

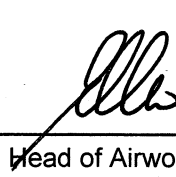

SECTION 9

**Airplane Flight Manual Supplement
Day-VFR and Night-VFR Operation**

This AFM-Supplement is applicable and must be inserted into Section 9 of the Airplane Flight Manual if the AQUILA AT01 is equipped for Day- and Night-VFR operation in accordance with the Service Bulletin AT01-010. The information of this AFM-Supplement adds or replaces information of the basic Airplane Flight Manual.

The technical content of this Airplane Flight Manual Supplement is approved under the authority of DOA No. EASA.21J.025.

Schönhausen, 17.03.2010

Head of Airworthiness Department

EASA approved:

100 294 39

Date:

25.03.2010

EASA, Certification Directorate

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A.1 LIST OF REVISIONS AND AMENDMENTS

Revision	Reason for Amendment/Revision	Affected Pages	Date of Issue
A.01	Initial Issue	all	Sep. 03. 2009
A.02	Implementation of the Low-Voltage-Control-Unit	all	Mar. 17. 2010

0.2 LIST OF EFFECTIVE PAGES

Page	Revision	Date
AVE23-1	A.02	Mar.17. 2010
AVE23-2	A.02	Mar.17. 2010
AVE23-3	A.02	Mar.17. 2010
AVE23-4	A.02	Mar.17. 2010
AVE23-5	A.02	Mar.17. 2010
AVE23-6	A.02	Mar.17. 2010
AVE23-7	A.02	Mar.17. 2010
AVE23-8	A.02	Mar.17. 2010
AVE23-9	A.02	Mar.17. 2010

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AVE23-10	A.02	Mar.17. 2010
AVE23-11	A.02	Mar.17. 2010
AVE23-12	A.02	Mar.17. 2010
AVE23-13	A.02	Mar.17. 2010
AVE23-14	A.02	Mar.17. 2010
AVE23-15	A.02	Mar.17. 2010
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1. GENERAL

1.1. INTRODUCTION

This Supplement provides the information necessary for the efficient operation of the AQUILA AT01 in Night-VFR conditions.

The information contained within this Supplement is to be used in conjunction with the complete Airplane Flight Manual.

This Flight Manual supplement has been arranged in the same way as the Basic Flight Manual. All listed chapters in this supplement are affected by the Major change AT01-00219 “Operation under Night-VFR conditions”.

1.2. Aircraft Type Certification

With the approval of the Major Change AT01-00219 the aircraft model AQUILA AT01 is type certificated in accordance with the certification specifications as defined in the “Certification Review Item A-01” dated 15.06.2007 as a change to the type design TCDS: EASA.A.527. The Aquila AT01 has been approved for operation also under Night-VFR conditions.

Aircraft Category:	NORMAL
Noise Certificate	Noise Requirements for Aircraft (LSL) Chapter X
Additional Noise Requirements:	Airfield Noise Requirement, Issue Jan. 01. 1999
Approved Kinds of Operation:	Day-VFR and Night-VFR

1.11.3 Meteorological Terminology

VFR-Night Night: (SS) Sunset + 30min to (SR) Sun Rise – 30 min

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2. LIMITATIONS

2.12. KINDS OF OPERATION LIMITS / MINIMUM EQUIPMENT

The aircraft may be operated under Day-VFR and Night-VFR conditions.

