

# MINIJ FLYING REVIEW

## Reviewer Background - Andrew von Berky

Although I've been slope soaring on and off for years, I'm only a "competent", not an "expert" flyer. I'm comfortable flying foam combat wings in difficult places, doing a bit of combat, basic aerobatics etc and I can fly around upside down for a while and land back near my feet. But really I'm a bit of a klutz. I've never done dynamic soaring (yet!). But the Minij is targeted as the introductory step into faster composites for flyers like me.

## Prelude

At the time I got the Minij, I was frustrated that I couldn't get up to the big slopes, and mostly flew at coastal slopes in the suburbs close to my house (Shorncliffe and Woody Point, near Brisbane). People only ever fly foamies at these spots because they're very small spots with no possibility of an into-wind landing, lots of obstructions, narrow lift band, rocks and trees, no flat ground to land on bigger than a picnic blanket, ocean very close in front, road and houses just behind. But the foamies just don't have the elegance, grace and pose-factor that I love about conventional sailplanes, so I started seeking out a sailplane that was small, tough and responsive. Researching on the net, I quickly worked out that composites were the way to go. After checking out reviews and googling for the words "tough" and "slope soarer" in the same phrase, I stumbled onto the Aeromod planes on the RC-Sailplanes.com site, phoned up David Leigh, got lots of advice and decided I was onto the right thing. I'm glad I did.



## Building

I've written a separate article about building the Minij. In summary, it's not difficult but takes quite a bit of time if you're new to cutting ailerons, silicon hingeing, making a V-tail and setting up servos on a removeable plate. But it's very well worth the effort. I'd happily do it all again if I had to. The final result is much more robust than the ARF composites I've seen.

## Trim flights

First up, we threw the Minij in a flat paddock with soft grass, into a very light breeze. It was immediately impressive and efficient, catching bits of lift. At 80mm CG I had to put on a fair amount of down elevator to avoid stalls. We were able to do big circles and figure 8's; lining it up for a catch! It retained its height and speed amazingly well. Very, very efficient. By comparison, my foam wing couldn't even make the full circle no matter how hard I threw it.

I went home and put a bit more lead in the nose (CG 75mm) but didn't need to do anything more for the plane. I programmed the radio for elevator/ aileron camber mixing; increased the ail/rud mix; and set up a 2-step switch to drop the ailerons, combined with compensatory down elevator for landing.

## Slope Flights



When we got up to a big slope (Bald Knob, near Maleny) the conditions were a bit severe – about 30 knots variable direction gusty wind and plenty of wild turbulence. I got a shock because with so much lift, I had to point the nose down and man, the Minij picked up speed SOOOO fast! With the high speed the response rates were berserk, and being very light it was blown around by the wind shear. My first landing approach was a bit crazy, with the plane bucking about as I turned from downwind leg and banked over the top of the hill. After I got it down I wondered if the ail/rud mix might be too high (I had it set at 100%). So I put some neg exponential on the ailerons, lowered the ailerons a bit to slow it down, and drastically

reduced the rudder-aileron mix. I also taped some strips of lead on the bottom of the fuse under the CG. The next flight was *much* more stable.

I thought I had added quite a lot of ballast but I later weighed the lead I had put on ... it was only 55gms, and they reckon you can add 250gm!

## Flying Characteristics

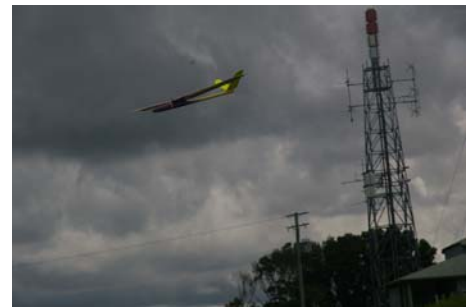
Amazing! Fast, fun, nippy, nimble, great climber, well behaved but radical. If you're used to flying a combat wing with high throw rates, you can still expect the Minij to surprise you! Because it's so much quicker, so good at penetrating, so efficient at lifting, so light, and rolls insanely fast. It pulls loops easily at almost any time – big smooth ones or you can make it almost flip over on the spot. I think it outperforms a foamie in pretty much every respect, obviously except survivability in a big crash. I fly the Minij confidently in very small, narrow lift band spots. It turns on the spot if required. It doesn't seem to have any bad habits – I've never seen it do a wingtip stall etc.

