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A PIONEER WITH MORE POWER
With a 141hp Rotax 915iS under the bonnet, it'll now carry four at an astonishing 162kt

Pilot

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Alpi's four-seat wonder

It can get out of a short strip with four adults and full fuel, and then cruise at up to 162kt. Is there a trick?

Words: Eugenio Facci
Photos: Alpi Aviation

PHOTO: LUCA OCRETTI / ALPI AVIATION

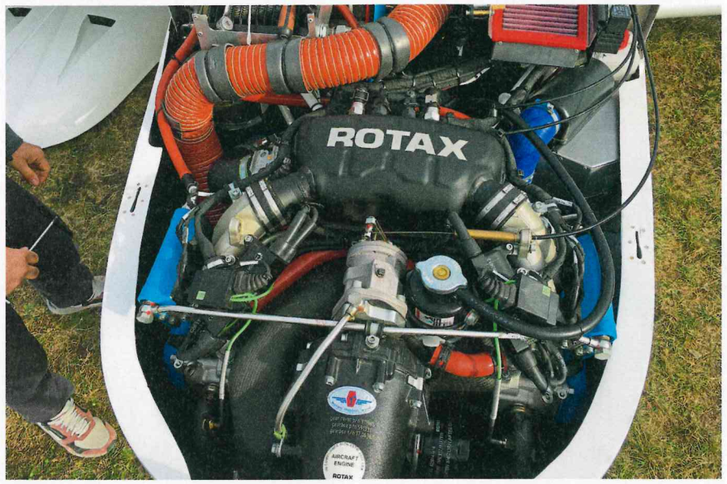

PHOTO: EUGENIO FACCI

PHOTO: EUGENIO FACCI

The cowling can be opened quickly by one person by removing two pins

The compact and powerful (141hp) Rotax 915 iS turbo engine

I'm pulling back on the stick as hard as I can. The nose is high, I have full power, and the stall warning has been on for maybe a minute now. But it's only a warning, because we're flying. In fact, we are *climbing*, and I have full aileron control. It's something that I have never experienced in another aeroplane, and it does make me wonder if there is some sort of trick at work here.

But 'the trick', it turns out during my visit to Alpi Aviation's headquarters, is simply good engineering applied to a project with a clear goal: building a family aeroplane that can cruise fast and that can operate from small grass airstrips. The Pioneer 400 debuted in 2009 with a 100hp Rotax engine, and over time evolved with the adoption of more powerful powertrains (see our November 2011 issue for a test of the Rotax 912 version). The latest iteration that we are flying today is powered by the Rotax 915 iS turbo powerplant: it is a response to market demand, its 141hp giving an extra buffer of safety and power for short-field operations.

"I wanted an aircraft that I could use to take my family on trips" tells me Corrado Rusalen, the founder of Alpi Aviation and designer of the Pioneer line. "Being in Italy, where we have a lot of grass strips, I needed to be able to operate from small airfields. Also, I wanted to go places, so I wanted a high cruise speed. And finally, I would be flying in the aircraft with my wife and children, so I wanted it to be extra safe".

In terms of safety, the idea was to take out of the flying equation some of the most frequent dangers of general aviation. That is why, for instance, the Pioneer 400 will not allow you to enter an after-takeoff 'distraction stall' with full power, and it will simply continue to slowly climb in that scenario, even if you keep the stick full aft.

The solutions adopted to have a high cruise speed were a retractable undercarriage and variable pitch propeller – obviously combined with the sleek aerodynamics typical also of other Alpi models. And for short-field performance, a lot of thought went into weight limitation, using a careful balance of wood and carbon-fibre to maximise the strength to weight ratio.

PHOTO: EUGENIO FACCI

The Pioneer 400-915 iS runs on mogas, but it can use leaded avgas for short periods of time if needed

Obviously not as roomy as bigger American tourers, the Pioneer 400 is nonetheless a true four-seater that can takeoff with full fuel and four adults

IMPRESSIVE PAYLOAD

On that note, one thing that stood out for me, as I studied the aircraft before the flight, was the ratio of Maximum Takeoff Weight to Empty Weight: an impressive 1.77, much higher for instance than the Pipistrel Panthera (1.61) and Cessna 172R (1.45). When empty, in fact, the Pioneer 400 weighs 480kg. You can then put four adults weighing 70kg each, baggage (15kg) and 97 litres of mogas – almost full fuel – before you hit the MTOW of 850kg. That will carry you for four hours and thirty minutes at 125kt (TAS), and give you thirty minutes of reserves. If you ditch the 15kg of baggage, you can take four adults and full fuel.

On the day of our test, I try the aircraft almost fully loaded to re-create the most demanding conditions. Two Alpi Aviation engineers kindly volunteer to sit in the back while in the front I fly with Alpi's sales representative Ed Dockendorf – who is based in Luxembourg and routinely uses the aircraft for quick trips back and forth from Italy. With seventy litres of mogas, I calculate our takeoff weight as 830kg (twenty kilograms lower than MTOW), on a day with rather standard conditions: OAT 11 degrees, QNH 1016 and airport elevation 560ft (we are flying at Rivoli Osoppo airport in north-eastern Italy, where all Alpi Aviation testing takes place).

