

Radi- C-ntrol-lled Soaring Digest

July & August 2011 Vol. 28, Nos. 7 & 8



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Front cover: Dave Garwood's photographs are always of the highest quality, and the cover shot for this month is no exception. Taken during a MWSC Warbird practice session, Dave provides *RCSD* readers with a unique perspective on the action taking place in the air and the teamwork of pilot and spotter on the slope edge. Canon EOS 7D, ISO 400, 1/350 sec., f19, 40mm

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The Wings Over Wilson Soaring Club presented their 18th annual event in May — Combat, and ODR, Unlimited and Warbird racing on the slopes of Kansas. Full event coverage by Alex Paul with photos by Alex Paul and Dave Garwood.

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When we say we've flown a glider very far away... How far is far? How far away, feeling comfortable flying it, and knowing what you are doing? Genaro Solé used a GPS data logger to find out.

Large Scale Glider Fly-In at Warthog Radio Flyers 33

A fantastic flying site, huge sailplanes and a unique tug set this event apart from others. Coverage by John Godwin.

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Pete Carr found this inexpensive 2.4GHz unit while looking for a smaller receiver, compatible with his Futaba 10CG transmitter, to put into a 2M glider.

Altitude Limited Electric Soaring Man-on-Man Scoring Spreadsheet 40

Created by Curtis Suter, this Excel spreadsheet features preassigned flight groups (can be changed manually), entry of up to 32 pilots, optional dropping of the lowest score, normalized scoring, and the ability to have different flight times for each round.

46 Power Supplies

Rudi Oudshoorn describes 11 power supplies. Ten put out DC voltage from 12 volts to 15 volts DC at 5 to 25 Amps and one has an output of 5 volts 2 Amps.

52 Carlisle Aeromodelers Polecat/Soaring Circuits 2K11 Open Soar (ALES)

Twenty-eight entrants battled it out on June 24-26 2011 when the Carlisle Aeromodelers club hosted the Polecat/Soaring Circuits 2k11 ALES open soaring event in Blosserville, Pennsylvania. Event coverage by Fred Maier with photos by Fred Maier, Dave Garwood, and Andrew Maize.

61 Winged Shadow Systems Equipment review

Dave Garwood describes the Winged Shadow Systems Thermal Scout, How High RT, Smart Bat, and See How units and relates his experiences with each.

66 Get your eyes tested. No, REALLY tested!

Robert Budniak relates his personal experience with a vision problem and offers advice to others.

JR Aerotow Australia 2011 68

The first ever Australian JR Aerotow was held over the Easter break at the Jerilderie Racecourse. Full event coverage by Brian Ford with photos by Jo Carbine.

RDS G2 System 78

RDS is a concept more than ten years old. Harley Michaelis has been improving the system over the years and has been able to have many of its various components professionally manufactured. The latest version of the system, designated G2, features several improvements and nearly all of the parts are readily available "off the shelf." RDS is very popular in the F3B world; the new G2 system has the potential of benefitting all phases of the RC soaring realm.

New Simple Spoiler Linkage 82

Ray DiNoble provides a brief overview of the spoiler linkage he fabricated for his Topaz-S. Links to additional photos are provided in the text.

82 **Black Eagle PSS Festival 2011**

Sponsored by the Two Oceans Slope Soarers, Cape Town, South Africa, this event consisted of static and flight judging of some of the best looking PSS 'ships in the world. Terrific slope soaring weather allowed lightweight and heavyweight soarers to fly, and a monetary contribution to a fund dedicated to the Percy Fitzpatrick Fund for the continued study of raptors and specifically the Black Eagle. Coverage by Kevin Farr with photos by Kevin Farr and Malcolm Riley.

99 **WAZUP?**

Chuck Clemans has been involved in the design of tailless models for decades. His latest is an EPS "plank" which uses the BW050209 thickened to 12%, 1/64" plywood spar caps, and a Park 300 motor using a 1300 mAh Li-poly battery. This compact flyer has a span of 38.5" and weighs 10.5 ounces. Links to full size plans, airfoil coordinates, and a source for wing cores are noted within the text.

100 **Modifying the Turnigy 9x with custom firmware**

Increasing the programming options available on an inexpensive transmitter, along with information on the potential for a wireless "buddy box," colored backlighting, and other modifications.

By Stuart Bradley.

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Back Cover: An ArtHobby Skua (1.5m) being flown by L. P. How of Santa Fe, New Mexico, on a slope south of Gunnison, Colorado. Photo by Rocky Stone
Panasonic DMC-ZS6, ISO 80, 1/1600 sec., f6.3, 49.2mm

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In the Air

You are reading the largest issue of *RC Soaring Digest* ever published, 114 pages. The outpouring of submissions following the cancellation of the July issue was incredibly impressive. Our sincere thanks to everyone who contributed materials - articles, event coverage, reviews, photos and ideas - over the last few weeks.

Several things have happened since the middle of June which have affected us directly.

Maynard Hill passed away on June 7th, leaving a huge void in model aviation. Mr. Hill's TAM 5, with a six foot wingspan and weighing less than 11 pounds, flew from Newfoundland to Ireland, a distance of 1,882 miles, non-stop. But before that he had held a number of international records for RC aircraft, including altitude, duration (he mentioned during one of the MARCS Symposia that he had acquired the nickname "Rusty Zipper") and distance. Maynard's energy and drive to excel, despite severe macular degeneration and near deafness, serve to inspire modelers everywhere.

The Academy of Model Aeronautics has approved two proposals for the upcoming US F3J Team Selection in Cocoa Florida at the end of October. One rule change will allow for five man teams consisting of a maximum of four seniors and one junior. This rule also requires the juniors to fly in their own separate group. The other approved rule states that standardized F3B winches be used for launching. This is important information for anyone planning to participate in the Team Selection.

Time to build another sailplane!

MIDWEST SLOPE

This year's Midwest Slope Challenge was a fine example of what slope flying in Kansas winds with friends/competitors is all about.

The Wings Over Wilson Soaring Club presented their 18th annual event and those that attended will attest it was a bit chilly, but the wind strength offered outstanding flying before/through the event and afterwards. The event this year ran from May, 12th through the 15th.

I flew into Wichita again this year from the Bahamas with a glider filled Sport Tube, camera gear loaded carry-on, and personally filled with anticipation over getting back to Lucas Kansas and flying with established friends. As usual, I had a new "take down" travel plane being built for me by designer/master builder Erik Eaton of Magnum Models waiting for me. It is an ODR "Duster." Thanks Erik and Larry of Magnum Models.

When the flight was arriving in Wichita I knew by the upper level turbulence and strong cross winds we were landing in





CHALLENGE 2011

that this year's event would most likely offer outstanding racing conditions. It proved to be the right impression. Pulling into Lucas I met up with fellow "New York Slope Dogs" at our rented cottage and we were almost immediately heading for the Wilson Lake State Park hill for "Add ballast if you have it" flying.

Check in was held at Kent and Ann Palmer's facility in Lucas the evening of May 12th. It was great seeing everyone again. There were 26 flyers registered for the event this year. During check-in it was announced that the pilots

meeting would be held at Wilson Lake State Park "Main Hill" at 8 am on the 13th. After registration, partying, and sharing stories and laughs it was time to head to residences and be sure needed planes were ready for action. I am sure the local electric company enjoys profits of the event as there are power strips filling every available socket running more chargers, heat guns, and irons than the wall sockets alone will accommodate. Lamps, fans, kitchen appliances, and everything else we normally wouldn't live without cease to be a priority. Planes and assorted

gear cover kitchen counters, tables, and every available space including (in our case) an unplugged kitchen stove. Most of us can relate?

The following morning with weather being a little on the nasty side, pilots gathered at the top of the hill at Wilson Lake State Park. Cold, raining off and on but with good wind conditions it was determined that the contest would begin at 10am and we would all meet at Jim Lawson's hill ready to race, as it was the best established location for the North wind direction. Wind was blowing at 20mph with higher gusts.

ODR

By 10am the weather had improved to mainly over cast skies, with good wind remaining. Arriving at Lawson's hill the organizers and volunteer team had pylons mounted and everything ready to go. We were off and running. The first contest flown was ODR "One Design Racer." With solid winds it made for good racing action... No scratching for "last one up" this year. The Magnum Models "Bad Voodoo" seemed to be the dominant force. 10 years old Darren Ammon showed his training and talent, putting in an amazing display of piloting skills. This young man is going to be a "Top Gun" in the world of slope racing in the years to come. Congratulations on an awesome performance Darren. All pilots flew extremely well with many close races. In the end the top three finishers were:

1st Andrew Williams of Denver, Colorado flying a Magnum Models Bad Voodoo

2nd "10 year old" Darren Ammon of Lucas, Kansas flying an Edge RC Tornado

3rd Erik Eaton of Hayes, Kansas flying a Magnum Models Bad Voodoo.

Thane Kerchoff coaches Darren Ammon during the ODR race. Dave Garwood



Terry Dwyer and Darren Ammon with their ODRs, ready to fly! Dave Garwood





Above: ODR racers rounding the far turn. Flaggers dressed like Eskimos, for a good reason. Alex Paul

Right: Dave Day's Bad Voodoo ODR being held up high for flagger ID. Alex Paul



Above: Larry Blevins of Magnum Models launches for Thane Kerchoff in ODR competition. Mike Tallman, AMA rep, keeping things honest. Alex Paul





Above left: Larry Blevin spots for Dave Garwood, and Justin Eamon spotting for his son Steven during ODR race. Alex Paul

Above right: Close! Dave Garwood

Lower right: A bit of a respite between races. Dave Garwood



Opposite page: A little too close during ODR race. Terry Dwyer's Duster gets T-boned and recovers unscathed. Alex Paul



Unlimited

After ODR finished the pylons were set up for “Unlimited Class” Racing and the first race started at 2pm. Winds were still out of the North and speed had increased to 25 with considerably higher gusts. Each race was extremely competitive. Accomplished pilots flying beautiful full house Sailplanes, in solid wind is always a blast to watch. As in ODR the races were very close and a few times the unlimited planes got to close to stay off of each other. No unfortunate landings resulted but in “exchanging paint “it was strictly the talent of the pilots that got their sailplanes back in good form to continue the action. In the end the top three finishers were:

1st Thane Kirchoff of Lincoln, Nebraska flying a Trinity

2nd Chance Cooper of McPherson, Kansas flying a Tragi

3rd Justin Ammon of Lucas, Kansas flying a DS Tool

At the end of Unlimited racing the event director announced the remainder of the day would be for fun flying with frequency board in place.. It was a great day of flying for everyone. No one seemed to mind the cold winds once the action was underway. This heat spoiled Bahamas dweller included.



Right: Jim Baker (brown funny hat) displays Thane Kirchoff's (green funny hat) unlimited racer to the flaggers. Mike Tallman (gray funny hat) is an AMA District Vice President who came to help with officiating at the races, as he does many years.



Left: Jim Baker (brown funny hat) displays Thane Kirchoff's (green funny hat) unlimited racer to the flaggers. Mike Tallman (gray funny hat) is an AMA District Vice President who came to help with officiating at the races, as he does many years.



unlimited racing action



Paint exchange action during an Unlimited race.

COMBAT

The morning of the 14th the winds were still out of the North at 25 mph and so Lawson's hill remained the designated hill for Combat, and Warbird racing. The temperature climbed a bit and the Sun was out more than it was hidden behind clouds, so it was the beginning of an excellent day. Meeting at Lawson's hill for a 10 am start time was announced at the pilots meeting held at 8am. This year there was a slight change in the rules for combat which offered an improvement in the ease of scoring and longer flight times between rounds. Combat was handed over by Erik Eaton to Andrew Williams from Colorado, who announced the "Colorado Combat" rule changes and every competitor enjoyed the improved format. Good action both high up and in close was achieved and as always the laughs, and controlled antics were a lot of fun. In the end the top three finishers were:

1st David Day of Houston, Texas flying a Cyclone.

2nd Greg Hine of Boulder, Colorado flying a Predator Bee

3rd Fred Maier of Akron, New York flying a Windrider Bee



Alex Paul

Opposite page: Chance Cooper of McPherson, KS gets ready to relaunch his 48-inch span combat wing in the midst of the foam combat match. We had cool air temperatures and plenty of wind. As the soaring philosopher Steve Savoie (retired from the US Coast Guard) taught us, "There is no such thing as foul weather. There is only under-dressed sailors."



Dave Garwood

Scenes from the Combat event

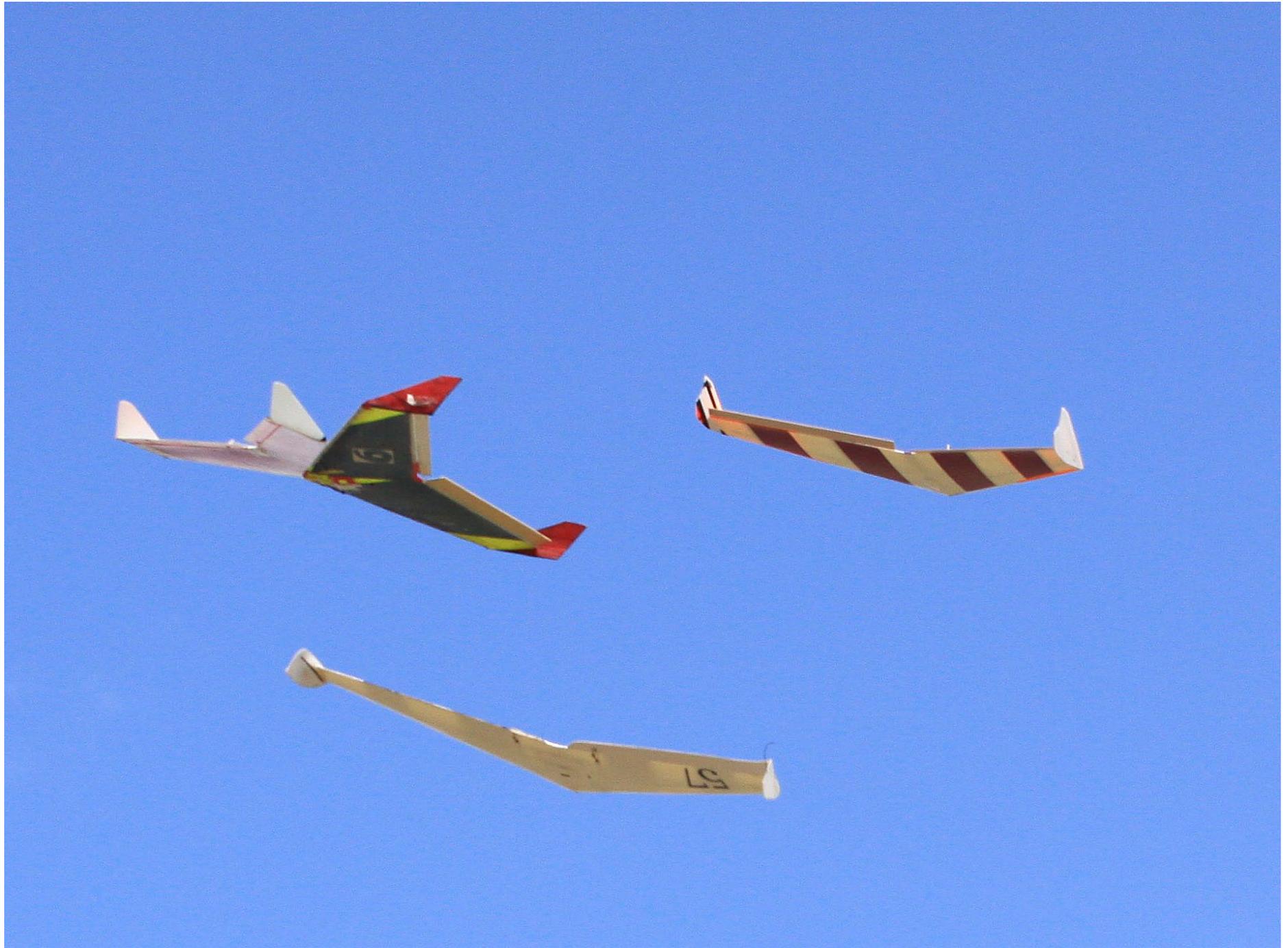


Alex Paul



Launches, collisions, piloting skills and close proximity flying. Alex Paul





WARBIRDS

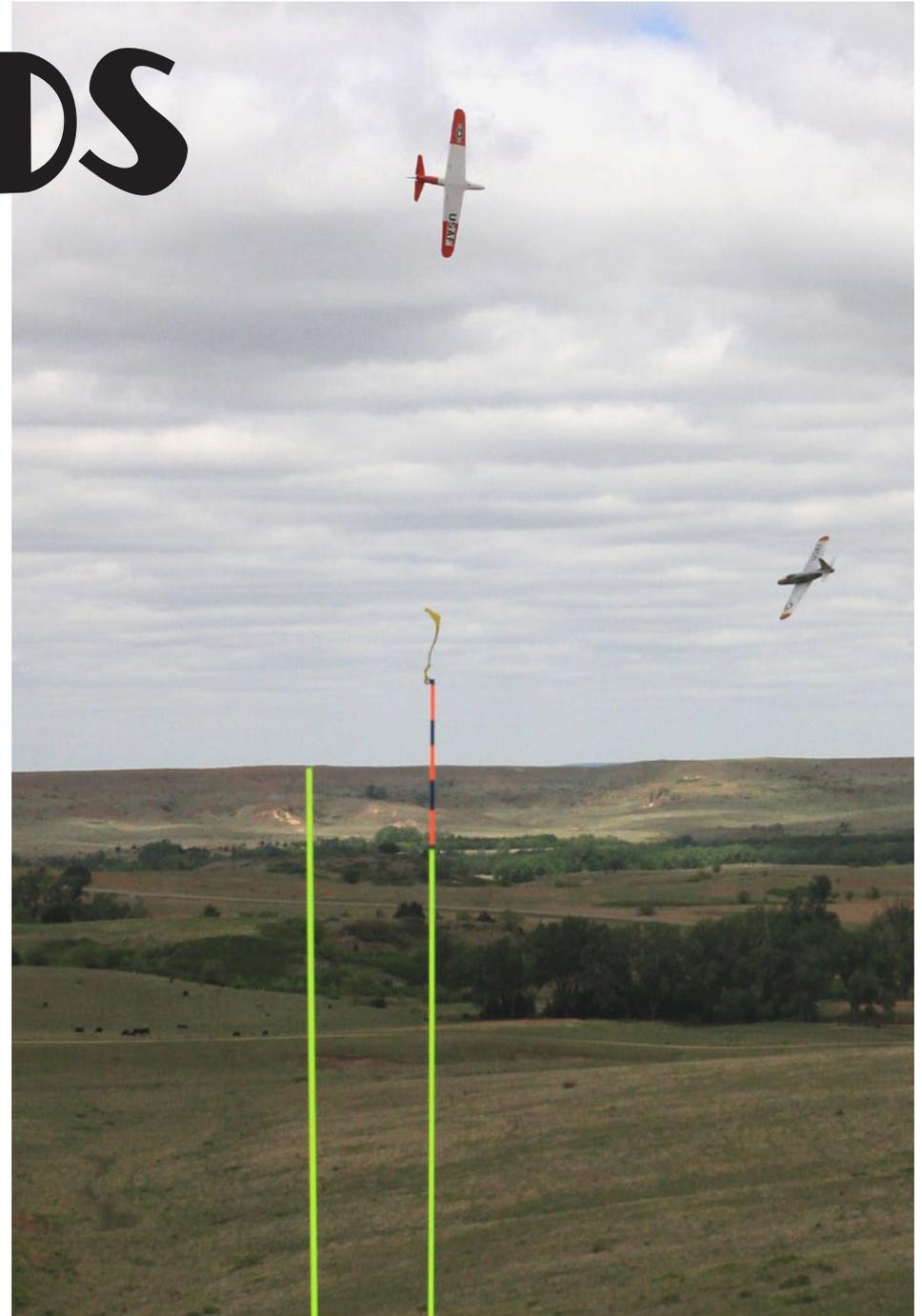
With the North wind and weather continuing to cooperate, the Warbird Race was held at 1pm. This is one of my favorite events because the races are often tight, and there is something about seeing “scale like” military planes flying that gets my imagination focused on the real deal. Leading Edge Gliders and Magnum Models seemed to dominate the field and they both offer very realistic looking foam plane kits that fly beautifully. After a number of exciting heats with tight results, also with plenty of “paint exchanges” around the pylons the top three finishers were:

1st Joe Chovan of Syracuse, New York flying a Leading Edge Gliders P-80 Shooting Star

2nd Erik Eaton of Hayes, Kansas flying a Magnum Models Mig-3

3rd Mike Bailey of Wichita, Kansas flying a Leading Edge Gliders P-80 Shooting Star

P-80s round the pylon. Alex Paul





Two "Reno racers" battle it out. Alex Paul





*Above and right: Chovan's P-80 and Blevins' MiG-3_round the pylon.
Dave Garwood*



*Below: More Warbird practice.
Dave Garwood*





Left: A launch of Dennis Brown's original design Focke-Wulf Ta-152 during a Foam Warbird race heat. Alex Paul

Below left: Heavy heave for a P-80 Shooting Star. Dave Garwood

Below right: David Day's Magnum Models MiG-3 and Mike Bailey's Leading Edge Gliders P-80 Shooting Star tangle at the near turn in the Foam Warbird race. Alex Paul





Warbirds and pilots waiting for the action to start. Alex Paul



Top left: Mike Bailey prepares to launch a race plane in the Foam Warbird race.



