SkyView Classic
SkyView Touch

Pilot's User Guide

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These instruments are not intended for use in type certificated aircraft at this time. Dynon Avionics makes no claim as to the suitability of its products in connection with FAR 91.205.

Dynon Avionics' products incorporate a variety of precise, sensitive electronics. SkyView products do not contain any field/user-serviceable parts. Units found to have been taken apart may not be eligible for repair under warranty. Additionally, once a Dynon Avionics unit is opened up, it is not considered airworthy and must be serviced at the factory.

Dynon Avionics Returns and Warranty web page can be found at dynon.com/warranty.

Revision History

Revision	Revision Date	Description
A-Z	December 2009 – January 2018	See Appendix C: Revision History Archive
AA	April 2019	Changed: Clarified throttle position and ECO indications New: Rotax 912 temperature caution if idling New: Glideslope indication of VFR vertical guidance New: Tie Flight Plan Source to HSI Source setting Changed: Removed redundant copyright notice on front
AB	January 2020	Moved most of Revision History to Appendix C: Revision History Archive Added the SV-COM-X25 COM radio to Sections: 2, 3, and 11.
AC	January 2021	System Software version 15.4: Change: Yaw Damper section New: Alerts for Yaw Damper/Servo System Software version 16.0: Change: Color of Bearing 2 indications (Fig 32, 33) Change Maintenance Log section New: Flight ID section Change: ADS-B OUT Transmissions section Change: Features Overview (Map) section Change: Traffic Display on Map Page (Fig 106) Change: Traffic Targets (Fig 107) Change: Traffic Advisories (Fig 108, 109) Change: Proximity Advisories (Fig 110, 111) New: Ghost Traffic Targets section Change: Traffic Receiver Priority section Change: Weather Options Controls section Change: NEXRAD Precipitation Legend. (Tab 8) Change: Weather Data (Fig 167, 168, 169) Change ADS-B Receiver Status / Data Age section New: Lightning section New: PIREPS section Change: Top Bar Autopilot Status Area section
AD	November 2021	System Software Version 16.2: New: Info about Auto-Trim Control and SV-AP-TRIMAMP in Section 2. New: Info about twin-engine monitoring in Section 5. New: Info about disabling ADS-B OUT transmissions in Section 6. Change: Updated Databases and Charts content in Section 7. New: Info about traffic filtering in Section 7. New: Info about Wifi ChartData download in Section 7. Added info about Auto-Trim Control and SV-AP-TRIMAMP in Section 12.
AE	December 2021	Revised document for SV-HARNESS-D37 update to remove USB port.

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1. Introduction

Thank you for purchasing the Dynon Avionics SkyView system.

This chapter provides some important cautionary information and general usage instructions for this guide.

The printed version of this guide is in grayscale. Some figures and diagrams contain important color information. Reference the electronic version of this guide to view it in color.

Before You Fly

We strongly recommended that you read this entire guide before attempting to use SkyView in an actual flying situation. Additionally, we encourage you to spend time on the ground familiarizing yourself with the operation of the system. While first learning to use the system in the air, we recommend you have a backup pilot with you in the aircraft. Finally, we encourage you to keep this guide in the aircraft with you at all times. This document is designed to give you quick access to information that might be needed in flight. *In a flying situation, it is the pilot's responsibility to use the system and the guide prudently.*

Warning

Dynon Avionics' products incorporate a variety of precise, sensitive electronics. SkyView products do not contain any field/user-serviceable parts. Units found to have been taken apart may not be eligible for repair under warranty. Additionally, once a Dynon Avionics unit is opened up, it is not considered airworthy and must be serviced at the factory.

Video and In-person Training

This guide is intended to familiarize a new SkyView pilot with the basics of operating a SkyView system. No printed (or electronic) guide, such as this, can substitute for "seeing it in action," and thus Dynon Avionics provides an online collection of instructional videos; including a complete SkyView operations course - see dynon.com/videos. These videos help new owners quickly learn the basics so they can safely start flying with the system. Also, current SkyView owners can gain in-depth knowledge of many of the more advanced or complex features.

Dynon Avionics provides hands-on training classes to help you in your transition to new SkyView system. These are typically half-day courses, sitting in front of live SkyView displays combined with in-depth instruction on how to operate SkyView. Visit our training page at dynon.com/training for details on upcoming classes.

About this Guide

This guide helps you configure and get acquainted with SkyView Classic's many functions and facilitates quick access to vital information. If you have a SkyView SE, or SkyView HDX system, *this* is not the correct guide for those products – each has its own dedicated user's guide available at dynon.com/docs. For detailed technical and installation information, refer to the Installation Guide, also available at dynon.com/docs.

This guide is revised, at a minimum, several times per year, usually coinciding with the release of a new version of SkyView software, or the introduction of new SkyView-related products from Dynon Avionics or partner companies. This revision reflects the features available as part of the software version stated on the cover page. If your SkyView Classic system currently has an *earlier* software version, some features may not be available for use on your SkyView system (until you update its software).

Printing This Guide

To reduce waste and confusion resulting from outdated information in print, Dynon Avionics no longer provides this guide in printed form. The latest, most up-to-date, most complete version of this guide (and all Dynon Avionics documentation) is always available at dynon.com/docs. Rather than printing this guide on a home printer (typically, with relatively expensive inkjet printing) we recommend that you take the PDF file of this guide to be printed at a large office supply retailer that provides printing services. The statement on the cover of this guide: **Permission to print this manual is granted to third parties.** should be sufficient permission to do so.

It is also handy to have the electronic version on your tablet computer as reference, as you can perform keyword searches, and the electronic version includes figures and diagrams that contain important color information. We have found that the free "iBooks" application that can be installed on Apple iPad tablet computers can import this guide's PDF file for easy reference.

In the electronic (.PDF) version of this guide, page and section references in the Table of Contents and elsewhere act as hyperlinks, taking you to the relevant location in the guide. The latest electronic version (.PDF) of this guide may be downloaded from our website at dynon.com/docs.

This guide discusses the most common operation scenarios. If you have an operational issue that is not discussed in this guide, you can find additional operational information on Dynon Avionics' internet sites:

- forum.flydynon.com – Dynon Avionics' Online Customer Forum is a resource for Dynon Avionics customers to discuss installation and operational issues relating to Dynon Avionics products. The Forum is especially useful for pilots with uncommon aircraft or unusual installation issues. For customers that cannot call Dynon Technical Support during our normal business hours, the Forum is a convenient way to interact with Dynon Avionics Technical Support. The Forum allows online sharing of wiring diagrams, photos, and other types of electronic files.

Dynon Avionics Product Registration

Please take a moment to register your Dynon Avionics SkyView system at dynon.com/register. Registering your product with Dynon ensures that your contact information is up-to-date. This helps verify product ownership, can expedite warranty claims, and allows us to notify you in the event a service bulletin is published for your product. You can also optionally sign up to receive other Dynon news and product announcements. Dynon will not share your contact information with third parties or send you announcements without your explicit consent.

The following icons are used in this guide.

This icon denotes information that merits special attention.

This icon denotes a helpful tip.

2. System Overview

This chapter provides a general overview of the various parts of SkyView, as well as the theory of operation. The information in this chapter serves as a reference only and helps familiarize you with the inner workings of the units. It should not be used for diagnostic or reparative work.

Dynon Avionics provides periodic software updates that enable new functionality. Use the contact information mentioned earlier in this guide as resources for staying current on software availability for SkyView equipment. Reference the *SkyView Classic / SE / HDX System Installation Guide* for instructions on how to update software on SkyView equipment.

SV-D700, SV-D1000 and SV-D1000T

This guide refers to the SV-D700, SV-D1000, and SV-D1000T (SkyView Touch) as displays.

Functions

SkyView displays can act as a Primary Flight Display (PFD) with Synthetic Vision, an Engine Monitoring System (EMS), and a Moving Map in a variety of customizable screen layouts. Data is sourced from various connected modules and devices. Subsequent chapters in this guide address PFD, EMS, and Moving Map functions in more detail.

Power

SkyView displays require between 10 and 30 volts DC for operation. Approximate current consumption of a SkyView system at 12 and 24 volts DC is 3.5 amps and 1.8 amps, respectively. SkyView's robust power protection *allows it to be powered on during engine start*.

The current draw figures for the display provided do not include Autopilot servo, COM radio, SV-ADSB-470/472, or transponder power draw as they receive power directly from the aircraft and not from SkyView. Be sure to include these power requirements when considering your overall power budget.

Each SkyView display supports an optional external SV-BAT-320 Backup Battery. See SV-BAT-320 section for more information about backup battery behavior and operation.

SkyView Network

Modules such as the SV-ADAHRS-200/201 (flight instruments), SV-EMS-220/221 (engine instruments), SV-ARINC-429 (for communication with IFR GPS/NAV/COM devices), SV-COM-C25/X25/X83 (COM Radios), SV-KNOB-PANEL, SV-AP-PANEL and Autopilot servos use Dynon Avionics' redundant SkyView Network to communicate with SkyView's displays.

SkyView Network is designed to continue to work properly in the event of wiring or module faults by utilizing multiple power pathways and a redundant data network. In fact, SkyView has

the ability to annunciate wiring issues as they are discovered, often while preserving full system functionality until full troubleshooting can be performed on the ground. These alerts are presented in SkyView's alerting system, which is described in a later chapter of this guide.

Serial I/O

SkyView displays have five RS-232 serial ports for connection to compatible equipment. All serial ports are wired into the SkyView Display Harness (SV-HARNESS-D37). All serial ports have configurable baud rates and data formats for use as general purpose inputs and outputs.

USB

SkyView displays have two USB ports built into the back of the display. USB ports are used for software updates and backups, database updates, and configuration file uploads and downloads. Each SkyView display ships with a USB flash drive for use in these instances. The USB ports are also used for Procedure Chart, Airport Diagram and enroute chart database storage. This requires a USB flash drive to remain plugged into the unit during use. The SkyView Video Input and Wi-Fi Adapters also connect via USB. These devices must be plugged into the display before power on and remain plugged in for the full flight. Reference the *SkyView Classic / SE / HDX System Installation Guide* for instructions on how to use the USB ports for the operations mentioned above. Note that only one USB flash drive memory stick can be connected to a SkyView display at a time. However, the Video Input and Wi-Fi Adapters can be plugged in simultaneously and at the same time as a USB flash drive.

Display

The SV-D700 display is a 7-inch, 800 by 480 pixel, 1200+ nit TFT active matrix LCD screen. The SV-D1000 display is a 10.2-inch, 1024 by 600 pixel, 1350+ nit TFT active matrix LCD screen. The SV-D1000T display is a 10.2-inch, 1024 by 600 pixel, 1350+ nit TFT active matrix capacitive multi-touch LCD screen. SkyView displays utilize LED backlighting technology for increased lifespan, more uniform brightness, superior dimmability, and reduced power consumption.

Displays are capable of automatic screen backlight level management. Reference the *SkyView Classic / SE / HDX System Installation Guide* for instructions on how to enable this feature.

Joysticks and Buttons

User interaction takes place via the two joysticks and eight buttons along the bottom of the display's bezel.

Data Logging

SkyView displays with software version 5.1 or later have the ability to record and store flight information in two logs for export by the user. The User Data Log recording rate can be configured by the user in the SkyView Setup Menu. For more information on configuration, retrieval, and analysis see the *SkyView Classic / SE / HDX System Installation Guide*.

SV-ADAHRS-20X

This guide uses SV-ADAHRS-20X to refer to both the SV-ADAHRS-200 and the SV-ADAHRS-201. The SV-ADAHRS-200 and SV-ADAHRS-201 are identical in performance and are designed to work together as a redundant ADAHRS solution. An SV-ADAHRS-200 must be installed in your SkyView system in order to use an SV-ADAHRS-201.

The primary flight instruments on your SkyView PFD are generated using a group of calibrated sensors built into the SV-ADAHRS-20X ADAHRS module. All sensors are solid state–that is, there are no moving parts. These sensors include accelerometers, which measure forces in all three directions; rotational rate sensors, which sense rotation about all three axes; pressure transducers for measuring air data; and magnetometers on all three axes for measuring magnetic heading. These sensors form the core of Dynon Avionics' Air Data Attitude and Heading Reference System (ADAHRS). Additionally, in some installations the magnetic heading is provided by the SV-MAG-236 remote magnetometer. When it is installed, it deactivates and replaces the magnetic sensors in the ADAHRS.

Table 1 describes which inputs and sensors are used within the ADAHRS module to generate the different displayed instruments.

	GPS	Pitot	Static	AOA	Magnetometers	Rate Sensors	Accelerometers	OAT	External magnetometer
Ball							✓		
Altitude			✓						
Airspeed		✓	✓						
AOA		✓		✓					
Turn Rate		✓	✓			✓	✓		
Heading		✓	✓		✓**	✓	✓		✓
Attitude	✓*	✓	✓			✓	✓		
Density Altitude			✓					✓	
TAS		✓	✓					✓	
Winds	✓	✓	✓		✓**			✓	✓
Flight Path Marker	✓		✓		✓**	✓	✓		✓
Synthetic Vision	✓	✓	✓		✓**	✓	✓		✓
Ground Speed	✓								

Table 1 – Instruments and Sensors (*GPS only used when airspeed from pitot and static is not available) (ADAHRS Magnetometer deactivated when remote magnetomber installed)**

Attitude Calculation

The SkyView artificial horizon display (attitude) is generated via a complex algorithm using a multitude of sensors as described in Table 1. In normal operation SkyView uses airspeed to provide superior attitude accuracy. Should airspeed become unavailable due to inadvertent pitot icing, GPS ground speed will be used as an attitude aid. You will see a GPS ASSIST annunciation on the primary flight display when this is the case.

Compass Accuracy Effects on Synthetic Vision, Map Performance, and Autopilot

It is critical that the magnetic heading be as accurate as possible for optimal Synthetic Vision and Moving Map performance. The ADAHRS or Remote Magnetometer must be installed correctly, calibrated, and operating well *in all attitudes*. However, it is important to note that magnetic heading is not used to aid attitude determination under any circumstance.

SV-MAG-236

Due to the sensitivity of the SkyView ADAHRS to magnetic interference, some aircraft installations are better served by mounting the SV-ADAHRS-20X within the center of gravity box and also installing a remote magnetometer outside the box and well away from any dynamic magnetic interference. When installed, the SV-MAG-236 is the sole source of magnetic heading data to the SkyView System.

SV-EMS-22X

The engine gauges on your SkyView Engine Page are generated from the data acquired by the SV-EMS-22X Engine Monitoring module and its sensors. This module supports popular four and six-cylinder engine installations and can measure a variety of engine and environmental parameters such as RPM, manifold pressure, oil temperature and pressure, exhaust gas temperature (EGT), cylinder head temperature (CHT), fuel levels for multiple tanks, voltage, current, fuel pressure, fuel flow, carburetor air temperature, coolant pressure and temperature, flap and trim potentiometers, external contacts, and general purpose temperature sensors. Two SV-EMS-22X modules can be installed to monitor either extra CHT/EGTs for large engines or dual engines.

SV-GPS-250

The SV-GPS-250 GPS Receiver module is an optional externally mounted 5 Hz WAAS enabled GPS receiver designed specifically for use with SkyView. It supplies GPS data in NMEA format and automatically sets the time on SkyView.

The SV-GPS-250's WAAS capability does not allow it to be used as a primary navigation source in an IFR environment where a TSO'd WAAS GPS may be required. It does mean that it utilizes the WAAS GPS satellite to improve its positional accuracy compared to a non-WAAS enabled GPS.

SV-GPS-2020

The SV-GPS-2020 GPS Receiver module is an optional externally mounted 4 Hz WAAS enabled GPS receiver designed specifically for use with SkyView to meet the requirements of the FAA's 2020 ADS-B Out mandate. It supplies GPS data in NMEA format and automatically sets the time on SkyView.

The SV-GPS-2020's WAAS capability does not allow it to be used as a primary navigation source in an IFR environment where a TSO'd WAAS GPS may be required. It does mean that it utilizes the WAAS GPS satellite to improve its positional accuracy compared to a non-WAAS enabled GPS.

SV-BAT-320 Backup Battery

The SV-BAT-320 Backup Battery is an optional backup battery for use with SkyView. It can power a typical SkyView display and most of its connected modules for at least 60 minutes in the event of failure of the aircraft electrical system.

Navigation Mapping Software (SV-MAP-270)

SkyView has a robust navigation mapping option that is enabled by a one-time licensing of your SkyView system. Aviation and Obstacle data is available for free for US-based customers, and is available via Jeppesen and PocketFMS for other customer worldwide. Additionally, when this option is equipped, SkyView can display VFR and IFR enroute charts, procedure charts (plates), and airport diagrams through subscriptions from either Seattle Avionics or PocketFMS. See the SV-MAP-270 Navigation Mapping Software section of this guide for further details about SkyView's mapping capability. Prior to August, 2016, the SV-MAP-270 was an optional feature of SkyView. After August, 2016 the equivalent function of the SV-MAP-270 is included with each new SkyView display.

SV-XPNDR-26X

The SV-XPNDR-261 (Class 1) and SV-XPNDR-262 (Class 2) are TSO'd remote mounted Mode-S transponder modules that, in addition to their transponder capability, contain ADS-B Out capability via 1090 ES, and TIS traffic input capability (US Only).

SV-ADSB-470/472

The SV-ADSB-470 and SV-ADSB-472 receive traffic and weather information from the Automatic Dependent Surveillance – Broadcast (ADS-B) system. ADS-B data allows integrated traffic and NEXRAD weather data to be displayed on your SkyView display. The SV-ADSB-470 is a 978 MHz (UAT Band) receiver, while the SV-ADSB-472 is a dual band 978 MHz/1090 MHz receiver.

Currently the UAT Band is only used in the US.

SV-COM-X25

The SV-COM-X25 is an integrated VHF Com Radio for SkyView consisting of two modules, the SV-COM-PANEL, and the SV-COM-T25. The SV-COM-X25 has 25 kHz spacing and is able to tune frequencies by integrating with SkyView's aviation database. SkyView can support two SkyView COM radios. The SV-COM-X25 is available in both horizontal and vertical versions. The SV-COM-X25 replaced the SV-COM-C25 in late 2019.

SV-COM-X83

The SV-COM-X83 is an integrated VHF Com Radio for SkyView consisting of two modules, the SV-COM-PANEL, and the SV-COM-T8. The SV-COM-X83 has 8.33 kHz spacing and is able to tune frequencies by integrating with SkyView's aviation database. SkyView can support two SkyView COM radios. The SV-COM-X83 is available in both horizontal and vertical versions.

SV-COM-C25

The SV-COM-C25 is an integrated VHF Com Radio for SkyView consisting of two modules, the SV-COM-PANEL, and the SV-COM-425. The SV-COM-C25 has 25 kHz spacing and is able to tune frequencies by integrating with SkyView's aviation database. SkyView can support two SkyView COM radios. The SV-COM-C25 is available in both horizontal and vertical versions.

SV-INTERCOM-2S

A two-place stereo intercom that is designed to pair perfectly with your SkyView System and SkyView COM Radio. It has stereo inputs for SkyView, stereo music, and multiple other mono muting and non-muting inputs for all the technology in your cockpit.

SV-KNOB-PANEL

The SV-KNOB-PANEL is an optional panel-mounted module for SkyView. This control panel has three knobs dedicated to the most common SkyView bug functions. This module is particularly useful in systems with the SkyView autopilot installed. The SV-KNOB-PANEL is available in both horizontal and vertical versions.

Autopilot Servos

Dynon Avionics SV32, SV42, and SV52 servos enable the operation of SkyView's integrated autopilot system. Refer to the *SkyView Classic / SE / HDX System Installation Guide* for more information about Dynon Avionics autopilot servos. SkyView can only control Dynon Avionics servos.

SV-AP-PANEL

The SV-AP-PANEL is an optional panel-mounted module that affords dedicated controls for the SkyView AP's Expert Mode. The SV-AP-PANEL includes dedicated buttons for engaging the Flight Director; Autopilot; and all modes including setting up fully-coupled approaches; VNAV; IAS Hold; and mode sequencing (provided that the necessary IFR navigation sources are installed in the aircraft). It also has a LEVEL button to immediately return the aircraft to straight and level flight.

Auto-Trim

The SkyView Autopilot Control Panel can also function as a complete electric trim controller, replacing the conventional "relay deck". When trim motors are connected through the SV-AP-PANEL, it can also Autopilot Auto-Trim. Auto-Trim allows the autopilot to adjust the elevator trim system as required while the autopilot is engaged. This ensures that the airplane is always properly trimmed when the pilot disconnects the autopilot.

If your aircraft's trim motor(s) exceeds a current draw of 2 amps, then an SV-AP-TRIMAMP Trim Motor Adapter is required to operate the Auto-Trim feature.

Trim Motor Adapter SV-AP-TRIMAMP

The SV-AP-TRIMAMP allows the SkyView Autopilot system to interface with trim motors drawing up to a maximum of 5 amps.

To enhance safety, the SV-AP-TRIMAMP also monitors the elevator trim system for faults and provides crew alerts for conditions such as a runaway trim system, an inoperative trim system, or a system test failure during Skyview bootup. The SV-AP-TRIMAMP can provided these safety enhancements to any electric trim system that operates at 5 amps or less.

Video Input Adapter for SkyView

The Video Input Adapter for SkyView plugs into a SkyView USB port and allows you to display any S-Video or Composite video source on your SkyView Display in full screen or half screen modes. The SkyView Video Input Adapter plugs into the USB port, and must be plugged into the display before power on and remain plugged in for the full flight to view video on the connected display.

SkyView Wi-Fi Adapter

The optional SkyView Wi-Fi Adapter allows supported devices with supported apps to exchange data with SkyView. For example, you can compose a flight plan with a third-party app, and after you get to your plane, send it to SkyView over Wi-Fi.

Each display in the SkyView system needs to have a SkyView Wi-Fi Adapter inserted into one of its USB ports. A SkyView Wi-Fi Adapter needs to remain inserted in the display during system power startup and while operating.

To connect SkyView and third-party apps via Wi-Fi:

1. Set up the Wi-Fi network on SkyView; see the *SkyView Classic / SE / HDX System Installation Guide* for details.
2. From your device's Wi-Fi menu, select your SkyView system. The network name will contain your aircraft tail number. You will need the password you chose when you set up your SkyView Wi-Fi network.
3. Launch your third-party app to complete the connection to SkyView and use Wi-Fi-enabled features. Configuration, usage, and available features vary by device and app.

Wi-Fi Features

SkyView can interface with several third-party apps running on iOS, Android, and Windows devices to exchange flight information. See the app provider for specific model and version requirements.

The information SkyView and a third-party app can exchange varies. For more information on SkyView compatibility with third-party apps, go to dynon.com/docs. Flight Plans can be sent and/or received between SkyView and the following third-party apps. Not all apps support transfer in both directions.

- ForeFlight Mobile
- PocketFMS EasyVFR
- AvPlanEFB
- FltPlan Go
- Seattle Avionics FlyQ
- OzRunways
- iFLY GPS
- SkyDemon

Some third-party apps can receive and display additional information that SkyView sends via Wi-Fi. This includes:

- Flight instrumentation information from SkyView like speed, attitude, altitude.
- SkyView's high quality GPS position (useful for devices that do not have onboard GPS).
- SkyView's ADS-B traffic and weather.

See the third-party app's documentation for information about displaying information from SkyView in their apps.

Aviation databases and charts can also be downloaded over Wi-Fi from some third-party apps – such as Seattle Avionics FlyQ – directly to a USB drive inserted in SkyView display. This eliminates the manual procedure of removing the USB drive from Skyview and downloading updated files to it from a personal computer. More information about FlyQ Slingshot capability can be found in the *SkyView Classic / SE / HDX System Installation Guide*.

SkyView Wi-Fi can also be used to connect to the network stream (TCP or UDP) of system serial data. This allows technical users to log or otherwise receive and process SkyView's documented proprietary serial stream data in real time. the *SkyView Classic / SE / HDX System Installation Guide* for more information.

3. SV-D700, SV-D1000 and SV-D1000T Operation

After reading this chapter, you should be familiar with basic SkyView display operation. For details regarding specific procedures (e.g., adjusting the barometer), refer to the PFD, EMS, and Moving Map operation chapters.

The SkyView SV-D700 and SV-D1000 displays are identical in functionality and presentation. The only difference is in the size and resolution of the screen. SV-D1000T displays also include all the same functionality found in the other displays.

Screen Synchronization

If you have multiple SkyView displays in your aircraft, the system will synchronize important information between them. Actions such as setting baro, bugs, engaging the autopilot, or acknowledging warnings only need to be performed on one display (or control panel) to be reflected across the system.

Some settings such as screen layout and map range level are not synchronized on purpose. Sensor configuration file (.sfg) updates must also be done to each screen individually. Navigation and obstacle databases may or may not synchronize, depending on whether the displays are connected via Ethernet. Reference the System Installation Guide for more information on this topic.

If you are using two EMS modules to monitor dual engines, the engine page layouts and engine-specific timers like the Hobbs and Tach time, as well as engine alerts, are not synchronized between multiple displays. Additionally, fuel computer computations may or may not be combined between displays depending on system configuration. See the System Installation Guide for additional details on this topic.

Display Bezel Layout

Figure 1 illustrates the front of an SV-D1000 display and its important parts.

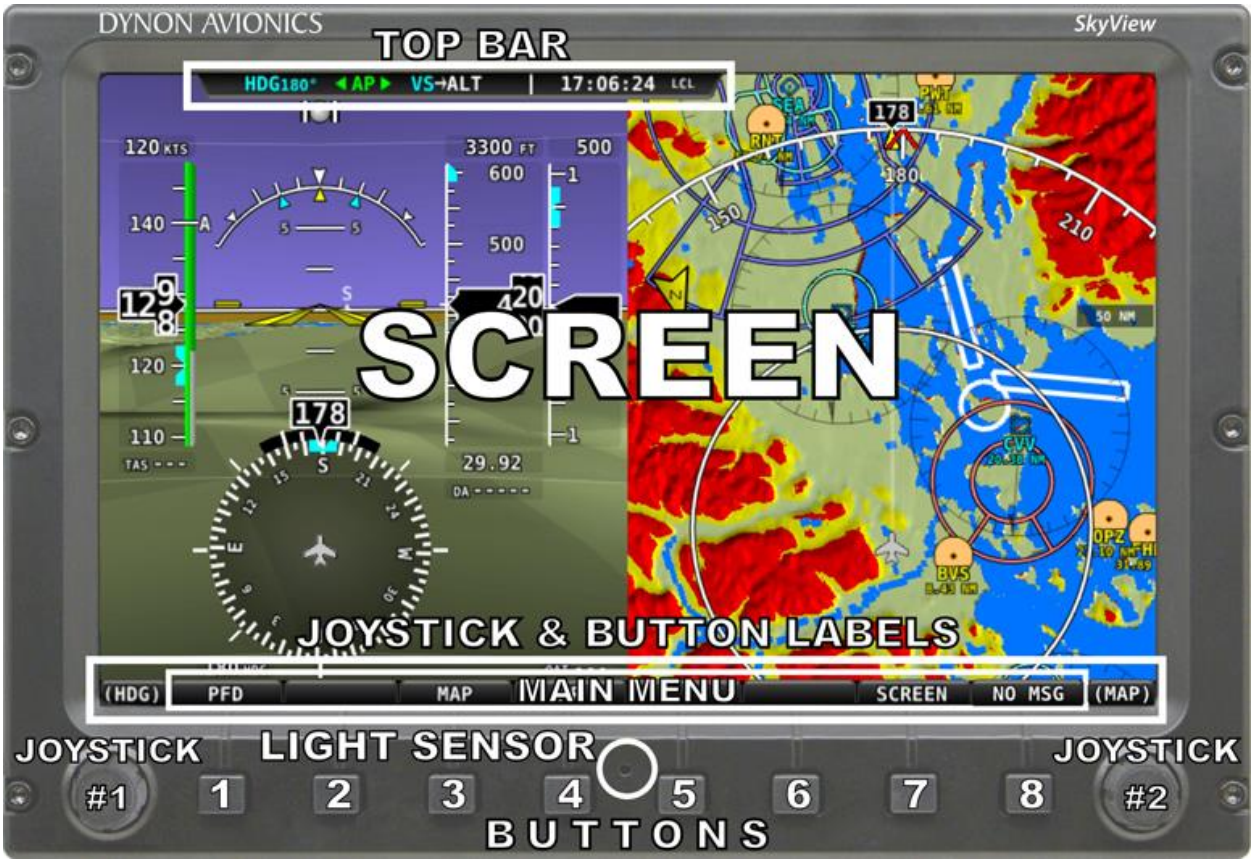


Figure 1 – SkyView Display Front Bezel Layout

Note the Top Bar, screen, joystick and button labels, light sensor, two joysticks and eight buttons.

The Top Bar is user configurable and displays important textual information. The Top Bar will display clock time or a timer (when running), autopilot status, battery status (when an issue requiring attention is detected), transponder status, and COM Radio status. Reference the How to Configure the Top Bar Section of this guide for details on how to configure the Top Bar.

The screen shows PFD, Engine, and Moving Map data, configuration information, and system alerts. Its layout is user configurable. See the Screen Layout Configuration Section for specific instructions on how to configure the layout of your screen.

Joystick and button labels are also on the screen as seen in Figure 1. *Joystick and button functionality is contextual based on what is onscreen and these labels show the user the current function.* For example, the (MAP) label above joystick #2 in Figure 1 shows that manipulating that joystick will affect what the user can see on the Moving Map Page.

The set of button labels displayed immediately after the display turns on is referred to as the *Main Menu*.

Each SkyView display has an integrated light-detecting sensor in the front bezel. This light sensor can be used for automatic backlight level management. Reference the *SkyView Classic / SE / HDX System Installation Guide* for instructions on how to configure the display for automatic backlight level management.

Joystick and Button Operation

Joysticks and buttons are used for various functions including powering the unit on and off, entering and navigating menus, and adjusting values.

Operation Basics

Joysticks can be turned and moved. Specific joystick behavior is addressed in subsequent sections of this guide when necessary.

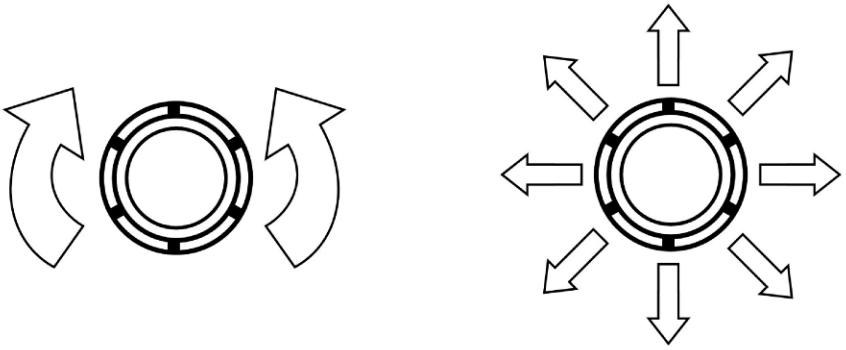


Figure 2 – Joystick Turn (left) and Movement (right) Directions

A button has a function if there is a label above it. If there is no label, there is no function. The figure below shows an example button label.

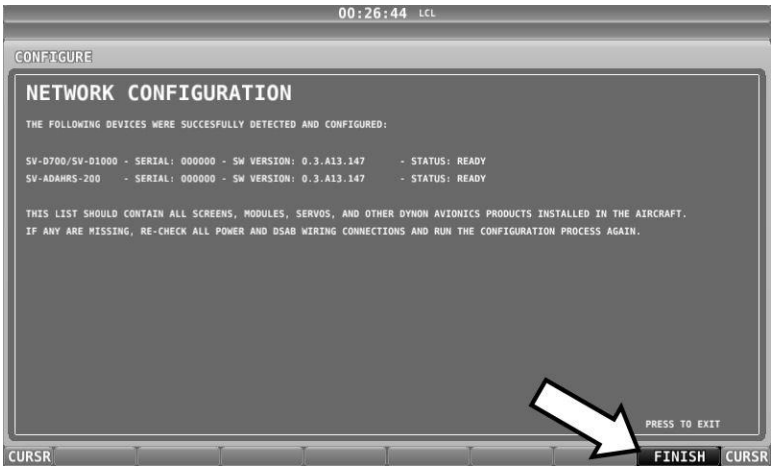


Figure 3 – Example Button Label

When you press the softkey button (or tap its label on SkyView Touch) momentarily, its action is invoked.

Button labels are called out in all capital letters such as BACK, EXIT, FINISH, and CLEAR. This guide directs users to press a button by using its label. For example, when this guide asks you to press FINISH, it is asking you to press the button with the FINISH label above it.

Joystick and Button Operation Example

Some parameters may need to be adjusted using a joystick. When setting values with the joystick, each character (symbol, letter or digit) must be selected and adjusted successively.

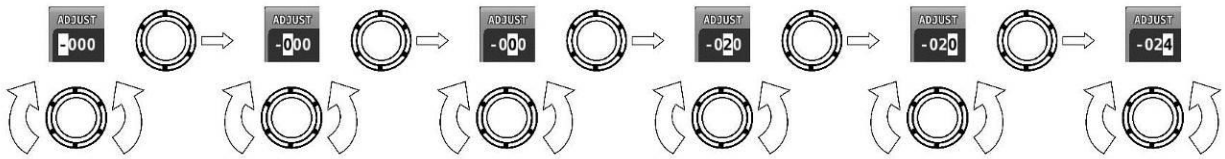


Figure 4 – Adjusting Successive Characters with a Joystick

In this example, the first time you turn the joystick, you toggle between the "-" and "+" symbols. To change the succeeding characters, you must move the cursor joystick to the right. In this example, you first adjust the "-" or "+" character, move the joystick right, then adjust the one hundreds digit, and so forth. Once you have adjusted the value appropriately, press ACCEPT or move the joystick to the right again.

At times, the next item in the menu path in this guide may be a joystick selection OR a button push—the correct choice will be apparent.

Menu Navigation

All menu navigation in this guide starts at the In Flight Setup Menu.

After the display turns on, you will see a screen similar to the one in Figure 1. This guide refers to the label bar at the bottom of the screen as the *Main Menu*.

Throughout this guide, the ">" character is used to indicate a sequence of menu selections or other actions you would take as you navigate the menu system. Menu selections which are followed by "…" indicate full-screen wizard interfaces which guide you through the appropriate steps. These wizard interfaces are not described in detail in this guide, as the on-screen instructions provide adequate information.

SkyView menus follow this structure: SETUP MENU > MENU > ... > MENU > PAGE or WIZARD. The setup menus (In Flight Setup or Setup) are the root of most menu navigation. Each nested menu is more specific than the previous one and there is no set limit for the number of nested menus before reaching a page. A page or wizard is at the end of the chain and it is where the

user can perform a specific action such as create a system software backup, configure a SkyView network, or set up the layout of the onscreen engine gauges. Wizards employ easy-to-follow onscreen instructions.

For example, SETUP MENU > SYSTEM SETUP > MEASUREMENT UNITS > BAROMETER indicates entering the SETUP MENU, then selecting SYSTEM SETUP, then selecting MEASUREMENT UNITS, and then entering the BAROMETER Menu to select INHG, MBAR, or MMHG.

Desired Menu Action	User Action
Enter the Setup Menu	Simultaneously press and hold buttons 7 and 8 (if airspeed is greater than zero, you will enter the In Flight Setup Menu)
Scroll through different menus	Turn either joystick OR Move either joystick up or down
Enter menu	Move either joystick toward the right
Return to previous menu	Move either joystick toward the left (saves settings) OR Press BACK (saves settings) OR Press CANCEL (does not save settings)
Save adjusted value	Press ACCEPT
Reset adjustable value	Press DEFAULT
Save settings and return to Main Menu	Press EXIT

Table 2 – Menu Navigation Summary

Basic Display Operation Procedures

This subsection covers basic operation procedures for displays. *Detailed instructions for various menus and individual menu items are described in the SkyView Classic / SE / HDX System Installation Guide.*

How to Turn the System On or Off

Table 3 summarizes the procedures for toggling SkyView system power states:

SkyView System Displays	Toggle SkyView System Power
One display	Toggle primary power state OR Toggle display power by pressing and holding button 1.
Multiple displays	Toggle primary power state OR Toggle all displays off or on by pressing and holding button 1 on each display.

Table 3 – How to Toggle SkyView System Power State

In the first seconds after turning a SkyView display on, you may see momentary display artifacts such as multicolored lines and/or flashes of light as the display initializes. This is normal.

Loss of External Power with Backup Battery Connected

If external power is lost to a display that is connected to a backup battery, it will either stay on for an additional 30 seconds or stay on indefinitely depending on whether or not the aircraft is in flight. This feature minimizes backup battery discharge when on the ground and master/external power is shut off normally. It also reduces pilot workload during an actual in-flight power loss.

If the aircraft is not in flight, SkyView displays the message “POWERING DOWN IN xx SECONDS” while counting down from 30 seconds. During this countdown, the menu displays the buttons STAY ON and PWR OFF at the bottom of the screen. Press PWR OFF to turn off the SkyView display immediately. Press STAY ON to keep the SkyView display on via the connected backup battery. If STAY ON is pressed, the display will continue to use the backup battery to power itself until the battery’s charge is depleted or the display is turned off manually pressing and holding button 1. Finally, if neither button is pressed before the countdown expires; the display will automatically turn off after 30 seconds to conserve the backup battery charge.

If the aircraft is in flight, SkyView displays the message “AIRCRAFT POWER LOST” with no additional count down. This ensures that active pilot action is required to turn off a display when power is lost in-flight and backup battery power is available. The STAY ON and PWR OFF buttons are still offered, but the display will stay on indefinitely unless PWR OFF is pressed.

How to Reboot the Display

Press and hold buttons 1, 2 and 5 simultaneously to instantly reboot the system. This may be helpful if you need to cycle power after changing certain settings and for general troubleshooting.

How to Manually Adjust the Backlight Brightness or Dim Level

SkyView's display backlighting is controlled by its ambient light sensor to actively adjust the brightness based on the current lighting conditions in the cockpit. The brightness is synchronized across multiple displays and SkyView network panel mounted modules (COM Radio, Knob Control Panel and AP Control Panel).

If however, you find that the displays are too bright or not bright enough for you, you can adjust the brightness by pressing SCREEN on the Main Menu and then pressing DIM. This menu allows you to manually choose an offset from the default brightness values based on current ambient lighting. This lets you fine tune the brightness of the display to your preference, while still allowing SkyView to adjust for changing lighting conditions.

To decrease or increase the backlight brightness press DEC- or INC+, respectively or twist the joystick labeled DIM. The current offset appears in a window above the DIM knob. Press DEFAULT to quickly reset the offset to zero. Press FULL to quickly set the offset to its maximum. Press BACK twice to exit the Dim Menu and return to the Main Menu.

SkyView will not dim the display to a level that would cause it to be illegible for the ambient lighting conditions.

On boot up, depending on your SkyView settings, the dimming offset will either be reset to zero or remember the previous setting. See the System Installation Guide for further information about the brightness settings.

How to Enter the Joystick Function Menu

These menus are used to specify which bug or parameter that joystick adjusts if turned. For example, joystick 1 could be set to adjust the heading bug and joystick 2 could be set to adjust the altitude bug.

Figure 5 illustrates the joystick menu when all possible bugs and functions are enabled. The joystick menu on your display may contain fewer items than seen here:

Figure 5 – Joystick Menu

To set the function of a joystick:

1. Click a joystick or move it in any direction to enter its Joystick Function Menu.
2. Choose the joystick function by moving the joystick up or down.
3. Confirm the highlighted function by clicking the joystick or moving it left or right.

If the Map Page is onscreen, the joystick closest to the Moving Map is labeled (MAP) and is used to affect the Map Page and cannot be assigned a different function.

How to Enter the In Flight Setup Menu

When airspeed is greater than zero or groundspeed is greater than 15 knots, simultaneously pressing and holding buttons 7 and 8 when on the Main Menu will open the In Flight Setup Menu. This menu gives users access to SkyView system tools which may be useful during flight such as the Flight Angle Pitch Adjust Page and the Angle of Attack Calibration Wizard.

You may also access the Setup Menu from the In Flight Setup Menu by using the ENTER FULL SCREEN SETUP MENU… option.

How to Check Installed Database Status

Enter the Installed Databases Page (IN FLIGHT SETUP MENU > FULL PAGE SETUP MENU > LOCAL DISPLAY SETUP > INSTALLED DATABASES) to see which databases are installed and their respective versions.

How to Adjust Time Zone Offset

Enter the Time Zone Offset Page (IN FLIGHT SETUP MENU > FULL PAGE SETUP MENU > SYSTEM SETUP > TIME > TIME ZONE OFFSET) and adjust the time zone accordingly.

How to Configure the Top Bar

The Top Bar is the strip across the top of the screen. It displays textual information such as the clock and autopilot status. Future software updates will use this space for information such as radio status.

Enter the Top Bar Setup Page to configure the Top Bar (IN FLIGHT SETUP MENU > FULL PAGE SETUP MENU or > LOCAL DISPLAY SETUP > TOP BAR SETUP).

Screen Layout Configuration

SkyView can display many combinations of PFD, Engine, and Moving Map data in full-screen and partial-screen configurations as well as distribute this data across multiple displays. Each display in the system can also have its own layout. This section tells you how to configure the display(s) in your SkyView system.

SkyView displays only display data from connected modules. For example, if an SV-EMS-22X module is not present on the network, the display will not show any engine data.

The following table lists the amount of screen space you can allot for a given page. Note that pages may also be turned off by the user.

Page	100%	80%	60%	50%	40%	20%	OFF
PFD	✓	✓	✓	✓	✓		✓
Engine	✓			✓		✓	✓
Map	✓	✓		✓	✓		✓
Video	✓			✓			✓

Table 4 – Onscreen Page Allotments

The following diagram illustrates example screen layout configurations.

Figure 6 – Example Screen Layout Configurations

Manufacturers that install SkyView into their aircraft can choose to standardize the screen layouts that are available. When a SkyView system is set up this way, you may not be able to remove some or all of the pages on a display. Additionally, the LAYOUT and SWAP buttons may not be available.

Selecting and Arranging Pages on your SkyView Screen

1. Press SCREEN on the Main Menu.
2. Press PFD PG, EMS PG, or MAP PG to toggle the display of page on or off.
   - Alternately, press and hold any of the above buttons for a few seconds to turn on that page and turn all others off with just one button push.
3. Press LAYOUT to toggle between different layouts of the pages that are being displayed.
4. Press BACK to finalize the layout and return to the Main Menu.

Swap Mode

You may, at times, wish to swap the entire screen contents of your left and right displays without having to select and deselect each page on each display using the above process. This can be useful for flying from the “other” seat, for use when flight instructing, etc.

Press SCREEN > SWAP on either display to enter swap mode and switch the screen contents of both displays simultaneously. When your screens are in swap mode, the PFD PAGE, EMS PAGE MAP PAGE, and LAYOUT buttons are unavailable. Press SWAP again to exit swap mode and revert to normal display operation.

Note that the SWAP button is only shown on SkyView systems that contain exactly two displays.

Reversion Mode

In multi-display SkyView systems, you can specify a reversion mode that automatically changes the screen configuration to a specific layout when only one display remains powered on.

For example, if you normally have your left display configured to show PFD and your right display showing Engine and Map, reversion mode could be configured to show all three pages automatically on the single remaining display, should the other fail.

If reversion mode is enabled, any one of the following layouts can be pre-configured (via SkyView setup procedures) to be displayed when only one display remains powered on in a multi-display system. This behavior applies equally whether all but one display in your system has failed, or if you turn on one SkyView display before all others (as some customers do to see engine instruments before engine start):

- PFD 40% / EMS / MAP 40%.
- PFD 50% / MAP 50%.
- PFD 50% / EMS 50%.
- PFD 80% / EMS 20%.
- PFD 100%.

See the *SkyView Classic / SE / HDX System Installation Guide* for further information about Reversion Mode configuration.

Backup Battery Charging and Testing

In the event of an electrical failure that causes SkyView to run on the SV-BAT-320, the SV-BAT-320 supplies power to the SkyView display it is connected to, along with any connected SV-ADAHRS-26X, SV-EMS-22X, SV-ARINC-429, and SV-GPS-250 modules. Because of higher power requirements, the SV-BAT-320 does not power Autopilot servos, the SV-XPNDR-26X, SV-COM-C25/X25/X83devices connected via a serial connection, or any other third party devices. SkyView’s maximum display brightness is reduced very slightly when operating on backup battery power to reduce power consumption.

When connected, the battery's charge level is automatically managed by the SkyView display it is physically connected to. This ensures that SkyView has a fully charged backup battery in case of emergency. Charging a completely discharged battery may take up to 4 hours. To conserve your aircraft battery, the SV-BAT-320 is only charged when SkyView detects that your alternator or generator is online. Specifically:

- If SkyView system voltage is above 12.25V: SkyView runs on master power and charges the SV-BAT-320.
- If SkyView system voltage is above 10V, but below 12.25V: SkyView runs on master power but does not charge the SV-BAT-320.
- If SkyView system voltage is below 10V: SkyView runs on the SV-BAT-320. This discharges the SV-BAT-320.

Reference the *SkyView Classic / SE / HDX System Installation Guide* for more details regarding current consumption while charging a backup battery.

A battery is fully charged when it reaches 12.25 volts and should power a typical SkyView system for at least 60 minutes. If SkyView has switched to the backup battery due to a power loss in your aircraft, it is advised that you land as soon as possible.

Backup Battery Status

SkyView performs an automatic 30 second self-test of the battery every time a SkyView is shut down normally when master power is turned off after a flight. Additionally, a manually-actuated discharge test should be performed annually when prompted by SkyView.

A battery status icon in the top bar and alert messages let you know when SkyView's backup battery is not operating nominally. These indications are as follows:

No battery icon displayed:

- No battery has been connected to this display or battery status is normal. If a battery is connected, and no icon is displayed, all of the following are true:
  - The Annual Backup Battery Test is not yet due.
  - The self-test routine has not discovered abnormal behavior. Backup battery self-tests are performed automatically every time master power is removed on the ground (after a flight, for example) while the 30-second "power lost" timer is counting down.

Needs test:

Figure 7 – Backup Battery Test Needed

- SkyView has determined that the backup battery should be tested using the manually-actuated Backup Battery Test. This can be because:
  - It has been one year since the last full Backup Battery Test. See the *SkyView Classic / SE / HDX System Installation Guide* for instructions on how to perform this test.
  - The 30 second automatic battery self-check that is performed when master power is removed during a normal shutdown did not complete properly at least 3 consecutive times. Perform the Backup Battery Test per the *SkyView Classic / SE / HDX System Installation Guide*.

Fault/test Failed:

Figure 8 – Backup Battery Test Failed

A fault has been detected because of one of the following conditions:

- The battery is no longer connected.
- A battery test has failed. The battery may need to be replaced. Contact Dynon Technical Support for more information.

4. PFD Operation

One of the main functions of SkyView is its Primary Flight Display (PFD) with Synthetic Vision. This chapter highlights the layout of the PFD page, its symbology, and contains instructions for adjusting bugs.

SkyView's PFD requires data from an SV-ADAHRS-20X module. Synthetic Vision further requires valid GPS data. If installed, SkyView's heading will be determined by the SV-MAG-236 Remote Magnetometer.

The heading/track, altitude, vertical speed and indicated airspeed bugs are used to control the SkyView Autopilot.

PFD Page Layout

The PFD Page as shown in Figure 9 displays important flight information and Synthetic Vision.

Figure 9 – SkyView PFD

The primary information shown on the PFD includes:

- Synthetic Vision
- Airspeed Indicator with Airspeed Bug and Airspeed Trend Rate.
- Attitude Indicator with Extreme Pitch Warning Indicators (Pitch Warning Indicators not shown in Figure 9).
- Flight Path Marker.
- Altimeter with Altitude Bug, Altitude Trend Rate, Barometer Setting, and Density Altitude.

- Vertical Speed Indicator with Vertical Speed Bug.
- Heading Indicator/Directional Gyro with Heading Bug.
- Slip/Skid Ball.
- Angle of Attack Indicator (not shown in Figure 9).
- OAT.
- Wind Information (not shown in Figure 9).

The PFD in Figure 9 is a basic depiction and does not include any HSI or autopilot information.

GPS Signal Source

SkyView's PFD contains display elements – such as Synthetic Vision, ground speed, and the HSI - that depend on GPS information to work. Reference the GPS Source section in the SV-MAP-270 Navigation Mapping Software chapter of this guide for information about how SkyView utilizes and prioritizes the available GPS sources that are used for this purpose.

PFD Symbology

Bugs

The SkyView PFD makes use of airspeed, altitude, vertical speed, indicated airspeed, minimum descent altitude, and heading (or track) bugs. Note that the altitude, vertical speed, indicated airspeed, and heading (or track) bugs are used for autopilot control if Autopilot servos are installed. Instructions for setting bugs are detailed in subsequent sections of this guide.

The airspeed, altitude, vertical speed and indicated airspeed bugs are located above their respective tapes and the heading (or track) bug is located to the lower left of the Magnetic Heading Indicator/ Directional Gyro.

You can toggle the display state of bugs using the following procedure. Ensure that bugs that are used as control mechanisms for autopilot axes (i.e., HDG ALT, IAS, and VS) are available on at least one display or knob control panel. If you have multiple displays in your aircraft, you can toggle the bugs on each independently.

1. Press PFD while on the Main Menu.
2. Press BUGS.
3. Press HDG, ALT, IAS, VS, CRS or MIN to toggle the display state of each respective bug. *If a bug label is highlighted, it will show up on the PFD and in the joystick menu.*
4. Press BACK to return to the PFD Menu.

A bug is only adjustable if it is on and it is an option in the Joystick Menu. Bugs that are turned off are displayed as "- - - "with their respective units (e.g., "- - - FT" for an altitude bug).

When all bugs are turned on, all bugs are available in the Joystick Menu as illustrated in Figure 10.

Figure 10 – All Bugs On

For example, if the Minimums bug (MIN) is off, it is not an option in the Joystick Menu as illustrated in Figure 11. The same is true for other bugs.

Figure 11 – MDA Bug Off

If all bugs are off, none of them show up in the Joystick Menu as illustrated in Figure 12. Also note how the heading bug is displayed (i.e., "- - - HDG" above the BACK label).

Figure 12 – All Bugs Off

Airspeed Indicator

The Airspeed Indicator is displayed on the left side of the PFD and incorporates an airspeed tape with a digital readout, true airspeed (TAS), airspeed trend indicator, and airspeed bug. Figure 13 is an example SkyView Airspeed Indicator.

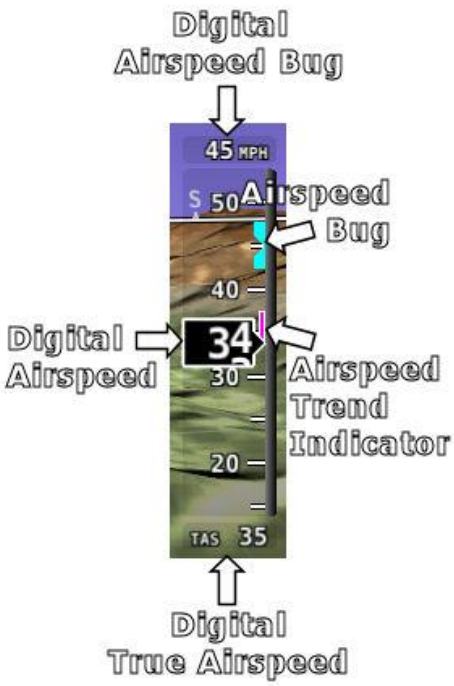


Figure 13 – Example Airspeed Indicator

Units can be set to miles per hour, nautical miles per hour (knots), or kilometers per hour. Reference the *SkyView Classic / SE / HDX System Installation Guide* for instructions on how to change the displayed units.

The airspeed tape displays indicated airspeed including gray, white, green, yellow, and red ranges to provide a graphical representation of aircraft speed in relation to the aircraft's limits. These ranges are controlled by setting the airspeed limitations for the aircraft. Performance speeds (Vx, Vy and Va) are displayed as a letter on the right side of the airspeed tape. Refer to the *SkyView Classic / SE / HDX System Installation Guide* for instructions on how to configure the airspeed limitation color thresholds.

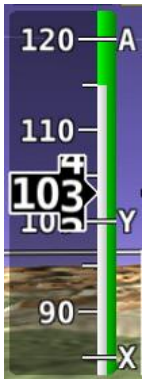


Figure 14 – Example V speeds

Airspeed will display "---" at zero through 20 knots, at which point it will become alive. Once alive, it will read down to 15 knots. Below 15 knots, "---" will again be displayed.

The indicated airspeed (IAS) digits scroll up and down, simulating an analog Airspeed Indicator. The rate of change of the digits provides a sense of the increase or decrease in speed.

The airspeed trend indicator (ATI) is displayed as a magenta bar on the airspeed tape. It grows proportionally in the direction of the rate of change (acceleration or deceleration). The ATI is scaled to indicate a 6-second airspeed trend which means that if the acceleration is kept constant, the airspeed will end up at the number indicated at the end of the trend line after 6 seconds have passed.

True airspeed (TAS) is digitally displayed at the bottom of the airspeed tape. If configured with a GPS, Ground Speed (GS) is also displayed under the True Airspeed.

In some aircraft, Vne (red line) is limited by TAS instead of IAS. When SkyView is configured to indicate Vne as TAS, the red airspeed range will dynamically adjust so that the TAS limit is what starts the red airspeed range. Additionally, a red marker is shown at the IAS that Vne would be at

Figure 15 – Vne as TAS

when at sea-level on a standard day, which is when TAS equals IAS. This lets you quickly see the difference between your current Vne as TAS and Vne as IAS. In the example shown here, the Vne is configured to be based on a TAS of 190. However, because the aircraft is at altitude, that TAS occurs at a lower IAS. In this case, you can see that the red range has been lowered to an IAS of 173, which is where the TAS has reached its limit of 190.

Airspeed Bug

The airspeed bug is displayed in cyan on the airspeed tape and its associated digital readout is displayed at the top of the Airspeed Indicator.

To set the airspeed bug:

1. Enter the Joystick Function Menu.
2. Move the joystick up or down to highlight (IAS).
3. Click the joystick or move it left or right to close the menu (this is optional).

