SECTION 1

GENERAL

INDEX

1.1. INTRODUCTION

The safe use of the aircraft in accordance with the instructions provided in this Flight Manual shall guarantee to you hours of safe and entertaining flying.

We ask you to carefully read this Flight Manual. We ask you to make an appropriate use of this manual and to fully comply with the instructions, flight parameters and warnings listed below at any time you use the aircraft.

For all information about systems and sub-systems, including operational limitations, please refer to the Technical Description (Document RT002) which forms part of this handbook.

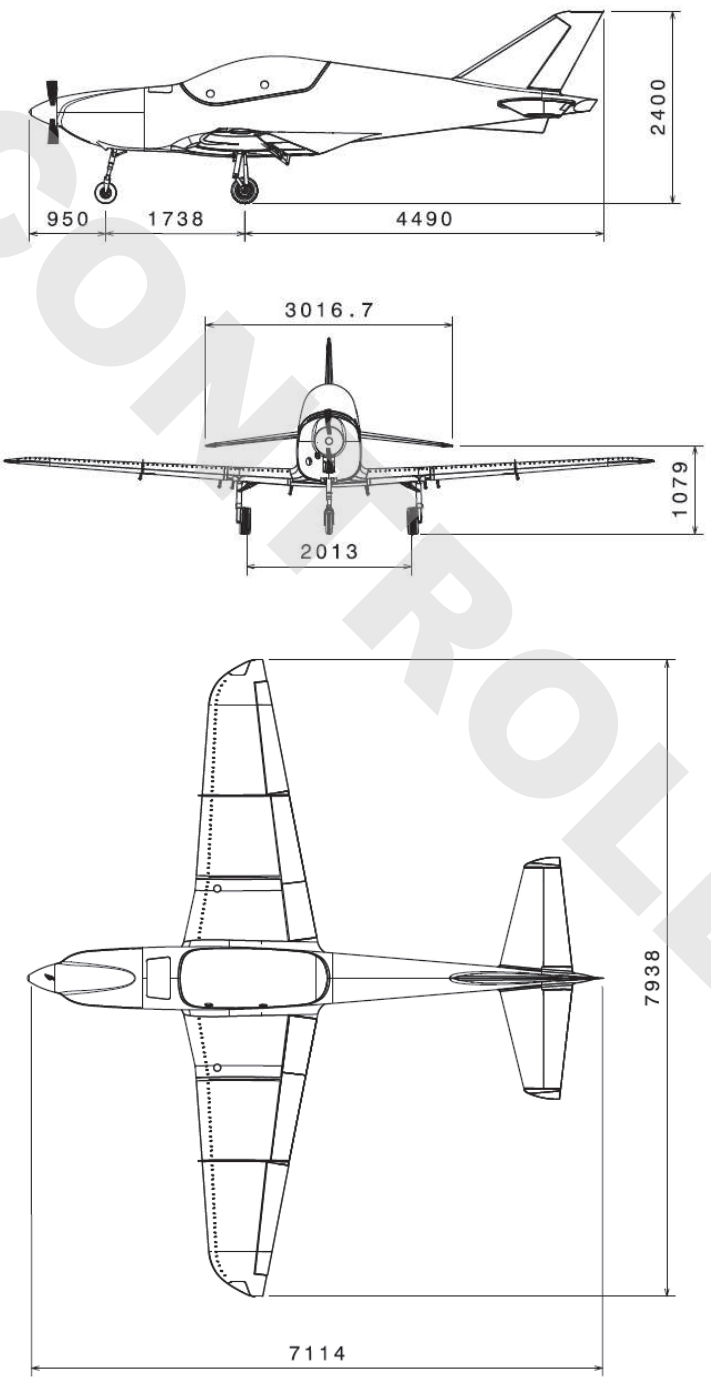
1.2. WARNINGS, CAUTIONS AND NOTES

The following definitions apply to articles: warnings, cautions and notes used in the Flight Manual.
The manufacturer declines any responsibility in case of reduction of safety due to non-compliance by the user with texts marked with "WARNING", "CAUTION" and "NOTE".

1.3. THREE-VIEW DRAWING OF THE AIRPLANE

The following figure is a three-view drawing of the aircraft CF-300.

- The dimensions listed here (in mm) correspond to an aircraft weighting 472.5 kg with tires inflated at normal operating pressure.



1.4. MAIN DIMENSIONS

WING		
	Wingspan	7,94 m
	Mean Aerodynamic Chord (MAC)	1,3 m
	Wing Area	9,6 m^2
	Wing Loading	49,2 kg/m^2
	Aspect Ratio	6,75
	Taper Ratio	2,133
	Dihedral	4°
FUSELAGE		
	Total Length	7,15 m
	Maximum Width	0,79 m
	Total Height	2,41 m
TAIL PLANES		
	Horizontal Stabilizer Span	3,02 m
	Fin Height	0,83 m
LANDING GEAR		
	Track	2,01 m
	Wheel Base	1,76 m
	Main Tires Size	4”
	Wheels and Brakes	Beringer
	Nose Tire Size	3”

1.5. CONTROL SURFACES TRAVEL

Ailerons	+15° -11°
Elevator	+20° -10°
Trim	+6° -30°
Rudder	+20° -20°
Flaps	10° 20° 30°

1.6. ENGINE

Model:	**ROTAX 912 ULS3**
Manufacturer:	Rotax Gmbh
Engine type:	4 horizontally-opposed cylinders with a total displacement of 1352 cm3, mixed cooling (liquid-cooled heads, air-cooled cylinders), dual carburetors, integrated gearbox (2.4286:1) with torque damper. Compression ratio 11:1
Maximum power:	100 hp (73.5 Kw) at 5800 RPM – max 5 min.

1.7. PROPELLER

Manufacturer:	MT Propeller
Model:	MTV-33-1-A
Number of blades:	2
Diameter:	1750 mm
Type:	Hydraulic controlled variable pitch

1.8. FUEL

Fuel (*):	Min. RON 95
	En 228 Super
	En 228 Super plus
	AVGAS 100LL
Fuel tank:	2 anti-blast tanks, installed into the central wing, one left one right with the capacity of 33 liters each. 2 option auxiliary anti-blast tanks, installed into the outer wing, one left one right, with the additional capacity up to 15 liters each
Total fuel capacity:	66 liters (96 liters optional)

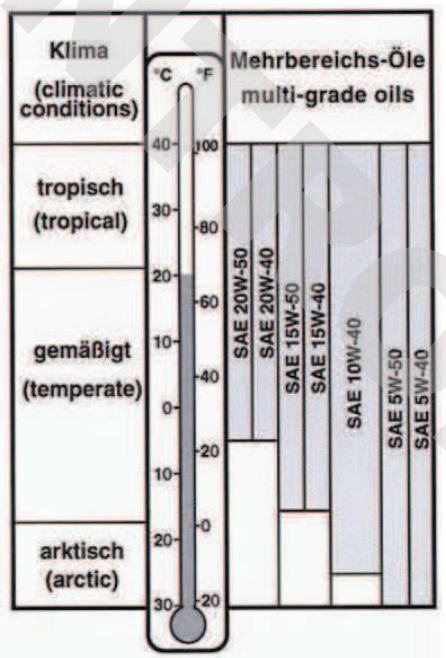
(*) Refer to the “Rotax Operator’s Manual”

1.9. LUBRICANT

Lubrication system:	Forced, with external tank.
Lubricant (*):	Use API “SG” type oil or similar. The type of lubricant used may vary with climatic conditions of use (see Table below).
Lubricant quantity:	Max. 3 liters
	Min. 2 liters
(*)Refer to the “Rotax Operator’s Manual”	

1.9.1. Table of Lubrication oils

Depending on the external temperature when using the aircraft, adjust the type of lubricant oil used, according to the SAE viscosity grades, as shown in the following table:



1.10. COOLING LIQUID

Cooling system:	Mixed air/liquid cooling, with closed and pressurized circuit.
Liquid (*):	Use mainly those two types of cooling liquids: 1) Conventional based on ethylene glycol 2) Propylene glycol
Mixture ratio:	The cooling liquid shall be mixed with water in the proportions indicated in the following table

(*) Refer to the "Rotax Operator's Manual"

1.10.1. Table of Mixture Ratios

	mixture ratio %	
designation	**concentrate**	**water**
Conventional e.g. BASF Glysantine Protect Plus G48 anticorrosion	50	50

1.11. WEIGHT

Maximum Take-Off Weight (MTOW)[1]	472,5 Kg (1041 lbs)
Maximum Landing Weight	472,5 Kg (1041 lbs)
Empty Weight	See Chapter Mass and Balance
Maximum Useful Load (MTOW – Empty Weight)	See Chapter Mass and Balance

1 With ballistic rescue system installed

1.12. LIST OF DEFINITIONS AND ABBREVATIONS

1.12.1. Airspeeds

CAS	**Calibrated Airspeed:** Indicated airspeed, corrected for installation and instrument errors. CAS equals TAS at standard atmospheric conditions (ISA) at medium sea level (MSL).
GS	**Ground Speed:** Speed of the airplane relative to the ground.
IAS	**Indicated Airspeed:** Indicated Airspeed as shown on an airspeed indicator.
TAS	**True Airspeed:** The speed of the airplane relative to the air. TAS is CAS corrected for errors due to altitude and temperature.
V_{FE}	**Maximum Flaps Extended Speed:** This speed must not be exceeded with the given flap setting.
V_{LE}	**Maximum landing gear extended speed:** This is the maximum speed at which it is safe to fly with the landing gear extended.
V_{LO}	**Maximum landing gear operating speed:** This is the maximum speed at which it is safe to extend or retract the landing gear.
V_{NO}	**Maximum Structural Cruising Speed:** This speed may be exceeded only in smooth air. It corresponds to the top end of the green arc on the airspeed indicator.
V_A	**Maneuvering Speed:** It is the recommended airspeed when flying in turbulent air. This is the maximum speed at which the airplane is not overstressed at full deflection of control surfaces. Full or abrupt control surface movement is not permissible above this speed.
V_{NE}	**Never Exceed Speed:** This speed must **NOT** be exceeded in any operation.
V_S	**Stall speed:** The power-off stall speed with the airplane in its standard configuration.
V_{S0}	**Stall speed in landing configuration:** The power-off stall speed with the airplane in landing configuration (gear and flaps extended).
V_X	**Best Angle-of-Climb Speed.**
V_Y	**Best Rate-of-Climb Speed.**
V_r	**Rotation Speed:** This is the speed at which the aircraft rotates about its pitch axis during take-off.
V_{REF}	**Reference Speed.**

1.12.2 Flight Performance and Flight Planning

DEMONSTRATED Crosswind component	The maximum speed of the crosswind component at which the maneuverability of the airplane during take-off and landing has been effectively demonstrated during test flights.
Service ceiling	The altitude at which the maximum rate of climb is 0.5 m/s (100 ft/min).

