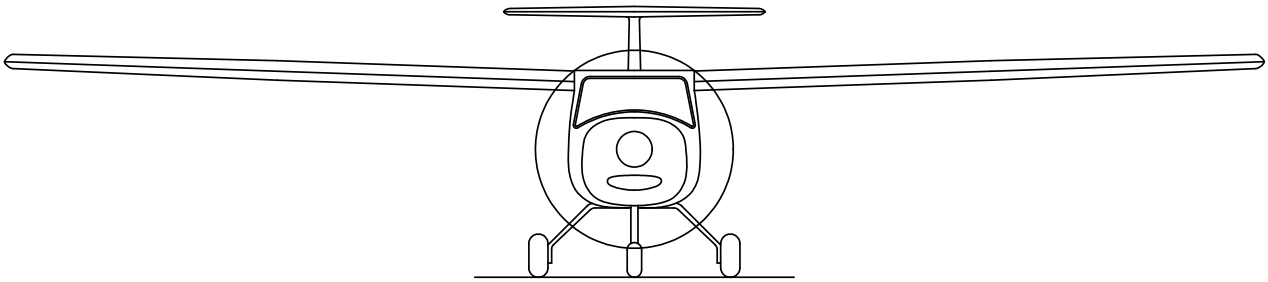
PIPISTREL

Pilot's Operating Handbook and Flight Training Supplement

applies to all ALPHA Trainer LSA aircraft up to and including s/n 890 AT 912 LSA as well as s/n 926 AT 912 LSA, 932 AT 912 LSA, 935 AT 912 LSA , 958 AT 912 LSA,equipped with a Rotax 912 (80 HP) engine



REVISION B00

(24th October, 2019)

Doc.no. : POH-162-00-40-050

Aircraft Registration Number: N520AT

Aircraft Serial Number: 738 AT 912 LSA

This publication includes the material required to be supplied to the pilot by ASTM F2245, F2279 & F2295

WARNING!

This document MUST be present inside the cockpit at all times.
Should you sell this aircraft make sure this document is given to the new owner.

This page is intentionally left blank.

Performance - specifications

ALPHA Trainer	80 hp Rotax 912
Stall speed (flaps extended)	37 kts (68 km/h)
Stall speed (flaps retracted)	43 kts (80 km/h)
Cruise speed (5300 RPM)	108 kts (201 km/h)
Maximum horizontal speed at sea level	120 kts (222 km/h)
VNE	135 kts (250 km/h)
Standard endurance 108 knots cruise	3.0 hours + 30 min reserve
Standard range at 108 knots cruise	324 NM (600 km)
Fuel flow at 108 knots cruise speed (typical)	3.6 gph (13.6 L/h)
Best speed for maximum endurance	90 knots 4900-5000 rpm
Maximum endurance at 90 knots	3.6 hours + 30 min reserve
Takeoff - ground roll - at MTOM	555 ft (170 m)
Takeoff total distance over 50 ft obst. at MTOM	870 ft (265 m)
Landing distance over 50 ft obst.	1510 ft (460 m)
Absolute ceiling at MTOM	18,000 ft (5500 m)

NOTE The above performance figures are based on an airplane weight at 1212 lbs (550 kg), standard atmospheric conditions, level hard-surfaced dry runways and no wind. They are calculated values derived from flight tests conducted by Pipistrel, under the supervision of the Slovenian CAA and under carefully documented conditions. Figures may vary based on numerous factors (surface condition, temperature, water on wing, etc).

ALPHA Trainer	80 hp Rotax 912
Maximum weight takeoff	1212 lbs (550 kg)
Maximum weight landing	1212 lbs (550 kg)
Standard empty weight	615 lbs (279 kg)
Payload without fuel	597 lbs (271 kg)
Payload with full fuel	518 lbs (235 kg)
Baggage allowance aft of the cabin*	22 lbs (10 kg)
Fuel capacity, total	13.2 US gal (50 L)
Fuel capacity, usable	12.7 US gal (48 L)
Fuel weight full	79.4 lbs (36 kg)
Oil system capacity	3.5 Liters
Engine	Rotax 912 80 hp
Propeller	Pipistrel FP02-80, dia. 65” 1660 mm

* **WARNING!** only when baggage net or solid baggage compartment is installed (p/n 6023077). CG limits must be always respected!

Noise levels

According to independent testing performed by German LBA-LTF noise regulations the airplanes, the equivalent exhibited noise measures 55.8 dBa. Noise is measured on the ground when the airplane overflies at 500 ft at full power, at speed of best climb. Measures have been taken to make the cockpit exceptionally quiet on the inside as well.

Coverage

The Pilot's Operating Handbook (POH), found in the airplane at the time of delivery from Pipistrel contains information applicable to the ALPHA Trainer airplane and to the airframe designated by the serial number and registration number shown on the title page. All information is based on data available at the time of publication. Continued airworthiness is according to ASTM F2295, information is available below.

This POH consists of ten sections that cover all operational aspects of a standardly equipped airplane. Section 10 contains the supplements which provide amended operating procedures, performance data and other necessary information for those airplanes that conduct special operations and/or are equipped with both standard and optional equipment. Additional supplements are individual documents which are issued/revised separately. The log of effective pages should be used to determine the status of each supplement.

Revision tracking, filing and identifying

Pages to be removed or replaced in the Pilot's Operating Handbook are determined by the log of effective pages located in this section. This log contains the page number and revision number for each page within the POH. As revisions to the POH occur, the revision number on the effected pages is updated. When two pages display the same page number, the page with the latest revision shall be used in the POH. The revision number on the log of effective pages shall also coincide with the revision number of the page in question. As an alternative to removing and/or replacing individual pages, the owner can also print out a whole new manual in its current form, which is always available from www.pipistrel-aircraft.com.

Revised material is marked with a vertical double-bar that will extend the full length of deleted, new, or revised text added to new or previously existing pages. This marker will be located adjacent to the applicable text in the marking on the outer side of the page. The same system applies when the header, figure, or any other element inside this POH is revised. A list of revisions is located at the beginning of the log of effective pages. Pipistrel is not responsible for technical changes/updates to OEM manuals supplied with the aircraft (eg. radio, transponder, GPS, etc.).

Online updates, service notice tracking & airworthiness reporting

To receive and report Issues and anomalies identified by the aircraft owner or maintainer during the operation or maintenance of this aircraft or to report content errors in this manual then please log into the Owner's section of the Pipistrel website where you can report service difficulties and receive updates and information relevant to service and airworthiness of your aircraft.
Go to: www.pipistrel-aircraft.com, go to support section - technical documentation, and log in with:

Username: owner1 Password: ab2008

Index of revisions

The table below shows the revision history of this POH. Check your registration authority's or the manufacturer's website occasionally for the most up-to-date releases of operation-relevant documentation, which includes this POH.

Designation	Reason for revision	Release date	Affected pages	Issuer
Preliminary	/	15 November, 2011	/	Tomazic, Pipistrel LSA s.r.l.
Preliminary		2nd January 2012	Various Review Before Release	Coates, Pipistrel LSA s.r.l.
Release	Revision 1	19th March 2012	Various Review Before Release	Coates, Pipistrel LSA s.r.l.
Revision 2	Added Section 10, Language US English	19th December 2012	All and added Section 10	Coates, Pipistrel LSA s.r.l.
Revision 3	Specification changes	22nd July 2013	Several	Coates, Pipistrel LSA s.r.l.
Revision 4	Specification changes	13th August 2013	Several	Coates, Pipistrel LSA s.r.l.
Revision 5	Reordering of chapters to comply with ASTM F2746-12	31st January 2014	ALL	Coates, Pipistrel LSA s.r.l.
Revision 6	Small Changes	31st March 2015	Cover, 5-5 and 9-6	Coates, Pipistrel LSA s.r.l.
Revision 7	Change operating temperature	24th April 2015	Cover, 2-5	Coates, Pipistrel LSA s.r.l.
Revision 8	Changes	11th August 2015	Cover, i-2, 1-4, 1-5, 2-5, 4-5, 4-7, 5-2.	Coates, Pipistrel LSA s.r.l.
Revision 9	Fuel information	24th January 2017	Cover, 1-4, 2-3, 2-6	Coates, Pipistrel LSA s.r.l.
Revision A00	New baggage restrictions, new company website, release of SI-160-001, LX Instrument Suite, Fuel system description improved, V_A speed changed	30th Aug 2019	ALL	SLO.DOA.002
Revision A01	Flapless landing NOTE added	8th October 2019	Cover, I-4, I-5, 4-9	SLO.DOA.002
Revision B00	Instrument panel description improved (supplement), Kinds of operations, Flapless landing limitet do day-time	24th October 2019	ALL	SLO.DOA.002

Log of Effective Pages

Use the table below to determine the currency and applicability of your POH. Pages affected by the current revision are marked in bold text in the page number column.

Page number	Rev. number	Page number	Rev. number
Cover	**-**	4-7	0
i-1	-	4-8	0
i-2	0	4-9	0
i-3	0	4-10	0
i-4	0	5-1	0
i-5	0	5-2	0
i-6	0	5-3	0
i-7	-	5-4	0
0-1	0	5-5	0
0-2	-	5-6	0
1-1	0	5-7	0
1-2	0	5-8	-
1-3	0	6-1	0
1-4	0	6-2	0
1-5	0	6-3	0
1-6	0	6-4	0
2-1	0	6-5	0
2-2	0	6-6	-
2-3	0	7-1	0
2-4	0	7-2	0
2-5	0	7-3	0
2-6	0	7-4	0
2-7	0	7-5	0
2-8	0	7-6	0
2-9	0	7-7	0
2-10	0	7-8	0
2-11	0	7-9	0
2-12	-	7-10	0
3-1	0	7-11	0
3-2	0	7-12	-
3-3	0	8-1	0
3-4	0	8-2	0
3-5	0	8-3	0
3-6	-	8-4	0
4-1	0	8-5	0
4-2	0	8-6	0
4-3	0	9-1	0
4-4	0	9-2	0
4-5	0	9-3	0
4-6	0	9-4	0

Log of Effective Pages (continued)

Page number	Rev. number	Page number	Rev. number
9-5	0	10-5	0
9-6	0	10-6	0
9-7	0	10-7	-
9-8	0	10-8	0
10-1	0	10-9	-
10-2	0	10-10	0
10-3	0	10-11	-
10-4	0	Back cover	0

CAUTION!

This manual is valid only if it contains all of the original and revised pages listed above.

Each page to be revised must be removed, shredded and later replaced with the new, revised page in the exact same place in the manual.

IMPORTANT !

This Pipistrel ALPHA Trainer aircraft is sold globally in more than 40 countries. Many countries have their own individual requirements for information required to be shown in an aircraft manual. This manual is the only official manual for the ASTM-LSA version, published by Pipistrel, in some countries it may be necessary to add supplements or inserts to comply with local regulations, these are listed in Section 10 if required.

Warnings, Cautions and Notes

Safety definitions used in the manual:

WARNING! An operating procedure or technique that may result in personal injury or loss of life if not followed.

CAUTION! An operating procedure or technique that may result in damage to equipment if not followed.

NOTE An operating procedure or technique needing special emphasis.

This page is intentionally left blank.

Table of contents

This page is intentionally left blank.

1 General

Introduction

This manual contains all information needed for appropriate and safe use of ALPHA Trainer.

IT IS MANDATORY TO CAREFULLY STUDY THIS MANUAL BEFORE USING THE AIRCRAFT.

Pipistrel do.o. is not responsible for any damage or injury resulting from not following the instructions contained in this manual.

Technical brief

DIMENSIONS	ALPHA Trainer
Wing span	34' 6" (10.5 m)
Length	21' 4" (6.5 m)
Height	6" 9' (2.05 m)
Wing surface	102.4 sqft (9.51 m^2)
Vertical fin surface	11.8 sqft (1.1 m^2)
Horizontal stabilizer and elevator surface	11.6 sqft (1.08 m^2)
Aspect ratio	11.8
Positive flap deflection (down)	0°- position (0), +15° - position (+1), +25° - position (+2)
In flight Center of Gravity (MAC)	25% - 36%
Propeller - fixed pitch	Pipistrel FP02-80, dia. 65" 1660 mm

3-view drawing

Powerplant, fuel, oil

Engine manufacturer: ROTAX
Engine type: Rotax 912 (80 HP)

The engine

TEMPERATURE °C / ROTAX ENGINE	912 80 HP
Maximum coolant temp. (CT)	120
Maximum exhaust gas temperature (EGT)	880
Oil temperature (OIL TEMP); minimum, normal, highest	50; 90-110; 140
RPM, PRESSURE	**912 80 HP**
Oil pressure (OIL PRESS); lowest, highest bar (psi)	0.8; 2.0-5.0; 7.0
Maximum continuous speed (RPM)	5500
Take-off speed; maximum allowable 5 min (RPM)	5800
Magneto check at (RPM)	4000
Maximum single magneto drop (RPM)	< 300

Fuel and oil

ROTAX ENGINE	912 80 HP
Recommended fuel **	minimum 90 RON grade, up to 10% alcohol content permitted, 0% is preferable*
Also approved fuels **	leaded* or AVGAS 100 LL
Recommended oil **	SAE 10 W-40 AeroShell Oil Sport Plus 4
Oil system capacity typical	3.5 L (check dipstick)

*** Engine life is reduced. If using this type of fuel is unavoidable, changing the engine oil every 50 flight hours is crucial. Please consult the manufacturer on which type of oil to use.**

**** See latest edition of Rotax Service Instruction SI-912-016R10 Selection of suitable operating fluids for Rotax Engine.**

IMPORTANT!
Four-stroke engines should only be powered by unleaded fuel, for lead sedimentation inside the engine shortens its life. Provided you are unable to use unleaded fuel, make sure engine oil and the oil filter are replaced every 50 flight hours.

WARNING! Use of fuels with alcohol content exceeding 10% is not permitted. See Rotax specification - please refer to SI-912-016 "Selection of suitable operating fluids" latest issue.

NOTE Please refer to the applicable Rotax operator's manual for additional engine operating limirations.

NOTE The fuel indicator is equipped with coloured markings for fuel status which indicates the percentage of fuel tank capacity. The fuel indicator is electric and may not be reliable at all times. Pilot caution is advised.

When fuelling or de-fuelling, verify that the vent tube remains unobstructed from contamination.

Propeller

ALPHA Trainer	Propeller
Rotax 912 (80 HP)	Pipistrel FP02-80, diameter 1660 mm

Engine instrument markings

Instrument	Red line (minimum)	Green arc (normal)	Yellow arc (caution)	Red line (maximum)
Tachometer (RPM)	/	1400-5500	5500-5800	5800
Oil temperature	50°C (122°F)	90-110°C (194-230°F)	110-125°C (230-257°F)	140°C (266°F)
Coolant temp	/	/	110-120°C (230-248°F)	120°C (248°F)
Oil pressure	1.0 bar (14.5 psi)	1.5 - 5.0 bar (21.7 - 72.5 psi)	5.0 - 6.5 bar (72.5 - 94.0 psi)	6.5 bar (94.3 psi)

Weights

ALPHA Trainer weights

WEIGHT	ALPHA Trainer
Standard empty weight	615 lbs (279 kg)
Maximum takeoff weight (MTOM)	1212 lbs (550 kg)
Fuel capacity (full)	13.2 US gal (50 L)
Fuel capacity (usable)	12.7 US gal (48 L)
Maximum fuel weight allowable	79.4 lbs (36 kg)
Payload with full fuel	518 lbs (235 kg)
Minimum combined cockpit crew weight	121 lbs (55 kg)
Baggage allowance aft of the cabin*	Maximum 22 lbs (10 kg)

* **WARNING! only when baggage net or solid baggage compartment is installed (p/n 6023077). CG limits must be always respected.**

WARNING! MTOM must be kept at or below 1212 lbs (550 kg). Exceeding baggage weight or c.g. limits can shift aircraft's balance to the point when the flight becomes uncontrollable! More information on baggage allowance can be found in chapter "Weight and Balance".

Center of gravity range

- The aircraft's in-flight safe center of gravity position ranges between 25% and 36% of mean aerodynamic chord.
- The in flight center of gravity point ranges between 10 7/16'' (265 mm) and 14 21/64'' (364 mm) aft of the datum. The datum is the wing's leading edge at the fuselage root.

G-load factors

Max. positive wing load: + 4 G
Max. negative wing load: – 2 G

All parts have been tested to a safety factor of a minimum 1.875, meaning they were subjected to at least a load of 7.5 G

2 Limitations

Introduction

This section includes operating limitations, instrument markings and basic placards necessary for the safe operation of the airplane, it's engine, standard system and standard equipment.
The limitations included in this section have been approved by target authority.
Observance of these operating limitations is required by law.

Airspeed limitations

	Velocity	IAS [kts (km/h)]	Remarks
VS	**Stall speed Clean**	**43 (80)**	Stall speed flaps up (0) position.
VS0	**Stall speed Landing configuration**	**37 (68)**	Stall speed flaps full (+2) position.
VFE	**Max. velocity flaps extended**	**70 (130)**	Do not exceed this speed with flaps extended.
VA	**Design maneuvering speed**	**96 (177)**	Do not make full or abrupt control movements above this speed.
VNE	**Velocity never to be exceeded**	**135 (250)**	Never exceed this speed in any operation.
VNO	**Velocity normal operating**	**108 (201)**	Maximum structural cruising speed in turbulent air.

Airspeed indicator markings

MARKING	IAS [kts (km/h)]	Definition
White band	**37 -70 (68 - 130)**	Full Flap Operating Range. Lower limit is the maximum weight VS0 in landing configuration. Upper limit is maximum speed permissible with flaps extended.
Green band	**43 -108 (83 - 201)**	Normal Operating Range Lower end is maximum weight VS1 at most forward C.G. with flaps retracted. Upper limit is maximum structural cruising speed.
Yellow band	**108 - 135 (201 - 250)**	Maneuver the aircraft with caution in calm air only.
Red line	**135 (250)**	Maximum speed for all operations. VNE
Blue line	**76 (140)**	Best climb rate speed (Vy)
/	**58 (108)**	Best angle of climb speed (Vx)

Powerplant limitations

Engine manufacturer: ROTAX
Engine type: Rotax 912 UL2 (80 HP)

Data below is data relevant for the pilot. Consult the original Rotax engine manual for all other details.