(IAS) will now display just above that joystick. The airspeed bug setting on the PFD will be outlined to signal that it is selected. Turn the joystick to adjust the airspeed bug. Note that while the airspeed bug is changing, its display window lights up in cyan to draw your attention to it. *You may also synchronize the bug to current airspeed by pressing and holding the joystick to the left or right for 2 seconds or middle (½ second click). After the bug is synchronized, an "IAS SYNC" message will appear above the knob.*

Attitude Indicator

Attitude indicator symbology is displayed on PFD and incorporates a roll scale with roll pointers and a zero pointer reference, pitch scale with horizon lines, and water line symbology. Figure 16 is an example SkyView attitude indicator.

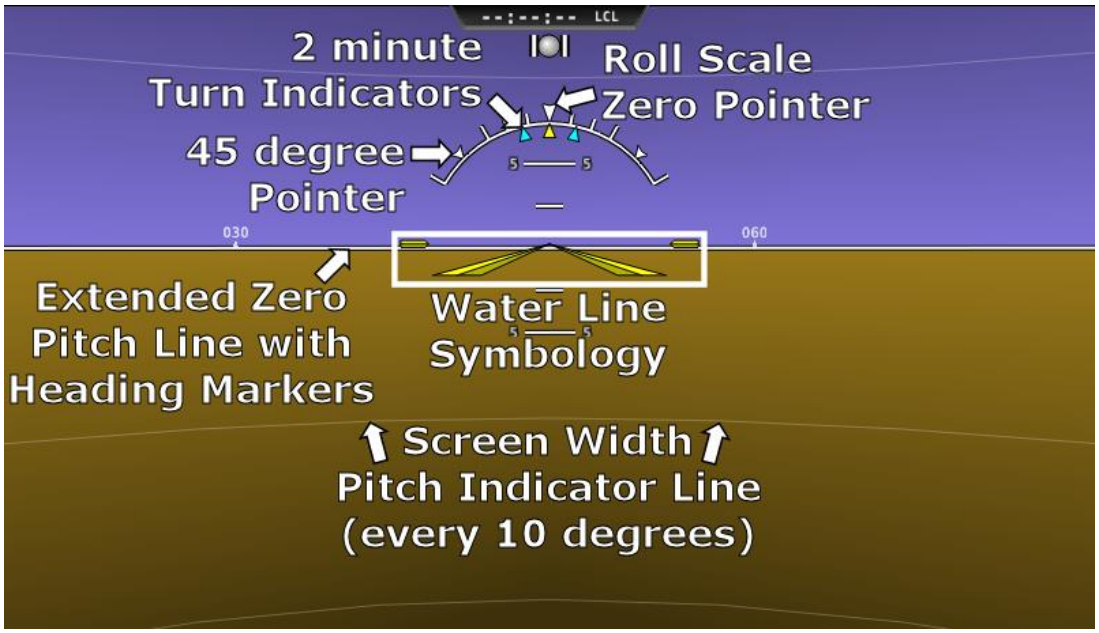


Figure 16 – Example Attitude Indicator

The roll scale contains tick marks at 10, 20, 30, and 60 degrees and larger white triangles at 0 and 45 degrees. The roll pointer (small yellow triangle on the bottom side of the roll scale) points to your current bank angle. The roll scale will rotate 360 degrees. When the aircraft is wings level, the roll pointer aligns with the roll scale zero point. The water line symbology also indicates wings level flight.

The pitch scale has tick marks in 2.5 degree increments and every 10 degree tick mark provides a horizon line across the width of the screen. If the displayed pitch on the screen requires adjustment to match the view outside, use the Flight Angle Pitch Adjust Page in the In Flight Setup Menu (IN FLIGHT SETUP MENU > FLIGHT ANGLE PITCH ADJUST…). The pitch may be adjusted to a maximum of ±20 degrees.

The extended zero pitch line features heading markers every 30 degrees to help maintain directional awareness when attention is being paid to the attitude indicator.

Attitude Rate Limit

SkyView's ADAHRS will operate normally at rotational rates of up to 150 degrees per second in any axis. If the aircraft's rotational rate exceeds 150 degrees per second – as can happen in a well-developed spin or when performing aggressive aerobatic maneuvers – the PFD page will annunciate "ATTITUDE RECOVERING". During this time, SkyView's attitude indication may be degraded and other instruments should be used to maintain safe flight.

After straight and level flight is restored for a few seconds, the ATTITUDE RECOVERING message will disappear. Full performance of the attitude indication is restored. This requires no additional action by the pilot.

CHECK PITOT HEAT

In the event of airspeed loss (due to icing or other blockage) an accurate attitude is maintained if there is an accurate GPS ground speed source. When in this mode, a magenta CHECK PITOT HEAT message is displayed on the PFD and the ground speed is displayed below the indicated airspeed (IAS). If the connectivity with the GPS fails while in GPS assist mode, the attitude continues to be displayed, using the last known GPS ground speed as a reference. This mode is flagged on the horizon with a yellow CROSS CHECK ATTITUDE message. In the very rare case that this sequence of events occurs, the ADAHRS' attitude accuracy is reduced; use other references in the aircraft to cross-check against the SkyView display.

Note that due to a limitation of the SV-GPS-250 hardware, it cannot be used for GPS Assist above 415 knots ground speed if it is being used as the GPS source

Flight Path Marker

The flight path marker as shown in Figure 17 is an icon that is superimposed on the PFD. It depicts the actual trajectory that the aircraft is flying through space. In contrast, the attitude indicator displays the direction that the aircraft is pointed.

Figure 17 – Example Flight Path Marker

The flight path marker is extremely helpful in correlating and distinguishing between aircraft attitude and flight path, giving the pilot a better understanding of what the aircraft is doing. Given this, the marker can also be a valuable aide for avoiding terrain when used with Synthetic Vision.

The flight path marker can be enabled or disabled through the setup menus. See the *SkyView Classic / SE / HDX System Installation Guide* for information about this setting. To calculate and display the Flight Path Marker, SkyView requires an indicated Airspeed that is not zero or a GPS ground speed of more than 25 kts. The flight path marker also uses vertical speed, magnetic heading, GPS ground speed and ground track to calculate its guidance. The flight path marker will not appear if any of these sources are unavailable.

Several examples of Flight Path Marker behavior:

- If the aircraft's nose is pitched up, but the marker stays on the horizon, this indicates that the aircraft is not climbing or descending. You will see this behavior during slow flight.
- If the aircraft is neither climbing nor descending, the flight path marker will align with the zero pitch line. Many aircraft do not cruise at an exactly level attitude. In this case, it is normal to have a slightly pitched up or pitched down attitude indication, even though the flight path marker indicates the aircraft is indicating no vertical trajectory.
- If the marker is to the left or right of the attitude indicator's aircraft symbol, this indicates that the path over the ground is different than the direction the aircraft is pointing. This depicts the effects of wind or a slip attitude.
- If the aircraft is climbing out of a canyon and the marker is above the terrain ahead, this indicates that the aircraft, at its current trajectory, will clear that terrain.

- If the aircraft is climbing out of a canyon and the marker is overlaid on the terrain ahead, this indicates that the aircraft, at its current trajectory, will impact the terrain.
- If the marker is pointed at a runway threshold during an approach, that is where you will be when you land if you keep the same approach path to the runway.

Altimeter

The altimeter is displayed on the right side of the PFD. It incorporates an altitude tape and digital readout, Density Altitude (DA), barometer setting, and altitude bug. Figure 18 is an example SkyView altimeter.

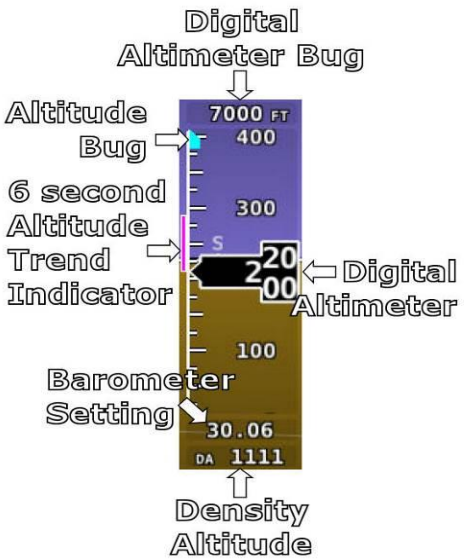


Figure 18 – Example Altimeter

The altitude tape displays 200 units above and below the current altitude digital readout. Each tick represents 25 units, with every 50 unit tick drawn slightly longer to differentiate them. Units can be set to feet or meters. Reference the *SkyView Classic / SE / HDX System Installation Guide* instructions on how to change the displayed units.

The digital readout scrolls up and down in the manner of an analog altimeter. The rate of change of the digits provides a sense of the increase or decrease in altitude.

An altitude trend indicator based on current vertical speed is represented as a magenta bar on the altimeter. It grows proportionally as your climb or descent rate increases/decreases. The altitude trend indictor is scaled to indicate a 6-second altitude trend. This means that if current rate of altitude change is kept constant, the altitude will end up at the number indicated at the end of the trend line after 6 seconds have passed.

DA will display "----" if an OAT cannot be determined. Since relative humidity is not readily available to SkyView in flight, density altitude is calculated using an approximation. The results of SkyView's DA computation will closely match a traditional handheld E6B.

Barometer Setting

To change the barometer setting:

1. Enter the Joystick Function Menu.
2. Move the joystick up or down to highlight (BARO).
3. Click the joystick or move it left or right to close the menu (this is optional).

(BARO) will now display just above that joystick. The barometer setting on the PFD will be outlined to signal that it is selected. Turn the joystick to adjust the barometer setting. Note that while the barometer setting is changing, its display window lights up in cyan to draw your attention to it.

To quickly sync the barometer, press and hold the joystick to the left or right for 2 seconds or middle (½ second click). When BARO is synchronized a message will appear above the knob. If none of the conditions below are met the altimeter will not synchronize and "NO SYNC" will appear in the altimeter box on the PFD. The table below details how the BARO setting is synchronized:

	With SV-ADSB-470/472 Installed	**Without SV-ADSB-470/472 Installed**
On the Ground:	Adjusts the altimeter based on the current GPS Altitude. After the (BARO) is synchronized a GPSALT message will appear in the altimeter box on the PFD.	
In the Air:	Adjusts the altimeter based on the METAR of the flight plan's destination airport if within 20nm. If there is no flight plan waypoint or it is too far away then the altimeter is set to the nearest ADS-B METAR within 100nm with a valid altimeter setting. After the (BARO) is synchronized a SYNC message will appear in a window above the knob and the airport identifier will appear in the altimeter box on the PFD.	Adjusts the altimeter to the standard pressure setting *(i.e., 29.92 in Hg, 1013 mbar, or 760 mm Hg).*
Above 18,000 ft indicated altitude	R*esets the altimeter to standard pressure altitude for use in the flight levels (i.e., 29.92 in Hg, 1013 mbar, or 760 mm Hg).*	

Table 5 – Conditions for Synchronizing BARO BUG

Altitude Bug

The altitude bug is displayed in cyan on the altitude tape and its associated digital readout is displayed at the top of the altimeter. *The altitude bug is used as a target for the pitch axis of the SkyView Autopilot when a pitch axis servo is installed.*

The reaction of the autopilot to an altitude bug change depends on the state of the pitch axis, its armed mode of operation, and the current state of the aircraft. See the Autopilot Operation chapter for more information about how the autopilot uses the altitude bug.

To set the altitude bug:

1. Enter the Joystick Function Menu.
2. Move the joystick up or down to highlight (ALT).
3. Click the joystick or move it joystick left or right to close the menu (this is optional).

(ALT) will now display just above that joystick. The altitude bug setting on the PFD will be outlined to signal that it is selected. Turn the joystick to adjust the altitude bug. Note that while the altitude bug is changing, its display window lights up in cyan to draw your attention to it.

You can synchronize the altitude bug with the current altitude by pressing and holding the ALT joystick to the left or right for 2 seconds or middle (½ second click). After the bug is synchronized an "ALT SYNC" message will appear above the knob.

Altitude Alerter

SkyView can be configured to audibly alert as the aircraft changes altitude in relation to the altitude bug. When the bug is active, audio out is configured, and the altitude alerter is configured, SkyView announces "APPROACHING ALTITUDE" as the aircraft flies within a chosen amount of feet/meters of the bug. SkyView announces "LEAVING ALTITUDE" as the aircraft flies away from the altitude bug by more than a chosen amount of feet/meters. The altitude thresholds that trigger the two above alerts are individually configurable, and the altitude alerter will work even if the autopilot is engaged. See the *SkyView Classic / SE / HDX System Installation Guide* for details on how to configure the altitude alerter.

Minimum Descent Altitude (MIN) Bug

The Minimum Descent Altitude (MIN) Bug allows the pilot to set a bug to alert when approaching a set altitude. This is typically used during approaches to remain aware of approach minimums. This bug is distinct from the altitude bug, which is used to control the autopilot.

When the MIN bug is set:

- When the aircraft descends through 200 feet above the MIN bug:
    - An "APPROACHING MINIMUMS" audio alert is played.
- When the aircraft descends through the MIN bug:
    - A "MINIMUMS" audio alert is played.
    - A visual "MINIMUMS" alert is displayed on the PFD as seen below.

Figure 19 – MDA Bug

Figure 20 – MDA Bug Detail

Vertical Speed Indicator

The vertical speed indicator (VSI) is displayed to the immediate right of the altimeter and incorporates a vertical speed tape, vertical speed pointer (with digital readout), and bug. Figure 21 is an example SkyView VSI.

The VSI tape can display ±1000 units, ±2000 units, or ±4000 units. Units can be set to feet or meters. Reference the *SkyView Classic / SE / HDX System Installation Guide* for instructions on how to change the displayed units and the indicator scale.

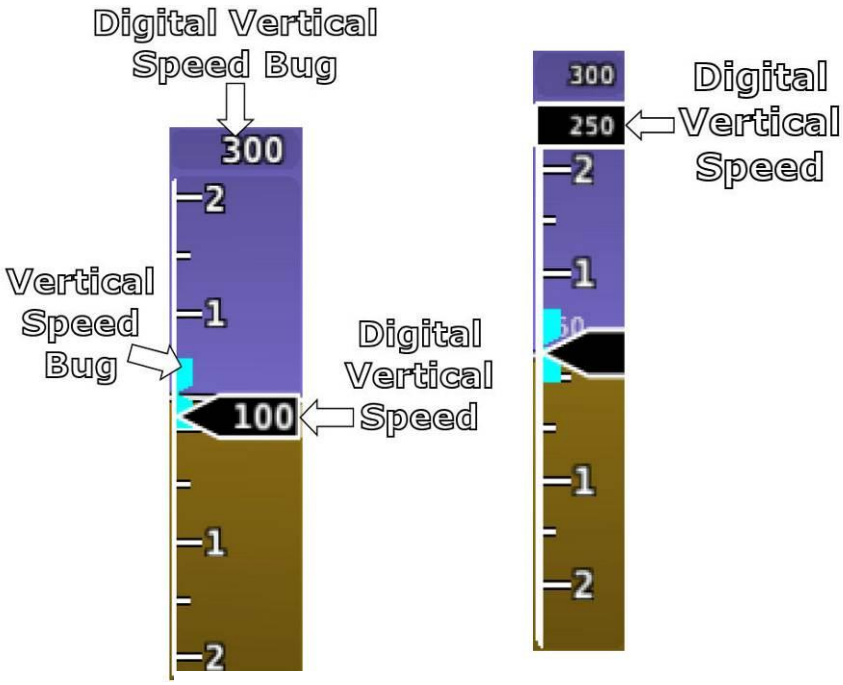


Figure 21 – Example Vertical Speed Indicator. Partial Screen PFD Version on Right.

The vertical speed pointer scrolls up and down the VSI tape, simultaneously displaying the instantaneous vertical speed in both analog and digital formats. If there is very little or no vertical speed, the pointer appears blank. When the PFD is configured as a 40% page, the digital vertical speed readout appears above or below the VSI tape as shown in Figure 21, but the analog sliding behavior of the pointer is the same as described above. When the Vertical Speed Required to Destination info item is active on the Map a magenta arrow is drawn on the VSI at that speed.

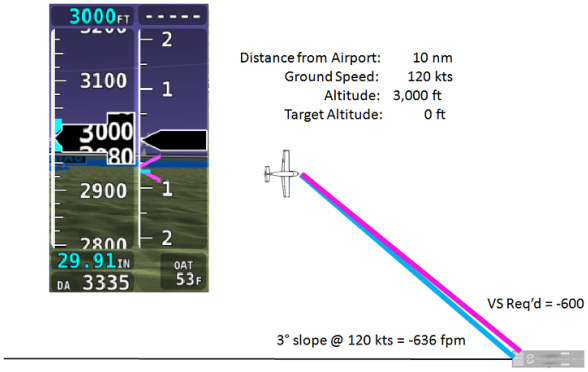


Figure 22 – Vertical Speed Required to Destination

Vertical Speed Bug

The vertical speed bug is displayed in cyan on the right side of the VSI tape and its associated digital readout is displayed at the top of the VSI. This bug is also used as a target for the pitch axis of the SkyView Autopilot. See the Autopilot Operation chapter for details.

To set the VS bug:

1. Enter the Joystick Function Menu.
2. Move the joystick up or down to highlight (VS).
3. Click the joystick or move it left or right to close the menu (this is optional).

(VS) will now display just above that joystick. The vertical speed bug setting on the PFD will be outlined to signal that it is selected. Turn the joystick to adjust the vertical speed bug. Note that while the vertical speed bug is changing, its display window lights up in cyan to draw your attention to it.

You can synchronize the vertical speed bug with the current vertical speed by p*ressing and holding the VS joystick to the left or right for 2 seconds or middle (½ second click).*

The vertical speed bug is used by the autopilot as a target vertical speed when it is climbing or descending.

Magnetic Heading Indicator/ Directional Gyro

The Magnetic Heading Indicator/ Directional Gyro is displayed on the lower center of the PFD and incorporates a magnetic heading compass rose, magnetic heading digital display, turn rate indicator, ground track GPS pointer, heading bug, and heading bug digital display. Figure 23 is an example SkyView Magnetic Heading Indicator/ Directional Gyro.

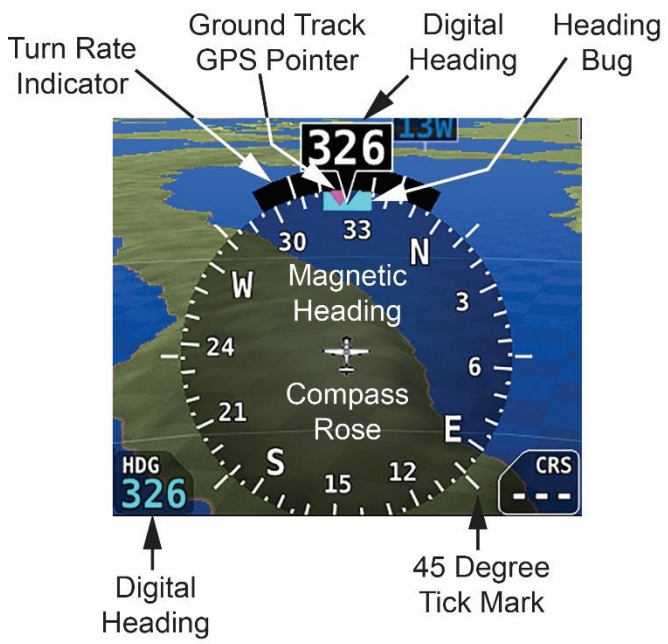


Figure 23 – Example Magnetic Heading Indicator/Directional Gyro

The compass rose displays in heading-up orientation. The cardinal points are displayed as letters, and 30-degree increments are displayed numerically, in 10-degree multiples, (e.g., 330 degrees is displayed as 33). The numeric display at the top of the compass rose indicates

magnetic heading. If magnetic heading is unavailable, for example due to a magnetometer failure, GPS ground track is displayed at the top.

Figure 24 – GPS Track substitute for Magnetic Heading

The turn rate indicator is displayed as a curved bar along the top, outside curve of the compass rose. The bar grows in the direction that the aircraft is currently turning and is anchored at the arrow of the numeric display. The minor tick marks to the immediate right and left of the numeric display arrow represents a half-standard-rate-turn. The major tick marks to the left and right of the minor tick marks represent a standard rate turn of 3 degrees per second.

The ground track GPS pointer is displayed as a magenta triangle on the inner edge of the compass rose.

Heading/Track Bug

If your SkyView system includes an autopilot, the heading (HDG) bug is replaced by a track (TRK) bug when the autopilot is flying in GPS ground track (TRK) mode. The bug is displayed in cyan on the inner edge of the compass rose. The digital display of the bug is displayed to the lower left of the compass rose.

To set the heading/track bug:

1. Enter the Joystick Function Menu.
2. Move the joystick up or down to highlight (HDG) or (TRK).
3. Click the joystick or move it left or right to close the menu (this is optional).

(HDG) or (TRK) will now display just above that joystick. The heading/track bug setting on the PFD will be outlined to signal that it is selected. Turn the joystick to adjust the heading/track bug. Note that while the heading/track bug is changing, its display window lights up in cyan to draw your attention to it.

You can synchronize the heading/track bug to the current heading or track by pressing and holding the joystick to the left or right for 2 seconds or middle (½ second click).

HSI

Figure 25 – HSI Example - Localizer

Figure 26 – HSI Example - GPS

When a valid NAV or GPS source is connected to your SkyView system, its data can be displayed on and around the heading indicator in a standard HSI presentation. Refer to the *SkyView Classic / SE / HDX System Installation Guide* for details on how to connect and configure these data sources. The following sections describe the HSI display elements.

HSI Source

There are two primary types of sources, GPS and NAV radio. Anytime a GPS is being used as an HSI source, all of the HSI data is colored magenta. When a radio is being used as the source, its data is in green. To the right of the heading indicator, a textual info item describes the data source of the HSI. It can be any of GPS, NAV (VOR), BC (back course) or LOC (localizer). Additionally, each GPS or radio source either has a custom name or is numbered – depending on how those devices are configured within SkyView - to prevent confusion in systems that have multiple navigational devices. SkyView's own navigation mapping capability is always labeled "SKYVIEW". The GPS waypoints are displayed in HSI info area for SKYVIEW and ARINC navigators such as the GNS and GTN. To cycle through the available sources, press HSI SRC in the PFD Menu.

Back course tracking under AP will only work if the NAV radio has a backcourse mode that reverses sensing. E.G. the SL30 has this in the form of the BC button.

Course Indicator

Figure 27 – HSI Course Indicator

The course indicator has an arrow at its end which points to the currently selected course. When a GPS source is selected, course direction is automatically by the programmed route. When a NAV radio source is selected, the course direction can be set either on the radio or via the course (CRS) joystick function on SkyView, depending on the NAV radio that is connected. The course indicator is fixed to the rotation of the heading indicator, so it is easy to see which way you must turn to get on course. When tuned to a LOC, course should be set to the runway heading via the joystick CRS function. Courses are remembered for each navigation source, this is especially helpful when switching between VOR and ILS or GPS and ILS sources. *You may also synchronize the CRS to point at the station (when tuned to a VOR only) by pressing and holding the joystick to the left or right for 2 seconds or middle (½ second click). After the course is synchronized a "CRS SYNC" message will appear above the knob.*

Note that when the Garmin SL30 is tuned to a LOC/ILS frequency, it disables its own OBS knob.

Course Deviation Indicator (CDI)

Figure 28 – HSI CDI

The CDI indicates how far to the left or right you are from the selected course. When in NAV mode, full scale deviation indicates ten degrees of deviation from the VOR radial that has been chosen as the course. When tuned to a localizer, full scale represents 2.5 degrees of deviation. When following a GPS course, full scale represents 5 nautical miles of deviation. When on course, the course indicator and the CDI make a solid line, making it easy to see when there is little error in your aircraft's position. Unlike a CDI indicator found in basic aircraft, the CDI needle on an HSI rotates with the heading indicator and course indicator. By turning the aircraft towards the CDI needle you reduce your deviation.

To/From Indicator

Figure 29 – HSI To Indication

Because an HSI rotates the course line on top of the heading indicator, the to/from indicator always points at the physical VOR/LOC transmitter, or towards the GPS waypoint. If it is pointing the same direction as the arrow at the end of the course line, then that is a "to" indication. If it is pointing the opposite direction of the arrow at the end of the course line, then that is a "from" indication.

Bearing Pointers

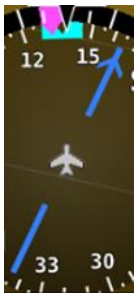


Figure 30 – HSI Bearing 1 Pointer

Figure 31 – Bearing 1 Pointer with Distance

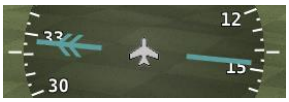


Figure 32 – HSI Bearing 2 Pointer

Figure 33 – Bearing 2 Pointer with Distance

These arrows show you the bearing directly to a radio station or waypoint–in other words, the track that you would need to fly to go directly to it. BRG 1 is depicted with a single arrow head when displayed on the HSI display. BRG 2 has a double arrow head. There is also a textual information item for each bearing pointer that describes its source (e.g. SKYVIEW, NAV1, etc.) and the distance from that source in available. Distance is only shown when only one bearing source is selected. Each of the bearing pointers can be cycled between all available bearing sources by pressing BRG 1 or BRG2 in the PFD Menu.

Note that some radios, such as the Garmin SL30, provide information about standby frequencies that can be loaded into bearing pointer locations. These are only available for standby VORs that are within range. They are labeled as SBY bearing pointers.

NAV radios tuned to a LOC/ILS frequency do not provide bearing information due to the nature of the localizer radio signal.

Glideslope/VNAV Indicator

Figure 34 – HSI Glide Slope

This only appears when tuned to an ILS or a GPS with vertical navigation output. When displaying an ILS glideslope, full deflection is 0.5 degrees.

HSI Info Items

Figure 35 – HSI GPS Info

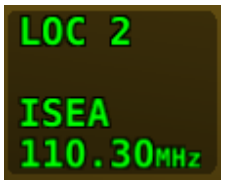


Figure 36 – HSI NAV Info (LOC Example)

Figure 37 – Virtual DME

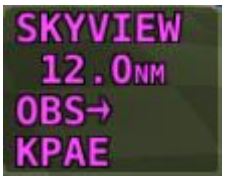


Figure 38 – OBS Mode Active

Textual info items that provide additional data about the HSI source are displayed to the right of the HSI display. The information available depends on the data being provided by the HSI source. Examples of info items that may be displayed include DTW (distance to waypoint), ID (VOR identifier), and frequency. When a NAV radio decodes the identifier for a frequency, SkyView displays it in the HSI info area and tries to match the identifier to the same one in its aviation database. When it finds a match, it displays Virtual-DME (non-certified) distance in magenta. Note that ARINC-connected devices like the 430/GTN do not decode identifiers, and therefore SkyView cannot calculate Virtual-DME for those radios.

Wind Vector

Figure 39 – Wind Vector

Wind vector information is located just above the OAT display on the PFD. The winds aloft arrow indicates the wind direction relative to your current direction of flight. The wind strength, direction, and cross wind component are also textually provided. If SkyView cannot make an accurate winds aloft calculation, the arrow is not displayed and the numbers are replaced by dashes. The display of winds aloft requires an active GPS connection and an OAT probe. In very light winds, the wind speed number is not displayed, although the arrow is. Note that due to a limitation in the SV-GPS-250 hardware, winds information will not be available above 415 knots ground speed if it is being used as the GPS source. The Wind Vector will not appear if the SV-ADAHRS-20X, SV-MAG-236, GPS, or OAT is not functional.

Slip/Skid Ball

The action of the slip/skid ball simulates an analog slip/skid ball and provides a visual representation of lateral acceleration. When the ball is within the two vertical lines, the aircraft is in coordinated flight. Figure 40 is an example SkyView slip/skid ball.

Figure 40 – Example Slip/Skid Ball

Angle of Attack Indicator

The Angle Of Attack (AOA) Indicator will display only when a Dynon AOA/Pitot probe has been properly installed and calibrated. During normal flight, the AOA Indicator will display green. As the AOA approaches and then reaches critical, the green and yellow bars will disappear, leaving only red. Figure 41 is an example SkyView AOA indicator.

Figure 41 – Example AOA Indicator

A thorough explanation of AOA and the principles of operation of Dynon Avionics' AOA Pitot probe are beyond the scope of this guide. Detailed information about AOA and Dynon Avionics' approach to AOA is available at dynon.com/aoa.

OAT

Outside air temperature (OAT) as shown in Figure 42 is displayed in the very lower-right corner of the PFD. Units can be set to degrees Fahrenheit or degrees Celsius. Reference the *SkyView Classic / SE / HDX System Installation Guide* for instructions on how to change the displayed units. If OAT is not valid (i.e., out of range, disconnected or damaged), then "OAT ---" is displayed.

Figure 42 – Example OAT

Synthetic Vision (SYNVIS)

Synthetic Vision depictions of terrain, runways, obstacles, and other information are meant as informational aids only. These depictions should not be used as the primary means for obtaining situational awareness of these features in flight.

Terrain data is obtained from third party sources. Dynon cannot independently verify the accuracy of terrain data at all geographical points.

When valid GPS data is available, the PFD features integrated Synthetic Vision. Synthetic Vision displays the terrain directly ahead of the aircraft. Terrain is graphically represented in sectional chart color variations which represent topographical elevations and water features. Terrain is textured with a subtle checkerboard pattern to aid in identifying aircraft movement.

In software version 13.0 and later, terrain alerting is available and is toggled on or off in the PFD>MODE>TERR ALERT menu. When enabled, terrain that is an immediate threat is colored red. Terrain that is potentially a threat is colored yellow. The coloring algorithm is different than yellow and red indications on the map and is only shown on terrain relatively close to the aircraft.

You may toggle the Synthetic Vision system off or on at any time. Press PFD on the Main Menu, then press MODE and then press SYNVIS. Additionally, SkyView offers the ability to show synthetic vision in “wide” mode that shows more of the peripheral view. Similar to wide angle lens camera in order to show more of the peripheral view, objects will also appear farther away. To adjust the view Press PFD on the Main Menu, then press MODE and then press WIDE. The following are examples of SkyView Synthetic Vision.

Figure 43 – SkyView Synthetic Vision View with Runways

Figure 44 – SkyView Synthetic Vision Normal View

Figure 45 – SkyView Synthetic Vision Wide View

Runways on Synthetic Vision

Runways are depicted at airports for which runway information is available in the US only. See the Moving Map Operation section for more information about aviation data availability. Note that in many cases, the information in the Synthetic Vision depictions of runways may not match the actual physical markings seen in real life. In fact, in many cases, the Synthetic Vision depictions show more information about them. The following information is shown on Synthetic Vision runways:

- Runway edge lines.
- Runway centerline.
- Runway numbers.
- Runway thresholds / displaced thresholds.
- Aiming point markings: two white strips drawn 1000’ after the threshold on runways 4000’ and longer.
- Runway width threshold markings: drawn immediately after the runway threshold, these groups of parallel lines visually indicate the width of the runway in the following manner according to runway width:
    - 0’-59’ wide: no lines.
    - 60’-74’ wide: 4 lines.
    - 75’-99’ wide: 6 lines.
    - 100’-149’ wide: 8 lines.
    - 150’-199’: 10 lines.
    - 200’+: 12 lines.

Flight Plan Airports and Waypoints on Synthetic Vision

In software version 15.0 and later, when a Flight Plan is engaged, airports and waypoints are shown in SynVis as flags.

Obstacles on Synthetic Vision

Obstacles are only depicted when the Navigation Mapping Software is licensed or in its 30 flight hour free introductory trial mode. See the SV-MAP-270 Navigation Mapping Software section for more information about map licensing and obtaining obstacle data.

Obstacles are only shown on Synthetic Vision if their highest point is within 1000 feet below your aircraft's GPS altitude. If the highest point of an obstacle is within 100 feet below your current GPS altitude to anywhere above you, it will be red. If the highest point of the obstacle is between 100 and 1000 feet below your current GPS altitude, the obstacle will be yellow. This is the same color scheme used on the Map Page as described in the Topography with Terrain Proximity Alerts Section.

Obstacles are shown at their actual height above the ground. In other words, if the flight path marker is above the top of an obstacle in the Synthetic Vision version, your aircraft should clear it in real life as well.

The tower symbology used to denote different types of obstacles is the same as used in the Moving Map depiction. See the Moving Map Symbology section of this guide for more information.

Traffic on Synthetic Vision

When a device that can receive traffic information is installed and configured, traffic can be displayed within the Synthetic Vision display to improve situational awareness.

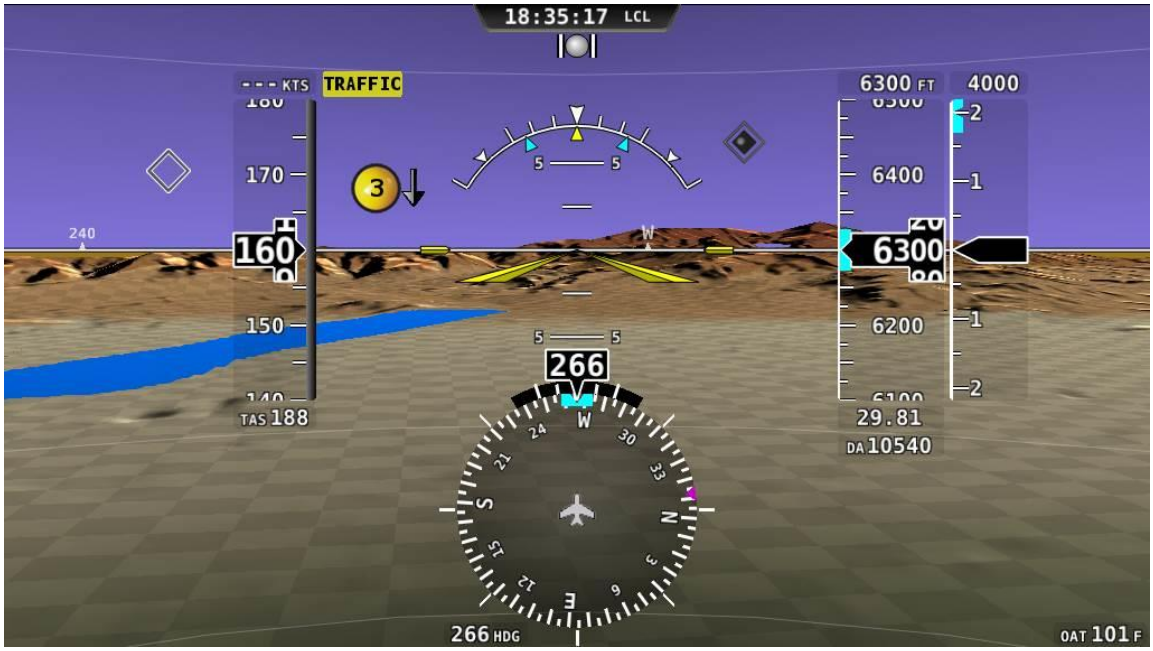


Figure 46 – Traffic Display on Synthetic Vision

Traffic information is informational only, and does not relieve the pilot-in-command of his or her responsibility to see and avoid traffic.

The graphical depiction of traffic is only displayed when Synthetic Vision is turned on via the PFD>SYNVIS menu option. However, the yellow textual “TRAFFIC” alert message on the PFD page is always shown when Traffic Advisories are known and traffic is enabled.

Traffic is displayed as reported by the device sending it to SkyView. The precision and accuracy of the location of traffic targets may vary from device to device, and this may impact how accurately the position is represented on the SkyView display. For example: TIS traffic updates, such as those received by the SV-XPNDR-26X, may be anywhere from 2-12 seconds old due to radar latency and other technical factors. Be sure to understand the traffic-detection capabilities of your traffic device thoroughly so you understand how to best interpret the position of the traffic displayed on SkyView.

Traffic targets are displayed using the same symbols that are used on the Map Page display of traffic. See the traffic section in the SV-MAP-270 Navigation Mapping Software section for complete descriptions of the types of targets that may be shown. Unlike the Map Page display, however, relative altitude is not provided numerically on Synthetic Vision. Instead, relative altitude is depicted by having the traffic symbols appear either above or below the zero pitch line, just like they would be if you were looking at traffic out the window. For example, in the figure above, all of the traffic targets being displayed are above our current altitude. Similarly, traffic targets that are shown to the left or right of the center of the attitude indicator are not directly ahead of you.

Traffic displayed on the PFD page can be configured to include just Traffic Advisories (TA), all targets, or no targets. See the *SkyView Classic / SE / HDX System Installation Guide* for information on how to configure how traffic is displayed.

Note that traffic is not visually scaled for distance. In other words, targets always appear the same size on the Synthetic Vision depiction, no matter how far away they are. However, yellow Traffic Advisory Targets (threats) are displayed larger than the diamond shaped Proximity Advisory Targets and Non-Threat Targets to accentuate their increased importance.

Figure 47 – Traffic Advisory on Synthetic Vision

Figure 48 – Proximity Advisory on Synthetic Vision

Figure 49 – Non-Threat on Synthetic Vision

Additionally, yellow Traffic Advisory targets contain a number within them that represents how far away they are (in miles, nautical miles, or kilometers, depending on your system setup) from your aircraft. The yellow Traffic Advisory target in Figure 50, for example, is 3 miles away, to the left, above, and descending.

Figure 50 – Traffic Alert

When a Traffic Advisory target is present, a yellow Traffic Alert Message appears on the PFD Page near the top of the IAS tape. Note that Traffic Advisory targets behind your aircraft will generate alerts. They can be seen on the Map Page, but will not be visible on the Synthetic Vision display as Synthetic Vision only shows the view in front of the aircraft.

Highway In The Sky (HITS) on Synthetic Vision

In software version 15.0 or later, when a Flight Plan is engaged, either with, or without Autopilot, Highway In The Sky (HITS) indicators (rectangles) can optionally be displayed in Synthetic Vision of the PFD. HITS is most useful for “hand steering” a Flight Plan when Autopilot is not installed or not engaged.

HITS will show the (VFR-oriented) Vertical Guidance that SkyView generates. All other altitude guidance is at the altitude bug, even when an external flight plan is being shown. HITS is intended to be used for enroute flight and during SkyView-generated Vertical Guidance.

Display of HITS can be toggled on and off: PFD > MODE > HITS. Repeated presses of the HITS button toggles display of HITS on and off. Note that SYNVIS must be enabled, and an altitude bug set, to display HITS.

Figure 51 – SkyView Classic Highway In The Sky (HITS) Presentation

Extreme Pitch Warning Indicators

The SkyView PFD shows large red arrows as pitch warning indicators in extreme attitudes (i.e., 45 degrees or greater pitch up or down). These indicators point to the horizon and indicate which way to maneuver to attain a level attitude. Indicators are accompanied with a small sliver of sky or ground bordered with a white dashed horizon line, depending on the current attitude. The pitch warning indicators can be enabled or disabled through the setup menus. See the *SkyView Classic / SE / HDX System Installation Guide* for information about this setting.

Figure 52 illustrates the pitch up warning arrows with the slivers of ground.

Figure 52 – Extreme Pitch Warning Indicator Arrows

Six-Pack Presentation

In software version 10.0 or later, SkyView includes the traditional six-pack analog presentation of flight instruments as well as the EFIS tape-based display. SkyView's "six-pack" flight instrumentation mode lets you fly the gauges you're used to if you're new to glass. After flying in the six-pack mode, try out the "EFIS" style as you get comfortable: changing the presentation is just a few buttons away.

Figure 53 – Analog PFD with Synthetic Vision

Figure 54 – Analog PFD without Synthetic Vision

To turn on the six-pack, SynVis, or EFIS presentation go to the PFD Menu > MODE and select the layers to turn on either EFIS or SIX-PACK with or without SYNVIS. All the same information is displayed on the six-pack and EFIS tapes and the six-pack format respects all the same settings. All of the information boxes for Density Altitude, True Airspeed, Autopilot alert banners, Flight Director, and bugs, etc. appear just like they do for the EFIS tapes. However, EFIS tapes are required to view the Extreme Pitch Warning Indicators. The six-pack presentation can be turned off completely in the Setup Menu, see the *SkyView Classic / SE / HDX System Installation Guide* for details.

In SkyView software version 15.1, indicators for 1000 and 10000 feet were added to better emulate a mechanical gauge.

For example, here is what 4500 feet looks like on the new instrument:

Figure 55 – New Instrument Altitude Gauge

ADAHRS (Flight Instrument) Redundancy and Cross-Checking

SkyView systems support multiple SV-ADAHRS-20X modules for redundancy and manage failure scenarios by automatically switching to backup modules should an ADAHRS completely fail.

Additionally, in the event that multiple ADAHRS disagree, the display will annunciate this with an on-screen alert that calls out which parameter(s) are not the same on all ADAHRS. Parameters that are continuously cross-checked include attitude (pitch and roll), magnetic heading, G Meter, turn coordinator (slip/skid ball), airspeed, and altitude.

Figure 56 – ADAHRS Cross-Checking Disagreement

Once SkyView has annunciated a cross-check comparison problem, press COMPARE to see both ADAHRS side-by side. The ADAHRS that was previously displayed on the PFD is labeled “ACTIVE”, while the one that was not previously being displayed - but which was being used as the cross-check reference – will be labeled as “STANDBY”. Additionally, the labels “PRIMARY” and “ALTERNATE” designate which ADAHRS is normally displayed when both are in agreement and neither is disabled.

Figure 57 – ADAHRS Cross-Check Comparison

Once you have determined which ADAHRS is incorrect, press DISABLE to tell SkyView not to use it for the duration of the flight:

Figure 58 – ADAHRS Cross-Check Comparison (one ADAHRS disabled)

Figure 59 – ADAHRS Cross-Check Comparison – six-pack

Press exit to return to normal operation. The PFD will annunciate that only a single ADAHRS is available for use:

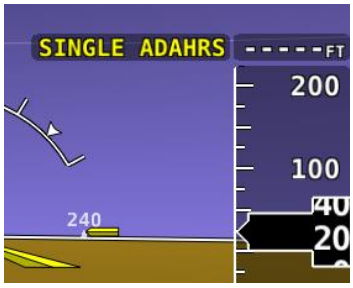


Figure 60 – Single ADAHRS Mode Flag

If, after you've entered the ADAHRS comparison screen, you do not disable an ADAHRS, a red warning and ADAHRS CROSS CHK ERROR alert will persist in the Message Alert Area (above button 8). To go back to the ADAHRS comparison screen to disable an ADAHRS, see the below instructions:

ADAHRS Source Selection and Configuration

Enter the ADAHRS Source Selection Page: IN FLIGHT SETUP MENU (press/hold buttons 7/8)> ADAHRS SOURCE SELECTION…).

If you are on the ground, this will be under SETUP MENU > PFD SETUP > ADAHRS SOURCE SELECTION.

ADAHRS Status

The ADAHRS labeled ACTIVE is the one that is being displayed on the PFD.

An ADAHRS labeled STANDBY is being used for cross-checking, but it is not being displayed on the PFD.

PRIMARY / ALTERNATE ADAHRS Selection

The ADAHRS labeled PRIMARY is the one that will be preferentially chosen by SkyView as the active ADAHRS.

An ADAHRS labeled ALTERNATE is one that is available to be used in the event of a failure or problem with the primary ADAHRS. However, it normally won't be chosen for display on the PFD unless the primary ADAHRS has failed or has manually been disabled.

To change which ADAHRS is the PRIMARY ADAHRS, highlight an ALTERNATE ADAHRS and press the PRIMARY button to elevate it to PRIMARY status.

To disable an ADAHRS until SkyView is next powered up, simply highlight it with the joystick and press the DISABLE button.

To see the same comparison screen that is presented when a cross-check error occurs, press the COMPARE button at the bottom of the display.

Press BACK to exit the ADAHRS Source Selection Page or press EXIT to return to the Main Menu. Either of these actions will save the ADAHRS source settings.

PFD Menu

BACK	G METER	MODE	BRG 1	HSI SRC	BRG 2	BUGS	NO MSG

The PFD Menu is accessible from the Main Menu by pressing PFD (MAIN MENU > PFD). Users can reset the baro, toggle Synthetic Vision on or off, and configure the bearing and NAV sources.

Back

Press BACK to return to the Main Menu.

G Meter

Press G METER to toggle the G Meter on and off. When the G Meter is displayed, it replaces the HSI/Compass Rose, though numerical magnetic heading above the HSI area remains. The G Meter shows an analog "needle" that indicates the instantaneous G loading of the aircraft. Depending on how the G Meter is configured, the analog range may have yellow and/or red caution ranges configured to visually indicate aircraft G limits are being approached. Instantaneous G information is also shown digitally in the center of the gauge.

Figure 61 – G Meter on PFD

The smaller digital numbers above and below the larger instantaneous G number are the maximum and minimum Gs that the aircraft has experienced since the G Meter was last reset. Press PFD > RESET G to manually reset the G Meter. The G Meter may also be set up to automatically reset the min/max G readings every time SkyView starts up.

The G Meter can also be configured to “pop up” automatically under certain conditions. When configured this way, the G Meter will appear automatically when the aircraft’s instantaneous G loads exceed thresholds that have been selected. Once the G Meter has appeared, it will remain on the display until the instantaneous aircraft G loading falls back below those thresholds.

See the *SkyView Classic / SE / HDX System Installation Guide* for further information about G Meter configuration.

MODE

Figure 62 – PFD Display Mode Selection Options

Enter the Mode menu to:

- Turn on/off synthetic vision.
- Toggle between normal and wide PFD view.
- Turn on/off terrain alerts in synthetic vision.
- Turn on/off highway in the sky.
- Turn on/off airport flags.
- Toggle between PFD tape mode and six-pack mode.

Bearing Source 1 (BRG 1)

Press this button to cycle through the available bearing sources for the first bearing needle.

HSI Source (HSI SRC)

SkyView's Navigation Mapping Software course information can be displayed on the SkyView HSI display when it is navigating to an active waypoint. It is always the SKYVIEW source.

Press this button to cycle the HSI through the different navigation data sources that are connected to the SkyView system (e.g., GPS 0-4, NAV 1-4, or custom names that may be configured). Other than SKYVIEW, which is sourced from SkyView's own Navigation Mapping Software, these are all external navigation devices such as other portable GPS units (such as the Garmin 496), panel mounted IFR GPS systems (such as the Garmin 430), and panel-mounted navigation radios (such as the Garmin SL30). In SkyView software version 10.0+, pilots can change the displayed names of external GPS and NAV radios to custom names (e.g. GPS 1 could become "GTN650", for example). These names appear on the PFD HSI Info Item, and for ARINC IFR GPSs such as the GTN and GNS series, in the Flight Plan menu as well (see Navigation Mapping Software features for more details). Reference the *SkyView Classic / SE / HDX System Installation Guide* for more information regarding external serial navigation device installation, configuration and naming.

Note that using the HSI SRC button to toggle the HSI source does not affect what is displayed on the SkyView map: It normally displays the flight plan from SkyView's own GPS mapping capabilities. However, note that from within the MAP Menu there exists a feature that allows one to display flight plans from external IFR GPS devices on the map.

As this button is used frequently for IFR flight with the Autopilot, and is duplicated in the Autopilot menu for convenience.

Bearing Source 2 (BRG 2)

Press this button to cycle through the available bearing sources for the second bearing needle.

Bugs

Enter the Bugs Menu to configure which bugs are on or off. Reference the PFD Symbology Bugs Section for more information.

Messages (Text Varies)

The Message Alert Area is always present above the rightmost button and contains important SkyView messages and alerts.

Top Bar

The Top Bar contains a clock, as well as status information for Autopilot, Transponder, SkyView Backup Battery and COM Radio. Clock behavior is described here. All other Top Bar behavior is covered in the relevant chapter of this guide.

The clock is part of the Top Bar which is always displayed regardless of the screen layout.

The clock is always displayed centered at the top of the screen in all screen display modes on the Top Bar in 24 hour/military format. Time is initially sourced from a GPS feed and is only displayed when valid GPS data is being received or if (primary or battery) power has been maintained continuously since valid GPS data was received. If there has never been an initial GPS time set or time has been lost due to loss of power,"--:--:--" is displayed. When valid GPS data is received again, time will be displayed.

Figure 63 – Example SkyView Clock

Reference the How to Configure the Top Bar Section of this guide for instructions on how to configure the Top Bar.

Up/Down Timers

A configurable count up/down timer can be found by going to TOOLS > TIMER.

Figure 64 – Timer Menu

Figure 65 – Up Timer

Figure 66 – Down Timer

Figure 67 – Down Timer Expiring

Once the TIMER menu is entered, the clock in the top bar displays TIMER information instead of the local or UTC clock that is normally shown. Leaving the timer menu will restore the clock if a timer is not running.

To operate the timer once in the TIMER menu:

- MIN and SEC knobs: Turn to set the time.
- BACK: Leaves the timer menu and returns you to the Main Menu.
- ZERO: Resets the timer to zero.
- LAST: Resets a DOWN timer to the last value it was set to before it was started.
- DOWN/UP: Toggles the timer mode. Both count-up and count down timers are available:
    - When a DOWN timer reaches zero, an audible "timer expired" message is played (if audio output is connected), the timer flashes white for a few seconds, and a "timer expired" alert is annunciated in the message alert area. Press button 8 to view and acknowledge this alert. If a DOWN timer is not reset, the timer will continue to count down negatively.

- When the UP timer is running, it will stop at 99:59 minutes.
- RUN: Turns the timer on and off. RUN is highlighted when the timer is on.

Checklists

Checklists are composed on a computer and then transferred to SkyView with a USB flash drive. Checklists can be composed with any plain ASCII text editor such as the “Notepad” app included with Windows, or the “TextEdit” app included with Mac OS. Microsoft Word and Windows WordPad will also work to compose a checklist file if you save the file as a .txt file (plain text format). For more information how to make and load your own checklists, see the System Installation Guide.

Checklists are shown on the display as a “list of lists”. The top-level checklist is a list of all available checklists.

Accessing a Checklist on your SkyView Display

To access your checklist on a SkyView display, from the main menu, go to the TOOLS menu and push the CHECKLIST button. Selecting a list (by touch or using the cursor) will bring up the steps of that list. The lists are nested only one level. Scroll through the list using the cursor.

Note that your checklist will continue to be displayed until the CHECKLIST button is pressed again or the X in the corner is touched. If the menus change, return to the main menu, push the TOOLS button, and press the CHECKLIST button.

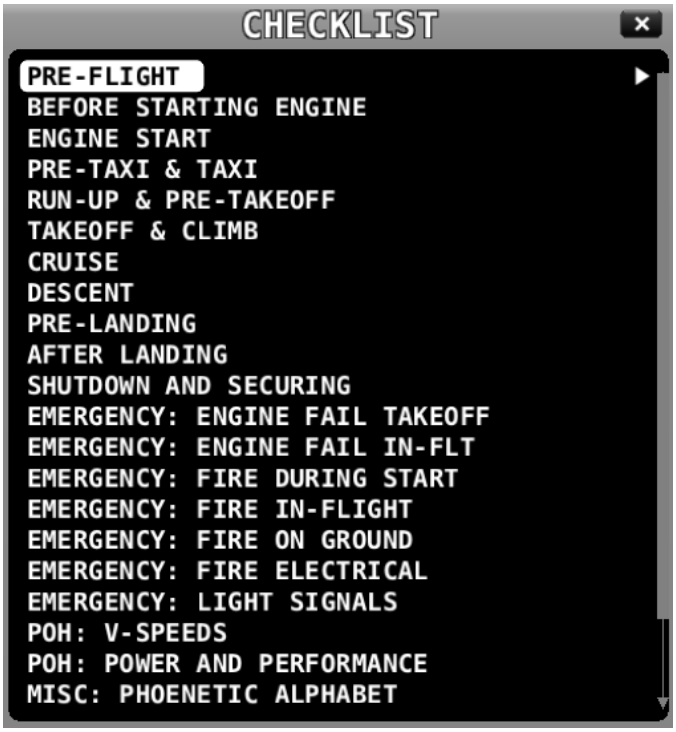


Figure 68 – (Example) List of Checklists Available

Accessing the Weight and Balance Calculator on your SkyView Display

Once the Weight and Balance Calculator has been properly configured in System Setup, it is available for viewing on your SkyView display. During installation you will have entered basic information about your aircraft, including empty weight, its arm and moment, defined various loading stations, specified the aircrafts CG limits, and whether they are metric values.

To access the Weight and Balance Calculator on your SkyView display, from the main menu, go to the TOOLS menu and push the WT & BAL button. Enter the required information to determine your aircraft's current Weight and Balance. The zero fuel line shows the predicted weight, arm and moment when your fuel is empty. Notice that the CG moves forward when the fuel is exhausted.

Weight and Balance supports metric units, as well.

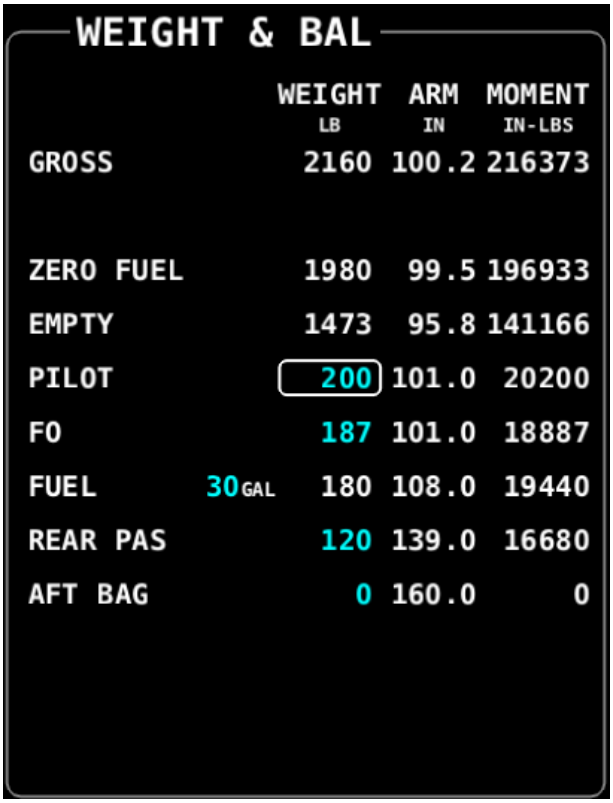


Figure 69 – Weight and Balance Calculator

Accessing the Maintenance Log on your SkyView Display

To access the Maintenance Log on your SkyView display, from the main menu, go to the TOOLS menu and push the MAINTENANCE button. The Maintenance Log will display any a list of items tracked for maintenance either in chronological time, or in reference to TACH TIME or HOBBS TIME. Items that are past due are shown in Red. In Figure 70 below, note that the Annual is past due. Additionally, when an item is past due a "Maint Log Item Expired" message is displayed during system startup.

