



***SkyView* HDX**

Airplane Flight Manual Supplement

(or Supplemental Airplane Flight Manual)

For Software Version 16.0.8

103272-000

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FAA Approval

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Airplane Registration: _____

Airplane Manufacturer: _____

Airplane Model: _____

Airplane Serial Number: _____

This document serves as a supplement to the aircraft flight manual, or as a supplemental flight manual. It must be attached to the FAA Approved Airplane Flight Manual (AFM) or, when no AFM exists, used as a supplemental aircraft operating manual when the SkyView HDX system is installed in accordance with STC SA02594SE.

The information contained herein supplements the information of the basic Airplane Flight Manual. For Limitations, Procedures, and Performance information not contained in this Supplement consult the basic Airplane Flight Manual or the placards and markings in the aircraft.

The following sections of this document are FAA APPROVED:

- 2: Limitations
- 3: Emergency & Non-Normal Procedures
- 4: Normal Operations
- 5: Performance
- 9: Appendix 1: Cessna Models 172F through 172S
- 10: Appendix 2: Beechcraft Bonanza P35 through V35B
- 11: Appendix 3: Beechcraft Bonanza 36
- 12: Appendix 4: Piper PA-34 Seneca

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Federal Aviation Administration

Seattle, WA

Date: 11/8/2021

Revision History

REV	DYNON SUBMITTAL DATE	FAA ACCEPTANCE DATE	CHANGE DESCRIPTION
A	03/05/2018	Not Accepted	Initial Submission.
B	06/08/2018	Accepted by Seattle AIR-715 on 7/20/2018	Added 91.227 Language
C	07/10/2018	Accepted by Seattle AIR-715 on 10/11/2018	Added knob modules and updated operating limitation.
D	04/01/2019 ECO 324900	Not Accepted	<ul style="list-style-type: none"> • Added 6-cylinder EGT/CHT, Flaps and Landing Gear functionality, • Revised illustrations, • Moved Airplane Limitations to section 8, and Emergency Procedures to Section 9, • Revised format of Emergency Procedure checklist, • Deleted the appendix. • Revised limitations section for new models
E	04/10/2019 ECO 326715	Not Accepted	<ul style="list-style-type: none"> • Added autopilot slip, trim, slip/trim, airspeed high/low message. • Added autopilot VNAV engagement caution. • Formatted emergency procedures for improved clarity. • Added autopilot servo jam emergency procedure. • Clarified language on FAA approval signature page. • Formatted section 5.5 (Autopilot Operation) for improved clarity.
F	04/29/2019 ECO 327677	Not Accepted	<ul style="list-style-type: none"> • Changed section 3.6 to reference "14 CFR 23.1545" instead of "FAR 23.1545". • Changed wording in section 5.5 to read "pull" instead of "turn off" with reference to circuit breakers. • Updated Figure 18
G	07/02/2019 ECO 331341	Accepted by Seattle AIR-715 on 7/2/2019	<ul style="list-style-type: none"> • Changed name of document to "SkyView HDX Airplane Flight Manual Supplement". • Added note regarding use of this document as an SAFM.
H	03/03/2020 ECO 344060	Not Accepted	<ul style="list-style-type: none"> • Applied new document template. • Added information in Section 3.7, 3.10, 3.11 for twin engine airplanes / Dual EMS. • Added Section 4.5: Temperature Indicators. • Added Section 4.6: Synchroscope. • Added Section 6.4.2: Trim Messages. • Added Section 6.4.3: Slip Trim Messages. • Revision to Section 6.9: Yaw Damper behavior. • Added Section 9.6.4: Piper Aircraft PA-34 Seneca.

REV	DYNON SUBMITTAL DATE	FAA ACCEPTANCE DATE	CHANGE DESCRIPTION
I	04/10/2020 ECO 346079	Not Accepted	<ul style="list-style-type: none"> • Addressed FAA review comments on Rev H, including: <ul style="list-style-type: none"> ▪ Update Section 2: System Overview to better distinguish between Primary, Secondary, and Standby EFIS displays. ▪ Replace Section 3: Flight Crew Alerting System with new, updated information. ▪ Updated the following sections of Section 4: Indications for technical accuracy: <ul style="list-style-type: none"> ○ 4.1 Airspeed Indicator ○ 4.3 Landing Gear Position Indicators ▪ Updated the following sections of Section 6: Autopilot for technical accuracy: <ul style="list-style-type: none"> ○ 6.1: Protective Features ○ 6.4.2: Trim Messages ○ 6.4.3: Slip Trim Messages ○ 6.5: Autopilot Controls ○ 6.6: Vertical Guidance Source Loss ○ 6.9: Yaw Damper ▪ Updated the following sections of Section 7: Normal Operations for technical accuracy: <ul style="list-style-type: none"> ○ 7.10: Course (OBS) Setting ○ 7.11: HDX Backup Power Check ○ 7.13: Backup EFIS-D10A Battery Condition Check ○ 7.16: Yaw Damper ○ 7.10: Course (OBS) Setting ○ 7.11: HDX Backup Power Check ○ 7.13: Backup EFIS-D10A Battery Condition Check ○ 7.16: Engage Autopilot ○ 7.17: Engage Flight Director ○ 7.18: Disengage Autopilot ○ 7.22: Go Around ○ 7.25: Approaches ○ 7.26: Autopilot Operational Check ▪ Updated the following sections of Section 9: Limitations for technical accuracy: <ul style="list-style-type: none"> ○ 9.1: General ○ 9.2: Backup Power ○ 9.6.4: Piper Aircraft PA-34 Seneca ▪ Updated Section 10.1: Airspeed, Altitude and/or Attitude Unreliable for technical accuracy. • Proofread document and fixed language, layout, and linking issues. • Removed outdated links and references.
J	05/01/2020 ECO 346986	Not Accepted	<ul style="list-style-type: none"> • Addressed FAA review feedback on Rev H: <ul style="list-style-type: none"> ▪ Re-ordered Table 1: Warnings, Table 2 Cautions, and Table 3: Messages. Ordering is by 1) core system, 2) component, 3) function per type of alert. ▪ Updated Section 4.2.1, 4.2.3, and 4.2.3 with additional screenshots and verbiage to clearly differentiate single- and twin-engine EMS indications. ▪ Updated Section 4.5 with new screenshot. ▪ Added Table 4: Autopilot Fail Down Modes in Section 6.1, describing Autopilot fail down modes. Subsequent tables renumbered. ▪ Re-arranged screenshots in Section 6.4 for readability. Updated screenshot in Section 6.4.4 to reflect UI. ▪ Removed table from Section 6.4, as information was outdated. Updated Sections 6.4.1 through 6.4.4 to sync with info in Section 3. ▪ Updated procedure in Section 7.14 to disable Dual Mode. ▪ Updated verbiage in Section 7.18 to be clearer. ▪ Added new Section 7.26.2: Yaw Axis Operation Check. Subsequent sections renumbered. ▪ Removed 2 limitations from Section 9: Limitations per FAA request. ▪ Updated Section 10.6: Autopilot / Yaw Damper Servo Jam to clearly describe role of frangible link.

REV	DYNON SUBMITTAL DATE	FAA ACCEPTANCE DATE	CHANGE DESCRIPTION
K	08/11/2020 ECO 353760	Not Accepted	<ul style="list-style-type: none"> • Reorganized document according to GAMA 1 guidelines. • Aircraft-specific information moved to separate Appendices to aid technical reviews of document as more Autopilots are added to airplanes on the AML. • Failure Modes (now Section 3.2) renamed to Non-Normal Procedures and content converted to GAMA style procedures. Emergency Procedures: Autopilot Disconnect and Yaw Damper Disconnect moved from Emergency Procedures to Non-Normal Procedures. • Engage Autopilot (now Section 4.4.1) updated per feedback from FAA/Dynon meeting. • Warning Alerts (now Section 7.8.2) updated per Dynon software developer input. • Caution Alerts (now Section 7.8.3) updated per feedback from FAA/Dynon meeting and Dynon software development input. • Message Alerts (now Section 7.8.4) updated per Dynon software developer input. • Airspeed Indicators (now Section 7.9.1) updated per feedback from FAA/Dynon meeting. • Engine Monitoring (now Section 7.9.2) updated per feedback from FAA/Dynon meeting. • Autopilot Protective Features (now Section 9.1.1) updated to include servo break-away information.
L	9/14/2020 ECO 356791	Not Accepted	<ul style="list-style-type: none"> • Updated document footers per GAMA 1 guidelines (all pages affected). • Updated FAA Approval section (Page X) per FAA feedback. • Updated Tables 2, 3, 4 (Pages 7-4 through 7-20) with new column heads and some language/terminology changes per FAA feedback. • Updated Sections 10 (Page 10-1), 11 (Page 11-1), 12 (Page 12-1) to use prohibitive language per FAA feedback.
M	10/08/2020 ECO 358194	Not Accepted	<ul style="list-style-type: none"> • Moved FAA Approval page to first page per GAMA 1 guidelines. • Moved References page to Section 1: General • Added new Section 2.2: Engine Monitoring Visibility to Section 2: Limitations. Subsequent Section 2 headings renumbered. • Moved old Section 3.1.2: Autopilot / Yaw Damper Override to new Section 9.1.1. Subsequent Section 6 headings renumbered. • Updated language in new Section 3.1.3 Autopilot / Yaw Damper Servo Jam. • Updated language in Table 2: Warning Alerts, Table 3: Caution Alerts, Table 4: Messages per FAA feedback. • Updated language in 7.9.2: Engine Monitoring per FAA feedback.
N	10/23/2020 ECO 360164	Accepted by Seattle AIR-715 on 10/29/2020	<ul style="list-style-type: none"> • Moved FAA Approval page per FAA request. (page iii)

REV	DYNON SUBMITTAL DATE	FAA ACCEPTANCE DATE	CHANGE DESCRIPTION
O	10/14/2021 ECO 360038	Not Accepted	<ul style="list-style-type: none"> • Revised format of Revision History table per FAA feedback. • All but one instance of "Frangible Link" changed to "Shear Screw" to standardize nomenclature across Dynon documentation. • Revised format of Section 2.1: IFR Operations to standardize format with other subsections. • Added Section 2.6: Autopilot per FAA feedback. • Revised Section 3.1.1: Airspeed, Altitude, and/or Attitude Unreliable for clarity and usability. • Added Section 3.1.4: Trim Runaway. • Added Section 4.1.11: G Meter. Subsequent sections renumbered. • Updated Section 4.4.1: Engage Autopilot with info about Auto-Trim. • Revised Section 4.4.2: Disengage Autopilot. • Revised Section 4.4.3: AP DISC Button. • Added Section 4.4.4: AP POWER Switch. Subsequent sections renumbered. • Added Section 4.4.5: TRIM POWER Switch. Subsequent sections renumbered. • Revised Section 6: Weight and Balance per FAA feedback. • Revised format of Section 7: System Overview to remove installation info. • Revised format of Section 7.4: Map for clarity and usability. • Added Section 7.6: Traffic Information. Subsequent sections renumbered. • Added Section 7.6.1: Traffic Targets. • Added Section 7.6.2: Target Symbols. • Added Section 7.6.3: Traffic Alerts. • Added Section 7.7: Weather Information. Subsequent sections renumbered. • Updated external links in Section 7.8 Navigation Databases. • Updated external links in Section 7.9 Operational Software. • Revised Section 7.10: Flight Crew Alerting System per FAA feedback. • Revised Section 7.10.1: Notification Methods per FAA feedback. • Revised and updated Section 7.10.2: Warning Alerts per FAA feedback and to add new alerts and alerts that were shown elsewhere in doc. • Revised and updated Section 7.10.3: Caution Alerts per FAA feedback and to add new alerts and alerts that were shown elsewhere in doc. • Revised and updated Section 7.10.4: Messages per FAA feedback and to add new messages and messages that were shown elsewhere in doc. • Revised format of Section 8: Handling, Service, and Maintenance to remove installation info. • Updated Section 9.1.4.1: Autopilot Indications to show all AP activity in the AP Info Bar. • Added Section 9.1.5: Auto-Trim. Subsequent sections renumbered. • Added Section 9.1.6.5: G Limit Alert. • Added new Section 12: Appendix 3: Beechcraft Bonanza 36. Subsequent appendices renumbered.

REV	DYNON SUBMITTAL DATE	FAA ACCEPTANCE DATE	CHANGE DESCRIPTION
P	10/28/2021 ECO 360038	Not Accepted	<ul style="list-style-type: none"> • Revised following sections per feedback received during Dynon/FAA meeting on 10/27/2021: <ul style="list-style-type: none"> ▪ 1: General, revised verbiage about optional autopilot. ▪ 2.6: Autopilot, added two new limitations. ▪ 3.1.1: Airspeed, Altitude, and/or Attitude Unreliable, revised emergency procedure to sync with Alerting tables. ▪ 3.1.4: Trim Runaway, revised emergency procedure to sync with Alerting tables. ▪ 3.2.1: Loss of Airspeed, Altitude, Attitude, and/or Heading Display, revised non-normal procedure to sync with Alerting tables. ▪ 3.2.4: GPS # Fail, revised verbiage to sync with Alerting tables. ▪ 3.2.5: GPS Position # Fail, revised verbiage to sync with Alerting tables. ▪ 3.2.6: Autopilot Disconnect, revised verbiage to sync with Alerting tables. ▪ 3.2.7: Yaw Damper Disconnect, revised verbiage to sync with Alerting tables. ▪ 4.1.11: G Meter, revised verbiage about G Meter being automatically removed. ▪ 4.4: Autopilot Controls, revised verbiage about optional autopilot. ▪ 4.4.1: Engage Autopilot, revised verbiage about SkyView Auto-trim. ▪ 4.4.3: AP DISC (Autopilot Disconnect) Button, revised verbiage about SkyView Auto-trim. ▪ 4.5: Autopilot Operation Check, revised verbiage about optional yaw damper. ▪ 7.10.2: Warning Alerts and Table 2, revised verbiage to sync with emergency and non-normal procedures. ▪ 7.10.3: Caution Alerts and Table 3, revised verbiage to sync with emergency and non-normal procedures. ▪ 7.10.4: Messages and Table 4, revised verbiage to sync with emergency and non-normal procedures. ▪ 7.12.2: Protective Features, revised verbiage to make autopilot bank limit clearer. ▪ 7.12.5: SkyView Auto-trim, revised verbiage about SkyView Auto-trim and trim power switch. ▪ 7.12.11: Yaw Damper, revised verbiage about yaw damper function. ▪ 9: Supplements (old section removed from document) ▪ 9.1: Autopilot (old section and subsections moved to Section 7.12) ▪ 9.1, 10.1, 11.1, 12.1: Autopilot Limitations, added new limitation.
Q	11/05/2021 ECO 360038	Accepted by Seattle AIR-715 on 11/08/2021	<ul style="list-style-type: none"> • Revised Contact Information section and links within doc with current info and locations. • Revised following sections per feedback received from FAA 11/04/2021: <ul style="list-style-type: none"> ▪ 1.1: Document Control, added verbiage about what revision of doc is posted. ▪ 3.2.1: Loss of Airspeed, Altitude, Attitude, and/or Heading Display, revised procedure to clarify the aural annunciation. ▪ 4.5: Autopilot Operation Check, moved note to Section 4.5.2. ▪ 7.10.3: Caution Alerts and Table 3, revised procedures to sync with emergency and non-normal procedures. ▪ 7.12: Autopilot, added verbiage about autopilot not controlling throttle.

Technical changes since previous revision are tracked with change bars in margins. Formatting and style changes are not tracked.

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1 General

SkyView HDX is an integrated system that aggregates air, engine, traffic, and navigation information for display to the pilot. The information is portrayed on the SkyView HDX display, which is a touchscreen, coupled with mechanical knobs and buttons. The SkyView HDX display provides Primary Flight Information (PFI) on the Primary Flight Display (PFD), Map with current position, and optionally Engine Monitoring information. Subsystems, such as the Autopilot, Communications, Transponder, as well as third-party equipment integrate with SkyView HDX to perform their functions.

Voice aural annunciations and written messages are used to alert the pilot to exceptional conditions, such as departures from desired altitudes or exceeding engine parameter limits.

Airspeed, altitude, and attitude data is collected by the Air Data, Attitude, Heading Reference System (ADAHRS.). Engine, fuel, and electrical system data is collected by the optional Engine Monitoring System (EMS).

Navigation data is provided by an integrated GPS and by external navigation sources.

ADS-B In traffic data is provided by an integrated ADS-B In receiver. ADS-B Out capability is provided by a position source and transponder, which have been shown to meet the requirements of 14 CFR 91.227.

The system stores an onboard terrain and chart database for display as the VFR Map.

This document also contains information related to operating the optional SkyView Autopilot system. Not every airplane is approved to be equipped with the SkyView Autopilot system.

