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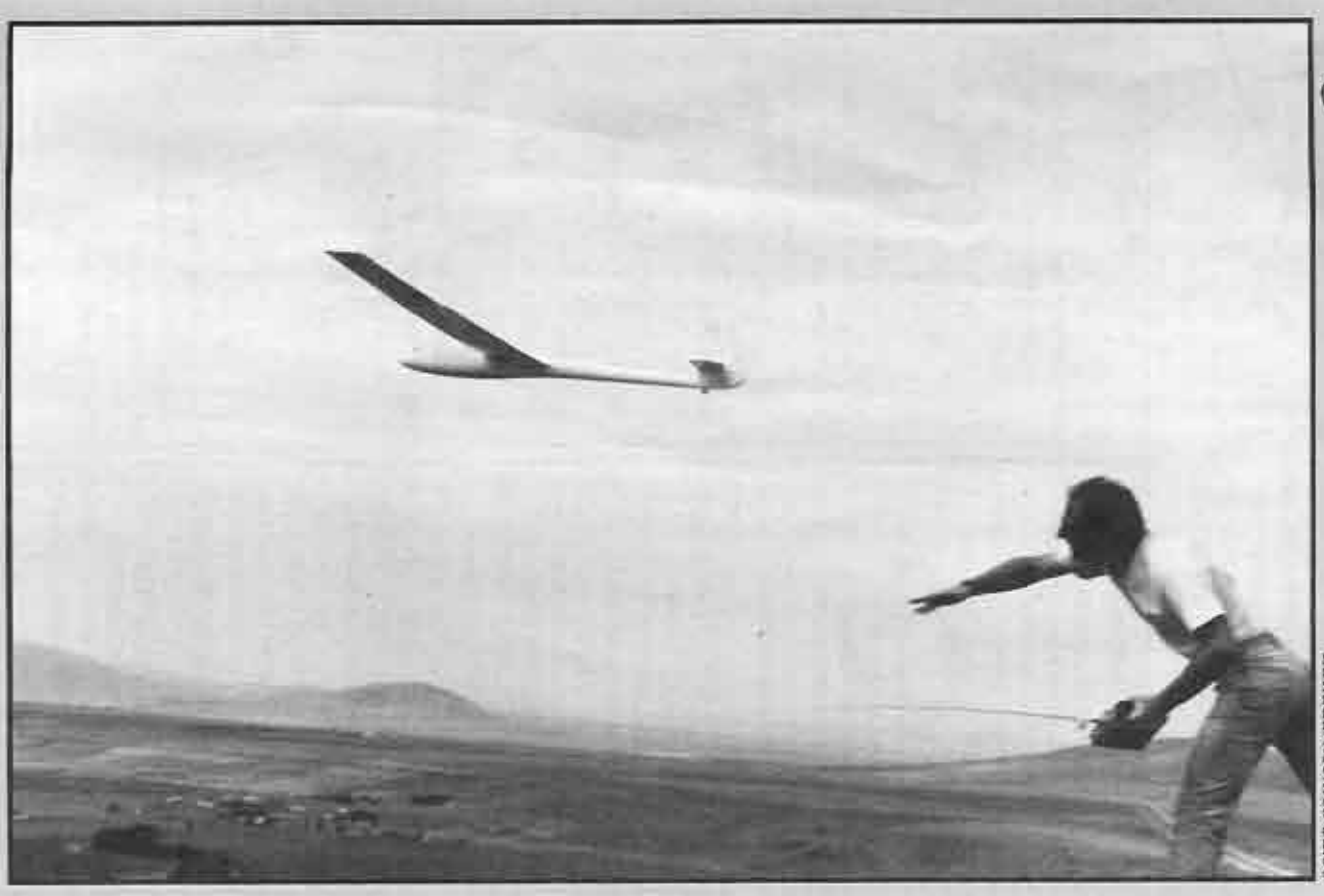

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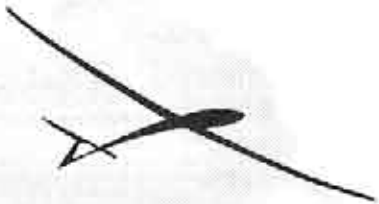
R/C Soaring Digest

A publication for the R/C sailplane enthusiast!



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R/C Soaring Digest (RCSD) is a reader-written monthly publication for the R/C sailplane enthusiast and has been published since January, 1984. It is dedicated to sharing technical and educational information. All material submitted must be exclusive and original and not infringe upon the copyrights of others. It is the policy of *RCSD* to provide accurate information. Please let us know of any error that significantly affects the meaning of a story. Because we encourage new ideas, the content of all articles, model designs, press & news releases, etc. are the opinion of the author and may not necessarily reflect those of *RCSD*. We encourage anyone who wishes to obtain additional information to contact the author. *RCSD* was founded by Jim Gray, lecturer and technical consultant. He can be reached at: 210 East Chateau Circle, Payson, AZ 85541; (602) 474-5015.

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RCSD Staff

- Jerry Slates — Editor/Technical Editor/Jer's Workbench
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Feature Columnists

Wil Byers
Gordon Jones
Bill & Bunny Kuhlman (B²)
Martin Simons
Ed Slegers

R/C Soaring Digest
P.O. Box 2108
Wylie, TX 75098-2108 U.S.A.
(214) 442-3910, FAX (214) 442-5258

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The Soaring Site

June 27 and 28 will find us in Memphis, Tennessee at the Mid-South Soaring Championships contest and trade show. We expect to have available literature, brochures and displays from over 40 R/C sailplane related businesses or organizations, several of which will be there in person. Who? Well, the list currently includes Rich Spicer (RnR Products), David Layne (Layne/Urwyler), Jerry Slates (Viking Models, U.S.A.), Chuck Anderson (Model Design Programs), Michael Stump (LSF), Peggy Jones (Mother & Daughter Originals), along with a group of fliers from Texas rumored to include Gordon Jones and Don Chancey. The grapevine says that numerous personal invitations and challenges to near-by states have gone out, as well! So, come join the fun as a spectator or contestant. The ad for who to contact is with the events schedule in this issue. Hope to see you there!

About The Cover

Gregory Vasgerdsian of Concord, California is launching his scale Cirrus at the Washington Fun Fly in 1990. Photo by Jerry Slates.

SLOPE-TECH & Fun Fly

We received a note from Bob Reynolds in Lakewood, California who says, "Our BBS name is "Slope-Tech", not "Slope Soar. The number has changed to (310) 866-0924. Thank-you for the mention. The software we are using is the pits, but at least we are "up" 99.9% of the time. (We are busy writing our own BBS software to make available some unique features including high res. plots and illustrations while on line.) The BBS has been up continuously since late '90 and has 130 registered users from a lot of states coast to coast and north to south, and Alaska, Hawaii, and Canada...

"Please, if there is room somewhere,

mention our 4th annual 4th of July Fun Fly at Bluff Park in Long Beach. This year is the second annual running of the "Slow Slope Race". It is open to any unpowered glider, 25 laps, one attempt for each glider, but you may have as many gliders as you wish. The race starts at 9:30 A.M. sharp, and the first to complete 25 laps from a single toss out wins! (Last year it took almost 2 hours to finish thru 5th place. The actual race, from toss out of the winning plane until 5th crossed the line was about 40 min.) During the day, Dr. Norm Thompson will CD some interesting "Hand Launch" events, including a 15 sec. precision duration to a hand catch, a "Limbo" to a hand catch, and an "out and back" max. distance to a landing (or hand catch). Dr. Norm will also be CDing a special slope race for aircraft weighing 10 oz. or less, two racers at a time, double elimination, ten laps of approx. 125 ft. straights. These fun flys have always been family affairs with picknics encouraged (with mini-pot lucks usually happening). Come early (slow slope race pilots meeting at 9:00 A.M.) and stay late for the Queen Mary's fireworks (and maybe some nite flying by lighted aircraft). Enjoy."

The Bluff Park location is at the foot of Redondo Ave. on Ocean Blvd. In the July 1990 issue of *RCSD*, page 23, Bob and Kim Reynolds provided information and background on this fun event. Bob or Kim can be reached on (310) 866-2104.

Bent Torque Rod Technique

We received a FAX from Jef Raskin, Pacifica, California. He says, "I was pleased to see the bent torque rod technique written up in *R/C Soaring Digest;* it has proved useful in model sailplanes for nearly twenty years, and in other applications long before that. Unfortunately, Mr. Siposs will find that he cannot patent the idea: it is neither new nor revolutionary as the headline proclaims.

"An insert sent with my Western Wind R/C glider kit (first sold in 1974) said, "Many fliers have added clever touches...Kent Strother built an internal rudder linkage: it is a simple torqued wire with a bend at the end. The bent portion goes inside the rudder so that when the 3/32" wire is rotated by the servo the rudder turns. This linkage is invisible, and adds no drag as external linkages do."

"Kent's servo attachment was much simpler than Mr. Siposs'; he mounted the servo vertically with the arm's axis pointed backward so it could drive the torque rod directly. There is some danger in using this method for ailerons: a long music wire rod makes a very good torsion spring, and it can abet aileron flutter.

"Lastly, external horns do not "add tremendously to induced and parasitic drag". Induced drag is a consequence of the generation of lift, and if your control horns are parallel to the airfoil, they contribute only to parasitic drag — which is sufficient reason to use internal linkages." ■

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Chuck Anderson, P.O. Box 305
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"Getting Started"

by D.B. Matthews
...Review by Jim Gray
Payson, Arizona

Here is a publication produced by ACE R/C that ought to be on every modeler's shelf because it provides the kind of basic information that many of us have forgotten. For us, it's a good refresher, and for the beginner it's a necessity.

