

Pilot's User Guide

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

Revision History

Revision	Revision Date	Description
Q	August, 2025	**System Software Version 17.3:** • New: Support for turbine engine monitoring with data from a TurboTech ECU. • New: Support for ECU Temperature monitoring with data from a ULPower ECU. • Revised: Rotax 921, Rotax 912 iS / 915 iS, and ULPower 520T subsections of Section 6: ENGINE Operation for accuracy and clarity. • Fixed: Changing the Flight Plan now exits Emergency Glide mode. • Change: The WiFI adapter signal has increased connection resiliency. • Fixed: Fuel Level indicator now covered with Red X when sensor input value is out-of-bound (i.e., sensor wire shorted or disconnected). • Fixed: Removing a USB drive from ChartData Menu now returns the display to the System Setup Menu. • Fixed: Download Button in ChartData Menu is now present when entering menu. • New: Slingshot ChartData download messaging. • Fixed: Serial numbers for SV-ADAHRS-200/201 now consistently written to configuration file. • New: SV-XPNDR-262 software version SW02.15 included in SkyView software build.
P	August, 2024	**System Software Version 17.1:** • New: Emergency Glide autopilot safety feature. New content added to Section 8. • New: EMS support for Aithre Shield EX 2.0 and 3.0 CO detectors. • New: SV-COM-760 software version 2.24 included in SkyView software build. • Change: LEAN Mode indications can now be displayed in metric units. • Change: ADAHRS warm-up time reduced to 5 minutes for Compass Calibration. • Change: Hobbs and Tach time maximum now increase to 99,999.9. • Fixed: Slingshot loader for Seattle Avionics now loads chart data on SkyView from the FlyQ app. • Fixed: Software Update Status bar always displays 'Update Complete' after successful SkyView software installation.
O	May, 2024	**System Software Version 17.0:** • New: Support for SV-HDX1200 Display. Updated Sections 2 and 3 to include HDX1200. • Change: EMS Lean Mode function no longer available for Rotax engines. Updated LEAN (Lean Assist Mode Control) subsection of Section 6. • Fixed: Resolved bug that caused some SV-Network modules to sometimes fail to complete software update process. **Other Changes:** • Clarified throughout document that SV-ADSB-470/470 receivers support TIS-B and SV-XPNDR-261/262 transponders support TIS-A.

Revision	Revision Date	Description
N	February, 2024	**System Software Version 16.7:** • New: Support for SV-COM-PANEL with new LCD screens. Updated Figure 239 in Section 9. • New: Support for new Kavlico manifold air pressure (MAP) sensor. • Fixed: Software update process for SV-ADSB-472. • Fixed: Green range fill coloring on CHT and EGT widgets. Updated Figure 239 in Section 9. • Change: CHECK CANOPY LATCH alert default RPM is now 200 RPM. • Fixed: CPU TEMP CRITICAL alert for older SkyView displays. • Change: Access to Advanced Flight Systems' Advanced Control Module menu no longer requires an SV-EMS-220/221. • Fixed: Flight Plans no longer skip waypoints when paths have legs that double back on themselves. • Fixed: Fuel at Destination now shows destination when using external flight plan on some GPS navigators. • Change: ADS-B NO RADAR status message updated to ADS-B PARTIAL. Updated screenshot in Traffic Receiver Status subsection of Section 5. • Change: ADS-B PARTIAL reception prioritized over TIS. Revised verbiage in Traffic Receiver Priority subsection of Section 5. • Fixed: AOA indicator still functions when flaps position exceeds the range of calibrated flap values.
M	November, 2023	**System Software Version 16.6:** • Change: Text in Angle of Attack Indicator subsection of Section 4 for new AoA calibrations for flap positions. • Change: Text and screenshots in MAP Items on Charts subsection of Section 5 for new array of MAP items that can be drawn on a chart. • Change: Traffic Receiver Status and Traffic Receiver Priority subsections of Section 5 for new ADS-B traffic priority. • New: Setting for showing MAP Items on Charts in MAP SETUP – Moving Map Preference Configuration subsection of Section 5. • Change: Text in SkyView Autopilot Control Panel Operation subsection of Section 8 for new Autopilot Control Panel functions for simplified controls.

Revision	Revision Date	Description
L	June, 2023	**System Software Version 16.5:** • Change: Rotax 912/912iS Behavior subsection of Section 6 for 915iS engine support. • New: ULPower 520T Behavior subsection to Section 6 for 520T engine support. • Change: FUEL (Fuel Computer Control) subsection of Section 6 to include Fuel at Destination indicator. **Other Changes:** • Added Dynon Certified links to Contact Information and throughout document. • Added new icon to Manual Iconography subsection to denote information specifically for Dynon Certified installations. • Updated most references to the System Installation Guide to include the Certified System Installation Manual. • Added notes throughout document with information specifically for Certified aircraft. • Updated outdated Setup Menu screenshots throughout document. • Revised verbiage of Vertical Speed Indicator and Glideslope/VNAV Indicator subsections of Section 4 to clarify VNAV behavior. • Added missing verbiage in Extended Runway Centerlines subsection of Section 5. • Revised verbiage of MAP SETUP and MAP INFO COLUMN subsections of Section 5 to clarify VNAV behavior. • Revised verbiage and added new screenshot in VNAV: Vertical Navigation subsection of Section 5 to clarify VNAV behavior.
K	January, 2023	System Software Version 16.4.4: • New: Trim Yaw Left/Right alerts to Section 8: Autopilot Operation and Section 12: Message, Caution, and Warning Alerting System.
J	September, 2022	**System Software Version 16.4:** • New: SV-COM-760 COM radio and repackaging of the SV-COM-X25/X83 and SV-COM-C25 COM radio kits. • New: Note about Flight Plans being tied to HSI Nav sources in the Flight Planning subsection of Section 5. • New: AGL to Map Info Column in Map Controls subsection of Section 5. **Other Changes:** • Added Dynon Certified links to Contact Information and throughout document. • Removed Bank Angle audio alert from Messages, Alerts, and Audio Alert Details subsection of Section 12. • Fixed typos in Messages, Alerts, and Audio Alert Details subsection of Section 12. • Added Transponder Errors subsection to Section 12.

Revision	Revision Date	Description
I	May 2022	**System Software Version 16.3:** • Change: Section 8: Autopilot Operation with new screen shots and verbiage of updated AP-related alerts and messages. • New: Bank Angle and Trim Switch Stuck alerts in Section 12. **Other Changes:** • Revised Table 16 – Messages, Alerts, and Audio Alert Details to list alerts alphabetically and to include graphics for alerts that appear on PFD, Map, and Top Bar.
H	December 2021	Revised document for SV-HARNESS-D37 update to remove USB port.
G	November 2021	**System Software Version 16.2:** • New: Info about Auto-Trim Control and SV-AP-TRIMAMP in Section 2. • New: Info about Wifi ChartData download in Section 5. • New: Info about traffic filtering in Section 5. • New: Info about twin-engine monitoring in Section 6. • New: Info about disabling ADS-B OUT transmissions in Section 7. • New: Info about Auto-Trim Control and SV-AP-TRIMAMP in Section 12.
F	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 50, 51) • Change: Features Overview (Map) section • Change: Traffic Display on Map Page (Fig 122) • Change: Traffic Targets (Fig 124) • Change: Traffic Advisories (Fig 125, 126) • Change: Proximity Advisories (Fig 127, 128) • New: Ghost Traffic Targets section • Change: Traffic Receiver Priority section • Change: Separated Weather and TFR Depictions section into two sections • Change: Weather Options Controls section • Change: NEXRAD Precipitation Legend. (Tab 8) • Change: Weather Data (Fig 188, 189, 190) • Change ADS-B Receiver Status / Data Age section • New: Lightning section • New: PIREPS section • Change: Transponder Control Page (Fig 215) • New: Flight ID section • Change: ADS-B OUT Transmissions section • Change: Top Bar Autopilot Status Area section • Change Maintenance Log section. • New: Alerts for Auto-Trim

Revision	Revision Date	Description
E	November 2019	Added the new SV-COM-C25. C25 radio to all sections in document that pertain to COM radios.
D	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
C	January 2018	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.
B	December 2017	**System Software Version 15.1 and 15.2.** • Changed: Autopilot disconnect button behavior in expert mode. • Changed: Corrected typos on pages 5-10, 8-3, 8-8, 8-16. • Changed: HITS vertical guidance. • Changed: Transponder auto mode defaults to ALT. • Changed: Autopilot operation on back course. • Changed: OAT out of range displays ---. • New: SV-ADSB-472 operational documentation. • Changed: Checklist items are scrolled with the cursor. • New: Airport flags. • 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: 912iS fault list. • Changed: Com panel ATC button ignores on-ground/in-air. • Changed: Six pack altimeter has 1000 and 10000 indicators. • New: Yaw damper.
A	October 2016	Initial release

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1. Introduction

Thank you for purchasing the Dynon SkyView HDX system! This section 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, use 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 flight. 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 always keep this guide in the aircraft with you. This document is designed to give you quick access to information that might be needed in flight. *In a flying situation, it is your responsibility to use the system and the guide prudently.*

Warning

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

Video Training

This guide is intended to familiarize a new SkyView HDX 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 aims to provide various instructional videos, including a complete SkyView operations course – see youtube.com/DynonAvionics. 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.

About this Guide

This guide helps you configure and get acquainted with SkyView HDX's many functions and facilitates quick access to vital information. If you have a SkyView SE, or SkyView Classic/Touch system, *this* is not the correct guide for those products. Each has its own dedicated guide. The SkyView SE Pilot's User Guide and the SkyView Pilot's User Guide are available at dynon.com/docs. For detailed technical and installation information, See the *SkyView System Installation Guide* at dynon.com/docs or the *SkyView HDX System Installation Manual (Certified)* at dynoncertified.com/docs.

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

Printing This Guide

To reduce waste and confusion resulting from outdated information in print, Dynon no longer provides this guide in printed form. The latest, most up-to-date and most complete version of this guide – and all Dynon documentation – is always available at dynon.com/docs or dynoncertified.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 document 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. For example, 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. Similar PDF reader applications are available for Android devices.

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 or dynoncertified.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's internet site:

- forum.flydynon.com – Dynon Online Customer Forum is a resource for Dynon customers to discuss installation and operational issues relating to Dynon 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 Technical Support. The Forum allows online sharing of wiring diagrams, photos, and other types of electronic files.

Dynon Product Registration

Please take a moment to register your Dynon SkyView HDX 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.

Manual Iconography

The following icons are used in this document:



This icon denotes information that merits special attention.



This icon denotes information specifically for Dynon Certified installations under Dynon's STC SA02594SE.



This icon denotes a helpful tip.

2. SkyView HDX System Overview

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



Dynon provides periodic software updates that enable new functionality. See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for instructions on how to update software on SkyView components.

Displays – SV-HDX800, SV-HDX1100, and SV-HDX1200

This guide refers to the SV-HDX800, SV-HDX1100, and SV-HDX1200 as displays.

Functions

Each SkyView HDX display 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 sections in this guide address PFD, Engine, and Moving Map functions in more detail.

Power

SkyView displays require between 10- and 30-volts DC for operation. See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for details on power consumption. SkyView systems have robust power protection that allows the SkyView system to be powered on during engine start.

SV-BAT-320 Backup Battery

If an SV-BAT-320 Backup Battery is installed, a SkyView HDX display can be powered up without energizing the avionics bus, such as to monitor engine parameters during engine start. If avionics power is lost in flight, a properly operating SV-BAT-320 can provide power to a SkyView HDX display, SkyView Network modules, and an SV-GPS-250/2020 GPS receiver for at least 60 minutes. The SV-BAT-320 is automatically (re)charged by the SkyView HDX display during flight. Refer to Section 10 of this manual for more information about use of the SV-BAT-320 and operation when using the SV-BAT-320 to power the SkyView system.



Note that the following SkyView components are not powered by the SkyView HDX display / SV-BAT-320, and will not function if aircraft/avionics power is lost in flight:

- SkyView Autopilot (AP) Servos.
- SV-COM-760, SV-COM-T25/T8, SV-COM-C25 COM Radio.
- SV-ADSB-470/472 ADS-B Receiver.
- SV-XPNDR-261/262 Transponder.

SkyView Network

SkyView modules such as the SV-ADAHRS-20X (provides flight instrument data), SV-EMS-220/221 (provides engine instrument data), SV-ARINC-429 (for communication with IFR GPS/NAV/COM devices), SV-COM-760, -T25/T8, -425 (COM Radio), SV-KNOB-PANEL, SV-AP-PANEL and Autopilot servos use Dynon's redundant SkyView Network to communicate with SkyView HDX displays.

The 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 can annunciate wiring issues as they are discovered, often while preserving full system functionality until troubleshooting can be performed on the ground. These alerts are presented in SkyView HDX's alerting system, which is described in Messages and Alerts section of this guide.

RS-232 Serial

SkyView HDX displays have five RS-232 serial ports for connection to compatible equipment. SkyView modules which use RS-232 serial communications include the SV-GPS-250/2020 GPS receivers, SV-ADSB-470/472 ADS-B receiver, and SV-XPNDR-261/262 transponders. 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 HDX displays have two built-in USB ports. USB ports are used for transferring files (software updates and backups, database updates, configuration file uploads and downloads), the optional SkyView Wi-Fi Adapter, and optional SkyView Video Adapter. These devices must be plugged into the display before power on and remain plugged in for the full flight. See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for instructions on how to use the USB ports for the operations mentioned above.

When using a USB flash drive with a computer file system, only one USB flash drive is recognized at one time by the SkyView HDX display. If a second USB flash drive is plugged in, the second one will not be recognized by the display until the first USB flash drive is removed, and the second USB flash drive is re-inserted.

USB Flash Drive

Each SkyView HDX display ships with a USB flash drive, labelled "Dynon Avionics"; however, there is nothing unique about this USB flash drive (other than the label). Any appropriate size USB flash drive may be used with SkyView HDX. If Procedure Charts, Airport Diagrams, and Enroute Charts are used, a USB flash drive with those database files must reside in one of the display's three USB ports while in operation (the files are not transferred to SkyView HDX's internal storage).

SkyView HDX Displays

SkyView HDX displays have sunlight readable, TFT active-matrix capacitive multi-touch LCD screens. The SV-HDX800 has a 7-inch, 1280 x 800-pixel screen, the SV-HDX1100 has a 10.1-inch, 1280 x 800-pixel screen, and the SV-HDX1200 has a 12.1-inch, 1280 x 800-pixel screen. SkyView HDX displays utilize LED backlighting technology for increased lifespan, more uniform brightness, superior dimmability, and reduced power consumption.

SkyView HDX displays are capable of automatic screen backlight level management. See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for instructions on how to enable this feature.

Displays Are Synchronized

If you have multiple SkyView HDX displays in your aircraft, actions such as setting BARO, BUGS, engaging the Autopilot, or acknowledging warnings only need to be performed on one display (or control panel) and that action is synchronized throughout the SkyView HDX system.

Some settings such as individual screen layout and map range level are deliberately *not* synchronized between multiple SkyView HDX displays.

Buttons, Knobs and Touch Interface

User interaction takes place via the two knobs, two buttons integrated into the knobs, and eight buttons along the bottom of the SkyView HDX display's bezel and via touch gestures on the display screen itself.

Data Logging

SkyView HDX displays record and store flight information in several datalogs which can be exported for analysis by the owner, and a high-resolution datalog which can be used by Dynon for troubleshooting. To configure the data recording rate and other parameters of the datalog, see the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified).*

Synthetic Vision (SynVis)

When valid GPS data is available, and a high-resolution terrain database for the appropriate region is loaded, 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.

GPS Moving Map and VFR GPS Navigator

SkyView HDX features a robust GPS moving map and VFR GPS navigator. Aviation and Obstacle data can be displayed, as well as VFR and IFR enroute charts, procedure charts (plates), and airport diagrams. Go to dynon.com/download or dynoncertified.com/data to find links to the various sources of aviation / obstacle data, and chart data.

Flight Data Modules – SV-ADAHRS-200, SV-ADAHRS-201, and SV-MAG-236



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 to use an SV-ADAHRS-201.



Dual ADAHRS modules (i.e., SV-ADAHRS-201) are not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.

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.

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 specified center of gravity box and installing an SV-MAG-236 Remote Magnetometer well away from any dynamic magnetic interference – and possibly outside the center of gravity box specified for the ADAHRS. If an SV-MAG-236 is installed, *its magnetometer* provides magnetic heading data to the system, and data from the integrated magnetometer(s) in the SV-ADAHRS-20X are disregarded.

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

	GPS	Pitot	Static	AOA	Magne-tometers	Rate Sensors	Acceler-ometers	OAT	External Magne-tometer
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)
(SV-ADAHRS-20X Magnetometer deactivated when SV-MAG-236 is 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 blockage of the pitot system, GPS ground speed will be used as an attitude aid. **CHECK PITOT HEAT** will be annunciated on the PFD when this mode is in effect.

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 SV-ADAHRS-20X (and SV-MAG-236, if included in the system) 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.

GPS Receivers – SV-GPS-250 and SV-GPS-2020

The SV-GPS-250 and SV-GPS-2020 GPS modules are externally mounted GPS receivers designed specifically for use with SkyView systems. Both modules are powered by the SkyView HDX display (and thus will provide position updates when the SkyView HDX display is operating on battery backup power). Each module outputs GPS data to SkyView in NMEA format and automatically sets the time on the SkyView HDX display.

To improve positional accuracy, both the SV-GPS-250 and the SV-GPS-2020 receive Wide Area Augmentation System (WAAS) GPS correction signals (where WAAS is available). *The ability to receive WAAS GPS correction signals does not allow the SV-GPS-250 or SV-GPS-202, to be used as a primary navigation source in an IFR environment where a TSO'd WAAS GPS may be required.*



The SV-GPS-250 is not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.

The SV-GPS-2020 became available in early 2016 and provides position updates 4x/second. In the US, the SV-GPS-2020 GPS receiver is qualified to serve as the required GPS position source for purposes of meeting the FAA 2020 ADS-B Out mandate. It must be installed in a SkyView system, together with the SV-XPNDR-261 Class 1 Mode-S transponder (see below for more information), for full ADS-B Out compliance.

Engine Data Modules – SV-EMS-220 and SV-EMS-221

The engine gauges on your SkyView ENGINE Page are generated from the data acquired by the SV-EMS-220 or SV-EMS-221 Engine Monitoring module and their connected sensors. These modules support 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.



The SV-EMS-221 is not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.

Autopilot Servos

Dynon SV32, SV42, and SV52 servos enable the operation of SkyView's integrated Autopilot system. See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for more information about Dynon autopilot servos. SkyView HDX can only control Dynon autopilot servos.

Autopilot Control Panel – 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.

Transponders – SV-XPNDR-261 and SV-XPNDR-262

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-A traffic input capability (US Only).



Only the Class 1 SV-XPNDR-261 meets the 2020 mandate for ADS-B Out.



The SV-XPNDR-262 is not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.

ADS-B Receiver – 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 (TIS-B) and NEXRAD weather data to be displayed on your SkyView HDX 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.



The SV-ADSB-470 is not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.

COM Radios – SV-COM-760, -T25/T8, -425 and SV-COM-PANEL

A complete radio system consists of an SV-COM-760, SV-COM-T25/T8, or SV-COM-425 transceiver and an SV-COM-PANEL COM radio control panel. All Dynon COM radios can tune frequencies by querying an aviation database installed in SkyView HDX.



The SV-COM-760 and the SV-COM-425 are not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.

The SV-COM-760 and SV-COM-425 transceivers have 25 kHz channel spacing and are intended for the experimental and LSA markets in the US and other regions where 25 kHz channel spacing is the standard. The SV-COM-760 is designed for 12V aircraft power; the SV-COM-425 is designed for 12V and 24V aircraft power.

The SV-COM-T25 and SV-COM-T8 are TSO'd transceivers. The SV-COM-T25 is intended for use in the in the US and other regions where 25 kHz channel spacing is the standard. The SV-COM-T8 is intended for use in Europe where 8.33kHz channel spacing is the standard. However, the SV-COM-T8 is configurable for 25 kHz channel spacing for use outside Europe. Both the SV-COM-T25 and SV-Com-T8 are designed for 12V and 24V aircraft power.

Intercom – SV-INTERCOM-2S

The SV-INTERCOM-2S is 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 audio alerts, stereo music, and multiple other mono muting and non-muting inputs.



The SV-INTERCOM-2S is not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.

Knob Panel – 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 – ALT, BARO, and HDG/TRK. This module is particularly useful in systems with the SkyView Autopilot installed. Note that these bugs can also be adjusted from the SkyView HDX display.

SkyView Video Input Adapter

The optional SkyView Video Input Adapter enables the display of a video signal (must be S-Video or Composite) on your SkyView HDX display in a 50% window (replaces the non-PRIMARY CONTENT window). If a 100% window is selected, when a video signal is displayed, the 100% window will be reduced to a 50% window while the video signal is displayed. The SkyView Video Input Adapter must be inserted into one of the two USB plugs on the back of the SkyView HDX display during system power-on and while operating.



The SkyView Video Input Adapter is not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.

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.



The SkyView Wi-Fi Adapter is not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.

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 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 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 System Installation Guide* for more information.

External Controls, Indicators, Jacks, etc.

The primary harness for each SkyView HDX display provides inputs or outputs for external buttons, switches, indicators, jacks, etc. Some of these are required (such as Servo Disconnect / CWS), while others provide optional additional functionality.

As part of your familiarization with your SkyView HDX system, you should identify these additional controls on your panel or elsewhere in your cabin, and how they interact with your SkyView HDX system. For additional detail, see the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified).*

This list does not reference power control breakers, switches, or semi-automated power control systems such as ADVANCED Control Module or VP-X.

- Autopilot (AP) Servos:
  - Servo Disconnect
  - Trim Power Button
  - Control Wheel Steering (CWS) Button*
- Heated AOA/Pitot Probe*:
  - Heated Pitot Off/Failed Warning Indicator
- SV-AP-PANEL (Electric Trim):
  - Pilot and Copilot Trim Controls (likely integrated into a "Hat Switch")
- SV-COM-760*, SV-COM-T25/T8, SV-COM-425*:
  - Copilot Headset Jacks
  - Copilot Push-To-Talk (PTT) Button (likely integrated into the stick)
  - Pilot Headset Jacks
  - Pilot Push-To-Talk (PTT) Button (likely integrated into the stick)
  - Active / Standby Frequency Flip/Flop Button
- SV-HDX800, SV-HDX1100, SV-HDX1200:
  - Autopilot GO AROUND Button
  - Autopilot SV-BUTTON-LEVEL (LEVEL Button)
  - SV-KNOB-DIMMER (Dim Control Knob)
  - USB Jacks (two per display)
- SV-EMS-220, SV-EMS-221*:
  - Master EMS Warning Indicator
- SV-INTERCOM-2S*:
  - Copilot Push-To-Talk (PTT) Button (likely integrated into the stick)
  - Copilot Headset Jacks
  - Music In Jack
  - Pilot Push-To-Talk (PTT) Button (likely integrated into the stick)
  - Pilot Headset Jacks
  - Radio Select (Transmit) Switch
- SV-XPNDR-261, SV-XPNDR-262*:
  - Standby Switch
  - Ident Button



* Indicates a component not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.

3. SkyView HDX Display Operation

After reading this section, you should be familiar with basic SkyView HDX display operation. For details regarding specific procedures, see the PFD, ENGINE, and MAP operation sections.

The SkyView SV-HDX800, SV-HDX1100, and SV-HDX1200 displays are identical in functionality and presentation. The only difference between them units is the size of the screen.

Display Layout

The following image shows the front of a SkyView SV-HDX1100 10" display and its important parts. Note that the layout of the SkyView SV-HDX800 7" display is the same, just scaled down for the smaller size of the display.



Figure 1: SkyView HDX Display front bezel layout (SV-HDX1100 shown).

The structure surrounding the lighted LCD screen itself is referred to as the bezel. All tactile controls for the system are located on the tilted shelf at the bottom of the bezel. On that shelf are located 8 buttons, two knobs and an integrated light sensor, whose functions are described below.

The LCD screen contains three main regions, described from top to bottom:

- The Top Bar – also referred to as the status bar – is user configurable and displays important contextual information. The status bar will display clock time or a timer (when running), autopilot system status, battery status (when an issue requiring attention is detected), transponder status, and Com Radio status.

- The largest, central portion of the screen presents PFD, ENGINE, Moving Map data, configuration information, menu and feature control pages, and many system messages. Its layout is user configurable. Detailed instructions on how to configure the layout of your screen are presented in a later section of this manual.
- Knob and button labels are arranged across the bottom of the display in a menu bar. Knob and button functionality is contextual based on what is on screen, and these labels show the user the current function. For example, the (HDG) label above the right knob in Figure 1 shows that manipulating that knob will affect the heading bug on the HSI.



Throughout this manual, the buttons are referred to by their relative numbered position, counting from left to right. Button 1 is the left-most button, and Button 8 is the right-most button.



The bottom menu bar initially displayed once the system is fully powered on is referred to as the Main Menu.

Each SkyView HDX display has an integrated light-detecting sensor in the front bezel. This light sensor can be used for automatic backlight level management. See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for instructions on how to configure the display for automatic backlight level management.

Basic Display Operation Procedures

This subsection covers basic operation procedures for displays. Detailed instructions for various setup menus and individual menu items are described in the *SkyView System Installation Guide* and the *SkyView HDX System Installation Manual (Certified)l.*

How to Turn the System On or Off

The following table 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 2: 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.

How to Manually Adjust the Backlight Brightness or Dim Level

SkyView HDX'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 selecting DISPLAY (Button 7) on the Main Menu, then touching the DIM OFFSET icon on the screen. The DIM OFFSET menu, shown in the figure below, 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.

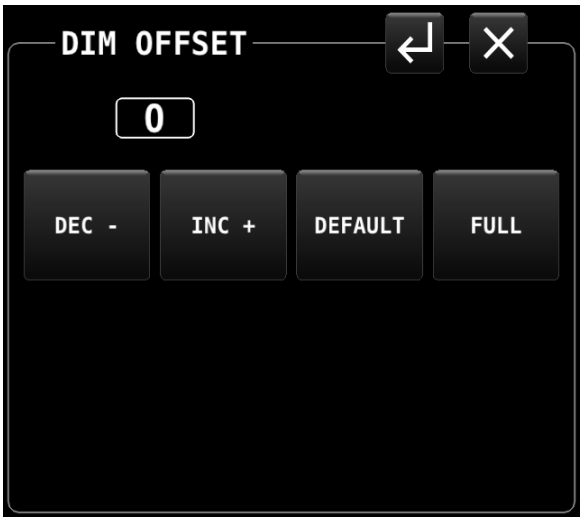


Figure 2: DIM OFFSET Page

To decrease or increase the backlight brightness press DEC- or INC+ icons, respectively. Alternately, to adjust the backlight brightness with the knob, touch the "value box" (shown in Figure 2 as "0"), then rotate the left knob (if the DIM OFFSET menu is displayed on the left side of the display) or rotate the right knob (if the DIM OFFSET menu is displayed on the right side of the display).

The current offset appears in a window above the DIM knob. Touch the DEFAULT icon to quickly reset the offset to zero. Touch the FULL icon to quickly set the offset to its maximum. Press the EXIT icon ("X") located in the upper right corner of the DIM OFFSET menu to exit.

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 retained from the previous session. See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for further information about the brightness settings.

Optionally, the brightness of the SkyView HDX (and the panel mounted modules) can be adjusted by an external dim control. Also, optionally, SkyView HDX's ambient light sensor can control other (not manufactured by Dynon) panel components (and other devices). See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for details on these options.

Screen Content

Each SkyView HDX display can present many combinations of several types of content. Controlling the content and layout of the display is described in a later section of this manual.



Dynon Certified installations under Dynon's STC SA02594SE have specific display layout requirements and limitations! See the *SkyView HDX System Installation Manual (Certified)* for display layout requirements and the *SkyView HDX Airplane Flight Manual Supplement* for display layout limitations.

Primary Content – these items are selectable as 100% screen content:

- PFD: A presentation of primary flight instruments and other useful information.
- ENGINE: combination of engine and aircraft system instruments and fuel computer data.
- Moving Map: computer-generated GPS moving map with navigation information.

Optional Content – these items are available in a 50% wide split content window:

- PFD,
- ENGINE,
- Moving Map,
- Video display from an external camera source (requires optional SkyView Video Input Adapter).

Menu and Feature Control Pages:

- Many different Icon-based menu pages for controlling various SkyView HDX features, optional components, and the content of the primary pages.

Setup Menus:

- In-Flight and System Setup pages used for controlling the overall configuration and behavior of the SkyView system.

Button and Knob Operation

Buttons and knobs are used for various functions including powering the unit on and off, entering and navigating menus, selecting, or activating features, and adjusting values.

Button Behaviors

Buttons generally require a single action, that is, to momentarily press and release the button. Pressing the button will provide a distinct tactile click feedback to the pilot. The click occurs when the button is fully depressed, but the commanded action does not occur until the button is released.

When a button is pressed in this manner, a function or action denoted by the label above the button is invoked. Button labels are contextual and may change dependent on menus and feature control pages the pilot selects.

A button has a function if there is a label above it. If there is no label, there is no function.

Some buttons have an additional behavior when the button is pressed and held down for 2 seconds. This action is called press-and-hold. An example is Button 1. Press-and-hold action on Button 1 will power a SkyView HDX display either on or off, depending on its current state. Additional press-and-hold behaviors for other buttons are described elsewhere in this manual. Typically press-and-hold behaviors have no on-screen label denoting the action to be performed. Rather, they are called upon for infrequently used special-purpose actions.

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.

Knob Behaviors

Knobs can be rotated both directions and pushed. The current knob function is indicated by the label above the knob. Knob function is contextual and can change when the contents of the screen is changed by the pilot.

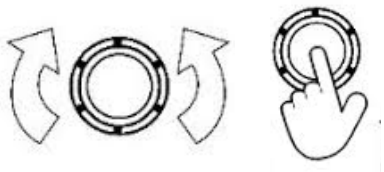


Figure 3: Knob rotation and pushbutton actions.

On some screen pages with both vertical lists and a horizontal group of tabs, one or both knobs can exhibit a push-hold-and-rotate behavior which controls horizontal scrolling of the cursor across tabs on some feature pages.

The following table summarizes knob behavior in various contexts:

Desired Action	Knob Behavior
Adjust Bug (HDG, ALT, etc.) or BARO value	Rotate knob (labeled with respective function)
Change Map scale	Rotate knob (labeled MAP)
Scroll vertically through a list (on text menus or data pages)	Rotate knob (labeled CURSR)
Scroll horizontally across tabs on the NRST or INFO Page	Push-Hold-and-Rotate knob (labeled CURSR)
Choose items on icon-based menu and feature control pages:	
• Activate and/or move cursor	• Rotate knob (labeled CURSR)
• Select menu or feature icons	• Push knob (labeled CURSR)
Navigate text menus: (i.e.: In-flight Setup; System Setup)	
• Move cursor to desired item	• Rotate knob (labeled CURSR)
• Select menu item:	• Push knob (labeled CURSR)
• Retreat to prior menu:	• Push-and-hold knob (for at least ½ second)
Edit a data field: (i.e.: Airport ID on INFO Page)	
• Begin editing:	• Push knob (labeled CURSR)
• Adjust selected character	• Rotate knob (labeled CURSR)
• Advance to next character	• Push knob (labeled CURSR)
• Retreat to prior character	• Push-and-hold knob for at least ½ second
• End editing:	• Touch another field to edit, or select any of the available action items on the page (e.g.: EXIT (menu or icon), ACCEPT, RETURN icon)

Table 3: Knob Operation Summary

Main Menu (Buttons) Navigation

After the display turns on you will see a screen like the one shown below.



Figure 4: Displaying Main Menu Bar at bottom of the screen.

This guide refers to the labels above the buttons at the bottom of the screen as the *Main Menu* bar, or simply *Main Menu*. The Main Menu at the bottom of the SkyView HDX screen is quite simple and intuitive. Four of the seven MAIN MENU buttons – D→, NRST, INFO, and FPL – are related to airport information, Flight Planning, and VFR GPS navigation. Use of these four Main Menu items is discussed in detail in the MAP and VFR GPS Navigator Operation section.

The following functions are available on the Main Menu bar:

- (blank) – No function.
- D→ – Direct-To: Opens the INFO menu for easy access to select and confirm information about a potential destination.
- NRST – Nearest: Opens a list of various navigational data, such as airports, fixes, navaids, etc. which may be used as Flight Plan waypoints, plus other information. Each list is sorted by proximity to either the aircraft's position or the position of the panning cursor on the moving map.
- INFO: Opens the INFO Page, providing access to all available information for a designated airport, including optional weather data.

- FPL – Flight Plan: Opens SkyView's currently entered Flight Plan.
- MENU – Opens a menu page providing access to many configuration options, features and utility functions.
- DISPLAY – Opens a menu page allowing control of the main screen contents and additional display layout options.
- NO MSG / MESSAGE / CAUTION / WARNING – System Messages. Provides access to a pop-up page displaying system messages, alerts and warnings. This menu item will be labeled as "NO MSG" when there are no messages or warnings.

SkyView HDX Touch Features

SkyView HDX was designed with an intuitive and comprehensive touch interface while still maintaining a full complement of tactile controls. This design assures the pilot has effective use of all necessary controls in a demanding cockpit environment, especially in turbulence. Even the physical design of the HDX bezel and button/knob control shelf has been optimized to assure comfortable use in a bumpy cockpit.

In almost every instance of touchable items or controls, there are tactile controls to accomplish the same action. Two exceptions to this design objective exist on the MAP Page, where touch gestures are the only method for panning the map display and for maximizing/minimizing the area of the screen occupied by the MAP. Especially in the case of map panning, the touch gesture has proven to be more effective in turbulence than nearly any tactile control.

Touch gestures are available throughout the HDX system. They serve as primary methods of selecting and controlling certain features and actions, as well as providing shortcuts to features otherwise accessed through various menus.

On the PFD and MAP Pages, touch gestures can be easily discovered by the pilot simply touching the screen. On the MAP you will discover many touch gestures familiar from use of other touch-screen devices such as tablets and smart phones. Touchable regions and the actions they control are described in greater detail in the respective sections of this manual covering the PFD and MAP.

SkyView HDX also presents many menus, informational pages and feature control pages that are easily navigated using touch gestures. Many visual clues will alert the pilot to the presence of touchable gestures. These include graphical icons, selectable tabs, and editable fields, each with a 3-dimensional shaded box appearance, like command buttons and boxes on other computing devices. Touch gestures and touchable items on any given screen page are described in detail in the respective sections of this manual covering each feature or menu page.

When "Show Touches" is enabled (in SETUP), a circle appears at the point of contact on the screen and remains under your finger until contact is removed. This allows you to see where your finger is contacting the objects on the screen. See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for details on enabling/disabling Show Touches.



Figure 5: Show Touches enabled.

Configuring the Layout of Your SkyView HDX Display

SkyView HDX displays can be configured to present many combinations of PFD, MAP, and ENGINE data. Other screen components include the presentation of engine instruments along the bottom of the screen, and a vertical column of GPS navigational data which can be displayed on the right or left of the display depending on selected layout options. The process for selecting and arranging these various screen components is described in detail below.

If your instrument panel contains multiple SkyView HDX displays, the layout of each display can be configured independently.

Role of Each Display

A thorough understanding of this section is critical to using a single or multiple HDX displays effectively in the cockpit. Please read this section carefully!

Dynon Certified installations under Dynon's STC SA02594SE have specific display layout requirements and limitations! See the *SkyView HDX System Installation Manual (Certified)* for display layout requirements and the *SkyView HDX Airplane Flight Manual Supplement* for display layout limitations.

SkyView HDX can only display data from installed modules. For example, if an SV-EMS-220/221 module is not installed, ENGINE and ENGINE BOTTOM BAND will not be selectable.

In aircraft that have SkyView HDX pre-installed by the aircraft manufacturer, the SkyView HDX screen layouts may be pre-configured, with changes to the screen layout restricted. For example, your SkyView HDX display may not offer the option for the PFD window to not be displayed. Thus, for factory-installed SkyView HDX systems, you may need to contact your aircraft manufacturer to assist you in changing the screen layout.

Establishing the screen layout for SkyView HDX displays begins with the pilot choosing a cockpit role for each display in the system. The cockpit role assigned to the display will define the content of the 100% page when that layout is selected. The cockpit roles from which you may choose are:

- PFD: Primary Flight Display
- MAP: GPS Moving Map
- ENGINE: Engine Monitoring System

You will also choose whether to present engine instruments in a horizontal band across the bottom of the display, referred to as the ENGINE Bottom Band, a key distinguishing characteristic of the HDX display compared to earlier SkyView systems.

Defining the Default Screen Layout

To define the default layout of a SkyView HDX display (that is displayed when powered up), select DISPLAY (Button 7) on the Main Menu to display the DISPLAY Page.



Figure 6: DISPLAY Page

Next, tap the SETUP icon at the lower right corner of the DISPLAY Page. The DISPLAY LAYOUT Page will appear, as shown below.



Figure 7: DISPLAY LAYOUT Page

The cockpit role for the display, also referred to as Primary Content, is selected in the top row of buttons on the DISPLAY LAYOUT Page. A white box with the title "PRIMARY CONTENT" groups the three options. The item selected will define the cockpit role and Primary Content of the display.

Selecting items or command buttons on SkyView HDX's touchable menu pages can be accomplished in either of two ways:

- Touch the command button for the desired item. Command buttons are square or rectangular boxes populated with a text label and sometimes also with a graphical icon denoting the function, feature or menu controlled by that button. In Figure 7 above, PFD, MAP, EMS, etc. are command buttons.
- Activate a movable cursor box by rotating the knob labeled CURSR. When activated, the cursor is denoted by a white box which will form a border around the selected command button or editable field. Once the desired item is surrounded by the cursor box, press the knob to select that item.

Throughout SkyView HDX's menu pages, a green bar at the top of a command button (such as the PFD command button in Figure 7 above) denotes that the function of the command button is selected/active. An unlit/no color bar in the command button (such as the MAP command button in Figure 7 above) denotes that the function of the command button is not selected/not active.

Next, select whether the primary content should be displayed on the left or right side of the SkyView HDX display when you choose to split the screen 50% / 50%. That selection is made from the buttons on the bottom row of the DISPLAY LAYOUT Page in the box titled "PRIMARY SIDE". Select either LEFT or RIGHT. In Figure 7 above, LEFT is selected, with PFD as the Primary Content.

Finally, choose your preference for three separate items on the middle row of the DISPLAY LAYOUT Page:

- SPLIT AT BOOT:
  - Set to OFF to have a 100% wide presentation of the selected primary content displayed at bootup.
  - Set to ON to have the display arranged as 50% / 50% windows at bootup.
- ENGINE BOTTOM BAND:
  - Set to ON to have the ENGINE BOTTOM BAND displayed at bootup.
  - Set to OFF to have the ENGINE BOTTOM BAND not displayed at bootup.
    Note that selecting ON will override ENGINE being selected as PRIMARY CONTENT or SPLIT CONTENT (see below).

The figure below shows the recommended default DISPLAY LAYOUT selections for a single SkyView HDX display.

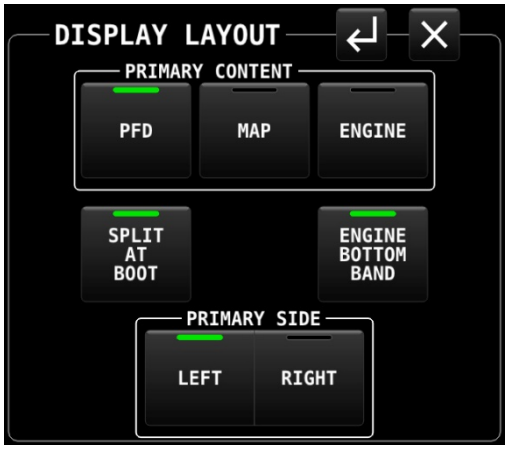


Figure 8: DISPLAY LAYOUT Page (recommended for single display system)

The default DISPLAY LAYOUT selections for a single SkyView HDX display, plus selecting MAP INFO COLUM from the DISPLAY Page, results in the following recommended screen presentation.



Figure 9: Recommended single display layout (settings shown in Figure 8).

The figures below show the recommended default DISPLAY LAYOUT selections for dual SkyView HDX displays.

