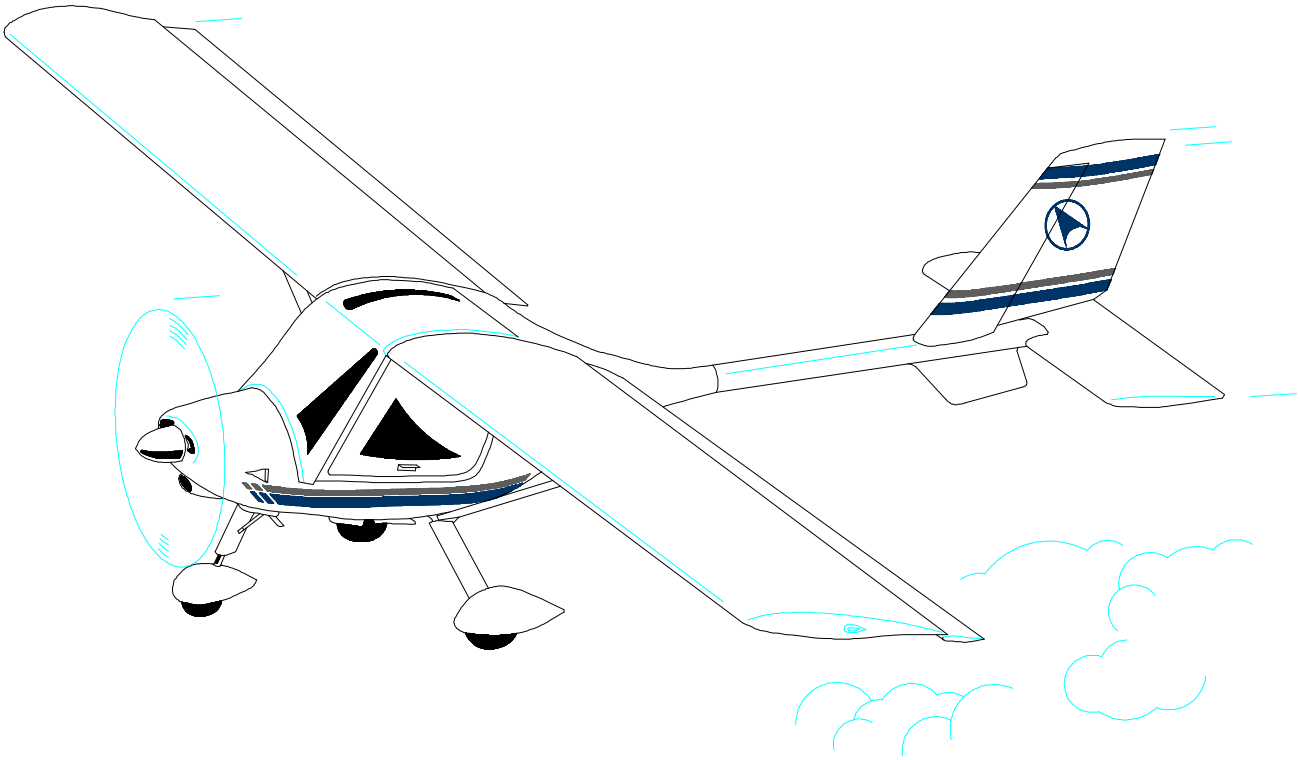
FLYSYNTHESIS

TWO-SEATERS ULTRALIGHT AIRCRAFT

STORCH CLASSIC

ENGINE JABIRU 2200



FLIGHT MANUAL

REV.0

STORCH CL FLIGHT MANUAL N° .....

THIS FLIGHT MANUAL IS SUPPLIED WITH ULTRA LIGHT AIRCRAFT STORCH CL N°…… AND MUST BE KEPT ON BOARD AT ALL TIMES.
PILOT MUST BE AWARE OF ALL "NORMAL" AND "EMERGENCY" PROCEDURES IN ADDITION TO THE AIRCRAFT LIMITATIONS REPORTED IN THIS MANUAL.
ALL THESE INFORMATION ARE NECESSARY FOR SAFE OPERATION OF THE AIRCRAFT.
THE FOLLOWING IS THE DATA SHEET FOR THIS PARTICULAR AIRCRAFT

AIRCRAFT.: ..... STORCH
MODEL: CL
ENGINE TYPE: ..... JABIRU 2200
BUILDER: ..... FLY SYNTHESIS S.R.L.
EDITION: ..... JULY 2002

AIRCRAFT DATA:

- **SERIAL NUMBER .....**
- **DATE OF MANUFACTURE .....**
- **EMPTY WEIGHT (TESTED) .....KG**
- **FUEL WEIGHT (WITH LIT....).....KG**
- **ALLOWED WEIGHT FOR LUGGAGE .....KG**

INSTALLED ACCESSORIES (COUNTED IN EMPTY WEIGHT)

LOG OF REVISIONS

All the revisions to this manual, excluding data concerning weight and load tests, must be registered in the following table and, in case of approved sections, signed and stamped from CAAI.

Rev. Nr.	Chapter	Pages affected	Date	Approval	Date	Date of modify	Signature

LOG OF PAGES

Chapter	Pages	Date	Chapter	Pages	Date

INTRODUCTION

This Flight Manual contains all the information necessary for a Correct and SAFE use of the two seats ultra light

STORCH CL

Such information includes:

Procedures to prepare aircraft for flight;
Normal Procedures;
Emergency Procedures;
Limitations;
Flight performances;

Adherence to these procedures is MANDATORY for the aircraft operator.

FLY SYNTHESIS Srl is not responsible for any damage or injury due to a total or partial non-observance of directions / procedures stated in this Flight Manual.

FLY SYNTHESIS Srl reserves all rights to the property of this Manual, which can neither be reproduced partially, nor integrally; this Manual is not to be disclosed to competitors without a previous written authorization.

GENERAL INDEX

FIGURES INDEX

1. Description

In this charter the aircraft is described in all its parts:

FUSELAGE

THE FUSELAGE consists of a cockpit of composite materials with a self-support
Ting shell structure. The cockpit shell contains five transverse frames of composite materials, which guarantee the rigidity of the structure and high degree of safety and reliability.

The central transverse frame crosses the whole cockpit section and bears the loads of the aircraft both during flight and on the ground. To it is connected
The tail trunk consisting of a metal tubular beam of the same type as used on the wing. A fireproof bulkhead, on the edge of which is also fastened the metal engine-support frame, which also supports the front wheel, closes the front area of the cockpit.

The cockpit ceiling is crossed by a welded-tube frame, which allows good upward visibility without affecting the structural compactness. The undercarriage is fastened to the belly of the fuselage through a welded tube structure and the bending element consists of two milled bars of light alloy.

LANDING GEAR
The landing gear has a fixed tricycle configuration where the main part is mounted on two Self-suspension high resistance aluminum entering of the lower part of the fuselage, fixed inside connected by tube. The front part is a light metal suspension fork independent and pivoting directionally intended by the pilot on ground movement, 30° L-R from his centerline.
The wheels are covered by aerodynamic fairings, easy to remove.
In case of using the airplane without these fairings you must beware of decreasing seriously the performance of the airplane.

BRAKES
A central system is related to a brake, which act on both wheels.

FLIGHT AND ENGINE INSTRUMENTS
The flight instruments are mounted at the front panel at the pilot's convenience right or left.
The engine instruments on the opposite side.
The serial mounted instruments are:

Engine instruments: rpm counter, cylinder. head temp., exhaust gas temp., oil temp., oil press.,
Fuel press., hour counter, fuel low level lamp.

Flight instruments: speed indicator, altimeter, variometer, magnetic compass, slip indicator.

SEATS AND SEAT BELTS

Seats

The seats are fixed on the floor part and can be adapted to the size of the pilot or passenger. The bottom of the seat has an easy take away system to allow underlying inspection of flight commands. The stick bottom has a protection to avoid that some objects will fall down, blocking partially the steering components.

SEAT ADAPTION

The seats of the airplane can be adapted to the convenience of the occupant.
These adjustments are only possible on the ground, NOT IN-FLIGHT!

Seat belts

All the seats are equipped with 4-points attached seat-belts independent adjustable by the Occupant. Safely locked due to a bayonet quick release locking-system.
These can be released by pushing the red bottom at the lock system.

WINDSHIELD

A fixed windshield in lexan material frontally closes the airplane.

WARNING

Before starting the engine make sure that the windows are properly locked at all their points.

WING

THE WING is designed with full-length slotted detached ailerons (Junker Type) to allow high lift coefficients and a good degree of maneuverability. The wing contour adopted is of the laminar flow type to obtain very low frictional resistance and therefore high cruising speeds (for an ultra light aircraft) with low fuel consumption.
The wing consists of a shell of layered compounds held together by a metal structure consisting of a tubular longeron to which are fastened the metal wing ribs. The Material Used Is aerospace Aluminum alloy. The skin is riveted to the structure.
The aileron is built with the same principle as the wing, to which it is connected through pods fastened to the ribs. The wind bracing consists of metal structural elements of drop-shaped cross section to increase the streamlining. The wing and fuselage are connected to each other thought two bearing points: a lower frame which supports the bracing and the landing gear and an upper frame of welded steel tube which crosses the cockpit ceiling. The first part of the leading edge of the wing houses the fuel tanks.

FULL COMPOSITE WING ARE NOW AVAIABLE

EMPENNAGE

THE EMPENNAGE is entirely of epoxy-fiberglass. PVC compounds and consists of a fin riveted directly to the cantilever tail and supporting directly the rudder through two metal hinges fastened directly to the fin longeron. The horizontal tail assembly is a stabilator with anti-tab, which also acts as trim-tab, and the whole assembly is fastened to the fuselage through a welded steel unit, while the smoothness of the controls is guaranteed by two ball bearings.

FLIGHT CONTROLS

THE DUAL CONTROLS are of conventional type with control stick and rudder pedals, central gas throttle. All the controls are of welded steel construction and milled alloy elements. The ailerons are controlled directly from inside the fuselage through rigid rods with ball joints. The horizontal tail elements are operated through double push-pull controls with ball-joint terminals. The rotation movement of both the ailerons and the stabilator is statically balanced.

TRIM PLANT

The airplane is equipped with a manual trim command, which ensures adjustment to different CG positions and different speeds.
The pitch-trim is installed on the cockpit ceiling.
A blinded cable to the rear transmits the movement. By positioning the level, the attitude is changing descending or ascending.