For example, you'll find a very useful table of contents-cum-reference that allows the reader to quickly select the appropriate information needed at the moment. While we think of ACE as catering mostly to builders of powered models, Matthews' book will quickly change your mind. Here are chapters on the workshop, adhesives, building materials, building techniques, radios, finishing techniques, final assembly, field equipment, pre-and post-flight checks, the first flight and training. Yes, there is a chapter on engines too, but notice how the other chapters all apply to us glider-guiders. You'll find a useful glossary of modeling terms and an appendix of useful data about airfoil shapes, flight attitudes and nomenclature of the model airplane.

Let's take a f'rinstance to see just how helpful "Getting Started" can be. Suppose you are planning to build a model and want to try out a new method of putting the parts together on the plan. First, you look under "Building Techniques", Chapter 5, and look at the different sub-headings which include: 5.2: The 3M ™ Spray 77 "pinless" method. Have you tried that yet? I have, and won't go back to the old pin method except for certain structures. 5.2a tells you how to attach the plans to the building surface, and 5.2b describes installation and gluing parts. 5.3 describes the tried-and-true pin method we've all used for years. 5.4 talks about the use of building fixtures, while 5.5 talks about expansion and shrinkage of plans...something we seldom think about, but need to consider. 5.6 tells you how to work with styrofoam; 5.7 instructs you on working with plastic. 5.8 describes the use of reinforcing cloth and tape; 5.9 talks about lapping sheet joints, and 5.10 - carving and sanding basics. If you need to consider hinging of control surfaces, look at section 5.11. 5.12 is all about fuel tanks (Which we won't need unless we plan to put an auxiliary power unit on our sailplanes.), and 5.13 gives you the best way to check and align the surfaces. All pretty basic, you say...and you're right, of course...but how many of us would have given almost anything for the information when we started our building careers? D. B. Matthews leads the builder step-by-step when that is necessary, or provides a quick reference about a particular technique for the advanced builder who may want to try it for a change.

The other chapters are arranged in similar fashion, and I was particularly interested in Chapter 8: "Finishing Techniques" and specifically 8.4, "Covering Molded Styrofoam", because I've not done that before and have heard all kinds of horror stories about over-heating the surface. Matthews tells you what to use, what NOT to use, and the best method. Now, I don't have to wonder because I have learned from the book.

Likewise, you can find things about color scheme selection for your model (8.2), trimming your finished model (8.6) and other useful information.

By now you get the picture of this useful compendium of information directed at ALL modelers, beginners and experienced ones alike. It's fun to read, interesting to learn, and practical to use. I won't spoil you with further details, but only suggest that you find out for yourself by contacting ACE R/C, P.O. Box 511, Higginsville, MO 64037. Tell 'em when you write or call that you saw it in *R/C Soaring Digest* and, by the way, ask about getting multiple copies for your club to pass along to beginners in your group. ■

on the Wing

P.O. Box 975
Olalla, Washington
98359-0975

A small 3-view of Dieter Paff's PN9f appeared in *The White Sheet* (#7, Feb/Mar 1982; the "Flying Wings Special"), and a photograph of a PN9F constructed by Martin Simons appeared in the December, 1988 issue of *RCSD*. We are impressed by the design philosophy Dieter used for the PN9f, and recently asked Martin to describe the model for readers of ON THE 'WING. Martin replied with a copy of the article which set him off on this particular project (*Radio Modeler*, March 1980), together with some other interesting bits of information.

Design Philosophy

The PN9f is just one of many of Dieter Paff's models; it is actually the sixth in a series of models of a projected full sized sailplane. A wider, larger fuselage would be incorporated in the full sized 'ship.

The PN9f was designed as one approach to high aspect ratio tailless design, and as a result has a wing geometry which is rather unique. The leading edge is straight, while the trailing edge has a double taper. This configuration was designed to provide optimum pitch stability, and elevator leverage is enhanced by having the elevators placed well aft of the CG. The ideal elliptical lift distribution is achieved at minimum sink rate through a combination of wing geometry and airfoil selection.

Dieter's model was constructed utilizing foam core wings with obechi veneer skins. Each wing panel weighed just 17 ounces, and total weight was just under 60 ounces. Martin's model, constructed by the same methods, came out excessively heavy in comparison. He blames this on a combination of factors: less care in selection of materials, 2 mm wing skins, and a large amount of lead in the nose to achieve a proper CG location. Additionally, Martin added a braking parachute which is operated by a special servo and is enclosed in a compartment in the rear fuselage. A complete weight breakdown for Martin's model is included at the end of this column.

I keep telling you - it will never fly! Miaow!

Details

Several small but very important details are incorporated in the PN9f. The elevator hinge, for example, is center mounted, giving a relatively gapless fit. Additionally, the leading edge radius of the elevator is slightly larger than normal, making the leading edge of the elevator larger than the trailing edge of the wing at the hinge point. This gives smoother air flow (and less drag) when the control surface is deflected. Also, since the elevators are a part of the reflexed section of the wing, and hence subject to heavy air loads even in level flight, Flettner flaps have been added. Flettner flaps are small tabs bent in the direction opposite to the reflex curve. They push the elevators upward against the downward air load, acting as an aerodynamic balance. (Several of Dieter's models were lost before this corrective action was incorporated.) Lastly, the ailerons are hinged at the upper skin, and differential is provided by the servo output wheel. This set up is very effective and allows fine adjustments without major linkage changes.

PN9f Weight Chart

Wing:	cores, white foam and 'glass	550 g
	skins, 2 mm obechi	840 g
	covering, glue, wing rods	95 g
		1485 g
Fuselage pod, bare:		470 g
Radio: 370 g		
Lead, parachute, paint, etc.:		490 g
TOTAL 2815 g		
Dieter Paff's model:		1692 g

Flying

Martin tells us his PN9f flies very well off the slope, but due to its being overweight it has not been winch launched. Aileron differential and coupled rudder are used, and adverse yaw is in evidence if aileron-rudder coupling is disconnected. The elevator is not sensitive, as it is with most planks, due no doubt to its location well aft of the CG. The Flettner flaps are very efficient at reducing servo loads.

Some of Dieter Paff's other models will be covered in future "ON THE 'WING..." columns. ■

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Flying in Wind and Weather

...By Martin Simons

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13 Loch Street, Stepney,
South Australia 5069

Forces and trim in a turn

We may look now in a very basic way at the requirements for a correctly flown turn.

The diagram (Figure 15), some form of which may be found in every reputable book or instruction manual about flying that has ever been published, shows forces on an aircraft in a turn. The wing is banked because the force required to keep the turn going comes from the lift force being partly directed sideways. (Turning flat without banking is very inefficient, since the side force required has to be created by yawing across the airflow, with large increases in drag and only a small lateral force being produced.)

Inertia is the reaction of any object to forces tending to change its motion. A change of either speed or direction of motion will be resisted by the mass of the object. A turn is a constant change of direction, strictly a lateral acceleration, so mass reaction, which is inertia, arises in direct opposition to the turning force. The pilot and passengers in an aircraft turning are made aware of the acceleration and the corresponding inertia, feeling a 'g' force pushing them down harder into their seats. The steeper the bank, the tighter the turn and the larger the inertia. This of course applies in exactly the same way to model sailplanes.

The inertia in a turn is often described as a centrifugal force. The turning force caused by banking then may be termed the centripetal force. The centripetal force creates the inertial reaction and the two forces are equal so long as the rate of turn remains the same. All this is standard Newtonian mechanics. (Since aircraft do not move at anything like the speed of light, Einsteinian relativity equations produce no detectable changes.)

Banking to provide the turning force does not remove the necessity for the wing still to support the weight of the aircraft. The action of gravity on the model's mass remains the same and when some of the lift is directed sideways in the turn, a vertically upward supporting force must still be maintained. If this force is not produced, the aircraft will lose height in the turn, which is not desirable as a rule, especially near the ground.

A sailplane, it is true, does not maintain its height in a turn; relative to the air it always has some rate of sink. This does not affect point that in order to maintain the upward support for the weight, the lift from the wing has to be increased. The amount of the increase demanded is indicated by the length of the diagonal arrow in the diagram. This obviously depends on the angle of bank and that, in turn, settles the rate of turn.

The lift can be increased by bringing the banked wing to a higher angle of attack. To do this, the elevators are raised. In a correct turn, therefore, the wing is always closer to its stalling angle of attack than in straight flight at the same airspeed. It is a necessary consequence of this that the aircraft when turning, has a higher stalling speed than when flying straight.

Entering a turn at a low airspeed is obviously dangerous since the wing will already be at a high angle of attack before the turn starts and has to be brought to a still higher angle in the turn. Turning when flying at a low airspeed is a good way of stalling and entering a spin. One of the commonest cause of accidents is thus established. To avoid this danger, the pilot should consciously increase the airspeed slightly before making any attempt to turn, and **maintain this higher airspeed all the time the turn continues.** This leads to the following point. To keep the wing at a higher angle of attack to prevent loss of height, the wing has to be at a higher angle of attack, which requires some up elevator. But if the up elevator is overdone, the airspeed in the turn will be reduced dangerously near the stalling speed. Hence, to settle a sailplane into a smooth turn, the wing should be banked, safe airspeed maintained and **the elevator must be raised**, but not too much.