The operational serviceable minimum equipment in accordance with the CS-VLA is listed in the following chart. Additional minimum equipment for the kind of operation may be required by national requirements and may be depend from the flight route.

	for Day-VFR	additional for Night-VFR
Flight- and Navigation Instruments	<ul style="list-style-type: none"> • Air speed indicator (0-200 kts) • Altimeter (0-20.000 ft) • Magnetic compass 	<ul style="list-style-type: none"> • Variometer (± 2000 ft/min) • Attitude Gyro • Slip indicator • Directional Gyro • Out side Air Thermometer • Clock with Hour-, Minutes- and Second Indication • VHF-Radio Transceiver • VOR-receiving equipment • Transponder (XPDR)
Engine Instruments	<ul style="list-style-type: none"> • Fuel level indicator • Oil Temperature indicator • Low Fuel Pressure Warning Light • Oil Pressure Indicator • Cyl. Head Temperature Indicator • Manifold Pressure Indicator • Amperemeter • Tachometer • Voltmeter • Alternator Warning Light (Gen 1) 	<ul style="list-style-type: none"> • Alternator Warning Light (Gen 2) • Low-Voltage-Control-Unit • Amperemeter • Voltmeter
Lighting		<ul style="list-style-type: none"> • Position Lights (NAV-Lights) • Anti Collision Light (ACL) • Landing/Taxi Light • Instrument lighting • Cabin Light • Pocket Lamp for any occupant
Other Equipment	<ul style="list-style-type: none"> • 2 x Seat Belts 	<ul style="list-style-type: none"> • Battery >26Ah

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WARNING

Additional a spare fuse of 3 Ampere must have all aircrafts equipped with the electrical attitude gyro type: RC Allen RCA26AK-4.

2.16. PLACARDS

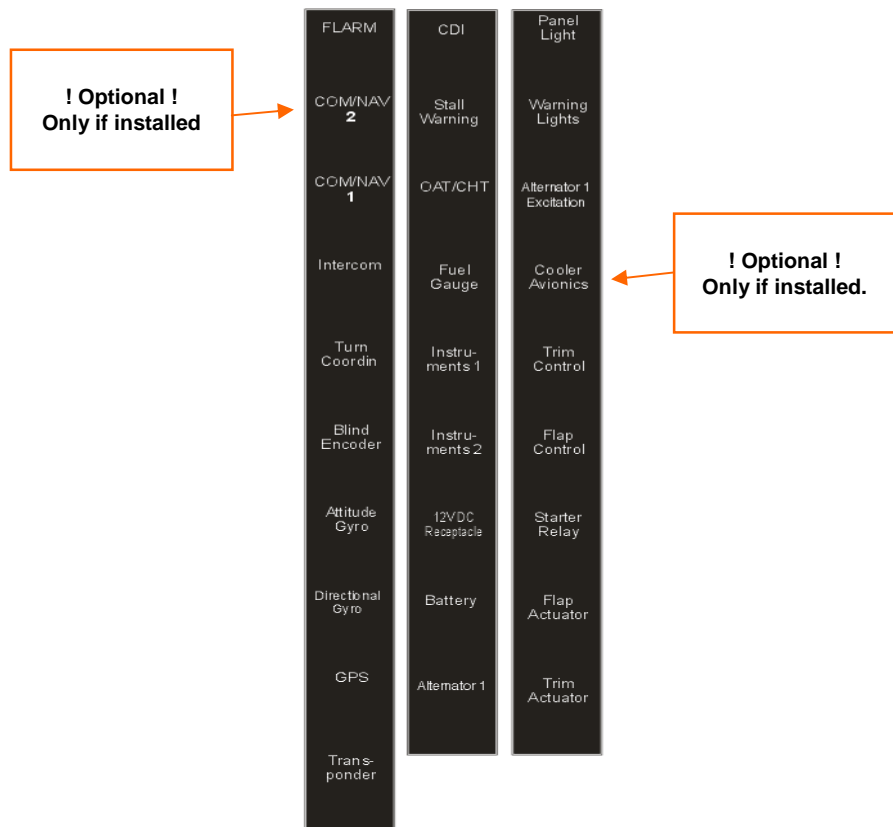
- 1.) In the lower mid section of the instrument panel:

This aeroplane is classified as a very light aeroplane approved for day VFR and night VFR, in non-icing conditions. All aerobatic manoeuvres, including intentional spinning are prohibited. See Flight Manual for other limitations.