1.1 Document Control

This document is released, archived, and controlled according to the Dynon Avionics document control system. To revise this document, a letter is submitted to the FAA with the revision. The FAA then accepts and approves any revision to the content listed in the FAA Approval section. After FAA acceptance/approval, Dynon posts the revised document for customer use at dynoncertified.com/docs. Only the latest revision of the document is made available. STC owners and installers are notified of the new revision via an official Dynon Marketing email release.

1.2 Reference Documents

- 102949-000 SkyView HDX Pilot's User Guide (current revision)
- 103261-000 SkyView HDX System Installation Manual (current revision)
- 103221-000 SkyView HDX System General Maintenance Manual (current revision)

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2 Limitations

The limitations listed in this section apply to all airplanes with a SkyView HDX system.

Autopilot limitations for specific airplane makes/models are listed in separate appendices at the end of this document.

2.1 IFR Operations

For all airplanes:

- SkyView HDX system must have at least one of each of the following components in fully functioning condition, with no error messages displayed:
 - SkyView HDX display unit.
 - SV-ADAHRS-200 module.
 - SV-BAT-320 backup battery.
 - EFIS-D10A standby display.
 - Functioning external navigation source, either an IFR GPS Navigator or NAV radio.
- IFR flight with Yellow or Red Backup Battery indicator status displayed is prohibited.

2.2 Engine Monitoring Visibility

For all airplanes equipped with an Engine Monitoring System (EMS):

- Configuring the screen layout of a SkyView HDX display unit so the primary engine instruments are not visible to the pilot is prohibited.

For twin-engine airplanes with an EMS:

- A secondary (non-PFD) Skyview HDX display unit must be installed and dedicated to present Engine Monitoring information.
- The SkyView HDX display unit dedicated to present Engine Monitoring information must be configured to always show (no exceptions) EMS information in either 100% or 50% display page layout during takeoffs and landings.

2.3 Backup Power

For all airplanes:

- Backup power for both the primary and standby display systems must be checked prior to IFR flight. (See [Section 4.2: SkyView HDX Backup Power Check](#) and [Section 4.3: Standby Flight Display Backup Battery Condition Check](#) for instructions.)

2.4 Synthetic Vision

For all airplanes:

- SkyView HDX Synthetic Vision is advisory in nature and must not be used as the sole means of terrain and obstacle avoidance.

2.5 Map

For all airplanes:

- The SkyView HDX Map and Flight Planning function is advisory in nature and must not be used as the sole means of terrain and obstacle avoidance.

2.6 Autopilot

For all airplanes equipped with the SkyView Autopilot system:

- Use of the autopilot when any servo shear screw is broken is prohibited.
- Use of the autopilot without a successful preflight operations check is prohibited. (See Section 4.5: [Autopilot Operation Check](#) for instructions)

For airplanes equipped with the Yaw Damper function:

- Use of the Yaw Damper function during takeoff and landing is prohibited.

3 Emergency & Non-Normal Procedures

3.1 Emergency Procedures

3.1.1 Airspeed, Altitude, and/or Attitude Unreliable

CONDITION: Airspeed, Vertical Speed, and/or Altimeter indications are not consistent with Pitch Attitude. CHECK PITOT HEAT or CROSS CHECK ATTITUDE alert may be displayed.

1. Autopilot _____ DISCONNECT.
2. Standby Flight Display _____ MONITOR.
3. Pitot Heat Switch _____ ON.
4. Alternate Static Air Source _____ ON.
5. Maneuver aircraft to avoid icing conditions.
6. Fly by reference to Standby Flight Display and Whiskey Compass.
7. Alternate Static Air Source no longer needed _____ OFF.

3.1.2 Autopilot / Yaw Damper Disable

CONDITION: One or more autopilot servos are operating in a confusing or un-commanded fashion.

1. AP Power Switch _____ OFF.
2. Fly Manually.
 - Power has been removed from the Autopilot servos.

3.1.3 Autopilot / Yaw Damper Servo Jam

CONDITION: One or more flight controls fail to move as expected and are jammed by an autopilot servo.

1. Autopilot _____ DISCONNECT.
2. Flight Controls _____ APPLY BREAK-AWAY FORCE.
3. Flight Controls _____ OPERATE.
4. AP POWER Switch _____ OFF.
5. Plan to land at nearest suitable airport.
 - When pilot applies force to flight control system, shear screw will break and safely disconnect flight controls from malfunctioning Autopilot servo.
 - Once shear screw breaks, pilot needs to relax flight control input to avoid over correction. The flight controls will then operate normally.
 - Autopilot operation is prohibited until the cause of the malfunction has been determined and corrected.

3.1.4 Trim Runaway

CONDITION: TRIM RUNAWAY alert is displayed.

1. AP DISC Button _____ PRESS AND HOLD.
2. TRIM POWER Switch _____ OFF.
3. Mechanical Pitch Trim _____ MOVE AS NEEDED.
4. Fly Manually.
 - Power has been removed from the Trim motor.
 - *DO NOT* use electric Trim system until cause of malfunction has been determined and corrected.

3.2 Non-Normal Procedures

3.2.1 Loss of Airspeed, Altitude, Attitude, and/or Heading Display

CONDITION: Red X replaces the airspeed, altitude, attitude and/or heading indicators.

If autopilot is engaged, "AUTOPILOT DISCONNECT" alert is annunciated.

1. Autopilot _____ DISCONNECT.
2. Standby Flight Display _____ MONITOR.
3. Aircraft Attitude _____ MAINTAIN / REGAIN AIRCRAFT CONTROL.
4. Plan to land at nearest suitable airport.
 - Monitor Secondary Displays, Standby Display, and other sensory cues as available.

3.2.2 Loss of Electrical Power

CONDITION: AIRCRAFT POWER LOST message is displayed, and the Main Menu indicates STAY ON and POWER OFF.

1. STAY ON Button _____ PRESS.
2. Plan to land at nearest suitable airport.
 - The system is operating on the Backup Battery.
 - The system will continue to operate normally until the Backup Battery is depleted.
 - There is no indicator for Backup Battery power or time remaining. A fully charged Backup Battery provides 45 minutes of operation at a minimum.

3.2.3 Engine Monitoring System Failure

CONDITION: Red X replaces all engine and fuel indications.

1. Control engine power by sound and control lever position. Monitor engine performance using airspeed and vertical speed.
2. Plan to land at nearest suitable airport.

3.2.4 GPS # Fail

CONDITION: GPS # FAIL alert is displayed. ("#" being the configured GPS source (1, 2, 3, etc.)).

- The GPS position source has failed.
- The system is operating on the next available GPS position source.

3.2.5 GPS Position Source # Fail

CONDITION: POSITION SOURCE # FAIL alert is displayed. ("#" being the configured position source (1, 2, 3, etc.)).

1. Use other navigational means.

- The system has no remaining GPS position sources available.
- The Map is no longer available.

3.2.6 Autopilot Disconnect

CONDITION: The autopilot needs to be disconnected for any reason.

1. Disconnect Autopilot:

- Press and release AP DISC Button (either yoke- or panel-mounted).
- OR–
- Press AP Button on the Autopilot Control Panel.
- OR–
- Press the AP Button on the Autopilot Control Menu.
- OR–
- Turn AP POWER switch/breaker OFF.

2. Fly manually.

3.2.7 Yaw Damper Disconnect

CONDITION: The yaw damper needs to be disconnected for any reason.

1. Disconnect Yaw Damper:

- Press and release AP DISC Button (either yoke- or panel-mounted).
- OR–
- Press the YD Button on the Autopilot Control Menu.

2. Fly manually.

4.1.2 Touch Controls

SkyView HDX displays contain touchscreen functionality. Touching various items on the display allows for the item to be selected and the value adjusted. For example, touching the HSI data source allows for alternate sources to be selected.

Pilot-selectable choices for the layout of each screen can be selected by pressing DISPLAY button on Main Menu. This allows the pilot to choose whether a display should show PFD, Map, or Engine information, or some combination thereof.

See Figure 2 for details for the touchable screen areas of main flight functions. Additionally, the Timer function has touchscreen control, and if a compatible NAV device is connected, the Course (CRS) functions as well.



- | | |
|--------------------------------|-----------------------------|
| 1. Autopilot Menu Selector | 6. Heading Bug Selector |
| 2. Transponder Menu Selector | 7. BARO Selector |
| 3. Speed Bug Selector | 8. Density Altitude Display |
| 4. Altitude Bug Selector | 9. HSI Source Selector |
| 5. Vertical Speed Bug Selector | |

Figure 2: HDX Touch Controls

4.1.3 Synthetic Vision

Synthetic Vision can be turned on or off by pressing the MENU button on the Main Menu, touching the PFD TOOLS screen icon, and then touching the SYNVIS screen icon. A green highlight on the SYNVIS icon means it is turned on. No highlight means it is turned off.

4.1.4 HSI Data Source

To cycle through the available sources of navigation data for display on HSI:

- Press MENU button on Main Menu, then select PFD TOOLS > HSI SRC. Repeated touches of HSI SRC will cycle through available HSI data sources.

Or,

- Touch HSI SRC area near lower right corner of the PFD and beneath the Altimeter. Repeated touches of HSI SRC area will cycle through available HSI data sources.

4.1.5 Adjusting Values and Bugs

To adjust bug values using the left knob:

1. Touch applicable area on screen (see [Figure 2](#)). The function is shown and highlighted above knob.
2. Rotate left knob as needed to set value.

Or,

1. Push left knob to enter Knob Function Menu.
2. Rotate knob as needed to set value.
3. Push left knob to close menu (menu will also close automatically after 5 seconds). This assigns function to knob.
4. Rotate knob as needed to set value. The value is shown and highlighted on screen.



If a function is not present in the Knob Function Menu, then it does not have a touchable screen area and cannot be assigned to the left knob. To add or remove bugs to/from the Knob Function Menu, go to MENU > PFD TOOLS > BUGS.

4.1.6 BARO Setting

The Barometer setting can be adjusted with the left knob on the display or the BARO knob on the optional Knob Control Panel (see [Section 4.1.12](#)). Using the knob on the control panel simplifies the adjustment by eliminating the need to assign the function to the left knob.

To change the Barometer setting:

1. Push left knob to enter Knob Function Menu.
2. Rotate knob to highlight BARO.
3. Push knob to close menu (menu will also close automatically after 5 seconds). This assigns BARO Bug to knob, and BARO is shown above knob. The Barometer area on the PFD is also outlined to show that it is selected.
4. Rotate knob to adjust Barometer setting. While Barometer setting is changing, screen area is highlighted in Cyan to draw attention to it.
5. To synchronize Altimeter with the Barometer settings in [Table 1](#), push and hold BARO knob (on display or control panel) until a SYNC message appears on PFD. The following occurs:
 - Altimeter is set to the nearest METAR (when ADS-B is available in-flight).

- Standard pressure is set (29.92 inHg or 1013 millibars when at/above 18k feet or no ADS-B on board).
- Altimeter is set to match the published airport elevation (when on the ground).
- Altimeter is set to match GPS altitude (when on the ground).

If none of the conditions in [Table 1](#) are met, the Altimeter will not synchronize, and a NO SYNC message appears on the PFD.

Table 1: BARO Settings

	With SV-ADSB - 472 Installed	Without SV-ADSB - 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>(i.e., 29.92 in Hg, 1013 mbar, or 760 mm Hg)</i>
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).	

4.1.7 Altitude Bug

The Altimeter can be adjusted with the left knob on the display or the ALT knob on the optional Knob Control Panel (see Section [4.1.12](#)). Using the knob on the control panel simplifies the adjustment by eliminating the need to assign the function to the left knob.

To change the Altitude bug:

1. Push left knob to enter the Knob Function Menu.
2. Rotate knob to highlight ALT.
3. Push knob to close menu (menu will also close automatically after 5 seconds). This assigns ALT to knob, and ALT is shown above knob. The Altimeter area on the PFD is also outlined to show that it is selected.
4. Rotate knob to adjust ALT bug. While ALT bug is changing, screen area is highlighted in Cyan to draw attention to it.
5. To synchronize Altimeter to airplane's current altitude, push and hold ALT knob (on display and control panel) until SYNC message appears above left knob on display.

4.1.8 Minimum Altitude Bug

To set the Minimum Altitude bug:

1. Push left knob to enter Knob Function Menu.
2. Rotate knob to highlight MIN.
3. Push knob to close menu (menu will also close automatically after 5 seconds). This assigns MIN to knob, and MIN is shown above knob. The Minimum Altimeter area on the PFD is also outlined to show that it is selected.
4. Rotate knob to adjust MIN bug. While MIN bug is changing, screen area is highlighted in Cyan to draw attention to it.

4.1.9 HDG/TRK Bug

Heading/Track can be adjusted with the left knob on the display or the HDG/TRK knob on the optional Knob Control Panel (see Section 4.1.12). Using the knob on the control panel simplifies the adjustment by eliminating the need to assign the function to the left knob.

To set the Heading/Track bug:

1. Press left knob to enter Knob Function Menu.
2. Rotate knob to highlight HDG or TRK.
3. Push knob to close menu (menu will also close automatically after 5 seconds). This assigns HDG or TRK to knob, and HDG or TRK is shown above knob. The Heading or Track area on the PFD is also outlined to show that it is selected.
4. Rotate knob to adjust HDG or TRK bug. While HDG or TRK bug is changing, screen area is highlighted in Cyan to draw attention to it.
5. To synchronize Heading and Track to airplane's current heading/track, push and hold HDG/TRK knobs (on display or control panel) until SYNC message appears above left knob on display.

4.1.10 Course (OBS) Setting

To set the HSI course (OBS):

1. Press left knob to enter Knob Function Menu.
2. Rotate knob to highlight CRS.
3. Push knob to close menu (menu will also close automatically after 5 seconds). This assigns CRS to knob, and CRS is shown above knob. The HSI course area on the PFD is also outlined to show that it is selected.
4. Rotate knob to adjust CRS setting. While CRS setting is changing, screen area is highlighted in Cyan to draw attention to it.



The CRS value for each available HSI source is retained when that source is deselected and will be used when that HSI source is re-selected.

4.1.11 G Meter

When triggered or enabled by the pilot, the G Meter replaces the HSI on the PFD (see [Figure 3](#)). The G Meter has an analog needle that indicates the G loading of the aircraft. Digital G information is also instantaneously shown in the center of the gauge. Depending on how the G Meter is configured, the analog range may have yellow and/or red ranges to indicate that the aircraft's G limits are being approached. The numerical magnetic heading above the HSI area remains displayed when the G Meter is displayed.

The G Meter is automatically displayed when the aircraft's G loading reaches the yellow threshold configured during initial system setup. (See the *103261-000 SkyView HDX System Installation Manual* document for more information). If the G Meter was automatically displayed, it will be removed when the aircraft's G loading returns to normal range, and the HSI will be restored. Pilots can also choose to display the G Meter at any time by selecting MENU (Button #6) > PFD TOOLS icon > G METER icon. The G METER icon toggles the indicator on/off.

The smaller digital numbers above and below the Digital G information are the maximum (top) and minimum (bottom) Gs that the aircraft has experienced since the G Meter was last reset. These can be reset at any time by selecting MENU (Button #6) > PFD TOOLS icon > RESET G icon.



Figure 3: Example of G Meter Being Displayed

4.1.12 Knob Control Panel

The Knob Control Panel (see [Figure 4](#)) 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 because it directly controls the bugs that allow the selection of Altitude (ALT), Heading (HDG) or Track (TRK), and Barometric Setting (BARO).

Rotating the knob change the value of the associated bug. Pushing and holding the ALT and HDG/TRK knobs synchronizes the bugs with current values. Pushing and holding the BARO knob sets the Altimeter to match the GPS altitude, standard pressure if above 18,000 feet, or (if SV-ADSB-472 is installed), the nearest appropriate METAR station.



Figure 4: Knob Control Panel (horizontal and vertical configurations)

4.1.13 VHF COM Radio

The optional COM Radio Control Panel (see [Figure 5](#)) tunes frequencies by airport and station type and allows the simultaneous reception of two frequencies, referred to as Dual Mode. To use the radio:

1. Press the APT button and use the knob to scroll through nearby airports.
2. Press the knob to select an airport.
3. TWR, ATIS, GND, and ATC will now select appropriate frequencies for the selected airport.
4. Press the knob to toggle the selected active and standby frequencies.
5. Press and hold the knob to monitor both active and standby frequencies (i.e., Dual Mode). The active frequency will have priority.
6. To exit Dual Mode, push and hold the knob again, or press DUAL on the Radio Menu.
7. Adjust frequencies with the labeled buttons or manually with the dual concentric knob.



Figure 5: COM Control Panel (Horizontal and Vertical Configurations)

4.2 SkyView HDX Backup Power Check

When the SkyView HDX system detects that it is not moving, and power is removed from a display connected to a backup battery, the system will automatically run an additional 30 seconds on backup battery power. This is so it can complete a battery condition test. The result of the test will appear in the battery status indicator at next system startup.

