



*Sirius*

*Welcome to flying fun without limits!*





## OUR HISTORY

The TL-ULTRALIGHT aircraft company was established more than 20 years ago in 1989. The company owner, Mr. Jiri Tlustý designed powered hanggliders which were our first products with an engine. Later motorized trikes were successfully added to the product line but Mr. Tlustý had even bigger plans.

In 1991 TL began serial production of the TL 32 Typhoon, a fixed wing, 2-seater, constructed with a tubular metal frame. The Typhoon aircraft became very popular for flight training and introduced a whole new pilot generation to the wonders of flight. It was also a very economic aircraft for recreational flying. The successful Typhoon had become a legend in the Czech light aircraft history of flight. Its popularity pushed production to over 200 aircraft.

Within four years of operation another new design was introduced to the aviation press. With Tlustý's leadership, TL began production of an affordable metal high wing aircraft named Condor. It too was a great success and in two variants, the Condor TL 132 and TL 232, production exceeded 300 aircraft.

Planning ahead, TL pursued ever more sophisticated designs and materials. In 1996, Mr. Tlustý brought to the market a completely new concept, the TL 96 Star. A very modern design, the Star was a low wing, full composite aircraft which sets both performance and market class records at the time.

By 2000 it was clear to TL that composite design and fabrication was the method to provide customers with a sleek and low drag airframe. Using the best features of the Star the TL design team added a new high performance wing, an anti-servo elevator and a low drag conforming engine cowling. Thanks to total effect of these design innovations there was a new member of TL family, named the TL 2000 Sting Carbon. This exciting aircraft is manufactured in serial production as several variants, a Light Sport (LSA) named the Sting S3, a ULM version with fixed gear, and even a model with retractable gear known as the Sting RG. Improvements and innovations continue to make the TL 2000 Sting Carbon an industry leader with an excellent safety record due to its performance, ergonomic design, and the outstanding view from the cockpit.

At the two largest airshows of 2007, AERO Friedrichshafen and Airventure Oshkosh, TL introduced its fifth model of production aircraft, the TL 3000 Sirius. It is a full composite high wing aircraft that meets ultralight and LSA rules. Early production figures indicate that it has been well accepted in the aviation market and is very good aircraft for flight training.

In 2009 TL again led the competition by announcing its latest design creation the TL 4000. This aircraft is a full featured four seat cruiser intended to revolutionize the extended cross country travel of its owners. With the TL 4000, TL-ULTRALIGHT aircraft company has now extended its range of products to the entire world aircraft market.

The TL-ULTRALIGHT company currently ranks among the biggest producers of UL and LSA aircraft. Its aircraft are flying all around the world. The production programme consists of TL 3000 Sirius and TL 2000 Sting S4 which is an upgraded version of the well proven Sting S3 to include enhancements in response to customer feedback.

The employees of the company continue working on new versions and modifications of the aircraft and implementation of modern technologies. The latest successes are production of own in flight electrically adjustable propeller and amphibian LSA version of TL 3000 Sirius.









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# Sirius

## TL 3000 Sirius – the perfect partner for flying fun without limits

Behind the TL 3000 Sirius – the new high wing carbon composite aircraft from TL-ULTRALIGHT – stands the experience of more than 700 of its low wing siblings, the Star and the Sting. It is a refined aircraft with elegant contours, superb flight performance and unmatched comfort in the cockpit. The spacious and well-equipped cockpit, together with TL's trademarks of high durability, reliability and ease of handling make the Sirius the perfect travel partner for relaxed and luxurious flying.

TL-ULTRALIGHT manufactures the TL 3000 Sirius in both ultralight and LSA versions, powered by Rotax 912 (80 HP), 912 S (100 HP) or 912iS (100 HP) four cylinder, four stroke engines.

## The new benchmark in comfort and ergonomics – you'll feel right at home!

The TL 3000 Sirius is setting new benchmarks in comfort and ergonomics: The well-appointed cockpit is easily accessible and offers generous space for pilot and passenger, with deluxe cushioned body-contoured seats, perfectly locking doors, ergonomically designed control and operating systems, dual yoke controls for aileron and elevator, electric flaps, and a spacious baggage compartment.

The view is excellent – thanks to the high wings. Typically TL, the Sirius also runs very smoothly – low vibration and a very low noise level contribute to the feeling of pure enjoyment.

## Powerful, versatile and reliable

Once in its element, the TL 3000 Sirius shows its full potential: It transforms engine power efficiently into cruising speeds up to 225 km/h (138 mph) and aero towing for gliders up to 720 kg (1,587 lbs). Its range is enormous: The 130 l (29.5 gal) standard tank offers 7 hours of safe flight endurance with a reach of 1400 km (870 miles)!

The TL 3000 Sirius combines high performance and very docile flight characteristics, its controls are agile and manoeuvrable and it is docile and predictable during landing and touch-down procedures. Its sturdy landing gear with GRP legs dampens impact well and forgives even pancake landings.









## HOW IT FLIES

The TL 3000 Sirius aircraft has been constructed to offer the crew the ultimate in comfort, ease of entry and ergonomic design where every control falls perfectly in place.

### Cabin entry

The large doors on the TL 3000 Sirius open upwards and are held in place by hydraulic struts making entry and exit into the aircraft easy for even older pilots with reduced flexibility. The bottom edge of the door is intentionally designed to be located below the seat level making entry easy for even shorter pilots. Lots of head room means that your headsets will never touch the roof. You only need to pull the handle and the cabin door will open automatically.

### Taxiing

Thanks to the conventional nosewheel design the aircraft behaves perfectly on the ground offering easy and docile handling. The pedals are fitted with very effective hydraulic brakes and the great view from the cabin makes taxiing easy.

