

Radio Controlled Soaring Digest

January 2005— Vol. 22, No. 1



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Front Cover Dave Garwood's Yellow Aircraft Douglas A-4 *Skyhawk* streaks across the skies above Lake Ontario. See Dave's *Skyhawk* article starting on page 4. Photo by Dave Garwood.

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About *RCSD*

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 exclusive and 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 all articles are 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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This January issue marks the start of the twenty second year of publication for *R/C Soaring Digest*.

Since its inception in 1984, *RCSD* has served R/C sailplane enthusiasts around the world. A small portion of that world wide community is brought to the pages of *RCSD* this month with articles about a PSS model and a full size aircraft firm in the United States, a description of an excellent soaring site in Calgary, Alberta, Canada, coverage of a slope event in South Africa, notice of a web site in Hong Kong, and information about a rapidly growing international contest format, RC-HLG.

Resolutions for the new year are said to be a usual custom, so we've jotted down a couple which we'd like to share with readers...

We recently read the following quote by Thomas Carlyle (1795-1881), Scottish historian and political philosopher: "Man is a tool using animal... Without tools he is nothing, with tools he is all." Our first resolution is to initiate a column on choosing and using tools, as well as maintaining them. Several authors writing in rotation would lighten the load on the individuals involved, as well as adding a bit of variety to the column writing style. Any volunteers?

Our other resolution is to write a brief description of what potential authors need to know in preparation for submitting material for publication in *R/C Soaring Digest*. We believe this can be accomplished within the confines of a portion of a single page, and our plan is to first publish it within the magazine, then post it to the web site as a separate PDF.

We are always searching for ways to improve *R/C Soaring Digest*, and feedback, positive or negative, is always appreciated. We can be contacted at <rcsdigest@themacisp.net>.

Happy New Year!

The Douglas A-4 *Skyhawk* Project: *Converting a Ducted Fan Kit into a Slope Jet*

prepared by Dave Garwood for *R/C Soaring Digest*

I wanted a Douglas A-4 "Skyhawk" slope jet ever since I saw video of Steve Hinderks' scratch built model performing on the west coast.

I imagined a large plane that looked convincingly scale, especially a model with a prototypical delta wing which not all slope jet kits have, and I have yet to learn to make my own fuselage mold. I got my chance when Yellow Aircraft cleaned out their warehouse and gave me a favorable price on the last A-4 *Skyhawk* sold before they started pulling parts from their new mold.

KIT CONTENTS

The A-4 arrives in two large boxes, one for the fuselage and the other for the pre-sheathed wing and stab kits, and small plywood parts. The 65.5 inch long

polyester resin fuselage is light and beautifully molded. Molded parts for the distinctive landing gear fairings are also included, as well as a clear canopy and molded cockpit in case you want to model these details.

The white foam core wings and horizontal stabs are sheeted with 1/16 inch balsa with leading edge and trailing edge parts already glued in place. The wing has servo wells and landing gear wells routed out and landing gear mounts built in. The vertical fin is molded and the rudder built from plywood and balsa.

MODIFICATIONS TO THE KIT

The major changes needed to fly this plane on the slope are those that save weight and increase strength where possible. For me, disassembly for compact storage and transportation are important,

so I modified the kit to make the wings and horizontal stabs removable.

In addition to not fitting the DF ducts and the motor mount, and not cutting intake and nose gear openings to preserve strength in the fuselage, I decided not to cut the cockpit opening, as fewer holes make a stronger fuselage and the painted canopy looks just fine to me. Landing gear were left off as well.

I knew from Bob Powers' conversion of an F-4 *Phantom* kit that larger ailerons were needed, so they were cut full-span and the original chord was retained. The elevator was left stock, and the rudder on my plane is fixed.

CONSTRUCTION

Fuselage construction is similar to any 'glass fuselage glider

except that the fuselage is a lot wider. The plywood formers provided in the kit were fitted in place as instructed with Pacer Poly-Zap CA, and glassed in place with polyester resin.

Since I was fitting full-span ailerons, I moved the aileron servos to the landing gear mounts, so the servo arms and control linkages would be protected on landing by the molded fairings. The original pre-routed servo mount holes and the forward part of the landing gear cut-outs were filled with expanding insulating foam, smoothed with light spackle and capped with fiberglass cloth and resin.

My removable wing system relies on a pair of 1/8 inch, 5-ply birch plywood spars set into each wing and bolted to "spar receiver

NOTE: This article is based on a similar article that appeared originally in Model Airplane News in May 2000. The photos are previously unpublished.



Dave Garwood's Yellow Aircraft Douglas A-4 *Skyhawk* performs a low altitude pass for the camera. Photo by Dave Garwood.

plates” glassed into the fuselage, also made of 1/8 inch plywood.

The forward pair of spars are 1.8 inches tall and 9.125 inches long, the rear pair are 1.125 by 10.25 inches. The spars are fixed into the wing halves with epoxy and are secured in the fuselage with eight nylon bolts and wing nuts which thread through the spar receiver plates. Cutting slots into the wing cores for the spars was accomplished with a hacksaw blade ground to a point, working carefully to extend the existing slots which were designed to receive shorter spars provided in the kit.

The removable horizontal stabilizer modifications were patterned on the two-wire system commonly seen in open class sailplanes. My *Skyhawk* stabs are fixed on two steel music wires, and pitch is controlled with the original elevator. This requires cutting into the sheeted stabs to fit brass wire receiver tubes, and fitting a balsa block inside the tail to lend strength where the wires pass through the fin.

The elevators are actuated via a pair of Carl Goldberg Models No. 280 nylon steering arms, one

fitted to an 1/8 inch wire from each elevator and extending into the fuselage, and the set screws on these arms lock the stabs in place. I am indebted to Doug Buchanan for developing this system on his BAe *Hawk* slope jet kit.

I spent 42 hours on construction of the *Skyhawk*, and about a third of that time was spent in designing and building the removable wing and stab options.

FINISHING

Real slope planes are painted, not covered. The final finish on all wood surfaces is light fiberglass cloth applied with finishing resin and smoothed with a credit card under a heat gun. They are then sanded, prime painted, sanded and final painted. The fuselage and landing gear fairings were sanded, filled, primed, and painted with spray can enamel.

I decided on the commonly seen “tactical gray over gloss white,” and used these Testors Model Master paint colors in small spray cans. The markings came from Sig Manufacturing stars and bars sheets, Byron Originals decals, and cut vinyl lettering made at a local sign shop. Finish sanding,



Dave and his *Skyhawk* on the slope at Lake Ontario.
Photo by Joe Chovan.

painting, and markings took me 19 hours.

RADIO INSTALLATION

While this airframe has plenty of room for radio gear, in order to keep it light I installed a JR R600 “credit card” receiver, a pair of JR NES-341 servos in the wings, and a JR NES-3021 mini ball bearing servo for elevator control. The JR/Sanyo 1200 mAh battery pack is pretty hefty for a glider, but nose weight might as well be nickel-cadmium as lead.

The aileron servos are located in the landing gear cut-outs in the wing and connected to a single radio channel via Y-cord. The elevator servo is mounted in the tail and is connected to the receiver via a long extension cable.

With the big 1200 mAh battery pack in the nose, I added only 7.5 ounces to balance the plane at the recommended CG. My plane weighs 87.5 ounces ready to fly and has a wing loading of 19.4 ounces per square foot. Aileron throws were 1.25 inch and 1 inch down. Elevator throws were 0.75 inch up and down.