ENGINE DESCRIPTION

ENGINE

JABIRU 2200, 4 strokes, 4 cylinders opposite, cooled by air.

Cylinder.:		2200 cm^3
Max. take-of power:	80 HP	60 kW at 3300' (RPM)

For more information, please consult the engine manual.
The instruments are positioned at the instrument panel.
The starting procedure is explained in the concerning charter.

PROPELLER

It is a two-blade mix wood and fiberglass fixed pitch .

FUEL SYSTEM

ELECTRIC FUEL PUMP

The electric fuel pump is provided as an auxiliary pump.
This pump ALWAYS MUST BE ON during take-off and landing.

ELECTRIC REFUELING PUMP

The electric pump is provided for tank refueling procedure.

FUEL SWITCHES

- The fuel switches are positioned between seats frontward at the central console

WARNING

The fuel tab must be in closed position in case of emergency landing, during engine fire, and during fuel plant inspection.
Always check before each flight that the position is open to avoid engine failure during take-of.

ELECTRIC PLANT

GENERAL

The STORCH CL is provided with an electric plant providing continuous 12V (DC).
The alternator is integrated in the engine and connected to a rectifier with tension regulator who provides electricity to the engine and electrical plant.
The users:
Engine instruments, fuel pump.
A 12V accumulator loaded by the alternator provides tension for the engine instruments and for electric plant alimentation, when engine is stopped.
The accumulator also supports the alternator in case of high electrical consumption.
(Strobe –lights, landing-lights, and navigation lights).
Automatic fuses secure all the electric plant. The main switch (contact switch) powers the entire electric plant of the airplane.

ELECTRIC ALIMENTATION CIRCUIT

The electric power is ensured by two independent circuits, powered by the generator and controlled by a pick-up system. This assures a correct functioning electric system in case of failure of the general electric plant.
The alimentation is supplied with a switch connected at mass for each circuit, including two separate contacts, operated by one key.

WARNING
When the engine is not running, but the magnetos and the main switch is in the on position, it is prohibited to turn the propeller manually!
This can start the engine with heavy consequences for person in the propeller area.

STATIC AND DYNAMIC PORT

The total pressure intake is located on the tip of the right wing and is calibrated.
The static pressure is registered by the same pitot who has small lateral holes not disturbed by the dynamic pressure.
The tubes connected to the instrument are guided from the wing, to the fuselage into the instrument panel. The dynamic pressure tubes are colored white, the static ones blue.
Along the tubes junctions are positioned to allow drain and control of these tubes.

2. Technical data

DIMENSION

OVERALL DIMENSION

Wing Span:	10.14	m
Length:	6.25	m
Height:	2.44	m

WING

Area:	13.0	m^2
Wing chord:	1.34	m
Wing load:	33.1	kg/m^2

AILERON

Area (each):	1.1	m^2
Span:	4.58	m
Chord:	0.25	m
Travel (*):	+2° -32°	

STABILATOR

Area:	1.65	m^2
Span:	2.45	m
Chord:	0.69	m
Travel (*):	+12° -17°	

HORIZONTAL TRIM

Travel (*): +30° -27°

With max forward trim position and stabilator max up and max down

Travel (*): +20° -32°

With max backward trim position and stabilator max up and max down

VERTICAL FIN (RUDDER INCLUDED)

Area:	0.96	m^2
Height:	1.28	m
Medium chord:	0.93	m

RUDDER

Area:	0.59	m^2
Height:	1.20	m
Average chord:	0.48	m
Travel:	+/-22°	

Note: angles are taken considering angle of top fuselage flange (where windows are attached) of 3° towards front side up.

WEIGHTS

Basic configuration with JABIRU:	283	kg
Max Take-off weight:	450	kg
Min Pilot weight:	55	kg
Max Pilot + Passenger weight:	172	kg
Max fuel capacity:	60	lit

LANDING GEAR

Type:	Trike with directional front wheel	
Main gear track:	1.6 m	
Main wheel – Nose wheelbase:	1.4 m	
Main wheel tire:	4.00x6''	
Nose wheel tire:	4.00x4''	
Inflation pressure: Nose wheel:	1.2	kg/cm^2
Inflation pressure: Main wheel:	2.0 - 2.2	kg/cm^2

FUEL SYSTEM

Type:	two wing extractable tank with 2-way 2-selector cock for delivery; with drain tube.
Fuel feed:	mechanical pump; auxiliary electrical pump.
Filter:	fuel filter- placed before mechanical and electrical pump.
Tank capacity:	2 x 30 lt.
Not usable fuel:	2 lt.

ELECTRICAL SYSTEM

Type:	Independent circuit for magnetos ground; 12 Volts Main circuit for instruments and battery – generator link; Rectifier with Voltage regulator. Fuses on Main and auxiliary circuits
Battery:	12 Volts

POWER PLANT

Engine:	Jabiru 2200, 4 Strokes
Displacement:	2200 cm^3
Cylinder:	4 Opposite cylinders
Ignition:	Dual breaker less capacitor discharge ignition
Feed:	one constant depression carburetors
Cooling:	air-cooling system (ram air on cylinder)
Cooling accessories	oil radiator
Starter:	electrical
Max power:	80 HP – 60 kW at 3300 rpm.
Fuel:	min RON 95, leaded or unleaded, AVGAS 100 LL

PERFORMANCE WITH JABIRU 2200 ENGINE

Data verified with following specifications: weight 450kg.

Max efficiency (E max):	13.8	(at 89 km/h at 1st position flap)	13,8	(at 55 Kts - 1st flap position)
Stall speed (Vso):	57	km/h	30,8	Kts
Stall speed with flaps extracted (Vs1):	63	km/h	34,0	Kts
Max allowable speed with extracted flaps 2nd & 3rd position:	110	km/h	59,4	Kts
Top speed (Vh):	165	km/h	89,1	Kts
speed at 75 % power (2350 rpm):	124	km/h	67,0	Kts
Cruise speed at 2800 rpm :	151	km/h	81,5	Kts
Cruise speed inside turbulence:	145	km/h	78,3	Kts
Best glide ratio speed:	110	km/h (0° flap)	59,4	Kts (0° flap)
Best glide ratio speed:	89	km/h (1° flap)	48,1	Kts (1° flap)
Maneuvering Speed (Va):	130	km/h	70,2	Kts
Speed never exceed (Vne):	180	km/h	97,2	Kts
Take-off run (a.s.l./ISA) at Max weight:	90	m	295	feet
Landing run (a.s.l./ISA) at Max weight:	120	m	328	feet

DIFFERENT USEFUL DIMENSION

Distance between propeller blade and ground (at 450kg): > 0.27 m

GRAVITY CENTER POSITIONING

Max forward limit: 30% M.A.C. corresponding to 402 mm
Max afterward limit: 36% M.A.C. corresponding to 482 mm