Figure 70 – Maintenance Log

SkyView Knob Control Panel Operation

The SV-KNOB-PANEL SkyView knob control panel adds three additional dedicated knobs to the SkyView system for the most frequently adjusted bugs. One knob is dedicated to each of the Altitude Bug (ALT), Altimeter Setting (BARO) and Heading/Track Bug (HDG/TRK) on the primary flight display. These knobs behave exactly like the SkyView joystick knobs do when they are set to these functions: turn them to adjust the value they control. Press and hold them to synchronize the ALT and HDG/TRK bugs to the aircraft's current altitude or heading/track. Press and hold BARO set the altimeter setting to either the nearest METAR (when ADS-B is available in-flight), to standard pressure (29.92 inHg or 1013 millibars) (when at/above 18k feet or no ADS-B on board), or to make the altimeter match GPS altitude (when on the ground).

5. EMS Operation

This chapter describes SkyView EMS functionality and a few of the advanced ways to use it to monitor the health and operation of your engine.

This chapter references the Engine Page. This page should have been configured during SkyView installation. Reference the *SkyView Classic / SE / HDX System Installation Guide* for more information.

Engine Page Layout

The three Engine Pages (100%, 50%, and 20%) are configurable by the pilot and should be configured during system installation. The specific widgets in, and overall appearance of the 20% and 50% Engine Pages are not scaled down versions of the 100% Engine Page. They are unique layouts and must be laid out individually.

Each of the three engine pages displays important engine parameters acquired using an SV-EMS-220/221 module, its sensors, and other advanced engine monitoring features. The engine page shown below in Figure 71 is the 50% page.

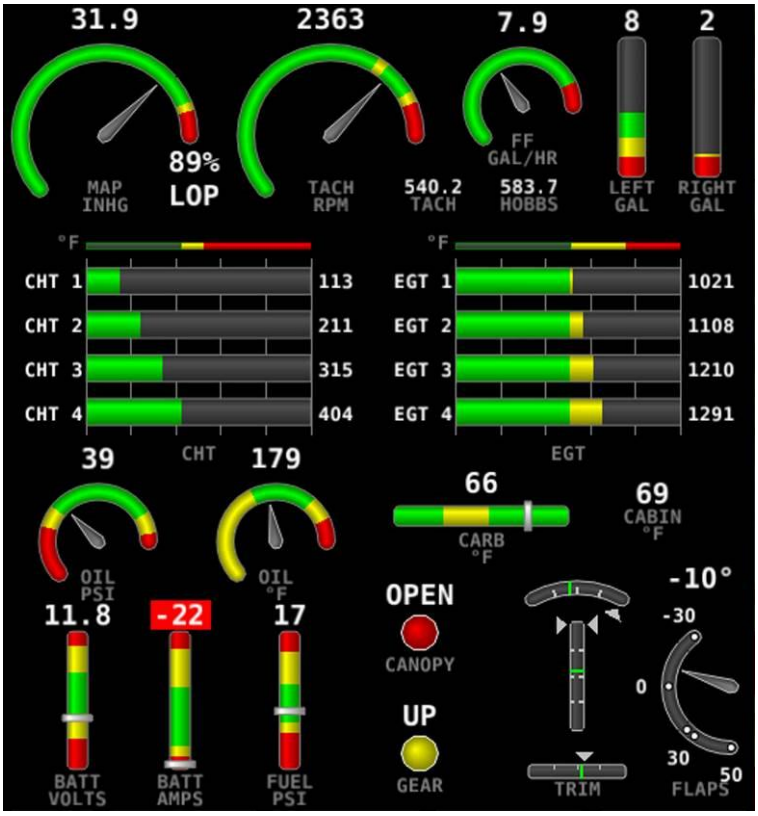


Figure 71 – Example 50% Engine Page for Single Engine

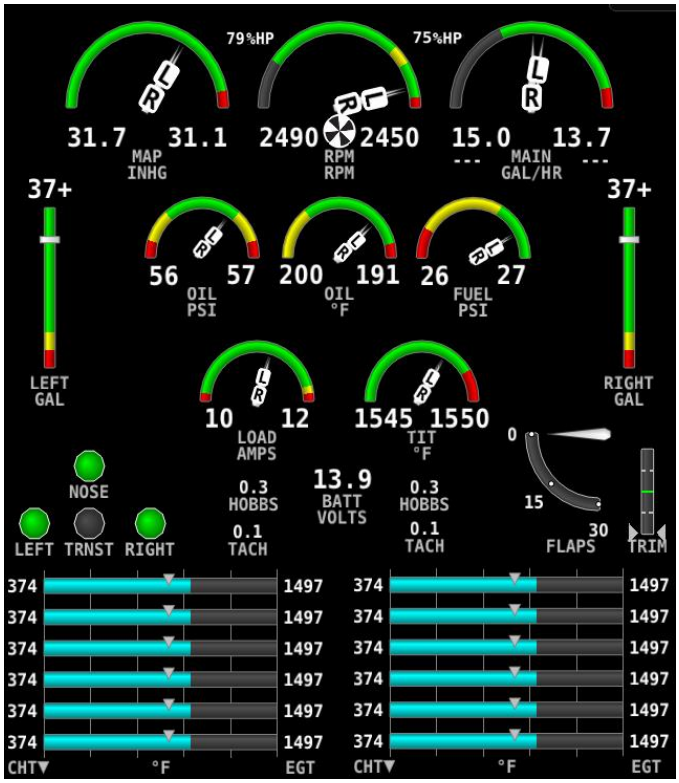


Figure 72 – Example 50% Engine Page for Twin Engine

The appearance and position of each element on the engine page is configurable using the SCREEN LAYOUT EDITER under the EMS SETUP Menu in System Setup. It should have been configured during installation. All engine widgets that have assignable color ranges (e.g., red, yellow, green, black, blue, white, purple, cyan, and orange) for customization. For more information regarding the Screen Layout Editor, reference the SkyView Classic / SE / HDX System Installation Guide.

The green markings on pitch/roll/rudder trim indications, if they exist, nominally depict the take-off position markings as defined during calibration.

Engine warning alerts are only triggered when their respective sensors are configured as self-clearing or latching alarms. If a sensor's alarm is configured as off, no alert will trigger, even if that sensor's measurement enters a range defined as red. Reference the *SkyView Classic / SE / HDX System Installation Guide* for more information regarding alarm configuration.

Engine parameters only trigger alerts in the Message Notification Area and Message Window when they enter their "red" ranges. In other words, "yellow" caution ranges for engine parameters do not trigger alerts. Yellow caution ranges, however, are visually annunciated via yellow highlighting on the Engine Page.

Combined CHT/EGT Widgets

Most of the graphical engine widgets present information from a single engine sensor. An exception is the combined CHT/EGT widget shown in the figure blow.

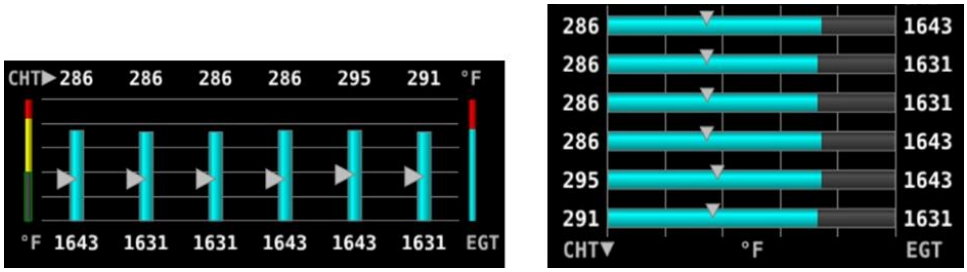


Figure 73 – Example of Combined CHT/EGT Gauge (Vertical and Horizontal Styles)

This combined CHT/EGT widget displays all the engine's CHTs and EGTs in one compact gauge. EGTs are displayed numerically down the right side of the gauge. They are represented graphically by the solid bar graph. CHTs are displayed numerically on the left side of the gauge. They are graphically represented by the white "tick marks" that overlay the EGT bars. When caution or alarm points are red, this tick mark changes colors with the numbers. This representation allows all CHTs and EGTs to be displayed in a way that affords quick comparison of their values, whether raw data or a graphical comparison is preferred.

Combined Twin-Engine Widgets

The following functions can be placed on an Engine page as combined widgets:

- Oil Pressure (OIL PRES)
- Oil Temperature (OIL TEMP)
- Fuel Pressure (FUEL PRES)
- Main Fuel Flow (MAIN FLOW)
- Amperage Load (LOAD AMPS)
- Manifold Air Pressure (MAP PRES)
- Turbine Inlet Temperature (TIT TEMP)
- RPMs (RPM RPM)

Figure 74 – Example of Combined Oil Temperature Widget Styles

Combined twin-engine widgets are useful for laying-out Engine pages with 50% and smaller page layouts. They have two pointers or tick marks, indicating left and right engines. Combined engine widgets are configurable using the Screen Layout Editor. These widgets should have been configured during installation.

Synchroscope

The Synchroscope is used to help synchronize engine RPMs in twin-engine aircraft. It should be located near the RPM widget (see Figure 75). When the Synchroscope is rotating clockwise, the right engine is turning faster than the left. When the Synchroscope is rotating counterclockwise, the left engine is turning faster than the right. This indication is configurable using the Screen Layout Editor. These widgets should have been configured during installation.

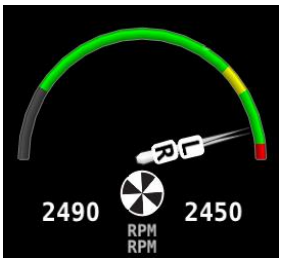


Figure 75 – Example of a Synchroscope and a Combined RPM Widget

Rotax 912/912iS Behavior

Indicators for Rotax 912iS power/eco mode and throttle position are available:

- The POWR/ECO widget will turn green and display “ECO mode” when the engine is running economically. In this mode you will experience reduced fuel consumption.
- When the engine is off, the THRTL widget will show a green range to assist cold-start scenarios. Note that both lane switches and start power must be on in order to display the throttle position widget.

See your Rotax manual for more information.

SkyView can be configured to adjust the oil temperature and tachometer gauges for the Rotax 912 engine dynamically to reflect limitations that Rotax specifies for that engine. When this behavior is turned on (per the *SkyView Classic / SE / HDX System Installation Guide*), the tachometer and oil temperature behave in the following ways:

Tachometer for Rotax 912:

When OIL TEMP < 120° F, the TACHOMETER displays these ranges:

- 0-1400 *and* 4000-6000 RPM in RED.
- 1400-1800 *and* 2500-4000 RPM in YELLOW.
- 1800-2500 RPM in GREEN.

When OIL TEMP > 120° F, the TACHOMETER displays *different* ranges:

- 0-1400 *and* 5800-6000 RPM in RED.
- 1400-1800 *and* 5500-5800 RPM in YELLOW.
- 1800-5500 RPM in GREEN.

The alarm type for the tachometer is the "self-clearing" type.

Oil Temperature Gauge for Rotax 912:

When OIL TEMP < 190° F, the OIL TEMP gauge displays these ranges:

- 100-120 and 230-266° F in YELLOW.
- 120-190° F in GREEN *if OIL TEMP has been above 190° F "more recently" than OIL TEMP was below 120° F;* otherwise 120-190° F is displayed in BLACK OUTLINED IN WHITE.
- 190-230° F in GREEN.
- 266-280° F in RED.

When OIL TEMP is > 190° F, the OIL TEMP gauge will display *different* ranges:

- 100-120 *and* 230-266° F in YELLOW.
- 120-230° F in GREEN.
- 266-280° F in RED.

The alarm type for oil temperature is the "self-clearing type.

Rotax 912iS

A detailed list of faults reported by the Rotax 912iS engine computer is shown under EMS > FAULTS. Normally, it should say NONE. Consult your Rotax service organization for details of what to do if a fault is shown.

Engine Menu

The Engine Menu is accessed from the Main Menu when EMS data is displayed by pressing ENGINE.

LEAN

The engine monitor provides multiple methods to assist you in setting the mixture of your engine for various functions. The first, and most basic, is to just watch the EGT display as the engine is richened or leaned. You can watch for the EGTs to peak and then richen or lean as desired from that point. The engine monitor also includes a leaning function to automate this process.

To activate leaning mode, press LEAN. With this mode activated, LEAN highlights, and the label "LEAN" is displayed underneath the EGT bars to clearly differentiate it from the normal operating mode. This is depicted in Figure 76.

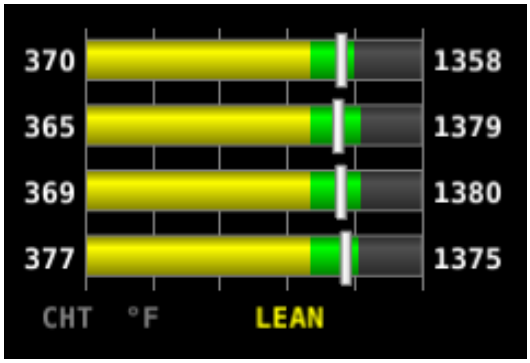


Figure 76 – Entering Lean Mode

As each cylinder peaks, the cylinder numbers on the left side of the EGT bars are replaced by a number indicating the cylinder peak sequence, followed by the difference from its peak temperature (on combined EGT/CHT graphs pages, this information replaces the EGT temperature itself due to space constraints). Given this information, you may set your mixture more accurately to achieve a given EGT delta value on either the rich or lean side of peak EGT. This is depicted in Figure 77.

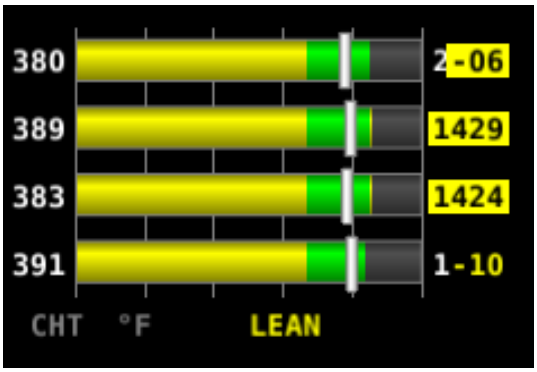


Figure 77 – EGTs Peaking

After the last cylinder peaks during a leaning operation the difference in fuel flow between the first and last cylinder peaks is displayed. If the fuel flow decreases, it is shown as Lean of Peak. If fuel flow increases, it is shown as Rich of Peak. This is depicted in Figure 78.

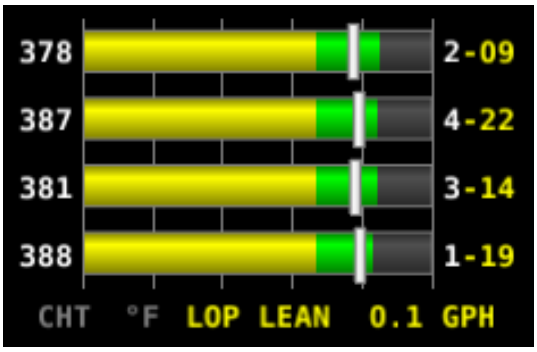


Figure 78 – Lean of Peak

To exit the Lean mode, press LEAN again; the EGT/CHT display then returns to its normal state.

For best results, lean carefully by making small adjustments and allowing some time for temperatures to stabilize before leaning further. In addition to the EGT temperatures, you can also watch the fuel flow rate and CHT temperatures. Carefully read and follow your engine manufacturer's leaning recommendations for best performance.

On some engines, when given the proper set of inputs, the EMS can also calculate lean-of-peak or rich-of-peak operation in real time. To do this, the EMS needs access to OAT, MAP, RPM, Altitude and fuel flow, engine horsepower setting, engine redline setting, and be used on a normally aspirated Lycoming or Continental engines. This information is based on Lycoming and Continental power charts and is updated in real time. The leaning information has four states: LOP, ROP, and PK (Peak), and PK? (Peak Unknown). This information can be used to determine when it is safe to lean the engine, and if the current operating state is near peak or not. While this information is based on published charts, you should independently verify via manual leaning that this data matches your install and engine. If the EMS does not have all of the information it needs to calculate the peak state, PK? (Peak Unknown) is shown.

FUEL

The FUEL menu primarily contains controls for adjusting the fuel computer. See the dedicated Fuel Computer section for details on fuel computer operation.

CLR TMR

Press CLR TMR to reset both the Engine Trip Timer and the Flight Trip Timer to 0 hours. See the Timers section for more information on timer functions.

Timers

SkyView has internal tach, Hobbs, and other timers that each run at different times. EMS timers are available for placement on the Engine Pages via the Screen Layout Editor. For more information regarding the Screen Layout Editor, reference the *SkyView Classic / SE / HDX System Installation Guide*.

Engine timers are displayed at 1/10 hour increments.

Tach Time - labeled **TACH** when displayed on an Engine Page - is a measure of engine time normalized to a cruise RPM. The cruise RPM parameter must be set properly in the system setup to generate a correct tach time

Hobbs Time - labeled **HOBBS** when displayed on an Engine Page - is a simple timer that runs whenever the oil pressure is above 15 PSI or the engine is above 200 RPM. It essentially runs when the engine does.

The **Engine Run Timer** - labeled **RUN TIME** when displayed on an Engine Page - is a Hobbs style timer that records the time your engine has been running during your current flight. It resets the first time the engine is started after SkyView is powered on. This allows you to view your previous flight's Engine Run Time any time before you start your engine before a flight.

The **Engine Trip Timer** - labeled **TRIP RUN** when displayed on an Engine Page - is a Hobbs style timer that records the time your engine has been running. Unlike the Hobbs time, it can be reset by pressing ENGINE > CLR TMR.

The **Total Air Timer** - labeled **AIR TOTAL** when displayed on an Engine Page - runs any time that SkyView determines that the aircraft is in flight. SkyView uses the presence of significant airspeed or GPS speed to decide whether the aircraft is flying. This timer can only be reset or adjusted in the Aircraft Information menu within SkyView Setup. See the *SkyView Classic / SE / HDX System Installation Guide* for information about using SkyView's Setup Menu.

The **Air Timer** - labeled **AIR TIME** when displayed on an Engine Page - runs any time SkyView determines the aircraft is in flight. SkyView uses the presence of significant airspeed or GPS speed to decide whether the aircraft is flying. Resets as SkyView detects that the aircraft has transition to "in the air" This time is also optionally used to calculate the Switch Fuel Tank Reminder.

The **Air Trip Timer** - labeled **AIR TRIP** when displayed on an Engine Page -runs any time that SkyView determines that the aircraft is in flight, just like the Total Flight Timer. Unlike the Total Air Timer, it can be reset by pressing ENGINE > CLR TMR.

A **Switch Fuel Tank Reminder** can be configured to alert the pilot to switch their fuel tanks at a set time or fuel usage interval (based on the fuel computer's fuel calculations). When enabled, it will periodically annunciate a "Switch Fuel Tank" alert message and audio alert. There is no visible counter for this timer. See the *SkyView Classic / SE / HDX System Installation Guide* for details on configuring this reminder.

Fuel Computer

The Fuel Computer is a built-in feature which monitors fuel consumption as determined by an optional fuel flow sensor and maintains continuously updated dual engine monitoring.

For aircraft with two engines, SkyView can be configured to monitor both engines when two SV-EMS-220/221 modules are installed. The flow-based fuel computer feature can be configured in one of two ways:

- In one configuration, it will totalize all fuel and usage throughout the aircraft – as you'd want when there is a single combined fuel system in the aircraft.
- Alternatively, it can compute each engine's fuel totals and usage quantities separately, as you'd want if each engine were served by a completely independent fuel system.

In either case, the instantaneous fuel flow reading will be indicative of the current fuel usage of the corresponding engine. The following info items will either be based on either the total fuel in the aircraft or the total fuel per fuel system: Fuel Remaining, Fuel Used, Fuel Efficiency, Fuel at Waypoint, and Range values.

In a dual engine system, the following timers are running when either engine is running: Run Time, Total Air Time, Trip Run, Air Trip, and Air Timer. However, the Hobbs and Tach timers are tied to the individual engine.

See the *SkyView Classic / SE / HDX System Installation Guide* for more details on setup and configuration of dual engine monitoring.

By using the fuel flow sensor data and GPS information together, SkyView can generate and display different info items that pertain to your aircraft's computed fuel state and performance. They are available for placement on the Engine Pages via the Screen Layout Editor. For more information regarding the Screen Layout Editor, reference the *SkyView Classic / SE / HDX System Installation Guide*.

The Fuel Remaining, Fuel Used, Fuel Efficiency, Fuel at Waypoint, and Range values are not directly measured. These values are calculated based upon measured flow rates and *user input* of fuel quantity. Do not use these values as primary indicators.

By using the optional fuel flow sensor and GPS information together, SkyView can generate and display different info items that pertain to your aircraft's computed fuel state and performance. They are available for placement on the Engine Pages via the Screen Layout Editor. For more information regarding the Screen Layout Editor, reference the *SkyView Classic / SE / HDX System Installation Guide*.

The Fuel Remaining info item (displayed as FUEL REM) displays the current amount of fuel computed on board, based on your input of the aircraft's starting fuel state and the amount of fuel that has the fuel flow sensor has seen flow through it.

The Fuel Used info item (displayed as GALS USED) displays the amount of fuel that has been used during your flight. Note that Fuel Used resets itself when the unit detects that oil pressure has exceeded 15 PSI for the first time after being powered on. This allows you to view the fuel used value from your last flight before engine start.

The Time Remaining info item (displayed as TIME REM) displays how much time is estimated remaining before the aircraft is out of fuel.

The Fuel Efficiency info item (displayed as NM/GAL) displays how efficiently the aircraft is using fuel with respect to the speed it is traveling over the ground (this also can be displayed as MI/GAL, KT/GAL, KM/LTR).

The Fuel at Waypoint info item (displayed as WPT GAL) displays how much fuel will remain at the next waypoint. This info item uses the current HSI navigation source for waypoint information, and only displays information when there is a waypoint being navigated to. It assumes you are flying directly at the waypoint and does not adjust for non-direct flights.

The Fuel Range info item (displayed as RANGE) displays the distance the aircraft can travel at its current GPS ground speed before it is out of fuel.

Fuel Menu (Adjusting the Fuel Computer)

To obtain accurate data, you must reset the fuel computer every time you add fuel to the aircraft. SkyView can assist with this through the Fuel Auto Detect setting described in this section.

Fuel computer adjustments are made under the ENGINE > FUEL menu. When FUEL is pressed, the window in Figure 79 is displayed:

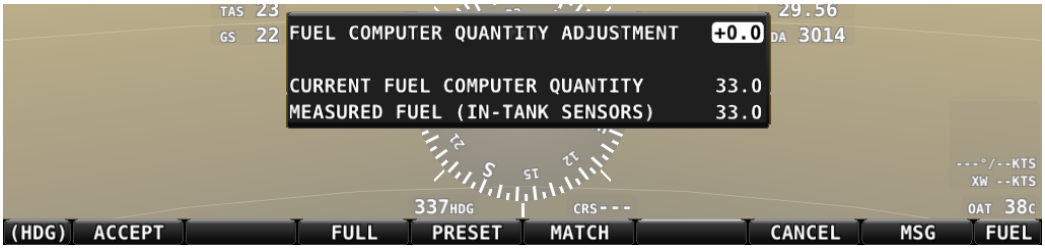


Figure 79 – Fuel Computer and Fuel Menu

- "Fuel Computer Quantity Adjustment" is the amount of fuel that you have told the fuel computer to presently add or subtract from the previous total fuel state.
- "Current Fuel Computer Quantity" is the total amount of fuel on board as far as the fuel computer knows. This is the number that ultimately needs to be correct in order for the fuel computer to accurately perform its calculations.
- "Measured Fuel (In-Tank Sensors)" is the amount of fuel measured by the resistive or capacitance senders, if installed. If these are well-calibrated, then the Total Fuel and the Measured Fuel lines should be very close to each other.
- If no fuel sensors are installed or calibrated, "Measured Fuel" and "Levels Mismatch" will not be displayed.

There are a few different ways to adjust the fuel computer's fuel state:

- While the FUEL menu is displayed, turn the FUEL knob to add or subtract fuel. This is limited to adjustments that set the Total Fuel to between 0 and the total fuel capacity as defined in the Setup Menu.
- Press FULL to have SkyView recall a previously programmed amount of fuel which represents the full fuel load of the aircraft. See the *SkyView Classic / SE / HDX System Installation Guide* for information about how to set this value.

- Press PRESET to have SkyView recall a previously programmed amount of fuel which represents different fuel loading besides “full”. This is commonly used in aircraft that have visual tabs in the tanks to easily fill to a non-full but well-defined fuel state. See the *SkyView Classic / SE / HDX System Installation Guide* for information about how to set this value.
- Press MATCH to have SkyView automatically add/subtract the appropriate amount of fuel so that Total Fuel matches the Measured Fuel value that the physical fuel tank sensors are measuring. Press ACCEPT to confirm the new displayed Total Fuel and exits the FUEL menu,
- Press CANCEL to discard any changes made to the Total Fuel and exit the FUEL menu.

Beware that the value that SkyView adjusts the fuel computer when MATCH is used is only as accurate as your fuel level sensor measurements.

Auto Fuel Detect

The fuel computer can optionally be configured to detect when fuel has been added while SkyView was off, as would be the case during a normal refueling operation. When configured to detect fuel additions, SkyView will automatically display the FUEL menu upon startup as a reminder to adjust the fuel computer, along with a FUEL MISMATCH message to indicate that the fuel measured by the in-tank fuel quantity sensors does not closely match the fuel computer’s fuel remaining value.

Twin Engine Monitoring

For aircraft with two engines, SkyView can be configured to monitor both engines when two SV-EMS-22X modules are installed. This requires two or more SkyView displays in the system, as each EMS module’s information is displayed on one display exclusively. In this set up each engine is monitored independently on a single display.

One exception to the above is that SkyView’s flow-based fuel computer feature can be configured in one of two ways: In one configuration, it will totalize all fuel and usage throughout the aircraft – as you’d want when there is a single combined fuel system in the aircraft. Alternatively, it can compute each engine’s fuel totals and usage quantities separately, as you’d want if each engine were served by a completely independent fuel system. In either case, the instantaneous fuel flow reading will be indicative of the current fuel usage of the corresponding engine. The following info items will either be based on either the total fuel in the aircraft or the total fuel per fuel system: Fuel Remaining, Fuel Used, Fuel Efficiency, Fuel at Waypoint, and Range values.

In a dual engine system, the following timers are running when either engine is running: Run Time, Total Air Time, Trip Run, Air Trip, and Air Timer. However, the Hobbs and Tach timers are tied to the individual engine.

See the *SkyView Classic / SE / HDX System Installation Guide* for more details on setup and configuration of dual engine monitoring.

VP-X Operation

Dynon SkyView can interface with the Vertical Power VP-X System to provide robust monitoring and control of your electrical system via your SkyView system. In order to use this feature, a Vertical Power VP-X system is required, along with software license for the VP-X features within SkyView.

VP-X License Information

The VP-X software features are enabled on Dynon SkyView by purchasing a VP-X license code from Dynon Avionics and entering it into your SkyView system. Only **one** VP-X license is needed in a SkyView system, no matter how many displays are attached. That license is applied to only one display, but that display stores the license information for the entire system. In normal use, license information is shared with all displays connected via SkyView Network to allow the VP-X features to be operated on any display in the system.

Information about purchasing a license, installing a VP-X license on a SkyView system, and configuring SkyView to properly interface with the VP-X can be found by referencing BOTH the Dynon *SkyView Classic / SE / HDX System Installation Guide* and the Vertical Power VP-X manuals.

VP-X SkyView Interface Overview

SkyView's VP-X page provides the ability for SkyView to view and control the following features of the VP-X:

- Show a list of all configured channels on the VP-X, including the starter, alternator, trim, and flap channels.
- Show the status of each circuit, whether on or off or faulted (and type of fault).
- Total current draw of all circuits.
- View the current draw, in amps, of each circuit, down to 1/10 of an Amp.
- Reset a faulted circuit.
- Show graphical electrical system diagram, including battery, alternator and system currents, main bus voltage and aux aircraft battery voltage (if any).
- Allow manual control of each individual circuit, including trim and flaps.
- Display of trim and flaps position.
- Pitch trim speed, as a percentage of maximum speed.
- Display VP-X system faults.

- On the Engine Page: Widgets for VP-X measured battery voltage, VP-X measured starter status, and VP-X fault status can be added to any of the EMS pages via the EMS SETUP > SCREEN LAYOUT EDITOR.

Displaying the VP-X Page

The VP-X page is displayed on-demand by pressing MAIN MENU > ENGINE > VP-X. In addition to bringing up the VP-X page alongside the Engine Page, this will also bring up the VP-X menu along the bottom of the display. Once in the VP-X menu, pressing BACK will both close the VP-X page and back out of the VP-X menu.

Because the VP-X page is part of the Engine Page, the Engine Page must be visible on the display that you are trying to access the VP-X page on. The ENGINE page can be toggled on and off on a display by pressing MAIN MENU > SCREEN > EMS PG.

The Engine Page dynamically resizes to accommodate the VP-X page alongside of it. If all of the PFD, Engine, and Map Pages were being displayed when the VP-X page is toggled on, the Map Page will automatically be removed to accommodate the VP-X page. When you turn the VP-X page off, the Map Page will automatically be re-opened.

Figure 80 – VP-X Page with Fault

Graphical Electrical System Diagram

The top portion of the VP-X page depicts the following information about your aircraft's electrical system graphically:

- Center, bottom (Vertical Power logo): Total current draw of all circuits in the system. Yellow cautions and red warning levels are triggered at the values specified during setup.

- Upper left: Main and auxiliary (if installed) alternators. The status of the alternator, as well as the amount of current (in Amps) it is producing is displayed. Current will not be displayed if an amps shunt is not installed and connected to SkyView. Yellow cautions and red warning levels are triggered at the values specified during setup. Additionally, if SkyView detects airspeed but not an active alternator, a fault will be generated.
- Upper/lower Right: Main and auxiliary (if installed) aircraft batteries. Displays voltage of the aircraft batteries, as well as the amount of current flowing into or out of the batteries. Current will not be displayed if an amps shunt is not installed and connected to SkyView. When current is available, an arrow next to the Amps reading depicts whether the battery is charging or discharging by the way that it is pointing. An arrow pointing towards the battery implies that current is flowing into the battery. In other words, it is charging. Yellow cautions and red warning levels are triggered at the values specified during setup.
- Lower left: Fault. Displayed when VP-X detects fault in a circuit, system overvoltage, system overcurrent, and other failures. Look at all elements on the VP-X page to identify the specific error.

Power Circuit List

The bottom ¾ of the VP-X page depicts the status of all circuits that have been configured and are enabled in the VP-X setup process.

The center column displays the name of the circuit.

The column to the left of the circuit name is blank when the circuit is turned off, displays a green checkmark when it is turned on, and displays a red “X” when there is a fault condition.

The column to the right of the circuit depicts contextual information about the circuit. Nominally, this is the current draw - in Amps - for circuits that are powered on.

If the circuit is in a fault condition, the fault condition is described. Possible fault conditions for circuits include:

- OVERV: Over Voltage Limit (alternator only).
- SHORT: Shot Circuit.
- OVERC: Over Current.
- OPEN: Open Circuit.

Additional information that is only displayed for flaps/trim includes:

- RUNWY: Runaway trim or flaps.
- ACTVE: Actively moving trim or flaps.
- DSABL: Trim or flaps disabled.

Circuit Control

Whenever the VP-X page is being displayed, the joystick underneath that page lets you highlight and select each circuit. Simply rotate or move the joystick up and down to select a circuit. If a fault exists, the first faulted circuit will be automatically highlighted.

When a circuit is selected the menu at the bottom of the SkyView screen automatically changes to allow control of the circuit.

All Circuits

- RESET button: Press this button to reset any circuit that has a fault condition that the VP-X will allow to be reset. This button will be grayed out and unavailable if the circuit is not in a fault condition.

Flaps and Trim Circuit Controls

- UP and DOWN buttons:
  - For Elevator Trim: Moves the elevator trim up or down as described in the VP-X documentation. This button can be held down for continuous trim movement.
  - For Flaps: Moves flaps up or down as described in the VP-X documentation. Depending on the VP-X configuration, a single quick press of the UP or DOWN button may move the flaps to a preconfigured angle or notch of flaps. Or, it may only move the flaps momentarily. This button can be held down for continuous trim movement.
- LEFT and RIGHT buttons:
  - For Roll Trim: Moves the roll trim left or right as described in the VP-X documentation. This button can be held down for continuous trim movement.

Power Circuits

- ON and OFF buttons: Press these buttons to turn a circuit or device on or off on demand. These buttons are not available if the circuit is in a fault condition. ON and OFF override the physical VP-X switch for the circuit (if configured) until the relevant VP-X physical switch is toggled.

6. Transponder Operation

Dynon Avionics offers two transponder modules that can be connected to SkyView. When installed and configured, SkyView displays gain an integrated transponder that is controlled directly from the SkyView display.

The SV-XPNDR-262 is a Class 2 Mode S transponder that is limited to use beneath 15,000 feet and under 175 knots. The SV-XPNDR-261 is a Class 1 Mode S transponder that can be used above those limitations.

For US aircraft, the FAA 2020 ADS-B Out mandate (14 CFR § / FAR 91.227) requires a Class 1 transponder for flight in Class B or Class C airspaces.

Throughout this manual, they are often referred to together as the SV-XPNDR-26X for instructions that apply to both versions. Be sure that your aircraft is operated within the limitations of the transponder model that is installed in your aircraft.

The SV-XPNDR-26X also outputs ADS-B OUT messages via its 1090ES capability.

The SV-XPNDR-26X transponder is controlled using the SkyView's on-screen menu system. This allows the transponder to be mounted separately from the instrument panel, and reduces the amount of panel space taken by the transponder. SkyView also provides pressure altitude directly to the transponder, eliminating the need for a separate altitude encoder.

Transponder Status

When the transponder is installed and configured, the Top Bar will display transponder status as shown in the following figure:

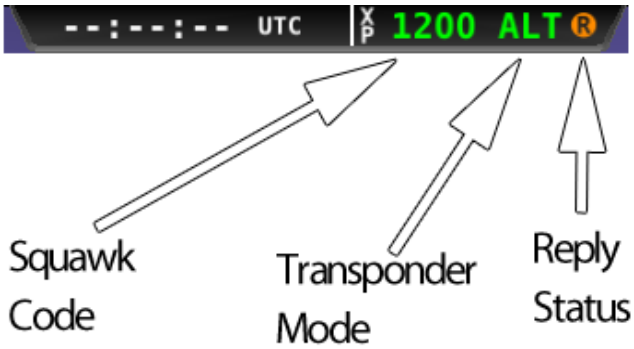


Figure 81 – Transponder Status Area in Top Bar

The transponder status area is comprised of the following status elements:

1. Squawk Code: This code is transmitted when the transponder is in a broadcast mode.
2. Transponder Mode: Displays the current operating mode and status of the transponder. Modes in which the transponder will reply to interrogations are colored green, while other modes, such as standby and errors, are in yellow or red. The different modes possible include:
    a. SBY: The transponder is on, but will not reply to any interrogations. This is the mode that the transponder is in when none of the modes below are active.
    b. GND: The transponder will only reply to direct Mode S interrogations using the specific ICAO address from surface movement radar. It will not reply to mode A, C and Mode S all-call interrogations.
    c. AUTO (replaces GND, above): Available when the transponder is configured to automatically switch between ALT/GND automatically (see the *SkyView Classic / SE / HDX System Installation Guide* for details). When AUTO is selected, the transponder will automatically switch between ALT and GND modes - reflected in the transponder status in the top bar – using a combination of GPS and air data changes. Defaults to ALT when GPS position is unknown.
    d. ON: The transponder will respond to all interrogations, but altitude reporting is suppressed.
    e. ALT: The transponder will respond to all interrogations.
    f. IDT: Displayed while the transponder is broadcasting an ident after the IDENT button is pressed at ATC's request.
    g. Big red "X" (covering entire transponder status area): Indicates an error, either with the transponder itself or in the communication between the transponder module and SkyView. The transponder is not responding to interrogations. Check the wiring and settings between the transponder module and SkyView if you are authorized to maintain your aircraft. Contact Dynon Technical Support for further assistance.
3. Reply Status: The reply indicator illuminates when the transponder replies to interrogations.

When connected properly, third party transponders such as the Garmin GTX 330 and GTX 327 can provide status as described above. However, they cannot be controlled from the SkyView display as the SV-XPNDR-26X can.

Transponder Menu

Figure 82 – Transponder Menu Example

When the Dynon SV-XPNDR-26X transponder module is installed and configured, the Transponder Menu becomes accessible from the Main Menu by pressing XPNDR (MAIN MENU > XPNDR). All transponder operation can be accomplished from this menu. There is no dedicated or separate control panel needed (or available).

Note that there are some situations when the selected transponder mode may be different from the status annunciated in the Transponder Status Area. For example, if you select ALT mode, but there is a squat switch installed, it will keep the transponder in GND mode until the aircraft has become airborne. The requested ALT mode would then be activated.

BACK

Press BACK to return to the Main Menu.

GND

Press to set the transponder to ground mode. In ground mode, the transponder will respond to Mode S ground interrogations from surface movement radar. When active, the GND button will remain highlighted in this menu, and GND is annunciated in the transponder status area in the Top Bar. When the transponder is in ground mode, pressing GND again will turn ground mode off and put the transponder in standby mode.

ON

Press to set the transponder to respond to all interrogations, but with altitude reporting suppressed. When active, the ON button will remain highlighted in this menu, and ON is annunciated in the transponder status area in the Top Bar. When the transponder is on in this mode, pressing ON again will turn put the transponder in standby mode.

ALT

Press to set the transponder to respond to all interrogations with altitude reporting. When active, the ALT button will remain highlighted in this menu, and ALT is annunciated in the transponder status area in the Top Bar. When the transponder is on in this mode, pressing ALT again will turn put the transponder in standby mode.

FLIGHT ID

If enabled, FLIGHT ID allows you to enter an ADS-B Flight ID (i.e., aircraft name). If FLIGHT ID is enabled, but no value is entered, SkyView will report the aircraft's tail number by default. (Refer to the Installation Guide to enable the FLIGHT ID function.)

CODE

Press to type in a squawk code. If you make a mistake while typing a squawk code, stop typing and after a few seconds the CODE menu will exit automatically without changing the squawk code. Codes that are standardized include:

1200:	VFR code in the USA
7000:	VFR code commonly used in Europe.
7500:	Hijack code
7600:	Loss of communications
7700:	Emergency code

VFR

Press to quickly tune the VFR squawk code. This is usually 1200 in the US and 7000 in Europe. Refer to the Installation Guide to set the VFR code that this button tunes. Once pressed, the VFR button will remain highlighted until the transponder code is changed to show that you are in VFR mode. Press the button while VFR is highlighted to return the transponder to the last code tuned.

IDENT

Press to ident when requested to “ident” by ATC. “IDT” will be displayed in the Transponder Status Area for the next 18 seconds as the transponder sends the ident signal. Note that if a button is pressed to change the transponder mode or to turn it off, that action will be delayed until the ident transmission completes.

Reported Pressure Altitude

At times it may be useful to know the altitude that is being reported to the transponder. Since SkyView sends pressure altitude to the SV-XPNDR-26X, setting BARO to 29.92 will display the pressure altitude being transmitted to the transponder in the normal SkyView altitude display on the PFD page.

ADS-B OUT Transmissions

If SkyView has a valid GPS signal and a SV-XPNDR-26X module is installed and working, it automatically provides ADS-B output at the appropriate integrity level for the GPS signal being used.

ADS-B OUT transmissions that meet the 2020 FAA ADS-B equipment mandate require that a compliant GPS be provided to a capable ADS-B device (such as the SV-XPNDR-261). For this purpose, a dedicated serial input is provided on the SV-XPNDR-26X module that allows an appropriate GPS receiver serial output to be connected directly to the SV-XPNDR-26X. When an

SV-XPNDR-261 is connected to a suitable GPS source and is running the latest version of transponder software, the SV-XPNDR-261's ADS-B transmissions can attain the integrity level necessary to meet the FAA's 2020 ADS-B equipment mandate. Refer to the *SkyView Classic / SE / HDX System Installation Guide* for more details about connectivity and information on updating the firmware on the SV-XPNDR-261 for this compliance. Note that only the SV-XPNDR-261 is capable of meeting the 2020 ADS-B Out mandate because of power transmission requirements that the FAA ADS-B rules imposes on ADS-B transmitter devices.

If you are operating in a region where ADS-B broadcast is not permitted or may be legally disabled, you can disable ADS-B OUT transmissions without disabling GPS-based functions. (Refer to the System Installation Guide for instructions.) Within the United States, ADS-B Out features must - per FAA rule - be enabled if equipped.

Flight Plan Codes

ICAO Flight Plans

If your aircraft is equipped with a Dynon Mode-S transponder, a certified GPS navigator or SV-GPS-2020, the appropriate ICAO Surveillance Equipment Code is "EB1". The E adds ADS-B credit, and the B1 indicates that you are 1090 OUT.

If you do not have a certified GPS navigator on board, but do have a Dynon Mode-S transponder, the appropriate ICAO Surveillance Equipment Code is "S."

FAA Flight Plans

If your aircraft is equipped with a Dynon Mode-S transponder and an IFR certified GPS navigator, you may file /G, which indicates that you have at least a Mode C transponder and RNAV capability with GNSS (GPS).

If your aircraft does not have an IFR certified GPS navigator, but you do have a Dynon Mode-S transponder, you should file /U to indicate you have at least a Mode C transponder.

7. SV-MAP-270 Navigation Mapping Software

This chapter outlines what users should expect from SkyView's Navigation Mapping Software capabilities and also covers operations that are specific to this function.

SkyView's Moving Map requires valid GPS and terrain data to function as a real time, look down topographical map. Aviation data is further required to show airspaces, airports, airport identifiers and other features overlaid on top of the map. More information about these three requirements is contained in this chapter.

Use of the Navigation Mapping Software beyond an initial 30 flight hour free trial period requires the purchase of a Navigation Mapping Software license. This section contains detailed information about how this purchase is made and the software activated in your SkyView system.

Starting with SkyView Software version 11.0, the Moving Map functions are temporarily unavailable immediately after boot up while the databases are loading. This change allows SkyView to power on substantially quicker so that you can utilize the EMS and PFD pages as quickly as possible. A message will appear on the map "MAP UNAVAILABLE WHILE DATABASES LOADING" and the map will be available once the message clears.

Beginning with SkyView software version 3.0, the SV-MAP-270 Navigation Mapping Software is available for purchase. The Navigation Mapping Software replaces the free trial of mapping features that was included in software versions prior to version 3.0.

As of August, 2016, all new SkyView displays include a SV-MAP-270 (or equivalent functionality) at no additional cost. SkyView (Classic) displays sold prior to August, 2016 still require the purchase of an SV-MAP-270.

SkyView Classic and Touch displays shipped prior to August, 2016, included a 30 flight hour free trial of the Navigation Mapping Software that allows you to try it out before you purchase it. After the 30 flight hour free trial period expires, the MAP menu and all navigation, mapping, and other features that are displayed on the map page, including traffic, weather and the depiction of databases will cease to be available until a Navigation Mapping Software License is activated. Additionally, all other features that rely on aviation/obstacle databases, such as the depiction of runways and obstacles on Synthetic Vision, are also unavailable without a Navigation Mapping Software License.

License Information

The SV-MAP-270 Navigation Mapping Software license is activated by purchasing a Dynon Avionics SV-MAP-270 license code and entering it into your SkyView system. Only **one** Navigation Mapping Software license is needed in a SkyView system, no matter how many displays are attached. That license is applied to only one display, but that display stores the

license information for the entire system. In normal use, license information is shared with all displays connected via SkyView Network to allow the Navigation Mapping Software to be operated on any screen.

Checking License Status

If the MAP MENU (MAP > MAP MENU) can be entered on every display in the system and SkyView doesn't present the "MAP TRIAL MODE" message when the Map Page is first displayed on boot, Navigation Mapping Software is licensed for use in your aircraft.

If Navigation Mapping Software is not available, then either the system is not licensed or there is no valid aviation database in the system. To determine which of these is the case, check the status of the license in the Setup Menu under SETUP MENU > LOCAL DISPLAY SETUP > LICENSE. See the *SkyView Classic / SE / HDX System Installation Guide* for more details about using Setup to check licenses.

In some cases, SkyView may display one of the following messages when the Map Page is first displayed after boot:

- LICENSED DISPLAY OFFLINE − XX HOURS REMAIN: The system is licensed, but the display that actually stores the license is not currently connected. If the display that stores the license is not returned to the system when this countdown expires, the display will revert to an unlicensed state. This feature is intended to allow the map to continue to function in the event that the display that stores the license fails or is out of the airplane for repair.
- MAP TRIAL MODE − XX HOURS REMAIN: The system is not licensed, but the Navigation Mapping Software is in its 30 free flight hour introductory trial period. At the end of this period, the map will cease to function until a license is purchased. Note that this timer is only checked on boot. If it expires during a flight, the Navigation Mapping Software will remain available for the remainder of that flight.
- MAP TRIAL MODE − TRIAL EXPIRED: The system is not licensed, and the Navigation Mapping Software has used all of the 30 free flight hour introductory trial period. This message will appear once at boot to notify the pilot when the 30 hours were finished during the previous flight.

Features Overview

Once licensed, the following features are enabled as long as SkyView has the appropriate high resolution terrain database installed for the region of the world that you are flying in, and an aviation database installed.

- Use of MAP menu and features, including:
  - Display of airport, airspace, obstacles, and other aviation data that is available (capabilities depend on available databases and other installed equipment).
  - Display of basemap features, including roads, city names, railroads, rivers, and political boundaries.

- All Navigation Mapping Software features available via the MAP menu.
- Display of obstacles and runways on Synthetic Vision.
- All future updates to the SV-MAP-270 Navigation Mapping Software product (databases may incur additional costs).
- Display of geo-referenced procedure charts and airport diagrams from Seattle Avionics and PocketFMS.
- Display of enroute charts from Seattle Avionics.
- Display of ADS-B Traffic and Weather, including Lightning and PIREPS (if SV-ADSB-470/472 ADS-B Receiver is installed, and in an ADS-B service area).
- The ability to send and receive Flight Plans with supported aviation applications (if SkyView Wi-Fi Adapter is installed).

Purchasing and Installing a Navigation Mapping Software License

A license can be purchased in one of two ways:

1. Call Dynon Avionics with your SkyView display model (SV-D1000 or SV-D700) and serial number (as displayed on the case sticker, or in SETUP MENU > LOCAL DISPLAY SETUP > DISPLAY HARDWARE INFORMATION). An SV-MAP-270 Navigation Mapping Software License Code can be purchased for the entire aircraft you wish to enable the Navigation Mapping Software on. This six character License Code is then entered in SETUP MENU > LOCAL DISPLAY SETUP > LICENSE > LICENSE CODE. If you have more than one display in the aircraft, choose one to install it onto and provide information for only that display. Once any display is licensed, all connected displays in the Aircraft can use the Navigation Mapping Software.
2. An SV-MAP-270 SkyView Navigation Mapping Software Certificate may be purchased from Dynon Avionics or any authorized Dynon Avionics retailer. This certificate can be redeemed for a license code that can be entered in SETUP MENU > LOCAL DISPLAY SETUP > LICENSE > LICENSE CODE. To redeem a certificate simply follow the instructions on the certificate itself. Similar to the above, you will need to redeem your certificate by visiting dynon.com/redeem with your SkyView display model and serial number ready. Alternatively, you can call Dynon Avionics to redeem a certificate.

Databases and Charts

SkyView utilizes a variety of databases to display information on the Moving Map and to present options for navigation. These include:

- Aviation data: Airports, navaids, airspace, airport information, etc.
- Obstacles data: Obstacles of interest to pilots.
- Terrain data: High, low, and very low resolution terrain database data is used to display the topographic map and Synthetic Vision.

- Base-map: Additional cultural features such as cities, railroads, etc. when such information is available (not every city, railroad, etc. is shown).
- Stadium TFR (Temporary Flight Restrictions): US Temporary Flight Restrictions for Stadiums.
- Language Databases: (Not supported in SkyView as of firmware v15.0)
- Instrument Procedure Charts (requires optional data).
- Airport Taxi Diagrams (requires optional data).
- Enroute Charts (requires optional data).

For information on SkyView databases / updates, including other providers' database and chart / diagrams products, see dynon.com/download.

Viewing Information about Installed Databases

The Installed Databases Page (SETUP MENU > LOCAL DISPLAY SETUP > INSTALLED DATABASES) allows users to see the databases installed on their equipment as well as their respective versions and expiration dates. The sections below outline the various databases that are installed in SkyView.

Aviation / Obstacle Databases

Like paper charts, Aviation / Obstacle databases are valid only for specific periods and thus expire. It is your responsibility to stay current with these updates and keep the SkyView system up to date.

SkyView uses aviation and obstacle databases to display airports, runways, navaids, airspace, obstacles, and other aviation data on the Moving Map and Synthetic Vision. Aviation and obstacle databases also allow SkyView to provide detailed information about aviation features. SkyView can also provide navigation to these aviation features.

Aviation / Obstacle databases for US pilots are provided by Dynon Avionics. Aviation / Obstacle databases for regions outside the US are provided by other providers – see dynon.com/download.

Terrain Databases

SkyView displays use high resolution terrain databases to display topographic features on the MAP, as well as to display Synthetic Vision on the PFD. High Resolution Terrain Databases are partitioned by region.

All available high resolution terrain databases can be downloaded at dynon.com/download.

All SkyView displays are shipped with high resolution terrain databases for North America (includes the continental United States, part of Alaska, most of Canada, Mexico, part of Central America, and the West Indies). If you are outside the US, your SkyView display may have already been loaded with high resolution terrain databases for your region by an aircraft manufacturer or other reseller of Dynon products.

Base-Map (Cultural Data) Database

The SkyView Base-Map (Cultural Data) database contains roads, city names, railroads, rivers, and political boundaries. The SkyView Base-Map database is partitioned by region.

All available Base-Map databases can be downloaded at dynon.com/download.

All SkyView displays are shipped with the Base-Map database for North America (includes the continental United States, part of Alaska, most of Canada, Mexico, part of Central America, and the West Indies). If you are outside the US, your SkyView display may have already been loaded with the Base-Map database for your region.

Stadium TFR Database

(US Only) FAA Temporary Flight Restrictions (TFRs) for stadiums were formerly broadcast through the ADS-B system, but no longer.

All SkyView displays are shipped with the Stadium TFR database. If you are outside the US, the Stadium TFR database may have been removed from your SkyView display.

Geo-referenced Procedure and Enroute Charts and Airport Diagrams

SkyView supports display of various chart types, including US Approach / Departure Procedure charts (commonly called plates), Enroute Charts, and Airport Diagrams. Dynon Avionics does not supply this data, but various vendors worldwide provide these charts for different regions in a format compatible for display on SkyView.

Details on available vendors and available chart / diagram data, including costs / subscription information is available at dynon.com/download.

USB Flash Drive Considerations for Charts / Diagrams

Because of their size (scanned bitmap images), procedure and enroute charts and airport diagrams cannot be stored in SkyView's internal memory. Rather, they are stored on a USB flash drive plugged into a USB port on the SkyView display. The USB flash drive must be at least 16 GB.

Each SkyView display (on which you wish to display procedure and enroute charts and airport diagrams) must have its own USB flash drive with procedure and enroute charts and airport diagrams data (plugged in).

If you are plugging a USB flash drive into a USB jack on your panel, consider using a “SanDisk Cruzer Fit.” This USB flash drive is so short and light that it could be mistaken for a USB port "cap", only protruding a few millimeters from the USB jack.

Note that the USB flash drive that came with your SkyView display may not have sufficient storage to be used for storing procedure and enroute charts and airport diagrams; Dynon Avionics has provided USB flash drives of sizes 4 GB, 8 GB, 16 GB, and most recently 32 GB.

Note that a SkyView display only allows one USB flash drive to be connected at a time. To display procedure and enroute charts and airport diagrams, any other USB flash drive – such as the one that you normally use for SkyView software and database updates – must be disconnected from the SkyView display before plugging in the USB flash drive containing procedure and enroute charts and airport diagrams.

Use Wi-Fi to Download Seattle Avionics ChartData

Seattle Avionics’ ChartData can be downloaded over Wi-Fi directly to a USB flash drive that is inserted in SkyView display. This download method uses Seattle Avionics’ Slingshot system and their FlyQ EFB app on an iPad or iPhone. This method eliminates the manual procedure of removing the USB flash drive from Skyview and downloading updated files to it from a personal computer.

See the *SkyView Classic / SE / HDX System Installation Guide* for information on setting up and using this download method.

GPS Source

The *SkyView Classic / SE / HDX System Installation Guide* contains comprehensive instructions for physically installing, electrically connecting, and configuring a GPS device to work in a SkyView system. This guide assumes these steps have been properly executed. You should be familiar with the information in the *SkyView Classic / SE / HDX System Installation Guide* regarding this topic.

SkyView’s Moving Map display depends on the system having a valid GPS source. In the event of the failure of the primary GPS source used to display the Moving Map, SkyView will automatically use other available GPS sources that are configured in the system. SkyView determines which GPS source to use by using the following prioritized list of GPS sources:

POS 1 ▸ GPS 1 ▸ GPS 2 ▸ GPS 3 ▸ GPS 4 ▸ POS 2 ▸ POS 3 ▸ POS 4

See the *SkyView Classic / SE / HDX System Installation Guide* for more information on setting up GPS sources.

If you need to check the status of your GPS source:

- Enter the Serial Port Setup Menu (IN FLIGHT SETUP MENU > ENTER FULL SCREEN SETUP MENU… > LOCAL DISPLAY SETUP > GPS FIX STATUS).

Moving Map Page Layout

The Moving Map Page as shown in Figure 83 displays a real-time topographical map in Track Up or North Up mode (depending on user setting). The map is sourced from a database that is stored inside the display and correlated to your current position using a GPS feed.

