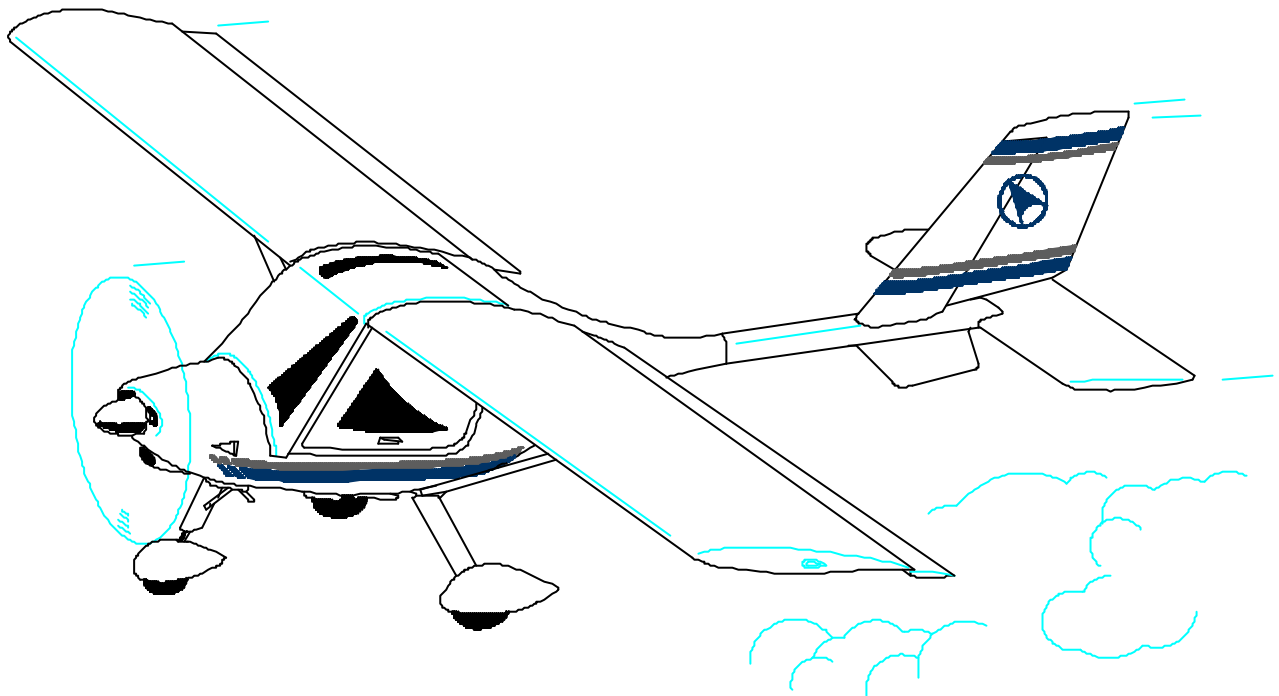


# FLIGHT MANUAL



## HS J



Issue: 1  
Revision: 0  
Issued: September, 2004

**This manual 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 the **FLY SYNTHESIS STORCH HS J** microlight.

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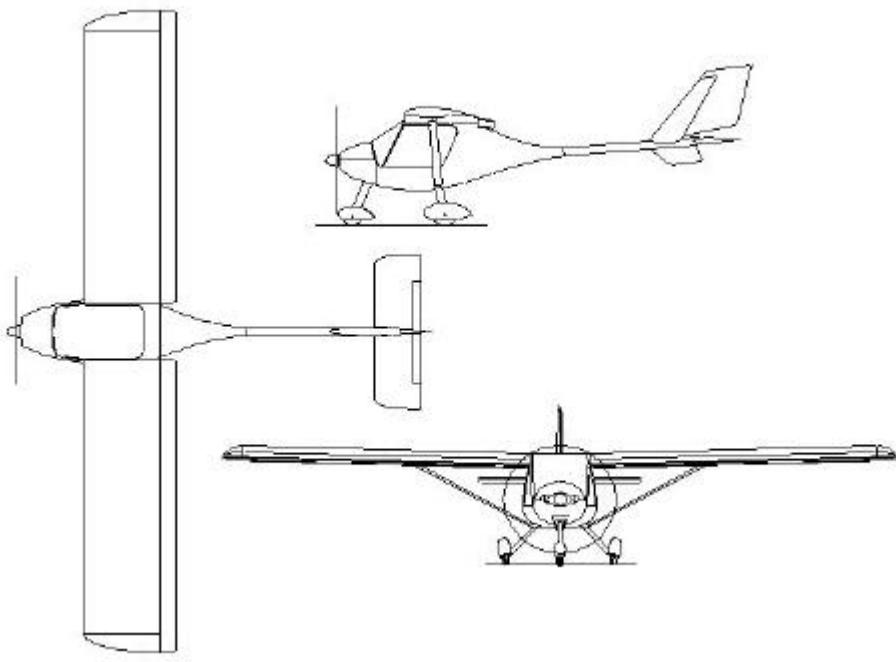
## SECTION 1

### Introduction

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## AIRCRAFT THREE VIEWS



### OVERALL DIMENSION

|           |   |      |
|-----------|---|------|
| Wing span | m | 8.71 |
| Lenght    | m | 5.75 |
| Height    | m | 2.45 |

### WING

|            |                   |      |
|------------|-------------------|------|
| Area       | m <sup>2</sup>    | 11.5 |
| Wing chord | m                 | 1.34 |
| Wing load  | kg/m <sup>2</sup> | 38.5 |

### 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.<br>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>Vfe</b> | Maximum Flap Extended Speed is the highest speed permissible with wing flaps in a prescribed extended position.                               |
| <b>Vne</b> | Never Exceed Speed is the speed limit that never must be exceeded.  |
| <b>Vno</b> | Maximum Structural Cruising Speed is the speed that never must be exceeded in turbulent air.  |
| <b>Va</b>  | Manoeuvring Speed is the maximum speed at which full or abrupt control movements may be used.   |
| <b>Vx</b>  | Best angle-of-climb speed is the speed which results in the greatest gain of altitude in a given horizontal distance.                         |
