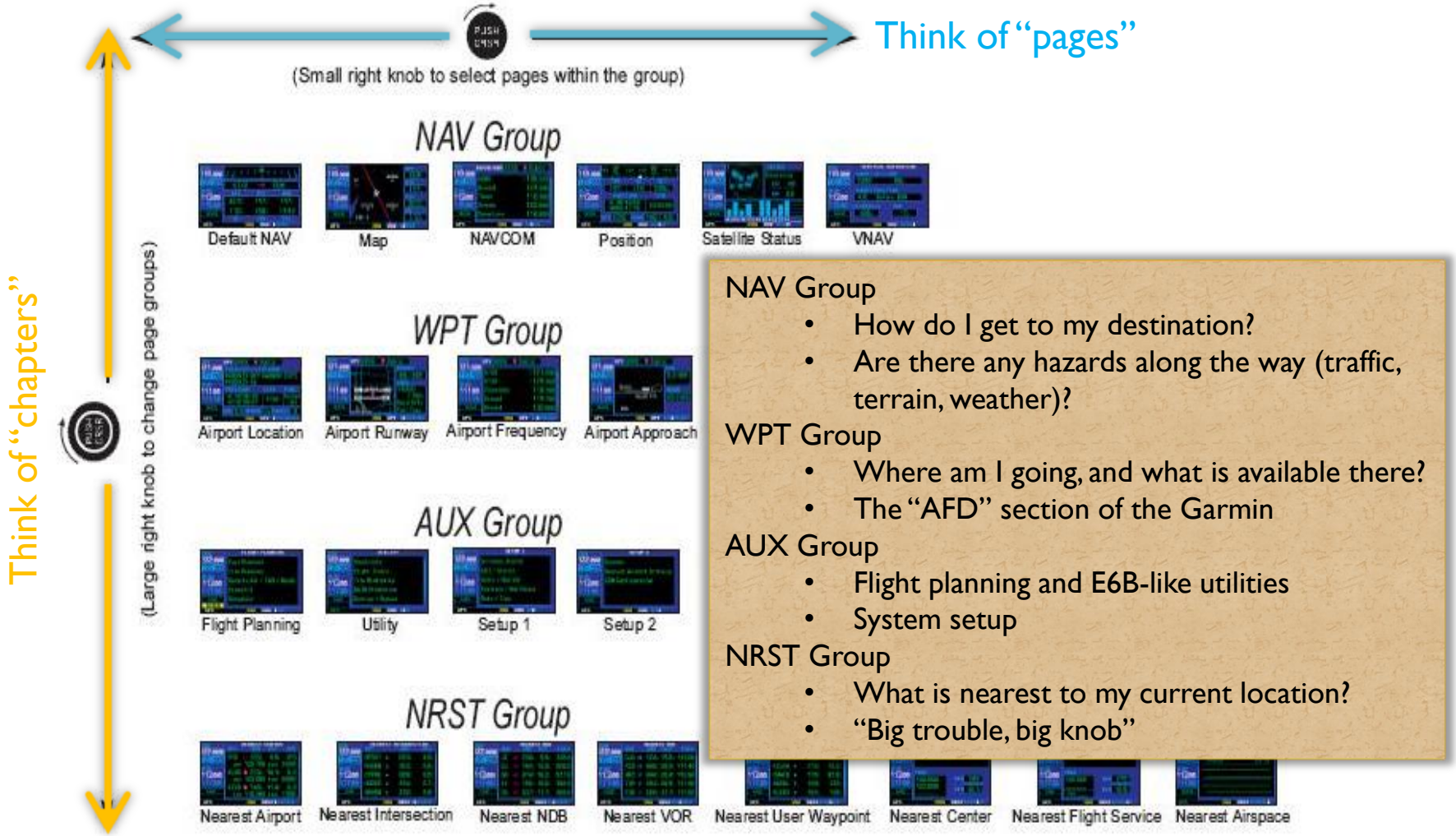
User-selectable data fields

Current page group

Individual pages in current page group

* Always TO when in GPS mode

GNS 430/530 Page Navigation



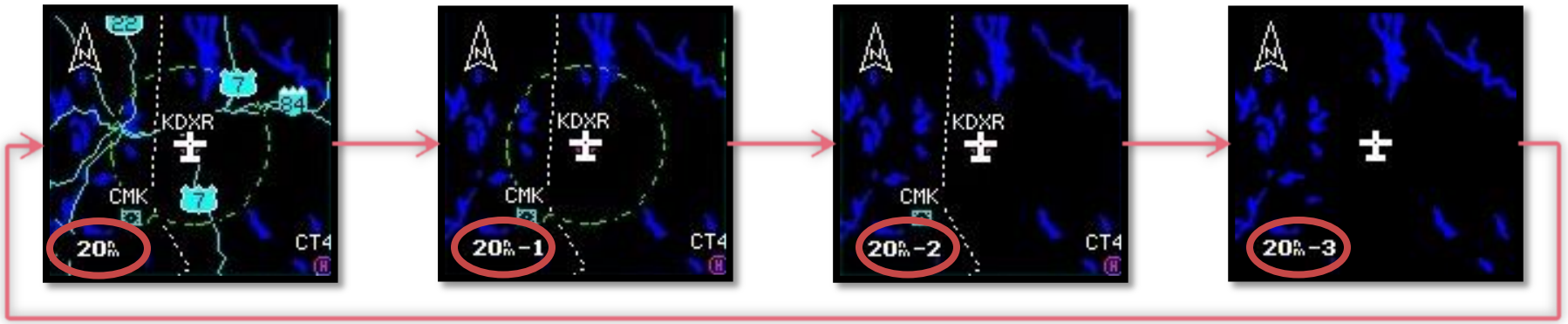
NAV Group
- How do I get to my destination?
- Are there any hazards along the way (traffic, terrain, weather)?

WPT Group
- Where am I going, and what is available there?
- The "AFD" section of the Garmin

AUX Group
- Flight planning and E6B-like utilities
- System setup

NRST Group
- What is nearest to my current location?
- "Big trouble, big knob"

Map Declutter



- Pressing the "CLR" button cycles through the four modes
  1. Removes all land data except rivers & lakes.
  2. Removes all airspace except Prohibited & Restricted. Also removes NDBs, Intersections, and User waypoints.
  3. Removes all data except the Active Flight Plan, Prohibited airspace, rivers, lakes, traffic, and lightning data.
- While inbound to the FAF, an additional "-A" declutter mode (equivalent to -3 above) is automatically activated

