AVIDYNE CORPORATION
710 North Drive
Melbourne FL 32934

(321) 751-8520
Toll Free 800-AVIDYNE (800 284-3963)
www.avidyne.com

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Vantage 12 Pilot's Guide

VANTAGE 12
Flight Display System
Pilot's Guide

VANTAGE

Revision History

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00	July 2025	Initial Release (Software Release 12.0.0.2)
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1 System Overview

The Vantage 12 System is a retrofit solution designed to replace the Entegra EX5000/EXP5000 systems in Cirrus SR20 and SR22 aircraft with an updated suite of avionics from Avidyne. The Vantage 12 system consists of the Vantage 12 PFD, Vantage 12 MFD, 1 or 2 ADC900(s), DFC90 Autopilot, and two IFDs, as shown in the figure below. Beyond these required Avidyne components, the Vantage system supports integration with common commercially available avionics equipment, such as traffic systems and other inputs and sensors.

Each display is touchscreen but also retains buttons and knobs as an additional input method. The PFD (left) displays the same information full-time. The MFD (right) is user-configurable, displaying the functions assigned to three page keys along the bottom edge of the display.

These functions and tabs are covered in detail throughout this reference manual. The primary method for accomplishing a task will be outlined, and if applicable, alternative methods will be explained in the appendices. One consistent message that will be emphasized is the method and position of displaying data does not change between these different views and tabs.

For information on equipment other than the Vantage 12 displays, refer to the equipment specific Pilot's Guide. Equipment not covered in this guide includes, but is not limited to, Avidyne IFDs, DFC90 Autopilot, audio panel, and transponder.

Avidyne strongly believes in the concept "Fly like you train and train like you fly." In other words, the views used daily are identical to what is available during emergency and reversionary conditions.

Functional Overview

The Avidyne Vantage 12 flight display system supports the following functions:

- Primary Flight Display (PFD)
- Multifunction Flight Display (MFD)
- Air Data Computer (ADC)
- Flight Management System (FMS)
- Attitude and Heading Reference System (AHRS)
- Moving Map
- Weather Information via XM Datalink or FIS-B Broadcast
- Traffic display from ADS-B, TAS, or hybrid ADS-B & TAS
- Lightning display from onboard sensor or datalink sources
- Electronic Charts including Approach and Departure procedures, airport diagrams
- Engine Display
- Electronic Checklists
- Data Logging
- Crew Alerting System (CAS)
- Forward Looking Terrain Alerting (FLTA)
- Synthetic Vision (SynVis)
- Personal Electronic Device charging via USB-C

Basic Concepts

The Primary Flight Display (PFD) is the main display providing flight instrument data, navigational information, engine and fuel data, and autopilot information to the pilot. The PFD displays information from the following sources:

- DAU/SIU - Manifold Absolute Pressure (MAP) [in Hg], Engine Speed [RPM], Percent Power [%], Fuel Flow Rate [Gal/Hr.], Oil Temperature [°F], Oil Pressure [PSI], Throttle [%]
- OAT - Outside Air Temperature [°C]
- ADC - Airspeed Indicator (ASI): Indicated Airspeed (IAS) [Kts], True Airspeed (TAS) [Kts], Altimeter: Altitude [Ft], Barometric pressure [in Hg], Vertical Speed Indicator (VSI): Climb Rate [FPM]
- ARS - Attitude Indicator (AI): Bank Angle Indicator, Roll Pointer, Pitch Ladder, Attitude Reference Symbol, Turn Coordinator (TC): Rate of Turn, Slip/Skid
- Magnetometer - Heading Indicator (HI): Heading [°]
- DFC90 - Airspeed Set Point [Kts], Altitude Set Point [Ft], Vertical Speed Set Point [FPM], Heading Set Point [°], Flight Director Bars
- IFD - Primary NAV Source and Frequency, Bearing Pointer, Flight Plan Data, GPS location

The MFD supplies the pilot with supplementary flight information, such as maps, charts, and more detailed engine and system information. The display is also capable of split display functions and reversionary PFD operation. At the top of all MFD screens, there is an information bar perpetually displaying data. Additionally, on all non-PFD and non-split-screen screens, there are information columns on either side. These columns contain configurable flight data.

Page Keys - MFD

The 3 buttons along the bottom of the MFD bezel are called Page Keys. Each key is labeled by function:

- PFD (Primary Flight Display)
- Map (Moving Map)
- SYS (System Pages)

Each page has several associated tabs. Each Page Key has a left and right rocker action associated with it. Select the page of interest by pressing the middle of the Page Key and navigate through the available tabs by pressing the left or right side of the Page Key. Press and release one side of the key to incrementally step through the tabs. The tabs can also be selected using the touchscreen.

Page keys and tabs

Line Select Keys

Line Select Keys, typically abbreviated to LSK in this manual, are the buttons found along the left side of the bezel for both PFD and MFD. A label, just inside the bezel – adjacent to the physical LSK, indicates the function of the LSK. Pressing the LSK either performs the labeled action or changes the state, which can be done by either pressing the respective button or touching the label.

MFD Display Formats

Full format – The function selected (e.g., Map, SVS, Chart) takes up the entire screen.

Split format – Some of the PFD, MAP and SYS pages are split vertically down the center, letting two different functions be displayed at once. Examples include PFD/MAP, PFD/CHART, MAP/FLPN, MAP/INFO, MAP/NRST.

Display formats Vantage 12 MFD

PFD Page

SVS TAB (Full Screen PFD)

MAP TAB (Split PFD/MAP)

CHART TAB (Split PFD/Chart)

MAP Page

MAP

SVS

CHART

FPL

INFO

NRST

SYS Page

CHKLST

ENG

SETUP

SYS

DOCS

ALERTS

Primary Navigation Source

The means of selecting which nav source is driving the deviation indicators on the PFD and HSI, as well as driving the autopilot when the autopilot is in NAV or GPSS modes, is the Primary Nav LSK on the PFD. Choices are Nav1, Nav2, GPS1, and GPS 2. Primary Nav is synchronized (replicated) across all displays.

Live Edits

All edits are "live edits" in that they are immediately applied. Examples include:

- Course Entry on both the PFD and MFD (applicable only in OBS mode)
- Waypoint name entries in flight plans
- Autopilot targets when it is armed via DFC90 (Altitude, Heading, and Vertical Speed)
- Waypoint deletions in flight plans
- Knob control on PFD
- Flight management on both PFD and MFD

Panning

The map pages support a panning capability. Using the touchscreen or a lower right side knob, any map page on the MFD provides the ability to pan anywhere on the map, zoom in or out as desired, hover over hotspots, and see information boxes pop-up.

Integration with Other Systems

Integration is provided with other systems such as traffic awareness system (TAS), ADS-B receiver, lightning, and autopilot.

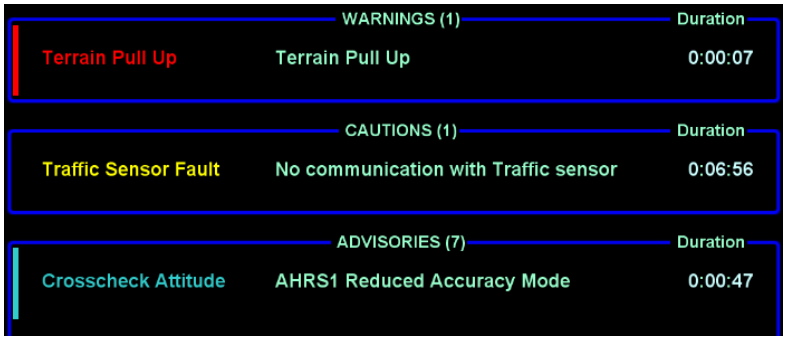
Traffic sensor data is displayed on all map pages and is available in a dedicated traffic thumbnail display. Data will only be displayed on the PFD pages when SVS is enabled. Traffic sensor modes and display ranges can be controlled through various LSK options.

The integration with the DFC90 autopilot is a tighter integration than previous display-autopilot integrations. This reduces the need for manually pressing the autopilot control head buttons and reduces pilot workload in many flight scenarios.

Crew Alerting System (CAS)

A crew alerting system is provided, comprised of a system of Warning (red), Caution (amber), and Advisory (cyan) alert messages that are displayed to the pilot on both displays, and a dedicated page for display of all active alerts. Below is an example of all three CAS alert messages in each color. For more information about the CAS, see Section 10 .

Figure 1-1 CAS Messages for Warning (red), Caution (amber), and advisory (cyan)



Datablocks

The datablock setup tab is a combination of graphical blocks and text lists. The graphical datablocks are arranged on this page in a pattern that represents how they are displayed on the MFD.

Redundancy

All Vantage 12 systems provide dual Attitude Reference Systems for redundancy. *Entegra* only had 1 AHRS and loss of PFD meant loss of Autopilot. In Vantage 12, an autopilot relay allows the MFD to control the autopilot in the event of a PFD failure.

A second MAG300 and ADC900 are available to increase system redundancy.

Charging from USB

The USB-C port on the Vantage bezel is capable of charging Personal Electronic Devices (PEDs) such as iPads. This port can supply up to 2.1A at 5V.

Cleaning the Display

If the Vantage 12 PFD or MFD screen should become dirty due to fingerprints or dust, clean the screen using the following materials and methods:

- A clean, soft, lint-free microfiber cloth such as 3M Ultra-Brite Cloth #2011 or similar. Do not use rags, paper towels, or abrasive materials as it will cause damage.

- Dampen a lint-free cloth with Isopropyl Alcohol. Wipes that are pre-saturated with 70% isopropyl alcohol and 30% deionized water work best. Do not use ketone type materials (ex. Acetone), ethyl alcohol, toluene, ethyl acid or methyl chloride. It will permamently damage the coatings on the cover glass.

CAUTION

Isopropyl alcohol is flammable. Please handle with care and keep away from open flames or high heat sources. Ensure proper ventilation when using or storing this substance.

- Turn off the display before cleaning. Cleaning when the display is on can cause damage. It is also easier to see the dust and smudges when the screen is black.

The use of any 3rd party screen protectors, especially those that adhere directly to the display glass, is not endorsed by Avidyne and may void the warranty for any display related issue.

How to use the rest of this Manual

Starting with Section 2, the manual is organized in a phase-of-flight order, ultimately ending with a number of appendices, which are organized by Page Keys.

This manual assumes that the pilot is appropriately licensed, is proficient in operation of the aircraft and its equipment, and is in compliance with all Federal Aviation Regulations (FARs).

Areas of special significance, from a safety perspective, are identified in cautionary notes within the manual. Pilots should pay close attention to these notes.

All images contained in this manual are for reference use only and are subject to change.

For information on equipment other than the Vantage12 displays, refer to the equipment-specific Pilot's Guide. Equipment not covered in this guide includes, but is not limited to, Avidyne IFDs, DFC90 Autopilot, audio panel, and transponder.

Avidyne strongly recommends that pilots use the Vantage 12 Flight Display System only under VFR conditions until completely familiar with its operation and use.

2 System Setup / User Preferences

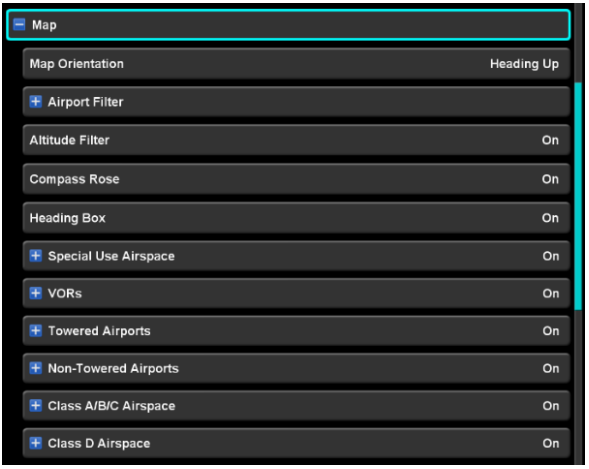
System setup, user preferences, and all factory settings are all controlled through the "Setup" tab of the "SYS" page on the MFD. The Setup Tab provides the capability for one or more users to tailor the look and feel of the display to best accomplish their mission. Many of the setup options exist simply to adjust the format of data that is presented on the display (e.g. Map filtering, whether page tabs are hidden). However, there are many setup options that control the overall operation of the display, including FMS behavior.

Some of the settings affect the entire system and can be changed from the IFDs as well. The changes for system-wide settings will be synced with the IFDs automatically.

Category Structure

The Setup Tab is organized using a set of categories. Each category can be expanded to show settings relevant to that category. Each setting within a category will be indented as a visual indication that it belongs to the category. Some categories contain further sub-categories, which can also be expanded. The result is a hierarchical structure of settings which uses familiar "+" and "-" icons to indicate whether a category is expanded or condensed. In order to limit the page to a manageable number of items, only one category can be expanded at a time. Therefore, when one category is expanded, all other categories at that same level are condensed.

Figure 2-1 Setup Tab – Single category expanded



When an item represents a category that can be expanded, a "+" icon will be shown on the left side of the panel. If the category is already expanded, a "-" icon will be shown on the left side. To expand or condense a category, first move the cursor to the category either by touching the item or by rotating the inner or outer knob. Once the cursor is surrounding the desired category, either touch the icon on the left side or push the knob button to expand or condense that category.

Presets

Presets provide a means to configure many display settings with one operator action. In order to configure the display using a preset, press the "Presets" LSK. The Setup Page will then present a list of possible presets to be selected using the same category/item organization as the main page, as illustrated below.

Figure 2-2 Setup Presets

Alerts

Items in this category control whether the display will issue alerts for various events.

Controlled Airspace Alerts

This setting controls whether the display will issue an airspace alert when the aircraft is on course to intercept a controlled airspace within the next five minutes. The factory default setting is "On".

TFR Alerts

This setting controls whether the display will issue an airspace alert when the aircraft is on course to intercept a Temporary Flight Restriction (TFR) airspace within the next five minutes. The factory default setting is "On".

SUA Alerts

This setting controls whether the display will issue an airspace alert when the aircraft is on course to intercept a special use airspace (SUA) within the next five minutes. The factory default setting is "On".

Transition Altitude/Level Alerts

This setting controls whether the display will issue an alert as the aircraft approaches the transition altitude and transition level. The factory default setting is "Off".

If the aircraft is below, then climbs to within 250 feet of the transition altitude, the display will issue the "Transition Altitude" alert. Once issued, the alert will not be eligible to be issued again unless the aircraft has descended more than 500 feet below the transition altitude.

If the aircraft is above, then descends to within 250 feet of the transition level, the display will issue the "Transition Level" alert. Once issued, the alert will not be eligible to be issued again unless the aircraft has climbed more than 500 feet above the transition level.

Switch Tanks Alert

This setting controls whether the display will issue an alert to switch fuel tanks. The setting varies the time interval between alerts. Time

intervals of 15, 30, 45, and 60 minutes can be selected, or the alert can be disabled by selecting "Never". The factory default setting is "Never". Note that this setting is purely based on time, not fuel quantity.

Charts

This section on "Setup" tab provides the selection of chart day/night mode. The pilot can choose the chart display mode by selecting "Day" or "Night".

When the selection is "Day", charts are displayed using black text and graphics on a white background.

When the selection is "Night", charts are displayed using white text and graphics on a black background.

Datablocks

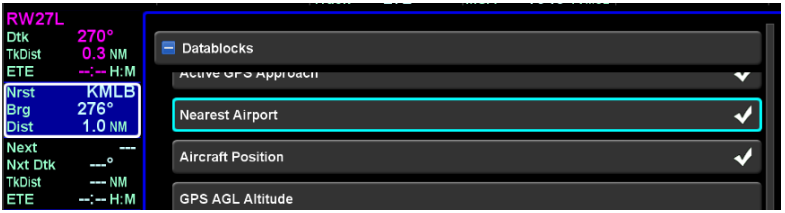
The display defines "datablocks" as focused data that can be displayed around the edges of the display. Datablocks are meant to be used as full-time displays of desired data that can be accessed at a glance.

The datablocks category is used to select which datablocks are displayed in each datablock slot that is available. While the space allocated for the set of datablocks is fixed, the number of datablocks that can be displayed is variable since not every datablock takes up the same amount of space.

When the datablocks category is expanded, the Setup Page cursor is limited such that only datablocks can be selected. **In order to return to normal operation of the Setup Page, the cursor must be returned to the Datablock category item at the top, and the category condensed.** If the datablocks category is expanded and a different page is selected on the display, then upon return to the Setup Page, the datablocks category will no longer be expanded.

Once the datablocks category is expanded, the operation of the right knob is slightly different than the normal Setup Page operation. The outer knob selects the datablock "slot" to be affected. The inner knob selects the datablock that is to be displayed in the selected slot. The selected slot is shown with a blue background. The selected datablock is shown with the typical cyan cursor surrounding the item.

Figure 2-3 Datablock selected slot and block



In order to change the datablock selected in a given slot, first turn the outer knob or touch to move the cursor to the desired slot. Then, use the inner knob or touch to select the datablock item to be displayed. Then, press the knob button or touch the datablock again to place it into the selected slot.

When a datablock has been selected for display in a slot, a check mark is displayed next to the name of that datablock.

When a given datablock is not allowed to be placed into the selected slot, that row will be presented in a dim color and the datablock will not be selectable either with the knob or by touch.

Datablock presets are available in the Presets LSK.

NOTE

Some items cannot be deselected due to regulatory requirements.

Display

This tab allows the pilot to adjust the display preferences, such as:

Hide Page Tabs

This setting controls the amount of time that the page tabs at the bottom of the display are shown. When the current page is changed, the tabs are displayed. If this setting is set to "Never", the tabs will remain displayed at all times. Otherwise, the tabs will scroll out of view after the selected number of seconds. This feature is useful in order to reclaim some usable space at the bottom of the map and charts pages. The factory default setting is "Never".

Background Color

Pilots can select their preferred background color. The factory default setting is black.

FMS

The items in this category are used to control the appearance and behavior of the FMS. Options available on this page include:

- VNAV
- Transition Altitude
- Transition Level
- Cruise Altitude
- High Altitude Airways
- Low Altitude Airways
- Arrivals
- Departures
- Approaches
- Visual Approaches
- Visual Approach Settings
- Patterns
- SBAS Channel Numbers
- Mini Flight Plan Format
- Advisory Glideslope
- Auto Enable Missed

For more information about particular FMS settings, refer to the IFD Pilot Guide.

Map

This section provides detailed control of map elements including:

- Map Orientation – Heading Up or Track Up
- **Airport Filters** – Runway length, runway surface, and type of fuel available
- Use of altitude filter for display elements – On or Off
- Display of map compass rose – On or Off
- Heading Box – On or Off
- **Map Layers**
  - Special Use Airspace
  - VORs
  - Towered Airports
  - Non-Towered Airports
  - Class A/B/C Airspace
  - Class D Airspace
  - Comm Airspace
  - High Obstacles
  - Low Obstacles
  - Intersections
  - Victor Airways
  - Jet Airways
  - VFR Waypoints
  - User Waypoints
  - NDBs
  - Non-TA Traffic
  - Power Lines
  - Interstates
- Flight Plan Labels – ON or OFF

NOTE

Some of these map layers can simply be toggled on and off on the map, while others are more advanced. For the advanced layers, not only can they be turned on or off, but they can also be displayed with additional features defined by the user such as labels, a selected map range, specific detail levels, and aircraft altitude.

For more information about particular MAP settings, refer to the IFD Pilot Guide. Map presets are available in the Presets LSK.

PFD

Items in this category control the presentation of features on the PFD screen.

Figure 2-4 PFD Setup

Horizon Heading Marks

This setting controls whether the display will show heading reference marks along the horizon of the SVS display. The factory default setting is "On".

ADI HDI display

This setting controls whether the Horizontal Deviation Indicator (HDI) will always be shown on the PFD ("Always On") or only during approaches ("Auto"). The factory default setting is "Auto".

Optional V-speeds

This setting controls whether the airspeed tape includes optional V-speeds.

Keyboard Timeout

The keyboard presented on the PFD can be configured to disappear after 10s of inactivity. On enables the timeout feature.

Terrain

Settings in this category control the behavior of terrain awareness/avoidance functions within the display.

FLTA

This setting controls whether Forward Looking Terrain Avoidance (FLTA) function is enabled. The factory default setting is "On".

Terrain Awareness (TA)

This setting controls whether Terrain Awareness function is enabled. The factory default setting is "On".

Note that this setting will need to be set to "Off" for all units in the system to disable the function.

FLTA Exclusion Areas

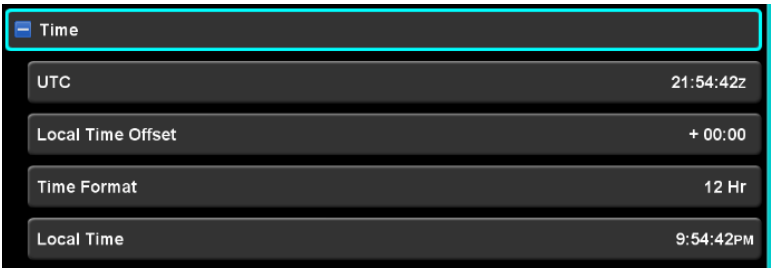
This setting controls whether FLTA Exclusion areas around airfields are enabled. The factory default setting is "On".

If the FLTA setting is "Off", this setting will not be shown.

Time

Settings in this category control the presentation of time throughout the system.

Figure 2-5 Time Setup



UTC

This item is not actually a setting and the cursor will skip it. It is merely a display of the current UTC time to be used for reference with the other settings.