| <b>Vy</b>  | Best rate-of-climb speed is the speed which results in the greatest gain of altitude in a given time.   |

## **METEOROLOGICAL TERMINOLOGY**

|            |  |
|------------|--|
| <b>OAT</b> | Outside Air Temperature is the free air static temperature. It is expressed in either degrees Celsius or degrees Fahrenheit.   |
| <b>ISA</b> | International Standard Atmosphere in which: <ol style="list-style-type: none"><li>1. The air is a perfect dry gas.</li><li>2. The temperature at sea level is 15° C (59° F).</li><li>3. The pressure at sea level is 29.92 in. Hg (1013,2 mbar).</li><li>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.</li></ol> |

## **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**

|               |                         |
|---------------|-------------------------|
| <b>M.A.C.</b> | Mean Aerodynamic Chord. |
| <b>C.G.</b>   | Centre of gravity.      |
| <b>Rh</b>     | Right.                  |
| <b>Lh</b>     | 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 215 |
| - Stall speed (Vs)                    | Km h 70  |
| - Stall speed with full flap (Vso)    | Km h 64  |
| - Manoeuvring speed (Va)              | Km h 138 |
| - Maximum speed with full flaps (Vfe) | Km h 110 |

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

For the following engine and propeller:

- Engine, JABIRU 2.200
- Propeller, GT Tonini two fixed wood blade, 151 x 105

Following limitations are apply:

