LIFT AIR

FLIGHT DESIGN

Supplement S7 to the Pilot's Operating Handbook (POH)

Dynon SkyView Glass Cockpit

Airplane Type	:	**CT, MC**
Airplane Model	:	**CTLS-LSA** **CTLS-HL-LSA** **MC-LSA**

Airplane Registration Number	:	_____
Airplane Serial Number	:	_____
Document Number	:	**AZ 0430 0013**
Date of Issue	:	**12-Nov-11**

This Supplement is approved on the Basis of Manufacturer Self Declaration

THIS DOCUMENT IS THE PROPERTY OF FLIGHT DESIGN general aviation GMBH
AND MAY NOT BE CITED, REPRODUCED, DISCLOSED OR DISTRIBUTED IN WHOLE OR IN PART
WITHOUT PRIOR EXPRESS WRITTEN PERMISSION OF FLIGHT DESIGN general aviation GMBH

Template No.: PZ 0100 0033_01

<blank page >

I RECORD OF MANUAL REVISIONS

Manual revisions are provided by Flight Design general aviation GmbH (hereinafter referred to as Flight Design) as available and approved through the Agency (if applicable). The updates shall be manually entered to the individual printed version of the POH by the owner/operator of the aircraft.

Manual updates are provided in electronic format (pdf file) directly to aircraft owners/operators, when the owner/operator leaves the correct contact information with Flight Design. Manual updates are also provided through the webpage of Flight Design, in the section Service Documents: http://www.flightdesign.com/index.php?page=service.

It is the duty of the aircraft owner/operator to ensure that the manual contains all updates applicable to his aircraft serial number. Updates are done by manually removing invalid pages and inserting new or updated pages. Manual update must be logged in the subsequent table.

Rev. No.	*Date*	*Pages Removed*	*Pages Inserted*	*Signature*
00	*12-Nov-11*	*none*	*all*	
01	*10-Dec-13*	*I-1; II-1; III-1; IV-1; 2-1; 3-1; 3-2; 3-3; 3-4; 3-5; 4-1; 4-2; 6-1;7-1; 7-2; 7-3; 7-4; 7-5; 7-6; 7-7;7-8; 7-9; 7-10; 7-11; 7-12;7-19; 7-20; 7-21; 7-22; 7-23;7-24; 7-25;*	*I-1; II-1; III-1;III-2; IV-1; 2-1; 2-2;3-1; 3-2; 3-3; 3-4; 3-5; 3-6; 3-7; 3-8; 3-9; 3-10;4-1; 4-2; 4-3; 4-4; 4-5; 6-1; 7-1; 7-2; 7-3; 7-4; 7-5; 7-6; 7-7; 7-8; 7-9; 7-10; 7-11; 7-12; 7-19; 7-20; 7-21; 7-22; 7-23; 7-24; 7-25; 7-26; 7-27; 7-28; 7-29; 7-30; 7-31; 7-32; 7-33; 7-34;*	
02	*27-Aug-14*	*I-1; II-1; IV-1*	*I-1; II-1; IV-1*	
03	*27-Feb-15*	*I-1; II-1; 2-1; 4-1; 4-4; 4-5; 6-1; 7-1; 7-2; 7-3; 7-5; 7-7; 7-8; 7-9; 7-10; 7-11; 7-12; 7-13; 7-14; 7-15; 7-16; 7-17; 7-18; 7-19; 7-20; 7-21; 7-22; 7-23; 7-24; 7-25; 7-26; 7-27; 7-28; 7-29; 7-30; 7-31; 7-32; 7-33; 7-34*	*I-1; II-1; 2-1; 4-1; 4-4; 4-5; 6-1; 7-1; 7-2; 7-3; 7-5; 7-7; 7-8; 7-9; 7-10; 7-11; 7-12; 7-13; 7-14; 7-15; 7-16; 7-17; 7-18; 7-19; 7-20; 7-21; 7-22; 7-23; 7-24; 7-25; 7-26; 7-27; 7-28; 7-29; 7-30; 7-31; 7-32; 7-33; 7-34; 7-35; 7-36; 7-37; 7-38; 7-39; 7-40; 7-41; 7-42; 7-43;*	
04	*07-Mar-18*	*I-1, II-1, III-1, IV-1, 2-1, 2-2, 3-1 – 3-10, 4-1 – 4-5, 6-1, 7-1– 7-33, 7-35 – 7-38, 7-40 – 7-43.*	*I-1, II-1, III-1, IV-1, 2-1, 2-2, 3-1 – 3-10, 4-1 – 4-5, 6-1, 7-1– 7-33, 7-35 – 7-38, 7-40 – 7-45.*	

II LIST OF EFFECTIVE PAGES

Sect. No.	Page No.	Rev. No.	Approval Reference
I	I-1	**04**	Approved by manufacturer self declaration
II	II-1	**04**	
III	III-1	**04**	
	III-2	01	
IV	IV-1	**04**	
	IV-2	00	
1	1-1	00	
2	2-1	**04**	
	2-2	**04**	
3	3-1	**04**	
	3-2	**04**	
	3-3	**04**	
	3-4	**04**	
	3-5	**04**	
	3-6	**04**	
	3-7	**04**	
	3-8	**04**	
	3-9	**04**	
	3-10	**04**	
4	4-1	**04**	
	4-2	**04**	
	4-3	**04**	
	4-4	**04**	
	4-5	**04**	
5	5-1	00	
6	6-1	**04**	
7	7-1	**04**	
	7-2	**04**	
	7-3	**04**	
	7-4	**04**	
	7-5	**04**	
	7-6	**04**	
	7-7	**04**	
	7-8	**04**	
	7-9	**04**	
	7-10	**04**	
	7-11	**04**	
	7-12	**04**	
	7-13	**04**	
	7-14	**04**	
	7-15	**04**	
	7-16	**04**	
	7-17	**04**	
	7-18	**04**	
	7-19	**04**	
7 (cont.)	7-20	**04**	Approved by manufacturer self declaration
	7-21	**04**	
	7-22	**04**	
	7-23	**04**	
	7-24	**04**	
	7-25	**04**	
	7-26	**04**	
	7-27	**04**	
	7-28	**04**	
	7-29	**04**	
	7-30	**04**	
	7-31	**04**	
	7-32	**04**	
	7-33	**04**	
	7-34	03	
	7-35	**04**	
	7-36	**04**	
	7-37	**04**	
	7-38	**04**	
	7-39	03	
	7-40	**04**	
	7-41	**04**	
	7-42	**04**	
	7-43	**04**	
	7-44	**04**	
	7-45	**04**	
8	8-1	00	
9	9-1	00	

III TABLE OF CONTENTS

I RECORD OF MANUAL REVISIONS
II LIST OF EFFECTIVE PAGES
III TABLE OF CONTENTS
IV INTRODUCTION
- IV.1 Approval
- IV.2 Certification Basis
- IV.3 Manufacturer Contact
- IV.4 Recovery of Certification Data
- IV.5 Warnings, Cautions and Notes

1. GENERAL INFORMATION
2. LIMITATIONS
   - 2.1. Revision Levels
   - 2.2. Minimum Equipment
   - 2.3. Safety Harness: Four-point; one per seatAutopilot Limitations
3. EMERGENCY PROCEDURES
   - 3.1. General Information
   - 3.2. Electric Power Failures
   - 3.3. Glass Cockpit Failures
   - 3.4. Autopilot Failures (if installed)
4. NORMAL PROCEDURES
   - 4.1. Glass Cockpit Operation
   - 4.2. Autopilot Operation (if installed)
5. PERFORMANCE
6. MASS AND BALANCE, EQUIPMENT LIST
   - 6.1. Mass and Balance, Weighing, Loading
   - 6.2. Equipment List
7. DESCRIPTION OF AIRPLANE AND SYSTEMS
   - 7.1. Avionics
   - 7.2. Autopilot (if installed)
   - 7.3. SkyView VHF Com Radio
   - 7.4. SkyView SV Intercom 2S
   - 7.5. Electric System
8. HANDLING AND SERVICING
9. SUPPLEMENTS

IV INTRODUCTION

This document supplements the information provided in the aircraft Pilot's Operating Handbook (POH) but does not replace it.

The purpose of this supplement is to provide all applicable information valid when the aircraft is equipped with the equipment described in Section 7.

IV.1 Approval

The contents of this Supplement to the POH is approved on the basis of Manufacturer Self Declaration against the applicable ASTM industry standard.

IV.2 Certification Basis

The aircraft is in conformance with ASTM F2245.

The Supplement to the Pilots Operating Handbook is in compliance with ASTM F2746, and is part of the Required Product Information per ASTM F2745.

The revision level of these standards applicable to the specific S/N is identified on the aircraft's Statement of Compliance.

IV.3 Manufacturer Contact

The aircraft is manufactured by:

Flight Design general aviation GmbH
Am Flugplatz 3, 99820 Hörselberg Hainich
Germany
Web: www.flightdesign.com
e-mail: info@flightdesign.com

IV.4 Recovery of Certification Data

In case the original manufacturer loses the ability to support the make and model of this aircraft, certification documentation can be recovered through the following contact:

E-UA Engineering Ukraine Ltd.
Rabochaya 82a
73000 Kherson
Ukraine

IV.5 Warnings, Cautions and Notes

Please pay attention to the following symbols used throughout this document, emphasizing particular information:

▲**Warning:** Identifies an instruction, which if not followed may cause serious injury or even death.

■ **Caution:** Denotes an instruction which if not followed, may severely damage the aircraft or could lead to suspension of warranty.

● **Note:** Information useful for better handling.

“Shall”, “will”, “should” and “may”:

The words “shall” or “will” are used to express a mandatory requirement or instruction. The word “should” is used to express non-mandatory provisions that are nevertheless highly recommended. The word “may” is used to express permissible provisions.

1. GENERAL INFORMATION

Chapter not affected by this Supplement.

2. LIMITATIONS

All chapters of Section 2 of the basic POH not listed in this supplement are not affected by this Supplement.

2.1. Revision Levels

The supplement is applicable to SkyView system installations with Firmware revision 15.3.3 or higher installed and aircraft manufacturer locked configurations.

2.2. Minimum Equipment

The following information replaces the chapter “Minimum Equipment” of the basic POH with the following information.

- **Note:** Additional equipment may be required to satisfy (national) specific operational rules. It is in the responsibility of the operator to ensure that the applicable (national) operational rules are followed.

When equipped with Dynon SkyView electronic flight instrument system (EFIS), the following minimum equipment is required, instead of the minimum equipment defined in the basic POH.

Flight Instruments (must be displayed while in flight):

Representation of:
- Airspeed Indicator
- Altimeter with barometric adjustment possibility

… on at least one of the displays

Analog Magnetic Compass with calibration card

When one of the installed displays is inoperative, this screen must be marked “inop“ and flights must be conducted using the remaining displays.

If only one display remains operative a ferry flight to a service center may be conducted in the daytime with good visibility.

Engine Instruments (must be displayed for all operations):

Representation of:
- Tachometer
- Cylinder Head Temperature Indicator
- Oil Temperature Indicator
- Oil Pressure Indicator

… on at least one of the screens

Safety Harness: Four-point; one per seat

2.3. Autopilot Limitations

The autopilot is limited to VFR day operation only. The autopilot is intended to be used in cruise flight, cruise climb and cruise descent. It is prohibited to use the autopilot in any other than the mentioned flight phases.

Additionally the autopilot may only be activated or used in conditions satisfying the requirements below:

Minimum Altitude GND:	>1000 ft
Flap Settings:	-6°
Airspeed Range:	74 KIAS … 120 KIAS
G-Loads Range:	0.5…. 1.5
Bank Angle:	<35°
Vertical speed:	-1000ft/min …. 1000 ft/min

The autopilot *is not approved* for the flight phases take off, initial climb, final approach and landing.

3. EMERGENCY PROCEDURES

3.1. General Information

▲Warning: To completely understand the logic of the emergency procedures it is mandatory to study the technical description section, where all redundancy features are explained in detail.