1.12.3. Powerplant

RPM	**Number of revolutions per minute:** the number of engine revolutions per minute, divide by 2.4286 (912 ULS3) to obtain the number of propeller revolutions per minute.
Throttle Lever	**The lever which controls the engine power**, and therefore the manifold absolute pressure (MAP).
Propeller Lever	**Regulation of the propeller pitch setting:** this is a control lever that allows to set the propeller pitch, and as a consequence, the engine RPM.
Tachometer	**Indicates the number of revolutions per minute of the engine**. The instrument is connected directly to the engine via a flexible hose.
Cylinder Head Temp. (CHT)	**Indicates the head temperature of the cylinder n° 3.**
Exhaust Gas Temp. (EGT)	**Indicates the temperature of the gas that are expelled directly from the cylinders.**
MAP	**Manifold pressure display**: Indicates the engine absolute manifold pressure.
Fuel Pressure	**Fuel pressure indicator**
Voltmeter	**Indicates the battery load**
Water temp.	**Indicates the cooling water temperature**
Oil Temp.	**Indicates the engine oil temperature**

1.12.4. Weight and Balance

Reference Datum (RD)	An imaginary vertical plane from which all horizontal distances for the center of gravity calculations are measured.
Lever arm	The horizontal distance from the reference datum to the center of gravity (of a component).
Moment	The weight of a component multiplied by its lever arm.
Station	A defined point along the longitudinal axis which is generally presented as a specific distance from the reference datum.
Center of gravity (C.G.)	Point of equilibrium for the airplane weight.
C.G. position	Distance from the reference datum to the CG. It is determined by dividing the total moment (sum of the individual moments) by the total weight.
Center of Gravity Limits	The CG range within which an airplane with a given weight must be operated.
Usable Fuel	The amount of fuel available for the flight plan calculation.
Unusable Fuel	The amount of fuel remaining in the tank, which cannot be safely used in flight.
Empty Weight	Weight of the airplane including unusable fuel, all operating fluids and maximum amount of oil.
Useful Load	The difference between take-off weight and empty weight.
MTOW	Maximum Take-Off Weight: Maximum weight permissible for take-off.

1.12.5. Meteorology

OAT	**Outside Air Temperature**
Indicated Pressure Altitude	**Altitude reading with altimeter set to 1013.25 hPa (29.92 inHg).**
ISA	**Standard ICAO atmosphere** in which: 3) The air is a dry perfect gas 4) The temperature at sea level is 15°C (59°F) 5) The pressure at sea level is 29,92 in Hg (1.013,2 mbar) 6) The temperature gradient from sea level to the altitude at which the temperature equals -56.5°C (-69.7°F) is -1.98°C (-3.6°F) per 1.000 ft.
T_s	**Standard temperature**: Assuming a temperature at sea level of 15°C with a diminution of 1.98°C per 1.000 ft.
AGL	**Above Ground Level.**

1.13. CONVERSION FACTORS

1.13.1. Conversion of units of measurement

Multiply		by →	to obtain	
Temperature				
Fahrenheit	[°F]	$\frac{5}{9}.(F-32)$	Celsius	[°C]
Celsius	[°C]	$\left(\frac{5}{9}.C\right)$ E	Fahrenheit	[°F]
Force				
Kilograms	[kg]	2.205	Pounds	[lbs]
Pounds	[lbs]	0.4536	Kilograms	[kg]
Speed				
Meter per second	[m/s]	196.86	Feet per minute	[ft/min]
Feet per minute	[ft/min]	0.00508	Meter per second	[m/s]
Knots	[kts]	1.852	Kilometer per hour	[km/h]
Kilometer per hour	[km/h]	.05369	Knots	[kts]
Pressure				
Atmosphere	[atm]	14.7	Pound per square inch	[psi]
Pound per square inch	[psi]	0.068	Atmosphere	[atm]
Length				
Kilometer	[km]	0.5369	Nautical miles	[nm]
Nautical miles	[nm]	1.852	Kilometer	[km]
Meter	[m]	3.281	Feet	[ft]
Feet	[ft]	0.3048	Meter	[m]
Centimeter	[cm]	0.3937	Inch	[in]
Inch	[in]	2.540	Centimeter	[cm]
Volume				
Liters	[l]	0.2642	US Gallons	[US Gal]
US Gallons	[US Gal]	3.785	Liters	[l]
Surface area				
Square meters	[m²]	10.76	Square feet	[sq ft]
Square feet	[sq ft]	0.0929	Square meters	[m²]

1.13.2. Conversion Liters / US Gallons

LITERS	US GALLONS
5	1,3
10	2,6
15	4,0
20	5,3
25	6,6
30	7,9
35	9,2
40	10,6
45	11,9
50	13,2
60	15,9
70	18,5
80	21,1
90	23,8
100	26,4

US GALLONS	LITERS
1	3,8
2	7,6
4	15,1
6	22,7
8	30,3
10	37,9
12	45,4
14	53,0
16	60,6
18	68,1
20	75,7
22	83,3
24	90,9
26	98,4
28	106,0

1.13. MISCELLANEOUS

M.A.C.	**Mean Aerodynamic Chord**
RHS	**Right-Hand Side**
LHS	**Left-Hand Side**

SECTION 2

OPERATING LIMITATIONS

INDEX

2.1. INTRODUCTION

Section 2 of this Flight Manual comprises the operating limitations, instrument markings, airspeed indicator markings, and the limitation placards which are necessary for the safe operation of the airplane CF300, its engine, and standard systems and equipment.

WARNING

ALL LIMITATIONS GIVEN IN THIS CHAPTER MUST BE COMPLIED WITH FOR ALL OPERATIONS

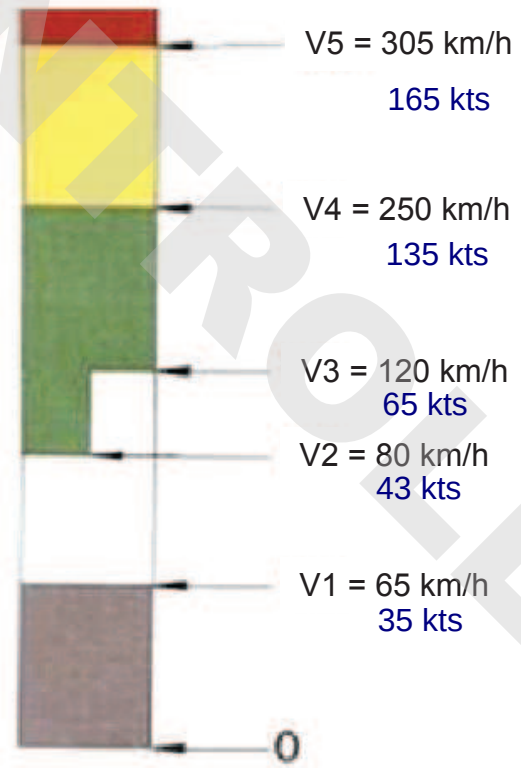
2.2. AIRSPEED LIMITATIONS

SPEED Km/h		IAS	DESCRIPTION
V_A	Maneuvering Speed	**160 Km/h** 86 kts	Do not make full or abrupt control movement above this speed. Under certain conditions the airplane may be overstressed by full control movement.
V_{LDG}	Max LDG Extended Speed	**130 Km/h** 70 kts	Do not exceed this speed with landing gear down.
V_{FE} **10° (Take - Off)**	Max Flap Extended Speed	**120 Km/h** 65 kts	Do not exceed this speed with flaps in take-off position.
V_{FE} **20° (Approach)**		**110 Km/h** 59 kts	Do not exceed this speed with flaps in approach position.
V_{FE} **30° (Landing)**		**105 Km/h** 57 kts	Do not exceed this speed with flaps in landing position.
V_{NO}	Maximum Structural Cruising Speed	**250 Km/h** 135 kts	Do not exceed this speed excepted in smooth air and then only with caution.
V_{NE}	Never exceed speed	**305 Km/h** 165 kts	Do not exceed this speed in any operation.

2.3. AIRSPEED INDICATOR MARKINGS

Airspeed limitations and their meaning of use are reported in the table below:

MARKING	IAS Km/h	EXPLANATION
White arc	**65-120 Km/h**	Flap operating speed range.
Green arc	**80-250 Km/h**	Normal operating range.
Yellow arc	**250-300 Km/h**	Maneuvers must be conducted with caution and only in smooth air.
Red line	**305 Km/h**	Maximum permissible speed for all operating modes.



2.4. ENGINE LIMITATIONS

The following table shows the operating limitations of the engine installed on this aircraft. Please also refer to the Operation Manual of the manufacturer Rotax Aircraft Engines.

