The Windburner right before it's first flight. (image: Michael Berends)

RC Soaring Diaries

Some speed from Down Under: The Windburner and RPM from Kevie Built RC Planes.

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After being involved in RC soaring for 40 years, I've had a chance to do pretty much every type of discipline the hobby has to offer. Although I thoroughly enjoy the grace and romance of gently guiding a glider from thermal to thermal under a sky of puffy cumulus clouds. The wild child in me has the 'need for speed' and dynamic soaring (DS) is something that I can't get enough of!

The first time I ever heard about dynamic soaring was roughly 20+ years ago. There was talk about Joe Wurts reaching amazing speeds flying on the back of the slope. The place

where we were always told to stay far away from as it took your glider and slammed it into the ground due to all the turbulent rotor that was on the backside of the hill. There was descriptions of how this was accomplished in magazines, such as this, but none of it really made sense to most of us. I just couldn't wrap my head around crossing between different energy zones in an elliptical path to obtain insane speeds. Even with the drawings and diagrams provided I was just left scratching my head and doubting everything I read.

That all changed one day when I was at a friend's house after a slope soaring session and he turned on the TV, popped in a VHS tape and I got to see what DS flying looked like for the very first time! There was Joe Wurts flying at speeds so fast it appeared as if the video was on fast forward with the glider emitting roaring sounds as it ferociously tore apart the air at these insane speeds!

This was a life changing moment that started my dynamic soaring pursuits. Although the beginnings and learning process were difficult and frustrating at times, the rewards in the end have been absolutely amazing!

After flying a number of different types of gliders on the 'dark side', including EPP (expanded polypropylene) DS planes and a variety of composite ships. I have never owned a composite glider that was designed specifically for dynamic soaring. So for this season I decided to invest in a few fast ships to help me hit some higher speeds and reach some new goals.

The first ship that came to mind was the *Windburner*, produced by Kevin Bennet of Kevie Built RC Planes in Australia. I had followed this sleek flying wing for quite a number of years. Here's what Kevin had to say about it:

> *"I wanted a fast plank which was easy to build and just as fun and easy to fly for dynamic soaring. It started off as a 40" plane with a lost foam fuselage. From the very first* Windburner *I realised I had something special. So I made a plug for a fuse and increased the wing size to 48". The wing was made from a plastic laminate material which is a skinny laminate of 0.5 mm. It flew so well that it broke the 48" tailless world record. So then I decided to make a hollow moulded wing version. From then on, the* Windburner *has gone from strength to strength. I've refined it to make it faster and faster over time and so far it*

> *has broken not only the 48" world record but holds the outright world record for a tailless aircraft."*

After 10 years of watching this little marvel break 200 mph, then 300mph and eventually smashing it all with the current 48" world record speed of 341mph for a 48" wingspan glider. I knew that I finally needed one.

So, I reached out to Kevin, who is a super nice guy, and put in an order for one. He told me that he had to finish up a few *RPM* gliders first which is the new plane he is producing. This had me wanting to dive in and know more about the *RPM* and really liked what I saw, so I was quickly swayed into putting in an order for an *RPM* too!

