INTRODUCTION

With the AQUILA AT01 you have acquired a very efficient training and utility aircraft, which is easy to operate and exhibits excellent handling qualities.

To ensure reliable operation and trouble free flight, we recommend that you read this Pilot's Operating Handbook thoroughly and adhere to the operating instructions and recommendations given herein.

CAUTION

All limitations, procedures and performance data contained in this handbook are EASA/FAA approved and mandatory. Failing to follow the procedures and limits set forth in this handbook can lead to a loss of liability by the manufacturer.

THE HANDBOOK

The handbook is presented in loose-leaf form to ease the substitution of revisions and is sized in A5-format for convenient storage in the aircraft.
Tab dividers throughout the handbook allow quick reference to each section. A Table of Contents is located at the beginning of each section to aid the location of specific data within that section.

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* - partially approved

LIST OF REVISIONS

All revisions to the handbook, with the exception of individual weight and balance data and revisions to the Equipment List, must be recorded in the List of Revisions. Revisions must either be approved by the EASA or, in the case of documentary changes, in accordance with Part 21A.263(c)(4) by the Design Organization of AQUILA Aviation GmbH.
Additions and revisions to text in an existing section will be identified by a vertical black line adjacent to the applicable revised area. A new issue code appears in the footer of the revised pages.

If revisions are distributed, the applicable sections are to be exchanged with the updated version. Generally only complete sections of the POH will be exchanged, and not individual pages.

The operation of the AQUILA AT01 is only permitted with a current and up to date POH carried on board. Please refer to the following web page whenever the revision status of your POH is in question.

www.aquila-aviation.de

Issue	Description of Revision	Revised Section(s)	EASA Approval-number	Approval by AQUILA / EASA Date / Signature
A.01	First Issue	All	10045112	29.05.2013
A.02	Editorial changes, Supplements 8,33 kHz FAA certification	All		15.10.2013
A.03	AS-00 „Winter Operation“	0, 9		08.04.2014
A.04	Editorial changes	0, 4		19.10.2015

Revision A.04 of AFM ref. FM-AT01-1010-101 is approved under the authority of DOA ref. EASA.21J.025.

AQUILA Aviation GmbH AQUILA Head of Airworthiness DOA EASA.21J.025

19. 10. 2015

Date, Signature Office of Airworthiness

PURCHASE OF TECHNICAL PUBLICATIONS

To guarantee safe operation and correct maintenance of the AQUILA AT01-100 aircraft, all manuals and technical publications must be kept in the current effective status.

All manuals and technical publications relating to the aircraft AQUILA AT01-100 are available from the companies listed below:

(a) *AQUILA AT01-100B related Manuals and Publications*

AQUILA Aviation GmbH
OT Schönhagen
Flugplatz
D-14959 Trebbin

Tel: ++49 (0)33731-707-0
Fax: ++49 (0)33731-707-11
E-Mail: kontakt@aquila-aviation.de
Internet: http://www.aquila-aviation.de

(b) *Engine ROTAX 912 S related Manuals and Publications*

Contact the ROTAX® authorized distributor for ROTAX® Aircraft Engines of the applicable distribution area.
For contact details of the local authorized distributor for ROTAX Aircraft Engines, please refer to chapter 13 of the ROTAX® Operator's Manual for 912 S Engines.

(c) *Propeller MTV-21 related Manuals and Publications*

mt-Propeller Entwicklung GmbH
Flugplatz Straubing- Wallmühle
D-94348 Atting

Tel: ++49 (0)9429-9409-0
Fax: ++49 (0)9429-8432
Internet: www.mt-propeller.com
E-Mail: sales@mt-propeller.com

SECTION 4

NORMAL PROCEDURES

4.1 INTRODUCTION

This section provides normal operating procedures and checklists for the aircraft as well as recommended airspeeds.

Additional information is provided in the current issues of the Operators Manual for ROTAX® engine Type 912 series and the Operation and Installation Manual of mt-Propeller® ATA 61-01-024.

Normal procedures associated with optional equipment can be found in Section 9.

4.2 AIRSPEEDS FOR NORMAL OPERATION

The following airspeeds are based on the maximum take-off weight of 1653 lbs (750 kg). They may also be used for any lower operational weight.