Top right: Joe Chovan prepares to launch Dave Garwood's Leading Edge Gliders P-80 Shooting Star in a Foam Warbird race heat.



Below left: Justin Ammon prepares to launch Larry Blevins' Magnum Models MiG-3 in the Foam Warbird race. The other three guys in the picture? They are, well, they're looking for someone's dropped car keys.



Below: One of the "Reno racer" models flown in the Warbird event.



Mike Bailey launches Mike Gantner's Me-109. Dave Garwood

At the end of the Warbird race more fun flying was open at Lawson's hill and wrapped up a very successful flying event. At 7 pm the awards banquet was held, and as is the case every year the catered meal was an amazing feast. The awards ceremony was conducted by WOW President and event organizer, Erik Eaton, and with his usual humor and public speaking skills he insured the awards ceremony was a lot of fun. With many generous sponsors both locally and nationally, there was something for everyone in attendance, and some of the luckier raffle ticket holders left with some outstanding stuff.

I know I can speak for everyone that attends the Midwest Slope Challenge when I say thank you to Wings Over Wilson Soaring Club, Erik Eaton (President), Larry Purdy (Vice President), AMA rep Mike Tallman, Kent, and Ann Palmer of Lucas, Jim Lawson from Lucas for his continued event support and generosity, allowing us to use his land for the event, and all of the folks that help make this annual event run so well. Everyone involved not only volunteers their precious time to help the event run but they are meaningful friends as well. Friends I know we all look forward to getting back to see. Lucas welcomes us

back as family every year, and they know how to take good care of family.

One of the many wonderful things about the area for the soaring pilot is that there are many good flying hills facing every direction with wind more often than not, and on the "not" day's thermal flying couldn't be better. Permission to fly is usually granted by land owners if approached, asked nicely and their specific instructions are followed. This demonstrates our appreciation and shows the respect each generous landowner deserves. This helps assure permission will be given again in the future. A lot of good people live in Kansas.

Local Business MWSC 2011 event supporters/sponsors

Bob Smith
 Eric Abraham Porceland<http://www.ericabraham.net>
 Gantner Engineering
 Home Oil
 Leache & Nagele Hardware Store
 Leon's Welding and Fabrication
 Pro-Tech, Inc.
 Radio Control Models
 Troy's Grocery
 Rodrick and Minerar Funeral Homes

Model Designers and Manufacturers attending MWSC-2011

Justin Ammon	Edge RC	http://www.edgerc.com
Mike Bailey	Fancy Foam	http://www.FancyFoam.com
Larry Blevins	Magnum Models	http://www.MagnumRCModels.com
Joe Chovan	Tufflight	http://www.Tufflight.com
Erik Eaton	Eaton Air	http://www.eatonairrc.com
Michael Gantner	G.E.M.S.	440-759-7144
Cory Schanz	Got Gas RC	http://www.gotgasradiocontrol.com
Andrew Williams	Canuck Engineering	http://www.canuckengineering.com

The following is a list of all the supporters/sponsors of the MWSC event

Academy of Model Aeronautics	http://www.modelaircraft.org
Aero Works	http://www.aero-works.net
Castle	http://www.castlecreations.com
Dymond Modelsport LTD	http://www.rc-dymond.com
Eaton Air RC	http://www.eatonairrc.com
Fancy Foam Models	http://www.fancyfoam.com
Great Planes Model Mfg.	http://www.greatplanes.com
Hobby Horse	http://www.hobbyhorse.com
Magnum Models	http://www.MagnumRCModels.com
Nano Planes	http://www.nanoplanes.net
Sig Manufacturing	http://www.sigmf.com
Windrider Aviation	http://www.windrider.com.HK
Wyoming Wind Works	http://www.wyowindworks.com

MWSC 2011 Photographers:



Alex Paul by Dave Garwood



Dave Garwood by Alex Paul



<http://tinyurl.com/3gpl7yg>

From David Vels <davensam@bigpond.net.au> through the MRSSA yahoo.com.au mailing list:

Awesome Cross Country flight... without leaving the flying field!!! 55km goal and return using a 34 second motor run. All done with telemetry and video link.

<<http://vimeo.com/24210629>>

Montiel Roberto's setup is the following :

Model: Grafas Top Model CZ, 3 m. span. (14:1 glide ratio @ 50 km/h.)

Motor: AXI 2820/14

Prop: Aeronaut foldable 13x6,5

ESC: Jeti 44 adv.

Battery: Graupner LIPO 3S 5200 mAh

Aux. battery: Flightpower LIPO 3s 2500 mAh

FPV camera: Pixim DX 201

OSD: Range Video Gen 4 (with autopilot)

RC TX: Thomas Scherrer LRS (Standard whip antenna tx 0.5 W.)

RC RX: Thomas Scherrer LRS 12 ch. V 4 (two dipole antenna).

Transmitter: Graupner MC24

Video TX: BEV 1.3 Ghz. 1.5 W. (3 db. whip).

Video RX: BEV 1.3 Ghz. (14 db patch antenna).

Logger: SM Modellbau GPS Logger.



How far is "far"?

Genaro Solé, genarosole@gmail.com

When we say we've flown a glider very far away... How far is far?

Of course, the answer depends on how well you see, your pilot skills, the size and color of the glider, and a very long flight, etc.

But in general terms, how far can you control a glider? How far away, feeling comfortable flying it, and knowing what you are doing?

The question can be answered using one of the many GPS data loggers now present in the market.

Specifically, we answered the question with the help of a Canmore GT-730FL-S USB GPS Tracker Stick Data Logger <<http://www.amazon.com/gp/product/B002UWKUZQ>>, on board a Multiplex Easy Glider Pro, on a good windy day at our Club Las Águilas in Caracas, Venezuela.

This GPS data logger only weights 30 gr. and is small enough to be accommodated under the canopy.

Once the data was downloaded from the data logger and plotted on Google Earth, the question was easily answered:

626 meters! (2.053 feet!)

At this distance we felt comfortable flying the glider, but frightened by the great distance it was. I surely can overcome this limit, but it greatly increases the risk for me not being able to understand what my glider is doing.

Other data can be obtained from the GPS data logger:

Flight time: 11 minutes

Height (on track): 234 meters

Average speed: 33 km/h

Maximum speed: 109 km/h (diving steeply)

Horizontal speed reached a maximum of around 60 km/h.

With the data you even can do a video simulation delivered by Google Earth software.

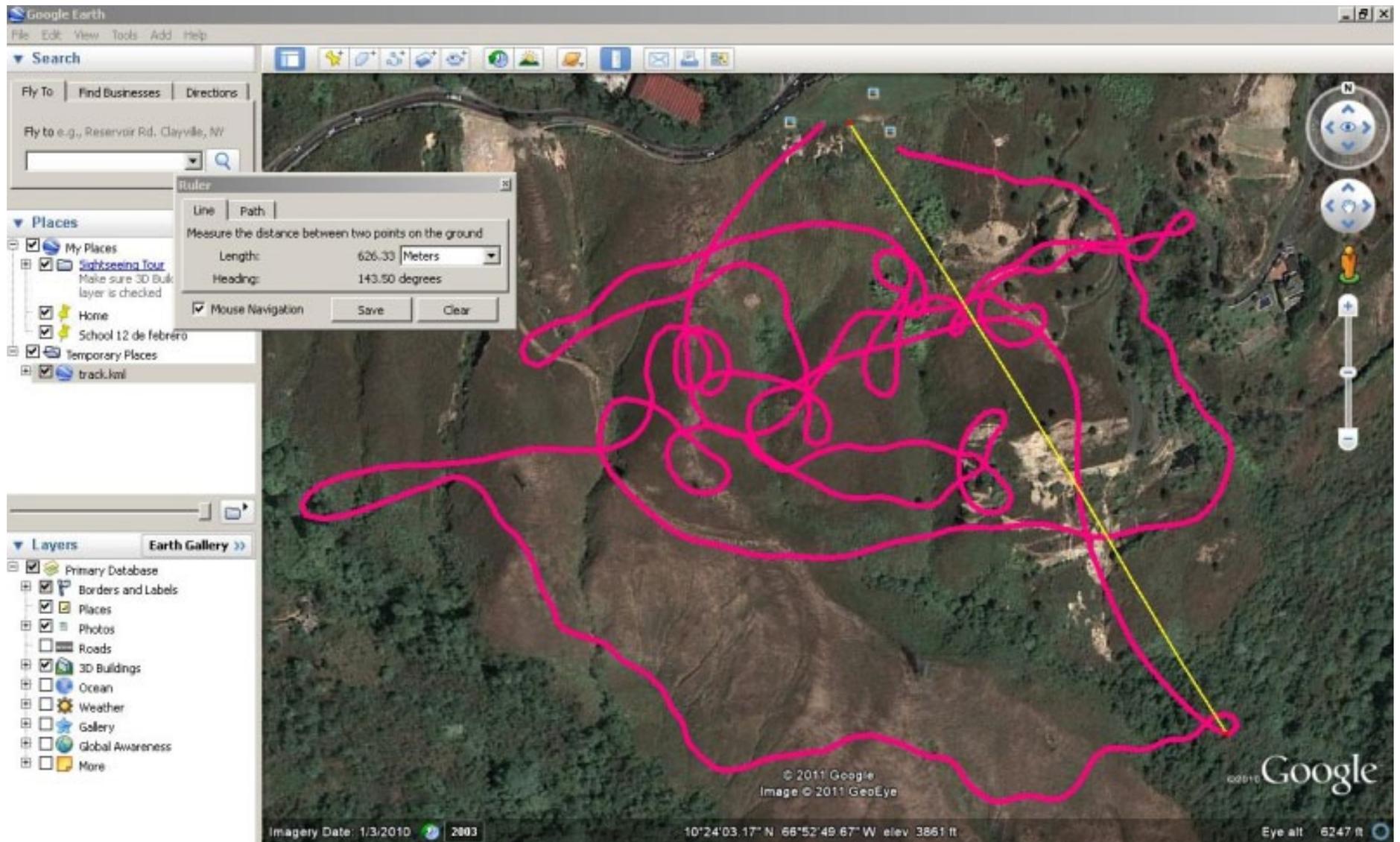
<<http://www.youtube.com/watch?v=pQyYWFrLI64>>

New technologies are not indispensable to fly, but in my personal opinion, they can enrich our flight experience, providing information that can later be used in other ways.

And, in my opinion, this GPS data logger turned obsolete and impractical the current velocity meters and altimeters based on pressure difference, which cost a lot more.

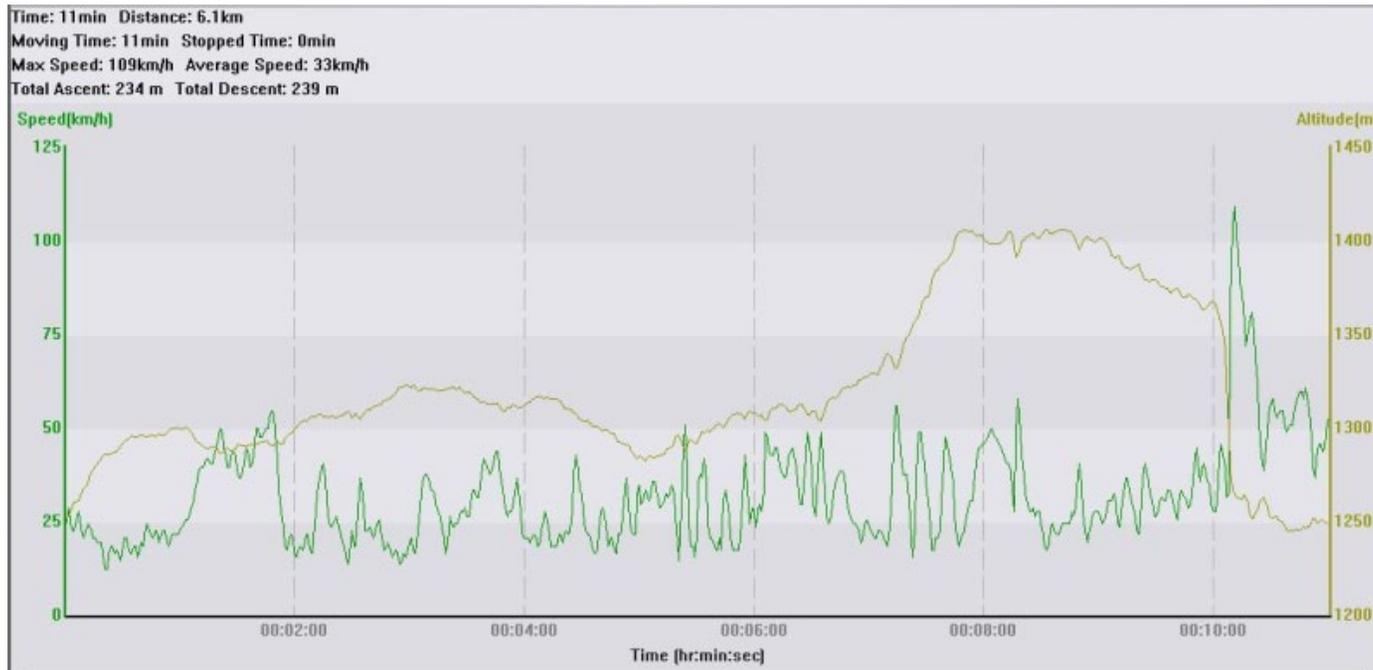
I want to thank Miguel "Miche" Lagardera for providing the GPS data logger and processing the data, and Carlos Nava for his field support.

How far is far? Far away!



After downloading data from the Canmore GT-730FL-S USB GPS Tracker Stick Data Logger, the flight track can be plotted on Google Earth. Distances can then be measured directly on-screen.

Speed and altitude can also be plotted. See the next page for the representative graph for this 11 minute flight.



Speed and altitude data for the 11 minute flight documented in this article.



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

Claim number: 16072
 Sub-class: F5 Open (Radio Control Flight)
 Category: Aeroplane
 Group: Electrical Motor Rechargeable Sources
 Type of record: Gain in altitude: 173
 Course/location: Orléans (France)
 Performance: 3 843 m
 Pilot: Patrick VALLET (France)
 Members: Antoine PELLETIER (France), Jean-François ALLAIS (France)
 Date: 06.08.2010
 Previous record: 3 418 m (02.10.2004 - Giorgio AZZALIN, USA)

FAI congratulates the Pilots on this splendid achievement.



Large Scale Glider Fly-In at Warthog Radio Flyers

John Godwin, old.bok@gmail.com

I went to Warthog Radio Flyers Large Scale Glider Fly-In with the express idea of taking photos. I took a great many but only half a dozen were any good. Here are the best.

The Warthogs fly from inside the Gerotech Antenna Testing Range, north of Pretoria, South Africa. This is an excellent site, with acres of short grass, 24 hour security, buildings with water and electricity and even, I have heard, a swimming pool.



The Warthogs fly from inside the Gerotech Antenna Testing Range, north of Pretoria, South Africa



A selection of some of the gliders that made it to the fun-fly





One of the “tugs” used during the event.



Mike May and his 8M DG 505





FASST ORANGE RECEIVER

ORNG8F

Pete Carr WW30, wb3bqo@yahoo.com

Several months ago I received an e-mail from HobbyKing that they had opened a store on the west coast. The e-mail also offered an Orange receiver that was supposed to work with Futaba FASST technology radios. I had been looking for a smaller receiver for a two meter sailplane and it seemed that the Orange might fill the bill.

As you may know, 2.4 GHz radios operate differently from the 72/75 MHz variety. The older 72 MHz rigs would all encode information the same and the receivers could process just about any transmitters' signals. That has pretty much disappeared now. Futaba uses the FASST method while Airtronics uses another type. That means that, if you buy a transmitter you will be required to buy their receivers too. It gets uglier than that. Some manufacturers seem to specialize in pattern or 3D radios where enormous numbers of channels are needed and equipment size isn't too important. Others make airborne gear that will work well in hand launched sailplanes where



light weight and small size are necessary. I had bought a Futaba 10CG transmitter which came with a 14 channel receiver that was bigger than the old 72 MHz types of several years ago. Until now, that gave me little choice in receivers and their size was a big issue for my sailplanes.

That is why I was interested in the Orange receiver. It looked smaller than the Futaba 6014 and promised full range. It was also less than half the price of the least expensive receiver that Futaba makes for the 10CG.

I ordered a receiver on their web site and sat back to wait for delivery. The receiver arrived in about 10 days in a box with air pillows. The receiver was not even wrapped up, just thrown into the box along with the pillows and sealed up.