- 3.) In the lower left section of the instrument panel, below the switches:



- 5.) On the instrument panel, adjacent to the right side of the circuit breakers:



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NOTE

Depending on the equipment installed in the aircraft, not every position shown above might be actually assigned with a circuit breaker. In those cases the respective positions are covered by a blank plastic plug and reserved for that application by the placard.

Furthermore, the positioning of the circuit breakers can vary on early aircraft serial numbers and diverge from the arrangement shown above. In some cases, the circuit breaker for the CDI may be placed together with its correct marking on the GPS or COM/NAV 2 position of the above illustration.

38.) Above or below the Warning Lights on the instrument panel:



52.) Beside of the circuit breaker of the alternator 2 (internal Alternator):

A dark rounded rectangular button with white text that reads 'Alternator 2'.

53.) Beside of the dimmer control of the panel lighting:

A dark rounded rectangular button with white text that reads 'Switch / Dimmer Panel Light'.

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3. EMERGENCY PROCEDURES

3.1. INTRODUCTION

This section provides checklists with the recommended procedures for coping with various emergency situations, especially under Night-VFR conditions.

Emergencies caused by aircraft or engine malfunctions are extremely rare if all pre-flight inspections and required maintenance activities are conducted properly.

Nevertheless, if an emergency situation occurs, the herein provided basic procedures are recommended to correct the problem and to master the situation.

However, it is impossible to account for all kinds and combinations of emergency cases that may arise in operation in this manual. Therefore, the pilot must be familiar with the aircraft, its systems, and its flight behaviour. Very important in such cases is a sound judgment and sufficient knowledge of the aircraft and its systems.

3.4 Precautionary Landing

A precautionary landing under Night VFR conditions, which is recommended in the most of the emergency procedures in the Basic Flight Manual, demands special skills to the pilot. The selection of a suitable landing area under night-VFR conditions may be difficult.

The recommendation ALT1/BAT-switch: OFF before landing will be used in a hazard of possible collision with obstacles during the landing only.

After switch-off of the ALT1/BAT-switch the landing light will also be switched OFF. A suitable illumination of the landing area is not possible.

3.10. ELECTRICAL POWER SUPPLY SYSTEM MALFUNCTION

3.10.1 Complete Failure of Electrical System

- | | |
|---------------------------------|---------------------------------|
| 1. Attitude of Flight | STABILIZE |
| 2. Pocket Lamp | TAKE, from the side pocket – ON |
| 3. Circuit Breaker Alternator 2 | RESET, if tripped |
| 4. Circuit Breaker Battery | RESET, if tripped |
| 5. ALT1/BAT –switch | CHECK for ON |
| 6. Circuit Breaker Alternator 1 | RESET, if tripped |

If the power can not be restored, use the pocket lamp to illuminate all necessary flight instruments and perform a precautionary landing on the next appropriate airfield.

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WARNING

The defect must be analysed and repaired before the next operation of the aircraft.

Both Alternator Warning Lights illuminate:

- | | |
|---------------------------------|--------------------|
| 1. ALT 1 – switch | Switch OFF then ON |
| 2. Circuit Breaker Alternator 1 | RESET, if tripped |
| 3. Circuit Breaker Alternator 2 | RESET, if tripped |

If both Alternator warning lights still illuminates:

- | | |
|---------------------------------|-----|
| 1. Circuit Breaker Alternator 1 | OFF |
| 2. Circuit Breaker Alternator 2 | OFF |

NOTE

The power supply of the essential instruments for safety operation and landing will be taken over by the main battery for the **next 30 min.**

The illumination of the Low-Voltage-Warning Light indicates the beginning of this time-period.

The function of the essential instruments for safety operation will be extended by economical using of the VHF-radio transmitter and switch-off of all not required additional equipment (i.e. Moving Maps).