- |  |           |
|--|-----------|
| - Maximum engine take off power                | 80 HP     |
| - Maximum engine take off RPM                  | 3.300 RPM |
| - Maximum engine 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 the 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 2 x 30 L.
- Unusable fuel 3 L.
- Usable fuel 57 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 270 |
| Minimum single pilot weight                   | Kg s 55  |
| Maximum single pilot weight                   | Kg s 105 |
| Maximum Take Off Weight:                      | Kg s 450 |
| Maximum allowed weight in baggage compartment | Kg s 12  |

## CENTRE of GRAVITY LIMITATIONS

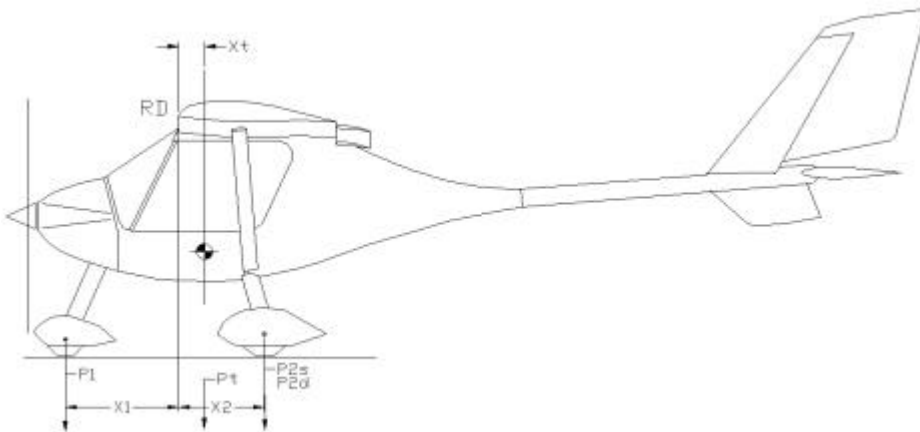


Fig.1 Schema di pesata:

$P_1$  = 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**

- a. All aerobatics manoeuvres are prohibited.

### **WARNING**

- b. 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.
- c. 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 flying.
- 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 215 Km h
- Red line 215 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

|   |  |
|---|--|
|  <p><b>FLYSYNTHESIS</b></p> <p>Via Gorizia , 63 - 33050 Gonars (UD)<br/>tel &amp; Fax : 0432/992482 - 993557</p> |  <p><b>FLYSYNTHESIS</b></p> <p>STORCH HS JABIRU</p>   |
|  <p><b>FLYSYNTHESIS</b></p> <p>STORCH Airframe Serial No. _____<br/>Date of manuf.: _____</p>                    |  <p><b>FLYSYNTHESIS</b></p> <p>Engine Type: _____<br/>Engine serial number: _____<br/>Propeller Type: _____<br/>Propeller serial: _____</p> |



**FLYSYNTHESIS**

Via Gorizia, 63 - 33050 Gonars (UD) - Italy

STORCH HS JABIRU

| Speeds           | kts   | Weights.               | kg    |
|------------------|-------|------------------------|-------|
| VNE Never Exceed | - 116 | Maximum Take-Off       | - 450 |
| VA Manoeuvring   | - 74  | Empty Weight           | - 270 |
| VFE              | - 59  | Max. weight in baggage |       |
| Vs Stall speed   | - 37  | compartment            | - 12  |
| Vso Stall speed  |       | Minimum Solo Pilot ..  | - 55  |
| full flap        | - 34  | Maximum Solo Pilot.    | - 105 |

AEROBATIC MANOEUVERS  
AND SPIN 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 450 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 | 90 |
| Best rate of climb speed $V_y$ ,           | Km h | 95 |

### **MANOEUVERING SPEED**

|                                 |      |     |
|---------------------------------|------|-----|
| Maximum cruising speed          | Km/h | 195 |
| Cruising speed @ 75%            | Km/h | 166 |
| Economical cruising speed       | Km h | 135 |
| Manoeuvring speed ( $V_a$ )     | Km/h | 138 |
| Never Exceed Speed ( $V_{ne}$ ) | Km/h | 215 |

**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



## FUEL DRAIN

**Warning:** This operation should be performed before moving the aircraft from its Parking place in order to avoid that the condense water in case present on tank bottom emulsify with fuel. Check for water presence in tank. In that case, repeat fuel drain operation

- Check that ignition key is switched off.,
- Draining is accomplished by operating the cock located in the lower fuselage section just after the firewall frame. Draining 80-100 cc (5-6 cubic inch) is considered enough to completely eliminate the possible water in the tank.