Bottom view of the Skyhawk. The molded fairings near the wing root protect the aileron drive system

FLYING

The slope *Skyhawk* has been flown four times over two days at a lake front site from a steep 100-foot bluff, in each case in winds of 18-22 MPH. The first launch went well with the plane rapidly gaining altitude, showing

smooth pitch control but hypersensitive roll control. The glider required full back elevator trim to fly level.

For each of the two subsequent flights I took out nose weight and reduced the aileron throw in the transmitter. The plane handled

better and better with each adjustment, but the day's flying ended with a bad landing and one set of stripped servo gears.

On the second flying day the *Skyhawk* came into its own. With 5.5 ounces removed from the nose the CG moved back 1.125

inch, to 10.75 inches in front of the wing trailing edge, and the big ailerons detuned with 50% rates and 75% exponential set in the transmitter, the plane now flies well. Straight and level flight is smooth and steady. High-bank pylon turns are easy. Rolls are quick and axial.

My *Skyhawk* flies slowly, likely a function of the high frontal area and I think more importantly its thick semi-symmetrical airfoil. If

I were to build it again, I would not hesitate to use the light ply formers as patterns to make stronger formers, and I would provide for a pound or more of ballast, or alternatively reinforce the fuselage with glass cloth applied to the inside with polyester resin. Since weight is not a problem on this conversion project, it can easily bear the weight of standard servos for the ailerons, and they might be more

resistant to landing damage on this low-wing plane.

Is a conversion project like this worth the time and effort involved? I think that's an individual decision, something you must judge for yourself. As for me, I'm glad I converted this power kit to a glider. Not many slope planes look as good to my eye as a Navy slope jet cruising over water.



Dave's *Skyhawk* and JR 388 transmitter. Dave Garwood photo.

REFERENCES

Great Fighting Planes by Alan Austin and Anthony Dicks, 1985, Military Press, New York. ISBN 0-517-60392-6

The A-4 Skyhawk in Detail and Scale by Bert Kinsey, 1989, Squadron/Signal Books ISBN 0-8306-8042-X

Colors and Markings of US Navy A-4 Skyhawks by Bert Kinsey and Ray Leader, 1990, Squadron/Signal Books ISBN 0-8306-4542-X

SUPPLIERS MENTIONED

Yellow Aircraft International
(ducted fan jet model kits)
203 Massachusetts Avenue
Lexington, MA 02173
<www.yellowaircraft.com>

Bob's Aircraft Documentation
(photos and 3-view drawings of prototypes)
3114 Yukon Avenue
Costa Mesa, CA 92926
<www.bobsairdoc.com>

Squadron/Signal Books
(scale documentation books)
Squadron Mail Order
1115 Crowley Drive
Carrollton, Texas 75011-5010
<www.squadron.com>

Have Sailplane, Will Travel

by Tom Nagel
<tomnagel@iwaynet.net>

Some New Events for the NATS



One of the places I like to travel to each summer is Muncie Indiana for the sailplane NATS. I'm not much of a contest flier. I go to watch and to volunteer. I usually spend one or two days as a LSF volunteer or crewing on somebody's cross country team. One year I helped Joe Hahn rig winches for the scale event.

My wife was trying to schedule our summer and asked me to check the NATS calendar. The first thing I noticed was that there is no XC or Scale this year. The weekend events are two days of F3B, which I understand to be an exotic event devised by the Brits which involves kippers fried in sheep tallow and buckets of warm beer. Frankly, I'm not interested.

This got me thinking that maybe we need some new events at the NATS to draw in some new blood, or at least to pump some new enthusiasm into the old blood.

Here are my suggestions:

1. The VIAGRA Cup Each plane has an LSF supplied altimeter watch tucked into the cockpit. The pilot has a 10 minute window in which to launch and 6 minutes in which to gain as much altitude as possible. After six minutes, the pilot has to pop spoilers, flaps, drag chute or whatever and land back at the field. No landing points. Max altitude gained wins. No restrictions on model size or functions. (My club, Mid Ohio Soaring Society, actually ran this contest a few years ago.)

2. CSOB This event is similar to RES and the initials stand for Cheap Son of a Bugger. (Some of my former friends wanted to call this the Nagel Cup. I now have a new group of friends.)

CSOB is run like a thermal duration event but scoring is weighted to favor low cost model sailplanes, based on MSRP (Manufacturer's Suggested Retail Price). Contestants need to show their receipts.

I recognize that CSOB may present some scoring difficulties, but if LSFers can manage normalized man-on-man F3B scoring, it can deal with a few Cheap Son Of a Buggers.

3. Flamingoid This event is similar to RES except that planes must be built to resemble a bird, and landing skegs are permitted,

if necessary, to keep droopy necks from breaking on landings. Extra landing points for shaving cream dispensers.

4. Scale This is the same as Flamingoid, except models have to look like a fish. Or maybe a snake or a turtle. Whatever. Something scaly. But not politicians. We've had enough of that for a while. (The original Scale event gets re-named "Original Scale Event.")

5. The NSP Cup I got Sal to sponsor this one. The winner is the plane which is able to actually gain altitude in a thermal while carrying the most servos on board. Each servo must actually operate a control surface or a retract or a brake or something. I expect Cap'n Jack will have a plane with a little tiny servo

operated ash tray on the dash and a small margarita blender under the hood. In case of a tie, servos will be disassembled and gears will be counted.

6. Ornithopter A thermal duration event for the techies. Models are launched under battery power via flapping wings. The only trick is to stop the flapping action with the wings in “glide” mode as opposed to “plummet” mode. The turnout for Ornithopter might be small, but no worse than for Original Scale.

7. Lawn Dart This one is a landing contest, pure and simple. After winch launch, the wing is jettisoned to return via parachute, and the model is guided to the landing target via tail surfaces only.

This is a brief contest, with only one flight per model. Pop offs are irrelevant, even expected. I figure that by the time LSF gets around to changing its rules to adopt Lawn Dart, the current festivities in Iraq will have simmered down

to the point that army surplus APC's will be available for use by the landing judges. Or we could just use Gordy.

8. Concours de Stupidite This event is also known as DS, which in this context does not stand for dynamic soaring. The trophy goes to the DS in any of the above events, except Lawn Dart, who manages to devise the most spectacularly stupid way of destroying a model. The inclusion of this event is designed to meet the needs of those who feel compelled to have an event where judging is purely subjective and style points are freely awarded. It also should be fun to watch.

Whether or not any of these events are ever adopted (and I think the Viagra Cup has real potential for fun, not to mention sponsorship) I hope you will make it a point to visit Muncie, the AMA flying site, the AMA Museum and the NATS when you are traveling in the Midwest.

FAI has received the following Class F (Model Aircraft) record claim:

=====
Claim number: 9927
Sub-class F3B (Glider)
F3: Radio controlled flight Category
Type of record: N°158: Distance to goal and return
Course/location: Location to be confirmed
Performance: 25.6 km
Pilot: Gary B. FOGEL (USA)
Date: 23.10.2004
Current record: 1.90 km (27.05.2003 - David L. HALL, USA)
=====

The details shown above are provisional. When all the evidence required has been received and checked, the exact figures will be established and the record ratified (if appropriate).

FAI has ratified the following Class F (Model Aircraft) record:

=====
Claim number: 9643
Sub-class F3B (Glider)
F3: Radio controlled flight Category
Type of record: N°158: Distance to goal and return
Course/location: Saint-Vincent les Forts (France)
Performance: 7.14 km
Aeromodellers : Frédéric JACQUES (Monaco) and Thierry REGIS (Monaco)
Date: 17.07.2004
Previous record: 1.90 km (27.05.2003 - David L. HALL, USA)
=====

FAI congratulates the aeromodellers on their splendid achievement.

