MicroMAX, the Pocket F3F!

Promises kept by offering exceptional flying qualities for its size.

Pierre RONDEL

The MicroMAX ready for a memorable flying session in a gorgeous place in the French Alps.

The MicroMAX is a project initiated by Henning Schmidt (Sansibear.de), designed by Christophe Bourdon, and manufactured by Anton Ovcharenko (OA Composites). The idea came initially from the 1m hand thrower called *Strike*, but this time optimized for the slope, with the possibility to double the flying weight, while using the latest construction techniques in F3K competition, with materials such as UHM

(ultra-high modulus) carbon on a machined Rohacell core. So let's see if this MicroMAX has managed to concentrate both F3K and F3F glider DNA in a 1.15m glider. I must admit that it is a daring challenge!

A Quick Look at the Kit

Photo 1: The MicroMAX kit arrives complete, with all accessories.

The kit arrived two days before Christmas in a sturdy wooden box, just in time to be under the tree. The kit is gorgeous and so cute with this very nice and unusual but very original moon grey metallic color. The wing is in one piece, where the concept could have been taken even further with a two piece wing, but this choice is perfectly understandable for many reasons. It has a big cartoonish MicroMAX logo with neon colors, although the neon pink and orange mix is not the best color combination for my taste. The servo compartments are prepared; the aileron horn location and the control outputs are also drilled. The

wing is maintained on the fuselage by two metal screws. In the front centre of the wing there is a recess for the wing servo connector.

The fuselage is very innovative at the rear end: the fuselage section is reduced in width over the last 4 cm to provide an elevator exit with a direct connection to the elevator horns, which therefore remain outside the fuselage. This is a very simple but clever solution for a small glider. The end of the piano wire is simply bent, and allows the V-tails to be easily assembled or removed for transport. The captive nuts are already in place to receive the wing. The tail joiner is simply glued to the outside of the fuselage in a slot molded for this purpose.

