

# Radi- C-ntr-ll-ed Soaring Digest

September 2012

Vol. 29, No. 9



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**Front cover:** For a maiden flight, it looks like the Axel pilot figure has quite a routine planned over the skies of Interlaken, Switzerland. Photo taken by Steve Pasierb at the 2012 Les Arpents V'Air Aerotow held July 20-22, Quebec Canada. Steve's coverage of the event starts on page 33 of this issue. Sony DSLR-A300, ISO 100, 1/125 sec., f13.0, 50.0 mm

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- 3** *RC Soaring Digest* Editorial
- 4** **RC Soaring at the International Vintage Sailplane Meet 2012**  
Going small in a big way. Event coverage by Steve Pasierb.
- 21** **New England Aerotow, Salem Connecticut, May 18-19 2012**  
Event coverage by Wayne Richardson with captioning by Steve Pasierb.
- 33** **Parlez-Vous Le Arpents V'air Quebec Aerotow?**  
Scale soaring near the United States / Canada border. Event coverage by Steve Pasierb.
- 46** **Predictions for the F3J World Championships in South Africa**  
"Uncle Sydney" Lenssen's "Mini" gossip column.
- 48** **Rebuilding Old Radios**  
Pete Carr tackles some World Engines equipment.

**Alexander Lippisch's 1955 Smoke Pulse Wind Tunnel Photos... 54**

... which should have ended the "longer path," "equal transit times" notions and associated misBernoulliganisms. By Philip Randolph.

**End of an era for Academy's gliders 58**

TG-10C makes final flight. By Amber Baillie, Air Force Academy Public Affairs.

**Walkaround – Mü 13d-3 60**

Mark Nankivil presents Leland Cowie's N13MU. Flying impressions authored by Leland Cowie.

**Horse Heaven Hills photos by Adam Weston 86**

With retroactive credit for Adam's photo in last month's *Fake Slope Reports*. By Philip Randolph.

**Sky Limit altitude limiter/timer correction and clarification 88**

Larry Dunn, Greg Potter and Dave West of Winged Shadow Systems eliminate some confusion.

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**Back cover:** Steve Meusel's Bearcat makes a close pass at the Black Eagle Trophy PSS Festival 2012, Capetown, South Africa. Photo by Kevin Farr  
Panasonic DMC-FZ100, ISO 100, 1/800 sec., f4.0, 52.1 mm

# R/C Soaring Digest

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## In the Air

Forty-two pages of this issue are devoted to aerotow event coverage, starting with the International Vintage Sailplane Meet at Elmira, New York, then the New England Aerotow in Salem, Connecticut, and closing out with the Quebec Aerotow held in Lacolle. Our sincere thanks to Steve Pasierb of [rcaerotowing.com](http://rcaerotowing.com) and Wayne Richardson for supplying the photographs. We're hoping this will entice some readers into getting involved in a new aspect of RC soaring. Getting your power plane friends to pilot a tow plane now and then may open new vistas for them as well.

It's been a while since a full size sailplane walkaround appeared in *RC Soaring Digest*, so we're pleased to be able to include one in this issue. The photographic skills of Mark Nankivil are once again on display, this time showing the Mü 13d-3, a rare glider from the 1940s. N13MU is owned and flown by Leland Cowie, and Leland has graciously offered some background information on his 'ship and his impressions of its flying qualities. This would be a wonderful glider to model in large scale, perhaps 1:3, for aerotowing of course.

Our friends in the Central Region of Argentina have recently put up a web site focusing on electric powered sailplanes and the FXJ events in thier locale. Check it out! <<http://fxjregioncentro.blogspot.com.ar/>> You can use Google Translate <<http://translate.google.com/>> to read the site in your language.

Time to build another sailplane!



# RC Soaring at the International Vintage Sailplane Meet 2012

*Going small in a big way*

Can full scale and model scale co-exist at the same facility? In a word, yes. RCAeroTowing.com, the National Soaring Museum, the Vintage Sailplane Association, Harris Hill Soaring Corporation, and the International Vintage Sailplane Meet successfully delivered on this unique collaboration as we joined together to host the 2012 Harris Hill Vintage RC Soaring Aerotow on July 5-7 in Elmira, New York.

Flying large scale RC sailplanes from the National Soaring Museum (NSM) site holds a special place in the hearts and memories of many in our hobby. Back in 1996, Robin Lehman of Sailplanes Unlimited, John Derstine of Endless Mountain Models, Chris Wahl, Jim Blum and others put on the first Elmira Aerotow. That first event was not up on Harris Hill, rather down in the town of Horseheads at a local RC club field. Given the great response and a packed

flight line, the event moved to Harris Hill the second year.

Then, just as quickly, the event went away. More than a dozen years passed with no organized affair at Harris Hill. As the 2012 International Vintage Sailplane Meet (IVSM) approached, those of us at RCAerotowing.com (RCAT) and the team at the NSM struck on the idea of bringing RC soaring back by specifically featuring vintage models. Ron Ogden,



*The whole reason we came. Flying from Harris Hill right in front of the National Soaring Museum while surrounded by a field packed with vintage full-scale airplanes.*

Development & Marketing Director of the NSM played a key role in brokering the relationship between the different groups. The result? Another great contingent of RC fliers turned out and once again scale models were flying over the “Soaring Capitol of America.”

The designation of “vintage” conveyed from our partners at NSM is that a vintage sailplane is any glider out of production since 1958, or a more recently built glider with appearance, performance and construction

characteristics similar or comparable to gliders manufactured before 1958. A classic sailplane is a glider that is at least 25 years old, but is not categorized as a vintage sailplane.

Models flown during the event ranged in wingspan from three to nine meters. There was a beautiful Schweizer 1-26 in 1:4 scale built from the Skybench Aerotech kit , a companion scratch built Schweizer 1-23 in 1:4 scale, a CNC Bayer / Rosenthal ASK-18 in 1:3 scale, a Let Model 5-meter DHS Reiher, a SG-38

primary gilder from the Vintage Sailplaner short kit, a scratch 1:4 scale Maupin Woodstock, a 1:3 scale Foka, and two stunning 1:3 scale Polish IS-4 Jastrzab sourced from Old Gliders, among many others.

True to scale, we were towed by the new 1:3 scale Hangar 9 Piper Pawnee. Many in the IVSM group commented there was never a full-scale Pawnee tow plane that looked that good. The Pawnee was powered by at Desert Aircraft 100L engine turning a Vess 27B propeller.



*The full scale Jastrzab sailplane was known for speed, ability to dive vertically, and decent aerobatics. The model is very much*

*the same in that it tows well and can then dart around the sky doing pretty much whatever the pilot asks.*



*The allure of the newly refinished Harris Hill runway was just too much for the group. Even with a grass strip, we all had to get our tastes of flying directly from the tarmac of the Soaring Capitol of America. The black marks on skids and wingtips from landing was absolutely worth it!*



*Tom Mavaro's Woodstock gets its turn behind the Pawnee. These two look perfect together heading to the skies above Harris Hill – part of the majesty of scale soaring.*

We also employed a Top Model Pilatus Porter to do some towing. The Porter, set-up with a DA120 is simply a perfect platform for aerotow.

For those who have not yet experienced the joy of towing, remote controlled aerotow is accomplished very much in the same manner as full-scale. RC scale sailplanes are outfitted with nose or belly release mechanisms activated by a high torque, metal gear servo. The tow plane has a similar release placed on top of the fuselage at or slightly ahead of the

trailing edge of the wing, rather than the typical tail tow point in full scale. A popular misconception is that the tow plane release goes on the center of gravity point. This provides an unstable tow, and the approximate trailing edge point is vastly preferred. A 100-125' tow line unites the models in flight.

Once the sailplane pilot gives the tow plane pilot the nod to take off, it's a coordinated flight to altitude. At the most basic level, the sailplane pilot focus on keeping wings level, using aileron

inputs only, and simply follows the pull of the tow plane to altitude flying directly behind and slightly above the tug. Wind can complicate matters requiring rudder input to keep the sailplane on an outside line in turns. Sleek composite models can also tend to catch-up on the tow plane in downwind segments of the tow requiring the glider pilot to deploy airbrakes to keep the towline tight and not risk overtaking the tug. The riskiest part of this dance? The first ten seconds as the sailplane gathers enough



*A companion blue 1:3 Jastrzab owned by Vladimir Holis on tow from the main runway early Saturday morning.*

speed to become airborne behind the tug. Crashes that are both extremely unfortunate and spectacular most frequently occur in that brief ten second window. None occurred at Elmira.

After great soaring conditions on Thursday and Friday, Friday evening towing amounted to nothing more than getting sailplanes a hundred feet or so above the end of the Harris Hill runway. A strong wind from the valley below and fantastic slope lift dominated. Everyone

had a blast! Drifting back over the center of the airport (the airport was closed at this time) and making low speed runs down the runway and back out into the lift seemed to be standard practice. There were a couple hour plus flights put in that probably never went over two hundred feet in altitude.

As the weekend went on, the model flyers cheated a bit and brought out stunning modern sailplane models including a 6.6-meter span Arcus

manufactured by H Models. A Discus or two also snuck into the action.

When not flying RC, participants went for flights in full scale 2-33s and ASK-21s operated by Harris Hill Soaring Corporation, toured the amazing array of full scale vintage gliders on the field and visited the National Soaring Museum exhibits. For example, Friday started with folks arriving to fly at 7:00 AM and not leaving the field until 8:45 PM. That's a full day of soaring!

Saturday morning, towing started at 7:30 AM. Soaring conditions were once again perfect and the gang flew up until 11AM when folks, tired from three long days, began to pack and head for home. This was fortuitous as skies quickly darkened and a series of violent thunderstorms rolled through the Chemung Valley by noon. After more touring of the museum and photo taking, everyone was on the road home by mid afternoon. The Saturday evening flying session never happened, but all were happy.



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*A fully articulated pilot occupies the seat in Erich Schlitzkus' beautiful SG-38 built from the Vintage Sailplaner short kit. The head moves left-right while the hands follow the stick and feet follow the pedals. Complete "how-to" construction article at <<http://www.rcaerotowing.com/1340-pilot-animation.html>>*



*Erich Schlitzkus chose a different path on the scale detailing of his SGS 2-32, so he recruited a couple pilots who would not be able to pass the company drug test. Here Cheech and Chong do the duties taking the Schweizer “Up in Smoke.”*



The National Soaring Museum and RCAeroTowing.com hope to bring scale model sailplane flying back to Elmira as an annual event. There is also strong interest for RC to make a repeat appearance at the next IVSM.

