

AIRPLANE FLIGHT MANUAL

Savannah

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LOG OF REVISIONS

Revision Number	Revised Pages	Description of Revision	Date
00	All	New emission	03/01
01	All	Corrections	04/01
02	6 to11,18, 21,24,28, 32,34	Corrections	10/02
03	2,3,14,	Correction	10/02
04	2,3,14	Note on Instruments	July '03
05	2,3,5,8,9, 10	Note on Engine	July '03
06	2,3,6		

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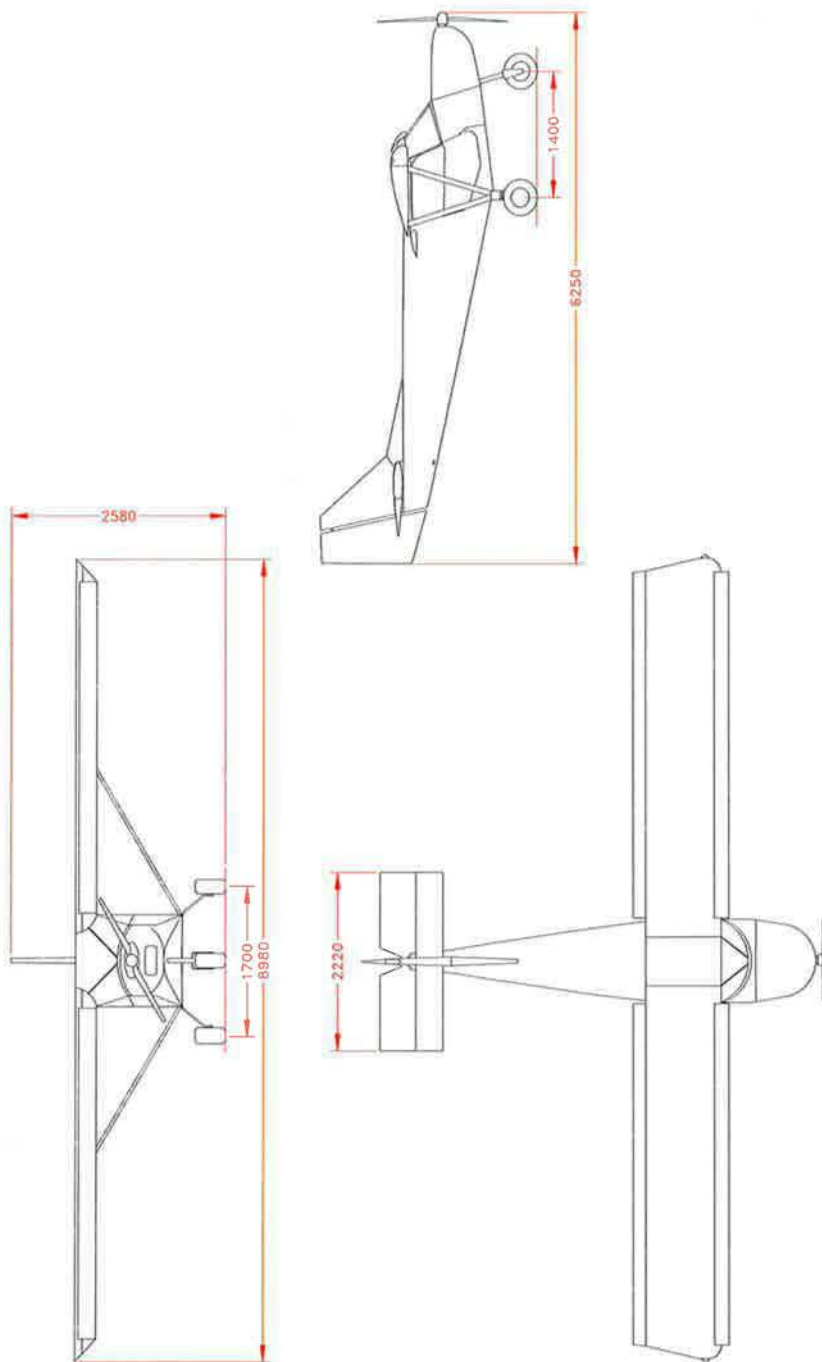
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AIRPLANE THREE VIEW



1.1 GENERAL SPECIFICATIONS

Dimensions

Wing span	30.0/9.0	ft/m
Wing area	141/12.7	sq. ft/m ²
Length	21.3/6.5	ft/m
Height	8.0/2.45	ft/m
Propeller diameter	68/1.73	in/m

Weights

Maximum take-off weight	1000/454	lbs/kg
Empty weight	600/272	lbs/kg
Useful load	400/182	lbs/kg

NOTE: empty weight may increase and is depended on the optional equipment installed as per the customer requirements

Powerplant

Engine	DIMENSION	ROTAX 912 UL	ROTAX912 ULS
Take off performance		59.6 kW (5800 rpm)	75.3 kW (5800 rpm)
Displacement	cu.in/cm ³	73.9/1211	82.5/1352
Compression ratio		9.0:1	10.5:1
Fuel consumption (75% power)	gph/lt/h	4.3/16.2	4.9/18.5

Fuel and oil

Fuel capacity	72	lt
Fuel grade	Mogas/Avgas	100/100 LL
Oil capacity	3/3.16	lt/US qts

Landing gear

Wheel track	5.6/1.7	ft/m
Tire size	6	in
Tire pressure	14.5/1	psi/bar

1.2 STRUCTURE

The aircraft is a monoplane type, with two side-by-side seats, fitted with a high wing supported by struts. The wing presents a “high lift” NACA 650-18 modified airfoil with fixed slats along the full wing span and Junkers type flaperon (aileron + flap). The airframe structure is a full-metal one with load-resisting panels. The horizontal tailplane features a symmetric bi-convex airfoil. The rudder is attached to the fixed vertical fin. The dorsal fin is fitted to improve the directional stability.

1.3 LANDING GEAR

The aircraft is fitted with a tri-cycle type landing gear. The main landing gear is made by a single-piece aluminium alloy single-leaf leg. The nose landing gear is fitted with a telescopic, elastic chord shock absorber, and is steerable in order to ease the taxiing.

1.4 ENGINE

The engines installed onboard the aircraft are the ROTAX 912 ULS or ROTAX 912 UL. Please refer to Engine manual for any data and specifications.

WARNING: the installed engine, by its design is subject to sudden stoppage. Engine stoppage can result in crash landings, forced landings or no power landings. Such crash landings can lead to serious bodily injury or death. Never fly the aircraft equipped with the engine at locations, airspeeds, altitudes, or other circumstances from which a successful no power landing cannot be made, after sudden engine stoppage. Aircraft equipped with this engine must only fly in DAYLIGHT VFR conditions. The installed engine is not a certificated aircraft engine. It has not received any safety or durability testing, and conforms to no aircraft standards. This is for use in experimental, uncertificated aircraft and vehicles only in which an engine failure will not compromise safety. User assumes all risk of use and acknowledges by his use that he knows this engine is subject to sudden stoppage.