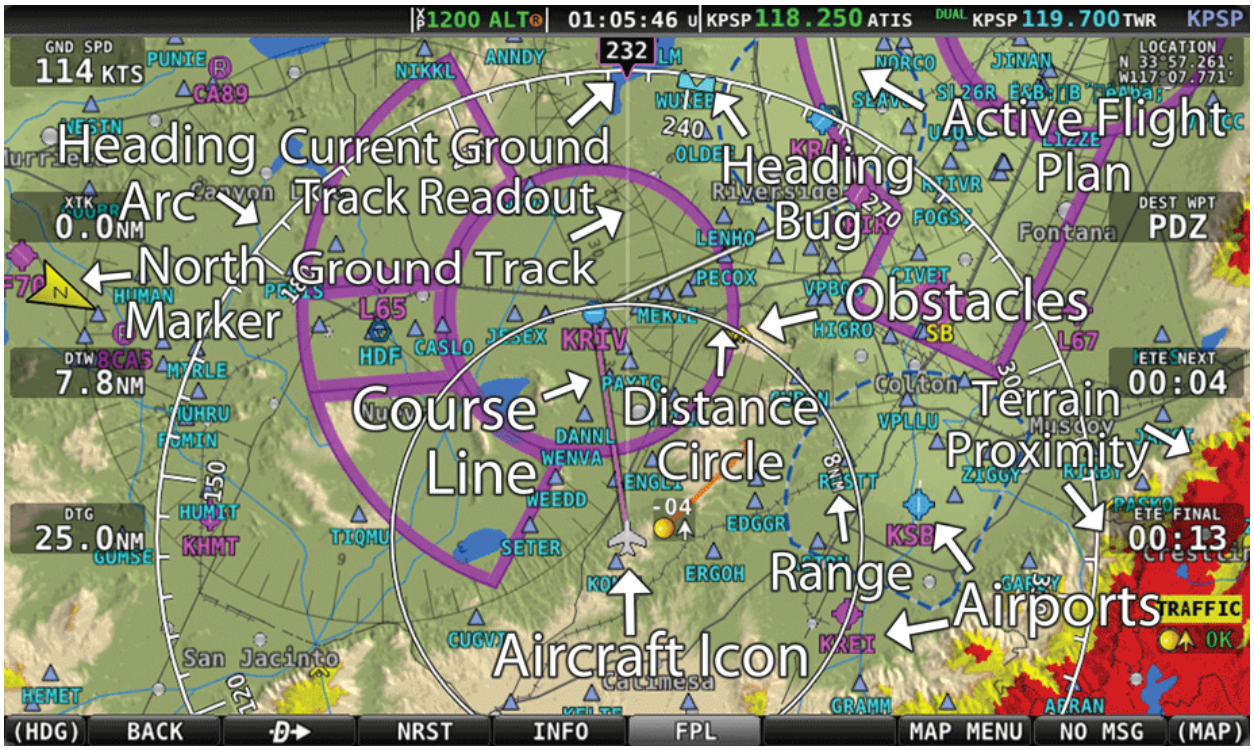


Figure 83 – SkyView Moving Map

The following items are displayed on the Moving Map Page shown in Figure 83:

- Topography (terrain and bodies of water) with Terrain Proximity Alerting.
- Default Aircraft Icon with Ground Track Line.
- Distance Circle and Range.
- Heading Arc, Current Ground Track, Heading Bug, True North Marker.
- Configurable Info Items. Examples include GPS Ground Speed (SPEED), GPS Altitude (ALTITUDE), Distance to Waypoint (DTW), and Bearing to Waypoint (BTW).
- Course line (only displayed when actively navigating to an aviation waypoint).
- Airports with runways (if known).
- Obstacles.
- Airspace (with floors/ceilings).
- Navigation aids, such as VORs, NDBs, and Fixes.
- Active Flight Plan.

SkyView uses a map projection that does not distort distance. This means that the courses - which are the ideal “great circle” routes - appear as straight lines on the screen.

Moving Map Symbology

Topography with Terrain Proximity Alerts

SkyView’s Terrain Proximity Alerting should not be used as the primary terrain avoidance tool. It should be used as an aide with primary navigation instruments, charts, and other tools.

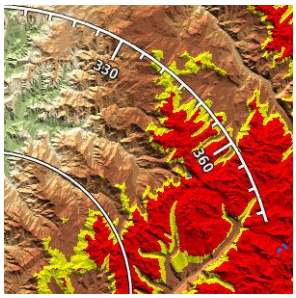


Figure 84–Topography with Terrain Proximity

Moving Map terrain is displayed in sectional chart color variations, representing various topographical elevations. Major bodies of water are displayed as solid blue.

The SkyView Moving Map also adds in-air Terrain Proximity Alerting, based on GPS Altitude:

- *Yellow* terrain default setting is between 100 and 1000 feet below the aircraft's current GPS altitude.
- *Red* terrain default setting is within 100 feet below or above the aircraft's current GPS altitude.
- These altitude thresholds can be adjusted to suit your preference. See the *SkyView Classic / SE / HDX System Installation Guide* for details.
- The Yellow/red terrain alert coloration does not appear on the map until the aircraft is in flight.

Aircraft Icon with Ground Track Line

The aircraft icon as shown in the figure below represents your aircraft on the Moving Map Page. The ground track line represents the projected ground track of the aircraft. The aircraft icon in the figure below denotes that SkyView has obtained a GPS fix, and points in the magnetic heading of the aircraft. When GPS communication is present, but a fix has not been obtained, a question mark (?) shows up on top of the icon. In North Up, the plane symbol will rotate with the compass heading. In Track Up, the compass rose and plane will rotate with the compass heading.

There is also a pilot-configurable option to overlay the ground track line with distance and time prediction marks. The time/distance prediction marks show where the aircraft will be over the ground, for example in 10 nautical miles and/or in 5 minutes based on current speed. You may configure the time and distance shown via the Map Menu (MAP > MAP MENU > TRACK LINE OPTIONS).

The Altitude Intercept Arc is also drawn on the ground track line (on Terrain, Enroute Charts, and Procedure Charts). Based on the aircraft's current vertical speed and ground speed, the Altitude Intercept Arc shows the position over the ground the aircraft will be when it intercepts the altitude bug. It will not show if the vertical speed is not in agreement with the altitude bug, for example if the aircraft is descending but the bug is set above the present altitude. Also, if you're within 100 ft of the altitude bug or if the arc is close enough to touch the aircraft icon, it is not displayed.

Figure 85 – Default Aircraft Icon

Figure 86 – Ground Track Line

Figure 87 – Altitude Intercept Arc

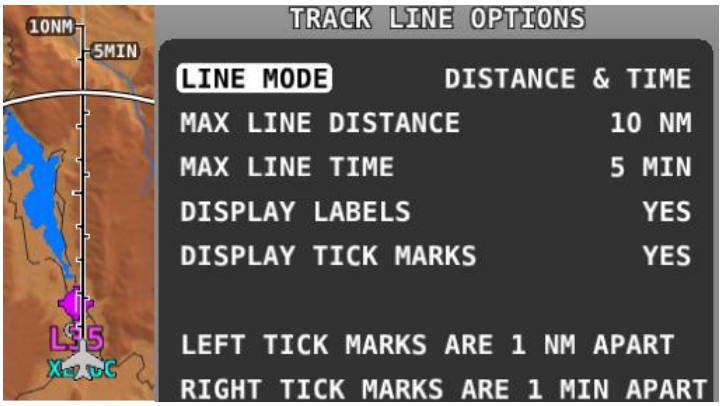


Figure 88 – Time and Distance Prediction Marks

Optional Aircraft Icon Symbols

The Aircraft Icon on SkyView's Moving Map and HSI can be changed from the default to any of the following icons:

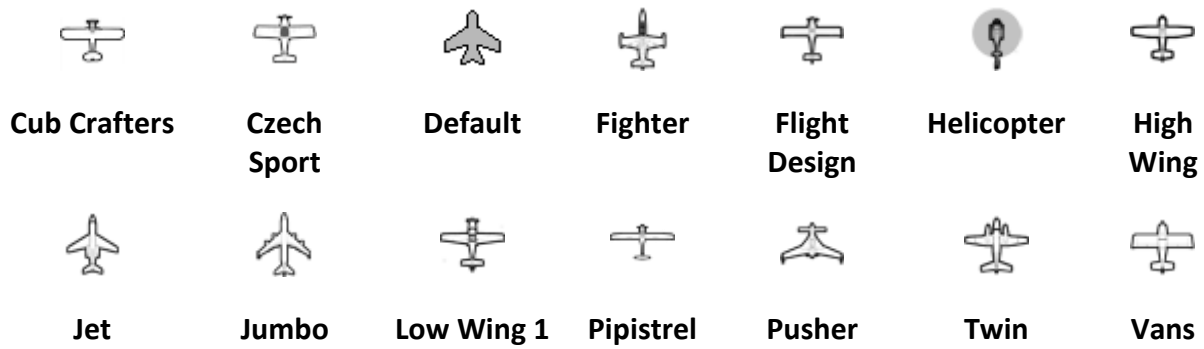


Figure 89 – Additional Aircraft Icons

Reference the *SkyView Classic / SE / HDX System Installation Guide* instructions on how to change the displayed Aircraft Icon Symbol.

Distance Circle

The distance shown on the map between the aircraft icon and the inner circular ring is the distance between them. The distance between the aircraft and the outer Ground Track Arc is twice this distance.

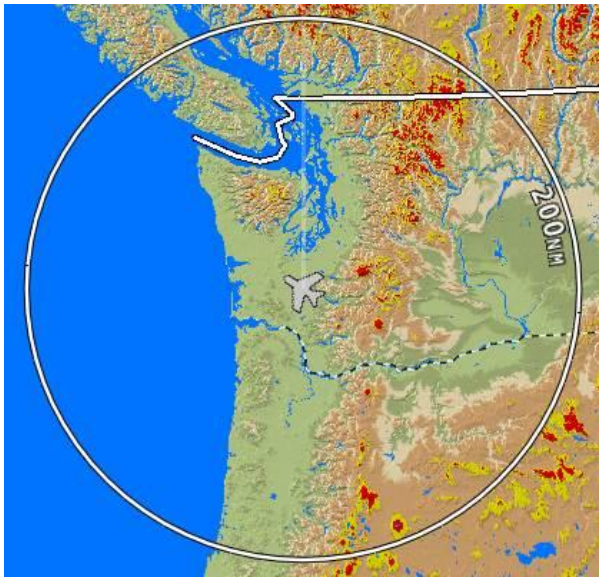


Figure 90 – Distance Circle

This distance is displayed in the middle of the right side of the Map Page, near the Distance Circle. Turn the (MAP) joystick to adjust the range of the map (zoom in/zoom out). To change whether twisting clockwise or counterclockwise zooms in, go to MAP > MAP MENU > MAP MODE > INC MAP RANGE. Range level can be adjusted between 0.3 and 1200 nautical miles.

Distance units can be set to miles, nautical miles, or kilometers. Reference the *SkyView Classic / SE / HDX System Installation Guide* instructions on how to change the displayed units.

The heading arc is explained in the next section.

Ground Track Arc, Current Ground Track and Marker, Heading Bug, North Marker, and Course Line

The ground track arc as shown in Figure 91 is centered on the current ground track.

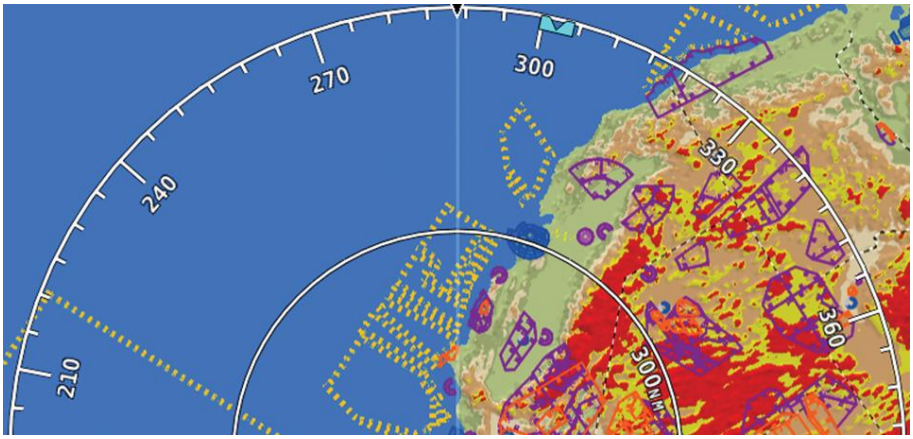


Figure 91 – Ground Track Arc

The current ground track, as shown in Figure 92, is displayed in two ways: the digital readout and the white ground track line. The border around the digital readout is normally magenta when based on the GPS ground track. When the aircraft is not moving fast enough for SkyView to reliably determine the ground track direction, magnetic heading is used instead. In this case, the border around the digital readout will be white.

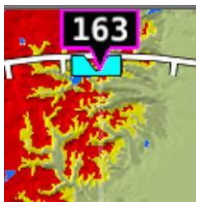


Figure 92 – Current Ground Track

The heading bug as shown in Figure 93 is represented with a cyan marker. When moving the heading bug, a cyan colored lubber line that extends from the aircraft to the bug is displayed as well. Reference the Heading/Track Bug Section for instructions on how to adjust the heading bug.

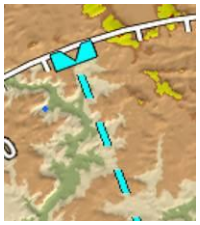


Figure 93 – Heading/Track Bug

The north marker as shown in Figure 94 is represented with a yellow arrow marked with an "N" and points to True North.

Figure 94 – North Marker

The magenta course line shown in Figure 95 appears whenever the Navigation Mapping Software is navigating to an active waypoint. It is the shortest path between the two points that it connects on the map.

Figure 95 – Course Line

Flight Plan Legs

Flight plan legs appear in the Moving Map display whenever a flight plan has been activated. The magenta line corresponds to the current leg of the Flight Plan and subsequent legs are shown in white. Legs prior to the current leg are not shown. See the Flight Planning section of this guide for more information about creating and working with flight plans.

Figure 96 – Flight Plan Legs

Obstacles

SkyView's Moving Map represents obstacles using the same symbology found on sectional charts, as shown in Figure 97 and Figure 98. Only high-intensity lighted obstacles are shown as lit.

The geographic location of the obstacle is represented by the tip on single icons and the point directly between the tips of group icons.

Obstacles are only shown on the Moving Map if their highest point is within 1000 feet below your aircraft's GPS altitude. If the highest point of an obstacle is within 100 feet below your current GPS altitude to anywhere above you, it will be red. If the highest point of the obstacle is between 100 and 1000 feet below your current GPS altitude, the obstacle will be yellow. This is the same color scheme mentioned in the Topography with Terrain Proximity Alerts Section.

Figure 98 – Obstacles on the Map

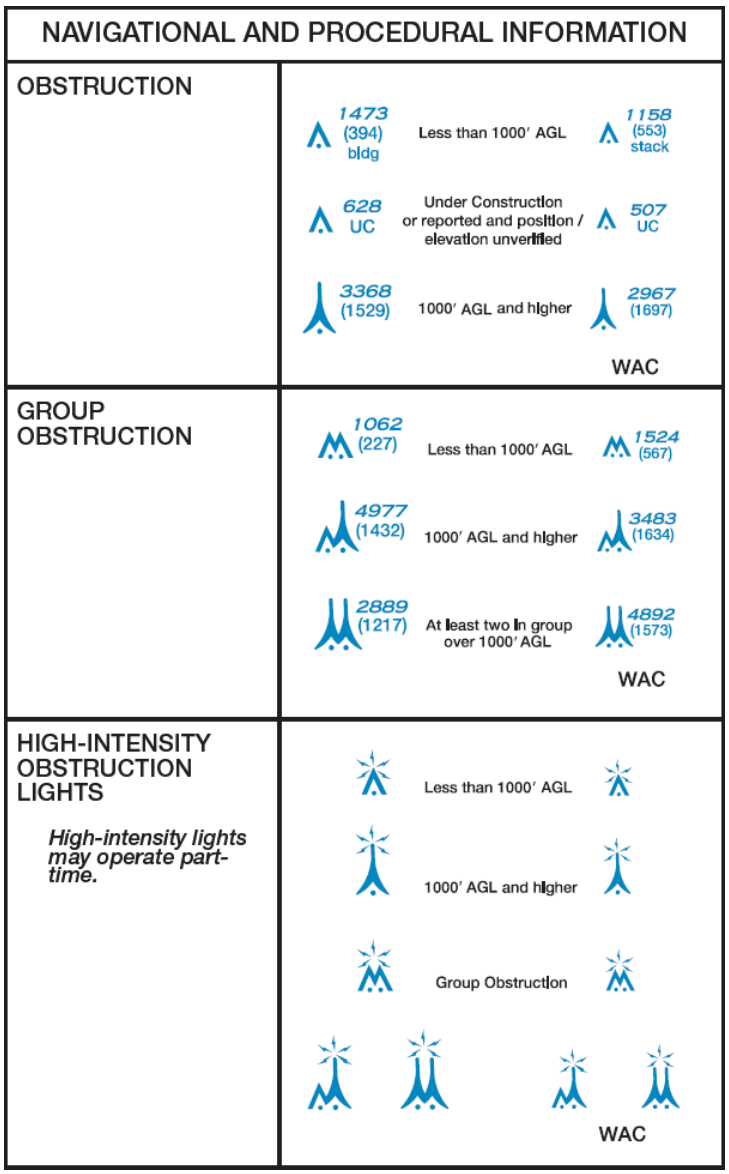
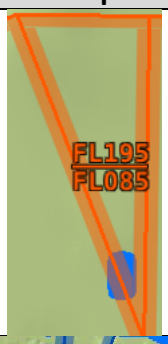
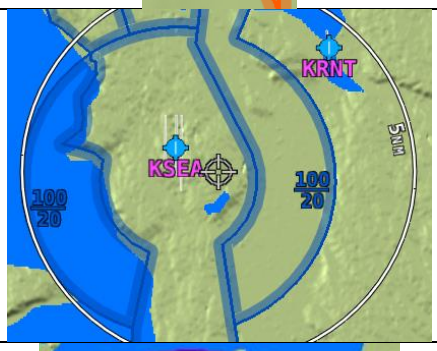


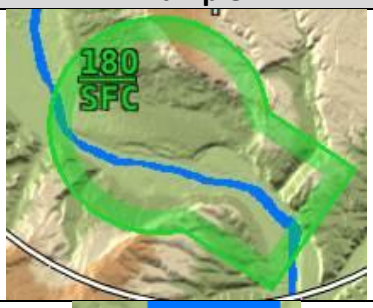
Figure 97 – FAA Sectional Chart Obstruction Key

Airspace

SkyView's Moving Map represents different classes of airspace with the colors specified in Table 6.

The floors and ceilings of airspaces are shown within each airspace segment in the familiar sectional-style notation.

Airspace Type	Color	Example
Class A	Solid orange with interior shading. Not depicted in the US, where all airspace above FL180 is Class A	
Class B	Solid dark blue with interior shading	
Class C	Solid dark magenta with interior shading	
Class D	Dashed light blue	

Airspace Type	Color	Example
Class E (only those areas that extend to the surface in US depictions)	Solid green with interior shading	
Restricted and Prohibited	Solid orange with tick marks	
Warning, Caution, Training, and Alert Areas	Yellow tick marks (not solid)	
Military Operations Area (MOA)	Solid purple with ticks marks	
TMA / MTMA (Terminal Control Area)	Solid dark blue with interior shading	

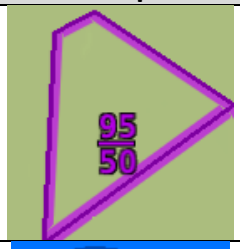
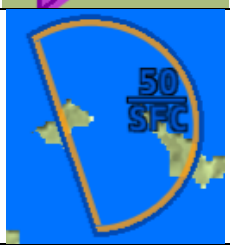
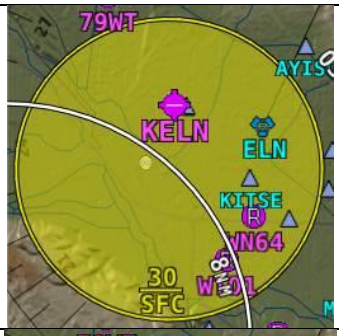
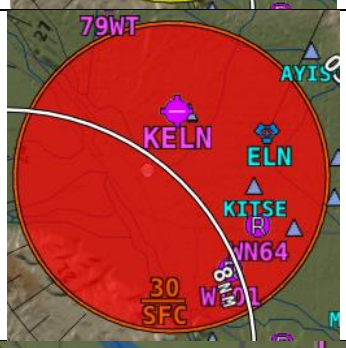
Airspace Type	Color	Example
CTA (Control Area)	Solid purple	
CTR (Control Zone)	Blue/orange solid	
Mode C Veil	Not shown	None
Upcoming Temporary Flight Restriction (TFR)	Yellow	
Active Temporary Flight Restriction (TFR)	Red	
Stadium Temporary Flight Restriction (TFR)	Orange	
Air Defense Identification Zone (ADIZ)	Not shown	None

Table 6–Airspace Colors

Airspace Proximity

SkyView's Moving Map displays class of airspace the aircraft currently occupies as well as the airspace class and distance above, ahead and below the aircraft. This map detail shows the aircraft currently 2500 feet below class B, currently in class D, class B 4 minutes ahead and no other airspace below. This feature is selected in MAP > MAP MENU > MAP ITEMS > AIRSPACE PROXIMITY:

Figure 99 – Airspace proximity

Navaids

SkyView's Moving Map displays navaids such as VORs, fixes, NDBs, and User Waypoints.

VORs

SkyView's moving displays VORs, VOR-DMEs, DMEs and VORTACs with the same icons used on sectional charts as shown in Figure 100.

VOR **VOR-DME** **DME** **VORTAC** **TACAN**

Figure 100 – Moving Map VOR Icons

Each VOR has a floating identifier which hovers near its icon as well as a gray compass rose ring that shows the orientation of the VOR's radials.

Fixes

SkyView represents a fix using a light blue triangle with a six character name underneath as shown in Figure 101.

Figure 101 – Moving Map Fix

NDBs and Markers

SkyView represents NDBs using the same symbols that are used on a sectional chart with a two-three-character name underneath as shown in Figure 102.

NDB **Outer Marker**

Figure 102 – Moving Map NDBs and Markers

Visual Reporting Points

SkyView can display visual reporting points if they are contained in the database that is currently loaded. As of this time, only PocketFMS databases contain visual reporting points.

Figure 103 – Visual Reporting Point

Airports

SkyView represents an airport with a circle and a text name. If more information is provided in the database, a modifier may be added to the icon. A line in the circle represents the direction of the primary runway. Other symbology may be used in the circle such as an “R” to denote a private airport, an anchor to denote a seaplane base, or a ring to denote a military airport.

Airport	Airport (primary runway direction indicated)	Private Airport	Airport With Control Tower (blue)	Airport with services (ticks at edges)	Seaplane Base	Public Airport (no hard surface runway)

Figure 104 – Moving Map Airport Example Icons

User Waypoints

SkyView supports a diverse set of icons that can be used to identify User Waypoints. A few of the many available icons are shown here. See the SkyView User Waypoints section below for detailed information on editing user waypoints.

Figure 105 – User Waypoint Icon Examples

Cities

SkyView displays cities and towns on the map. Their prominence on the map is determined by population.

"Mega" City **Large Place** **Medium Place** **Small Place**

Figure 106 – Places on Moving Map

Motorways, Primary Roads, Railroads, and Rivers

SkyView displays motorways as thick solid black lines, primary roads as thinner solid black lines, railroads as thin dark lines with railroad "ties", and rivers as thin blue lines:

Figure 107 – Roads, Railroads, and Rivers

Enroute VFR, IFR Low Altitude, IFR High Altitude Charts

When a USB stick with supported enroute charts is connected to your SkyView display(s), enroute chart options will be available under MAP > LAYERS.

To View Charts

In the MAP LAYERS menu there are options for VFR, IFR LOW, and IFR HIGH. Choose a chart type in this menu to replace the SkyView digital representation on the moving map with it. A particular chart type is only selectable if the product is on the USB stick. Pressing TERRAIN will return to the normal SkyView moving map plus terrain. If any of the charts on the USB stick are out of date a message will appear on the Map page at startup to alert you to update your chart data. Once you enter the MAP menu, this message can be cleared until the next power-up.

Map Items on Charts

To reduce visual clutter on charts, map items from SkyView's databases will only appear on top of a chart in some circumstances. Traffic, user waypoints and terrain warning colors will always appear on charts. Obstacles will be drawn in yellow and red on the charts when the aircraft altitude is within the warning range and flight plans will appear when Active. With an SV-ADSB-470/472 installed, TFRs appear on the charts. Pilots can still select items for more information by selecting them with the map pointer (airports, airspaces, navaids, etc.) Weather is drawn on top of the charts when the WEATHER button is selected in the LAYERS menu.

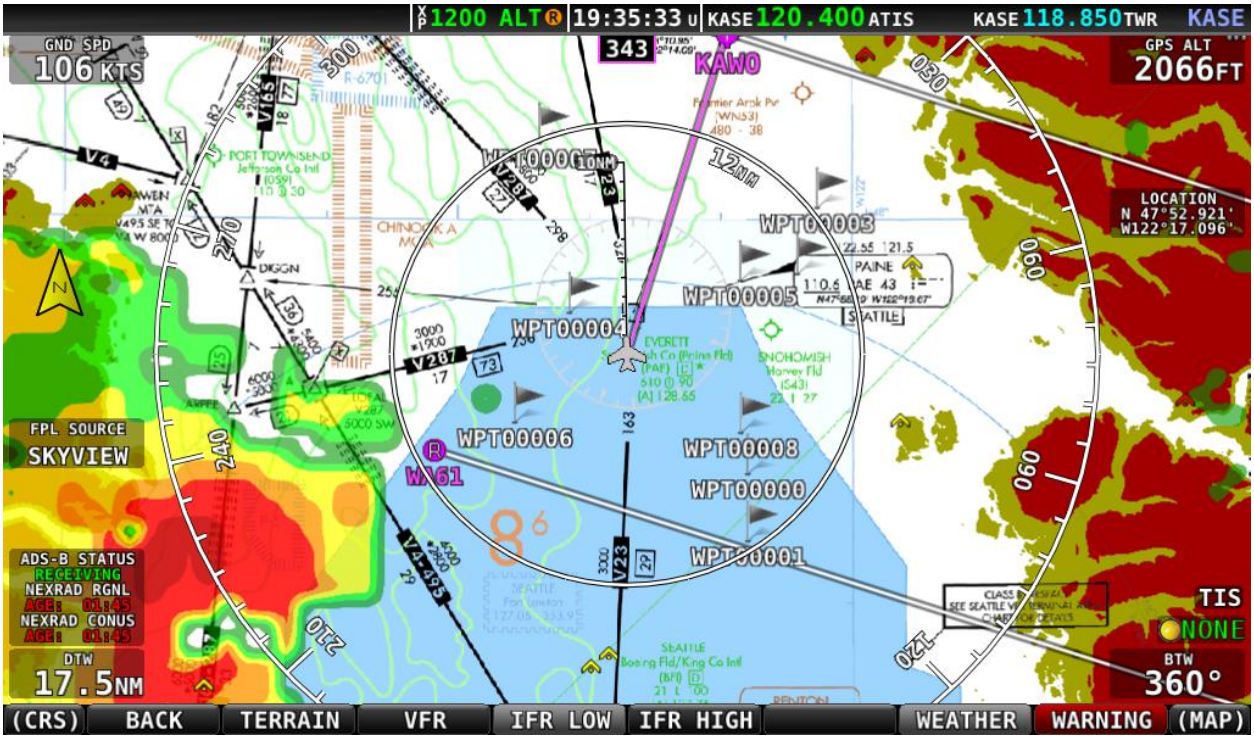


Figure 108 – Chart Integrated on Map

Figure 109 – VFR Chart with Airport selected

Customizing Displayed Map Items

The display of various map elements can be customized to reduce visual clutter. These preferences are in MAP > MAP MENU > MAP ITEMS. Use these settings to specify the highest range (zoom) level that the various features are displayed.

In addition to the max range (zoom) level settings, airspaces can be shown or hidden based on two more filters. First, SkyView will not display airspace sectors above the altitude chosen (in feet) in the HIDE AIRSPACES ABOVE option. Second, SkyView will only show airspace sectors within the chosen range (in feet) relative to the aircraft's current altitude in the SHOW AIRSPACES WITHIN option. For example, if the aircraft's service ceiling is 20,000 ft, the HIDE AIRSPACES ABOVE option would be set to 20,000 ft and would hide all airspace sectors above that altitude. Second, if the aircraft is at 10,000 ft and the SHOW AIRSPACES WITHIN value is set to 3,000 ft, ONLY airspace sectors that are between 7,000 ft and 13,000 ft will be displayed. To show all airspaces, set both values to 99,999 ft.

SHOW AIRSPACES WITHIN is temporarily disabled while panning across the map.

Traffic

When a device that can receive traffic data is installed and configured, traffic can be displayed on the Map Page to improve situational awareness. See the *SkyView Classic / SE / HDX System Installation Guide* for details on how to turn the display of traffic on and off.

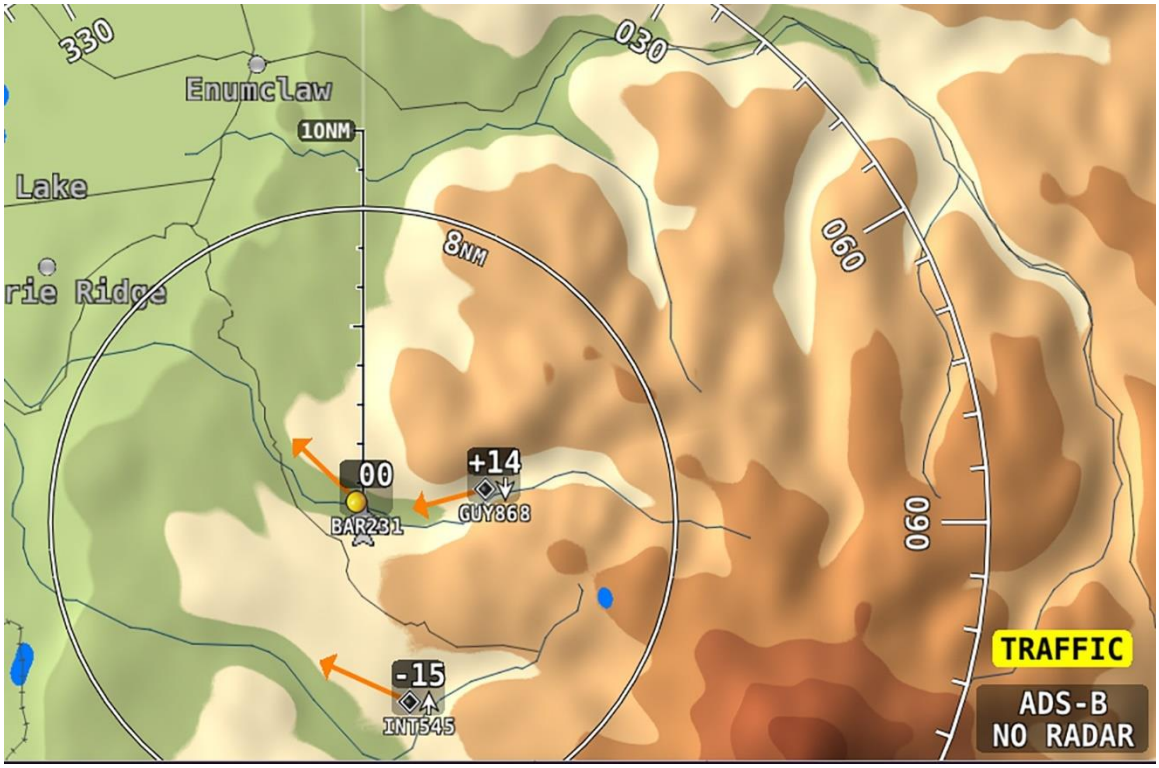


Figure 110 – Traffic Display on Map Page

SkyView can receive traffic information from a variety of devices. These currently include the SV-ADSB-470/472 (US Only), TIS traffic supplied by the SV-XPNDR-26X or Garmin GTX 330/330ES Transponders, passive traffic from the Zaon XRX, FLARM (predominantly in Europe) and the NavWorx ADS-B receivers.

Traffic is displayed on the Map Page in the location that it is reported to be in by the connected traffic device.

Traffic information is informational only and does not relieve the pilot-in-command of their responsibility to see and avoid traffic.

ADS-B traffic received from the SV-ADSB-470/472 is filtered by SkyView to a 15 Nm radius and +/- 5000 ft. Traffic outside this range is not shown on the display.

Traffic is displayed as reported by the device sending it to SkyView. The precision and accuracy of the location of traffic targets may vary from device to device, and this may impact how accurately the position is represented on the SkyView display. For example: TIS traffic updates, such as those received by the SV-XPNDR-26X, may be anywhere from 2-12 seconds old due to radar latency and other technical factors. Be sure to understand the traffic-detection capabilities of your traffic device thoroughly so you understand how to best interpret the position of the traffic displayed on SkyView.

Useful information about the TIS traffic system, including airports that have TIS service can be found in the FAA AIM:
http://www.faa.gov/air_traffic/publications/ATPubs/AIM/aim.pdf

SV-ADSB-470/472 Traffic Display Capabilities (US Only)

The SV-ADSB-470/472 works in tandem with your SV-XPNDR-26X or Garmin GTX 330ES transponder module to provide the ADS-B based TIS-B traffic picture around your aircraft when you have both products and a Navigation Mapping Software License is activated. This is enabled by the following bidirectional data link capability:

1. The SV-XPNDR-26X or Garmin GTX 330ES has ADS-B out capability via its 1090ES capability.
2. The SV-ADSB-472 contains an ADS-B 978 MHz "UAT Band" and an ADS-B 1090 MHz "Extended Squitter" receiver.
3. The SV-ADSB-470 contains an ADS-B 978MHz "UAT Band" receiver that can see other traffic – both ADS-B equipped targets AND radar targets – in the following manner:
   - TIS-B: Additionally, the FAA's ADS-B TIS-B service, seeing your transponder's 1090ES ADS-B out transmission – but knowing that your aircraft only has 978 MHz input capability via the SV-ADSB-470 – assembles a traffic portrait of all traffic that it knows about that are within 15 Nm and +/- 5000 ft. of your aircraft. This includes:
     - ADS-R (rebroadcast) targets: The FAA ADS-B system will rebroadcast all of the 1090ES ADS-B-equipped targets onto the 978 MHz band for your benefit.
     - Radar targets: Any targets that the FAA's radar system is aware of via approach, center, and other radar facilities.

Note: The SV-ADSB-472 is a dual band receiver and generally relies on direct reception of ADS-B equipped aircraft. As a result, ADS-B equipped aircraft may not be retransmitted by the FAA's ADS-R service.

The result: your aircraft sees the vast majority of the aircraft that can possibly be a factor. Since SkyView participates in the ADS-B system via the SV-XPNDR-26X's or GTX-330ES's ADS-B out capability, it receives all of the traffic that the FAA knows is around your aircraft. In contrast, "receive only" ADS-B traffic solutions aren't able to see the all traffic (such as radar-only targets) because they are not able to request traffic data from the FAA ADS-B ground stations. To reduce clutter from targets that are far away, targets that are farther than approximately 15 nm away from your position or more than 5,000 ft above or below your altitude are not shown.

Tail numbers will be shown below traffic targets when available. These can only be shown if your aircraft is equipped with Dynon Avionics' ADS-B receiver, and will only be shown for target aircraft that are ADS-B OUT equipped. Aircraft with Mode-C transponders or Mode-S transponders without extended squitter support will not have tail numbers shown:

Although weather and TFR information are available any time the SV-ADSB-470 is in an ADS-B ground station coverage area, ADS-B TIS-B traffic is only available if an ADS-B Out capable transponder is installed and is providing ADS-B out position reports into the ADS-B system.

Useful information about the ADS-B traffic and weather systems can be found in the FAA AIM: http://www.faa.gov/air_traffic/publications/ATPubs/AIM/aim.pdf
For updated coverage maps see the FAA's website:
http://www.faa.gov/nextgen/implementation/programs/adsb/

Traffic Target Information

Figure 111 – Traffic Target

Traffic is displayed using a set of symbols that are commonly used in aviation for traffic/TCAS systems. As seen in Figure 111, this includes:

- A symbol that depicts the type of traffic. It can be a Traffic Advisory Symbol, Proximity Advisory Symbol, or Non-Threat Symbol. These are further discussed later in this section. Data being received by a TIS device, such as the SV-XPNDR-26X, is limited to 8 simultaneous targets by the inherent capability of the TIS system. If there are more than 8 traffic targets that are potential threats, the TIS ground station determines the highest priority targets and transmits them to your aircraft.
- Relative altitude in hundreds of feet is displayed above the symbol as a signed integer. So, the target in Figure 111 is +14, or 1400 feet higher than our aircraft. This area is blank if the altitude of a target is not known.

- An up or down arrow to the right of the traffic symbol indicating whether the aircraft is climbing or descending, if available from the traffic source. No arrow is shown when an aircraft is maintaining altitude, or if climb/descend information is not available. Traffic from TIS traffic sources such as the SV-XPNDR-26X will not show a vertical speed component unless it is greater than +/-500 fpm
- If available from the traffic device, an orange vector arrow that starts at the target and points in the aircraft's direction of travel. This length of the vector represents where the aircraft is expected to be in one minute based on its current trajectory.
    - The data received by a TIS device (such as the SV-XPNDR-26X) does not include the speed of aircraft since it is not sent by the ground-based TIS equipment. SkyView therefore assumes that all TIS targets are travelling at 150 knots.
    - TIS additionally only provides the direction that individual traffic targets are moving in to the nearest 45° increment (0 °, 45°, 90°, etc.). This limitation may be noticed as a seemingly abrupt change in aircraft direction on the display as the traffic direction "snaps" from one 45° increment to the next when the TIS device updates an aircraft's direction.

Traffic displayed on the Map Page can be configured to include just Traffic Advisories (TA), all targets, or no targets. See the *SkyView Classic / SE / HDX System Installation Guide* for information on how to configure how traffic is displayed.

Traffic Advisory (TA) Targets

Figure 112 – TA Symbol (On-screen)

Figure 113 – TA Symbols (Off-screen)

These are targets that have a high chance of ending up near the aircraft. They will often be lower priority targets that then become higher priority targets as they approach. SkyView considers a target a threat if the device providing traffic reports that it is a threat. TIS reports a target to be a threat if it is calculated to be within 1/4 mile of your aircraft at its closest approach within 30 seconds (20 seconds if the target is not reporting altitude). ADS-B, ADS-R and TIS-B (generically ADS-B) uses 20 seconds in the calculation. This is based on a 3D calculation of your aircraft path and the other aircraft path. It expands a bit as you climb as well since aircraft aren't as close to one another enroute as in the terminal environment. Other traffic devices may have different criteria for reporting traffic as threats. Refer to their documentation for more information.

If a target is a Traffic Advisory but cannot be displayed on the screen because its location is beyond the edge of the map at its current range (zoom) level, it will appear at the edge of the Map Page, half shaded as seen in Figure 113 above (the darkly shaded area of the Traffic Advisory Symbol will always point towards the edge of the screen). This ensures that you are

aware of the threat regardless of map range level. Note that the orange vector arrow may not be visible when a Traffic Advisory is off the screen.

Proximity Advisory Targets

Figure 114 – Proximity Advisory

Proximity have less of a chance of being a factor based on their position, but are not a Traffic Advisory because they are not converging with your aircraft within the next 30 seconds. A Proximity Advisory symbol is shown on the map when it is closer than 5 nm and within +/- 1200 ft. of your altitude, but doesn't meet the criteria to trigger a Traffic Advisory.

Non-Threat Targets

Figure 115 – Non-Threat

Non-threat Targets are any other detectable aircraft that are neither Traffic Advisory Targets nor Proximity Advisory Targets.

Ghost Traffic Targets

SkyView monitors TIS-B traffic information and automatically hides new targets that appear in immediate proximity to the aircraft to prevent false Traffic Advisories. False traffic targets (aka Ghosts) usually represent your own aircraft and are typically generated when the aircraft is in marginal RADAR coverage. (Refer to the System Installation Guide for information about configuring the proximity distance.)

Traffic Coasting

Traffic directly received from ADS-B equipped aircraft is normally updated once per second. TIS-B traffic derived from radar coverage may update less often – sometimes only once per 6 seconds. SkyView predicts where the target is between these slower updates by calculating a new position using the last known position and velocity information. This calculation is performed every second and applied to traffic on the screen, synthetic vision and for the generation of traffic alerts. If 15 seconds elapses with no updated position information, the traffic target is no longer displayed.

Traffic Receiver Status

Figure 116 – Traffic Status

A widget in the lower right area of the Map Page annunciates both the device that is currently providing traffic and the status of the traffic receiver.

Possible devices and their possible states include:

- ADS-B: Any ADS-B source – such as the SV-ADSB-470/472.
  -

This signifies that the transponder is communicating with the US-based ADS-B ground stations; that those ground stations are replying to the ADS-B Receiver; and that your aircraft is in a known radar service volume. This allows the ADS-B ground stations to report all ADS-B targets and radar-only targets that are not yet ADS-B out equipped, thus providing a full traffic picture.
  -

The ground-based ADS-B system is reporting that it does not have your airplane in radar contact, or that your system is not seeing the ground station reporting your airplane is in radar contact. Although you are receiving ADS-B traffic from other ADS-B equipped aircraft, you may not be receiving all detectable traffic because you may not be currently in a radar service volume and ADS-B service volume. Therefore, the traffic portrait may be incomplete.
- TIS: Traffic provided from an SV-XPNDR-26X, Garmin GTX 330, or any other device that is configured to output traffic information in the Garmin TIS format.
  -

SkyView is receiving traffic data from the device which is providing traffic to the best of its ability.
  -

SkyView is connected to a TIS traffic device, but you are not in a TIS service volume (actual TIS devices such as the SV-XPNDR-26X or GTX 330 only).
- ZAON: A Zaon XRX.
  -

SkyView is receiving traffic data from the device which is providing traffic to the best of its ability.
- FLARM: A device outputting FLARM format data (predominantly in Europe)
  -

SkyView is receiving traffic data from the device which is providing traffic to the best of its ability.

-

SkyView is configured for Traffic but there are no devices that are currently capable of providing traffic to SkyView. This could be due to failure of traffic devices, or an external device that is turned off.

Traffic Receiver Priority

Only one device can provide traffic information to SkyView at any moment. If you have more than one device that is capable of providing traffic, these traffic sources are priority ordered based on the completeness of the traffic portrait they provide:

1. SV-ADSB-470/472 with a full traffic portrait (ADS-B OK): Means that you have an ADS-B ground station reporting, and that ground station is retransmitting radar traffic. This is only possible if you are equipped with an ADS-B Out device such as a SV-XPNDR-26X or Garmin GTX 330 ES transponder. In this case the ADS-B system delivers all known ADS-B equipped traffic and all radar targets that FAA radar system can see.
2. SV-ADSB-472 with an incomplete traffic portrait (ADS-B NO RADAR): SkyView will annunciate “No Radar” traffic when it has ADS-B reception capability, but that ADS-B reception does not include either ADS-B ground station coverage or radar targets included within those ground-based ADS-B traffic reports. Thus, the ADS-B ground station is not able to convey a full traffic picture and cannot make you aware of all possible detectable traffic.
3. TIS transponder from SV-XPNDR-26X / Garmin GTX 330 (when in an active TIS coverage area).
4. Flarm device.
5. Zaon device.
6. SV-ADSB-470 with an incomplete traffic portrait (ADS-B NO RADAR): SkyView will annunciate “No Radar” traffic when it has ADS-B reception capability, but that ADS-B reception does not include either ADS-B ground station coverage or radar targets included within those ground-based ADS-B traffic reports. Thus, the ADS-B ground station is not able to convey a full traffic picture and cannot make you aware of all possible detectable traffic.

Traffic Alert

Figure 117 – Traffic Alert

The above alert is shown on both the PFD Page (near the top of the IAS tape) and the Map Page (lower right) whenever there are Traffic Advisory Targets present.

MAP Menu

The MAP Menu is accessed from the Main Menu when the Map is displayed by pressing MAP MENU.

BACK

Press BACK to return to the Main Menu.

Direct-To

The button brings up the Info page when it is pushed in the Map Menu when nothing is selected. If there is an active flight plan, the current waypoint will appear on the resulting info page. also instantly starts navigation to an airport, navaid, or other waypoint when one is selected in the Nearest, Info, Flight Plan, or Map Pointer pages. See the Navigation Mapping Software section below for more information.

NRST

Press NRST (Nearest) to bring up a window that displays the nearest airports, navaids, and user waypoints. Once the Nearest list is displayed, the FILTER button can be used to filter out airports that are less useful to the pilot (based on length, surface type, and usage). If the FILTER button is highlighted the list is filtered. Press FILTER again to show all airports (button is black when filter is off). Filtered options can be configured in MAP MENU> NEAREST LIST OPTIONS. Note that some airports may be completely screened out of the NRST list, regardless of the FILTER settings, if they are set to OFF in the MAP MENU > MAP ITEMS options. See the Navigation Mapping Software section below for more information.

INFO

Press INFO to display detailed information about any selected airport, navaid, or other item that is selected in the map pages or that is being pointed to with the Map Pointer.

Additionally, the Info window doubles as a way to find airports, navaids, and user waypoints in a variety of ways. When used this way, the first press of INFO will display detailed information about the airport or navaid that was most recently used or selected. The cursor will highlight the tab for the selected item type at the top of the window. From here, you can either move the CURSR joystick down to find the desired item by identifier, facility, or city. Or, move the CURSR joystick left to the RECENT tab to choose from the most recently used and viewed airports and navaids.

FPL

Press FPL (Flight Plan) to bring up a window that can be used to create, display, or modify a Flight Plan. Reference the Flight Planning section of this guide for details.

ADD->FPL

This button appears on the MAP Menu when the Nearest, Info, or D→ window is open and an airport, navaid, or other waypoint is selected. Press ADD->FPL to insert the selected item into the Flight Plan. Reference the Flight Planning section of this guide for more details.

LAYERS

This button opens the LAYERS Menu, which allows the pilot to select which terrain, weather, and chart layers are displayed on top of the moving map. This does not affect the display of airport diagrams or procedural charts - they are chosen for display via the airport information window. In the US, enroute charts are part of a Seattle Avionics ChartData package. Please note that the actual terminology and order of the button names can differ from what is shown here as of SkyView software version 13.0. It is dependent on the actual terminology that the data provider uses in their naming convention and may change.

The pilot can select the map display from the following options, (terrain warning colors appear on all layers):

- **TERRAIN –** Pressing the TERRAIN button displays SkyView's built-in high resolution terrain and basemap with digital aviation and obstacle data from Dynon (FAA), Jeppesen, or PocketFMS, depending on the databases installed.
- **VFR –** Pressing the VFR button displays Geo-referenced VFR enroute charts (sectionals/world area/terminal area charts in the US).
- **IFR LOW** – Pressing the IFR LOW button displays Geo-referenced IFR low altitude enroute charts.
- **IFR HIGH**– Pressing the IFR HIGH button displays Geo-referenced IFR high altitude enroute charts.
- **WEATHER –** Pressing the WEATHER button toggles the weather overlay on or off of the current map (when a weather device such as the SV-ADSB-470/472 is connected).

MAP MENU

Press the MAP MENU button for additional map features and settings. Additionally, this menu includes the ability to create and manipulate user waypoints.

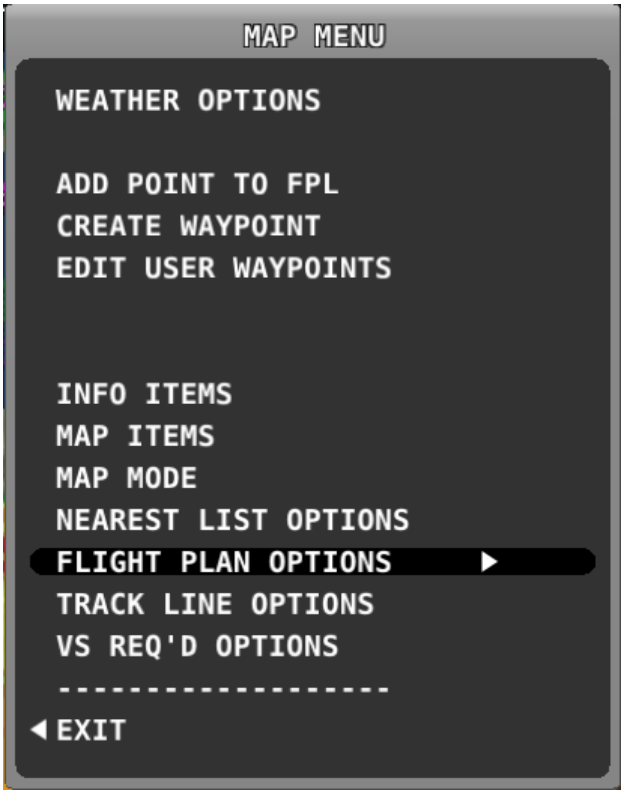


Figure 118 - Map Menu

To select an operation from the menu, scroll up and down by turning the joystick or moving it up/down. Move the joystick left to exit the menu, or move the joystick knob right to accept/initiate the selected operation or sub-menu. Once you have selected an option, move the joystick to the left until to save your selection and exit the menu.

Map Menu Preference Configuration

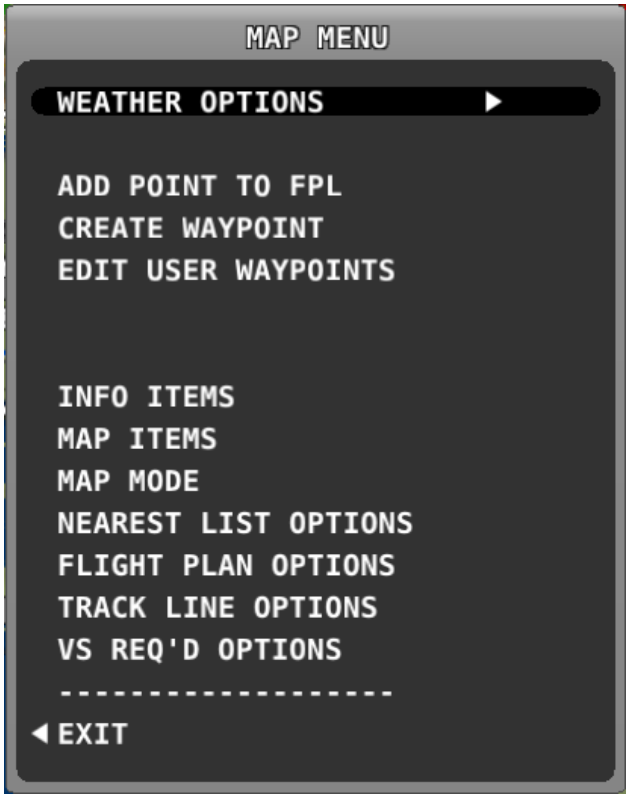


Figure 119 – Map Menu Window

Go to MAP > MAP MENU> to adjust the following map preferences and options:

- WEATHER OPTIONS: (if equipped) Adjusts the display of weather-related options. See the Weather section of this chapter for further information about the options in this menu.
- MAP ITEMS: Use these settings to specify the largest range level that the various features are displayed. You may also completely inhibit the display of various items on the map using this feature.
- MAP MODE:
  - MAP MODE: Use this setting to specify when the map is displayed in “Track Up” vs. “North Up” orientations.
  - WITH CHART: Use this setting to specify when the map is displayed in “Track Up” vs. “North Up” orientation on a Geo-referenced chart when enroute charts are being displayed. Some pilots choose to keep this in North Up to preserve chart text legibility.

- SHOW VOR AS: Use this setting to choose whether VOR directions are shown as "bearings" (the direction the VOR is relative to the aircraft position) or "radials" (what radial the aircraft is on relative to the VOR, with the published deviation of the VOR station correctly taken into account, like would be seen on a sectional) when listed on the NRST page.
- INC MAP RANGE: Use this setting to select between clockwise or counterclockwise to Increasing / decreasing range on the map.
- FULL SCREEN MAP: Use this setting to assign either the left or right joystick knob to the (MAP) when the Map Page is full screen.

- NEAREST LIST OPTIONS: Use these settings to choose whether or not the NRST list shows full airport names or not, and to adjust what airports the nearest list FILTER button affects.
- FLIGHT PLAN OPTIONS: Use these settings to allow incoming flight plans from Wi-Fi-connected devices and to set other flight plan-related settings like the ground speed used for ETA calculations while the aircraft is not flying.
  - ALLOW INCOMING FLIGHT PLANS:
    - Set to Yes to allow incoming flight plans from Wi-Fi connected devices, such as ForeFlight Mobile.
    - This setting does not affect the ability to show flight plans from other ARINC-429-connected GPS navigators like the GTN and GNS series navigators.
- TRACK LINE OPTIONS – Use these settings to set up the distance and time markings shown on the ground track line.
- "VS REQ'D OPTIONS:" Use these settings to configure the Vertical Speed Required to Destination Info block on the map. Select the distance from and the distance above the last waypoint in the SkyView flight plan and SkyView will continuously compute what vertical speed you would need to maintain from your present position to converge on the point above and before the point specified. This information is reflected in the VS REQ'D DESTINATION Info Item and on the vertical speed tape on the PFD.

Map Info Items

- MAP > MAP MENU> INFO ITEMS: Use these settings to display up to 10 informational items along the left and right sides of the Map Page. Items available for display include:
  - Bearing to Waypoint.
  - Cross Track:
    - This is the shortest possible distance that can possibly be traveled that will put you back on course. Essentially, it is the perpendicular distance from the current location to the course line.
  - Current Location

- Destination Waypoint:
  - Identifier of the final waypoint in your flight plan.
- Distance to Go:
  - The total distance remaining along the flight plan.
- Distance to Waypoint:
  - Distance to the currently active waypoint.
- ETA (Final):
  - The estimated time of arrival at the final waypoint in the flight plan. This time does not account for time zone changes. If GPS ground speed is <25 knots, the Plan Ground Speed setting (MAP MENU > FLIGHT PLAN OPTIONS) is used so that you can see approximate travel times while on the ground.
- ETA (Next):
  - The estimated time of arrival at the next waypoint in the flight plan. This time does not account for time zone changes. If GPS ground speed is <25 knots, the Plan Ground Speed setting (MAP MENU > FLIGHT PLAN OPTIONS) is used so that you can see approximate travel times while on the ground.
- ETE (Final):
  - The remaining estimated time enroute to the final waypoint in the flight plan. If GPS ground speed is <25 knots, the Plan Ground Speed setting (MAP MENU > FLIGHT PLAN OPTIONS) is used so that you can see approximate travel times while on the ground. Display switches from hh:mm to mm:ss automatically.
- ETE (Next):
  - The remaining estimated time enroute to the next waypoint in the flight plan. If GPS ground speed is <25 knots, the Plan Ground Speed setting (MAP MENU > FLIGHT PLAN OPTIONS) is used so that you can see approximate travel times while on the ground. Display switches from hh:mm to mm:ss automatically.
- GPS Altitude:
  - The current GPS altitude. Note that this is MSL, not AGL. This number may differ significantly from your barometric (indicated) altimeter due to variations in the GPS data model, GPS accuracy, and nonstandard variations in outside pressure.
- Ground Speed:
- Next Course:
  - The direction from the next waypoint to the waypoint after that in a flight plan.
- Next Waypoint

- Course:
  - The direction from the previous waypoint to the next waypoint.
- VS REQ'D DESTINATION:
  - Vertical Speed Required to Destination shows the vertical speed necessary to descend from the current position and altitude to a defined target position and altitude above and before your final waypoint at the current ground speed. This information is also displayed as a magenta line on the vertical speed indicator.