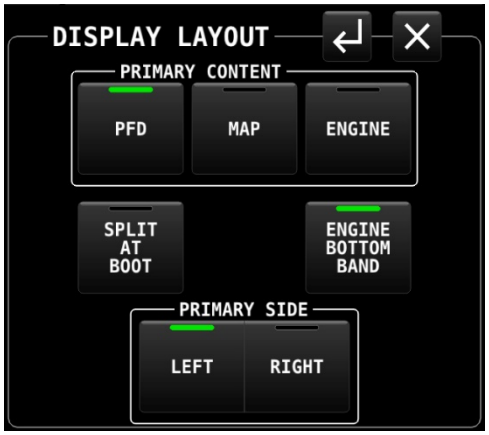


Figure 10: Dual display configuration – pilot display.

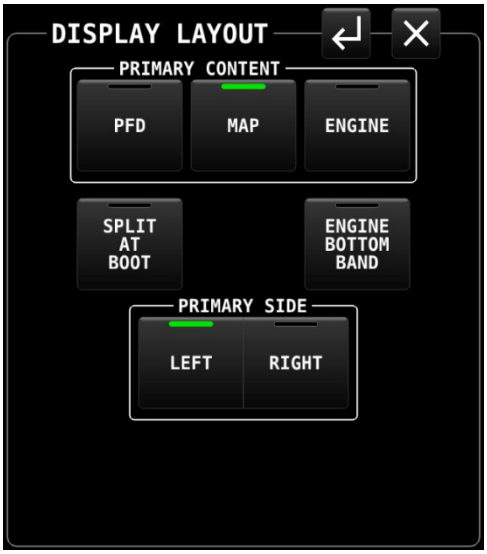


Figure 11: Dual display configuration – copilot display.

The default DISPLAY LAYOUT selections for a dual SkyView HDX displays, plus selecting MAP INFO COLUM from the DISPLAY Page on the Copilot display, result in the following recommended screen presentations.



Figure 12: Dual display layout – pilot display (settings shown in Figure 10).

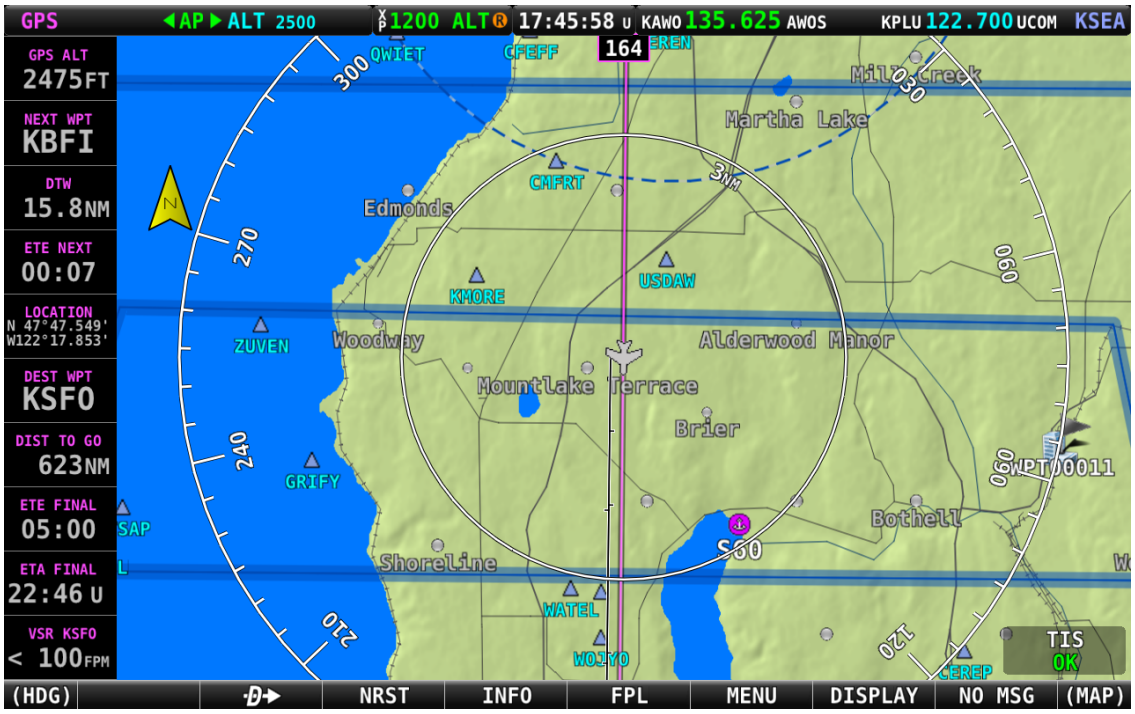


Figure 13: Dual display layout – copilot display (settings shown in Figure 11).

Selecting Split Screen Layout

Once the default, or startup, display layout has been defined for each display in the aircraft, you may choose to periodically change the display layout on the ground or in flight, perhaps switching between the 100% window and 50%/50% split windows to provide additional information useful in various phases of flight.

Changes to the display layout other than selecting primary content and the optional components described previously are made using the DISPLAY Page, accessed by pressing DISPLAY (Button 7) on the Main Menu, as shown below.

With PFD as the Primary Content of your display, select the MAP icon in the SPLIT CONTENT on the DISPLAY Page to add a 50% wide MAP Page to your screen, as shown below.



Figure 14: DISPLAY Page

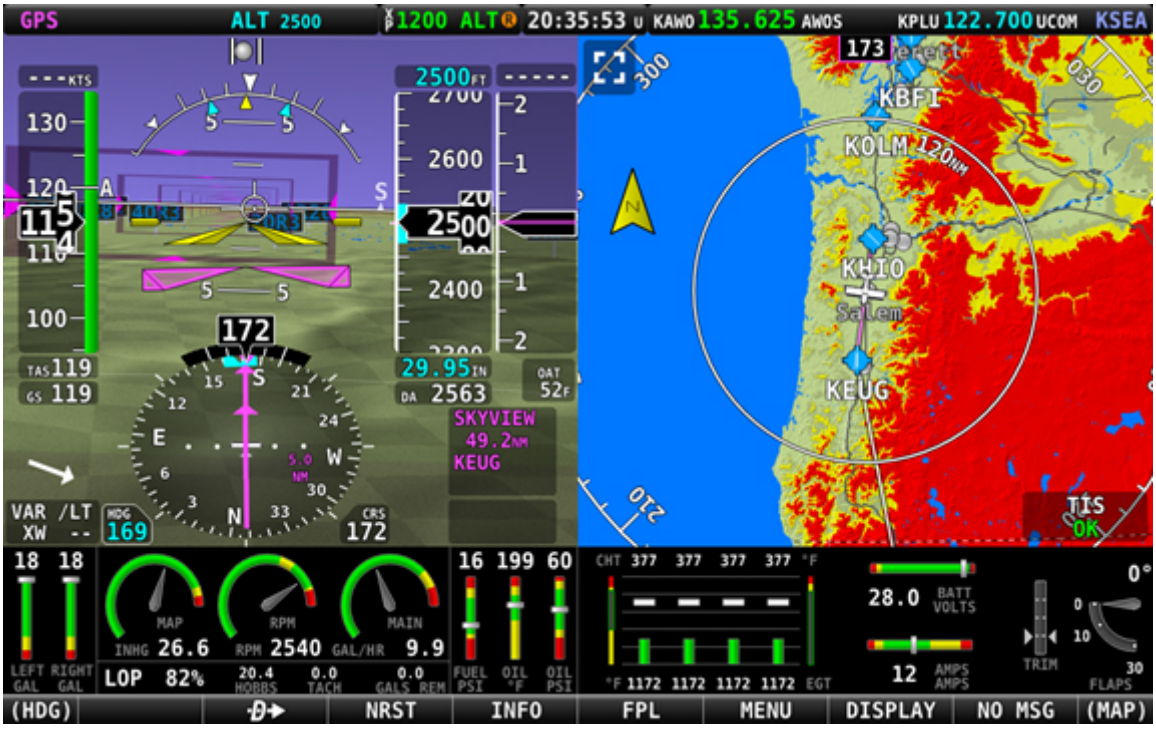


Figure 15: 50% PFD / 50% MAP Page with ENGINE BOTTOM BAND

On the DISPLAY Page, items are grouped together in a white box titled SPLIT CONTENT. The items available in the SPLIT CONTENT box include:

- PFD,
- ENGINE,
- MAP,
- VIDEO,
- VP-X.

The first three items are not selectable (grayed out) if the same item is already designated as Primary Content on that display. VIDEO is only selectable if an optional USB Video Adapter is installed, and a properly configured video source is connected. VP-X is only selectable if a VP-X system is licensed and installed.

When ENGINE is selected as the SPLIT CONTENT, a 50% engine page is presented. By default, this page will show engine and aircraft system instruments not already presented on the ENGINE BOTTOM BAND. An example of the 50% ENGINE split content is shown in Figure 16.

The SkyView Video Input Adapter and a VP-X system are not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.

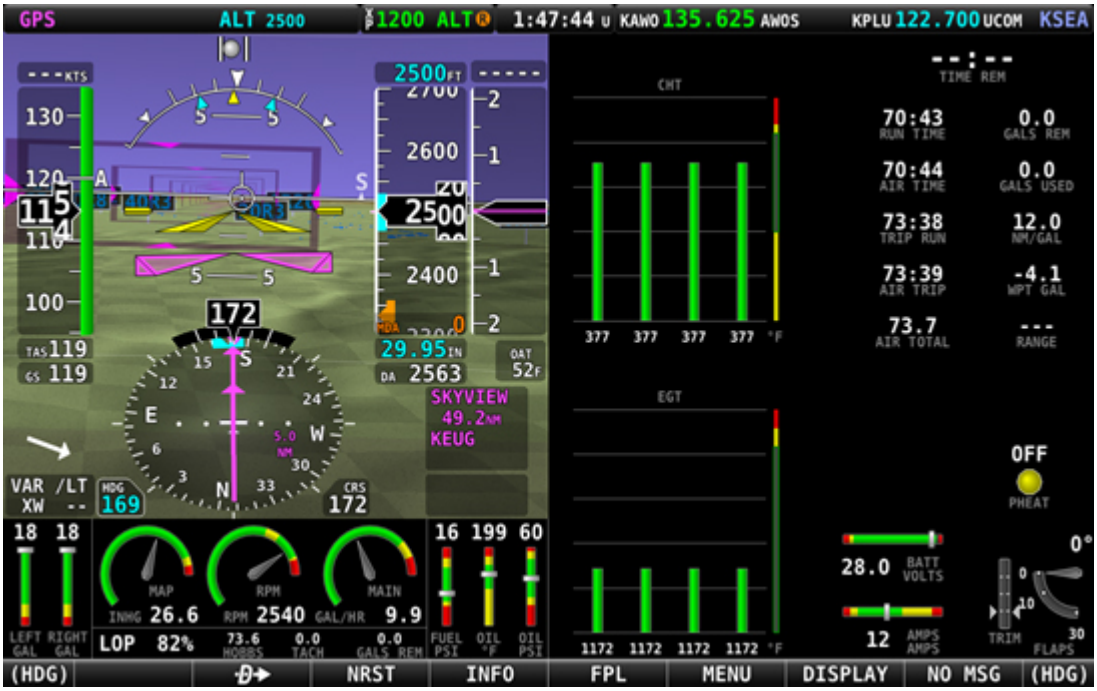


Figure 16: 50% PFD / 50% ENGINE with ENGINE BOTTOM BAND

If you choose not to use the ENGINE BOTTOM BAND configuration, the 50% ENGINE split content might become your primary source of engine instruments. In that case you will need to modify the layout of that page using the EMS SETUP > SCREEN LAYOUT EDITOR in System Setup.

Returning to Full Screen Layout

To return the display to the 100% layout, select DISPLAY (Button 7) on the Main Menu, then tap the FULL icon at the top of the DISPLAY Page.

Swap Between Two Screens

The SWAP function is typically used to transfer roles of pilots between two screens was added in SkyView Software version 15.1. If the system has exactly two displays, then the layout of each display can be swapped back and forth between the two displays.

The SWAP function is disabled upon installation and not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.



Figure 17: DISPLAY Page showing the SWAP button.

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.

Reversion Mode is disabled upon installation and not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.

If reversion mode is enabled and active (other display(s) offline), the following display layout settings to be displayed can be selected in Setup. 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):

- Primary Pane,
- Split Content,
- ENGINE BOTTOM BAND,
- Primary Side,
- MAP Info Column.

Behavior of ENGINE BOTTOM BAND

The ENGINE BOTTOM BAND is functionally divided into two halves, left and right. The half underlying the Primary Side of the screen – as selected on the DISPLAY LAYOUT Page – is known as the protected half. The default arrangement of the ENGINE BOTTOM BAND has the required engine instruments positioned in this portion of the band to assure they normally remain in the pilot's view.

Menu and feature control pages activated by the pilot will occupy 50% width of the screen on the non-primary side, and many require the full height of the screen. When the ENGINE BOTTOM BAND is enabled, those menu and feature control pages requiring the full screen height will overwrite the unprotected side of the bottom band, again assuring the most critical instruments remain in the pilot's view. An example of the ENGINE BOTTOM BAND being over-written by the MENU Page is shown below.



Figure 18: ENGINE BOTTOM BAND partially over-written by MENU Page.

Display of External Video Device

If the optional SkyView Video Input Adapter is installed, VIDEO is one of the SPLIT CONTENT options on the DISPLAY Page. When an external video device, such as a nose camera or belly camera, is connected and properly configured, the video can be activated by selecting DISPLAY (Button 7) on the Main Menu, then selecting the VIDEO icon in the SPLIT CONTENT group.

The SkyView Video Input Adapter is not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.

If the ENGINE BOTTOM BAND is active when video is selected, the VIDEO Page will over-write the unprotected half of the bottom band. The figure below shows a display with the VIDEO Page active.

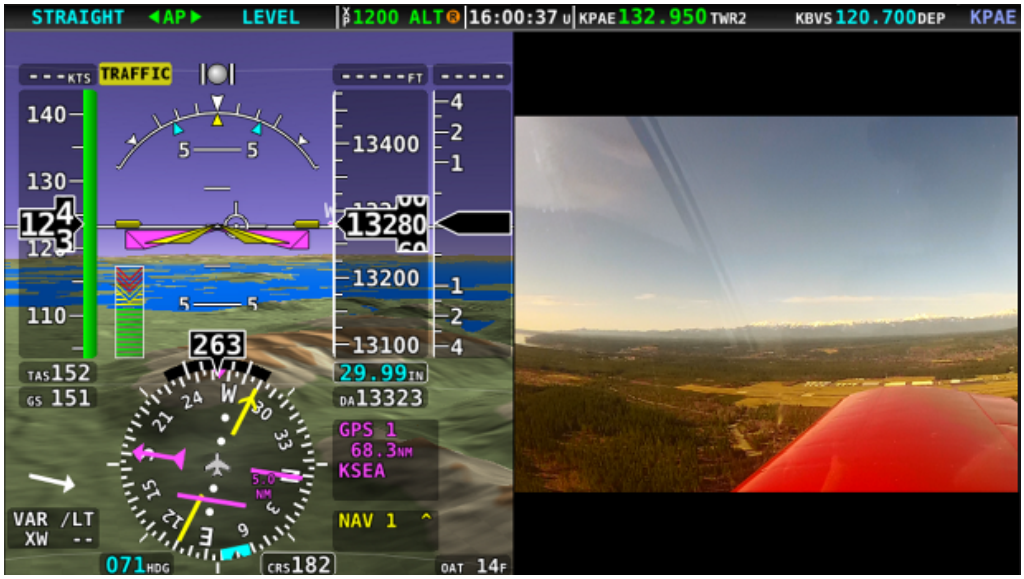


Figure 19: Optional VIDEO shown in split content pane.

MENU Page

Button 6 on the Main Menu bar at the bottom of the screen is labeled MENU. Selecting this item will open an icon-based MENU Page for accessing various system controls, sub-menus, and other tools.



Figure 20: MENU Page

All the items on the MENU Page are briefly described below. The function of each item will be discussed in greater detail in appropriate sections of this manual.

- Top Row – CONTROLS:
  - AUTOPILOT: Control panel for Autopilot operation.
  - XPNDR – Transponder: Control panel for setting transponder codes and transmitting modes.
  - TIMER: Control panel for a count-up/count-down timer.
  - Com RADIO: Control panel for the Dynon Com radio.
- Second Row:
  - PFD TOOLS: Controls for selecting features and display modes for the PFD.
  - ENGINE TOOLS: Controls for engine and fuel related features.
- Third Row – MAP CONTROLS:
  - LAYERS: Menu for selecting layers for presentation on the moving map, e.g., topography (terrain), and optional charts (VFR sections, Hi/Lo IFR enroute charts, etc.).
  - WEATHER OPTIONS: Controls for the presentation of ADS-B IN weather data on the MAP and airport information pages.
  - USER WAYPOINTS: Controls for managing user-defined navigation waypoints.
  - MAP SETUP: Controls for the moving map, e.g., display of MAP and info items, MAP mode, and options for nearest destinations, Flight Plans, track lines, and vertical navigation.
- Fourth Row – TOOLS:
  - CHECK LIST: Menu of user-created check lists.
  - WEIGHT BAL – Weight and Balance: Customizable weight and balance calculator.
  - MAINT LOG – Maintenance Logs: Customizable list of aircraft maintenance deadlines, pilot currency items, etc.

Top Bar (Status Bar)

The Top Bar is the row of information presented across the top of the screen. The middle portion of the Top Bar always presents a clock or timer, regardless of display layout. Three other areas of the Top Bar will enunciate the status of Autopilot, Transponder and Com Radio, provided these optional devices are installed and properly configured.

Each of these four enunciation areas are also touchable and, when touched, opens a control panel for the respective device. Only clock behavior is described here. The function of the other three devices enunciated in the Top Bar behavior is covered in respective sections of this guide.

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. The time reference can be selected in System Setup to display either UTC or local time (based on a local offset from UTC).



Figure 21: SkyView Clock example

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.

See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for instructions on how to configure the Top Bar.

Count-Up/Count-Down Timer

The Top Bar clock can be temporarily repurposed to present a configurable count up/down timer. The Timer function is selected either by touching the clock portion of the Top Bar, or by selecting MENU (Button 6) on the Main Menu bar, then selecting the TIMER icon to present the TIMER Page.

While the TIMER Page is displayed, 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. Examples of the timer display are shown below.



Figure 22: Up Timer



Figure 23: Down Timer



Figure 24: Down Timer expiring.

The TIMER Page includes the following controls:

- RUN: Touching the RUN icon will start the timer.
- STOP: Touching the STOP icon will stop the timer.
- UP: Touch the UP icon to toggle the timer to count up.
- DOWN: Touch the DOWN icon to toggle tie timer to count down.
- ZERO: Resets the TIME field to zero.
- LAST: When DOWN is selected, the LAST icon resets the TIME field to the last value it was set to before it was started.
- Editable TIME field: The TIME field is only editable when DOWN is selected. It establishes the starting value for the count-down timer. Touch the Time field to begin editing. The "minutes" character will become highlighted. Change the value by rotating the knob labeled "CURSR". Select the "seconds" character in the time value by pushing the knob or touching the field again.

- 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 an UP timer is running, it will stop at 99:59 minutes.

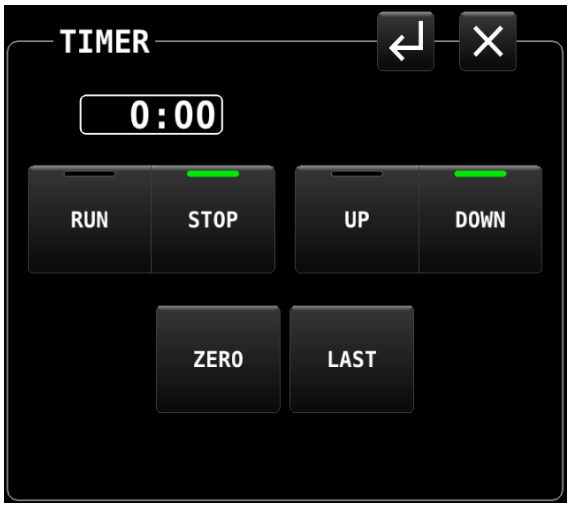


Figure 25: TIMER Page

If the TIMER Page is closed while the timer is running, the TIMER will continue to be displayed in the TOP BAR. It will continue to be displayed until the TIMER Page is opened again and the timer is stopped. Any time the TIMER Page is closed while the timer is stopped, the TOP BAR will return to displaying the normal clock.

SETUP MENU Navigation

The SkyView HDX system relies on a series of setup menus for configuring the system for initial use and for defining the behavior of various features and components. These setup items are not accessed directly by any of the standard menus or pages. Rather, all setup items are available in System Setup, which is accessed by concurrently pressing-and-holding Buttons 7+8 for approximately two seconds.

Except for a few user settings, use of SETUP MENU is reserved for certified technicians for initial system setup. See the *SkyView HDX System Installation Manual (Certified)* for more information.

When the aircraft is stationary on the ground, this button combination will change the entire display to present the SETUP MENU screen, shown below.



Figure 26: SETUP MENU

While the SETUP MENU is displayed, none of the regular display contents are available to the pilot. Use of System Setup is fully covered in the *SkyView System Installation Guide* and the *SkyView HDX System Installation Manual (Certified).*

Some portion of System Setup items are useful or necessary to the pilot in flight. Those items have been added to an IN FLIGHT SETUP MENU. This menu is also accessed by concurrently pressing-and-holding Buttons 7 and 8. The system will detect the aircraft's flight state and present the appropriate menu to the pilot. An example of the IN FLIGHT SETUP MENU is shown below.



Figure 27: IN FLIGHT SETUP MENU

Note that the bottom item in the IN FLIGHT SETUP MENU provides access to the full screen SETUP MENU. When in flight pilots should only choose this item carefully and deliberately.

Navigation of both the In Flight and System setup menus is identical. As each menu page is displayed, the top item in the list will be highlighted by a white cursor bar. Move the cursor up or down to the desired item by rotating either knob (labeled "CURSR"). Select the desired item by pushing the knob. The next menu – referred to as a sub-menu – will be displayed.

In the case of the IN FLIGHT SETUP MENU, each successive sub-menu will replace the previous menu and will be presented only in the 50% wide non-primary side of the screen. In the full-screen System SETUP MENUs, the current menu is presented in the left half of the screen, and the prospective sub-menu in the right half. When a menu selection is made by pushing the knob, the selected sub-menu will move to the left half of the screen, and a new menu will appear on the right.

In both the IN FLIGHT and System setup menus, pushing-and-holding the knob for one second will return to the previous menu. Both menu systems also make use of the bottom menu bar to present some navigation selections, such as BACK and EXIT.

The following table summarizes menu navigation IN FLIGHT and System setup menu navigation.

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 knob
Enter menu	Push either knob
Return to previous menu	Push-hold either knob (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 4: Menu Navigation Summary

Non-Menu Operations ("Hidden" Functions)

The HDX display relies on a few button operations to perform actions that are not indicated to the pilot through on-screen labels or other markings. One of those unlabeled button operations was described above for accessing SETUP menus.

The table below explains available non-labeled button operations.

Button(s)	Action	Pre-condition	Result
N/A	Apply power to display(s)	N/A	Display powers ON
N/A	Disconnect power to display(s); turn off avionics circuit breaker or power switch	*SV-BAT-320 Backup Battery Installed, aircraft is in flight:*	Warning is displayed: "POWERING DOWN IN 30 SECONDS". Press Button 8 to acknowledge Display remains powered ON (for duration of SV-BAT-320)
		SV-BAT-320 Backup Battery Installed, aircraft is stationary:	Warning is displayed: "POWERING DOWN IN 30 SECONDS". Within 30 seconds, press Button 8 to acknowledge. If Button 8 is not pushed within 30 seconds Display remains powered ON (for duration of SV-BAT-320)
		SV-BAT-320 Backup Battery Not Installed	Display powers off
1	Push for approx. 2 seconds	If display is OFF	powers display ON.
		If display is on	powers display OFF.
1+2+5	Push simultaneously and release		Reboots display; equivalent to powering off and on again.
2+7	Push simultaneously and release	If USB flash drive is plugged in	records "screenshot" file to the USB flash drive. Message: SCREENSHOT SAVED TO USB DRIVE
		If no USB flash drive plugged in	Message: SCREENSHOT MISSING USB DRIVE
7+8	Push simultaneously for approx. 2 seconds	If in flight	opens IN FLIGHT SETUP MENU
		If stationary	opens SETUP MENU

Table 5: Non-Menu Operations ("Hidden" Functions)

4. PFD Operation

This section explains the layout of the PFD Page, including the Synthetic Vision (SynVis) functions, PFD symbology, and explains how to adjust the various bugs.

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.* The terrain data displayed in SkyView HDX is obtained from third party sources. Dynon cannot independently verify the accuracy of terrain data at all geographical points.

SkyView HDX's PFD requires data from an SV-ADAHRS-20X module.
SkyView HDX's display of Synthetic Vision, ground speed, and HSI requires valid GPS data.

PFD Page Layout

The PFD Page, as shown in the figure below, displays important flight information and Synthetic Vision.



Figure 28: SkyView PFD

The primary information shown on the PFD includes:

- Synthetic Vision,
- Airspeed Indicator, Airspeed Bug, and Airspeed Trend Rate,
- Attitude Indicator with Extreme Pitch Warning Arrows (not shown in Figure 28; see Figure 74 for an illustration of the Extreme Pitch Warning Arrows),
- Flight Path Marker,
- Altimeter with Altitude Bug, Altitude Trend Rate, Barometer Setting, and Density Altitude,
- Vertical Speed Indicator with Vertical Speed (VS) BUG,
- Heading Indicator/Directional Gyro with Heading (HDG) BUG.
- Slip/Skid Ball,
- Angle of Attack Indicator (aural indication only for Dynon Certified installations under Dynon's STC SA02594SE),
- OAT,
- Winds Aloft magnitude and vector.

PFD TOOLS Page

Many components of the PFD are selected and controlled on the PFD TOOLS Page. Access this menu by selecting MENU (Button 6) on the Main Menu, then selecting the PFD TOOLS icon on the second row of that menu. The PFD TOOLS Page is shown below.



Figure 29: PFD TOOLS Page

Each of the options on the PFD TOOLS menu is discussed in more detail in later sections of this manual.

PFD Symbology

Bugs

The SkyView PFD uses the following bugs to control the SkyView AP (if Dynon servos are installed to provide Autopilot functionality):

- Altitude (ALT).
- Barometer (BARO).
- Course (CRS).
- Heading (HDG) / Track (TRK).
- Indicated Airspeed (IAS).
- Minimum Descent Altitude (MIN).
- Vertical Speed (VS).

See Figure 30 for locations on the PFD of the various BUGS.

How to Enter the BUGS Knob Function Menu

Knob Function menus for each knob are used to specify which bug or parameter the knob adjusts if turned. For example, Knob 1 could be set to adjust the heading bug and Knob 2 could be set to adjust the Altitude bug.



Figure 30: BUGS Knob Function Menu

Figure 30 shows the Knob Function menu when all possible BUGS and functions of the SkyView HDX are enabled (via the BUGS on the PFD TOOLS Page) and selectable for use. Depending on which BUGS you have enabled, the BUGS Knob menu on your SkyView HDX display may contain fewer items than shown in Figure 30.

To change the function of a knob:

1. Push on the desired knob to open the Knob Function menu.
2. Rotate the knob to highlight the preferred Knob Function.
3. Push on the knob a second time to change the Knob Function.

To select which BUGS are enabled for selection on the BUGS Knob, select MENU (Button 6) on the Main Menu, then select the PFD TOOLS icon, then BUGS icon. On the BUGS menu, select/deselect the various BUGS per your preferences. NOTE: The selection of active bugs on the KNOB function list is a local display setting. That is, changing the bugs included in the KNOB function list on one display will have no effect on the contents of the KNOB function list other SkyView HDX displays in the aircraft.

If the MAP window is displayed, the knob closest to the MAP is labeled (MAP) and is used to change the scale of the MAP Page.

To change the function of a knob using touch, merely tap the element on screen for which you wish to assign function control to the knob. For example, to change the knob function to BARO bug, touch the BARO window on screen to re-assign the knob function to BARO bug. Touching the bug value box will only have effect if that bug is active in the KNOB function list.

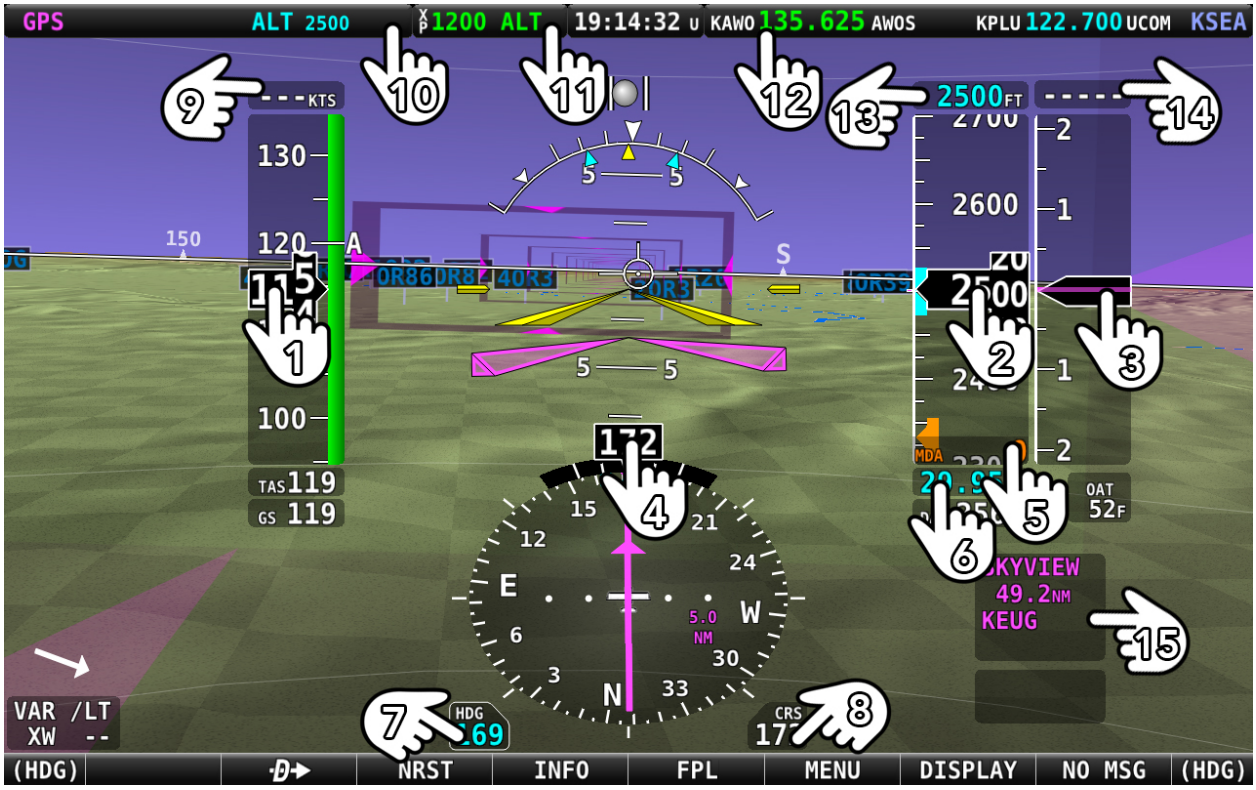


Figure 31: Touchable on-screen regions that change Knob BUG function.

Legend for Figure 31:

1. IAS (Indicated Air Speed) (same as number 9).
2. ALT (Altitude) (same as number 13).
3. VS (Vertical Speed) (same as number 14).
4. HDG (Heading; same as number 7).
5. MIN (Minimum Descent Altitude).
6. BARO (Barometer).
7. HDG (Heading; same as number 4).
8. CRS (Course).
9. Airspeed BUG set.
10. Autopilot Menu selector.
11. Transponder Menu selector.
12. Tune Radio selector.
13. Altitude BUG Knob set (same as number 9).
14. Vertical BUG set (same as number 3).
15. Navigation Source selector.

When the 100% PFD window is used, touching the screen element will change the function of the Left knob. When a 50% / 50% window is used, the function of the knob on the side of the PFD is changed.

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 33 is an example Airspeed Indicator.

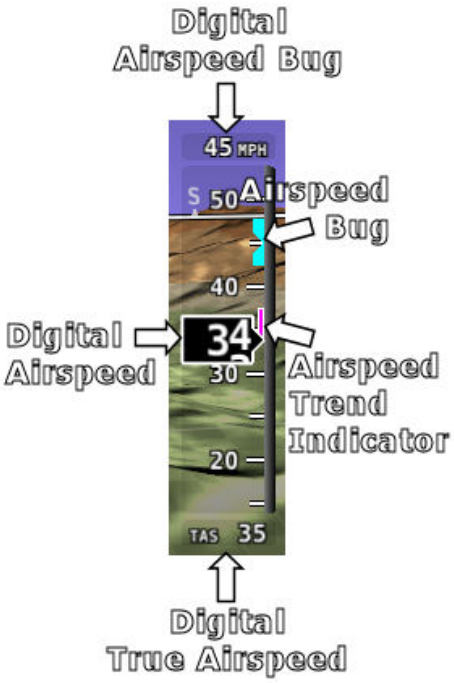


Figure 33: Airspeed Indicator example

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

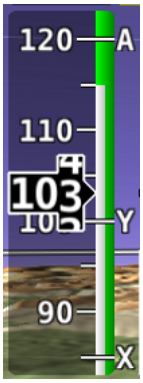


Figure 32: V Speeds example

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.

See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for instructions on how to configure the airspeed limitation color thresholds.

Airspeed will display "---" at zero through 20 knots, at which point it will become live. Once live, it will display airspeeds 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 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 airspeed trend indicator 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, V_{NE} (Redline) is limited by TAS instead of IAS. When configured to indicate V_{NE} 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 V_{NE} would be at when at sea-level on a standard day, which is when TAS equals IAS. This lets you quickly see the difference between your current V_{NE} as TAS and V_{NE} as IAS. In the example shown here, the V_{NE} 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.

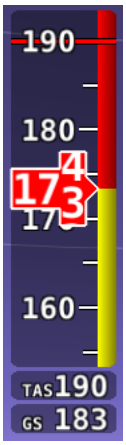


Figure 34: V_{NE} as TAS

V_{NE} as TAS is disabled upon installation and not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.

Airspeed Bug

The airspeed bug is displayed in cyan (light blue) 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 Knob Function Menu.
2. Rotate the knob to move the cursor up or down to highlight (IAS).
3. Push the knob to close the menu (this is optional; the menu will close after approximately 5 seconds). This step assigns that knob to IAS BUG.

(IAS) will now display just above that knob. The airspeed bug setting on the PFD will be outlined to signal that it is selected. Turn that knob 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.

An alternate method of setting the Airspeed bug is to synchronize the bug to current airspeed by pushing the knob for ½ second. 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-bank angle reference, pitch scale with horizon lines, and water line symbology. Figure 35 is an example SkyView attitude indicator.

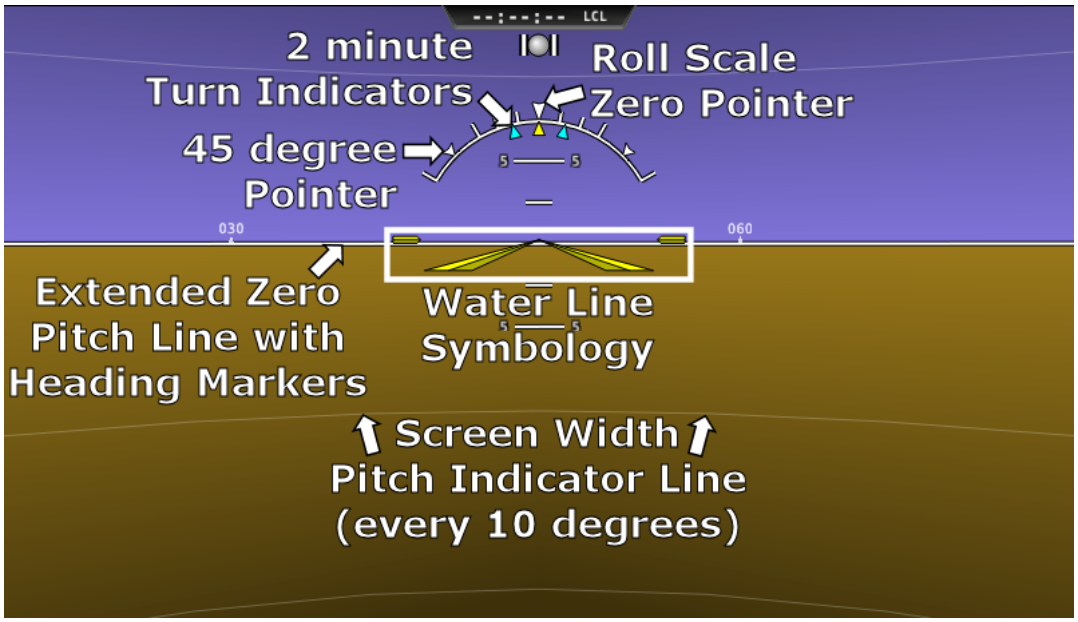


Figure 35 – Example Attitude Indicator

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 accurately depict the aircraft's attitude in level cruise flight, 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.

NOTE: the Flight Angle Pitch Adjustment is only intended to adjust for minor differences in the aircraft's attitude at various weights or CG locations. It is not intended to compensate for an ADAHRS which is improperly oriented with the aircraft's longitudinal axis.

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 HDX'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 HDX'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 you.

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 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 this 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-250/2020 hardware, it cannot be used for this mode 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 36 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 36: Flight Path Marker example

The flight path marker is extremely helpful in correlating and distinguishing between aircraft attitude and flight path, giving you 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 System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for information about this setting. To calculate and display the Flight Path Marker, SkyView HDX 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.
- The marker will not "peg" on the sides of the PFD but will move off screen (disappear) when the relative flight path exceeds the perspective of the PFD.
- 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 37 is an example SkyView HDX 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. See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for 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 is not valid. Since relative humidity is not readily available to SkyView in flight, density altitude is calculated using an approximation. The results of SkyView HDX's DA computation will closely match a traditional handheld E6B.

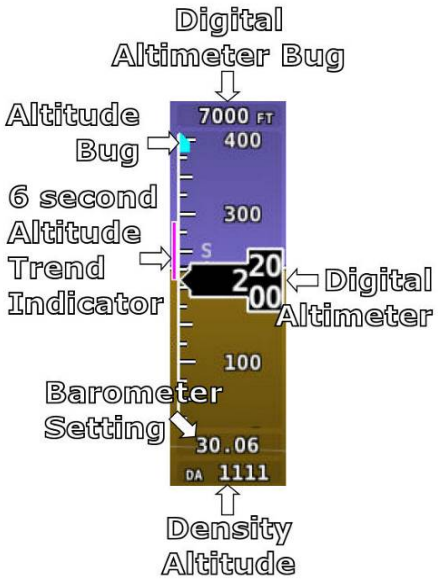


Figure 37: Altimeter

Setting Barometer (BARO)

To change the barometer setting:

1. Enter the Knob Function Menu.
2. Rotate the knob up or down to highlight (BARO).
3. Push the knob to close the menu (this is optional; the menu will close after approximately 5 seconds). This step assigns that knob to BARO BUG.

(BARO) will now display just above that knob. The barometer setting on the PFD will be outlined to signal that it is selected. Rotate the BARO BUG knob 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.

If your panel has the optional SV-KNOB-PANEL Knob Panel installed, simply rotate the SV-KNOB-PANEL's BARO knob to adjust the BARO BUG.

To quickly sync the Barometer BUG (see Table 6 below for synchronization criteria), push and hold the knob (½ second click).

If your panel has the optional SV-KNOB-PANEL Knob Panel installed, simply push the BARO knob (click) to sync the Barometer BUG (see Table 6 below for synchronization criteria).

When BARO is synchronized, a BARO RESET 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. Table 6 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	Resets 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 6: Conditions for synchronizing BARO BUG.

Altitude BUG

The Altitude BUG is displayed in cyan (light blue) 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 changing the Altitude BUG depends upon:

- The state of the AP's Pitch axis, and
- The AP's armed mode of operation, and
- The current state of the aircraft.

See the Autopilot Operation section later in this guide for more information about how the Autopilot uses the Altitude BUG.

To set the Altitude (ALT) BUG:

1. Enter the Knob Function Menu.
2. Rotate the knob to highlight (ALT).
3. Push the knob to close the menu (this is optional; the menu will close after approximately 5 seconds). This step assigns that knob to ALT BUG.

(ALT) will now display just above that knob. The Altitude BUG setting on the PFD will be outlined to signal that it is selected. Turn the knob 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.



If your panel has the optional SV-KNOB-PANEL Knob Panel installed, simply rotate the SV-KNOB-PANEL's ALT knob to adjust the ALT BUG.