### Take-off and climb

Setting the electric flaps to take-off position, 10.5° and introducing throttle will immediately move the TL 3000 Sirius down the runway. After a very short take-off roll the aircraft becomes airborne with the controls being effective even at very slow speeds. The climb rate will exceed most pilots' expectations and visibility from the aircraft is great during climb out.

### Flight characteristics

The TL 3000 Sirius is a very stable but easily manoeuvrable aircraft throughout the whole speed range; from just above the stall through to fast cruise the performance will surprise you.

The engineers have paid great attention to the design and aerodynamics of the aircraft which allow it to perform perfectly at low speed thanks to the large wing area and electric flaps. At high speed the aerodynamic cleanness of the aircraft offers great performance with low fuel consumption.

The aircraft has no tendency to behave badly or spin at low speeds.

The aircraft can be equipped with a wide range of avionics to suit every owner's requirements making their flight enjoyable and comfortable. The TL 3000 Sirius offers a great view out of its cabin. And if aerial photography interests you, the door can be opened in flight or easily removed on the ground.

### Landing

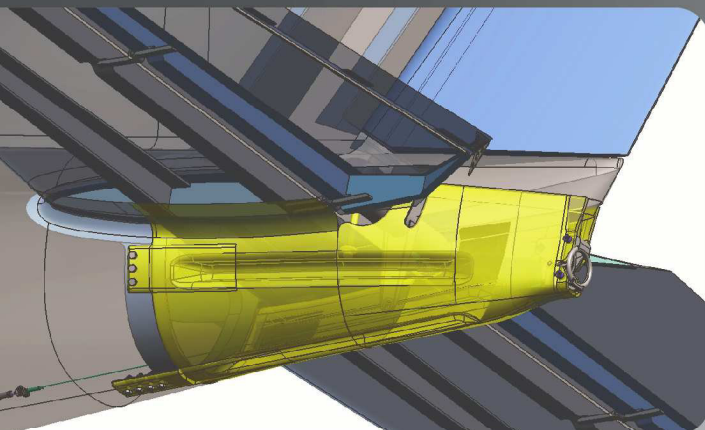
Landing with the Sirius could not be easier. Even at slow speeds the controls are very efficient and controllable even with strong cross wind landings. With maximum flaps set to 45° and the strong and effective hydraulic brakes the stopping distance is surprisingly short.











## AERO-TOWING

Thanks to the carefully designed aerodynamics, large wing and very effective flaps the TL 3000 Sirius can tow older types of gliders at low speed as well as modern efficient gliders at high take-off weights.

During aero-towing flight tests with various types of gliders, the TL 3000 Sirius demonstrated excellent towing performance. For example, the take-off distance over a 15 m high obstacle while towing a two-seat glider of 650 kg is within 550 m. The Sirius towing a single-seat glider of 300 kg attains a climb speed of 3.6 m/s. With a two-seat glider of 650 kg, the climb speed is up to 2.3 m/s.

High performance, combined with low noise level (58 dB(A)), low fuel consumption and easy piloting, make the TL 3000 Sirius the perfect aircraft for aero-towing.

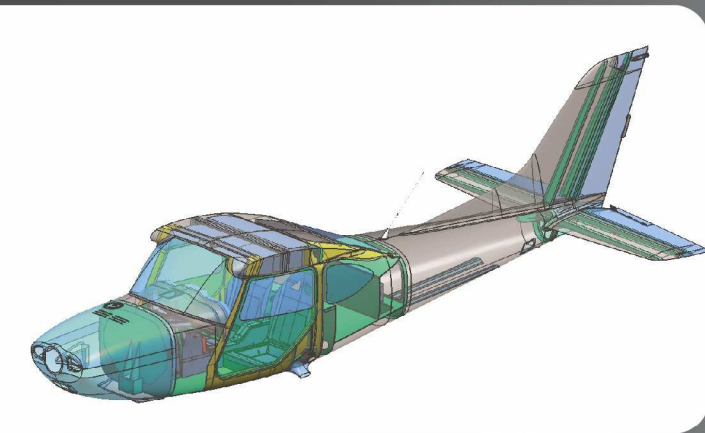
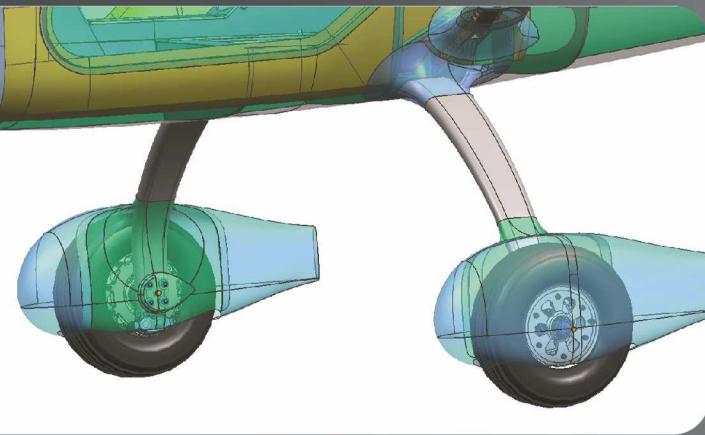
### AERO-TOWING TECHNICAL DATA:

Maximum strength of towing rope weak link.....	300 daN +/- 30 daN
Maximum take-off weight of glider.....	720 kg
Optimal climb speed.....	110 – 120 km/h
Maximum towing speed.....	160 km/h