1.5 ENGINE CONTROLS

There are two vernier type (push-pull) throttle controls fitted with a friction adjusting knob. The mixture control is located near to pilot's side throttle control. The air-box control (Rotax 912 ULS) is located near the throttle control: pull for hot air to carburetors, push for cold air to carburetors (for values of temperature to maintain see chapter 2.3).

The key-operated master switch connects the electrical system to the 12V battery. The whole electrical system is protected by thermal type re-settable breakers.

The engine can be operating with the master switch OFF and the breakers OFF since the ignition system is independent and can be cut-off by switching OFF the two magneto switches only. With the master switch OFF any electrical instrument and all other electrical devices, electric engine starter included, won't be operating.

WARNING: The engine may be started-up with the master switch OFF if even one magneto switch only is ON, when the propeller is hand rotating or due to windmilling. For safety, it's strongly recommended to pull-out the master switch key when the engine is shut-off.

The master switch key is located near to the pilot's throttle. All the switches and the engine controls commute to ON if moved UPWARD or FOREWARD. The mixture control only, is activated pulling it BACKWARD.

1.6 PROPELLER

The aircraft features the following propeller:

- "DUC Helice", 3 blades in carbon fiber (Rotax 912 ULS), adjustable on ground.
- "DUC Helice", 2 blades in carbon fiber (Rotax 912 UL), adjustable on ground.

1.7 FUEL SYSTEM

With reference to fig. 1 on page 11, the fuel system is equipped with two tanks (1, 2). They are installed into the wings and have a 72 lt. capacity. The filler caps include a vent hole. The reservoirs features an overcapacity fuel pipe ending below the wing. The left fuel tank is with a visual fuel level indicator located on left wing first rib. The drain valve (5.) is located in the fuel bowl (3.) installed in the fuselage, on the right side; a fuel reserve warning is installed on the bowl to indicate low remaining fuel. A fuel valve is fitted (7.): this fuel valve is held in the OPEN position by a safety wire. That safety wire can be broken in an emergency. This safety wire must be used to prevent an accidental in-flight fuel valve closure leading to an engine shut-down or, even worse, to a closed fuel valve take-off. The fuel pump (8.) is mechanically cams operated. A fuel pressure gauge is installed.

1.8 ELECTRICAL SYSTEM

With reference to fig.2 on page 12, the airplane's electrical system includes a 12V battery, a generator, wiring and switches to supply and connect the engine starter, an auxiliary fuel pump, anti-collision and navigation lights, and the avionics. A voltmeter is provided as a standard equipment.

The key-operated master switch connects the electrical system to the 12V battery. The whole electrical system is protected by thermal type re-settable breakers.

With the master switch OFF any electrical instrument and all other electrical devices, electric engine starter included, won't be operating.

With reference to fig. 2:

- A. starter relais
- B. regulator
- C. electric fuel pump
- D. master switch
- E. power supply
- F. elevator trim motor
- G. battery
- 4. revolution counter supply
- 5. hourmeter
- 6. voltmeter
- 7. left head temperature
- 8. right head temperature
- 9. oil temperature
- 10. oil pressure
- 15. low voltage warning lamp
- 18. elevator trim switch
- 21-25 switches
- 26-27 breakers

1.9 CABIN

Two large lateral doors allow an easy independent access to the cabin. They are hinged by means of two hinges on the upper edge of the doors, and may be closed by a key handle located in the lower edge and a latch in the front edge. The doors may be removed unscrewing the hinges bolt as required for flying in hot regions or to take pictures. Those windows **MUST NOT** be opened in flight.

WARNING: close latch in the front edge before flight.

1.10 CABIN FEATURES AND UPHOLSTERY

The cabin arrangement features two canvas covered side-by-side seats.

1.11 VENTILATION

The cabin's ventilation is provided by an opening between the doors and the upper part of the cabin door frame. A dynamic air scoop intended to extract the cabin air is fitted at the bottom of the baggage compartment. It's possible to improve the cabin ventilation by using two rotating air scoops in the doors windows. It's important to get an efficient cabin ventilation to avoid the windshield frosting in high humidity, low temperature and rainy weather.

1.12 CABIN HEATING

On the right-upper side of the instruments panel there is a push-pull control. Pull it for having a hot ventilation in the cockpit. The outlet may be opened by a rotating panel on the cockpit skin. The air is heated by the heat exchanged integrated the silencer.