On these first flights I found that, as expected with the asymmetrical wing profile, the Minij didn't like inverted flight ... and no matter how fast I dived, the Minij wouldn't make an outside loop. The designer, Alexis Marechal said that the Minij is the "introductory" aerobatic composite in the Aeromod range, not designed for full aerobatic ability. But he advised that by increasing the elevator/ aileron camber mix rate ("snap-flap") you can get it do these manoeuvres. I programmed lots more flaperon/ camber mix (so that when you push the stick down, the ailerons come up and v-v), and yippee ... no problems with the outside loops, and inverted passes across the hill are part of the routine!

I also use a "Camber" step on my landing switch which drops the ailerons a few mm to provide more lift when searching for height, which works well.

## Ballast

The instructions describe installing a ballast tube, but due to my lack of experience I opted for a low-tech approach. There's not much room in the fuz. After much head-scratching, I made up a solid lead slab about 100mm long, 15mm wide, and 8mm thick (about 120gm I think) which is fitted in exactly the same manner as; and directly opposite to the the servo mount plate, ie with 2 small bolts that screw thru the side of the fuz, through holes in the lead, and into captive nuts. I drilled a hole in the front end of the slab and I screw a bike spoke into it to make a handle so I can manipulate it into position – then I remove the bike spoke. I think it weighs about 120gm.



Initially my strategy was only to install the ballast if the wind was strong. But these days I'm doing the opposite ... I just leave it in and only take it out if we're struggling for lift. The ballast gives more stability, better penetration, higher max speed in dives and speed retention through loops etc.

## Landings

The biggest feature to get used to is the speed and penetration of these models and that really affects your landings! If you've never flown a fast plane and your site doesn't allow an into-wind approach, you're going to have a battle at first. Please take my advice here – it could avert tragedy!

When flying foamies at places like Shorncliffe, you're happy if you get it down in any fashion. Sometimes the wing gets stuck in a tree, clips the fence and cartwheels over the road, hits a cactus, noses into the cliff or even goes for a swim. Most of the time you just check it over, throw it back out and keep flying. But no "conventional" shaped composite plane, no matter how tough, is going to take that sort of abuse! You have to really fly the thing into the right spot, at the right speed, with the right attitude.

Even if you're lucky enough to have a big grassy landing area but you bring the Minij in too fast, one wingtip hitting a tussock could send it cartwheeling and perhaps damage something. So you have to slow the plane down, and at the right moment, force it onto the ground or jam the nose into the grass.

The Minij doesn't have separate flap/s, so I set up a switch to drop the ailerons (like flaps) for landing, combined with some compensatory down elevator to stop the plane pitching up. To get enough drop, I had to cut sections out of the ailerons to clear the fuselage but I could only get about 35 degrees drop, compared to the 80 or so degrees flap used in a full house sailplane. I persisted with this setup for a long time, but it never really worked. It slows the plane down to some extent, but still allows the wing to lift very strongly. Coming across a strong lift band trying to land, you have to push the nose down, so it picks up speed, but you have less aileron roll response than normal. Scary.

When there's no back to the slope, I would fly the Minij down low, zig-zagging down then turning back and running up the slope to wash off speed. But even so, it is hard to slow it down! It doesn't "run out of

puff" like a heavier model - it often seems to laugh at you as it shoots past you on the lip! It's not easy! You have to do lots of practice approaches, but they're great fun.

A couple of guys recommended raising the ailerons for landing – they said I needed to “kill the lift”. I was scared to do it for a long time, but finally tried it recently. I set it so I flip a switch on, then slide a lever which raises the ailerons to about 20 degrees, with some compensatory up elevator. As soon as I tried it I wished I'd done it first up!. The plane changes from being nippy and lifty, to sludgy and slow, but it retains aileron response better than with the dropped flaps. It's dead set easy to use and I don't have to fly way down the hill. I couldn't find anything bad about it.

## **Resilience!**

If I flew the Minij only at decent slopes, it would probably still look new! But I persisted with flying it at Woody Point and Shorncliffe, with inevitable results! I've had 2 really bad crashes, and innumerable small ones.

The Minij takes knocks that other sailplanes won't. Despite my best intentions I have done lots of “foamie landings” which cause the other flyers to cringe. When it hits a shrub hard, or cartwheels on the dirt, bangs the nose in hard etc, they expect me to put it back in the car ... but the thing is very hard to hurt. I have sheared off quite a few nylon wing bolts, replaced them on the spot and kept flying!