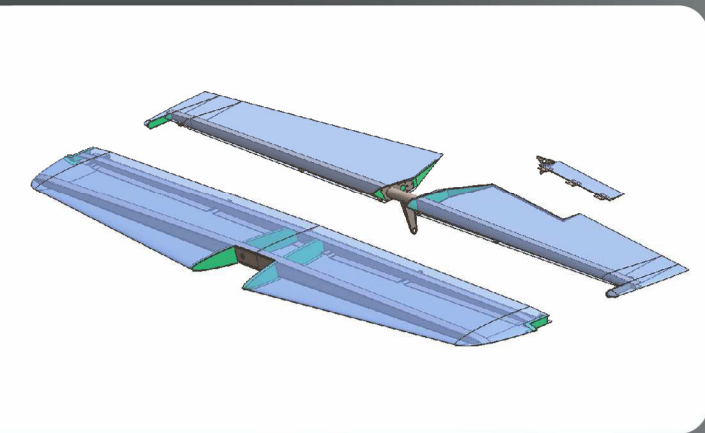


## CONSTRUCTION / DESIGN

Our customers in the European “Ultralight”, American and U.K. “Light Sports Aircraft” categories want flight performance and usability comparable to general aviation aircraft. That’s why we created the TL 3000 Sirius.

We designed the TL 3000 with the aid of virtual CAD prototyping and refined it through extensive physical prototyping and testing. The result is an airplane that offers dimensions and capacities equivalent to higher weight categories, with even better performance and economy.

To realize the benefits of the TL 3000’s design in a production aircraft, we overhauled our manufacturing process. Highly accurate CNC machine technology now performs repetitive tasks with great precision. The TL 3000 Sirius is light, strong and safe, with a comfortable interior, a tough airframe and exceptional performance.











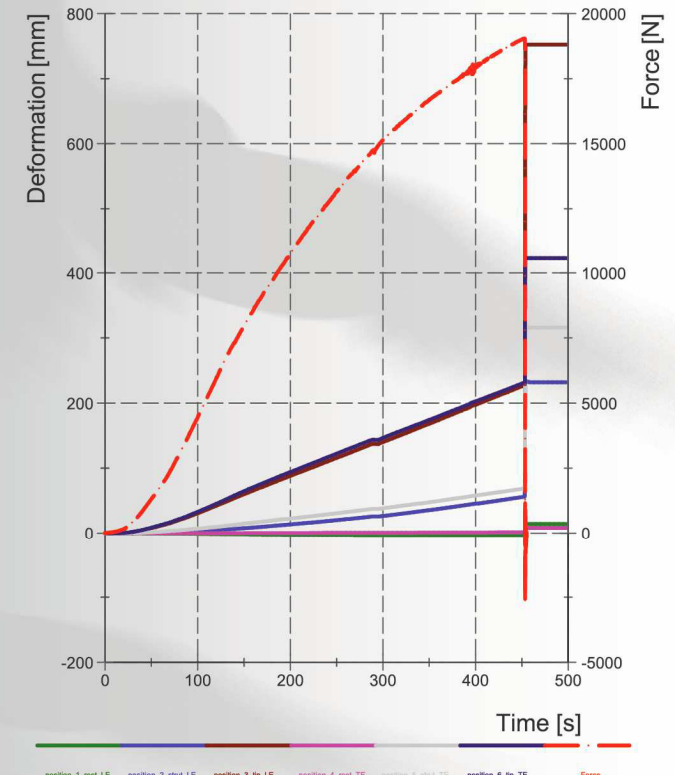
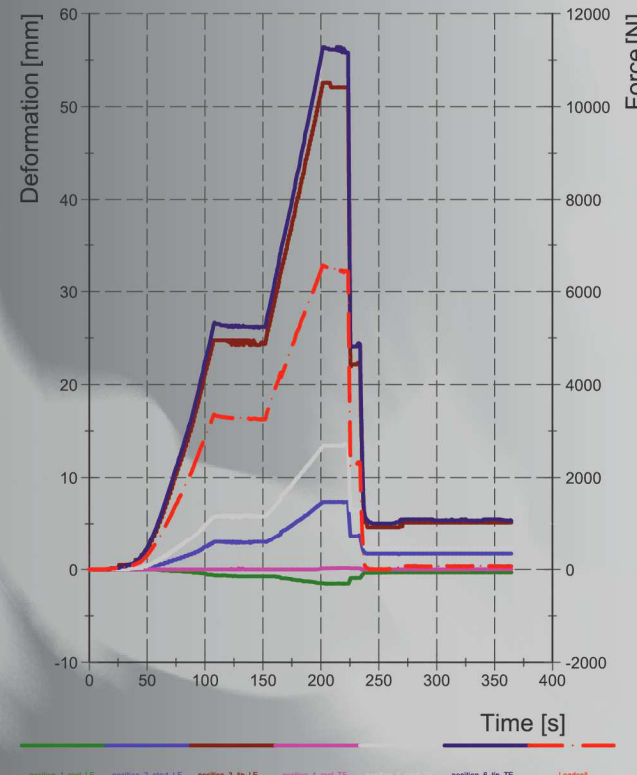
# PROOF OF WING STRUCTURAL INTEGRITY

The supporting structure for the TL 3000 Sirius passed the certification tests at the laboratories of ČVUT University in Prague, faculty of mechanical engineering, Department of Aerospace Engineering.

For wing testing with strut a hydraulic cylinder is connected with a special system that divides the loading force according to the required load calculation. The flap and the aileron are loaded with sand bags precisely scaled.