Local Time Offset

This setting defines the time difference between UTC and local time. The value ranges from -12 hours to +14 hours, in increments of 15 minutes. The factory default setting is 0:00 (no offset).

Time Format

This setting controls the display of time throughout the system. Selections are as follows

- **UTC** – time values are displayed as UTC times and will be suffixed with "Z"
- **12 Hr** – time values are displayed with respect to local time and will be suffixed with "AM" or "PM"
- **24 Hr** – time values are displayed with respect to local time, ranging from 0:00 to 23:59, and will have no suffix.

The factory default setting is "12 Hr".

Local Time

This item is not actually a setting and the cursor will skip it. It is merely a display of the current local time affected by the selected local time offset and time format settings.

Units

The settings in this category control the units in which different quantities throughout the system are displayed.

Bearing Reference

This setting defines whether courses and headings are to be displayed with reference to true north or magnetic north. The factory default setting is magnetic north.

Distance/Speed Units

This setting defines the units in which distances and speeds are to be displayed. Options are as follows:

- **NM/Kts** – Nautical miles and knots

Altitude/VS Units

This setting defines the units in which altitudes and vertical speeds are to be displayed. Options are as follows:

- **Ft/FPM** – Feet and feet per minute

Pressure Units

This setting defines the units in which atmospheric pressure is displayed. Options are as follows:

- **InHg** – Inches of mercury
- **Millibars** – Millibars
- **hPa** – Hectopascals

The factory default setting is "InHg".

Temperature Units

This setting defines the units in which temperatures are displayed. Options are as follows:

- **Fahrenheit**
- **Celsius**

The factory default setting is "Fahrenheit".

Fuel Units

This setting defines the units in which fuel quantities are displayed. Options are as follows:

- **Gallons**
- **Imperial Gallons**
- **Liters**
- **Pounds**
- **Kilograms**

The factory default setting is "Gallons".

Position Units

This setting defines the format in which positions are displayed. Options are as follows:

- **Ddd°mm.mm'** – degrees, minutes, and tenths of minutes
- **Ddd°mm'ss"** – degrees, minutes, and seconds
- **UTM** – Universal Transverse Mercator
- **MGRS** – Military Grid Reference System

The factory default setting is ddd°mm'ss".

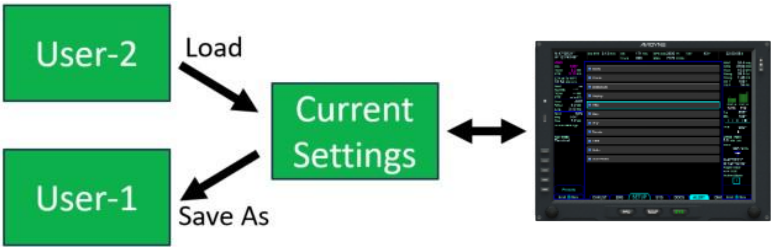
User Profile

Settings in this category define names for each of the several user profiles. A user profile is a named set of setup options. Vantage 12 is capable of storing up to ten user profiles. User profiles can be useful in situations where an aircraft is shared among several pilots, and each pilot has different preferences for viewing data on and interacting with the display. In scenarios where an aircraft is always flown by the same pilot, it may be useful to define a profile for VFR flights and another profile for IFR flights. From the factory, a single user profile named "User-1" is defined.

Figure 2-6 User Profile Setup

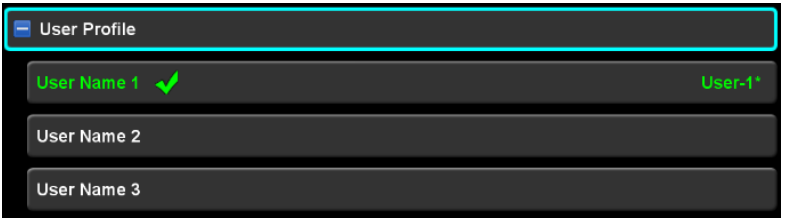
When changes are made using the setup page, the changes are applied to the "current options". A user profile can be "loaded", causing the options in the user profile to replace the current options. The current options can be "saved as", causing the selected profile to be replaced with the current options. This theory of operation is illustrated in the diagram below:

Figure 2-7 User Profile Management – Theory of Operation



The user profile that is currently being used will be shown in a green color with a checkmark displayed on the row. If the current settings have any differences from that user profile, the profile name will be suffixed by an asterisk. The asterisk is an indication that there are unsaved changes to that user profile. If another user profile is loaded while the asterisk is displayed, those changes will be lost.

Figure 2-8 User Profile with Unsaved Changes



To save the current options, use the right knob or touch to select the desired user profile, then press the "Save As" LSK. If the selected user profile was not named prior to the Save As LSK being pressed, the system will create a new profile named "User-n". Once the current settings have been saved, the selected user profile will become the current profile and, therefore, will be shown in green with a checkmark and no asterisk. If the current settings contain no changes from the current profile, the Save As LSK will not be shown.

This tab allows the user to swap between various saved profiles. Provides a selection of the user profile, based on the previously defined preferences. Once all preferences are selected, they can be saved to be user-specific using the "Save As User" LSK.

To load a different user profile into the current settings, rotate the right knob or touch to select the desired user profile, then press the "Load" LSK. If the selected user profile is the same as the currently loaded user profile and there are no unsaved changes to that user profile, the Load LSK will not be shown. Once the user profile has been loaded, the selected user profile will become the current profile and, therefore, will be shown in green with a checkmark and no asterisk.

Figure 2-9 Save As or Load User

To rename a user profile, rotate the right knob or touch to select the desired profile. Press the right knob or touch the selected profile to enter the new name. Renaming a user profile does not change any of the settings associated with that profile. To create a new user profile from the current settings, the recommended procedure is to first save the settings (i.e. To "User-n") and then rename the user profile.

The name of a user profile can be deleted at any time by using the right knob or by using touch to move the cursor to the desired profile and then pressing the CLR key. However, the currently selected user profile cannot be deleted.

At power up, the display will first restore the user profile that was selected at the last power down, then restore the current settings from the last power down. As a result, the display will have the same settings as it did on power down, including any unsaved changes to the selected profile. The display will generate a green notification alert indicating the name of the user profile that was loaded. If there is only one user profile defined, then no notification will be presented.

3 Normal Startup Sequence

System Power

The display system will automatically start when the aircraft bus power is applied via the bolster panel battery switches. Several seconds later, the displays will begin to have indications. The PFD is powered by a pair of circuit breakers, while the MFD has a single circuit breaker.

Brightness Controls

For convenience, each display has its own brightness control on the bezel to control the individual display brightness. The default power–on brightness of both displays will be set to 75%. Bezel lighting is controlled via the cockpit dimming controls. For more information, see Section 9 .

Startup Indications

During normal start up conditions, the displays will go through a series of informational startup screens, then present their standard flight mode functions. The PFD will present an Attitude Heading Reference System (AHRS) alignment indication in the upper half of the display and the MFD will present the Initial Fuel view of the Engine tab.

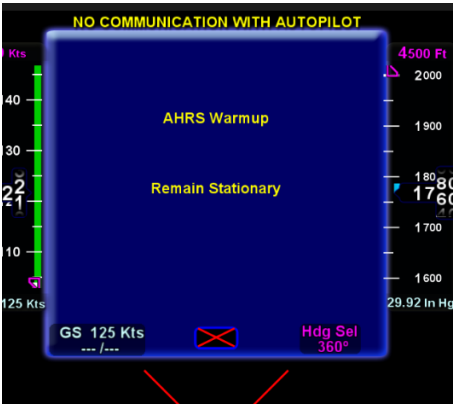
AHRS alignment time is less than 1 minute from the time the AHRS alignment box is displayed on the PFD.

While early taxi is permitted prior to alignment for flexibility, Avidyne highly recommends that the aircraft remain stationary until the alignment of all AHRS are complete and the alignment indications are replaced by the ADI. Any discrepancies between the AHRS will be announced in the form of a CAS message.

NOTE

While all systems have dual AHRS, not all are equipped with dual ADCs.

Figure 3-1 AHRS Initial Alignment



Until an initial fuel state has been entered, all other bezel controls for the MFD are not available. In other words, until an initial fuel value has been entered via one of the labeled line select keys along the left side of the bezel or via the left-hand knob, no other pages or tabs can be accessed on the display.

NOTE

It is very important that the amount of usable fuel on board is entered accurately to ensure the accuracy of the fuel totalizer and fuel range ring functions. The image below describes the fuel entry options.

Figure 3-2 Fuel Entry Options

If one or more of the displays has:

- An out-of-date database (e.g., expired Nav data, expired Charts data, expired Obstacle data) or
- A software mismatch between the displays

An information screen is displayed before the PFD screen or the Initial Fuel entry on the Engine tab to indicate which component is out of date or mismatched.

COOL FEATURE

Persisted Tabs

As soon as the pilot has made the initial fuel entry, all tabs become "persisted." This means that the last tab selected on any given page will be retained, even if a different page is selected. For example, if the Split Map-FPL tab of the MAP Page Key is selected and then the SYS Page Key is selected, when the MAP Page Key is pressed again, the Map-FPL tab will still be the active tab. An exception to this is the SYS page; in the event an alert is active, pressing the SYS page key will display the active alerts.

4 Ground Operations

This section covers cockpit tasks that are typically performed during ground operations. Included are inputs of the local altimeter setting, performing start, taxi, and pre-takeoff checklists, proper monitoring of the engine and electrical systems, entering intended flight plan into the FMS, and setting up the autopilot to begin the flight.

All the tasks mentioned can be done in several locations in this system. A few alternative locations or methods will be described if they are considered common or used by a large percentage of system users.

NOTE

To avoid diverting attention from the task of safely taxiing, pilots should avoid performing the described cockpit tasks while the aircraft is in motion.

Electronic Checklists

Use the knob or the touchscreen to scroll through the checklist directory for the desired checklist (e.g., Preflight, Before Start, Start, Before Taxi, and Before Takeoff). Push the knob to select the desired checklist or use the touchscreen to do so, then use the knob push action to complete or "un-complete" a step. Alternatively, tap the step on the touchscreen. Each completed step and section will turn green, which gives a clear visual indication that all required checklist steps have been accomplished.

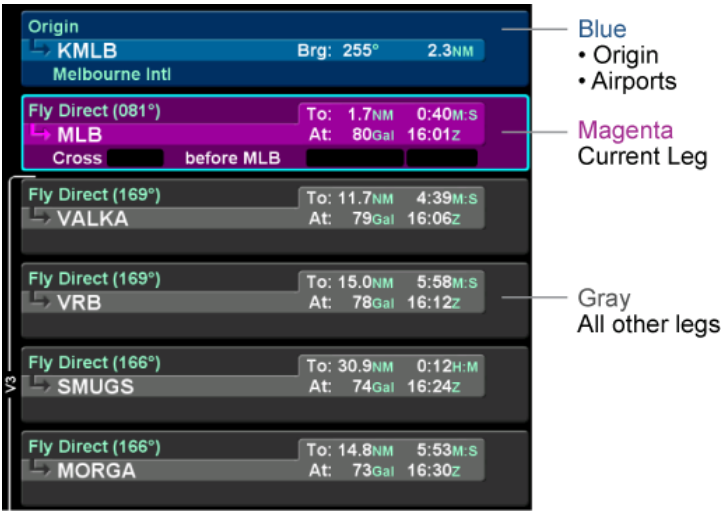
FMS Basic Concepts

Ground operations are the ideal time to enter the intended flight plan into the FMS. Entering the plan is only required on one of the IFDs or the MFD since the data is automatically shared between each unit in the system.

Each leg of a flight plan has its own color-coded background designed to make the overall flight plan easier to read.

The origin and all airport waypoints are depicted with a blue background. The active leg of the active flight plan is always depicted with a magenta background. All other legs of a flight plan are depicted with a gray background.

Figure 4-1 Flight Plan Detail



Each line can be accessed by scrolling the outer right knob, or by directly selecting the desired line, since Vantage 12 has a hybrid touchscreen capability.

Figure 4-2 Insert Cursor

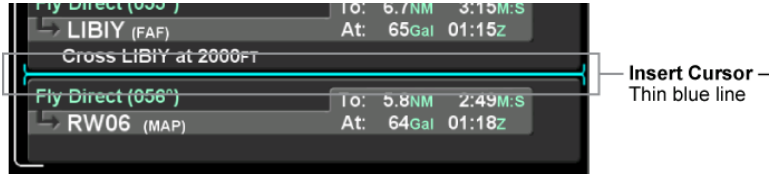
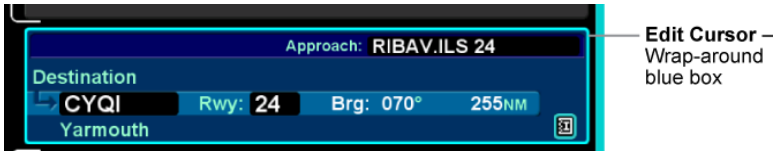


Figure 4-3 Edit Cursor



Individual fields within a leg can be edited by rotating the inner right knob; this highlights each editable field within the flight plan. When the desired field is highlighted, press the knob to get into edit mode. Turn the knob as required to edit the value or touch the field to type via the on-screen keyboard, then push the knob again to exit edit mode.

Using a combination of push and rotation via the knob or via the touchscreen, an entire flight plan can be entered within seconds.

Creating a new Flight Plan

The flight plan can be created by selecting the MAP button on the MFD display, and navigating to the "FPL" tab. Once the tab is accessed on any given flight, an empty flight plan page is presented with the origin waypoint. Begin adding waypoints by selecting the "Insert" LSK or softkey on the "FPL" page. The origin is pre-populated with the closest airport to the current GPS position, or the airport from the previous power down if GPS position has not locked on yet. Use the MFD or either IFD to enter the origin or waypoint and select "ENTR" to add it to the flight plan.

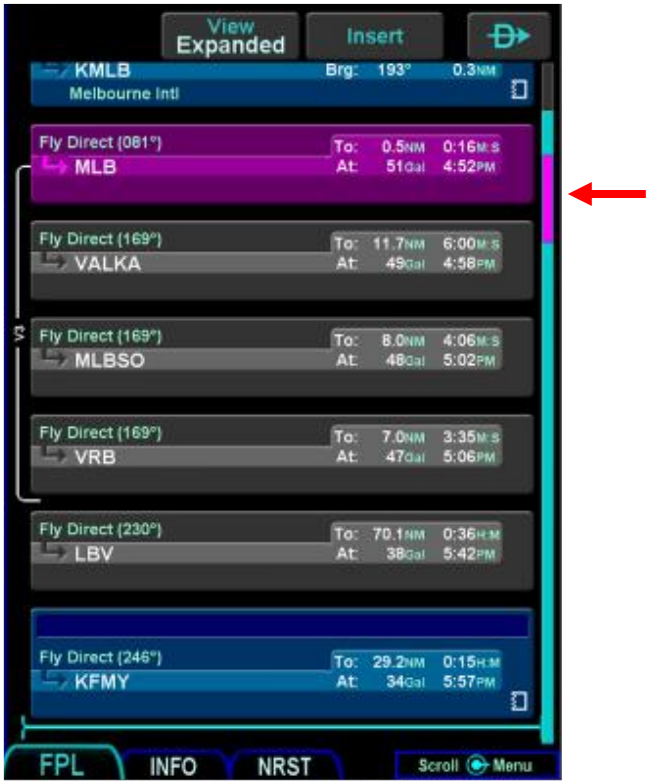
Figure 4-4 Flight Plan Tab

COOL FEATURE

Geofill™ is a geographic-based prediction algorithm that significantly reduces the number of pilot actions for entering waypoints. Usually, after the first character entry, the system uses existing characters to determine the closest, and most likely, waypoint based on the aircraft's geographic position or existing flight plan.

For those flight plans that have more legs than can be displayed on a single page, a scroll bar is presented along the right edge of the flight plan. It indicates where the viewable window is with respect to the entire flight plan, as well as where the active leg is in the flight plan using a magenta vertical rectangle.

Figure 4-5 Magenta Scroll Bar



COOL FEATURE

Expanding and Compacting the Flight Plan

The FPL (Flight Plan) tab of the MAP page provides a means to show every leg of the flight plan ("Expanded") or an abbreviated version of the flight plan ("Compact") via the "View" tab. The compact view hides all intermediate legs of an airway between the entry and exit point. It also hides intermediate legs of published departures, arrivals, and approaches such as step-down fixes. The active procedure or airway is always expanded.

Activating a Flight Plan

While the flight plan can be manually activated via the softkey, the flight plan will automatically activate on takeoff roll when a threshold groundspeed is achieved (approximately 40 knots). If the flight plan was constructed on one of the IFDs using the "Routes" tab, it will need to be manually activated via the softkey on the MFD or the softkey/LSK on the IFD.

Engine Tab

The engine tab "ENG" of the SYS Page on the MFD is designed to provide all available engine, electrical, and related system information to enable safe operations. This page is commonly used during engine start and before takeoff run-up operations.

Figure 4-6 Engine Tab

During engine start, the pilot can review and execute the Checklist while monitoring engine parameters in the datablock on the right side of the display. It is also possible for the pilot to navigate to the "ENG" Tab and bring the full engine data page back into view.

Figure 4-7 Engine Datablock beside checklist

Engine exceedances are constantly monitored regardless of which pages and tabs are selected. If an exceedance occurs, the CAS system will present an associated textual alert in the bottom right corner of each display. There is more information on this in the System Alerts – Section 9.

Distance to a VHF navaid

The distance to a VHF navaid displays the distance when a navaid is selected in the Primary Nav or the Bearing Ptr field on the PFD page. This distance is a terrestrial range, not slant range, based on current GPS position to the station position from the navigation database. The distance is computed when the tuned navaid identifier has been decoded by the radio and the tuned navaid is a VOR, VORTAC, ILS/DME or VOR/DME.

NOTE

Distance is not calculated to an ILS without a co-located DME but is calculated to a VOR even if it does not have a co-located DME.

Setting up the Autopilot

Avidyne recommends setting up the autopilot target bugs before takeoff.

The DFC90 has a dedicated knob for Indicated Airspeed, and another for Vertical Speed. Altitude and Heading are the default Vantage knob control settings, and therefore, those functions are available on the PFD.

Figure 4-8 DFC90 Autopilot

Designed primarily for speed, the Vantage PFD knobs for Heading and Altitude have several useful behaviors. Rotating the knobs results in coarse control of that bug. For example, coarse control for Altitude means that each click of the Altitude knob changes the Altitude bug incrementally by 500'. Coarse control of Heading means that each click of the Heading knob changes the Heading bug incrementally by 10 degrees. In each case, pushing the knob and rotating it activates fine control (100' increments for altitude and 1-degree increments for heading). Pushing the knob without rotating syncs to the current aircraft state (altitude syncs to the nearest 100').

Verify the autopilot is initialized as indicated by the "AP READY" annunciation on the PFD. If there are plans to use the autopilot in flight, per the DFC90 Pilot Guide, an autopilot pre-flight test should be conducted.

Figure 4-9 Setting the Autopilot Bugs

The autopilot bugs (airspeed, altitude, vertical speed, heading) can be adjusted using the knobs (described above), or by using the touchscreen. To adjust using the touchscreen, select the value displayed in magenta on the PFD to change it. Once the keyboard display is established, enter the desired value, and select ENTR to apply. Note that validity checking is performed on the entry and will reject invalid data.

Knob Control

The knobs on the PFD (and MFD's PFD page) adjust altitude and heading by default. To use the knobs to adjust baro or course, first press the Knob Control LSK or softkey, then make the required adjustment using the knobs. The system will automatically revert the Knob Control setting after a period of inactivity.

Barometer Setting

To set the barometer correction, use Knob Control to switch the function of the knobs on the PFD and adjust as required, or simply touch the barometer setting and enter the value on the keyboard.

Figure 4-10 Barometer

Taxi Charts

If a published procedure was used via the "CHART" tab located in the MAP page on the MFD for the landing airport, the displayed chart will automatically switch over to the airfield diagram during post-landing roll out. The aircraft's position on the airfield diagram chart will be displayed as an aid in surface navigation.

If an electronic chart was not used for approach, the local airfield diagram can still be accessed. Navigate to the MFD's MAP page, "CHART" tab, then use the MFD knob or touchscreen to select the desired airfield diagram.

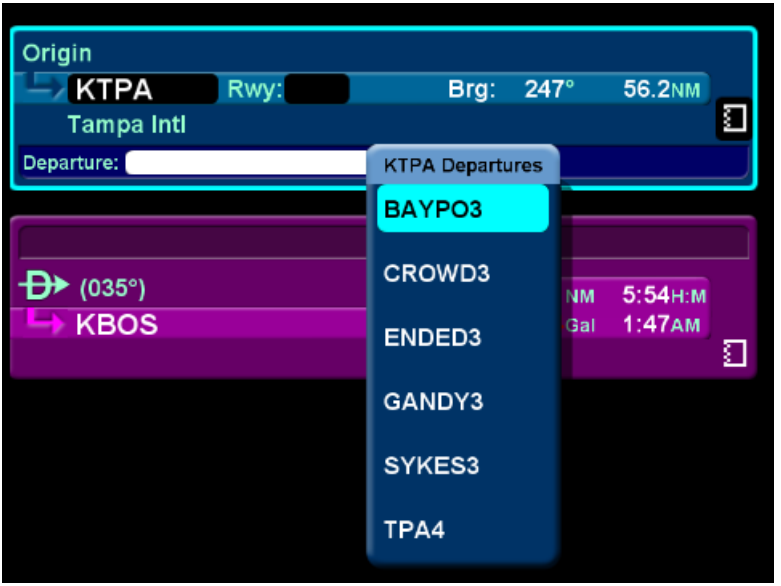
5 Departure

Departure Procedures

If the origin has a published departure, that procedure can be loaded into the flight plan. It can then be coupled to the autopilot for either automatic flight guidance or flight director guidance. The image below shows an example of a published departure being selected in the flight plan. Use the "FPL" tab by pressing the MAP key on the MFD to create the departure. Click on the "Insert" to produce the dropdown list of available published departures. Select the desired departure from the dropdown list. The same action can be achieved via knobs by navigating to the departure field.