The battery icon is displayed next to the clock to indicate battery status:

- No icon: Last battery check was satisfactory.
- Yellow battery icon:
 - The manual battery test has not been accomplished within the last 365 days. Refer to the SkyView installation manual for instructions on performing the manual battery test.
 - The automatic condition test failed during the last three attempts. Perform the manual battery test according to the SkyView installation manual.
- Red X battery icon: battery check or annual test failed, or the battery is not connected



IFR flight with a yellow or red back up battery status indicator displayed is prohibited.

4.3 Standby Flight Display Backup Battery Condition Check

The charge on the EFIS-D10A's backup battery needs to be checked prior to IFR flight.

To check the charge on the EFIS-D10A backup battery:

1. Enter menu system by pressing any button (except far left and right buttons) on an EFIS page, and then press EFIS > MORE > INFO > LEFT > VMETER.
2. Make sure backup battery is charged to at least 16.0 volts.

4.4 Autopilot Controls

This section covers the primary means of operating the optional SkyView Autopilot. Additional methods and shortcuts can be found in the *Pilot's User Guide*. The primary means of controlling the autopilot is via the Autopilot Control Menu (see [Figure 36](#)).

- On the HDX primary page, press MENU, then AUTOPILOT to display the Autopilot Control Menu.
- Or touch the Autopilot Mode Display to enter the Autopilot Control Menu.

In the Autopilot Control Menu:

- A green bar indicates the function is active.
- A white bar indicates the function is armed.
- A black bar indicates the function is off or not selected.
- Gray button labels indicate the mode is not available (e.g., gray NAV indicates no valid NAV source).
- HSI source color indicates the type of source. Magenta indicates a GPS-based source; Green indicates a radio-based source (VOR or localizer).

The optional Autopilot Control Panel (see [Figure 6](#)) for the SkyView Autopilot provides dedicated buttons for engaging the Flight Director, autopilot, and all control modes, including coupled approaches, VNAV, IAS Hold, and mode sequencing (provided that IFR navigation sources are installed). It also has a Level button to immediately return the airplane to straight and level flight.

The "ALT" and "SRC" buttons on the control panel are abbreviations for "ALT HOLD" and "HSI SRC" in the Autopilot menu.



The control panel buttons are illuminated for low-light visibility, but do not indicate autopilot operation status. Use the autopilot mode display and/or the autopilot menu to determine autopilot operation status.



Figure 6: SV-AP-PANEL (Horizontal and Vertical Versions)

4.4.1 Engage Autopilot

Press the AP button to engage the servos. The Flight Director is automatically engaged. SkyView Auto-trim is also automatically engaged if the airplane is equipped with an electric trim system and an SV-AP-TRIMAMP Trim Motor Adapter is installed.

If an AP mode or modes have been preselected, that mode will become active when the AP button is pressed, and the servos will engage. See below to pre-select an AP mode.

If no mode has been selected, 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. Different modes may then be selected.



Normally, the Autopilot will not engage if airspeed is outside the normal speed range configured by the installer during initial system setup. The only exception is LEVEL Mode, which will engage at any speed.

4.4.2 Disengage Autopilot

The Autopilot is disengaged by the following:

- Pressing "AP" button on the Autopilot Control Panel (see [Figure 6](#)).
- Pressing "AP" button on the Autopilot Control Menu (see [Figure 36](#)).
- Pressing AP DISC button (see [Section 4.4.3](#) below):
 - Press button once to disengage the autopilot servos but leave Modes and Flight Director active.
 - Press button twice (i.e., double-click) to disengage the autopilot servos and cancel all Modes and Flight Director.
- Turning AP POWER switch/breaker OFF (see [Section 4.4.4](#) below).

4.4.3 AP DISC (Autopilot Disconnect) Button

SkyView HDX systems with SkyView Autopilot will have a button labeled, AP DISC, mounted either on the wheel/yoke or prominently on the instrument panel. This button, when pressed, will immediately disengage the autopilot. If the SkyView Auto-trim feature is installed, it will also temporarily interrupt power to the trim motor(s).



If the SkyView Auto-trim feature is installed, releasing the AP DISC button restores power to the trim motor(s). To permanently disable electric trim, turn the TRIM POWER switch OFF.

Where the AP DISC button is mounted depends upon the autopilot installation:

- If the SkyView Auto-trim feature is installed, the AP DISC button will be on the yoke/wheel grip, opposite the throttle control.
- If the airplane does not have SkyView Auto-trim, the AP DISC button will be on either the yoke/wheel grip or prominently on the instrument panel.

4.4.4 AP POWER Switch

SkyView HDX systems with SkyView Autopilot will have a switch/breaker labeled AP POWER that is mounted prominently on the instrument or circuit breaker panel. This switch/breaker, when turned OFF, immediately removes power from all autopilot servos.

4.4.5 TRIM POWER Switch

SkyView HDX systems with SkyView Auto-trim will have a switch/breaker labeled TRIM POWER that is mounted prominently on the instrument or circuit breaker panel. This switch/breaker, when turned OFF, immediately removes power from all electric trim motors.

4.4.6 Engage Flight Director

The Flight Director is engaged by pressing the "FD" button instead of the "AP" button. To subsequently engage the servos, press the "AP" button.

4.4.7 Level Mode

Press the LEVEL button on the panel to engage Level Mode. Level Mode can be selected at any time, even if Autopilot is disconnected.



The level function cannot guarantee recovery below V_{NE} in all starting attitudes due to G limiting and servo effort limiting. Recoveries have only been demonstrated from 45 degrees of bank and 10 degrees nose down pitch.

4.4.8 Climb or Descend to a New Altitude at a Set Vertical Speed

1. Adjust the altitude bug to the new desired altitude.
2. Press the VS button.



If ALT HOLD is currently engaged VS bug will be set to zero. If no vertical mode is currently engaged, the VS bug will synchronize with the current vertical speed.

3. Adjust the vertical speed bug using the NOSE UP / DN buttons.



In ALT HOLD mode, the NOSE UP / NOSE DOWN buttons may be used to command a vertical speed transition without pressing the VS button. The initial press of NOSE UP/DN selects the default vertical speed of 500 fpm in the desired direction.



The AP limits airspeed to a safe value if the commanded vertical speed would over-speed or under-speed the aircraft.

4. ALT capture is automatically armed.
5. Engage the servos if not already engaged by pressing the AP button. ALT capture is automatically activated as the airplane approaches the target altitude.

4.4.9 Climb or Descend to a New Altitude at a Set Airspeed

1. Adjust the altitude bug to the new desired altitude.
2. Press the IAS button.



The IAS bug will synchronize to the current airspeed.

3. NOSE UP / DN buttons to adjust the Autopilot's target airspeed.



Airspeed command is limited to the Autopilot minimum and maximum limits configured by the installer during initial system setup.

4. ALT capture is automatically armed.
5. Engage the servos if not already engaged by pressing the AP button. ALT capture is automatically activated as the airplane approaches the target altitude.

4.4.10 Go Around

The Go Around function is available when the Autopilot is engaged in vertical guidance and is tracking a vertical deviation (i.e., status bar shows "VNAV" or "GS" as the active mode). To engage the Go Around function, press the NOSE UP button on the AP Control panel. Pressing Go Around (NOSE UP) at any time automatically switches Pitch and Roll Modes to:

1. TRK Mode, with value defaulting to the current GPS track, and
2. One of the following, depending upon how owner/pilot configured system in Autopilot Setup menu:
 - VS Mode defaulting to the default climb rate, or
 - IAS Mode, defaulting to the current airspeed



The need for airplane trim changes during the go-around may cause the autopilot servos to slip. The pilot must adjust the pitch trim to prevent the pitch servo from slipping.

4.4.11 HDG and TRK Hold

1. Adjust the HDG/TRK bug to the desired value.
2. Select HDG to follow a magnetic heading equal to the bug value.
3. Select TRK to follow a GPS referenced ground track equal to the bug value.
4. Engage the servos if not already engaged.

4.4.12 Enroute Lateral Navigation - VOR or GPS

This procedure is identical whether you are tracking using an enroute navigation source (GPS or VOR) or a non-precision approach (GPS, VOR or LOC).

1. Select a navigation source on the HSI (MENU > AUTOPILOT > HSI SRC). The navigation source must be providing valid course and deviation information.
2. Press the NAV button. If the CDI is already near-centered NAV mode will immediately become active. Otherwise, NAV mode will arm. If NAV mode is armed, adjust the current mode's target (heading, track, or roll) to establish the desired intercept with the navigation source. NAV mode will become active once the navigation source CDI can be captured by the autopilot.

4.4.13 Approaches

1. While navigating on a course intercepting the approach course, select a navigation source on the on the HSI (MENU > AUTOPILOT > HSI SRC).
2. If appropriate, tune and identify the station and set the OBS appropriately via the CRS setting. The external navigation source must be providing valid course and deviation information.
3. When cleared for the approach:
 - a. Press the NAV button in the Roll Menu to arm the NAV mode.
 - b. Press the VNAV button in the Pitch Menu to arm VNAV mode.



NAV and VNAV modes arm and activate independently from each other. There is no limitation upon the order the modes can be armed or activated.



Autopilot pitch authority may be exceeded when lowering the flaps. Trim appropriately during changes in flap settings.



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.



VNAV mode will only capture vertical approach guidance from below. Plan your glide slope or a glide path capture accordingly.

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 Navigator does not support auto-switching from GPS to NAV, you must manually perform this action by using AUTOPILOT > HSI SRC.
2. Some devices, such as the Garmin 430, 430W, and GTN series, can automatically change from the GPS to the localizer and send a signal to the SkyView to automatically change the HSI source at the appropriate time.



If the 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 navigators' CDI or NAV/GPS toggle to change whether 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 navigator at any time.

4.5 Autopilot Operation Check

Perform the following on the ground (i.e., during a pre-flight inspection) to test the functionality of the optional SkyView Autopilot.

4.5.1 Pitch and Roll Axis Operation Check

With master switch and autopilot servo power switches ON:

1. Center flight control yoke, and lightly hold in place.



The weight of an unbalanced elevator may cause the servo to slip. Lightly hold the controls in the centered position when operating the autopilot on the ground to offset this effect.

2. Align HDG/TRK bug with current heading.
3. Select ALT and HDG.
4. Engage Autopilot.
5. Set Vertical Speed +1000.
6. Set Altitude 1000 feet above current. Feel yoke move in "Nose Up" direction.
7. Press and hold ALT button to return altitude bug to current. Feel yoke move to neutral.
8. Change HDG/TRK bug to right of current heading. Feel yoke move in "Right Roll" direction.
9. Change HDG/TRK bug to left of current heading. Feel yoke move in "Left Roll" direction.

4.5.2 Yaw Axis Operation Check



If the autopilot is a two-axis (pitch and roll) control system, do not perform the following check. Autopilot systems without a Yaw Damper will not have Yaw Damper (YD) controls in the Autopilot Control Menu (see [Figure 36](#)).

With master switch and autopilot servo power switches ON:

1. Move rudder pedals left and right to feel operation.
2. Center rudder pedals, and lightly hold in place.
3. Engage Yaw Damper.
4. Move rudder pedals to the left. Rudder pedals should encounter some resistance to movement; the servo may slip.
5. Move rudder pedals to the right. Rudder pedals should encounter some resistance to movement; the servo may slip.
6. Disconnect Yaw Damper.
7. Move rudder pedals left and right to feel operation. Resistance should not occur.



The resistance offered by the servo indicates that the system is operating normally.

4.5.3 Autopilot Disconnect Check

With master switch and autopilot servo power switches ON:

1. Engage Autopilot.
2. Accomplish all that apply:
 - Press the AP button in the Autopilot Control menu, and ensure the autopilot disconnects. "AUTOPILOT DISCONNECT" aural should be heard.
 - Turn the AP Servo Power switch to OFF, and ensure the autopilot disconnects. "AUTOPILOT DISCONNECT" aural should be heard.
 - Press the AP button on the Autopilot Control Panel (if installed), and ensure the autopilot disconnects. "AUTOPILOT DISCONNECT" aural should be heard.
 - Press the panel mounted disconnect button (if installed), and ensure the autopilot disconnects. "AUTOPILOT DISCONNECT" aural should be heard.
 - Press the yoke mounted disconnect button (if installed), and ensure the autopilot disconnects. "AUTOPILOT DISCONNECT" aural should be heard.

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5 Performance

Use of the SkyView HDX system has no effect on the airplane's performance.

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6 Weight and Balance

Installation of a SkyView HDX system impacts the airplane's level weight and balance once, during initial installation. Certified installers must add new empty weight and balance information to airplane's Aircraft Flight Manual.

Refer to the airplane's Pilot's Operating Handbook and associated Aircraft Flight Manual and supplements. Pilots manage loading weight and balance according to the Aircraft Flight Manual. SkyView HDX has no impact on operational loading.

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7 System Overview

7.1 SkyView HDX Display Units

The SkyView HDX display unit installed in the pilot's position is designated the Primary Display. It is configured during initial setup to always present PFD. It can also present Map and Engine Monitoring. Additional installed display units (referred to as Secondary Displays) have no PFD restrictions and can present any combination of PFD, Map, or Engine Monitoring. A Secondary Display may also function as a backup should the Primary Display fail.



Primary Displays and Secondary Displays share attitude, air data and engine data. However, SkyView HDX systems include a Standby Display to provide instant attitude and air data. The standby display is a separate system from the SkyView HDX system.

7.2 Standby Display System

SkyView HDX-equipped airplanes always include a Standby Display that provides a display screen and an ADAHRS in a single component with a back-up battery to present attitude, altitude, and airspeed information. The approved standby display is the EFIS-D10A.

7.3 Synthetic Vision

SkyView HDX provides a synthetic vision representation of the local terrain and obstacles. This display is for advisory purposes only and must not be used as the sole means of avoidance.

7.4 Map

SkyView HDX can present a Map to display airport, airspace, obstacle, and other available aviation data using navigation databases (FAA Obstacle/Terrain and Airport) databases and GPS-derived airplane position data. The Map can also be used for flight planning and plot navigational course guidance.



The Map is for advisory purposes only and must not be used as a sole means of avoidance, nor is it an IFR-approved navigation source.

7.5 Terrain Alerts

Terrain clearance alerts are provided based on the predicted path of the airplane relative to the terrain database and the proximity of the aircraft to terrain. The synthetic vision alert is based both on altitude and on flight path. Terrain shown in red is an immediate threat to the aircraft. The map alert is based solely on GPS altitude.

- Yellow terrain is between 100 and 1000 feet below aircraft GPS altitude.
- Red terrain is above the aircraft, or 100 feet or less below the aircraft.

7.6.1 Traffic Targets

Traffic targets are presented with symbols and information commonly used in aviation for traffic/TCAS systems. SkyView HDX can display up to 8 targets simultaneously. If there are more than 8 potential threats, the TIS ground station determines the highest priority targets.



Figure 8: Example of a Traffic Target

A traffic target includes the following:

- A symbol that depicts the type of traffic target: Traffic Advisory (TA) target, Proximity Advisory target, or Non-threat target. See Section 7.6.2 for more information.
- Relative altitude in hundreds of feet. This is displayed above the target symbol as a signed integer. In Figure 8, the target is +14, or 1400 feet higher than your aircraft. This area is blank if the altitude of a target is not known.
- An up or down arrow to the right of the target symbol that indicates whether the target aircraft is climbing or descending.
- Depending upon target aircraft equipment, an orange vector arrow that points in the target aircraft's direction of travel. The length of arrow represents where the aircraft is expected to be in one minute based on its current trajectory. SkyView HDX assumes that all TIS targets are travelling at 150 knots. The target's direction is shown to the nearest 45° increment (0°, 45°, 90°, etc.).
- Depending upon target aircraft equipment, the aircraft's tail number will be shown below target symbol.

7.6.2 Target Symbols

This section describes the types and significance of the symbols that SkyView HDX displays on the PFD and Map for traffic targets.

Traffic Advisory (TA) Targets:

These targets have a high chance of ending up near the aircraft. They often start as lower priority targets and become TA targets as they approach. SkyView HDX considers an aircraft a threat if the traffic device in the target aircraft is reporting that it is a threat. TIS reports a threat if a target aircraft is within a 1/4 mile of your aircraft and converging within 30 seconds. This calculation is 20 seconds if the target aircraft is not reporting altitude. ADS-B reports also use a 20 second calculation.



Figure 9: TA Target Symbol (On-screen) Figure 10: TA Target Symbols (Off-screen)

If a TA target cannot be displayed on the screen because its location is beyond the edge of the Map at its current range, it will appear at the edge of the Map with shading, as shown in [Figure 10](#). The shaded area of the symbol always points towards the edge of the screen. This provides threat awareness regardless of Map range level.

Proximity Advisory and Non-Threat Targets:

Proximity Advisory targets have less of a chance of being a factor based on their position. They are not considered TA targets because they are not converging with your aircraft within the next 30 seconds. A Proximity Advisory target 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 TA alert.