There was no paperwork in the box other than the invoice. I went down to the shop and plugged the receiver into a battery and some servos and tried to "bind" it to the transmitter. No luck. Then, I got out the Futaba manual and followed the instructions for the binding procedure. That didn't work either. I shut everything off and went upstairs to the computer to get on the HobbyKing web site.

The site offered a help desk where I could send an e-mail so I outlined the situation and sat back to wait. It was over a week before a reply arrived which sent me to a document on their site that I downloaded. It directed me to hold the bind button on the receiver down while turning on the receiver power with the transmitter on. When I followed those instructions the receiver recognized



The top fuselage is a 9-servo sailplane so the 14 channel R-6014 receiver gets a workout. The Orange 2.4 GHz FASST receiver in the Oly II fuselage is about the same size as the Futaba receiver but slightly thinner. The two coaxial leads used on each receiver are identical. Current drain was also about the same for each receiver with the servos unplugged.



The Orange receiver fits a typical fuselage radio room in the same manner as the Futaba. Coaxial cable antennas are installed at 90 degrees from each other and battery and servo connections are the same. The Orange receiver requires that the 10CG transmitter be placed in 8-channel mode with the fail-safe feature disabled to prevent servo jitter.

the transmitter and the servos became active. This is different from the Futaba binding procedure as outlined in the manual so be prepared for the change.

HobbyKing also has a section where customers can post concerns about various products. I checked the one related to the Orange receiver and found a bunch of posts, all mentioning the lack of documentation or instructions and several posted their feeling about the substandard shipping methods.

Okay, that problem was solved so I checked the hanger for a sailplane that would be good for receiver flight tests. The Olympic II sailplane was the prime choice since the servo and power connectors would connect right up. I took an Ace Pro-810 receiver out of the radio room that had flown the ship on 53.4 MHz. The sailplane handled the “great leap forward” in technology just fine! I was surprised that the Orange receiver wasn’t much smaller than the Pro-810. Anyway, after setting the servo directions on the 10CG transmitter and doing some backyard range checks I took the Oly II out to fly.

The antennas of the Orange receiver are two pieces of coax with some of the shield removed to expose the center conductor. The antennas of the Orange were the same size and coax type as the Futaba 6014 and I mounted them 90 degrees from each other for signal reception diversity. The radio worked just

fine and I was able to get the sailplane “wicked high” with not a hint of control problems. Still, I live out in the sticks where radio interference is quiet and nobody else flies planes. The acid test would be to go to a city and try it.

The Clarence Soaring Society of Buffalo, NY is now known as the New York Sailplane and Electric Fliers. It holds contests in Hamburg, just south of Buffalo, next to the NFL football stadium where the Buffalo Bills play ball. The parking lots and beautiful grass of the flying site are a joy to fly. This is where I decided to test fly the Oly II.

The June 18th, 2011 contest was a great day with blue skies and good lift. It was possible to get really high and downwind in circles that really tested the receiver operation. I’m glad to report that the Orange receiver worked perfectly. I can now say with confidence that the receiver operates in a typical urban setting without problems.

About ten days later I received a letter from Bank of America where I have a credit card. They informed me that my card had been “compromised” so they were closing the account. Enclosed was a new credit card and not much additional information. I called them and was not given any more information other than to say that the trouble seemed to originate “offshore.”

There are some recurring charges such as the Sirius radio for the car and some

magazine renewals that all had to be changed over to the new card number. If you’ve ever had to do this chore you can understand the situation. I was not happy. There have been several stories in the media about hackers and lost credit card account information of various types so I can’t say if that was the cause of the credit card change. Still, it was curiously near the time when I bought the Orange receiver. You might consider this if you deal with vendors from out of this country.

So I now have an Oly II sailplane that flies great and works with the Futaba 10CG transmitter. I did save some money but feel that I paid dearly considering the inconvenience. The features of the 10CG transmitter are now available with the 8-channel receiver so I will migrate the radio to a more challenging sailplane shortly.

Resources:

<<http://www.hobbyking.com>>; source for the Orange FASST Futaba compatible receiver ORNG8F.

<http://www.hobbyking.com/hobbyking/store/_14300_OrangeRx_Futaba_FASST-Compatible_8Ch_2.4Ghz_Receiver.html>

<<http://www.futaba-rc.com>>; web site for the Futaba 10CG radio with specifications.



ALTITUDE LIMITED ELECTRIC SOARING MAN-ON-MAN SCORING SPREADSHEET

Curtis Suter, suter@msn.com

Bringing Soaring to Montana

You're probably asking yourself now what does Soaring in Montana have to do with a Scoring Spreadsheet article? Well as a man who is addicted to thermals I have finally thought of a way to bring soaring contests to Montana. My first thought was to get folks interested in DLG but that takes some physical aspects that some folks aren't interested in. Then I thought perhaps we could hi-start our DLG's but that didn't seem to garner much interest. I also thought of using hi-starts but that requires a lot of walking and winches and retrievers were cost prohibitive for me. With the advent of very efficient and light weight electric motors and batteries, as well as some very nice and inexpensive foam gliders, I noticed more and more club members with electric assisted gliders at our field. Finally thanks to Randy Brust for making the CAM, an altitude limiter for

our motors, now with very little effort we can have a contest with electric assisted gliders. I was now in need of some way to score the contest. I had downloaded a few programs and spreadsheets and they were very well done but I noticed that they were either too complex for our needs nor would they sort flight groups out evenly for very small contests.

Since each pilot has to have a timer then a minimum of two flights groups are required. I noticed that other programs/spreadsheets didn't evenly mix the pilots in flight groups for each round when only a small number of pilots were present. If only eight pilots showed up then each group needed to have four pilots. So this spreadsheet is ideal for small clubs and contests to learn how flying in contests. Flying in contests not only hones ones skills for learning to read air, how to land in a consistent location but

also how much fun can be had with little effort. Contest flying can be intimidating at first and I am trying to reduce that intimidation. My first thought is that the simpler it is to hold a contest the more folks I could attract and perhaps more folks may be interested in CD'ing their own contest. It's really not a daunting task to hold a small contest.

I thought it would even be possible to fly a contest without the use of a printer at the field or any kind of electronic equipment for that matter. Although without a computer scores would have to be input at a later time thus the pilots would have no idea where they stood in the contest after each round. Even without a computer my thought is that it's better to have had a contest as it would still be fun and an excellent learning experience. So this spreadsheet allows for an evenly mixed flight matrix to be printed directly to the score cards, even at home. More later.

Prior to explaining the spreadsheet first let me give a quick overview of what Man-on-Man Soaring is.

Man-on-Man Soaring

This is where pilots launch and fly their flight at the same time and in the same air; i.e. fly in the same flight conditions. The scores are normalized by flight groups based off of the top pilot's score of that flight group. So if you have 10 pilots at a contest and two flight groups, you do need timers so not all 10 could fly at once; then there should be five pilots per flight group.

Thus if the first flight group, we'll call "A", fly in excellent conditions and max their time the top pilot will receive 1,000 points and everyone else's score will be normalized off the leaders score. Then when flight group "B" flies and the air is all sink, then the same scoring holds true. Thus the group that flew when the conditions weren't so good isn't penalized adversely from the first flight group when the conditions were better. This is called Man-on-Man soaring or MOM.

When I make spreadsheets I prefer not to have any special coding, macros, VBA etc. This ensures that the spreadsheet

will work on all versions of Excel and other spreadsheet programs. I believe I've succeeded in doing so.

So I took my skills in Microsoft Excel and started some programming.

What this spreadsheet does NOT do:

- It does not sort frequencies.
- It does not assign flight groups in a true "Seeded" matrix
- It does not handle scoring of re-flights
- It does not sort by class or plane type. Such as Open, Standard or Expert, Beginner, or RES, Unlimited etc.
- Maximum of 32 pilots, four flight groups and eight rounds.

Note: The spreadsheet does not allow extra rows to be added to increase the number of pilots or extra columns to be added to increase the number of rounds due to several programming factors.

What the spreadsheet DOES do:

- It preassigns flight groups via a "fixed" matrix so that contestants are mixed as evenly as possible. Even for very small contests flight groups are assigned evenly.
- The spreadsheet allows for a maximum of 32 pilots, four flight groups and eight rounds of soaring.

- It allows for the lowest round to be dropped at the end of the contest.
- Flight groups may be manually changed by unprotecting the spreadsheet; it is not password protected.
- The spreadsheet normalizes flight scores for each round by Flight Group then adds the landing score.
- Flight time is scored at one point per second up to the target time and then one point is deducted for each second over the target time. All fractions of seconds are dropped.
- If the contestant's flight time exceeds the target time by one minute no landing bonus points are awarded.
- It allows for the individual rounds to have different task times
- Ties are identified.

So now that you know what it does and does not do I'll explain how simple it is to use.

How to Use the Spreadsheet

All the cells are protected except what is highlighted in bright yellow, which are data entry cells.

There are 12 tabs at the bottom of the spreadsheet and they are used logically from left to right.



Instructions Tab

This is self explanatory and a good reference for later use.

Flight Groups Tab

First the CD first enters the pilots name and model type if so desired. Then he/she enters the number of flight groups for this contest. This automatically produces a flight matrix and also copies this matrix to the Score Cards tab. The flight matrix is produced on the score cards as soon as the number of flight groups is entered, regardless if pilots have been assigned yet.

Rounds Tab

Enter the target time for this round as it's required for proper scoring.

Then as the pilot flies enter his/her score in minutes and seconds and their landing bonus. When entering times there is no colon or semi-colon required. Just numbers directly from the number pad on the keyboard.

Accomplish this for all the rounds flown. Ensure that for rounds not flown that there is no scoring data in those rounds. A fresh or blank copy of this spreadsheet is recommended for each specific contest. Notice there is a column under a light blue header that sorts the pilots in chronological score order. It also identifies if there is a tie score. It's left up to the CD to determine how to break the tie.

Round 1										
Target Time 10.00 minutes										
#	FLT Group	Pilot	Min	Sec	Landing	Score (seconds)	Normalized Score	Normalized Score with Landing	Pilot Rank	Player Ranking and Score This Round (In Order)
1	C	Mickey Mouse	11	0	15	540	900	908	7	1 Wile E. Coyote 1050
2	B	Donald Duck	6	38	10	398	663	981	4	2 Bullwinkle 1050
3	A	Snoopy	5	13	10	313	522	958	6	3 Lucy 1000
4	A	Linus	5	20	0	320	533	970	5	4 Donald Duck 980
5	C	Lucy	9	55	0	595	992	1000	3	5 Linus 969
6	B	Tasmanian Devil	3	19	25	199	332	510	11	6 Snoopy 958
7	C	Garfield	1	14	0	74	123	124	13	7 Mickey Mouse 907
8	B	Charlie Brown	6	1	0	361	602	880	8	8 Charlie Brown 880
9	A	Wile E. Coyote	5	30	50	330	550	1050	1	9 Rocky 651
10	A	Bugs Bunny	0	19	0	19	32	58	14	10 Road Runner 609
11	C	Road Runner	5	21	70	321	535	609	10	11 Tasmanian Devil 510
12	B	Daffy Duck	2	59	0	179	298	437	12	12 Daffy Duck 436
13	C	Rocky	5	56	53	356	593	651	9	13 Garfield 124
14	B	Bullwinkle	6	50	50	410	683	1050	1	14 Bugs Bunny 57
15						0	0	0	15	15

TIE
TIE

Final Scores															
Drop Lowest Score "Yes" or "No" No Suggest "No" till end of Contest															
Number of Rounds for this contest 5 Maximum of Eight															
#	Pilot	Model Name	Rounds								Lowest Score Dropped	Total Score	Pilot Rank	Player Ranking and Score All Rounds Flown (In Order)	
			1	2	3	4	5	6	7	8					
1	Mickey Mouse	Duck	908	1000	908	1000	1000	0	0	0	0	4815	3	1 Lucy 5000	
2	Donald Duck	Aggression	981	679	1010	981	981	0	0	0	0	4631	4	2 Bullwinkle 4939	
3	Snoopy	Doghouse	958	889	773	536	536	0	0	0	0	3693	9	3 Mickey Mouse 4815	
4	Linus	Blanket	970	899	804	593	780	0	0	0	0	4046	8	4 Donald Duck 4631	
5	Lucy	Football	1000	1000	1000	1000	1000	0	0	0	0	5000	1	5 Charlie Brown 4155	
6	Tasmanian Devil	Whirlwind	510	394	510	510	394	0	0	0	0	2318	11	6 Wile E. Coyote 4091	
7	Garfield	Lazy	124	137	124	137	137	0	0	0	0	660	13	7 Rocky 4076	
8	Charlie Brown	Bad Luck	880	607	907	880	880	0	0	0	0	4155	5	8 Linus 4045	
9	Wile E. Coyote	Dynamite	1050	977	855	605	605	0	0	0	0	4091	6	9 Snoopy 3693	
10	Bugs Bunny	Carrot	58	53	48	35	46	0	0	0	0	240	14	10 Road Runner 3047	
11	Road Runner	Speed	609	609	609	609	609	0	0	0	0	3047	10	11 Tasmanian Devil 2318	
12	Daffy Duck	Screwball	437	331	437	437	331	0	0	0	0	1973	12	12 Daffy Duck 1972	
13	Rocky	Dudley Do-Right	651	1053	947	712	712	0	0	0	0	4076	7	13 Garfield 659	
14	Bullwinkle	Moronic Moose	1050	739	1050	1050	1050	0	0	0	0	4939	2	14 Bugs Bunny 240	
15			0	0	0	0	0	0	0	0	0	0	15	15	0
16			0	0	0	0	0	0	0	0	0	0	15	16	0

Rank by Round Tab

This shows each pilot ranking and score by round. This is a convenient way to print and post each rounds scores and pilot ranking after the scores for each round have been entered.

Final Scores Tab

This shows the scores for all the rounds completed and the pilot's ranking for the entire contest. There are two yellow cells for data entry. These are only required if the CD wishes to drop the Pilot's lowest round score at the end of the contest. Enter the number of rounds flown; the rest of the rounds should contain zeros. The lowest score will automatically be dropped when answered with "Yes".

Score Cards Tab

The score cards will automatically be filled with the Pilot's and their Models names from the "Flight Groups" tab as they are entered into the spreadsheet. This requires a printer at the flying site. However, a printer isn't required if the score cards are printed prior to the contest. Once the number of flight groups has been determined then the score cards may be printed, even if the Pilot's have not been entered on the Flight Groups tab. This allows for a contest to be held without pre-registration. Thus the pilot and model sections of the score cards are blank and will need to be filled in manually. An

1						
Pilot _____						
Model _____						
Round	Flt Group	Target Time	Time		Land Points	Timer (init)
			Min	Sec		
1	C					
2	A					
3	B					
4	B					
5	A					
6	C					
7	A					
8	C					
2						
Pilot _____						
Model _____						
Round	Flt Group	Target Time	Time		Land Points	Timer (init)
			Min	Sec		
1	B					
2	B					
3	C					
4	A					
5	B					
6	B					
7	B					
8	B					
3						
Pilot _____						
Model _____						
Round	Flt Group	Target Time	Time		Land Points	Timer (init)
			Min	Sec		
1	A					
2	C					
3	C					
4	C					
5	C					
6	A					
7	C					
8	A					
4						
Pilot _____						
Model _____						
Round	Flt Group	Target Time	Time		Land Points	Timer (init)
			Min	Sec		
1	A					
2	C					
3	A					
4	B					
5	B					
6	A					
7	B					
8	B					

accurate flight matrix is also assigned to the score cards. This is one advantage of the fixed matrix. This makes it easier for last minute changes to the pilot list on the day of the contest without the need for a printer at the flying site.

Once the pilot list is complete write the name on the score card that matches the corresponding pilot number and their flight groups for each round will be on their score cards. This should also

help prevent a pilot from missing his/her round.

Additional Information

A contest can actually be accomplished without the use of any electronic device at the field. Although, knowing your actual standing during the contest will be impossible. All that needs to be done is print the score cards prior to leaving the comfort of your home. If the number

of contestants is unknown, thus the number of flight groups unknown, print score cards for all possible flight group combinations. i.e. Two, Three and Four flight groups. Then cut these at home into stacks and you should have score cards for flight groups of two, three and four.

On contest day when you know how many contestants there are you can decide how many flight groups to use. Then just hand out the score cards from that flight group stack and write the contestants name on the score card that matches their pilot number on the Flight Groups tab.

Lastly, there is a flight group matrix verification chart at the bottom of the Flight Groups tab. What this does is show how many pilots there are per flight group, per round. This is a quick check that shows if all pilots are evenly sorted for each round by flight group. Here is an example with 14 contestants and as you can see they are mixed as evenly as possible using a fixed matrix system.

The Matrix

Let's say there are 16 pilots that sign up at the contest. So now we have to decide if to fly two, three or four flight groups, per round. If we fly two flight groups there will be eight in each flight group. Three flight groups would have five in two groups and six in another. Lastly if there were four flight groups there would

Pilots and Groups

Number of Groups **3** Maximum of Four

#	Pilot	Model	Flight Groups							
			1	2	3	4	5	6	7	8
1	Mickey Mouse	Duck	C	A	B	B	A	C	A	C
2	Donald Duck	Aggression	B	B	A	A	B	B	B	B
3	Snoopy	Doghouse	A	C	C	C	C	A	C	A
4	Linus	Blanket	A	C	A	B	B	A	B	B
5	Lucy	Football	C	B	B	C	C	C	C	C
6	Tasmanian Devil	Whirlwind	B	A	C	A	A	B	A	A
7	Garfield	Lazy	C	A	B	B	A	A	C	B
8	Charlie Brown	Bad Luck	B	B	A	A	B	B	B	A
9	Wile E. Coyote	Dynamite	A	C	C	C	C	C	A	C
10	Bugs Bunny	Carrot	A	C	A	B	B	A	B	B
11	Road Runner	Speed	C	B	B	C	C	B	C	C
12	Daffy Duck	Screwball	B	A	C	A	A	C	A	A
13	Rocky	Dudley Do-Right	C	C	A	B	A	A	B	B
14	Bullwinkle	Moronic Moose	B	B	C	A	B	B	A	C

Total Groups Per Round	A	4	4	5	5	5	5	5	4
	B	5	5	4	5	5	5	5	5
	C	5	5	5	4	4	4	4	5
	D	0	0	0	0	0	0	0	0

be four in each group. The significant difference here is that with less flight groups then more rounds can be flown in the same amount of time. Field length is the main consideration on size of flight groups. More pilots per group will require a larger field.

I would be remiss if I didn't mention a few words about the fixed matrix. Since it is fixed it doesn't change randomly. So if you held two contests and had the same pilots sign up in the same exact order, fly the exact same models, fly in the exact same weather conditions and have the exact same flight times and landings, then I guess it would get boring quickly. The chances of that happening are slim to none. Just trying to get Mother Nature to cooperate is next to impossible.

That's it! The spreadsheet is available for free at www.TailwindGliders.com on the "Articles/File" page of the website. There are two copies of the spreadsheet in the downloaded file. One has information already entered and the other is a blank copy ready to sign up pilots for a contest.