To quickly sync the Altitude BUG with the current altitude, press and hold the ALT knob (½ second click).



If your panel has the optional SV-KNOB-PANEL Knob Panel installed, simply push the ALT knob (click) to sync the Altitude BUG with the current altitude.

After the Altitude BUG is synchronized an "ALT SYNC" message will appear above the knob.

Altitude Alerter

SkyView HDX can be configured to audibly alert as the aircraft changes altitude in relation to the Altitude BUG. When the Altitude BUG is active, audio out is configured, and the altitude alerter is configured, an audio alert of "APPROACHING ALTITUDE" is spoken as the aircraft flies within a user-selectable distance of the setting of the Altitude BUG. Similarly, an audio alert of "LEAVING ALTITUDE" is spoken as the aircraft flies away from the setting of the Altitude BUG by more than a user-selectable distance. The altitude thresholds that trigger the two above alerts are individually configurable/ The altitude alerter function is not dependent on the state of the Autopilot (engaged, vs not engaged). See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for details on how to configure the altitude alerter.

Minimum Descent Altitude (MIN) BUG

The Minimum Descent Altitude (MIN) BUG allows you 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 separate 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 spoken.
  - When the aircraft descends through the MIN bug:
  - A "MINIMUMS" audio alert is spoken.
  - A visual "MINIMUMS" alert is displayed on the PFD as seen below.

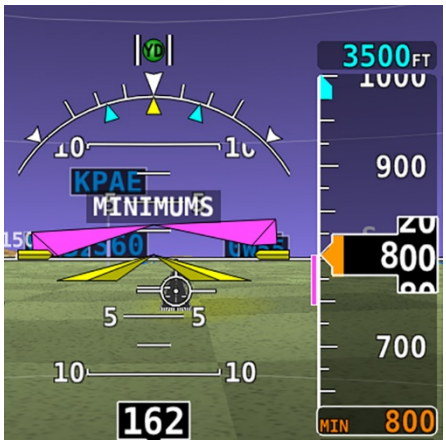


Figure 38: MIN Bug and "MINIMUMS" alert

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 39 is an example SkyView HDX VSI.

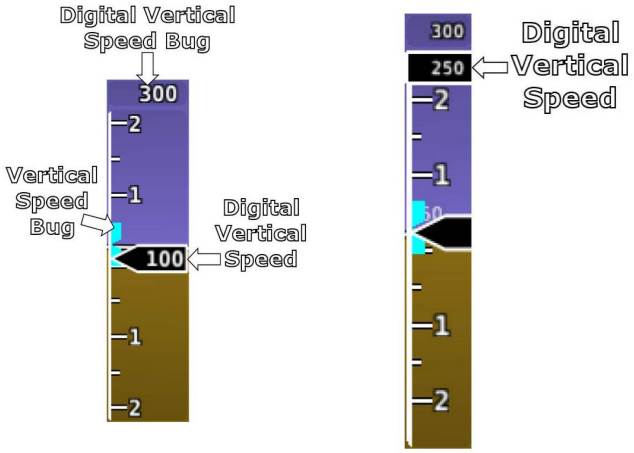


Figure 39: Vertical Speed Indicator example (partial screen PFD version on right)

The VSI tape can display ±1000 units, ±2000 units, or ±4000 units. Units can be set to feet or meters. See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for instructions on how to change the displayed units and the indicator scale.

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 50% page, the digital vertical speed readout appears above or below the VSI tape as shown in Figure 39, 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 an arrow is drawn on the VSI at that speed (see VNAV: Vertical Navigation for more information).

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. *The Vertical Speed BUG is used by the Autopilot as a target vertical speed when it is climbing or descending (when a Pitch axis servo is installed).*

To set the VS BUG:

1. Enter the Knob Function Menu.
2. Rotate the knob to highlight (VS).
3. Push the knob to close the menu (this is optional; the menu will close after approximately 5 seconds). This step assigns that knob to (VS).

(VS) will now display just above that knob. The Vertical Speed BUG setting on the PFD will be outlined to signal that it is selected. Rotate the knob 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 pushing and holding the VS knob (½ second click).

After the Vertical Speed BUG is synchronized, a "VS SYNC" message will appear above the knob.

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 40 is an example SkyView Magnetic Heading indicator/ Directional Gyro.

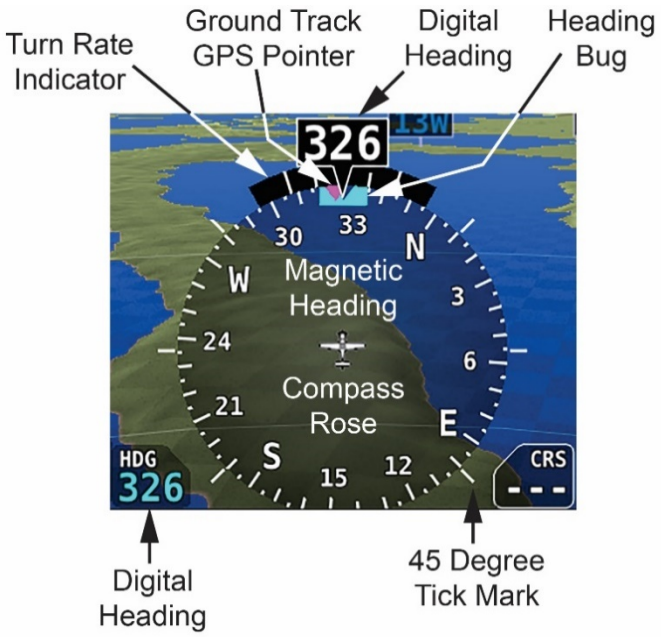


Figure 40: Magnetic Heading indicator / Directional Gyro

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 41: GPS Track substitute for Magnetic Heading indicator

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 HDX 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 Knob Function Menu.
2. Rotate the knob to highlight (HDG) or (TRK).
3. Push the knob to close the menu (this is optional; the menu will close after approximately 5 seconds). This step assigns that knob to HDG or TRK.

(HDG) or (TRK) will now display just above that knob. The Heading / Track BUG setting on the PFD will be outlined to signal that it is selected. Turn the knob 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.



If your panel has the optional SV-KNOB-PANEL Knob Panel installed, simply rotate the SV-KNOB-PANEL's HDG/TRK knob to adjust the Heading or Track BUG.

You can synchronize the Heading / Track BUG to the current Heading or Track by pushing and holding the knob (½ second click).



If your panel has the optional SV-KNOB-PANEL Knob Panel installed, simply push the HDG/TRK knob (click) to synchronize the Heading / Track BUG to the current Heading or Track.

After the Heading BUG or Track BUG is synchronized, a "HDG SYNC" or "TRK SYNC" message, respectively, will appear above the knob.

HSI



Figure 42: HSI example: Localizer



Figure 43: HSI example: GPS

When a valid NAV or GPS source is connected to your SkyView HDX system, its data can be displayed on and around the heading indicator in a standard HSI presentation. See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* 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. When a GPS is being used as an HSI source, HSI data generated by that source is colored magenta. When a NAV 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),
- LOC (localizer),
- SKYVIEW.

Additionally, each GPS or NAV radio source either has a custom name or is numbered (depending on how those devices are configured within SkyView) to reduce confusion in systems that have multiple navigational devices. SkyView HDX's own navigation mapping capability is always labeled "SKYVIEW". The GPS waypoints are displayed in HSI info area for SKYVIEW and external GPS navigation sources.

To cycle through the available sources of HSI data, you can either:

- Select MENU (Button 6) on the Main Menu, then select the PFD TOOLS icon, then select the HSI SRC icon. Repeated touches of the HSI SRC icon will cycle through the available HSI data sources. Or,
- Touch the HSI SRC data block near the lower right corner of the PFD and beneath the Altimeter. Repeated touches of the HSI SRC data block will cycle through the available HSI data sources.

Back course tracking under Autopilot will only work if the NAV radio has a back course mode that reverses sensing. For example, the SL30 has this in the form of the BC button.

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 set by the programmed route. When a NAV radio source is selected, the course direction can be set either on the NAV radio or via the Course (CRS) knob function on SkyView HDX (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 knob CRS function. Courses are remembered for each navigation source, this is especially helpful when switching between VOR and ILS or GPS and ILS sources.



Figure 44: HSI Course Indicator

You may also synchronize the CRS bug value to point at the station (when tuned to a VOR only) by pushing and holding the knob (½ second click), providing the CRS function is currently assigned to the knob. After the Course is synchronized a "CRS SYNC" message will appear above the knob.

When a third-party COM / NAV radio is connected to SkyView HDX, when tuned to a LOC / ILS frequency, its own OBS knob is disabled.

Course Deviation Indicator (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.



Figure 45: HSI CDI

To/From Indicator

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.



Figure 46: HSI To indication

Bearing Pointers

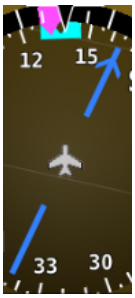


Figure 47: HSI Bearing 1 Pointer



Figure 48: Bearing 1 Pointer with Distance



Figure 49: HSI Bearing 2 Pointer



Figure 50: Bearing 2 Pointer with Distance

Bearing Pointer 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 arrowhead when displayed on the HSI display. BRG 2 has a double arrowhead. 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, if available. Distance is shown only when a single bearing source is selected, and the bearing source does not match the HSI source. Each of the bearing pointers can be cycled between all available bearing sources by pressing BRG 1 or BRG2 in the PFD Menu. As shown in Figure 51 to the right, press the MENU button in the Main Menu, then tap the PFD TOOLS icon, then tap the BRG 1 or BRG 2 icons to select Bearing 1 or Bearing 2 respectively. Repeated taps on the BRG 1 or BRG 2 icons will select (appears on the HSI) or de-select (does not appear on the HSI) each bearing.



Figure 51: Bearing Pointer selector on PFD TOOLS page

Some third-party radios provide information about standby frequencies that can be loaded into bearing pointer locations. These are only available for standby VORs that are within range and 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

When the selected HSI is transmitting valid vertical navigation data from a NAV radio tuned to an ILS, a green glideslope is displayed immediately to the right of the HSI, indicating angular deviation from an ILS. The indicator is also displayed when a Flight Plan using VNAV is selected (see Chapter 5: VNAV: Vertical Navigation for more information). Additionally, if the valid vertical navigation data is from a GPS source, a magenta glidepath indicator, indicating vertical deviation from the target descent path, is displayed instead. When displaying a glideslope, full deflection of the vertically moving indicator bar is 0.5 degrees.



Figure 52: HSI Glideslope

HSI Info Items



Figure 53: HSI GPS Info

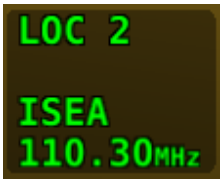


Figure 54: HSI NAV Info (LOC example)

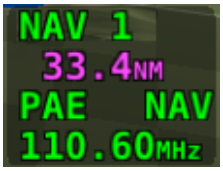


Figure 55: Virtual DME

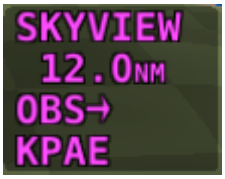


Figure 56: OBS Mode active

Textual info items that provide additional data about the HSI source are displayed to the right of the HSI display, and right of the glideslope indicator if it is shown. 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 distance in magenta.

The Virtual-DME function is disabled upon installation and not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.

Some third-party devices that are connected via the SV-ARINC-429 interface module do not decode identifiers, and thus SkyView cannot calculate Virtual-DME for those radios.

Wind Vector

As shown in Figure 57, 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 is unable to calculate winds aloft, 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. The Wind Vector will not appear if the SV-ADAHRS-20X, SV-MAG-236, GPS, or OAT is not functional.



Figure 57: Wind Vector

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 58 is an example of SkyView Slip/Skid ball.



Figure 58: 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. If "CAL?" is displayed, the AOA calibration procedure has not been performed. See the *SkyView System Installation Guide* for information about performing the AOA calibration procedure. SkyView allows you to set multiple AOA calibrations for various flap positions.



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 59 is an example SkyView HDX AOA indicator.

Figure 59: Example AOA indicator

The on-screen AOA indicator is disabled upon installation and not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.

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

OAT

Outside Air Temperature (OAT) as shown in Figure 60 is displayed below the Vertical Speed (VS) scale. Display of OAT can be set to °F or °C. See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* 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 60: OAT example

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, and high-resolution terrain databases are loaded for the appropriate region, SkyView HDX's 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.

As shown in Figure 61, display of Synthetic Vision may be enabled or disabled at any time by selecting MENU (Button 6) on the Main Menu, then selecting the PFD TOOLS icon, then the SYNVIS icon.



Figure 61: SYNVIS Enable/Disable

SkyView offers the ability to show the PFD and/or Synthetic Vision in "Wide View" which displays additional peripheral view. When Synthetic Vision is disabled (SYNVIS icon not lit), enabling or disabling WIDE VIEW changes the perspective of the PFD. When Synthetic Vision is enabled, enabling or disabling WIDE VIEW changes the perspective of both Synthetic Vision and the PFD.

Similar to using a wide-angle camera lens to show more of the peripheral view; when WIDE VIEW is enabled objects shown in Synthetic Vision, the PFD will also appear farther away.

As shown in Figure 62, display of WIDE VIEW may be enabled or disabled at any time by pushing the MENU button on the Main Menu, then tapping the PFD TOOLS icon, then the WIDE VIEW icon.



Figure 62: WIDE VIEW Enable/Disable

Terrain Alerting can provide additional situational awareness of terrain. Terrain that is relatively close to the aircraft, that SkyView HDX considers an immediate threat, is colored Red. Terrain that is relatively close to the aircraft, that SkyView HDX considers *potentially* a threat, is colored Yellow. See "Obstacles on Synthetic Vision" later in this section for an explanation of the algorithm used in Terrain Alerting, which is different from the algorithm used for MAP terrain alerting, which is based on vertical proximity of terrain.

As shown in Figure 63, display of TERRAIN ALERT may be enabled or disabled at any time by selecting MENU (Button 6) on the Main Menu, then selecting the PFD TOOLS icon, then the TERRAIN ALERT icon. Terrain alerting is inhibited when the aircraft is on the ground.



Figure 63: TERRAIN ALERT Enable/Disable



Figure 64: SkyView HDX Synthetic Vision – Normal View

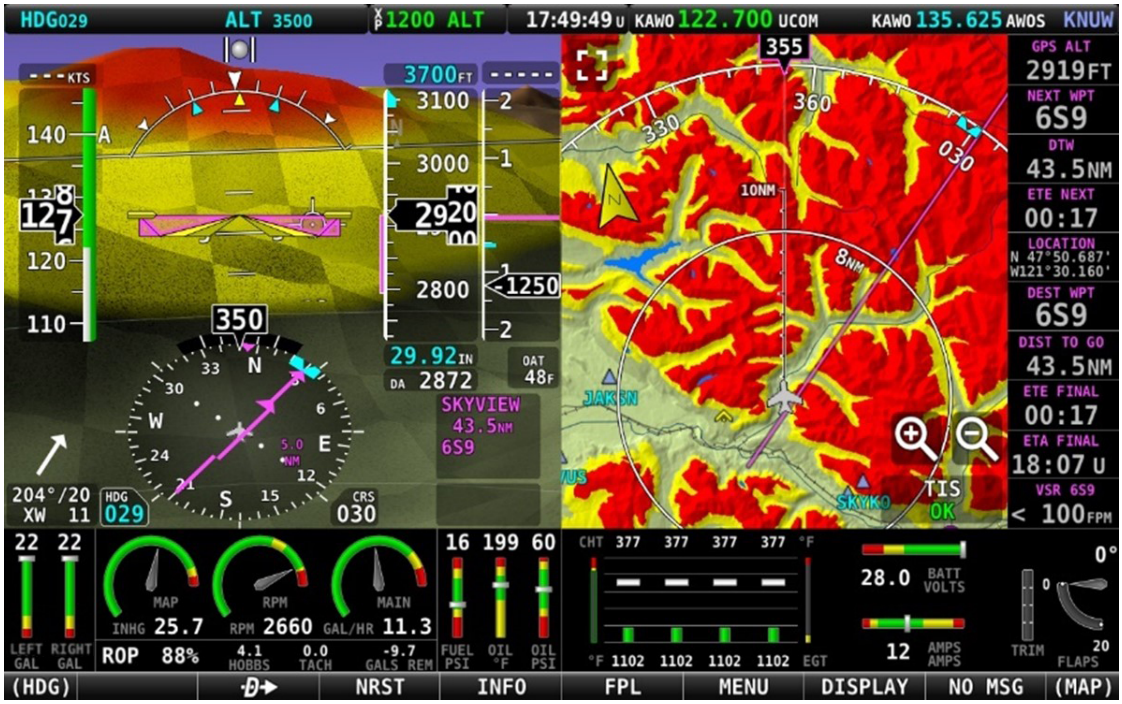


Figure 65: SkyView HDX Synthetic Vision – Terrain Alert

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 is 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 at any time by selecting MENU (Button 6) on the Main Menu, then selecting the PFD TOOLS icon, then the HITS icon, as shown below. Note that SYNVIS must be enabled, and an altitude bug set to display HITS.



Figure 66: Highway In The Sky Enable/Disable



Figure 67: Highway In the Sky (HITS)

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 markings of the physical runway. 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.



Figure 68: SkyView HDX Synthetic Vision with Runways

Flight Plan Airports and Waypoints on Synthetic Vision

When a Flight Plan is active, airports and waypoints are shown in SynVis as flags.

Obstacles on Synthetic Vision

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 displayed in Red. If the highest point of the obstacle is 100 − 1000 feet below your current GPS altitude, the obstacle will be displayed in Yellow. This is the same color scheme (but not the same algorithm for determining the coloring of the displayed object) 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 is on a path to clear the physical object.

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 capable of receiving traffic, information is installed and configured, traffic can be displayed within the Synthetic Vision display to improve situational awareness.



Figure 69: SkyView HDX Synthetic Vision Traffic Alert

Traffic information is informational only and does not relieve 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 enabled. However, the yellow textual "TRAFFIC" alert message on the PFD Page (shown in Figure 69 to the right of the IAS window, and Figure 73 below) is always shown when Traffic Advisories are received, and traffic is enabled. See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for additional information.

Traffic is displayed as reported by the device sending it to SkyView HDX. 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 HDX display. For example: traffic updates, such as those received by the SV-XPNDR-261/262 (TIS-A), 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 MAP and VFR GPS Navigator Operation 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, a non-threat airborne traffic target is being displayed above the aircraft's 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 System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* 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 70: Traffic Advisory on Synthetic Vision



Figure 71: Proximity Advisory on Synthetic Vision



Figure 72: 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.



Figure 73: 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.

Extreme Pitch Warning Indicators

SkyView HDX's PFD can display 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. See the *SkyView*

System Installation Guide or the *SkyView HDX System Installation Manual (Certified)* for information about this setting.

Figure 74 shows the pitch up warning arrows with the slivers of ground.



Figure 74: Extreme Pitch warning indicator arrows

Airport Flags on Synthetic Vision

Airport Flags is symbology on the PFD representing the location of airports in your field of vision. They can be enabled and disabled through the PFD TOOLS menu item.



Figure 75: Airport Flag on PFD

Six-Pack Presentation

As an alternative to the EFIS tape-based display, SkyView HDX can display a traditional Six-pack analog presentation of flight instruments. If you're new to flying with a "glass panel", SkyView HDX's Six-Pack presentation on the PFD lets you fly the gauges you're used to. After flying in the Six-pack presentation, try out the "EFIS" style as you get comfortable: changing the presentation is just a few buttons away.

With the exception that the Flight Path Marker is not displayed on the Six-Pack presentation, the EFIS presentation and the Six-pack presentation display the same information on the PFD – only the presentation style is different. The Six-pack presentation respects all settings used to configure the EFIS presentation – units, etc. All information boxes for Density Altitude, True Airspeed, Autopilot alert banners, Flight Director, and bugs, etc. appear the same as in the EFIS presentation.

Figure 76 below illustrates the Six-pack presentation with Synthetic Vision enabled (in the background).



Figure 76: Six Pack PFD presentation, Synthetic Vision enabled.

Figure 77 below illustrates the Six-pack presentation with Synthetic Vision disabled (Gray background).



Figure 77: Six Pack PFD presentation, Synthetic Vision disabled.

The Six-pack presentation on the PFD may be enabled or disabled at any time by selecting MENU (Button 6) on the Main Menu, then selecting the PFD TOOLS icon, then the SIX-PACK icon. For easier viewing of the Six-pack presentation, display of Synthetic Vision can be enabled or disabled in the same menu.

In SkyView software version 15.1, indicators for 1000 and 10000 feet were added to emulate a mechanical gauge more accurately. For example, here is 4500 feet depicted on the new instrument:



Figure 78: New Instrument Altitude Gauge

The Extreme Pitch Warning Indicator Arrows (Figure 74 above) can only be displayed when the EFIS presentation is enabled on the PFD.

If you have the Six-Pack presentation enabled on the PFD, the Extreme Pitch Warning Indicator Arrows (Figure 74 above) *will not be displayed*.

G Meter

A G Meter can be displayed on the PFD. When enabled, the G Meter replaces the HSI / Compass Rose in both the PFD presentation (Figure 79) and the Six-pack presentation (Figure 80) of the PFD. Note that when the G Meter is displayed, the numerical magnetic heading above the HSI area remains displayed.



Figure 79: G Meter in EFIS Presentation



Figure 80: G Meter in Six-Pack Presentation

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.

As shown in Figure 81 below, display of the G Meter in place of the HSI / Compass Rose on the PFD may be enabled or disabled at any time by selecting MENU (Button 6) on the Main Menu, then selecting the PFD TOOLS icon, then the G METER icon.



Figure 81: G Meter Enabled/Disabled

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.

The Minimum and Maximum Gs displayed on the G Meter can be manually reset at any time. As shown in Figure 82, select MENU (Button 6) on the Main Menu, then select the PFD TOOLS icon, then the RESET G icon.



Figure 82: Reset G Meter

The G Meter can also be configured with several settings, including:

- Automatically display the G meter at a particular G.
- Restore the HSI / Compass Rose at a particular G (when the G Meter is displayed).
- Displayed range of Gs.
- Ranges (colors) of Gs.
- Automatically reset the Minimum and Maximum Gs displayed on the G Meter when SkyView HDX boots up.

See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for details about configuring the G Meter to your preferences.

SV-KNOB-PANEL – Panel Operation

The SV-KNOB-PANEL, available in both Horizontal and Vertical versions (shown below) is an optional control panel that adds dedicated knobs for the most used BUGS. The three knobs on the SV-KNOB-PANEL are the most frequently adjusted BUGS: Altitude Bug (ALT), Barometer (BARO), and Heading/Track Bug (HDG/TRK).



Figure 83: SV-KNOB-PANEL – Horizontal version



Figure 84: SV-KNOB-PANEL – Vertical version

Unlike the knobs on the SkyView HDX display, the SV-KNOB-PANEL's knobs are dedicated functions, i.e.: the BARO knob will always control BARO. Some pilots prefer having single-purpose dedicated controls for these frequently used functions.

The SV-KNOB-PANEL's knobs behave exactly like the SkyView HDX display's (multipurpose) knobs behave when set to these functions:

- Turn them to adjust the value of the function.
- Press and hold ALT to synchronize the ALT bug to the aircraft's current altitude.
- Press and hold HDG/TRK to synchronize the HDG/TRK bugs to the aircraft's current heading / track.
- Press and hold BARO to:
  - Set the altimeter setting to either the nearest METAR (when ADS-B is available in-flight), or
  - Set standard pressure (29.92 inHg or 1013 millibars when at/above 18k feet or no ADS-B on board).
  - Make the altimeter match GPS altitude (when on the ground).

The dedicated knobs on the SV-KNOB-PANEL allow the multipurpose knobs on the SkyView HDX display to be used for other functions, such as MAP range, CRS BUG, IAS BUG, VS BUG, or MIN BUG.

ADAHRS (Flight Instrument) Redundancy and Cross-Checking



Dual ADAHRS modules (i.e., SV-ADAHRS-201) are not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.



Normally, the SV-ADAHRS-200 will be assigned by the SkyView HDX system as "PRIMARY / ACTIVE and the SV-ADAHRS-201 will be assigned as ALTERNATE / STANDBY. However, your SkyView HDX system may assign the SV-ADAHRS-201 as "PRIMARY / ACTIVE. This "reversal" does not affect performance of your SkyView HDX system – the SV-ADAHRS-201 is functionally equivalent to the SV-ADAHRS-200.

If you wish to change the "role" of the two units (for example, make the SV-ADAHRS-200 the PRIMARY unit. See the *SkyView System Installation Guide* for details.

For flight data to be displayed, a SkyView HDX system must have a SV-ADAHRS-200 ADAHRS (Air Data Attitude Heading Reference System) module. For redundancy, SkyView HDX systems also support the installation of a SV-ADAHRS-201 Backup / Standby ADAHRS module. The SkyView HDX system continuously monitors the two units and compares their respective flight data.

If the SV-ADAHRS-200 fails completely, and an SV-ADAHRS-201 is installed, SkyView HDX will switch to using the SV-ADAHRS-201 for flight data.

If an SV-ADAHRS-200 has failed and an SV-ADAHRS-201 is providing flight data, the flight can continue normally as there is no functional difference between the SV-ADAHRS-200 and the SV-ADAHRS-201. The only difference between the two units is that the SkyView HDX system requires the presence of an SV-ADAHRS-200 prior to the installation of an SV-ADAHRS-201.

If there is a significant difference in:

- Airspeed,
- Altitude,
- Attitude (pitch and roll),
- G Meter,
- Magnetic heading (compass),
- Turn coordinator (slip / skid ball).

between the SV-ADAHRS-200 and SV-ADAHRS-201, SkyView HDX will annunciate that there is a significant difference between the two units (see Figure 85 below) and show the COMPARE button, which, when pressed, will display a side-by-side comparison of the flight data from each unit.

If there is a significant difference in flight data between the SV-ADAHRS-200 and SV-ADAHRS-201 ADAHRS modules, SkyView HDX does not make a decision about which ADAHRS module is accurate, nor does it automatically switch to using the secondary module. It is the pilot's responsibility and task to decide which unit is providing accurate flight data and to switch the PFD to use that unit's flight data.



Figure 85: ADAHRS cross-checking disagreement.

Once SkyView has annunciated a cross-check comparison problem, press COMPARE to see flight data from both units 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.

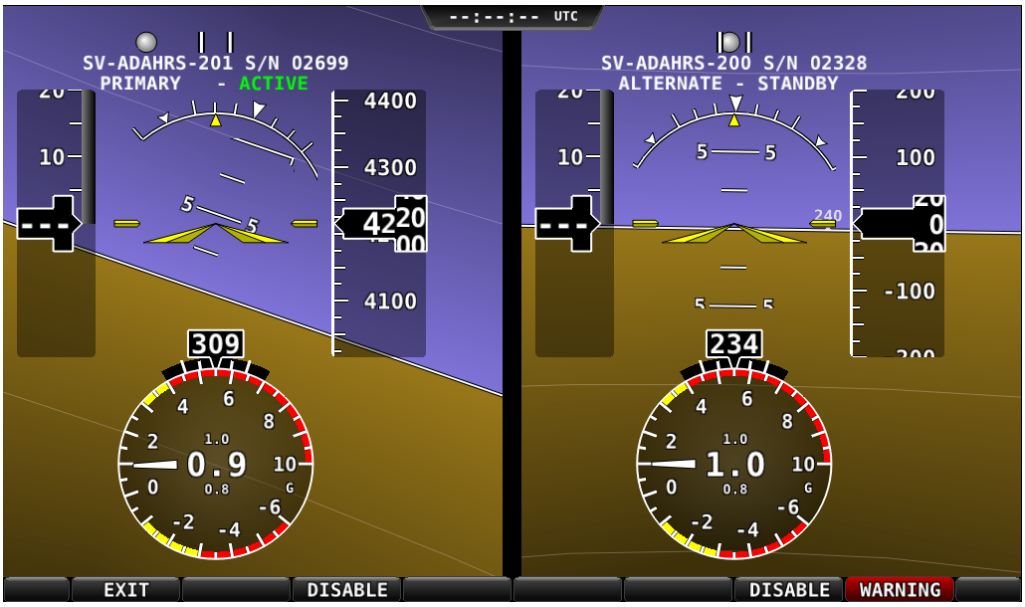


Figure 86 – ADAHRS Cross-Check Comparison (EFIS Presentation)

Once you have determined which ADAHRS is incorrect, press DISABLE under the unit with the incorrect flight data. This disables the unit for the remainder of the flight.

If the unit that you disabled was the ALTERNATE / STANDBY unit, the only effect will be that SkyView HDX will not perform cross-checking between the two units.

If the unit that you disabled is the PRIMARY / ACTIVE unit, the unit that was ALTERNATE / STANDBY will now be ALTERNATE / ACTIVE and SkyView HDX will display the flight data from that unit.

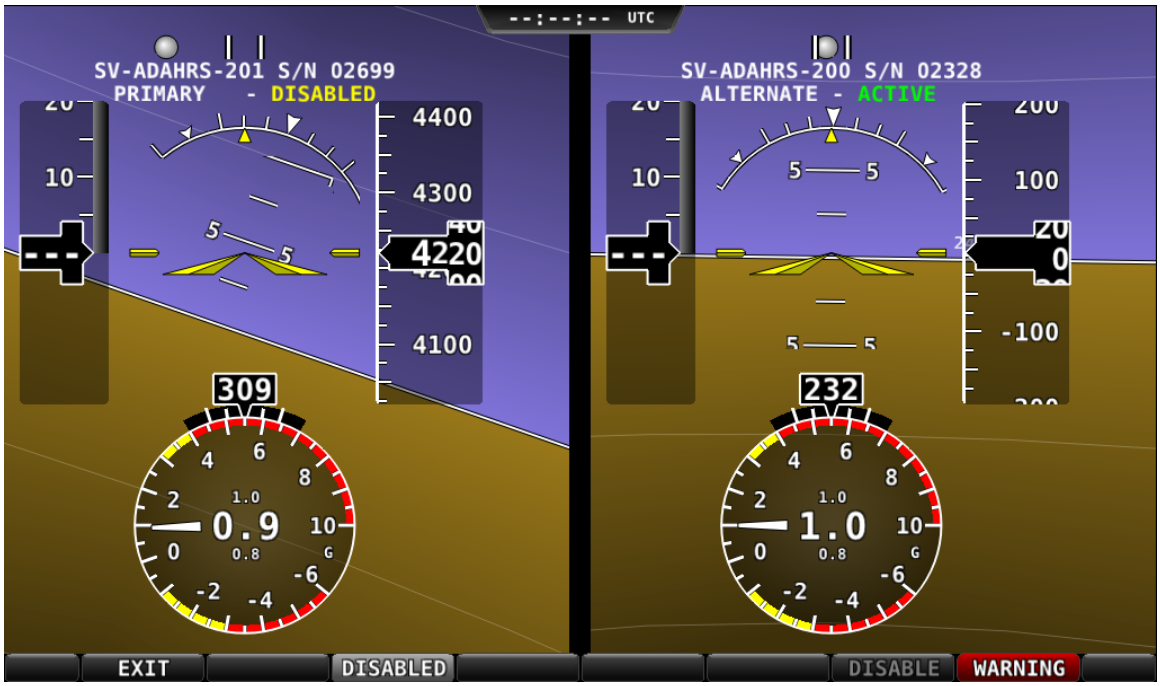


Figure 87: ADAHRS cross-check comparison (one ADAHRS disabled).

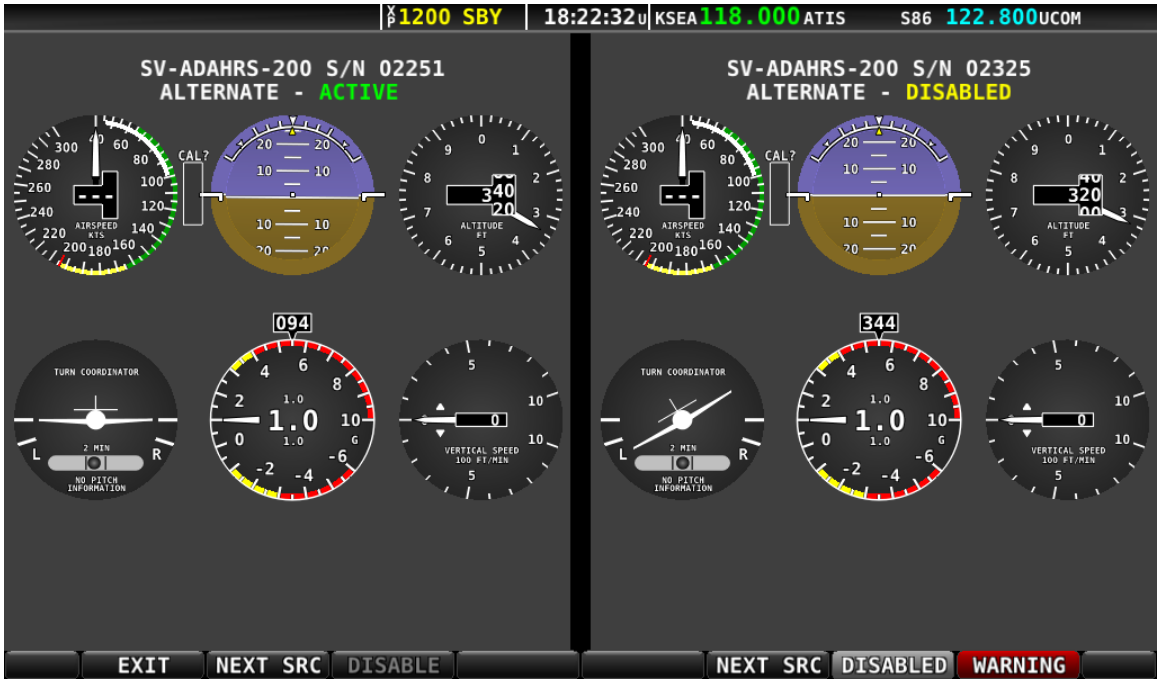


Figure 88: ADAHRS cross-check comparison (Six Pack presentation).

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

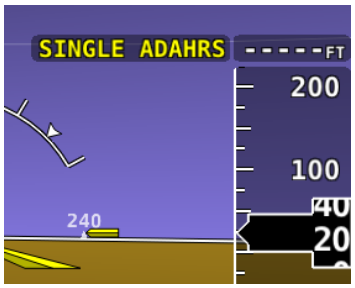


Figure 89: Single ADAHRS mode

If you are in flight, and you pushed the COMPARE button, but did not disable one of the ADAHRS units (just pushed the EXIT button), 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:

- Push buttons 7+8. This opens the IN FLIGHT SETUP MENU.
- Select ADAHRS SOURCE SELECTION.
- The side-by-side view of the two unit's flight data will be displayed.
- Push the DISABLE button under the unit with incorrect flight data.
- Push the EXIT button to return to the normal PFD display.

5. MAP and VFR GPS Navigator Operation

This section outlines what users should expect from SkyView HDX's Moving Map system and covers operations that are specific to this function.



SkyView HDX's 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 section.



MAP functions are temporarily unavailable immediately after boot up while the databases are loading. This allows SkyView HDX to display its primary screen substantially quicker so that you can utilize the ENGINE 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.

Features Overview

The following features are enabled when SkyView HDX has the appropriate high resolution terrain database installed for the region of the world you are flying in, and an aviation database installed:

- Display of airport, airspace, obstacles, and other available aviation data (capabilities depend on available databases and other installed equipment).
- Display of base-map features, including roads, city names, railroads, rivers, and political boundaries.
- VFR GPS Navigation features, including airport information and multi-leg Flight Planning.
- Display of obstacles and runways on Synthetic Vision.
- Display of geo-referenced procedure charts and airport diagrams (if optional chart data is available).
- Display of enroute charts (if optional chart data is available).
- Display of TIS-A Traffic (if SV-XPNDR-261/262 transponder or other compatible transponder is installed, and in a TIS service area).
- Display of ADS-B Traffic (includes TIS-B) and Weather (FIS-B), including Lightning and PIREPS (if SV-ADSB-470/472 ADS-B Receiver is installed, and in an ADS-B service area).
- If the SkyView Wi-Fi Adapter is installed, send, and receive Flight Plans with supported aviation applications. (The SkyView Wi-Fi Adapter is not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.)

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.
- Obstacle 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 HDX as of software v15.0)
- Instrument Procedure Charts (requires optional data).
- Airport Taxi Diagrams (requires optional data).
- Enroute Charts (requires optional data).

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

Viewing Information about Installed Databases

If a database is expired, a message will be displayed upon bootup. To check the status of databases:

- Press-and-hold Buttons 7+8 (SETUP MENU) > LOCAL DISPLAY SETUP > INSTALLED DATABASES.

This page lists all databases installed on that SkyView HDX display, with respective versions and expiration dates.

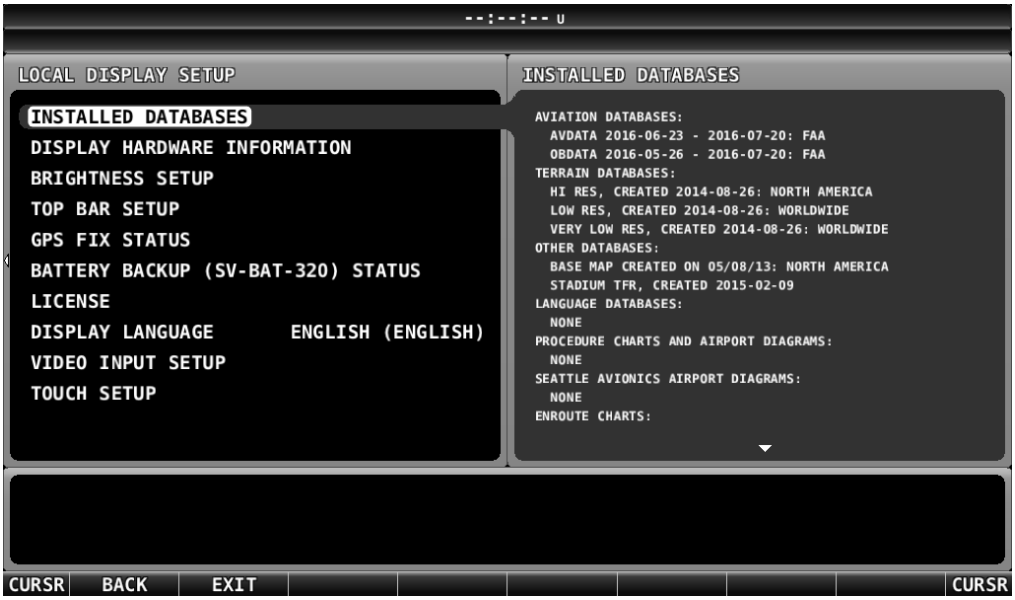


Figure 90: INSTALLED DATABASES menu

For details on updating SkyView HDX databases, see the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)*.

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 HDX system up to date.

SkyView HDX 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 HDX to provide detailed information about aviation features. SkyView HDX can also provide navigation to these aviation features.

Aviation / Obstacle databases for US pilots are provided by Dynon at see dynon.com/download or dynoncertified.com/data. Aviation / Obstacle databases for regions outside the US are provided by other providers.

Terrain Databases

SkyView HDX 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 SkyView HDX 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 HDX display may have already been loaded with high resolution terrain databases for your region by an aircraft manufacturer or other reseller of Dynon products.



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

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 SkyView HDX 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 HDX display may have already been loaded with the Base-Map database for your region.



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

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 HDX 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 HDX display.

Geo-referenced Procedure and Enroute Charts and Airport Diagrams

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



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

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 HDX's internal memory. Rather, they are stored on a USB flash drive plugged into a USB port on the SkyView HDX display. The USB flash drive must be at least 16 GB.

Each SkyView HDX 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 has provided USB flash drives of sizes 4 GB, 8 GB, 16 GB, and most recently 32 GB.

Note that a SkyView HDX 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 HDX 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 HDX 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.



Using Wi-Fi to download charts / diagrams directly to a USB flash drive that is inserted in SkyView HDX display is not authorized in Dynon Certified installations under Dynon's STC SA02594SE.

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

GPS Source

The *SkyView System Installation Guide* and the *SkyView HDX System Installation Manual (Certified)* contain 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 System*

Installation Guide or the *SkyView HDX System Installation Manual (Certified)* regarding this topic.

SkyView HDX'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 System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for more information on setting up GPS sources.



While SkyView HDX can receive and utilize GPS position data from any connected GPS device transmitting in proper format, those position data are updated at a rate of only 1 Hz (once per second). Even when another high-integrity GPS source is connected to SkyView – such as a WAAS IFR GPS navigator – it is preferable to install the Dynon SV-GPS-250 or SV-GPS-2020 as the primary position source. These GPS receivers provide position updates to the SkyView HDX display at 5 Hz (5 times per second), resulting in the best possible performance of Synthetic Vision and the Moving Map.