Non-threat targets are any other detectable aircraft that are neither TA targets nor Proximity Advisory targets.



Figure 11: Proximity Advisory Target



Figure 12: Non-Threat Target

7.6.3 Traffic Alerts

"Traffic" is an aural and visual caution alert that notifies pilots that there are Traffic Advisory (TA) targets present. The visual notification is shown on the PFD (near Airspeed tape) and on the Map (lower right corner), as shown in [Figure 13](#).



Figure 13: Traffic Alert Notification

7.7 Weather Information

SkyView HDX can display weather information on the Map, including lightning and PIREPS. Display of traffic information is for advisory purposes only and must not be used as a sole means of avoidance.



The display of weather information is enabled from the IN-FLIGHT MENU under WEATHER OPTIONS.

7.8 Navigation Databases

SkyView HDX uses a variety of databases containing navigation and obstacle related information. Depending on the database, these may be updated as frequently as every month. SkyView components should be kept updated with the latest available databases. These may be downloaded to a USB flash drive in accordance with the instructions found at dynoncertified.com/data.

7.9 Operational Software

Software is updated using a USB flash drive in accordance with the instructions for certified aircraft found at dynoncertified.com/download.

Updating the SkyView software will automatically update all components connected to the SkyView Network as appropriate.

7.10 Flight Crew Alerting System

The Flight Crew Alerting System is a central feature of the SkyView HDX system. This system provides the pilot and crew with system information organized by condition priority for all installed SkyView HDX sub-systems. The alerts and messages will vary depending upon the installed equipment. This section describes all possible alerts and messages.

System information is delivered in the form of flight crew alerts and messages that are organized by severity into one of three categories:

1. **WARNING** Warning Alerts:

- Warning alerts are for conditions that require immediate flight crew awareness and immediate flight crew response. These alerts are displayed in the Alert Notification Window (see [Figure 15](#)) and are usually coupled with a voice aural annunciation.



Some warning alerts are for flightpath or autopilot conditions, these alerts are displayed directly on the PFD and/or have associated voice aural annunciations.

2. **CAUTION** Caution Alerts:

- Caution alerts are for conditions that require immediate flight crew awareness and subsequent flight crew response. These alerts are displayed in the Alert Notification Window (see [Figure 15](#)) and are usually coupled with a voice aural annunciation.



Some caution alerts are for flightpath or traffic conditions, these alerts are displayed directly on the PFD and Map and/or have associated aural annunciations.

3. **MESSAGE** Messages

- Messages are for conditions that require immediate flight crew awareness and may require subsequent flight crew response. Messages appear in the Alert Notification Window (see [Figure 15](#)) and are usually coupled with a voice aural annunciation.



Some messages are for flightpath or autopilot conditions, these messages are displayed directly on the PFD and/or have associated aural annunciations.

7.10.1 Notification Methods

Whenever a new non-flightpath alert is triggered, the Alert Notification Indicator (i.e., button label) shown in [Figure 14](#), flashes Red for Warning alerts, Yellow for Caution alerts, and Gray for Messages. A corresponding voice aural annunciates a spoken word such as "WARNING", "CAUTION" or "MESSAGE" depending on the alert type. Some alerts, like engine-related warnings, will announce the actual message name, such as "OIL PRESSURE", or "AUTOPILOT DISCONNECT".



Figure 14: Warning Notification Indication

Pressing the WARNING, CAUTION, or MESSAGE button (i.e., Button #8) opens the Alert Notification Window. This window displays text associated with each active alert. After pressing the button, the alerts present in the window are considered acknowledged and the indicator stops flashing. The indicator color corresponds with highest alert level that is currently being triggered. Individual alerts may be configured by the installer to require acknowledgement after they have been triggered for the alert to disappear.

The appearance of alerts within the Alert Notification Window change when first triggered and after acknowledgement. The difference between an un-acknowledged and acknowledged message is shown in [Figure 15](#). This difference is consistent with all alerts, regardless of color. When no alerts are active, the Alert Indicator states, "NO MSG".



When the Alert Notification Window is open, the displayed information is frozen and does not change. If a new alert or message is triggered or cleared, the pilot must re-open the window to refresh the information.

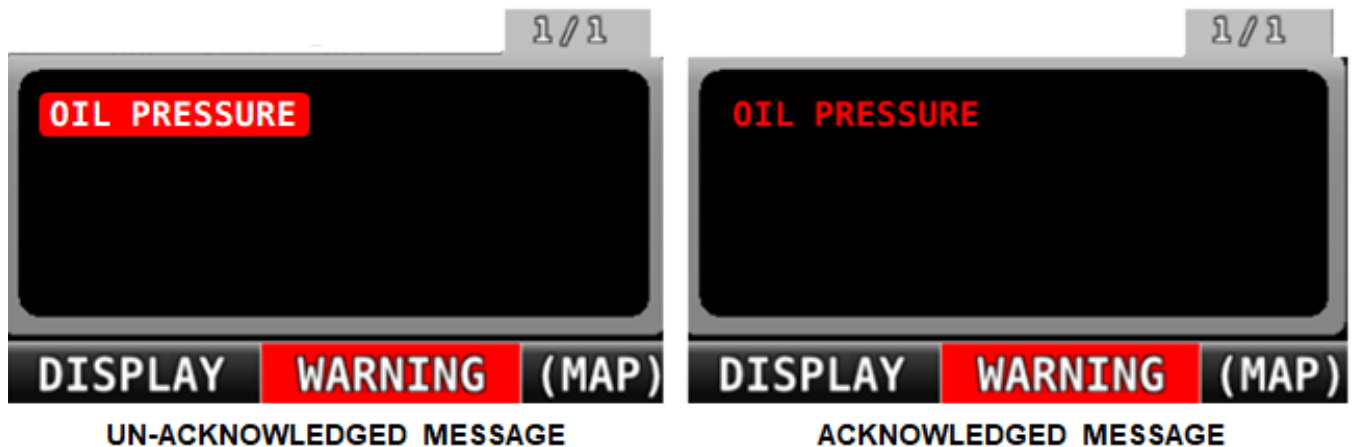


Figure 15: Alert Notification Window, Alert Appearance

7.10.2 Warning Alerts

Warning Alerts are for conditions that require immediate flight crew awareness and immediate flight crew response. Most warning alerts are red and may have specific voice aural annunciations. If a warning alert is flightpath or autopilot related, a visual annunciation (see [Table 2](#) for visual appearance) is displayed directly on the PFD.

Warning alerts are dependent upon installed systems and components. See [Table 2](#) for a full listing of Warning alerts, ordered by 1) Core System, 2) Component, and 3) Function.

Table 2: Warning Alert Conditions and Associated Crew Responses

WARNING ALERTS				
VISUAL INDICATION	AURAL INDICATION	CONDITION	PRE-FLIGHT ACTION	IN-FLIGHT ACTION
AUDIO OUTPUT FAIL	"WARNING"	Audio Alert System has failed. AoA system will not operate if installed.	Do not fly.	Use visual alerts to monitor status.
BACKUP BATTERY LOW	"WARNING"	The Backup Battery connected to the SkyView display unit is in use and has entered a low charge state.	Do not fly if flight requires Instrument Flight Rules (IFR). Allow backup battery to fully charge before flight.	Avoid operations in Instrument Meteorological Conditions (IMC). Land at nearest suitable airport.
DEMO MODE	(None)	System is in demo mode and is not airworthy.	Do not fly.	Monitor Standby Display System.
SKYNET POWER FAULT	"WARNING"	A fault has been detected in wiring that provides power to SkyView Network. Failure of Flight, Engine, and/or Navigation information may be imminent.	Do not fly.	Monitor Standby Display System.
(None)	"FLAPS OVERSPEED"	The value configured for V _{FE} has been exceeded with flaps extended.	No action.	Take command to manually decrease airplane's speed until the flaps have been fully retracted.

WARNING ALERTS				
VISUAL INDICATION	AURAL INDICATION	CONDITION	PRE-FLIGHT ACTION	IN-FLIGHT ACTION
(None)	"GEAR OVERSPEED"	The value configured for V_{LE} has been exceeded with gear extended.	No action.	Take command to manually decrease airplane's speed until the landing gear has been fully retracted.
(None)	"OVER GEES"	The G Meter has entered the configured Red range	No action.	Reduce loads acting on airplane using pitch and power as appropriate.
(None)	"OVERSPEED"	The value configured for V_{NE} has been exceeded.	No action.	Take command to manually decrease airplane's speed below V_{NE}
ADAHRS CAL CORRUPT	"WARNING"	The calibration of the ADAHRS is corrupt.	Do not fly.	Monitor Standby Display System.
ADAHRS INTERNAL ERROR	"WARNING"	System sensor tests performed on ADAHRS failed.	Do not fly.	Monitor Standby Display System.
ADAHRS FAIL	"WARNING"	SkyView HDX has detected a problem with the ADAHRS module.	Do not fly.	SkyView PDF has failed. Monitor Standby Display System.
ARINC-429 OFFLINE	"WARNING"	The SV-ARINC-429 module is not communicating with the SkyView display unit (if installed).	Do not fly if flight requires external navigation sources.	SkyView will not display navigation from external sources. Use internal source, or follow navigation information on external devices.
CHT # HIGH	"CYLINDER HEAD TEMPERATURE"	CHT indicator for identified sensor has entered configured Red High range.	Refer to Airplane Flight Manual	Refer to Airplane Flight Manual

WARNING ALERTS				
VISUAL INDICATION	AURAL INDICATION	CONDITION	PRE-FLIGHT ACTION	IN-FLIGHT ACTION
CHT # LOW	"CYLINDER HEAD TEMPERATURE"	CHT indicator for identified sensor has entered configured Red Low range.	Refer to Airplane Flight Manual	Refer to Airplane Flight Manual
AMPS HIGH	"ELECTRICAL CURRENT"	Electrical current indicator has entered configured Red High range.	Refer to Airplane Flight Manual	Refer to Airplane Flight Manual
AMPS LOW	"ELECTRICAL CURRENT"	Electrical current indicator has entered configured Red Low range.	Refer to Airplane Flight Manual	Refer to Airplane Flight Manual
EMS # FAIL	"WARNING"	The identified EMS module has failed.	Do not fly.	Use control position(s) and aural cues to operate engine(s).
RPM HIGH	"ENGINE SPEED"	Tachometer indicator has entered configured Red High range.	Refer to Airplane Flight Manual	Refer to Airplane Flight Manual
RPM LOW	"ENGINE SPEED"	Tachometer indicator has entered configured Red Low range.	Refer to Airplane Flight Manual	Refer to Airplane Flight Manual
EGT # HIGH	"EXHAUST GAS TEMPERATURE"	EGT indicator for identified sensor has entered configured Red High range.	Refer to Airplane Flight Manual	Refer to Airplane Flight Manual
EGT # LOW	"EXHAUST GAS TEMPERATURE"	EGT indicator for identified sensor has entered configured Red Low range.	Refer to Airplane Flight Manual	Refer to Airplane Flight Manual
FUEL FLOW HIGH	"FUEL FLOW"	Fuel Flow indicator has entered configured Red HIGH range.	Refer to Airplane Flight Manual	Refer to Airplane Flight Manual
FUEL FLOW LOW	"FUEL FLOW"	Fuel Flow indicator has entered configured Red Low range.	Refer to Airplane Flight Manual	Refer to Airplane Flight Manual

WARNING ALERTS				
VISUAL INDICATION	AURAL INDICATION	CONDITION	PRE-FLIGHT ACTION	IN-FLIGHT ACTION
FUEL PRES HIGH	"FUEL PRESSURE"	Fuel Pressure indicator has entered configured Red High range.	Refer to Airplane Flight Manual	Refer to Airplane Flight Manual
FUEL PRES LOW	"FUEL PRESSURE"	Fuel Pressure indicator has entered configured Red Low range.	Refer to Airplane Flight Manual	Refer to Airplane Flight Manual
LEVEL HIGH	"FUEL QUANTITY"	Fuel Quantity indicator has entered configured Red High range.	Refer to Airplane Flight Manual	Refer to Airplane Flight Manual
LEVEL LOW	"FUEL QUANTITY"	Fuel Quantity indicator has entered configured Red High range.	Refer to Airplane Flight Manual	Refer to Airplane Flight Manual
OIL PRES HIGH	"OIL PRESSURE"	Oil Pressure indicator has entered configured Red High range.	Refer to Airplane Flight Manual	Refer to Airplane Flight Manual
OIL PRES LOW	"OIL PRESSURE"	Oil Pressure indicator has entered configured Red Low range.	Refer to Airplane Flight Manual	Refer to Airplane Flight Manual
OIL TEMP	"OIL TEMPERATURE"	Oil Temperature indicator has entered configured Red range.	Refer to Airplane Flight Manual	Refer to Airplane Flight Manual
<i>Visual annunciation varies by configuration</i>	"ENGINE MONITOR"	A system monitored by EMS other than the above has entered the configured Red range.	Refer to Airplane Flight Manual	Refer to Airplane Flight Manual
VOLTAGE HIGH	"VOLTAGE"	Voltage indicator has entered configured Red High range.	Refer to Airplane Flight Manual	Refer to Airplane Flight Manual

WARNING ALERTS				
VISUAL INDICATION	AURAL INDICATION	CONDITION	PRE-FLIGHT ACTION	IN-FLIGHT ACTION
VOLTAGE LOW	"VOLTAGE"	Voltage indicator has entered configured Red Low range.	Refer to Airplane Flight Manual	Refer to Airplane Flight Manual
On PFD near Autopilot Information Bar: ASPD HIGH	"AUTOPILOT AIRSPEED HIGH"	The autopilot is applying nose up inputs to protect the airplane from exceeding the configured maximum autopilot airspeed. Visual annunciation appears immediately. Aural warning after 10 seconds.	No action.	Take command to manually decrease airplane's speed.
On PFD near Autopilot Information Bar: ASPD LOW	"AUTOPILOT AIRSPEED LOW"	The autopilot is applying nose down inputs to protect the airplane from slowing below the configured autopilot minimum airspeed. Visual annunciation appears immediately. Aural warning after 10 seconds.	No action.	Take command to manually increase airplane's speed.
On PFD near Autopilot Information Bar: G LIMIT	(none)	Autopilot is engaged and vertical acceleration has exceeded the 0.5G to 1.5G range.	No action.	Monitor autopilot performance. If airplane departs from intended flight path, disconnect autopilot and take command to fly manually.
Autopilot Information Bar changes color and temporarily flashes	"AUTOPILOT DISCONNECT"	Both autopilot axes have been disconnected.	No action.	Take command to fly manually.

WARNING ALERTS				
VISUAL INDICATION	AURAL INDICATION	CONDITION	PRE-FLIGHT ACTION	IN-FLIGHT ACTION
<i>Autopilot Information Bar changes color and temporarily flashes</i>	"AUTOPILOT PITCH DISCONNECT"	The autopilot pitch axis has been disconnected.	No action.	Take command to fly manually.
<i>Autopilot Information Bar changes color and temporarily flashes</i>	"AUTOPILOT ROLL DISCONNECT"	The autopilot roll axis has been disconnected.	No action.	Take command to fly manually.
TRIM FEEDBACK STUCK	"WARNING"	The trim feedback monitor received a positive activity signal during system boot.	Do not fly. Electric trim system must not be used until fault has been corrected.	1) TRIM POWER switch__OFF. 2) Trim airplane manually. Electric trim system must not be used until fault has been corrected.
<i>On PFD:</i> TRIM RUNAWAY	"TRIM RUNAWAY"	SkyView HDX detected electric trim motor activity that was not commanded.	Do not fly. Electric trim system must not be used until fault has been corrected.	1) AP DISC button__PRESS AND HOLD. 2) TRIM POWER switch__OFF. 3) Mechanical Pitch Trim__MOVE AS NEEDED. 4) Fly manually. Refer to Section 3.1.4: Trim Runaway . Electric trim system must not be used until fault has been corrected.

7.10.3 Caution Alerts

Caution Alerts are for conditions that require immediate flight crew awareness and subsequent flight crew response. Most caution alerts are displayed in yellow and may have specific voice aural annunciations. If a caution alert is flightpath or traffic related, a visual annunciation (see [Table 3](#) for visual appearance) is displayed directly on the PFD.

Caution alerts are dependent upon installed systems and components. See [Table 3](#) for a full listing of Caution alerts, ordered by 1) Core System, 2) Component, and 3) Function.

Table 3: Caution Alert Conditions and Associated Crew Responses

CAUTION ALERTS				
VISUAL INDICATION	AURAL INDICATION	CONDITION	PRE-FLIGHT ACTION	IN-FLIGHT ACTION
<div style="border: 1px solid black; background-color: yellow; padding: 5px; text-align: center;"> BACKUP BATTERY IN USE </div>	"CAUTION"	The SkyView display unit presenting the alert has switched to Backup Battery power.	Do not fly.	Choose one: a) Alert appears on all displays, and airplane Master Switch is OFF: Turn airplane Master Switch ON, Confirm message(s) stop. b) Alert appears on one display, and airplane Master Switch is ON: Affected display will operate for 45 minutes. Remaining displays continue to function normally. c) Alert appears on all displays, and airplane Master Switch is ON: Displays will operate for 45 minutes. Plan to land at nearest suitable airport.