The engine

TEMPERATURE °C / ROTAX ENGINE	**912 80 HP**
Maximum coolant temp. (CT)	120
Maximum exhaust gas temperature (EGT)	880
Oil temperature (OIL TEMP); minimum, normal, highest	50; 90-110; 140
RPM, PRESSURE	**912 80 HP**
Oil pressure (OIL PRESS); lowest, highest bar (psi)	0.8; 2.0-5.0; 7.0
Maximum continuous speed (RPM)	5500
Take-off speed; maximum allowable 5 min (RPM)	5800
Magneto check at (RPM)	4000
Maximum single magneto drop (RPM)	< 300

Fuel and oil

ROTAX ENGINE	**912 UL2 (80 HP)**
Recommended fuel **	minimum 90 RON grade, up to 10% alcohol content permitted, 0% is preferable *
Also approved fuels **	leaded* or AVGAS 100LL*
Recommended oil **	SAE 10 W-40 AeroShell Oil Sport Plus 4

*** Engine life is reduced. If using this type of fuel is unavoidable, changing the engine oil every 50 flight hours is crucial. Please consult the manufacturer on which type of oil to use.**

**** See latest edition of Rotax Service Instruction SI-912-016R10 Selection of suitable operating fluids for Rotax Engine.**

IMPORTANT!
Four-stroke engines should only be powered by unleaded fuel, for lead sedimentation inside the engine shortens its life. Provided you are unable to use unleaded fuel, make sure engine oil and the oil filter are replaced every 50 flight hours.

WARNING! Use of fuels with alcohol content exceeding 10% is not permitted.

Propeller

ALPHA Trainer	Propeller
with Rotax 912 UL2 (80 HP)	Pipistrel FP02-80 diameter 65" (1660 mm)

Engine instrument markings

Instrument	Red line (minimum)	Green arc (normal)	Yellow arc (caution)	Red line (maximum)
Tachometer (RPM)	/	1400-5500	5500-5800	5800
Oil temperature	50°C (122°F)	90-110°C (194-230°F)	110-125°C (230-257°F)	140°C (266°F)
Coolant temp	/	/	110-120°C (230-248°F)	120°C (248°F)
Oil pressure	1.0 bar (14.5 psi)	1.5 - 5.0 bar (21.7 - 72.5 psi)	5.0 - 6.5 bar (72.5 - 94.0 psi)	6.5 bar (94.3 psi)

Weights

ALPHA Trainer weights

WEIGHT	ALPHA Trainer
Maximum takeoff weight (MTOM)	1212 lbs (550 kg)
Minimum combined cockpit crew weight	121 lbs (55 kg)
Baggage aft of the cabin*	22 lbs (10 kg). Always verify baggage allowance with a center of gravity calculation!

* **WARNING! only when baggage net or solid baggage compartment is installed (p/n 6023077) and payload secured. CG limits must be always respected.**

WARNING! MTOM must be kept at or below 1212 lbs (550 kg). Exceeding baggage weight or c.g. limits can shift aircraft's balance to the point when the flight becomes uncontrollable! More information on baggage allowance can be found in chapter "Weight and Balance".

Center of gravity range

- The aircraft's in-flight safe center of gravity position ranges between 25% and 36% of mean aerodynamic chord.
- The in-flight center of gravity point ranges between 25% and 36% of MAC or 10 7/16'' (265 mm) and 14 21/64'' (364 mm) aft of the datum. The datum is the wing's leading edge at the fuselage root.

G-load factors

Max. positive wing load: + 4 G

Max. negative wing load: – 2 G

All parts have been tested to a safety factor of a minimum 1.875, meaning they were subjected to at least a load of 7.5 G

Service ceiling, crosswind

Service ceiling is. 18,000 ft. Maximum crosswind component is 18 kts.

Maneuver limits

ALPHA Trainer is approved as a Light Sport Aircraft and is intended for recreational and instructional flight operations. In the acquisition of various pilot certificates certain maneuvers are required and these maneuvers are permitted in this airplane.

The following non-aerobatic maneuvers are permitted as defined:

- Power-on and -off stalls not below 1500 feet (450 meters) above ground level.
- Power on and off lazy eights not below 1500 feet (450 meters) above ground level, entry speed 90 kts
- Steep turns with initial speed of 80 kts.
- Chandelle maneuvers not below 500 feet (150 meters) above ground level, entry speed 105 kts.
- Spin initiation and recovery (at most 180° in actual spinning maneuver).

WARNING! Aerobatic maneuvers, including intentional spins, are prohibited.

CAUTION! Intentional flying with both cabin doors open is prohibited. Flying with one door open in flight is approved with airspeeds up to 60 kts, flying with one door removed is approved without changes to the limitations of the normal operational envelope.

Kinds of operations

ALPHA Trainer is approved for:

Day and night VFR operations
IFR operations in VMC conditions only
IFR flight only allowed with approved IFR instruments and appropriate pilot rating/certification

WARNING! Should you find water drops on the airframe during pre-flight check-up at temperatures close to freezing, you may expect icing to appear in flight.

Minimum equipment list (DAY - VFR)

- Placards, checklist, this POH.
- Airspeed indicator (functional), altimeter (functional), compass (functional).
- Tachometer (RPM), EGT indication (functional), CT indication (functional), OIL temp. indication (functional), OIL press. indication (functional).
- 12 V Main battery (functional), alternator (functional), safety belts (2x), fuel shut-off valve (functional), electric fuel pump (functional).

Minimum equipment list (IFR - VMC)

The minimum equipment list for IFR-VMC is identical that for DAY-VFR, but shall include any additional equipment deemed necessary by local regulations in the given area of operation.

Minimum equipment (NIGHT - VFR)

The minimum equipment list for Night VFR is identical that for DAY-VFR, but shall include any additional equipment deemed necessary by local regulations in the given area of operation.

Fuel limitations

FUEL	ALPHA Trainer
Fuel capacity (full)	13.2 US gal (50 L)
Fuel capacity (usable - all flight conditions)	12.7 US gal (48 L)
Unusable fuel	0.5 US gal (2 L)
Maximum fuel weight allowable	79.4 lbs (36 kg)

WARNING! Takeoff is prohibited if there is less than 1.5 USgal or when unsure about the fuel quantity on board for any reason.

WARNING! **Use of fuels with alcohol content exceeding 10% is not permitted. See Rotax specifications - please refer to SI-912-016 "Selection of suitable operating fluids" latest issue.**

NOTE Maximum full capacity is indicated only through the fuel filler neck on fuselage, by visual check. At the same time, verify that the vent tube remains unobstructed from contamination.

Other restrictions

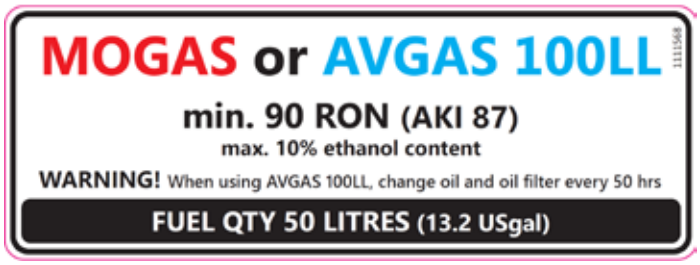
Due to flight safety reasons it is forbidden to:

- fly in heavy rainfall.
- fly during thunderstorm activity.
- fly in a blizzard.
- attempt to fly in zero visibility conditions (IMC).
- fly when the temperature of the aircraft´s surface is at risk of exceeding 55°C (130°F).
- perform aerobatic flying.
- the 12 Volt power outlet is not approved to supply power to flight-critical communication or navigation devices.
- takeoff with flaps retracted (0°).
- fly into known icing conditions

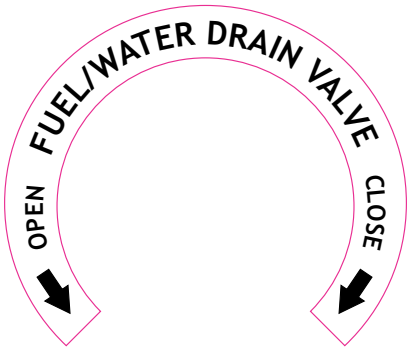
Placards

Placards (external):

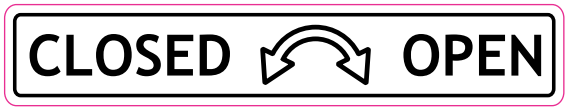
Next to fuel tank filler neck:

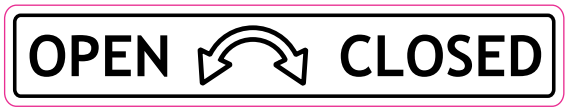


Next to gascolator outlet:



Next to door opening latches:





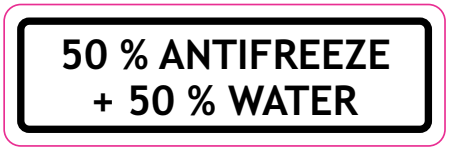
Next to wheels:

or

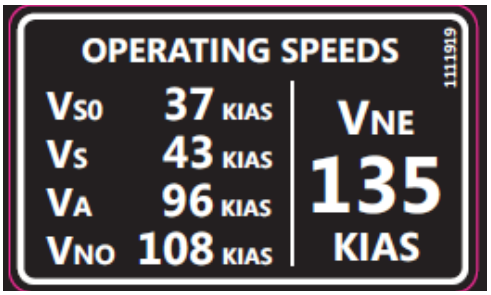
Next to fuel drain outlet:

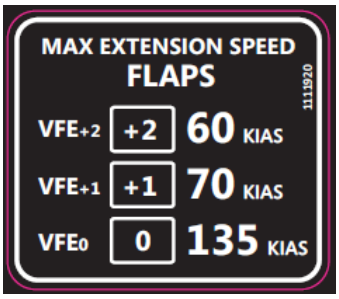
Placards (engine compartment):

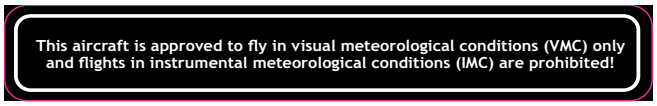
On coolant bottle, oil bottle :

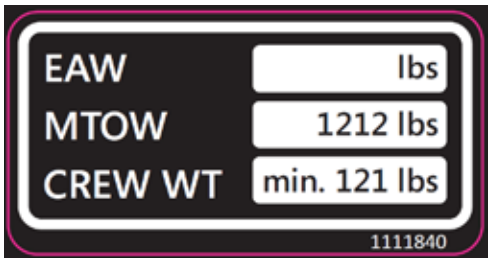


Placards (instrument panel and center console):

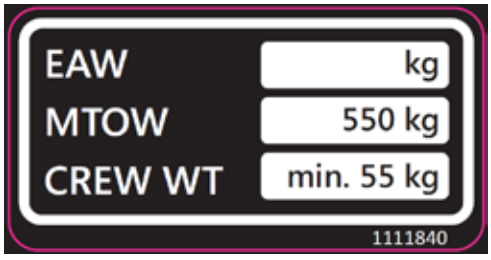








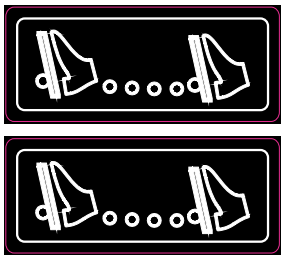
or



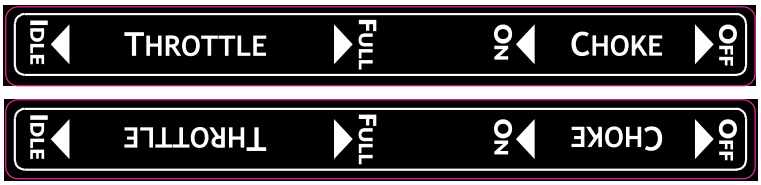
Next to microphone jacks:

Next to headphone jacks:

In front of control sticks (rudder pedal adjustment):

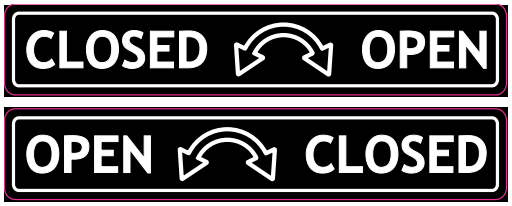


Next to choke and throttle levers:



On flap lever:

Below each door to depict door handle operation:



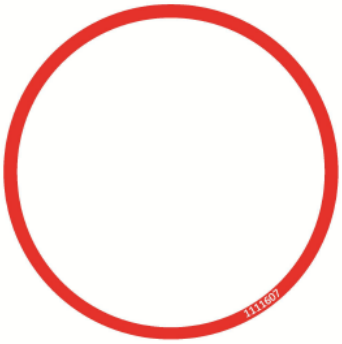
On upper tube in front or pilot:

Next to wheel brake pull (2x):

Placards (Ballistic Parachute Rescue System):

On BPRS hatch (top of fuselage):

Next to rocket exhaust (bottom of fuselage):



Next to each door, top aft corner (2x):

Next to activation handle (cockpit)

This page is intentionally left blank.

3 Emergency procedures

Introduction

This section provides information for coping with emergencies that may occur. Emergencies caused by airplane or engine malfunctions are extremely rare if proper pre-flight inspections and maintenance are practiced. Enroute weather emergencies can be minimized or eliminated by careful flight planning and good judgment when unexpected weather is encountered. In any emergency, the most important task is continued control of the airplane and maneuvering to execute a successful landing.

Stall recovery

1. Reduce the angle of attack by pushing the control stick forward.
2. Add full power (throttle lever in full forward position).
3. Resume horizontal flight.

Spin recovery

ALPHA Trainer is constructed in such a manner that it is difficult to be flown into a spin, and even so only at aft center of gravity positions. However, once spinning, intentionally or unintentionally, react as follows:

1. Set throttle to idle (lever in full back position).
2. Push stick forward and centered.
3. Apply full rudder deflection in the direction opposite the spin.
4. Lower the nose towards the ground to build speed (stick forward).
5. As the aircraft stops spinning neutralise rudder deflection.
6. Slowly pull up and regain horizontal flight.

ALPHA Trainer tends to recover from spin by itself usually after having spined for a mere 90°-180°.

WARNING! Keep the control stick centered along its lateral axis (no aileron deflections throughout the recovery phase! Do not attempt to stop the aircraft from spinning using ailerons instead of rudder!

WARNING! After having stopped spinning, recovering from the dive must be performed using gentle stick movements (pull), rather than overstressing the aircraft.
However, VNE must not be exceeded during this maneuver.

Resume normal flight when the aircraft is straight and level.

Engine failure

Engine failure during takeoff

Ensure proper airspeed first (100 km/h / 55 kts) and land the aircraft on the runway heading, avoiding obstacles in your way. Set fuel shut-off valve to OFF and set master switch to OFF position just before touch down (flight instruments will switch off).

WARNING! DO NOT CHANGE COURSE OR MAKE TURNS IF THIS IS NOT OF VITAL NECESSITY! After having landed safely, ensure protection of aircraft and vacate the runway as soon as possible to keep the runway clear for arriving and departing traffic.

Rough engine operation or engine failure in flight

First ensure proper airspeed (120 km/h / 64 kts), then start analyzing terrain underneath and choose the most appropriate runway or site for landing out.

Provided the engine failed aloft, react as follows:

Make sure the master switch is in the ON position, magneto switches both set to ON, fuel valve OPEN and Fuel pump switch ON (if applicable - see chapter 7). Attempt to restart the engine. If unsuccessful, begin with the emergency landing/outlanding procedure immediately.

Emergency landing / Outlanding

1. Shut off fuel valve.
2. Fuel pump switch OFF (if applicable - see chapter 7).
3. Magneto L/R - OFF
4. Seatbelts - secured.
5. Approach and land with extreme caution, maintaining normal airspeeds.
6. Radio: transmit Mayday - Transponder: squawk 7700 (if time permits)
7. Flaps (+2) - when landing is assured
8. Master OFF - just before touch down (flight instrument will switch off)
9. After having landed leave the aircraft immediately.

The outlanding maneuver MUST be preformed with regard to all normal flight airspeed parameters.

Engine fire

Engine fire on ground

This phenomenon is very rare in the field of sport aviation. However, if an engine fire occurs on ground, react as follows:

1. Shut fuel valve OFF
2. Fuel pump OFF (if applicable - see chapter 7).
3. Come to a full-stop, engage starter and set throttle to full power (lever full forward).
4. Disconnect the battery from the circuit (pull battery disc. ring on the switch column)
5. Master switch OFF immediately after the engine has stopped.
6. Abandon the aircraft and start the fire extinguishing.

WARNING! After the fire has been extinguished DO NOT attempt to restart the engine.

Engine fire in flight

1. Shut fuel valve OFF.
2. Fuel pump OFF (if applicable - see chapter 7).
3. Set full power (throttle lever in full forward position) until engine stops.
4. Set magnetos to OFF.
5. Keep avionics ON and master ON as required, on final approach set both OFF (instruments will switch off).
6. Set ventilation for adequate breathing. Keep in mind that oxygen intensifies fire.
7. Perform side-slip (crab) maneuver in direction opposite the fire.
8. Perform emergency landing out procedure.

Smoke in cockpit

Smoke in cockpit is usually a consequence of electrical wiring malfunction. As it is most definitely caused by a short circuit it is required that the pilot reacts as follows:

1. Fuel pump switch OFF (if applicable - see chapter 7)
2. Avionics OFF

WARNING! Setting Avionics switch off will switch off all instruments but enables unobstructed engine operation while at the same time disconnects all other electrical devices from the circuit. Verify that the 12 V socket is OFF as well.
2. Disconnect the battery from the circuit (pull battery disconnection ring on the instrument panel's switch column).
3. Land as soon as possible.

In case you have trouble breathing or the visibility out of the cockpit has degraded severely due to the smoke, open the cabin door and leave it hanging freely. Flying with the door open, do not, under any circumstances exceed 110 km/h / 60 kts.

Carburetor icing

First noticeable signs of carburetor icing are rough engine noises and gradual loss of power.

Carburetor icing may occur even at temperatures as high as 10°C (50°F), provided the air humidity is increased.

Should you be suspecting carburetor icing to take place, descend immediately into warmer and/or less humid air!
In case of complete power loss perform emergency landing out procedure.

Electrical system failure

The engine will continue to function due to the onboard alternator and battery. In case of battery failure, be aware that the engine can keep running, however a re-start will not be possible. In event of alternator failure, the battery will support the onboard avionics. In event of double power source failure, flight instruments will not be available.

Flutter

Flutter is defined as the oscillation of control surfaces. It is most cases caused by abrupt control deflections at speeds close to or in excess of VNE. As it occurs, the ailerons, elevator or even the whole aircraft start to vibrate violently.

Should flutter occur, increase angle of attack (pull stick back) and reduce throttle immediately in order to reduce speed and increase load (damping) on the structure.

WARNING! Fluttering of ailerons or tail surfaces may cause permanent structural damage and/or inability to control the aircraft. After having landed safely, the aircraft MUST undergo a series of check-ups performed by authorized service personnel to verify airworthiness.

Exceeding VNE

Should the VNE be exceeded, reduce airspeed slowly and continue flying using gentle control deflections. Land safely as soon as possible and have the aircraft verified for airworthiness by authorised service personnel.