To learn more about RC giant scale soaring, point your web browser to <<http://www.rcaerotowing.com>>.

The National Soaring Museum can be found at <<http://www.soaringmuseum.org>>.

The Vintage Sailplane Association is at <<http://www.vintagesoaring.org>>.

Harris Hill Soaring is located at <<http://www.harrishillsoaring.org>>.

*Ace F3J and F3B soaring competition pilot Mike Lachowski knows how to relax and yet also wring out a scale sailplane at the same time. Here Mike returns from another flight with his 1:2.9 scale Bruckmann Foka.*



*No, that's not a model. It's a beautiful full-scale 2-33 landing at the far end of Harris Hill on Friday morning. Perspective makes it look much much closer than it really is.*



*Mike Zakowany's beautiful Polish Jastrzab on final approach after another high speed run. On one flight I swear he raced the tow plane down looping and rolling, beating it resoundingly and was ready to tow again when it landed. He pushed this plane hard and it rewarded him with spectacular flying in return. The full scale Jastrzab was capable of speeds approaching 280 mph. Only 35 were ever build, starting in 1949.*



*Erich Schlitzkus scratch-built this stunning Schweizer 2-32 from the Chris Williams plan set did double duty in one July 4th holiday week first at a vintage event in Newark, DE and then up north in Elmira, NY. The wings are vacuum-bagged composite while the fuselage is built up. It stops the crowd on tow and in high-speed passes. A work of art. Photo credit: John Kirchstein*



*It's not a trip to Elmira, NY without honoring the memory of all the Schweizer sailplanes built in the Chemung Valley through the years. This is the tail of Erich Schlitzkus' SGS 2-32.*



*A fantastic-flying Woodstock built and flown by Tom Mavaro of Connecticut. Tom was “Mr Spot Landing” throughout the event, never coming to a stop more than a few paces away from where he stood. Tom went home with a set of full-scale Woodstock plans given to him from one of the IVSM participants. He’s gonna need a bigger basement!*



*The author's Schweizer 1-26 constructed from the Ray Hayes Skybench kit and reconstructed with parts from Tom Martin at TMSS. This 1:4 scale model has countless flights through the years and is still a great performer.*



*Erich Schlitzkus of Pennsylvania assembles his meticulous SG-38 primary glider. There is a lot of rigging that goes into getting this plane ready to fly. A video of it in flight can be found at: <<http://www.facebook.com/RCAeroTowing>><http://www.facebook.com/RCAeroTowing>*



*Len Buffinton of Connecticut finds himself strategically located at the valley end of the Harris Hill runway right between his 1:3 scale Hangar 9 Piper Pawnee tow plane and his gorgeous 1:3 scale Let Models Reiher in a custom paint scheme*



*The author's Bayer-CNC Modellbautechnik wing / Rosenthal fuselage ASK18. This plane was originally constructed by Tom Augustine in California. The tip stall can be brutal if flown too slowly, but otherwise it's a rewarding plane to fly and just look so "right" in the air. This 1:3 scale model has had a long life and is now sporting fresh fuselage paint and graphics. The Axel pilot bust looks eager to get back into the air for a sunset flight.*

*Fabric-covered and detailed airframes just look so good. Even better when the flying surfaces get to glow in the sunlight.*



258: Gudmund Thompson of Ontario, Canada cheated on the whole vintage sailplane theme and flew his Ventus like he stole it. Here it's on tow on Thursday evening.



# New England Aerotow

Salem, Connecticut May 18 - 19 2012

Photos by Wayne Richardson, waynerichardson3@cox.net  
with captions by Steve Pasierb, steve@rcaerotowing.com





*Sometimes it takes a team. Fixing a stuck landing gear without disassembling a model takes muscle and coordination.*



*Above left: Roger Kleinert flying his distinctive green and yellow Ka6, heads out for another flight behind the Pawnee tow plane.*

*Above: Steve Pasierb makes it to the head of the tow queue with is sleek 6.6 meter Nimbus 4 from HKM Modellbau.*

*Left: Tom Mavaro hooks-up his 1/3 scale Woodstock to the tow line.*



*Above: Grass? A loose bolt? Don Chamberlain is trying to shake something out of the cockpit?*

*Opposite page: A beautiful Schweizer TG2, owner / builder are unknown. The attention to detail can be seen in the TG2's exterior finishes and the cockpit detailing gives the TG2 added impact.*





*A Top Model Pilatus Porter with a DA120 engine shared towing duties with the Hangar 9 Pawnee.*



*The rather small looking flaps on the Pawnee actually work very well and the plane is a pussycat to land.*



*Tom Mavaro scoops up Don Chamberlain's 4.4 meter Valenta Fox from the flying field.*



*There is a bit of a competition going on between clubs on the East Coast. Who can tow the most sailplanes at one time? The previous record was seven planes on one towline by the Silent Knights Soaring Society. Here, the Propbusters group tries to up that total to nine!*

*Many of those planes lacked aileron control, and the polyhedral Dutch rolls began. The Pilatus Porter tow plane climbs steeply to keep speed down.*

*Lots of fun, and lots of CA glue afterward.*







*Opposite page: The Discus on final over the Probusters' field, the lush grass runways are surrounded by hundreds of acres of corn just sprouted.*

*Above: The Discus gets closer to the ground.*

*Right: Charlie Reeves of Delaware campaigned a huge 50% Ka6 sourced from Bill Hempel's Team Edge. The pilot figure looks happy to be in Connecticut.*





*The Woodstock floats so beautifully that the power plane hardly indicates there is a glider in tow.*



# Parlez-Vous Les Arpents V'air Quebec Aerotow? Scale Soaring near the United States / Canada border

Steve Pasierb, [steve@rcaerotowing.com](mailto:steve@rcaerotowing.com)



Quebec is the only Canadian province where the official language is French. By simply crossing a line on a map, in some ways it's like entering another world. A wonderful people proud of their heritage and language, a beautiful natural landscape and a dedicated group of soaring

nuts (enthusiaste!) make for a most enjoyable three-day weekend. The 2012 Les Arpents V'air Aerotow held July 20-22, fully delivered on the promise of great flying and warm hospitalité.

Held in the small town of Lacolle, just a scant few miles over the international border, the event drew heavily from Quebec and Ontario, but also from the New England states in the USA. Lacolle is in farm country and one of the local crops is turf grass. Acres and acres of beautiful sod located in the middle of miles of corn, soybeans and cows with

the occasional church spire or silo rising above. It is a geography that makes for a bounty of thermal generators. On this particular July weekend, low humidity, cooler temperatures and big puffy cumulus clouds maximized the potential of this bucolic soaring site.

Aircraft Modelers Research (AMR) of Canada was a major sponsor of the

event and this support included bringing their tow planes into service each day. An AMR Payloadmaster 100 and an AMR Air Tractor 401-B, both with Moki radial engines and flown by Michel Renaud, provided the base support. The Les Arpents V'air club and rcaerotowing.com also put their Top Model Pilatus Porter tow planes into service. Since both Porters, flown by Len Buffinton and Daniel Plouffe, were originally sourced from ICARE outside Montreal, it just seemed right. The range of these and other tugs meant that sailplanes from small two-meter foamies to a 95 pound, 9-meter Paritech DG-1000 were able to take to the skies at will.

With the 9-meter DG-1000 topping the list, a pair of 8-meter span H Model Duo Discus models came in next followed by a 7-meter Hans Muller Salto. A flock of various makes of Ka6 sailplanes were also in the air, most in 1:4 scale. A nice new 1:3 scale 6-meter Let ASH26 successfully made its maiden and several additional flights. Two other ASH26 models also saw action. There was a 4.5 meter Valenta Fox and a good looking 4.5-meter Cirrus v-tail. Fiberglass and

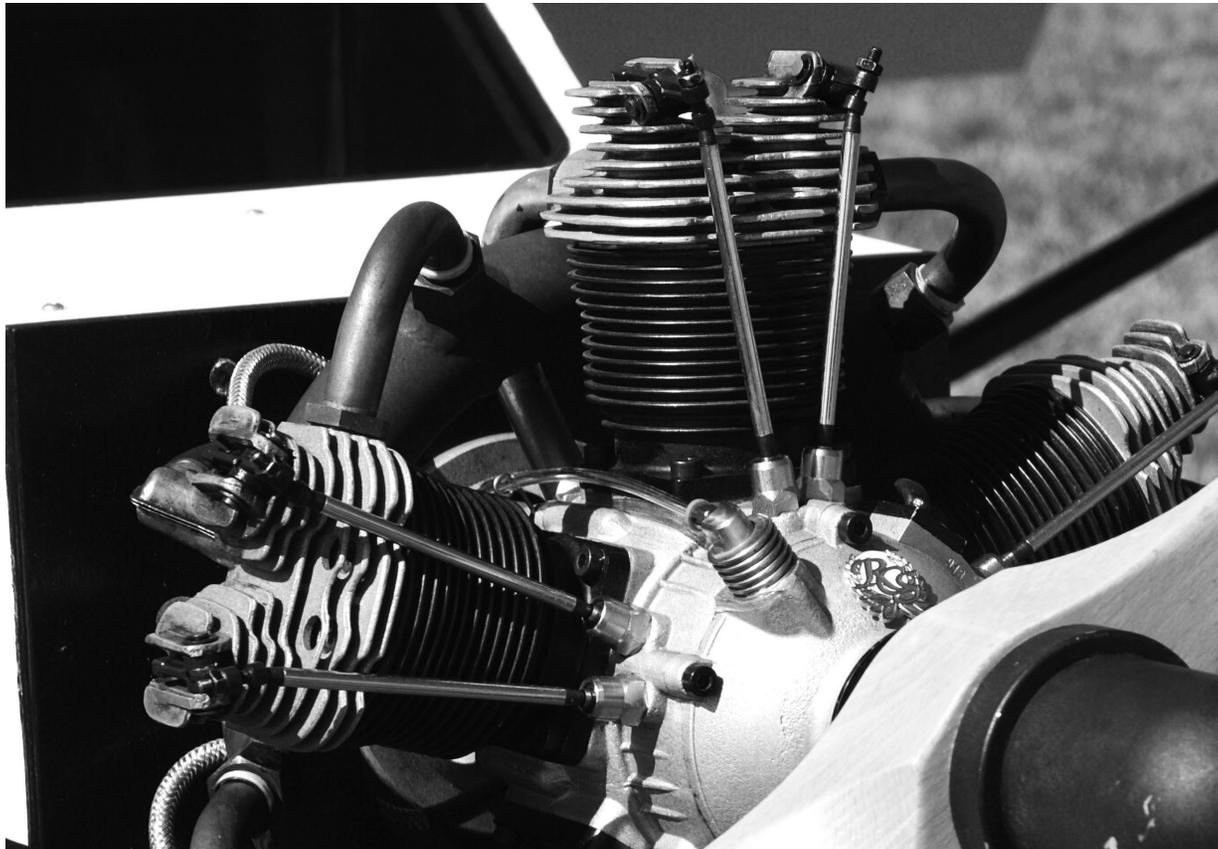
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*A beautiful machine. The big radial engines sound great on idle and spectacular at full throttle when towing. Here, a MOKI radial pictured on the business end of an AMR Payloadmaster 100.*

