

SECTION 9

Pilot's Operating Handbook Supplement AS-03

ASPEN EFD1000 PFD



This supplement is applicable and must be inserted into Section 9 of the POH when the Aspen Avionics Evolution Flight Display (EFD 1000 PFD) is installed in the AQUILA AT01-100 as the Primary Flight Display. The information in this supplement adds to or replaces information in the basic POH and, in the case of night VFR, information in the POH-Supplement AS-01.

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0.1 RECORD OF REVISIONS

Issue	Reason for Change	Effectuated Pages	Date of Issue
A.01	Initial Issue	All	28.05.2013
A.02	Editorial Changes	All	15.10.2013

0.2 LIST OF CURRENT PAGES

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1 - 16	A.01	28.05.2013
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1. General

1.1. Introduction

The information contained in this supplement must be used in conjunction with the basic POH.

CAUTION

Aircraft approved for N/VFR must also be operated in accordance with Pilot's Operating Handbook Supplement AS-01.

This supplement provides the information necessary for the safe operation of the AQUILA AT01-100 when the ASPEN Avionics Primary Flight Display (PFD) EFD 1000 is installed.

It is **NOT** applicable to the ASPEN EFD 1000/500 **MFD**.

The chapters of this POH Supplement follow the same structure as the basic POH. Only the chapters listed in this document are affected by the installation of the ASPEN EFD-1000 PFD.

For a detailed description and full operating instructions please refer to the current issue of the ASPEN EFD 1000 (PFD) Pilot's Guide.

NOTE

The operating instructions of the ASPEN Avionics EFD 1000 PFD are available in English only. They must be kept on board the aircraft at all times.

1.11. Terminology and Abbreviations

PFD	Primary Flight Display (electronic flight instrument system)
MFD	Multi-function Flight Display
SI	Service Information
AI	Attitude Indicator
OAT	Outside Air Temperature

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2. Limitations

2.1 Introduction

ASPEN Document 091-00005-001, EFD1000 PFD Pilot's Guide, Revision A or later must be kept on board the aircraft and be available to the pilot in command at all times.

CAUTION

The Aspen EFD 1000 must be switched off during engine start-up and shut-down. Non-compliance could destroy the equipment. All warranty and guarantee claims will become void!

CAUTION

All primary functions of the Aspen EFD 1000, including the attitude indicator, are only available as long as the pitot/static system of the aircraft is functioning properly. The aircraft must be operated in such a manner as to prevent blockage to the pitot/static system, for example by ice!

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2.12 Kinds of Operation Limits / Minimum Equipment

Certified for: visual flights by Day and Night

Table 1	VFR day only*	Additional for Night VFR*
Flight and navigation instruments	<ul style="list-style-type: none"> • ASPEN EFD 1000 PFD • magnetic compass • timepiece with seconds displayed** • VHF radio*** 	<ul style="list-style-type: none"> • attitude indicator (standby AI) • transponder with altitude indication or transponder with no altitude indication plus an analog altimeter • VOR navigation receiver or area navigation equipment**** • CDI (with ASPEN EFD 1000 Pilot only)****
Engine instruments	<ul style="list-style-type: none"> • fuel indicator • oil temperature indicator • fuel pressure warning light • oil pressure indicator • cylinder head temperature indicator • manifold pressure indicator 	<ul style="list-style-type: none"> • ammeter • rpm indicator • voltmeter • ALT 1 warning light • ALT 2 warning light • VOLT warning light
Lighting		<ul style="list-style-type: none"> • navigation lights • anti-collision lights (ACL) • landing light • instrument lighting • cockpit lighting • flashlight for every crew member
Miscellaneous equipment	<ul style="list-style-type: none"> • Seat belts for each occupied seat • Emergency Hammer 	<ul style="list-style-type: none"> • Battery \geq 26 Ah • Alternator ALT 2

* The minimum equipment listed in Table 1 is valid for Germany. Other countries may require different minimum equipment. This may depend on the type of flight being carried out and the route being flown.

** In Germany a watch with a seconds hand may be used as a working timepiece. Please observe all differing national regulations.

***In Germany a VHF Transceiver is not required for flights that do not leave the vicinity of an uncontrolled airfield (§3a Abs. 3 d. Luftverkehrs-Ordnung). Regulations of other nations must still be observed (§ 21a Abs. 1 der Luftverkehrs-Ordnung).

**** For night VFR flights out of sight of an airfield approved for night flight with appropriate lighting.

NOTE

For specific operations, additional equipment may be necessary. It is the aircraft operator's responsibility to observe the applicable requirements.

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2.18 Internal battery Aspen EFD1000**CAUTION**

Take-off is not permitted when the voltage displayed in the EFD display is below 12.3 V.

CAUTION

The EFD1000 has an internal battery which automatically supplies power when there is a drop in aircraft system voltage (<12.3V).

