

Exclusivity Bristell XL8

TURBOTECH

Feedback

After 300 hours of flight



What better guarantee of confidence can Info-Pilote offer you than that of long-term feedback from the field?

Since September 15, 2024, we have completed 300 hours of flight time on board the XL8 powered

by Turbotech. A first for

This turbine confirms its enormous potential for light aviation. Here is a first step forward.

Text and photos: Jean-Marie Urlacher.

ESSAY

I finally arrive at the Kunovice (LKKU) airfield in the Czech Republic. Objective: to try out the Turbotech turbine mounted on the Bristell. In the company of Jaromír Bouda, a former fighter pilot on Mig and Sukhoi (see IP No. 807). The XL8 Turbine had only flown a few times. One outing was enough to convince me of the exceptional potential it could bring to light aviation. It was a "silent revolution", I thought as I returned to the ground. Finally, an interesting technological solution that made up for the announced disappearance of Avgas, solved the problems of nuisance with local residents, made life easier for the pilot, lightened the mechanics, provided real comfort in flight and an undeniable "cool" effect on the ground. But what credit should be given to an engine that had only just been born? At that time, several aircraft manufacturers said it in their own way: *"– Come back and see us when you have made a complete engine potential! – One day perhaps". "Prove yourself and we'll see."*

For the turbine to gain credibility, there is only one solution: fly! April 2024, a year later, development is stalling. The turbine mounted on the XL8 has flown less than 20 hours since the beginning. The Czechs, busy producing aircraft in series and cooled by an electrical failure not attributable to Turbotech, are not showing any signs of motivation to continue development flights. Especially since the weather in this region of Europe is not favorable for a good part of the year. I propose to Damien Fauvet and Jean-Michel Guimbard, the founders of Turbotech, to entrust me with the plane in Gap-Tallard (LFNA). In the Hautes-Alpes, a micro climate gives us 300 flyable days per year. I believe in the project and I have identified a few pilots with whom to form a great team to move forward. At the end of August 2024, Turbotech gives the green light.

For the turbine to gain credibility, there is only one solution: fly!



This article is a continuation to the two previous articles that we published on the subject and that you will find in our issues

IP No. 801 (presentation of Turbotech and operating principle) and IP No. 807 (first flight test of the turbine).



September 2, 2024, the start of the adventure: Jean-Marie Urlacher, Damien Fauvet and Cyril Giraud leaving Paris.



Part of the Gap team: Jean-Marie Delacourt, Cyril, Mathis and Jean-Marie.

FIRST STEP

September 2, 2024, Toussus-le-Noble. Taking advantage of a weather window, I go up to Paris in RV-4 with my buddy Cyril Giraud. The Turbotech technicians are busy sorting out the last details. The weather is very average and the Olympic Games are greatly complicating the formalities, but a slot should arrive early in the afternoon. I carefully prepare the relief fields on Google Maps in the event of a breakdown, review the procedures and prepare for any eventuality. These first flights are not trivial and can potentially play a role in the future of Turbotech. After acceleration-stop tests on the runway, full throttle tests, we have to make a small hood modification to improve the cooling of the scavenge pumps. The Turbotech technicians are extremely efficient. The plane is finally ready. Early in the afternoon, the promised clearing is there. I take off for

ESSAY

take the plane to Etampes and I take the opportunity to test the machine. The airfield is surrounded by fields, a more suitable environment to take control of the plane. Freeing oneself from the constraints of the Paris class A means gaining altitude and therefore safety. After a series of tests and flights with Cyril, we feel confident enough to head for Gap on patrol. In the RV-4, I will do the radio and navigation and Cyril will bring back the XL8 prototype. Our goal is to fly as much as possible to send back to Turbotech the data and feedback useful for the development of the turbine but also to test the equipment in the restrictive conditions of the mountains: harsh winter, hot summer.

