

*EUROFOX AVIATION, The hangar,  
Wanshurstgreen Farm,  
Battle lane, Marden, Kent,  
TN12 9DF*



*EuroFOX Aviation is a trading name of Ascent industries Ltd. Company  
registration nr 7731403*

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## **Pilot operating handbook**

**EuroFOX Aviation**

# **EuroFOX**

The EuroFOX aircraft design has been assessed by the CAA against BCAR Section S.  
The aircraft is a Type Approved Microlight under the ultimate supervision of the CAA.

Aircraft Type:

**EuroFOX Aviation Nose wheel, Tail wheel, 450  
kg and  
472.5 kg Type Approved Microlight**

Note: MAUW is limited to 450 kgs without a parachute. All performance figures in this POH are based on 472.5 kg MAUW

Type Approved Microlight Serial Number:

Registration:

Date of Issue: 7<sup>th</sup> June 2016

Stamp, Signature

**AIRCRAFT DATA**






	Type	Production	Serial Number:		Destination and year of production (if known)
<b>Fuselage</b>	EuroFOX Nose or Tail wheel	EUROFOX AVIATION			EuroFOX Aviation Luke's Field Kent
<b>Engine</b>	ROTAX 912 UL or 912 ULS	BOMBARDIER -ROTAX GMBH AUSTRIA			
<b>PROPELLER</b>	DUC Swirl  1660 mm (80 hp)  1730 mm (100hp)	DUC Helices, France	Blade	S/N's	
			1 .		
			2 .		
			3 .		
<b>Parachute Safety system (if fitted)</b>	Magnum  501 Light Speed	Stratos 07 s.r.o.	S/N		

.....  
Stamp

..... Signature

**RECORD OF REVISIONS**

Any revisions or amendments to the present manual shall be issued in the form of bulletins with attached new pages. It is in the interests of every user to enter such revision into the table of revisions and to replace the existing page by the new one. The revised or corrected text shall be indicated by a vertical line on left page margin and the page shall bear revision number and date of its issue.

Rev. No.	Pages Affected	Date of Issue	Change	New Page Inserted	Signature EuroFOX Aviation
1.0	All	February 2016	First issue		
2.0	Various	April 2016	Changes in line with BMAA review		
3.0	Page 10 Para 2.3 engine	May 11 <sup>th</sup> 2016	Rotax MPD re CHT now CT and "01" engine designation		
4.0	Various	May 19 <sup>th</sup> 2016	<b>KIAS</b> added and other minor changes in line with BMAA review		
5.0	Various	7 <sup>th</sup> June 2016	Va corrected		

## TABLE OF CONTENTS:

<b>1. GENERAL INFORMATION.....</b>	<b>- 7 -</b>
1.1 INTRODUCTION.....	- 7 -
1.2 CERTIFICATION BASIS.....	- 7 -
1.3 MANUFACTURER .....	- 7 -
1.4 WARNING, CAUTION AND NOTE .....	- 7 -
<b>2. AIRCRAFT AND SYSTEMS DESCRIPTION.....</b>	<b>- 8 -</b>
2.1 NOSE WHEEL .....	- 8 -
2.2 TAIL WHEEL .....	- 9 -
2.3 ENGINE .....	- 10 -
2.4 UK APPROVED PROPELLERS FOR USE WITH YOUR TYPE APPROVED MICROLIGHT.....	- 10 -
2.5 FUEL AND FUEL CAPACITY .....	- 10 -
2.6 OIL .....	- 11 -
2.7 OIL WARMING FLAP .....	- 11 -
2.8 OPERATING WEIGHTS AND LOADING (OCCUPANTS, BAGGAGE, FUEL, BALLAST) .....	- 11 -
2.9 CREW.....	- 11 -
2.10 CABIN OVERVIEW (GUIDE ONLY) .....	- 12 -
2.11 CO MONITORING PATCH.....	- 14 -
<b>3. OPERATING LIMITATIONS.....</b>	<b>- 15 -</b>
3.1 STALL SPEED AT MAXIMUM TAKEOFF WEIGHT ( $V_S$ AND $V_{SO}$ ) .....	- 15 -
3.2 FLAPS EXTENDED SPEED RANGE ( $V_{SO}$ TO $V_{FE}$ ) MIAS .....	- 15 -
3.3 MAXIMUM MANEUVERING SPEED ( $V_A$ ) MIAS .....	- 15 -
3.4 NEVER EXCEED SPEED ( $V_{NE}$ ) MIAS .....	- 15 -
3.5 CROSSWIND AND WIND LIMITATION.....	- 15 -
3.6 LANDING APPROACH SPEED.....	- 15 -
3.7 SERVICE CEILING .....	- 16 -
3.8 LOAD FACTORS.....	- 16 -
3.9 PROHIBITED MANOEUVERS.....	- 16 -
3.10 OTHER LIMITATIONS.....	- 16 -
<b>4. WEIGHT AND BALANCE INFORMATION.....</b>	<b>- 17 -</b>
4.1 CENTER OF GRAVITY (CG) RANGE AND DETERMINATION.....	- 17 -
4.1.1 <i>Weight and balance determination for flight.....</i>	- 17 -
4.1.2 <i>Detailed calculation of CG position (applies to nose or tail wheel versions) .....</i>	- 17 -
<b>5. PERFORMANCE.....</b>	<b>- 18 -</b>
5.1 TAKEOFF AND LANDING DISTANCES.....	- 18 -
5.2 RATE OF CLIMB.....	- 18 -
5.3 CRUISE SPEEDS .....	- 19 -
5.4 RPM .....	- 19 -
5.5 OTHER PERFORMANCE DATA .....	- 19 -
<b>6. EMERGENCY PROCEDURES .....</b>	<b>- 20 -</b>
6.1 INTRODUCTION.....	- 20 -
6.2 ENGINE FAILURE AND EMERGENCY LANDINGS.....	- 20 -
6.2.1 <i>Engine Failure during Take-Off Run.....</i>	- 20 -
6.2.2 <i>Engine Failure during Take-Off.....</i>	- 20 -
6.2.3 <i>In-flight Engine Failure .....</i>	- 20 -
6.2.4 <i>Additional information on engine failure and emergency landing procedures .....</i>	- 20 -
6.2.5 <i>Carburettor Icing .....</i>	- 21 -
6.2.6 <i>In-flight Engine Starting .....</i>	- 21 -
6.3 FIRES .....	- 21 -
6.3.1 <i>Engine fire on the ground .....</i>	- 21 -
6.3.2 <i>Engine fire during takeoff.....</i>	- 22 -
6.3.3 <i>Engine fire in flight.....</i>	- 22 -
6.3.4 <i>Cockpit or electrical fire.....</i>	- 23 -
6.4 GLIDING.....	- 23 -
6.5 PRECAUTIONARY LANDING .....	- 23 -
6.6 BLOWN-OUT TYRE LANDING .....	- 23 -
6.7 DAMAGED LANDING GEAR LANDING .....	- 23 -

6.8	VIBRATIONS OR OTHER ENGINE PROBLEM .....	- 23 -
6.9	INADVERTENT ICING ENCOUNTERED .....	- 24 -
6.10	EXTREME TURBULENCE ENCOUNTERED .....	- 24 -
6.11	ELECTRICAL SYSTEM MALFUNCTIONS .....	- 24 -
6.12	INADVERTENT STALL AND SPIN RECOVERY .....	- 24 -
<b>7.</b>	<b>NORMAL PROCEDURES .....</b>	<b>- 25 -</b>
7.1	WING FOLD OPERATION AND DESCRIPTION .....	- 25 -
7.2	DESCRIPTION .....	- 25 -
7.3	WING FOLD FOR TRANSPORT .....	- 25 -
7.4	PRE-FLIGHT INSPECTION .....	- 27 -
7.4.1	<i>Daily Preparation</i> .....	- 27 -
7.4.2	<i>Engine Warm-Up, Power Check</i> .....	- 28 -
7.4.3	<i>Pre-Flight Inspection</i> .....	- 29 -
7.5	ENGINE STARTING .....	- 29 -
7.5.1	<i>Use of External Power Supply</i> .....	- 29 -
7.5.2	<i>Engine Starting</i> .....	- 29 -
7.6	TAXIING .....	- 30 -
7.6.1	<i>Prior to Taxiing</i> .....	- 30 -
7.6.2	<i>Taxiing</i> .....	- 30 -
7.7	NORMAL TAKEOFF .....	- 30 -
7.7.1	<i>Prior to Take-Off</i> .....	- 30 -
7.7.2	<i>Take-Off</i> .....	- 31 -
7.8	BEST ANGLE OF CLIMB SPEED ( $V_X$ ) .....	- 31 -
7.9	BEST RATE OF CLIMB SPEED ( $V_Y$ ) .....	- 32 -
7.10	CRUISE .....	- 32 -
7.11	APPROACH .....	- 32 -
7.11.1	<i>Descent</i> .....	- 32 -
7.11.2	<i>Downwind</i> .....	- 32 -
7.12	NORMAL LANDING .....	- 33 -
7.12.1	<i>On Base Leg</i> .....	- 33 -
7.12.2	<i>On Final</i> .....	- 33 -
7.12.3	<i>Short Final</i> .....	- 33 -
7.12.4	<i>Landing</i> .....	- 33 -
7.12.5	<i>After landing</i> .....	- 33 -
7.12.6	<i>Engine Stopping</i> .....	- 33 -
7.12.7	<i>Post-Flight Check</i> .....	- 34 -
7.13	SHORT FIELD TAKE-OFF AND LANDING PROCEDURES .....	- 34 -
7.14	BALKED LANDING PROCEDURES .....	- 34 -
7.15	INFORMATION ON STALLS, SPINS AND ANY OTHER USEFUL PILOT INFORMATION .....	- 34 -
7.15.1	<i>Rain</i> .....	- 35 -
<b>8.</b>	<b>AIRCRAFT GROUND HANDLING AND SERVICING .....</b>	<b>- 36 -</b>
8.1	SERVICING FUEL, OIL, COOLANT .....	- 36 -
8.1.1	<i>Servicing fuel</i> .....	- 36 -
8.1.2	<i>Servicing oil</i> .....	- 36 -
8.1.3	<i>Servicing coolant</i> .....	- 36 -
8.2	LANDING GEAR TYRE DIMENSION AND PRESSURE .....	- 36 -
8.3	GROUND HANDLING AND TIE-DOWN INSTRUCTIONS .....	- 37 -
8.3.1	<i>Aircraft moving instruction</i> .....	- 37 -
8.3.2	<i>Aircraft tie-down instruction</i> .....	- 37 -
<b>9.</b>	<b>PARACHUTE INSTALLATION .....</b>	<b>- 38 -</b>
9.1	PARACHUTE OPERATING DATA AND PROCEDURES .....	- 38 -
9.2	MAINTENANCE REQUIREMENTS FOR CONTINUED SAFE OPERATION OF THE PARACHUTE .....	- 38 -
<b>10.</b>	<b>REQUIRED PLACARDS AND MARKINGS .....</b>	<b>- 39 -</b>
10.1	AIRSPED INDICATOR RANGE MARKINGS (THESE MUST BE MARKED ON THE ASI) .....	- 39 -
10.2	OVERVIEW OF SPEED LIMITS: .....	- 39 -
<b>11.</b>	<b>OPERATING LIMITATION PLACARDS IN SIGHT OF OCCUPANTS .....</b>	<b>- 40 -</b>
11.1	“NO INTENTIONAL SPINS” .....	- 40 -
11.2	MISCELLANEOUS PLACARDS AND MARKINGS .....	- 40 -
11.3	EUROFOX AIRCRAFT PLACARDS .....	- 40 -

<b>12.</b>	<b>SUPPLEMENTARY INFORMATION .....</b>	<b>- 41 -</b>
12.1	FAMILIARIZATION FLIGHT PROCEDURES.....	- 41 -
12.2	PILOT OPERATING ADVISORIES .....	- 41 -
12.3	FURTHER INFORMATION .....	- 41 -
12.4	STARTING AND PRE-FLIGHT CHECKS .....	- 42 -

## 1. General information

### 1.1 Introduction

This handbook is provided with your aircraft to allow you to attain as much knowledge about the aircraft and its operation as possible. Read this manual thoroughly before your first flight and make sure you understand all the information contained here. This aircraft is equipped with a non-certified engine. When flying the aircraft always ensure that a safe landing would be possible in the event of loss of engine power. Pay attention to the fact that you as the pilot, are fully responsible for safety of your passengers and persons or property on the ground.