Within this **30 min** a landing on the next appropriate airfield must be assured.

WARNING

The defect must be analysed and repaired before the next operation of the aircraft.

Low-Voltage-Warning-Light illuminate:

The main-electric-bus will not be supplied with power by both generators.

- | | |
|---------------------------------|--------------------|
| 1. ALT 1 – switch | Switch OFF then ON |
| 2. Circuit Breaker Alternator 1 | RESET, if tripped |
| 3. Circuit Breaker Alternator 2 | RESET, if tripped |

If both Alternator warning lights still illuminates:

- | | |
|---------------------------------|-----|
| 1. Circuit Breaker Alternator 1 | OFF |
| 2. Circuit Breaker Alternator 2 | OFF |

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NOTE

The power supply of the essential instruments for safety operation and landing will be taken over by the main battery for the **next 30 min.**

The illumination of the Low-Voltage-Warning Light indicates the beginning of this time-period.

The function of the essential instruments for safety operation will be extended by economical using of the VHF-radio transmitter and switch-off of all not required additional equipment (i.e. Moving Maps).

Within this **30 min** a landing on the next appropriate airfield must be assured.

WARNING

The defect must be analysed and repaired before next operation of the aircraft.

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4. NORMAL PROCEDURES

4.4.1 Daily Pre-Flight Check

A) CABIN

- | | | |
|-----|---|---------------------------------|
| 1. | Papers | CHECK on board |
| 2. | Ignition Key | REMOVED |
| 3. | BAT Switch | ON |
| 4. | Warning Lights (Alternator 1,
Alternator 2, Fuel pressure,
Low-Voltage) | ILLUMINATE |
| 5. | Engine Instruments | CHECK |
| 6. | Fuel Quantity | CHECK |
| 7. | External Lights | CHECK for proper operation |
| 8. | Instrument / Panel lighting | CHECK for proper operation |
| 9. | BAT Switch | OFF |
| 10. | Foreign Objects | CHECK and REMOVE |
| 11. | ELT | CHECK |
| 12. | Baggage | STOWED and STRAPPED |
| 13. | Canopy | CHECK for damages and cleanness |
| 14. | Pocket Lamp (2pcs.) | CHECK for proper operation |

Additional for installed attitude gyro RC Allen RCA26AK-4:

- | | | |
|-----|--------------------------|-------|
| 15. | Spare Fuse (rate: 3Amp.) | CHECK |
|-----|--------------------------|-------|

4.5 CHECKLISTS FOR NORMAL PROCEDURES

4.5.1 Before engine start-up

Instead of the Anti-Collision-lights (item 16) the NAV-lights will be switched on during the Night-VFR-operation. The dazzle effect to other aircrafts can be eliminated.

4.5.3 Before Taxiing (Night operation)

- | | | |
|----|---------------------------------|--|
| 1. | AVIONICS Switch | ON |
| 2. | Avionics and Flight Instruments | SET UP |
| 3. | Engine Instruments | CHECK |
| 4. | Taxi/Landing Light | ON |
| 5. | Alternator 1 switch | OFF, check the low-voltage-
warning light |

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NOTE

If the low-voltage-warning light illuminates and the alternator 2-warning light is still "OFF", a broken cable may be occurred in the wiring of the alternator 2 –system. The defect must be analysed and repaired before operation of the aircraft.

- | | | |
|----|------------------------------|--|
| 6. | Circuit Breaker Alternator 2 | OFF, the low-voltage-warning light illuminates |
| 7. | Alternator 1 switch | ON, check the low-voltage-warning light |

NOTE

If the low-voltage-warning light illuminates and the alternator 1-warning light is still "OFF", a broken cable may be occurred in the wiring of the alternator 1 –system. The defect must be analysed and repaired before operation of the aircraft.

