Radio Controlled

Soaring Digest

April 2015 Vol. 32, No. 04

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Front cover: Pat Teakle's Celestial Horseman vintage design, caught at White Sheet Hill in Wiltshire in 2014 by Chris Williams.
Canon EOS 70D, ISO 160, 1/800 sec., f4.0, 70mm

CONTENTS page cloud photo taken by Meri Yamamoto on her way from Japan to the US earlier in March.
Panasonic DMC-SZ3, ISO 400, 1/8 sec., f3.1, 25mm

In the Air

Welcome to the April 2015 issue of *RC Soaring Digest*, the start of year twelve for the digital edition.

It doesn't seem possible, but the last printed-and-mailed issue of *RCSD* was that of March 2004. The move to digital transformed the magazine from an 8½ x 11 photocopied black and white magazine of 20 pages and a subscription base of roughly 300, to a full color, photo-intensive e-zine of 62 pages which can be downloaded for free, read on a variety of electronic devices, and printed, if desired, either at home or through any number of print services.

While the "subscription base" is at this point difficult to establish, we do know there are more than 2900 *RC Soaring Digest* Yahoo! Group members, and more than 1900 "Likes" for the *RC Soaring Digest* FaceBook page.

There were only a few overseas subscribers when *RCSD* was mailed out, and the magazine was pretty much focused on what was happening here in the States. That all changed with the advent of the digital format, and now submissions from outside the US are increasingly frequent.

While many of us find it difficult to keep up with the rapidly advancing technologies of today, it is sometimes interesting to take a look at how things have evolved from investigations of a decade ago. Several articles in this issue will hopefully illustrate this perspective.

Time to build another sailplane!

R/C Soaring Digest

April 2015

Volume 32 Number 03

Managing Editors, Publishers Bill & Bunny (B²) Kuhlman

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R/C Soaring Digest (*RCSD*) is a reader-written monthly publication for the R/C sailplane enthusiast and has been published since January 1984. It is dedicated to sharing technical and educational information. All material contributed must be original and not infringe upon the copyrights of others. It is the policy of *RCSD* to provide accurate information. Please let us know of any error that significantly affects the meaning of a story. Because we encourage new ideas, the content of each article is the opinion of the author and may not necessarily reflect those of *RCSD*. We encourage anyone who wishes to obtain additional information to contact the author.

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RC Soaring Digest is published using Adobe InDesign CS6

From "Products of Tomorrow," NASA Tech Briefs, March 2015

Guidance and Control for an Autonomous Soaring UAV

Detecting and soaring in thermals enables UAVs to optimize flight performance, increase speed, extend flight duration, and range, and reduce energy consumption. Although piloted gliders and low-powered aircraft have systems to detect thermals, a guidance and control system from Armstrong Flight Research Center is the first ever to be used by UAVs. Potential applications include remote sensing, surveillance, atmospheric research, firefighting, law enforcement, and border patrol.

If you are interested in licensing the technology described here,

Contact: Armstrong Innovative Partnerships Office
Phone: 661-276-3368
E-mail: DFRC-IPO@mail.nasa.gov

NASA Autonomous Soaring Project, EC05-0198-08, 2005
Michael Allen (with Victor Lin and Tony Frackowiak)

<http://www.nasa.gov/centers/dryden/multimedia/imagegallery/Autonomous_Soaring/Autonomous_Soaring_proj_desc.html>

<http://appel.nasa.gov/2006/01/01/learning-to-soar/>

F3J EVENT

MARCH 7-8, 2015
MILANG, ADELAIDE, SOUTH AUSTRALIA

Anatoly Patrick, anatolypatrick@gmail.com

The line up - collection of F3J planes behind launching lines

Pike Perfects and Perfections

Matt Lowe with Explorers, Carl Strautins holding a Pike Perfection, Mitch Todd and Bjorn Rudgely watching on

Gavin Bowden preparing for launch

Gavin Bowden using body language to zero in his landing

Mike Frizell with Warren Lewis preparing for launch

Greg Potter heaving a Pike Perfection

Clive Warmen concentrating for the launch

Clive Warmen heaving a launch with Darren Blow in foreground

Andrew Meyer holding Brad Merryweather Pike Perfect awaiting count down.

Dave Hobby with Jim Houdalakis dorking dead on the marker

Marcus Stent launching for Rod Watkins

Paul Moorefeild launching Mark Stones Pike Perfection. Photogenic white outfit offset with a special order pink colour scheme.

Mark not succeeding in convincing us that it is actually maroon...

Theo Arvanatkis and Mike O'Reily landing approach

Mike Todd calmly lining up for landing

An easy method for copying fuselage contours to make templates

Tony Fu, tony@sloperacer.co.uk

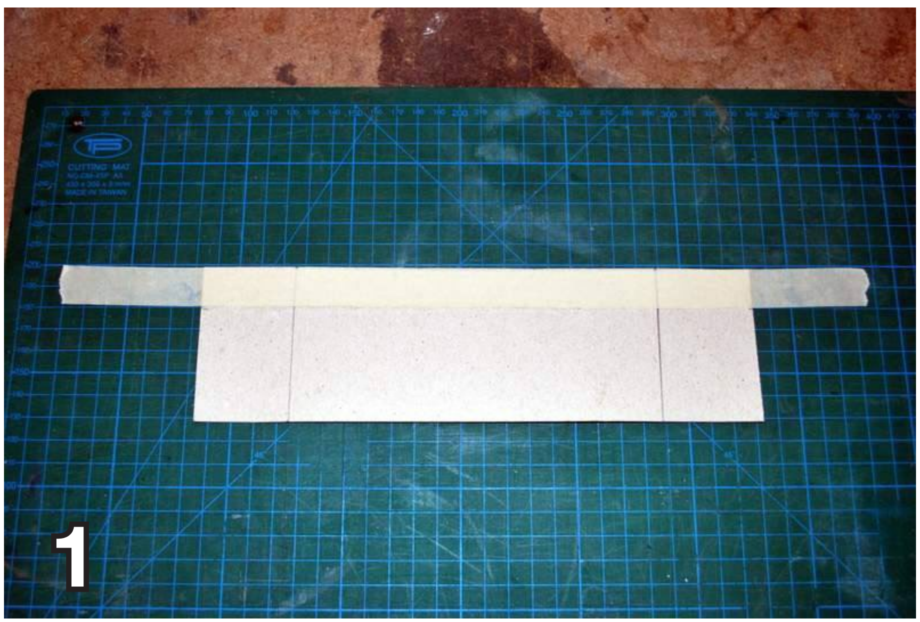
via Marco Ter Beest and RC Glider Universe
<https://www.facebook.com/groups/RCGU1/>

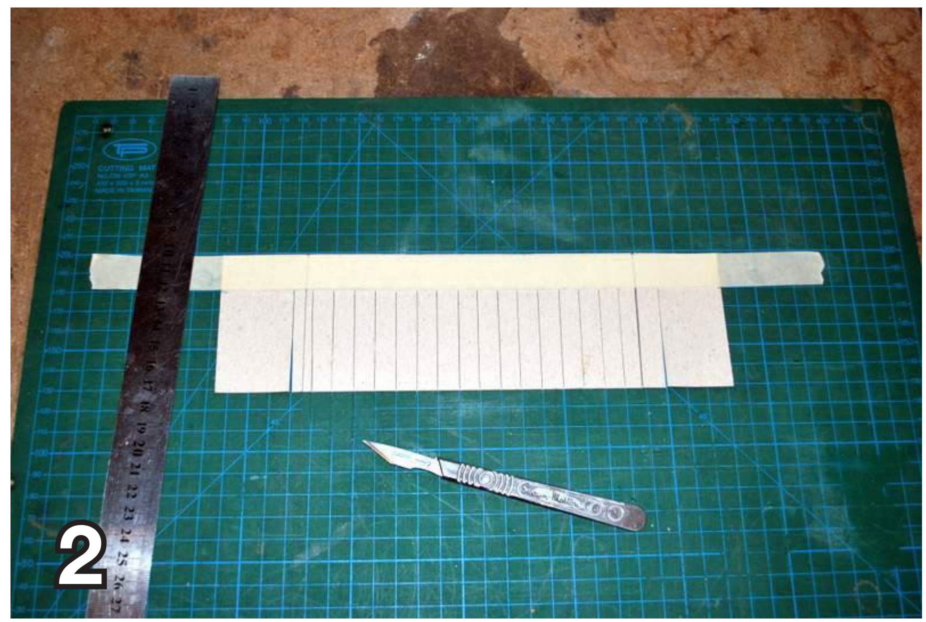
When building my Prismaray, I found a build log on a forum and I was impressed with the templates made to reinforce the fuselage.

I sent the poster of the topic, Tony Fu, a personal message, hoping that he would share the templates with me so I could use them to make mine.

Instead of sending me the templates however, Tony did something much better; he taught me how to do it myself!

I think the pictures he sent me explain themselves!