The diagram of forces is valid whether there is a wind or not, and valid for any direction of turn, upwind, crosswind or

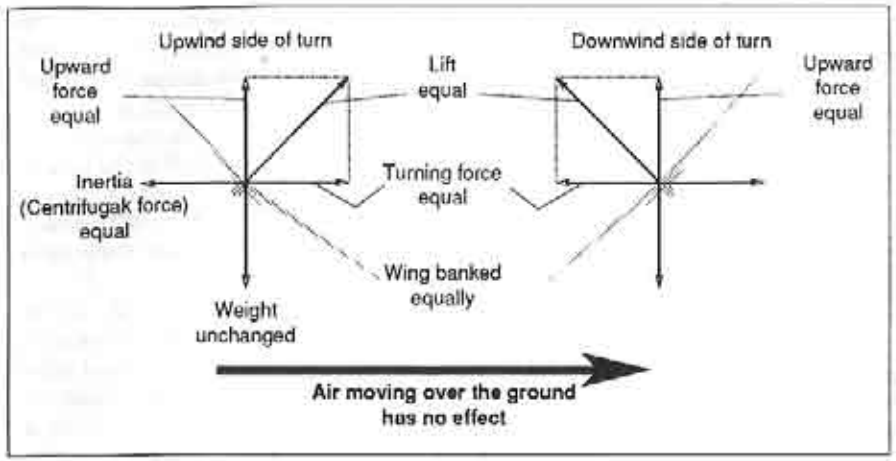

Figure 15 The forces on an aircraft in a correctly flown turn

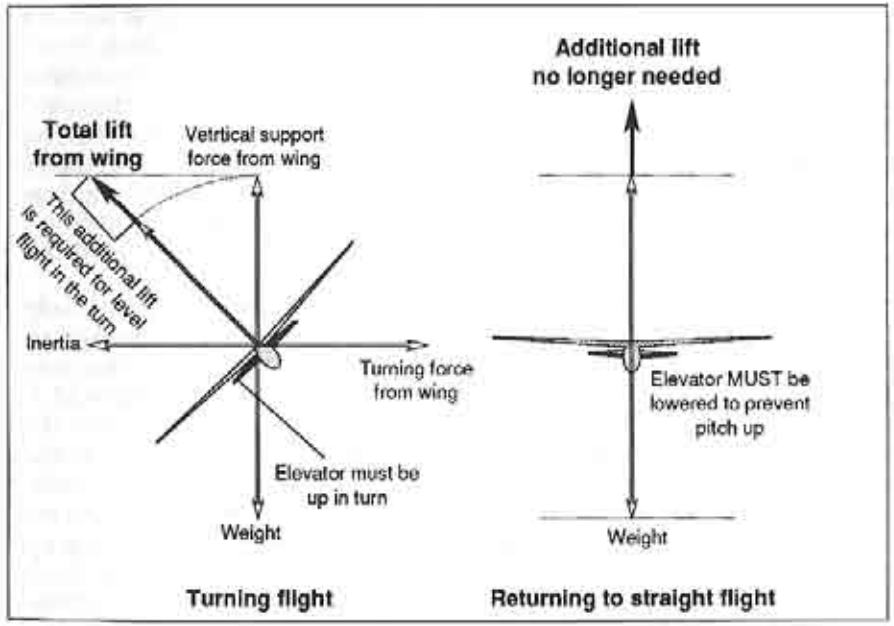

Figure 16 On leaving turn, elevator must be lowered: nothing to do with the wind direction

downwind. The air within which the model is flying may or may not be moving over the land. This general air movement does not in any way change the forces on the sailplane. The model is changing direction at a constant rate. The lateral acceleration produced by the banked wing is constant and inertia (centrifugal force) resists the turn all the way round, it does not switch on and off as the model changes its heading. Airspeed (velocity) is constant so kinetic energy and momentum are constant. Going upwind, with an airspeed 10 m/s as before, the 4 kg model has 4 x 10 = 40 kg-m/s of momentum. Going downwind at the same airspeed it has 4 x 10 = 40 kg-m/s. Going crosswind, 40 kg - m/s, the same, going in any direction, if the airspeed is constant, the same momentum. And of course the kinetic energy is constant too, all the way round the turn. No amount of specious reasoning can alter these facts.

Entering and leaving a turn

So why do so many models seem to surge up when they emerge from the final turn before landing?

The procedure for entering a turn from straight flight is the same in calm air or in wind, and irrespective of the direction of flight (Figure 16). If the airspeed is low before the turn starts, it should be increased. Bank is applied to provide the turning force and **simultaneously, to maintain height, the elevator is moved up** sufficiently. The airspeed must not be allowed to fall. If a steep turn is required, the up elevator movement will be greater and there must be more airspeed also.

To leave the turn, the bank is taken off, the centripetal force disappears and with it goes the centrifugal, inertial reaction. The need for high angle of attack also disappears as soon as the wing returns to level, because all the lift force is once again directed upwards and needs only to equal the weight. The stalling speed is reduced also. On coming out of the turn, the wing is **lifting more** than it need to support the weight in level flight and also the aircraft **has more airspeed** than it had before the turn. Because of this excess speed and lift, the sailplane will try pull up to rid itself of the excess. To prevent this, the angle of attack of the wing has to be reduced further, which requires **down elevator as the model straightens out**.

This is the true explanation of why so many models pitch up as they straighten out of a turn. The inexperienced pilot simply does not use enough down elevator to compensate for taking off the bank and the extra airspeed. But this happens without respect to the wind direction or the wing section. **It happens every time the model is brought out of a turn, whatever the direction.** Whenever the pilot fails to move the elevator down as the bank comes off, the model will surge up. This happens whatever the wind is doing. And, like any response of a stable aircraft to a disturbance, there will be an oscillation, nose up, nose down, and very possibly a stall if the pilot's reactions are ill judged.

Ham fisted, inexperienced pilots only realise what the model is doing when it is close in and turning to land. Then they blame the wing profile and the wind. If they could see more clearly what the model does when it is higher up and further away, they would find their mishandling of the elevator is causing exactly the same behaviour, pitching up when coming out of turns, irrespective of the wind direction, because their controlling skills are not well developed.

To make a tidy approach circuit and touch down at, or near, the desired point obviously requires judgment of ground speeds and distances. Base and final turns have to be made at appropriate points and so on. There are, too, posts and trees and other things to be avoided; momentum and inertia of impact do matter! The beginner is always very conscious of these things and may be nervous, so forgetful of the basic principles spelled out here. But all these nice judgments have to be made while remembering at every moment that it is the **airspeed** that the model 'senses', until the moment of contact with the ground, not the wind. To make a good landing requires the **airspeed** to be controlled until the very last instant of touchdown. ■

Flight Planning

...by Frank Deis
Colorado Springs, CO
Pikes Peak Soaring Society (PPSS)
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(This article originally appeared in the Journal of the Pikes Peak Soaring Society, *The Spoiler*, and is reprinted with the permission of Frank Deis.)

As with most endeavors, planning and preparation increases the likelihood of maxing the duration flights. This is especially true in competition when you don't get to pick the time and conditions for your flight. Preparations fall into two categories: 1) preparing the airplane, and 2) planning the flight. Preparing the airplane is the subject of a future article. Here, we will focus on preparing a "flight plan".

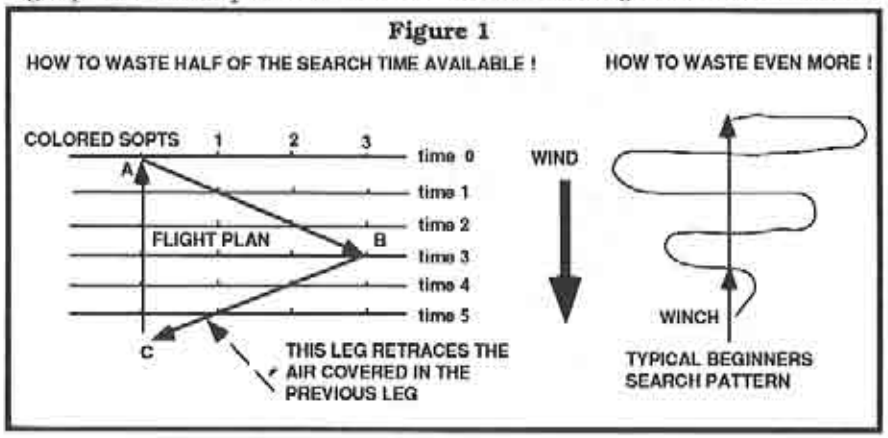
It is likely that you have not thought about preparing a flight plan except when you check to see if anyone ahead of you is in a thermal. Flight planning is a technique used by competition pilots and if you don't watch them closely, you may not be aware they are doing it. The objective is to figure out where to go in search of a thermal when it is your turn to fly. Now you say, "That's simple and I do it all of the time. What is the big deal?" By the end of this discussion I hope to convince you that making and following a flight plan is not simple and that it can have a big impact on your flight scores.

Flight planning is the merging of the results of three separate activities: 1) mapping the flying site, 2) observing the results of preceding flights, and 3) understanding the basic dead air performance of the airplane. I will cover all of this as though you write it all down. That is a good idea but is a bit formal. Most pilots just do it in their heads. Either way will work. The important idea is that you consciously think through the flight planning process instead of doing whatever comes to mind when you get off the winch.

The first step is to map out the flying site. This means estimating how far away I can see the airplane and then adding 1/4 or 1/2 mile to allow for thermals to drift in or waves to form downwind of something. Then go for a walk — a long walk! The walk must cover the entire radius of visibility plus that 1/4 or 1/2 mile border. Find out what is out there and where it is located. I try to build a picture of everything on the ground that can affect the air I might fly in.

