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Exploitation **REF: N EX NO 07 00**

MCR UL FLIGHT MANUAL

N° d'exemplaire	

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0. TABLE OF CONTENTS

1. GENERAL

1.1. INTRODUCTION

The flight manual for the aircraft was designed to provide pilots and instructors with the information necessary to efficiently and safely fly this very light aircraft.

This manual contains information that are imperative to be given to the *MCR UL* pilot. It also contains supplementary information given by the builder.

The builder should complete the information appropriate to the particular configuration and selection of options.

A special place must be reserved on the luggage compartment floor in order to store this flight manual.

1.2. BASIS OF CERTIFICATION

This type of aircraft was approved by the French Airworthiness Authorities in accordance with the regulations applicable to Ultra-Light aircraft

Category of Airworthiness : **ULM**

1.3. SPECIFICATIONS

Kit aircraft of the type : *Dyn'Aéro MCR UL*
Cantilever low-mounted wing.
Carbon structure and wing skin with control surface skins made in light alloy.

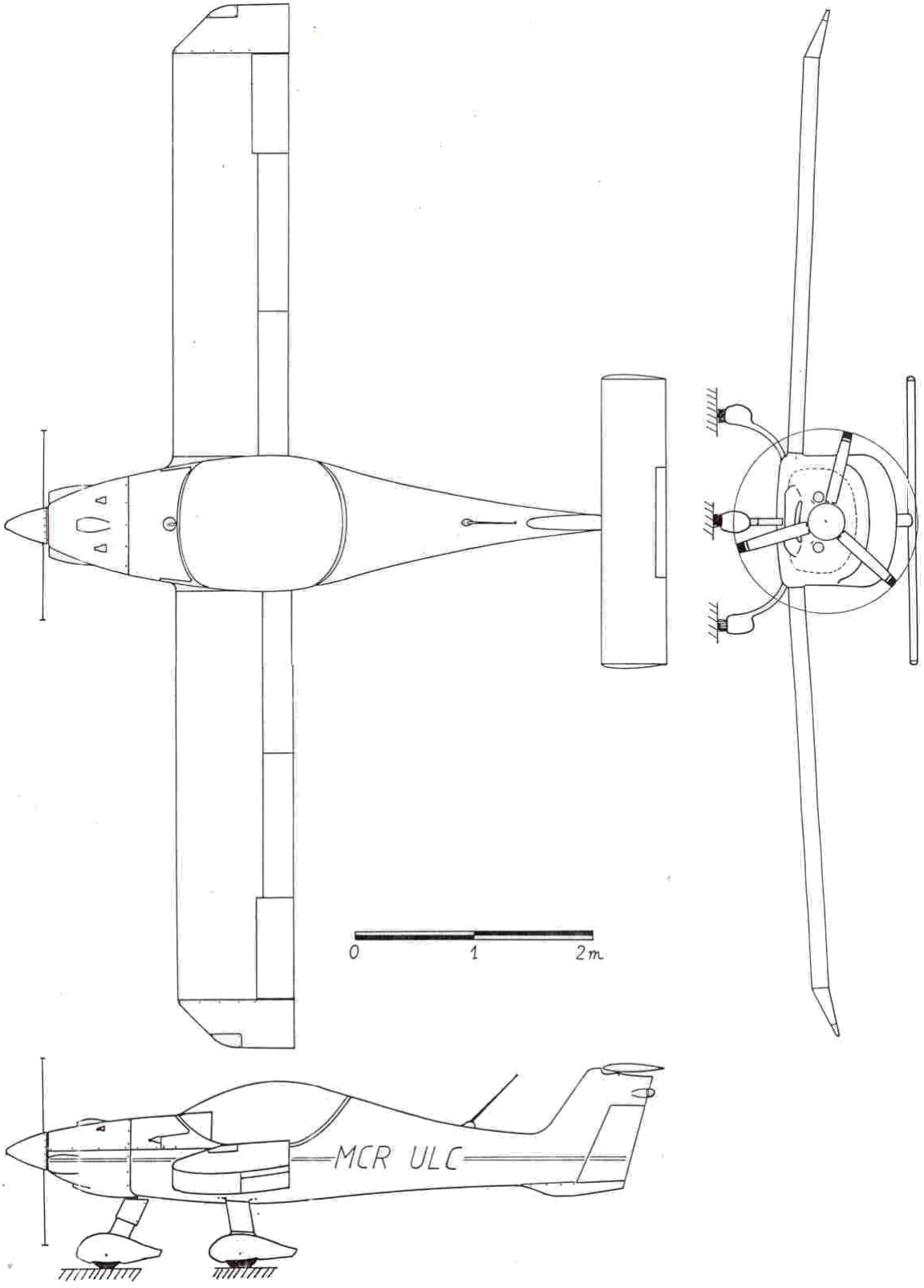
Engine and Propeller

Span	8.66	m
Wing surface	8.31	m²
Aspect ratio	9.02	
Cabin width	1.12	m
Fuel capacity	80	l
Overall Length	5.53	m
Height	1.53	m

1.4. CONTROL SURFACE DEFLECTION

Ailerons :	- 20° $^{(\pm 1)}$ trailing edge upwards
	+10° $^{(\pm 1)}$ trailing edge downwards
Flaps :	0-45° $^{(+0-1)}$
Rudder :	20° $^{(-0+5)}$ in both directions (left and right)
Tailplane :	- 10° $^{(+0-2)}$ trailing edge upwards
	+3.5° $^{(-0+1)}$ trailing edge downwards

1.5. THREE VIEW DIAGRAM



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2. LIMITATIONS

2.1. INTRODUCTION

This section includes operating limitations, reference marks of instruments and placards necessary for the safe use of the aircraft, its engine, standard systems and equipment.

