STORCH CL/HS

FLIGHT MANUAL

(for Rotax 912 UL and Jabiru 2200 engines versions)

02	29/10/09	Added KTS speed values	C. Cosatto	C. Cosatto	C. Cosatto
01	21/07/08	Fuel system description	C. Cosatto	C. Cosatto	C. Cosatto
00	01/08/07	Handbook new edition	M. Fiorindo	M. Fiorindo	C. Pinzana
Num.	**Date**	**Description**	**Issued**	**Verified**	**Approved**
REVISION					

FLYSYNTHESIS

THIS DOCUMENT MUST BE CARRIED IN THE AIRCRAFT AT ALL TIMES

DATI IDENTIFICATIVI:

Manufacturer	FLY SYNTHESIS SRL
Address	Provincial Rd 78 Km 12.150 Mortegliano 33050 (UD) ITALY
Model:	FLY SYNTHESIS STORCH
Version:	
Airframe Serial No:	
Engine Model:	
Propeller:	
Propeller Serial No:	
Engine Serial No:	
Registration:	
Date:	
Signature:	
Stamp:	

LOG OF REVISIONS

This manual may be revised in the future and pages/or sections re-issued in part or whole. Any revisions and/or sections should be printed and replaced in the manual at the earliest possible time for flight safety.

The revisions added to the manual should be logged and recorded in the table under log of ammendments of this manual, by the owner/user.

Revision No.	Revision	Date	Signature
01	Modified Fuel System description	21/07/2008	C. Cosatto
02	Added KTS speed values in section 2.2	29/10/2009	C. Cosatto

The parts of text revised or new will be marked with a black vertical on the left side, as in this example. The number and the date of the revision will be suitable on the cover of the manual, on the present page and on the heading aloft to the right. In the case of complete updating of the manual, the black line on the left side won't be present.

DEFINITIONS

Definitions used in this handbook such as **WARNING**, **CAUTION** and **NOTE** are employed in the following context.

WARNING
Procedures or instructions that if not followed correctly may result in injury or death.

CAUTION
Procedures or instructions that if not followed correctly may result in damage to the aircraft or its parts.

NOTE: Procedures or instructions that is essential to highlight.

INTELLECTUAL PROPERTY

LOG OF EFFECTIVE PAGES

Section	Page	Date	Revision	Section	Page	Date	Revision
-	1	01/08/07	0	4	35	01/08/07	0
-	2	01/08/07	0	4	36	01/08/07	0
-	3	01/08/07	0	5	37	01/08/07	0
-	4	01/08/07	0	5	38	01/08/07	0
-	5	01/08/07	0	5	39	01/08/07	0
1	6	01/08/07	0	5	40	01/08/07	0
1	7	01/08/07	0	5	41	01/08/07	0
1	8	21/07/08	01	5	42	01/08/07	0
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2	14	01/08/07	0	6	48	01/08/07	0
2	15	21/07/08	01	7	49	01/08/07	0
2	16	01/08/07	0	7	50	01/08/07	0
2	17	01/08/07	0	7	51	01/08/07	0
3	18	01/08/07	0	-	52	01/08/07	0
3	19	01/08/07	0				
3	20	01/08/07	0				
3	21	01/08/07	0				
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4	33	01/08/07	0				
4	34	01/08/07	0				

GENERAL INDEX

SECTION 1 – General informations

1.1 INTRODUCTION

This Flight Manual contains the necessary information for a sure and efficient employment of the aircraft **FLY SYNTHESIS STORCH CL/HS ROTAX 912 UL 80 HP** and **FLY SYNTHESIS STORCH CL/HS JABIRU 2200 85 HP**. Unless indicated, all descriptive data are valid for both engine versions.

The Flight Manual is valid only for the particular aircraft identified on page 2, the identification page.

1.2 WARNINGS, SUGGESTIONS AND NOTES

The observance of this manual is compulsory for the aircraft's use.
FLY SYNTHESIS S.r.l. declines every responsibility for any damage to person and property derived by a missed or partial observance of the prescriptions contained in this manual.
FLY SYNTHESIS S.r.l. reserves it, to terms of law, the exclusive ownership of this manual and also forbids the partial or integral reproduction of it and however to communicate it to competing firms without a preventive written authorization.

1.3 DESCRIPTIVES AIRCRAFT DATA

Storch is an ultra light aircraft with airframe, wing and control surfaces in composite materials. The tail beam is made of aeronautical aluminum alloy, fixed on composite structure. The high wing with laminar profile and rectangular plant, is provided of Junker ailerons with flapperon system, the vertical tail control surface is composed by a fixed fin and by a mobile rudder, the horizontal tail control surface is completely mobile, hinged in the central part with integrated trim. The tricycle type landing gear is fixed, with dampered nose wheel and with main legs in steel or aeronaultical aluminium alloy.

DIMENSIONI

General:	**CL**	**HS**
Wing span:	10.140 m	8.710 m
Length:	6.250 m	5.750 m
Height:	2.450 m	2.450 m
Wing	**CL**	**HS**
Superficie:	13.580 m^2	11.700 m^2
Corda alare:	1.340 m	1.340 m
Carico alare:	33.110 kg/m^2	38.500 kg/m^2
Flapperon	**CL**	**HS**
Surface:	1.080 m^2	0.960 m^2
Span:	4.580 m	3.360 m
Chord:	0.250 m	0.250 m
Travel (neutral position +6°):	+15° - 2°	+15° - 2°
Stabilator	**CL**	**HS**
Surface:	1.650 m^2	1.650 m^2
Span:	2.450 m	2.450 m
Chord:	0.700 m	0.700 m
Travel:	+17° - 12°	+17° - 12°

Vertical fin (with rudder)	**CL**	**HS**
Surface:	1.120 m^2	1.120 m^2
Height:	1.280 m	1.280 m
Mean chord:	0.930 m	1.930 m

Rudder	**CL**	**HS**
Surface:	0.600 m^2	0.600 m^2
Height:	1.200 m	1.200 m
Mean chord:	0.480 m	0.480 m
Travel:	+/-22°	+/-22°

WEIGHT CL VERSION	**R912 UL**	**Jabiru 2200**
Empty weight	283 kg	275 kg
Maximum allowed weight in baggage compartment	12 kg (*)	12 kg (*)
Maximum Take Off Weight	450 kg	450 kg
Minimum Pilot Weight	55 kg	55 kg

WEIGHT HS VERSION	**R912 UL**	**Jabiru 2200**
Empty weight	278 kg	270 kg
Maximum allowed weight in baggage compartment	12 kg (*)	12 kg (*)
Maximum Take Off Weight	450 kg	450 kg
Minimum Pilot Weight	55 kg	55 kg

Note: (*) different configurations excepted (see section 2 - Limitations)

LANDING GEAR

Valid for each version

Type:	Tricycle type landing gear with dampered nose wheel	
Main gear track:	1.640 m	
Wheelbase:	1.340 m	
Tyre:	Main:	4.00x6"
	Nose wheel:	4.00x4"
Tyre pressure:	Main:	2.2 - 2.4 bar
	Nose wheel:	0.8 bar
Brakes:	Main wheels drum brakes.	
	Main wheels disc brakes (optional)	

FUEL SYSTEM

Valid for each version

Type:	Two lines with mechanical and auxiliary eletric fuel pump Fuel plant draining system and return line system in the right tank Refueling by through the tanks caps
Tanks:	Two integrated tanks in glass fibers with 40 liters of capacity for each tank. Fuel tank with vent system
Non-usable fuel	2 liters for each tank
Fuel filter:	Gascolator on firewall, entry fuel line filtered
Fuel specification	
Rotax 912ULS	Premium Automotive Unleaded fuel min 95Ron.

Jabiru 2200A Avgas 100LL.

ELETRIC PLANT (valid for Rotax 912 ULS and Jabiru 2200 engines)

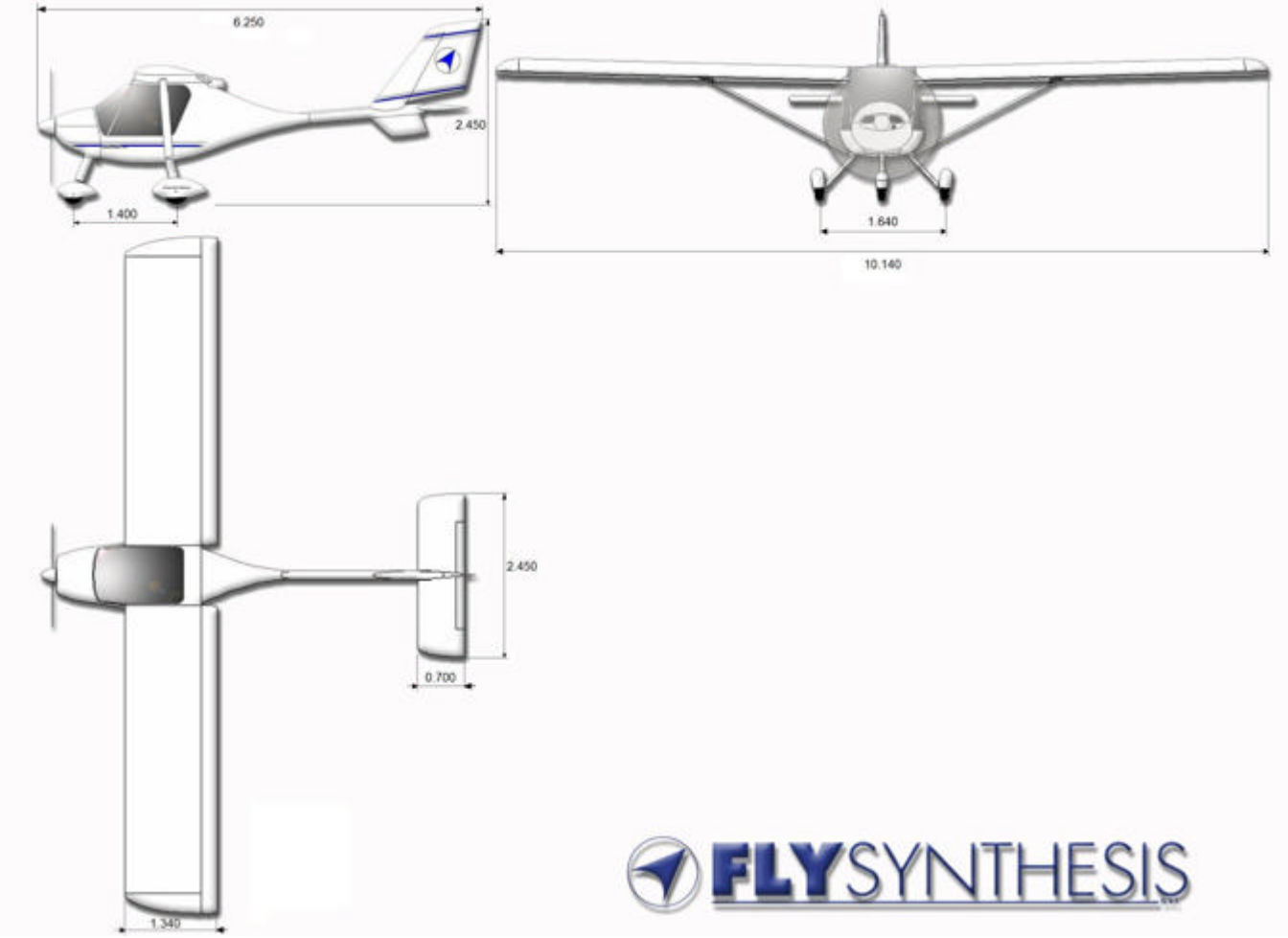
Type:	12 V CC eletric plant with starting battery Electrical plant protected with fuses External rectifier-regulator
POWERPLANT	
Engine:	Rotax 912 UL
Type:	4 strokes, 4 cylinder horizontal opposed, spark ignition engine, liquid cooled cylinder heads, ram air cooled cylinders, two constant depression carburettors, mechanical fuel pump, dry sump forced lubrification.
Ignition:	Increased electric ignition system HD
Battery:	Sealed Lead Acid Battery 12 Volts
Standard propeller:	DUC composite three blades propeller, diameter 1670 mm, ground variable pitch. DUC composite two blades propeller, diameter 1670 mm, ground variable pitch GT-2 wood two blades propeller, diameter 1660 mm, fixed pitch 1450 mm.

