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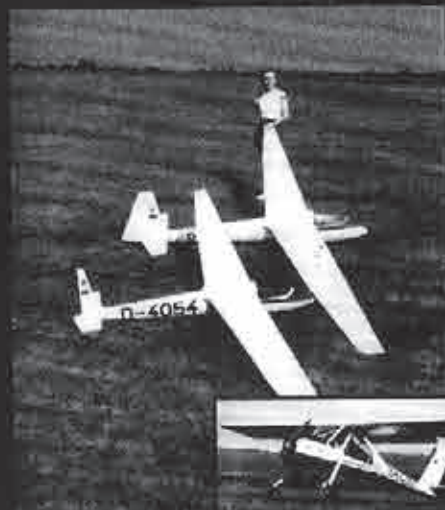
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"Hey, Rick!! I TOLD you to play with that toy, **OUT-SIDE!!**"

Photography by Rick Palmer, Springerville, Arizona, Christmas 1995.

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The Soaring Site

A Sad Note

Ben Matsumoto, of "Wings" fame in Southern California, a beloved sailplane enthusiast and friend of many sailplanes folks, has departed this world to soar with the Eagles. His friends deeply miss him, and it is with sadness that we tell you of their loss. May memories of all the good times be with them, always.

Another Sad Note

Struts, beloved mascot of the Memphis Area Soaring Society, has departed this world, but his memory lives on with those that met him. In honor of his devotion to his sailplane family, the MASS folks held the First Annual Struts Memorial Contest.

Quick Survey

A bunch of you folks out there are on-line, and undoubtedly see a number of short stories, many of which never go into print, unless a sharp newsletter editor picks up on them, including them in a club newsletter for the enjoyment of those not on-line. Right?

We want to do a quick survey. Should we print articles that have appeared before, such as Tom Nagel's delightful short story "Thermal Vagrant Meets Slope Gypsies" in the November issue? If you don't care one way or the other, no response is necessary. For those that can, send us an e-mail called Quick Survey - (your first name), with a yes or no. Why do we want your first name? When we open the e-mail, we don't want all the messages to have the same title on the subject line!! :-)

For those not on-line, a sticky with: Quick Survey, yes or no, is just fine.

On Vacation

Viking Models, U.S.A. will be taking some time off from doing fuselages; but, we'll be back after the first of the year.

Corrections

In the November issue of RCSD, two photo captions were reversed: the caption for Pat Bowman's Ruffneck II on page 14, and Marc Webster's Survivor II on page 15. The phone number for Ron Davis, page 17, is also incorrect and should read (805) 250-0020. Sorry Guys!

Happy Flying!
Judy & Jerry Slates

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Molded Hollow Core Wings Part IV Preparation

The wing molds are completed! Remember, this is my first attempt doing a hollow core wing. So, what to do next? Well, from this point, I'm just going to play it by ear, so to speak. We'll learn by trial and error.

The first thing to think about are the ailerons. In order to ensure a gap free aileron, I molded a Kevlar™ strip into the top wing skin for my hinge, which still leaves the bottom with a gap. In order to fix this, a step was added to the bottom skin of the aileron. (The step was not in the original wing plug.) It was created by simply adding a 1/32" by 3/8" plywood strip to the bottom half of the mold, using thin CA. See photo 1 and figure 1.

Now for the wing skins. What would be best? Balsa or Foam? Well balsa is good, although it is a bit heavier than foam; plus, I would need to glue several sheets together in order to form each wing skin. Checking out the foam options, Rohacell™ seemed a bit expensive choice, so was eliminated; a sheet of pink foam was finally selected, as it was sitting there, having nothing better to do.

Several 1/16" thick sheets were cut from the pink foam; then, test strips were prepared using 1.4 oz. fiberglass on one side, and 2 oz. fiberglass on the other side. While very light, the strips were not strong.

Later that evening, I was chatting with Steve Savoie on the telephone, and he suggested trying some Spyder foam. I decided to give it a try.

The next day, I gathered up all the small scraps I could find, preparing

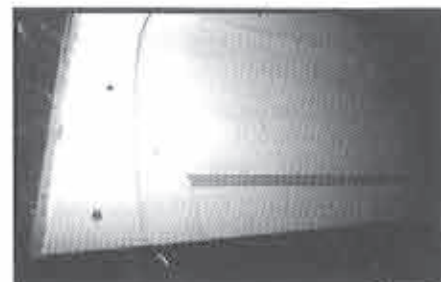


Photo 1

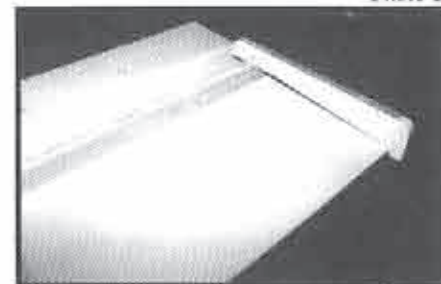


Photo 2

more test strips the same way that the pink foam strips were prepared. Perfect! They appeared to be just what I was looking for! (Thanks, Steve!)

The next day, I called George Sparr at Aerospace Composite Products and asked his opinion regarding the use of Spyder foam as a core material. After discussing the subject for awhile, he just happened to mention that he had a set of wings that were made using Spyder foam as a core material; he said they looked good. Well, that was good enough for me; so, full ahead with Spyder foam.

The last problem to solve was to ensure that the wing spars would be straight; the wing joiner rod would have to line up. A set of jigs were prepared as shown in photo 2; three jigs are used on each spar, one at each end of the spar, and one in the middle.

For now, all the immediate problems appear to have been solved, although something else will probably pop up. It appears that everything is ready; the actual layup of the hollow core molded wing can now begin.



Figure 1

Until next month! Have a Merry Christmas and a Happy New Year!

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Improved Tape Hinges

...by Martin Simons
Stepney, South Australia

I have been dissatisfied for some time with the ordinary tape hinges on ailerons, flaps, etc., that many of us have been using for years. Just running lengths of sticky tape, normally both outside and inside the hinge line, is quick and has the advantage that if a control surface does get knocked off, it can be replaced, easily. The tape also seals the gap against air leakages, which makes for greater aerodynamic efficiency.

But the simple tape hinge soon becomes sloppy, tends to unpeel after a few hours exposure to the sun, and the tape tends sometimes to crack. On my own models, for some time now, I have backed up the tape with some other form of hinge points, one at each end of an aileron and another close to the drive horn.

Nic Wright, a former World Champion in F3B competitions, visited Australia at Easter 1996, and his models attracted a lot of attention. Almost the only feature that Nic did not explain in detail was his method of making the working part of the hinges for ailerons and flaps. I have never seen these described in any of the regular



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A NEWSLETTER FOR
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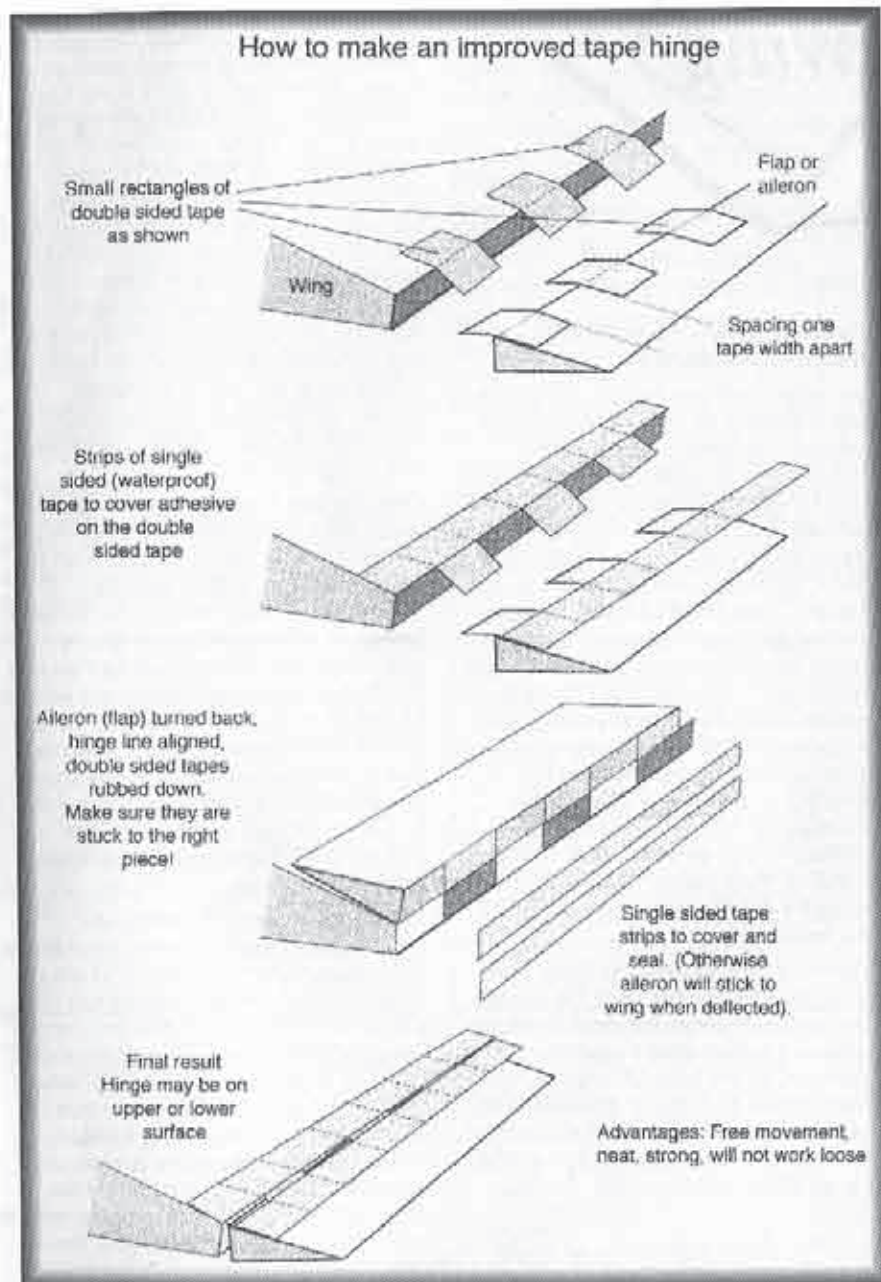
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modelling magazines, but very likely they have appeared somewhere before and I missed them. Still, after asking a few people about them, I found nobody who could explain how they were done. Nic himself answered my letter helpfully, but didn't understand the question! He probably thought the whole matter too obvious to require description.

I made a few small trials to work out how this kind of hinging may be done, and the result is presented in diagram form here. I have now at least one model which has hinges of this type. They work well, and I shall use them, again. There is no slop, they are strong and show no signs of coming undone, and yet, the movement is free. The gap is well sealed.

The only disadvantage is that they take a little time and care to make and, if a model was sufficiently damaged to require the hinges to be completely stripped and replaced, that would not be altogether easy. I would not like to do it in the field during a competition. There may be easier ways of achieving the same end. If so, please let us all know about it.

Double sided tape in different widths can be bought in good stationers and



art shops. It is important to use the tape which comes with protective paper on one side. Some shops do sell double sided tape, which is not protected in this way. I find this impossible to use.

Of course, the hinges can still be properly faired as Nic Wright does. But for those of us who are not so fussy, they work perfectly well as plain unfaired hinges too, as the diagram shows. ■



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Achieving the Potential of Tailless Planforms

As mentioned previously, Hans-Jürgen Unverferth is an ardent supporter of tailless planforms. He has been involved in the design, construction, and flying of a large number of tailless aircraft, both glider and powered. His list of accomplishments includes Just In Time, CO², CO⁵, CO⁷, Joined 1 and Joined 2, and other sailplanes, plus Extase, an electric powered pylon racer. He is the author of "Faszination Nurflugel" ("Fascinating Tailless"), published by Verlag für Technik und Handwerk GmbH in Germany, and is now completing a second book, entitled "Der diskrete Charme des Nurflugels" (The Discreet Charm of Tailless"). This latest book is a continuation of "Faszination Nurflugel", and includes detailed information on CO⁷, his latest design.

Hans-Jürgen has been building and flying model aircraft since 1969, when he was in his teens. He quickly found radio controlled speed models, powered by OS Max .15 engines, to be his favorite. In 1976, he discovered RC sailplanes, and almost immediately became involved with F3-type models, flying F3B in international competitions.

In 1985, Hans-Jürgen was out slope soaring with a friend who was having some problems flying his tailless glider. The friend asked, "Do you want to try?" Hans-Jürgen accepted the invitation, and has been hooked on tailless aircraft ever since. Hans-Jürgen

has been flying swept wing tailless entries in various contests throughout Europe, competing several times at Kaltenschirken and in the Viking Race. Additionally, he made an attempt at breaking the world speed record for gliders using his JOINED 1 design. Together with Reinhard Sielemann, Christian Belrens, Stefan Siemanns, and Christian Tallmeir, Hans-Jürgen has tried to improve the performance of tailless gliders and establish them in F3B, F3E, F3J, and F3F. Despite this continuing endeavor, Hans-Jürgen feels the real values to be derived from tailless planforms are fun, a little bit of adventure, and a feeling of being one of the aviation pioneers!

Over the last decade, many advancements have been made in the realm of swept wing tailless sailplanes, both full size and model. Winch launching of tailless swept wing models, for instance, had always presented a number of difficulties, including instability on tow and lack of height upon release from the line. Both of these problems have been solved from within a rapidly evolving design process consisting of incorporation of anhedral, proper location of the tow hook relative to the CG, better airfoils, and programmable full span camber changing.

Despite these advancements and performance improvements, there is one area where tailless sailplanes have not quite met their tailed counterparts — sink rate. Tailless planforms can be designed to have excellent glide ratios, but they tend to fly significantly faster than their tailed counterparts when operating at the same wing loading. Their sink rate is therefore higher, and duration times in still air are shorter. Through careful tailoring of wing section and other planform parameters, however, this last gap in performance is rapidly shrinking.

Hans-Jürgen's focus is now the perfection of a system by which the center of gravity can be moved in flight. Together with some amount of automatic stabili-

zation, a moveable CG may be the key to unlocking extremely high performance from the tailless planform.

In the past, various methods have been used to move the CG in flight. One popular method is to simply connect a servo to the battery pack. Since the mass of a battery pack is relatively small in comparison to the entire airframe, it's difficult to get enough CG movement. Tests done by Hans-Jürgen's team, for example, show a CG movement of around 4 mm on airframes suitable for competition. Stefan Siemanns, however, has perfected a way to move the entire fuselage, thus obtaining CG movements over a 15 mm range, which is quite an improvement.

In the words of Hans-Jürgen, "Why do we use radio controls? To build constructions characterized by very high 'own-stability'? It's a joke! We have to be

creative; fantasy has to rule our thoughts! Think about the F-16, B-2, all the modern fighters. There is no 'own-stability', there is a computer! This is the future of model sailplaning. And there is one geometry waiting for this time — the tailless glider!"

A system which integrates the power to move the center of gravity over a wide range and a method of maintaining aerodynamic stability should allow tailless planform performance to far surpass and remain permanently ahead of that of conventional tailed designs.

As noted earlier, Hans-Jürgen has a number of projects in which he is currently involved. We will attempt to keep readers of this column informed of the progress and results of these various endeavors. ■

T.W.I.T.T.

(The Wing Is The Thing)

T.W.I.T.T. is a non-profit organization whose membership seeks to promote the research and development of flying wings and other tailless aircraft by providing a forum for the exchange of ideas and experiences on an international basis. T.W.I.T.T. is affiliated with The Hunsaker Foundation which is dedicated to furthering education and research in a variety of disciplines. Full information package including one back issue of newsletter is \$2.50 US (\$3.00 foreign). Subscription rates are \$18.00 (US) or \$22.00 (Foreign) per year for twelve issues.

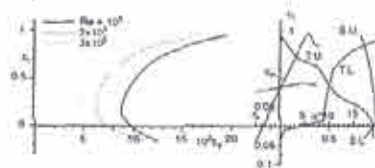
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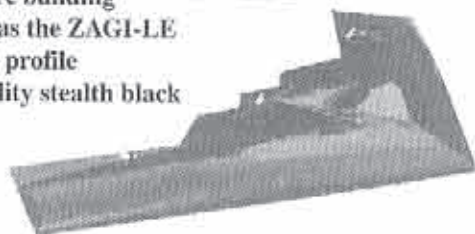
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Video Review

"How to Paint Sailplane Figures"

...reviewed by Jim Gray
Payson, Arizona

If you're an average aircraft modeler, you probably place a seated pilot figure in the cockpit or the cabin of your model. Right? And, if you're like me, you're probably NOT happy with the results of your efforts. My pilot figures usually turn out looking like caricatures — or worse — and don't even faintly resemble miniature human pilots. I'm sure we both agree that a grotesque pilot figure spoils the appearance of a great-looking model; many modelers, including myself, often leave it out, because we don't know how to make a good one.

Now, there's help for us: a two-hour video of master modeler, Don Typond, seated at his workbench in his shop, showing step-by-step how to create the illusion of a full-size human pilot for a model aircraft. He begins with a Williams Brothers molded pilot figure, but the principles he demonstrates can be applied to almost any of the available figures.

First, Don shows a selection of water-based acrylics in the various colors needed for painting the pilot and his/her clothing. Then he shows the brushes we'll need for painting the pilot, and, which ones never to buy. Surprisingly, we need only two or three brushes and half a dozen paints. Examples of paint and brushes are shown in clear, close-up, full-color video. Next, we're shown the other basic things we'll need: a jar of water for cleaning brushes, paper towels for blotting, good illumination, a cheap hair dryer or heat gun, and of course, the pilot.