- | | | |
|----|------------------------------|---|
| 8. | Circuit Breaker Alternator 2 | RESET |
| 9. | Voltmeter | CHECK if needle is within the green range |

CAUTION

Warm up the engine for approx. 2 min at 820 RPM and then at 1030 RPM until the Oil Temperature reaches 50°C (latter can be done during taxiing).

4.5.7 Climb (Night operation)

- | | | |
|----|-------------------------|-----------------|
| 1. | Propeller Control Lever | SET 2260 RPM |
| 2. | Throttle | OPEN |
| 3. | Engine Instruments | CHECK |
| 4. | Flaps | CRUISE Position |
| 5. | Climb | at 65 KIAS |
| 6. | Electrical Fuel Pump | OFF |
| 7. | Taxi /Landing Light | OFF |
| 7. | Trim | SET as required |

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NOTE

The Best Rate-of-Climb Speed V_Y is a function of the operating mass and decreases with increasing altitude. For more information, refer to Section 5.2.6.

5. PERFORMANCE

No change to the basic Airplane Flight Manual.

6. WEIGHT AND BALANCE

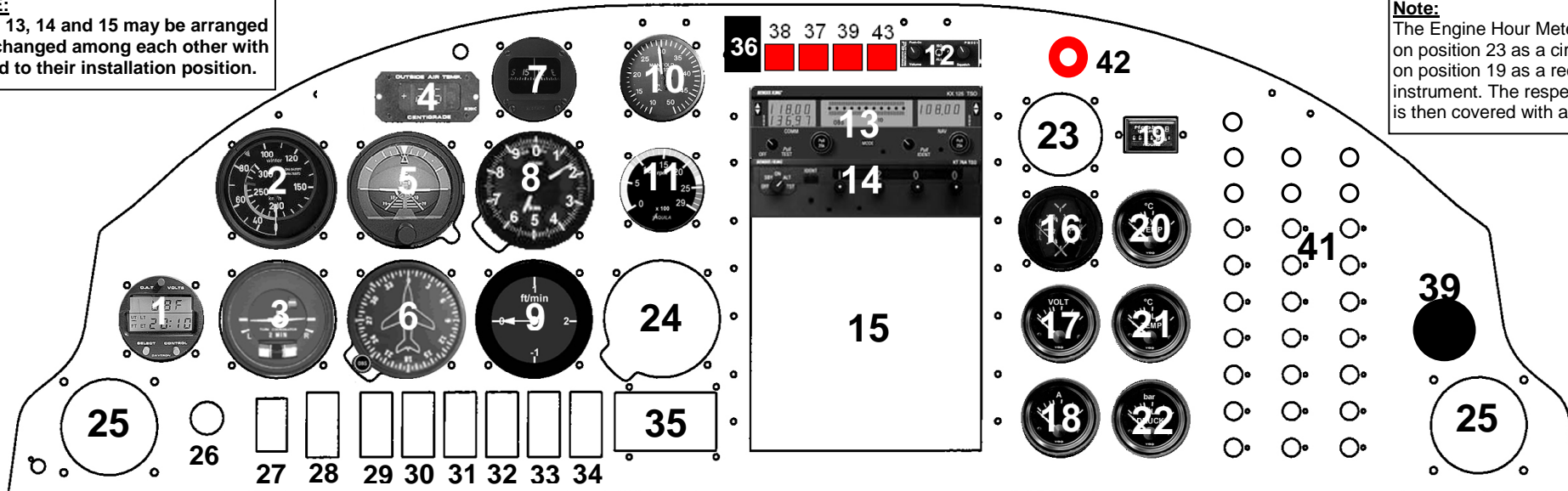
The empty weight and corresponding centre of gravity is determined and recorded in section 6 of the basic Airplane Flight Manual.

7. SYSTEMS DESCRIPTION

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7.4 INSTRUMENT PANEL (Standard Equipment for NVFR-Operation)

NOTE:
Items 13, 14 and 15 may be arranged
interchanged among each other with
regard to their installation position.