## REFUELING PROCEDURE

**CAUTION:** use only type of gasoline as stated in the engine operator's manual.

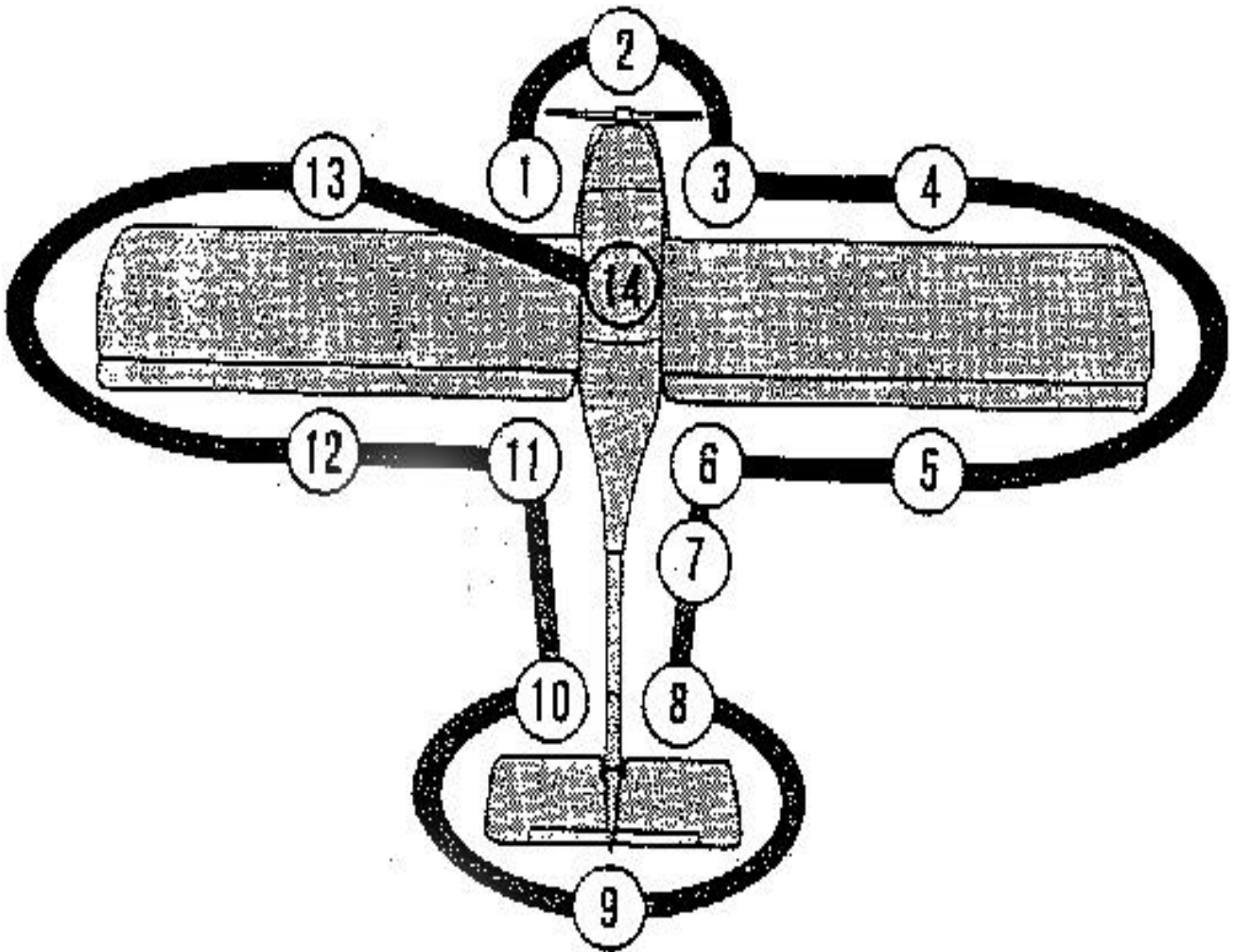
Refueling must be done using the electrical pump switched inside the cockpit.