2.2. AIRSPEED

Airspeed limits and their operational significance.

	Airspeed	(IAS)	Remarks
VNE	Never exceed speed	270 km/h 146 kts	Velocity you must Never Exceed, in any case
VNO	Maximum structural cruising speed	210 km/h 113 kts	Do not exceed this Velocity in Normal Operations, except in calm air, and then , only with great cautions.
VA	Manoeuvring speed	172 km/h 93 kts	Do not apply abrupt or full-range control deflections beyond this speed, because under certain conditions, the Aircraft might be exposed to excessive loads.
VFE_1	Maximum speed allowed with flaps extended at 45°	123 km/h 67 kts	Do not exceed this Velocity with Flaps Extended
VFE_2	Maximum speed allowed with flaps extended at 17°	140 km/h 76 kts	Do not exceed this Velocity with Flaps Extended

2.3. INDICATED AIRSPEED INSTRUMENTS MARKINGS

Air speed indicator reference marks and colour significance.

Marking	(IAS)	Significance
White segment	(63 / 140 km/h) (34 / 76 kts)	Speed range allowed with flaps extended
Green segment	(86 / 210 km/h) (46 / 113 kts)	Speed range for normal operational flight
Yellow segment	(210 / 270 km/h) (113 / 146 kts)	Manoeuvres must be carried out with caution and only in conditions of calm air
Red segment	(270 km/h) (146 kts)	Maximum speed for all operations

2.4. ENGINE INSTALLATION

Only the following engine and propeller configurations are authorised.

2.4.1. Rotax 912 Engine

Engine manufacturer	Rotax
Engine type	912 UL
Engine/propeller reduction ratio	2.27 / 1
Maximum power	
Take-off	80.0 HP
Continuous	77.8 HP
Maximum engine RPM	
Take-off	5800 RPM
Continuous	5500 RPM
Maximum Cylinder Head Temperature	150 °C / 302 °F
Maximum Oil Temperature:	140 °C / 284 °F
Oil pressure	
Minimum:	1.5 Bar
Maximum:	5 Bars
Fuel pressure	
Minimum:	0.15 Bar
Maximum:	0.40 Bar
Octane grade of fuel:	Refer to Rotax manual
Oil quality:	Refer to Rotax manual

2.4.2. Rotax 912 ULS-FR Engine

Engine manufacturer	Rotax
Engine type	912 ULS-FR
Engine/propeller reduction ratio	2.43 / 1
Maximum power limited to (Pa<25.4" Hg)	**80 HP**
Take-off	80 HP
Continuous	80 HP
Maximum engine RPM	
Take-off	5800 RPM
Continuous	5500 RPM
Maximum Cylinder Head Temperature	135 °C / 275 °F
Maximum Oil Temperature:	130 °C / 266 °F
Oil pressure	
Minimum:	0.8 Bar
Maximum:	7 Bars
Fuel pressure	
Minimum:	0.15 Bar
Maximum:	0.40 Bar
Octane grade of fuel:	Refer to Rotax manual
Oil quality:	Refer to Rotax manual

2.4.3. Jabiru 2200

Engine manufacturer	Jabiru
Engine type	2200
Engine/propeller reduction ratio	Prise directe sur vilebrequin
Maximum power limited to (or Pa<25.4" Hg)	
Take-off	80.0 HP
Continuous	77 HP
Maximum engine RPM	
Take-off	3300 RPM
Continuous	3150 RPM
Maximum Cylinder Head Temperature	200°C
Maximum Oil Temperature:	118°C
Oil pressure	
Minimum:	0.8 Bar
Maximum:	5.25 Bars
Fuel pressure	
Minimum:	0.05 Bar
Maximum:	0.20 Bar
Octane grade of fuel:	Refer to Jabiru manual
Oil quality:	Refer to Jabiru manual

2.4.4. Variable pitch MT Propeller to be used with Rotax 912 engine

Propeller manufacturer	MT Propeller
Propeller model	MTV-7-A/152-106
Type	Three-bladed, electrical variable pitch
Propeller diameter	1.52 m
Reference pitch setting (75% of propeller radius)	
normal:	variable pitch
Maximum allowed propeller rotation speed	2550 rpm
Torque	4.6 daN.m

Propeller manufacturer	MT Propeller
Propeller model	MTV-6-A/152-106
Type	Three-bladed, hydraulic variable pitch
Propeller diameter	1.52 m
Reference pitch setting (75% of propeller radius)	
normal:	variable pitch
Maximum allowed propeller rotation speed	2550 rpm
Torque	4.6 daN.m

2.4.5. Fixed pitch EVRA propeller to be used with Rotax 912 engine

Propeller manufacturer	EVRA
Propeller model	156-178-106
Type	Fixed pitch
Propeller diameter	1.56 m
Reference pitch setting (75% of propeller radius)	
normal:	178 mm
Maximum allowed propeller rotation speed	2550 rpm
Torque	2.2 daN.m

!! Tighten propeller bolts before first flight, after 1 flight hour and 5 flight hours. Then control tightening every 50 flight hours and after each ground period that last more than 1 mouth !!!!!!!!