Ditching

Should you be forced to land in a body of water, use the same emergency procedure as above for the "Emergency landing / Landing out" case. In addition, make sure to open both doors fully before hitting the water, as well as disconnect the battery from the circuit (pull ring on electrical panel). Touch the water with the slowest possible speed, possibly from a high-flare situation.

Icing/Pneumatic instrument failures

Turn back or change altitude to exit icing conditions. Consider lateral or vertical path reversal to return to last "known good" flight conditions. Maintain VFR flight!

Set cabin air (heating) ON. Watch for signs of icing on the pitot tube. In case of pneumatic instrument failures, use the GPS (optional) information to reference to approximate ground speed. Plan the landing at the nearest airport, or a suitable off airport landing site in case of an extremely rapid ice build-up.
Maneuver the airplane gently and leave the wing flaps retracted. When ice is built up at the horizontal stabilizer, the change of pitching moment due to flaps extension may result of loss of elevator control. Approach at elevated speeds (70 kts, also if using the GPS as a reference).

WARNING! Failure to act quickly may result in an unrecoverable icing encounter.

This page is intentionally left blank.

4 Normal procedures

Daily inspection

The daily inspection matches the pre-flight inspection.

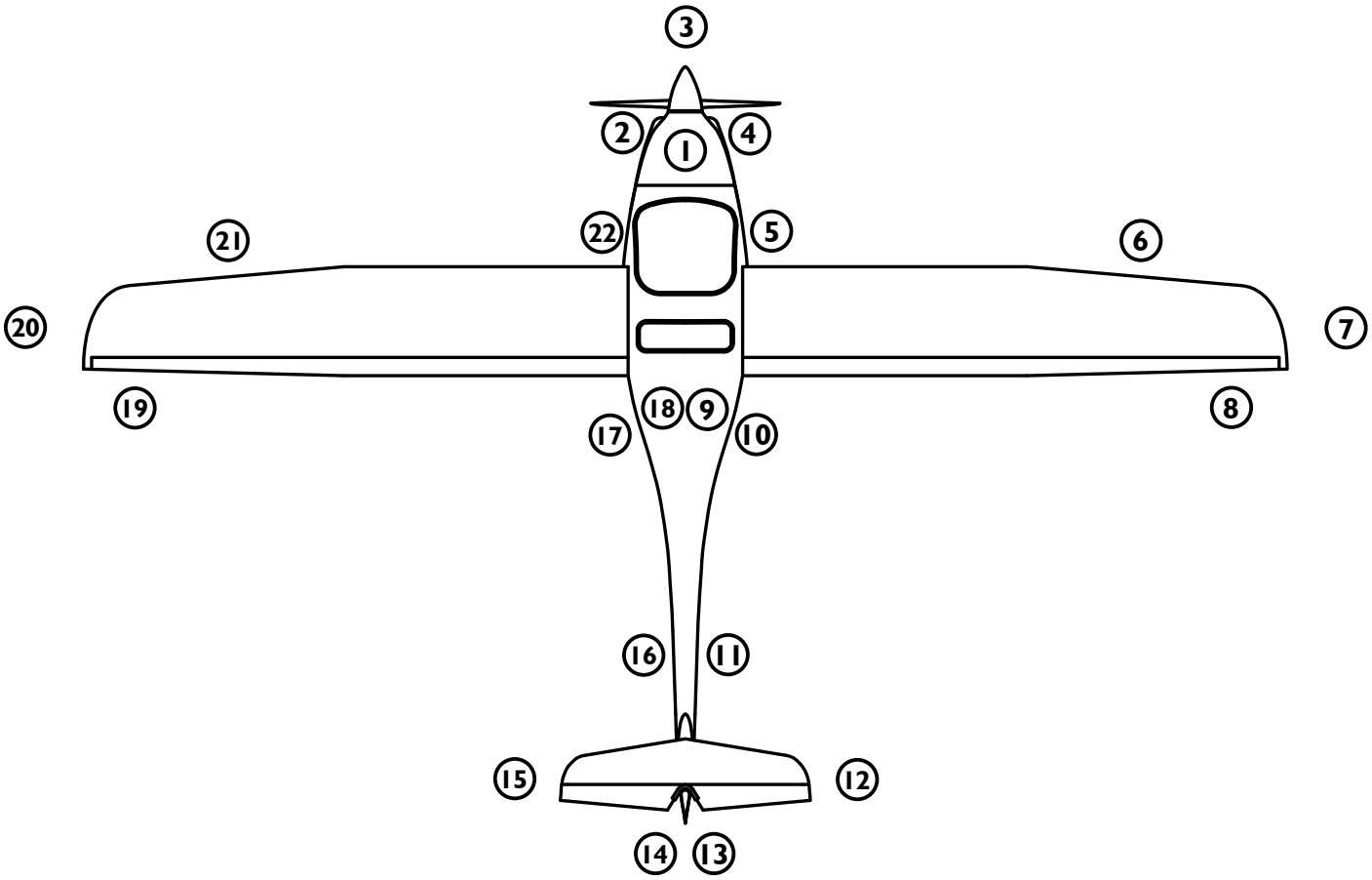
Pre-flight inspection

WARNING! Every single inspection mentioned in this chapter must be performed prior to EVERY FLIGHT, regardless of when the previous flight took place!

The person responsible for the pre-flight inspection is the pilot, who is required to perform the check-up in the utmost thorough and precise manner.

If the status of any of the parts and/or operations does not comply with conditions stated in this chapter, the damage MUST be repaired prior to engine start-up. Disobeying these instructions may result in serious additional damage to the plane and crew, including injury and loss of life!

Schematic of pre-flight inspection



1 Engine, engine cover
2 Gascolator
3 Spinner, Nose wheel
4 Propeller
5 Undercarriage, RH wheel
6 Right wing - leading edge
7 Right wingtip, lights
8 Right wing - trailing edge
9 BPRS cover
10 Fuselage (RH side)
11 Fuselage, continued (right)
12 Hor. tail surfaces (right)
13 Vert. tail surfaces (right)
14 Vert. tail surfaces (left)
15 Hor. tail surfaces (left)
16 Fuselage, continued (left)
17 Fuselage (LH side)
18 Fuel reservoir cap/vent tube
19 Left wing - trailing edge
20 Left wingtip, lights
21 Left wing - leading edge
22 Undercarriage, LH wheel

Engine, engine cover ①

Cooling fluid level: half way to the top

Oil quantity: within designated limits

Throttle, choke and oil pump wires: no mechanical damage, smooth and unobstructed movement

Radiators and hoses: no mechanical damage and/or leakage, air filters clean and intact

Exhaust pipes and muffler: firmly in position, no cracks, springs intact and in position, rubber dumpers intact

Fuel and/or oil leakage: no fluid on hoses, engine housing or engine cover

Reduction gearbox: check for eventual oil leakage, all bolts and plugs attached firmly

Fasteners and engine cover screws: tightened, engine cover undamaged

Gascolator ②

Drain approximately 1 cup of fuel and check for contamination.

Spinner ③

Spinner: no mechanical damage (e.g. cracks, impact spots), screws tight
Bolts and nuts: secured
Nose wheel: grab aircraft's propeller and push it towards the ground to verify proper nose wheel suspension operation. Then lift the nose wheel off the ground and check for nose leg strut free play.
Bolts: fastened
Tire: no cracks, adequate pressure
Wheel fairing: undamaged, firmly attached, clean (e.g. no mud or grass on the inside)

Propeller ④

Hub and blades: no mechanical damage (e.g. cracks), both immaculately clean
Bolts and nuts: secured

Undercarriage, wheels ⑤ ㉒

Bolts: fastened
Landing gear strut: no mechanical damage (e.g. cracks), clean
Wheel: no mechanical damage (e.g. cracks), clean
Wheel axle and nut: fastened
Fluid line (hydraulic brakes): no mechanical damage and/or leakage
Tire: no cracks, adequate pressure

Wings' leading edge ⑥ ㉑

Surface condition: pristine, no cracks, impact spots, no paint and/or edge separations
Pitot tube: firmly attached, no mechanical damage or bends. Remove protection cover and make sure it is not blocked or full of water.
Wing drain holes: make sure they are not blocked and clean accordingly.
Airbrakes (if applicable - see SPOH-161-00-41-050): makes sure they are flush to the wing surface when closed.

Wingtip, lights ⑦ ⑳

Surface condition: pristine, no cracks, impact spots or bumps, no paint separations

Wings' trailing edge ⑧ ⑲

Surface condition: pristine, no cracks, impact spots, no paint and/or edge separations
Aileron: pristine surface, no cracks and/or impact spots, no paint abnormalities and edge separations, no vertical or horizontal free play, smooth and unobstructed deflections

BPRS cover and Fuel reservoir cap ⑨ ⑱

BPRS cover: intact
Fuel reservoir cap: fastened. Make sure the vent pipe is completely clean.

Fuselage, antenna ⑩ ⑰

Self-adhesive tape: in position, no separations
Flaperon control system cover, antenna: firmly attached

Fuselage, continued ⑪ ⑯

Surface condition: pristine, no cracks, impact spots or bumps, no paint separations

Horizontal tail surfaces ⑫ ⑮

Surface condition: pristine, no cracks, impact spots or bumps, no paint and/or edge separations
Hinges: no free play in any direction
Horizontal stabilizer attachment mechanism: fastened and secured
Mylar seals covering the gap between horizontal and vertical tail surfaces: in position
Elevator: smooth and unobstructed up-down movement, no side-to-side free play

Vertical tail surfaces ⑬ ⑭

Vertical fin bottom part: no cracks, impact spots or paint separations along main chord
Surface condition: pristine, no cracks, impact spots or bumps, no paint separations
Hinges: no free play in any direction
Rudder cable endings: intact, bolts in position

CAUTION! Pre-flight inspection should be performed following stations 1 through 22!

Cockpit pre-flight inspection

Instrument panel and instruments: checked
Battery disconnection lever: in position for battery operation (lever deflected towards the firewall)
Master switch OFF: no control lights and/or electronic instrument activity
Fuel pump switch: OFF (if applicable - see chapter 7)
Master switch ON: generator fail light on (engine not running!)
Avionics switch ON: Make sure you have set all instruments to correct initial setting
Main wing spars and connectors: no visible abnormalities of metal parts, spars, pins and bolts; all bolts and nuts in position and tightened
Fuel hoses, pitot-static lines and electrical cables: correctly connected and in position
Safety belts: undamaged, verify unobstructed harness opening; fastening points intact
Doors and windshield: perfect closing at all three points, smooth opening, hinges firmly attached; transparent surfaces immaculately clean with no cracks.
Flap handle: button spring firm, locking mechanism working properly, smooth movement along full deflections, no free play or visible damage.
Radio wiring: test the switches, check connectors and headset, perform radio check
Battery: firmly in position, joints clean with wires connected
Emergency parachute release handle (optional): safety pin removed.
Elevator trim: verify travel and set neutral before start-up.
Make sure unobstructed access is provided.

CAUTION! Make sure that baggage compartment limitations (22 lbs - 10 kg max) and aircraft weight and balance limitations are respected.

Normal procedures and recommended speeds

To enter the cabin first lift the door all the way to the bottom wing surface. The silver knob will grab and secure the door in position. Sit on the cabin's edge and grab it to support your body. Drag yourself onto the seat, lifting only one leg over the stick for best position. Immediately after positioning yourself in the seat, check the rudder pedals' position suits your size and needs. The pedals' position is also adjustable during flight.
To close the door, gently pull the silver knob and allow the door to fall into the vertical position. Check for obstructions at the lower and side connection points. With a gentle inwards pressure, rotate the handle into the over center position (slightly past horizontal).

CAUTION! Failure to fully rotate handle can cause inadvertent door opening in flight due to aircraft vibration and result in door damage.

CAUTION! If a door needs to be opened in flight, (for example to retrieve a seatbelt strap), firmly grasp the handle so as to not allow the door to raise uncontrolled up into the airflow.

Fasten the safety belts according to your size.
Adjust the rudder pedals according to your required legroom. Sit inside the cockpit and release the pressure off the pedals. Pull the black knob in front of the control stick to bring the pedals closer to you. To move the pedals further away, first release the pressure of the pedals, then pull on the knob slightly (this will release the lock in the mechanism). Now push the pedals forward using with your feet, while keeping the black adjustment knob in your hand.

WARNING! The safety harness must secure you in your seat. This is especially important when flying in rough air, or else you may bump your head on the cabin support strut assembly and/or wing spars. Make sure you tighten the bottom straps first, then shoulder straps.

Engine start-up

Before engine start-up

CAUTION! To ensure proper and safe use of the aircraft it is essential to familiarize yourself with engine's limitations and engine manufacturer's safety warnings. Before engine start-up make sure the area in front of the aircraft is clear. It is recommended to start-up the engine with the aircraft's nose pointing into the wind.

Make sure the fuel quantity is sufficient for the planned duration of flight.
Make sure the pitot tube is uncovered and rescue parachute safety pin removed.
Engage wheel brakes. Engage parking brake.

Engine start-up

Make sure fuel valve is OPEN and Master switch in OFF position, Avionics switch OFF.
Should the engine be cold, apply choke (lever full back).
Throttle idle position.
Set master switch ON, Avionics switch ON. Set both magnetos ON, engage engine starter. Verify oil and fuel pressure within limits.
Set RPM to 2000 for the first two minutes, then 2500 RPM. Slide the choke lever forward gradually.

CAUTION! When the engine is very cold, the engine may refuse to start. Should this occur, move the choke handle fully backwards and hold it there for some 20 seconds to make mixture richer.

Engine warm-up procedure

The engine should be warmed-up at 2500 RPM up to the point working temperature of oil is reached.
Warming-up the engine you should:
1 Point aircraft's nose into the wind.
2 Verify the engine temperature ranges within operational limits.

CAUTION! Avoid engine warm-up at idle throttle as this causes the spark plugs to turn dirty and the engine to overheat.

After the working oil temperature has reached, engage wheel brakes and control stick in full back position, first set engine power to 4000 RPM in order to perform the ignition check. Set the ignition switches (MAG L/R) OFF and back ON one by one to verify RPM drop of not more than 300 RPM.
When the ignition check has been completed, add full power (throttle lever full forward) and monitor engine's RPM. Make sure they range between maximum recommended and maximum allowable RPM limits.
NOTE The engine does not reach 5800 RPM on ground. Engines are factory set to reach maximum ground RPM of 5300 - 5500 at sea level at 25 degrees Celsius. Maximum ground RPM may vary depending on the season and service elevation.

CAUTION! Should engine's RPM be lower than the recommended on ground amount (min. 5000 RPM) or in excess of maximum allowable RPM on ground (5800) during this maneuver, check engine and wiring for correct installation.

WARNING! If the aircraft is equipped with airbrakes (optional), ensure they are closed for takeoff! See SPOH-161-00-41-050 - Electric airbrakes POH supplement - for additional information about use, setting and testing.

Taxi

Release parking brake if set and release the handbrake. Taxiing technique does not differ from other aircraft equipped with a steerable nose wheel. Prior to taxiing it is essential to check the wheel brakes for proper braking action.

In the case you expect taxi a long way, take engine warm-up time into account and begin taxiing immediately after engine start-up. Warm-up the engine during taxiing so the engine does not overheat because of prolonged ground operation.

Holding point

Make sure the temperatures at full power range are within operational limits.
Make sure the safety belts are fastened and doors closed and secured at all three closing points.
For short field operations set flaps to (+2) position (flap handle full up). For all other operations select (+1) position. Ensure the airbrakes (optional) are closed for takeoff.
Power idle.

Fuel pump switch: ON (if applicable - see chapter 7).
Fuel pressure: check (increase)

NOTE See SPOH-161-00-41-050 - Electric airbrakes POH supplement - for information about testing and use of airbrakes (optional).

CAUTION! Should the engine start to overheat because of long taxi and holding, shut down the engine and wait for the engine temperatures drop to reasonable values. If possible, point the aircraft's nose into the wind. This will provide radiators with airflow to cool down the engine faster.

Take-off and initial climb

Before lining-up verify the following:

Parking brake / brakes : disengaged
Fuel valve: check fully open
Fuel quantity: check sufficient
Safety belts: fastened
Cabin doors: closed securely
Trim: in neutral position or slightly nose-down
Flap handle: for short field operations set flaps to the (+2) position (flap handle full up). For all other operations select (+1) position.
Runway: clear

Now release brakes, line up and apply full power, adding power gradually.
Verify engine RPM at full throttle (5300 - 5500 RPM).

WARNING! Should engine RPM not reach more than 5000 RPM when at full throttle, ABORT TAKE-OFF IMMEDIATELY, come to a standstill and verify systems.

Start the takeoff roll pulling the control stick one third backward and lift the nose wheel off the ground as you accelerate. Reaching 40-43 kts (75-80 km/h), gently pull on the stick to get the aircraft airborne.

CAUTION! Crosswind (max 18 kts) takeoff should be performed with control stick pointed into the wind. Special attention should be paid to maintaining runway heading!

Initial climb

When airborne, engage brakes momentarily to prevent in-flight wheel spinning.
Accelerate at full power and later maintain proper climbing speed.
As you reach 60 kts (110 km/h) above 150 ft (50 m), set flaps to (+1), reaching 70 kts (130 km/h) at 300 ft (100 m) retract flaps. Reduce RPM by 10% or below 5500 RPM and continue climbing at 76 kts (140 km/h).
Adjust the trim to neutralize the stick force if necessary.
Remember to keep the temperatures and RPM within operational limits during climb out.

CAUTION! Reduce power and lower nose to increase speed in order to cool the engine down if necessary.

Should you be climbing for a cross-country flight, consider climbing at 100 kts (185 km/h) as this will greatly increase your overall travelling speed.
Reaching cruise altitude, establish horizontal flight and set engine power to cruise (5300 RPM).

Cruise

As horizontal flight has been established, verify on-board fuel quantity again.
Switch fuel pump OFF (if applicable - see chapter 7)
Keep the aircraft balanced while maintaining desired flight parameters.

Check engine operation and flight parameters regularly! Recommended cruise is at 5300 RPM, with an expected fuel burn of around 13.6 L/h (3.6 USgal) per hour.

Cruising in rough conditions

Should you experience turbulence, reduce airspeed below VNO and continue flying with flaps retracted.

CAUTION! In rough air, reduce engine power if necessary to keep airspeed below VNO.

Descent and final approach

Descent at speeds at or below VNO and flaps retracted.

For approach reduce speed to 70 kts (130 km/h) and set flaps to (+1) before turning to base leg.
Fuel pump switch: ON (if applicable - see chapter 7)
Adjust engine power to maintain proper airspeed. Set trim to neutralise stick force if necessary.
During the descent monitor temperatures and keep them within operational limits.

