



*Sirius*

*Welcome to flying fun without limits!*





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## OUR HISTORY

The TL Ultralight aircraft company was established more than 20 years ago in 1989. The company owner, Mr. Jiří 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 Typhoon became so successful it has 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 titled the 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, 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 set 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. It is a full composite high wing aircraft that also meets the 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 has now extended its range of products to the entire world aircraft market.









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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) or 912 S (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 maneuverable 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 and 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, 8.5° and introducing throttle will immediately move the TL 3000 Sirius down the runway and after a very short takeoff 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 maneuverable 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 and 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 hydraulic brakes which are very effective on the ground 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 tall obstruction 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-seater 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.

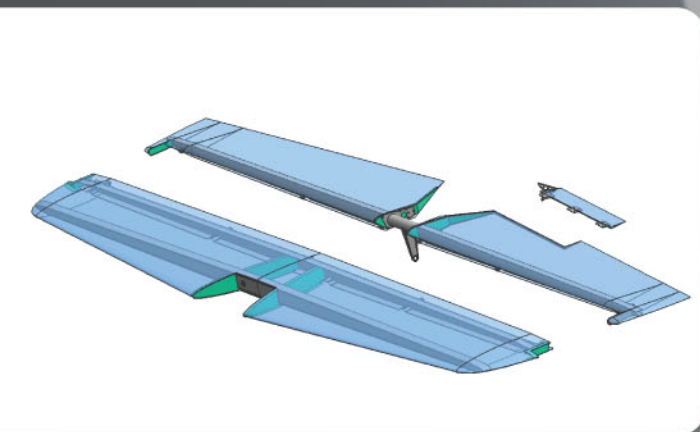
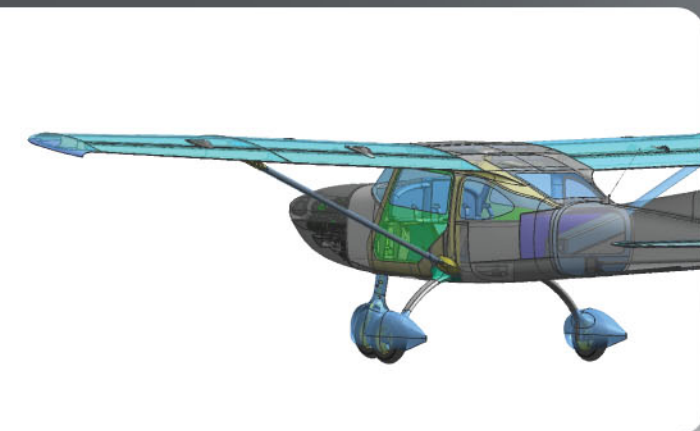
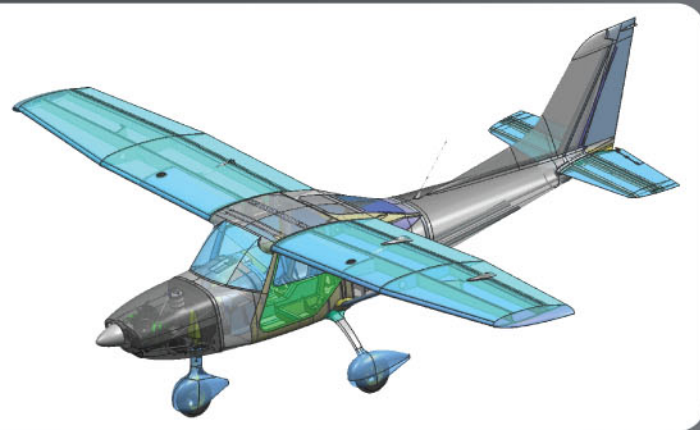
### AERO-TOWING TECHNICAL DATA:

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” and American “Light Sport 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.