I have never been any good at guessing where the good and bad air will be. I have found sink over freshly plowed fields and lift over lakes - it makes no sense to me. Others have written extensively on this subject so I will not provide a discourse here. I will provide my belief that is more religious than scientific. In

Figure 1



my experience, thermals seem more likely to occur where there is some change or discontinuity in the landscape to trigger it. Any change (e.g., a change in color, texture, moisture, angle to the sun, etc.) will do; any discontinuity that will turbulate the boundary layer next to the surface if the wind is blowing. I call these things trigger points because they give a thermal the excuse to break loose and start to float away. So, I look for trigger points. The other things I look for are features that can generate ridge lift or wave lift conditions. They help the sailplane get from one trigger point to another with the minimum loss of altitude. They can also keep it up if I cannot find anything else. These features include hills, buildings, tree lines, etc. Just for kicks I have included a map I made of the PPSS flying field and the area around it. It is easy to see why it is a good field. There are many trigger points around it: roads, tall weeds, short grass, trees, buildings, gentle rolling contours, steep drops, strong moisture and color variations, etc. It is a very rich place.

The day of the contest, I watch the pilots and make little notes on the map about where the thermals were, how strong they were and how far apart in time they were. This tells me what trigger points are active and how active they are. That is how I collect the results of the previous pilot's flights.

OK, we know the landscape and what features are actively generating thermals. Now what? Now it is time to develop the flight plan.

You should know how much time you get (usually 3 - 4 minutes) in dead calm air with no thermals (i.e., your "dead air time") from your tests and practice. Your flight plan is a search pattern that uses all of that time efficiently to search for thermals. If you fail to find one, it returns you to the landing pattern entry point with just enough altitude to make a 100 point landing. Your flight plan is based upon your knowledge of the field, the air, the previous good and bad flights. It should take you over every likely thermal trigger point while avoiding the likely down air spots. It should make use of slope lift, ridge lift and rotors to get from trigger point to trigger point quickly and with minimal altitude loss.

The thermal cycle (the time between thermal formations from the same trigger point) is typically longer than your dead air time. Therefore, if there wasn't a thermal there the first time you visited the trigger point there is not likely to be one there a minute or two later. Hence, the flight should never retrace itself through air you have already tested. Retracing your path cuts your opportunities of finding a thermal in half! Remember the air is moving so flying over a new ground track does not automatically mean you are flying through "new air".

Figure 1 attempts to show this "retrace" problem graphically. Suppose your flight path takes you up wind off of the winch a couple hundred meters to point A. You then fly cross wind to point B then turn back to land at point C. Now suppose there are colored puffs of smoke in the air (like dye marker spots in the water of a flowing river) at points 1, 2 and 3 just as you make the turn at point A at time = zero. After the turn to the cross wind leg at point A you fly through the smoke puff at point 1 at time 1. A few seconds later the sailplane moves cross wind to the next color spot which has also moved (downwind) during that same period of time. After passing through puff 2 at time 2 the sailplane moves on to puff 3 at time 3 and then it turns onto the home bound leg for the second half of the flight. As it moves from point B toward point C it flies through puff number 2 again (at time 4 this time)! A few seconds later it encounters puff number 1 for the second time. If you get the flight path and wind just exactly right (or wrong as the case may

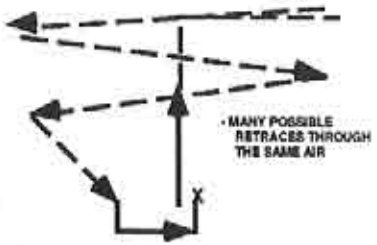
be) it is possible to fly through the same air between B and C as you searched for thermals in flying from point A to B. There are many search patterns that will produce this retrace problem, and the most common one, unfortunately, is the one that most beginners use as shown in the figure.

The key to finding a thermal is to look in many, MANY places. Staying in one place means the thermals must come to you and they don't always understand their responsibility! If you fly in "new air" at 15 - 20 MPH for 3-4 minutes you will cover 3/4 to 1.5 miles! With an F3B type airplane and one of the new airfoils, you could perhaps double that! (That is why the new designs are so exciting.) Now, if you fly in a straight line for that distance, finding a thermal is almost a sure bet! Obviously you cannot fly in a straight line because you will lose sight of the airplane and the path would not leave you in position to start the landing pattern. We need a closed pattern that constantly takes the sailplane through new air with no retraces.

The particular pattern you use depends on many variables. Some commonly used generic patterns are shown in the figures below. You can start with one of them and taylor it to the site and weather.

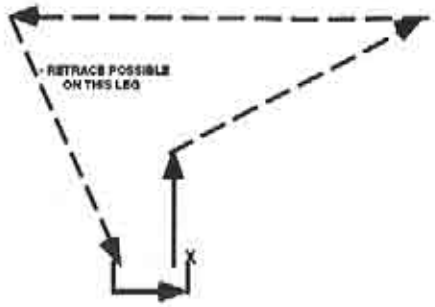
a) Novice "hang around up wind until it is time to land" pattern. Not very efficient due to frequent retraces. Stay away from this pattern.

NOVICE " HANG AROUND UPWIND UNTIL IT'S TIME TO LAND" PATTERN (A)



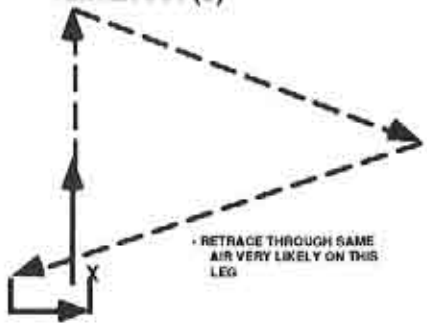
b) Up wind full triangle. This is better but it is still not very good. It produces about 30% retraces.

FULL UPWIND TRIANGLE (B)



c) Aft- left/right triangle - vertex out. Poor because of 50% retrace. Note that changing direction along the path fixes the problem

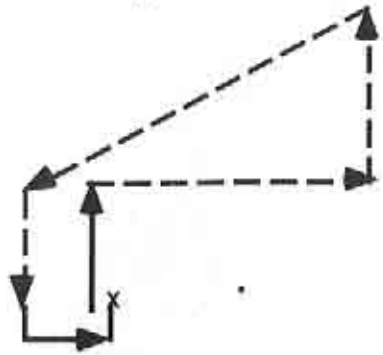
AFT - LEFT/RIGHT TRIANGLE VERTEX OUT (C)



d) Forward - left/right- vertex out. Not too bad, only minor retraces. Good for floater type airplanes that don't cover much distance. Best of the small patterns. If possible, fly to visual limit and back.

e) Forward- left/right triangle - base out. Not too bad, no retraces. Good for floater type airplanes and aggressive pilots. Stay at visual limit for as long as you dare.

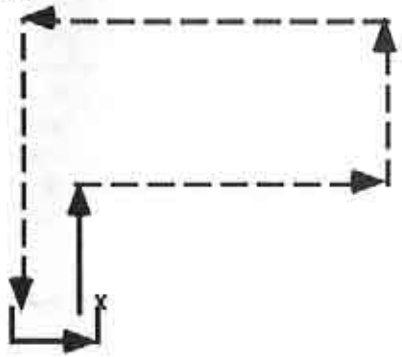
FORWARD LEFT/RIGHT TRIANGLE BASE OUT (E)



f) Forward - left/right rectangle. Covers more ground than d) or e) and keeps airplane at visual limit longer.

Also takes more courage. Efficiency drops if flown in the other direction. Requires moderate Lift/Drag to complete.

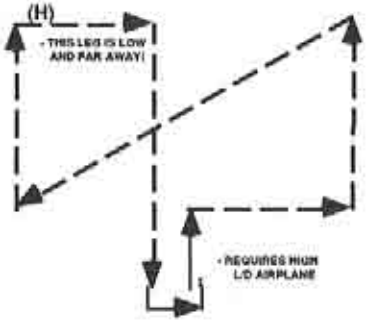
FORWARD LEFT/RIGHT RECTANGLE (F)



g) Full forward rectangle. This one can be extended to the visual limits on both sides. Note the potential retrace problem. It can be extended to a full semicircle at the visual limit. It requires a pretty good airplane and much courage to execute because you end up low and far away.

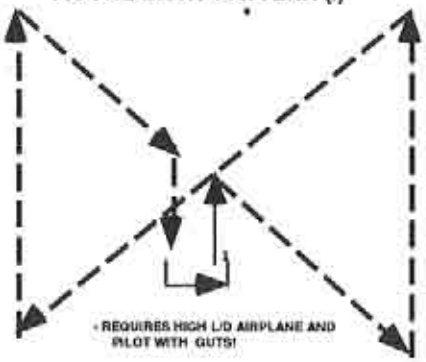
h) Improved forward rectangle. Eliminates the retrace in g) and can be modified to a full semicircle. It turns out to be a special case of a family of figure eight patterns. It requires a good Lift/Drag airplane and an aggressive pilot because you get very low very far away.

IMPROVED FORWARD RECTANGLE (H)



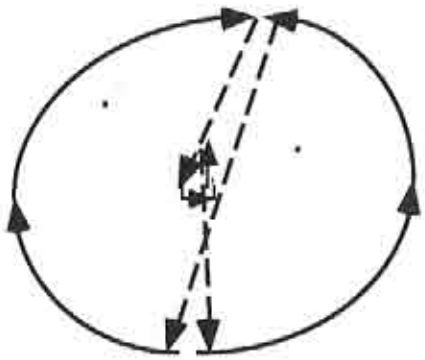
i) Figure eight patterns. These look like two forward left/right triangular base out patterns placed vertex to vertex. They have great flexibility, almost no retrace problems and can be extended to the visual limits in all directions. They require very high Lift/Drag and a very aggressive pilot.

FIGURE EIGHT PATTERN (I)



j) The ultimate! (for lack of a better name). This requires a fool hardy pilot, expendable airplane and a motor!