FUEL SYSTEM

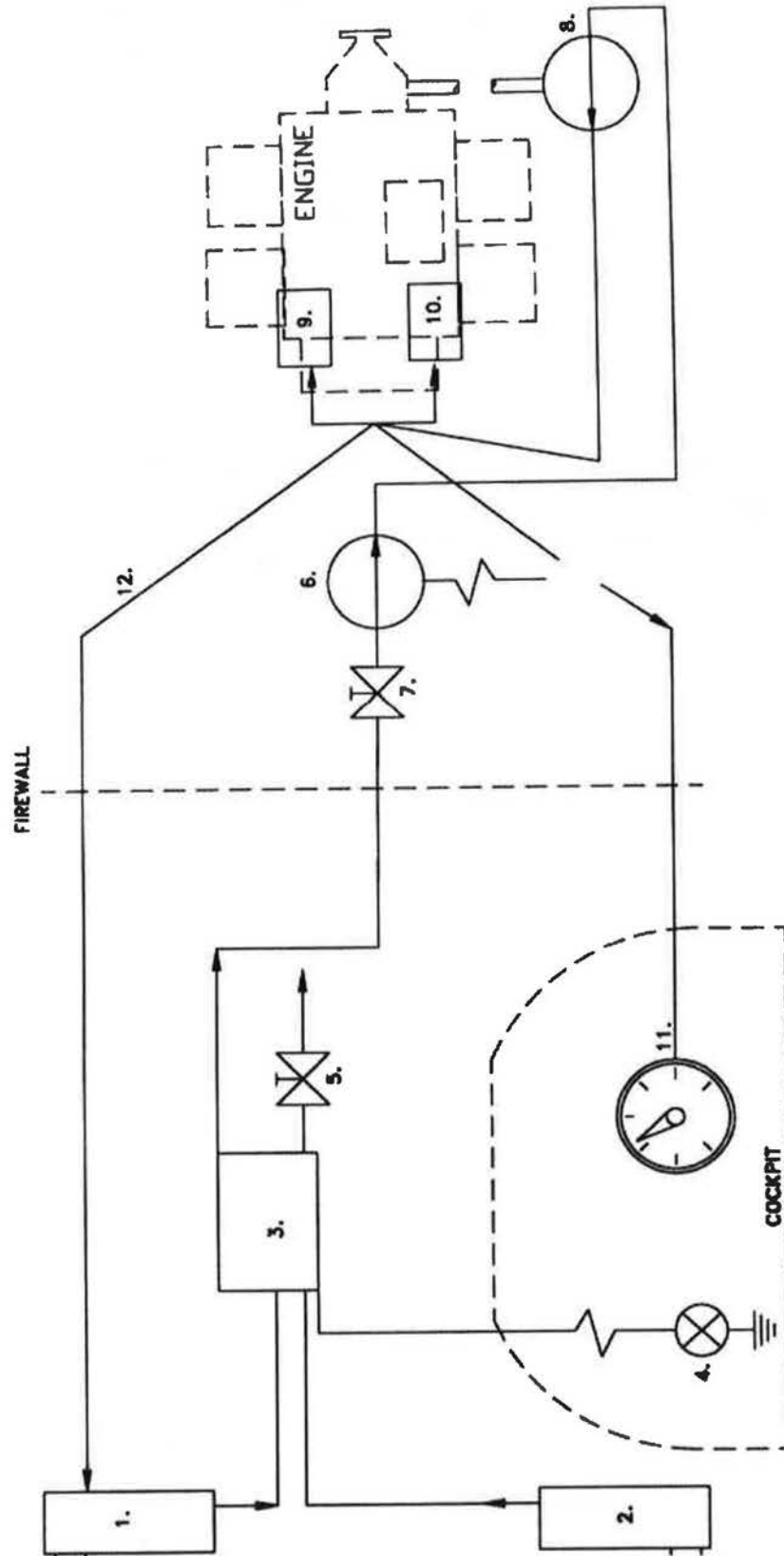


Figure nr.1

ELECTRIC SYSTEM

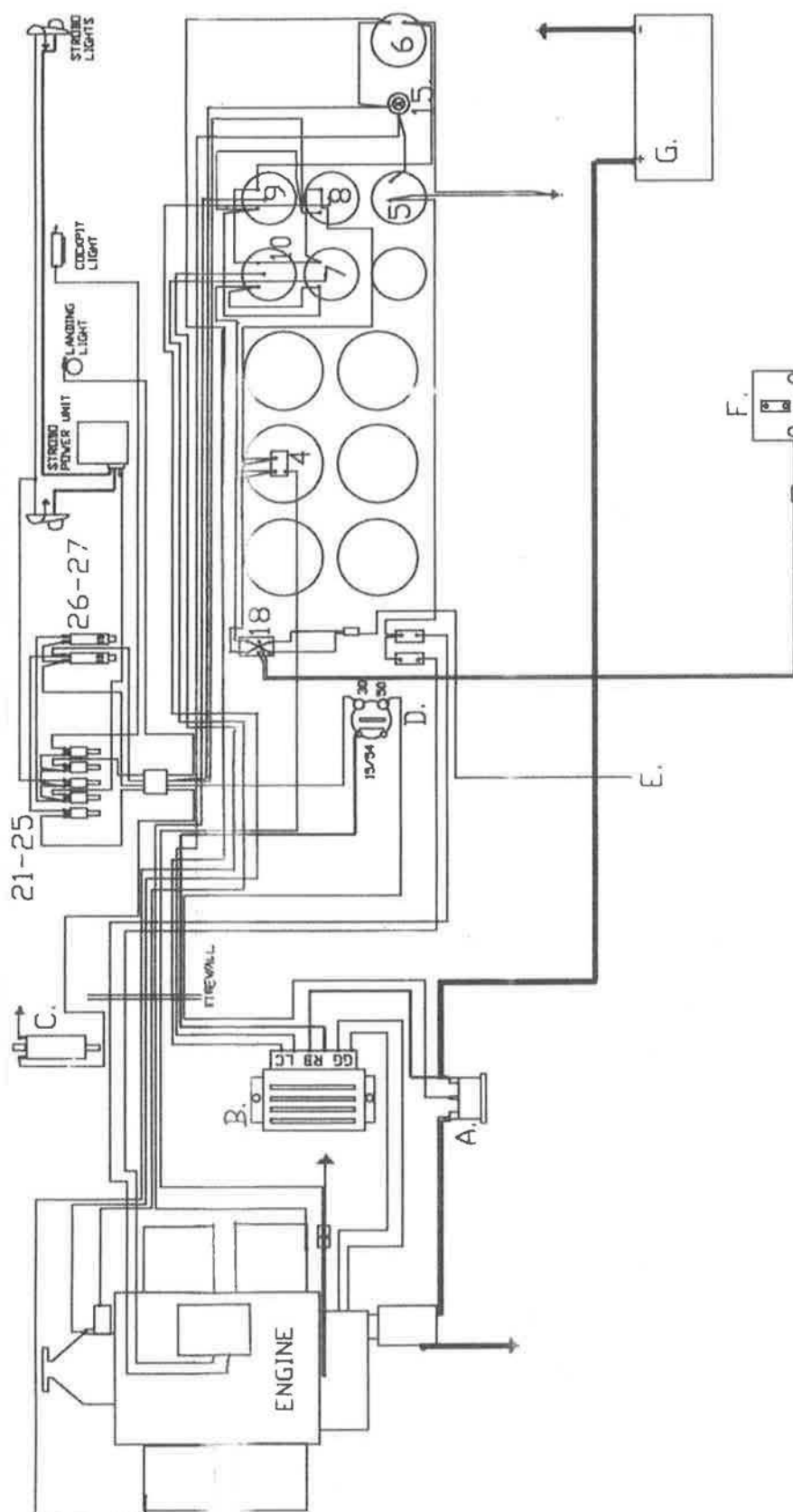
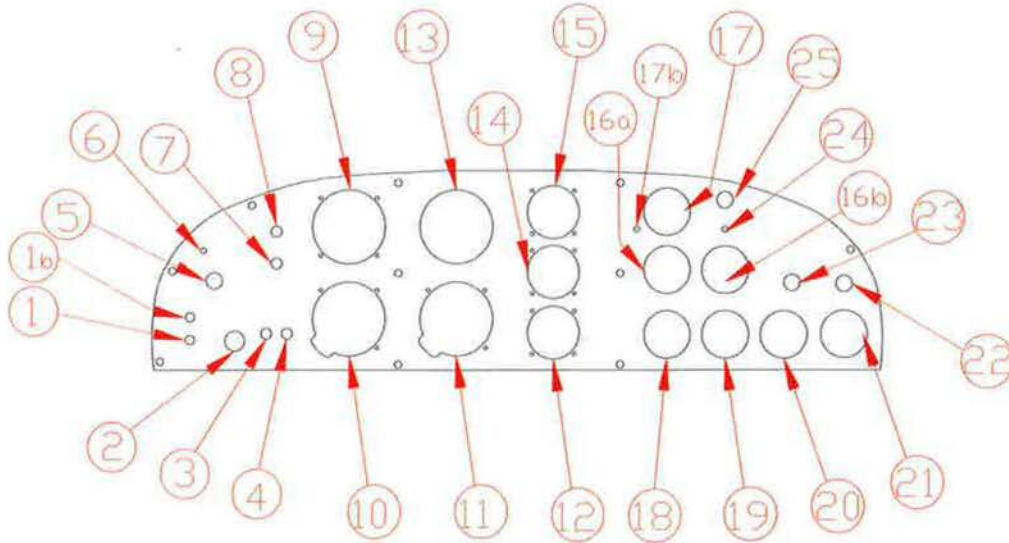