2.4.6. Variable pitch MT Propeller to be used with Rotax 912 ULS-FR engine

Propeller manufacturer	MT Propeller
Propeller model	MTV-7-A/156-122
Type	Three-bladed, electrical variable pitch
Propeller diameter	1.56 m
Reference pitch setting (75% of propeller radius)	
normal:	variable pitch
Maximum allowed propeller rotation speed	2400 rpm
Torque	4.6 daN.m

Propeller manufacturer	MT Propeller
Propeller model	MTV-6-A/156-122
Type	Three-bladed, hydraulic variable pitch
Propeller diameter	1.56 m
Reference pitch setting (75% of propeller radius)	
normal:	variable pitch
Maximum allowed propeller rotation speed	2400 rpm
Torque	4.6 daN.m

2.4.7. MT fixed pitch Propeller to be used with Rotax 912ULS-FR engine only

Propeller manufacturer	MT Propeller
Propeller model	MT 156-220-2M
Type	Two-bladed, fixed pitch propeller
Propeller diameter	1.56 m
Reference pitch setting (75% of propeller radius)	
Normal:	220 mm
Maximum allowed propeller rotation speed	2400 rpm
Torque	1.6 daN.m

!! Tighten propeller bolts before first flight, after 1 flight hour and 5 flight hours. Then control tightening every 50 flight hours and after each ground period that lasts more than 1 mouth !!!!!!!!

2.4.8. EVRA Propeller to be used with 2200 Jabiru engine only

Propeller manufacturer	EVRA
Propeller model	Jabiru
Type	Two-bladed, fixed pitch propeller
Maximum allowed propeller rotation speed	2400 rpm
Torque	1.6 daN.m

!! Tighten propeller bolts before first flight, after 1 flight hour and 5 flight hours. Then control tightening every 50 flight hours and after each ground period that lasts more than 1 mouth !!!!!!!!

2.5. ENGINE INSTRUMENT MARKINGS

2.5.1. Rotax 912 Engine

ROTAX 912

Instrument	Units	Red line Minimum Limit	Green sector Normal Range	Yellow sector Warning Range	Red Line Maximum Limit
Tachometer	Tr/Min		1500 to 5500	5500 to 5800	5800
Oil temperature	°C °F	50 °C 122 °F	90 to 100 °C 194 to 212 °F	110 to 140 °C 230 to 284 °F	140 °C 284 °F
Cylinder Head Temperature	°C °F	50 °C 122 °F	80 to 120 °C 176 to 248 °F	120 to 150 °C 248 to 302 °F	150 °C 302 °F
Fuel Pressure	Bar PSI	0.15 Bar 2.2 PSI	0.15 to0.40 Bar 2.2 to 5.8 PSI		0.40 Bar 5.8 PSI
Oil Pressure	Bar	1.5 Bars	1.5 to 4 Bars	4 to 5 Bars	5 Bars
Fuel Quantity	Litre	1 Litre			80 Litres

Note carefully :

Do not switch off the main switch before turning off the engine.

2.5.2. Rotax 912 ULS-FR Engine

ROTAX 912 ULS-FR

Instrument	Units	Red line Minimum Limit	Green sector Normal Range	Yellow sector Warning Range	Red Line Maximum Limit
Tachometer	Tr/Min		1500 to 5500	5500 to 5800	5800
Oil temperature	°C °F	50 °C 122 °F	90 to 100 °C 194 to 212 °F	110 to 130 °C 230 to 266 °F	130 °C 266 °F
Cylinder Head Temperature	°C °F	50 °C 122 °F	80 to 120 °C 176 to 248 °F	120 to 135 °C 248 to 275 °F	135 °C 275 °F
Fuel Pressure	Bar PSI	0.15 Bar 2.2 PSI	0.15 to0.40 Bar 2.2 to 5.8 PSI		0.40 Bar 5.8 PSI
Oil Pressure	Bar	0.8 Bars	2 to 5 Bars	5 to 7 Bars	7 Bars
Fuel Quantity	Litre	1 Litre			80 Litres

Note carefully :

Do not switch off the main switch before turning off the engine.