- 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) Open the fuel tank knob of the selected tank for refuelling;
- 5) Completed the refueling operation, in case of air intake it is recommended to drainage the air inside the fuel system using the drainage system;

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

## PRE-FLIGHT INSPECTION

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



PRE-FLIGHT inspection path

### **FUSELAGE LEFT SIDE**

- a) External surface - clean and without defects
- b) Door and related attachments - clean, well fixed and without defects

### **FUSELAGE FRONT SIDE**

- a) Windshield - clean and with no defects
- b) Engine lube oil - check level (inside limits)
- c) Propeller - clean, well fixed and with no defects
- d) Spinner - clean, well fixed and with no defects
- e) Front wheel - good condition and no clearance
- f) Tire pressure - well inflated
- g) Gear support frame - Locking nuts tightened; No distortion
- h) Wheel fairing - clean, well fixed and with no defects
- i) Alignment - pedals centered, rudder aligned with nose

### **FUSELAGE right SIDE**

- a) External surface - clean and without defects
- b) Door and related attachments - clean, well fixed and without defects

### **right WING**

- a) Trailing edge and top surface - no defects
- b) Pitot tube and non-ramming intake - well fixed and not clogged
- c) Wing tip - no defects, well fixed
- d) Wing-tip flare - no defects, well fixed
- e) Wing - stiffness, well fixed without any clearance
- f) Aileron - free movement an without any clearance
- g) Balance weight - well fixed
- h) Hinges and control sticks - smoothness an without any clearance
- i) Wing strut - no clearance, nuts well tightened

### **right MAIN LANDING GEAR**

- a) Disk and caliper (if installed) - state and tightness
- b) Tire - wearing check
- c) Tire pressure - well inflated
- d) Oil leakage (if installed) - not found
- e) Strut distortion - inside limits
- f) Fairing - well fixed and without debris

**right SIDE FUSOLAGE**

- a) Verify the good condition of the fuselage

**TAIL BOOM**

- b) Verify the good condition of the tail boom and fuselage connection with the all rivets well fixed

**EMPENNAGE**

- c) External surface - clean and without defects
- d) Control surface - movements without friction and no clearance
- e) Trim - without defects and no clearance
- f) Stabilator hinge - without defects and no clearance
- g) Flying controls - smoothness and no clearance
- h) Balance weight - well fixed

**left SIDE FUSOLAGE**

- i) Verify the good condition of the fuselage

**left WING**

- a) Trailing edge and top surface - no defects
- b) Wing tip - no defects, well fixed
- c) Wing-tip flare - no defects, well fixed
- d) Wing - stiffness, well fixed without any clearance
- e) Aileron - free movement an without any clearance
- f) Balance weight - well fixed
- g) Hinges and control sticks - smoothness an without any clearance
- h) Wing strut - no clearance, nuts well tightened

**left MAIN LANDING GEAR**

- i) Disk and caliper (if installed) - state and tightness
- j) Tire - wearing check
- k) Tire pressure - well inflated
- l) Oil leakage (if installed) - not found
- m) Strut distortion - inside limits
- n) Fairing - well fixed and without debris