THE ULTIMATE (J)



The generic flight plans are just that. They give you general sizes and shapes of the flight plan options. If you don't know your dead air performance, waste a few flights by trying a couple of generic plans. Start with e), the forward base out triangle, for example. Most sailplanes can complete it. If you get back with altitude to spare, try the full forward rectangle and then stretch it to a semi-circle. If you are still too high on your return, try one of the figure eight patterns. Don't cheat by riding a thermal to stretch the pattern because you won't always be able to do it. It is fun to make a quick turn if you pass through a thermal to confirm it and then move on through the plan. I like to see how many thermals I can find in a single 4 minute search. You would be surprised at the size of the number. Anyway, I think it is best to pick the largest possible generic pattern as a starting point.

The last step is to lay out the generic pattern on the landscape map. Then, bend and tweak it to take advantage of the trigger points and transit (ridge lift) areas. (Remember you can always flip a pattern left to right if you need to.) Assume you will be losing altitude the whole time and include the effect of both the wind and the altitude when visiting the trigger points (i.e., thermals will be further downwind of the trigger points if you are higher). Just for kicks I put a Falcon and a Legionair 100 flight plan on the landscape map. Notice how I bent them to fit the field conditions discussed in the landscape section. If you find something, ride it. If it fizzles out, go back to the flight plan and continue your search.

Remember, whatever pattern you select it should result in just reaching the entry point conditions for the precision landing pattern with –30 seconds of altitude left. Typically the home bound leg of the pattern is pretty low. Remember the search isn't over until you hit the landing pattern entry point, "It ain't over till it's over."

Discuss your plan with your co-pilot and void changing the plan at the winch. For every time you change and find a thermal, there are 5 other times when you will not find a thermal. On those occasions you will be out of position, plans, ideas and altitude all at the same time.

That is all there is to it. Now that you have a plan, go try it out. Flight planning is not a one shot process. You are usually well advised to change the flight plan two or three times a day as the wind direction changes and trigger points increase or decrease in activity. In my experience, if flight planning is done properly you can max more than 90% of your attempts. The goal, of course, is a thermal every time! ■

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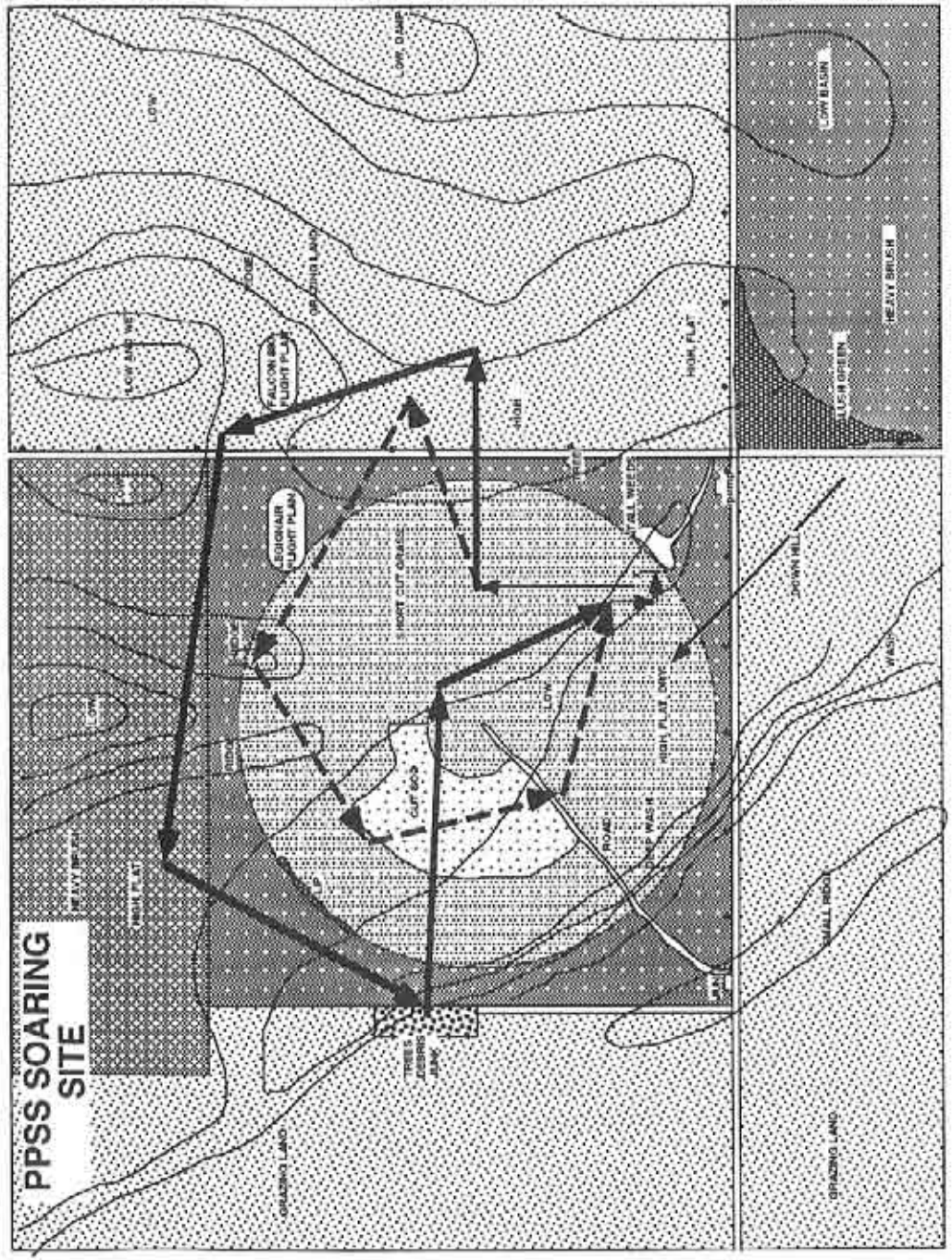

Documentation for Scale Sailplanes

...by Martin Simons, Australia

There have been some sad cases where a scale model has been submitted for judging in a competition and has scored zero, or nearly zero, because of poor documentation. It comes as a nasty shock to the modeller who has worked hard, and who may have travelled a long way to get to the contest, to have the model written off as worth next to nothing.

We are in this game for fun, so providing we have fun, winning or losing doesn't matter. But we can all learn something from competitions and, as a result improve our models. In the longer run, we should have even more fun with our better models. So, in future, avoid the disaster of scoring badly simply because the paper work was inadequate.

It is ironic, but true, that the emphasis in a competition of this kind is not to produce a perfectly accurate replica, but to produce something that is consistent with the documentation. It is the documentation that the judges have to study, not the actual aircraft. I once attended a scale sailplane contest in Germany where one entrant, with the co-operation of the owners, positioned the full-sized sailplane alongside his scale version of it. Nearly perfect though his model was, the judges would not, in fairness, apply different criteria to him from those they applied to the other entrants, who were unable to arrange such a convenient demonstration. The judges studied the submitted documents for scoring purposes, not the original that stood, in full view, a few metres away. Fortunately the papers were also first class.

In Germany it is usual to go over the models thoroughly with tape measures and calipers, deducting points for every measurable error in dimensions. I know of a model which lost points, in a very big and serious event, because it had a moulded g.r.p. fuselage. The original is a wooden sailplane. The ideal is undoubtedly the perfect, reduced size, copy of a full-sized aircraft and the judges have to be convinced by the documents that this is what has been attempted. The rules put the onus of proof on the entrant. You may have gone to great trouble to get everything right, but you will only get credit for this work if you can show drawings and/or photographs, or at least some authenticated textual matter, in support.

So, from the beginning of a new scale project the modeller has to consider documentation. Probably most of us start the wrong way round, with an idea of the aircraft we want to build, having perhaps seen it, or a picture of it, noticed someone else flying a model, or spotted and hastily bought an attractive looking kit from a shop or mail order catalogue.

It is likely, with such an approach, that the model will be half built, or even flying, before any proper search for documentary support is made. It may then prove very difficult to find anything at all. Desperate last minute scratching around produces very little. Even if some good reference material is found at the last minute it is probably far too late to change anything. Fundamental errors simply cannot be put right at such a late stage, and even if the faults discovered are relatively small, it may still be very difficult to correct them in the last few weeks, or days, before the competition date.

It is best, for serious competition entrants, to turn the process completely round and gather the documentation first. This means planning ahead, perhaps even years ahead. The sailplane to be modelled should be chosen in the secure knowledge that excellent information is already available before cutting the first piece of wood or even looking for a kit. (A prototype that will also make a good flying model should be chosen. This requires another kind of decision.)

Anyone who has gone into a search for documentation soon realises that the apparently simple task of finding a three view drawing showing the true outline of an aircraft, is difficult.

Note that a drawing on reasonably large scale is always a **requirement** of the rules. If there is no such drawing the judges are justified in writing zero without even looking at the model.

Published drawings (it has to be admitted even by one who has published a good many) may contain errors, or be too small and lacking in detail. I saw, at one recent competition, several copies (or was there only one, handed round from person to person?) of Andrew Coates' book, **"Jane's All The World Sailplanes"**. This is an excellent work but it was never intended for model making purposes and the small outlines are hardly adequate, even if they are enlarged. The same applies even more to magazine sketches. When, as may happen, such drawings actually conflict with photographs standing on the pages alongside them, the judges cannot really be expected to know where they are. The model suffers badly in the scoring, however well it has been made. (A few useful sources, though mostly somewhat vulnerable to the above criticisms, are listed below.)