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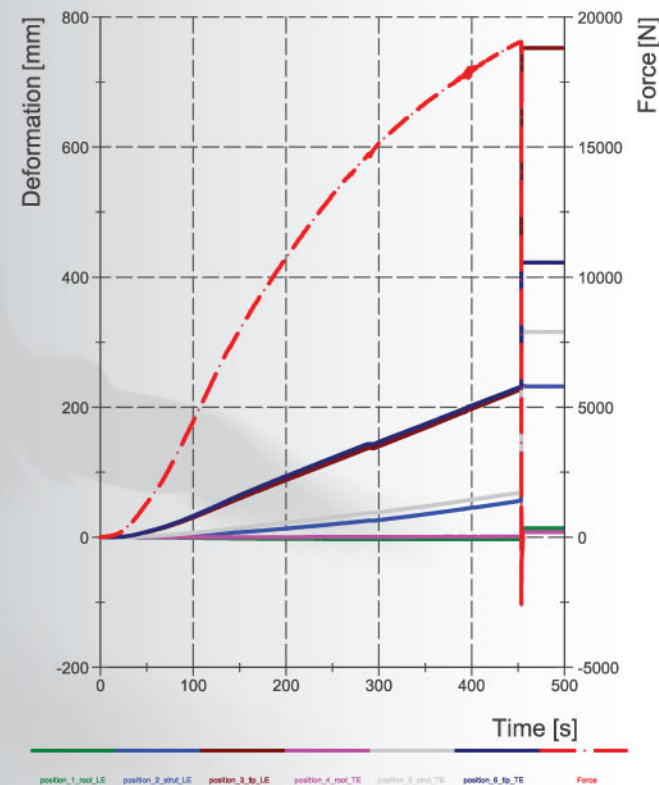
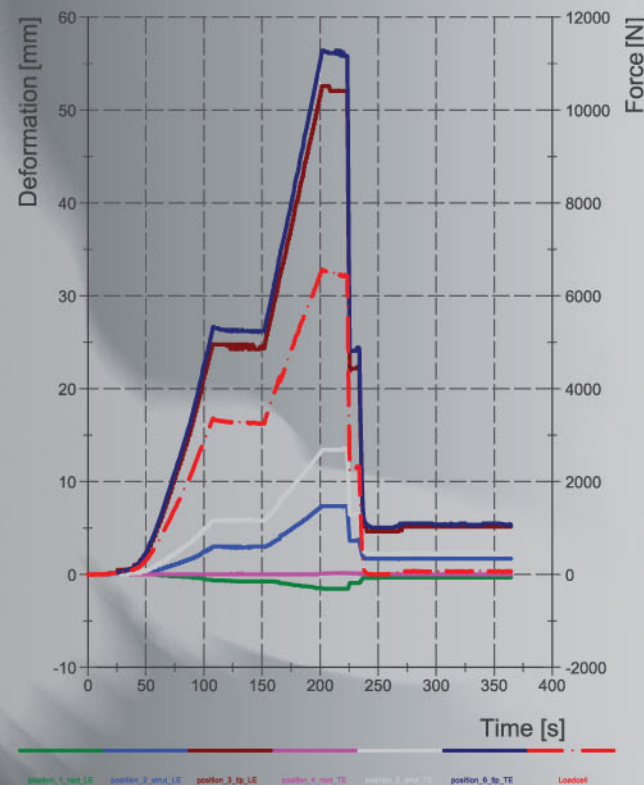