The first big crash was when I was looping and rolling down low at Woody Point ... took a quick look at someone walking on the path below and forgot which way was up as it went behind a beachfront cotton tree. Completely my stupid mistake. Whack – it went between the thick lower trunks of the tree. I went a bit numb as each wing and the fuse reappeared on my side of the tree. It had sheared the nylon wing bolts and snapped the aileron control links. The aluminium joiner tube was torn out of one wing and the carbon tube broken. The other wing had a big smash where it had hit a branch – the f/glass skin was torn back. Both tail servos had stripped. It was a sorry sight, and I didn't feel good. I couldn't bear to look at my pride and joy in that state, and I hid the wreckage out of sight.

But after a week or so, I decided to try and fix it, and the repair was really quite easy. The foam core is an enormous advantage because it's the mould for re-epoxying any torn wing skin back down. Also, the wing “beds” (the foam from which the wing cores were cut) are supplied with the kit and they are also an enormous advantage since they can be pressed around the wing (with plastic film over the glue) to remolding any missing bits, eg using epoxy and microballoons. I replaced the broken leading edge with a pieced of thin fiberglass rod kite spar.

Sadly I have to say I had big crash no. 2 before I worked out that there was a fault causing my radio to drop out (it's been replaced on warranty). I was flying the Minij at Shorncliffe and it stopped responding, flew over the road and crashed down between 2 close-together roofs! Again, both wings came off .... But the damage was surprisingly minimal. I had it flying again with only a couple of hours work.

There's no doubt this plane is tough. It's amazing how tough the high density foam wing core is – it really holds the wing together (keeping any damage localized to the point of impact). From speaking to other guys, hollow molded planes don't have this feature – they tend to shatter or split widely. The wings would have been written off in that first crash

A couple of times I've cartwheeled hard, so the weight of the plane landed on the wingtip which flexed and creased the top skin. I found that filling the dent or crack in the skin with dental acrylic or epoxy makes it as stiff as new.

Through all this, the fuselage has remained totally undamaged! The ball links on the ailerons are as solid as a rock, and I can attest to the quality of the Robbe Futaba servos – incredibly durable.

But I have to make this point very strongly ... what I've put this poor plane through, flying at these crappy sites, is not normal! The experienced wiser guys would call it “abuse” and obviously think I'm stupid or very rich because even with their skills, they've decided that Shorncliffe & Woody Point are EPP-only zones!

This year we've been getting up to the hills often, to fly on big slopes with big lift and big sky. Up there, the Minij is just incredible. As time goes on my admiration for the Minij grows. I feel ashamed that it looks so beaten up, but amazingly, it flies exactly as well as when it was new. I've handed it over to a number of flyers with more experience than me and every time, they seem to go silent for a bit, then say dreamily “Wow, this thing flies beautifully – it's amazing”. You'll think I'm just saying these things for effect, but it's the honest truth.

## Summary!

As time goes on I get to love the Minij more and more. Despite the repairs I've had to do due to my own clumsiness, it flies just like new. It's the sort of plane you throw around the sky a lot, land roughly, and when you bring it home it doesn't need any maintenance. No kidding. I now sheepishly wish I hadn't abused it at the beach ... I'm sure it would be unmarked.

When I got to an unfamiliar slope I used to pull out a foamie to test the lift and practice landings. Now I often throw the Minij off first. It's always ready to go, because it fits straight into the car without taking the wings off! (I love that). It's my all-round first choice, least problems, most fun plane. It's an inspiring attention-grabber and passers-by stop and admire it rather than the foamies.

It's just so good at everything, but exciting and fast. Very impressive and fun. It's given me a taste for bigger fast molded planes with flaps. I want a Miraj!

These Aeromod planes are just excellent. You won't ever regret getting one of these. I get the impression that each year, newer model hollow molded planes compete against each other with claims of being a fraction of a second faster for pylon racing etc. Most of us don't compete – we just love sloping, where the value of durability can't be understated. The Minij is right up at competition level, but it's tough.

If my Minij ever dies (and it obviously doesn't want to!) I reckon I'll get its meaner brother, the Prodig. It's the same very practical size, has the same fuse, but has a more aerobatic and tougher carbon reinforced wing. From what I've read it's but a step up in terms of being more aerobatic (happier upside down), a bit faster when pushed, and even tougher.

If you want to ask me more info, you can contact me ("thevon") via the forum on the Windsock website

<http://www.frogmedia.com.au/windsock/>