Engine:	Jabiru 2200
Type:	4 strokes, 4 cylinder horizontal opposed, spark ignition engine, ram air cooled cylinders, 2 carburatori a depressione costante, two constant depression carburettors, mechanical fuel pump, warm air at carburettor system.
Ignition:	Eletric ignition system
Battery:	Sealed Lead Acid Battery 12 Volts
Standard propeller:	DUC composite three blades propeller, diameter 1520 mm, ground variable pitch. DUC composite two blades propeller, diameter 1620 mm, ground variable pitch GT-2 wood two blades propeller, diameter 1510/1520/1570 mm, fixed pitch 1050/1000 mm.

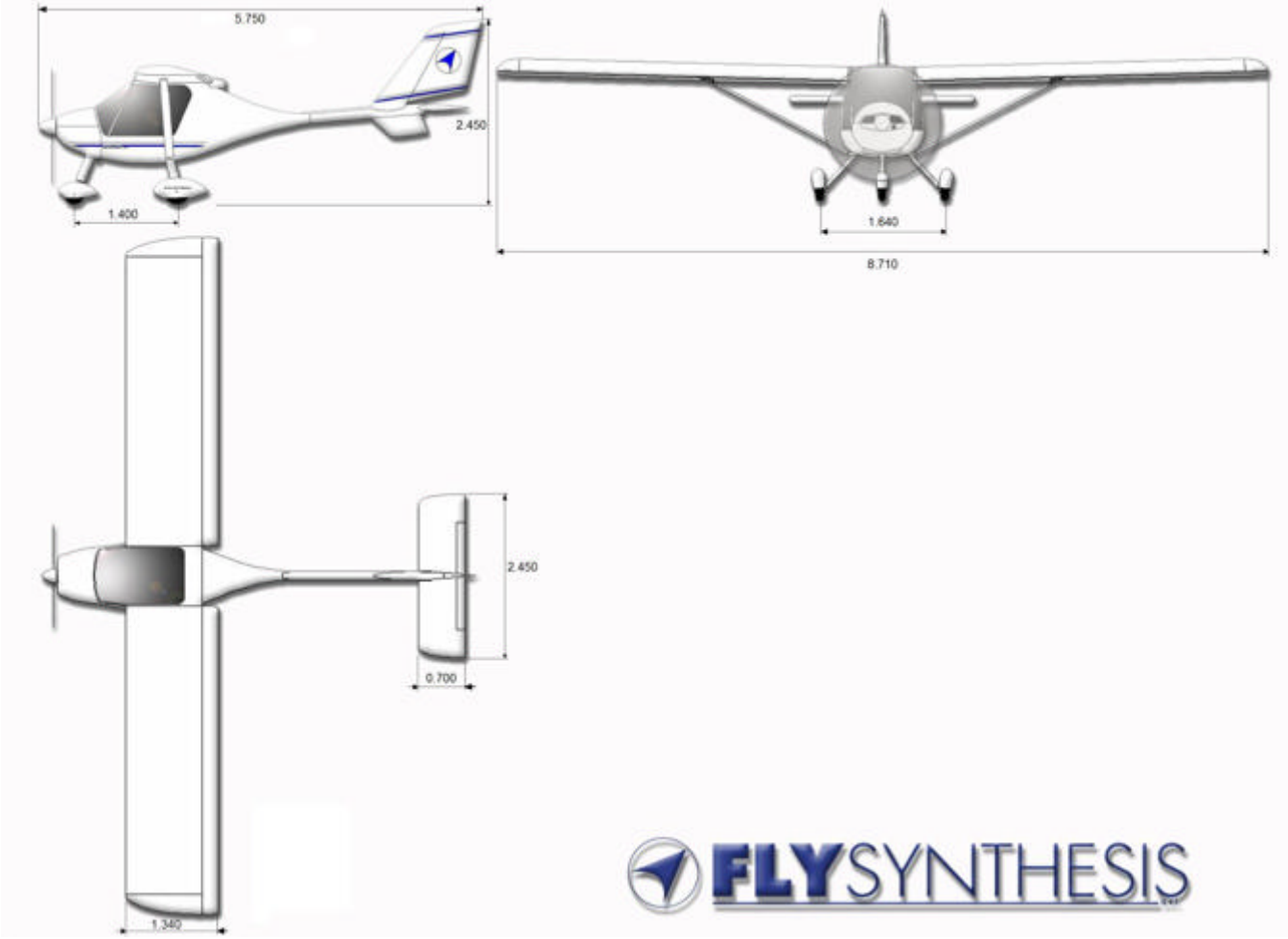
INSTRUMENTS

Standard instruments:	air speed indicator, altimeter, vertical speed indicator, magnetic compass, bank indicator, two low fuel level amber lamp, CHT, EGT, RPM, oil temperature indicator, oil pressure indicator, fuel pressure indicator, engine run time indicator, carburettor temperature indicator (only Jabiru 2.200), base tapestry, manual trim.

1.4 STORCH CL THREE VIEWS



1.5 STORCH HS THREE VIEWS



SECTION 2 - Limitations

2.1 INTRODUCTION

This section contains the operational limitations and the instruments marking for use in safety condition the aircraft, the engine, the equipments and standard plant. The limitations of speed are been calculated following the BCAR-S and LTF-UL rules, the structures are been tested following the same rules.

2.2 STORCH HS/CL WITH JABIRU 2200 & ROTAX 912 UL AIRSPEED LIMITATIONS

	Speed	Storch HS IAS	Storch CL IAS	Notes
Vne	Never Exceed speed	205 km/h 110 KTS	180 km/h 97 KTS	Never exceed this speed in every condition or configuration
Vmo	Maximum Structural Cruising Speed	173 km/h 93 KTS	160 km/h 86 KTS	Never exceed this speed in turbolent air condition
Va	Manoeuvring speed	138 km/h 74 KTS	130 km/h 70 KTS	Do not use full stick and full rudder deflections above this speed
Vfe	Maximum speed with full flaps	105 km/h 56 KTS	105 km/h 56 KTS	Do not exceed this speed with flap extended
Vs	Stall speed without flap	64 km/h 35 KTS	59km/h 32 KTS	Do not descende this speed without flap to avoid undesired stall conditions
Vs1	Stall speed in take off position – first position	62 km/h 34 KTS	57 km/h 31 KTS	Do not descende this speed with flap in take off position to avoid undesired stall conditions
Vs0	Stall speed in landing position – second position (full flap)	58 km/h 32 KTS	56 km/h 30 KTS	Do not descende this speed with flap in landing position to avoid undesired stall conditions

2.3 STORCH HS/CL WITH JABIRU 2200 & ROTAX 912 UL ANEMOMETERS MARKING

Marking	Speed range (IAS)		Definition
White arc	HS	[Vs_0 – Vfe] 58 – 105 km/h (32 – 56 KTS)	Speed range where flap may be extended
	CL	*[Vs_0 – Vfe] 56 – 105 km/h (30 – 56 KTS)*	
Green arc	HS	[Vs – Vmo] 64 – 173 km/h (35 – 93 KTS)	Speed range of normal operation
	CL	*[Vs – Vmo] 59 – 160 km/h (32 – 86 KTS)*	
Yellow arc	HS	[Vmo- Vne] 173 – 205 km/h (93 – 110 KTS)	Manoeuvre the aircraft with great caution
	CL	*[Vmo- Vne] 160 – 180 km/h (86 – 97 KTS)*	
Red line	HS	[Vne] 205 km/h (110 KTS)	Maximum speed allowed
	CL	*[Vne] 180 km/h (97 KTS)*	

2.4 POWERPLANT AND PROPELLER LIMITATIONS

(Refer always to Rotax's or Jabiru operator manual)

Engine manufacturer:	**Rotax Bombardier**	**Jabiru Aircraft**
Engine model:	**912 UL**	**2200**
Maximum take off power:	**60 kW**	**63.4 kW**
Maximum continuos power:	**58 kW**	**63.4 kW**
Maximum take-off RPM:	**5800 rpm**	**3300 rpm**
Maximum continuos RPM:	**5500 rpm**	**3300 rpm**
Minimum cylinder head temperature:	**150°C**	**200°C**
Maximum oil temperature:	**140°C**	**118°C**
Minimum oil pressure:	**1.5 bar**	**2.2 bar**
Maximum oil pressure:	**7 bar**	**5.25 bar**
Minimum fuel pressure:	**0.15 bar**	**0.05 bar**
Maximum fuel pressure:	0**.4 bar**	**0.2 bar**
Usable type of fuel:	**minimum 95 RON**	**minimum 95 RON**
Usable type of oil:	**See engine manual specifications**	