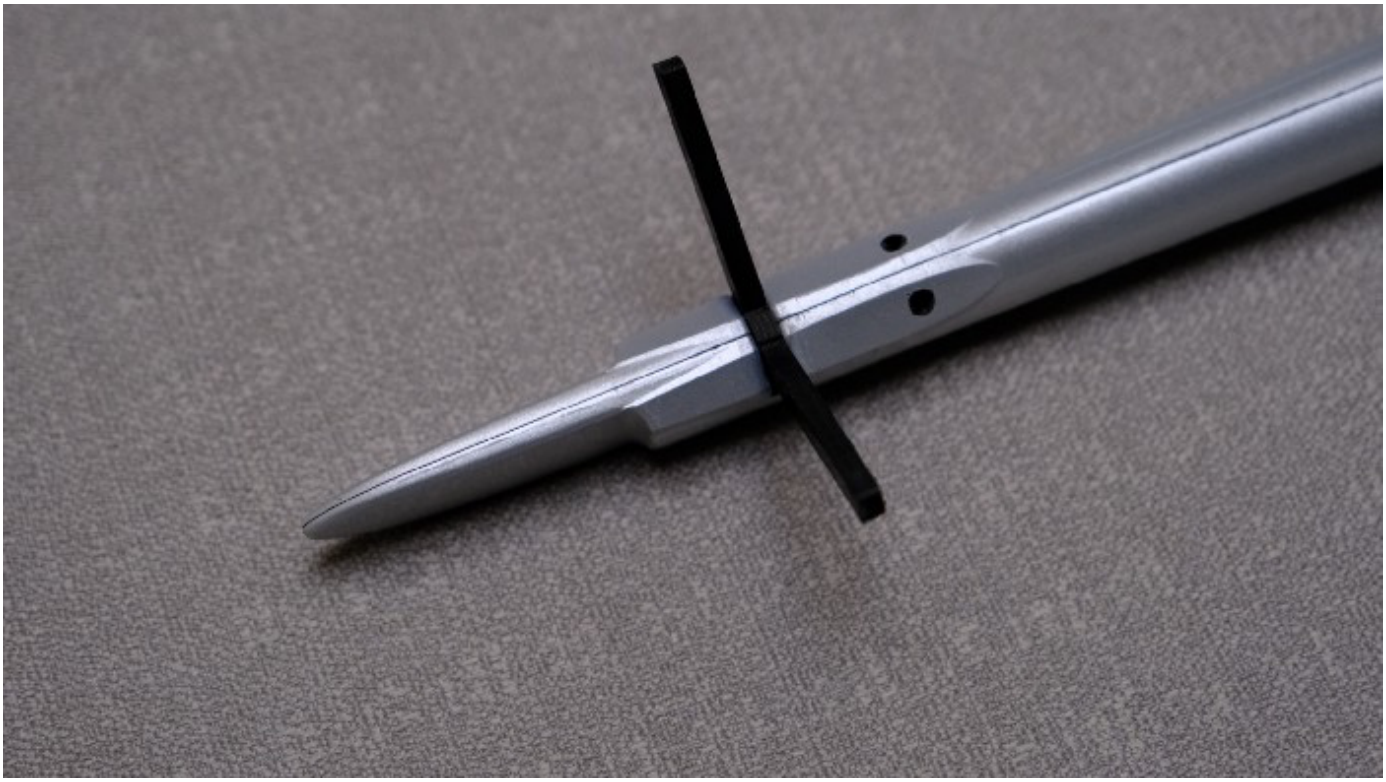


Photo 2: The tail joiner is glued to the outside of the fuselage in a special recess.

All the necessary accessories are supplied in the kit, including receiver-side servo cable extensions, connectors, elevator piano wire and plastic sleeves, aileron piano wire, epoxy fuselage servo plate, servo covers, carbon elevator and aileron horns. The finish and fit are excellent, as you would expect from an F3K construction. The weight of the components is as follows: Fuselage + nose cone: 30.5 g, Wing: 103.25 g, Tail: 5 g each, V-stab key: 1.35 g, total 145g.

Assembly

Photo 3: 4 MKS HV75K-N servos and 1s LiPo battery.

Installing the radio in such a tiny glider is unusual for me, especially in the fuselage where you have to place two servos, a four channel receiver and a battery, not forgetting all the wires, and plugs. This is where you realize that a single servo connector takes up a lot of space! It is

therefore imperative to choose the radio elements carefully because, for example, the height of the servos becomes important, as does the size of the four channel receiver, or the size of the receiver battery, not forgetting the minimum operating voltage. For my part, I opted for the excellent MKS HV75K-N (without mounting brackets) in the fuselage or wings, and a Tattu LiPo 600mAh 1s battery, the receiver and servos accepting an operating voltage of 3.6 v.

Photo 4: The 3D printed servo tray, of which I provide the link to the STL file.

I also decided, in order to optimize the space, to design and 3D print a removable servo tray. The idea is to free up some space on the side of the servos for the wires and servo connectors. I made a few prototypes before finalizing and validating it. It uses two short (3 mm) MPJet captive nuts. The front nut is glued in the fuselage and reinforced with some fiberglass strands. The second captive nut is located at the rear of the plate. The second 3D printed part is glued

into the fuselage with cyanoacrylate glue. Installation of the servo plate is easy: simply slide and snap the rear screw head into the fuselage part and screw both sides together with a screwdriver. The servos are simply held on the plate with a little rapid epoxy. If desired, you can download the STL file.

The plastic control sleeves are glued in place in the fuselage with a little cyanoacrylate glue, after cutting them to the right length. When installing the elevator control piano wire, I had a small problem with the holes in the elevator horn being a little too large (1 mm) for the 0.8 mm piano wire. To solve this little problem, I glued a second carbon plate (from the servo cover scraps) on the horns and re-drilled to 0.8 mm.

