ALLEGRO 2000

Ultralight Aircraft

Type Certificate DEAC e.v. Germany No.61173 and 1249 from December 23.1999

Type Certificate LAA Czech Republic No. 05/2000 from October 17.2000

FLIGHT & OPERATING MANUAL

- FANTASY AIR Ltd.
- Kollárova 511
- 397 07 Písek
- Tel.: 00420/777 112 144
- Fax: 00420/382 212 962
- e-mail: info@fantasyair.com

TABLE OF CONTENTS

Ten Rules of Safe Flying

1. Observe the relevant regulations for Ultralight aircraft.

2. Do not overestimate your piloting skills and never show off for the sake of spectators. On the contrary, try to use suitable strips of land for practising emergency landing procedures and land where possible on approved airstrips.

3. Watch the weather all the time. Do not set off on a long flight if thunderstorms, rain, strong winds, fog or icing are likely to occur.

4. Pay attention to how much fuel you have left, not only by watching the gauge but also by comparing the current flight duration to the actual fuel consumption rate.

5. Always choose the flight direction and altitude with respect to the possibility of making a safe emergency landing manoeuvre.

6. Always fly with sufficient speed margin to avoid stalling the aircraft, especially during the take-off and landing manoeuvres.

7. Do not perform any aerobatics (e.g. wing-overs) even if you might feel that you're piloting skills and the flying qualities and handling characteristics of the aircraft are good enough for aerobatic manoeuvres.

8. Under no circumstances exceed the maximum allowable speed (VNE) even if it were just for a few seconds.

9. Do not overestimate your navigation skills. Do not fly into unknown terrain without appropriate navigation preparation and tools (a map, compass or GPS).

10. Do not fly unless you are in good physical and mental condition.

Introduction

The Allegro 2000 Ultralight aircraft is a 2-seat high-wing monoplane aircraft designed for sport purposes, for recreational or tourist flying as well as for the training of learner pilots.

The Allegro's superbly accurate and forgiving handling characteristics, high comfort for the crew and the economical fuel economy, which is due to the aerodynamic design of the aircraft, will reward owners who pay the necessary attention to routine maintenance with many years of trouble free and enjoyable flying.

Our company guarantees the airframe for 100 flight hours or 2 years, whichever occurs earlier.

The guarantee terms regarding the engine and the propeller are specified in the manufacturer's manuals entitled "ENGINE LOG BOOK" and "PROPELLER LOG BOOK", which form integral parts of this manual as its enclosures No.1 and No.2.

During the flight you should always bear in mind that the aircraft may not be equipped with a certified aircraft engine and therefore you should fly the aircraft in such a way that in case of an engine failure you could make a safe emergency landing manoeuvre.

We hope that each of your flights will be uniquely rewarding and finished with a graceful landing.

The Allegro 2000 Ultralight aircraft has the official Type Licence from the Light Aircraft Association of the Czech Republic No.05/2000 dated October 17th 2000.

Caution

This Flight & Operating Manual must be thoroughly studied by every owner, aircraft business operator and pilot of this aircraft. The manual describes the necessary flight and maintenance procedures and it must be always present on board of the aircraft.

This Ultralight aircraft is not subject to the certification by the Civil Aviation Authority of the Czech Republic and it is operated entirely at the user's own risk.

Amendments to the Manual – Changes

In case of any changes in the construction or operation of the aircraft or any airworthiness notices which every owner should be notified of, you will be sent the respective amendments to the text of this manual.

The amendments will be numbered progressively and you shall be required to record them in this manual. If you sell the aircraft you are required to inform the manufacturer, the local importer and the inspector-technician who has maintained this aircraft about the address of the new owner.

The same applies when you move home elsewhere and your postal address changes; it is YOUR responsibility to keep your contact records current with Fantasy Air and your importer.

In case of any damage to your aircraft you need to inform your inspector-technician who will recommend the most appropriate method of repair, should there be any question please refer all inquires about repair to the manufacturer Fantasy Air.

General Information

Contact Details

Contact Details for each customer or change of ownership, these details MUST be filled out in this manual.

