



# Shulman Av Tur



The Turbinator sits ready for action. Those large flaps allow for some very slow flying

## Germany's David Bueskin tests out this sport jet/trainer from Shulman Aviation

**T**he warbird guys know Nick Zirolì as a designer of great flying scale warbirds. A couple of years ago he designed his first trainer/sport jet named the Turbinator. The flying-characteristics were, without a doubt, great, but being a builders' kit it was quite a challenge for most pilots. David Shulman came up with the idea of an ARF version of this jet and together with three nice colour schemes it suits today's demands well.

### Let's Get Started

In Europe the Turbinator is distributed through Al's Hobbies, which makes it very easily obtainable. The kit comes finished in Oracover film, heavy-duty control-linkages and fibreglass fuel cell. All parts fit out of the 'fairly big' box – even the canopy-hatch is pre-fit. The

two-piece wing is joined by two carbon fibre wing-tubes and holds down with four bolts. The elevator-halves slide onto two carbon-tubes and are screwed to the fuselage with one bolt each side.

The first test-assembly showed a perfect fit of the parts so we were able to start fitting the radio and gear. The only part missing in the kit was the manual, but with some practice in building ARF models, it is no big deal. David Shulman sent us some pictures of his finished model with the recommended radio-settings and C of G, so it was time to start.

First of all we installed the aileron and flap servos. A friend of mine recommended Dymond DS9999TG servos from Staufenbiel in Germany. These are coreless servos with a very strong and play-free titanium gear for a more than reasonable price. The servos are

not attached to the servo-covers but screwed into plywood-ribs. That makes it easy to install and tune the linkages and servo-horns. Once satisfied you just screw the cover on and you're done.

The control-horns and linkages that come with the kit are very strong, so there is no reason to change them. We only missed some matching bolts to connect them to the surfaces. The hinges are a bit small if you are used to Robart hinges, but due to the numbers of hinges that are used, there is no reason to worry.

### Retracts

I have had some good service and experience with retracts from Airtech-Germany, so I called Erwin Tratz to get a set that would fit the Turbinator. The main-gear



# Aviation Turbinator

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The small pin-hinges proved to be strong enough for the arising forces



The servos are bolted to the wing-ribs. Dymond DS9999TG all around



Setting up the controls is quite easy with the provided horns and linkages



The Turbinator kit comes nicely covered in Oracover film and with all necessary hardware



Elevator and rudder are driven with long rods. We glued short carbon-tubes to the formers

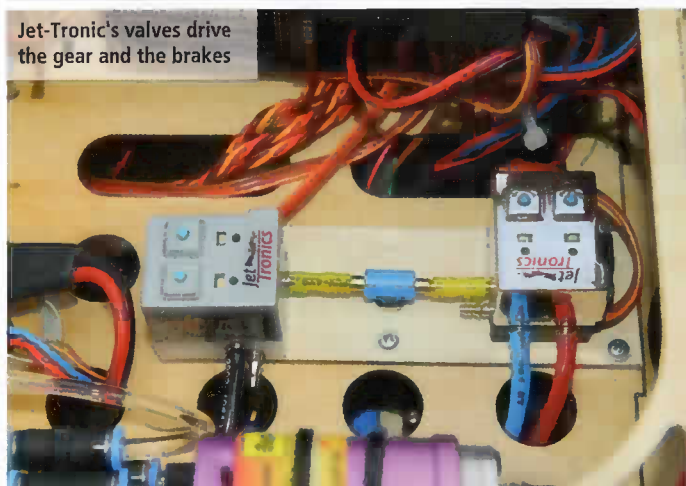




The pre-installed turbine rails have the wrong angle. After removing them, a new set of rails is glued in place



Our solution to drive the landing light in the nose. A 1S-LiPo, a little servo and a switch is just enough for the 3 Watt LED