For those who may be a bit confused by the above, the current record is that by Frédéric JACQUES (Monaco) and Thierry REGIS (Monaco) which is now ratified. The claim by Gary B. FOGEL (USA), once ratified by the FAI, will eclipse the new record as well.

Gordy's Travels

by Gordy Stahl
<GordySoar@aol.com>



If you don't fly much or if you only fly thermal versus slope, or slope versus thermal, it's difficult for me to explain how much fun it is to live in a place where both are equally available.

I recently traveled to Calgary, the site for this year's World F3J Competitions (well, just outside of Calgary on the way to Edmonton by about an hour) and while I have been many places, only Calgary's terrain offers a

cornucopia of soaring site options.

Literally right in the city are huge grass slopes located at the sides and backs of shopping centers, with steep but comfortable grass declining areas just made for lunch time soaring breaks. You can drive right up to the curb and throw your sailplane off, and from what I saw it's likely you can locate a spot to match the wind direction on any day!

Here's an excerpt from a local's e-mail:

I have just come back to Calgary and on the way to the office I stopped at the hill overlooking Sunnyside. The Spirit was in the truck and the weather today is SPECTACULAR with just a light breeze.

So I am standing at the top of the hill with Spirit

in hand and as I look out towards downtown there is a Bald Eagle thermalling over Prince's Island. I feel a WARM breeze and launch into a boomer. 45 minutes later, unsure of my batteries, I reluctantly land.

I look forward to flying with everyone soon.

Gentlemen, life is good!

Dave Fowlow



Gordy discusses one of the finer points of soaring with a Calgary RC Soaring Society member.

Prior to flying out from Louisville to Calgary, I signed on to their website <<http://groups.yahoo.com/group/CRCSS/>> to let everyone there know I'd be invading. (By the way, they use the same frequencies as we do and your AMA membership is valid coverage for their field rules.)

As is usually the case, some were happy I was coming and some were less happy, but in any case, a plan was made to get some soaring in. When I arrived on Wednesday it was snowing, but just to let you know that the CRCSS knows how to show hospitality, Saturday morning it was green grass and 70's with light breezes and fluffy clouds.

The flying site is due south of the city on highway 22, near Spruce Meadows Horse facility. If you mention it to anyone in Calgary, they'll know where you mean, it's a world class facility for big money international Show Jumping.

The field road entrance is just west a few streets, at Lloyds Park,

of which most is a dried and grassed lake bed — a huge lake bed — surrounded by tall grassed hills. Terrain thermal generators are abundant, but the most unique thing about it is how quiet the site is. Sure, the view of snow capped mountain ranges off to the west is spectacular, but other than the occasionally electric model flying around, the winch/retriever, or the scream of a TD ship making an occasional speed pass, it's quiet. Definitely a good thing! Being a dried lake bed, the soil has a high sand content so slightly nose hard landings get some cushion.

There are plenty of motels within a few miles of the flying site, restaurants, too!

Adam Till is the existing club president and easily one of the youngest members, but no worries because the RC sailplaner experience of the club is tremendous. During the recent winter, the club started a club project starter plane program based around the Great Planes ARF Spirit 2m. The Spirit is a perfect choice because of its strength, quality, ease of assembly, availability and price, as well as the fact that under the covering are pre-cut spoilers! An important feature considering the

rising popularity of Rudder Elevator Spoiler competition class.

The day we flew, the field was sort of split into a high start group and a winch group, with most of the newbies together with one of the more experienced pilots assisting, and us guys. Sailplanes in our group included the current most popular molded composite competition class 3m sailplanes — Pike Superior, Icon, Extreme Xtail and some others — as well as an older but excellent flying Airtronics obechi-over-foam Peregrine.

The most interesting sailplane was a variant of the Drela/Barnes Aegea, forerunner to the Mantis that has been so popular on our East coast soaring contest scene.) A bagged carbon/Kevlar over foam three piece 130" wingspan, pod and boom fuselage with the full flying elevator mounted on a rocking mount (introduced and made popular by Dr. Drela on his Bubble Dancer and other designs). It also featured the DHLG type tall vertical and rudder which extends well below the fuse boom. Its builder, easily one of the top RC sailplane modelers in Canada, flew it all day with our moldies and it gave



Gordy launches off the CRCSS winch in search of some thermal activity.

up nothing in launch, thermal capabilities or landing ability in comparison. Weight is in the low 60oz range.

Aegeas are available complete or wings only from Phil Barnes <PhilipDBarnes@aol.com> (301-916-9574).

But I digress! This is about Calgary! Within about 3 miles from the Lloyd Lake thermal site and directly East on the highway is a huge river valley with access

to the very steep and grassed slopes, a perfect site for some after thermal, slope combat fun! It seems wherever I drove there were easy access slope opportunities.

Scale soaring is abundant here, too! You find both aerotow and Alpine slopes, great for 7m planes to really wring their stuff out. Martin Pilko, Eric, Simon are names to look for in the scale sailplane department.

If you have an opportunity to get up to Calgary, Alberta, Canada, make sure you check out their website and make contact, but most important. don't go without a sailplane!

I'm a lucky guy!

Many thanks to Martin Pilko for supplying all of the photos for this month's column!

The 2004 Hermanus Slope Weekend

by John Godwin
<johng@cis.co.za>

It is the last Sunday in November 2002. I'm standing at the top of a hill, a mountain even. A stiff southeast wind is blowing. Far below is the town of Hermanus. There are some whales in the sea. There is no other land between the South Pole and me.

Steve McCarthy and his friends make repeated passes with a squadron of large PSS aircraft. They have three Impalas and a BAe. Hawk. They come in low over the fynbos (a kind of mountain heath) and sweep out in a climbing turn. They fly in a loose finger four formation. I look at their faces. Although concentrating fiercely they have the smiles of happy men.

I take some photos and vow to return with an aircraft of my own to fly.

It is now two years later, the last Saturday of November 2004. I am back at Hermanus with an Aeromod Minij. This is my first composite and foam aircraft. For fifty years I've used balsa wood. Now I've joined the Twenty First Century.

I've test-flown the Minij from a bungee on a flat field. Now I launch it from the slope. The Minij climbs up into the lift. I understand the look on Steve McCarthy's face.

After ten minutes or so I think about landing. I'm used to landing on a flat field into a gentle breeze. How do I land on a hill with half a gale blowing? Besides, this aircraft you have to Fly. It's not the Gentle Lady I'm used to. The task is daunting and I damage the wing mounting bolts and an aileron horn.

It's Sunday of the same weekend. Berger Hartmoed a local resident arrives in an elderly BMW. In the car are several small boys. Only two of them are wearing shoes. They have three gliders with them. All three are clearly veterans of many encounters with Mother Earth. Quietly and without fuss Berger is teaching disadvantaged boys to build and fly.

I learn later that both the Atlantic Flying Club and Cape Sailplanes have agreed to help Berger with his project. They will give him kits, equipment and encouragement.

I'll be back at Hermanus, maybe not next year, but sooner or later.

Every year at the end of November the Atlantic Flying Club in Cape Town holds a slope meeting at Hermanus. I'm not

sure when this tradition started but the event is now one of the most popular on the gliding calendar. This year over one hundred pilots registered.

The town of Hermanus lies on Walker Bay on the Southern Cape coast. Walker Bay is a well-known whale-spotting site. Behind the town rise the Cape Mountains. In front is the sea. This combination of mountains and sea must make it one of the most spectacular flying sites in the world.

