Radio Controlled Soaring Digest

February 2010 Vol. 27, No. 2

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Front cover: Piet Rheeders' CMP Discus puts on a show in front of a beautiful cloud formation. This photo was taken at Tamatieberg near Volksrust, South Africa, during a mid-summer slope excursion celebrating the transition from 2009 to 2010. Coverage of this several day "event" can be found starting on page 4 of this issue. Photo by Jochen Smit.
Canon EOS 450D, ISO 400, 1/2000 sec., f8, 250mm

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Back cover: Jochen Smit caught flying Piet Rheeders' 'glass Zagi at Tamatieberg. Photo by Piet Rheeders.
Panasonic DMC-FZ50, ISO 100, 1/640 sec., f4

R/C Soaring Digest

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In the Air

Markus Frey of Switzerland has succeeded in building and flying a huge model of the Austria Elefant — at 1:2 scale it spans 15 meters. A video of the first long flight (at the Wasserkuppe) of this phenomenal scale project can be seen at <http://vimeo.com/6150893>. The video shows the aerotow launch, about two minutes of flying, and the landing to a well deserved round of applause. Watch the wing flex as the model turns and flies through minor turbulence. If you think this model sets a record of some kind, you'd be correct. The Guinness World Records organization has recognized Markus Frey's Elefant as the world's largest model aircraft.

This issue features a large amount of material from our friends in South Africa who are now enjoying good summer flying weather. If you live in an area with weather not so conducive to flying, now is an excellent opportunity to check out your radio gear and the airworthiness of your fleet in anticipation of better conditions.

Time to build another sailplane!

Mid-summer slope soaring trip

VOLKSRUST

Text and photos by Piet Rheeders, rheedersdj@telkomsa.net
Additional photos by Jochen Smit, Edmund Brandon and Sam Linakis

With the South African Summer in full swing, and lots of holidays around Christmas we once again seek the tranquility of Volksrust and the 1500 foot high inland mountain of “Tamatieberg” about 290km and three hours easy drive from my home in Randburg- Johannesburg.

This was the third year that we have done so, and so far the best in terms of perfect slope weather. Sadly, only five pilots attended the first group of slope pilots — 28 Dec 2009 to 1 Jan 2010 — but nonetheless we certainly had more than enough models to cater for most weather conditions that could arise during our four day stay.

We took around 1000 pictures between four of us and selecting some to forward with this article proved not too easy; there were so many nice pictures and you just do not know which to select and which to omit.

Preparation for the trip started about a week beforehand when I took all my slope gliders from their hibernation place in my garage attic roof to remove the dust and cycle the batteries for the upcoming trip.

It is at this stage that you have to select which models to take with and which to leave behind, but over the last two trips I now find the selection process easier. I still ended up with eight gliders to take with, and a small trailer with lid and a custom made “wing rack” is a must to get the gliders safely transported.

We set off on Monday morning at around 6.30 AM the 28th of December, and the weather did not look too promising at all with 5/8 overcast and low clouds. This, however, started to lift and when we got to Volksrust at 9.45 AM “Tamatieberg” was just about clear with a steady and strong NNW blowing up the slope.

The plan was to meet up with Edmund and Sam at the guest farm (they had arrived on Sunday already), unpack our luggage and then ascend to the NW slope. This we did and when got to the main slope could fly straight away. My anemometer registered +/- 40 km/hour.

The wind coming up the slope was, however, very gusty and cold. Jochen Smit arrived at 12.00 midday and was also wise to leave his planes in the safety of his car and instead he set about taking pictures.

I must admit that I was very tempted to fly my Aero Commander first but played it safe and flew my Hill Billy and Glass/bagged Zagi first. Launching in this wind proved to be difficult and on one of my launches with the Hill Billy it got totally out of shape, and it shot straight up for five meters, did a half roll to the left and nearly inverted before I could get my hands on the controls.

I managed to get it upright but at this stage the Hill Billy was heading 90 degrees to the original launch path and straight for the hip high bushes on my left. Just as I thought that I had it under control it flipped to the right and now with no height left only just managed to get wings and nose level as the Hill Billy flopped to the ground with luckily no flying speed left and minor damage to the fuselage. Jochen managed to take a photo sequence of all this and it still amazed me that I did not end up with a total write-off.

Landings presented similar problems but we soon adapted to the conditions. Once you were safely over the edge you had a ball of a time.

At around 4.00 we stopped flying after having our first fix of slope flying and by now the clouds were just about blown clear, setting the scene for Tuesday. I still had go Volksrust town and Jochen followed Edmund to our guest house as this was his first slope trip.

Tuesday the 29th of December and day Two started out clear with very high clouds and blue skies.

Jochen was up before me at 6:30. At this stage of the day there was no wind and after my first cup of coffee I proceeded to rig my E-Tsotsi for the first flight of the

First flight of the New Year and last flight of the trip with E-Tsotsi.

day as breakfast was only scheduled for 7.30 AM.

Once again, Jochen set out to take pictures. With the white cloud as background I could climb out higher than normal and once up high cut the ESC and glide with no wind or thermals down. This is also the ideal time to confirm the still air trim and minimum sink setting on my glider. Three or four long motor runs will get you 35 to 40 min flight and in this farm type setting is very relaxing and a pleasant experience.

Shortly after breakfast we departed to the mountain, and from where we were to the top amounts to a 13km semicircle drive to the NW slope directly above the guest farm.

As we drove up the mountain we were treated with the most amazing and beautiful cloud scenery, the air was clear with no haze or fog to spoil your visibility and I just got that gut feeling that it was going to be one of those near perfect days that you can dream of on the slope.

Once on top and the flag pole set up we could fly straight away again. The wind was coming straight up the mountain at 25 to 35 Km/h with no gusting. Better conditions I don't think you can get here. To confirm this we were treated by a flock of 30 or so storks that were circling high above the slope and rapidly gaining height. I managed to get a few pictures of them with my camera set at full zoom before they disappeared out of sight.

Jochen started off with his two meter Tsotsi and found the lift too strong for it and switched to his F3B Shongololo and soon had it on the step whistling from the left side to the right side of the slope. I think you can safely bet your bottom dollar that you will see him back on the slope for sure. Unfortunately, Jochen had to leave back for home at around 3 PM.

During the day the wind stayed this way and at no stage did we have the lack of slope lift, and apart from our thermal and electric ships we flew just about everything that brought along. This included the 1/7th PSS Rockwell Aero Commander and, like last year, I was just totally amazed with this plane's handling characteristics and flight performance.

On the second flight I had the privilege to put the Aero Commander thru its passes as a small group of paraglide enthusiasts formed an audience, giving me the feeling that Bob Hoover must have had when he performed his aerobatic routine in front of the crowds with the real Rockwell Aero Commander.

The conditions seemed just too strong for the paragliders and after they left it were just Sam, Edmund, my wife Jenny and myself with whole slope to us. Sam managed to do her first solo take off and landing and later on launched Edmund's Zagi.

At this time of the day around 4.00 PM the wind kept on blowing and I was flying my CMP Discus with the now experienced toy pilot "Teddy Brown" at the controls and after a perfect flight switched to the Hill Billy. We only stopped flying at 6.00 PM.

Wednesday the 30th of December the day dawned with no wind whatsoever and we made use of this time to go the local town of Volksrust to shop for the necessary odds and ends.

However by 12.00 PM midday we were back on top of the mountain and this time we had to move to the northeast slope before we could fly our Zagis in reasonably smooth lift. The wind direction kept on shifting to the northwest until we ended up on the main, northwest slope at around 3:00 pm and very light lift.

Thursday 31 December (Old Year's eve) happened to be the day we had the lightest of wind for the whole week (5 to 10km/h). Allen joined us with his 2.2 meter Fox locally build glider produced by Craig Baker, but unfortunately could not fly because of the lack of wind. Shortly after 3:00 pm we gathered all our models for a group picture and then disassembled and packed them away for the journey back home on New Year's day.