Figure 5-1 Inserting an origin or waypoint

Figure 5-2 Departure Dropdown Box



With autopilot reference bugs preconfigured during ground operations, all that is required is to activate the autopilot in the desired mode after takeoff (e.g. HDG, IAS for climbing on an assigned heading to a desired altitude at a desired indicated airspeed or NAV, VS for following FMS guidance along the flight plan while climbing to an assigned altitude, etc.).

Solid magenta bugs indicate the bug is coupled to, and being used by, the autopilot or flight director. Hollow magenta bugs indicate that the bug is not coupled to, or being used by, the autopilot or flight director.

Vspeeds on ASI

Under high power conditions, the V_x and V_y labels are shown at the correct airspeeds for the Best Angle of Climb speed (V_x) and Best Rate of Climb speed (V_y). V_x and V_y are adjusted based on density altitude, as described in the Airspeeds for Normal Operations section of the aircraft Pilot Operating Handbook.

Under low power conditions, the V_G label displays the Best Glide airspeed as listed in the Airspeeds for Emergency Operations section of the aircraft Operating Handbook. If the aircraft's POH

lists Best Glide airspeeds for multiple gross weights, V_G is displayed as a range between the highest and lowest Best Glide airspeed. The POH must be consulted for the correct Best Glide airspeed for a particular gross weight.

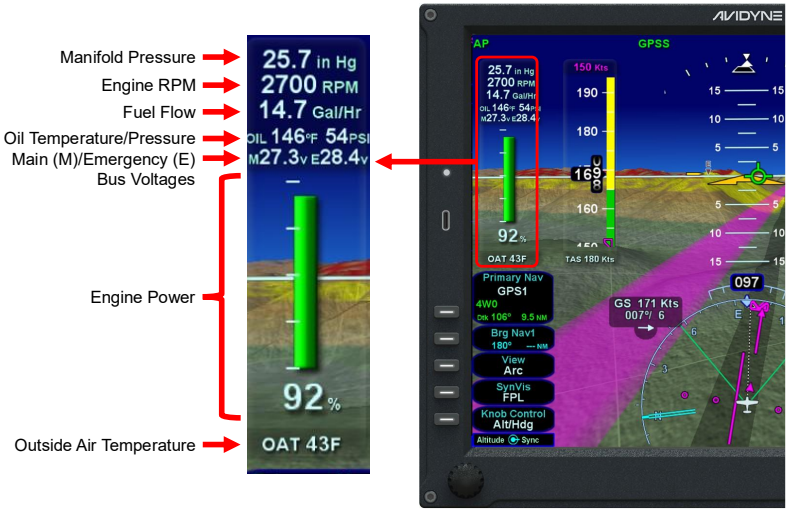
Figure 5-3 Vspeeds on ASI

Engine Indication on PFD

A % power indication of engine power is displayed on the left edge of the display. In aircraft still equipped with analog round dial engine gauges, this indication of power is for reference only. In aircraft not equipped with analog round dial engine gauges, this indication of power on the ASI can be considered the primary engine power indication.

While there is constant engine monitoring going on "behind-the-scenes" in the system designed to alert the pilot to engine behavior requiring immediate attention, some engine parameters are also displayed full time on the PFD.

Figure 5-4 Engine data on the PFD



The specific parameters will vary by engine type but for example, on a normally aspirated engine, the parameters displayed are:

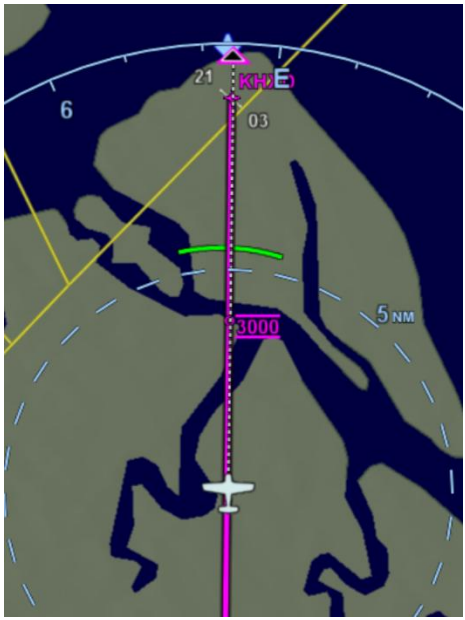
- Manifold Pressure
- RPM
- Fuel Flow
- Oil Temperature
- Oil Pressure
- Main (M) and Essential (E) Bus Voltages

Flight Planning

The flight plan will automatically activate on departure roll and, as soon as the autopilot is engaged, all autopilot mode transitions will automatically follow the FMS flight plan. There is no manual nav tuning required. When airborne with the flight plan loaded in the FMS, navigating the chosen course should be as simple as "fly the magenta line."

A small green arc will be drawn on the map that depicts the geographic point where, at the current vertical speed, the aircraft will reach the altitude target (Alt Bug value). It will be removed from the map when the current aircraft altitude is within 150' of the target altitude.

Figure 5-5 Range to altitude indication



6 Cruise / Enroute

Navigational Situational Awareness

Several aids have been included in this system to provide navigational situational awareness.

Fly the Magenta Line

From any of the Map or PFD page tabs, a moving map is presented that always contains a depiction of the entered flight plan. The active or current leg is always shown in the color magenta and enables the "**fly the magenta line**" concept.

Wind Vector

A wind vector is displayed on the PFD. The arrow indicates the direction of the wind relative to the current aircraft heading. Expect a several second lag after coming out of a turn. The wind vector is useful in any phase of flight where winds aloft need to be considered. A combination of the wind vector and projected track line in navigation tasks can be used. Wind speeds less than 5 knots will be displayed as "Winds Calm".

Projected Track Line

The dashed gray line that originates from the aircraft's present position symbol on the HSI display and maps is a projection of the current ground track of the aircraft. By aligning the projected track line with the desired track, the guesswork is removed from determining proper crab angles for wind corrections.

Heading Horizon Tick Marks

A series of heading indicators are always displayed on the HSI, marking every 30 degrees. Cardinal directions are indicated by the letters N, E, S, W. When turned on in the setup options, heading indications along the Synthetic Vision horizon are also available.

Bearing Pointer

A bearing pointer can be turned on or off for display on the HSI. It has its own dedicated LSK for selecting the nav source used to drive the bearing pointer. It will also contain a snap vector (bearing

or distance) to the waypoint or station selected. If a LOC or ILS is tuned, a bearing pointer will not be displayed for the NAV source.

Top Data Strip

The top of the MFD display contains a few data block fields, some of which are user configurable. Therefore, one common technique is to select steering information to the current waypoint or next waypoint to be displayed in that data block for continual navigational awareness.

Precision Flying

This section provides an overview of some of the features to produce precision flight performance.

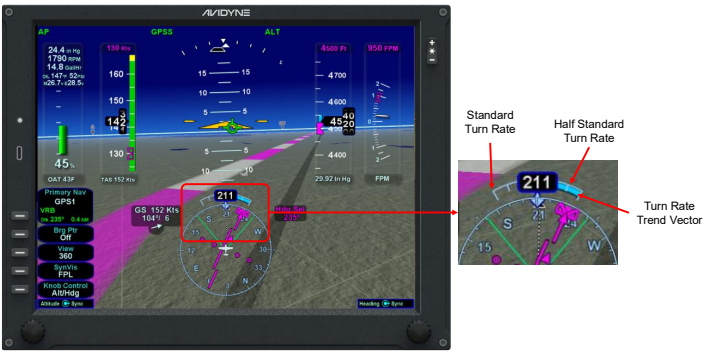
Obtaining Level Flight

If hand-flying, level flight can be obtained by placing the Total Velocity Vector (TVV) on the horizon.

Flying a Constant Rate turn

The proper technique for flying a constant rate turn involves using a combination of the turn indicator and the bank angle indicator.

Figure 6-1 Turn Coordinator and Heading Trend Vector



Initiate the standard rate turn by banking to an initial angle of 20 degrees with reference to the bank indicator. Adjust the bank angle to standard rate by reference to the standard rate turn indicator. The tip of the blue rate of turn indicator displays the current rate of turn. The indicator is marked for ½ and full standard rate of turn. An arrowhead indicates a value beyond 1 ½ standard rate.

Deviations from the intended bank angle are easy to notice with the wide horizon line. Maintain altitude by keeping the TVV on the horizon.

Trend Indicators

Several of the indicators (airspeed, altitude) contain trend indicators in addition to their primary function. Use the trend indicators to capture and maintain a desired airspeed and altitude by adjusting the pitch and/or power. This results in a smooth capture of the desired altitude or airspeed. The tip of the indicator displays the predicted value to be reached in 6 seconds. An arrowhead indicates a value beyond the current tape field of view.

Engine Leaning

For normally aspirated engines, select the "SYS" page and then "ENG" tab. From the Engine tab, select the "Lean Assist" LSK and follow the on-screen instructions for optimum engine leaning. See Appendix D for more detailed descriptions.

Figure 6-2 Engine Leaning

Use of the Map

The map has several formats and views. On the MFD, pages allow both a full map and split map depictions as well as datablocks. In all cases, map feature density and overlays can be controlled via the LSKs along the left edge of the bezel or by using the touchscreen.

The active flight plan is always overlaid on the map as are any traffic depictions.

While the current leg of the active flight plan is always depicted in magenta on all moving maps, the next leg is also indicated using alternating magenta and white stripes. This "candy cane" indication can come in handy during such circumstances as teardrop entries into a holding pattern. It gives a clear indication of what the system will do next. All future legs beyond the next leg will be depicted in white.

Figure 6-3 Next leg depiction

Turning the right-hand bezel knob (inner or outer ring) will result in a map range change. By pressing the right knob, toggle between three map orientations: North up, Aircraft nose up, and 250° Aircraft nose up. The current map view is indicated at the top right corner of the map.

Figure 6-4 North-Up View

Decluttering the Map

LSKs allow separate control of the information density of the land-based (Land) map features (e.g., terrain, political boundaries, rivers, lakes, oceans, roads, etc.) and the navigational-based (Nav) map features (e.g. Airspace, Victor and Jet airways, airports, obstacles, navaids, etc.). The land declutter LSK also includes a VFR chart map view. Use the Land and Nav declutter LSKs to select the preferred level of feature density. The level specified remains consistent across all map pages on the display on which it was set.

Figure 6-5 Declutter Map Controls

NOTE

The VFR chart available on the Land Declutter LSK is intended for situational awareness only. Do not rely on this VFR chart map view as the sole source for navigational data, terrain, or obstacle avoidance.

Panning the Map

Use the touchscreen to move around the map, panning ahead along the route or determining bearing and distance of any location from the present position. Pop-up boxes offer information about an area of interest.

There are many selectable sources of information on the map, including every depicted Navaid, airport, and airspace (including TFRs). When a location is selected via the touch screen, an informational pop-up box appears and contains relevant information about that location.

NOTE

In every case, there is a page count in the bottom right corner of each pop-up box. For those boxes that indicate more than one page, touching the box cycles through the various pages of the pop-up box.

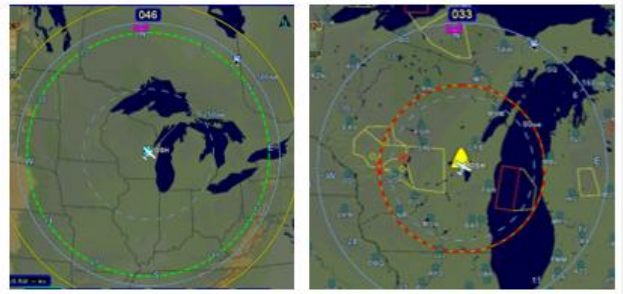
Figure 6-6 "Hot Spot" Pop-up Box

To enhance situational awareness during panning operations, a dashed line, or range ring, is drawn around the panning cursor and a read-out of the cursor's bearing and distance from own ship is immediately adjacent to the cursor.

COOL FEATURE

Fuel Range Ring

The green fuel range ring depicted on the map provides a visual indication of the max range of the aircraft, allowing a 45-minute reserve. Winds are indirectly considered. The calculation uses ground speed to compute the size of the circle and is based on the value of the fuel totalizer. The dashed green line represents the fuel remaining without reserves. The solid yellow line indicates the fuel remaining, including reserves. The dashed yellow and red line shows the fuel remaining when only reserve fuel is available. The rings are always displayed and cannot be turned off.



Note: The indications depicted are for a maximum fuel range, calculated with reference to the current groundspeed and the remaining fuel as indicated by the fuel totalizer. Changes in power settings or winds aloft will alter range and endurance.

Flight Plan Operations

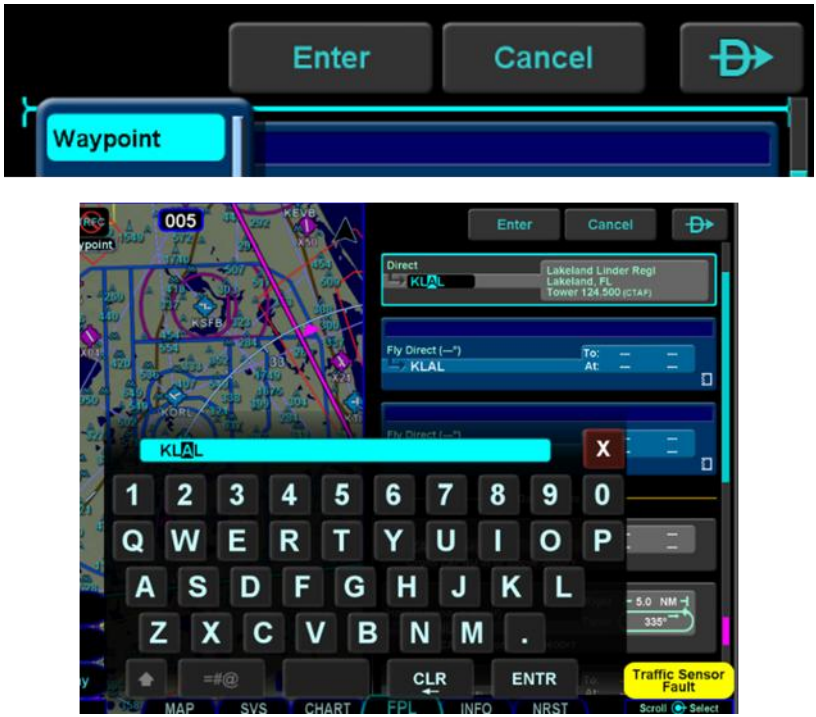
Modifying a Flight Plan

An existing flight plan can be modified on the MFD. Several of the more common tasks to modify the flight plan are described below. Since the MFD's flight planning functionality is very similar to the IFD's, consider referring to the IFD Pilot Guide for additional information.

Inserting a Waypoint

From the "FPL" tab of the MAP page on the MFD, a new waypoint can be inserted. Use the touchscreen or knob to place the cursor at the desired insertion point, then use the "Insert" button on the MFD to insert a waypoint. A keyboard will appear on the screen if editing was initiated with the touchscreen, or the field will be highlighted and ready for entry using knobs if that was the method used to insert the waypoint. Press "ENTR" to apply the waypoint into the flight plan.

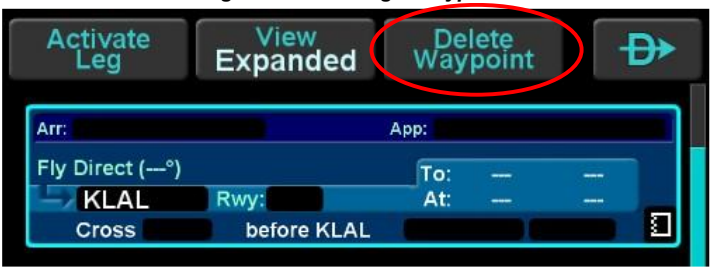
Figure 6-7 Inserting a waypoint



Deleting a Waypoint

From "FPL" tab of the MAP page on the MFD, any waypoint can be deleted. Select the waypoint and the "Delete Waypoint" button will appear next to the "View" button. Continue pressing the "Delete Waypoint" button and it will walk up the flight plan deleting waypoints.

Figure 6-8 Deleting a waypoint



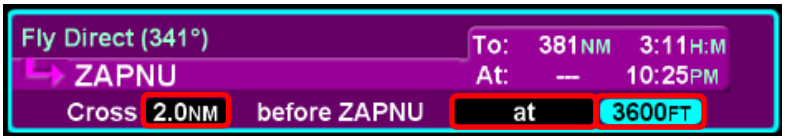
Editing a Waypoint

From the "FPL" tab where the flight plan is displayed, the right-hand knob on the MFD or the touchscreen can be used to edit an existing waypoint. To edit using knobs, use the right outer knob to scroll up or down the flight plan until an edit cursor surrounds the waypoint to be modified. Use the inner knob to highlight one of the editable fields with reverse video. Pushing the knob activates the field, allowing changes to be made by entering a new designator, or through a drop-down box as appropriate for the type of field.

Adding a Vertical Constraint

On each waypoint, a vertical constraint can be assigned (e.g., cross the waypoint at or above a specific altitude, be at a specific altitude a specified distance prior to the waypoint, etc.). This is accomplished by selecting the empty box to highlight one of the vertical constraint fields on the waypoint of interest and entering the desired value.

Figure 6-9 Vertical Constraint Fields



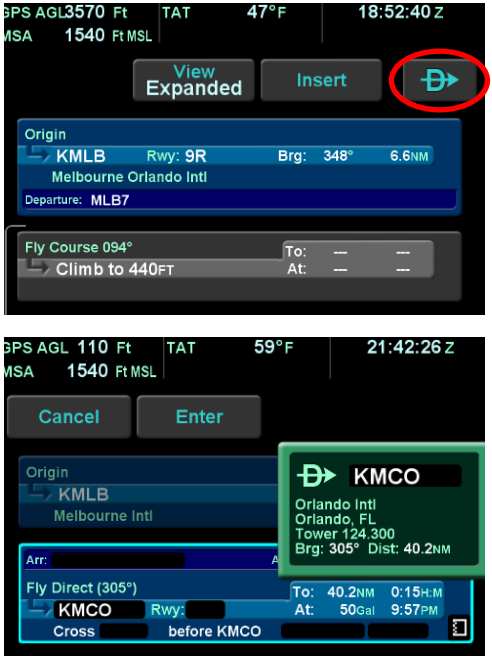
The only waypoints that do not permit vertical constraints are:

- Origin
- Destination (provided there is an approach loaded for it)
- Missed Approach Point
- Altitude Terminated Legs

Performing a Direct-To

Direct-To can be accomplished at any time from MFD "MAP" Page and "FPL," "INFO" or "NRST" Tabs combination. Press the "-D->" (Direct-To) function key and it will automatically highlight the waypoint asking for the flight activation. Geofill™ provides the most logical choice of destinations in that dialog box. If that is the desired point, press "Enter" and that point automatically becomes the active system waypoint. If that is not the desired point, press the identifier field and start typing the intended Direct-To destination identifier into the keyboard. Press "ENTR."

Figure 6-10 Direct-To



Canceling a Direct-To is as easy as selecting the Direct-To waypoint of interest and pressing the "Delete Waypoint." Once a Direct-To entry has been accepted, it becomes a standard waypoint in the plan. Canceling it is the equivalent of deleting any other waypoint.

Creating a Holding Pattern

A hold can be put on any waypoint that has a fixed terminated leg – waypoints that terminate with a GPS position such as navaids, enroute waypoints, user waypoints, airports, etc. Legs that terminate at an altitude, DME distance, radial crossings, etc. Do not support attaching a hold.

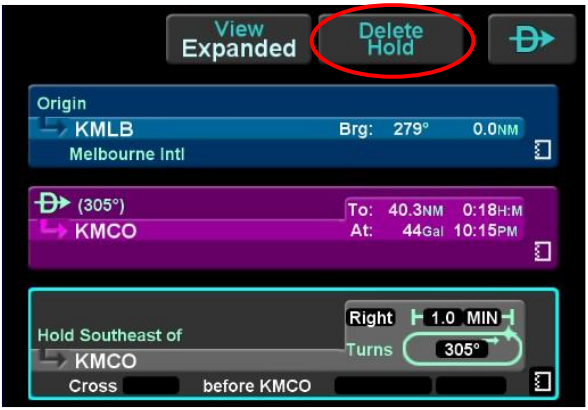
Much like inserting a waypoint, push the right-hand knob on the MFD with Flight Plan displayed or simply use the touchscreen to generate a drop-down list of options. Selecting "Hold at <waypoint name>" will add a holding leg, populated with standard hold data.

Figure 6-11 Adding a hold at waypoint

Deleting a Holding Pattern

To delete a holding pattern from the flight plan, select the hold leg, then press the "Delete Hold" button.

