direct fly

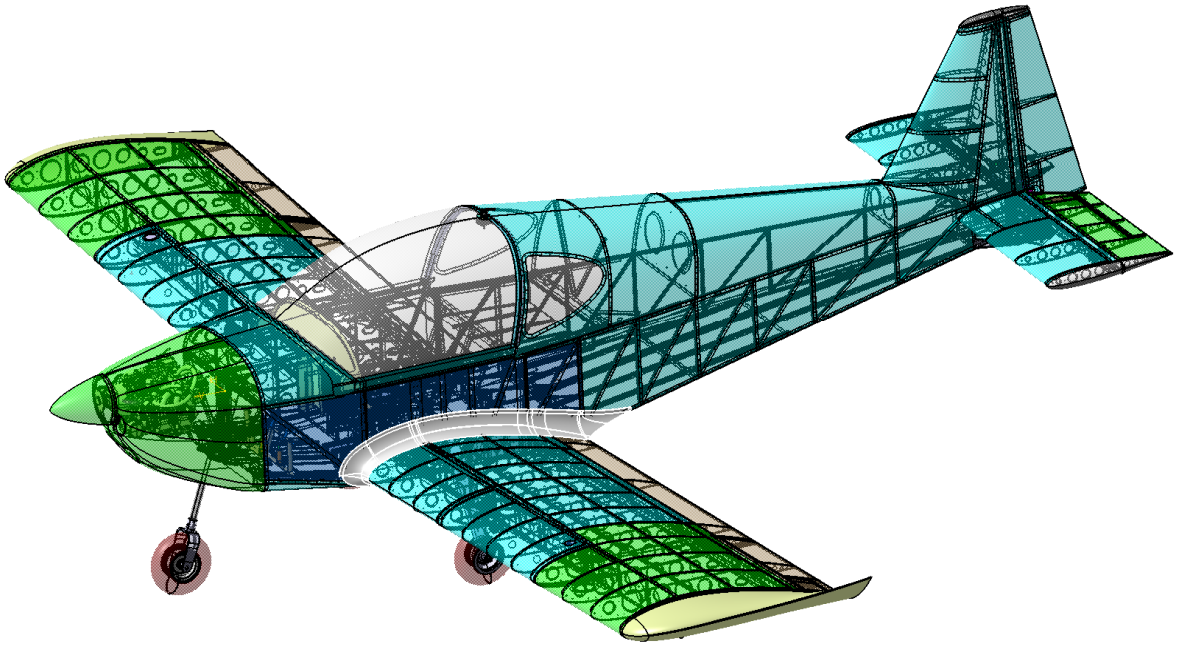
RRES

The Direct Fly

Alto 912 TG

PILOT´S OPERATING HANDBOOK

DFE-POH-AR1



Aircraft model / modification**:** **ALTO** **912 TG**

Manufacturer : **Direct Fly s r.o.**

Airplane Serial Number: **DF051**

Airplane Registration Number: **PU-RJR**

Issued on : **February 27, 2015**

Revision : **2**

This aircraft must be operated following the instruction and limitation stated in this flight manual.

This flight manual must be kept within reach of pilot during flight.

RECORD OF MANUAL REVISIONS

This manual is revised as a complete document. All pages must display the same revision number.

Revision Notes:

Revision	Issue Date	Description
0	Oct 26, 2010	Initial Issue
1	Jul 20, 2014	Layout revised per ASTM F2746-12. Publication number is now using the Direct Fly / Erres Industria Aeronautica patern. Revised to comply with the Brazilian version of the Alto 912 TG. Revised List of Supplements.
2	Feb 27, 2015	Revised list of ASTM Consensus Standards

TABLE OF CONTENTS

INTRODUCTION

ASTM Standards

List of the ASTM standards used for the design, construction, continued airworthiness, and compliance with this standard.

Designation: F 2245 – 12b
Design and Performance of a Light Sport Airplane

Designation: F 2972 - 12
Standard Specification for Light Sport Aircraft Manufacturer's Quality Assurance System

Designation: F 2295 – 06
Standard Practice for Continued Operational / Safety Monitoring of a Light Sport Aircraft

Designation: F 2483 – 12
Standard Practice for Maintenance and the Development of Maintenance Manuals for Light Sport Aircraft

Designation: F 2626 – 12
Standard Terminology for Light Sport Aircraft

Designation: F2746-12
Pilot's Operation Handbook (POH)

Designation: ASTM F2506-10
Standard Specification for Design and Testing of Light Sport Aircraft Propellers

Designation: ASTM F2339-06
Standard Practice for Design and Manufacture of Reciprocating Spark Ignition Engines for Light Sport Aircraft

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Section 1 – GENERAL INFORMATION

1.1 Introduction to the Alto

Direct Fly ALTO 912 TG is an all-metal low wing aircraft with a riveted aluminum structure. Some non-load bearing parts such as the engine cowling, wing tips, empennage tips, and wheel covers are made of composite materials. The Alto is powered by the ROTAX 912 ULS engine (100 hp) and Woodcomp Propuls three-blade ground-adjustable propeller. The two seats are arranged in a side-by-side configuration. The tricycle landing gear features a steerable nose wheel and hydraulic brakes on main wheels.

Wing span	8.20 m	(26ft 11 in)
Length	6.14 m	(20ft 2 in)
Height	2.26 m	(7ft 5 in)
Wing Area	10.52 m²	(114 sq ft)
Mean aerodynamic chord (MAC)	1,31 m	(51.77 in)
Maximum take-off weight	600 kg	(1,320 lb)

1.1.1 Side, Top, and Front Views.

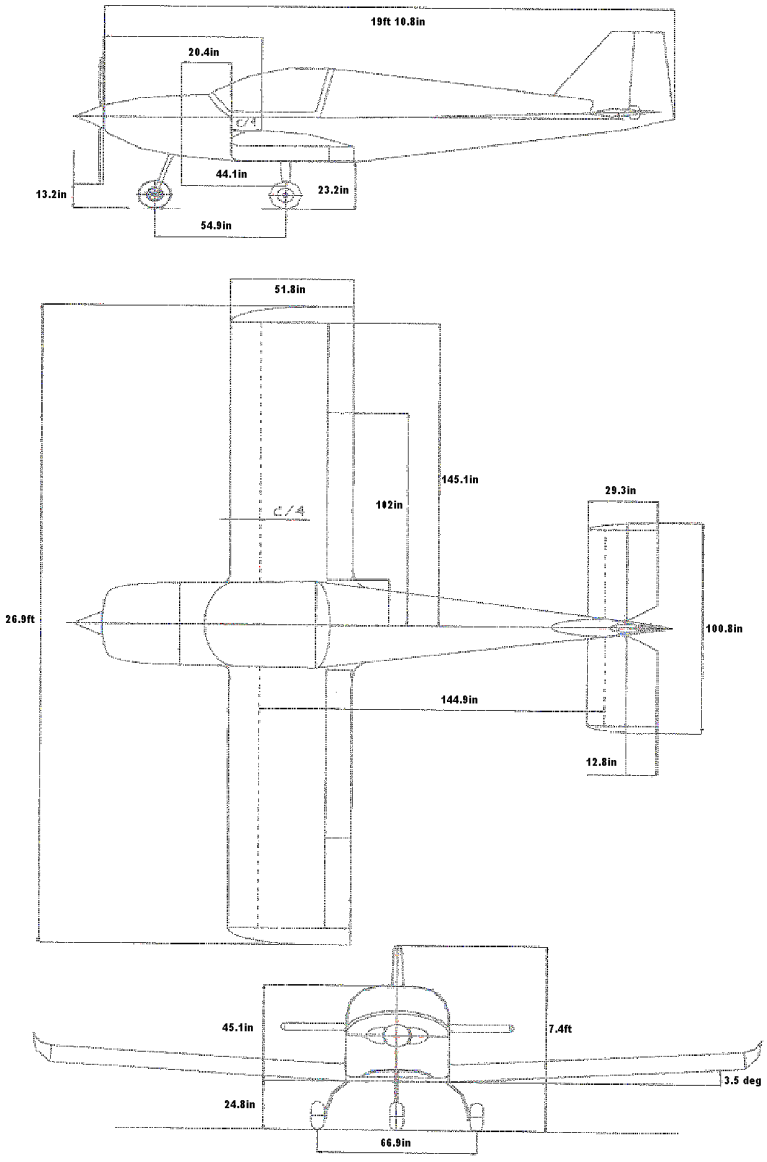


Fig 1-1: Side, Top, and Front Views

1.2 Performance Specifications

AIRSPEEDS FOR NORMAL OPERATION

Takeoff: .... 45 KIAS
Climb:
Normal: .... 65 KIAS
Best Rate of Climb (Vy): .... 60 KIAS
Best Angle of Climb (Vx): .... 50 KIAS
Design Cruise Speed (Vc): .... 110 KIAS
Landing Approach:
Flaps 0º: ....70 KIAS
Flaps 15º Position 1: ....60 KIAS
Flaps 25º Position 2: ....55 KIAS
Flaps 45º Position 3: ....50 KIAS

Balked Landing: ..... 65 KIAS
Maximum Horizontal Flight Speed (V_h): .....120 KIAS
Maximum Structural Cruising Speed (V_{No}): ....110 KIAS
Maximum Demonstrated Crosswind Velocity: ... .12 Knots
Maximum (Never Exceed Speed'(V_{NE}): ..... 131 Knots

1.2.1 Maximum Gross Weight..... 600 kg (1320 lbs)

1.2.2 Aircraft Speeds and Power Settings (at 3,000‘ MSL)

Engine RPM	4,200 rpm	4,500 rpm	4,800 rpm	5,000 rpm	5,200 rpm	5,500 rpm
IAS, kts	73.0	88.0	99.0	107.0	114.0	118.0
CAS, kts	72.0	85.0	95.0	104.0	111.0	115.0
TAS, kts	73.0	86.0	97.0	106.0	112.0	117.0

1.2.3 Aircraft Range and Endurance.

The following table lists fuel consumption, endurance and range at 3,000‘ MSL. Endurance and range are with 45 minutes of fuel reserves remaining.