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*Title page: The AMR Air Tractor climbing out with a 1:4 scale Woodstock tucked in close behind.*



carbon did not rule as there were also a number of built-up airframes flying including a Minimoa, Woodstock and a Blanik among others.

Carnage was kept to a minimum with the only notable loss being a 1:5 scale DFS Kranich which folded a wing on tow when speeds got excessive. This unfortunate event is another good opportunity to point out that active communication between the sailplane pilot and tow plane pilot is essential. And, ultimately it is the responsibility of the sailplane pilot to abandon a tow that is going wrong. Regrettably, the plane was lost deep in a massive corn field and not recovered in spite of an extensive search.

Otherwise, the hallmarks of the 2012 annual event were flying, laughing, eating and hauling away piles of prizes. The ideal soaring conditions had a core group out on the flight line from morning into the early evening on Friday and Saturday. A lunch wagon cooking daily hot lunches meant nobody passed out from starvation. Each of those many sailplane and towplane flights earned the respective pilot a raffle ticket. By the time Saturday night's "way too huge" banquet dinner and raffle arrived we were fat, happy and well-stocked with raffle tickets ready to win.

AMR and the other sponsors went all out. AMR clearly met the definition of "over the top" with several very expensive engines, gift certificates, parts and logo swag contributed to the raffle. Sponsors and raffle contributors included

- Aeroworks,
- Balsa USA,
- Castle Creations,
- Hobbyco,
- Micro Fasteners,
- Mirage 2000 cleaning products.
- Arvika.ca bike racks,
- Bob Smith Industries,
- Canadian Tire,
- ICARE-RC,
- Usinage DDR, and

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*There is just something so right about the wing planform of the Schempp-Hirth Duo Discus.*

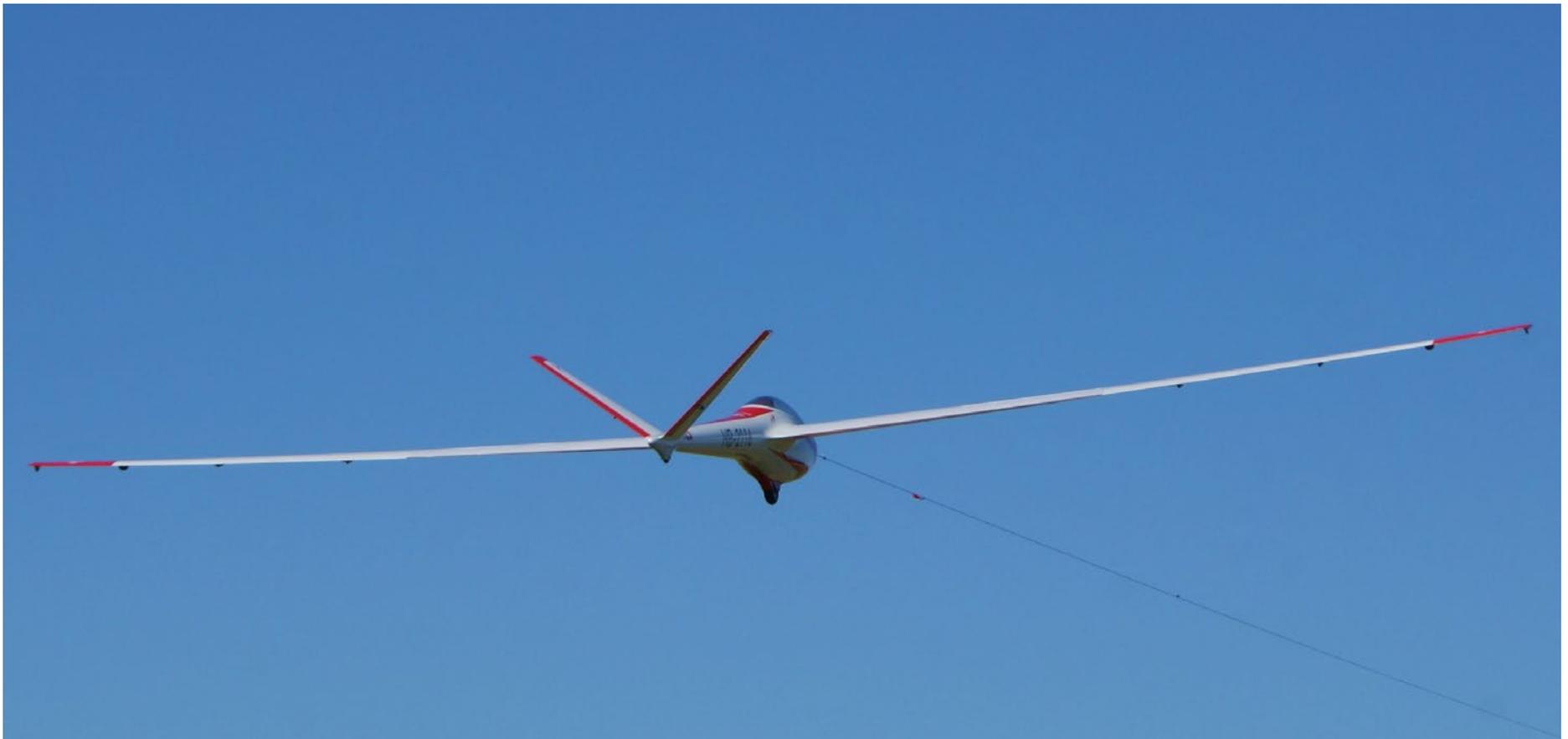


The ICARE donation went to help fund beautiful coffee mugs given to each registrant while Usinage sponsored the large party tent for the banquet. It was an impressive Saturday evening.

Sunday dawned bright blue and quite windy. Once again the faithful assembled at the field, but with a bit the wind out of their own sails. By 1:00 PM all had a few great flights and interesting landings

and were thinking more about the drive home. Everyone expressed their appreciation to the wonderful group of club members and volunteers from their families. The club team worked hard to produce a successful event. With many pronouncements of “très bon” and “merci” and “vous l’année prochaine” a great weekend of flying came to an early end.

The Les Arpents V’air club website is located at <<http://www.lesarpentsvair.com>>. An extensive collection of photographs can be found in the Events Section at <<http://www.rcaerotowing.com>> discussion forums. Making a trip to lower Quebec for the 2013 event will be well worth the effort for anyone who loves big sailplanes, big lift and wide open spaces.



074 The big Salto heads out on tow for another round of far too many loops, rolls and Lomcovák maneuvers.



*Seven-Eight-Nine! The 7-meter Muller Salto sits next to an 8-meter H Model Duo Discus which sits next to a 9 meter Paritech DG-1000.*



The author's Duo flying at the event is a 5.3 meter EMS version with wings that are glassed and painted over the obechi sheeting.



*An impressive H Model Arcus spanning 6.6-meters looks fast and impressive just sitting in the grass.*



*Even the hard working volunteers had a smile throughout the weekend. The club members and their families worked their tails off!*



*Michel Renaud at the controls of the AMR Payloadmaster 100 next to Len Buffinton as they tow Len's 6.6-meter Arcus.*



*Another Ka6 headed back to the pits after a successful flight that leaves its pilot smiling. Ka6 was the popular bird at this event.*



*An excellent-flying Ka6 model owned by Brain Buchanan of Ontario just about to touch down on the center runway.*



*A 5 meter HF Model Discus on final after coming home from a distance, low over the corn.*



*Left: Daniel Plouffe scratch-built this beautiful Alpha Cub that he uses as a back-up tow plane to his Top Model Porter.*

*Below left: The ARM Payloadmaster 100 is an excellent workhorse airframe for sailplane towing duty. The radial is way cool, but a big DA150 or DA 170 would be the bomb!*

*Below: Note that the Air Tractor uses a bridle tow set-up with a standard release mechanism on each side of the fuselage. It's posing here with a Top Model Pilatus Porter.*





*Don Chamberlain's 6-meter Let Model ASH26 about to touch down after its maiden flight.*



*The Air Tractor makes for great looking tow plane. Yet another landing and quick turnaround, then back in the air. Note the bridle tow line set-up.*

# F3J World Championships in South Africa

Sydney Lennsen, sydney.lennsen@virgin.net

25 July 2012

Approaching the eighth FAI F3J World Championships in South Africa I began to itch with gossip. Two years ago after France I decided to give up gossiping, perhaps a sign of old age, certainly it was getting harder to plough through my disorganised F3J documents for names, results and the dramas which paved the way since 1998 in Upton.

But the urge to tap the keyboard is still strong, the excitement of the forthcoming championships is real, and for the first time sadly, I shall not be there to witness this trial of the best thermal soaring pilots and their teams in the world. London's Olympics - forget them - just look out for Michelle's big contest!

And I know after last year's Eurochamps in Bovec from the number of friends who bemoaned the demise of Uncle Sydney, that the popular read was the betting on who will make the flyoffs. That should be easier this time because we only need

the recent form of 58 senior pilots and 21 juniors.