The Dynon SkyView system as installed in the CTLS provides an integrated flight deck solution with up to three displays, a primary flight display (PFD) an Engine Management System Display (EMS) and, if installed, a Multifunction Flight Display (MFD). Along with a multitude of connected sensor units that provides full flight, engine and navigation information as well as integrated autopilot functionality, all with a comfortable interface to a number of other systems.

All flight information is provided by two independent Air Data and Heading Reference System (ADAHRS) units. Individual sensors within the ADAHRS units provide air and flight data information for display on the SkyView displays. In normal operation the system utilizes ADAHRS data of the selected primary ADAHRS. In case of an ADAHRS failure the units switch automatically to the second ADAHRS as data source. This can also be triggered manually.

One EMS module provides all engine information via different sensors that interface to the units. Failure of the EMS module will lead to unavailability of engine data. In this case the pilot should be familiar how to achieve moderate power settings to best avoid exceeding of any one of the engine limitations.

All installed components are connected by network and share the data. In the case of a display failure in any one of the units, the data from the unit can be shown on the remaining functioning displays. In the case of only one remaining functional display, all data will be automatically displayed on the remaining unit.

Two displays are powered by backup batteries. The backup batteries will allow the screens and the most relevant sensor units to operate allowing safe completion of the flight.

▲**Warning:** Whenever you experience problems or come into an abnormal situation have the following sequence of action in mind:

Aviate–Navigate–Communicate–Trouble Shoot.

First priority shall always be to fly the aircraft safely, and then you can direct your attention to the resolution of the issue.

3.2. Electric Power Failures

3.2.1. Complete Loss of Electric Power

If the onboard electrical power of the aircraft is lost:

- PFD and EMS displays will provide the message “Aircraft Power Lost”
- MFD will fail (if installed)
- Systems continue to run from backup power
- Backup power is available for a minimum of 30 minutes per unit.
- Backup power ***only*** supports
    - Display
    - ADAHRS
    - EMS
    - ARINC 429 module
    - GPS module
- Backup power does ***not*** support:
    - Autopilot servos (if installed)
    - Transponder (if installed)
    - Other external devices
- Land as soon as reasonably and safely possible within the 30 minutes backup power limit, in case electric power cannot be restored in flight.

3.2.2. Loss of Generator

▲Warning: In case of GEN failure the aircraft battery will not be charged any more. To ensure maximum availability of the battery to operate the radio, transponder and flaps it is required to manually revert the PFD and EMS to their internal backup power, and power off the MFD (if installed)

When losing generator power of the aircraft (GEN warning light on; no battery charging; voltage drops):

- Push the PFD breaker off (may be labeled EFIS)
- Push the EMS breaker off
- Push the MFD breaker (if installed)
- EFIS and EMS units may show message “Aircraft Power Lost”
- Press “STAY ON” (button 3) on EMS and EFIS (if displayed)
- Systems continue to run from backup power
- Backup power is available for a minimum of 30 minutes per unit
- Backup power ***only*** supports
    - Display
    - ADAHRS
    - EMS
    - ARINC 429 module (if installed)
    - GPS module
- Backup power does ***not*** support:
    - Autopilot servos (if installed)
    - Transponder (if installed)
    - Other external devices
- Land as soon as reasonably and safely possible within the 30 minutes backup power limit, in case electric power cannot be restored in flight.
- If the backup battery low message is indicated on the PFD display, or the display fails, push the PFD circuit breaker on (May be labeled EFIS)

3.2.3. Loss of Aircraft Battery Power

▲Warning: When the aircraft battery power is lost the aircraft power bus may be supplied from generator, depending on the type of battery failure. For high engine rotational speeds, the generator may supply sufficient power to run all systems. With decreasing engine rpm (descent and approach, taxiing) the power availability reduces. To ensure power availability for essential systems it is required to revert PFD and EMS to their internal backup power, and power off the MFD (if installed) before reducing the engine rpm.

When loosing battery power while GEN continues works normally (system voltage appr. 13.5V):

- While at high engine rpm (cruise flight):
  - Continue the flight unchanged
- Before reducing power to low rpm (less than cruise, approx. 4.800)
  - Push the PFD breaker (May be labeled EFIS)
  - Push the EMS breaker
  - Push the MFD breaker
  - EFIS and EMS units may display the message “Aircraft Power Lost”
  - Press “STAY ON” (button 3) on EMS and EFIS (if displayed)
  - Systems continue to run from backup power
  - Backup power is available for a minimum of 30 minutes per unit
  - Backup power ***only*** supports
    - Display
    - ADAHRS
    - EMS
    - ARINC 429 module (if installed)
    - GPS module

- Backup power does ***not*** support:
  - Autopilot servos (if installed)
  - Transponder (if installed)
  - Other external devices
- Land as soon as reasonably and safely possible within the 30 minutes backup power limit, in case electric power cannot be restored in flight.
- If the backup battery low message is indicated on the PFD display, or the display fails, push the PFD circuit breaker on (may be labeled EFIS)

3.3. Glass Cockpit Failures

■ **Caution:** It is highly recommended to verify aircraft power setting for "moderate power" during transition training or regular flight, so that the setting can be remembered without instrument reference.

3.3.1. Display Failure

Display failure (black screen) can have different reasons. When all but one display unit fails completely the system automatically switches to a split setting showing the PFD and EMS and MAP page (if installed) on the remaining display.

In case of a display unit failure:

- Check breaker of the failed unit is in (PFD or EFIS = left screen, EMS = center or right screen, MFD = right most screen)
- If the breaker is open:
  - Reset (close) breaker.
  - When display unit starts again and functions as intended, end of procedure.
  - When breaker opens again, do not reset.
  - Continue flight using the remaining displays.
  - Land as soon as reasonable to allow repair of the failure.
  - End of procedure.
- Reboot the unit by pressing and holding buttons 1, 2 and 5 simultaneously for more than three seconds.
- Wait if the unit boots up again.

- When the display unit works again, End of procedure.
- To fully reset the affected unit, push the breaker of the affected unit (PFD or EFIS = left display , EMS = right or center display, MFD = right most display)
- Unit may try to continue to run on backup power. Therefore hold button 1 for 5 seconds to ensure that the unit gets switched off.
- After minimum 10 seconds, reset (close) breaker.
- Check if the unit boots up again.
- When the display unit works again, End of procedure.
- When unit does not restart:
    - Continue the flight using the remaining displays.
    - Land as soon as reasonable.
    - End of procedure.
- Verify system after landing

3.3.2. PFD Failure

PFD failure is likely when data provided is frozen, erratic, incorrect, or partially lost.

Complete loss of either of the two ADAHRS may be announced by warning "ADAHRS FAIL". In this event the system will automatically switch to the standby ADAHRS, or if pilot action is required due to a conflict in data from the ADAHRS units "Compare" will be displayed above a softkey.

- If the compare is displayed proceed to ADAHRS Cross Check Error below.
- If the PFD appears to be erroneous, and there is no compare button:
    - Hold down the two right softkeys to display the "In Flight Setup Menu" (if the menu does not display, or states "USB Key Required" power off by holding button 1 for 5 seconds, next, hold down button 7 while powering the unit on by holding button 1).
    - Select "ADAHRS SOURCE SELECTION"
    - Press the corresponding "COMPARE" button
    - Select the PFD presentation with the correct information.

- If the PFD remains frozen, or blank
    - Reboot any inoperative PFD display units by holding buttons 1, 2 and 5 simultaneously:
- When ADAHRS provides reasonable results again, End of procedure.
- If the PFD still remains incorrect, reset complete SkyView system:
    - Hold soft key 1 “PWR OFF” at the bottom of the left hand of each display, one at a time until each powers off.
    - Push off the EMS, PFD, and MFD breakers (PFD breaker may be labeled “EFIS”)
    - After a minimum of 10 seconds push on EMS, PFD, and MFD breakers.
    - Wait for units to boot
    - If units do not boot, boot manually by pressing and holding button 1.
- When the PFD provides reasonable results again, End of procedure.
- When the PFD does not provide reasonable results:
    - Expect PFD flight instruments be erroneous
    - Refer to outside visual reference and GPS speed values for navigation.
    - Use familiar pitch and power settings for landing when indicated airspeed is not reliable. Do not use GPS groundspeed, or movement over ground to estimate airspeed.
    - Land as soon as practicable, selecting a suitable airfield that allows landing with 0, or 15 deg. flap settings and reserve speed.
- Verify system after landing

3.3.3. ADAHRS Cross Check Error (if two ADAHRS installed)

In the event that information obtained by the two ADAHRS differs, the display will annunciate this with an on-screen alert that calls out which parameter(s) are not the same on all ADAHRS. Additionally a spoken Alert "ADAHRS Cross Check ERROR" occurs.

- Compare both ADAHRS data by pressing "COMPARE"
  - Both ADAHRS will be displayed side by side
  - The ADAHRS previously displayed is labeled "ACTIVE"
  - The reference ADAHRS is labeled "STANDBY"
- Identify the incorrect ADAHRS and press "DISABLE" (button 3 or 7)
  - The disabled ADAHRS will not be used for the rest of the Flight
- Press "EXIT" to return to normal operation
- "SINGLE ADAHRS" will be displayed next to the altitude tape for the remaining flight
- Verify system after landing

3.3.4. EMS Module Failure

EMS module failure is likely when the displays work normally but some EMS values are frozen, erratic or lost.

In case of individual function loss (not wrong reading), the individual indication is exchanged by a red "X".

In case of complete EMS module loss the complete page is replaced by one large red "X".

- Continue flight using moderate power settings to avoid over speeding and overheating of the engine (100 Kts IAS or less).
- Land as soon as practicable
- Verify system after landing

■ **Caution:** It is highly recommended to verify aircraft setting for "moderate power" during transition training or regular flight, so that the setting can be remembered without instrument reference.

3.3.5. Loss of GPS Function

Primarily there are two main causes which result in a loss of the GPS function.

One is the loss of the satellite lock. In this case the MAP freezes and the aircraft symbol is replaced by "?".

A complete loss of the GPS module results in a black MAP with a red cross.

- Continue flight using aeronautical charts, pilotage and dead reckoning.
- Use VOR navigation system (if installed).
- Verify system after landing

3.4. Autopilot Failures (if installed)

3.4.1. Autopilot Malfunction

An autopilot malfunction may be recognized as an uncommanded deviation in the airplane flight path, when there is abnormal control stick motion or if there are warning messages displayed.

The primary concern in reacting to an autopilot malfunction is in maintaining control of the airplane. Therefore, for any autopilot malfunction the procedure is the same:

- Immediately grasp the control, prepare for high stick forces
    - Manually override the autopilot servos as necessary
    - gently recover if in abnormal attitude
- momentarily press the A/P DISC switch on the control stick (White)
- push the A/P circuit breaker off
- if no mitigation:
    - continue overriding the servo manually,
    - if necessary breathe shear pin (mechanical servo disconnect) by forcing the stick against the servo.
- use the controls as required to safely maintain operation of the airplane within all of its operating limitations.
- Verify system after landing

<blank page >

4. NORMAL PROCEDURES

4.1. Glass Cockpit Operation

4.1.1. General Information

This section provides only the minimum information that is needed to be able to follow the Normal Procedures to fly the aircraft as defined in the basic aircraft POH. For further information on enhanced operation of EFIS see Section 7 of this supplement, and the EFIS manufacturer's manuals as identified in Section 7.

▲Warning: Information as by the basic POH Section 4 "Normal Procedures" remains valid. Information provided here enhances the basic POH information.

▲Warning: Audio warnings including the stall warning are only available through the headsets, and when the intercom is switched on and set to the correct volume level.