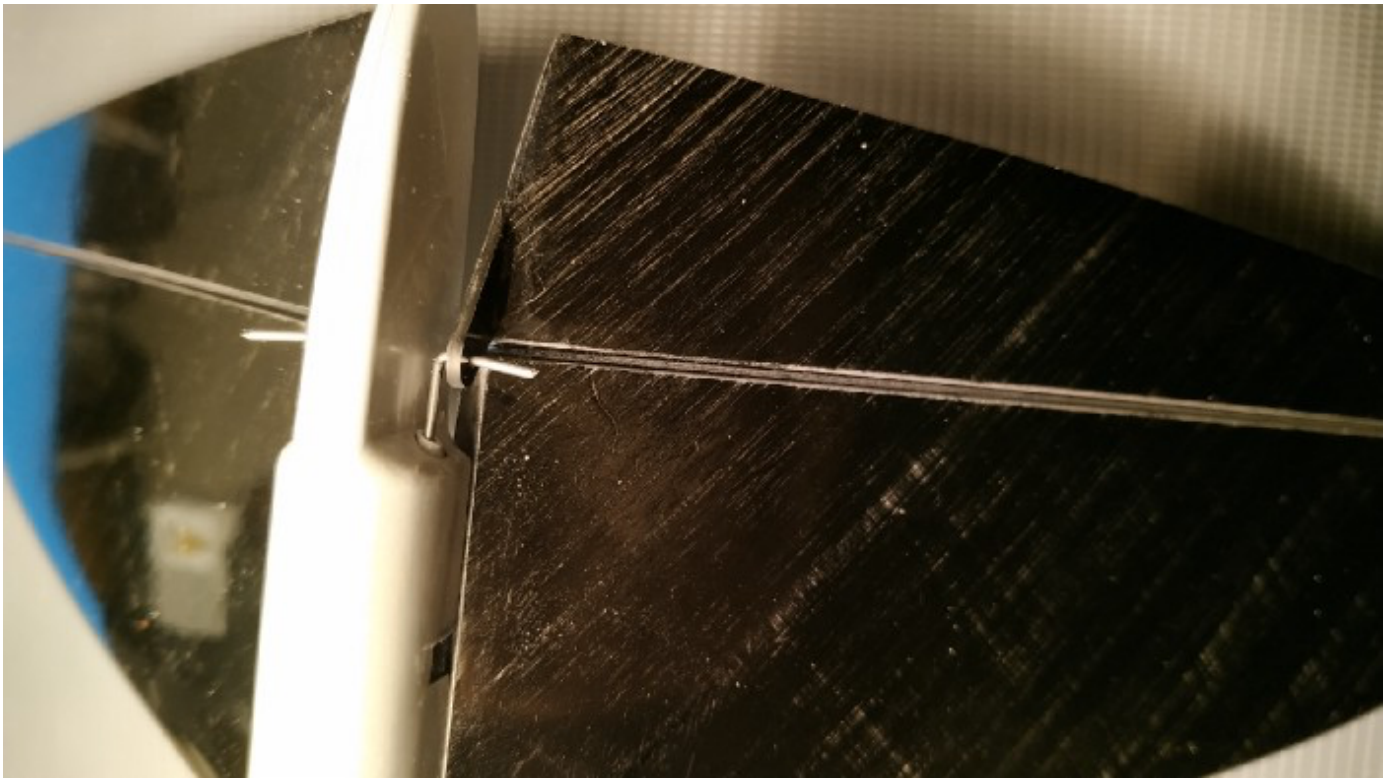


Photo 5: The particular shape of the back of the fuselage and the very well thought out

control exit!

MKS HV75K-Ns servos are simply glued in place with the servo arm in the neutral position and in order to have more down travel for the airbrakes. The control is a piano wire bent into a Z-shape on the servo side, and bent into an L-shape on the control surface side. Simply drill the passage from the servo compartment to the control output with a small round file and glue the carbon horn in place with the control connected on both sides. You can then go on to solder the servo wires to the 4-pin connector (at 90°) and glue the connector to the centre of the front of the wing. Thin servo covers are cut to size and then held in place with a little transparent adhesive.

Photo 6: The aileron servos in place, just glued with rapid epoxy.

Finally, back on the fuselage, after preparing the female

connector with the cables to the receiver, I just widened the hole and left the connector free.

Photo 7: The space in the fuselage is really limited!

I ended up with an empty weight of 227gr, with only 8gr of centring lead for a 65mm CG.

For the ballast, I found an aluminium profile of the right size, which allowed me to cast 2 lead ballasts: one of 85gr, and a heavier one of 190gr. It is however possible to reach 250grs with a two parts ballast. The ballast is secured to the underside of the fuselage with a 3mm screw.

Photo 8: The two ballasts, 85gr for the smallest and 190gr for the heaviest. It is possible to go further with a 2 pieces ballast

Like a Larger Plane!

Photo 9: The author and his MicroMAX, really a great pocket glider!

The first flight of the MicroMAX was done in less than ideal conditions, with no wind, grey skies and snow on the

ground, but it allowed me to see some of the glider's flying capabilities.