Figure nr.2

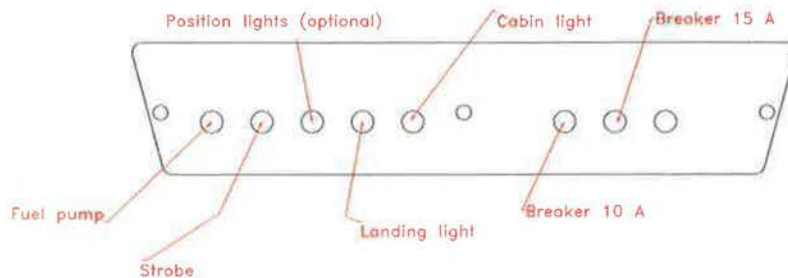
1.13 INSTRUMENT PANEL

ATTENTION: the installed instruments are not certified according to any aeronautical regulation: it is advisable to avoid dangerous flight conditions and do not consider the values given by the instruments as an absolute value.

As standard equipment the following instruments are fitted:



- 1 Choke actuator
- 1b Airbox control (Only Rotax 912 ULS)
- 2 Master switch
- 3,4 Magneto switches
- 5 Pilot side accelerator
- 6 PTT switch (optional)
- 7 Elevator trim switch
- 8 not used
- 9 Anemometer
- 10 Altimeter
- 11 Variometer
- 12 Radio-intercom (optional)
- 13 Revolution counter
- 14 Fuel pressure indicator
- 15 Slip indicator
- 16a Left cylinder head temperature
- 16b Right cylinder head temperature
- 17 External temperature (912 UL) + Airbox temperature (912 ULS)
- 17b Switch external temperature - airbox temperature (only 912 ULS)
- 18 Oil pressure indicator
- 19 Oil temperature indicator
- 20 Hourmeter
- 21 Voltmeter
- 22 Low battery voltage warning lamp
- 23 Passenger side accelerator
- 24 Reserve fuel tank (Nurise) test button
- 25 Fuel reserve warning lamp



Instruments for each aircraft may vary according to the requirements of the customers.

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1.14 FLIGHT CONTROLS

The aircraft is equipped with a single “Y” shaped stick and dual conventional rudder pedals fitted with toe operated brake controls on the pilot’s side only. The aircraft is provided with one longitudinal trim electrically operated. Longitudinal trim: by pushing upwards the toggle switch the pilot achieves a nose-down attitude.

Flaperons range:	$\pm 15^\circ (\pm 2^\circ)$
Elevators range:	$-35^\circ (\pm 2^\circ) / +28^\circ (\pm 2^\circ)$
Rudder range:	$\pm 25^\circ (\pm 2^\circ)$

1.15 FLAPS CONTROL

This system controls the “flaperons”, full-span trailing edge movable surfaces, and is located on the cabin floor. With the stick in the center and the control lever full forward the flaps are fully retracted. In the intermediate position the flap results $18^\circ (\pm 3^\circ)$ extended, while with the control lever full backward the flap results $36^\circ (\pm 3^\circ)$ lowered; with flaps fully extended and stick completely pushed to the right position, the left flap results extended of $40^\circ (\pm 3^\circ)$ the right flaperon results extended of $32^\circ (\pm 3^\circ)$.

1.16 PITOT-STATIC SYSTEM

The total pressure to the instruments is supplied by the Pitot tube located on the left hand forward wing strut. No static pressure source is provided since it is assumed the static pressure is equal to the pressure inside the cabin.

WARNING: blowing into the Pitot tube may results in an airspeed indicator damage.

1.17 BAGGAGE COMPARTMENT

An open space behind the seats is provided to carry some baggage up to 45 lbs. The luggage **MUST** be evenly arranged on the baggage compartment floor and firmly fastened.

NOTE: the pilot **MUST** check, for every configuration, that the weight and balance of the aircraft are within the allowed limits.

