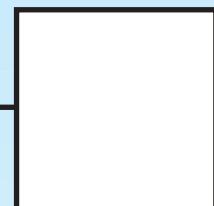




**BENCHMARKS** - By Tony Fu



# MINI FIREWORKS



Tony learnt something new with this lightweight discus-launched glider from PCM

## DLG for slope flyers?

As a slope hack I am of course ideally qualified to review a high performance DLG (Discus-Launched Glider) and thoroughly test the claim that it is also suitable for beginners! It was probably because I was asked by another slope hack (who, true to form, didn't think it through either) but I like to believe it was to advance the humanitarian notion we can all benefit from learning something new and I remember that rare occasion very clearly.

It was on a Sunday morning of another F3F slope race event about to be called off due to lack of wind. I sat there with a magnificent slope taunting me. Of course we had the usual entertainment: A few couldn't resist and

scratched precariously. These brave souls risked not only pride but also international humiliation as the audience included some of the best European flyers!

One of them, a German competitor, readied his small lightweight. A comical run, skip but admittedly impressive '360' put paid to any jibes as his DLG zoomed, making the telltale sound of high speed respected by all racers. The fact that it stayed up was enough to make it more successful than anyone else's attempts. But not only that, it was rolled, bunted and even went into an imaginary F3F run. The final straw was when he caught it by its wing tip, spun and did it all again!

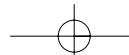
A light came on in my tiny brain at that moment.

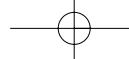
## Which DLG to have?

One like his will do! Until I discovered it was, in fact, a 'state-of-the-art' competition DLG, with RDS and Dissler wing, which meant it is very costly and had a year-long waiting list. (It was a SAI.peter, incidentally.)

So when the makers of all things 'bling' and manufacturer of the 'Erwin' introduced a 1m version of their acclaimed Fireworks series of DLGs, it was that light again! PCM describe their Mini Fireworks as having 'maximum fun factor' and 'extreme starting heights', but they had me at 'Hello!'

There are two versions, a rudder/elevator (mini-S) and an even newer 3-channel, aileron/flap/elevator (mini-Q). Flat fielders and beginners will go for the lighter mini-S,





**LEFT:** As it comes - tiny and doesn't seem very much for your money! **ABOVE:** Prepare first and make sanding blocks and templates for sanding the section in the fin and tailplane. A piece of glass makes an excellent flat surface to work on.

but I couldn't control my slope hack predisposition and went for the aerobatic 3-channel, mini-Q.

I got mine from T9HobbySport; R/E versions are £135 and £160 for the three-channel.

### What do you get?

The Mini Fireworks sports a modified Drela section, AGO3, an HLG section especially for low drag during the high speed launch phase and good manoeuvrability for working small, low level lift. The wing is a diminutive 950mm and a glass/balsa sandwich, hollow mould with carbon reinforcement in the spars, tips and ailerons. The wing mounting holes are done and suitably reinforced.

The tips are trademark PCM and, like their competition DLGs, contoured in carbon for good finger hugging. These are mirrored at both ends for right or left fliers.

The ailerons are full span, bottom-hinged with tape and the hinge gap is therefore on the top surface. It is not sealed. This is because the section is designed to delaminate the air by the time it reaches the hinge point. So, true to the minimal design philosophy, the gap is left and not an oversight.

The fuselage is a pod and boom with a removable nose cone and moulded in carbon. The pod and cone moulds are paper thin and feel like a soft shell crab! Fortunately, a liteply radio tongue adds some rigidity and also ties in the boom, which strengthens things up considerably. The boom is made of sterner stuff and oval in cross-section to add extra strength. Booms need to be rigid to resist energy sapping bending which will, during the more exuberant launches, reduce launch heights.

The fin and tail is 4mm lightweight balsa sheet, with only the profile cut. You have to shape this yourself to make an aerodynamic section!

Finally, you get some very thin multistrand cable, a bit of wire, carbon pushrods, very nice carbon control horns, some glass cloth, carbon tow, wing bolts and a paper template for sanding the fin and tail sections. Oh, and best of all, you also get a CD containing very comprehensive building instructions with lots of useful photos and excellent throw setups suggestions.

### The build

This is fairly straightforward but more involved than a normal mouldie. It's pretty much to instructions so not a lot to report except go for smaller cells, 1/2 AAA, 210 mAh for the lightest setup. PCM's photos show this smaller battery which helped me achieve the quoted weight of 165g.

### Flying

First flight was at the slope, naturally, and unusually in perfectly suited conditions with



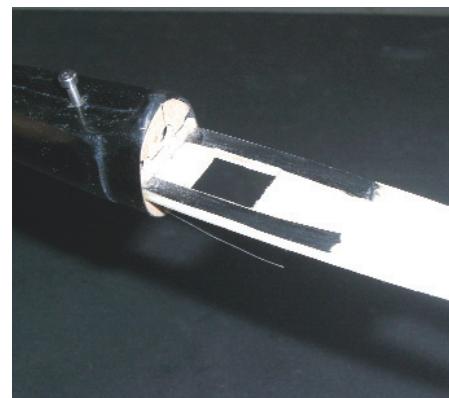
Finished back end reinforced with glass. Look in the open hinge and see the thin wire spring that keeps the elevator open. The carbon horn has a thin multi-strand wire hooked over and pulls against the spring. Simple, accurate and very light.



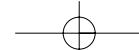
Standard Liteply radio tongue, reinforced with carbon tows using thin cyano.