Propeller manufacturer:	**DUC Hélices**	**GT Propellers**
Propeller model:	**Carbon three-blades (J2200)** **Ground variable pitch**	**Wood two-blades (J2200)** **1570 mm (Fixed pitch)**
Maximum diameter:	**1520 mm**	**1000 mm**
Propeller model:	**Carbon two-blades (J2200)** **Ground variable pitch**	**Wood two-blades (R912)** **1450 mm (Fixed pitch)**
Maximum diameter:	**1620 mm**	**1660 mm**
Propeller manufacturer:	**DUC Hélices**	
Propeller model:	**Carbon three-blades (R912)** **Ground variable pitch**	
Maximum diameter:	**1670 mm**	
Propeller model:	**Carbon two-blades (R912)** **Ground variable pitch**	
Maximum diameter:	**1670 mm**	

2.7 POWERPLANT INSTRUMENTS MARKING

Rotax 912 UL engine version

Instrument	Red line Inf. limit	Inf. yellow arc Caution	Green arc normal operations	Sup. yellow arc Caution	Red line Sup. limit
RPM indicator	nd	nd	1.400 – 5.500 rpm	5.500 – 5.800 rpm	5.800 rpm
Fuel pressure gauge	0.15 bar	nd	0.15 – 0.4 bar	nd	0.4 bar
Oil pressare gauge	0.8 bar	0.8 – 2 bar	2 – 5 bar	5 – 7 bar	7 bar
Oil temp. gauge	50°C	50° - 90°C	90° - 110°C	110° - 140°C	140°C
CHT	50°	nd	50° – 110 °C	110° – 150°C	150°C

Jabiru 2200 engine version

Instrument	Red line Inf. limit	Inf. yellow arc Caution	Green arc normal operations	Sup. yellow arc Caution	Red line Sup. limit
RPM indicator	nd	nd	900 – 3.300 rpm	nd	3.300 rpm
Fuel pressure gauge	0.05 bar	nd	0.05 – 0.2 bar	nd	0.2 bar
Oil pressare gauge	0.8 bar	nd	2.2 – 5.25 bar	nd	5.25 bar
Oil temp. gauge	15°C	15° – 80°C	80° – 100°C	100° – 118°C	118°C
CHT	50°C	nd	50° – 180 °C	180° – 200°C	200°C
	Below 70% of power		Above 70% of power		
EGT	680° - 750°C		640° - 780°C		

2.8 WEIGHT LIMITATIONS

HS Version

	Rotax 912 UL	**Jabiru 2200**
Empty weight	283 Kg	275 Kg
Maximum fuel weight	46 Kg	46 Kg
Maximum allowed weight in baggage compartment	12 Kg	12 Kg
Maximum allowed weight in baggage compartment with ballist parachute installed	___Kg	___Kg
Maximum Take Off Weight	450 Kg	450 Kg

CL Version

	Rotax 912 UL	**Jabiru 2200**
Empty weight	278 Kg	270 Kg
Maximum fuel weight	46 Kg	46 Kg
Maximum allowed weight in baggage compartment	12 Kg	12 Kg
Maximum allowed weight in baggage compartment with ballist parachute installed	___Kg	___Kg
Maximum Take Off Weight	450 Kg	450 Kg

2.9 CENTER OF GRAVITY LIMITATIONS

With the purpose to achieving the best performances of flight and operations in complete safety, according to the procedures described in this manual, the aircraft must have employed respecting all the schemes of load and balancing pointed out in the section 6.
Pilot must consider the limit of weighing and all correlated parameters.
Before the delivery of the airplane, center gravity position and weight of the airplane are verified.

NOTA: Empty weight & Center gravity position must be updated after a new weighing, in the following case:
- Substitution and/or modify of one or plus accessories and equipment;
- After painting or reparations of fuselage.

Weight and Center Gravity position must be reported after every relief in the weighing report inside this manual only by authorized personnel.

The location of the CG can be defined by reference to the % MAC.:
- Maximum anterior limit: 28% M.A.C. correspondent to 375 mm
- Maximum back limit: 37% M.A.C. correspondent to 496 mm

For methodology and conditions for weight and balance procedure, see section 6.

2.10 MANOEUVRE LIMITATIONS

All aerobatics maneuvers are prohibited.
The normal flight operations permitted are as follows:
- Every connected maneuver to the normal flight operation,
- Stalls, with exclusion of the accelerated stall (superior to 1 g)
- Low speed figure eight, chandelle, turns below 60°

The use of the aircraft has to conform with the Rules of the State within it flies

WARNING: Flight in known icing conditions, snow and heavy rain is prohibited.

The pilot is responsible for determining the airworthiness of the aircraft before each flight including on board fuel level verification.

All maneuvers at load factor less than - 0.5 g must be performed for no longer than 5 seconds.

In single pilot operation, belt and shoulder harness of the vacant seat must be secured to avoid uncontrolled movement of seat back and belt.

2.11 LOAD FACTOR LIMITATIONS

The load factors limit used for the calculation of the structures are conforming with BCAR-Section S and LTF-UL rules:

Flap retracted		**Flap extendeed**	
- Maximum positive load factor	**4.0 (+)**	- Maximum positive load factor	**2.0 (+)**
- Maximum negative load factor	**2.0 (-)**	- Maximum negative load factor	**0.0 (+)**

2.12 CREW

The minimum crew for flight operations is a person. The owner can choose the place of pilotage to the right or to the left. The maximum number of people permitted on board is two.

2.13 PLACARDS STORCH HS

FLYSYNTHESIS

Engine type: _____
Engine s/n: _____
Propeller type: _____
Blades s/n: _____
Semi-Hub s/n: _____

FLYSYNTHESIS

Storch HS s/n: ___ Fusolage s/n: ____
Date of manufacture: _____

FLYSYNTHESIS

Vs, Stall speed without flaps	64 Km/h (34 KTS)
Va, Design manoeuvring speed	138 Km/h (74 KTS)
Vfe, Max full extendeed flap speed	105 Km/h (57 KTS)
Vne, Never exceeded speed	205 Km/h (110 KTS)
Centre of Gravity possible range	28% ÷ 37%
MTOW, Maximum Take Off Weight	450 Kgs

This aeroplane is certified LTF-UL rules. All aerobatic manoeuvres, including intentional spin, are prohibited.
See Flight Manual for other limitations

FLYSYNTHESIS

BAGGAGE COMPARTMENT
MAXIMUM 12 Kgs
EVENLY DISTRUBUITED

2.14 PLACARDS STORCH CL

FLYSYNTHESIS

Engine type: _____
Engine s/n: _____
Propeller type: _____
Blades s/n: _____
Semi-Hub s/n: _____

FLYSYNTHESIS

Storch CL s/n: ___ Fusolage s/n: ____
Date of manufacture: _____

FLYSYNTHESIS

Vs, Stall speed without flaps	59 Km/h (34 KTS)
Va, Design manoeuvring speed	130 Km/h (70 KTS)
Vfe, Max full extendeed flap speed	105 Km/h (57 KTS)
Vne, Never exceeded speed	180 Km/h (97 KTS)
Centre of Gravity possible range	28% ÷ 37%
MTOW, Maximum Take Off Weight	450 Kgs

This aeroplane is certified LTF-UL rules. All aerobatic manoeuvres, including intentional spin, are prohibited.
See Flight Manual for other limitations

FLYSYNTHESIS

BAGGAGE COMPARTMENT
MAXIMUM 12 Kgs
EVENLY DISTRUBUITED

SECTION 3 – Emergency procedures

3.1 INTRODUCTION

The emergency situation are extremely rare if daily pre-flight controls are meticulously effected by the pilot responsible of the aircraft and if he has been made a correct ordinary maintenance and, eventually, not ordinary maintenance. This section contains the operations to meticulously follow if a situation of emergency income. Such situations of emergency are separated for typology..

3.2 GROUND EMERGENCY PROCEDEDURES

ENGINE ON FIRE

1. Fuel tank faucet - Close
2. Electric fuel pump - Off
3. Cabin heating - Off
4. Throttle - All forward
5. Master switch - OFF
6. Ignition magnets key - OFF
7. Get out of aircraft immediatly
8. If possible, use an extinguisher to extinguish the fire.

WARNING:

Not remove the engine cowling until the complete extinction of the fire.
Don't use water to extinguish the fire.

3.3 TAKE OFF EMERGENCY PROCEDURES

TAKE OFF INTERRUPTION (during take off run)

1. Throttle - All rearward (reduce to minimum RPM)
2. Brakes - Brake avoiding to stop the wheels
3. Flap - Retract
4. Ignition magnets key - OFF
5. Master switch - Off
6. Fuel tank faucet - Off

ENGINE FAILURE DURING TAKE OFF (after rotation - below 50 mt)

1. Fuel tank faucet - Close
2. Electric fuel pump - Off
3. Master switch & ignition magnets key - Off
4. Safety belts - Tighten well
5. Maintain a rectilinear line of flight, without turning if possible, and if the area allows it, get ready to a forced landing (see relative paragraph)

ENGINE FAILURE DURING TAKE OFF (during climb)

If the heigth allows it, procede in the following way:

1. Best glide speed - Km h 97 (52 KTS)
2. Electric fuel pump - Verify ON
3. Fuel tank faucet - Verify RH tank faucet open
4. Fuel tank level - check fuel quantity
5. Fuel pressure - Verify within limits
6. Ignition magnets key - Verify ON

7. Throttle - Position warm engine starting
8. Engine start procedure

- - If the engine immediately start up, climb to safety height and land ASAP for a check.
- - If the engine doesn't start up choose a proper zone to an emergency landing and procede as follows

9. Flap - As necessary (30° or 40°)
10. Fuel tank faucet - Close
11. Electric fuel pump - Off
12. Master switch & ignition magnets key - Both Off

WARNING:
- Landing AS SOON AS POSSIBLE in case of fire on board.
- Never perform a turn of 180° to low height to try to return on runway.