4.1.2. Engine Starting

Before starting the engine

- Confirm that EMS display has booted

After Engine Start

- Check for any alarms on EMS
- Check alarm and evaluate as required
- Acknowledge all active alarms by pressing "MSG"

4.1.3. Before Takeoff

- Confirm that all SkyView screens have booted.
- If not in the main menu, select BACK as often as required or EXIT to reach the main menu.
- Adjust altimeter setting on PFD screen by:
    - When no label over one of the knobs at the EFIS shows (BARO)
        - Move one joystick at EFIS screen up
        - If the HDX display is installed, push the knob.
        - Rotate joystick to highlight BARO

- Move knob right, or for HDX, push again
- Label will show (BARO) above the knob

- rotate knob labeled with (BARO) to adjust barometric setting as required.

4.1.4. Cruise Flight

- Frequently check values displayed on PFD and EMS for plausibility
- If an error is suspected, verify PFD data against backup instrumentation as available. GPS data can help to estimate approximate values for altitude and speed. The transponder can display density altitude information from the Altitude Encoder.
- In case of confirmed error follow procedures in Chapter 3.

4.1.5. Stalls

▲**Warning:** Normal procedure from the basic POH remains valid.

▲**Warning:** The audible stall warning is only available when the intercom is switched on and set to the correct volume level.

- Angle of Attack display (PFD) shows yellow and/or red arrows pointing down announcing approaching stall situation
- Audible alarm from SkyView through Intercom with increasing intensity on increasing Angle of Attack
- React as per normal procedure “Stalls” of the basic POH

4.1.6. Descent / Approach

- Adjust altimeter setting on the PFD screen by:
  - When no label over one of the knobs at the PFD shows (BARO)
    - Move one joystick at EFIS screen up
    - If the HDX display is installed, push the knob
    - Rotate joystick to highlight BARO
    - Move joystick right
    - If the HDX display is installed, push the knob
    - Label will show (BARO) above the joystick
  - Rotate joystick labeled with (BARO) to adjust barometric setting as required.

4.2. Autopilot Operation (if installed)

4.2.1. General Information

This section provides only the minimum information that is needed to be able to follow the Normal Procedures to control the autopilot. For further information on enhanced operation the autopilot refer to the manufacturer's manuals as identified in Section 7.

▲**Warning:** Information as by the basic POH Section 4 "Normal Procedures" remains valid. Information provided here enhances the basic POH information.

4.2.2. Engaging the Autopilot (Simplified mode. For advanced modes refer to the manufactures manuals identified in Section 7)

The Skyview, Skyview Touch Autopilot Menu is accessible from the Main Menu by pressing the Autopilot button (button 4) (MAIN MENU > AUTOPILOT)

The HDX Autopilot Menu is accessible by pressing Menu (button 6) for the Main Menu then Autopilot:

4.2.2.1. Engage TRK+ALT Mode

- Verify above minimum engagement altitude and airspeed
- Adjust power / trim aircraft for coordinated level flight
- Enter Autopilot Menu from main menu
- Press TRK+ALT for lateral / vertical control
    - Verify engaged modes in top bar
    - Release stick gently, verify A/P operation
    - Manipulate ALT/TRK via knobs as required
    - Follow trim commands in top bar

4.2.2.2. Engage HSI+ALT Mode

- Verify above minimum engagement altitude
- Adjust power / trim aircraft for coordinated level flight
- Enter Autopilot Menu from main menu
- Press HSI+ALT for lateral / vertical control

- Verify engaged modes in top bar
- Release stick gently, verify A/P operation
- Manipulate HSI navigation source as required
- Manipulate ALT via knobs as required
- Follow trim commands in top bar

4.2.2.3. Engage Level Mode

- Verify above minimum engagement altitude
- Enter Autopilot Menu from main menu
- Press LEVEL for lateral / vertical control
  - Verify engaged mode in top bar
  - Release stick gently, verify A/P operation
  - Follow trim commands in top bar
- Alternatively, press the “Level” button beneath the PFD if installed.

4.2.3. Autopilot Operation

4.2.3.1. Altitude changes

- Check HSI+ALT or TRK+ALT mode active
- Verify above minimum engagement altitude
- Select desired altitude via knobs
  - Verify selected altitude above minimum engagement altitude
- Check selected vertical speed
  - Default 700ft/min decent, 500ft/min climb, adjust according climb /descent performance at altitude if required
- Monitor autopilot operation (esp. VS)
- Watch for trim commands

4.2.3.2. Track changes

- Check HSI+ALT or TRK+ALT mode active
- Verify above minimum engagement altitude
- Check airspeed
- Check airspace in turn direction
- Select desired track via knob

- Apply rudder as required
- Monitor autopilot operation (bank angle / pitch)

4.2.3.3. 180° turn

- Check A/P active / A/P menu selected
- Verify above minimum engagement altitude
- Check airspeed / power
- Check airspace
- Push 180
  - Apply rudder as required
  - Monitor autopilot operation (bank angle / pitch)

4.2.4. Disconnecting the Autopilot

- Grasp control stick
  - Prepare for off-trim stick forces
- Press disconnect button on pilot control stick (white)
  - Alternatively press OFF in A/P menu (button 2)
  - Alternatively press active mode (highlighted green in A/P menu)
- Verify disconnect in the PFD top bar
- Trim a/c as required and maintain manual control

▲**Warning:** In LEVEL mode, subsequent pressing of the LEVEL button in the autopilot menu will not disengage the autopilot.

5. PERFORMANCE

Chapter not affected by this Supplement.

6. MASS AND BALANCE, EQUIPMENT LIST

6.1. Mass and Balance, Weighing, Loading

The mass and balance, weighing and loading information provided by the POH is not affected by this Supplement.

6.2. Equipment List

The list of equipment approved for installation in the CTLS-LSA provided by the POH of the aircraft is enhanced by the following items:

Description	***Type / partNo.***	***Manufacturer***
SkyView Display	SV-D700	Dynon
SkyView HDX Display	SV-HDX800	Dynon
SkyView Display	SV-D1000	Dynon
SkyView Touch Display	SV-D1000T	Dynon
SkyView HDX Display	SV-HDX1100	Dynon
Primary ADAHRS module	SV-ADAHRS-200	Dynon
Backup ADAHRS module	SV-ADAHRS-201	Dynon
EMS module	SV-EMS-220	Dynon
GPS module	SV-GPS-250	Dynon
GPS Antenna/Receiver Module (meets ADS-B Out requirements)	SV-GPS-2020	Dynon
Backup battery	SV-BAT-320	Dynon
ARINC module	SV-ARINC-429	Dynon
Transponder	SV-XPNDR-261	Dynon
ADS-B Dual Band Traffic and Weather Receiver	SV-ADSB-472	Dynon
SkyView VHF Com Radio (25 kHz, Horizontal)	SV-COM-C25/H	Dynon
2-Place Stereo Intercom	SV-INTERCOM-2S	Dynon
Pitch autopilot servo	SV-42	Dynon
Roll autopilot servo	SV-42T	Dynon

7. DESCRIPTION OF AIRPLANE AND SYSTEMS

7.1. Avionics

7.1.1. General

The data provided in this supplement provides information on the aircraft specific installation and on the basic operation when used in the CTLS. For complete system description and operational instructions of the unit as such refer to the respective Dynon Pilot's User Guide in the latest revision applicable to the firmware, and model installed in your aircraft.

7.1.2. Installation

The aircraft can be equipped with a Dynon SkyView integrated flight deck. In this configuration one display is installed in the upper left panel, one in the upper right panel of an increased size instrument console. The upper and the lower center panel remain in size and use comparable to the basic aircraft installation. See Fig. 7-1 and 7-2 for installation examples.



Fig 7-1
Instrument console with SkyView system installed – example view

In the version shown in Fig.7-1 the SkyView system is installed together with the basic Garmin COM and Transponder, and with the Garmin GPSMap79X as second GPS unit. Due to the size of the 10" screens all breakers are located in a breaker box that replaces the right hand map pocket on the basic aircraft.

Optionally, the aircraft can be equipped with three displays a PFD in the upper left pane, a EMS in the upper center panel, and a MFD in the upper right panel.



Fig 7-2
Instrument console with SkyView HDX system installed – example view

In the version shown in Fig.7-2 the SkyView system is installed together with the Dynon COM, and intercom. The USB ports are located beneath the corresponding displays.

7.1.2.1. Displays

The CTLS depending on avionics package can consist of two SV-D700 (7inch) two SV-D1000(T) (10.2 inch), or two SV-HDX1100 and one SV-HDX800 LED backlit technology displays. All SkyView components are interconnected with both displays with a redundant data bus system that allows sharing of data and settings and representation of information on either screen.

Each SkyView display can act as Primary Flight Display (PFD) with Synthetic Vision, Engine Monitoring System (EMS) and Multifunction Flight Display (MFD). Each SkyView SV-D1000(T) display is supported by external backup battery. For SkyView SV-D700 backup battery is supported for left display only. When three displays are installed, the leftmost, and center displays are supported by a backup battery.

A 30 second check of the battery condition is performed on each system shutdown, it monitors battery deterioration. The system requires a manually activated full battery check if the 30 second check shows battery deterioration beyond internal limits. The full check verifies the backup battery capable to power the display for 45 minutes.

USB ports are used for firmware updates and backups, database updates, and configuration file uploads and downloads. Access to the USB ports depending of aircraft model is provided either at the right firewall side, directly next to the instrument console dashboard (CTLS) inside middle tunnel directly under access hatch (CTLSi) or on the instrument console directly under the respective display.

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

The system will synchronize important information between the two installed screens. Actions such as setting baro, bugs, engaging the autopilot, or acknowledging warnings only need to be done on one display.

Displays are factory set to automatic screen backlight level management on the basis of the cockpit light situation detected by a photo sensor. Pilot has the option to override this with manual adjustment.

It is required to have the EMS display turned on during engine start.

7.1.2.2. Air Data Attitude and Heading Reference System (ADAHRS)

Primary flight information is generated from a group of calibrated sensors built into the ADAHRS module. The installed system Skyview SV-D1000, and SV-HDX1100 provide two independent ADAHRS modules, one installed to the left and one to the right wing. The Skyview SV-D700 system is equipped with one ADAHRS module, installed to the right wing. The ADAHRS modules provide all required information to generate the primary flight instruments on the SkyView PFD. All sensors are solid state, there are no moving parts. These sensors include accelerometers, which measure forces in all three directions; rotational rate sensors, which sense rotation about all three axes; pressure transducers for measuring air data; and magnetometers on all three axes for measuring magnetic heading.

Air data is provided to each ADAHRS unit directly. Total pressure and Angle of Attack (AoA) sensing pressure are connected from one separate AoA capable pitot probe per ADAHRS, installed to the left and right wing leading edge.

Table 7-1 describes which inputs and sensors are used within the ADAHRS module to generate the different displayed instruments.

	GPS	Pitot	Static	AOA	Magneto-meters	Rate Sensors	Accelero-meters	OAT
Ball							✓	
Altitude			✓					
Airspeed		✓	✓					
AOA		✓		✓				
Turn Rate		✓	✓			✓	✓	
Heading		✓	✓		✓	✓	✓	
Attitude	✓*	✓	✓			✓	✓	
Density Altitude			✓					✓
TAS		✓	✓					✓
Winds	✓	✓	✓		✓			✓
Flight Path Marker	✓		✓		✓	✓	✓	
Synthetic Vision	✓	✓	✓		✓	✓	✓	
Ground Speed	✓							

Table 7-1 Instruments and Sensors
(*GPS only used when airspeed from pitot and static is not available)

7.1.2.3. Attitude Calculation

The SkyView artificial horizon display (attitude) is generated via a complex algorithm using several sensors as described in Table 7-1. In normal operation SkyView uses airspeed to provide superior attitude accuracy.
In the event of airspeed loss an accurate attitude is maintained if there is an accurate GPS ground speed source. When in this mode, a magenta GPS ASSIST message is displayed on the PFD and the ground speed is displayed below the indicated airspeed (IAS) indicator. If the connectivity with the GPS fails while in GPS assist mode, the attitude continues to be displayed, using the last known GPS ground speed as a reference. This mode is flagged on the horizon with a yellow CROSS CHECK ATTITUDE message. In the very rare case that this sequence of events occurs, the ADAHRS' attitude accuracy is reduced; use other references in the aircraft to cross-check against the SkyView display.