CAUTION! During the descent engine power MUST be reduced. Should you be forced to descend at idle power, make sure you keep adding throttle for short periods of time, not to turn the spark plugs dirty and minimize the risk of ice formation on carburetors.

On final, set flaps to (+2).
Align with the runway and reduce power to idle.
Maintain an airspeed of 55 kts (102 km/h).
Use throttle to control your descent glide path, otherwise control your attitude and crab if necessary.

NOTE For flapless approach and landing increase speeds by 5 kts.
NOTE Flapless landings are permitted only during day-time operations.

NOTE See SPOH-161-00-41-050 - Electric airbrakes POH supplement - for information about use of airbrakes (optional).

CAUTION! Crosswind landings require higher final approach speeds to ensure aircraft's safe maneuverability. Increase the approach speed by 1 kts for every 1 kts of crosswind component e.g. in case of 5 kts crosswind component, increase the approach speed by 5 kts.

Roundout and touchdown

CAUTION! See chapter "Performance" for landing performance.

Roundout and touchdown (flare) occurs at following airspeeds:

Calm air, aircraft at MTOM	**40 kts (75 km/h) IAS**
Rough air, aircraft at MTOM (incl. strong crosswinds up to 34 km/h (18 kts))	**42 kts (78 km/h) IAS**

CAUTION! Land the aircraft in such a manner that the two main wheels touch the ground first, allow the nose-wheel touchdown only after speed has been reduced below 25 kts. When lowering the nose wheel to the runway the rudder MUST NOT be deflected in any direction (rudder pedals centered).

CAUTION! Elevated speeds must be used when landing with flaps retracted.

When on ground, start braking action holding the control stick in full back position. Provided the runway length is sufficient, come to a complete standstill without engaging the brakes holding the control stick slightly backwards as you slow down.

Crosswind approach and roundout

CAUTION! Crosswinds prolong landing runway length due to elevated airspeed that should be used, see previous page.

Performing a crosswind landing, the wing-low method should be used. When using the wing-low method it is necessary to gradually increase the deflection of the rudder and aileron to maintain the proper amount of drift correction.

WARNING! If the crab method of drift correction has been used throughout the final approach and roundout, the crab must be recovered before the touchdown by applying rudder to align the aircraft's longitudinal axis with its direction of movement.

Balked landing

Add full power, establish Vy, retract flaps as required.

WARNING! If the aircraft is equipped with airbrakes (optional), ensure they are closed in event of go around maneuver! See SPOH-161-00-41-050 - Electric airbrakes POH supplement - for additional information.

Parking

Come to a complete standstill by engaging the hand brake.
Re-check RPM drop by switching ignition OFF and back ON, one by one.
Fuel pump OFF (if applicable - see chapter 7).
Leave the engine running at idle RPM for a minute in order to cool it down.
Set all green switches OFF, both magnetos OFF, Avionics switch OFF and Master switch OFF.

Insert parachute rescue system handle's safety pin. Apply parking brake. Open cabin door, unfasten safety belts and exit the cockpit. Chock the wheels and secure the pitot tube by putting on a protection cover.
It is recommended to shut the fuel tank valve.

5 Performance

Introduction

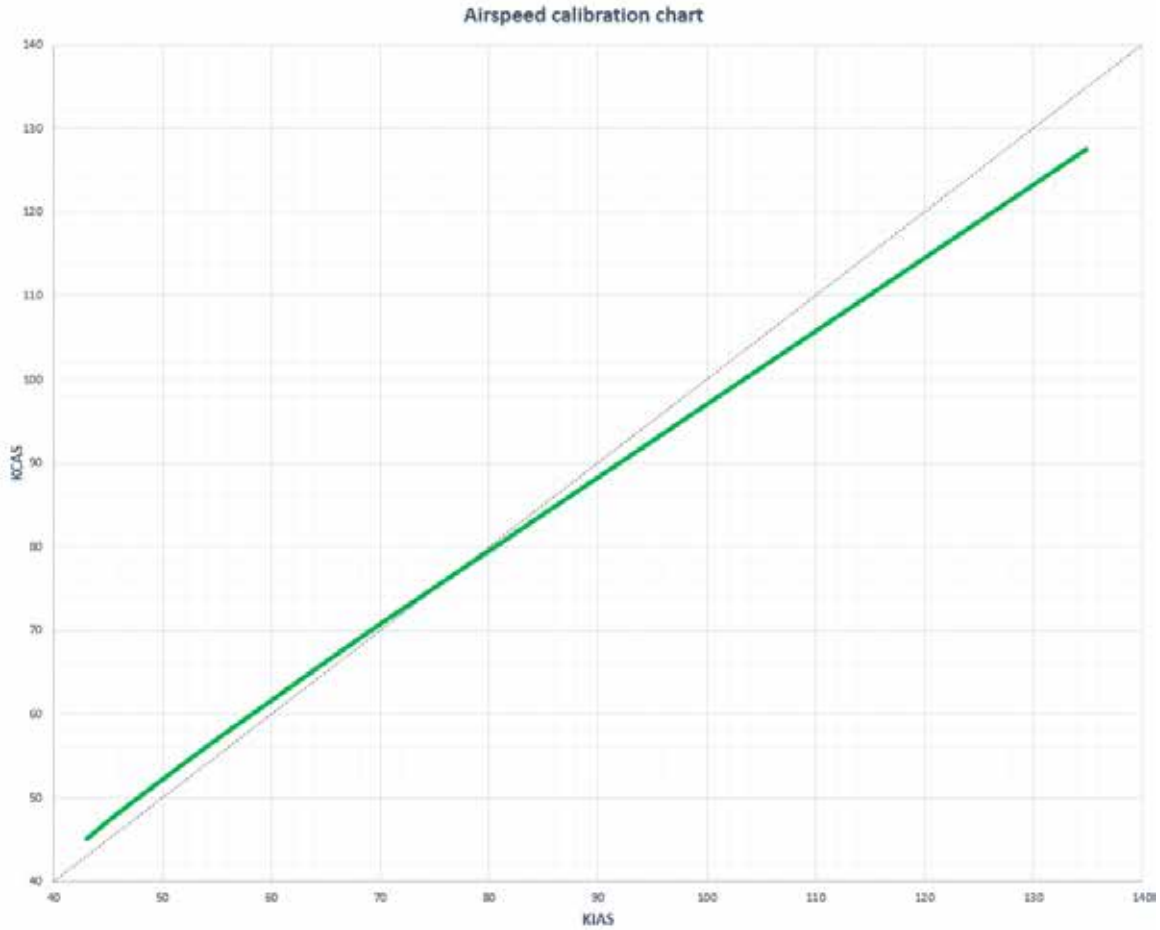
This section provides information about the aircraft's airspeed calibration, stall speeds and general performance. All data published was obtained from test flight analysis using average flying skills.

ALPHA Trainer has demonstrated adequate engine cooling performance at ambient temperatures of 45°C (113 F). This is not to be regarded as the limit temperature, however temperatures higher than the mentioned may have an adverse effect on engine cooling and overall performance.

Airspeed indicator calibration (IAS to CAS)

The Pitot tube's mounting point and constructions results in the following IAS to CAS correction values.

Airspeed calibration chart



Stall Speeds

Stall speeds at MTOM (1212 lbs / 550 kg) for ALPHA Trainer are as follows:

Stall speed (Indicated)	KIAS
Flaps retracted (0); 0°	43 kts (80 km/h)
Flaps (+1); +15° (down):	40 kts (74 km/h)
Flaps (+2) ; +25° (down):	37 kts (68 km/h)

Take-off performance

All data published in this section was obtained under following conditions:

Aircraft at MTOM
Elevation: sea level
Wind: calm
Runway: hard runway
Data extrapolated for ICAO standard atmosphere

ALPHA Trainer	**ALPHA Trainer**
Takeoff ground roll at MTOM	555 ft
Takeoff runway length (over 50 ft/15 m obstacle)	870 ft

NOTE In order to meet the data for takeoff runway length over 50 ft obstacle maintain V_X (58 kts, 108 km/h) after take-off.

Soft (grass) runways increase the published take-off performance data by 20%.

Takeoff runway length may vary depending on the wind, temperature, elevation and wing & propeller surface condition.

Effect of elevation

The table below provides data about the effect of elevation on takeoff runway length.

Elevation ft (m)	0	1650 (500)	3280 (1000)	4920 (1500)
Atmosph. pressure (inHg)	29.92	28.17	26.52	24.95
Atmosph. pressure (hPa)	1013	954	898	845
Outside temperature (°C)	15,0	11,7	8,5	5,2
Outside temperature (°F)	59	53	47	41
	Takeoff ground roll [ft]			
ALPHA Trainer	555	700	870	1090
	Takeoff distance over 50 ft / 15 m obstacle [ft]			
ALPHA Trainer	870	1035	1295	1420

WARNING: Calculating take-off performance in Hot Atmosphere, it is mandatory to consider the takeoff runway length prolongs as follows: $L = 1{,}10 \cdot (L_h + L_t - L_0)$.
Abbreviations are as follows:
L_h = takeoff runway length at present elevation, ISA standard conditions
L_t = takeoff runway length at sea level at same temperature/wind as on the given location,
L_0 = zero wind takeoff runway length at 15°C at sea level.
e.g. if outside temperature is 25°C and you are on 500 m elevation, your takeoff runway length will be: $L = 1{,}10 \cdot (L_h + L_t - L_0) = 1{,}10 \cdot (205\ m + 215\ m - 180\ m) = 264$ meters.

Effect of the wind

Wind (head, cross or tailwind) affects aircraft's ground speed (GS).

Headwind on takeoff or landing causes the takeoff and landing distance length to shorten as the GS is smaller during these two flight stages. The opposite holds true for tailwind on takeoff and landing as tailwind prolongs takeoff and landing distances significantly.

Headwind shortens takeoff and landing distances by 25 feet (8 meters) with every 3 kts (5 km/h) of wind increase (e.g. provided there is a 6 kts (10 km/h) headwind on takeoff and landing, distances will be approximately 50 ft (16 meters) shorter than ones published in the manual).

Tailwind prolongs takeoff and landing distances by 60-65 feet (18-20 meters) with every 3 kts (5 km/h) wind increase (e.g. provided there is a 6 kts (10 km/h) tailwind on takeoff or landing, distances will be approximately 120-130 feet (36-40 meters) longer then ones published in the manual).

WARNING! Tailwind affects takeoff and landing performance by more than twice as much as headwind does.

The table below provides data about the effect of headwind (+) and tailwind (-) on takeoff runway length (referenced for sea level conditions, airplane at MTOM). Relative effect is maintained at any elevation.

Windspeed (kts)	-6	-4	-2	0	4	8	12
				Takeoff runway length [ft]			
ALPHA Trainer	680	645	605	555	525	495	480
				Takeoff distance over 50 ft / 15 m obstacle [ft]			
ALPHA Trainer	1130	1065	965	870	810	760	720

Effect of outside air temperature

The table below provides data about the effect of outside temperature on takeoff runway length. Data is referenced for sea level performance at MTOM.

Temperature (°F)	59	68	77	86	95
			Takeoff runway length [ft]		
ALPHA Trainer	555	670	820	935	1020
			Takeoff distance over 50 ft / 15 m obstacle [ft]		
ALPHA Trainer	870	965	1045	1280	1410

Temperature (°C)	32	41	50
		Takeoff runway length [ft]	
ALPHA Trainer	960	1090	1220
		Takeoff distance over 50 ft / 15 m obstacle [ft]	
ALPHA Trainer	1360	1460	1620

Climb performance

ALPHA Trainer	ALPHA Trainer
Best climb speed (Vy)	76 kts (140 km/h)
Best climb rate at MTOM, sea level	1220 fpm (6.1 m/s)
Climb rate at 100 kts (185 km/h), sea level	800 fpm (4.0 m/s)
Best angle climb speed (Vx)	58 kts (108 km/h)

Effect of outside air temperature

For every 5 degrees Celsius (10 F) of OAT increase versus the ISA, the climb rate decreases by 60 fpm (0.3 m/s).

Effect of altitude

The table below provides data about the effect of elevation on climb rate at best climb speed V_y at MTOM

ALPHA Trainer	ALPHA Trainer
0 m (0 ft)	1220 fpm (6.1 m/s)
500 m (1600 ft)	1180 fpm (5.9 m/s)
1000 m (3300 ft)	1100 fpm (5.5 m/s)
1500 m (5000 ft)	1020 fpm (5.1 m/s)

NOTE Climb rate is measured at max continuous power (5500 RPM) of the engine with the flaps retracted at V_y and MTOM.

Climb performance may vary depending on, temperature, altitude, humidity and wing & propeller surface condition.

Cruise

Aircraft at MTOM, recommended cruise power of 5300 RPM in ISA and sea level altitude, flaps retracted:

ALPHA Trainer	ALPHA Trainer
Cruise airspeed	108 kts (200 km/h)

Best economy cruising level or the ALPHA Trainer is 6000 ft. There, cruise performance is equivalent or better than above due to IAS-TAS relation, but fuel consumption is lower. At these parameters the fuel burn is around 3.6 USgal (13.6 L) per hour. For detailed fuel consumption determination for various cruising regimes consult the Rotax 912 Operators manual.

Effect of outside temperature

Every 10 degrees Celsius of OAT increase versus the IAS, the cruising speed at 5300 RPM decreases by 3 kts.

Descent

Reference sink rate, with flaps set to (+2) position measures 440 fpm (2.2 m/s) at 50 kts (92 km/h), power idle.

ALPHA Trainer	ALPHA Trainer
Sink rate at 50 kts (92 km/h) - flaps (+2)	440 fpm (2.2 m/s)

The glide

The glide is defined as unpowered wings-level flight at speed providing best lift over drag ratio or minimum sink rate.

Should the engine become inoperative in flight, as a result of either intended or unintended actions, and it cannot be restarted, react as follows:

Establish wings-level flight at the speed providing best lift over drag ratio, if you desire to glide the greatest distance from a given altitude.

Establish wings-level flight at speed providing minimum sink rate, if you desire do stay airborne the longest. This may come in handy when you're forced to give way to other aircraft or if you simply need time to determine the most appropriate site to land out on.

ALPHA Trainer	ALPHA Trainer
Minimum sink speed	58 kts (108 km/h)
Minimum sink rate, flaps (0)	460 fpm (2.3 m/s)
Best lift/drag ratio speed	64 kts (118 km/h)
Best lift over drag ratio , flaps (0)	15:1

CAUTION: If the engine fails, especially in climb, the aircraft always loses some 100 feet (30 meters) of altitude before reaching best glide speed in wings-level unpowered flight.

Landing performance

Final approach speed should always be 55 kts (102 km/h) with full flaps. Landing runway length may also vary depending on the elevation, gross weight, touchdown velocity, wind direction and how aggressive the braking action is.

The landing roll measures 410 feet (125 meters) in the following conditions: aircraft at MTOM, airport at sea level and wind calm. Should you be flying solo, the length shortens by another 30 feet (10 meters).
Total landing distance over 50 ft / 15 m obstacle measures 1510 feet (460 m).

Landing roll increases by 10 % for every 2000 ft increase in density altitude.
Total landing distance increases by 2% for every 2000 ft increase in density altitude.

CAUTION! Minimum recommended runway length for approaches is 500 m (1640 feet) with no obstacles inside the 3 deg glide slope area and runway heading in order ensure safe flying activity. Use of shorter strips should be considered a major exception and requires a lot of skill, heavy use of slipping until the last moment before touchdown and is performed at own risk.

Crosswind takeoffs/landings

The maximum allowed crosswind speed on takeoff and landing is 18 kts. The runway length required increases by 10 % for every 5 kts of crosswind component.

This page is intentionally left blank.

6 Weight and balance

Introduction

This section describes the procedure for establishing the basic empty weight and moment of the airplane. Sample calculations are provided for reference.
Specific information regarding the weight and arm for this airplane as delivered from the factory can be found in the aircraft documentation folder, look for Weight and Balance Report.

WARNING! It is the responsibility of the pilot to make sure the airplane is loaded properly. Operation outside of the prescribed weight and balance limitations could result in an accident and serious or fatal injury.

Weighing procedure

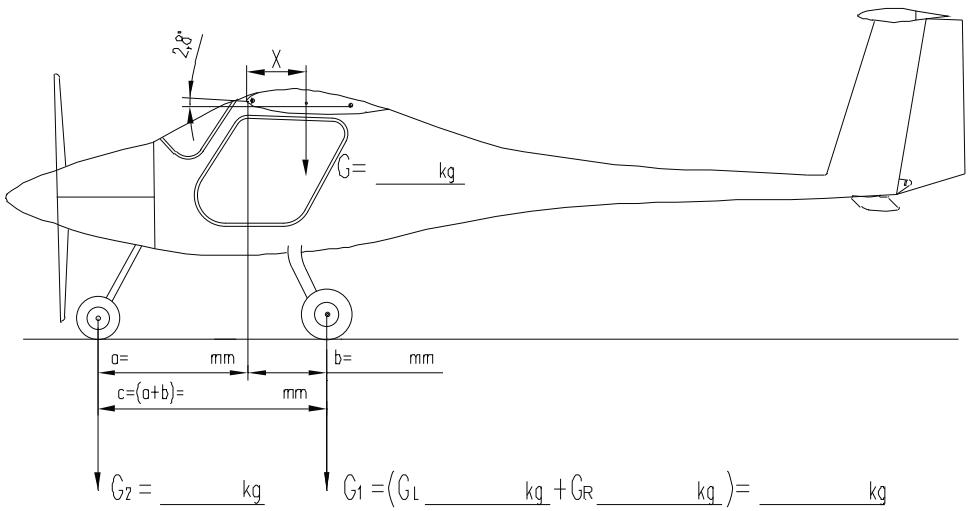
Make sure all listed aircraft parts and appliances are installed and in position.
Remove all other objects (e.g. tools, rugs, tie downs and other items ...).
Empty fuel tanks except for the unusable fuel, inflate tires to recommended operating pressures.
Fill up engine oil to the top marking.
Retract flaps and leave control surfaces centered.
Level the aircraft inside a closed space - use the leveling tool positioned on the tail cone and make sure its straight edge is level (horizontal).
Once leveled, read the scale readings and subtract eventual tare weight.
Now record all readings and fill out the bottom table.

The datum is the wing's leading edge at the fuselage root. Calculate the lever arm of CG using this formula:

$$\textbf{Lever arm of CG (X)} = \quad CG_{(mm)} = \frac{b \times G_1 - a \times G_2}{(G_1 + G_2)}$$

Weighing form

Weighing point and symbol	Scale reading	Tare	Net
Right main wheel (G_R)			
Left main wheel (G_L)			
$G_1 = G_R + G_L$			
Nose wheel (G_2)			
Total ($G = G_R + G_L + G_2$)			



Equipment list

The aircraft's empty weight data is unique for each and every ALPHA Trainer delivered. The owner is responsible for keeping the equipment list up to date. Fill it out according to actual status.