If you need to check the status of your GPS source in flight, press-and-hold Buttons 7+8 (IN FLIGHT SETUP MENU) > GPS FIX STATUS.

If you need to check the status of your GPS source when not in flight, press-and-hold Buttons 7+8 (SETUP MENU) > LOCAL DISPLAY SETUP > GPS FIX STATUS.

Moving Map Page Layout

The Moving Map as shown in Figure 91 displays a real-time topographical map in Track Up or North Up mode (depending on user setting). The Moving Map is sourced from a database that is stored inside the display and correlated to your current position using a GPS feed.



Figure 91: SkyView Moving Map

The following items are displayed on the Moving Map shown in Figure 91:

- 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 HDX 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

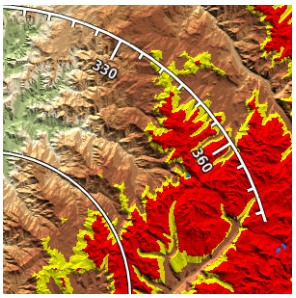


Figure 92: Topography with Terrain Proximity

SkyView HDX'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.

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 System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for details.
- The Yellow/Red terrain alert coloration does not appear on the Moving 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. 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 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 in MENU > MAP SETUP > 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 are within 100 ft of the altitude bug or if the arc is close enough to touch the aircraft icon, it is not displayed.



Figure 93: Default Aircraft Icon



Figure 94: Ground Track Line



Figure 95: Altitude Intercept Arc

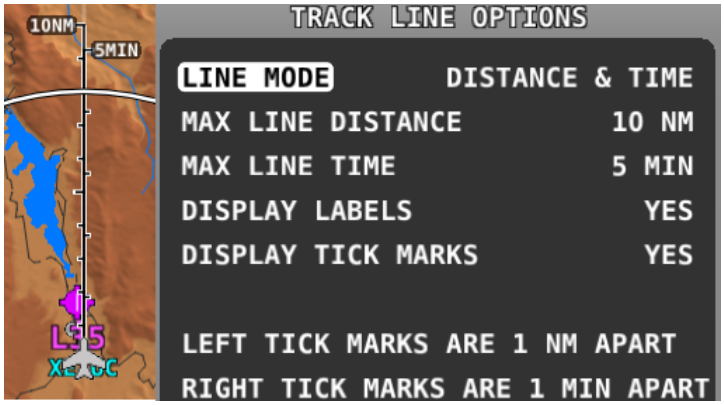


Figure 96: Time and Distance Prediction Marks

Optional Aircraft Icon Symbols

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

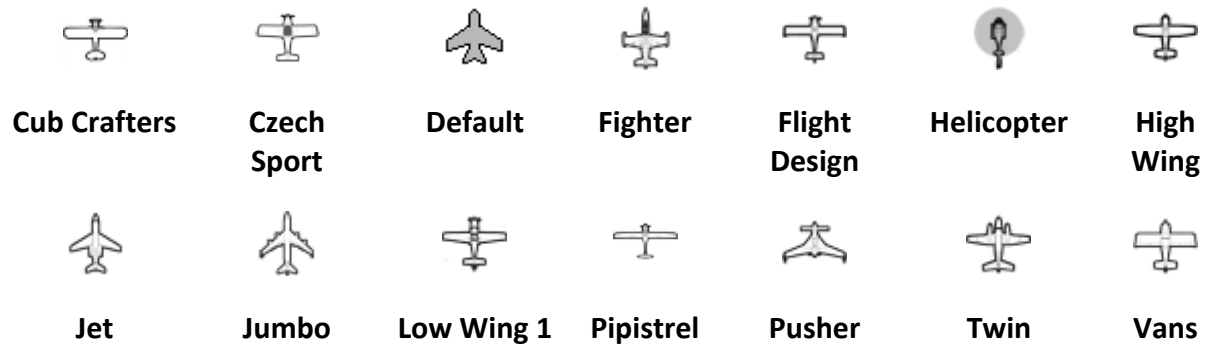


Figure 97: Additional Aircraft Icons

See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for instructions on how to change the displayed Aircraft Icon Symbol.

Distance Circle

The distance shown on the Moving 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.

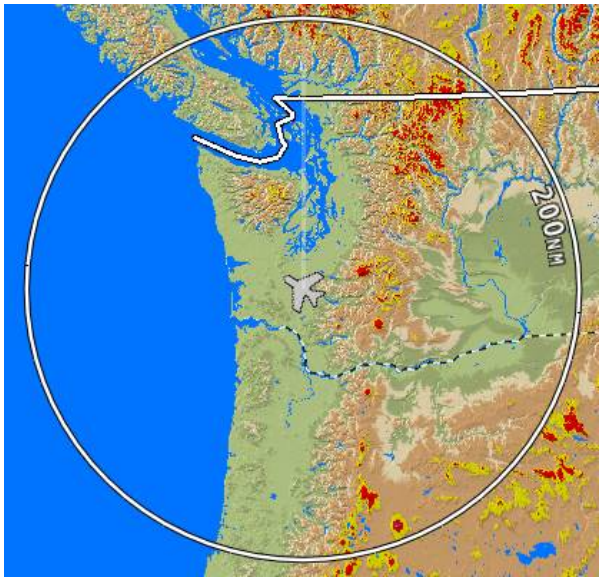


Figure 98: Distance Circle

This distance is displayed in the middle of the right side of the MAP Page, near the Distance Circle. Turn the (MAP) knob to adjust the range of the map (zoom in/zoom out). Turning the knob clockwise or counterclockwise to zoom is user-adjustable (MENU > MAP SETUP > MAP MODE > INC MAP RANGE > CLOCKWISE | COUNTERCLOCKWISE.

Range level can be adjusted between 0.3 and 1200 nautical miles. Distance units can be set to miles, nautical miles, or kilometers. See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for instructions on how to change the displayed units.

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

The ground track arc as shown in Figure 99 is centered on the current ground track.

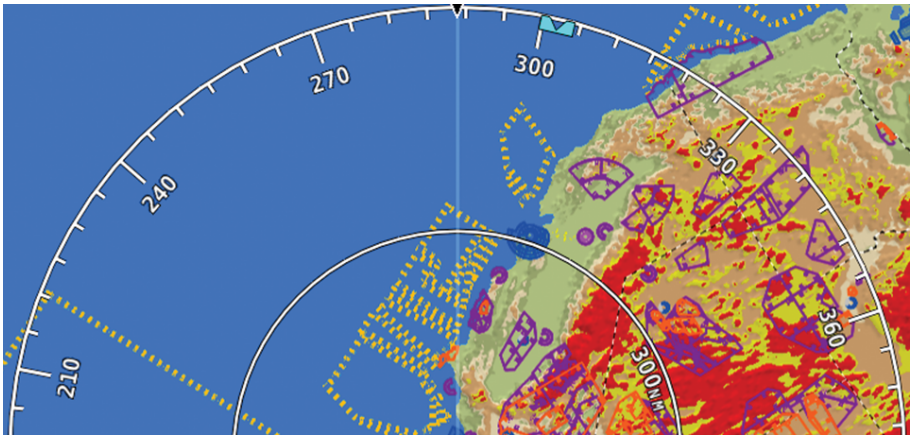


Figure 99: Ground Track Arc

The current ground track as shown in Figure 100 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.

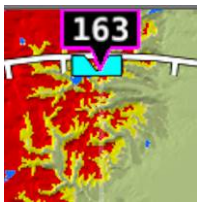


Figure 100: Current Ground Track

The heading bug as shown in Figure 101 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. See the Heading/Track Bug section for instructions on how to adjust the heading bug.

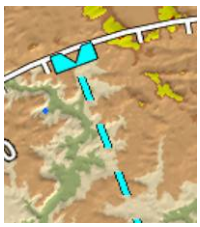


Figure 101: Heading/Track Bug

The north marker as shown in Figure 102 is represented with a gray arrow marked with an "N" and points to True North.



Figure 102: North Marker

The magenta course line shown in Figure 103 appears whenever the Moving Map is navigating to an active waypoint. It is the shortest path between the two points that it connects on the Moving Map.



Figure 103: 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.

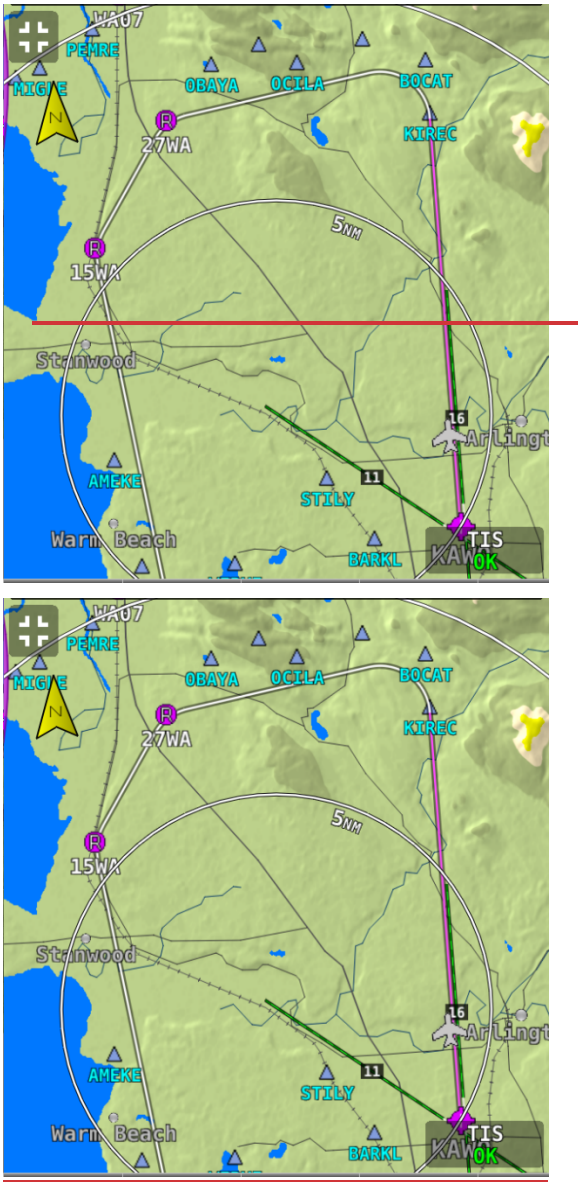


Figure 104: Flight Plan Legs

Obstacles

SkyView HDX's Moving Map represents obstacles using the same symbology found on sectional charts, as shown in Figure 105 and Figure 106. 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 105: Obstacles on the Moving Map

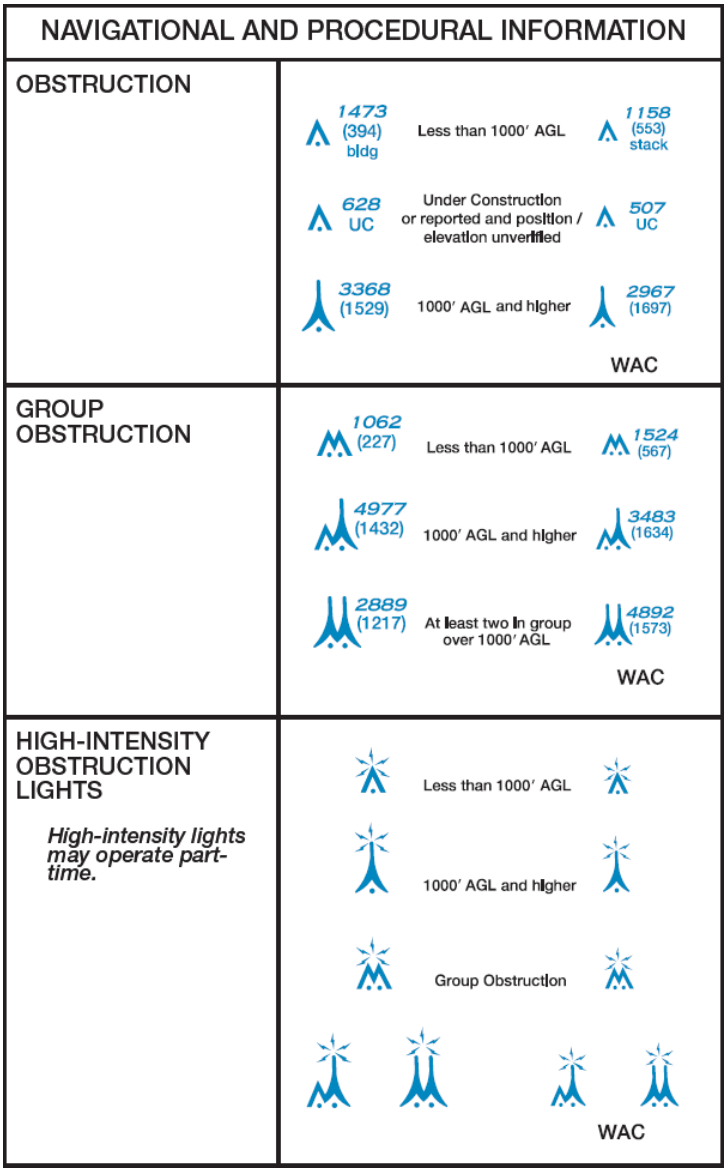
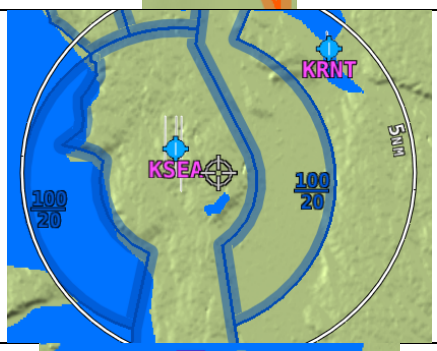
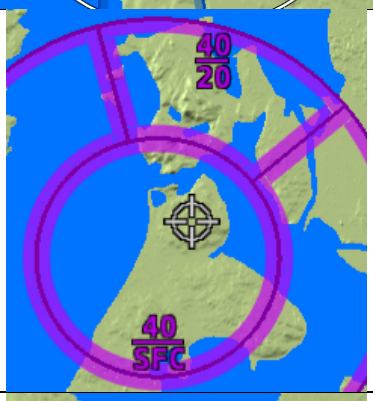


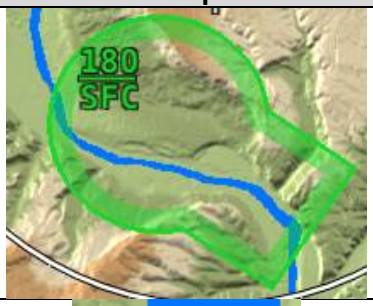
Figure 106: FAA Sectional Chart Obstruction Key

Airspace

SkyView HDX's Moving Map represents different classes of airspace with the colors specified in Table 7.

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 tick marks	
TMA / MTMA (Terminal Control Area)	Solid dark blue with interior shading	

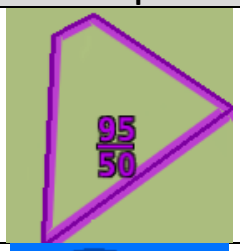
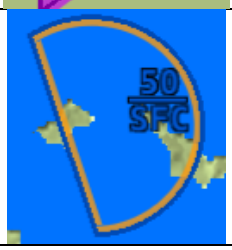
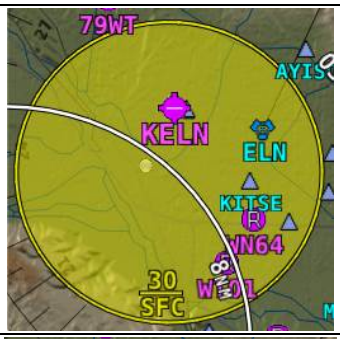
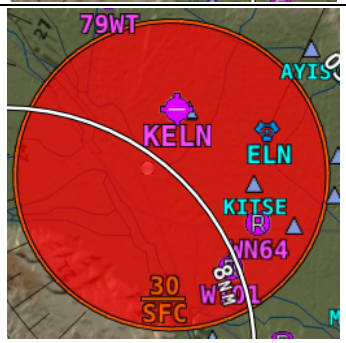
Airspace Type	Color	Example
CTA (Control Area)	Solid purple	
CTR (Control Zone)	Blue/orange solid	
Mode C Veil	Not shown	None
Upcoming Temporary Flight Restriction (TFR)	Yellow	
Active Temporary Flight Restriction (TFR)	Red	
Stadium Temporary Flight Restriction (TFR)	Orange	
Air Defense Identification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

Table 7: 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 figure 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 MENU > MAP SETUP > MAP ITEMS > AIRSPACE PROXIMITY.

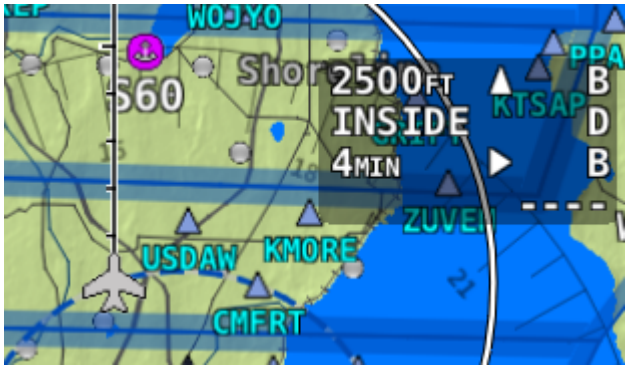


Figure 107: Airspace data block

Navaids

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

VORs

SkyView HDX's Moving Map displays VORs, VOR-DMEs, DMEs and VORTACs with the same icons used on sectional charts as shown in Figure 108.



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

Figure 108: 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 109.



Figure 109: 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 Figures Figure 110 and Figure 111.



Figure 110: NDB



Figure 111: Outer Marker

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 112: Visual Reporting Point

Airports

SkyView represents an airport with a circle and a text identifier. 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 113: 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 User Waypoints section below for detailed information on editing user waypoints.



Figure 114: User Waypoint Icon examples

Cities

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



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

Figure 115: 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:

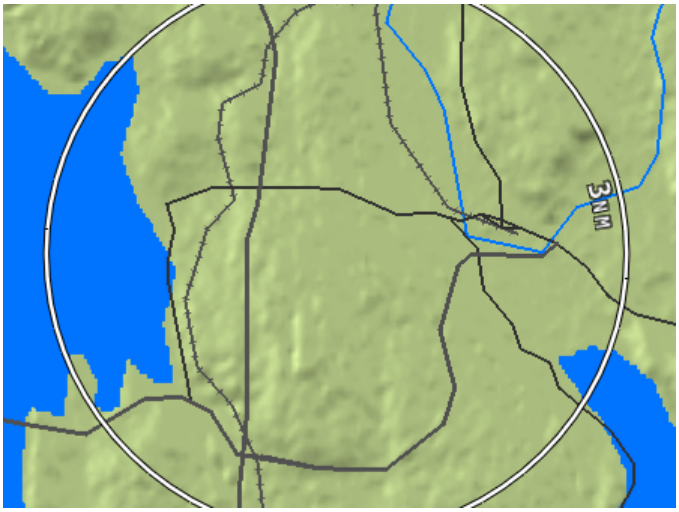


Figure 116: Roads, Railroads, and Rivers

Enroute VFR, IFR Low Altitude, IFR High Altitude Charts

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

To View Charts

On the LAYERS menu there may be options for VFR, IFR LOW, and IFR HIGH when using chart data for the US. Other chart types may be listed when using data for other regions of the world. 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 TOPOG (Topography) 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 screen at startup to alert you to update your chart data. This message can be acknowledged and cleared until the next power-up.

MAP Items on Charts

MAP items from SkyView HDX's databases (see Figure 117), including Regions, Airspaces, Airports, Fixes, NDBs, VORs, and VRPs, will be drawn on top of charts (see Figure 118) if enabled. (Refer to the MAP SETUP – Moving Map Preference Configuration section for information about enabling this feature). Weather items, including Pireps and Lightning, are also drawn on top of charts when enabled in the WEATHER OPTIONS menu.

Traffic, user waypoints, and terrain warning colors will always be drawn on charts. Obstacles will be drawn in yellow and red on charts (see Figure 118) when the aircraft altitude is within the warning range Flight Plans will be drawn on charts (see Figure 118) when Active. With an SV-ADSB-470/472 installed, TFRs are drawn on charts. Pilots can select items (airports, airspaces, navaids, etc.) for more information by selecting them with the MAP pointer.

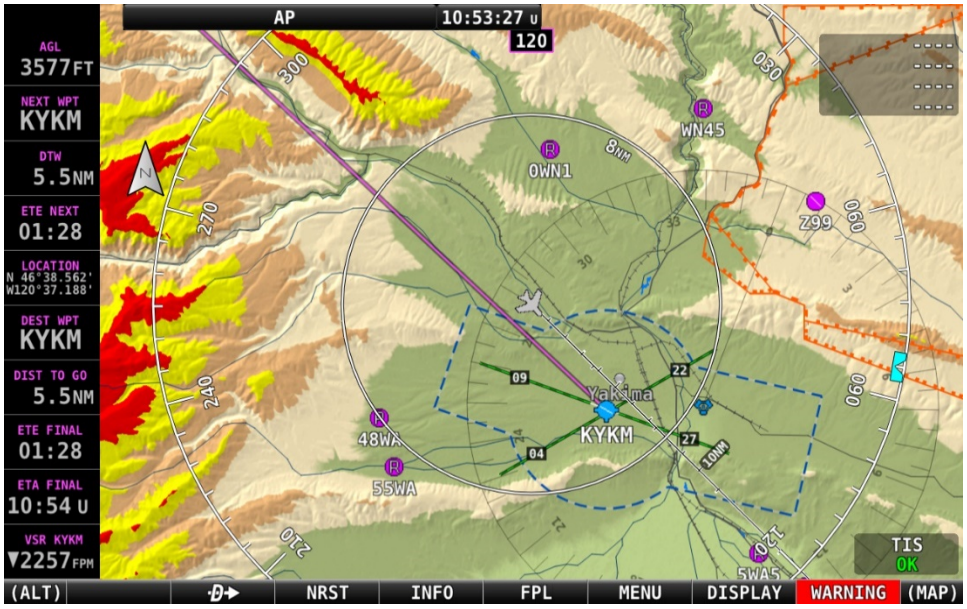


Figure 117: MAP Items Displayed on Moving Map

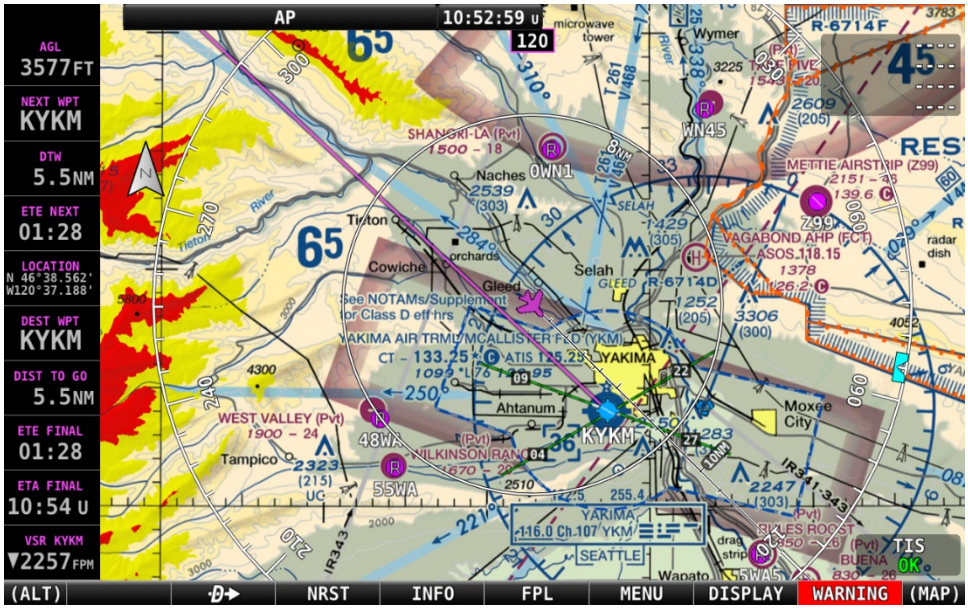


Figure 118: MAP Items Drawn on a Chart

Customizing Displayed MAP ITEMS

The display of various MAP elements can be customized to reduce visual clutter. These preferences are in MENU > MAP SETUP > MAP ITEMS. Use the MAP ITEMS settings to specify the highest visible range that the various features are displayed.

In addition to the visible range 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 Moving Map.

Traffic

When a device able to receive traffic, information is installed and configured, traffic can be displayed on the MAP Page to improve situational awareness. See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for details on how to turn the display of traffic on and off.

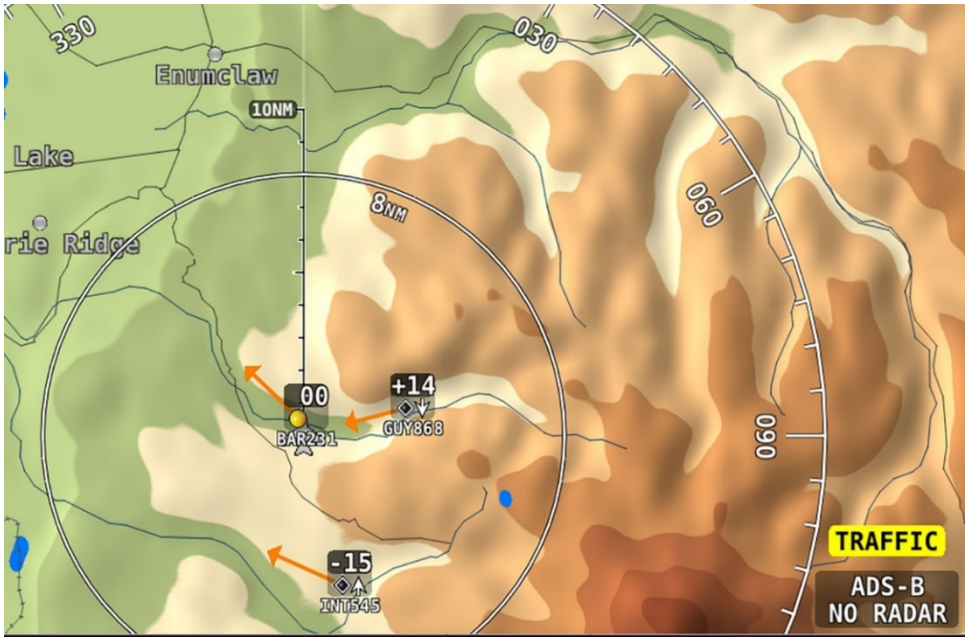


Figure 119: Traffic displayed on Moving Map

SkyView can receive traffic information from a variety of devices. These currently include the SV-ADSB-470/472 (TIS-B) (US only), SV-XPNDR-261/262 (TIS-A) (US only), or Garmin GTX 300 Series Transponders, passive traffic from the Zaon XRX, FLARM (predominantly in Europe) and the NavWorx ADS-B receivers.

Displaying traffic information on SkyView HDX from a third-party device is not authorized in Dynon Certified installations under Dynon's STC SA02594SE.

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

Traffic information is informational only, and does not relieve 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-261/262 (TIS-A), 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-261/262 transponder module to provide the ADS-B-based TIS-B traffic picture around your aircraft when you have both products, and a Moving Map License is activated. This is enabled by the following bidirectional data link capability:

1. The SV-XPNDR-261/262 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 that 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 end 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-261/262 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 are not able to see all the 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's 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.



Figure 120: Displaying tail number on Traffic targets.

Although weather and TFR information are available any time the SV-ADSB-470/472 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: https://www.faa.gov/air_traffic/publications/atpubs/aim_html/ For updated coverage maps see the FAA's website: https://www.faa.gov/nextgen/programs/adsb/.

Traffic Target Information



Figure 121: Traffic target

Traffic is displayed using a set of symbols that are commonly used in aviation for traffic/TCAS systems. As seen in Figure 121, 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-261/262 (TIS-A), 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 121 is +014, 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-A traffic sources such as the SV-XPNDR-261/262 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. The 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-A device (such as the SV-XPNDR-261/262) does not include the speed of aircraft since it is not sent by the ground-based TIS equipment. Thus, SkyView 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 System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for information on how to configure how traffic is displayed.

Traffic Advisory (TA) Targets



Figure 122: TA Symbol (on-screen)



Figure 123: 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 123 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

Proximity Advisory Targets 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.



Figure 124: Proximity Advisory

Non-Threat Targets

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



Figure 125: Non-Threat

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. See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* 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

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



Figure 126: Traffic Status

Possible devices and their possible states include:

- 

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.
- 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.
  - 

An ADS-B system is reporting that it does not know about radar traffic targets, or that it is not receiving information from any ADS-B ground station (in this case, you may still see aircraft that are equipped with 978 MHz ADS-B out devices via the ADS-B receiver). Although you are receiving ADS-B traffic from other ADS-B equipped aircraft, you are not receiving all detectable traffic because you are not currently in a radar service volume and ADS-B service volume. Thus, the traffic portrait may be incomplete.
- TIS: TIS-A traffic provided from an SV-XPNDR-261/262 or any other device that is configured to output traffic information in the Garmin TIS format.
  - 

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

SkyView is connected to a TIS-A traffic device, but you are not in a TIS service volume (actual TIS devices such as the SV-XPNDR-261/262 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.

The SV-ADSB-470 is not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.

Displaying traffic information on SkyView HDX from a third-party device is not authorized in Dynon Certified installations under Dynon's STC SA02594SE.

Traffic Receiver Priority

Only one device can provide traffic information to SkyView at any moment. If you have more than one device 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 receiving radar traffic. This is only possible if you are equipped with an ADS-B Out device such as a SV-XPNDR-261/262 or Garmin GTX 300 Series 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-470/472 with an incomplete traffic portrait (ADS-B PARTIAL): SkyView will annunciate "Partial" 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-A transponder from SV-XPNDR-261/262 / Garmin GTX 300 Series (when in an active TIS coverage area).
4. Flarm device.
5. Zaon device.

The SV-ADSB-470 is not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.

Displaying traffic information on SkyView HDX from a third-party device is not authorized in Dynon Certified installations under Dynon's STC SA02594SE.

Traffic Alert

The alert in Figure 127 below 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.



Figure 127: Traffic alert

MAP Buttons

Direct-To

The D→ (Direct-To) button brings up the INFO window when it is pushed, and nothing is selected. If there is an active Flight Plan, the current waypoint will appear on the INFO window. D→ also instantly starts navigation to an airport, navaid, or other waypoint when one is selected in the NEAREST, INFO, FLIGHT PLAN, or MAP POINTER windows. See the Moving Map section below for more information.

NRST

The NRST (Nearest) button brings up the NEAREST window. This window lists the nearest airports, navaids, and user waypoints. Once the NEAREST window is displayed, the FILTER button can be used to filter out airports that are less useful to you (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).

FILTER options can be configured in MENU > MAP SETUP > NEAREST LIST OPTIONS. Note that some airports may be completely screened out of the NEAREST list, regardless of the FILTER settings, if they are set to OFF in the MENU > MAP SETUP > MAP ITEMS options. See the Moving Map section below for more information.

Additionally, pushing and holding the NRST button activates/deactivates the Emergency Glide safety feature (see Emergency Glide in Section 8).

INFO

The INFO button brings up the INFO window. This window provides 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 is used 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.

On windows with multiple tabs across the top, the knob labeled CURSR is used to move the highlight cursor both vertically on the displayed tab and horizontally to select other tabs.

- To move the white cursor bar vertically, simply rotate the knob.
- To move the cursor horizontally across the tabs, push-and-hold the knob, then rotate. While the knob is held down, a secondary cursor, colored cyan (light blue), will appear on the current tab header and will move laterally across tab headers when the knob is rotated.
- Releasing the knob push will return control to the white vertical cursor.

FPL

The FPL (Flight Plan) button brings up the FLIGHT PLAN window. This page is used to create, display, or modify a Flight Plan. See the Flight Planning section of this guide for details.

ADD->FPL

The ADD->FPL button appears when the NEAREST or INFO window displayed and an airport, navaid, or other waypoint is selected. Press ADD->FPL to insert the selected item into the Flight Plan. See the Flight Planning section of this guide for more details.

MAP Controls

The MAP CONTROLS (see Figure 128) are accessed through the Main Menu. To access the MAP CONTROLS, press the MENU button.



Figure 128: MAP CONTROLS

MAP LAYERS

The MAP LAYERS menu allows the pilot to display "layers" (overlays) on top of the Moving Map. Enabling these features will display SkyView's built-in high resolution terrain and base-map with digital aviation and obstacle data from Dynon (FAA), Jeppesen, or PocketFMS, depending on the databases installed.

- **TOPOG –** Displays high resolution terrain and base-map with digital aviation and obstacle data. The aviation and obstacle data will vary depending on the various databases installed (Dynon / FAA, or others)
- **TERRAIN ALERT –** Displays terrain in Red or Yellow as an alert to elevations.
- **VFR –** Displays geo-referenced VFR enroute charts (sectionals/world area/terminal area charts in the US). The VFR icon is only displayed when that data is available on a USB flash drive plugged into the SkyView HDX display. The label of this icon may change when using data for regions outside the US.
- **IFR LOW –** Displays geo-referenced IFR low altitude enroute charts. The IFR LOW icon is only displayed when that data is available on a USB flash drive plugged into the SkyView HDX display.
- **IFR HIGH –** Displays geo-referenced IFR high altitude enroute charts. The IFR HIGH icon is only displayed when that data is available on a USB flash drive plugged into the SkyView HDX display.

WEATHER OPTIONS

The WEATHER OPTIONS Page allows the pilot to control what and how weather reports are shown on top of the Moving Map when a weather device such as the SV-ADSB-470/472 is connected. See the Weather section below for more information.

USER WAYPOINTS

The USER WAYPOINTS Page presents a list of user-created waypoints existing in SkyView, together with button controls on the bottom of the page for creating, editing, and deleting user waypoints and for importing and exporting user waypoints to/from a USB stick. Managing user waypoints is discussed in detail in a later section of this manual.

MAP SETUP

The MAP SETUP menu (see Figure 129) provides additional Moving Map feature settings.

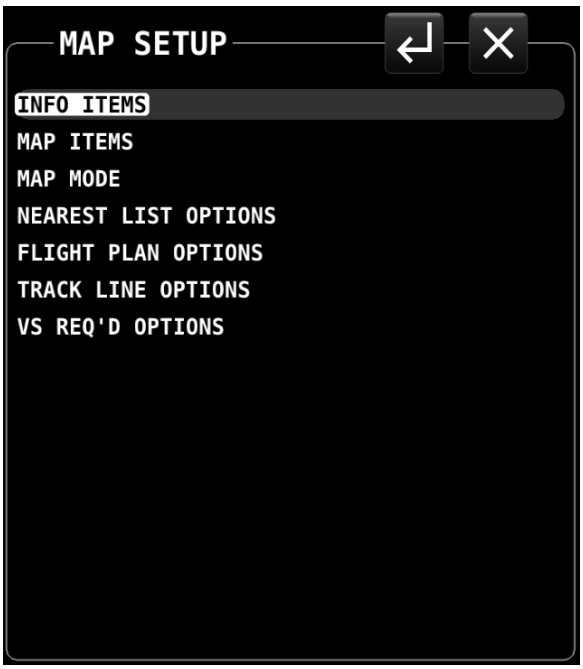


Figure 129 – MAP SETUP menu

MAP SETUP – Moving Map Preference Configuration

Many aspects of the Moving Map's appearance can be configured or modified using the MENU > MAP SETUP menu.

The following section describes the various MAP features and behaviors that can be adjusted through this menu.

- INFO ITEMS: Info Items are user-selectable data relating to VFR GPS navigation which can optionally be displayed in a special region on the screen. These items are described in more detail in the MAP INFO COLUMN section below.
- 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 Moving Map using this feature.
- MAP MODE:
  - MAP MODE – Use this setting to specify when the Moving Map is displayed in "Track Up" vs. "North Up" orientations.
  - WITH CHART – Use this setting to specify whether the Moving 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 AVIATION DATA OVER CHART – Use this setting to choose whether the following MAP Items are drawn over charts: Regions, Airspaces, Airports, Fixes, NDBs, VORs, and VRPs
  - 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 increase / decrease the range of the Moving Map.
  - FULL SCREEN MAP – Use this setting to assign either the left or right knob to the (MAP) when the MAP age 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 and apps.
    - 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 final waypoint (i.e., destination airport/runway) in the 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 on the PFD in the VS REQ'D DESTINATION Info Item, the vertical speed tape, and the VNAV Indicator if Synthetic Vision is enabled.
- TERRAIN WARNING COLORS: Selecting this item ON will enable the display of terrain proximity alerting on the Moving Map, subject to the following proximity parameters:
  - RED START: defines the proximity – in hundreds of feet below, and above or below the aircraft – which trigger red terrain color coding.
  - YELLOW START: defines the proximity – in hundreds of feet below, and above or below the aircraft – which trigger yellow terrain color coding. The feet proximity value for YELLOW START should fall <u>below</u> that designate for RED START.

MAP INFO COLUMN

The MAP INFO COLUMN is an optional vertical data column which can be displayed on the screen in addition to any of the primary content (PFD, ENGINE, MAP). This column is selected On or Off on the DISPLAY LAYOUT Page described in Section 3: SkyView HDX Display Operations.

When the MAP INFO COLUMN is displayed, it contains up to 10 separate information items derived from SkyView's VFR GPS Navigator. Each of the items in the list below can be selected for display in one of the 10 positions in the vertical data column. The positions are numbered 1 through 10 from top to bottom.

The following figure shows an example of the MAP INFO COLUMN displayed together with the PFD (Primary Content) and MAP (Split Content).



Figure 130: MAP INFO COLUMN displayed on right side of screen.

The contents of each position in the MAP INFO COLUMN can be selected by accessing MENU > MAP SETUP > INFO ITEMS.

- Off: (no data will be displayed).
- AGL – Above Ground Level: The literal height above the ground over which the aircraft is currently flying. Displayed in same units as altimeter.
- BEARING TO WPT - Bearing to Waypoint: bearing from the aircraft's current position to the next waypoint in the active Flight Plan.
- COURSE: Course designated by the active leg.

- CROSS TRACK: This is the aircraft's lateral displacement from the current course line, measured as the perpendicular distance from the aircraft's current location to the course line.
- CURRENT LOCATION: Lat/Long position of the aircraft.
- DESTINATION WPT – Destination Waypoint: Identifier of the final waypoint in your Flight Plan.
- DISTANCE TO GO: The total distance remaining along the Flight Plan.
- DISTANCE TO WPT - 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 (MENU > MAP SETUP > 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 (MENU > MAP SETUP > 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 (MENU > MAP SETUP > 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 (MENU > MAP SETUP > 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: The aircraft's current GPS ground speed.
- NEXT COURSE: The direction from the next waypoint to the waypoint after that in a Flight Plan.
- NEXT WAYPOINT: The waypoint after the current active waypoint in the Flight Plan.
- 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 on the vertical speed tape and the VNAV Indicator if Synthetic Vision is enabled.

MAP and Chart 50% Window – Maximize/Minimize Controls

When the MAP is presented as the 50% split content, you may wish to maximize the area dedicated to the Moving Map for better situational awareness. Located in the upper-left corner of the MAP you will find a "Maximize" icon, shown at right:



Figure 131: Maximize

When the Maximize icon is touched, the MAP will expand to the full 50% window of the display, removing from view the MAP INFO COLUMN (if selected ON) and the ENGINE BOTTOM BAND (non-primary side, if selected ON).

While the MAP is maximized, the icon in the upper left hand corner will change to the image at right. This is the "Minimize" icon. To restore the MAP INFO COLUMN and/or the hidden portion of the ENGINE BOTTOM BAND (if they are selected ON) to view, touch the Minimize icon.



Figure 132: Minimize

Examples of MAP in the maximized and minimized views are shown in the two figures below:



Figure 133: MAP is maximized



Figure 134: MAP is minimized

The Maximize/Minimize icon and behavior is also available when displaying charts (taxi diagrams and instrument procedures).

Navigation and Flight Planning

SkyView HDX's Moving Map 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 methods are covered in the following sections.

Find an Airport or Navaid by Identifier

To find an airport or navaid, press INFO (Button 4) on the Main Menu bottom bar. A window like the one seen in Figure 135 will be displayed.



Figure 135: 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 knob down to find the desired item by identifier, facility, or city*. To do this, move the CURSR knob 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 knob right to select the next character and continue until the desired facility is shown.

Alternatively, if you move the CURSR knob 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 knob up to highlight the APT tab. Then, move the knob to the right to select different subcategories 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 NRST (Button 3) on the Main Menu. A window like the one seen in the following figures will be displayed.