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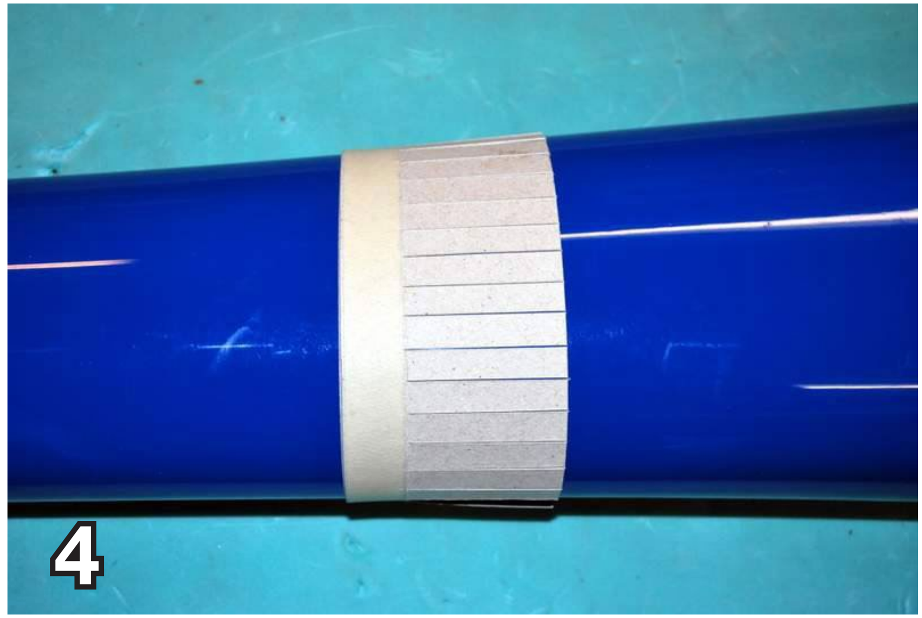
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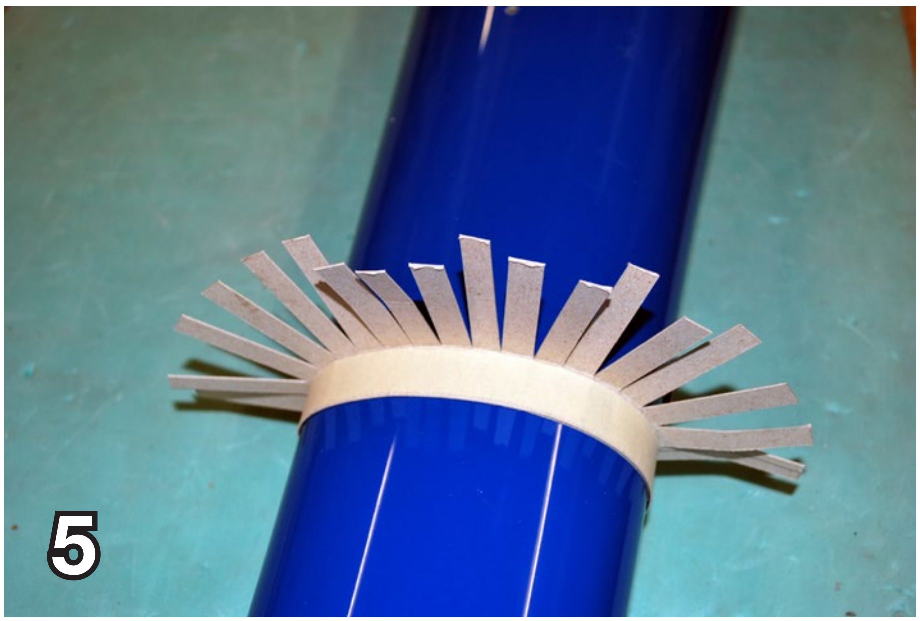
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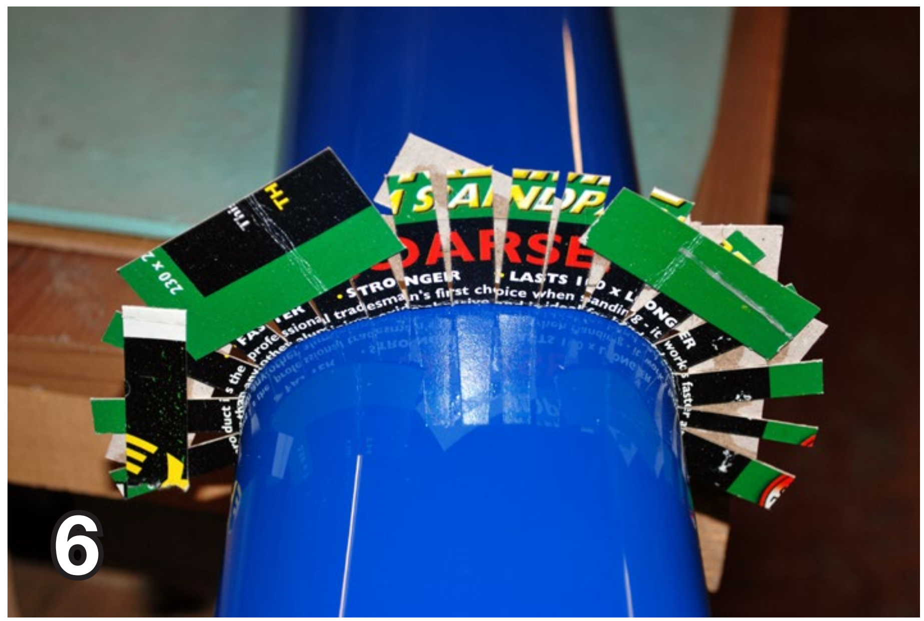
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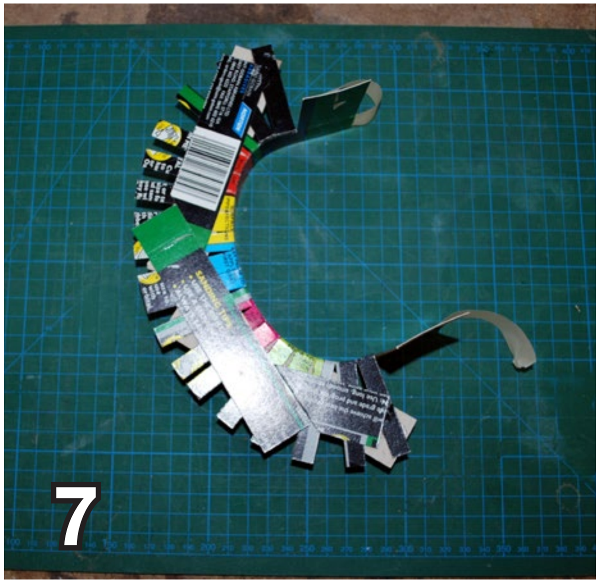
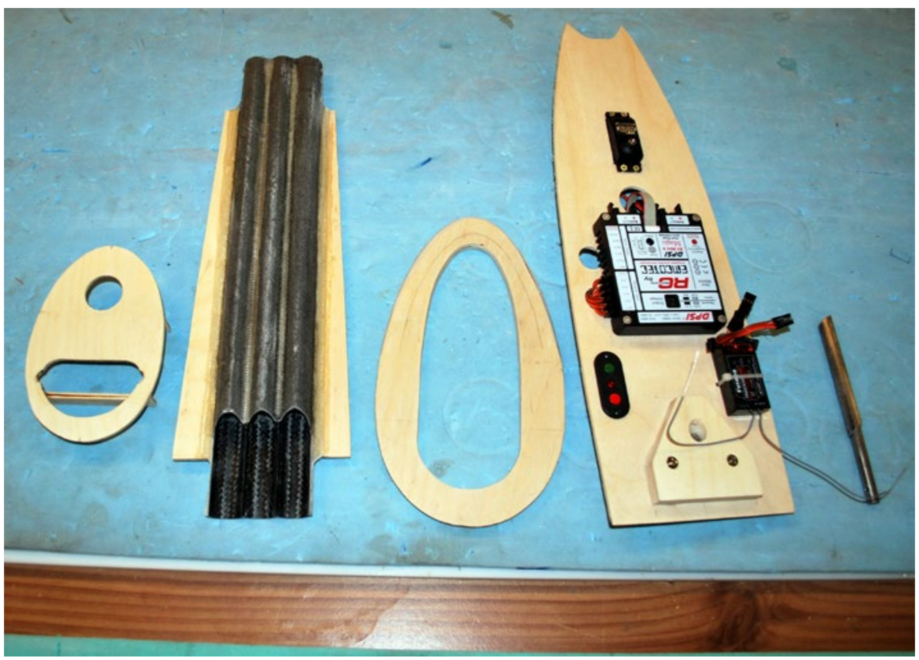