### 1.2 Certification Basis

This aircraft is a Type Approved Microlight and was manufactured in accordance with BCAR Section S airworthiness standards approved by the UK CAA. A certificate of conformance is supplied with each Type Approved Microlight.

### 1.3 Manufacturer

Ascent Industries Ltd T/A EUROFOX AVIATION  
The Hangar  
Wanshurstgreen Farm,  
Battle lane,  
Marden,  
Kent, TN12 9DF

*EuroFOX Aviation is a trading name of Ascent industries Ltd. Company registration nr 7731403*

UK and Ireland Distributor [www.eurofoxuk.co.uk](http://www.eurofoxuk.co.uk)

### 1.4 Warning, Caution and Note

In this handbook the following is used to highlight especially important information:

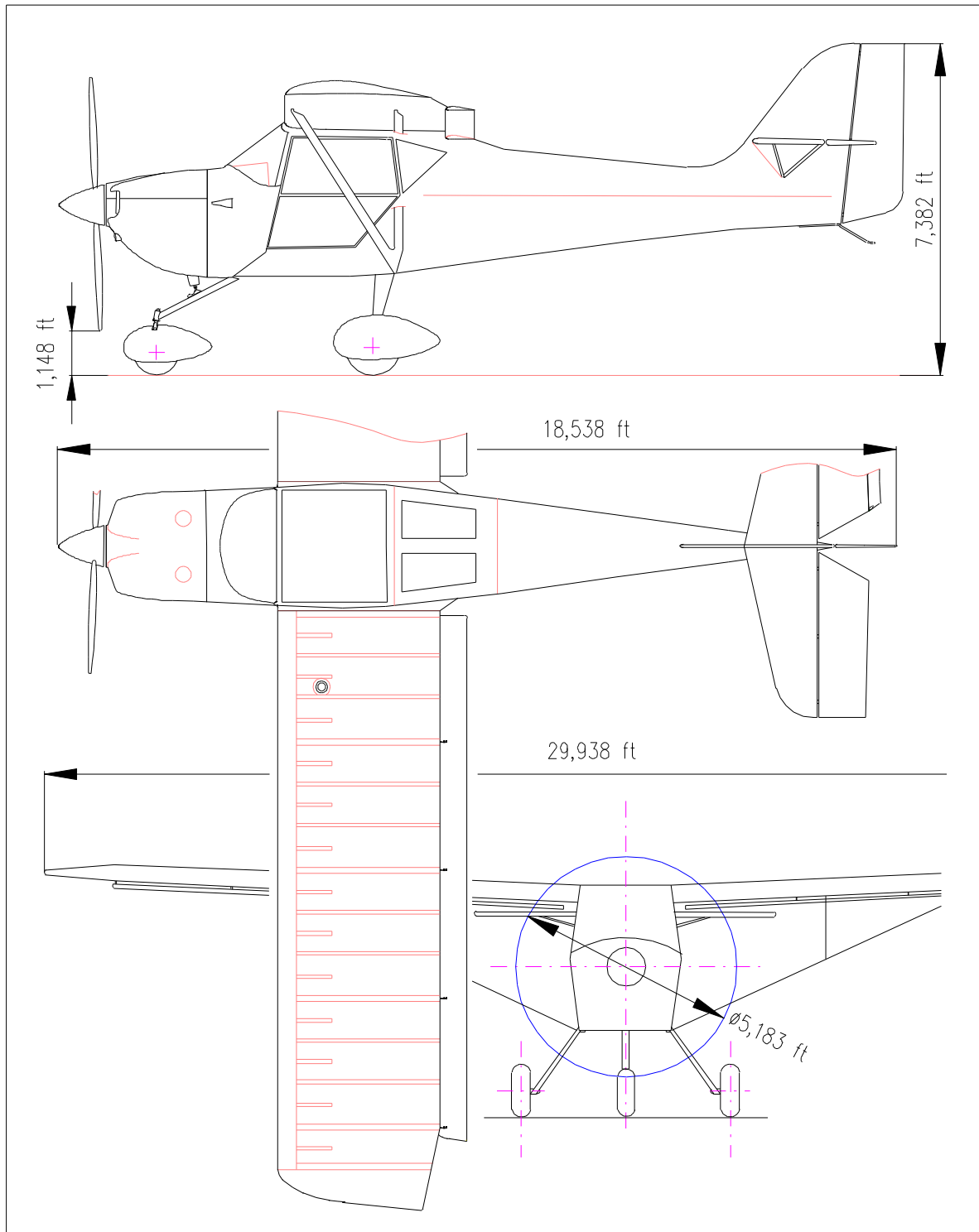
<b>WARNING</b>	Information which could prevent personnel injury or loss of life
<b>CAUTION</b>	Information which could prevent damage to equipment
<b>NOTE</b>	Information of special importance to pilots

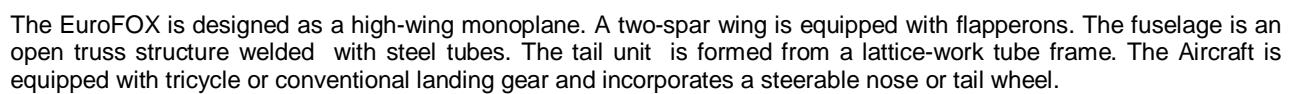


## 2. Aircraft and Systems Description

### 2.1 Nose wheel

(Note: All versions have the swept forward wings that are shown in the tail dragger drawing)





Wing span .....	.9,125 m
Length.....	.5,65 m
Height.....	.2,25 m
Wing area with flap.....	.11,4 m <sup>2</sup>
Chord length without flap.....	.1,12 m
with flap .....	.1,3 m
Wing loading 450 kgs MAUW .....	.39,47 kgm <sup>-2</sup>
Wing loading 472.5 kgs MAUW .....	.41.44 kgm <sup>-2</sup>
Aspect-ratio .....	.7,3
Propeller clearance (Minimum).....	.0,300 m

## 2.3 Engine

The EuroFOX is powered by ROTAX 912 UL (80 HP) or 912 ULS (100HP) engine – **NOTE** only the “01” engine variants, modified for coolant temperature measurement as opposed to the previous cylinder head temperature measurement are permitted to be installed. Any reference in this manual to a Rotax 912 refers to the “01” engine variants only.

It is a four-cylinder, four-stroke, horizontally opposed-cylinder, centre-camshaft engine with over-head valves. Engine cooling is of a combined type, cylinder heads are water-cooled, while cylinders are air-cooled. The engine has dry sump lubrication. The ignition system is of a dual, distributor less and capacitor flywheel magneto type. The engine is equipped with an electric starter, AC generator and a mechanical fuel delivery pump, with optional additional electric pump. The propeller is powered from an integrated reduction gear with mechanical damping.

**Engine manufacturer** ..... ROTAX GmbH., Austria

Engine model ROTAX 912 UL (80hp) or Rotax 912ULS (100HP) “01” engine variants only

For all engine information and limitations please refer to the Rotax operators manual as issued with the Eurofox Type Approved Microlight. As the aircraft owner, you are responsible for applying any Rotax updates or bulletins issued by Rotax.

### **WARNING**

**This engine is not certified and it may fail at any time**

## 2.4 UK approved propellers for use with your Type Approved Microlight

DUC Swirl “R” design 1660mm dia (used with the Rotax 912UL (80hp)) and 1730mm dia (used on the Rotax 912ULS (100hp)) are the approved propeller types and specifications

For additional propeller information see **Operators Manual and Technical description** supplied with the propeller in your Type Approved Microlight.

## 2.5 Fuel and fuel capacity

Fuel tank capacity - wing tanks..... 2x 40 litres

- central connecting tank ..... 6 litres

Max. fuel quantity..... 86 litres

Usable fuel quantity ..... 85 litres

Unusable fuel quantity..... 1 litre

Fuel specification EN228 min RON 90 (912UL) RON 95 (912ULS) unleaded Mogas fuel (Standard Spec. for Automotive Spark-Ignition Engine) or AVGAS 100 LL.

Due to the higher lead content in AVGAS, the deposits in the combustion chamber and lead sediments in the lubrication system will cause an increase in the wear of the valve seats. Therefore, use AVGAS only if you encounter problems with vapour lock or if other fuel types are not available.

For additional information concerning fuel specification consult **Operator’s Manual for all versions of Rotax 912** supplied with the engine and the most recent updates as issued by Rotax.

The fuel system includes two wing tanks of 40 litres each, a central tank of 6 litres, Fuel drain valve, fuel valves, a fuel filter, an engine fuel pump and connecting lines. Fuel tanks and fuel lines are suitable for fuel containing ethanol.

The fuel is gravity-fed from the right-hand or left-hand wing tank into the 6L central tank depending on which wing tank fuel valve is open. The fuel is then further directed from the central tank via the main fuel valve and fuel filter into the mechanical fuel pump on the engine which delivers the fuel to the carburetors. (additional electric fuel pump optional)

The amount of fuel in each tank is indicated by a wing root visual fuel gauge which is a part of each tank. Minimum fuel quantity in the central feeder tank is indicated by a warning light on the instrument panel. When remaining fuel is 4,1 litres, the light will illuminate and this means enough fuel for approximately 10-15 minutes of flight. The warning light condition can be verified at any time by pushing the control button. No red light indication when the control button is pushed and held means the bulb is blown out and the minimum fuel quantity is not indicated:- In this case, make a more conservative estimate for fuel on board, check fuel quantity in wing tanks and land as soon as you are not confident of the fuel quantity inside the wing tanks. Optionally, an EuroFOX Aviation back up fuel pump is available.

Do not forget to properly open and manage the main fuel tank valves to ensure continuous flow of fuel to the engine. **Both fuel tanks should be open and used at all times, thus feeding the header tank in normal flight.** A single tank can be shut off if required (suspected contamination for example) without affecting the aircraft operation, but of course the range will be reduced.

The fuel drain valve outlet is behind the left seat on the outside bottom side of the fuselage; to drain off water and dirt, the drain pipe is to be pressed into the fuselage and subsequently a fuel sample is to be taken.

For refuelling information see section 8.1

## 2.6 Oil

Oil tank capacity .....	3.2 litres
Maximum oil quantity .....	2.6 litres
Minimum oil quantity .....	2.1 litres

Oil specification:

When selecting the most suitable lubricants refer to the latest recommendations issued by Rotax and/or it's UK distributor.

— Use only oil as recommended by Rotax or its distributor

**CAUTION:** If the engine is mainly run on AVGAS **more frequent** oil changes will be required. See the latest Rotax Service and maintenance Information required for running on avgas.

For additional information concerning oil system consult **Operator's Manual for all versions of Rotax 912** supplied with the engine, with supplements as issued periodically by Rotax.

The maximum and minimum oil level is indicated by two marks on the dip stick in the oil tank.