# PROOF OF WING STRUCTURAL INTEGRITY

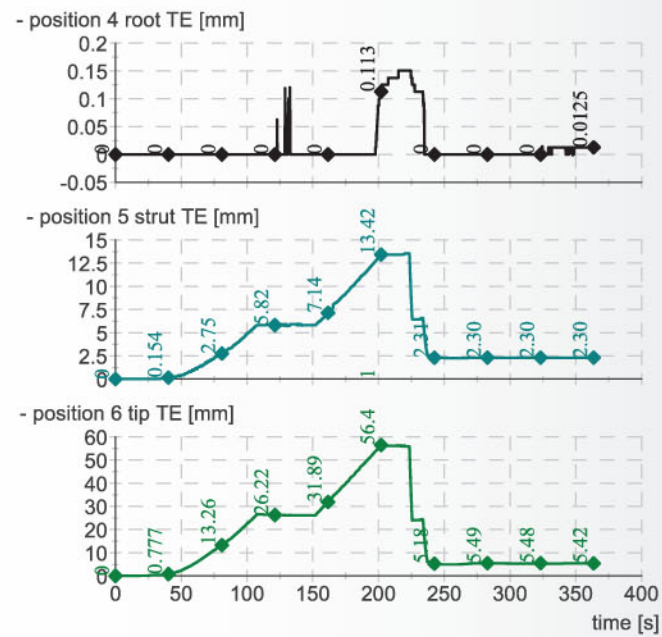
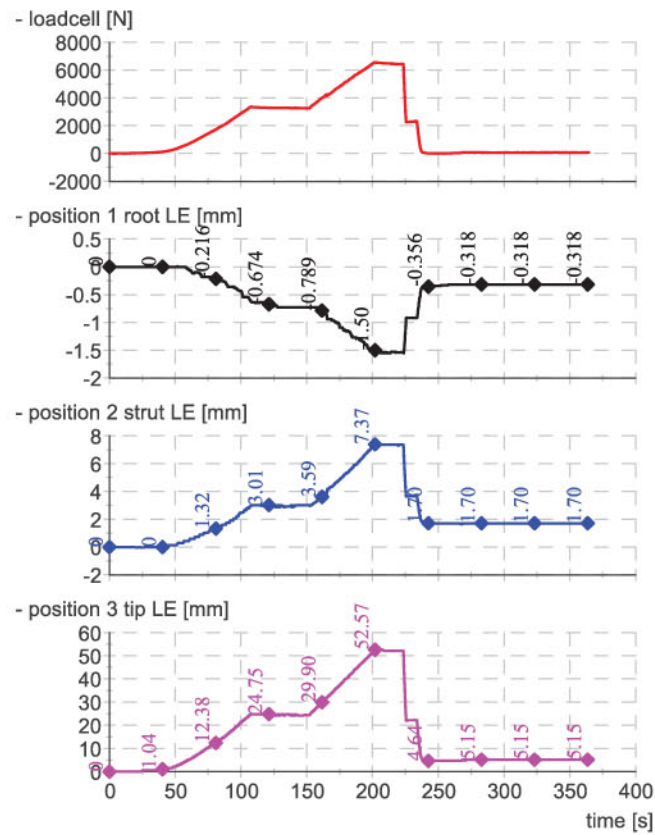
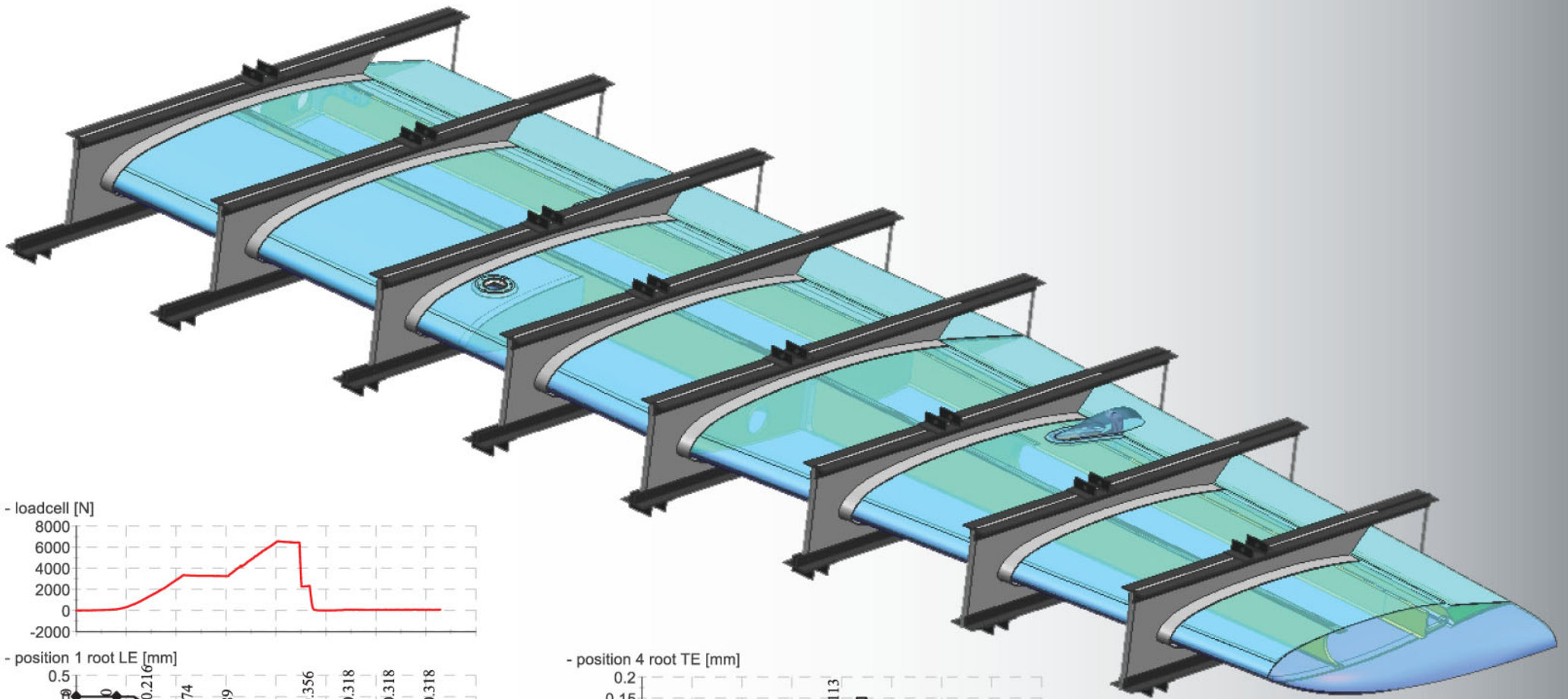
The supporting structure for the TL-3000 passed the certification tests at the laboratories of ČVUT University in Prague, faculty of mechanical engineering, Department of Aerospace Engineering.