Note:
The Engine Hour Meter is either installed
on position 23 as a circular instrument or
on position 19 as a rectangular
instrument. The respective other position
is then covered with a plate.

For minimum instrument requirements, refer to Section 2, Paragraph 2.12, of this Aircraft Flight Manual-supplement.

No.	Description	No.	Description	No.	Description	No.	Description	No.	Description	No.	Description
1	Cockpit Watch	9	Variometer	17	Voltmeter	25	Ventilation Nozzle	33	Instrument Light Switch	41	Circuit Breakers
2	Airspeed Indicator	10	Manifold Press. Indicator	18	Ampèremeter	26	Ignition Switch	34	Cabin Light Switch	42	Instr. Panel Light Switch
3	Turn Coordinator	11	RPM-Indicator (Prop.)	19	Engine Hour Meter	27	ALT/BAT-Switch	35	Flap Control Switch	43	Low-Voltage-Warning Light
4	OAT-Indicator	12	Intercom PM 501 (opt.)	20	Cyl. Head Temp. Indicator	28	Electrical Fuel Pump	36	Trim Position Indicator		
5	Attitude Gyro (ADI)	13	COM/NAV	21	Oil Temp. Indicator	29	Master Switch Avionics	37	Alternator 1 Warn. Light		
6	Directional Gyro (HSI)	14	Transponder	22	Oil Pressure Indicator	30	NAV-Light Switch	38	Alternator 2 Warn. Light		
7	Compass	15	Multifunctional Display	23	Engine Hour Meter	31	Anti-Collision-Light Sw.	39	Fuel Press. Warn. Light		
8	Altimeter	16	Fuel Level Indicator	24	Course Dev. Ind. (opt.)	32	Landing Light Switch	40	12VDC-Receptacle		

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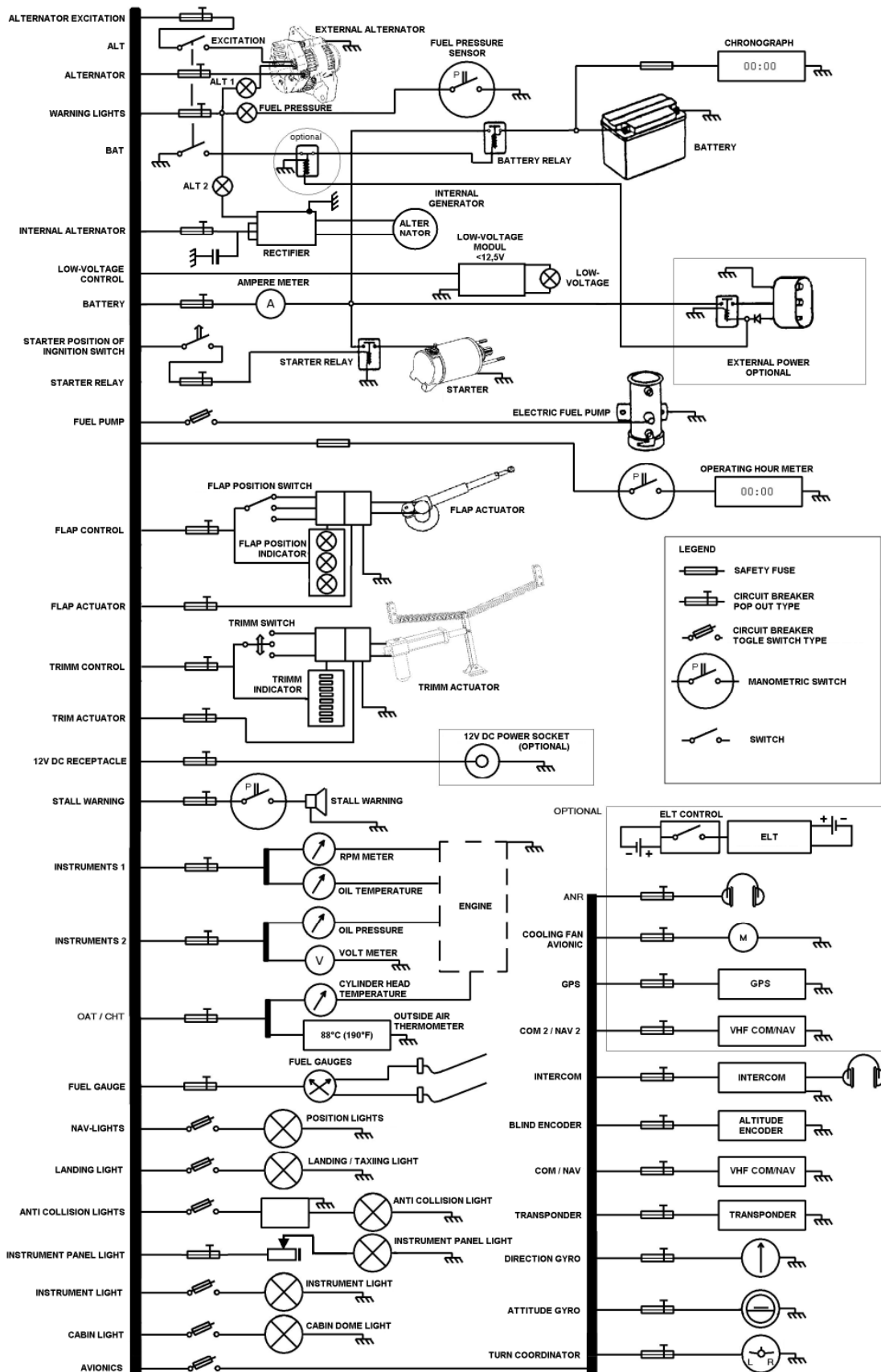