## 2.7 Oil Warming Flap

The EuroFOX is fitted with an adjustable aluminum flap that when operated (knob on panel pulled out), will blank off all air going to the oil cooling radiator. This enable rapid warming of the oil at first start and in colder conditions, adjustment of this flap will enable the pilot to keep the oil temperature in the green operating arc in the gauge. Care should be taken when the flap is closed and the air blocked off, that the oil temperature does not rise outside placarded limits. This is only likely to happen in very hot weather or continual high power work e.g multiple circuits

## 2.8 Operating weights and loading (occupants, baggage, fuel, ballast)

Max basic empty weight (80HP MAUW for 450kg version) ...	270 kg
Max basic empty weight (100HP MAUW for 450kg version)...	269 kg
Max. take-off weight.....	450 kg
Max. landing weight .....	450 kg
Max. fuel weight.....	61 kg
Max. baggage weight in baggage compartment .....	18 kg

Max Basic empty weight (80HP MAUW for 472.5kg version)	292.5 kg
Max Basic empty weight (100HP MAUW for 472.5kg version)	291.5 kg
Max. take-off weight.....	472.5 kg
Max. landing weight .....	472.5 kg
Max. fuel weight.....	61 kg
Max. baggage weight in baggage compartment .....	18 kg

## 2.9 Crew

Number of seats .....	2
Minimum crew weight.....	55 kg
Max crew weight per seat.....	83 kg (Note: occupant limit is 100kgs per seat)

**WARNING**

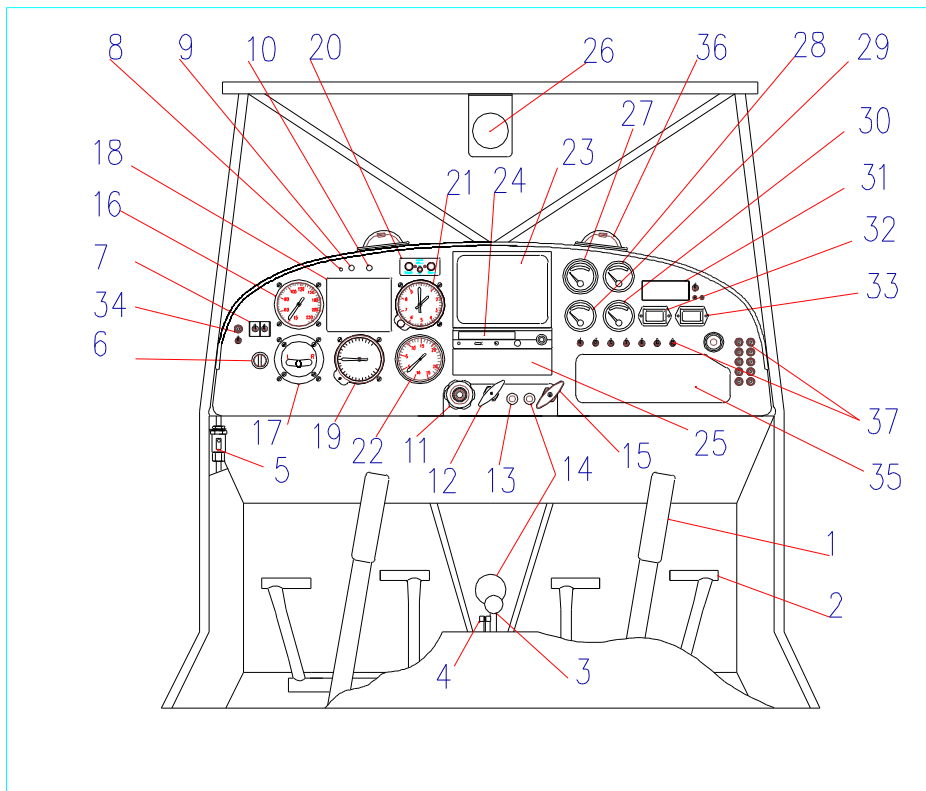
**Make sure that above mentioned weight limits are strictly followed.**

**Structural failures which result from overloading of the aircraft may be dramatic and catastrophic.**

The additional stress placed on the structural parts by overloading can accelerate the occurrence of metal fatigue failures. Also flight characteristics might change significantly when the aircraft is overloaded. Takeoff and landing distance are

significantly longer for overloaded aircraft. Overloading and out of balance loading of the aircraft is one of the most common causes of accidents.

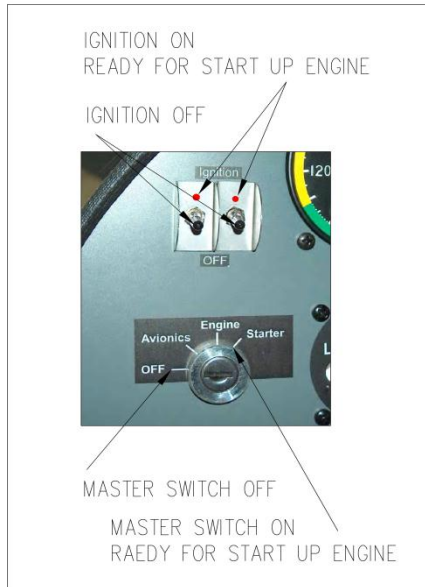
## 2.10 Cabin overview (guide only)



### TYPICAL LAYOUT OF THE PANEL CONTROLS AND INSTRUMENTS

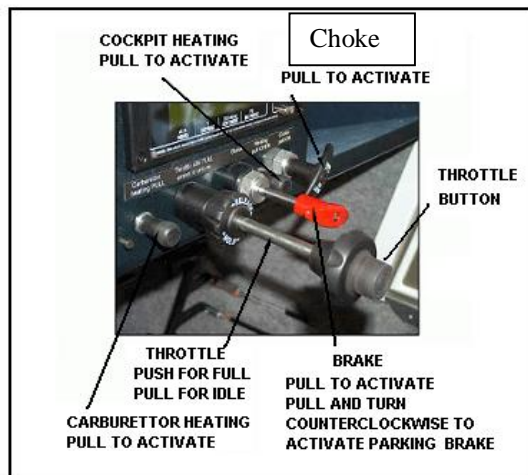
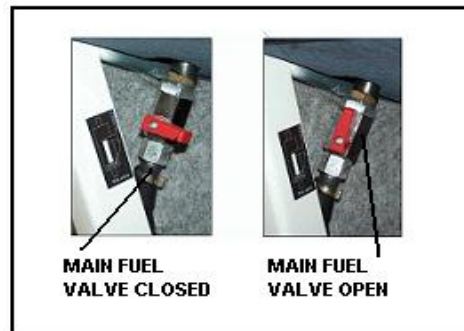
(see following pages for details, however the Type Approved Microlight has freedom to organise the panel to his or her wishes – this is only a guide as each aircraft will be different)

- |                               |                            |                                    |
|-------------------------------|----------------------------|------------------------------------|
| 1. Control stick              | 15. Choke                  | 30. Fuel pressure gauge            |
| 2. Rudder pedals              | 16. ASI                    | 31. Outside temperature.           |
| 3. Wing flaps                 | 17. Slip Ball indicator    | 32. Flight hours gauge             |
| 4. Trim elevator              | 18. EFIS – D6 or D10       | 33. Engine hour gauge              |
| 5. Fuel cock                  | 19. VSI                    | 34. Switch for Electric fuel pump. |
| 6. Master Switch              | 20. INTERCOM               | 35. Compartment for maps           |
| 7. Ignition                   | 21. Altimeter              | 36. Ventilation                    |
| 8. Min. fuel pushbutton       | 22. RPM indicator          | 37. Switch + circuit breakers      |
| 9. Last 4 liter warning light | 23. GPS                    | 37.1 Landing light                 |
| 10. Charging light            | 24. Radio                  | 37.2 Strobe light                  |
| 11. Throttle control lever    | 25. Transponder            | 37.3 Gyro or EFIS                  |
| 12. Brake with park brake     | 26. Magnetic Compass       | 37.4 Free                          |
| 13. Carb heat.                | 27. Oil temperature        | 37.5 Radio                         |
| 14. Heater                    | 28. Oil pressure gauge     | 37.6 Transponder                   |
|                               | 29. Head temperature gauge | 37.7 GPS                           |



Ignition and master switch

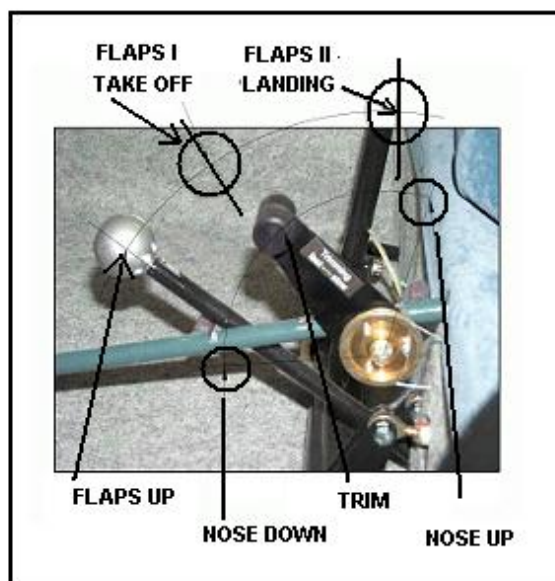
Main Fuel Valve open and close position



Central panel (typical overview)

Note: A simple friction throttle is supplied for UK Type Approved Microlights

Aircraft  
firewall



Pilot  
seat side

Intuitive flap and trim levers located between P1 and P2 seat position



Example of switch and fuse layout



Warning lights and fuel reserve bulb check button



Door locking mechanism. Note: The door handle needs to be turned to close door as well as open door

The battery is typically a lightweight ETX18B lithium iron phosphate ( $\text{LiFePO}_4$ ), a starter battery with high cranking abilities and is located behind the right-hand pilot's seat. Nominal voltage in aircraft system is 13.5 to 14.2 V. The engine is equipped with integrated AC generator with external rectifier-regulator (12 V, 20A DC). The battery has its own internal fully integrated battery management system, but is further isolated from the aircraft systems with a pullable 30a circuit breaker.

Type	EarthX 18B	
Voltage	12 V	
Capacity	340 cranking amps, 6 amp hours	

## 2.11 CO Monitoring patch

As the EuroFOX uses hot air from around the silencer via a heat exchanger and ducting, it is mandatory that a CO detector patch is fitted within sight of the pilot and in the cabin area.

This patch must be regularly monitored, and replaced after it discolours or at the "end of life date". Any discoloring should lead to an investigation by the owner operator as to why and the exhaust system and cabin heat system checked.



### 3. Operating limitations

All flight speeds in this POH are presented in Knots calibrated airspeed (MIAS) using an approved calibration table for Type Approved EuroFOX. The static tube reference point is inside the cabin behind the panel.

#### 3.1 Stall speed at maximum takeoff weight ( $V_s$ and $V_{so}$ )

Aircraft configuration	Stall speed MIAS – angle of bank 0°	
	MIAS	KIAS
Flaps down ( $V_{so}$ )	35	30
Flaps up ( $V_s$ )	43	37
Loss of height in stall	50-100 ft	

#### WARNING

The stall speed mentioned above are with wings level. Once any angle of bank (e.g. turn) is encountered the stall speed is significantly increased.

Max angle of bank – 60°

The more bank – the higher stall speed. This simple rule is especially important when a turn at maximum permitted angle of bank (60°) is performed. Do not start the turn until you have sufficient airspeed reserve. Full throttle is also essential to have sufficient thrust in reserve as the drag is increased during a steep turn.