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

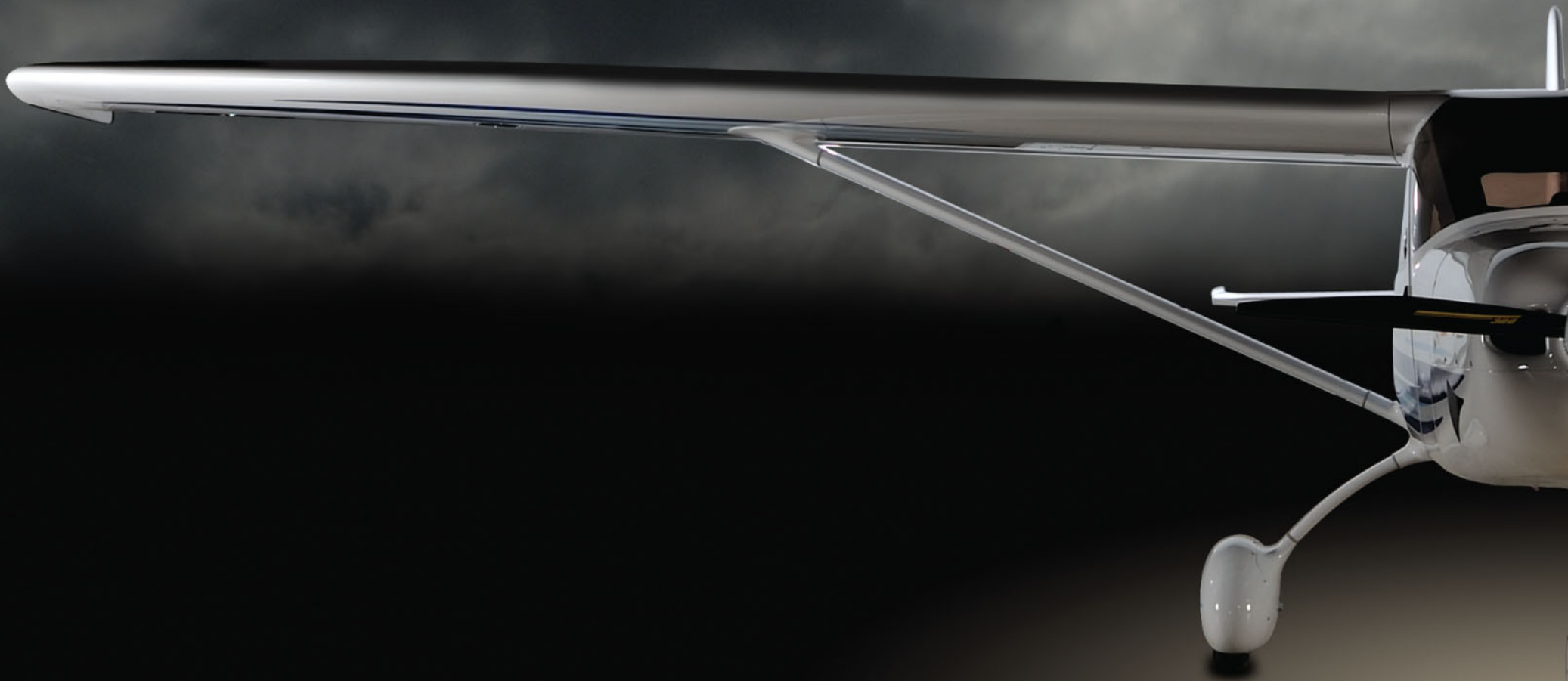
In all tests the construction and structure carried all operational loads without permanent deformations and during calculation load testing no failures have occurred. The testing of the supporting structure has shown higher strengths than required by regulations.