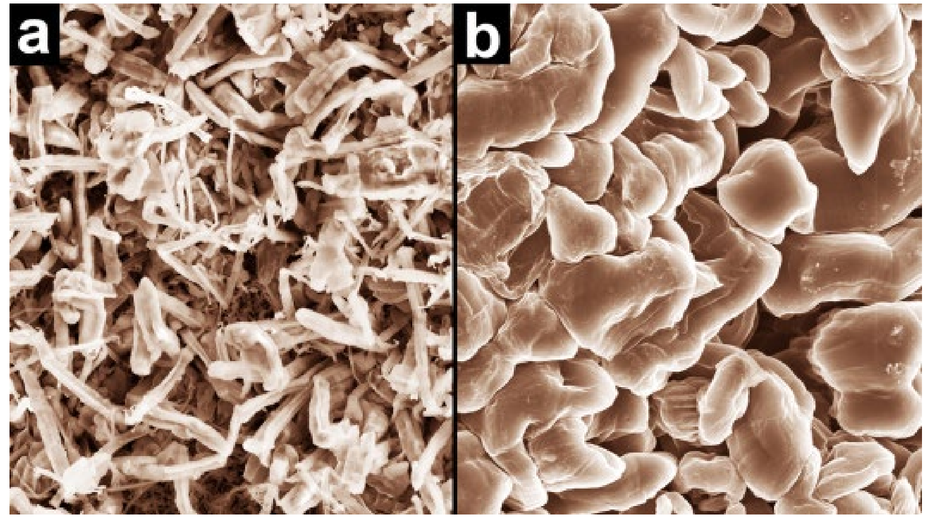
Tony sent the additional photos below to *RCSD* to show other items which can be made using this technique.



New electrolyte promises to rid lithium batteries of short-circuiting dendrites

Colin Jeffrey

http://www.gizmag.com/dendrite-electrolyte-lithium-batteries/36274/



Scanning electron microscope images that show how normal electrolyte promotes dendrite growth (a, left), while PNNL's new electrolyte produces smooth nodules that don't short-circuit cells (b, right)

Dendrites – thin conductive filaments that form inside lithium batteries – reduce the life of these cells and are often responsible for them catching fire. Scientists working at the Pacific Northwest National Laboratory (PNNL) of the US Department of Energy claim to have produced a new electrolyte for lithium batteries that not only completely eliminates dendrites, but also promises to increase battery efficiency and vastly improve current carrying capacity.

Many of the rechargeable batteries used in portable devices today are of the lithium-ion (Li-ion) type, composed of two electrodes in a recharging battery (a positive one made of lithium and a negative one created from graphite) and a chemical electrolyte. Basically, the electrolyte chemically contains the electric charge and also acts as the medium through which the current flows between electrodes when the battery is connected in a circuit.

Unfortunately, as the electrolyte in a Li-ion battery also contains a solution of lithium, the lithium electrode tends to react with this medium, causing dendrites to form.

When these fibers snake their way out from the electrode and into the electrolyte, they tend to break down the controlled path that the electrons generally take by producing conductive paths haphazardly throughout the structure. As a result, there is often a sudden and rapid discharge that allows excess current to flow. At best, this causes the battery to fail prematurely. At worst, this heats up the battery to such an extent that it can set fire to its own packaging or even the device in which it is contained.

In an attempt to counteract this dendrite formation, some researchers have tried such things as coating the anode of Li-ion batteries with carbon nanospheres or tweaking the formula of the electrolyte with additives. Others have even added Kevlar to the mix, but this doesn't stop the dendrites growing, it merely stops them from expanding too far into the electrolyte.

The new electrolyte developed by the PNNL researchers, however, aims to completely replace the electrolyte with one that does not promote the growth of dendrites at all. And, as a fortunate aside, it also ups the capacity and efficiency of the battery too.

“Our new electrolyte helps lithium batteries be more than 99 percent efficient and enables them to carry more than 10 times more electric current per area than previous technologies,” said Doctor Ji-Guang “Jason” Zhang of PNNL. “This new discovery could kick-start the development of powerful and practical next-generation rechargeable batteries such as lithium-sulfur, lithium-air and lithium-metal batteries.”

Doctor Zhang and his team based their research on the premise that Li-ion batteries with graphite electrodes may well be approaching their useful energy carrying capacity, and that an increase in efficiency could be wrought with the use of a higher-capacity lithium electrode. Of course, with the fact that an increased capacity lithium electrode would just add to the dendrite problem, the researchers realized that this would be difficult to achieve.

Building on other research that showed electrolytes containing particularly high salt concentrations also exhibited far less dendrite growth into the medium, Doctor Zhang and his co-workers chose to use large amounts of the lithium bis(fluorosulfonyl)imide salt, an organosilicon compound, added to the solvent dimethoxyethanein to produce their experimental electrolyte.

To test its new composition, the team constructed a circular test cell slightly less than 25 mm (0.955 in) in diameter. When this test cell was charged, rather than growing long filament dendrites, the lithium electrode instead developed a thin sheet of lithium nodules across its surface that showed no signs of growing into the electrolyte and short-circuiting the battery.

The team then subjected the test battery to more than 1,000 charge and discharge cycles, and claims that it managed to maintain a rather outstanding 98.4 percent of its initial charge, all of this while supporting a current of around 4 milliamps per square centimeter. Varying the current density also slightly affected the efficiency of the test battery, with 10 milliamps per square centimeter resulting in an efficiency of approximately 97 percent, while just 0.2 milliamps per square centimeter managed to produce an exceptionally high 99.1 percent efficiency.

According to the researchers, this is an outstanding set of figures, particularly as the large majority of Li-ion batteries with lithium electrodes run at a current density of 1 milliamp per square centimeter or less and are prone to failure after less than 300 charge/discharge cycles.

Given the high efficiency of the new electrolyte, the researchers also believe that this raises the possibility of a radical new design in battery technology – an “anode-free” cell. In other words, the electrolyte itself could act as an electrode. The actual construction would need to be refined, but with an electrolyte that runs at up to 99-plus percent efficiency, there may be an opportunity to manufacture a battery that only has a negative current accumulator, without a reactive material coating on the anode.

“Not needing an anode could lower the cost and size of rechargeable batteries and would also significantly improve the safety of these batteries,” said Doctor Zhang.

Of course the electrolyte compound and its battery need further testing and refinement before potentially being made available commercially, and Doctor Zhang and his co-workers are gauging ways to achieve this along with numerous other additives that may further improve their electrolyte. This is a necessary step in achieving somewhere around 99.9 percent efficiency, which is a prerequisite to commercial production and release.

Testing and incorporating possible new cathode metals that work well in an amalgam with the new electrolyte are also being considered by the researchers.

The results of this research have recently been published in the journal *Nature Communications*.

Tom's Tips

Two specialty battery packs

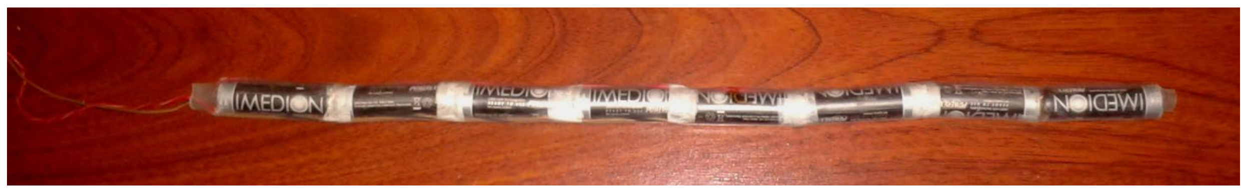
Tom Broeski, T&G Innovations LLC, tom@adesigner.com

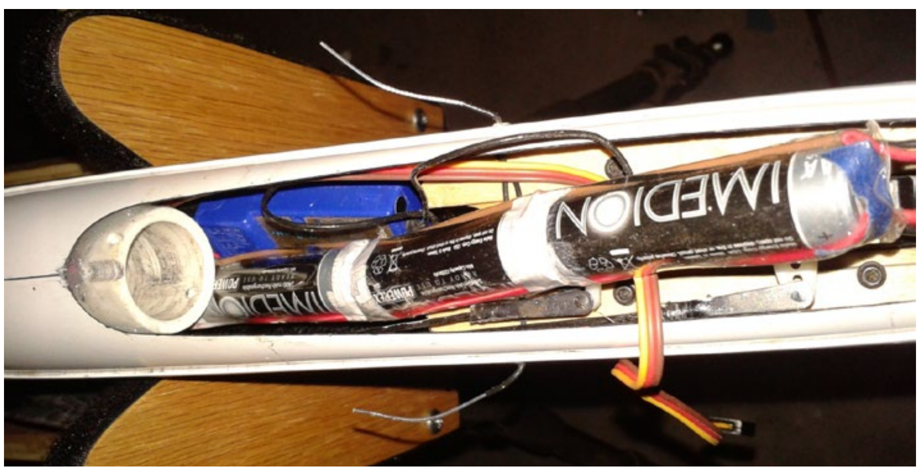
SPECIALTY PACK 1

The first battery pack is fairly self explanatory. Separate the pack into two 2-cell units. This makes it easier to fit into narrow fuselages and saves having to take servo trays out.