CAUTION ALERTS				
VISUAL INDICATION	AURAL INDICATION	CONDITION	PRE-FLIGHT ACTION	IN-FLIGHT ACTION
B/U BATT UNAVAIL	"CAUTION"	The SkyView display unit presenting the message no longer detects the Backup Battery.	Do not fly	Avoid operations in Instrument Meteorological Conditions (IMC).
CPU TEMP CRITICAL	"CAUTION"	The SkyView display unit presenting the message has critically high internal temperature. The display will automatically shutdown.	Use remaining SkyView display units, if available.	Monitor remaining SkyView display units and/or Standby Display System.
<i>G Meter is automatically presented on PFD</i>	"GEES"	The G Meter has entered the configured Yellow range.	Do not fly.	Operate elevator control to reduce G loading.
KNOB PANEL OFFLINE	"CAUTION"	Knob control panel is not communicating with SkyView.	Use SkyView display unit knob controls.	Use SkyView display unit knob controls.
NO HI RES TERRAIN	"CAUTION"	No high-resolution terrain database is installed for airplane's current position.	Install high-resolution database.	Be aware that Synthetic Vision and Terrain Map resolution is degraded.
STANDBY NETWORK ERROR	"CAUTION"	SkyView Network has lost a redundant network connection to one or more system components.	Do not fly if flight requires Instrument Flight Rules (IFR).	Avoid operations in Instrument Meteorological Conditions (IMC).
TOUCH PANEL FAULT	"CAUTION"	Touch screen of affected SkyView unit display no longer functions.	Use SkyView display unit knob controls.	Use SkyView display unit knob controls.

CAUTION ALERTS				
VISUAL INDICATION	AURAL INDICATION	CONDITION	PRE-FLIGHT ACTION	IN-FLIGHT ACTION
EMS SFG FILE MISMATCH	"CAUTION"	EMS configuration files in SkyView display units do not match.	Update configuration file to most current version in all displays in SETUP MENU > SYSTEM SOFTWARE.	No in-flight action.
ACTV ADAHRS VIBRATION	"CAUTION"	The ADAHRS has detected vibration that affects performance of G-Meter, Attitude indicator, and Autopilot.	Do not fly.	Cross check and monitor instruments. If Autopilot is engaged, disengage, and turn AP Power switch OFF. Do not use Autopilot for remainder of flight.
ADAHRS CAL OLD	"CAUTION"	The calibration of the ADAHRS module is out-of-date.	Do not fly.	Avoid operations in Instrument Meteorological Conditions (IMC).
NEED COMPASS CAL	"CAUTION"	Compass calibration for ADAHRS not performed.	Do not fly if flight requires Instrument Flight Rules (IFR).	Avoid operations in Instrument Meteorological Conditions (IMC).
NEED USER AOA CAL	"CAUTION"	Angle of Attack (AoA) calibration for ADAHRS not performed.	Do not fly if flight requires Instrument Flight Rules (IFR).	Avoid operations in Instrument Meteorological Conditions (IMC).

CAUTION ALERTS				
VISUAL INDICATION	AURAL INDICATION	CONDITION	PRE-FLIGHT ACTION	IN-FLIGHT ACTION
<p>On PFD:</p> <div style="background-color: #333; color: #fff; padding: 5px; text-align: center; width: fit-content; margin: 5px auto;"> CHECK PITOT HEAT </div>	"CAUTION"	Airspeed is no longer available, or is unreliable. GPS ground speed is being used to aid attitude computations.	Do not fly.	<ol style="list-style-type: none"> 1) Autopilot__ DISCONNECT. 2) Standby Flight Display__ MONITOR. 3) Pitot Heat Switch__ ON. 4) Alt. Static Air Source__ ON. 5) Maneuver to avoid icing conditions. 6) Fly by reference to Standby Flight Display and Whiskey Compass. 7) Alt. Static Air Source no longer needed__ OFF. <p>Refer to Section 3.1.1: Airspeed, Altitude, and/or Attitude Unreliable.</p>

CAUTION ALERTS				
VISUAL INDICATION	AURAL INDICATION	CONDITION	PRE-FLIGHT ACTION	IN-FLIGHT ACTION
<p>On PFD:</p> <p>CROSS CHECK ATTITUDE</p>	"CAUTION"	Airspeed is no longer available, or is unreliable. All GPS sources have failed.	Do not fly.	<ol style="list-style-type: none"> 1) Autopilot__ DISCONNECT. 2) Standby Flight Display__ MONITOR. 3) Pitot Heat Switch__ ON. 4) Alt. Static Air Source__ ON. 5) Maneuver to avoid icing conditions. 6) Fly by reference to Standby Flight Display and Whiskey Compass. 7) Alt. Static Air Source no longer needed__ OFF. <p>Refer to Section 3.1.1: Airspeed, Altitude, and/or Attitude Unreliable.</p>
ADS-B IN OFFLINE	"CAUTION"	ADS-B module has failed or not communicating with SkyView.	<p>Traffic and Weather is no longer available,</p> <p>Use alternate sources for traffic and weather information.</p>	<p>Traffic and Weather is no longer available,</p> <p>Use alternate sources for traffic and weather information.</p>
COM RADIO PNL OFFLINE	"CAUTION"	COM Radio control panel is not communicating with SkyView.	If Dynon COM radio required for flight, do not fly.	Use alternate communication equipment. If none available, use Lost Comms Procedures.
COM XCEIVER OFFLINE	"CAUTION"	COM Radio receiver is not communicating with SkyView.	If Dynon COM radio required for flight, do not fly.	Use alternate communication equipment. If none available, use Lost Comms Procedures.

CAUTION ALERTS				
VISUAL INDICATION	AURAL INDICATION	CONDITION	PRE-FLIGHT ACTION	IN-FLIGHT ACTION
HDG SOURCE FAIL	"CAUTION"	The Remote Magnetometer module has failed or is not communicating with SkyView. Heading information is unavailable.	Use magnetic compass and GPS track for directional reference. Do not fly if flight requires Instrument Flight Rules (IFR).	Use magnetic compass and GPS track for directional reference. Avoid operations in Instrument Meteorological Conditions (IMC).
MAG FACT CAL CORRUPT	"CAUTION"	The Remote Magnetometer's factory calibration is no longer valid. Heading information is unavailable.	Use magnetic compass and GPS track for directional reference. Do not fly if flight requires Instrument Flight Rules (IFR).	Use magnetic compass and GPS track for directional reference. Avoid operations in Instrument Meteorological Conditions (IMC).
GPS # FAIL	"CAUTION"	The identified GPS position source has failed. SkyView has switched to the next available GPS position source.	Be aware that GPS redundancy has been reduced.	Be aware that GPS redundancy has been reduced.
NO ADSB OUT: GPS LOST	"CAUTION"	The Transponder's GPS source is not communicating with SkyView. ADS-B Out is not available.	If ADS-B Out is required, request clearance online using FAA's ADS-B Deviation Authorization Preflight Tool (ADAPT).	Continue to destination. Be aware that ATC or other aircraft may not be able to determine your position.
POSITION SOURCE # FAIL	"CAUTION"	The identified position source has failed.	Verify that all navigation equipment is powered ON. If message persists, use other navigational means.	Use other navigational means. The system has no remaining GPS position sources available. The Map is no longer available.

CAUTION ALERTS				
VISUAL INDICATION	AURAL INDICATION	CONDITION	PRE-FLIGHT ACTION	IN-FLIGHT ACTION
XPNDR ALT ENCODER FAIL	"CAUTION"	The Transponder is not communicating with the altitude source.	If Mode C Altitude Encoding is required, do not fly.	Advise ATC, continue to destination.
XPNDR FAIL	"CAUTION"	Transponder has failed.	If Transponder is required, do not fly.	Advise ATC, continue to destination.
XPNDR HEX CODE NOT SET	"CAUTION"	Transponder hex code is not entered in SkyView display units.	If Transponder is required, do not fly. Enter Transponder hex code in SETUP MENU > TRANSPONDER SETUP.	Advise ATC, continue to destination.
On PFD and Map: TRAFFIC	"TRAFFIC"	A new Traffic Advisory (TA) target has been identified.	No action, alert is suppressed on the ground.	Pilot awareness only.
AP DISCONNECT BROKEN	"CAUTION"	The autopilot disconnect monitor has detected a wiring fault.	Turn Autopilot power OFF. Autopilot is disabled and must not be used until fault has been corrected.	Turn Autopilot power OFF. Do not use Autopilot for remainder of flight.
AP DISCONNECT STUCK	"CAUTION"	The autopilot disconnect monitor has detected a wiring fault.	Turn Autopilot power OFF. Autopilot is disabled and must not be used until fault has been corrected.	Turn Autopilot power OFF. Do not use Autopilot for remainder of flight.
On PFD: TRIM NOSE UP TRIM NOSE DOWN	"TRIM NOSE UP" "TRIM NOSE DOWN"	The autopilot requires pitch trim in direction indicated. Visual annunciation appears immediately. Aural warning after 10 seconds.	No action.	Apply pitch trim until the message stops.

CAUTION ALERTS				
VISUAL INDICATION	AURAL INDICATION	CONDITION	PRE-FLIGHT ACTION	IN-FLIGHT ACTION
<p>On PFD:</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 5px;">TRIM ROLL LF</div> <div style="border: 1px solid black; padding: 2px; width: fit-content;">TRIM ROLL RT</div>	<p>"TRIM ROLL LEFT" "TRIM ROLL RIGHT"</p>	<p>The autopilot requires roll trim in direction indicated.</p> <p>Visual annunciation appears immediately. Aural warning after 10 seconds.</p>	<p>No action.</p>	<p>Apply roll trim until the message stops.</p>
<p>On PFD:</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 5px;">TRIM NOSE LF</div> <div style="border: 1px solid black; padding: 2px; width: fit-content;">TRIM NOSE RT</div>	<p>"TRIM NOSE LEFT" "TRIM NOSE RIGHT"</p>	<p>The autopilot requires yaw trim in direction indicated.</p> <p>Visual annunciation appears immediately. Aural warning after 10 seconds.</p>	<p>No action.</p>	<p>Apply yaw trim until the message stops.</p>
<p>On PFD:</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 5px;">SLIP TRIM NOSE UP</div> <div style="border: 1px solid black; padding: 2px; width: fit-content;">SLIP TRIM NOSE DOWN</div>	<p>"SLIP TRIM NOSE UP" "SLIP TRIM NOSE DOWN"</p>	<p>The autopilot has carried a large trim load for an extended period, and the affected servo is slipping.</p>	<p>No action.</p>	<p>Turn trim motor power <i>OFF</i>.</p> <p>Trim airplane using mechanical pitch trim control.</p>
<p>On PFD:</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 5px;">SLIP TRIM ROLL LF</div> <div style="border: 1px solid black; padding: 2px; width: fit-content;">SLIP TRIM ROLL RT</div>	<p>"SLIP TRIM ROLL LEFT" "SLIP TRIM ROLL RIGHT"</p>	<p>The autopilot has carried a large trim load for an extended period, and the affected servo is slipping.</p>	<p>No action.</p>	<p>Turn trim motor power <i>OFF</i>.</p> <p>Trim airplane using mechanical roll trim control.</p>
<p>On PFD:</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 5px;">SLIP TRIM NOSE LF</div> <div style="border: 1px solid black; padding: 2px; width: fit-content;">SLIP TRIM NOSE RT</div>	<p>"SLIP TRIM NOSE LEFT" "SLIP TRIM NOSE RIGHT"</p>	<p>The autopilot has carried a large trim load for an extended period, and the affected servo is slipping.</p>	<p>No action.</p>	<p>Turn trim motor power <i>OFF</i>.</p> <p>Trim airplane using mechanical yaw trim control.</p>
<div style="background-color: yellow; border: 1px solid black; padding: 5px; text-align: center;"> AP PANEL OFFLINE </div>	<p>"CAUTION"</p>	<p>Autopilot control panel is not communicating with SkyView.</p>	<p>Autopilot control panel unavailable. Use SkyView Control Menu.</p> <p>Trim airplane manually.</p>	<p>Autopilot control panel unavailable. Use SkyView Control Menu.</p> <p>Trim airplane manually.</p>

CAUTION ALERTS				
VISUAL INDICATION	AURAL INDICATION	CONDITION	PRE-FLIGHT ACTION	IN-FLIGHT ACTION
<p style="text-align: center;">AP TRIM MALFUNCTION</p>	"CAUTION"	<p>SkyView HDX sent a command to move the trim motor, but did not receive feedback that the motor is moving.</p> <p>A trim switch was held <i>ON</i> continuously for more than 5 seconds while SkyView Auto-trim was enabled.</p>	<p>1) TRIM POWER switch <i>OFF</i>.</p> <p>2) Trim airplane manually.</p> <p>Electric trim system must not be used until fault has been corrected.</p>	<p>1) TRIM POWER switch <i>OFF</i>.</p> <p>2) Trim airplane manually.</p> <p>Electric trim system must not be used until fault has been corrected.</p>

7.10.4 Messages

Messages are for conditions that require immediate flight crew awareness and may require subsequent flight crew response. Most messages are displayed in gray and may have specific voice aural annunciations. If a message is flightpath or autopilot related, a visual annunciation (see [Table 4](#) for visual appearance) is displayed directly on the PFD.

Messages are dependent upon installed systems and components. See [Table 4](#) for a full listing of Messages, ordered by 1) Core System, 2) Component, and 3) Function.

Table 4: Messages and Associated Crew Responses

MESSAGES				
VISUAL INDICATION	AURAL INDICATION	CONDITION	PRE-FLIGHT ACTION	IN-FLIGHT ACTION
BACKUP BATTERY LOW CHARGE	"MESSAGE"	The Backup Battery connected to the SkyView display unit has a low charge, but is not in use.	Do not fly if flight requires Instrument Flight Rules (IFR). Allow backup battery to fully charge before flight.	Avoid operations in Instrument Meteorological Conditions (IMC).
BATTERY TEST FAILED	"MESSAGE"	Battery backup battery test did not pass.	Perform successful battery test prior to flight.	N/A
BATTERY TEST NEEDED	"MESSAGE"	A year has passed since the previous backup battery test.	Perform successful battery test prior to flight.	N/A
CHECK BARO SETTING	"MESSAGE"	The current BARO setting and the nearest METAR-based altimeter setting are more than 0.1 INHG apart; or, the airplane has descended below FL180 and the BARO should be reset.	Adjust BARO to field elevation.	Adjust BARO setting as appropriate.
CPU TEMP HIGH	"MESSAGE"	An SkyView display unit's internal temperature is high.	Do not fly.	Increase airflow or reduce ambient temperature near affected display.

MESSAGES				
VISUAL INDICATION	AURAL INDICATION	CONDITION	PRE-FLIGHT ACTION	IN-FLIGHT ACTION
<p>On PFD:</p> <p>MINIMUMS</p> <p>Minimums bug appears on Altimeter</p>	"MINIMUMS"	Airplane has descended below set MINIMUM altitude.	No action.	Pilot awareness only.
<p>SYSTEM EVENT #: SEE SETUP</p>	"MESSAGE"	<p>SkyView has logged a system event for the Dynon Diagnostic file.</p> <p>The airplane can be flown.</p>	Contact Dynon Technical Support for instructions on how to provide Dynon with a Diagnostic File for review.	No action.
<p>SOFTWARE MISMATCH</p>	"MESSAGE"	Software versions in SkyView HDX display units do not match.	Before flight, update software to most current version in all displays in SETUP MENU > SYSTEM SOFTWARE.	Do not use SkyView HDX display unit presenting Red Xs over indicators.
<p>TAIL # MISMATCH</p>	"MESSAGE"	Tail numbers in SkyView display units do not match.	Before flight, enter correct tail number in all displays in SETUP MENU > SYSTEM SETUP.	Pilot awareness only.
<p>TIMER EXPIRED</p>	"TIMER EXPIRED"	A User-Determined timer has expired.	Pilot determined.	Pilot determined.
(None)	"APPROACHING ALTITUDE"	The airplane is approaching the bugged altitude.	No action.	Pilot awareness only.
(None)	"APPROACHING MINIMUMS"	The airplane's altitude is 200 feet above the selected MINIMUM altitude.	No action.	Pilot awareness only.
(None)	"APPROACHING WAYPOINT"	The airplane is within 30 seconds of crossing flight plan enroute waypoint.	No action.	Pilot awareness only.