Engine RPM	4,200 rpm	4,500 rpm	4,800 rpm	5,000 rpm	5,200 rpm	5,500 rpm
Fuel consumption, gallons per hour	3.0	3.7	4.5	4.9	5.3	6.1
Fuel consumption, liters per hour	11.3	14.0	17.0	18.5	20.0	23.1
Endurance, hours	7.0	5.6	4.6	4.2	4.0	3.4
Range, miles	511	488	452	454	443	402

1.2.4 Rate of climb

***Vx – Best* Angle of Climb**

Altitude	Rotax 912 ULS	Airspeed to achieve best angle of climb (KIAS)
Sea Level	15.8 fps	50
	948 fpm	

***Vy –Best* Rate of Climb**

Altitude	Rotax 912 ULS	Airspeed to achieve best rate of climb (KIAS)
Sea Level	17 fps	60
	1020 fpm	
3,000 ft	14 fps	60
	850 fpm	

1.2.5 Stall speed: Vs_1 and Vs_0

Vs_1 .... 41 kts
Vs_0 ..... 35 kts

Stall speed table is valid for weight of for 1320 lb (600 kg) and level flight.

	Degrees	Indicator	Stall speed (KIAS)
Flaps up	0º		41
Flaps – take-off	15º	I	39
Flaps – landing	25º	II	37
Flaps – landing	45º	III	35

1.2.6 Total fuel capacity, total usable fuel and approved types of fuel

Usable fuel – each wing tank..... 46.0 l (12.1 gal)
Usable fuel – total both tanks ..... 92.0 l (24.2 gal)
Unusable fuel – total both tanks ..... 11.4 l (3.0 gal)

Automotive fuel Natural 95 – unleaded fuel (standard fuel for automotive, ASTM D 4814) or AVGAS 100 LL.

1.2.7 Maximum engine power output at stated RPM

100 hp @ 5800 rpm ..... take off

94 hp @ 5500 rpm ..... continuous

Section 2 — LIMITATIONS

2.1 Airspeed Indicators Marking

Marking	IAS, Kts	Meaning
White Arc	35 – 70	Operating range with extended flaps. Lower limit – Vs_0 at maximum weight (flaps 45°) Upper limit – V_{FE}
Green Arc	41 – 110	Normal operation range Lower limit – V_{s1} at maximum weight (flaps 0°)
Yellow Arc	110 – 131	Maneuvers must conducted with caution and only in smooth air
Red Line	131	Maximum speed for all operations – V_{NE}

2.2 Airspeed Limitations

Airspeed		IAS, kts
V_{S1}	Stalling speeds at maximum takeoff weight. (flaps 0°)	41
V_{S0}	Stalling speeds at maximum takeoff weight. (flaps in landing position 45°)	35
V_{FE}	Highest permissible speed for wing flap extension.	70
V_{NE}	Never exceed this speed in any operation.	131
V_{NO}	Maximum structural cruise speed.	110
V_A	Maximum maneuvering speed.	89
V_B	Maximum gust intensity speed	90
Vo	Operating maneuvering speed at gross weight 600 kg	86
Vo	Operating maneuvering speed at minimum weight 350 kg	70

WARNING!

Do not make full or abrupt control movement above maneuvering speed — aircraft might be overloaded.

2.3 Service Ceiling

(Rotax 912 ULS) ..... 14,500 ft

2.4 Load Factors

Flaps Up
Maximum positive load factor..... +4
Maximum negative load factor ..... -2

Flaps Down
Maximum positive load factor..... +2
Maximum negative load factor 0

2.5 Approved Maneuvers

- Steep turns up to bank angle of 60°
- Climbing turns
- Lazy eights
- Stalls (except for steep stalls)
- Normal flight maneuvers
- Entry speed into maneuvers 89 kts.

2.6 Total Fuel Capacity, Approved Fuel Grades

2.6.1 Fuel Capacity

Usable fuel –	each wing tank.....	46.0 l	(12.1 gal)
Usable fuel –	total both tanks	92.0 l	(24.2 gal)
Unusable fuel –	total both tanks	11.4 l	(3.0 gal)

2.6.2 Approved Fuel Grades

- Min. RON 95, EN 228 Premium, EN 228 Premium plus or AVGAS100LL
- Fuel according to FAA - Standard Spec. for Automotive Spark-Ignition Engine Fuel, ASTM D 4814 or AVGAS 100 LL.
- Fuel according to DOT - CAN/CGSB-3.5 Quality 3 min AKI 91 or AVGAS 100 LL.

Refer to the ROTAX engine Operator's Manual-section 2.4

2.7 Max Engine Power Output @ stated RPM

Maximum take-off power	100 hp	(73.5 kW)
Maximum continuous power	94 hp	(69.0 kW)
Maximum (5 min)	5,800	rpm
Maximum for continuous operation	5,500	rpm

2.8 Applicable Environmental Limitations

Maximum demonstrated cross-wind component	12	knots
Maximum demonstrated wind (parallel to the runway)	24	kts
Maximum tail wind (takeoff or landing)	10	kts
Maximum outside temperature.....	50	°C
Minimum outside temperature.....	-25	°C

2.9 Applicable VFR night or IFR limitations

The airplane is approved for:

- VFR daylight flights.
- VFR night flights are approved only when required lighting for such flights is installed and flight performed by a pilot holding a current medical and appropriate ratings.
- IFR daylight and night flights are approved only when instrumentation and lighting required for such flights by FAR Part 91 is installed and operational and the flight is performed by a pilot holding current medical and appropriate ratings.
- The airplane is not authorized for flight into known or forecast possible icing conditions.
- The airplane is not authorized for flight within 25 miles of known lightning or thunderstorms.

Section 3 — EMERGENCY PROCEDURES

3.1 General Information

This section covers the recommended procedures to follow during emergency and adverse flight conditions. Emergency situation arising from engine failure are highly unlikely if pre-flight checks and maintenance are properly performed according to the aircraft and engine manuals. Proper flight planning and using good judgment can minimize or reduced emergencies caused by poor or unexpected weather conditions.

As it is not possible to define every type of emergency that may occur, it is the pilot's responsibility to use sound judgment based on personal experience and knowledge of the aircraft to determine the best course of action.

It is considered mandatory that the pilot be familiar with this entire manual, in particular, the "Emergency Procedures" section prior to flight.

3.2 Airspeeds for Emergency Procedures

Optimum gliding speed - 67kts (9:1 glide ratio)

3.3 Emergency Checklist

3.3.1 Engine Fire During Start

Fuel valve ..... OFF
Throttle ..... FULL

Once engine stops:
Ignition ..... OFF
Alternator ..... OFF
Master switch ..... OFF
Abandon aircraft and extinguish (if possible)
Damage to aircraft ..... evaluate

WARNING!

Do not operate aircraft until cause of fire has been identified and problem is solved.

3.3.2 Engine Failure during Take-Off

Airspeed ..... adjust to 67 kts
Landing site selection
Below 150 ft ..... straight ahead, if possible
Above 150 ft ..... suitable place without obstacles, preferably in the runway direction
Flaps ..... as needed
Fuel boost pump ..... OFF
Fuel valve ..... OFF
Seat belts ..... Tighten
Master switch ..... when landing assured OFF

3.3.3 Loss of Engine Power in Flight

Ignition .....BOTH ON
Fuel boost pump ..... ON
Fuel valve ..... Fuel tank with higher quantity
If carburetor icing is suspected, apply carburetor heat (if available).
Look for possible landing area.

3.3.4 Emergency Landing Without Engine Power

Airspeed	67 kts
Trim	adjust
Landing site selection	select

Make sure the engine failure is not a consequence of unintentional switching off the ignition, or fuel valve.
Try to restart the engine using 3.3.16 In-Flight Engine Starting, if altitude permits, otherwise proceed with emergency landing using 3.3.2 Engine Failure during Take-Off.

3.3.5 Precautionary Landing with Engine Power

Select suitable location; evaluate wind speed/direction, surface, and obstacles. Fly past the selected location at 67 kts and at a suitable altitude (150 ft recommended); evaluate the landing site.

Flaps	as needed
Land.	
Once on the ground:	
Brake	as necessary
Ignition	OFF
Master switch	OFF
Fuel valve	OFF

3.3.6 Fire in Flight

Fuel valve	OFF
Throttle	full, if possible
Airspeed	increase to extinguish fire — Do not exceed V_{ne} limitation

Land at nearest airfield or other suitable location.