ENGINE MANUFACTURER:	BRP-Powertrain GmbH & Co KG
ENGINE MODEL:	912 ULS3

2.5. OPERATING LIMITATIONS

2.5.1. Engine

- Maximum Power	Max T/O (5 min)	73,5 Kw (100 hp)
- Max RPM	Max RPM T/O	5.800 rpm
- Maximum Continuous Power	Max Power	69 Kw (93 hp) at 5500 rpm
- Maximum Continuous RPM	Max RPM	5.500 rpm

2.5.2. Oil pressure

- Minimum	under 3500 rpm	0.8 bar / 12 psi
- Normal	up 3500 rpm	2.0 – 5.0 bar / 29 – 73 psi
- Maximum	cold engine, short period	7.0 bar - 102 psi

2.5.3. Temperature

- Max cylinder head	CHT	135°C
- Oil	Min - Max	50°C – 130°C
- Normal Operating Oil Temperature		90°C – 110°C
- Max. exhaust gas temperature		880°C

2.5.4. Acceleration

Engine limitation in operations at 0 gravity and negative “G”

- Max	5 second at max. -0.5 G

2.5.5. Engine Start Operating Temperature

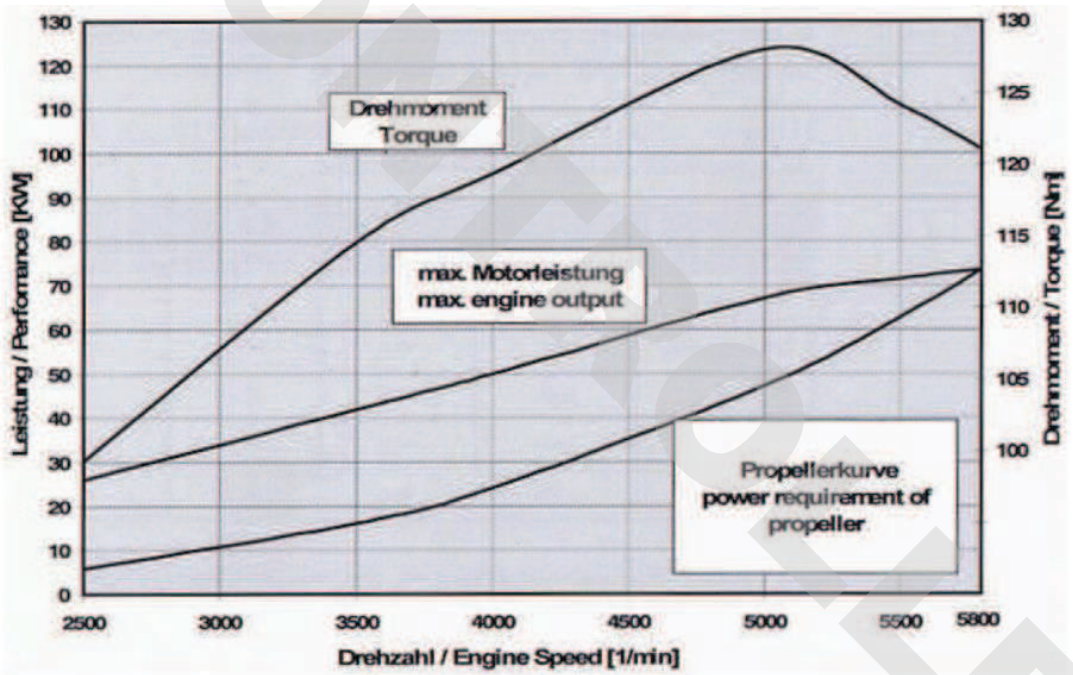
- Max	+ 50°C
- Min	- 25°C

2.5.6. Fuel pressure

- Max	0.4 bar – 5.8 psi
- Min	0.15 bar – 2.2 psi

2.5.7. Performances graph in Standard Conditions (ISA)

Providing engine speed over 5500 rpm is restricted to 5 minutes



2.5.8. Engine performances table

The following table optimizes engine performances as a percentage of power settings compared to the number of revolutions RPM:

Engine Power-Setting	Engine Speed [rpm]	Output Power (kW)	Torque [Nm]	Manifold pres. [in.HG]
Take-off perform.	5800	73,5	121,0	27,5
cruising power	5500	69,0	119,8	27
75%	5000	51,0	97,4	26
65%	4800	44,6	88,7	26
55%	4300	38,0	84,3	24

2.5.9. Propeller

For technical data, proper installation and maintenance of the propeller, refer to the Operation and Maintenance Manual of the manufacturer.

Manufacturer: MT Propeller
Model: MTV-33-1-A
Diameter: 1750 mm
Pitch: variable hydraulically

2.5.10. Lubricant – Coolant - Fuel

Data and Information contained in the Operation and Maintenance Manual of the manufacturer must be considered.
Section 1.9.1 shows features and tables.

2.6. POWER PLANT INSTRUMENTS MARKINGS

The marks of the power plant and the meaning of the code of the colors are shown in the following table:

INSTRUMENT		RED LINE Min Limit.	GREEN ARC Normal Op. Range	YELLOW ARC Caution	RED LINE Max Limit.
Tachometer	RPM	----------	1400-5500	5500-5800	5800 (5 min)
Oil temperature	°C	50	90-110	50-90 110-130	130
Head cylinder Temp.	°C	----------	75-135	----------	135
Oil pressure	bar	0.8	3.0 – 5.0	0.8 – 3.0 5.0 – 7.0	7.0

2.7. MISCELLANEOUS INSTRUMENTS MARKINGS

INSTRUMENT	RED LINE Min Limit.	GREEN ARC Normale Op. Range	YELLOW ARC Caution	RED LINE Max Limit.
Voltmeter	10 Volt	12 – 14 Volt	----------	----------

2.8. WEIGHTS

- Maximum Take-Off Weight Kg. 472.5 Kg
- Maximum Baggage Weight See Weight & Balance section

WARNING

EXCEEDING WEIGHT LIMITATIONS MAY LEAD TO OVERLOADING OF THE AIRPLANE AND CAUSE LOSS OF CONTROL OF THE AIRPLANE AND/OR STRUCTURAL DAMAGE.

2.9. CENTER OF GRAVITY

The center of gravity (CG) is described in section 6, section 6.4.4. and calculated using the maximum take-off weight from the table of weights centering. It is the responsibility of the pilot to ensure, depending on the loading of the airplane, the correct weight and balance in flight line.

- FWD limit 16.6% MAC
- AFT limit 36.6% MAC
- Reference Plane Engine firewall

2.10. APPROVED MANEUVERS

This airplane is for non-aerobatic use only. The aerobatic use does not includes:

- All the maneuvers related to “normal” flights;
- Stalls (except whip stalls)
- Lazy eight;
- Turns with angle of inclination not exceeding 60°

WARNING

ANY TYPE OF ACROBATIC OPERATION IS FORBIDDEN

2.11. MANEUVERING LOAD FACTORS

Table of structural maximum permissible load factors.

	at V_A	at V_{NE}	With Flaps in T/O or LDG position
Positive	+ 4	+ 4	+ 2
Negative	- 2	- 2	+ 0

2.12. MAXIMUM PASSENGER SEATING

- Maximum passenger seating: Back seat- one passenger

2.13. FLIGHT CREW

- Max Flight Crew: Front Seat- one pilot

2.14. KINDS OF OPERATION

Permission is granted to visual flight VMC - Day VFR, in compliance with regulations of the country in which you are flying.

2.15. EQUIPMENTS

2.15.1. Minimum equipment, flight and navigation Instruments:

- Airspeed Indicator
- Altimeter
- Magnetic Compass

2.15.2. Minimum equipment, flight control:

- Fuel quantity indicator
- Oil pressure indicator
- Cylinder head temperature indicator
- Trim indicator and regulator
- Flaps Control
- Parking Brake
- Master switch
- Engine Power Throttle
- Starter
- Switches
- Breakers

2.16. FUEL

Refer to the Technical Description (Document RT002) to have information about fuel system.

According with the ROTAX 912 ULS Operators Manual the authorized fuels is:

- AVGAS
- EN 228 Super
- EN 228 Super Plus

Fuel capacity is as follow:

Maximum fuel capacity: LH+RH main tanks	lt. 64 (56 usable)
Maximum usable fuel	lt. 56
Unusable fuel	lt. 8

SECTION 3

EMERGENCY PROCEDURES

INDEX

3.1. INTRODUCTION

Section 3 includes the checklists and detailed procedures to be observed on a number of emergencies that might take place.

Emergencies caused by aircraft malfunctioning – or by damage and malfunctioning – are extremely rare, provided all limitations, parameters and flight maneuvers are respected and pre/post flight inspections as well as appropriate calendar maintenance are duly carried out.

In the case of an emergency, and in order to solve the problem in the most appropriate manner, you are required to scrupulously follow and abide by all of the instructions supplied in the section below.

Before operating the airplane and after executing an appropriate course or action, the pilot should thoroughly familiarize with the contents of this manual, especially the “Emergency Procedures section”; besides, he/she should engage in follow-up training relevant to the said procedures.

3.2. SPEED TO BE KEPT DURING AN EMERGENCY PROCEDURE

DESCRIZIONE	Km/h
Engine failure after take-off, with flaps in T/O position	120 65 kts
Maneuver Speed	160 86 kts
Precaution speed for landing with flaps in LDG position	90 49 kts
Landing speed with flaps in T/O position	100 54 kts
Landing with flaps UP (cruise position)	110 59 kts

3.3 EMERGENCY PROCEDURE – CHECKLIST

3.3.1 Engine Failures

a) Engine Failure During Take-Off Run

(1)	Engine Throttle	IDLE
(2)	Brakes	As required
(3)	Flaps	UP
(4)	Fuel Selector	OFF
(5)	Ignition	OFF
(6)	GEN/BATT	OFF

b) Engine Failure Immediately After Take-Off

INSUFFICIENT ENGINE POWER:

(1)	Airspeed	120 km/h
(2)	Engine Throttle	FULL Power
(3)	Fuel Selector	BOTH
(4)	Ignition	BOTH
(5)	Electric Pump	check ON

WARNING
IF ADEQUATE ENGINE PERFORMANCE CANNOT BE RESTORED IMMEDIATELY, PREPARE FOR AN EMERGENCY LANDING. IF POSSIBLE, LAND STRAIGHT AHEAD, AVOIDING OBSTACLES

SHORTLY BEFORE LANDING:

(1)	Engine Throttle	IDLE
(2)	Fuel Selector	OFF
(3)	Ignition	OFF
(4)	Flaps	As Required
(5)	GEN/BATT	OFF

ENGINE OFF:

(1) Perform Emergency Landing

c) In-Flight Engine Failure

(1)	Airspeed	120 km/h
(2)	Engine Throttle	Open 1/3
(3)	Carb. Heat	OPEN
(4)	Fuel Selector	BOTH
(5)	Ignition	BOTH
(6)	Electric Pump	ON
(7)	Ignition	START
(8)	If No Improvement	Perform Emergency