In Gap, I gathered a small team of heterogeneous pilots with varied flight experiences but who have one thing in common: intellectual honesty. Egos have no place in this adventure. Cyril Giraud, microlight, paramotor, paraglider pilot, speed riding pioneer, brings his excellent touch, his constant good humor and his sharp mechanical eye. Jean-Marie Delacourt, alias epsi, former width pilot on Pilatus and Twin Otter (16,000 h), has solid turbine experience, he is an instructor at the Alpin aeroclub. Tom Fitzgerald, pilot and former mechanic for Nicolas Ivanoff on the Red Bull races, will be our mechanical guarantor, with Etienne Rigaud, mechanic and instructor who has built more than 80 G1s. Mathis Movio, a young glider, microlight and airplane pilot aged 21 (and already 1,000 h of flight) is preparing for the naval aviation, he brings his rigor and his fresh eye. Martin Camon, professional pilot, and Florian Derval (currently in ATPL) have excellent technical and regulatory advice and good piloting expertise. Corinne and Mike Fitzgerald from Icarus are not far away if needed.

IN CONDITION “AEROCLUB”

In 16 weeks of flight (we were blocked for 5 weeks by a part delivery), we achieved 300 hours of flying, an average of 20 hours per week. We flew up to FL 170, experienced temperatures down to -19°C, and made hundreds of flights, some lasting more than 3 hours. We can say that the use was very similar to that of an aeroclub, varying the navigations, laps, turbine shutdown and in-flight restarts, go-arounds, continuous 100% power climbs or prolonged descents at reduced power... We did not spare the 140 hp TP-R90. In 300 hours, no major events were reported. In the list of mechanical interventions: we only changed a small oil circuit pipe seal that had been poorly installed and was leaking a little. At 300 hours, as required by the propeller maintenance manual, we replaced the carbon brushes on the propeller pitch actuator and installed a bypass on the oil circuit following pressure peaks during starts in very cold weather (the oil being less fluid in winter). The system works wonderfully. We simplified the fuel circuit.

Regular endoscopies were performed every 100 hours to check the condition of the compressor blades, the mantle and the combustion chamber. We replaced the Andair low pressure fuel pump (aircraft equipment) which was leaking drop by drop with a double pump, on the advice of Turbotech,

THE PILOT POOL FROM GAP-TALLARD



Cyril Giraud
ULM pilot, paramotor, paraglider, pioneer of speed riding.



Jean-Marie Delacourt, alias epsi
Former width pilot on Pilatus and Twin Otter (16000 hdv), ACB alpine instructor.



Mathis Movio
Glider, microlight and airplane pilot.



Tom Fitzgerald
Driver and former mechanic of Nicolas Ivanoff on Red Bull races.



Etienne Rigaud
Pilot, mechanic and instructor.



Jean-Marie Urlacher
Paraglider, microlight, airplane pilot. Info-Pilote journalist.



Martin Camon
Professional pilot, ULM/airplane, instructor.



Florian Derval
ULM/airplane pilot, professional training in progress.



Etienne and Tom in full inspection of the turbine.



Cyril discovers the turbine at Toussus-le-Noble.

ESSAY

who had already tested this system with JMB Aircraft. Redundancy is thus ensured, and they have been working perfectly for 230 hours.

First observation: no longer having 25 hours, 50 hours, 100 hours, 200 hours offers a huge gain in machine availability. This is a real asset for flying clubs or flight schools by avoiding operating losses. Second observation, maintenance operations and inspections - tions do not take a lot of time, so the downtime is not too penalizing.

We only had one alarm on the "Engine Master", during a takeoff. The screen displayed a fault on the fuel line and, after checking the data, it was only the ignition delay of a pump of a few milliseconds. For the record, the fault was cleared by telephone and in flight because the engine data is transmitted in real time at Turbotech. Guillaume Mallet, the technical director, was able to instantly check the data on his computer and judge its "non-seriousness".

100% of starts and ventilations have been carried out without a park group and without any external battery charging. And this despite negative temperatures down to -10 °C. This little battery is incredible.

POINTS OF IMPROVEMENT

If we had to list a few points for improvement, we could mention reading the oil level. Since turbine oil is almost transparent, reading it on the gauge is difficult. The porthole system that is generally found on turbines would be more comfortable but we imagine it would be more complex to manufacture.

Cabin heating is another point of improvement - tion. On the prototype, the air tapping around the heat exchanger is not satisfactory. The cause is the pressure losses on the plug boas

dynamic air. Improvement in progress.