Did you know that a pilot figure is painted from the skin out? Like we dress? The skin is painted first; then, the eyes and hair; finally, the clothing and details. Don shows how to avoid the staring, pop-eyed look, and where shadows and highlights are located when direct sunlight falls on a pilot seated in a cockpit.

As this fascinating demonstration progresses, we learn easily and naturally to see and paint as an artist sees and

paints. Don shows us when and where to use long, smooth brush strokes, or short, stippling ones, and how to paint hair.

Gradually, a very human-looking pilot takes shape under his hands and before our eyes; we realize that we, too, can create such a pilot. Little details of shoulder harness and buckles, folds and creases in clothing and hat, and all the illusion-creating techniques are demonstrated carefully and completely. In fact, as I watched, I felt that I couldn't wait to try those techniques myself; the video is that compelling.

Finally, Don shows us some advanced techniques for creating a believable pilot... How to avoid a stiff pilot figure staring up at the sky by leaning forward in the cockpit, and by turning his head to right or left. Or, tilting it down as if the pilot were looking at the instrument panel. Then, he shows us how he created a very lifelike simulation of himself, and how each of us can work toward that goal as our skills develop and grow.

As has been said before, "If you enjoy instructional videos of this type, and would like to see more of them, please don't make free copies of the tape for your friends. If the producers can't earn a decent living making these tapes, they won't be able to continue producing them, and we all lose out."

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LSF



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1996 F5B World Championships

The '96 edition of the F5B World Champs were held in Prague, Czech Republic, from August 19th thru the 24th. Two of our club members, Peter George and Cal Ettl, made the long trip across the Atlantic to take part in the World Champs - Cal as a FAI jury member and Peter as an interested spectator. This year's USA team members were the '94 F5B World Champion, Jerry Bridgeman (speed controller designer and previous member of F3E and F5B teams), Steve Neu, newcomer Thomas Pils, and team manager Bob Sliff.



US '96 F5B Team - (L - R) Thomas Pils, Steve Neu, Jerry Bridgeman and Team Manager Bob Sliff. Peter George photo.



Steve Neu holding F5B model flown by US team. Called the Tornado, model spans 65" and uses the RG14 airfoil. Total weight is 75 oz. Motor is an Aveox with a Neu designed speed controller - powered up with 27-1000mah cells. Peter George photo.

This year's WC was held on a flying field outside of Prague and, after 8 rounds of flying, the new World Champion is Franz Weissgerber of Germany. Franz has been a team member since the 1st World Champs in Belgium way back in '86 and has always been in the hunt for the trophy and this time he caught it!

Final individual standings were:

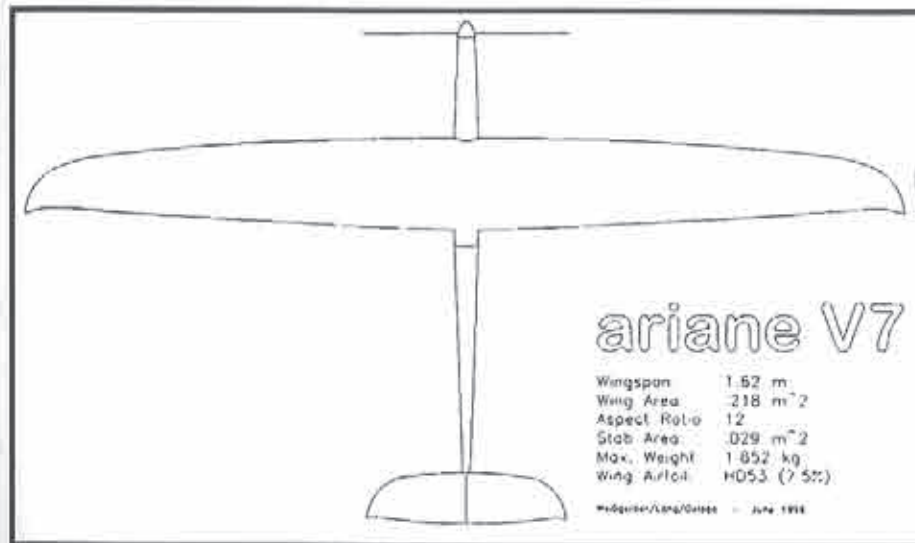
- | | | |
|-------------------------|-------------|------|
| 1. Franz Weissberger | Germany | 4048 |
| 2. Florian Lang | Germany | 3999 |
| 3. Urs Leodolter | Switzerland | 3972 |
| 4. Rüb Guntmar | Germany | 3949 |
| 5. Rudolf Freudenthaler | Austria | 3947 |
| 6. Thomas Pils | USA | 3942 |
| 7. Jerry Bridgeman | USA | 3927 |
| 8. Steve Neu | USA | 3883 |

Final Team standings were:

- | | |
|----------------|--------|
| 1. Germany | 11,996 |
| 2. USA | 11,722 |
| 3. Austria | 11,424 |
| 4. Switzerland | 11,380 |
| 5. Italy | 10,974 |

Franz flew a fully moulded design called the Ariane V7. The Ariane is a team effort design using production grade moulds and building methods to produce the models. The model has a wingspan of 1.62 meters (64.6"), a flying weight of 1.85 kg (65.2 oz.), and was powered by a new, geared, brushless motor from Kontronik-Bloch of Germany using 27 - 1000mah cells. The motor uses a kevlar casing instead of steel, which results in a very light motor, which in turn allows for a lower overall model weight. The model was noticeably faster accelerating when the motor came on. To give you some perspective, the airframe is close to the same size as that of a 60" slope racer such as a Renegade, Whip, or Night-hawk, albeit with a slightly larger volume fuselage. Now stuff the motor, speed controller, and 27 cells into the fuselage. Altogether, that makes for some dense packaging!! In reality, these are pylon racers.

Congrats to Franz who has been in the hunt all these years and also to the USA team members for their 2nd place team finish, and for representing the United States. Initial indications look like the '98 World Champs will be in Germany. I'm up for going there!



1996 World Champion Franz Weissgerber (waving) with team helper holding the Ariane V7. The angle that the model is being held masks that it is a V-tail. Peter George photo.

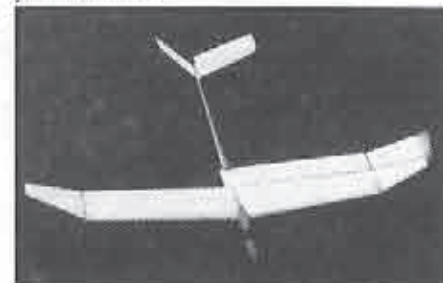
There will be an article in a future issue of *Model Aviation* on the World Champs with plenty of color photo coverage and details of the event.

Monarch Ex Review - Continued!

Last time around, we were finishing up the flapperon surfaces of the wing. When all the wing parts were completed, I joined the fixed wing panels, again checking alignment and dihedral, by tacking the panels together with foam compatible CA. After double checking alignment again, I

used the supplied fiberglass strip to reinforce the joint, taking care to use only enough epoxy to wet out the 'glass, and no more.

Once the wing was joined and in one piece, I made the decision to seal the balsa wood, using Deft semi-gloss clear wood finish sprayed on in light (And I do mean light!) coats. With that dry and done, the hinges and gap seals were installed. There was a 1/8" gap between the wing and the flapperon surfaces, and the hinge curved to match the surface movement, versus the usual taped hinge line and the resultant kink at the hinge line. When it comes to installing the hinges, just follow the construction notes and you'll do fine.



Partially completed Monarch EX. Note the flapperons! They're huge!

Installing the flapperon couplers takes a bit of finesse to get it right. This plastic coupler is an inverted vee with

flats on the open end of the vee - these flats are what gets glued to the upper surface of the flappers. Be patient here, and do one surface at a time. I got cocky and tried to do both surfaces at once, and had a mess on my hands. Luckily, there was a third coupler in the kit, and I was more patient the next try; it worked out fine.

With the general construction essentially done, it was time to decide on the final finish. I had made my mind up early on that I would do the butterfly finish; for that I used 21st Century Space Age Paint in orange for the base color, a strip of flat white paint on the trailing edge and a small portion of the leading edge of the wing for the white spots, and black permanent markers for the black butterfly markings. This all worked out pretty well, though I am sure it added a bit of weight. Oh well, I like the way it looks!! I left the fuselage as is because I was a bit uncomfortable putting a black finish on a fuselage with such a light lay up and turning the fuselage into jelly while sitting in the sun.

When it comes to fitting the radio equipment and motor bits, the drawings and notes show a 6 cell pack being fitted. I planned on using a 7-500AR cell pack for competition and sport use, so I had some concerns about fit and balance. Also, the drawing shows the receiver located directly behind the motor, which to me is dicey due to the electrical "noise" these motors put out. I much prefer to separate the receiver and the motor as much as possible, so the receiver ended up back under the wing, instead. I also had to take into account that I will later try out a Graupner Speed Gear 400 geared motor, and the gearbox will take up a bit more room up front. I used HITEC HS-60s in the fuselage driving the ruddervators and HS-80s in the wings to move the flappers.

We'll finish up (I promise!!) with the Monarch EX the next time!!

Merry Christmas to all, and may you find the models and equipment of your wishes under the Christmas tree! ■

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This Old Plane



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A Christmas Stocking

By way of explanation, for those of you who don't know about the Christmas stocking custom, a Christmas stocking is hung from the mantle, and filled with goodies over night.

As a Christmas present to all my current and future flying buddies, I wanted to send you each a gift certificate, but my dog ate the check book. Instead, I decided to give you an article full of goodies I have come across in the last year. These are goodies of knowledge, and hopefully some will be new to you. So, this column is an eclectic stocking full of tips, mostly for vacuum bagged planes, as lately I have been up to my ears in bagging wings. I'll try to think of a couple tips for the composite builders, too. (You know: balsa, plywood, iron on covering, and glue). So, if this article seems like a jumble of odds 'n ends, it was planned that way.

Cleaning Mylars

After pulling 30 wings from each set of Epsilon mylars, the back sides were getting rather grungy. If you put them face down to scrape the backs, you end up scratching them. Turns out, the answer was easy. After laying up a wing, while the wing is still in the mylars, go ahead and use a razor blade as a scraper, and get all the spooxies off. After that, you can carefully use alcohol and a cloth to clean them up, from things like paint overspray, and 3M77. Use alcohol sparingly, as it will mar the paint if it gets between the mylar and wing.

For those who don't know what a spooxie is, the Hawaiian Board

builders dictionary defines:

Spooxie: Pookie where it does not belong. And, Pookie: Epoxy.

To reduce the bump that occurs where the mylar stops at the leading edge, sand or scrape the edge of the mylar to a 30 degree angle; this allows the vacuum bag to follow the edge.

The most under rated (least used, but should be commonly used) **fiberglass cloth**, is 2.5 oz. It is usually a very tight weave, and quite pliable. Works good for both fuselages, and wings.

If you use **caulking** to seal your vacuum bags, you might have heard, "Go buy the cheapest rope caulking you can get." Garbage. Look for the 3M "Tacky Tape" variety. It seals better, with less pressure, and comes apart easier than any other I have used. Darn, when I think about it, I could have unloaded all the rolls of poor quality caulking tape from the shop into my friends' stockings. Next year...

All epoxies are not created equal. I took .2 oz. off a 4.6 oz. wing by using a thinner viscosity resin. It allowed me to wet out the cloth with less resin. (**PJ's resin** - It is advertised in this magazine.)

If you use balsa, and plan to cover it with an iron on covering, first use thinned **nitrate dope**, then the "Balsarite" or whatever "pre-glue" you prefer, before the iron on. It is measurably lighter, and the balsa is stronger than just with the Balsarite.

Ever use acid brushes for moving pookie around? Ever been able to keep them clean? Me neither. I have found that the **artist brushes** with stiff bristles (but fine hair), that are spread in a very thin arc (called fan brushes) clean very easily. The thicker brushes hold too much epoxy. These thin fan brushes clean with a single shake in an acetone can, or by squirting acetone over them on a paper towel.

Speaking of squirting stuff, arts and crafts stores sell **squirt bottles**, which I use for alcohol, acetone, and even laminating epoxy, for when small amounts are needed. They are real cheap, and rather more user friendly than a gallon can.

Ever need to make long, straight cuts in anything? From striping balsa, to cutting

plywood, to cutting out ailerons from a bagged wing? The hard part is usually keeping the straight edge from moving. Enter the sponge type, **shelve liner**. The stuff looks like coarse window screen that has seen too many bug storms. It comes in rolls, and many colors. Take a 1" wide long strip of this stuff and throw it in your hobby room. To make a fool proof, straight cut, drop the strip of spongy shelve

liner so that one edge of your straight edge is on it, and the other edge is flush to the surface you are cutting. It will be difficult to align the edge, as it won't slide (But, this is good!). Just lift the ends 'til they line up, then drop them. It takes very little down pressure to keep the straight edge in place. That is it for now; let me know if you wanna hear more of these!

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Weight: 62 Ounces
Fuselage Length: 54 inches
Wing Area: 961 Square inches
Stabilizer Area: 110 Square inches
Aspect ratio: 15.4:1
Recommended CG: 1.0" aft of Spar
Tow Hook: F38 Style

PRICE: \$550.00

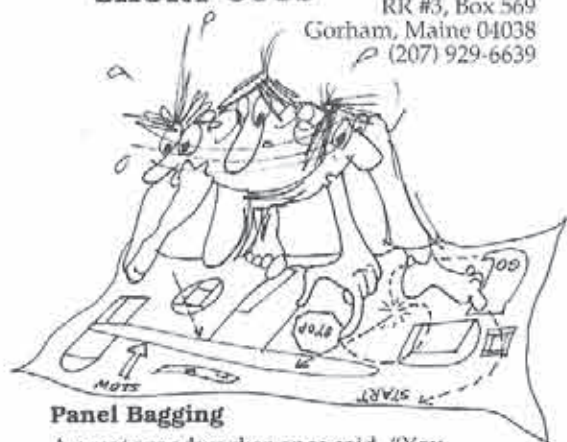
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Panel Bagging

A great woodworker once said, "You can never have enough clamps," so what do you do when you run out? Well, I didn't run out, but I often get lazy and take the easy way out. By that I mean, using the vacuum bag. It's easy, quick, and provides an evenly distributed, uniform pressure, instead of the concentrated pressure of a clamp. Several days ago, I was preparing to lay up some heavy, 6" glass tape in order to make small panels; I planned to cut out control horns. I didn't like all those holes in printed circuit boards that are so commonly used in applications similar to this, so I figured I could make my own; just add some black pigment to the resin and press. Well, it soon became quite apparent that pressing would not be an option, especially since the workshop temperature was 55 degrees and I could not get my electric blanket around the entire panel without making a mess. I then remembered George Sparr from Aerospace Composite Products telling me about a builder in California using a frame to bag small components.

I decided to build my own and try it out. The first thing I did was to purchase a 10' length of 1" schedule 40 PVC pipe. Please note I said pipe, not tubing; the schedule 40 designates a nominal pipe wall thickness. I then purchased four 90 degree elbow fittings that slip over the outside of the pipe to assemble the four legs of the frame. This was where a problem arose. The whole concept of the frame

was to stretch the tubular vacuum bag taut so that panels could be pressed against each side of the bag.

Since the elbows slipped over the **outside** of the piping, the bag was tight at the elbows, but loose in the middle of the frame where the smaller diameter piping did not draw the bag tight. Back to the hardware store again; boy those folks are very willing to sell me anything I need, but they no longer ask what I'm building. I guess that joke about the Still has them afraid to ask what the hardware is for.

Anyway, this time I purchased barbed 90 degree plastic elbows that were designed to fit **inside** PVC tubing. After a few minutes on the belt sander (the fittings not me), I managed to sand down the barbs so that the elbows fit inside the 1" PVC pipe. On the subject of sanding, remember that the vacuum bag will be making direct contact with the pipe and fittings, so make sure all surfaces are smooth. I finish sanded mine with 320 wet paper. Next, I changed the length of the frame legs, so that when assembled the bag was somewhat taut. Remember, measure twice and trim only half of what you intend to, or just buy a lot of pipe.

Once the frame (pipe) was cut to size, I drilled 1/16 holes every 1" along each length. I kept the holes straight by first scribing a line along the pipe. After all the holes were drilled, I cleared the chips and re-sanded the surfaces smooth. I then gave the frame a test fit in a new bag by first assembling the frame with the holes pointing towards the center of the bag, and leading breatherfelt from the external vacuum tube fitting in the bag to one section of piping. The piping and the pre-drilled holes served to evenly evacuate air from the bag when placed under vacuum.

The next thing I did was to remove the frame, flip the bag inside out and wax the bag. This was done to reduce the tendency of excess epoxy grabbing onto the bag, and to also facilitate sliding the frame into the bag. The bag



was reversed, and I did a leak test on the assembled bag, which was fine.

My lay up was made on a small piece of mylar, which was then covered by peel ply. The entire assembly was positioned inside the frame with only three legs assembled. The last leg, near the bag clip, was assembled, and the entire unit placed under 25 inches of vacuum. As the air was evacuated out of the bag, the two bag surfaces (top and bottom) made contact in the center of the frame, and eventually pulled in to make contact throughout almost the entire inner area of the frame. This created a very tight film plane that's almost as flat as glass. At this point, the frame was very easy to handle and hang out of the way until the epoxy cured.

I wrapped the frame inside an electric blanket, and cranked the temp control up to the max. After only eight hours, the epoxy was cured enough to remove the panel from the mylar and still retain a mylar smooth surface. I have since used this method several times to bag small panels with combinations of epoxy/glass/foam/carbon; it's also been used with 3M 77 and CA as a clamp when gluing balsa/plywood/fiberglass.