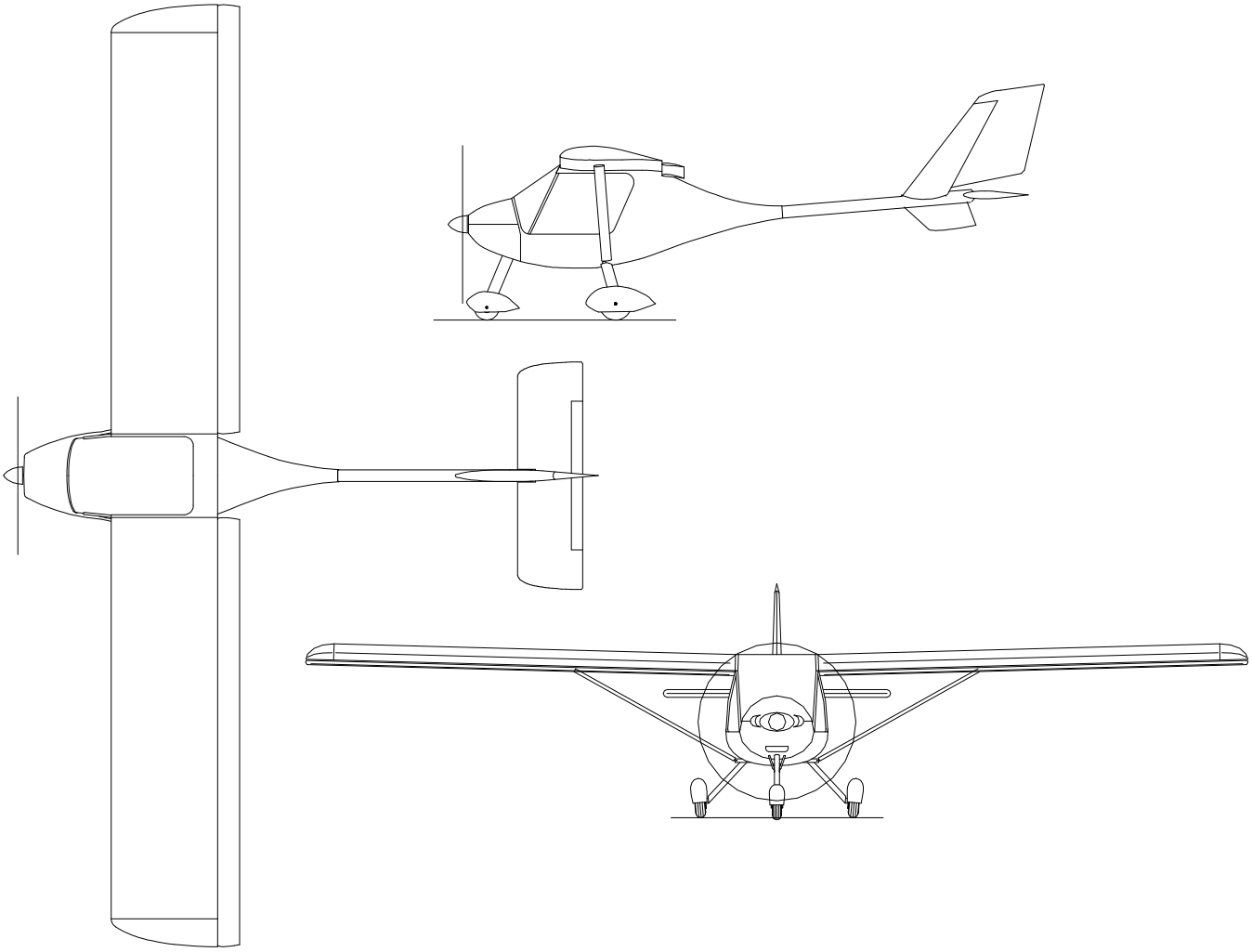


fig. 1 triptych, STORCH CL MODEL 3 views

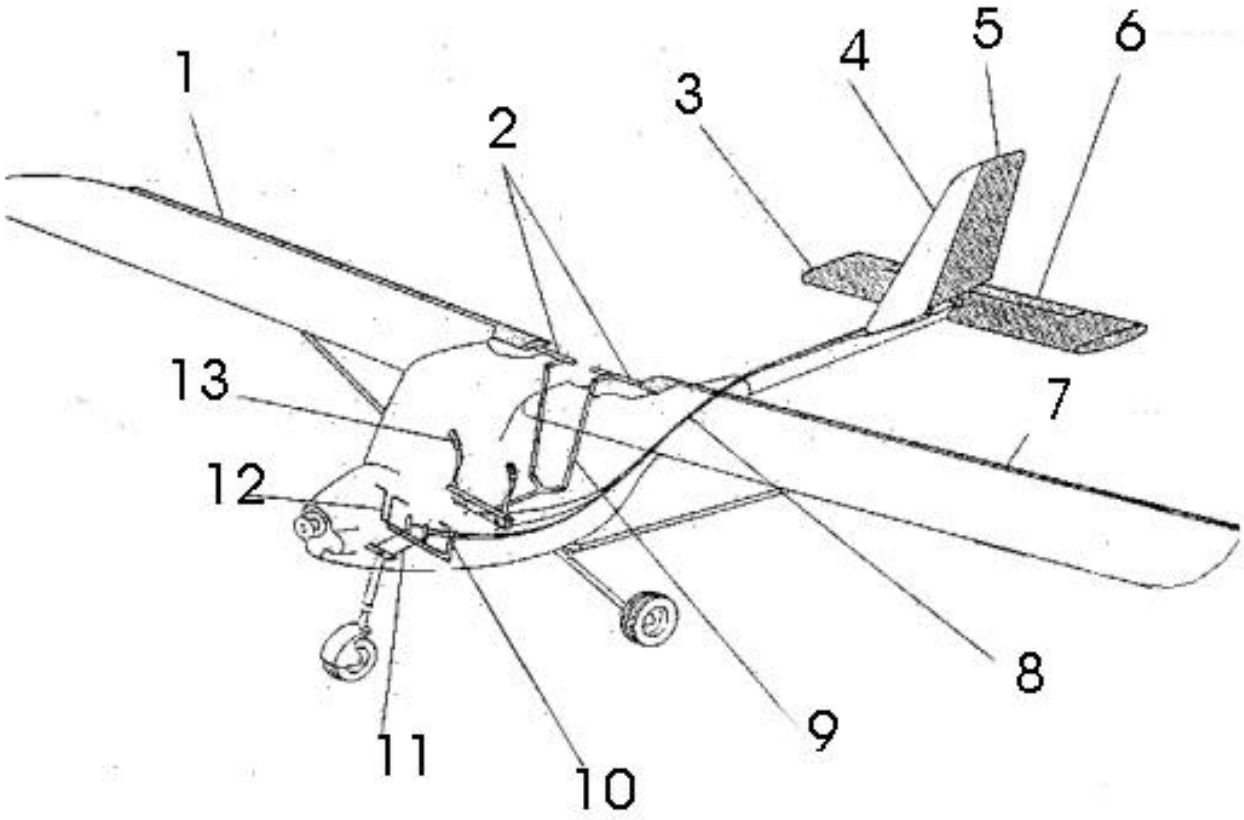


fig. 2 Sketch of Storch – part list –first part

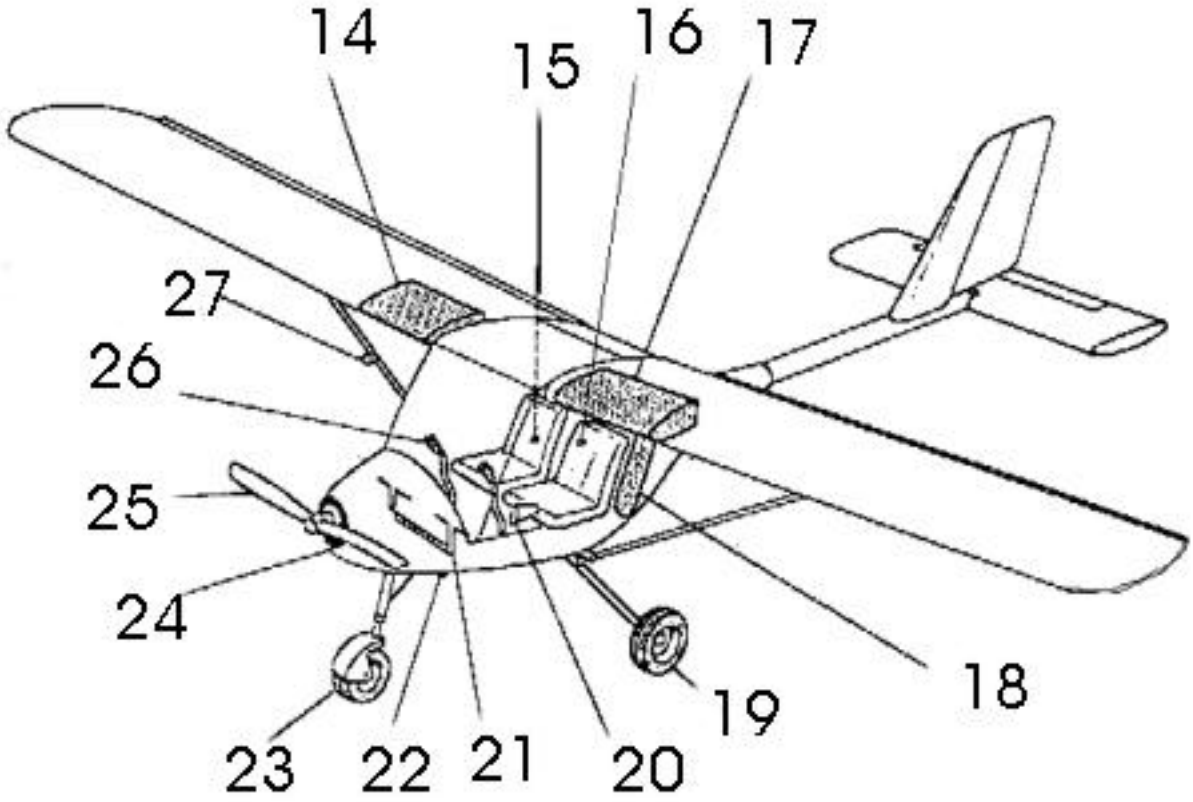


FIG. 3 Sketch of Storch – part list –second part

AIRCRAFT LIST OF PARTS

1. Right aileron
2. Connecting tube for aileron flight control
3. Stabilator
4. Vertical fin
5. Rudder
6. Trim tab, acting also as anti servo tab
7. Left aileron
8. Push pull wires for rudder and stabilator flight control
9. Aileron flight control rod inside cabin
10. Left rudder pedal
11. Steering wheel control rods
12. Right rudder pedal
13. Stick lever
14. Right wing tank
15. Refueling place
16. Battery
17. Left wing tank
18. Ballistic parachute
19. Main landing gear
20. Cockpit air intake
21. Engine cowling
22. Fuel draining
23. Front wheel
24. Engine
25. Propeller
26. Handle grip
27. Anemometric probe

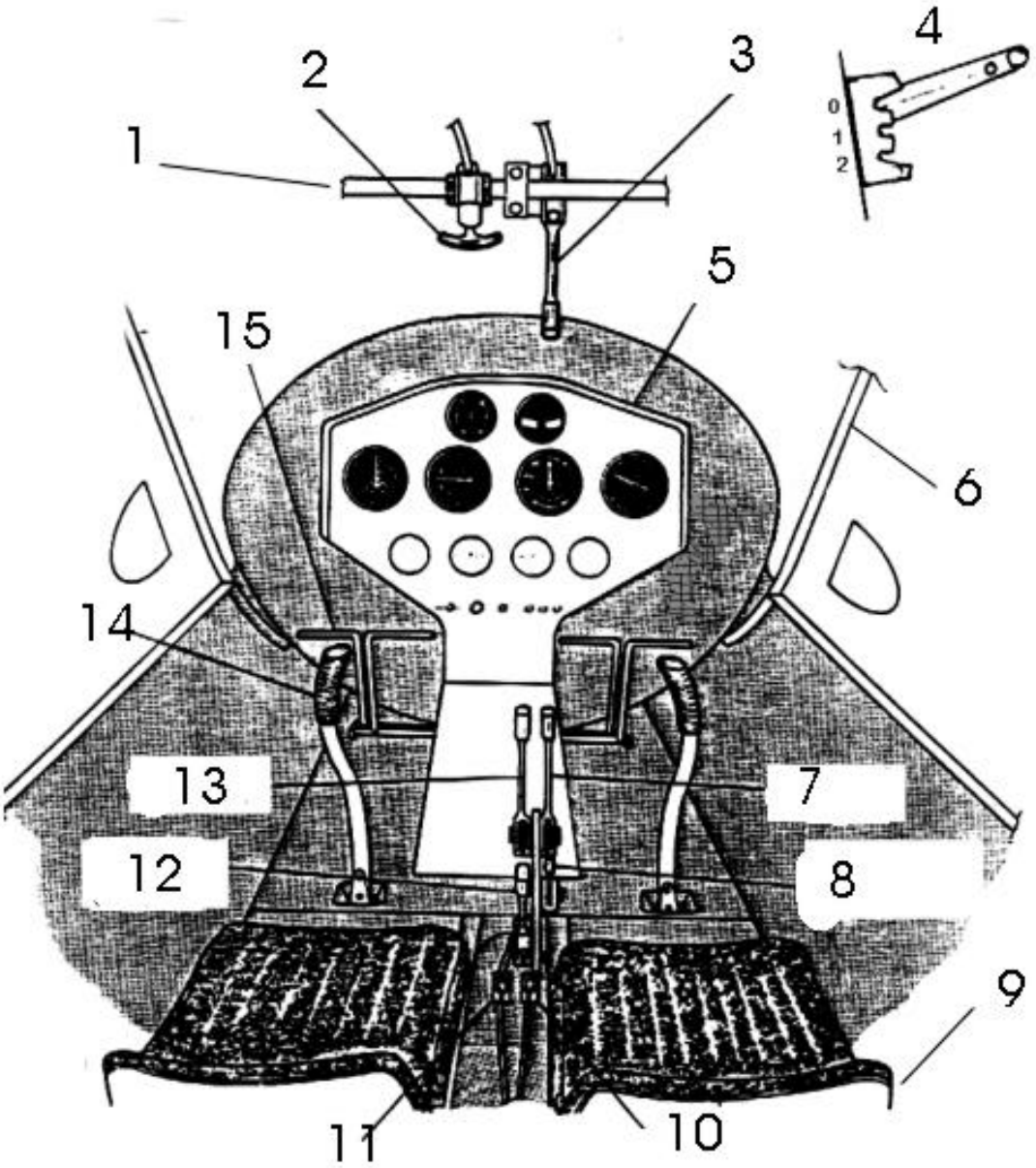


fig. 4 Sketch of Storch – part list –inside cockpit

COCKPIT LIST OF PARTS

1. Wing frame
2. Parachute handle (accessory)
3. Trim handle
4. Flap handle (located on ceiling back-side of cabin)
5. Instrument panel
6. Cabin strut
7. Right brake lever
8. Choke
9. Seat
10. Right fuel valve
11. Left fuel valve
12. Throttle lever
13. Left brake lever
14. Control lever
15. Rudder pedal

3. ROUTINE SERVICES

FUEL DRAIN

CAUTION: 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 water in the tank.