#### 3.2 Flaps extended speed range ( $V_{so}$ to $V_{FE}$ ) MIAS

	MIAS	KIAS
Lower limit	35	30
Upper limit	76	66

#### 3.3 Maximum maneuvering speed ( $V_A$ ) MIAS

	MIAS	KIAS
Max. manoeuvring speed ( $V_A$ )	93	81

Full control deflections may only be used up to  $V_A$ . Above  $V_A$  control deflections must be restricted to 1/3 full deflection.  $V_A$  is also the maximum speed for flight in turbulent air.

#### 3.4 Never exceed speed ( $V_{NE}$ ) MIAS

	MIAS	KIAS
Never exceed speed ( $V_{NE}$ )	136	118

#### 3.5 Crosswind and wind limitation

Maximum permitted wind speed components for take-off and landing:

Max. wind (in runway direction)..... 25 MIAS 22 KIAS

Crosswind.....(tail wheel 14 MIAS 12 Kts) 17 MIAS 15 KIAS

tail wind..... 5 MIAS 4 KIAS

Cross wind take offs and landings require training and experience, the higher the crosswind component, the better your skill must be. Do not fly without proper experience when the wind speed is approaching the limit. Avoid take offs with tail wind when possible – the total take off distance is significantly longer and longer ground distance is required to gain altitude.

When landing with tail wind the aircraft ground speed is higher resulting in a longer landing distance.

#### 3.6 Landing approach speed

Nose wheel version.....65 MIAS 56 KIAS

Tail wheel version.....59 MIAS 51 KIAS



### 3.7 Service ceiling

Ceiling ..... 14 760 ft

**WARNING**

Oxygen mask and/or other equipment required to reach maximum ceiling, consult respective regulations.

### 3.8 Load factors

Flaps up:

Maximum positive centre of gravity load factor ..... + 4 Gs

Maximum negative centre of gravity load factor ..... - 2 Gs

Flaps down:

Maximum positive centre of gravity load factor ..... + 4 Gs

Maximum negative centre of gravity load factor ..... 0 Gs

### 3.9 Prohibited manoeuvres

**WARNING**

Aerobatics and intentional spins are prohibited.

Maximum angle of bank, port and Starboard: 60°

Maximum angle of pitch up and down: 45°

### 3.10 Other Limitations

**WARNING**

No smoking

**WARNING**

Flights with rear "turtle deck" canopy removed are prohibited

**WARNING**

Only VFR day flights at ambient temperature above -10° C are permitted.

Flights at ambient temperature between -10° C and 0° C are permitted only under no icing conditions and when the carburettor heating is activated (if fitted).

**WARNING**

IFR flights and flying in cloud is prohibited.

Flight into known icing conditions is prohibited

This aircraft is not certified for operation in IMC (Instrument meteorological conditions). Always stay clear of clouds and have visual contact with the ground. Follow the airspace classification regarding distance from clouds.

Always evaluate the weather during your flight and try to get weather information from your destination using the radio whenever possible. When weather is deteriorating make a diversion or turn back before low cloud base and/or low visibility are outside local licence requirements.

## 4. Weight and Balance Information

### 4.1 Center of gravity (CG) range and determination

Aircraft handling and performance have been determined for this range of CG positions.

Centre of gravity limits	Front limit (mm)	Rear limit (mm)
For 80 HP version	260	410
For 100 HP version	260	385

The CG position of the dry empty aircraft is determined by weighing. The procedure is described in the Maintenance manual. The whole procedure must be repeated and new **Aircraft weight and balance statement** be prepared whenever a modification or repair having an impact on the weight of the aircraft occurs.

Each EuroFOX Type approved microlight will be issued with a factory produced weighing and CG report

**Weighing attitude: The aircraft longerons on the base of the entry doors, must be level 0 degrees**

#### 4.1.1 Weight and balance determination for flight

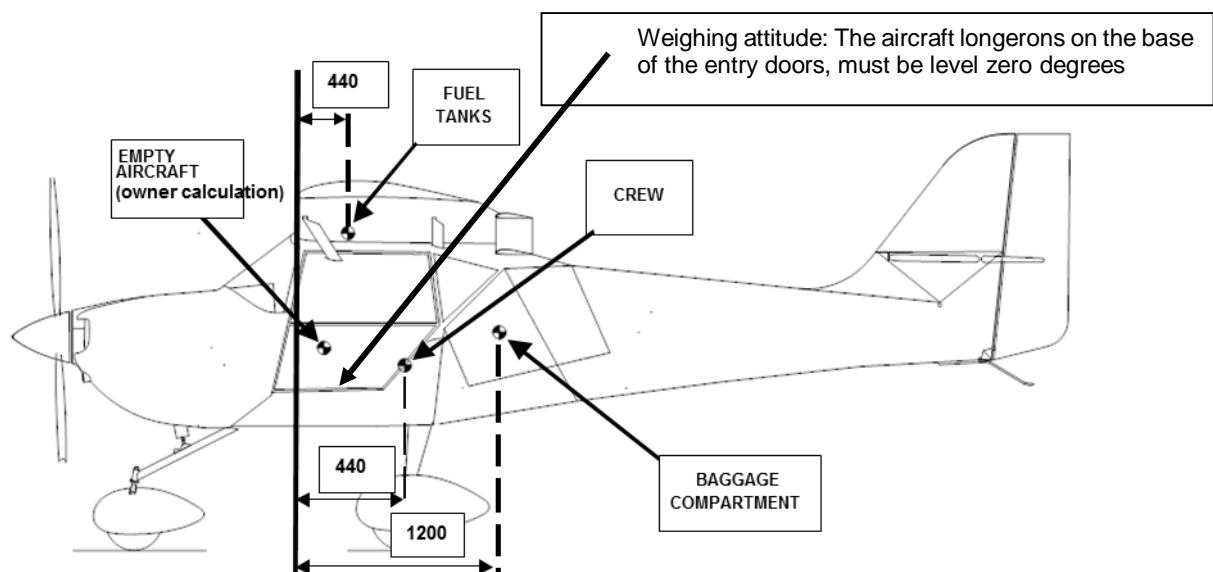
**WARNING**

**The aircraft must not be operated outside of its approved weight and balance limitations to assure safe flying.**

Providing that the pilot does not load the aircraft outside the placarded weights, then the aircraft will always be inside the aircraft CG range.

It is imperative that the pilot knows exactly the real empty weight of his or her aircraft.

#### 4.1.2 Detailed calculation of CG position (applies to nose or tail wheel versions)



As all reference points are located behind the leading edge of the wing at the root, the leading edge was selected as the reference plane. The table below shows a typical calculation including an example.

**The datum point (50 mm forward of the wing leading edge at the root) to wheel centre line distances on all EuroFOX aircraft are as follows:** (these figures take into account the wing forward sweep of 50)

Nose wheel:

- From datum point to nose wheel centre line = - 919 mm
- From datum point to main wheel centre line = 503 mm

Tail wheel

- From datum point to main wheel centre line = - 21 mm
- From datum point to tail wheel centre line = 4289 mm

**These measurement values are to be used to calculate the weight and balance**

## 5. Performance

The data is based on particular flight measurements undertaken with the aircraft of this type in good service conditions and with application of average piloting skills. The performance stated below are calculated at sea level of the international standard atmosphere (ISA). Variations in pilot technique can cause significant differences as well as the other conditions like runway slope, runway surface condition, humidity etc.

Use the following data for guidance but do not plan a take-off or landing when only 50 ft extra runway length is available or do not plan a cross country with only 8 litres of fuel expected to remain when arriving at your destination. Always be conservative when planning a flight and be ready for the unexpected – unexpected wind, atmospheric turbulence or sudden weather change at the destination forcing you to divert to airfield 60 NM away. Always plan a reasonable fuel reserve – 60 minutes seems to be sufficient time for most of flights, but this time should be increased when complicated weather conditions (strong headwind or rain showers) are expected en route.

The propeller installed on your aircraft was set to achieve the best compromise between take off and cruising performance (the performance information below are based on this setting).

The propeller pitch may not be changed without formal approval. Contact EuroFOX Aviation for details.

Always be carefully when making this change and make a record of the current settings. When the propeller is set to achieve a maximum cruise speed, the take-off distance is significantly longer.

On the other hand, when the propeller is set to achieve good rate of climb, the fuel consumption during level flight is higher. When a finer pitch is set (e.g. climb setting), a higher static RPM is achieved when aircraft is static and full power is applied. Be careful not to exceed the Rotax maximum limit RPM.

### 5.1 Takeoff and landing distances

Surface	Take off Distance (Metres) (912 80HP)	
	Ground run	Take off distance to 50 ft
Grass runway 80 HP 912UL	149	415 (319 without safety factor)
Grass Runway 100 HP 912ULS	149	325 (250 without safety factor)

Surface	Landing Distance (Metres)	
	Landing distance from 50 ft	Ground run
Grass runway	80 and 100 HP - 349 (no safety factor)	170

Both take-off and landing distance are significantly increased by the following factors:

- Tail wind
- High airport altitude
- High air temperature
- Up-hill runway slope
- Runway wet or covered with snow, dust or water
- Propeller set to achieve better cruising performance

### 5.2 Rate of climb

	912UL	912ULS
Rate of climb (fpm)	960	1100
Best climb angle speed (V <sub>x</sub> )	65 MIAS 56 <b>KIAS</b>	72 MIAS 63 <b>KIAS</b>
Best climb rate speed (V <sub>y</sub> )	72 MIAS 63 <b>KIAS</b>	78 MIAS 68 <b>KIAS</b>

### 5.3 Cruise speeds

VA should not be exceeded in rough air.

### 5.4 RPM

Max. take off power..... 5,800 (5 mins)

Max. continuous power ..... 5,500

Idle speed..... approx. 1,600

EuroFOX with 100hp Rotax engine, using the DUC Swirl 1730 mm diameter propeller has a pitch setting of 25 degrees at 215mm from tip to give 5000-5100 rpm during ground roll.

EuroFOX with 80hp Rotax engine, using the DUC Swirl 1660 mm diameter propeller has a pitch setting of 21 degrees at 200 mm from blade tip to give 5000-5100 rpm during ground roll.

The Rotax max rpm figures for the engine (5500rpm continuous and 5800rpm for 5 mins max) are the limits for the engine. In order to maximise fuel burn, 4200rpm in the straight and level cruise will show a fuel burn of approx. 10 lph (912UL) and 11 lph (912ULS)

Fuel consumption during cruise flight is dependent on various factors. The most important ones are engine settings and propeller settings. The higher the engine RPM is set during cruise, the higher the fuel consumption. When propeller is set to minimum angle to achieve good climbing performance, level flight will be slower together with higher fuel consumption.

When planning a flight, always consider all these and other factors like wind direction and speed or expected weather en route. Always plan for sufficient fuel reserve when arriving at the destination. Always carefully evaluate fuel consumption during the flight.

### 5.5 Other performance data

Max. endurance.....6 hours

Max. range..... 620 Statute miles

Max. speed flying with doors open..... 70 MIAS 61 **KIAS**

## 6. Emergency procedures

### 6.1 Introduction

This section contains procedures for various emergencies which may occur. Emergencies caused by aircraft or engine malfunctions are rare if proper pre-flight inspections and maintenance are practised.

The chapter describes basic emergencies and recovery procedures. Not all emergencies that may occur can be listed here in full, therefore their solution depends on the experience of the crew controlling course of such events. All air speed values in this chapter are presented in MIAS, as this value represents instrument reading better than the Calibrated air speed. In respect to any engine failure, first priority is always FLY THE AIRCRAFT.