On the ground, with the engine off, on windy days, the turbine propeller acts like a wind turbine. A system will have to be provided to block it because the linked turbine then turns without lubrication.

The Airmaster propeller we have on the prototype is efficient but it has a small chord, which has the effect of having very little propeller brake at the reduction - gas. Result: the plane is spinning. We will be testing the DUC propeller in a few weeks and will be able to compare them.

REAL PERFORMANCES

We could write an anthology of the questions we are asked in the field. How much does it consume? How fast does it go? So is it good?

One thing is for sure, you will not go unnoticed on the airfields and the friendly questions from people interested in the turbine are the occasion - to truly discuss current issues (price of Lycoming parts, supply times - sioning, disappearance of Avgas, local residents...)

So how much does it consume? Consumption depends of course on altitude, power, temperature... So it's not easy to give a simple answer - ment to this question. The shortest answer: it consumes roughly the same as a Rotax engine of the same power (140 hp, so in our case the Rotax 915). The longest answer is in the table below.

Regarding speed, it is of course linked to the profile from the wing, to the aerodynamics of the cell, to the propeller, to the altitude, the temperature... The same turbine mounted on two different machines will have varying speeds. The XL8 and the VL3 are about 30 kt apart. 120 kt for the XL 8, 155 kt for the VL3.

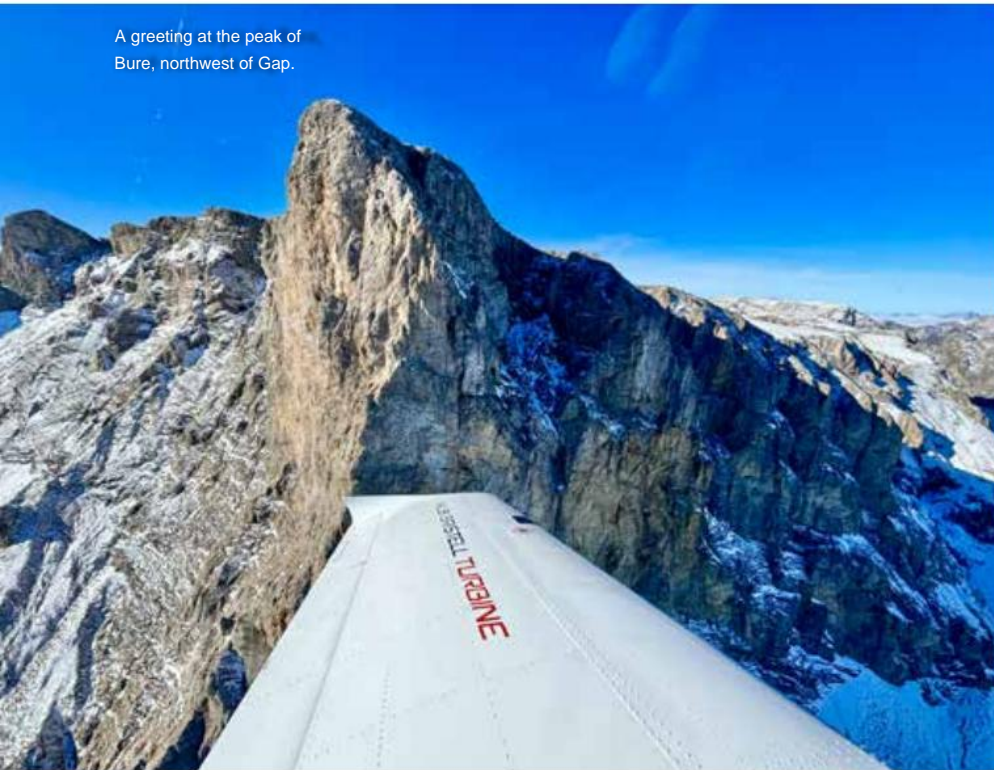
	3500 ft	5500 ft	7500 ft	9500 ft	11500 ft
45%	22.6	20	20	18.9	17.5
55%	27.8	24.6	22.7	21.3	20
75%	31	31	27.1	25.6	24.4
90%	39.8	36.3	33	31.4	29.9
100%	44	40	37	35	33.9

NB: Indicative values of the "fuel flow" for a 140 hp turbine, OAT at 0° at 2,000 ft.