ALPHA Trainer

Serial number:

Registration number:

Equipment installed:

Determination of CG

	Weight [lbs] (kg)	Weight's lever arm [inch] (mm)	Moment [inch x lbs] (kgxm)	Remarks
Basic cfg. empty weight				
Baggage aft of the cabin		46 (1168)		
Instruments		- 12.5 (-318)		minus!!!
Pilots		10.3 (262)		
Fuel		44 (1118)		

CAUTION! Each newly installed part or appliance must be registered in the upper table. Also, new total weight and lever arm of CG values must be entered and position of CG re-determined. Furthermore, the moment must be recalculated. This is rather easy to do. First multiply the new part's weight by it's lever arm measured from the reference point (wing's leading edge). Then sum up all moments and divide the sum by the new total weight.

WARNING! The aircraft's in-flight safe center of gravity position ranges between 10 7/16" (265 mm) and 14 21/64" (364 mm) aft of datum and is not critically affected by cockpit crew weight.

WARNING! Absolute safe measure for the amount of luggage is 22 lbs (10 kg). The actual amount of luggage you can safely transport depends on the center of gravity of empty aircraft. See next pages.

Sample c.g. calculation

Guidelines

"G" is the total mass of empty aircraft. All calculations can be performed starting with aircraft empty weight and empty weight centre of gravity (CG). Pilot's and fuel shift Centre of Gravity backwards. Refer to table of lever arms for more information ("Determination of CG" - Pag 6-3)
Reference MAC is 900 mm, R = 40 mm!

WARNING! It is the responsibility of the pilot to make sure the airplane is loaded properly. Operation outside of the prescribed weight and balance limitations could result in an accident and serious or fatal injury.

Basic CG formulas and calculation

Read thoroughly. Note also that the basic c.g. at 275 mm will be used purely as an example.

First, weigh the aircraft according to the procedure described in this chapter and write down values of G1 (sum of scale readings at main wheels) and G2 (scale reading at tail/front wheel). Then calculate the position of c.g. in millimeters (mm) from the datum (wing's leading edge at wing root).

Use the following formula:

$$CG_{(mm)} = \frac{b \times G_1 - a \times G_2}{(G_1 + G_2)} = \frac{505 \times G_1 - 1020 \times G_2}{(G_1 + G_2)} = 275 \text{ mm}$$

where:
a is the distance from nose wheel axis to wing's leading edge,
b is the distance from main wheel axis to wing's leading edge,

Second, determine the c.g. position in percentage (%) of Mean Aerodynamic Chord (MAC) with following the formula:

$$CG_{\%MAC} = \frac{CG_{mm} - R}{MAC} \times 100 = \frac{275 - 40}{900} \times 100 = 26.1 \%MAC$$

where:
CGmm is the position of CG in millimeters (mm),
R is the difference between wing's leading edge and MAC's leading edge (40 mm),
MAC is the Mean Aerodynamic Chord (900 mm).

Fuel and CG

The fuel shifts the CG backward, however the aircraft is factory tuned so that a full load of fuel and luggage the CG stays forward of the aft allowable limit. Similarly, when the fuel tank is empty and there is no baggage in the baggage area, the CG is backwards of the forward allowable limit. In every case, the fuel does not shift the CG out of limits.

Baggage and CG

The amount of baggage you can carry in the baggage behind the seats is limited by the center of gravity of the empty aircraft and by the MTOM.

To calculate how much the c.g. shifts because of added baggage into the solid baggage compartment aft of the cabin use the following formula:

$$CG_{\text{with bags}} = \frac{(G_{tot} \times CG_{mm}) + (G_{bags} \times L_{mm})}{G_{tot} + G_{bags}} = \frac{(275\ \text{kg} \times 275\ \text{mm}) + (10\ \text{kg} \times 1160\ \text{mm})}{(275\ \text{kg} + 10\ \text{kg})} = 306\ \text{mm}$$

where:
Gtotal is the aircraft empty weight,
CGmm is the position of CG of empty aircraft in millimeters (mm),
Gbags is the weight of the baggage,
Lbags is the lever arm from the datum to baggage area (1160 mm).

Again, express the new c.g. in percentage of MAC:
where:
CGwith.bags is the position of CG now with bags in millimeters (mm),
R is the difference between wing's leading edge and MAC's leading edge (40 mm),
MAC is the Mean Aerodynamic Chord (900 mm).

$$CG_{\text{with bags, \%MAC}} = \frac{CG_{\text{with bags}} - R}{MAC} \times 100 = \frac{306 - 40}{900} \times 100 = 29.6\ \%MAC$$

We now have the data of c.g. of the sample aircraft with 10 kgs (22 lbs) of baggage. You can recalculate the formulas using the weights and c.g. of your empty aircraft and the planned amount of baggage aft of the cabin for your flight.

CAUTION: The baggage weight limitations in this manual represent fool-proof limits for safe operation, even without special c.g. calculation. However, the actual baggage weight limitation is different of each individual aircraft and can be determined using the above formulas. The decision of how much baggage to carry on a flight is the pure responsibility of the pilot in command!

WARNING! Always make sure that the baggage is placed fixed inside the baggage area. Movements of baggage in-flight will cause shifts of center of gravity!

WARNING! Do not, under any circumstances attempt to fly the aircraft outside the allowable c.g. limits! Allowable in-flight c.g. range is between 10 7/16" (267 mm) and 14 1/2" (368 mm), measured from the wing's leading edge backwards.

WARNING! Maximum takeoff weight (MTOM) MUST NOT, under any circumstances, exceed 1212 lbs (550 kg).

This page is intentionally left blank.

7 Aircraft & systems

Introduction

The Pipistrel ALPHA Trainer is a 34' 6" wingspan, two-seat T-tail high-wing airplane made almost entirely of composite materials.

It has a robust, tricycle undercarriage that incorporates brake-equipped wheels, a U-shaped composite strut and a steerable nose wheel.

ALPHA Trainer features flaperons, meaning that one movable surface on each wing acts both as the flap and the aileron.
Flaps offer 3 settings: the flaps handle is marked with three positions 0, +1 and +2, corresponding respectively to 0° (retracted), extracted +15° and extracted +25°.

Full dual main flight control levers make the ALPHA Trainer ideal for initial and advanced flight training. All aileron, elevator and flap controls are connected to the cabin controls using self-fitting push-pull tubes. The rudder is controlled via cables. The elevator trim is electric.

All aircraft ship with H type safety belts attached to the fuselage at three mounting points. The rudder pedals can be adjusted before and also in-flight to suit your size and needs.

The fuel tank is located in the fuselage with the fuel shut-off valve located in the cockpit. The gascolator is located beneath the lower engine cover. Refueling can be done by pouring fuel through the fuel filler neck on the fuselage.
All transparent surfaces are made of 2 mm anti UV GE tinted Lexan, which was specially developed not to shatter or split on impact.

The main wheel brakes are hydraulically driven disc type and activated via a cockpit hand-lever.

The hydraulic brake fluid used is DOT 4.

Cabin ventilation is achieved through special vents fitted into the doors, cabin heating is provided utilizing hot air from the engine.

The propeller is a fixed pitch two-blade design.

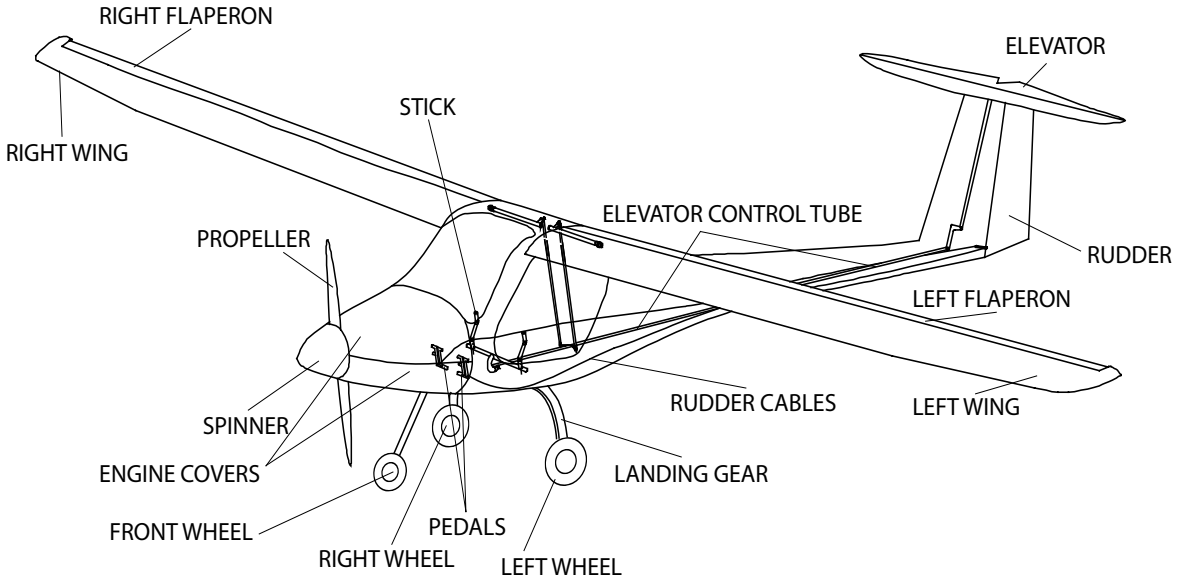
The electric circuit enables the pilot to test individual circuit items and to disconnect the battery from the circuit, should there be a distress situation.

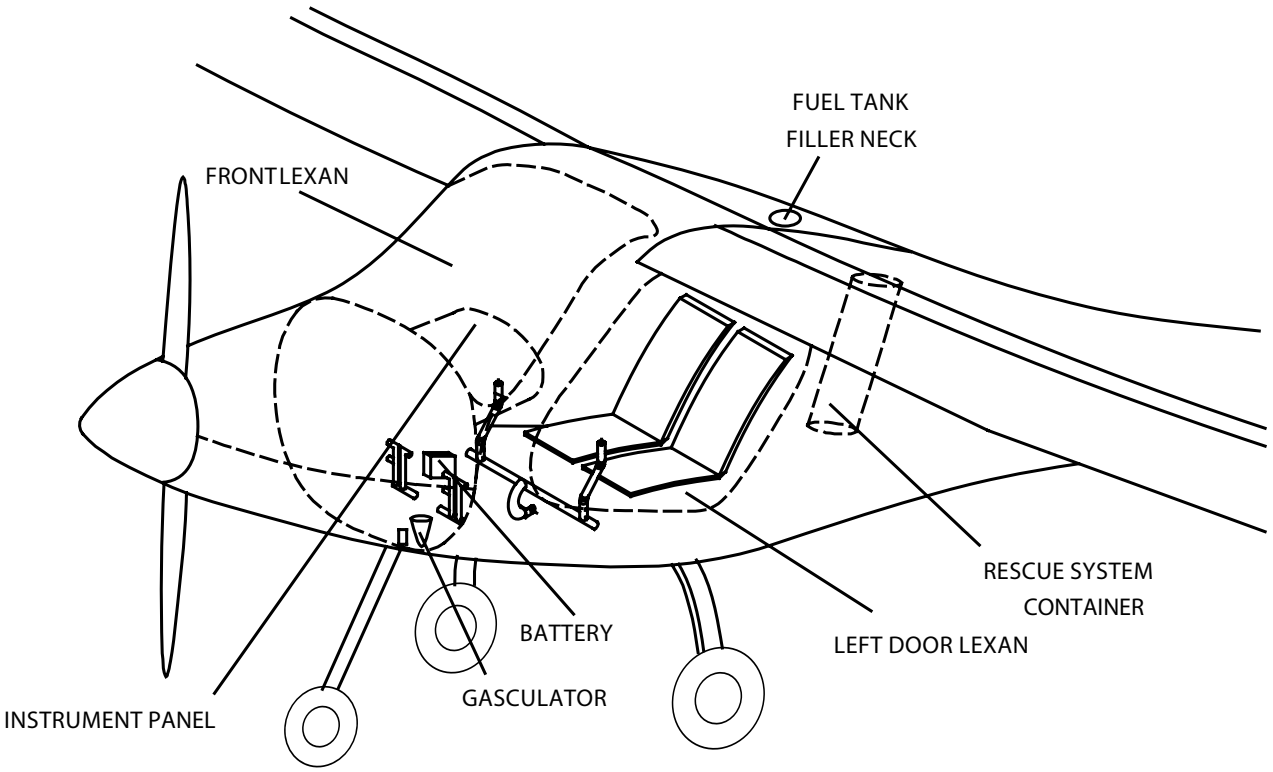
Navigation (NAV) lights, anti collision (AC) lights and a landing (LDG) light are installed.

The firewall is reinforced with heat and noise insulation.

Basic instruments come installed with operational limits pre-designated.

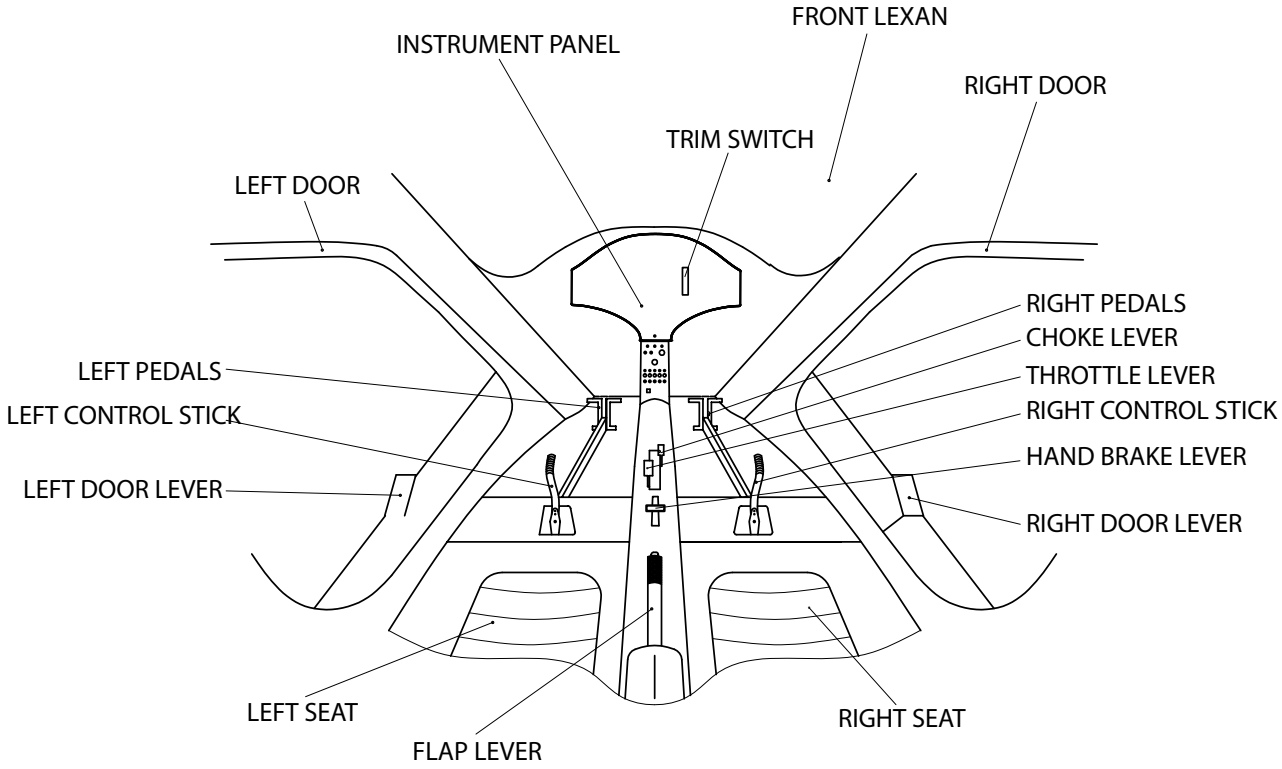
A BPRS (Ballistic Parachute Rescue System) is present and located in aft fuselage.


RIGHT FLAPERON
ELEVATOR
STICK
RIGHT WING
ELEVATOR CONTROL TUBE
PROPELLER
RUDDER
LEFT FLAPERON
RUDDER CABLES
LEFT WING
SPINNER
ENGINE COVERS
LANDING GEAR
FRONT WHEEL
PEDALS
RIGHT WHEEL
LEFT WHEEL


FUEL TANK
FILLER NECK
FRONT LEXAN
RESCUE SYSTEM
CONTAINER
BATTERY
LEFT DOOR LEXAN
GASCULATOR
INSTRUMENT PANEL

Cockpit controls

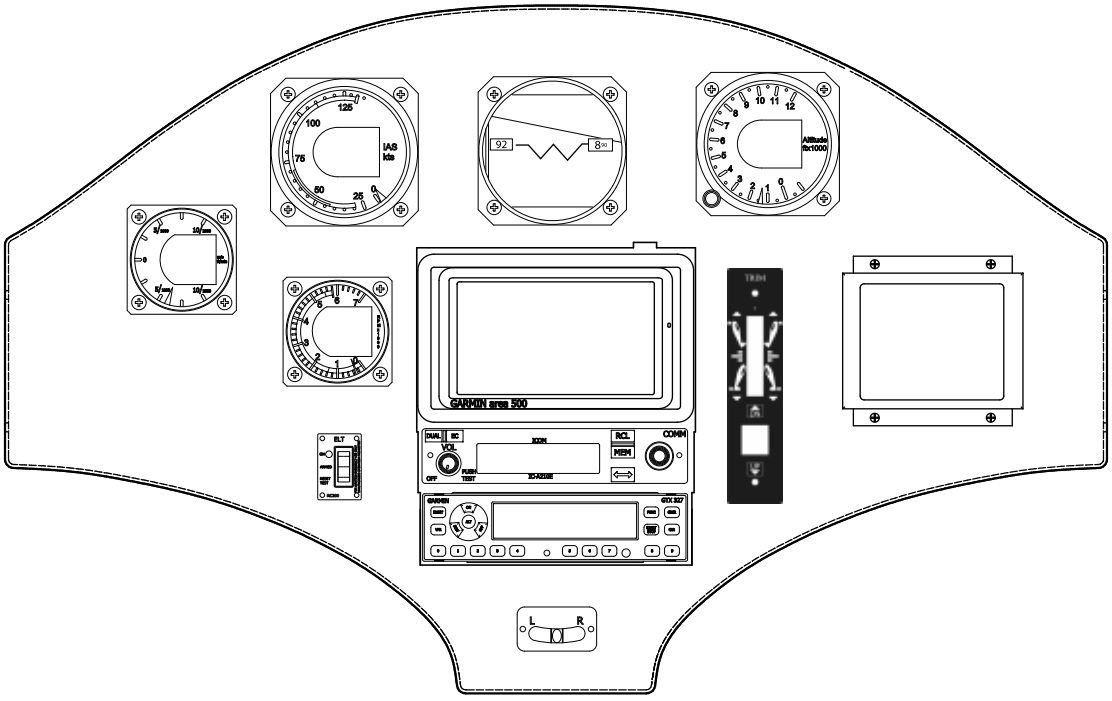
ALPHA Trainer cockpit levers are divided into two groups:



Individual control levers: pilot stick and rudder pedals

Dual control levers: throttle lever, handbrake lever, choke lever, flap lever, trim lever, door handles, battery disconnection lever/ring and emergency parachute release handle.