The latest iteration of the Pioneer 400, powered by the turbocharged Rotax 915iS, is a response to market demand

You board the aircraft from the front, helped by a step in front of the wing. The gull-wing doors opening upwards make it easy to enter, and both pedals and seats can be adjusted for maximum comfort. Once seated, the pilot view is very good, both

PHOTO: EUGENIO FACCI

You enter the aircraft from the front of the wing, aided by a small metallic step. The gull-wing doors make entry easy

looking out and in terms of seeing all instruments on the panel. There are a few things to note here, and to get used to if you don't know the aircraft. One of the levers on the engine panel, for instance, is actually not related to the engine but is the cabin heat lever – I initially got confused reading 'heat' underneath it, and assumed incorrectly that it was the carburettor heat control.

There is a bit less room here than in a typical American four-seaters (like the Cessna 172 I usually fly), but nonetheless space can be used very well here too. For instance, Ed flies with a very high-spec four-screen digital cockpit, which can be set up without sacrificing any instrument – and actually keeping an analogue backup in the form of one ASI and one altimeter. Specifically, from left to right, we will be flying with SkyDemon showing on a large iPad, a Dynon PFD, a Garmin backup, and a Dynon MFD.

REDUNDANT ALTERNATORS AND BATTERIES

One interesting feature of this setup is that the devices can be linked to work together, so for instance you can have the SkyDemon information shown on the Dynon PFD screen. The Pioneer 400 also has an autopilot with a variety of modes (Heading, Nav, and Vertical Nav for instance), and you can actually practice airline-style navigation with it. Ed in fact tells me that this setup minimises his cockpit workload, and it enables him to do frequent long flights all around Europe that would otherwise be much more tiring.

Another thing to note is that electrics are important in this aircraft, both for the engine CDI system and electric fuel pumps. Consequently, the Pioneer 400 is equipped with two generators, and two batteries for added redundancy. Startup is quite simple: you put power to idle, prop full forward, and the boost pump on, then engage the starter, with the usual oil pressure checks to follow.

Taxying does not take much effort on the pedals, which are light and comfortable. At the holding point of Runway 21, we action the Before Takeoff checklist, which includes a check of the electrics, and of the two electric fuel pumps. On the runway (which in Osoppo is a concrete runway) I line up as far back as I can for distance measuring and then apply full power without holding the brakes. We quickly build up speed and at 55kt I start the rotation, which requires a farily firm pull for liftoff. We leave the ground as the taxiway goes past on my right (310m of takeoff run) and I select gear up. We initially climb at 70kt with takeoff flaps, obtaining a 650fpm rate of climb. After raising the flaps, we reduce MAP to 40in and bring RPMs to 5,300 for a normal climb, accelerating to 90kt and obtaining a 800fpm climb rate.

As we climb, I notice that the aircraft requires a fair amount of rudder, and I realise that the rudder trim (a fairly rare feature in light aircraft) is actually quite useful in the Pioneer 400 - which is also equipped with aileron trim. Once level at 4,500ft, I start doing some gentle turns, and then some steeper ones.

PHOTO: EUGENIO FACCI

The autopilot has a variety of modes (NAV and V-NAV for instance) that allow you to do airline-style navigation

PIONEER 400-915 iS

Dimensions

Length	7.00m
Wingspan	8.80m
Wing area	11.20sq m

Weights

Empty Weight	480kg
Max Takeoff Weight	850kg
Fuel capacity	110 lit

Performance

Max cruise (TAS at FL100)	162kt
Stall speed	43kt
Takeoff run	250m
Best climb rate	950fpm
Max range	600nm
Glide ratio	13:1

Engine & Propeller

Rotax 915 iS (turbo) producing 141hp and driving a 3-blade variable pitch CS propeller

Manufacturer

Alpi Aviation
www.alpiaviation.com

Price

£217,000 Ready To Fly
£118,000 Kit
[glass cockpit; VAT not included]

The model we flew has a very high-spec digital cockpit with (left to right) an iPad for SkyDemon, a Dynon PFD, a Garmin backup, and a Dynon MFD. The standard setup has two Dynon screens (PFD and MFD)

PHOTO: EUGENIO FACCI

On the model we flew there were no toe brakes on the right-hand sidebut you could use the main brake lever between the seats (which also serves as parking brake)

PHOTO: EUGENIO FACCI

In the centre console, between the two front seats, you also find the trim controls (elevator, rudder, aileron), the flap lever, and the emergency parachute

PHOTO: EUGENIO FACCI

If both alternators fail, and the main battery runs out, you still have power from the backup battery, activated after lifting the guarded switch

PHOTO: EUGENIO FACCI

The pedals, like the seat, can be adjusted for maximum comfort

PHOTO: EUGENIO FACCI

The gear handle with its lights sits on top of the panel, in front of the left seat

The controls are well balanced and harmonised and, in fact, I find the aircraft quite striking for its adaptability: it feels like a mini-fighter aeroplane when you want it to be agile, and firm and stable when you want it to be settled. I have the impression that, actually, the Pioneer 400 would be a good platform for IFR training, if Alpi ever wanted to market it for that use.