7.1.2.4. Angle of Attack Indication – Stall Warning

Angle of Attack is determined from a measurement of two total pressure values on the pitot probe. One pressure is detected with the port facing forward, the second one with the port facing forward / downward. The difference between the two pressures is a scale for the actual Angle of Attack.

Angle of Attack is represented in the PFD, next to the lower end of the airspeed indication tape. In normal cruise flight the indication will look like the picture shown aside. As Angle of Attack increases, the bars at the bottom will disappear, leaving an empty box. When the Angle of Attack increases further, yellow gets less and only the yellow and red arrows pointing downwards remain. The arrows shall indicate to the pilot the need to push the aircraft nose down.



Angle of Attack indication is connected to an audible stall warning. For more details refer to the Warnings section of this POH supplement.

7.1.2.5. Engine Monitoring System (EMS)

The engine gauges on the SkyView Engine Page are generated from the data acquired by the Engine Monitoring module and its sensors. This module measures a variety of engine and environmental parameters such as RPM, manifold pressure, oil temperature and pressure, exhaust gas temperature, cylinder head temperature, voltage, current, fuel pressure, fuel flow, and coolant temperature.

7.1.2.6. GPS

The GPS Receiver module is an externally mounted 5Hz, or 4Hz WAAS / EGNOS / MSAS enabled GPS receiver designed specifically for use with SkyView. It supplies GPS data in NMEA format and automatically sets the time on SkyView. The optional 4Hz high integrity GPS can be used as a ADS-B position source for the Dynon 261 transponder.

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

7.1.2.7. Backup Battery

In the event of an electrical failure that causes the SkyView to run on the backup battery, the battery supplies power to the SkyView display it is connected to, and with this to the connected ADAHRS, EMS, GPS and ARINC 429 modules. Because of higher power requirements, the backup battery does not power Autopilot servos (if installed), Transponder (if installed) or any other external device. The Backup Battery powers a typical SkyView display and most of its connected modules for at least 30 minutes in the event of failure of the aircraft electrical system. The battery's charge level is automatically managed by the SkyView display it is physically connected to. This ensures that SkyView has a fully charged backup battery in case of emergency.

7.1.3. Operation

7.1.3.1. Front Panel Operation

All normal operations happen via the front panel, see Fig.7-2. The following key elements are available on the front panel:

1. Top bar with important textual information
2. Screen area with PFD data (in this example)
3. Knob and button levels; whereas the labels above the buttons form the menus
4. Left knob
5. Right knob
6. Softkey buttons. Buttons are numbered 1 … 8 from left to right in the manuals.

In the center of the bottom row the light sensor is integrated in the front bezel, that is used for automatic backlight level management.

For SkyView Touch SV-D1000T, and SV-HDX1100 touching a menu label at the bottom of the screen is equivalent to pressing the physical button below it. This allows the pilot to perform most actions via touch. For detailed explanation additional touch features please refer to the Dynon Pilot's User Guide (Dynon Part Number 101321-016) in the latest revision applicable to the firmware installed on the instrument in your aircraft.



Fig. 7-3

Front panel - example view

7.1.3.2. Interaction with the System

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

Knobs can be rotated in both directions, moved left/right and up/down for Skyview, and Skyview touch. For Skyview HDX knobs can be rotated in both directions, and pushed. When a label is shown above the knob and you rotate it, the value identified by the label above the knob will be changed. Turn clockwise – increase, turn anti-clockwise, reduce. To change the label above the joystick, move the joystick up, or push for HDX Then again rotate the joystick to change the selection. Move left or right, or push for HDX to select the highlighted option.

When you are in a text field with a cursor / highlighted selection, rotation or movement of the knob changes the selection up or down. When you move the knob to the right, or push the HDX knob you open the sub-menu connected with the active selection. For the Skyview, and touch, when you move the knob to the left you return to the previous menu and selection.

A button has a function if there is a label above it. If there is no label, there is no function. When you press a button, its label is highlighted. When you release the button, its action is invoked.

With buttons you either open further menus, directly select actions, return to previous menus (BACK) or exit menu operation (EXIT). To close or exit a menu after modifying values you have several options. A changed value is saved by pressing ACCEPT.

EXIT closes all menus and brings you back to the main menu selection while saving the changed value. Pressing DEFAULT restores the initial value. Pressing CANCEL closes the menu and brings you back to the next higher menu level while not saving the changes.

For SV-D1000T and HDX touching the transponder, autopilot status, or clock/timer displays instantly enables those features' controls in the menu, eliminating the normal button pushes the pilot would use to navigate to those controls.



Fig. 7-4

Top Bar Touch Regions

Touch region shortcuts:

1. MAIN MENU > AUTOPILOT
2. MAIN MENU > XPNDR
3. MAIN MENU > TOOLS > TIMER

7.1.3.3. Powering the System

The system is normally started by providing power to the system. Closing the battery master breaker will power the EMS display. Switching the Avionics Master to "ON" will start the left PDF display, and the rightmost MFD display. In case you must start the units manually, simply press and hold button 1 until the units start to boot.

If the aircraft is not in flight and power is lost, SkyView displays the message "POWERING DOWN IN xx SECONDS" while counting down from 30 seconds. During this countdown, press STAY ON to keep the SkyView display on via the connected backup battery instead. If the aircraft is in flight and power is lost, SkyView displays the message "AIRCRAFT POWER LOST" with no additional count down. Button 6 will be labeled PWR OFF to allow manual switch off. Button 3 will be labeled STAY ON to exit this selection menu.

It may be helpful to instantly reboot the system in some situations during troubleshooting. To achieve this, press and hold buttons 1, 2 and 5 simultaneously. To simply switch off the display systems, press and hold button 1 until the units begin to shut down.

7.1.3.4. Adjusting Display Brightness

To manually adjust backlight brightness of the screens, press SCREEN on the Main Menu and then press DIM. This menu allows to manually choose an offset from the default brightness values based on current ambient lighting. This enables to fine tune the brightness of the display, while still allowing SkyView to adjust for changing lighting conditions. To decrease or increase the backlight brightness press DEC- or INC+, respectively or twist the joystick labeled DIM. The current offset appears in a window above the DIM knob. Press DEFAULT to quickly reset the offset to zero. Press FULL to quickly set the offset to its maximum. Press BACK twice to exit the Dim Menu and return to the Main Menu.

7.1.3.5. PFD

This chapter highlights the layout of the PFD page, its symbology, and contains instructions for adjusting bugs.

Signal Sources

PFD display requires data from one ADAHRS module. If the system is installed with two independent ADAHRS modules and as long as the primary ADAHRS is available, data from this module are used on either screen. Only when the primary ADAHRS module fails, data provided by the backup module are used. It is possible to manually switch the ADAHRS source, see relevant Dynon manual.

The SkyView system provides its own GPS signal source. Further GPS systems can be connected to the SkyView system. When the primary GPS module is not available, the backup GPS source is used to support PFD data.

PFD Page Layout

The PFD Page as shown in Figure 7-4 displays important flight information and synthetic vision. The following key information is provided by the PFD:

1. Attitude indication
2. Airspeed
3. Altitude
4. Vertical speed
5. Slip-skid ball
6. Compass rose / directional gyro
7. Angle of attack



Fig. 7-5
SkyView PFD – example view

SkyView includes the traditional six-pack analog presentation of flight instruments as well as the EFIS tape-based display. To turn on the six-pack, Synvis, or EFIS presentation go to the PFD Menu > MODE and select the layers to turn on either EFIS or SIX-PACK with or without SYNVIS. All the same information is displayed on the six-pack and EFIS tapes and the six-pack format respects all the same settings. All of the information boxes for Density Altitude, True Airspeed, Autopilot alert banners, Flight Director, and bugs, etc. appear just like they do for the EFIS tapes.

▲***Warning:*** In Six-Pack mode no Extreme Pitch Warnings are displayed. EFIS tapes are required to view the Extreme Pitch Warning Indicators.

The PFD Page in Six-Pack mode as shown in Figure 7-5 displays important flight information and synthetic vision. The following key information is provided by the PFD:

1. Attitude indication
2. Airspeed
3. Altitude
4. Vertical speed
5. Slip-skid ball
6. Compass rose / directional gyro
7. Angle of attack
8. Turn coordinator

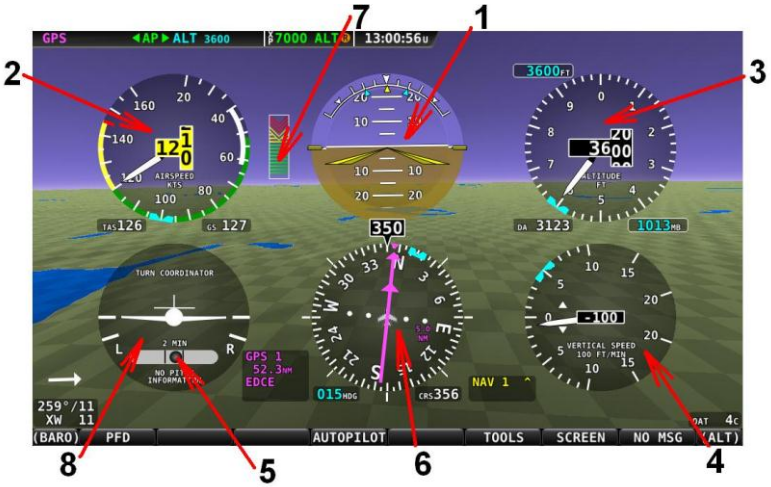


Fig. 7-6
SkyView PFD Six-Pack mode – example view

For SV-D1000T and HDX Touching a PFD item that has an adjustable bug instantly re-assigns a SkyView PFD knob to that touched item, eliminating the need to manually reassign a joystick knob. When multiple pages are up on the display the knob closest to the PFD page is assigned, when 100% PFD is shown it will assign the left knob.

Further information is available and provided in the Dynon Avionics SkyView Pilot's User Guide.



Fig. 7-7
EFIS Touch Regions

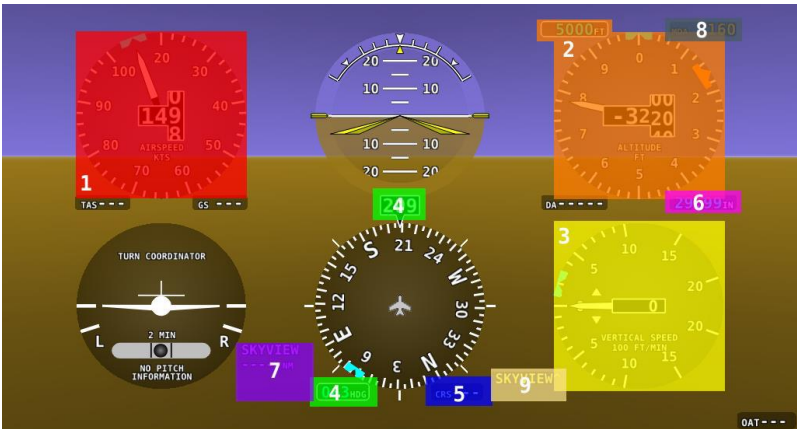


Fig. 7-8
Six Pack Touch Regions

Touch Region functions:

1. Assigns knob to IAS bug
2. Assigns knob to ALT bug
3. Assigns knob to VS bug
4. Assigns knob to HDG or TRK bug
5. Assigns knob to CRS bug
6. Assigns knob to BARO
7. Equivalent to pressing HSI SOURCE button; cycles the HSI through the different navigation data sources that are connected to the SkyView system.
8. Assigns knob to MDA (Minimum Descent Altitude) bug
9. Equivalent to pressing MAIN MENU > PFD so that the pilot can adjust the bearing needle sources.

