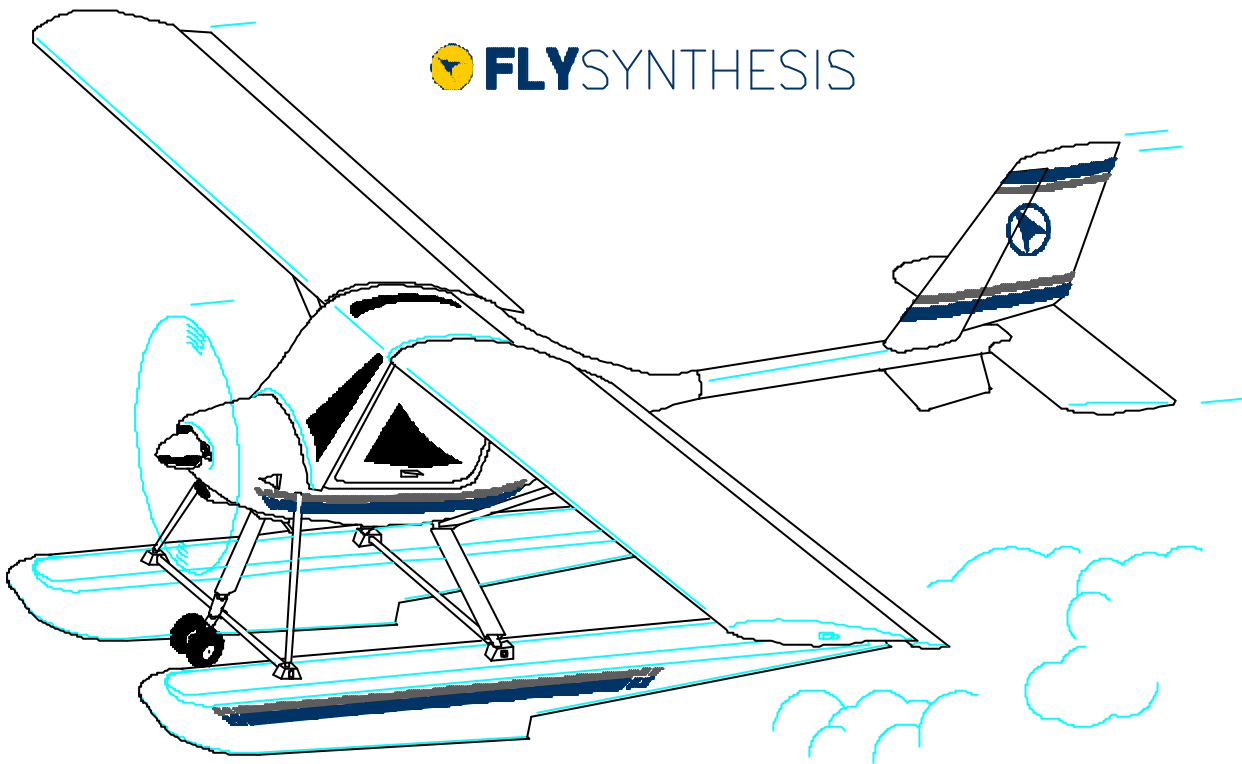


# FLIGHT MANUAL



## CL J AMPHIBIAN

 **FLY**SYNTHESIS



Issue: 1  
Revision: 0  
Issued: April 23, 2004

**This document must be carried in the aircraft at all times**

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## **SCOPE**

This manual contains the necessary information for safe and efficient operation of **FLY SYNTHESIS STORCH CL J AMPHIBIAN** aircraft.

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3	Normal Procedures
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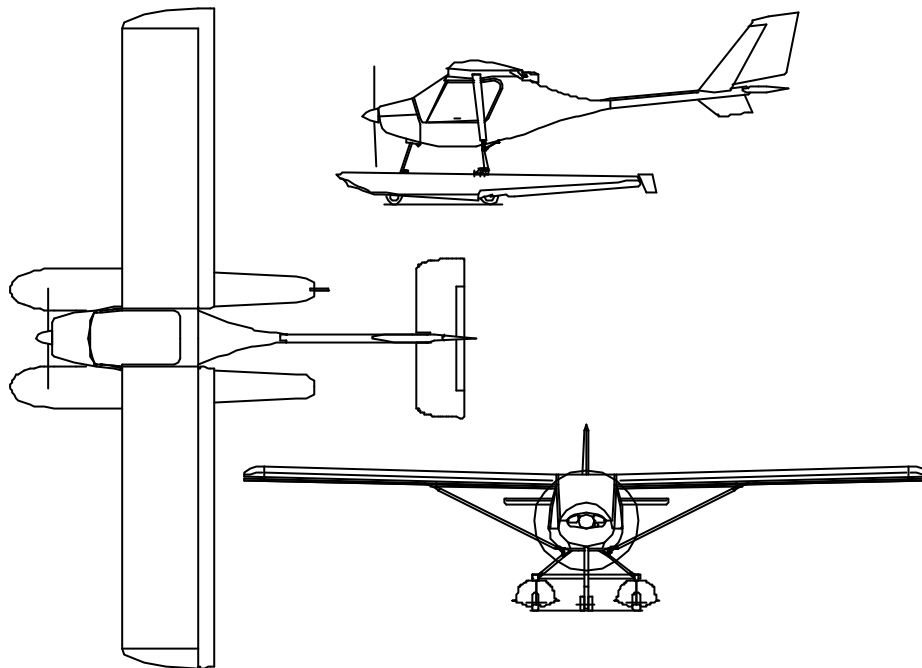
## SECTION 1

### Introduction

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## AIRCRAFT THREE VIEWS



### OVERALL DIMENSION

Wing span	m	10.14
Lenght	m	6.84
Height	m	3.16

### WING

Area	m <sup>2</sup>	13.0
Wing chord	m	1.34
Wing load	kg/m <sup>2</sup>	38.4

### AILERON

Area (each)	m <sup>2</sup>	0.96
Span	m	3.36
Chord	m	0.25

### STABILATOR

Area	m <sup>2</sup>	1.65
Span	m	2.45
Chord	m	0.70

### VERTICAL FIN

Area	m <sup>2</sup>	1.12
Height	m	1.28
Medium chord	m	0.93
Lower fin	m <sup>2</sup>	0.15

### RUDDER

Area	m <sup>2</sup>	0.60
Height	m	1.20
Average chord	m	0.48

## **SYMBOLS ABBREVIATIONS and TERMINOLOGY**

### **GENERAL AIRSPEED TERMINOLOGY and SYMBOLS**

<b>GS</b>	Ground Speed is the speed of an aircraft relative to the ground.
<b>CAS</b>	Calibrated Airspeed, indicate airspeed correct for position and instrument error. CAS is equal to TAS in standard atmosphere at sea level.
<b>IAS</b>	Indicated Airspeed is the speed shown on the airspeed indicator.
<b>TAS</b>	True Airspeed is the airspeed relative to undisturbed air which is CAS correct for altitude, temperature and compressibility.
<b>V<sub>fe</sub></b>	Maximum Flap Extended Speed is the highest speed permissible with wing flaps in a prescribed extended position.
<b>V<sub>le</sub></b>	Extended Landing gear maximum speed is the highest possible speed the aircraft can reach with extended landing gear.
<b>V<sub>lo</sub></b>	Maximum Landing Gear Operating Speed is the highest speed at which the landing gear can be safely extended or retracted.
<b>V<sub>ne</sub></b>	Never Exceed Speed is the speed limit that never must be exceeded.
<b>V<sub>no</sub></b>	Maximum Structural Cruising Speed is the speed that must be exceeded in turbulent air.
<b>V<sub>a</sub></b>	Manoeuvring Speed is the maximum speed at which full or abrupt control movements may be used.
<b>V<sub>x</sub></b>	Best angle-of-climb speed is the speed which results in the greatest gain of altitude in a given horizontal distance.
<b>V<sub>y</sub></b>	Best rate-of-climb speed is the speed which results in the greatest gain of altitude in a given time.

## **METEOROLOGICAL TERMINOLOGY**

**OAT** Outside Air Temperature is the free air static temperature. It is expressed in either degrees Celsius or degrees Fahrenheit.

**ISA** International Standard Atmosphere in which:

1. The air is a perfect dry gas.
2. The temperature at sea level is 15° C (59° F).
3. The pressure at sea level is 29.92 in. Hg (1013,2 mbar).
4. The temperature gradient from sea level to the altitude at which the temperature is – 56,5° C (-69,7° F), is -1,98° C (-3,6° F) per 1000 feet.

## **ENGINE POWER TERMINOLOGY**

- Throttle Lever The lever used to control engine power.
- Carburettor Heat Control This control adjusts the air temperature to the carburettor of the engine.
- Tachometer Indicates the engine speed in RPM. The instrument is mechanically driven by a flexible shaft connected to the engine tachometer drive.
- Cylinder Head Temperature Indicates the temperature at cylinder n° 4 head.