Ignition	OFF
Airspeed	67 kts
Flaps	as needed
Alternator switch	OFF
Seat belts	tighten
Master switch	When landing assured OFF

Perform emergency landing. Exit aircraft and if possible, extinguish fire.

WARNING!

Do not start the engine once fire has been extinguished.

Do not operate aircraft until the cause of the fire has been identified and the problem is solved.

3.3.7 Loss of Oil Pressure

Engine failure typically occurs shortly after loss of oil pressure. Reduce throttle and land as soon possible, consider off-field landing.

3.3.8 High Oil Pressure

Monitor oil pressure, (oil pressure is sense by electrical sending unit) land as soon as practical.

3.3.9 Emergency descent

Power	Idle
Optimum gliding speed	67 kts
Flaps	as needed
Best glide ratio (at 67 kts)	1:9

3.3.10 Alternator Failure

Turn OFF all the non-essential equipment. You have approximately 30 minutes of battery, NOTE time.

Land	as soon as practical

3.3.11 Overvoltage

Eletrical Equipment	Turn all on - Monitor Voltage (If Volt Meter is available)
Engine	Reduce Power - Monitor Voltage (If Volt Meter is available)
Land	as soon as practical

3.3.12 Inadvertent Spin

WARNING!

Characteristics of this aircraft during spin were not tested.
Use the following settings for spin recover.

Throttle	IDLE
Aileron	NEUTRAL
Rudder	against rotation
Control stick	push

Once the rotation has stopped, center the rudder and establish level flight.

3.3.13 Inadvertent Icing Encounter

Throttle	increase above normal cruise
Heading	leave icing area
Altitude	climb, if possible
Airspeed, recommended	90 kts
Airspeed, minimum	62 kts
Carb heat	ON (If available).

In case of possible carburetor icing, pull on the carburetor heat (if available), immediately after icing clears, push it back in again – as significant power is lost.

Land at the nearest airfield or proceed with emergency landing using 3.3.5 Precautionary Landing with engine power.

3.3.14 Loss of Primary Instruments

Circuit breakers	Check – Reset once
Master switch	Cicle ON-OFF
Land	as soon as practical

3.3.15. Loss of Flight Controls

- Such type of failures are extremely rare if pre-flight checks and maintenance are properly performed according to the aircraft Manuals. Primary flight controls failures can potentially be caused by the following:
- Failure caused when either end of the cable becomes free of its clamp
- Failure of the cable connecting hardware (bolts, rod ends, etc.)
- Failure of the cable itself.
- Jamming of the controls within the cabin
- Jamming of the external controls
- Structural failure of the control
- Failure of autopilot mechanism (if available)

In an emergency the secondary effect of controls may be used to direct the aircraft:

- The secondary effect of the rudder is to roll the aircraft. Loss of aileron control can be partially addressed through the use of the rudder.
- The secondary effect of the aileron is to yaw the aircraft. Loss of rudder control can be partially addressed through the use of the ailerons.
- The trim mechanism is separate to the elevator system and can be used to control the pitch and attitude of the aircraft.
- In some cases the autopilot mechanism (if available) may still function and can be used to control the aircraft.
- Wing flap position and engine power setting also affect the pitch of the aircraft and can be used to assist in control.

In some cases, shaking a jammed control can free it. However it can also potentially exacerbate the problem. Shaking is therefore not recommended until other troubleshooting techniques have been attempted.
The following steps are recommended:

Secondary Control	Apply
Control mechanism inside cabin	Check. Clear any obstructions
Control	Shake
Brute Force	Apply if control is jammed
Land	As soon as practical

WARNING!

Where possible, ask to the passenger carry out the checks. Complicated or awkward trouble-shooting measures which divert the pilot's attention should be avoided if possible.

3.3.16 In-Flight Engine Starting

WARNING!

Altitude loss for in-flight engine starting is approximately 600 ft.

Airspeed	70 kts
Master switch	ON
Fuel valve	fuel tank with higher quantity
Fuel pump	ON
Throttle	1/3 of travel
Starter	activate

Note: Use choke if engine is cold and place throttle to idle.
If engine is not starting (e.g., weak battery not able to turn engine fast enough to start, etc.) accelerate to 90-110 kts to help spin the propeller.

Section 4 — NORMAL PROCEDURES

4.1 Preflight Check List

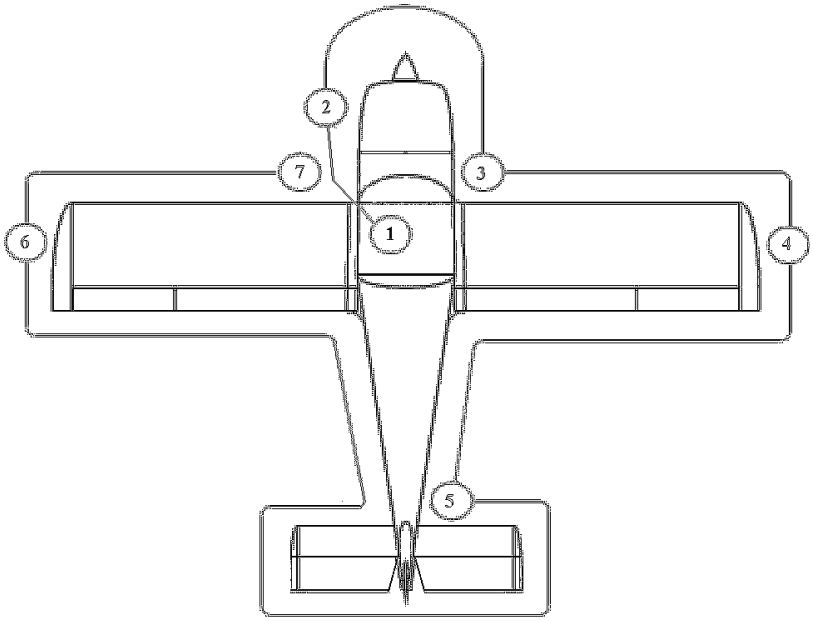


Fig 4-1: Preflight check list

4.1.1 Cockpit ①

Canopy Glass	check
Master Switch	OFF
Ignition Switches	OFF
Control Lock	OFF

NOTE: If this is to be a night flight, turn Master Switch ON and check nav, strobes, and landing light.

4.1.2 Power Unit ②

Engine, Propeller – Condition	check
Exhaust Muffler and Attachment	check
Fuel System, Tubing	check, drain sumps
Cooling System Liquid Quantity	visual check
Oil Quantity	between MIN and MAX marks
Brake Fluid Quantity	visual check

4.1.3 Undercarriage ③

Brake System	visual check for leaks
Landing Gear Leg and Attachment	check
Tire Pressure	visual check

4.1.4 Right Wing ④

Surface & wing tip	check condition
Flaps – surface, hinges, controls	check condition
Aileron – hinges	check, free and full travel
Fuel Leakage and Fuel Cap	check

4.1.5 Empennage and Fuselage ⑤

Empennage	check for damages
Elevator	check, free and full travel
Trim	check

Rudder	check (see note below)
Fuselage surface, tail skid	check for damage

NOTE: Nose wheel steering is connected to the rudder pedals. Do not try to deflect the rudder by hand.

4.1.6 Left Wing ⑥

Surface & wing tip	check condition
Flaps – surface, hinges, controls	check condition
Aileron – hinges	check, free and full travel
Fuel Leakage and Fuel Cap	check
Pitot tube	remove cover / check condition

4.1.7 Undercarriage ⑦

Brake System	visual check for leaks
Landing Gear Leg and Attachment	check
Tire Pressure	visual check

4.2 Engine Starting

Exterior Pre-Flight Inspection	completed
Seat Belts	adjust and secure
Master Switch	ON
Fuel Pump	ON, as required
Ignition switches	ON
Instrument Switch	ON
Strobe Lt	ON
Nav Lt	As req'd
Fuel shut-off valve	OPEN (fullest tank)
Choke	ON, cold engine only
Throttle	1/5 of travel (IDLE, cold engine)
Brakes	hold
Propeller Area	clear
Canopy	Position for engine start
Starter	Engage (maximum 10 seconds of cranking followed by 2 minutes of cooling)
After start	
Instruments	check (oil pressure must be indicated within 10 seconds)
Choke	smoothly OFF
Throttle	max 2,000 rpm for 2 min.

4.2.1 Engine Warm-Up and Test

Engine warming up	initially (approx 2 minutes) at 2,000 rpm; if necessary increase slightly to reach oil temperature of 120°F
Indicated Pressures and Temperatures	must stay within limits
Ignition Check	set to 3,850 rpm, switch off I/II

NOTE: Maximum drop 300 rpm, difference between I and II must not be above 120 rpm.

Max. Static RPM	around 4,900 -5,000
Idle	1850 ± 100 rpm
Voltmeter and Ammeter	Checked (if available)

4.3 Taxiing

Do not use excessive speed when taxiing. Always check brakes at the beginning of movement.

4.4 Normal Take-Off

Brakes	as required
Trim	neutral
Flaps	take-off position
Master Switch	ON
Ignition	ON (L+R)
Fuel Pump	ON
Fuel Quantity	check
Fuel Valve	tank with higher fuel quantity or RIGHT when both tanks are full
Instruments	check
Canopy	closed, locked
Seat Belts	lock, tighten
Controls	free and full travel

Gradually apply full throttle, lift the plane by gentle adding backpressure to stick at speed between 40 and 44 KIAS. Unless obstacles prevent it delay climb until reaching 62 KIAS.