3.4 DURING FLIGHT EMERGENCY PROCEDURES

ENGINE ROUGHNESS/ ENGINE SHUTDOWN

1. Throttle - Check position and friction
2. Check engine instruments - Check parameters
3. Choke lever - OFF / All rearward
4. Fuel tank faucet - Select more full tank
5. Electric fuel pump - ON
6. Fuel pressure - Verify within limits
7. Warm air to carburettors - ON
8. Ignition magnets key - Both / Verify
9. Master switch - Verify / ON
10. Throttle - Position warm engine starting
11. Start - Operate start procedure
12. Check all the engine parameters and land as soon as possible for a check

If the engine doesn't start up choose a proper zone to an emergency landing procedure

ENGINE ON FIRE

1. Fuel tank faucet - Close
2. Electric fuel pump - Off
3. Throttle - All forward
4. Vent system - All closed
5. Cabin heating system - Off
6. Master switch & ignition magnets key - Off
7. Best glide speed - Km h 97 (52 KTS)
9. Landing ASAP

WARNING: Do not attempt to re start the engine even if engine fire has ceased, but prepare for an emergency landing.

STALL RECOVERY PROCEDURE

1. Apply full power to reduce the loss of height.
2. Push softly forward the cloche to eliminate the stall conditions.

NON INTENTIONAL SPIN RECOVERY PROCEDURE

WARNING: don't try to stop the rotation using the ailerons opposition

1. Throttle - At minimum RPM
2. Rudder pedals - All opposed to the sense of rotation
3. Cloche - Neutral, softly to dive
4. When the rotation stops and the aircraft is under control, return to level flight,

WARNING: do not overcome the Vne speed.

3.5 ELETRIC PLANT FAILURE

GENERATOR WARNING LAMP LIGHTING

1. Voltmeter - Check (if installed)
2. Not necessary electric consumption - Off
3. Landing ASAP

The battery guarantees the operation of trim, flap and pomp fuel auxiliary for about 20 minutes.

OVERTENSION (Volmeter indication [if installed] over 16 V)

1. Master switch - Off
2. Voltmeter - Verify the decrease of voltage
3. Master switch - On
4. Voltmeter - Verify the increase of voltage (within limits)

If the check to the precedent point (4.) has negative result, proceed as it follows

5. Not necessary electric consumption must be excluded
6. Landing ASAP

The battery guarantees the operation of trim, flap and pomp fuel auxiliary for about 20 minutes.

LOW TENSION IN FLIGHT

1. Possible causes
   - Excessive consumption (Too electric consumptions)
   - Damage of the alternator
   - Interrupted fuse
2. Landing ASAP

LOW TENSION ON GROUND

1. RPM - Reduce
2. Navigation and landing lights - Off
3. Voltmeter - Verify within limits
4. If the check has negative result - Shutdown engine

ELECTRIC PLANT ON FIRE

You can recognize the fire to the electric plant with this informations: white smoke and burnt plastic odor.

1. Master switch - Off
2. Vent system - All open
3. Cabin heating - Off
4. Landing ASAP

WARNING: get ready to a landing without flaps and trim (if electric).

SMOKE ELIMINATION FROM CABIN

1. Vent system - All open
2. Cabin heating - Off
3. Master switch - Off
4. If the smoke remain dense land immediately

WARNING: absolutely do not open the canopy

3.6 LANDING EMERGENCY PROCEDURES

LANDING WITH DEFLATE TIRE

1. Landing as a normal condition
2. Before the ground contact shutdown the engine and turn off electric consumption
3. Landing maintaining high, until is possible, the side of the deflate tire
4. Get ready to a tendency of yawed by the side of the deflate tire
5. Maintain the directionality with rudder
6. If nose wheel is deflate pull cloche, trying to maintain the nose whell in a central position.

FORCED LANDING

1. Best glide speed - Km h 97 (52 KTS)
2. Safety belts - Tighten well
3. Throttle - All rearward
4. Fuel tank faucet - Closed
5. Electric fuel pump - Off
6. Master switch & ignition magnets key - Off

Choose a proper zone to a forced landing, make sure that the area is free and sure

7. Flap - As necessary
8. Trim - As necessary
9. Final - Check velocity
10. Landing - Check velocity (atleast 70 Km/h (38 KTS), full flap).

The contact with the ground has to happen to the minimum possible speed, maintaining lifted the nose wheel the for a longer time possible.

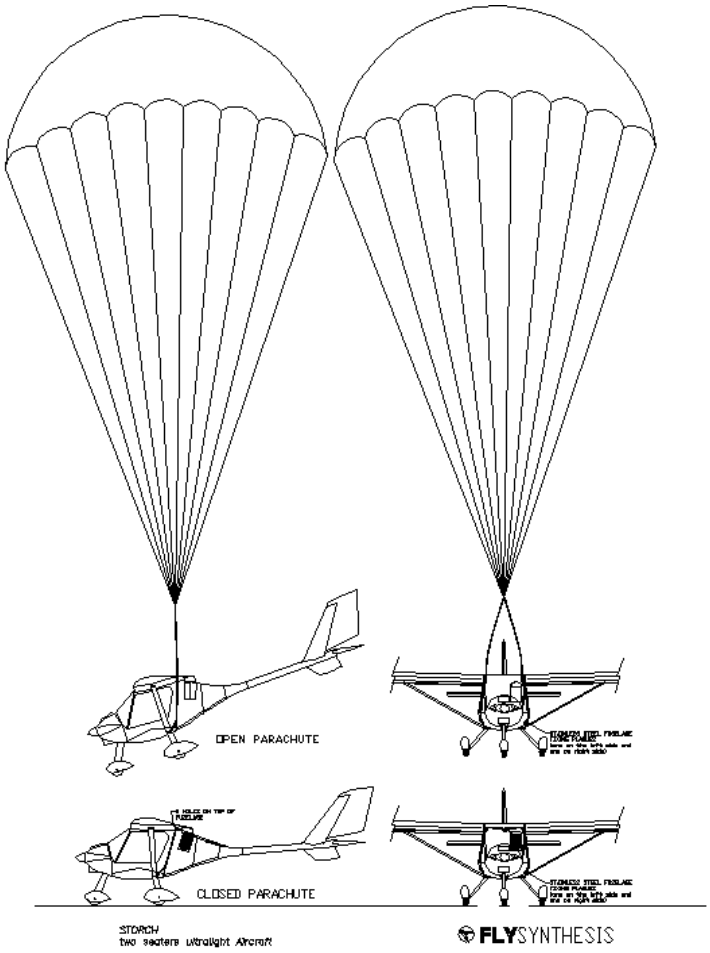
3.7 OPENING PARACHUTE PROCEDURE (IF INSTALLED)

The emergency parachute is situated in the left back part behind the canopy, situated in a special container drawn inside the fuselage. The emergency parachute is fixed to the aircraft through four Kevlar ropes, passing in the external part of the fuselage, attached to antitorsional tube of the wing. The emergency parachute must be uses only in case of complete loss of the control of the aircraft.

In case of emergency:

a. Shutdown the engine (magnetos OFF)
b. Pull red handle among the two seats, at least 20 centimeters,
c. Close both fuel faucets
d. Tighten the safety belts
e. Shutdown the electric plant (Master OFF)
f. To crouch and to protect the face with the hands

For further information and notes on the maintenances to consult the parachute manual.



3.8 OTHER EMERGENCY

OIL TEMPERATURE & PRESSURE IN YELLOW ARC OR REL LINE

If the oil pressure is low (yellow arc) but the oil temperature is in normal range (green arc)
- Landing following a normal procedure.
- If the pressure indication is too much low or too much high (red arc)
- Land ASAP and get ready for a forced landing (see relative paragraph)

LOW FUEL PRESSURE

1.	Electric fuel pump	- On
2.	Fuel tank faucets	- Open alternately the faucets for check the fuel circuit
3.	Fuel pressure	- Check within limits

If the fuel pressure do not reach the normal operation range, landing ASAP

UNINTENTIONAL FLIGHT WITHIN ICING CONDITIONS

Flight in known icing conditions, snow and heavy rain is prohibited. If you meet unintentional icing condition during the flight, descend as soon as possibile to a lower height. If the wing leading edge and the stabilator leading edge are covered by icing formations, remeber that stall speed will increase, you will need more engine power to maintain the same velocity and the manoeuvrability of the airplane will decrease.

1. Carburettor heating system (if installed) - On
2. Engine RPM - Maintain the max continuos engine power
3. Cabin heating (if installed) - On
4. Move all control surfaces to break eventually icing formations.

ICING FORMATIONS ON CARBURETTORS

You can recognize icing formations on carburettors if RPM decresing without moving the throttle. You can find this phenomenon during a descent with low RPM in a day with a lot of humidity.

1. Carburettor heating system (if installed) - On
2. Throttle - All forward when RPM start to increase
3. Carburettor heating system (if installed) - Off
4. Repristinate normal flight conditions

ANOMALOUS ENGINE VIBRATIONS

1. Verify the reduction of the vibrations with a reduction of the RPMs
2. Landing as soon as possible
3. Get ready to an possible engine failure and to a forced landing

LANDING WITH BRAKE SYSTEM FAILURE

1. Look for a long grassy runway with absence of obstacles (the grass has a light braking action)
2. Land with the flaps to the maximum extension and the least maintenance speed

After touch the ground

3. Master switch & ignition magnets key - Off

SECTION 4 - Normal procedures

4.1 INTRODUCTION

This section contain the informations for the normal flight conditions and the check list to follow before every flight.

4.2 SPEED FOR NORMAL EMPLOYMENT

Except otherwise suitable, the following speeds refer to the maximum weight of take-off equal to 450 Kgs. These speeds are indicative and could change for different aircraft configurations.

	HS	CL
Take off (Flap pos.1)		
Rotation	75 Km/h (40 KTS)	75 Km/h (40 KTS)
Speed at 50 ft (15 m) obstacle	85 Km/h (46 KTS)	85 Km/h (46 KTS)
Climb, (Flap retracted)		
Best angle of climb speed Vx,	85 Km/h (46 KTS)	85 Km/h (46 KTS)
Best rate of climb speed Vy,	98 Km/h (53 KTS)	98 Km/h (53 KTS)
Best glide speed Ve,	97 Km/h (52 KTS)	97 Km/h (52 KTS)
Cruise		
Velocità di manovra (Va)	138 Km/h (74 KTS)	130 Km/h (70 KTS)
Velocità max in aria turbolenta (Vmo)	173 Km/h (93 KTS)	160 Km/h (86 KTS)
Velocità da non superare (Vne)	205 Km/h (111 KTS)	180 Km/h (97 KTS)
Landing	97 Km/h (52 KTS)	97 Km/h (52 KTS)
Landing approach (Flap pos.2)	80 Km/h (43 KTS)	80 Km/h (43 KTS)
Touch & go (Flap pos.1)	85 Km/h (46 KTS)	85 Km/h (46 KTS)
Maximum demonstrated crosswind velocity	28 Km/h (15 KTS)	28 Km/h (15 KTS)

4.3 FUEL CIRCUIT DRAINING PROCEDURE AND REFUELLING OPERATIONS

The fuel circuit draining procedure must have effected before the first flight of the day, 10 minutes after the refuelling and if the aircraft has remained parked for more than three hours among two flights.
The fuel circuit draining is performed through the gascolator filter, situated in the right inferior part of the firewall. Use a transparent and clean container, drain about 80 - 100 ccs of fuel. Verify the absence of water.