## **AIRCRAFT PERFORMANCE and FLIGHT PLANNING TERMINOLOGY**

- Rate of climb The change in altitude during the time interval.
- Demonstrated Crosswind The demonstrated crosswind velocity is the velocity of the crosswind component for which adequate control of the aircraft during take off and landing was actually demonstrated during certification tests.
- Land as soon as practical Land at the nearest airport or nearest site that is usually used as landing and take off field compatible with aircraft characteristics.
- Land immediately Land at the nearest suitable site with such characteristics as to cause the least possible damage to the aircraft and passengers.

## **MISCELLANEA**

**M.A.C.** Mean Aerodynamic Chord.

**C.G.** Centre of gravity.

**Rh** Right.

**Lh** Left.

## SECTION 2

### OPERATING LIMITATIONS

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## GENERAL

This section includes operating limitations, instrument markings necessary for the safe operation of the aircraft, of the engine and its standard systems and equipments.

### AIRSPEED LIMITATION

- Never Exceed speed (Vne)	Km h 160
- Stall speed (Vs)	Km h 63
- Stall speed with full flap and extended landing gear (Vso)	Km h 55
- Manoeuvring speed (Va)	Km h 138
- Maximum speed with full flaps	Km h 100
- Maximum speed with landing gear extended (Vle)	Km h 100
- Maximum speed for landing gear operation (Vlo)	Km h 95

### POWER PLANT LIMITATIONS (Ref. JABIRU operator's manual)

For the following engine and propeller:

- Engine, JABIRU 2.200
- Propeller, DUC TWO BLADE SWIRL INCONEL 01-08-001

Following limitations apply:

- Engine take off power	80 HP
- Engine take off RPM	3.300 RPM
- Engine maximum continuous power	80 HP
- Maximum continuous RPM	3.300 RPM
- Maximum continuous cylinder head temperature	150° C
- Maximum cylinder head temperature	175° C
- Maximum continuous oil temperature	118° C

Fuel:

- For detailed information on approved fuels refer to the attached edition of JABIRU operator's manual.



## **FUEL QUANTITY, OIL TYPE and ATMOSPHERIC TEMPERATURE**

Fuel tank capacity:

- Fuel tank capacity 60 L.
- Unusable fuel 2 L.
- Usable fuel 58 L.

### **ENGINE OIL**

For detailed information on recommended oil grades refer to the attached edition of JABIRU operator's manual.

### **ATMOSPHERIC TEMPERATURE**

Maximum atmospheric temperature, at which the aircraft has been verified as functional (determined by tests) is 37.8° C (100° F).

### **WEIGHT LIMITATIONS**

Empty weight	Kg s 325
Minimum single pilot weight	Kg s 55
Maximum single pilot weight	Kg s 105
Maximum Take Off Weight:	Kg s 500
Maximum allowed weight in baggage compartment	Kg s 12

## CENTRE of GRAVITY LIMITATIONS

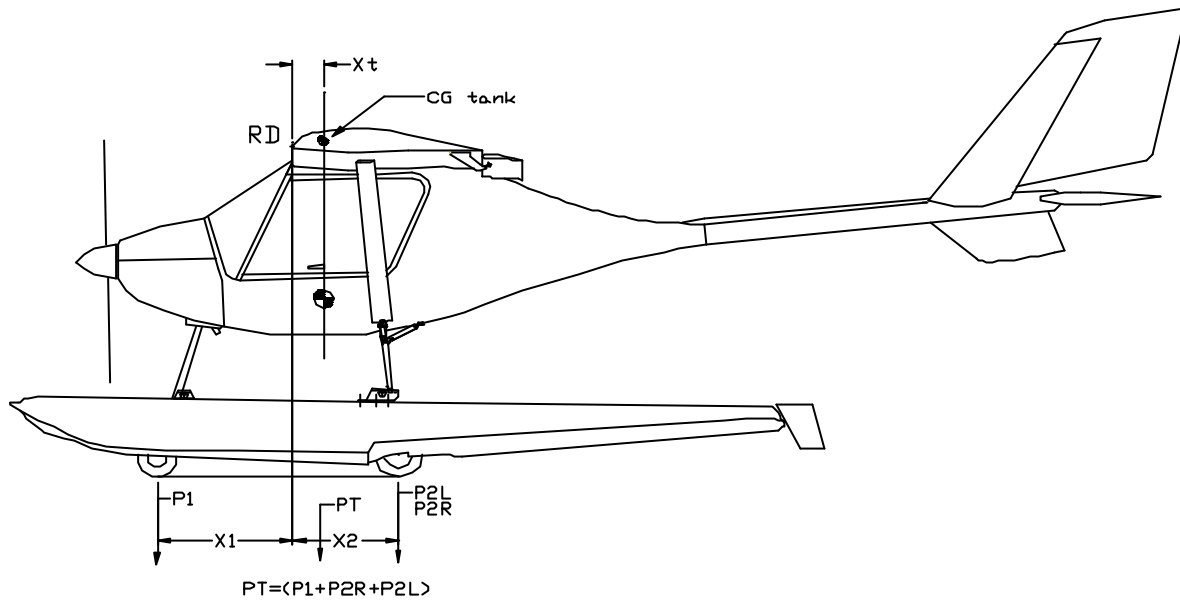


Fig.1 Schema di pesata:

$P_1$  = Forward reaction (kg)

$P_{2s} + P_{2d}$  = Rear reaction (kg)

$P_t$  = Total weight =  $P_1 + P_{2s} + P_{2d}$  (kg)

M-moment =  $(P_{2s} + P_{2d}) \times (X_1 + X_2)$  (kgm)

$X_t$  - center of gravity =  $(M/P_t) - X_1$  (m)

### WARNING

Verify the desired configuration, accommodating pilots and necessary fuel, than proceed with the balance.

Forward limit: 25% M.A.C. corresponding at 335 mm from the leading edge

Rear limit: 37% M.A.C. corresponding at 497 mm from the leading edge

## **MANOEUVRE LIMITATIONS**

- All aerobatics manoeuvres are prohibited.

### **WARNING**

All manoeuvres at load factor less than - 0.5 g, must be performed for no longer than 5 seconds, with throttle in idle and with engine oil pressure no less than 1,1 bar.

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

## **LOAD FACTOR LIMITATIONS**

- Maximum positive **4**
- Maximum negative **2**

## **MINIMUM FLIGHT CREW**

The minimum flight crew required for all operations is one pilot (on left or right side, according to configuration).

## **CONFIGURATION WITH MAXIMUM PASSENGER SEATING**

The maximum number of persons on board is two.

## **KINDS of OPERATIONS**

- The aircraft must operate only for day and visual contact fling.
- Flight operations of the aircraft have to comply with the applicable national flight operation regulations.

## **WARNING**

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

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

## INSTRUMENTS MARKINGS

### AIRSPEED INDICATOR (IAS)

- White arc	From 57 Km h	to	110 Km h
- Green arc	From 60 Km h	to	138 Km h
- Yellow arc	From 138 Km h	to	160 Km h
- Red line	160 Km h		

### TACHOMETER (RPM)

- Green arc	From 900 RPM	to	3.000 RPM
- Yellow arc	From 3.000 RPM	to	3.300 RPM
- Red line	3.300 RPM		

### FUEL PRESSURE GAUGE (psi)

- Red line			0,1
- Green arc	From 0,1	to	0,4
- Red line			0,4

### OIL PRESSURE GAUGE (psi)

- Red line			1,1
- Green arc	From 1,1	to	7,2
- Red line			7,2

### OIL TEMPERATURE GAUGE (° C)


- Red line			15
- Yellow arc	From 15	to	80
- Green arc	From 80	to	100
- Yellow arc	From 100	to	118
- Red line			118


### CYLINDER HEAD TEMPERATURE GAUGE (° C)

- Red line			50
- Green arc	From 50	to	150
- Yellow arc	From 150	to	175
- Red line			175

# PLACARDS

On instrument panel

 <b>FLYSYNTHESIS</b> Via Gortzla, 63 - 33050 Gonars (UD) tel. & Fax: 0432/998488 - 999557	 <b>FLYSYNTHESIS</b> STORCH CL/J AMPHIBIAN
 <b>FLYSYNTHESIS</b> STORCH Airframe Serial No. _____ Date of manufacture _____	 <b>FLYSYNTHESIS</b> Engine Type: _____ Engine serial number: _____ Propeller Type: _____ Propeller serial: _____


**FLYSYNTHESIS**  
 Via Gortzla, 63 - 33050 Gonars (UD) - Italy  
  
**STORCH CL/J AMPHIBIAN**  
  

<table border="0"> <tr> <td>Speeds</td> <td>-</td> <td>kwh</td> <td>Weights</td> <td>-</td> <td>kg</td> </tr> <tr> <td>VNE Never Exceed</td> <td>-</td> <td>160</td> <td>Maximum Take-Off</td> <td>-</td> <td>500</td> </tr> <tr> <td>VMO Max Operating</td> <td>-</td> <td>140</td> <td>Empty Weight</td> <td>-</td> <td>325</td> </tr> <tr> <td>VA Manoeuvring</td> <td>-</td> <td>133</td> <td>Useful Load</td> <td>-</td> <td>12</td> </tr> <tr> <td>VFE Flap 15</td> <td>-</td> <td>100</td> <td>Minimum Solo Pilot</td> <td>-</td> <td>55</td> </tr> <tr> <td>Flap 20</td> <td>-</td> <td>90</td> <td>Maximum Solo Pilot</td> <td>-</td> <td>105</td> </tr> <tr> <td></td> <td></td> <td></td> <td>Max Pilot &amp; Passenger</td> <td>-</td> <td>165</td> </tr> </table>	Speeds	-	kwh	Weights	-	kg	VNE Never Exceed	-	160	Maximum Take-Off	-	500	VMO Max Operating	-	140	Empty Weight	-	325	VA Manoeuvring	-	133	Useful Load	-	12	VFE Flap 15	-	100	Minimum Solo Pilot	-	55	Flap 20	-	90	Maximum Solo Pilot	-	105				Max Pilot & Passenger	-	165	<table border="0"> <tr> <td>Stall Speed Flaps UP</td> <td>-</td> <td>63</td> </tr> <tr> <td>Stall Speed Flaps DN</td> <td>-</td> <td>55</td> </tr> </table>	Stall Speed Flaps UP	-	63	Stall Speed Flaps DN	-	55
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**AEROBATIC MANOEUVERS  
AND SPINS ARE PROHIBITED**

## SECTION 3

### NORMAL PROCEDURES

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## **SPEEDS FOR NORMAL OPERATION**

Unless otherwise noted, the following speeds refer to a maximum weight of 500 Kg and may be used for any lesser weight.