Fig.: Electrical System Schematic (NVFR-operation)

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7.4.2. Switches and Other Controls

The Aquila AT-01 equipped for Night-VFR-operation has a redundant instrument lightning system. This lightning system includes the following elements:

1. Panel lightning in the panel cover (the lightning can adjusted by the dimm-control in the right section of the instrument panel).
2. Lightning of instruments by internal lightning and additional external lightning units for instruments, control levers and switches/circuit breakers.

A pocket lamp for each occupant is stored in the side pockets of the aircraft cabin.

7.11.1. Power Supply and Battery System

A low-voltage-control unit is installed as an additional monitor device of the condition of the power supply. This illuminated control unit indicates a low-voltage condition if less than 12,5V remain. This warning light indicates clearly the status: "Both alternators do not feed the main electrical bus!".

7.11.3. Electrical Equipment and Circuit Breakers

All electrical equipment may be separately turned on or off by circuit breakers of push-pull type or by rocker switches with built-in circuit breaker function.

The instrument panel lightning is protected by a circuit breakers of push-pull type. It can be switched "ON" by turning the knob and can also be dimmed by this knob (see chapter 7.4, Position 42). The dimm-control is located in the right upper section of the instrument panel.

7.11.5. Alternator Warning Lights (external/internal alternator)

The AQUILA AT-01 equipped for NVFR-operation has a second alternator integrated.

The RED Alternator Warning Lights are OFF during the normal operation.

The warning lights will illuminate only if:

- Failure of alternator (the associated alternator not supply power)

occurs.

After failure of one alternator the power supply will be done by the second alternator and the battery.

After failure of the second alternator in the same time the battery will supply the electrical system only. The battery is able to supply the electrical system for at least 30 min.

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This does not effect the operation of the engine ignition system because it depends exclusively on the function of the internal ignition system.

NOTE

If the ALT1-switch will be switched off the alternator warning light for alternator 1 will be also switched off.

8. HANDLING, SERVICE AND MAINTENANCE

No changes to the basic Airplane Flight Manual.

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