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

REFUELLING

CAUTION: use only type of gasoline as stated in engine manual.

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

PRE-FLIGHT INSPECTION

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.

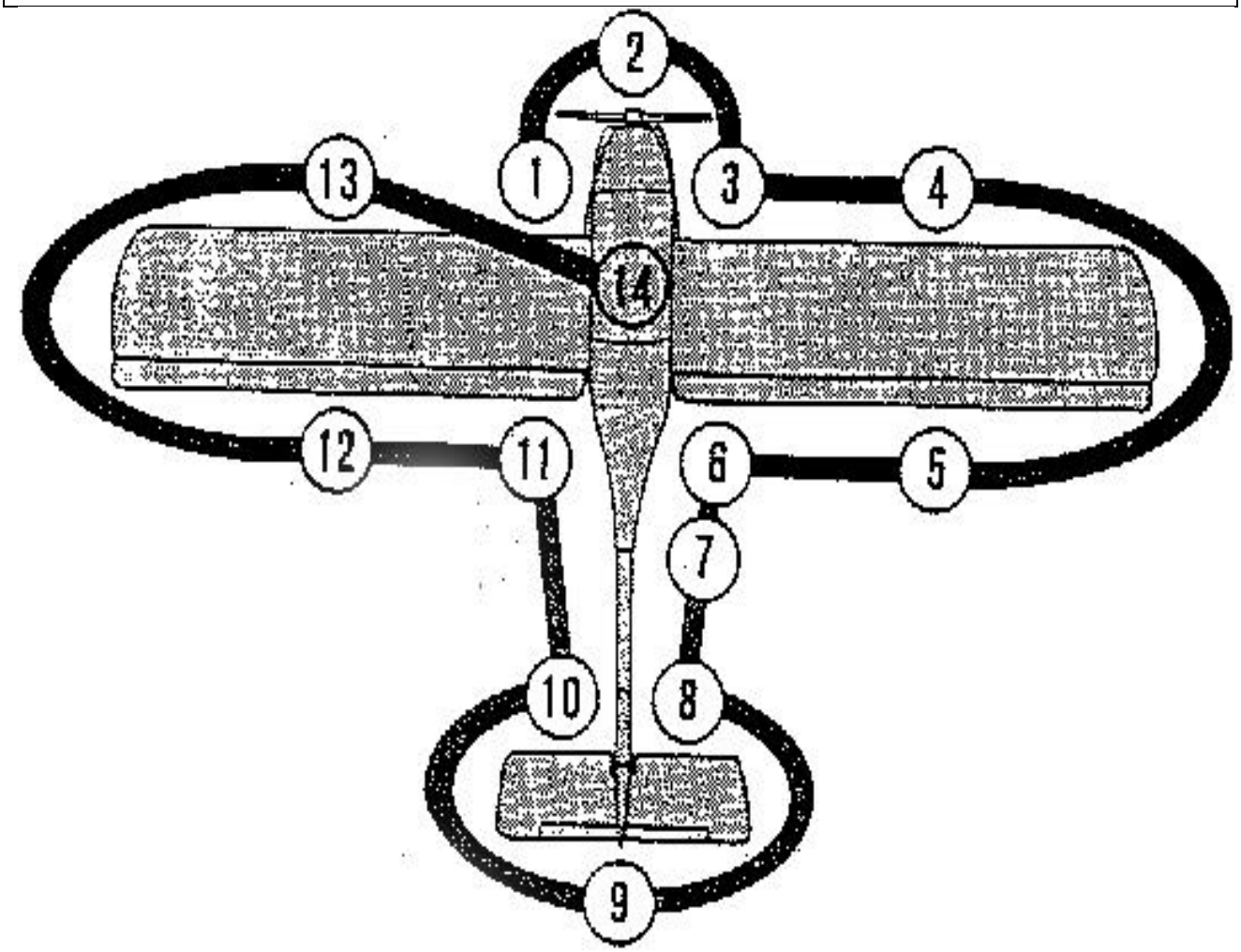


fig. 5 PRE-FLIGHT inspection path

Caution: Sight check is important to verify that there are no failures or excessive clearance.

LEFT 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

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

FUSELAGE LEFT SIDE

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

EMPENNAGE

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

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

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

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

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

ENGINE START UP

CAUTION: For safe aircraft operation a complete knowledge of engine.
The operator requires LIMITATIONS and WARNINGS.
Refer to operator's manual issued by engine 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 (if installed)		- inside limits
c)	Electrical pump		- OFF
d)	Fuel throttle:	cold engine	- minimum +0.5 cm
		Warm engine	- forward + 1 cm.
e)	Choke lever:	cold engine	- ON (completely backward) (for 15-30 sec.)
		Warm engine	- OFF (completely forward)
f)	Ensure that the propeller area is clear of any persons and objects		
g)	Ignition magneto		- ON
h)	Push button START		- max 5 sec. For each attempt
i)	Fuel throttle		- medium position
h.	Engine oil pressure		- inside limits
j)	Generator pilot lamp		- OFF
k)	Fuel pressure		- inside limits
l)	Fuel pump		- ON
m)	Head temperature		- inside limits
n)	Oil temperature		- inside limits
o)	Check ignition magneto		- max loss inside limits
p)	Check Minimum RPM		- inside limits

BEFORE TAXIING

a.	Electrical system	- On and checked
b.	Navigation instrument	- checked
c.	Flaps	- take-off position
d.	Altimeter	- adjusted on Q.N.H.
e.	Parking brakes	- OFF

TAXIING

a.	Brakes	- check each
b.	Moving parts	- check (stick and pedals)
c.	Flight instruments	- check
d.	Rpm	- hold moderate

CHECK ENGINE

a.	Brakes	- engaged
b.	Safety belts	- strapped
c.	Doors	- closed and locked
d.	Fuel	- open
e.	All temps. And press.	- In the green
f.	Fuel quantity	- check level Check during flight, quantity and Reserve
g.	Flaps	- take-off position
h.	Trim	- neutral position
I.	Commands	- free
L.	RPM-check	- inside limits
n.	Magneto-check	- maximum drop= inside limits
o.	Max rpm	- inside limits
p.	Parking brakes	- disengaged

TAKE OFF

a.	Electric pumps	- ON
b.	Power command	- move foreword in 3-4 seconds
c.	Pedals	- maintain direction

NOTE: with side component wind it may occurs to act on one of the brake levers to maintain direction
This will result in a longer take-off distance.

NOTE: do not maintain extended flaps for any reason when the speed excess limits

NOTE: the best rate of climb decreases by increasing the angle of climb.

CRUISING

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

ATTENTION: check frequently the fuel level and the engine instrument indications.

NORMAL DESCENT

a.	Altimeter	- control of the QNH value
b.	Throttle	- at minimum
c.	Engine	- inside limits
d.	Speed	- inside limits

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

FAST DESCENT

a.	Throttle	- at minimum
b.	Engine	- inside limits
c.	Flaps	- retracted
d.	Speed	- inside limits

NOTE: in hard wind condition or in wind-shear condition do not descend approach speed more Than 10 km/h, (5 knots).

NOTE: when learning do not practice overshoot under 30m (100 ft)

In case of **TOUCH AND GO**

-	Flaps	- take-off position
-	Same as take-off procedure	

AFTER TOUCH-DOWN

a.	Throttle	- at minimum
b.	Flaps	- up
c.	Let free the runway	
d.	Brakes	-

ENGINE SHUTDOWN

a.	Throttle	- at minimum
b.	Parking brakes	- engaged
c.	Electric Pump	- OFF
d.	Avionics	- OFF
e.	Magnetos	- OFF (one after the other)
f.	Contact	- OFF

FLYING IN RAINY CONDITIONS

NOTE: during a flight in rainy conditions the airplane performances are reduced, and also the visibility. Flying in heavy rain must be avoided.

4. Limitation

ENGINE LIMITATIONS **(SEE ENGINE MANUAL SPECS.)**

SPEED LIMITATIONS **(AT MAXIMUM WEIGHT)**

-Never exceed speed (V_{NE})	180 km/h
-Maneuvering speed (Va)	130m/h
-Max. Speed with extended flaps	110 km/h

MANOUVERING LIMITATIONS

Correct turn at maximum 60°

AUTHORISED MANOUVERS

(Related to normal category)

Basic flight maneuvers

PROHIBITED MANOUVRES

All aerobatic configurations

STRUCTURAL RESISTANCE

- Positive	+4
- Negative	-2

WEIGHT LIMITATIONS

- Minimum solo pilot weight	- 55 kg
- Maximum solo pilot weight	- 105 kg
- Maximum pilot and pass. Weight	- 172 kg
- Maximum take-off weight	- 450 kg

NOTE: in case that the maximum authorized take-off weight is exceeded, the flight performance will
Decrease in all conditions.

WEIGHT & BALANCE LIMITATIONS

The reference point (RD) in relation to determinate the position of the center of gravity, is tangent to the leading edge and perpendicular to the ground when the airplane is static or in flight, and when the axis of the airplane is horizontal. The weight calculation procedure and the determination of the center of gravity are related to the concerning chapter.
The position and the center of gravity (C.G.) are 402 mm to 482 mm (30-36%) of the reference (datum) (RD).