### **TAKE OFF (Flaps 20°)**

Rotation	Km h	75
Speed at 50 ft (15 m) obstacle	Km h	80

### **CLIMB, Flaps UP**

Best angle of climb speed $V_x$ ,	Km h	75
Best rate of climb speed $V_y$ , sea level	Km h	85
Best rate of climb speed $V_y$ ,	Km h	80

### **MANOEUVERING SPEED**

Maximum cruising speed	Km/h	155
Economical cruising speed	Km h	135
Manoeuvring speed ( $V_a$ )	Km/h	138
Velocità da non superare ( $V_{ne}$ )	Km/h	160

**LANDING APPROACH** Km h 80

**TOUCHDOWN** Km h 70

### **ABORTED LANDING (GO AROUND)**

Maximum power, flaps 20°	Km h	80
--------------------------	------	----

**MAXIMUM DEMONSTRATED CROSSWIND VELOCITY** Km h 30

## **FLIGHT PREPARATION**

### **OPERATING LIMITATIONS**

Refer to Section 2.

### **FLIGHT PLANNING**

Data required for flight planning is contained in section 5.

### **WEIGHT and BALANCE**

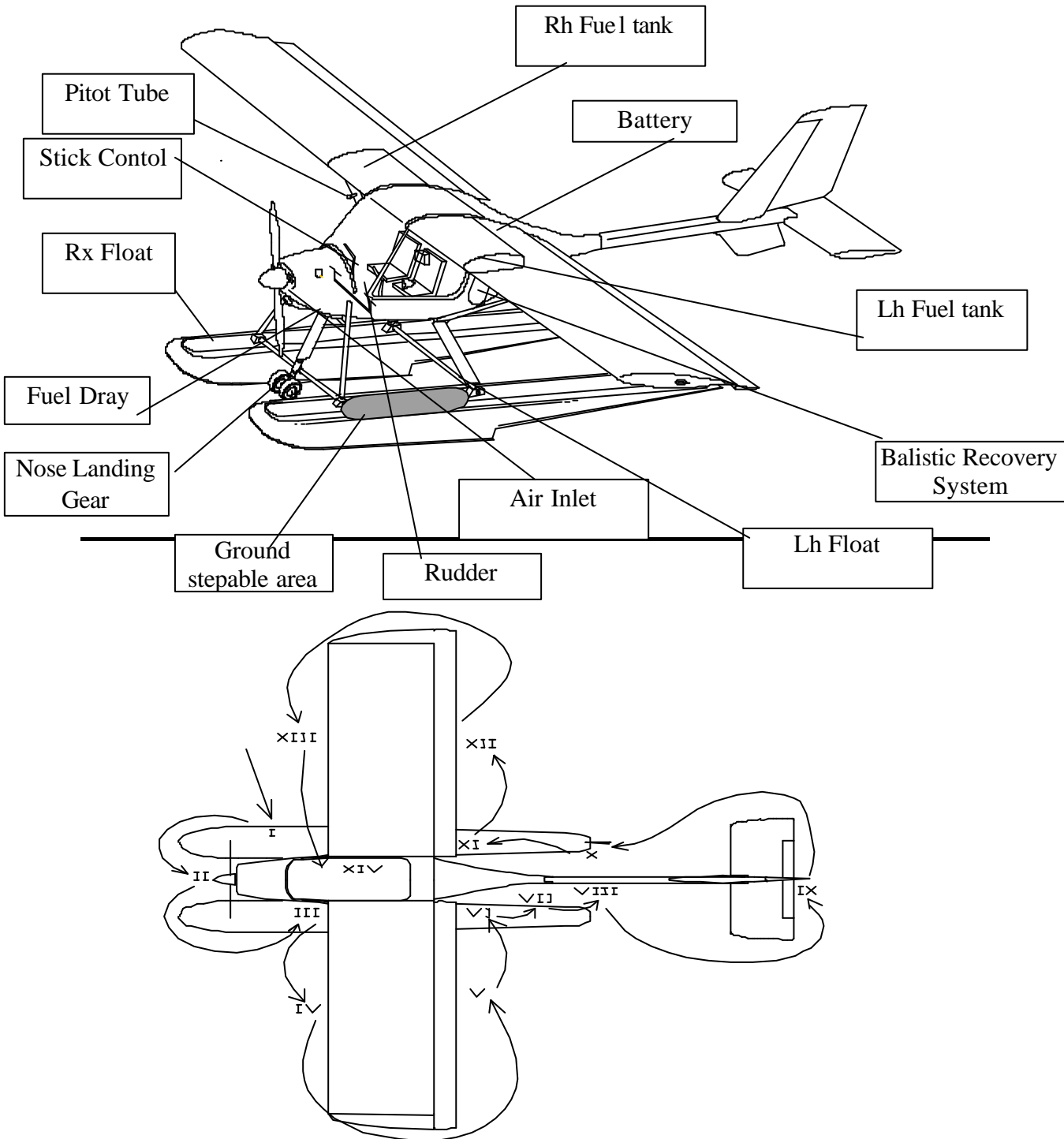
Refer to section 5 for weight and balance limitations



## PRE-FLIGHT INSPECTION

**Warning:** During ground inspection and operations it is forbidden to step on the float out of the stepable area.

**Warning:** All checks in this section should be carried out BEFORE EACH FLIGHT, even if last flight was very short. These checks should be performed with great care directly from aircraft user.



## BEFORE EXTERIOR INSPECTION

a) Key	Not set-in,
b) Electrical switches	Off,
c) Ship's papers	Check due date,
d) Circuit breakers	Connected,
e) Master switch	On,
f) Gen. OUT indicator	Check ON,
g) Battery tension	Check 12 V. (If applicable)
h) Electric gyroscopic instrument	Verify absence of feed warning (If applicable)
i) Fuel level	Check
l) Stall warning indicator	Check (If applicable)
m) Landing gear control	Verify DOWN and locked
n) Flaps	Verify UP
o) Master switch	Off
p) Trim	Neutral
q) Check list	On board
r) Parking brake	On
s) Doors and windshield	Clean and with no defects
t) Flight controls	Check for free and correct movement
u) Seat	Adjust and secure
v) Luggage	Closed belts
z) Safety harness	Adjust and fasten

### **I° FUSELAGE: Right Side**

a) Right float:	Condition and security,
Cavity inspection:	Lack of Water;
b) Bracing float:	
Strut:	Condition and security,
Wire:	Condition and security,
c) Main landing gear:	
Wheel:	Condition and security,
Tire pressure	Verify 1,8 PSI

### **II° FUSELAGE Front side**

a) Propeller:	
Blade and Hub:	Condition and security,
Windshield	Clean and with no defects,
Nut:	Fixed,
Flange:	Condition and security,
Spin:	Condition and security,
b) Nose landing gear:	
Gear support frame	Locking nuts tightened; No distortion,
Wheel:	Verify 1,4 PSI,

Tire pressure	Verify 1,8 PSI,
Leg	Condition and security,
Support frame:	Fixed nut – Deformation absence,
Alignment	Pedals centered, rudder aligned with nose,

**III° FUSELAGE: Left side**

a) Air inlet	Condition and security, absence of obstruction,
b) Engine cowling Engine lower side	Condition and security, Absence of gasoline leak and oil,
c) Engine exhaust: Springs:	Condition and security, Well fixed,
d) Left float: Cavity inspection	Condition and security, Lack of Water,
e) Bracing float: Strut: Wire:	Condition and security, Condition and security,
f) Main landing gear: Wheel: Tire pressure	Condition and security, Verify 1,8 PSI,

**IV° LEFT WING front side**

a) <u>Stall system</u> (if applicable)	Condition and security,
b) Trailing edge and top surface	No defects,
c) Wing tip	No defects, well fixed,

**V° LEFT WING rear side**

a) Leading edge	Condition and security,
b) Wing	Stiffness, well fixed without any clearance,
c) Flaperon	Condition and security, Clean and without defects, Movements without friction and no clearance,
d) Balance weight	Well fixed,
e) Hinges and control sticks	Smoothness an without any clearance,
f) Wing strut	No clearance, nuts well tightened,

g) Pitot tube Well fixed, no obstruction, remove protection

### **VII° FUSELAGE Left central side**

- a) Tail:  
Rivets Condition and security,  
Push-pull cable Condition and security,
- b) Door and related attachments Clean, well fixed and without defects,

### **VIII° FUSELAGE Left rear side**

- a) Tail boom:  
Rivets Condition and security,  
Push-pull cable Condition and security,

### **IX° EMPENNAGE**

- External surface Clean and without defects,
- a) Stabilator hinge Without defects and no clearance,  
Movements without friction,
- b) Balance weight Well fixed condition and security,
- c) Trim Without defects and no clearance,
- d) Tail Without defects and no clearance,  
Movements without friction,
- e) Push-pull tail cable Well fixed, condition and security,

Pull down the rear side of the plane up to guarantee the visual and physical control of the upper hinge stabilator, verify the freedom of movement without friction and clearance.