Attitude Indication

The attitude indicator incorporates a roll scale with roll pointers and a zero pointer reference, pitch scale with horizon lines, and water line symbology. Figure 7-5 is an example SkyView attitude indicator.

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

The pitch scale has tick marks in 2.5 degree increments and every 10 degree tick mark provides a horizon line across the width of the screen.

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

Airspeed

The airspeed indicator is displayed on the left side of the PFD and incorporates an airspeed tape with a digital readout, true airspeed (TAS), airspeed trend indicator, and airspeed bug. The airspeed tape displays indicated airspeed including gray, white, green, yellow, and red markings as adequate for the aircraft. The indicated airspeed (IAS) digits scroll up and down, simulating an analog airspeed indicator. The airspeed trend indicator (ATI) is displayed as a magenta bar on the airspeed tape. It grows proportionally in the direction of the rate of change (acceleration or

deceleration). The ATI is scaled to indicate a 6-second airspeed trend which means that if the acceleration is kept constant, the airspeed will end up at the number indicated at the end of the trend line after 6 seconds have passed. True airspeed (TAS) is digitally displayed at the bottom of the airspeed tape.

Altimeter

The altimeter is displayed on the right side of the PFD. It incorporates an altitude tape and digital readout, density altitude (DA), barometer setting, and altitude bug. The altitude tape displays 200 units above and below the current altitude digital readout. Each tick represents 25 units, with every 50 unit tick drawn slightly longer to differentiate them. The digital readout scrolls up and down in the manner of an analog altimeter. An altitude trend indicator based on current vertical speed is represented as a magenta bar on the altimeter. It grows proportionally as your climb or descent rate increases/decreases. The altitude trend indicator is scaled to indicate a 6-second altitude trend. This means that if current rate of altitude change is kept constant, the altitude will end up at the number indicated at the end of the trend line after 6 seconds have passed.

To change the barometer setting, move the knob up, or push for HDX rotate to highlight BARO and move the knob to the right, or push for HDX to assign the BARO function to the knob. (BARO) will now display just above that joystick. The barometer setting on the PFD will be outlined to signal that it is selected. Turn the joystick to adjust the barometer setting. Note that while the barometer setting is changing, its display window lights up in cyan to draw your attention to it. You may reset baro (i.e., 29.92 in Hg, 1013 mbar, or 760 mm Hg) by pressing and holding the joystick to the left or right for 2 seconds.

Vertical Speed

The vertical speed indicator (VSI) is displayed to the immediate right of the altimeter and incorporates a vertical speed tape, vertical speed pointer (with digital readout), and bug. The VSI tape displays ±2000 ft per minute (±10 m/s). The vertical speed pointer scrolls up and down the VSI tape, simultaneously displaying the instantaneous vertical speed in both analog and digital formats. If there is very little or no vertical speed, the pointer appears blank.

Compass Rose / Directional Gyro

The compass rose/directional gyro is displayed on the lower center of the PFD and incorporates a magnetic heading compass rose, magnetic

heading digital display, turn rate indicator, ground track GPS pointer, heading bug, and heading bug digital display. The compass rose displays in heading-up orientation. The cardinal points are displayed as letters, and 30 degree increments are displayed numerically without the trailing zero (e.g., 330 degrees is displayed as 33). The numeric display at the top of the compass rose indicates magnetic heading.

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

Slip/Skid Ball

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

Angle of Attack

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

7.1.3.6. EMS

This chapter highlights the layout of the EMS page and its symbology.

Engine Page Layout

The engine screen is shown as partial screen on the right side display. Data is provided by the EMS module that connects to the individual sensors. Elements provided are:

1. Engine speed (RPM)
2. Manifold pressure (MAP)
3. Fuel flow
4. Fuel pressure
5. Battery voltage
6. Electric power in amps
7. Oil pressure
8. Oil temp
9. Cylinder head temperature (CHT)
10. Exhaust gas temperature (EGT)

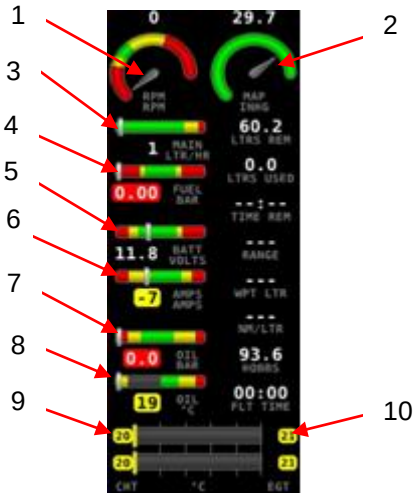


Fig. 7-9

20% Engine Page (EMS) – example view

Engine speed is shown as true engine speed, not propeller speed. Propeller speed is by the gear box ratio (1:2.43) lower.

Electric power (amps) is indicated as energy flow to or from the battery. Positive electric power indicates charging of the battery, negative power indicates a discharging battery. Neutral power indicates a charged battery and all systems are supported by the generator, alone.

CHT is measured at cylinder 2 (left forward) and cylinder 3 (right rear).

EGT is measured at the both rear cylinders (cylinder 3 and 4).

7.1.3.7. Navigation Map

This chapter introduces the key functionality of the map page. The moving map is provided on the remaining part of the right hand screen, together with the 20 % EMS page.



Fig. 7-10
Right Screen with EMS and moving map display - example view

The appearance of the map page depends greatly on the installed databases and from the selection of active features that are shown.

For SkyView Touch SV-D1000T the map responds to touch in much the same way you've come to expect from modern tablets and phone maps. You can pan, zoom, point, pinch, select and navigate with simple touch-based gestures. Fig. 7-11 shows the available touch "buttons" on the map.

Touch Region functions (Fig. 7-11):

1. Info items that display information only - such as those colored red in the image above - do not respond to touch.
2. Touching the Map Pointer information bar will exit panning mode. The map will resume following the aircraft.
3. The + and – will zoom the map in or out. In addition, you can use two fingers anywhere on the map to pinch to zoom in or out of any point or area of interest.

4. Touching any of the shortcut info item buttons will result in the same action as pressing the corresponding menu soft key regardless of what menu is currently displayed. These touchable info items are only available on touch displays:

   a) Touching FPL Source will toggle the course legs displayed on the SkyView map between the SKYVIEW flight and any available external flight plans connected to SkyView. It is the same as selecting that device's Flight Plan in the Flight Plan menu and choosing the "SHOW _EXTERNAL NAVIGATOR_ FPL on MAP" option.

   b)  Touching the button performs the same actions that the button does in the Map Menu.

   c) FPL: Touch FPL (Flight Plan) to bring up the Flight Plan window. It is used to create, display, or modify Flight Plans. It is equivalent to pressing Map Menu > FPL in the menu system. Reference the Flight Planning section of this guide for details.

   d) INFO: Touch INFO to bring up the Info window with detailed information about any selected airport, navaid, or other item that is selected in the map pages or that is being pointed to with the Map Pointer. It is equivalent to pressing Map Menu > INFO in the menu system. See the Navigation Mapping Software section for more details.

   e) NRST: Touch NRST (Nearest) to bring up the window that displays the nearest airports, navaids, and user waypoints. It is equivalent to pressing Map Menu > NRST in the menu system.

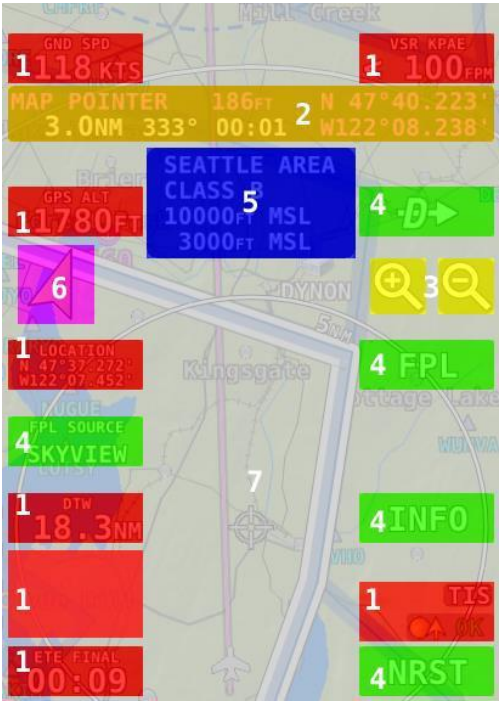


Fig. 7-11

Map Touch Regions

5. After you have touched a region on the map that has multiple airports, airspaces, or other items underneath it: Touch the information pop-up text box on its left or right side to scroll through the additional items. It is equivalent to turning the joystick when multiple possible items can be selected on the map.
6. Touch the North arrow to toggle the map display between track up and north up mode. Unlike the preference setting in MAP MENU > MAP MODE, this is not a permanent setting and will revert to the preferred orientation when the zoom level changes.
7. Touch anywhere on the map to place the map pointer on the map. This lets you choose items to see more information about them, navigate to them, add them to flight plans, etc. Press the resulting information bar near the top of the display to clear the pointer and resume following the aircraft.

The Moving Map Page as shown in example Fig.7-10 displays a real-time topographical map in track-up mode. The map is sourced from a database that is stored inside the display and correlated to your current position using a GPS feed.

- **Note:** Fig. 7-12 is in full screen display and for illustration of the features only. The installed software in the aircraft only allows for a split screen display together with the EMS page. This only changes the map page format in size, but does not reduce the content.

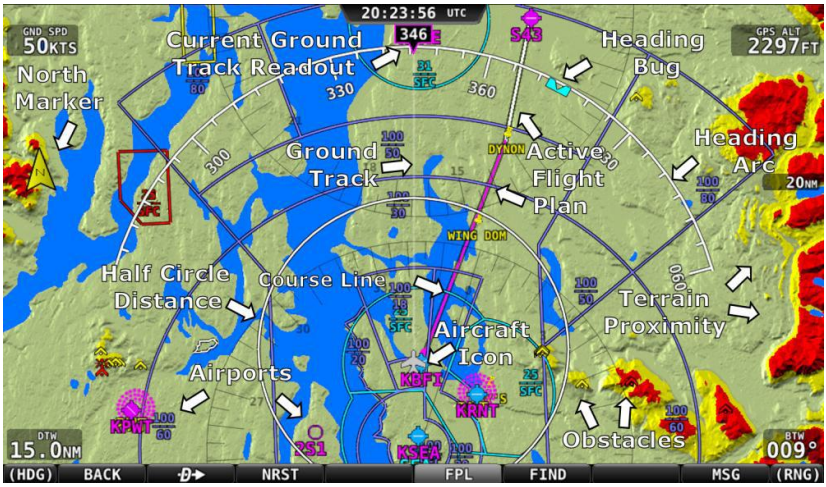


Fig. 7-12

Topographic Map – example view

The following items are displayed on the Moving Map Page:

1. Topography (terrain and bodies of water) with Terrain Proximity Alerting
2. Aircraft Icon with Ground Track Line
3. Half Distance Circle and Range
4. Heading Arc, Current Ground Track, Heading Bug, True North Marker
5. Configurable Info Items. Examples include GPS Ground Speed (SPEED), GPS Altitude (ALTITUDE), Distance to Waypoint (DTW), and Bearing to Waypoint (BTW).
6. Course line (only displayed when actively navigating to an aviation waypoint)

7. Airports with runways (if known)
8. Obstacles
9. Airspace (with floors/ceilings)
10. Navigation aids, such as VORs, NDBs, and Fixes
11. Active Flight Plan

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

1. Terrain data (High, low, and very low-resolution terrain database data is used to display the topographic map)
2. Aviation data (Airports, navigation aids, airspace, airport information, etc.)
3. Obstacles data
4. Basemap/Cultural Data.

SkyView's Moving Map display depends on the system having a valid GPS source. In the event of the failure of the primary GPS source used to display the Moving Map, SkyView will automatically use other available GPS sources that are configured in the system.

● **Note:** SkyView's Moving Map requires valid GPS and terrain data to function as a real time, track up, look down topographical map. Aviation data is further required to show airspaces, airports, airport identifiers and other features overlaid on top of the map.