Figure 136: Moving Map Nearest window – full data



Figure 137: 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 (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 MENU > MAP SETUP > MAP ITEMS, such as private airports or seaplane bases, will not appear in the nearest list at all.

To view data under each tab, either touch the tab name or push-and-hold the CURSR knob while rotating to move a secondary blue cursor left and right among the tabs. Rotate the CURSR 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

You 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 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 – You can choose to display Any Surface, Water only, Hard and Soft or Hard only when FILTER is engaged.
  - PRIVATE AIRPORTS – You can choose to Show or Not Show private airports when FILTER is engaged.

- MINIMUM RUNWAY LENGTH – You 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 pushed, 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, COM (frequencies), WX (weather), RWY (runways) and RMK (remarks) tabs.

Push-and-hold the CURSR knob while rotating to move a secondary blue cursor left and right among the tabs to select the information you wish to see.

Some tabs have more information than can fit on the screen at once. In this case, rotating the knob 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 COM tab, many of the frequencies 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  or touch anywhere in the area with the additional information.

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.

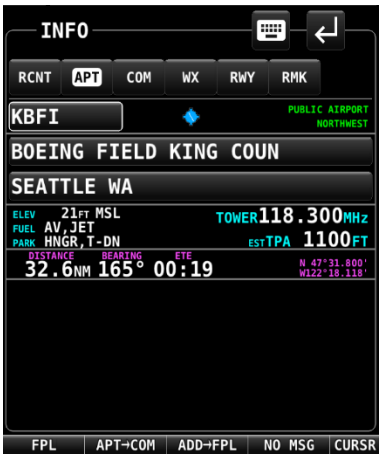


Figure 138: Airport Info

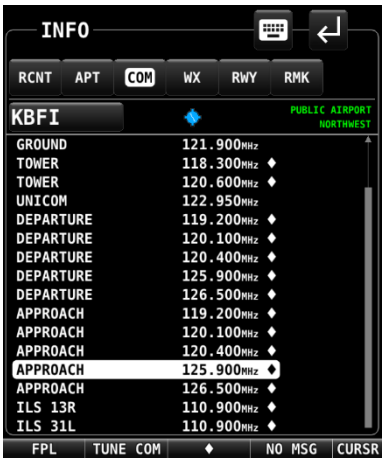


Figure 139: Airport Frequency Info



Figure 140: Frequency Narrative



Figure 141: Airport Runway Info

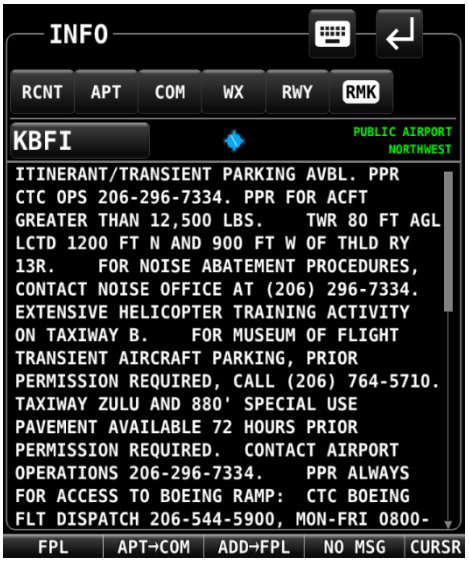


Figure 142: Airport Remarks

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 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. A PFD, HSI, and MAP depiction of this behavior is show in Figure 143.

Whenever navigation to a waypoint is active the FPL > NAVIGATE button highlights to indicate that a Flight Plan is active.

*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.

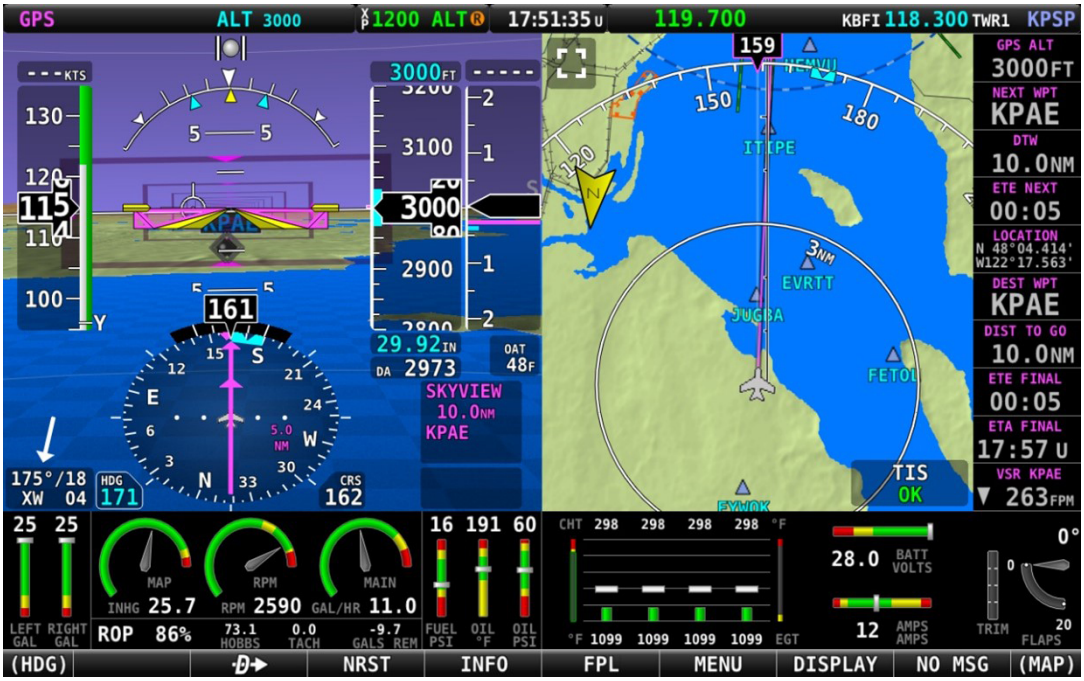


Figure 143: MAP/HSI with Navigation active

Suspend Navigation

When SkyView is providing navigation guidance to a waypoint, press 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 HDX'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 PUSH the knob 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

Panning on the Moving Map is used to view areas away from the aircraft's current position. Panning is one of the rare actions in SkyView HDX which can only be accomplished using a touch gesture. To pan on the Moving Map, simply touch the map and drag your finger across the screen in any direction to pull the desired area into view.

When in this MAP Panning Mode, the MAP Page does not auto-center on the airplane, but on the MAP Pointer instead. Turning the knob causes the Moving Map range to increase and decrease (zoom in/zoom out) around the MAP Pointer, just like it does when it is following the aircraft.

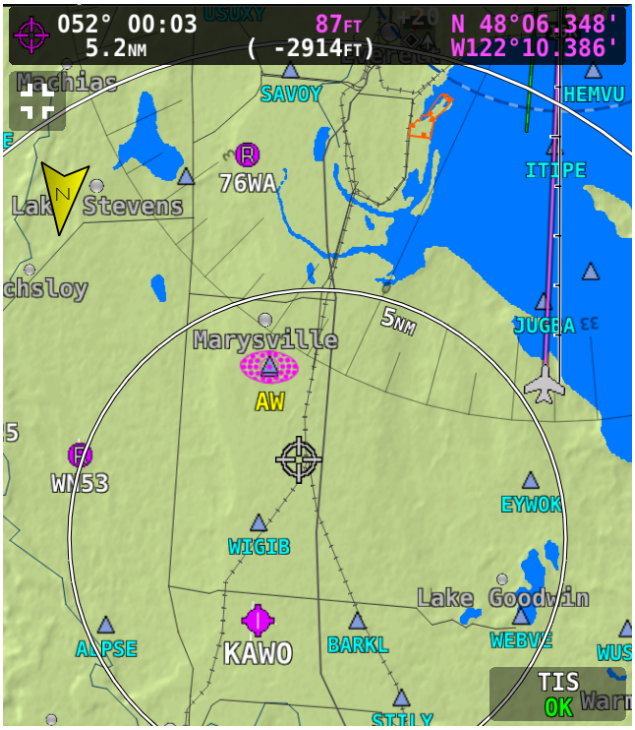


Figure 144: MAP Panning Mode

To exit MAP Panning Mode, press the knob, or touch the black information box which is displayed across the top of the Moving Map while in panning mode. The Moving Map will revert to centering on the aircraft's position. Pressing the knob 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.)

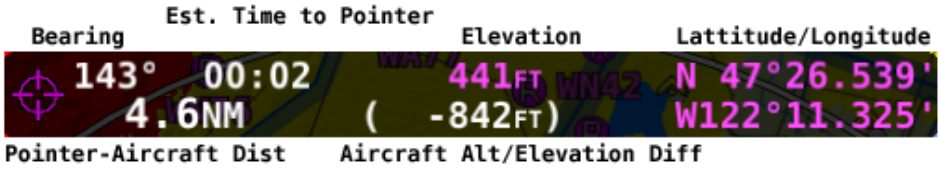


Figure 145: MAP Pointer Information Bar

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 section on User Waypoints for more information about using the user waypoints feature).

When in MAP Panning Mode, the MENU > USER WAYPOINTS > ADD MAP CURSOR POSITION 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. In this context, the position being referenced is noted in magenta colored print 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 Moving Map can be selected. This includes items such as airports, airspaces, navaids, waypoints, obstacles and cities.

To select an item, simply touch the Moving Map at the location of the item of interest. 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 touching anywhere inside 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 knob. Note that this disables the normal range/zooming function of the knob, unless there is only one item selected. To re-enable the ranging function of the knob you must touch somewhere else on the Moving Map where there is no more than a single item stack or no selectable item. Then the knob will resume its MAP scaling function.

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 146: Airspace selected.



Figure 147: 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 Moving 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 a third-party navigator is active and that device is selected as the navigation source.

It is important for you to know whether SkyView has been configured to always tie Flight Plans to the HSI navigation source (i.e., SkyView or a third-party navigator), or not. When enabled, this ensures that if you change the HSI or Flight Plan source, the other will follow automatically. If not enabled, the HSI may show navigation guidance that is different from that shown on the Moving Map.

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 > USER WAYPOINTS Page, or by importing a Flight Plan file from a USB flash drive 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 HDX's Flight Plan window and on SkyView HDX's Moving Map, but all waypoint editing must be done on the source GPS.

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 flash drive for later retrieval or sent to a compatible a supported app. Importing a Flight Plan from a USB flash drive 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 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 flash drive. 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 Runway Centerlines

When the Flight Plan origin, a waypoint, or the destination is an airport, extended runway lines for all runways on the airport are shown on the Moving Map, as shown in Figure 148. To navigate along a specific runway's extended centerline, push the INFO button with the desired airport selected, select the RWY, and rotate the knob to select the desired runway, and press "Direct-To."



Figure 148: 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 FPL (Button 5) on the Main Menu bottom bar 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. Push-and-hold the knob while rotating it left or right to display information associated with each tab. Simply rotate the knob 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. Additional Flight Plan tabs may be available if other compatible GPS navigators are connected to SkyView.

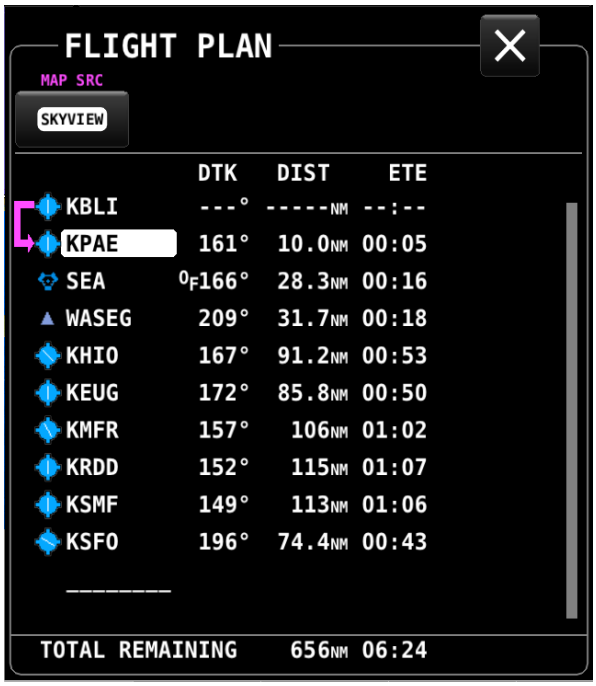


Figure 149: Flight Plan window

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 (MENU > MAP SETUP > 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:

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.

APT->COM

Press to send the ID of the selected airport to the Dynon SkyView Com radio as the airport of reference.

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. See 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 rotating the knob. Push the knob to select the intended operation.

Some operations require confirmation when selected. In those cases, push the knob twice – once to select, then again to confirm – to select the intended operation. This confirmation prompt is depicted in Figure 151.

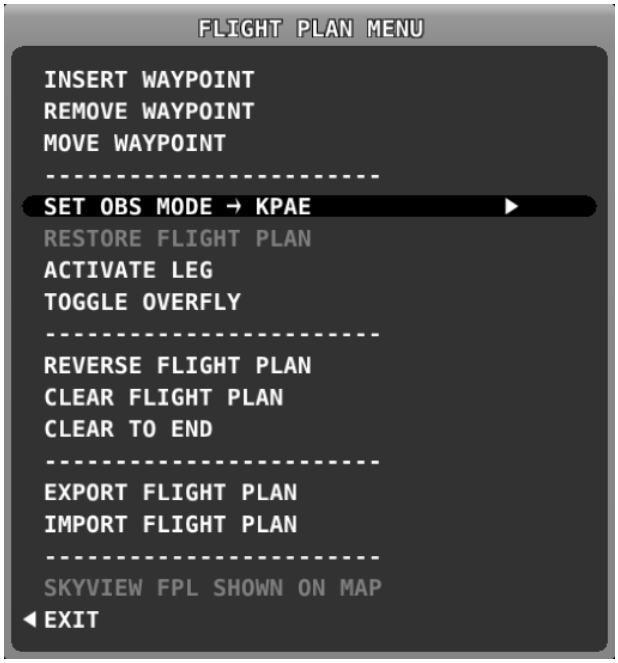


Figure 150: FLIGHT PLAN MENU

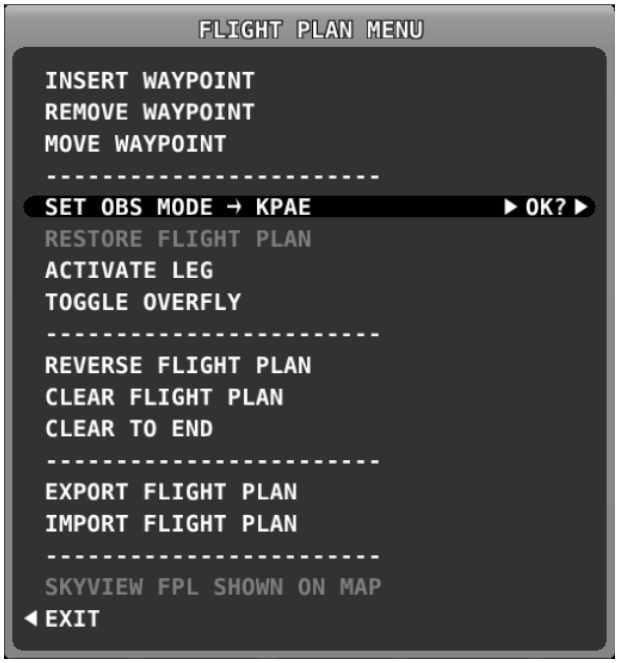


Figure 151: FLIGHT PLAN MENU – Confirmation Prompt

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 knob.
- RESTORE FLIGHT PLAN: Restores a Flight Plan that was temporarily overwritten by using the D→ function from elsewhere in the Moving 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 flash drive. 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 receiving a Flight Plan from 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 HDX's Moving Map. The waypoints from an external navigator cannot be edited within SkyView.

Activating a Flight Plan

With the Flight Plan window open, 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 within a Flight Plan other than the first or currently active waypoint, open the Flight Plan window, scroll to the waypoint you want to navigate to, and simply 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 figures 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 152: Active Flight Plan – Flight Plan shown



Figure 153: 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 FPL (Button 5) on the Main Menu to open the Flight Plan window and menu. The currently active Flight Plan is displayed. Push-and-hold the knob while rotating to move the blue secondary cursor left or right to display each available Flight Plan sources in the window. The Flight Plan currently being displayed on the Map is designated by the magenta label "MAP SRC" above the Flight Plan's tab. To make the selected Flight Plan the source for MAP source, 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).

Changing the Flight Plan source on the MAP Page DOES NOT change the HSI source on the PFD unless enabled in System Setup.

With recent software updates, Garmin disabled the ability for GNS and GTN series avionics to accept changes from non-Garmin equipment. Thus, 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 Moving Map.



Figure 154: 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.

Exchanging Flight Plans with third-party apps over Wi-Fi is not authorized in Dynon Certified installations under Dynon's STC SA02594SE.

To exchange Flight Plans:
Make sure third-party app is connected to SkyView Wi-Fi (see SkyView Wi-Fi Adapter for instructions).

1. On SkyView, set "Allow Incoming Flight Plans" "Over WI-FI" to YES under MAP > FLIGHT PLAN OPTIONS.
2. On third-party app, send or receive Flight Plan per app provider's instructions.
3. Once SkyView receives Flight Plan a confirmation message will appear on the Moving Map and the Flight Plan will be in SkyView Flight Plan window. The Flight Plan can then be used and edited on SkyView.



Figure 155: 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 Moving Map is excessive.



Figure 156: Flight Plan alert messages

VNAV: Vertical Navigation

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 or designated runway threshold in the Flight Plan, including commanding the Autopilot to fly this calculated descent path.

The descent path is defined by parameters established by the pilot in MENU > MAP SETUP > VS REQ'D. 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, rising from the defined destination point upward toward aircraft at the angle specified. It is important to note that the target descent path is mathematically calculated and does not assure terrain or obstacle clearance.

A magenta arrow on the VSI indicates the vertical speed necessary to descend along a path calculated at the defined height/angle and arriving at the intended destination point. This indicator is a "future value," in other words, it gives 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 bar indication, the aircraft would descend well prior to the intended point. If the aircraft maintains is current altitude until vertical speed and the arrow match, the aircraft will have intercepted the calculated descent path.

If Synthetic Vision is enabled, a VNAV indicator is presented next to the HSI. The VNAV indicator uses a bar and tick marks to indicate vertical or angular deviation from the target descent path. The bar is magenta, indicating vertical deviation from a glidepath, when GPS is the navigation source. The bar is green, indicating angular deviation from a glideslope, when a NAV radio tuned to an ILS is the navigation source. Note that when SkyView's built-in VFR vertical navigation is the source, the magenta bar does not appear on the VNAV indicator until the aircraft is within 5 minutes of Top of Descend (TOD).

Synthetic Vision gives the pilot more awareness of possible terrain or obstacle clearance but should never be a substitute for visual confirmation.

If Autopilot is engaged and VNAV mode is properly armed (see Chapter 8: Expert Autopilot Pitch Modes), then the autopilot will sequence to VNAV mode and fly the necessary vertical speed to stay on the calculated path when the aircraft approaches the destination, and the calculated descent path is reached.

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

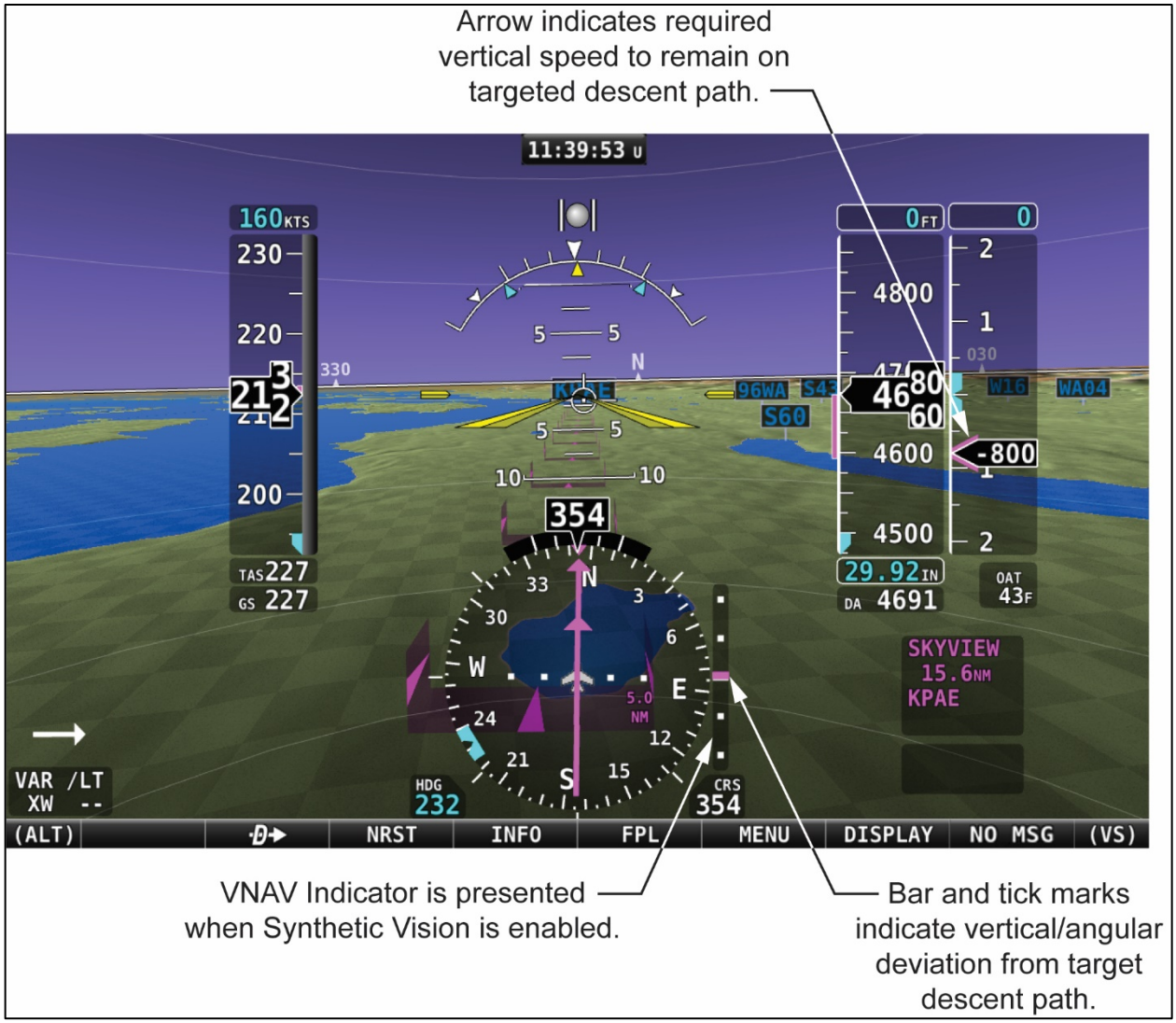


Figure 157: VNAV approach to airport using glidepath.

OBS Mode

OBS Mode allows you to set and adjust an inbound course to any navigable point on the Moving Map. That inbound course may then be easily adjusted with the HSI CRS knob, like 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, select FPL, highlight the waypoint you would like to 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.

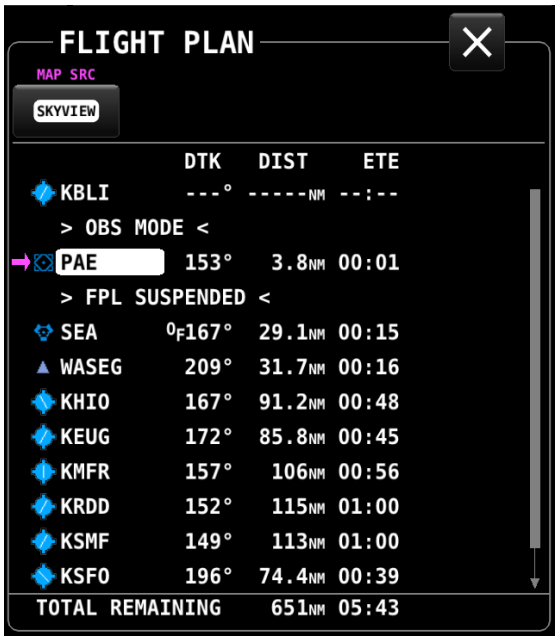


Figure 158: OBS Mode activated

Adjusting the OBS Course

Once OBS Mode is set, you can use the CRS knob 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 HDX's MAP Page rotate in tandem with the course on the HSI display.

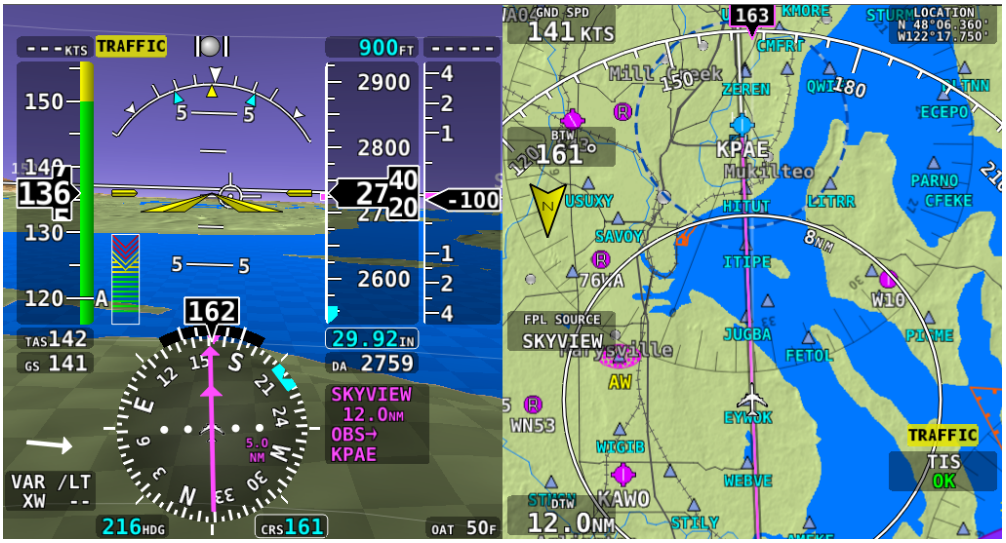


Figure 159: OBS Mode – on course

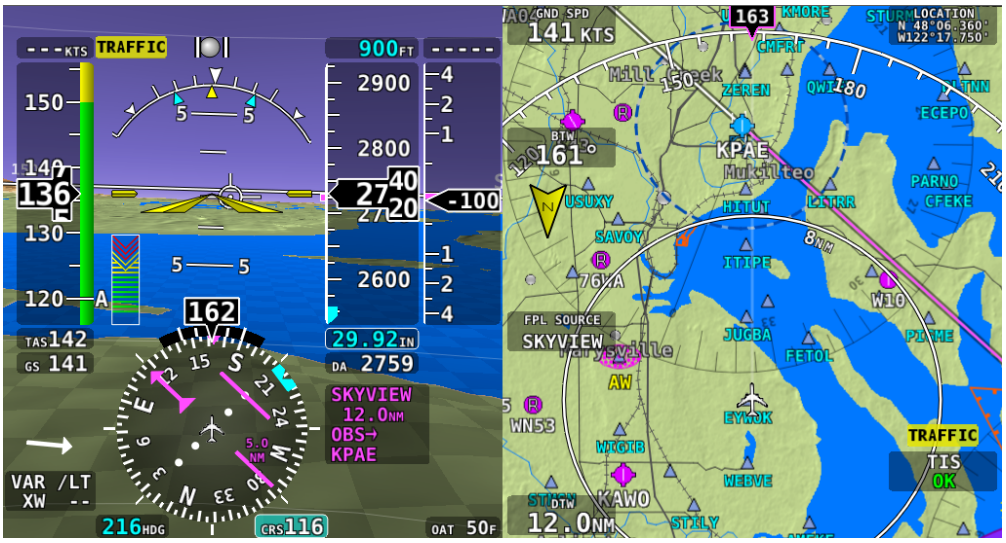


Figure 160: OBS Mode – course set to 116

Turning Off OBS Mode

To turn off OBS Mode, open the Flight Plan, then select 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 – Turning 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 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 PLT ("Plates", another term for instrument procedure charts) tab available in their Information window – see Figure 161 below.

Viewing Procedure Charts and Airport Diagrams

Turn the CURSR 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, turn the knob to zoom in and out of the chart. Panning is accomplished using touch gestures. Both panning and zooming function the same on charts and on the regular MAP Page.

Returning to the MAP View

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

- Press EXIT icon  in the top right corner of the chart.
- Press (click) and hold the 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 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.

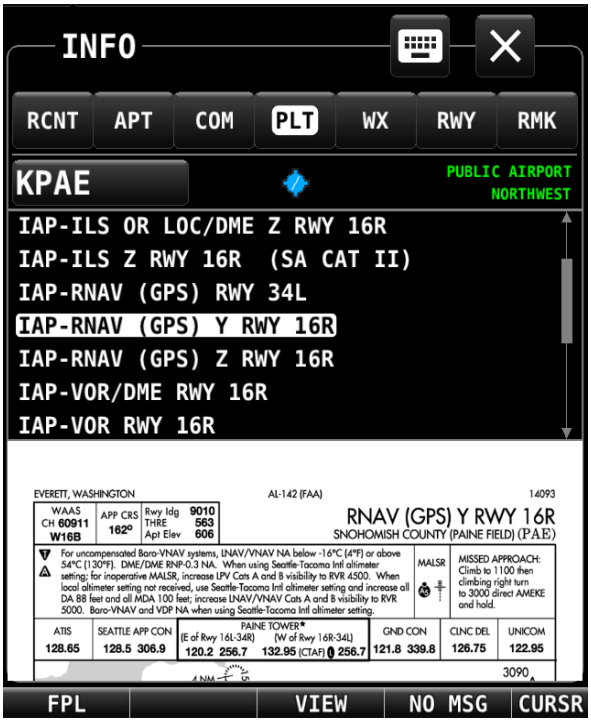


Figure 161: Charts Tab – preview

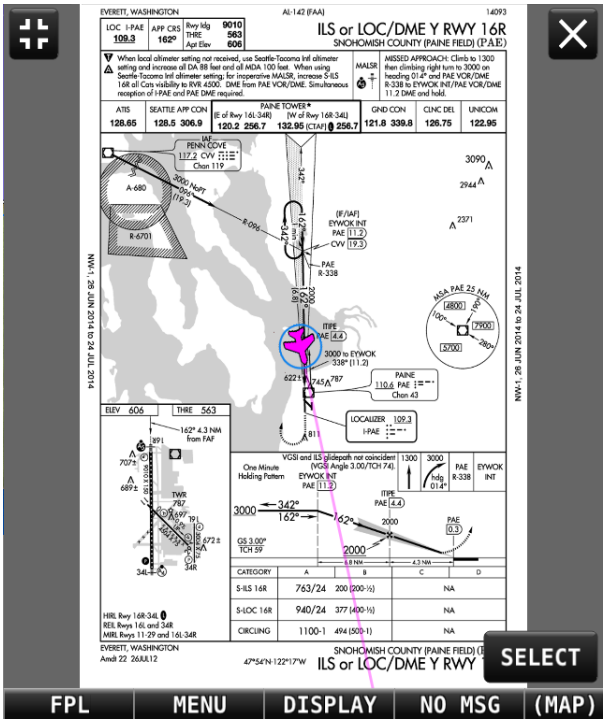


Figure 162: Charts Tab – full view

SkyView User Waypoints

SkyView supports the ability to create, manipulate, and import/export User Waypoints. A User Waypoint is a point on the Moving 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.

User waypoints are managed from a touchable control page. Open that page by selecting MENU (Button 6) on the Main Menu, then selecting the USER WAYPOINTS icon. The following page will appear.



Figure 163: USER WAYPOINTS Page

The top portion of the USER WAYPOINTS Page shows a list of all user waypoints currently stored in the system. The cursor highlight bar can be scrolled vertically in the list by rotating the CURSR knob. The listing for each waypoint includes ID, custom icon, distance and bearing from the aircraft's position to the waypoint.

The bottom portion of the USER WAYPOINT Page has several buttons for managing waypoints. Their functions are briefly described below, with examples following.

- EDIT: For the waypoint item highlighted in the list, selecting EDIT will open the EDIT WAYPOINT Page. There all information associated with the waypoint can be edited and saved.
- ADD MAP CURSOR POSITION: Selecting this item will open the ADD WAYPOINT Page, where all necessary information for a waypoint can be entered. The ~~LATITUTDE~~LATITUDE and ~~LONGTITUDE~~LONGITUDE fields will be pre-populated to reflect the position of the MAP cursor at the time the page was opened. Note: this button will only be available if the MAP is in panning mode. Otherwise, this button will be greyed out and not selectable.
- ADD PRESENT POSTION. Selecting this item will open the ADD WAYPOINT Page, where all necessary information for a waypoint can be entered. The ~~LATITUTDE~~LATITUDE and LONGTITUDE fields will be pre-populated to reflect the present position of the aircraft.
- DELETE: For the waypoint item highlighted in the list, selecting DELETE will remove the selected item from the waypoint database. A confirmation dialogue will appear, requiring the pilot to respond YES or NO to complete the deletion.

- EXPORT: Selecting EXPORT will export the entire user waypoint list to a USB stick, provided one is present in either of the USB ports on the SkyView HDX display.
- IMPORT: Selecting IMPORT will import a valid user waypoint file from a USB stick, provided one is present in either of the USB ports on the SkyView HDX display.
- CLEAR DATABASE: Selecting CLEAR DATABASE will erase the entire contents of the USER WAYPOINTS database stored in the system.

Creating Waypoints

A new user waypoint may be created either at the aircraft's current position or at the position of the MAP cursor provided the MAP is currently in the panning mode. Selecting the appropriately named button will open the ADD WAYPOINT Page shown below.



Figure 164: ADD WAYPOINT Page

This page includes six editable fields. The first field will be selected with a white box, indicating the selection cursor is located there. Select each field to be edited in turn either by touching the field or by rotating the CURSR knob to move the white cursor box to that field, then pushing the knob to commence editing. Once in the edit mode, select each character by rotating the knob. Move to the next character in the field by pushing the knob. If an incorrect character is entered, retreat to the previous character by pushing-and-holding the knob for one second.

After completing the edit of each field, select another field to edit by touching the desired field.

The six (6) editable fields for a waypoint are:

- ID - IDENTIFIER: 8-character identifier which will appear on the MAP at the waypoint's location. Similar to an airport ID or fix label.
- NAME: A 22-character text field for describing the waypoint. This name will only appear in the waypoint control pages but will not be displayed on the Moving Map.

- LATITUDE: The latitude value defining the waypoint's position.
- LONGITUDE: The longitude value defining the waypoint's position.
- ALTITUDE: A reference altitude associated with the waypoint. This altitude value is informational only and is not used for navigation by the Autopilot.
- Customizable Icon: Each waypoint can be assigned a symbol or icon to further identify its location on the Moving Map. The user can select from a built-in list of multiple symbols in multiple colors.

Once all information has been entered for the new waypoint, complete the process by taking one of the following actions:

- RETURN: Select the RETURN icon  in the upper left corner of the page to save the new waypoint and return to the USER WAYPOINTS Page.
- CANCEL: Select the CANCEL button at the bottom of the page to exit the ADD WAYPOINT Page without saving the new waypoint and return to the USER WAYPOINTS Page.
- ADD TO FPL: Select the ADD TO FPL button to 1) save the waypoint to the User Waypoints database and 2) insert the newly created waypoint into the current Flight Plan. In that case, the ADD WAYPOINT Page will be closed, the FLIGHT PLAN Page will open, and page navigation will proceed normally from controls on the FLIGHT PLAN Page.
- SAVE: Select the SAVE button to save the new waypoint and return to the USER WAYPOINTS Page. This action is identical to selecting the RETURN icon at the top left corner of the page.

When new user waypoints are saved, they will automatically be synchronized across multiple SkyView displays in the aircraft provided they are connected via an optional Ethernet connection. See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for more details about this connection.

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 knob 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 165: INSERT WAYPOINT window

After INSERT is pushed from the Insert Waypoint Menu, or if ADD->FPL is pushed when a waypoint is highlighted in the Nearest/Info/ window, the selected waypoint is highlighted within the Flight Plan. Turn the knob or move the knob 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.

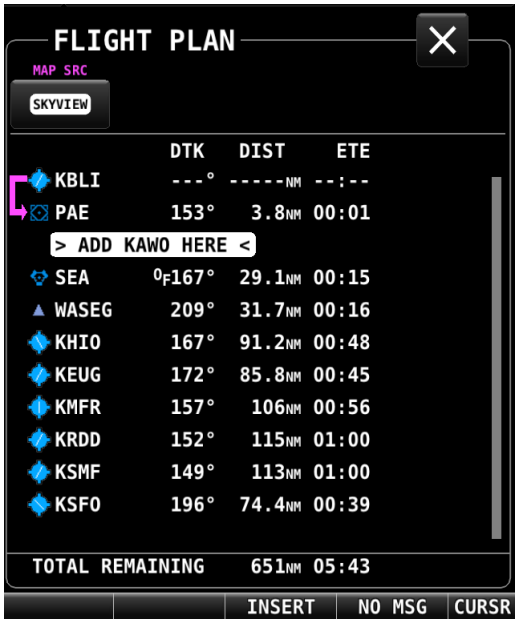


Figure 166: Flight Plan Waypoint insertion

Editing and Deleting Waypoints

Waypoints may be either edited or deleted by highlighting the intended waypoint in the USER WAYPOINTS list, then selecting the appropriately labeled button at the bottom of the USER WAYPOINTS Page.

An alternative method for editing a waypoint is to highlight the intended waypoint in the list, then push the CURSOR knob to open the EDIT WAYPOINT Page.

When the EDIT action has been selected, the EDIT WAY POINT Page will appear.



Figure 167: EDIT WAYPOINT Page

This page offers two alternative actions when editing is complete:

- Save the edits and return to the USER WAYPOINT Page by selecting either the RETURN icon at the top left corner of the page, or the UPDATE button at the bottom of the page.
- Discard any edits without changing the waypoint's data by selecting the CANCEL button at the bottom of the page.

User Waypoints CSV 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; 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's 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 USR ("User") tab on the NEAREST Page. The USR 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

When connected to an SV-ADSB-470/472 module, SkyView can display NEXRAD weather and 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. Thus, 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. Thus, 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 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 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.

The SV-ADSB-470 is not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.

As soon as SkyView HDX 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 you 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 HDX'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 HDX'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 is able to convey 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.

Weather Options Controls

The display of various weather data is controlled through WEATHER OPTIONS (MENU > WEATHER OPTIONS).



The SV-ADSB-470 is not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.

The WEATHER OPTIONS Page includes the following controls:

MAP LAYER:

- WEATHER – Pressing the WEATHER icon toggles the weather overlay on or off (when a weather device such as the SV-ADSB-470/472 is connected). When WEATHER is toggled on, the normal topographical colors-coding will become muted or shade, and any graphical weather will be depicted in bright colors.

- ANIMATE – Pressing the ANIMATE icon "animates" the weather presentation on the Moving Map. (The SV-ADSB-470/472 must have been running for a long enough period to gather successive NEXRAD Pages.)

MAP CONTENTS:

(This group controls the two types of weather data that can be displayed when the WEATHER layer is turned on)

- METAR ICONS – Pressing the METAR ICONS button toggles on/off the display of weather condition icons over the airport symbol for each airport reporting weather. When selected ON, the airport icon will be overlaid with a round color-coded icon indicating current weather: green for VFR; blue for MVFR; red for IFR.
- NEXRAD – Pressing the NEXRAD button toggles on/off the display of graphical NEXRAD weather data.
- LIGHTNING – Pressing the LIGHTNING button toggles on/off the display of lightning weather data.
- PIREPS – Pressing the PIREPS button toggles on/off the display of pilot-reported weather data.

METAR / TAF TEXT:

- DECODED – Pressing the DECODED button will present text weather data in decoded format when viewing the WX tab for a selected airport on the INFO Page.
- RAW – Pressing the RAW button will present text weather data in raw METAR format when viewing the WX tab for a selected airport on the INFO Page.

The following sections refer to these controls on the WEATHER OPTIONS Page.

Displaying NEXRAD Weather

When an SV-ADSB-470/472 is connected and configured, graphical NEXRAD weather data can be depicted on the Moving Map.

First, the WEATHER button within the MAP LAYER group must be enabled. Once the weather layer is turned on, the two types of data controlled in the MAP CONTENTS group will be presented on top of any other active MAP layer. If the TOPOG (topography) MAP layer is enabled, the terrain color coding will be muted while the WEATHER layer is enabled to allow the NEXRAD weather 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.