### 6.2 Engine Failure and Emergency landings

#### 6.2.1 Engine Failure during Take-Off Run

- throttle                      REDUCE TO IDLE
- ignition                      OFF
- master switch              OFF
- brakes                        AS REQUIRED

#### 6.2.2 Engine Failure during Take-Off

- airspeed                      72 MIAS 63 **KLAS**
- choice of landing site      - after take-off and up to a height of 500 ft - land in straight direction ahead, if possible
- over 500 ft choose suitable landing site

The landing site is to be preferably chosen in the runway direction or the nearest suitable site clear of obstacles

- master switch              OFF
- ignition                      OFF
- main fuel valve            SHUT
- tank fuel valves            SHUT
- flaps                         EXTEND AS NEEDED
- safety belts                TIGHTEN

after touchdown:

- brakes                        AS REQUIRED

#### 6.2.3 In-flight Engine Failure

- airspeed                      72 MIAS 63 **KLAS**
- landing site selection      SELECT
- transmit MAYDAY on 121.5, ELT ON, XPDR 7700 - if time permits

- |       |                         |                             |
|-------|-------------------------|-----------------------------|
| check | - master switch         | ON                          |
|       | - ignition              | ON                          |
|       | - main fuel valve       | OPEN                        |
|       | - wing tank fuel valves | OPEN to tank with more fuel |
|       | - throttle              | SET TO 1/3 OF TRAVEL        |
|       | - starter               | START THE ENGINE            |

If the engine cannot be restarted, proceed in accordance with the procedure 6.2.2.

#### 6.2.4 Additional information on engine failure and emergency landing procedures

If the engine failure occurs during the take-off run, the pilots main concern should be to stop the aircraft on the remaining runway. Those extra items in the checklist are to add protection should the runway be too short to stop.

In flight, prompt reduction of pitch attitude to obtain and maintain a proper glide speed upon experiencing an engine failure is the first priority. If the failure has occurred shortly after take-off, a landing should be planned straight ahead with only small changes in the flight direction to avoid obstacles. The best gliding ratio can be achieved with flaps up – flaps

down will reduce the stall speed but at the same time deteriorating gliding performance. Try to stop rotation of propeller if restarting efforts are not successful – wind milling propeller has a higher drag than stopped propeller.

While gliding towards a selected forced landing site, an effort should be made to determine and correct the cause of engine failure – time and altitude permitting. Do not concentrate on cause determination or restart effort unless you have selected a suitable landing site and you are confident of this manoeuvre. Flying the aircraft (especially maintaining the proper gliding speed) is always the first priority. If the cause cannot be determined and corrected the emergency landing must be accomplished.

Always announce your intent and position after engine failure using radio and other equipment when time permits. Turn radio to international emergency frequency – 121.5 and transmit MAYDAY message. Activate Emergency locator transmitter (ELBA) – set the switch to ON position. Set transponder (XPDR) to emergency code 7700. When the above mentioned procedure cannot be performed due to time constraints try to complete as many steps as possible. Transmitting MAYDAY message on the frequency already tuned on your radio should be the minimum procedure.

### WARNING

**During a landing it is vital for the pilot to continue to fly the aircraft. Damages and/or injuries can be minimised if the pilot is fully concentrating on controlling the aircraft until it comes to complete stop**

## 6.2.5 Carburettor Icing

Carburettor icing mostly occurs when getting into an area of ice formation. The carburettor icing shows itself through a decrease in engine power and an increase in engine temperatures. To recover the engine power, the following procedure is recommended:

- carburettors heating                      **ACTIVATE**
- airspeed                                      **72 MIAS 63 KIAS**
- throttle                                      **1/3 of power ≈ (3500 RPM)**
- if possible, leave the icing area
- gradually increase the engine power to cruise conditions after 1-2 minutes
- if you fail to recover the engine power, land at the nearest airfield (if feasible), or, depending on circumstance, off-airfield, following the procedure given under 6.2.2

## 6.2.6 In-flight Engine Starting

- airspeed                                      **72 MIAS 63 KIAS**
- landing site selection                      **SELECT**
- master switch                              **ON**
- main fuel valve                              **OPEN**
- wing tank fuel valves                      **OPEN to tank with more fuel**
- choke                                      **SWITCH ON (cold engine only)**
- throttle                                      - **ADJUST to 1/3 of travel**  
- **IDLE (when choke is activated)**
- ignition                                      **ON**
- starter                                      **START UP**
- if the engine cannot be restarted, increase the airspeed to 92 MIAS so that air flow can rotate the propeller, thus enabling engine starting. Don't spend too long trying to restart, if you see a good out landing field, take it immediately

### WARNING

**Loss of height needed for in-flight engine starting is about 500 to 650 ft.**

## 6.3 Fires

Follow these procedure when fire or smoke in the engine compartment or cockpit is detected. Fires are extremely rare in properly maintained aircraft.

### 6.3.1 Engine fire on the ground

- main fuel valve                              **SHUT**

- tank fuel valves SHUT
- Brakes APPLY
- throttle FULL
- ignition switch off when engine has stopped as all remaining fuel in carburettors was burned
- master switch OFF
- abandon the aircraft and extinguish fire (if possible)
- Fire damage INSPECT

**NOTE**

Time needed to burn fuel remaining in carburettors after fuel valves are closed is around 30 sec.

**WARNING**

**DO NOT CONDUCT ANOTHER FLIGHT BEFORE THE FIRE CAUSE HAS BEEN DETERMINED AND REPAIRED BY AUTHORISED PERSONNEL**

## 6.3.2 Engine fire during takeoff

- throttle IDLE
- main fuel valve SHUT
- tank fuel valves SHUT
- airspeed 72 MIAS 63 **KIAS**
- brakes STOP
- throttle FULL
- ignition switch off when engine has stopped as all remaining fuel in carburettors has burned
- abandon the aircraft and extinguish fire (if possible) once the aircraft is stopped

## 6.3.3 Engine fire in flight

- main fuel valve SHUT
- tank fuel valves SHUT
- throttle FULL
- airspeed INCREASE as required to find an airspeed which will provide an incombustible mixture. Do not exceed  $V_{NE}$
- landing site selection guide the aircraft to the nearest airfield, or choose a suitable landing site for emergency landing
- ignition switch off when engine has stopped as all remaining fuel in carburettors was burned
- master switch OFF
- airspeed 72 MIAS 63 **KIAS**
- wings flaps EXTEND AS NEEDED
- safety belts TIGHTEN
- perform emergency landing
- abandon the aircraft and extinguish fire (if possible)

**WARNING**

**DO NOT ATTEMPT TO RESTART THE ENGINE**

**WARNING**

**DO NOT CONDUCT ANOTHER FLIGHT BEFORE THE FIRE CAUSE HAS BEEN DETERMINED AND REPAIRED BY AUTHORISED PERSONNEL**

#### 6.3.4 Cockpit or electrical fire

Electrical fires are usually signalled by the odour of burning insulation.

- cockpit door                                      OPEN to remove smoke from the cockpit
- avionics and other switches                  OFF

Land at the nearest suitable landing site. Consider shutting down the engine (and master switch) once the suitable landing site is reached. Extinguish fire as soon as possible.

### 6.4 Gliding

gliding ratio..... .9 : 1  
 optimum gliding speed ..... .65 MIAS 56 **KIAS**  
 rate of descent..... .551 fpm

Always consider flying through areas of descending air when calculating gliding range. Do not forget to have and maintain sufficient altitude to perform a landing procedure once suitable landing site has been reached.

### 6.5 Precautionary Landing

- choose suitable landing site, evaluate wind direction and speed, surface, surrounding obstacles and total safety of the manoeuvre under consideration
- perform approach and fly-over at a speed of 60 MIAS 61 **KIAS** along the selected landing site at a height of 150 ft to estimate the area condition, obstacles and to determine exact landing direction
- Follow normal landings checklist and land

after touchdown

- Ignition                                      OFF
- master switch                              OFF
- fuel valves                                  SHUT
- brakes                                        AS REQUIRED

A precautionary landing is preferable to an emergency landing. When engine vibration or engine roughness is presented, do not wait until the engine stops, perform a precautionary landing as soon as possible.

A precautionary landing is also used when the fuel exhaustion is imminent. This should not happen when proper flight preparation is performed. Always perform a precautionary landing before all fuel is consumed, emergency landing following the loss of power is more complicated and more risky.

Also consider a precautionary landing when bad weather is encountered. Again, it should not happen when proper flight planning is made. When the cloud base is forcing you to fly in low altitude and/or visibility is limited, try to fly a 180 course to avoid bad weather area. If the conditions are not getting better or even are deteriorating, perform a precautionary landing before the conditions become even worse.

### 6.6 Blown-Out Tyre Landing

- carry out normal approach-to-land
- when flaring at landing, keep the damaged wheel above ground as long as possible using ailerons (or elevator for the nose wheel)
- maintain the direction at landing run, applying rudder

### 6.7 Damaged Landing Gear Landing

- carry out a normal approach-to-land
- if the nose wheel is damaged, perform a touch-down on main wheels and hold the aircraft nose wheel up as long as possible till the speed is lost.
- if the main landing gear is damaged, perform touch-down at the lowest speed possible and maintain direction at landing run, if possible

### 6.8 Vibrations or other engine problem

If any forced vibrations appear in the aircraft, it is necessary:



- to set engine speed to such power rating where the vibrations are the lowest
- to land on the nearest airfield, or to perform a precautionary landing off-airfield
- if the vibrations are increasing, carry out an emergency landing off-airfield, following procedures given under 6.2.2

If the oil pressure reduces during a flight, an engine failure is probable. Reduce the engine power and execute a nearest airfield or precautionary landing before the engine failure occurs.

## 6.9 Inadvertent icing encountered

- carburettor heating           ACTIVATE
- throttle                        INCREASE above normal cruise settings
- course                         REVERSE or ALTER as required to avoid icing

**WARNING**

**EVASIVE ACTION SHOULD BE INITIATED IMMEDIATELY  
WHEN ICING CONDITIONS ARE ENCOUNTERED**

A prompt action must be taken immediately once icing conditions are encountered. A 180° turn and a climb is usually appropriate. If the airframe ice builds extremely rapidly, consider off-airport forced landing. Approach speed should be increased slightly depending upon icing severity.

## 6.10 Extreme turbulence encountered

- Airspeed                        REDUCE to VA
- safety belts                    SECURED
- loose objects                  SECURED

When an area of extreme turbulence is entered reduce airspeed to VA. Do not reduce the airspeed too low in order to prevent the aircraft from stalling due to turbulence. Do not increase the speed as this could cause structural damage to the aircraft.

## 6.11 Electrical system malfunctions

Charging indicating light is illuminated

When the red charging light is illuminated no immediate action is required. All avionics and other equipment are powered from the battery, so the power source is limited. Try to switch off instruments which are not necessary for flight and land at the nearest airfield

## 6.12 Inadvertent Stall and spin recovery

Spins should not occur during normal aircraft operation and they are prohibited.

The following general procedure should be followed should a stall occur:

lower the nose by pushing the control stick

gradually increase power

The following general procedure should be followed should a spin occurs:

- throttle                        IDLE
- rudder                         Neutral
- control stick                 Neutral

Once the rotation is stopped, establish a level flight.

## 7. Normal procedures

### 7.1 Wing Fold operation and description

#### 7.2 Description

The rectangular-plan wing is of a metal frame structure. It is composed of two duralumin carrying tubes and a system of duralumin ribs and diagonal stiffeners. The duralumin rib system comprises of 14 full ribs and 13 false ribs, stiffening the skin in the leading-edge area of assembly. The horizontal plane section of the wing is strengthened with a system of steel diagonal tubular stiffeners. There is a 40 litre fuel tank built in the wing root section which is welded of aluminium alloy metal sheet. Correct shape of the wing leading edge is guaranteed due to a fiberglass die-formed shell glued on the leading edge tube. The trailing edge is formed of a duralumin shaped piece. The wing is fabric-covered.