Jet-Tronic's valves drive the gear and the brakes



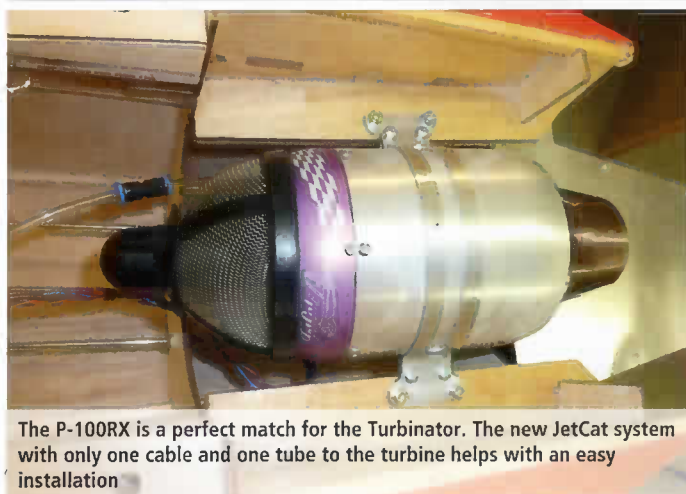
The turbine installation is a tight fit



Some sanding is required to fit the fiberglass tank provided with the kit. It's held in place with Velcro tape



To protect the fuselage from heat a metal sheet is bolted to the bottom



The P-100RX is a perfect match for the Turbinator. The new JetCat system with only one cable and one tube to the turbine helps with an easy installation



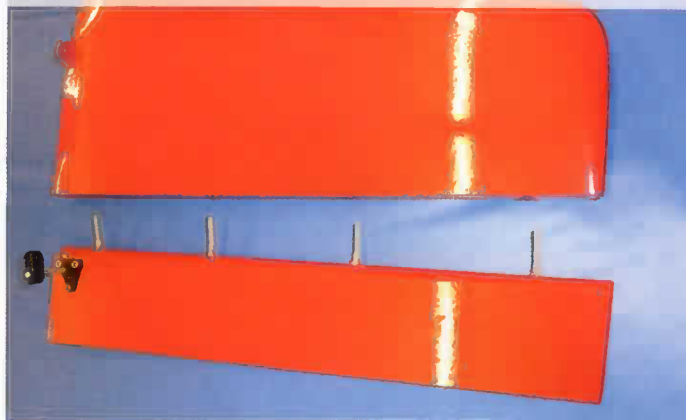
It's great that they thought of holes and space for all the cables and tubes



A tidy installation is easy in the Turbinator. The header-tank is from CARF models, but a BVM UAT would fit just as good. The PowerBox sensor switch is just perfect for jets of this size



Due to the fact that there is no servo in the tail itself, you only have to glue the hinges and install the control-horn



The large canopy is pre-installed and fits perfectly. You only have to install the canopy-release and the clear canopy



The blind nuts to hold the elevator come ready installed

was pretty easy, as it only needed some trimming of the balsa sheeting to fit the mechanics. The oleos and wheels are the same size as for the Composite ARF Rookie, so that was a quick fix.

The nose-gear is a different story and we ended up with a nose-gear that is a fair bit shorter than the one that is recommended. I was a little bit concerned that the negative angle of attack would end up in the aircraft having bad habits, but the first flights proved that it is no problem at all.

In combination with Festo connectors and tubes and Jet-Tronics valves for retracts and brakes the system works flawlessly. The trailing-legs help to keep track, the brakes are optional, as you will not touch them on a grass strip.

### Turbine Installation

The turbine installation is more time-consuming as I thought. Due to the fact that the angle of the turbine rails were not changed in the second batch, you have to redo them. This is the part where you get your Dremel and start a mess! The rails were completely removed and new ones glued in place with the right angle. David sent me a drawing with the right angle so it was finished in two evenings. The kit came with some spare turbine-formers, but I decided to make them fit the JetCat P-100RX that was bought for the Turbinator.

Once you are finished with the turbine installation, the turbine-bay is covered with a

The clear canopy has to be glued to the hatch. A little pilot gives the right look



plywood-cover. The rear fuselage is protected with a stainless cover that is screwed to the underside of the rear. This gives perfect access to the elevator and rudder pushrods. As an addition we glued short carbon-tubes to support the pushrods.