ORIGINAL OWNER

Owners Name:_____

Address:_____

Phone Details:_____

Email Contact:_____

Aircraft Serial No:_____

Aircraft Registration No:_____

Country Registered:_____

Aircraft Colour:_____

Aircraft Hours:_____

SECOND OWNER

Owners Name:_____

Address:_____

Phone Details:_____

Email Contact:_____

Aircraft Serial No:_____

Aircraft Registration No:_____

Country Registered:_____

Aircraft Colour:_____

Aircraft Hours:_____

THIRD OWNER

Owners Name:_____

Address:_____

Phone Details:_____

Email Contact:_____

Aircraft Serial No:_____

Aircraft Registration No:_____

Country Registered:_____

Aircraft Colour:_____

Aircraft Hours:_____

FOURTH OWNER

Owners Name:_____

Address:_____

Phone Details:_____

Email Contact:_____

Aircraft Serial No:_____

Aircraft Registration No:_____

Country Registered:_____

Aircraft Colour:_____

Aircraft Hours:_____

Aircraft Details Allegro 2000

Year of Manufacture:_____

Aircraft Serial Number:_____

Fuselage Shell Serial Number:_____

Wing Serial Numbers:_____

Horizontal Tail Unit Serial Number:_____

Vertical Tail Unit Serial Number:_____

Main Metal Fuselage Serial Number:_____

Main Landing Gear Serial Number:_____

Nose Landing Gear Serial Number:_____

Wing Strut Serial Numbers:_____

Engine Mount Serial Number:_____

Engine Details

Manufacturer:_____

Engine Type:_____

Year of Manufacture:_____

Serial Number:_____

Reduction Gearbox (type, reduction ratio):_____

Further information can be found in the “ENGINE LOG BOOK”

Propeller

Manufacturer:_____

Type:_____

Serial Number:_____

Further information can be found in the “PROPELLER LOG BOOK”

Brief Technical Description

The Allegro 2000 aircraft is an aerodynamically controlled, two-seat, side by side high-wing Ultralight aircraft with the engine at the front and a T-shaped tail. Tricycle landing gear, hydraulic main wheel brakes, steerable nose wheel, landing gear suspension using the flexibility of the tyres and rubber pads for suspension.

The aircraft is constructed of aluminium, steel and composite laminates; the fuselage is welded from metal tubes and is enclosed in composite.

The wing is divided in the middle into two halves, both of which are mounted to the fuselage by bolts and supported by wing struts. The wing is designed as a rectangle with trapezoidal outer end. The load-bearing part of the wing is represented by a torsion box consisting of an aluminium spar and a skin made of aluminium sheet. The spar flanges are made of aluminium L-sections, the spar web is made of aluminium sheet.

The airfoil of the wing is maintained by ribs made of aluminium sheet.

The ailerons and flaps are separate.

The tail is T-shaped; its construction is similar to the wing.

The fuselage is all-laminate, stiffened by several internal ribs. The engine mount and the nose wheel leg are attached to the front “engine” bulkhead made of laminate sandwich. The central “pilot” bulkhead serves for attaching adjustable seats and at the rear end of the fuselage there are two ribs made of laminate sandwich to stiffen the tail fin.

The fuselage structure is welded together from metal tubes; the cockpit is covered by a transparent windshield made of polycarbonate splinter-proof material. (Beware of fuel staining which damages this material!!!) Below the seats there is a fuel tank made of laminate whose inner surface is covered by a conductive layer of graphite, fuelling is made from the left side of the aircraft.

The landing gear is tricycle type. The main wheels are equipped with hydraulic disk brakes controlled by a mechanical brake lever located on the control stick. The nose wheel is steerable; it is connected to the foot control system. The nose wheel has rubber suspension.

The power plant of the aircraft consists of an engine, the type of which is specified in the “ENGINE LOG BOOK”, and a propeller, the type of which is specified in the “PROPELLER LOG BOOK”.

The aircraft has single joystick control; the control stick is situated in the middle of the aircraft between the two seats. The foot control system consists of two sets of pedals (one set for each of the pilots). The flaps are actuated by means of an electric switch located on the panel between the two pilots.

Main Specifications – Allegro 2000

Airframe Dimensions

Wing Span	10810 mm
Airframe Length	6360 mm
Total Height	2050 mm
Wing Area	11.37 m2
Aspect Ratio	9.5
Wing Chord-max	1200 mm
Wing Chord-min	655 mm
Airfoil Section	SM 701

Aileron and rudder deflection

Aileron	Up	165 mm	+- 5 mm
	Down	55 mm	+- 5 mm
Elevator	Up	79 mm	+- 5 mm
	Down	66 mm	+- 5 mm
Rudder	Right	134 mm	+- 5 mm
	Left	134 mm	+- 5 mm

Other Data

Undercarriage	tricycle front landing gear
Main Wheel Track	1550 mm
Tyre Dimensions	
Main wheels	14 x 4 (350 x 100)
Nose wheel	14 x 4 (350 x 100)
Tyre Pressure	0.10 - 0.12 Mpa (15 psi – 17 psi) nose wheel
	0.18 Mpa (26 psi) main wheels
Suspension	by flexibility in the laminated undercarriage leg
Wheel brakes	hydraulic brakes
Engines	Rotax 912 80 hp
	Rotax 912S 100 hp
	Rotax 582 65 hp

Engine Warning

These engines may not certificated aircraft engines and sudden stoppage can occur at any time. They have not received any safety or durability testing and conform to no aircraft standards.

Never fly the aircraft equipped with these engines at locations, airspeeds, altitudes, or other circumstances from which a successful no-power landing cannot be made after a sudden engine stoppage.