SPECIALTY PACK 2

The second pack is a ballast tube battery. It can sometimes fit under the ballast tube. I use it in my AVA tube and under my Royale XC tube. Comes in handy for those very long flights for





XC or for the LSF 8 hour task. It is made up of two 4-cell packs in parallel. As an example, two 2400 mAh 4-cell packs make a 4800 mAh double pack.

Step 1

Solder together two 4-cell units. I use Soder Wick fine braid, since it solders well and bends easily.

Step 2

Lay the pack out straight. I usually put a piece of tape around each joint to keep it together.

Step 3

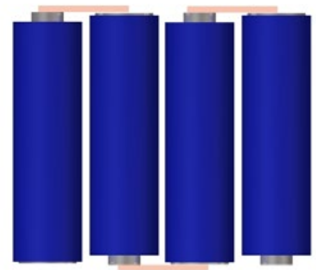
Solder the two 4-cell packs together in parallel. Positive to Positive in the middle. (You can do negative to negative also if you wish). Attach a good length of appropriately colored wire, also.

Step 4

Lay this out straight and solder the negative wire to the bottom and top of the pack. You now have two 4-cell packs in parallel. I shrink-tube the pack, but it will work fine with just taping it together.

You could also use a single 4-cell tube pack, if they are the same type and amperage battery, and connect to your receiver along with your normal nose pack. I have the same type 4-cell pack in the nose of my Royale XC and with the three in parallel, I actually have 7200 mAh to run on.

Step 1



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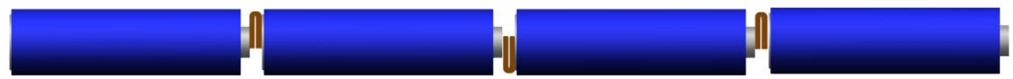

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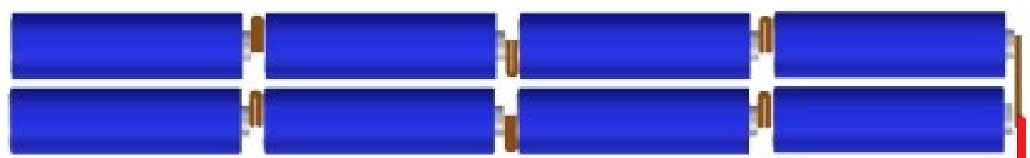

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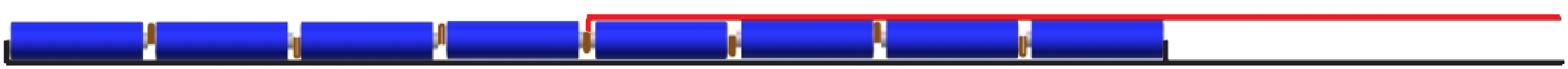

electric LAUNCH

Electric launch is not the same as electric powered!

Gordy Stahl, GordySoar@aol.com

With the increasing popularity of electric launch sailplane contests, suddenly us sailplane guys have to learn a whole new bunch of things for the nose of our sailplanes.

Choosing the right speed control (ESC), the right voltage battery eliminator device (BEC) or whether to use a standard receiver battery pack, the right motor battery, the right motor, the right prop.... Argh, its complicated. And mostly because the guys who have been using motor's in the nose of their models have not used them in our context.... "electric launch."

An Electric Launch sailplane is different than an electric-powered-airplane-with-long-wings. Electric launch means the model is a thermal sailplane which uses a motor in the nose to get to launch altitude and, same as a towed launch sailplane, it's launch system is not restarted in flight.

The moment a pilot restarts his motor, his model becomes an electric-powered-airplane-with-long-wings.

Examples of this kind of model is the warm-liner and hot-liner airplanes that look like a sailplane but are advertised as fast and aerobatic — a dead give away that they weren't planning on spending much time hunting thermals?

Their wings are flat. They are a lot of fun, but it's important to understand the context when discussing Electric Launch sailplanes.

We sailplane guys hate motors because they are a hassle and noisy, they get in the way of us finding thermals, but we are getting lazy (or old) and with the crazy advances in lightweight, high performance and cheap stuff for the nose, using a motor and prop to get our models to altitude has become very attractive.

The common argument is that its "sooo much easier to use a nose motor than to set up a winch or high start, it saves all that walking for the chute each flight." Well it turns out that at Electric Launch contests we pilots end up doing a LOT more walking than we used to... And Electric Launch is far more time consuming at the field than the winch....

Why?

Because each round you have to trek from launch/land area to car and back, whether flying or timing. I have been as much as 600' from launch tape to my battery charging stuff! That made for a long day and a tired pilot.

In fact electric launch contests ARE easier.... on the organizers. So for that single reason, ALES contests (Altitude Limited Electric Launch is what ALES stands for. There isn't any such thing as an electric sailplane, but the anachronism was coined by guys who didn't know any better.) have begun filling up weekend dates.

One great by-product of Electric Launch is that lots of new pilots are getting involved in RC soaring, largely because of Horizon Hobbies' Radian 2m foamie electric launch sailplane.

It is an outstanding thermal ship, and durable for beginners. It comes ready to fly with battery, charger, heck you can even get it with the transmitter!

And its cheap for what you get. Unlike many pretenders before it, the Radian turned out to be a feeder design which inspired their owners to make the next step, purchasing something bigger and non-foam.

The Radian has in many cases, including my own, caused growth in clubs. Pilots who start out playing with a foam toy airplane become RC sailplane enthusiasts!

My lament is that many RC soaring pilots to come will never know the excitement and fulfillment of winch launching. They are cheated out of that time we spent studying how to set up a model for the launch, learning to optimize the technique, that moment of excitement and terror when you load the winch line to the point of release, watching it rise, experiencing the dread that something could go wrong, that moment about 50' up where the sailplane's wing finally decides to get to work, and then the pilot managing the launch energy, careful not to take in too much line, yet keep the speed up, then, at the apex of the launch, pulling off the flap camber, pushing over "into the bucket" to build speed, then pulling up for that explosive ping straight upwards, zooming toward the clouds - and finally, the frustration of finding you aren't on top of the pack, or the elation that you are... That your practice, set up and technique paid off! That entire part of RC soaring will be missed out on by so many pilots to come.

So what about all that stuff in the front? Well, it's been a real experience trying to make heads or tails out of the information about motors and batteries.

There are terms like Watts that seem should be a simple indicator of which motor to use, but it turns out that's just a number of very little value to our application.

Then there is Amps, which again ought to be of some value, but you can have a very powerful, speedy system with both high and low Watts and Amps or a mix of the two!

Then there are three kinds of motors, really four if you consider gear-boxed systems.

Out-runners are torquey, but their outside bodies spin and for the most part their power wires exit out the front and head back over the spinning motor bodies, a real hassle for those of us converting standard skinny sailplane fuselages to hold a motor. They do work well without a gearbox, but need to be about 36mm diameter and weigh the most (about 250 grams for our use).

Mounted with a gearbox (usually 4:1-ish), the 28mm diameter size motors fit our converted fuselages really well (and are lightest, coming in at about 140 grams) .

In-runners are slim, so fit really well. They have a lot of power for their size but are heavier than the 28mm Out-runners (about 180 grams with 4:1 gearbox).

In-runners are the most efficient motors, but again that's a value that does not apply to our extremely limited use application, electric launch.

In-runner/Out-runners are Out-runners that have a shell around them to make them easier to install in our fuselages. Their wires exit out the back of the shells. They are intended to be direct drive and are about 36mm diameter,. Weight wise they fall in between the other two at about 160 grams for the same power application.

For a 4m contest ship this is the average motor power sizes that work:

- 28mm Out-runner with gearbox – 2500kv
- 28mm In-runner with gearbox – 2500kv to 4400 kv
- 36mm Out-runner direct drive – 860kv to 940kv
- 36mm Out-runner/In-runner direct drive – 860 to 960 kv

3-cell packs using a 15/10 prop works well on all the above, but require some personal tuning depending on your strategies.

Okay, so you want to know which is 'best'? Sorry, that's for you to find out and it depends on your wallet, ego and airframe. Airframe depending on how much weight (and or space) you can have (or need) in your model's nose.

The key thing to remember is that it is powered aircraft where motors count, not so much in Electric Launch sailplanes. We have 30 seconds to get to altitude, and the first one there has likely missed a bunch of pockets of lift in the race to get there. To win an Electric Launch sailplane contest you have to make the time task and the landing task.... The launch speed doesn't add points.

So what about motor batteries?

We don't need capacity for Electric Launch soaring. The motor is run for about two total minutes over a two day contest. Heck, one small battery pack would get us through the weekend! But we do need voltage.

You see, it's voltage that turns the prop, and if the pack voltage sags 15 seconds into the launch, we lose prop RPM to run toward lift in both ALES and F5J. You'll notice I didn't say lose power to climb.

So just like the motor thing, the information used up to this point was all important to powered airplanes, but not so much in our application.

Things like C-rating and capacity don't apply to our application much. The one thing I found in my extensive testing of various electric launch systems was that battery "thickness" counts more than anything.