As the Maximum power is limited to 80 CV, do not exceed 25.4" Hg of manifold pressure

2.5.3. Jabiru 2200

JABIRU 2200

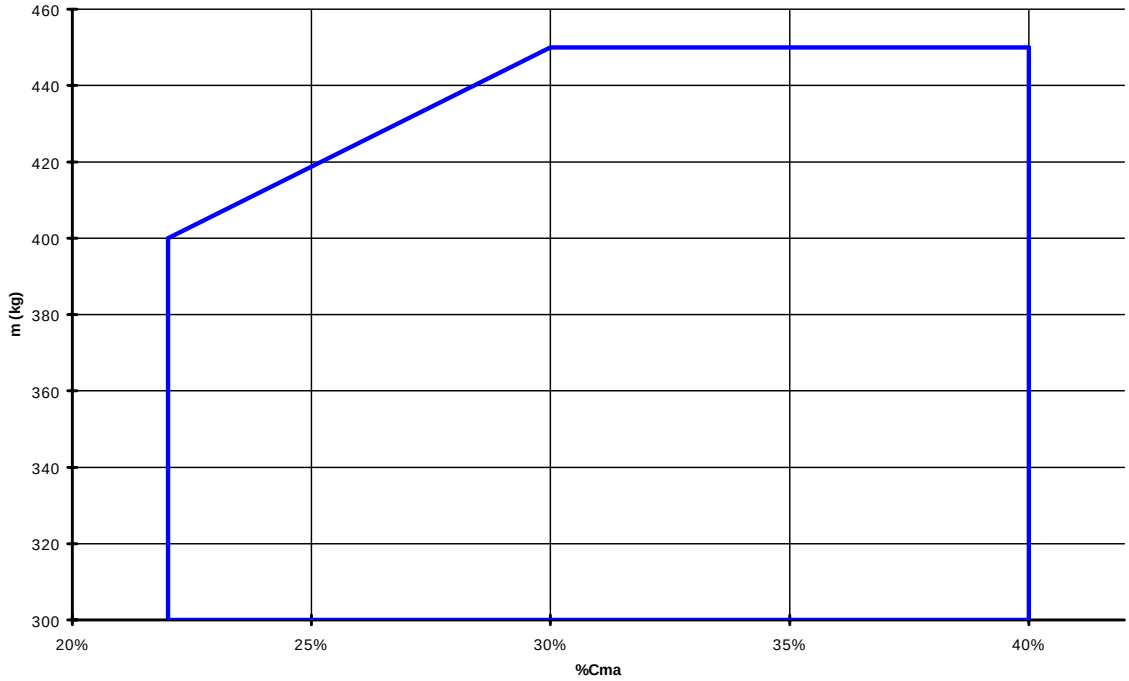
Instrument	Units	Red line Minimum Limit	Yellow sector Warning Range	Yellow sector Warning Range	Yellow sector Warning Range	Red Line Maximum Limit
Tachometer	Tr/Min		900 to 2000	2000 to 3150	3150 to 3300	3300
Oil temperature	°C °F	15 °C 59 °F	15 to 80 °C 59 to 176 °F	80 to 100 °C 176 to 212 °F	100 to 118 °C 212 to 244 °F	118 °C 244 °F
Cylinder Head Temperature	°C °F	50 °C 122 °F	50 to 100 °C 122 to 212 °F	100 to 150 °C 212 to 302 °F	150 to 200 °C 302 to 392 °F	200 °C 392 °F
Fuel Pressure	Bar PSI	0.05 Bar 0.7 PSI		0.05 to 0.20 Bar 0.7 to 2.9 PSI		0.20 Bar 2.9 PSI
Oil Pressure	Bar	0.8 Bars	0.8 to 2.2 Bars	2.2 to 5.25 Bars		5.25 Bars
Fuel Quantity	Litre	1 Litre				80 Litres

2.6. WEIGHT

	With parachute	Without parachute
Maximum take-off weight :	472.5 kg	450 kg
Maximum landing weight :	472.5 kg	450 kg

2.7. WEIGHT & BALANCE

Centre of Gravity range 22/40% M.A.C.
Datum M.A.C.



M.A.C. = 960 mm ; reference datum : 13.5 mm before left wing leading-edge.

2.8. APPROVED MANOEUVRES

THIS AIRCRAFT IS CERTIFIED IN THE NORMAL CATEGORY.

AEROBATIC FLIGHT IS PROHIBITED.

SPINS ARE PROHIBITED.

2.9. MANOEUVRING LOAD FACTOR

+4 / - 2g

2.10. MINIMUM FLIGHT CREW

Minimum flight crew is one pilot.
Two people onboard maximum.

2.11. TYPES OF FLIGHT

VFR / DAY.

2.12. FUEL

Total fuel	:	80 l
Useable fuel	:	79 l
Unusable fuel	:	1 l
Fuel Octane grade approved:		Refer to Rotax manual

2.13. MAXIMUM NUMBER OF SEATS

Two

2.14. TIRE PRESSION

Nose landing gear :	280 mm diameter wheel	2.2 bar
Main landing gear :	280 mm diameter wheel	2.2 bar

2.15. INSTRUMENT PANEL WEIGHT LIMITATION

Maximum weight of instrument panel when equipped and wired = 15 kg

2.16. SOLO FLIGHT

For each solo flight, the unused harness must be locked.