ULTRALIGHT

Sirius





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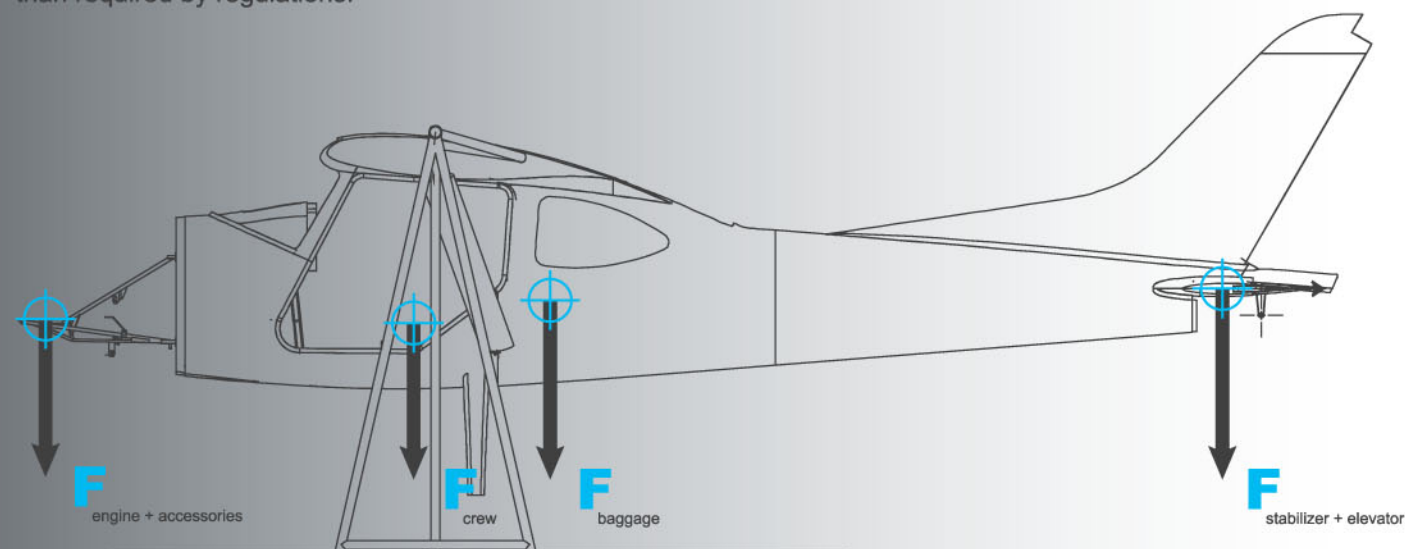