LOW FUEL PRESSURE:

(1)	Electric Pump	ON
(2)	Fuel Selector	BOTH
(3)	Fuel Quantity	CHECK
(4)	Get Ready to Perform an Emergency Power-Off Landing	
(5)	Land as soon as Possible	

LOW OIL PRESSURE:

(1)	OIL TEMP	CHECK
(2)	Get Ready to handle an imminent engine failure: reach the glide range of an area suitable for an emergency landing	
(3)	Ignition	OFF
(4)	Get Ready to Perform Emergency Power-Off Landing	

HIGH OIL TEMPERATURE:

(1)	OIL TEMP above green arc IF OIL TEMP FALLS	Reduce Power to Minimum
(2)	Land as soon as Possible IF OIL TEMP DOES NOT FALL	
(3)	CHECK CHT and EGT	
(4)	CHT and EGT Fall	Land as soon as Possible
(5)	CHT and EGT Does Not Fall	Get Ready to Perform Emergency Landing

ROUGH ENGINE OPERATION:

(1)	Engine Throttle	Maintain the Position
(2)	Carb. Heat	OPEN
(3)	Electric Pump	ON
(4)	Ignition Cycle	L – BOTH – R – BOTH
(5)	Engine Parameters	CHECK
(6)	If No Improvement	Get Ready to Perform Emergency Power-Off Landing

3.3.2 Emergency Landing

a) Emergency Power-Off Landing

(1)	Airspeed	120 km/h
(2)	Fuel Selector	OFF
(3)	Ignition	OFF
(4)	Seat Belts	Fastened and Tightened
(5)	Radio	Communicate on 121,5 Mhz, give Location and Intentions
(6)	Landing Gear	DOWN
(7)	Flaps	As Required
(8)	GEN/BATT	OFF
(9)	After Touchdown	Apply brakes as Required

b) Precautionary Power-On Landing

NOTE:
A precautionary landing would be required if continuing the flight would endanger the aircraft or its occupants. Circumstances, including mechanical defects, low fuel quantity or deteriorating weather conditions could require a precautionary landing.

(1)	Identify landing Area. Pay particular attention to wind direction and obstacles.	
(2)	Seat Belts	Fastened and Tightened
(3)	Initiate Descent	
(4)	Flaps	As Required
(5)	Landing Gear	DOWN
(6)	Fly over the landing area (not below 500 ft / 150 m AGL) to confirm suitability and that the approach route is free of obstacles.	
(7)	Climb to circuit	
(8)	Radio	Communicate Location and Intentions
(9)	Approach:	
	A. Engine Throttle	As Required
	B. Electric Pump	ON
	C. Flaps	LANDING
	D. Airspeed	95 km/h
(10)	Touchdown shall be performed with minimum airspeed, nose wheel should be kept above the ground as long as possible.	

(11) After Touchdown:

A.	Brakes	As Required
B.	Fuel	OFF
C.	Ignition	OFF
D.	GEN/BATT	OFF

NOTE:
If no suitable level landing area can be found, an up-hill landing should be performed if possible.

3.3.3 Gliding

(1)	Flaps	UP
(2)	Airspeed (at 472 kg)	120 km/h
(3)	Glide Ratio	11:1

Example: For every 1,000 ft of altitude the aircraft can move forward 15,000 ft or 2.8 NM (4.5km).

3.3.4 Landing Gear Failure

(1)	Circuit Breaker	CHECK, Reset if Tripped
(2)	Airspeed	Max. 120 km/h
(3)	Landing Gear Lever	DOWN
(4)	Landing Gear Lights	CHECK 3 Green

(5) If the landing gear does not go down due to electrical issue:

A.	Airspeed	Max. 120 km/h
B.	Actuate individually each emergency gear extension handle until their stops to ensure the gear is down and locked	
C.	Follow the normal landing procedure	
D.	Airspeed	Max. 150 km/h

(6) If the landing gear does not go down due to mechanical issue:

A.	Airspeed	Max. 120 km/h
B.	Landing gear full UP	
C.	Flaps -> full UP	
D.	Follow emergency landing procedure	

3.3.5 Fire

a) Engine Fire During Engine Start-Up on the Ground

(1)	Engine Cranking	CONTINUOUS

IF THE ENGINE STARTS:

(2)	Power	High RPM for 2 - 3 minutes
(3)	Engine	Shut Off - Inspect for Damages

IF THE ENGINE FAILS TO STARS:

(4)	Throttle	FULL OPEN
(5)	Engine Cranking	CONTINUOUS
(6)	Fuel Selector	OFF
(7)	Cabin Heater	CLOSE
(8)	Ignition	OFF
(9)	All electrical switches	OFF

(10) Evacuate The Aircraft

(11) Extinguish the fire using a powder or CO^2 extinguisher direction the jet directly on the intake of the engine cowling.

b) In-Flight Engine Fire

(1)	Fuel Selector	OFF
(2)	Engine Throttle	FULL Power
(3)	Cabin Heater	CLOSE
(4)	Airspeed	120 km/h
(5)	Electric Pump	OFF
(6)	Ignition	OFF
(7)	Flaps	As Required
(8)	Get Ready for Emergency Power-Off Landing	
(9)	GEN/BATT	OFF in Final

c) In-Flight Cabin Fire

(1)	GEN/BATT	OFF
(2)	Cabin Heater	OFF
(3)	Cabin Ventilation	CLOSE
(4)	Fire	Smother

When Fire is Out:

(5)	Cabin Ventilation	OPEN
(6)	Cabin Heater	Keep OFF

If the Situation Cannot be Controlled:

(7) Proceed to Immediate Emergency Landing

d) Fire of Electrical Origin Including Smoke during flight

(1)	BATT	OFF
(2)	Cabin Ventilation	CLOSE
(3)	Cabin Heater	CLOSE
(4)	Fire	Smoother

<u>If fire is out and the electricity is required to continue the flight:</u>

(5)	Cabin Ventilation	OPEN
(6)	AVIONIC Switch	OFF
(7)	All Switches	OFF
(8)	Circuit Breakers	Press All
(9)	Circuit Breakers	Press BATT
(10)	BATT Switch	ON
(11)	AVIONIC Switch	ON
(12)	Circuit Breakers	Operate individually and Check the presence of Smoke
(13)	Radio	ON

(14) Land as soon as Possible
If the Situation Cannot be Controlled:
(15) Proceed to Immediate Emergency Landing

e) Ground Fire of Electrical Origin Including Smoke

<u>IF ENGINE IS OFF:</u>

(1)	GEN/BATT	OFF

<u>IF ENGINE IS RUNNING:</u>

(2)	Engine Throttle	IDLE
(3)	Fuel Selector	OFF
(4)	Ignition	OFF
(5)	Canopy	OPEN
(6)	Extinguisher	Use as Required

3.3.6 Unintentional Flight Into Icing Area

(1) Leave the area of ice formation through a change of altitude and/or flight direction. Fly to an area with a higher air temperature.

(2) Keep moving the control surfaces to maintain their movability.

(6) Increase RPM to avoid icing of propeller blades (Maximum RPM)

WARNING
IN CASE OF FORMATION OF ICE ON THE WINGS, THE STALL SPEED WILL INCREASE

3.3.7 Recovering From Unintentional Spin

(1)	Engine Throttle	IDLE
(2)	Rudder Pedals	Opposed to the Direction of Rotation
(3)	Control Stick	Ease Forward, Ailerons Neutral
(4)	Rudder Pedals	Centered after Rotation Stop
(5)	Flaps	UP
(6)	Elevator	Pull cautiously. Bring the airplane from descent into level flight. Do not exceed the maximum permissible airspeed (V_{NE}).

WARNING
THE AIRCRAFT IS NOT SUITABLE TO SPIN MANEUVRES. SPIN RECOVERY HAS NOT BEEN DEMONSTRATED. IF RECOVERY MANEUVRES FAIL, PREPARE TO ACTUATE THE BALLISTC RECOVERY SYSTEM ACCORDING TO MANUFACTURER'S INSTRUCTION.

3.3.8 Landing with a Deflated Tire on the Main Landing Gear

(1) Final approach with Flaps in LANDING position

(2) Land airplane on the side of runway opposite to the side with the defective tire to compensate for change in direction which is to be expected during the landing roll.

(3) Land with wing slightly tipped in the direction of non-defective tire. To increase the maneuverability during rolling, the nose-wheel should be brought to the ground as soon as possible after touch-down.

(4) To ease the load on the defective tire, the aileron should be fully applied in the direction of the non-defective tire.

3.3.9 Electrical Failure

a) Total Electrical Power Failure

(1)	BATT Circuit Breaker	If Tripped, Reset
(2)	GEN/BATT	CHECK ON
(3)	If No Improvement	Land as soon as Possible

b) Generator Failure

(1)	GEN Annunciator Illuminated / Indication on Avionic System (Dynon)	
(2)	GEN/BATT	RESET OFF/ON
(3)	GEN Circuit Breaker	If Tripped, Reset
(4)	If Unsuccessful:	
	A. Switch OFF all non-flight essential electrical consumers	
	B. Monitor Voltmeter/Ammeter	
	C. Land as soon as Possible	

NOTE

On shutdown of generator, there is up to 30 min of battery power if it is fully charged and properly maintained.

c) Electric Charge

(1)	AMP/VOLT	CHECK
(2)	GEN	OFF
(3)	VOLT	Green Arc
(4)	GEN	ON
(5)	VOLT	CHECK
	IF NO IMPROVEMENT:	
(6)	GEN	OFF

3.3.10 Flaps System Failure

(1)	Flaps Mode	MAN
(2)	Flaps Actuator	Check Operation/Position
	IF NO IMPROVEMENT:	
(3)	Flaps Circuit Breaker	RESET
(4)	Actuator	CHECK Operation
(5)	In Case of Failure	Landing Procedure with No Flaps

3.3.11 Trim System Failure

(1)	Circuit Breaker	CHECK, Reset if Tripped
(2)	Trim Control	CHECK Correct Operation
(3)	If No Improvement	Continue the flight normally considering a greater effort on the control stick

3.3.12 In-Flight loss of Canopy

(1)	Airspeed	Do Not Exceed 120 km/h
(2)	Maneuverability	CHECK at 110 km/h
(3)	Land as soon as Possible	

3.3.13 Opening the Emergency Parachute

(1)	Level Aircraft	If Possible
(2)	Ensure Min. Opening Height if Possible. Min. 33 m.	
(3)	Fuel Selector	OFF
(4)	ALTERNATOR	OFF
(5)	BATT	OFF
(6)	All electrical switches	OFF
(7)	Opening Handle	Pull Vigorously
(8)	Seat Belts	Fastened and Tightened
(9)	Open canopy safety latches	
(10)	Before Impact	Curled Up Position
(11)	After impact	Move away from the aircraft as quickly as possible

NOTE

Should you actually need to open the emergency ballistic parachute, allow for the time it will need to unwrap completely (about 2 seconds).