Entering Data

5 PRESS CLR key to cancel entry

1 PRESS once to activate cursor, PRESS again to deactivate

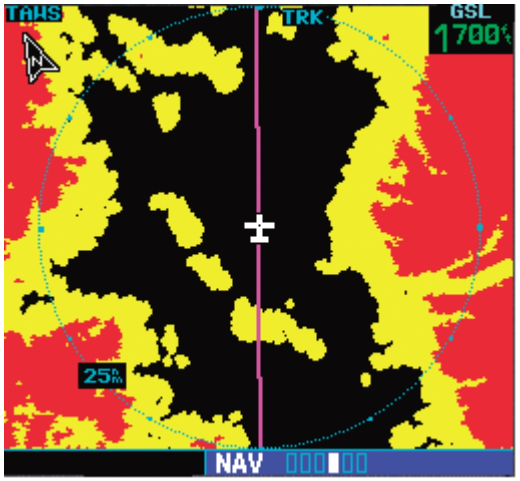
4 PRESS ENT key to confirm entry

3 TURN BIG KNOB to move cursor, or change fields (when cursor is off)

2 TURN SMALL KNOB to select characters

Optional Displays

Terrain

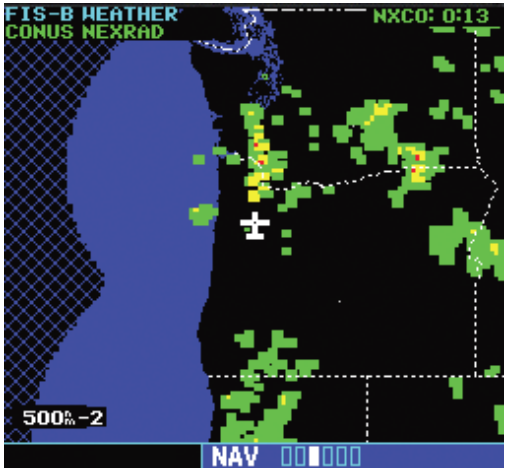


Obstacle/Terrain DB Card

Traffic

ADS-B Data

Weather



ADS-B Data

1. Use the RIGHT BIG KNOB to select the NAV page group
2. Use the RIGHT LITTLE KNOB to change the page

Computing Winds Aloft

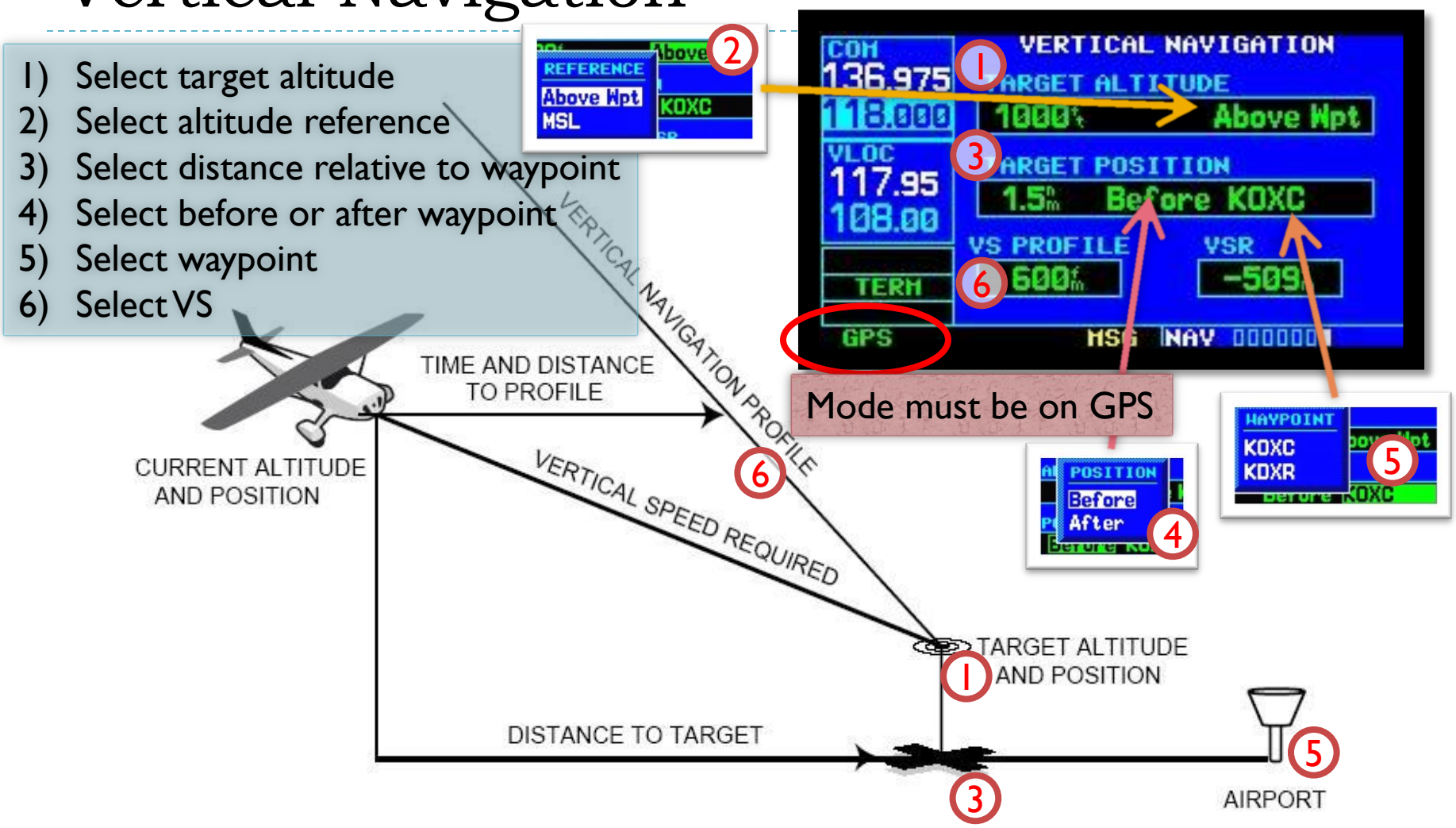
- Great tool to use when submitting a PIREP
- "Ind Alt" will initially show your GPS altitude
  - Will likely need fine tuning, but not by much
- "CAS" will initially show your GPS ground speed
- "BARO" will show the last entered value
- "HDG" will show your GPS ground track heading
  - This should be set to your magnetic heading

Map Orientation

- Three modes of map orientation
  - DTK up
    - Desired track (course) is straight up
  - **North up**
    - Orientation of paper charts
  - **Track up**
    - Current heading is straight up
- From the "NAV" page, press MENU, select the "Map" group, then "ORIEN"