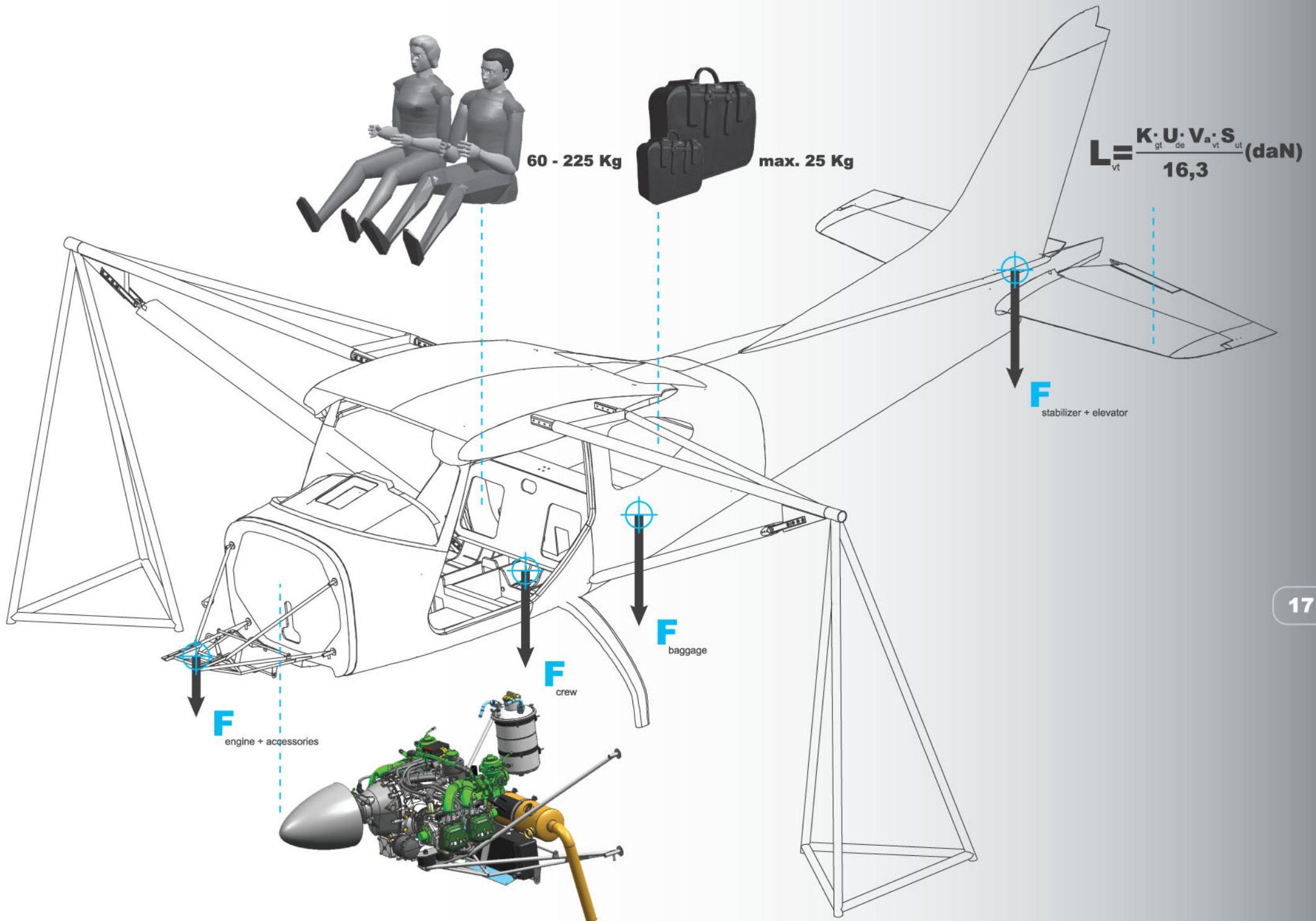
## PROOF OF FUSELAGE **STRUCTURAL INTEGRITY**

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/



2/



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## ENGINE ROTAX



### engine type

### performance

### torque

### max. RPM

	kW	hp	1/min	Nm	t. b	1/min	1/min
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 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 80hp or 100hp versions.

### 2/ 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 115hp.







## COCKPIT

The Sirius has a **spacious** and very comfortable 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.