ATTENTION: when the weight and balance limitations are exceeded the dynamic stability and maneuvers will be reduced or unacceptable for a safe flight.

FLIGHTS LIMITS

Aircraft use is PROHIBITED under following weather conditions:

FLIGHT IN HEAVY RAIN
FLIGHT IN HAIL
FLIGHT IN SNOW

5. EMERGENCY PROCEDURE

INTRODUCTION

The following chapter contains a controls, checklist, and operation instruction to resolve emergency procedures. Problems due to engine failure, other than emergencies, due to a non correct use and a restraint
Pre-flight check.

When an emergency procedure is needed, a correct way to resolve the problem is the procedure described in the flight manual for a particular emergency. The knowledge and the experience of the pilot concerning this specific airplane are essential to resolve the problem.

ENGINE FAILURE

Proceed to a forced landing.

POWER FAILURE

a.	Fuel	- check both tanks
b.	Fuel handle	- selected
c.	Electric pump	- ON
d.	Magneto's	- ON (check)
e.	Throttle	- course check
f.	In case of no results	- decrease engine rpm and land a.s.a.p.

LOW ENGINE OIL PRESSURE

a.	Oil temperature	- check
b.	Oil pressure is not in the green, But the temperature has a normal value	- land at the nearest airport
c.	Oil pressure above the green	- reduce rpm at minimum Land as soon as possible - Prepare for a forced landing

LOW FUEL PRESSURE

a.	Electric pumps	- ON
b.	Check fuel level in the tank	- when low, land as soon as possible or prepare a forced landing
c.	Switch fuel tank	- waits 3-4 seconds and checks fuel pressure when the pressure is at value, restart the engine

RESTARTING

a. Flaps - retracted
b. Electrical pump - ON
c. Magnetos - ON
d. Fuel tanks valve - open
e. Electric instruments - ALL OFF
f. Push start button - START

After engine recovering

a. Oil pressure - in the green
b. Choke - OFF (full forward)
c. Electric instruments - ON as needed
d. Oil temp. - CHECK (in the green)

ENGINE FAILURE DURING TAKE-OFF

a. Throttle - reduce to minimum
b. Brakes - brake gently (no wheel-blocking)

ENGINE FAILURE AFTER TAKE-OFF DURING CLIMB

a. Choose a safe landing zone,
b. Throttle - full foreword
c. Choke - OFF (full foreword)
d. Fuel tank (switch) - fully open
e. Magnetos - ON
f. Fuel pump - ON
g. Restart - try

ATTENTION: if the engine restarts, proceed for a secure climb and land for a check.

If the engine will not start, proceed to a forced landing.

a. Fuel switch - OFF
b. Magnetos - OFF
c. Contact - OFF

ATTENTION: **don't turn back! Do not try to land down wind!** .

During this attitude you will loose 100- 300 ft., or you may even loose controls witch will end in a very dangerous spin at low altitude

FORCED LANDING WITH ENGINE STOPPED

a. Speed - best glide ratio
b. Flaps - 2nd position
c. Fuel tanks - OFF
d. Magnetos - OFF
e. Main switch - OFF

PRECAUTIONAL EMERGENCY LANDING

NOTE: A precaution emergency landing can only be effectuated in case that the situation is such that the airport of departure or destination cannot be reached in safe conditions. This without endangering the occupants and, or the airplane.

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 - UP
e. Make a security flew-over to ensure that the area is clear and safe to land, if the conditions allow it, make an precaution approach, and overshoot
f. Final approach - check speed
g. Throttle - set to maintain a correct approach speed
h. Electric pump - ON
i. Flaps - 2-3rd position
j. Touchdown must be effectuated at the lowest poss. speed, maintain the front wheel lifted as long as poss.

After contact:

a. Fuel - OFF
b. Magneto - OFF
c. Main switch - OFF

NOTE: if there is no convenient landing area close by, try to land an upward run, note that your touchdown speed must be higher than a landing on a flat area.

FIRE ON THE GROUND AND DURING STARTING PROCEDURE

a. Fuel switch - OFF
b. Brakes - engaged
c. Throttle - full open
d. Battery - OFF
e. Main switch - OFF
f. Propeller - stopped
g. Leave airplane

FIRE DURING FLIGHT

a. Fuel - OFF
b. Throttle - fully 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.

FIRE IN FLIGHT DUE TO AN ELECTRICAL FAILL. (WITH SMOKE)

a. Electrical users (avionics) - OFF
c. Ventilation - open
e. Avionics and master - OFF
f. Electrical users - OFF
g. Main switch - OFF
h. Land as soon as possible

FIRE ON THE GROUND DUE TO AN ELECTRICAL FAIL. (WITH SMOKE)

a. Main switch - OFF

With engine started:

b. Throttle - at minimum
c. Fuel switch - OFF
d. Magneto - OFF
e. Doors - open
f. Fire extinguisher - if needed

FIRE IN THE COCKPIT DURING FLIGHT

a. Battery - OFF
b. Ventilation - open
c. Extinguisher - if needed
d. Land as soon as possible

NON INTENTIONAL FLIGHT IN ICING CONDITIONS

a. Change angle and flight direction
b. Engine air box heating- (if provided) - ON
c. Move continuous the flight commands
d. Increase the rpm of the propeller
e. Cabin heat - ON

ATTENTION: in case of ice on the leading edge of the wing the stall speed will increase

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 ultra-light, even at low speed, it is improbably 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.

LANDING WITH A FLAT TIRE

a. Fulfill a normal procedure with a full flap setting landing
b. after landing switch off contact and engine (magneto, main contact, fuel: OFF)
c. Touch down must be effectuated on the inflated tire
d. Maintain the wing-up on the flat tire side
e. After contact, brake on the inflated side and maintain direction

LANDING WITH BRAKE FAILURE

Land at the lowest possible speed (a landing on a grass area will be preferred because of the higher resistance and better drag)
After contact: make small direction changes to increase landing run

a. Magneto - OFF
b. Main switch - OFF

GLIDE

a. Flaps - 0°

NOTE: full attention must be given to the wind direction.

ELECTRIC PLANT 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 airport

NOTE: when the battery is in good or sufficient condition to continue one hour of flight in complete safety,
Insure that the electrical power needed to extend the flaps and to engage the fuel pump will be available during the approach and landing.

LOW TENSION INDICATOR ILLUMINATED

- 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 it
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. Landing light illuminated and low volt value
Probable generator or fuse failure - land A.S.A.P.
d. After landing - CHECK PREVIOUS POINTS

FLAPS FAILURE

a. Visual if the flaps are extended
b. Reduce the speed to the limit
c. In landing configuration remind that the lift is reduced.

Landing with flaps UP

a. Increase the speed in final with10 km/h (5 knots)
b. In case of engine failure maintain the flight limits.
c. The approach must be effectuated in a flat flight configuration

Landing with the flaps in T/O position

a. Maintain a normal landing speed
b. With engine failure maintain the flight limits
c. The approach must be effectuated in a flat flight configuration

ENGINE STARTER FAILURE

a. Throttle - at minimum
b. Magneto - OFF

6. SPECIFICATIONS / PERFORMANCES

The performances is this chapter referring to the following airplane configuration:

Empty weight	- 283 kg
TOTAL at minimum T.O.W.	- 355 kg
Maximum T.O.W.	- 450 kg

These take-off and landing limits referring to a dry grass runway ISA and ISA +13°C.

CORRECTION TO THE INDICATED AIRSPEED (IAS)

The air speed pitot notes a dynamic pressure related to the angle of influence and the speed; because of the direct proportional relation between the air pressure and the air speed, the speed indicated on the instrumental the Z angle must be corrected referring to the real speed of the airplane to the ground speed (TAS)
The result after this correction is that under an angle the speed of the airplane increases.

WIND INFLUENCE

Wind influence (in front, in the back, or sideward), has a big influence to the ground speed of the airplane.
With a headwind component the landing and take-off will in a slower ground speed and a shorter run.
A backwind will result in a longer run and an increased ground speed during landing and take-off.
NOTE: we refer here to the concerned chapter

With a headwind component: the take-off and landing run will be shorter app. 8-10 meters each 5km/h that the wind increases

Example: with a headwind of 10 km/h the landing run will be 16-20 meters shorter.

With a side wind component: we need to remember that a side wind with a certain angle to the runway results in two components: one, regarding to the direction of the runway, and another 90° crossing the runway. For this resulting value please refer to the diagram at page 40 of the relative chapter.

CLIMB

The related figure can be found in the diagram, which related the climb and the engine setting at maximum continuous RPM (3300 RPM/ min.). This diagram is related to M.S.L., the number of occupants and the ambient temperature.

Climb speed

- V_x – Max. Rate of climb – this is the best speed to obtain the maximum gain in angle of climb related to the ground distance.

- V_y –Max. Climb speed – this is the best climb speed related to the maximum climb speed.

CRUISE

The diagram is related to the cruise speed in function of the installed propeller type and the number of occupants at M.S.L., with an engine setting at 2800 RPM.

LANDING

The concerning diagrams referring the landing distance including a 15 meters obstacle at M.S.L. This diagram is related to the runway type, the number of occupant's en the ambient temp.

MAXIMUM RATE OF GLIDE CONFIGURATION

In case of engine failure during climb without restarting possibility it is very important to assume the best rate of glide to reach a landing area. Important is to maintain the lowest angle of descent versus the lowest rate of descent. For the STORCH CL the indicated airspeed related to the maximum glide rate =(E=13.8) at:

$V_{eff.max}$ = 89 km/h (IAS) with 1st position flaps

Following index indicates the maximum distance to go related to the height at the max. Glide rate setting.

fig. 6 Table showing available distance from each altitude at best glide ratio

Height in feet	Distance in statutary miles
328	0,86
656	1,71
984	2,57
1312	3,43
1640	4,29
1968	5,14
2297	6,00
2625	6,86
2953	7,72
3281	8,57

7. Diagrams & CHARTS

fig. 7 ROLL DISTANCE / TAKE-OFF DISTANCE -

Second norm BCAR SECTION S , S-75
CONDITIONS I.S.A.: TEMP.: 15° C - PRESS.: 760 mmHg –M.S.L.