FLIGHT CONTROLS

Figure nr.3

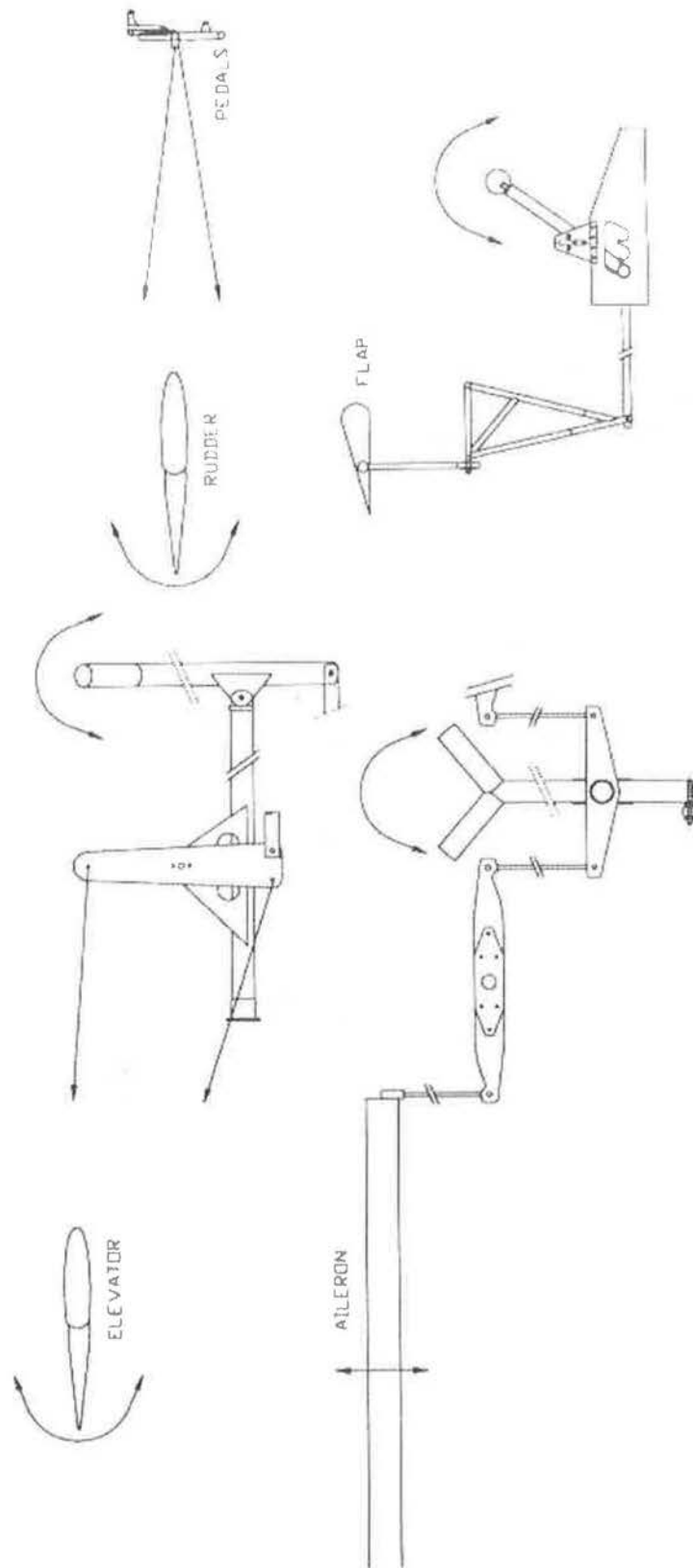


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2.1 SPEED LIMITS

NOTE: the following speed limits (IAS) are set at a maximum take off weight of 1000 lbs/454 kg

Stall speed, full flaps, V _{so}	30 mph / 48 km/h	
Flaps range (white arc)	30-60 mph / 48-96 km/h	26-53
Stall speed, no flaps, V _s	35 mph / 56 km/h	31-53
Normal operating range (green arc)	40-85 mph / 64-137 km/h	35-76
Max. maneuvering speed (1)	70 mph / 112 km/h	62
Attention zone (yellow arc) (2)	85-125 mph / 137-201 km/h	76-112
V _{mo}	100 mph / 160 km/h	89
Never exceeding speed, V _{ne} (red line)	125 mph / 201 km/h	112
Flaps speed limit	60 mph / 96 km/h	53

NOTES:

- (1): the maximum maneuvering speed is the maximum speed at which the flight controls may be fully operated (maximum movable surfaces deflection angles);
 (2): when flying in turbulence conditions this speed range has to be avoided.

2.2 LOAD FACTORS

Flaps retracted	+ 4 g	- 2 g
Flaps full extended	+ 2 g	----

NOTE: the maximum load factors (limit load factors) are obtained multiplying the above indicated values by the coefficient 1,5.

2.3 ENGINE OPERATING LIMITS

- Maximum RPM for T/O and climb 5800 RPM (5 min.) (red line)
- Caution range 5500-5800 RPM (yellow arc)
- Normal range 1400-5500 RPM (green arc)
- Maximum continuous power 5500 RPM
- Idle speed around 1400 RPM
- Oil pressure normal range 2-5 bar (29-73 psi) (green arc)
caution range 5-7 bar (73-102 psi) (yellow arc)
min. 0.8 bar (12 psi) (red line), max 7 bar (102 psi) (red line)
- Oil temperature normal range 90-110 °C (green arc)
caution range 50-90 / 110-140 °C (yellow arc)
max 140 °C (red line)
- Fuel pressure max 0.4 bar (5.8 PSI)
Min 0.15 bar (2.2 PSI)
- Air-box temperatures (Only 912 ULS) Caution range 18 °C – 20 °C (yellow arc)
Caution range 24 °C – 35 °C (yellow arc)
Normal range 20 °C – 24 °C (green arc)
Minimum air box temp. 18 °C
Maximum air-box temp. 35 °C (red line)

2.4 WEIGHT LIMITATIONS

Maximum take off weight:

450 kg

Minimum take off weight (minimum pilot weight 86 kg and ½ h flight fuel):

454 kg

367 kg

2.5 C of G LIMITATIONS

Forward C of G limit:

30% MAC

Rear C of G limit:

38.5% MAC

See also section 6.

2.6 KIND OF OPERATIONS

The airplane can be operated only in day-VFR conditions.

2.7 KIND OF MANEUVERINGS

The airplane is intended for non-aerobatic operations only.

2.8 MAX CROSSWIND FOR T/O AND LANDING

The maximum cross-wind component allowed during take-off and landing is 30/48 mph/km/h.

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3.1 EMERGENCY LANDING

Best descent ratio speed	60 mph/96 km/h
Flaps	Retracted
Fuel valve	Shut-off
Engine	Shut-off
Seat belts	Fastened and tightened
Steep turns	Avoid
Flaps in final	Fully extended, 40°
Landing	Normal landing

3.2 FIRE ON THE GROUND

Starter	Keep engaged
Fuel valve	Shut-off
Throttle	Fully open, to burn the fuel and stop the fire

3.3 FIRE ON THE GROUND, ENGINE OPERATING

Fuel valve	Shut-off
Throttle	Fully open, to burn the fuel and stop the fire

3.4 IN FLIGHT FIRE

Fuel valve	Shut-off
Engine	Stop Don't try to restart the engine
Electrical system	All switches OFF
Landing	Go on to an emergency landing

3.5 CABIN FIRE

Electrical system	All switches OFF
Fire extinguisher	Operate

3.6 UNINTENTIONAL SPINS

Rotation	To stop the rotation push the pedal opposite the rotation direction
Control stick	Center, slightly forward
Upon taking aircraft's control	Level flight attitude

3.7 ENGINE FAILURE DURING T/O

Magneto switches	OFF
Master switch	OFF
Throttle	Idle
Fuel valve	Shut-off
Brake	Fully operated

Immediately after take off

Airspeed	Keep 60 mph IAS and first notch of flap
Eventual landing	Check for adequate spaces within 30° left and 30° right
Throttle	50%, fuel pump ON and try to restart the engine
If previous point fails	Before touching the ground, magnetoes OFF, master switch OFF, throttle idle, fuel valve shut off
Flaps	Fully deflected
On the ground	Touch and brake

3.8 ENGINE START DURING FLIGHT

Throttle	Idle
Magneto switches	ON
Master switch	ON
Fuel pump	ON
Restart the engine	-----
RPM	As requested for the type of flight

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NOTE: The flight characteristics of the **Savannah** are conventional. There is no need of exceptional piloting skills to manage the aircraft within its flight envelope.