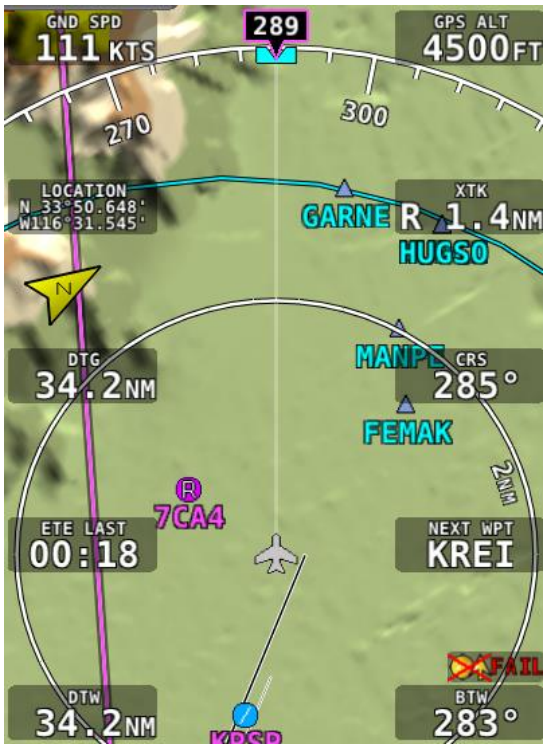


Figure 120 – Map Info Items

Touch-enabled Info Items

These Info Items are only available on an SV-D1000T display. Additionally, the top left and top right info item boxes cannot be set as TOUCH items.

You can place any of the following menu shortcuts in the info block space on the Moving Map. Tapping on any of the shortcut buttons will result in the same action as pressing the corresponding menu button, regardless of what menu is currently displayed.

- Direct-To: When an airport, navaid, or other waypoint is selected on the map tap the D button brings up the Info page on it. Tap D again to instantly start navigation to an airport, navaid, or other waypoint selected in the Info, Nearest, Flight Plan, or Map Pointer pages. If there is an active flight plan, touching D and the current waypoint will appear on the resulting info page.

- FPL Page: Tap FPL (Flight Plan) to bring up a window that can be used to create, display, or modify the SkyView Flight Plan.
- Info page: Tap INFO to bring up the Info window with detailed information about any selected airport, navaid, or other item that is selected in the map pages or that is being pointed to with the Map Pointer. Additionally, the Info window doubles as a way to search for airports, navaids, and user waypoints through a text search
- NRST Page_ Tap NRST (Nearest) to bring up the window that displays the nearest airports, navaids, and user waypoints.

Figure 121 – Touch Shortcut Map Info Items

Navigation and Flight Planning

SkyView's Navigation Mapping Software course information can be displayed on the SkyView PFD's HSI display when it is selected and navigating to an active waypoint. It is always labeled SKYVIEW in the HSI and in the Flight Planning window.

Navigation Methods

SkyView supports two internal types of navigation. Direct-To navigation lets you quickly fly "directly to" a waypoint by pushing the D→ button whenever it is displayed. Additionally, SkyView offers robust Flight Planning that allows navigation to a sequence of one or more waypoints. Both of these methods are covered in the following sections.

Find an Airport or Navaid by Identifier

To find an airport or navaid, press MAP > INFO. A window like the one seen in Figure 122 will be displayed.

Figure 122–Moving Map Info Window

When the Info window is first displayed it shows detailed information about the airport or navaid that was most recently used or selected. From here, you can move the CURSR joystick down to find the desired item by identifier, facility, or city*. To do this, move the CURSR joystick up/down to move between identifier (top), facility name (middle), and city* (bottom) fields; Once you have selected the field you wish to use to search, rotate the knob to change the highlighted character. Move the joystick right to select the next character and continue until the desired facility is shown.

Alternatively, if you move the CURSR joystick left after the first press of the INFO button, you can choose from the most recently used and viewed airports and navaids under the RECENT tab.

Press D→ to navigate directly to the currently displayed or highlighted airport or navaid, or ADD->FPL to add it as a waypoint in a Flight Plan.

When an airport is being displayed in the INFO window, more information about that airport can be found under additional tabs along the top of the window. To see this information, move the CURSR joystick up to highlight the APT tab. Then, move the joystick to the right to select different sub categories of information about the selected airport.

*Search by city is not available when Jeppesen aviation databases are used.

Nearest Airports, Navaids, and User Waypoints

To quickly bring up a list of the nearest airports, navaids, and user waypoints press MAP > NRST. A window similar to the one seen in the following figures will be displayed.

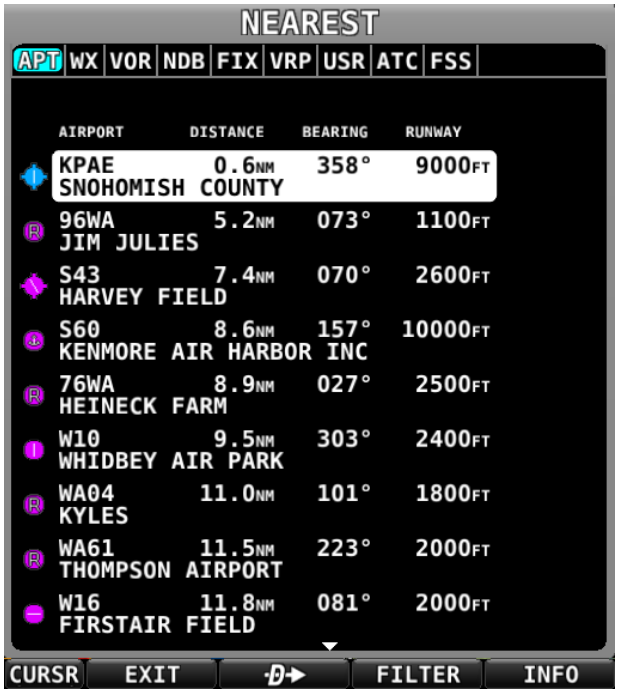


Figure 123–Moving Map Nearest Window Full

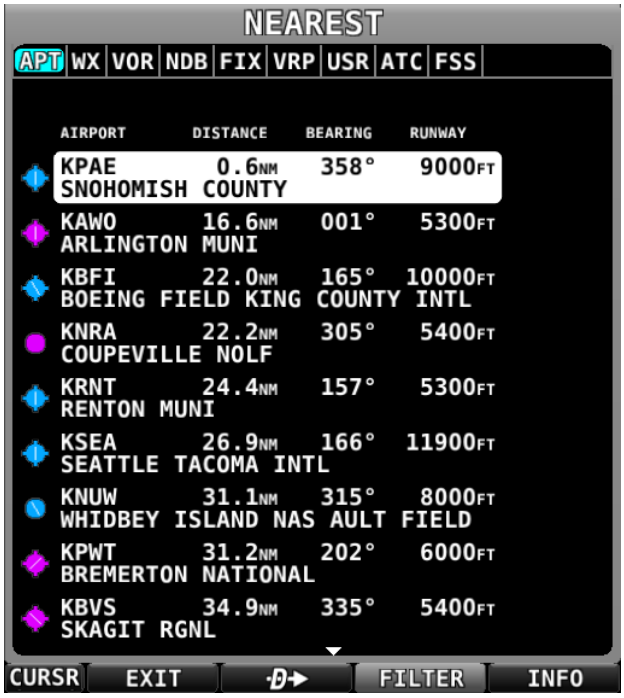


Figure 124 - Moving Map Nearest Window Filtered

Each tab in the bar of tabs at the top of the Nearest window contains a list of aviation features, they include:

- APT – Airport
- WX – Weather (when a weather device is connected)
- VOR
- NDB
- FIX – Fixes
- VRP – Visual Reporting Points
- USR – User Waypoints
- ATC – Nearest non-airport specific ATC-frequencies, such as centers. Available with FAA aviation data only.
- FSS – Nearest FAA Flight Service Station frequencies. Available with FAA aviation data only.

Map Items which are set to Off in the MAP ITEMS menu, such as private airports or seaplane bases, will not appear in the nearest list at all.

Move the joystick left and right among the tabs to select the category you are interested in. Rotate or move the knob up/down to highlight different items in the list. Once the desired facility is shown, press INFO for more information about it, D→ to navigate directly to it, or ADD->FPL to add it as a waypoint in a Flight Plan. Items that have COM frequencies associated with them can have their frequencies sent to a connected COM radio by pressing TUNE COM.

Nearest Airports List Filter and Other Options

The pilot can also apply additional criteria to the list of nearest airports with the FILTER button, which replaces the NRST button when the list is displayed. SkyView will remember if the filter was selected when it was powered off and automatically filter the list again on the next bootup. To see the full list of airports, press the FILTER button again.

To configure the filter, go to MAIN MENU > MAP SETUP > NEAREST LIST OPTIONS

- SHOW FULL AIRPORT NAME – Yes/No, turns the full airport name on or off regardless if FILTER is engaged or not.
- WHEN FILTERED – The following restrictions are applied to the nearest list when FILTER option is active:
  - RUNWAY SURFACE – The pilot can choose to display Any Surface, Water only, Hard and Soft or Hard only when FILTER is engaged.
  - PRIVATE AIRPORTS – The pilot can choose to Show or Not Show private airports when FILTER is engaged.

- MINIMUM RUNWAY LENGTH – The pilot can select a minimum runway length for airports to be displayed when FILTER is engaged. Runways with unknown length are not shown when the NRST list is being filtered by runway length.

Detailed Facility Information

When an airport is displayed in the Info window after the INFO button is pressed, detailed information about the selected facility is displayed. Information is arranged into tabs of organized information. For example, information about airports is divided into APT, FREQ, RWY (runways), and RMK (remarks) tabs. Move the joystick left and right to select these different tabs of information at the top of the window.

Some tabs have more information than can fit on the screen at once. In this case, turning the knob or moving it up/down will scroll or change the information displayed. For example, some airports have multiple runways listed under the RWY tab. Once the RWY tab is selected, different runway information can be displayed by turning or moving the CURSR knob up/down. Under the FREQ tab, many of the frequency's include a description, which can show information about the sector or ATC frequencies or valid runways for tower and ground, etc. To view the additional information press . To return to the full list press .

You may press ADD->FPL from the info window to add the displayed facility as a waypoint to the Flight Plan. You may also press the TUNE COM button to send the selected frequency to the standby on the COM Radio.

Figure 125 – Airport Info

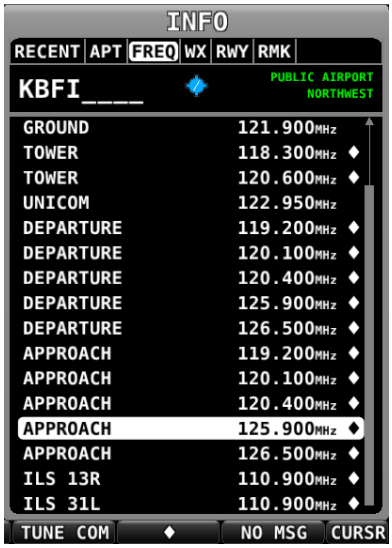


Figure 126 – Airport Frequency Info

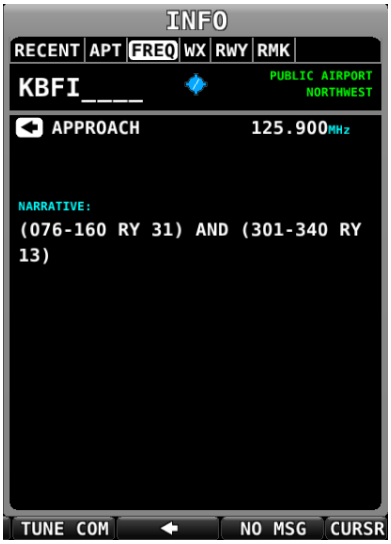


Figure 127 – Frequency Narrative

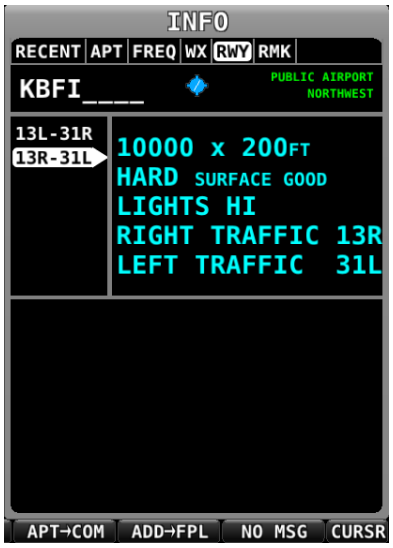


Figure 128 – Airport Runway Info

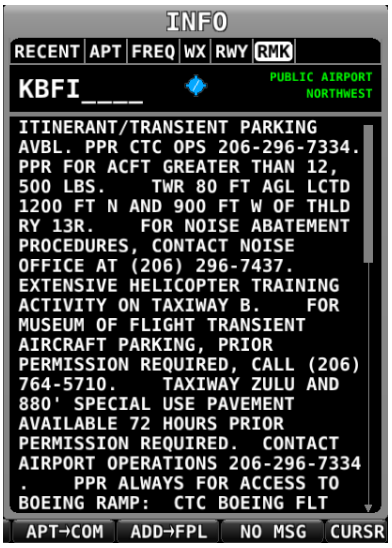


Figure 129 – Airport Remarks

Information available for different types of facilities includes:

- Name
- Type (public/military/private*/VOR/NDB/etc.)
- Identifier
- Current distance/bearing to facility
- Region
- Field elevation
- Parking availability*

- Communications and Localizer frequencies
- ATIS/AWOS Frequencies
- Traffic pattern altitude/direction*
- Runway information, including pattern directions* and surface type*
- Lighting type*
- Parking/Fuel availability*
- Remarks*

Note that not all information is available for all facility types and that the depth of information may differ from airport to airport. Typically, larger public airports have the most information available. Small private airports may have very little or no information available.

*These items are not in Jeppesen databases.

Navigate to a Selected Waypoint with ·D→ (Direct-To)

To navigate to an airport, navaid, or other waypoint via a direct course from your present position, press ·D→ in the Nearest, Info, or Map Pointer windows when the desired item is highlighted. This instantly makes the selected item an active waypoint that SkyView is navigating to, and automatically closes the Info or Nearest window.

Press ·D→ from the Map Page to bring up the Info window that allows you to search for a waypoint by identifier, name, or city*. If navigation is already active, the current waypoint will be shown. You may also select the RECENT tab of the Info window to find waypoints that have been navigated to recently. After the desired waypoint is found, simply press ·D→ again to navigate directly to it from your present position.

A magenta course line is created that starts from your current location and ends at the selected waypoint. It is the shortest path between your current location and that waypoint. The PFD can also display the course on the HSI. It is always SKYVIEW. A PFD, HSI, and map depiction of this behavior is show in Figure 130.

Whenever navigation to a waypoint is active the MAP > FPL and MAP > FPL > NAVIGATE buttons highlight to indicate that a Flight Plan is active. This is also depicted in the figure below.

*Search by city is not available when Jeppesen aviation databases are used.

If a waypoint is selected in any window that waypoints can be selected in, pressing ·D→ will immediately replace your current ·D→ destination with the selected destination.

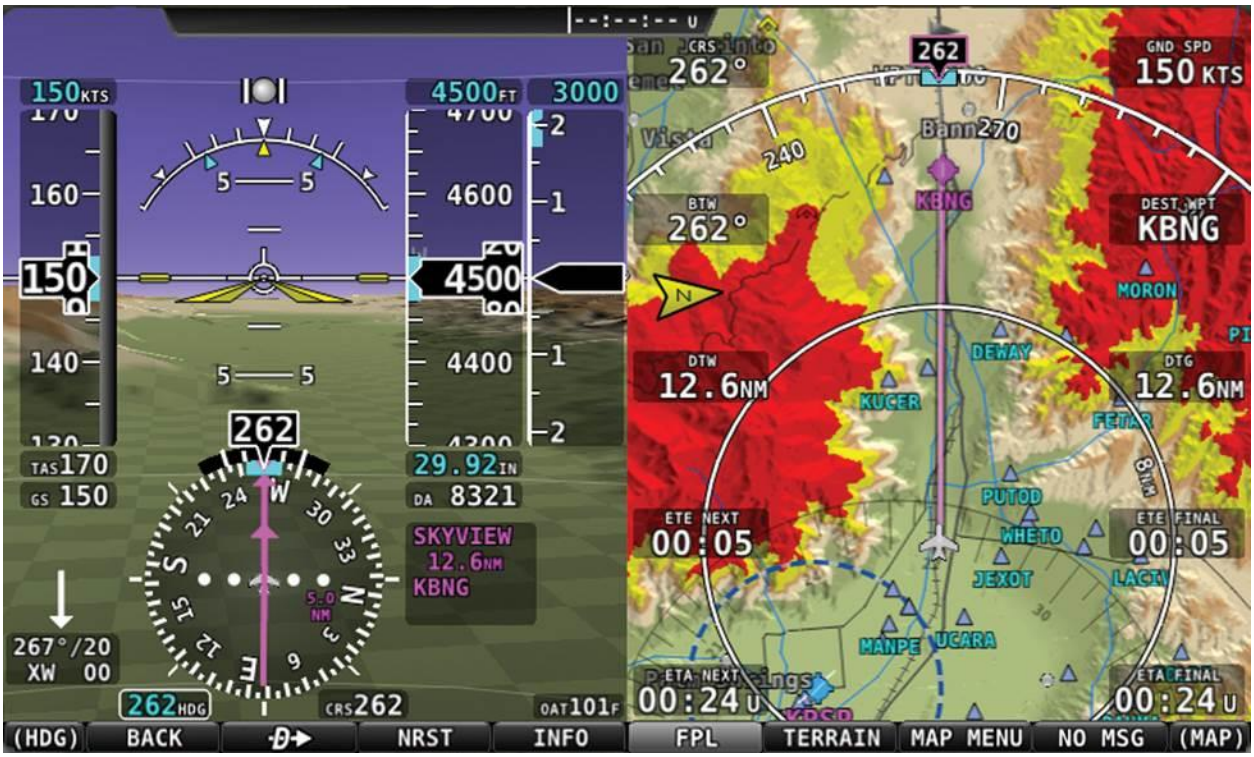


Figure 130 - Map/HSI with Navigation Active

Suspend Navigation

When SkyView is providing navigation guidance to a waypoint, press MAP > FPL > NAVIGATE to suspend navigation. The NAVIGATE button will un-highlight to indicate that navigation is no longer active. Note that this operation does not clear the active flight plan: It simply suspends SkyView's active course guidance.

Clearing the Navigation Flight Plan

To completely clear the active target or Flight Plan press FPL > FPL MENU, select CLEAR FLIGHT PLAN, and then move the joystick right twice (once to select, twice to confirm) to clear all waypoints from the flight plan and cancel navigation simultaneously. This effectively "resets" the navigation and flight planning feature in SkyView.

Map Panning with the Map Pointer

Move the (MAP) joystick up, down, left or right, or in any diagonal direction to cause the map to follow your joystick movement instead of following the aircraft's movement. When in this Map Panning Mode, the Map Page does not auto-center on the airplane, but on the Map Pointer instead. Turning the joystick causes the map range to increase and decrease (zoom in/zoom out) around the Map Pointer, just like it does when it is following the aircraft.

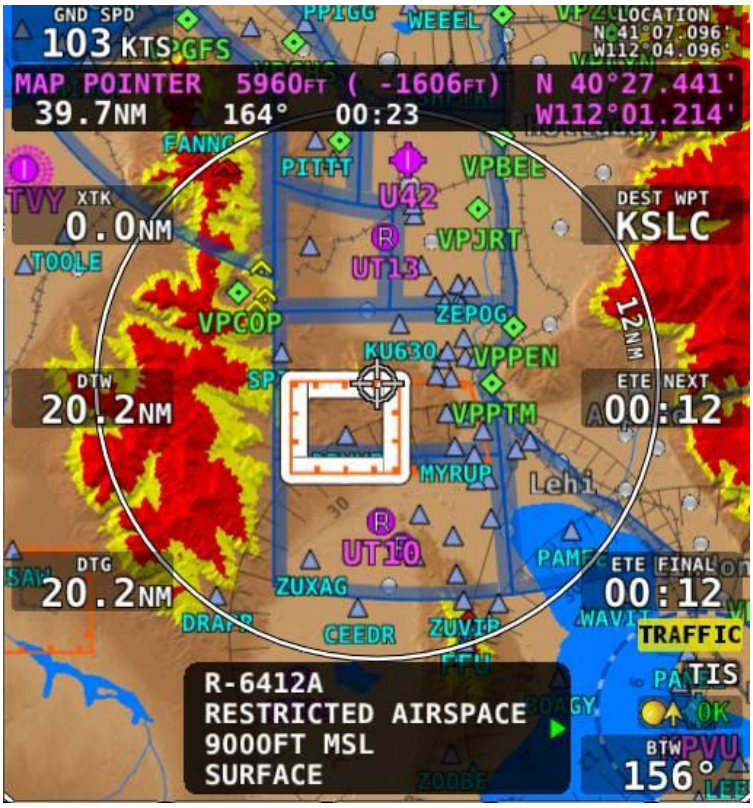


Figure 131 - Map Panning Mode

To exit Map Panning Mode, press or “click” the center of the joystick. The map will revert to following the aircraft. Pressing the joystick again will return to the Map Panning Mode at the last known Map Pointer position.

In addition to the Map Pointer, a Map Pointer Information Bar displays the following information about the Map Pointer:

- Latitude / Longitude.
- Distance between the Map Pointer and the aircraft.
- Magnetic bearing from the aircraft position to the Map Pointer.
- The estimated time, in minutes, that it would take to reach the Map Pointer if you were to fly directly to it at the current GPS ground speed.
- Elevation of the terrain underneath the Map Pointer, along with the difference between the aircraft’s current GPS altitude and the terrain elevation (in parentheses.).

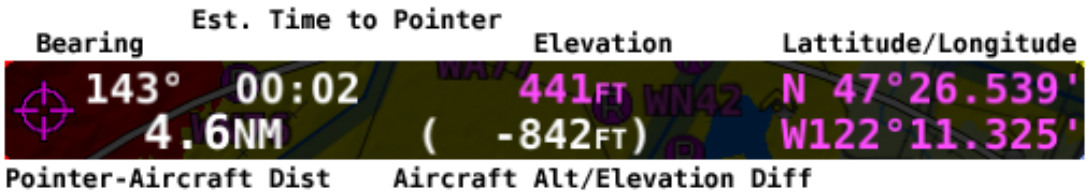


Figure 132 – Map Pointer Information Bar

When in Map Panning Mode, pressing D→ will cause a temporary MAP POINTER waypoint to be created that allows you to navigate Direct-To the location that you are pointing at with the map pointer. (Note that this waypoint is not stored as a "user waypoint". See the following section on user waypoints for more information about using the user waypoints feature).

When in Map Panning Mode, the MENU > ADD POINT TO FPL menu item will allow you to create a user waypoint and immediately add it to your flight plan.

Pressing NRST in Map Panning Mode will cause the list of nearest airports and other aviation features to be based on the location of the Map Pointer instead of the aircraft. This noted at the top of the Nearest Window.

Selecting Map Items with the Map Pointer

When panning with the Map Pointer, virtually any item on the map can be selected. This includes items such as airports, airspaces, navaids, waypoints, obstacles and cities.

To select an item, simply use the Map Pointer to point directly at the item. After a couple of seconds, the item is highlighted in white to indicate it is selected. A pop-up block of informational text about the item also appears.

Note that airspaces can be selected by putting the Map Pointer inside of any airspace segment. You need not point directly at the lined boundary.

The presence of multiple selectable items under the Map Pointer is indicated by a green arrow in the information pop-up text box. This frequently occurs, as airports often have surrounding airspaces or collocated navaids. To choose between the available items, turn the joystick. Note that this disables the normal range/zooming function of the joystick, unless there is only one item selected. To re-enable the ranging function of the joystick, move the map pointer in any direction by nudging it in any direction. Then, before the map pointer re-selects new items, turn the joystick knob.

When a navigable item such as an airport, waypoint, or navaid is selected, the INFO and D→ button can be used just like they can in the menu system.

Figure 133 – Airspace Selected

Figure 134 – Airport Selected

Flight Planning

A Flight Plan consists of a sequence of one or more waypoints. A maximum of 99 waypoints are supported. The great circle track between each waypoint defines the individual legs of the Flight Plan. When a Flight Plan is active and shown on the Map, the current leg is magenta in color. Future legs are white.

HSI Guidance is provided to the active leg of an active Flight Plan on the PFD when *SKYVIEW* is selected as the navigation source or when the flight plan from an ARINC GPS such as the 430 is active and that GPS is selected as the navigation source.

Waypoints may be entered into the current Flight Plan by direct entry from the Flight Plan Menu, by pressing ADD->FPL from the Nearest or Info windows, by using the MENU>ADD POINT TO FPL, or by importing a Flight Plan file from a USB memory stick in GPX format. Operations are performed on the flight plan via the FPL MENU. Flight Plans from external ARINC and Aviation serial format GPS navigators can be displayed in SkyView's Flight Plan window and on SkyView's moving map, but all waypoint editing must be done on the source GPS.

A center-click press of the knob/joystick from within the FPL menu brings up the insert waypoint function.

SkyView supports one Flight Plan at a time. This Flight Plan can be manipulated, and it can provide navigation if it is activated, and it can be exported to a USB memory stick for later retrieval or sent to a compatible device with supported apps. Importing a Flight Plan from a USB memory stick causes the currently loaded Flight Plan, if any, to be overwritten.

When the D→ feature is used after a multi-leg flight plan has been created to go to a new single destination, the current Flight Plan is temporarily "overwritten" by the D→ action. To restore a flight plan that has been "overwritten" by a temporary D→ activation, use the FPL > FPL MENU > RESTORE FLIGHT PLAN menu option. This feature allows you to temporarily divert without permanently losing your existing flight plan. However, it is important to note that if you build additional legs around a D→ destination, the new resulting multi-leg flight plan will now permanently overwrite the previous flight plan.

There are two types of leg transitions. A flyby leg transition causes the aircraft to fly by the leg's destination waypoint in order to smoothly transition from one leg to the next with no overshoot. This is the default transition type for each leg. An overfly transition causes the aircraft to fly directly over the waypoint before transitioning to the next leg. The transition type can be selected for each individual waypoint transition in the Flight Plan.

The Flight Plan is synchronized across all displays. A Flight Plan is also preserved on each display over a power-cycle, but navigation is not active after the Flight Plan has been restored upon start-up.

SkyView can import and export Flight Plans in GPX format to a USB Memory Stick. See Dynon Wiki - Importing Flight Plans for information about specific aviation software products that are known to output compatible GPX files. Additionally, a technical reference for this format can be found at http://www.topografix.com/gpx.asp. There are many utilities available that convert other formats to GPX format and vice-versa.

When parsing GPX files, SkyView looks at the first 99 route points (<rtept> tags) within the first route (<rte> tag) in the GPX file. All other data is ignored.

Extended Runways

When the Flight Plan origin, a waypoint, or the destination is an airport, an extended runway line is shown on the map, as illustrated here.

To navigate to a particular runway, push the INFO button, select RWY, rotate the knob to select the desired runway, and press "Direct-To."

Figure 135 – Extended Runways

Creating and Working with SkyView Flight Plans

This section describes the windows and menus that are available for creating and manipulating a SkyView Flight Plan.

Flight Plan Window

Press the FPL button in the MAP Menu to open the Flight Plan window and menu. The Flight Plan window contains tabs of available flight plan sources: SKYVIEW and external ARINC GPS navigators capable of providing flight plan data. Move the joystick left or right to display information associated with each tab, and either turn the joystick or move up/down to scroll within the window.

SKYVIEW Tab

The Flight Plan window opens with the SKYVIEW tab selected and the currently active Flight Plan displayed.

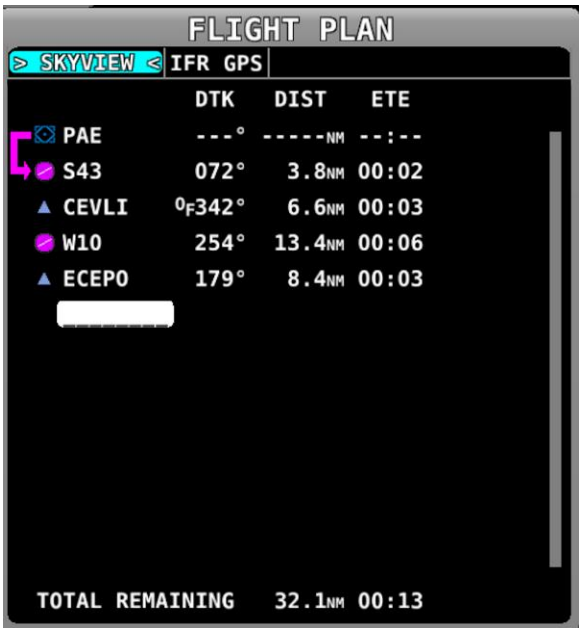


Figure 136 – Flight Plan Window

The SkyView Tab screen shows the following items:

- Waypoint List: The list of waypoints making up the current Flight Plan.
- Waypoint Icons: The icon that would be shown on the Map Page for the waypoint is shown to the left of each waypoint in the Flight Plan.
- Active Leg Icon: The active leg of the Flight Plan is depicted by a hooked arrow from origin waypoint to the destination waypoint if the leg is point-to-point. If the FPL Menu D→ function has been used to go directly to a waypoint within, the flight plan, this arrow will instead be straight arrow pointing at the selected destination waypoint.

- OF (overfly) Icon: This indicates the transition type of the leg. When OF is present, the leg ending at this waypoint has an overfly transition, otherwise, it has a flyby transition.
- DTK (Direct Track): The direction of the leg. For the active leg, though, this is the direct track from the aircraft to the destination waypoint.
- DIST: The distance of the leg. For the active leg, it is the distance from the aircraft to the next waypoint.
- ETE: The estimated time enroute for the leg, based on the current ground speed if flying, and if stationary based on the Plan Ground Speed setting (MAP MENU > FLIGHT PLAN OPTIONS). For the active leg, this is the estimated time until the aircraft reaches the next waypoint based on its current closure rate towards it.
- ------: The last item in the waypoint list is a placeholder for adding another waypoint at the end of the Flight Plan.
- TOTAL REMAINING: This is always displayed at the bottom and is the total distance and total ETE of the legs of the Flight Plan. If the route is active, only the current and remaining legs are included in the calculation. If inactive, all legs are included.

Flight Plan Menu Bar

When the Flight Plan window is open with the ACTIVE tab displayed, select one of the following Menu items to proceed:

BACK

Press to exit the FPL MENU if open, or press to exit the Flight Plan window.

Direct-To ·D→

When a ·D→ is active, press to go directly to waypoint that is currently highlighted by the cursor in the Flight Plan window.

NRST and INFO

Press these to bring up the Nearest or Info windows. The Flight Plan window will be exited.

NAVIGATE

Press to activate/deactivate the current Flight Plan. The button is highlighted when a Flight Plan is active.

FPL MENU

Press to bring up the FPL MENU. The FPL MENU provides access to various operations that can be performed on the Flight Plan and its waypoints. Reference the FPL MENU section below for more information.

FPL MENU Overview

The following figures show the FPL MENU. To select an operation from the menu, scroll up and down by turning the joystick or moving it up/down. Move the joystick left to exit the FPL MENU, or move the joystick knob right to accept/initiate the selected operation.

Some operations require confirmation when selected. Move the joystick right to "OK" a confirmation prompt, or to the left to cancel the action. This confirmation prompt is depicted in Figure 138.

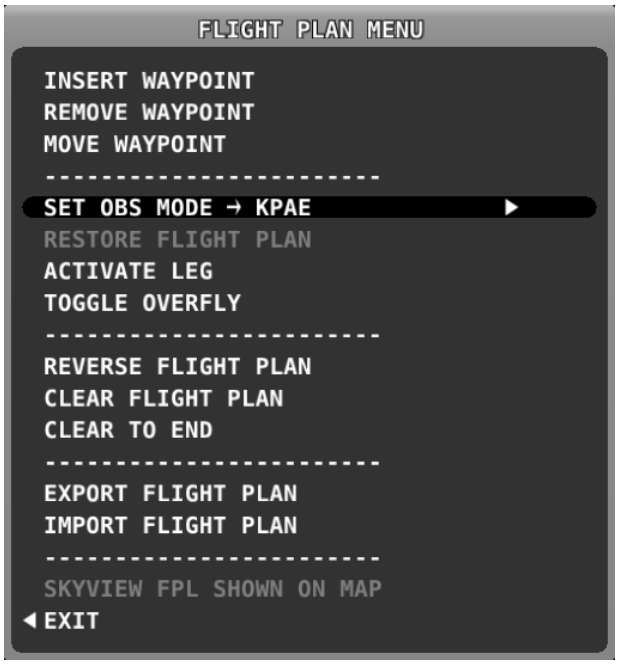


Figure 137 – FPL Menu

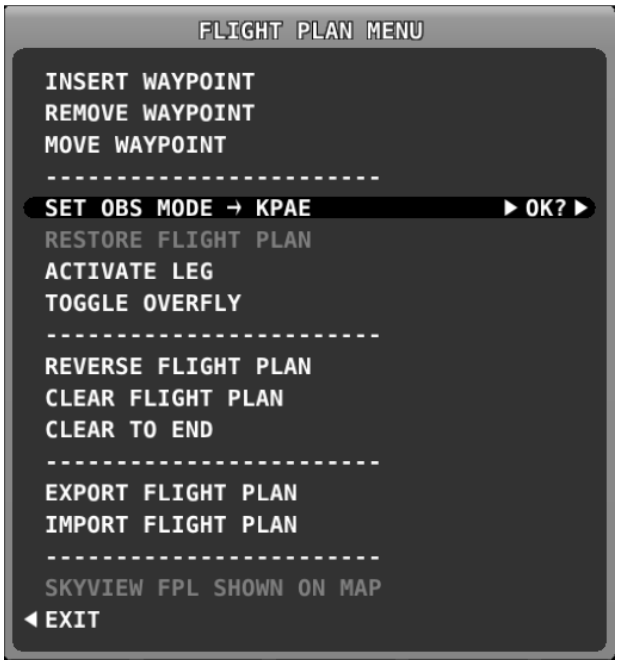


Figure 138 – FPL Menu Confirmation Prompt

FPL MENU Actions

The following actions can be initiated from the FPL MENU:

- EXIT: Select to close the Flight Plan Menu.
- INSERT WAYPOINT: Select to bring up the Insert Waypoint pop-up menu.
- REMOVE WAYPOINT: Select to remove the currently selected waypoint and adjust the remaining legs and totals.
- MOVE WAYPOINT: Select to move the currently selected waypoint to another place in the flight plan.
- SET OBS MODE: Select to turn on OBS mode using the selected waypoint. When OBS Mode is active, you can then adjust the inbound course to the waypoint using the CRS function of the PFD joystick knob.
- RESTORE FLIGHT PLAN: Restores a flight plan that was temporarily overwritten by using the ·D→ function from elsewhere in the map.

- ACTIVATE LEG: Select to make the leg that ends at the selected waypoint the current leg.
- TOGGLE OVERFLY: Select to toggle the transition type at the selected waypoint from overfly to flyby or vice versa. An “OF” icon next to the waypoint in the flight plan denotes that the waypoint will be overflown instead of flown by.
- REVERSE FLIGHT PLAN: Select to reverse the sequence of waypoints in the Flight Plan.
- CLEAR TO END: Select to clear all waypoints from the currently selected waypoint to the end of the Flight Plan.
- CLEAR FLIGHT PLAN: Select to clear all waypoints from the Flight Plan.
- EXPORT FLIGHT PLAN: Select to export the current Flight Plan to a USB stick memory stick in GPX format. The filename is automatically generated using the names of the first and last waypoints. Note that this is different from sending a flight plan to mobile apps over Wi-Fi. That action is solely done via the compatible mobile app.
- IMPORT FLIGHT PLAN: Select to open the Flight Plan Import window. The import window contains a list of all GPX format files that are present on a connected USB memory stick. Press LOAD to import the currently selected GPX file into the Flight Plan and activate it. This action will overwrite an existing flight plan. To start at the first waypoint, press NAVIGATE. To begin navigating on a different leg, use the Flight Plan menu or Direct-TO to activate the specific leg. Press BACK to exit the Flight Plan Import window and return to the FPL MENU. Note that this is different from sending a flight plan to mobile apps over Wi-Fi. That action is solely done via the compatible mobile app.
- SHOW SKYVIEW FPL ON MAP or SHOW _EXTERNAL NAVIGATOR_ FPL on MAP: This option is only available when a compatible external navigation device is installed. Select this to choose which flight plan appears on SkyView’s moving map. The waypoints from an external navigator cannot be edited within SkyView.

Activating a Flight Plan

Press the NAVIGATE button to activate your *SKYVIEW* Flight Plan routing. Guidance will be provided directly to the first waypoint in the Flight Plan and along each leg in the Flight Plan thereafter. Guidance is visible for each leg on the HSI if *SKYVIEW* is selected as the HSI SRC.

To go directly to a waypoint other than the first, go into the Flight Plan menu, scroll to the waypoint you want to navigate to, press D→. Guidance will be provided directly to the selected waypoint and to the remaining legs in the Flight Plan after that. Similarly, use the ACTIVATE LEG option in the FPL MENU to skip to the leg that ends with the highlighted waypoints. In contrast to the D→ option, ACTIVATE LEG does not use your aircraft’s current position to generate a Direct-To course. It instead displays course guidance according to the selected leg.

The following figure shows an active Flight Plan where the first leg is active and the aircraft is partway between the first two waypoints of the Flight Plan and is on course. The route is

depicted on the Moving Map display and the course is displayed on the HSI. Since the aircraft is on course, there is no deviation on the CDI needle on the HSI.

Figure 139 – Active Flight Plan: Map and Flight Plan View

Figure 140 – Active Flight Plan: HSI and MAP Depictions

Displaying Flight Plans from External Navigation Devices on the Map

When a compatible external GPS navigator is installed, press MAP > FPL to open the Flight Plan window and menu. The currently active Flight Plan is displayed. Move the joystick left or right to display any available flight plan sources in the window. The flight plan currently being displayed on the Map is designated with two arrows that point at the name: **>SKYVIEW<** or **>IFR GPS<** To display the flight plan on SkyView's moving map press the FPL MENU button, and select "SHOW [GPS NAME] FPL ON MAP" (where [GPS NAME] is the display name you've assigned your external navigator). Note that changing the Flight Plan source on the Map page does not change the HSI source on the PFD unless enabled in System Setup (Setup > Map Setup). This allows your autopilot and other primary navigation activities be uninterrupted by the changes you make to the flight plan display on the map.

With recent software updates, Garmin disabled the ability for GNS and GTN series avionics to accept changes from non-Garmin equipment. Therefore, you cannot edit the waypoints of external flight plans from SkyView. Once you make a change on the external navigator, SkyView will reflect it in the list of waypoints and redraw it on the map.

Figure 141 - Example of External Flight Plan Echo

Exchanging Flight Plans with Third Party Apps

SkyView can interface with some third-party apps running on iOS, Android, and Windows devices to exchange Flight Plans.

To exchange flight plans:

1. Make sure third-party app is connected to SkyView Wi-Fi (see SkyView Wi-Fi Adapter for instructions).
2. On SkyView, set “Allow Incoming Flight Plans” “Over WI-FI” to YES under MAP > FLIGHT PLAN OPTIONS.
3. On third-party app, send or receive flight plan per app provider’s instructions.
4. Once SkyView receives Flight Plan a confirmation message will appear on the Map and the Flight Plan will be in SkyView Flight Plan window. The flight plan can then be used and edited on SkyView.

Figure 142 – Flight Plan Received

Flight Plans are only updated when you explicitly send or receive them from the app. This ensures that no flight plan changes are made to flight plan on the app or on SkyView without explicit action.

Flight Plan Alert Messages

Alert Messages related to the active Flight Plan are displayed on the bottom of the Map Page when appropriate:

- FPL TURN: XXs: Displayed when there is less than 30 seconds before a transition from one leg to the next in a flight plan, where XX is the number of seconds.
- LAST LEG EXTD: Displayed when the destination waypoint of the last leg has been passed. SkyView automatically extends the active leg indefinitely.
- TRN TOO STEEP: Displayed when the required bank to complete the upcoming turn as depicted on the map is excessive.

Figure 143 – Flight Plan Alert Messages

Vertical Navigation – Internal SkyView Flight Plan

When the SkyView Flight Plan includes at least one airport or a specific runway at an airport, the system can provide VFR vertical navigation to a defined point referenced to the last airport in the flight plant or to the designated runway threshold, including commanding the autopilot to fly a calculated descent path.

The descent path is defined by parameters established by the pilot in MAP MENU > VS REQ'D OPTIONS. There, the pilot defines a height above the airport or runway and a distance prior to the airport or runway threshold, thus establishing an intended destination point. The pilot must also enter a desired descent angle in degrees. A target descent path is then calculated which rises from the defined destination point upward toward aircraft at the angle specified. The resulting descent path is somewhat analogous to a traditional glideslope. However, it is mathematically calculated only and does not assure terrain or obstacle clearance.

As the aircraft approaches the destination airport and the calculated descent path is reached, the autopilot will fly the necessary vertical speed to stay on the calculated path. In this mode, the target vertical speed to achieve descent along the calculated path is indicated in the VSI.

In a series of figures on the next page, the blue tick mark shown on the VSI represents the vertical speed necessary to descend along a path calculated at the defined angle and arriving at the intended destination point. Note, however, this indicator is a "future value," giving the pilot advance notice of the vertical speed which will be necessary once the aircraft intersects that calculated path at its current altitude and ground speed. If the pilot were to immediately start descending at a VSI equal to the blue tick mark indication, the aircraft would descend well prior to the intended point.

In contrast, the magenta line on the VSI indicates is a "current value" indicating the vertical speed which will take the aircraft along a straight descent path from its current position to the selected runway threshold (or specified height above). The arrow is magenta when GPS is the navigation source (i.e., glidepath); the arrow is green when a NAV radio is the navigation source (i.e., glideslope).

If the aircraft maintains is current altitude until the magenta line descends to match the blue tick mark, the aircraft will have intercepted the calculated descent path, similar to intercepting a glideslope. If properly armed in the VNAV mode, the autopilot would sequence to that mode and navigate down the calculated descent path.

Additionally, if Synthetic Vision is enabled a glidepath/slope indicator is presented next to the HSI. Again, this is indication colored magenta for a glidepath and green for a glideslope. Synthetic Vision gives the pilot more awareness of possible terrain or obstacle clearance but should never be a substitute for visual confirmation.

The following sequence of figures illustrates an aircraft's approach to an airport, together with screenshots of the vertical speed indicator showing both the magenta VS REQ'd reference line and the blue calculated descent path indicator. Note that the vertical speed markers will not show when navigating to an externally provided glide slope.

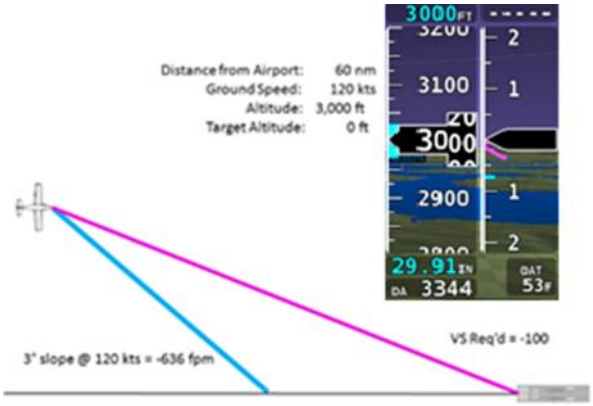


Figure 144

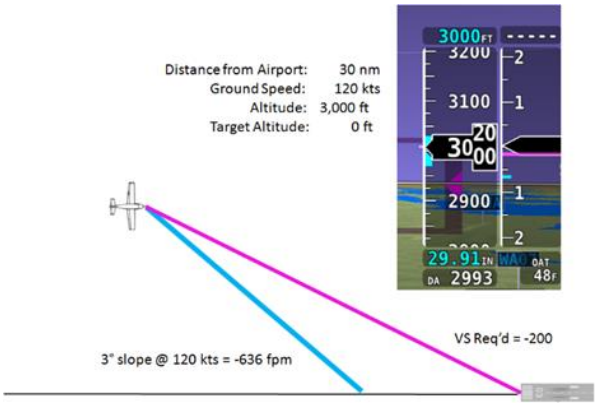


Figure 145

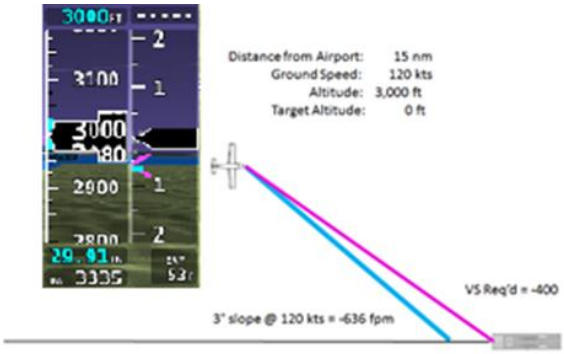


Figure 146

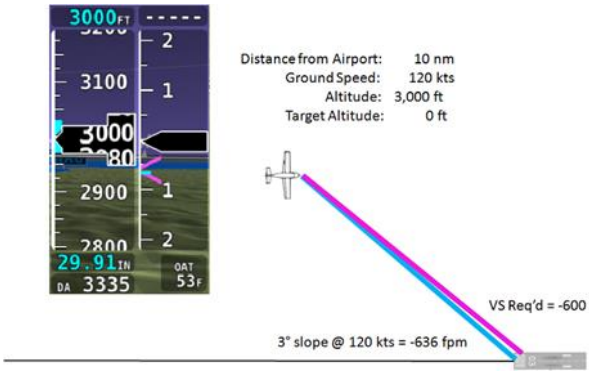


Figure 147

In the final figure in the sequence, the aircraft is moments from intercepting the calculated descent path, indicated by the magenta line and blue tick mark nearly coinciding. If the autopilot is holding altitude and armed in the VNAV mode, it would sequence to VNAV and commence a descent along the calculated path as a vertical speed matching the two indicators.

To enable SkyView's Flight Plan VNAV capability, prior to flight go to MAP MENU > VS REQ'D OPTIONS and enter your desired VNAV.

OBS Mode

OBS Mode allows you to set and adjust an inbound course to any navigable point on the map. That inbound course may then be easily adjusted with the HSI CRS knob, similar to how you would with a VOR. This is useful to approach an airport from a specific direction, for example, without having to create a second waypoint to create a full flight plan leg.

Turning On OBS Mode through your Flight Plan

To turn on OBS Mode to a point that is already in your flight plan, go to MAP > FPL, highlight the waypoint you would like set a course to and then select FPL MENU > SET OBS MODE. The flight plan display will surround the waypoint that OBS Mode is set on with OBS MODE and FPL SUSPENDED messages. When OBS Mode is active, normal flight plan leg sequencing is suspended, and the suspended flight plan is not displayed on the map page. Only the single waypoint that OBS Mode is set to is being actively navigated to. After you turn on OBS Mode, the course to the selected can be adjusted.

Figure 148 – OBS Mode Activated

Adjusting the OBS Course

Once OBS Mode is set, you can use the CRS knob/joystick on the PFD page to change your inbound course to the selected waypoint. Your HSI source must be set to SkyView. This works much like the course setting on when tuning a radio-based VOR.

As you turn the CRS knob, both the magenta inbound and white outbound course on SkyView's map page rotate in tandem with the course on the HSI display.

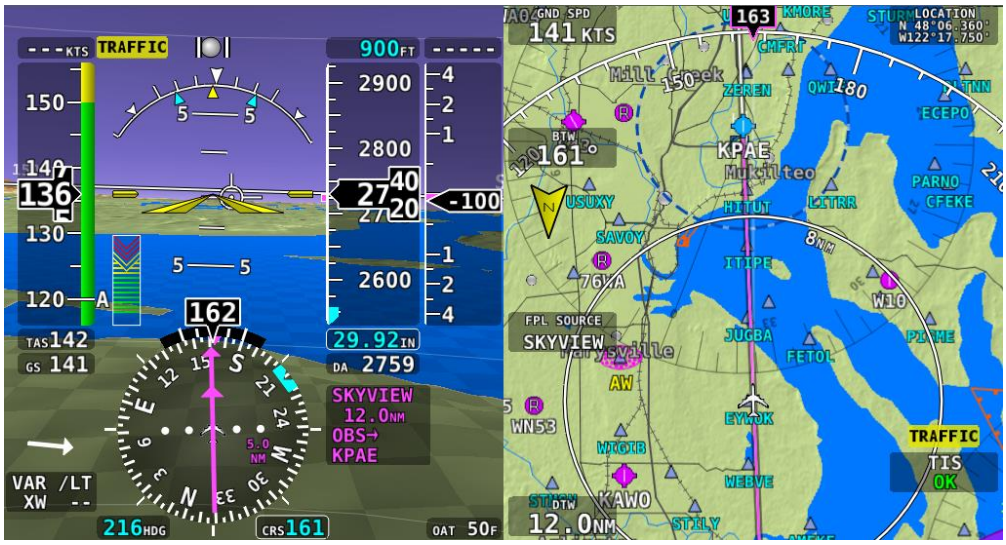


Figure 149 – OBS Mode: On Course

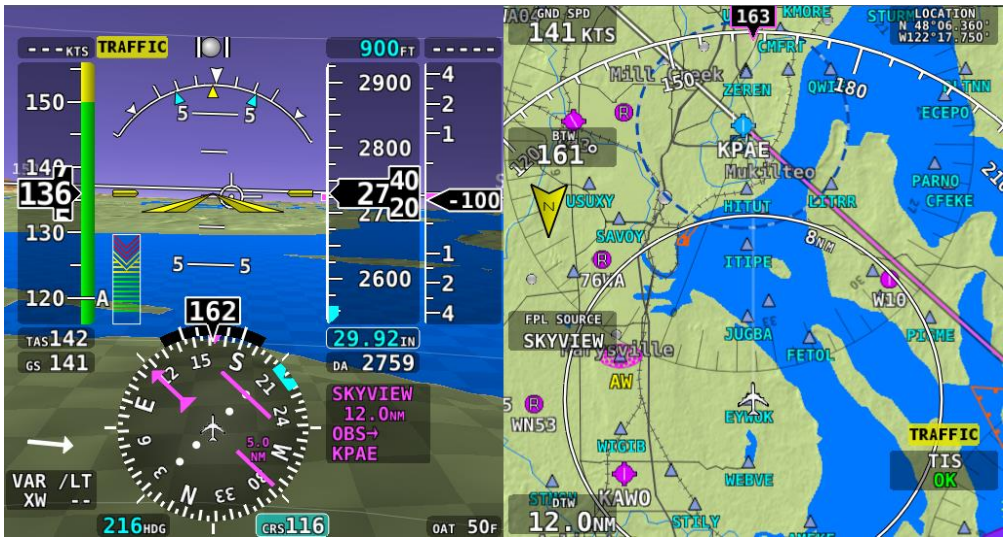


Figure 150 – OBS Mode: Course set to 116

Turning Off OBS Mode

To turn off OBS Mode, go to FPL > FPL MENU > CANCEL OBS MODE.

Alternatively, you can perform any action that would cause SkyView to navigate somewhere else. Examples of this include:

- Activate a different leg on the flight plan by using the FPL MENU > ACTIVATE LEG action.
- Press the D→ button on a flight plan waypoint to go direct to that waypoint on the flight plan.
- Use the D→ feature to navigate to any waypoint available via INFO, NRST, or other Map menus.

Advanced – Tuning OBS Mode On and Off via the D→ button

In addition to using the SET OBS MODE menu item, you can alternatively activate OBS Mode on any waypoint that is selectable in the NRST list, FPL list or INFO page. To do this, select the waypoint and then press and hold D→ for a two seconds.

Once OBS mode is set, you can choose a new waypoint OBS Mode by pressing and holding D→ on another waypoint in the NRST list, FPL list or INFO page.

To turn off OBS Mode, press and hold D→ when only the map page is showing (with no waypoint selected on the NRST list, FPL list, the INFO page, or on the map itself).

Approach/Departure Procedure Charts and Airport Diagrams

When a USB stick with supported charts and airport diagrams is connected to your SkyView display(s), airports with available charts/diagrams will have an additional CHARTS tab available in their Information window. See Figure 152 below.

Viewing Procedure Charts and Airport Diagrams

Turn the CURSR joystick knob to select from a list of the available charts/diagrams. A preview of the chart is shown below the list. To view a chart on the map page, press VIEW.

Zooming/Panning Charts

Once a chart is displayed, turning and moving its joystick knob will pan around and zoom in and out of the chart, just like on the regular map page.

To quickly zoom the chart so that its entire width fills the window, depress (click) the CURSR knob. A second press of the knob will zoom out so that the entire chart can be seen at once.

Automatically Follow your Aircraft

Press FOLLOW to have the SkyView pan the chart automatically so that the airplane is centered as it flies over the chart. This feature is not available on charts that are not geo-referenced. When a chart is not geo-referenced, the following icon is shown at the bottom right of the chart page. Additionally, when an airport diagram is initially chosen, FOLLOW is automatically enabled to aid situational awareness at airports.

Figure 151 – Chart not Geo-Referenced

Returning to the Map View

To close the chart and return to the map, you can either:

- Press MAP MENU > CLOSE, and then EXIT.
- Press (click) and hold the joystick knob for a second.

Returning to the Last Viewed Chart

To quickly return to the last chart that was viewed:

- With the normal map page displayed, press (click) and hold the joystick knob for 1/2 second.
    - When you are within 300 feet AGL of at an airport with an available diagram, that airport diagram is displayed instead of the most recently viewed chart.