What a pity that for some teams the expense of travelling to what so many people reckon is the most beautiful country in the world has been too much. But the pilot I shall miss most is Philip Kolb, not in the German team for once, and now that he has made Turkey his home, he is not yet in the Turkish team. At least he and his presence will be there.

Trying to pick the winners made me realise just what a pack of tried and proven past winners will be vying for the flyoffs. I ticked off 20 pilots, any of whom could take the contest, never mind the last twelve. Of course it might not be twelve, the contest director might add or take off one or two. But how to narrow the list to twelve!

Carl Strautins from Australia retains his bubbling enthusiasm, and David Hobby will be eager to come back after his sad

problems in France. Arend Borst from Canada has not won since Lappeenranta and is the only pilot I know who will take off his servo cases to save a gram or two.

Arijan Hucaljuk from Croatia who startled us all with his mighty one second preliminary round launches by his father and won in Bovec last year to become Eurochamp, is a strong contender even if the team has only two pilots. Germany has Benedikt Feigl, Turkey's 2008 winner, and Tobias Lammlein, junior world champ in Finland and rarely off the podium anywhere.

Italy and particularly the Gallazia family have established F3J successes for many years and Giovanni Gallazia will not have studies in the US to distract him this year. Can New Zealand repeat the triumphs they have achieved since Joe Wurts changed countries just a few years ago? You can't keep him down in F3J or F3K.

Jo Grini and his son Fredrik will be in the Norwegian team with Aril Rosvik, and I hope that Jo will have no quarrels with the rules or timing this year and concentrate on making the final rounds. Poland were strong in Bovec last year and Wojciech Byrski's models and his piloting skills will make him a favourite. Jan Littva, the younger, from Slovakia will be competing with his father, also Jan Littva, but I do not see any conflict of interest except when it comes to the scores.

Primož Rizner from Slovenia has a consistent knack of sticking with the leaders and their team is strong. Missing name from the South African team is Craig Goodrum and I guess that his omission stems from the support he is giving to chief organiser Michelle and the whole event. Turkey will be more determined than ever to keep their team triumph in Bovec and you could pick out any one of the team for the final rounds. I go for Eser Kismir.

I wish the UK team all the best, and from the forecast weather conditions, the South African flying experience could be far closer to UK conditions than is usual in FAI championships. On their day any one of the three could make it, but with four or five days to fly, they will need a little luck or some of the London 2012 fervour from home.

The United States of America have probably got the largest team on the sod farm, with defending champions Daryl Perkins and Brendon Beardsley, junior but now senior pilot, added to their official team of three pilots. Glad to see that Jim Monaco has come back into the fold as team manager.

That still does not reduce to twelve. My guess list is: Carl Strautins, Arend Borst, Arijan Hucaljuk, Tobi Lammlein, Giovanni

Gallazia, Joe Wurts, Joe Grini, Wojciech Byrski, Primož Rizner, Eser Kismir, Cody Remington and Daryl Perkins. The 2012 champion to be: my bet would be that Arijan will become the first pilot to win both Euro and World championships in consecutive years.

My biggest wish is that everyone taking part has a wonderful sporting championships.



*The one thing NOT predicted by Uncle Sydney for the 2012 F3J World Championships - snow. Photo courtesy of John, Moreton Region Sports Soaring Association (MRSSA), Australia*

# Rebuilding an Old Radio

Pete Carr WW30, wb3bqo@yahoo.com

There is a Yahoo web group devoted to the Ace MicroPro 8000 and MicroStar 2000 radios.

The people who hang out there are modelers who enjoy building and rebuilding radios as much as models. I have two MicroStar 2000 rigs and enjoy reading about the various mixing abilities put to use by modelers around the world. It was with some surprise that, a few weeks ago, I saw a comment offering old radios to anyone who could use them. They were free. All that was needed was to pay the shipping costs.

The attached pictures were of some World Engines transmitters and airborne gear. I still fly a World Engines Expert 5-channel AM radio on 53.3 MHz and have a ball with it. Kent, who was offering the equipment, was glad to hear from me and we agreed on the shipping costs. Last week a fairly large box arrived and opening it was like Christmas morning!

The radios inside were four transmitters, seven receivers and 22 servos, mostly

World Engines manufacture, but some that I'd never seen before. Specifically, there were some Valair servos in the group. These were physically the same as World Engines S-5 standard size servos but red in color and with a different circuit board. Also, the plastic gears were much larger and stronger, similar to retract servos. Most all the airborne gear used the classic 4-pin connectors with the silver plating which, 30+ year on, had turned midnight black.

As is the case with radios of this age group, the batteries were left in the transmitters and had turned to a mass of white powder. I removed that mess and scrubbed out the interior of each transmitter case. Water and Dawn detergent and a tooth brush does a great job on the aluminum.

After the bath each unit was left to dry out for a day.

There were two Noble on-off switches in the group so I cleaned the contacts with a mixture of tooth paste and alcohol

using a tooth brush. They cleaned up really well and showed no sign of being intermittent. Then I checked the wiring on the connectors on the wires from the switch. The equipment was made before they invented shrink tubing so bits of plastic tubing covered each solder joint to prevent breakage due to vibration. That stuff was hard as rock so was removed in favor of some new shrink. The wires were okay so I tied them in place at the switch ends using dental floss. Some Noble switches had a plastic cover over the terminals. These did not so I coated them with a layer of RTV clear insulating sealant.

The battery space in the transmitters is similar to Futaba radios where the battery is made up of two 4-cell packs laid out end to end. I build a test pack shaped this way and stuck it into the space using a dab of RTV gel. The old pack had been hard wired to the transmitter without any connector or fuse. I guess World Engines didn't think the battery would ever go bad! Anyway, I installed a 3-pin Deans

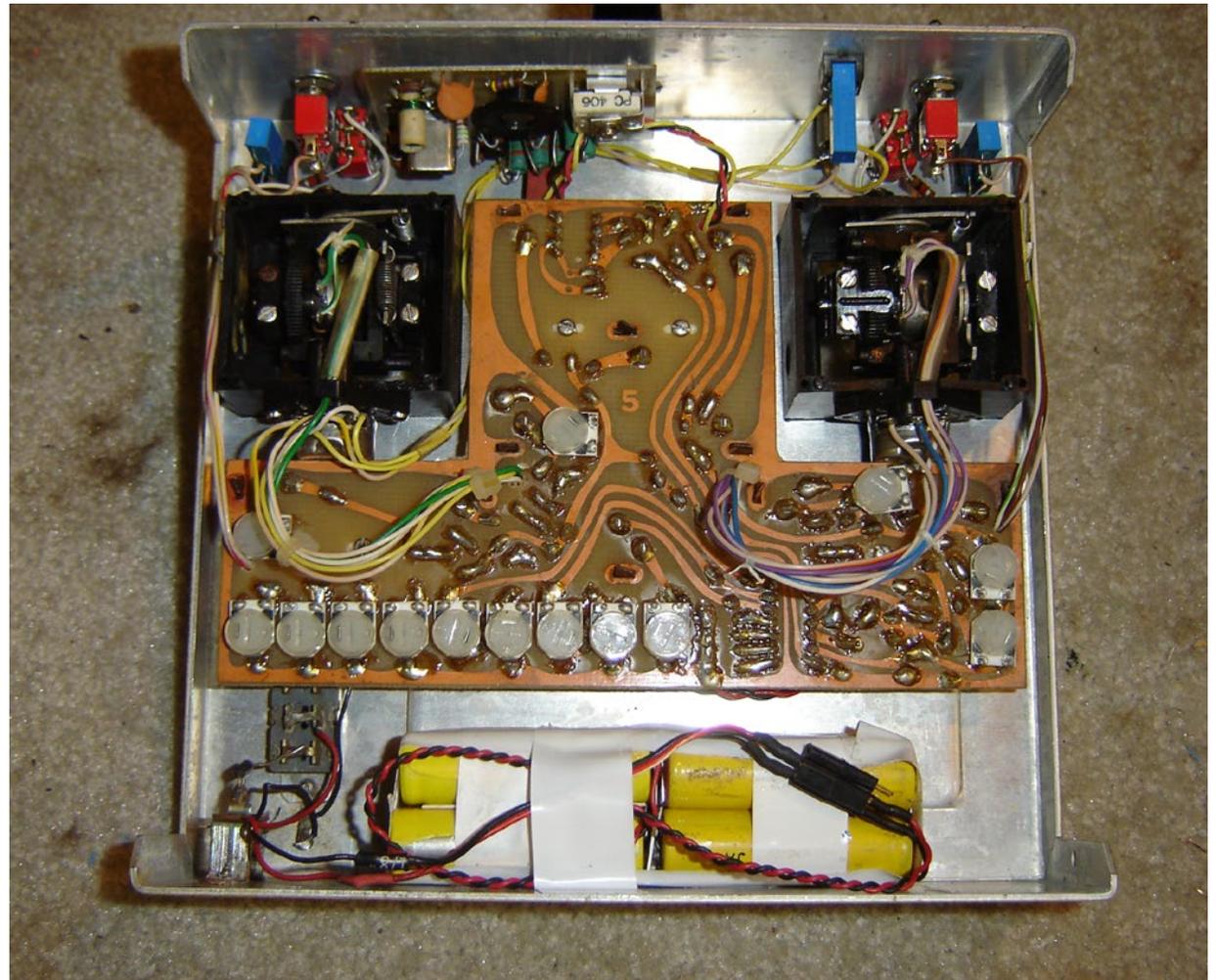
connector in the wiring. That allows me to work on the circuit boards and sticks with the power disconnected.

The Expert 7-channel radio is of particular note because it contains a separate encoder board and RF deck. Most all the other World Engines radios had the two combined on a single board. The encoder takes resistance data from the stick pots and forms a data stream of a clock pulse followed by seven channel pulses. The channel pulse width varies according to the associated stick position. This data stream is then passed to the RF deck where it turns the RF on and off controlled by the various

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*The transmitter battery is at the bottom of the case with a 3-pin Deans connector.*

*Pots along the bottom of the circuit board set each channel neutral to 1.5 milliseconds. The RF deck is attached to the case top near the antenna matching network in the small box.*





pulse widths. This is the old amplitude modulation scheme. Its main drawback is that, while the transmitter RF is switched off, the receiver in the aircraft is able to hear noise or interference which would drive the servos to one end or the other. This interference or “glitch” has sent many a model into an unscheduled landing sequence!