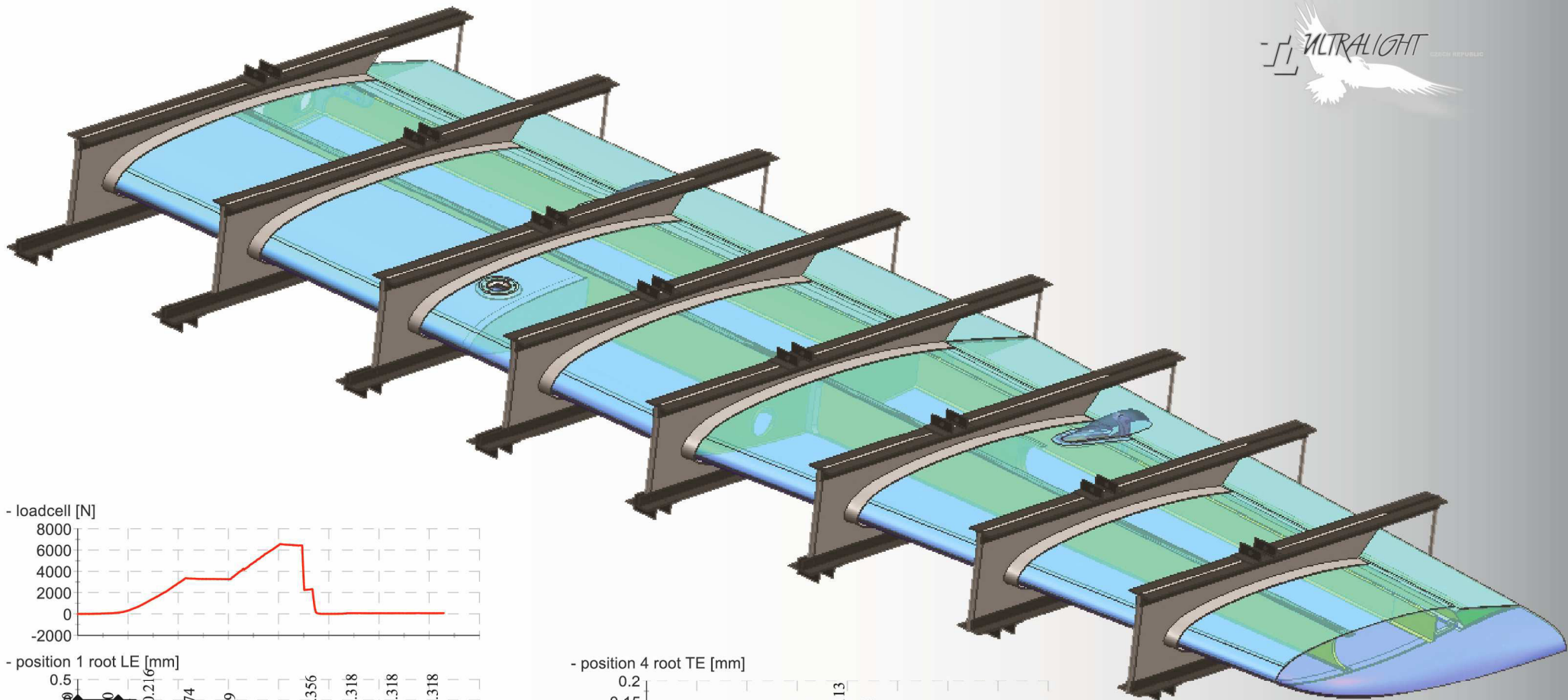
In all tests the construction and structure carried all operational loads without permanent deformations and during calculation load testing no failures have occurred. The testing of the supporting structure has shown higher strengths than required by regulations.

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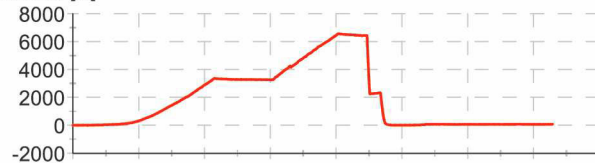


position\_1\_root\_LE position\_2\_strut\_LE position\_3\_sp\_LE position\_4\_root\_TE position\_5\_strut\_TE position\_6\_sp\_TE Loadcell Force

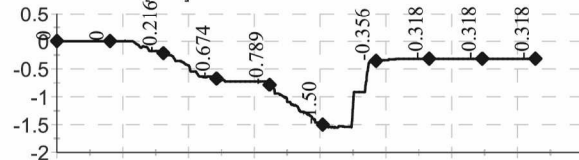




- loadcell [N]



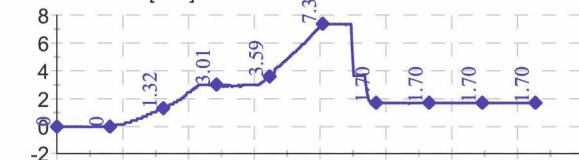
- position 1 root LE [mm]



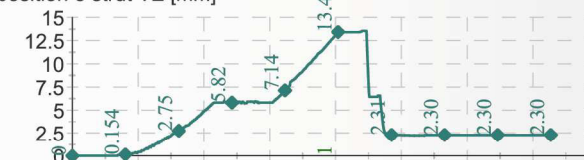
- position 4 root TE [mm]



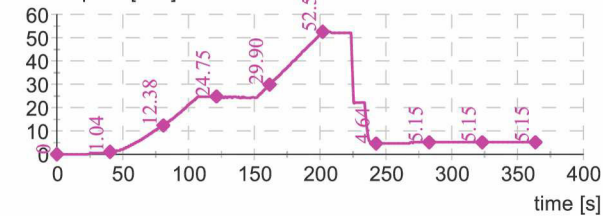
- position 2 strut LE [mm]



- position 5 strut TE [mm]