MESSAGES				
VISUAL INDICATION	AURAL INDICATION	CONDITION	PRE-FLIGHT ACTION	IN-FLIGHT ACTION
(None)	"FLIGHT PLAN UPDATED"	A new flight plan has been received by SkyView from the external flight plan source.	Pilot awareness only.	Pilot awareness only.
(None)	"LEAVING ALTITUDE"	The airplane is leaving the bugged altitude.	No action.	Pilot awareness only.
(None)	"TRAFFIC NOT AVAILABLE"	Traffic information is no longer available.	Revert to alternative traffic avoidance methods.	Revert to alternative traffic avoidance methods.
XPNDR ERROR	"MESSAGE"	The transponder has detected a problem and notified SkyView. The Transponder may not function correctly.	If Transponder is required, do not fly.	Advise ATC, continue to destination.
XPNDRNOTINALT MODE	"MESSAGE"	Airplane is in the air and Transponder is not set to ALT Mode.	No action	Set transponder mode as required.
(None)	"CHECK GEAR"	Gear is not DOWN, and airspeed is below configured Landing Gear Check Speed.	Not Applicable.	Confirm correct landing gear position.
SWITCH FUEL TANK	"SWITCH FUEL TANK"	A reminder to switch fuel tanks at a user-selectable elapsed time or quantity.	Not Applicable.	Pilot determined.
On PFD: ADD POWER	"GO AROUND"	The autopilot Go Around function has been engaged.	No action.	Set power for Go-Around.
Autopilot Bar flashes momentarily	"AUTOPILOT"	The autopilot has been engaged.	Pilot awareness only.	Pilot awareness only.

MESSAGES				
VISUAL INDICATION	AURAL INDICATION	CONDITION	PRE-FLIGHT ACTION	IN-FLIGHT ACTION
<i>Autopilot Bar flashes momentarily</i>	"AUTOPILOT MODE"	An autopilot mode has changed either manually or automatically since it was engaged.	Pilot awareness only.	Pilot awareness only.
EXT LEVEL BUTTON STUCK	"MESSAGE"	The system has detected a wiring fault.	Turn AP POWER switch <i>OFF</i> . Autopilot is disabled and must not be used until fault has been corrected.	Turn AP POWER switch <i>OFF</i> . Do not use Autopilot for remainder of flight.
PITCH SERVO OFFLINE	"MESSAGE"	The autopilot pitch servo is not communicating or is not powered on.	a) If AP POWER switch is <i>OFF</i> , AP POWER switch__ <i>ON</i> . b) If AP POWER switch is <i>ON</i> and message persists, AP POWER Switch__ <i>OFF</i> . Autopilot is disabled and must not be used until fault has been corrected.	a) If AP POWER switch is <i>OFF</i> , AP POWER switch__ <i>ON</i> . b) If AP POWER switch is <i>ON</i> and message persists, AP POWER switch__ <i>OFF</i> . Do not use Autopilot for remainder of flight.
ROLL SERVO OFFLINE	"MESSAGE"	The autopilot roll servo is not communicating or is not powered on.	a) If AP POWER switch is <i>OFF</i> , AP POWER switch__ <i>ON</i> . b) If AP POWER switch is <i>ON</i> and message persists, AP POWER Switch__ <i>OFF</i> . Autopilot is disabled and must not be used until fault has been corrected.	a) If AP POWER switch is <i>OFF</i> , AP POWER switch__ <i>ON</i> . b) If AP POWER switch is <i>ON</i> and message persists, AP POWER switch__ <i>OFF</i> . Do not use Autopilot for remainder of flight.

MESSAGES				
VISUAL INDICATION	AURAL INDICATION	CONDITION	PRE-FLIGHT ACTION	IN-FLIGHT ACTION
YAW SERVO OFFLINE	"MESSAGE"	The autopilot yaw damper servo is not communicating or is not powered on.	<p>a) If AP POWER switch is OFF, AP POWER switch__ON.</p> <p>b) If AP POWER switch is ON and message persists, AP POWER Switch__OFF.</p> <p>Autopilot is disabled and must not be used until fault has been corrected.</p>	<p>a) If AP POWER switch is OFF, AP POWER switch__ON.</p> <p>b) If AP POWER switch is ON and message persists, AP POWER switch__OFF.</p> <p>Do not use Autopilot for remainder of flight.</p>
PITCH SLIP	"PITCH SLIP"	<p>Autopilot servo is unable to move controls in direction commanded by autopilot.</p> <p>Slip messages are generally transient.</p>	Not Applicable.	<p>Monitor autopilot performance.</p> <p>If alert persists, take command to fly manually.</p>
ROLL SLIP	"ROLL SLIP"	<p>Autopilot servo is unable to move controls in direction commanded by autopilot.</p> <p>Slip messages are generally transient.</p>	Not Applicable.	<p>Monitor autopilot performance.</p> <p>If alert persists, take command to fly manually.</p>
YAW SLIP	"YAW SLIP"	<p>Autopilot servo is unable to move controls in direction commanded by autopilot.</p> <p>Slip messages are generally transient.</p>	Not Applicable.	<p>Monitor autopilot performance.</p> <p>If alert persists, take command to fly manually.</p>
Slip/Skid Indicator Ball turns Green with "YD"	"YAW DAMPER"	The autopilot yaw damper has been engaged.	Pilot awareness only.	Pilot awareness only.
Slip/Skid Indicator Ball turns White	"YAW DAMPER DISCONNECT"	The autopilot yaw damper has been disengaged.	Pilot awareness only.	Pilot awareness only.

7.11 Indications

7.11.1 Airspeed Indicators

Installation of SkyView HDX does not necessitate changes to airplane's airspeed limitations. Refer to the Aircraft Limitations in the airplane's Aircraft Flight Manual (AFM) for the airspeed limitations. Configuration values for airspeed markings are entered into SkyView HDX during initial system setup.

The following airspeed indicator provides 14 CFR 23.1545 compliant airspeed markings for vertical tape-style displays:

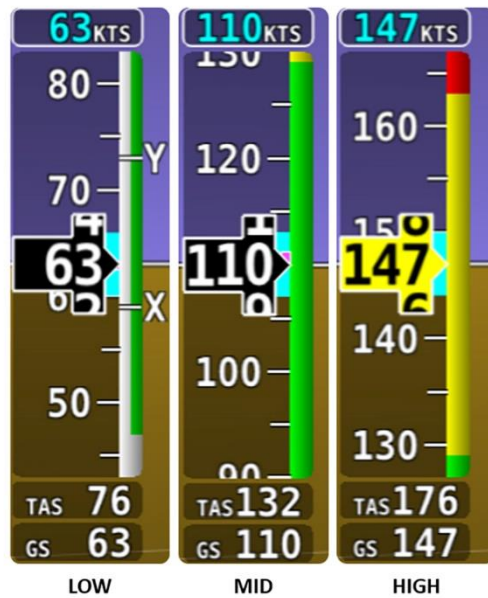
- RED BAND: Indicates speeds at and above the never exceed speed (V_{NE}).
- RED LINE: Indicates minimum control speed (V_{MC}) – twin-engine airplanes.
- YELLOW BAND: Indicates the range of speeds below the never exceed speed (V_{NE}), and above the maximum normal operations speed (V_{NO}).
- GREEN BAND: Indicates the range of speeds at or below the maximum normal operations speed (V_{NO}), and above the flaps up stall speed (V_{S1}).
- WHITE BAND: Indicates the range of speeds above the minimum flight speed in landing configuration (V_{S0}) and below the maximum flaps extended speed (V_{FE}).
- CYAN LINE: Indicates best rate of climb with a single engine (V_{YSE}) – twin-engine airplanes.

Other, optional indications can include:

- WHITE X: Indicates best angle of climb (V_X).
- WHITE Y: Indicates best rate of climb (V_Y).
- WHITE A: Indicates maneuvering speed (V_A).

Reference [Figure 16](#) for an example of airspeed markings typical across the airspeed range.

Single-engine Airplane



Twin-engine Airplane

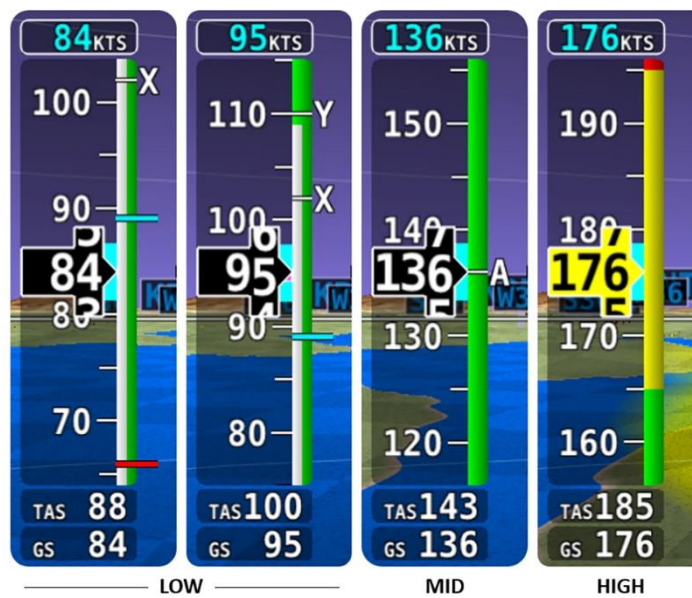


Figure 16: Airspeed Marking Examples

7.11.2 Engine Monitoring

The optional SkyView HDX Engine Monitoring System (EMS) provides engine and airplane system information to the pilot.

EMS information can be presented on a SkyView HDX display in three different size formats, depending upon owner/pilot preference or requirements of the airplane:

- 100% display page
- 50% display page
- Bottom Band

During initial system setup, SkyView HDX is configured to indicate the limitations described in the Airplane's Flight Manual (AFM). The only colors used to express these limitations are:

- RED: Do not exceed
- YELLOW: Caution range
- GREEN: Normal Operating range

For twin-engine airplanes, SkyView HDX is configured to provide EMS information as follows:

- During takeoffs and landings, a secondary (non-PFD) display unit must always present EMS information in either 100% or 50% display page layout with no exceptions.
- During normal flight operations a secondary (non-PFD) display is configured to present EMS information in either 100% or 50% display page layout, with the following exception:
 - If the pilot selects to present the Map on 50% display page instead of EMS information, then minimum required EMS information (i.e., fuel level, manifold pressure, and condensed engine health indications) must be presented on the Bottom Band.



To present the minimum required EMS information on the Bottom Band, the pilot needs to turn on the Bottom Band from the Main Menu (i.e., press DISPLAY > SETUP > ENGINE BOTTOM BAND).

7.11.2.1 100% Display Page

The 100% display page fills an entire display screen.

On Single-engine airplanes, the 100% page (see [Figure 17](#)) is used only when a display unit has been dedicated to EMS, or when operating the engine on the ground for maintenance reasons.

On Twin-engine airplanes, the 100% page (see [Figure 18](#)) is used for all normal flight operations.



Figure 17: Example 100% Display Page for Single-engine Airplanes



Figure 18: Example 100% Display Page for Twin-engine Airplanes

7.11.2.2 50% Display Page

The 50% display page fills one-half of a display screen.

On Single-engine airplanes, the 50% page (see Figure 19) is used to provide additional information beyond what is needed for engine operations, such as timers and counters.

On Twin-engine airplanes, the 50% page (see Figure 20) is used to show the required information if the dedicated EMS display unit fails.

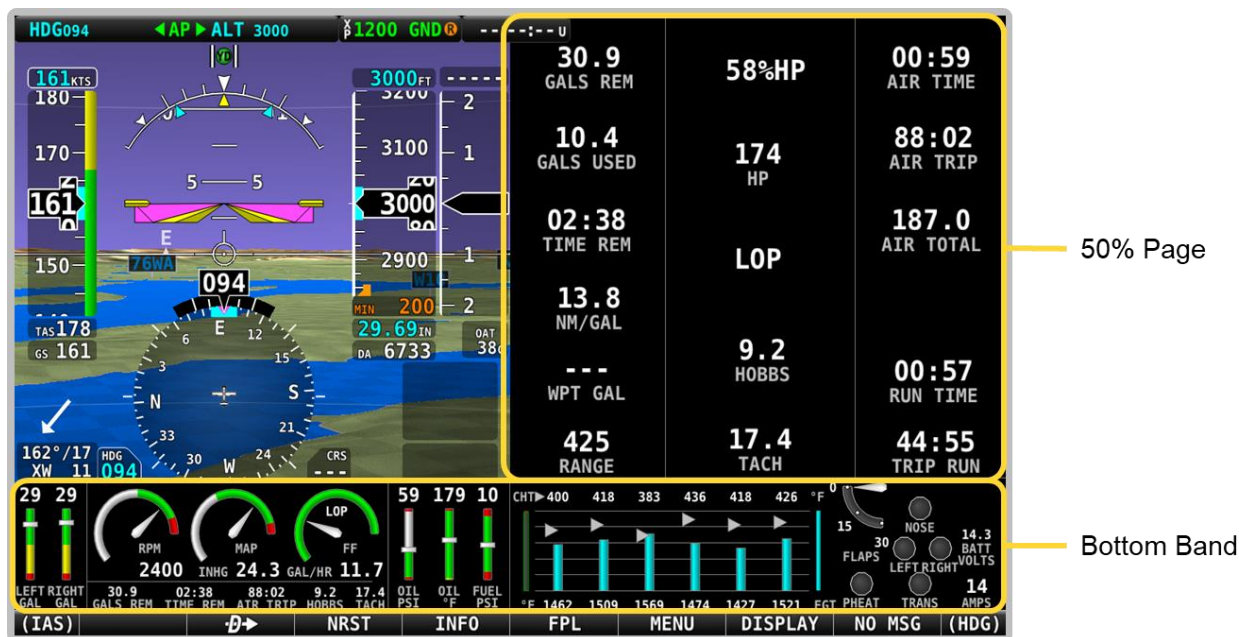


Figure 19: Example 50% and Bottom Band for Single-engine Airplanes

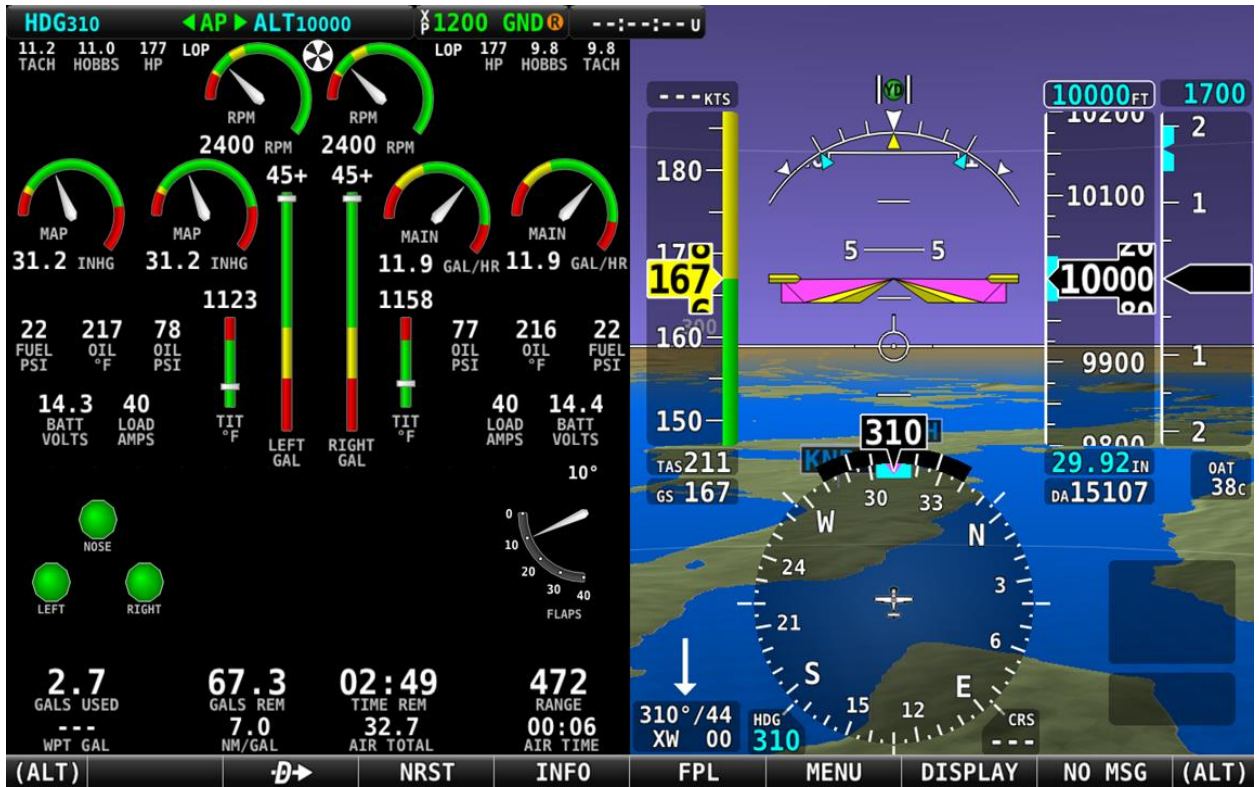


Figure 20: Example 50% Page for Twin-engine Airplanes

7.11.2.3 Bottom Band

The Bottom Band allows EMS information to be displayed along with the PFD and/or Map on one display screen.