Figure 6-12 Deleting a holding pattern



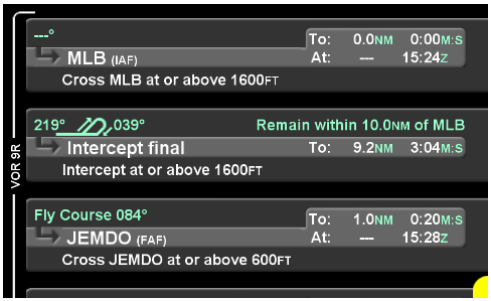
Editing a Holding Pattern

Select the hold leg of interest in the flight plan. Highlight the desired field (e.g., turn direction, leg length, leg units, inbound leg course) and make an edit. Any changes made will immediately be applied.

Graphical Flight Plan Leg

Select legs of a flight plan can display a graphical representation of the leg. This is especially useful for procedure turns and holding patterns.

Figure 6-13 Graphical flight leg plan



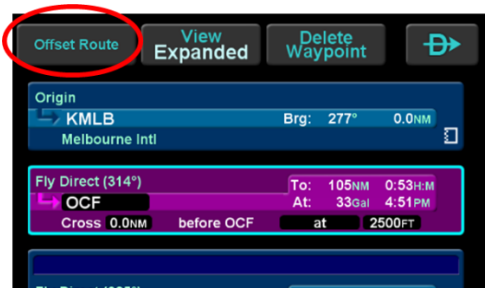
Manual Flight Plan Sequencing

The FMS assumes that the pilot will fly the flight plan as defined. If that does not occur, legs may not sequence as expected. Therefore, to manually sequence the desired leg, select it and press "Activate Leg."

Lateral Offsets

The system supports the capability to create and fly a lateral offset from the flight plan. From the "FPL" tab of the MAP page, press the "Offset Route" softkey and use the right-hand knob on the MFD to dial in the desired offset. Use the outer ring for coarse control (1 NM increments) and the inner ring for fine control (0.1 NM increments). Rotate the knob left for left offsets and right for right offsets. Once the intended offset has been entered, press the "Confirm Right/Left X.X NM" LSK. At that point, the original softkey will indicate "Offset Route Right/Left X.X NM." To delete a lateral offset, press the "Delete Offset" softkey. The maximum offset that can be dialed in is 20 NM. Lateral offsets are not available when in OBS mode.

Figure 6-14 Offset Route



Gaps or Discontinuities in Flight Plans

A "Gap In Route" will appear within the flight plan when there is a discontinuity between legs. A discontinuity occurs when the FMS cannot compute the guidance to the next leg due to an invalid leg type combination based on preset guidance rules. The objective is to inform the pilot that the Gap must be manually closed if the next leg is to be automatically sequenced. Otherwise, the leg before the Gap will not be sequenced and guidance will not be provided to the next waypoint. If desired, close the gap by selecting the gap indication and pressing the Connect softkey. Closing a Gap

connects the waypoint prior to the Gap with waypoint that follows by a direct (straight) leg.

Figure 6-15 Connecting gap in route

View softkey

The View softkey controls the content of flight plan rows. The View softkey can be set to either "Expanded" or "Compact".

Typically, the view is set to "Expanded", which causes each row in the flight plan to represent a leg in the flight plan. This view is useful to track progress during the flight.

When the View is set to "Compact", each section of the flight plan with procedure brackets is reduced to a single entry. The content of this entry will reflect the entire procedure. When the flight plan is active, however, the procedure that contains the active leg is always expanded. The compact view is useful for viewing flight plans in a format that more closely resembles a clearance.

Figure 6-16 Flight Plan Expanded vs. Compact

Nearest Function

Nearest is available as a tab on the MFD "MAP" page, "NRST" tab.

On the left side of the split page is the map, and the right side is the Nearest list of Airports. As that list is scrolled up or down via the touchscreen or the right-hand bezel knob, the associated airport or fix is highlighted in reverse video blue on the map. This provides a powerful graphical indication of the element in relation to own ship and other map features. Each subsequent press of the "NRST" button cycles through the list of nearest elements in the following order:

- Airports nearest to present position
- Airports nearest to destination
- Nearest VORs
- Nearest NDBs
- Nearest Intersections
- Nearest ARTCCs
- Nearest FSS

If GPS position is not available, an error message is displayed.

Traffic Display

While not required, most installations will have a traffic sensor of some type.

Basic Traffic Symbols

Unless otherwise noted, all traffic sensors can generate basic non-directional traffic symbols.

Symbol	Definition
	Traffic Advisory (TA) Traffic which meets the alert criteria for the traffic sensor (solid yellow circle)
	Proximate Traffic (PA) Traffic which does not meet the alert criteria but is "close" to the aircraft (within 6NM and 1200ft) (solid cyan diamond)
	Other Traffic Traffic that is detected by the traffic sensor but determined not to be a current threat. (Hollow cyan diamond)

Additional information is displayed adjacent to the traffic symbol to indicate relative altitude, in hundreds of feet, and vertical trend.

Directional Basic Traffic Symbols

Depending on how the traffic device is connected to the Vantage display, ADS-B traffic may appear with the ADS-B symbology (below) or basic symbols. When the basic symbols are used, track pointers are added to the symbols pointing in the direction of travel. These track lines only show direction; they do not convey any information about the sensed traffic's speed. These track pointers are typically reported and indicated to 45° cardinal increments (e.g., 0°, 45°, 90°, 135°, etc.), but can be more precise depending on installed equipment.

Since the traffic data can be re-radiated data from FAA ground stations, there are a few additional possible states of the data

beyond normal operating state. The non-normal status states will be displayed in the traffic thumbnail and as CAS messages and include:

TIS-A Traffic Thumbnail Status	Definition
"Coasting"	Traffic communications have ceased for more than 6 seconds but less than 12 seconds.
"Removed"	Traffic communications have ceased for more than 12 seconds.
"Unavailable"	No ground station is available, or communications have ceased for more than 60 seconds.

ADS-B Directional Traffic Symbols

ADS-B traffic sensors can display directional versions of the basic traffic symbols when track or heading information is available. The symbol is oriented to reflect the target's track. If speed information is also available, a one-minute Horizontal Velocity Vector (HVV) barb is shown on the map display of traffic.

Symbol	Definition
	ADS-B Traffic Advisory (TA) Traffic which meets the alert criteria for the traffic sensor (solid yellow arrowhead surrounded by a ring).
	ADS-B Proximate Traffic (PA) Traffic which does not meet the alert criteria but is "close" to the aircraft (within 6NM and 1200ft) (solid cyan arrowhead).

Symbol	Definition
	ADS-B Other Traffic Traffic that is detected by the traffic sensor but determined not to be a current threat (hollow cyan arrowhead).

Additional information is displayed adjacent to the traffic symbol to indicate relative altitude, in hundreds of feet, and vertical trend.

ADS-B Ground Traffic Symbols

ADS-B traffic sensors can also show ground targets. No additional traffic information (e.g. Altitude, vertical trend) is shown with these targets. If a track or heading is available, the directional version of the symbol will be presented.

Symbol	Definition
	On-ground traffic (non-directional) Traffic reporting an on-ground state (hollow brown diamond).
	Ground vehicle (non-directional) Traffic identifying as a ground vehicle (hollow brown rectangle with four wheels).
	On-ground traffic (directional) Traffic reporting an on-ground state (hollow brown arrowhead).
	Ground vehicle (directional) Traffic identifying as a ground vehicle (hollow pointed brown rectangle with four wheels).

Additional Traffic Information

The Aircraft ID (tail number, call sign, or squawk code) may also be displayed adjacent to the traffic symbol on the Map display, when it is available from the traffic sensor.

Figure 6-17 Additional traffic information

Non-TA Traffic Range Filter

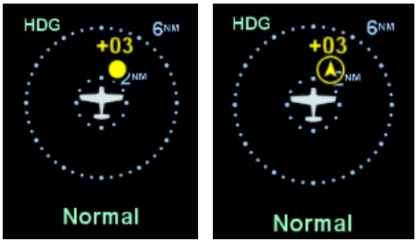
TA and PA traffic is always displayed on the map. However, to avoid display clutter at wide map zoom ranges, "other" and "ground" traffic, collectively "Non-TA Traffic", is defined as a map layer that can be configured independently. The "Non-TA Traffic" map layer is part of the Map settings on the Setup Page and can be turned on or off. If the layer is on, then the range below which the traffic will be displayed is also configurable.

Figure 6-18 Non-TA traffic range filter

Traffic Thumbnail Datablock

For space reasons, the Traffic Thumbnail data block does not show the traffic ID or ADS-B HVV barbs. TAs which are beyond the range of the traffic thumbnail will display as a half symbol at the edge of the thumbnail's outer range ring. The traffic thumbnail is always displayed with the own ship heading up (HDG) for TAS and TCAS sensors. For ADS-B and TIS-B, the traffic thumbnail may be displayed as track-up (TRK) if heading is not available.

TAS Traffic ADS-B Traffic



Traffic Advisories (TA) will generate a CAS message. Depending upon the type of traffic system installed, an aural alert may also be generated.

Most installations will ensure the traffic system is in Standby or Ground mode on the ground and will automatically toggle to one of the enroute altitude modes per the table below.

Traffic Altitude Mode	Relative Altitude Window
Below	-9900' to 2700'
Normal	-2700' to 2700'
Above	-2700' to 9900'
Unrestricted	All known traffic

To change the display range on the traffic thumbnail, touch the area showing the range rings, roughly the upper two-thirds of the thumbnail.

Datalink Weather Operations

XM Satellite Weather Broadcast Datalink

XM Weather Broadcast Datalink comes directly from satellites to a dedicated onboard receiver, requires a monthly subscription, and provides weather data continuously. The display of received data can be controlled on the Map page.

XM provides US and Canadian METARS, radar, lightning, winds aloft, AIRMETs, SIGMETs, turbulence and icing data. Product availability depends on the level of XM subscription chosen.

NOTE

Database Accuracy and Completeness
Avidyne does not control, review, or edit the information made available by XM, and is therefore not responsible for the accuracy of that information.

The coverage area for Datalink weather is defined by diagonal lines. If, however, Datalink radar is unavailable in a particular area for any reason, hatched lines appear in that area. In the mountains and off the coast, hatched lines may represent no coverage below 10,000 feet. If there are radar returns in that region above 10,000 feet, the returns will be displayed as "islands of precipitation" surrounded by the hatched lines.

The Datalink radar is a composite image depicting precipitation as seen by multiple ground-based weather radar sites. The image is color-coded to show intensity levels and precipitation types.

Figure 6-19 Datalink Precipitation

NOTE

Datalink Data Intended to Aid Decision Making
Weather Datalink information is meant to aid pilot planning and near-term decisions focused on avoiding areas of inclement weather that are beyond visual range or where poor visibility precludes visual acquisition of inclement weather. The system is not designed for use for weather penetration and storm cell circumvention. The system lacks sufficient resolution and updating necessary for tactical maneuvering.

At large map ranges beyond 250NM from the aircraft, small areas of high-intensity Nexrad returns may not be displayed; instead, larger areas of surrounding lower-intensity Nexrad returns will be shown. The Wx Overlay key in the Map tab produces a fly-out menu allowing for the selection of the following options:

- US Radar
- Canadian Radar
- Icing
- Storm Cells
- Winds

Depending on the XM Satellite Weather Broadcast subscription, XM Satellite Weather Broadcast may provide lightning strike data, allowing the Map page to add "Datalink" as a source of strike. The actual weather products delivered depend on the satellite weather subscription plan and the region of the world.

US ADS-B Weather (FIS-B Datalink)

FIS-B weather data is provided on the 978mhz ADS-B band by a network of broadcast stations operated by the FAA. FIS-B Datalink is a subscription-free product provided by the FAA and the receiver receives weather data when in range of an ADS-B ground station. The display of received data can be controlled on the Map page.

At large map ranges beyond 250NM from the aircraft, small areas of high-intensity RADAR returns may not be displayed; instead, larger areas of surrounding lower-intensity RADAR returns will be shown. The Wx Overlay key in the Map tab produces a fly-out menu allowing for the selection of the following options:

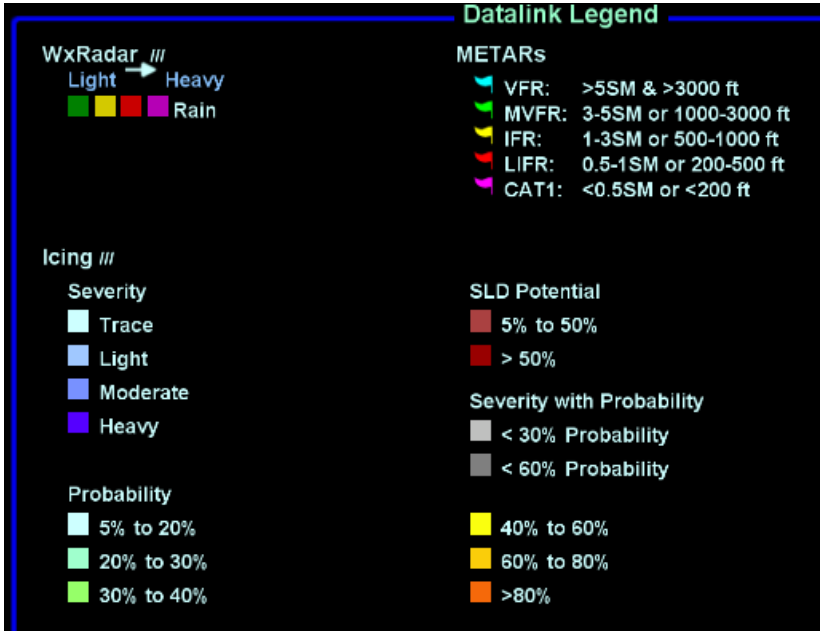
- Turbulence
- Winds
- Icing
- Icing + SLD
- Icing > 30% Prob.
- Icing > 60% Prob.
- Icing Probability
- Off

When receiving both Regional Radar and CONUS weather radar from the ADS-B ground stations and MAP zoom ranges are greater than 240nm, ONLY CONUS radar depiction will be used. If the user reduces the zoom range below 240nm, US Regional radar depiction will be used. If US Regional radar depiction is not received and the zoom range is less than 240nm, then CONUS radar depiction will be used. If no data is received then no hatching is shown, once the first data is received hatched lines appear as a bounded rectangle that surrounds the received data and is approximately 100 NM wide on each side.

There is no "unavailable" area relative to the outline of the Continental United States or altitude. If, however, ADS-B weather radar is unavailable in a particular area for any reason, hatched lines appear in that area.

ADS-B ("FIS-B") radar data coverage areas can be very irregularly shaped areas – the geometry is dependent on how many transmission sites are in view and how much data has been received by the on-board receiver.

Figure 6-20 Weather Data Legend (FIS-B ADS-B Weather)



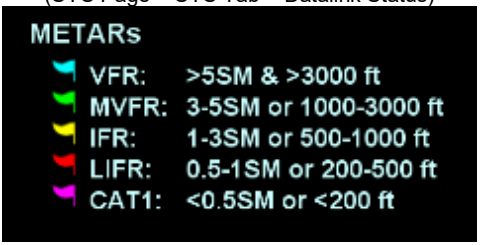
Weather Reports (FIS-B and XM Satellite Weather Broadcast)

The Wx Overlay provides a means to control display of other weather-related data on the Map. The choices include "METARS" and "AIR/SIGMETS". The choices are individually selectable, but more than one can be selected at a time.

METARs – These are available in both text and graphical formats and represent recent surface weather observations. Text METARs are presented on the "INFO" tab of the "MAP" page. The graphical METARs are color-coded flag symbols that summarize a recent surface weather observation and can appear as overlays on the Map and embedded in the flight plan on the Flight Plan tabs and Nearest tabs. These flags allow an overview of general weather conditions in an area.

Figure 6-21 Graphical METAR Legend

(SYS Page > SYS Tab > Datalink Status)

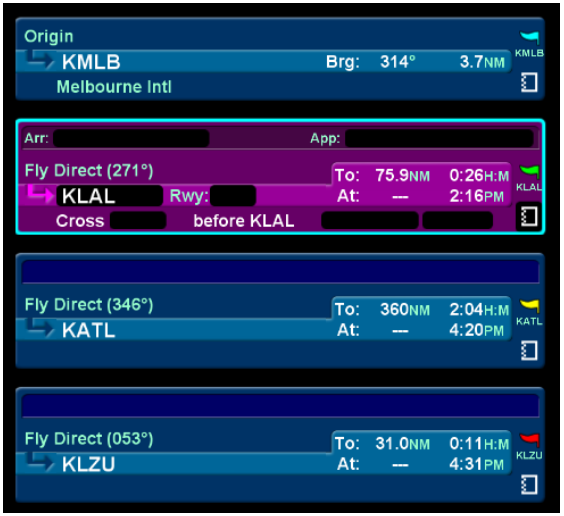


COOL FEATURE

METAR Flags in Flight Plan

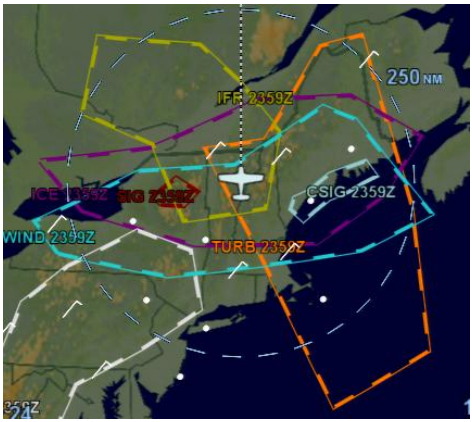
The right edge of each leg in a flight plan presents a METAR flag for the closest reporting station, if the station is different from the previous leg's station. The station for which the METAR flag applies is decoded immediately beneath the flag and may not be the same location as the leg itself.

Figure 6-22 METAR flags in flight plan



AIRMETs and SIGMETs (US only) – These are areas which the National Weather Service has issued advisories for various types of hazardous weather. They are depicted on the Map page along with an abbreviated description of the hazard, such as "ICE" (icing), "MTN" (mountain obscuration), or "IFR" (instrument flight conditions). AIRMET & SIGMET labels include the year and report number.

Figure 6-23 AIRMET and SIGMET Detail

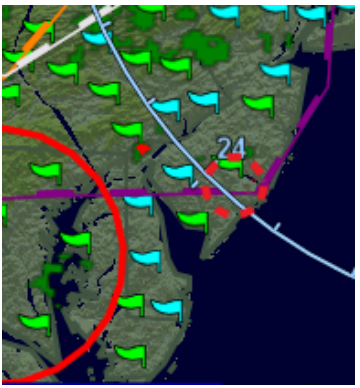


TFRs

Active and Pending TFRs

TFR data is also transmitted either via XM Satellite Weather Broadcast or the ADS-B network. There are two types of TFRs depicted – active and pending. Active TFRs are depicted as solid red lines and Pending TFRs are depicted as dashed red lines, which become solid when the TFR transition time rolls from pending to active. This time can be viewed by tapping the TFR on the map, or by navigating to the SYS page, Datalink tab. Display of TFR data on the map cannot be turned off. Since TFRs can change in a short period of time, it is strongly recommended for the pilot to obtain the latest information through other approved sources for their operation.

Figure 6-24 Graphical display of TFRs



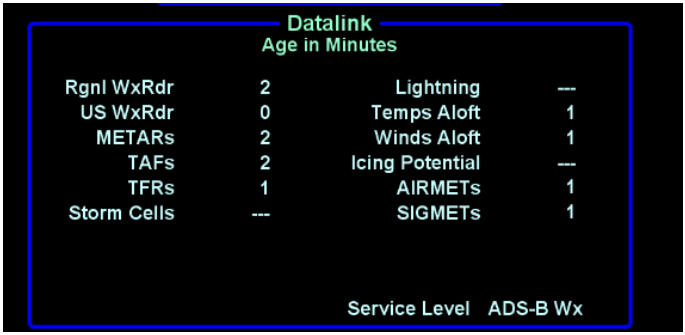
Indications of Data Age

As noted above, there are multiple products that are transmitted as part of the ADS-B network and XM Satellite Weather Broadcast. They can come in at different rates and so to provide an easy-to-use indication of data age, two indications are provided at the bottom of each map. The bottom left corner of each map depiction provides a METAR data age, and the bottom right corner provides radar (Nexrad or WXRAD) age. If a Datalink Icing product was selected for map display via the "Wx Overlay" key, the radar age is replaced by the icing altitude age that is currently being displayed.

IMPORTANT NOTE

Pilots must monitor the age of the data in assessing its reliability. The in-cockpit weather received by either the XM Satellite Weather Broadcast, or the ADS-B network depicts where the weather WAS, not where it is. The age indicator does not show the age of the actual weather conditions but rather the age of the mosaic image. The actual weather conditions could be up to 15 to 20 minutes OLDER than the age indicated on the display. Pilots should consider this potential delay when using in-cockpit weather received via the two networks and its capabilities, as the movement and/or intensification of weather could adversely affect safety of flight.

Figure 6-25 Data Age
SYS Page > SYS Tab > Datalink Status



Textual ADS-B Weather and Airspace Info

In addition to the graphical display of TFRs and AIRMETS/SIGMETS, textual descriptions of the ADS-B Stations/Status and Unavailable ADS-B products can be found on the SYS page, SYS tab by cycling through the Datalink LSK options.

Autopilot Display

The top edge of the ADI will continually present annunciators that reflect the current state and mode of the autopilot.

Figure 6-26 PFD Autopilot Annunciator

The DFC90 Pilot Guide for Vantage 12 contains a more complete description of the system operation.

Synthetic Vision

Synthetic Vision (SynVis) is meant to serve as a situational awareness aid. As an aid to situational awareness, it is intended to provide terrain, obstacle, and traffic awareness in the proximity of the aircraft. It is not meant to be the sole means of terrain or obstacle avoidance nor is it meant to serve as the sole means to conduct an instrument approach.