The back-up battery is a function which is not certified, but may be helpful in the event of an emergency. Under no circumstances should one reckon with the availability of this function.

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3. Emergency Procedures

3.1 Introduction

This section provides checklists and recommended procedures for coping with various emergency situations, especially during N/VFR operation.

Should an emergency occur, the basic procedures provided here are recommended to master the situation.

Not all types of emergencies situations or combinations can be described in the POH. A pilot must therefore always use good airmanship and have a sound knowledge of the aircraft and its systems.

3.1.1 Resetting Circuit-breakers

The **one time only** resetting of a tripped circuit breaker or safety switch is considered a recommendation for the following emergency procedures.

Applicable for all switches: pushing the top = ON; pushing the bottom = OFF

CAUTION

A tripped circuit breaker or safety switch should only be reset if it is needed for continued safe flight and landing. In extreme cases, resetting a circuit breaker may cause an electrical fire.

*A circuit breaker or safety switch should only be reset **once** and be inspected after flight.*

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3.5 Smoke and Fire

3.5.4 Electrical Fire with Smoke in Flight

- | | |
|---|--|
| 1. ALT1 / BAT switch | OFF |
| 2. Press any key (excepting REV) on the EFD1000 PFD to prevent the instrument from switching itself off | |
| 2a. If EFD 1000 is the cause of the fire: | |
| PFD switch | OFF |
| ALT1 / BAT switch | ON (continue with point 6) |
| 3. ALT 2 circuit breaker (N/VFR) | PULL |
| 4. Avionics switch | OFF |
| 5. All other switches (except ignition switch) | OFF |
| 6. Cabin vents and side window | OPEN |
| 7. Flashlight (N/VFR) | ON |
| 8. Fire extinguisher (if installed) | Use only if smoke persists |
| 9. Land immediately | Refer to Section 3.4 Precautionary Landing |

After landing:

- | | |
|------------------------|-------------------|
| 10. Engine | Shut down |
| 11. Canopy | OPEN |
| 12. After engine stops | Evacuate aircraft |

CAUTION

When a large amount of smoke is present or the fire extinguisher has been used, ventilate the cabin by unlocking the canopy latch. If possible, the fire extinguisher should be secured after use.

WARNING

*Turning the **ALT1 / BAT** switch OFF and simultaneously pulling OFF **ALT 2** circuit breaker turns off all electrical and electronic equipment, including the flaps, stall warning and landing light !*

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3.10 ELECTRICAL SYSTEM MALFUNCTIONS

3.10.1 Complete Electrical Failure

1. Press any key (excepting REV) on the EFD1000 PFD to prevent the instrument from switching itself off
2. Flashlight (N/VFR) remove from side pocket – ON
3. **ALT1 / BAT** switch CHECK if ON
4. **ALT2** circuit breaker (N/VFR)(siehe 3.1.1) RESET if tripped
5. **BAT** circuit breaker (siehe 3.1.1) RESET if tripped
6. **ALT1** circuit breaker (siehe 3.1.1) RESET if tripped

If power cannot be restored, illuminate the instruments using the flashlight and execute a precautionary landing at the next airfield.

NOTE

The Aspen EFD1000 PFD has an internal back-up battery which allows the instrument to function for approx. 30 minutes. If supply voltage is lost, the instrument automatically switches to the internal back-up battery. To ensure that the instrument does not automatically switch itself off after a few seconds, any key other than the red "REV" key must be pressed. The back-up battery is a uncertified function. Refer to Section 2.18 of this supplement.

Pay attention to information on display!!

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3.10.2 Alternator Failure

NOTE

*If the aircraft is approved for night operations, it is equipped with two alternators (**ALT1** und **ALT2**).*

*For N/VFR aircrafts only **ALT1** is installed. In this case a failure of **ALT1** should be treated as if all alternators have failed.*

3.10.2.1 Ammeter shows discharge and / or **ALT 1** warning light illuminates

1. **ALT1** switch SWITCH OFF then ON, approx. 10 sec. interval
2. **ALT1** circuit breaker (see 3.1.1) RESET if tripped

If **ALT1** warning light remains illuminated:

3. **ALT1** circuit breaker PULL
4. **ALT1** SWITCH OFF
5. Instruments not required for the safe continuation of flight should be turned off or dimmed to at least half the intensity.
6. Monitor the voltmeter and ammeter
7. Land at the nearest airfield.

NOTE

***ALT2** (internal alternator) takes over the power supply. The flight may be continued as limited power supply is available. However, the battery will no longer be charged and could indeed discharge. The ammeter must be monitored and a landing at the next suitable airfield considered.*

*If **ALT2** also fails, the emergency procedures described under in 3.10.2.3 or 3.10.2.4 must be followed.*

Even with the audio panel turned off the pilot can still transmit with COM 1 (Failsafe Design) via his headset. Use of the Intercom is not possible.