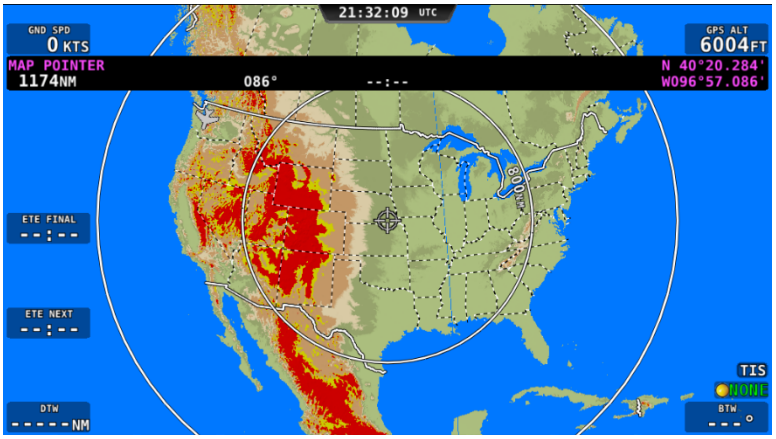


Figure 168: MAP – Terrain view (no weather)

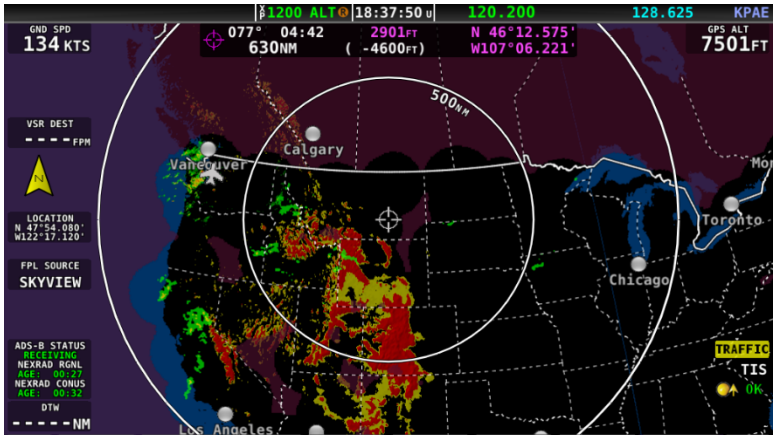


Figure 169: MAP – Weather Only view

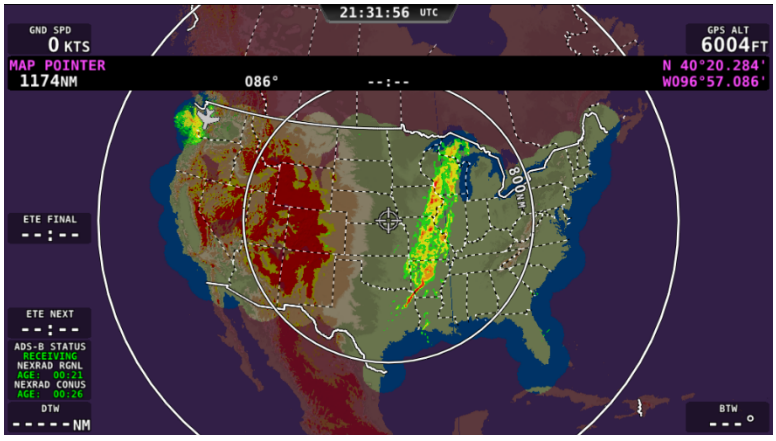


Figure 170: MAP – Terrain and WX view

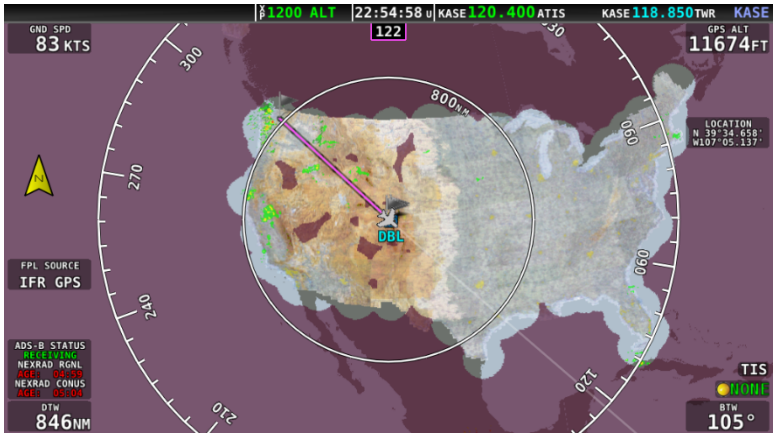


Figure 171: MAP – VFR and WX view

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 8: 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 170 above.

Data blocks not received for an area due to radio signal obscuration, interference, or other radio phenomena:



Figure 172: Missing NEXRAD 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:

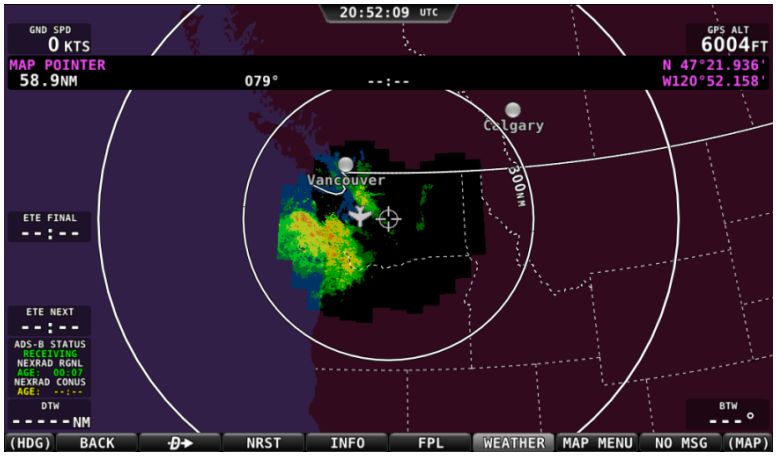


Figure 173: Regional NEXRAD Only / No CONUS

In all of these cases, areas for which no data is available is 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 174: Data Current



Figure 175: Data Stale



Figure 176: Data Expired



Figure 177: 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 Moving Map.)
  - 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 Moving Map.)

  - 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 Moving Map (see Figure 178).

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.

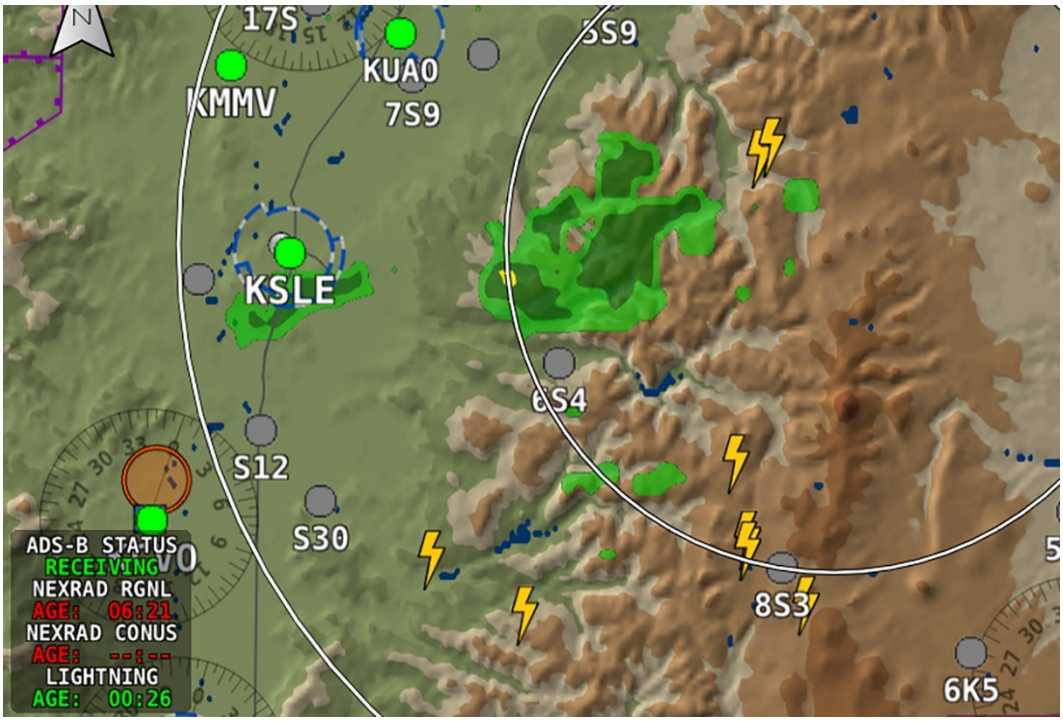


Figure 178: Lightning indications on MAP example.

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 179). The on-screen indications for PIREPS are dynamic and touching them opens a PIREP Page (see Figure 180) 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 180. (See Table 9 for a list and descriptions of the PIREPS that SkyView displays.)



Figure 179: PIREP indication on MAP example.



Figure 180: 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 9: 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 NRST window will contain a WX (weather) tab whenever weather information is available to SkyView:

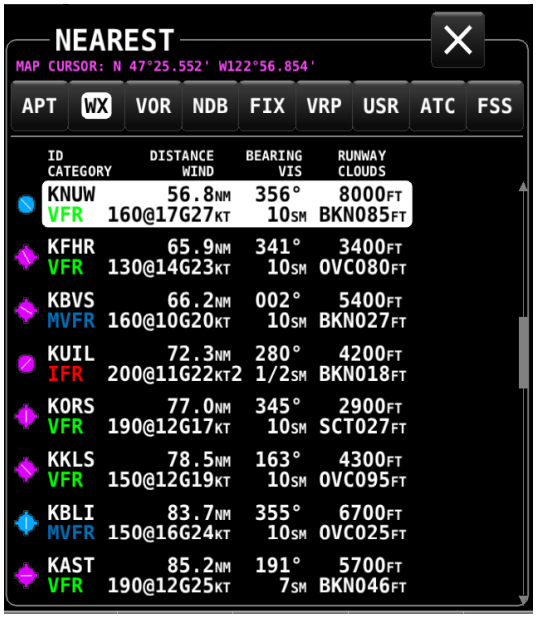


Figure 181: NEAREST WX

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

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 on 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 (MENU > WEATHER OPTIONS > [MAP CONTENTS] > 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 MENU > WEATHER > [METAR/TAF TEXT], the METARs and TAFs on the WX Page can be in raw or decoded form:

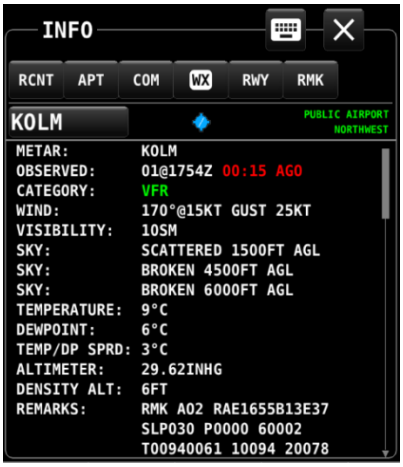


Figure 182: METAR – decoded

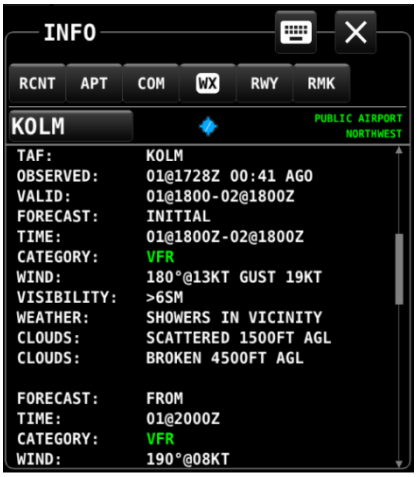


Figure 183: TAF – decoded

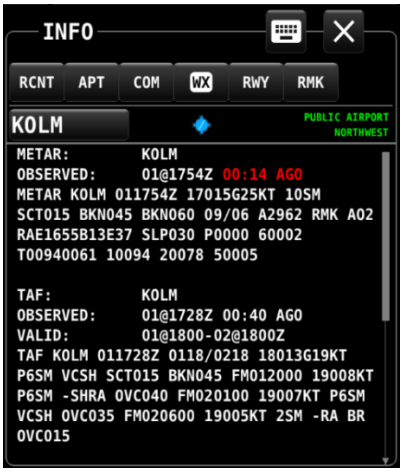


Figure 184: METAR/TAF – raw

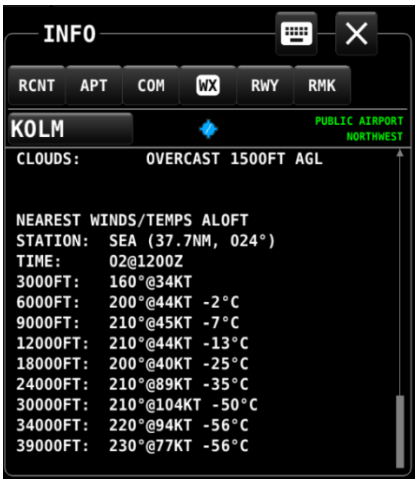


Figure 185: Winds Aloft Forecast text

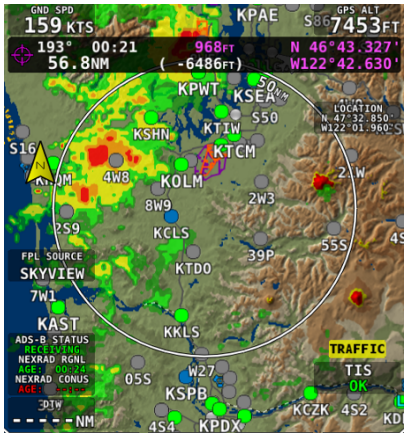


Figure 186: METAR icons on MAP

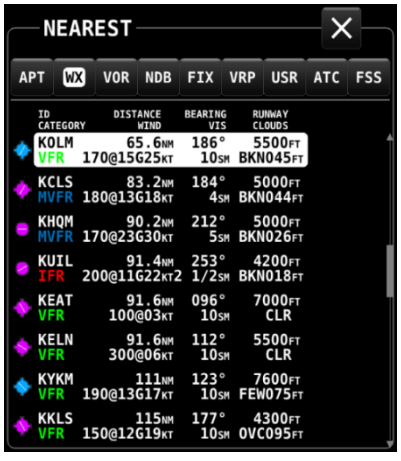


Figure 187: METAR icons in NEAREST list

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

When connected to an SV-ADSB-470/472 module, SkyView can display Temporary Flight Restriction (TFR) information visually on the SkyView MAP.



The SV-ADSB-470 is not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.

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 time 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 like 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. Thus, 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 MENU > MAP SETUP > MAP ITEMS > TFR OPACITY.

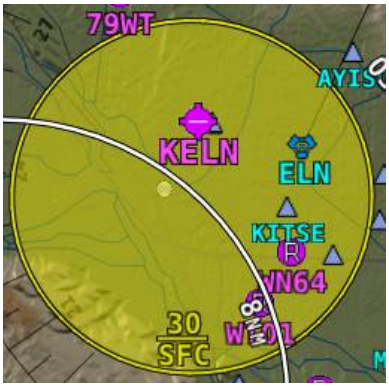


Figure 188: Upcoming TFR

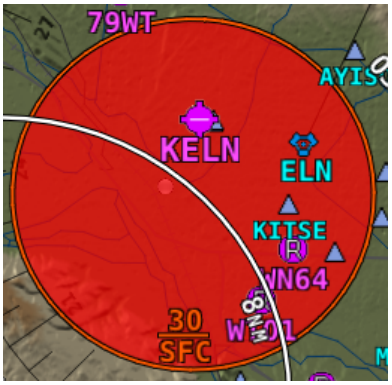


Figure 189: Active TFR



Figure 190: 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 Moving Map. See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* 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 MENU > MAP SETUP > MAP ITEMS.

The calculated area does not take into 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 actual conditions.

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.



Figure 191: Glide Ring example

6. ENGINE Operation

This section describes SkyView ENGINE functionality and a few of the advanced ways to use it to monitor the health and operation of your engine(s).

ENGINE Page layouts on SkyView HDX displays should have been configured during initial system installation and setup. See the *SkyView System Installation Guide* for more information.

For Dynon Certified installations under Dynon's STC SA02594SE, ENGINE Page layouts on SkyView HDX displays should have been configured by a certified technician during initial system installation. See the *SkyView HDX System Installation Manual (Certified)* for more information.

Twin-engine (i.e., dual EMS modules) installations in Dynon Certified installations under Dynon's STC SA02594SE have specific EMS display requirements and limitations. See the *SkyView HDX System Installation Manual (Certified)* and the *SkyView HDX Airplane Flight Manual Supplement* for more information.

ENGINE Layout

Each of the three ENGINE Pages display important engine parameters acquired using an SV-EMS-220/221 module, its sensors, and other advanced engine monitoring features. The ENGINE Pages shown below are the ENGINE BOTTOM BAND, which is the preferred engine presentation in SkyView HDX.

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

The SV-EMS-221 is not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.

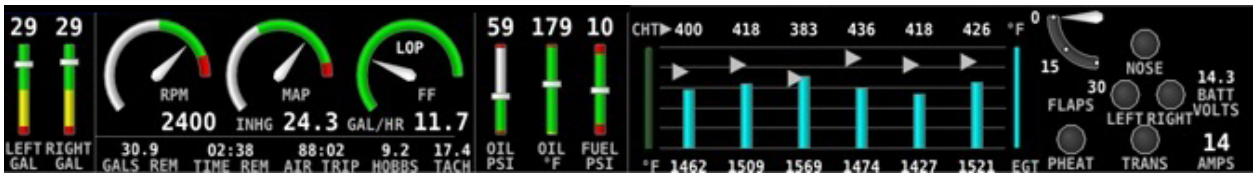


Figure 192: Example of an ENGINE BOTTOM BAND Page layout for single-engine monitoring.

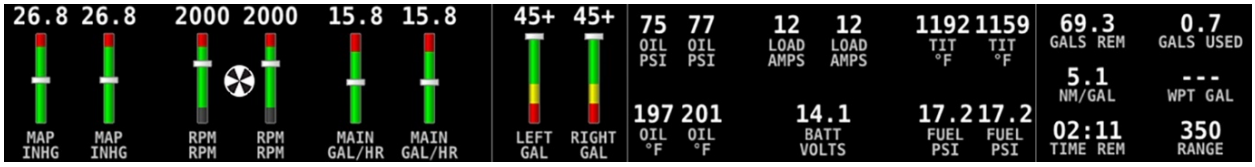


Figure 193: Example of an ENGINE BOTTOM BAND Page layout for twin-engine monitoring.

The appearance and position of each indicator (aka widget) on the ENGINE Page was configured during system setup. All engine widgets have assignable color ranges (e.g., red, yellow, green, black, blue, white, purple, cyan, and orange). For more information, see the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)*.

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. See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* 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.

100% ENGINE Page

When ENGINE is selected as Primary Content for a display using the DISPLAY LAYOUT menu, engine instruments will be presented in a 100% page when the FULL screen layout is selected. If the screen is then split to display PFD, MAP, or VIDEO Pages, the ENGINE Page layout will change to the 50% page while the screen is split. It will return to the 100% page when FULL layout is selected.

50% ENGINE Page

Because the ENGINE BOTTOM BAND is the preferred engine presentation in the SkyView HDX display, the 50% page is configured by default to present additional or alternative engine information and other systems information not already shown on the ENGINE BOTTOM BAND. In that configuration the 50% page is normally selected as Split Content on the screen when the pilot needs access to that additional information.

If ENGINE BOTTOM BAND has been turned off, the 50% page may become the primary source of engine information. In that case, it's layout should be reconfigured to assure all required engine instruments are displayed and conveniently located on the 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 below.

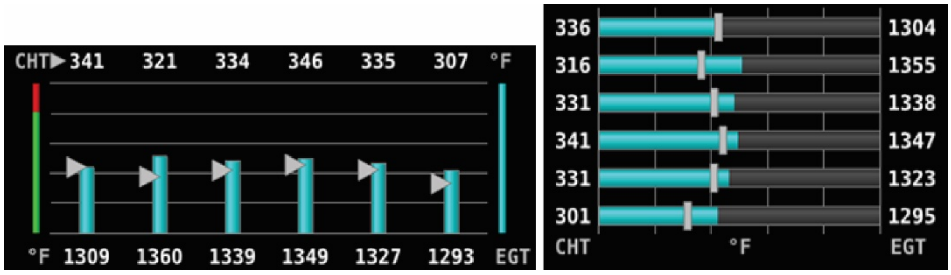


Figure 194: Example of Combined CHT/EGT Gauge (Vertical and Horizontal Styles)

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.

Horizontal style CHT/EGT widgets are not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.

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 195: Examples of combined Oil Temperature widgets.

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 configured during system setup. For more information, see the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified).*

Synchroscope

The Synchroscope is used to help synchronize engine RPMs in twin-engine aircraft. It should be located near the RPM widget (see Figure 196). 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 configured during system setup. For more information, see the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)*.

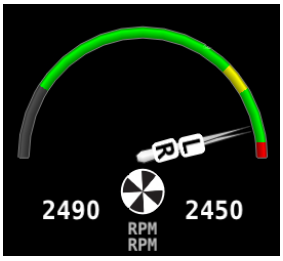


Figure 196: Example of a Synchroscope and a combined RPM widget.

Rotax 912 ~~/ 912 iS / 915 iS Behavior~~Engines

Rotax 912 engine monitoring by SkyView is not authorized in Dynon Certified installations under Dynon's STC SA02594SE.

See the *SkyView System Installation Guide* for setup and configuration information for Rotax 912 engines.

See the manufacturer's manual for more information about the Rotax 912 engine.

912 Oil Temperature and Tachometer

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 System Installation Guide*), the tachometer and oil temperature behave in the following ways:

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.

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 912 iS / 915 iS Engines



Rotax 912 iS / 915 iS engine monitoring by SkyView is not authorized in Dynon Certified installations under Dynon's STC SA02594SE.

The Rotax 912 iS / 915 iS Electronic Control Unit (ECU) provides the following information to SkyView via a computerized CAN BUS interface:

- Cold Start Assistance (Color Coding on Throttle Position Widget)[1],
- Coolant Temperature (CHT 1-2),
- Engine RPM (Tachometer),
- Engine Time,
- Exhaust Gas Temperature (EGT) 1-4,
- Fuel Flow,
- Lane A and B Bus Voltage,
- Oil Temperature and Pressure,
- Manifold Pressure,
- Manifold Boost and Static Pressure[1,3],
- Oil Temperature and Pressure,
- Power / Eco Mode State[2],
- Throttle Position[2],
- Wastegate Duty Cycle Percentage[1,3].

1 915 iS only.

2 As of SkyView Software v13.0.

3 As of SkyView Software v16.5.

See the *SkyView System Installation Guide* for setup and configuration information for Rotax 912 is / 915 iS engines.

See the manufacturer's manual for more information about the Rotax 912iS / 915 iS engine.

912 iS / 915 iS Power/Eco mode and Throttle Position

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.~~

912 iS / 915 iS Temperature Caution

The default Van's RV-12 configuration includes a parameter that enables detection of high coolant temperature. The default behavior is if the coolant temperature exceeds 220 degrees F and tachometer is <2500 RPM, a caution message will appear (TEMP HIGH – INCR RPM) to encourage the pilot provide more cooling.

915 iS Boost/Static Pressure and Wastegate Duty Cycle Percentage

The BOOST and STATIC widgets are available for manifold pressure monitoring on 915 iS engines. Additionally, an optional WSTGT counter is available for wastegate duty cycle monitoring on 915 iS engines.~~ULPower 520T Behavior~~

ULPower 520T Engines



ULPower 520T engine monitoring by SkyView is not authorized in Dynon Certified installations under Dynon's STC SA02594SE.

~~520T~~The ULPower Electronic Control Unit (ECU) provides the following information to SkyView via a computerized CAN BUS interface:

- Air Temperature,
- Cylinder Head Temperature (CHT) 1-6,
- ECU Temperature,
- Engine RPM (Tachometer),
- Engine Time,
- Exhaust Gas Temperature (EGT) 1-6,
- Fuel Flow and Pressure,
- Ignition Status
- Manifold Boost~~/~~ and Static Pressure,
- ~~The BOOST and STATIC widgets are available~~Oil Pressure and Temperature,
- Throttle Position.

See the *SkyView System Installation Guide* for ~~manifold pressure monitoring on~~ setup and configuration information for ULPower 520T engines.

See the manufacturer's manual for more information about the ULPower 520T engine.

520T Throttle Position

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 ULPower 520T manual for more information.

TurboTech Turbine Engines



TurboTech engine monitoring by SkyView is not authorized in Dynon Certified installations under Dynon's STC SA02594SE.

The TurboTech Electronic Control Unit (ECU) provides the following information to SkyView via a computerized CAN BUS interface:

- Bypass System State (Start/Stop),
- Engine Ambient Air Pressure and Temperature,
- Engine Cycles,
- Engine RPM (Tachometer) and Setpoint,
- Engine Sequence State,
- Engine Time,
- Exhaust Gas Temperature (EGT) and Setpoint,
- Fuel Flow and Pressure,
- Oil Pressure and Temperature,
- Power Level (Throttle Position),
- Starter Amperage and Voltage,
- Ventilation System State (On/Off).

See the *SkyView System Installation Guide* for setup and configuration information for TurboTech turbine engines.

See the manufacturer's manual for more information about the TurboTech turbine engine.

TurboTech Fault Reporting

When the TurboTech ECU detects engine faults, it generates more detailed fault codes. SkyView displays a list of these faults under MENU > ENGINE MENU > FAULTS.

See the *SkyView System Installation Guide* for more information about TurboTech engine fault reporting.

ENGINE TOOLS

Controls for features related to the engine are available by selecting MENU (Button 6) on the Main Menu, then selecting the ENGINE TOOLS icon. The ENGINE TOOLS Page will appear, as shown below:

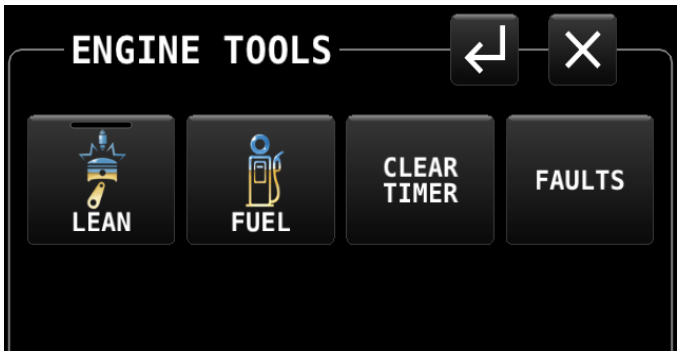


Figure 197: ENGINE TOOLS Page

Each control on the ENGINE TOOLS Page is described below.

LEAN (Lean Assist Mode Control) (Lycoming/Continental Engines Only)

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, select the LEAN icon on the ENGINE TOOLS Page. With this mode activated, the LEAN shows a green bar indicating the feature is enabled. Additionally, the label "LEAN" is displayed underneath the EGT bars to clearly differentiate it from the normal operating mode. This is depicted in Figure 198.

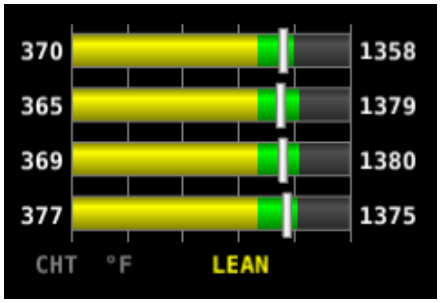


Figure 198: Entering Lean Mode

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 199.

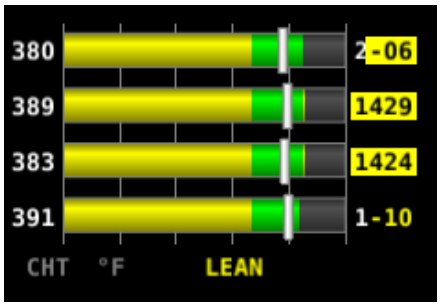


Figure 199: EGTs Peaking

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 200.

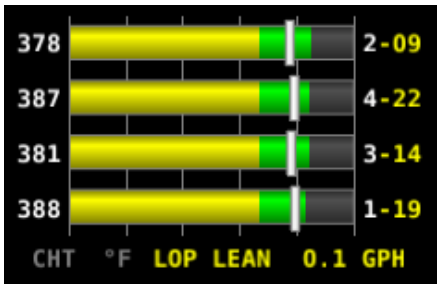


Figure 200: Lean of Peak

To exit the Lean mode, press LEAN again; the EGT/CHT display then returns to its normal state and the LEAN icon indicates the feature is turned off.

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 ENGINE can also calculate lean-of-peak or rich-of-peak operation in real time. To do this, the ENGINE 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 ENGINE does not have all of the information it needs to calculate the peak state, PK? (Peak Unknown) is shown.

FUEL (Fuel Computer Control)

The FUEL icon(s) on the ENGINE TOOLS Page provides access to a menu for adjusting the fuel computer. See the dedicated Fuel Computer section for details on fuel computer operation.

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, Fuel at Destination, 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 System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for more details on setup and configuration of dual engine monitoring.

By using the fuel flow sensor data and GPS information together, SkyView HDX 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, see the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)*.



The Fuel Remaining, Fuel Used, Fuel Efficiency, Fuel at Waypoint, Fuel at Destination, 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.

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 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 also can be displayed as LTR). This info item uses the current HSI navigation source for waypoint information, and only displays information when navigating to a waypoint. It assumes you are flying directly to the waypoint and does not adjust for non-direct flights.

The Fuel at Destination info item (displayed as <Airport Call Letters> GAL) displays how much fuel will remain at the destination. (This also can be displayed as LTR). This info item uses the current HSI navigation source for information on the final waypoint in a Flight Plan, and only displays information when there is an active Flight Plan. It assumes you are flying directly to the destination via the planned course and does not adjust for off-course 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 HDX can assist with this through the Fuel Auto Detect setting described in this section.

Fuel computer adjustments are made by selecting the FUEL icon(s) on the ENGINE TOOLS Page. When FUEL is selected, a pop-up window will appear near the bottom of the screen, and the bottom bar menu will change to present options for changing the current fuel state in the fuel computer.



Figure 201: 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 tank level 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 System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* 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 System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* 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 exit the FUEL menu,
- Press CANCEL to discard any changes made to the Total Fuel and exit the FUEL menu.



Be aware that the value SkyView HDX adjusts the fuel computer to 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.

CLEAR TRIP TIMER

The CLEAR TRIP TIMER icon on the ENGINE TOOLS Page is used to reset two system timers maintained by SkyView HDX: Engine Trip Timer and the Flight Trip Timer. Pressing the icon resets both these timers to 0 hours.

System Timers

SkyView has internal tach, Hobbs, and other timers that each run at different times. ENGINE timers are available for placement on the ENGINE Pages via the Screen Layout Editor. For more information regarding the Screen Layout Editor, see the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)*. 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 System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for information about using SkyView HDX'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 CLEAR TRIP TIMER.

A **Switch Fuel Tank Reminder** can be configured to alert you 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 System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for details on configuring this reminder.

FAULTS

A detailed list of faults reported by ~~the Rotax 912iS/915iS~~an engine computer via CAN BUS is shown under MENU > ENGINE TOOLS > FAULTS. Normally, it should say NONE. Consult your ~~Rotax~~manufacturer's service organization for details of what to do if a fault is shown.

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, Fuel at Destination, 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 System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for more details on setup and configuration of dual engine monitoring.

VP-X Operation

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



SkyView engine monitoring via the VP-X system is not authorized in Dynon Certified installations under Dynon's STC SA02594SE.

VP-X License Information

The VP-X software features are enabled on SkyView by purchasing a VP-X license code from Dynon and entering it into your SkyView HDX display. 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 in the *SkyView 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.
- Rename
- 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.

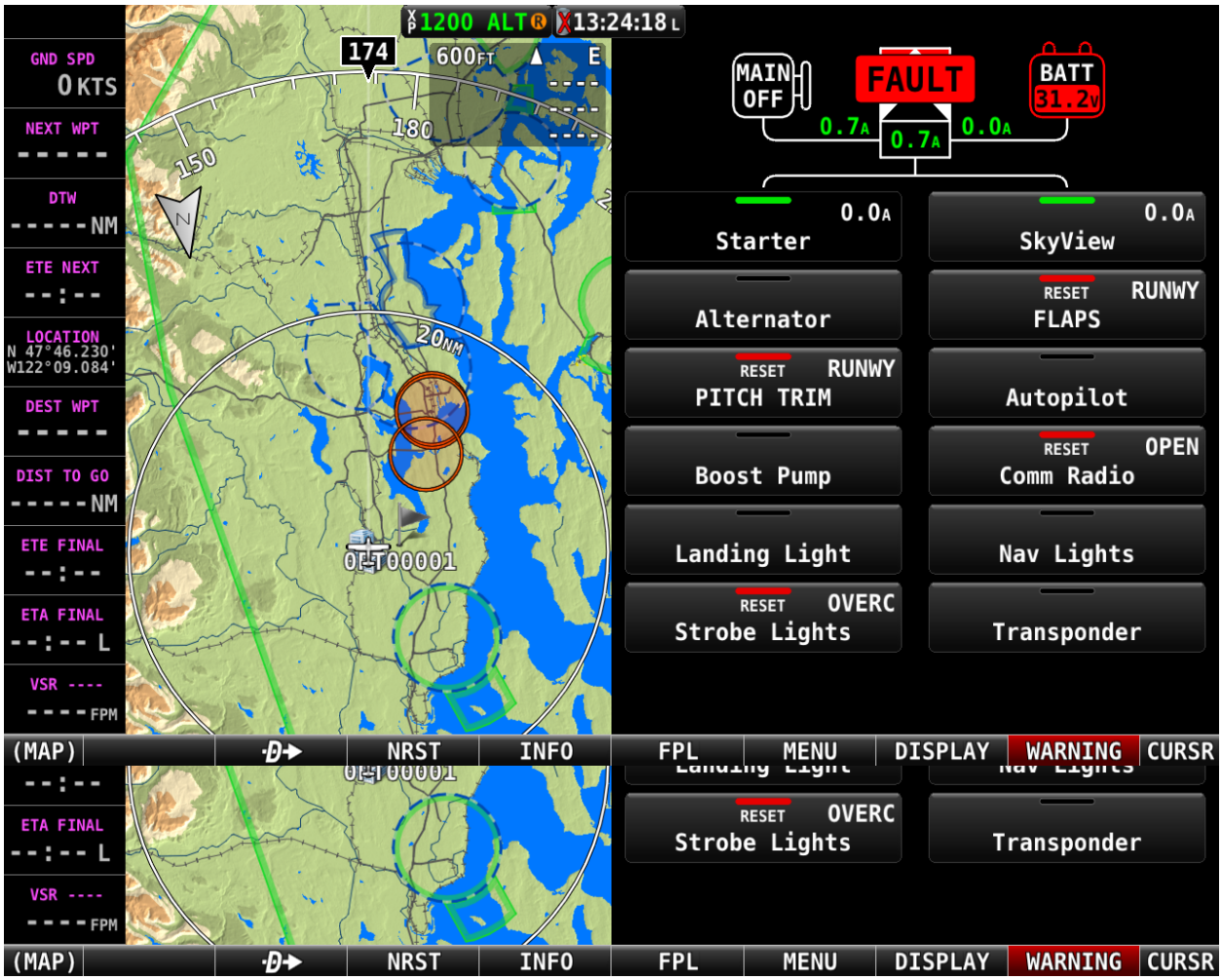


Figure 202: VP-X Page

7. Transponder Operation

Dynon 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.

The SV-XPNDR-262 is not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.

Throughout this guide, they are often referred to together as the SV-XPNDR-261/262 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-261/262 also outputs ADS-B OUT messages via its 1090ES capability.

The SV-XPNDR-261/262 transponder is controlled using the SkyView HDX's on-screen control page. No dedicated panel-mounted control panel is required (or available). This allows the transponder to be mounted separately from the instrument panel and eliminates any panel space taken by the transponder. SkyView HDX 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 to the left of the Clock, as shown in the following figure:

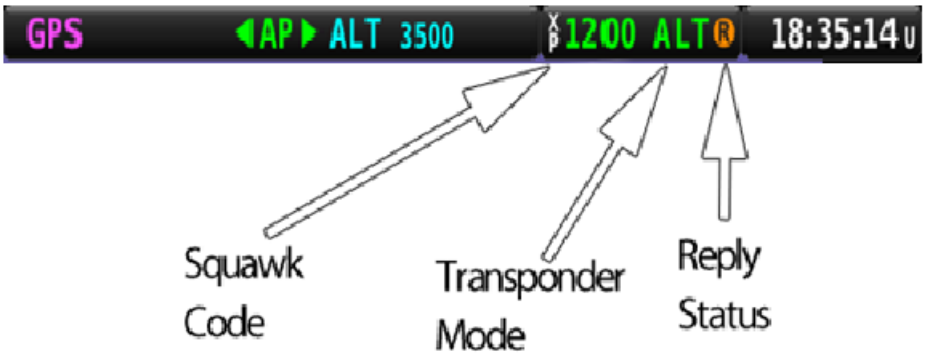


Figure 203: Transponder Status Area in Top Bar

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

- Squawk Code: This code is transmitted when the transponder is in a broadcast mode.
- 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:
  - 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.
  - 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.
  - AUTO (replaces GND, above): Available when the transponder is configured to automatically switch between ALT/GND (see the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* 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 there is no GPS fix.
  - ON: The transponder will respond to all interrogations, but altitude reporting is suppressed.
  - ALT: The transponder will respond to all interrogations.
  - IDT: Displayed while the transponder is broadcasting an ident after the IDENT button is pushed at ATC's request.
  - Big red "X" (covering entire transponder status area): Indicates a failure, 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.
- Reply Status: The reply indicator illuminates when the transponder replies to interrogations.



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.



When connected properly, third party transponders such as the Garmin GTX 300 Series can provide status as described above. However, they cannot be controlled from the SkyView display as the SV-XPNDR-261/262 can.

Transponder Control Page

All control of the transponder is performed using the TRANSPONDER Page, selected either by touching the Transponder status area on the TOP BAR, or by selecting MENU (Button 6) on the Main Menu, then selecting the XPNDR icon. The following page will appear:

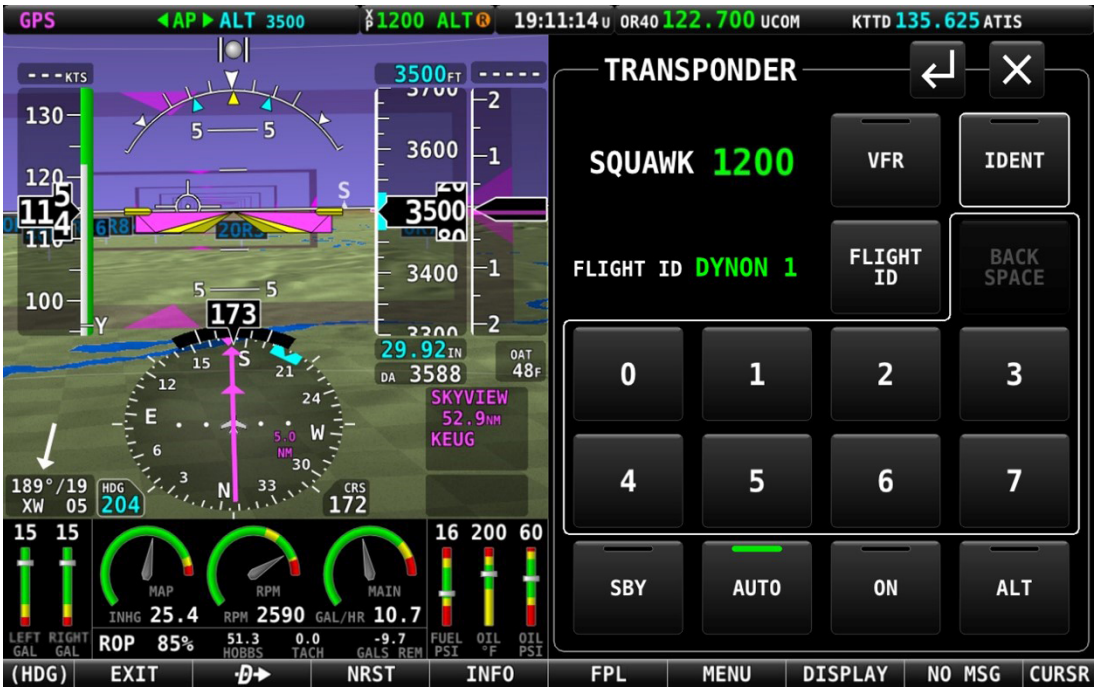


Figure 204: TRANSPONDER Page

Use of each of the controls/icons on the TRANSPONDER Page is described below.