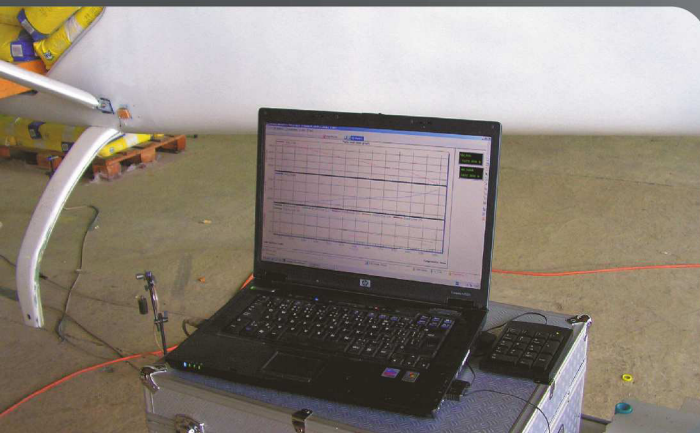
- position 3 tip LE [mm]



- position 6 tip TE [mm]







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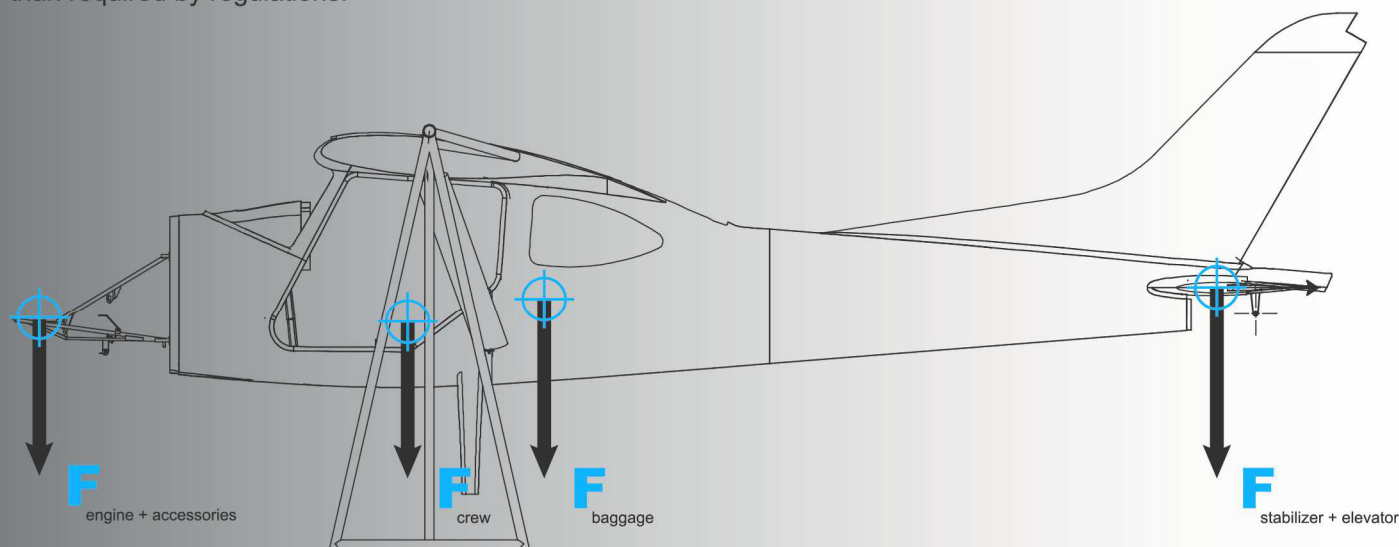