## **COCKPIT**

- a) Ship's papers - check due date
- b) Check list - on board
- c) Parking brake - on
- d) Key - not set-in
- e) Doors and windshield - clean and with no defects
- f) Fuel level gauge - check fuel level
- g) Gas throttle - at the minimum position
- h) Control sticks - free movement with no friction
- i) Flap control (if installed) - check movement
- j) Luggage - closed belts
- k) Fuel feed cock - only one tank open
- l) Fuel drainage - performed
- m) Refueling - performed
- n) Throttle clutch - trim – choke - well adjusted

## **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,
- l) Oil temperature - Inside limits,
- m) Check Minimum RPM - 900 RPM,

## BEFORE TAXIING

- n) Electrical system - On and checked,
- o) Navigation instrument - Checked,
- p) Altimeter - Adjusted as request,
- q) Parking brakes - OFF,

## TAXIING

- r) Brakes - Check each,
- s) Moving parts - Check (stick and pedals),
- t) Flight instruments - Check,
- u) Rpm - Hold moderate,

## 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

## BEFORE TAKE OFF

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

## TAKE OFF

- a. Fuel pumps - Verify ON
- b. Fuel throttle - Move full foreword in 3-4 seconds
- c. RPM - Minimum 2.800
- d. Pedals - Maintain direction

## CLIMB,

- a. Flaps - up
- b. Best rate of climb ( $V_y$ ) - Km h 85
- c. Best angle of climb ( $V_x$ ) - Km h 78

## CRUISE

- a. Fuel throttle - settled
- b. Engine - inside limits
- c. 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 - As necessary

## **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
- a. 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
- 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. Fuel knob - Closed
- l. Fuel pump - Off
- m. 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

## **INFLIGHT EMERGENCY PROCEDURES**

### **ENGINE FAILURE**

- a. Obtain best glide speed of - Km h 90
- b. Fuel - Check both tanks
- c. Fuel knob - Selected the full one
- d. Fuel pump - ON
- e. Magnetos - ON (check)
- f. Fuel throttle - Course check
- g. In case of no results - Land a.s.a.p.

### **ENGINE RESTART**

- h. Obtain best glide speed of - Km h 90
- i. Fuel pump - ON
- j. Fuel throttle - Reduce to ¼ open
- k. Magnetos - ON
- l. Master - ON
- m. Fuel knob - Open
- n. Electric instruments - ALL OFF
- o. Push start button - START

### **ENGINE FIRE**

- a. Fuel knob - Closed
- b. Fuel throttle - Full forward
- c. Electric pump - OFF
- d. Cabin heating - OFF
- e. Flaps - At convenience
- f. Main switch - OFF (when engine is stopped)
- g. Proceed to a forced landing

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

## **ELECTRICAL FIRE**

- a. Electrical users - OFF
- b. Ventilation - Open
- c. Avionics and master - OFF
- d. Main switch - OFF
- e. Land as soon as possible

## **SMOKE or FUME ELIMINATION**

- f. Vents - Open

## **ELECTRICAL SYSTEM FAILURE**

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

- g. Volt meter - Check indication
- h. Less than 12 Volt indication - Switch off all electrical equipment

**Not needed to precede 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 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**

- a. 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 Vne during this maneuver is not exceeded)

**NOTE:** Due to the excellent stability and characteristics of this microlight, 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.

**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<br>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 | 51    |
| 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.<br>m/sec. | 100 ft/min.<br>100 ft/min. | m/sec.<br>m/sec. | 100 feet/min.<br>100 ft./min. | m/sec.<br>m/sec.. | 100 feet/min.<br>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