Below the wing trailing edge are the flapperons incorporating both function of ailerons and wing flaps; they are attached to the rib ends by means of five hinges. The flapperon structure consists of a duralumin load-carrying tube swinging in the hinges and a fiberglass sandwich part, itself an inversely moulded aerofoil.

The wings are attached to the fuselage by wing struts which are load-carrying tubes attached to the underside section of the wing and the side the fuselage at special location tabs. The wing attachment uses a rotation bolt at the lower wing strut attachment point which makes it possible to swing the wings simply backward lengthwise to the fuselage.

#### 7.3 Wing fold for transport

Required Tools: Screwdriver, 8,9,12 mm spanners

Parts required: None

To transport the aircraft, it is necessary to fold the wings to the transport position, i.e. to disconnect the wing front suspensions, to fold wings and fix them to the fuselage in transport position secured with transport struts ( pos. 7).

For short distances the aircraft can be towed on its own landing gear behind a vehicle by means of a simple tow bar attached to the rear fuselage suspension section.

For longer distances it is recommended to transport the aircraft on a suitable trailer, either open or covered.

To prepare the aircraft for transport: (see photos on the following page

- a. Unlock and remove the rear "turtle deck" cover, and put it on the seat (pos.1,2).
- b. Close the wing tank fuel cocks.
- c. Fit simple foam protection at each end of the flapperon trailer edge
- d. Disconnect the flapperon tie rods on both wings (pos.3).
- e. Remove the split pin and nut from the leading edge wing bolt connecting the wing to the fuselage.
- f. Remove the wing bolt (either a light tap or move the wing to relieve the load on the bolt
- g. Holding the wing with one hand, fold it carefully backwards while simultaneously moving the flapperon using the other hand to prevent it from striking on fuselage cross tubes (above the baggage bay).
- h. Fix the fully folded wing to the fuselage by means of the transport struts (pos.7).
- i. Repeat above points for the second wing (pos.4).
- j. To open the wings out in preparation for the next flight, repeat the above, in reverse.

Note: if loading the aircraft onto a trailer for road transport, ensure the transport struts are fully tightened, and also have a back up strap holding both wings together, just to be sure!



## 7.4 Pre-flight inspection

Pre-flight inspection must be conducted before the first flight of the day. The pre-flight inspection is recommended prior to any flight or series of flights by one pilot on any given day. Prior to any flight fuel and oil quantity should be checked as a minimum.

If the aircraft has been stored outside the engine area and other points of entry should be checked for evidence of bird occupancy. All control surfaces and travel stops should be examined for wing damages. Wheel fairings are not recommended for muddy field operation due to possible mud accumulation inside the fairings. When operating from gravel fields pay special attention to propeller leading edges. Fuel caps should be monitored for any deterioration periodically to avoid fuel leakage in flight or water infiltration.

The aircraft general condition should be noted during a visual inspection of the aircraft. Inspect any signs of deterioration, distortion and any damages to fabric skin of the aircraft. In cold weather, all traces of ice, snow, and frost should be removed from the aircraft. Make sure that no ice, snow or debris is trapped between any movable control surfaces.

Make sure that all instruments are in good condition with no broken glass. Airspeed indicator should read zero, altimeter should be checked against ramp or field elevation.

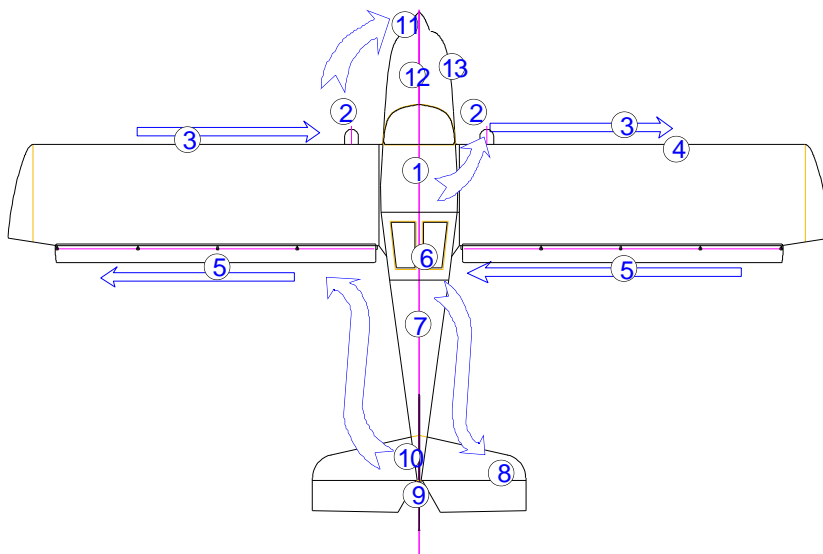
Do not activate the electrical system when anyone is near the propeller to prevent injury that could possibly result from an electrical system malfunction.

Pay special attention to the propeller area – make sure the ignition and master switches are OFF before touching the propeller. Avoid touching propeller when possible to prevent possible injury resulting from electrical system malfunction.

### WARNING

**DO NOT FLY THE AIRCRAFT IF YOU FIND ANY DAMAGE OR PROBLEMS DURING A PRE-FLIGHT INSPECTION. ALWAYS CONSULT AUTHORISED PERSONNEL FOR REPAIRS**

### 7.4.1 Daily Preparation



#### 1. Cockpit

POH and other documentation	review and available to pilot
master switch	OFF
ignition	OFF
fuel valves	OPEN, fuel quantity check
instruments	INSPECT
safety belts	INSPECT
check main L/E bolts attached	INSPECT
check of flaperon tie rods	INSPECT
control stick	INSPECT , freedom of movement

rudder pedals	INSPECT , freedom of movement
brakes	INSPECT
trim	freedom of movement, proper function
engine controls	INSPECT, freedom of movement
loose objects in cockpit	remove
cockpit windows	INSPECT
door	INSPECT, shut and locked

2. Main landing gear

gear legs and attachment	INSPECT
wheels	INSPECT
brakes	INSPECT

3. Wings INSPECT – wing, struts, hinges, surface

4. Pitot tube INSPECT

5. Flaperons INSPECT –hinges, surface  
freedom of movement  
counterweights attachment.

6. Rear cockpit cover INSPECT, secured

7. Fuselage INSPECT

8. Stabilizer, elevator, hinges INSPECT –surface, hinges, attachment of stabilizer struts  
freedom of movement of elevator and trim tab.

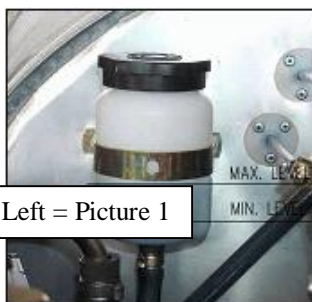
9. Fin, rudder, hinges INSPECT surface, attachment, freedom of movement  
condition and attachment of balance tab.

10. Nose wheel INSPECT

11. Propeller INSPECT / blades, propeller hub, check of locking propeller nuts (when visible)

12. Engine Remove the top engine cowling and  
INSPECT - engine mount  
INSPECT - air intake, carburettors and controls  
INSPECT - exhaust system

INSPECT – coolant, quantity (0.4 inch above bottom) - (between MIN and MAX marks), leakages –(see picture 1)



INSPECT – oil, quantity (between MIN and MAX marks), leakages. The oil level should be at least in the middle between marks when planning a long term operation.

INSPECT - fuel system, filter and carburettors

INSPECT - electrical system, ignition, cable connections

13. Fuel

Quantity (between MIN and MAX, at least middle for longer flights)

INSPECT - draining off water and dirt from the central tank. Fuel system must be sampled daily to assure lack of contamination. Inspect the type of fuel.

Fuel caps secured, correct vent orientation – open end against air in flight.

## 7.4.2 Engine Warm-Up, Power Check

- wheels chocked, brakes on.
- Start the engine - see section 7.5

- warming-up to operating temperature – as per the Rotax instructions and until the oil temperature reaches 50 deg C
- temperature and pressure values - within operating limits
- set maximum power - speed of about 5000 RPM (3 to 5 secs.). The maximum RPM may vary with temperature and propeller setting
- check of ignition (magnetos) – set 3,850 RPM, RPM drop should not exceed 300 on either magneto nor 120 differential between magnetos.
- Idle rotation - 1600 RPM
- All engine instrument readings must not exceed operating limits under any rating
- Remove wheel chocks for further operation, secure the aircraft

**CAUTION**

Perform the engine check heading upwind. Do not carry it out on loose terrain. Nobody is allowed to stand within dangerous proximity and, in particular, within the propeller arc. Select proper aircraft orientation – propeller blast can be surprisingly powerful.

**CAUTION**

The engine is cowled for optimum cooling during flight. Use high power settings for limited time only during ground operation to avoid engine overheating

**CAUTION**

*After a check of engine power, cool down the engine for a short time to avoid evaporation of the cooling liquid in cylinder heads.*

### 7.4.3 Pre-Flight Inspection

Make a brief walk around before you board the aircraft. This short inspection might discover damage or problems when occurred during the last flight. It is especially important to make this inspection when you are taking over the aircraft from other pilot.

Use chocks for main wheels when possible and practical to prevent the aircraft from moving. Always make sure that the person you asked to remove your chocks while the engine is running is aware of propeller danger. The best practise is to use chocks only for engine warm-up and engine checks and shut the engine down and remove chocks with the engine stopped. Before using chocks make sure they do not make contact with wheel spats to prevent any damage.

Cockpit	- INSPECT COCKPIT INTERIOR EQUIPMENT
	- INSPECT SAFETY BELTS
	- CONTROL SYSTEM-FREEDOM OF MOVEMENT, CHECK FOR DAMAGE
wings	- INSPECT WING SURFACES
	- INSPECT WING AND STRUTS SUSPENSIONS
	- INSPECT FLAPERONS.
Fuselage	- INSPECT
tail unit	- INSPECT
landing gear	- INSPECT
engine and propeller	- INSPECT.

## 7.5 Engine starting

Lack of oil pressure within 10 seconds after engine starting can lead to serious engine damage.

Make sure people or objects are near the propeller when starting the engine. Shout CLEAR PROP.

### 7.5.1 Use of External Power Supply

If the aircraft is not provided with a connection for external power supply - the external power supply may be connected to battery contacts when necessary.

### 7.5.2 Engine Starting

- |                         |                   |
|-------------------------|-------------------|
| - pre-flight inspection | COMPLETED         |
| - safety belts          | ADJUST AND SECURE |



- rudder pedals	FREEDOM OF MOVEMENT
- brakes	CHECK FUNCTION
- control stick	FREEDOM OF MOVEMENT
- trim	FREEDOM OF MOVEMENT
- wing flaps	FREEDOM OF MOVEMENT, RETRACTED
- engine control + choke	FREEDOM OF MOVEMENT
- instruments	CHECK OF VALUES, SETTINGS
- door	CLOSED, LOCKED
- master switch	SWITCH ON
- main fuel cock	OPEN
- wing tank fuel cocks	OPEN TO TANK WITH MORE FUEL
- choke	SWITCH ON (COLD ENGINE ONLY)
- throttle	1/3 OF TRAVEL (IDLE for cold engine)
- control stick	PULLED (clamped between legs)
- brakes	ON
- propeller area	"CLEAR"
- ignition	SWITCH ON
- starter	SWITCH ON (10 sec as maximum without interruption, followed by a cooling period of 2 minutes)
- after starting the engine, adjust speed to smooth operation – IDLE	
- instruments	CHECK OF INDICATION (oil pressure must rise within 10 seconds. Increase of engine speed is permitted only at steady oil pressure readings above 30 PSI)
- choke	SWITCH OFF (cold engine only)
- avionics and other switches	SWITCH ON (transceiver, IC, turn-and- slip indicator .....)