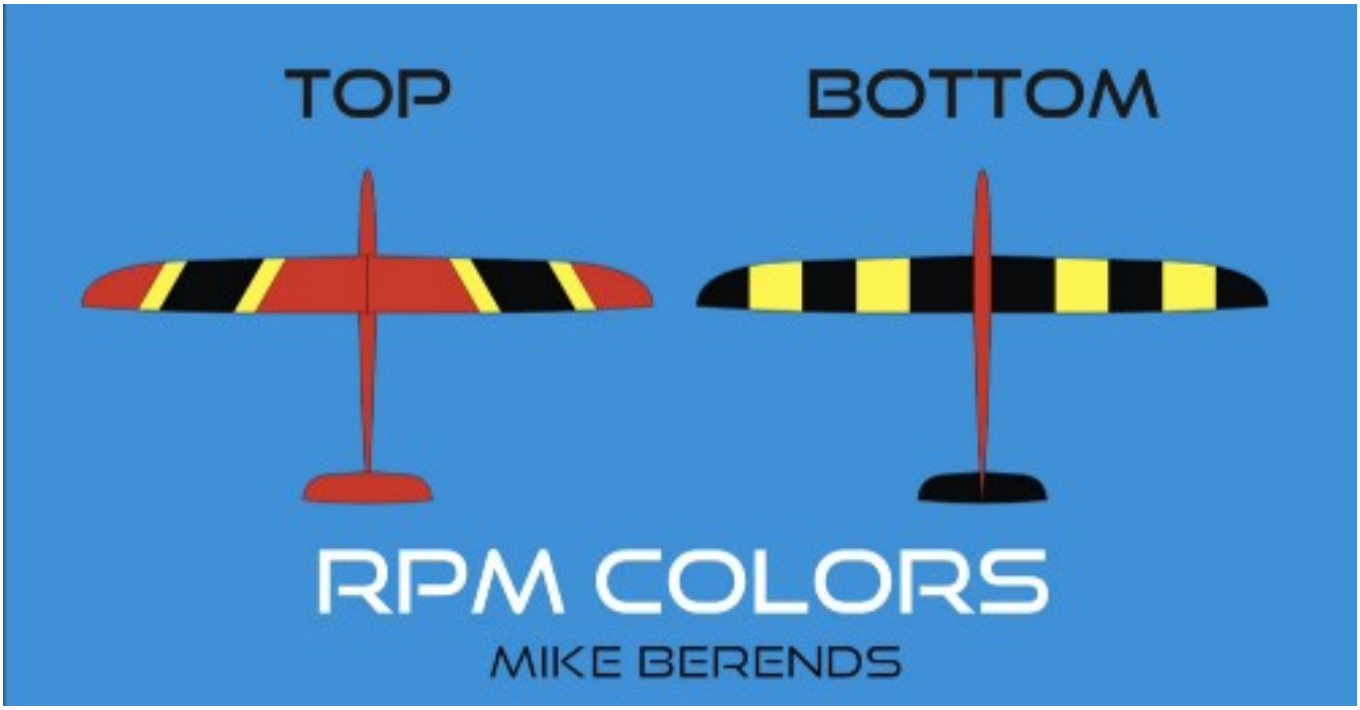
The *RPM* is a 71" DS plane that was designed to push the 300mph mark. It wasn't designed to crush world speed records but to be a stable platform that you can put into the air and find the 'groove' at your site on the given day, before you break out the heavy hitters. It also flies well on the front side unlike some of the other DS ships in it's size category. It all sounded great to me so I couldn't resist!

The process was started which spurred lots of conversations with Kevin. A new friendship was building and the airplanes weren't even started yet! This is one of the beautiful things with this past time. It's not always about the planes and the flying, but also the friendships and people you meet along the way. Some of my best friends are people I've been flying with for decades, creating good memories both on and off the flying field.

I quickly found out that he was an extremely genuine guy with a passion for everything he does. Not only a fine craftsman with the gliders that he produces but also puts the same pride into other things he does outside of the hobby. As a matter of fact, through our conversations it was found that we both have built theatrical props for movies. Some of Kevin's handiwork can be seen in one of the installments of *Pirates of the Caribbean*.

As he was finishing some of the other planes that were ahead of mine, I had a chance to come up with a color scheme, something he does for all the people that order from him. I really wanted to make sure that these planes were vivid and stood out against not only the sky but terra firma, as half your flight is typically below the hill. Wanting to keep some of the beauty of the bare carbon fiber, I opted to go with red and yellow with black

stripes for both ships. Top and bottom differ to keep good track of orientation, red the primary color on top with diagonal accent stripes. Yellow and black 'invasion stripes' on the bottom. All easy to see even on a cloudy day with flat lighting.



Drawing 2: The picture of the vivid color scheme that I designed. (image: Michael Berends)

The morning soon came when I woke up to some messages and photos that Kevin had started on my planes. The excitement started and as the days unfolded the photos just kept coming. It was just great to see all the pieces of composite cloth, resins, paint and molds all working together to give birth to my new speed machines. I was along for the ride during the whole process and even though I was familiar with building molded ships, and have done some myself, Kevin had some techniques that he has honed over the years that were very enlightening. He has always shared his knowledge and has an active YouTube channel where has has published some of his builds.