Active Code (not labeled)

When the TRANSPONDER Page is first displayed, the active transponder code is presented as a 4-digit value in green text in the upper left corner of the TRANSPONDER Page. As a new discrete code is entered by the pilot, this code value will add each digit in sequence as it is entered by the pilot. Note, however, that until a valid 4-digit code is entered, the code active in the transponder is not changed. The new transponder code will only be programmed into the transponder and updated in the TOP BAR once a new, complete 4-digit code is entered on the TRANSPONDER Page.

IDENT

Press the IDENT button 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 pushed to change the transponder mode or to turn it off, that action will be delayed until the ident transmission completes.

VFR

The VFR button controls an On/Off VFR mode. When the VFR button is selected ON – green bar is shown at the top of the button – the transponder is automatically tuned to the VFR squawk code. This is usually 1200 in the US and 7000 in Europe. See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* to set the VFR code that this button tunes.

Once selected ON, the VFR mode will remain in effect until either of the following actions occurs:

- Selecting the VFR button while it is ON will toggle the button and the VFR mode to OFF. The transponder will be reset to the last discrete code tuned.
- Entering a new valid transponder code will reset the VFR button and mode to OFF.

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. See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* to enable the FLIGHT ID function.

BACK SPACE

The BACK SPACE button is selected to erase an erroneous digit while entering a new transponder code. This action will only have effect when a partial code – containing one, two or three digits – has been entered. Once a valid code is entered, the BACK SPACE button will have no effect.

Number Buttons

Eight numbered buttons – "0" through "7" – are used to enter a discrete transponder code. Enter a new code by pressing the desired 4 numbers in sequence. If you make a mistake while entering a code, press the BACK SPACE button to erase an undesired digit. 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

If the TRANSPONDER Page is closed while an incomplete code value is shown in the upper left corner (green text), the incomplete code is disregarded, and the transponder will continue transmitting with the last valid code entered.

SBY (Standby mode)

Select the SBY button to set the transponder to Standby mode. In Standby mode, the transponder will not respond to interrogations from ground or airborne radar. When active, SBY is annunciated in the transponder status area in the Top Bar, and the SBY button will have a yellow bar at the top indicating the mode is selected. However, the yellow color indicates the transponder is not in an actively transmitting mode.

GND (Ground mode)

Press the GND button 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 display a green bar at the top and GND is annunciated in the transponder status area in the Top Bar.

AUTO (Optional Ground mode)

IF the AUTO ALT/GND option is selected in setting up the transponder, the GND button will be relabeled to AUTO, indicating that the transponder will automatically switch between the GND and ALT modes based on the aircraft's state. The current transmitting mode will be accurately labeled in the Top Bar transponder enunciation, but the button label will always be AUTO.

ON (On mode)

Press the ON button to set the transponder to the On mode, in which it will respond to all interrogations, but with altitude reporting suppressed. When active, the ON button will display a green bar at the top and ON is annunciated in the transponder status area in the Top Bar.

ALT (ALT mode)

Press the ALT button to set the transponder to ALT mode, in which it will respond to all interrogations with altitude reporting. When active, the ALT button will display a green bar at the top and ALT is annunciated in the transponder status area in the Top Bar.

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-261/262, 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 HDX has a valid GPS signal and an SV-XPNDR-261/262 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-261/262 module that allows an appropriate GPS receiver serial output to be connected directly to the SV-XPNDR-261/262. 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. See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for more details about connectivity and information on updating the software on the SV-XPNDR-261 for this compliance. Note that only the SV-XPNDR-261 can meet 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 outside the United States, you can disable ADS-B OUT transmissions without disabling GPS-based functions. See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for instructions.

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.

8. Autopilot Operation

This section guides you through the functionality, symbology, and operation of the integrated Dynon Autopilot in SkyView HDX. It assumes that the autopilot servos have been properly installed, calibrated, tested, and tuned according to the procedures in the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)*, and the *SkyView Autopilot In-Flight Tuning Guide*. For instructions on how to change autopilot controls see the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)*.

Autopilot Safety Features

Servo Failsafe

The Dynon 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 you can always override SkyView's commands.

Next, the autopilot servos are designed so that you 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 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. Thus, Dynon 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 mechanical 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-engineered 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 System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for connection details).

Emergency Glide

The Emergency Glide feature allows pilots to perform a single action which initiates SkyView to automatically control the aircraft to fly at best glide speed to the nearest suitable airport. Emergency Glide considers terrain between the aircraft and target airports, so it may not choose the closest airport if terrain would obstruct a successful glide to an airport. Emergency Glide does not automatically land the aircraft, align the aircraft with the runway, nor account for traffic or obstacles. Using Emergency Glide does not assure a survivable landing; however, it does relieve the pilot of most aircraft control while troubleshooting the emergency. Pilots will still need to deploy landing gear, lights, and flaps, and respond to ATC instructions or terminal instrument procedures while Emergency Glide is active.

Emergency Glide is not authorized in Dynon Certified installations under Dynon's STC SA02594SE.

To activate or deactivate Emergency Glide, push and hold the *NRST* button (#3) for three seconds. Once the pilot holds the *NRST* button, SkyView displays either the HOLD TO ENABLE EMERGENCY GLIDE notification or the HOLD TO EXIT EMERGENCY GLIDE notification (see Figure 205). If Best Glide Speed is not configured in the SETUP MENU, SkyView displays the MISSING BEST GLIDE SPEED notification (see Figure 206) and Emergency Glide is not activated.

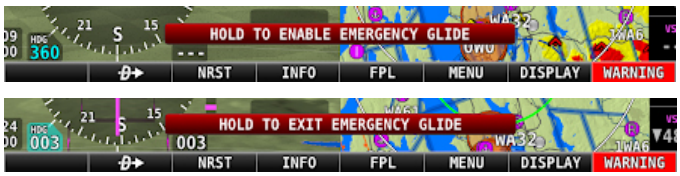


Figure 205: HOLD TO ENABLE EMERGENCY GLIDE and HOLD TO DISABLE EMERGENCY GLIDE notifications



Figure 206: NO GLIDE SPEED SET notification

When enabled, the EMERGENCY GLIDE ACTIVE alert (see Figure 207) displays, and SkyView will perform the following:

1. Engage the Autopilot.
2. Attempt to reach and maintain the configured best glide airspeed.

3. Search for the best landing airfield:
   - If a best landing airfield is found, Emergency Glide continues.
   - If no best landing airfield is found, SkyView alerts the pilot (see Figure 208) and exits Emergency Glide (see Figure 211)
4. Activates a Direct-To (see Direct-To in Section 5) the best landing airfield.
5. If an SV-COM radio is installed, loads the best landing airfield into the COM radio airport slot.
6. Switches the Autopilot to NAV Mode and the aircraft follows the course to the airport at best glide speed.
7. When approaching the best landing airfield, alerts the pilot to take manual control (see Figure 209).
8. When reaching the best landing airfield, alerts the pilot (see Figure 210) and switches the Autopilot to Roll Hold Mode (see the Expert Autopilot Roll Modes subsection) and begins a 20 degree bank left turn and circles the airfield .

Emergency Glide requires the following to function properly:

- Best Glide (Vg) and Sink Rate Under Glide configured (see the Emergency Glide section of the *SkyView System Installation Guide*),
- The aircraft's airspeed limitations configured (see the Airspeed Limitations section of the *SkyView System Installation Guide*),
- Current Aviation Databases, including High-Resolution Terrain Data, loaded (see the Databases section 6 of the *SkyView System Installation Guide*),
- Expert Mode enabled (see the Autopilot Controls section of the *SkyView System Installation Guide*),
- *NRST* filters configured (see *NRST* in Section 5).

Upon activation, the EMERGENCY GLIDE ACTIVE alert displays on the PFD and the Autopilot is engaged and commands the aircraft to fly level at best glide speed. Emergency Glide then begins to set up for a NAV-based Autopilot and starts calculations, considering terrain and current wind conditions, to determine the best airport for landing.



Figure 207: Emergency Glide Active alert

If no suitable airport is found, then the EMERGENCY GLIDE NO VALID APT alert displays on the PFD. This alert displays for 15 seconds Afterward, Emergency Glide is deactivated, but the Autopilot continues flying the aircraft level and at best glide speed. Note that SkyView considers an airport invalid if there is less than 1,000 feet of clearance from all terrain during estimated remaining flight to airport.

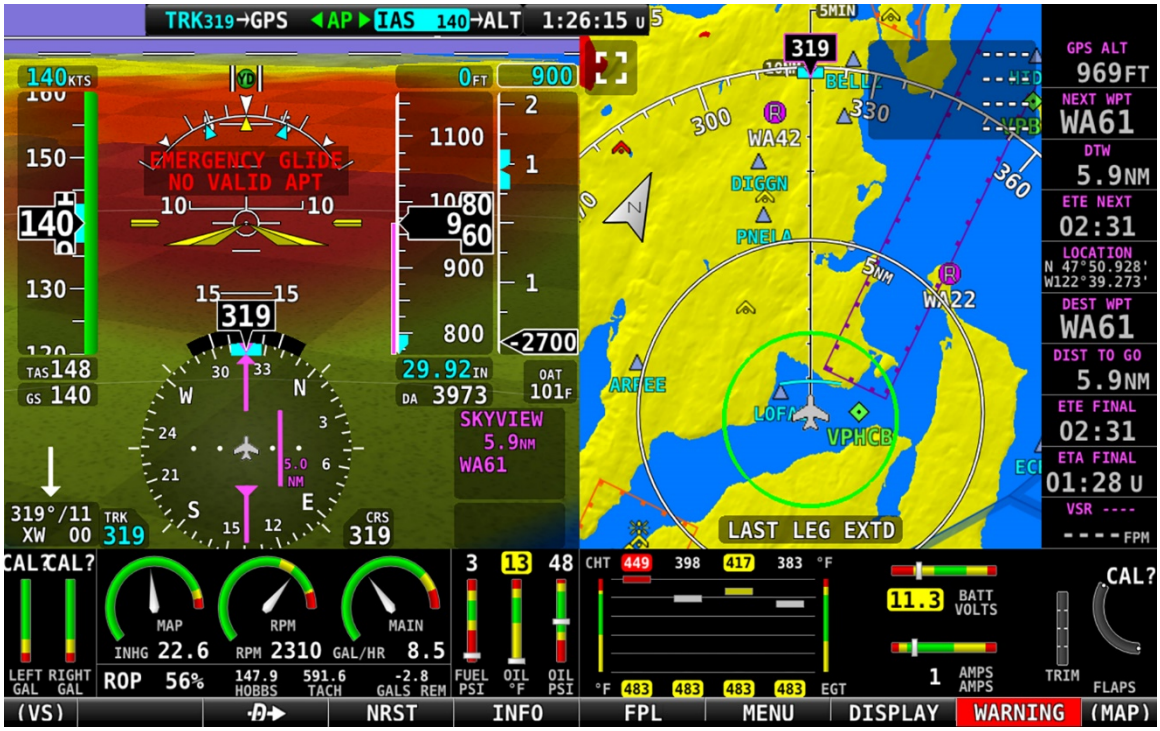


Figure 208: Emergency Glide No Valid Airport alert

If a suitable airport is found, then the heading indication changes to point to the airport and NAV Mode (see Expert Autopilot Roll Modes later in this section) is armed. Until NAV Mode takes control, SkyView recalculates the flight path and changes the heading indication to match the targeted airport every 15 seconds. At the same time, SkyView sets the targeted airport on the COM panel (i.e., if a COM panel is installed and the airport's frequencies are in the aviation database).

The Autopilot will continue to control the aircraft to fly level at best glide speed until it is roughly 60 seconds away from the airport. At this point the NEARING APT TAKE CONTROL alert replaces the EMERGENCY GLIDE ACTIVE alert.



Figure 209: Emergency Glide Nearing Airport Take Control alert

The NEARING APT TAKE CONTROL alert continues until the aircraft crosses over the center of the airport. At that point, the aircraft will start a 20-degree roll to the left and begin circling the airport and the EMERGENCY GLIDE CIRCLING APT alert displays. It should be noted that the roll does not account for wind and the aircraft can drift away from the airport.



Figure 210: Emergency Glide Circling Airport alert

There are several ways to exit Emergency Glide. Upon exiting EMERGENCY GLIDE, the EMERGENCY GLIDE EXITING alert displays. The most common way to exit is simply interacting with the Autopilot. If Emergency Glide does not find a suitable or a targeted airport, or the targeted airport is no longer no suitable, then Emergency Glide is automatically exited. Additionally, the pilot can press and hold the *NRST* button. It should be noted that exiting Emergency Glide does not deactivate the Autopilot.



Figure 211: Emergency Glide Exiting alert

Simplified or Expert Controls

In SkyView HDX, you can choose between two different control schemes for your Autopilot: Simplified or Expert Controls. For instructions on changing the control scheme, see the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified).*

Simplified Controls are disabled upon installation and not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.

Simplified Controls are ideal 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 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 section.

Top Bar Autopilot Status Area



Figure 212: Example Top Bar with Autopilot Status

Center AP Text 

- 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 

during Pitch Auto-Trim and left/right during Roll Auto-Trim.

Roll and Pitch Axis Information

  - Active Mode and Target 

or 

- 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.

Pitch Trim Nose Up / Down Alerts

When the Autopilot is flying the aircraft in the pitch axis, a Pitch Trim alert can appear. This 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 pitch Auto-Trim configured on the pitch 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.

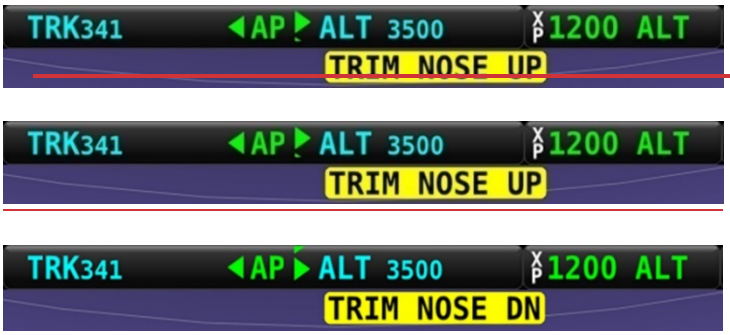


Figure 213: Trim Nose Up and Down alerts

Pitch Slip Message

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 message as shown:



Figure 214: Pitch Slip message

See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for more information regarding servo slippage.

Pitch Slip Trim Nose Up / Down Alerts

If prolonged periods of pitch slipping are detected, the condition may be relieved with pitch trim. SkyView displays a slip alert combined with a trim request. However, Auto-Trim will not attempt to actuate the trim controllers during a slip.



Figure 215: Pitch Slip Trim Nose Up and Down alerts

Roll Trim Left / Right Alerts

When the Autopilot is flying the aircraft in the roll axis, a Roll Trim alert may appear. This alert lets you know when the roll servo is having to maintain a sustained force on the ailerons 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 System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* 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 216: Roll Trim Left and Right alerts

Roll Slip Message

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 message, as shown in the following figure. See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for more information regarding servo slippage.



Figure 217: Roll Slip message

Yaw Trim Left / Right Alerts

When the Autopilot is flying the aircraft in the yaw axis, a Yaw Trim alert may appear. This alert lets you know when the yaw servo is having to maintain a sustained force on the rudder to hold the desired course. 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 System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for more information regarding trim indication configuration.

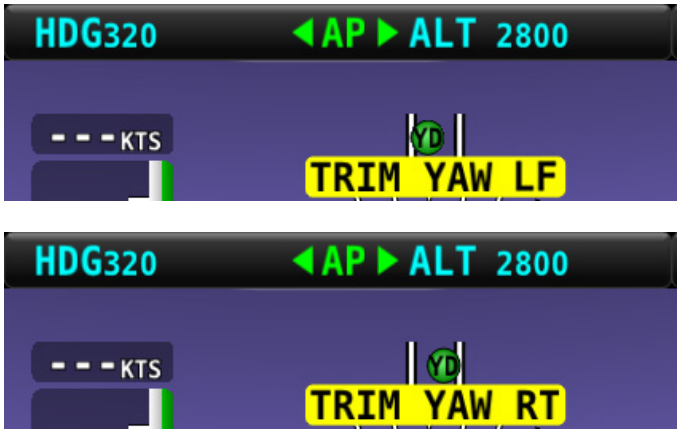


Figure 218: Yaw Trim Left and Right alerts

Yaw Damper Indicator

When the Yaw Damper is engaged, the ball turns green, and YD is displayed: 

Yaw Slip Message

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 yaw servo, SkyView displays a slip message, as shown in the following figure. See the *SkyView System Installation Guide* or the

SkyView HDX System Installation Manual (Certified) for more information regarding servo slippage.



Figure 219: Yaw Slip Message

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.

The Hold To Engage function is disabled upon installation and not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.



Figure 220: 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 Autopilot Operation and Controls sections below for additional Control Wheel Steering behavior information.

The Control Wheel Steering function is disabled upon installation and not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.



Figure 221: Control Wheel Steering Mode indicator

The Control Wheel Steering feature can be enabled and disabled via the Autopilot Setup Menu. See the *SkyView 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 222: Speed Out-Of-Range indicator

G Limit Alert

SkyView uses the indicator shown in the following figure to denote that the Autopilot's preset G limits are hit, and thus the Autopilot will not pull or push on the pitch axis in a way that would exceed these limits.

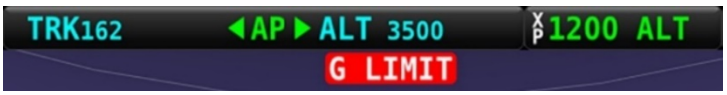


Figure 223: G-LIMIT alert

Airspeed High / Low Alerts

When the Autopilot is engaged, SkyView uses the alerts 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 alerts 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 to remain within the allowed airspeed limits.

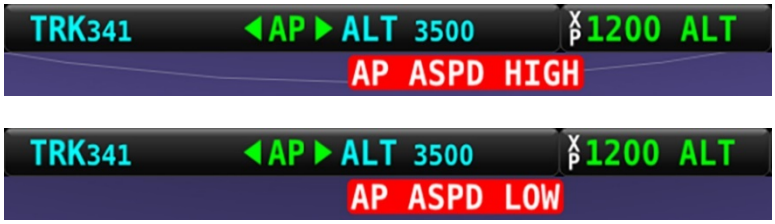


Figure 224: Airspeed High and Low alerts

When CHECK PITOT HEAT is annunciated on the PFD Page, SkyView does not have airspeed information, likely due to a pitot failure or icing event. Thus, when 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 Offline Messages

When a servo is offline (for example, when the autopilot circuit breaker has been pulled), the following is displayed in the Top Bar and an accompanying Message is generated. When in Expert Mode, press the MESSAGE button twice to view and acknowledge this error. After the error is acknowledged, the Top Bar indicator is suppressed so that you can continue to use the Flight Director for guidance.



Figure 225: Roll and Pitch Servo Offline messages

Servo Error Alerts

When a servo has failed (for example, when an internal error has occurred or ADAHRS data is unreliable), the following is displayed in the Top Bar.



Figure 226: Roll and Pitch Servo Error alerts

Auto-Trim

SkyView can 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. See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* 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 HDX'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 may 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. While most aspects of configurating the Autopilot should be accomplished during installation of the SkyView HDX system, the pilot may need access to the Autopilot setup options during flight, including the ability to change between Simplified and Expert controls. To do so, access the Setup menu system by pressing-and-holding Buttons 7 and 8, then selecting AUTOPILOT SETUP, either from the IN FLIGHT SETUP MENU if the aircraft is in motion or from the SETUP MENU if the aircraft is stationary on the ground.



Prior to operating in flight, the Autopilot must be fully configured. See the *SkyView System Installation Guide* for detailed instructions on how to change the Autopilot control scheme between Simplified and Expert controls and how to configure the Autopilot.



Simplified Controls are disabled upon installation and not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.

Simplified Autopilot Menu

The Autopilot can be fully controlled using the touchable AUTOPILOT Page. This page may be opened either by touching the Autopilot enunciation area on the Top Bar, or by selecting MENU (Button 6) on the Main Menu, then selecting the AUTOPILOT icon. The control page shown below will appear.



Figure 227: AUTOPILOT Page – Simplified Control Scheme

All the buttons in the above figure are explained in the following sections in the order they appear on the AUTOPILOT Page.

TRK+ALT

Press the TRK+ALT button to engage the Autopilot to simultaneously follow the Track bug and hold current altitude. When engaged, the TRK+ALT button will show a green bar indicating that mode is engaged, TRK and ALT bugs are synchronized to the aircraft's current values, and the ground track and altitude that the Autopilot is flying is shown in the Top Bar.



Figure 228: TRK+ALT mode is engaged.

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 show a green bar indicating the mode is engaged, ALT bug is synchronized to the aircraft's current value, and the HSI source and altitude that the Autopilot is flying is shown in the Top Bar.

If the aircraft is not currently on the intended course – HSI course deviation needle is not centered – when this mode is engaged, the Autopilot will turn the aircraft to establish and intercept course. Once the needle is nearly centered, the Autopilot will turn as necessary to follow the course.



Figure 229: HSI+ALT Mode is engaged.

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.

YD

Pressing YD engages and disengages the Yaw Damper. Yaw damper normally engages when the Autopilot is engaged but can be controlled separately from roll and pitch servos with this button. Button is not shown if the yaw servo is not installed.

180°

Press 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 normally turn the aircraft to the left. An exceptional turn to the right may occur if the aircraft is already established in a right turn when the 180° mode is engaged.

During the turn both the TRK+ALT and 180° buttons will show the green mode engaged bar.



Figure 230: 180° Mode is engaged; turn is not yet complete.

As the turn nears completion, the 180° button's green bar will turn off, and the Autopilot will continue in the TRK+ALT mode.

To disengage the Autopilot press either the OFF button or TRK+ALT button.

OFF

Press the OFF button to disengage both servos from any mode.

LEVEL

Press the LEVEL button to engage the Autopilot in Level mode. This button is wider than the other autopilot control buttons and is prominently surrounded by a blue box even when the LEVEL mode is not engaged.

The objective of the LEVEL mode is to promptly get the aircraft to a bank angle of zero with zero vertical speed. In this mode, the Autopilot will attempt a recovery from usual attitude using the same methodology a pilot is trained to execute, that is, adjust bank angle towards zero, then adjust pitch attitude to achieve vertical speed of zero. This mode will be enunciated as STRAIGHT for roll axis and LEVEL for pitch axis on the Top Bar.

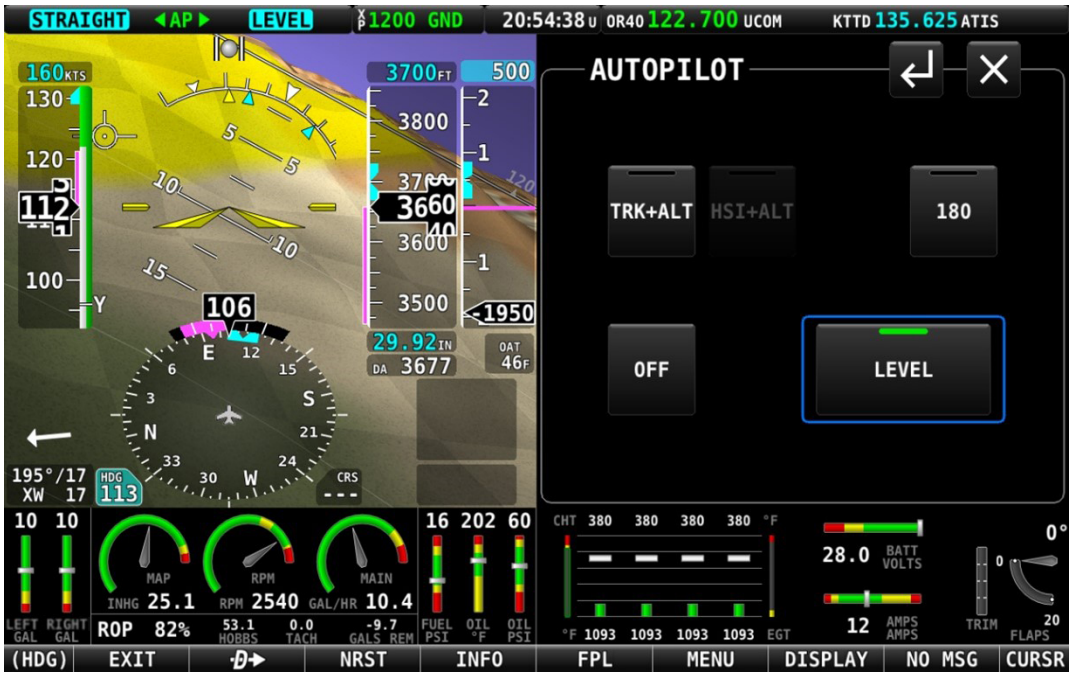


Figure 231: LEVEL Mode is engaged

For safety in emergency situations, subsequent presses of the LEVEL button do not disengage level mode (unlike other AP mode controls). To disengage the Autopilot, press the OFF button or the Autopilot Disconnect switch. Alternatively, change to one of the other autopilot modes by pressing the TRK+ALT or HSI+ALT buttons.

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.
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 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 you 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.

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 232: 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 System Installation Guide* for details.

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 233: 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 thus the Autopilot's altitude target) is synchronized to the aircraft's current altitude.
  - Roll axis: The TRK bug (and thus 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 thus 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 System Installation Guide* for details.

Single Axis Operation

If only one axis is installed, the AUTOPILOT Page reflects the actions available for the single axis that can be controlled. Single axis operation is not allowed with the Simplified Autopilot Interface when two servos are installed and configured.

When only a roll servo is installed, the ALT function will be absent from the two normal mode buttons on the AUTOPILOT Page. Similarly, when only a pitch servo is installed, the normal mode button will offer only the ALT (altitude hold) mode.

Expert Autopilot Operation and Controls

This section covers how the Autopilot is used when set to the Expert controls. See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for instructions on how to change the autopilot control scheme between Simplified and Expert controls.

Simplified Controls are disabled upon installation and not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.

Expert Autopilot Menu

As with the Simplified mode previously discussed, the Autopilot can be fully controlled in the Expert mode using the touchable AUTOPILOT Page. This page may be opened either by touching the autopilot enunciation area on the Top Bar, or by selecting MENU (Button 6) on the Main Menu, then selecting the AUTOPILOT icon. The control page shown below will appear.



Figure 234: AUTOPILOT Page – Expert Control Scheme

All of the buttons in the above figure are explained briefly in the order they appear on the AUTOPILOT Page in the Expert mode. The modes and functions controlled by each button will be explained in greater detail in following sections:

AP

Engages and disengages the autopilot servos.

FD

Activates and deactivates the Flight Director. When the autopilot servos are engaged, the Flight Director is always activated.

YD

Pressing YD engages and disengages the Yaw Damper. Yaw damper normally engages when the Autopilot is engaged but can be controlled separately from roll and pitch servos with this button. Button is not shown if the yaw servo is not installed.

HDG

Activates and deactivates the Heading mode for roll axis control.

HDG will be unavailable and grayed-out if the Autopilot is outside of its allowable engagement speed ranges.

TRK

Activates and deactivates the Track mode for roll axis control.

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.

ALT HOLD

Activates and deactivates the Altitude Hold mode for pitch axis control. 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.

VS

Activates and deactivates the Vertical Speed mode for pitch axis control during altitude changes.

VS will be unavailable and grayed-out if the Autopilot is outside of its allowable engagement speed ranges.

HSI Source HSI SRC

Press this button to cycle the HSI through the different navigation data sources that are connected to the SkyView system (e.g., GPS 1-4, NAV 1-4, or custom names that may be

configured). The source displayed on the HSI is the guidance for the Autopilot in NAV and VNAV modes.

NAV

When the aircraft is approximately on course, this control activates and deactivates the NAV (navigation) mode for lateral guidance when a suitable navigation source is available. If the aircraft is not yet on course, this control will arm and de-arm the NAV mode. NAV can be armed before the aircraft is positioned on an intended course lateral navigation transition to be armed in advance.

VNAV

When the aircraft can intercept a vertical course, this control arms and de-arms the VNAV (vertical navigation) for vertical guidance when a suitable navigation source is available. If the aircraft is very near the vertical course, selecting the VNAV control may direct activate and deactivate the mode. VNAV can be armed before a valid glideslope indication has been established to allow GPS to ILS transitions to be armed in advance.

IAS

Activates and deactivates the Indicated Airspeed mode for pitch axis control during altitude changes.

IAS will be unavailable and grayed-out if the Autopilot is outside of its allowable engagement speed ranges.

NOSE UP/DOWN

Increments the commanded vertical transition rate when either the VS (Vertical Speed) or IAS (Indicated Airspeed) modes are selected.

Each press of these buttons will perform the following action:

- NOSE UP:
  - In VS mode: increase the (positive) target vertical speed rate in 100 fpm increments, thereby raising the aircraft's nose for a climb.
  - In IAS mode: decrease the target indicate airspeed by 1 kt increments (or the selected speed unit), thereby raising the aircraft's nose for a climb.
- NOSE DOWN:
  - In VS mode: decrease the (negative) target vertical speed rate in 100 fpm increments, thereby lowering the aircraft's nose for a descent.
  - In IAS mode: increase the target indicate airspeed by 1 kt increments (or the selected speed unit), thereby lowering the aircraft's nose for a descent.

NOSE UP/DOWN will be unavailable and grayed-out if the active mode is not VS, IAS or Altitude Hold.

Expert Autopilot Menu Annunciation

Most of the mode control buttons on the AUTOPILOT Page have a color-coded bar enunciator across the top of the button. The color of that bar on each button indicates 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 to the Flight Director. If the AP control is green, the servos are engaged and actively controlling the aircraft.
- 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 figure illustrates each of these mode enunciations on the AUTOPILOT Page. In this example, the Flight Director is on, both pitch and roll servos are engaged (AP is ON), the NAV mode is controlling the roll axis, ALT HOLD mode is controlling the pitch axis, VNAV mode is armed in preparation for intercepting a vertical course, and the HDG, VS and IAS modes are disengaged.

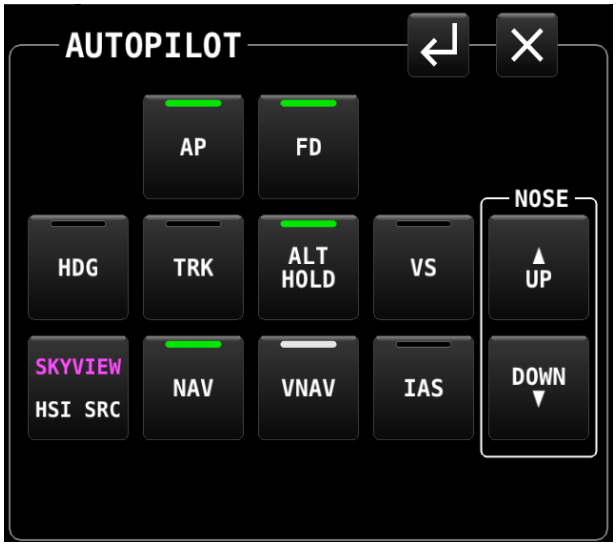


Figure 235: AUTOPILOT Page

Engaging the Autopilot

Engaging the Autopilot with the expert controls preserves the current roll and pitch state of the aircraft thereby providing you 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 of 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 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		
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 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 tracks before you want to 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. You then manipulate 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		
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 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 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 CHECK PITOT HEAT is annunciated on the PFD Page SkyView does not have airspeed information, likely due to a pitot failure or icing event. When using this mode, 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 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. Thus, 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 from 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 glideslope or VNAV indicator comes alive – will the Autopilot sequence to VNAV mode.

The altitude that is held prior to VNAV must be <u>below</u> the glideslope/VNAV profile. In other words, when VNAV is armed, the glideslope indicator should be above its centered position. If you descend through a vertical course from above with VNAV mode armed, the Autopilot will ignore the vertical need and simply fly through the course with no intercept.

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 to satisfy the targets of the currently active autopilot modes. A Flight Director allows the Autopilot to provide guidance while you are still allowed to provide direct control of the aircraft.

There are two types of Flight Director symbologies available in the Expert Autopilot control scheme: a single cue or inverted-V; or a dual cue or cross bars.

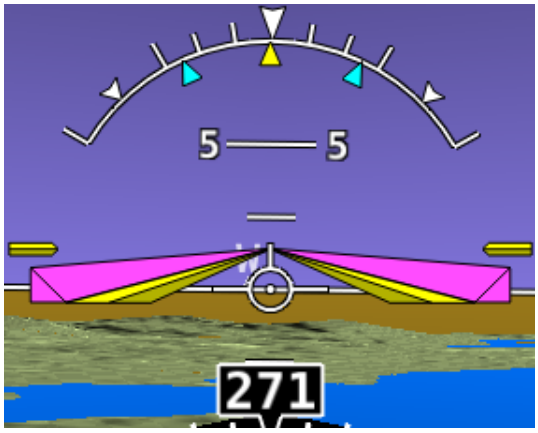


Figure 236: Single Cue / Inverted-V with Autopilot servos engaged.

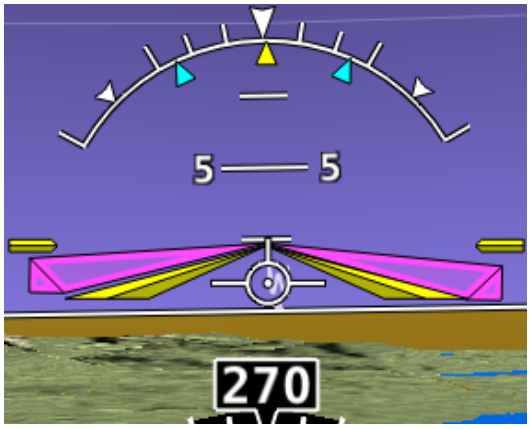


Figure 237: Single Cue / Inverted-V with Autopilot servos not engaged.

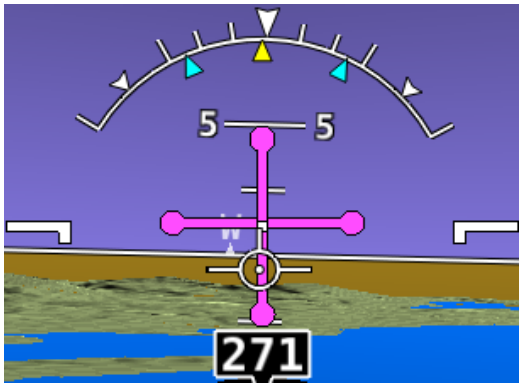


Figure 238: Dual Cue / Cross Bars with Autopilot servos engaged.

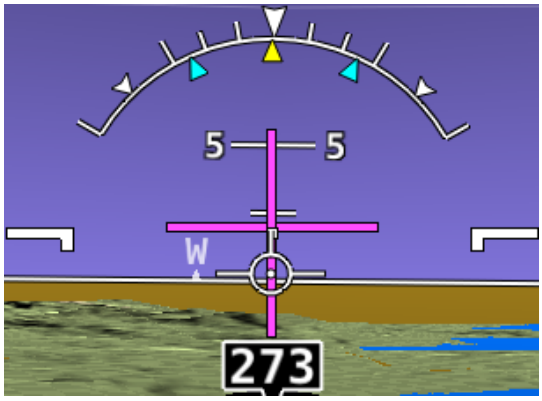


Figure 239: Dual Cue / Cross Bars with Autopilot servos not engaged.

If the Flight Director symbol is aligned with the aircraft's pitch and roll watermarks 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.

See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for instructions on how to change the type of Flight Director used.

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.

The Hold To Engage function is disabled upon installation and not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.



Figure 240: 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 System Installation Guide* for details.

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.

The Control Wheel Steering function is disabled upon installation and not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.



Figure 241: 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 System Installation Guide* for details.

Single Axis Operation

Although installing both roll and pitch servos is required 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's green indicator 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 your responsibility to control the aircraft in that axis.

Common Operations

Initial Engagement

1. Enter the Autopilot Menu (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 or adjust the vertical speed bug.
6. Select HDG or TRK 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 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.
3. If you weren't already climbing or descending, initiate a climb or descent with the NOSE UP / DN buttons 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 (MENU > AUTOPILOT > HSI SRC).
3. The navigation source must be providing valid course and deviation information.
4. Press the NAV button.
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 (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 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 HDX'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 third-party devices 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. Thus, 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 HDX's HSI. SkyView HDX'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 you 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 (formerly NOSE UP) on AUTOPILOT Page or the NOSE UP button on the Autopilot Control Panel. The Autopilot will annunciate "go around" and display the ADD POWER alert on the PFD (see below).
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.

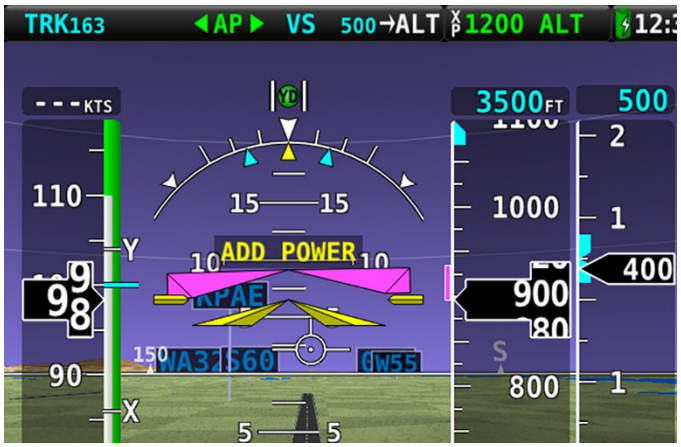


Figure 242: ADD POWER alert

SkyView Autopilot Control Panel Operation



Figure 243: SkyView Autopilot Control Panel

The optional SkyView Autopilot Control Panel provides dedicated controls for all Autopilot modes. Its buttons are identical to the buttons available on the touchable AUTOPILOT Page, with the exception that the external panel includes a dedicate button for the LEVEL mode.

This dedicated external button panel for Autopilot allows you to navigate other menus on the SkyView display while retaining direct access to the Autopilot. Autopilot status appears on the Top Bar as normal to show active and armed modes as well as current bug values. The buttons on the control panel perform the same functions as their counterpart buttons on the on-screen AUTOPILOT Page (which remain available and usable). When the system is configured to use the Expert Autopilot control scheme, the Autopilot Control Panel provides controls for all autopilot modes, including VNAV, IAS hold, Flight director, etc. When the system is configured to use the Simplified Autopilot control scheme, the Autopilot Control Panel provides HDG, TRK NAV, ALT, and LEVEL buttons that engage the autopilot in modes of TRK + ALT or HSI + ALT or LEVEL mode, and it continues to function as an auto-trim controller if properly configured for that function. See the following section about Integrated Trim Control 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 normally be installed. It is connected to your trim motor(s) (usually pitch, and sometimes roll or rudder, dependent on the aircraft). Its control inputs are normally wired to 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, see the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)*.

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 switch is continually depressed is three seconds. After three seconds, the trim motor will cease responding until the trim button is released and pushed again.

9. Com Radio Operation

The SV-COM-760, -T25/T8, -425 transceivers and SV-COM-PANEL integrate with your SkyView HDX 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 HDX's airport info pages. And of course, you can also spin frequencies in the "old fashioned way" when you are feeling nostalgic (or are following ATC instructions).

The airport lookup, loading and reverse lookup features of the SV-COM-760, -T25/T8, -425 require a connected SkyView with a GPS signal, SkyView HDX's Moving Map, and an aviation database.

The SV-COM-760 and the SV-COM-425 are not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.

Com Control Panel Overview

The SV-COM-760, -T25/T8, -425 have 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 Airpot
G: Dual Watch Mode Indicator
H: RX/TX Status Indicator
I: Airport Button
J: Dual Concentric Multifunction Knob (Tune, Selection, Flip/Flop)

Figure 244: Com Radio Control Panel

COM RADIO Page

SkyView HDX offers a COM RADIO Page for on-screen control of nearly all the functions available on the dedicated control module. Access the COM RADIO Page either by touching the Com enunciation area on the Top Bar or selecting MENU (Button 6) on the Main Menu, then selection the COM RADIO icon. The figure below shows the COM RADIO Page.



Figure 245: COM RADIO Page

The on-screen COM RADIO Page offers all the same function controls as the external control module except:

- Volume control.
- Squelch break.
- APT button (functionality is replaced on screen by the NRST option on the Main Menu).

Manual frequency tuning via the on-screen COM RADIO Page is accomplished using the number keypad buttons.