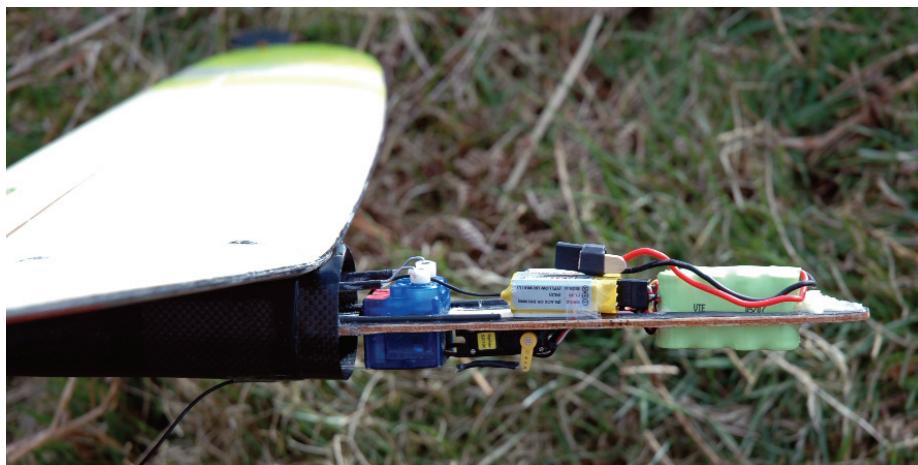
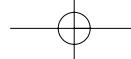


Modified with a former, which wasn't part of the instructions. The lightening holes gave about the same amount of wood removed as that added!



**ABOVE LEFT:** Modification added a bit more rigidity to the 'soft shell crab!' It also locates the tongue accurately. **ABOVE RIGHT:** Beautiful CNC produced carbon aileron horns in place.





Here's one with HS55 squeezed in, a new lighter tail and fin allowed lighter 210 mAh battery to be used. Since changed 55s to SD100 and got the weight down to 165g. Yippee!



**ABOVE LEFT:** Ready to go and finished with logos printed on tissue and lacquer in place. **ABOVE RIGHT:** It's tiny at 950mm span. The tail was finished in water-soluble lacquer for lightness but some carbon tows were added to stiffen the fin and elevator. A highlighter marker adds a little trim matching those on the wing.

only lightweights flying. The trim was only marginally out on the elevator thankfully and easily clicked out. The aerobatic setup with 10mm snap flap up and down (!) and loads of equal aileron throw (18mm) is not what you would expect for a thermal soarer. The CG was moved back from the recommended 62mm which was nose-heavy for the slope. I ended up with 64mm. Slopers will appreciate this and in light slope lift it battened around with ease. It rolls easily and loops (and bunts) can be made ridiculously small.

It's surprisingly quick, too; no paper bag this, despite its obvious light weight and generous dihedral. It does a surprisingly respectable reversal, and inverted isn't bad either. In fact you can easily gain height inverted. So, the mini-Q is teaching me something already! Of course, you won't get great energy retention, it's just too light, but it uses the

available lift very effectively and gaining enough height to point the nose down was not a problem.

Next time was a virtually windless day in the company of a full-sized carbon Fireworks III. Well, what a hilarious session that turned out to be! After some trimming in start mode the mini-Q easily launched as high as its bigger brother, impressive! The best bit undoubtedly was catching the little beast. Brakes set with just down flap were surprisingly effective, definitely no sign of tip stall. These funny middle-aged men were getting a bit of a sweat on; coats were coming off!

The antics got worse; launch, then goading each other to do sillier and sillier things as we reverted to type and all this when everything else was grounded. Its aerobatic envelope was fully explored and coming straight from a launch attempting a rolling circle is exciting

stuff with the ground coming in ever closer and closer!

As for extending flight times, I've had a few sessions at this. Now no way am I a thermal soarer, but even I could see that the bigger Fireworks III floated around better. The mini-Q has a faster glide - slow it down too much and it loses height. It veers off easily and speeds up and slows down without input from me. In fact every little bump in the air and it responds. I know it's trying to tell me something...

## Conclusions

The Mini Fireworks is an entertaining aeroplane and I've had a few, but nothing so small and seemingly fragile. You will, however, need be obsessive about keeping the weight down and be prepared for the more than average build work.

For your efforts you will be rewarded with a minimalist lightweight with a difference for those low to windless days, as this is built to withstand a few 'Gs' and high speed.

A sports aeroplane it is then but with some important differences: Want a bit of exercise? Try the run, skip and spin. How about just a quick flying session without the long trek to the slope or, even better, slope soaring a tree or a building? For the even more reckless, loops at ridiculously low levels and catching inverted keeps my slope hack mentality amused.

There is, of course, the deeper intellectual challenge of gaining lift and nothing will train you better. The mini-Q circles in the tiniest of spaces and responds to bumps and lumps in the air more sensitively than anything else I have flown. And yes, you will need to search out and actually find lift; this will not hang there waiting for lift to come.

Overall, even without taking its more attractive cost into account, the mini-Q is a better introduction to DLGs than most. It does it with a lot of fun which sugar coats the medicine of learning to thermal soar in earnest. And despite the fact that it may not float quite as well as a full-size machine it just might have the right balance to provide the necessary encouragement, especially if you predominantly slope fly like me.

It will creep up on you, timing your flights will be the first indication. This will give instant feedback on your progress and it's a major part of the enjoyment. Then you'll be thinking days when the wind doesn't blow aren't so disappointing; in fact they're something to look forward to. A transformation will have started... Now, where are my shorts and sandals?

**BELLOW LEFT:** A bit of exercise, hilarious fun but keep that arm straight! Who said you can't teach an old dog new tricks! **BELLOW RIGHT:** Brakes are very effective and catching is much simpler than any other model in my fleet.