### **X° FUSELAGE Right rear side**

- a) Tail boom:  
Rivets Condition and security,  
Push-pull cable Condition and security,
- b) Rudder float:  
Connection cable control Condition and security,  
Fixing nut rudder Condition and security,

**XI° RIGHT WING rear side**

- |                              |   |
|------------------------------|---|
| a) Leading edge              | Condition and security,   |
| b) Wing                      | Stiffness, well fixed without any clearance,  |
| c) Plaperons                 | Condition and security,<br>Clean and without defects,<br>Movements without friction and no clearance, |
| d) Balance weight            | Well fixed,   |
| e) Hinges and control sticks | Smoothness and without any clearance,   |
| f) Wing strut                | No clearance, nuts well tightened,  |

**XII° RIGHT WING front side**

- |                                  |                         |
|----------------------------------|-------------------------|
| a) Wing tip                      | No defects, well fixed, |
| b) Trailing edge and top surface | No defects,             |

**Warning:** During ground inspection and operations it is forbidden to step on the float out of the stepable area.

Perform the following described operation with KEY disengaged

### **FUEL DRAINAGE**

Fuel drainage must be performed by the valve fitted in the lower left side of the engine cowling. For this kind of operation use clean and transparent tank to verify the water presence.

### **WARNING**

Perform this operation before to move the plane

Repeat the operation more than one time

### **REFUELING**

Use only approved gasoline as specified in the attached JABIRU's operator manual

Refuel must be effected by the electrical refueling pump, controlled inside the cabin

### **REFUELING PROCEDURES**

- 1) Verify that every fuel tube is safety fitted;  
Use the specify refueling tube system, provided with the plane;
- 2) Connect the refuel tube system at the refueling valve fitted at the lower right side of the fuselage. Insert the intake side of the tube in the external fuel tank.
- 3) Switch on the refueling electrical pump and open the valve fitted at the lower right side of the fuselage.
- 4) Completed the refueling operation, in case of air intake it is recommended to drainage the air inside the fuel system by the drainage system

When the low fuel level warning lights are on, any fuel quantity left in the tank cannot be utilized safely.

### **Check before engine start up**

- |                   |                             |
|-------------------|-----------------------------|
| a) External check | - Performed,                |
| b) Seat           | - Well adjusted,            |
| c) Seat belts     | - Fasten and well adjusted, |
| d) Doors          | - Closed and locked,        |
| e) Parking brake  | - On,                       |
| f) Control sticks | - Free movement,            |
| g) Fuel switch    | - Open,                     |
| h) Trim           | - Neutral position,         |
| i) Fuel throttle  | - Minimum position,         |
| j) Key            | - On,                       |
| k) Generator lamp | - On,                       |

## STARTING ENGINE

**CAUTION:** For safe aircraft operation a complete knowledge of engine is required.

The pilot must acknowledge LIMITATIONS and WARNINGS.

Refer to Jabiru operator's manual issued by the manufacturer.

If possible, engine start-up should be carried out with engine positioned into the wind.

- a) Electrical pump - ON for 5 sec.,
- b) Fuel pressure - inside limits,
- c) Electrical pump - OFF,
- d) Fuel throttle: Cold engine - Forward 0.5 cm,  
Warm engine - Forward 1 cm,
- e) Choke lever: Cold engine - Open,  
Warm engine - Closed
- f) Ensure that the propeller area is clear of any persons and objects,
- g) Ignition magneto - Both ON
- h) Push button START - Max 5 sec. For each attempt,
- i) Fuel throttle - Forward to reach 1.600 RPM,
- l) Engine oil pressure - Inside limits,
- j) Generator warning lamp - OFF,
- k) Fuel pressure - Inside limits,
- m) Head temperature - Inside limits,
- n) Oil temperature - Inside limits,
- o) Check ignition magneto - Max loss inside limits,
- p) Check Minimum RPM - 900 RPM,

## BEFORE TAXIING

- q) Electrical system - On and checked,
- r) Navigation instrument - Checked,
- s) Flaps - Take-off position,
- t) Altimeter - Adjusted as request,
- u) Parking brakes - OFF,

## TAXIING

- v) Brakes - Check each,
- w) Moving parts - Check (stick and pedals),
- x) Flight instruments - Check,
- y) Rpm - Hold moderate,



## **WARNING**

During taxi operation make attention at the bigger dimension of the float  
Perform taxi operation at the minimum speed due the absence of a shock absorber system in the landing gear.

### **ENGINE RUN-UP**

- a. Brakes - Engaged
- b. Safety belts - Strapped
- c. Doors - Closed and locked
- d. Fuel quantity - Check level
- e. All temps. and press. - Inside limits
- f. RPM-check - Inside limits
- g. Commands - Free
- h. Magneto-check - Maximum drop= inside limits
- I. Max rpm - Inside limit
- L. Parking brakes - Disengaged

### **BEFORE TAKE OFF**

- a. Fuel pumps - ON
- b. Flaps - Take-off position,
- c. Trim - Neutral position
- d. Fuel - Open / Check sufficient for flight
- e. Engine instruments - Inside limits
- f. Safety harness - Lock

### **TAKE OFF**

- a. Fuel pumps - Verify ON
- b. Fuel throttle - Move foreword in 3-4 seconds
- c. For a correct take off, maintain the cloche at 1/3 nose up, reduce at minimum the rotation
- d. Pedals - Mantein direction

### **FROM WATER TAKE OFF**

- a. Fuel pumps - ON
- b. Fuel throttle - Move foreword in 3-4 seconds
- c. For a correct water take off, maintain the full nose up cloche position, than gently reduce the angle of attack up to the correct rotation speed.
- d. Pedals - Mantein direction

## **CLIMB,**

- a. Flaps up
- b. Landing Gear Up
- c. Best rate of climb (Vy) Km h 85
- d. Best angle of climb (Vx) Km h 78

## **CRUISE**

- a. Flaps - up
- b. Fuel throttle - settled
- c. Engine - inside limits
- d. Trim - settled

## **DESCENT**

- a. Altimeter - control of the QNH value
- b. Fuel throttle - settled / verify the cylinder head temp.
- c. Engine - inside limits
- d. Speed - inside limits

## **WARNING**

During a long descent from time to time increase throttle for a few seconds to clean the combustion chamber and the spark plugs.

## **APPROACH**

- a. Fuel pump - On
- b. Flaps - Full flaps
- c. Landing gear - Down

## **WATER APPROACH**

- a. Fuel pump - On
- b. Flaps - Full flaps
- c. Landing gear - Verify Up

## **WARNING**

**For a water approach verify the landing gear position (UP)  
Check the mirror to have a landing gear position confirmation (UP)**

## **LANDING**

- a. Landing approach speed Km h 80
- b. Touch down speed Km h 75

## **GO-AROUND**

- a. Maximum power
- b. Flaps 20°

## **AFTER LANDING**

- a. Fuel Throttle - At minimum
- b. Flaps - Up
- c. Brakes - As requested
- d. Let free the runway

## **ENGINE SHUTDOWN**

- a. Fuel throttle - At minimum
- b. Parking brakes - Engaged
- c. Fuel Pump - OFF
- d. Avionics - OFF
- e. Magnetos - OFF (one after the other)
- f. Master - OFF

## **SECTION 4**

### **EMERGENCY PROCEDURES**

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## **GROUND OPERATION EMERGENCY PROCEDURES**

### **ENGINE FIRE**

- a. Fuel - Closed
- b. Fuel pump - Off
- c. Brakes - Engaged
- d. Fuel throttle - Full open
- e. Master - OFF
- f. Main switch - OFF
- g. Propeller - Stopped
- h. Leave airplane

## **TAKE OFF EMERGENCY PROCEDURES**

### **ABORT TAKE OFF**

- a. Fuel throttle - Reduce to minimum
- b. Brakes - Brake gently (avoid the wheel-blocking)

### **ENGINE FAILURE AFTER TAKE OFF**

- a. Obtain best glide speed of - Km h 90
- b. Fuel pump - Verify On
- c. Fuel knob - Verify Open
- d. Throttle - Full foreword
- e. Choke - OFF (full foreword)
- f. Magnetos - ON
- g. Restart - Try
- h. If the engine does not restart, select a place for an emergency landing without steep turns
- i. Choose a safe landing zone, - As best as possible practical
- j. Flaps - As necessary
- k. Landing gear - As necessary
- l. Fuel knob - Closed
- m. Fuel pump - Off
- n. Magnetos and battery - Off

## **WARNING**

In case of fire, land as soon as practical

In case of very low altitude, land immediately

Never perform a 180° turn towards the airfield

Landing gear must be operated in accordance with the characteristics of the terrain chosen for the forced landing

## **INFLIGHT EMERGENCY PROCEDURES**

### **ENGINE FAILURE**

- o. Obtain best glide speed of - Km h 90
- p. Fuel - Check both tanks
- q. Fuel knob - Selected the full one
- r. Fuel pump - ON
- s. Magneto's - ON (check)
- t. Fuel throttle - Course check
- u. In case of no results - Land a.s.a.p.