To make matters worse, The RF generated by the World Engines transmitter is lower in power than the other transmitters of the day. I questioned this many years ago and was told that it was the only way World Engines could get long enough battery life out of the transmitter pack.

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*The front of the transmitter has the power switch at the lower right side. Dual rate switches are at the top corners with access holes next to them. A small screwdriver can adjust pots inside the case that set the amount of travel in half rate.*

It probably wouldn't matter to power pilots who keep their models in close. Sailplane pilots, on the other hand, stretch the range to impossible lengths and could fly out of range, even if the radio was working correctly. Back in the 70s I had this happen to me at the Canadian Nationals at the Huron Park airport north of London, Ontario. I was flying a Sailaire in a field that was flat as a pancake and in dry hot weather that was like a typical Arizona day. I was circling in some weak air when the ship quit responding. I took off at a fast trot holding the transmitter as high as possible and finally got the ship back in range. I probably looked like an idiot during this event but radios of the day were prone to this sort of range trouble. Next I checked the receivers. They are made up of two circuit boards sandwiched into a plastic case and separated by an plastic insulator. One of the receives didn't have this insulator so would have smoked if power had been applied. One board contains the

receiver and the other is the decoder. The incoming RF is demodulated on the receiver board and passed to the decoder input. The clock pulse tells the decoder that the next pulse is the channel-1 data pulse. That data is sent out the three-wire cable to the channel-1 servo. The second pulse following the clock pulse is channel-2 and so on. This arrangement makes troubleshooting easy. If all the servos jitter or run to one end then the trouble is usually in the receiver. If they don't move at all then the trouble is in the battery, switch or the power path in the receiver/decoder. If the servos jump once when power is applied and then won't respond, that usually means that the receiver crystal is broken.

These receivers all worked so I just checked the soldering and looked for frayed wires and set them aside.

The servos, particularly the Valairs, were very interesting. Servos of the era were made up of three parts. The case held the gear train with a place to hold

the electric motor. The motor itself had two wires from the circuit board along with a capacitor that quieted brush noise. The circuit board routed power to the feedback pot, and powered the motor in one direction or the other depending on the incoming pulse width. The feedback pot told the board where the servo output arm was presently located. This information was compared to the incoming pulse width and the motor moved the arm until there was zero difference between the two. Then the motor would stop until a difference developed again.

Thirty year old plastic is very brittle. I expected to see damaged gear teeth and was surprised that they all looked great. Similarly, the wiring and solder joints were tight and bright with no sign of age. The only obvious problems were at the connectors where age and vibration required that all the wires be reconnected using shrink over the joints.



As mentioned before, the transmitter uses an RF deck that generates the carrier on 72.400 MHz. This Rf is passed to the 10-section telescoping antenna. Antennas of this type can go open between sections over time so I tested it from end to end using a multimeter on the ohms scale. Typically the resistance should be less than a couple of ohms and should not change when the antenna is flexed. Sometimes they can be saved by adding DeOxit fluid to the joints. This is a red liquid that cleans corrosion from electrical connections and is excellent for working on R/C radios. If the antenna is intermittent, the RF will drop when the pilot moves the transmitter as when walking. The resulting “glitch” will go away when the pilot remains motionless.



*Upper: The World Engines receiver is at the top and is cube shaped for easier installation in the model. The Valair servos are standard size with good power and very robust gears. These are the most powerful servos I've seen that didn't use rare earth magnets in the servo motors.*

*Lower: At top left is a Kraft linear servo and below that is a low-profile World Engines linear servo. At bottom left is an Ace Bantam Linear servo. These linear servos also had rotary output. At top right is a World Engines receiver and below are two Valair rotary servos, one standard size and the other a mini.*

The last test was to look at the data pulse train at the transmitter encoder output and again at the input to the receiver decoder. There are many electrolytic capacitors in these radios which can dry out over time. The result is a distortion in the shape of the individual pulses. Obviously, if the capacitor goes short then the circuit won't work at all. The test of the data pulses will show if any capacitors are close to failure.

While working on the World Engines Expert I was reminded of the spring of 1976 when my son Jeff and I were preparing for the trip to the AMA Nats. Jeff flew an Expert on 72.400 MHz (orange and white colored antenna flag) and crashed his sailplane in practice. It cracked the receiver crystal so I quickly packed it up and sent it to the factory with a note about needing it back for the Nats. Less than a week later the receiver arrived back with a new crystal and a note saying there was no charge and wishing up good luck in the competition. That was very nice of the them and

remains a fond memory of them which Jeff and I share.

Back in 1991 when narrow band radios became a requirement for 72/75 MHz band, radios like the Expert were stuck in a drawer and forgotten. Their single conversion receivers wouldn't handle 25 Khz spacing and the transmitter signals were a bit wide for the new specifications. They worked perfectly well but the technology had moved on. Then came digital TV and the TV channels from 2 to 6 went away. This means that the nearby channels 4 and 5 that surrounded the R/C band are gone. Then came the 2.4 GHz band and most pilots moved away from the old VHF R/C band. The result is that the RF atmosphere around 72.400 MHz has gone quiet. There are still some radios in use that would interfere with the old orange and white channel but not many. Adjacent channel interference is still possible but unlikely. That means that it may be possible to safely fly these old radios again.

I'm having visions of finding a Aquila kit and building it as a home for the Expert. A Bird of Time ARF would also make a good combination. Even a DeBolt Champ with a brushless motor and ESC would work well with this old AM radio. The possibilities are endless!

So, if you see an old dude holding a transmitter with antenna that could double as a fishing pole and a great big smile on his face out in the middle of an open field flying an old airplane, it may be me. Please stop and share some stick-time!

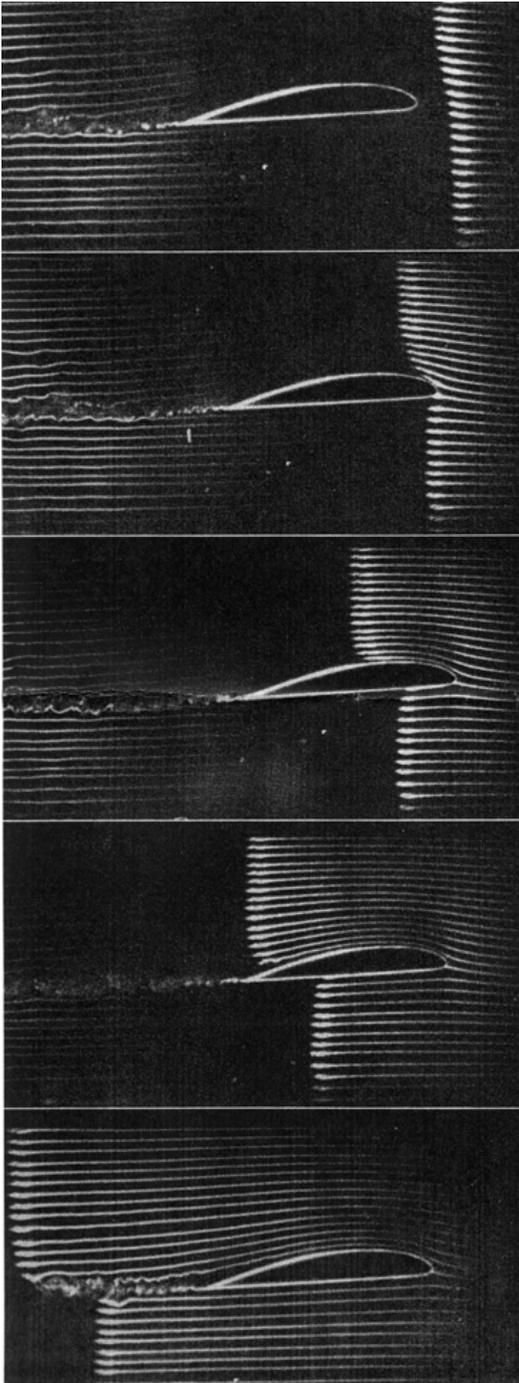
#### Resources:

DeOxit; Corrosion remover  
<http://www.deoxit.com>

RTV sealant; Waterproofer, insulator  
<http://www.lowes.com>

World Engines radios; Manufacturer from Cincinnati, OH  
<<http://www.rchalloffame.org>>





*Alexander Lippisch's  
1955 smoke pulse  
wind tunnel photos...*

*... which should have ended  
the 'longer path,' 'equal transit  
times' notions and associated  
misBernoulliganisms*

Philip Randolph, [amphioxus.philip@gmail.com](mailto:amphioxus.philip@gmail.com)

Alexander Lippisch was the designer of the rocket powered Messerschmitt Me 163 Komet interceptor for Nazi Germany. After eight minutes of furious propulsion, Komets became gliders, and during landing patterns were easy marks for Allied fighters.

After the war, Lippisch was taken to the United States as part of the program to import German scientists, 'Operation Paperclip.' He helped Convair develop its delta-wing planes. From 1950-1964, Lippisch worked for the aeronautical division of the Collins Radio Company of Cedar Rapids, Iowa.

In 1955, in the "Collins Signal," Lippisch published a number of wind tunnel smoke-stream photographs around various wing shapes, including the series shown here. The photographs are crude. The perspective shifts between frames—it appears that he was using a hand-held camera, at various distances, rather than a stroboscope synced with a high-speed motion picture camera mounted on a tripod. He probably selected the most illustrative, from among many, in his attempts to portray roughly even time intervals. Yet they showed the truth, and should have been the stake through the lack-of-heart of the 'equal transit times' notion.

'Equal transit times' was an insidiously popular notion that particles separated

at the leading edge of a wing must meet at the trailing edge at the same time. That such particles must be reunited is a sort of faux-aerodynamic equivalent of quantum entanglement. It was linked with the causally backwards idea that since air over the top of a wing had to follow 'longer path' to get to the trailing edge at the same time as air below, it had to go faster. That was followed by the misBernoulligan notion that the faster speed made lower pressure. That's backwards — pressures are Newton's 'external forces' that accelerate and decelerate flows. Speeds are not forces. Changes in flow speeds are always a result, not a cause.