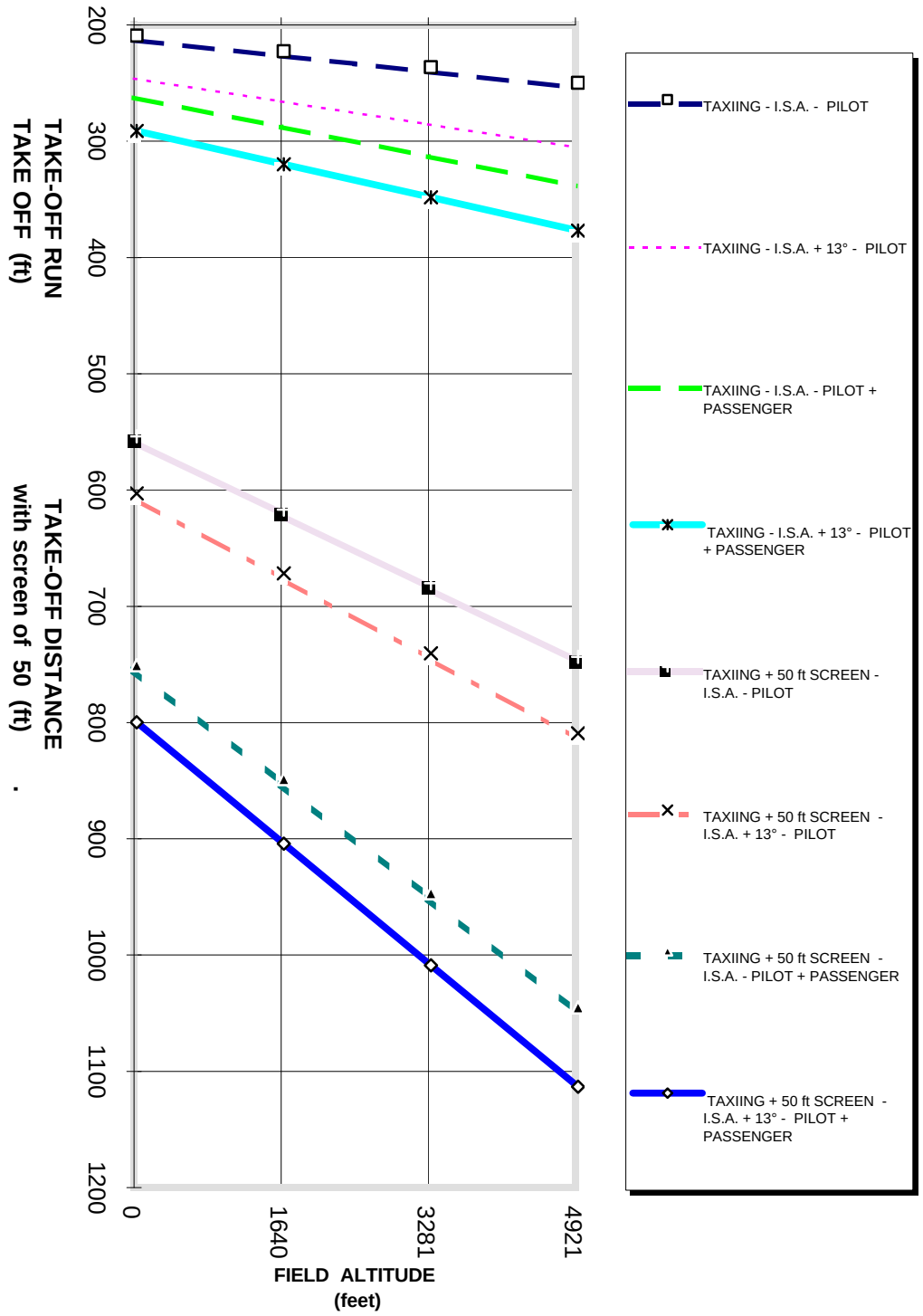
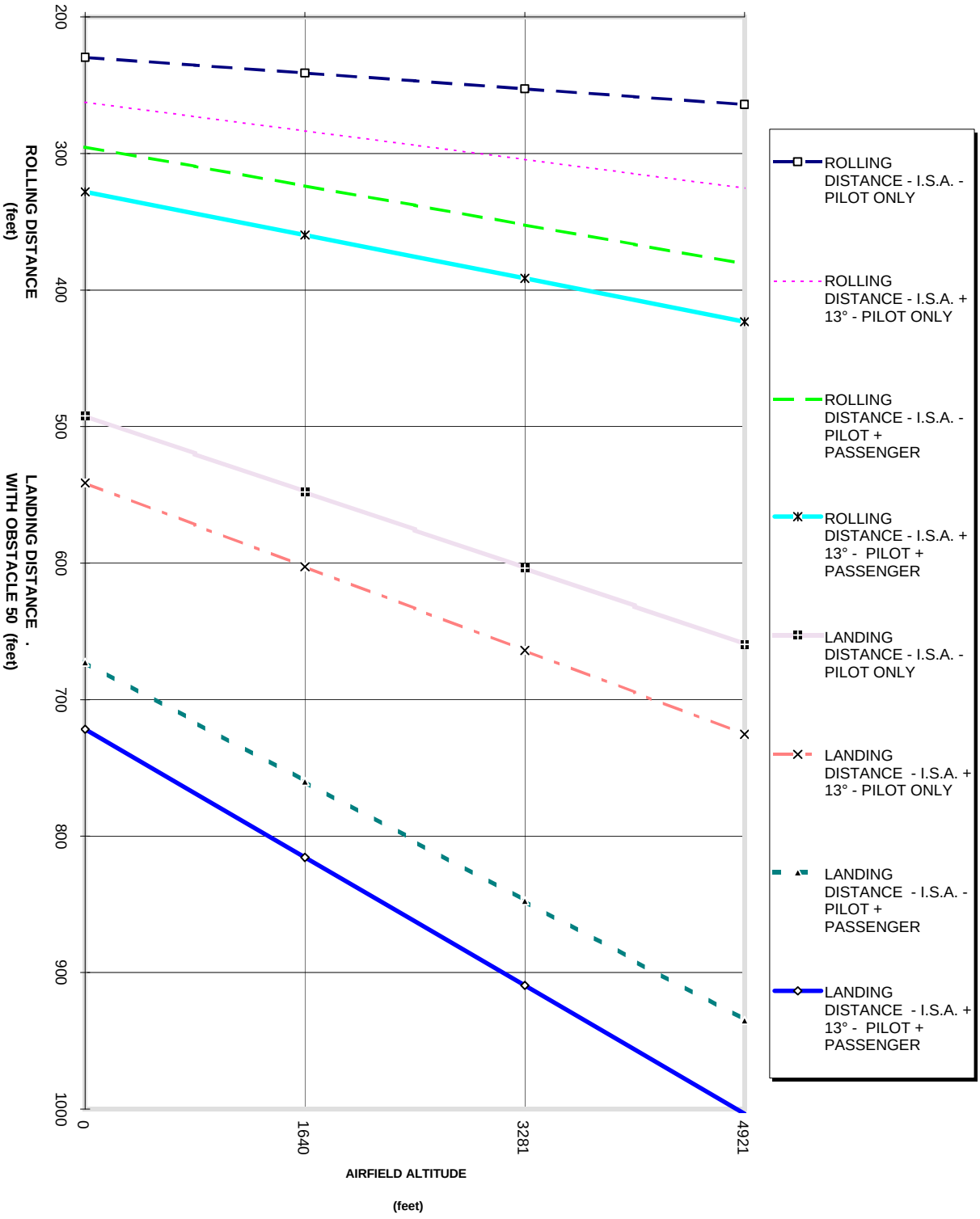


fig. 8 LANDING RUN / LANDING DISTANCE

standard BCAR SECTION S
CONDITIONS I.S.A.: TEMP.: 15° C - PRESS.: 760 mmHg – M.S.L.



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;) .

fig. 9 RELATIVE WIND DIAGRAM VERSUS WIND COMPONENT

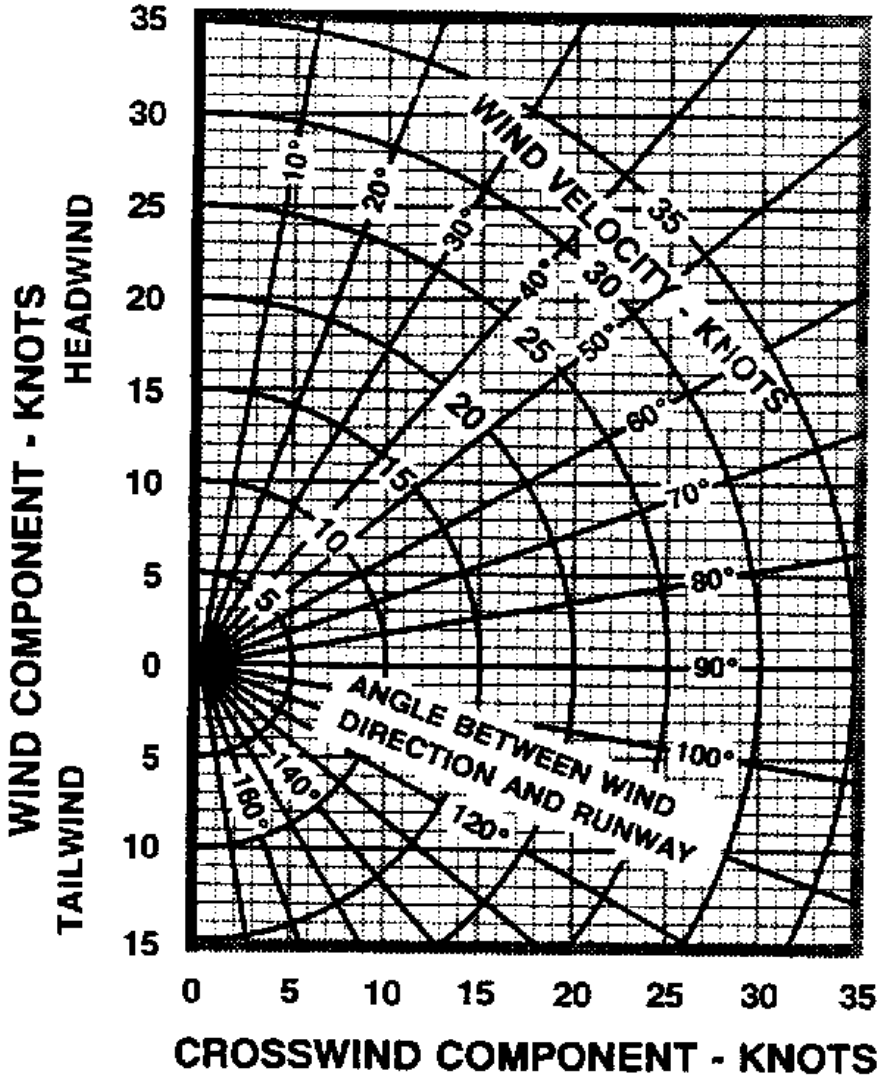


fig. 10 MAX. RATE OF CLIMB DIAGRAM AT MAXIMUM RPM

Second norm BCAR SECTION S , S-65
I.S.A. CONDITIONS:
Temp.:15° C- Press.:760 mmHg- M.S.L.