Vertical Navigation

1) Select target altitude
2) Select altitude reference
3) Select distance relative to waypoint
4) Select before or after waypoint
5) Select waypoint
6) Select VS

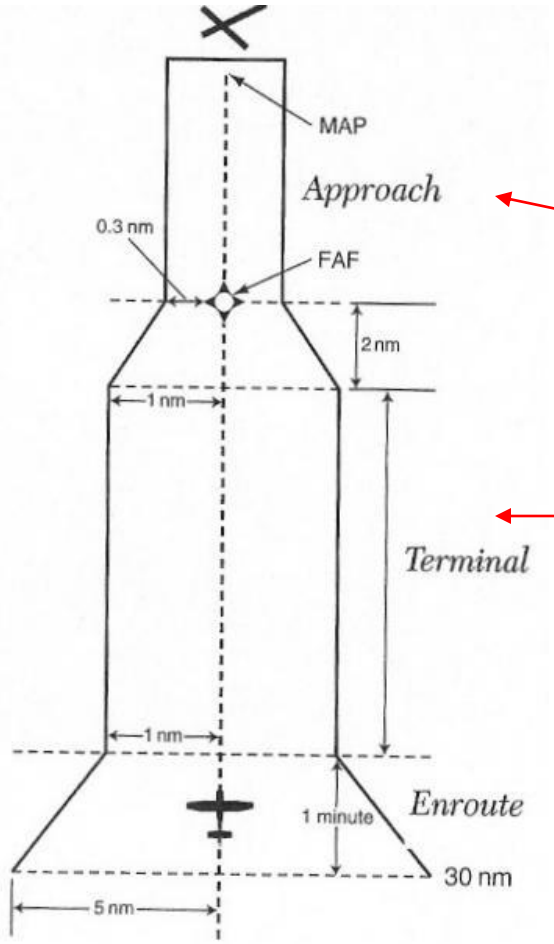


When Your Database is Not Current

- VFR
  - No legal requirements to have a current database

- IFR
  - Legal for en-route and terminal navigation
    - Each waypoint must be verified with an alternate source of *current* data (e.g. paper or electronic chart)
  - Per the Garmin 430W STC, "GPS", "or GPS", and "RNAV (GPS)" approaches are *not* allowed
    - Example: Danbury's "GPS RWY 08" approach is not allowed, but the "VOR or GPS-A" approach is allowed *if flown using VOR guidance*.

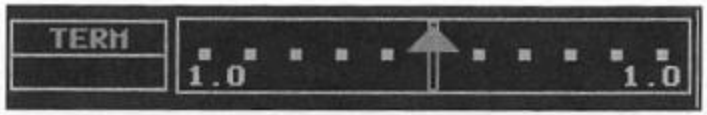
CDI Scale Transitions



CDI Scale Transition

CDI scales and corresponding modes:

Approach



Terminal

Enroute

430W GPS Approach Mode Summary

Annunciation	Approach	Description
LPV	LPV	Localizer Performance with Vertical guidance
LNAV+V	LNAV	Non-precision Lateral Navigation with *advisory* vertical guidance
LP	LP	Non-precision Localizer Performance – allows for lower minimums than LNAV
LNAV	LNAV	Non-precision Lateral Navigation
MAPR		Missed Approach CDI full scale deflection = 0.3 NM
ENR		En-route navigation CDI full scale deflection = 5.0 NM
TERM		Terminal area navigation CDI full scale deflection = 1.0 NM

GPS Substitutions

- AC90-108 – Operational & Airworthiness Guidance
  - Suitable RNAV system as an alternate means of navigation

- Allowed substitutions
  - *Determine aircraft position* relative to/distance from a VOR, TACAN, NDB, compass locator, DME fix, fix defined by a VOR radial/TACAN course/NDB bearing/compass locator bearing intersecting a VOR or LOC course
  - *Navigate to/from* a VOR, TACAN, NDB, or compass locator
  - *Hold* over a VOR, TACAN, NDB, compass locator, or DME fix
  - *Fly an arc* based upon DME
  - All of the above is allowed even when a facility is identified as required on a procedure (e.g. "ADF required")
- **Non-allowed substitutions**
  - When a procedure is NOTAMed as "not authorized" ("NA")
    - Example: A procedure is based upon a recently decommissioned NAVAID
  - Substitution on a Final Approach Segment
  - Lateral Navigation on LOC-Based Courses

NOTES