I've been told that this technique has been used to bag small stabs without mylar; just wax the bag. I haven't

PANEL BAGGING



AT REST



UNDER VACUUM

tried that yet, but I have bagged stabs with the mylars. The only problem I had was getting the bag to adequately pinch down on the leading edges of the mylar, "Look Ma! No beds!" This method of bagging small stabs without beds only works on symmetrical airfoils; anything with camber gets flattened out. I hope to experiment this winter by bagging more components, and I'm interested to hear from others who have tried this technique or a variation.

Til next time, keep your bag waxed. ■

Heating Element

Several months ago, I wrote an article which discussed using a small, electric, cartridge heater to melt out servo channels in foam core wings. I recently received two calls from kit manufacturers requesting the source of supply. Well, here it is for anyone else interested.

15 Watt Cartridge Heater (120VAC)
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Steve

How To Choose Your Best Scale Sailplane



What it's really all about. Is it real? An ASK 18 on final.

We've Come A Long Way

Let me start this by saying "hats off" to you scale scratch builders who create your masterpieces from the plans up! What follows is primarily for those of us who, like myself, are much less talented, or don't have the patience or time necessary to create a scratch built scale model.

Just the other day, I had a not very successful flight on someone else's scale model. It was built from a 15 year old kit. That reminded me of trying to fly some of the scale sailplanes built from kits 20 years ago or more, and then it dawned on me: we've come a long way! Most of the contemporary scale kits are well manufactured and fly beautifully. The same is true of plans - if you are a scratch builder you can lay your hands on many superb, well-tested, flying scale models. This wasn't always the case.

Just think what it would be like to build a scale model with only paper, or silk, or nylon and dope. No heat shrink "plastic" covering materials were around then, no decent paint out of a spray can, no zap, epoxy or other specialty glues, no dremmel tools or battery-operated drills, and no computer-generated drawings or wing

Robin Lehman
63 East 82nd St.
NYC, NY 10028
(212) 879-1634

"Hot Air"



sections, just to name a few of today's, taken for granted, handy-dandy tools. Very few decent kits existed back then!

Also, if you wanted a model of a particular scale ship, you had to get factory drawings from the manufacturer and build it yourself from the plans up. If you didn't have considerable experience - or help from somebody who knew how - very often your creation, which took many, many months to build, didn't fly very well, at all. Sometimes the wing section needed changing, sometimes the stab needed changing, and a lot of time the incidence of both needed fiddling around with! And even then, sometimes your creation never flew well! Yuck!

With the wealth of excellent flying scale,



Once airborne, the 1/2.5 LS4 is in its element, and can float in the lightest of lift. This one also winches very well. (Miller kit)

non-scale and competition ships on the market today, I'm sure all of this sounds like the dark ages. It was, only we didn't know it then. Add to that, lots and lots of radio problems, as in those days the radios didn't work anywhere near as well as they do today, and there was much, much more interference! Of course, there were no computer radios either!

One or two incredible individuals and companies were many, many years ahead of their time. A few of you might remember a beautiful all-glass Ka6 manufactured and sold by Jerry Nelson. This aircraft flew extremely well and was beautifully designed, but nobody had seen any glass ships before, so this model was not appreciated very much.

If you go back in time just a little further, the absolutely best full sized sailplanes were the Ka6E and the ASK 18. The glass ships were just beginning to be invented - no ASW 24, DG 600, DG 800, ASK 21, Discus, DG 202, or Nimbus 4! All of these were yet to be invented. And of course, nobody had ever thought of, or heard of, winglets!

Airtowing (scale models) was in its infancy then, and the biggest motor you could lay your hands on was a somewhat unreliable 60 sized power plant. If the best motor available today put out only 10 pounds of thrust, it would certainly limit airtowing!

Back to the Present

Today we are blessed with powerful towplanes and excellent towpilots. The many superb scale sailplanes we fly in our group all, for the most part, perform extremely well. We try not to mess with

the lemons.

Unfortunately, however, every once in awhile we do run across a scale model which doesn't fly all that well.

If you are an experienced scratch builder, you can examine plans and see where there might be possible problems and remedy the situation, but if you are inexperienced, DO try to get together with somebody who has done this before so that your creation performs very well.

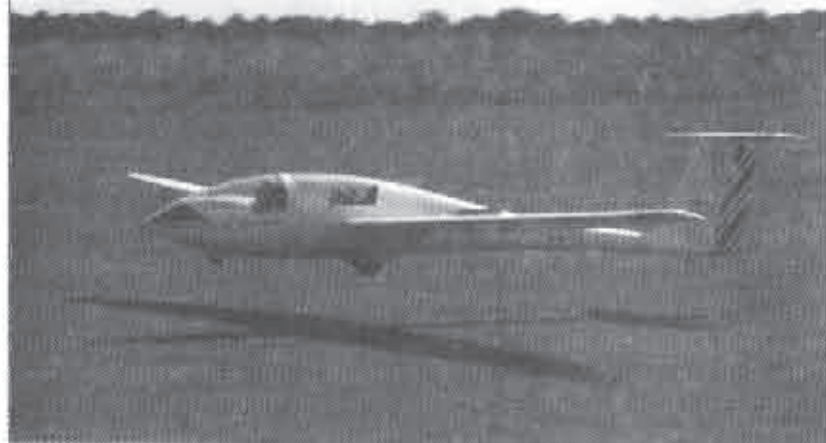
If you plan to build from a kit, ask around and see what others think of your project. Beware of the "real cheap deal" on a scale kit or finished sailplane which has been sitting in your friend's attic for 15 years. It might or might not fly very well, and if you have to invest a lot of time into it to put it together, try to find out from friends whether or not this project is worth all the effort.

The bad reputation that scale sailplanes had just a few years ago or so was well earned - all that work put into a model and it doesn't fly no matter what you do! What a pain! Discouraging to say the least. There used to be many such kits on the market.

Now there are literally hundreds of excellent kits and plans on the market and if you fall in love with a particular scale ship, the chances are you will be able to find either a kit or plans available. Do, however, do a little additional "research" to find out if this scale model performs well. A few additional minutes spent on this aspect of your scale project is time well spent!

One other point on scratch building: don't think that just because you're going to cut out all the pieces and put it all together yourself that this is necessarily an inexpensive way to go. Not counting the time you invest, perhaps on your next scratch building job you should keep a piece of paper handy and add up the out-of-pocket cost of everything that you put into the airplane. You might be very surprised!

Last but not least, some of the time you DO get what you pay for. Whether it be plans, a kit, an ARF or a second-hand well-flown scale model, try to get accurate information on its flight performance and you will be richly rewarded with many, many hours of problem-free airtime!



Recently, I've spoken to quite a few people who are interested in scale sailplanes, but are not quite sure which glider would be best for them.

Firstly, let's dispel the myth that scale sailplanes do not fly well. The fact is that many scale ships will outperform your non-scale competition ships. By now most of you have seen this first hand, and certainly very soon almost all of you will have encountered an excellent scale glider - whatever that means for you! It's obvious that different flying machines will best suit different needs and aesthetic tastes, but how do you go about choosing the scale sailplane which will best suit you?

What follows might be helpful in pointing them in the right direction, and how to make the best possible choice.

1) Price

Price is most important. I can't help you with that one, but just remember that you probably get what you pay for! A \$200.00 kit is likely to be very small and may involve a lot of building, whereas a \$2000.00 kit will probably be quite large with much less building, if not completely finished. Or perhaps you prefer to scratch build something. You might be amazed to find out how much that will cost in time and materials! Some of you are great builders and can create real works of art which the rest of us admire. But not all of us are master builders and so kits and ready built ships are becoming quite popular.

If you have a large landing area, you can safely fly the largest of scale models. This 1/2.5 Grob G102 is both a real floater and a highly aerobatic ship. The body is by Roke; pre-built wings by Dan Troxell. The pilots help to make it look super realistic in flight.

Marie Rolf with 2 Ka6Es: 1/4 Multiplex and 1/3 RZ Flugtechnik models. The smaller one is highly aerobatic, while the larger one is a real floater.



2) Are you an experienced flyer?

If so, you will be at home flying any good scale ship.

If not, get something that has a reputation for being very gentle and easy to fly. Most importantly, try to get somebody else who is experienced to trim out your glider. Many scale ships will fly as well as what you are used to flying - whatever that may be - but they most likely will require DIFFERENT inputs on the controls.

3) Scale appearance

Do you want a modern glass slipper or something older and very distinctive?



This 1/2.5 Grob G103 is very aerobatic; it's great in thermals, too! It takes at least two people to hand launch off a slope, but it is a piece of cake with a large towplane.



This huge Speed Astir (A.R.F. Roke kit) is winched up on a regular basis. Marty Bell makes the 50+ lb. model look like a feather weight!



This is partly an aesthetic decision, but your choice should also be colored by what performance will best suit your needs. Should your scale ship be a floater? Slow or fast flying? Should it be aerobatic? What's important to you?

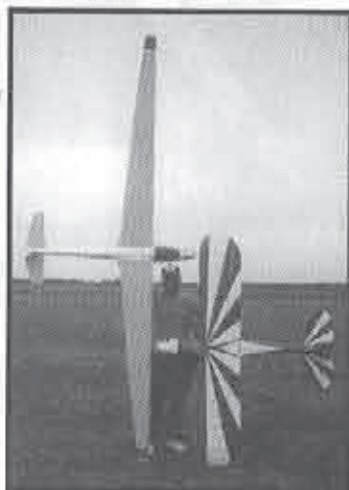
Many scale models fly much like their full size counterparts. For example, a Minimoa is a lovely early bird, but don't expect it to fly too fast or be very aerobatic. Don't expect a Nimbus 4 or an ASW 22 to be very aerobatic, either. On the other hand an ASK 21, ASW 27 or a Salto should do just about anything!

4) How do you plan to use this sailplane?

What is your primary method of launching? Airtow? Winch? Slope? A

December 1996

A nicely matched pair: 1/4 Ka6E with 1/4 cub. Although the original is not aerobatic, this Ka6E will do anything you want, and then some.



combination of all of these?

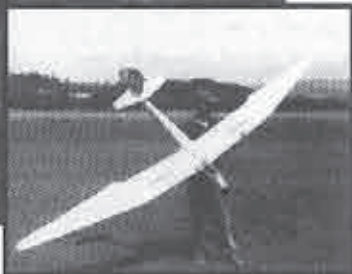
A) Slope soaring is one of the easiest and most satisfying ways to get aloft. If you normally fly off a large hill with bags of lift, then virtually any scale glider will work well for you! If, on the other hand, your hill is small or marginal, then you might favor something which floats well and turns easily. You can safely fly quite large gliders off small hills as long as the flight characteristics of that glider makes it easy for you to best exploit the lift on your particular hill. Most of us end up with a couple of ships which we take to our favorite hill: one for light conditions (a real floater) and one for maximum lift conditions (whatever suits).



How's this for a beautiful, scratch built subject? It's an almost 1/2 sized Minimoa! It takes two to lift, but it is a real floater!

(L) Victor Hurbin with his beautiful 6m, 8 kilos, ASW 22. Super, high aspect ratios lend themselves best to thermal sniffing.

Jack Kagi with his scratch built Minimoa. You can't confuse this wing with any other!



examples. Others, like the ASK 21 or ASW 27 (with flaps), have a very wide speed envelope and are at home in strong winds as well as very light air.

With a little research, you can find just the right flying scale ship to suit your fickle slope site.

B) Winching is an excellent way to get up, however you do need something with strong enough wings to bear up to the occasional heavy foot or unforeseen gust of wind. Also, be sure to get a sailplane which will suit the winch power you have available. Remember, the larger they are, the better they fly, and the easier they are to see at height. After all, the whole point is to try to thermal. Go for the largest floater you can come up with which your winch can handle!

The very largest of scale models are winchable. The huge, almost half size Speed Astir (a Roke kit) and the 6+ meter LS-4 (a Müller kit), weighing over 50 pounds, are winched up on a regular basis. You just need a lot of pull power to do the job.

C) Airtowing is by far the gentlest



You can take scale as far as you want, including cockpit detail, as well as a self-portrait pilot! This masterpiece of a Twin Acro was seen in Switzerland.

Of course, all great slopes do encounter light lift days, and so, no matter how good your hill is, a floater is a big asset and can save the day!

Some very good hills are limited by very small landing areas. If this is a factor, you should pick a glider which can slow down and is easy to land. Flaps (and spoilers) will help you a lot. Some scale ships are inherently slow and gentle; the Minimoa and the ASK 18 are

and most reliable way to get consistently high launches, no matter what the wind velocity or direction. You are guaranteed to fly, because you are not dependent on Mother Nature's fickle whims - the towplane will get you up as high as you care to go. Even if you have no lift at all you can expect 10 to 15 minute flights.

If you plan to airtow, then you should tailor your choice of sailplane to the size and power of the towplane(s) you have available. As with winching, you pay for every foot of altitude, so you should consider floatability as a prime factor. If you have access to a powerful enough towplane, airtowing is certainly the best, safest and by far the most consistently reliable way to launch the very largest of scale models.

D) Aerobatics can be a lot of fun. It's easiest to practice aerobatics off a decent slope, but once you know how, you can do a nice routine off a winch or airtow. The question is, do you want an aerobatic machine?

All sailplanes are aerobatic to some degree and all will be able to execute the simpler aerobatic maneuvers (stall turn, inside loop, etc.). The real question is, do you want something highly aerobatic which will do all possible maneuvers, including inverted flight, or don't you care? In this regard I might mention the obvious fact that most full sized sailplanes are not aerobatic machines, and you will never see a Ka6E or an ASK 18 doing snap rolls, inverted flight, rolls, stall turns, or anything else except perhaps a spin (which all full sized pilots must learn for safety reasons). The LO-100, Grob Twin Acro or Salto are examples of very snappy, full sized and scale sailplanes which DO perform very well.

Do you care if the real one was aerobatic or not? If not, the Ka6E (Multiplex), ASK 18 (Alro), ASK 21 (Roedelmodell), ASW 24/27 (Roebbers and Krause), DG 300 (Multiplex) and a Grob G-103 (Roke and Müller) are some examples of hot performers that will do just

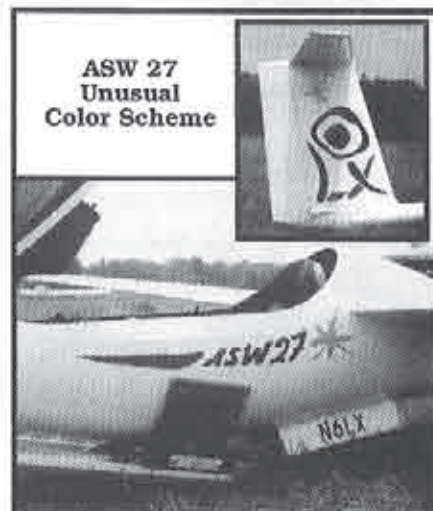
about anything.

E) Speed runs or pylon racing might turn you on. Obviously, you want a fast ship and there are many scale sailplanes which will accommodate you in this area!

F) All of the above flight characteristics are extremely important in your choice of a scale model. **CHOOSE THE PERFORMANCE WHICH WILL BEST SUIT YOUR OWN PARTICULAR STYLE OF FLYING.**

5) Is she beautiful?

Last, but certainly not least, aesthetic taste is perhaps your most important choice of all. It's really very simple - do her looks turn you on? After all, why fly scale at all? Why go through



**ASW 27
Unusual
Color Scheme**

If any of you want to use this unique color scheme, please get in touch, and I will send you color photographs. This is John Murray's (Eastern Sailplanes) own aircraft. According to him, there are many interesting color schemes appearing on the modern glass slippers in Europe.

As most of you probably know, most of the contemporary all-glass sailplanes come with very little color on them, but apparently, there is a new trend, and people are beginning to "personalize" their glass slippers!

...Robin

all this trouble and expense? I think the real answer is: It's basic instinct! Are you an airplane watcher or a model airplane watcher? Are you the type who enjoys full sized airshows? Do you glance up every once in awhile when you're near your local airport? If so, beware, you're quite likely to get hooked on scale.

Scale sailplanes allow you the choice of building and flying something uniquely suited to the why, where, and how you wish to fly. When you factor in the possibility of duplicating in miniature the real thing (cockpit detail, etc.) the possibilities are virtually infinite! Perhaps that's the real appeal of scale: You can take it as far as you want in every respect! With each new project and, for that matter, with each and every flight, you can continue to explore and expand your experience! And on top of that, watching other pilots fly their beautiful birds is great spectator sport.

Above all, whatever you choose to fly, enjoy it to the utmost! Good flying! ■

**Attention:
All Scale Competitors!**

There is a possibility that we might be able to try a new scale event at the AMA Nationals this summer using aerotow. All types of scale models (scratch built to A.R.F., old-timers to modern) will be able to compete. You will not be penalized if you have never been airtowed before; we will show you how during the competition.

What I would like to find out is how many of you scale enthusiasts out there might be interested in participating in such an event. I'd like to find out if it is worthwhile for us to make the schlep to Indiana with towplanes, etc.

Please drop me a note if you have any interest.

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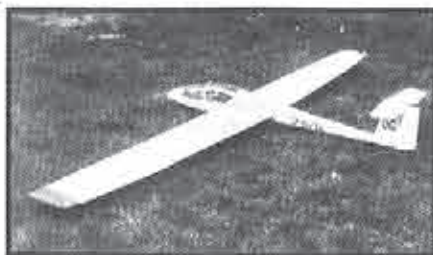
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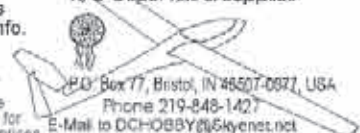


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An Option to Power Flying For Teaching Model Glider Pilots

...by Craig Foreman
Roseville, NSW, Australia

Reading Robin Lehman and John Dvorak's articles in the May and October 1996 *RCSD's*, on the pros and cons of teaching model glider pilots to fly model power planes, made me think that I could offer an option, based on my own experience, which I believe addresses two of the main issues raised by Robin. These being: the ability of model glider pilots to land their plane where they want to in a safe, consistent, and controlled manner, and the use of the rudder when turning. The option is to do some full size glider flying; however, a bit of background, first.