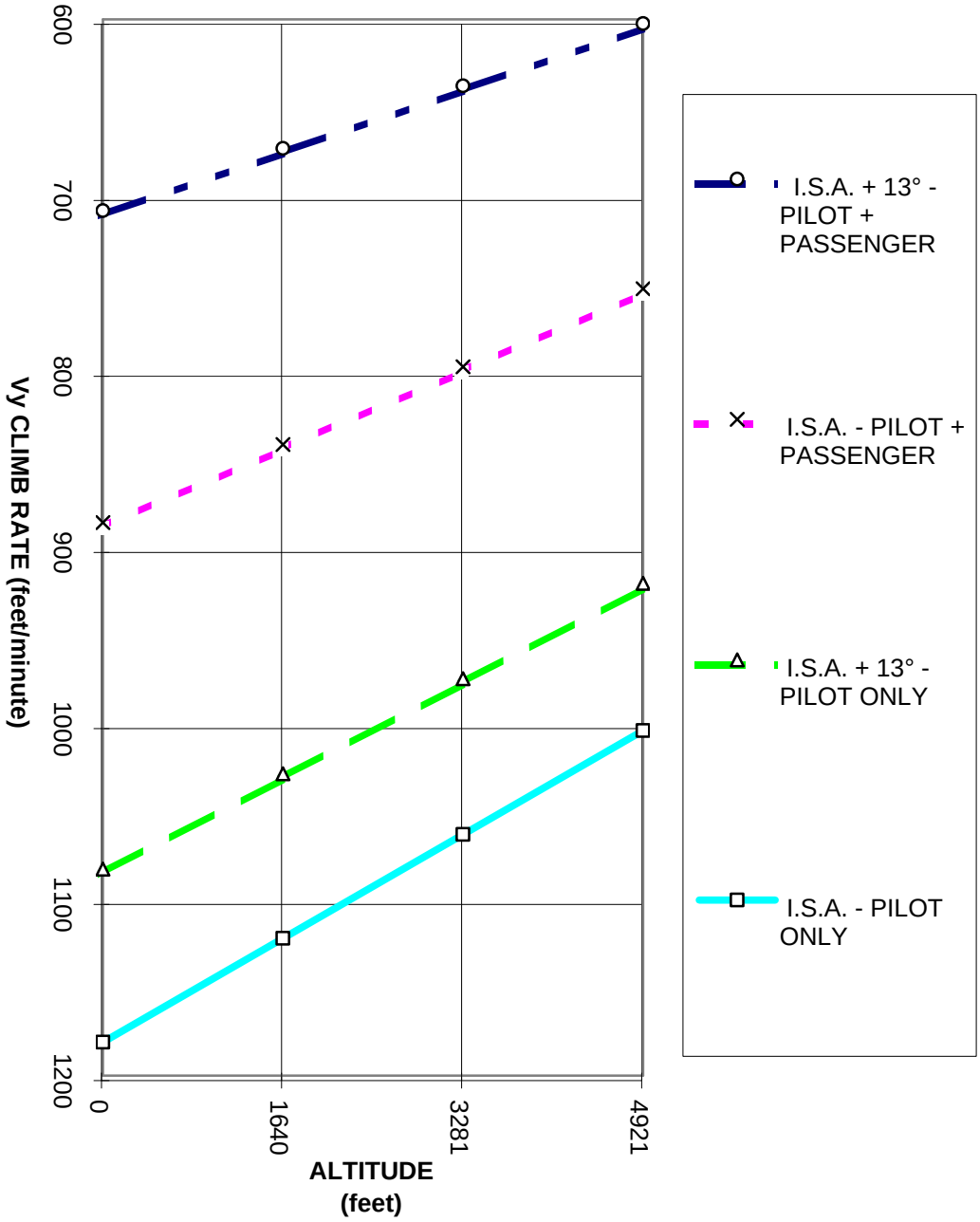
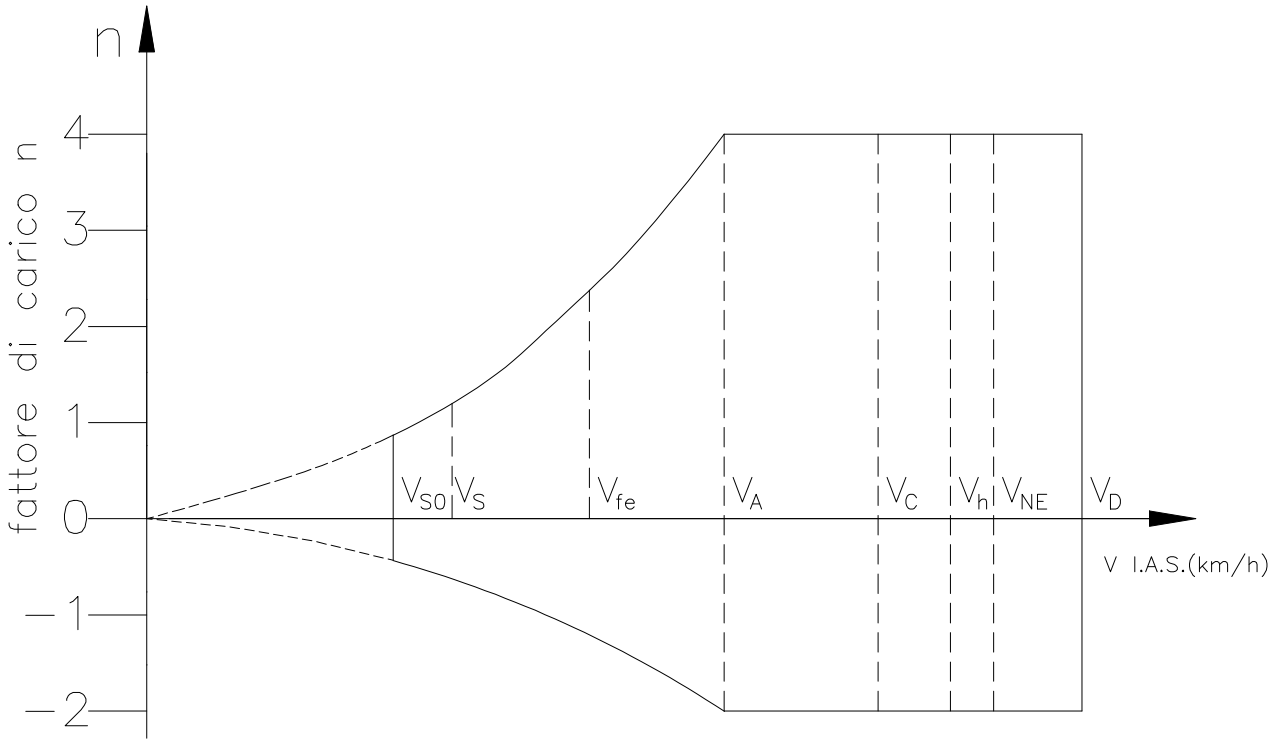


fig. 11 FLIGHT ENVELOPE



LEGEND

Vso =	Stall speed with extended flaps	57	km/h
Vs =	Stall speed with retracted flaps	63	km/h
Vfe =	Maximum speed with extended flaps (30°)	110	km/h
Va =	Maneuvering speed	130	km/h
Vc =	Cruise speed	151	km/h
Vh =	Maximum leveled flight speed	165	km/h
Vne =	Velocity never to exceed	180	km/h
Load factor		+4/-2	

8. WEIGHT AND BALANCE

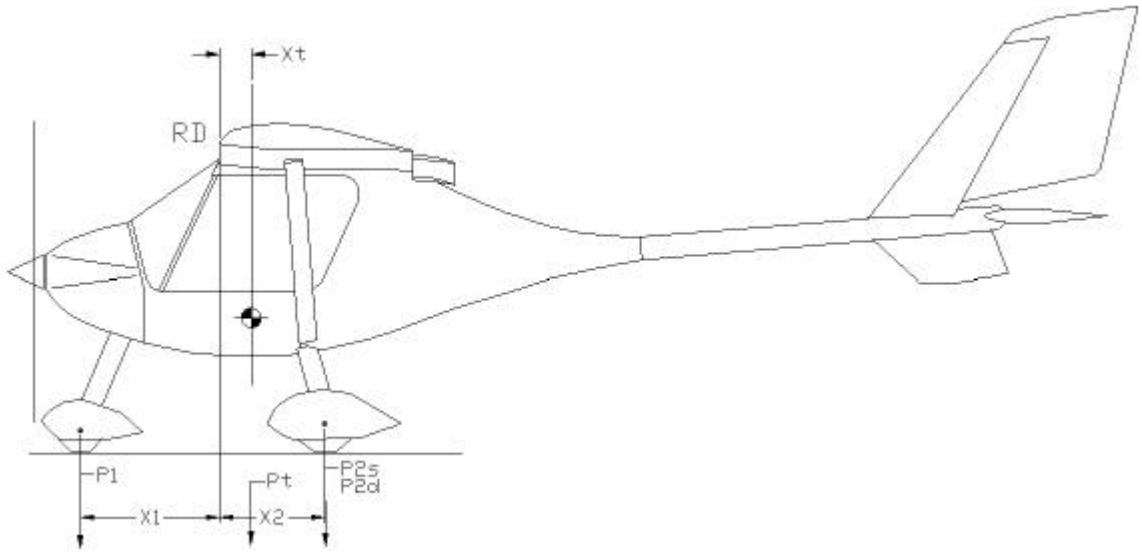
GENERAL

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 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 work.



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

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

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, anti-freeze liquid, 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 delivery of the airplane 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
Oil, cooling liquid
Non usable fuel

Support	Full weight kg	Tare kg	net weight kg	Arm m
Frontal (P_1)				X_1 =
Outside left (P_{2S})				X_{2S} =
Outside right (P_{2D})				X_{2D} =
Empty weight P_T =				kg.