Fuel tank volume	55 Litre /41 Kg fuel

Weights

Maximum Take-off Weight	520 Kg
Empty Weight	275 Kg
Maximum useful load	245 Kg

Standard Aircraft equipment

Instruments

Airspeed

Altimeter

Compass

Climb Indicator

Fuel Gauge

Tachometer

CHT

Engine Oil Thermometer

Engine Operating Hour

Oil pressure gauge + Booster

Towing Equipment

Type	TOST S.No.
Maximum weight of towed glider	500 kg
Minimum length of tow rope	40 m
Maximum length of tow rope	60 m
Tow rope safety fuse	300 Kg

Aircraft Control

Foot Control – when the left pedal is depressed the aircraft turns to the left, both on land and in the air, and vice versa.

Hand Control (located in the middle of the cockpit) – when the control stick is pulled backwards, the nose of the aircraft raises upwards (the angle of incidence increases); when the control stick is pushed forward, the nose of the aircraft goes down. When the stick is deflected to the left, the aircraft banks to the left and vice versa.

Throttle Levers – are located on the outer side of each seat. When the lever is pushed forward, the more the engine speed increases. There is a screw for adjusting the mechanical rigidity of the lever's movement, located in the middle of the operating rod (under the central cover of the control panel).

Engine Ignition Switches – are located on the control panel in the middle of the cockpit. The ignition is enabled when the switches are set to the down position.

Main Wheel Brakes – are controlled by means of a lever located on the control stick. The lever is also equipped with a control for the parking brake.

Manoeuvring and Gust Envelope

Operation Limitations – Allegro 2000

Limiting Speeds (never to be exceeded):

Wing flaps	Lever position	Flaps Deflection	Never Exceed Speed
Cruise position	0	-4.5 °	VNE 118 Knots
Take-off	1	15 °	VFE 60 Knots
Landing	2	48 °	VFE 60 Knots

THESE SPEEDS MAY NOT BE EXCEEDED UNDER ANY CIRCUMSTANCES !!!

Stall Speed at maximum take-off weight 520 kgs - level flight

Wing Flaps Position	Engine Power Output	Stall Speed	
		IAS Knots	CAS Knots
0	Engine at idle	46 Knots	43 Knots
1	Engine at idle	40 Knots	39 Knots
2	Engine at idle	37 Knots	35 Knots

Maximum Level Speed with extended flaps VFE = 60 Knots

Caution - Do not exceed this speed with extended flaps!

Design Manoeuvring Speed VA = 78 Knots

When flying faster than this you must not suddenly use the full deflection of the rudder and elevator nor do any quick manoeuvres otherwise an overload could occur. Do not exceed this speed in turbulence +-2000 fpm!

Limiting Speed VNE = 118 Knots

Caution - Do not exceed this speed under any circumstance !!

Limiting Wind Speeds

Maximum Allowable Headwind Speed 20 Knots
(i.e. against the direction of the flight)

Maximum Allowable Crosswind Speed 10 Knots
(i.e. perpendicular to the direction of the flight)

Do not try to take off or land with the tail-on wind except for emergencies!

Weights

Minimum Front-Seat Pilot Weight 55 kg
Maximum Weight of the Crew and Fuel 245 kg
Baggage Weight 10 kg

Maximum Take-off Weight	520 kg
Empty Weight	275 kg

Allowable Distances of the Centre of Gravity from the Wing Leading Edge

+ Maximum CG front position	278 mm = 25 %
+ Maximum CG back position	390 mm = 35 %

How to Determine the Aircraft's Centre of Gravity Position

Place the aircraft with its wheels onto three scales. The aircraft must be in the cruise position, i.e. with its fuselage axis levelled horizontally.

Determine the total weight of the aircraft (G) in kilograms as a sum of the weight readouts from the scales located under the main wheels (Gh), (which is the total of the weight readouts from the scales located under the left and right main wheels) and the weight readout from the scales located under the nose wheel (Gp).

Measure the distance between the main undercarriage axis and the nose wheel axis (Lp) in millimetres.

Measure the distance from the wing leading edge (using a plumb bob) to the main undercarriage axis (La) in millimetres.

Measurements chart:

Calculation for determining the aircraft's centre of gravity position

$$Lt = \frac{Gp \times Lp}{G} =$$ the distance of the aircraft centre of gravity from the main undercarriage axis G (mm)

Xt = La - Lt – XSAT/ Allegro 2000/- bSAT = 1115mm XSAT =14mm

This distance expressed as the percentage of the mean aerodynamic chord (SAT) is

X% = 100 x Xt /bSAT

Determined values

bMAC =……mm
Gp =……..... / *……..kg
Gh =……..…/ *……..…..kg
G =……..... / *……..kg
Xt =……..... / *..... mm

La =……..mm
Lp =……..mm
Lt =……...../*.....mm
X% =……...../*……..%
* One pilot ……..... kg

The position of the aircraft's centre of gravity has to be from 25 % to 35 % of SAT.