TAKE-OFF		
Airspeed (IAS)		**kts**
Normal climb speed to 50 Feet (Flaps **T/O**)		57
Best rate of climb speed at sea level (Flaps **UP**)	V_Y	65
Best angle of climb speed at sea level (Flaps **T/O**)	V_X	52

LANDING		
Airspeed (IAS)		**kts**
Final approach speed for landing (Flaps **LDG**)		60
Balked landing (Flaps **LDG**)		60
Maximum demonstrated crosswind component for take-off or landing		15
Maximum airspeed with Flaps **LDG**	V_{FE}	90

CRUISE		
Airspeed (IAS)		**kts**
Maneuvering speed	V_A	112
Maximum Turbulent Air Operating Speed	V_{NO}	130

4.3 DAILY INSPECTION

CAUTION

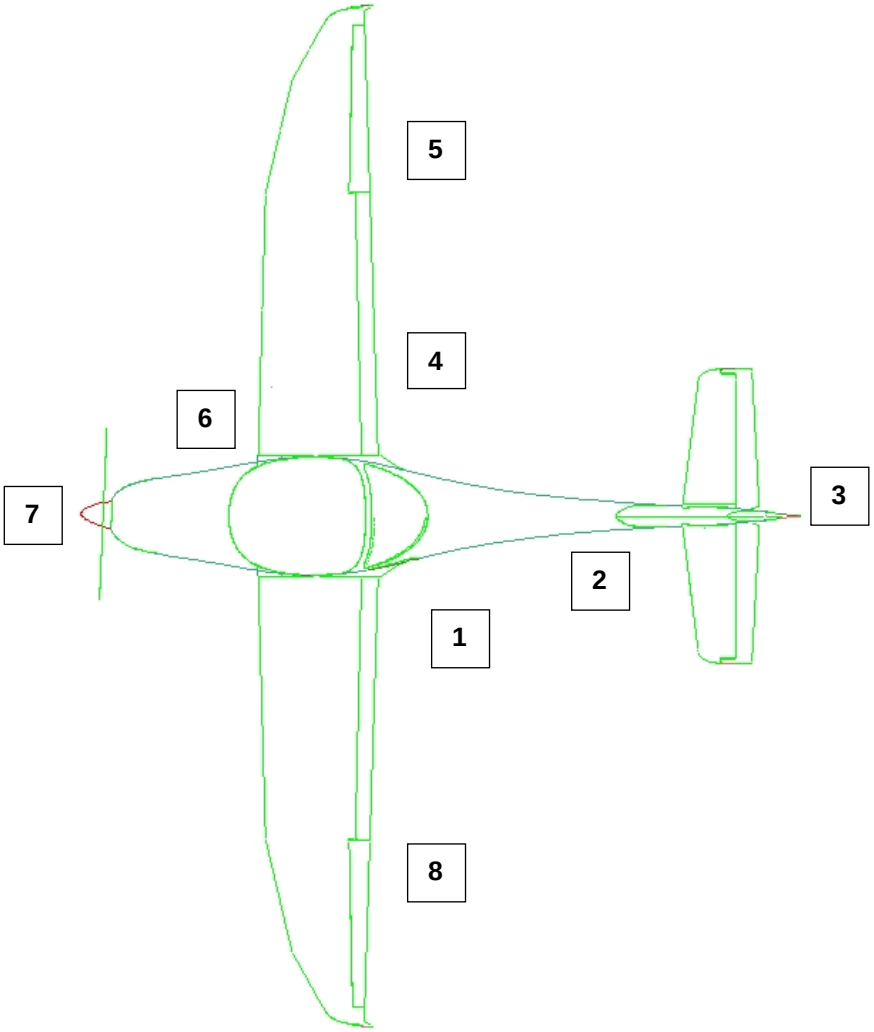
*The daily inspection is begun by checking all 3 fuel sumps for water and contamination. This must be done **before** the aircraft is moved. Otherwise the fuel in the sump may mix.*

1.	Tank drain (left / right wing)	drain and visually inspect for contamination
2.	Electrical fuel pump drain	drain and visually inspect for contamination