Contacts:

Atlantic Flying Club:
<<http://www.rc-sa.co.za/afc/>>

Cape Sailplanes:
<<http://www.capesailplanes.com>>

Hermanus:
<<http://www.hermanus.co.za>>



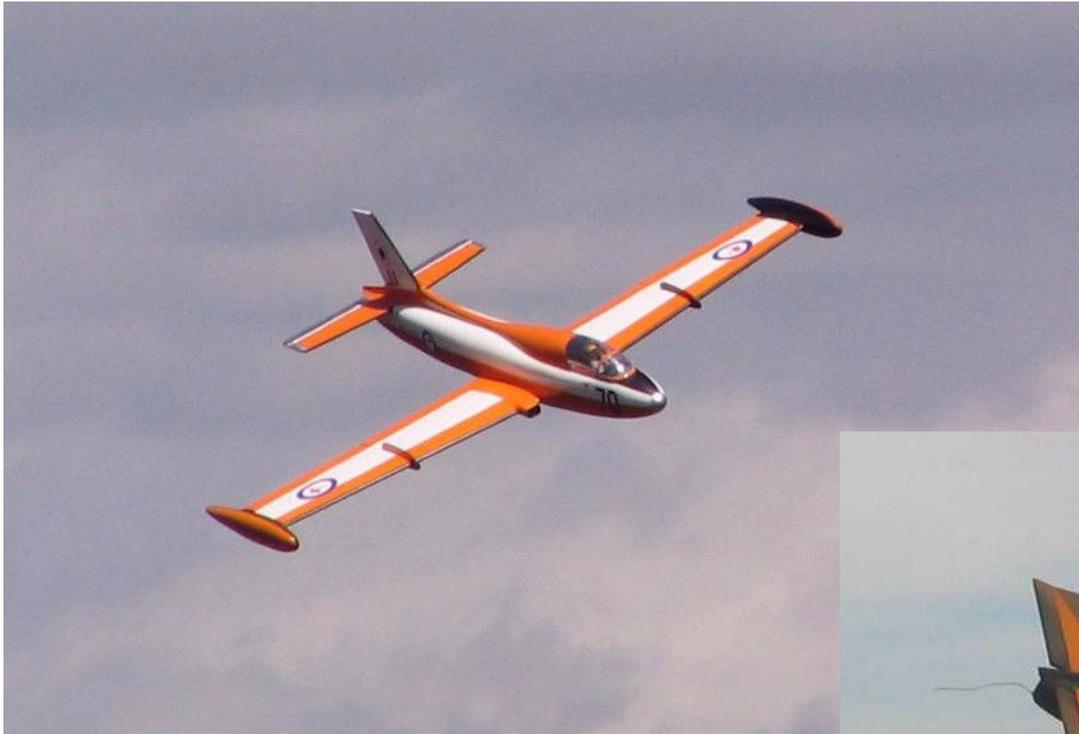
Upper left: Andrew Basson of the Atlantic Flying Club dealing with registration. The sinister looking razor wire protects a radio repeater installation. Upper right: Dave Greer and Chris Adrian study a flying object. Dave... is it a bird, is it a plane... ? Lower left: Charlie Blakemore with an electric biplane. Lower right: One of the many models entered in the 2004 event. Photos by John Godwin.



Upper left: The man under the elegant hat is Ross Lieghton, chairman of the Atlantic Flying Club. He may be busy with something or else just asleep. Upper right: Berger Hartmoed with his aspiring pilots and models. Lower left A general view from the slope showing Walker Bay and the town. Lower right: Some of the many models entered in the 2004 event. Photos by John Godwin.



Upper left:, upper right:, lower left: More of the models at the 2004 event. The vegetation on the slope is fynbos, a kind of mountain heath. It is an important part of the biodiversity of the region. The slope site is a protected conservation area. Lower right: Tony Burton a slope flyer from England with his Mini Dragon. He's a long way from home. Photos by John Godwin.



A couple of the great PSS 'ships at the 2004 Hermanus Slope Weekend, these by Andy and Colin Gray.

Above: Colin's Aermacchi MB 326 *Impala*.

Right: Andy's Aermacchi MB 326 *Impala*.

Both photos by Colin Gray.

More photos from this event will appear in future issues of *R/C Soaring Digest*. Watch for them!

A RANDOM WALK IN DISCUS LAUNCH TERRITORY

by Dave Register
<RegDave@aol.com>

Hand launch/Discus launch has been one of my favorite pastimes for years now and I'd be remiss not visiting this topic from time to time.

I'm no great competitor at this event – wouldn't be able to fly contests at all if it weren't for Tim Bennett and the guys in SLNT. I used to CD a HLG contest at our "Last Fling" a few years ago but the participation waned enough that we switched to electric.

I don't really understand why this sailplane class isn't more popular. With the development of DLG, even geezers like me can participate without pain. The price is affordable and kits/ARFs are getting more capable all the time. Maybe the burgeoning interest in "Zip-Start" events may see resurgence in this event.

A BRIEF AND NOT VERY ACCURATE HISTORY OF HLG/DLG

The whole idea of hand launching a sailplane can probably be blamed on Dave Thornburg. We all have done a toss or two to trim out our ships but it was the Old Buzzard who was daring enough to think it might be a challenging way to catch a full blown thermal flight. He started hand launching Gentle Ladies and BOT's shortly after the 7th day. If you check out his "Old Buzzard Goes Soaring" video, you can learn a great deal about thermal soaring as well catch some out takes and other fun stuff by the master.

<<http://www.soaringstuff.com/buzzvid.html>>



In the early days of HLG, a lot of folks flew the ubiquitous “Skeeter” (I still have most of the pieces). But hand launch probably had its biggest and best supplier at DJ Aerotech. These guys put out a string of great kits at affordable prices. V-tails are a specialty and there’s still a wealth of knowledge on the DJ website that’s applicable to all classes of sailplanes. Don Stackhouse and Joe Hahn freely share a great deal of experience then (and now) and supply many very well designed planes.

<<http://www.djaerotech.com/index.html>>

One of the little sidelights that really got me going back around ’97 was an inexpensive concept plane from the Torque and Recoil Club in TX. BOB was simply blue foam with some plywood reinforcement. The wing was covered with clear packing tape. The moments and planform were simple and sized right and the darn thing just flew.

One of the things that BOB demonstrated was that HLG was accessible to anyone that wanted to scratch build. It still is. So before too long, a bunch of HLGs were emerging from the

basement workshop, eventually leading to the Tahlequah design (published in *RCS*). A LOT was learned about structures, bagging, moments and weights.

During this time, the airfoils that were used were primarily Eppler, Selig, Selig-Donovan or other open class sections that were designed for thermal duration work. That was fine since the speed range covered by a hand launch isn’t too severe and the drag penalty during the launch phase just wasn’t a huge part of the equation.

Then a funny nothing happened. Unless you were a close cousin to Hercules, a whole bunch of guys started showing up with bum shoulders. As we got lighter and more capable ships, we tried throwing harder to get better altitude. After a year or so, something had to give. Unfortunately for some it was rotator cuffs. As Dirty Harry once said, “A man has GOT to know his limitations”.

As much fun as hand launch had been, the price for the enjoyment could be high. Zip starts were developed with a launch limiting capability (used first at SLNT to my knowledge). Limiting zips

attempted to level the playing field with the hand tossers. Since the “javelin” launch method didn’t get great height, Zips had to be severely limited. It was an alternative to not flying at all but it seemed like a lot of work for a 30 sec. dead air flight.

All you guys that went straight to DLG, think about that for a sec. There was a time when 30 seconds could be considered pretty good flight. Where would a half minute flight put you in any contest today? We used to be PROUD of that achievement at one time. Anyone who can say that and smile is definitely in the founders circle!