The rule that one should start with the paperwork, is harsh. I personally have a long list of beautiful sailplane types I would like to build in model form, and I certainly shall try some of them, but there are many that I have not yet been able to support with adequate plans or pictures. This applies especially to some of the really old types, for which there are no surviving drawings at all. The few photographs one can find in old journals and books are often out of focus or otherwise spoiled. With no colour film existing, in those days, paint schemes, if any, can only be guessed at. I might build models of some of these, one day, **for fun**, but I cannot expect them ever to make a high score in a scale judging.

Even some modern sailplanes provide serious documentation problems. Manufacturers, if contacted personally or by letter, will sometimes be very helpful but they cannot be expected to spend much time on our requests. Their preoccupation is designing, building and selling their products and we, collectively, may become a thundering nuisance if we bother them too often.

Even when they are forthcoming, they cannot always be relied on to provide totally satisfactory material.

What seems to happen is that, when the main design decisions have been made about a new type of sailplane, and work has started on building the first example, a junior draughtsperson knocks out a general arrangement drawing, probably on a scale of 1:25 or 1:20, showing the shape and layout of the main components. This will be accurate as far as it goes but that may not be very far. Probably such important details as fuselage cross sections, wing profiles, control hinge details, and cockpit layout, will not be shown. Possibly an artist will be brought in to do a quick impression with an airbrush. These items at once go to the publicity department. Pamphlets may be printed and circulated to all the aviation journals and prospective customers even before the prototype is flying, or very soon afterwards, and the all-important order book is opened.

This sort of publicity material is usually easy to get hold of, requiring only a letter, or perhaps a phone call to the agency whose advertisements appear in such magazines as ***Sailplane and Gliding***, and ***Soaring*** in the USA, ***Australian Gliding*** and ***Gliding Kiwi*** 'down under'. Some good material which may be useful appears also in ***Technical Soaring***, published, like ***Soaring*** from Hobbs, NM., by the Soaring Society of America. Such drawings and 'hand out' pamphlets are

the absolute **minimum** requirement before starting on any scale model of a modern sailplane, but we should try to do much better.

About this stage in the prototype development at the factory, it may be that some enterprising model kit producers get hold of the three view drawing and set out to make kits. The idea is to release these onto the model market at about the same time as the new full-scale type makes its public debut on the competition field. This will usually be quite soon after flights of the prototype, if all goes well. How accurate the kit model is, even relative to the manufacturer's earliest published outline, varies a good deal: some kit makers seem to be quite conscientious. Other kits, unfortunately, resemble the prototype only in name and it is hard to comprehend why they are claimed as scale, or even 'semi scale' models at all. It is easily demonstrated that accurate scale model sailplanes, in the larger sizes, fly every bit as well as the clumsy copies, so there is no excuse for the kit producers who cannot be bothered to get their scale rulers into action. There does not seem to be any very significant difference in the price that has to be paid for an accurate kit as compared with a merely nominal one, so beware! This is one reason why it is most necessary to begin with good documentation, so that we are not misled by a pretty box.

Meanwhile, the design and test flying team 'back at the ranch' will almost certainly have made some significant alterations to the full-scale aircraft. Control surfaces may have been increased or decreased in area and shape, air brakes may have been relocated, the fuselage may have been lengthened, the tail unit might have been totally redesigned, the junction of wing to fuselage may have been tested in a wind tunnel and reshaped, the cockpit canopy might have been improved, and so on. It is not likely that all these things will happen to one design, but it is quite rare for the prototype of any new sailplane to go immediately into production without some alterations.

Before too long, some photographs of actual production aircraft, as opposed to the prototype, will begin to appear in the full-scale gliding magazines, but the original three view drawing will quite possibly never be re-done. By this time the drawing office at the factory will be working on the next new design and there is little pressure to revise the old promotional material. The prospective buyer of an aircraft will usually be offered an actual example for a trial flight, so why should anyone worry if the three-view drawing is somewhat wrong?

Even if a completely new, up-to-date general arrangement drawing is now made available from the factory, having been done quickly between coffee break and lunchtime on a slack day, the magazine editors, who have problems of their own, may decide that re-publication is not worth the space. It is this year's contest reports, or advanced information about **next year's** new type, they want to print.

Of course the manufacturer does make very precise drawings, usually on large scales, for the workshops to use in production. The dedicated scale modeller will try to get access to this information if possible. There has been a good deal of success with some of the older sailplanes in this respect. Various collections of old factory plans exist. In the USA, **Schweizers** of Elmira, NY, have an excellent package of information about all their former production aircraft, which they may be willing to supply, on request. If it is not possible to get access to these collections directly, help can often be obtained by making contacts through soaring clubs and associations, among whose members are many modellers. The **Vintage Glider Club** in England and the **Vintage Soaring Society** in the

USA, are particularly keen to find and save such plans. Virtually all the **Slingsby** and **Elliotts of Newbury** drawings, for instance, and a good many popular German types, are looked after by various VGC members in Britain. Similar archives can be found in Germany, France, Hungary, Switzerland, etc. (Some addresses are given below.) Magazines, such as ***Modellflug International***, from time to time do publish drawings by such outstanding draughtsmen as Jürgen Fischer, which are based on the full-scale factory plans, though the number of types so covered is unfortunately quite small.

There are still difficulties with the most recent sailplane types. Detailed information about these is often confidential, so the modeller has next to no hope of getting it. Industrial espionage is not recommended! Even if the material is not kept secret, it is unlikely that the manufacturer will be prepared to divert staff to sort through the stack of large drawing sheets that become associated with any particular aircraft type, simply in order to help some unknown model builder in a distant country. Even a personal visit to the factory may not overcome this sort of problem, although it has occasionally been done successfully. Personal contacts, if the modeller is lucky enough to have some in the right places, can be extremely valuable.

One useful type of drawing which is sometimes readily available, is produced for customers who want to build, or pay someone else to build, a road trailer to carry the sailplane. These drawings, which can sometimes be borrowed from the sailplane owners after they have finished the trailer and taken delivery, show wings, fuselage, tail etc., in precise outline, with dimensions and cross sections. They can usually be relied on. (Even here one can have nasty shocks. I once used such a drawing to build, ahead of delivery date, an enclosed, steel framed trailer for my LS3, so that I would have it ready for immediate use on arrival. It was only when dragging the fuselage into place, after the wings had been safely stowed inside, that I discovered the fin of the LS3A had been redesigned. My shining new trailer had to have a hole sawn in the roof to get the fin in.)

Assuming, after all such efforts, the modeller has in hand a good drawing, there is still the necessity to check the details against the particular sailplane chosen. This is more than merely getting the colours right and sticking on the correct insignia, if any. Quite apart from unadvertised alterations made in the factory (like that LS3A fin), there may be all kinds of small changes done by the sailplane owners themselves, or optional extras, not shown on drawings, but apparent when the sailplane itself is examined. Tail skids and tail wheels, for instance, may be interchangeable, wing root fairings may be modified, wing tip wheels may be removed or added, instrument sensors (pitot heads and total energy heads), may be in various positions, ventilators in the cockpit canopy may be improved, there may be scoops and intakes for pneumatic turbulators, and so on.

The only way to ensure that these details are documented, is to go over the aircraft with a tape measure and perhaps a large pair of calipers, and to take a series of good photographs from all angles, close up and further away. This applies equally to the paint scheme, of course, though the photographic print may bear only a distant relationship to the actual colours. (A case was noted once of registration letters being blue on the photographs and on the model, but grey on the original sailplane which stood nearby in its hangar. But the model is judged against the documentation, so nothing was lost. It would, paradoxically, have cost points if the colour had been changed, unless the photographs were changed too.)

To fill in the final details it becomes almost essential to visit the gliding site to study the chosen aircraft. Better still, choose an aircraft at a site which can easily be visited. Such a study session, or several, will usually be easy to arrange, making contact first through the relevant gliding club. It will certainly be necessary to come to an amicable agreement with the sailplane owners, whoever they are, and get their full and willing co-operation. This is not usually difficult but if it does prove so, choose another aircraft! To give the modeller adequate access the glider may have to be taken out of its trailer or wheeled from the hangar and safely parked. Good light, and plenty of time, will be needed. If the owners want to fly, they will not tolerate delays but if asked tactfully, most will be glad to help and may even be a little flattered to have such intense interest shown in their beautiful (and precious) sailplane.

Do not choose a time when it is likely the glider will be engaged in a major competition or rally. No-one will welcome your arrival with notebook, tape measure and camera on such occasions, unless you are also prepared to help with the work that has to be done.

In the case of older sailplanes, which is a special interest of my own, it is rarely easy to find examples to study closely at first hand. One has to find what one can, and use it fully. Fortunately, I have been around gliding for some decades and have quite a lot of information collected over the years, including some measurements I made as long ago as 1949. (I may be able to help other modellers, in some cases, but I did not own a good camera in those days.)

A good many old sailplanes are still flying in restored condition. My rather elderly and battered Kirby Kite model, for instance, was based on the one owned at Dunstable by my friend Ted Hull, and I have actually flown in it myself for some hours. A few enthusiasts have recently built replicas of other types from the original plans. There is, for example, a new Habicht in Germany, brand new Gull 3, Hols der Teufel and H-17 may be seen in Britain. In all such cases, the vintage glider clubs will usually be able to supply names and addresses of members who own the aircraft. Co-operation and very generous help almost invariably follow if a carefully worded letter is despatched.

A surprising number of sailplanes, ancient and relatively modern, are to be found in European and American museums, such as on the Wasserkuppe, in the Deutsches Museum in Munich, and other scattered places in Germany, the Verkhershaus transport museum in Lucerne, Switzerland and in the Smithsonian Institution's Paul Garber facility at Silverhill, Washington DC, and the National Soaring Museum on Harris Hill near Elmira, the famous gliding centre in New York State. There are others in France, Poland and elsewhere. To visit any such distant museum specially for purposes of scale modelling is probably out of the question, but if the chance arises when travelling overseas, take a camera and notebook, and dodge the trip to the Kaiser's bathroom or the Duke's dungeons!