A) CABIN

1.	Aircraft Documentation	CHECK on board
2.	Ignition key	REMOVED
3.	**ALT1/ BAT** switch	ON
4.	Warning lights (**ALT1, FUEL**)	ILLUMINATE
5.	**ALT1** switch	OFF
6.	Engine instruments	CHECK
7.	Fuel quantity	CHECK
8.	**Nav Lights** switch	ON, CHECK, OFF
9.	**Landing Light** switch	ON, CHECK, OFF
10.	**BAT** switch	OFF
11.	ELT	CHECK operational
12.	Foreign objects	CHECK and REMOVE, when necessary
13.	Baggage	STOWED and SECURED
14.	Canopy	CHECK condition and cleanliness

B) EXTERIOR CHECK, Visual Inspection



CAUTION

In this manual, visual inspection means the following:
Inspect for mechanical damage, dirt, cracks, delamination, excessive play, looseness, leaks, incorrect attachment, foreign objects and general condition.

Control surfaces: in addition, check for free movement.

1. Left main landing gear

a) Landing gear strut	Visual inspection
b) Wheel fairing	Visual inspection (refer to 7.11.4)
c) Tire pressure and slip marking	CHECK
d) Tire, wheel, brake	Visual inspection
e) Chocks (if in use)	REMOVE

2. Fuselage

a) Fuselage shell	Visual inspection
b) Skid plate	Visual inspection
c) Tail tie-down	DISCONNECT

3. Empennage

a) Elevator	Visual inspection
b) Horizontal stabilizer	Visual inspection
c) Rudder	Visual inspection, CHECK: fitting and bolt connection, proper control cable connection and safe-tied.
d) Vertical stabilizer	Visual inspection

4. Right main landing gear

a) Landing gear strut	Visual inspection
b) Wheel Fairing	Visual inspection (refer to 7.11.4)
c) Tire pressure and slip marking	CHECK
d) Tire, wheel, brake	Visual inspection
e) Chocks (if in use)	REMOVE

5. Right wing

a) Entire wing surface (upper and under side)	Visual inspection
b) Fuel vent	CHECK if clear
c) Flap	Visual inspection
d) Aileron and inspection window	Visual inspection
e) Wing tip, NAV lights and ACL	Visual inspection
f) Fuel level	CHECK with dipstick (see inner surface of baggage compartment door) and verify with the indicated fuel level on the fuel gauge cockpit
g) Fuel tank filler cap	CHECK if closed
h) Wing tie-down	DISCONNECT

6. Nose section, cowling

WARNING

Before cranking the propeller:
*Ignition and **ALT1/BAT** switch: OFF*
Set the parking brake.

WARNING

RISK OF BURNS !
Only check the oil and coolant levels when the engine is cool.

a) Check oil level — Turn the propeller several times in the **direction of engine rotation** to pump oil from the engine back into the oil tank.

CAUTION

***NEVER** turn the propeller against the direction of engine rotation.*

Stop turning the propeller when air begins to return to the oil tank. This is indicated by the sound of air rushing from the open oil tank.
Use the oil dip stick to check that the oil level is between the -min./max.- markings. The difference between -min./max.- is approximately 0.48 US Quarts (0.45 l).

CAUTION

The oil specification in Section 1.9.1 must be adhered to!

b) Check coolant level: Verify coolant level in the **expansion tank** and replenish as required. (The expansion tank must be at least 2/3 filled or coolant has to be visible at the gauge glass.)

Verify coolant level in the **overflow bottle** and replenish as required. (The coolant level must be between the min. and max. markings.)

CAUTION

The coolant specification in Section 1.9.2 must be adhered to!

c) Air Intakes — CHECK if clear
d) Cooler intake — CHECK if free from obstructions
e) Cowling — Visual Inspection; CHECK Camloc fasteners
f) Propeller and Spinner — Visual inspection
g) Propeller blades — CHECK for cracks and other damage

7. Nose landing gear

a) Nose gear strut	Visual inspection
b) Wheel fairing	Visual inspection

CAUTION

Both parts of the 2 piece nose wheel fairing must always be installed on the aircraft

c) Tire pressure and slip marking	CHECK
d) Tire, wheel	Visual inspection
e) Shock absorber unit	Visual inspection
f) Chocks and tow bar	REMOVE