Note: The position of the centre of gravity of an empty aircraft almost exactly equals to that of an aircraft in the cruise position with one or two pilots and with the fuel tank empty or full.

Allowable Turns

Load Factors

Maximum positive load factor in the centre of gravity + 4.0 g

Maximum negative load factor in the centre of gravity - 2.0 g

Cautions

Besides the flight rules imposed from your local authorities it is also forbidden to

- Start the engine by rotating the propeller manually
- Get in or out of the plane when the engine is running
- Taxi with the cockpit open
- To manoeuvre the aircraft by holding its wing struts, horizontal tail unit or propeller.

Kinds of Operation

It is allowed to fly the aircraft only during the day (and on condition the ground is visible) = VFR and when no danger of icing exists. Other kinds of flight are forbidden.

MINIMUM OUTSIDE AIR TEMPERATURE ALLOWED FOR TAKE-OFF - 25.0 C

MAXIMUM OUTSIDE AIR TEMPERATURE ALLOWED FOR TAKE-OFF + 35.0 C

Emergency Procedures

If the engine fails while the aircraft is less than 500 feet above the ground

At a low altitude

- Push the control stick forward bringing the aircraft to the glide path
- Make the landing in the original direction of the flight
- Set the wing flaps to the landing position

At a high altitude

- Push the control stick forward bringing the aircraft to the glide path
- Turn off the ignition and set the throttle lever fully backwards

- Tighten the safety harness
- Set the wing flaps to the landing position when the aircraft is approximately 100 feet above the ground
- Make the landing manoeuvre in the open area free from any obstacles, into the wind if possible

If the engine fails while the aircraft is more than 500 feet above the ground

- Push the control stick forward bring the aircraft to the glide path
- Check the ignition, throttle lever and the fuel gauge
- Try to start the engine again
- Follow the steps described above for the case when the engine fails at the flight altitude of 500 feet above the ground or less

In case of fire

- Turn off the fuel supply
- Set the throttle lever fully forward and wait until the engine runs out of fuel
- Switch the ignition off
- Do not try to start the engine again
- Land the aircraft immediately by following the steps of emergency procedures

In case of excessive vibrations

- Adjust the engine speed to such RPM value which minimalises the vibrations
- Make the emergency landing manoeuvre
- If the vibrations keep increasing, turn the engine off and make the emergency landing manoeuvre with the engine stopped

How to Use the Emergency System (if available)

In case of emergency, when you definitively lose the control of the aircraft use the rescue system of the aircraft

- Switch the ignition off
- Turn off the fuel supply
- Tighten the safety harness
- Activate the emergency system

In case of emergency landing in a very limited area when the danger of a crash into an obstacle is imminent, you can use the rescue system for slowing down the aircraft. In such a case the aircraft is likely to be damaged.

- Switch the ignition off
- Follow the instructions of the parachute manufacturer
- Leave the aircraft in such a way that you might not come into contact with the propeller or any other part of the aircraft.

Normal Operation Procedures

Pre-flight inspection

Attention All inspection steps mentioned in this chapter must be done very carefully before each flight. Do all inspection steps in the order as demonstrated on the following picture:

Picture:

Attention: Before doing the pre flight inspection ensure the ignitions are turned off and the key is removed from the plane.

1. Front fuselage – left side

Nose undercarriage

- Wheels axis - fixed and tightened
- Distance between pneumatic tyre and wheels cover – sufficient
- Tyre inflation, creep marks aligned - checked
- Nose leg - nuts and split pins, damper - checked

Front cowling

- Camlocks - fixed and checked
- Obvious damages, cracks - checked
- Oil or fuel leakage - checked
- Fuel tank cap - checked
- Fuel tank cap tightness - checked

2. Front fuselage

Propeller

- Propeller cone - no cracks, clearance - checked
- Cone screws tightness – checked
- Propeller blades - no damage – checked
- Attachment screws – fixed - checked

3. Front fuselage – right side

Cowling

- Camlocks – checked
- Obvious damages, cracks – checked
- Oil and fuel leakage – checked

Engine bay

- Engine mount, and engine fixing mounts - rubber - checked
- Spark plug cable fixing - checked
- Air filter clearness - checked
- Exhaust - obvious damages - checked
- Spring and screws fixing - checked
- Engine cables and choke state control - checked

4. Right wing - front part

- Wing surface leading edge deformation, damages - checked
- Dirt and water on the wing leading edge - clean up
- Wing and strut attachment screws, bolts and metal cover - checked
- Fixing control - checked
- Fittings of spar fixing - checked
- Rivets inspection - checked
- Drive control - connected, fixed