WARNING

THE CAPABILITY OF THE BALLISTIC RECOVERY SYSTEM HAS NOT BEEN DEMONSTRATED IN FLIGHT

SECTION 4

NORMAL OPERATING PROCEDURES

INDEX

4.1. INTRODUCTION

Section 4 contains checklists and describes extended procedures for the normal operation of the airplane.

4.2. AIRSPEEDS FOR NORMAL FLIGHT OPERATIONS

The following table contains the applicable airspeeds for maximum take-off and landing weight. The airspeeds may also be used for lower flight weights.

TAKE-OFF	IAS (Km/h)
Climb speed during normal take-off for 50 ft. (15 mt.) obstacle	140
Best Rate-of-Climb speed at sea level $\mathbf{V_Y}$ – Wing Flaps CRUISE	1100 fpm at 160
Best Angle of Climb speed at sea level $\mathbf{V_X}$ – Wing Flaps CRUISE	10° at 120

LANDING	IAS (Km/h)
Approach speed for normal landing – Wing flaps LDG	100
Balked landing climb speed – Wing flaps LDG	120
Maximum demonstrated crosswind speed during T/O and LDG	30

CRUISE	IAS (Km/h)
Maximum permissible speed in rough air $\mathbf{V_{NO}}$	250
Maximum permissible speed with full control surfaces deflections $\mathbf{V_A}$	160
Maximum permissible speed $\mathbf{V_{FE}}$ with Wing Flaps in T/O position (V_{FE} T/O)	120
Maximum permissible speed $\mathbf{V_{FE}}$ with Wing Flaps in LDG position (V_{FE} LDG)	105

4.3. NORMAL OPERATION CHECKLIST

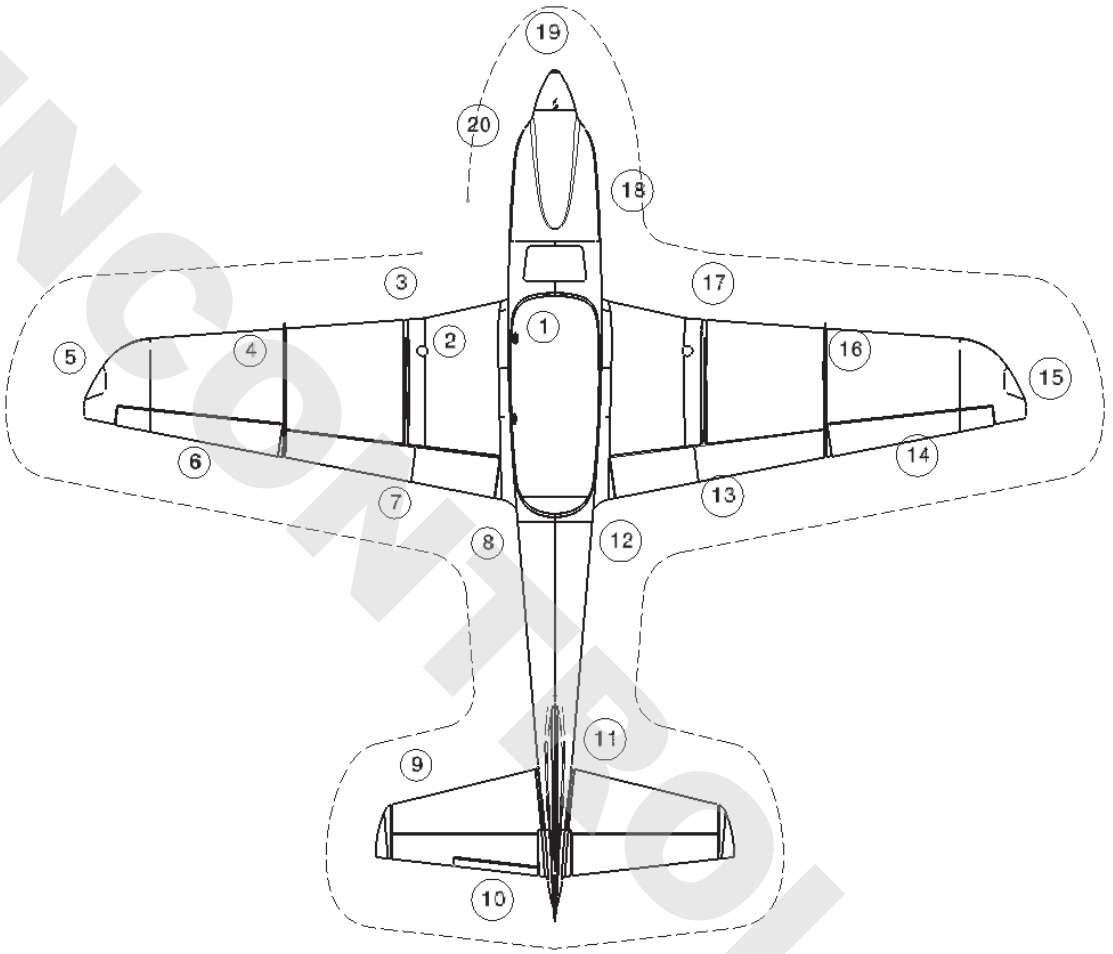
4.3.1.Pre-Flight Inspection

The PIC (Pilot-In-Command) user of the aircraft CF300, as the only responsible of everyone carried, must, before every flight, perform a complete inspection of the aircraft, known as “pre-flight inspection”. Below is reported the complete list of the “pre-flight inspections” checks.

(a) In-Cabin Check

(1) Airplane Documents	CHECK
(2) Flight Controls	Check for proper direction of movement
(3) Ignition Key	PULLED OUT
(4) Parking Brake	ON
(5) Throttle	IDLE
(6) BAT	ON
(7) AVIONIC	ON
(8) Fuel quantity	CHECK
(9) Circuit breakers	pressed in
(10) Flaps	CHECK, extend and retract fully
(11) Trim	CHECK, fully UP, fully DWN, Neutral
(12) Exterior Lights	CHECK
(13) BATT	OFF
(14) Foreign Object Inspection	CHECK
(15) ELT	ARM
(16) Baggage	Stowed, baggage net attached
(17) Canopy	Clean, undamaged
(18) Parking Brake	OFF

(b) Walk Around Check and Visual Inspection



(1) Canopy and opening handle — CHECK

(2) Tank Cap — CHECK closed

(3) Left Main Landing Gear:

(A) Main Leg Conditions

(B) Shocks Conditions

(C) Tire wear

(D) Tire Pressure

(4) Leading Edge and Wing Skin (LH):

(A) CHECK Integrity, cleaning and good conditions

(B) CHECK inspections doors

Check the static / PITOT for possible contamination or obstruction

(5) Left Wing Tip:

(A) CHECK Integrity and good conditions

(B) CHECK strobe and navigation lights

(6) Left Aileron:

(A) CHECK Integrity and good conditions

(B) CHECK control fittings attachment points, control and joints

(7) Left Flap and hinges:

(A) CHECK Integrity and good conditions

(B) CHECK plays and controls

(8) Left Side Fuselage — Visual Inspection

(9) Fixed horizontal tail plane:

(A) CHECK the leading edge, verify its cleaning

(B) CHECK fin junction

(10) Elevator:

(A) CHECK Integrity and good conditions of elevators

(B) CHECK control fittings and attachment points

(C) CHECK movements

(D) CHECK trim

(11) Vertical Empennage and Rudder:

(A) CHECK Integrity and good conditions

(B) CHECK control fittings and attachment points

(C) CHECK movements (min plays)

(12) Right Side Fuselage Visual Inspection

(13) Right Flap and hinges:

(A) CHECK Integrity and good conditions

(B) CHECK plays and controls

(14) Right Aileron:

(A) CHECK Integrity and good conditions

(B) CHECK control fittings attachment points, control and joints

(15) Right Wing Tip:

(A) CHECK Integrity and good conditions

(B) CHECK strobe and navigation lights

(16) Leading Edge and Wing Skin (RH):

(A) CHECK Integrity, cleaning and good conditions

(B) CHECK inspections doors

(17) Right Main Landing Gear:

(A)Main Leg Conditions

(B)Shocks Conditions

(C)Tire wear

(D)Tire pressure

(18) Upper/lower cowling:

(A) CHECK Integrity, cleaning and good conditions

(B) CHECK Air Intake

(19) Propeller and Spinner:

(A) CHECK fixing and condition of material (absence of chipping, plays)

(20) Control engine compartment:

(A)	Foreign bodies	Absent
(B)	Cooling circuit	Absence of leaks
(C)	Coolant	CHECK quantity
(D)	Coolant Radiator	Absence of leaks
(E)	Oil circuit	Absence of leaks
(F)	Propeller	Rotate 6/10 rounds

(G)	Oil	CHECK level
(H)	Oil Radiator	Absence of leaks
(I)	Fuel Circuit	Absence of leaks
(L)	Gascolator	Bleeding
(M)	Throttle control cables	CHECK
(N)	Air ducts and filters	Visual Inspection
(O)	Air-box (optional)	CHECK
(P)	Breakings and reference marks	CHECK
(Q)	Silentblocs	CHECK
(R)	Cowling	CLOSE and LOCK

4.3.2. Before Starting the Engine

WARNING

BEFORE STARTING THE ENGINE, THE CANOPY MUST BE CLOSED AND LATCHED.

AFTER STARTING THE ENGINE, THE CANOPY MUST STAY IN THE CLOSED AND LATCHED POSITION UNTIL THE ENGINE IS SHUT DOWN.