Engine data is transmitted in real time in flight to the technical team of l'équipe technique de Turbotech.

ESSAY



A greeting at the peak of Bure, northwest of Gap.



Turbine driving is much simpler than a piston engine.



December 31, 2024, perfect weather conditions, the Turbotech turbine flies overhead Mont Blanc, a symbolic step for the project.

In Gap, we adopted two techniques. The first is to take off without flaps. The runway is long and the acceleration is so fast that it is very easy to get out of the white arc on takeoff. The second is the systematic adoption of the Vy when climbing (130 km/h). The slope is so steep (2,000 ft/min when climbing) that the risk exposure time (TER) is only about ten seconds.

That is, we quickly reach a safe altitude if we had to turn around.

POINTS OF REFLECTION

To date, three aircraft are flying with the turbine. In addition to the XL8, Gogetair in Slovenia, which has completed 60 hours, and the VL3, 75 hours. These 300 hours on the XL8 have allowed us to learn a lot and especially to glimpse what future this turbine could have in aeroclubs. I am convinced that this turbine is perfectly suited for school and travel. For school, because the Faded offers single-control use and therefore the student only has to worry about his power percentage to display. He has nothing else to manage and can thus concentrate on his airspeed indicator, his altimeter, his navigation, etc. Starting and stopping are so easy that there are no more injection problems, failed starts, or faulty magnetos. There is no more waiting at the stopping point in

waiting for it to heat up, the turbine is immediately available. Imagine the time saved on the potential of an engine, when it takes 10 minutes to warm up for each flight... For the trip, the turbine allows you to find fuel anywhere in the world.

The climb slope quickly brings the crew to safety. In Tallard, where the DCA (Defense of the Alpine Sky) association brings together local residents unhappy with the noise, some members came to inform us that the noise footprint of this plane was "ideal".

The idea of opening a kitty for local residents to finance the retrofit of my plane's engine crossed my mind for a second (humor). The comfort during the cruise is indisputable: no more vibrations, a noise level so low that we can talk to each other without headphones. The only problem today: changing our habits to find fields where there is Jet A-1 or filling up diesel cans. If the turbine becomes more widespread, new fuel tanks on the fields will make sense. In short, this first 300-hour stage is a real boost for Turbotech since it anchors this experience in something concrete.

We will continue to fly until we reach the 1,000 flight hours mark hoped for this summer, which we will not fail to debrief you on. If Damien Fauvet allows us, we would like to push it up to 3,000 hours and thus see full potential.

During these trials we hope to be able to come to meet the flying clubs and share this experience with you and answer your questions.

Do not hesitate to send an email to contact@turbotech-aero.com if you would like to have the turbine visit your site one day.

OUTLOOK DEVOLUTION

Without revealing any state secrets, Turbotech has started end of 2024 the design of a higher power turbine in the 200/250 hp range. A prototype will be ready by mid-2026. This turbine will be ideal for retrofitting Cessna, Diamond, Piper, Cirrus (with a 30 hp electric boost) and more generally all aircraft in these power ranges. A Lycoming O-540 weighs 230 kg, the turbine will offer the same power for 100 kg less. *"To double the power on a piston engine, you have to double the displacement. On a turbine, you only have to increase it by 20% "*, explains Damien Fauvet. A 400 hp turbine will follow next.

In 2025, Turbotech's objective is to put its products into commercial service at the beginning of the summer, as part of the ULM S. Around twenty firm orders have been placed for VL3, XL8, Gogetair and Tarragon .

Soon a STC DR400/Turbine supported by the FFA

The FFA, Turbotech and the Gap-based company Icarus (www.icarius.fr) will work together to obtain an STC that will allow the DR400s to be retrofitted with the TP-R90-140. Icarois has purchased a DR-400 from the Alpin flying club chaired by François Grange. The aircraft will undergo a parameter measurement campaign with the current Lycoming engine before being re-engined with the Turbotech turbine and undergoing a flight test campaign. The FFA is financing part of the Turbotech project, and the Green Fund – Territories of industry in ecological transition is financing the Icarus Aerotechnics part, which will hold the STC. The aircraft will join the FFA FabLab and will serve as a demonstrator for flying clubs. Start of operations: spring 2025.