Here is one of his videos showing how much work goes into a *Windburner* wing:

Laying up a hollow molded wing.

Video 3: Laying up a hollow moulded wing. (video: Kevie Built RC Planes)

From a world where I've always built the majority of my own composite gliders for light weight, I was amazed at how much carbon and glass cloth were put into these planes. Layers and layers stacked on top of each other. I was clearly seeing why his planes had a reputation for being extremely strong. Stories of cartwheel landings on top of rocky slopes where they were picked back up, had the dust blown off and sent back in the air were common.

Photo 4: RPM composite fabric layup. (image: Kevie Built RC Planes)

"I was amazed at how much carbon and glass cloth were put into these planes. Layers and layers stacked on top of each other."

Photo 5: Windburner wing in the mold. (image: Kevie Built RC Planes)

After an enjoyable few weeks of watching the progress, the planes were completed. After seeing the finished pictures I was really happy with my color choices. They looked exactly as I envisioned them. He replicated the pictures perfectly. He even took the time to make some custom *Maple Leaf* decals to honor their new home in Canada.

Photo 6: Both planes completed and ready to ship to their new home half way around the world. (image: Kevie Built RC Planes)

I received word that they had been packed up and shipped out. I was eager for them to arrive but knew that their trek would take awhile. I was pleasantly surprised when the package tracking showed that it was actually moving very quickly across the world. It was received at my door in just over a week.

Once the package arrived, in a very sturdy box, I carefully opened it up to find all the pieces neatly wrapped for protection and fully intact. The first thing I noticed was how robust everything was. All the pieces were built like tanks — literally rapping my knuckles on the wings with no worries of any denting or damaging. The wings were like carbon riber *Ginsu* knives ready to slice the air like butter!

After ogling over the workmanship of my shiny new machines it was time to start getting radio gear into them so they can take to the air. I had already ordered some KST X10 servos and had them on hand ready to go. They fit in all the servo bays easily and mounting them was done as recommended. First scuffing up the cases and then using epoxy to lock them on the wing skins with a fillet attaching them to the spar for rigidity. The supplied carbon control horns then needed to be mounted into the control surfaces. This was accomplished by marking out their location on the skin of the wing surface, then using a rotary tool to carefully cut through the skin and making sure that the slot went all the way down to the bottom skin but not through the bottom skin, which took some patience but worked out really well.