WARNING!

Do not take-off if engine is not running smoothly or there are obstacles on the runway.

4.5 Climb

Initial Climb Speed	62 KIAS
Throttle	reduce to 5,500 rpm
Flaps	retract above 500 AGL
Trim	adjust
Engine Instruments	check within limits.
Airspeed	65kts to 75 kts, as required
Fuel Pump	OFF

4.5.1 Best Angle of Climb Speed (V_X)

Throttle	5,500 RPM max
Airspeed	50kts, as required
Fuel Pump	OFF, or as required

4.5.2 Best Rate of Climb Speed (V_Y)

Throttle	5,500 RPM max
Airspeed	60 kts, as required
Fuel Pump	OFF, or as required

4.6 Cruise

Level the aircraft at the desired cruising altitude

Throttle	not to exceed 5,500 rpm
Airspeed	as required
Engine Instruments	check values within limits
Fuel quantity	check
Fuel Valve	switch tanks as appropriate

During cruising flight, an RPM of 4200 – 5500 RPM should be used (redline is 5800 RPM), monitor your fuel consumption and total fuel on board for flight planning.

WARNING!

Always properly switch between tanks to supply fuel to the engine.
When both tanks are full or nearly full, use RIGHT tank first.

4.7 Approach

4.7.1 Descend

Throttle	as required
Airspeed	as required within limits.
Engine Instruments	check within limits.
Trim	as necessary

4.7.2 Approaching the Airport

Throttle	as required
Airspeed	80-110 kts

WARNING!

Do not set IDLE for prolonged periods to avoid overcooling the engine and loss of power.

4.8 Normal Landing

4.8.1 Downwind

Throttle	as required for level flight
Airspeed	75–85 kts
Engine Instruments	check, within limits
Fuel Valve	tank with higher fuel quantity
Fuel Pump	ON
Seat Belts	tighten

4.8.2 Base Leg

Throttle	as required for descent
Airspeed	65 kts
Engine Instruments	check, within limits
Flaps	as required
Trim	adjust

4.8.3 Final approach

Throttle	as required for descent
Airspeed	59-62 kts
Engine Instruments	check, within limits
Flaps	landing (as required)
Trim	adjust

4.8.4 Landing

Reduce throttle to IDLE at approximately 30 ft and maintain 59 kts. Flare the aircraft at 1-2 ft above the ground. After touchdown, gently lower the nose wheel to the ground.

4.8.5 After Landing

Brakes	as needed
Flaps	clearing runway - UP
Trim	Neutral

4.8.6 Engine Cooling and Stop

Throttle	cool engine, approx. 2,000 rpm
Flight instruments switch	OFF
Ignition	L then R OFF
Master Switch	OFF
Alternator Switch	OFF
Fuel Valve	OFF
Secure Aircraft	use tie downs and lock controls

4.8.7 Check After Flight

Check overall aircraft condition

4.9 Short Field Takeoff and Landing Procedures

4.9.1 Short Field Takeoff

For short field take-offs with 100 HP engine the 25° flap landing position can be used. The aircraft will become airborne at a speed below **V_X.** Level the aircraft to stay in ground effect until reaching **V_X** then continue to climb. As speed increases retract flaps and accelerate to **V_Y** while continuing to climb.

4.9.2 Short Field Landing

For short field landings use approach speed of 54 to 67 kts with caution to achieve short landing distance.

4.10 Soft Field Takeoff and Landing Procedures

4.10.1 Soft Field Takeoff

For soft field take-offs with 100 HP engine the 25° flap landing position can be used. Keep constant backpressure on the control stick while taxiing and during the takeoff roll to prevent the nose wheel from digging in to the soft ground. During takeoff as speed increases maintain the backpressure on the control stick to keep weight off the nosewheel. The aircraft will become airborne at a speed below **V_X.** Level the aircraft to stay in ground effect until reaching **V_X** then continue to climb. As speed increases retract flaps and accelerate to **V_Y** while continuing to climb.

4.10.2 Soft Field Landing

For soft field landings use approach speed of 54 to 67 kts while using caution not to have a high sink rate. Try to achieve a smooth touchdown and do not allow the nose wheel to touch down on landing. After the main wheels touchdown, hold the nose wheel off during the initial rollout. As the speed decreases, gently lower the nose wheel to the ground but continue to hold backpressure on the stick. The objective is to prevent the nose wheel from digging in and possible damaging the aircraft.

4.11 Balked Landing Procedures

Throttle	smoothly to FULL
Flaps	take-off position (I)
Airspeed	50 KIAS (Vx)
Trim	adjust
Flaps	retract above 500 AGL
Throttle	reduce to maximum 5,500 rpm
Airspeed	60 KIAS (V_Y) or higher

Section 5 — PERFORMANCE

Flight performances figures stated in this manual are valid for aircraft of standard version with maximum take-off weight of 1,320 lbs (600kg) assuming average pilot and ISA conditions (15°C/59°F temperature, 29.92" Hg pressure). Actual performances of your aircraft might vary according to pilot skills, weather and aircraft condition.

5.1 Takeoff over a 50' (15,2 m) obstacle (flaps 0 – 15 degrees)

Grass Runway

Take-Off Roll ..... 120 m (394 ft)
Take-Off Distance to 50 ft. ..... 264 m (886 ft)

Paved Runway

Take-Off Roll ..... 110 m (361 ft)
Take-Off Distance to 50 ft. ..... 250 m (820 ft)

5.2 Landing over a 50' obstacle (flaps 45 degrees)

Grass Runway

Landing Distance from 50 ft ..... 390 m (1280 ft)
Landing Roll ..... 108 m (354 ft)

Paved Runway

Landing Distance from 50 ft ..... 366 m (1201 ft)
Landing Roll ..... 91 m (299 ft)

5.3 Rate of Climb

altitude	Rotax 912 ULS	Airspeed to achieve best rate of climb (KIAS)
0 ft	17 fps	60
	1020 fpm	
3,000 ft	14 fps	60
	850 fpm	

5.4 Cruise Speed

Engine RPM	4,200 rpm	4,500 rpm	4,800 rpm	5,000 rpm	5,200 rpm	5,500 rpm
IAS, kts	73.0	88.0	99.0	107.0	114.0	118.0
CAS, kts	72.0	85.0	95.0	104.0	111.0	115.0
TAS, kts	73.0	86.0	97.0	106.0	112.0	117.0

5.5 RPM settings and Fuel Comsumption

The following table lists fuel consumption, endurance and range at 3,000‘ MSL. Endurance and range are with 45 minutes of fuel reserves remaining

Engine RPM	4,200 rpm	4,500 rpm	4,800 rpm	5,000 rpm	5,200 rpm	5,500 rpm
Fuel consumption, gallons per hour	3.0	3.7	4.5	4.9	5.3	6.1
Fuel consumption, liters per hour	11.3	14.0	17.0	18.5	20.0	23.1
Endurance, hours	7.0	5.6	4.6	4.2	4.0	3.4
Range, miles	511	488	452	454	443	402

5.6 Airspeed System Calibration

Indicated Airspeed (IAS) can be read from airspeed indicator. Calibrated Airspeed (CAS) is the actual airspeed, corrected for aerodynamic error.

IAS, kts	27	32	38	43	49	54	59	65	70	76	81	86
CAS, kts	28	34	39	45	50	55	60	65	70	75	79	84

IAS, kts	92	97	103	108	113	119	124	130	135	140	146
CAS, kts	89	94	99	104	110	114	120	125	131	136	141

5.7 Stall Speed

Stall speed table is valid weight of for 1320 lb (600 kg) and level flight.

	Degrees	Indicator	Stall speed (KIAS)
Flaps up	0º		41
Flaps – take-off	15º	I	39
Flaps – landing	25º	II	37
Flaps – landing	45º	III	35