A thicker battery has the muscle to hold its rated voltage longer! A cheap thick low C-rated battery will hold its voltage longer than an expensive high C-rated thin battery. And in our context where our batteries are run for a max of 30 seconds every half hour or so — and never restarted after that first 30 second launch till the model lands — high rated expensive batteries of any thickness don't return anything of use to us for the dollar investment.

That is not saying the same thing that quality high rated batteries aren't 'better' than cheap low rated batteries — maybe the best way to make the point is to point out that you can't be more "launched" than launched.

The same goes for ESC's, and motors, but there is the feel good factor. If having the best of everything in your model makes the experience more fun, definitely do it! And there are some really high quality components out there for our use.

Props galore!

There is a rule of thumb that applies specifically to our application but its not that clear how it applies because there are two ways to get up to altitude. The rule is "big wing – big prop."

One of the most popular and lightweight drive systems is the Hacker A20 6XT 10 Turn 28mm Out-runner with 4.4:1 gearbox. Its TINY, so it fits most fuselages, it can turn an 18/10 prop pulling under 60 Amps. (60 Amps is on the high side, but is a very acceptable current draw for our application.) That prop is very efficient on a 4m electric launch sailplane because there is very little slip. Those big blade really grab the air!

So why not use that prop on that system? Simple. If the prop blade stops under the nose of the fuselage, it makes a really good sliding surface during landings.

What's the difference between a European electric launch pilot and an America electric launch pilot? The European F5J pilot manages to clear the wing as his model slides under him!

Sometimes efficiency doesn't translate to utility. A 15/10 prop has less diameter to swing and has a lot of slip when first turned on at launch. That doesn't sound so good, but it translates to spiking less Amps while in your hand. And the motor can turn faster, building less heat. The prop's pitch can eventually create more airspeed and all at lower amps, which is really good to help the battery have less voltage sag.... and, by the way, help the battery last longer, too.

I've paid for a lot more insights into this topic via my testing, but you'll have to wait a few months because there's still space on my wall for trophies this season. 🙂

Yup, if you wanted to launch well on the winch it took study, experimentation, practice, and trials. Looks like the same is true for electric launch. 'You' have to do some work to get the benefit.

But here's a little tip I found on the internet from one of the motor gearbox suppliers to keep those pesky Out-runner wires from scrubbing on the spinning motor case.

I bent a piece of 0.047" (0.056" works, too) music wire into a "U" shape. The two legs are bent to fit into the front cooling slots of the motor and go all the way through and out the bottom slots. That's it, the wires are spring loaded against the side, top or bottom of your fuselage safe from rubbing.

If you want, you can slip a piece of shrink tubing over the wires and the music wire guard to keep the wires on top of the guard, but I haven't found that necessary.

If your particular motor doesn't have cooperative cooling holes, just drill some! That case is aluminum and not sacred.

On some motors it takes a little creative bending and wiggling to get the guard's legs all the way through the bottom cooling holes. Take care not to poke through the wires in the front of the motor.

For the most part I have not found one of the 28mm motors that I couldn't use this trick on.

I'd love to hear your thoughts on motors, gearboxes and batteries. While I don't like electric launching, I'm a modeler who

A piece of 0.047" music wire bent into a "U" shape. The two legs fit into the front cooling slots of the motor and go all the way through and out the bottom slots.

loves to fly, so I've decided to figure it out as best as possible.

Tune in next month for another pretty cool bit of Electric Launch legerdemain.

If you have questions or comments you can reach me at GordySoar@aol.com.

Midwest USA Aerotow Events Schedule

Spring 2015 finally decided to show up in Midwest after a long hibernation, so it is now time to pencil couple dates in your agenda for helping us grow the aerotowing community in the Midwest.

From the total beginner to the expert in aerotowing, here are five events to join if you live in the Midwest or if you are simply stopping by on your way to another destination:

- May 2nd & 3rd MRCA Aerotow, Ann Arbor, Michigan (45 min west of Detroit)
- May 22nd, 23rd & 24th Wilbur Wright Birth Place Aerotow, Henry County, Indiana (15 miles east of Indianapolis)
- June 18th to 21st Horizon Hobby Aerotow, Monticello, Illinois (20 min west of Champaign, IL)
- July 9th to 12th SLED-WORKS Aero tow, Owatonna, Minnesota (1 hr south of Minneapolis)
- August 28th to 30th Winamac Aero tow, Winamac, Indiana (mid-distance between Chicago and Indianapolis)

You can find details of and fliers for every aerotow event organized on the east side of the US on the RCAerotowing.com forum:

<http://www.rcaerotowing.com/forum/threads/2523-2015-Eastern-USA-Scale-Soaring-amp-Aerotow-Events-Schedule>

Video footage of these fields can be found here: <https://www.youtube.com/user/sruelle>

If you want to be involved in this side of the hobby and need some help, do not hesitate to contact me:
Stéphane Ruelle, steffruelle@att.net

ANNUAL GLIDER RALLY

HOSTED BY KALAMUNDA AERONAUTICAL MODEL SOCIETY, INC.

SOUTH OF PERTH, AUSTRALIA

Nigel Molyneux and Wayne Richardson, wrichardson999@gmail.com
Photos by Wayne Richardson

The annual KAMS Glider Rally was hosted at the Kalamunda Aeronautical Model Society, Inc. Club Sunday 15th February 2015 from 9.00am, with Ian Salau as the CD.

KAMS club is located about 45 minutes south of Perth in open, flat countryside at Jackson Road, Oldbury, Perth Western Australia.

This was not a competition event, just a relaxed day of flying all forms of RC gliders.

Ian brought a bungee and a model to allow children an opportunity to try their hand at flying. Additionally, there was a winch setup, electric models, DLGs and two tugs for aero towing the scale boys.

The full gamut of RC gliding models was present, for a complete day of flying.

February arrives towards the end of a particularly dry season in south west Australia, with many devastating bush fires and frequent State-wide fire bans. The KAMS field is sometimes closed to all forms of flying. Fortunately, the weather cooperated on the day of the glider rally and the field was open for flying.

Following is a picture summary and commentary of the event.

Nigel Molyneux SWA Rep', 42% Extreme Composites Extra 260, 126" / 3.2m wingspan, 3W170 twin Comp series twin cylinder engine with optical ignition kill switch on canister exhaust swinging a 32x12 Menjlik carbon prop. Futaba 14MZ 2.4ghz radio system, Emcotec power system with Hitec servos throughout (14). Weighs 22.25kg without fuel, 100oz or 3L tank fitted for longer aerotowing duties. Tow release behind top of canopy.

Jenna Salau, Hanger 9 - 33% Piper Pawnee, 130" / 3.3m wingspan with Axle pilot and cockpit detail. Futaba 14MZ 2.4ghz radio system and eight servos. DLE 111 twin cylinder engine with optical ignition kill switch on canister exhaust swinging a 28x12 Menjlik carbon prop. Model built by Ian Salau flown by Jenna Salau.

Jenna flew over from Melbourne especially for the event and to help dad Ian on the day. Perth to Melbourne 2,700km / 1675 miles by air.

<http://www.hangar-9.com/Products/Default.aspx?ProdID=HAN5190>

Malcolm "Kiwi" Woodbury, Phoenix Models Ka8b Wingspan: 6000mm (236.2 in) - Length: 2873mm (113.1 in) - Wing type: HQ airfoils JR 10x radio system with 8 Hitec servos. Unfortunately, a programming issue grounded the Ka8 and the model did not fly

IMAC Elite Comp' pilot and part time "glider guider" Roman Pasznicki and his 7m Let Models ASH 31MI with Up&Go self-launch system, Futaba 18MZ 2.4ghz radio system. <http://www.letmodel.cz/gallery-ash31.htm>

Above: Ian Salau and his 6m ASW15 Glider

Above right: Nigel Molyneux launching his Baudis Models “bitser” F3B E glider (Ceres E Fuse with Ceres Lift F3F tail feathers and Cyril F3B wings) 2.95m span, 2.8kg, Futaba 14mz 2.04ghz radio system, Hacker B50-10s in-runner motor with 6.7:1 gear box swinging a 20x12 Vita carbon prop pulling 110amps on 3s 3700 li-poly. Hacker motor is now 10 years old and still going strong after being in three previous models. It’s great fun to fly and to practice the F3b tasks, especially on windy or big lift days which we get a lot of in WA.

Right: Malcolm “Kiwi” Woodbury, Radian E glider, 3ch R-E-motor on Spectrum 2.4ghz DSX6 radio system. “Crouching tiger, low flying Kiwi.”

Danny Hales Duo Discus 5.5m with Up & Go self-launch system.

CD Ian Salau enjoying some "alone time" flying a 2ch rudder/elevator bungee-launch balsa glider from the "olden days."

Ian Salau's Hanger 9 - 33% Piper Pawnee, flown by son Jenna.

Going up! Simon Watts' 5.0m Ventus takes to the skies.

Roman Pasznicki 7m Let Models ASH 31MI ready to be towed up behind Piper Pawnee piloted by Jenna Salau.