8. Left wing

a) Entire wing surface (upper and under side)	Visual inspection
b) Fuel vent	CHECK if clear
c) **BAT** switch	ON
d) Stall warning	press to upper detent, warning tone is audible
e) **BAT** switch	OFF
f) Pitot / Static tube	REMOVE cover, CHECK if all openings are clear
g) Wing tip, NAV lights and ACL	Visual inspection
h) Aileron and inspection window	Visual inspection
i) Cooler cover (if installed)	Visual inspection
j) Fuel level	CHECK with dipstick and verify with the indicated fuel level on the fuel gauge
k) Fuel tank filler cap	CHECK if closed
l) Flap	Visual inspection
m) Wing tie-down	DISCONNECT

4.4 PRE-FLIGHT INSPECTION (Walk Around)

1.	Daily Inspection	Confirm has been carried out.
2.	Tow bar	Remove
3.	Fuel level	CHECK with dipstick and verify with the indicated fuel level on the fuel gauge

WARNING

Before cranking the propeller:
*Ignition and **ALT1/BAT** switch: OFF,*
Set the parking brake.

WARNING

RISK OF BURNS !
Only check the oil and coolant levels when the engine is cool !

4.	Check oil level	Turn the propeller several times in the direction of engine rotation to pump oil from the engine back into the oil tank. Stop turning the propeller when air begins to return to the oil tank. This is indicated by the sound of air rushing from the open oil tank. Use the oil dip stick to check that the oil level is between the min. and max. markings. The difference between min. and max. is approx. 0.48 US Quarts (0.45 l).

CAUTION

The oil specification in Section 1.9.1 must be adhered to !

10.	Check Coolant Level	Verify coolant level in the overflow bottle and replenish as required. (The coolant level must be between the min. and max. markings)

CAUTION

The coolant specification in Section 1.9.2 must be adhered to !

6.	Tie-down straps	remove
7.	Baggage door	CHECK if closed and locked
8.	Pitot cover	remove
9.	Control locks	remove
10.	Seating position	adjust and lock, check that nose wheel steering and brakes can be operated
11.	Carburetor heat	CHECK for free movement, then PUSH (OFF)
12.	Cabin heat	CHECK for free movement, then PUSH (OFF)
13.	Choke	CHECK for free movement and automatic reset
14.	Throttle	CHECK for free movement, then set IDLE
15.	Propeller Control Lever	CHECK for free movement, then set in START Position
16.	Weight and balance	within limits?

4.5 CHECKLISTS FOR NORMAL PROCEDURES

4.5.1 Before Engine Start-up

1.	Daily and Pre-Flight Inspection	COMPLETED
2.	Passenger Briefing	COMPLETED
3.	Seats	ADJUSTED
4.	Seat Belts and Harnesses	FASTENED
5.	Canopy	CLOSED and LOCKED Check locking mechanism
6.	Parking Brake	SET (pull lever back)
7.	Control column	CHECK for free movement and correct control surface deflections
8.	Fuel Selector Valve	LEFT or RIGHT
9.	Carburetor Heat	PRESS
10.	Throttle	IDLE
11.	Propeller Control Lever	START position
12:	**Avionics** Switch	OFF
13.	**P/S-Heat** (if installed)	OFF
14.	Circuit Breakers	CHECK all set

NOTE

*Cage the Attitude Indicator (if installed) before switching **ALT1/BAT** on.*

15.	**ALT1 / BAT** switch	ON
16.	**ALT 1** warning light	ILLUMINATES
17.	**FUEL** warning light	ILLUMINATES
18.	**P/S-HEAT** warning light (if installed)	ILLUMINATES
19.	**ACL** switch	ON

4.5.2 Engine Start-up

1.	**Fuel Pump** switch		ON
2.	**FUEL** warning light		OFF
3.	Throttle	- Cold Engine	IDLE
		- Hot Engine	0.8 in. (2 cm) OPENED
4.	Choke	- Cold Engine	PULL, and keep pulled
		- Hot Engine	RELEASE (automatic reset)
5.	Brakes		PRESS both pedals
6.	Propeller area		CLEAR
7.	Ignition switch		START, then BOTH
8.	Oil Pressure		CHECK, if oil pressure rises

CAUTION

The oil pressure has to show rising values within 10 seconds after engine start, otherwise shut down the engine immediately!