5. Right wing – rear part

- Leading edge entirety, deformations - checked
- Surface state - checked

Right aileron and flap

- No deformation – checked
- No cracks on the rivet fastening spot - checked
- Drive control axis - fixed
- Up and down movement - free and fluent
- Drive control axis - fixed

6. Main undercarriage – right leg

Undercarriage leg

- No cracks, no surface breaks - checked
- Wheel axles - right placed and secured
- General state, no deformations - checked

Wheel

- Rim - checked
- Pumped up tyre, no damages - checked
- Creep marks on the rim - checked
- Distance between tyre and wheel cover - sufficient

- Rotation axis - checked
- Brakes axis, free run, no damage - checked
- Brakes cable, fixed, no torsion - checked
- Brake system tubing - checked

7. Tail unit

Tail fin

- Leading edge no deformation, no damage - checked

Rudder

- General state, no deformation - checked
- Rivets no cracks - checked
- Feathering hinge, clearance, corrosion, securing - checked
- Rudder free movement , after the tail part is pushed - checked
- Down and nose wheel is up - checked
- Fixing or rudder cables - checked
- Control placing, corrosion, securing - checked

Elevator

- Leading edge no damages - checked
- Skin and rivets state - checked
- Two screws of elevator fixing - fixed and secured
- Elevator hinge clearance, corrosion - checked
- Elevator movement - checked
- Control no corrosion - checked
- Trim tab placing and hinge - checked

8. Main undercarriage – left leg

- Identical as by no. 6

9. Left wing – rear part

- Identical as by no. 5

10. Left wing – front part

- Identical as by no.4

Pitot tube

- Pitot tube covering – removed and stored
- Hose for static and dynamic pressure - connected
- Inlet for stall speed indication - checked
- Static inlets -checked

11. In cabin

Instrument panel

- Fuse - checked
- Instruments state, altimeter adjustment - checked
- Ignition key - green checking light on
- Fuel gauge - indicates fuel state

Control stick

- Movement - free and fluent
- Operating rods seating - checked

Pedal-operated

- No deformation - checked
- Nose leg, rudder & pedals adjustment - checked

Control - throttle, choke, brakes, trimmer

- Movements - free and fluent
- Bowden cables - checked

Centre-section

- No deformation, welded points without damage - checked

Safety belts

- General state - checked
- Fixing to fuselage - checked

Doors

- General state, clean, no scratches - checked
- Fixing to the centre-section - checked
- Door closing system - functional

Baggage compartment

- Flaps drive cover - checked
- Baggage - checked

Emergency system

- Readiness of the system - checked
- Securing against unplanned deployment - checked

General inspection of the fuselage shell, damage, cracks, etc.

12. Fuel tank draining

- Stand the aircraft on a horizontal area
- Loosen the tank drain plug
- Drain off 120 cc of fuel (1/2 cup) into a transparent cup and check up its quality (impurities, water, etc…)
- Tighten the drain plug and check the fuel cap tightness

Refuelling

To be made only after the engine and all aircraft electric equipment has been switched off. It is strictly prohibited to smoke and to have an uncovered flame within 20 m vicinity of the aircraft.

Fill the aircraft fuel tank using a filtering funnel to check the fuel purity as well as the purity of the storage vessels. Avoid the use of second quality fuel or old stale fuel, buy the fuel at new fuel stations with new storage tanks and use new drums for transporting the fuel to the aircraft.

Check the earthing cable on the aircrafts left undercarriage leg before fuelling.

Operations to be done before the take-off

Operations to be done on the aircraft stand

- Inspection according to the Flight & Operating Manual
- Position the seat

- Adjust and fasten seat belts – check also the second crew member
- Make sure the cockpit door is closed – check also the passenger
- Fuel cock – open
- Rescue System – unlocked (if fitted)
- Parking brake – ON
- Main switch – ON
- Check the fuel quantity
- Engine choke – open – at a cold engine only
- Fuel pump – ON
- Check the fuel pressure – min. 0.15 bar
- Strobes – switched on
- Check the engine – key in the position 1
- Magnetos – ON
- Check the space around the aircraft
- Starter – turn the key into the position 2
- Adjust RPM to 2000 – 2500 for engine warm-up
- Check the oil pressure – minimum 0.8 bar
- Close the choke slowly, keep RPM by using throttle lever to 2000 – 2500
- Turn off the fuel pump – fuel pressure minim. 0.15 bar
- Radio + Intercom – switch ON
- Transponder – switch ON – set position “stand by”
- Artificial horizon – arrestment check up – switch ON
- Taxing light – switch ON
- After reaching the CHT minim. 50° Celsius – start taxiing

Starting the engine

Before you first start the engine

- Secure the aircraft so that it could not move spontaneously (by means of wedges)
- Make sure there is nobody standing in the vicinity of the propeller
- Turn the fuel cock on
- Pump the fuel into the carburettor by hand or electric fuel pump
- Switch the magneto on
- Start up the engine by turning the key into the position 2

- Let the engine warm up according to the engine producer manual

Check the operation of the ignition system

Engine test

According to the engine producers' manual.