▲ **Warning:** Use of the maps and terrain information for pilotage navigation or obstacle avoidance is prohibited. These data are intended only to enhance situational awareness. Navigation is to be conducted using only current charts, data and authorized navigation facilities. It is the pilot's responsibility to provide terrain and obstacle clearance at all times.

▲ **Warning:** Database information loaded to the GPS unit has strictly limited validity durations. Validity may differ from database to database. It is in the sole responsibility of the pilot to ensure that current databases are loaded on the unit prior to commencing a flight and using the GPS unit. This may be connected with additional cost. Refer to the relevant Dynon SkyView Pilot's User Guide and to the information of the provider of the individual database for validity and updating information.

Topography with Terrain Proximity Alerts

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

The SkyView Moving Map also adds Terrain Proximity Alerting:

- *Yellow* terrain is between 100 and 1000 feet below the aircraft's current altitude.
- *Red* terrain is within 100 feet below or above the aircraft's current altitude.

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

Aircraft Icon with Ground Track Line

The aircraft icon represents your aircraft on the Moving Map Page. The ground track line represents the projected ground track of the aircraft. The aircraft icon in the figure below denotes that SkyView has obtained a GPS fix, and points in the magnetic heading of the aircraft. When GPS communication is present, but a fix has not been obtained, a question mark (?) shows up on top of the icon.

Range and Half Distance Circle

The range parameter is the distance on the map between the aircraft icon and the inner circular ring. The distance between the aircraft and the outer Ground Track Arc is twice this distance. The range value is displayed in the middle of the right side of the Map Page, near the Range Circle. Turn the (MAP) joystick to adjust the range. Range can be adjusted between 0.3 and 1200 nautical miles.

Current Ground Track and Course Line

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

The north marker is represented with a yellow arrow marked with an "N" and points to True North.

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

Map Panning with the Map Pointer

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

A Map Pointer Information Bar (example see Fig. 7-13) appears on the upper end of the map and displays the following information about the Map Pointer:

1. Latitude / Longitude
2. Distance between the Map Pointer and the aircraft
3. Magnetic bearing from the aircraft position to the Map Pointer.
4. The estimated time, in minutes, that it would take to reach the Map Pointer if you were to fly directly to it at the current GPS ground speed.

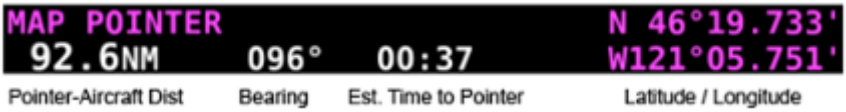


Fig. 7-13
Map Pointer Information Bar – example view

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

7.1.3.8. Direct-To Navigation

Press the MAP button to access the map menu. From this menu you have two possibilities to identify the desired waypoint.

Find an Airport or Navigation Aid by Identifier

To find an airport or navigation aid, press the FIND button. A window like the one seen in Fig. 7-14 will be displayed.

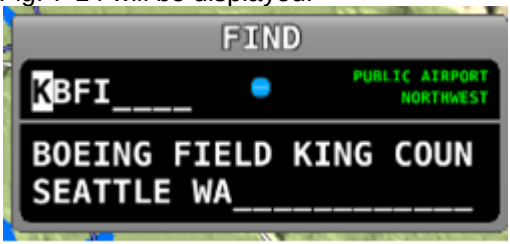


Fig.7-14

Moving Map Find Window – example view

You can find airports, navigation aids, and fixes by identifier, facility name, or city (Search by city is not available when Jeppesen aviation databases are used). To do this, move the CRSR joystick up/down to move between identifier (top), facility name (middle), and city (bottom) fields; Once you have selected the field you wish to use to search, rotate the knob to change the highlighted character. Move the knob right, or push for HDX to select the next character and continue until the desired facility is shown. Once the desired facility is shown, press INFO for more information about it and D→ to navigate directly to it.

Nearest Airports and Navigation Aids

To quickly bring up a list of the nearest airports and navigation aids, press the NRST button. A window similar to the one seen in Fig. 7-15 will be displayed.

The top bar of tabs each contains a category of aviation features. They include APT (airports), NDB, VOR, FIX (fixes). Move or rotate the joystick left and right among the tabs to select the category you are interested in. Rotate or move the knob up/down to highlight different items in the list. Once the desired facility is shown, press INFO for more information about it or D→ to navigate directly to it.

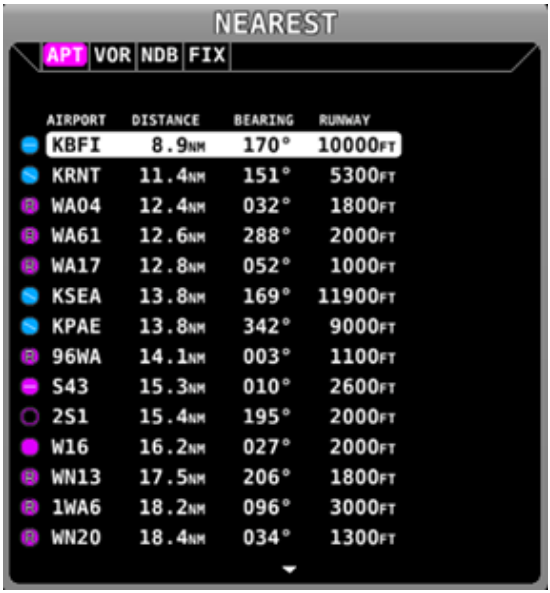


Fig. 7-15

Moving Map Nearest Window – example view

Window

If no waypoint is selected in the Find, Nearest, or Info Windows, pressing instead brings up a window that allows you to search for a waypoint by identifier, name, or city (Search by city is not available when Jeppesen aviation databases are used). You can also select the RECENT tab of the window to find waypoints that have been navigated to recently. After the desired waypoint is found, simply press again to navigate directly to it from your present position

A magenta course line is created that starts from your current location and ends at the selected waypoint. It is the shortest path between your current location and that waypoint.

Clearing the Active Waypoint

Press when it is highlighted (but when no other waypoint is selected) to bring up the current waypoint information. From the resulting menu, press STOP to clear the active waypoint and cancel navigation.

- **Note:** If a waypoint is selected in any window that waypoints can be selected in, pressing will immediately replace your current destination with the selected destination.

7.1.3.9. Screen Layout *Rotation*

The Skyview units allow several layout options to be chosen by the pilot. This gives the option to adapt the displayed information to flight phases, e.g. for transition training.

The selection options are restricted in order to ensure that one PFD and one EMS page are always visible.

To change between the available screen layout options, press SCREEN on the Main Menu and then select in the lower bar the pages to be displayed.

- **Note:** The examples below do not consider SIX PACK, Wide Angle, SynVis or G-Meter selection options.

PFD Screen Layout Options



100% PFD Boot Screen



80% PFD+ 20% EMS



40% PFD + 20% EMS+ 40% MAP



50% PFD + 50% MAP

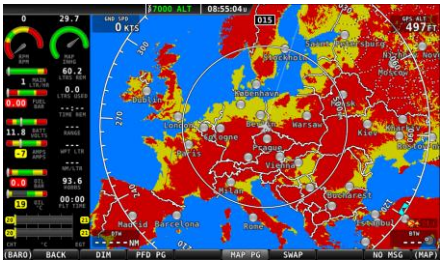
Fig. 7-16

PFD Screen Layouts

Fig.7-16 shows the PFD layout options, starting with the screen directly after boot in the upper left corner.

EMS Screen Layout Options

Fig. 7-17 shows the EMS layout options, starting with the screen directly after boot in the upper left corner.



20%EMS + 80% MAP Boot Screen



100% EMS



50% EMS+ 50% PFD



40% MAP+20%EMS+40% PFD

Fig. 7-17

EMS Screen Layouts

- **Note:** On the 100% EMS page, the gauges are arranged in pairs. The needle / indicator of the respective right gauge in the pair moves counterclockwise with increasing values. The needle / indicator of the respective left gauge in the pair moves clockwise with increasing values.

Swapping Screens

When exactly two displays are installed, it is possible to swap the content of the left to the right display and vice versa. This can be done by pressing “SWAP” in the screen menu on one of the displays. The intent is to have a simple and fast one-button method

available, for example when the flight trainer needs to take over control of the aircraft.

In Swap Mode it is not possible to further change the screen layout selection; all buttons to alter the screen layout are greyed out. When you want to change the screen layout, you first have to revert the “SWAP” mode.

Reversion Mode Layout

If one of the units fails, or additionally to “MAP” the “EMS” is selected, the following layout will appear. This screen layout is available on both display units and compresses all relevant flight information onto a single screen (Fig. 7-18).



Fig. 7-18

Screen in Reversion Mode (40% PFD, 20%EMS, 40% MAP)

7.1.4. Transponder (when installed)

The Transponder that can be optionally connected to the SkyView System is a Class 1 Mode S transponder that is controlled using the SkyView’s on-screen menu system. This allows the transponder to be mounted separately from the instrument panel and reduces the amount of panel space taken by the transponder. The remote transponder is TSO certified. When required by national regulations, a separate TSO certified altitude encoder is installed. In this case the transponder does not use the altitude signal provided by the Dynon SkyView ADAHRS unit.

7.1.4.1. Operation

Transponder Status

When the transponder is installed and configured, the top bar will display transponder status as shown in Fig. 7-19.

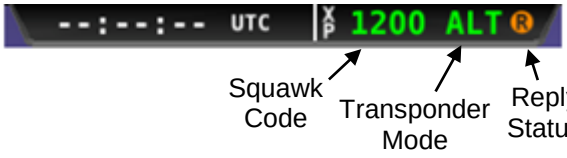


Fig. 7-19
Transponder Status Area in Top Bar – example view

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

1. Squawk Code: This code is transmitted when the transponder is in a broadcast mode.
2. Transponder Mode: Displays the current operating mode and status of the transponder. Modes in which the transponder will reply to interrogations are colored green, while other modes, such as standby and errors, are in yellow or red. The different modes possible include:
    a. SBY: The transponder is on, but will not reply to any interrogations. This is the mode that the transponder is in when none of the modes below are active.
    b. GND: The transponder will respond to Mode S ground interrogations from surface movement radar.
    c. ON: The transponder will respond to all interrogations, but altitude reporting is suppressed.
    d. ALT: The transponder will respond to all interrogations.
    e. IDT: Displayed while the transponder is broadcasting an ident after the IDENT button is pressed at ATC's request.
    f. Big white "X" (covering entire transponder status area): Indicates an error, either with the transponder itself or in the communication between the transponder module and SkyView. The transponder is not responding to interrogations.
3. Reply Status: The reply indicator illuminates when the transponder replies to interrogations.

Transponder Menu

The Transponder Menu (Fig. 7-20) becomes accessible from the Main Menu by pressing XPNDR on any display, or by pressing menu>xpdr for HDX. All transponder operation can be accomplished from this menu. There is no dedicated or separate control panel.



Fig. 7-20
Transponder Menu – example view (Skyview, Skyview Touch)

Press BACK to return to the Main Menu.

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

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

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

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

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

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

7.1.5. Alerts

SkyView annunciates important notifications onscreen or in a message window. This chapter describes SkyView alert behavior and how to acknowledge them.

Onscreen Alerts

SkyView notifies users with a large red **X** and a descriptive label if a failure occurs. A red **X** may overlay an entire page if a data source such as an EMS module fails or a red **X** may overlay a single item if a single engine sensor fails. For example, the PFD would look like Fig. 7-21 if ADAHRS in the system fail without backup going active.

Some ongoing alerts will display until acknowledged. An example of this is loss of primary power resulting in SkyView operating from backup battery. In this condition there will be an initial notification which requires user acknowledgement.



Fig. 7-21
Example SkyView Failure

Message Window

The message window shows basic user notification messages, non-critical but important warning messages, and critical condition alarms. Use the message window to display and acknowledge alerts.