WARNING

Before returning the aircraft to service, the problem must be resolved

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3.10.2.2 ALT 2 warning light illuminates (N/VFR)

1. **ALT 2** circuit breaker (see 3.1.1) RESET if tripped

If **ALT 2** warning light remains on:

2. **ALT 2** circuit breaker PULL

NOTE

***ALT 1** (external alternator) takes over the power supply. The flight may be continued, reducing electrical power consumption to a minimum (monitor ammeter) as sufficient power is available. If **ALT 1** also fails, the emergency procedures described under 3.10.2.3 or 3.10.2.4 must be followed.*

WARNING

The problem must be ascertained and eliminated before the next flight!

3.10.2.3 ALT 1 and ALT 2 warning lights illuminate (N/VFR)

When both alternator warning lights are illuminated the **VOLT** warning light also indicates, that the electrical system is no longer receiving current from the alternators.

1. **ALT 1** switch switch OFF then ON
2. **ALT 1** circuit breaker (see 3.1.1) RESET if tripped
3. **ALT 2** circuit breaker (see 3.1.1) RESET if tripped

If warning lights **ALT 1** and **ALT 2** remain on:

4. **ALT 1** circuit breaker PULL
5. **ALT 2** circuit breaker PULL
6. **ALT 1** switch OFF

NOTE

*The battery will supply all critical aircraft systems with power for at least 30 minutes. The illumination of the **VOLT** warning light marks the beginning of the 30 minute power supply.*

Radio communications should be kept to a minimum and all equipment which is not required for the continuation of flight should be shut off to extend battery life.

A landing must be completed within 30 minutes.

WARNING

Before returning the aircraft to service, the problem must be resolved!

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3.10.2.4 **VOLT** warning light illuminates or blinks

Both alternators supplies either too low (permanent red light) or too high voltage (red flashing light).

- | | |
|---|---|
| 1. ALT 1 switch | switch OFF then ON;
approx. 10 sec. interval |
| 2. ALT 1 circuit breaker (see 3.1.1) | RESET if tripped |
| 3. ALT 2 circuit breaker (see 3.1.1) | RESET if tripped |

If the warning light **VOLT** remains on:

- | | |
|---------------------------------|------|
| 4. ALT 1 circuit breaker | PULL |
| 5. ALT 2 circuit breaker | PULL |
| 6. ALT 1 switch | OFF |

NOTE

*The battery will supply all critical aircraft systems with power for at least 30 minutes. The illumination of the warning light **VOLT** marks the beginning of the 30 minute power supply.*

Radio communications should be kept to a minimum and all equipment which is not required for the continuation of flight should be shut off to extend battery life.

A landing must be completed within 30 minutes.

NOTE

Even with the audio panel turned off the pilot can still transmit with COM 1 (Failsafe Design) via his headset. Use of the Intercom is not possible.

WARNING

Before returning the aircraft to service, the problem must be resolved !

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3.13.4 Primary Flight Display Failure

- | | |
|------------------------|------------------|
| 1. PFD circuit breaker | RESET if tripped |
| 2. PFD switch | ON (if OFF) |

It is possible to safely continue flight, even if the PFD failure cannot be corrected in flight, by referencing the remaining instruments. It may, none the less, be prudent to land at the nearest airfield.

NOTE

Following information is still available when the PFD fails:

<u>Attitude:</u>	<i>Natural horizon or standby attitude indicator (if installed)</i>
<u>Altitude:</u>	<i>GPS altitude, Transponder altitude, ground visibility</i>
<u>Heading/Track:</u>	<i>Compass, GPS ground track</i>
<u>Airspeed:</u>	<i>GPS ground speed, stall warning</i>

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4. Normal Procedures

4.5.3. Before Taxiing

2a. Internal Battery - PFD

Verify battery status is not shown as "FAIL" (normally shows "CHARGING" or "READY"). Take Off with less than 80% capacities is not permitted.

NOTE

Immediately after switching on the master switch, the "pull to cage" button on the attitude indicator (if installed) must be pulled. It should be pulled again 3 to 4 minutes later.

Do not allow the "pull to cage" button to snap back. Allow it to slowly return to its starting position!

NOTE

Pay attention to any messages on the PFD monitor during the start-up phase!

4.5.3.1 Dimming the brightness of the Display

The ASPEN PFD has a light sensor which automatically adjusts the brightness of the display to ambient light conditions. In addition, it is also possible to alter the brightness using the instrument menu. Press the "menu" key to access settings mode. After pressing the left rotary knob once, the brightness level can be adjusted by turning the knob. Pressing the "menu" key saves the brightness level and exits the settings mode.

4.5.13 Engine Shut-down

The Aspen EFD1000 PFD must be switched off **before** shutting the engine down.