Taxiing

- Taxi slowly (at walking speed) and adjust the speed to the condition of the terrain
- When taxiing, keep the control stick fully pulled backwards (so that the load upon the nose undercarriage is minimised)
- Under crosswind conditions move the control stick into wind to deflect the ailerons in such a way that the aircraft is sufficiently banked against the wind.

Operations to be done at the holding point

- Cockpit doors closed and locked – check the passenger side too
- Check up the tightness of safety belts – check the passenger side too
- Choke – closed
- Rescue system – unlocked
- Fuel cock – open
- Elevator trim in the take-off position – green line
- Flaps main switch – ON
- Flaps position "take-off No.1" – visual checking of extended flaps
- Electrical fuel pump – switched on
- Check magneto at 4000 RPM – maxim. allowed drop of RPM 200 – 300
- Set the altimeter
- Set the transponder (usually squawking code 1200 MOD"A")
- Check the artificial horizon
- Check up the engine instruments
    - Fuel pressure min. 0.15 bar max. 0.4 bar
    - Oil pressure min. 0.8 bar max. 7 bar normal 2.0 to 5.0 bar
    - CHT max. 150° Celsius

    - Oil temperature min. 50° Celsius, max. 140° Celsius, Normal 90-110°
- Manoeuvrability checking
- Check for base leg traffic
- Wing lights – switched on
- Release the brake and line up

Note: In all instances refer to the Engine Manufacturers manual for all engine limits

Operations to be made on the runway threshold

- Line-up the plane on the runway centreline
- Unlock the horizon
- Maximum engine power
- Check the engine revolutions, oil and fuel pressure

Take-off

- Opening the throttle makes the aircraft move; when you reach the take-off speed, pull the control stick slightly backwards to get the aircraft off the ground
- After you take off, keep on flying level close above the runway for a while until you reach the climbing speed and then maintain that speed until you get into safe altitude in case the engine failed
- Set the flap control lever to the cruise position (0) after reaching 100 feet

Do not take off

- If the engine does not run smoothly (when you turn off any one of the ignition circuits, the engine speed must not drop by more than 200 rpm)
- If the instrument readouts fall outside the prescribed operation tolerances
- If the take-off runway is not free
- If the circumstances do not comply with the requirements of the UL-1 regulations CZ, or the applicable regulations in your country of registration.

Flight

- Observe the recommended speeds.

Flying in turbulence

- In a strong turbulence preferably maintain the speed of about 55 to 65 knots

- When making a turn do not bank more than 20°.

Flying in the rain

- It is not recommended to take off in the rain!
- If you get into rain during the flight, maintain the speed above 65 knots
- If you must land during the rain, approach at higher speed 65 knots

Caution keep in mind that both the stall speed and the landing speed are higher when the wing is wet

Landing

- Maintain the landing approach speed according to the table
- 200 feet above the ground set the flaps to the landing position
- Bring the aircraft to approximately 2 feet above the ground and with the throttle lever set to minimum pull the control stick slightly backwards to make the aircraft slow
- The aircraft lands at the speed of about 35 to 37 knots

Operations to be made after landing

- Set the wing flaps to the cruise position – 0
- Observe the recommended taxiing speed
- Before turning the engine off let it cool down to the recommended temperature according to the engine manual and switch off all electrical equipment
- After you have stopped the aircraft and turned the engine off, secure the aircraft so that it might not move in the wind, take the key out of the ignition lock
- If the aircraft is likely to stay parked for a longer period, anchor it.

Performance and Recommended Speeds

TOTAL WEIGHT OF THE AIRCRAFT (kgs)	380 kgs	520 kgs
Take-off Speed (kph)	32 Knots	38 Knots
Climbing Speed (kph)	60 Knots	60 Knots
Landing Approach Speed (kph)	60 Knots	60 Knots
Maximum Rate of Climb with Rotax 912 80hp	1200 fpm	950 fpm

Caution All above mentioned IAS speeds values were measured at a company

aircraft test flights made on June 19, 2002 on the airfield Pisek-Krasovice Elevation 1351 ft, air temperature: + 27.0 Celsius

CAUTION With any aircraft flying in different condition, i.e. Different altitude above sea level and different air temperatures, the listed values can differ!

- Optimum Cruise Speed (Vopt) 70-86 Knots
- Economical Cruise Speed (Vecon) 73 Knots
- Power Off Glide Ratio (with engine off) 12:1
- Power Off Descent Rate (60 Knots, flaps position 0) 300 ft/min
- Power Off Descent Rate (60 Knots, flaps position 1) 400 ft/min
- Power Off Descent Rate (60 Knots, flaps position 2) 700 ft/min
- Fuel Consumption at the Cruise Speed of 70 Knots and Maximum Weight 520 kgs approx. 11 litres per hour
- Flight Range 4 hour 30 minutes

- Take-off distance MSL, 15ºC, wind 0, MTOW 520 kgs 100 m
- Take-off distance over 15 metres obstacle
  - With engine Rotax 912 80 hp 520 Kgs 260 m
  - With engine Rotax 912S 100 hp 520 Kgs 250 m
  - With engine Rotax 582 65 hp 520 Kgs 290 m

Caution The take-off distance is longer with higher temperatures and higher altitude!