2.17. FLAPS: 45° FLAP POSITION

The use full flaps (45° - short landing position) is authorized only on finals for short landings (or emergency landing), and only when no go-around is envisaged.

When the flaps are fully extended (45°) :

- In the event of a go-around : the throttle must be use with caution, slowly.
- Slide-slipping is strictly prohibited. During the final, the aircraft must be maintained in a straight line and without angled attack.

3. EMERGENCY PROCEDURES

3.1. INTRODUCTION

This section provides a list of appropriate actions in the event of certain emergencies. Providing that the aircraft is well maintained and proper pre-flight inspections are made, emergencies due to failure of the aircraft, aircraft engine or other systems is very rare.

However, should an emergency occur, the procedures described in this section of the manual should be adopted.

3.2. ENGINE FAILURE

3.2.1. Engine failure on take-off run

If there is enough runway length remaining :
- Fully reduce Power and apply brakes.

If there is insufficient runway length remaining :
- Fully reduce power
- Brake hard
- Fuel tap ..... **closed**
- Magnetos .....**OFF**
- Battery .....**OFF**

3.2.2. Engine failure immediately after take-off

- Airspeed ..... **70 knots**
- Fuel tap ..... **closed**
- Magnétos .....**OFF**
- Flaps ..... **as required**
- Battery .....**OFF**

Never attempt to make a U turn to return to the runway.

3.3. IN-FLIGHT RESTART

3.3.1. Starter motor restart

If the altitude is sufficient to attempt to restart the engine :

- Airspeed ..... **70 knots**
- Fuel tap ..... **open**
- Electric fuel pump ..... **on**
- Throttle setting **1/2**
- Magnetos ..... **"BOTH"**
- Starter ..... **on**

If the motor does not start, plan to make a forced landing.

3.3.2. Dive restart

If the altitude is sufficient to attempt to restart the engine (minimum altitude lost 1500 feet) :
Nose dive as explained :

- Airspeed ..... >**135 knots**
- Fuel Tap ..... **open**
- Electric pump ..... **on**
- Throttle setting **1/2**
- Magnetos ..... **"BOTH"**

If the motor does not start, plan to make a forced landing.

3.4. SMOKE AND FIRE

3.4.1. Fire on engine start

Continue starting the engine (or leave it running if it is has already started)
- Throttle setting ..... **fully open**
- Electric fuel pump ..... **off**
- Fuel tap ..... **closed**

If the fire persists :

- Magnetos ..... **off**
- Battery ..... **off**

EVACUATE THE AIRCRAFT

3.4.2. Airborne engine fire

- Fuel tap ..... **closed**
- Full throttle until the engine stops
- Electric fuel pump ..... **off**
- Cabin heating and ventilation ..... **closed**
- Airspeed ..... **70 knots**

Prepare for a forced landing with an engine inoperative.

3.4.3. Cabin fire

Extinguish the fire
Open ventilation to eliminate the smoke.

In case of an electrical fire (recognised by the smell of burning insulation) :

- Reduce cabin ventilation
- Battery ..... **off**

LAND QUICKLY

3.5. GLIDING

Recommended air speed, ... **70 knots**
Flaps . ..... **0°**
Glide ratio **16.3**

3.6. FORCED LANDING

3.6.1. Planned forced landing with engine stopped

Choose a suitable site

- Best glide ratio airspeed ..... **70 knots**
- Flaps ..... **retracted / as required**
- Belt / Safety harness ..... **tight**
- Electric fuel pump ..... **off**
- Throttle setting ..... **closed**
- Magnetos ..... **off**
- Fuel Tap ..... **closed**
- Battery ..... **off**

3.6.2. Planned forced landing with engine running

- Proceed as for a normal landing
- Best glide ratio speed ..... **70 knots**
- On final approach, unlock the canopy
- Approach speed on final ..... **65 knots**

Prior to touchdown:

- Magnetos ..... **off**
- Battery ..... **off**

3.7. RECOVERY FROM AN UNINTENTIONAL SPIN

- Throttle ..... **reduce**
- Flaps ..... **retract**
- Rudder ..... **opposite spin direction**
- Elevator ..... **to neutral**
- Aileron ..... **to neutral**

3.8. OTHER EMERGENCIES

3.8.1. Vibrations and erratic engine behaviour : likely causes.

- Contaminated fuel ..... **switch on the electric fuel pump**
- Ignition : magneto switch ..... **"L", then "R", then return to "BOTH"**

Select the position that gives the smoothest running and land as soon as possible on the closest runway.

3.8.2. Oil feed malfunction

If the oil pressure us low, look at the oil temperature

If the oil temperature rises (into the red), do not touch the throttle but contact the closest airfield and prepare to make a forced landing.

3.8.3. Icing

Avoid entering icing meteorological zones and change altitude.
Set heating system to de-mist and/or apply carb heat (if equipped).

3.8.4. Electric generation failure

Low battery warning light ..... **lit**

3.8.5. Low voltage (voltmeter).

Switch off all non-essential electrical equipment and fly to the nearest airfield and land.

3.8.6. Parachute (if installed).

Please, read before flying the different scenarri in the user's manual written by the manufacturer in order to understand and recognise the situations that would justify the deployment of the parachute.