4.1 BEFORE FLIGHT CHECKS

Master switch	OFF
Magnetos	OFF
Fuel selector	OPEN
Flight controls	UNLOCKED
Fuel gascolator	DRAIN
Powerplant fairings	FASTENED
Pre-flight/Daily inspection	PERFORM

4.2 EXTERIOR CHECKS

Propeller and engine	Visual check to bolts and nuts, oil leaks
Forward landing gear	Visual check of connection pions
Main landing gear and strut attachments	Visual check to bolts and nuts
Slat	Visual check to damages and dirt
Ailerons	Visual check of hinges bolts and nuts
Horizontal and vertical tail	Visual check to attachment bolts and nuts
Coolant radiator	Visual check to absence of dirt, insects

4.3 ENGINE START-UP

COLD ENGINE	=====
Master switch	ON
Magnetos	ON
Brakes	OPERATE
Throttle	FULLY CLOSED
Choke	ON
Starter	ENGAGE
NOTE	Upon engine start-up let the engine run for some seconds then gradually release the mixture control while slightly pushing the throttle control

HOT ENGINE	=====
NOTE	Perform the same as for COLD ENGINE items except pulling the choke control
NOTE	The engine starts easily with the throttle full closed. In case of fuel flooding only it's useful to open the throttle to supply a large amount of air to recreate the normal carburation condition.
NOTE	It's strongly recommended the pilot, immediately before to engage the engine starter, call with loud voice "BEWARE OF PROPELLER". Then, upon making sure himself none is close to the propeller, he can start the engine. If someone is standing close to the aircraft, it would be his responsibility to stay away enough and answer the pilot "PROPELLER CLEARED".
Engine warm-up	WAIT FOR PROPER CHT READING
Instruments operation	CHECK
Windshield cleanliness	CHECK
Brake effectiveness	CHECK
Safety belts and shoulder harnesses	FASTENED AND CHECKED
Fuel quantity	CHECK
Electrical devices operation	CHECK

4.4 TAXYING

POWER	Apply reduced engine power and use the brakes at the minimum
STEERING	The steering should be obtained by using the rudder pedals and not the brakes
CROSSWIND	In the event of a stronger than 19 mph/30 km/h crosswind, taxi at a very low speed and move the control stick laterally towards the up-wind wing; this will raise the up-wind wing flaperon thus avoiding the wing accidental raising.
NOTE	Use rudder holding the heels on the floor: in that way there will be no accidental brake operation.

4.5 BEFORE TAKE-OFF

Altimeter	ADJUST
Trim	ADJUST to neutral position
Flaps retracted	CHECK
Flight controls freedom of movement and correct movement of surfaces	CHECK
Doors closed and locked	CHECK
Safety belts fastened	CHECK
Fuel level	CHECK
Engine instruments, green arc	CHECK
NOTE	The engine has been running at 2.500/3.000 RPM while warming-up; the CHT reading has risen to 60 °C.
Magnetos; check the RPM drop: one magneto at a time at 3.000 RPM (the max. allowed speed drop with only one ignition circuit is 300 RPM) (the max difference of speed by use of either circuit is 115 RPM max)	CHECK
Magnetos	BOTH ON
Full power check	AS REQUIRED
Runway and circuit traffic	CLEARANCE CHECK
Runway threshold	LINE-UP

4.6 TAKE-OFF AND CLIMB

Flaps, 20°	SET
Brakes	RELEASED
Throttle (operate progressively)	FULLY OPENED
Engine RPM	CHECKED
Air-box control	COMPLETELY PUSHED FOR COLD AIR
Control stick	SLIGHTLY PULLED
NOTE	The aircraft will take-off at a 30-35 mph speed and will keep climbing at a 40-45 mph speed
NOTE	While take-off running, be sure to hold your heels in contact with the cabin floor to avoid to inadvertently operate the brakes
Flaps, at a safety altitude	FULLY RETRACTED
Climb airspeed at 60-65 mph	SET
Upon reaching the required altitude	LEVEL
Cruise speed as required, RPM as required	SET
Trim (to get no reaction on the control stick)	SET
SHORT TAKE OFF	
Flaps, 40°	SET
Brakes	FULLY APPLIED
Throttle	FULLY OPENED
Air-box control	COMPLETELY PUSHED FOR COLD AIR
Brakes	RELEASED
Pilot's heels	ON THE FLOOR
Nose-up attitude, control stick pulled-on until taking off	SET AND HOLD
Climb airspeed at 45 mph until the 50 ft obstacle clearing	SET
Flaps, upon reaching a safe altitude and airspeed	FULLY RETRACTED

NOTES:

- the best rate of climb makes the aircraft climb to the required altitude in the shortest flight time;
- the best angle of climb makes the aircraft climb to the required altitude in the shortest distance;
- in normal flight conditions, set the flaps to 20° to shorten the take-off roll in order to clear a 50 ft. high obstacle. That's possible since the aircraft flies at a lower airspeed but the extended flaps decrease the rate of climb.
- in case of operation from high elevation airfields and/or at high ambient temperature the extended flaps induced drag increase affects the aircraft's performance as far as to increase the take-off run. So it's recommended to check the take-off performance chart to determine if it is advantageous the flaps extension in the take-off.

The above indicated data are medium ones since they may be varied with relation to the aircraft's weight, balance and configuration.

4.7 CRUISE

The cruising speed is achieved by applying the 75% of the engine power available at the propeller. Normally the propeller required power (fixed pitch propeller only) decrease by 50% following a 20% RPM decrease only. So, at a constant aircraft's configuration, the propeller will use the full engine power (full RPM) while, at 4.600 RPM, the propeller will be supplied with half the full engine power.

The cruise speed is 90 mph (5000rpm/27.2in.HG) with Rotax 912 UL and 95mph (5000rpm/26 in.HG) with Rotax 912 ULS; remember that the fastest will run the engine the highest will be its fuel consumption and the lowest its operating life, while a slow running engine, for the same power output, will have its mechanical components loaded by greater forces and torques, thus increasing the risk to break rods, crankshaft and the other moving (rotating) parts. Low RPM settings DON'T increase safety!

Low RPM settings produce low power output thus a lower airspeed would be achieved.

By increasing the flight altitude the engine power output will decrease as well as the propeller's thrust: to compensate it, it's required to increase the engine's RPM. The normal engine running speed is 4,000 to 5,400 RPM.

The engine has been designed to be safely and continuously operated at the maximum RPM setting.

Air-box control: keep 20-24 °C of temperature. (Only Rotax 912 ULS)

4.8 DESCENT

During the descent it's recommended not to operate the engine at idle to avoid a hard engine cooling which could lead to cylinder heads cracks.

Keep air-box control pulled for hot air.