The truth, as shown by Lippisch, is that flows along the wing upper surface reach the trailing edge well before flows along the lower surface.

The second truth is that the temporarily faster speeds above a wing are caused by the pressure gradient along streamlines. Air is accelerated from ambient pressures ahead toward the lowest pressure above the wing, and then upper flows pile into slower air aft, raising pressures that again slow the flows to near ambient speeds and pressures near the trailing edge.

The third truth is that the low pressures atop a wing are caused by centrifuging. That's another story. But an awkward

truth is that accurate explanations are sometimes more difficult than garbage explanations, especially since, in the debunking, the false notions are pulled further into popular consciousness. Bother.

As you can see from Lippisch's photos, air above a wing at lifting angle-of-attack gets to the trailing edge long before air below.

Even earlier, the opening moments of a 1941 training film by the War Department show wind tunnel smoke pulses over a stalled wing:  
<<http://www.youtube.com/watch?v=dY3daNK1Tek&feature=related>>

Pausing the video shows that even in stall, smoke pulses above the wing move aft slightly faster than those those below. Other footage must have showed pulses by wings not in stall, in which pulses above the wing would have reached the trailing edge long before pulses below. Was this kept secret? Considered iconoclastic, and quashed? Or was it clear experimental evidence simply not recognized as important?

The many attempts to kill the false notion

Oddly, even six decades after Lippisch, a number of aerodynamicists are proudly repeating his results in attempts to dispel the spurious equal-transit-times and longer-path notions. There are

animations and wind tunnel movies, diagrams and photo series, each attempting to put the false notions of 'equal transit times' in the grave. Few recognize that Lippisch was there first. <[http://www.av8n.com/irro/profilo1a\\_e.html](http://www.av8n.com/irro/profilo1a_e.html)> This link opens to an animation of timed flows for wings at various angles of attack, 'Streaklines,' second in a superb series of airflow animations, by Professor

"will finally lay to rest a commonly used yet misleading explanation of how wings lift." It debunks the idea that particles of air, separated at the leading edge of a wing, must again meet up at the trailing edge. 59 years later, it more elegantly reproduces Lippisch's presentation, but without mentioning him.

<<http://www.amasci.com/wing/airgif2.html>> This site has half-a-dozen similar

by NASAconnect from 2007, apparently aimed at misleading youth, includes a video showing equal transit times: <<http://www.youtube.com/watch?v=ooQ1F2jb10A&feature=related>>

It all reminds me of the Eagle's lyric, from Hotel California (another thing that just won't die): "They stab it with their steely knives,/But they just can't kill the beast." Not quite true, for the beast of

*The truth, as shown by Lippisch, is that flows along the wing upper surface reach the trailing edge well before flows along the lower surface.*

Marco Colombini, of the University of Genoa. It's hosted in the U.S. by John S. Denker, Ph.D., Physics.

<<http://www.av8n.com/how/htm/airfoils.html#sec-bernoulli>> Dr. Denker also has static simulations. See Figures 3.11- 3.23 in his excellent, on-line book, See How It Flies.

<<http://phys.org/news/2012-01-wings.html>> This is an excellent article with a one-minute video of pulsed smoke streamlines by University of Cambridge Professor Holger Babinsky. The article says Professor Babinsky hopes the video

demonstrations, including a photo by Lippisch. It has a 1992 pulsed smoke series, remarkably similar to Lippisch's, by aerodynamicist Martin-Ingleman Sundberg, "...who first saw synchronized smokepulses when visiting a windtunnel maker in USA 1962." It also includes this link to two excellent simulations: <<http://www.youtube.com/user/JiggerShah>> courtesy of Jigger Shah and Kartik Venkatraman.

Post mortem, one hopes

Please note that YouTube vids of the false explanation are still out there! Even one

equal transit times is pretty well dead by now. But its persistence has been a wretchedly destructive story. And I wanted to get Lippisch's photos out there.

Acknowledgment: Thanks to Bradley J. Kuennen, Special Collections and University Archives, 403 Parks Library, Iowa State University, Ames, Iowa

Alexander Lippisch's wind tunnel smoke-pulse photos were originally published in the Collins Signal, Fall 1955.



# Southern Fling 2012

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Sunday 4/11 Southern Fling 9 - 2



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# End of an era for Academy's gliders

by Amber Baillie  
Air Force Academy Public Affairs  
7/27/2012

COLORADO SPRINGS, Colo. (AFNS) -- The TG-10C gliders that have been the Academy's sailplane of choice for basic and aerobatic training for the last decade ascended for its final flight here Monday.

The TG-10 trainer, which has been replaced by the new German TG-16A model, was flown for the last time on Academy grounds by Cadet 2nd Class Kurt Luithly, who flew the plane as a check ride to upgrade as a cadet instructor pilot. His evaluator, Lt. Col. Jeff Riddlebarger, an Air Force reservist, said it was one of the best check rides he'd seen.

"Luithly was very successful due to excellent discipline standards and leadership," said Lt. Col. Richard Roller, commander of the 94th Flying Training Squadron. "That's what the soaring program is all about: discipline, enthusiasm, and teamwork."

Twelve TG-10 planes were brought to the Academy in May 2002 and used to give cadets firsthand experience flying an aircraft. The planes are no longer being manufactured, but can still be flown and were transferred to the U.S. Air Force Auxiliary, Civil Air Patrol.

"They were used for 140,000 flights," Roller said. The TG-10 flew as high as 24,000 feet and had a record duration of 6.1 hours.

The Academy has received 15 TG-16s and will import four more. Five are smoke-capable and can perform aerial demonstrations. The remaining 14 are non-smoke capable and will be used for training purposes only.

"I'm really looking forward to training cadets again with the TG-16, as well as taking it on the road to air shows and, hopefully, football games," Roller said. "It's a great recruiting tool for the Academy."

Roller said the TG-16 is aesthetically pleasing and white instead of yellow. It also features a lightning bolt symbol

similar to those on the Falcons' athletic gear.

"It's a good-looking glider," Roller said. "These gliders are a brand-new look for the Academy, a new face to the soaring program, and are made of fiber-glass instead of sheet metal. It's leading-edge soaring equipment."

The TG-16 is an overall upgrade because it's a newer product, can soar faster, and has an extended service life, Roller said.

"The TG-10 had a 28-to-1 glide ratio and the TG-16 has approximately a 42-to-1 ratio," Roller said.

The biggest challenge with the new model has been getting cadets qualified in time to fly the TG-16 and get through the program, Roller said.

"Due to the use of a new airplane, a new technical order had to be written and cadets will have to restudy and relearn how to fly the airplane," Roller said. "A lot of work has taken place behind the scenes to transition to this new model. There is still a lot of work to be done to reach top airmanship, leadership, and victory."

The TG-16s were first tested at Edwards Air Force base, Calif., to ensure Air Force regulations were met before they were shipped to the Academy.

Roller said new cadets began to use the new plane July 16. He said the core of the mission is for cadets to be leaders on

the airfield and run the program on their own.

“We have the youngest instructor pilots in the country and train the most inexperienced,” Roller said. “These young men and women are making life and death decisions flying solo in these

planes. Our goal is to develop leaders of character and I think these new airplanes will help achieve that. I’m looking forward to them excelling in this model.”



## Walkaround

# Leland Cowie's Mü 13d-3 N13MU

Mark Nankivil, [nankivil@covad.net](mailto:nankivil@covad.net)

The 2012 Vintage/Classic Glider Regatta hosted by the Wabash Valley Soaring Association had a number of “new” sailplanes in attendance which I had not seen before at other meets. One that had been high on my list to see and photograph was the Mü 13d-3 now owned by Leland Cowie. The sailplane is one of only two original airframes in existence of this later variant of the Mü 13 which initially appeared in 1943 with a longer fuselage, slightly greater wingspan and a revised vertical fin/rudder arrangement. Leland’s Mü 13d-3 appears to have been built in 1944.

The Mü 13 family started in 1932 with the construction of the two seat Mü 10 Milan designed by Egon Scheibe of the FFG Munich group. The Milan had many exceptional flights and led two German pilots, Tony Trilger and Kurt Schmidt, to build single seat versions of the Milan called the Mü 13. Egon Scheibe helped with the design and improvements incorporated into these new sailplanes. Tony’s sailplane was completed first in 1935 and was named Merlin. Kurt’s ship was completed in 1936, just in time for the 1936 Rhon contest, and was named Atalante.



*Leland Cowie in the cockpit of his Mü 13d-3 N13MU*

Interestingly, both sailplanes were designed to be fitted with a small engine of 12 to 24 hp to convert them into motorgliders. There is a photo of Merlin so equipped (see [http://www.scalesoaring.co.uk/VINTAGE/Documentation/Mu-13/Mu-13\\_documentation.html](http://www.scalesoaring.co.uk/VINTAGE/Documentation/Mu-13/Mu-13_documentation.html) ).

The Mü 13d-3 version first appeared in 1943 and featured a longer fuselage (7.05 meters vs. 6.0 meters for most earlier Mü 13 variants) of triangular cross section (vs. the original rectangular cross section), a revised vertical fin and rudder, and a wing with a slightly greater wing span with ailerons that had a revised leading edge profile out towards the wing tips. It appears that most of these d-3 versions were produced by Schwarzald Flugzeugbau in 1943/44.

The origins of Leland's sailplane are a bit confused as the sailplane was claimed by Canadian forces as war booty in 1945. At the end of the war, many German sailplanes were destroyed by advancing forces but a number were claimed as war booty with many going to Great Britain and France (along with other liberated European countries), but a number came to the United States and Canada as well. The book "War Prizes" by Phil Butler states that the d-13 came to Canada aboard a Royal Canadian Navy destroyer in 1945, along with three Grunau Baby gliders. The long trip across the

Atlantic as deck cargo was rough on the airframe. Once in Canada, the port authority apparently seized it, along with the Grunau Babies, and once that was done, the government did not know what to do with them but were eventually turned over to the National Research Council (NRC). The newly formed Soaring Association of Canada approached the NRC and requested that the four sailplanes be allocated to soaring clubs and that the clubs could use them for research. The idea was accepted and the Mü 13d-3 was loaned to the McGill University Club, later to be brought under the umbrella of the Montreal Glider Council. The Mü 13d-3 was delivered to the club in 1948/49 and soon registered as CF-ZPQ.