### **ENGINE RESTART**

- a. Obtain best glide speed of - Km h 90
- b. Fuel pump - ON
- c. Fuel throttle - Reduce to ¼ open
- d. Magnetos - ON
- e. Master - ON
- f. Fuel knob - Open
- g. Electric instruments - ALL OFF
- h. Push start button - START

### **ENGINE FIRE**

- i. Fuel knob - Closed
- j. Fuel throttle - Full forward
- k. Electric pump - OFF
- l. Cabin heating - OFF
- m. Flaps - At convenience
- n. Main switch - OFF (when engine is stopped)
- o. Proceed to a forced landing

**Do not try to restart after a principal fire but prepare a forced landing.**

### **ELECTRICAL FIRE**

- p. Electrical users - OFF
- q. Ventilation - Open
- r. Avionics and master - OFF
- s. Main switch - OFF
- t. Land as soon as possible

## **SMOKE or FUME ELIMINATION**

1. Vents – OPEN

## **ELECTRICAL SYSTEM FAILURE**

### **GENERATOR INDICATOR ILLUMINATED DURING ENGINE RUN in flight**

- a. Volt meter - Check indication
- b. Less than 12 Volt indication - Switch off all electrical equipment

**Not needed to proceed the flight or to reach the nearest field**

**NOTE:** when the battery is in good or sufficient condition, it is possible to continue one hour of flight in complete safety,

Insure that the electrical power needed to engage the fuel pump will be available during the approach and landing.

### **LOW TENSION INDICATOR ILLUMINATE**

- Possible cause:
  - Low RPM
  - Excessive consumption (Too much electric. Equipment in use)
  - Alternator failure
  - Failure with the rectifier / regulator
  - Fuse interrupted

### **LOW TENSION INDICATOR ILLUMINATED ON THE GROUND**

- a. RPM - Reduce
- d. Volt meter - Check value
- e. Indicator illuminated and low volt value - Cut engine

### **LOW TENSION INDICATOR ILLUMINATED IN FLIGHT**

- a. Volt meter - Check value
- b. Switch off all electrical equipment not needed - Check volt meter
- c. Low volt value prob. generator or fuse failure - Land A.S.A.P.
- d. After landing - CHECK PREVIOUS POINTS

## **STALL RECOVERY**

- a. Apply full power to reduce altitude loss to a minimum
- b. Ease stick forward as necessary to clear stall

## SPIN RECOVERY

In case of a non-intentional spin straight down:

- a. Throttle lever - At minimum
- b. Pedals - Opposite at the rotation
- c. Ailerons - Neutral
- d. Stabilator - Neutral
- e. Flaps - Neutral
- f. When the rotation is stopped and the airplane is under control, recover to a leveled flight, (take care that the  $V_{ne}$  during this maneuver is not exceeded)

**NOTE:** Due to the excellent stability and characteristics of this ultra-light, even at low speed, it is improbable that in what configuration so ever an accidental spin will occur during leveled flight, during turns, during climb or descent, **as long as the limits of weight and balance are respected**

## WARNING

Premature or abrupt forward movement of the stick during recovery, will cause the nose to pitch down excessively.

## LANDING EMERGENCY PROCEDURES

### FORCED LANDING

- a. Make a choice and check the landing area, take a good view of wind speed and direction, ensure there are no obstacles
- b. Begin descent
- c. Throttle - At minimum
- d. Trim - At convenience
- e. Make a security flew-over to ensure that the field is clear and safe to land, if the conditions allow it, make a precaution approach and overshoot
- f. Final approach - Check speed
- g. Fuel throttle - Set to maintain a correct approach speed
- h. Fuel pump - ON
- i. Flaps - As requested
- j. Touchdown must be effectuated at the lowest possible speed, maintain the front wheel lifted as long as possible.



TABLE WITH STANDARD ATM. CONVERSION

z	z	t	T	T/T <sub>0</sub>	p	p	p/p <sub>0</sub>	r	g	d	1/S d	V <sub>s</sub>	n*10 exp 6
(m)	(ft)	(°C)	(°K)		(mm.Hg)	(Kg/m <sup>2</sup> )		(kgs <sup>2</sup> /m <sup>4</sup> )	(Kg/m <sup>4</sup> )			(m/s)	(m <sup>2</sup> /s)
-1000	-3281	21,5	294,5	1,0226	854,6	11619	1,1245	0,1374	1,3478	1,0996	0,9536	344,2	13,44
-900	-2953	20,85	293,85	1,0203	844,7	11484	1,1115	0,1361	1,3352	1,0894	0,9582	343,9	13,54
-800	-2625	20,2	293,2	1,0181	835	11351	1,0986	0,1349	1,3227	1,0792	0,9626	343,5	13,65
-700	-2297	19,55	292,55	1,0158	825,3	11220	1,0859	0,1336	1,3103	1,069	0,9672	343,1	13,76
-600	-1969	18,9	291,9	1,0136	815,7	11090	1,0733	0,1323	1,2979	1,0589	0,9718	342,7	13,86
-500	-1640	18,25	291,25	1,0113	806,2	10960	1,0608	0,1311	1,2857	1,0489	0,9764	342,4	13,97
400	-1312	17,6	290,6	1,009	796,8	10832	1,0484	0,1298	1,2735	1,039	0,9811	342	14,08
300	-984	16,95	289,95	1,0068	787,4	10705	1,0361	0,1286	1,2614	1,0291	0,9857	341,6	14,19
200	-656	16,3	289,3	1,0045	779,2	10580	1,024	0,1274	1,2494	1,0194	0,9905	341,2	14,3
100	-328	15,65	288,65	1,0023	769,1	10455	1,0119	0,1262	1,2375	1,0097	0,9952	340,9	14,41
0	0	15	288	1	760	10332	1	0,125	1,2257	1	1	340,5	14,53
100	328	14,35	287,35	0,9977	751	10210	0,9882	0,1238	1,2139	0,9904	1,0048	340,1	14,65
200	656	13,7	286,7	0,9955	742,2	10089	0,9765	0,1226	1,2023	0,9809	1,0097	339,7	14,76
300	984	13,05	286,05	0,9932	733,4	997	0,9649	0,1214	-1,191	0,9715	1,0146	339,3	14,88
400	1312	12,4	285,4	0,991	724,6	9852	0,9534	0,1202	1,1793	0,9621	1,0195	338,9	14,99
500	1640	11,15	284,75	0,9887	716	9734	0,9421	0,1191	1,1679	0,9529	1,0244	338,5	15,1
600	1969	11,1	284,1	0,9865	707,4	9617	0,9308	0,1179	1,1566	0,9436	1,0294	338,1	15,22
700	2297	10,45	283,45	0,9842	699	9503	0,9197	0,1168	1,1454	0,9344	1,0345	337,8	15,34
800	2625	9,8	282,8	0,9819	690,6	9389	0,9087	0,1156	1,1342	0,9254	1,0395	337,4	15,46
900	2953	9,15	282,15	0,9797	682,3	9276	0,8978	0,1145	1,1232	0,9164	1,0446	337	15,59
1000	3281	8,5	281,5	0,9774	674,1	9165	0,887	0,1134	1,1122	0,9074	1,0498	336,6	15,71
1100	3609	7,85	280,85	0,9752	665,9	9053	0,8762	0,1123	1,1013	0,8985	1,055	336,2	15,83
1200	3937	7,2	280,2	0,9729	657,9	8944	0,8656	0,1112	1,0905	0,8897	1,0602	335,8	15,96
1300	4265	6,55	279,55	0,9707	649,9	8835	0,8551	0,1101	1,0798	0,8809	1,0654	335,4	16,09
1400	4593	5,9	278,9	0,9684	642	8728	0,8447	0,109	1,0692	0,8723	1,0707	335	16,22
1500	4921	5,25	278,25	0,9662	634,2	8621	0,8344	0,1079	1,0586	0,8637	1,076	334,7	16,36
1600	5249	4,6	277,6	0,9639	626,4	8516	0,8242	0,1069	1,0481	0,8551	1,0814	334,3	16,49
1700	5577	3,95	276,95	0,9616	618,7	8412	0,8141	0,1068	1,0377	0,8466	1,0868	333,9	16,63
1800	5905	3,3	276,3	0,9594	611,2	8309	0,8041	0,1047	1,0273	0,8382	1,0923	333,5	16,76
1900	6234	2,65	275,65	0,9571	603,7	8207	0,7943	0,1037	1,0171	0,8298	1,0978	333,1	16,9
2000	6562	2	275	0,9549	596,2	8106	0,7845	0,1027	1,0069	0,8215	1,1033	332,7	17,05
2100	6890	1,35	274,35	0,9526	588,8	8005	0,7748	0,1016	0,9969	0,8133	1,1089	332,3	17,19
2200	7218	0,7	273,7	0,9504	581,5	7906	0,7652	0,1006	0,9869	0,8051	1,1145	331,9	17,34
2300	7546	0,05	273,05	0,9481	574,3	7808	0,7557	0,0996	0,9769	0,797	1,1201	331,5	17,48
2400	7874	-0,6	272,4	0,9458	576,2	7710	0,7463	0,0986	0,9671	0,789	1,1258	331,1	17,63
2500	8202	-1,25	271,75	0,9436	560,1	7614	0,7369	0,0976	0,9573	0,781	1,1315	330,7	17,77
2600	8530	-1,9	271,1	0,9413	553,1	7519	0,7277	0,0966	0,9475	0,7731	1,1373	330,3	17,92
2700	8858	-2,55	270,45	0,9391	546,1	7425	0,7189	0,0956	0,9379	0,7652	1,1432	329,9	18,07
2800	9186	-3,2	269,8	0,9368	539,3	7332	0,7096	0,0946	0,9284	0,7574	1,149	329,6	18,22
2900	9514	-3,85	269,15	0,9346	532,5	7239	0,7006	0,0937	0,9189	0,7497	1,1549	329,2	18,37