Thanks to Randy Brust for his excellent electronic skills and providing the CAM to us at a very reasonable price.

It's always nice to hear from folks who use the work I've accomplished. I'd be interested in any contest experience/ results as well as any suggestions or comments on this scoring spreadsheet.

Links:

The Competition Altimeter for Models (CAM) is available at Soaring Circuits <<http://www.soaringcircuits.com/>>. There are two versions of the CAM available and the 100m/150m/200m is the most popular model by far.

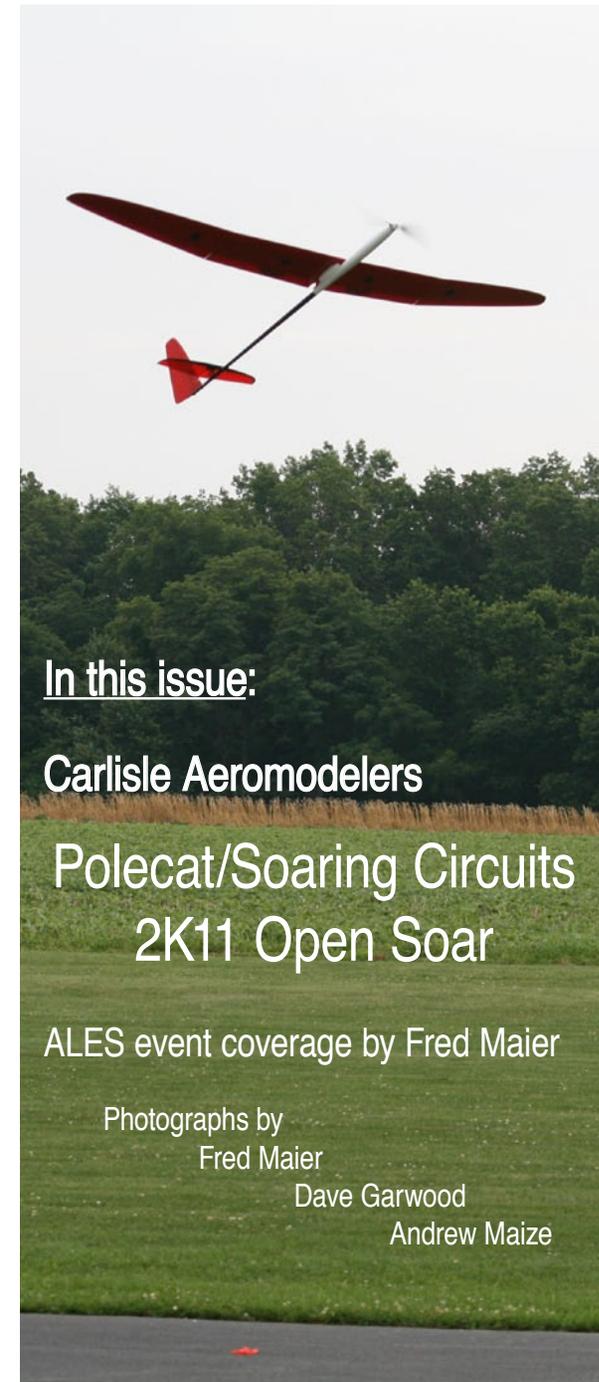
Here are a few links to other very nice scoring spreadsheets and programs:

ALES Score was originally written for F5J by Dan Tandberg and modified for ALES by Dave Register, Randy Brust and Lauren Brust of Soaring Circuits fame. <<http://www.soaringcircuits.com/alescore2d1.zip>>

GliderScore by Gerry Carter <<http://www.gliderscore.com/>>.

F3KScore by Olog Golovidov <<http://olgol.com/F3KScore/>>.

Don Harban has a lot of excellent information for electric assisted gliders as well as a scoring program. It's available at Yahoo Groups <<http://groups.yahoo.com/group/RCALES/files/>>. A free membership is required to access his excellent work!



In this issue:

Carlisle Aeromodelers

**Polecat/Soaring Circuits
2K11 Open Soar**

ALES event coverage by Fred Maier

Photographs by

Fred Maier

Dave Garwood

Andrew Maize

Power Supplies

Rudi Oudshoorn, wa2nub@yahoo.com

As a modeler, the subject of power supplies to drive our battery chargers (and perhaps other devices) is often broached. There are many types of them out there; from units that cost a few dollars to several hundred dollars. Regulated and unregulated, high voltage to low voltage, AC to DC, etc.

We will be mainly interested in power supplies that supply DC voltage from 12 volts to maybe 15 volts DC. Today 95% of the 12 volt power supplies on the market are units that actually supply 13.8 volts (it's a car thing). Most of the hobby chargers we use need 11 to 15 volts DC so these will work just fine.

The next item we need to look at is the ability to deliver sufficient CURRENT to the charger at the required voltage. Small chargers will charge a variety of chemistries (Lilo, LiPo, LiFe, NiMh, NiCd, lead acid, etc.) at up to say, 4 to 5 Amps, or about 50-60 watts, therefore power supplies that can supply 6 to 7 Amps would work fine. Examples of

these chargers would be: FMA Multi4, Electrify Triton EQ, E-flite, B6, etc. We are staying with receiver and transmitter sized batteries for now. These chargers are also adequate to handle the motor batteries for the likes of Radian and Easy Glider type electric planes that typically use 2 to 3 cell LiPo's of less than 3000 mAh. The guys that fly supersized 3D planes, helis and drive the larger electric powered cars may charge at much higher rates and would need much heftier power supplies and chargers.

Over the years I have gathered a few of these power supplies. Mainly they fall into two groups:

1/ Regulated Power Supplies*

These are simple and now old fashioned, brute force power supplies. They are fairly large, heavy a bit pricey and usually work on only 110 volt household current and are not very efficient (green). But they do work. High current units get larger and heavier very quickly.

2/ Switched Mode Power Supplies (SMPS)

These are lighter, cheaper and are much more efficient and often work from 100-240 volts ac (they travel well). Additionally when not actually being used they draw very little idle current and consequently many do not have power switches.

I like to add a power switch myself whenever possible.

So where do we go from here? Most of us simply buy a power supply from Radio Shack or some other stores (expensive).

* My old 1970's era 13.8 Volt, 25 Amp regulated power supply (still working) weighs in at 21(!) lbs, is the size of a shoe box, and costs more than a weeks pay (then)... (Picture A) In comparison the 14 Volt, 25 Amp Green Power from HobbyPartz weighs in at only 2lbs 3oz, 90% less and has less than 1/8th the volume!



A



B

My very first SMPS was purchased some seven years ago, a 13.8 volt 20 Amp Pro Peak. Cost was \$50 plus shipping. (Picture B) This unit has served me well and runs my main charger. I added an additional set of banana plugs and a 12 volt LED desk lamp to let me know it was on.

However, if you are handy there are even cheaper solutions... I have picked up cheap units at flea markets, Walmart or on eBay which required none to very little effort to convert them for hobby use. It should be noted that these power supplies are over current (short circuit) and over voltage protected.

Here are some examples:

1) Picked up a 15 VDC 6 Amp laptop power supply at a flea market for \$1.00.

Simple wire change to add banana plugs (and a red LED) made it usable with chargers that can tolerate 15.4 volts, the actual output voltage. Not all chargers do. My Triton charger, for example, doesn't like anything over 14.5 volts. These type chargers cannot be opened to add an on/off switch.

2) A 13.8 Volt 6 Amp Black and Decker camping converter picked up at Walmart for \$25. Four screws opened the unit up so it was easy to add an on/off switch and banana plugs for convenience. It

already came with a handy cigarette lighter socket which worked great for charging cell phones etc.

3) Saw a nice Traco 12 Volt 12 Amp power supply, for commercial use, in electronic equipment on eBay, costs about \$25 shipped. I added an on/off switch and a lead with two Cinch Jones sockets for my amateur radio equipment and added the ubiquitous banana plugs. It had a potentiometer to adjust the voltage +/- 10%, so now it puts out 13.2 Volts at 11 Amps. It serves as a desktop power supply for my amateur transceivers and can be used to run battery chargers too (multitasking). This unit is not as ideal to modify as the





5



6

others, as the 120 VAC wiring is exposed and a cover (the red thingy) of some sorts should be added to avoid risk of electrocution.

4) My old Coleman Peltier type cooler's ac adapter (14.7 Volt 5 Amp) I owned for years was used to keep cold cuts cool on the boat. I added banana plugs so it can do double duty if needed. I think it cost me about 35 - 40 dollars at the time in the mid '90's but at least it can serve a dual purpose now.

5) I also picked up a 12 Volt 5 Amp computer type adapter from eBay for \$10 shipped from China! (The first one failed and the seller replaced it with no problems.) Added the obligatory banana plugs and it is good to go. Note that most of these types of units already come with a laptop type connector; check the description to see that it will fit your charger! Then there is no further action required.

6) Recently I ordered up a 25 Amp 14 Volt supply from HobbyPartz for \$40 delivered. It looks promising. It is big enough (up to 350 Watts gross) to test outrunner motors (or actually any DC motor that needs 14 or so volts, or 4 cell LiPo's) and it'll run bigger chargers as well! I added the cigarette lighter socket. Remember the boat fan? This power supply abruptly died after 5 weeks of light service. Poof... Refund received. Perhaps that old regulated 25 Amp, 13.8 volt power supply will have to fill the void.



7



C

7) Over the years I have also collected (for free) several small 12 Volt (1.5 Amp) SMPS from people like Cablevision which work well with cordless phones, police scanners, etc. They are not big enough for driving chargers but are great for light duty. This one has multiple plugs for a variety of devices that need 12 volts Another great find was a free 5 Volt 2 Amp switch mode wall wart type power supply sent to me by Verizon. This unit had its little round plug removed and in its place I wired a male servo connector (make sure the polarity is correct) so I can use it to power my servo tester or for bench testing receiver setups without draining batteries at a bad time...

This is a great device to set up electric powered planes like the Easy Glider or Radian (Pro) without running the risk of accidentally starting the motor! (Picture C)

When and if you pick up any of the aforementioned power supplies and you are ready to attack it with wire clipper and solder iron -- make sure that you keep track of the polarity! Not all of these power thingies use the standard Black is negative Red is positive approach. The 15 Volt unit had brown and blue leads, some had shielded leads (the shield is usually ground, but don't assume), check and recheck before you plug in your expensive chargers. If unsure ask

for some more experienced person to help you. Another caveat, if you have a 5 Amp (60 Watt) charger charging at full load you need a 6 Amp or greater, power supply to cover the inefficiencies of the system -- so err on a larger power supply or reduce maximum charge current.

Lastly, there's a Microsoft Xbox power supply (Picture D) that should be able to deliver 12 Volts at around 14 Amps. I picked this gem up at a flea market for \$5. To modify the Xbox power supply all you need to do is cut off the large plug that goes into the Xbox, and strip all the wires. You should have 3/4 yellow, 3/4 black, 1 red and 1 blue. I then soldered the yellows together and the blacks.



Then solder the red and blue together, or as I did add a small single pole single throw on/off switch, this tricks the PS into turning on. You know it's working because the pilot light turns from yellow to green. Now all you have to do is solder on a plug of choice and you're done, again I added the banana plugs in my case it was just that simple.

The last suggestion would be to convert an old PC power supply. Many of these are available for free from friends, work places, etc. Converting them can require somewhat more serious hacking and can present potentially serious hazards to the tinkerer. Sometime they work well and sometime not.-- I never did it, lazy I guess; lots of info on the internet about them.

For those that need more power than the units mentioned, there are power supplies that will supply say, 24 or 36 VDC at 100 or more Amps. Check with your bank to see if you can afford the mortgage and electric bill.



Manilla Slopefest 2011

**Mt Borah
Manilla NSW**



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A local event at a world class location

Carlisle Aeromodelers

Fred Maier, fmaier@rochester.rr.com

POLECAT/SOARING CIRCUITS 2K11 OPEN SOAR



Photographs by
Fred Maier
Dave Garwood
Andrew Maize



On June 24-26 2011 the Carlisle Aeromodelers club hosted the Polecat/ Soaring Circuits 2k11 ALES open soaring event in Blosserville, Pennsylvania.

The ALES concept is in its infancy here in the United States. There are five people instrumental in its development. Denny Maize, Randy Brust, Ed Franz, Dave Register, and Tom Kelavang were behind the development and growth of this concept. Four of the five flew in the contest! The heart of the ALES concept is an altitude limiting and time switch that shuts the motor down at a predetermined altitude or time, whichever comes first. Limiting the altitude for cutoff helps even the playing field on wattage and allows pilot skill to take over, thus making a wide variety of planes competitive.

Friday June 24 was practice and clinic day at the field. The clinic consisted of going over rules, timing, reading air as well as modifications to Radian/Radian pros to improve performance. A practice contest was held for first timers to learn the mass launch, tasks and timing basics to help ease nerves.

Saturday we woke to better than predicted conditions. At 9:00am 28 pilots (double the attendance of last year) from 11 states and the province of Ontario Canada assembled on the runway for the pilots meeting and

group photographs. Overcast and somewhat breezy conditions prevailed for most of the day. Lift was challenging to find and stay with, however the majority of the pilots had little problems.

Four flight groups consisting of seven pilots took to the field for the first day of the contest. The mass launches were fun and there were no mishaps all weekend. Pilots had a 10 second window to launch after the start was signaled. Each pilot had a 30 foot landing area at each station with a graduated tape to measure landing points. Seven rounds were flown with etched beer mugs awarded to the top 5 pilots.

Day 1 Results

1. Dave Register, Oklahoma
2. Gudmund Thompson, Ontario Canada
3. Aurele Alain, Ontario Canada
4. Jim Noel, Pennsylvania
5. Jack lafret, Michigan

After the awards ceremony we were treated to a very tasty barbeque dinner and then the pilots raffle.

Sunday turned out to be a beautiful day. Morning overcast gave way to sun and puffy cumulus clouds. Lift was abundant and relatively easy to find. However, with the lift comes the dreaded sink. Some rounds most pilots timed out at 10 minutes while other

ALES group photo. Andrew Maize



rounds seemed like all but the best or luckiest pilots were down early.

With most pilots completing the 10 minute tasks also meant that these pilots would also be landing within seconds of each other for landing points. I thought it was cool to see Topaz's, Supra E's and Pulsars landing with Radian/Radian Pro's, Aquila's, Olympic II's and a variety of other planes.

Sunday consisted of five rounds with the top five receiving the cherished mugs.

Day 2 Results

1. Steve Youse Pennsylvania
2. Jack lafret Michigan
3. Aurele Alain Ontario, Canada
4. Matt Struck New York
5. Randy Brust Pennsylvania

The overall 2-day winners received very large mugs for their efforts.

2-Day Combined Results

1. Aurele Alain, Ontario, Canada
2. Gudmund Thompson, Ontario, Canada
3. Jack lafret, Michigan
4. Dave Register, Oklahoma
5. Jim Noel, Pennsylvania

An impromptu Radian/Radian Pro only, all-up-last-down contest was held at the conclusion of competition. Randy Brust

Ed Franz (Kentucky) launching Jack lafret's (Michigan) Supra-E. Fred Maier



Ed Franz, everybody's favorite flyer from Kentucky. Dave Garwood

took home bragging rights from the 9-10 pilots who flew.

What I found interesting was the wide variety of planes that competed. By limiting the altitude at which the motor cut off meant Kenny Sharp's 1000 watt Topaz started at the same altitude as my 200 watt Radian Pro. Otherwise I would have been blown away altitude wise.

Aside from competition, electric sailplanes offer several advantages over regular thermal gliders. No winch or highstart is required so you aren't encumbered by hauling launch equipment around or looking for room to use those methods of launching. The motor is also handy if you get too far downwind and are in danger of not making it back to the field.

ALES is a fun and exciting form of glider competition for beginner or experienced pilots alike and I would encourage anyone with an electric glider to give it a try.



Aurele Alain's Gracis and Gudmund Thompson's Pulsar 3.2. Fred Maier



Above: Kenny Sharp returns to the paddock with an impressive grin, carrying his 120-inch Topaz. Kenny flew well during this, his first ALES contest. Dave Garwood



Above: Bill Grenoble thinking about the round just completed, carrying his ElectroBird back to the paddock. Fred Maier





Opposite page lower left: Warren Avis and Dave Register return from the flight line with an electrified Dynafight Bird of Time. Dave Garwood

Opposite page lower right: Rick Rensi with his Multiplex Alpha Club. Dave Garwood

Above: The flight line of seven landing tapes. In the foreground is Gudmund Thompson of Ontario, Canada. Dave Garwood



Ray Forceno's Olympic II being flown by Warren Avis. Photo by Fred Maier



ParkZone Radian Pro sports ailerons and flaps. Sold by Horizon Hobby and local dealers complete with servos, motor and ESC installed. This example flown by Fred Maier. Dave Garwood



Aurele Alain's Gracis in flight. Fred Maier



Ed Franz's Wind Dancer. Fred Maier

Ray Forceno nails a landing. Dave Garwood



Thanks to the sponsors who graciously donated prizes:

Airtronics
Radio Carbon Art
Soaring Circuits
Castle Creations
Atlanta Hobby

Hobby Shack
Tail Wind Gliders
Polecat
Esprit Model
Wright Brothers R/C
Leading Edge Gliders



Denny Maize, Contest Director and Polecat Aero proprietor, briefs the assembled multitudes during the Saturday pilots meeting. Dave Garwood

Bill Grenoble landing his ElectroBird. Fred Maier

Participants:

Dave Reisinger, PA
 Paul Naton, PA
 Kenny Sharp, MA
 Allan Wright, NH
 Matthew Struck, NY

Mike Gantner, OH
 Fred Duncan, PA
 Frederick Maier, NY
 Roman Montano, MA
 Jack Lafret, MI

Paul Hawkins, NY
 Aurele Alain, Ontario
 Gudmund Thompson, Ontario
 Rick Rensi, PA
 Bill Grenoble, PA
 Kenneth Troxell, MD
 Lee Messick, DE
 Steven Youse, PA
 Dave Garwood, NY

Raymond Meyer, NY
 Steve Hine, PA
 David Register, OK
 Ray Forceno, NJ
 Ed Franz, KY
 Denny Maize, PA
 Warren Avis, NJ
 Randy Brust, PA
 Jim Noel, PA



Winged Shadow Systems

- Thermal Scout
- How High RT
- Smart Bat
- See How

Equipment review by Dave Garwood, dgarwood518@gmail.com

I have long been fascinated and impressed with the electronic wizardry that comes from David West at the Illinois design lab of Winged Shadow Systems. Over the years I've used the original How High onboard altitude recording device, and the How Fast onboard airspeed recording device.