SkyView Top Bar Com Radio Status Overview

Com Radio status is also reflected in the top bar of your SkyView HDX display. The identification lettering (B-I) depicted below matches the figure above:



Figure 246: SkyView Top Bar Com Radio status overview

Using your SkyView 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-760, -T25/T8, -425 transmit 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:





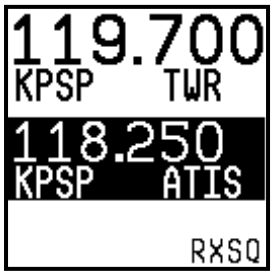
Note the arrow on the top bar that points to the active frequency, and the up arrow on the RX area of the control panel display that points "up" to the active frequency:

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:

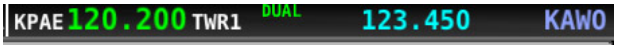




The squelch setting, which determines how strong a radio transmission must be before the radio receives it, is configured during setup. See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for instructions on adjusting this parameter.

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 HDX'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:

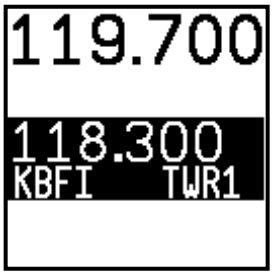
- Turn the large, outer ring of the dual concentric knob to change the standby frequency in 1 MHz increments.
- Turn the small, inner ring of the dual concentric knob to change the standby frequency. The SV-COM-760, -T25, -425 adjust in 25 kHz increments and by either 25kHz or 8.33kHz increments on the SV-COM-T8 (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:

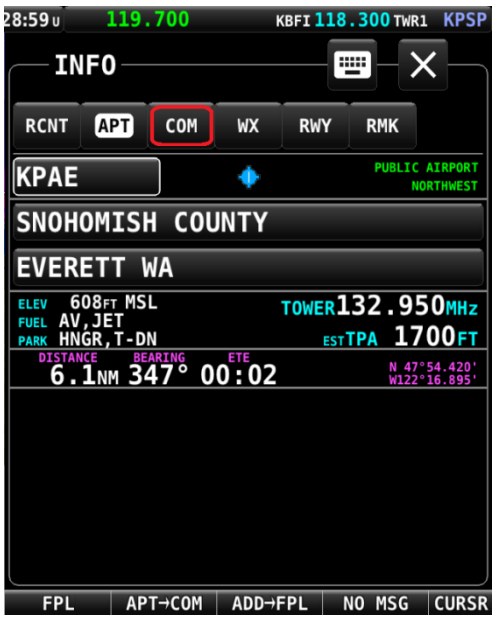


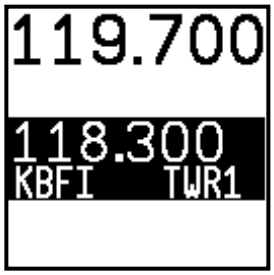


Tuning Individual Frequencies from SkyView HDX

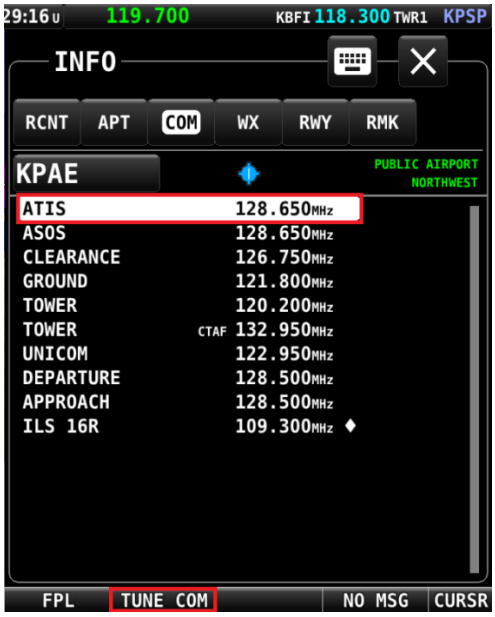
To send an individual frequency from SkyView HDX's airport information pages:

- Select the INFO Page for an airport.
- Then, use the knob to select a frequency from under the COM tab:





- With a valid Com frequency highlighted, (25kHz frequency on the SV-COM-760, -T25, -425 and 8.33kHz on the SV-COM-T8) 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 third-party device is appropriately configured. Additionally, some third-party devices can 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

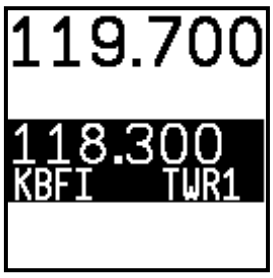
The SV-COM-760, -T25/T8, -425's most unique and innovative feature is its ability to load airports onto the control panel. Once an airport is loaded, single presses of the TWR, ATIS, GND, and ATC buttons automatically tune those frequencies (to the standby location) for that airport.

Loading Airports via SkyView

By Nearest

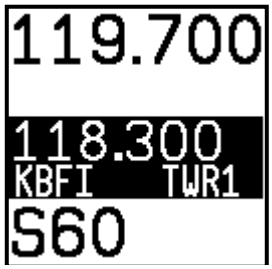
- From SkyView HDX's MAP Page, press NRST.
- Highlight the airport you wish to load to the control panel:





- 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 HDX's MAP Page, look up an airport via SkyView HDX'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-760, -T25/T8, -425 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:



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

If SkyView does not have an aviation database loaded the airport loading and 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:



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 System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for details on connecting an external flip/flop switch.

Dual Com Radios

If you have more than one Com radio that can communicate 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 HDX's TUNE or APT>COM buttons are used.

However, if your second Com radio is from Dynon, all 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.

10. Utility Tools

SkyView HDX includes several useful tools or utilities to help pilots manage various information useful in managing and operating the aircraft.

These tools are accessible on the bottom row of the MENU Page, as shown below.



Figure 247: MENU Page, showing Utility Tools in the bottom row.

Select each tool by touching its respective named icon.

CHECK LIST – 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 *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)*.

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 HDX Display

To access your checklist on a SkyView HDX display, select MENU (Button 6) on the Main Menu, then select the CHECK LIST icon on the bottom row. The CHECKLIST Page will appear, as shown below.



Figure 248: Example of List of Checklists Available.

The page initially shows a master list of all available checklists. Select an individual list by touching the list name twice: the first touch relocates the highlight cursor to that list name; the second touch displays the contents of the selected list.

Alternatively, lists may be selected by moving the cursor to the list name using the CURSR knob, the pressing the knob to select the list and show its contents.

You can scroll through the checklist items by touching the item or using the CURSR knob.

Your selected checklist will continue to be displayed until one of the following actions is performed:

- Select EXIT (Button 1) on the Main Menu, to close the CHECKLIST Page and return to the normal display.
- Select the RETURN icon  to return to the master list.
- Select the EXIT icon  to close the CHECKLIST Page and return to the normal display.

WEIGHT & BAL – Weight and Balance

The WEIGHT & BAL Page provides an interactive calculator customized for your aircraft. To be available in SkyView HDX, the calculator must first be configured in System Setup. Navigate to SETUP MENU > SYSTEM SETUP > AIRCRAFT INFORMATION > WEIGHT & BALANCE. See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for more information configuring the weight and balance calculator.

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 HDX 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 view the calculator on screen, Select MENU (Button 6) from the Main Menu, then select the WEIGHT BAL icon in the bottom row.

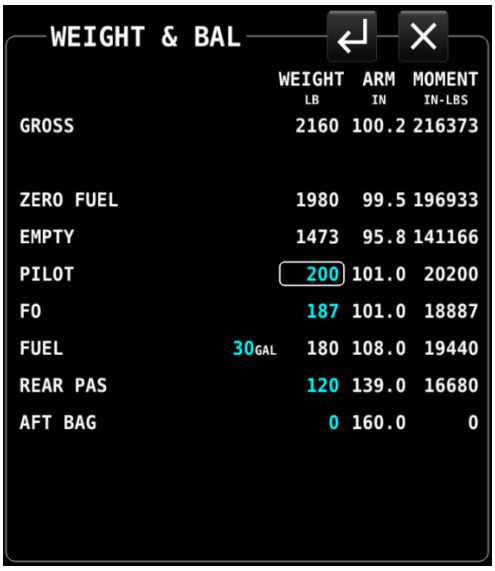


Figure 249: Weight and Balance calculator

With the WEIGHT & BAL Page displayed, you can then enter actual weights for each station for the current flight. The page dynamically recalculates the aircraft's total weight and CG status as you enter new values. The zero fuel line shows the predicted weight and CG status when your fuel is empty. Notice that the CG moves forward in this plane when the fuel is exhausted.

Weight and Balance supports metric units as well.

MAINT LOG – Maintenance Log

The MAINT LOG Page is a list of various maintenance and other time-based items to assist with managing your aircraft, pilot currency requirements and virtually any other items with expirations based on calendar dates or aircraft system times.

All items displayed on the MAINTENANCE Page must be entered and configured in System Setup. Navigate to SETUP MENU > SYSTEM SETUP > AIRCRAFT INFORMATION > MAINTENANCE LOG. There you can enter up to 10 separate maintenance items to be tracked by the system. See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for more information configuring the maintenance log feature.

Accessing the Maintenance Log on your SkyView Display

To view the Maintenance Log on screen, Select MENU (Button 6) from the Main Menu, then select the MAINT LOG icon in the bottom row.

The MAINTENANCE Page displays 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 . Additionally, when an item is past due a "Maint Log Item Expired" message is displayed during system startup.



Figure 250: Maintenance Log

11. Operations if Avionics Power is Lost / SV-BAT-320 Backup Battery



If, due to loss of Avionics power, your SkyView HDX display is powered solely by the SV-BAT-320 Backup Battery, it is advised that you land as soon as possible.

Each SkyView HDX display can be connected to one SV-BAT-320. When an SV-BAT-320 is new and fully charged, it provides sufficient power to operate a SkyView HDX display and connected devices on SkyView Network for at least 60 minutes.

Loss of Avionics Power While In Flight

If a SkyView HDX display with an installed SV-BAT-320 is in flight, and Avionics power is lost, the SkyView HDX will display:

AIRCRAFT POWER LOST

and the MAIN MENU will change to display two buttons:

- STAY ON
- POWER OFF

When this message is displayed, the SkyView HDX display is now receiving power solely from the SV-BAT-320 and will operate until the SV-BAT-320's available power is depleted.



To maximize operational time when the SkyView HDX display is receiving power solely from the SV-BAT-320, the maximum display brightness of SkyView HDX display is automatically reduced very slightly.

If neither button is pushed, the SkyView HDX display and SkyView system will continue to operate. However, the AIRCRAFT POWER LOST message will continue to be displayed.

To continue "normal" operations with the SkyView HDX display after the AIRCRAFT POWER LOST message appears, push the STAY ON button. As soon as the STAY ON button is pushed, the AIRCRAFT POWER LOST message will be suppressed, and the normal Main Menu will reappear. The SkyView HDX display and SkyView system will operate until the SV-BAT-320's available power is depleted.



When the SkyView HDX display and SkyView system are powered solely by the SV-BAT-320, there is no "battery gauge" graphic, "% power remaining", "countdown timer" displayed to provide guidance of remaining power in the SV-BAT-320.

If the POWER OFF button is pushed, the SkyView HDX display will power itself off. For example, this might be useful if you have two SkyView HDX displays, and want to power your SkyView system from only one display until that display's SV-BAT-320 available power is depleted; you can then power up the remaining SkyView HDX display on its SV-BAT-320 by pushing and holding Button 1.

Loss of Avionics Power On Ground

If a SkyView HDX display with an installed SV-BAT-320 is stationary / on the ground (not in flight), and Avionics power is lost, the SkyView HDX will display:

POWERING DOWN IN xx SECONDS

and count down from 30 seconds. The MAIN MENU will change to display two buttons:

- STAY ON
- POWER OFF

If neither button is pushed, the countdown will progress to 0 and then the SkyView HDX display will shut off. This feature minimizes backup battery discharge when on the ground and master/external power is shut off normally.

During the 30-second countdown, you can press the PWR OFF button to turn off the SkyView display immediately.

During the 30-second countdown, you can press the STAY ON button to keep the SkyView HDX display and SkyView system operating until the SV-BAT-320's charge is depleted.



When the SkyView HDX display and SkyView system is operating solely on power from the SV-BAT-320, and you wish to power off the SkyView HDX display to conserve available power in the SV-BAT-320, you can push and hold Button 1 to manually power off the SkyView HDX display.

On SV-BAT-320 Backup Battery – Operational Subsystems

The following SkyView HDX system components *are powered by a SkyView HDX display / SV-BAT-320* and thus *will remain functional* if Avionics power is lost during flight:

- SkyView HDX display.
- SV-GPS-250/2020 GPS Receiver (MAP functions will be normal).
- SV-ADAHRS-20X ADAHRS Module (PFD functions).
- SV-EMS-220/221 Engine Monitor Module (ENGINE functions will be normal):
  - Includes engine sensors that require power to operate.
- SkyView SV-ARINC-429 Module.*
- SV-KNOB-PANEL Knob Panel.
- SkyView Video Input Adapter.*
- SkyView Wi-Fi Adapter.*

*Although this component is powered by the SkyView HDX display and will thus function during the loss of Avionics power, it is typically connected to components that require Avionics power, and thus *that subsystem* may not function when Avionics power is lost.

Not Powered by SV-BAT-320 Backup Battery

The following SkyView HDX system components are powered by Avionics power, and thus will *not* function / be powered by an SV-BAT-320 Backup Battery if Avionics power is lost:

- SV-XPNDR-261/262 Transponder (transponder non-functional).
- SV-ADSB-470/472 ADS-B Receiver (ADS-B information cannot be displayed).
- SV-COM- SV-COM-760, -T25/T8, -425 COM Radio (COM radio is non-functional).
- SV-AP-PANEL Autopilot Control Panel (AP is non-functional).
- Dynon Autopilot (AP) Servos (AP is non-functional).
- Heated AOA/Pitot Probe (AOA / Pitot Probe will not be heated).

SV-BAT-320 Charging and Testing

When connected, each SV-BAT-320's charge level is automatically managed by the SkyView HDX display it is (directly) connected to. This ensures that your SkyView HDX system has a fully charged backup battery in case of loss of Avionics power.

To conserve your aircraft battery, the SV-BAT-320 is only charged when the SkyView HDX display detects that your alternator or generator is online. Specifically:

- If SkyView system voltage is above 12.25V: SkyView runs on Avionics power and charges the SV-BAT-320.
- If SkyView system voltage is above 10V, but below 12.25V: SkyView runs on Avionics 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.

See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for more details regarding current consumption while charging a backup battery.

Charging a completely discharged SV-BAT-320 may require up to 4 hours.

Backup Battery Status

If not manually powered off (pushing the POWER OFF button / Button 1), your SkyView HDX display performs an automatic 30 second self-test of the battery each time:

- SkyView HDX detects that your aircraft is stationary, and
- Avionics power is disconnected from the SkyView HDX display (turn off Master switch / breaker).

Your SkyView HDX display will prompt you to perform a Backup Battery Test when 365 days have elapsed since the previous annual Backup Battery Test.

A battery status icon in the top bar and alert messages let you know when SkyView HDX'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 251: 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 System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* 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 System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)*.

Fault/test Failed



Figure 252: 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.

12.Messages and Alerts

SkyView annunciates important notifications onscreen, in a dedicated Message Window, and optionally via audio (if connected and configured). This section 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 253 if all ADAHRS in the system fail:

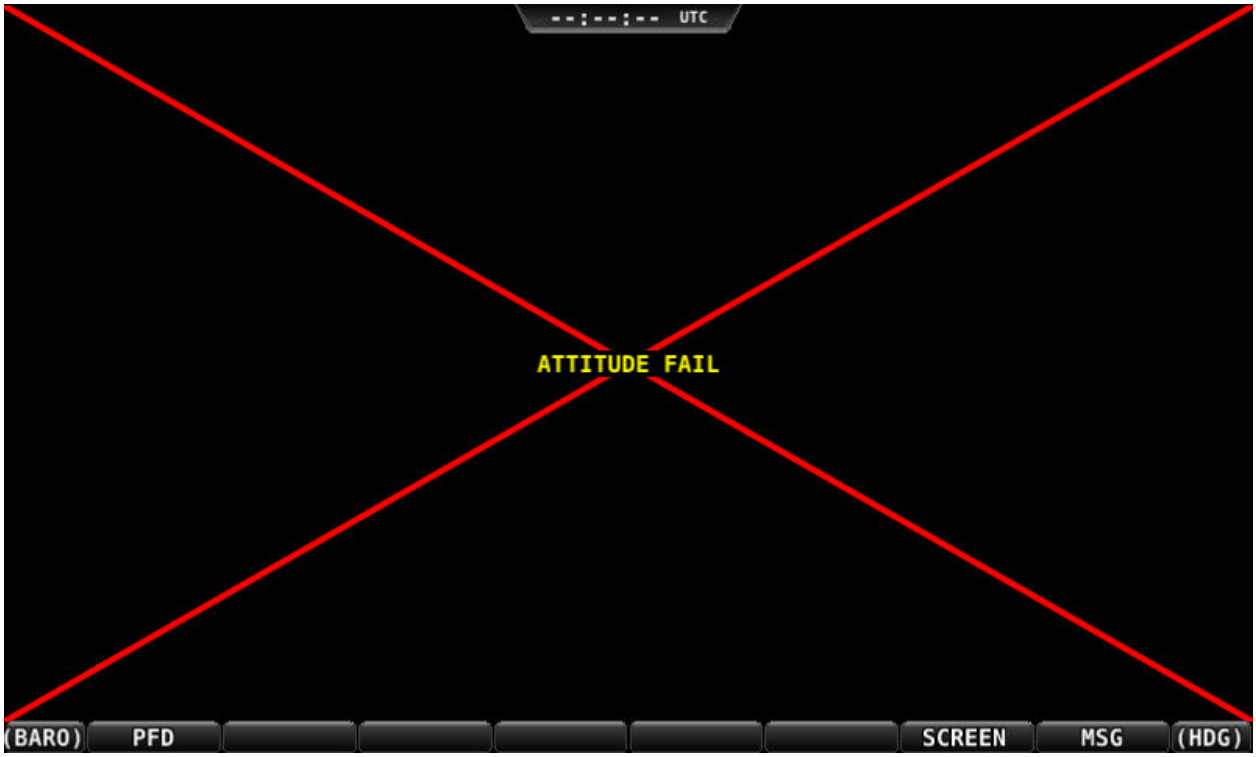


Figure 253: Example SkyView Failure

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 you 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 254: 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. See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* 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.

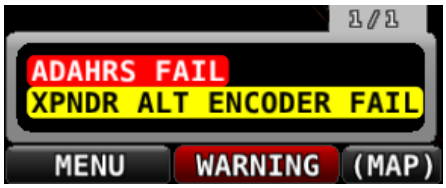


Figure 255: Message Window

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 256: Unacknowledged (left) and Acknowledged (right) alerts

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 System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)*.

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.

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, you 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.

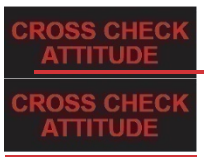
Inhibited Alerts

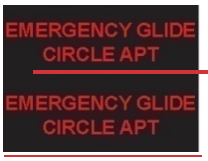
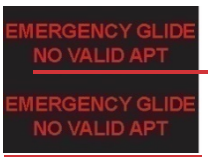
Audio alerts that occur within 5 seconds of SkyView initially powering on are inhibited to reduce transient nuisance alerts that may occur as SkyView comes online.

Engine alerts can be optionally configured to be inhibited before engine start or 5 minutes, whichever comes first. See the *SkyView System Installation Guide* or the *SkyView HDX System Installation Manual (Certified)* for details.

Messages, Alerts, and Audio Alert Details

Spoken Alert (if configured)	Message Displayed in Message Window	Visual Alert (severity)	Description
"Warning"	ADAHRS CAL CORRUPT		The calibration of the ADAHRS module is corrupt. Contact Dynon for assistance
"ADAHRS Cross Check Error"	ADAHRS CROSS CHK ERROR		Displayed after an ADAHRS cross-check error was announced in a multi-ADAHRS systems and one of the ADAHRS modules was not disabled. *Alert is disabled upon installation and not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.*
"Warning"	ADAHRS FAIL		SkyView has detected a problem with the ADAHRS module.
"Warning"	ADAHRS INTERNAL ERROR		SkyView has detected a problem with the ADAHRS module. Contact Dynon for assistance.
"Electrical Current"	AMPS HIGH		Electrical current indicator has entered configured red high range.
"Electrical Current"	AMPS LOW		Electrical current indicator has entered configured red low range.
"Warning"	ARINC-429 OFFLINE		The ARINC-429 module is not communicating SkyView.

Spoken Alert (if configured)	Message Displayed in Message Window	Visual Alert (severity)	Description
"Warning"	AUDIO OUTPUT FAIL		SkyView has detected a problem with the audio system.
"Autopilot Airspeed High"	None	*Near Top Bar:* 	The Autopilot is applying nose up inputs to protect the airplane from exceeding the configured maximum autopilot airspeed. Visual annunciation appears immediately; aural after 10 seconds.
"Autopilot Airspeed Low"	None	*Near Top Bar:* 	The Autopilot is applying nose down inputs to protect the airplane from slowing below the configured autopilot minimum airspeed. Visual annunciation appears immediately; aural after 10 seconds.
"Warning"	BACKUP BATTERY LOW		The backup battery connected to the display is low.
"Check Canopy Latch"	CHECK CANOPY LATCH		A canopy latch alert is configured and the canopy is not latched and the engine has been advanced past a configured RPM. *Alert is disabled upon installation and not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE*.
"Warning"	CHECK PITOT HEAT	*On PFD:* 	Airspeed information is not available; GPS is being used to aid in the computation of attitude information; Attitude may be degraded.
"Cylinder Head Temperature"	CHT # HIGH		CHT indicator for identified sensor has entered configured red high range.
"Cylinder Head Temperature"	CHT # LOW		CHT indicator for identified sensor has entered configured red low range.
"Warning"	CROSS CHECK ATTITUDE	*On PFD:* 	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.

Spoken Alert (if configured)	Message Displayed in Message Window	Visual Alert (severity)	Description
"Warning"	DEMO MODE		System is in Demo Mode and is not airworthy.
"Warning"	EGT # HIGH		EGT indicator for identified sensor has entered configured red high range.
"Warning"	EGT # LOW		EGT indicator for identified sensor has entered configured red low range.
"Warning"	None	*On PFD:* 	Emergency Glide is active, Autopilot is engaged and commanding the aircraft to fly level at best glide speed. SkyView is looking for or found a suitable airport for landing.
"Warning"	None	*On PFD:* 	Emergency Glide is active, aircraft crossed the center of targeted airport, and Autopilot commands aircraft to begin a 20-degree roll to the left to circle airport.
"Warning"	None	*On PFD:* 	Emergency Glide is exiting.
"Warning"	None	*On PFD:* 	Emergency Glide was active, but SkyView found no suitable airport for landing. After 15 seconds, Emergency Glide is exited.
"Warning"	EMS # FAIL		The identified EMS module has failed.
"Warning"	ENGINE FAULT		The TurboTech ECU has detected a Level 3 engine fault. Faults are listed under MENU > ENGINE MENU > FAULTS. Consult the TurboTech service organization for fault details. *Alert is disabled upon installation and not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.*

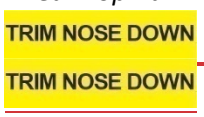
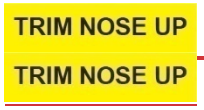
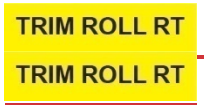
Spoken Alert (if configured)	Message Displayed in Message Window	Visual Alert (severity)	Description
"Engine Monitor"	*Visual indication varies by configuration.*	WARNING	A system monitored by EMS and configured as a general-purpose input has entered the configured red range.
"Fuel Flow"	FUEL FLOW HIGH	WARNING	Fuel flow indicator has entered configured red high range.
"Fuel Flow"	FUEL FLOW LOW	WARNING	Fuel flow indicator has entered configured red low range.
"Fuel Pressure"	FUEL PRES HIGH	WARNING	Fuel pressure indicator has entered configured red high range.
"Fuel Pressure"	FUEL PRES LOW	WARNING	Fuel pressure indicator has entered configured red low range.
None	None	*Near Bottom Bar:* MISSING BEST GLIDE SPEED	The *NRST* button was pushed and held to enable Emergency Glide, but Best Glide Speed is not configured in SkyView.
None	None	*Near Top Bar:* G LIMIT G LIMIT	Autopilot is engaged and vertical acceleration has exceeded the 0.5G to 1.5G range.
None	None	*Near Bottom Bar:* HOLD TO DISABLE EMERGENCY GLIDE	The *NRST* button was pushed and held, and Emergency Glide is exiting.
None	None	*Near Bottom Bar:* HOLD TO ENABLE EMERGENCY GLIDE	The *NRST* button was pushed and held, and Emergency Glide is activating.
"Fuel Quantity"	LEVEL HIGH	WARNING	Fuel quantity indicator has entered configured red high range.
"Fuel Quantity"	LEVEL LOW	WARNING	Fuel quantity indicator has entered configured red low range.
"Warning"	None	*On PFD:* NEAR APT TAKE CONTROL NEAR APT TAKE CONTROL	Emergency Glide is active, and the aircraft is roughly 60 seconds away from the targeted airport.
"Oil Pressure"	OIL PRES HIGH	WARNING	Oil pressure indicator has entered configured red high range.
"Oil Pressure"	OIL PRES LOW	WARNING	Oil pressure indicator has entered configured red low range.

Spoken Alert (if configured)	Message Displayed in Message Window	Visual Alert (severity)	Description
"Oil Temperature"	OIL TEMP		Oil temperature indicator has entered configured red range.
None	None	*On Top Bar:* 	An internal servo error has occurred or ADAHRS data is unreliable.
None	None	*On Top Bar:* 	An internal servo error has occurred or ADAHRS data is unreliable.
"Engine Speed"	RPM HIGH		Tachometer indicator has entered configured red high range.
"Engine Speed"	RPM LOW		Tachometer indicator has entered configured red low range.
"Warning"	SKYNET POWER FAULT		A fault has been detected in the wires that provide power to SkyView Network devices.
"Slip Trim Nose Down"	None	*Near Top Bar:* 	The Autopilot has carried a large trim load for an extended period, and the affected servo is slipping.
"Slip Trim Nose Up"	None	*Near Top Bar:* 	The Autopilot has carried a large trim load for an extended period, and the affected servo is slipping.
"Warning"	TRIM FEEDBACK STUCK		The trim feedback monitor received a positive activity signal during system boot.
"Trim Runaway"	None	*On PFD:* 	SkyView detected electric trim motor activity that was not commanded. *Requires SV-AP-TRIMAMP Installation.*
"Voltage"	VOLTAGE HIGH		Voltage indicator has entered configured red high range.
"Voltage"	VOLTAGE LOW		Voltage indicator has entered configured red Low range.
"Caution"	ACTV ADAHRS VIBRATION		The currently-active ADAHRS has detected vibration that will affect G Meter, Autopilot, and attitude indicator performance. Troubleshoot when able.

Spoken Alert (if configured)	Message Displayed in Message Window	Visual Alert (severity)	Description
"Caution"	ADAHRS CAL OLD		Calibration of the ADAHRS module is out-of-date. Contact Dynon for assistance.
"Go Around"	None	*On PFD:* 	The Autopilot Go Around function has been engaged.
"Caution"	AP DISCONNECT BROKEN		The Autopilot Disconnect switch wire is broken.
"Caution"	AP DISCONNECT STUCK		The system has detected a wiring fault in the AP DISC button/switch.
"Caution"	AP PANEL OFFLINE		The Autopilot Control Panel is no longer communicating with SkyView.
"Caution"	AP TRIM MALFUNCTION		SkyView sent a command to move the trim motor but did not receive feedback that the motor is moving, or a trim switch was held ON continuously for more than 5 seconds while Auto-Trim was enabled.
"Caution"	BACKUP BATTERY IN USE		System has switched to SkyView Backup Battery.
"Caution"	BACKUP BATTERY UNAVAIL		A previously connected backup battery is no longer detected or has failed.
"Caution"	BATTERY TEST FAILED		A full backup battery test was performed, and it failed. See appropriate *SkyView System Installation* document for further troubleshooting information.

Spoken Alert (if configured)	Message Displayed in Message Window	Visual Alert (severity)	Description
"Caution"	CAN FAULT	CAUTION	The Rotax or ULPower ECU has detected an engine fault. Faults are listed under MENU > ENGINE MENU > FAULTS. Consult the Rotax or ULPower service organization for fault details. The TurboTech ECU has detected a Level 1 or 2 engine fault. Faults are listed under MENU > ENGINE MENU > FAULTS. Consult the TurboTech service organization for fault details. *Alert is disabled upon installation and not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.*
"Caution"	CPU TEMP CRITICAL	CAUTION	The display's 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"	EMS SFG FILE MISMATCH	CAUTION	EMS configuration files in SkyView HDX displays do not match.
"Caution"	EXT LEVEL BUTTON STUCK	CAUTION	The system has detected a wiring fault in the LEVEL button.
"Caution"	FLARM OFFLINE	CAUTION	The connected FLARM traffic receiver has not replied to a status query in the last 3 seconds. *Alert is disabled upon installation and not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.*
"Gees" (repeats)	None	*G-Meter is displayed.*	The G meter is in the yellow caution range.
"Caution"	GPS # FAIL	CAUTION	The identified GPS position source has failed. SkyView has switched to the next available GPS position source.

Spoken Alert (if configured)	Message Displayed in Message Window	Visual Alert (severity)	Description
"Caution"	HDG SOURCE FAIL	CAUTION	The Remote Magnetometer module has failed or is not communicating with SkyView. Heading information is unavailable.
"Caution"	KNOB PANEL OFFLINE	CAUTION	Knob Control Panel is not communicating with SkyView.
"Caution"	MAG FACT CAL CORRUPT	CAUTION	The Remote Magnetometer's factory calibration is no longer valid. Heading information is unavailable. Contact Dynon for assistance.
"Caution"	NEED COMPASS CAL	CAUTION	Magnetic compass heading in either the ADAHRS or Remote Magnetometer module is not calibrated.
"Caution"	NEED USER AOA CAL	CAUTION	Angle of Attack (AoA) calibration for the ADAHRS module has not been performed.
"Caution"	NO HI RES TERRAIN	CAUTION	No high-resolution terrain database is installed for airplane's current position.
"Caution"	OTHER DISPLAY OFFLINE	CAUTION	A SkyView display has failed or is no longer communicating via SkyView Network.
"Caution"	POSITION SOURCE # FAIL	CAUTION	The identified position source has failed.
"Caution"	ROTAX: LIMIT FLIGHT OP	CAUTION	The ROTAX engine has informed SkyView there is a problem with the engine. *Alert is disabled upon installation and not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.*
"Caution"	ROTAX: LAND AIRCRAFT	CAUTION	The ROTAX engine has informed the SkyView EMS-221 there is a significant problem with the engine. *Alert is disabled upon installation and not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE*.

Spoken Alert (if configured)	Message Displayed in Message Window	Visual Alert (severity)	Description
"Caution"	TEMP HIGH – INCR RPM		The ROTAX engine coolant temperature should be reduced by increasing idle speed.
"Caution"	SOFTWARE MISMATCH		SkyView components are not all running the same software version.
"Caution"	STANDBY NETWORK ERROR		SkyView Network has lost a redundant network connection to one or more system components. See Standby Network Error Explained section at end of this table for more information.
"Caution"	TRIM SWITCH STUCK		The system has detected a wiring fault in the trim button/switch.
"Caution"	TOUCH PANEL FAULT		Touch screen functionality of affected SkyView HDX display is not working.
"Traffic"	None	*On PFD and MAP:* 	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 will persist.
"Trim Nose Down"	None	*Near Top Bar:* 	The Autopilot requires pitch trim in direction indicated. Visual annunciation appears immediately; aural after 10 seconds.
"Trim Nose Up"	None	*Near Top Bar:* 	The Autopilot requires pitch trim in direction indicated. Visual annunciation appears immediately; aural after 10 seconds.
"Trim Roll Left"	None	*Near Top Bar:* 	The Autopilot requires roll trim in direction indicated. Visual annunciation appears immediately; aural after 10 seconds.
"Trim Roll Right"	None	*Near Top Bar:* 	The Autopilot requires roll trim in direction indicated. Visual annunciation appears immediately; aural after 10 seconds.

Spoken Alert (if configured)	Message Displayed in Message Window	Visual Alert (severity)	Description
"Trim Yaw Left"	None	*Near Top Bar:* TRIM YAW LF	The Autopilot requires yaw trim in direction indicated. Visual annunciation appears immediately; aural after 10 seconds.
"Trim Yaw Right"	None	*Near Top Bar:* TRIM YAW RT TRIM YAW RT	The Autopilot requires yaw trim in direction indicated. Visual annunciation appears immediately; aural after 10 seconds.
"Caution"	ZAON OFFLINE	CAUTION	The connected Zaon traffic receiver has not replied to a status query in the last 10 seconds. *Alert is disabled upon installation and not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE*.
"Message"	ADS-B IN OFFLINE	MESSAGE	The connected ADS-B traffic/weather receiver has failed or is no longer communicating with SkyView.
"Message"	BACKUP BATT LOW CHARGE	MESSAGE	The backup battery connected to the SkyView display has a low charge but is not in use.
"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"	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"	COM RADIO PNL OFFLINE	MESSAGE	The COM radio control panel is no longer communicating with SkyView.
"Message"	COM XCEIVER OFFLINE	MESSAGE	The COM radio transceiver module Is no longer communicating with SkyView.

Spoken Alert (if configured)	Message Displayed in Message Window	Visual Alert (severity)	Description
"Minimums"	None	*On PFD:* MINIMUMS *Minimums bug appears on Altimeter*	Airplane has descended below set MINIMUM altitude.
"Message"	NO ADSB OUT: GPS LOST	MESSAGE	The GPS source that provides GPS position to the SV-XPNDR-261 for ADS-B Out use is offline.
"Message"	OEM CONFIG MISMATCH	MESSAGE	OEM-customized displays are not in sync with each other.
"Message"	PITCH SERVO OFFLINE	MESSAGE	The pitch autopilot servo has stopped communicating with SkyView, or autopilot servos are not receiving power.
"Pitch Slip"	PITCH SLIP	MESSAGE	Autopilot servo is unable to move controls in direction commanded by Autopilot. Slip messages are generally transient.
"Message"	ROLL SERVO OFFLINE	MESSAGE	The roll autopilot servo has stopped communicating with SkyView, or autopilot servos are not receiving power.
"Roll Slip"	ROLL SLIP	MESSAGE	Autopilot servo is unable to move controls in direction commanded by Autopilot. Slip messages are generally transient.
"Switch Fuel Tank"	SWITCH FUEL TANK	MESSAGE	The optionally-configured fuel tank timer has reached its pre-configured time or fuel quantity consumption limit.
"Message"	SYSTEM EVENT: SEE SETUP	MESSAGE	SkyView has logged a system event for the Dynon diagnostic file. Contact Dynon for instructions on how to provide Dynon with a diagnostic file for review.
"Message"	TAIL # MISMATCH	MESSAGE	Tail numbers differ between SkyView displays – system settings will not properly synchronize.
"Timer Expired"	TIMER EXPIRED	MESSAGE	A user-determined timer has expired.

Spoken Alert (if configured)	Message Displayed in Message Window	Visual Alert (severity)	Description
"Message"	Wi-Fi Offline		The Wi-Fi Adapter is currently offline. *Alert is disabled upon installation and not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE*.
"Message"	XPNDR ALT ENCODER FAIL		Altitude is not being sent to the SV-XPNDR-261/262 because it is not available from its nominal barometric altitude source.
"Message"	XPNDR ERROR		The transponder has detected a problem and notified SkyView. The transponder may not function correctly. See Transponder Errors for information about specific transponder errors.
"Message"	XPNDR FAIL		The transponder has failed.
"Message"	XPNDR HEX CODE NOT SET		A SkyView Transponder or ADS-B receiver is installed but the HEX Code has not been set.
"Message"	XPNDR NOT IN ALT MODE		The aircraft is in flight and the Transponder is not in Alt Mode.
"Message"	YAW SERVO OFFLINE		The yaw autopilot servo has stopped communicating with SkyView, or autopilot servos are not receiving power.
"Yaw Slip"	YAW SLIP		Autopilot servo is unable to move controls in direction commanded by Autopilot. Slip messages are generally transient.
"Approaching Altitude"	None	None	The aircraft is approaching the bugged altitude.
"Approaching Minimums"	None	None	Altitude is within 200 feet of the MIN bug.
"Approaching Waypoint"	None	None	The aircraft is within 30 seconds of an upcoming SkyView Flight Plan waypoint (except the final waypoint).
"Autopilot"	None	None	The roll or pitch autopilot axis has been engaged.

Spoken Alert (if configured)	Message Displayed in Message Window	Visual Alert (severity)	Description
"Autopilot Disconnect"	None	None	The roll and pitch autopilot axis has been disconnected.
"Autopilot Mode"	None	None	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 Roll Disconnect"	None	None	The roll autopilot axis has been disconnected
"Autopilot Pitch Disconnect"	None	None	The pitch autopilot axis has been disconnected
"Check Gear"	None	None	The aircraft is configured with retractable gear and the landing gear is up, and the aircraft is descending through the configured minimum warning speed.
"Flaps Overspeed"	None	None	Indicated airspeed is exceeding Vfe (and flaps are at least partially deployed)
"Flight Plan Updated"	None	None	A new Flight Plan has been received by SkyView from an external Flight Plan source (such as a mobile app).
"Gear is Down for Runway Landing"	None	None	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.
"Gear is Up for Water Landing"	None	None	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.

Spoken Alert (if configured)	Message Displayed in Message Window	Visual Alert (severity)	Description
"Gear Overspeed"	None	None	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.
"Leaving Altitude"	None	None	The aircraft is leaving the bugged altitude.
"Over Gees" (repeats)	None	None	The G Meter is in the red warning range.
"Overspeed"	None	None	Indicated airspeed is exceeding Vne.
"Traffic Not Available"	None	None	Traffic is not available from a previously available source.
"Trim Nose Up"	None	None	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	None	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.
"Yaw Damper"	None	None	The autopilot Yaw Damper has been engaged.
"Yaw Damper Disconnect"	None	None	The autopilot Yaw Damper has been disengaged.

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 recommends that the root cause of the failure is determined before flying again.

The *SkyView System Installation Guide* and the *SkyView HDX System Installation Manual (Certified)* has troubleshooting procedures for finding the root cause of standby network errors.

Transponder Errors

If an SV-XPNDR-261/262 fault is detected, a system message will be displayed: XPNDR ERROR. To see the detailed information on the fault, go to SETUP MENU > TRANSPONDER SETUP and right-click the knob to see the specific error message. Table 17 below provides a recommendation for each specific error message.

Message	Message Explanation	Recommendation
ANT FAULT (value)	Antenna Fault; value is Power output.	Generally, an installation issue with antenna, feedline, or connector. Check antenna, feedline, or connector. A visual inspection is often not sufficient to find the fault.
NO ADSB POSITION	GPS data is not being received by transponder.	Check connection to GPS receiver or transponder configuration.
DPSK UNLOCK	Internal diagnostic warning.	Internal fault, contact Dynon Technical Support for help.
REMOTE HOT (value)	Transponder is receiving excessive heat; value is Temperature (°C).	Check location of transponder for exposure to excessive heat.
RX PSU FAIL	Internal diagnostic warning.	Internal fault, contact Dynon Technical Support for help.
SQUITTER FAIL	Extended Squitter data not transmitted.	Internal fault, contact Dynon Technical Support for help.
TX POWER LOW (value)	Transmit power output is low; value is Power output.	Generally, an installation issue with antenna, feedline, or connector. Check antenna, feedline, or connector. A visual inspection is often not sufficient to find the fault.
TX PSU HIGH (value)	Transmitter power supply output is abnormally high; value is Volts.	Internal fault, contact Dynon Technical Support for help.

Message	Message Explanation	Recommendation
TX PSU LOW (value)	Transmitter power supply output is abnormally low; value is Volts.	Check power being supplied to SV-XPNDR-261/262.
TX RESTART	Internal diagnostic warning	Remove and re-apply power to transponder.
TXPNDR FAULT	Generic fault message	Internal fault, contact Dynon Technical Support for help.

Table 17: SV-XPNDR-261/262 Error Messages



The SV-XPNDR-262 is not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.

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).



The on-screen AOA indicator is disabled upon installation and not authorized for use in Dynon Certified installations under Dynon's STC SA02594SE.

13.Appendix: License Information

GPL License Information
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Version 2, June 1991

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