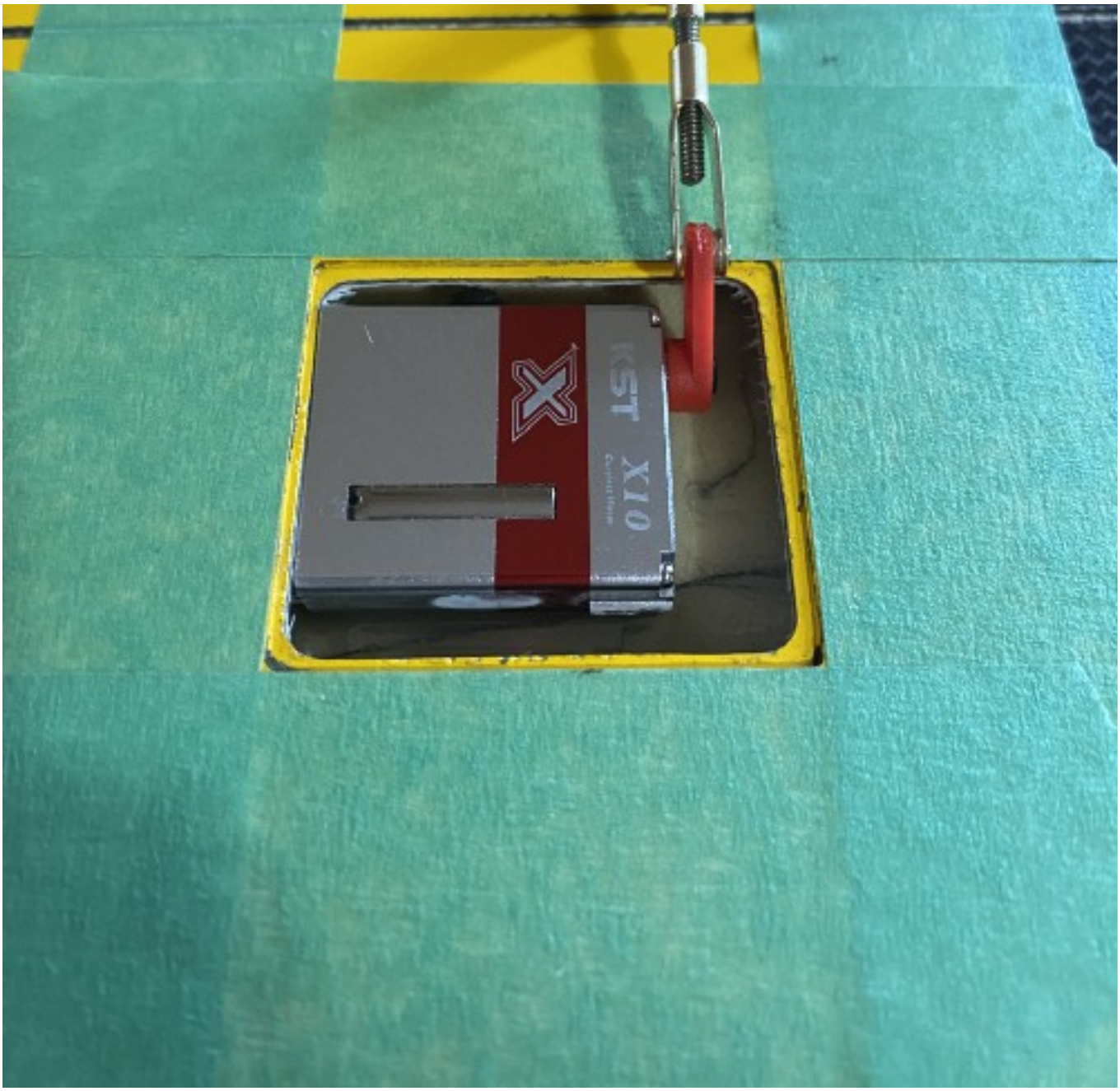


Photo 7: KST X10 servos were used on all surfaces of both planes. (image: Michael Berends)

The control horns were then cemented in place with an adhesive that I've never used before but about which I was informed by a fellow *RPM* owner, *JB Kwik-Weld*. At first I was a little apprehensive but after doing a few of them I knew that it was the right choice. Much like a five minute metal epoxy, it allowed me to mount all seven control horns in less than two hours one after an other in succession. Using masking tape and taking it off within a few minutes of potting the control horns gave me nice fillets with crisp edges. This will now be my preferred way of mounting control horns in the future. No taping and propping things in place until the epoxy cures. Each horn takes around

five minutes and you're ready to move onto the next one. So a big shout out to Jeremy DeFrisco for that tip! Thanks my friend!