I am now an intermediate model pilot having learnt on a Gentle Lady (although I am not a Gentle Lady fanatic - Gordy Stahl please note!). When I first turned up at the field with my just completed model, I met a member who I had worked with in a model shop during school holidays some 16 years earlier! (Sydney has a population of 4 million.) He offered to be my instructor, which I gladly accepted.

Right from the beginning, he emphasized the need to plan the landing. This was before we even launched. We had to choose a height where we were going to begin "the landing", and a position in the air (relative to the ground) where we were going to be. This was done after working out the direction of the wind and taking into account the ubiquitous, strategically placed tree. At our field there is also a radio mast.

Over the weeks that I was first learning, I noticed that it didn't matter what type of model my instructor was flying; he invariably landed it right at his feet. I also noticed that many other pilots used a method which involved circling in the middle of the field, ad infinitum, until the altitude of the model was such that it intersected with that of the ground. This produced the odd cartwheel, models which rotated

"I wholeheartedly agree with everything Craig has to say. What strikes me most is the **PLANNING!** As he points out, it's always good to plan your flight ahead of time! Whether you are going to fly a thermal flight or whatever, it really helps to think it out before you take off. This is especially true of aerotowing. We try to avoid flying through the sun or over spectators! Generally speaking, we make the same flight pattern every time for this reason. And it makes it much easier on the glider pilots, because they know what is going to happen in advance."

...Robin Lehman

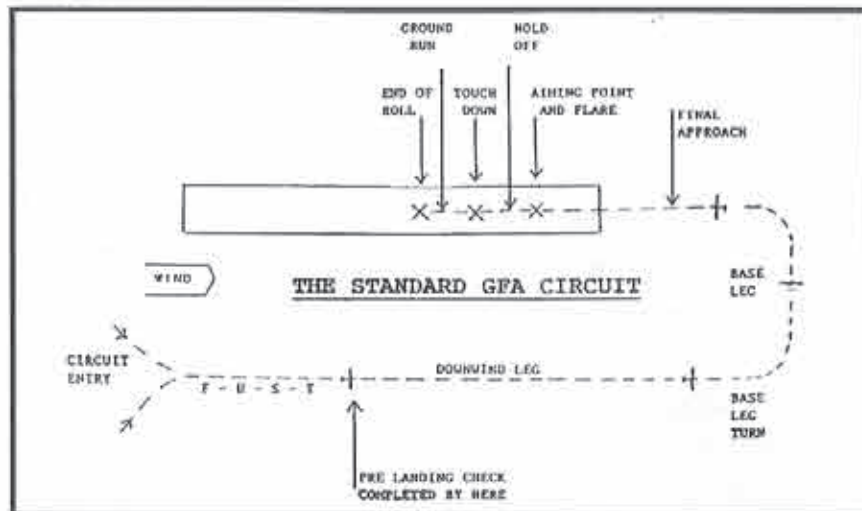
around their wing tips, and other various, ground-based aerobatics. Are we the only club where this happens?

I soon learnt from my instructor that the method we were using to "land" was one that he had been taught when he had learnt to fly full sized gliders. In his article, Robin called this a square landing pattern; I call it the landing circuit, or just "the circuit".

In the meantime, I continued to learn by flying thermal with bungee launching, and going to a couple of the slope sites around Sydney. From this experience, I agree with John Dvorak's points (*RCSD* Oct. '96, page 22). Bungee launches often do not offer a very long flight, while the slope will give you a lot of stick time, which is what you need when you are learning. However, my instructor and I did take advantage of some no wind days at a remote field to just continually launch, land and practice the circuit. Landing at the slopes was invariably tricky due to rotors, irate golfers and kite flyers (and their kites).

The Full Size Experience

Some months after beginning to learn to fly the Gentle Lady, I decided to have a holiday with a difference - an eight day course learning how to fly full size gliders. I went to Benalla in the state of Victoria, which is about nine hours drive south from Sydney. I expected this to be fun and relaxing, which it was; however, it was other things, as well.



Over the eight days, the instructors pounded three things into me that I remember more than most: a) How to plan a landing if the tow rope broke, b) How to plan and execute the landing circuit, and c) How to use the rudder when turning. For some reason, some modellers take delight in seeing mishaps occur at the field; in full size, there are no "good" or "spectacular" crashes.

The landing circuit we were taught is that shown in Figure 1, the Standard Gliding Federation of Australia Circuit. There is a circuit entry area which consists of a location and a height. Then, there is a downwind leg where trim has been set for a faster speed (FUST = Flaps, Undercarriage, Speed, Trim). A 90 degree turn is then made onto the base leg, and then a second 90 degree turn is made onto the final approach, where you set up your aiming point. The flare is made at the aiming point, and then the touch down occurs down the runway.

Now, the use of the rudder. For those who don't quite understand what all the fuss is about, I believe it goes a bit like this: there is a thing called "adverse yaw" or "aileron drag" when a turn is made. If, say, a turn is being made to the left, the left aileron moves up (reducing the lift generated by the left wing), and the right aileron goes down (increasing the lift generated by the right wing). This creates the roll.

The increased lift on the right wing increases the induced drag on the right wing. With more drag on the right wing than on the left wing, the result is that the glider yaws to the right, which is the opposite (or adverse) direction of the intended turn. Hence, the term 'adverse yaw'. The only way to fix it is to apply left rudder.

This is something I had heard about, but couldn't reconcile until I saw it from inside the cockpit. How did I see it? Well, there is a small piece of string attached to the canopy in front of the student, and another one further back for the instructor. It's called the yaw string, and I'll tell you that, in the first few days, you come to hate it. As Robin said, when the yaw string is aligned with the axis of the fuselage, then you have the correct combination of yaw and roll; you aren't side-slipping. When the instructor was in control, it was as if the yaw string was glued in place; when I took over, well... I realized that it wasn't. However, when you get it under control, you can see and feel how much better and efficient your turns are. (It is also incredibly satisfying!)

So, where is all this leading? Well, based on my experience, I would like to propose that an option for model pilots to learn about (proper?) landings and turns, is to do some full size flying, regardless of what type of models you fly. I acknowledge that it is expensive,

and probably out of reach of many modellers. It cost me about \$110 (Aussie dollars for the eight days including accommodation, handouts, tuition and tug and glider fees. I think a lot could be learned though in just a weekend for around \$250 - the price of the next glider? Or, a powered model? I also think that making a hundred touch and goes in a day, with a powered model, where you know you can pull out, doesn't quite compare with making some landings where you know your life depends on it (even

Hike & Fly Finding a Slope Site

...by William G. Swingle II
Pleasanton, California
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How did you find the slope on which you fly? If you're like many slopers, the answer is word of mouth and for good reason. A good slope requires favorable topology, consistent wind, and easy access. Finding a location with an acceptable combination of these three can be quite a challenge. I've always kept an eye open for new locations but, until recently, had been rather complacent (read lazy). Most of my sites didn't even require any significant walking. I still found myself aiming for the closest parking spot. Fortunately, motivation was just around the corner.

Necessity is the mother of invention, and a friend and I were recently in need of lift. There was plenty of wind, but its direction was poor for every slope we knew of in the area. With the threat of flying withdrawals looming, we got creative. Suddenly, hiking didn't seem like such an inconvenience, after all.

Out came the topographical maps. Having one of the necessary site qualities in abundance (wind), we searched for the remaining two: topology and access. At this point, the possibilities were overwhelming. We narrowed the search by concentrating first on the topic, which is more constrained. In our area, that means access; we started with public park lands.

with the instructor there). Flying full size also gives you a feeling for the forces that are put on the plane in stalls, spins and various other maneuvers.

All up, being in the plane, and in control, is an experience which cannot be replicated in any other way on the ground. It made me a different model pilot and, if you can afford it, I would highly recommend it, certainly before spending money on a powered model.

The search began by following ridge lines that were perpendicular to the wind conditions. We followed the squiggly lines, hoping for a cliff or steep face. Any bowl-like curvature was considered a definite plus. We had been scanning the pages for only a few minutes when we got lucky. We found a ridge line with a steep face that was nearly perpendicular to the wind, and it was located in a regional park. The only downside was that it was two miles from the nearest road. Typically, that would have caused me some concern, but I was so glad to have found a site that I didn't care. Well, yes I did care, but I was ignoring it. Reality can be very patient, but it had begun creeping up on me. A two mile reality was now beginning to sink in.

I've got a lot of accessories in my car's trunk. How much of it did I really need to bring? Realizing that my entire day's flying might depend on my ability to make repairs, it was a daunting question. The first item that came to mind was tape. The most versatile thing you can have is tape. With a little creativity you can use tape to attach ballast, re-attach a broken tail, or even tighten up a badly loosened wing joint. Yes, tape was my first choice. To be honest, the first four things I chose were tape. I decided to bring rolls of masking, packing, electrical and double sided servo mounting tape. With these four types, I figured there wouldn't be a taping need that I couldn't meet.

Glue was next. As much as I hate to admit it, tape can't fix everything. CA

and epoxy, the old standbys, were selected. A hobby knife and two small screwdrivers rounded out the base essentials. These were items that should go on every outing. All other items would be plane specific, and chosen based on the planes taken.

Now, the question was, "How do I carry everything?" My solution was an external frame back pack. It has lots of room, and the external frame provides many secure places for tying an airplane. Long distance comfort was an obvious requirement, which the external frame design also met with flying colors, so I was all set.

First, the small gear went into the pack along with the transmitters. Old T-shirts were used to protect the transmitter switches, knobs, etc. Then came the planes. I attached the first plane, nose pointing down with its belly held flat against the pack, by two horizontal straps, one running above and one running below the wing. To prevent any side to side motion, the wings were secured to the pack frame with strips of packing tape. With the first plane secured, the second was attached to the first. Foam spacer blocks were placed between the wings, and single wraps of masking tape were run between the planes, from nose to nose and fuselage to fuselage, mid-way between the wing and tail. The tape turned out to be very good for securing planes. The adhesive prevented slippage and insured that the tensional loads were distributed across the entire width of the tape. It also eliminated the need to run a strap over the TE of the wing, which is real hard on an aileron. A simple strip at the LE was all that was needed.

I did notice an inherent problem with one-piece planes. There's no way to prevent portion(s) of the plane(s) from extending significantly beyond the pack in one or more directions. This invites damage from trail hazards, but can't be helped. Be sure, though, if you try this, that nothing extends below the pack. Falling on your rear is all too easy while hiking. There's no need to risk crunching a wing or a tail group in a fall that would have otherwise been completely benign.

Once the destination had been chosen and the planes packed, only one thing remained. We still had to hike to the site, so up the trail we went. I wasn't looking forward to the hour that we estimated would be necessary, but it actually went fairly quickly. Thanks mainly to the non-stop hanger flying, I hardly noticed the time passing. Luckily, I did notice the beautiful areas that we traveled past, such as the coy little creek, which is soon to grow more bold with winter rain, the picturesque hillside and, of course, the stunning views each contributed to the adventure. My pictures just don't do them justice.

Our estimate was close. It took just over an hour for us to reach the site. We arrived to find the prevailing winds still blowing strong and nearly straight into the slope face. Absolutely gorgeous lift was in abundance, and we let none go to waste. It was so good, that I began to feel guilty (a little) about having ignored the majestic place we'd now found.

A quick survey of the surrounding area revealed several promising slopes in the near vicinity. Each of these faced a slightly different direction. It seems that the general area would be good for a 90 degree variation in wind direction. Flexibility is a very good thing with a difficult to reach site, and I looked forward to the opportunity to explore the different slopes.

We'd found a keeper. ■

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Lars Ivansen at the slope flying site at Hammars Backar. Close up behind his desk.



The Model Airplane Flyer's Guide to The Internet

...by Lars Ivansen
Kopparvagen 47
176 72 Jarfalla, SWEDEN
e-mail: ivansen@algonet.se

The Internet is a treasure for us model sailplane addicts. On the Internet you will find anything you can possibly imagine, and then some. This includes a huge amount of resources related to model sailplanes. Out there you will find discussion groups, advertisements, clubs, shops, magazines, aerodynamic research findings, electronic mail addresses to people involved in the hobby, computer programs for wing design and much, much more.

Who can use it?

It is interesting to watch the development of the Internet. I cannot say that I was there when it all started, since the history of the net goes back to the time when I wasn't even born. The truth is that I have only used it for a couple of years, but during that short period of time I feel that the amount of information available has more or less exploded.

The rapid growth is also true when it comes to the number of users. Friends and colleagues that were previously more or less skeptical about computers, take great pleasure in exploring this new dimension and are fascinated about the possibilities it brings.

One of the most important reasons for this development was the introduction of hypertext, which opened the net to the public by making it user-friendly. More about this later.

What is the point of this article?

The point with this article is not to go into any technical depth about the Internet, but to tell the story about my own experiences and how I, as a model airplane enthusiast, have great joy of it. Hopefully, this will inspire some of you to give it a try.

Please note that the Internet resources referred to will be listed at the end of the article.

My Experiences

When I first started using the Internet about two years ago, and when the first charm of novelty passed away, I started to search for information related to model airplanes. I found what I was looking for, and quite a lot of it.

I encountered a conference group for radio controlled models. Apart from model airplanes, the group covered cars, helicopters, boats and about anything that could remotely be called a radio controlled model. It was great fun, but since my main interest is in model sailplanes, I was at the same time overloaded with petitions that were of little use to me.

In this information flow, there were advertisements for a new forum for model sailplanes, originating from the *Model Airplane News* magazine. Yes, you read it right: a pure thermal, slope soaring, cross-country sailplane media, and the big boys are out there, too! I am not very familiar with the "famous" people in the hobby, but I recognize many names from various articles in magazines, and quite a few of them are participating in the discussions on the Internet. Have you ever wanted to ask Joe Wurts about thermals? It is as easy as buttering a

slice of bread, and almost as quick.

In general, if you write a serious question in one of the discussion groups, you will get informative answers. When I wondered about wingers, I came in contact with Dave Garwood, a frequent article writer and soaring enthusiast. He helped me sort out many things about model sailplanes and flying, and he also tipped me about RCSD.

Once upon a time, I started the design of an electric twin motor model airplane, the SAAB 340 (previously known as SAAB/Fairchild 340). In my search for a suitable airfoil, I encountered Michael Selig's huge database of airfoils, many explicitly for model use. The database contains co-ordinates for over a thousand airfoils, and some of them have their specific characteristics described, as well.

To print out the airfoil of my choice and at the correct scale, I used the excellent airfoil plotting program named Plotfoil by Shamim Mohamed. This program is absolutely free, and works on a multitude of computer platforms. You specify the desired airfoil, wing chord and sheeting; the program outputs a drawing in postscript. The postscript format is recognized by many printers and plotters.

Weather forecast is of great value for model flyers. In Sweden, the SMHI (Swedish Meteorological and Hydrological Institute) kindly publish a five day forecast, for each township in Sweden, on the Internet. This is very useful, especially for me, as I have to travel quite far to get to the best slope soaring sites. If the wind blows from the wrong direction, or if heavy rain is expected, it is better to stay home and build a plane, or read a good magazine. Unfortunately, this particular service is not free any longer.

Internet can help you meet new people. During the spring, I suggested that my club committee should publish information about our club on the Internet. It was approved and, in mid-April, the first version of the so called "home page" was launched for the world to see. I found it quite amazing that the words I wrote and the pictures I supplied instantaneously were

available to the whole Internet society. Imagine that.

One of the articles published was about our trip in 1995 to Hammars Backar, the best slope soaring site in Sweden that we have found, so far. We got plenty of feedback on that text, and one reader, who never tried this type of flying before, found this article very inspiring. He asked if he could join us this year, and in July we met at the slope.

He stood there all day long, struck with wonder as he watched our small birds tear the sky apart, go supersonic in violent dives and sometimes smash into each other. We laughed, repaired and flew again. In the evening, he plucked up courage and gave it a try. Because he was inexperienced with slope soaring, he was quite anxious to begin with; after a few minutes of flying, a big smile spread on his face. A new slope soarer was born.

Would he had tried slope soaring on his own if he had not read the article and made contact with us? Perhaps he would, but in this way he got a flying start...

Above all, I think that simple electronic mail is still one of the most powerful features of the Internet. Have you ever noticed that many writers today supply their electronic mail address with their articles? If I am eager to discuss a matter with any of them, I send an electronic mail message. I do not have to pay attention to time zones; I do not have to buy stamps and envelopes. The mail will reach the destination within hours or minutes; all this for the cost of a local telephone call.

All is not gold that glitters.

To put some balance to this so far, unbiased homage to technology, I must admit that not everything is done better on the Internet. In RCSD, there was a discussion whether the magazine should go on-line or not. I am glad that the decision was made to keep it in the original form. This type of magazine does not benefit much from the interactivity that Internet offers and above all - who would bring the computer to the hammock?

The Internet is democratic in the sense that no material is restricted from publication, unless it is downright illegal. This means that in order to find the gold out there, you must be prepared to wade through tons of information that is sometimes quite silly. There are ways to search, but the result can often be a surprise.

Think of a large international press center, where all newspapers and magazines from the whole world are represented. Imagine that this store is struck by a tornado that destroys the classification of all mags, and you will get a good picture of how the Internet is organized. You know that the latest issue of *RCSD* is in there somewhere, the hard thing is to find it. If you ask the shop assistant for help, he or she may be able to point you in the right direction, but you must do the digging yourself.