FIGURE 5-2

AIR CORRECTION TABLE

**ICAN (INTERNATIONAL COMMITTEE AIR NAVIGATION) TEMPERATURE, RELATIVE PRESSURE AND RELATIVE DENSITY ALTITUDE DATA AND CORRECTION FACTORS BY WHICH THE INDICATED AIR SPEED (IAS) MUST BE MULTIPLIED TO OBTAIN THE TRUE AIR SPEED (TAS)**

Altitude		Temperature		Relative pressure	Relative density	Correction factors
Feet	Meters	C.	F.			
0	0	15	59	1	1	1
1.000	305	13,019	55,434	0,9644	0,971	1,0149
2.000	610	11,038	51,868	0,9298	0,9428	1,0299
3.000	914	9,056	48,301	0,8962	0,9151	1,0454
4.000	1219	7,075	44,735	0,8636	0,8881	1,0611
5.000	1524	5,094	41,169	0,8320	0,8616	1,0773
6.000	1829	3,113	37,603	0,8013	0,8358	1,094
7.000	2134	1,132	34,037	0,7716	0,8106	1,1108
8.000	2438	-0,85	30,471	0,7427	0,7859	1,128
9.000	2743	-2,831	26,904	0,7147	0,7619	1,1457
10.000	3050	-4,812	23,338	0,6876	0,7384	1,1638
11.000	3353	-6,793	19,772	0,6614	0,7154	1,1823
12.000	3658	-8,774	16,206	0,6359	0,6931	1,2012
13.000	3965	-10,76	12,641	0,6112	0,6712	1,2207
14.000	4267	-12,74	9,074	0,5873	0,6499	1,2403
15.000	4572	-14,72	5,507	0,5642	0,6291	1,2607
16.000	4877	-16,7	1,941	0,5418	0,6088	1,2816
17.000	5182	-18,68	-1,625	0,5202	0,5891	1,3029

FIGURE 5-3

**CONVERSION OF ALTITUDE PRESSURE FROM mb TO inch Hg**

z=-1000	mbar=1139,3	inch Hg= 33,6	z=1300	mbar=866,5	inch Hg= 25,6
z=-950	mbar=1132,8	inch Hg= 33,5	z=1350	mbar=861,2	inch Hg= 25,4
z=-900	mbar=1126,2	inch Hg= 33,3	z=1400	mbar=855,9	inch Hg= 25,3
z=-850	mbar=1119,7	inch Hg= 33,1	z=1450	mbar=850,7	inch Hg= 25,1
z=-800	mbar=1113,2	inch Hg= 32,9	z=1500	mbar=845,5	inch Hg= 25
z=-750	mbar=1106,7	inch Hg= 32,7	z=1550	mbar=840,3	inch Hg= 24,8
z=-700	mbar=1100,3	inch Hg= 32,5	z=1600	mbar=835,2	inch Hg= 24,7
z=-650	mbar=1093,8	inch Hg= 32,3	z=1650	mbar=830	inch Hg= 24,5
z=-600	mbar=1087,5	inch Hg= 32,1	z=1700	mbar=824,9	inch Hg= 24,4
z=-550	mbar=1081,1	inch Hg= 31,9	z=1750	mbar=819,9	inch Hg= 24,2
z=-500	mbar=1074,3	inch Hg= 31,7	z=1800	mbar=814,8	inch Hg= 24,1
z=-450	mbar=1068,5	inch Hg= 31,6	z=1850	mbar=809,8	inch Hg= 23,9
z=-400	mbar=1062,3	inch Hg= 31,4	z=1900	mbar=804,8	inch Hg= 23,8
z=-350	mbar=1056,0	inch Hg= 31,2	z=1950	mbar=799,8	inch Hg= 23,6
z=-300	mbar=1049,8	inch Hg= 31	z=2000	mbar=794,9	inch Hg= 23,5
z=-250	mbar=1043,7	inch Hg= 30,8	z=2050	mbar=790	inch Hg= 23,3
z=-200	mbar=1037,5	inch Hg= 30,6	z=2100	mbar=785,1	inch Hg= 23,2
z=-150	mbar=1031,4	inch Hg= 30,5	z=2150	mbar=780,2	inch Hg= 23
z=-100	mbar=1025,3	inch Hg= 30,3	z=2200	mbar=775,3	inch Hg= 22,9
z=-50	mbar=1019,3	inch Hg= 30,1	z=2250	mbar=770,5	inch Hg= 22,8
z=0	mbar=1013,3	inch Hg= 29,9	z=2300	mbar=165,7	inch Hg= 22,6
z=50	mbar=1007,3	inch Hg= 29,7	z=2350	mbar=760,9	inch Hg= 22,5
z=100	mbar=1001,3	inch Hg= 29,6	z=2400	mbar=756,2	inch Hg= 22,3
z=150	mbar= 995,4	inch Hg= 29,4	z=2450	mbar=751,4	inch Hg= 22,2
z=200	mbar= 989,4	inch Hg= 29,2	z=2500	mbar=746,7	inch Hg= 22,1
z=250	mbar= 983,6	inch Hg= 29	z=2550	mbar=742,1	inch Hg= 21,9
z=300	mbar= 977,7	inch Hg= 28,9	z=2600	mbar=737,4	inch Hg= 21,8
z=350	mbar= 971,9	inch Hg= 28,7	z=2650	mbar=732,8	inch Hg= 21,6
z=400	mbar= 966,1	inch Hg= 28,5	z=2700	mbar=728,2	inch Hg= 21,5
z=450	mbar= 960,3	inch Hg= 28,4	z=2750	mbar=723,6	inch Hg= 21,4
z=500	mbar= 954,6	inch Hg= 28,2	z=2800	mbar=719	inch Hg= 21,2
z=550	mbar=948,9	inch Hg= 28	z=2850	mbar=714,5	inch Hg= 21,1
z=600	mbar=943,2	inch Hg= 27,9	z=2900	mbar=709,9	inch Hg= 21
z=650	mbar=937,5	inch Hg= 27,7	z=2950	mbar=705,5	inch Hg= 20,8
z=700	mbar=931,9	inch Hg= 27,5	z=3000	mbar=701	inch Hg= 20,7
z=750	mbar=926,3	inch Hg= 27,4	z=3050	mbar=696,5	inch Hg= 20,6
z=800	mbar=920	inch Hg= 27,2	z=3100	mbar=692,1	inch Hg= 20,4
z=850	mbar=915,2	inch Hg= 27	z=3150	mbar=687,7	inch Hg= 20,3
z=900	mbar= 909,	inch Hg= 26,9	z=3200	mbar=683,3	inch Hg= 20,2
z=950	mbar=904,2	inch Hg= 26,7	z=3250	mbar=679	inch Hg= 20,1
z=1000	mbar=898,7	inch Hg= 26,5	z=3300	mbar=674,6	inch Hg= 19,9
z=1050	mbar=893,3	inch Hg= 26,4	z=3350	mbar=670,3	inch Hg= 19,8
z=1100	mbar=887,9	inch Hg= 26,2	z=3400	mbar=666	inch Hg= 19,7
z=1150	mbar=882,5	inch Hg= 26,1	z=3450	mbar=661,8	inch Hg= 19,5
z=1200	mbar=877,1	inch Hg= 25,9	z=3500	mbar=657,5	inch Hg= 19,4
z=1250	mbar=871,8	inch Hg= 25,7	z=3550	mbar=653,3	inch Hg= 19,3