Section 6 — WEIGHT AND BALANCE AND EQUIPMENT LIST

6.1 Weight and Balance Chart

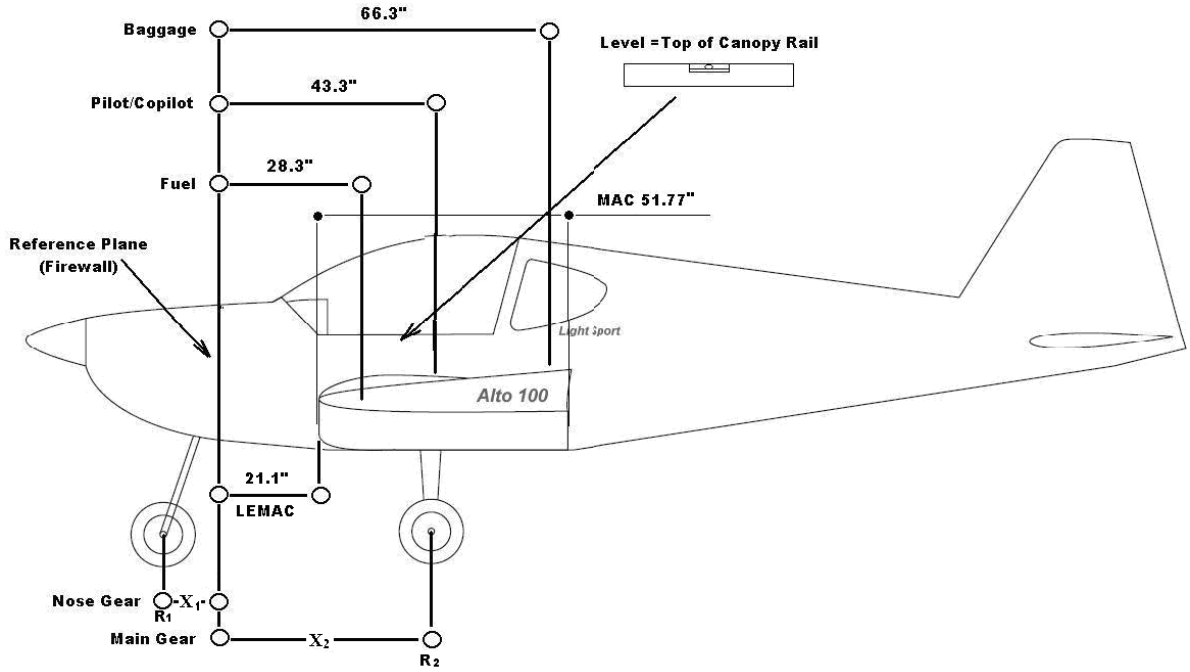


Fig 6-1: Weight and Balance

CG reference plane is at the firewall

Nose Gear weight **R_1**	= 53.5 kg (117 lbs)
Left Main Gear weight **R_{2L}**	= 125.7 kg (277 lbs)
Right Main Gear weight **R_{2R}**	= 128.8 kg (284 lbs)
Distance of Nose Gear weight from reference plane **X_1**	= 300 mm (11.8 in)
Distance of Main Gear weight from reference plane **X_2**	= 1100 mm (43.3 in)
Distance of Fuel weight from reference plane	= 719 mm (28.3 in)
Distance of Baggage weight from reference plane	= 1684 mm (66.3 in)
Distance of Pilots weight from reference plane	= 1100 mm (43.3 in)

6.2 Operating weights and loading

Approved Maximum weight ..... 600 kg (1320 lbs)

Correct CG position is ensured if all limitations (e.g., crew, baggage, fuel and equipment) stated in this handbook are met.

6.3 CG range and determination

Approved CG range for empty aircraft is	810 – 875 mm (31.9 – 34.4 in) aft reference plane, e.g., 21 – 25% MAC
Approved center of gravity range for flight	875 – 1005 m(34.4 – 39.6 in) aft reference plane, e.g., 25 – 35 % MAC

This Weight and Balance information is for Aircraft DF051 PU-RJR

Item	Weight	Arm	Moment
Nose Gear	118	-11.8	-1392
Left Gear	277	43,3	11994
Right Gear	284	43,3	12297
Empty Weight	679	33,7	22882
Fuel	0	28.3	0
Pilot	0	43.3	0
Copilot	0	43.3	0
Baggage	0	66.3	0
Totals	679	33,7	22882
CG limits = 34.4 – 39.6 in			

EXAMPLE

Item	Weight	Arm	Moment
Nose Gear	118	-11.8	-1392
Left Gear	277	43,3	11994
Right Gear	284	43,3	12297
Empty Weight	679	33,7	22882
Fuel	145	28.3	4104
Pilot	120	43.3	5196
Copilot	0	43.3	0
Baggage	0	66.3	0
Totals	944	34,1	32182
CG limits = 34.4 – 39.6 in			

EXAMPLE

Item	Weight	Arm	Moment
Nose Gear	118	-11.8	-1392
Left Gear	277	43,3	11994
Right Gear	284	43,3	12297
Empty Weight	679	33,7	22882
Fuel	145	28.3	4104
Pilot	248	43.3	10784
Copilot	215	43.3	9311
Baggage	33	66.3	2188
Totals	1320	37.3	49269
CG limits = 34.4 – 39.6 in			

6.3.1 Empty Weight

Approved empty weight range ..... 650 – 750 lbs

6.3.2 Aircraft CG

Use the following to calculate aircraft CG. for Aircraft DF051 PU-RJR

Empty Weight	679	33,7	22882
Fuel		28.3	
Pilot		43.3	
Copilot		43.3	
Baggage		66.3	
Totals			
CG limits = 34.4 – 39.6 in			

Date	Empty Weight, M = lbs	Center of Gravity		Signature
		XL (in)	X_T %	
11-14-2013	**679**	**33,7**	**24,5**	

6.4 Installed optional equipment list

Optional:

- AERA 500 GPS
- Icom IC-A210 VHF
- Garmin GTX 327 Transponder
- Hour Meter Honneywell 85094

NOTE:

Each time any change to aircraft configuration occurs, a new weight and balance form must be filled out and recorded or the Aircraft must be weighed and recorded.

WARNING!

Ballistic Recovery / Glider Towing Hook

If this aircraft is equipped with ballistic recovery system as well as glider towing hook, the center of gravity of the aircraft is **already on the aft range**. Make sure you calculate center of gravity position with actual weight of pilot, passenger and baggage and that the center of gravity position if still within limits described the this Flight Manual. Pay special attention to aft limit – 35 % MAC.

Section 7 — DESCRIPTION OF AIRPLANE AND SYSTEMS

7.1 General

Direct Fly ALTO 912 TG is a single-engine, low-wing, cantilever monoplane, all-metal, with a riveted aluminum structure aircraft. Some non-load bearing parts such as the engine cowling, wing tips, empennage tips, and wheel covers are made of composite materials. The Alto is powered by the ROTAX 912 ULS engine (100 hp) and Woodcomp Propuls three-blade ground-adjustable propeller. The two seats are arranged in a side-by-side configuration.

7.2 Airframe

Wing span	8,20 m	(26 ft 11 in)
Length	6,14 m	(20 ft 2 in)
Height	2,26 m	(7ft 5 in)
Wing Area	10,14 m²	(114 sq ft)
Mean aerodynamic chord (MAC)	1,31 m	(51.77 in)
Maximum take-off weight	600 kg	(1,320 lb)

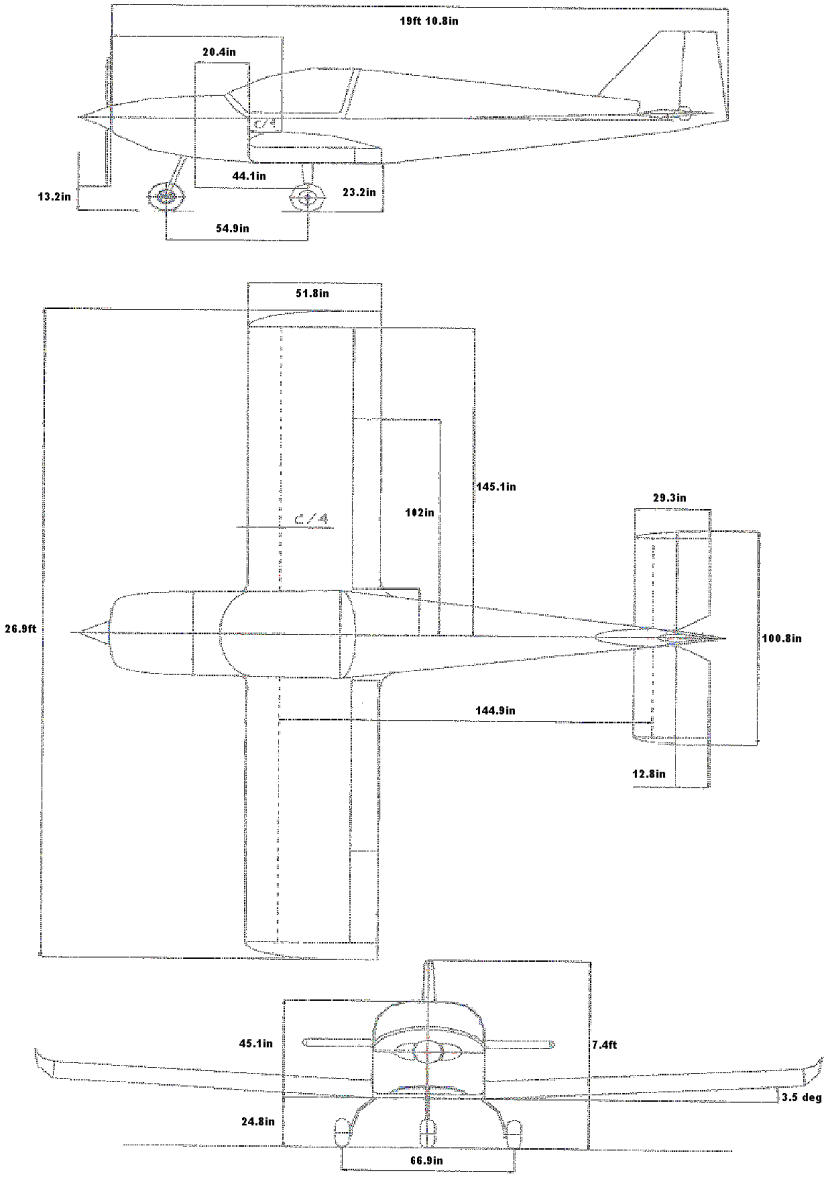


Fig. 7-1: Side, Top, and Front Views

7.2.1. Wings

The rectangular wing is a monospar construction with an auxiliary spar. The skin is made from duralumin sheet. The wing is equipped with ailerons, flaps and integral fuel tanks with a total capacity of 96 l. All the elements are riveted together. The wing-body attachment forms a wing centre section, which is firmly placed into the fuselage. The wing main spar is connected to the wing centre section by bolts and the rear auxiliary spar is connected by means of a hinge.