Opposite page: Roman Pasznicki and his 7m Let Models ASH 31MI with Up&Go self-launch system.


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Futaba
50 Years


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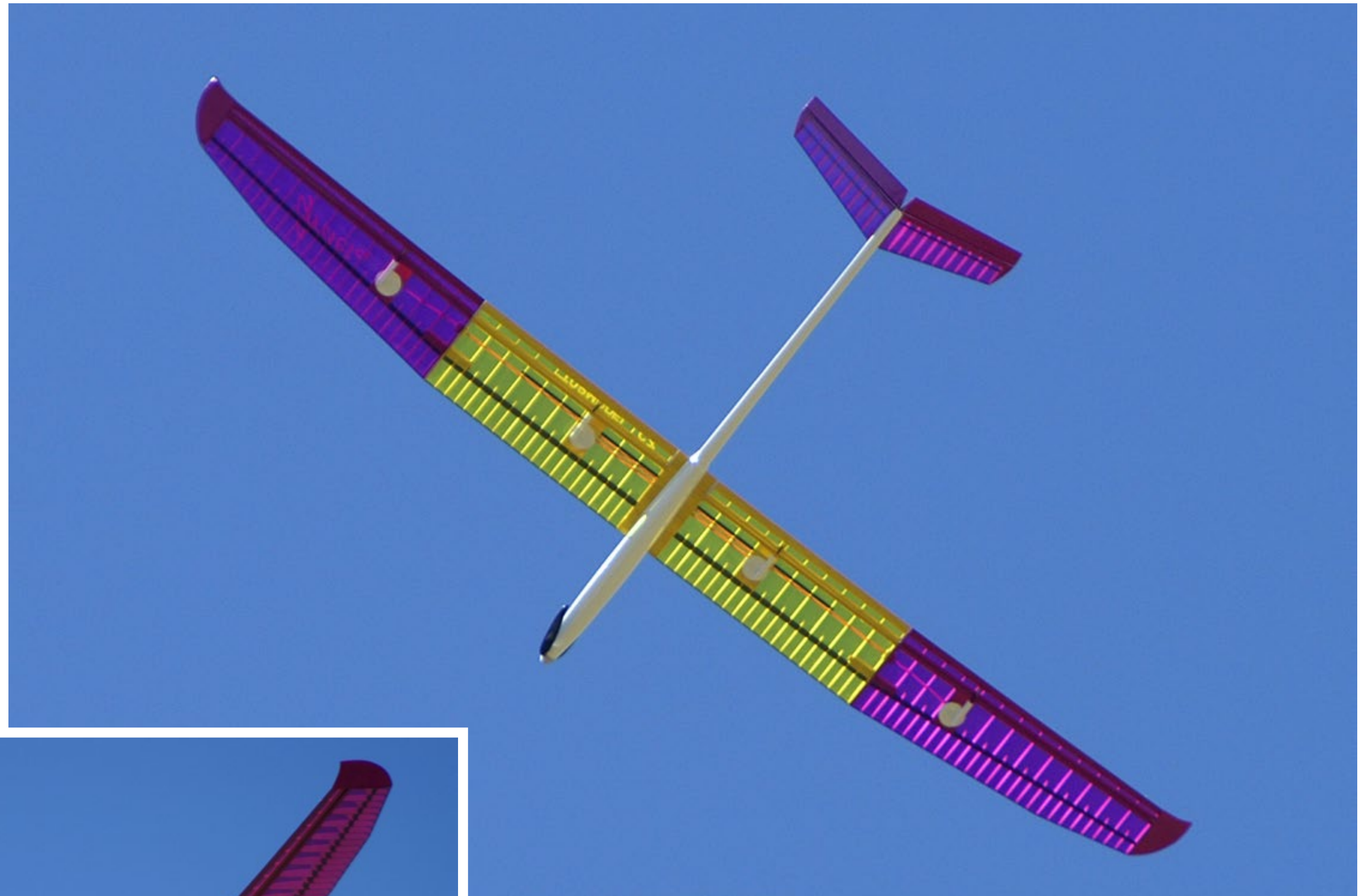
Above: Simon Watts closing the canopy of his new 4.8m Ventus 2CX.

Above right: KAMS Club secretary Tim Watson launching his 3.7m Pulsar E. <http://www.soaringusa.com/Pulsar-Pro-3600-E-FH-.html>

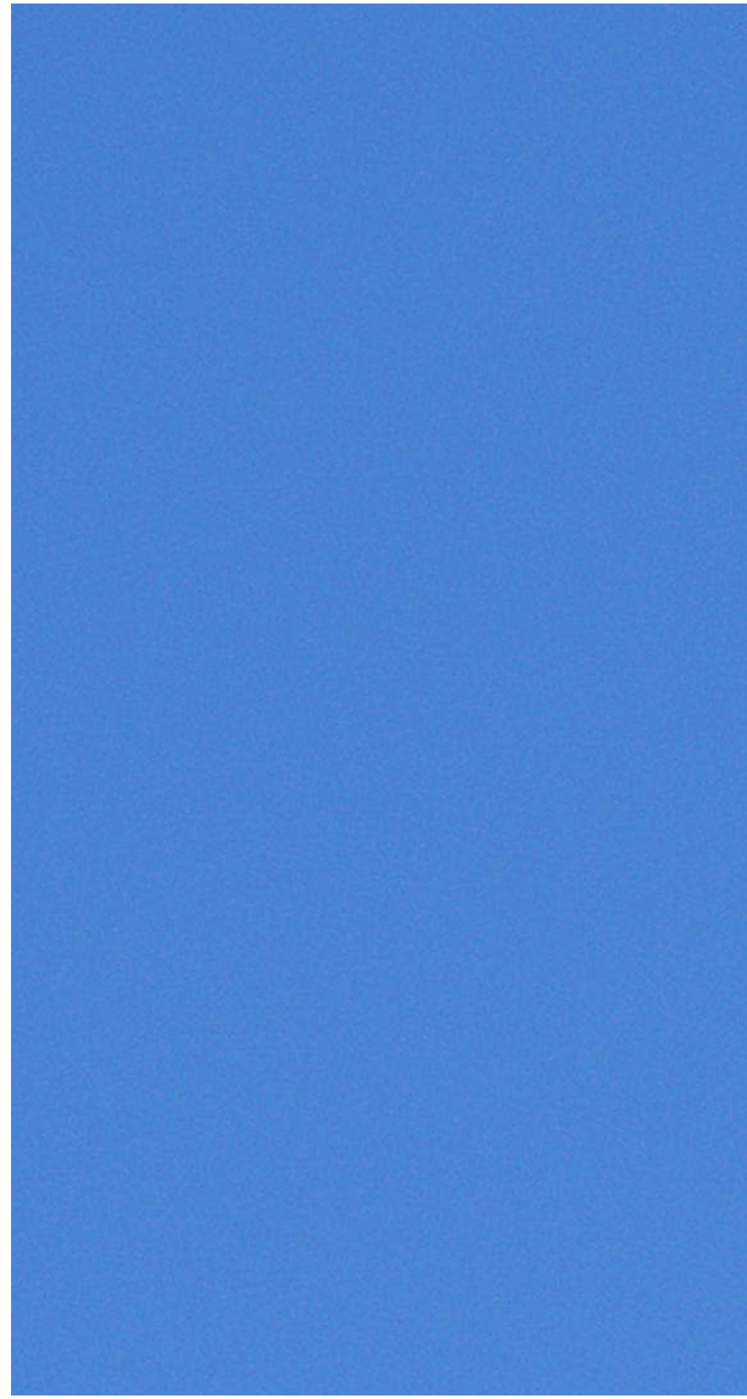
Right: Don Tester about to winch launch Brian Mitchell's "Europhia F3B" glider. (Brian on the controls, out of shot.)



Roman Pasznicki's TopModel Gracia E glider. Something a little different from his 7m ASH 31 and 40% Extra.
<http://www.e-fliterc.com/Products/Default.aspx?ProdID=EFL4905>

Above: *Simon Watts was flying his new XXLites F3K model to great effect on the day.*
<http://www.compositegliders.com/#XXLite>

Opposite: Roman Pasznicki 7m Let Models ASH 31MI with Up&Go self-launch system.

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Right: Malcolm "Kiwi" Woodbury and Roman Pasznicki try and sort out the JR 10x programming on the Phoenix Models Ka8b. It was decided to postpone the flight for another day.

Below right: Danny Hales, Nan Models "Orion" Mini Xplorer 2.4m, F5J Electric glider, Futaba 14MZ 2.4ghz radio system, 3s lipol, outrunner motor, 7 channels, 6 servos, fully molded composite model. <http://cw00523.compweb.com.au/?stg=1160&view=1160>

Below: Ian Salau (Cd for the day) Hooking up Roman Pasznicki 7m Let Models ASH 31MI with Up & Go self-launch system ready to be towed up behind his Piper Pawnee piloted by Jenna Salau.

The front end of Danny Hale’s 5.5m Duo Discus with onboard “up & go system.”