Loss of altitude stalling in level flight – engine idle

- flaps 0 100 feet
- flaps 1 85 feet
- flaps 2 82 feet

Loss of altitude stalling in a slipping turn – engine idle

- flaps 0 215 feet
- flaps 1 190 feet
- flaps 2 185 feet

Transition time from the left to the right turn by a bank of aircraft of 30°

- 1.5 – 2 sec

Other Information

Obligatory Labelling

In the pilot's cockpit there must be a label located on a well visible place with the following text

"This Ultralight aircraft is not subject to the certification by the Civil Aviation Authority of the Czech Republic and it is operated at the user's own risk. Aerobatics and deliberate spins are prohibited."

Additional to the warning above there must be another label, also well visible to the pilot with the following information

• Aircraft Serial Number	No.
• Empty Weight	275 Kg
• Maximum Take-off Weight	520 Kg
• Maximum Payload	245 Kg
• Maximum Load in the Baggage Compartment	10 Kg
• Minimum Pilot Weight	55 Kg
• Never Exceed Speed (Vne)	120 Knots
• Stall Speed (Vs0)	35 Knots

On the fuel tank cap there must be a label specifying the tank capacity and the required fuel quality.

• Premium Unleaded for the 100 hp Rotax – Quantity = 55 litres
• Normal Unleaded for the 80 hp Rotax - Quantity = 55 litres

Aircraft Registration Label

• Aircraft Serial No.	No.
• Aircraft Manufacturer	Fantasy Air s.r.o.
• Empty Weight	275
• Aircraft Type	Allegro 2000
• Maxim. Take off Weight	520 Kg
• Year of Manufacture	2004

The aircraft user (operator) is responsible for all labels legibility for the life of the aircraft.

Airspeed Indicator Marking

Mark	Range – Value [IAS Knots]	Meaning
white curve	35-60	Operating range with flaps out
green curve	48-78	Standard operating range
Yellow curve	78-118 Knots	Manoeuvring must be done carefully and in calm conditions
red radial line	118 Knots	Maximum speed for all operations

Engine gauges must have the scales marked according to the requirements of the manufacturer.

Aircraft Assembly

There must be at least two people to assemble the aircraft, preferably three. Follow the instructions below

Fit the horizontal tail unit onto the tail fin, connect them using a bolt having the diameter of 6 mm and secured by a slotted nut with a cotter pin. When you are fitting the tail plane onto the tail fin, it is necessary to connect the operating rod of the tail plane balancing surface using a pin having the diameter 6 mm .You must not forget to secure the pin by a cotter pin, the arms of which must be bent carefully so that it could not get caught against the tail plane. Finally, attach the vertical bolt having the diameter of 6 mm. Do not forget to insert as many washers as necessary, because these washers determine the actual setting of the tail plane stabilizer. Using a torque wrench tighten the 6 mm bolt and the vertical bolt to the torque of 10 Nm.

Prepare all the bolts for fixing the wing struts. The procedure is described below only for one half of the wing. Follow the same instructions when attaching the other half as well.

First fit the wing strut onto its mount on the fuselage and insert the bolt. Lean the strut on the ground (put something soft under the strut to protect it from scratching).

Two people holding the wing can move it towards the mounts. Don't handle the wing by touching its wingtips. It must fit in place easily. If it does not, the position of the wing in respect to the centre-section is not correct.

Do not force too much; the mounts could become damaged. When the wing is in place, insert the upper bolt. Then fit the strut onto the bracket on the wing and secure the bolt too. Then push the back bolt through the back wing and centre-section mount. At all times during the assembly somebody must hold the wing at its tip to keep it in the correct position. Secure all the bolts with nuts with cotter pins. Using a torque wrench, tighten the nuts to the torque of 22 Nm. This value must be observed otherwise the bolts, which are of vital importance, could be

damaged.

Attach the needle for operating the flaps and also secure it by a cotter pin. Connect the ailerons control in the cockpit and secure it.

Using tailor's pins instead of appropriate cotter pins is dangerous and therefore strictly forbidden!

Attach the cover of the joint between the wing and the centre-section. Do not forget to connect the hoses of the Pitot tube!

Aircraft Disassembly

Follow the instructions described above (Aircraft Assembly) in reverse order.

For the assembly and disassembly of the aircraft we recommend using special mounting wrenches, which can be ordered as optional accessories. They make the whole process of assembly and disassembly much faster and easier.