## PROOF OF FUSELAGE STRUCTURAL INTEGRITY

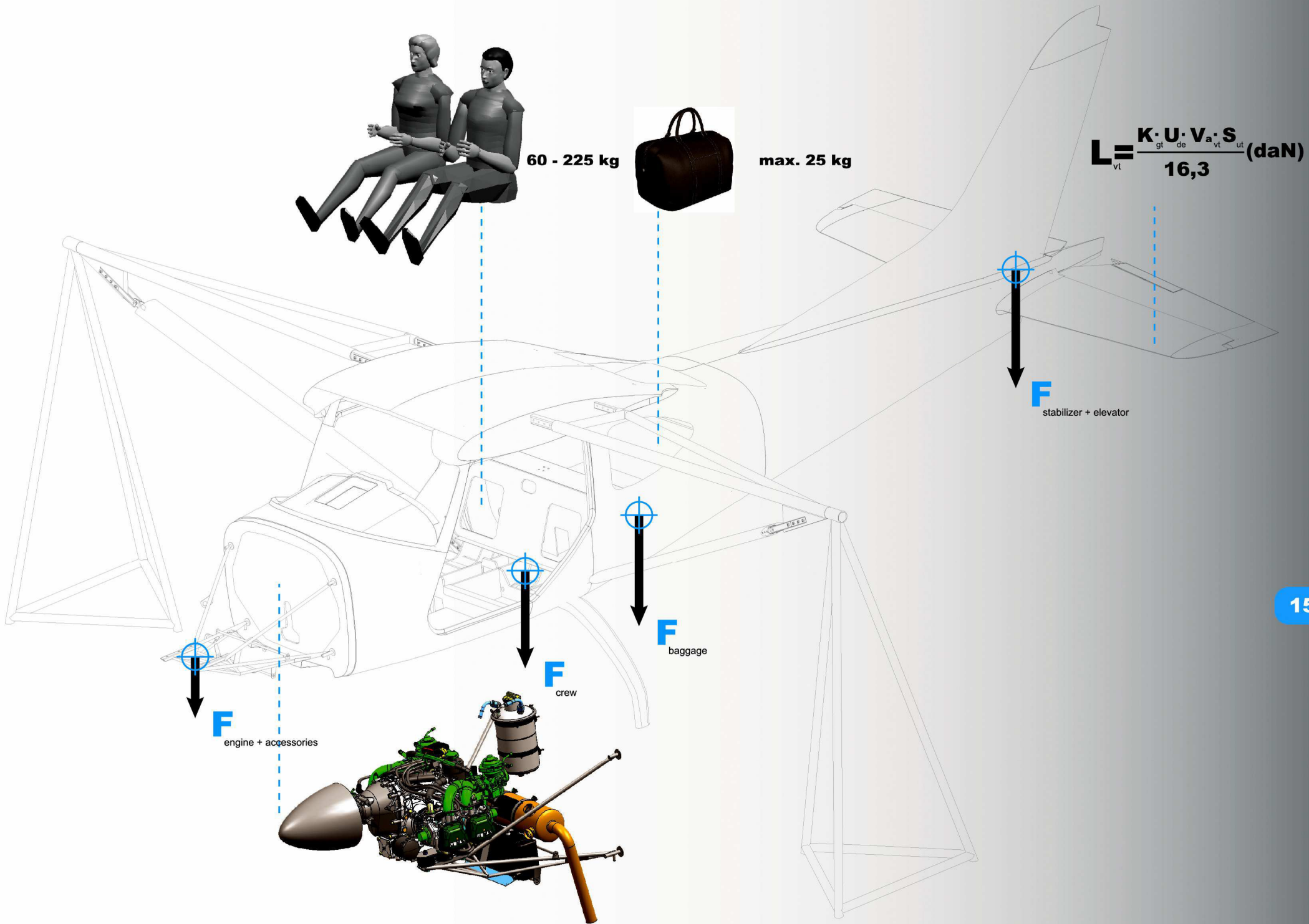
The main aircraft parts which included the fuselage together with horizontal and vertical fin underwent strength tests which were carried out at the premises of TL-ULTRALIGHT under the supervision of the LAA inspectors.

The fuselage was attached to a special jig and was loaded with precisely scaled sand bags at the area of engine unit, crew and baggage area and also horizontal fin area. Side force was applied on the vertical fin at the same time.

In all tests the aircraft structure was loaded without permanent deformation and even exceeding the design calculation loads no failure has occurred. Additionally the testing of the main structure has shown higher strengths than required by regulations.











1/



# ENGINE ROTAX



2/



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3/



engine type	performance			torque			max. RPM
	kW	hp	1/min	Nm	t. b	1/min	1/min
912 IS	73,5	100	5800	121	89	5800	5800
912 ULS	73,5	100	5800	128	94	5100	5800
912 UL	59,6	80	5800	103	75,9	4800	5800
914 UL	84,5	115	5800	144	106	4900	5800

### 1/ ROTAX 912iS

The Rotax 912iS is 4-cylinder, 4-stroke liquid/air-cooled engine with opposed cylinders, dry sump forced lubrication with separate oil tank, automatic adjustment of the hydraulic valve tappets, redundant electric fuel injection, engine management system, electric starter, propeller speed reduction unit, air intake system.

### 2/ ROTAX 912UL, 912 ULS

The Rotax 912 series engine are 4-cylinder, 4-stroke, liquid/air-cooled engine with horizontally opposed cylinders, dry sump with forced lubrication and separate oil tank, automatic hydraulic adjustment of the valve tappets, 2 carburetors, mechanical fuel pump, dual electronic ignition, electric starter, propeller speed reduction unit (gearbox), engine mount assembly, air intake system, exhaust system and are available in either 80 hp or 100 hp versions.

### 3/ ROTAX 914

The Rotax 914 turbo charged engine with automatic waste gate control is a 4-cylinder, 4-stroke, liquid/air-cooled engine with horizontally opposed cylinders, dry sump with forced lubrication and separate oil tank, automatic hydraulic adjustment of the valve tappets, 2 carburetors, mechanical fuel pump, dual electronic ignition, electric starter, propeller speed reduction unit (gearbox), engine mount assembly, air intake system, exhaust system and produces 115 hp.









## COCKPIT

The Sirius has a **spacious** cabin with ergonomically shaped and **extremely comfortable** side-by-side seating providing absolute comfort after many hours of flight. The Sirius's ergonomic cockpit layout promotes confident flying. All the controls are well-arranged and located within the pilot's easy reach. The layout of the instrument panel facilitates a quick and easy scan. The steering yokes with PTT and adjustable rudder pedals are provided for both, pilot and co-pilot. In the cabin the pilot can also visually check the content of fuel tanks. The inside of the cabin is lined with high quality carpet and map pockets are provided on both sides. Four point harnesses are standard, as is fresh-air-sourced cabin heat and very effective ventilation. The cabin has a **large baggage compartment** with a capacity of 415 litres! Large doors which open upwards towards the wing locking in place allow unobstructed and easy access for pilot and passenger. The **low noise** cockpit is well organized and comfortably appointed for hours of flying fun.