This equipment review covers three new offerings, and mentions an existing device from Winged Shadow Systems:

1. Thermal Scout - onboard altitude gain signalling device
2. How High RT- improved onboard altitude recording device

3. Smart Bat - small portable power source for How High RT and How Fast airspeed instrument

4. See How - data reading and recovery device for altimeters and airspeed instruments

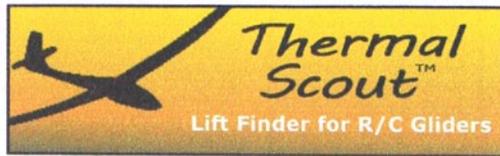
Conclusion

Each and every one of these four electronic devices works exactly as described. The design wizardry is amazing, and the build quality is top notch on every Winged Shadow Systems device that I have used over the years and the new releases are no exception. They are marvels of brainy design and quality production.

1. Thermal Scout - onboard altitude gain signalling device

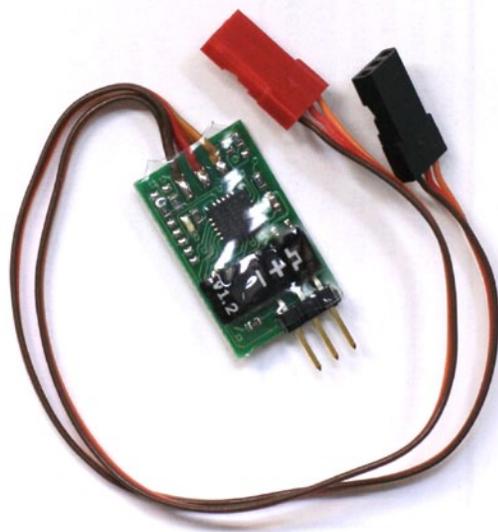
The Thermal Scout helps the sailplane pilot find thermals by slowly and gently wagging the rudder when in rising air. The unit mounts in the sailplane's radio compartment, is powered by the receiver battery pack, and does not require telemetry back to the pilot as did earlier onboard lift-signaling devices.

The instrument connects between the receiver's rudder channel and the rudder servo. It uses an unused transmitter and receiver channel which can be switched on and off from the transmitter. The "GEAR" channel in a six-channel radio



The Simple Way to Better Soaring

- Wags the rudder and rocks the wings to indicate lift
- Installs between your receiver and rudder servo
- *Flight Filter™* technology removes false lift signals
- For all R/C gliders and motorgliders



set is often not used on a sailplane. The device is switched off for most of the flight - we do not want the rudder wagging on tow, or when climbing out under electric motor power. After the sailplane enters cruise mode, and when switched on from the transmitter, it indicates rising air by gently wagging the rudder side-to-side, sensing a decrease in atmospheric pressure to detect lift.

Does it really work? How sensitive is it? Yes, and quite sensitive. The instructions suggest this test: "To test overall operation turn the Control Switch ON and place your plane on the ground for at least 4 seconds. Then, lift the plane up over your head for 4 seconds. The unit will move the rudder through at least one side-to-side sequence in response to the gain in altitude." My Thermal Scout, installed in a motorized Multiplex Cularis, worked exactly as this test procedure describes.

During my test flying with the Multiplex Cularis motorglider, the Thermal Scout performed exactly as described by the maker - gentle wagging of the rudder when in rising air. Rudder-wagging is a new way for a sailplane to indicate lift, different from the traditional pilot watching for "tail up" or "tip up" or "plane flies faster" or "whole sailplane goes up" signs. The "rudder wag" is without a doubt more positive and less

ambiguous than the traditional methods. Whether it helps an individual pilot learn to find lift and transition to a thermal turn will depend on individual learning styles, but there is no question that the instrument works as described.

The Thermal Scout package includes a truly excellent article on thermal finding. Study this guide, and it will advance your thermal soaring skills.

2. How High RT- improved onboard altitude recording device

How often have you wondered just how high your model is flying? Winged Shadow Systems produced an onboard altitude recording device early on and now it has been updated and improved. The current instrument can be powered by the R/C receiver battery (It plugs in like a servo.), a battery pack from 3 to 12 volts, or the Winged Shadow Smart Bat device. Carried up with your model, after landing it reports the maximum altitude reached during the flight via flashing LED. If the instrument reports: flash-flash-flash pause, flash-flash pause, flash pause the model reached 321 feet above launch height.

In addition to the end-of-flight type reporting, it can provide real-time data to radio systems which feature data telemetry capabilities, including the Spektrum DX8 and Hitec Aurora 9.

How High RT™ Model Aircraft Altimeter

- 35 to 9999 ft. AGL
- 1 ft. (1 m) Resolution
- Works on its own or with the *See How™* display unit.
- Real-time output for telemetry systems.



3. Smart Bat - small portable power source for How High RT

All the Winged Shadow instruments that I know of are powered by the receiver battery. The Smart Bat device makes them more portable by freeing them from the requirement to be plugged into the receiver for power. It makes How High and How Fast easily transferable between airframes.

It's designed to power those devices when an R/C receiver or other power source is not available or not practical, like kites, free-flight models, model rockets, and even falconry. It makes it easy to move a How High RT from model to model to compare results with your flying buddies.

The Smart Bat is very small, very light. Specifications are available on the company website.

4. See How - data reading and recovery device for How High RT

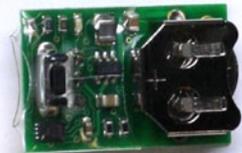
The How High altimeters and How Fast airspeed instruments report via a series of LED flashes. The See How converts those series of flashes into numbers. Further, it stores data from the last ten altitude or airspeed readings.

In addition, How High enables pilot-controlled in-flight data capture points,

Smart Bat™ Battery Board

Designed specifically for the *How High RT™*, *How High™*, and *How Fast™* Products

- Single-cell 1.5V Input, 3.3V Output
- Push Button On/Off
- Auto Off After 2 Hours
- Battery Included





Dave and his Multiplex Cularis



See How™ Hand-Held Display

- Designed for the *How High* Altimeter (Sold Separately)
- Quick Optical Data Transfer
- No Waving or Counting
- Multiple Flight Memories
- Enables In-Flight Captured Altitudes



and retrieves the series of recorder data points at the end of the flight. It can capture and report up to nine altitude or airspeed readings captured at pilot-commanded points, plus the maximum altitude or airspeed for each flight.

The See How is key-fob size and shape, ruggedly built, and the battery in mine has lasted more than five years.

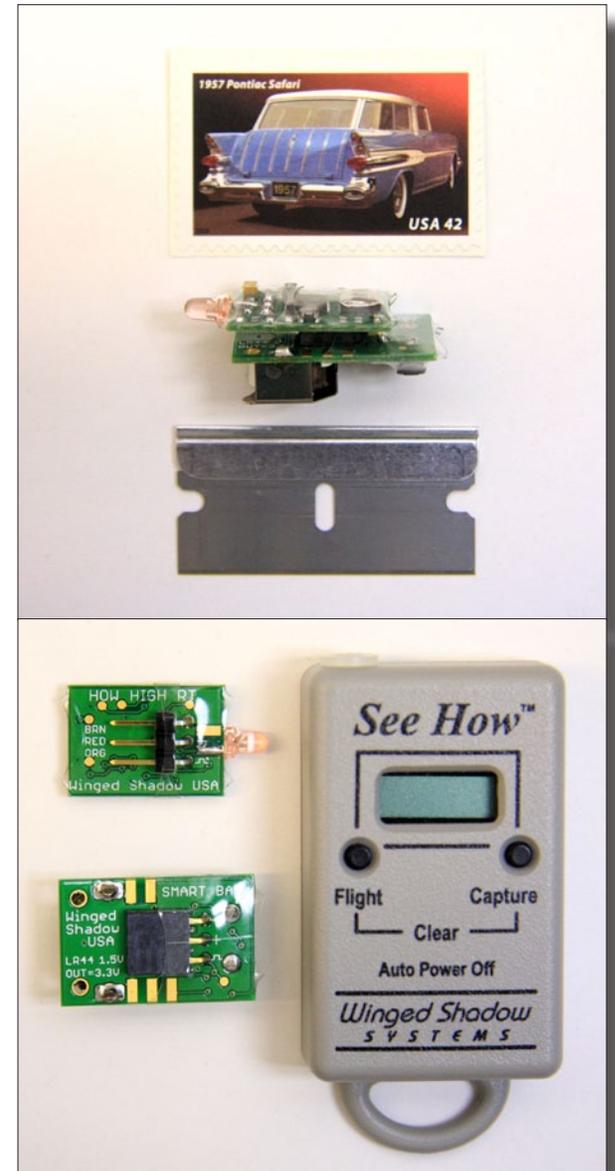
Conclusion Revisited

I can describe the design innovation of Winged Shadow Systems devices with one word: Amazing. Their production quality in a word: Superb. My experience includes the four devices mentioned above, an earlier How High design, and the How Fast onboard airspeed measuring instrument.

Winged Shadow Systems products are designed and produced in the USA. Detailed instruction sheets for each of these instruments are available on the company's website.

Winged Shadow Systems
<http://www.wingedshadow.com>

Multiplex Modelsport USA
<http://www.multiplexusa.com>
<http://www.multiplexusa.com/model-kits/cularis.html>



RC
SD

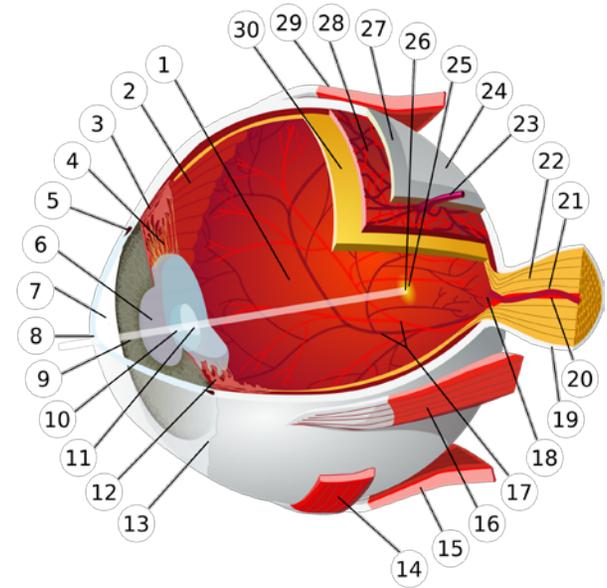
Get your eyes tested. No, **REALLY** tested!

Robert Budniak, budniak@ozemail.com.au

One's eyes are one of life's gifts. We take them for granted 'til our vision is too impaired, and that may be too late do something to correct the problem. In our sport, as in many other sports, we need our eyes to guide our planes, even in free flight and control line.

However, I don't believe that we do enough to care for our sight. This is my story of how I found out I had eye problems. It's a story that I would like others to hear and to act upon.

Let me tell you that I'm in my early fifties. Some would say that's old. Some would say that's young. I have had corrected vision (myopia) since 12 years of age, and suffer a small amount of reading vision impairment, to the extent that I wear multifocal glasses. I get an eyesight test every few years. My health is pretty good. No major illnesses. I don't take any medications. I'm a healthy middle aged man.



- | | | | |
|-----|-------------------------|-----|----------------------------|
| 1. | posterior compartment | 16. | medial rectus muscle |
| 2. | ora serrata | 17. | retinal arteries and veins |
| 3. | ciliary muscle | 18. | optic disc |
| 4. | ciliary zonules | 19. | dura mater |
| 5. | canal of Schlemm | 20. | central retinal artery |
| 6. | pupil | 21. | central retinal vein |
| 7. | anterior chamber | 22. | optical nerve |
| 8. | cornea | 23. | vorticose vein |
| 9. | iris | 24. | bulbar sheath |
| 10. | lens cortex | 25. | macula |
| 11. | lens nucleus | 26. | fovea |
| 12. | ciliary process | 27. | sclera |
| 13. | conjunctiva | 28. | choroid |
| 14. | inferior oblique muscle | 29. | superior rectus muscle |
| 15. | inferior rectus muscle | 30. | retina |

A few months ago I noticed some floaters in my left eye. These were more than the usual ones that I have, and they appeared suddenly. I made an appointment with my optometrist. My prescription (4 years old) was still good. He did a pretty thorough examination of my eyes.. He took some photos and did some tests, but he could not find anything wrong.

So he made an appointment for me with an ophthalmologist. Two days later I was at the ophthalmologist.

**An ophthalmologist, for those who don't know,
is a medical doctor who specialises in the eye.
An optometrist is one who corrects your vision
and is not a medical doctor.**

The ophthalmologist did very detailed examinations of my eyes. The first problem she found was that I had a retinal tear. That explained the sudden appearance of floaters in the eye. So she sent me that day to have laser surgery on the left eye. A retinal tear needs to be fixed quickly, or else it leads to more serious problems later, like loss of vision.

So the first point of this article is to say, if there are any sudden changes to your vision, get them checked out immediately. As I said, the retinal tear,

if not fixed quickly, could have lead to vision loss.

The second thing the ophthalmologist noticed was that I had cataracts (clouding of the lens) in both eyes, worse in the left.

Up until now, I had always considered that I had good corrected vision. I didn't really notice any impairment to my vision. Sure I found it hard to read print in low light; sure the lights of oncoming cars dazzled me; sure I sometimes lost orientation of my plane.

But didn't everybody suffer this as they got older? The answer is no.

Once I was diagnosed with cataracts, I did some research, and this is some of what I found out.

By the time a person reaches 90, they will have developed cataracts. The disease can start in people as young as 40 and it's just a part of growing older.

The visual problems that I considered to be a part of normal life were in fact caused by the cataracts. But I had

normal vision and lived an unimpaired life. Once I started to do the research, I realised that many of the problems I was having were a direct result of my cataracts.

The biggest issues that I recognised were that even though I wore sunglasses, and good quality ones, the sun was always glary. When flying, I couldn't see my planes through the centre of my eye and I was always rolling my eyes to find a spot where I could see my planes. I sometimes, too often maybe, lost orientation of my planes. Because one eye was more affected than the other, my distance judgement was poor when flying. But in everyday life my distance judgement was good. In most people, cataracts are diagnosed only when they reach a point where people's vision is severely impaired in every day life.

How many of you have undiagnosed cataracts? If I had not had a retinal tear and had to visit an ophthalmologist, I would not be the wiser today.

As I said, I had considered my vision normal for a bloke my age. Why not get a check up soon and find out whether you have undiagnosed cataracts?

I'm going to have my cataracts removed shortly and I expect that my enjoyment of flying will improve immensely.

JR Aerotow Australia 2011

Text by Brian Ford, bananaman@bigpond.com

Photos by Jo Carbines



The first ever Australian JR Aerotow was run over the Easter break at the Jerilderie Racecourse. The event was organised in conjunction with Australian chapter of the LSF, RCGA (Radio Control Gliding Association Victoria), SSA (Scale Soaring Australia) and of course with JR Australia via Mike O'Reilly of O'Reilly Model Products as the major sponsor.





30cc Pilatus Porter in Australian Army colours

Fugly, the Piper Pawnee

Jerilderie is a town in southern New South Wales just over the border from Victoria. The town is famous for its association with Australian bush ranger Ned Kelly. For readers who aren't familiar with Australia's regions it is in the lower eastern side of the country. Look at the area on Google Earth, scroll out, and move the mouse around, at the bottom of the screen next to the lat/long is the height. As you move the mouse around you will notice that it doesn't change much. The whole region is very flat. It is

also remote from any city, as the tug flies, it is 175 miles from Melbourne and 1730 miles from Perth which apart from our overseas visitors was greatest distance travelled by the locals. I travelled 705 miles to be there and I guess half the attendees had drives of at least a day or more.

As you may have already worked out, there are a number of groups of scale sailplane pilots doing their own thing in each state, but loosely associated with

various interest groups. It is a rare event here that so many get together in one place. Jerilderie is a special place in the Australian R/C Soaring scene. It is the venue for this country's largest annual thermal tournament, run by the LSF each June (mid winter in this hemisphere). Flying takes place within a huge horse racing course that can accommodate any wind direction. There is also a nearby pavilion and other buildings that allow on-site camping and model storage. The nearby township is very supportive of

Opposite page: 50% Ka 6 on approach





Flying wing



Schleicher K 8

the modelling activities carried out there each year.

The idea for an annual scale gathering started in 2004, some of the competition focussed pilots from the winter LSF tournament particularly Gregg Voak, looked at the facilities, wide open spaces and model friendly local community and they organised a scale aerotow fly-in each Easter. It has slowly grown as an event, as has interest in Aerotow. The last large event for this facet of r/c soaring

was held in 2000 at Bordertown in South Australia, which was hugely successful at the time. Obviously this year, good organisation and planning worked together to again lure participants from across this big country and gave us arguably one of the best r/c soaring events ever held.

The weather was almost perfect for the whole time. The clear bright blue sky did make models hard to see at height though. You may know that this country

is often in prolonged drought, and that there have recently been flooding rains across much of the continent. Not good for those affected at the time but the aftermath of a flood over here is incredible. Mainly due to the speed at which the landscape goes from red/brown/grey colours to green. Jerilderie, although not flooded did receive much needed rain and the surrounding countryside was very lush.

Opposite page: 50% ASW 28





One fantastic Fafnir

Colourful 4m Fox

Unlike the competition scene that I am used to, the days were very relaxed, it was good to set up and fly when I wanted to without the pressure of the “clock” or Jo Grini calling through a loud speaker. I’m pretty content with how I fly a sailplane of any type, particularly scale models, but lately and mainly due to a lack of them where I fly, I’ve been “tugging.” This event was a great opportunity to get advice from very experienced tug pilots like David Hobby (yes THAT Mr Hobby), Chris Carpenter, John Copeland and practise my towing on some unsuspecting stick twirlers. My

tool for the job was an AMR 120” Big Stick with a piped DA100. For the others that did duty as “tuggers” I apologise for not naming you here. Aerotow simply doesn’t happen without you guys, so thanks from me for getting my sailplanes airborne when I needed to and no doubt every other person there appreciated your selfless efforts as well.

Some of my weekend highlights were:

- Catching up with people I’d never met but knew by their various online r/c forum user names.

- A long multi thermal flight with my 3.5m Kirby Kite, I needed a quick break (I’d been towing for a solid hour before that flight as well) I spun it down (35 graceful spins) and still had heaps of height to burn, I again flew into good lift but this time low in the circuit, it was too good to ignore, so much for the break!

- Chris Brislin’s daily giant scale Freestyle displays were awesome stuff from a very talented and friendly young guy. Mick Dakers also a very skilled IMAC pilot was his caller, with Chris’s Dad being the helper. What is best is that they are also Queenslanders!



John Greenfield, giant model guru from the UK, discussing a Kookaburra

- The large hugely powerful Extra, doubled as a powerhouse tug for some of the larger sailplanes. The models were anywhere from 2m to 8+m but most were around the 4 to 6m mark i.e. 1/3 scale. In their trailers they looked massive (and were!) but assembled and together in that great big paddock they looked "normal."

In the large model department was Gregg Voak's (who now lives in Belgium and was the second most distant traveller) 1/2 scale ASW28 and a Don Costelloe's 1/2 scale Ka6. The Ka6 had a camera onboard and we watched

that video on the last night, it was great. Those large models look so good thermaling above and it is impossible to tell they aren't full size until they are on the ground. I'd hate to have to pay for all the models displayed over the weekend. There were some bad moments, a 40% TG 1-26 crashed, a 1/3 scale Woodstock and an ASW20 mid-aired. They were destroyed unfortunately, but there were also some good saves, with stuck elevators etc. I had an aileron servo fail in the full down position during a tow on my 4m ASW27, that made for an interesting flight and landing.