**FIGURE 5-4**

## CONVERSION KILOMETERS / HOUR (km/h) - KNOTS

km/h	knots	km/h	knots	km/h	knots
1,9	1	63,0	34	124,2	67
3,7	2	64,9	35	126,0	68
5,6	3	66,7	36	127,9	69
7,4	4	68,6	37	129,7	70
9,3	5	70,4	38	131,6	71
11,1	6	72,3	39	133,4	72
13,0	7	74,1	40	135,3	73
14,8	8	76,0	41	137,1	74
16,7	9	77,8	42	139,0	75
18,5	10	79,7	43	140,8	76
20,4	11	81,5	44	142,7	77
22,2	12	83,4	45	144,6	78
24,1	13	85,2	46	146,4	79
25,9	14	87,1	47	148,3	80
27,8	15	89,0	48	150,1	81
29,7	16	90,8	49	152,0	82
31,5	17	92,7	50	153,8	83
33,4	18	94,5	51	155,7	84
35,2	19	96,4	52	157,5	85
37,1	20	98,2	53	159,4	86
38,9	21	100,1	54	161,2	87
40,8	22	101,9	55	163,1	88
42,6	23	103,8	56	164,9	89
44,5	24	105,6	57	166,8	90
46,3	25	107,5	58	168,6	91
48,2	26	109,3	59	170,5	92
50,0	27	111,2	60	172,3	93
51,8	28	113,0	61	174,2	94
53,7	29	114,9	62	176,1	95
55,6	30	116,8	63	177,9	96
57,4	31	118,6	64	179,8	97
59,3	32	120,5	65	181,6	98
61,2	33	122,3	66	183,5	99

**FIGURE 5-5**

**SPEED IN METERS PER SECOND (m/sec) RELATIVE TO SPEED IN 100 FEET PER MINUTE (100 ft/min.)**

m/sec. m/sec.	100 ft/min. 100 ft/min.	m/sec. m/sec.	100 feet/min. 100 ft./min.	m/sec. m/sec..	100 feet/min. 100 ft./min
0,5	2,0	17,3	66,9	34,0	131,9
1,0	3,9	17,8	68,9	34,5	133,9
1,5	5,9	18,3	70,9	35,1	135,8
2,0	7,9	18,8	72,8	35,6	137,8
2,5	9,8	19,3	74,8	36,1	139,8
3,0	11,8	19,8	76,8	36,6	141,7
3,6	13,8	20,3	78,7	37,1	143,7
4,1	15,7	20,8	80,7	37,6	145,7
4,6	17,7	21,3	82,7	38,1	147,6
5,1	19,7	21,8	84,6	38,6	149,6
5,6	21,7	22,4	86,6	39,1	151,6
6,1	23,6	22,9	88,6	39,6	153,5
6,6	25,6	23,4	90,6	40,1	155,5
7,1	27,6	23,9	92,5	40,6	157,5
7,6	29,5	24,4	94,5	41,1	159,4
8,1	31,5	24,9	96,5	41,7	161,4
8,6	33,5	25,4	98,4	42,2	163,4
9,1	35,4	25,9	100,4	42,7	165,4
9,7	37,4	26,4	102,4	43,2	167,3
10,2	39,4	26,9	104,3	43,7	169,3
10,7	41,3	27,4	106,3	44,2	171,3
11,2	43,3	27,9	108,3	44,7	173,2
11,7	45,3	28,4	110,2	45,2	175,2
12,2	47,2	29,0	112,2	45,7	177,2
12,7	49,2	29,5	114,2	46,2	179,1
13,2	51,2	30,0	116,1	46,7	181,1
13,7	53,2	30,5	118,1	47,2	183,1
14,2	55,1	31,0	120,1	47,8	185,0
14,7	57,1	31,5	122,0	48,3	187,0
15,2	59,1	32,0	124,0	48,8	189,0
15,7	61,0	32,5	126,0	49,3	190,9
16,3	62,9	33,0	128,0	49,8	192,9
16,8	65,0	33,5	129,9	50,3	194,9

**FIGURE 5-6**

CONVERSION TABLE meters/feet

ME S(m)/FEET (ft)  
TER

m	ft.	m	ft.	m	ft.
0,30	3,28	10,36	111,55	20,42	219,82
0,61	6,56	10,67	114,83	20,73	223,10
0,91	9,84	10,97	118,11	21,03	226,38
1,22	13,12	11,28	121,39	21,34	229,66
1,52	16,40	11,58	124,67	21,64	232,94
1,83	19,69	11,89	127,95	21,92	236,22
2,13	22,97	12,19	131,23	22,25	239,50
2,44	26,25	12,50	134,51	22,56	242,78
2,74	29,53	12,80	137,80	22,86	246,06
3,05	32,81	13,10	141,08	23,16	249,34
3,35	36,09	13,41	144,35	23,47	252,63
3,66	39,37	13,72	147,64	23,77	255,91
3,96	42,65	14,02	150,92	24,08	259,19
4,27	45,93	14,33	154,20	24,38	262,47
4,57	49,21	14,63	157,48	24,69	265,75
4,88	52,49	14,94	160,76	24,99	269,03
5,18	55,77	15,24	164,04	25,30	272,31
5,48	59,06	15,54	167,32	25,60	275,59
5,79	62,34	15,85	170,60	25,91	278,87
6,10	65,62	16,15	173,88	26,21	282,15
6,40	68,90	16,46	177,17	26,52	285,43
6,71	72,18	16,76	180,45	26,82	288,71
7,01	75,46	17,07	183,73	27,13	292,00
7,31	78,74	17,37	187,01	27,43	295,28
7,62	82,02	17,68	190,29	27,74	298,56
7,95	85,30	17,98	193,57	28,04	301,84
8,22	88,58	18,29	196,85	28,35	305,12
8,53	91,86	18,59	200,13	28,65	308,40
8,83	95,14	18,90	203,41	28,96	311,68
9,14	98,43	19,20	206,69	29,26	314,96
9,45	101,71	19,51	209,97	29,57	318,24
9,75	104,99	19,81	213,26	29,87	321,52
10,05	108,27	20,12	216,54	30,18	324,80

FIGURE 5-7

## WARNING

Beware that between moment of engine failure and the max. rate of glide setting the loose of height is about 75 meters ( 250 ft;).