The glider was being flown by club members but its condition was rather poor with delaminations in the plywood and problems with its tubular steel frame work. The club had access to the expertise of Canadair Ltd. (aircraft manufacturer) along with many Canadair employees being members of the Montreal Glider Council. Assessment of the airframe pointed out the unique features that gave it its high performance. The plywood D-tube skins were thin and light and plywood of that type was unavailable in postwar Canada. This forced the restoration team to resort to injecting glue into the delaminated areas and clamping them until the glue cured.

The steel tubing of the fuselage structure was thin walled, more so than tubing normally used in aircraft construction, and repairing/welding the tubing was found to be quite difficult. Restoration work was extensive and the sailplane did not fly again until 1952.

Once again flying, it was clear that its performance was exceptional and just months later, was used by Ron Claudi to claim the National Champion title at the National Soaring Meet. It wasn't long though before the condition of the wings became a safety issue and in late 1955, it was placed in storage. In 1959, Walter Piercy purchased the remains and set about building a new set of wings and she did not fly again until April, 1963. Walter flew the sailplane until 1966 when it was sold to Walter Chmela and put to use by the York Soaring Association until it was damaged in a landing accident in August of 1973. Two club members bought the wreck and set about restoring it again. The sailplane flew again in 1974 and appeared at the Antique Glider Regatta at Elmira, New York, where it put in a number of impressive flights. In 1976, the sailplane was again sold and finally in 1990, purchased by Robert Gaines and brought into the U.S.

Leland Cowie has kindly provided some comments on the Mü 13d-3 and his experiences owning and flying it:

“When asked to write about what it is like to fly the Mu-13D/3, I have to reflect on my motivation for flying it in the first place. As a kid, my father built 1/72nd scale models and hung them in my room. My ceiling looked like a recreation of the air battles associated with the opening phases of the Second World War. I remember lying on my floor staring up at various German aircraft such as the Ju-52, Ju-88, FW-189, and a Dornier ‘Flying Pencil.’ I quickly noticed that the only model of a German aircraft with a ‘blown canopy’ was the Me 163 my father built. So, in my young mind, with the exception of the Komet, all Luftwaffe aircraft were supposed to have angular canopies made from multiple panes of glass. That concept was reinforced when it came to playing. Most kids my age played with Hot Wheels cars, but I had an old lunchbox filled with Matchbox airplanes. My collection included a Ju-87 and Me-110, again reinforcing my idea that Luftwaffe aircraft had to have angular canopies.

“My father kept a 1941 Piper J-5A at the Highland, Illinois, Airport, just east of St. Louis. There was a glider club on the airfield. Several members owned and flew a 1944 Grunau Baby IIB. I can still remember being in the pattern and my father telling me to keep my eyes on the Luftwaffe aircraft sharing the airspace with us. Though the war had been over for more than thirty-five years, I still was

intrigued and a little concerned that Luftwaffe was still flying. After that flight, my father, always the historian, explained to me how the Germans had trained their pilots in gliders. In their attempt to skirt the provisions of the Treaty of Versailles, they mass-produced pilots for their air armada using the simplest of flying machines.

“In middle school I worked for my neighbor, a CFI, as his lawnboy and firewood ‘pack mule’ in exchange for flight time in his Cessna 172. I was ready to solo by the time I got to high school; however, I was still too young. So I began flying sailplanes at the now defunct Wentzville, Missouri, Airport, just west of St. Louis. Among the sailplanes the CFIG owned was an LNS-1, a US Navy version of the US Army Air Corps Schweitzer TG-2. I loved the history behind that sailplane. I had become quite a fan of ‘warbirds,’ and though it was a glider, I saw it as a neat piece of military history. Unfortunately, my flight instructor passed away and the LNS-1 was sold before I got the chance to fly it.

“I continued soaring at the US Air Force Academy. In the summer between my freshman and sophomore year, I soloed a TG-4 ‘Finch’ (military version of the Schweitzer 2-33). That fall I spent every other day after class, and both days on the weekend, training as a Cadet Soaring Instructor Pilot. I eventually became an

evaluator on the TG-4 and an aerobatic demonstration pilot/spin instructor on the TG-9 ‘Sabre’ (military version of the ASK-21). Most people think that military gliders were a small chapter in the Second World War; however, the US Air Force continues training cadets in sailplanes to this day. After graduation I began looking for a sailplane of my own; there was no question in my mind—it had to be a ‘warbird’ glider.

“Eventually, my father and I purchased a Grunau Baby IIB from our good friend, the late Bob Gaines. We were under the impression that our Grunau might have been built in England from the captured parts of various German Grunau Babies brought back from the continent following the cessation of hostilities. The more we researched it, the more it became apparent that ours had been built from scratch in the UK. Eventually we found out that the Royal Navy built it for use in meteorological research.

“Several years later, Bob called me and asked if I was interested in purchasing his Mu-13D/3. He explained that he really did not want to sell any of his sailplanes. Due to an upcoming move, he had to sell one of his gliders. He had enjoyed watching my passion for ‘warbird’ gliders flourish as I flew the Grunau. Bob said that of all his gliders, he thought that the only person who would appreciate any of them more than him, was me and



my admiration for the Mu-13D/3. I drove to Atlanta with my parents and spent an evening pouring over the boxes of Mu-related historical material that Bob had accumulated over the years. As we went to leave the next morning with the Mü in tow, Bob pulled me aside and cautioned me, saying something to the effect of 'Leland, this sailplane is a joy, it is also a challenge; unlike the Grunau, it is not something that you can let any glider pilot with a license hop in and fly. It is nice that you share your Grunau with others, but if you want to preserve this piece of history, I would advise you against letting other people fly it, and be very discriminating when you do.'

"With that warning in mind, we drove to the Lawrenceville Airport, situated on the border between Illinois and Indiana. No sooner had we gotten the wings on the Mu, than my father said 'I've just go to see if I fit' and proceeded to hop in it. That served as the 'ops check' which told me that the Mü is capable of seating pilots up to six feet in height. After we finished the assembly and conducted the control checks, I looked at the placard listing the operations limits for the sailplane. The first thing that I noticed was that all of the 'ops limits' were listed in knots, which was not at all unexpected for a glider flight-tested in Canada following the Second World War. What did get my attention was that the airspeed indicator displayed speed

in kilometers/hour! So, I did some quick mental conversions to make sure I knew what airspeeds to look for in Km/hr, in order to stay within the limits calculated in knots.

"I wore a parachute on the first few flights. I have made one flight without a parachute, but I found, at five foot ten inches, I really had to stretch forward to get full-forward stick deflection. So, I continue wearing a backpack parachute in the Mu. The other thing that I quickly noticed about flying it was that you hold your feet straight-out in front of you to operate the rudder pedals. The floor boards end prior to the rudders, so it becomes quite taxing to hold your feet in that position for long periods of time. It was not until my third flight that I realized there were leather stirrups attached to the rudders to rest my heels in. The only problem with the stirrups is that they are narrow and if your feet fall out of them, they sink down to the bottom of the pedal and there is no-way to pull them back up and 're-seat' your feet. As a runner, I usually wore an old pair of running shoes when I flew, but I noticed that the heels of my running shoes were too wide for the stirrups, so now I wear a very narrow pair of casual shoes. The other thing I noticed quickly after my first takeoff, was that I was looking through an angular canopy made of multiple panes of Plexiglas. I started grinning from ear-to-ear when I made the connection

to my 'mental image' of how a Luftwaffe canopy was supposed to look and realized that I was actually piloting a German warbird and getting to look out through one of those angular canopies. Unlike most sailplanes, whose plan form makes a '+,' the Mu's plan form makes a 'T.' With its very short nose, your head rests against the spar. In order to facilitate your field of view, the wings are cut out at about a 30 degree angle from the spar and that portion of the canopy is actually airfoil shaped. While it lets more light into the cockpit and improves your overall field of view, objects become greatly distorted when you look directly at them through that section of canopy. The last thing that I noticed during a three hour flight was that there are not any vents in the cockpit. Several wartime photos show a vent on the left side of the canopy. That is a modification that I hope to make soon in order to increase my comfort while flying.

"The Mü handles like it looks. It has very long wings and a short vertical stabilizer with a very long rudder. As a result you have to work to keep the aircraft coordinated, even on tow. She has the tendency to weathervane into the relative wind. Additionally, you have to apply quite a bit of pressure to the rudder pedals to get them to deflect the Mu's obnoxiously long rudder. When you combine the pilot's sitting position, forcing you to hold your feet out in front





of you, with the rudder forces, I've often joked that the Mü was not designed to train military pilots, it was created to train Olympic weight-lifting squat thrust champions. All of these traits combine to make the yaw string, attached to the front of the canopy, the Mu-pilot's most important instrument. As to actual performance, I have not found another sailplane, modern or otherwise, that can hang out in as little lift as the Mu. The aircraft cannot penetrate and carry the distance of modern types; however, I can stay aloft in the most minimal of lift.

"At the end of the day, these are the things that I think are the neatest aspects of flying the Mu. First, I do not have to worry about someone else showing up with one. It is also a definite 'conversation starter.' Second, I am one of the few modern aviators who has actually served as a military glider pilot. Flying the Mü is my way of perpetuating

a proud history of sailplanes in the armed forces. Third and finally, I may never get to fly a Spitfire, P-51, or Me-109; but, every time I take to the skies in the Mu-13D/3, I am flying a genuine warbird that once took part in the battle for control of the war-torn skies over Europe.

The subject of the war booty (or "war prizes") aircraft is a fascinating one and many vintage pre-war sailplanes from Europe owe their existence to being liberated by Allied troops. If anyone has information, photos or documentation on these sailplanes, and the Mü 13d-3 in particular, please feel free to contact me and share this information so we can add to what's known about these sailplanes. The book "War Prizes" by Phil Butler (Midland Counties Publications) is an excellent source about the aircraft that were acquired from Germany, Italy and Japan during the war.