NOTE

The starter may not be operated for more than 10 seconds at a time. Allow the starter to cool off for at least 2 minutes between attempts.

9.	**ALT 1** warning light	OFF
10.	**Fuel Pump** switch	OFF

4.5.3 Before Taxiing

CAUTION

Warm up the engine for approx. 2 min at 800 RPM and then at 1000 RPM until the Oil Temperature reaches a temperature of at least 122°F (50°C)

1.	**Avionics** switch	ON
2.	Avionics and flight instruments	SET
3.	Engine Instruments	CHECK

NOTE

Oil can be brought up to temperature during taxiing.

4.	Voltmeter	CHECK, if needle is within the green range
5.	Trim switch and indication	functional CHECK
6.	Flap switch and indication	functional CHECK, afterwards UP
7.	**P/S Heat** switch (if installed)	ON, **P/S HEAT** warning light goes off
8.	**P/S Heat** switch (if installed)	OFF, **P/S HEAT** warning light goes on
9.	all switches	AS REQUIRED

4.5.4 Taxiing

1.	Parking Brake	RELEASE
2.	Brakes	CHECK
3.	Nose Wheel Steering	CHECK (function, free movement)
4.	Flight instruments and Avionics	CHECK

CAUTION

Do not operate the engine at high RPM when taxiing to prevent damage to the propeller through stones or other foreign objects.

4.5.5 Before Take-off (at the Taxi Holding Position)

1.	Brakes		APPLY
2.	Parking Brake		SET
3.	Compass and gyro Instruments		CHECK setting
4.	Fuel Selector Valve		LEFT or RIGHT, switch to the fuller tank
5.	**FUEL** warning light		OFF, (otherwise, <u>do not attempt</u> take-off)
6.	Engine instruments		CHECK if within the green range
7.	Throttle		SET 1700 RPM
8.	Ignition switch		Magneto check: SWITCH through: "L-BOTH-R-BOTH" – positions. CHECK RPM-drop
		max. RPM-drop:	120 RPM
		max. difference L/R:	50 RPM
		RPM drop must be noticeable	
			<u>then</u>: BOTH position
9.	Carburetor heat		PULL (ON)
		(RPM drop: 20 to 50 RPM)	
10.	Carburetor temperature indicator (if installed)		CHECK
11.	Carburetor heat		PUSH (OFF)
12.	Propeller control lever		SWITCH 3 times between START and CRUISE positions (end stops)
		Check points:	1) RPM drop: 200 ± 50 RPM
			2) increase manifold pressure
			3) constant oil pressure (± 0,5 bar
			<u>then</u>: START position
13.	Throttle		IDLE
14.	**Fuel Pump** switch		ON
15.	Flap switch		T/O
16.	Trim switch		white marking
17.	Circuit breakers		CHECK all set
18.	Control column		CHECK for free movement
19.	Lap belt		FASTENED and TIGHTENED
20.	Canopy		CLOSED and LOCKED
21.	Parking brake		RELEASE

4.5.6 **Take-off** (up to 50 ft)

1.	Throttle	WIDE OPEN
2.	Tachometer	CHECK if within 2300 - 2385 RPM
3.	Elevator, control column	NEUTRAL during initial ground roll
4.	Rudder pedals	Maintain direction
5.	Rotatespeed	50 KIAS
6.	Climb speed	57 KIAS

CAUTION

*To **increase power setting raise RPM first** and **open throttle second**.*
*To **decrease power setting close throttle first** and **lower RPM second**.*

CAUTION

For the shortest take-off distance over a 50-feet obstacle at sea level:

7.	Rotate speed	50 KIAS
8.	Climb speed (V_X)	52 KIAS

4.5.7 **Climb**

1.	Throttle	WIDE OPEN
2.	Propeller control lever (max. 5 minutes)	2385 RPM, afterwards 2260 RPM
3.	Engine instruments	CHECK if in GREEN range

NOTE

During take-off and climb at take off power the RPM is intended to be in the caution area because the maximum continuous rpm is exceeded. This is acceptable for max. 5 minutes.