*Sirius*

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## INSTRUMENT PANEL

The TL 3000 Sirius is delivered with an EFIS (Electronic Flight Instrumentation System) supplied by the Italian ATECH company, or the US built Dynon Avionics system. Communications are normally the Garmin sport stack and GPS which are made in USA, or the ICOM systems from Japan. Below you may find some specific detailed information.

AV 3000 integrates, in a completely automated system, both an EMS and EFIS that offer solid-state reliability and a large transreflective, colour 8.5"LCD, sunlight readable monitor. The AV 3000 represents a new generation of digital instruments with either analogue or graphic reading. Its class-leading display allows screen partitioning by showing, simultaneously, 7 primary flight instruments, and 10 degree parameters, in a simple and immediate graphical form. EFIS consists in an Inertial Navigation System coupled with GPS system, where the Inertial Navigation Platform is the core component for providing accelerations, speeds, rotations and displacement in the space data and it is supplemented by a GPS, which provides a reference position calculation as often as possible. Depending on the satellite signals availability, at its highest frequency of 1Hz. AV3000 is able to provide all dynamic data for performance and navigational aid and planning, and is coupled with an air data computer for checking all parameters relative to altitude, speed etc. It has been designed for the Rotax engine series.



AV 3000 made by ATECH



Green Line

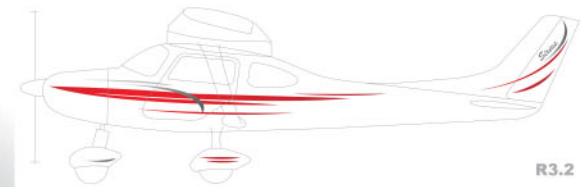
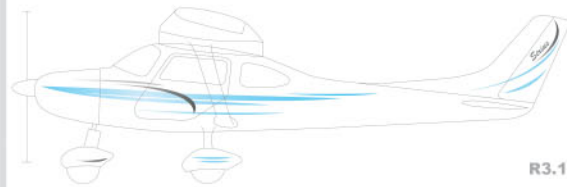
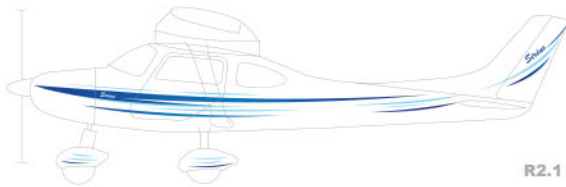
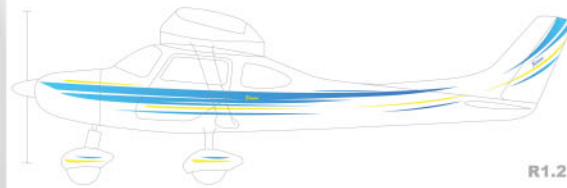
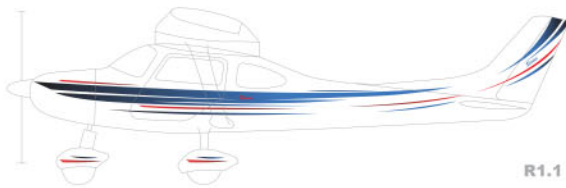
Another popular panel choice is called the GreenLine™ EMS engine monitoring system, manufactured exclusively for TL aircraft by I-K Technologies, USA. The GreenLine EMS displays critical engine parameters at a single glance, with obvious alerts for out-of-limit conditions and digital details when needed and a remote alert light mounted in front of the pilot.



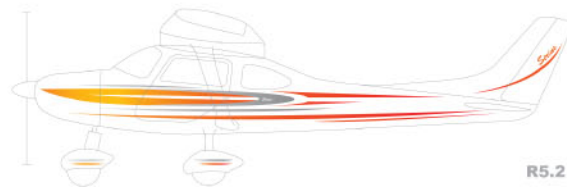
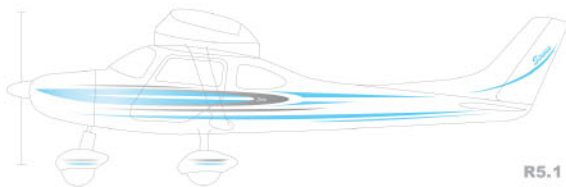
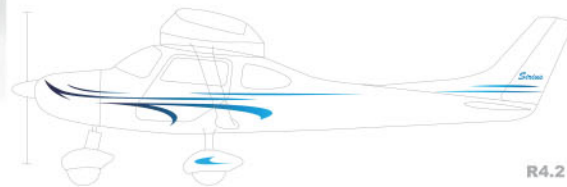