The ECU and pump are installed under the canopy hatch; solenoids are no longer needed with the latest RX-turbines from JetCat. The fibreglass fuel cell fits perfectly into the fuselage and is held in place with some Velcro. The header-tank sits just in front of it and was a leftover from the C-ARF Ultraflash.

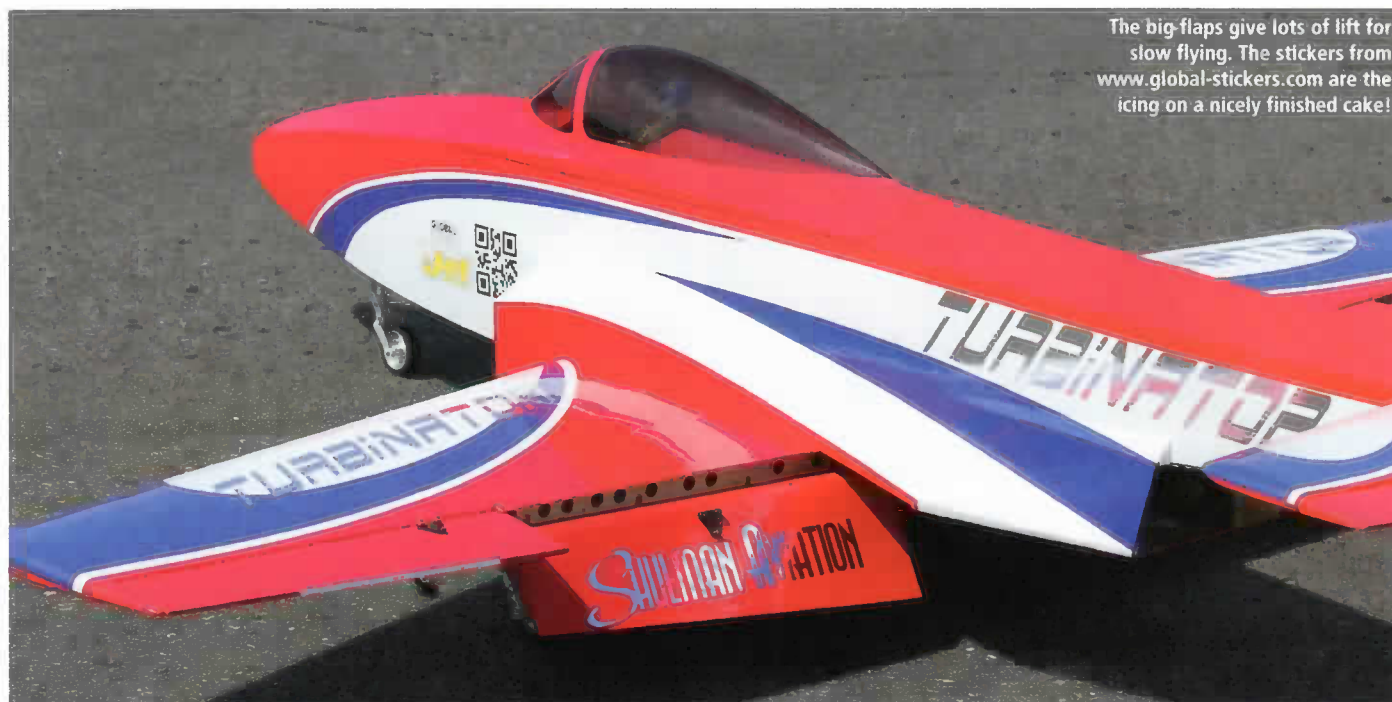
### Equipment

The rudder and elevator servos are situated just behind the fuel cell. The cut outs are made

for standard-size servos and the holes for the screws are laser-etched. That makes installing the Dymond DS9999TG's straightforward. I only had to open the cut outs in the former to clear the quick-links.