Meanwhile, the creative juices were flowing in the Pacific Northwest. As documented in Paul Naton’s video (“Endless Lift 3”), Phil Pearson (and Harold Locke) in the Seattle Washington area had been wrestling with exactly this problem – how do you get a decent launch without the pain and suffering of the javelin launch? Well, in Track and Field there are these other guys who don’t chuck spears. They spin around and get these amazing distances flinging a discus. Interesting concept.

A bunch of trial and error later and the “Side Arm Launch” (SAL) technique was born. Shortly thereafter, the full monty spin was developed by Dick Barker with his “Uplink” design. That maneuver gave rise to the Discus Launch terminology (DLG). SAL and DLG are pretty much the same technique although SAL is generally associated with smaller wingspans and a side arm throw without the full 360 spin. A nice summary of this evolution can be read at:

<<http://www.barcs.clara.net/index.htm?hlg/definitions.htm>>

and:

<<http://eiss.cnde.iastate.edu/articles/discus.shtml>>

What an amazing development! All of a sudden, us old guys with the bum shoulders were back in business.

Let’s see... just take a HLG, add a peg to the wing tip, dosey-do a bit and let ’er rip. Sounds easy.

The carnage on the Old Geezers stable of HLGs was horrific. 4 ships utterly destroyed in less than a week. There was definitely something missing!

For those who skipped all that excitement, the classic symptom is the spiral dive of death. Immediately upon release from the spin, a peg-equipped standard HLG will roll inverted to the inside of the spin and give forth a very satisfying “crunch” as the nose and wing tips smack into the ground about 30 feet out. Works every time. One of the more repeatable maneuvers you can experience – it takes no skill to do this. And no amount of preset or offset will cure the problem.

A closer examination of the designs appearing on the web (there weren't any DLG kits to speak of yet) showed this funny little thing called a sub rudder. Maybe there was something to that?

Plane # 5 still had some life left in it. This was an aileron ship with obechi wings weighing in at 14oz or so. A real pig but rugged enough to survive two inverted concrete collisions. We have some old control line rings at the local park. The ultimate insult was landing nose first on the center circle both times this plane was sacrificed.

A piece of scrap kevlar was taped to the rudder below the center

line. Back to the park. Field check shows the gears are almost stripped on the left aileron but what the heck, this wasn't going to work anyway.

Might as well go out in a blaze of glory. A lot of effort went into that spin. The plane released, the pilot staggered around for a second or two and then started looking around for the pile of balsa and obechi trash. Hearing nothing (yet) I gaped skyward and there it was about 50 feet up still climbing out straight as an arrow.

What an epiphany!

Several more days experimenting with that kevlar scrap indicated the sub rudder was a key enabling technology for DLG. Sadly, old #5 was eventually lost but even a pig can teach some lessons. I remain convinced that wing downwash and turbulence effectively blanks the vertical stabilizer above the centerline during the first few seconds of launch. Even a little area in the clean air below the centerline provides that critical yaw tracking that makes it all work so very well.

From those early days (not more than about 5 years ago?) a lot has

evolved. Arrow shafts have given way to spiral wrapped booms to manage the torque problem. Piezo gyros are available to dial out the residual yaw response at launch. Sophisticated new airfoils (largely due to Dr. Mark Drela) were developed to more efficiently handle the wide speed range encountered with this event.

Kevlar and carbon structures are providing more strength and stiffness at lighter weights. Young guns are tossing DLGs thrice the height anyone could achieve with the javelin throw. And a bunch of old guys are having fun without experiencing the joy of bursitis.

Probably (IMHO) the best example of this new breed of DLGs is the XP3/4 series from Polecat Aero. There are others coming on the scene in kit/ARF form now but Denny Maize's product has a track record that's as enviable as Don and Joe's back in the HLG days.

<http://www.polecataero.com/>.

A MINOR CONTRIBUTION TO DLG CONTROL SURFACE COUPLING

One of the lessons learned from frequent DLG flying is that

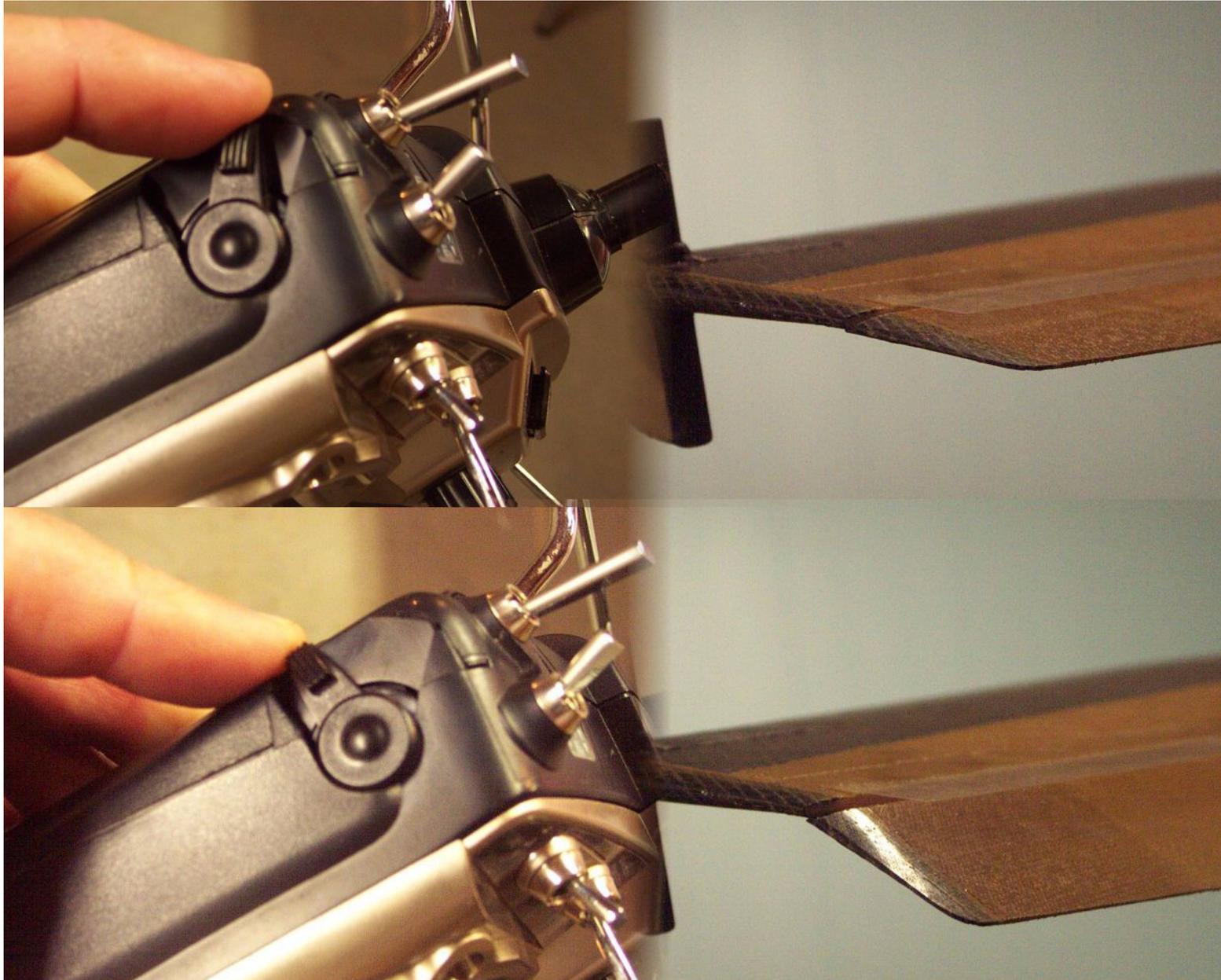
“simple is good.” If something can go wrong, the demands of this flight regime pretty much guarantee it will. An area that recently improved for me was managing the transition from retrieval to launch.