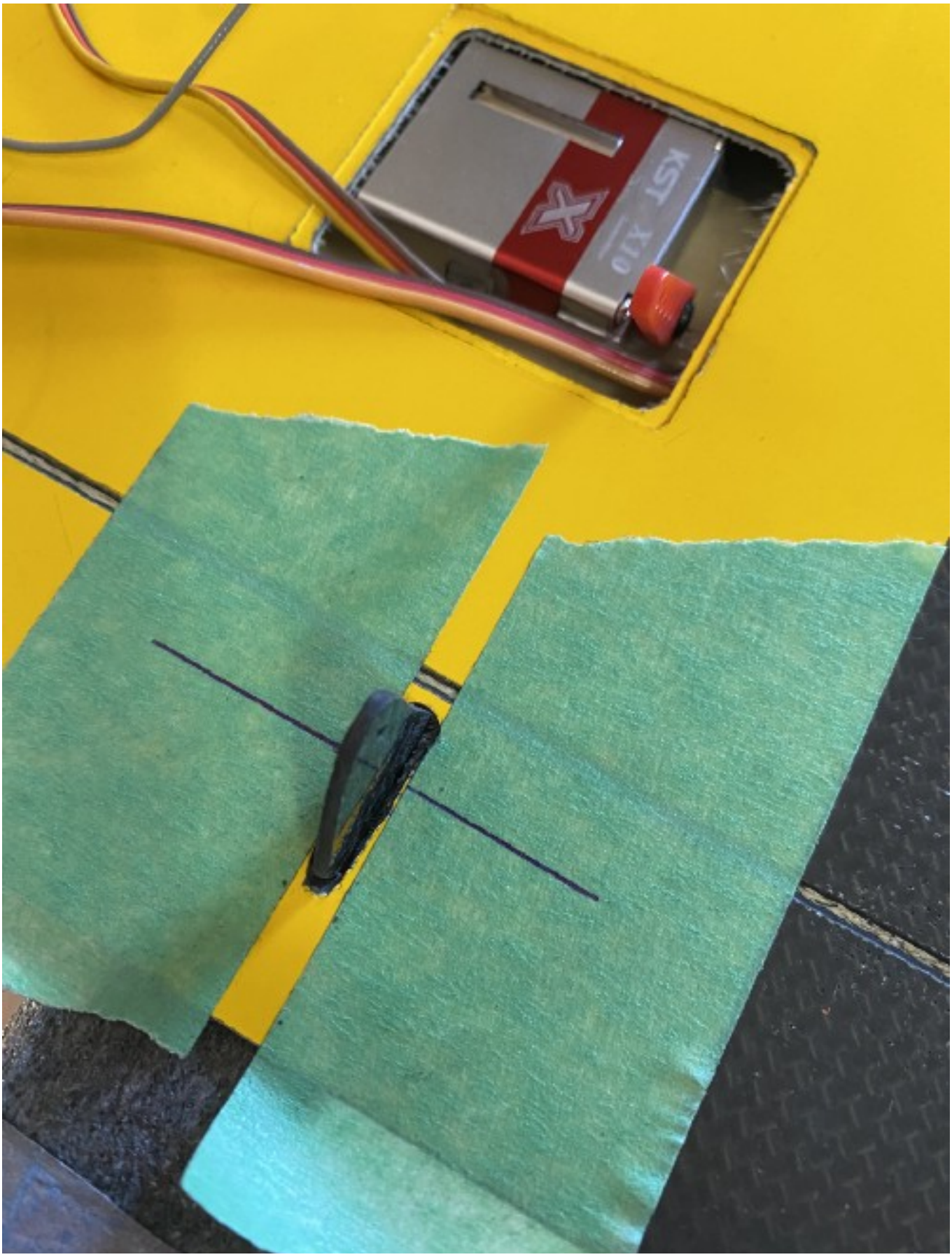


Photo 8: Control horn put in place just before potting in place with JB Kwik-Weld. (image: Michael Berends)

After that was accomplished all that was left to do was to make some 4–40 pushrods and install them. Easily done with threaded rod and good end links. One end was screwed on and secured to the rod with *JB Kwik-Weld* to prevent it from turning and the other end was left to rotate in case any adjustments needed to be made. Kevin was always there to guide me through the whole process and with his help that was in the form of diagrams, messages and pictures of his own plane, the geometry of everything worked out perfectly! Getting proper flap geometry can some times be troublesome but I was so happy to see that everything worked out first attempt and hassle free. Once again a good testament to the amount of care and customer service that he always provides with a sense of cheer.

All control throws were setup exactly to the settings prescribed on the info sheets for the planes. This was easily achieved due to the proper geometry described earlier. Using the stroke of each servo to utilize the servos power and resolution properly.

Battery and receiver installation was nothing out of the ordinary. I chose to go with NiMH *Eneloop* battery packs for stable chemistry in case there is ever a crash. I would never have to worry about any type of fire hazard.