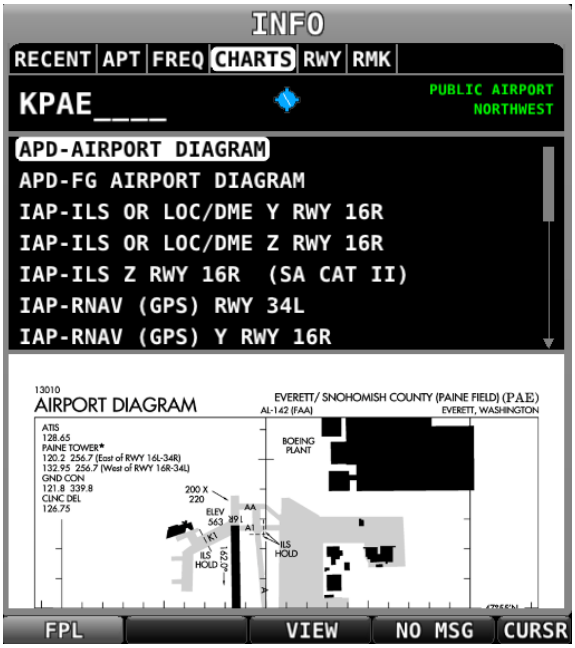


Figure 152 - Charts Tab with Preview

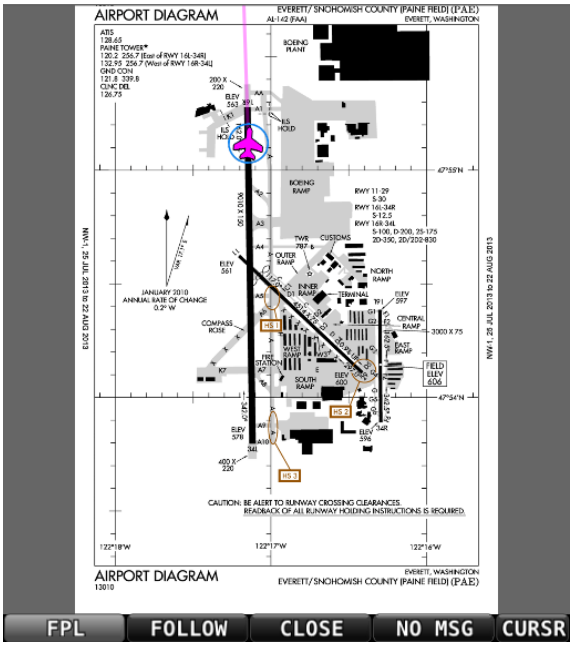


Figure 153 - Full View

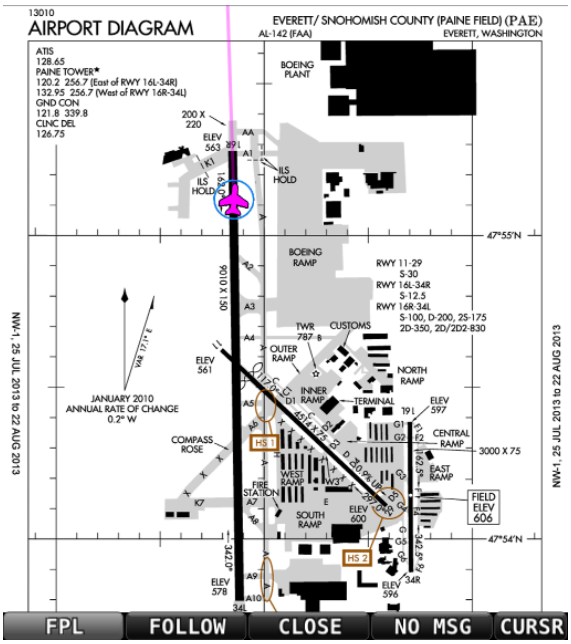


Figure 154 - Full Width View

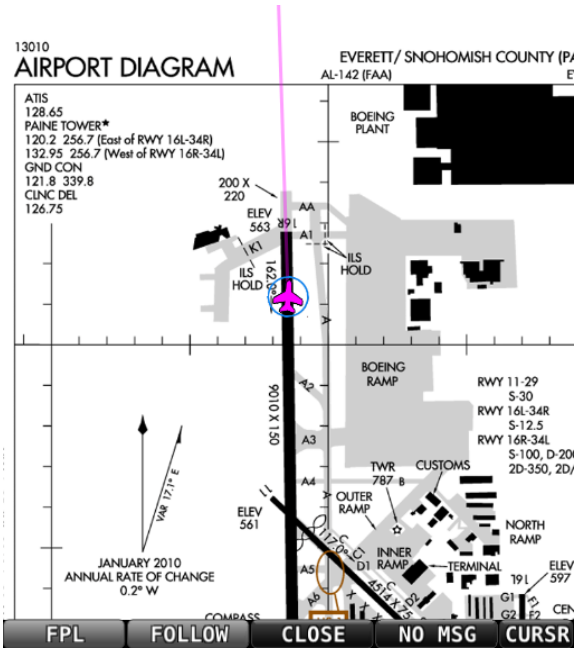


Figure 155 –Following Enabled

SkyView User Waypoints

SkyView supports the ability to create, manipulate, and import/export User Waypoints. A User Waypoint is a point on the map which shows up as an icon of your choosing. Like other airports or navaids, they can be used in flight plans, as Direct-To navigation waypoints, or can simply be used visually on the Map Page to help you navigate.

Creating Waypoints

To create a waypoint at your current location (if the map is centered on the aircraft), or the lat/long that the map pointer is pointing (at if the map is in map panning mode), select MAP > MAP MENU > CREATE WAYPOINT to enter the user waypoint creation tool. A window similar to the following will be shown.

Figure 156 – Waypoint Tools in the Map Menu

Move the CURSR joystick up and down to move the cursor between the various fields. Turn it to select characters. The editable fields include:

- Identifier – Like other airports and navaids, the identifier is displayed on the map.
- Name – Longer description that is shown on the Info page.
- Latitude/Longitude – Defaults to the current aircraft lat/long if the map is centered on the aircraft, or the lat/long that the map pointer is pointing at if the map is in map panning mode. However, this field can be changed with the cursor if you would like to create a waypoint based on other coordinates.
- Altitude – Not currently used for navigation purposes, but is shown on the Info page.
- Icon – Choose from a variety of aviation style icons, pushpins, buildings, etc.

Press SAVE to save the waypoint. User waypoints will automatically be synchronized across multiple SkyView displays in the aircraft provided they are connected via an optional Ethernet connection. See the *SkyView Classic / SE / HDX System Installation Guide* for more details about this connection.
When you want to create a waypoint and immediately use it in a flight plan, you can use the MAP > MAP MENU > ADD POINT TO FPL command. It will first prompt you to create a waypoint based on the current aircraft location or map pointer before it adds that newly-created point to the flight plan.

Inserting a Waypoint

Waypoints can be added from the FPL MENU by selecting INSERT WAYPOINT. This action causes a window to appear that allows you to select a waypoint by identifier, name, or city. Use the joystick to select a waypoint and press INSERT to initiate the insert mode (see below) or press CANCEL to cancel the operation and exit the Insert Menu.

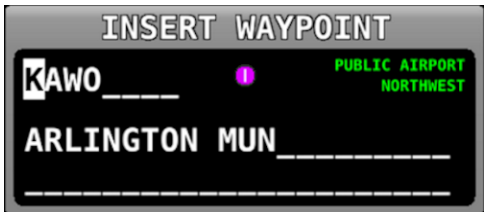


Figure 157 – Insert Waypoint Window

After INSERT is pressed from the Insert Waypoint Menu, or if ADD->FPL is pressed when a waypoint is highlighted in the Nearest/Info/D→ window, or when MAP MENU > ADD POINT TO FPL is used in map panning mode, the selected waypoint is highlighted within the Flight Plan. Turn the knob or move the joystick up/down to choose the precise place in the Flight Plan that you would like to insert the waypoint. Then, press INSERT to confirm your placement. The waypoint will be added at the cursor location.

If you insert a waypoint via the ADD->FPL button, the default insert location will be the end of the Flight Plan, but a different location can be selected in this case as well.

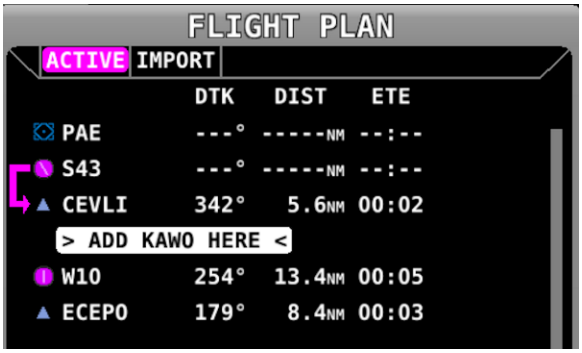


Figure 158 – Flight Plan Waypoint Insertion

Editing and Deleting Waypoints

Select MAP > MAP MENU > EDIT USER WAYPOINTS to view a list of all current user waypoints. To modify or delete a waypoint, highlight the waypoint of interest and press EDIT or DELETE.

Waypoint Menu

The WPT MENU button under MAP > MAP MENU > EDIT USER WAYPOINTS contains the following additional user waypoint options:

- Export Waypoints – Exports all user waypoints to a CSV (comma separated values) file on a USB memory stick. A USB memory stick must be connected to the display that you perform this operation from.
- Import Waypoints – Imports user waypoints into the display from a properly-formatted CSV (comma separated values) file on a USB memory stick. A USB memory stick must be connected to the display that you perform this operation from. Imported waypoints are added to any existing user waypoints that are in the SkyView system. If your SkyView displays are connected via Ethernet in addition to SkyView network, the user waypoints database will be distributed and synchronized between all displays. If your displays are not connected via Ethernet, you will need to import this file on each display separately. See the *SkyView Classic / SE / HDX System Installation Guide* for more details about this connection.
- Clear Database – Deletes all user waypoints currently stored in SkyView.

User Waypoints CSV (comma separated values) File Format

An easy way to obtain a valid CSV file to edit is to simply create a user waypoint using your SkyView display and then export it. You can then edit it to add additional waypoints using a text editor. You can also use a spreadsheet program such as Excel to edit the file. If you use a spreadsheet, make sure that you save the file in the CSV format and not in a proprietary spreadsheet format.

The CSV file format used to store user waypoints contains one waypoint per line. Each waypoint (line) is separated into fields by commas in the following manner:

- Short Name Long Name, Latitude, Longitude, Altitude, Icon, Narrative Text

Valid data for the fields are:

- Short Name (Identifier):
  - Up to 8 characters, A-Z, 0-9, all upper case.
- Long Name (Name):
  - Up to 22 characters, A-Z, 0-9, all upper case.
- Latitude:
  - Decimal format. Example: 47.770840.
- Longitude:
  - Decimal format: Example: -122.151749.

- Altitude:
  - Integer, feet.
- Icon:
  - Possible choices include: HOME; OFFICE; AIRPORT_FILLED; AIRPORT_HOLLOW; AIRPORT_GLIDER; AIRPORT_PRIVATE; AIRPORT_HELICOPTER; AIRPORT_ULTRALIGHT; AIRPORT_HANG_GLIDER; AIRPORT_SEAPLANE; VOR; TOWER_TALL; TOWER_SHORT; PIN_GREEN; PIN_BLUE; PIN_RED; PIN_YELLOW; PIN_GRAY; FLAG_GREEN; FLAG_BLUE; FLAG_RED; FLAG_YELLOW; FLAG_GRAY; DOT_GREEN; DOT_BLUE; DOT_RED; DOT_YELLOW; DOT_GRAY; BOX_BLUE; BOX_RED; BOX_YELLOW; BOX_GRAY; ARROW_GREEN; ARROW_BLUE; ARROW_RED; ARROW_YELLOW; and ARROW_GRAY.
  - Note that even though airport, navaid, and tower (obstacle) icons are available for use, user waypoints using them still only appear under the USER tab of the Nearest Window.
- Narrative Text:
  - Text in this field is shown on the RMK (remarks) tab on the Info Page. Upper and lower case characters can be used. If your narrative text contains any commas, and you are editing in plaintext, enclose the entire narrative text section in “quotes.” Otherwise, the comma will be respected as the field delineator, and everything after the first comma will not be imported (this procedure is not necessary when using a spreadsheet program, such as Excel).

The following is an actual example of a waypoint file. It contains two points: Dynon Avionics’ offices and Mount Rushmore. The first line in a waypoint file is considered “header” information. It is not counted as a waypoint. The below contents can be copied and pasted into a file and imported into a SkyView display. The file must have the extension “.csv.”

Short Name, Long Name, Latitude, Longitude, Altitude, Icon, Narrative Text, Dynon User Waypoints File v1.0

DYNON,DYNON AVIONICS,47.770840,-122.151749,,OFFICE,

MTRUSH,MOUNT RUSHMORE,43.878811,-103.458809,5725,ARROW_GRAY,"Mount Rushmore National Memorial is a sculpture carved into the granite face of Mount Rushmore near Keystone, South Dakota, in the United States. Sculpted by Danish-American Gutzon Borglum and his son, Lincoln Borglum, Mount Rushmore features 60-foot (18 m) sculptures of the heads of former United States presidents (in order from left to right) George Washington, Thomas Jefferson, Theodore Roosevelt, and Abraham Lincoln. The entire memorial covers 1,278.45 acres 5,725 feet above sea level."

Using User Waypoints

User Waypoints are searchable via the “USER” tab on the “Nearest” window. The “USER” tab only appears if there are User Waypoints stored in SkyView.

User Waypoints can also be found like any other airport or navaid by searching on identifier or name in the Info Window.

Weather and TFR Information

When connected to an SV-ADSB-470/472 module, SkyView can display NEXRAD weather and Temporary flight Restriction (TFR) information visually on the SkyView map page. Additionally, textual METAR and TAF weather reports are available for airports that report such information.

The SV-ADSB-470/472 receives traffic and weather via the 978 MHz UAT ADS-B frequencies, which are only utilized by the FAA’s ADS-B system. Therefore, traffic and weather are only available in the US (and other places the FAA may have ADS-B ground stations, including Guam, Puerto Rico, and the US Virgin Islands). The SV-ADSB-470/472 will not work outside these areas, with the exception that the SV-ADSB-472 can receive air-to-air 1090 MHz ADS-B Out equipped aircraft wherever they might be encountered.

Weather information is transmitted continuously over a data link from the ground, but reception of weather data is dependent on ADS-B ground station proximity/coverage, signal strength, and other environmental conditions. Therefore, ADS-B weather reception may not be continuous.

Due to latencies that accumulate while NEXRAD weather images are created, and the way that the FIS-B/NEXRAD services timestamp weather data, NEXRAD images are actually ALWAYS older than the age indicated on the display. In extreme cases, this can mean that the images you see on SkyView may be 15-20 minutes older than the age indicated by SkyView. See http://www.ntsb.gov/doclib/safetyalerts/SA_017.pdf for further information about this phenomenon.

Never rely on NEXRAD imagery to try to “squeeze” through a weather system. Often, deadly turbulence and wind shear are present, even in places in storm systems where there is no precipitation indicated.

The Weather and TFR information that SkyView provides is supplemental information only. It should not be used as your primary means of weather information. Only official FAA briefing information sources should be used to make critical aeronautical weather decisions.

SV-ADSB-470/472 Weather Capabilities (US Only)

The FAA's network of ADS-B ground stations continuously transmits weather and other information such as TFRs via a 978 MHz UAT Band ADS-B data link. The SV-ADSB-470/472 module can receive this information, and currently supports the following FIS-B products. Future updates to SkyView will support additional FIS-B products.

In software version 12.2 or later, once SkyView has a GPS fix, it will load all the active ADS-B weather and all active/upcoming TFRs from the last two hours before the display was powered off. This gives the pilot access to weather and TFR information that is still valid when SkyView is turned on and acquires time via GPS lock.

METARs (Aviation Routine Weather Reports)

Routine weather reports at airports that are updated at least hourly. SPECI (aviation special weather report) information that augments METAR information during times of significant weather deterioration or improvement is aggregated into SkyView's weather reporting capability.

TAFs (Terminal Area Forecasts)

TAFs are future weather forecasts, centered on many (but not all) airports and include the predicted future weather conditions.

Winds Aloft Forecast

The most recent winds aloft forecast from the nearest station for your airport (or the closest within 200mn that has a forecast) is displayed in SkyView's Airport WX Info window. The winds and temperature aloft forecasts wind direction relative to true north, wind speed (knots), and temperature (Celsius) for specific altitudes in feet above mean sea level.

NEXRAD Radar Imagery

NEXRAD radar transmits short high-frequency beams of radio energy into the atmosphere from the ground at various angles and receives reflections of that energy back at the original site. The return signal is then amplified, processed, and colorized for easy interpretation. Based on the time it takes to receive the reflected energy, the radar data product conveys the approximate location and density of precipitation at a specific location. This is then depicted graphically on the SkyView map page.

NEXRAD radar provides high resolution local regional imagery and lower resolution imagery that covers the entire continental US (CONUS). The FAA's ADS-B system transmits both of these periodically, limiting the high resolution regional weather imagery to your locale to preserve available ADS-B data link bandwidth. SkyView presents all this data seamlessly.

TFRs (Temporary Flight Restrictions)

SkyView can graphically depict FAA temporary flight restrictions (TFRs) that restrict GA aircraft movement.

Weather options

Go to MAP > MAP MENU> WEATHER OPTIONS to adjust the following weather preferences and options. These only apply when the weather layer is turned on:

- Metar Icons – Turns the ability to depict airports as color-coded Metar icons on or off.
- NEXRAD – Turns the ability to display NEXRAD imagery on and off.
- METAR/TAF Text – Sets whether the METAR and TAF reports that are displayed are in their raw form, or are decoded per FAA standard abbreviations. Reports that use non-standard codes (such as those used by military installations) will be shown in their raw textual format.
- LIGHTNING – Turns the ability to display lightning indications on and off.
- PIREPS – Turns the ability to display pilot-reported weather indications on and off.

Displaying NEXRAD Weather / TFRs

When an SV-ADSB-470/472 is connected and configured, MAP > LAYERS opens the layers menu that allows you to depict weather on top of any of the other layers. Pushing the WEATHER button will toggle the NEXRAD overlay to be displayed, or not displayed.

To see an animated sequence of the last few NEXRAD pages received, push and hold the WEATHER button. (The SV-ADSB-470/472 must have been running for a long enough period to gather successive NEXRAD pages).

Terrain highlighting is always displayed, but in muted tones, to allow the NEXRAD weather / TFR graphics to stand out. Weather information is partially transparent to allow chart information to remain visible. Other databases (aviation, obstacles, base map, etc.) are always displayed.

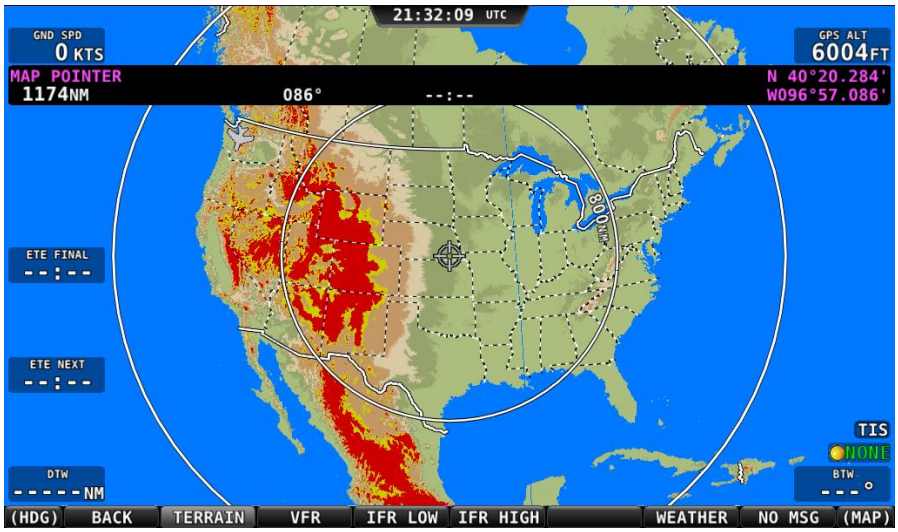


Figure 159 – Map Page: Terrain View (no Weather)

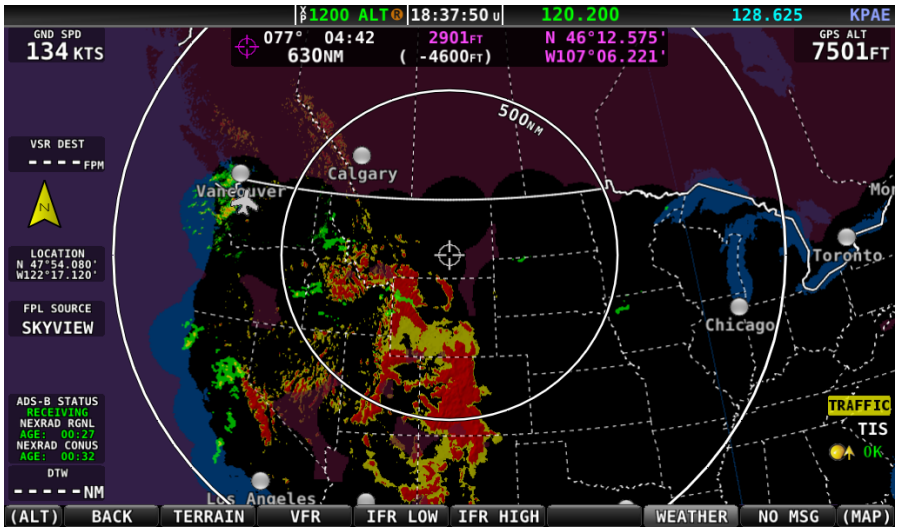


Figure 160 – Map Page: Weather Only View

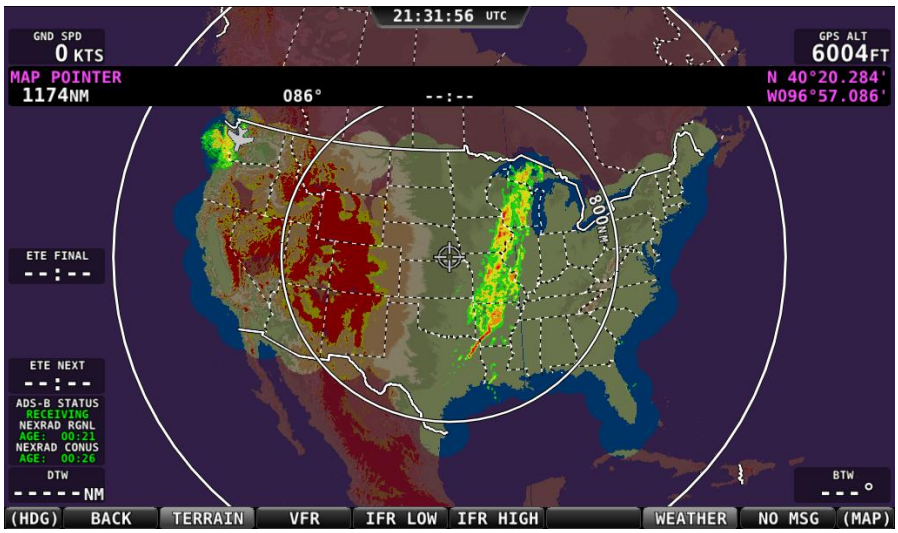


Figure 161 - Map Page: Terrain and WX View

Figure 162 – Map Page: VFR and WX View

NEXRAD Legend

NEXRAD imagery is color-coded to indicate density of precipitation:

PURPLE	BLACK	DARK GREEN	LIGHT GREEN	YELLOW	ORANGE	RED	MAGENTA
No Data	Trace	Light	Moderate	Heavy	Heavier	Extreme	More Extreme

Table 7 - NEXRAD Precipitation Legend

NEXRAD Data Coverage

In some circumstances, geographic areas may not have NEXRAD imagery available. This may be the case if:

- Data is not available for the area because there is no NEXRAD coverage in the locale. This can be observed in the areas surrounding the US in Figure 161 above.
- Data blocks not received for an area due to radio signal obscuration, interference, or other radio phenomena:

Figure 163 – Missing NEXAD Data Blocks

- Data has not yet been received for an area for which there is available coverage, due to the time it takes for the ADS-B system to transmit information. For example, the following

figure depicts what the continental US would look like when higher resolution regional NEXRAD weather information has been received, but the lower resolution continental US (CONUS) NEXRAD imagery has not yet been received:

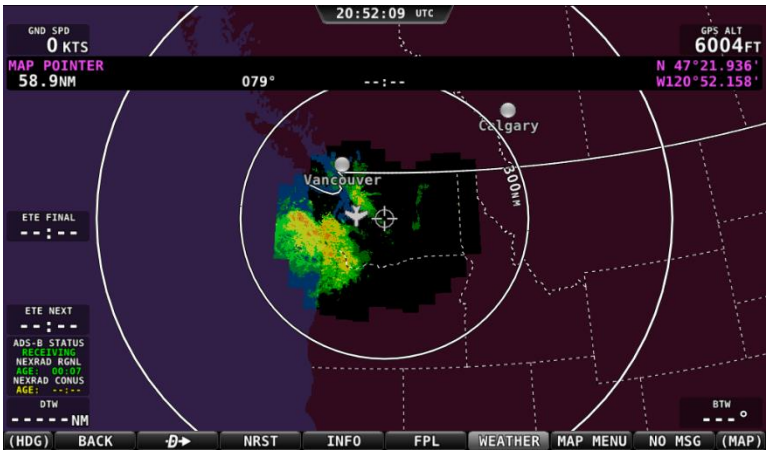


Figure 164 - Regional NEXRAD Only / No CONUS

In all of these cases, areas for which no data is available will depicted in purple by SkyView.

ADS-B Receiver Status / Data Age

A status data block in the lower left corner of the map page contains information about both the ADS-B Receiver's state as well as age of the weather data that was last received by the ADS-B receiver. This block only appears on the Moving Map when the WEATHER Layer is currently displayed.

Figure 165 – Data Current

Figure 166 – Data Stale

Figure 167 – Data Expired

Figure 168 – ADS-B Receiver Not Found

Information contained within this data block includes:

- ADS-B STATUS
  - RECEIVING: The SV-ADSB-470/472 is communicating with SkyView, and FIS-B weather data is being received from an ADS-B ground station.
  - NO SIGNAL: The SV-ADSB-470/472 is communicating with SkyView, but there is no ADS-B ground station in range.
  - NOT FOUND: The SV-ADSB-470/472 is not communicating with SkyView.
- NEXRAD RGNL and NEXRAD CONUS: The age of the regional NEXRAD information being shown on the map page:

  - Current (green) – Data is between 0 and 60 minutes old.
  - Stale (yellow) – Data is between 60 and 75 minutes old.
  - Expired (red) – Data is at least 75 minutes old.
- LIGHTNING: The age of the lightning information being shown on the map page:
  - Current (green) – Data is between 0 and 60 minutes old.
  - Stale (yellow) – Data is between 60 and 75 minutes old.
  - Expired (red) – Data is at least 75 minutes old.

Lightning

If connected to an SV-ADSB-470/472 module and enabled to do so, SkyView will display lightning information on the Map (see Figure 169).

Two sizes of lightning indications are displayed on the Map:

- The smaller icon indicates 1–5 lightning strikes in the identified area within a 5-minute period.
- The larger icon indicates 6 or more lightning strikes in the identified area within a 5-minute period.

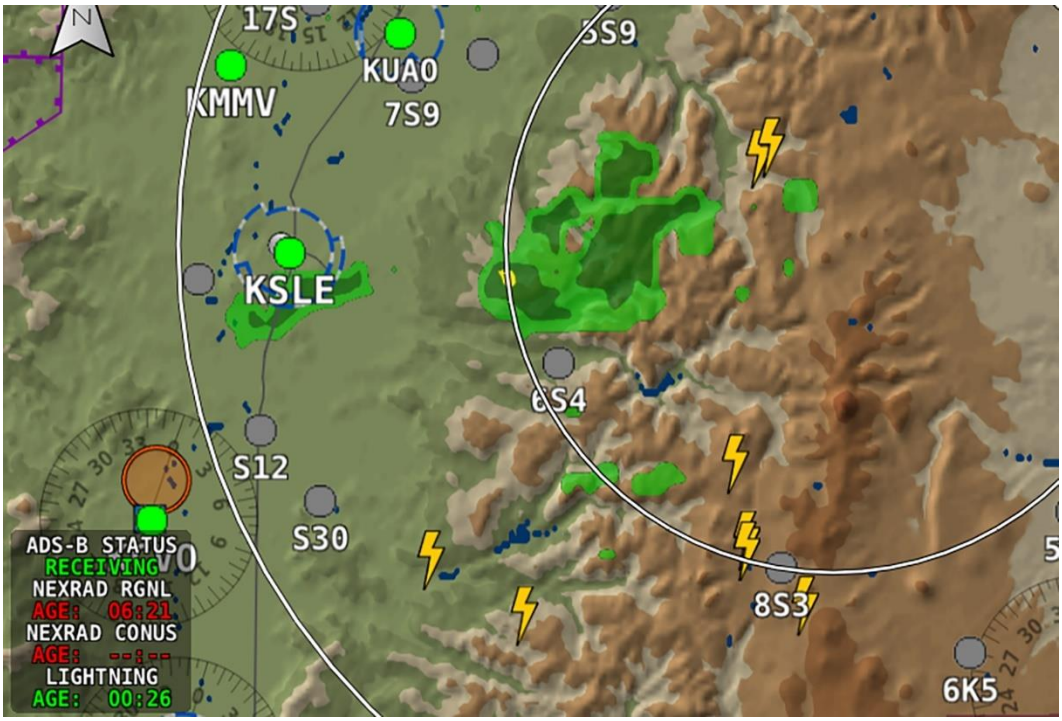


Figure 169 – Example of Lightning Indications on Map

PIREPS

If connected to an SV-ADSB-470/472 module and enabled to do so, SkyView will display pilot weather reports (PIREPS) on the Map (see Figure 170). The on-screen indications for PIREPS are dynamic and touching them opens a PIREP page (see Figure 171) for the selected report. Once the PIREP is selected the on-screen indication changes appearance (i.e., highlighted), indicating it has been viewed. PIREP pages provide full report details, as shown in Figure 171. (See Table 8 for a list and descriptions of the PIREPS that SkyView displays.)

Figure 170 – Example of a PIREP Indication on Map

Figure 171 – Example of a PIREP Page

INDICATION		DESCRIPTION
UNVIEWED	VIEWED	
		No Turbulence
		Light Turbulence
		Moderate Turbulence
		Severe Turbulence
		Extreme Turbulence
		No Icing
		Light Icing
		Moderate Icing
		Severe Icing
		Weather – Wind
		Weather – General (i.e., weather phenomena other than turbulence, icing, or wind)

Table 8 – PIREP Indications

METAR/TAF/ Winds Information

Textual METARs, TAFs and Winds Aloft can be viewed for individual airports on their INFO pages. Additionally, a summary of the nearest METAR weather reports for airports that report METAR information can be found in the NRST list.

Nearest Weather

The MAP > NRST window will contain a WX (weather) tab whenever weather information is available to SkyView:

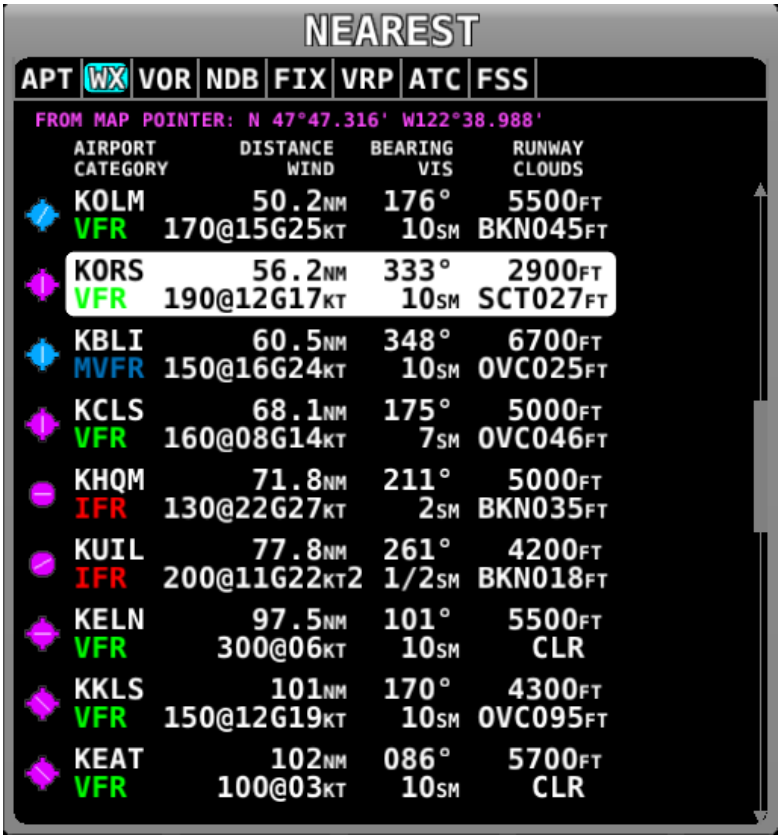


Figure 172 - Nearest WX

The flight category below the airport identifier indicates the weather conditions at the airport. Possible flight categories are:

	VFR	MVFR	IFR	LIFR	UNKNOWN
Visibility	> 5 NM	3-5 NM	1-3 NM	< 1 NM	Unknown
Ceiling	> 3000’	1,000’ - 3,000’	500’ – 1000’	< 500’	Unknown

Table 9 - Possible flight categories

The flight category is determined based on the lowest of either Visibility or Ceiling. For example, if the airport has 5NM visibility but only 800FT ceilings, it is categorized as IFR.

Individual Airport METARs / TAFs / Winds Aloft Forecast

When METAR and/or TAF and/or Winds Aloft Forecast weather reports are available for an airport, they are accessed by selecting the WX tab the INFO window for that airport. Those reports can also be displayed as colored icons for the airport icons on the moving map and in the nearest window (MAP > MAP MENU > WEATHER OPTIONS > METAR ICONS).

Alternatively, pressing INFO when the list of NRST WX is being shown will also bring you directly to the WX tab of the airport's INFO PAGE.

Depending on the setting chosen in MAP > MAP MENU > WEATHER OPTIONS > METAR/TAF TEXT, the METARs and TAFs on the WX page can be in raw or decoded form:

Figure 173 – METAR - Decoded

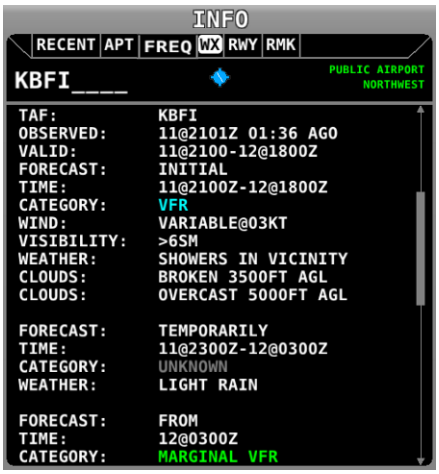


Figure 174 – TAF - Decoded

Figure 175 - METAR/TAF – RAW

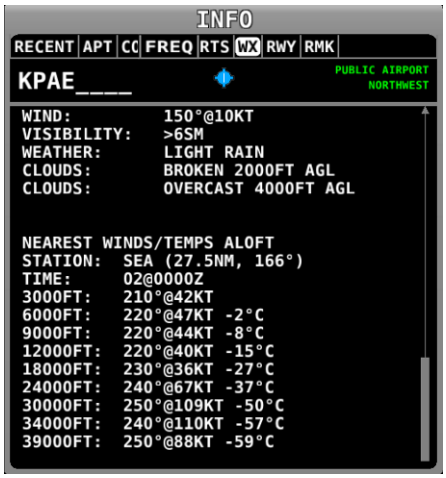


Figure 176 – Winds Aloft Forecast Text

Figure 177 - METAR Icons on Map

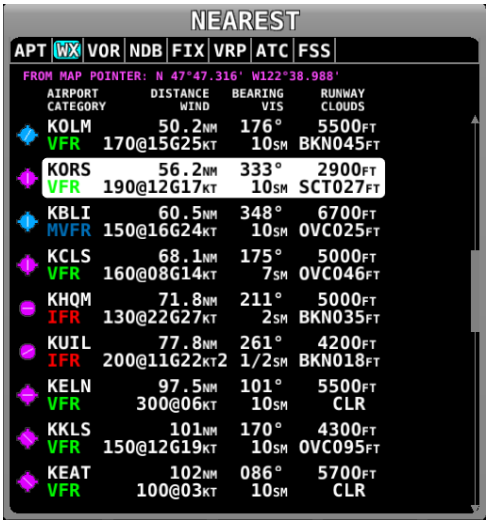


Figure 178 - METAR Icons in Nearest List

Flight categories for METAR and TAF reports are the same as described in the above Nearest Weather section.

The age of METARs and TAFs are explicitly stated via the OBSERVED line of the report. Reports are considered:

- METAR
  - Current (white): Data is between 0 and 70 minutes old.
  - Stale (yellow): Data is between 70 and 120 minutes old.
  - Expired (red): Data is at least 120 minutes old.
- TAF
  - Current (white): Data is newer than the end of the TAF forecast period.
  - Stale (yellow): Not applicable.
  - Expired (red): Data is older than the end of the TAF forecast period.

TFR Depictions

Known published TFRs, both upcoming and active TFRs are depicted on the map page as shown below. After the TFR expires, it is no longer displayed.

As of mid-2014, the FAA's ADS-B data broadcast no longer includes graphical depictions of Stadium TFRs. Although SkyView retains the capability to show them, at this the FAA has given no indication that they intend to restore them to the data that is sent via ADS-B. Dynon has created a database for Stadium TFRs which can be loaded similar to other Aviation databases from the Dynon website. Pilots are reminded the ADS-B services are considered advisory and supplementary information only. Dynon recommends that you always obtain official briefing information about all aspects of your flight, including TFRs.

Due to limitations in the way that the FAA currently transmits TFR information via ADS-B, many TFRs, including but not limited to such as VIP movement / Security / Hazard / Presidential movement, cannot be depicted by SkyView. Therefore, pilots should not rely on SkyView TFR depiction as an authoritative source of TFRs. Make sure to use official briefing data sources for complete TFR information.

The level of opaqueness for TFRs can be adjusted under MAP > MAP MENU > MAP ITEMS > TFR OPACITY.

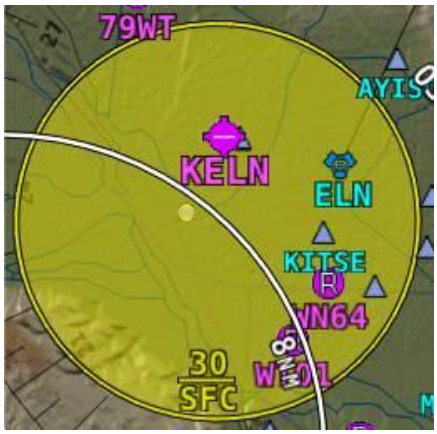


Figure 179 - Upcoming TFR

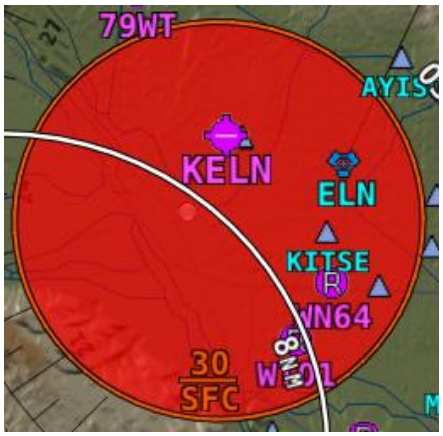


Figure 180 - Active TFR

Figure 181 - Stadium TFR

Glide Ring

When the Sink Rate During Glide and the Best Glide parameters are set properly in SETUP, SkyView displays a green glide ring on the map. See the *SkyView Classic / SE / HDX System Installation Guide* for more details on setting Glide Ring parameters for your aircraft.

This ring approximates the area on the ground that can be reached using these parameters in addition to the current AGL *of the aircraft* and calculated wind speed/direction. The maximum range at which the glide ring will be visible is set in MAP > MAP MENU > MAP ITEMS.

The calculated area does not take in account changing winds, terrain that may be in the way and the AGL within the ring. Use the ring as a guide of *possible* safe landing zones taking into account of actual conditions.

Figure 182 - Example Glide Ring

In this figure, note how the ring is offset behind the aircraft due to a strong headwind. Also note that attempting to reach KVCV is a better choice than KAPV due to the terrain between the aircraft and the airport.

8. Autopilot Operation

This chapter guides you through the functionality, symbology, and operation of the SkyView Autopilot. It assumes that the Autopilot servos have been properly installed, calibrated, tested, and tuned according to the procedures in the *SkyView Classic / SE / HDX System Installation Guide* and the SkyView Autopilot In-Flight Tuning Guide. For instructions on how to change Autopilot controls see the *SkyView Classic / SE / HDX System Installation Guide*.

Autopilot Safety Features

Servo Failsafe

The Dynon Avionics Autopilot is designed with multiple failsafe features to ensure that the autopilot can always be disabled, even in the event of electronic or mechanical failure.

First, the required disconnect switch commands the servos to disengage directly, ensuring that the pilot can always override SkyView's commands.

Next, the Autopilot servos are designed so that the pilot can always overpower them and move the control stick/yoke manually with minimal force, even when the servo is operating at its highest torque output capability.

When the servos are not receiving power, they revert to their normal power-off state. Thus, simply opening the Autopilot circuit breaker or fuse on in the aircraft will completely inhibit the Autopilot servos from controlling the airplane.

However, SkyView does continuously look for the presence of powered-up servos, even when the autopilot is disengaged, and will show an error condition if they are not communicating with the rest of the system. Therefore, Dynon Avionics recommends that the servos be powered on whenever SkyView is powered on in routine operation. When the servos are receiving power but the autopilot is not engaged, the servos draw negligible power.

Finally, in the unlikely event of an internal catastrophic failure of the servo, moderate but firm force on the control/stick yoke will physically decouple the servo internals from its link to the aircraft control surface. This action breaks a specially-designed shear screw which is designed to yield in this scenario to preserve positive pilot control of the aircraft.

Level Mode

The autopilot's Level Mode (or Straight and Level Mode) will immediately attempt to reach zero vertical speed and a roll angle of zero. It will not attempt to fly the aircraft to any previous altitude or track and it will not respect any bug inputs. When activated, Level Mode will cause the autopilot to engage if it was not already engaged.

Level mode can be activated in two ways:

- The LEVEL Autopilot menu button as described in the following sections.
- An optionally-installed external Level button (see the *SkyView Classic / SE / HDX System Installation Guide* for connection details).

Simplified or Expert Controls

In SkyView 6.0 and later, you can choose between two different control schemes for your Autopilot: Simplified or Expert Controls. For instructions on changing the control scheme, refer to the *SkyView Classic / SE / HDX System Installation Guide*.

Simplified Controls are great for VFR pilots that are looking to reduce the complexity of the Autopilot and cruise in comfort without a steep learning curve. With these controls, there are fundamentally two autopilot modes, each activated by a single button. TRK+ALT flies the aircraft in a commanded direction and holds altitude, while HSI+ALT flies the navigation source on the HSI, such as a GPS flight plan or VOR.

Expert Controls include all of the autopilot modes IFR pilots need to complete their mission, including VNAV, IAS Hold, mode sequencing, fully-coupled approaches, a Flight Director with single cue (v-bars) or dual cue (crosshairs) presentation, and more.

Each of these control schemes are detailed in separate sections in this chapter.

Top Bar Autopilot Status Area

Figure 183 – Example Top Bar with Autopilot Status

Center AP Text AP

- AP is displayed in green when either or both AP axes' servos are engaged.
- AP flashes in yellow when the autopilot has been disengaged within the last 10 seconds.

Roll and Pitch Axes Engaged Arrows ◀ or ▶

- A green arrow to the left and right of the green AP center text points at the axis or axes for which the servo is engaged.
- Flashes in yellow when the autopilot has been disengaged within the last 10 seconds.
- Arrows scroll up/down ◀AP▶ during Pitch Auto-Trim and left/right during Roll Auto-Trim.

Roll and Pitch Axis Information

- Active Mode and Target TRK042 or VS -500
  - The current mode and the mode's target for each axis for which the autopilot is providing guidance.
  - Flashes for 10 seconds when an armed mode is sequenced and has become the active mode.
- Armed Mode →GPS or →ALT
  - The mode to which the autopilot will automatically transition when the capture criteria for the new mode is satisfied.

Other Autopilot Status Information

In addition to the modes that are engaged and armed, the Top Bar and the area around it can communicate other important Autopilot status information.

Yaw Damper

When the Yaw Damper is engaged, the ball turns green and YD is displayed

Pitch Trim Indicator

When the autopilot is flying the aircraft in the pitch axis, a Pitch Trim Indicator can appear. This indicator alerts you when the pitch servo detects excessive load on the elevator which would result in an out-of-trim condition when the autopilot is disengaged. To eliminate the excessive trim forces that the autopilot is trying to overcome, trim the nose of the aircraft in the direction indicated: up or down. Adjust the trim in small increments and wait a few seconds between adjustments to see whether the adjustment is sufficient to remove the out-of-trim indication. If you have roll Auto-Trim configured on the roll axis, the autopilot will automatically apply trim commands to resolve the out-of-trim condition and the Autopilot engaged arrows will spin up or down.

Figure 184 - Trim Nose Up Indicator

Pitch Slip Indicator

You may see this during periods of turbulence or if the strength of the servo is not sufficient to actuate the control surface.

If slipping occurs on the pitch servo, SkyView displays a slip warning as illustrated:

Figure 185 - Pitch Slip Indicator

Reference the *SkyView Classic / SE / HDX System Installation Guide* for more information regarding servo slippage.

Pitch Slip/Trim Indicator

If prolonged periods of pitch slipping are detected, the condition may be relieved with pitch trim. SkyView displays a slip indication combined with a trim request. However, Auto-Trim will not attempt to actuate the trim controllers during a slip.

Figure 186 – Pitch Slip / Trim Nose Up Indicator

Roll Trim Indicators

When the autopilot is flying the aircraft in the roll axis, a Roll Trim Indicator may appear. This indicator lets you know when the roll servo is having to maintain a sustained force on the ailerons in order to hold the desired bank angle. To eliminate the excessive trim forces that the autopilot is trying to overcome, trim aircraft in the direction indicated: left or right. Adjust the trim in small increments and wait a few seconds between adjustments to see whether the adjustment is sufficient to remove the out-of-trim indication. This alert may not be configured in all aircraft. See the *SkyView Classic / SE / HDX System Installation Guide* for more information regarding trim indication configuration. If you have roll Auto-Trim configured on the roll axis, the autopilot will automatically apply trim commands to resolve the out-of-trim condition and the Autopilot engaged arrows will turn to the left or right.

Figure 187 – Roll Trim Indicators

Roll Slip Indicator

You may see this during periods of turbulence or if the strength of the servo is not sufficient to actuate the control surface. If slipping occurs on the roll servo, SkyView displays a slip warning as illustrated in the following figure. Reference the *SkyView Classic / SE / HDX System Installation Guide* for more information regarding servo slippage.

Figure 188 – Roll Slip Indicator

Hold To Engage Indicator

Displayed when the disconnect switch is held down to engage the autopilot. The behavior upon release is different for Simplified and Expert Autopilot Control schemes. See the Simplified and Expert Control sections below for additional Hold To Engage behavior information.

Figure 189 – Hold to Engage Indicator

Control Wheel Steering Indicator

Displayed when the disconnect switch is held down while the autopilot is engaged to adjust the autopilot's targets. Control Wheel Steering behavior is different for Simplified and Expert Autopilot Control schemes. See the Simplified and Expert Control sections below for additional Control Wheel Steering behavior information.

Figure 190 – Control Wheel Steering Mode Indicator

The Control Wheel Steering feature can be enabled and disabled via the Autopilot Setup Menu. See the *SkyView Classic / SE / HDX System Installation Guide* for details.

Airspeed Out-Of-Range Indicator

SkyView uses the indicator shown below to denote that the aircraft airspeed is outside of the specified autopilot airspeed range as specified during installation. *When SPD is displayed in the Top Bar the autopilot cannot be engaged.*

Figure 191 – Speed Out-Of-Range Indicator

G Limit Indicator

SkyView uses the indicator shown in the following figure to denote that the autopilot's preset G limits are hit, and therefore the autopilot will not pull or push on the pitch axis in a way that would exceed these limits.

Figure 192 – G-Limit Indicator

Airspeed High/Low Indicator

When the Autopilot is engaged, SkyView uses the indicator shown in the following figure to denote that the aircraft has reached its maximum or minimum airspeed limits as configured when the Autopilot was set up.

When either of these indications is displayed, the autopilot will not pull or push on the pitch axis in a way that would exceed these limits. Instead, the Autopilot will actively pitch the aircraft up or down to prevent exceeding the maximum airspeed or dropping below the minimum airspeed. This may prevent the Autopilot from reaching its programmed targets, and can even cause the Autopilot to maneuver contrary to its programmed targets in order to remain within the allowed airspeed limits.

Figure 193 – Airspeed Low Indicator

When GPS ASSIST is annunciated on the PFD page SkyView does not have airspeed information, likely due to a pitot failure or icing event. Therefore, when GPS ASSIST is active, SkyView cannot limit operations to the maximum and minimum airspeeds as described in this section. Use extreme caution when using the autopilot under this circumstance.

Servo Errors

When a servo is offline (for example, when the Autopilot circuit breaker has been pulled) or has failed, ROLL ERR and/or PTCH ERR are displayed in the Top Bar:

Figure 194 – Roll and Pitch Servo Failures

When Expert Autopilot is in use, press the MESSAGE button twice to view and acknowledge this error. After the error is acknowledged, the Top Bar message is suppressed so that you can continue to use the Flight Director for guidance.

Auto-Trim

SkyView has the ability to automatically trim the aircraft while the Autopilot is engaged. This feature requires that you have an SV-AP-PANEL installed and are using its integrated trim controller to actuate your pitch and/or roll trim servos. Reference the *SkyView Classic / SE / HDX System Installation Guide* for more information about configuring Auto-Trim.

When Auto-Trim is enabled, you should not need to manually adjust the trim when the autopilot is engaged. When the AP is running the trim, the Roll and/or Pitch Axes Engaged Arrows will animate as described in the above sections. SkyView's Auto-Trim feature is only

active on roll or pitch when that axis' Autopilot servo is engaged. It does not actuate the trim when you are hand-flying.

The Auto-Trim's goal is to minimize the stick forces so that the Autopilot servos do not need to apply much force to the control surface to maneuver the aircraft. This allows it to have the ideal amount of control authority over the control surface, while keeping the aircraft in trim continuously. Essentially, Auto-Trim flies the aircraft very similarly to how you do.

Although Auto-Trim is constantly monitoring and adjusting to neutralize trim forces, you may occasionally see the Pitch and Roll Trim messages and advice as described in the above section. However, given a short period of time, the Auto-Trim system's movement should neutralize the forces and the messages should subside. Note that Auto-Trim moves the trim surfaces slower than your trim switch commands normally do.

Similarly, Autopilot servo slips may still be observed, particularly when in turbulence. Note that Auto-Trim is not active in the moments that the air loads are overpowering the servos when a servo slip annunciation is being shown.

If persistent servo slip alerts are accompanied by trim up/down/left/right alerts, the Auto-Trim feature many not be able to achieve its goals. This could be due to an Autopilot or Auto-Trim configuration issue, a broken trim motor, or another issue.

Yaw Damper

Many aircraft exhibit a tendency to 'wag their tails', particularly in turbulence. The result is an uncomfortable ride for the passengers. The natural lateral/directional stability of the aircraft in these cases is inadequately damped. By artificially improving the damping the 'tail wag' tendency may be reduced or eliminated. The rudder is controlled by the servo to oppose unwanted yaw motions. An added benefit to rudder control is that it automatically coordinates turns and provides rudder trim. The Yaw Damper subsystem of the autopilot combines these two features.

When installed, the Yaw Damper engages and disengages automatically when the pitch/roll axes are engaged. Additionally, the Yaw Damper can be separately engaged or disengaged at any time, whether the pitch/roll axes are engaged or not, via either the display-based controls or an external dedicated yaw damper button (if installed). Additionally, the Autopilot Disconnect (AP Disc) button will disengage the Yaw Damper whether the pitch/roll axes are engaged or not.

Simplified Autopilot Operation and Controls

This section covers how the Autopilot is used when set to the Simplified controls. Refer to the *SkyView Classic / SE / HDX System Installation Guide* for instructions on how to change the autopilot control scheme between Simplified and Expert controls.

Simplified Autopilot Menu

The Autopilot Menu is accessible from the Main Menu by pressing the Autopilot button (over button 4) (MAIN MENU > AUTOPILOT):

Figure 195 – Press AUTOPILOT in the Main Menu to enter the Autopilot Menu

The Simplified Autopilot Menu, assuming both pitch and roll servos are installed in the aircraft, is illustrated below:

Figure 196 – Simplified Autopilot Menu

All of the buttons in the above figure are explained in the following sections in the order they appear in the Simplified Autopilot Menu from left to right.

BACK

Press the BACK button to return to the Main Menu.

OFF

Press the OFF button to disengage both servos from any mode.

YD

Engages and disengages the yaw damper separately from roll and pitch servos. Button is not shown if the yaw servo is not installed.

TRK+ALT

Press the TRK+ALT button to engage the autopilot in Track Hold and Altitude Hold modes simultaneously.

When engaged, the TRK+ALT button will highlight in green, and the ground track and altitude that the autopilot is flying is shown in the Top Bar.

Figure 197 – TRK+ALT Active

Figure 198 – Target Track and Altitude in Top Bar

To disengage the autopilot, press the OFF button, the autopilot disconnect switch, or the TRK+ALT button a second time.

TRK+ALT will be unavailable and grayed-out if there is not a valid GPS signal or if the autopilot is outside of its allowable engagement speed ranges.

HSI+ ALT

Press the HSI+ALT button to engage the autopilot in HSI and Altitude Hold modes simultaneously.

When engaged, the HSI+ALT button will highlight in green, and the HSI source and altitude that the autopilot is flying is shown in the Top Bar.

Figure 199 – HSI+ALT Active

Figure 200 – HSI Source and Target Altitude in Top Bar

To disengage the autopilot, press the OFF button, the autopilot disconnect switch, or the HSI+ALT button a second time.