How does it work?

As mentioned earlier, I do not intend to go into technical details; that has already been covered many times before and is not in the profile of this magazine. But if some of this sounds interesting, and you would like to give it a try, some fundamental knowledge will not hurt you.

The Internet is an information carrier; nothing more. You may think of it as an advanced telephone. With your ordinary phone and a subscription to say, AT&T, you are free to call anybody in the world who have similar equipment, right? The Internet uses the same principle, except that instead of a phone, you are using a personal computer plus a modem; you subscribe to an Internet Service Provider (ISP) and reach information published on other computers around the world. And the best thing is that it won't cost you a fortune to connect to China; you are only charged for local calls, regardless of where you call. (*As with anything, there's always gotta be a qualifier(s). There are some exceptions. Before sending messages to another country, it's best to see if they are gonna have to pay for the incoming e-mail, for example. ED.*)

On your computer, you run applications that make use of Internet as an

information carrier. Some programs handle several of these applications in the same package. The most common applications are:

- E-mail (Electronic Mail)

This is a method to send text and program files to a particular person or organization. This very article was sent to *RCSD* by electronic mail, including the pictures.

Note that the address is not a specific destination, since the addressee may read the letter from anywhere in the world, as long as he or she can connect to the Internet. If you subscribe to an ISP, you will get your own E-mail address.

The E-mail service can also be used for mailing lists. A mailing list is a discussion forum related to subjects that are too narrow for a regular news group (see Usenet News).

- Usenet News

Conferences in the form of written text where you can participate by writing your own messages. There is a news group related to every subject that can be discussed, including model airplanes. There are currently more than 30,000 news groups on the Internet, and the number is increasing.

- WWW

WWW stands for World Wide Web. When people are talking about "surfing the information super highway", they mean browsing the WWW. The WWW consists of documents in hypertext format.

Hypertext allows us to select a word or phrase and immediately jump to more information on that topic. The additional information may be on the same computer, or on another computer connected by the Internet.

The hypertext documents may, except for text, contain pictures, film clips, animations and sounds.

- FTP

File Transfer Protocol allows you to download files from a computer, connected to the Internet, that have files to share. This is how I downloaded the Plotfoil program.

There are a number of additional applications that exist, but are of

limited use for modelers, such as Internet Phone, real-time audio, real-time debates, games, etc. I recommend that you start with the basic ones; it will be more than enough if the technology is new to you.

The Internet Service Provider you subscribe to will help you with the programs and information you need to get started. Chances are big that you also have a friend or relative that can assist you in your first stumbling steps into cyberspace. And do not be afraid to make mistakes; you don't have to worry about starting a nuclear war just because you typed something wrong. Such stories are pure fiction. Remember, if you can soar the sky, you can surf the net!

Internet Resources Mentioned in This Article (and a Few More)

To subscribe to the Internet soaring mail list, Air Age Publishing Radio Control Soaring Exchange (RCSE), send an E-mail containing just the word "subscribe" to: <soaring-request@airage.com>. For further information, see the R/C Soaring Resources Section - BBS/Internet page in *RCSD*.

The original news group for modelers is named: [nntp://rec.models.rc](http://rec.models.rc)

A purified version is named: [nntp://rec.models.rc.air](http://rec.models.rc.air)

UIUC Applied Aerodynamics Group: <http://uxh.cso.uiuc.edu/~selig/>

The resource library for the R/C model newsgroups containing the Plotfoil program: <http://www.crl.com/~spm/rec.models.rc.air/>

INTELLiCast Weather: <http://www.intellicast.com/>

A huge collection of addresses called the RC Websites Index: <http://www.bucknell.edu/~chronstr/rc/>

Tower Hobbies R/C web directory: <http://www.towerhobbies.com/rcweb.html>

The Yahoo list of model airplane resources: http://www.yahoo.com/Recreation/Hobbies_and_Crafts/Models/Model_Airplanes/

Pay a visit to my club: <http://www.algonet.se/~ivansen/jmfk>

Or to me: ivansen@algonet.se

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Specifications

Wing Span 110"
Airfoil SD7080
Weight 59-61 oz.



VULCAN 2M

Designed by Mark Allen

V-tail

Vucanistics:

Wing Span 78.73"
Weight 33 - 38 oz.
Airfoil (8 1/2%) S7012
Wing Area 558.55 sq. in.
Wing Loading 9.25 oz./sq. ft.
Aspect Ratio 11:13:1
Average Wing Chord 7.07"

Pre-sheathed wings
Epoxy, high tek fuselage

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Specifications	Spectrum Open	Spectrum 2M
Wing Span	104"	78.5"
Wing Area	855 sq. in.	554 sq. in.
Airfoil	SD7037/RG-15	SD7037
Aspect Ratio	13:1	11.2:1
Weight	60 oz.	40 - 43 oz.
Wing Loading	10 oz./sq. ft.	10 oz./sq. ft.

ELECTRIC HAWK

Designed by Mark Allen

Wing Span: 74 in.
Wing Area: 510 sq in
Airfoil: SD7037

Fiberglass fuselage reinforced with Kevlar
Pre-sheathed wings and stab
Double layer platform
7 - 10 cell electric

NIGHTHAWK

Designed by Mark Allen

Wing Span: 60 in.
Wing Area: 370 sq in
Airfoil: RG15

The design features a slightly longer
fuselage and larger stab for high speed
stability and to provide better energy
retention through turns and aerobatics.
Fiberglass fuselage
Pre-sheathed wings

Sky Hawk

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- ✓ Lots of room for radio gear

Sky Hawk kit features a kevlar - carbon reinforced, fiberglass fuselage with carbon reinforced obechi - foam, pre-sheathed wings. A unique direct drive elevator servo is installed in the vertical fin.

Designed by Mark Allen

Specifications

Wing Span 116"
Weight 58 - 65 oz.
Airfoil - Root SD 7037 or S7012
Airfoil - Tip SD 7037 or S7012 - 8%
Wing Area 900 sq. in.
Wing Loading 9.5 - 10.5 oz./sq. ft.
Aspect Ratio 15:1

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AND MUCH, MUCH MORE!

Tubular Wing Spar

...by Barry Kennedy
Irving, Texas

The next step in wing spar construction has evolved... It utilizes a tube for a wing spar. The sound application of carbon, or carbon and fiberglass, has overcome the limitations of the ideal, structural shape. Now, we have a shape we can easily use: round. The favored, American style wing joiner is a round rod. So, carbon, titanium, aluminum, or music wire rods can be utilized for joiners with the tubes.

This isn't anything original, or new on my part. I first heard of the application from Dave Hill back in 1992. Dave said that he picked up the technique from some Australians. At the time, Dave indicated that they were using an 18" tube in a 3 meter wing. We tried a 1/2" X 18" section in a 106" wing, launched off a Rahm winch with 180 lb. test line. The system worked, but the wing would flex slightly on a good zoom. A longer spar was called for. The spar length has grown to 30", now giving flex free launches on 150 lb. test monofilament line using a BAT winch. The most trying part of the whole project was matching the joiners and the tubes in order to obtain an acceptable fit. After many tries, the solution was having mandrels made for the spar tubes.

Let's discuss some sizes that have worked for us. The 2M ships can use a 3/8" X 18" carbon tube in each wing panel, along with a matching 3/8" O. D. carbon or titanium wing rod. Since the tubes go in the wing panel, parallel with the lower surface, the titanium can be bent giving the dihedral angle needed for the wings. This spar system and joiner weigh only 4.8 ounces. So, a 106 inch Zoom master obeche/foam/carbon tube wing builds up at 12 oz. each, 24 ounces total. Imagine that! This is lighter than a built-up wing, and is winchable. **(Mandatory disclaimer: I know that someone, somehow, some time will manage to do it; so don't call.)** For open class ships, 1/2" X 30" carbon tubes produce an unbreakable wing. A matching 1/2" X 20" carbon, 5 degree joiner rod, holds them together. The wing rod weighs 3.4 ounces; pared



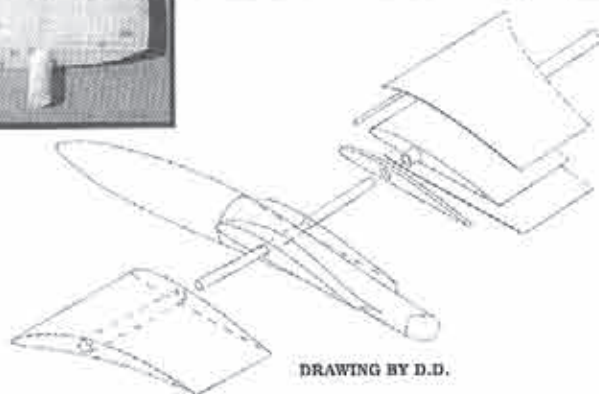
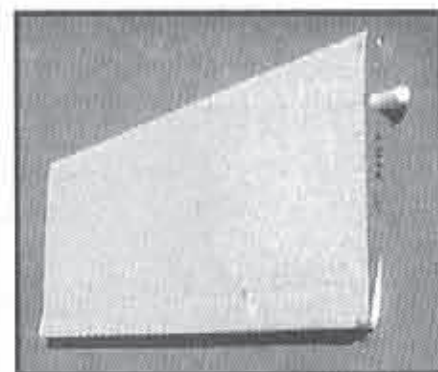
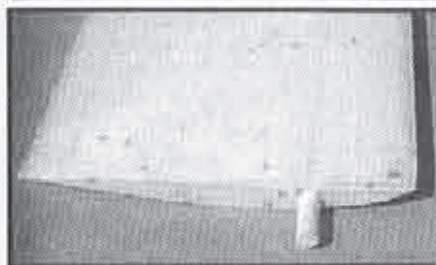
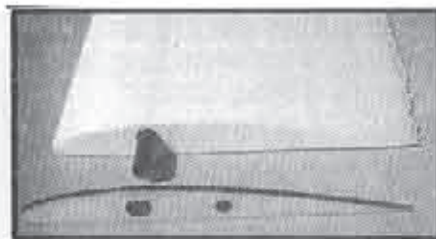
down to 12 inches, it weighs a paltry 2 ounces. The 30 inch tubes weigh 1.4 oz. (38g) each, and the 40 inch tubes for the 12 foot wing weigh 1.9 oz. (54g) each. For very large sailplanes, or F3B, 5/8" tubes and joiners are called for. The 5/8" X 30" tube is 2 oz. (56g). The matching 5/8" carbon, 5 degree rods, are 3 oz. (85g).

Typical construction for an obeche/foam/carbon tube wing is quite straight forward. Do it right; I recommend that you first call Eric Sanders and purchase a copy of CompuFoil Pro for creating your templates. It has a great library of airfoils to go along with it. Use the jig feature to create the hole for the wing tube spar and the servo wire channel. After choosing your favorite airfoil, print it out and glue it to a piece of 1/16" phenolic board for wing core templates. Make an additional set of templates for cutting the spar channel with an entry cut from the bottom. Cut the cores as usual. My preference is to cut the channel for the wing spars from the bottom. So, flip the cores over and pin the tube templates on the ends. Make the cut and trial fit the tube, the wing spar should slip in with a snug fit. The cut leading in will be filled with a slurry of epoxy and cabosil when the wing is skinned later.


Well, the hard part is over so skin your wing, as usual. Another couple of quick tips to save an ounce or two on a set of wings are: 1) Mix micro balloons with the epoxy into a mayo consistency, and 2) Notch the epoxy scraping tool every inch about a 1/16" to remove excess epoxy. This leaves nice little rows of epoxy.

In conclusion, the tube spar system works great. The down side is cost. You know the GOLDEN rule; cost is inversely proportional to the weight. However, the advantages are many: shape, available diameters and, most importantly, ease of construction.

The materials mentioned can be obtained from myself at Kennedy Composites, (972) 831-1141. ■



DRAWING BY D.D.




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Flying in a Winter Wonderland



Here in Maine, many of the members of The Downeast Soaring Club enjoy flying all year long, in good weather and in snow, as you can see by the photographs.

In one, Jim Armstrong's Spirit is piggy back on a Telemaster fitted with skis. This is much easier than setting up a winch in February.

There are, of course, hazards to winter sloping! The second photo shows me after I slipped on the ice; it was quite a trip sliding down one of the truck access roads at our Brunswick DPW slope site!

Hope you enjoy the photos! Whatever your Winter Wonderland, Merry Christmas, and a Happy New Year to you and yours!

...Steve Savoie

Merry Christmas to All!

May you find all the models and equipment of your wishes under the Christmas tree!

...Mark Nankivil

HOLIDAY GREETINGS! MAY ALL THE IMPORTANT JOYS IN LIFE BE YOURS!

May your holidays be decorated with heartwarming moments!

...B²

All the Best for the Holidays & the New Year!

May all the team trials for F3I be successful ones, and we hope to see the thermal soaring community in England in 1998 for the first F3I World Championships!

...Jack Sile, Thermal Talk

A Christmas Story

Recently heard in the Red Sea vicinity on an Israeli pleasure boat's scanner..... Sometimes ya' just never know how close you came to having a REAL tough day at work!....

Red Leader, I've got a contact bearing one-seven-five, angels 20.

Copy that Red Two. What's estimated intercept?

Uhh.. We can get a lock in about 30 seconds on this heading.

You see him yet?

Nah. Not yet. I can see he's cookin' on the scope here, though.

I got a visual on him... Hey, you know 'bout any types with a red marker light on the nose?

Uhhh.... No... That's weird.... Hmm.. Whatta' ya' say we just tell the Skipper we lost him and head back to the boat... It's almost Christmas, man; and I don't wanna' spend our whole shore leave talkin' to some pinheads from the Pentagon about this bogie.

Copy that Red Leader. Damn, I can't see a thing now, can you?

Nah...Not a thing. Let's take these birds back to the coop.

Roger that. Man, Mom's mashed potatoes are sure gonna taste great after six months of ship's chow! I can't wait!.....

-End of transmission-

Merry Christmas, Happy Hanukkah, and Peace to you and yours!

...from Dave, Shelby, Ian & Trevor Sanders at Dave's Aircraft Works

Good lift to those geographically blessed,
Happy projects to those whose air has turned cold,
My hat's off to those in cold lands, still flying,
And great holiday cheer to all!
...Fred Mallett



Happy Aerotowing Over the Holidays and Throughout The New Year!

...Robin Lehman



Christmas Thanks!

To those of you that read Jer's Workbench, To those that send notes of encouragement, or call, To those that needed help with a special project, To those that offer suggestions for my column, And to all of our readers that are not covered above, Keep your workbench clean, and your wing tips up!

Wishing each of you a very Happy Holiday Season!

...Jerry Slates

A Christmas Recipe

Take one sailplane enthusiast,
Season well with Honey-do's, and CA glue,
Leave them to build all winter in the workshop,
And turn them loose when spring arrives.
Then, send them flying!

...Judy

(If any of you have a favorite recipe,
we'd love to hear it!)

Merry Christmas & Happy New Year!

...from the folks at California Soaring Products
Three and 1/2 Peas in a Pod



ZIKA

Lee Murray flying Dale Uecker's Apogee on Anderson Sod Farm this fall. (Dale's photo.) Lee still has his work clothes on since Dale met him at the field with a charged plane for him to fly.

Fran LeClercq's Spectrum after lending it to Lee for an afternoon. (Fran's photo.)



Page 41

An Open Letter to James E. Keller

...by Herk Stokely
Virginia Beach, Virginia
HERKSTOK@aol.com

Dear James,

I read with interest your Article Wish List on page 43 of the October '96 issue of *RCSA*. Particularly, I noticed your reference to that article by Brian Agnew about the best place to balance an airfoil. (As I remember, it was the Eppler 205.)

The fact is that there is no best place to balance an airfoil. Brian was reporting his experience with that airfoil on sailplanes with a very conventional layout. Applying that experience, across the board, to any plane that uses the airfoil won't work.

In fact, a good question to ask would be, "38% of what?"

The aerodynamic fact is that when balance points are mentioned in terms of percent, it usually means percent of the Mean Aerodynamic Chord (MAC) measured from leading to trailing edge. Not many modelers know what the MAC actually is, and even fewer know how to find it on the complicated wing platforms that we're flying, today. So, when you see a report that the plane was balanced at 38%, it

usually means the root chord at the fuselage and, unless it's a straight wing with no sweep or taper from root to tip, that doesn't mean anything; except, it's a way to tell someone where to balance that airplane.

Now, that's the real story - balance the airplane - not the airfoil. The best balance for a model really has to be fine tuned in flight. It depends on the airfoil to a small extent, but it's much more affected by the size of the tail, the length of the fuselage, the planform of the wing, and yes, even the flying style of the pilot. Even with a complete aerodynamic analysis, the best balance point can't be pinned down exactly. There are good analytical tools available, and with some knowledge of the subject, a "safe" balance point can be determined. That's just the starting point though, and you have to tune the model in flight to find what works best for you. And I do mean "best for you". If you were to take the sticks of the plane flown by today's World Champion, there is every likelihood that you wouldn't be able to fly it, or at best you'd find it very unpleasant to fly. He, on the other hand, would definitely be able to fly one tuned for you, but he wouldn't like its handling qualities.

My advice is to give up on that one - forget balancing the airfoil; balance the plane. ■

Sailplane Homebuilders Association (SHA)

A Division of the Soaring Society of America



The purpose of the Sailplane Homebuilders Association is to stimulate interest in full-size sailplane design and construction by homebuilders. To establish classes, standards, categories, where applicable. To disseminate information relating to construction techniques, materials, theory and related topics. To give recognition for noteworthy designs and accomplishments.