METER S(m)/FEET (ft)

| 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

RELATIVE WIND DIAGRAM VERSUS WIND COMPONENT

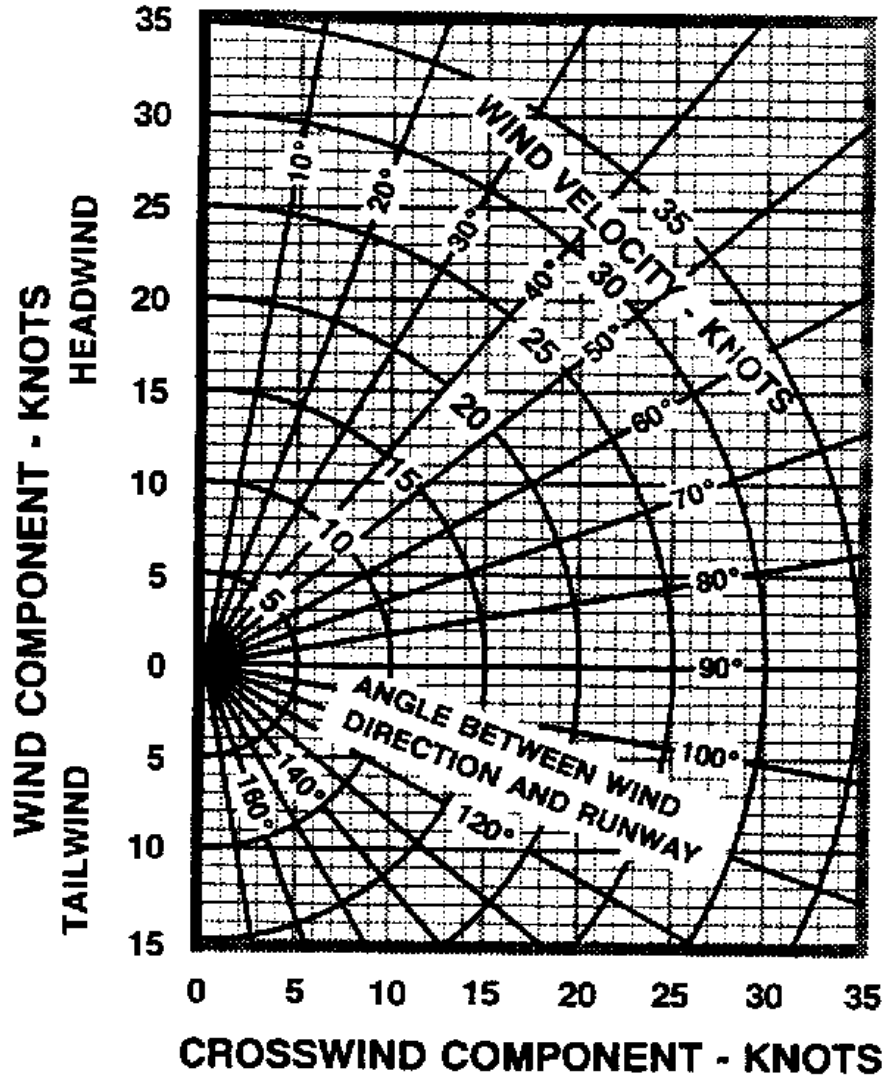
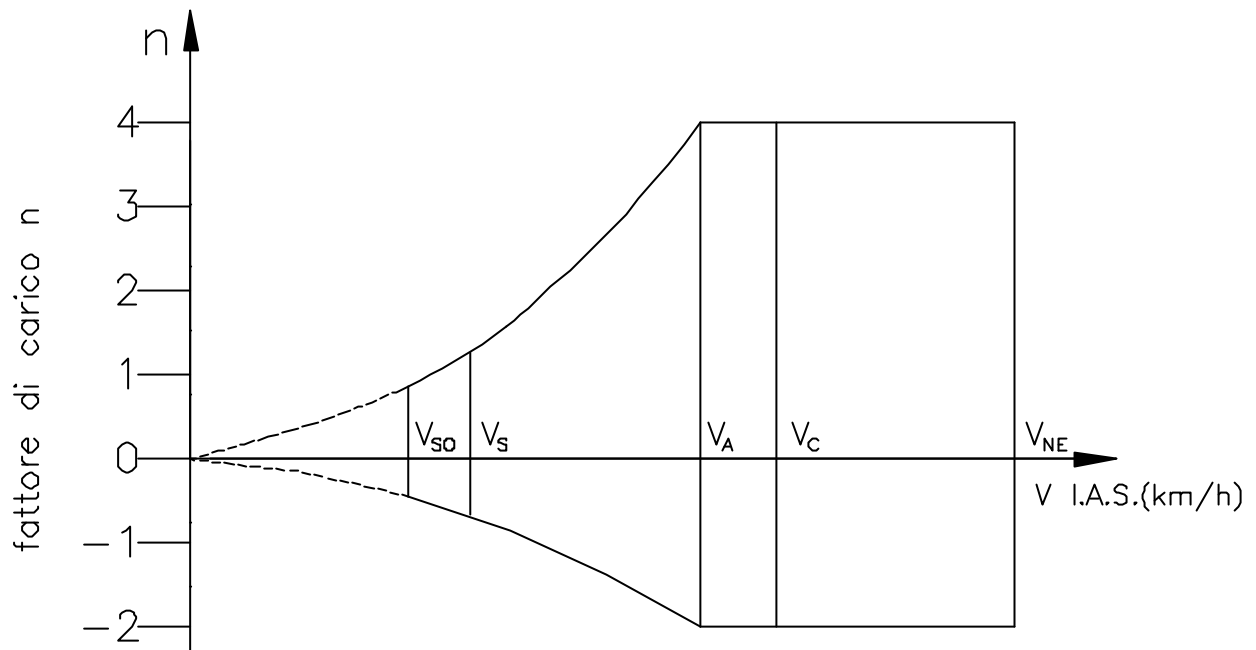