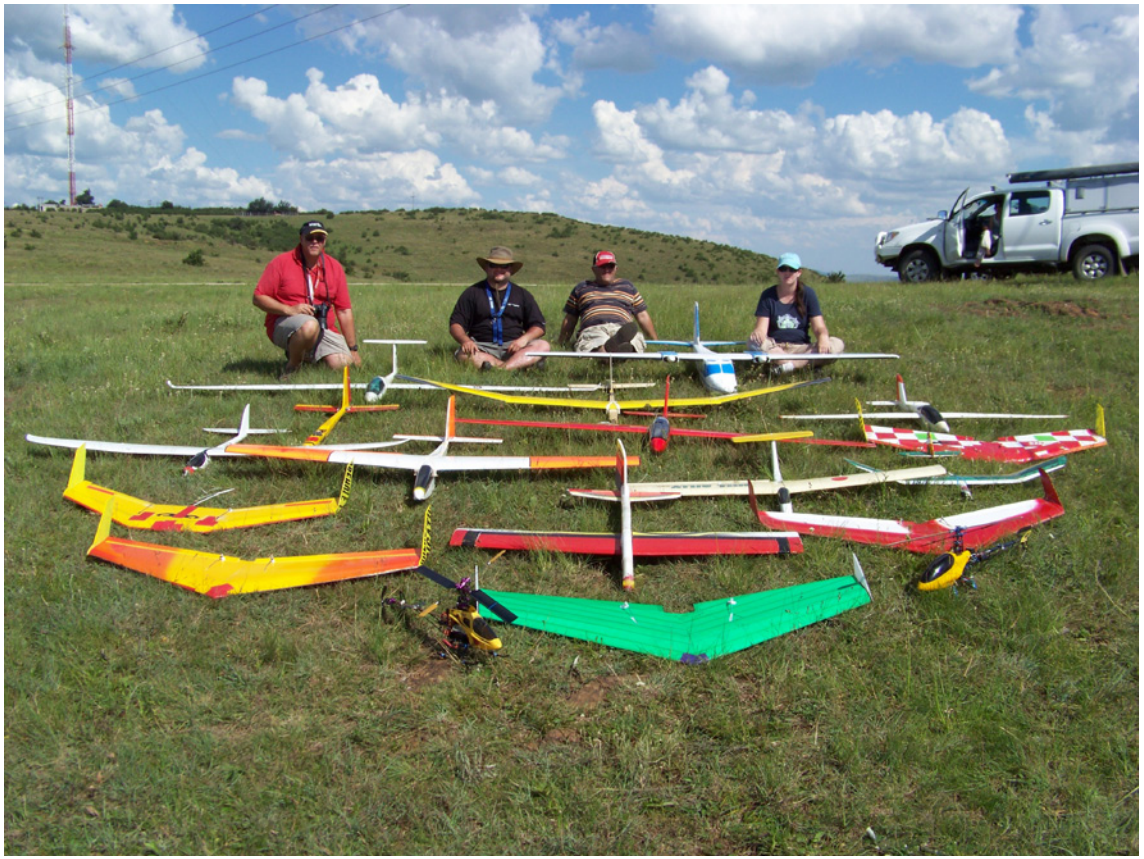
Early on New Year's day I had my first flight for the year and also the last flight of the trip with my E-Tsotsi before breakfast and the trip back home. Every one of us had lots of flying and one thing is for sure — we will be back at the end of this year, wind or no wind.

Above: Edmund and 2.5 Meter E-Tsotsi

Above right: Edmund's balsa, foam and veneer slope ship. Not sure about the name but had "Fledgling" stickers on wing tips.

Right: Edmund's charging setup.

180 degree panoramic view toward the south at Volksrust.



Group picture of pilots and gliders from left to right, Piet, Edmund, Allen and Sam.

180 degree panoramic view of the northwest slope at Volksrust.

View of the NW slope from my bedroom at the guest farm.

Jochen launches the Aero Commander.

The Commander against the clouds.

Jochen ready to launch his Shongololo.

Allen and locally manufactured 2.2meter Fox slope glider.

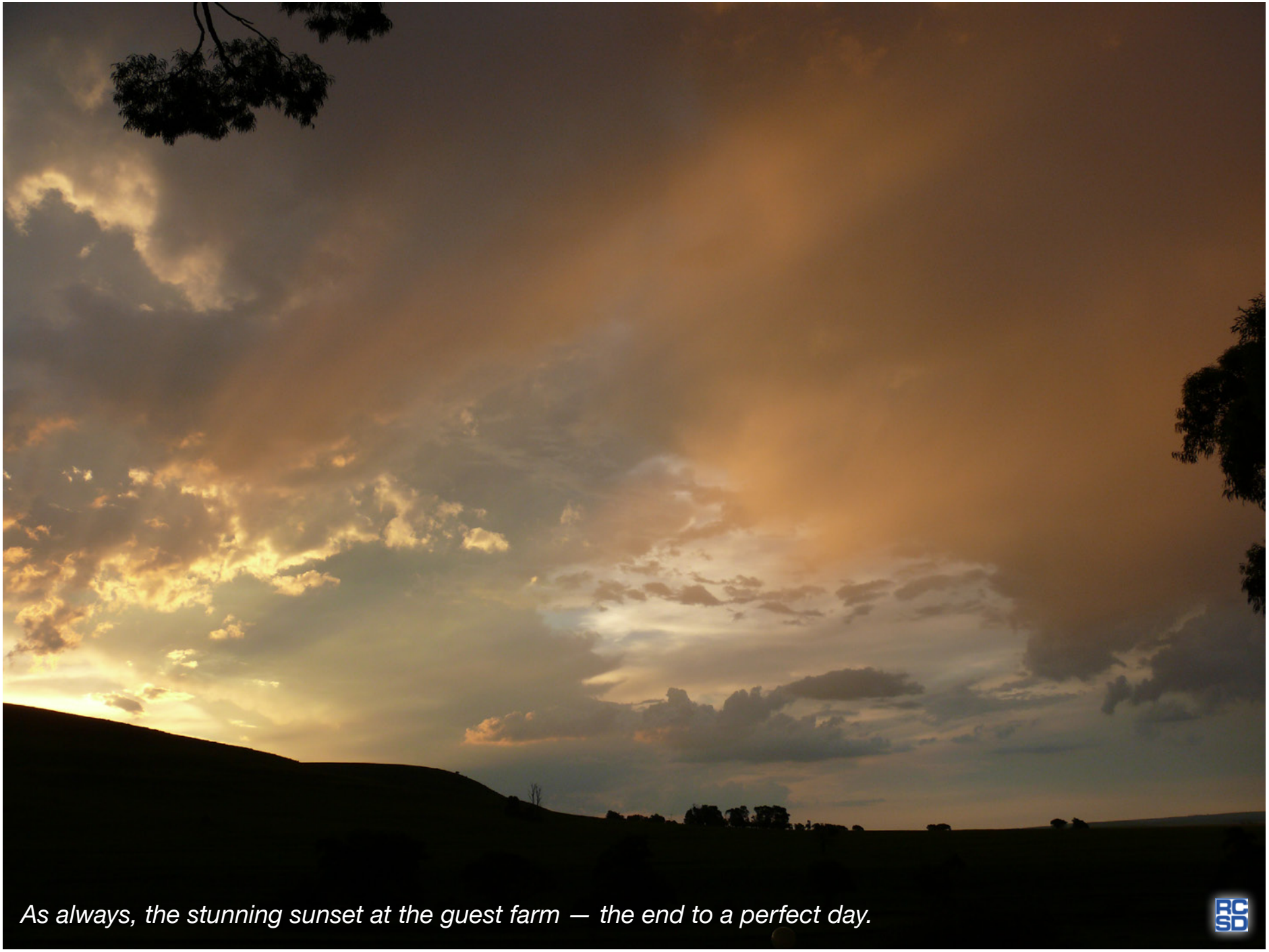
Above:Edmund launches the Discus.
Opposite page: The Discus on flight.

D-6541

The Discus on high speed flypast.

The Hill Billy — first to "fly" in strong wind on Monday.

Launching the Hill Billy and getting it all out of shape. Luckily, the "landing" was soft.



As always, the stunning sunset at the guest farm — the end to a perfect day.

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

Claim number : 15588
Sub-class :F3 Open (Radio Control Flight)
Category: Glider
Type of record : 155: Duration
Course/location : Koktebel (Ukraine)
Performance : 39 h 3 min 9 sec
Pilot : Valery MYAKININ (Russia)
Members : Alexander VASILIUK (Russia)
Date :11.09.2009
Previous record : 36h 03 min 19 sec (08.09.2001 - Nicholas SHAW, UK)

and

Claim number : 15589
Sub-class :F3 Open (Radio Control Flight)
Category: Glider
Type of record : 160: Distance in a closed circuit
Course/location : Koktebel (Ukraine)
Performance : 777 km
Pilot : Valery MYAKININ (Russia)
Date :11.09.2009
Previous record : 739.2 km (09.09.2007 - Valery MYAKININ, Russia)

and

Claim number : 15650
Sub-class :F3 Open (Radio Control Flight)
Category: Glider
Type of record : 161: Speed in a closed circuit
Course/location : Tushino (Russia)
Performance : 133.2 km/h
Pilot : Alexander VASILIUK (Russia)
Date :18.10.2009
Previous record : 129.70 km/h (23.06.1997 - Zufar VAKKASOV, Russia)

Wandering neutrals and the Ace R/C Datamaster

By Pete Carr WW3O, wb3bqo@yahoo.com

The Ace R/C Datamaster was a piece of test equipment that calibrated radio control systems about 30 years ago. Mine has been hanging around the shop about that long. Occasionally I drag it out to help solve a particular problem or just for fun. In this recent case there was an interesting trouble that brought it out of storage.

The Datamaster, shown above, has a 3-digit LED readout at the upper left which shows the number of milliseconds of pulse width. The slide switch in the upper right corner of the case selects either external pulses from a receiver plug-out or internal self-generated pulses. The latter setting allows the unit to control servos without a receiver.

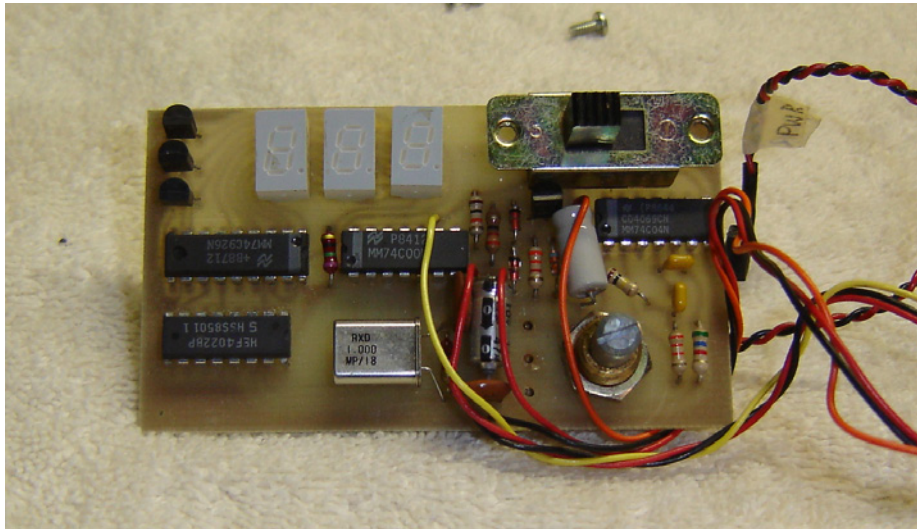
I was flying a vintage electric sailplane called a Foote Westerner that was built from a Spirit of Yesteryear kit. The power plant is a 600 size brushed motor with ElectriFly on-off switch for motor control. On the previous outing the neutrals on both the rudder and elevator had been a little off (kind of like the pilot) so I'd reset them with the clevises. The ship had flown great, with reasonable good air and with four climbs yielded about 45 minutes of air time.

This time when I arrived at the field and powered up the Foote, I found that the rudder and elevator were, again, off neutral. The clevises were already close to the end of adjustment range and I remembered having set them the previous time. This was not good.

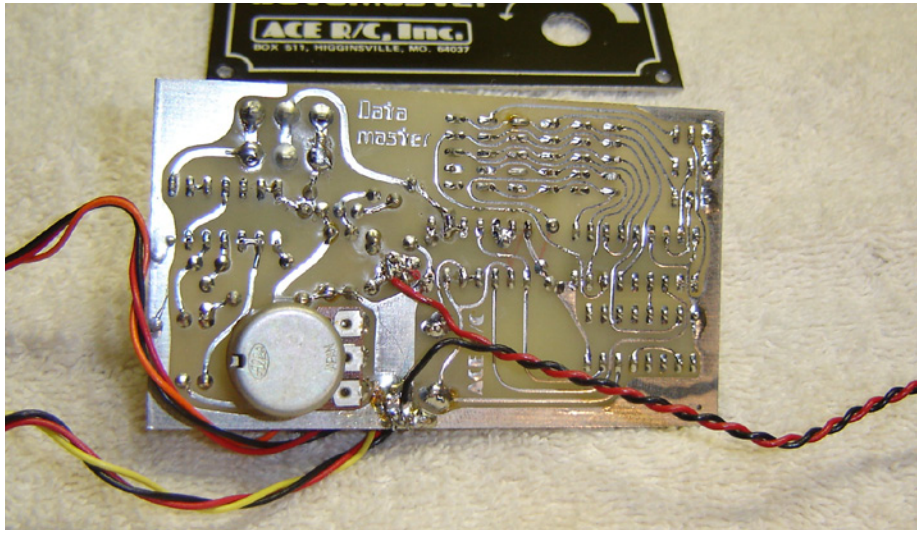
I put the ship back in the vehicle and resolved to get to the bottom of the problem.

The receiver is an Ace Silver Seven (how retro!) on 53.5 MHz AM and has served with perfect reliability in that electric ship for about five years.

I think I did a pretty good job of building the Foote but all anyone wants to talk about was THEIR SS-7 system and all the fun they had with it. I listen patiently and share their experiences and am secretly glad that my system is not gathering dust in some shop drawer. The problem of the wandering neutrals was made all the more intense because of the pride and enjoyment the equipment has given me. This was going to get fixed!



This is the circuit board front view with the LED display, select switch and control pot. In Internal mode the pot sets the pulse width output of the on-board pulse generator.



This is the rear view of the Datamaster circuit board. Connections for the receiver, servo and battery pack are made to the board.

Of the three channels in use, only the motor control had not seemed to shift. It really hasn't a "neutral" and switches the motor on or off at about "half throttle" depending on the throttle trim setting.

I usually set up a new ship by adjusting the servos for neutral when the transmitter aileron/rudder/elevator controls are at neutral and the trim levers are centered.

Then I install the pushrods with the clevises at middle throw and the surfaces at center.

Over time, if one surface fails to neutralize then I know that something changed at the hinges or at the servo.

The trouble in this case was that both the flight surfaces changed about the same amount at the same time. I suspected that the source was in the transmitter.

The Silver Seven encoder has two variable resistors (pots) in the lower left corner of the circuit board. The top one is master centering (R-11) while the lower one is for master throw (R10). I adjusted the centering variable resistor (R-11) and both flight surfaces came right back to center. I wiggled the pot looking for a defect but it was smooth and clean.

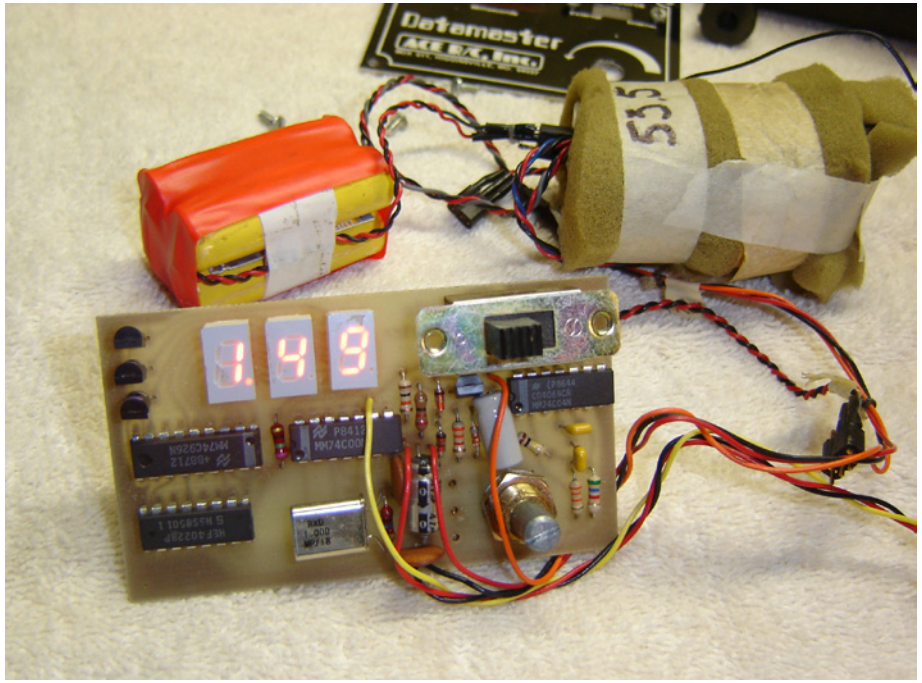
This was NOT good. I'd solved the immediate problems but wondered if I'd just covered a deeper one.

To verify the results of the adjustment I connected the Datamaster to the elevator servo connector of the Foote Silver Seven receiver. I moved both the elevator control and trim lever on the transmitter and watched the numbers change. They seemed normal. I did the same test with the master trim control on the encoder board and also verified good response of the pot. That meant that the true source of the problem was not where I had looked.

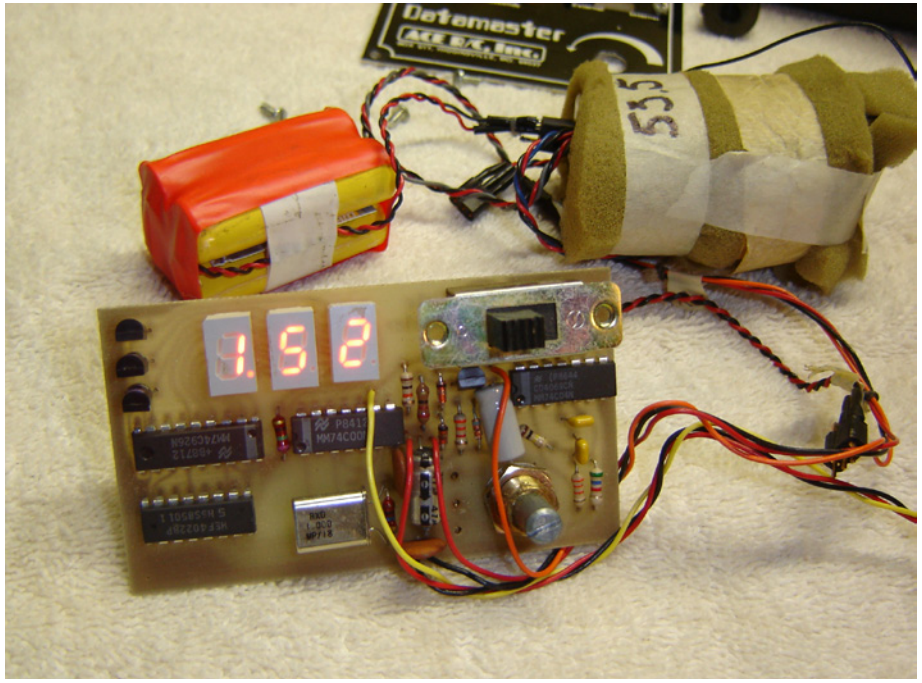
The actual cause of the neutral shift was in the receiver — a leaking capacitor at C-4 from pin 14 of the NE5044 IC chip to ground. It's a mylar capacitor and supposed to NOT change value over time. Evidently 30+ years of use caused it to shift value. It was replaced with a new capacitor.

With the Datamaster connected to the elevator servo output of the receiver I again checked that the neutral timing was 1.50 ms. This required readjusting the transmitter pot at R-11 again since the value of the receiver C-4 had changed. Now, with the Datamaster telling me that elevator was set to 1.50ms, I moved over to the aileron (Foote rudder) output. The Datamaster readout was 1.48 ms and

The Datamaster is connected to a 53.5 MHz receiver and NiCad battery pack . The output of the receiver channel is 1.49 milliseconds on elevator.



The Datamaster is now connected to the aileron channel of the 53.5 MHz receiver. The output is 1.52 milliseconds and easily adjusted to 1.50 milliseconds with the transmitter aileron trim lever.



easily adjusted to 1.50 ms using the transmitter aileron trim.

Most everyone that plays with old Ace equipment is familiar with the web information source at <www.roguebay.com>. I found the schematic and operations manual of both the Silver Seven encoder and the Datamaster in Ace R/C sub-menu of that site.

In addition, I also found a wealth of advice and information on Yahoo Groups at Ace RC. The guys that inhabit this Group are dedicated geeks who know the various Ace products inside and out. They are also very willing to share their knowledge with listers like me. Many are Ham Radio Operators who fly Ace gear because it is about the only stuff that still operates in the 53.xx MHz portion of the 6-meter Amateur band. Specifically, Dan Thompson WB4GUK and Georges Bery HB9EFN were instrumental in the preparation of this article. They have my continued thanks for their friendship and assistance.

Resources:

http:// www.roguebay.com

AceRC Yahoo Group

This is the Foote Westerner electric sailplane from Spirit of Yesteryear models. It's a 72 inch span 3-channel ship with a heavily undercambered wing. It's slow in flight but will climb on a whisper of lift.

The Foote has its flight battery, a 6-cell NiCd, installed in the pylon while the RC gear is housed just underneath in the main fuselage. The ElectriFly on-off switch for the motor is mounted with Velcro hook and loop fasteners just behind the motor.

The Longboom Project

A tail of amateur aerodynamic development

Garth Warner, gwarner@cox.net

PART 1

A number of years ago I was moderately active in javelin hand-launch RC. As a member of the Torrey Pines Gulls, I was able to work and participate in the International Hand-launch Glider Festivals that we offered here in Southern California. During this period I had the opportunity to see, and fly, a wide variety of javelin launch designs. I flew Epsilons, Wasps, Raptors, and Logics.

From the Javelin launch designs of the time I became “hooked” on the Mike Waters Logic hand-launch design. The Logic featured a bagged wing, an innovative, for the time, molded carbon fuselage pod, a really looooong tail boom, and a very small conventional tail hanging waaaaaay out there in the back. It was somewhat challenging to launch high and hard because the tail boom was very soft by today’s standards. In the air it was easy to fly and very smooth. The long moment arm dampened much of the pitching moment and subsequent drag experienced by small light sailplanes in turbulent air.

This design forced the pilot to fly the wing instead of the stab. The aircraft “hang time” in dead air from a good launch was impressive and very smooth.

Time marches on.

The advent of Discus Launch gliders pretty much killed the popularity of the Logic.

Design criteria changed to maximizing launch height. This mandated stronger (shorter) tail booms and larger fin/rudder combinations.

I still have the pods from a couple of Logics that I tried to convert unsuccessfully to DLG.

All of the above takes us to about eight or ten years ago when I got to daydreaming about building an open class sized ship based on the Logic design.

I started reading books about aerodynamic stability as it relates to moment arm and tail volume. All were interesting reading, but most of the math was beyond me.

I then found a series of sailplane design articles that had been presented in the old *Model Builder* magazine. They used small words and the math was simple to the point where I could follow it. Now I was getting fired up.

I had a set of Esteem wings that had survived a fuselage and I had a Sapphire fuselage that someone had given me second hand. With pencil in hand I sat down and scaled up the Logic based on the Esteem wing plan.

Since I was trying to do this cheap and quick, I hit a local fishing show at the fair grounds and found a relatively light, blue water Salmon rod blank that would mate with the boom diameter on the Sapphire fuselage. Once I got everything home, I cut the fuselage and then cut the fishing rod boom to the appropriate lengths.

WARNING: Don’t do this in front of your wife. She will NOT understand. You will catch a ration of #$^% for weeks about cutting up your new fishing rod.

In this first version, the rod/boom extends 10 inches into the back of the fuselage to fit in a 1/8" ply centering bulkhead. I cut and built a scaled up Logic tail group from light quarter inch contest balsa. Spruce leading and trailing edge inserts were used on the surfaces to protect against hanger rash. All tail surfaces were sealed with clear dope. The stab was bolted to a flat plate glued to the top of the boom. The fin/rudder was butt glued in front of the stab and I used CA’d glass on the sides to lock it in place.

Finally, I installed a radio and started the process to balance the beast.

Here reality finally caught up with me. Based on my sloppy math, the theoretical CG starting point was going to need to be at 48 percent back on the root chord. This took a ton of lead. In #9 lead shot this was a baggie about the size of a baseball... and it wouldn’t fit in the nose of the Sapphire with the radio gear installed. I ended up ripping out the radio tray and molding melted lead into the nose. (Don’t try this at home if you do not have a respirator and the proper protective equipment. Molten lead is dangerous.)

Version 1 ready to fly. The long boom and small tail group area is readily apparent.

With the radio re-installed further back in the fuselage, and at the theoretical CG point, the beast weighed a staggering 85 ounces. Not exactly the floater that I had in mind.

Nevertheless, out to the field I go — on a weekday to avoid peer pressure — to see if this turkey will fly. I took a couple of back breaking hand-launches and the basic CG and incidence proved to be spot on. It was time for the winch. The hook was set conservatively for the CG location and no launch preset was attempted.

The Version 1 tail group. It's built from light quarter inch contest balsa with spruce leading edge and trailing edge inserts. All tail surfaces were sealed with clear dope.

I'd like to say this thing climbed like crazy and pinged to the moon... but I'd be lying. The launch was low and fast and the ½" wing rod (and the wings themselves) bowed alarmingly.

The glide was flat and the turns were wide and flat very similar to the Logic hand launch.

I made a quick circuit around the field and landed. Full flaps produced no noticeable pitch change and the approach was dead arrow straight. Here you could really feel the weight as it did not slow down well. Even with skegs, it slid a long way in the hard Southern California clay.

Subsequent flights with a more rearward towhook position produced a marginally better launch, but it was clear that the structure and flight envelope were severely challenged by the gross overall weight.

In addition, the glider exhibited signs of being nose heavy, and the rudder, while keeping the nose pointed in the right direction, was basically ineffective for yaw control at normal flight speeds.

The small stab was totally adequate and exhibited no problems with pitch authority at any speed.

I flew this thing on a couple of more trips to the field, but finally decided to retire it before I blew it up. I remained fascinated by the flight characteristics but was at a dead end with this particular model because of the poor material choices I had made during the construction phase that resulted in the gross overweight condition.

The final specs on this unnamed Version 1 model were as follows…

- Wingspan 117 inches
- Area 946 sq inches
- Weight 85 ozs
- Fuselage overall length, (tip of nose to TE of rudder), 85 inches
- Surface separation, (TE of wing to TE of stab), 61 inches
- Stab area 57.75 sq inches or 6.10% of the wing area
- Rudder/Fin area 28.12 sq inches or 2.97% of the wing area
- Wing loading 12.93 oz per sq ft

I vowed to myself to try this design concept again if I could manage to build something lighter. For the next few years I began looking for suitable components to build another one.

And time moved on...

PART 2

Fast forward a couple of years and I run into Ed Whyte of Whyte Wings. Ed had an unidentified all fiberglass fuselage that he acquired as a result of a shipping accident. The boom was broken behind the wing and crushed up to the leading edge of the fin. I made a quick deal and got a start on building another open class Logic.

Fast forward another year and I run into Don Richmond of HiLaunch.com. Don had a selection of fairly large diameter carbon fiber booms that were 32 inches long. A quick measurement shows that the big end is just a hair smaller than the ID of the broken fuselage I acquired from Ed.

Cue the squeaking door sound... An idea is forming. I just happen to have a set of brand new never used MH-32 Addiction wings that I had purchased from Fred Sage. The wings have the large diameter wing rod that has turned out to be a lot less flexible than the old ½" diameter rods. Also in my bench collection I have several sets of old "Planes Wings and Things" built-up stabs from days gone by.

The squeaking door noise is now as loud as a seized main bearing on a locomotive. I have a plan.

I start by reviewing my impressions of the flight characteristics of the first model and measuring and rechording all of the surface areas and moments. I then sit down and measure all of the components that I have collected for the project.

The first criterion is to reduce the weight as much as possible. Other considerations are to increase the fn/rudder authority and to stiffen up the boom.

I know from flying a Tempest that the MH-32 will carry weight well. I also

Version 2 ready to fly.

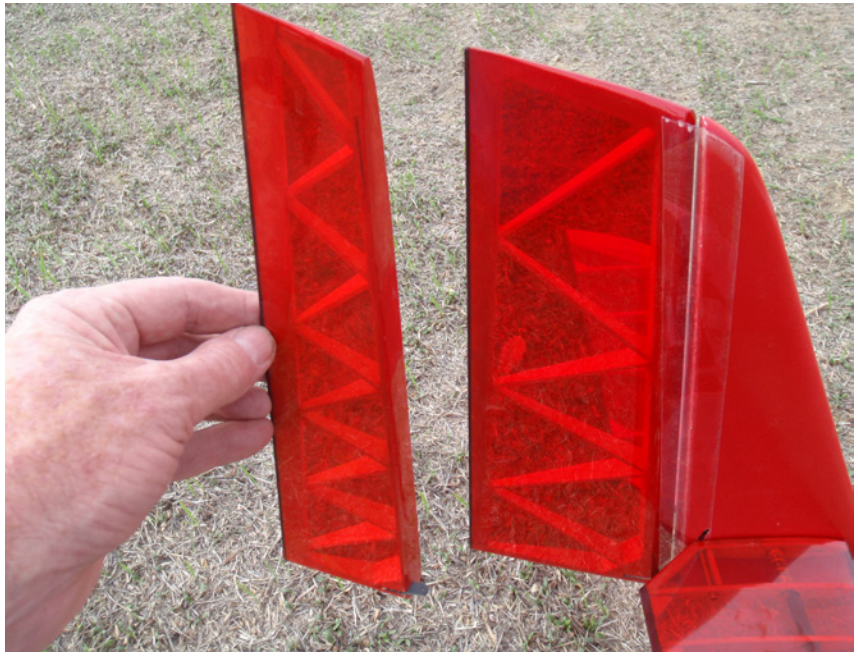
know from flying an Addiction that the wing and wing rod can hold up to some real abuse on launch. At this point I'm thinking that I have the right wing and airfoil for this idea.

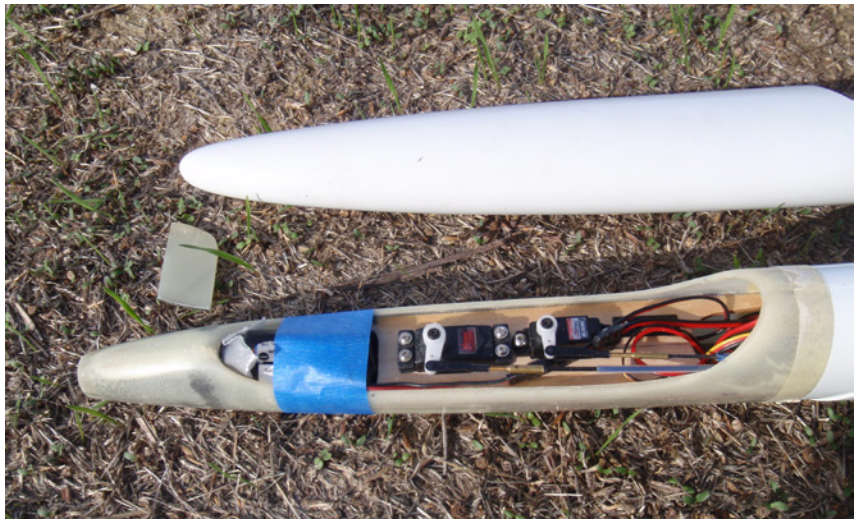
With concerns for weight reduction I cut up a "Planes Wings and Things" stab and cut a new set of stab ribs. Each stab half will now have a span of 10 inches, a root chord of 4.5 inches and a tip chord of 3 inches. Another goal for the stab was to keep the aspect ratio as low as possible. I didn't want the stab to stall before the wing at minimum airspeed in tight thermal turns or on final landing approach.

Remembering that the rudder-fin combination on the first version was less than effective, I decided to salvage the tall fiberglass fin on the crushed fuselage. After an hours work repairing the leading edge of the fin from the inside I am satisfied that it is still light enough to work. Here however, the original chord of the fin is too broad. An inch was removed from the trailing edge of the fin to reach the higher aspect ratio that I wanted to see for the rudder.

Scrap balsa was used to build the original rudder. The original measurements for the rudder were 12" tall x 3" wide at the bottom and 1.75" wide at the top. This turned out to be optimistic on my part as I ended up increasing the size of the rudder by 34% to get an effective turn response.

Boom construction was next on the agenda. The boom I had acquired from Don was both tapered and thin wall carbon fiber. Having owned a Logic I had some experience with flexible booms and decided to try to stiffen this one up. I built a 1/16" vertical grain balsa spine





shear-web with a 1/8" balsa spar cap top and bottom. This spine extended several inches from both ends of the carbon boom to allow for the attachment of the pushrod tubes. The whole thing was then glued down the interior length of the boom using thin CA.

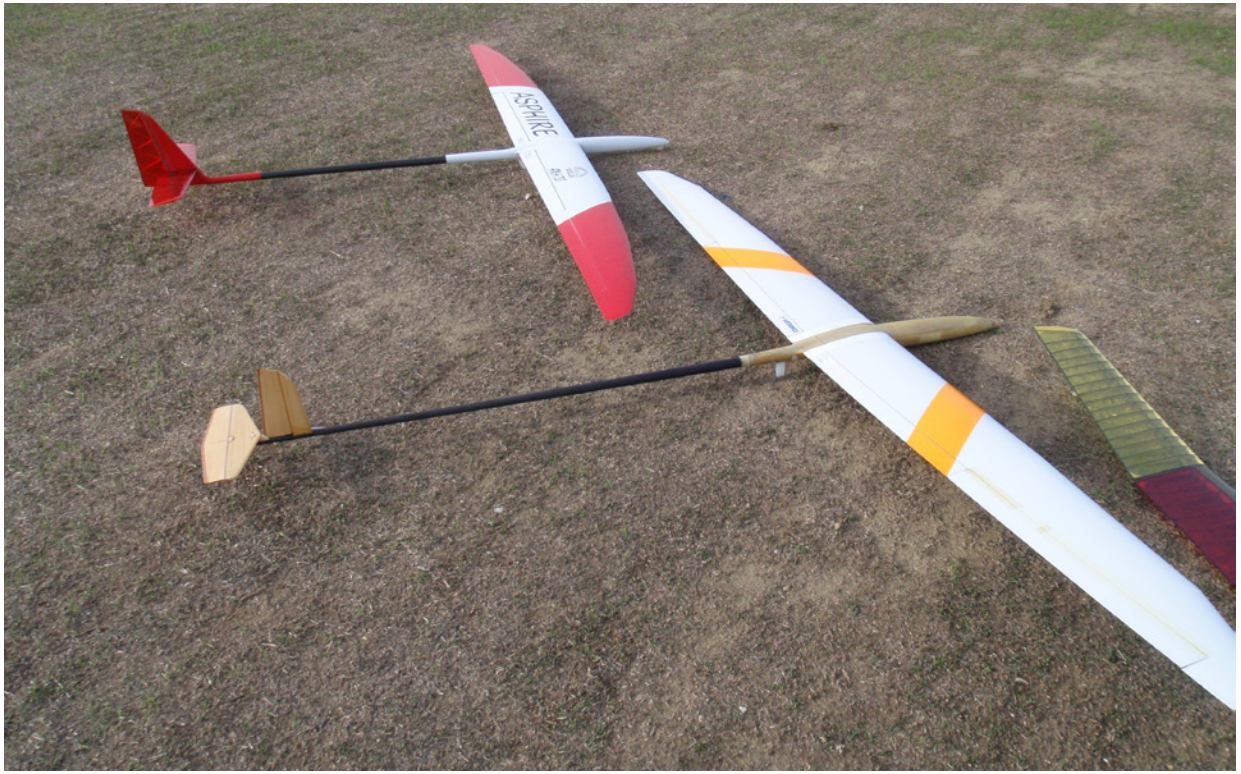
The boom was less than 1/32" in diameter smaller than the ID of the fiberglass fuselage. I wrapped ¼" masking tape several times around the boom about an inch and a half apart for a perfect fit at each end. Twenty minute epoxy mixed with micro-balloons filled the voids and bonded the boom to the fuselage on both ends.

Upper left: Two sets of stabs.

Upper right: The two rudder planforms.

Above: Layout of the radio gear in the fuselage.

Left: Close-up of the functional tail group.



Version 2 (Asphire) in the background, Version1 in the foreground. Various planform and structural changes and a weight reduction have made for a better flying machine.

The Asphire sits next to an Onyx JW. The long tail moment and smaller tail surface areas of the Asphire are easily seen.

Having had a bad experience with the space required for lead in the nose of my last attempt, I provided the equivalent space of 2 four-cell packs, plus nose weight, in front of the radio tray to allow for any miscalculations.

This time I calculated the CG to be at 46% of the root hord and installed the tow hook back to 50% point “just in case.” The rest of the build was pretty straight forward without anything unique so I will not cover it here.

The first chance I had to fly was following an SC2 contest at the Gulls’ Encinitas field on the coast.

The final weight had come out right at 78 ounces and I was thinking “lead sled” again.

The first launch was low and fast without any presets. The glide was really flat, but the glider felt nose heavy. Minor elevator compensation was required for landing to prevent ballooning.

On the following weekend I was able to spend all day tweaking the ship and things began to improve. I was able to remove four ounces of lead from the nose. This moved the CG back to 52% of the root chord. The launches were not getting any better, but the glide was improving. The dive test showed a slow pullout after 100 feet or so. Flying inverted required just a hair of down elevator.

At this point I was happy with the way it was flying, but disappointed with the launch. I began to think that I had undersized the stab and that it was stalling on launch due to loading. Over the next week I built a larger stab that increased the area from 75 square inches to 130 square inches.

On the next weekend I tried a few hand launches with it and everything looked good with the new stab. When I put it up on the winch I got the same flat launch and was seriously disappointed.

Up ’til now I had only preset the flaps for about 3/8’s of an inch preset and had not programmed in any launch elevator. (I tend not to use elevator preset on my open class ships). On the next launch I programmed in a little “up” elevator and immediately noticed an improvement in launch height.

About this time I started hearing that creaking door, squealing main bearing sound in my head again. Doh! On the previous weekend I had removed four ounces of nose weight and moved the CG back more than a half inch. But I never moved the tow hook back to compensate for the change in the CG.

I immediately flipped the glider over and moved the tow hook back to about the THAR — That Looks About Right — location. I put the smaller set of stabs back on and also removed the elevator preset. On the next launch it looked like a real glider and felt like it had a good pull on the line. On the next launch after that, I moved the tow hook all the way back to the rear stop at 50% of the root chord.

Now we were talking real launch potential.

I can “feel” the glider all the way up the line and get a decent ping off the top. There is more work to be done on refining the launch set up, but it is much better now and I’m feeling much more confident about the design considerations

Like the old Logic HLG, or any glider, the Asphire is a series of design compromises.

My basic theory/premise is that any RC glider is subject to frequent pitch changes from turbulent air and the pilot’s thumb.

On a conventional glider, the larger stab, with its larger wetted area, on the shorter moment arm, creates more drag, more often, because it has to work harder to stabilize the glider against the constantly shifting center of pressure on the main wing airfoil. (Short lever arm.)

The rapid and repeated induced drag from the airfoil constantly changing its angle of attack to the air stream can adversely affect the glide ratio as well.

On a long boom glider the smaller stab, with its smaller wetted area, on a longer moment arm, creates less drag, less often, because it has to work less to stabilize the glider against the constantly shifting center of pressure on the main wing airfoil. (Long lever arm.)

The slowed and less frequent induced drag from reductions in the airfoil changing its angle of attack to the air stream can benefit the glide ratio.

Basic physics states that you need to use more pressure on a short lever than on a long lever to reach the same level of force.

This long boom “pitch damping” can create less drag and result in a flatter glide ratio by some fractional amount.

Based on the very unscientific trials of ground observation of flight paths, it looks like that goal is being met with this design. The glide is very flat.

Before you ask, no I don’t have a logger to document the results. I’m not that serious about it. This has been a fun project to play with and I’m not trying to sell anyone anything. Your mileage may vary.

My basic flight impressions and the final specifications are listed below.

The good stuff

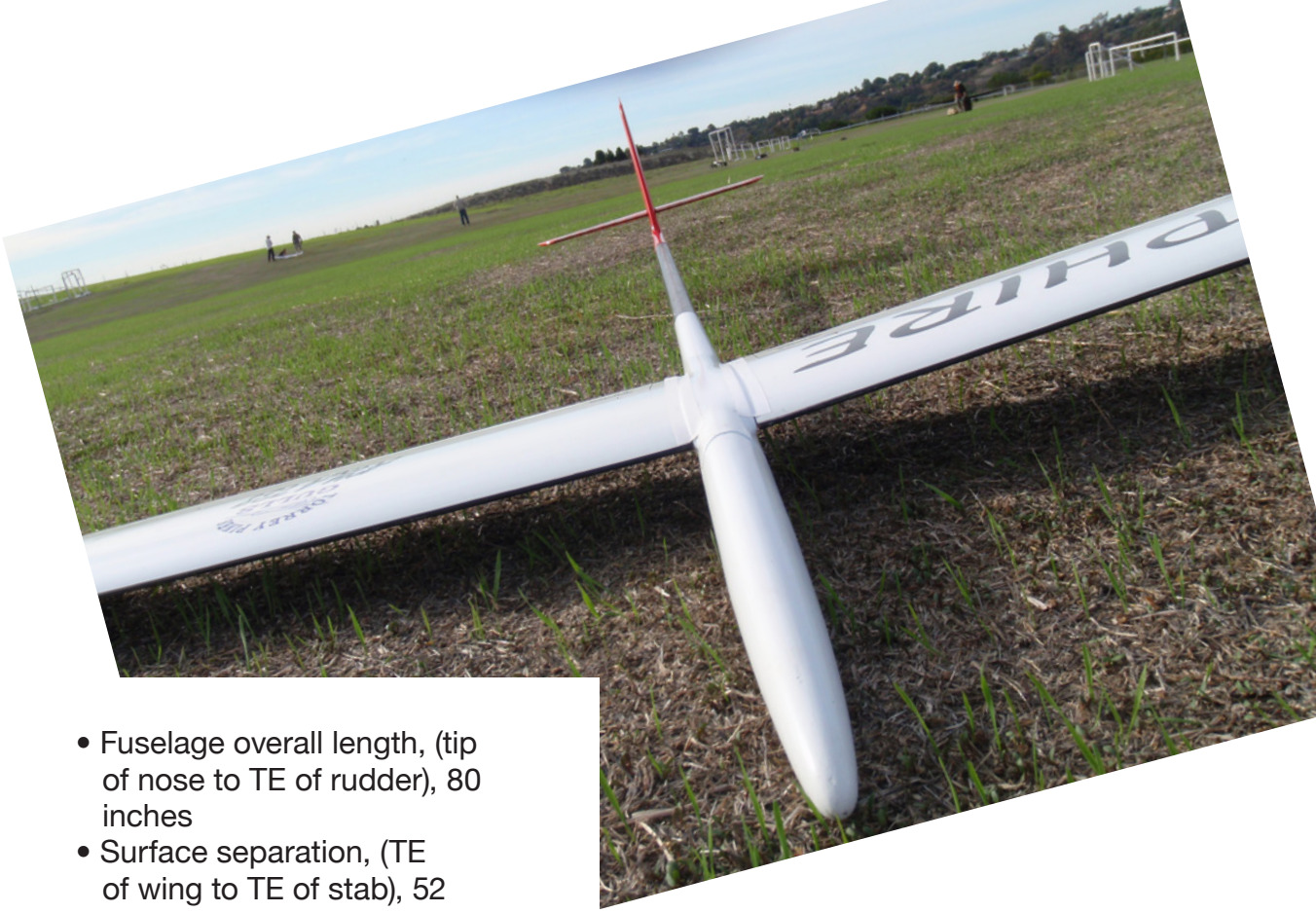
- It will launch well (now)
- It has a really impressive L/D
- It seems to ride lift very well without acrobatics
- It will circle very flat
- It is very stable in the wind or in turbulent conditions
- Minimal pitch change on flap deployment
- Landings are very predictable and straight
- It is very distinctive in the sky - hard to mistake for anything else when your in a group.
- It is not a $2000 molded ship

The bad stuff

- It is still too heavy
- It will not circle tight on one wing tip
- Had to increase rudder area for yaw authority
- Needs a 7 or 8 degree wing rod (5 degree now)
- As a function of weight, it does not slow down well for landing
- You need a big vehicle to transport the fuselage
- It is not a $2000 molded ship

The final specs on the Asphire model are as follows…

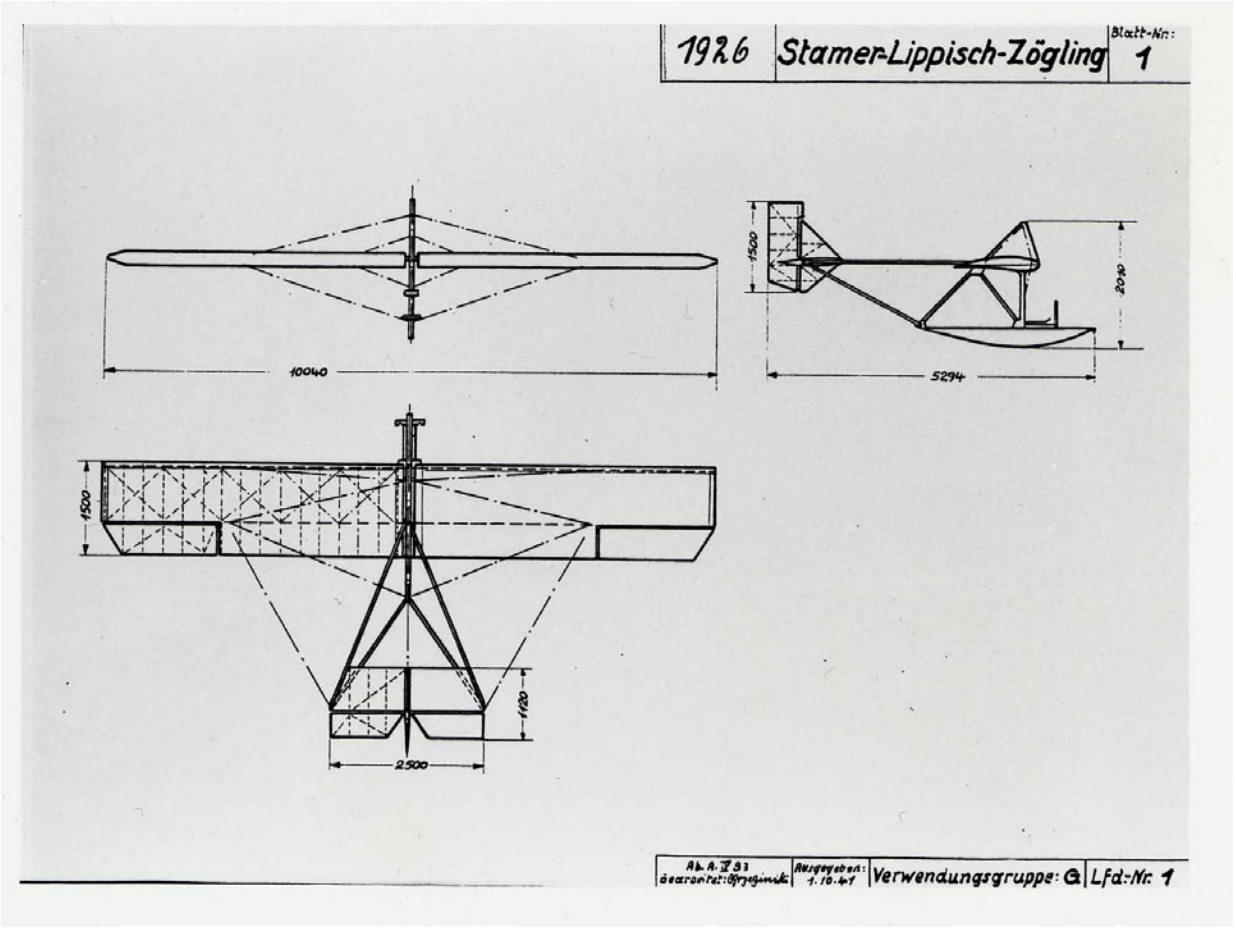
- Wingspan 120 inches
- Area 946 sq inches
- Weight 74 ozs
- Fuselage overall length, (tip of nose to TE of rudder), 80 inches
- Surface separation, (TE of wing to TE of stab), 52 inches
- Alternate Stab area 130 sq inches or 13.73% of the wing area
- Final Stab area 75 sq inches or 7.92% of the wing area
- First Rudder/Fin area 55 sq inches or 5.86% of the wing area
- Final Rudder/Fin area 75 sq inches or 7.92% of the wing area
- Wing loading 12.93 oz per sq ft



Will there be a version 3? The answer is a firm maybe. I seem to have acquired a really light weight Terry Luckenbach “Pretty Mantis” fuselage with a really long, not stock, tail boom. Now if I can find somebody that has a surplus tail group from a Supra or Ava, I may have to do some more kit bashing. BTW, if you were wondering about the name Asphire, next time you see Fred Sage, ask him...

RESTORATION OF A ZÖGLING

Vincenzo Pedrielli, vincenzopedrielli@gmail.com



Stored in the warehouse of the Museo Nazionale della Scienza e della Tecnologia “Leonardo da Vinci” in Milano there was a Zögling in dreadful condition and probably forgotten for more than 30 years.

Because of lack of space, the museum management thought to get rid of it, but luckily a consultant of the museum saw the wreck and suggested restoring it, as he said it was important to Italian gliding history.

Good point, but who could do that? The idea came out just after we restored the Urendo and so we were considered the perfect candidates for the project.

I was contacted by the museum curator and we agreed to challenge the restoration project, but because of the bad condition of this primary, we decided to restore it for display only and not for flying.

Just to give you an idea, the fuselage was heavily damaged in the lower part and the skid was almost non existent. The tail planes were the best part of the machine, say 70% recoverable. The big disaster was the wings.

The D-Box was no longer there and not even a single rib was saved.

The spars were almost OK but all metal parts were heavily rusted.

Difficult in fact to find the enthusiasm to start this project, but we decided to do it and so we moved the wreck by truck to Calcinate, near Varese, at the Centro Studi Volo a Vela Alpino.

The first step was to recover the original drawings and put together the history of that flying machine. Lino Del Pio, our project leader, did a great job and he dug into the different primaries used by all gliding clubs in Italy and identified the one we were going to restore: a Zögling with four tube steel struts to support the tail, identified with the number 435 and originally built by an Aero Model Group based in Rovereto, near Trento, between the end of 1940 and 1950.

During this period a series of 4 or 5 primaries of that type were built and given to different gliding clubs.

The 435 was acquired by the Aero Club of Bolzano, where it flew for quite a few years, until 1970, when it was taken by the Associazione Volovelistica Alta Lombardia di Calcinate. Quite shortly, the Zögling 435 lost its interest to new pilots, as most of the gliding Clubs adopted the two-seaters.

Zögling 435

Above: The Zögling horizontal stabilizer before the commencement of the reconstruction process.

Below: The rebuilt stabilizer and elevator are ready for covering.

From Calcinate it ended up at Museo Leonardo Da Vinci, where it slept for over 30 years and, funny enough, came back again to Calcinate to be restored.

Five persons formed the restoration team, headed by Lino Del Pio, not new to this type of activity, as he was deeply involved in the restoration of the Urendo.

We split the project in several tasks and each of us took responsibility for some of them.

Lino first built stocks on which to assemble the wing and I took care of remaking all ribs and noses for the D-Box as well as repairing the tail planes.

Roberto Martignoni took care of all metal parts, while Gilberto Rama and Andrea Tursini worked on restoring the fuselage.

The recipe adopted was at least one day/ week, but finally, because of too hot or too cold conditions, we could not follow completely this schedule.

Anyway, we started in early 2007 and three years later where are we standing?

- The fuselage has been completed.
- Tail planes are ready to be covered with fabric.
- One wing completed and just lacking coverage.

We only have to build the second wing and put the whole thing together. We need at least another two years to complete the project.

We do believe that it is important to save this primary glider. There are not

Above: The fuselage under reconstruction.

Above right: Zögling at Calcinate

Right: The king post and wing half rest against a wall awaiting rebuilding.

Above: New ribs, with noses.

Above right: Lino Del Pio working on the wing.

too many left in our territory and , as I said before, it is an important witness of how the new pilots were trained in the past.

In Italy, after 1933, as gliding was becoming more and more popular, many Zöglings were built, sometimes as single units and other times as small series, ordered by the Royal Aeroclub of Italy to be given to the gliding schools spread all over the territory.

Looking at the photo archive of Calcinate, you can see that most of those primary gliders were slightly different one to the other.

During the investigation of our Zögling 435 I realized how many pieces of history have been lost so far, so we have now to save what is still available to maintain a link with the past.

Above: The author with the rebuilt stabilzer.

Right, above and below: The left wing under restoration. Lino Del Pio is in the background in the upper photo.

The Model Gliding Association (South Africa)

Postal Thermal Contest Rules

Revised for 2010

Introduction

The Postals competition is a typical "thermal duration" competition, which includes a restricted launch, defined flight task and scored landing. The Postals competition attempts to place everyone on an equal footing, but permits "home ground" advantage. This competition is considered the ideal development and promotion tool of the Model Gliding Association (MGA) Special Interest Group.

To further encourage participation, 2010 sees the addition of electrical powered glider models and encouragement for clubs to bring new pilots into the sport with low cost 2M models.

Climbing the Postals ladder is part of the fun, sliding down the ladder is a definite indication that you aren't doing enough flying.

Dates

1. The contest consists of four rounds, flown on the first two weekends in February, May, August and November, the four scores giving the total for the year.

2. Each pilot may make only two attempts to record a score during each round. These may be on any day of the two weekends but, once started (stopwatch running on first flight), the pilot is committed to completing that day's score for one of the two submissions. Note that only one attempt per day is permitted.

3. The highest score of the two attempts will be entered as the score for that round.

4. The club score does not have to be recorded by pilots on the same day but must be scored from the same venue.

Flights

4. Each entrant is entitled to FIVE (5) flights, which must be flown consecutively (allowing for legitimate reflights, or test flights which have to be nominated before launch)

5. All FIVE (5) flights, count towards the pilot's round score.

6. Timing must always be performed by someone other than the pilot.

Launch

7. Launching may be by one of the following mechanisms:

- electric winch (max available line from turnabout to 'chute 200 m)
- bungee (200 m maximum stretched length)
- 200 m hand tow, and two towmen
- electric powered (the motor may only be used once for launching in a window of 30 seconds maximum and limited to a launch height of 200m - an onboard altitude limiting device should be used to achieve this)

Relaunch

8. A relaunch may be called for if the line breaks, or the model pop s off and “re-launch” is called before the parachute touches the ground . The flyer must then land and relaunch as quickly as possible – if the parachute touches the ground before relaunch is called, then the flight will count.

9. A relaunch may be called by the pilot if the electric motor malfunctioned during the 30 seconds launch window.

10. Once relaunch is called by the pilot, the flight is immediately cancelled even if the model continues to be flown.

11. If any part comes off a model during launch or in flight , then the pilot may request a relaunch.

Models

12. There is no restriction on the number of models an entrant may use in the course of the contest.

13. The models will be classified into one of the following classes:

2M = Model with a projected wingspan not exceeding 2000 mm and any number of controls

RES = Model with any wingspan but controls are limited to Rudder, Elevator and Spoiler

Open = Any other Model

Scoring

14. Scoring is as for Task A in the (old) F3B rules, i.e. to a precise six minutes and a landing bonus of 100 if the model’s nose is within one metre of the spot

15. The flight time is taken from the moment the model leaves the line/electric motor cuts out, until it comes to rest

16. The landing bonus is measured after the model has come to rest and is reduced from 100 by 5 points for each metre beyond the spot (e.g. 95 points if the distance to the spot is from 1 metre to before 2 metres) down to 30 points or within 15 metres.

17. The maximum score per flight is 460 points and 2300 points per round.

18. A single table of results will be produced quarterly and will include details of the model class and pilot class.

19. The club score shall consist of the top four individual scores posted for the club per round. Each pilot can only enter one score towards the club total per round.

20. In the Unlimited 2M Club sub-event, each club has the opportunity to register any number of 2M scores for the quarter (but these must be from unique pilots) and will be kept separate from the individual & club competition. The MGA will sponsor a 2M glider (Tsotsi) as prize to the winning club as part of its “Development” initiative at the MGA’s end of the year function.

Submission of Scores

21. Scores are to be sent to the Postals Representative & must include:

- Club
- Pilot name
- Pilot Class (Senior, Junior, Rooky)
- Model Class (2m, RES, Open, Electric)
- Total score (only, no round by round times, etc.)
- Model
- Span
- Launch method

22. Please submit all scores to the Postal Coordinator, Gert Nieuwoudt — by e-mail to

gnieuwoudt@telkomsa.net

23. These scores should be in the first Wednesday following the second Postals weekend of the designated month, or you will receive a zero score!

24. Scores not specifying pilot class will assume “Senior”, and similarly scores not specifying model class will assume “Open” – there will be no retrospective changes permitted

25. Scores not specifying the model, wingspan & launch method will be withheld from the table

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