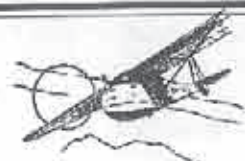
SHA publishes the monthly *Sailplane Builder* newsletter. Membership cost: \$15 U.S. Student (3rd Class Mail), \$21 U.S. Regular Membership (3rd Class Mail), \$30 U.S. Regular Membership (1st Class Mail), \$29 for All Other Countries (Surface Mail).

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The Vintage Sailplane Association

Soaring from the past and into the future! The VSA is dedicated to the preservation and flying of vintage and classic sailplanes. Members include modelers, historians, collectors, soaring veterans, and enthusiasts from around the world. Vintage sailplane meets are held each year. VSA publishes the quarterly *BUNGEE CORD* newsletter. Sample issue: \$1.00. Membership is \$15.00 per year. For more information, write to the:

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Flying in Australia

...by Brian Keeffe
Belouder@aol.com
Bellevue, Washington

Photo 1 - Brian Keeffe and first launch.



Photo 3

These pictures were taken while on the Neil Diamond Tennessee Moon Tour in Australia, in March and April, 1996. We were in Sydney for several weeks doing tech rehearsals and concerts. The Sydney harbor area has an extensive system of harbors and bays, many with quite tall bluffs overlooking the water. The prevailing winds work two areas quite well during this time of year, I believe. I was able to get ahold of some Sydney and Brisbane area flyers via the internet, and they told of some areas and even offered to let me use local legal radios.

Photo 1 shows my first launch, which resulted in photo 2, aptly labeled "Ooops". In my excitement to get the plane in the air, I called up the wrong plane memory, and found my plane to be completely un-controllable. Fortunately, as you can see, a perfect, soft, nose-in beach landing resulted. Nothing was damaged except for a little pride.

Later, I was to meet a scale plane in a spectacular mid-air, leaving me with a bunch of parts to reassemble. Didn't hurt the big plane, but my C.R. Aircraft Blazer needed some extensive work.

These first pictures were taken at a place called "Long Reef". It is a municipal golf course built on a peninsula of land north of the Sydney

Harbor area. The slope is shared with hanggliders and para-sailors. A para-sailor was flying that day and was very helpful in helping me locate all the pieces of my plane, scattered after being re-kitted. He would just hover over a place when he saw some bits and direct me to them. If you look closely, you can almost make out the coast of California over the horizon.

Photos 3 & 4 were taken while flying at a place called Dobroid Head, between Manly Beach and Balmoral Bay. As you can see, this wonderful slope site looks out over the entrance to Sydney Harbor and has some spectacular lift along with a great view!! After some nights spent in my hotel repairing the Blazer, we were able to get back to the flying site and have some fun. The Blazer is a great, light lift plane, but needed quite a bit of ballast to stay close in the heavy lift. I think I ended up with 16 oz. of extra weight. Made for some pretty interesting landings. But the site has a great landing spot, as right behind the flying area is a large open area which is used as a rugby and cricket pitch. The only problem is that when the slope is working, the field is used by kite flyers. As you turn to land, a lot of altitude is needed to allow you time to climb up to the road behind you and get the plane behind the kite flyers. Then, it's a matter of "threading the needle" to get down between kites. Some interesting situations.

My next trip will take me to Toronto to start rehearsals with the band "Rush". I'll be carrying a hand launch, and hopefully a two-meter. I'm still searching for the ultimate traveling two-meter. I've tried several planes and haven't come up with one that meets all the things I'm looking for. Durability, compactness, flexibility of flying conditions, and repairability are some of the important ones. Sounds like some design conflicts, but I think the plane is out there; I'll just keep trying them 'til I come up with the right one.

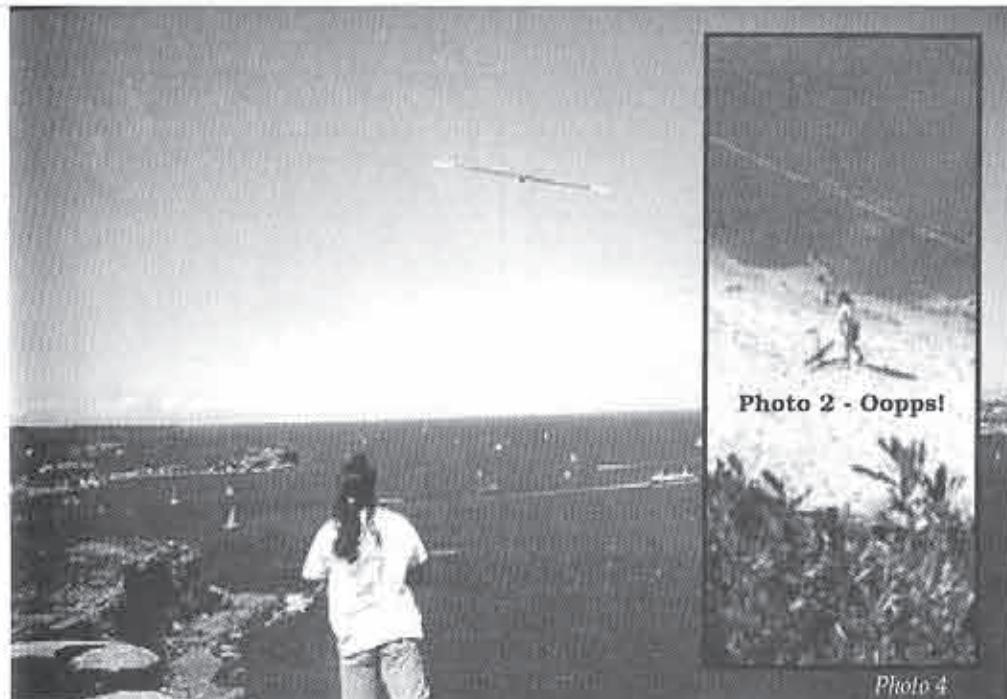


Photo 2 - Ooops!

Photo 4

Some planes I've tried include: Banshee (good, strong plane, flexible flight envelope, but took up too much room with its built-in dehdral), an early Weston design Two Meter that Bob Champine built for me (good traveler, but too fragile and limited flight envelope), a Dodgson Design Pivot (great traveling plane, but a bit small), a Falcon 600 (good traveler, but a little bit too heavy, limiting its

thermaling ability), a Dodgson Pixie (Good all around plane until I destroyed it, and now I really don't have that much time to build another!), and a C.R. Aircraft poly-flap Climax (great plane for a hand launch that packs into a mail box). What I think I'd like to try are some of the new, molded planes. They appear quite strong, yet are light. We'll see. ■

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NEW PRODUCTS

The information in this column has been derived from manufacturers press releases or other material submitted by a manufacturer about their product. The appearance of any product in this column does not constitute an endorsement of the product by the R/C Soaring Digest.

New Products

...from Hobby Horizon Hobby Distributors



Hangar 9 Aeropacks

Hangar 9 Aeropacks are four-cell receiver battery packs, quadruple welded with gold plated pins, constructed from highest-quality Sanyo cells available to ensure premium performance and long life. Aeropacks come complete with Futaba "J" connectors; double-thick, double-shrink guarantees utmost in vibration resistance.

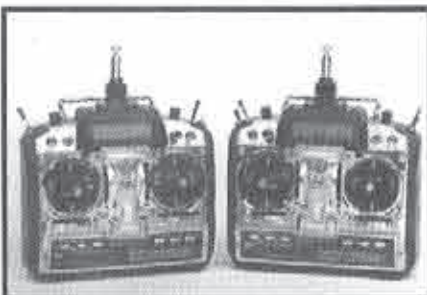


351 Sailplane Servo

JR's new 351 Micro Servo takes JR's 341 servo, and adds a machined brass gear train. Close machined tolerances offer zero gear train backlash for the ultimate in precision. With a narrow 1/2" width, the 351 fits flush in the thinnest airfoil sections; with over 31 oz./in. of torque, the 351 has more than enough power for the largest Unlimited Class and fastest F3B type sailplanes. The 351 is designed with rough landings in mind; if the flaps aren't retracted just before a rough landing, the stress on the flap servos can cause servo gears to strip.

R-600 FM Receiver

The new R-600 6-channel FM receiver, based on JR's exclusive ABC&W reception technology, is "credit card" size, and light weight; it will fit into almost any model



JR XP783 Radio System

The JR XP783 doubles the model memory of the JR-347 from 4 to 8 models, in addition to other expanded features. The XP783 system is available in two dedicated transmitter versions, one for airplanes and one for helicopters, as opposed to the all-in-one approach of the X-347; and the 783's programming capability matches that of JR's popular 8 channel X388S.

The XP783 can be used with JR's S-PCM, Z-PCM, and FM receivers. Servo reversing is available on all 7 channels, as is travel adjustment and sub-trim. This radio system also features the most advanced trainer system available today, allowing the trainer to transfer any combination of channels to the student for safe, progressive-stage learning.

Upgrades, for airplanes pilots, over the X-347 include: trim memory, elevator to flap mixing, aileron differential, more programmable mixes (6), trim include and include mixing, landing switch.

Sailplane features include: 6 programmable mixes, trim offset memories, flap to elevator mixing, aileron differential, dual flap trim, full trailing edge mixing and pre-set capability, full variable trailing edge camber independent of pre-sets, user selectable switches for all mixes, elevator to flap mixing, aileron to flap mixing and vice versa, butterfly/crow mixing, and programmable 3-position switch.



F-400 FM Radio System

Intended for first time fliers and budget-minded sport fliers, the F-400 is a 4-channel radio system. The transmitter's form fitting "biocurve" case combines great balance and great looks with comfortable ergonomics. The four servo reversing switches are located out of the way, behind the rechargeable transmitter battery pack. F-400 features include: trainer system, adjustable stick length with machined aluminum stick tips, flush mounted battery meter, and a neck strap eyelet. The R-600 6-channel FM receiver is standard; three JR 507 servos each provide 40.3 in./oz. of torque; a dual overnight charger is also provided. The F-400 uses Sanyo Batteries in both the receiver and transmitter packs; a 12" aileron extension and servo accessories complete the package.



Beat Gear 2 Channel AM System

The Beat Gear two-stick radio system is now available on channel 72Mhz aircraft frequencies. The system comes with two

510 servos, receiver, switch harness, battery box, and servo mounting hardware; it fits most 2 channel aircraft including sailplanes, slope soarers, etc. Features include: servo reversing, elevator and rudder/aileron trims, and the JR Biocurve.

All the products above are exclusively distributed by Horizon Hobby Distributors, Inc., 4105 Fieldstone Rd., Champaign, IL 61821; (217) 355-9511. Additional information may be obtained from them, by contacting local hobby shops, or by contacting other sailplane related businesses and manufacturers that sell their products.



Scale Aircraft Documentation

...from Scale Model Research

Scale Model Research, the World's largest commercial collection of full-color, full-size, aircraft documentation FOTO-PAAKS, and 3-view drawings, has expanded their inventory, again. The 1997 issue of their "Catalog and Resource Guide" contains 203 pages of listings for FOTO-PAAKS, 3 view drawings, and scale related articles.

FOTO-PAAKS are full-color 3 1/2" x 5" pictures, detailing paint schemes, markings, instruments, landing gear, etc.

The "1997 Scale Aircraft Documentation and Resource Guide" (catalog) is \$8.00 U.S.A. (Canada/Mexico \$10.00, Overseas \$15.00 - includes air post). Scale Model Research, 3114 Yukon Ave., Costa Mesa, CA 92626; (714) 979-8058 ■

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New Products



The Razor: A Slope Combat Flying Wing ...from Trick R/C

The Razor is computer optimized for the combat environment: stall recovery, speed range, and maneuverability. The Razor is built to fly into harm's way.

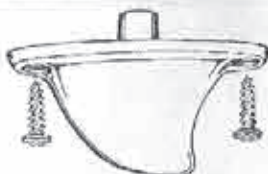
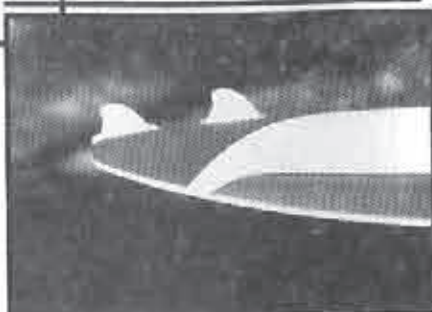
Strength: The wing cores are pre-grooved and drilled for a unique, triangular, carbon fiber tube spar system. Pre-shaped balsa trailing edge stock form the elevons and center section. The Coroplast winglets are ramp-shaped for impact deflection and are held in place with a music wire spar. All EPP foam construction will absorb collisions with other airplanes or the ground.

Weight: The Razor has a flying weight of 24 ounces with a loading of only 7.5 ounces per square foot. Standard servos, a square pack 500/700 mAh battery and receiver fit in the thickness of the wing. Nothing sticks out. Imbedded control tubes and cable complete a clean invisible radio installation. Covered with Ultrakote, the wing has the clean line simplicity of a razor.

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Trick R/C, 938 Victoria Avenue, Venice, CA 90291; Voice/Fax (310) 301-1614, e-mail Zod@Zagi.com. ■

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Radio 2 Channel or Mixer



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...from Tim McCann

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Thermoflügel DG-600

...from Mark Foster

Mark Foster has announced that the high performance, 1/4 scale DG-600 is in stock and available for \$565.00, which includes 1/2 the shipping cost to anywhere in the U.S.A. DG-600 is recommended for scale competition and/or slope fun flying; 1/4 scale DG-300 is also available.

Mark Foster, 1738 Hanscom Dr., South Pasadena, CA 91030; (213) 257-4573. ■

DG-200/17

...from ICARE Sailplanes

A semi-scale reproduction of the full-size, high aspect ratio, performance glider, the DG-200/17 is manufactured in Germany, imported, and kitted by ICARE. High quality kit is suitable for all around flying.



Wing Span 83"
Wing Area 395 sq. in.
Airfoil Ritz
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including aerobatics; no tendency to tip stall in tight, spiral turns; reacts well to lift.

Requires two micro servos fitted in the wings for aileron, and two standard size servos for elevator and rudder. Tow release can be installed for aerotow.

Kit includes high quality, white glossy, epoxy fiberglass fuselage with carbon reinforcement; sturdy but light, veneer sheeted and fiberglass reinforced foam wings have servo wells and ailerons pre-routed; root rib with wing joiners are installed. All you have to do is install the leading edge, tip blocks, face the ailerons, and install the servos for the ailerons. Tail surfaces are veneer sheeted foam, and need to be finished with leading edge and tip blocks. Kit also includes a smoked plastic canopy, detailed fiberglass canopy tray, all wood, complete hardware set (including carbon wing joiner), fully detailed instructions, and building drawings.

ICARE, 381 Joseph-Huet, Boucherville, Quebec, Canada J4B 2C4; (514) 449-9094, fax (514) 449-3497, e-mail ICARE@telts.com. ■

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Personal ads are run for one month and are then deleted automatically. However, if you have items that might be hard to sell, you may run the ad for two months consecutively.

For Sale - Business

GLIDER RETRACTS - high quality, 1/5, 1/4, 1/3 scale made in U.S.A. 1/4 are standard or heavy duty. Contact Bill Liscomb, 7034 Fern Place, Carlsbad, CA 92009; (619) 931-1438.

PC-Soar Version 3.5 Sailplane Performance Evaluation Program Optional Sailplane Library now expanded to 54 models including: Alcyone, Anthem, Genesis, Mako, Probe, Thermal Eagle, and Synergy-91. Free Library Upgrades. PC-Soar Upgrade to Ver. 3.5 \$10, PC-Soar New Purchase \$40. New Libraries of Sailplanes and Airfoil Polars \$30. Please include \$3 P&H for all purchases & upgrades. Also available: RCSD Database and Laser cut airfoil templates. LJM Associates, 1300 Bay Ridge Rd., Appleton, WI 54915; ph: (414) 731-4848 after 5:30 pm weekdays or on weekends; <http://dataex.com/~atkr095/pcsoar.htm>.

PRECISION AMAP WING CUTTER, replacement parts, and service. AMAP Model Products, 2943 Broadway, Oakland, CA 94611. Butch Hollidge, (510) 451-6129, or FAX (510) 834-0349.

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Critter Bits announces **SERVO CANS** for JR 341/351 servos! Sold in sets of two cans... \$10.00. Colors: red, white, black, natural. Order yours today! Great Christmas gifts! (800) 375-1312, or fax (818) 790-1346.

For Sale - Personal

Multiplex DG-500, pictured on page 39 July '95 RCSD, 4.5m, Ritz airfoil, all flying surfaces refinished, scale cockpit, new canopy, retract and decals, no damage, spectacular performance... \$650.00. Randy Banta, (541) 664-5025, So. Oregon.

Roke DG 202, long wings, NIB; Roedel 3.6 scale Ka6E, NIB; 1/3 Nimbus II, 6.7m, NIB. \$1395.00 O.B.O. F3B, all molded, hollow core, gelcoat, NIB, from Czech... \$349.00 O.B.O. Dan, (714) 831-8013, California.

RnR Genesis, full house, loaded, all molded, hollow core, thermal ship, 4 Airtronics 141's, nice condition... \$400.00; NSF Sparrow Hock T with 6 servos, full house, loaded, 100", great condition, RG15 airfoil, flies light, very fast, all white w/red wing tips... \$300.00; C.R. Aircraft Renegade, 60" slope racer, flies light, thermals well, very fast, easy to fly, two fma micro servos in wing, one mini in fuse, with battery, very clean... \$200.00. S&H included. Rich Ventura, (415) 941-8782, Calif.