RELATIVE WIND DIAGRAM VERSUS WIND COMPONENT

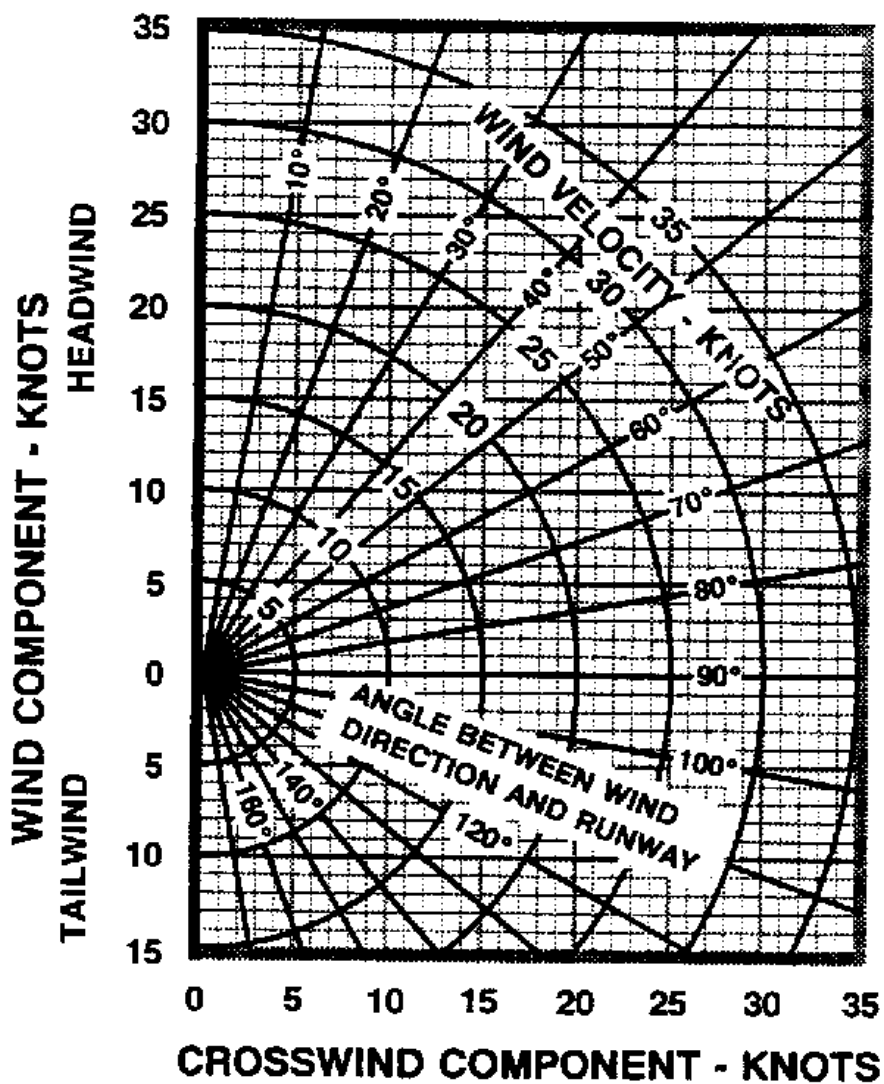
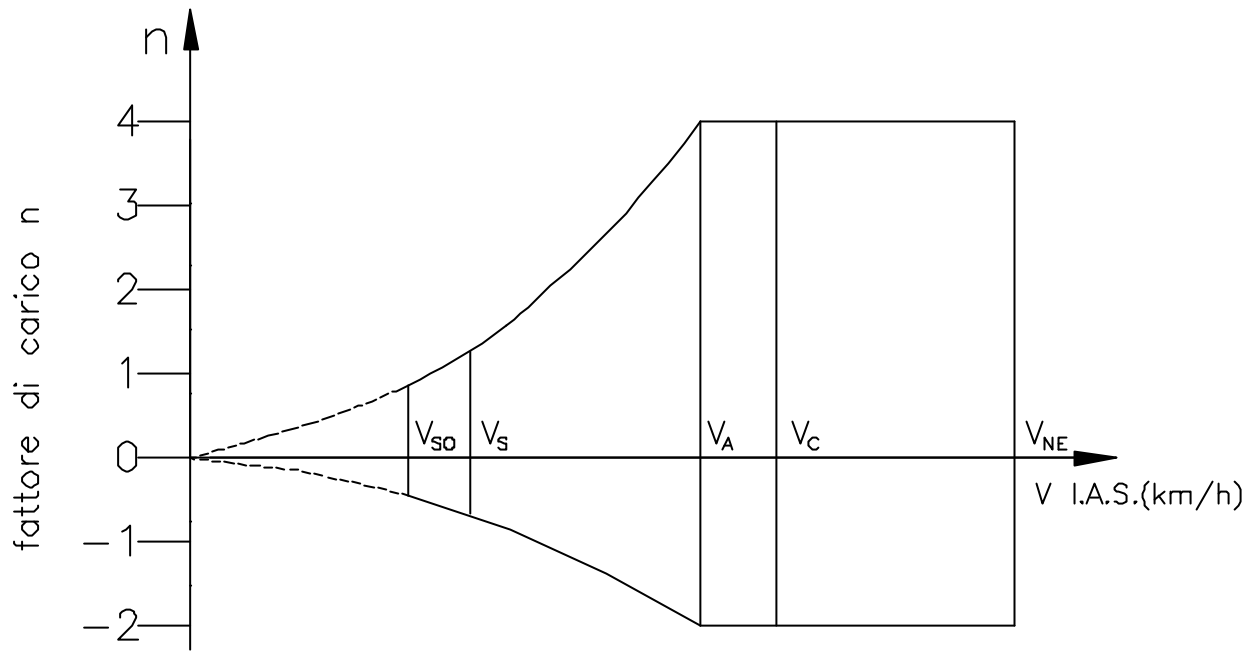


FIGURE 5-8

## FLIGHT ENVELOPE



### LEGEND

$V_{SO}$ =	Stall speed with full extended flaps	55	km/h
$V_S$ =	Stall speed with retracted flaps	63	km/h
$V_A$ =	Maneuvering speed	138	km/h
$V_C$ =	Cruise speed	155	km/h
$V_{NE}$ =	Velocity never to exceed	160	km/h
Load factor		+4/-2	

**FIGURE 5-9**



# WEIGHT AND BALANCE

## GENERAL

To obtain the best flight performances and to operate in safe conditions, the airplane must be operated following the prescriptions for weight and balance according with this flight manual.

The pilot must be aware of the importance to the weight and balance and the limits of the airplane.

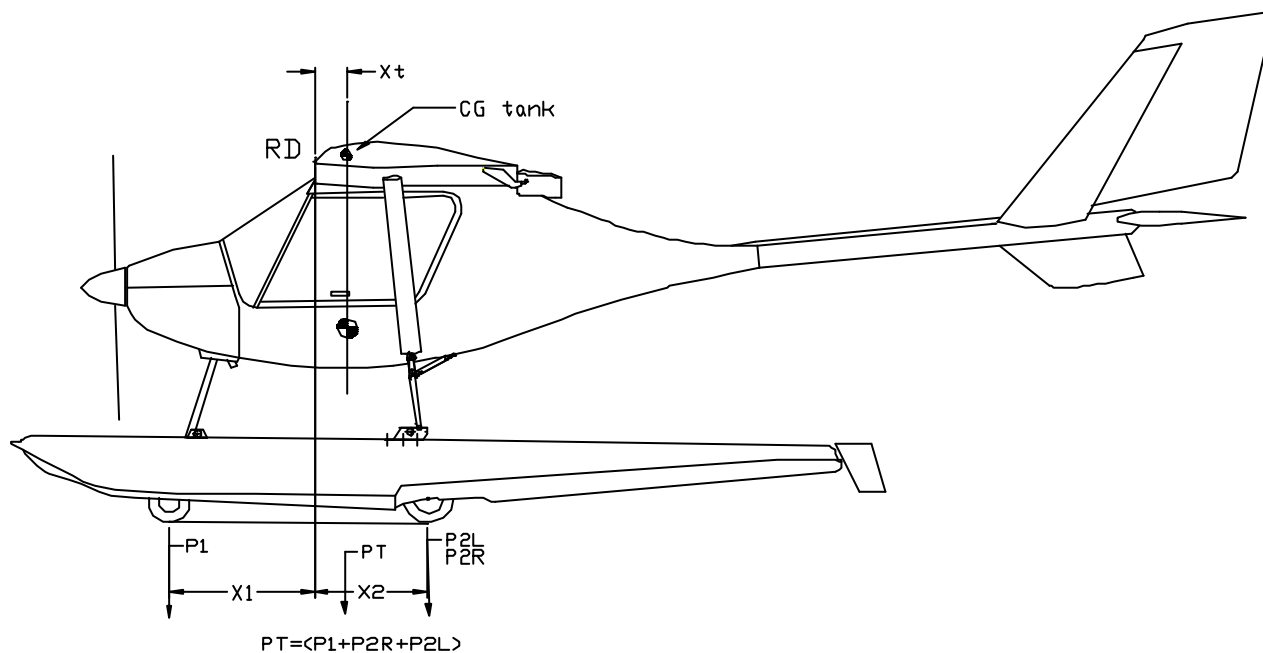
All prescriptions related to the manual of this airplane must be followed exactly to obtain a correct weight and balance, and to avoid that the limits of these will be trespassed.

### NOTE:

The empty weight and also the center of gravity changes in the following cases:

- When adding or modifying equipment and/or accessories;
- After repairing and bodying or repainting structural parts.

The empty weight and the corresponding position of the center of gravity must be reported and registered by authorized persons related to this kind of operation.



$$X_T = (P_1 * X_1 + P_{2S} * X_2 + P_{2D} * X_2) / (P_T)$$

Where  $P_t = P_1 + P_{2S} + P_{2D}$

This exposed formula explains the position of the datum of the center of gravity related to the referring axes. The methodology will be explained further.

## **WEIGHT CONDITIONS**

To obtain the correct weight the airplane must be under following conditions:

- The equipment must be complete as listed on the reference.
- Including: brake fluid, engine oil, and non-usable fuel.
- It is suitable to use an independent three balance and to maintain a fully horizontal setting of the airplane. Also using a plumb line.

To determinate the empty weight and the gravity center position, the airplane must be in the previous mentioned conditions and must be positioned on three independent balances, under each landing wheel. It is imperative that the airplane is fully horizontally stabilized. A check must be established by referring a leaded wire on the right referring side of the airplane.

This procedure is done to determinate the RD.

At this place reference is reported for all measurement needed for a correct application of the formula mentioned before.

All the results of this test must be registered on the weight report as model-A.

## **WEIGHT AND BALANCE REPORT.**

The factory before the airplane delivery makes the first registration of the weight and balance report.

Each change of instruments, or repair works needs a new empty weight check and recalculation of gravity center position.

All updates must be reported in the weight and balance report as shown in model B.

### MOdel“A” weight report

Model: STORCH CL - S/N : \_\_\_\_\_ - Registration: \_\_\_\_\_

Data recording to the flight man. weight motif: \_\_\_\_\_

Reference: Leading edge to the first wing section (RD)

Equipment list – date: \_\_\_\_\_

Weight conditions: with brake liquid and non usable fuel

Support	Full weight kg	Tare kg	net weight kg	Arm m
Frontal (P <sub>1</sub> )				X <sub>1</sub> =
Outside left (P <sub>2S</sub> )				X <sub>2S</sub> =
Outside right (P <sub>2D</sub> )				X <sub>2D</sub> =
Empty weight P <sub>T</sub> =			kg.	

Position of the CG related to the empty weight:

Moment in empty weight configuration:  $M_L = P_T \times X_T = \text{_____} \times \text{_____} = \text{_____} \text{ kg x m}$

Useful max. weight	
Maximum weight	kg.
Empty weight	kg.
Useful weight	kg.

Date to add to the flight manual:

Empty weight:	Moment of the empty weight:
kg	kg x m

Log and data	Stamp	Signature