NOTE

The PFD may also be switched off using the red "REV" key.

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5. Performance

No change to the basic POH.

6. Weight and Balance

No change to the basic POH.

7. System Description

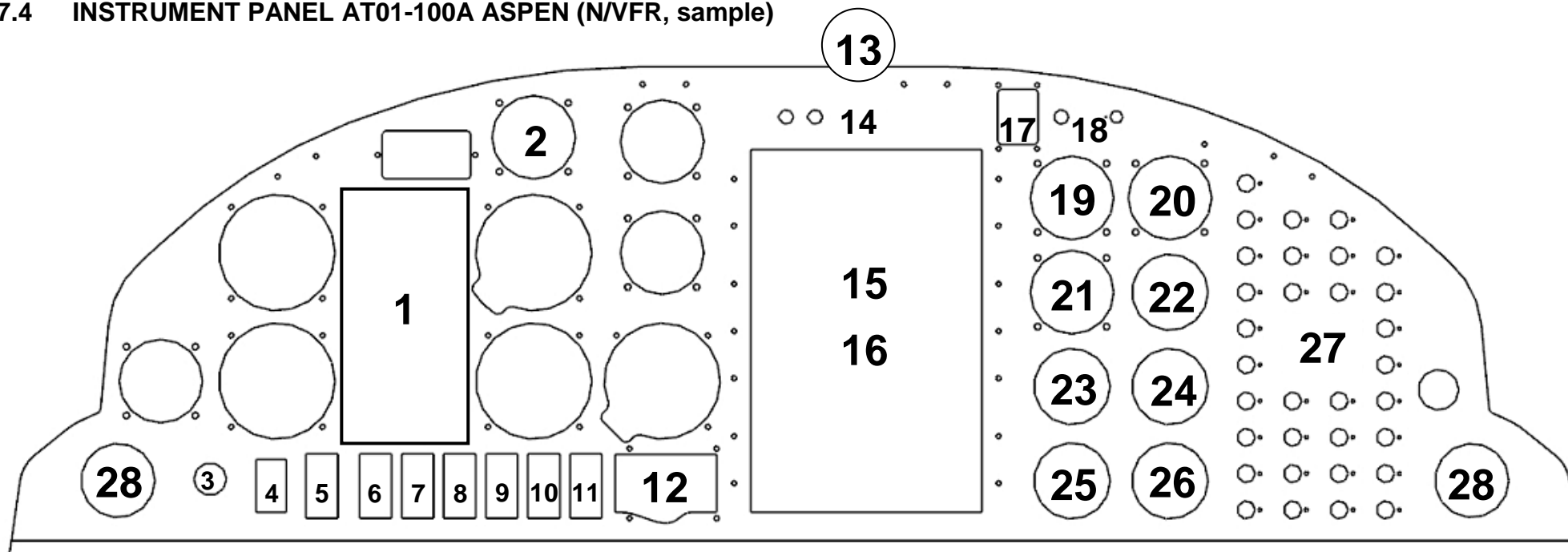
NOTE

This POH-Supplement contains a general description of the integration of the PFD into the AQUILA AT01-100 instrument panel. For a detailed description of the EFD 1000 PFD and full operating instructions, refer to the current issue of the ASPEN Avionics „EFD 1000 PFD Pilot's Guide“ (P/N 09-000005-001).

The Aspen EFD 1000 PFD Avionic-bus is switched on by a push-pull type circuit breaker and a switch. The circuit breaker and switch are both labeled **PFD**. The circuit is active as soon as the **PFD** switch is turned on.

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7.4 INSTRUMENT PANEL AT01-100A ASPEN (N/VFR, sample)



For minimum instrument requirements, depending on type of operation, refer to Section 2.12 of this POH supplement.

No.	Description	No.	Description	No.	Description	No.	Description	No.	Description	No.	Description
1	ASPEN EFD 1000 PFD	6	Avionics	11	P/S Heat (opt.)	16	Transponder	21	Fuel indicator	26	Oil pressure indicator
2	Attitude indicator (N/VFR)	7	Nav-Lights	12	Flap switch	17	ELT	22	Cylinder head temp.	27	Circuit breaker
3	Ignition switch	8	ACL	13	Compass	18	Dimmer (N/VFR)	23	Voltmeter	28	Ventilation nozzles
4	ALT1 / BAT	9	Landing Light	14	Warning Lights	19	Manifold press. indicator	24	Oil temperatur		
5	FUEL	10	Instrument Light (N/VFR)	15	COM/NAV/GPS	20	RPM indicator (prop.)	25	Ammeter		

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8. Handling, Service and Maintenance

8.6 Handling Avionics

The Aspen EFD 100 must be switched off during engine start-up and shut-down. Otherwise it could be seriously damaged or destroyed. All warranty and guarantee claims will become void!

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