Prism 118" V-tail (unpainted fuse), Matsumoto 7037 glass-bagged wings (white on top, black on bottom), RTF less receiver... \$600.00 + S&H, firm. Paul, (818) 966-7215 (eve), or Curt, (818) 966-7876 (eve), California.

Airtronics Whisper, NIB, 2m, full house, built-up wood construction... \$65.00; Airtronics Sagitta 900, NIB... \$135.00; Daveys Lucifer, NIB, 2m electric, all wood... \$25.00; Foameron, NIB, all foam construction, slope plane... \$50.00; JR347Tx... \$125.00; Great Planes Spirit 100, very strong wing, carbon fiber on the spars, 5/8 steel wing rod, will take zoom launch, with servos and Tx... \$150.00. John Pearson, (303) 745-1615, (800) 888-6996, jpearso1@netcom.com, Colorado.

Start + Flug Salto, 1/3 scale fuse by Rosenthal, white gelcoat, canopy, cockpit interior, 3-view dwgs... \$220.00; Thresher 73" slope racer by Clyde Duncan, Spyder foam/carbon wings, S6062 profile, 13 oz. loading dry, 3 Hitec metal gear servos, 6V battery & ballast, RTF. Rob, (619) 930-0616, S. California.

Saber, Dodgson Designs, 121", SD7037 airfoil, fiberglass fuse, NIB... \$245.00; Chuperosa HL, SD4061 airfoil, NIB... \$45.00; Cox Sportavia, w/electric motor... \$75.00. Bill Maserang, (817) 838-2069 (day or eve.), Texas.

Dart, Cumulus, Paramount 14", large tow plane "Stinson Reliant", Stearman Bi Plane, or trade for large gliders, scale, etc. Gene Molnar, 5362 Aurelia St., Simi Valley, CA 93063; (805) 527-8582.

RnR Synergy V SE pre-release, rare F3B set-up, RG14, includes extra SD2048 wing set, ballast in wing panels, 1000Mah bat, ten 141's, custom yellow & blue, hot, you add Rx and fly... \$1050.00; FA105 motor, 20 flights... \$50.00; JR X-347 w/Rx, new bat. packs, switch, manual... \$250.00; Hans Krause Carat, 3m, w/elec. set-up, no servos, damaged rt. wing (very fixable)... \$50.00. Howard Stearn, (312) 527-0347 (day), (312) 539-1868 (eve), 104763.1447@compuserve.com, Illinois.

Ultima, w/9 servos (4 in ea. wing, 1 in fuse), 2 sets of wings (130" & 136"), T-tail, open class soarer, Selig 4061 airfoil, Schuermann wing planform, good condition, set up for Airtronics... \$250.00. Aubrey, (202) 584-3074, Washington D.C.

Kraus Crystal, early 80's F3B, 110", E205... \$200.00, w/Futaba FP-7FG/K w/2-131's and 2-33's... \$300.00 + ship.; ARF Clipped Wing Cub for 90-120 engines, 79" span, 1100 sq. in., covered red & white... \$200.00 + shipping; Genesis Flying Wing, 1/32 sheeted foam wing, set up for computer radio... \$65.00 or \$100.00 w/2-533 servos + ship.; Larry Jolly Comet XC fuse, 16" span, 11" E205 roof, w/canopy and tray, 69" long, brand new... \$125.00 + ship.; Craft Air Leo, 12.5" span, 15" root cord, 2200 sq. in., big airplane, RTF... \$125.00 + ship.; Home Brew, 2m, S3021, low A.R., Scorpion fuse, w/2-101 servos... \$100.00 + ship.; 26 sheets 3/32x4x48 balsa, 6 sheets 3/32x3x48 balsa... \$35.00 includes ship.; Ace Sniffer on 49.845 mhz... \$85.00 includes ship. Ed Lightcap, (412) 828-5905, betw. 6 - 10 pm, EST, Pennsylvania.

Super Duck, 123" span, developmental model for Unlimited Duck by Troy Lawicki, design won LSF NATS in 1989, good condition, never crashed, flies great, no servos included... \$275.00. Jim Johnston, (616) 938-1272, Michigan.

Multiplex Fiesta w/flaps, w/Bag Lady custom bag, Critter Bits servo cans for the flaps, w/servos, receiver, 1000 mil pack, absolutely RTF... \$475.00 + shipping. Karlton Spindle, (818) 790-9908.

1/4 Roebbers Pilatus B4, 3.75 meter span (147"), wing profile Ritz 3, NIB... \$495.00; 1/4 Roedel Super Cub (towplane), 2.687 meter span, wing profile Clark Y mod. (suitable motors are 160 T, 300 T, OS BGX-1, Brisson 3.2 or similar), NIB... \$385.00; 1/4 Rosenthal Ralley Morane (towplane), 2.78 meter span (109"), NIB... \$495.00; 1/5 Wik Twin Astir, all glass, NIB... \$595.00; Roedel PSS A-10 Warthog, all styro, 1.7 meters, E205 wing profile, weight ca. 4 lbs... \$100.00. Contact Robin Lehman, 63 E. 82nd St., New York, NY 10028; (212) 879-1634.

Vision VSSSP with four 8 ch PCM receivers #92985... \$650.00; 1/5 scale ASW 17 w/foam cores for wings & stabs... \$130.00; Oden semi-scale w/foam cores for wings, S3021 airfoil... \$120.00. Add S&H to all prices. Dale, (972) 475-8093, Texas.

Shadow 118", RTF, a few war wounds, structurally sound, great flyer, 78 oz. all up... \$250.00 or \$500.00 with 4 Airt. 141 & 2 Airt. 102 servos, and wiring harnesses; Vulcan 2m, custom all composite, 3-piece Spyder foam/glass wing, Spyder foam/glass tails, all integral Kevlar linging, 39 oz. all up... \$300.00 or \$550.00 with 6 Airt. 141 servos and wiring harnesses. NIB kits: Multiplex Schaumpup 3 or 3.5 meter... \$375.00; Mark Allen Falcon 600... \$175.00; Dodgson Camano 100... \$175.00; Fox Lil Scorpion 2m... \$175.00. All items are plus shipping. Jim Thomas, (206) 488-2524 or e-mail LSF5@LSF5.SEANET.COM, Washington.

Wanted

Nelson KA6 glider or parts. Large, wood sailplanes, Baby Boas, Albatross, Minimoa, Comet. Broken or not. Kits or plans for gliders. Synergy, 91SE, Samuri, ASK-18; or wings and tailfeathers for DG-600. Primary trainer. Hollow core wings, any size. Racers or scale. Hobbie Hawk parts - tail feathers, left wing, or whatever may be available. Gene Molnar, 5362 Aurelia St., Simi Valley, CA 93063; (805) 527-8582.

Multiplex Ka6E kit, NIB. Dan, (714) 831-8013, California.

JR FM xmitter module for 347, 388, or Galaxy, ch 50 preferred, any other 72 mhz ch OK. Bill Maserang, (817) 838-2069 (day or eve.), Texas.

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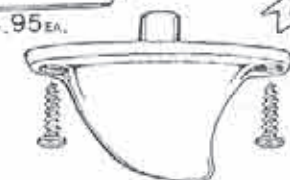
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Want A Good High Start?

...by Allan K. Scidmore
Madison, Wisconsin

I recently had an opportunity to get a new, light duty, high start for 2-meter or smaller airplanes. Having just spent the time and effort, I thought perhaps there might be someone considering the purchase of one, and interested in some thoughts on the subject. To give my end results first, I bought the rubber from Hobby Lobby. Hobby Lobby has three different sets of rubber available for high starts, and I have high-starts made from all three. I can recommend Hobby Lobby as a source for quality elastic. Incidentally, for the web-surfing set, WACO company has an article on high starts on <http://www2.ari.net/home/waco>.

The object of a high-start is to get your glider in the air. The amount of pull needed depends upon the glider weight, airfoil, wind, etc. Theoretically, to get a two pound glider up 400 feet requires an elastic band, bungee, spring, or whatever that will store 2# times 400' = 800 foot pounds of energy and release it to the glider. Well, that's the theory. You may know from experience that if there's a bit of a breeze, that you get a higher launch. You may also note that using a heavy duty high start on a small glider doesn't necessarily produce a higher launch. The optimum results are obtained matching the glider and the high-start.

There is the question of how far to stretch a high start. The WACO article gives some reference here in that it indicates that the MIL spec for the breaking elongation for natural latex rubber should be 750% or more. The usual limit observed in practice is a conservative 300%. I feel that a 300% limit should generally be observed to ensure a good working life for the rubber. A good high-start is expensive but it should last for years in normal sport flying for a few individuals or a small club.

The force exerted by the stretched rubber is proportional to the stretch. In algebraic form, the force, F , is approximated quite well by the equation:

$$F = k \times L$$

Here, k is some constant and ΔL is the change in length. Given this relation, we can determine the energy stored in

the stretched rubber to be:

$$\text{Energy} = 0.5k \times \Delta L^2$$

I measured the force produced by each of the three available Hobby Lobby high-start rubbers at 300% elongation and they are tabulated in the accompanying chart.

HOBBY LOBBY HIGH-START RUBBERS

Part	ID"	Wall"	Force	Cost
HIS002	3/16	1/16	12.5#	\$36
HIS003	1/4	3/32	26#	\$50
HIS004	3/8	1/8	72#	\$81

The smallest size (HIS002) is advertised as being useful for gliders up to 2 meter size. I recommend this particular rubber for sport flying for 2 meter planes up to 2 pounds, even though WACO says it's for wimps. Note that at a stretch of 3X, the force on the glider wing is 12.5 pounds at the time of launch. If this is a 3 pound glider, there is a launch pressure of more than 4Gs.

Using the equations above, we can evaluate the constant k as $k = 0.042$. Plugging this into the second equation we find that stretched to 300 feet, a 100 foot rubber of this kind stores 1876 foot pounds. In theory, this will give the three pound glider 625 feet of altitude. Well, we know that inefficiencies exist. You can hear some of them at launch. The whistling sound made by the glider and the singing of the line are two of the losses. The pull on the tow ring, at some value of stretch, say 100%, is less upon release than the force initially required to stretch it. This inelastic behavior amounts to a loss of about 11% for the HIS002 rubber.

From experience and observation, I know that stretched to 3X, this rubber, on a calm day, can give a two pound plane a launch height equal to the length of the unstretched rubber and line, or about 400 feet. If we accept that figure, the efficiency of the high-start and glider system is about 64%.

The middle size (HIS003) is advertised as being good for planes under 3 meters. You can see that at 3X, this rubber gives a healthy pull of 26 pounds. The constant k for this baby is $k = .089$, and at 3X it can store 4015 foot

pounds. Using the 64% efficiency figure, we estimate that it can launch a sailplane weighing 10 pounds to 400 feet! I don't know about 10 pound planes, but can recommend this particular rubber for 5 to 6 pound planes. From experience, I know that I can launch my 5 pound, 3M Shadow to about 400 feet, using a stretch of 100 paces, or about 250 feet. The theoretical numbers are close to what is observed in the field.

Please note, though, that when stretched to 3X, this rubber provides a force of 26 pounds on the wings at launch. For a 3 pound plane, this would be a force of 8.7Gs. This raises the question, "Is the plane designed to handle that stress?"

The largest tubing (HIS004) is a real hose. I have used it to launch an 11 pound Sagitta XC. The biggest problem with this rubber is the tremendous force it produces. My arms and shoulders still remember the last time I used it. I know that I never got anywhere near 3X. I don't think that I ever got it stretched past 200% (48 pounds!). A very difficult physical situation arises when flying alone with this rubber. You end up trying to hold a plane pulled forward by a force of 50 pounds or more, and still hold your transmitter. Your balance will be precarious, and your arms will ache by the time you manage to raise the plane and launch it. I remember one launch when the wing hit my head and then knocked the transmitter out of my hand. The transmitter hit the ground about 10 feet away. Don't consider purchasing it unless you have the need and the muscle. What a catapult launch this rubberband would give!

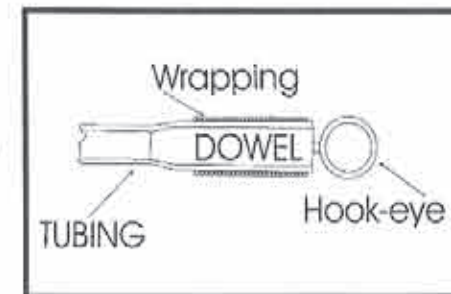
To store your high start, buy one of those inexpensive plastic reels used to store extension electrical cords for \$6 or \$7. The 11" cordwheel will do for the HIS002, while you will need the 14" for the HIS003. The only way to store the big one is to put it back in a cardboard box.

For the two smallest sizes, I use 300 to 400 feet of 40 pound orange STREN mono-filament line, because it is highly visible. Braided nylon line (or used winch line) works well, also. I purchase winch line from a fish-netting supply house. You will need welded rings or sturdy split rings from the hardware store. For a parachute...

Look around in RCSD.

When storing the high start, I always start winding at the parachute end and finish with the rubber on top. I find this to have two advantages. First, the line winds up and lays out smoothly in contrast to the reverse method of winding the line on top of the rubber. Second, I don't have to carry the weight of all that rubber while I wind in 300-400 feet of line. It saves the arm muscles. However, some of my flying buddies always do the reverse; they wind the rubber on first. That way they always have the chute where they want when they finish laying out the high-start. You can accomplish the same objective by remembering the overall length of the high-start, and pacing it out accurately when you set it out.

I have found that plugs made from birch dowels can be used to make a good connection of the rubber to the line and to the stake. A big spike can be used to anchor the rubber to the ground. A spike can be obtained from any good building supply house or lumberyard. I cut off a chunk of dowel about 1' long and slightly larger diameter than the ID of the tubing. Drill a hole in the center of the dowel to keep the birch from splitting. Now, turn the point of a small screw-eye into the drilled hole. Then, put the screw eye into a vise and clamp down on it to hold it. Next, lubricate the dowel by glopping on some rubber cement. While it is wet and slippery, force the rubber tubing over the dowel. To keep it from working its way off as it is stretched and released during repetitive launches, secure the dowel with a couple layers of tightly wrapped string. This is wound only over the rubber which covers the wooden plug. Now, saturate the string with a flexible glue like RC56 and let dry. Voila... You are ready to go fly. ■



Video Review

"Elmira Aerotow 96"

...reviewed by Jerry Slates
Wylie, Texas

Well, some folks say that watching a video is the next best thing to being there. Not so, in my case; when the Elmira video arrived, I wished I had gone, even more so! I wanted to reach out and pick up the dolly, feel the sticks in my hands as the tug gracefully headed out, watch the sailplane rise gently into the air, and enjoy the camaraderie that obviously occurred...

And what do the guys say? Well, according to John Derstine, the next video will be even better. I didn't see anything missing in the video... Of course, they were there, but I wasn't. Guess the only way I'll know what they're talking about for sure, is to attend next time! Then, I can see it for myself! And, then I'll know what was left out!

Is aerotowing "infectious" as Robin Lehman says in the video? You bet! Oh, you want to hear about the video?? It's very well done, music is perfect and just right, narration is excellent, timing of shots was very good, it's informative, some of the folks such as John Derstine and Joe Enhuei "explain" important facts about aerotowing, the on-going narration tells the viewer what is happening most of the time, etc., etc. Shall I continue? If you want to learn something, this video is for you; for me, I am trying to figure out what it will take to attend the Elmira 97 event!

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Yes, all that could be was right there,
And a twinklin'!

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There's a trail of the stuff!
Boy, will mom make a fuss!!
Wait! How did Santa get back up the flue?

...Judy Slates



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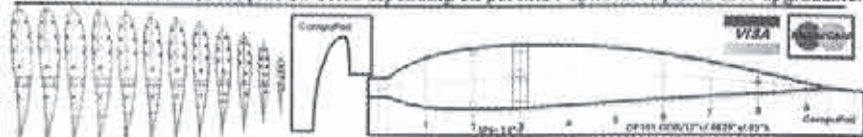
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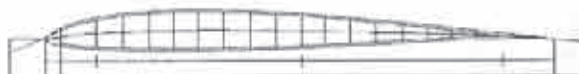
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April 9-13	Dortmund Intermodellbau - Germany		
June 13-15	Elmira Aerotow 97	Elmira, NY	John Derstine, (717) 596-2392 2076482@mcimail.com
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The detailed plans sell for \$12.50. Thirty-three pages of building instructions and a bill of materials are included. The wood to complete the kit can be ordered from Superior or Lone Star for less than \$25. Two rolls of film covering are sufficient to cover the flying surfaces. Call Ollie Wilson at (941) 627-2117 or write: 1987 Nuremberg Blvd., Punta Gorda, FL 33983.

R/C Soaring Resources

These contacts have volunteered to answer questions on soaring sites or contests in their area.

Contacts & Soaring Groups - U.S.A.

Alabama - North Alabama Silent Flyers, Ron Swinehart, 8733 Edgehill Dr. SE, Huntsville, AL 35802; (205) 883-7831.

Alabama - Central Alabama Soaring Society, Ron Richardson (Treas.), 381 Stonebridge Rd., Birmingham, AL 35210; (205) 956-4744, e-mail: lamrehf@concentric.net.

Alabama - Southern Alabama & NW Florida Aerotow, Asher Carmichael, (334) 626-9141, or Rusty Rood, (904) 432-3743.

Arizona - Central Arizona Soaring League, Iain Gilthero, (602) 839-1733.

Arizona - Southern Arizona Glider Enthusiasts, Bill Melcher (contact), 14260 N. Silwind Way, Tucson, AZ 85737; (602) 325-2729. SAGE welcomes all level of flyers!

Arkansas - Northwest Arkansas Soaring Society, Tom Tapp (President), RT 2 Box 306, Huntsville, AR 72740; (501) 665-2201, eve.