The extreme difference in landing (catching) and launching speeds makes it difficult to handle a lot of transmitter interactions during the “turn around” time. In a contest, peg catching is favored for certain events. A typical time from catch to release needs to be around 2-3 seconds at most. A number of good video clips from the 2001 IHLGF, some of which highlight the catch-launch transition, can be seen at:

<http://www.silentflyer.org/ihlgf01.html>

If you have to “nose” catch, switch off the landing flaps, switch on the launch preset, get the launching tip back into your launching hand and then spin, 2 seconds ain't gonna happen.

There are videos of proficient DLG contestants (Joe Wurts is an excellent example) peg catching and launching. The launching hand doesn't go near the Tx to activate the presets. How do you do that?



A slider for camber control seems more reasonable than using a stick. It's right there under your finger with no need to lift or move your hand. The coupling curve can be tailored to the amount of throw used in the slider and the slider can be used for normal camber control. This photo sequence shows a Futaba 9C but the concept applies to any transmitter with a similar slider available. The left index finger moves the slider as needed with no need to re-position the transmitter between catching and tossing.

At this point, I'll offer a suggestion or two. If these are off base, maybe our competition pilots can work a thread on this topic on one of the web based forums.

About 6 months ago, I started back into DLG after an extended illness. Good therapy and, if you're gonna go, it might as well be doing something you enjoy.

A foray down to Texas and a discussion with Andy Lawson suggested that the gyro could be eliminated. Andy wasn't using one. Nor was he using preset. His launches were straight and true. Had to be something to it.

Out went the gyro. The results were OK but not great. Preset was definitely needed for both yaw and pitch. Next step was messing with the CG.

The more rearward the CG, the less pitch preset was needed. The plane finally arrived at a point of neutral stability. That is, the CG and trims are such that just about any flight attitude will remain in effect until deliberately changed. Point the nose at the ground and it just keeps on coming – no pull out and no tuck.

Under this condition no pitch preset is needed (makes sense). Nor does camber or reflex seem to be of significant advantage for launch. The plane will basically track in whatever direction it's thrown. It turns out (for reasons that aren't completely clear) that most of the yaw response also seems to come out at this CG/trim setting. A little bit of residual yaw was found to be due to a loss of "lock" in the throwing elbow during the last quarter turn of the spin – check out Paul Naton's recent HLG Pro Clinic video.

<http://www.radiocarbonart.com/>>

At this point, Denny Maize offered some coupling suggestions. In addition to Denny's suggestions, it became apparent that a bunch of flap (with elevator coupling) was needed for good landing control, especially for peg catches.

Since minimal launch preset is needed, and only flap-elevator input is needed for retrieval, the remaining problem is managing a switch (or stick) on the Tx during the catch to launch transition. Enter the slider.

A slider for camber control seems more reasonable than using a stick. It's right there under your

finger with no need to lift or move your hand. In higher end trannies the slider coupling can be multi-point. That is, the coupling curve can be tailored to the amount of throw used in the slider. In the present case, could the slider be used for normal camber control (minimal elevator coupling) AND for landing flaps (up to 60% elevator coupling)? With multi-point program, it certainly can.

The following example is specific to my Futaba 9C but the concept applies to any Tx with a slider available to the index finger of your flying hand. To start the setup, first assign the Auxiliary channel to the slider (Vr-D for the left slider in the AUX-CH menu on the 9C). Set the flap trim to an appropriate level for about 35 degree flap deflection (55% FLAP-TRIM for the 9C example). Then set flap-elevator coupling (PROG.MIX3 in this case).

In flap-elevator coupling, flaps are the master channel and the elevator is the slave channel. On the 9C, a switch needs to be assigned to activate the mix. I used switch B but set the activation to NULL so it's on all the time. Remember, keep it

simple. I had it set to DOWN for awhile and one day bumped the switch up and couldn't figure out why my landings were ballooning all day long.

When you enter the PROG.MIX3 menu, the slider shows up with a dual position coupling option (that's as multi-point as the 9C will go - but it's enough). For the first half of the slider movement, I have no coupling. For the second half, I have ~ 50% down elevator coupling. A convenient feature of this slider is a little "beep" when it's halfway through its travel. So I have an audible cue when I'm out of the first half of the flap range.

With this setup, the first half of the slider (up to ~ 15 degrees flap deployment) is just used for camber control. A small amount is used initially to reach minimum sink trim. After entering a thermal, more is added to aid in keeping things light and tight. Adding camber while banked also minimizes elevator input so this coordination works out very comfortably.

When setting up for landing, the slider is deployed into the landing flap region (up to ~ 35 degrees) and adjusted for glide slope,

wind, etc. It took a few sessions to get the elevator trim right for a good steep, but slow decent. If it's light winds and a real scratchy flight, sometimes only the camber region is needed.

The nice thing about this setup is the ability to re-launch the plane with an economy of movement that makes this part of the event a lot more enjoyable. Catching and launching is with the right hand. The left index finger moves the slider as needed with no need to re-position the tranny between catching and tossing.

It also works nicely for sport flying since there's no need to move your hand to find the left stick for camber control in normal cruise and thermal conditions. It's just a more natural and comfortable configuration (I think).

This is not exactly a break through addition to DLG progress but I've found it helpful.



The idea was assimilated from the input of 3 or 4 different folks. The several times I've explained it to other DLG'ers, the response was, "neat trick", so give it a try if you've got a spare slider and aren't already doing something like this.

If you haven't flown DLG in a while, come back. If you're just getting started, you'll immediately benefit from the 10 years experience that is built into today's DLG sailplanes. If the spin throws you, zip starts are returning. Since discus launch gives inherently higher launch altitudes, many of the severe height restrictions on zips are being relaxed.

Give it a try. The pain is gone, the new ships are great and the performance of a well trimmed DLG is rather amazing. Besides, what could be simpler for a day's outing than you, your plane, a flying field and a little bit of good exercise to boot?

FAI has ratified the following Class F (Model Aircraft) record :

=====
Claim number : 9531
Sub-class F5-S (Aeroplane, electric motor (rechargeable sources of current))
F5: Radio Controlled Flight Category
Type of record : N°174: Distance to goal and return
Course/location : Kiia (Estonia)
Performance : 20.02 km
Aeromodeller : Jüri LAIDNA (Estonia)
Date : 03.06.2004
Previous record : 6.21 km (27.05.2003 - Gary B. FOGEL, USA)

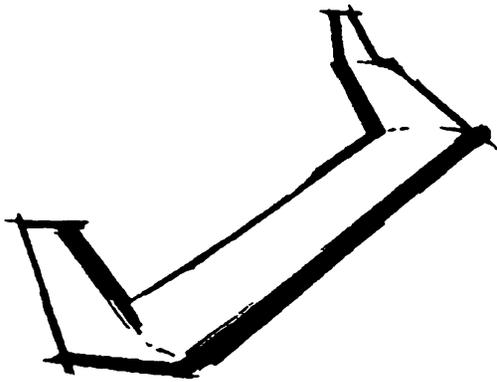
=====
FAI congratulates the aeromodeller on his splendid achievement.