I am still left with many types on my personal list of which no examples exist now, even in museums, and which were never photographed in colour. The PWS 101, with which I have done quite well, is a case in point. A Polish emigré friend and his friend in Warsaw, between them supplied me with almost everything I needed, but only black and white photographs exist. For the colour scheme I relied on their written assurances, and various textual references, all of which I included in the portfolio. Whether the judges read Polish I am not sure, but presumably my documentation was good enough for the occasion.

In the end, for serious competitors, the policy has to be, get the documentation together first, as much as possible. If there is not enough, choose another sailplane which can be documented more adequately, and build that instead.

If you cannot be bothered to do all this, have fun, but don't expect to win!

A very small selection of the available, useful reference books: (I can usually supply Xerox copies of selected pages, on special request, but no promises!)

"Alianti (Soarers)", F. Galé, NASP Italy, 1978. (Varied selection of types current in 1978, factory g.a. drawings on various scales and of varying quality, some photographs. Brief parallel text in Italian, English, French & German.)

"British Gliders and Sailplanes", 1922 to 1970, Norman Ellison, A & C Black & Co., 1971. (Good, though rather small, drawings, some lacking detail, of all British types up to and including the Slingsby version of the Glasflügel Kestrel.)

"Konstrukcje Lotnicze Polski Ludowej", P. Zbiorowa & A. Glass, WKL Warsaw 1965. (Polish sailplane types from 1946 till 1965. Excellent full page drawings with details & photographs, but photos not very well printed. Text in Polish. A larger, similar book by Glass is available for pre WW2 types.)

"Rhönsegler", R & M Ferriere & P. Selinger, Motorbuch Verlag 1988. (All Schleicher types since 1951, up to and including the ASH 25. Good drawings & photographs. Text in German, including some colour information.)

"Segelflugzeuge", P. Selinger, Motorbuch Verlag 1978. (All Schempp Hirth types from Wolf of 1935 to Nimbus 2 & Mini Nimbus. Factory g.a. drawings but many extra details, good photographs, text in German.)

"The World's Sailplanes, Volume 1", OSTIV 1958. (Very small drawings, poor photographs but accurate numerical data on very many types current at the time of publication. Parallel brief text English, German & French.)

"The World's Sailplanes, Volume 2", OSTIV 1963. (Accurate but bare outline drawings, reasonably large scale, numerical data and photographs of many types current in 1963. English text.)

"The World's Vintage Sailplanes 1908 - 1945", M. Simons, Kookaburra Technical Publications, P.O. Box 498 Dandenong, VIC., Australia. 1986. (Large selection of pre 1945 types, drawings scaled 1:90 with fair detail, b. & w. & some coloured photographs. Available only by direct order to publisher.)

Clubs and Associations

Vintage Sailplane Association (USA) publishes magazine ***Bungee Cord***, with photographs, occasional drawings, etc. Currently, the editor is Jim Ealy, a modeller.

Secretary, Jan Scott
Rt. 1, Lovettsville
VA 22080 USA

Vintage Glider Club (Europe) publishes a quarterly magazine, ***VGC News***, with drawings, photographs, text etc.

C.Wills, (President)
Wings, The Street,
Ewelme, Oxon OX9 6HQ England

Vintage Glider Association of Australia publishes ***Vintage Times***, small newsletter, with occasional photographs and drawings, news of rallies, etc.

Secretary, Allan Ash
2 Heath Avenue
Frankston, VIC 3199

Note: Allan Ash is also the Editor of *Australian Gliding*, but the postal address of the magazine is GPO Box 1650, Adelaide, S.A 5001. ■

Cape Cod, the Sequel

...by Stan Eames
Northeast Sailplane Products
Underhill, Vermont

Last year I reported on our annual trip to Cape Cod. The response to the article was so positive that I decided to write a sequel on the 1992 trip. I hope that readers enjoy it as much as we enjoyed the experience.

I stood and stared out the large glass window of my office at the leaves dancing in the cold October air. Although I could not hear, I imagined the scratch of the dried leaves on the sandy pavement as they skipped their way to the silence of the dried and matted grass. The wind was strong, and the conditions were excellent for slope soaring, my favorite flavor of RC. I found my mind drifting from leaves to sand, and the breezy dunes of Cape Cod where Sal and I would find ourselves in one week. Our annual trip to the Cape was close enough to get the imaginative juices flowing, and the sounds in my head shifted to the whistle of a Quabeck airfoil screaming by my head. The phone rang, a double-dinger, meaning that the call was from the outside. "Stan Eames", I said as I continued to gaze at the windy conditions outside. "Hi Stan, it's Sal," was the reply. For some strange reason Sal always identifies himself to me when he calls on the phone. Not that this is unusual, but at this point it's kind of like my wife calling and saying, "Hi, it's Nancy."

The conversation centered around our plan of attack for travel and lodging. This year we opted to share the Cape experience with our families, and that required some additional planning. We opted to travel separately, with Sal renting a large van to carry our vast collection of planes, tools, glue, lead, and kleenex. (Ever see a grown man cry after crashing a 3 meter airplane?) I would leave earlier than Sal with my wife, two children, and anything else I could fit in my car. After deciding how we would get there, we discussed the weather outlook. It's fun to conjecture on how the conditions will be in 5 days, but it really is a complete waste of time. Seldom are the weather gurus accurate in their predictions, and we are ultimately at the mercy of the Gods of wind. No matter, in 5 days we would be there and nothing would stand in the way of our having our typical outrageous time.

With 5 days left I still had time to throw together a couple of airplanes. This year I wanted to bring a ship that would fly so fast vapor would bleed off its wings when I pulled back the stick to turn. I also wanted it to be unusual in that no one else around would have one. Given this criteria I selected the Simprop Sagitta slope racer. A German kit that looks fast standing still, the Sagitta built fast and turned out to be a gorgeous ship. After programming my X-347 to allow the Sagitta ailerons to act as air brakes upon command, I finished the wings with a rainbow color scheme and packed the speed demon in its box for travel.

Stan flying the lumbering Alpina.

Stan's Albatross and Bob Power's F4 ready for action.

"One more kit, just one more kit," I said to myself, remembering the extreme carnage on the slopes last year. The dunes of Cape Cod are hungry and merciless. The more gliders you bring the more likely you will be flying the entire time you are there. Planes crash, of course, but then they also are crashed. I am referring to the antics of the annual Fight To The Death (FTTD) between Sal and myself. Last year we used Talons for this event, and my last building effort prior to departure was to be a new gladiator. Given that durability is an important consideration in the FTTD competition, I elected to build a Cheetah by Cheetah models. This kit features a fuselage that could double as a whiffle ball bat, and wing and tail surfaces made of foam covered with strong cardboard. It is designed for Combat, and makes the perfect FTTD machine. Sal had already sheeted the wing for me, so slapping this baby together took no time at all. I finished the ship with a black skeleton cross bones on the wing, and the words "Fly and Die" as a warning to Sal that I was "combat ready".

The ride from Vermont to the arm of Massachusetts was uneventful. It was a beautiful breezy Fall day, and my thoughts wreaked of anticipation. Upon arrival at the motel it was immediately evident that soaring conditions were good. The flag in the parking lot was stretched out from the slope as if were fleeing from the ocean, and the clang of the hoisting rope against the pole was causing my heart rate to increase rapidly. After helping my wife Nancy, and kids (Alex, 3 years, and Lauren, 3 months) to become relatively settled in the apartment, I grabbed the Cheetah. (Yes, of course, I brought a plane with me. Sal was hauling the bulk of our supply, but I had to bring at least one just in case the conditions were good. Otherwise, I might suffer from slope withdrawal and fall quivering in pain on the floor!)

You know, when the wind is blowing and you are near a slope with a slope plane that needs the receiver and battery pack installed, installing the flight pack is like diffusing a bomb with 10 seconds left on the timer. After my obvious nervous fumbling I finally stretched the last rubber band over the wing and charged out the back door to the awaiting slope. The wind had died down somewhat, but I still managed to fly the Cheetah for 15 minutes prior to the wind sinking with the setting sun. That initial small experience of flight was highly satisfying, and I knew after that moment that we would be blessed with good conditions.

The next day I discovered that Sal had arrived intact along with a gaggle of gliders and two friends of ours, Tammy and Jim Trumper. Sal's wife, Carolyn (or "Cooie" as her friends call her), would arrive later with Sal's daughter Sarah.

As the wind was blowing in a Northeasterly direction, we decided to travel to the other side of the Cape (the east side) where there was a lighthouse on a section of land that jutted out enough to form a north slope. This was the first time we had flown this slope, so we were in experimental mode. The slope was perhaps the highest on the Cape, and was formed by the erosion of a monstrous dune. Pipes and old sections of a foundation jutted out from the slope face as though a giant shark had bitten off the side of a hill, taking with it a house that was once on top. Mother nature and her erosion process had provided us with a slope that had lift extrodinaire.