The wing flaps are a slotted design to provide maximum lift for minimum drag. Flaps are driven electrically via a switch on the instrument panel.

7.2.2. Fuselage

The rectangular fuselage is of semimonocoque, riveted construction and has a bottom and the side walls reinforced by diagonal stiffeners. The dorsal is of oval cross section

7.2.3. Tail Unit

All-metal, riveted structure and has a standard configuration

7.2.4. Landing Gear

Tricycle, with steering nose landing gear. The main wheels are attached to the flexible all-composite legs. The main landing gear wheels brakes are operated by a hydraulic system, by means of central brake lever with parking function.

7.2.5. Cockpit

The forward sliding canopy makes the boarding easy. The canopy is made from high-quality organic glass. Due to its 110 cm wide, is very comfortable and spacious.

7.3 Flight Controls

Airplane control consists of ailerons, elevator and rudder. Directional control is connected by means of push / pull rods with nose gear steering. Main Landing gear brakes are controlled by a handle between the seats.

Airplane is equipped with dual controls enabling flight with two crew members.

7.3.1 Longitudinal Control

Longitudinal control is actuated by the control stick. From the control stick the movement is transferred through the system of cables and push / pull rods to the elevator.

7.3.2 Lateral Control

Lateral control is actuated by the control stick. From the control stick the movement is transferred through the system of push / pulls rods to the ailerons.

7.3.3 Rudder Control

Rudder control is controlled by pedals of foot control. The rudder is interconnected with foot control pedals by a cable system to the rudder.

7.3.4 Elevator Trim Tab Control

A electric elevator trim control is located between the seats. A servo on the elevator is interconnected to the trim tab by means of a push rod and clevis arrangement.

7.3.5 Aileron Trim Tab Control (Optional)

A electric aileron trim control is located on the top of both pilot and co-pilot sticks, which controls a trim tab on the "Right" aileron trailing edge, a servo on the aileron is interconnected to the trim tab by means of a push rod and clevis arrangement.

7.4 Instrument Panel

The instrument panel is made of Carbon fiber with a aluminum face plate which support the components.

The ALTO may be customised with several different instrument panels. A typical primary layout is shown below:

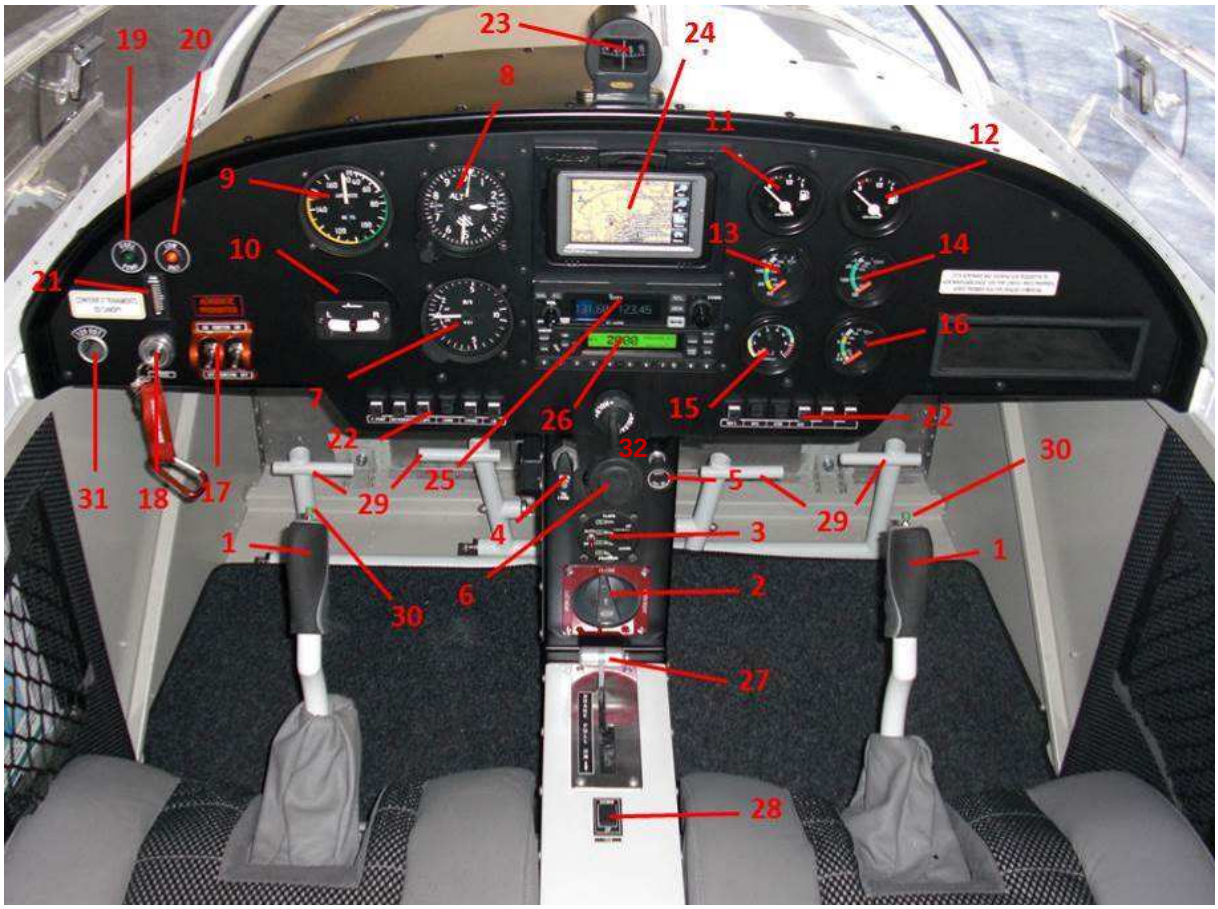


Fig. 7-2: Primary Instrument Panel

7.5 Flight Instruments / Controls

INSTRUMENTS / CONTROLS LIST			
1	Control Sticks	**17**	Magnetos Switches
2	Fuel Tank Selector	**18**	Master / Start Switch
3	Flaps Control	**19**	Fuel Pump Annunciator
4	Choke Lever	**20**	Low Voltage Annunciator
5	Cabin Heat Control Lever	**21**	Trim Position Annunciator
6	Throttle Lever	**22**	Eletrical Switches / Circuit Breakers
7	Vertical Speed Indicator	**23**	Compass
8	Altimeter	**24**	GPS
9	Airspeed Indicator	**25**	VHF
10	Slip Indicator	**26**	Transponder
11	Left Tank Gauge	**27**	Wheel Brake Lever with Parking Lock
12	Right Tank Gauge	**28**	Elevator Trim Tab Control
13	Oil Temperature	**29**	Rudder / steering pedals
14	CHT	**30**	PTT buttons
15	Tachometer	**31**	12V Power output
16	Oil Pressure	**32**	Hourmeter

7.5.1 Instrument Markings

7.5.1.1 Airspeed

Marking	IAS, Kts	Meaning
White Arc	35 – 70	Operating range with extended flaps. Lower limit – Vs_0 at maximum weight (flaps 45°) Upper limit – V_{FE}
Green Arc	41 - 110	Normal operation range Lower limit – V_{s1} at maximum weight (flaps 0°)
Yellow Arc	110 - 131	Maneuvers must conducted with caution and only in smooth air
Red Line	131	Maximum speed for all operations – V_{NE}

7.4.1.2 Oil Temperature

Marking	Temperature	Meaning
Red Line	50 ºC 120 ºF	Minimum limit - Do not operate the airplane under this mark.
Green Arc	90 – 110 ºC 195 – 230 ºF	Normal operation range
Yellow Arc	110 – 130 ºC 230 – 265 ºF	Precautionary range
Red Line	130 ºC 265 ºF	Maximum limit

7.4.1.3 CHT

Marking	Temperature	Meaning
Green Arc	50 – 135 ºC 120 – 275 ºF	Normal operation range
Red Line	135 ºC 275 ºF	Maximum limit

7.4.1.4 Tachometer

Marking	RPM	Meaning
Yellow Arc	0 - 1400	Precautionary range – Low IDLE
Green Arc	1400 - 5500	Normal operation range – Continuos operation
Yellow Arc	5500-5800	Precautionary range – Max. 5 min operation
Red Arc	5800 - 7000	Exceeded RPM range

7.4.1.5 Oil Pressure

Marking	Pressure	Meaning
Red Line	0.8 BAR 12 PSI	Minimum limit - Do not operate the airplane under this mark.
Yellow Arc	0.8 – 2 BAR 12 – 29 PSI	Precautionary range – Below 3500 RPM
Green Arc	2 – 5 BAR 29 – 73 PSI	Normal operation range – Above 3500 RPM
Yellow Arc	5 – 7 BAR 73 – 102 PSI	Precautionary range
Red Line	7 BAR 102 PSI	Maximum limit

7.6 Engine

ALTO aircraft is powered by ROTAX 912ULS engine rated at 100 hp.