SynVis uses a GPS-based MSL altitude and a 3 arc-sec terrain database to display a 3D scene representing an "egocentric" out-the-window view. The SynVis scene displays:

- A Total Velocity Vector (TVV) / Flight Path Marker (FPM)
- Airport flags with METAR coloration
- Runway depictions
- 3D terrain
- 3D traffic
- 3D obstacles
- Large bodies of water (oceans, lakes, major rivers)

NOTE

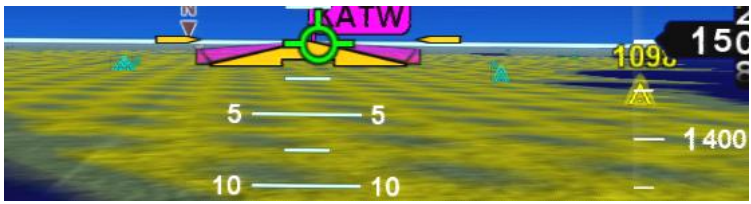
SynVis computes height above terrain via GPS inputs and is not a radio altimeter (RADALT).

Figure 6-27 PFD Synthetic Vision Scene

The TVV is a visual representation of the aircraft flight path – it indicates where the airplane is going, and not necessarily where the aircraft is pointing. The TVV is marked in the picture above. The TVV will grow when it is behind the airspeed, altitude, or heading digital readout bubbles to remain viewable.

Traffic and the flight path cast shadows on the terrain, providing additional situational awareness. The terrain is also overlaid with subtle grid lines, spaced 1NM apart, to provide speed, distance, and depth cues.

Figure 6-28 Obstacle threat bubbles



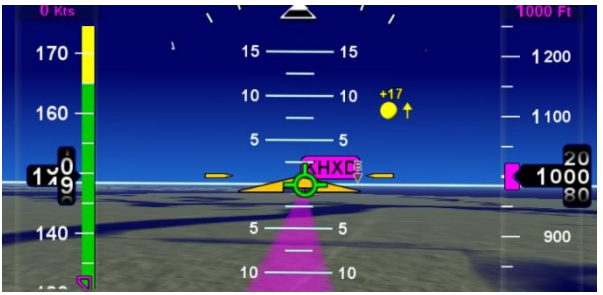
Terrain Awareness (SV-TA) and Forward Looking Terrain Alerting (FLTA) alerts are provided via terrain coloration, and Crew Alerting System (CAS) alerts.

The SynVis LSK allows the pilot to cycle between FPL mode (displaying the current flight plan overlaid on the SVS scene), SVS mode (without FPL overlay), and "Off". Turning the SynVis LSK to Off leaves the pilot with a traditional blue/brown interface.

Figure 6-29 SynVis LSK

The 3D traffic uses the same symbology as the basic symbols in the traffic thumbnails and map overlays. The traffic depictions in the SynVis scene attempt to indicate relative threat level by size/symbol type and are depicted at the relative altitude and bearing as received from the traffic sensor, consistent with the SynVis field of view. As traffic draws nearer, it grows in size in the SynVis scene.

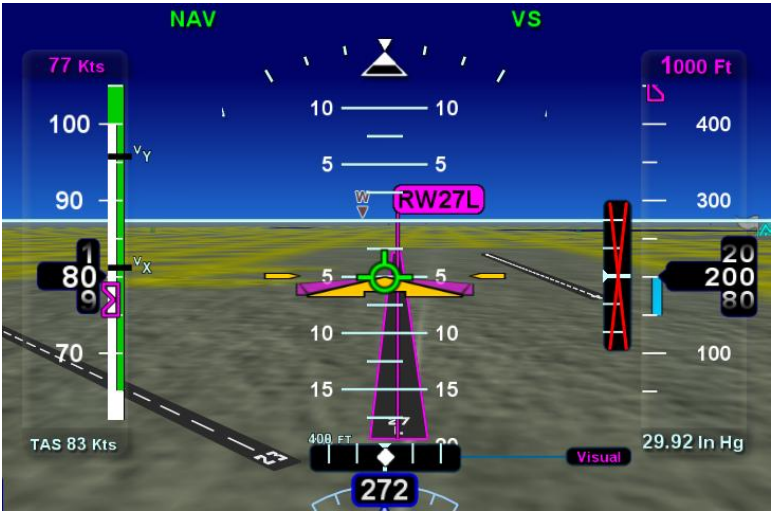
Figure 6-30 3D Traffic Symbology in SynVis Scene



Any airfield that is in the FMS database and in the SynVis field of view will be depicted in the SynVis scene with a gray flag until the airfield is within 1.5NM at which time, the flag is removed, and the runway outlines should be clearly visible. If the FMS receives a valid METAR, the airfield flag will be color coded to represent the ceiling and visibility, consistent with the moving map.

Figure 6-31 Airport METAR Flag

Figure 6-32 Runway markings



Provided the aircraft position is close enough to the runway, runway numerical identification (e.g., "27L") will be visible as will centerline markings. Any runway that is part of the active flight plan will be further outlined in magenta.

Obstacles will be depicted in the SynVis scene out to 12NM. Standard high, low, and grouping symbology is used to depict

obstacles. Depiction of non-threat obstacles in the SynVis scene is governed in part by the Map Setup page selections. If obstacle filtering is disabled on the Map Setup page, then all obstacles within 12NM will be displayed in the SynVis scene. If obstacle filtering is enabled, then the system will display the greater of 2000' or the selected altitude filtering number. For example, if 500', 1000', or 1500' were selected on the Map Setup page for low obstacle altitude filtering, the system will depict all obstacles within 2000' vertical feet of the aircraft out to 12NM in the SynVis scene.

Synthetic Vision Terrain Awareness (SV-TA)

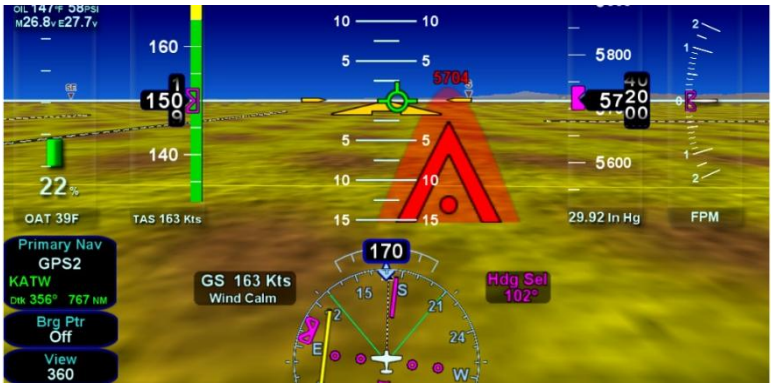
SV-TA is for general situational awareness purposes and consists of hatched terrain on the SynVis scene and any map page. SV-TA will not generate a CAS message.

Any terrain that is within a 10NM radius of aircraft position and between 100' below aircraft altitude and 1000' below aircraft altitude will generate yellow hatched indications on the SynVis scene and the map pages. Any terrain that is within a 10NM radius of the aircraft position and is 100' below aircraft altitude to anything above aircraft altitude will generate red hatched indications on the SynVis scene and the map pages.

Any obstacle in the database within a 5NM radius of the aircraft position and whose top is within 2000' vertically (above or below) of the aircraft altitude will generate a cyan (blue) threat bubble over the obstacle on the SynVis scene. Obstacles inside a 3NM radius of the aircraft position and whose top is between 100' below aircraft altitude and 1000' below aircraft altitude will generate a yellow threat bubble over the obstacle on the SynVis scene and the map pages. Obstacles inside a 1.5NM radius of the aircraft position and whose top is between 100' below aircraft to anything above aircraft altitude will generate a red threat bubble over the obstacle on the SynVis scene and the map pages.

Yellow or red highlighted obstacles on the SynVis scene will also display the MSL altitude of the obstacle top.

Figure 6-33 Obstacle Threat Depiction



Obstacle-induced SV-TA awareness functions cannot be turned off. Terrain-induced SV-TA awareness functions can be turned off in the SYS>SETUP page. When turned off, there is no terrain SV-TA display on the SynVis scene, nor the map pages for PFD.

Forward Looking Terrain Alerting (FLTA)

FLTA alerting is triggered by either a projected imminent impact with terrain or obstacle **or** reduced terrain and obstacle clearance. Projected imminent impact with terrain occurs when the TVV is projected to intersect with terrain up to 3.0NM (yellow caution) or up to 1.5NM (red warning) in front of the aircraft flight path. By way of reference, this means an aircraft traveling at 180 knots of ground speed will have 60 seconds of notice for caution and 30 seconds for a warning. Reduced terrain or obstacle clearance occurs when the TVV is not projected to impact the terrain but the projected clearance between the aircraft flight path and nearby terrain or obstacles falls below a designated safe vertical distance. The reduced terrain and obstacle clearance distance varies with phase of flight and aircraft dynamics but generally ranges from 100' to 500'.

Either terrain or obstacles can trigger FLTA alerts, and they are distinguished via the CAS messaging. The difference between FLTA warnings and cautions is exclusively based on distance-to-go to projected impact points or reduced clearance areas.

The projected imminent impact location or the projected reduced terrain and obstacle clearance area is depicted on the SynVis scene and the maps with a solid yellow (caution) or red (warning) "flashlight" elliptical depiction. Depending on aircraft dynamics, it may be possible for a solid red FLTA "flashlight" projected terrain impact point to appear on top of a larger hatched yellow SV-TA depiction.

The Vantage 12 alert system notifies the pilot that action needs to be taken, but it is ultimately up to each individual pilot to enact the correct avoidance maneuver. Should an FLTA alert be generated, there are several courses of action that can be taken, and the specific scenario will dictate the optimum avoidance maneuver. For example, sometimes the best course of action is to immediately add power and climb, yet sometimes the best course of action may be a small heading change, especially in the case of a single obstacle off the nose. The pilot in command must assess the

specific circumstances presented and take action to avoid flight into terrain.

FLTA Alert Messages Prioritization

It is possible to have multiple terrain and obstacle FLTA caution and warning conditions at the same time. However, the CAS alerts will only honor the highest priority alert. The priority order is Obstacle Warning, Terrain Warning, Obstacle Caution, Terrain Caution.

FLTA Exclusion Areas

The area immediately surrounding an airport is considered an FLTA "exclusion area." If the aircraft position or an FLTA conflict area is anywhere within that exclusion area, the Vantage display will not generate the typical FLTA caution or warning alerts. For each known runway at an airport, an exclusion area extends 1NM past each end and 0.75NM on each side of the centerline. Therefore, at an airport with multiple runways, the airport exclusion area comprises the exclusion area for every runway. At an airport with no known runways, the airport exclusion area is a 1NM radius circle centered on the Airfield Reference Point (ARP).

NOTE

For airfields with multiple runways, this may have the effect of looking like several irregular shapes around the airfield. If the aircraft position or the TVV projected impact point is anywhere within that exclusion area, no FLTA alert will be generated. Obstacle threat bubbles can still appear inside the exclusion area.

Figure 6-34 FLTA Exclusion Area Depiction

FLTA Inhibition

FLTA alerts are inhibited if any of the following conditions are met:

- FLTA is manually turned off via the pilot-accessible Terrain Setup menu (generates a "FLTA Off" CAS advisory).
- The ownship position is inside the FLTA exclusion area discussed above.
- The projected ground impact point along track intersects the terrain inside the FLTA exclusion area discussed above.

Figure 6-35 FLTA Off advisory

Each unique FLTA alert will generate a new CAS message and display the elliptical solid yellow/red coloration on the SynVis scene and maps.

Each unique FLTA alert can be acknowledged by pressing on the CAS message, which turns off the CAS message. The FLTA acknowledgment does not turn off the solid red or yellow coloration on the SynVis scene and maps.

Terrain Awareness

Terrain Awareness is a graphical representation of aircraft height above surrounding terrain and obstacles, shown as colored overlays on the map. It is for general situational awareness purposes and is not intended to be the sole means of terrain or obstacle avoidance. Terrain awareness is often abbreviated as "TA", but that is avoided in this document to prevent confusion with the same acronym being used for "Traffic Alert". Terrain Awareness is based on GPS altitude, not baro-corrected or radar altitude, and will not generate a CAS message. Terrain Awareness coloring can be triggered by terrain within a 10NM radius of the aircraft and is displayed as follows:

Depiction	Displayed As
Terrain between 100 and 1000 feet below aircraft altitude	Hatched yellow
Terrain less than 100 feet below aircraft altitude, including terrain above aircraft altitude	Hatched red

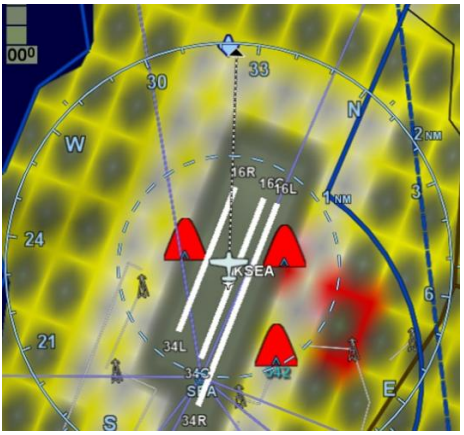
Figure 6-36 Terrain Awareness

When the aircraft is more than 3000 feet above any surrounding terrain, Terrain Awareness is turned off automatically. Terrain Awareness can also be triggered by obstacles as follows:

Depiction	Displayed As
Obstacles between 1000 and 2000 feet below aircraft altitude	Cyan threat bubble over the obstacle
Obstacles between 100 and 1000 feet below aircraft altitude	Yellow threat bubble over the obstacle
Obstacles less than 100 feet below aircraft altitude, including above aircraft altitude	Red threat bubble over the obstacle

Terrain Awareness coloring is inhibited in an area immediately surrounding airports to allow for enhanced visual distinction of those facilities. If the orientation of runways at the airport can be determined, then the inhibited area will be based on the outlines of the runways. Otherwise, coloring will be inhibited in a circular area around the airport, including waypoints that have been designated as an airfield.

Figure 6-37 Terrain Awareness Inhibited Area



Terrain Awareness coloring can be turned off via the Setup Page, but that setting will not affect Terrain Awareness for obstacles, which cannot be turned off.

7 Arrivals/Approaches/Landing

Avidyne recommends the pilot enter the arrival and approach for the destination airfield, and alternates into the flight plan. Selecting a published arrival and/or approach will automatically load the procedure including all altitude constraints into the FMS.

Take advantage of the system to stay ahead of the airplane by using the Baro knob to set system altimeter setting, using the wind vector for arrival planning, and the electronic checklists and various map views.

Enroute Descents

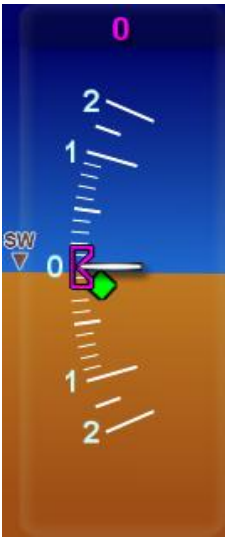
A top of descent marker (TOD) is drawn on the map, giving a clear visual cue when it is appropriate to begin the enroute descent. It is based on the vertical constraint associated with a down path waypoint.

Figure 7-1 Top of Descent Marker

Once the descent has begun, the Vertical Speed Required (VSR) cue on the Vertical Speed Indicator (VSI) can be used.

When a vertical constraint has been added to the flight plan for the next leg, a green VSR cue is drawn on the VSI. By matching the actual VSI with the VSR, the aircraft will meet the entered vertical constraint.

Figure 7-2 Vertical Speed Required
(green diamond)



COOL FEATURE

Enter Approaches for Multiple "Destinations" The FMS will allow multiple airfields or destinations to be built into the flight plan. Each can have the published approach and missed approach as part of the plan. This is useful in pre-building the primary destination with a missed approach, expected alternate and its published approach. Similarly, a training flight with multiple intended approaches and locations can all be created in a single flight plan, before takeoff.

Entering an Arrival and Approach

From the "FPL" tab where the flight plan is capable of being edited, select the "Arr" section to browse the arrivals or the "App" to browse the approaches for the desired waypoint. Once selected, a dropdown list of possible selections appears. Enter an arrival or an approach as needed, specifying the transition if required. As soon as one is selected, the arrival or approach field displays the name of the selected procedure, and new legs are automatically added to the flight plan. A labeled white vertical line then brackets the procedure in the flight plan as another visual cue that the procedure is part of the flight plan. When the active leg is part of the procedure, the bracket will be magenta.

NOTE

If a runway is entered before an arrival is entered and the runway does not belong to the arrival, the arrival is not accepted in the flight plan.

Figure 7-3 Adding an Arrival

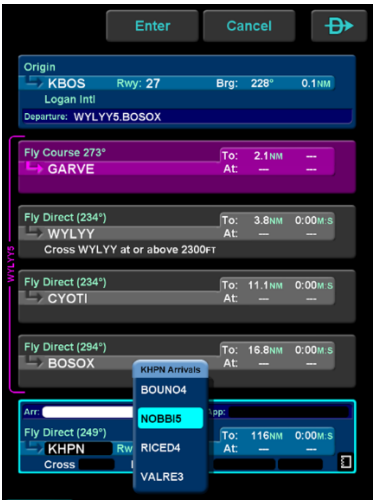
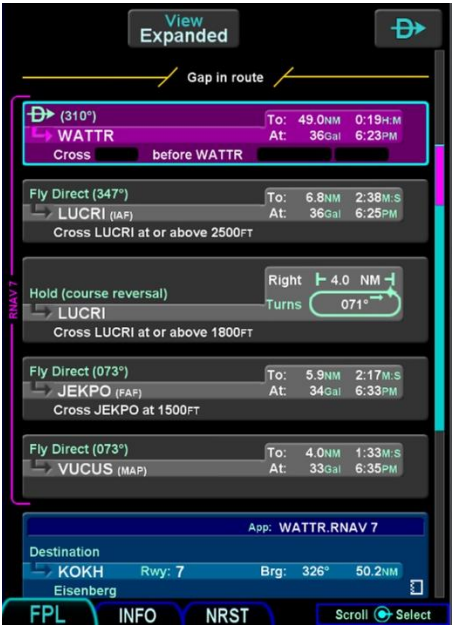


Figure 7-4 Approaches Dropdown Box

Figure 7-5 Flight Plan Brackets



The Map-FPL split tab on the MFD presents the moving map on the left and the FMS flight plan on the right. This can be most useful to correlate the flight plan with the graphical depiction on the map. This aids in error reduction and helps visually see options for diversions, airspace management, etc.

Use of Approach Charts

The system is typically loaded with IFR Approach charts (not Enroute charts) that can be accessed via hot link from the FPL (below) or via the "CHART" tab on the MAP page.

COOL FEATURE

Hot Links to Charts in Flight Plan

Whenever an airfield flight plan leg has at least one published approach associated with it, a chart icon is presented on the right edge of the leg. Use the touchscreen or the right-hand knob on the MFD to select the chart icon. Press the knob to display the chart applicable to the selected procedure (if applicable) or the directory of procedures for the airfield.

Figure 7-6 Hot Links to Charts

A green chart extent box is drawn on the map and represents the geographic boundaries of an instrument approach plate associated with a FMS destination. When the ownship symbol crosses the boundary of the chart extent box, this is a good time to switch over to the CHART tab on the MAP page.

Figure 7-7 Chart Extent Box

Figure 7-8 CHART Tab

If an approach has already been defined in the flight plan, the "CHART" tab will present the selected approach for the designated airfield.

If an approach has not yet been defined in the flight plan, the "CHART" tab will present a Charts Selection page on which a list of available charts is presented in list format. Use either the touchscreen or the right knob to select the desired chart from the presented list and push the knob in to select and display the chart.

Once a chart is displayed, the left-hand LSKs provide means to alter the view or presentation of the chart. For example, one of five chart views can be selected (Plan, Header, Profile, Minimums, All). The chart can be zoomed in/out as desired by using the right-hand knob on the MFD or via the touchscreen. Panning is available by using the touchscreen.

An own ship symbol is automatically displayed in a properly geo-referenced location on the chart, as well as an overlay of the current flight plan.

Flying an Autopilot-coupled Approach

Ensure the approach has been entered into the FMS flight plan, that it is currently active, and the correct local baro setting has been entered into the Vantage and standby altimeter. If the autopilot had been engaged in NAV mode and one of the vertical modes (Alt Hold, Alt Capture, VS Hold, IAS Hold) prior to starting the published approach, the inbound course will be automatically set, including on localizer or ILS approaches where the course pointer is just for reference. In every case, the CDI deflection will be driven by the localizer signal itself, regardless of the course setting.

The HDI and VDI will automatically display on the ADI when the appropriate localizer and glideslope signals are received but can optionally be turned on full-time from the SETUP tab of the SYS page.

Automatic mode switching (Primary Nav source and autopilot) will occur if the primary nav frequency can be auto identified. If auto-tuning has not been enabled on the setup pages, or a station cannot be identified, manual mode switching will be prompted via CAS.

NOTE

If used on visual approaches with close-in turns, autopilot may not provide desired precision.

Precision Approaches

On ILS/LOC approaches with a Vectors-to-Final transition, the FMS will automatically toggle the autopilot from HDG to NAV on intercepting the localizer. APPR mode will automatically activate after the intercept and the Primary Nav LSK will automatically change from GPS to Nav to track the localizer and glide slope. Conversely, it will toggle the Primary Nav LSK from Nav back to GPS when going missed at the Missed Approach Point.