Note : this record was also superseded on 04.07.2004 by Raymond COOPER (Australia) with a performance of 54.30 km.
(FAI claim number 9616 ratified on 30.09.2004)

FAI has ratified the following Class F (Model Aircraft) record:

=====
Claim number : 9726
Sub-class F5-COMB (Aeroplane, electric motor (all sources of current))
F5: Radio Controlled Flight Category
Type of record : N°195: Distance to goal and return
Course/location : Nehatu (Estonia) - Kudasoo (Estonia) and return
Performance : 41.14 km
Aeromodeller : Jüri LAIDNA (Estonia)
Date : 04.09.2004
Previous record : new

=====
FAI congratulates the aeromodeller on his splendid achievement.



On the 'Wing...

by Bill & Bunny Kuhlman
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Jim Marske has been designing and building full size tailless sailplanes for nearly fifty years, beginning with his XM-1 which first flew in September of 1957. The evolution of the XM-1 to the Pioneer II took a number of years and several prototypes, but the evolution of Jim's design did not stop there. The fundamental planform has now been used as the basis for the Pioneer III (a very much updated Pioneer II-D), currently nearing completion, the Pioneer IV (15 meter span), and the Pioneer V (16.6 meter span), a two place side-by-side trainer.

Since Bill attended a workshop at Marske Flying Wings in 2000, we've been keeping abreast of the happenings at Marske Flying Wings by visiting the web site <<http://www.continuo.com/marske/>>.

Bill noticed a "flying wing design" workshop announcement on the web site early in 2004 and was seriously considering attending. Plans were quickly firmed up when Mark Nankivil expressed an interest in attending as well.

The plan was for Bill to fly from Seattle to St. Louis, and for the two to take off on a road trip through Muncie (via the AMA Museum) to Marion Ohio, with a side trip to the Air force Museum on the return. The entire trip went smoothly, and some of Mark's photos from the Air Force Museum have already appeared in *RCSD*. (See the CG-4A photos in the September 2004 issue.)

The workshop took place over the weekend of July 17-18 at the Marske facility near the Marion

airport. Participants included an aerodynamicist, a couple of computer code writers/software engineers, a test pilot, and several others with an interest in kit planes, both as private ventures and with an eye to kit production. Mark and Bill were the only modelers in attendance.

Mat Redsell lead the workshop and valiantly tried to follow the predetermined schedule of topics within the allotted time. As is usual with this sort of group, it was natural for participants to link one subject to another and become so entirely engrossed in the path of conversation that it was extremely easy to lose track of time. Although we nearly always gave out groans as Mat brought us back on track, Mark and Bill both agreed the weekend was an excellent blend of short

"lectures" by Mat, Jim, or one of the attendees, and relaxed conversations where representatives of the various disciplines could interact at will.

The "icebreaker" was a discussion focused on the misconceptions about tailless aircraft — instability, a tendency to tumble, complicated control systems, etc. Each of these was dispelled in turn by relating the experiences of Jim and Mat with the Pioneer II-D with photo or video tape evidence.

The Marske planform was then presented as a safe, economical method for achieving exceptional performance given its class and construction materials. Again, everything was supported with photos and videos, then Mat brought out the spreadsheets.

From there, the presentation moved on to the actual design process. This is the one area where the expertise of modelers turned out to be invaluable to the ongoing discussion. Compared to those involved with full size aircraft, modelers tend to design, build and fly a much larger number of aircraft over a given time span. This provides an enormous body of first hand evidence for what does and does not work in practice. And Mark and Bill had arrived with a large mental store of ideas from technical papers, magazine articles, and personal experience regarding tailless planforms.

The last portion of the workshop involved the future of tailless aircraft. Projected improvements in design and construction, and the advances in performance which are expected to result, were balanced with the acceptance of tailless aircraft by the public/consumer.

Mark and Bill came away from the workshop with a number of ideas for tailless designs, predominantly involving planforms with quarter chord lines which are perpendicular to the aircraft centerline or slightly swept forward.

As mentioned in prior columns, such a planform, with taper, provides a large arm for the elevator function and moves the ailerons to a position closer to the CG, allowing use of differential without adversely affecting pitch. If the aspect ratio is held to under ten, stall characteristics are quite benign and the Reynolds numbers are larger. Additionally, tailless aircraft of this type are quite easily constructed, can be very light, and can be designed to have minimal drag. All of this means an expanded speed range, ease of control, and excellent thermal ability.

Mat, until recently, had been flying his Monarch and thrilling in his ability to thermal well in very small areas of lift. When flying the Monarch, the pilot is almost entirely out in the open, and subject to feeling the air warm and cool, smelling the pollen being lifted by thermals, and having to wipe spider webs from his or her glasses. Mat explains that flying the Monarch is the closest thing to actually being a bird that one can imagine.

Jim flew his own Monarch at Harris Hill a few years ago and surprised everyone with a flight



Mat Redsell takes his Monarch up on auto tow. This launch method is quite inexpensive. A strain gauge readout visible to the driver makes sure the line tension remains consistent. Photo by Bill Kuhlman taken during the May 2000 workshop.



Mike Coutts at the controls as the Pioneer II-D starts its aerotow to altitude. This 'ship originally belonged to Lloyd Watson who had purchased it in nearly complete form from another owner. The Marske Flying Wings team rebuilt the entire aircraft. The wing surfaces were contoured to match the original airfoil and the fuselage underwent some modifications, including addition of a nose wheel. Wing tip extensions were added, increasing the wing span to just over 15 meters. Not readily apparent in this photo are the fences which separate the inner edge of the elevator from the fuselage fillet. This addition nearly eliminated the separated turbulent flow at the aft end of the fuselage. Photo by Bill Kuhlman/

in excess of four hours from a reasonable launch height.

Jim and Mat have recently experimented with a moveable CG for the Pioneer II-D. This opens even more vistas, as trim drag is substantially reduced. A ten pound weight has been installed, and it travels the length of the fuselage inside a tube, pulled along by a continuous cable attached to a rotary dial. The weight is slid forward for high speed cruising, to the rear for thermalling.

When Mike Coutts landed the Pioneer after the workshop demonstration flight, it seemed like the rollout was extremely long. Mike later related that once the nose wheel touches the ground, the glider just continues to travel in a straight line, and it's easy to run off the runway if the aircraft is canted on landing due to a cross-wind. When the main wheel touched the ground, Mike had simply moved the weight to the extreme rear of the aircraft and was able to hold the nose wheel off the ground for an extended run. Rudder authority was good enough that he could steer the aircraft down nearly the entire length of the runway.

Was the workshop worthwhile? Bill and Mark agree they learned a lot from the workshop, particularly because of the varied disciplines involved in the frequent discussions both during the workshop and during breaks. Additionally, watching the advanced Pioneer II-D fly was an awesome experience.

Mark is currently in the last stages of designing a TD 'wing which he hopes to campaign in local contests, and Bill is ready to start building two competition aircraft for the 2005 Visalia Fall festival — a two meter and an unlimited.

The one other item which Mark and Bill agree on is the need for scale models for preliminary flight testing of a new design and the desire to construct scale models just because it's so cool to be flying the closest thing to a full size aircraft without leaving the ground. In fact, Marske Flying Wings is well on the way to building a quarter scale Pioneer IV. And a future "On the 'Wing..." column will give details of the Monarch G, in hopes an *R/C Soaring Digest* reader will take on the challenge.

Until next time...



The Pioneer III takes shape at Marske Flying Wings in Marion Ohio. This is how the airframe appeared in July 2004. Both photos by Mark Nankivil.

Left: The fuselage consists of a welded steel tube internal frame and a fiberglass shell. The canopy will be hinged from the front. When the photo was taken, the instrument panel was cut out and in place. The rudder was constructed but was not attached. As is in keeping with what we have seen as a trend, the airfoil has minimal reflex and the pitching moment is only slightly positive.