DURING ENGINE OPERATION IT IS PROHIBITED TO ENTER OR EXIT THE AIRPLANE.

(a) Pre-flight inspection	COMPLETED
(b) Flight Planning/CG	CHECK
(c) Rudder Pedals	ADJUSTED
(d) Belts	FASTENED
(e) Parking Brake	ON
(f) Flight commands	FREE AND CORRECT
(g) Fuel selector	BOTH
(h) Throttle	IDLE
(i) RPM	MAX
(j) AVIONIC	ON
(k) Canopy	CLOSED and LOCKED
(l) Strobe lights	ON

4.3.3. Starting the Engine

(1) Fuel selector	CHECK BOTH
(2) Ignition Key	Insert
(3) Throttle	IDLE
(4) CHOKE	OPEN (if necessary)
(5) Carburetor Air/defrost	CLOSED
(6) BATT	ON
(7) Electric Pump	ON
(8) Strobe	ON
(9) Propeller Zone	FREE

(10) Starting engine – key in position START (MAX for 10 sec.)

After starting:

(11) RPM	2000 for 2 min then 2500 RPM
(12) GEN	ON
(13) Electric Pump	OFF
(14) CHOKE	push CLOSED
(15) AVIONIC	ON
(16) Engine Instruments	CHECK
(17) Oil pressure	CHECK (max value, cold situation, 7 bar)

4.3.4. Before Taxi

(1) Oil pressure	CHECK green arc
(2) Oil temperature	MIN 50°C
(3) AVIONICS	SET
(4) Radio	SET
(5) ALTIMETER	QNH
(6) NAV lights	ON

4.3.5. Taxi

(1) Parking Brake	OFF
(2) Throttle	As required
(3) Brakes	CHECK
(4) Directional Control	CHECK
(5) Flight and navigation instruments	CHECK
(6) Compass	CHECK

4.3.6. Holding Point

(1) Parking Brake ON	
(2) Throttle	2000-2500 RPM
(3) Strobe light	ON
(4) Breakers	Check all in

(5) Engine:

(A)Oil temperature	50° - 110 °C
(B)Oil pressure	2.0 – 5.0 bar
(C)CHT	Max 135 °C

(6) Throttle	4000 RPM (1700 propeller)
(7) Magnetos:	Cycle L – BOTH – R
	Max Drop 300 (130 prop.)
	Max Difference L/R 120 (50 prop.)
(8) Throttle	4000 RPM (1200 prop.)
(9) RPM full back 3 times	decrease RPM / increase MP
	decrease RPM / decrease OIL pressure
	decrease RPM / increase RPM max time
	5’ sec to be at 4000 RPM
(10) Amp	CHECK light off
(11) Fuel	CHECK quantity
(12) Fuel selector	BOTH
(13) Flight Instruments	CHECK
(14) Flaps	T/O
(15) Flight controls	FREE AND CORRECT
(16) Trim	Neutral
(17) Belts	FASTEN

4.3.7. Entering the runway

(a) Parking brake	OFF
(b) Electric Pump	ON
(c) GEN/BAT	ON
(d) Ignition	BOTH
(e) Flaps	CHECK T/O
(f) Trim	CHECK Neutral
(g) Take Off Area / Final	FREE
(h) LND light	ON
(i) Controls Free and Centered	

4.3.8. Take-Off and Climb

(a) Take Off Authorization	RECEIVED
(b) Brakes	RELEASED
(c) Throttle	FULL POWER
(d) Directional Control	Keep with pedals
(e) ASI	CHECK increasing
(f) Rotate	Vr
(g) Brakes	Apply temporarily After Liftoff
(h) Vertical Speed	Increasing
(i) Landing Gear	UP
(j) Flaps (>300ft AGL)	UP
(k) LND light	OFF
(l) Electric pump	OFF
(m) Throttle	As required
(n) Trim	SET

4.3.9. Cruise

(a) MAP / RPM	SET
(b) Engine:	
(A)Oil temperature	90° - 110°C
(B)Oil pressure	2.0 – 5.0 bar
(C)CHT	Less than 135°C
(c) Hot air carburetor	As required

4.3.10. Descent and Approach

(a) Flight and avionics instruments	SET
(b) RPM	MAX
(c) Electric Pump	ON
(d) Hot air carburetor	As required
(e) Throttle	As required
(f) Flaps	CHECK V_{FE} As required

4.3.11. Landing

(a) LND light	ON
(b) Belts	Fastened and Tightened
(c) GEN/BATT	CHECK ON
(d) Ignition	CHECK BOTH
(e) Electric Pump	CHECK ON
(f) Throttle	As required
(g) Speed	MAX 140 Km/h
(h) Landing Gear	DOWN and Locked
(i) Flaps	LND 120Km/h MAX
(j) Speed	110 Km/h
(k) Contact Speed	85 Km/h
(l) Brake progressively	As Required
(m) Clear the Runway	

(n) Flaps	UP
(o) Landing Light,	Switch OFF
(p) Taxi to Parking Area	
(q) Engine	Shut Down

WARNING

FOR STRONG HEADWIND, CROSSWIND, DANGER OF WINDSHEAR OR TURBULENCE: A HIGHER APPROACH SPEED SHOULD BE SELECTED.

4.3.12. Taxi

(a) Parking Brake	ON
(b) Power	2000-2500 RPM X 1MIN
(c) Transponder	GROUND
(d) Timer	check 5 min after landing

4.3.13. Engine Shut-Off

(a) Parking Brake	ON
(b) Engine instruments	Check
(c) Electric Use	OFF
(d) Generator	OFF
(e) RPM	min 1600-1700 RPM
(f) Ignition	OFF
(g) Key	OFF
(h) Battery	OFF
(i) Fuel selector	OFF
(j) All electrical switches	OFF
(k) Safety pin for emergency ballistic parachute	INSERT
(l) Place caps on the pitot tube and any other safety	

4.3.14. Flight in Rain

NOTE

Flight performance might be reduced. T/O distance and maximum horizontal air speed might be especially affected. The influence on flight characteristics of the airplane might be subject to variation. Flights through heavy rain should be avoided due to the reduced visibility.

WARNING

NO WATERPROOF

SECTION 5

PERFORMANCE

INDEX

5.1. INTRODUCTION

Section 5 contains all the data necessary for complete and accurate flight planning, from take-off to landing.
The data given in tables and diagrams have been determined using the following parameters:

- Aircraft and engine in flying conditions
- Normal flight procedures and piloting techniques
- Wind speed
- Outside air temperature
- QFE altitude
- QNH atmospheric pressure at sea level
- Weight

The diagrams and tables are determined in accordance with ICAO standard atmosphere (ISA - m.s.l).

5.2. PERFORMANCE TABLES AND DIAGRAMS

5.2.1 Airspeed System Calibration

Airspeed calibration might be subject to changes due to operational use. An airspeed calibration check is recommended each 6 months and is scheduled at each annual inspection.

5.2.2. Cruising performance

Maximum power RPM is 5500.

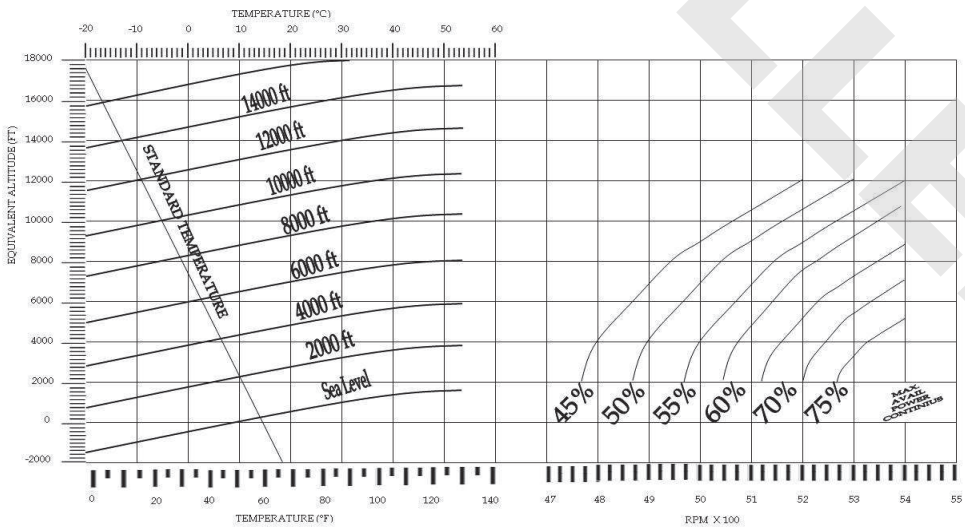


Figure 5.1 – Cruising performance

5.2.3 Stall Speeds

Configuration:

Engine at idle, CG at the forward limit, MTOW 472.5 kg.

(This represents the worst possible condition)

	BANK ANGLE	
	0°	30°
FLAP SETTING	IAS / TAS	IAS / TAS
CRUISE – UP	78	83
T/O	72	77
FLAP 2	68	73
LDG	65	70

NOTE

Stall speeds are in Km/h.