HSI+ALT will be unavailable and grayed-out if there is not a valid source (with active CDI) currently selected on the HSI, or if the autopilot is outside of its allowable engagement speed ranges.

When your HSI source is a radio-based VOR or LOC, SkyView uses GPS position information to help the autopilot correct for wind effects. If no GPS is available to SkyView, VOR and LOC sources can still be flown by the autopilot, but the autopilot's ability to perfectly track the course guidance may be reduced.

LEVEL

Press the LEVEL button to engage the autopilot in Level mode. For safety in emergency situations, subsequent presses of the LEVEL button do not disengage level mode (unlike other AP mode switches).

To disengage the autopilot, press the OFF button or the autopilot disconnect switch. Or change to one of the other autopilot modes by pressing the TRK+ALT or HSI+ALT buttons.

180°

Pressing 180° to initiate an autopilot controlled 180 degree turn from the current track while maintaining the current altitude. This is effectively the same as pressing TRK+ALT and then immediately turning the bug turned 180° from the current track. The autopilot will turn the aircraft to the left.

To disengage the autopilot press either the OFF button or TRK+ALT button.

Messages (Text Varies)

The Message Alert Area is always present above the rightmost button and contains important SkyView messages and alerts.

Simplified Autopilot Modes

The following table summarizes the different autopilot modes of operation for the roll axis as annunciated in the Top Bar.

Mode	Annunciation	Description
Track Hold (TRK)	TRK042	Track hold mode keeps the aircraft flying in a particular direction, as determined by the GPS's ground track, or direction of travel over the ground. This target is reflected by the track (TRK) bug in the HSI. When the autopilot is initially engaged, the TRK bug will automatically be synchronized to the current ground track of the aircraft. Effectively, this means that the autopilot will keep flying in the same direction that the aircraft was flying in the moment before the autopilot was engaged. After the autopilot is engaged, change the track you want the autopilot to fly by adjusting the TRK bug.
HSI (GPS)	GPS	In HSI mode, the autopilot will fly the lateral course guidance that is displayed on the HSI from the provided source. For example, if the selected HSI source is the SkyView GPS, and there is an active Flight Plan, the autopilot will fly that flight plan. Or if the source is a VOR the autopilot will seek to capture and hold the set CRS to or from the VOR. If the HSI source provided GPS roll steering commands (GPSS) the autopilot will follow those commands.
HSI (GPSS)	GPSS	
HSI (VOR)	VOR	
HSI (LOC)	LOC	
Level Mode	STRAIGHT	Holds the aircraft in a wings level attitude (zero degrees roll).

Table 10 – Simplified Autopilot Roll Modes

The following table summarizes the different autopilot modes of operation for the pitch axis.

Mode	Annunciation	Description
Altitude Hold	ALT 3500	Altitude hold mode keeps the aircraft flying at a particular altitude. The altitude that the autopilot holds is governed by the ALT (altitude) bug. When the autopilot is initially engaged, the ALT bug will automatically be synchronized to your current altitude. Effectively, this means that the autopilot will maintain the altitude that the aircraft was at the moment before the autopilot was engaged. After the autopilot is engaged, you may adjust the altitude that the autopilot holds by adjusting the ALT bug.

Mode	Annunciation	Description
Vertical Speed Hold to Altitude Capture	VS -500→ALT	Moving the ALT (altitude) bug away from the current altitude (when already holding altitude) automatically initiates a climb or descent to the new altitude in vertical speed mode. The rate of climb or descent during autopilot controlled changes in altitude is governed by the VS (vertical speed) bug. When the autopilot is engaged and a new altitude is selected, the Autopilot will automatically choose one of two preset default vertical speeds to perform that altitude change, depending on whether or not the Autopilot needs to climb or descend. These default climb and descent vertical speeds are configured during Autopilot setup. See the *SkyView Classic / SE / HDX System Installation Guide* for further details on adjusting these defaults. Once the Autopilot is climbing or descending to a new altitude, the VS bug can be adjusted by the pilot at any time.
Level Mode	LEVEL	Holds the aircraft level by holding zero vertical speed.

Table 11 – Simplified Autopilot Pitch Modes

If a GPS signal is not available, modes that depend on it will also be unavailable. These include TRK, GPS, and GPSS.

If magnetic heading is unavailable, modes that depend on it will be unavailable. These include HDG, VOR, and LOC.

Control Wheel Steering

When the autopilot is engaged, press and hold the Autopilot disconnect switch to put the autopilot into Control Wheel Steering mode.

Figure 201 – Control Wheel Steering Active

While Control Wheel Steering mode is active, the Autopilot servos are temporarily disengaged. This lets you fly the aircraft by hand for short periods to make an adjustment to the autopilot's targets without completely disengaging the Autopilot.

When the disconnect switch is released, the Autopilot's targets are adjusted as follows:

- When in TRK+ALT mode:
  - Pitch axis: The ALT bug (and therefore the Autopilot's altitude target) is synchronized to the aircraft's current altitude.
  - Roll axis: The TRK bug (and therefore the Autopilot's track target) is synchronized to the aircraft's current GPS ground track.
- When in HSI+ALT mode:
  - Pitch axis: The ALT bug (and therefore the Autopilot's altitude target) is synchronized to the aircraft's current altitude.
  - Roll axis: No change. The roll axis resumes tracking its HSI source.

The Control Wheel Steering feature can be enabled and disabled via the Autopilot Setup Menu. See the *SkyView Classic / SE / HDX System Installation Guide* for details.

Hold To Engage

When the autopilot is not already engaged, press and hold the Autopilot disconnect switch will place the autopilot into Hold To Engage mode. The Top Bar annunciates REL TO ENG (release to engage) while the disconnect switch is held.

Figure 202 – Hold to Engage Indicator

When the disconnect switch is released, the Autopilot engages in TRK+ALT mode, and the TRK and ALT targets are both synchronized to the aircraft's current GPS ground track and altitude. Effectively, this operation is the same as pressing the TRK+ALT button in the Autopilot menu.

The Hold To Engage feature can be enabled and disabled via the Autopilot Setup Menu. See the *SkyView Classic / SE / HDX System Installation Guide* for details.

Single Axis Operation

If only one axis is installed the autopilot menu reflects the actions available for the single axis that can be controlled. Single axis operation is only allowed with the Simplified Autopilot Interface.

Roll axis only:

Figure 203 – Autopilot Menu in Roll Servo Only Installation

The functionality of this menu is identical to the normal dual axis installation described earlier, except that no ALT mode functionality is provided.

Pitch Axis only:

Figure 204 – Autopilot menu in Pitch Servo Only Installation

The functionality of this menu is identical to the normal dual axis installation described earlier, except that only ALT mode functionality is provided.

Yaw Axis only:

Single servo control of only the yaw axis is supported.

Expert Autopilot Operation and Controls

This section covers how the Autopilot is used when set to the Expert controls. Refer to the *SkyView Classic / SE / HDX System Installation Guide* for instructions on how to change the autopilot control scheme between Simplified and Expert controls.

Expert Autopilot Menu

The Autopilot Menu is accessible from the Main Menu by pressing the MAIN MENU > AUTOPILOT button:

Figure 205 – Press AUTOPILOT in the Main Menu to enter the Autopilot Menu

The Expert Autopilot Menu is illustrated below:

Figure 206 – Expert Autopilot Menu

All of the buttons in the above figure are explained in the following sections in the order they appear in the Expert Autopilot Menu from left to right.

BACK

Press the BACK button to return to the Main Menu.

AP

Engages and disengages the Autopilot servos including the yaw servo, if so equipped.

FD

Activates and deactivates the flight director. When the autopilot servos are engaged, the flight director is always activated.

ROLL

Enters the Roll Menu, which allows you to configure the roll axis of the Autopilot. See the Roll Menu section below for details.

PITCH

Enters the Pitch Menu, which allows you to configure the pitch axis of the Autopilot. See the Roll Menu section below for details.

YD

Engages and disengages the yaw damper separately from the pitch and roll servos.

LEVEL

Press the LEVEL button to engage the autopilot in Level mode. Subsequent presses of the LEVEL button are ignored.

Messages (Text Varies)

The Message Alert Area is always present above the rightmost button and contains important SkyView messages and alerts.

Roll Menu

The Expert Autopilot Roll Menu is illustrated below:

Figure 207 – Autopilot Roll Axis Menu

All of the buttons in the above figure are explained in the following section in the order they appear in the Expert Autopilot Roll Menu from left to right.

BACK

Press the BACK button to return to the Expert Autopilot Menu.

HDG

Activates / Deactivates heading mode.

HDG will be unavailable and grayed-out if the autopilot is outside of its allowable engagement speed ranges.

TRK

Activates / Deactivates GPS ground track mode.

TRK will be unavailable and grayed-out if there is not a valid GPS signal or if the autopilot is outside of its allowable engagement speed ranges.

NAV

Arms / disarms NAV navigation mode.

NAV will be unavailable and grayed-out if there is not a valid source (with active CDI) currently selected on the HSI, or if the autopilot is outside of its allowable engagement speed ranges.

ROLL HOLD

Activates / Deactivates roll hold mode.

ROLL HOLD will be unavailable and grayed-out if the autopilot is outside of its allowable engagement speed ranges.

Pitch Menu

The Expert Autopilot Pitch Menu is illustrated below:

Figure 208 – Autopilot Pitch Axis Menu

All of the buttons in the above figure are explained in the following section in the order they appear in the Expert Autopilot Pitch Menu from left to right.

BACK

Press the BACK button to return to the Expert Autopilot Menu.

VS

Activates / Deactivates vertical speed mode.

VS will be unavailable and grayed-out if the autopilot is outside of its allowable engagement speed ranges.

IAS

Activates / Deactivates indicated airspeed mode.

IAS will be unavailable and grayed-out if the autopilot is outside of its allowable engagement speed ranges.

ALT HOLD

Activates / Deactivates altitude hold mode. Activation of this mode commands the Autopilot to hold the current altitude immediately. Altitude hold is always armed when activating VS or IAS modes so manual arming is not necessary.

ALT HOLD will be unavailable and grayed-out if the autopilot is outside of its allowable engagement speed ranges.

VNAV

Arms / disarms vertical navigation mode. If not already active, also activates altitude hold mode.

VNAV will be unavailable and grayed-out if the autopilot is outside of its allowable engagement speed ranges. VNAV can be armed before a valid glide slope indication has been established to allow GPS to ILS transitions to be armed in advance.

NOSE DN

Allows easy adjustment of the Autopilot's active pitch target. Each press of the NOSE DN button will perform the following action for each of the AP pitch modes:

- VS mode: Lowers the VS target, thereby causing the autopilot to pitch the nose of the aircraft down.
- IAS mode: Raises the IAS target, thereby causing the autopilot to pitch the nose of the aircraft down.
- ALT HOLD mode: Immediately changes the active mode to VS, and sets the initial VS to the Default Descent Vertical Speed configured during setup. This allows you to start a descent at a commonly-used vertical speed of your choosing with a single button press.

NOSE DN will be unavailable and grayed-out if the active mode is not VS, IAS or Altitude Hold.

NOSE UP

Allows easy adjustment of the Autopilot's active pitch target. Each press of the NOSE UP button will perform the following action for each of the AP pitch modes:

- IAS mode: Lowers the IAS target, thereby causing the autopilot to pitch the nose of the aircraft up.
- VS mode: Raises VS target, thereby causing the autopilot to pitch the nose of the aircraft up.
- ALT HOLD mode: Immediately changes the active mode to VS, and sets the initial VS to the Default Descent Vertical Speed configured during setup. This allows you to start a climb at a commonly-used vertical speed of your choosing with a single button press.
- VNAV mode: Label changes to GA (go around). When the autopilot is in an active VNAV mode (such as glide slope captured) pressing this button will initiate the go around function.

NOSE UP will be unavailable and grayed-out if the active mode is not VS, IAS or Altitude Hold.

Expert Autopilot Menu Annunciation

The expert autopilot menu uses a system of background highlighting of the buttons to indicate the current state of the autopilot servos, flight director, active modes and armed modes.

- A solid green background indicates that a mode is active and the autopilot is providing guidance with the servos engaged.
- A green border and black background indicates that the autopilot is providing guidance via the flight director with the servos disengaged.
- A solid light gray background indicates that a mode is armed and will become active when the autopilot detects the capture criteria for the armed mode have been met.
- A black background indicates that the mode or function is off.

The following figures illustrate the highlighting scheme:

Figure 209 – Autopilot and Flight Director Engaged

Figure 210 – HDG Mode Active / NAV Mode Armed / Autopilot Engaged

Figure 211 – Flight Director On and Servos not Engaged

Figure 212 – VS Mode Active / ALT HOLD Mode Armed / Servos Not Engaged

Engaging the Autopilot

Engaging the autopilot with the expert controls preserves the current roll and pitch state of the aircraft thereby providing the pilot with the opportunity to command the autopilot without unexpected deviations. With the default modes of the autopilot being roll hold and vertical speed hold upon activation the aircraft continues its current attitude.

The following table describes the activation of the autopilot modes on an initial press of an autopilot control, assuming no modes were previously activated:

Control	Autopilot Servos	Flight Director	Lateral Mode	Vertical Mode
AP	Engaged	On	ROLL	VS
FD	Not Engaged	On	ROLL	VS
HDG	Not Engaged	On	HDG	VS
TRK	Not Engaged	On	TRK	VS
NAV	Not Engaged	On	NAV	VS
VS	Not Engaged	On	ROLL	VS
IAS	Not Engaged	On	ROLL	IAS
ALT	Not Engaged	On	ROLL	ALT
VNAV	Not Engaged	On	ROLL	ALT->VNAV
LEVEL	Engaged	On	ROLL (0 degrees)	VS (0 ft./min)
Disconnect Hold To engage	Engaged	On	ROLL	VS

Table 12 – Expert Autopilot Button Press Results

Disengaging the Autopilot

When engaged:

- Press the autopilot disconnect switch once to disengage the servos while leaving the flight director active with all active and armed modes unchanged. Press the autopilot disconnect again within 1 second to turn the flight director off (regardless whether the autopilot was engaged).
- Press the AP button to disengage the servos while leaving the flight director active with all active and armed modes unchanged. Flight director guidance continues.
  - Using the AP button to disconnect is useful for times when you want to will want to re-engage the autopilot with the same modes that you had used previously.
- Press the FD button when the servos are disengaged to turn off the flight director and remove all active and armed modes and indications. This effectively "resets" the autopilot.
- Pressing the button for any active mode (except an external LEVEL button or SV-AP-PANEL LEVEL button) turns off that mode and any armed mode for the axis, turns off the flight director and disengages the servo for the axis.
- Pressing the button for any armed mode disarms that mode.

Expert Autopilot Roll Modes

The following table summarizes the different autopilot modes of operation for the roll axis.

Mode	Annunciation	Description	Control
Roll Hold	ROLL	Holds the current aircraft roll angle.	Default mode or ROLL HOLD button
Heading	HDG042	Holds the selected magnetic heading target.	HDG button
Track	TRK042	Holds the selected GPS ground track target.	TRK button
NAV (GPS) Armed	→GPS	Captures the selected navigation source from the active ROLL, HDG or TRK mode. The Autopilot will automatically sequence and activate the armed mode when the autopilot determines that it can capture the CDI.	NAV button
NAV (GPSS) Armed	→GPSS		
NAV (VOR) Armed	→VOR		
NAV (LOC) Armed	→LOC		
NAV (GPS) Active	GPS	Tracks the selected navigation source.	Automatically sequenced from the NAV armed mode.
NAV (GPSS) Active	GPSS		

Mode	Annunciation	Description	Control
NAV (VOR) Active	VOR		
NAV (LOC) Active	LOC		
Level Mode	STRAIGHT	Holds the aircraft in a wings level attitude.	LEVEL menu button or optional external Level button.

Table 13 - Expert Autopilot Roll Modes

If a GPS signal is not available, modes that depend on it will also be unavailable. These include TRK, GPS, and GPSS.

If magnetic heading is unavailable, modes that depend on it will be unavailable. These include HDG, VOR, and LOC.

HDG

In this mode, the roll axis will fly the selected heading via the HDG (heading) bug.

The HDG bug value is not synchronized unless you manually synchronize the HDG bug or utilize Control Wheel Steering (see section below for detail). This allows you to pre-select headings in an IFR environment before you want to actually fly to them.

TRK

In this mode, the roll axis will fly the selected GPS ground track via the TRK (track) bug.

The TRK bug value is not synchronized unless you manually synchronize the TRK bug or utilize Control Wheel Steering (see section below for detail). This allows you to pre-select headings in an IFR environment before you want to actually fly to them.

NAV

In this mode, the roll axis will track the selected HSI source from a GPS, VOR, localizer (LOC) or GPS roll steering (GPSS).

If the HSI CDI is not already near-centered, NAV mode will be armed, not immediately activated. The pilot then manipulates the autopilot via TRK, HDG, or Roll Hold mode to command an intercept of the HSI course guidance. As the CDI centers, the autopilot will automatically sequence and activate NAV mode.

When the autopilot mode sequences, the autopilot annunciation in the top bar will blink for 10 seconds.

When your HSI source is a radio-based VOR or LOC, SkyView uses GPS position information to help the autopilot correct for wind effects. If no GPS is available to SkyView, VOR and LOC sources can still be flown by the autopilot, but the autopilot's ability to perfectly track the course guidance may be reduced.

Roll Hold

In this mode the roll axis will fly the target aircraft roll angle. The roll target is the current roll angle of the aircraft at the time roll hold is activated. The roll target can be adjusted with Control Wheel Steering (see section below for detail).

Expert Autopilot Pitch Modes

The following table summarizes the different autopilot modes of operation for the pitch axis.

Mode	Annunciation	Description	Control
Vertical Speed	VS -500	Holds the aircraft selected vertical speed target.	Default mode or VS button
Indicated Airspeed	IAS 100	Holds the aircraft selected airspeed target.	IAS button
Altitude Capture Armed	→ALT	Captures the selected altitude target.	Automatically armed when VS or IAS is active and the selected altitude target is set.
Altitude Hold	ALT 3500	Holds the current altitude target.	ALT HOLD button or automatically sequenced from the ALT armed mode.
Vertical Navigation Armed	→VNV	Captures the vertical navigation of the selected navigation source. The Autopilot will automatically sequence and activate the armed mode when the autopilot determines that it can capture the GS or VNAV indicator.	VNAV button
Glideslope Armed	→GS		
Vertical Navigation Active	VNV	Tracks the vertical navigation of the selected navigation source.	Automatically sequenced from the VNAV armed mode.
Glideslope Active	GS		

Mode	Annunciation	Description	Control
Level Mode	LEVEL	Holds the aircraft in a zero vertical speed attitude.	LEVEL button or Level Discrete.

Table 14 – Expert Autopilot Pitch Modes

VS

In this mode, the pitch axis of the Autopilot flies the vertical speed as set by the VS (vertical speed) bug. Upon initial engagement, the aircraft's current VS is used as the target VS and the VS bug is synchronized accordingly. The vertical speed target can be adjusted with the VS bug, the NOSE UP / DN menu buttons or utilizing Control Wheel Steering.

If the ALT bug is set, the Autopilot will also arm ALT mode. This allows it to sequence to ALT HOLD mode and level off at the pre-selected bugged altitude as the aircraft approaches it. Note that the Autopilot does not enforce "agreement" between the VS and ALT bugs. For example, it is possible to set the ALT bug below your current altitude, but set VS to a positive number. In this case, the aircraft will climb at the commanded VS indefinitely (until it reaches the Autopilot's programmed speed limits as it hits the aircraft's service ceiling) because it will never approach the ALT bug.

IAS

In this mode, the pitch axis of the Autopilot flies the indicated airspeed as set by the IAS (indicated air speed) bug. Upon initial engagement, the aircraft's current IAS is used as the target IAS, and the IAS bug is synchronized accordingly. The IAS target can be adjusted with the IAS bug, the NOSE UP / DN menu buttons or utilizing Control Wheel Steering.

If the ALT bug is set, the Autopilot will also arm ALT mode. This allows it to sequence to ALT HOLD mode and level off at the pre-selected bugged altitude as the aircraft approaches it. Note that the Autopilot does not enforce "agreement" between the IAS and ALT bugs. For example, it is possible to set the ALT bug below your current altitude, but set IAS to a target which results in a climb. In this case, the aircraft will climb at the commanded IAS indefinitely (until it reaches the Autopilot's programmed speed limits as it hits the aircraft's service ceiling) because it will never approach the ALT bug.

When GPS ASSIST is annunciated on the PFD page SkyView does not have airspeed information, likely due to a pitot failure or icing event. When using GPS ASSIST, SkyView does not inhibit the autopilot. However, IAS mode should not be used.

ALT HOLD

In this mode, the pitch axis of the autopilot holds the altitude target. Upon initial engagement with the ALT HOLD button the aircraft's current altitude is used as the target altitude. Upon capture of the selected altitude from VS or IAS modes the preselected bugged altitude becomes the target altitude.

When in alt hold mode, the altitude target can be adjusted with the NOSE UP / DN menu buttons for small adjustments or utilizing Control Wheel Steering.

Note that changing the altitude bug does not affect alt hold mode when it is active. This allows you to use the altitude bug to pre-select a future altitude that you would like to capture. You can then activate IAS or VS mode to capture an altitude bug as described in the above VS and IAS sections.

VNAV

In this mode, the pitch axis of the autopilot tracks the vertical navigation of the selected HSI source.

Flying a VNAV profile requires more control authority from the autopilot pitch servo than other autopilot modes, particularly during the final stages of an approach. In some aircraft, this may result in autopilot servo slips. The autopilot is not controlling the aircraft when the servos are slipping. Therefore, it is important that your aircraft's behavior in a VNAV profile is well-understood BEFORE you fly a VNAV-based approach in actual IMC.

If your aircraft experiences excessive servo slips, your servo torque setting may need to be increased. If the torque setting is at its maximum setting, you may need a bigger pitch servo. If you see any significant servo slipping during a VNAV approach, disconnect the autopilot servos with the AUTOPILOT > AP menu button to preserve Flight Director guidance (the disconnect switch will cancel Flight Director guidance). Then, if you continue with a hand-flown approach, both Flight Director and NAV/VNAV/GS guidance will continue to be available. Consult the SkyView In-Flight Tuning Guide for Autopilot tuning procedures that are designed to maximize the performance of your autopilot installation.

Before using VNAV, verify that SkyView is holding altitude in ALT HOLD mode within 10 feet of the altitude target stated in the Top Bar. If the altitude being held is offset by the requested altitude by more than 10 feet, VNAV performance will suffer.

If altitude hold is offset by more than 10 feet, simply leave the autopilot in ALT HOLD for 5-10 minutes in smooth air. During that time, the autopilot will automatically remove the erroneous altitude offset. Once the offset is resolved, the autopilot will be able to track VNAV guidance ideally.

Selecting VNAV always causes ALT HOLD to engage, with the VNAV mode armed. Only when the glideslope/ or VNAV Indicator next to the HSI can be captured − as the GS/VNAV indicator comes alive − will the Autopilot sequence to VNAV mode.

The altitude that is held prior to VNAV must be BELOW the glideslope/VNAV profile. In other words, when VNAV is armed, the glideslope indicator should be above its centered position.

When the autopilot mode sequences, the autopilot annunciation in the top bar will blink for 10 seconds.

Flight Director

The flight director is a visual indication on the PFD that shows what the aircraft should do in order to satisfy the targets of the currently active autopilot modes. A flight director allows the autopilot to provide guidance while the pilot is still allowed to provide direct control of the aircraft.

There are two types of flight director symbologies available in the expert autopilot controls: a single cue or inverted-V; or a dual cue or cross bars.

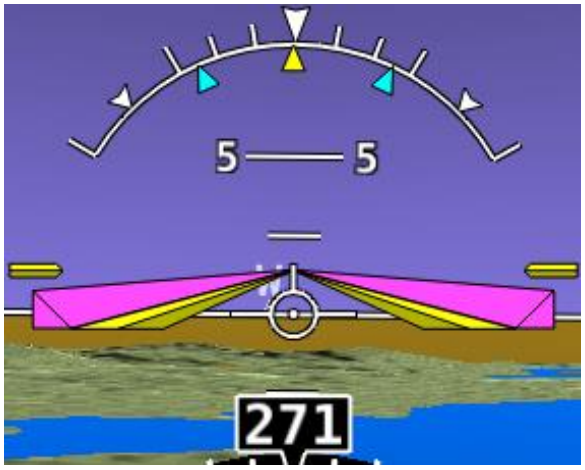


Figure 213 – Single Cue / Inverted-V with Autopilot Servos Engaged

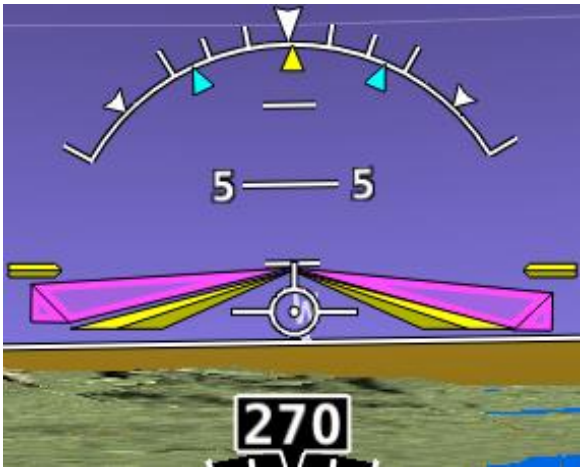


Figure 214 – Single Cue / Inverted-V with Autopilot Servos Not Engaged

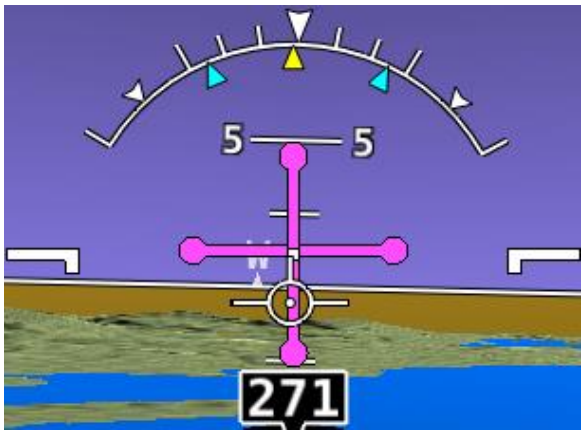


Figure 215 – Dual Cue / Cross Bars with Autopilot Servos Engaged

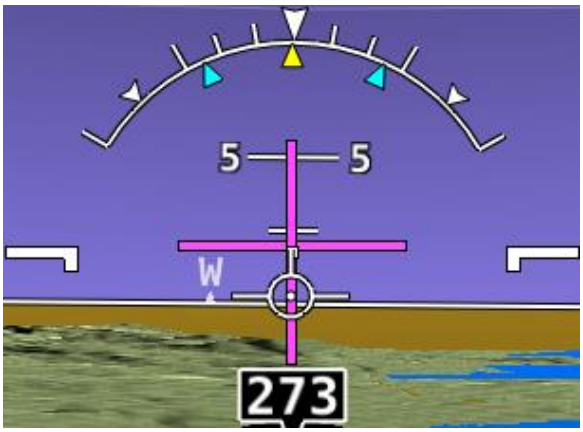


Figure 216 – Dual Cue / Cross Bars with Autopilot Servos Not Engaged

If the flight director symbol is aligned with the aircraft's pitch and roll water-marks the aircraft is in the desired attitude in order satisfy the autopilot's guidance. When the autopilot servos are engaged, it will maneuver the aircraft to align the flight director cues.

Refer to the *SkyView Classic / SE / HDX System Installation Guide* for instructions on how to change the type of flight director used.

Control Wheel Steering

When the autopilot is engaged, press and hold the Autopilot disconnect switch to put the autopilot into Control Wheel Steering mode. While Control Wheel Steering mode is active, the Autopilot servos are temporarily disengaged. This lets you fly the aircraft by hand for short periods to make an adjustment to the autopilot's targets without completely disengaging the Autopilot.

Figure 217 – Control Wheel Steering Active

When the disconnect switch is released, servo engagement, flight director, active modes and armed modes are restored to their states prior to activation of control wheel steering. Active modes which have adjustable targets are synchronized to the current aircraft state; heading mode, track mode, roll hold mode, vertical speed, indicated airspeed, altitude hold. Active modes which do not have adjustable targets resume tracking their source; NAV and vertical navigation.

The Control Wheel Steering feature can be enabled and disabled via the Autopilot Setup Menu. See the *SkyView Classic / SE / HDX System Installation Guide* for details.

Hold To Engage

When the autopilot and flight director are not already engaged, press and hold the Autopilot disconnect switch will place the autopilot into Hold To Engage mode.

Figure 218 - Hold to Engage Indicator

When the disconnect switch is released, the Autopilot engages in roll hold and vertical speed modes. Effectively, this operation is the same as pressing the AP button in the Expert Autopilot Menu.

The Hold To Engage feature can be enabled and disabled via the Autopilot Setup Menu. See the *SkyView Classic / SE / HDX System Installation Guide* for details.

Single Axis Operation

Although installing a roll and pitch servo is required in order to utilize the Expert Autopilot controls, the autopilot will function with a single axis turned off or one or both servos failed. With the autopilot on a single axis can be turned off by pressing the button associated with the active mode AFTER the autopilot has been engaged. The button (highlighted in green) will toggle to black, the status information for the axis will be cleared from the top bar and the axis engaged arrow will blink for 10 seconds.

Failure of an axis' servo triggers a disconnect of the servo, a warning in the messaging system and a PITCH or ROLL ERR annunciation on the top bar. Acknowledging the warning in the messaging system clears the PITCH or ROLL ERR and the mode annunciation returns to normal. The flight director continues to provide guidance in the affected axis however it is still the pilot's responsibility to control the aircraft in that axis.

Common Operations

Initial Engagement

1. Enter the Autopilot Menu (MAIN MENU > AUTOPILOT)
2. Press the AP button.
3. The autopilot will turn on and engage the servos in Roll Hold mode and Vertical Speed mode with the targets set to the current aircraft roll attitude and vertical speed.
4. Set the desired heading and altitude bugs. This can be done on the ground prior to take-off.
5. Altitude hold mode will automatically be armed at the altitude bug value. Adjust the rate of climb or descent with the NOSE UP / DN buttons in the Pitch Menu or adjust the vertical speed bug.
6. Select HDG or TRK from the Roll Menu to proceed in the desired direction.

Change Altitude with Vertical Speed

1. Adjust the altitude bug to the new desired altitude.
2. If you weren't already climbing or descending, initiate the climb or descent with the NOSE UP / DN buttons (either in the PITCH menu or on the Autopilot Control Panel) or adjust the vertical speed bug.
3. This automatically engages VS->ALT mode.

Change Altitude with Indicated Airspeed

1. Adjust the altitude bug to the new desired altitude.
2. Press the IAS button on the Pitch Menu or the Autopilot Control Panel.
3. If you weren't already climbing or descending, initiate a climb or descent with the NOSE UP / DN buttons (either in the PITCH menu or on the Autopilot Control Panel) to adjust the autopilot's target airspeed. Or adjust the airspeed bug or adjust the aircraft's power.

Track a Navigation Source

1. This procedure is identical whether you are tracking an enroute navigation source (GPS or VOR) or a non-precision approach (GPS, VOR or LOC).
2. Select a navigation source on the HSI (MAIN MENU > AUTOPILOT > HSI SRC).
3. The navigation source must be providing valid course and deviation information.
4. Press the NAV button in the Roll Menu.
5. If the CDI is already near-centered NAV mode will immediately become active. Otherwise NAV mode will arm.
6. If NAV mode is armed, adjust the current mode's target (heading, track or roll) to establish the desired intercept with the navigation source.
7. NAV mode will become active once the navigation source CDI can be captured by the autopilot.

Precision Approach

1. Select a navigation source on the on the HSI (MAIN MENU > AUTOPILOT > HSI SRC).
   a. The external navigation source must be providing valid course and deviation information.
2. When cleared for the approach, and in alt hold mode:
   a. Press the NAV button in the Roll Menu.
   b. Press the VNAV button in the Pitch Menu.
3. Adjust the current modes target (heading, track or roll) to establish the desired intercept with the navigation source or follow ATC vectors.
4. NAV mode and VNAV will sequence independently once their CDI / GS indications can be captured by the autopilot.
   a. Note: If a precision GPS approach is being flown with an approach approved GPS navigator and the autopilot is already in NAV mode (i.e. not flying vectors to final) arming of NAV mode is not necessary. Only VNAV will only need to be armed when cleared for the approach.
   b. Note: If an ILS approach is being flown with another navigation source being used in the transition, for example an approach approved GPS navigator, upon being cleared for and activating the approach the SkyView's HSI source must be switched from GPS to NAV. This may happen one of two ways:
      (1) If the GPS does not support auto-switching from GPS to NAV, you must manually perform this action by using AUTOPILOT > HSI SRC.
      (2) Some devices, such as the Garmin 430, 430W and GTN series, can automatically change from the GPS to the localizer and send a signal to the SkyView to automatically change the HSI source at the appropriate time. If your external

GPS/NAV device is configured with this behavior enabled, one important detail is that such devices ALWAYS control whether its GPS or NAV radio is providing guidance. Therefore, when configured for auto-switching, you must use that device's CDI or NAV/GPS toggle to change whether it's NAV or GPS guidance is shown on SkyView's HSI. SkyView's own HSI SRC button can only see EITHER the GPS or NAV side of the device at any time.

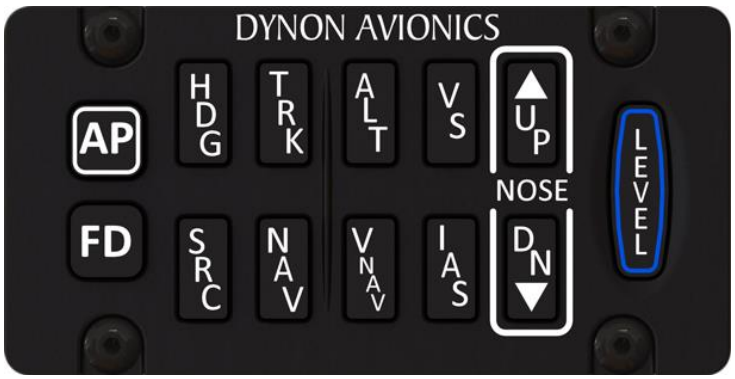
Missed Approach (Go around)

The Go Around (GA) function of the autopilot allows the pilot to quickly manage the transition from a descending precision approach to a climbing missed approach. The function is available when the autopilot is active in VNAV mode (such as following the glide slope) and replaces the NOSE UP button once captured. Upon activation of the GA function the active vertical autopilot mode switches to VS with the default climb vertical speed target or IAS with the current indicated airspeed target. The lateral autopilot mode switches to TRK with the current track. ALT hold mode at the altitude bug is always armed. The active vertical mode is determined by Autopilot Setup.

This go around feature is solely intended to initiate the missed approach – specifically the transition in vertical navigation. It does not follow the published go around procedure. SkyView is not a substitute for an IFR navigator, has no awareness of approaches and never should be used as the primary means of navigating while flying IFR.

1. Once arriving at the missed approach point, press the GA button (in AUTOPILOT > PITCH), the discrete GA button or the NOSE UP button on the Autopilot Control Panel. The autopilot will annunciate "go around" and display "ADD POWER" in the PFD.
2. Press the NOSE UP or NOSE DN to set the desired climb out rate.
3. Select a new track direction or press HDG and select a new heading direction.

SkyView Autopilot Control Panel Operation



The SkyView Autopilot Control Panel provides dedicated controls for all Autopilot modes. This allows the pilot to navigate other menus on the SkyView display while retaining direct access to the autopilot. Autopilot status appears on the SkyView top bar as normal to show active and armed modes as well as current bug values. The buttons on the control panel perform exactly the same functions as the menus under MAIN MENU > AUTOPILOT (which remain available and usable). As the Autopilot Control Panel provides controls for all Autopilot modes, including VNAV, IAS hold, Flight director, etc., it can only be used when the system is configured to use the Expert Autopilot control scheme. When SkyView is set for Simplified Controls, the AP module is inactive. See the Expert Autopilot Operation section of this manual for more details.

Integrated Trim Control Operation

The SV-AP-PANEL has an integrated two channel trim controller that can be used instead of the normal relay decks that would nominally installed. It is connected to your trim motor(s) (usually pitch, and sometimes roll or rudder, dependent on the aircraft). It control inputs are normally wired to the pilot and/or copilot sticks or switches on the panel. When you press and hold the button or switch corresponding to the trim direction requested, the trim motor moves in that direction. To enable Auto-Trim while the autopilot is engaged reference the *SkyView Classic / SE / HDX System Installation Guide*.

Speed Scheduling

When configured, the trim controller's adjustable speed scheduling capability may be set to slow down the speed of your trim motors as you fly faster so that your trim sensitivity is the same across your airspeed ranges. This behavior is configured during installation.

Trim Controller Safety Features

Controlling aircraft trim in your aircraft is serious. The SV-AP-PANEL's integrated trim controller features the following safety features:

- When the trim controller is connected to two sets of switches or stick controls, one of them will always take priority over the other when the requested trim commands disagree. This is normally the "pilot" position, but whether or not this is the left or right seat or set of controls will vary by aircraft.
- Although it is contained within the SV-AP-PANEL, the electronics in the trim controller are powered by aircraft power and are independent from SkyView. Trim control will remain available even if SkyView itself is unpowered or offline. In this failsafe condition, the trim controller's speed scheduling is disabled and the trim motors will run at their full speed when trim is commanded.
- To protect from a "runaway" trim condition, the longest that a trim motor will run continuously even when a trim button or switched is continually depressed is five seconds. After three seconds, the trim motor will cease responding until the trim button is released and pressed again.

9. SkyView Touch (SV-D1000T) Operation

SkyView Touch was designed specifically for the cockpit. Recognizing the challenge that turbulence poses in using touch gestures, SkyView's pilot-engineers created an interface specifically to complement SkyView's existing button/knob interface and not completely replace it. Touch actions are designed to be easy to learn and are used in places where they can reduce pilot workload the most. So, although many aspects of SkyView's operation are touch-enhanced, the full set of buttons and knobs are always available for when it gets bumpy.

Effective control is critical in turbulence: While you usually hold a smartphone or tablet in your hands, your EFIS screen is at the end of your outstretched arm, and it's moving with the aircraft, not with you. These two things conspire to make touch control less than ideal for control during turbulence. The touch interface philosophy is derived from SkyView's complete set of buttons and joystick knobs, so you don't have to learn any different processes for turbulence, when you can rely on the buttons and knobs when you need them most.

When "show touches" is enabled (via a setup mode option): appears at the touch point of contact and remains under your finger until contact is removed. This allows you to see exactly where your finger is making contact with the objects on the screen. See *SkyView Classic / SE / HDX System Installation Guide* for more details on enabling or disabling "show touches".

Menu Operations

Touching a menu label at the bottom of the screen is equivalent to pressing the physical button below it. This allows the pilot to perform most actions via touch.

Top Bar Operations

Touching the transponder, autopilot status, or clock/timer displays instantly enables those features' controls in the menu, eliminating the normal button pushes the pilot would use to navigate to those controls.

Figure 219 – Top Bar Touch Regions

Touch region shortcuts:

1. MAIN MENU > AUTOPILOT
    a. When the Autopilot is configured with Simplified controls, this region will bring up the Autopilot menu.
    b. When the Autopilot is configured with Expert controls the left half of the status bar will short cut to AUTOPILOT > ROLL and the right half of the status bar will shortcut to AUTOPILOT > PITCH.
2. MAIN MENU > XPNDR.
3. MAIN MENU > TOOLS > TIMER.

PFD Operations

Touching a PFD item that has an adjustable bug instantly re-assigns a SkyView PFD joystick knob to that touched item, eliminating the need to manually reassign a joystick knob. When multiple pages are up on the display the joystick knob closest to the PFD page is assigned, when 100% PFD is shown it will assign the left knob.

Figure 220 – EFIS Touch Regions

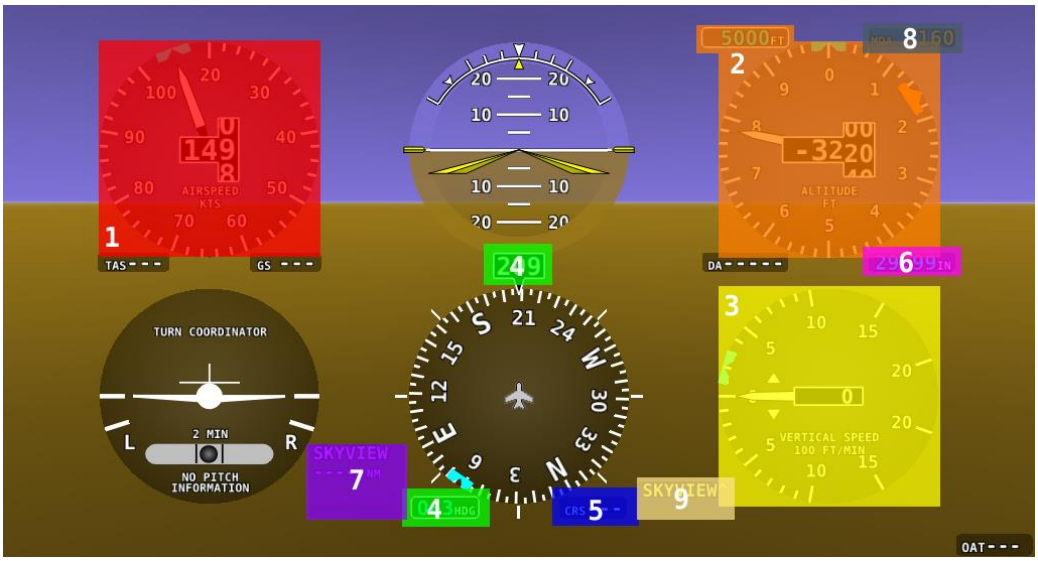


Figure 221 – Six Pack Touch Regions

Touch Region functions:

1. Assigns knob to IAS bug.
2. Assigns knob to ALT bug.
3. Assigns knob to VS bug.
4. Assigns knob to HDG or TRK bug.
5. Assigns knob to CRS bug.
6. Assigns knob to BARO.
7. Equivalent to pressing HSI SOURCE button; cycles the HSI through the different navigation data sources that are connected to the SkyView system.
8. Assigns knob to MDA bug (if MDA bug is turned ON in the PFD menu).
9. Equivalent to pressing MAIN MENU > PFD so that the pilot can adjust the bearing needle sources.

Engine Operations

Touching anywhere on the EMS page will open the Engine menu (MAIN MENU > EMS).

Map Operations

The map responds to touch in much the same way you've come to expect from modern tablets and phone maps. You can pan, zoom, point, pinch, select and navigate with simple touch-based gestures. Figure 222 shows the available touch "buttons" on the map.

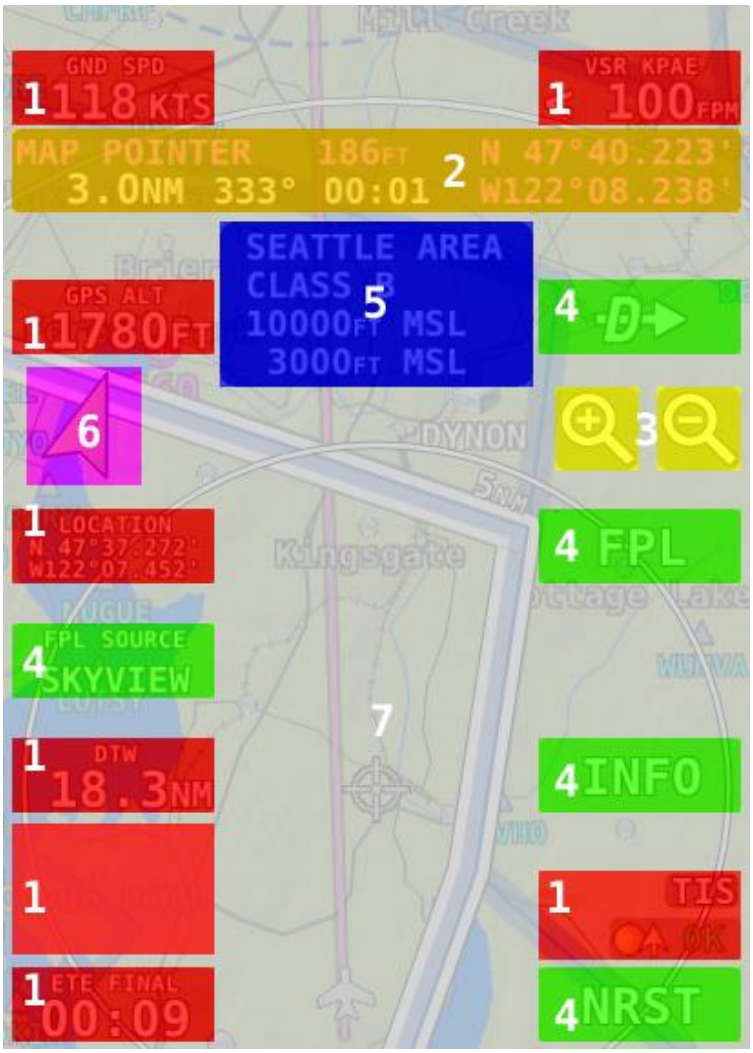


Figure 222 – Map Touch Regions

Touch Region functions:

1. Info items that display information only – such as those colored red in the image above – do not respond to touch.
2. Touching the Map Pointer information bar will exit panning mode. The map will resume following the aircraft.
3. The + and – will zoom the map in or out. In addition, you can use two fingers anywhere on the map to pinch to zoom in or out of any point or area of interest.
4. Touching any of the shortcut info item buttons will result in the same action as pressing the corresponding menu softkey regardless of what menu is currently displayed. These touchable info items are only available on touch displays:
    a. Touching FPL Source will toggle the course legs displayed on the SkyView map between the SKYVIEW flight and any available external flight plans connected to

SkyView. It is the same as selecting that device's Flight Plan in the Flight Plan menu and choosing the "SHOW _EXTERNAL NAVIGATOR_ FPL on MAP" option.

b. : Touching the button performs the same actions that the button does in the Map Menu.

c. FPL: Touch FPL (Flight Plan) to bring up the Flight Plan window. It is used to create, display, or modify Flight Plans. It is equivalent to pressing Map Menu > FPL in the menu system. Reference the Flight Planning section of this guide for details.

d. INFO: Touch INFO to bring up the Info window with detailed information about any selected airport, navaid, or other item that is selected in the map pages or that is being pointed to with the Map Pointer. It is equivalent to pressing Map Menu > INFO in the menu system. See the Navigation Mapping Software section for more details.

e. NRST: Touch NRST (Nearest) to bring up the window that displays the nearest airports, navaids, and user waypoints. It is equivalent to pressing Map Menu > NRST in the menu system.

5. After you have touched a region on the map that has multiple airports, airspaces, or other items underneath it: Touch the information pop-up text box on its left or right side to scroll through the additional items. It is equivalent to turning the joystick when multiple possible items can be selected on the map.

6. Touch the North arrow to toggle the map display between track up and north up mode. Unlike the preference setting in MAP MENU > MAP MODE, this is not a permanent setting and will revert to the preferred orientation when the range level changes.

7. Touch anywhere on the map to place the map pointer on the map. This lets you choose items to see more information about them, navigate to them, add them to flight plans, etc. Press the resulting information bar near the top of the display to clear the pointer and resume following the aircraft.

Info Pages

In the Info window and other places that you can look up locations by their identifier or name, SkyView Touch will present a keyboard that can be used to type these in. The on-screen keyboard can be set to display in "QWERTY" or alphabetical order in the SkyView Setup Menu. For more precise character entry in turbulence, you still use the knob to choose characters as well.

The INFO, Nearest, Flight Plan, and other lists within the Map Menu can be scrolled through and their items selected with touch. Additionally, the tabs in the Nearest and similar windows are selectable. However, deeper settings menus under the MAP Menu and Flight Plan menu are only navigable with the CURSOR joystick.

Within the Map, there are places where you can perform complex multi-step operations, such as when manipulating flight plans, working with waypoints, etc. If you are in the middle of an operation and touch an item - such as the shortcuts on

the top bar - that cause the menu to change, the menu and any open windows will close just as if CANCEL/BACK had been pressed. For example, if you are adding a waypoint to the SkyView flight plan and touch the top bar for the TIMER before finishing the insert, it is the same as pressing CANCEL out of the flight plan menu.

Figure 223 – Touch ABC Keyboard Entry

Figure 224 – Touch QWERTY Keyboard Entry

10. Video Input Operation

The Video Input Adapter is compatible with all SkyView SV-D1000T Touch displays, SV-D1000 displays serial number 6000 and higher, and SV-D700 displays serial number 4000 and higher. Additionally, compatible displays will register HARDWARE VERSION: 2 in SETUP MENU > LOCAL DISPLAY SETUP > DISPLAY HARDWARE INFORMATION.

This chapter describes the functionality and operation of the SkyView Video-In, added in software version 11.0. Dynon Avionics offers a Video Input Adapter (part number 102211-000) that allows SkyView to display s-video or composite video sources on SkyView. This adapter can be connected to either of the USB ports on the back of a SkyView display. (Some SkyView display harnesses (SV-HARNESS-D37) may include a USB cable; it is not recommended to plug the Video Input Adapter into it.) The Video Input Adapter can be connected at the same time as USB memory sticks that are used for loading software, loading databases, and storing charts. SkyView's video input capability is only available when SkyView recognizes a connected Video Input Adapter when it is powered on. Additionally, if a Video Input Adapter is disconnected from SkyView while it is powered on, video will not be available until the connection is restored and the SkyView display is restarted. Video is only shown on the display that the Video Input Adapter is physically connected to.

When the Video Input Adapter is connected as previously described, press MAIN MENU > TOOLS > VIDEO to display your video. This will turn on video as a single page that uses 100% of the screen. To show any of the PFD, EMS or Map pages in a 50%/50% split screen with video, go to MAIN MENU > SCREEN and toggle one of the other three pages on, shown in the figures below. To turn off video, go to MAIN MENU > TOOLS > VIDEO, and SkyView will resume the screen layout you used before the video was turned on. If your video source needs to be flipped horizontally and/or vertically in order to appear correct, this can be accomplished via the setup menu. Reference the *SkyView Classic / SE / HDX System Installation Guide* for details.

Figure 225 – Full Screen Video Display

Figure 226 – Half Screen PFD/Video Display

Figure 227 – Half Screen EMS/Video Display

Figure 228 – Half Screen Map/Video Display

11. COM Radio Operation

The SV-COM-X25/X83/C25 integrates with your SkyView system in a novel way, allowing you to "load" airports to it to enable quick, single button-push frequency tuning via the dedicated TWR, ATIS, GND, and ATC buttons. You can also send individual frequencies to your SkyView COM radio from SkyView's airport info pages. And of course, you can also spin frequencies in the "old fashioned way" when you're feeling nostalgic (or are following ATC instructions).

The airport lookup, loading and reverse lookup features of the SV-COM-X25/X83/C25 requires a connected SkyView with a GPS signal, SkyView's Navigation Mapping Software, and an aviation database.

COM Control Panel Overview

The SV-COM- X25/X83/C25 has a dedicated control panel that contains full status information about the radio:

A: Volume Knob / Power Button

B: Active Frequency

C: Associated Airport

D: Station Type

E: Standby Frequency

F: Loaded Airport

G: Dual Watch Mode Indicator

H: RX/TX Status Indicator

I: Airport Button

J: Dual Concentric Multifunction Knob (Tune, Selection, Flip/Flop)

Figure 229 – COM Radio Control Panel

SkyView Top Bar COM Radio Status Overview

COM Radio Status is also reflected in the top bar of your SkyView displays. The identification lettering (B-I) depicted below, matches the figure above:

Using your COM Radio

Power

The SkyView COM Radio normally powers on and off with your SkyView system. Press and hold the Volume Knob / Power Button to manually turn the SkyView COM Radio off and on.

Volume

Use the volume knob to adjust the radio volume. You may want to use Squelch Override – covered below, to aid in finding a comfortable volume level.

Transmitting and Receiving

The SV-COM- X25/X83/C25 transmits on the active frequency only, and normally receives only on that frequency. When transmitting, the following indications are shown:

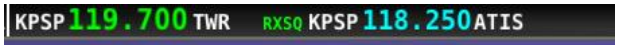
When receiving on the active frequency, the following indications are shown:

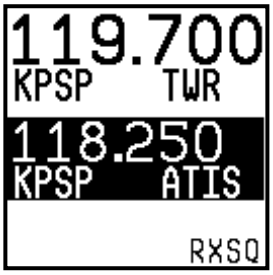
Note the arrow on the top bar that points to the active frequency, and the up arrow on the RX area of the control panel display that points “up” to the active frequency.

Squelch Override (Monitor)

The radio has an automatic squelch function which screens out noise and only receives radio stations that have active transmissions on them. However, you may wish to override this feature to hear a distant radio station or to help set the radio volume. To listen to the active frequency, press the volume knob momentarily.

RXSQ will be shown in the RX/TX Status Indicator areas on both the control panel and SkyView Top Bar to indicate the squelch is being overridden:





The squelch setting, which determines how strong a radio transmission must be before the radio receives it, is configured during setup. See the *SkyView Classic / SE / HDX System Installation Guide* for instructions on adjusting this parameter.

Dual Watch

Press and hold the dual concentric knob to enable dual watch:

When dual watch is enabled, the SkyView COM Radio monitors the standby frequency for transmissions while simultaneously monitoring the active frequency, allowing you to listen to both (but not simultaneously). This allows you to listen to ATIS on standby, for example, while keeping tower tuned to the active frequency.

The active frequency always receives priority. This is true even if dual watch is listening to a continuous broadcast on the standby frequency. For example, if ATIS is on standby and tower is on active, and dual watch is enabled, the COM will receive ATIS continuously on standby when there is no tower activity. But, when a tower transmission is received on the active frequency, it immediately takes priority and is heard exclusively.

To help you determine whether the radio is receiving on the active or standby frequency, both the control panel and SkyView's top bar visually indicate which of the standby or active frequency is being received on at any moment:

Manual Frequency Tuning

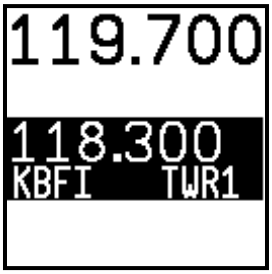
To manually tune a frequency via the control panel:

- Turn the large, outer ring of the dual concentric knob to change the standby frequency in 1 MHz increments.
- Turn the small, inner ring of the dual concentric knob to change the standby frequency. The SV-COM-X25/C25 adjusts in 25 kHz increments and by either 25kHz or 8.33kHz increments on the SV-COM-X83 (depending on how it is configured):
  - For example, if the frequency you start with is 123.450, turning the large knob will change the numbers before the decimal – 123 – while the small knob will adjust the numbers after the decimal – 450.
- Press the dual concentric knob on the control panel to flip/flop the chosen frequency from the standby frequency to the active frequency.