Aircraft Anchoring

If the aircraft is to be parked in an open area it is necessary to anchor it using ropes and anchoring stakes. In order to avoid any unplanned movement turn the aircraft with its nose against the wind, fix the tie down ropes to the catches on the wing ends and to the nose wheel, and if necessary also to the rear end of the fuselage. Tie the control stick to lock the rudder and ailerons from moving in gusty winds. Cover the cockpit with a canopy cover to avoid any damage of the windscreen.

Place wheel chocks around the wheels to stop the aircraft rolling.

All fixing must be made in such a way that the aircraft will not become damaged.

If anchoring the aircraft in a rainy weather or in conditions where water could condense in the airframe, it's necessary before the next flight to follow the steps as described in the section "Aircraft Washing".

Aircraft Repairs

Minor repairs are considered to be the repairs of such components which do not affect the flight properties and the strength of the aircraft. These may be done by the owner.

All repairs of the torsion box, wing spars or tail units, struts and load-bearing parts of the airframe must be carried out by the manufacturer only.

Aircraft Cleaning and Washing

Openings of the static inlet, stall speed indicator and Pitot's tube must be covered before any aircraft washing.

Wash the aircraft with standard car-shampoo and water. Avoid using any solvents or any cleaning agents which may influence aluminium or laminate which you are not sure about.

All insects stuck on the aircraft can substantially influence performance and handling characteristic of the aircraft. Remove them BEFORE they go hard.

The best way to wash the aircraft is to soak the plane with plenty of clean water first. If there are lots of bugs wet a cloth and lay over the affected area and allow the soaking water to soften the bugs for easier removal. Avoid using brushes which could damage the aircraft surface.

After drying the aircraft surface you should treat it with car polish, we recommend Nu-Finish which will make cleaning the aircraft much easier next time.

The cockpit transparent windshield cleaning requires special care. You mustn't use any organic solvents or fuel which will cause permanent damage. Use lots of water for its cleaning. Never use the same water used for the aircraft cleaning, use fresh water. Use also a separate sponge and rag for drying of the windshield. When clean we recommend Plexus to keep the screen clean till the next washing.

After finishing the aircraft cleaning, check if there is no water in wings and tails. Remove the cowling and check if there is no water inside the engine compartment, dry it if necessary.

Remove the covers from the static inlet, stall speed indicator and Pitot's tube, check there is no water.

By a light blowing into the Pitot tube the airspeed indicator pointer must move and return back onto the "0" position.

When operating the aircraft on grassy or muddy areas remove the wheel spats from time to time and clean them. Mud layers inside the wheel spat can cause additional weight and excessive stress and possible cracking.

Periodic Inspections of the Aircraft

The inspections to be carried out before each flight and after each landing are described in the section "Pre-flight Inspection".

After the first 20 flight hours the warranty inspection shall be carried out by the manufacturer's technician to "Inspection A".

After 50 flight hours (total) the "Inspection A" shall be made.

After 100 flight hours (total) the "Inspection B" shall be made.

After 150 flight hours (total) the "Inspection A" shall be made again….etc.

The allowable tolerance for carrying out the scheduled inspection is ±5 flight hours.

"Inspection A"

- Wing, horizontal tail unit and vertical tail unit skin check
- Check the torsion boxes
- Mounting clearance check
- Check the free play of all direction controls
- Direction control mechanical condition check
- Check all the fittings
- Check all riveted and bolted joints
- Battery and wiring condition check
- Fuel system tightness check
- Landing gear condition and wheel alignment check
- Brake condition and efficiency check
- Check the condition of the wheel tyres and rims
- Check for water in the fuel tank

Engine and propeller inspections according to the manufacturers "ENGINE LOG BOOK" and "PROPELLER LOG BOOK".

"Inspection B"

- All the checks listed under "Inspection A"
- Check the bolts used for attaching the wing and struts
- Check the wear and tear of the bolts in the undercarriage and replace if necessary
- Check the engine mounts used for attaching the engine
- Brake lining check and replace if necessary
- Check the wheel bearings

The "Inspection A" may be carried out on request at the owner of the aircraft, which must be prepared at an airfield in order that a testing flight could be made. The "Inspection B" must be carried out at the manufacturer's premises.

The manufacturer's technician shall make a record in the flight manual to acknowledge that the inspection was carried out and, as the case may be, he shall

describe the repairs made.

If the above inspection schedule is not adhered to, the manufacturer does not consider the aircraft to be airworthy and the manufacturer hereby disclaims any liability for the consequences arising there from.

Periodic Inspections of the Engine and Propeller to be made according to the respective manuals

Periodic Inspections

Date	Inspection Type	Defects Found	Technicians Name And Signature

Compulsory Adjustments Prescribed by the Manufacturer

Number	Date	Description Of The Adjustment	Technician's Name And Signature

End of Allegro 2000 Flight Manual