The last thing was setting up the proper center of gravity (CG). For this I made a quick balancing rig out a piece of scrap lumber and some dowels with nails sticking out of them, pointy side up. I wanted to insure a very accurate CG setting, especially with the *Windburner*. Flying wings are very sensitive to CG and even moving them a millimeter in either direction makes a difference. Multiple layers of masking tape on the bottom of the wing that was marked at the proper measurement protected the wing skin from the nail. Filling a small sandwich bag taped to the nose of the plane and slowly filling it with lead shot until it was almost balanced but still on the tail heave side was a good start. I then put the planes on their nose put all the weight in the nose and poured some epoxy on top of it letting it ooze around all the weight securing it in place. The final balance was done with small pieces so that I could remove or add weight as needed to fine tune.

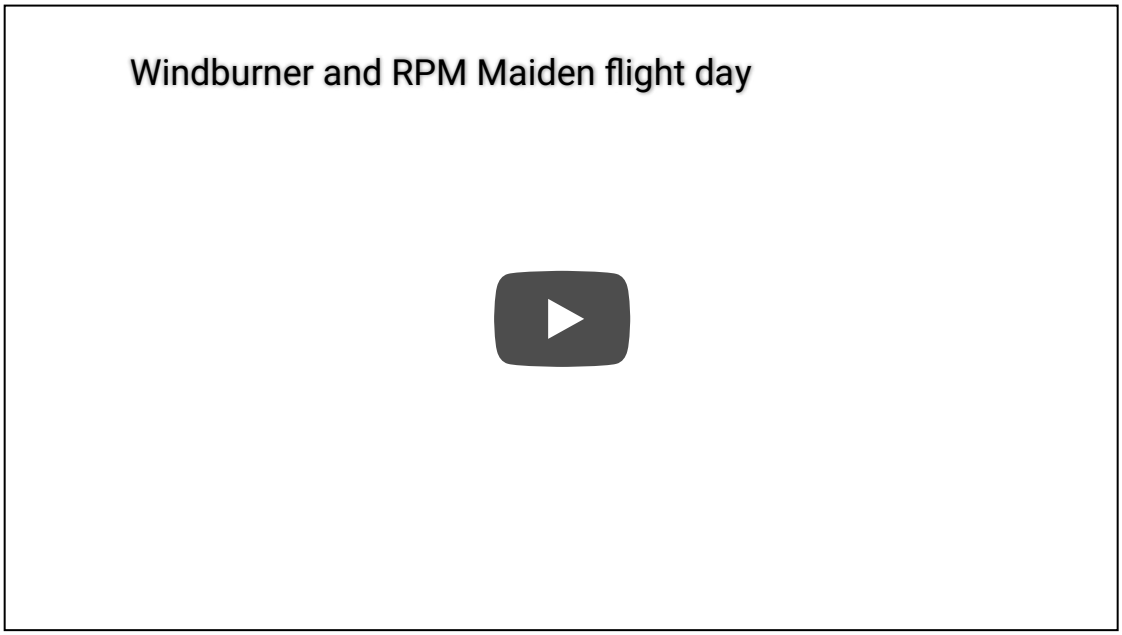
That’s it! They were done and ready to fly. Assembly was enjoyable, straightforward and quick. It really took me very little time to get these beauties ready for the air. On top of

having some new planes I also gained a number of friends around the world in the process. Other *Windburner* and *RPM* owners from around the globe helped me decide on radio gear, building techniques and a variety of other choices I needed to make on this extremely gratifying journey.

As of this date I haven't had the chance to do any dynamic soaring with these flying razor blades due to scheduling and the very odd spring weather that we have seen here, but have had them out on the front side to feel them out and put them through their paces. They both flew well setup the way Kevin recommended with no changes needed other than some expo dialed in for personal taste. You can see the maiden videos on the link below!

Hoping to get these doing some dynamic soaring laps soon to see what kind of speeds I can reach! If you're in the market for some DSing machines, get hold of Kevie Built RC Planes through his Facebook page (see *Resources* below). He will definitely help you out and get you some quality planes that you'll be 'rippin' around!

Thanks for joining me again this month! Happy flying and we will see you next time.



Video 10: RC Soaring Diaries: RPM and Windburner Maiden Flights. (video: Michael Berends)

Resources

- RC Soaring Diaries (YouTube)
- Kevie Built RC Planes (Facebook)

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