Above and opposite page: *Danny Hale's 5.5m Duo Discus with onboard "up & go system" gets a tow.*


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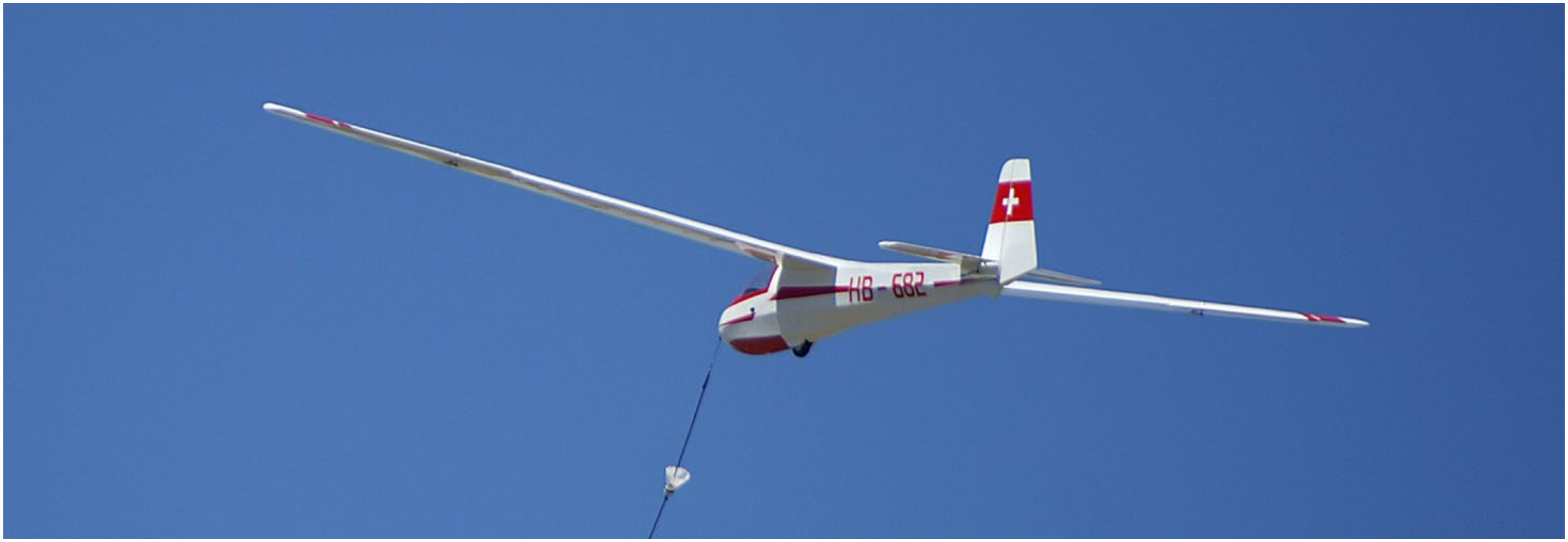
Danny Hale's 5.5m Duo Discus with onboard "up & go system," spoilers up, comes in for a landing.

The front end of Simon Watts' 4.8m Ventus 2CX

Ian Salau steadies the wings tips of Tim Watson's 3.5m Phoenix Models Ka8b as Tim signals he's ready to tow.



Tim Watson's 3.5m Phoenix Models Ka8b on tow and landing. <http://phoenixmodel.com/Product.aspx?ProductId=294>

Les Stockley with his 4m Discus.

Don Tester's Baudis Models Fosa Lift F3B hunting for lift down low.

Danny Hale's Orion E 2.4m heads into the blue.

Simon Watts in action with his XXLite F3K.

Kiwi import and current Western Australia F3K and F3J Champion Les Stockley shows his style with his Stobel 3 F3K DLG model.

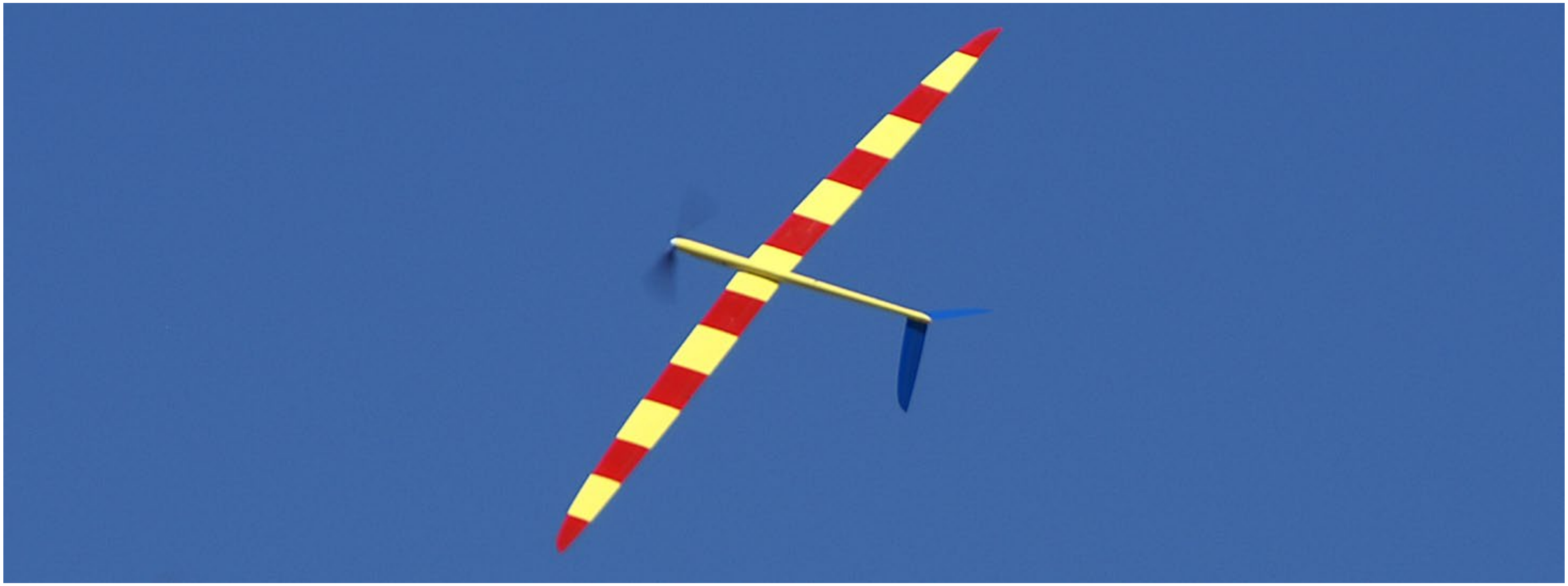




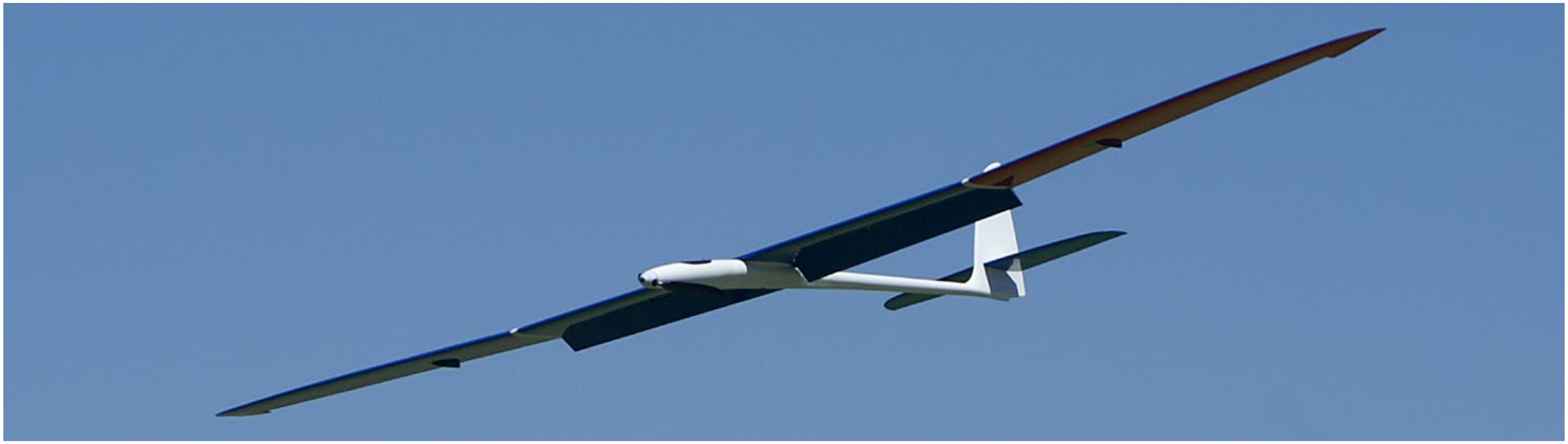
Left: Malcolm Woodbury launching Ian Salau's 3.7m Samba Models Pike Perfect "Extended Tip" F5J thermal glider. <http://www.f3j.com/f5j.htm>

Left below: Simon Watts (left in green shirt) test fly's Radian E glider for new glider pilot (name unknown?)