The first thing that I noticed is that the glider flies like a much larger glider, is precise in all axes, stable and allows to fly almost at a standstill or to accelerate and fly fast. Its size allows it to tighten the circles around the wing tip, like an HLG. Flaps in the thermal position are particularly effective, so I lowered them a little to 2mm. The glider quickly puts you at ease and despite the 1.15m wingspan you find yourself covering long distances and exploring a significant flying volume, and on the other hand just circling in front of you.

Photo 10: The MicroMax sitting in the snow and waiting for its maiden flight, which will be the next day.

The same day, curious to see how the glider could fly with a

bit of wind, I decided to go to another slope, better exposed to the wind, but unfortunately also with freezing and negative temperatures allowing me to fly only 5 minutes despite my gloves. However, this allowed me to continue to discover the abilities of the MicroMAX: even when empty, therefore very light, the glider penetrates the wind well, accelerates quickly and has excellent energy retention for such a small size! I was able to do 4 loops in a row without any effort, and also tested the roll and 4 steps roll without any problem. The rudder is efficient for a V-stab and even allows you to fly with the rudder alone in certain circumstances.

Photo 11: Winter atmosphere but superb panorama for the MicroMAX tests.

For the next flight session, a few days later, it was with snowshoes and a 2km walk in 25 to 30 cm of fresh snow that I reached the flight site with much better conditions and an absolutely superb landscape to continue exploring

the capabilities of the mosquito! This time I decide to use 85gr ballast for a 3 to 5 m/s wind. First observation, the MicroMAX takes the load with a disconcerting ease, and allows having even tighter trajectories, even more energy restitution, more speed and acceleration, but keeps its good behaviour at low speed and its ease of piloting. Turning with a bit of speed does not require any snap-flaps which I finally use very little. Well, after this good flight session alternating passage, aerobatics, some F3F type basics, it's time to go home because the curfew is at 6pm! What better than a little video to illustrate the text:

Video 12: Flying the MicroMAX in 5m/s of wind with 85gr of ballast.

One to two weeks later, this time there is more wind, and I decide to use 190gr of ballast for a wind around 8m/s, but decreasing later in the afternoon. Once again the glider takes the ballast with obvious ease, and shows its muscles. The wing does not bend under load, energy retention is even better, the straight speed even higher. Surprisingly, the MicroMAX does not get "heckled" by the wind and remains unperturbed on its trajectory despite its 1.15m. Rolls, loops, Cuban eights, vertical eights, reversal, F3F type turns on the edge, nothing seems to stop it.

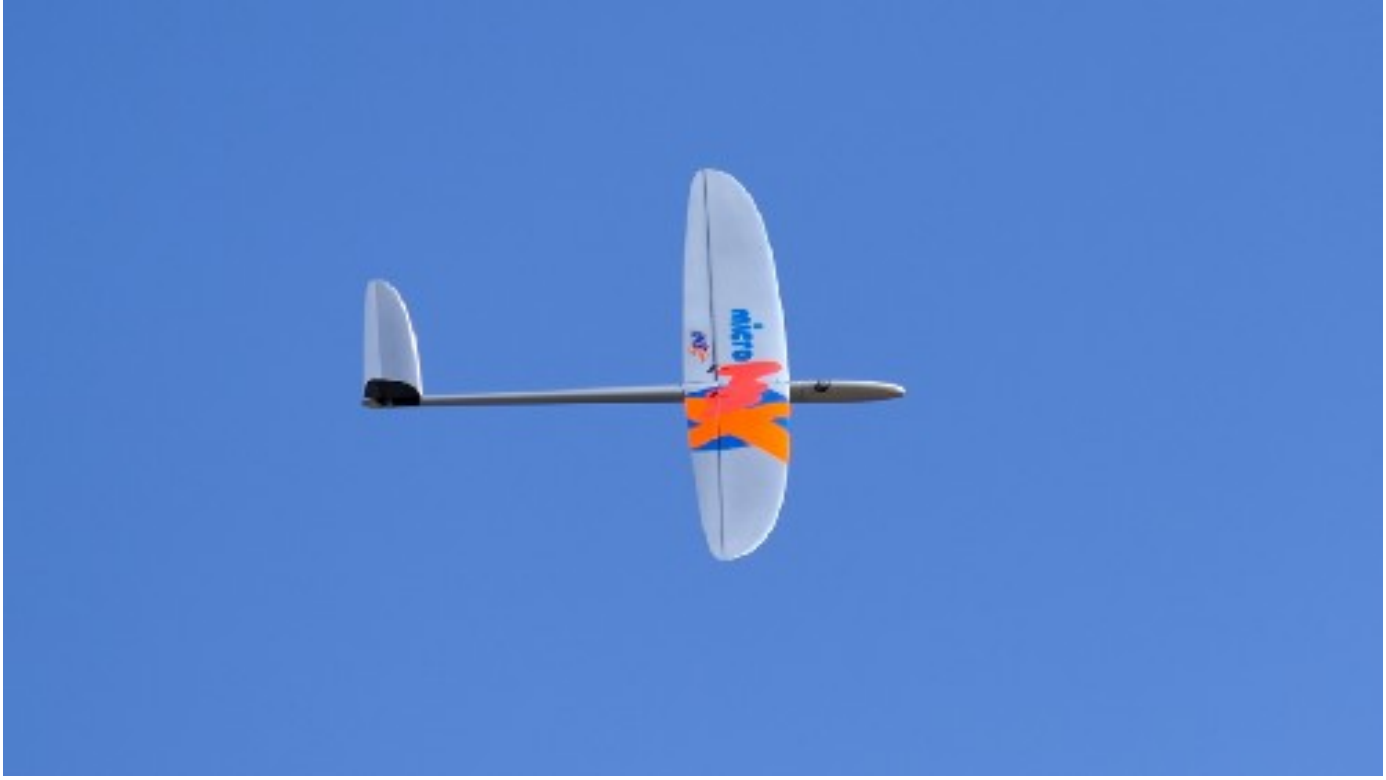
Photo 13: 1.15m of muscles !