The rest of the equipment is mounted as far forward as possible. The Jet-Tronic valves for the retracts, brakes, the fill-valves, receiver and Powerbox Sensor-Switch were mounted under the canopy-hatch. The two PowerBox 1500 batteries and the JetCat LiFe battery are mounted just on top of the nose-gear bay. Access to the batteries is not too easy, but usually those batteries are charged onboard. The big nose-gear cover gives the ability to mount the air-tanks on both sides of the nose-gear.





The big-flaps give lots of lift for slow flying. The stickers from [www.global-stickers.com](http://www.global-stickers.com) are the icing on a nicely finished cake!

The Airtech-Germany retracts are a perfect fit for the Turbinator



We only had to slightly cut the balsa sheeting to fit the main-gear



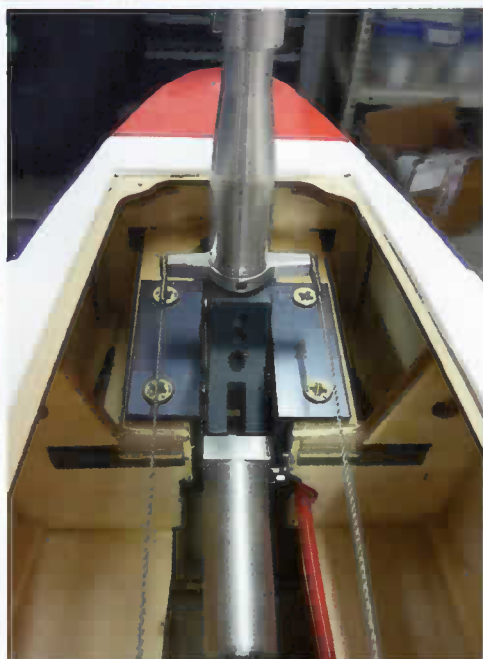
### Final Work

The canopy hatch is pre-fitted and only needs a canopy-latch that comes with the kit. The clear canopy is painted in a matching red and needs some cutting before it is glued to the hatch. I used canopy glue from Pacer and a couple of magnets to hold the canopy itself in place. As I had a landing light from a different jet, the nose was cut off and a clear cover moulded. The LED is driven with a 1S LiPo and a micro-switch as an easy and cheap solution.

For easier assembly of the elevator-linkages, locknuts were glued to the horns. Now you only have to tighten the hex-screw without the hassle of a small locknut. Finally, the wheel-wells were closed with the vacuum-formed covers to keep dirt and water from the wings.



Cable-ties are a great way in keeping the nose-wheel cables from clashing with the nose-leg



The nose-gear had to be moved back to make sure the control-horn does not collide with the mounting-rail



There is enough space on both sides of the nose-leg to fit small air bottles. They are just glued in place with silicone



The take-off is pretty easy and the Turbinator rotates after just 15 metres



Landing with full flaps and crouching needs almost half-power for the landing pattern



The Turbinator has clean lines with flaps and gear tucked away



### Let's Go Flying

With the power of the JetCat P-100RX the Turbinator takes-off after less than 40 m from a concrete runway. Even the negative angle of attack doesn't affect the take-off. After two circuits I realized that angle of the turbine was still not right. Trimmed with full throttle the Turbinator went into a dive on idle. It is not a big deal to handle it, so the rest of the flight was relaxing.

From those first few circuits the Turbinator felt just great on the sticks. There are only a few airplanes that give you a feeling like you had never flown anything else and the Turbinator definitely has it for me! The flaps are very effective so the landing pattern is flown with a bit over half power until you reach the runway. Slowly throttle back and put in elevator for smooth landings.

After the first couple of flights the angle of the turbine was changed by adding a shim. Since then the flying has been lots of fun. The Turbinator is an aerobatic airplane and has no bad habits. Due to the design of the airframe, it doesn't get very fast with full throttle and slows down if you throttle back. Constant speed aerobatics is what it likes most, and, different to most of the super fast sport jets, it can be flown pretty tight, but is capable of 400 m knife-edge passes.

Now after more than 30 flights I can highly recommend the Turbinator to everyone who wants to get started with turbine powered jets or is just looking for the perfect, everyday sport jet for relaxed flying. ✈