Below: Don Tester (right) just released his Baudis Models Fosa Lift F3B off the winch. Brian Mitchell (left) looks on and learns the art of winch launching.



Nigel Molyneux's Baudis Models "bitser" F3B E glider from below.



Ian Salau's 3.7m Samba Models Pike Perfect "Extended Tip" F5J thermal glider sets up for a landing.

Roman Pasznicki 7m Let Models ASH 31MI shoots for the moon. This shot required patience and a steady hand. No Photoshop trickery here! Konica Minolta Dynax 5D, ISO 100, 1/800 sec., f5.6. 200mm

Legacy Class Radio Control Thermal Soaring Rules

Legacy: something of value handed down from times past….

Conceived by Larry Jolly 1-1-2015

The vision. To encourage Sailplane modelers to relive the golden age of RC Soaring, when competitors actually built their gliders. No two gliders were identical and there was a certain amount of individuality expressed by each builder in the creation of his glider.

A Legacy class glider is defined as a Soaring design that is 25 years old. Proof of compliance can be accomplished by published plans, kits, magazine articles, magazine photographs, or personal photographs with date printed on the photo.

While the builder is encouraged to construct his glider as accurately as possible, including correct construction methods, outline, and airfoils. Deviations are allowed, including a fiberglass fuselage in place of a fully sheeted fuselage, stronger spars and joiners to withstand modern launch equipment, increased dihedral, control surfaces, if none is shown on the drawings, glide path controls, and other changes deemed necessary by the builder to improve handling, and safety. In addition small changes to improve the gliders appearance are allowed and encouraged. If the original design was 120” span or less, the builder is allowed to scale his design to a maximum of 4 meter wingspan.

In the case of little known designs, the builder should be prepared to provide documentation to the contest director for review, and approval. This is not a scale model competition, and the documentation requirements are lenient by design. The purpose is to give as much latitude as possible to the competitor to explore his creative instincts, as he constructs a recognizable replica of his favorite old glider.

The Legacy class is designed to be adaptable, to be included as an additional class at any RC Soaring Contest. So if the contest is an open meet then Legacy gliders will also be of open class capability. If it is an RES-Bent wing type contest the Legacy Class models will be limited to RES, REF, or RE functions. Legacy Class models are also suitable for alternate launching contests such as ALES, Hand Launch, or Slope Soaring competitions.

Legacy class designs offer special consideration for precision landings. If the original design had no glide path control as designed. The landing will receive maximum points if the glider comes to rest inside the landing zone or circle. If the design had glide path controls, they should be present and operational as the landing will be scored by its resting position on the landing tape or zone.

Prior to flying all Legacy class gliders will be brought forward for judging by the competitors in the class. All Gliders will be scored with the best glider receiving a 1 rating, and all other gliders judged in ascending order. The Gliders are judged for craftsmanship, originality, obscurity, and historical significance.

There will be at least one award for Pilots Choice, This glider will attain the lowest score in the pilot judging and will need to complete one contest flight in the competition.

Duration tasks should be considered, so that the limited performance of most of these designs are considered. It should be recognized that these old gliders will not generally tow as high or run as far as their modern counterparts.

Legacy class is designed as a slower paced contest flying planes that many of us grew up flying. Hopefully it will give fellow soaring pilots that did not live the golden years of RC Soaring development, the opportunity to view these old gliders performing, and help celebrate our heritage by joining in.

<http://www.rcgroups.com/forums/showthread.php?t=2369813&highlight=CVRC#post31059667>


PROPWORKSWEST

Brent's Superhawk

Tony Johnson, toomanyplanes@yahoo.com
Photos by Peter G. Rissman

Brent Daly launches and pilots his Synergy Composites Superhawk sailplane at Torrey Pines during the June 7, 2014, Katie Martin Tribute.

Brent was organizer of the event and Bob Martin was a part of the event.

The wings of this model were covered by Bob Martin himself.

Yes, I do make the Superhawk from time to time. (Many years between runs as I just don't have much spare time nowadays!)

These Superhawk photos were posted on the tribute thread on RCGroups <http://www.rcgroups.com/forums/showthread.php?t=2071361&highlight=Katie+Martin+Tribute> by Bob Martin and credited to Peter G. Rissman.

Permission to print in *RCSD* by Peter G. Rissman.

Mimicking Humpback Whale Flippers May Improve Airplane Wing Design

Date: May 13, 2004

Source: Duke University

Summary: Wind tunnel tests of scale-model humpback whale flippers have revealed that the scalloped, bumpy flipper is a more efficient wing design than is currently used by the aeronautics industry on airplanes. The tests show that bump-ridged flippers do not stall as quickly and produce more lift and less drag than comparably sized sleek flippers.

DURHAM, N.C. -- Wind tunnel tests of scale-model humpback whale flippers have revealed that the scalloped, bumpy flipper is a more efficient wing design than is currently used by the aeronautics industry on airplanes. The tests show that bump-ridged flippers do not stall as quickly and produce more lift and less drag than comparably sized sleek flippers.

The tests were reported by biomechanicist Frank Fish of West Chester University, Penn., fluid dynamics engineer Laurens Howle of the Pratt School of Engineering at Duke University and David Miklosovic and Mark Murray at the U.S. Naval Academy. They reported their findings in the May 2004 issue of Physics of Fluids, published in advance online on March 15, 2004.

In their study, the team first created two approximately 22-inch-tall scale models of humpback pectoral flippers -- one with the characteristic bumps, called tubercles, and one without. The models were machined from thick, clear polycarbonate at Duke University. Testing was conducted in a low speed closed-circuit wind tunnel at the U.S. Naval Academy in Annapolis, Md.

The sleek flipper performance was similar to a typical airplane wing. But the tubercle flipper exhibited nearly 8 percent better lift properties, and withstood stall at a 40 percent steeper wind angle. The team was particularly surprised to discover that the flipper with tubercles produced as much as 32 percent lower drag than the sleek flipper.

“The simultaneous achievement of increased lift and reduced drag results in an increase in aerodynamic efficiency,” Howle explains.

This new understanding of humpback whale flipper aerodynamics has implications for airplane wing and underwater vehicle design. Increased lift (the upward force on an airplane wing) at higher wind angles affects how easily airplanes take off, and helps pilots slow down during landing.

Improved resistance to stall would add a new margin of safety to aircraft flight and also make planes more maneuverable. Drag -- the rearward force on an airplane wing -- affects how much fuel the airplane must consume during flight. Stall occurs when the air no longer flows smoothly over the top of the wing but separates from the top of the wing before reaching the trailing edge. When an airplane wing stalls, it dramatically loses lift while incurring an increase in drag.

As whales move through the water, the tubercles disrupt the line of pressure against the leading edge of the flippers. The row of tubercles sheers the flow of water and redirects it into the scalloped valley between each tubercle, causing swirling vortices that roll up and over the flipper to actually enhance lift properties.

“The swirling vortices inject momentum into the flow,” said Howle. “This injection of momentum keeps the flow attached to the upper surface of the wing and delays stall to higher wind angles.”

“This discovery has potential applications not only to airplane wings but also on the tips of helicopter rotors, airplane propellers and ship rudders,” said Howle.

The purpose of the tubercles on the leading edge of humpback whale flippers has been the source of speculation for some time, said Fish. “The idea they improved flipper aerodynamics was so counter to our current doctrine of fluid dynamics, no one had ever analyzed them,” he said.

Humpback whales maneuver in the water with surprising agility for 44-foot animals, particularly when they are hunting for food. By exhaling air underwater as they turn in a circle, the whales create a cylindrical wall of bubbles that herd small fish inside. Then they barrel up through the middle of the “bubble net,” mouth open wide, to scoop up their prey.

According to Fish, the scalloped hammerhead shark is the only other marine animal with a similar aerodynamic design. The expanded hammerhead shark head may act like a wing.

The trick now is to figure out how to incorporate the advantage of the tubercle flipper into man-made designs, said Fish.

The research team now plans to perform a systematic engineering investigation of the role of scalloped leading edges on lift increase, drag reduction and stall delay.

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Duke University. (2004, May 13). Mimicking Humpback Whale Flippers May Improve Airplane Wing Design. ScienceDaily. Retrieved February 22, 2015 from <http://www.sciencedaily.com/releases/2004/05/040512044455.htm>

Photo from NOAA <http://www.flickr.com/photos/51647007@N08/5077889241/>

This is one of my pictures taken from the flight line at the F3J World Championship 2014 at Martin, Slovakia. It was taken just before the first start of the Fly-Off rounds.

Pilot (not in the picture) is Lennart Arvidsson, Sweden
People in the picture are:

Jo Grini (Helper)

Lucia Cuypersova-Kostanova (Timekeeper)

....and the little swedish supporter, Nalle

Best regards,
Magnus Hedlund, magnus@maghed.se
Team Manager
Team Sweden - F3J

HTC One, ISO 125, 1/1098 sec., f2.0, 28mm (for 35mm)