If necessary:

- Safety pin ..... **removed**
- Engine ..... **turn-off**
- Pilot and passenger..... **Check safety belts**
- Parachute handle ..... **fully grasp handle and pull firmly**
- Pilot and passenger..... **Protect face and regroup limbs close to body**

After touchdown and analysis of possible wounds or damage, evacuate the aircraft rapidly.

4. NORMAL PROCEDURES

4.1. INTRODUCTION

This section provides with a list of standard checks and procedures to be used in normal flight conditions. Procedures applicable to the use and check of optional equipment should be found in the "Supplementary systems and equipment" section.

4.2. DAILY CHECK

1 CABIN

- Seats ..... adjusted, locked
- Safety harness attachments ..... checked
- Elastic (left and right side) ..... in place
- Flap control belt ..... in place, tight
- Primary wing attachment pins ..... in place, safety pinned
- Front wing fixings ..... in place, secure
- Rear wing fixings ..... in place, secure
- Pitot tube ..... connected
- Controls ..... free
- Magneto contacts ..... off / cut
- Master (battery) switch ..... on
- Fuel level ..... checked
- Fuel tank ..... check actual level
- Fuel filler cap ..... in place, locked
- Master (battery) switch ..... off
- Documentation ..... all present and correct
- Weight and balance (including luggage) ..... checked
- Canopy condition (clean) ..... checked

2 FUSELAGE, LEFT SIDE

- Static vent, ... clean, unobstructed
- Antenna mounting ..... checked

Watch out not to hurt yourself with antennas

3 TAIL

- Smooth, non-blemished surfaces ..... checked
- Rudder ..... mounting / fixing / movement / cables / absence of play
- Tailplane..... mounting / fixing / movement / absence of play

- Control rod ..... in place, secure
- Anti servo tab control ..... in place

4 FUSELAGE, RIGHT SIDE

- Static vent ..... clean, unobstructed
- Antenna mounting ..... checked

Watch out not to hurt yourself with antennas

5 RIGHT WING

- Aileron and flap conditions and hinges ..... checked
- Tightness to fuselage ..... checked
- Tightness & safety of front wheel and main undercarriage fairings and spats ..... checked
- Wing tip condition and safety, navigation lights (where fitted) ..... checked
- Main undercarriage ..... brakes / tyre inflation checked

6 ENGINE COWLS

- Cowl fixing screws ..... checked
- Air vents ..... clean, unobstructed
- Propeller spinner ..... screws checked, no play or looseness
- Propeller ..... clean, good condition
- Oil level ..... checked
- Fuel drain : Check for absence of water and impurities ..... operate and check
- Exhaust pipe ..... fixings checked
- Fuel tank air vent (beneath fuselage) ..... clean, unobstructed

* To correctly determine the oil level it is necessary to remove and clean the dip stick before dipping and reading the level.

7 LEFT WING

- Main undercarriage (left) ..... mounting, brakes, tyre inflation checked
- Pitot ..... clean, unobstructed
- Wing tip condition and security, navigation lights (where fitted) ..... checked
- Aileron and flap conditions and hinges ..... checked
- Tightness to fuselage ..... checked
- Tightness & security of front wheel and main undercarriage fairings and spats ..... checked

4.3. PRE-FLIGHT CHECK

Repeat the daily inspection

4.4. NORMAL PROCEDURES AND CHECK-LISTS

4.4.1. Cabin check prior to engine start

- Parking brake ..... **on**
- Flaps ..... **retracted**
- Seats ..... **adjusted**
- Rudder pedals ..... **adjusted**
- Safety harness ..... **tightened**
- Flight controls ..... **full and free**
- Pitch trim operation ..... **full fwd / aft range checked / take-off position**
- Canopy ..... **closed not locked**

4.4.2. Cold engine start (ROTAX)

- Battery ..... **on**
- Fuel tap ..... **check function / open**
- Fuel Quantity ..... **noted**
- Electric fuel pump ..... **on**
- Propeller ..... **set minimum pitch**
- Throttle setting **1/4**
- Choke ..... **pull**
- Propeller area ..... **clear**
- Magneto contacts ..... **BOTH**
- Starter ..... **operate when ready**

As soon as the motor starts :

- Choke ..... **push**
- RPM ..... **1 600 rpm**
- Oil pressure ..... **within yellow sector in 10 sec. (4 bar for Rotax 912)**
- Battery voltage ..... **checked**
- Canopy ..... **locked / checked**

4.4.3. Hot engine start

- Battery ..... **on**
- Fuel tap ..... **open**
- Fuel quantity ..... **noted**
- Propeller ..... **full fine pitch**
- Throttle ..... **closed**
- Magnetos ..... **BOTH**
- Propeller area ..... **clear**
- Starter ..... **operate when ready**

Then follow the procedure for starting when cold.