My sincere thanks to Leland and to his parents, Lee and Mary Cowie, for allowing me access to the historical information and correspondence on the Mü 13d-3 that they have collected. My thanks as well to the Wabash Valley Soaring Association for their wonderful hospitality whenever I am at their airport in Lawrenceville, Illinois. A truly great group of people to be around and they willing share their interest about soaring and vintage sailplanes in particular. Also to be complimented is the Vintage Soaring Association (VSA), a motivated group of pilots, owners and aficionados dedicated to vintage and classic sailplanes. If you are interested in vintage and classic sailplanes, the VSA publishes the Bungee Cord which is a great resource to have in your personal collection.







































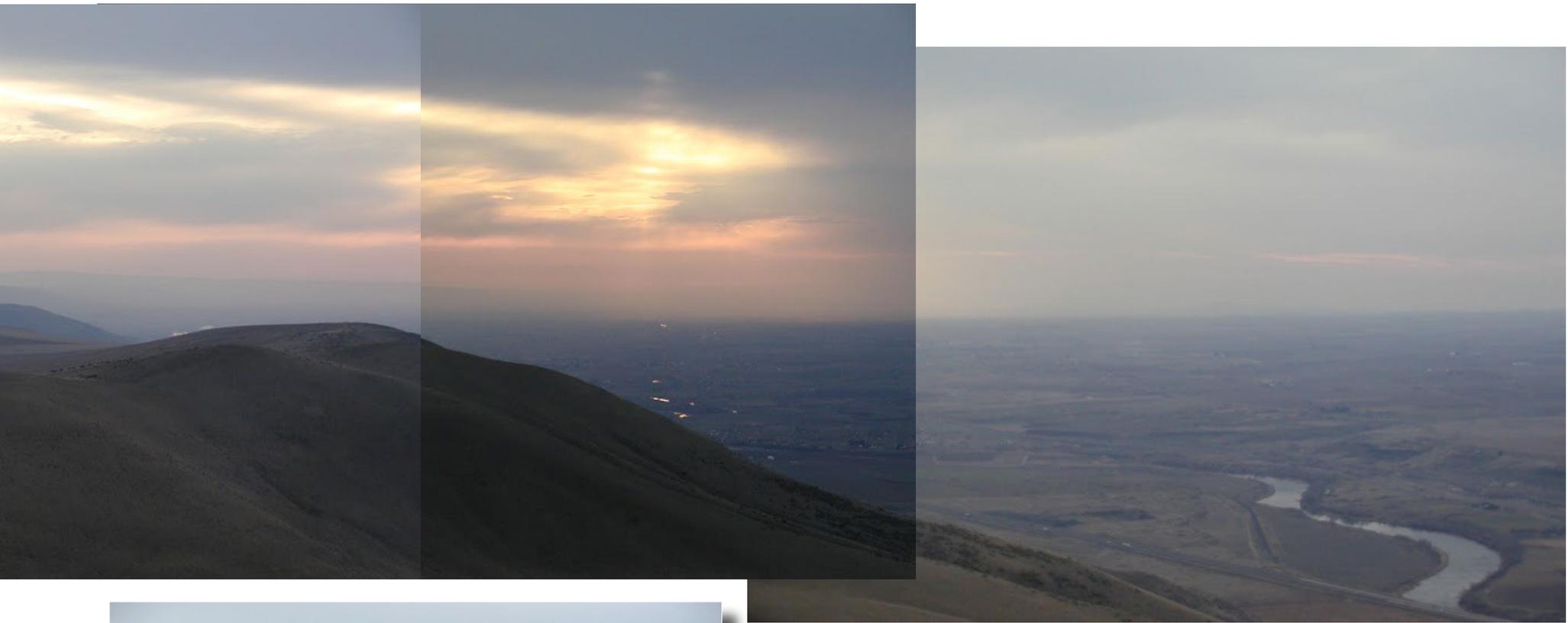


# HORSE HEAVEN HILLS

## PHOTOS BY ADAM WESTON

and retroactive credit for Adam's photo in last month's  
*Fake Slope Reports*

Philip Randolph, [amphioxus.philip@gmail.com](mailto:amphioxus.philip@gmail.com), and the editors



Philip Randolph's GoteWAMS Fake October Fools Bogus Slope Reports appeared in the last issue of *RC Soaring Digest* (Vol. 29, No. 8, August 2012). Regarding the photo on page 41, "Looking west along the Horse Heaven Hills from Chandler Butte, near Kiona, WA, USA": Philip says, "Whoops, Adam, I failed to include credit to you for your gorgeous photo. I apologize!" Adam Weston, well known in RC-HLG and F3K circles, uploaded a series of photos from that 2002 trip to the area (with Philip) and we were able to arrange several of them into the panorama shown above. And, for those who are wondering... Yes, Philip really does fly RC, mainly slope. As proof, consider the photo at the left, also taken by Adam Weston, which shows Philip flying his Boomerang in nearly dead lift off the cliff at Chandler Butte.



## Winged Shadow Systems

# Sky Limit altitude limiter/timer

## *Correction and clarification*

We received a message from Greg Potter pointing out an error in the August issue Sky Limit review authored by Larry Dunn.

The article stated:

One note on Launch Altitude - the Sky Limit records your launch altitude at a point 10 seconds after the motor cutoff. This is to allow time for any zoom to be included in the reported launch altitude. If you're flying a low powered, light weight model like my Mirage that has essentially no zoom, the recorded launch altitude may be off to one degree or another depending on how well you handle the motor cutoff. For example, if you stall the model when the motor cuts off, the recorded launch altitude may be lower than your actual peak launch altitude if it takes you more than 10 seconds to regain any altitude lost in the stall. On the other hand, if you launch into some serious lift, the reported launch altitude may be a good bit higher than the actual motor cutoff point.

Greg pointed out "This is not correct. The Sky Limit instruction sheet states

'Launch Altitude / Starting Height (ver 1.2+) —  
"Launch Altitude" (also called "Starting Height")  
is the maximum altitude between takeoff and 10  
seconds after the motor is shut off.'



“So if you shut off at 150m and zoom to 155m and then drop to 145 10 seconds after motor cutoff your launch altitude will be recorded as 155m not 145m.

“If you shutoff at 150m and immediately stall to 135m and recover to 140m 10 seconds later your launch height will be recorded as 150m not 140m.

“This is as per the F5J draft rules.”

Dave West, Winged Shadow Systems, sent the following reply to Larry and to *RC Soaring Digest*:

“The Launch Altitude (also known as Starting Height) is a bit confusing. It is defined by the F5J specification and works the same for all F5J-compatible devices, regardless of brand. The key point is that the captured altitude is the highest point reached between takeoff and 10 seconds after motor cutoff. It is not simply a snapshot of the altitude at 10 seconds after cutoff. So, if you stall or dive the model immediately after cutoff it will still report your highest altitude -- not the lower altitude 10 seconds later.

“So your reader, Greg Potter, is correct. I don’t consider it a huge gaffe -- but it does perpetuate a common misconception about the F5J rules. Another is the use of altitude limits in F5J. Strictly speaking, F5J has no altitude limit -- only a time limit. Pilots can power as high as they wish in the 30 second window. However, they lose points for every meter of powered climb (with an even greater loss of points for each meter over 200). Altitude limiters or real-time altitude feedback is not allowed. So for F5J-style contests, the Sky Limit altitude limit must be turned off and the Launch value is used in scoring.

“We have updated the Sailplane Competition note that we include with the instructions (I’ve attached a copy). It briefly covers popular competition formats and the Sky Limit features that apply.”



## Features for Electric Sailplane Competition

The *Sky Limit* has features that make it useful for many types of electric glider contests:

- Altitude-Limited Electric Soaring (ALES) events limit the motor run to a specific altitude and time. All planes start soaring at the same height (similar to a conventional winch-launch contest) so high-powered planes don’t have an advantage.
- F5J is an international FAI competition class for electric-powered thermal duration gliders. While F5J has a time limit, it does not limit the altitude. Instead, points are deducted based on the altitude when the motor is shut off. [FAI competitors: please read the note at the bottom of this page.]
- The *Sky Limit* is also great for casual and club contests. It can turn popular “All Up, Last Down” events (where the plane with the biggest battery used to win) into a real test of thermaling skill.

Here are details on a few features added specifically for glider competition. Some require an updated version of the *Sky Limit* airborne unit. If you have an earlier version please contact us regarding updating your unit.

### Launch Altitude / Starting Height (ver 1.2+)

“Launch Altitude” (also called “Starting Height”) is the maximum altitude between takeoff and 10 seconds after the motor is shut off. This is designed to capture the altitude of the powered climb plus any overshoot (zoom) after shutoff. It is captured by the *Sky Limit* and displayed on the Programmer after landing. This feature is primarily for F5J-style competition.

A rectangular display showing the text 'Launch' on the top line and '212m' on the bottom line.

### Restart Indicator (Tattletale) (ver 1.4+)

If you restart the motor in flight, the Launch Altitude will display zero. Although, most contests do not allow the motor to be restarted, you may want to enable restarts (all the time or only below 50ft/15m) to save your plane in an emergency. This feature will allow you to prove that your motor was, or was not, restarted.

A rectangular display showing the text 'Launch' on the top line and '0m' on the bottom line.

### Clearing Altitude Values (ver 1.2+)

The *Sky Limit* automatically resets the Peak Altitude and Launch Altitude values whenever the power is cycled or the programmer is plugged in. However, it retains the last flight data for display (so you can read it as often as you like, even after turning the power off and on). When your next flight reaches 35ft (11m) it overwrites the old data with new data. This way, you never need to remember to reset or zero the values. However, contest officials may want to see that the Launch value is zero before takeoff – so we have added a manual clearing feature. When either altitude value is on the display, hold the MOV button for 3 seconds until the value clears to zero.

ALES -- The *Sky Limit* is approved for League of Silent Flight LSF/AMA Altitude-Limited Electric Soaring contests in the United States.

F5J -- The CAIM/FAI F5J Working Group recently created a detailed specification for F5J altimeter/timer devices. Once formally adopted, only devices meeting this specification will be allowed in official FAI competitions. An important requirement in the specification is that devices have no configurable settings or adjustments. This means that the device cannot have any other capabilities or features. The *Sky Limit* is designed to be useful in a wide variety of applications and has many features and adjustments. Therefore, while the *Sky Limit* can be used in casual F5J-type contests and practice, it will not be approved for future FAI-listed events.

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