Typical Instrument panel



The typical instrument panel is equipped with various instruments/gauges that indicate airspeed, altitude, engine parameters (RPM, EGT, COOLANT TEMPERATURE, OIL TEMP, OIL PRESS, FUEL QTY, Fuel pressure) Garmin COM Radio, Garmin GTX 327 Transponder and the Garmin AERA GPS. Instructions on how to use individual equipment (COM, XPDR, GPS) are found in individual equipment manuals, as supplement to this POH. The gauges are round, 80 mm or 57 mm diameter, with the GPS being a touchscreen unit. Radio is a modern lightweight unit, features full intercom and dual PTT connections. See supplement for additional information about flight instruments.

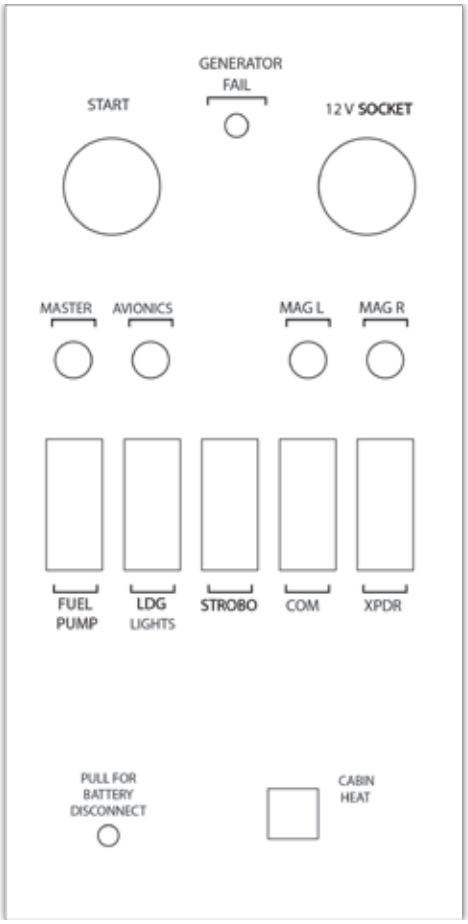
Cockpit electrical system panel (switch panel)

The cockpit electrical system panel (switch panel) incorporates a separate master switch, avionics switch and engine starter push-button, separate magneto control. There are fuses located in the illuminated rectangular toggle switches, as well as wired behind the avionics switch to each of the electrical avionics loads (COM, XPDR, Lights)

NOTE The electric auxiliary fuel pump usually has a separate activation switch on the panel. Some older aircraft may have the old configuration with the fuel pump connected to Master switch (see service bulletin *SB-162-00-80-006 Fuel pump switch retrofit*).

When using the cockpit electrical system panel, use the following sequence:

MOTOR START-UP		**MOTOR SHUT-DOWN**	
MASTER SWITCH	**ON**	OTHER SWITCHES	**OFF**
AVIONICS SWITCH	**ON**	FUEL PUMP*	**OFF**
MAG (L&R)	**ON**	MAG (L&R)	**OFF**
STARTER	**ENGAGE**	AVIONICS SWITCH	**OFF**
OTHER SWITCHES	**ON as desired**	MASTER SWITCH	**OFF**
FUEL PUMP*	**ON before take-off**	* if applicable - see NOTE above	



Undercarriage

The tricyle undercarriage incorporates brake-equipped wheels, a U-shaped composite strut and a steerable nose wheel. The rudder pedals are used to steer the nose wheel.

Distance between main wheels:	63 inch (1.6 m)
Distance between main and nose wheel:	60 inch (1.52 m)
Tire, 8 ply:	4,00'' x 6'' (main wheels), 4,00'' x 4'' (nose wheel)
Tire pressure:	40 psi (main wheels), 26 psi (nose wheel)
Brakes:	disk type, driven by brake lever centrally located in cockpit
Brake fluid:	DOT 4

The parking brake function is applied using a lock-latch on the handbrake lever. To apply the parking brake, pull handbrake lever firmly, hold it engage and use the lock-latch to activate parking brake function. To release, simply release the lock-latch, and push handbrake lever to full forward position.

Seats and safety harnesses

The seats have no stiff internal structure and can therefore be folded forward easily for access to aft fuselage. The seat has one position, whereas the pedals are adjustable. Custom made seats are available for ordering. All ALPHA Trainer ship with H type safety harness attached to the fuselage at three mounting points.

Pitot-static system

The pitot tube is attached to the bottom side of the starboard wing. The pitot lines run through the inside of the wing all the way to the instrument panel.

Propeller

Propeller type:

Pipistrel FP02-80 (for Rotax 912 80 HP):	two blade, fixed pitch propeller, diameter 65'' (1660 mm)

Powerplant

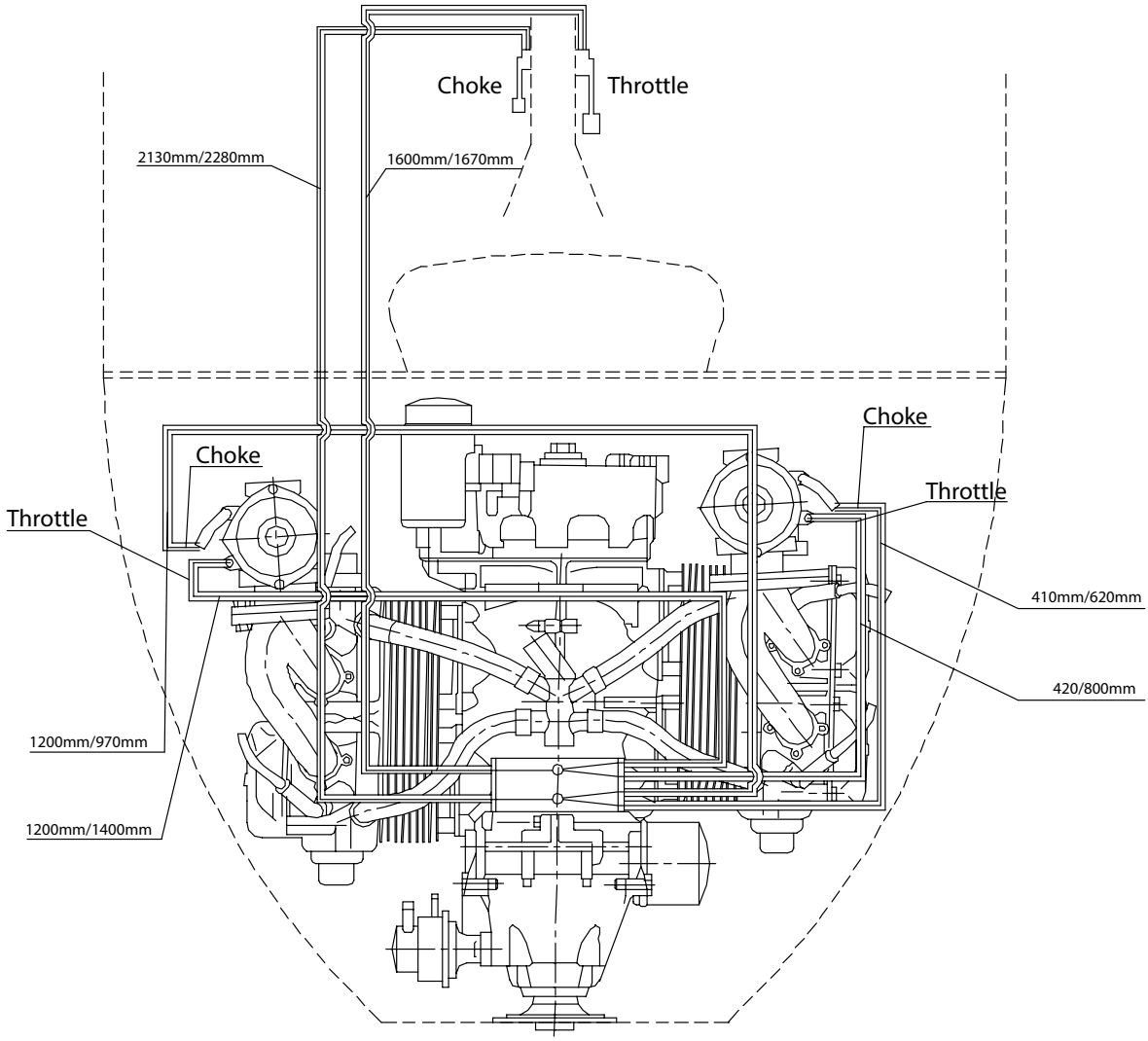
ALPHA Trainer is equipped with Rotax 912 (80 HP) engine.

Engine description:

Engine:	**ROTAX 912 80 HP (4-stroke boxer, four cylinders, 1211 cm³)** twin carburated - dual electronic ignition
Cooling:	crank case air-cooled, cylinder heads water-cooled - own radiator and pump, other moving parts oilcooled - own radiator and pump
Lubrication:	centrally oiled - own oil pump and radiator
Reduction gearbox:	integrated
Reduction ratio:	1 : 2.27
El. generator output power:	250 W at 5800 RPM
Starter:	electric
Engine power:	80 HP at 5800 RPM
Battery:	12 V, 10 Ah

All metal cables used are fire resistant, kept inside bowdens i.e. self-lubricating flexible tubes.

Schematic of throttle and choke control



Fuel system

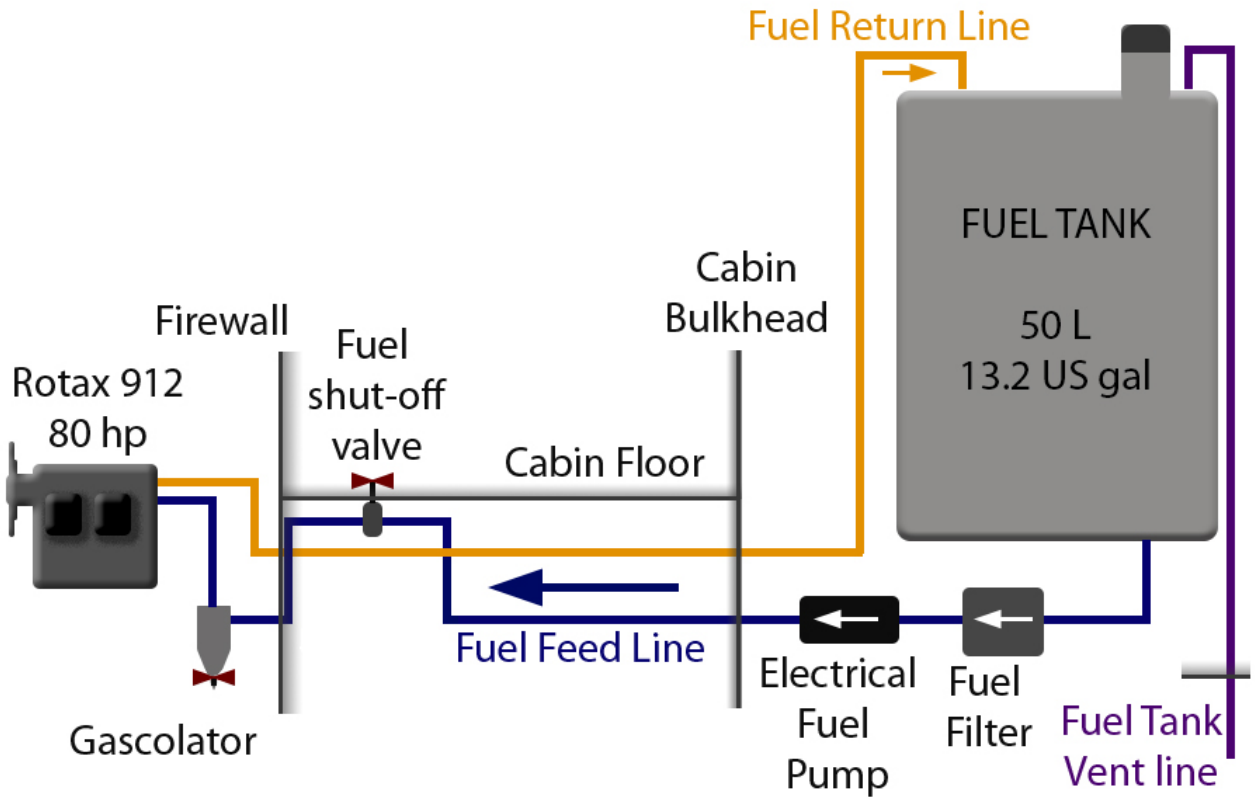
Description:	vented fuselage fuel tank refueling opening on top/side of fuselage
Fuel shutoff valve:	one, located in cockpit
Gascolator:	filter equipped with drain valve
Fuel capacity:	13.2 US gal - 50 litres
Unusable fuel:	0.5 US gal - 2 litres
Fuel filter (main):	installed on the fuel feed line before the electric fuel pump + inside the gascolator
Boost pump:	electrical: activated by a dedicated switch (or linked to master switch always on with master ON - see switch panel description)

All fuel hoses are protected with certified glass-silicon rubber. ALPHA Trainer's fuel system features fuel return circuit into the fuel tank.

There is an electric - gauge style fuel quantity indication for the pilot.

NOTE The actual fuel consumption/flow and fuel quantity remaining are calculations based on engine rpm and manifold pressure. These settings are to be used as a guide only and are NOT to be relied upon for the safe operation of the aircraft. If in doubt confirm the fuel quantity remaining before flight. Draining of water and/or particles is carried out by draining the contents of the gascolator, installed below the bottom engine cowl and reachable through a dedicated placarded opening. Unscrew the discharge valve and drain at least 1 cup of fuel in a transparent canister, verify for water/particle contamination. Always fasten the drain valve before flight!

When using the single point fuel valve, found below the draining opening (placarded), make sure you have closed it before flight. The single point fuel valve can either be used for fuelling the aircraft by using a pump and container, or for discharging all of the fuel on board before disassembling the aircraft.



POH-162-00-40-050

Electrical system

Description:	dual electronic ignition. Standard, 12/14 V circuit charges the battery and provides power to all appliances and instruments.
Master switch:	toggle switch type
Avionics switch:	toggle switch type, powers all electrical avionics.
Magneto switches:	separate Left (MAG L), Right (MAG R)
Other switches:	fused and equipped with control lights (switch illumination)
Battery:	12 V, 10 Ah
Measured power consumption of some electrical loads:	NAV/AC lights: 1 (steady) - 2 (peak) A , Cockpit light: 0.5 A, Radio & Transponder, EFIS, Please consult item's operating manual

The electrical system uses simplified architecture. Characteristic are separate magneto toggle switches and a switch-type master switch. Avionics switch is separate.
There are individual fused rocker switches used to control individual electrical loads (lights, etc.), apart from electrical avionics.

The generator is integral to the engine and provides up to 250 Watts at 5800 RPM. It is connected to the rectifier with an output of 14 V (DC).

The electrical system itself includes three solenoids, one activated by the master switch, the second activated by the avionics switch and the starter engage. All electrical loads, apart from the 12 V socket and the Pitot heat, are connected to the avionics bus via push-pull circuit breakers. For loads, which are engaged and disengaged more often, fused rocker switches are used (Electrical fuel pump, 12 V socket, NAV/AC lights, LDG light, etc.) All other loads (e.g. avionics) receive power as soon as the Avionics switch is ON. The avionics switch has no function when the master switch is OFF. The starter engage button is also disabled when the master switch is OFF.

Battery disconnection system

On the ALPHA Trainer, Battery Disconnect Switch the battery can be disconnected from the circuit. The battery disconnection lever is a red flag-type lever is found on the main electric board (cabin-side of the firewall) above the main battery on the right-hand side of the cabin. It is attached to a wire which leads to the battery disconnection ring on the instrument panel's switch column. To disconnect the battery from the circuit, pull the battery disconnection ring on the instrument panel's switch column. To reconnect the battery back to the circuit, use the flag-type lever on the firewall. Deflect the lever so that its flag end points towards the firewall. Having done this correctly, you will feel the flag-lever jam into position.

Battery reconnection can be done in-flight as well (e.g. following a successfully rectified emergency situation) but only from the left-hand seat, since you cannot reach the flag-lever from the right-hand side of the cockpit.

Engine cooling system

Rotax 912 (80 HP) cooling system

The Rotax 912 engine's cylinders are air-cooled, the cylinder heads are liquid cooled. The cooling-air intake is located on the right-hand bottom part of the engine cover.