Warning: Perform the fuel circuit draining operation before moving the airplane from the parking area, to avoid that the condenses water present on the fuel tanks will emulsify with the fuel. Repeat the fuel circuit draining operation one or more times.

Refuelling procedure:
1) Check that the fuel pipelines are correctly connected; use the special refuelling tube system with filter (check integrity and cleaning).

2) Connect the special refuelling tube system (the side with filter) on apiration faucet, set on the inferior-right side of the fuselage, behind the main gear strut. Insert the other extremity of the special refuelling tube system in the tank of the gasoline.

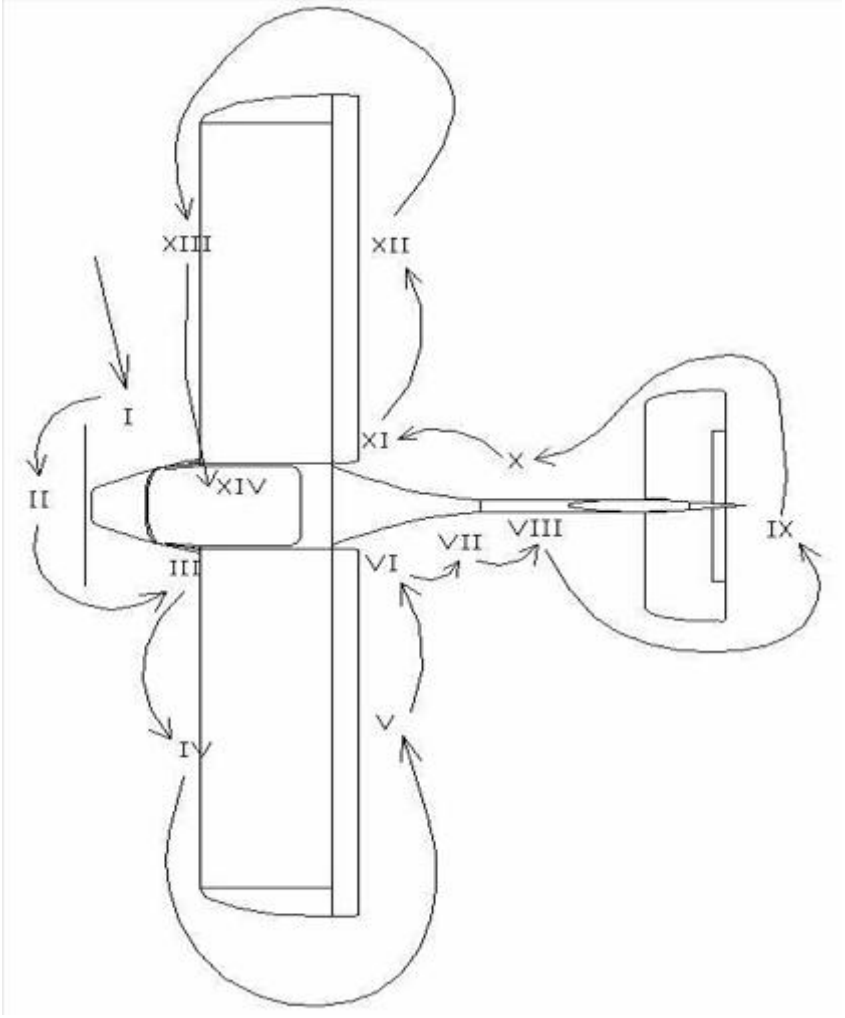
3) Start loading pump and open the refueling faucet. Refuel before the left fuel tank.

CAUTION: As the Storch employs an overflow fuel system that returns excess fuel to the right hand side tank, it is recommended to always use the right side fuel tank. When the right tank is near empty use the left tank. To avoid the right tank being overfilled with excess fuel, frequently alternate the use the both fuel tanks during the cruise. The drawing of fuel simultaneously from both tanks is not recommended.

4) Completed the refuelling, if air has been aspirated, it is advisable to expel possible present beads in the pipelines. Drain alternatively the tanks to expel the air.

4.4 PRE-FLIGHT INSPECTION

WARNING
Before every flight pilot must check completely the airplane with great attention and accuracy.
In this section there is a standard pre-flight check list. (Valid for each version**)**



The pre-flight inspections must be carried out **BEFORE EVERY FLIGHT**. The pilot in command is responsible for such inspections. The inspection does not require any special tooling, although a flashlight can be useful for inspecting dark areas. The purpose of the pre flight inspection is to verify that there's no evidence of defective parts or problems that can endanger the safety of flight.

Remove all the protections

1. pitot-cover,
2. wheels stops,
3. mobile surfaces stops,
4. windshiel covering,
5. propeller protection,
6. fuel draining procedure.

Fusolage: left forward side (I)

a) NOSE WHEEL

Fixing axle bolts	check correct tightness
Wheel fairing	good conditions and free space between the wheel and it.
Tire	general good condition, inflated correctly
Dumper	no signs of cracks or distorsion, free movement
Nose wheel support structure	no signs of cracks or distorsion.
Alignment	check dumper-rudder alignment

Fusolage: frontal side (II)

a) PROPELLER

Hub & blades	no signs of cracks & clean.
Fixing bolts	check correctly fixed
Propeller attacching flange:	check integrità
Spinner	no signs of cracks, fixed correctly

Fusolage: right forward side (III)

a) ENGINE COMPARTMENT

Upper cowling	remove
Oil tank	check level (for R 912UL remove the cap inside fusolage)
Refrigerant tank	check level (for R 912UL remove the cap inside fusolage)
Radiator and air inlet	no signs of cracks, free from obstructions
Engine	clean, no oil or refrigerant leakage
Muffler & silencer manifold	no signs of cracks, muffler hooked.
Oil and refrigerant tube system	correct functionality, no leakage
Ignition & electric plant	correct functionality.
Throttle & chocke cables	free movement
Upper cowling	reinstall and check tightness

Right wing: forward side (IV)

a) STALL DEVICES (if present):
Fixed and present

b) WING SURFACE

Wing surface	absence of buckling absence of delaminations
Leading edge	absence of delaminations,

c) RIGHT WING STRUT MOUNT
No defects

Upper and lower attachment poin:	integrity of rivets
Wing-main gear structure attachment point:	Nut correctly screwed

d) ANEMOMENTRIC SONDE
No defects
Correct allignement with flight line
Absence of obstructions
Check tubes joints

Right wing: rearward side (V)

a) TRAILING EDGE
absence of delaminations,
no signs of cracks

b) AILERON
absence of delaminations,
no signs of cracks,
free movement,
no excessive play on hinges,
fixed correctly,
balancing mass fixed correctly,
no signs of lateral movement.

Command stick:	Integrity, fixed correctly, free movement, liberty of oscillation
Aileron support hinges:	Fixed on wing lower side
Balancing masses:	Fixed, absence of play

Right main landing gear (VI)

a) LEG AND MAIN GEAR STRUT
no distorsion,
bolts locked,
no sign of cracks on the weldings

b) BRAKE ASSEMBLY
Good condition and tightness of bolts
Integro
Nut of wheel pin: correctly screwed

For disc brakes
Pneumatic braking tube: Integrity, absence of abrupt bending
Brake: Absence of oil leakage, correct installation of disc and brake pincer

c) TIRE
general good condition,
inflated correctly

d) WHEEL FAIRING
Good conditions
Free space between the wheel and fairing.

Fusolage: tail beam (VII)

Tail beam	Check joint tail beam/fusolage
Bowden cables	Check fixing

Empennage (VIII)

Vertical fin	absence of buckling, absence of delaminations, check all rivets
Rudder	absence of delaminations, hinges fixed correctly

Lower the tail of the aircraft to lift the nose wheel, check the free movement of the rudder, any problem on the hinge.

Bowden cables	fixed correctly.
Stabilator	free movement during all travel range, absence of buckling, absence of delaminations
Stabilator hinge	absence of delaminations, fixed correctly, no play
Balancing mass	fixed, no play
Hinge pins	fixed correctly

Empennage (IX)

Trim tab	free movement, absence of defects, no play.
Stabilator trailing edge	absence of delaminations

Fusolage: tail beam (X)

Repeat point (VII)

Left main landing gear (XI)

Repeat point (VI)

Left wing: rearward side (XII)

Repeat point (V)

Left wing: forward side (XIII)

Repeat point (IV)

Check inside cabin (XIV)

Instruments panel	fixed correctly, all placards
Master switch ON	all instruments ON
Master switch OFF	all instruments OFF
Cloche	free movement, fixed correctly in its support
Rudder pedals	no distorsion, no signs of cracks, correct functionality, fixed orrectly in its support, correct functionality of centring system.
Throttle & chocke levers	free movement, fixed correctly in them support
Brake lever and parking brake	Remove parking brake lock, check lever functionality. Insert parking brake.
Trim lever	check correct functionality
Safety belts	check correct functionality
Seats	fixed correctly.
Windshield	clean, fixed correctly on fusolage
Doors	clean, fixed correctly on fusolage, check locked system
Luggage	secured.
Weight&balance	calculated.