The big Ka 6 dwarfs a 4 meter ASW 27

The Sunday night was also the social highlight consisting of a BBQ (grill) and presentation for the best models etc. The highlight was John Greenfield (the most distant traveller and guest speaker), a founding member of the UK Ghost Squadron, he has had a lifelong interest in large and unusual models. He gave a very detailed lecture showing his journey at mostly the leading edge of giant scale r/c aero modelling. What that guy hasn't done in modelling just hasn't been invented yet. He has an unbelievable



history and the pictures to prove it, a very passionate, interesting, knowledgeable and friendly man.

Unfortunately between my towing and flying, I didn't get to catch up with many of the owners of all the beautiful models that were there. One stand out for me was a beautiful all wood Fafnir which was incredibly well built by Leon Carlos and won best vintage scale and came second in the pilot's choice.

Opposite page:

1. *What else do you do when it's in a big thermal?*
2. *Large Fournier motor glider*
3. *Some hand-made pilots with character sitting in a Kookaburra*
4. *One of the very well set-up trailers at the event*

Below: The relaxed pits area

By Monday morning the weather had improved even more but many of the participants had travelled from, South and Western Australia and Queensland and needed to hit the road for the long drive home. The inaugural JR Aerotow Australia event has certainly reinvigorated interest in scale gliding and hopefully encourages many more aerotow events. I am looking forward to the next one!

Pilots Choice (Prizes by JR Australia)

- 1st Don Costelloe, half scale Ka 6
- 2nd Leon Carlos, quarter scale Fafnir
- 3rd Gregg Voak, half scale ASW 28

Best Vintage Glider - Leon Carlos, quarter Fafnir

Best Modern Glider - Gregg Voak, half scale ASW 28

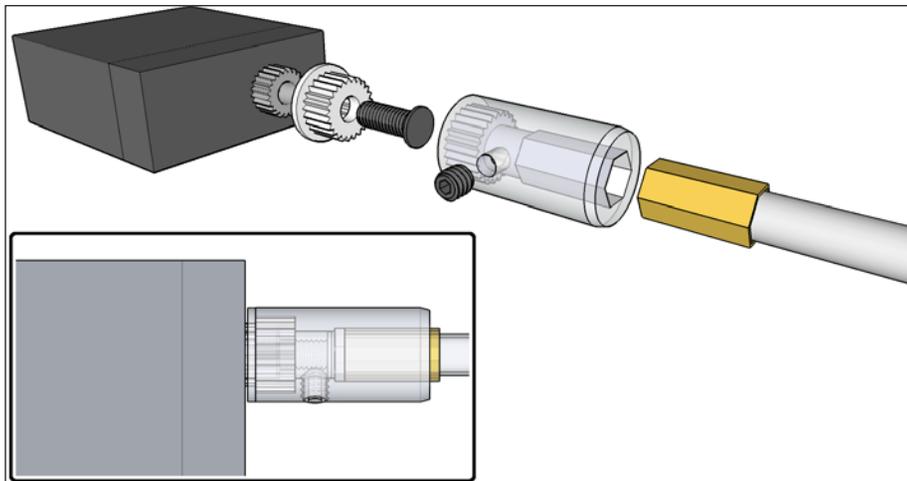
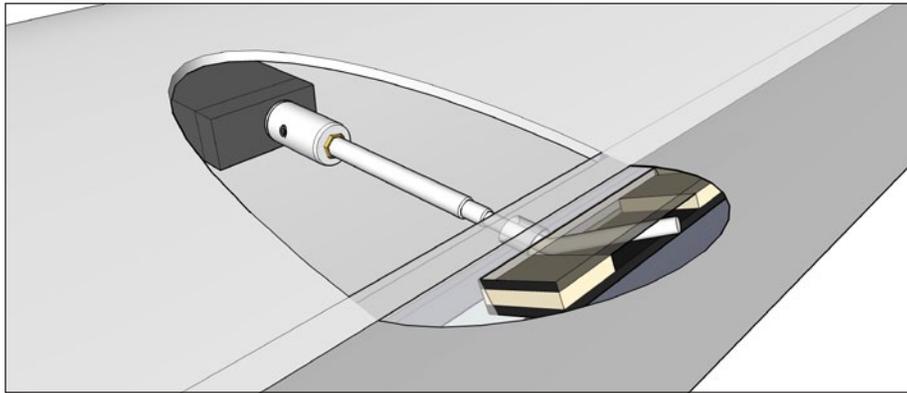
Best Tug Plane (under 80cc) - Toby Gaumann, Pilatus Porter

Best Tug Plane (over 80cc) - John Copeland, Wilga



RDS G2 System

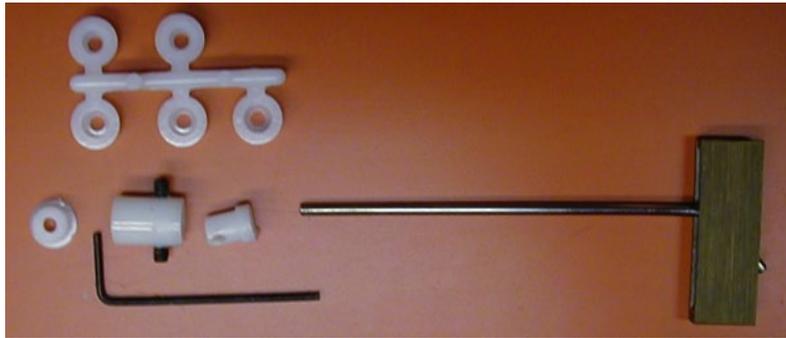
Harley Michaelis, LSF 023, harleyem@charter.net
veteran modeler & RDS originator



The e-mail received about 18 months ago from Dieter Mahlein of Shred-Air fame took me by surprise. He was saying that the F3B guys had gone almost exclusively to the RDS to maximize performance in those highly-refined airframes. It was even being offered pre-installed in higher end ships. The expectation was it would gradually work its way into mainstream RC. Wow! Could we see the last of unsightly, noise-making, drag-inducing, external hardware that gets dirty, catches on things and gets mangled? Could it go the way of the buggy whip?

I had an intense interest, the RDS concept having popped into mind in 1988. For years I experimented with homemade mechanics. None worked well. In 1999 the late Chuck Kimbrough, a flyer and founder of Kimbrough RC Racing Products, Inc., called me. He offered to collaborate to design and produce an injection-molded coupler. It worked with solid drive shafts, looked as shown on the left and came in pairs with a tree of double-splined adapters to attach to various popular servos.

On my website I detailed how to make a shaft and pocket as shown on the right and how to install the system. Getting the shaft the optimum length and securing it well were troublesome and installation could be exasperating. Those setscrews got loose, even with Loctite, etc., especially if flaps dragged on landings. Solid shafts don't have the torsional rigidity needed for applications such as extreme launching.



The original RDS as produced by Kimbrough RC Racing Products, Inc. An injection-molded coupler worked with solid drive shafts, and came in pairs with a tree of double-splined adapters to attach to various popular servos.

Dieter mentioning that RDS could go mainstream inspired me to rethink the whole concept as something for all who fly RC. After all, if it could be refined, easily installed, be modest in cost, readily available and with extensive website support, who wouldn't prefer prettier, cleaner wings and better performance? Wouldn't that be true whether flying DLG's, F3x, giant scale sailplanes and every other kind of powered aircraft, too? Why should F3B be the only facet of the hobby enjoying this advanced technology?

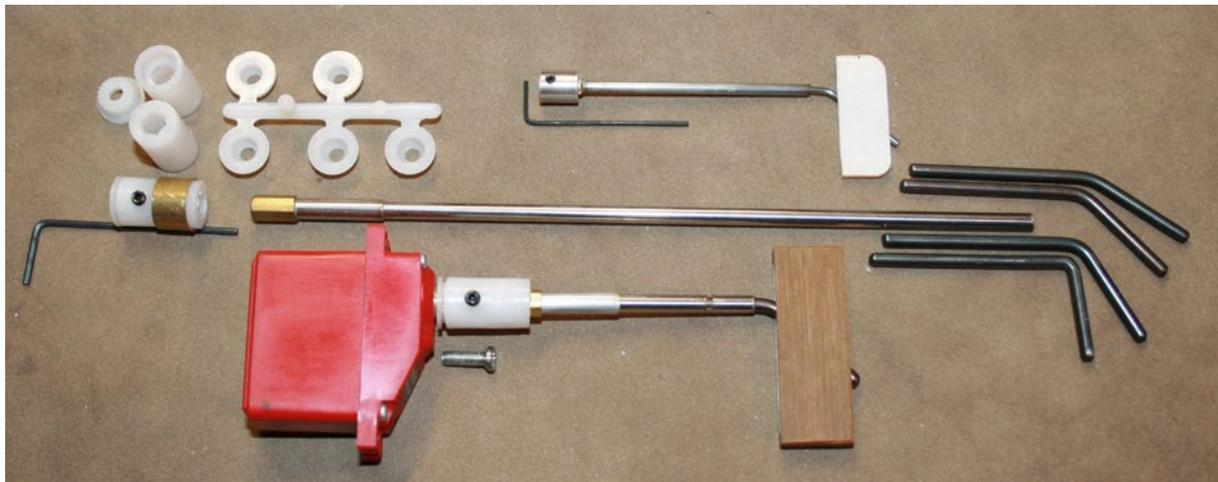
Clearly, the 1999 coupler was obsolete as were solid shafts and set screws to hold them on. All sizes of airframes had to be accommodated. A new array of accessories, shafts and pockets had to be made available. A website for modeler support on the new technology was needed.

After some 18 months of R & D, in collaboration with Kimbrough Products, Inc., and modeler-machinist Walt Dimick of IRF Machine Works, Inc. it's a done deal. It offers something for everyone who flies fixed wing aircraft with hinged flaps, ailerons, flaperons or elevons, etc.

Since it replaces the 1999 version, it's a "Generation 2, Rotating, All-internal, Hinged Surface Deflecting System." But the acronym "G2RAHSDS" is just too much of a mouthful and we've elected to call it the "G2 System."

At \$5 a pair the couplers couldn't support magazine advertising. Limited mention was made in a few sailplane related articles I wrote. Guys flying other kinds of ships never heard of the RDS. Then the "death blow" struck or so it seemed.

ARF's started to appear which made for some form of the old horn/clevis/pushrod technology. The world economy had improved, guys had money to spend and went to ARF's. RDS went essentially unknown, unused and unappreciated except for those intrepid F3B fliers.



The new G2 System with the coupler engineered to control unwanted rotation and allow a sliding fit with the hex-ended drive shafts.

It's unlike all other "RDS" around and particularly well-suited to all sailplanes. Study the partial array of the new hardware line in the photo and guess what? All's available *a la carte* to customize a system to your liking.

The front end of the new coupler and the tree are unchanged. In the photo, the

are not co-incident. This is a common scenario, such as top hinged ailerons and a pocket lower in the aileron or bottom hinged flaps and a higher pocket location.

The drawings on the initial page depict the mechanics. An Auxiliary Servo Screw, the longer item shown black,

balancing. The standard shaft has 1" of gauge 8 and 6" of gauge 10 tubing.

It accepts 0.104" diameter bent wipers. The heavy duty shaft is all gauge 8. It accepts 0.1285" wipers. A super heavy duty shaft can be made by attaching gauge 8 tubing over the 10. Shafts are \$10 a pair.

The separate bent items are wipers made from steel drill bit stock. They are first bent at low radius, then hardened and tempered. Wipers are \$5 a pair.

The larger rectangular items are pockets. Tops and bottoms are in perfect parallel planes with an opening to fit the wipers with a precise "slightly snug" fit. This fit is essential to prevent play in a surface that would cause buzz at higher speeds or bind that would prevent return to a well-defined neutral. The smaller rectangular item is a "reusable spacer" that's slipped into a pocket opening during installation to keep tops and bottoms in perfect parallel planes until the adhesive has set. Pockets are time-consuming to accurately hand make and \$15 a pair.

Research on pockets continues including with the razor blade industry. It may be possible to have tops and bottoms about as thin as single-edged razor blades and done quickly to reduce the labor cost. At this time, for a 4-servo wing, the total cost for couplers/trees, auxiliary screws, shafts, wipers and pockets is \$69.

The new G2 System offers components for everyone who flies F3X.

top left one pointing up fits the new MKS 6125 servo series. Couplers with trees sell for \$3.50 a pair. Money for the very costly tooling came from USA friends in the sailplane fraternity. The low cost is the result of their generosity.

What's different? The coupler has a hex rear opening engineered to control unwanted rotation but allow a sliding fit with the hex ended drive shafts. The fit allows the shaft to automatically move fore-aft during deflection as needed to avoid stress and binding on hinges or structure if hinging and pocket planes

goes through the seated adapter and threads into the output gear. 1/8" of it extends and recesses into a chamber in the coupler. The single coupler set screw is captured behind it without bearing on it. There's no play and the coupler can't slip off.

With an industrial process, the brass hex end is ruggedly and permanently silver soldered to the rigid stainless steel hypo tube drive shafts that come 6" long. Shafts can be cut to length to put servos where preferred for headroom and

G2 weight? About 6 grams for coupler/ adapter/2" of standard shaft/wiper and pocket.

For DLG's, there are lathe-turned aluminum couplers with 1/8" hex openings and hex ended hypo tube shafts that take a 1/16" wiper. There are pre-made pockets and wipers. Weight? 2-3 grams per surface.

For pennies, you can make pockets out of CA hinges and balsa and wipers out of brads. See my website.

My website <http://www.geniebuild.com/harleys_genie.html> has full G2 System details and offers extensive support for it. There are detailed installation instructions and a document about making pockets for pennies as I've done for years.

IRF Machine Works is the exclusive source of the extensive array of meticulously engineered "G2 System" hardware. There's a pre-ordering worksheet that describes all and gives the cost. A link to IRF makes it easy to place an order.

P.S.: I see there is an imported, limited application version of the RDS offered at about \$180 for a 4-servo wing. The machining is nice, but appears to have no provision for "fore-aft" shaft movement and appears to use the 1999 Kimbrough coupler with set screws.



NEW SIMPLE SPOILER LINKAGE

Ray DiNoble

As most of you know I have been working on a new and simple spoiler linkage system. My final effort, as installed in my new Topaz-S sailplane is also shown in the RC Groups web site. If you are interested click on the following link and take a look. <<http://www.rcgroups.com/forums/showthread.php?t=955499>>

A modeler from Alabama, Rob Glover, decided to install this linkage after seeing it in RC Groups earlier this week.

Rob did a very nice installation photo segment. You can see his photos by clicking on the following link and going to pages 18 and 19, items #263 through #273. <<http://www.rcgroups.com/forums/showthread.php?t=853850>>

For those of you who do not frequent "RC Groups - Sailplane" topics you might want to consider adding the site to your "Favorites" list. It has a ton of sailplane, electrics, etc., information available every day.

From Airfoil, Las Vegas Soaring Club Newsletter, December 2008





Black Eagle PSS Festival 2011

Hosted by Two Oceans Slope Soarers
Cape Town, South Africa

Coverage by Kevin Farr
Photos by Kevin Farr and Malcolm Riley

A very successful Black Eagle 2011 PSS Festival was once again hosted by Two Oceans Slope Soarers on the weekend of the 18th and 19th June 2011.

In the spirit of a slope soaring festival atmosphere, all and sundry were invited to enter and participate even if not entering any of the competitive categories.

Even Mother nature came to the party in a festival mood and delivered two fantastic days of slope soaring at Chapmans Peak on the back of strong North Westerlies, the predominant wind for this time of the year in this particular part of the world.

PSS or Power Scale Soaring is a description of a non-powered slope soaring glider that is modelled after a real, full size aeroplane that required a power plant for sustained flight and has flown as a full size aircraft, and now gets tossed off a mountain side for some slope soaring fun. Four classes were available to the 15 entrants should they wish to compete, from the Black Eagle Scratch Built Class, Sportsmans Heavy, Sportsmans Light and Combat classes.

Due to a few over ambitious ideas about scratch building two meter class planes in six months, seeing the time widdle away and the dream become an impossibility, there were no entrants in the scratch built class this year. In defence of the builders out

there, it appears that next year will see a proliferation of scratch built gliders making their debut as the time required to scratch build a two meter class glider for a PSS contest is somewhat longer than the optimistic six months.

Saturday dawned as still as a lake and the Hout Bay area put up a picture perfect view as the contestants unpacked their gliders and set up for the day. Entrance bags were handed out packed full of goodies - T-shirts and a set of nice gloves that are thin and give slopers ability to fly during those

very cold Cape winter days without the risk of losing any digits to the ice cold Westerlies.

While the wind sorted itself out, the chance was taken to do the static judging as the wind was predicted for after 11:00 am. Herbie Newton judged each of the gliders in the class and the day was then set as we waited for the predicted blow.

With 11:00 am come and gone we thought we had been deserted, but by 11:30 am mother nature came to the party (half an hour late from the



Not a bad collection of PSS subjects for the weekend.



Kevin Farr's P38 Lightning in the light heavy weight class. 2.2 meters: Weight 5kg. What a sweetie to fly!

Anton Benning and the super lightweight foamie.

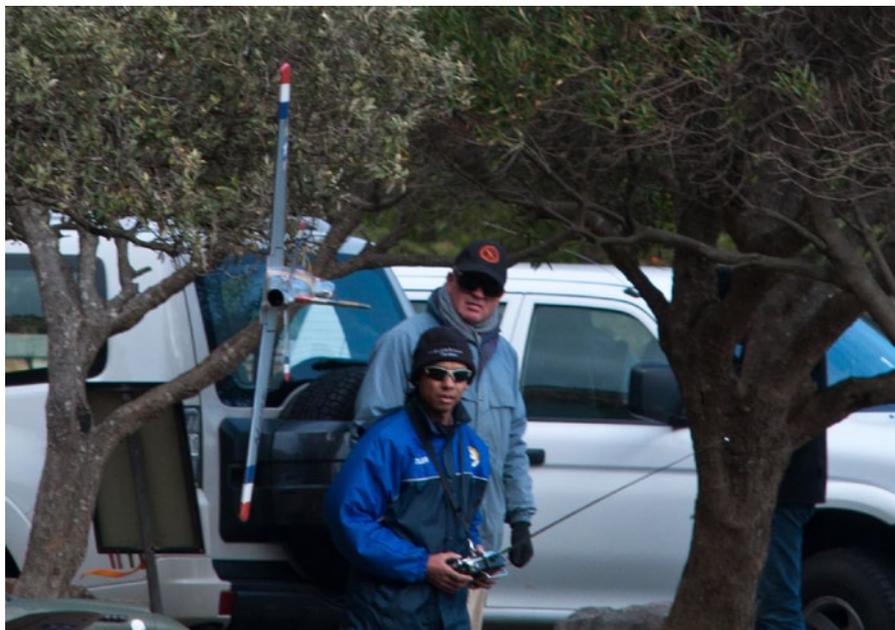


Christo Le Roux, TOSS Chairman, gets to grips with the P-47 Warhawk.