5.2.4. Wind Components

Maximum demonstrated crosswind component……16.1 Kts (30 Km/h)

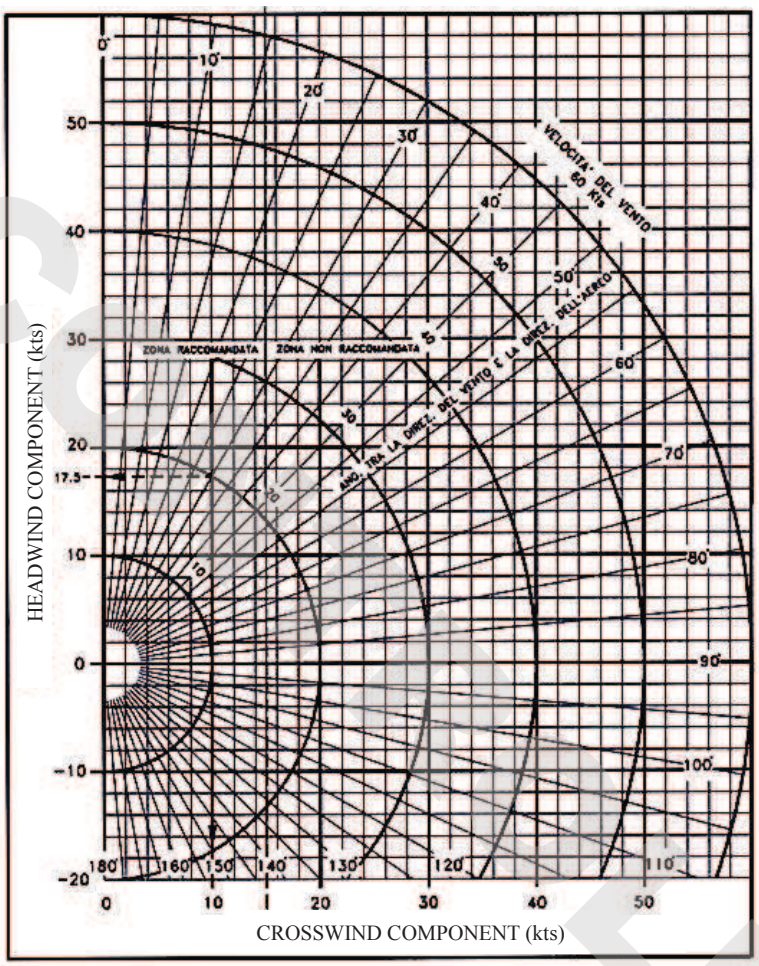


Figure 5.2 – Wind components

5.2.5. Take-Off

Take-Off Speeds and distance

Dry runway, no slope, ISA , SL , flaps T/O, wind calm

TOW (kg)	Vr (km/h)	T/O run	To 15 m height
472.5	95	130 m	300 m

Correction for differing conditions:

Difference in	Correction
1. Pressure Altitude:	+ 10% per 1000ft Pressure altitude
2. Temperature:	+/- 1% per °C temperature deviation
3. Slope:	+/- 10% per 1% slope
4. Wet surface:	+ 10%
5. Soft surface	+ 50%
6. High grass	+ 20%

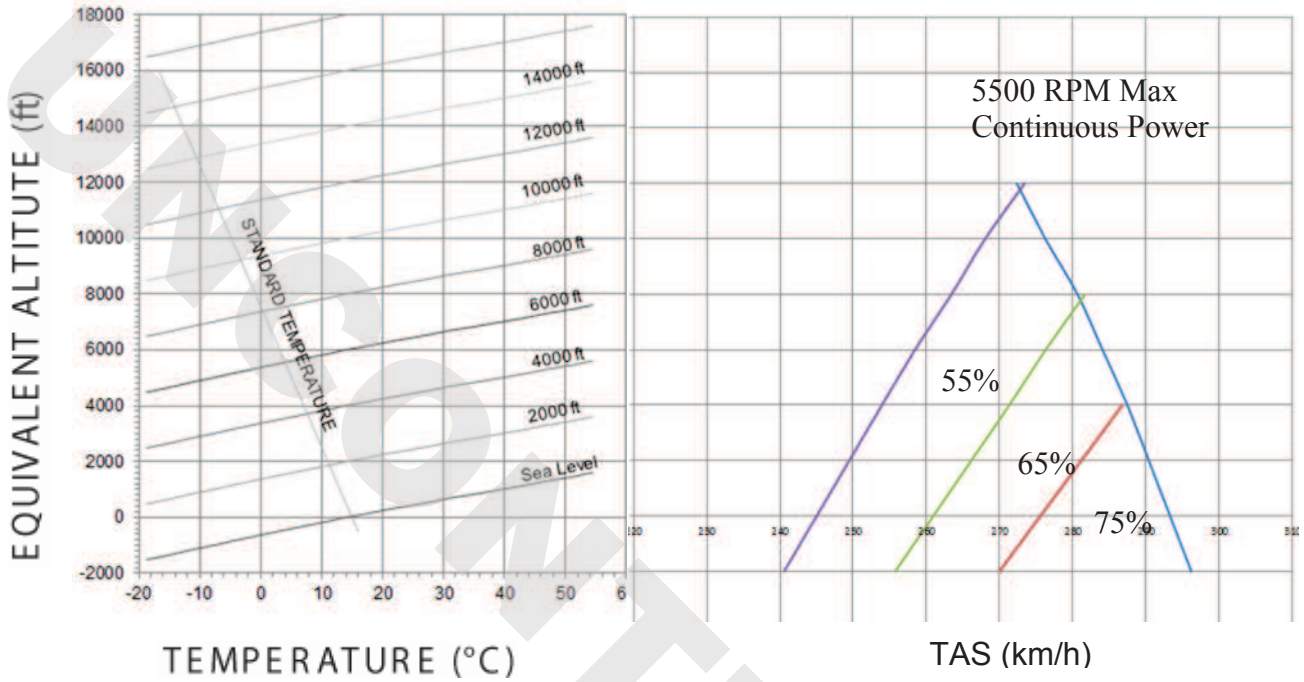
5.2.6. Climb performance with CRUISE FLAPS setting

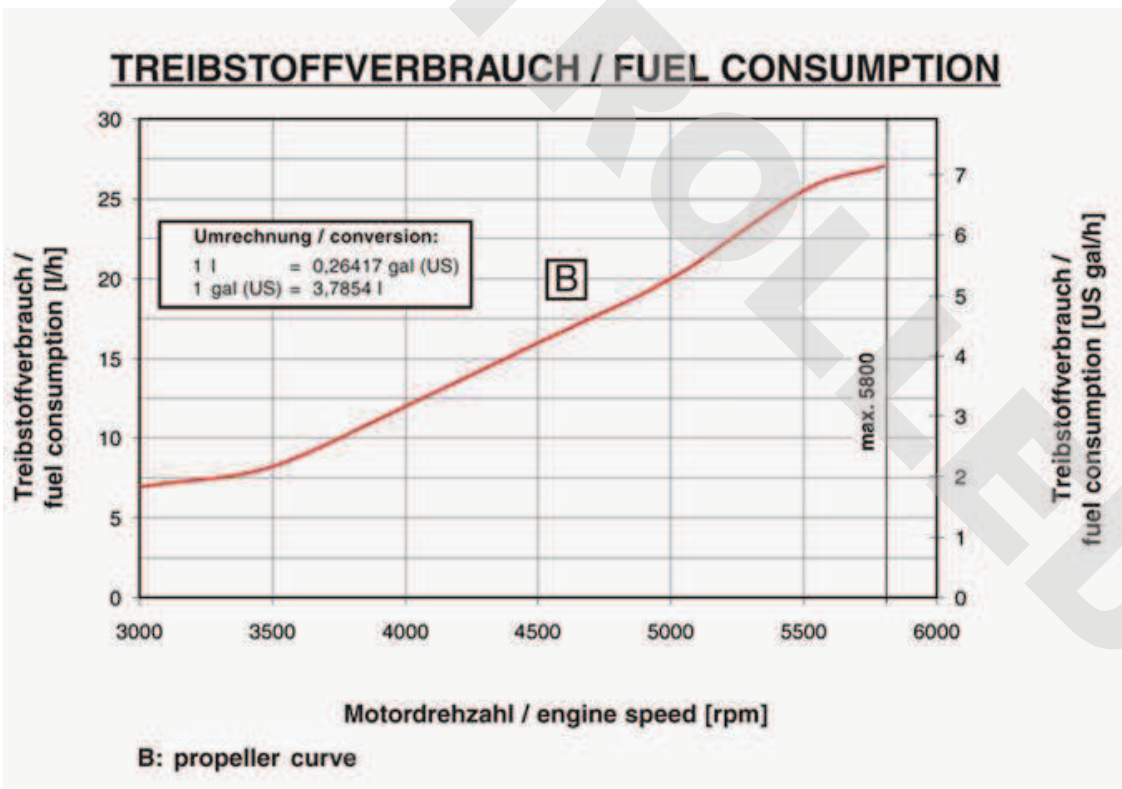
Maximum Cruising Altitude (ISA):……12000ft (3650 m)

Best Rate-of-Climb Speed (ROC) with CRUISE configuration:...R/C 1100 fpm at 0 m

5.2.7. Cruising speed (True Airspeed)

Fast cruise speed (TAS), 5500 rpm





5.3 Rotax 912 S/ULS (100 hp) fuel consumption

5.2.8. Landing distance

Conditions:
- Throttle at idle
- Maximum T/O Weight
- Approach speed.....100 km/h
- Level Runway, paved
- Flaps in landing position (LND, 30°)
- MSL

Landing distance over a 15 m (50 ft) obstacle.....approx. 320m
Landing roll distance.....approx. 120m

NOTE

Bad aircraft maintenance, failure to respect standard procedures or unfavorable external conditions (such as high temperature, rain, wind, slopped runway) can considerably increase the landing distance.

5.3. NOISE DATA

Noise Measurement Method	MT propeller MTV-33-1-A	Maximum Allowable
German Noise Requirements for Aircraft (LVL) NfL II 70/04	58.4	60

SECTION 6

WEIGHT AND BALANCE

INDEX

6.1. INTRODUCTION

To obtain the performance, flight characteristics and safe operation described in this Flight Manual, the airplane must be operated within the permissible weight and balance envelope as described in Chapter 2. It is the pilot's responsibility to comply with the weight and balance limitations and to take into consideration the change of the center of gravity (CG) position due to fuel consumption.

The procedure for weighing the airplane and calculating the empty weight CG position are given in this Chapter.

The aircraft is weighed when new and should be weighed again in accordance with applicable air regulations. Empty weight and the center of gravity are recorded in a Weighing Report and in the Weight & Balance Report, included at the back of this manual.

.

In case of equipment changes, the new weight and empty weight CG position must be determined by calculation or by weighing and must be entered in the Weight & Balance Report. These sample forms are included in this manual and can be used for airplane weighing, calculation of the empty weight CG position, and for the determination of the useful load.

NOTE

After every repair, painting or change of equipment, the new empty weight must be determined as required by applicable air regulations. Weight, empty weight, CG position, and useful load must be entered in the Weight & Balance Report by authorized personnel.