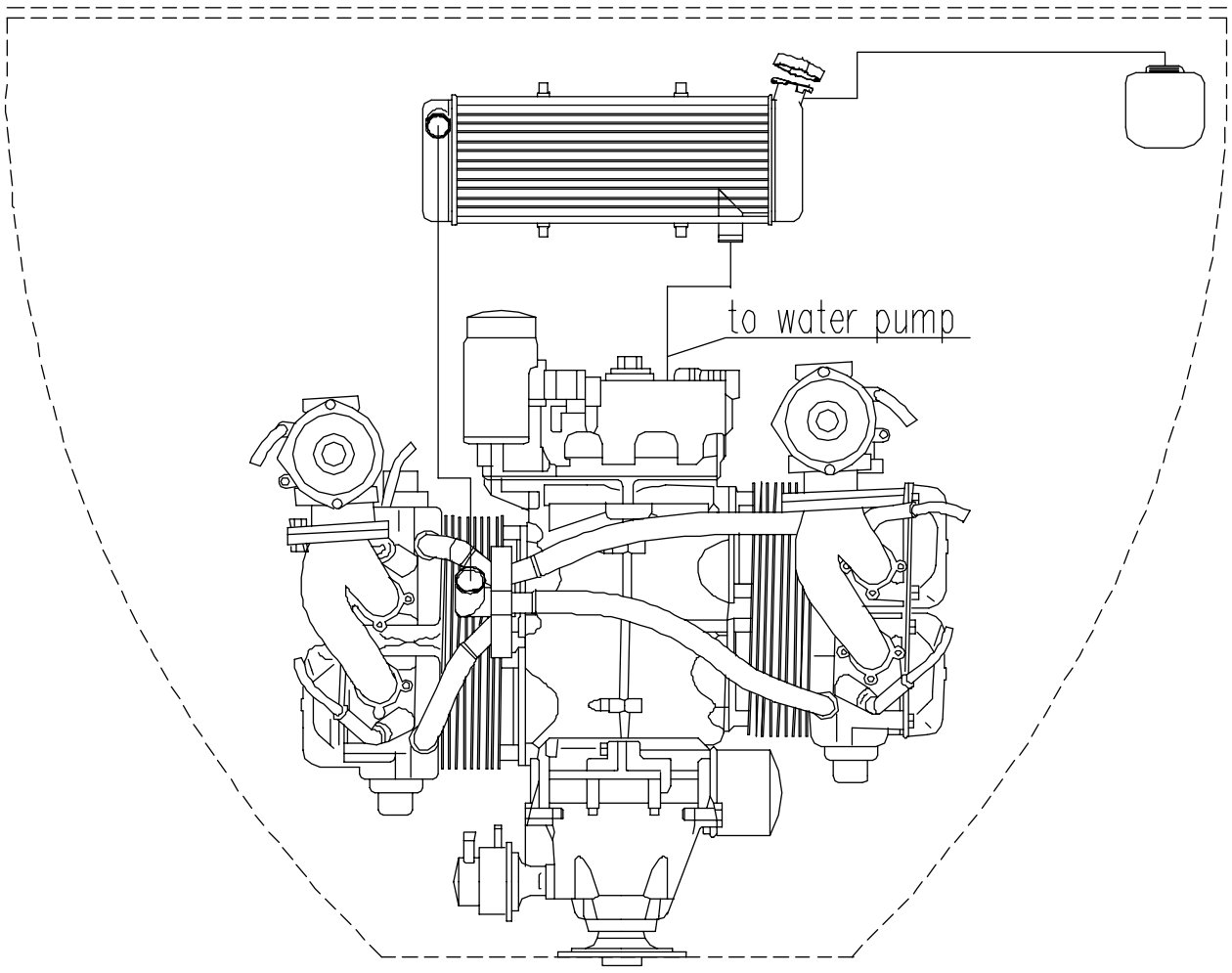
Cylinder heads are liquid cooled. The water pump forces water through the radiator. The engine does not feature a thermostat valve. The overflow tank fluid level must always be inside the designated limits!

The engine does not feature a cooling fan, therefore cooling is entirely dependent on moving air currents and airspeed.

CAUTION! You are strongly discouraged from leaving the engine running at idle power when on ground for extended periods of time.

The manufacturer recommends use of cooling fluids used in car industry diluted in such a manner that it withstands temperatures as low as - 20°C/ -4°F (please refer to SI-912-016 "Selection of suitable operating fluids", latest issue, for details).

Schematic of engine cooling system

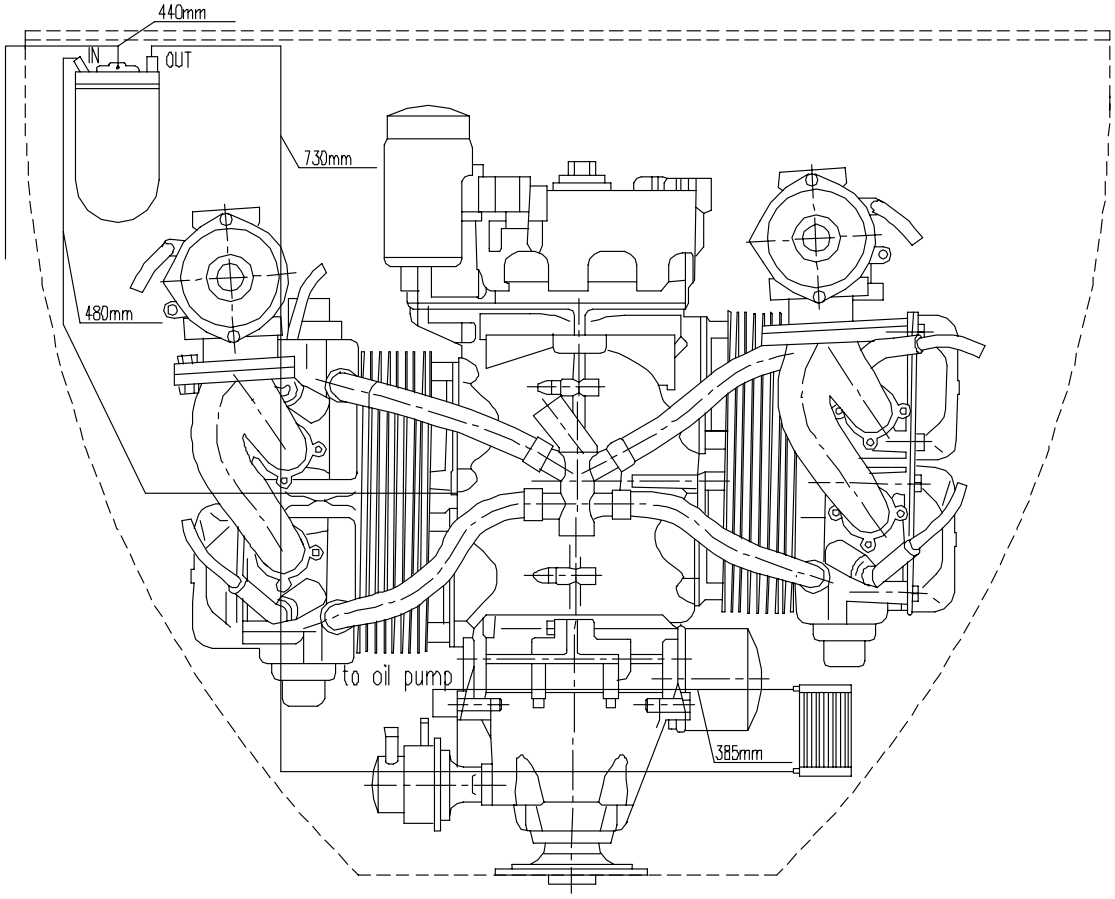


Engine lubrication system

Rotax 912 is a four-stroke engine, equipped with a dry sump and lubricated centrally with use of its own oil pump. All the oil needed is located inside a separate canister. When the engine is running, the oil cools itself passing through a radiator. Oil quantity can be checked visually with a oil dip stick. Make sure the oil quantity is within limits at all times.

CAUTION! Oil temperature, pressure and quality is strictly defined and must not, under any circumstances, vary from its safe values.

Schematic of engine lubrication system



Wheel brake system

The wheel brakes are disc, hydraulic type, actuated together by pulling on the common handbrake lever.

The hydraulic brake fluid used is DOT 4.

The parking brake function is engaged using a lock-latch on the handbrake lever. To apply the parking brake, pull handbrake lever firmly, hold it engage and use the lock-latch to activate parking brake function. To release, simply release the lock-latch, and push handbrake lever to full forward position.

This page is intentionally left blank.

8 Handling and maintenance

Special inspections

After having exceeded VNE or landed in a rough manner:

Check the undercarriage, fuselage & wing surfaces and main spars for abnormalities. It is highly recommended to have the aircraft verified for airworthiness by authorized service personnel.

Clicking noise overhead

The wings are factory fitted to the fuselage to make a tight fit at approximately 80 F. When exposed to low temperatures, materials shrink. Therefore, flying in the winter or in cold temperatures, you may encounter "click-clack" like noises above your head. The remedy for this unpleasant noises is to add washers, typically of 0,5 mm thickness in-between wing and fuselage. Washers must be added both at rear and front bushings at one side of the fuselage only!

WARNING! It is mandatory to consult the manufacturer or authorised service personnel before applying washers!

Draining and refueling

Whenever draining or refueling make sure master switch is set to OFF.

Draining the fuel system

The gascolator is located beneath the bottom engine cover on the left hand side of the fuselage.
To drain the fuel system, open the drain valve on the gascolator. Drain approximately 1/2 cup of fuel.
Try to prevent ground pollution by collecting the fuel with a canister.
To close the valve simply turn it in the opposite direction. **Do not use force or special tools!**

CAUTION! Always drain the fuel system before you have moved the aircraft from a standstill to prevent mixing of the fuel and eventual water or particles.

Refueling

CAUTION! Before refueling it is necessary to ground the aircraft!

Refueling can be done by pouring fuel through the fuel tank opening on top/side of the fuselage.

After refueling it is recommended to eliminate eventual air pockets from inside the fuel system. To do that, drain some fuel with fuel valve fully open. Also, leave the engine running at idle power for a couple of minutes prior to taking-off and test the engine at full power for a minimum of 30 seconds.

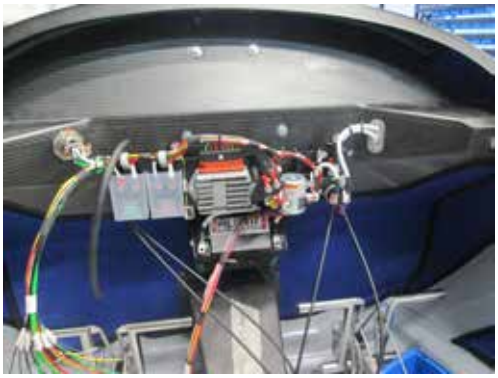
CAUTION! Use authorized plastic containers to transport and store fuel only! Metal canisters cause water to condensate on the inside, which may later result in engine failure.

Connecting auxiliary power supplies

Should you be unable to start the engine due to a weak battery, auxiliary power supplies can be connected to help starting the engine.

To connect an auxiliary power supply use battery connector cables with clamps at either ends.
Connect the negative (-) wire to aircraft's exhaust (sticking out below the engine cowling).
The positive (+) wire leads inside the cockpit to the relay mounted top-right of the aircraft's battery on the firewall. This relay has 3 nipples; the positive (+) wire must be connected to the upper-left nipple, the only one to which 2 cables are connected to.
After you have connected the wires correctly, start the engine normally by pressing the starter button in the cockpit.

Battery's & Relay's location



Battery (black) & Relay (top-right)

Top-left nipple (c. positive (+) wire here)

Exhaust (connect negative (-) wire here)

WARNING! The pilot must be in cockpit when starting the engine. The person who will disconnect the cables after the engine has started must be aware of the danger of spinning propeller nearby.

Tie down

Point the aircraft into the wind and retract flaps fully. Chock all three wheels. Put an extra rope around the tail-cone and into the slot between the propeller and the spinner. When using rope of a non-synthetic material, leave sufficient slack to avoid damage to the aircraft, should the ropes contract. To tie down the tail, tie a rope through the tail skid and secure it to the ground. At the end, cover the pitot tube with a protection cover.
Mechanical towing is prohibited at all times.

Storage

The aircraft should ideally be stored in a hangar. For increased in-hangar maneuverability use of original push-cart is recommended.
The parachute rescue system is installed in your aircraft, so make sure the activation handle safety pin is inserted every time you leave the aircraft.
Also, disconnect the battery from the circuit to prevent battery self-discharge (pull battery disconnection ring on the instrument panel's switch column) during storage period.

Cleaning

Use fresh water and a soft piece of cloth to clean the aircraft's exterior. If you are unable to remove certain spots, consider using mild detergents. Afterwards, rinse the entire surface thoroughly.
Lexan transparent surfaces are protected by an anti-scratch layer on the outside. Always use fresh water only to clean the transparent surfaces, not to damage these protection layers and coatings.
To protect the aircraft's surface (excluding transparent surfaces) from the environmental contaminants, use high-quality car wax.

The interior is to be cleaned with a vacuum cleaner.

Keeping your aircraft in perfect shape

Precautions

1) Eliminate the use of ALL aggressive cleaning solutions and organic solvents, also the window cleaning spray, benzene, acetone, aggressive shampoos etc.

2) If you must use an organic solvent (acetone) on small areas remove certain glue leftovers or similar, the surface in question MUST be polished thereafter. The only section where polishing should be avoided is the edge on the wing where the sealing gasket is applied.

3) When flying in regions with a lot of bugs in the air, you should protect the leading edges of the airframe before flight (propeller, wings, tail) with Antistatic furniture spray cleaner: "Pronto (transparent), manufacturer: Johnson Wax (or anything equivalent) – Worldwide", approximate price is only $3 USD / €3 EUR for a 300 ml spray bottle. Using such spray, do not apply it directly onto the wing but into a soft cloth instead (old T-shirts are best).
4) After having finished with flight activity for the day, clean the leading edges of the airframe as soon as possible with a lot of water and a drying towel (chamois, artificial leather skin). This will be very easy to do if you applied a coat of Pronto before flight.

Detailed handling (Airframe cleaning instructions)

Every-day care after flight

Bugs, which represent the most of the dirt to be found on the airframe, are to be removed with clean water and a soft cloth (can be also drying towel, chamois, artificial leather skin). To save time, soak all the leading edges of the airframe fist. Make sure to wipe ALL of the aircraft's surface until it is completely dry at the end.
Clean the propeller and the areas with eventual greasy spots separately using a mild car shampoo with a wax.

CAUTION! Do not, under any circumstances attempt to use aggressive cleaning solutions, as you will severely damage the lacquer, which is the only protective layer before the structural laminate.

When using the aircraft in difficult atmospheric conditions (intense sunshine, dusty winds, coastline, acid rains etc.) make sure to clean the outer surface more thoroughly.

If you notice you cannot remove the bug-spots from the leading edges of the aircraft, this means the lacquer is not protected any more, therefore it is necessary to polish these surfaces.

CAUTION! Do not, under any circumstances attempt to remove such bug-spots with abrasive sponges and/or rough polishing pastes.

Periodical cleaning of all outer surfaces with car shampoo

Clean as you would clean your car starting at the top and working your way downwards using a soft sponge. Be careful not to use a sponge that was contaminated with particles e.g. mud, fine sand) not to grind the surface. While cleaning, soak the surface and the sponge many, many times. Use a separate sponge to clean the bottom fuselage, as is it usually more greasy than the rest of the airframe. When pouring water over the airframe, be careful not to direct it over the fuel reservoir caps, wing-fuselage joining section, parachute rescue system straps and cover, pitot tube, tail static probe and engine covers.

Always rinse the shampooed surfaces again before they become dry! Thereafter, wipe the whole of the aircraft dry using a drying towel, chamois or artificial leather skin.
Also, clean the Mylar seals on the wing and tail control surfaces. Lift the seals gently and insert ONE layer of cloth underneath, then move along the whole span of the seal. Ultimately, you may wish to apply Teflon grease (in spray) over the area where the seal touch the control surfaces.

Polishing by hand

Use only the highest quality polishing compounds WITHOUT abrasive grain, such as Sonax Extreme or similar. Start polishing on a clean, dry and cool surface, never in the sunshine!
Machine polishing requires more skills and has its own particularities, therefore it is recommended to leave it to a professional.

Cleaning the Lexan transparent surfaces

It is most important to use really clean water (no cleaning solutions are necessary) and a really clean drying towel (always use a separate towel ONLY for the transparent surfaces). Should the transparent surfaces be dusty, remove the dust first by pouring water (not spraying!) and gliding your hand over the surface. Using the drying towel, simply glide it over the surface, then squeeze it and soak it before touching the transparent surface again. If there are bugs on the windshield, soak them with plenty of water first, so less wiping is necessary. Ultimately, dry the whole surface and apply JT Plexus Spray (~$10 USD / €10 EUR per spray) or at least Pronto antistatic (transparent) spray and wipe clean with a separate soft cotton cloth.

9 Appendix

Parachute rescue system: use, handling and servicing

System description

The PRS- parachute rescue system provides you with a chance to rescue yourself from an unexpected situation.
The system is placed inside a durable cylinder mounted on the right hand side of the baggage compartment. Inside this cylinder is the parachute which stored inside a deployment bag with a rocket engine underneath.
This brand new design deploys a canopy that is not gradually drawn from the container, exposed to distortion by air currents, but it is safely open after 0,4 to 0,7 seconds in distance of 50-60 ft above the aircraft. It is carried there in a special deployment bag, which decreases the risk of aircraft debris fouling the canopy.
The parachute rescue system is activated manually, by pulling the activation handle mounted on the back wall above. After being fired, the man canopy is open and fully inflated in about 3.2 seconds.

WARNING! Activation handle safety pin should be inserted when the aircraft is parked or stored in a hangar to prevent accidental deployment. However, the instant pilot boards the aircraft, safety pin MUST be removed!

Use of parachute rescue system

Typical situations for use of the parachute rescue system are:

- structural failure
- mid-air collision
- loss of control over aircraft
- engine failure over hostile terrain
- pilot incapacitation (incl. heart attack, stroke, temp. blindness, disorientation...)

Prior to firing the system, provided time allows:

- shut down the engine and set master switch to OFF (key in full left position)
- shut the fuel valve
- fasten safety harnesses tightly
- protect your face and body.

To deploy the parachute jerk the activation handle hard to a length of at least 15" towards the instrument panel.

Once you have pulled the handle and the rocket is deployed, it will be about two seconds before you feel the impact produced by two forces. The first force is produced by stretching of all the system. The second force follows after the inflation of the canopy from opening impact and it will seem to you that the aircraft is pulled backwards briefly. The airspeed is reduced instantly and the aircraft now starts to descent underneath the canopy.

As a pilot you should know that the phase following parachute deployment may be a great unknown and a great adventure for the crew. You will be getting into a situation for the first time, where a proper landing and the determination of the landing site are out of your control.

CAUTION! Should you end up in power lines (carrying electrical current), DO NOT under any circumstances touch any metal parts inside or outside the cockpit. This also applies to anyone attempting to help or rescue you. Be aware that anyone touching any part of the aircraft while standing on the ground will probably suffer mayor injury or die of electrocution. Therefore, you are strongly encouraged to confine your movements until qualified rescue personel arrives at the site to assist you.

After the parachute rescue system has been used or if you suspect any possible damage to the system, do not hesitate and immediately contact the manufacturer!

Handling and servicing

Prior to every flight all visible parts of the system must be checked for proper condition. Special attention should be paid to corrosion on the activation handle inside the cockpit. Also, main fastening straps on the outside of the fuselage must be undamaged at all times.
Furthermore, neither system, nor any of its parts should be exposed to moisture, vibration and UV radiation for long periods of time to ensure proper system operation and life.

CAUTION! It is strongly recommenced to thoroughly inspect and grease the activation handle, preferably using silicon spray, every 50 flight hours.

All major repairs and damage repairs MUST be done by the manufacturer or authorized service personnel.

For all details concerning the PRS rescue system, please see the "PRS - Parachute Rescue System Manual for Assembly and Use".

Training/familiarisation supplement

This chapter has been written to assist owners/pilots/instructors of ALPHA Trainer on their quest to learn how to safely and efficiently fly this aircraft in addition to the information already assembled in the rest of this POH. This section will cover most operations the aircraft offers in an order established in section Normal procedures and recommended speeds. Please consider what follows as an add-on to that chapter.