A rather unusual angle from across the bowl as Damian puts the F86 Sabre through its paces.







Above: Jeff Steffen and Bill Dewey launch the P-47 Warhawk.

Opposite page, far left: Kevin Farr's Impala in Team Toss colours.

Opposite page, upper right: Team TOSS warming up.

Opposite page, lower right: Malcolm Riley's big Impala in the bowl and ready for a landing approach.

Windfinder predictions) and started to deliver a silky smooth northwest blow that strengthened throughout the day.

Some fun foam warbird combat was had in the ever increasing lift and shortly after lunch conditions allowed for the Sportsmans Light Class to do their flight routines. Two set manoeuvres and then a choice of three alternate manoeuvres were selected by the pilots and the show hit the road. Three pilots flew this class, Anton Benning, Dave Greer, all the way from Durban, and Kevin Farr. As per the aerobatics contest the manoeuvres had to be done in the box and straight and level as possible. The Sportsman Light class is designed to cater for gliders with a 20-30 ounce wing loading or less, while the heavyweight class is for 30-40 ounce category.

Possibly the risk of the weekend had to be the entry of the P-38 Lightning in the Sportsmans Light Class, rather than the Heavyweight Class. True to form some great laps were flown but it was the rather large and bulky P38 Lightning that proved a gem as it soared in conditions it should really not be able to, and completed all the designated manoeuvres.

The rest of the afternoon was spent in glorious sunshine, beautiful slope conditions and by the time the guys left the slope at 6:00 pm, most were





Above: Carlo's Spitfire gets it's maiden launch.

Opposite page, far left: Team Toss Impalas flying in a close formation.

Opposite page, upper right: The P-38 Lightning, always an attention getter..

Opposite page, lower right: Damian Hinrichsen's Impala in slightly different Team TOSS colours. Thought these differences would be enough distinction, but in the end you just have to watch your own plane carefully. Very carefully!

toast and the grey matter well and truly fatigued.

Predictions are at the best of times predictions. The prediction for Sunday was of howling winds, sheets of rain and a good old wet one for the Cape area. In the early hours the rain did indeed appear, then as light broke it backed off a little and we headed back to Chapmans Peak to assess the situation.

Rain looked imminent at about 9:00 am but the wind was really pushing through in the 40-50 kilometer an hour range and so we were able to fly the Sportsmans Heavy class flight routines.

Carlo Davies stepped up to the plate with his Spitfire in Reno racing colours, delivered a maiden launch, knees and all going ballistic like a set of castanets, and he flew his routine to perfection. What a boykie!

Next stepped up Marc Beckenstrater with the Mosquito and as we set up the glider in the air, which was travelling with some noticeable speed, we noticed a kink in the wing appear resultant from a previous landing. The advent of this particular situation saw a very quick landing to save the machine and avoid any mishaps. All's well that lands well, and a repair should see her in the sky again.

Next up to the plate was Christo le Roux whose P-40 Warhawk is a static judging



Beautiful cloud formation behind this Impala launch.



P-38 Lightning drops a wing into the Fynbos below in the landing area on the slope.

masterpiece and was set out to the skies with intent. First few manoeuvres were straight off the bat, but in the middle of the downwind leg of the slope figure 8, the tail gave a little wiggle and she began to waggle herself into a really nasty place, aeronautically speaking... Thanks to Christo's awesome recovery skills the P-40 Warhawk made a relatively light date with terra firma and a bit of leading edge damage occurred, not significant, but sufficient to take it out of the sky for the rest of the day.

After all the flight judging was completed by Flight Judge Kurt Macrill, the skies were opened to general flight and probably one of the very best PSS sessions ever was had by the lads.

By now the skies had opened up, the clouds disappeared and the conditions were just about as perfect as you could wish for. Seven scale gliders took to the air simultaneously, from Jeff Steffen's smaller Impala to Malcolm Rileys large 2.5 meter, 7 kilogram Impala, accompanied by Damian Hinrichsen's F-86 Sabre, the P-38 Lightning and a good few foamies thrown in for fun.

What a blast we had as circuits were created with the entire gaggle as close as possible to each other while trying to match the size and speed of the respective gliders. Not an easy task and quite taxing when flying larger scale gliders, but what an incredible spectacle

to be part of and a definite highlight flight of the weekend.

This was followed by a mass Impala flight in which a total of seven same sized Impalas were taken to the sky at the same time for some formation flying. Talk about taxing on the brain as you had to concentrate on seven different targets simultaneously, and at certain times all within spitting distance of one another. What an awesome session, and all this in front of the imposing and perfectly beautiful Hout Bay scenery.

By this time most of the guys' grey matter was seriously taxed out after two days of perfect slope conditions and the near continuous flying.

Thanks to generous sponsorships from Chris Leal and the club coffers we were once again very proud to hand a cheque for R 2500-00 to the Percy Fitzpatrick Fund, which was gratefully accepted by Andrew Jenkins. The intent of this donations is for the continued study of raptors and specifically the Black Eagle after which the event was named in respect of one of the great masters of the sky.

An end to the day was called at 1:30pm, so as to ensure that a great prize giving could take place at an Italian trattoria down the road in Hout Bay, called Cassarecio.

If you are ever in town it is well worth the visit as the food is supreme. So we took over the restaurant, ate ourselves silly while sucking on the odd glass of wine to ward off the chills, and then preceded to hand out the awards.

A really big thanks must go out to our sponsors who spoil us silly and really came to the party with a generous amount of prizes to give away, including glass and EPP gliders. Without the superbly generous and passionate involvement of individuals and hobby shops we would really be hampered in the ability to host and make successful such an event.

First on the thank you list is Mother Nature for coming to the festival with some panache and delivering two really perfect days for slope soaring on the Cape Peninsula.

Thanks to the TOSS committee for making the event possible through a lot of hard work.

Thanks to Static Judge Herbie Newton, and to Flight Judge Kurt Macrill.

Thanks to Shirley for catering and taking care of the food needs for the weekend.

Thank you to all our generous sponsors who made sure each and every entrant went home with something useful tightly grasped in their hands.



A couple of Team TOSS lads give the Impalas some wind up the tailpipe.

Sponsors

Anton Benning	Cape Sailplanes	Chris Leal
Clowns Hobbies	InterMet Africa	Hobby Warehouse
Micton Hobbies	RC Hobby Shop	Southern Hobbies
Steve Meusel	Kevin Farr	

Final event positions

Sportsmans Heavy Class

1st: Carlo Davies (Spitfire)
2nd: Christo le Roux (P-40 Warhawk)
3rd: Marc Beckenstrater (Mosquito)

Sportsmans Light Class

1st: Kevin Farr (P-38J Lightning)
2nd: Anton Benning (Impala)
3rd: Dave Greer (Me-109)

Combat Class

1st: Carlo Davies (Corsair)
2nd: Christo le Roux (P-51 Mustang)
3rd: Bill Dewey (Mitsubishi Ki-61)
4th: Schalk Human (P-47 Thunderbolt)
5th: Tim Watkins-Baker (Mitsubishi Ki-61)

Congratulations lads!



In the September 2011 issue

THE ULTIMATE HIGH WIND SLOPER



The philosophy, design, construction
and flying of a lead sled

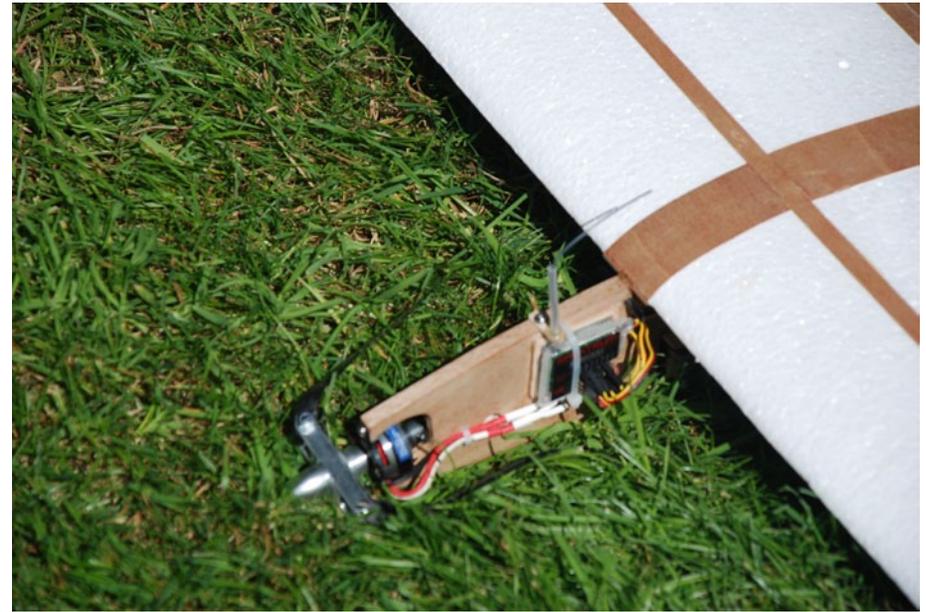
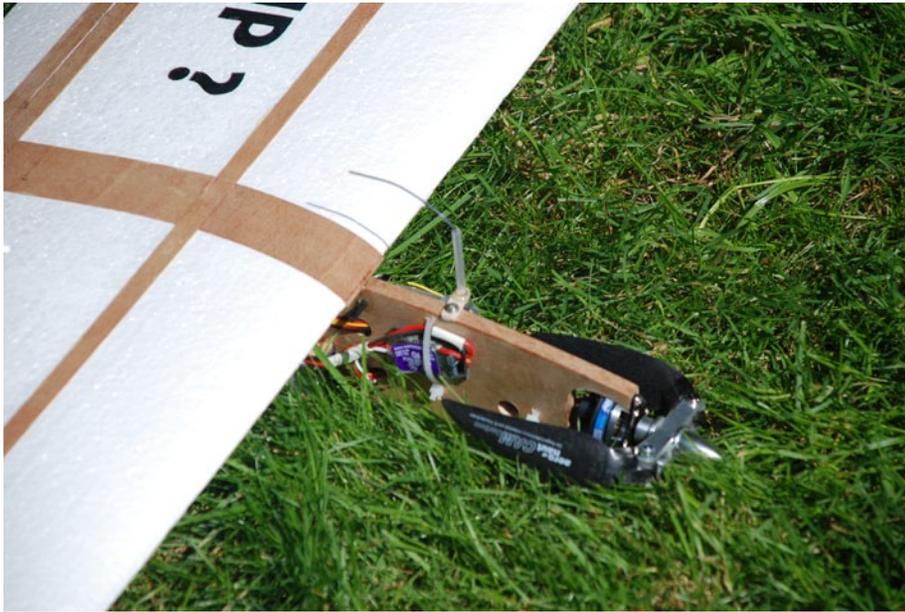
by Dave Jensen

WAZUP?



A foamie electric "plank" for thermal flying

Chuck Clemans, chuckclemans@msn.com



In the summer of 2001 I was vacationing in Coos Bay Oregon and the timing was right to attend the annual Small Fly event hosted by the Bay Area R-C Flyers. I had an OK Cub .049 powered Mini Mambo which fit right in. Steve Hindirks of Birdworks was there and had several of his designs which he kitted. I was especially taken with a 34 inch span double taper flying wing called "Bud." Bud had a CNC cut EPP foam wing and was tough as nails. Control was provided by elevons and it was powered by a GWS motor.

Upon returning to Bellevue Washington I constructed a Bud and upgraded the motor to an Astro 01 brushless and a folding propeller. Bud was and is a joy to

fly and is still active after ten years. The wing loading is a bit higher than Steve intended, but Bud will thermal easily in moderate lift.

The thing with Bud is that it has no dihedral and requires a lot of attention to thermal. None of this "center the thermal, trim, and sit back and enjoy." It requires constant tweaking to stay in a flat turn.

Over the years I've given some thought to designing a flying wing with the portability and agility of Bud and with added stability to make thermal flying a little more relaxing. I have some experience with flying wings and envisioned a plank configuration with a constant chord wing and polyhedral. This

configuration works well with rudder and elevator control.

I tried cutting some EPP wings with little luck. I have a home made gravity powered foam cutter and decided that white EPS insulation foam from Lowes or Home Depot would do the job just fine. The problem was how to make EPS foam strong enough for the task without adding too much weight.

Mike Evans has done some interesting work with his Aerial Photography airplanes which are constructed of white foam. Some of his designs have an 80 inch span with surface spars of 1/32" aircraft plywood. The power is electric and with a load of camera and FPV equipment the weight can reach 6 – 7

BW 050212

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<http://www.rcsoaringdigest.com/Airfoils/BW050209.txt>

lbs. His design techniques can be found at RCgroups.com. Search for "Orb" or "Beast" - I've built both and they are great airplanes.

This winter I finally got around to designing and building the WAZUP. It's about the size of the Bud and uses a Park 300 for power. I used the built-in prop saver and standard propeller initially, but recently switched over to an Aeronaut folding propeller from Hobby Lobby.

The design features 1/64" ply spar caps and hinge caps both of which are glued to the surface of the wing. The hinge caps allow the use of EZ Hinges. The fuselage consists of a 1/4" balsa core covered with 1/64" plywood. 1/32" plywood could be used throughout in place of the 1/64" and is much cheaper than the 1/64". WAZUP can easily accommodate the added weight. White Gorilla Glue is used to secure the spars to the wing.

The fuselage has compartments and access holes for cable storage. The speed control and receiver are mounted back to back just ahead of the wing. A 1300 mah Li-poly battery is mounted on the bottom of the fuselage under the wing. Receiver, ESC and battery are secured with zip ties.

I used a separate servo for each elevator half, but a single servo would be fine.

The airfoil on the WAZUP was designed by Barnaby Wainfan and has a near zero pitching moment. I increased the thickness from 10 to 12 percent to control flight speed and provide greater spar separation. <<http://www.rcsoaringdigest.com/Airfoils/BW050209.txt>>

Initial flight testing has gone well. Lift is indicated by the nose pitching up or dipping a wing which is typical of planks. Like Bud, Wazup is an airplane that travels fully assembled and requires little

space. Wazup is just plain fun whether your main thing is high performance gliders or the large noisy aircraft.

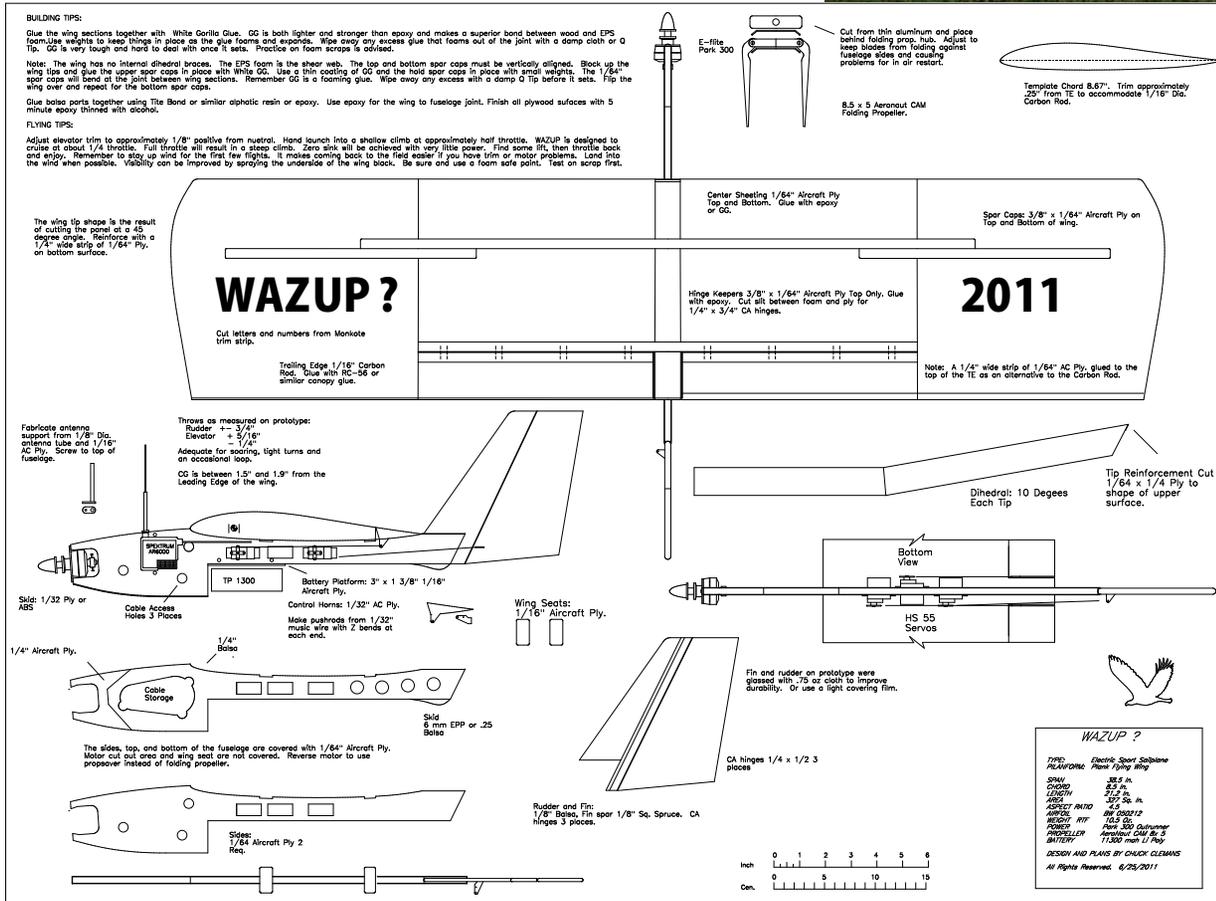
Wazup wing cores are available from Jeff McClain at <<http://www.mwcores.com>>. Jeff has indicated that a kit may be available in the near future.

Full size plans for WAZUP can be downloaded from the RCSD web site by using the following URL: <<http://www.rcsoaringdigest.com/images/WAZUPplans.pdf>>



WAZUP

Airfoil: BW 050212
 Span: 38.5"
 Chord: 8.5"
 Area: 327 sq. in.
 AR: 4.5
 Wt. 10.5 oz.



Full size plans for WAZUP are available as a free download from the RC Soaring Digest web site. These PDF plans are 48" by 36" and can be printed by your local office supply retailer with appropriate equipment.

<<http://www.rcsoaringdigest.com/images/WAZUPplans.pdf>>



Modifying the Turnigy 9x with custom firmware

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Turnigy 9X 9Ch Transmitter w/ Module & 8ch Receiver (Mode 2) (v2 Firmware) < http://www.hobbyking.com/hobbyking/store/uh_viewItem.asp?idProduct=8992>

I don't know how many other people are quite like I am, but I just love finding little gems of items that are cheap and with a little tweaking turn out to be awesome. As a kid this saw me pulling almost everything I owned apart, and once I got older I would be pulling down brand new fishing reels, doing a few modifications and regreasing them ready to be used and likely not catch a fish for months! There must be others like me out there, as what I am presenting wasn't originally done by me, nor would I have the skills to do without the direction of others.