On Single-engine airplanes, the Bottom Band (see [Figure 19](#)) is used for all normal flight operations unless a dedicated EMS display is installed. This is because the required information can be displayed in the Bottom Band, and the remainder of the display screen can be used for the PFD and/or Map displays, especially if the airplane only has one display.

On Twin-engine airplanes, the Bottom Band (see [Figure 21](#)) can be used to show the required information if the dedicated EMS display unit fails.



Figure 21: Example Bottom Band for Twin-engine Airplanes

The Bottom Band can be partially obscured by the Map page. The result is a partial Bottom Band (see [Figure 22](#)) with primary engine instruments. A full Bottom Band (see [Figure 23](#)) is available for primary and secondary engine instruments by controlling the Map page size. The Map page size is controlled by the operation of the Map Minimize/Maximize control button that appears on the Map page (see [Figure 24](#)). Pressing the map button toggles the map to maximize or minimize the page. Engine and system alerts continue to function even if the Map is maximized.



Figure 22: Example Partial Bottom Band Display



Figure 23: Example Full Bottom Band Display

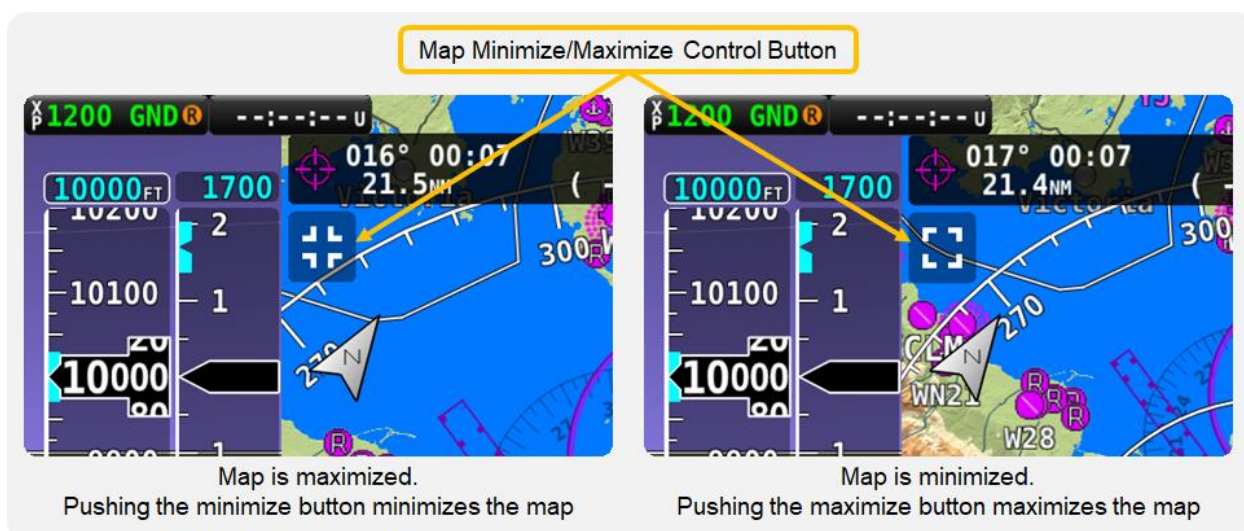


Figure 24: Map Minimize/Maximize Control Button

7.11.3 Landing Gear Position Indicators

If connected to the EMS module, landing gear can have position visual indicators (see [Figure 25](#)) and aural annunciations ("CHECK GEAR" and "GEAR OVERSPEED") to alert the pilot to landing gear conditions.

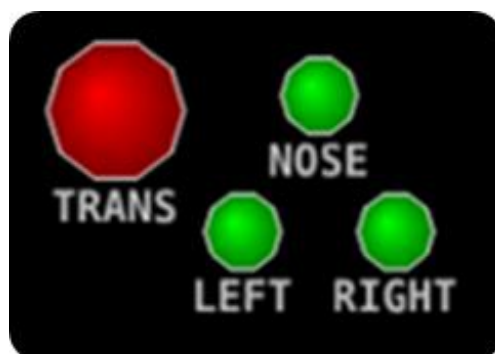


Figure 25: Example Landing Gear Position Indicator

The landing gear's visual indicators and the aural annunciations are optional and are configured to function during initial system setup. Visual indicators and aural annunciations function independently and are configured separately.

7.11.4 Flaps Position Indicator

If connected to the EMS module, flaps can have a position visual indicator (see [Figure 26](#)) and aural annunciation ("FLAPS OVERSPEED") to alert the pilot to flap conditions.

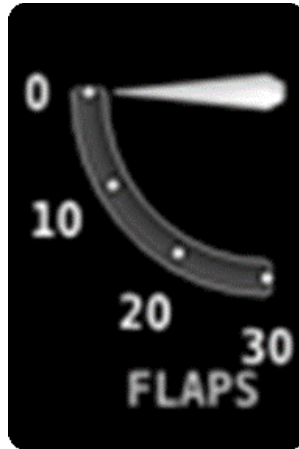


Figure 26: Example Flap Position Indicator

The flaps' visual indicators and the aural annunciations are optional and are configured to function during initial system setup. Visual indicators and aural annunciations function independently and are configured separately.

7.11.5 Temperature Indicators

Cylinder Head Temperatures (CHT) and Exhaust Gas Temperatures (EGT) can be displayed in separate indicators or combined (see [Figure 27](#)). The CHT function is depicted as a symbol, and the EGT function is depicted as a bar. Turbine Inlet Temperature (TIT) can also be indicated using a variety of indicator styles.

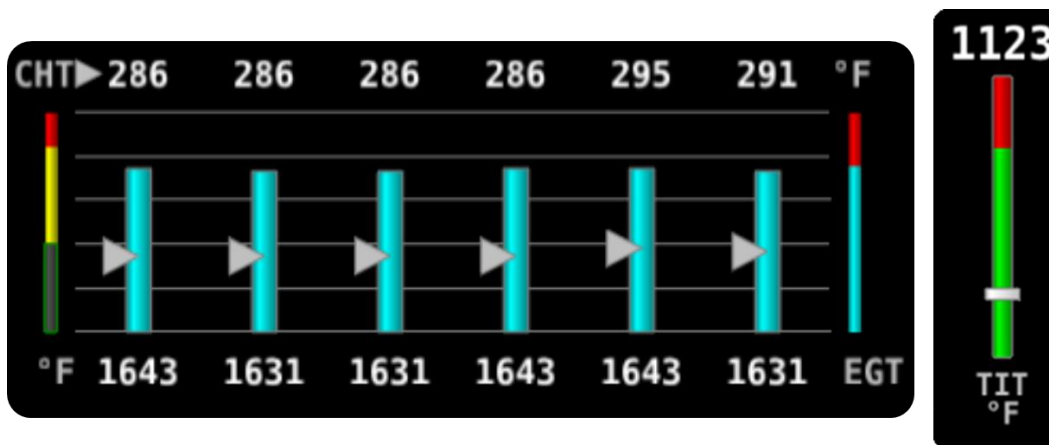


Figure 27: Example Combined CHT/EGT and TIT Indicators

7.11.6 Synchroscope

Twin-engine airplanes require the ability to exactly match the left and right engine RPM to prevent discomfort to the occupants, and fatigue to the airframe structure. To aid the pilot's task, the Synchroscope is used to match the engine RPM to be the same. The Synchroscope is located between the RPM indicators on all the engine displays. 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. To synchronize the engines simply adjust the propeller controls as required to stop the Synchroscope from rotating.

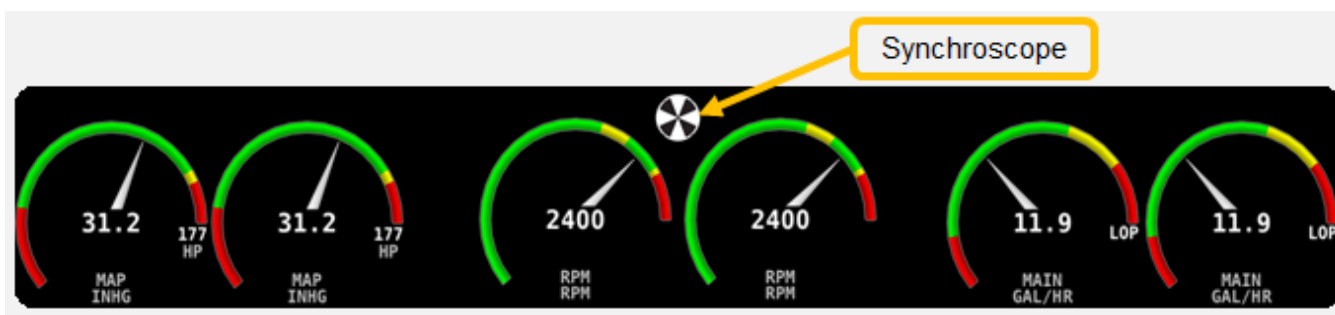


Figure 28: Example Synchroscope

7.12 Autopilot

The SkyView Autopilot system is an optional, digitally controlled two-axis (roll and pitch) or three-axis (roll, pitch, and yaw) control system that provides flight path control functions to the pilot. The autopilot can follow a heading by reference to the compass, follow direction over the ground by reference to GPS track information, or navigate according to a CDI when coupled to SkyView's internal VFR GPS navigation data, or when coupled to external navigation source providing VOR, localizer, cross track error or GPS navigation data.

The autopilot can hold altitude, and transition between altitudes at either a selected climb rate or airspeed. The autopilot will also follow vertical guidance including glideslope and glidepath information when coupled to an external navigation source. SkyView Autopilot does not control throttle; pilot action is required to modulate throttle.

On some airplanes, the autopilot may also have an optional third servo connected to the rudder. The rudder servo acts as a yaw damper to reduce and prevent yaw excursions while cruising or maneuvering, whenever the autopilot is engaged. The Yaw Damper (YD) function may also be activated during manual flight (see Section 7.12.11: Yaw Damper for more information).

All autopilot modes are annunciated visually on the PFD in a space reserved specifically for this purpose called the Autopilot Information Bar (see Figure 30). Visual and voice aural alerts are provided when the autopilot is engaged, disengaged, the autopilot mode is changed, or the autopilot encounters a limit condition.

The autopilot may be activated and deactivated by the pilot by several means, including on-screen AP icons, an optional push button mounted on the panel or control yoke, as well as the optional Autopilot Control Panel (see Figure 37).

In the event of a mechanical jam or failure in the servo motor, there is a frangible link called a shear screw for each servo that can be broken by the pilot (see Section 3.1.3: [Autopilot / Yaw Damper Servo Jam](#) for more information.). This frees the controls from the servo so that the airplane can continue to be flown manually.

If for any reason the pilot wishes to stop the autopilot from functioning, the servos can be electrically disabled via the AP Power switch mounted to the instrument panel.

7.12.1 Autopilot / Yaw Damper Override

If the airplane flight path needs to be temporarily adjusted from the current autopilot and/or yaw damper trajectory, then simply maneuver the airplane using the flight controls. Doing so will make the autopilot servos slip, and while maneuvering, servo forces will be felt in the flight controls. Upon release of the flight controls, the autopilot and/or yaw damper resumes normal operation.

7.12.2 Protective Features

The autopilot automatically protects the aircraft envelope while the autopilot is engaged. The autopilot will not, however, self-engage to protect the aircraft envelope while flying manually. The autopilot provides the following protective features:

1. G LIMIT PROTECTION:

- Keeps total vertical acceleration of aircraft between 0G and +2G.
- Overrides all vertical axis control modes.

2. AIRSPEED PROTECTION:

- Limits the maximum airspeed to: $V_{NE} - 5\%$.
- Limits the minimum airspeed to: $V_{S0} + 30\%$.
- Overrides all vertical axis modes except G limit.
- Prevents autopilot from being engaged outside of the minimum and maximum control speeds.

3. BANK LIMIT PROTECTION:

- Control inputs will not exceed 35° or a lower maximum that is configured based on aircraft model during system installation.
- Overrides all lateral axis modes.

4. TAKE OFF PROTECTION:

- Autopilot disengages if engaged when airspeed comes alive (~20 kts) to prevent the airplane from taking off with the autopilot engaged.
- This allows the autopilot to be engaged on the ground for test and maintenance.

5. FAIL-DOWN FEATURE:

- Autopilot will fail down to a less complex mode if the current or requested function is no longer possible. See [Table 5](#) for the corresponding fail-down mode for all autopilot modes.

- Prevents autopilot from disconnecting when data from an external source is lost.
- When such a fail-down occurs, the autopilot mode flashes and is replaced with the new mode. A visual and audio cue is generated for such mode changes.

Table 5: Autopilot Fail Down Modes

Engaged Mode	Primary Fail Down Mode	Secondary Fail Down Mode
NAV	TRK	HDG
TRK	HDG	Autopilot Disconnects
HDG	TRK	Autopilot Disconnects
IAS	ALT	Autopilot Disconnects
VNAV	ALT	Autopilot Disconnects
VS	Autopilot Disconnects	Not Applicable
ALT	Autopilot Disconnects	Not Applicable

6. SERVO BREAK-AWAY:

- Each autopilot servo has a shear screw that will break-away when applied force to the control reaches a certain value. (Refer to the Aircraft-Specific Appendices at end of document for break-away force values.)
- The shear screw provides protection from the condition of a flight control becoming jammed by an Autopilot servo malfunction.
- The pilot must overcome the servo break-away force if a flight control fails to move as expected and is jammed by the autopilot servo (see Section 3.1.3: Autopilot / Yaw Damper Servo Jam).
- Always hold the elevator control at or near the neutral position when the autopilot is engaged on the ground.



The weight of an unbalanced elevator may cause the servo to slip. Lightly hold the controls in the centered position when operating the autopilot on the ground to offset this effect.

7.12.3 Flight Director

Autopilot control modes can be used without engaging the servos by manually flying and following the commands provided by the Flight Director. Autopilot enforced limits on Airspeed and G are honored by the Flight Director. For example, if a descent rate is selected that reaches the maximum autopilot operation speed the flight director will indicate a pitch up to reduce speed and limit descent rate.

Single or Dual cue symbols (see Figure 29) are available to select as options in SETUP MENU > PFD SETUP > FLIGHT DIRECTOR.

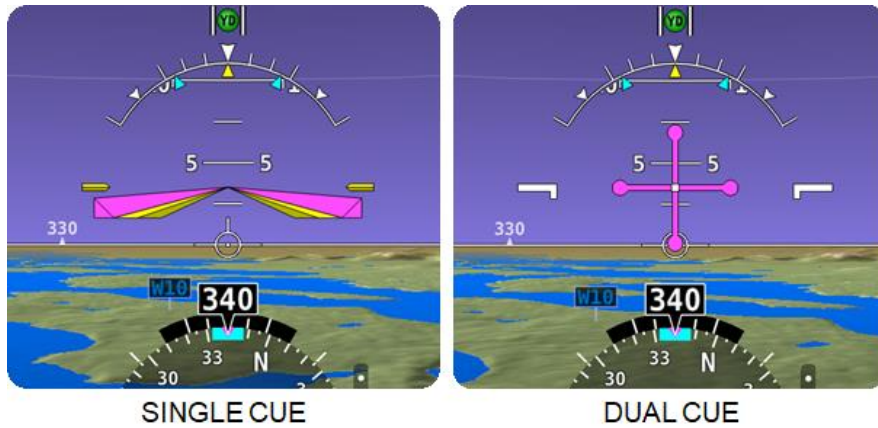


Figure 29: Flight Director Cues

7.12.4 Autopilot Information Bar

The Autopilot Information Bar (AP Info Bar) provides indications of when the autopilot is active, and what lateral and/or vertical control modes are active, and which are armed. The AP Info Bar is in the upper left corner of the PFD (see Figure 30). Touching the bar will open the Autopilot Control Menu (see Figure 36).




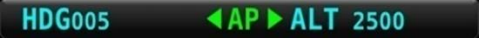

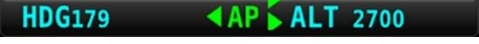
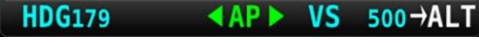
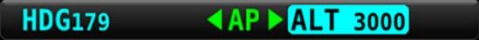


Figure 30: Autopilot Information Bar

7.12.4.1 Autopilot Indications

Table 6 identifies and describes the visual indications provided in the AP Info Bar. The layout of the bar is standardized to always show Autopilot (AP) status in the center with roll servo indication immediately to left, and pitch servo indication immediately to the right, of AP status. Additionally, lateral control modes and values are always shown left of AP/servo status, and vertical control modes and values are always shown to the right of AP/servo status.