Maximum take-off power	73.5 / 100	kW / hp
Maximum continuous power	69.0 / 93	kW / hp
Maximum (5 min)	5,800	rpm
Maximum for continuous operation	5,500	rpm
Maximum cylinder head temperature	135 / 275	°C / °F
Maximum oil temperature	130 / 265	°C / °F
Minimum oil pressure (below 3,500 rpm)	12	psi
Minimum oil pressure (above 3,500 rpm)	29	psi
Maximum oil pressure — cold engine start only	102	psi
Oil pressure — normal operation	29 – 73	psi
Fuel pressure — normal operation (min-max)	2 – 6	psi
Outside air temperature range	-25 to +50 / -13 to +122	°C / °F

For more detail refer to the Rotax engine manual supplied with your engine.

7.7 Propeller

Manufacturer	Woodcomp S.R.O.
Model	Propuls 174/3/R
Type	Composite
Number of blades	3
Diameter	1740 mm (69 in)
Pitch	Ground Adjustable
Max RPM	2600

For more detail refer to the Woodcomp propeller manual supplied with your propeller.

Section 8 — HANDLING AND SERVICING

8.1 Introduction

This section includes the procedures for airplaine handling, maintenance and operation recommended by the manufacturer.

It is advisable to park the aircraft inside a hangar, or eventually inside a other weather proof space (such as a garage) with stable temperature, good ventilation, low humidity and a dust-free environment.

It is necessary to tie-down the aircraft when parking outside. On occasions when the plane must be tied-down outdoors for extended periods, it is advisable to cover the cockpit canopy, and if possible, the entire aircraft using a suitable cover.

We recommend removing the battery in winter and storing it at indoor temperature.

CAUTION

Avoid parking airplane (especially airplane with dark design) on the direct sunshine during warm climate – this can create a "can effect" or wave can arise on the upper skin of the wing and fuselage. It disappears when airplane is parked in the hangar, in the shadow or during taxiing or in flight when airplane surface is cooled with air flow. This "can effect" or wave arise during parking has no effect onto functionality and it cannot be subject of claim.

8.2 Ground handling

All ground handling activities described below are considered as Line Maintenance and may be performed by a Sport Pilot or higher (or Aircraft owner for LSA).

8.3 Towing

It is easy to tow the airplane a short distance by holding the propeller blade root, since the empty weight of this airplane is relatively low.

Suitable surfaces to hold the aircraft airframe are the rear part of the fuselage before the fin and the wing roots.

A tow bar may be used to tow the aircraft over long distances. The steerable nose wheel is equipped with stops, to limit its travel.An optional tow bar is available to move the aircraft from the hanger or on the flight line. It is attached to the nose wheel axle assembly. If a tow bar is not available pivoting the aircraft by pushing down on the aft section of the fuselage **at one of the bulkhead points** is acceptable.

8.4 Tie-Down

When aircraft is parked, position chocks under each wheel to prevent it from moving. In severe weather conditions or when aircraft is being parked for an extended period of time (e.g., overnight) tie-down the aircraft. The tie-down is necessary to protect the aircraft against possible damage caused by wind gusts.

For this reason the aircraft is equipped with tie-down eyes, located on the wing lower surface Procedure:

1. Check: Fuel valve off, Master switch and ignition switches off.
2. Block the control stick up e.g. by means of safety harness or connect the control stick with rudder pedals by means of a suitable rope.
3. Shut all the ventilation windows
4. Close and lock cockpit
5. Tie-down the aircraft to the ground by means of a mooring rope passed through the eyes, located on the wing lower surface. It is also necessary to tie the nose wheel landing gear to the ground.

When the aircraft is parked (on the ground, stowed), position a pitot cover over the pitot-static tube to prevent wind gusts and contamination from entering the pitot port. A red flag must be attached to the pitot cover.

CAUTION

Do not push or lean on the control surfaces.

8.5 Servicing

8.5.1 Fueling

WARNING!

No smoking or open flames during fueling!
Fire extinguisher should be within reach!
Under no circumstances add fuel with the engine running!
Connect the aircraft to ground prior fueling.
No person in the cockpit during fueling!

A fuel tank filler is located on the upper side of each wing (see figure below).

Fig 8-1: Fuel tank filler Cap

Instructions:

1. Connect the aircraft to the ground.
2. Open fuel tank filler
3. Insert fuel delivery nozzle or a funnel into the filler.
4. Fill required quantity of fuel.
5. Remove nozzle.
6. Close fuel tank filler by its cap.

Task proper accomplishment check: check the fuel tank cap is home screwed and required amount of fuel is in the tank (according to fuel gauge).

CAUTION

It is highly recommended to pour gasoline through a filter if it was not tested for water content. After fueling, allow 20 min. for water to settle out on the bottom. Drain off some fuel and look for water.

8.5.1.1 Approved Fuel Grades and Specifications

- Min. RON 95, EN 228 Premium, EN 228 Premium plus or AVGAS100LL
- Fuel according to FAA - Standard Spec. for Automotive Spark-Ignition Engine Fuel, ASTM D 4814 or AVGAS 100 LL.
- Fuel according to DOT - CAN/CGSB-3.5 Quality 3 min AKI 91 or AVGAS 100 LL.

Refer to the ROTAX engine Operator's Manual - Section 2.4

8.5.2 Oil Filling

The oil reservoir is located in the engine compartment and is accessible when engine upper cowling is removed. Oil quantity is measured by wire-gauge under the Oil Reservoir Cap (see photo).

Fig 8-2: Oil Reservoir

Instructions:

1. Remove upper cowling.
2. Unscrew oil reservoir cap.
3. Verify the oil level.

The total oil quantity in the Rotax 912 lubricating system amounts to 0.9 U.S. gall (3.5 liters). Prior to oil check, turn the propeller in the normal direction of rotation by hand (ignition switched off!) several times to pump oil from the engine into the oil tank, or leave the engine idle for 1 minute. The oil level in the oil reservoir should be between the min. and max. marks and should not be below min. mark.

4. If the oil level is below min mark, insert a funnel and fill oil.
5. Remove funnel, screw oil reservoir cap, check cap proper attachment.
6. Mount upper cowling

Task proper accomplishment check: check the oil reservoir cap is fitted properly.

8.5.2.1 Approved Oil Grades and Specifications

Motor oils tested and released from BRP-powertrain (for use with unleaded fuel or MOGAS).

Shell Sport Plus 4 API SL SAE 10 W-40 Code 2.

Refer to the ROTAX engine Operator's Manual - Section 2.5

8.5.3 Coolant

The expansion reservoir located in the engine compartment attached to the firewall is used for filling the coolant. In addition to that, this reservoir absorb coolant in the case of engine overheating. (see figure below).

Fig 8-3: Coolant expansion reservoir

Instructions:

1. Remove upper engine cowling.
2. Check coolant quantity
   The total coolant quantity is about 0.4 U.S. gal (1.5 liters).
3. Unscrew coolant expansion reservoir cap.
4. fill some amount if needed.
5. Screw tank cap back
6. Mount upper cowling back.

Task proper accomplishment check: Check proper attachment of coolant tank cap after refilling,

8.5.3.1 Recommended Types of Coolant

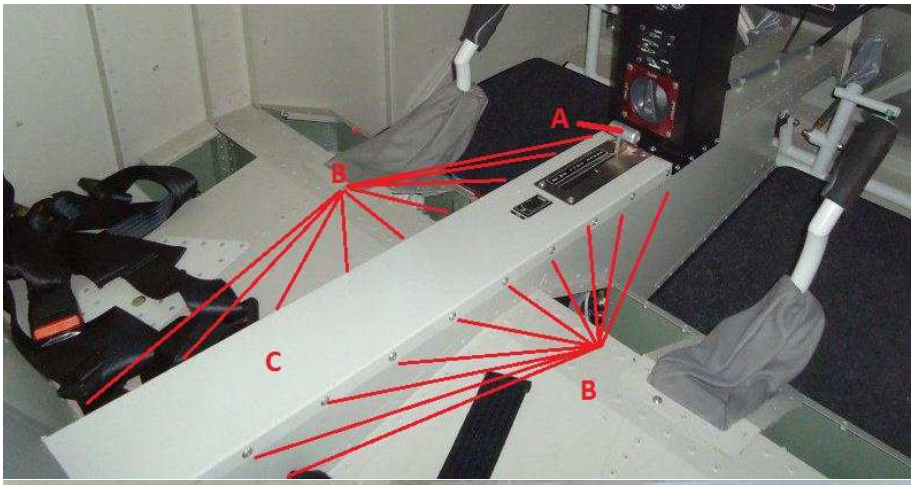
The "BASF Glysantin Protect Plus/G48" is recommended by the engine manufacturer. The engine manufacturer also recommends the use of antifreeze concentrate during cold weather operation. Castrol Radicool NF can also be used.

Refer to the ROTAX engine Operator's Manual - Section 2.3

8.5.4 Brake Fluid

A brake fluid is filled into reservoir located below the central panel between the seats - see "C" on the picture below. For the minimum and maximum brake fluid level – see picture below.

Brake fluid refilling is necessary when a low brake system efficiency occurs due to a fluid leak.