4.9 APPROACH AND LANDING

Throttle	IDLE
Airspeed	60 mph / 97 km/h (IAS)
Flaps	20 °
Airspeed	45 mph (IAS)
Flaps	40°
Airspeed	40 mph / 64 km/h (IAS)
Brakes, upon touching down	APPLY

If a higher rate of descent is required, fully extend the flaps. The angle of the descent path may be slightly varied by throttle operation as required to modify the gliding path. The flare will be flown in a nose-up attitude. Upon touching down, by releasing the control stick, the aircraft's nose will lower.

If downwind attitude, keep air-box control pushed for cold air. (Only Rotax 912 ULS)

4.10 CROSS-WIND LANDING

In the event of a crosswind the approach has to be flown lowering the up-wind wing or applying the yaw control to achieve a nose-into-the-wind aircraft's attitude or using both the two control techniques at the same time as required.

The aircraft must be lined-up along the runway shortly before the ground contact.

The maximum cross-wind component allowed during take-off and landing is 30/48 mph/km/h.

4.11 ABORTED LANDING (GO-AROUND)

Throttle, full power	SET
Flaps, when reaching a 54 mph (IAS) airspeed	RETRACT

The throttle control must be pushed smoothly and gradually to avoid an engine flooding or, worse, an engine shut-down.

4.12 ENGINE SHUT-DOWN

Engine operating, low RPM	2 MINUTES
Throttle	IDLE
Magnetos	OFF
Master switch	OFF

It's recommended to keep the engine running at low RPM for as long as two minutes in order to avoid a thermal shock and to achieve a thermal balance between the different engine's components. Moreover it will be achieved a good pistons and piston rings lubrication so the engine will be let in the best condition to the next start-up.

4.13 PARKING AND MOORING

To moore the aircraft tie two ropes to the mooring rings fitted under the wings (bolted to the wing spar) and a third one to the rear mooring ring.

Tie the control stick together with the rudder pedals by using an elastic chord to lock all the movable surfaces.

Make sure the doors are closed and locked.

Put in place the optional windshield and windows protection canvas to prevent dust accumulation and scratches.

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SECTION 5

PERFORMANCE

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5.1 STALL SPEED

NOTE: the speed values are expressed as anemometric (indicated) airspeed (IAS). It's assumed the aircraft and the powerplant are factory new and the airplane is flying in standard air condition.

Stall speed	Maximum weight (1000/454 lbs/kg)
Flaps retracted	35 mph/56 km/h
Flaps extended (40°)	30 mph/48 km/h

The above indicated airspeeds are achieved with engine set to IDLE: in those situations the aircraft simply sink without modifying the flight attitude while the control stick is pulled-up.

By applying power, the aircraft's nose go up to a great angle, the airspeed decrease until the stall occurs, followed by a quick nose lowering.

NOTE: the maximum flaps extended airspeed is 60/96 mph/km/h.

5.2 TAKE-OFF RUN

Take-off run (hard surface, flaps 20°)	Maximum weight (1000/454 lbs/kg)
Sea level (MSL)	115 ft/35 m
3,000 ft/900 m pressure altitude	160 ft/50 m
6,000 ft/1,800 m press. altitude	210 ft/63 m

NOTE: if the airplane is operated from a grass runway the take-off ground roll will increase.

NOTE: to clear a 50/15 ft/m high obstacle, a practical rule suggests to double the take-off ground roll.

5.3 LANDING DISTANCES FROM 15 m AND LANDING RUN

The airplane needs 150 m for landing upon a 15 m obstacle, and a 50 m of landing run, in no wind condition at full weight, with airspeed of 60-65 km/h IAS.

5.4 RATE OF CLIMB (Rotax 912 UL)

Rate of climb Full power setting	Maximum weight (1000/454 lbs/kg)
Sea level (MSL)	1,100 fpm/5.5 m/s 48 mph/77 km/h
3,000 ft/900 m pressure altitude	790 fpm/4.0 m/s 45 mph/72 km/h
6,000 ft/1,800 m press. altitude	520 fpm/2.6 m/s 40 mph/64 km/h
9,000 ft/2,700 m press. altitude	300 fpm/1.5 m/s 37 mph/60 km/h

The maximum ceiling is 14,000 ft/4200 m pressure altitude at the maximum weight.

The best rate of climb speed is 48/77 mph/km/h.

The best angle of climb speed is 45/72 mph/km/h.

The best gliding angle with flaps retracted is achieved at a 60/96 mph/km/h airspeed. The Lift to Drag ratio is 12.

The fuel consumption at 75% power setting amounts to 4.9/18.5 gph/lt/h for Rotax 912 ULS and 4.3/16.2 gph/lt/h for Rotax 912 UL

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SECTION 6

WEIGHT AND BALANCE

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6.1 GENERAL

The aircraft is allowed to have its CG (Centre of Gravity) within a quite large range thus easing the aircraft's loading and balancing. By knowing the weights of the people, fuel and baggage to be carried on board and using the attached W&B report, the pilot would be able to check for the proper aircraft's weight and balance configuration. To find out the CG position please refer to the attached table. Compute the total weight and the total moment, given by adding all the single moments. To be acceptable, the found point **MUST** be located into the **WHITE** area, between the two limit lines.

WARNING: a CG beyond the most forward limit, as well as a CG beyond the most rearward limit may result in a **VERY DANGEROUS** flight condition.

NOTE: it's strictly forbidden to make any change or modification to the aircraft since those modifications may affect the balance limits set by the manufacturer.

6.2 WEIGHT AND BALANCE REPORT

Procedure to be used to determine the Centre of Gravity position:

- The aircraft MUST be weighed fitted with all equipments, accessories, engine oil, coolant and WITHOUT FUEL;

NOTE: all the fuel MUST be drained accurately.

- Put the aircraft on three weight measuring equipments (each under each wheel of the landing gear);
- Put the aircraft in the flight level position by using a level fitted on the aircraft's fuselage, on the horizontal plane where doors will be closed;
- Record the three weight measuring equipments readings: the nose wheel weight will be called P1, the left wheel weight P2, the right wheel weight P3;
- By using a plumbing wire fixed to the leading edge, measure the distance D1 between the projection on the floor of the leading edge and the nose wheel axle, and the distance D2 between the same projected point and the main landing gear axle;
- By filling out the table below, make the calculations and find out the CG position. The airplane is in the correct balance if the line of the actual weight and the line of the actual total moment cross inside the white area.