Position of the CG related to the empty weight:

Moment in empty weight configuration: $M_L = P_T \times X_T$ = _____x_____=_____ 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

9. APPENDIX

fig. 12 CONVERSION TABLE KILOMETERS/HOUR (km/h) – KNOTS

KILOMETERS/HOUR (km/h) - KNOTS

km/h		knots	km/h		knots	km/h		knots
1,9	1	0,4	63,0	34	18,3	124,2	67	36,2
3,7	2	1,1	64,9	35	18,9	126,0	68	36,7
5,6	3	1,6	66,7	36	19,4	127,9	69	37,2
7,4	4	2,2	68,6	37	20,0	129,7	70	37,8
9,3	5	2,7	70,4	38	20,5	131,6	71	38,3
11,1	6	3,2	72,3	39	21,0	133,4	72	38,9
13,0	7	3,8	74,1	40	21,6	135,3	73	39,4
14,8	8	4,3	76,0	41	22,1	137,1	74	39,9
16,7	9	4,9	77,8	42	22,7	199,0	75	40,5
18,5	10	5,4	79,7	43	23,2	140,8	76	41,0
20,4	11	5,9	81,5	44	23,7	142,7	77	41,5
22,2	12	6,5	83,4	45	24,3	144,6	78	42,1
24,1	13	7,0	85,2	46	24,8	146,4	79	42,6
25,9	14	7,6	87,1	47	25,4	148,3	80	43,2
27,8	15	8,1	89,0	48	25,9	150,1	51	43,7
29,7	16	8,6	90,8	49	26,4	152,0	82	44,2
31,5	17	9,2	92,7	50	27,0	153,8	83	44,8
33,4	18	9,7	94,5	51	27,5	155,7	84	45,3
35,2	19	10,3	96,4	52	28,1	157,5	85	45,9
37,1	20	10,8	98,2	53	28,6	159,4	86	46,4
38,9	21	11,3	100,1	54	29,1	161,2	87	46,9
40,8	22	11,8	101,9	55	29,7	163,1	88	47,5
42,6	23	12,4	103,8	56	30,2	164,9	89	48,0
44,5	24	13,0	105,6	57	30,8	166,8	90	48,6
46,3	25	13,5	107,5	58	31,3	168,6	91	49,1
48,2	26	14,0	109,3	59	31,8	170,5	92	49,6
50,0	27	14,6	111,2	60	32,4	172,3	93	50,2
51,8	28	15,1	113,0	61	32,9	174,2	94	50,1
53,7	29	15,6	114,9	62	33,5	176,1	95	51,3
55,6	30	16,2	116,8	63	34,0	177,9	96	51,8
57,4	31	16,7	118,6	64	34,5	179,8	97	52,3
59,3	32	17,3	120,5	65	35,1	181,6	98	52,9
61,2	33	17,8	122,3	66	35,6	183,5	99	53,4

fig. 13 CONVERSION TABLE KNOTS (knots) – METERS / SECONDS (m/sec.)

	0	1	2	3	4	5	6	7	8	9
0	0,0	0,5 14	1,0	1,5	2,1	2,6	3,1	3,6	4,1	4,6
10	0,5	5,7	6,2	6,7	7,2	7,7	8,2	8,7	9,3	9,8
20	10,3	10,8	11,3	11,8	12,3	12,9	13,4	13,9	14,4	14,9
30	25,4	15,9	16,5	17,0	17,5	18,0	18,5	19,0	19,5	20,1
40	20,6	21,1	21,6	22,1	22,6	23,2	23,7	24,2	24,7	25,2
50	25,7	26,2	26,8	27,3	27,8	28,3	28,8	29,3	29,8	30,4
60	30,9	31,4	31,9	32,4	32,9	33,4	34,0	34,5	35,0	35,5
70	36,0	36,5	37,0	37,6	38,1	38,6	39,1	39,6	40,1	40,6
80	41,2	41,7	42,2	42,7	43,2	43,7	44,2	44,8	45,3	45,8
90	46,3	46,8	47,3	47,8	48,4	48,9	49,4	49,9	50,4	50,9

fig. 14 VERTICAL SPEED (m/sec.) ’ (feet/min.)

SPEED IN METERS PER SECOND (m/sec) RELATIVE TO SPEED IN 100 FEET PER MINUTE (l00 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	1	2,0	17,3	34	66,9	34,0	67	131,9
1,0	2	3,9	17,8	35	68,9	34,5	68	133,9
1,5	3	5,9	18,3	36	70,9	35,1	69	135,8
2,0	4	7,9	18,8	37	72,8	35,6	70	137,8
2,5	5	9,8	19,3	38	74,8	36,1	71	139,8
3,0	6	11,8	19,8	39	76,8	36,6	72	141,7
3,6	7	13,8	20,3	40	78,7	37,1	73	143,7
4,1	8	15,7	20,8	41	80,7	37,6	74	145,7
4,6	9	17,7	21,3	42	82,7	38,1	75	147,6
5,1	10	19,7	21,8	43	84,6	38,6	76	149,6
5,6	11	21,7	22,4	44	86,6	39,1	77	151,6
6,1	12	23,6	22,9	45	88,6	39,6	78	153,5
6,6	13	25,6	23,4	46	90,6	40,1	79	155,5
7,1	14	27,6	23,9	47	92,5	40,6	80	157,5
7,6	15	29,5	24,4	48	94,5	41,1	81	159,4
8,1	16	31,5	24,9	49	96,5	41,7	82	161,4
8,6	17	33,5	25,4	50	98,4	42,2	83	163,4
9,1	18	35,4	25,9	51	100,4	42,7	84	165,4
9,7	19	37,4	26,4	52	102,4	43,2	85	167,3
10,2	20	39,4	26,9	53	104,3	43,7	86	169,3
10,7	21	41,3	27,4	54	106,3	44,2	87	171,3
11,2	22	43,3	27,9	55	108,3	44,7	88	173,2
11,7	23	45,3	28,4	56	110,2	45,2	89	175,2
12,2	24	47,2	29,0	57	112,2	45,7	90	177,2
12,7	25	49,2	29,5	58	114,2	46,2	91	179,1
13,2	26	51,2	30,0	59	116,1	46,7	92	181,1
13,7	27	53,2	30,5	60	118,1	47,2	93	183,1
14,2	28	55,1	31,0	61	120,1	47,8	94	185,0
14,7	29	57,1	31,5	62	122,0	48,3	95	187,0
15,2	30	59,1	32,0	63	124,0	48,8	96	189,0
15,7	31	61,0	32,5	6.04	126,0	49,3	97	190,9
16,3	32	62,9	33,0	6.05	128,0	49,8	98	192,9
16,8	33	65,0	33,5	66	129,9	50,3	99	194,9

fig. 15 AIR CORRECTION TABLE

ICAN (INTERNATIONAL COMMITTEE AIR NAVIGATION) TEMPEPATURE. 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	Relative	Correction
Feet	Meters	C.	F.	pressure	density	factors
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	o,8320	0,8616	1,0773
6.000	1829	3,113	37,603	0,8013	0,8358	1,094
1.000	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
12000	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
16000	4877	-16,7	1,941	0,5418	0,6088	1,2816
17.000	5182	-18,68	-1,625	0,5202	0,5891	1,3029

fig. 16 CONVERSION TABLE meters/feet

METER S(m)/FEET (ft)

m		ft.	m		ft.	m		ft.
0,30	1	3,28	10,36	34	111,55	20,42	67	219,82
0,61	2	6,56	10,67	35	114,83	20,73	68	223,10
0,91	3	9,84	10,97	36	118,11	21,03	69	226,38
1,22	4	13,12	11,28	37	121,39	21,34	70	229,66
1,52	5	16,40	11,58	38	124,67	21,64	71	232,94
1,83	6	19,69	11,89	39	127,95	21,92	72	236,22
2,13	7	22,97	12,19	40	131,23	22,25	73	239,50
2,44	8	26,25	12,50	41	134,51	22,56	74	242,78
2,74	9	29,53	12,80	42	137,80	22,86	75	246,06
3,05	10	32,81	13,10	43	141,08	23,16	76	249,34
3,35	11	36,09	13,41	44	144,35	23,47	77	252,63
3,66	12	39,37	13,72	45	147,64	23,77	78	255,91
3,96	13	42,65	14,02	46	150,92	24,08	79	259,19
4,27	14	45,93	14,33	47	154,20	24,38	80	262,47
4,57	15	49,21	14,63	48	157,48	24,69	81	265,75
4,88	16	52,49	14,94	49	160,76	24,99	82	269,03
5,18	17	55,77	15,24	50	164,04	25,30	83	272,31
5,48	18	59,06	15,54	51	167,32	25,60	84	275,59
5,79	19	62,34	15,85	52	170,60	25,91	85	278,87
6,10	20	65,62	16,15	53	173,88	26,21	86	282,15
6,40	21	68,90	16,46	54	177,17	26,52	87	285,43
6,71	22	72,18	16,76	55	180,45	26,82	88	288,71
7,01	23	75,46	17,07	56	183,73	27,13	89	292,00
7,31	24	78,74	17,37	57	187,01	27,43	90	295,28
7,62	25	82,02	17,68	58	190,29	27,74	91	298,56
7,95	26	85,30	17,98	59	193,57	28,04	92	301,84
8,22	27	88,58	18,29	60	196,85	28,35	93	305,12
8,53	28	91,86	18,59	61	200,13	28,65	94	308,40
8,83	29	95,14	18,90	62	203,41	28,96	95	311,68
9,14	30	98,43	19,20	63	206,69	29,26	96	314,96
9,45	31	101,71	19,51	64	209,97	29,57	97	318,24
9,75	32	104,99	19,81	65	213,26	29,87	98	321,52
10,05	33	108,27	20,12	66	216,54	30,18	99	324,80

fig. 17 CONVERSION OF ALTITUDE PRESSURE FROM mb TO inch Hg

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	abar=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

fig. 18 TABLE WITH. STANDARD. ATM. CONVERSION

z (m)	z (ft)	t (°C)	T (°K)	T/T_0	p (mm.Hg)	p (Kg/m^2)	p/p_0	r (kgs^2/m^4)	g (Kg/m^4)	d	1/S d	V_S (m/s)	n*10 exp 6 (m^2/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	133,4	0,997	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	1522
700	2297	10,45	283,45	0,9842	699	9503	0,9197	0,1168	1,1454	0,9344	1,0345	337,8	1534
800	2625	9,8	282,8	0,9819	690,6	9389	0,9087	0,1156	1,1342	0,9254	1,0395	337,4	15146
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