6.2. AIRPLANE WEIGHING

Pre-weighing conditions:

- equipment must be in accordance with the airplane equipment list
- brake fluid, lubricant, cooling liquid and
- unusable fuel, included

To determine the empty weight and the empty weight CG position, the airplane must be positioned in the above mentioned pre-weighing condition, with the nose gear and each main gear on a scale. Ensure that the aircraft is level longitudinally and laterally.

With the airplane correctly positioned, a plumb line is dropped from each side of the firewall; join these two points to determine the reference datum (RD). Measure from this line the distances X (nose gear), X_{2LH} (left main gear) and X_{2RH} (right main gear).

The following formulas apply:

Find Empty – Center of gravity (X_{CG})

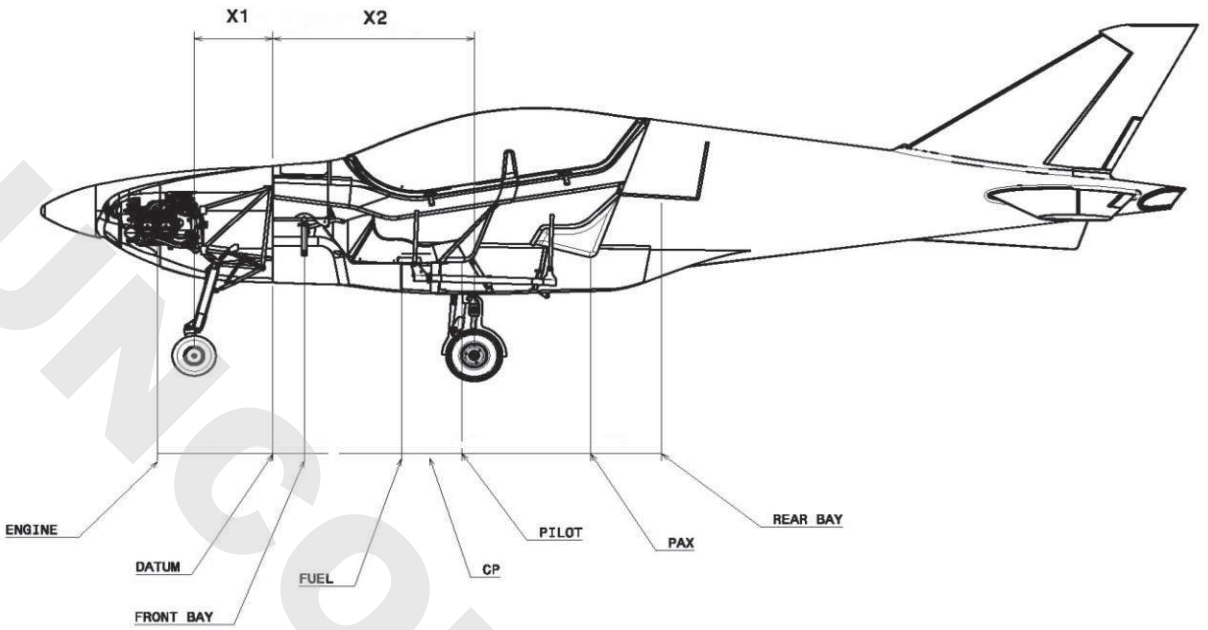
Empty Weight: $G=G_1+G_{2LH}+G_{2RH}$ lbs [kg]

Empty Weight CG Formula:

$$X_{CG} = \frac{(G_1 \times X_1) + (G_{2LH} \times G_{2LH}) + (G_{2RH} \times X_{2RH})}{G_1 + G_{2LH} + G_{2RH}}$$

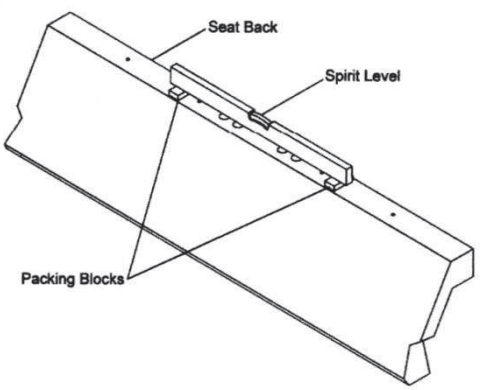
Find Empty Weight Moment:

Empty-Weight Moment M = Empty Weight (G) x CG (XCG)



LEGEND

Datum (reference) : FIREWALL
CG : center of gravity
X1 : Arm, datum to center line nose w heel
X2L : Arm, datum to center line main LH w heel
X2R : Arm, datum to center line main RH w heel
W1 : Net w eight, nose w heel
W2L : Net w eight, main LH w heel
W2R : Net w eight, main RH w heel
EW : Empty w eight (calculated)
XCG : Arm, empty w eight (calculated)
EM : Moment, empty w eight (calculated)



6.3. WEIGHING PROCEDURE

6.3.1. Preparation

1. Weigh in a closed room and with a smooth floor
2. Remove all the objects left on board aircraft
3. Align the nose wheel and the flight controls
4. Drain the fuel completely
5. Check oil/fuel/coolant level
6. Flaps retracted – UP 0°
7. Controls and control surface in neutral position
8. Place scales under each wheel

6.3.2. Leveling

1. Leveling the aircraft on pitch and roll axis
2. Use a level, positioned as shown in the image
3. Adjust the leveling on the horizontal axis using the shocks of the nose landing gear or acting on the pressure air of the nose tire

6.3.3. Weighing

1. Record the individual weights of each balance
2. Perform a minimum of three weighing for control
3. Calculate the empty weight of the aircraft

6.3.4 C.G. Determination

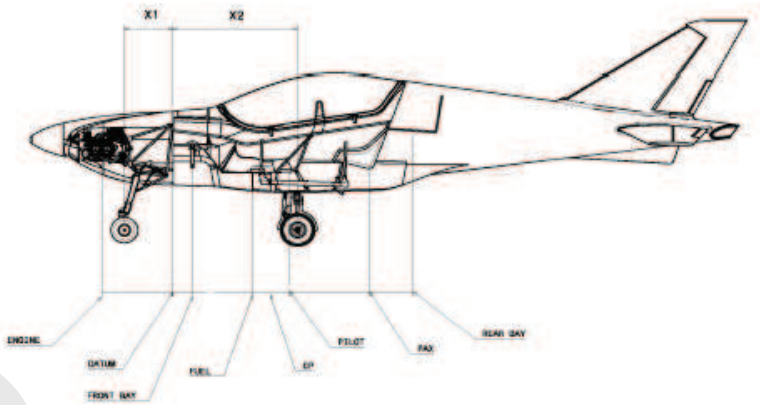
1. Place a plumb line tangent to the firewall bulkhead and identify the reference on the floor, performing the operation for both the sides.
2. Merge with a taut cable the two reference points so found.
3. Measure the distances between the reference cable and the axes of the wheels of the landing gear
4. Using the data recorded, it is possible to determine the position of C.G. and the moment of the aircraft

6.4 WEIGHT AND BALANCE REPORT

BLACKSHAPE

WEIGHT AND BALANCE REPORT

LEGEND
Datum (reference) : FIREWALL
CG : center of gravity
X1 : Arm, datum to center line nose wheel
X2L : Arm, datum to center line main LH wheel
X2R : Arm, datum to center line main RH wheel
W1 : Net weight, nose wheel
W2L : Net weight, main LH wheel
W2R : Net weight, main RH wheel
EW : Empty weight (calculated)
XCG : Arm, empty weight (calculated)
EM : Moment, empty weight (calculated)



FORMULAS

$$EW = W1 + W2L + W2R$$

$$XCG = \frac{(X1*W1)+(X2L*W2L)+(X2R*W2R)}{W1 + W2L + W2R}$$

$$EM = EW * XCG$$

Pre-weighing conditions:	OK	NOK
EQUIPMENT IN ACCORDANCE WITH THE AIRPLANE EQUIPMENT LIST (SEE LOG BOOK)		
BRAKE FLUID, LUBRICANT AND UNUSABLE FUEL INCLUDED		
AIRCRAFT LEVELLED LONGITUDINALLY AND LATERALLY		

AIRCRAFT TYPE : _____ S/N _____ Registration Mark _____

CG LIMITS : FWD (mm) = 890 16.6% MAC AFT (mm) = 1140 36.6% MAC (aft of datum)

MAX TAKE OFF WEIGHT : MTOW = 472.5 kgs Reason for Weighing : _____

MEASURING EQUIPMENT
(e.g. bubble level, weighing scales, etc)

DESCRIPTION	PART NUMBER	S/N (if applicable)	RECORD CARD NO.	EXPIRATION DATE

EMPTY WEIGHT CALCULATIONS
NOTE: Items forward of the datum are considered to have a negative lever arm. Items aft of the datum are considered to have a positive lever arm.

	SCALE READING (gross) kg	CORRECTION (tare) kg	NET WEIGHT kg	ARM mm	MOMENT kg*m
W1 =				X1 = -470	
W2L =				X2L = 1268	
W2R =				X2R = 1268	
		EMPTY WEIGHT (EW) =		XCG =	EM =
		MAXIMUM USEFUL LOAD (MTOW - EW) =			

TOT WEIGHT/CG VERIFICATION PRIOR TO DELIVERY
(including weights added to the basic empty weight before flight)

ITEM	W (kg)	TOT WEIGHT (kg)	X (mm)	M (kg*m)	CG POSITION (% MAC)
PILOT	0.0		1000		
PASSENGER	0.0		1795		
FUEL	0.0		760		
BAGGAGE	0.0		2249		
OTHER					
			TOT X =	TOT M =	

6.6 EQUIPMENT LIST

WEIGHT AND BALANCE						
STANDARD CONFIGURATION (issue)				W (g)	X (mm)	M/100 (g·mm)
ATA	P/N	Desctription	S/N			
TOT (complete aircraft CG) :						

6.7 WEIGHT AND BALANCE CHANGE

The Pilot is in charge of filling this table with any additional equipment that is not part of the standard equipment provided by the manufacturer.

WEIGHT AND BALANCE CHANGE											
Date	Article or modification	Added (+)			Removed) (-)			Total A/C			Stamp
		W	X	M/100	W	X	M/100	W	X	M/100	
	Basic weight & moment (ref section 6.6 – TOT)										

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