Precision SBAS approaches are flown in NAV mode on the autopilot using GPS as the Primary Nav LSK selection and no switching is required.

Non-Precision Approaches

As with the case in precision approaches, if the published approach is entered into the FMS as part of the active flight plan, the inbound course and all switching between FMS and NAV is done automatically. Non-precision approaches can make good use of the VS features of the Vantage system. Set the VS Bug at the desired descent rate (the VSR can provide an accurate cue) and consider using the autopilot to generate a controlled descent to the published approach minimum descent altitude (MDA). Use VS (engaged) ALT (armed) on descents to automatically level off at the selected altitude. The Altitude Bug can be set to a desired intermediate level-off altitude or the MDA as a visual reminder.

Back Course Approaches

This system is designed to fully support flying localizer back course approaches. To perform a back course approach, ensure the Primary Nav LSK has selected "Nav1" or "Nav2" and the front course value is set via the Course Set knob (left hand knob, after switching functions with knob control). Alternatively, if the published back course approach is entered into the FMS, all the above is done automatically.

As soon as the system determines that it is established on the localizer back course, the HDI source label indicates "LOC BCRS" and both the HDI and CDI display correct sensing. For autopilot-coupled approaches, ensure the NAV button is pressed on.

SBAS Approaches

LPV (RNAV) approaches are the preferred approach for the combined Vantage-DFC90 system, if available.

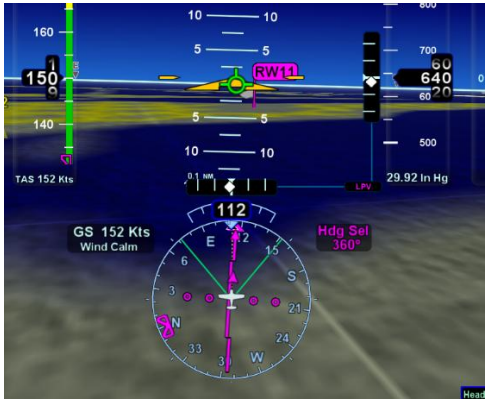
When GPS has been selected as the source in the "Primary Nav" LSK, and one of the RNAV/GPS approach types with vertical guidance (LPV, L/VNAV, LP+V, LNAV+V) is selected in the FMS, the ADI will provide horizontal and vertical guidance by means of the CDI, HDI, and VDI.

SBAS approaches must be flown with the DFC90 system in NAV APPR mode and the "Primary Nav" LSK set to GPS. For a full approach, the autopilot will remain in NAV throughout the approach. For a vectors-to-final approach, the autopilot will be in HDG with NAV armed until the final approach course is captured,

and then it will switch automatically to NAV. For those SBAS approaches that have a vertical guidance component, once the aircraft is on final, GS mode will also engage.

There are several types of SBAS approaches. The FMS will automatically select the best available approach based on current GPS integrity and will indicate the selection as the HDI source. The pilot must monitor the HDI source throughout the approach and use charted minimums appropriate to the approach type. If an approach type is not indicated by the time the final approach fix (FAF) is reached and the HDI source is given as FMS, ***do not descend*** – the conditions required to fly the approach have not been met and the missed approach procedure must be executed.

Figure 7-9 LPV Approach



8 Diverts/Missed Approaches

Missed Approach

The simplest and safest way to properly fly a published missed approach is to ensure it is part of the active flight plan. There are two ways the missed approach could be activated – manually or by selecting Auto Enable Missed Approach on the SETUP tab.

Prior to going missed approach, apply go-around power, ensure the aircraft is trimmed for the power setting, establish a climb attitude, and use the autopilot to smoothly execute the assigned climb-out or published missed approach procedures.

To fly a coupled missed approach, execute an ATC assigned climb-out. A recommended technique for executing the assigned climb-out instructions is as follows:

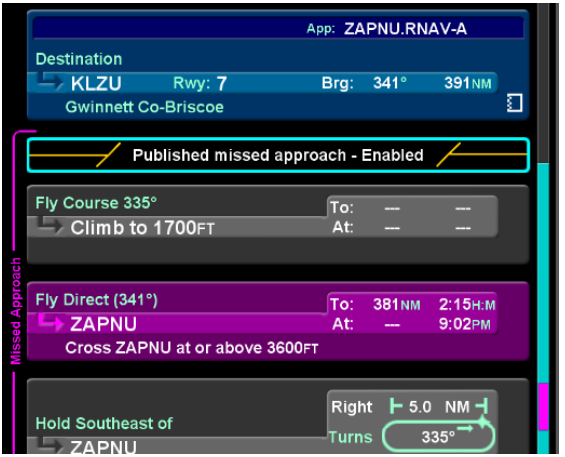
- Set the altitude bug to the assigned climb-out altitude.
- Set the VS bug to the desired climb speed or rate.
- Set the heading bug to the ATC assigned heading.
- At the missed approach point, add power as required.
- Press the "HDG" or "NAV" button on the autopilot control head, depending on missed approach instructions.
- Press the "VS" and "ALT" buttons on the autopilot control head to command an altitude capture at the desired VS.

Published Missed Approach

A recommended technique for executing the published missed approach procedures is as follows:

- Ensure the published missed approach is part of the active FMS flight plan.
- Select "Enable Published Missed" when sequencing FAF.
- At the missed approach point, add power as required.
- After the aircraft is cleaned up, go-around power applied, and climb-out attitude established, press the "Enable Missed" soft key on the FPL page if the missed approach was not enabled automatically. Note, the softkey will be labeled "Activate Missed" after the aircraft has passed the missed approach point.
- Press the "NAV" button on the autopilot control head after crossing the MAP.

Figure 8-1 Published missed approach



Retry Approach

If the pilot was flying non-published climb-out instructions on vectors, or did not have a published missed approach as part of the flight plan, press the HDG button on the DFC90 to activate HDG mode. Then, use the heading bug control to select the desired flight path.

9 Night Operations

There are several controls to assist in the selection of the proper and usable brightness level for night operations.

PFD and MFD Display Brightness

Each display individually controls its own display brightness using the manual rocker key on the top right edge of the bezel. The displays can never be dimmed to be completely off. The lowest dimmable setting via that rocker key may appear to be off during daylight conditions but is set for a proper low setting in a dark environment after the pilot's eyes have fully adapted to the dark.

PFD and MFD Bezel Brightness

The backlighting of the bezel LSKs, function buttons, and knobs are controlled via the cockpit dimming control for the aircraft. A typical configuration for this control is a cockpit-dimming rheostat located on the bolster or some other readily accessible cockpit location. This single rheostat controls the bezel backlighting of both Vantage 12 displays.

Charts Lighting Scheme

Some pilots prefer to always use the Charts pages in the daytime lighting scheme, and some prefer to always use the nighttime lighting scheme. To provide that flexibility, a separate Day/Night lighting setup has been provided on the "SETUP" tab of the Map page. Select Charts section and it will provide two possible mode selection to be made. "Day" will always provide a bright white background for readability. "Night" will always turn the bright white backlighting off.

Display of Terrain on Map

The display of terrain on the moving maps is not affected by the Day/Night lighting controls. For those pilots who prefer to remove the display of terrain from the map during night operations, use the "Land" part of the map declutter LSK to deselect terrain from being displayed.

10 System Alerts

Crew Alerting System (CAS)

Caution, warning, and advisory messages are shown on both PFD and MFD. Messages can be acknowledged by the pilot with a knob press (only applicable when on the alerts tab of the SYS page) or by touching the screen. A count of each type of active CAS message is maintained in the lower right corner of the display. To access the long text of the alert or review active alerts, visit the ALERTS tab of the SYS page.

There are three levels of message alerting:

- **Warnings** – Immediate action should be taken.
- **Cautions** – Immediate attention should be paid.
- **Advisories** – A change in system state that the pilot should be aware of.

CAS Message Prioritization

The displayed message is the highest priority, newest, un-acknowledged message. The message priority groups are listed in order below:

- FLTA Warning (highest); Red
- FLTA Caution; Yellow
- Traffic Advisory Caution; Yellow
- Engine Warnings (Red)
- Engine Cautions (Yellow)
- Loss of GPS Integrity in Approach Mode (Yellow)
- Other high-priority messages; Yellow
- Low-priority messages; Cyan

Messages are displayed first by priority and then by chronology, with only one message visible in the message bar at a time. If multiple messages of equal priority occur, the most recent message is displayed until it is acknowledged and removed or replaced by a higher-priority message, or a newer one of the same priority. When a message is acknowledged and removed from the message bar, the next highest priority message or most recent message of the same priority is displayed in the message bar. When no messages are active, the message bar is removed from the screen. If the status a message reports is still active, that message will be displayed in a message list on the Alerts tab of the SYS page. After all active messages have been acknowledged, the SYS page key will remain illuminated with the color of the message with the highest level.

Engine message colors conform to engine gauge markings; however, the messages are prioritized below Traffic messages due to the more immediate nature of those alerts.

Figure 10-1 Red warning CAS message

On the lower-right corner of the MFD, an active alerts section displays the currently active CAS messages. A numeric indication is provided on each of the colored message bars that indicates the number of active messages of each type. In the image below, there is 1 active warning, 1 active caution, and 3 active advisories.

Figure 10-2 Active alerts

Alerts are either "global" or "local" in nature. Global alert messages are displayed on all Avidyne displays in the system, whereas local alert messages are displayed only on the issuing device. A global message can be acknowledged on any display and that will cause the message to disappear on all displays. Because a local message is only displayed on one display, it must be acknowledged on the same display.

An optional timer can be set up to alert at a fixed period (e.g. Every 30 minutes) to switch fuel tanks. The alert comes in the form of a cyan advisory message.

A full listing of the system Warnings, Cautions, and Advisories is presented in the Airplane Flight Manual Supplement, 600-00746-000.

Alerts Tab

This tab can also be manually selected at any time via the page and tab structure along the bottom edge of the MFD.

Figure 10-3 Systems Alerts Tab

Miscompares

Every Avidyne Vantage 12 display installation provides dual AHRS for additional aircraft state awareness, providing a comparator function that cross-checks each AHRS with the other. If there is a difference in an AHRS parameter, the pilot will be informed and prompted to check the backup instruments. In a fully redundant installation, additional parameters also have miscompare monitoring:

- Airspeed
- Altitude

Figure 10-4 Altitude miscompare alert

In the event a miscompare is annunciated, Avidyne highly recommends diligence in crosschecking all on-board data sources.

NOTE

Miscompares will only be announced when the source selection (MFD's SYS Page, SYS Tab) is set to AUTO. Additionally, air data miscompare annunciation is not available when the aircraft is only equipped with a single ADC.

Real Time Clock Drift

The Vantage 12 system maintains an accurate time and date even when the system is powered off for long periods of time. Having accurate knowledge of the time and date is essential for the correct display of certain types of inputs. It is common for the flight display's clock to drift slightly over time, especially when the system has been powered down for an extended period. In order to compensate for this, the Vantage 12 uses the GPS data provided by the IFDs in order to adjust the system clock each time the flight display is powered on. If the Vantage 12 clock is found to have drifted significantly, it may be necessary to reboot the displays in order to make the proper clock adjustments. In these cases, the system will post an advisory instructing the pilot to cycle power to the display when convenient.

AHRS Monitoring

Each AHRS-equipped flight display comes equipped with a self-check monitor. These monitors detect conditions that do not warrant removal of data and are not of themselves indicative of a failure condition.

In Vantage 12, the AHRS system may lose GPS signal due to various factors, such as maneuvering. The AHRS is tested to ensure compliance with the performance standards specified in the TSO/MOPS for the "Degraded Mode" when GPS is unavailable. This performance category mandates that the system provides annunciation, which is fulfilled by the corresponding CAS message.

Figure 10-5 AHRS 1 Fault Condition

Figure 10-6 AHRS Degraded CAS message

While this message does not trigger failovers or a disconnect of the DFC system, pilots should crosscheck the active and backup instruments when this message is displayed.

11 System Failures

Power Distribution

Each Vantage display draws a total of 1.4 amps in nominal operation and up to 3.6 amps under peak conditions. This means a combined system of 2 Vantage displays draw a nominal load of 2.8 amps and a peak load of 7.2 amps. The system is designed to operate without degradation on a single power bus, including a single functioning alternator.

The PFD display is controlled by a pair of circuit breakers, and the MFD is controlled by a single circuit breaker. In most cases, the PFD will be connected to the aircraft's main power bus, whereas the MFD will be connected to the avionics bus. As noted earlier, there are no special reversionary modes or display formats during system failures, though the MFD has a PFD reversionary mode available at all times. In many cases, an electronic checklist exists that covers the various system failures.

Loss of Display

The simplest method of determining that a loss of one display has occurred is a loss of both the bezel backlighting and the display going black. The remaining display will also display some yellow caution messages such as loss of cross-side AHRS.

Loss of the MFD will not result in any behavioral differences on the PFD, only a loss of MFD-related functionality.

Figure 11-1 PFD failure condition

If PFD functionality is compromised, the Vantage 12 system is designed with a reversionary MFD mode that allows the MFD to take over the functional role and capabilities of the PFD. This occurs as the result of the pilot manually selecting the reversionary mode on the MFD using the button marked "PFD," pictured above as the left-most button on the bottom of the MFD bezel. Loss of PFD or MFD will have no effect on DFC90 autopilot operations or the ability to command the autopilot into any mode or target value.

Keep in mind that loss of a display will impact control and connectivity to any wired devices such as weather, lightning and traffic. Additionally, engines using an SIU interface connected to the MFD will lose engine data on the PFD if the MFD were to fail. Refer to the primary engine instruments.

Recommended Pilot Actions:

- No change in operations but be aware that some redundancy and functionality has been lost.
- If the PFD is operating in an anomalous way, press the PFD page key on the MFD.
- Consider cycling both circuit breakers of the affected Vantage display.
- In the event of an MFD failure, fly the airplane with no change to the remaining display and refer to the IFDs for moving map and all flight planning.
- If the PFD fails and the DFC90 does not establish communication with the MFD, indicated by the mode annunciation or CAS messages, disconnect the PFD breakers to allow the MFD to take control of the DFC90.

NOTE

If a display reboots in flight, the pilot should verify the Primary Nav field is still set to the appropriate source.

Loss of GPS/Navigation

The Primary NAV selection on the PFD controls the GPS/IFD Navigator used in both Vantage displays. If the PFD loses GPS, the MFD will also lose GPS, as the active GPS selection is applied system-wide.

Redundant paths for GPS data include legacy communication routes between the IFDs and high-speed communication routes between the Vantage displays. The four boxes are linked together in a circle with PFD to MFD, IFD to IFD, and each of the Vantage units connected to its respective onside IFD (PFD to IFD1 and MFD to IFD2).

If an IFD were to fail or if GPS lock were lost on the active navigator, the Synthetic Vision scene would be removed, the Map would lose position and FMS guidance would be lost. In this scenario, the pilot would manually select the secondary navigator using the Primary Nav selection.

Therefore, the only point of complete GPS loss to the Vantage system would be if both a Vantage display and its cross-side IFD were to fail simultaneously (e.g. PFD and IFD2 or MFD and IFD1), as all communication routes between the remaining Vantage Display and IFD would be severed.

Refer to the applicable IFD pilot guide for all other IFD failure scenarios.

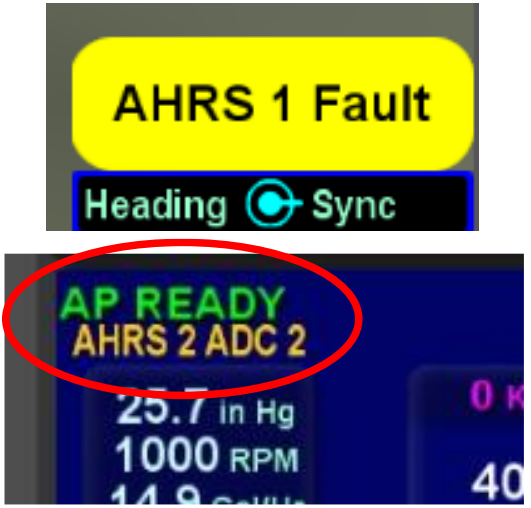
Loss of AHRS, Air Data OR ADC/AHRS (dual)

An ADC/AHRS source LSK is located in the SYS page, SYS tab. This LSK is provided in case the pilot wants to manually select an ADC/AHRS, but the default behavior is for the system to initialize both sources in "Auto" mode.

Under "Auto" operation in dual ADC and AHRS systems, each display shows its onside ADC/AHRS information. In the event of an onside ADC/AHRS failure, the system will fail over to cross-side sensors.

Loss of ADC/AHRS is indicated by an associated alert message and an annunciation on the upper left of the PFD page indicating use of a cross-side sensor.

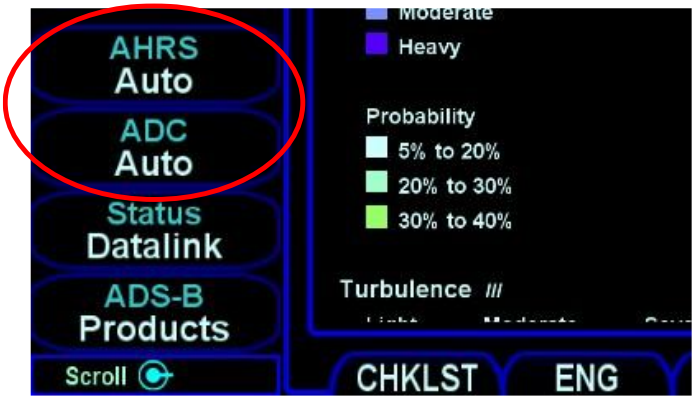
Figure 11-2 Sensor Fault Indications



If, at any time, the sensor source is different from desired, navigate to the "SYS" tab of the "SYS" page, press the "AHRS" and/or "ADC" LSKs to select the usable sensors for display on all displays (options are "Auto", "1", "2"). Whenever a display is using a cross-side sensor, an amber message will be presented in the top left corner of the display as seen in the image above.

The DFC90 autopilot will not disconnect if one of the AHRS or ADC sensors fail and the source selection is set to "Auto".

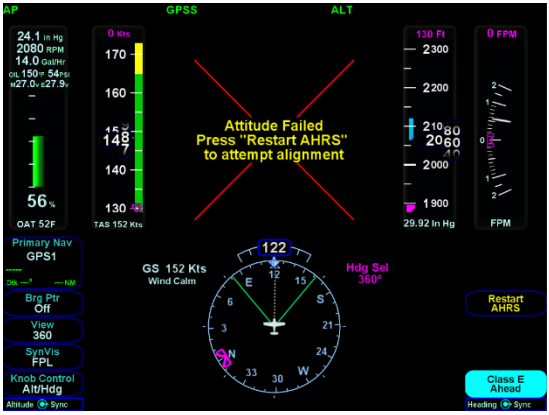
Figure 11-3 Cross-side AHRS/ADC Selection



Restart AHRS

If the AHRS experiences a significant malfunction, the "Restart AHRS" button on the Primary Flight Display (PFD) can be used to initiate a full realignment.

Figure 11-4 AHRS Restart



Loss of Engine Data

Loss of engine data can be indicated in several ways. A Caution message ("No Comm with Eng Snsr" or "Eng Snsr Fault") or advisory message ("No Comm Moritz DAU" or "No Comm Moritz SIU") will be displayed on each display for the pilot to acknowledge. The Engine tab of the SYS page and engine data blocks provide a clear indication that there is no usable data.

Loss of Autopilot

Loss of communication with the autopilot will be annunciated along the top strip of the PFD. Refer to the DFC90 Pilot Guide for autopilot failure remediation.

Figure 11-5 No communication with Autopilot

12 System Updates

Maintenance Mode

During normal operation, when power is applied to the Vantage Display it starts up in "flight mode". However, there is a separate built-in "maintenance mode" that is used for various reasons including changing the configuration of the display's interfaces, uploading databases, downloading logs, and performing software updates.

Typically, the only reason to get into maintenance mode is during initial installation and then periodically to update navigation, obstacle, and chart databases. A detailed explanation of the maintenance mode features that are used during installation is given in the installation manual. This section describes only the method for starting maintenance mode and the method to return to flight mode.

Starting Maintenance Mode at power-up

If the display is powered off, maintenance mode can be started by inserting a USB-C drive into the port located on the bezel of the display. Once the drive has been inserted, apply power to the display and the unit will power up into maintenance mode. If the drive is empty, the "Logs" tab will be selected. Otherwise, the "Update" tab will be selected.

Starting Maintenance Mode from Flight Mode

If the display is already powered up in flight mode ***and* the system can determine that the aircraft is on the ground**, maintenance mode can be started.

On a PFD, press and hold the first and third LSKs (counting from the top) for 3 seconds. When presented with the Software Status screen, use the Manage Logs/Databases LSK to reboot into Maintenance Mode.

On an MFD, navigate to the SYS page, SYS tab. Use the Manage Logs/Databases LSK to reboot into Maintenance Mode.

Exiting Maintenance Mode

To return to flight mode from maintenance mode, select either the Update tab or Logs tab by touching the tab or by pressing the left side of the SYS button until that tab is selected. At that point, a "Done" LSK will be presented on the left side of the display. When the Done button is pressed, either by touchscreen or by the LSK, the display will show a countdown. Pressing CLR or Cancel will cause the system to remain in maintenance mode. Once the countdown expires, the display will reboot back into flight mode.