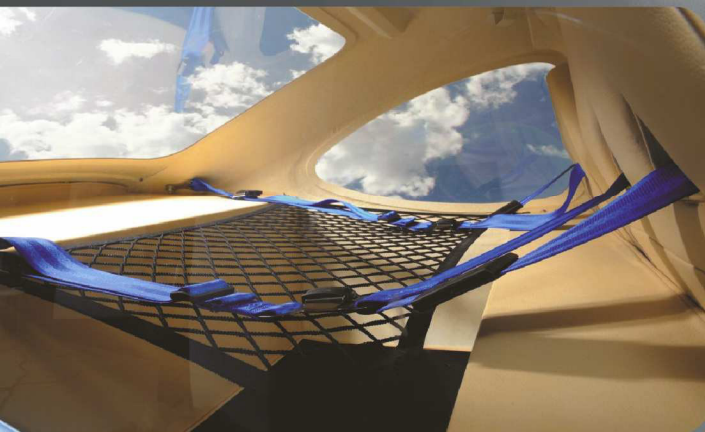


## SAFETY

The **whole-plane ballistic parachute system** looks very similar to other available products, but on closer inspection there are obvious differences in operation which make the GRS a superior unit. While it is unlikely that you will ever use the GRS in an aircraft, it is comforting to have a parachute system for an unexpected dramatic event.

The GRS is a new design in which the canopy is not gradually drawn from a box by means of a long conventional sleeve, distorted by air currents and possibly fouling on the aircraft structure or its debris, during deployment. The GRS canopy is drawn away from the aircraft in a short special compact container to a distance of 9 meters. At this point the whole hanging system from canopy to aircraft is stretched, a container lock is released and the canopy is inflated directly in clear air, significantly reducing the risk of debris damaging the canopy. The GRS is designed and constructed for the fastest possible opening, which enhances the potential of a rescue for the aircraft and crew from the lowest possible height.

Firing the system is achieved mechanically, by hand pulling the activation handle with a force of approximately 9 kg. The launching ignition mechanism is then activated by two igniters which are fired by double strikers; the solid fuel of the rocket engine is then ignited. During firing there is minimum rearward impact. Unlike other similar systems, the flame from the rocket tube is not directed back in the trajectory of the rocket, which can cause powerful backfire into an aircraft construction. After the canopy opens above the aircraft at height of around 20 meters the rocket engine continues its own flight with its remaining energy and separates from the main canopy. It then safely free falls with its own smaller parachute. The main canopy system is open and fully inflated above the aircraft within seconds of being fired. This means that a rescue can be successful from as little as 30 to 150 meters above the ground, depending on the position of the aircraft, its speed and trajectory.









# INSTRUMENT PANEL

The TL 3000 Sirius can be delivered with range of DYNON glass cockpit products or with analogue instruments.

Communications and navigations are normally offered with the Garmin sport stack made in USA or ICOM system made in Japan. This panel board is also designed for night flying and can be equipped with IFR instruments, below you may find some specific information.

## SKYVIEW D1000

The latest generation glass cockpit called the SkyView D1000 is completely automated system including EFIS and EMS. The SkyView System is designed to have an integrated GPS Moving Map and MODE S transponder. Skyview displays are very bright with high-resolution screens driven by advanced graphics processors which create highly visible and readable displays – even in direct sunlight.

The SkyView System is designed for ease of use while flying. The most used functions are accessed via two rotary/multi direction joysticks, for fast intuitive commands. Almost all other in flight commands, using the widely spaced buttons are only two button pressed away and no function requires more than three presses. SkyView is provided with software and USB port to allow the owner to download the latest systems and applications to stay up-to-date. This system is equipped with backup battery in case of electric failure.

## SKYVIEW AUTOPILOT

Every Dynon autopilot can fly magnetic heading, GPS ground track, and horizontal NAV from any connected compatible radio or GPS. In addition to being able to hold altitude, the autopilot can fly to a new altitude and level off on reaching. Additional standard features include emergency 180-degree turn capability, control wheel steering, and standard trim sensing and annunciation on all servos used on the pitch axis. And because Dynon's autopilot is built on its best-selling EFIS systems, it can respect bank angle, airspeed, and G limitations too.