The aircraft has a tendency to roll forward easily on paved surfaces like asphalt even when the engine is at idle. A tail wind is also a significant factor. Make sure that the aircraft is not moving once the engine is started. If the aircraft is rolling and cannot be stopped with brakes, turn the engine off immediately using the ignition switch.

## 7.6 Taxiing

### 7.6.1 Prior to Taxiing

Be aware of the entire area around the aircraft to ensure that the aircraft will clear all obstruction and other aircraft. When first beginning to taxi, the brakes should be tested for proper operation as soon as the aircraft is put in motion. If braking action is unsatisfactory, the engine should be shut down immediately.

- brakes	FUNCTIONAL CHECK
- stop watch	SWITCH ON, record time

### 7.6.2 Taxiing

- taxiing speed is 8 MIAS maximum. Steering is performed by rudder pedals controlling the nose wheel.
- in crosswind hold ailerons „upwind“, using the control stick.
- In strong crosswind taxi the aircraft with an assisting person holding the wing by its windward side.
- When taxiing on gravel surfaces use as low engine power as possible to prevent damage to the propeller leading edges.

## 7.7 Normal takeoff

### 7.7.1 Prior to Take-Off

- brakes	BRAKES ON
- speed	3,850 RPM
- magnetos	CHECK (R, BOTH, L, BOTH)
- carburettor heating	ACTIVATE WHEN NECESSARY

- choke	OFF
- trim	NEUTRAL
- wing flaps	TAKE-OFF POSITION
- master switch	ON
- ignition	ON
- main fuel valve	OPEN
- tank fuel valves	FUEL QUANTITY CHECK, OPEN TO BOTH OR TANK WITH MORE FUEL QUANTITY
- instruments	CHECK
- door	CLOSED, LOCKED
- safety belts	FASTENED, TIGHTENED
- controls	FREEDOM OF MOVEMENT
- runway	not occupied by another aircraft

### 7.7.2 Take-Off

Continuously increase engine power to maximum (max. 5800 RPM is not to be reached when aircraft is not moving and the propeller is not "in flight adjustable"), bringing the aircraft into motion. At a speed above 45 MIAS rotate the aircraft by slight pulling. Do not climb before the airspeed of 55 MIAS is reached.

Then make a transition to the climb out, get the aircraft to climb at a speed of 60 MIAS. Maintain the airspeed for best climb angle carefully, do not let the speed drop below 55 MIAS.

- throttle	FULL
- engine instruments	CHECK
- elevator control	ROTATE at 59 MIAS by slight pulling
- initial climb speed	72 MIAS 63 <b>KIAS</b>
- engine instruments	CHECK
- wing flaps	slowly FLAPS UP ABOVE 150 FT
- trimming	TRIM

#### **WARNING**

**Take-off is forbidden - if engine running is not smooth.  
- if runway is occupied.**

Perform a brief magneto check before take-off after positioning the aircraft clear of other aircraft. When a magneto problem is present, do not take off. Monitor power and engine RPM early during take-off run – if the engine RPM is lower than usual (exact RPM value depends on propeller settings) or engine is not running smoothly abort the take off immediately.

If taking off from a gravel surface apply the power slowly to prevent propeller leading edge damage.

Always retract wing flaps slowly – sudden retraction of the flaps might cause a loss of attitude.

Always judge, based on your experience, whether the available runway is sufficient for normal take off. Always make a realistic estimate and be ready to abort the take-off before critical speed is reached.

## 7.8 Best angle of climb speed ( $V_x$ )

### Climbing

- throttle	5,500 PRM MAX
- airspeed	65 MIAS 56 <b>KIAS</b> for 912UL, 72 MIAS 63 <b>KIAS</b> for 912ULS.
- engine instruments	CHECK



## 7.9 Best rate of climb speed ( $V_y$ )

### Climbing

- speed 5,500 PRM MAX
- airspeed 72 MIAS 63 **KIAS** for 912UL, 78 MIAS 67 **KIAS** for 912ULS
- engine instruments CHECK

## 7.10 Cruise

### Cruise Flight

- bring the aircraft into horizontal flight
- speed 3500-4200 RPM
- airspeed up to 99 MIAS 86 **KIAS** as required – Maximum airspeed in turbulent air is  $V_A$  93MPH.
- engine instruments CHECK
- fuel tank valves SWITCH BETWEEN TANKS (open one side and close the other) regularly

Monitor the atmospheric condition as well – do not enter an area of turbulence at a high speed. Be ready for a sudden weather change during your flight – stronger head wind can limit your ability to safely reach your planned destination.

When carburettor icing is possible, activate carburettor heating. Fuel consumption and remaining fuel on board should be monitored. Always make a comparison between planned and actual time above any waypoint.

Select carefully the flight route – avoid flying over large urban areas, large forests or large areas of water, as well as over mountains. Good landing possibilities are very limited in case of engine failure or other emergencies over these areas.

Always have a suitable landing area within gliding range. When it is necessary to cross a large area not suitable for emergency landing, always climb to the appropriate altitude to reach a suitable landing site if an emergency occurs.

Always monitor the airspace around you to prevent a mid-air collision.

### WARNING

**Do not forget to change the wing tank supplying the engine on regular basis to prevent fuel starvation.**

**A proper fuel supply to the engine is provided by a central connecting tank whilst changing fuel wing tanks.**

## 7.11 Approach

### 7.11.1 Descent

- throttle INCREASED IDLE OR AS REQUIRED
- engine instruments CHECK
- carburettor heating ACTIVATE WHEN NECESSARY

### WARNING

**During long approaches and when descending from a considerable height, it is not advisable to reduce the engine throttle control to idle. In this case the engine becomes overcooled and a loss of power might occur. When descending, apply increased idle so that engine instrument readings range within the limits for normal use.**

### 7.11.2 Downwind

- power 3,000 – 4,000 RPM
- airspeed 72-85 MIAS 63-74 **KIAS**
- engine instruments CHECK
- fuel FUEL QUANTITY CHECK, SWITCH TO TANK WITH MORE FUEL
- brakes CHECK FUNCTION BY SHORT BRAKING (check proper system resistance)

- |                                   |                     |
|-----------------------------------|---------------------|
| -safety belts                     | TIGHTEN             |
| - base leg and final leg airspace | CHECK OF FREE SPACE |
| - landing site                    | SITUATION           |

## 7.12 Normal landing

### 7.12.1 On Base Leg

- |                      |                                    |
|----------------------|------------------------------------|
| - power              | 3,000 RPM                          |
| - airspeed           | 72 MIAS 63 <b>KIAS</b>             |
| - engine instruments | CHECK                              |
| - wing flaps         | TAKE-OFF (half flap)               |
| - trimming           | TRIM (to keep stick pitch neutral) |
| - final leg airspace | CHECK FOR OTHER TRAFFIC            |

### 7.12.2 On Final

- |  |                                       |
|--|---------------------------------------|
| - airspeed   | 60 MIAS 55 <b>KIAS</b>                |
| - power  | ADJUST AS NEEDED                      |
| - carburettor heating  | ACTIVATE WHEN NECESSARY               |
| - engine instruments   | CHECK                                 |
| - wing flaps   | LANDING (full flap or see note below) |
| - trimming   | TRIM (fully back)                     |
| - engine instruments   | WITHIN LIMITS                         |
| - check of clear landing site ( people, obstacles).  |                                       |
| - use controlled side slip to lose any excess height, maintain at least minimum 60 MIAS 55 <b>KIAS</b> |                                       |

### 7.12.3 Short Final

- |   |                                       |
|---|---------------------------------------|
| airspeed  | 55 MIAS 50 <b>KIAS</b>                |
| - power   | ADJUST AS NEEDED                      |
| - carburettor heating                               | ACTIVATE WHEN NECESSARY               |
| - wing flaps  | LANDING (full flap or see note below) |
| - trimming  | TRIM (fully back)                     |
| - check of clear landing site ( people, obstacles). |                                       |

### 7.12.4 Landing

**Note: when on approach and landing lightweight, with only P1, no baggage, minimal fuel and full elevator trim, full flap will increase the “stick neutral” forces. It is recommended that in these conditions ½ or ¾ flap is more suitable.**

Always judge, based on your experience, whether the available runway is sufficient for A normal landing. Always make a realistic estimation and be ready for baulked landings.

At a height of about 30 ft reduce the engine speed to idle. reduce speed to 50 MIAS 45 **KIAS** till flare. When flaring at a height of 1,5 to 3 ft above ground, decelerate gradually by pulling the control stick backward. At a speed of about 45 MIAS the aircraft touches-down.

When landing with a significant crosswind component do not set the flap to landing position – use take-off setting to touch down at higher speed to ensure proper control over the aircraft before it touches the ground.

Entry speed to side slip ..... 72 MIAS 63 **KIAS**

### 7.12.5 After landing

- |              |                      |
|--------------|----------------------|
| - brakes     | APPLY WHEN NECESSARY |
| - wing flaps | RETRACT              |
| - trim       | TAIL HEAVY           |

### 7.12.6 Engine Stopping

- |         |  |
|---------|--|
| - power | cool down the engine at 2,000 RPM when necessary |
|---------|--|

- |  |   |
|--|---|
| - engine instruments                       | CHECK   |
| - Mags                                     | CHECK each mag individually   |
| - turn radio to 121,5                      | CHECK ELT IS NOT ACTIVATED.   |
| - avionics and other switches              | OFF   |
| - ignition                                 | OFF   |
| - master switch                            | OFF   |
| - avionics and other switches              | OFF   |
| - main fuel valve                          | SHUT  |
| - tank fuel valves                         | SHUT  |
| - secure the aircraft (using safety belts) | chocks or other way to prevent the aircraft from unintended movement, lock the controls |

During normal operation the engine is usually cooled enough during the approach and landing. Make sure that all avionics and other instruments are switched off before the engine is stopped.

Do not use parking brake to hold unattended aircraft, especially when the aircraft is located in hanger.

#### 7.12.7 Post-Flight Check

- |         |  |
|---------|--|
| - check | - damage to fuel system. fuel leakage          |
|         | - damage to oil system, oil leakage            |
|         | - damage to cooling circuit, liquid leakage    |
|         | - damage to electrical system, ignition        |
|         | - check the aircraft exterior for damage to:   |
|         | - fuselage - wings, flapperons                 |
|         | - tail unit                                    |
|         | - landing gear                                 |
|         | - fiberglass covers                            |
|         | - wash down the aircraft, remove dirt and bugs |
|         | - cover the cockpit with a protective cover    |

#### 7.13 Short field take-off and landing procedures

The standard take off procedure should be followed. The only difference is that the full throttle is applied with brakes on – do not forget to have elevator in full up (stick back) position to prevent the danger of the aircraft nosing over. Brakes are released when the maximum RPM is achieved from the engine. To clear possible obstacles in the runway direction climb at speed for best rate of climb – see section 7.9

When approaching a short field make sure that the approach speed of 65 MIAS is carefully maintained and full flaps are set.