Database Updates

Periodic updates to nav, chart, obstacle, and terrain databases are all made through the USB-C port on the front of each display. Updates must be performed in accordance with 14 CFR Part 43, Appendix A. Note that data updates require the use of Maintenance Mode, which is permitted only on the ground.

NOTE

Database Currency
It is important that the databases on the system are updated regularly and that the databases are verified to be current before conducting IFR flight operations.

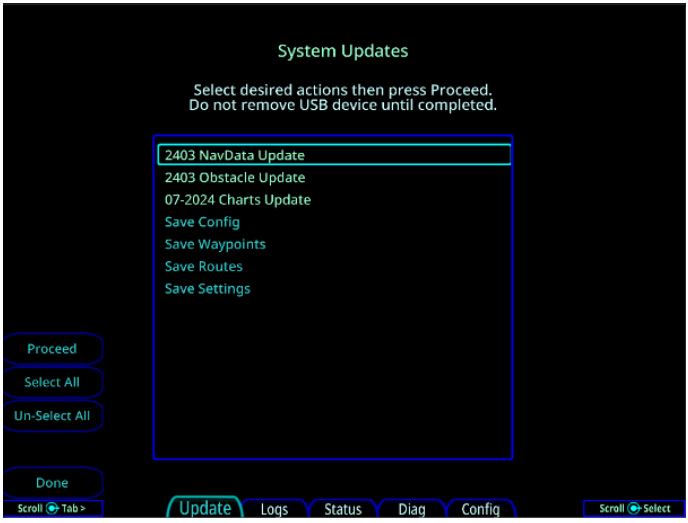
Database	Update Cycle	Comments (Source)
Chart Data	14 days	Not required for PFD. (Jeppesen)
VFR Charts	56 days	Not required for PFD. (Avidyne)
Nav Data	28 days	Airport, airway, navaid, airspace, and FMS data (Jeppesen)
Obstacle Data	56 days	Displayed on map and used for Terrain Awareness and FLTA functions (Jeppesen)

Database	Update Cycle	Comments (Source)
Terrain Data	As required	Displayed on map and used for Terrain Awareness and FLTA functions (Jeppesen). The display is shipped from the factory with this database already loaded and updates are anticipated to be a rare occurrence.

Use of one of the formatted drives supplied by Avidyne is recommended but alternative USB-C drives should be formatted FAT32. Avidyne recommends avoiding the use of adapters, preferring a native USB-C drive. Replacement drives can also be purchased directly from Avidyne.

To perform a data update, ensure the data to be updated is placed onto the USB drive. Insert the USB drive into the Vantage display's USB port, then enter Maintenance mode.

Figure 12-1 Update tab



Use the "Select All", "Un-select All" LSKs and the right knob or touchscreen as required to ensure check marks are placed beside

all the desired files to update, then press the "Proceed" LSK to begin the file upload.

CAUTION

Do Not Power Off the Display During Data Update

Cycling power to the display or removing the USB drive during a database update may result in a corruption of the memory device that stores the databases. If this happens, a service action may be required to restore data integrity. Use of a ground power unit is recommended.

Once the loading process is complete, the list will be shown with the load status of each item in the list. If an item was not selected, the status will be "Skipped". If an item was successfully loaded, the status will be "OK". If an error occurred, the status will be "ERROR". If all items loaded successfully, a message to that effect will the shown above the list. If not, an error message will be displayed above the list.

If the load was not successful, either try again using the error message as a guide or contact Avidyne technical support.

When all loading operations have been completed, press the "Done" LSK to restart the display in flight mode. Remove the USB drive after seeing the display go black. It is highly recommended to verify the data was updated from the "SYS" tab of the "SYS" page.

NOTE

Report Observed Discrepancies

Avidyne requests that any observed database discrepancies get reported. These discrepancies may be in the form of an incorrect procedure, incorrectly identified terrain, obstacles, navigation fixes, or any other displayed item used for navigation or communication in the air or on the ground. Use the Service Hotline defined on the inside back cover.

NOTE

Database Accuracy and Completeness

Avidyne accurately processes and validates the database data but cannot guarantee the accuracy and completeness of the data provided by various state sources and their suppliers.

NOTE

Consistent Nav Database Required for Sharing

If all databases are not the same version, the sharing of flight plans between devices in the system will be inhibited.

Document Updates

The documents presented on the SYS>DOCS tab can be updated in the same manner as databases. Simply obtain the latest document loader from the Avidyne website and apply the update. It's recommended to do this at the same time as VFR charts to stay up to date.

Software Updates

With very few exceptions, all software inside the displays is capable of being updated via the USB port as well. This means the display does not need to be returned to the factory for any future software updates.

User Data Backup/Restoration Procedure

Use the following procedure to store and reload user settings, waypoints, and routes. The original user data must be generated on a Vantage 12 display and backed up using this procedure. Then, they can be reloaded onto any Vantage 12 display via this procedure.

Saving User Data

Insert a USB-C drive in the port on the bezel.

Start the display in maintenance mode. From the Update tab, ensure the desired "Save <data type>" option(s) has a checkmark and then press the "Proceed" LSK.

TIPS AND TECHNIQUES

Additional Means of Recording Configurations
Avidyne highly recommends recording user preferences and configuration settings (including Maintenance Mode "Config" pages) in an alternate form (e.g. Smart phone photographs of the page settings) as an additional precaution.

When the download is complete (should take a matter of seconds), store the fob and/or the files on the fob somewhere secure.

Reloading previously stored User Data

Ensure the drive containing the previously stored user data is installed in the display.

Start the display in maintenance mode.

From the Update tab, ensure the dated file(s) of interest ("Restore <data type> YY.MM.DD-##") has a checkmark and then press the "Proceed" LSK option.

When the upload is complete (should take a matter of seconds), exit Maintenance Mode via pressing the "Done" LSK and then select the appropriate page to verify the restored data is present.

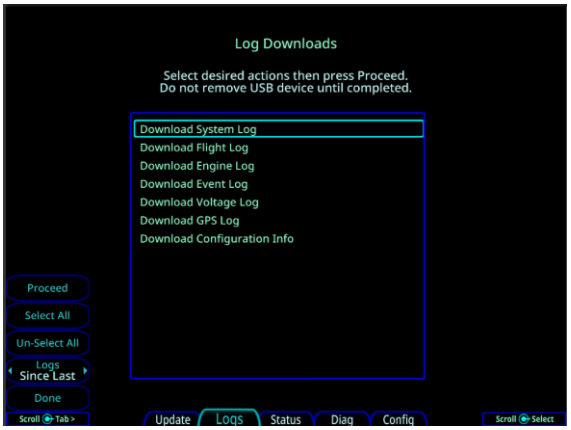
System Logs Download

Extensive data logging is performed automatically on all Vantage Displays. These data logs can be accessed post-flight and used for a number of purposes.

NOTE

The contents of the data logs remain the property of Avidyne, however, the pilot is free to download and use the data for their own training and safety improvement purposes.

Figure 12-2 Download logs



- **System Log** – This log provides an in-depth record of the navigation state. From this log, all aspects of the FMS output and autopilot state can be re-created.

- **Flight Log** – This log provides a detailed record of the aircraft state as measured by the on-board ADAHRS system.

- **Engine Log** – This log provides details on the engine and aircraft electrical state. Logging frequency is 1Hz.

- **Event Log** – This log provides details on the behavior of and errors within the display itself. It is designed to be a diagnostics log for Avidyne Service Center technicians and not expected to be used by owners/operators.

- **Voltage Log** – This log contains internal diagnostic data such as the voltages and currents on sub-system boards, temperatures and internal fan status.

- **GPS Log** – This log contains extensive internal state data for the GPS.

- **Configuration Log** – This set of .txt files contains various system settings, states, and calibrations at power down.

To download the logs, enter maintenance mode according to the directions above. Navigate to the Logs tab and select the desired logs using the lower right knob or touchscreen. Selected logs will have a check mark beside them. Once the appropriate files are selected, press Proceed. Typical download time for each log file is less than 1 minute.

To provide an indication of download progress, a progress bar will be presented with both a symbolic aircraft indicating download in progress and a % complete estimate. The files to be downloaded can have one of three states – "Completed OK", "In progress…" and "Pending".

Press the "Done" LSK after completing all downloads to reboot into flight mode.

When downloaded to the USB drive, the data logs will be saved in .csv files. This can be imported into newer versions of Microsoft

Excel into a table format. The data can then be plotted or analyzed by several 3rd party tools.

Data included in the files are as follows:

System Log Data

Date/Time stamp	Vertical Speed bug setting
Power On	Display mode
OAT	Nav mode
Autopilot mode	GPSS state
Localizer deviation	OBS value
Glideslope deviation	Desired track
Ground speed	Nav frequency
Ground track	Course select value
Crosstrack deviation	Nav type
Vertical deviation	VOR course
Baro setting	GPS altitude
Altitude bug setting	Distance to active waypoint
Heading bug setting	FMS course

Flight Log Data

Date/Time stamp	Flight director status and commands
Power on	Turn rate
Accelerations	Pressure altitude
AHRS status	Indicated airspeed
Heading	True airspeed
Pitch	Vertical speed
Roll	Lat/Lon

Engine Log Data

Date/Time stamp	Fuel Remaining (gal)
Power on	Fuel Time Remaining (min)
RPM	Fuel Economy (nm/gal)
Manifold Pressure (In. Hg)	Alternator 1 Current (A)
Oil Temperature (°F)	Alternator 2 Current (A)
Oil Pressure	Battery 1 Current (A)
TIT (°F)	Battery 2 Current (A)
CHT 1-6 (°F)	Main Bus 1 Voltage (V)
EGT 1-6 (°F)	Main Bus 2 Voltage (V)
Percent Power	Bus 2 Voltage (V)
Fuel Flow (gal/hr.)	Discrete Inputs
Fuel Used (gal)	Discrete Outputs

Voltage Log

This log contains more than 50 voltages and temperatures of each individual component. It is designed to be a diagnostics log for Avidyne Service Center technicians.

Event Log

This log contains miscellaneous data such as all alerts, keystrokes, system status and error messages, etc. It is a diagnostics log for Avidyne Service Center technicians.

GPS Log

This log contains miscellaneous internal GPS state data. It is a diagnostics log for Avidyne Service Center technicians.

Configuration Log

This log contains details about how the system is configured. It is typically used for troubleshooting with Avidyne Tech Support.

13 Legal / Regulatory

FIS-B Weather

FIS-B information may be used for pilot planning decisions focused on updating the pilot's awareness of the dynamic flight environment; including avoiding areas of inclement weather that are beyond visual range and pilot near term decisions where poor visibility precludes visual acquisition of inclement weather. FIS-B weather and NAS status information may be used as follows:

(a) To promote pilot awareness of ownship location with respect to reported weather, including hazardous meteorological conditions; NAS status indicators to enhance pilot planning decisions; and pilot near-term decision-making.

(b) To cue the pilot to communicate with Air Traffic Control, Flight Service Station specialist, operator dispatch, or airline operations control center for general and mission critical meteorological information, NAS status conditions, or both.

FIS-B information, including weather information, NOTAMs, and TFR areas, are intended for the sole purpose of assisting in long- and near-term planning and decision making. The system lacks sufficient resolution and updating capability necessary for aerial maneuvering associated with immediate decisions.

In particular, in extreme scenarios, the oldest weather radar data on the display can be up to 15 to 20 minutes older than the display's age indication for that weather radar data. Therefore, do not attempt to use FIS-B weather information to maneuver the aircraft at minimum safe distances from hazardous weather. FIS-B information may be used to support preflight preparation required by regulation. However, depending on the intended operation, FIS-B may not provide all available aeronautical or meteorological information concerning the flight. Regulatory compliant preflight preparation may be accomplished using automated resources or by contacting Flight Service.

FIS-B uplink is an FAA approved source for METAR, TAF, Winds, PIREPs, NEXRAD, AIRMET, SIGMET, and TFR information

subject to the range limits for the broadcast of these products. FIS-B uplink is not an FAA approved source for NOTAMs.

Avidyne Product Terms Of Use

Your use of the Avidyne product is conditioned on all the terms and conditions provided with the product sale, including, but not limited to the following:

(1). The warranties provided by Avidyne Corporation for its aviation products are exclusive of and in substitution for any other remedy available under the law. I understand my remedy arising out of or related to use of Avidyne aviation products for the life of the product is limited to the repair or replacement of the product to be determined in Avidyne's sole discretion. I hereby agree to waive, release, disclaim and renounce any other warranties, obligations and liabilities, whether express or implied, including the warranties of merchantability and fitness for a particular purpose, as against Avidyne Corporation and its officers, directors, successors, assigns, insurance companies, agents, employees and affiliates (the released parties),

(2). I hereby release Avidyne Corporation and the other released parties from any and all liability, loss, injury, damage, costs, claims and/or causes of action, including but not limited to all claims for bodily injuries and property damage arising out of or related to the use of said aviation products and the use of the aircraft in which the product is installed, whether in strict liability or in tort, regardless of how such injury, damage or loss may arise and regardless of whether the injury, damage or loss is occasioned in whole or in part by the negligence, neglect or fault of any one or more of the released parties. Notwithstanding the above, this provision (2) shall not apply if the National Transportation Safety Board determines that a defect in Avidyne's aviation product was the probable cause of the accident or incident. All other provisions of this agreement will remain in full force and effect.

(3). Avidyne Corporation and the released parties will have no obligation or liability whatsoever, whether arising in contract (including warranty), tort (whether or not arising from the negligence of Avidyne), strict liability, or otherwise, for any incidental, consequential, general or special damages.

(4). If the National Transportation Safety Board determines that the pilot (the person operating the aircraft equipped with Avidyne aviation products, hereinafter "pilot") was the probable cause of

an accident or incident, and provided the accident or incident occurred while I had an ownership interest in the accident or incident aircraft equipped with the Avidyne aviation products, I will indemnify and hold harmless Avidyne Corporation and the released parties from and against all claims referred to in the preceding paragraphs, and pay the costs of defending such claims (including attorney's fees), regardless of whether the alleged injury, damage or loss is occasioned in whole or in part by the negligence, neglect or fault of any one or more of the released parties.

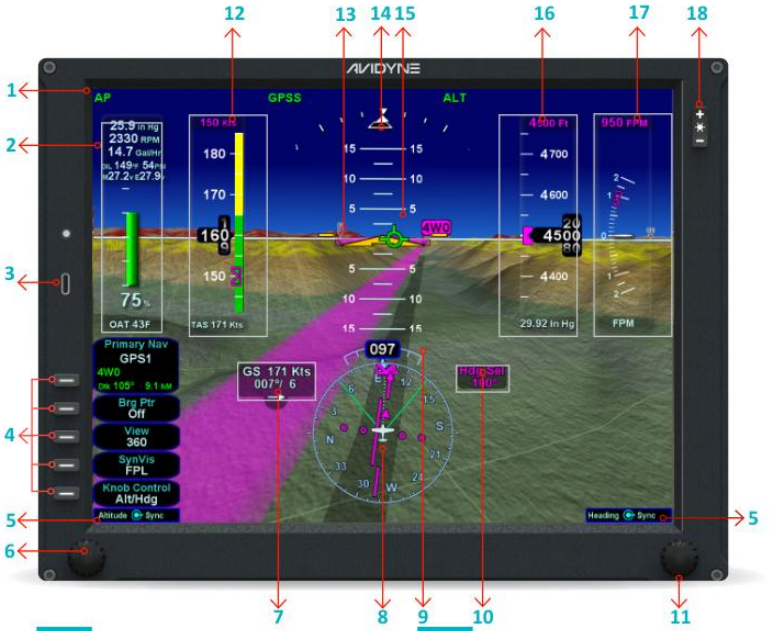
(5). The law of the state of Delaware shall govern the construction and enforcement of this agreement, as well as all aspects of the parties' relationships and any disputes that may arise between them. Any and all disputes or claims that I or my heirs and assigns may Assert against Avidyne Corporation shall be submitted to binding arbitration before the American Arbitration Association within the state of Delaware.

(6). The invalidity or unenforceability of any provision of this contract shall not affect the validity or enforceability of any other provision hereof. If any of the covenants or agreements in this contract are determined to be unenforceable, then the parties agree that all other terms are to remain in full force and effect.

(7). This agreement identified as Avidyne waiver, release and indemnification rev03-a supersedes and replaces prior versions of the agreement.

Appendix A PFD

Overview

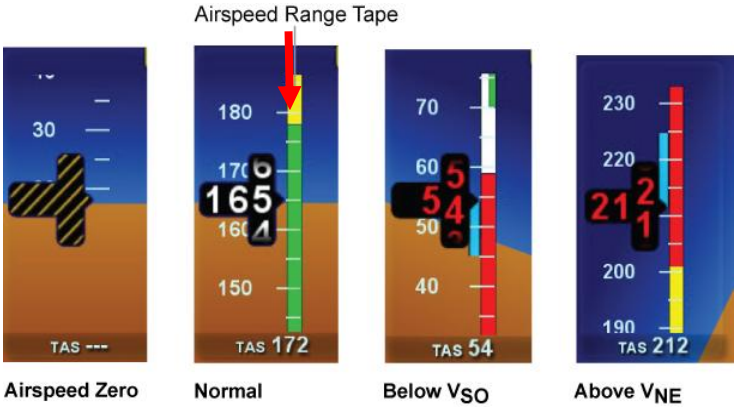


1	Autopilot Mode Annunciations	10	Selected Heading Readout
2	Engine Data	11	PFD Settings Right Knob
3	USB-C Port	12	Indicated Airspeed/ IAS Preselect Readout
4	PFD Line Select Keys (LSK1-5 top to bottom)	13	AP/FD Command Bars
5	Knob Function Labels	14	Roll Pointer/ Slip-Skid Indicator
6	PFD Settings Left Knob	15	Total Velocity Vector (TVV)
7	Wind Vector	16	Altimeter/ Alt Preselect Readout
8	Horizontal Situation Indicator	17	Vertical Speed/ VS Pre-select Readout
9	Rate of Turn Indicator	18	Display Brightness

Airspeed Indicator

The airspeed indicator provides Indicated Airspeed (IAS) as well as the True Airspeed (TAS).

Airspeed Color Bands

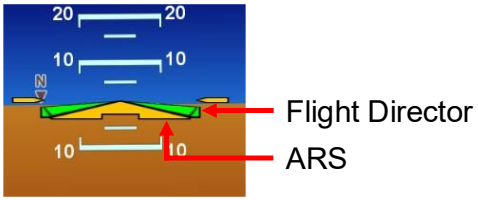


The color bands represent the airspeed ranges for the aircraft:

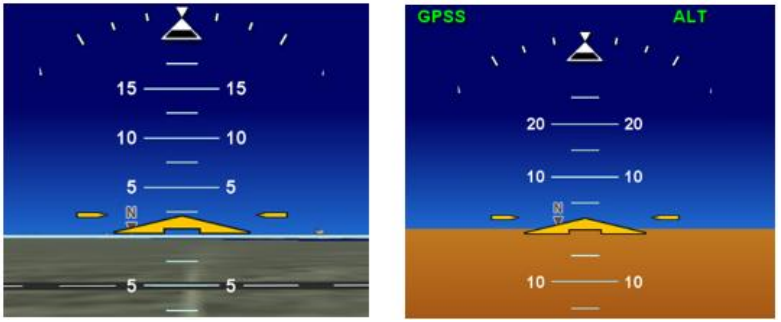
- **Green** – Normal range V_{S1} to V_{no}
- **Yellow** – Caution range V_{no} to V_{re}
- **White** – Flap range V_{S0} to V_{fe}
- **Red** – Structural failure range (above V_{ne}) or stall (below V_{S0}). Never exceed or fly in red range.

Attitude Indicator

The Aircraft Reference Symbol (ARS) is a yellow delta-shaped object indicates the aircraft and provides a reference from which aircraft's attitude can be determined.



Pitch Ladder Markings on SynVis (right) and SynVis off (left)



Attitude information is displayed over a virtual brown ground and blue sky, or a synthetic vision scene with a white horizon line.

The horizon line is part of the pitch scale. Pitch Ladder markings occur at 2.5˚ intervals if SynVis is turned on and at 5˚ intervals if SynVis is turned off.

The inverted white triangle symbolizes zero (reference point) on the roll scale. Minor tick marks indicating 10˚, 20˚, and 45˚, and major tick marks indicating 30˚ and 60˚ are shown to the left and right of the reference point.

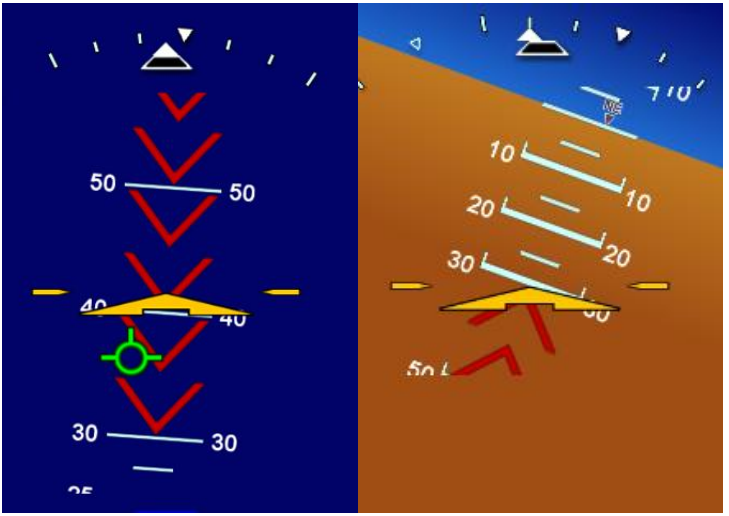
Unusual Attitude – Chevrons

The Excessive Pitch Chevrons display at pitch values:

- Nose Up attitude greater than 50 degrees
- Nose Down attitude greater than 30 degrees

Chevrons always point toward the horizon and indicate how to correct an unusual attitude.