This is aimed at both those who are new to the hobby and looking for a reasonably priced radio to get them started, and also people who already have the good stuff and may want a trainer radio or something cheaper to knock around with. The features in this radio with the custom firmware are at least as good as my JR-X378, and it's easier to program at the same time with a lot of added benefits that you would never find in a JR at least. Plus its just tricky!

The Turnigy 9x transmitter

The Turnigy 9x, otherwise known as Eurgle, FlySky and various other brand names, is apparently meant to be a bit of a copy of JR, which is visible in its layout. It is meant to be 9ch, but only 8 work with the 2.4ghz it seems. It has two sticks like any normal radio, three pots and 6 x 2 position switches which have various purposes in the original form. It is similar to any computer radio in that it has a screen and various buttons for moving through the menu and making alterations. This radio is sub \$100 everywhere I've seen, and I purchased it for around \$60 from HobbyKing. I originally bought this radio with the hope that I could use it as a



Rear of the Turnigy 9X showing the battery pack and open module compartment.



Interior of the Turnigy 9X, all components exposed.

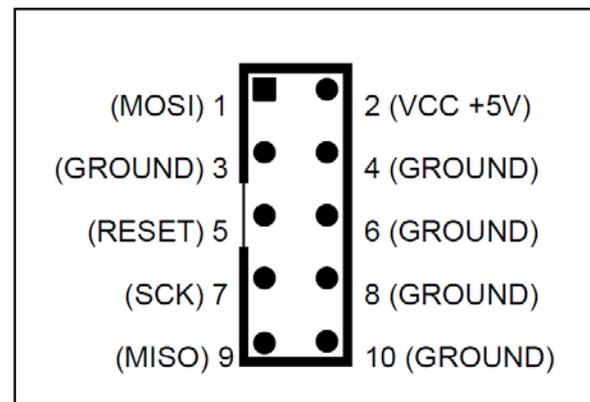
cheap buddy box to go with my JR in order to teach my son to fly after reading many reviews on www.rcmodelreviews.com (where he gives a good unbiased opinion on many different RC related products, well worth checking out the forums also). Everything I read said that the radio was a great value and well built for the money, but the firmware was a bit of a letdown as it was hard to program and limited in its abilities. No problem I thought, I didn't want to do anything ground breaking with it, just be able to

do mix for chevron wing so my son could learn to fly with something fairly tough.

The "version 2" radio I received had 2.4ghz module with the aerial installed in the transmitter, rather than on the module as in previous versions. One unfortunate fact is that the aerial is attached to the module through a permanent cable, and if you want to remove the module fully you have to cut this cable. (To jump the gun, I currently have the module taped in with some balsa underneath to stop the pins contacting, but will have to



How I have installed the IDC female header. The programmer is joined to this via a cable with male IDC headers at each end.



Pin out of the female IDC header on the programmer. Comparison of this image with the image showing the wiring should help reduce any confusion if following the ER9X installation instructions.

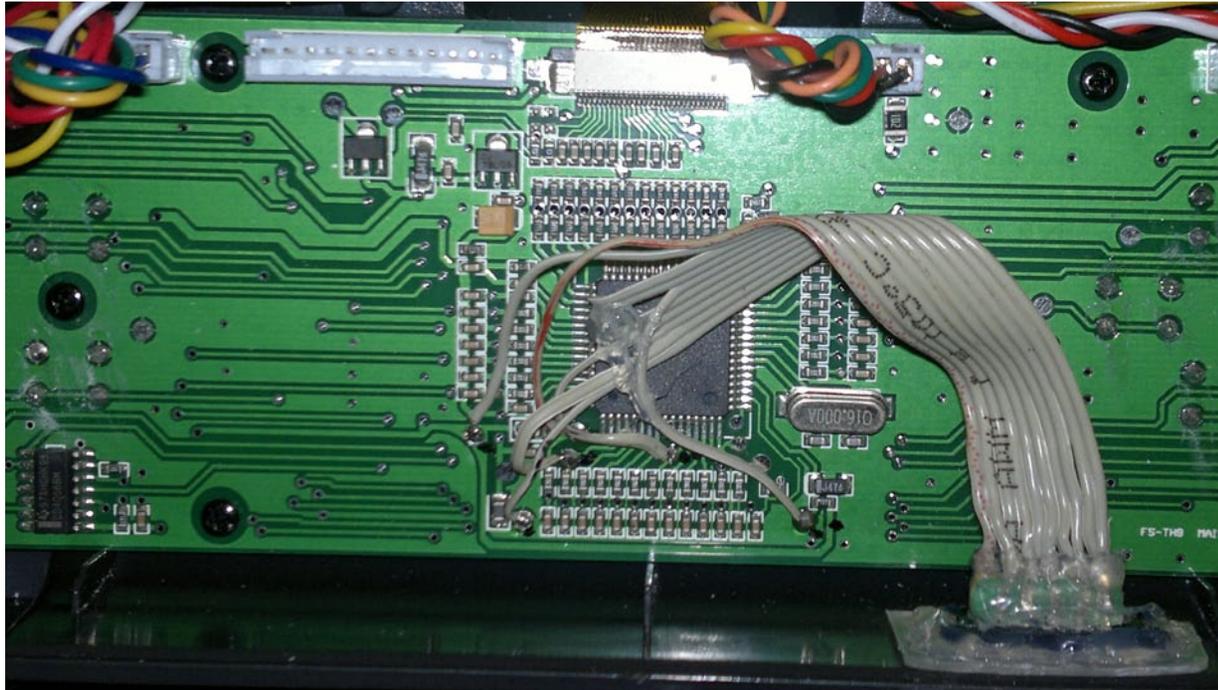
cut the cable soon as I have another 2.4ghz module coming for it.) The sticks, switches and pots all felt pretty good, and it definitely doesn't have a cheap feel it. It doesn't come with a battery pack, but rather a holder for 8 AA cells that plugs in with what seems to be a 2s JST lipo balance plug (using only 2 of the connections). This battery holder is a big source of failure from the comments I've seen, and I personally would be a lot more comfortable with a proper soldered battery pack. I will do this when

it progresses on from trainer box duties, but at the moment it isn't an issue.

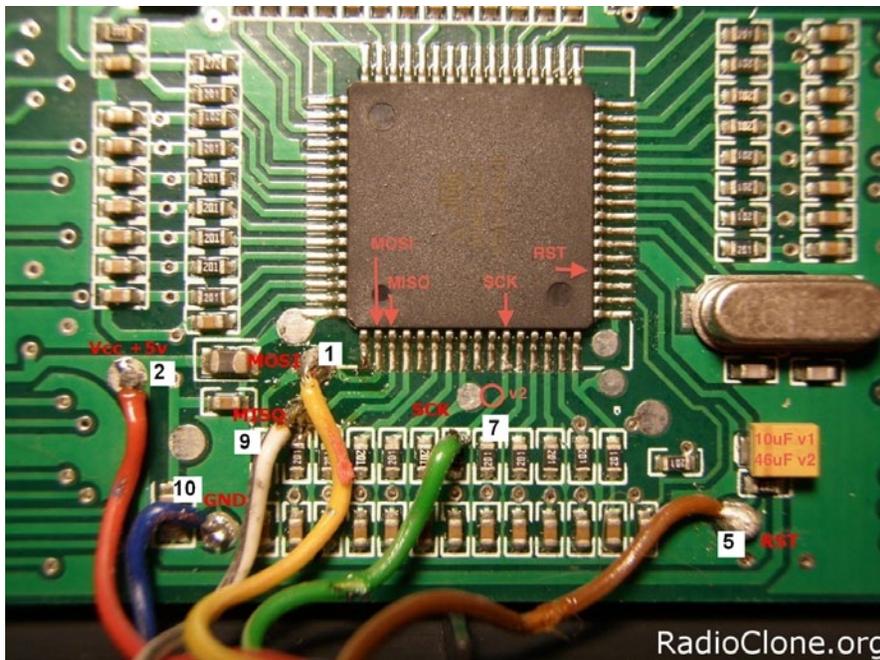
As far as the radio transmitting side of it, I have only bound the receiver that came with it and that's all. From what I have read, the range of this radio is alright, and interference rejection is supposedly better than at least one of the big names, but there is a lot better out there for somewhat serious use. As it was only being bought for buddy box duties that wasn't an issue, but the plan was to put

in another module when the time came. More on that part further along.

It took a fair bit of stuffing around and reading online to figure out that to use the Turnigy as a trainer radio, you have to remove the module. I found that the JR X-378 and the Turnigy 9x talked to each other fine once the module was removed, having the same 3.5mm mono jack cable connection, but the Turnigy used what I assume is the Futaba format for channel output (Did I mention it's meant to be a JR copy?). Thinking about it now, I may



Close-up of the main board. The IDC female header detailed on the previous page is located at the lower right.



This image shows the pads and what wires are soldered to them. Numbers for the ribbon cable start with 1 on the pink/red side through to 10 at the other side. Note the red circle for SCK, the radio in the image is version 1 and this wire is soldered to the resistor. All radios sold now are version 2 and there is a pad where the circle is that this wire is soldered to.

well have been able to customize some mixes to make the outputs correct, but I really wanted an excuse to have a go at installing this custom firmware I had read about.

Alternative firmwares

There are a few versions of custom firmware out there for the Turnigy 9x, and each seems to have a different focus. The people who wrote these are obviously pretty clued in and also generous, as these are supplied free of charge with instructions on installation and use (see links). I'm no expert on these, so it would be best to read up about them and make a decision based on your needs. There are variations also being done to include the telemetry functions available with the FrSky range of modules and receivers. This is something else to keep in mind if the idea of telemetry has some sway with you.

I chose the ER9X firmware based on the fact that the installation instructions were in English and I could understand them - though it turned out the equipment I got differed somewhat from the instructions, he was a member of the forums I was gaining a lot this information off, and I easily understood his instruction for usage and knew that I could do what I needed to with his firmware.

Hardware modifications and flashing the firmware

My intention in this section is not to provide instructions on how to flash the firmware, there are instructions out there written by people much better qualified than myself, but rather provide a bit of an overview to show how much is required and to point out any difficulties I encountered that will hopefully help others out when it comes time to do this. As such this section is shorter than what may be expected for doing something of this nature.

And the warning, of course there would be a warning. Doing this modification has the potential to completely stuff your radio, especially if it goes wrong! You want to be confident in your soldering skills, and know exactly what you need to do before you start pulling things apart. Read the instructions on the various sites, have a look at the threads on rcmodelreviews.com and if you're unsure then ask questions on there (some very knowledgeable people there). If you're still unsure of what you're doing then getting some help off someone who is good at working on electronics won't go astray. Don't be alarmed though, I have only very basic electronics experience and I didn't have a problem with this. There is also the option of the smartieparts board that has the programmer built in, it sits straight in and screws down using the existing screws. It's an extra cost but it saves the

possibility of stuffing up the solder joints if your not confident.

Following the installation instructions on the ER9X site, I purchased a USBASP AVR Programmer and a cable with 10pin female IDC headers on each end from Prostack (male cable came packaged with the programmer). When it came to looking at soldering onto the pads, I noticed discrepancies between what was shown in the cable and header arrangement in the instructions and what I had available. Mine was not only less colorful but also seemed to have a different pin arrangement, and I was very glad I took my time and double checked everything before getting stuck into it. Hereabouts you will see a diagram showing the cable pin arrangement, wire numbers and functions. If you purchase the same programmer, the functions are also printed on that and you can follow what is written to know where each wire goes by referring to the diagrams.

You will want to cut one end of the IDC extender cable off, leaving enough cable attached to one header to allow you to solder to all the little pads and mount the header to the radio case. The pink side of the cable is number 1, through to 10 at the other side. Wires 1, 2, 5, 7, 9, 10 are used, the other wires can be trimmed off short. Have a look at all the links in the various custom firmware pages so you get a good understanding of what wire is

being soldered to what little pad inside the transmitter (to reiterate once again, it wouldn't be nice to stuff this up due to carelessness or not fully understanding what your doing). Using a nice small soldering iron, tin the wire ends and tin the little pads inside the radio. I always use flux, especially in this sort of situation. You want the wire to stick right the first time and not have solder going all over the place. Note that there are some pads that are unused on the board where the wires are soldered, so it can be easy to make a mistake if you don't double check.

What is probably more painful than soldering the wires is figuring out how to mount the header. I ended up drilling and filing a hole to the right shape in the bottom of the transmitter, and then I trimmed thin plastic to the right shape to fit into the grooves on the header to hold at the back, then similar pieces were screwed into place on the front. This is very hard to explain, and I don't think a picture will do it justice, either. There are many ways to skin a cat, just get it stuck there any way you can. If you go with a custom battery modification, you might have plenty of space inside the battery compartment, in which case this would be a better spot for it. As there are updates released for the firmware as the authors work out any bugs, you may well need to access this plug more than a few times.



This image should help show how the mixing works with the ER9X firmware.

Next part is installing the actual firmware. This is covered pretty thoroughly in the instructions, so I won't repeat here. I found this process very easy, I just did what the instructions said and it worked the way it should. First of all you save the current EEPROM and firmware, and then install the new firmware. If you are updating the custom firmware, you may want to keep the old EEPROM which has the settings for your different models in it, once again just follow the instructions. Once flashed, you will need to calibrate

the sticks and pots as described in the user manual for the software.

The ER9X in use

I had expectations that the firmware would be better than the original, and would be user friendly, but I was blown away by just how many useful things were in this firmware. I thought it was so well thought out, and as there are constant updates it's probably even better by now. I reckon I've forgotten more features than I have used.

One of the main reasons for using the custom firmware was for the ability to be able to assign different functions to different channels, rather than being stuck with whatever the manufacturer decided was their way of outputting the functions. This meant that I was able to assign the elevator and ailerons to output the same as the master JR radio. This has other uses in that you can use a 4-channel receiver that will work with inputs from the pots or gear channel that normally wouldn't be able to be used with a 4-channel receiver.

Some other features that don't seem to be standard on other radios I have played with include: adjustable low battery voltage alarm (can use 2s lipo), inactivity alarm, all beeps and alarms are adjustable and can be turned off, increased model memory to 16 (double my JR), if used as instructor radio then all mixes and adjustments will be made to the PPM input from students radio also (minimal set up needed for students radio), backlight on/off/timed after key press (needs hardware modification of actual backlight), trim set switch that when hit will set current stick position to the subtrims and return everything back to normal (For a new model, just hold sticks in the right position and hit the trim set switch and the plane is trimmed.), select positive or negative pulse shift, multilevel mixing.

The mixing and limit functions are great, really easy to use. In fact it's this ease of use that stuffs me up when using this transmitter. Instead of scrolling through screen after screen to reverse channels and change rates etc, it's all there on the

...this would be an excellent project for those newer to the hobby looking for a radio with more features. It's a pretty low investment for the radio you get in return.

one screen. It's in the mixing screen that you assign whatever inputs will output on what channel, and it's on this screen that you really see what the ER9X is all about. It lists the channel, and next to

that what sticks or pots are assigned to that channel (can be more than one), the weight of that function to the channel and curves or switches associated with that channel. If you now consider that the same stick or input can be set to more than one channel, and more than one input can be set for each channel you should understand how the mixing works in this firmware. It seems simple to me, but it really needs you to get your head around to be able to get the best out of it. Referring to the image shown here of a mix for a combat slope wing should help give you a better idea on this. Yes, the mix shown isn't really correct as the ailerons work at 40% rather than 100%, but as it's a trainer radio the rates are dialed down a bit in comparison to the master radio.

Other modifications

There are other modifications that are popular to do on this radio. The backlight option was originally done as a hack, and was obviously popular enough to be included on the smartieparts board that can also be used for flashing the firmware. HobbyKing are also now selling a backlight available in various colours. I had intended to fit one of these, as the screen can be a bit hard to read in some light, but there are too many other jobs waiting to get done in the garage as it is, and the light isn't all that necessary.

The FrSky RF system seems to be very popular with many users being easy to use, good range and interference rejection better than some of the big brands and it is also very wallet friendly in comparison. A FASST receiver alone is worth more than most of my complete planes, and worth more than I am really willing to go throwing off a cliff. An FrSky JR module fits straight into the Turnigy 9X, and does away with the not quite as reliable RF system that comes standard. Fitting this will require cutting the wire from the existing module to the antennae. I have only just received a module and receiver and I am yet to fit them, so I am unable to speak from experience on any of this.

I have recently been trying to teach my son to fly with a cheap DLG, with my son using the Turnigy 9x as buddy box. It doesn't take much imagination to realize that this isn't really an ideal situation, trying to discuss launch while attached with a cable! I had the thought that it would be great if one was able to use a wireless buddy link, and while looking on the FrSky website I came across a link showing exactly this (see links section). It seems that a few of the FrSky receivers have a PPM output, and all you require to set this up is an FrSky module for the trainer radio, and one of these receivers attached to the master radio with the PPM plugged into the trainer port. I haven't tried this yet so I can't say the

correct way to wire it up, but I have it on good authority that it won't hurt your radio getting the PPM for the trainer port the wrong way around (don't blame me if something goes pop though). I have also recently come across someone on the HobbyKing forums doing the same thing wiring into the PPM on receivers that work with the original Turnigy module and also other FM receivers (see links).

Conclusion

This modification produces a pretty tricky radio for a very budget price tag, and I think it is also very educational at the same time. I don't think anyone would trust this radio as much as something that costs a lot more, but its functionality seems to put it up there with them. I think this would be an excellent project for those newer to the hobby looking for a radio with more features, it's a pretty low investment for the radio you get in return.

Links and references:

ER9X firmware homepage, including installation instructions: <<http://code.google.com/p/er9x/>>

Alternative firmware: <<http://code.google.com/p/th9x/>>

Another installation tutorial: <<http://www.instructables.com/id/Transform-a-cheap-RC-Transmitter-with-Custom-Firmw/>>

AVR programmer: <http://www.protostack.com/index.php?main_page=products>

ER9X instructions: <<http://er9x.googlecode.com/svn/trunk/doc/ER9x%20Users%20Guide.pdf>>

FrSky wireless trainer set up: <<http://www.frsky-rc.com/Downloads.asp?id=70>>

Turnigy 9x on HobbyKing RC store: <http://www.HobbyKing.com/HobbyKing/store/uh_viewItem.asp?idProduct=8991>

Smartieparts no solder programming board with backlight: <http://www.smartieparts.com/shop/index.php?main_page=product_info&cPath=3&products_id=331>

FrSky modules and receivers: <http://www.extremmerc.com.au/estore/index.php?main_page=index&cPath=162>

Alternative for wireless trainer system using original Turnigy 9x module: <http://www.HobbyKing.com/HobbyKing/forum/forum_posts.asp?TID=19313>

RC Model Reviews forum for information on the Turnigy 9x, FrSky RF modules and all general RC equipment: <<http://www.rcmodelreviews.com/forum/index.php>>