TABLE TO DETERMINE THE AIRCRAFT'S BASIC EMPTY WEIGHT

Aircraft serial number	
Weight measuring equipment	
Location and date	
Certifying staff	

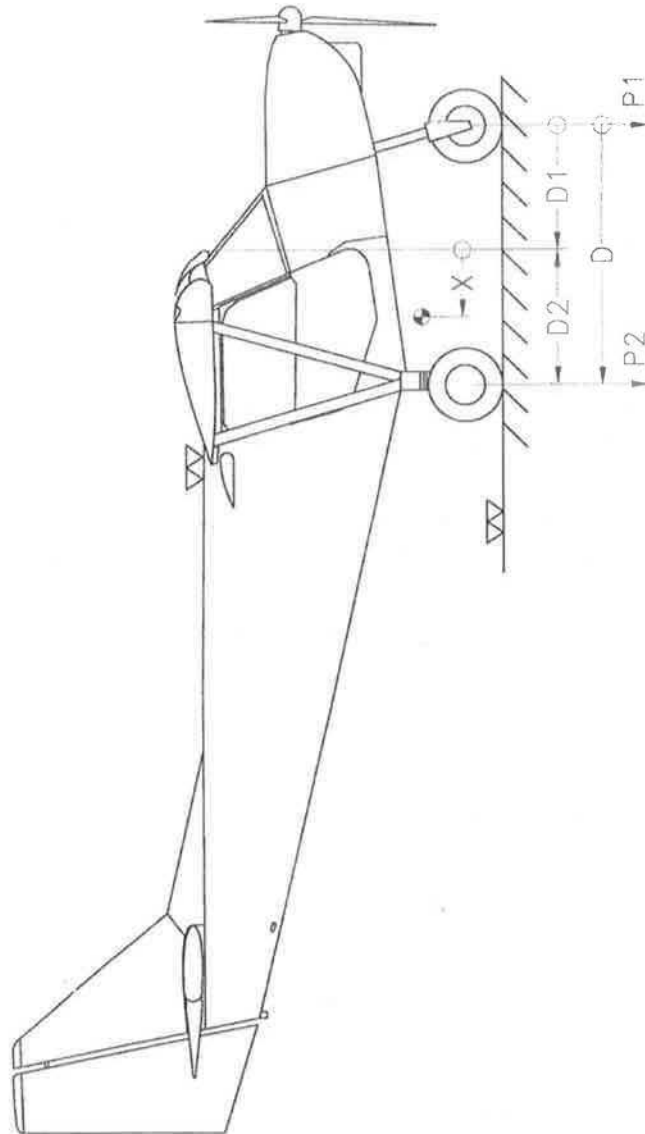
	Weight (kg)	Arm (m)	Moment (kg x m)
Nose landing gear	P ₁ = 69	D ₁ = 0,700	48,3
LH main landing gear	P ₂ = 104	D ₂ = 0,700	72,8
RH main landing gear	P ₃ = 101	D ₂ = 0,700	70,7
TOTALS			191,8

Signature	
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6.3 WEIGHT AND BALANCE DRAWINGS



where:

D1=700 mm;

D2=700 mm;

P1=weight on forward gear;

P2=total weight on principal gear;

$X = (P2 \cdot D) / (P1 + P2) - D1$

$$287 / 274 - 700$$

$$147 / 6041 = 0.2$$

$$X = -0.15m$$

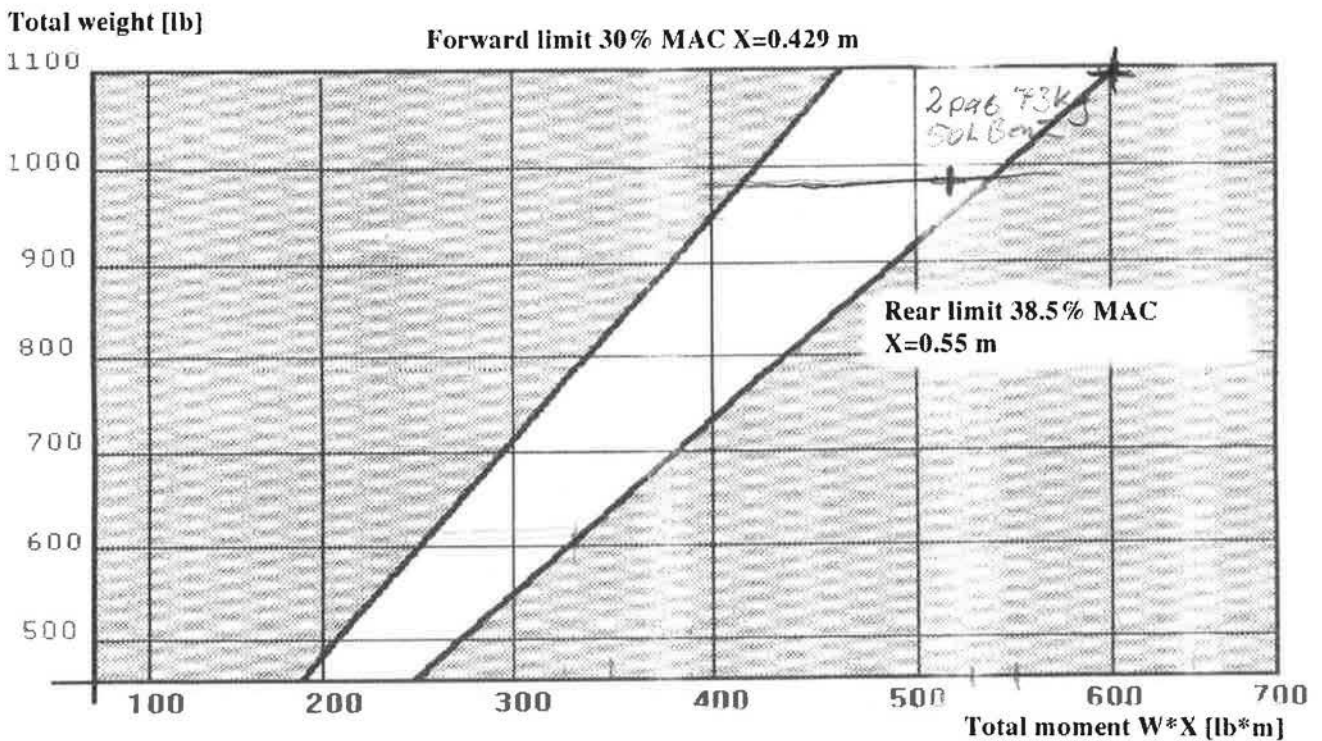
6.4 WEIGHT AND BALANCE PILOT'S COMPUTING TABLE AND GRAPH

COMPUTING TABLE

Item	Weight W [lbs]	Arm X [m]	Moment [W x X]
Basic empty weight	604 604	0.45	271.8
Pilot	163 163	0.65	105.95
Passenger	160 160	0.65	104
50L Fuel (max 110 lb max)	110 65	0.595	65.45 38.7
Baggage (45 lb max)	45 0	1.42	63.9 —
TOTALS	1082 992	=====	611.1 520

GRAPH

1 lbs = 0.45 kg



Forward C of G limit: 30% MAC
 Rear C of G limit: 38.5% MAC