Unusual Attitudes for SVS on the left and for non-SVS on the right



Skid/Slip Indicator

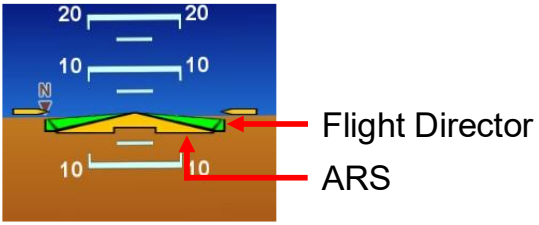
The Skid/Slip Indicator consists of a trapezoid that ideally is centered under the Roll Pointer in the Altitude Indicator. Besides leveling the wings and returning to level flight, the pilot would press the left rudder to coordinate the aircraft, "step on the trapezoid".

Skid/Slip Indicator

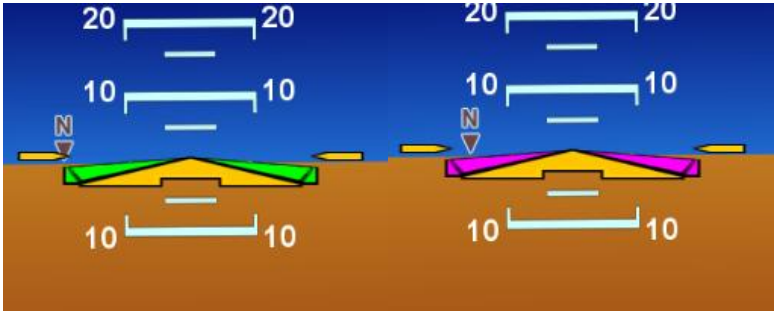
Flight Director

The Flight Director (FD) command bars, located immediately above the aircraft reference symbol (ARS) on the Altitude Indicator, are controlled by the autopilot. The FD is a command instrument that indicates the flight path being used by the autopilot.

Flight Director Command Bars



Flight Director Engaged (left) and AP engaged (right)



Flight Director Colors

- **Green** – FD is *NOT* coupled to the AP. Hand fly the aircraft as commanded by the flight director.

- **Magenta** – FD is coupled to the AP. The command bars of the flight director are magenta, indicating that the AP and FD are coupled. The autopilot flies the aircraft as directed by the flight director.

The autopilot couples to the command bars if the AP button is lit in green on the DFC90 Autopilot Control Panel (and displayed along the top edge of the PFD page).

Altimeter

The altimeter, on the right side of the PFD, includes the current altitude a window as well as the altitude pre-select value above the altitude tape, barometer setting below the tape, and altitude pre-select bug on the tape. The bug can be dragged via the touchscreen or adjusted using the knob.

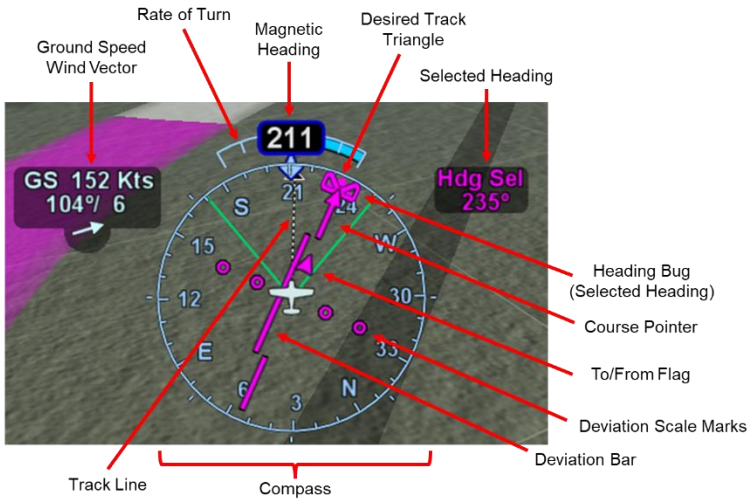
Vertical Speed Indicator

The vertical speed indicator, on the right side of the PFD, displays the instantaneous rate of change of altitude using a pointer on a fixed scale. A bug can be dragged via the touchscreen or adjusted using the knob on the connected DFC90. A green diamond may appear on the scale indicating a vertical speed required to achieve a particular altitude constraint on the flight plan.

Horizontal Situation Indicator (HSI)

The Horizontal Situation Indicator (HSI) displays either a 360-degree circle or 200-degree arc on the bottom half of the PFD pages.

Horizontal Situation Indicator



The HSI contains the following components:

- **Magnetic Heading Indicator** – A numeric indication of the current magnetic heading of the aircraft.

- **Rate of Turn Indicator** – Indicates current rate of turn.
  - A blue tape which indicates the current rate of turn
  - Rate of turn scale with the following markers:
    - Half-standard rate
    - Standard rate
  - The rate of turn tape becomes an arrow when the rate of turn exceeds 1 ½ times the standard rate.

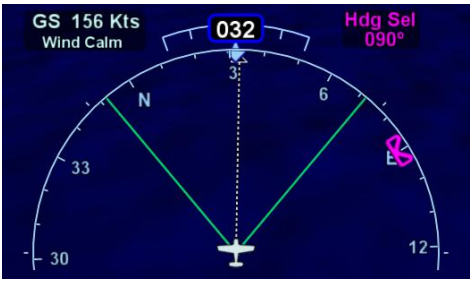
- **To-From Flag** – Indicates position relative to either the VOR radial or the current flight plan leg.

- **Compass Rose** – In both the 360-degree view and the 200-degree arc view, the graduation marks represent 10-degrees, with every 30-degrees labeled. The outer edge of the 360-degree compass rose contains reference marks every 45-degrees.

The HSI pointers are depicted using different colors:
- Primary Nav is **Green**.
- Bearing Ptr is **Light Blue**.

With the selection of the third LSK, the HSI view can be alternated into a 200º arc view in both the regular and SVS configurations.

HSI ARC view configuration



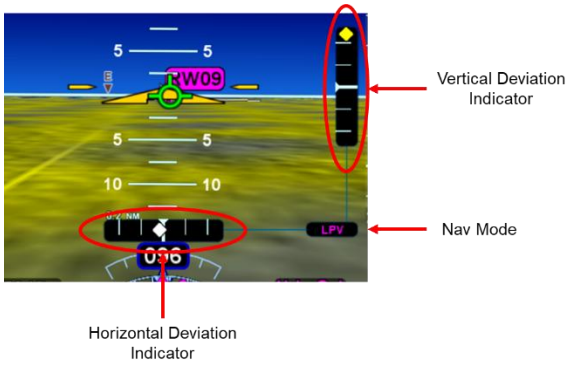
Horizontal Deviation Indicator (HDI)

The Horizontal Deviation Indicator (HDI) displays immediately above the HSI. The HDI indicates the course deviation and displays the deviation scale indicated in the HDI display (for example, 2.0 NM).

Vertical Deviation Indicator (VDI)

The Vertical Deviation Indicator (VDI) displays to the right of the pitch ladder. The VDI indicates the course deviation scaled to the current level of service. When VNAV is active, the VDI will show either VNAV or -V->, depending on the VNAV mode, as well as the deviation and scale value.

HDI and VDI



Course Capture Sequence

The HDI indicates the deviation from an FMS leg or VOR course, or the horizontal deviation on an ILS glidepath. The pointer moves along the HDI scale to indicate the deviation from the desired course. The deflection is depicted as follows:

- **Yellow** arrow – Deviation is greater than the Deviation Scale.
- **White** arrow – Deviation is indicated by the Deviation Scale.

Course Deviation Indicator (CDI)

The Course Deviation Indicator (CDI), which is part of the HSI, indicates the current course deviation. As an active FMS course or VOR radial or localizer is approached, the CDI comes into range so that the course can be intercepted. The CDI moves along the CDI scale to indicate the deviation from the desired course. The CDI reflects the HDI indications.

The deviation scale specifies the course deflection in degrees. The dots indicate half-scale and full-scale deflection in either direction. The actual deviation depends on the type of navigation being used; for example, VOR, NDB, ILS, or GPS (FMS). The CDI scale has the following VOR markers:

- 5-degree deviation marker
- 10-degree deviation marker

If not, VOR half and full-scale deflection applies. Also, the CDI color changes as follows to provide further deviation information:

- The CDI is green if the deflection is equal to or less than a full deflection.
- A yellow CDI indicates that the deflection is greater than full deflection.
- FMS Leg – The current leg of the flight plan is indicated as a magenta line.

The CDI non-color changes are as follows to provide further deviation information:

- For VOR navigation, the dots indicate 5- and 10-degree deflections.
- Heading Bug – In HDG (Heading) Mode or Vectors Mode the heading bug provides the flight path to the autopilot.

HDI Source

Indicates which primary navigation source (Nav1, Nav2) is providing navigation data to the HDI.

PFD Controls and Indicators

All PFD pages contain the primary flight controls and indicators, described here.

Primary Nav

Primary Nav determines and indicates which source is driving the CDI within the HSI. The sources can be:

- **GPS 1** – a primary GPS source from the IFD #1
- **GPS 2** – a secondary GPS source from the IFD #2
- **Nav 1** – A VHF (VOR or ILS Localizer) radio facility whose frequency is tuned in to the Nav 1 radio's active channel.
- **Nav 2** – VHF (VOR or ILS Localizer) radio facility whose frequency is tuned in to the Nav 2 radio's active channel.

Primary Nav is synchronized (replicated) across all displays. This applies to Primary Nav source, mode, and course changes.

Bearing Pointer LSK

The **Bearing Ptr** (Pointer) LSK turns the bearing pointer **Off** or selects the bearing pointer source. The sources can be:

- **Off** – No bearing pointer displayed.
- **GPS 1** – The bearing to the GPS 1 waypoint is displayed.
- **GPS 2** – The bearing to the GPS 2 waypoint is displayed.
- **Nav 1** – The bearing to the Nav 1 VOR is displayed.
- **Nav 2** – The bearing to the Nav 2 VOR is displayed.

The bearing pointer color is light blue. There is not a bearing pointer for localizer or ILS sourced Nav 1 or NAV 2.

Because the bearing pointers are informational, the bearing pointers are not synchronized between the Vantage displays. Each display can have its bearing pointer set to any of the available choices.

SynVis LSK

The **Synthetic Vision** LSK, located on the PFD page, provides three different synthetic vision views – Off, On, or FPL. FPL options include the synthetic vision background along with the selected flight plan shadow and magenta line.

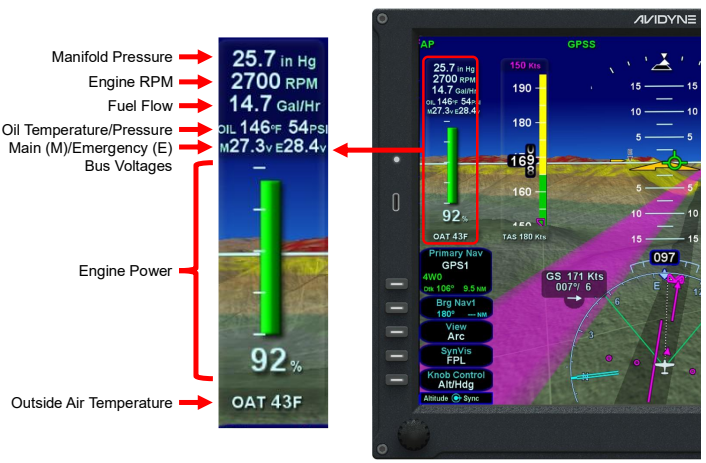
Supplemental Engine Data

There is constant engine monitoring going on "behind-the-scenes" in the system designed to alert the pilot to engine behavior requiring immediate attention. There is also a means to display some of the primary engine parameters full time on the PFD.

The engine parameters displayed are:

- Manifold Absolute Pressure (MAP)
- Engine Tachometer
- Fuel flow
- Oil temperature
- Oil pressure
- Engine power
- Turbo Inlet Temperature (TIT)
- Outside Air Temperature (OAT)

Supplemental Engine Data on PFD



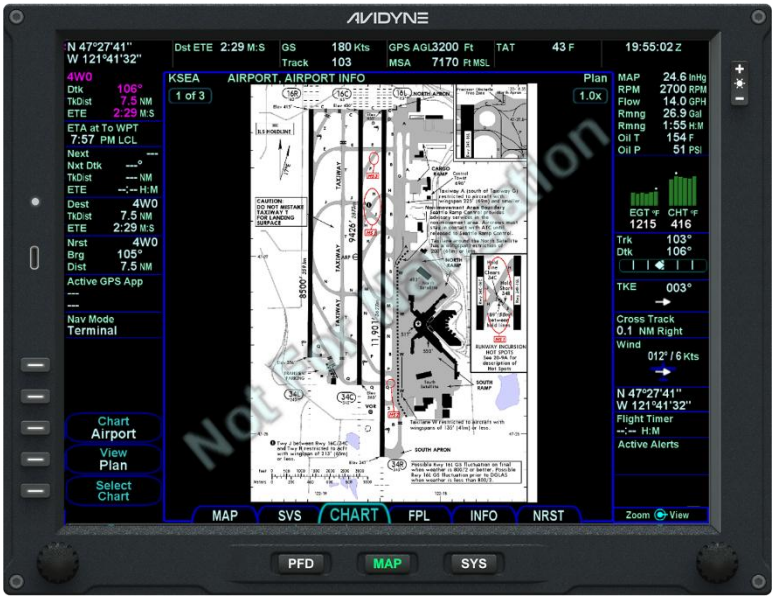
Appendix B MFD MAP Page Tabs

Tab	Description
MAP	The MAP tab contains a full-page map with the active flight plan overlaid. The MAP tab contains Land, Nav, and Wx Overlay LSKs to allow for adjusting the contents and overlay of the map. Use the touchscreen or the right knob to interact with the map. Datablocks are available on this tab.
SVS	The SVS tab displays a view of the aircraft and flight plan (optional) from a position above and behind the aircraft known as an "exocentric" view. FLTA coloring is also displayed on this page. SVS computes height above terrain via GPS inputs and is not a radio altimeter. Datablocks are available on this tab.
CHART	The CHART tab contains various types of charts, including airport, approach, arrival, and other charts. Datablocks are available on this tab.
FPL	The FPL tab enables the pilot to view and edit the flight plan. Add, edit, and delete waypoints within a current flight plan route by using the softkeys along the top. The FPL tab is split with the map occupying the left side of the screen.
INFO	The INFO tab displays airport information, including runway information, frequencies, and METAR data. The INFO tab is split with the map occupying the left side of the screen.
NRST	The Nearest page describes the nearest waypoints of a given type (Airports near present position, airports near destination, VORs, NDBs, Intersections, ARTCCs, FSSs, User Waypoints, and Airspaces).

MFD MAP Tab

MFD SVS Tab

MFD CHART Tab



MFD FPL Tab

MFD INFO Tab

MFD NRST Tab

Appendix C Symbols

Map Symbols

The table below includes the definition and description of map symbols.

Map Symbol	Item	Description
	Desired Track	Solid magenta triangle on inside edge of map compass rose
	Heading Pointer	Blue pointer on each side of the compass rose denotes the aircraft heading
	Heading Select ("Heading Bug")	A hollow magenta heading bug is displayed for reference on the inside edge of the map compass rose. The bug becomes solid when being used by the Autopilot.
	Projected Track Line	Dashed white line indicating actual track. Connects ownship symbol with compass rose.

Map Symbol	Item	Description
	Single Low Obstacle	200' AGL up to 1000' AGL (blue)
	Grouping of low obstacles	2 or more low obstacles (200' AGL up to 1000' AGL) within 1NM of each other (blue)
	Single high obstacle	1000' AGL or higher (blue)
	Grouping of high obstacles	2 or more high obstacles (1000' AGL or higher) within 1NM of each other (blue)
	Towered airport	If runway orientation is known, they are also depicted on the airfield symbol (blue with white runway)
	Non-towered airport	If runway orientation is known, they are also depicted on the airfield symbol (magenta)
	NDB	All NDBs in nav database (magenta diamond)
	VOR	All VORs in nav database (blue)

Map Symbol	Item	Description
	Intersection	All intersections in nav database (gray)
	Flight plan, course waypoints	Each waypoint in flight plan (white)
	Interstate highway	All interstate highways in the database (solid brown)
	Class A	Each boundary of Class A airspace (solid red line)
	Class B	Each boundary of Class B airspace (solid blue)
	Class C	Each boundary of Class C airspace (solid magenta)
	Class D	Each boundary of Class D airspace (dashed blue)
	Victor, Tango, or Jet Airways	All Victor, Tango, and Jet airways (solid blue gray)

Map Symbol	Item	Description
	Terrain scale	Indicates the highest and lowest limits of the terrain in displayed area in hundreds of feet. Legend colors in between these values represent terrain elevations. Blue obstacle clearance number shows the top of the highest obstacle, when greater than the highest displayed terrain.

Appendix D System Pages

SYS ENG Tab

NOTE
The exact fields displayed in the Electrical and temperature chart blocks may vary slightly from the image above for various different aircraft types. For example, turbo aircraft will include an additional TIT gauge.

Using Lean Assist

This feature is intended to aid in setting the optimum mixture for various operating conditions. When in Lean Assist mode, the system will automatically detect whether the goal is leaning for best power or best economy and provide visual indications to guide the pilot toward the correct mixture setting.

NOTE

It is very important that the mixture is adjusted slowly and continuously. Leaning the mixture too quickly can disrupt the system's ability to accurately track the peak EGT and could result in a mixture setting that can damage the engine. Always be sure to monitor Oil Temperature and CHT readings to ensure they stay within specified limits. If, at any time during the Lean Assist process, the engine begins to run roughly, richen the mixture slightly until the roughness abates.

To lean the engine for ***Best Power***, begin by pressing "Lean Assist" and smoothly lean the mixture control. The engine tab displays "Looking for Peak" in the Lean Assist Status box. When leaning for best power, the final mixture setting is based on the first cylinder to peak, indicated by a message. When this happens, begin to enrich the mixture. As the mixture is richened, the display first annunciates "Looking for #x to Peak (Rich)", then "Peak Detected (Rich)" as it determines the peak temperature. Finally, "Best Power" displays when the optimum best power mixture has been achieved. Exit the Lean Assist function by pressing "Lean Assist".

To lean the engine for ***Best Economy***, ensure the engine is below 75%, press "Lean Assist", and smoothly lean the mixture control. The same "Looking for Peak" message is displayed which will eventually change to "Looking for Last Peak" as the leaning continues. Continue slowly leaning after "Last Peak Detected" is displayed until "Best Economy" has been achieved. At that point, exit the Lean Assist function by pressing "Lean Assist".

Additional SYS Page Tabs

The SYS CHKLST tab includes a variety of essential checklists, such as those for before takeoff, in-flight procedures, and landing, as well as checklists for ground and in-flight emergencies, and system malfunctions. See Appendix E for more information.

SYS CHKLST Tab

The SYS ALERT tab provides a summary of any CAS messages (warnings, cautions, advisories) that are currently applicable. It also features the duration of each CAS message since it occurred. For a complete list of possible alerts, see the latest approved Airplane Flight Manual Supplement (600-00746-000).

SYS ALERT Tab

The SYS DOCS tab provides access to relevant documentation and features a comprehensive library function for easy reference and retrieval. See Section 12 for information on updating the documents in this tab.

SYS DOCS Tab

The SYS SYS tab includes detailed information about the software version, software part number/revision, unit serial number, and system ID. It also provides information on the relevant databases, including navigation, terrain, traffic, obstacles, charts, and VFR charts.

SYS SYS Tab

The SYS SETUP tab provides a range of user-configurable settings.

SYS SETUP Tab

Appendix E Checklists

Checklists can be displayed on the MFD as shown below.

Checklist Tab

Types of Checklists

Normal –Provides step-by-step information on performing normal tasks such as pre-flight inspection, taxi, take-off, cruise, descent, and Go-around. Normal checklist headers are white.

Emergency – Provides procedures for aircraft emergency situations and abnormal procedures. Emergency checklist headers are yellow.

Viewing Checklists

On the MFD, navigating to the SYS page and the CHKLST tab allows the user to scroll through the main checklist categories, arranged by phase of flight. The engine instruments and checklists can be viewed simultaneously using the datablocks.

Each category may contain a number of checklists for the aircraft. Using the touchscreen or the right knob, select a checklist to complete or un-complete the checklist steps.

CHKLST Tab

Using Checklists

To mark an item complete, press either knob or tap using the touchscreen. The item color changes to green and a checkmark is added. Press the knob again to toggle the item back to its original state. To reset an entire section of a checklist, scroll up to the directory and use the LSK labeled "Reset Checklist".

Checklist Directory

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The documents presented on the SYS>DOCS tab can be updated in the same manner as databases. Simply obtain the latest document loader from the Avidyne website and apply the update. It's recommended to do this at the same time as VFR charts to stay up to date.

T

U

V

W

Email Customer/product support issues can be emailed to pilotsupport@avidyne.com

Service Hotline A hotline has been established to service questions or issues regarding Avidyne products. The U.S. Toll Free number is 1-888-723-7592.

When emailing or calling for product-related help, please provide the following information available, if able:

- Customer Name/Account Information
- Email address (if calling)
- Aircraft tail number, Vantage 12 serial numbers and software versions
- A good description of the problem or question
- A copy of the system data logs