

Mathews' Low-Drag F1B



The wing structure is conventional modern F1B technology, with a carbon fiber D-box, and carbon spars, trailing edges and cap strips. I chose a custom Igor Vivchar motor tube and pylon using Roger Morrell's "Black Magic" electronic timer. The propeller hub is also Vivchar (variable pitch with 13 degree pitch change), with Stefanchuk propeller blades. The tailbooms are from Evgeny Gorban and are all carbon fiber and very strong. The stabilizer profile is from Stefanchuk and is a modified Wobbeking type profile slightly thinner than current practice.

Covering for our wings is Icarex (rip-stop polyester fabric) on the top surface, and Ultracoat Lite plastic on the lower surface. Stabilizer and fin are both mylar-covered. I use a three-position auto-rudder (mechanism supplied by Stefanchuk) with an "all flying" fin.

An initial three sets of wings were commissioned for myself and Doug Rowsell from Vasily Bechasny (Ukraine) and were received in the spring of 2009. Unfortunately, there was insufficient time to fully test these wings before the 2009 WC and they were not used

in the actual competition. However, they did appear to have plenty of potential, and as anticipated, worked better in the wind than most people would have expected.

Working with Stepan Stefanchuk (2003 World F1B Champion, Ukraine), we commissioned five more sets of wings for the late-2009 contest season. Doug Rowsell (Canada), Paul Beldam (Canada) myself, as well as Walt Ghio (USA) and Ron Felix (USA) received the new wings. Ron Felix completed a very methodical series of hand glide tests using these wings and some conventional "off the shelf" F1B wings and found that the new wings had a lower sink rate (calculated as 0.93 ft/sec. or .283 M/sec.) and were very "stable" (ie: easier to achieve the best glide).

Walt Ghio completed his new model using these wings in early 2010 and began flight testing. He found that the sink rate was at least as good as his AA six-panel wings, and he also remarked on the stability and easy handling of the new wings. Walt has obtained some altimeter readings of approximately 105 meters using good FAI Super Sport and a very competitive still air performance estimated to exceed 6-1/2 minutes in early morning air.

Doug Rowsell and I completed our models in the spring of 2010 and also began testing. I had some difficulties achieving the same climb height as Walt and many emails were exchanged to determine the cause of my

problems. Bob Piserchio was also very helpful at this stage as he had had similar difficulties with a new model of his own. Eventually, I found that I was not trimming my model correctly and reset everything back to square one and began with low power flights and worked up to a full climb trim. Eventually I also was able to achieve flights of over 100 meters with my model with a sub-1 ft./sec. sink rate.

I used this model for all flights at the 2010 U.S. Nats, but picked very bad air for the first round. An eventual 5th place was a decent showing, but I had really wanted to use the model for an early morning fly-off to see how it would fare against the other models.

I also used the model for many rounds during our Canadian team finals, when my shorter, windy model was damaged early in the contest. The new model flew well in the extreme wind and turbulence at Base Borden (Ontario) and I was able to make the Canadian team for the 2011 World Championships.

Walt Ghio used his version of the model to win

the 2010 Sierra Cup in the windy fly-off conditions and apparently the model performed very well.

I now have two identical versions of this model to use in the 2011 World Championships.

As for future development, Brian and I have recently come full circle and have again been looking at flapper airfoils and have used the results from the latest, low sink rate BE F1B airfoils to develop a new profile (BE-7151FVN1) that looks very much like Brian's well-known F1A profiles. The X-foil results suggest that the new profile will have nearly half of the burst drag of the BE5063/BE6156 series and a similar or better sink rate. This airfoil is much thicker than the profiles we are now using (7% thick versus 5%) which should result in a very strong and stiff wing capable of good all weather performance.

I want to thank the following for assistance in developing this model: Brian Eggleston, Doug Rowsell, Hank Cole, Walt Ghio, Lee Hines, Bob Piserchio, Igor Vivchar, Stepan Stefanchuk, Vasily Bechasny and Alex Andriukov. Thanks also to Ron Felix, Ladi Horak, Aram Schlosberg and others for advice and assistance during the (ongoing!) testing phase. 🦅

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