Right: The wings are resting in plywood cradles, leading edge down. Jim Marske's Monarch wings serve as a backdrop. Notice the wing tips carry the same elliptical leading edge planform as the new tips which have been installed on the Pioneer II-D. The ailerons are fabricated but not installed as yet. The aileron and air brake pushrods are in evidence. The ribs are specially corrugated fiberglass with lightening holes cut out. The fabrication of the Pioneer III owes a lot to a prior building project, an essentially all carbon Monarch. The weight savings and additional strength made a big impression on the team, and a good portion of the technology was transferred to the fiberglass composite Pioneer II design.

Opposite page: The highly modified Pioneer II-D on tow over the Marion airport. The Pioneer behaves in excellent fashion when using the bridle system. Positioning relative to the tow aircraft wake is not critical. Photo by Mark Nankivil.

Page 30: Mike Couets brings the Pioneer II-D in for a smooth landing. Photo by Bill Kuhlman





Soaring High

by Gregory Vasgerdsian
<gvasgerdsian@sbcglobal.net>

Soaring in World Class Style

With so many skilled pilots flying last October at the Fall Festival you'd think there might be something to learn. Good thumbs, the "best" sailplane, plenty of practice, a great timer/spotter, just luck — but I wondered if the top pilots really did anything differently.

I decided to tag along with four-time World Champion Daryl Perkins while he put up a flight in 2-Meter. Soaring icon and two-time World Champion, Joe Wurts, timed for him.

I think most of us know that 2-Meter is a very challenging class to fly. Heck, with just twelve pilots flying in it at the

Fall Festival, I'd say it is not a favorite at all. The smaller size models thermal ability just does not compare with the larger Open Class models. On top of that the 2-Meter model can be difficult to read from a distance — a real challenge indeed!

At the winch Daryl was ready to launch his 2-meter Laser. Relaxed and jovial enough it was clear that Daryl knew the flight would be a challenge. As the Laser towed up the winch line there was a small gaggle of Open Class ships at about 150 feet altitude just down-wind from the landing zones... in marginal lift. Elsewhere there was no observable lift to be seen. After a

Daryl Perkins about to launch is Laser at the Visalia Fall Festival 2004. Joe Wurts, hidden behind the Laser right wing, is ready to begin timing the flight. This photo is a segment of the larger image used on the front cover of the November 2004 issue. Photo courtesy of Dave Beardsley.



hard zoom-launch Daryl rolled the ship back and made a bee-line for the small patch of weak lift. But Daryl didn't guide the Laser into the pattern of the circling Open Class ships, he flew the Laser right on through. He continued further downwind then put the Laser into a wide search pattern. Yet it was clear the model still was in marginal lift as Joe called out, "still at the back end of it." Daryl agreed, and was certainly not ready to relax as Joe read off the time, "five and a-half minutes to go."

At this point we could feel a good breeze of air moving downwind towards the Laser — Daryl continues circling the Laser further downwind. Now 100 yards past the gaggle of Open Class sailplanes the Laser starts to climb to a more comfortable height as the gaggle are now dropping like flies. At three-and-half minutes Daryl has put the Laser up enough to relax at last. The Laser rate of climb is not great and the model continues to head further downwind from the landing zones.

Finally, at two minutes and 15 seconds left, Joe calls out the time and remarks, "I think you've made it." At this point the Laser is

the only model in the air out past the landing zone, it has climbed to a healthy altitude and is far downwind and looking pretty small. Then, with one-and-half minutes to go Daryl points the Laser upwind and makes a bee-line for the landing zone. Joe counts down the time in 5-second increments, then 1-second increments as the time drops below the 30-second mark. Daryl brings the Laser straight in with out a bobble and lands perfectly at six minutes in the ten point square of the landing zone. Well done!

How any pilot handles the current conditions varies, but Daryl certainly made the right decisions on this flight. Knowing there was just marginal lift downwind he could have gone looking upwind for something new. I suspect this is what a lot of pilots would have done on seeing these conditions. Instead, he flew to the one place that he knew lift was at (regardless of how marginal). He then continued to aggressively fly still further downwind in search of stronger lift and not follow the sinking masses. So he flew with the priority of finding lift first, then concerning himself with getting back to the landing zone



Screen shot of <www.rcsail.com> a slope soaring website of Hong Kong.

second. Not luck and not any special magic, but solid flying built on plenty of experience. Oh, and a good thumb!

Interesting places on the Internet

While looking for something else I found something else — or so it goes when you start digging around on the Internet! One site that I found a lot of information on was

<http://www.rcsail.com>,

a site dedicated to slope soaring around Hong Kong, China. A site put up by soaring enthusiast Stanley Chan, like a lot of soaring sites this one has plenty of cool stuff and it gives you some insight into flying sailplanes around Hong Kong. The page that I found most interesting was the sailplane manufacturers page at <http://www.rcsail.com/manufacturers.html>.

This page is filled with a listing of sailplane manufacturers by

Sailplane Manufacturers and Dealers

Argentina	Australia	Belgium	Canada	Chile	China	Czech Republic
France	Germany	Hong Kong	Hungary	India	Iceland	Israel
Italy	Japan	Korea	Mauritius	New Zealand	Norway	Poland
Slovenia	South Africa	Spain	Switzerland	Taiwan	UAE	United Kingdom
USA	Ukraine					

If your company manufactures R/C sailplanes and related products and is not listed here, please [add your URL](#).

Argentina

- [TNT Models](#), R/C airplane & sailplane manufacturer

Australia

- [Airstrike](#), all-moulded Stratos F31/F3B high-performance sailplanes
- [Airsport R.C.](#), manufacturer of Vector flying wings and retailer of a range of R.C. products
- [AirXstreams](#), supplier of various EPP warbirds in Australia
- [Composite Scale Models](#), manufacturing of large scale sailplane kits and accessories
- [Canterbury Sailplanes](#),  Australasian Manufacturer of EPP & Thermal Gliders, Rubber Dusky Aerials and Elevon Mixers
- [DezzaNet](#), Redback EPP - a 60 inch EPP pylon racer
- [Gliders Australia](#), supplier of MT Cobra, FVK models and Ellipse
- [Model Flight](#), Slope/thermal gliders including Taipan II, Pike Plus
- [Southern Sailplanes](#), importer of various scale gliders
- [Wowings](#), Australian manufacturer of high performance RC EPP foam glider kits, specialising in RC flying wing slope soaring gliders

Belgium

- [Innovative Model Aviation](#)

Canada

- [Hobbystuff Canada](#), importer of quality quietflyer products and accessories.

Screen shot of the sailplane manufacturers page on <www.rcsail.com>. The Czech manufacturers are interesting visits.

country. It's a great source to see what is available elsewhere, or just check out who makes what.

Another page that is a lot fun is the sailplanes' graveyard page. Filled with all those wonderful images of carnage brought on to our models usually by our own thumbs! For some reason breaking a sailplane really bites when it happens, but can be really funny to look at after the fact! Go to <<http://www.rcsail.com/graveyard.htm>> and have a look.

In addition the site has a full set of slope soaring images, a listing of flying sites around the Hong Kong area and quite a few tips that are useful regardless of where you live. Check it out.

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Right top: On the slope a *Tango* passes by the sun. Photograph from <<http://www.rcsail.com>>.

Right bottom: A *Prodiij* makes a high-speed pass at a coastal slope spot. Photograph from <<http://www.rcsail.com>>.





Dave Garwood's Yellow Aircraft Douglas A-4 *Skyhawk* pulls out after a high speed pass across a Lake Ontario slope. The kit, originally for ducted fan installation, is now a PSS. Dave's article on the conversion process starts on page 4 of this issue.