#### 7.14 Balked landing procedures

- |                      |                               |                        |
|----------------------|-------------------------------|------------------------|
| - power              | MAX. 5000 R.P.M               |                        |
| - airspeed           | 72 MIAS 63 <b>KIAS</b>        |                        |
| - engine instruments | CHECK                         |                        |
| - wing flaps         | TAKE-OFF                      |                        |
| - trimming           | TRIM                          |                        |
| - wing flaps         | RETRACT AT A HEIGHT OF 150 FT |                        |
| - trimming           | TRIM                          |                        |
| - power              | MAX. 5000 RPM - climb         | 72 MIAS 63 <b>KIAS</b> |

#### 7.15 Information on stalls, spins and any other useful pilot information

**WARNING**

Aerobatics and intentional spins are prohibited.

#### **7.15.1 Rain**

When flying in the rain, no additional steps are required. Aircraft qualities and performance are not substantially changed.

## 8. Aircraft Ground Handling and Servicing

### 8.1 Servicing fuel, oil, coolant

#### 8.1.1 Servicing fuel

1. Verify the main switch OFF position
2. Remove fuel tank cap
3. Service with fuel of proper type until level rises to the filler openings (or any required level)
4. Replace fuel cap and check for security
5. Wash any spilled fuel from wings with a clean water
6. Repeat for opposite fuel tank.

It is not advisable to change the type of fuel during engine operation. Refuelling should be carried out in places not endangering either the aircraft, its pilots or the environment. Prior to refuelling it is always necessary to check fuel for the absence of water. Sampling should be carried out from both any jerry cans used and from all aircraft tanks via the fuel system through drain sump. When refuelling from a jerry can, a funnel must be used containing a strainer to trap impurities, or, even better, with a buckskin leather which can trap any fuel moisture content. Fuel tank draining is performed similarly by means of the drain valve.

When filling fuel into tanks, be careful to avoid staining the cockpit window panels and glass with fuel as it contains corrosive components that will cause fast deterioration and damage to cockpit glazing. Make sure that fuel tanks are closed when refuelling is finished.

#### 8.1.2 Servicing oil

The proper oil type should be used – see this manual or engine manual. .

1. Make sure that ignition and master switch are off
2. Remove the top engine cowling.
3. Open the oil tank.
4. When a level is not between minimum and maximum marks (or not high enough for expected longer operation), add oil. Do not add oil above the MAX level – the oil will overflow out of the engine.
5. Replace oil tank cap
6. Replace the top engine cowling

The oil is to be changed every 50 or 100 hours of operation – see Maintenance manual and engine documentation for details. The first oil change is to be performed after initial 25 hours of operation of a new or overhauled engine.

#### 8.1.3 Servicing coolant

The proper coolant type should be used – see this manual or Rotax engine manual.

1. Make sure that ignition and master switch are off
2. Remove the top engine cowling.
3. Remove the cap of the coolant tank
4. Add estimated quantity of coolant
5. Replace coolant tank cap
6. Replace the top engine cowling

### 8.2 Landing gear tyre dimension and pressure

Track.....	1.96 m
Wheel base .....	1.3 m
Main landing gear wheel tyre.....	14x4
Tyre pressure .....	29 psi
Tyre pressure (Tundra's).....	7.5PSI
Nose wheel tyre .....	12x4
Tyre pressure .....	29 psi

## 8.3 Ground handling and tie-down instructions

### 8.3.1 Aircraft moving instruction

1. Make sure that parking brake is off
2. Check the space around the aircraft and in the proposed direction of movement
3. Push and hold the tail down - use handle located on fuselage close to rudder leading edge
4. Push the aircraft in the desired direction

Aircraft can be also ground handled using a nose wheel tow bar – optional equipment, ask your dealer for details.

**CAUTION**

Never push, pull, or lift the aircraft by use of control surfaces

### 8.3.2 Aircraft tie-down instruction

1. Turn the aircraft into wind, if possible
2. Lock the controls (using safety belts)
3. Make sure that parking brake is on, install wheel chocks when possible.
4. Attach ropes to the ring located on the lower wing surface (front strut attachment)
5. Attach rope the nose wheel
6. Attach rope to the tail (between tail skid and fuselage)
7. Secure all ropes to the tie-down points


It is recommended to install a soft foam rubber or fabric cover into the engine intakes to prevent foreign matter form accumulating inside the engine cowling. Before using make sure they do not collide with wheel fairings preventing any damage.

**CAUTION**

Never push, pull, or lift the aircraft by use of control surfaces

## 9. Parachute installation

The parachute limitation and specification are listed in the table below. The parachute is made by Magnum in CZ

	
<b>Magnum</b>	<b>501 Light Speed Soft</b>
	<b><u>visual</u></b>
Max. perm. loading (kg)	475
Max. perm. loading (lbs)	1050
Weight of system (kg)	9,65
Weight of system (lbs)	21,3
V max. (km/h)	300
V max. (mph)	187
Dimensions (mm)	360x245x200
Dimensions (inch)	14.2x9.7x7.9
Size (m2)	86
Size (sq.ft)	926
Repacking period (years)	6 (then every 5)
Rocket type	450 Magnum
Burn time (s)	0,6

### 9.1 Parachute operating data and procedures

Occupant warning – The parachute recovery system installation has been approved by the CAA on the basis that, as far as is practicable to demonstrate, it will create no hazard to the aeroplane, its occupant(s) or ground personnel whilst the system is not deployed; and that when properly maintained, the risk of malfunction, deterioration or inadvertent deployment is minimised. The CAA has not approved the system itself or considered the circumstances, if any, in which it might be deployed. The effectiveness of the system for the safe recovery of the aeroplane has not been demonstrated

### 9.2 Maintenance requirements for continued safe operation of the parachute

1. Refer to the manufacturers manual for operating instructions
2. Skeleton instructions for use of parachute system (not necessarily correct for every system!):
  - Only use as a last chance, when alternative is death or very serious injury.
  - Instructions for deploying. Pull handle firmly. If engine is still running turn ignitions off before deploying. If aircraft is on fire, shut fuel off and extinguish fire before deploying.
  - After deployment, brace yourself with head tucked in arms over your head (as usual aircraft brace position) before the parachute fully deploys and the opening shock is encountered.
  - Instructions for landing - Ensure engine ignitions and fuel are off, brace yourself for impact as above.
  - Instructions for accidental deployment on the ground. Pull riser to deflate parachute.
3. All maintenance carried out on the parachute system must be noted in the relevant pages of the aircraft log book, and signed by the appropriate approved signatory.
4. Keep the parachute pull handle LOCKED at all time when the aircraft is not in flight, especially during any maintenance.

## 10. Required Placards and Markings

### 10.1 Airspeed indicator range markings (these must be marked on the ASI)

Marking	MIAS	KIAS	Operations
Marking	MIAS	KIAS	Operations
White Arc	35 - 76	30-66	Flaps operating range. Lower limit is maximum weight zero thrust stall speed in the landing configuration. Upper limit is maximum speed allowable with flaps extended.
Normal flight	35 - 136	30-118	Normal operating range. Lower limit is maximum weight zero thrust stall with flaps retracted, upper limit is red line .
Red line	136 and above	118 and above	Operation not permitted

Whilst not mandatory on UK microlights, owners may decide to add a yellow Va to Vne arc on the ASI

### 10.2 Overview of speed limits:

Speed		MIAS	KIAS	Remarks
V <sub>NE</sub>	Never exceed speed	136	118	V <sub>NE</sub>
V <sub>A</sub>	Manoeuvring speed	93	81	V <sub>A</sub>
V <sub>FE</sub>	Maximum wing-flaps extended speed	76	66	V <sub>FE</sub>
V <sub>S0</sub>	Stall speed	35	30	V <sub>S0</sub>
V <sub>S1</sub>	Minimum steady flight speed	43	37	V <sub>S1</sub>



## 11. Operating limitation placards in sight of occupants

### 11.1 “No intentional spins”

The following placard should be located on the instrument panel

**AEROBATICS and INTENTIONAL SPINS  
ARE PROHIBITED**

### 11.2 Miscellaneous placards and markings

Occupant warning

**This aircraft has not been certified  
to an international requirement**

**Engine limitations** – a suitable placard with the current engine limitations will also be applicable. Coolant temp, Oil temp, Oil pressure, engine speed and engine model will be the minimum requirement.

**Flight limitations** – to include - max baggage weight, max occupant seat loading, Vne, Vfe, Va, Vso and loading limit (g) will also be placarded, see below 11.3

**Other** – all switches, levers, handles, lights or instruments shall be placarded accordingly with the operational position (e.g on/off) noted. If parachute fitted

#### Internal placard

**WARNING – Emergency Parachute  
Pull handle to deploy. Unapproved  
equipment – see POH**

#### External placard near ‘chute exit area

**WARNING – Danger rocket exit area**

General

**No Smoking  
Approved for flight in VFR conditions**

Weighing

**BASIC EMPTY WEIGHT:  
DATE OF WEIGHING:  
MAXIMUM PERMITTED EMPTY WEIGHT:  
MAXIMUM PERMITTED GROSS WEIGHT:  
MAXIMUM FUEL LOAD WITH TWO CREW OF 86 KG EACH:  
MAXIMUM COMBINED CREW WEIGHT WITH FULL FUEL TANKS (S)**

### 11.3 EuroFOX aircraft placards

1. Flight limitations placard – to be visible to the pilot
2. The EuroFOX Type Approved Microlight ASI calibration table as below

	V <sub>S0</sub>	V <sub>S1</sub>		App - glide		V <sub>FE</sub>		V <sub>A</sub>				V <sub>NE</sub>
MPH IAS	35	43	45	59	65	76	85	93	99	112	125	136
Knots IAS	30	37	39	51	56	66	74	81	86	97	109	118

## 12. Supplementary information

### 12.1 Familiarization flight procedures

The familiarisation flight procedure depends on the pilot's experience. The whole familiarisation should start with the careful study of this document (Pilot Operating Handbook). The maintenance manual should be read as well.

The recommended procedure for an experienced pilot usually consists of:

- Local flight of duration of approximately 30 minutes with instructor
- 5 to 10 circuits with instructor
- 5 flights – emergency situations
- local flight of 30 minutes – solo
- 5 circuits solo

Always perform as many flights as required to be able to properly control the aircraft, the syllabus above is for reference only.

### 12.2 Pilot operating advisories

It is always recommended that familiarisation flights should take place on fine weather days

### 12.3 Further Information

Further study is available from many books, please consult EuroFOX Aviation for the latest recommendations. Another invaluable source is other pilots and instructors.

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## 12.4 Starting and pre-flight checks

Starting, pre-flight, pre take off and pre landing check lists. This list is a guide and requirements will vary depending on the exact fit of the individual aircraft. It is recommended that the pilot compiles his or her own list using this table as a guide only.

Starting	
Park brake	On
Doors	Closed and secure
Harnesses	Secure and comfortable
Radio and TX	Off
Flap	Neutral
Master switch	On
Strobe landing light	On
Fuel tap + pump	On and on
Mags	On
Throttle + Choke	Set, choke on
Lookout	Clear prop
Start	Turn starter
Oil P & T	Check, Oil P rising?
Starter engage and volt light	Light out
Pre-flight / Take off	
Throttle	2000 rpm
Flying Controls	Full and free
Doors and Harness	Closed, locked, secure
Stowage items	Secure
Radio TX	On
Trim	Set take off
T & P's	All in range
RPM – Mag check	Up to 3800 rpm check
Choke	Off
Fuel and pump	Sufficient on and on
Flaps	Set take off
Lookout and line up	Check all clear
Landing	
Brakes	Check pressure OK
Undercarriage	Check no damage
Propeller	Set fine if VP
Fuel and pump	Sufficient on and on
Flaps	Set landing as POH
Landing light	On
Instruments	T & P's all ok
Carb heat	Set as required
Doors and harnesses	Closed, locked, secure
Park and shutdown	Hope you enjoyed the flight

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