FIGURE 5-8

## FLIGHT ENVELOPE



### LEGEND

|       |                                      |     |      |
|-------|--------------------------------------|-----|------|
| Vso = | Stall speed with full extended flaps | 64  | km/h |
| Vs =  | Stall speed with retracted flaps     | 70  | km/h |
| Vx =  | Best angle of climb speed,           | 75  | Km/h |
| Vy =  | Best rate of climb speed,            | 95  | Km/h |
| Va =  | Maneuvering speed                    | 138 | km/h |
| Vne = | Never exceed speed                   | 215 | 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.

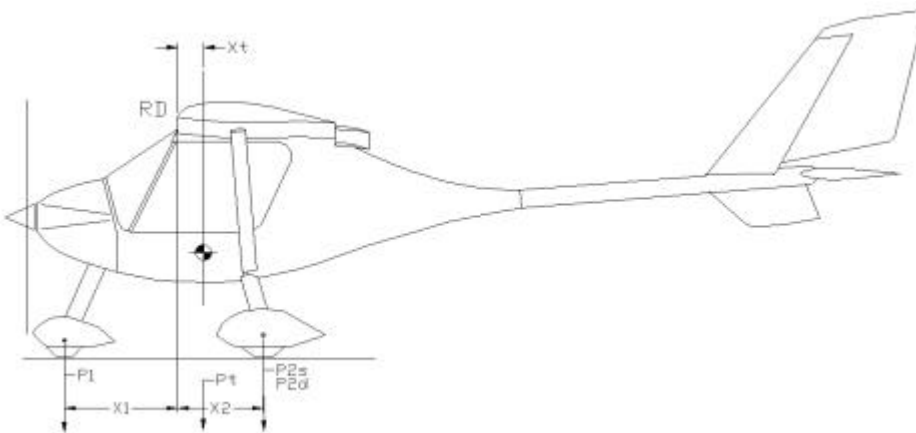
All prescriptions related to the manual of this airplane must be followed exactly to obtain a correct weight and balance and to avoid that the limits of these will be trespassed.

### **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.



$P_1$  = 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

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

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<br>kg | Tare<br>kg | net weight<br>kg | Arm<br>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 |
|--------------|-------|-----------|
|              |       |           |