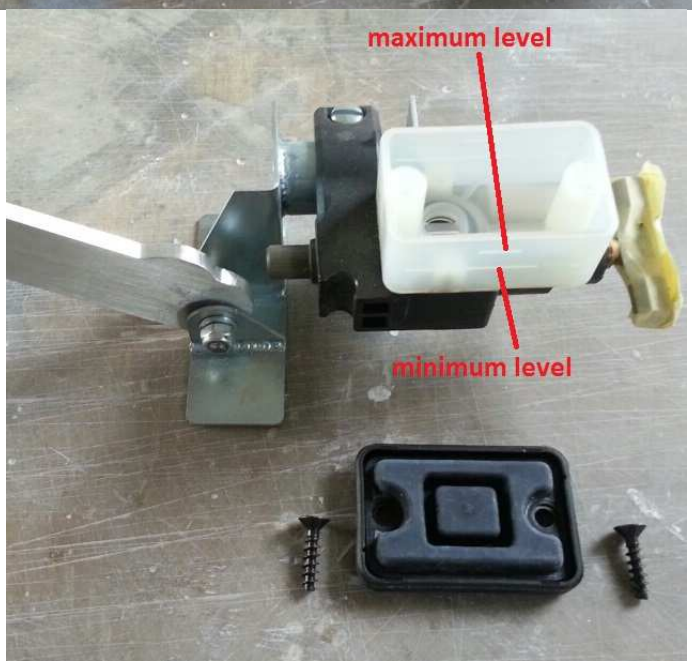


Fig 8-4: Brake Fluid reservoir

Instructions: - see the picture above

1. Disconnet the brake grip A
2. Remove screws B
3. Open the central panel C
4. Check brake fluid quantity and fill some amount if needed.
5. Brake repeatedly on the brake lever during refilling. Bleed the system after refilling.
6. Screw tank cap back, instal panel C and screws B, connect grip A

8.5.4.1 Recommended Type of Brake Fluid

ONLY DOT 4 or DOT 5.1 fluid should be used.

8.6 Cleaning and Care

Generally, the exterior surfaces can be kept clean by washing with water and a mild soap or detergent, followed by a rinse with water and drying with a cloth or a chamois. Oil spots on the aircraft surface (except the canopy!) may be cleaned with petrol.

The canopy may only be cleaned by washing it with a sufficient quantity of warm water and an adequate quantity of detergents. Use either a soft, clean cloth or sponge. Then use suitable polishers to clean the canopy.

Interior surfaces should be cleaned with a soft cloth, slightly dampened with fresh water and a mild detergent. Volatile substances must never be used.

Section 9 — SUPPLEMENTS

9.1 Aditional Information regarding the Airplane

9.1.1 Tire inflation pressure

Tire pressures are noted on placards located on the airplane Landin Gears. A car tire pump or compressor, or pressure bottle may be used for inflating the wheels.

Nose wheel Tire ..... 26 to +/-3psi
Main Tire ..... 26 to +/-3psi

9.1.2 Placards

The following placard is located on the sidewall of the canopy rail:

CLOSE AND LOCK CANOPY BEFORE

The following placards are located on the instrument panel:

THIS AIRCRAFT WAS MANUFACTURED IN ACCORDANCE WITH LIGHT SPORT AIRCRAFT AIRWORTHINESS STANDARDS AND DOES NOT CONFORM TO STANDARD CATEGORY AIRWORTHINESS REQUIREMENTS

Aerobatics and intentional spins are prohibited

AIRSPEED IAS

V_{S1} – Stalling Speed – Flaps 0º	41 kts
V_{S0} - Stalling Speed – Flaps 45º	35 kts
V_{FE} – Max. Flap Extended	70 kts
V_A – Max. Maneuvering Speed	89 kts
V_{NE} – Never Exceed Speed	131 kts

MAXIMUM TAKEOFF WEIGHT 600 kgf

One of the following placards is located on the sidewall of the canopy rail:

Day VFR airplane

The airplane is approved only for VFR daylight flights under no icing conditions.

Or (Night VFR airplane)

The airplane is approved only for VFR day and night flights under no icing conditions.

Or (IFR airplane)

The Manufacturer has approved this Light Sport Aircraft for IFR day or night flights under no icing conditions only when instrumentation and lighting required for such flights by FAR Part 91 is installed and operational and the flight is performed by a pilot holding current medical and appropriate ratings.

The following placard is located in the baggage compartment:

The following placard is located in on the lower right side of fuselage aft of the firewall:

The following placards are located on the lower side of each wing forward of the sump drains:

The following placards are located above the fuel cap of each wing:

9.2 Operation of Optional Equipments or Accessories

This section contains the appropriate supplements necessary to safely and efficiently operate the airplane when equipped with various optional systems and equipment not provided with the standard airplane.

9.2.1 List of Supplements

Title of Supplement	Supplement No.	Date Inserted
Flight Training Supplement - FTS	DF-FTS Rev. 1	07/20/2014
FLYBOX Eletronic Flap Controller	Revision #2 7/6/2011	07/20/2014
ROTAX Operators Manual	OM-912	07/20/2014
GARMIN AERA 500 GPS - Pilot's Guide	190-01117-02 Rev. C	07/20/2014
GARMIN AERA 500 GPS - Aviation Quick Reference Guide	190-01117-03 Rev. B	07/20/2014
GARMIN GTX 327 Mode A/C Transponder – Pilot's Guide	190-00187-00 Rev. D	07/20/2014
ICOM IC-A210 VHF Transceiver – Instruction Manual	A-6602H-1EX-7	07/20/2014
WOODCOMP Propuls – Operators Manual	13 134 69 3 PA	07/20/2014
AMERI-KING Altitude Encoder Model AK-350–Installation Manual	IM-3501001 Rev. NC	07/20/2014
GARMIN GTX 327 Transponder Installation Manual	190-00187-02 Rev. J	07/20/2014
ICOM IC-A210 VHF Air Band Transceiver – Installation Guide	A-6602H-2EX-③	07/20/2014

9.3 Airplane Flight Training Supplement (FTS)

FTS is included on the List of Supplements as Paragraph 9.2.1.

9.4 Information The Owner Can Use For:

9.4.1 Improvements or Corrections

In the interests of product development, we encourage owners to make suggestions related to design improvements. However, the final decision on their adoption or otherwise rests with Direct Fly S.R.O.

Any issues or corrections required of Direct Fly S.R.O. on publications are requested to be passed on to Direct Fly S.R.O. or its Completion Facilities on the adresses listed in the INTRODUCTION. The following proforma may be used:

CUSTOMER FEEDBACK

Return via FAX, mail or E-mail to the Direct Fly, s.r.o.

Publication title:	
Date of issue:	
Date of last revision:	
Section, Chapter, Paragraph affected:	
Your feedback:	
Now reads:	
Should reads:	
Your name:	
Address:	
Position:	Telephone No.
Company:	Fax. No.
	e-mail:
Your signature and date:	

9.4.2 Continued Operational Safety Reporting

The owner/operator of a LSA is responsible for notifying the manufacturer of any safety of flight issue or significant service difficulty upon discovery. The following proforma may be used & sent to Direct Fly S.R.O. or its Completion Facilities on the adresses listed in the INTRODUCTION.

DF

1 Notice of owner/operator about operating failure of the aircraft

Dear customer,

We would like to ask you for your assistance at obtaining information for continuous increasing reliability of airplanes produced by our company. Please fill out the card in case of any failure on your airplane. After filling out, send it to the address mentioned above. By sending us the card, you provide us with valuable data, which enable us to improve reliability of your airplane as well.

1.1 Mandatory data

Airplane type:	Registration mark:	Airplane S/N:

1.	Flight units: flight hours – number of landing	| | | | |:| | |-| | | |	
2.	Failure detection date: day – month – year (format: "dd mm yy")	| | | | | |	
3.	Failure has been detected at: (encircle appropriate number)	1. Flight 2. Taxiing 3. Take-off run 4. Take-off 5. Touch down	6. Landing run 7. Daily inspection 8. Periodical inspection 9. Other
4.	Consequences for operation: (encircle appropriate number)	1. No consequences 2. Airplane put out of operation 3. Airplane returned from take-off 4. Flight with damaged aggregates	5. Emergency landing 6. Occurrence on the ground 7. Other
5.	Failure description:		
6.	Identification of the damaged part		

Failed part name	Catalogue number of failed part	Worked out operation units	Serial No.*

Note: State maximum detectable data * fill out if required

7.	Notes, additional data (kind of failure, defect, incorrect activity):	

1.2 Additional data

8.	Claimed (encircle what applicable): YES - NO	No. of claim:
9.	Order of spare parts (encircle what applicable): YES - NO	

Item	Name of part	Catalogue part No.	No. of pieces

	Owner:	Home airport:	
	Operator:	Date:	Elaborated by:

9.4.3 Owner Change of Adress Notice

Each owner/operator of a LSA is responsible for providing the manufacturer with current contact information where the manufacturer may send the owner/operator supplemental notification bulletins. The following proforma may be used & sent to Direct Fly S.R.O. or its Completion Facilities on the adresses listed in the INTRODUCTION.

CHANGE OF OWNERSHIP OR ADRESS			
Aircraft Model			
Aircraft Registration			
Aircraft Serial Number			
Owner			
Adress			
e-mail		Phone	
Signature			
NEW CONTACT INFORMATION			
Owner			
Adress			
e-mail		Phone	
Signature			