BEFORE STARTING ENGINE

Pre-flight check	- completed
Seats	- adjusted
Safety belts	- adjusted and fastened
Doors	- closed and locked
Parking brake	- ON
Flight controls	- free
Fuel faucets	- RH open, LH closed
Trim	- Neutral

ENGINE START

Choke lever:	Engine cold	- ON (all rearward)
	Engine warm	- OFF (all forward)
Electric fuel pump		- ON for 10 sec. then OFF
Throttle		- At minimum + 1 cm.
Master key		- ON
Generator warning lamp		- ON
Ignition magnets switch		- each magnets ON

Warning: Ensure that the propeller area is clear of any person or object

Start button - Max 20 sec., to attend one minute before retrying

	Jabiru 2200	***Rotax 912 UL***
Throttle	- *1200 rpm/min.*	- *2500 rpm/min.*
Oil pressure	- Green arc in 5 sec.	
Generator warning lamp	- OFF	
Electric fuel pump	- OFF	

BEFORE TAXIING

Electrical system	- ON and checked
Navigation instruments	- checked
Flapperon	- Take off position (Pos.1)
Parking brake	- OFF

TAXIING

Brakes	- check both operate equally
Flight control	- free full movement, stick and pedals
Flight instruments	- Check magnetic compass, bank indicator gyro, setting altimeter
Throttle	- As necessary

ENGINE CHECKS

Parking brake	- ON
Fuel tank faucets	- Open RH, closed LH
Temperature & pressure	- Within limits, in green arc
Trim	- Neutral
Flight controls	- Free movement

	Jabiru 2200	***Rotax 912 UL***
Check magnets	*at 2000 RPM* *- maximum decrease 50 RPM for each magnets*	*at 4000 RPM* *- maximum decrease 300 RPM for each magnets*
Throttle	*- All forward, check minimum Min. 2800 RPM +/- 150 for 5"*	*- All forward, check minimum Min. 5000 RPM +/- 150 for 5"*
Check minimum RPM	*- 900 RPM*	*- 1400 RPM*

BEFORE TAKE-OFF

Flight controls	- Free
Trim	- Neutral
Electric fuel pump	- ON
Flaps	- Set for take-off (15º)
Fuel tank faucets	- RH Open, LH Closed
Engine instruments	- Within limits
Flight instruments	- Check an regulated
Safety belts	- adjusted and fastened
Doors	- Closet and locked
Parking brake	- OFF

TAKE-OFF

Aircraft	- Align with runway	
	Jabiru 2200	***Rotax 912 UL***
Throttle lever	*- all forward in 3-4" (2800 RPM/min)*	*- all forward in 3-4" (5000 RPM/min)*
At 75 km/h(40 KTS) Speed	- Rotation - Vx	

Warning: *for a take off from short runway with an obstable of 15 m.*

- Take of speed	- 85 km/h (46 KTS)
- Climb speed	- 98 km/h (53 KTS)**Vx**

At an altitude of 100 m (300 ft), if a steep climb is necessary to clear obstacles

Flaps	- Up
Trim	- As necessary
Speed	- Vx or Vy
Throttle	- As necessary
Electric fuel pump	- Off

Note : Don't maintain the flaps extendeed with speed higher than 105 km/h (57 KTS) (Vfe).

CLIMB

	Solo Jabiru 2200	***Solo Rotax 912 UL***
Engine rpm	*- 3300 RPM.*	*- 5800 RPM max for 5 min.*
Engine instruments	Within limits	
Trim	- As necessary	

CRUISE

	Jabiru 2200	Rotax 912 UL
Manetta	- Max continuos power 3300 RPM	- Max continuos power 5500 RPM
Engine instruments	- Within limits	

WARNING
Check frequently engine instruments, do not overcome limits. Check fuel tank level.

DESCENT

Altimeter	- Setting
Warm air at carburetto system	- As necessary
Throttle	- As necessary
Trim	- As necessary
Engine instruments	- Within limits

LANDING

Speed	- 105 km/h (57 KTS)
Flap	- As necessary
Trim	- As necessary
Throttle	- As necessary
Electric fuel pump	- ON
Parking brake check (see note b)	- Check
Final Approach speed	- 90 km/h (48 KTS)
Touch down speed	- 75 km/h (40 KTS)

NOTE:
a) In condition of strong lateral wind or in presence of wind-shear, increase the landing speed at least of 10 km/h. (5 KTS)
b) Before landing check pressure plant make two series of complete movement of brake lever, to control if inside hydraulic plant there are pressure (if disc brakes are installed)

TOUCH & GO

Throttle	- All forward
Trim	- As necessary
Flap	- 15°
Speed	- Vx o Vy

If you touch the ground repeat take off procedure

AFTER LANDING

Throttle	- Idle
Flaps	- UP
Electric fuel pump	- OFF
Brakes	- Check functionality with "warm brakes"

ENGINE SHUTDOWN

Throttle	- Idle
Parking brakes	- ON
Electrical consumers	- OFF
Magnets	- OFF (one by one)
Master switch	- OFF
Fuel tank faucets	- closed

4.5 FLIGHT INSIDE OF HEAVY RAIN

Flying inside heavy rain, the visibility and performances of the flight are reduced. Reduce speed until 150 Km/h (81 KTS). Remember to increase the landing speed at least of 10 Km/h (5 KTS) with wet wing. The activity of flight inside intense heavy rain is forbidden.

SECTION 5 - Performances

5.1 GENERAL INFORMATIONS

This section contains all the performance data required for accurate pre-flight planning.

SCHEME OF TAKE-OFF & LANDING PHASES

Figure 5-1 show the take-off and landing phases and medium value recorded

SPEED CONVERSION (DENSITY ALTITUDE)

The density altitude chart (figure 5-2) is provided to determine the density altitude for outside air temperature and pressure altitude combinations.

UNIT CONVERSION

Figure 5-3 shows the linear scales for conversion of [Km/h - KTS - m/s].
Figure 5-4 shows the linear scales for conversion of [m/s - feet/min and KTS - m/s].
Figure 5-5 shows the linear scales for conversion of [m -feet].

DEMONSTRATED CROSS WIND COMPONENT

The maximum demonstrated crosswind is 32 Km/h or 17 KTS
Figure 5-6 shows the relative wind diagram versus wind component

ENVELOPE DIAGRAM

Figure 5.7 shows the envelope diagram.

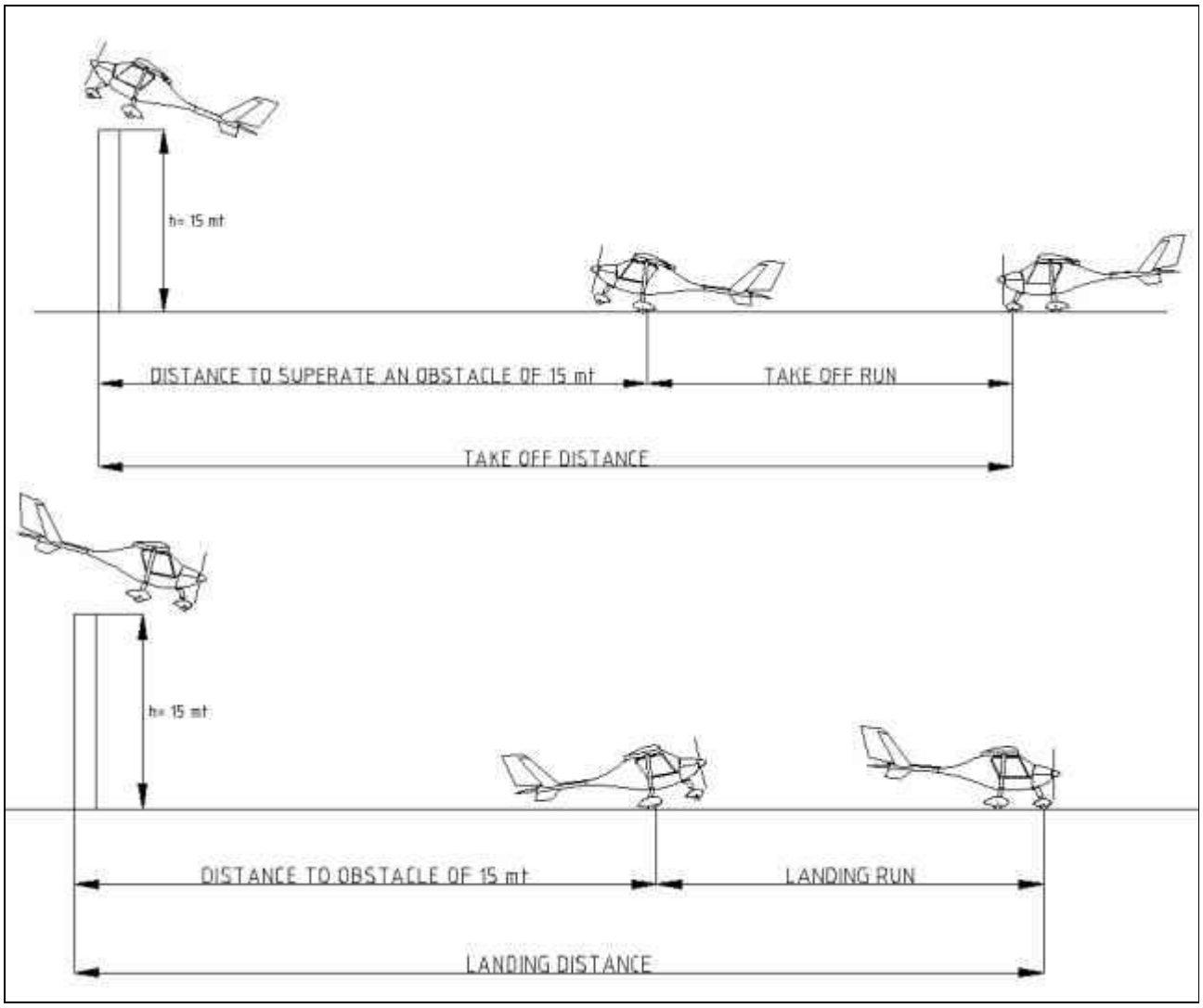


Figure 5-1

Take off run	Take off distance	Take off speed
110 m	**350**	**85 Km/h**
Landing distance	Landing run	Landing speed
265 m	**60 m**	**80 Km/h**

Note: remember that speeds and distances are indicative and could change for different configurations.