Fig. 7-22

Message Window Button – example view

Press MSG to display the message window as depicted in Fig.7-22. Once onscreen, it looks like Fig. 7-23.



Fig. 7-23

Message Window – example view

The message window is divided into two sections. The top section displays Engine alarms and warnings, while the bottom section displays all other system messages. The windows are dynamically sized for each message line being displayed. Each section can show a maximum of 5 message lines at once, while 6 total message lines can be displayed between the two sections at any one time. If SkyView has more messages than the window will allow, the messages are prioritized and displayed until acknowledged. Once acknowledged, messages are cleared or deprioritized to make way for other messages that have not yet been displayed.

Alarm Indicators

Any time an alarm set point is exceeded, a few things occur:

The MSG label blinks (see Fig.7-24) in the lower right hand corner of the screen.

The measurement's value blinks and is highlighted red (if displayed).

The external alarm light will flash.



Fig. 7-24

Blinking Message Button Label

If the alarm condition pertains to something that is not currently displayed on the screen, the only visible alert will be the blinking MSG label.

Engine Sensor Alarm Format

Engine sensor alarms are triggered when a sensor's measurement enters a red range on the respective indication. Indication ranges have been configured during installation.

Engine sensor alarms follow this format:

[SENSOR NAME] [#] [LO/HI]

For example, if oil temperature enters the red range of its widget, you will see an "OIL HI" alarm in the message box.

If exhaust gas temperature probe #2 enters the red range of its widget, you will see an "EGT 2 HI" alarm in the message box.

Alarm Acknowledgement

To acknowledge an alarm, press MSG. Pressing MSG opens the message window, displays the current alarm(s), and stops the blinking of the relevant alarm (Fig. 7-25). Note that self-clearing alarms may not need acknowledgement if the alarm condition ceases.



Fig. 7-25

Unacknowledged (left) and Acknowledged (right) Alarms – example view

Note that, even when acknowledged, the MSG label will remain red and the alarming onscreen widget's numeric value will continue to blink and remain highlighted red until that alarm condition ceases.

Alarms automatically rearm when their alarm condition ceases.

Depending on the alarm, the optional external alarm light will either remain lit after acknowledgement (while the alarm condition continues to exist) or may extinguish with acknowledgement.

Multiple Alarms

Any time multiple alarms occur simultaneously, they are handled in the following way:

1. Each numeric value and gauge posts its alarm by being highlighted red and blinking (if displayed).
2. The MSG label blinks.

3. Alarm messages in the message window are stacked into memory and presented in the order in which they occurred.
4. If a message was not displayed due to lack of room, these messages are not acknowledged, and thus the MSG button starts flashing again on closure of the message window.
5. When the last alarm is acknowledged, the message window is cleared and the MSG button is no longer red.

All alarmed parameters remain in their alarmed state until the alarm condition no longer exists.

Audio Alerts

The SkyView system is connected to the Intercom of the aircraft. This way the system can generate tones or voice alerts for various conditions.

Most warnings, cautions and messages go along with a message displayed in the message window on-screen, and with a alert in the notification area. The notification is depending on the severity either “Warning” (red), “Caution (yellow) or “Message” (grey).

Audible warnings are spoken and announce the name of the affected unit or function, or state “Warning” “Caution” or “Message.

The AOA audio alert is given by a progressive tone that increases in intensity as AOA increases. It is similar in nature to a conventional reed-type aircraft stall warning sound, although it is much more predictable in its progression. The tones get progressively quicker and closer together until a solid tone is played at critical AOA.

A complete list of available alerts is shown in the respective Dynon Pilot’s User Guide (Dynon Part Number 101321-016) in the latest revision applicable to the instrument S/N and firmware version installed into your aircraft.

7.1.6. SV-ADSB-472 (if installed)

The SV-ADSB-472 UAT 978 & 1090 MHz Band Traffic and Weather Receiver that can be optionally connected to the SkyView System is a remote mounted module that connects to the SkyView via a serial port and is controlled using the SkyView's on screen menu system. It also requires the installation of a dedicated antenna for ADS-B signal reception.

- **Note:** The SV-ADSB-472 receives weather via the 978 MHz UAT ADS-B frequencies, which are only utilized in the US. Therefore, weather is only available in the US.
- **Note:** Weather and TFR information (FIS-B services) available any time the SV-ADSB-472 is in an ADS-B ground station coverage area.

7.1.6.1. Operation

When the SV-ADSB-472 is installed and configured, traffic can be displayed on the Map Page to improve situational awareness (Fig. 7-26).



Fig. 7-26

● **Note:** Tail numbers will be shown below traffic targets when available (Fig. 7-27). These can only be shown if your aircraft is equipped with Dynon's ADS-B receiver and will only be shown for target aircraft that are ADS-B OUT equipped. Aircraft with Mode-C transponders or Mode-S transponders without extended squitter support may not have tail numbers shown.



Fig. 7-27

Traffic is displayed using a set of symbols that are commonly used in aviation for traffic/TCAS systems. As seen in Fig. 7-26, this includes:

- A symbol that depicts the type of traffic. It can be a Traffic Advisory Symbol, Proximity Advisory Symbol, or Non-Threat Symbol.
- Relative altitude in hundreds of feet is displayed above the symbol as a signed integer.
- An up or down arrow to the right of the traffic symbol indicating whether the aircraft is climbing or descending, if available from the traffic source. No arrow is shown when an aircraft is maintaining altitude, or if climb/descend information is not available.
- If available from the traffic device, an orange vector arrow that starts at the target and points in the aircraft's direction of travel. This length of the vector represents where the aircraft is expected to be in one minute based on its current trajectory.

Further information is available and provided in the Dynon Avionics SkyView Pilot's User Guide.

7.2. Autopilot (if installed)

7.2.1. Physical Integration

Two autopilot servos enable the Skyview system to move the aileron and elevator control system. A Dynon SV42 servo is installed in the pyramid below the pilot seat and a Dynon SV42 L, or SV42T servo is installed to the aileron control rods in the baggage compartment.

The servos are controlled from the Skyview System and utilize the navigation information available within the system. Each servo is managed by its own microprocessor, making the servo an active extension of the system. The servos can be dis-engage by pushing the disengage button on the pilot control stick. Power of the servos can be removed by pulling the Autopilot Circuit Breaker. When doing this the servos drop passive and release the controls immediately. The servo senses the applied torque and releases power when overridden by the pilot, trim system or similar. In addition each servo is equipped with a mechanical shear pin. In case of a full blockage of the servo this enables the pilot to break the servo free and take control.

7.2.2. Autopilot Modes

7.2.2.1. TRK+ALT

In TRK + ALT mode, the autopilot will use the information obtained by the SkyView system to maintain ground track (not heading) of the aircraft at the present altitude, as far as engine power permits.

Track and altitude hold mode keeps the aircraft flying in a particular direction and barometric altitude. The TRK is determined by the GPS's ground track, or direction of travel over the ground. This target is reflected by the track (TRK) bug in the HSI. The barometric altitude is determined by the active ADAHRS and displayed as altitude in the PFD.

When the autopilot is initially engaged, the TRK bug and ALT bug will automatically be synchronized to the current ground track and altitude of the aircraft.

When engaged, the TRK+ALT button will highlight in green(Skyview, and Skyview touch shown)::



The top bar will show the ground track and the altitude that the autopilot is using:



In this mode the autopilot chases the ALT and TRK bug displayed in the HSI and PFD. Both can be adjusted via the knobs.

For altitude changes with engaged autopilot the altitude bug is adjusted as required in the PFD and the autopilot will initiate a climb/descent with the preset vertical speed of 500ft/min. Once the Autopilot is climbing or descending to a new altitude, the VS bug can be adjusted by the pilot at any time via the joysticks on any Skyview unit. Trim action and power adjustments might be required during climb/descent.

When changing track, the autopilot will initiate a turn towards the selected track. The turn is bank angle limited to 35°, thus the turn rate will vary depending on the current true airspeed. During track changes small rudder inputs may be required to for a coordinated turning flight.

TRK+ALT will be unavailable and grayed-out if there is not a valid GPS signal or if the autopilot is outside of its allowable engagement speed ranges.

To disengage the autopilot press either the A/P button in the control stick (white), the OFF button or TRK+ALT button in the Autopilot Menu.

7.2.2.2. HSI+ ALT

In HSI + ALT mode, the autopilot will use the information obtained by the SkyView system to follow the ground track (not heading) that is defined by the HSI navigation source while maintaining the present altitude, as far as engine power permits.

For example, if the selected HSI source is the SkyView GPS, and there is an active Flight Plan, the autopilot will fly that flight plan. Or if the source is a VOR the autopilot will seek to capture and hold the set CRS to or from the VOR. If the HSI source provided GPS roll steering commands (GPSS) the autopilot will follow those commands.

When the autopilot is initially engaged, the ALT bug will automatically be synchronized to the current altitude of the aircraft, while the autopilot will initiate a turn to pick up the desired navigation source.

When engaged, the HSI+ALT button will highlight in green (Skyview, and Skyview touch shown):



The top bar will identify the HSI source and the altitude that the autopilot is using:



For altitude changes with engaged autopilot the altitude bug is adjusted as required in the PFD and the autopilot will initiate a climb/descent with the preset vertical speed of 500ft/min. Once the Autopilot is climbing or descending to a new altitude, the VS bug can be adjusted by the pilot at

any time via the joysticks on any Skyview unit. Trim action and power adjustments might be required during climb/descent.

Heading /track changes of the autopilot are commanded by the navigation source in HIS+ALT mode. Autopilot guided turns are bank angle limited to 35°, thus the turn rate will vary depending on the current true airspeed. During heading/track changes small rudder inputs may be required for a coordinated turning flight.

When your HSI source is a radio-based VOR or LOC, SkyView uses GPS position information to help the autopilot correct for wind effects. If no GPS is available to SkyView, VOR and LOC sources can still be flown by the autopilot, but the autopilot's ability to perfectly track the course guidance may be reduced.

The HSI+ALT button will be unavailable and grayed-out if there is not a valid source (with active CDI) currently selected on the HSI, or if the autopilot is outside of its allowable engagement speed ranges.

To disengage the autopilot press either the A/P button in the control stick (white), the OFF button or HSI+ALT button in the Autopilot Menu.

7.2.2.3. Level

The LEVEL mode keeps the wings level according to the artificial horizon information displayed in the PFD and holds the vertical speed 0.

To disengage the autopilot press either the A/P button in the control stick (white) or the OFF button.

- **Note:** Subsequent pressing of the LEVEL button will not disengage the autopilot.

7.2.2.4. 180°

Pressing 180° to initiate an autopilot controlled 180 degree turn from the current track while maintaining the current altitude. This is effectively the same as pressing TRK+ALT and then immediately turning the bug turned 180° from the current track. The autopilot will turn the aircraft to the left.

The turn is bank angle limited to 35°, thus the turn rate will vary depending on the current true airspeed. During track changes small rudder inputs may be required to for a coordinated turning flight.

To disengage the autopilot press either the A/P button in the control stick (white), the OFF button or TRK+ALT button in the Autopilot Menu.

7.2.3. Autopilot Safety Features

The Dynon Skyview Autopilot System is designed with multiple failsafe features to ensure that the autopilot can always be disabled, even in the event of electronic or mechanical failure.

In normal operation, the disconnect switch, mounted to the control stick, commands the servos to disengage directly.

The SkyView system does continuously look for the presence of powered-up servos, even when the autopilot is disengaged, and will show an error condition if the servos are not communicating with the rest of the system. Therefore it is recommended to keep the AP breaker switched on, whenever the SkyView System is in operation. Power draw in this mode is negligible.

The Autopilot servos are designed so that the pilot can always overpower them and move the control stick manually with reasonable force, even when the servo is operating at its highest torque output capability.

When the servos are not receiving power, they revert to their normal power-off state. Opening the Autopilot circuit breaker will completely inhibit the Autopilot servos from controlling the airplane.