# DESIGN



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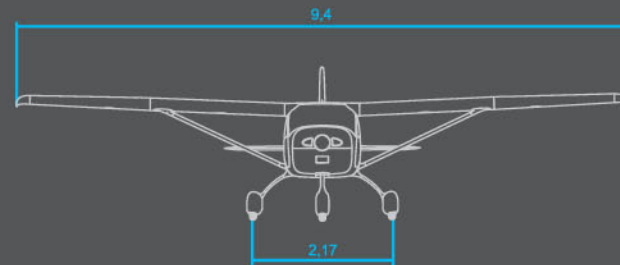
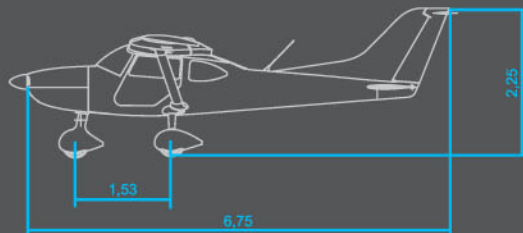
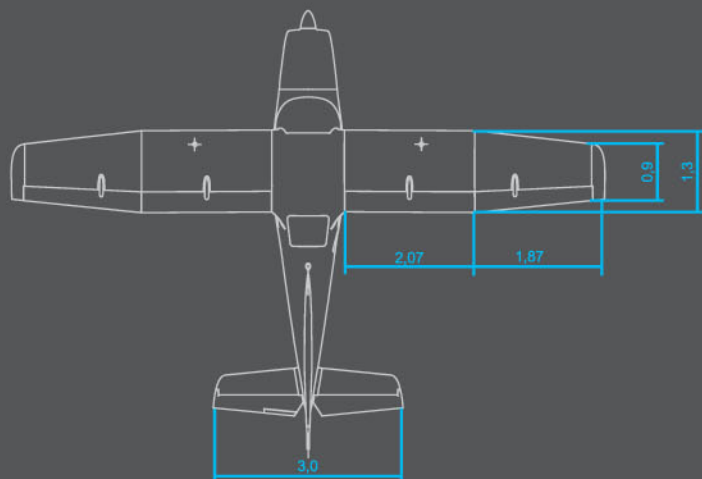
## PRODUCTION / SERVICE

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 and these records and part traceability are kept forever. 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.



## TECHNICAL DATA

Length.....	6,75 m
Total height.....	2,25 m
Wing span.....	9,4 m
Wing area.....	11,15 m <sup>2</sup>
Horizontal fin span.....	3 m
Horizontal fin area.....	2,01 m <sup>2</sup>
Vertical fin area.....	1,19 m <sup>2</sup>
Cabin width.....	1,125 m
Minimum speed.....	57 km/h
Maximum speed.....	230 km/h
Cruising speed.....	180-230 km/h
Never exceed speed.....	253 km/h
Climb rate.....	8 m/s
Empty weight (according to type).....	297 kg
Max. take-off weight.....	472,5 kg (600 LSA)
Max. crew weight.....	225 kg
Min. crew weight.....	60 kg
Max. luggage weight.....	25 kg
Fuel consumption.....	8-12 l/h
Fuel tank capacity.....	130 l
Flying range.....	2000 km

\*right to make changes reserved

## CZ / HRADEC KRALOVE

TL-ULTRALIGHT s.r.o.

Airport, building 84, Hradec Kralove, CZECH REPUBLIC

GPS: 50°14'33, 59 S / 15°50'34, 89 V







see our dealer list on [WWW.TL-ULTRALIGHT.CZ](http://WWW.TL-ULTRALIGHT.CZ)

*many years we fly all around the world*

*Typhoon Condor Star Sting Sirius*

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