SPEED CONVERSION (DENSITY ALTITUDE)

This table help you to calculate the TAS (true airspeed) from the IAS (indicated airspeed) using the simplified formula:

TAS = IAS*Cor. factor

ICAN (international comitee for air navigation) temperatures, relative pressure, relative density and IAS to TAS correction factors as related to altitude

Altitude		Temperature		Relative	Relative	Cor. factors
feet	metres	°C	°F	pressure	density	
-2.000	-610	18,96	66,13	1,074	1,059	0,971
-1	-305	16,98	62,56	1,036	1,029	0,985
0	0	15	59	1	1	1
1.000	305	13,01	55,43	0,964	0,971	1,014
2.000	610	11,03	51,86	0,929	0,942	1,029
3.000	914	9,056	48,30	0,896	0,915	1,045
4.000	1219	7,075	44,73	0,863	0,888	1,061
5.000	1524	5,094	41,16	0,832	0,861	1,077
6.000	1829	3,113	37,60	0,801	0,835	1,090
1.000	2134	1,132	34,03	0,771	0,810	1,110
8.000	2438	-0,850	30,47	0,742	0,785	1,128
9.000	2743	-2,831	26,90	0,714	0,761	1,145
10.000	3090	-4,812	23,33	0,687	0,738	1,163
11.000	3353	-6,793	19,77	0,661	0,715	1,182
12.000	3658	-8,774	16,20	0,635	0,693	1,201
13.000	3916	-10,75	12,64	0,611	0,671	1,220
14.000	4267	-12,73	9,074	0,587	0,649	1,240
15.000	4572	-14,71	5,507	0,564	0,629	1,260
16.000	4877	-16,69	1,941	0,541	0,608	1,281
17.000	5182	-18,68	-1,625	0,520	0,589	1,302

Figure 5-2

UNIT CONVERSIONS

kilometers per hour (km/h) - knots (kts) - metres per sec. (m/s)

km/h	kts	m/s	km/h	kts	m/s	km/h	kts	m/s
1,853	1	0,37	63,00	34	18,34	124,16	67	36,15
3,706	2	1,07	64,86	35	18,88	126,01	68	36,69
5,560	3	1,61	66,71	36	19,42	127,87	69	37,23
7,413	4	2,15	68,56	37	19,96	129,72	70	37,77
9,266	5	2,69	70,42	38	20,50	131,57	71	38,31
11,11	6	3,23	72,27	39	21,04	133,43	72	38,86
12,97	7	3,77	74,12	40	21,58	135,28	73	39,39
14,82	8	4,31	75,98	41	22,12	137,13	74	39,93
16,67	9	4,85	77,83	42	22,66	198,99	75	40,47
18,53	10	5,39	79,68	43	23,20	140,84	76	41,01
20,38	11	5,93	81,54	44	23,74	142,69	77	41,54
22,23	12	6,47	83,39	45	24,28	144,55	78	42,08
24,09	13	7,01	85,24	46	24,82	146,40	79	42,62
25,94	14	7,55	87,10	47	25,36	148,25	80	43,16
27,79	15	8,09	88,95	48	25,90	150,10	51	43,70
29,65	16	8,63	90,80	49	26,44	151,96	82	44,24
31,50	17	9,17	92,66	50	26,98	153,81	83	44,78
33,35	18	9,71	94,51	51	27,52	155,66	84	45,32
35,21	19	10,25	96,36	52	28,05	157,52	85	45,86
37,06	20	10,79	98,22	53	28,59	159,37	86	46,40
38,91	21	11,33	100,07	54	29,13	161,22	87	46,94
40,77	22	11,81	101,92	55	29,67	163.08	88	47,48
42,62	23	12,41	103,77	56	30,21	164,93	89	48,02
44,47	24	12,95	105,63	57	30,75	166,78	90	48,56
46,33	25	13,49	107,48	58	31,29	168,64	91	49,10
48,18	26	14,03	109,33	59	31,83	170,49	92	49,64
50,03	27	14,56	111,19	60	32,37	172,34	93	50,18
51,80	28	15,10	113,04	61	32,91	174,20	94	50,12
53,74	29	15,64	114,89	62	33,45	176,05	95	51,26
55,59	30	16,18	116,75	63	33,99	177,90	96	51,80
57,44	31	16,72	118,60	64	34,53	179,76	97	52,34
59,30	32	17,26	120,45	65	35,07	181,61	98	52,88
61,15	33	17,80	122,31	66	35,61	183,46	99	53,42

Figure 5-3

metres per second (m/s) - feet per minute (100 ft/min)

m/sec.		100 ft/min	m/sec.		100 ft/min	m/sec.		100 ft/min
0,50	1	1,96	10,66	21	41,33	20,82	41	80,70
1,01	2	3,93	11,17	22	43,30	21,33	42	82,67
1,52	3	5,90	11,68	23	45,27	21,84	43	84,64
2,03	4	7,87	12,19	24	47,24	22,35	44	86,61
2,54	5	9,84	12,75	25	49,21	22,86	45	88,58
3,04	6	11,81	13,20	26	51,18	23,36	46	90,53
3,55	7	13,78	13,71	27	53,15	23,87	47	92,52
4,06	8	15,74	14,22	28	55,11	24,38	48	94,48
4,57	9	17,71	14,73	29	57,08	24,89	49	96,45
5,08	10	19,68	15,24	30	59,05	25,45	50	98,42
5,58	11	21,65	15,74	31	61,02	25,90	51	100,4
6.09	12	23,62	16,25	32	62,92	26,41	52	102,3
6,60	13	25,51	16.76	33	64,96	26,92	53	104,3
7,11	14	27,55	17,27	34	66,92	27,43	54	106,2
7,62	15	29,52	17,78	35	68,89	27,94	55	108,2
8,12	16	31,49	18,28	36	70,86	28,44	56	110,2
8,63	17	33,46	18,79	37	72,83	28,95	57	112,2
9,14	18	35,43	19,30	38	74,80	29,46	58	114,1
9,65	19	37,40	19,81	39	76,77	29,97	59	116,1
10,16	20	39,37	20,32	40	78,74	30,48	60	118,1

knots (kts) - metres per second (m/s)

	0		2	3	4	5	6	7	8	9
0	0	0,51	1,02	1,54	2,05	2,57	3.08	3,60	4,11	4,63
10	0,51	5,65	6,17	6,66	7,20	7,71	8,23	8,74	9,26	9,77
20	10,28	10,80	11,31	11,83	12,34	12,86	13,37	13,89	14,40	14,91
30	15,43	15,94	16,46	16,97	17,49	18,00	18,52	19,03	19,54	20,06
40	20,57	21,09	21,60	22,12	22,63	23,15	23,66	24,17	24,69	25,20
50	25,72	26,23	26,75	27,26	27,76	28,29	28,80	29,32	29,83	30,35
60	30,86	31,38	31,89	32,41	32,92	33,43	33,95	34,46	34,98	35,49
70	36,00	36,52	37,04	37,55	38,06	38,58	39,09	39,61	40,12	40,64
80	41,15	41,67	42,18	42,69	43,21	43,72	44,24	44,75	45,27	45,78
90	46,30	46,81	47,32	47,84	48,35	48,87	49,38	49,90	50,41	50,90

Figure 5-4

metres (m) to feet (ft) conversion table

metres (m)		feet (ft)	metres (m)		feet (ft)	metres (m)		feet (ft)
0,304	1	3,280	10,36	34	111,5	20,42	67	219,81
0,609	2	6,562	10,66	35	114,8	20,72	68	223,09
0,914	3	9,843	10,97	36	118,1	21,03	69	226,37
1,219	4	13,12	11,27	37	121,3	21,33	70	229,65
1,524	5	16,40	11,58	38	124,6	21,64	71	232,94
1,828	6	19,68	11,88	39	127,9	21,91	72	236,22
2,133	7	22,96	12,19	40	131,2	22,25	73	239,50
2,438	8	26,24	12,49	41	134,5	22,55	74	242,78
2,743	9	29,52	12,80	42	137,7	22,86	75	246,06
3,048	10	32,80	13,10	43	141,1	23,16	76	249,34
3,352	11	36,08	13,41	44	144,3	23,46	77	252,62
3,657	12	39,37	13,71	45	147,6	23,77	78	255,90
3,962	13	42,65	14,02	46	150,9	24,07	79	259,18
4,267	14	45,93	14,32	47	154,1	24,38	80	262,46
4,572	15	49,21	14,63	48	157,4	24,68	81	265,74
4,876	16	52,49	14,93	49	160,7	24,99	82	269,02
5,181	17	55,77	15,24	50	164,1	25,29	83	272,31
5,48	18	59,05	15,54	51	167,3	25,60	84	275,59
5,791	19	62,33	15,84	52	170,6	25,90	85	278,87
6,096	20	65,61	16,15	53	173,8	26,21	86	282,15
6,400	21	68,89	16,45	54	177,1	26,51	87	285,43
6,705	22	72,17	16,76	55	180,4	26,82	88	288,71
7,010	23	75,45	17,06	56	183,7	27,12	89	291,99
7,310	24	78,74	17,37	57	187,0	27,43	90	295,27
7,620	25	82,02	17,67	58	190,2	27,73	91	298,55
7,948	26	85,30	17,98	59	193,5	28,04	92	301,83
8,220	27	88,58	18,28	60	196,8	28,34	93	305,11
8,530	28	91,86	18,59	61	200,1	28,65	94	308,39
8,830	29	95,14	18,89	62	203,4	28,90	95	311,68
9,144	30	98,42	19,20	63	206,6	29,26	96	314,96
9,448	31	101,7	19,50	64	209,9	29,56	97	318,24
9,750	32	104,9	19,81	65	213,2	29,87	98	321,52
10,05	33	108,2	20,12	66	216,5	30,17	99	324,80