4.4.4. Taxiing

- Parking brake ..... **off**
- Brakes ..... **checked**

4.4.5. Engine ground run

- Parking brake ..... **on**
- Oil temperature and pressure ..... **within green sector**
- RPM set to ..... **3 850 rpm**
- Magneto contact ..... **"L", BOTH, "R", BOTH**
  ..... **max drop 300 rpm, max difference 100 rpm, checked**
- Reduce throttle setting ..... **1 600 rpm**

4.4.6. Pre-take-off checks

- Magneto contacts ..... **BOTH**
- Controls ..... **full and free**
- Cabin (canopy, harness) ..... **checked**
- Oil pressure and temperature ..... **within green sector**
- Charge ..... **checked**
- Trim ..... **checked**
- Altimeter ..... **checked**
- Fuel tap ..... **open**
- Fuel quantity ..... **checked**
- Electric fuel pump ..... **on**
- Warning light panel ..... **unlit**
- Flaps ..... **Check full extension, and set to take-off position**
- Compass ..... **checked**

4.4.7. Take-off

- Minimum RPM at full throttle ..... **5 500 rpm checked for VP Propeller**
  ..... **4 600 rpm checked for fixed pitch Propeller**
- Take-off airspeed ..... **55 kts**
- Initial climb airspeed ..... **Vx : 70 kts**
- Climb airspeed when clear of obstacles ..... **Vy : 75 kts**
- Electric fuel pump @ 300 ft AAL ..... **off**
- Engine readings ..... **checked**
- Warning light panel ..... **unlit**
- Flaps ..... **Retracted**

4.4.8. Climb

Full throttle, maintain 75 kts I.A.S. until reaching 4000 ft AAL.

4.4.9. Cruise

See "Performance" section for rpm setting and performances.

4.4.10. Descent

- Fuel tap ..... **open**
- Engine minimum rpm..... **2 400 rpm**

4.4.11. Approach

- Cabin (harness) ..... **tight**
- Electric fuel pump ..... **on**
- Flaps (under 90 kts)..... **extended**
- Warning light panel..... **unlit**
- Altimeter ..... **set**
- Brakes ..... **free**

4.4.12. Final

- Airspeed ..... **65 kts**

4.4.13. Go-Around

- Airspeed ..... >**70 knots**
- Flaps ..... **retracted**
- Climb airspeed ..... **75 knots**

4.4.14. Post-landing checks

- Flaps ..... **retracted**
- Electric fuel pump ..... **off**

4.4.15. Engine Stop

- Parking brake ..... **on**
- Radio, Navigation and instruments..... **off**
- Magnetos ..... **cut-off test @ 2000 rpm**
- Strobe light ..... **off**
- Magneto contact..... **off**
- Battery ..... **off**

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5. PERFORMANCES

5.1. INTRODUCTION

This section provides approved information relating to standardised air speeds, stall speeds, take-off performance and supplementary non approved information.

The information given in the diagrams was obtained from flight tests with an aircraft and an engine in good condition and in the hands of an average pilot.

5.2. APPROVED DATA

5.2.1. Airspeed indicator calibration

V=Vi +1/23 knots

5.2.2. Stalling speed (knots)

m = **450** kg

	Flaps	0 °	17 °	30 °	45 °
Bank angle					
0 °		47	39	36	35
30 °		50	42	39	37
60 °		66	55	52	49

m = 400 kg

	Flaps	0 °	17 °	30 °	45 °
Bank angle					
0 °		44	37	34	33
30 °		48	40	37	35
60 °		63	52	49	46

5.2.3. Take-off performances (ROTAX 912 80 hp)

5.2.3.1. Climb rate

Take-off weight = 450 kg : 1000 ft/mn = 5 m/s (aircraft equipped with fixed pitch EVRA Propeller and Rotax 912 (80 HP) engine

5.2.3.2. Aircraft equipped with Rotax 912 ULS-FR and VP MT Propeller

Take-off run = 100 m
Slope at 70 knots = 25 %
Distance to 50 feet = 150 m

5.2.3.3. Aircraft equipped with Rotax 912 and fixed pitch EVRA Propeller

Take-off run = 150 m
Slope at 70 knots = 25 %
Distance to 50 feet = 230 m

5.2.4. Landing distances

Approach 44 kts = 1.3 VS
Land distance on a hard runway in standard conditions is 270 m.

5.2.5. Take-off distances calculation

Take-off distances must be increased by :

20% on a grass strip.
40% on a wet runway (take-off only)

They must be reduced by:

10% for each 10 kts head wind step.

They can be computed for intermediary masses by considering a 2.5% change for each 10 kg step.