Table 6: AP Info Bar – Autopilot Indications

INDICATION	STATUS SHOWN	NOTES
	Autopilot is OFF. Flight Director is OFF.	'AP' is white and no other indications are shown.
	Autopilot is OFF. Flight Director is ON with HDG and ALT modes active.	'AP' is white and active lateral and vertical modes and pilot-set values are cyan.
	Autopilot is ON with pitch servo engaged and roll servo disengaged. Flight Director is ON with ALT mode active.	'AP' is green and pitch servo arrow is green.
	Autopilot is ON with pitch and roll servos engaged. Flight Director is ON with HDG and ALT modes active.	'AP' is green and roll and pitch servo arrows are green.
	Autopilot recently disconnected.	'AP' and servo arrows are yellow and flash (i.e., highlight on/off) for 10 seconds after disconnect.
	Autopilot is ON with pitch and roll servos engaged. Flight Director is ON with HDG and ALT modes active. Auto-Trim has commanded pitch trim.	Pitch servo arrow scrolls up or down to indicate Trim activity. Arrow scrolls up to indicate Nose Up trim; arrow scrolls down to indicate Nose Down trim.
	Autopilot is ON with pitch and roll servos engaged. Flight Director is ON with HDG and VS modes active. ALT mode is armed.	Armed lateral and vertical modes are white with white arrows, indicating automatic mode transition when capture value is met.
	Autopilot is ON with pitch and roll servos engaged. Vertical mode recently changed.	Lateral and vertical modes and pilot-set values flash (i.e., highlight on/off) for 10 seconds after mode transition from armed to active.

7.12.5 SkyView Auto-trim

The optional SkyView Auto-trim feature automatically trims the pitch axis of the airplane while the autopilot is engaged. When SkyView Auto-trim is active:

- The trim system is commanded to maintain a near zero elevator control load force to the pitch servo.
- Trim activity is indicated in the AP Info Bar (see Section 7.12.4).
- SkyView HDX alerts (See 7.10: Flight Crew Alerting System) when the trim system operates in an unexpected manner
- SkyView HDX also alerts when a trim switch is held *ON* continuously for more than 5 seconds. If this safety function is triggered by the pilot inadvertently, it is reset by releasing the trim control momentarily, and then re-commanding trim with the switch.



When pushed and held, the Autopilot Disconnect Button will interrupt all trim commands for conditions such as a Trim Runaway.



The pilot or co-pilot trim switches on the yoke always override the SkyView Auto-trim commands to the airplane's electric trim system. Additionally, pilot switches override co-pilot switches.

7.12.6 Autopilot Annunciations

The autopilot will annunciate a variety of alerts to inform the pilot of conditions affecting the autopilot's performance. This section describes all autopilot performance related alerts, their associated voice aural annunciations, and the conditions that cause them to annunciate.

7.12.6.1 Servo Slip Alerts

Servo Slip alerts display on the PFD (see Figure 31 for examples and locations) whenever a servo is unable to move the controls in the direction commanded by the autopilot. Servo Slip alerts are generally transient (i.e., come and go) and usually occur when control loads are increased by:

- turbulent air,
- the pilot overriding the flight controls,
- out-of-adjustment trim for affected control.



Figure 31: Roll, Pitch, and Yaw Slip Alert Examples

7.12.6.2 Trim Alerts

Trim alerts are displayed on the PFD in airplanes with manual trim systems (see Figure 32) when the autopilot detects it is carrying trim load. These alerts indicate to the pilot that trim adjustment is necessary. After being displayed for 10 seconds, an aural annunciation will also commence to further alert the pilot. The pilot should adjust the trim in the direction indicated in the alert until the alert is removed.



If SkyView Auto-trim fails to properly trim the aircraft within 10 seconds of a trim request, the aural annunciation will still trigger to alert the pilot that the autopilot has detected an out-of-trim condition.



Figure 32: Trim Alert Examples

7.12.6.3 Slip Trim Alerts

When the autopilot carries a large trim load for an extended period, the affected servo may begin to slip. When this occurs, the Autopilot triggers a Slip Trim alert on the PFD for the affected axis (see Figure 33 for example and location). If the alert persists, the aircraft is likely severely out of trim. In this situation disconnect the autopilot, trim the aircraft appropriately, and then re-engage the autopilot.



Figure 33: Slip Trim Alert Example

7.12.6.4 Airspeed High and Airspeed Low Alerts

When the airplane reaches the minimum or maximum limit speeds configured in the autopilot, the autopilot will pitch the nose up or down as required to prevent the airplane from exceeding these limit speeds. Whenever this protective feature is active, the autopilot informs the pilot by displaying airspeed alerts on the PFD (see [Figure 34](#) for example and location). After being displayed for 10 seconds, an aural annunciation will also commence to further alert the pilot.

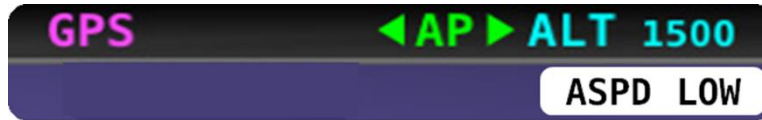


Figure 34: Airspeed High/Low Alert Example

7.12.6.5 G Limit Alert

When autopilot is engaged and vertical acceleration has exceeded normal G loading range (0.5G to 1.5G), the autopilot immediately begins reducing elevator input and displays the G Limit alert on the PFD (see [Figure 35](#) for example and location). The alert remains active until G loading returns to the normal range.



Figure 35: G Limit Alert Example

7.12.7 Autopilot Control

Operating the autopilot requires the selection of the correct control mode to accomplish the desired autopilot task. The lateral and vertical servos can be engaged individually or simultaneously. The servos can be engaged using the Autopilot Control Menu (see [Figure 36](#)), located on the display, or by using the optional instrument panel mounted Autopilot Control Panel (see [Figure 37](#)). Both controls provide the same buttons and functions, with two exceptions:

1. The *Autopilot Control Menu* does not provide the LEVEL button or function.
2. The *Autopilot Control Panel* does not provide the Yaw Damper button or function.

Only the AP and the LEVEL buttons will engage the autopilot servos. All other control mode selections only arm the servos for engagement directly into the selected mode. The servos will remain armed in the selected mode until the AP button is pushed. Pushing the AP button will engage the servos into the armed mode currently displayed on the AP Info Bar (see [Section 7.12.4](#)).

The Autopilot can be *engaged* using the following methods:

1. Press and release the AP button on the Autopilot Control Menu screen,
2. Press and release the AP button on the optional Autopilot Control Panel,
3. Press the LEVEL button on the optional Autopilot Control Panel.

The autopilot can be *disengaged* using the following methods:

1. Press and release the red Autopilot Disconnect Button,
2. Press and release the AP button on the Autopilot Control Menu screen,
3. Press and release the AP button on the optional Autopilot Control Panel,
4. Turn off the Autopilot master switch OR pull circuit breaker.



Pressing the AP button *DOES NOT* disable the Flight Director.



The AP DISC button may either be panel mounted or mounted on the control wheel/yoke.



If the SkyView Autopilot installation includes the SkyView Auto-trim feature, then the AP DISC button must be mounted on the side of control wheel/yoke opposite of the throttle controls.

For a functional description of the of each autopilot control mode, refer to [Table 7](#).

Table 7: Autopilot Control Modes

CONTROL MODE	FUNCTIONALITY DESCRIPTION
LEVEL	Rolls wings level, simultaneously raises nose above horizon, then holds zero vertical speed.
HDG	Turns toward and holds compass heading as selected by HDG/TRK bug.
TRK	Turns toward and holds ground track as selected by HDG/TRK bug.
ROLL	Holds current bank angle, within bank angle limits. NOTE: This mode can only be activated when the autopilot is activated and no other lateral mode (HDG, TRK, or NAV) has been selected at the moment of engagement.
NAV	Intercepts course by turning towards CDI needle, then maintains selected OBS course. VOR/LOC: Reverts to HDG mode if CDI is lost with HDG target set to OBS value, or to current HDG if OBS is not set. GPS: Reverts to TRK mode if CDI is lost with TRK target set to OBS value, or to current GPS ground track if OBS is not set.
ALT	Holds altitude commanded in the Autopilot status bar. NOTE: When activating this mode, commanded altitude is automatically set to the current indicated altitude.

CONTROL MODE	FUNCTIONALITY DESCRIPTION
VS	<p>Maintains the selected vertical speed as airplane performance allows, until approaching the altitude bug, then transitions to ALT mode.</p> <p>NOTE: If VS mode is selected when altitude is near the selected altitude the Autopilot will not automatically capture altitude. This allows the pilot to initiate a VS climb/descent away from the altitude bug.</p> <p>NOTE: A VS setting of 0 will not maintain a specific altitude. However, if a specific altitude is not required, a VS setting of 0 can provide a more comfortable ride quality than ALT mode in turbulent conditions.</p>
IAS	<p>Maintains the selected air speed during climb (if not aircraft performance limited) until the selected altitude approaches, then transitions to ALT to maintain selected altitude.</p>
VNAV	<p>Automatically captures and tracks a glideslope or glidepath when intercepted from below, regardless of selected lateral mode. It will not capture if descending from above the glideslope or glidepath.</p> <p>CAUTION: It is possible for the Autopilot to capture and track a glideslope or glidepath prior to the airplane reaching the final approach course of an instrument approach. If this is not desired, do not arm VNAV mode until established on the final approach course.</p>



Figure 36: Autopilot Control Menu

7.12.8 Vertical Guidance Source Loss

If vertical guidance information is lost, the autopilot reverts to ALT hold at the altitude at which the vertical guidance source was lost. The aural AUTOPILOT MODE will annunciate, and the new mode will indicate flashing on the AP Info Bar.

7.12.9 Go Around

The Go Around function is available when the autopilot is engaged in vertical guidance and is tracking a vertical deviation. To engage the Go Around function, press the NOSE UP button on the Autopilot Control Panel. Pressing the NOSE UP button at any time automatically switches Pitch and Roll modes to the following:

1. TRK Mode, with value defaulting to the current GPS track, and,
2. Depending on pilot preference and autopilot system setup:
 - VS Mode, defaulting to the preset vertical speed value.
 - IAS Mode, defaulting to the current airspeed.

7.12.10 Autopilot Control Panel

The optional Autopilot Control Panel ([Figure 37](#)) 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). It also has a LEVEL button to immediately return the airplane to straight and level flight.



Figure 37: Autopilot Control Panel

7.12.11 Yaw Damper

The optional Yaw Damper feature dampens yaw oscillations induced by turbulence, which improves the airplanes ride quality. The function will also keep the Slip/Skid Indicator centered during maneuvers.

The Yaw Damper may be engaged independently from the autopilot and can be engaged when the autopilot is not engaged. The Yaw Damper control appears only on the Autopilot Control Menu (see Figure 36). To independently engage the Yaw Damper, select the YD button. The YD button light will turn green when engaged, and the Slip/Skid Indicator will appear green, with the letters YD in black, as shown in Figure 38.

Because the Yaw Damper provides active control of the rudder, it should be deactivated when manual flight maneuvering is required, such as when entering an airport traffic pattern. Disengaging the Yaw Damper requires a pilot action such as those described in Table 8. However, if forgotten, applying pressure on a rudder pedal when the Yaw Damper is engaged will just override the Yaw Damper and cause the Yaw Damper servo to slip, just as do the Autopilot servos.

The Yaw Damper function is not available on all airplanes.

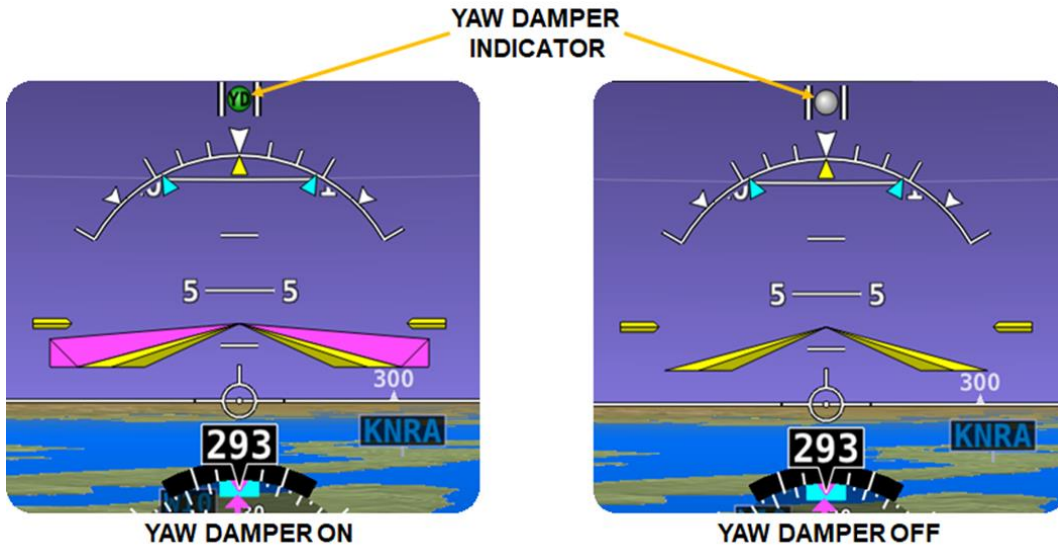


Figure 38: Yaw Damper Engaged Indication

Table 8: Yaw Damper Disconnect Methods

DISCONNECT METHOD	AP ENGAGED?	RESULT
Press YD button on AP Control Menu	YES or NO	Yaw Damper servo disengages (autopilot is not affected)
AP Disconnect Switch	YES	Yaw Damper and Autopilot servos disengage
	NO	Yaw Damper servo disengages

8 Handling, Service, and Maintenance

Maintain and service SkyView HDX in accordance with the *SkyView HDX General Maintenance Manual* document and the *Autopilot Servo Installation and Maintenance Manual* document associated with the airplane.

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9 Appendix 1: Cessna Models 172F through 172S

9.1 Autopilot Limitations

Maximum Flap Setting:

- Use of the Autopilot with flaps extended beyond 10 degrees is prohibited.

Minimum Altitude:

- Use of the Autopilot below 250 feet AGL is prohibited.

Servo Shear Screw:

- Use of the autopilot when any servo shear screw is broken is prohibited.
- Use of the autopilot without a successful preflight operations check is prohibited.
(See Section 4.5: [Autopilot Operation Check](#) for instructions)

9.2 Autopilot Servo Shear Screw Break-Away Forces

Pitch Servo:

63 lbs.

Roll Servo:

21 lbs.

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10 Appendix 2: Beechcraft Bonanza P35 through V35B

10.1 Autopilot Limitations

Maximum Flap Setting:

- Use of the Autopilot with flaps extended beyond 15 degrees is prohibited.

Minimum Altitude:

- Use of the Autopilot below 425 feet AGL is prohibited.

Servo Shear Screw:

- Use of the autopilot when any servo shear screw is broken is prohibited.
- Use of the autopilot without a successful preflight operations check is prohibited.
(See Section 4.5: [Autopilot Operation Check](#) for instructions)

10.2 Autopilot Servo Shear Screw Break-Away Forces

Pitch Servo:

73 lbs.

Roll Servo:

24 lbs.

Yaw Servo:

91 lbs.

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11 Appendix 3: Beechcraft Bonanza 36

11.1 Autopilot Limitations

Maximum Flap Setting:

- Use of the Autopilot with flaps extended beyond 15 degrees is prohibited.

Minimum Altitude:

- Use of the Autopilot below 200 feet AGL is prohibited.

Maximum Climb/Descend Rate:

- Use of the Autopilot when exceeding a climb or descent rate of 2000 FPM is prohibited.

Servo Shear Screw:

- Use of the autopilot when any servo shear screw is broken is prohibited.
- Use of the autopilot without a successful preflight operations check is prohibited.
(See Section 4.5: [Autopilot Operation Check](#) for instructions)

11.2 Autopilot Servo Shear Screw Break-Away Forces

Pitch Servo:

66 lbs.

Roll Servo:

30 lbs.

Yaw Servo:

77 lbs.

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12 Appendix 4: Piper PA-34 Seneca

12.1 Autopilot Limitations

Minimum Engine Operation:

- Use of the Autopilot when both engines are not operating at the same power setting is prohibited.

Maximum Flap Setting:

- Use of the Autopilot with flaps extended beyond 10 degrees is prohibited.

Minimum Altitude:

- Use of the Autopilot below 200 feet AGL is prohibited.

Maximum Climb/Descend Rate:

- Use of the Autopilot when exceeding a climb or descent rate of 2,000 FPM is prohibited.

Servo Shear Screw:

- Use of the autopilot when any servo shear screw is broken is prohibited.
- Use of the autopilot without a successful preflight operations check is prohibited.
(See Section 4.5: [Autopilot Operation Check](#) for instructions)

12.2 Autopilot Servo Shear Screw Break-Away Forces

Pitch Servo:

68 lbs.

Roll Servo:

38 lbs.

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