California - California Slope Racers, John Dvorak, 1063 Glen Echo Ave., San Jose, CA 95125; (408) 287-0375.

California - Inland Soaring Society, Robert Cavazos, 12901 Forman Ave., Moreno Valley, CA 92553, RCAV@aol.com.

California - Northern California Soaring League, Mike Clancy, 2018 El Dorado Ct, Novato, CA 94947; (415) 897-2917.

California - South Bay Soaring Society, Dave Burwell, P.O. Box 2012, Sunnyvale, CA 94087; ticedoff@ix.netcom.com.

California - Southern Calif. Electric Flyers, John Raley (President), 1375 Logan Ave., Costa Mesa, CA 92626; (714) 641-1776 (D), (714) 962-4961 (E), e-mail: E-Flyer@ix.netcom.com.

California - Torrey Pines Gulls, Ron Scharck, 7319 Olivetas Ave., La Jolla, CA 92037; (619) 454-4900.

Colorado - Rocky Mountain Soaring Assn., Phil Weigle, 1290 Salem St., Aurora, CO 80011; (303) 341-9256 eve.

Eastern Soaring League (VA, MD, DE, PA, NJ, NY, CT, RI, MA), Jack Cash (President), (301) 898-3297, e-mail BadIdeas@aol.com; Bill Miller (Sec./Treas.), (609) 989-7991, e-mail JerseyBill@aol.com; Michael Lachowski (Editor), 448 County Rt 579, Milford, NJ 08848, e-mail mikel@airage.com.

Florida - Florida Soaring Society, Mark Atzel (President), 1810 SW Terrace, Ft. Lauderdale, FL 33312, (954) 792-4918.

Georgia - North Atlanta Soaring Association, Tim Foster, (770) 446-5938 or Tom Long, (770) 449-1968 (anytime).

Hawaii - Maui Island Slope Soaring Operation, MISO, Hank Vendiola, 10-C Al St., Makawao Maui, HI 96768; (808) 572-5283.

Illinois (Chicago Area) - Silent Order of Aeromodeling by Radio (S.O.A.R.), Jim McIntyre (contact), 23546 W. Fern St., Plainfield, IL 60544-2324; (815) 436-2744. Bill Christian (contact), 1604 N. Chestnut Ave., Arlington Heights, IL 60004; (708) 259-4617.

Illinois (Northwest) - Valley Hawks R/C Soaring Club, Jeff Kennedy (President), 414 Webster St., Algonquin, IL 60102, (708) 658-0755, eve. or msg.

Iowa - Eastern Iowa Soaring Society (Iowa, Illinois, Wisconsin, Minnesota), Bob Baker (Editor), 1408 62nd St., Des Moines, IA 50311; (515) 277-5258.

Indiana - Bob Steele, 10173 St Joe Rd., Fort Wayne, IN 46835; (219) 485-1145.

Kansas - Wichita Area Soaring Association, Pat McCleave (Contact), 11621 Nantucket, Wichita, KS 67212; (316) 721-5647.

Kentucky - Bluegrass Soaring Society, Frank Foster (President), 4939 Hartland Pkwy., Lexington, KY 40515; (606) 273-1817.

Maine - DownEast Soaring Club (New England area), Steve Savoie (Contact), RR#3 Box 569, Gorham, ME 04038; (207) 929-6639. InterNet e-mail <Jim.Armstrong@acornbbs.com>.

Maryland - Baltimore Area Soaring Society, Russell Bennett (President), 30 Maple Ave., Baltimore, MD 21228; (410) 744-2093.

Maryland & Northern Virginia - Capital Area Soaring Association (MD, DC, & Northern VA), Chris Bovais (Coordinator), 12504 Circle Drive, Rockville, MD 20850; (703) 643-5513.

Michigan - Greater Detroit Soaring & Hiking Society, Greg Nilsen (Sec.), 2163 Highsplit Dr., Rochester Hills, MI 48307; (810) 651-8598, GNilsen624@aol.com.

Michigan - Great Lakes 1.5m R/C Soaring League & "Wings" Flight Achievement Program & Instruction, Ray Hayes, 58030 Cyrenus Lane, Washington, MI 48094; (810) 781-7018.

Minnesota - Minnesota R/C Soaring Society, Tom Rent (Contact), 17540 Kodiak Ave., Lakeville, MN 55044; (612) 435-2792.

Missouri - Independence Soaring Club (Kansas City area, Western Missouri), Edwin Ley (Contact), 12904 E 36 Terrace, Independence, MO 64055; (813) 833-1553, eve.

Missouri - Mississippi Valley Soaring Assoc. (St. Louis area), Ken Trudeau, 3033 Plum Creek Dr., St. Charles, MO 63303; (314) 926-3537.

Nebraska - B.F.P.L. Slopers, Steve Loudon (contact), RR2 Box 149 Ft., Lexington, NE 68850; (308) 324-3451/5139.

Nebraska - S.W.I.F.T., Christopher Knowles (Contact), 12821 Jackson St., Omaha, NE 68154-2934; (402) 330-5335.

Nevada - Las Vegas Soaring Club, Jim Allen (President), 7117 Caprock Cr., Las Vegas, NV 89129; ph (702) 658-2363, fax (702) 658-1998.

New Jersey - Vintage Sailplane R/C Association, Richard G. Tanis (President/Founder), 391 Central Ave., Hawthorne, NJ 07506; (201) 427-4773.

New York, aerotowing Rochester area, Jim Blum and Robin Lehman, (716) 367-2911.

New York - Elmira - Harris Hill L/D R/C, aerotowing & slope, John Derstine, (717) 596-2392, e-mail 2076482@mcimail.com.

New York, aerotowing Long Island Area, Robin Lehman, (212) 744-0405.

New York - (Buffalo/Niagara Falls area) - Clarence Sailplane Society, Lyn Perry (President), (716) 655-0775; e-mail perry@staff.sunverie.edu; Jim Roller (Competition Coordinator), (716) 937-6427.

New York - Long Island Silent Flyers, Stillwell Nature Preserve, Syosset, NY, Taylor Fiederlein (President), (516) 922-1336, or Joe Coppola (VP), (516) 798-1479.

New York - Syracuse area, Central NY Sailplane Group, Dave Zintek, Minoa, NY, (315) 656-7103, e-mail Zintek@aol.com.

North Carolina - Aerotowing, Wayne Parrish, (919) 362-7150.

Northwest Soaring Society (Oregon, Washington, Idaho, Montana, Alaska, British Columbia, Alberta), Roger Breedlove (Editor), 6680 S.W. Wisteria Pl, Beaverton, OR 97005; (503) 646-1695 (H) (503) 297-7691 (O).

Ohio - Cincinnati Soaring Society, Chuck Lohre, 3015 Beaver Ave., Cincinnati, OH 45213; (513) 731-3429, lohre@iac.net, http://www.iac.net/~lohre.

Ohio - Dayton Area Thermal Soarers (D.A.R.T.S.), Walt Schmoll, 3513 Pobst Dr., Kettering, OH 45420, (513) 299-1758.

Ohio - Mid Ohio Soaring Society (MOSS), Hugh Rogers, 888 Kennet Ct., Columbus, OH 43220; (614) 451-5189, e-mail tomnagel@freenet.columbus.oh.us.

Oklahoma - Central Oklahoma Soaring, George Voss, (405) 692-1122.

Oregon - Salem Soaring Society, AISzymanski, 8991 Edcliff Ct. SE, Aumsville, OR 97325-9549, e-mail aszy@teleport.com, (503) 585-0461, fax (503) 585-6929.

Oregon - Southern Oregon Soaring Society, Jerry Miller, 3431 S. Pacific Hwy. TRLR 64, Medford, OR 97501, e-mail jmill@cdsnet.net, ph/fax (541) 535-4410.

Tennessee - Memphis Area Soaring Society, Bob Sowder, 1610 Saddle Glen Cove, Cordova, TN 38018, (901) 751-7252, FAX (901) 758-1842.

Tennessee - Tullahoma (Southern Middle Area), Coffee Airfoilers, Craig Logan, 147 Stillwood Dr., Manchester, TN 37355, (615) 728-5446, jclogan@edge.net.

Tennessee - Soaring Union of Nashville, Terry Silberman, PO Box 17946, Nashville, TN 37217-0946, (615) 399-0846.

Texas - Texas Soaring Conference (Texas, Oklahoma, New Mexico, Louisiana, Arkansas), Gordon Jones, 214 Sunflower Drive, Garland, TX 75041; (214) 271-5334.

Texas - aerotowing, Dallas area, Andrew Jamieson, 9426 Hillview, Dallas, TX 75231, (214) 349-9346, e-mail ajsleep@aol.com, Larry Sengbush, (972) 291-4840.

Utah - Intermountain Silent Flyers, Bob Harman, (801) 571-6406. "Come Fly With Us!"

Virginia - Tidewater Model Soaring Society, Herk Stokely, (757) 428-8064, herkstok@aol.com.

Virginia - Appalachian Soaring Association, Virginia's Southwest (Bristol area), Greg Finney, 266 Plumb Alley West, Abingdon, VA 24210; (540) 628-4469 (H), (540) 676-3788 (W), (540) 676-3094 (fax).

Washington - Seattle Area Soaring Society, Waid Reynolds (Editor), 12448 83rd Avenue South, Seattle, WA 98178; (206) 772-0291.

Outside U.S.A.

Australia - Southern Soaring League, Inc. (SSL), Mike O'Reilly, Model Flight, 42 Maple Ave., Keswick SA 5035, Australia. Phones: ISD+(08) 293-3674, ISD+(08) 297-7349, ISD+(018) 082-156 (Mobile). FAX: ISD+(08) 371-0659.

Canada - Greater Niagara Area Thermal Soarers (GNATS), Flat Field Soaring & Aerotowing, Gerry Knight, (905) 934-7451 or Don Smith, (905) 934-3815.

Canada - MAAC Men Gliding Club, Jim Holland, 168 Verona Dr., Winnipeg, Manitoba, Canada R2P 2R8; (204) 697-1297.

Canada - Southern Ontario Glider Group, "Wings" Programme, dedicated instructors, Fred Freeman, (905) 627-9090, or Bill Woodward, (516) 653-4251.

England (Thermal Talk & Europe), Jack Sile (Editor), 21 Bures Close, Stowmarket, Suffolk, IP14 2PL, England; Tele. # 0449-675190.

England (southwest) - Sean Walbank, Woolcombe Hays, Melbury Bubb, Dorchester, Dorset, DT2 0NJ, phone 01935-83316.

Hong Kong - Robert Yan, 90 Robinson Road, 4th Floor, Hong Kong; (852) 25228083, FAX (852) 28450497, yan@asiaonline.net.

Japan - Dr. Paul "Sky Pilot" Clark, 2-35 Suikoen Cho, Hirakata Shi 573, Osaka Fu, Japan; IAC+(81) 720-41-2934, fax: IAC+(81) 6-954-4144, e-mail: 76055.3546@compuserve.com, http://chaos.hullerton.edu/~jclark/skypilot.

Scotland - Ron Russell, 25 Napier Place, South Parks, Glenrothes, Fife, Scotland KY6 1DX; Tele. # 01592 753689.

BBS/Internet

Internet - Email list/resource of RC soaring related folks, including US and international club contacts, vendors, kit manufacturers/distributors, software, equipment and supplies. Check out the web site: www.ocpapsych.com/yellow.htm, or contact Manny Tau at taucom@kaiwan.com.

Internet soaring mailing lists/serve linking hundreds of soaring pilots worldwide. Send a msg. containing just the word "subscribe" to soaring-request@airage.com. The "digested" version that combines all the msgs. each day into one msg. is recommended for dial-up users on the Internet, AOL, CIS, etc. Subscribe using soaring-digest-request@airage.com. Post msgs. to soaring@airage.com. For more info., contact Michael Lachowski at mikel@airage.com.

The Frequent Flier's Info. Hot Line, San Francisco Bay Area - Box 1 (lost & found airplanes, helpful tips, upcoming events), Box 2 (questions), Larry Levstik, (415) 924-4490.

Reference Material

Still a few copies available of some issues of the printed transcripts of talks given on RC Soaring at the Previous Annual National Sailplane Symposium. Prices reduced to clear out stock. Talks were on thermal meteorology, flying techniques, hand launch, cross country, plane design, airfoil selection, vacuum bagging, plastic coverings, flying wings, etc., etc. Send SASE or call for flyer giving details. Many copies of most recent (1992) transcript left. Clubs have found them good for raffle prizes, gifts, etc. Al Scidmore, 5013 Dorsett Drive, Madison, WI 53711; (608) 271-5500.

Summary of Low-Speed Airfoil Data - Volume 1 & "Volume 2", Michael Selig wind tunnel testing results. Cost for each: \$25 USA (includes postage), \$29 surface outside USA, \$31 air Western Hemisphere, \$38 air Europe, \$42 air all other countries. Computer disk, ascii text files (no narrative or illustrations), is \$15 in USA; \$16 outside USA. Source for all "SoarTech" publications, also. Contact Herk Stokely, 1504 N. Horseshoe Cir., Virginia Beach, VA 23451. Phone (757) 428-8064, email: herkstok@aol.com.

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If you aren't connected to the internet, please send 3.5" high density disks and SASE with stamps for 2 oz. Files can be loaded onto any word processor; search for a word or phrase and references pop up by issue, author, date, page, and comments. If you are connected, the index is available on-line. Lee Murray, 1300 Bay Ridge Rd., Appleton, WI 54915; (414) 731-4848 after 5:30 pm weekdays or on weekends, 74724.65@compuserve.com.

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ISSA is a non-profit organization formed in 1996, governed by a board of directors, dedicated to the advancement and expansion of all aspects of scale R/C soaring, both vintage and modern. It encourages LSF Achievement Goals, and promotes general interest in soaring flight. Quarterly newsletter provides information on plans, kits, accessories, and membership list of others interested in scale, as available.

General membership is \$15 per year, which includes organization By-Laws, Rules and Regulations for initial ISSA festivals and competitions, to be held at Empire Polo Field in Indio, California, are also available. For additional information, contact:

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The Condor is designed by Mark Allen, who is considered one of the best model sailplane designers in the United States, if not the world. Mark has taken all of his previous experience in competition thermal duration flying, plus all the knowledge he has gained from his earlier contest and sport designs, to design the Condor. Mark Allen's previous planes, to name only a few, are: Falcon 850 and 800, Falcon 600, Swift, Thermal Eagle, Vulcan, Night Hawk, Sky Hawk, Electric Hawk, Falcon 850E, Rocket, Pocket Rocket and, of course, the molded, world championship F3B Eagle. By taking the best of these designs and the new construction techniques available today, Mark has come up with what we feel, is the absolute best open-class sailplane available.

The wings are made in America by Ron Vann, owner of Spectrum Enterprises. Ron is also an avid competition flier, and is considered to be one of the best wing manufacturers in the industry. Taking his years of experience in manufacturing wings, Ron has produced wings and stabs for the Condor that we feel are world class. Starting with the spar that Mark Allen designed, Ron uses only the best and most accurately cut foam cores available. He then uses hand-picked beech from Kennedy Composites, which is applied with West Systems epoxy.

CONDOR *Tomorrow's Sailplane, Technology Today*

This is after he has first reinforced the wing with carbon fiber and fiberglass. The servo wells are routed out, as are the flaps and ailerons. What this means for the sailplane enthusiast is a minimum amount of work before getting the sailplane into the air. The wing is light but strong enough to take "pedal to the metal" launches. Also available as an option is Ron's unique internal capped hingeline. This means even less work for the modeler.

The fuselage is made by Steve Hug, owner of the Fuse Works. Steve is another master at what he does. Fuse Works makes what we consider to be the best fuselage in the business. Steve uses only the best fiberglass and KevlarTM available. All fuselages are manufactured using the West Systems epoxy. Steve's fuselages have the least amount of pinholes, if any, that we have seen. In fact, the fuselage is so pretty that many people do not paint it. The fuselage is extremely light, and yet strong enough for very aggressive flying and landing. For those with very little

building time, and those who don't like to paint, there is an optional pre-painted, in the mold, fuselage which includes a unique carbon fiber canopy.

All kitting is done at Slegers International's new and larger manufacturing facilities. We have spared no time or expense with supplying the modeler with the best materials available. The kit contains pre-sheathed wings and stabs by Ron Vann, fiberglass and KevlarTM reinforced fuselage by Steve Hug, 3/8" diameter titanium wing rod from Kennedy Composites, optional 3/8" diameter steel wing rod by Squires Model Products, control horns and tow hook by Ziegelmeyer Enterprises, pushrods by Sullivan, or optional one piece steel rods. All wood is custom-cut. Specially cut basswood of 60" is supplied to eliminate splices in leading edge, flaps and aileron capping. All balsa is hand picked, light to medium, to ensure light weight wing tips, stab tips, and rudder. Aircraft ply is used for the pre-fit servo tray and towhook block. A comprehensive instruction manual is included.

The Condor, designed by Mark Allen, wings by Ron Vann, fuselage by Steve Hug, and kit by Slegers International, we feel, is the best open-class, thermal duration sailplane available, at an affordable price of \$395.00 plus S&H.

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These wings are beautifully and meticulously crafted by the designer with the flaps and ailerons cut out, servo wire holes drilled, and root ribs installed.

The fuselage is strong and durable—made for aggressive launching and landing. Yet it is light weight. It is manufactured by the designer, using West Systems epoxy, fiberglass, a generous amount of Kevlar™ and strategically placed carbon fiber and aircraft plywood. The fuselage and canopy are not only aerodynamic and sleek, they are also aesthetically pleasing and uniquely stylish with a slightly descending nose, raised canopy and shapely tail.

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