5.2.6. Effect of rain and insects on aircraft performance, flying and handling qualities.

Decrease the performances by 4%

5.2.7. Cross-wind demonstrated performances

20 kts

6. WEIGHT & BALANCE

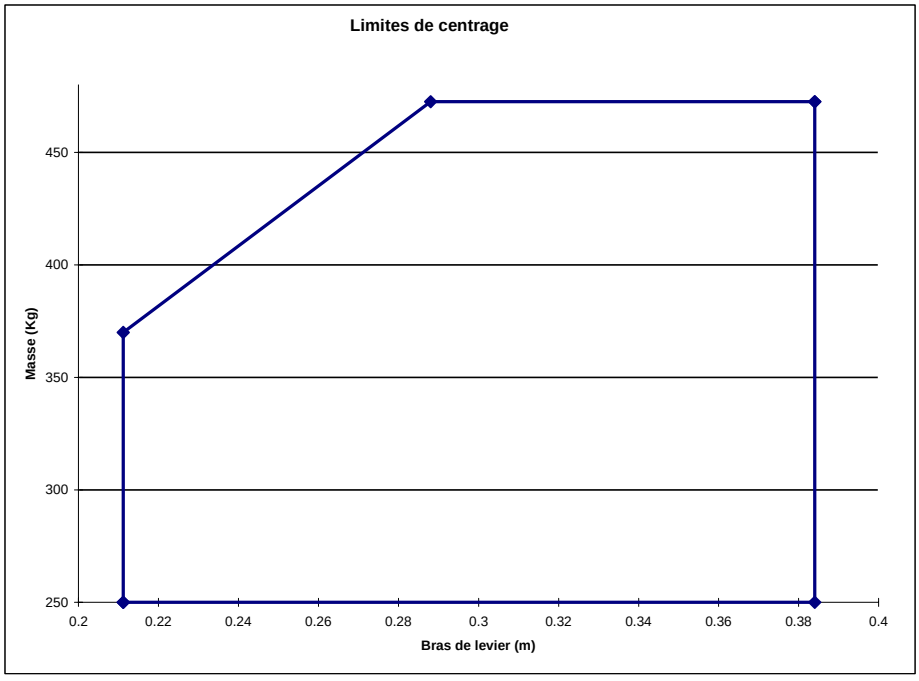
6.1. INTRODUCTION

This part presents loading cases where the aircraft can be safely operated.

Weighing and balance calculation procedures and a complete list of the equipment available (especially those mounted for weighing) on the aircraft are included in the maintenance manual.

6.2. WEIGHT & BALANCE REGISTRATION AND LOADING ENVELOPE

6.2.1. Loading envelope



M.A.C. =960 mm ; Reference datum : 13.5 mm ahead of left wing leading-edge.

6.2.2. Weight & balance procedure

	Weight	Moment arm			Moment
	Kg		M		m.Kg
Empty weight		x		=	
Pilot		x	**0.700**	=	
Co-pilot		x	**0.700**	=	
Luggage		x	**1.150**	=	
Front fuel tank		x	**0.020**	=	

Total Weight		**Moment sum**	

Note :

The above chart shows MCR mean moment arms. It must be completed with the actual empty weight and moment arm of the Aircraft. Also update if possible the actual moment arms of movable weight by weighing your Aircraft (refer to MBENOPP Weighing procedure).

Calculation method

- Note movable weights in above chart (shaded boxes).
- Compute total mass
- Multiply weights and corresponding moment arms and note the results in "Moment" column.
- Compute the moment sum.
- Divide the moment sum by the total weight. The result gives the location in meter of the actual Aircraft center of gravity.
- Check the computed moment arm is within the weight and balance envelope shown on previous page.

7. AIRCRAFT OPERATION, SERVICING AND MAINTENANCE

7.1. INTRODUCTION

This section provides the procedures required by the manufacturer for the handling and the maintenance of the aircraft. It also shows a few maintenance and inspection requirements which must be fulfilled in order to ensure performance and reliability of a new aircraft. According to the environment and flight conditions, a lubrication and maintenance schedule must be applied.

7.2. AIRCRAFT MAINTENANCE SCHEDULE

Advised inspections:

50 hours
100 hours / 1 years
1 000 hours
5 years

RESPECT THE MAINTENANCE MANUAL SCHEDULE M EX NO 03 *E*

7.3. AIRCRAFT MODIFICATIONS AND REPAIRS

The Airworthiness authorities and the manufacturer must be informed before all modification or repair, which can change the aircraft Airworthiness.

7.4. PARKING

Parking brake on,
Canopy locked,
Canopy cover advised,
Main landing gear wheels choked.

7.4.1. Ground fixing

The aircraft can be secured to the ground from the wheels.
Wing attach fittings using 6 mm diameter captive nut can also be installed.

7.5. CLEANING AND TREATMENT

Regularly clean all control surfaces and the inside of the aircraft.

Cleaning products must be suitable for surfaces to be cleaned. Check product before each canopy cleaning.

8. SUPPLEMENTARY SYSTEMS AND EQUIPMENTS

8.1. INTRODUCTION

This section presents the appropriate supplementary elements to safely and properly use the aircraft with the following optional systems and equipment that are not delivered with the standard aircraft (list to be completed by the assembler).

8.2. MINIMUM EQUIPMENT LIST

Flight instruments	Air speed indicator
	Altimeter
	Magnetic compass
	Ball bank indicator
Engine instruments	Tachometer
	Oil temperature
	Oil pressure
	Cylinder head temperature
	Fuel level indicator
Oil level indicator	

8.3. LIST OF THE SUPPLÉMENTARY SYSTEMS AND EQUIPMENTS

Date	Document N°	Title of the supplementary element

8.4. SUPPLEMENTARY ELEMENTS DESCRIPTIONS