4.	Flap switch	UP
5.	Climb speed	65 KIAS
6.	**Fuel Pump** switch	OFF
7.	**Landing Light** switch	OFF
8.	Trim switch	SET as required

NOTE

The best rate-of-climb speed, V_Y, is a function of the operating weight and decreases with altitude. For more information, refer to Section 5.2.6

4.5.8 Cruise

1.	Throttle	AS REQUIRED (Ref. to Section 5, Page 5-11)
2.	Propeller control lever	SET 1650 to 2260 RPM

CAUTION

Continuous operation with throttle wide open and propeller revolution below 2140 RPM should be avoided to prevent engine damage in particular at pressure altitudes below 3000ft and at high CHT (see SL-912-016)

NOTE

For best manifold pressure/propeller speed combinations: Refer to Section 5, page 5-11

3.	Flaps switch	UP
4.	Trim switch	SET as required
5.	**P/S Heat** switch (if installed)	AS REQUIRED, OFF at OAT above 59° F (15° C)
6.	Engine instruments	CHECK if in green range
7.	Carburetor temperature indicator (if installed)	MONITOR

CAUTION

*During flights above a pressure altitude of 6000 ft, the fuel pressure warning light must be monitored closely. If the **FUEL** warning light goes ON, the **Fuel Pump** must be switched ON to prevent fuel vapor formation in the fuel system.*

4.5.9 Descent

1.	Throttle	First decrease AS REQUIRED
2.	Propeller control lever	Second SET above 2000 RPM
3.	Carburetor heat	AS REQUIRED
4.	Carburetor temperature indicator (if installed)	MONITOR

CAUTION

For a rapid descent proceed as follows:

Throttle	*First IDLE*
Propeller control lever	*Second START*
Carburetor heat	*PULL (ON)*
Flaps	*UP*
Airspeed	*130 KIAS*
Oil and cylinder head temperature	*maintain in green range*

4.5.10 Landing

1.	Lap belt	CHECK SECURE
2.	**Fuel Pump** switch	ON
3.	Carburetor heat	PULL (ON)
4.	Throttle	AS REQUIRED
5.	Airspeed	90 KIAS
6.	Flaps switch	T/O or LDG
7.	Trim switch	AS REQUIRED
8.	Flaps switch	LDG
9.	Approach speed	60 KIAS
10.	Propeller control lever	START
11.	**Landing Light** witch	ON (as required)

CAUTION

In strong headwinds or crosswinds, in turbulent air or in wind shear, it may be desirable to approach using less flaps and at a higher airspeed.

4.5.11 Go-Around (Balked Landing)

1.	Throttle	First WIDE OPEN
2.	Propeller control lever	Second START
3.	Carburetor Heat	PUSH (OFF)
4.	Flaps switch	T/O
5.	Airspeed	65 KIAS

CAUTION

Any operation with throttle wide open and carburetor heat engaged should be avoided to prevent engine damage.

4.5.12 After Landing

1.	Throttle	AS REQUIRED
2.	Flaps switch	UP
3.	**P/S Heat** switch (if installed)	OFF
4.	Carburetor Heat	PUSH (OFF)
5.	**Fuel Pump** switch	OFF
6.	Transponder	OFF
7.	**Landing Light** switch	OFF

4.5.13 Engine Shutdown

1.	Throttle	IDLE
2.	Parking Brake	SET
3.	Flaps switch	LDG
4.	ELT	CHECK (frequency 121.5 MHz)
5.	**Avionics** switch	OFF
6.	Ignition Switch	OFF
7.	Electrical equipment	OFF
8.	**ALT1 / BAT** switch	OFF
9.	Chocks and tie-downs	AS REQUIRED

4.5.14 Refueling

1. Engine Shutdown as in Section 4.5.13
2. Ground the aircraft

CAUTION

*During refueling, the aircraft **must** be grounded (for example at the end of the exhaust pipe.)*

3. Open fuel tank filler cap
4. Refuel both tanks equally

NOTE

Insert the fuel pump nozzle carefully into the tanks to avoid damage.

5. Replace the fuel tank filler caps
6. Remove grounding cable

4.5.15 Flight in Heavy Rain and/or with Wing Contamination

CAUTION

When flying with wet and/or contaminated wings and control surfaces, performance and handling qualities may be reduced. This applies in particular to take-off distance, climb performance, cruising speed and stall characteristics.

The stall speed may increase up to 3 kts and the air speed indicator may give false readings.

Visibility may deteriorate considerably in rain.