Figure 5-5

CROSS WIND TABLE

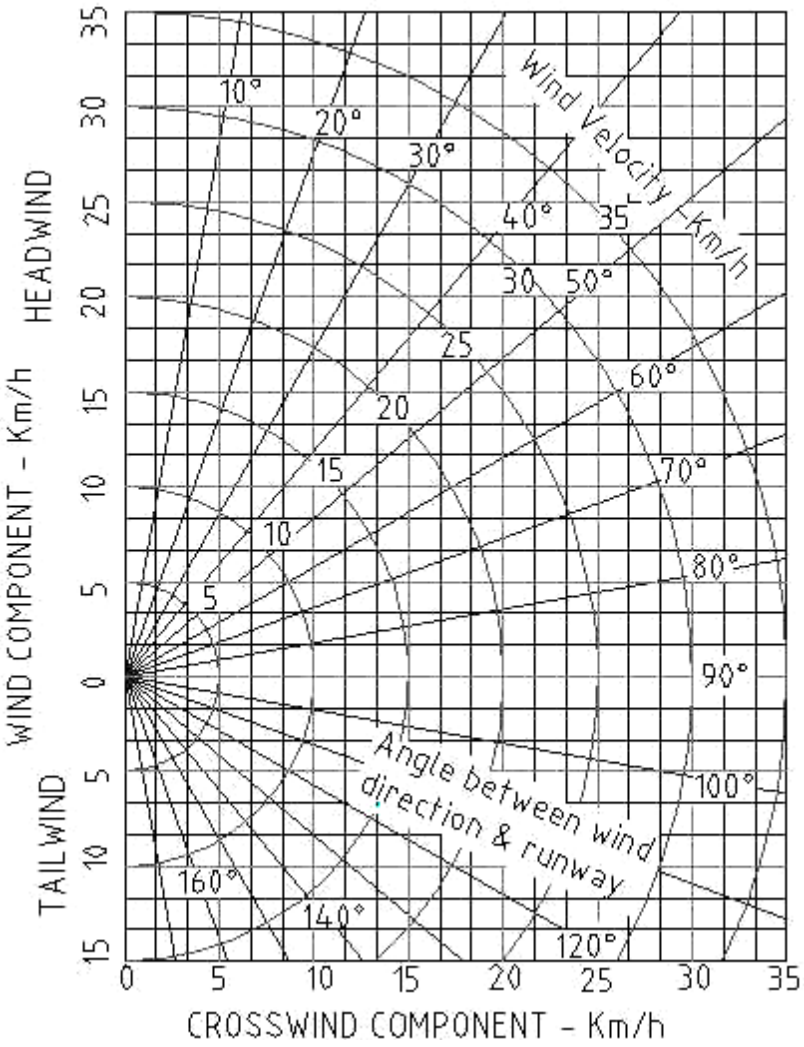
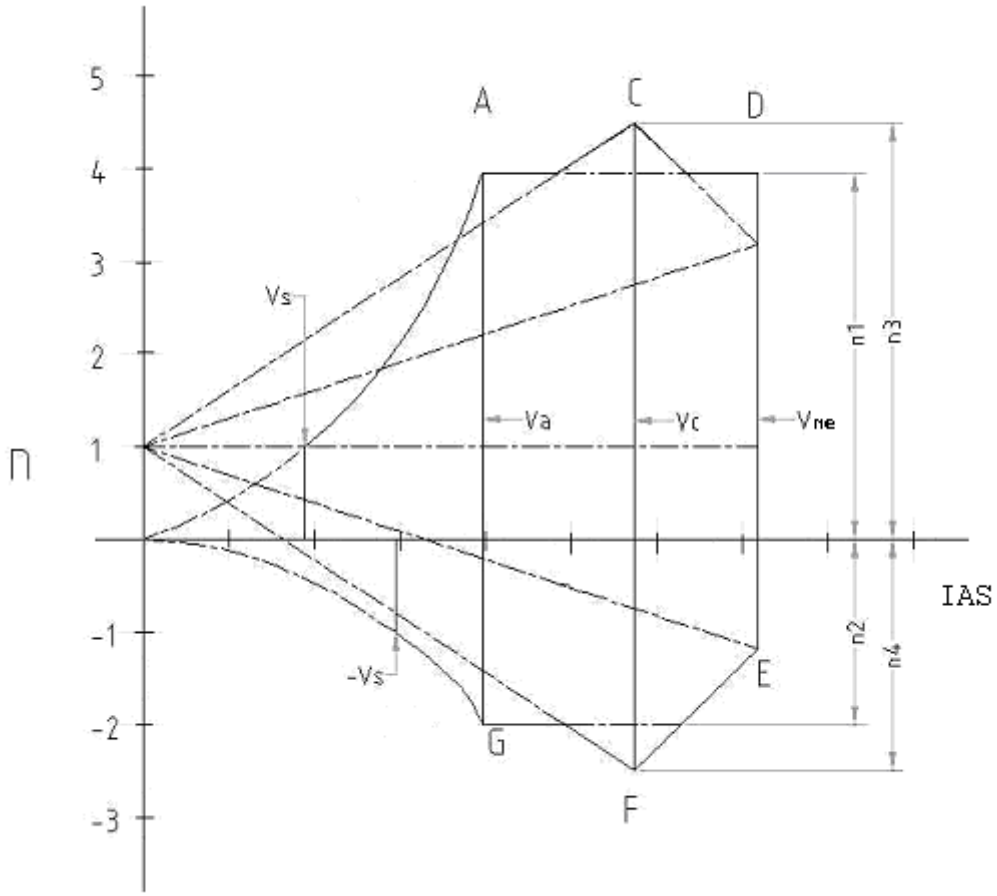


Figure 5-6

ENVELOPE DIAGRAM



Speed	Description	HS	CL
Vso	**Stall Speed with full flap**	**58 km/k**	**56 km/k**
Vs	**Stall Speed without flap**	**64 km/h**	**59 km/h**
Va	**Manoeuvring speed**	**138 km/h**	**130 km/h**
Vne	**Never exceed speed**	**205 km/h**	**180 km/h**

SECTION 6 – Weight & balance

6.1 INTRODUCTION

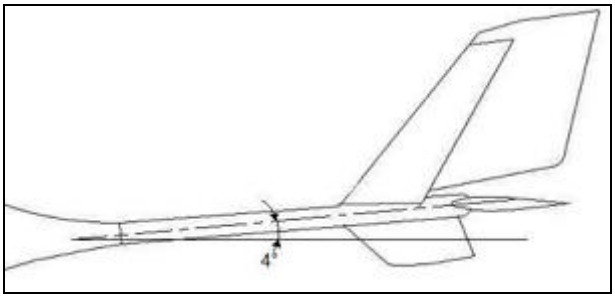
This section contains the informations for a correct procedure of weight and balance of the aircraft.

Warning: overcome the CG limits can provoke serious problems of stability and governability of the aircraft.

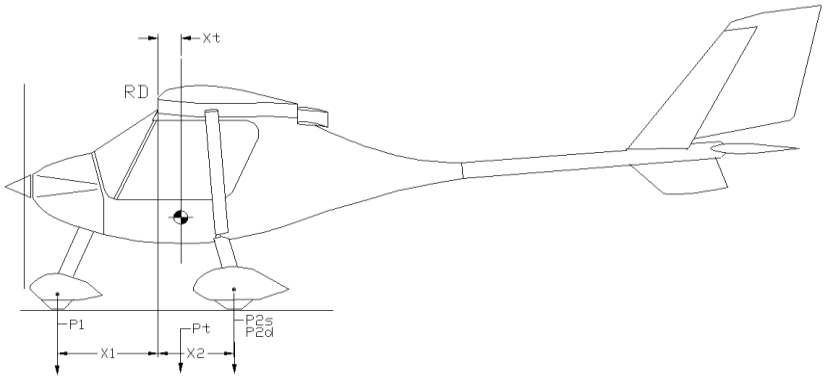
6.2 W&B CONDITIONS

For the weighing of the aircraft, the followings conditions apply:

- The equipment installed must be approved by the factory for the aircraft in question.
- Must be included the brake fluid, engine oil, water coolant and the non-usable fuel.
- Must use three independent scales for each tire horizontal plan and of a thread to lead.
- To determinate the empty weight and the position of the Center of Gravity, the aircraft must be positioned on three autonomous scales, one for each wheel. It is fundamental that the longitudinal and lateral axes of the aircraft are both in the same horizontal plane. You can verify the horizontal datum position when the tail beam reaches 4° with reference to ground level, as shown in the figure below..



Using a plum bob mark a line on the ground directly beneath the leading edge of the wing. This point is your reference datum RD. Measurements are to be taken from this point.



X1 is the distance from nose wheel axle center line to projection of RD.
X2 is the distance from main wheel axle center line to projection of RD

The standard distance are X_1 = 850mm (±0.5%) and X_2 = 560mm (±0.5%).

The formula for CG calculation is the following:

Xt = ML / PT . [CG position in mm on the wing chord]
Where:
ML = (P2DX + P2SX) x X2 - P1 x X1
Xt% = (Xt / MAC) x 100 [CG position in percentage to the wing chord]

ML = Empty weight moment
P2DX , P2SX = Weight measured on main wheel
P1 = Weight measured on nose wheel

6.3 WEIGHT & BILANCE REPORT

The first recording of the Weighing Report & the Center of Gravity Position of the aircraft is taken at the factory before the delivery of the same aircraft. The Factory Weight and Balance report will accompany the Aircraft on delivery.

Every variation due to the installation of new components or repairs and painting, implicate a new calculation of the empty weight and the relative positioning of the center of gravity.
Any weight and Balance changes should be recorded into the aircraft log book

SECTION 7
Aircraft Ground Handling and Servicing

7.1 AIRCRAFT GROUND MOVEMENT

Aircraft ground movement with engine running is as follows:
- Get on board
- Either lock or secure the doors
- Start engine
- Verify the absence of obstacles or people/animals in the aircraft vicinity
- Remove the parking brake
- Use throttle to regulate the advancement speed and use the rudder pedals for steering the aircraft
- When the aircraft has reached the destination, shut off the engine, operate the parking brake and leave the aircraft.

WARNING: never leave the aircraft with engine running, this can be fatal both for you and for other people/animals in the aircraft vicinity.

Aircraft ground movement with engine off is as follows:
- Remove the parking brake
- Take the aircraft for the tail beam and pressing downward to lift the dumper
- Verify the absence of obstacles or people/animals in the aircraft range
- Push or throw the aircraft and direct it using only the principal wheels
- Operate the parking brake

An optional front wheel tow bar is available for aircraft movement.

7.2 AIRCRAFT GROUND ANCHORAGE

The aircraft ground anchorage system is available as an option. Anchorage of the aircraft can be performed by first setting ON the park brake then secure the ropes to each wing mount, on its upper attachment. A third point of ground anchorage could be the stabilator hinge. When tightening the rope to ground mooring DO NOT have too much tension force, a small amount of tension will suffice to secure the aircraft without risking the potential to stress surfaces inadvertently during heavy wind conditions.

CAUTION: It is a good practice to secure the control stick from inadvertent movement by latching to the seatbelts when the aircraft is left unattended or in windy conditions.

7.3 AIRCRAFT CLEANING

The aircraft is supplied with a kit for complete cleaning.

The following procedure is suggested for cleaning the aircraft.

- Do not use a pressure cleaner directly on the aircraft, as the gel-coat is hygroscopic.
- Use a micro-fiber cloth and neutral soap to clean the aircraft.
- Avoid water bathing of metallic parts.
- Rinse with a damp and clean micro-fiber cloth.
- Dry excess moisture using a deerskin, natural or synthetic chamois.
- The cockpit can be cleaned with a dry micro-fiber cloth and a vacuum cleaner.

CAUTION: to avoid corrosion problems make sure that the metallic parts are not left damp. The use of a water dispersant spray and or approved lubricant is advised.

NOTE: