Radio Controlled Soaring Digest

November 2007 Vol. 24, No. 11

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Front cover: Mike Lee launches his Shadow cross-tail early Sunday morning during Round 5 of the 34th Annual Central Valley RC Fall Soaring Festival. Mike is the Team Manager for the U.S. Junior F3J Team. Photo by Bill Kuhlman. Konica Minolta Maxxum 7D, ISO 100, 1/640 sec., f8.0, 500 mm.

Back cover: Cesare de Robertis, Editor of the Italian magazine *Modellismo* <http://www.edimodel.com> sent us this photo of friend and contributor Valerio Ceccherini flying a Nano Floh. The river on the upper left is the Tiber that after another 40 miles flows through Rome. Nikon D70, 1/600 sec, f4, 18mm.

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In the Air

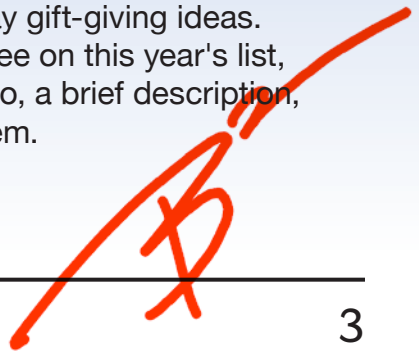
We'd like to welcome Peter Carr back to the pages of *RC Soaring Digest*. Pete was a contributor during the early years of *RCSD*, and his article in this issue is the first of two devoted to transmitter electronics.

Our sincere thanks to fellow members of the Seattle Area Soaring Society who provided photos for the CVRC Fall Fest coverage in this issue. Despite 24 pages of images, there were a large number of great shots which could not be included for reasons of space. We're hoping to include some of those in future issues.

Evan Shaw's "Composite F3B Glider Building Group" starting on page 71 is in our opinion one of the more exciting presentations in recent memory. Evan provides a detailed outline of a comprehensive, productive, and potentially long-term club project which has a huge benefit for participants. We're looking forward to seeing more clubs get something like this started, particularly here in the northern hemisphere where winter is definitely on the way. ("Shongololo," by the way, comes from Zulu and Xhosa, ukushonga, to roll up, and is equivalent to "millipede.")

We're looking forward to the December issue, scheduled to include the annual list of holiday gift-giving ideas. If you have an item you'd like to see on this year's list, please feel free to send us a photo, a brief description, and at least one source for the item.

Time to build another sailplane!



Central Valley RC Visalia 2007 Fall Soaring Festival

Photos by Seth Arlow, Bill Henley, Dave Jensen,
Bill Kuhlman, Jim Laurel, and Alyssa Wulick

Our fourth trip to the CVRC Fall Soaring Festival was just as exciting as the first, and we've come to realize that it's not just the contest itself and the large number of fellow enthusiasts in attendance that make the trip so worthwhile.

Arriving late Wednesday night, we had the opportunity to be involved in all of the Thursday and Friday activities, including the usual pre-contest practice as well as the crowd pleasing impromptu EasyGlider spot landing event Friday evening. Additionally, we were able to see a number of aircraft perform outside of the contest environment — RC-HLGs, a scale Windex, and a radio controlled full size model of a raptor.

The impromptu EasyGlider event was the highlight of Friday evening. Brendon Beardsley brought out his well-used EasyGlider and he and the other SASS Juniors, Michael Knight and Connor Laurel, started shooting landings from a hand launch with the goal of hitting the smaller landing circle with three attempts. Somehow the adults got involved, and that's when things got interesting. And downright hilarious.

Daryl Perkins missed the spot and fell face down on the grass in frustration. Joe Wurts complained about the lack of elevator authority - after the servo rate was upped from 100% to 125% - and also missed the spot. Joe came back with his Supra some time later and missed the spot again.

Roughly one third of the transmitter impound slots. The impound area, as with the score sheet pick-up window and winches/retrievers, was extremely efficient.

Some unsuspecting fellow with a brand new EasyGlider happened by and was corralled by Sherman Knight who then talked him into flying the spot landing task on what could have been the maiden flight for his model. His EasyGlider flew much better than Brendon's, most likely because of its pristine condition.

While all of this was going on near the landing area, a group had gathered at the beer garden. That group was wondering aloud as to why there was so much cheering, moaning, and shouting at the other side of the field.

Dennis Brandt flew his Windex during the evening hours. This is a beautiful model which is incredibly realistic in the air. The electric power system is quite efficient, and several climb-outs are possible on

Daryl Perkins wearing his pre-contest shirt.

"We're currently flying Group Q; Group R to the ready area." Group designations started at A, went through Z, and continued to AF. Timers picked up their pilot's score sheet and frequency pins here, then went around the corner to the left to collect the transmitter from impound. After flying, score sheets and pins were placed in the box.

a single charge. Additionally, the aircraft is capable of basic aerobatics, and Dennis put it through some very smooth maneuvers.

In the tent area, Bill Henley spent most of Thursday completing construction of his brand new Shadow. The "kit" had arrived at his door over the previous weekend, and he'd spent Monday and Tuesday getting as much done as possible. Wednesday was a travel day, and he still had quite a lot to do on the airframe to have it ready for contest flying Saturday morning. He was able to test fly the completed Shadow on Friday, and by Sunday afternoon had placed 14th out of 197 Open Class entries.

The scheduled RC-HLG contest on Saturday saw a bit of an upset, with Bob McGowan beating a number of competitors.

The 2007 Fall Soaring Festival contest saw nearly 300 entries in five classes: Open (197), 2 Meter, (35) RES (59), Woody (31), and Junior (7).

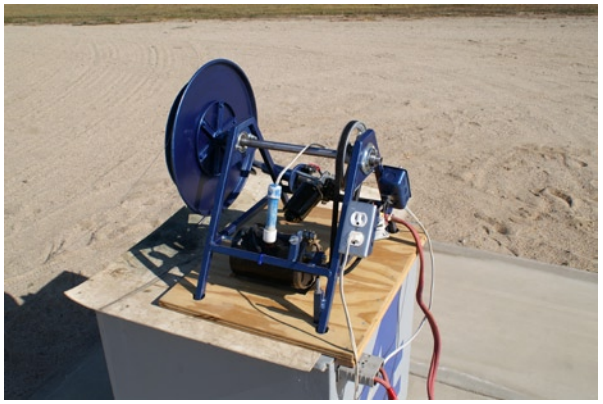
Flight times were three, five, seven and nine minutes on Saturday, and three, four and eight minutes on Sunday. The four winches and retrievers made over 2,000 launches with only a few short delays.

There seemed to be more carnage this year, with several sailplanes being destroyed. There were at least two instances of airplanes meeting their demise while flying over other transmitters, there were the inevitable mid-air collisions, and two more were lost to unknown causes.

Above: The landing area. Circle diameters were 55", 30", and 16". Overlap for the larger circles was 11", and about 3 inches for the smaller. Points awarded were 25, 15, and 10.

Upper right: Dave Jensen tries to get the well-used and abused EasyGlider into the smaller circle.

Below: Joe Wurts makes an attempt with the EasyGlider, then tries completing the task with his Supra. Although it looks like the Supra made it into the small circle, the nose was actually outside the red demarcation line.



The CVRC winches and retrievers are mounted on permanent pylons so they are well off the ground. After the CVRC team got the winches and retrievers set up, it was time to test their operation. Michael Knight was first, launching his Supra on winch #2.

The landing spot this year consisted of three circles in a “snowman” configuration. Landing in the larger circle garnered 10 points, the middle circle 15 points, and the small circle 25 points.

Final scores are available at the CVRC web site. At the end of this article we’ve included charts for the seven rounds showing flight times (overflights are shown as being “on time”) and landing scores.

If you came to the Fall Soaring Festival to fly, you had the opportunity to be in the air for 24 minutes on Saturday and 15 minutes on Sunday.

If you came to enjoy the camaraderie, there were several hundred people with whom to socialize, and the beer garden was open each evening.

If you were interested in talking with vendors or purchasing their wares, JR had a booth with information on their Spektrum radio systems, the Joys were there with all of their Peak Electronics items, and there were booths by E-Power RC, Planes Wings and Things, SoaringUSA, Kennedy Composites, MM Glider Tech, and others.

Visalia. First weekend in October, but consider coming in early on Thursday. Mark it on your calendar. Now.


SE-XSP


WINDEX 1200 C
SE-XSP


WINDEX 1200 C


SE-XSP

Above: Joe Wurts hand launches his Supra.

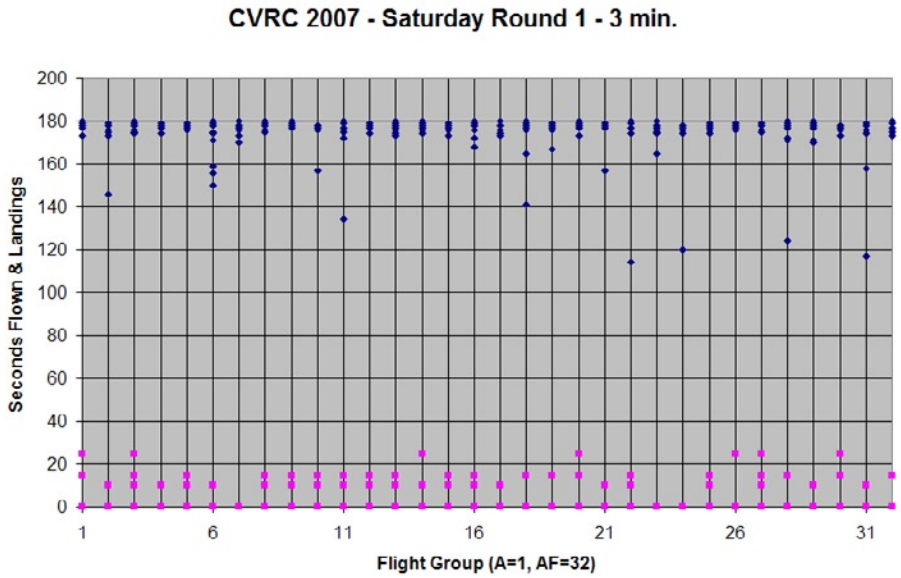
Below: Joe Wurts catches his Supra. Inverted.

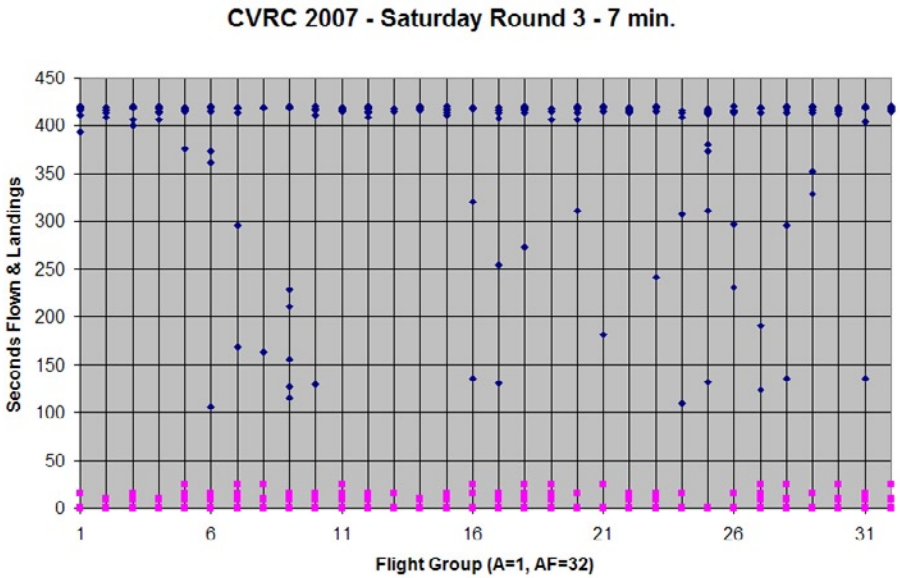

JR
SPEKTRUM
JR
MULTIPLEX

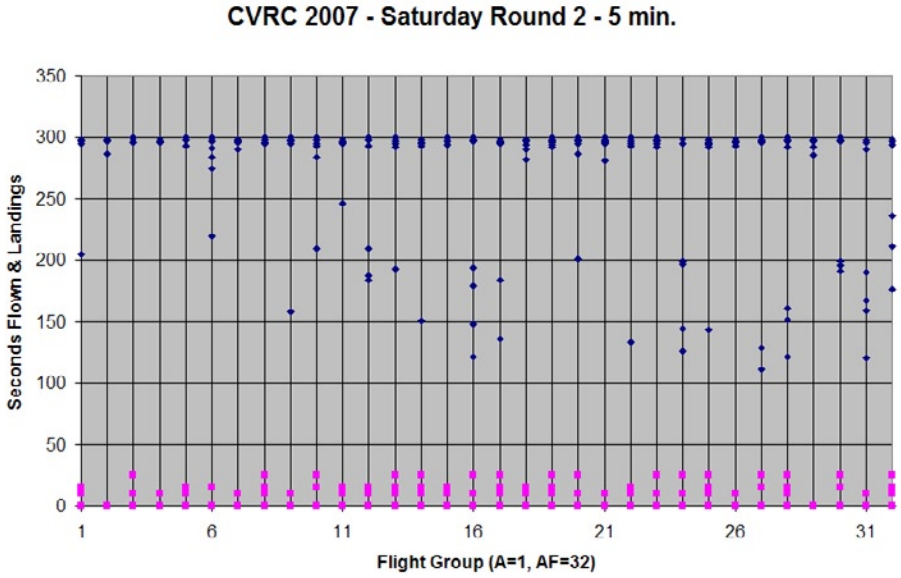
Above: Paul Measel launches his Supra.

Left: Jeff Johnson frames the thermal acivity for Brendon Beardsley.


SPACE


CVRC 2007 - Saturday Round 1 - 3 min.
Seconds Flown & Landings
0
20
40
60
80
100
120
140
160
180
200
1
6
11
16
21
26
31
Flight Group (A=1, AF=32)


CVRC 2007 - Saturday Round 3 - 7 min.
Seconds Flown & Landings
0
50
100
150
200
250
300
350
400
450
1
6
11
16
21
26
31
Flight Group (A=1, AF=32)


CVRC 2007 - Saturday Round 2 - 5 min.
Seconds Flown & Landings
0
50
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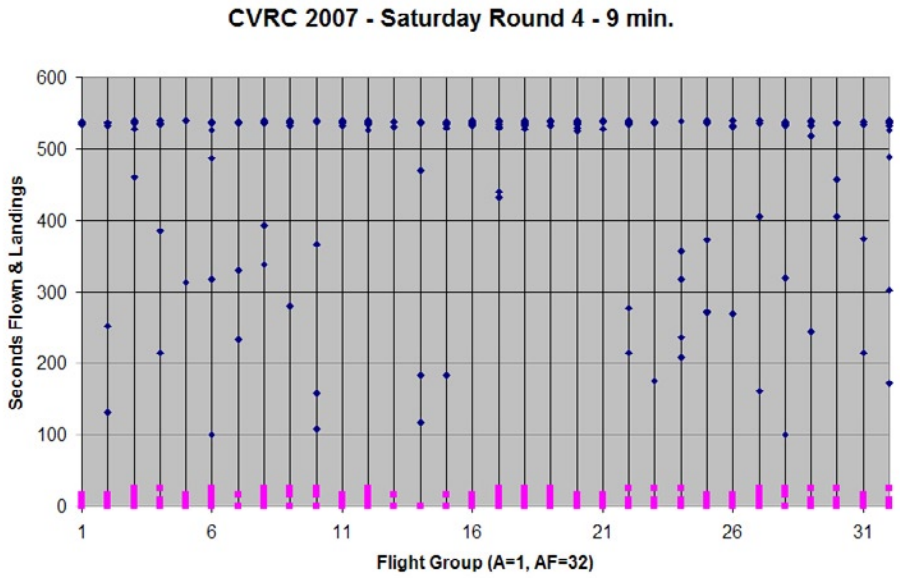
150
200
250
300
350
1
6
11
16
21
26
31
Flight Group (A=1, AF=32)


CVRC 2007 - Saturday Round 4 - 9 min.
Seconds Flown & Landings
0
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200
300
400
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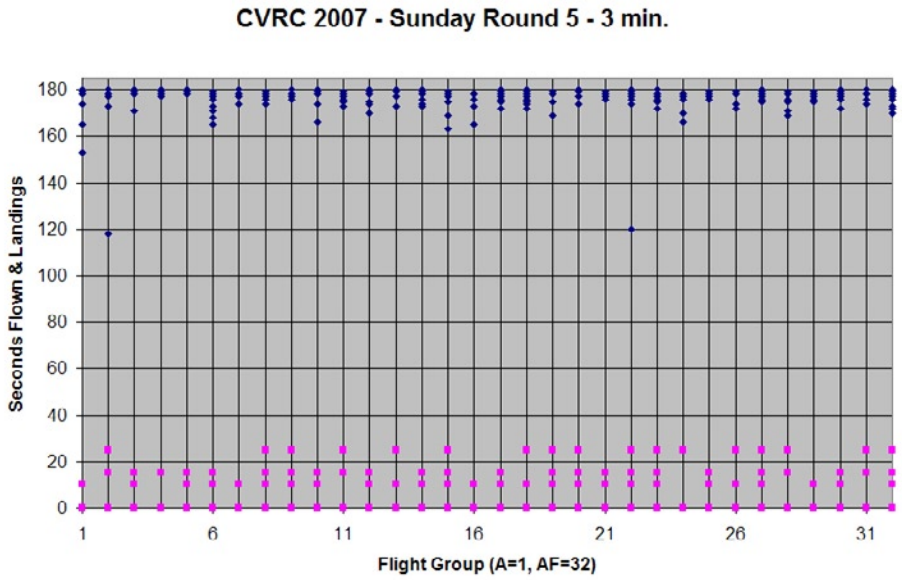
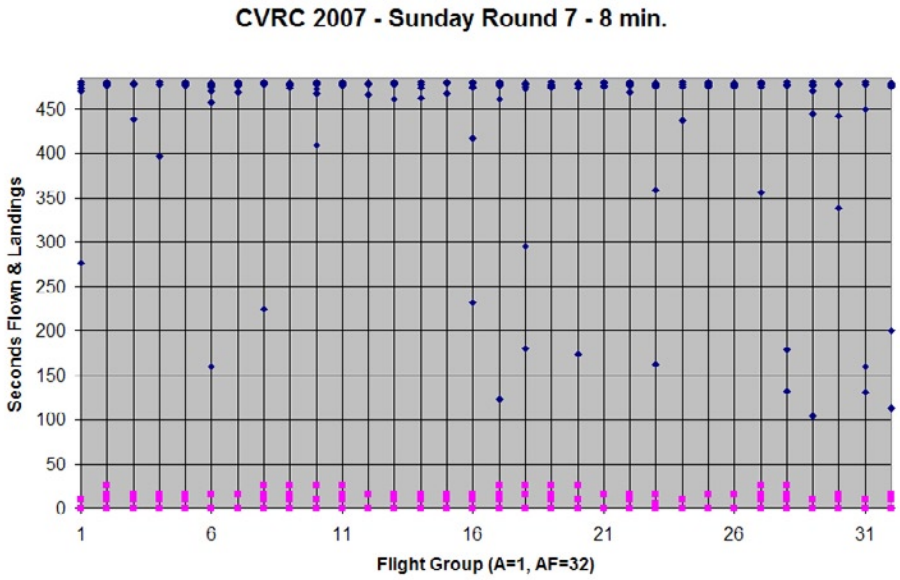
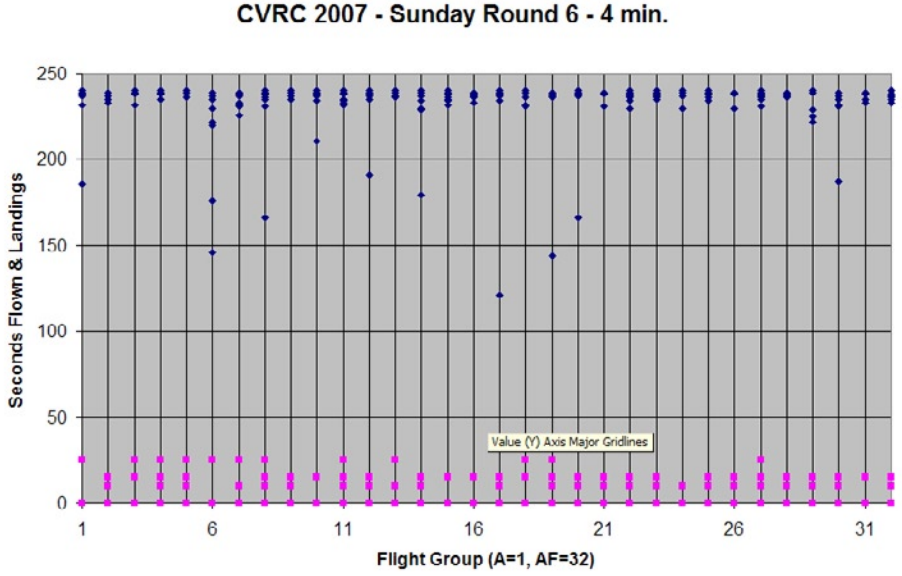
600
1
6
11
16
21
26
31
Flight Group (A=1, AF=32)







This and opposite page: Individual flight times and landing points, organized by Flight Group, A(1)-AF(32).

Here's an interesting mental exercise...

A pilot who could consistently land "on time" earned 2340 points, enough to place 71st (well within the upper half), even without landing points.

A pilot who could consistently land "on time" *and* hit the 15 point circle on every landing earned 2445 points and would have placed 4th.

Three 25 point landings would have put this person in 1st Place with 2475 points.

Daryl Perkins, 1st Place Open Class winner, earned a total of 2468 points, 47 points short of perfect.

Our thanks to Joe Nave for posting these to his web site <www.rcsoaring.com>. ■

Simply Superb Soaring in South Africa

Almost every month of the year, a different RC flying club hosts a Highveld Thermal League (HTL) event, and the scores for these are accumulated into an annual league table. No big prizes or anything for the league winners, just the prestige of having flown alongside some of the top RC glider pilots in South Africa. The 5th (HTL) event for the year on Sunday 9 September 2007 turned out to be one of the best competitions of 2007.

The success of the day was due in part to Silverton Gliding Club's (SGC's) superb field, located East of Pretoria, which has been turned into a grass (sod) farm over the past year, from its rather humble beginnings as an unused pasture. The hosting club is free to specify the rules, as long as a thermal duration event with a scored landing can be achieved, which has created numerous interesting variations for the pilots.

Another contributing factor has to be the wonderful soaring weather. The South African Highveld is the vast inland plateau at an altitude of around 1,600 msw (roughly 5,200 fsw). The somewhat rarefied atmosphere has its advantages; the differences between high and low pressures appear more marked which results in tremendous thermal activity from ground levels and upwards. This obviously creates a near perfect training ground for thermal duration gliding (soaring) events, for both the full size and RC aircraft. The 5th HTL event of 2007 was characterized by this, with typically massive African thermals being triggered by a light breeze and hot 32 degrees Celsius (almost 90 degree Fahrenheit!) conditions.

The HTL started in the 1990's as an intermediate development competition, but it also caters for top level F3J and F3B pilots who use it to keep there competitive skills honed. Perhaps the most important aspect for me has been the consistent supportive nature of participants; competitors and spectators. This event was no slouch in this department either, with the occasional genuine helping hand been provided to other competitors, last minute team change to accommodate pilots, and overall good banter shared by all, typical of any long-standing RC event held anywhere in the world.

Starting at 09h00ish, and run to F3J rules from winch launches, the event was reasonably well attended with 30 pilots from all over the Gauteng and Mpumalanga provinces representing the majority of the Highveld geography. The Weather Service's predicted wind direction and strength was spot on with the early morning thermals moving NW to SE, but at noon these started to moving from the SW to a NE direction. Strong feeders formed by the warm conditions over the adjacent plowed farm fields created booming thermals that generally sprawled across the entire field. Those teams that brought portable shade (gazebo's and umbrellas) were inundated with many new friends as most sought solace from the first signs of the South African summer (even though it was officially one of the first days of the southern hemisphere Spring).

The SGC field is huge, and allowed for more than enough space for all the teams (3-person teams, "matrixed" for the man-on-man based event) who were spread evenly at clearly marked 15 metre intervals, thanks to the very efficient setup by our SGC hosts. The turnarounds were also similarly clearly marked 150 metres (approximately 492 feet) away.

The strong thermal activity prompted some very aggressive launching – two second launches were not uncommon, although most elected for a more dependable 4-7 seconds to zoom high up into the strongest lift layers. The trees located on the outskirts of the field did create a minor challenge for some of the pilots, as these were at distance which just starting messing around with the

All the pilots and their RC models before the event. Photo by Lionel Brink

pilots' depth perception. I counted at least three models being swatted out of the sky by huge trees "leaping" into their flight paths.

I noted that the landings were not nearly as aggressive as the launches – most pilots electing for huge box-like approaches permitted by the large field and smooth wind conditions, slowly dragging in until the very last moment before dropping down onto the FAI spots located across the soft grass landing area. We are all grateful to SGC for hosting this event and I believe that everyone was very impressed with the way this field has developed – perfect for RC gliding events and a welcome break from the traditional granite-hard flying fields we are all accustomed to flying at.

This event again used the electronic timing system, similar to the approach adopted at the 5th F3J WC in Slovakia 2006, with two speakers set "back-to-back" from the middle of the field to minimize any timing delay issues. This also eliminates the need for a dedicated time keeper, but electronic issues just after Round 4 resulted in one of the speakers being shutdown.

CD for the day, Volney Klintworth, held the pilots briefing around 09h00 and we were quickly set into the automated matrix thereafter. No breaks for lunch though and the "spare" pilot would dash between flying slots for food supplied by the Martie's traveling-diner. With the conditions on the day, liquid refreshments were all sold out before 15h30. These, as always, were ice cold, and the fresh burgers were piping hot! Quality and exceptionally good value are all things that glider pilots appreciate; she has definitely set the standard for these events.

The only contact of the day saw Peter Eagle and Peter Joffe attempting to defy one of the basic laws of physics: "two bodies cannot occupy the same space at the same time". Peter E. was bleeding off speed after a massive thermal took his Europhia II to spec height, whilst Peter J. was ambling his Shongololo (SA designed F3B model) along to line up for his landing. At approx. 30 seconds to go, these two connected head on, with the Shongololo wing cut cleanly in half, and the Eagle main spar broken but not separated and ripping one of the Shongololo 's servos and harness neatly around its remaining structure. The Shongololo unceremoniously split apart and spun into the ground from around 60 metres (approx 200 feet) up, whilst the Eagle was landed somewhat hastily with the severed harness dangling from a gapping hole in the leading edge.

I created some confusion at the end of the day – the last minute and "on the fly" changes to the flight matrix required some "behind the scenes" alterations to the scoring program setup - and naturally differences between our standard approach to scoring landings and the software we used (F3JScore), after such a loooong and intense flying day, created some challenges.

Prize-giving was based on these results approximately 30 minutes after the final Round was flown, and consisted of very generous gift vouchers donated by a number of local hobby shops (LHS). Although very few LHS's actually stock the specialized FAI competition RC gliders, by far the vast majority of RC glider pilots source their components and others aspects of the hobby from the LHS, so these donations received considerable marketing benefit.

Open Class

The best five of six Rounds were considered for the scores. The Open class models are considered those that qualify for the FAI F3B/J class, usually exceeding 3 metres wing span with full house controls (RC club's are represented in brackets and scores are out of a possible 5,000 points):

Anton Coetzee (MMS) 4,978
Michelle Goodrum (MMS) 4,976
Conrad Klintworth - Jnr (SGC) 4,970
Joe Coetzer (SGC) 4,969
John Monk (SGC) 4,958
Volney Klintworth (SGC) 4,932
Kurt Stockton - Jnr (BERG) 4,928
Craig Baker (SGC) 4,915

Herman Weber (ETB) 4,874
Izak Theron (ETB) 4,832
Lionel Brink (MMS) 4,823
Evan Shaw (BERG) 4,802
Mark Stockton (BERG) 4,788
Hugh Edmunds (TMMGC) 4,648
Ian Lessem (MMS) 4,598
Johan Bruwer (SGC) 4,509
Derek Marusich (BERG) 4,283
Piet Rheeders (BERG) 4,278
Peter Eagle (MMS) 4,136
Peter Joffe (BERG) 4,123
Peter Moore (ETB) 3,045
Wolfgang Steffny (MMS) 917

Anton's first place in the Open class with his home built Supra saw him return to competitive RC thermal gliding after a few years absence with a vengeance! Michelle turned in yet another classy performance with her F3B Estrella model which bodes well for her upcoming F3J team trials in mid September. Once again, young Conrad showed the "moldie oldies" how to fly with only 8 points separating him from first place. Conrad flew an Xperience Pro and also claimed two of the highest scoring flights of the day with consistent times and on-the-spot landings. Wolfgang's wooden spoon was the result of a close encounter with one of those pesky trees during his second Round. Always the gentleman, he stayed on for the entire day to support the team he had been bundled with at the last minute – once again reinforcing the spirit of the HTL.

RES100 Class

The RES100 class permits models that are either Rudder – Elevator – Spoiler controlled (unlimited span) or wingspans of not exceeding 2.5 metres (approx. 100 inches) with unlimited control surfaces:

Alan Smith 3,718

Alan "Green Goblin" Smith was the sole pilot in RES100 with a Sagitta 600, and interesting also flew in the 2M class to add some spice to his day, or just confirms a somewhat split personality developed from too many DLG spins under the hot African sun?

2M Class

The 2M class is flown using RC models that do not exceed 2 metres (approx 78") wingspans, with unlimited control surfaces:

Derek Marusich 3,174
Robert Davies 3,021
Rudi King 2,956
Allen de Klerk 2,831
Alan Smith 2,466
Daniel Ralefeta 2,323

The 2m class saw and exciting three-way tussle between Robert and Rudi throughout the day, with Derek eventually snatching the win with some precision landings using his home built Tsotsi. Notably this was a first competitive event for Robert, Allen and Daniel – well done and I trust that we will see you all on the HTL circuit in the near future.

Club Results

The club results are calculated from the top 3 open class scores per club:

SGC 14,914
MMS 14,747
BERG 14,556
ETB 10,572
WHRF 4,832
TMMGC 4,598

A very consistent SGC (Conrad, Joe, John) who dominated 3rd through 6th positions, took away victory from the usually mighty MMS with their 1st and 2nd (Anton, Michelle) but only an 11th position from me. BERG's scoring was opened by Kurt (yet another junior – hmmm?), with Evan and Mark making up for the rest and a very closely contested top 3. ETB performed equally well – with credible scores from Herman, Izak and Peter Moore. WHRF and TMMGC were both single pilot entries.

It may take some effort to organize the individual RC soaring events and the annual league, but the satisfaction we gain from this is immeasurable and makes us always yearn for more.

After such an enjoyable day, my lasting memory for this event was sitting with a large group of RC pilots, long after the event had finished, just "chilling" under African skies as day gradually began turning into another fine evening.

Well done to all and see you next time.

Above: This vast grass field used for the competition makes for a welcome change from typical harsh conditions. Photo by Lionel Brink

Oppostie page: Last minute preparations before launching, Lionel Brink with his locally designed Eish! Photo by Kurt Stockton

Opposite page, clockwise from upper left: Craig Baker and Johan Coetzer (pilot) discussing flap settings on a local design F3J Makhulu. Photo by Lionel Brink. Pilots (from left to right) Izak Theron, Herman Weber and Evan Shaw discussing tactics prior to the start. Photo by Lionel Brink. First timers (from left to right) Daniel Ralefeta and Alan de Klerk are timed by Rudi King. Photo by Lionel Brink. Piet Rheeders (left) and Derek Marusich (pilot) share a moment with the locally designed and produced Shongololo F3B model. Photo by Kurt Stockton.

Above: A lone Spirit ARF floats down to the spot with flap brakes deployed. Photo by LIonel Brink

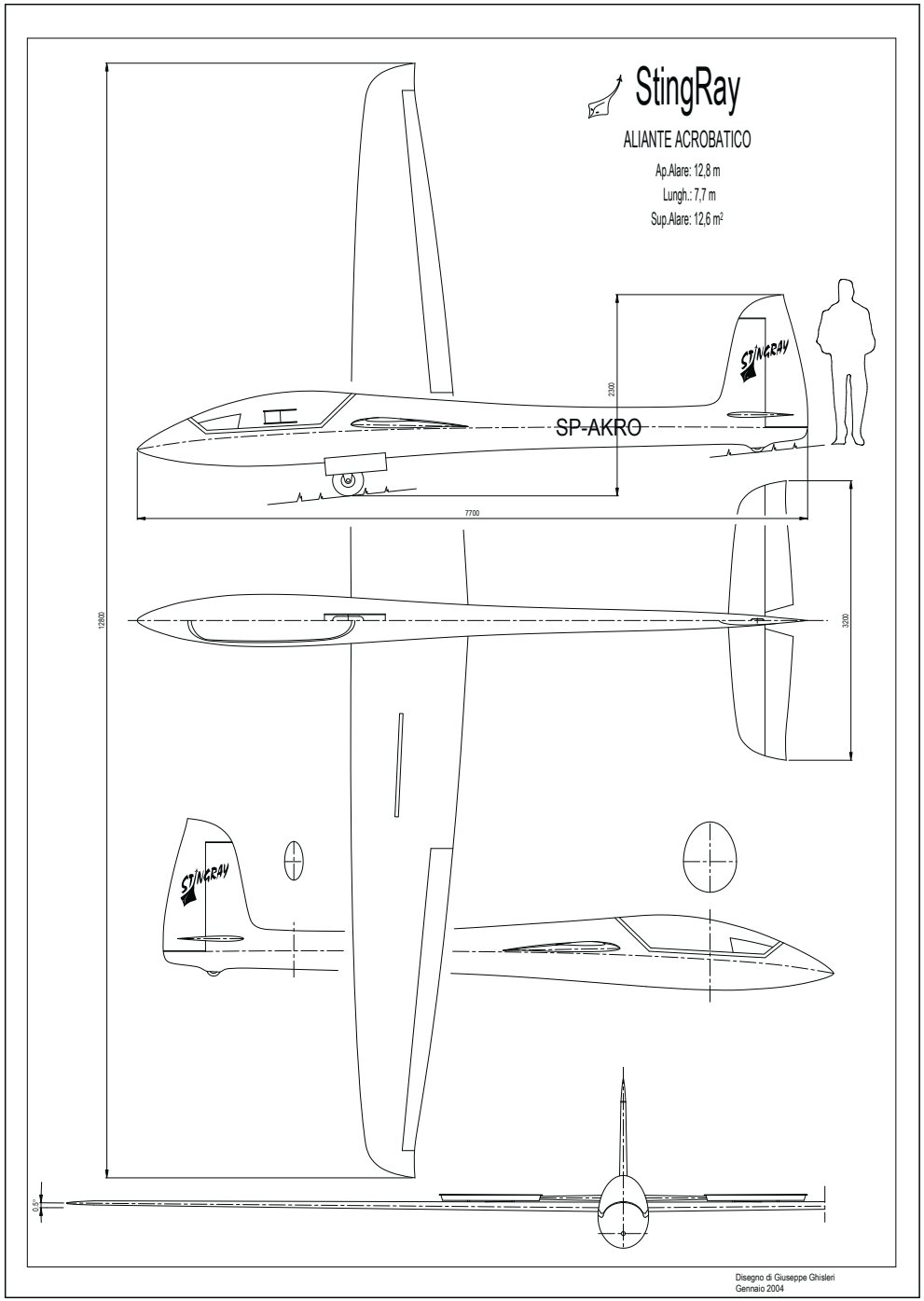
Left: Herman Weber landing his Xperience-Pro (v-tail) with Izak Theron timing. Photo by Lionel Brink

This page, from upper left: Peter Eagle landing his Europhia II on the spot, Michelle Goodrum timing and Piet Rheeders capturing the moment. One of the top F3B pilots, Michelle Goodrum, timed by Peter Eagle, landing her Estrella on the spot. One of the top F3B pilots, Michelle Goodrum, timed by Peter Eagle, after landing her Estrella on the spot. Photos by Lionel Brink.

Left: Top junior pilot, Conrad Klintworth, landing his Xperience-Pro (x-tail) on the spot. Photo by Lionel Brink.

Opposite page, clockwise from upper left: Xperience Pro (cross tail) with locally produced Ricky Mitchell F3B winch. A gaggle of F3J models, (from front clockwise) locally designed and produced F3J Inkwazi, Pike Perfect, and locally designed Shongololo F3B model. A gaggle of 2M models, (from left to right) Fling, locally designed and produced Tsotsi, and a Gentle Lady ARF. Father and son team Stockton, (from left to right) locally designed and produced Eish!, two moulded Supras, Xpwerienc Pro (cross-tail). Photos by Kurt Stockton.

Peter Eagle's Europhia II in a tight thermal turn. Photo by Lionel Brink



AN AEROBATIC SAILPLANE

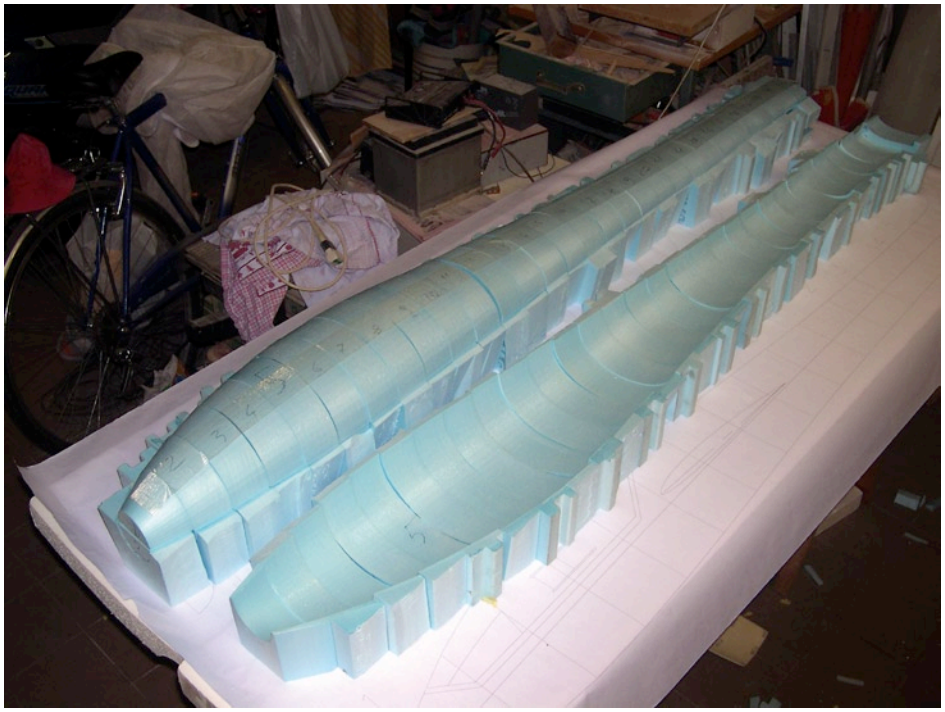
by Giuseppe “Beppe” Ghisleri, ghisl@tin.it

I have been building flying models for more than half a century. I started building free flight models, then went to UC flying. My passion was aerobatic models, and I still have a soft spot in my heart for them and, occasionally, I think I could build a stunter again. I’m collecting full size plans of vintage models, searching for the one I built when I was a teen.

For this reason, some time ago, I went through the web searching for StingRay, an aerobatic model designed by Robert Gialdini in the early sixties. I didn’t find what I was searching for; I discovered instead a lot of sites dedicated to that fish: the StingRay.

But... there was a Polish site speaking of sailplanes. I’m a fond sailplane flyer so I took a look.

On my monitor appeared two pages, in Polish and in English, with some 3D images of an aerobatic sailplane



Left: Well into making the fuselage plug. Right: The finished fuselage plug. The author stands in the middle.

designed by a group of freshly graduated Polish aeronautical engineers searching for investors.

I couldn't have found a more treasured site — a NEW aerobatic sailplane !

I was bored to see on the slopes around Italy only Foxes and Swifts and to talk about Swifts and Foxes. I immediately sent an e-mail to the address shown on the site in order to have a 3-view drawing. I got no reply.

But I couldn't stop thinking about building a model, so I started to draw plans based on the images, and modifying it according the overall dimensions stated on the site.

I took much help from the general appearance of the Swift and, finally, succeeded in drawing something that looked like the images I saw on the net.

To make sure my drawing was really looking like the original, I asked a friend of mine to draw a 3D model based on my 2D drawings. The result was beyond my best hopes.

This task accomplished, still there was a lot of work to do, like to decide the model size and, most important, find some friends to give a helping hand building the fuselage master and mould.

I showed the drawings and 3D images to friends and immediately found help from Elio Fornaciari, also known as "Il maestro di Fabbrico," a little town sited at some 50 km from mine.

He is a modeller, too, and a good friend of mine, and likes to build masters, moulds and 'glass fuselages for sailplanes along with wings and

Left: One half of the fuselage mold is set up on a sturdy flat table. Right: The first layer of glass goes into a mold.

tailplanes, if you need them.

He has a CNC foam cutting machine, so I thought to use it to cut foam slices 2" thick to build the basic master with little sanding.

I had to draw a lot of fuselage sections, and for my part it wasn't a fast task, but when all the slices were cut the fuse went together in a few minutes.

We had great help in transforming my sections drawings into files to feed the CNC machine from Giorgio Somenzi, another modelling friend.

The foam fuselage was then covered with glass and finished as a master should be.

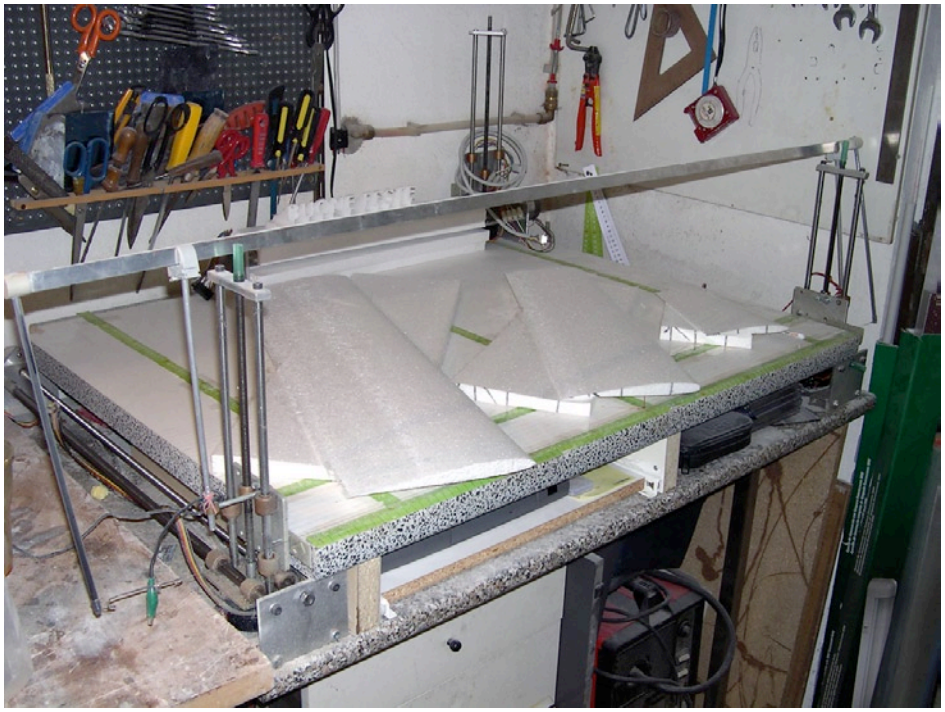
I have to go back and say that the model was dimensioned to a 3.2 meter wingspan, with a design weight varying between 6.5 and 7.5 kg.

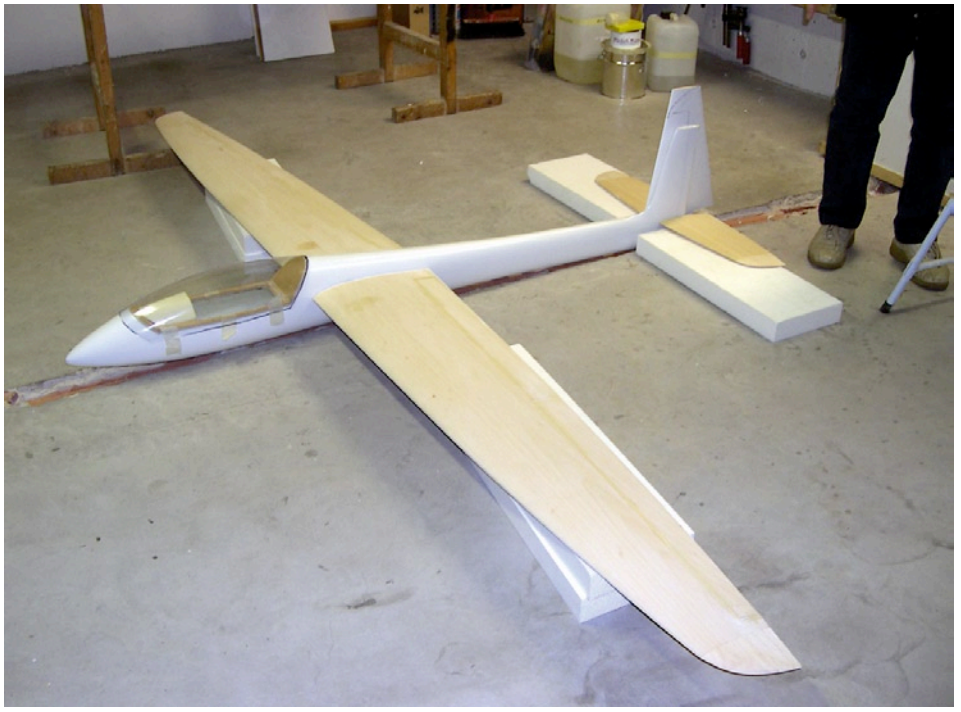
Most commonly, aerobatic slope models in Italy have a wingspan ranging from 2.5 and 3.0 meter. There are a lot with the shorter span and only a few with longer spans.

Weight can vary from 4 to 6 kg, giving for the most used class a wing loading from 80 to 100 gr/sqdm.

This depends, of course, on the flying site from which modelers will usually fly their models.

In the North of Italy we have only a few sites where a 100 gr/sqdm can be normally flown. There is Margone near Trento, Folgaria near Rovereto, and Croce Arcana near Modena. In the center of Italy it is possible to find slopes where you can almost invariabily fly models so heavily charged: Monte Catria near Fano, Monte Vettore near Ascoli Piceno,





Left: A collection of foam cores. Right: All the major parts arranged in the final configuration. Good looking sailplane!

and many places (I've never visited) near Florence.

By previous experience and much talk with friends who are aerobatic pilots, a relatively low thickness wing section was chosen: S6061, with a 9% thickness and 1.75 % camber.

I designed the model to have flap in order to help the model gain height fast so to reduce the time between manouvers.

I also thought to use snap flap to increase the Cl without accordingly increasing Cd for the high G maneouvers. Actually, my model uses snap flap through all flying.

As a side benefit, flap and aileron are used in butterfly to slow the model for landing.

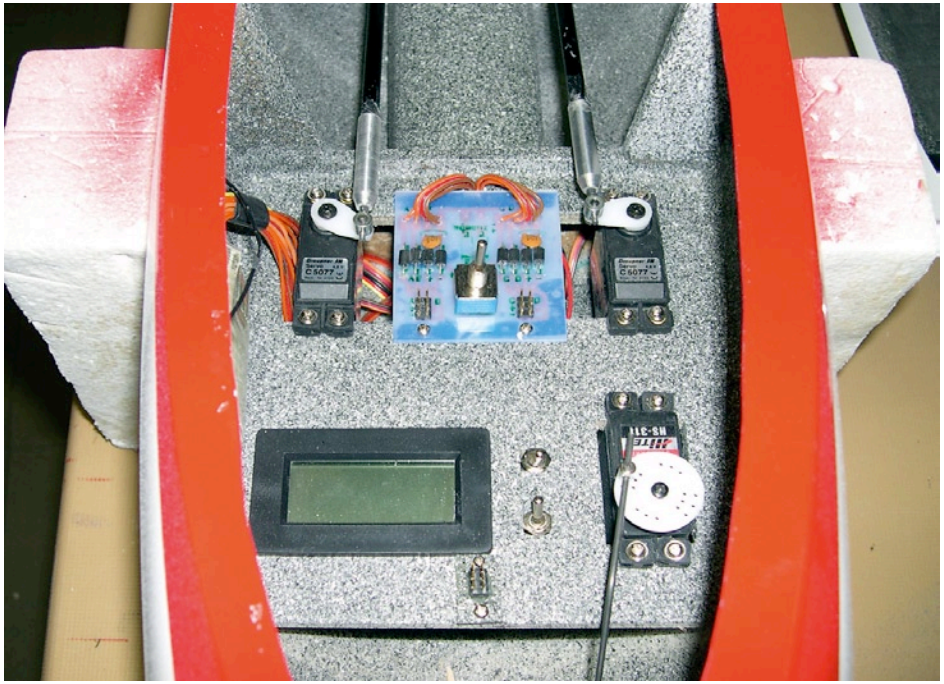
When we first flew the StingRay the pilot was Alberto Tarter, as his model was the first ready to fly.

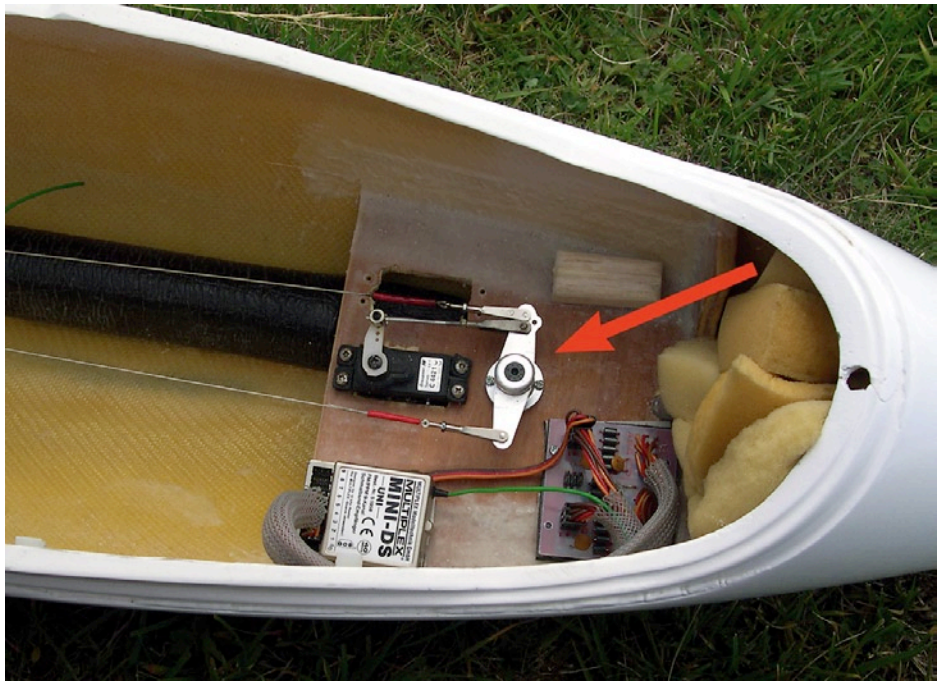
We met at Fabbrico and towed the plane.

In Fabbrico they have a concrete runway sorrounded by grass, but on the landing approach, at only some 40 meter from the landing strip, there is a small concrete water course used to flue the surrounding meadows. It is posed on the ground that has a lower level in regard to the strip, but it is one metre high and I'm sure that you can easily figure what happens if a model can't fly over it .

To make a long story short, after the first landing in the grass, Alberto performed three others landings putting the model down in the short space between the course and the concrete strip.

Remember, we are talking about a model with 85 gr/sqdm wing loading and weighing 6.5 kg.





Left: Well laid out electronics in this StingRay. Right: Pull-pull cable system. Note the cables are attached to a separate bellcrank.

The tailplane is so positioned in regard to the fuselage that is impossible to build it as a single piece, besides I choose to make it all flying. With a model that can reach a speed of 200 plus km/h, this could be a hazardous step.

The rotation point has to be chosen correctly — not behind the 25% of the mean aerodynamic chord of the tailplane, and not too forward to require a great moment to rotate it.

There should be no slop in the control system or flutter will inevitably arise. The same thing applies to the shaft, too, but all must move freely.

We installed a 6 mm diameter hardened steel rod (mine has 8 mm diameter) rotating in two ball bearing secured to the fuse sides.

A bit of cyano, accurately positioned, took care of the little play existing between the rod and the ball bearings, while an aptly built carbon tube was glued inside the tailplanes.

No need to hold them in place with some sort of mechanical retention. They stay in place by themselves, providing that they play a “flop” when they are taken away from the rod.

The tailplane is controlled via a pull-pull cable system,. There is a T-shaped horn in the tail and a normal horn in the front, and both are rotating on ball bearings.

I’ve never had, to this date, any flutter problem.

The StingRay has a longer tail moment arm than the Swift and Fox, and this makes the airplane more stable in the air. It looks as if it is flying on rails, but when you move the stick, well it responds as rapidly as could be.

Alberto Restelli

Have you ever flown a square loop really square, or a six sided loop... Well, not entirely regular!?

I have already told about snap flap, but have not said that ailerons, too, are involved, moving the same way as the flap, of course, but with a lower excursion.

The same mix applies when you feed in aileron control, and this time they move according to a different ratio: more aileron, less flap.

The model holds its energy for six or seven straight consecutive rolls.

Many StingRay models have been built around Italy, almost fifty I think. The best flying ones weigh on the heavy side; i.e. 8 kg for a wing loading of 100 gr/sqdm.

Are you tired of flying the same old Foxes and Swifts?

Then why not giving the StingRay a try. ■

Schweizer SGS 1-21

Walk-around by Mark Nankivil, nankivil@covad.net

The Schweizer SGS 1-21 was originally offered to the U.S. soaring community in late 1946 as a high performance single seat sailplane. With a glide ratio of over 27 to 1, provisions for carrying water ballast in wing tanks (a first for a production sailplane in the U.S.) and an expected selling price of $2,700.00, the 1-21 was seen by Schweizer as an answer to a perceived demand for a competitive, all metal sport sailplane.

Alas, orders for the design proved rather short with only two being placed. Schweizer decided to proceed and build these two in the hope that "seeing was believing" and further orders would transpire. Sadly this did not prove out and even though the SGS 1-21 proved its competitiveness at the 1947 Soaring Nationals and beyond, nothing more came of it. The cost of the sailplane was simply too much for a post war economy filled with surplus military sailplanes and the relatively small size of the soaring community that existed at that time.

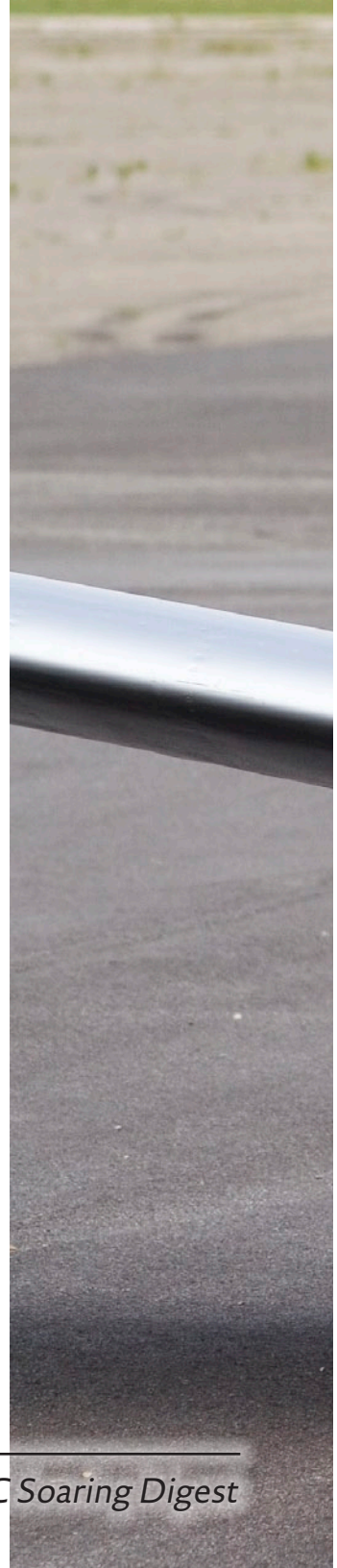
SGS 1-21 (S/N 1) won the U.S. Nationals in 1947 flown by Dick Comey, and amazingly 10 years later won the U.S. Nationals yet again when flown by Stan Smith. SGS 1-21 (S/N- 2) also had a significant competitive history after a late start.

Bob Moore of Richland, Washington, flew it to a 5th place finish in the 1958 U.S. Nationals held in Bishop, California. Bob subsequently flew it to other top 10 finishes in later Nationals, concluding with a 15th place finish in the 1963 U.S. Nationals held in Kansas. Bob, considered the most famous owner/pilot of S/N 2, at one time or another held most of the Washington State soaring records flying S/N 2. Its performance handily exceeded the requirements needed to attain the FAI Diamond "C" Award and the S/N 2 logbook shows altitudes of 35,000 feet, distances up to 340 miles and flight durations up to 8.5 hours.

Amazingly, 60 years later, the two SGS 1-21 sailplanes still exist. The SGS 1-21 featured in this article is now owned by Jim and Simine Short of Homer Glen, Illinois. Their 1-21 is the second of the two built and was recently purchased from Walter Cannon. Restored in the early 1990s by Walter, this sailplane received the "Best Schweizer" award at the 1995 International Vintage Sailplane Meet. As can be seen in the accompanying photos, the 1-21 is indeed well taken care of and looks simply beautiful whether at rest on the ground or in its element flying.

The SGS 1-21 has a wing span of 51 feet (15.54 meters) and is 21.9 feet (6.68 meters) long. The wing area is 165 sq. ft. (15.3 square meters) with an aspect ratio of 15.75.

Airfoils used are the NACA 23012A at the root transitioning to an NACA 43012A at the midspan of the ailerons. From there it transitions to an NACA 23009 at the tip with two degrees of twist for washout.

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Two sets of spoilers are fitted to each wing, inboard of the ailerons. The outboard spoiler opens both top and bottom whereas the inboard spoiler opens on the top only.

The fuselage is primarily oval in cross section save for a circular section at the nose cap and under the horizontal stabilizer where it transitions to vertical sides at the rudder tailpost.

Construction is all aluminum except for a blown plexiglass canopy with shoulder side windows, and fabric covered ailerons, rudder, elevator and a small section of the inboard wing surface aft of the spar.

Jim Short speaks highly of the SGS 1-21:

> "The 1-21 is indeed magnificent in its handling and performance, especially for a 60 year old sailplane. In comparisons, it seems to perform equal with the later model long wing SGS 1-23s and sometimes it will give an early Ka-6 a run for its money. The performance at slow speed is as would be expected with the NACA 23 and 43 series airfoil combination and it climbs very well. Although inconclusive, it seems that it holds its performance at higher air speeds better than the older Gottingen airfoils.
>
> "Given the time of its introduction in 1947, and the state of sailplane design in the world, the 1-21 was one of the very highest performing sailplanes in the world. Various sources list its L/D as 27:1 (Schweizer) or 29:1 (OSTIV, World Sailplanes Vol.1) which would make it the equal of the great 18 meter icon of the period, the Weihe.
>
> "Although the tail section of the 1-21 is beautiful, it is a bit short of rudder when maneuvering is necessary in tight thermals. None of its later owners have flown it with water ballast, but I expect a higher wing loading would help it in the glide. The ailerons are a bit heavy (common for that period of time) but no heavier than, for instance, the Olympia.
>
> "It is docile in handling, especially for heavier pilots, and has little tendency to spin unless fully provoked. Unlike older wooden sailplanes, it is as strong now as when it was built and should be mildly aerobatic, though I have not tried that portion of its performance envelope yet. It is stable in handling and having double dive brakes gives the opportunity to try something different. For cloud flying, the double dive brakes can be locked open which is a good safety feature.
>
> "As you might expect, I am in love with this exquisite and rare American bird."

The accompanying photos were taken by the author at the 2007 Wabash Valley Soaring Association's Vintage/ Classic Sailplane Regatta held in June in Lawrenceville, Illinois.

My deepest thanks to Jim and Simine Short for the additional information regarding their prized sailplane and for supplying the 1947 photo of Ernie Schweizer with S/N 1 as well as the period advertisement announcing the addition of the 1-21 to the Schweizer product line, and also to Martin Simons who graciously gave permission to include his rendering of the SGS 1-21 from "Sailplanes by Schweizer: A History" which he co-authored with Paul Schweizer.


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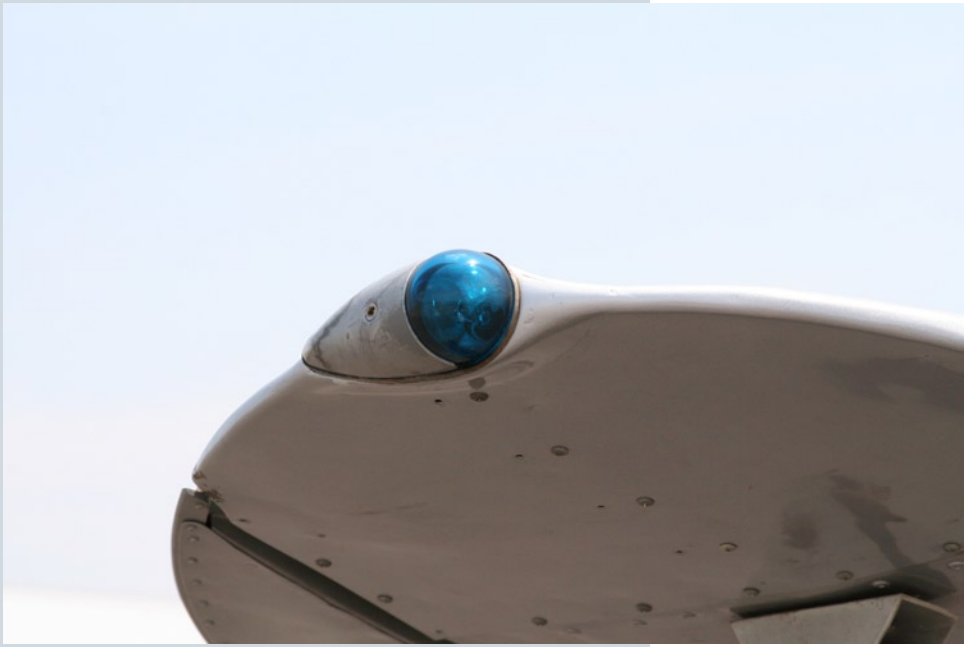

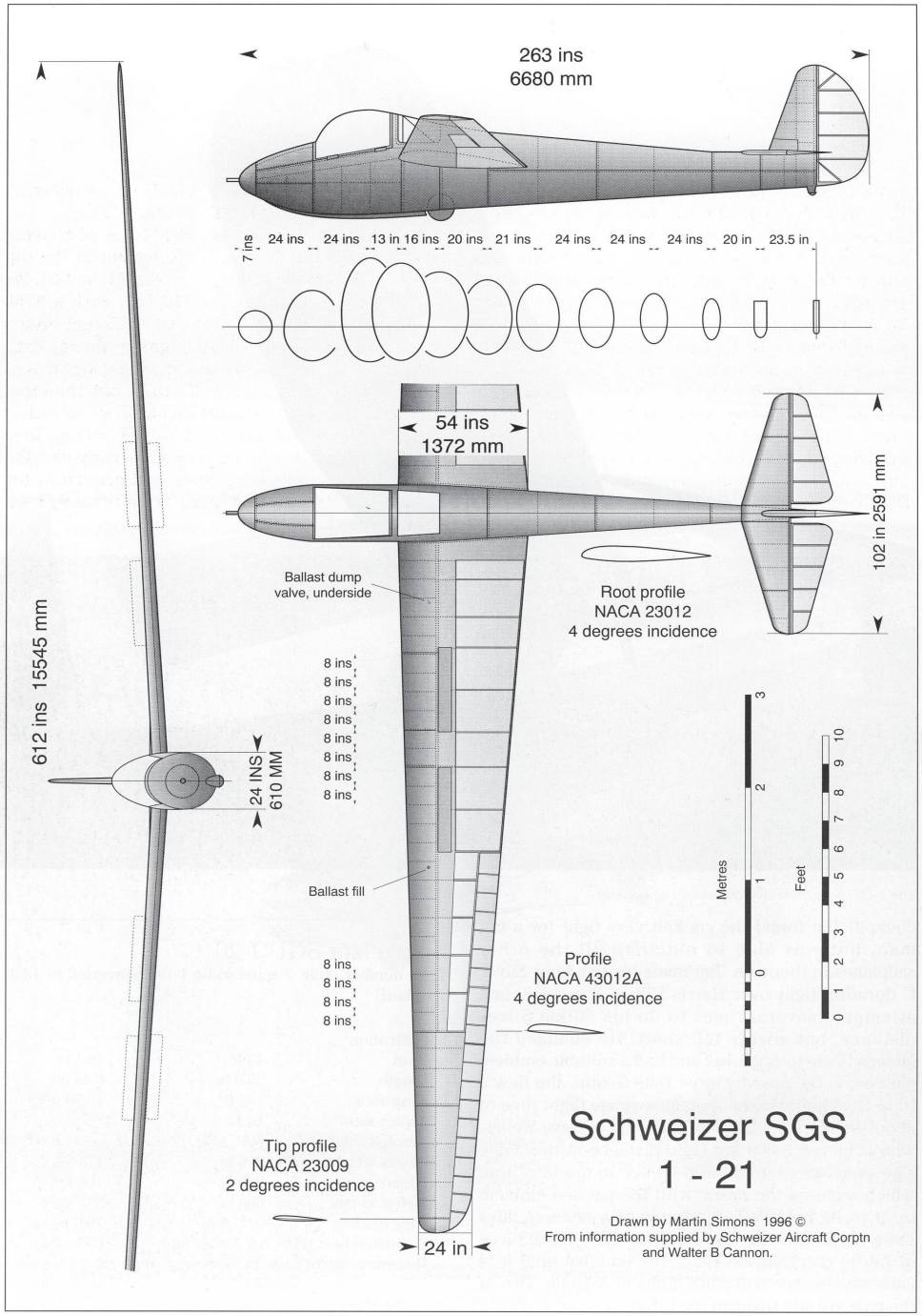

Above: Schweizer ad from SSA's *Soaring* magazine circa late 1946. Left: SGS 1-21 3-view and cross-section drawing from "Sailplanes by Schweizer: A History" by Paul Schweizer and Martin Simons.

Above: Jim Short with his Schweizer 1-21 S/N 2.
Right: A 1947 photo showing Ernie Schweizer with S/N 1.


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Uncle Sydney's Gossip Column

Sydney "Uncle Sydney" Lenssen, sydney.lenssen@ntlworld.com

Dateline: September 2007

European F3J medley

August was busy for European F3J enthusiasts. First a return to Deelen air base just outside Arnhem for Hollandglide, the 15th year of this event. Hollandglide is nowadays billed as the largest annual Euroleague competition, but others are coming close. It is almost too big for it takes a long time to walk to Spot 15 or 16. This year Deelen enjoyed its best weather for several years, reserving a soaking vicious storm for 30 minutes after the prize-giving.

But highlight for me was the fond farewell given to Harry "The Knife" Saunders and his wife who have been contest director *supremo* since the start. Hollandglide also started a new trophy for the top placing pilot "over-50." I complained to Jos Kleuskens who awarded the trophy to Colin Paddon (GB), that next year it should be "over-70" to give me a chance!

Then many pilots and helpers drove on across Germany, Austria or the Czech Republic into Slovakia, aiming this time for Trnava for the fifth European championships. The Trnava Cup held on the Friday, Saturday and Sunday morning before the champs and attracted 136 pilots. They enjoyed a wonderful treat with a foretaste of the tricky thermals, peppered with plenty of teasing flat calms and gusty speeding winds which was to come.

It's hard to choose between the highlights. UK achieved its best FAI F3J success ever, in contrast to the miserable F3B results

Harry "The Knife" Saunders and his wife plus grandchild collect their presentation after 15 years of serving as contest director/ supremo at Hollandglide, truly a servant of F3J Europe. Red hat is Albert Kort, organiser-in-chief, another hero.

German team manager Peter Feigl gets the now traditional hair shaving prior to being dunked in the pool as new European team champions.

Sebastian Feigl, new European F3J champion, has his head shaved in celebration, a somewhat dubious tradition going back at least two years.

from Switzerland. Models, gazebos and even caravans were lost or shifted bodily by the swirling storm which hit Trnava halfway through one afternoon slot. Also the emergence of Russia, Lithuania and the continuing rise in fortunes of the Italian pilots is most welcome.

The Feigl family legend grows bigger with Peter Feigl managing the German team to first place in the Eurochamps after taking a flyoff place in the Trnava Cup. His elder son Sebastian triumphed as European champion, dropping 1.50 points in the four round flyoff. Second son, Benedikt Feigl won second place at Hollandglide and has secured a German team place in next year's world champs in Turkey. Sebastian has not got a team place for next year, such is the scramble for the three team places.

2007 Eurochamps - Trnava, Slovakia

Allow me to sing the praises of the UK team - not often I get the chance.

Ten years ago at the very first F3J FAI champs in Poprad, Slovakia, the UK team did well, amongst the leaders and rightly so as originators of this new form of RC sailplane competition. Two pilots, Peter Cubitt and Simon Thornton, reached the flyoff, coming sixth and seventh respectively, and the team, which also included John Stevens of Eliminator fame, came fourth.

To set some perspective, let me quote Jack Sile's 1997 report of the event: Pete Cubitt having scored 1,000 in the first round - "had his worst flight in the second round, but then followed with seven consecutive 900 plus scores." How standards have changed. Today if you don't score 55 seconds plus and 100, you are unlikely to be near the flyoff places. Pilots returning from the flightlines don't talk about the minutes - times are assumed to be 9 minutes - only the seconds to two decimal places.

2007 allows UK heads to be held high, despite the team changes only a fortnight beforehand when Simon Jackson pulled out and was replaced by Colin Paddon. Adrian Lee and Austin Guerrier arrived with caravans in Trnava with two days of practice before the Open, Colin Paddon, team manager Graham Wicks and helper Kevin Beale flying in on Saturday with only one day to spare.

Each of the UK team pilots had one poor flight in the early rounds, but for once their spirits did not dampen and everyone pulled together. By the sixth round, the team was in 8th place, 500 points behind the leaders, but in the gusty winds, not irretrievable. Seventh round the team were up to fifth place and with consistent flying in ever more tricky conditions, so it stayed, Great Britain in fifth team place behind Slovakia, Italy, the Czech Republic and winners Germany.

Fifth-placed Team UK gathered around fifth-placed pilot Austin Guerrier, highest placed British pilot ever in an FAI F3J championships.

Austin Guerrier's progress to gaining the last flyoff place was more dramatic. After six rounds he was in 23rd place, moving up round by round to 19th, 18th, 14th and then 12th at the end of 10 rounds. I'd shared some of his disappointment in the early rounds - "I am annoyed with myself, I came here to win!" Being proprietor of Acemodel and UK supplier of NAN Models gives him an incentive. Just before launching in high winds of later rounds, he quipped: "There's only one way to deal with this - fly high and go far!" How true that was to prove in the flyoffs.

Saturday, sixth day of the championships, was flyoff day and dawned calm and sunny, seemingly set for eight 15-minute rounds of split second launches and spot landings. I had urged the contest director to squeeze in the first two rounds of senior and junior flyoffs into the tricky air of late afternoon on Friday, leaving everyone to relish the prospect and excitement of the final two rounds for Saturday. A similar schedule had produced a grandstand finish in Red Deer, Canada, three years earlier.

But contest director Milan Blazek and flight line king Miroslav Minarik, who had presided well over the whole week after a shaky start and a dodgy matrix, chose Saturday.

My fears that the flyoffs would be too easy proved wrong. First round of seniors saw several pilots risking two-second launches, and all bar one got away with it. Four pilots scored 14.55 seconds plus, Primoz Rizner getting 14.56.50 but only 90 landing points, three scored 14.54 plus, and only Juraj Adamek landed 45 seconds early.

Second round also looked easy, Jan Kohout netting 14.57.20 plus 100, Tobi Lammlein 14.56.90 and Philip Kolb and Sebastian Feigl both on 14.56.20. Austin Guerrier had his worst round scoring a good 14.53.50 but dropping 30 landing points.

Round three decided the championships. The wind had become stormy, gusty and far from predictable. Tempted into rash optimism by previous flights, all the pilots were prepared to rush downwind chasing what had become ephemeral patches of kinder air. The fields of corn and sunflowers downwind became littered with models. Gangs of helpers dashed to recover models among the high crops. Everyone bar one relaunched, few with the same model. Only one pilot, Marko Salvigni, triumphed with 10.36.90 and 100 to make his 1,000 points.

But salvation was at hand. Thomas Fischer and Primoz Rizner had touched each other minimally on launch and a reflight was called. Perhaps that explains why the pilots who heard the call flew so recklessly. Ten of the pilots claimed their refly scores in Round three, Sebastian Feigl scoring 14.53.30 and 100 to claim his 1,000 points. He was down to treetop height at around nine minutes, but then did some horizontal DS-ing which sent him 500 metres downwind to pick up 10 metres height, then slowed and flew out the slot - true champion style.

Round four was tame, only three pilots not managing to fly the slot out. New European champion was Sebastian Feigl, boldest and riskiest of all F3J flyers. Second place went to Tobi Lammlein who this year has specialised in coming second in all his contests. Following in third was Marko Salvigni, a worthy triumph which brought a huge smile to his face. Had the third round refly not been granted, I suspect that Marko would be the new champion.

Consistency also counts a lot, and Austin Guerrier proved that in coming fifth, just behind Philip Kolb. Although he dropped 50 landing points and 14.53.50 was his highest time, he became the highest placed British pilot in an FAI championship ever. Congratulations!

Heartiest congratulations of the whole week should go to Lesley van der Laan who is the new European Junior champion. He flew well enough to show that he will soon be a force to be reckoned with at senior level too. This young Dutchman always sports a laughing face and has competed at European and World level for the last four years. His success is most pleasing and well deserved.

Johannes Weber of Germany and Arijan Hucaljuk of Croatia claimed second and third places, narrowly squeezing Giovanni and Filippo Gallizia brothers from Italy into fourth and fifth places. Junior team results saw Czech republic in first place, followed by Italy and then Slovenia.

Ricardas Siumbrys from Lithuania, lying fourth after eight rounds, sadly scored 443 points and dropped out of sight in 29th place. F3J can be unforgiving!

How about predictions?

Now the reckoning. For flyoff places David Claeys of Belgium let me down and only managed 33rd place. Adrian Lee from UK did slightly better with 20th place and I should have stuck with Austin in my predictions. Damir Kmoch from Croatia managed 21st place and I was surprised that noone from that keen country made the flyoff. Primoz Rizner rather than Primoz Prhavc came fifth in the preliminaries, missed the third round of the flyoff and came last.

My bets got better with the Germans because Sebastian Feigl, Tobias Lammlein and Philip Kolb all made it. What I did not expect was that Thomas Fischer would also win a place to make it four out of four.

Jan Kohout, who I saw as the repeat champion, came close to predictions; he led the preliminaries up to Round seven only to be beaten into second place by Philip Kolb by less than three points. In the flyoff he suffered in the notorious third round dropping 325 points and down to seventh place. Another Czech, Jaroslav Tupec, who pretends to be my father, made the flyoff and repeated his promise to stop competing in championships because he's too old.

Massimo Verardi missed the flyoff by one place, but Marko Salvigni and Marco Generali did make it. Frank van Melick shot his bolt early, but Cor de Jong made it. Juraj Adamek from Slovakia made it, but team-mate Jan Ivancik didn't.

Finally Murat Esibatir, the quiet Turk, let me down. Among the leaders up to Round four, he suffered the indignity of sloping the trees as others had done before to spin out the slot. But then the lift stopped leaving him too low to get back and he hit a tent - bang, off go 100 points to add to his zero. Ouch! He promises me it'll be different next year.

So I named six of the 12 places in 14 guesses, about the same as last year. I wonder how many gossipers try for themselves? I named the team champions but hedged my bet with three

options. One matter was a good bet, and that is that every pilot and helper taking part enjoyed a good contest.

Trnava Cup

This gossip column is not meant to dwell too much on results, but the Trnava Cup was a testing contest with a super prize, a special edition of his Supra presented by Vladimir Gavrylko. Philip Kolb won the flyoff, and knowing that he only flies his own-design Samba Pike Perfects these days in F3J competitions, I offered to buy his prize. That was refused without hesitation. “Now I have the ideal opportunity to test Mark Drela’s design for myself, and I am looking forward to it.” Philip sees Supra in many respects as the father or mother of his Pike Perfect.

What surprised me was that the Trnava Cup flyoff had two pilots from Ukraine and three from Russia and a Pole, which shows that competition from former Eastern bloc countries is hotting up. Only the year before in Martin, the Russians had found themselves floundering and confused: they were new and had language difficulties. They have caught up fast and deserve full credit. Watch out next year!

Overfly panic stations

This year for the first time digital camcorders are being used to record landings and check overflying. Apparently this practice has become commonplace in Germany to prevent disputes about when models land, before or after the start of the long blast. Apparently one or two other countries are considering adopting the same practice.

I think that Philip Kolb’s second flight in the Trnava Cup flyoff was an overflight. It was certainly very close, but it was not penalised by the timekeeper. Afterwards I was shown two movies of the landing and on both you can hear the hooter before the nose hit the ground. Of course, there is a problem because the sound could come from a loudspeaker closer to the camera than the timekeeper. Problems caused by the differing velocities of sound and light not simple to solve. When I tackled Philip, he claimed that his landing was in time and on previous occasions, movie evidence he’d seen was vulnerable to sound errors.

In the Eurochamps, Tomas Bartovsky set up a camera to check landings and in one of the early rounds, a timekeeper - not the pilot - had appealed to the jury to decide because he was unsure. That evening the jury spent several hours viewing the evidence, calculating theoretical delays for sound and sight effects, and generally chewing over the problems. The flight was ruled as an overflight.

But before CIAM and F3J organisers get carried away on the trail of erratic forensic evidence, let’s remember that we fly for fun. F3J is supposed to be simple. The prospect of filming landings, then later launches, and perhaps tow-line releases, is crazy.

My guess is that there are now 20-30 pilots who fly out 10 minutes every time unless the weather is particularly nasty. These same pilots can almost guarantee that they will land within one metre and during the last second of the 10 or 15 minute slot. Next year, CIAM is likely to adopt the rule which divides the last metre into 20 cm lengths and the landing score could be 100, 99, 98 etc down to 95. The temptation to land in the last split second before the signal will become greater.

But please do not go the way of filming.

The problem arises because the penalty for overflying is so severe, and to win in good weather, top pilots become ruthless with themselves. The answer lies in stopping the stopwatches at exactly ten minutes and allowing the landing to count providing the nose is on the ground, not at the start of the hooter but by the time the hooter sound finishes. That allows at least one second margin of error before penalties apply. As at present, the timekeeper’s judgement should count, and his decision should be final.

Picture of new field at Adapazari, Turkey, site of the 4th F3J Soarist Open in the middle of October. The organisers in Istanbul want this contest to be the “championship of champions” and hope that all the world’s top pilots will be there. Adapazari is about 100 km east of Istanbul, and the field is being tested for the first time. It will be home for the F3J World Championships in 2008.

Future outlook - 2008 and all that

Invitations have gone out for the 4th F3J Soarist Open in the middle of October. The organisers in Istanbul want this contest to be the "championship of champions" and hope that all the world's top pilots will be there next month. The contest will be held in Adapazari, about 100 km east of Istanbul, and the field is being tested for the first time, and will be home for the World Championships in 2008.

Some of the 2008 team names have emerged in recent weeks.Team GBR will have seniors Simon Jackson (if he can make it this time), Adrian Lee and Brian Johnson. Sadly again there are no juniors in the UK league.

Team USA will be Daryl Perkins, Ben Clerx, Rich Burnoski with Skip Miller as first reserve. Juniors will be A J McGowan, Brendon Beardsley and Jeffrey Walter with Michael Knight and reserve. Cody Remington as last year's junior world champion will also fly in the 2008 F3J WC.

Gossipers will know that Daryl Perkins has been F3B world champion at least twice - maybe more. (Daryl was F3B World Champion four times: 1995, 1997, 1999, and 2001. -Ed.) He was the one who bought a second-hand Calypso Cobra from Steve Hailey and won the world champs with it. He has been acknowledged by Joe Wurts as the all-time best F3B pilot. As Jose Mourinho, ex-Chelsea manager, would say, he is a "special one," which left me astonished that he now wants to fly the far simpler sport of F3J.

Ben Clerx enlightened me, for it turns out Daryl enjoys F3J. "Daryl hasn't been able to make the team until now, although I don't think he's participated in all the team selections. He had tried many of them and always a little piece of bad luck has kept him out. His F3B schedule has also prevented some entries. But we are fortunate to gain Daryl as we lose Joe Wurts to the Kiwis."

Again Ben speaking: "I've also competed in all the team selections and haven't been able to make the team since the first Worlds at Upton 1998. Our team is based on a single three-day competition, so luck does play a part. You have one shot to be well prepared and practiced, which is like going to the world championships."

For pilots in those countries where to win a team place you have to enter several competitions, travel hundreds of kilometres in all weathers over many months, it is tempting to go for the simple "do-or-die" solution. In UK, I suspect we'd end up with the same pilots either way!

The German league attracted 120 pilots for their five events, and 24 of these flew in all five qualifiers. Two of the comps were in France and Holland to ensure international experience. The three man team is Philip Kolb, Tobias Lammlein and Benedikt Feigl. Junior team will be Johannes Weber with Manuel and Christian Reinecke, after 23 juniors took part in three contests to gain a place. The three will be under intense pressure to regain junior top team place, having missed last two years.

South Africa will send the usual pairing of Craig and Michelle Goodrum (with a two and a half year old budding child pilot) plus Chris Adrian and Mark Stockton in reserve.

As current world champion, David Hobby will be returning again from Australia - can he do it yet again? - and he will have Aussie team of Mike O'Reilly, Theo Arvatakis and Mathew Partlett or Gregg Voak. If any other countries would like to send me details of their teams, they'll have a mention in the next Gossip Column.

Apologies: This column should have been posted at least two weeks ago, and there's more gossip that I should have included. I hope to catch up and report from October's "championship of champions" at Adapazari, including details which will tempt supporters to attend next summer. ■

Composite F3B Glider Building Group

By Evan Shaw, evanevshaw@gmail.com

At the beginning of 2007 I started a building group at my house on the West Rand to provide people with the opportunity to build the all-composite F3B Shongololo glider designed by Craig Goodrum. The response has been overwhelming with places booked into next year already. It seems that there is a big demand for F3B gliders.

Because imported models are expensive, with the cheapest being around R6000.00 (US$875), many people that would like an F3B model simply cannot afford them. So having the opportunity to build your own at R2500.00 (US$360) is very attractive.

The Shongololo is a very good design, with lovely lines and smooth flying characteristics. Although the wing profile isn't as thin as the modern F3B gliders of today it is still competitive enough to use in the SA F3B League that will be running next year.

There is nothing new about building groups. This article is just to provide you with an idea of how it works. Basically there are four people involved — three working for 10 consecutive sessions, plus myself making up the 4th person. Four people building is essential, as each will work on one wing panel. This facilitates a quick turnaround and because of it a model can be completed every 3rd week. The group meets once a week in the evenings from 18h00 until around 22h00 (four hours). Sometimes this does extend, depending on what we are busy with or how much fun we are having at the time. There have been evenings when I get into bed after midnight.

Each model takes only three sessions to complete, and by the fourth everything is done and the persons whose model it is can take his components and bid us farewell so we can start the next model. There is an overlap on the 4th evening. Sounds complicated, but it isn't really! See the included table.

Session	A	B	C	Me
1	x			x
2	x			x
3	x			x
4	x	x		x
5	x	x		x
6	x	x		x
7	1	x	x	x
8	2	x	x	x
9	3	x	x	x
10	4	1	x	x
11		2	x	x
12		3	x	x
13		4	1	x
14			2	x
15			3	x
16			4	x

Table showing overlapping group schedules.

When someone joins the group he will first be helping to build two other models while gaining experience in the techniques of composite building. Because we build the wings first, they are ready for de-molding by the third session. This gives me a week to clean up the molds and prepare them for the following session. There is some homework to be done before a person can start his model. The wing skins are a sandwich construction and the Herrex used in this has to be cut and sanded at home by the person whose model will be built. Templates and instruction are provided.

Each session is divided into different tasks as per below.

Week 1 - Lay up wing skins & bag them. Make joiner box.

Week 2 - Lay up the first layers of the fuselage. Join wings. Lay up stab skins & bag them.

Week 3 - Lay up carbon tows and joining layer of fuselage. Insert sheer web and joiner tubes and join the stab. Lay up canopy, servo tray and make wing joiner. Join fuselage. De-mould wing.

Week 4 & 1 - De-mould fuselage, stabilizer, canopy, servo tray and wing joiner. Start new model. See 1 above.

This building group was started on the 14 February 2007 and in 6 months we have been able to produced eight Shongololos.

The evenings are very relaxed and those that have built models so far have enjoyed the experience tremendously. All report that the 10 weeks goes by very quickly and they come away with a new understanding and experience on how to build composite models, plus of course, their very own model which they have built with their own hands. This, on its own, gives one a great sense of achievement. Not only do you own a lovely model, but you have made it yourself!

To help, I also offer assistance on Saturdays with the little fiddly bits, like the hinging, servo mounting, wiring, etc. Basically fitting out of the model and getting it ready to fly.

The next few pages are a photo gallery of the models that have been produced in this building group to date.

Right: Hannes with his out-of-the-mould wing.

Far right:

Below: Henk and his Shongololo

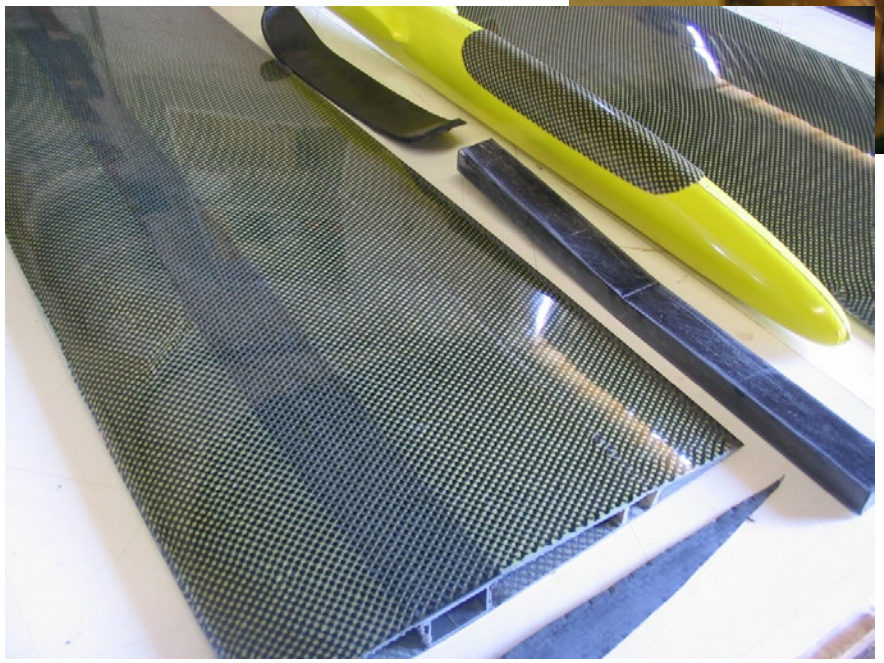
Below right: Gordon and his pristine white Shongololo.

Far left: Robert shows off his newly completed composite F3B glider.

Left: Len working a wing mould.

Below left: Robert's finished parts.

Below: Len with finished Shongololo.



Far left: Trevor with a moulded wing.

Left: Opening a wing mould.

Below left: Len (L) with finished wing.

Below: Tony on the occasion of the maiden flight of his Shongololo.

As mentioned earlier, the cost per glider is around R2500.00 each. This model is ideal for someone entering into F3B for the first time. Strong and robust and at a price that is unbeatable. If you're not interested in F3B or competitive flying, it's also a great general purpose thermal glider, with clean crisp responses and yet docile enough for anyone wanting a full house modern glider to just enjoy on a Sunday's social flying.

The wing lay-up is a hybrid carbon/ Kevlar skin as can be seen in the photo on the left, where the wing is painted with a clear coat so the hybrid cloth is visible underneath. (Click on the image to get the bigger picture) The dark strip is the carbon spar-cap. Made up of 50 x 12K carbon tows. The hinges for the flaps and ailerons are live. In other words the Kevlar strands in the skin lay-up acts as the hinge.

The fuselage is 'glass and Kevlar with carbon reinforcing. This model has a cruciform tail with all flying stabilizer. The aluminum joiner tube is built into the stabilizer when the molds are closed. The fuselage is one piece with a canopy and a carbon servo tray is provided as well as carbon end ribs. The wing joiner is a hollow core unidirectional rectangle carbon rod.

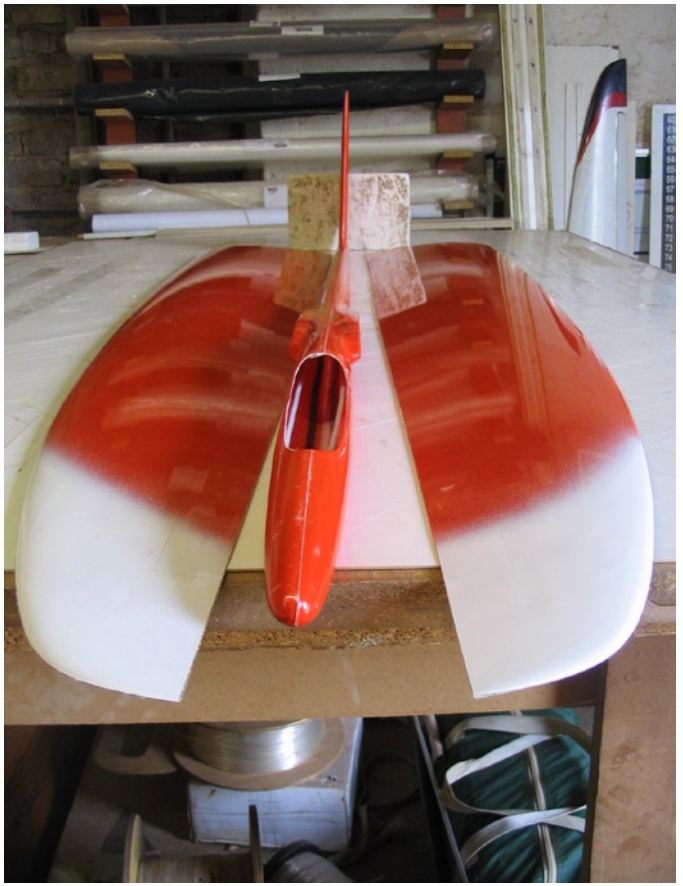
Because of the way the group is structured, anyone can build one of these fancy composite models. You don't need any special skills as there is plenty of help and guidance during the building process. All the specialized equipment and materials are provided for you. All you do is come and build.

I believe that building groups are a fantastic way of getting more people involved, not only in owning a decent composite models, but also teaching the skills required for working with these materials.

It makes composite molded model available to more and more people and not just the checkbook pilots. I'm sure there are building group happening all over amongst clubs and friends and I hope that my article will inspire more and more people to attempt similar projects.

I am fortunate in that I work from home, giving me time to do the odd bits and pieces that need to be done in between sessions and have a fairly decent size workshop with enough space to do this sort of thing. Also, the molds that I have and the way we build is conducive to a quick turnaround, with a model being produced in just three sessions. ■

Evan's Shongololo



Building your own transmitter

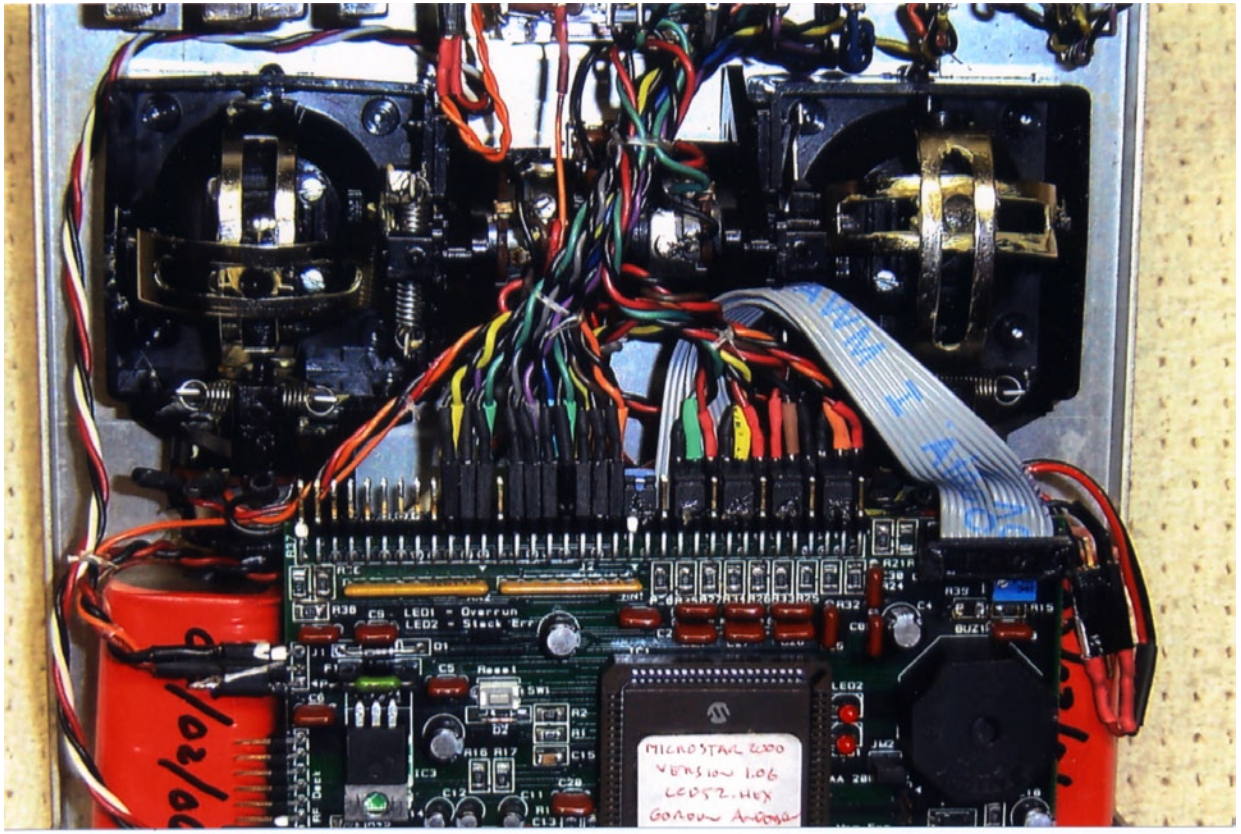
By Peter Carr WW3O, wb3bqo@localnet.com

Why would anyone want to build a R/C transmitter when there are so many excellent ones available already built? One answer might be that you have too much time on your hands or that your shop is already packed with too many sailplanes. My reason (and I'm sticking to it) is that there were certain features I wanted that did not all appear in one transmitter. It also is a journey of learning and discovery that is the essence of what this hobby is about.

Have you noticed that when you add a function such as dual rate to a control and that control is mixed with something else the dual rate affects both? That's where this all started. I was mixing ailerons with rudder and found that aileron dual rate affected rudder, too. I didn't want that, but could not decouple the effect.

Another thing that pushed the project was the fact that my computer radio drew about 230 milliamps of current from the 600 mAh battery, so operational time was short.

Peter's Kraft Series 73 transmitter with D/R switches, etc., at top left.



As you probably know, a transmitter is made up of four parts. There is the battery, the encoder, the RF generating module, and the antenna. Actually, the RF module and antenna are a matched set, but we will talk about that later. The key part is the encoder. This circuit takes the inputs from the various sticks, trims and switches and makes a pulse train from the information. The output of the encoder is fed to the RF module as modulation to the Frequency Modulated RF signal fed to the antenna. All the features such as memories, mixing, and displays come from the encoder.

Gorden Anderson has designed an encoder that does just what I want and offers it as a kit. The kit is a bag of parts, a circuit board and very complete instructions. The one small problem is that the parts are “surface mount technology,” not “through hole” type construction. That means that the parts are extremely small and the pads where they are soldered are truly tiny. I used a solder paste that is applied to the pads. The part is placed on the pads using incredibly small tweezers and a magnifying visor. Heat is then applied to the part and the paste solders the part in place.

The reward for all this effort is that the encoder winds up being very small and easy to mount in the transmitter case. The encoder is now available already constructed, so soldering is limited to the wires from the pots and trims to the circuit board.

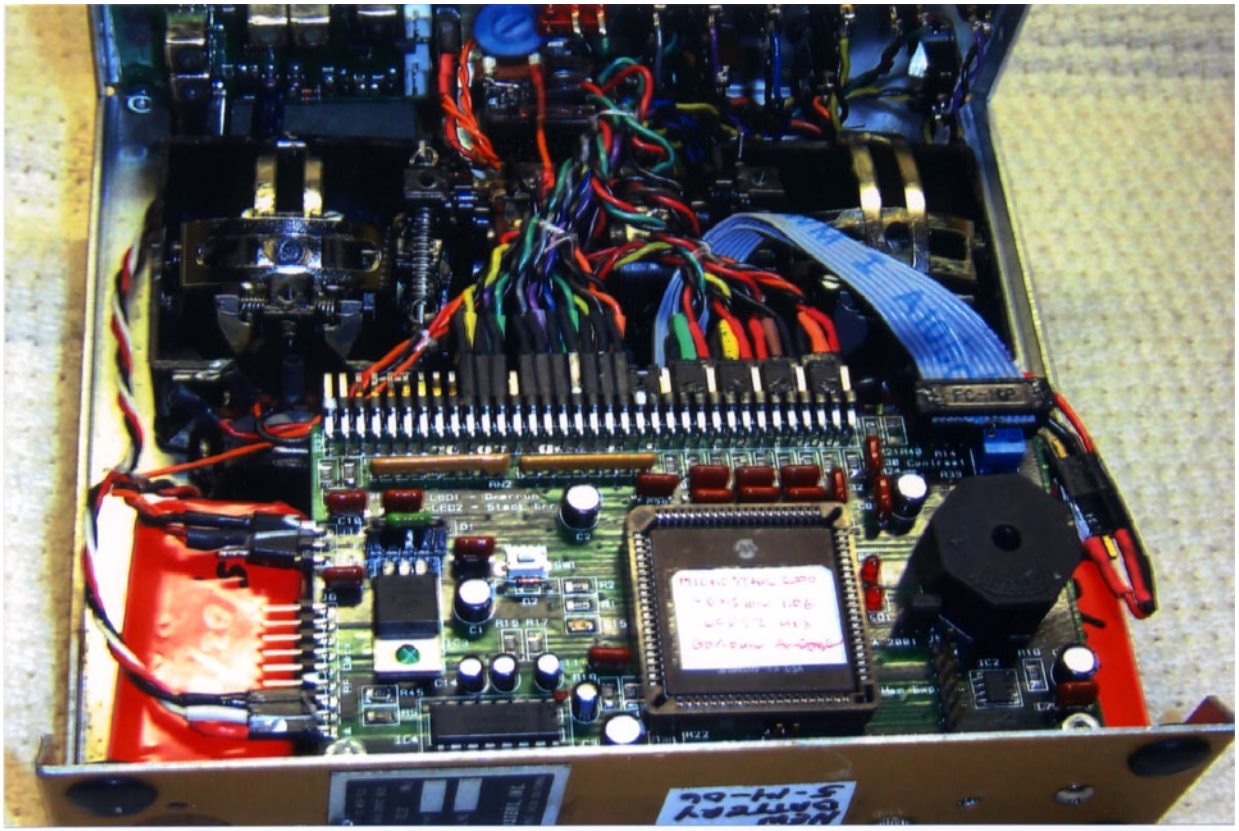
It takes about five hours of very careful work to complete the encoder board. The edge connectors for power, modulation output and interconnections took the most time. There is also a flat ribbon cable that goes to the LCD display.

The display did cause me some headaches. Since the display is visible through a square hole cut into the transmitter case face, it occupies the spot where the battery would normally be located. The solution was to use two 4-cell packs located each side of the display. The two packs were terminated in a Deans 3-pin plug/jack that attaches to the left side of the encoder. The display comes with a bezel so the hole in the case looks factory made. The display and battery packs are installed, and the encoder is attached to the case bottom with L-brackets and two screws.

Once the construction is complete it's time to run wiring to the various controls. In the time honored method used by ACE R/C in their MicroPro transmitters, there is a color scheme for the wiring. The control pots use red and black for the two end terminals and a specific color for the center pin. For example, the aileron pot might use red and black for the pot end terminals and brown for the center pin. The three wires are twisted together into a cable and routed to the encoder edge connector. It's the same with all the pots, trims and switches with a different "center" color for each.

There was a small glitch in the unit I built. I had obtained a Kraft Series 73 transmitter from EBAY and stripped out the old electronics. This unit used mechanical trims. This means that the front trim controls were mechanical adjustments to the main control pots, not secondary trim pots. Luckily the designer had made provision for this. The instructions show how to terminate the pins normally used for trim pots and let the mechanical trim continue to do their thing.

Once everything is wired there is a test procedure to follow that lets



you check for proper operation before powering up. The idea is to detect shorts or other trouble before applying power.

Once the tests are done it's time to put power to the encoder. In my case all went well and the display lit up. There is a contrast adjustment to make (mine is set at max contrast) and then you can check the programming.

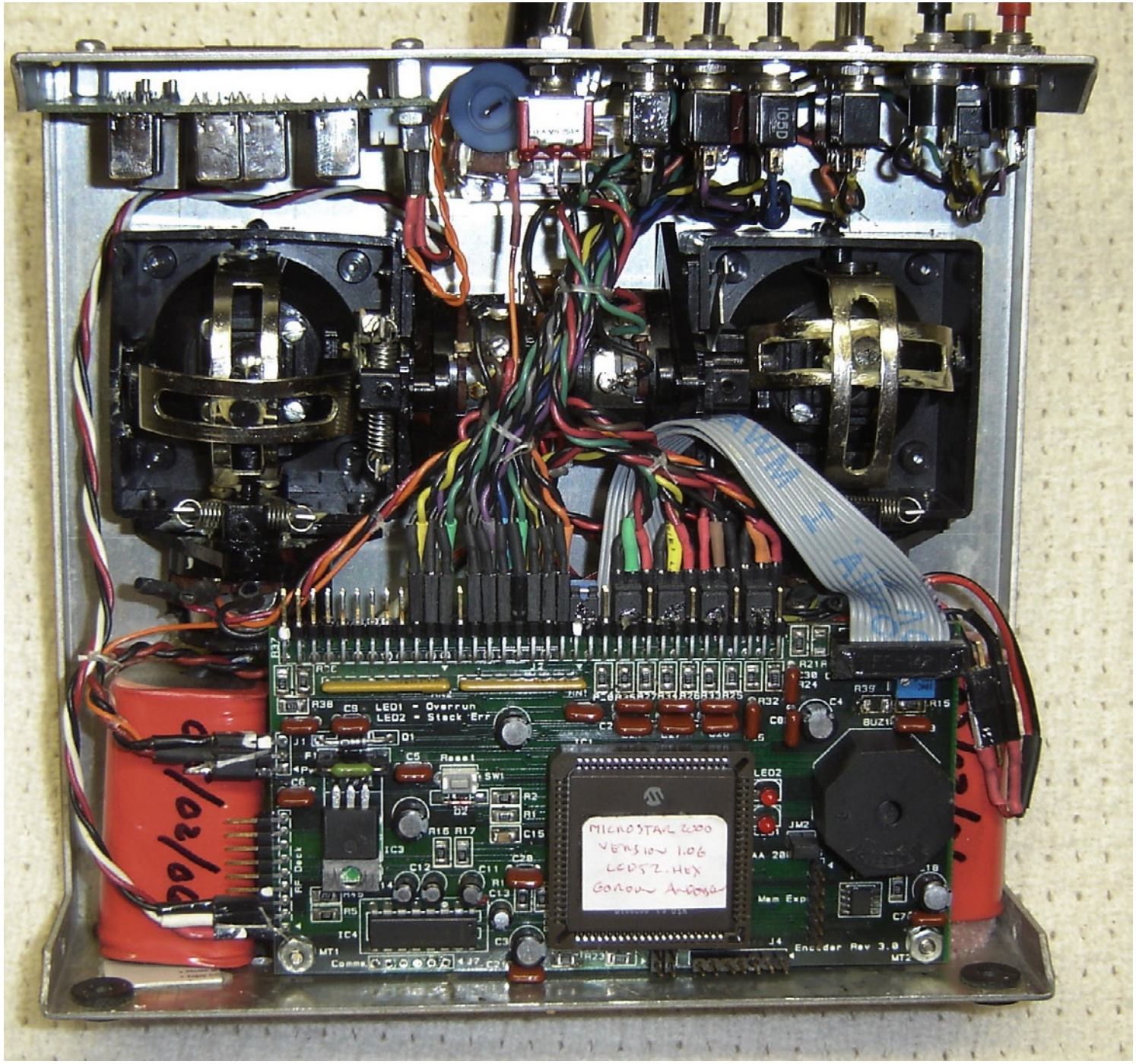
At this point there is a three wire cable hanging loose that goes to the RF module. These are plus and minus 9.6-volts from the battery and the modulation pulse train. The RF module I used was made by FMA and is on Channel 08 (50.960 MHz) in the Radio Amateur band. If you are not a Ham you will be using Channels 11 through 60 in the 72 MHz band.

All the RF modules are the same. They have the three pin jack for the plug from the encoder that powers the module and supplies modulation. The other jack is for the wire to the antenna. My module used a Deans connector with two pins wired together to a common wire to the antenna. The antenna in this case was not removable from the housing so the solder tab was very close to the RF module. A short piece of wire connected RF to the antenna.

At this point the transmitter is complete but not adjusted. Each channel needs to have a "center" pulse width of 1.5 milliseconds. This is done by setting the channel trim to center and the control to center. Then you need to rotate the pot body to obtain the 1.5 ms pulse width. For throttle control you have to hold the stick centered while doing the adjustment. Switched channels such as channels 5, 6 and 7 are adjusted to 1.0 and 2.0 ms pulse width as per the instructions.

The Kraft Series 73 sticks had "flats" on the pot shafts of the main control. It was necessary to mill new flats where the pot was positioned for the correct pulse width. This whole operation was done using an ACE Data meter that reads out the pulse width of each channel and plugged into a companion receiver. The same thing can be done using a servo that is set up for neutral at 1.5 ms pulse width.

Aside from the very cheap price of the transmitter case, the other reason I bought it was the antenna. There is an old saying in Ham radio that bigger antennas are better. Kraft put a really long antenna on their transmitter and that means more range. The other reason was that the case was aluminum which helps make the pilot part of the antenna system. The downside to that is that the FMA RF module was not adjusted to match the antenna. There are several tunable coil slugs on the RF module. The two nearest the antenna connector adjust the loading of the antenna. I use an absorption wave meter to read the radiated RF. It has an antenna and is placed close to the transmitter so that about 3/4 scale is displayed. I turn on the transmitter with the RF module swinging by its wires. Caution; it's possible for the module to touch something and short out so be careful. I adjust the two coils alternately to obtain



Interior of Kraft case. Encoder is at lower center, Display ribbon cable at middle right. RF Module is at Upper left.

maximum signal on the meter. It's also possible to insert a milliamp meter in the battery lead to read total transmitter current draw. Mine wound up at 140 milliamps. As you can see, that is a considerable reduction from factory-built transmitters.

When all is finished and the transmitter is tested with a companion receiver and servos, you are ready to make things neat. I bundle the various wire cables together and tie them up using dental floss. The objective is to clear wiring away from moving parts such as the control pots. It's also a good idea to immobilize wiring around the main on-off switch since that will be buried under the rest of the wiring. I also tied the power plug and jack on the left side of the encoder together to prevent accidental disconnect.

The next order of business was to install a receiver in an "experienced" airplane and go to the field. I performed the normal range test and got over 100 feet with the antenna down. Even at 100 feet the servos jittered a little but I still had partial control. In the air the aircraft operated normally with no range issues. Ham operators are authorized to work on the RF modules. If you are not a Ham, think about becoming one and getting in on the fun. If you are using Channels 11-60, you may need to find a repair shop that will tune up the RF end of your project.

Now that the transmitter worked, it was time to explore all the programming features that were the reason for the whole project. Once again, the manual was extremely complete in describing mixing sequences and such. I did make several copies of the manual and keep them in various places including the transmitter carrying case. The sequences are easy to follow, but once set you may not do programming for a while. It's nice to have the manual to refresh your memory.

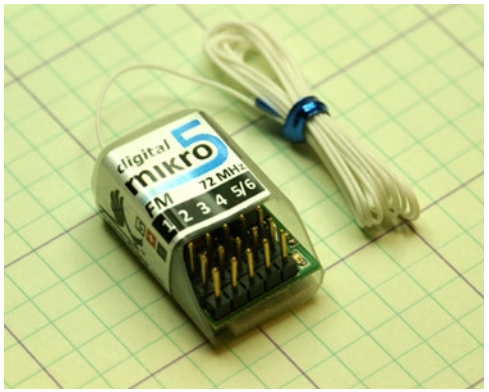
Is all the work worth the effort? Yes it is, for several reasons. First, the programming capabilities are truly impressive. Second, I know every part of the unit and am sure that they are all optimized for best performance. Third, the transmitter really stands out in the Impound area!

Here is the chance for you to solve all those niggling little problems that decrease the fun-factor of flying. For example, the old Pro-line transmitters were reputed to have the finest sticks in the business. If a MicroStar 2000 encoder were installed in the Pro-line that would be a match made in Heaven. Dual-rate switch positions? Put 'em where you want 'em. Left handed people can lay out the controls to suit their preferences. Big hands, small hands, no problem. You may have different preferences, but you can see the possibilities. The options are there for you to choose.

Sources:
<http://www.mstar2k.com>
<http://www.qsl,net/k5bcq/mstar2k/mstar2k.html>
<http://www.jensenjetmodels.com/id18.htm>

Mikro Designs
mikro-5 receiver

Update by Bill Kuhlman, bsquared@themacisp.net



Mikro Designs has teamed up with Michael Richter to improve the Mikro-5 receiver once again. Here are the highlights of the newest version.

The Mikro-5 arrives from the factory set up for servo channels 1-4 and 6. It can be easily reprogrammed for channels 1-5. Contrary to the procedure used for before, no configuration block is needed for reprogramming.

The Mikro-5 automatically adjusts to positive or negative shift, and so can be used with any 72 MHz FM PPM transmitter.

The Mikro-5 is a crystal-based receiver. While GWS crystals will work, it's highly recommended that a MikroDesigns crystal be used. Don goes through every one of the Mikro Designs crystals and rejects those that are more than 300 Hz over or under the stated frequency.

The Mikro-5 is happy running on 2.4V-6.0V, and can therefore be operated with a single lithium cell. This is a great feature for indoor and park flying.

We really appreciate the availability of the Mikro-5 in both vertical and horizontal (end) pin configurations. We're using the end pin configuration in our Alula, and the vertical pin receiver in a Weasel Pro.

The new case, designed and made by Michael Richter, is worthy of mention as well. Rather than the previous light cardstock case, the new Mikro-5 receiver comes with a mandrel-molded polyolefin case which offers far more protection. The receiver can be easily slipped out of the case if desired.

The Mikro-5 is small receiver at just 1.4" x 0.63" x 0.4" and 6.2 grams (horizontal pins), and 1.0" x 0.63" x 0.4" and 5.7 grams (vertical pins). For comparison, the Hitec HS-50 servo shown with the two Mikro-5 receivers in the photo to the right weighs in at 7.0 grams.

The Mikro Designs Mikro-5 is now being distributed by Michael Richter <http://www.dream-flight.com>. The introductory price is just $38 and includes the crystal. ■