Airport / Station Type Reverse-Lookup

When a frequency is manually tuned, SkyView will search for the closest known airport within 75 miles that has that frequency and automatically show that airport's identifier in the associated airport and station type fields on both the control panel and top bar.

For example, if you manually tune 118.300 near Seattle's Boeing Field, the associated airport will be shown as KBFI and the station type as TWR1.

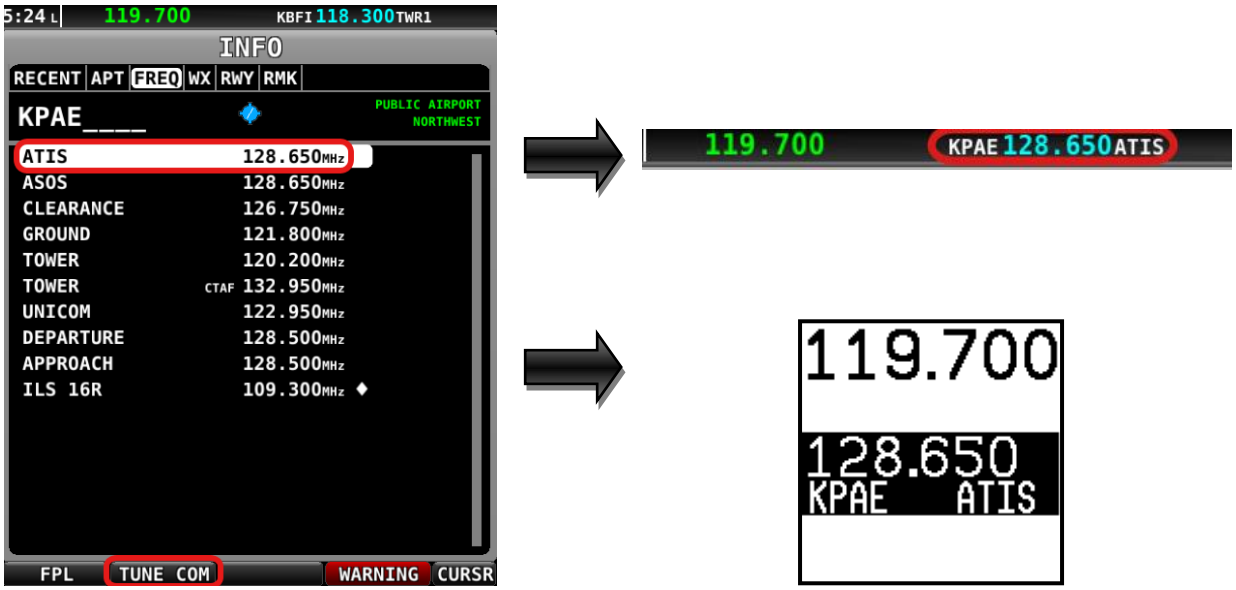


Tuning Individual Frequencies from SkyView

To send an individual frequency from SkyView's airport information pages:

- From SkyView, bring up the INFO page for an airport.
- Then, use the joystick to select a frequency from under the FREQ tab.

- With a valid COM frequency highlighted, (a 25kHz frequency on the SV-COM-X25/C25 and an 8.33kHz on the SV-COM-X83) press the TUNE COM button to send the frequency to the standby frequency:



- Press the dual concentric knob on the control panel to flip/flop the chosen frequency from the standby frequency to the active frequency.

This feature also works when a Garmin SL30, SL40, GTR 225, GNC 255, MGL V6, MGL V10, Trig TY91 series, Val NAV 2000, and f.u.n.k.e. ATR833 or Icom A210 (with Icom software version 1.53 or newer) is appropriately configured. The SL30 and GNC 255 can additionally receive NAV radio frequencies by selecting VOR, ILS and

LOC frequencies (MAP > NRST > VOR > TUNE NAV/ILS/LOC). You can tune NAV frequencies from both the NRST list of VORs, as well as from the detailed VOR and Airport Info pages.

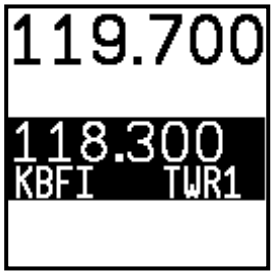
Loading Airports to the SkyView Com Radio

The SV-COM- X25/X83/C25 radio's most unique and innovative feature is its ability to load airports onto the control panel. Once an airport is loaded, single presses of the TWR, ATIS, GND, and ATC buttons automatically tune those frequencies (to the standby location) for that airport.

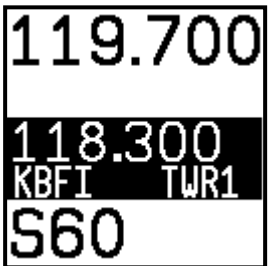
Loading Airports via SkyView

By Nearest:

- From SkyView's MAP page, press NRST.
- Highlight the airport you wish to load to the control panel:



- Press the APT>COM button to load the airport to the control panel:
  - Note this button is only available if SkyView has frequencies for the selected airport:



- Use the TWR, ATIS, GND, and ATC buttons on the control panel to send the associated airport frequencies to the standby frequency location:

By Airport Lookup

- From SkyView's MAP page, look up an airport via SkyView's INFO page:

- Press the APT>COM button to load the airport to the control panel:
  - Note this button is only available if SkyView has frequencies for the selected airport.
- Use the TWR, ATIS, GND, and ATC buttons to send the associated airport frequencies to the standby frequency location.

Loading Airports via the Control Panel

By Nearest

- Press the APT button once. NRST APT is displayed on the control panel, and the top bar shows a list of the nearest airports within 75nm of your current location:

- Rotate the small, inner dual concentric knob to the airport you wish to load:

- Press the dual concentric knob on the control panel to load the airport to the control panel (or press APT to cancel your selection):

- Use the TWR, ATIS, GND, and ATC buttons to send the associated airport frequencies to the standby frequency location:

By A-Z / 0-9 Character Entry

- Press the APT button twice:

- Use the dual concentric knob to type an airport identifier. Note that this search is limited to airports within 75 miles of your location to speed up entry by limiting the airport possibilities:
  - The small, inner knob chooses characters (A-Z, 0-9).
  - The larger, outer knob moves the cursor:

- When the desired airport is displayed, press the dual concentric knob on the control panel to load the airport to the control panel (or press APT to cancel your selection).
- Use the TWR, ATIS, GND, and ATC buttons to send the associated airport frequencies to the standby frequency location.

Using the TWR, ATIS, GND, and ATC Buttons

When an airport is loaded on the radio, press the TWR, ATIS, GND, and ATC buttons to send frequencies associated with that airport to the standby frequency. Repeated presses of these buttons will cycle through all available frequencies of that type (for example busy airports may have multiple tower frequencies):

- **TWR**: Tunes tower, Unicom, and Multicom frequencies.
- **ATIS**: Tunes ATIS and other weather/information frequencies, including AWOS, ASOS, AWIB, and AWIS frequencies.
- **GND**: Tunes ground control frequencies.
- **ATC**: When on the ground: Tunes pre-taxi, clearance, and departure frequencies associated with an airport. When in the air: Tunes departure, center, and approach frequencies when associated with an airport. As of SkyView software version 15.1, there is no longer filtering of ATC frequencies when on the ground and in the air. All ATC frequencies can be tuned at any time.

Other Status Information

Operating Without SkyView

The SV-COM- X25/X83/C25 can be used when SkyView is powered off or has failed. However, only manual tuning will be available, and the control panel will display NoSV. The control panel annunciates this condition in the following way:

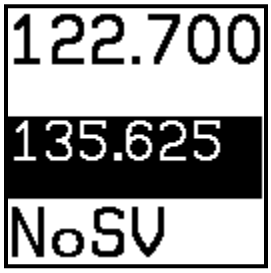


Figure 230 – No SkyView mode

You may see this annunciation as your SkyView displays first power up, as they take longer to initialize than the COM radio.

No Aviation Database / Map License

If SkyView does not have an aviation database loaded, or SkyView does not have a Navigation Mapping Software license, the airport loading, and the TWR/ATIS/GND/ATC buttons, will not be available. The control panel annunciates this condition by displaying NoDB:

Waiting for Data

The loaded airport area of the control panel will show an animating scrolling black cursor momentarily when it is waiting for airport data from SkyView:

Figure 231 - Scrolling Cursor

No GPS

The control panel and SkyView top bar annunciate that SkyView does not have GPS position information in the following way:

Without GPS position, airport loading and TWR/ATIS/GND/ATC will not be available.

You may see this annunciation as SkyView starts up or when the aircraft does not have GPS reception (for example, when inside the hangar).

Stuck Mic

If a transmission lasts more than 30 seconds, the mic is assumed to be stuck. Transmitting is discontinued, and both the top bar and control panel annunciate “STUC” in the TX/RX indication area.

External Flip/Flop

If you have an external flip/flop switch connected (typically to your control stick or yoke), pressing it flip/flops the active and standby frequencies just like pressing the dual concentric knob does. See the *SkyView Classic / SE / HDX System Installation Guide* for details on connecting an external flip/flop switch.

Dual COM Radios

If you have more than one COM radio that is capable of communicating with SkyView, only the primary COM radio’s status information will be displayed in the Top Bar. Additionally, only the primary radio will receive airports or frequencies from SkyView when SkyView’s TUNE or APT>COM buttons are used.

However, if your second COM radio is a Dynon SV-COM- X25/X83/C25, all of its control-panel based features work just like the primary radio’s. In other words, you can still use the APT button to load airports, the TWR/GND/ATIS/ATC buttons to tune frequencies, and airport/station types are reverse-looked up when you manually tune the second radio.

12. Messages and Alerts

SkyView annunciates important notifications onscreen, in a dedicated Message Window, and optionally via audio (if connected and configured). This chapter describes SkyView alert behavior.

Loss of Information

SkyView notifies users with a large red X and a descriptive label if a major failure occurs that prevents the display of information. A red X may overlay an entire page if a data source such as an EMS module fails, or a red X may overlay a single widget if a single engine sensor fails or is not connected.

For example, the PFD would look like Figure 232 if all ADAHRS in the system fail:

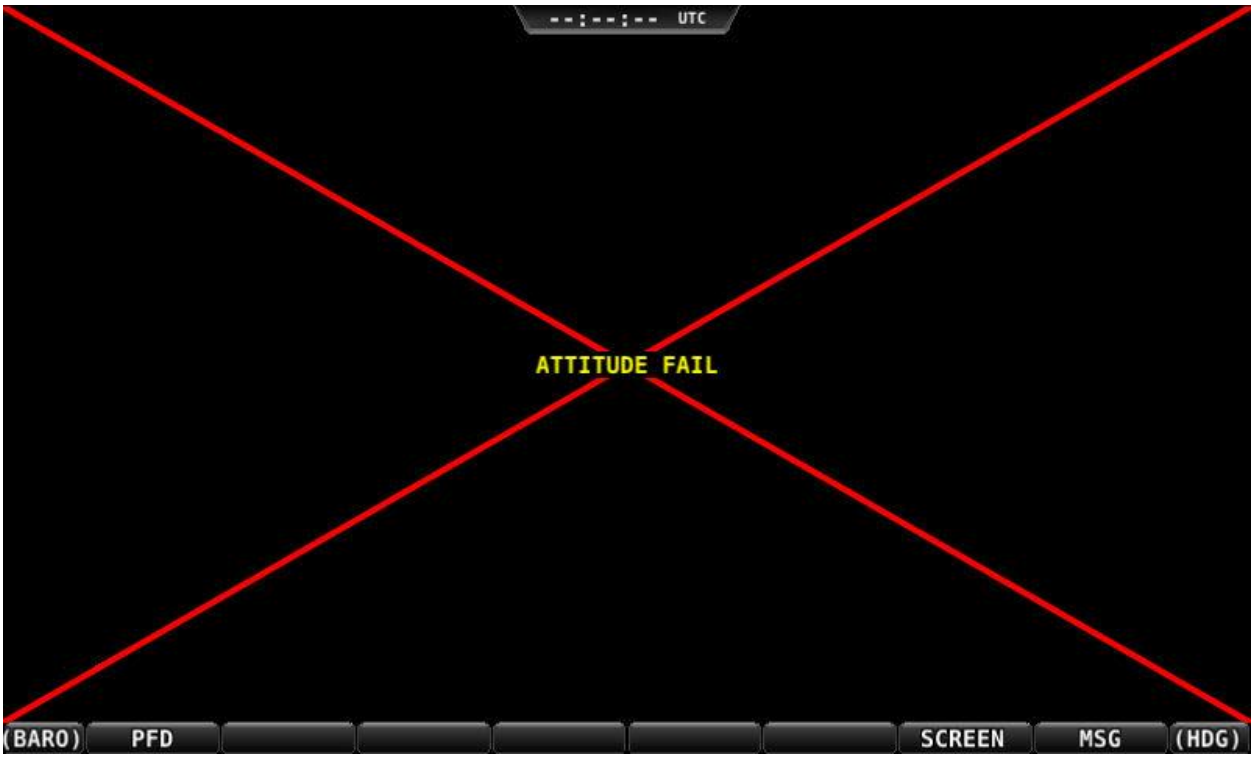


Figure 232 – Example SkyView Failure

Message, Caution, and Warning Alerting System

Message Notification Area

The area directly above the rightmost button (button 8) is the Message Notification Area. This area is reserved to notify the pilot of various messages and alerts that SkyView can present. All messages and alerts are categorized by severity into one of three categories. These include advisory “messages”, “caution” alerts, and “warning” alerts.

Alerts and messages are all categorized into one of three severity levels:

- MESSAGE:
  - Advisory message.
- CAUTION:
  - A condition which is abnormal but not critical in nature; may increase pilot workload.
- WARNING:
  - A critical condition that should be addressed immediately; may affect safety of flight if not addressed:

Figure 233 - Message Notification Area above button 8 (2nd from right), showing a Warning Notification

The Message Notification Area changes its appearance to reflect the highest level of alert that is present in the system at any given time:

Notification	Style	Alert Type
MESSAGE / MESSAGE	Flashing	Unacknowledged Advisory Message.
CAUTION / CAUTION	Flashing	Unacknowledged Caution Alert.
WARNING / WARNING	Flashing	Unacknowledged Warning Alert.
MESSAGE	Solid	Persistent (but acknowledged) Advisory Message condition still present.
CAUTION	Solid	Persistent (but acknowledged) Caution Alert condition still present.
WARNING	Solid	Persistent (but acknowledged) Warning Alert condition still present.
NO MSG	Solid	No active alerts or messages (no color).

Table 15 – Notification Types

Whenever a new alert or message is generated, the Message Notification Area will flash to provide a clear visual indication that there are unviewed messages or alerts that have not yet been seen and acknowledged.

When alert conditions are present - but they have been acknowledged by viewing them - the Message Notification Area will continue to show the highest notification type of all persisting alerts or messages. However, if there are no unviewed messages or alerts, the Message Notification Area will not flash.

Anytime a yellow caution alert is triggered, the following simultaneous events occur:

- If audio is connected and an audio alert exists for the particular alert, it will be played.

Anytime a red warning alert is first triggered, the following simultaneous evens may occur:

- If installed, the external alarm light will flash (for EMS-based alerts only).
- If audio is connected and an audio alert exists for the particular alert, it will be played.
- If the alert is related to an on-screen parameter on the Engine Page, that parameter's value will flash and highlight red simultaneously.

Engine warning alerts are only triggered when their respective sensors are configured as self-clearing or latching alarms. If a sensor's alarm is configured as off, no alert will trigger, even if that sensor's measurement enters a range defined as red. Reference the *SkyView Classic / SE / HDX System Installation Guide* for more information regarding alarm configuration.

Engine parameters only trigger alerts in the Message Notification Area and Message Window when they enter their "red" ranges. In other words, "yellow" caution ranges for engine parameters do not trigger alerts. Yellow caution ranges, however, are visually annunciated via yellow highlighting on the Engine Page.

Message Window

The Message Window provides more detailed information about messages and alerts. Press the rightmost button under the Message Notification Area to display the Message Window.

Figure 234 – Message Window

The Message Window prioritizes alerts and messages from top to bottom in the following order:

- Red warning alerts.
- Yellow caution alerts.
- White advisory messages.

Additionally, messages are further sorted in the order in which they occur, with the newest being higher.

Messages that are highlighted indicate that they are new (not acknowledged) and have not been seen before.

The tab at the top-right corner of the Message Window indicates how many pages of messages there are, and which page is being viewed. For example, if there were 2 pages of messages, and the first was being displayed, this tab would display “1/2”. If there is only one page of Alert Messages, pressing the rightmost button simply closes the Message Window. If there are more Messages present than can fit in the window, pressing the right most button moves to the next page of Messages. When you are on the last page of Messages, another press of the rightmost button closes the Message Window.

Alert and Message Acknowledgement

New messages and alerts that have not been seen are considered unacknowledged and are highlighted. Acknowledged messages are not highlighted in the Message Window. Display the Message Window with the rightmost button to acknowledge an alert message. This action displays the current alerts and messages and causes the Message Notification Area to stop flashing. Note that self-clearing alerts may not need acknowledgement if the alarm condition ceases.

Figure 235 – Unacknowledged (left) and Acknowledged (right) Alarms

Note that, even when all alerts are acknowledged, the Message Notification Area will remain solidly red, yellow, or white as long as an alert condition or message persists. Additionally, other on-screen displays − such as Engine gauges − will continue to blink and remain highlighted yellow or red until their alert condition ceases.

For EMS-based alerts only – the optional external alarm light will either remain lit after acknowledgement of a red warning alert (while the alarm condition continues to exist) or may extinguish with acknowledgement, depending on how SkyView is configured. Instructions for adjusting this behavior are discussed in the *SkyView Classic / SE / HDX System Installation Guide*.

If new messages or alerts are triggered while the Message Window is being displayed, they are not immediately displayed and will not be seen until the NEXT time the Message Window is displayed. This reduces visual noise in dynamic situations where alerts and messages may be triggering and/or clearing rapidly. If new alerts occur while viewing the window, the Message Notification Area will begin to flash again. In other words, any time the Message Notification Area is flashing, there are alerts that have not yet been seen and acknowledged.

In Dual Engine systems, the EMS alerts are not synchronized across the displays. Alerts appear on the display tied to that engine, audio is sent from that display, and alerts can only be acknowledged on that display.

Prompts Requiring Interaction

Some system events display outside of the Message Window and alerting system – usually via a "pop-up" near the bottom of the display. These often require a particular menu action or choice to proceed. An example of this is loss of primary power resulting in SkyView operating from backup battery (if installed). In this condition, the pilot must choose whether to keep the display on (on battery power) or to power the display off.

Audio Alerts

When connected to an audio panel or intercom, SkyView can generate tones or voice alerts for various conditions.

Inhibited Alerts

Audio alerts that occur within 5 seconds of SkyView initially powering on are inhibited to reduce transient nuisance alerts that may occur as SkyView comes online.

Engine Alerts can be optionally configured to be inhibited before engine start or 5 minutes, whichever comes first. See the *SkyView Classic / SE / HDX System Installation Guide* for details.

Messages, Alerts, and Audio Alert Details

Spoken Alert (if configured)	Message Displayed in Message Window	Notification Area Alert (severity)	Description
"Warning"	ADAHRS FAIL	WARNING	ADAHRS failure
"ADAHRS Cross Check Error"	ADAHRS CROSS CHK ERROR	WARNING	Displayed after an ADAHRS cross-check error was announced in a multi-ADAHRS systems, but you did not disable one of the disagreeing ADAHRS.
"Warning"	ADAHRS INTERNAL ERROR	WARNING	SkyView has detected a problem with the ADAHRS module. Contact Dynon Avionics for assistance
"Warning"	EMS FAIL	WARNING	Engine monitor failure

Spoken Alert (if configured)	Message Displayed in Message Window	Notification Area Alert (severity)	Description
“Engine Monitor” “Oil Pressure” “Fuel Pressure” “Fuel Flow” “Fuel Quantity” “Electrical Current” “Voltage” “Exhaust Gas Temperature” “Cylinder Head Temperature” “Engine Speed”	<Engine Parameter> HIGH or LOW	WARNING	Engine Parameter High or Low. “High” or “Low” is not displayed for all parameters. Engine Alerts can be optionally configured to be inhibited before engine start or 5 minutes, whichever comes first. See the SkyView Classic / SE / HDX System Installation Guide for details.
“Warning”	ADAHRS CAL CORRUPT	WARNING	Contact Dynon Avionics for assistance
“Warning”	DEMO MODE	WARNING	System is in Dynon demo mode and is not airworthy
“Warning”	ARINC-429 OFFLINE	WARNING	The SV-ARINC-429 module is not communicating with SkyView.
“Warning”	BACKUP BATTERY LOW	WARNING	The backup battery connected to this display is low.
“Warning”	SKYNET POWER FAULT	WARNING	A fault has been detected in the wires that provide power to SkyView Network devices.
“Warning”	AUDIO SUBSYSTEM FAIL	WARNING	SkyView has detected a problem with the audio system.
“Check Canopy Latch”	CHECK CANOPY LATCH	WARNING	A canopy latch alert is configured; The canopy is not latched; and the engine has been advanced past a configured RPM.
“Warning”	MAG FACT CAL CORRUPT	WARNING	Contact Dynon Avionics for assistance
"Warning"	TRIM FEEDBACK STUCK	WARNING	The trim feedback monitor received a positive activity signal during system boot.

Spoken Alert (if configured)	Message Displayed in Message Window	Notification Area Alert (severity)	Description
"Trim Runaway"	None	*On PFD:* **TRIM RUNAWAY**	SkyView detected electric Trim motor activity that was not commanded. *Requires SV-AP-TRIMAMP Installation.*
"Caution"	STANDBY NETWORK ERROR	CAUTION	SkyView Network has lost its secondary standby network redundancy. See below for more information.
"Caution"	POSITION SOURCE or GPS X FAIL	CAUTION	Position source (GPS) failure
"Caution"	XPNDR HEX CODE NOT SET	CAUTION	A SkyView Transponder or ADS-B receiver is installed but the HEX Code has not been set.
"Caution"	EMS SFG FILE MISMATCH	CAUTION	The Engine sensor indications may be incorrect, and screens may disagree.
"Caution"	NO ADSB OUT: GPS LOST	CAUTION	The GPS source that provides GPS position to the SV-XPNDR-261 for ADS-B Out use is offline.
"Caution"	BACKUP BATTERY IN USE	CAUTION	System has switched to SkyView Backup Battery.
"Caution"	OTHER DISPLAY OFFLINE	CAUTION	A SkyView Display has failed or is no longer communicating via SkyView Network.
"Caution"	NEED COMPASS CAL	CAUTION	Magnetic compass heading in either the SV-ADAHRS-20X or SV-MAG-236 is not calibrated.
"Caution"	COMPASS FAIL	CAUTION	The SkyView Remote Magnetometer has failed or is no longer communicating via SkyView Network.
"Caution"	NEED USER AOA CAL	CAUTION	AOA is not properly calibrated
"Caution"	CHECK PITOT HEAT	CAUTION	Airspeed information is not available; GPS is being used to aid in the computation of attitude information; Attitude may be degraded
"Caution"	ADAHRS CAL OLD	CAUTION	Contact Dynon Avionics for assistance

Spoken Alert (if configured)	Message Displayed in Message Window	Notification Area Alert (severity)	Description
“Caution”	AP BROKEN DISCONNECT	CAUTION	Autopilot disconnect switch wire is broken
“Caution”	AP DISCONNECT STUCK	CAUTION	Autopilot disconnect switch wire is stuck
“Caution”	XPNDR ALT ENCODER FAIL	CAUTION	Altitude is not being sent to the SV-XPNDR-261/262 because it is not available from its nominal barometric altitude source.
“Caution”	ACTV ADAHRS VIBRATION	CAUTION	The currently-active ADAHRS has detected vibration that will affect G Meter and Autopilot, attitude indicator performance. Troubleshoot when able.
“Caution”	ADS-B IN OFFLINE	CAUTION	The connected ADS-B traffic/weather receiver has failed or is no longer communicating with SkyView.
“Caution”	ZAON OFFLINE	CAUTION	The connected Zaon traffic receiver has not replied to a status query in the last 10 seconds.
“Caution”	FLARM OFFLINE	CAUTION	The connected FLARM traffic receiver has not replied to a status query in the last 3 seconds.
“Caution”	COM RADIO PANL OFFLINE	CAUTION	The COM radio control panel is no longer communicating with SkyView.
“Caution”	COM XCEIVER OFFLINE	CAUTION	The COM radio transceiver module Is no longer communicating with SkyView.
“Caution”	AP PANEL OFFLINE	CAUTION	The Autopilot Control Panel is no longer communicating with SkyView.
“Caution”	KNOB PANEL OFFLINE	CAUTION	The Knob Control Panel is no longer communicating with SkyView.
“Caution”	BATTERY MISSING/FAULT	CAUTION	A previously connected backup battery is no longer detected or has failed.

Spoken Alert (if configured)	Message Displayed in Message Window	Notification Area Alert (severity)	Description
“Caution”	CROSS CHECK ATTITUDE	CAUTION	While in flight, IAS has become invalid (likely due to icing or obstruction), and all GPS sources have failed. The attitude indication should be considered unreliable.
“Caution”	TOUCH PANEL FAULT	CAUTION	Touch Hardware is currently offline.
“Caution”	NO HI-RES TERRAIN	CAUTION	SkyView has detected that there is no high resolution terrain database installed for the aircraft’s current position.
“Caution”	CPU TEMP CRITICAL	CAUTION	The display internal temperature is high. To prevent permanent damage, the display may shut down at any time unless immediate action is taken to cool it down.
“Caution”	ROTAX: LIMIT FLIGHT OP	CAUTION	The ROTAX engine has informed SkyView there is a problem with the engine.
“Caution”	ROTAX: LAND AIRCRAFT	CAUTION	The ROTAX engine has informed the SkyView EMS-221 there is a significant problem with the engine.
“Caution”	TEMP HIGH – INCR RPM	CAUTION	The ROTAX engine coolant temperature should be reduced by increasing idle speed.
"Caution"	AP TRIM MALFUNCTION	CAUTION	SkyView sent a command to move the Trim motor but did not receive feedback that the motor is moving. A trim switch was held ON continuously for more than 5 seconds while Auto-Trim was enabled.
“Switch Fuel Tank”	SWITCH FUEL TANK	MESSAGE	The optionally-configured fuel tank timer has reached its pre-configured time or fuel quantity consumption limit.
“Timer Expired”	TIMER EXPIRED	MESSAGE	A DOWN timer under TOOLS > TIMER has expired.

Spoken Alert (if configured)	Message Displayed in Message Window	Notification Area Alert (severity)	Description
“Message”	ROLL SERVO OFFLINE	MESSAGE	The Roll Autopilot servo has stopped communicating with SkyView. Will be seen if Autopilot servos are not receiving power.
“Message”	PITCH SERVO OFFLINE	MESSAGE	The Pitch Autopilot servo has stopped communicating with SkyView. Will be seen if Autopilot servos are not receiving power.
"Message"	YAW SERVO OFFLINE	MESSAGE	The Yaw Autopilot servo has stopped communicating with SkyView. Will be seen if Autopilot servos are not receiving power.
“Message”	TRANSPONDER FAIL	MESSAGE	Transponder failure.
“Message”	EXT LEVEL BUTTON STUCK	MESSAGE	The external Level Button is stuck and is inoperative.
“Message”	CHECK BARO SETTING	MESSAGE	The current BARO setting and the nearest METAR-based altimeter setting are more than .1 inHg apart. Or the aircraft has descended below FL180 and the BARO should be reset.
“Message”	BATTERY TEST FAILED	MESSAGE	A full backup battery test was performed, and it failed. See the Installation Guide for further troubleshooting information.
“Message”	BATTERY TEST NEEDED	MESSAGE	A year or more has passed since the last successful backup battery test, or the last three SkyView shutdowns were abnormal.
“Message”	SOFTWARE MISMATCH	MESSAGE	SkyView components are not all running the same firmware version
“Message”	OEM CONFIG MISMATCH	MESSAGE	OEM-customized displays are not in sync with each other
“Message”	TAIL # MISMATCH	MESSAGE	Tail numbers differ between SkyView displays – settings will not properly synchronize
“Message”	XPNDR NOT IN ALT MODE	MESSAGE	The aircraft is in flight and the Transponder is not in Alt Mode
“Message”	CPU TEMP HIGH	MESSAGE	The display internal temperature is significantly higher than the normal operating temperature.

Spoken Alert (if configured)	Message Displayed in Message Window	Notification Area Alert (severity)	Description
“Message”	BACKUP BATT LOW CHARGE	MESSAGE	The backup battery connected to this display is not charged.
“Message”	Wi-Fi Offline	MESSAGE	The Wi-Fi Adapter is currently offline.
“Message”	SYSTEM EVENT n	MESSAGE	SkyView has detected a possible problem with software or hardware. Please fill out form at http://dynon.aero/event5 when convenient.
“Message”	XPNDR WARNING MESSAGE	MESSAGE	The transponder has detected a problem and notified SkyView. See the SETUP MENU for the specific problem.
“Gees” (repeats)	None	n/a	The G meter is in the yellow caution range
“Over Gees” (repeats)	None	n/a	The G meter is in the red warning range
“Traffic Not Available”	None	n/a	Traffic is not available from a previously available source
“Traffic”	None	*On PFD and Map:* **TRAFFIC**	A new traffic advisory target has been identified. Note that this audio alert is suppressed when not in flight to reduce nuisance alerts. Other visual traffic alert indications persist, however.
“Autopilot”	None	n/a	The roll or pitch autopilot axis has been engaged
“Autopilot Mode”	None	n/a	The autopilot roll mode has changed since it was engaged. This includes sequencing onto an armed mode (such as an ALT Hold > VNAV sequence)
“Autopilot Disconnect”	None	n/a	The roll and pitch autopilot axis has disconnected
“Autopilot Roll Disconnect”	None	n/a	Only the roll autopilot axis has disconnected
“Autopilot Pitch Disconnect”	None	n/a	Only the pitch autopilot axis has disconnected
"Yaw Damper"	None	n/a	The Autopilot Yaw Damper has been engaged.

Spoken Alert (if configured)	Message Displayed in Message Window	Notification Area Alert (severity)	Description
"Yaw Damper Disconnect"	None	n/a	The Autopilot Yaw Damper has been disengaged.
“Go Around”	None	*On PFD:* **ADD POWER**	The autopilot go around function has been engaged.
“Trim Nose Up”	None	n/a	The autopilot requires nose up trim to maintain control of the aircraft, and has been annunciating this visually on the display for at least 30 seconds. This alert is played a maximum of once every 30 seconds.
“Trim Nose Down”	None	n/a	The autopilot requires nose down trim to maintain control of the aircraft, and has been annunciating this visually on the display for at least 30 seconds. This alert is played a maximum of once every 30 seconds.
“Autopilot Airspeed High/Low”	None	n/a	The autopilot airspeed limits are exceeded.
“Approaching Minimums”	None	n/a	Altitude is within 200 feet of the MIN bug
“Minimums”	None	*On PFD:* **MINIMUMS**	Aircraft has descended below MIN bug
“Approaching Altitude” / “Leaving Altitude”	None	n/a	Altitude alerter notification that the aircraft is approaching or leaving the bugged altitude
“Overspeed”	None	n/a	Indicated airspeed is exceeding Vne
“Flaps Overspeed”	None	n/a	Indicated airspeed is exceeding Vfe (and flaps are at least partially deployed)
“Flight Plan Updated”	None	n/a	A new flight plan has been received by SkyView from an external flight plan source or supported app.
“Approaching Waypoint”	None	n/a	The aircraft is within 30 seconds of an upcoming SkyView flight plan waypoint (except the final waypoint)

Spoken Alert (if configured)	Message Displayed in Message Window	Notification Area Alert (severity)	Description
"Check Gear"	None	n/a	The aircraft is configured as a Retractable gear, and the Landing Gear is UP, and the aircraft is descending through the configured minimum warning speed.
"Gear Overspeed"	None	n/a	The aircraft is configured as either a retractable or amphibious gear, the landing gear is not UP, and the airspeed is exceeding the configured maximum gear down speed.
"Gear is Up for Water Landing"	None	n/a	The aircraft is configured as an amphibious gear capability of runway landings, and the gear is in the UP state and the airspeed is descending through the configured minimum warning speed.
"Gear is Down for Runway Landing"	None	n/a	The aircraft is configured as an amphibious gear capability of runway landings, and the gear is in the DOWN state and the airspeed is descending through the configured minimum warning speed.

Table 16 – Messages, Alerts, and Audio Alert Details

STANDBY NETWORK ERROR Explained

The SkyView Network that connects your ADAHRS(s), EMS module, Autopilot servos, ARINC module, and display are designed with fully redundant data pathways. When the STANDBY NETWORK ERROR alert is displayed, SkyView is telling you that SkyView Network no longer has a backup or redundant data pathway to fall back on should the primary data path fail. You should treat this error similarly to the way you would treat the failure of a single ADAHRS in a system that is equipped with two of them: There is little you can do to troubleshoot such an issue in flight, should it occur. However, you should exercise the same precautions you would exercise if you did not have backup flight instruments. If you are flying in IMC, especially, you should consider making a precautionary landing as soon as possible. Since a STANDBY NETWORK ERROR may be either a discrete single failure (breakage of a single wire) or indicative of a more serious failure in progress (an entire wire bundle that is slowly fraying against

another object), Dynon Avionics recommends that the root cause of the failure is determined before flying again.

The *SkyView Classic / SE / HDX System Installation Guide* has troubleshooting procedures for finding the root cause of standby network errors.

AOA Alerts

When AOA audio alerting is enabled, it enables a progressive tone that increases in intensity as AOA increases. It is similar in nature to a conventional reed-type aircraft stall warning sound, although it is much more predictable in its progression. It can be set to start its progressive tones at either the border of the yellow/green marks on the AOA bars, the middle of the yellow, or at the yellow/red border. The tones start at the level selected and get progressively quicker and closer together until a solid tone is played at critical AOA (in the red).

13. Appendix A: SkyView System Specifications

See the current revision of the *SkyView Classic / SE / HDX System Installation Guide*.

14. Appendix B: License Information

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Version 2, June 1991

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FTGL License Information

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15.Appendix C: Revision History Archive

Revision	Revision Date	Description
A	December 2009	Initial release
B	March 2010	Document number changed to 101321-001. Minor style, grammar, and cross reference changes and corrections. Added information regarding Autopilot servos in applicable sections. Addressed screen synchronization in applicable sections. SV-D700 and SV-D1000 Operation Chapter updates: • Added the Menu Navigation Section • Clarified the How to Turn the System On or Off Section • Expanded the How to Manually Adjust the Backlight Brightness or Dim Level Section • Expanded the How to Enter the Joystick Function Menu Section • Added the How to Check Installed Database Statuses Section • Added the How to Configure the Top Bar Section PFD Operation Chapter updates: • Added the ADAHRS Source Section • Added the GPS Source Section • Added “push to synchronize” instructions for applicable bugs Moving Map Operation Chapter updates: • Added an important note regarding Moving Map requirements • Added the GPS Source Section • Added the Terrain Data Section • Added the Aviation Data Section Corrected the Onscreen Alerts Section in the Alerts Chapter.
C	May 2010	Document number changed to 101321-002. Minor style and grammar changes and corrections. *Updated the guide to include HSI operation information.* *Updated the guide to include Autopilot operation information.* *Updated the guide with more Moving Map content.*
D	June 2010	Document number changed to 101321-003. Clarified intended use of Synthetic Vision. Added information about Synthetic Vision depictions of runways and obstacles. Added EMS menu, lean mode, engine timers, and fuel computer information. Clarified map Magnetic North pointer. Added Navigation Mapping Software information. Added Trial Navigation Mapping Software information and operation instructions. Added external alarm light behavior.

E	October 2010	Added information about User Waypoint power user feature that is fully documented on wiki web page. Added information about menu changes that may be present in SLSA and other aircraft that SkyView is integrated into as an OEM component. Added transponder operation information and specifications. Added traffic display information for both MAP and PFD pages. Added a better description of the combined EGT/CHT gauge. Added Synthetic Vision licensing information. Added Navigation Mapping Software Licensing and updated operation information.
G	March 2011	Revision F skipped to obtain version parity between Installation Guide and Pilot's User Guide. Added description of GPS Steering control of Autopilot. Pitch Trim Indicator behavior and performance expectations clarified. Added servo weights. Added product registration information. Described improved loss of external power with backup battery connected behavior. Added information about G Meter. Added information about new/improved Navigation Mapping Software purchase, licensing, and operation.
H	May 2011	Added description of enabling/disabling extreme pitch warning indicators and Flight Path Marker. Updated screen layout button labeling and figures Added information on Flight Planning. Updated several of the figures that were no longer valid due to button and screen changes. Changes made for new style of heading bug and heading readout. Screen Hardware changed to Display Hardware. Added section on autopilot safety features. Added additional information about airport graphics. Added additional information to SV-ADAHRS-20X Instruments and Sensors table.
I	September 2011	Added description of improved bug window outlining (when selected) and cyan highlighting (when being adjusted). Added "Show VOR Directions As" menu item description. Added Vertical Power VP-X information. Clarified SV-BAT-320 charging behavior; Clarified which devices and modules the SV-BAT-320 is capable of powering. Added permission to print the manual. Added map panning information. Remove erroneous checkmark in AOA column in winds row in "Instruments and Sensors " table. Improved HSI information.

J	March 2012	Clarified that Jeppesen data must be transferred to USB stick via the Jeppesen JSUM program. Added PocketFMS information. Clarified bearing sources and limitations (SBY bearings from some NAV radios and no availability of bearings from LOCs). Clarified EMS timers. Added special Rotax 912 tachometer and oil temp behavior when configured. Added altitude alerter information. Refreshed Messages and Alerts section to reflect feature improvements. Added Audio Alert information. Updated map instructions to reflect UI refresh, improved info items support, user waypoints, and visual reporting points support.
K	July 2012	Clarified engaging the Autopilot with the Disengage/CWS Button. Added information about when airspeed indication comes alive. Added SkyView Network redundancy information. Added ADAHRS cross-checking information. Updated Navigation Mapping Software to incorporate base map support and airspace improvements.
L	December 2012	Updated Screen Layout Configuration section to add information about display swap mode and reversion mode. Added information about DA calculation. Added engine alert inhibit information. Added information about normal display artifacts on power on. Updated recommendation to have servos powered whenever SkyView is powered on. Added description of take-off position marking for trim widget. Added information about attitude rate limit indications. Rearranged PFD Operation section for better information flow. Added SV-XPNDR-26X, SV-ADSB-470/472 information to system overview. Added ADS-B and Flarm traffic information. User waypoint altitude information now displayed on their Info pages. Added information about the AUTO transponder setting when automatic ALT/GND mode changes are enabled (only available with transponder firmware version 2.02 or above). Detailed improvements to ENGINE > FUEL UI. Added information about weather features and usage via SV-ADSB-470/472.
M	January 2013	Added information about Data Logging. Added information about Stadium TFRs. Added TACAN and Outer Marker symbols. Clarified information about the AIRSPACES BELOW feature in the Map Menu.

N	June 2013	Added MDA bug information. Updated PFD Bugs section with new bug names. Updated information regarding how the Flight Path Marker is displayed. Revised GPS 0 position source information, now labeled SkyView. Added Map Trial Mode – Trial Expired description. Added Map Aviation Database Expired description. Added Garmin GTX 330ES transponder support for activating ADS-B traffic. Revised “Show Airspaces Below” description. Added Traffic Fail announcement description. Added Battery status/test information. Revised Autopilot chapter to reflect new Simplified and Expert Autopilot Control schemes. Added COM Radio Chapter. Revised Messages, Alerts, and Audio Alert Details. Added information about Backup Battery status information and testing capabilities.
O	September 2013	Center click can now be used to pull up, set, and sync (by holding) the PFD joystick functions menus (bugs, baro, crs, etc.). Added new Up/Down Timers feature. Added new Fuel Tank Reminder alert. Added Geo-referenced Approach/Departure Charts and Airport Diagrams feature for US Data. Updated Navigation Mapping Software chapter to reflect refined direct-to and flight planning behaviors. Minor changes. Added new Map Pointer selection features. Clarified new shortcut of using Nose Up and Nose Down buttons to immediately start a climb/descent from Alt Hold mode in Expert Autopilot. Added audio alert inhibition upon SkyView startup information.
P	November 2013	Added Geo-referenced Approach/Departure Charts and Airport Diagrams feature for Europe data. Added procedure for downloading Europe Chart data. Added information about ICAO and FAA flight plan codes in the Transponder Operation section. Modified procedure chart FOLLOW behavior description (follow mode now default s to on for airport diagrams).

Q	March 2014	Added: Information about SV-INTERCOM-2S Added: Support for SkyView Touch. Added: Enroute charts, including VFR, IFR LO and HI. US support via existing Seattle Avionics Subscriptions at release. Clarified: GPS assist in Attitude Calculation Clarified: magnetic heading is not used to aid attitude determination Added: Support for dual engine monitoring by using two SV-EMS-22X modules. Added: Support to monitor up to 28 total EGT and/or CHTs by using a second SV-EMS-22X module. Clarified: Navigation Mapping Software required to view charts on SkyView Clarified: SV-COM-C25 product description Added: Support for SV-KNOB-PANEL dedicated knob control panel. Added: Support for SV-AP-PANEL dedicated autopilot control panel. Clarified: Top Bar status area configuration Added: 60% PFD Screen layout option when paired with 40% Map Added: Vertical Speed Required to destination Info Item on map and PFD VSI displays the current VS required to set up at a specified point at or before and above your final destination waypoint. Improved: GPS waypoints now displayed in HSI info area for ARINC navigators such as the GNS and GTN. Improved: External GPS and nav radios can now be named with a user-configurable 7 character “friendly name” to aid in identifying sources on the HSI display. Moved: Synthetic Vision description within the PFD Chapter Added: Conventional analog “six-pack” display mode for primary flight instruments. Changed: PFD menu now includes MODE button to select between EFIS or Analog presentation and to toggle SynVis on or off Added: HSI Source Button is duplicated in the Autopilot Menu for convenience. Added: Support for showing Flight plans from ARINC IFR GPS navigators such as the GNS and GTN series both on SkyView’s map (including holds and other procedure turns) and on SkyView’s flight plan display. Improved: Timer expiration in top bar changed from yellow to white Improved: All EMS widgets that have assignable color ranges (red/yellow/green/black) now have additional color options: blue, white, purple, cyan, and orange. Changed: All EMS timers that formerly had “flight” or “flt” in their names are now called “air” timers. The underlying behavior of these timers has not changed. Improved: Fuel Tank Switch Reminder is now based on Flight Time and not engine Run Time. Improved: Press and holding knob/joystick center-click from within the FPL menu brings up the insert waypoint function. Improved: When the map pointer is selecting a single item, range is still enabled by turning the map joystick knob (if two or more items are under the pointer, turning the knob chooses which one is selected). Improved: Yellow/red terrain alert coloration disabled on the map page when not in flight.

		Fixed: “Show Airspaces Below” feature did not always properly exclude airspaces whose altitudes were defined by flight levels (primarily in non-US data). Added: Support for MGL V6 and V10 Com radios. Added: Support for the Trig TY91 Com radio. Added: Support for Val NAV 2000 nav radio. Improved: Radios such as the Icom A210 that can receive frequencies but do not output status now need not cause the top bar radio status area to show a “red x”. Added DISPLAY COM IN TOP BAR option to configure this behavior. Fixed: Fuel Tank Switch Reminder is now a message, not a caution alert. Added: Touch Panel Fault Alert Added: Special alert behavior for Dual Engine monitoring Added: “Check gear” and “gear overspeed” audio alerts for retractable gear aircraft that are tied to both landing gear status and airspeeds. Added: “Gear up for water landing” and “gear down for runway landing” audio alerts for amphibious aircraft that are annunciated as a selected airspeed is transitioned through. Added: Tail numbers for ADS-B equipped traffic will be shown below traffic targets when available. Only available for aircraft equipped with Dynon Avionics’ ADS-B receiver, and will only be shown for target aircraft that are ADS-B OUT equipped. Improved: Radios such as the Icom A210 that can receive frequencies but do not output status now need not cause the top bar radio status area to show a “red x”. Added DISPLAY COM IN TOP BAR option to configure this behavior. Fixed: Warning, caution, and message alerts that do not have their own dedicated audio phrases were not annunciating the generic “warning”, “caution”, and “message” audio phrases they should have been. This bug is present in SkyView 7.0-7.1. It worked properly previously and is fixed with 10.0. Fixed: Items that shouldn’t be appearing on the map per the “map items” zoom/range declutter settings were appearing when the map was very zoomed in. New: Support for speed-scheduling of the trim control in the SV-AP-PANEL. Improved: HSI courses are now remembered for each HSI source. This is especially helpful when switching between VOR and ILS or GPS and ILS sources.

R	August 2014	New: Support for SV-COM-X83 8.33 kHz COM radio. New: Support for Video Input Adapter. Allows display of video via NTSC and PAL S-Video and composite connections. Note: Only compatible with SkyView Touch and newer SkyView SV-D1000 (s/n >= 6000) and SV-D700 (s/n >= 4000) displays. New: Virtual-DME (non-certified) distance to VORs via GPS when the VOR identifier is known. Magenta distance is displayed on HSI info area on PFD. New: SHOW AIRSPACES WITHIN XXXX FT option to declutter airspaces that aren't a factor at the current aircraft altitude. New: Wide field of view option for Synthetic Vision under PFD > MODE > WIDE. Setting also proportionately scales the pitch ladder. New: Vne can now be set as TAS. New: Option to turn on color-coded weather "dots" at airports with METARS via MAP MENU > WEATHER OPTIONS > METAR ICONS (SV-ADSB-470/472 required). New: BARO sync will now obtain either the nearest METAR (when ADS-B is available in-flight), set to 29.92 (when at/above 18k feet or no ADS-B on board), or to make the altimeter match GPS altitude (when on the ground). Added: Alert when engine sensor definitions do not match across multiple displays in a SkyView system. Added: Caution alert if transponder hex code is not set. Added: Option to alert the pilot when the current BARO setting and the nearest METAR-based altimeter setting are significantly different (requires SV-ADSB-470/472). Added: Audible "AUTOPILOT" callout when the autopilot is engaged. Added: Alerts when SV-AP-PANEL, or SV-KNOB-PANEL go offline. Added: Alert when an external Level button is connected and detected stuck at boot. Added: GPS-based distances to bearing sources in HSI info area (when only one bearing source is displayed). Added: Alert for detectable audio subsystem failures. Added: MAP MENU > FLIGHT PLAN OPTIONS > PLAN GROUND SPEED lets SkyView perform ETE, ETA, and other speed-dependent calculations at a user-specified ground speed when not flying. Improved: Traffic service/device reception quality indicator on map page. Improved: Additional failure detection and annunciation of rate sensors, accelerometers, and pressure transducers in the SV-ADAHRS-20X. Improved: Alert that annunciates when there is no high-res terrain available for the current aircraft location (usually because a different world region is loaded). Improved: Joystick knob menu now annunciates successful sync of any bug or BARO setting when you press/hold the joystick knob. Improved: Bugs can now be turned on and off per display via PFD>BUGS. The presence of an autopilot no longer forces all bugs to be shown on all displays. Improved: Display dimming algorithm and menu control scheme improved to disallow brightness settings that would result in an illegible (too dim) display.

		Improved: Airport identifiers on MAP are now white to improve legibility. Improved: PFD>XPNDR menu no longer has a time-out that automatically backs out of menu. Improved: ROP/LOP EMS info widget now says “PK?” instead of “UND” when calculation is out of range or not possible for the configuration.
S	January 2015	New: Autopilot Auto-Trim. The SkyView AutoPilot can automatically re-trim the aircraft as it flies under autopilot control. This feature requires that the aircraft has an SV-AP-PANEL and is using its integrated trim controller for trim servo actuation. New: OBS Mode that allows pilots easily set and adjust an inbound course to any navigable point on the map. That inbound course may then be easily adjusted with the HSI CRS knob, similar to how one would with a VOR. This is useful to approach an airport from a specific direction, for example, without having to create a second waypoint to create a full flight plan leg. New: Aircraft icon displayed on the Map and in the HSI PFD can be changed to one of over a dozen types of aircraft. Added: Alerts that let the pilot know if the CPU within SkyView's display is overheating due to failure of SkyView's thermal dissipation features. Added: New option under MAP MENU > MAP ITEMS > TFR OPACITY that allows pilots to change the opacity of TFRs. This can be used to tune the visibility of co-located TFRs and underlying map features. Added: Support for sending/receiving frequencies to the Garmin GTR-200. This does not include the ability to send aviation database information to the GTR-200. Fixed: When a USB stick containing expired chart data is removed, on-screen alerts about that expired data are no longer displayed. Fixed: User alert data logs sometimes had corrupt values in them. Fixed: Traffic vector length now correct for ADS-B targets. Fixed: Not all data from Garmin portable GPS products was being passed along to compatible Garmin radios as if they were directly connected.
T	February 2015	New: Support for the Wi-Fi Adapter for SkyView. The Wi-Fi Adapter allows supported devices to interface to SkyView. ForeFlight Mobile on iOS devices is supported on release. New: Tablet connectivity with ForeFlight Mobile. ForeFlight Mobile customers (US and Canadian markets only) can send and receive flight plans from their iOS devices and SkyView. SkyView can also transmit its GPS position and ADAHRS information to ForeFlight for use within the ForeFlight app. This feature requires one Wi-Fi Adapter for SkyView for each display in the aircraft.

U	April 2015	New: Support for SV-MAG-236 Remote Magnetometer for SkyView. New: Transponder firmware update to version 2.6 to support ADS-B+ format from capable Garmin IFR navigators. Using ADS-B+ format is a requirement for having an FAA ADS-B rule compliant installation in 2020 and beyond. Note that the transponder firmware update must be manually initiated and does not happen automatically during a SkyView software update. New: Tablet connectivity with PocketFMS EasyVFR. PocketFMS customers can send and receive flight plans from their devices and SkyView over Wi-Fi. Improved: SkyView now remembers the last two hours of ADS-B weather and all active/upcoming TFRs after when SkyView is power cycled. This gives the pilot access to weather and TFR information that is still valid when SkyView is turned on and acquires time via GPS lock. Updated: US Stadium TFRs now provided via database file after the ADS-B FIS-B service ceased transmitting them. Fixed: User data logs' time stamps were off by one day. Fixed: SkyView did not recognize more than 20 GPX files on a USB memory stick. Fixed: Permanent Disney TFR shown as upcoming instead of active. Fixed: Filtering for 912iS fuel pressure improved. For best results also update to the latest engine sensor definitions. Fixed: SkyView would restart for some customers after exporting data logs. Improved: Fuel computer no longer compares fuel computer totals to measured fuel in aircraft that do not have in-tank fuel level sensors.
V	July 2015	Improved: Single autopilot disconnect switch press leaves the flight director on. A double press will turn off the flight director and clear the lateral and vertical autopilot modes. New: Added multi-language support. SkyView Pilot's User Guide is only available in English at this time. New: A new warning message is displayed if the transponder detects an anomaly. New: A new message is displayed if the D1000 or D700 detects a potential anomaly. Improved: Chart data formats have changed resulting in improved rendering time and better enroute chart graphics. The correct format must be selected in the Seattle Avionics loader software. In addition, one may notice that the map layer buttons might change location and/or names when displaying Seattle Avionics charts. Improved: Synthetic vision can highlight terrain that is immediately a threat. Improved: Added new widgets to support Rotax 912iS throttle position and ECO mode.

W	January 2016	Changed: Transponder warnings are now messages not warnings. Changed: XPNDR GPS IN OFFLINE is now NO ADS-B OUT: GPS LOST Changed: SkyView now displays DATABASE NO LONGER CURRENT PRESS MAP > ACCEPT to clarify what action should be taken. Improved: New caution messages for Rotax engines with CAN bus EMS monitoring (limit flight ops and land aircraft). New: Added checklists to TOOLS. SkyView now supports user configurable checklists. New: SkyView map can show a circle on the map that represents the area to which the aircraft can glide. The glide ring is based on current calculated wind, AGL and programmed sink rate and best glide speed.
X	October 2016	Name of this guide changed to SkyView Classic Pilot's User Guide System Software version 15.0 New: Extended runway indications New: Sequenced NEXRAD New: Weight and balance New: Vertical navigation mode New: Maintenance Log New: Wi-Fi "streaming data" includes weather and traffic data New: Highway In The Sky (HITS) New: Airports and flight plan waypoints are shown with flags on synthetic vision New: Airspace Proximity indicates airspace type around the aircraft
Y	November 2017	System Software version 15.1 and 15.2 New: SV-ADSB-472 operational documentation Changed: Vertical Guidance documentation Changed: Checklist items are scrolled with the cursor Changed: Airport flags are selectable Changed: Weight and balance supports metric Changed: Weight and balance displays zero-fuel calculations Changed: Estimated time elapse (ETE) to waypoint uses minutes and seconds New: Detailed 912iS fault list Changed: Com panel ATC button ignores on-ground/in-air Changed: Six pack altimeter has 1000 and 10000 indicators Changed: Autopilot disconnect button behavior in expert mode Changed: HITS vertical guidance Changed: Transponder auto mode defaults to ALT Changed: Autopilot operation on back course Changed: OAT out of range displays --- New: Yaw damper

Z	January 2018	Minor style, grammar, and cross reference changes and corrections. Reformatted Document. Updated Figures: 25, 26, 30, 31, 32, 33, 91, 127, 128, 129, 130. Updated Header information. Added page numbers, by chapter. Changed: Bearing pointers in the HSI are now blue. Changed: SV-KNOB-PANEL synchronization is now a click. Changed: MDA bug is now labelled MIN. Changed: Vertical Speed Required (VSR) index line is now an arrow on the VS tape. Changed: The north arrow on the map is now gray. Changed: Servo failures are now white messages. Changed: Transponder failures are now white messages. Changed: GPS ASSIST warning is now CHECK PITOT HEAT. Changed: Autopilot audio messages changed to Trim Nose Up/Down and Autopilot Roll/Pitch Disconnect. New: Traffic coasting updates ADS-B targets.