Next on my list is slow flight. I pull back the power until we reach 60kt, then readjust it to maintain speed and altitude. We are almost full aft trim, and again here the controls behave as expected, somewhat mushy but responsive, and with no adverse yaw. We then slow down for a clean stall, which comes at 52kt with a very light buffet and no wing drop. But the 'safe stall' characteristics I mentioned earlier do not really allow you to induce a full stall: despite pulling firmly on the stick, I merely enter a slow descent with the nose nodding every

Another Pioneer 400 served as cameraship during the flight test, flown by Alpi's founder Corrado Rusalen

PHOTO: EUGENIO FACCI

Unusual for a light aircraft, the Pioneer 400 has a rudder trim (which Eugenio found particularly useful during climbs)

PHOTO: EUGENIO FACCI

now and then. The same happens with full flaps, when we 'stall' at about 46kt, again with a light buffet and no wing drop.

To remain in our work area, we now turn back south. The mountains ahead, where the Italy/Austria border is located, are getting higher, while to the south we need to stay clear of the Aviano airspace where both the USAF and the Italian Air Force (the latter with its aerobatic team, the Frecce Tricolori) operate. Still flying at 4,500ft we set manifold pressure 29in and 5,000rpm – the economy cruise setup – which gives us a speed of 118kt indicated (126kt TAS at this altitude) and a fuel flow of twenty litres per hour. For a normal cruise, we increase power to 34in MAP and 5,200rpm, accelerating to 124kt indicated (135kt TAS), and a fuel flow of 25 lph. It is possible to cruise significantly faster, but that makes the engine obviously more thirsty: with a MAP of 40in and 5,500rpm we fly at 140kt indicated (150kt TAS), the engine using 29 lph at this speed – though Ed tells me that he typically cruises at 7,500ft and 145kt TAS, using 25 lph.

Going back to the airfield for a few circuits, Ed explains his workflow for

Born out of passion

Alpi Aviation has made more than one thousand aircraft to date

Alpi Aviation was created in 1999 by Corrado Rusalen, a flight instructor and engineer with 8,000 flight hours and a passion for sleek design and airframes combining wood and carbon fibre. The company's first model, the two seat Pioneer 300, debuted the same year (see our flight test in the October 2018 issue), followed over the years by the Pioneer 200, the 330 (aerobatic) and the 400, the first four-seater manufactured by Alpi.

The firm is based in Pordenone (in north-east Italy about sixty miles from Venice), in the vicinity of the US Air Force Aviano airport (where F-16s are based) and the Italian Air Force base of Rivolto – where the Italian aerobatic team trains. It is a region rich in general aviation tradition, not far from the headquarters of Pipistrel and Fly Synthesis.

One of the current projects of Alpi is a twin-engine piston called Pioneer Twin, which may be developed into a hybrid model at a later stage, and whose mock-up was already unveiled in Friedrichshafen. As of today more than one thousand Alpi Aviation aircraft have been sold, and they are flying in thirty-one countries around the world. The model shown in this test flight can be bought directly from the company and registered in the UK as a Permit To Fly aircraft.

Sleek aerodynamics give the 400 a high cruise speed, while the fairly large wing area allows the aircraft to operate from short strips

the approach. First, you slow down to the white arc. Then, on downwind, you work from top to bottom on the central panel, lowering the landing gear first, then selecting approach flap, and finally advancing the prop lever fully forward. In this configuration the fast and sleek Pioneer 400 becomes a lot more draggy (in fact I initially get caught off guard, slow down too much, and end up needing quite a bit of power to get back to my target speed).

On downwind Ed aims for 85kt, which becomes 80kt when we turn base and start descending. On final, we select landing flap and settle on 75kt which, on the narrow concrete runway of Osoppo, looks a lot faster! In any case, I find it fairly easy to keep the aircraft on profile and on speed, and I am actually quite impressed by how settled the Pioneer 400 feels. In terms of approach stability, it does not feel at all like an aircraft with an empty mass of 480kg, but rather like a Piper Arrow or Cessna Skyhawk, or even something heavier. After a normal flare, we touch down gently and come to a complete stop in what I calculate to be 280m of ground run – which obviously would be a bit less on a grass runway.

It feels like a mini-fighter aeroplane when you want it to be agile, and firm and stable when you want it to be settled

Did I like the Pioneer 400? Yes, a lot. It is a pleasant and very versatile aeroplane, which does extremely well what it was designed for: touring. Its combination of four seats, large payload, fast cruise, low fuel consumption and short-field capability is a real winner, and it's no surprise that other GA manufacturers are now trying to go after the same market (Flight Design, for instance, with its F4 four-seat model).

In fact, I am surprised that I don't see more Pioneer 400s flying around the world, and I ask Ed why that is the case. He says that it is because many pilots do not even know this aircraft exists. Well, maybe this article will help with that!