Engine start-up

First and foremost **make sure you have sufficient fuel quantity on board** for the desired length of flight. If you are not completely confident there is enough, step out of the aircraft and add more fuel into the tanks. There is an old aviators' saying: *"The only time you have too much fuel is when you are on fire."*

When engaging engine starter, wheel brakes MUST be engaged. To keep your propeller in perfect shape, avoid starting up on areas where there are small stones on the ground. Those little stones can easily be picked up by the propeller causing damage to the blades.

Warming up must be conducted below 2500 RPM. When reaching safe operational engine temperatures, verify maximum engine ground RPM. **Hold the stick back completely and slowly(!) add throttle to full power, then verify RPM.**

Taxi

Taxiing with the ALPHA Trainer is rather simple considering the steerable nose wheel. It is recommended you **taxi slowly**, up to 10 km/s (5 kts), while holding the stick back fully to ease the pressure of the nose wheel.

During taxiing monitor engine temperatures. Due to low airflow around the radiators the CHT and Oil temperature will rise during long taxi periods. If you are holding position, do not leave throttle at idle. It is better you have some 2500 RPM as this will provide some airflow from the propeller to the radiators and the temperatures will not rise so quickly. **Should you see engine temperatures exceed safe operational values, shut off the engine, point the aircraft's nose into the wind and wait for the temperatures to reduce.**

Take off and initial climb

Having checked and set all engine and aircraft parameters, you should be ready for take off by now. **Reverify fuel valve is open. Trim indicator should be neutral.**

Start the take-off roll gradually. Keep adding throttle smoothly and slowly to full power. There are two reasons for this. First, you change flight stage from zero movement to acceleration slowly; this provides you with time to react to conditions. Second, especially if taking-off from a gravel runway, this method of adding full throttle will prevent the little stones on the runway to damage the propeller. Extremely short runways are an exception. There you should line up the aircraft, set flaps to (+1), hold the brakes, apply full power and release the brakes. Flaps (+2) can be used for short takeoff.
As you start to move, pull the stick 1/3 of elevator's deflection backwards to ease the pressure on the nose wheel and lift it off the runway slightly. **Do not use full back deflection as this will cause the aircraft's tail to touch the ground.**

When the nose wheel has lifted off the ground, there is nothing else but to hold the same pitch attitude and the aircraft will become airborne. Crosswind take-offs, depending on wind strength, require a little bit of aileron deflection into the wind. **Remember, wings must stay level throughout ground-roll, rotation and initial climb!**

Having lifted off the ground, gently push the stick forward just a bit to accelerate. At some 110 km/h (60 kts) set flaps to (+1) if position (+2) was used. At 130 km/h (70 kts) set them to neutral (0).

Climb

A comfortable setting for climb is flaps in zero/neutral position, speed of 76 kts (140 km/h) at or slightly below 5500 RPM. In summer time or **when outside temperature exceeds 85° F (30°C)** you should **consider climbing at some 85 kts (160 km/h)** to provide more airflow to the engine radiators. Trim the aircraft for comfortable stick forces.

Cruise

Make sure flaps are retracted. A comfortable cruise setting is 5300 engine RPM.

Cruising fast, do not kick-in rudder for turns! Above 85 kts (160 km/h) the rudder becomes almost insignificant in comparison to aileron deflections when it comes to making a turn. **Cruising fast, it is important to fly coordinated (ball in the middle) as this increases efficiency and decreases side-pressure onto vertical tail surfaces. Also, pay attention to turbulence. If you hit turbulence at speeds greater than VNO, reduce power immediately and pull up the nose to reduce speed.**

If flying a traffic pattern, set engine power so that airspeed does not exceed 150 km/h (80 kts).

Descent

Descending with the Alpha Trainer is the stage of flight where the most care should be taken. The aircraft is aerodynamically clean and builds up speed very fast.

Start the descent by reducing throttle and keep your speed below VNO.
During initial descent it is recommended you trim for a 10 kts lower speed than the one you decided to descent at. Do this for safety. In case you hit turbulence simply release forward pressure on the stick and the aircraft will slow down.

Also, keep in mind you need to begin your descent quite some time before destination. A comfortable rate of descent is 500 fpm (2.5 m/s). So it takes you 2 minutes for a 1000 ft (300 m) drop. At 105 kts (200 km/h) this means 3.6 NM for each 1000 ft drop.

Entering the traffic pattern the aircraft must slow down. In order to do this, hold your altitude and reduce throttle to idle. Gradually slow down to below 80 kts (150 km/h), then set proper engine RPM to maintain speed of 70 kts (130 km/h). Trim the aircraft for comfortable stick forces.

Before turning to base-leg, reduce power to idle and set flaps to (+1) at 70 kts (130 km/h). Once out of the turn, reduce speed towards 60 kts (110 km/h). Power remains idle from the point of turning base all the way to touch-down. If you plan your approach this way, you will always be on the safe side - even if your engine fails, you will still be able to safely reach the runway!

Turn to final at 55 kts (100 km/h). When in runway heading, set flaps to (+2). Use the throttle to obtain the desired descent path (if applicable).

Roundout (Flare) and touchdown

Your speed should be a constant 55 kts (100 km/h) throughout the final with the descent path constant as well. At a height of 10 meters (25 feet) start a gentle flare and approach the **aircraft must touch down with the main (back) wheels first,** so that you will not bounce on the runway. After touchdown, operate the rudder pedals if necessary to maintain runway heading and try to have the nose wheel off the ground for as long as possible. When the nose wheel is to touch the ground, rudder pedals MUST be exactly in the middle not to cause damage to the steering mechanism. **While braking, hold the stick back fully!** Once you have come to a standstill, retract flaps all the way to normal 0° position (handle full down).

Should you bounce off the runway after touch-down, do not, under any circumstances, push stick forward. Bouncing tends to reduce by itself anyhow.

Crosswind landings, depending on the wind speed, require some sort of drift correction. Most efficient is the low-wing method, where you are to lower the wing into the wind slightly and maintain course by applying appropriate rudder deflection. You can also try the crab method.

Crosswind landings on paved runways (asphalt, concrete, tarmac...)

In this case, special attention must be paid to straightening the aircraft before touchdown in order not to damage the undercarriage because of increased surface grip on impact.
Should the crosswind component be strong (8 kts and over), it is recommended to gently **flare in such a manner, that one of the main wheels touches-down an instant before the other** (e.g. if there is crosswind from your left, the left wheel should touch down just before the right wheel does). This way the undercarriage almost cannot be damaged due to side forces on cross-wind landings.

Landing in strong turbulence and/or gusty winds

First of all **airspeed must be increased** for half of the value of wind gusts (e.g. if the wind is gusting for 6 kts , add 3 kts to the final approach speed). In such conditions I would also recommend to only **use 1st stage of flaps for increased maneuverability. In very strong winds (20 kts and more), use retracted flaps for the complete approach and roundout.**

Balked landing

Add full power, establish Vy, retract flaps as required.

Parking

Nothing special to add here. Taxi to the apron with flaps retracted (minimum lift). Again, taxi slow for reasons mentioned under "Taxi". **Come to a standstill, shut down the engine, insert the parachute rescue system activation handle's safety pin**. It is recommended to shut the fuel tank valve.

Conversion tables

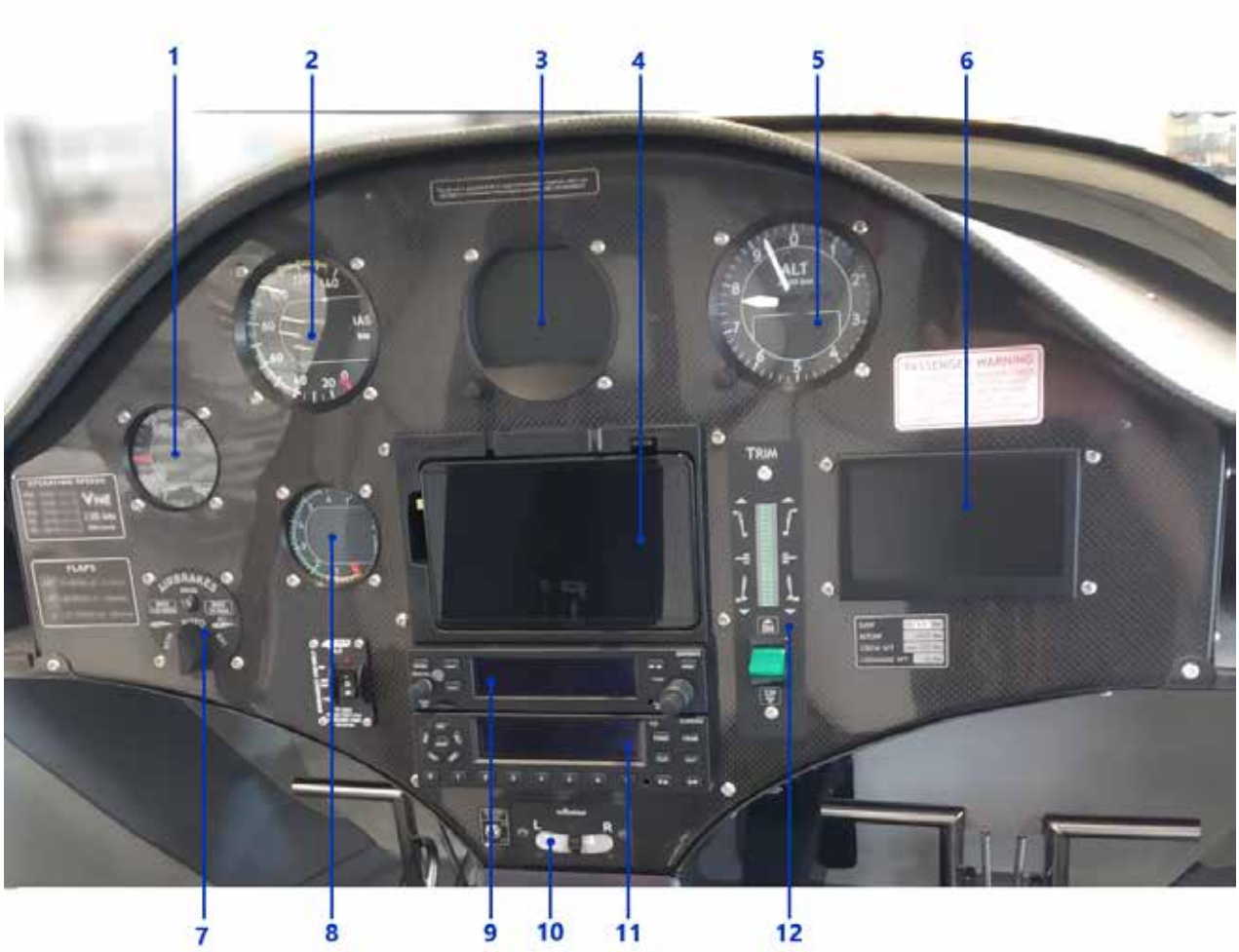
SI	US	US	SI
1 bar	14.5037 psi	1 psi	0.0689 bar
1 mm2	0.0016 in2	1 in2	625 mm2
1 cm2	0.1550 in2	1 in2	6.4510 cm2
1 daN	2.2481 lbf	1 lbf	0.4448 daN
1 g	0.0353 oz	1 oz	28.328 g
1 hPa	0.0295 in.Hg	1 in.Hg	33.898 hPa
1 kg	2.2046 lb	1 lb	0.4536 kg/min
1 kg/min	2.2046 lb/min	1 lb.min	0.4536 kg/min
1 l	0.2641 US gal	1 US gal	3.7864 l/min
1 l	1.057 US quart	1 US quart	0.9461 l
1 l/min	0.2641 US gal/min	1 US gal.min	3.7864 l/min
1 daNm	88.4956 lbf.in	1 lbf.in	0.0113 daNm
1 daNm	7.3801 lbf.ft	1 lbf.ft	0.1355 daNm
1 m	3.2809 ft	1 ft	0.3040 m
1 mm	0.0394 in	1 in	16.393 mm
1 cm3	0.06102 in3	1 in3	16.393 cm3
1 hPa	0.0145 psi	1 psi	68.965 psi

10 Supplements

Pipistrel ALPHA Trainer

Instrument Panel Operators Manual

Typical instrument panel configuration



1	Variometer	*2*	Air Speed Indicator (ASI)
3	HORIS	*4*	Garmin AERA GPS
5	Altimeter	*6*	Engine Data display
7	Airbrakes control switch (optional)	*8*	RPM indicator
9	COM Radio	*10*	Slip indicator
11	Transponder	*12*	Trim switch and indicator

System description

The typical Instrument configuration consists of following instruments:

- Horis Kanardia - AD-AHRS standalone unit with artificial horizon and air data source;
- DAQU engine monitoring box (mounted behind instrument panel);
- Engine data display;
- IAS indicator - 80 mm (3 1/8“);
- Altimeter - 80 mm (3 1/8“);
- Variometer - 57 mm (2¼”);
- RPM and hour meter - 57 mm (2¼”).

All instruments are electronic devices connected to the main system electrical bus. They have a familiar needle display recognized immediately by older pilots as well as large digital numbers which are easy to read in all conditions. The only unit which is connected to the airplane Pitot and Static source is Horis Kanardia.

1 Horis Kanardia

Horis is an electronic device. It consists of a set of sensors and an LCD display. Majority of sensors are built into its compact housing: static pressure, dynamic pressure, 3 axis ac-celerometer, 3 axis angular rate and GPS receiver. Only GPS antenna and OAT sensor are externally mounted. All sensors are solid state - there are no moving parts, which means less problems with fatigue and aging.
Horis has two processors: sensor processor and display processor. The sensor processor reads sensors and calculates airdata, attitude, GPS and other values using special sensor fusion algorithms. These values are passed to CAN bus where other CAN devices may use also them. The display processor monitors the CAN bus and it displays the information on LCD display.
One push/rotate knob is used for the operations. User interface is optimized so only minimal interaction is required to operate the instrument.

Safety Instructions!
Keep the unit powered during flight, otherwise engine data and air data will be lost from the displays until power is re-applied.

2 ASI

The IAS instrument is a 80 mm (3 1/8“) unit which consists of a familiar mechanical needle and a large OLED digital display. Both the needle display and the digital indicator show the indicated airspeed in knots. Green, yellow and white bars indicate the different airspeed limitations.

Never exceed the VNE which is clearly marked with a red line.

3 Altimeter

The Altimeter is a 80 mm (3 1/8“) unit which shows aircraft altitude based on QNH.

The Altimeter consists of familiar mechanical double needle.

The large OLED digital display shows altitude in feet, FL (flight level) and QNH in InHg. The QNH is adjusted by rotating the knob as shown in the picture.

4 Variometer

The Variometer is a 57 mm (2¼“) unit and consists of a familiar needle and OLED digital display. The needle shows if the aircraft is climbing or descending.
The scale is calibrated from 0 up to ± 2000 ft/min and from 0 up to ± 10 m/s.

5 Engine Data Display

The Engine Data Display is used for monitoring the engine operating parameters. The only exception is fuel tank indicator which indicates fuel tank status in percentage fuel remaining ranging from - 0% (empty) up to 100% (full). Most indicators have multicolored bars to show the preferred operating temperature. The red bar defines the out of limit status and exceeds the Rotax recommended limitations. The engine data display shows most settings with colored bars and digital numbers.

The Engine Data instrument displays the following readings:

- Oil Pressure
- Oil temperature
- Water Temperature
- Manifold pressure
- CT
- EGT
- Fuel Pressure
- Instant fuel flow
- Fuel % remaining
- Battery voltage
- Outside air temperature

NOTE The actual fuel consumption/flow and fuel quantity remaining are calculations based on engine rpm and manifold pressure. These settings are to be used as a guide only and are NOT to be relied upon for the safe operation of the aircraft. If in doubt confirm the fuel quantity remaining before flight.

6 RPM indicator

The RPM indicator is 57 mm (2¼") unit which displays the current engine revolutions with both a familiar mechanical needle as well as a large OLED digital display.

Color arcs display the operating limitations of the Rotax 912 UL engine.

|End |

This page is intentionally left blank.

fold here

ALPHA Trainer checklist

Before start-up

Fuel system drain	PERFORMED
Doors	CLOSED
Rudder pedals & hear rest position	SET
Seat belts	FASTENED
Parachute rescue system safety pin	REMOVED
Pitot tube protection cover	REMOVED
Brakes	SET
Flight controls and flaps	Free and correct
Battery switch	ON (PUSH)

Engine start-up

Area in front of aircraft	CLEAR
Fuel valve	OPEN
Throttle	IDLE
Choke	AS REQUIRED
Master switch	ON
Avionics switch	ON
Magnetos	ON
Starter	ENGAGE

After start-up

Warm up at	2000 RPM for 2 mins, then 2500 RPM
Magneto RPM drop	VERIFIED, MAX 300 RPM
Engine & Propeller check	CHECK parameters
NAV/AC lights	ON as required
NAV/COM, GPS, XPDR	SET

* if applicable

Before takeoff

Fuel valve	CHECK OPEN
Doors	CHECK CLOSED
Flight controls	Free and correct
Flaps	EXTENDED as required
Fuel pump*	ON
instruments/engine parameters	CHECK
Elevator trim	SET NEUTRAL

After takeoff

Flaps	RETRACTED 0°
Trim	SET
Fuel pump *	OFF

Descent - Approach

Throttle	IDLE
Flaps	(0) - RETRACTED
Fuel pump*	ON
Instruments	SET, CHECK

Landing

Throttle	IDLE
Flaps	(+1) below 70 kts, (+2) on final

Shutdown

Brakes	SET
Flaps	(0) - RETRACTED
NAV/AC lights	OFF
Fuel pump*	OFF
Magnetos	OFF
Avionics switch	OFF
Master switch	OFF
Fuel valve	CLOSED

fold here

POH-162-00-40-050

This page is intentionally left blank.

Warranty statement/voids

For applicable warranty terms and conditions please refer to www.pipistrel-aircraft.com

This page is intentionally left blank.

Pipistrel d.o.o.,
podjetje za alternativno letalstvo
Goriška cesta 50a
SI-5270 Ajdovščina
Slovenija - EU

t +386 (0)5 3663 873
f +386 (0)5 3661 263
info@pipistrel.si
www.pipistrel-aircraft.com

Pipistrel Italia
Via Fratelli Rusjan, 26
34070 Savogna d'Isonzo (GO)
Italia - EU

t +39 3703207623
info@pipistrel.si
www.pipistrel-aircraft.com

Pipistrel Vertical Solutions d.o.o.
Vipavska cesta 2
SI-5270 Ajdovščina
Slovenija - EU

t +386 5 366 38 73
f +386 5 366 12 63
info@pipistrel.si
www.pipistrel-aircraft.com