In the highly unlikely event of an internal blockage of the servo, moderate but firm force on the control stick will physically break a specially-designed and calibrated shear screw, and this way decouple the servo from the aircraft control system.

7.3. SkyView VHF Com Radio



Fig. 7-28 - Dynon SV-X83 Com radio

Power:

The SkyView Com Radio normally powers on and off with your SkyView system. Press and hold

the Volume Knob / Power Button to manually turn the SkyView Com Radio off and on.

Volume:

Use the volume knob to adjust the radio volume.

Transmitting and Receiving:

The Skyview VHF Com Radio transmits on the active frequency shown at the top of the display in black numbers over white, and normally receives only on that frequency.

Tuning a Frequency:

- Turn the large, outer ring of the dual concentric knob to change the standby frequency in 1 MHz increments.
- Turn the small, inner ring of the dual concentric knob to change the standby frequency. The SV-COM-C25 adjusts in 25 kHz increments and by either 25kHz or 8.33kHz increments on the SV-COM-X83 (depending on how it is configured).
    - For example, if the frequency you start with is 123.450, turning the large knob will change the numbers before the decimal – 123 – while the small knob will adjust the numbers after the decimal – 450.
- Press the dual concentric knob on the control panel to flip/flop the chosen frequency from the standby frequency to the active frequency.

7.4. SkyView SV Intercom 2S



Fig. 7-29 - Dynon SV-Intercom 2S

- Power. To power the SV-INTERCOM-2S on and off manually, press the volume knob. Once the SV-INTERCOM-2S is powered on, aircraft power can be used to turn the Intercom on and off in normal use.
- An LED Power/Transmit Indicator The LED indicator light in the center of the Intercom is green when the Intercom is powered on. When either the pilot or co-pilot PTT switch is depressed, the LED becomes orange to indicate radio transmission.

- The volume knob adjusts the audio levels of the stereo music input and pilot-to-copilot intercom communication only. It does not adjust the volume level of aircraft radios or other devices that are connected. Adjust the volume levels on your radios and other audio devices to achieve the desired volume balance between all audio devices in
- Squelch Adjustment The SV-INTERCOM-2S has voice-activated (VOX) microphone channels to reduce background noise from the aircraft when no one is speaking. Adjust squelch with the engine running: VOX feature will automatically close the microphone after you finish speaking. To reduce background noise, the pilot and co-pilot microphones are activated individually.

7.5. Electric System

The following block diagrams (Fig.7-30, Fig.7-31, and Fig.7-32) provide an overview over the electric integration of the SkyView System in the aircraft system.

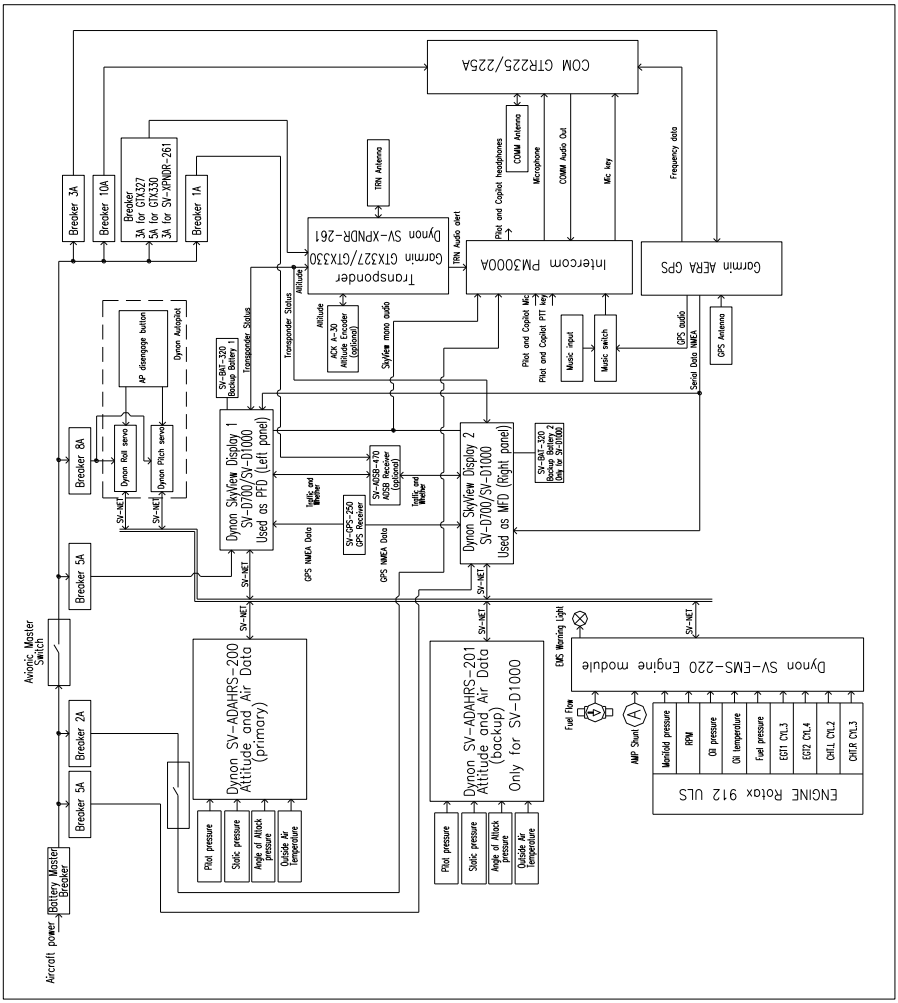


Fig. 7-30 - Block diagram –Basic SkyView Installation

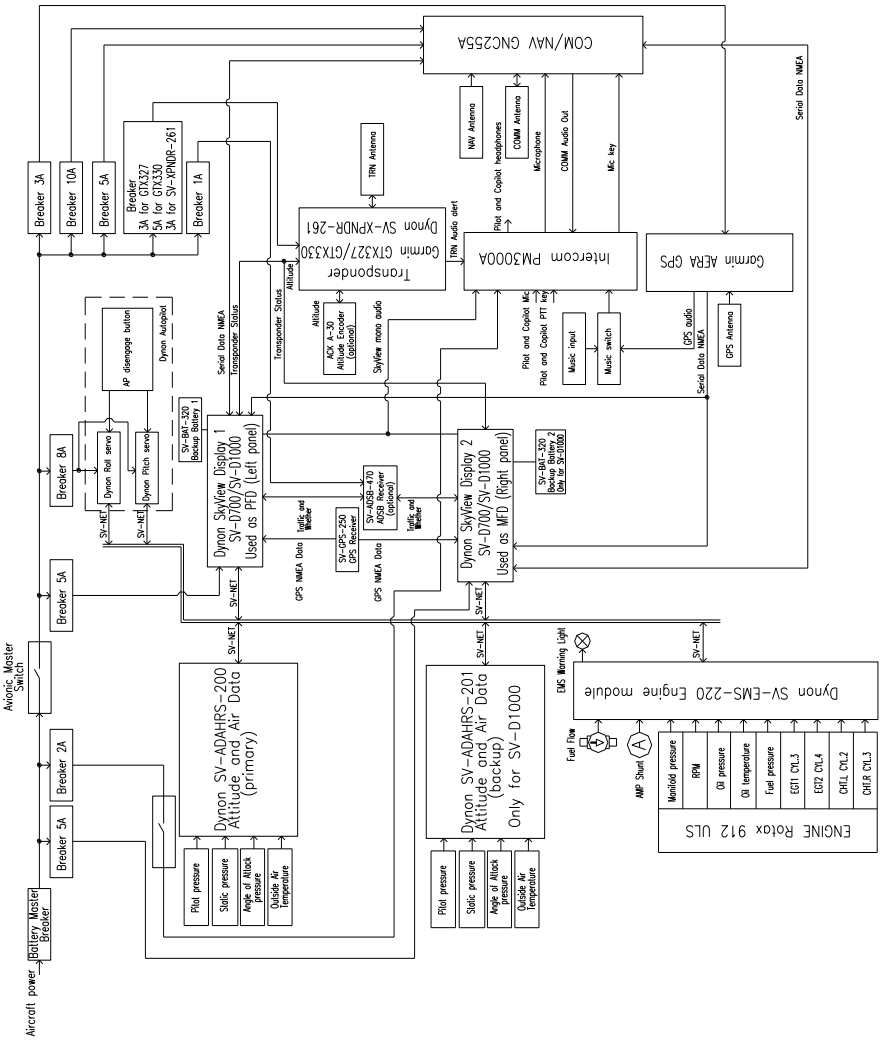


Fig. 7-31
Block diagram –SkyView installation with NAV

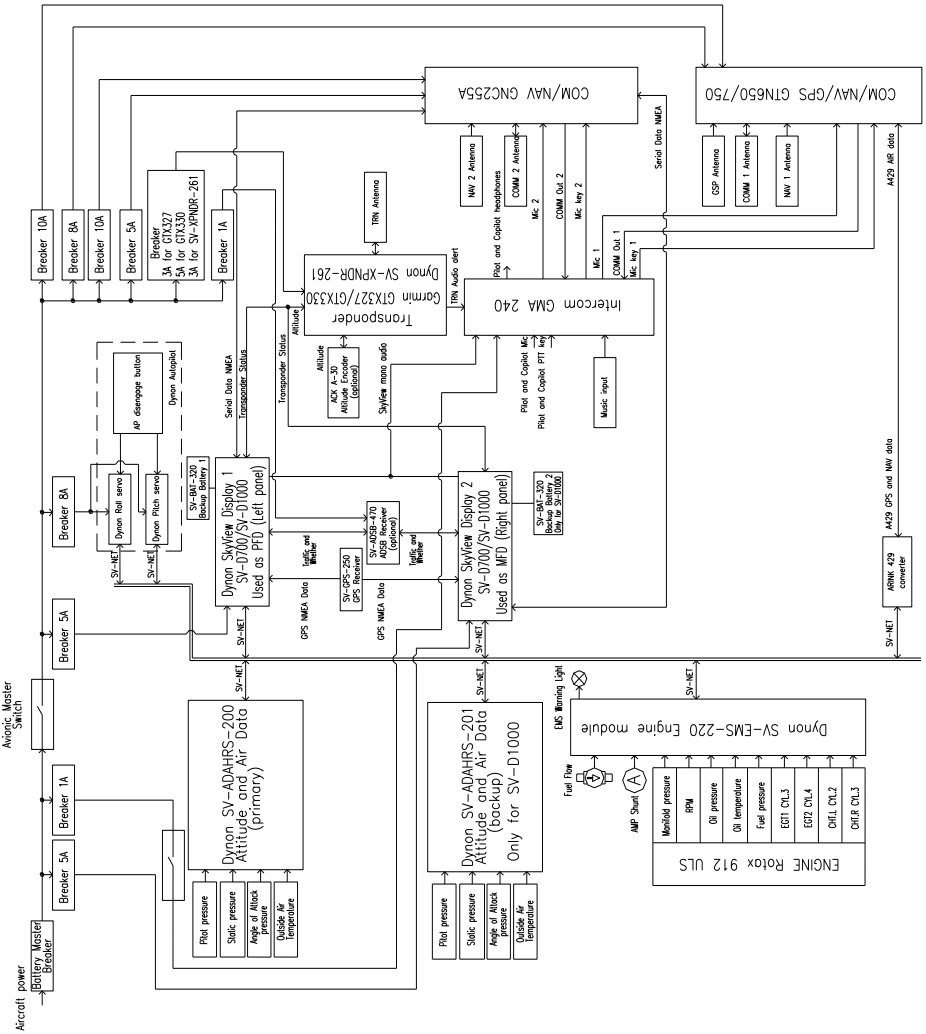


Fig. 7-32

Block diagram – SkyView installation with advanced GPS/NAV

8. HANDLING AND SERVICING

Chapter not affected by this Supplement.

9. SUPPLEMENTS

Chapter not affected by this Supplement.