OK - QUA 95

DYNON AVONICS

SkyView

DYNON AVONICS

FLIGHT

OFF R L BOTH

USB

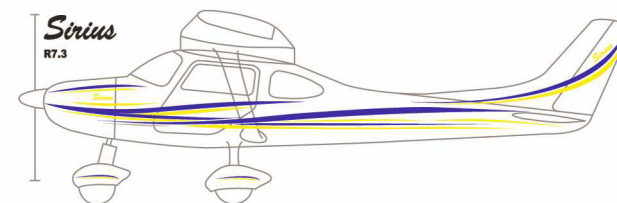
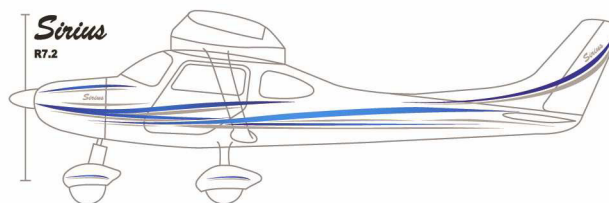
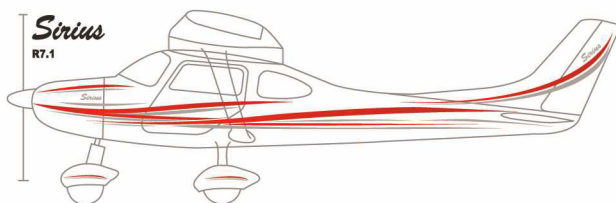
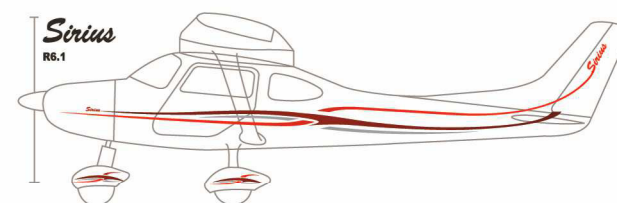
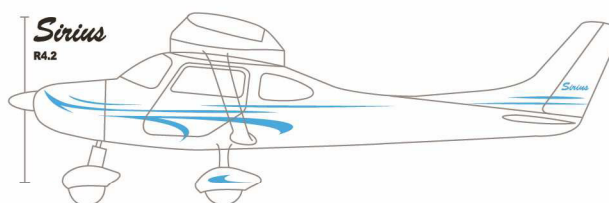
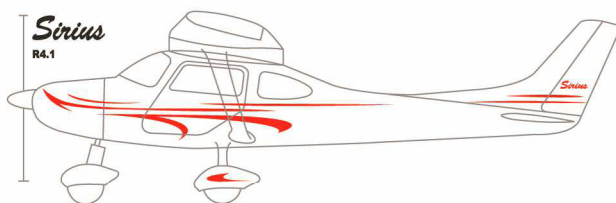
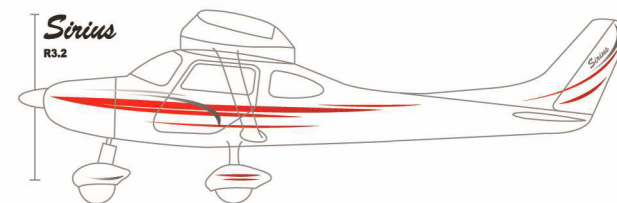
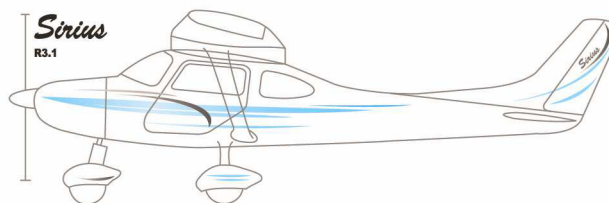
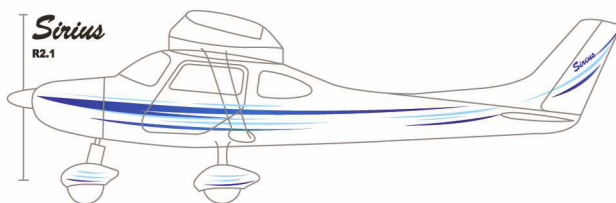
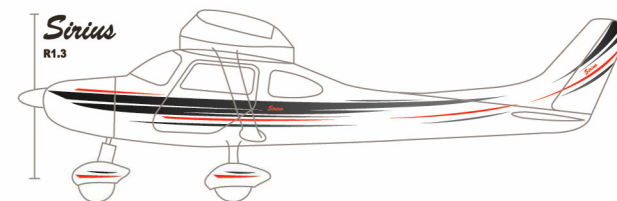
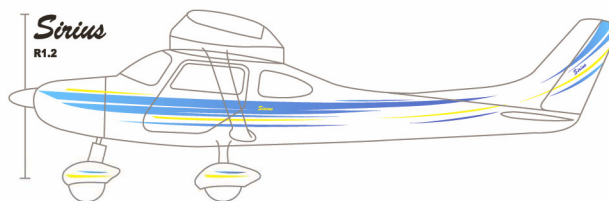
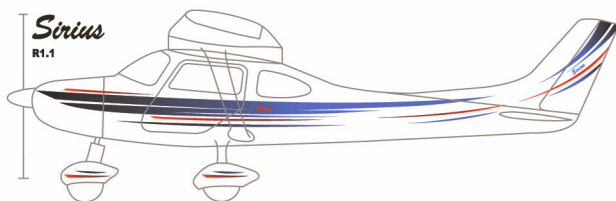
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FLIGHT

FLIGHT

MAX SPEED LIMIT  
LAP 1000 - 14  
1000 1000 - 14  
ALL AUTOMATIC OPERATIONS  
PROHIBITED

# DESIGN









## SIRIUS ON FLOATS

Sirius on floats - an amphibian version of successful construction of TL 3000 Sirius has been developed.

A well proven aircraft and carefully designed float system F-3000 Dolphin combine to create the TL 3000 Sirius on floats, developed in-house by TL-ULTRALIGHT. The aircraft is intended to meet the LSA Water category but can also be operated on land. The hydrodynamically shaped float body consists of a shell made from hybrid Kevlar cloth and including seven individual waterproof tanks. The tank in float's central part is designed as an additional compartment accessible by its own hatch. The 4-point undercarriage is retractable, the main wheels are braked.

The flight characteristics of the TL 3000 Sirius on floats are very similar to the standard undercarriage version TL 3000 Sirius.











## PRODUCTION / SERVICE

The TL-ULTRALIGHT aircraft company is located in its own buildings, offices and hangars at the Hradec Kralove airport in the Czech Republic. Within these self contained facilities the entire design, production, testing and quality control of our aircraft are carried out.

An average of 7 to 8 aircraft per month leaves the final assembly line for the TL flight testing hangar. We also provide repairs and service at the same time for all of our previously completed aircraft. We have more than ninety employees focused on the production and an additional team of more than ten employees taking care of sales, material supply, production management and quality control. At the Hradec Kralove airport all test flights, demonstration flights, training, warranty and after warranty repairs are carried out by our fully qualified mechanics.

The TL production and quality control system fully complies with the ASTM standards and allows us to track any production stage of an aircraft. The records are retained indefinitely to allow full traceability. Furthermore, every single aircraft is personally test flown by the owner of TL-ULTRALIGHT, Mr. Jiri Tlustý before it is released to a new owner.

Aircraft shipped overseas are packed and loaded into containers to over thirty worldwide dealers who distribute TL products. Currently we deliver aircraft to the United States, the European Union, and many other countries in the world.