It swallows the distances and is at the 4 corners of the flying volume in a few seconds, climbs, dives, does aerobatics, in short provides an intense pleasure of piloting inversely proportional to its size! Later in the afternoon while the wind is decreasing and the ballast should reasonably be reduced, I voluntarily decide to leave the 190gr and see how the glider behaves. Well ... it continues to fly well, certainly it does not climb as high as quickly, but the extra weight does not seem to bother him in the least, it's amazing! Serge, my club mate who shares the slope with me that afternoon, will have the opportunity to fly the MicroMAX while I am behind the camera taking some pictures. He told me that he too is impressed by the glider's flying capabilities.

Video 14: Flying the MicroMAX in higher wind with 190gr of ballast this time.

I have since been able to try it also on the dark side of the slope, i.e. in "dynamic soaring", and the qualities of energy

and speed restitution as well as its stability in trajectory make it possible to envisage making some turns of DS for fun. The wind was unfortunately not strong that day, but the MicroMAX “boots up” quickly enough, i.e. it doesn’t need much to maintain speed and circle behind the slope. Finally, ailerons down to 45° with the proper elevator compensation, allow short landings, even in the hand.



Photos 15 though 21: The MicroMAX proved to be an exceptional glider in terms of flight performance considering its size. It is capable of flying in all wind conditions.

Conclusion

The MicroMAX keeps its promises by offering exceptional flying qualities for its size. The only counterpart is to choose the radio elements with care because the space is counted in this so small fuselage. But in the end, the pleasure of flying the MicroMAX is immense and you will undoubtedly be amazed as I was. It fits all mounted in the car or dismounted on the rear deck. In short, the MicroMAX has all the assets to become a companion of all your outings to the slope! Good flights to everyone!

Photo 22: Size comparison with a 3 meters F3F glider, the Cosmos.

Characteristics:

- Wingspan: 115 cm
- Length: 74 cm
- Chords: 143mm/125mm/10mm
- Wing area: 13.5 dm2
- Wing loading: 18,0–38,0 g/dm2
- Empty weight: 230–250gr
- Ballasted weight: up to 410–500gr
- Construction: Rohacell and Carbon 40g/dm2 UHM wings, IMS Carbon fuselage
- Distributors: SansiBear.de or Hyperflight.co.uk

Photo 23: The MicroMAX ready for its next adventure.

Settings : (- means UP, + means DOWN)

- CG : 65 mm
- Elevator : + / — 9 mm
- Rudder : + / — 10 mm
- Ailerons : — 12 mm / + 7 mm
- Camber Thermal Position : + 2 mm
- Camber Speed Position: -1 mm
- Snapflaps : + 3 mm
- Butterfly : Ailerons : -18 mm / Elevator compensation : + 4 mm

*All photos are by the author. Read the **next** article in this*

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