The breeze was not very heavy so I started out with my light wind "ol' reliable", the Chuperosa. As it turned out the lift was fantastic, and soon we were flying Sparrows and having a ball. As we became more and more bored with high level flight, we started to hug the cliff face. At times our gliders would disappear from sight as we poked in and out of natural crevasses in the formation. Tammy and Jim had never flown at the Cape before, and they were flabbergasted over the smoothness of the lift band, and the ease with which you can get suddenly cocky with an airplane. The flying was so great that Sal forgot about the finite charge of Ni-Cad batteries. His Sparrow bit the dust on a landing approach and the first casualty of the trip had been experienced. Undaunted, Sal emerged from the van with our Pocket RC Harrier and began to fly the miniature airplane amidst the chuckles of onlookers. Such a small plane on such a large slope certainly was entertaining to watch, but we were also amazed at how well the Harrier handled. Later in the day we would discover just how much fun Pocket RC airplanes are.

After some lunch we discovered that the wind direction had shifted to the East. Given the shift, we hopped in the van and travelled to a dune located in a State Park area. I decided to fly my open class slope machine as the area was pretty open and the wind speed had picked up pretty good. For the first fifteen minutes or so the flying was great. After a while, however, several other pilots showed up and the slope began to look like O'Hare airport the day before Thanksgiving. I knew that a mid-air was inevitable, but I didn't know it would involve my airplane. SMACK! The left wing of my 118-incher got whacked by a two meter while travelling at top speed. Luckily, it went into a flat spin and landed on the sand with relatively little damage. However, it would not fly again before being put on the operating table in Vermont. Well, at that point it was Sal 1, Stan 1. We both

Jim Trumper holds Stan's Sagitta racer ready while Stan surveys the 40 knot winds. (Note the whitecaps!)

Jim Trumper holds Stan's Albatross steady while Stan checks the surfaces.

managed to put an airplane out of commission, but we had the "Cape Slope" frame of mind. This meant that we didn't care, we brought plenty of airplanes (keep crunchin'...we brought more!).

After picking up what small pieces of balsa and foam I could find, I packed my wing into a bag and we piled in the van. It had been a fine day of soaring, and we were burnt from the wind searing our faces. ("Stan's World...Sal's World...Party Time... Excellent!...".) We had a great meal at a local restaurant and retired for the evening.

The roar of the wind against an old structure has a recognizable sound. As I awakened I heard the familiar roar of the ocean breeze squeezing itself through window cracks with a high pitched whine. Gazing from the window I saw the ocean spotted with white-caps, and the sea grass reaching over the top of the slope, bent from the force of the wind. Yes indeed, we were truly blessed. On the second day of the trip we could soar in our back yard.

Sal exited from his room holding the same "Shadow" sloper that crashed into the motel chimney last year in conditions similar to what we were currently experiencing. He had repaired the fuselage so that it looked better than new, and I chuckled inside to think that in a few short moments the Shadow would return to the slope. I started off with my Douglas Quicksilver, and before we knew it the reason we travel to the Cape each year began to unfold.

The wind was blowing about 35 knots straight in, and the soaring was perfect. I was in my element. Sure, I enjoy thermal soaring off a winch, and I love hand launch flying, and I enjoy a light breeze off a slope, however...diving a high speed slope machine in a high wind/high lift condition is what I live for! After a while there were several aircraft in the sky and you had to watch your ship very carefully in order to avoid a collision. The planes were all flying at extreme speeds, and the excitement of the moment was fantastic. Like always I soon became cocky and began to do crazy things with my Quicksilver. After my third attempt at a straight in Immelman I smacked the slope and cracked my fuse enough to retire the Quick' for the day. No problem, however, as I had more ships waiting in the motel room on the bed like horses in barn stalls.

I decided it was time to fly the Sagitta. It was virgin, and I was nervous. Anyone who had flown one of these things had warned me of their deceiving speed and high energy retention. I checked out the control system and everything was working fine. I was particularly concerned that the airbrake mix was working so

that I would not have to use the slope to stop this animal. After the check, Jim Trumper launched the ship for me and she took off without a hitch. With a few trim passes under my belt I had the Sagitta roaring down the slope like a screaming banshee. This plane proved to be one spicy hot sloper and it truly satisfied my need for speed. Fearing a crash on the slope, I walked down to the beach below and landed the arrow-like ship on the sandy flatness. As I walked up the stairs to the top of the slope I felt a great sense of satisfaction from not having damaged the Sagitta, and figured that I could now fly the plane I had the most fear of damaging: The Albatross.

The Albatross is a Power Slope Scale (PSS) glider that represents a Czechoslovakian Jet trainer. This ship was built for me by Vern Hunt of Vern Hunt Models, and it is without a doubt the most beautiful glider I have ever seen. I thought seriously about building a stand for it and placing it on a table in my house, but it was meant to fly. I therefore placed radio gear in it just prior to coming to the Cape, and now was the test of nerves. Jim launched the ship for me and immediately it flew well with very little trim adjustment. Expecting a plane that is a mock up of a fighter jet to be squirrelly, I was amazed at how solid the handling was. The Albatross flew flawlessly, and I didn't want to land.

Bob Powers, another soaring buddy of ours, had brought with him his own PSS F4 Phantom of the same scale as my Albatross. Sal tossed the F4 for Bob and we found ourselves chasing each other around the sky like a scene from "Top Gun". This sight was so awesome that soon people were coming out of the woodwork to watch these two PSS jets fly together. After a short time Bob and I were flying at high speeds in very tight formation. We were so in sync with each other's flying that our turns made the jets look like they were on rails. People were requesting that we fly tip-to-tip in order for them to get better pictures. It was so much fun that I think we both lost sight of the risk involved in flying so close that we did it anyway. On about the third pass as we entered the turn our wings hit and my Albatross went into the ground. The damage was not extensive, but it was enough to send it to the showers for the trip home. Although I regret breaking my plane I will never forget the sight of Bob's F4 and my Albatross flying together. For me, it was the highlight of the trip.

The wind speed was dropping and the time was right to perform a little combat. I took out my Cheetah and Sal produced a big clunky two meter foam thing that he didn't care about breaking. Because the conditions had softened we were unable to get up any speed in attacking each other, so the results were somewhat disappointing. Sal got bored and handed the transmitter to Tammy. Since it wasn't her airplane she took great delight in trying to damage my Cheetah. Alas, we could not maneuver enough and the hits were more like thuds. Our biggest challenge was simply in keeping the planes up at all. It was fun, but I told Sal that next year he too has to build a Cheetah and that on the first high wind day the FTTD competition would take the highest priority.

Last year one of our priorities was to fly Sal's three-meter Alpina on the Cape shore. If you read last year's account, you know that the airplane had about a five-second flight before crashing into the ground due to a control mix-up. Well, I'm happy to report that this year the Alpina flew great. The big majestic bird lumbered along the crest of the slope, and handled like a trainer. Sal and I both flew it for about a half hour after trying the combat scene, and we both got a kick out of how well the giant responded to commands from the stick. The seagulls, however, weren't very happy with Mr. Alpina, and looked quite puzzled as its three-meters of wing cut through the local flock.

After flying the Alpina, we took a break for a while. The wind speed had dropped to near nothing and we thought it prudent that we take showers and shave. Our wives were beginning to become (totally justified, of course) disgusted with our obsession to remain planted on the crest of the slopes, and besides that, we smelled bad.

After our attempt at bodily cleanliness we noticed that there was a slight breeze blowing on shore. Sal took out his Shredder, an unusual pivot wing ship that flies very well in light lift. I followed him out the door with my Sagitta, and we flew until it was dark. We would have flown longer, but our wives were screaming at us to join them for dinner. When I finally landed the Sagitta, it took Sal to guide me in because I could barely see the airplane in the darkness. Once again the guys at NSP manage to squeak out the last bit of soarable conditions!

The next and final day of our trip started with an easterly wind. For this we returned to the State Park area and flew our Chuperosas. Bob also had his Chup and once again we found ourselves flying in formation. Sal followed us around with his Sparrow, and was hopping above and below us due to the difference in speed range. It was a beautiful sunny day, and I thought that we all should have been in an advertisement for Miller saying, "It doesn't get any better than this."

Sal landed his Sparrow and flew his Pocket RC Harrier. Another pilot was flying a three meter ship and Sal was trying to keep up with it with the little guy. As Sal approached the rear of the big plane the turbulence off the big wing bobbled the little Harrier and Sal had all he could do to keep it from stalling. It was a hysterical sight, and we all got a kick out of it.

Speaking of kicks, everything was great until a State Park ranger came along and kicked us off the dune. We were told that flying on the dune was not permitted during daylight hours. We were bummed, but not defeated. For the next hour Sal and I flew Pocket RC Harriers gliders off 5 foot dunes at the base of the big dune. Everyone with us was laughing so much at the sight of these little gliders actually soaring off the tiny humps of sand. It was great fun, and we shared the transmitters with our buddies so that they too could enjoy the challenge the Harriers presented. When everyone had their fill of micro soaring we returned to the motel to regroup.

Upon return to the motel our trusty flag told us that the wind had shifted to the North. Last year Sal and I went on an extensive search for a North slope and found one that worked well. Tammy, Jim, and I decide to take Chuperosas and drive to the slope, while Sal stayed behind for awhile to join us later.

Upon arrival at the North slope the wind had died down to next to nothing. However, the one pound Chuperosas had no problem staying up, and we flew in a very relaxing manner. The challenge in such conditions is to keep your turns as efficient as possible, and to build height on each pass. Of course, there is a limit to the height given the power of the lift band, but at times a bubble of warm air would appear, allowing the Chup to gain additional altitude. Once I was up high enough to venture I flew over a cottage behind the slope. As I suspected, there was heat pouring off the roof and my Chup went up like it was in an elevator. Within 5 minutes my 1.5 meter Chuperosa looked like a tiny spec in the sky. Just then Sal pulled in and asked, "How is it?...where is your plane?" I told him to look high over the roof of the cottage. "Holy sh..!", was the reply, and Sal's legs carried him as fast as they could to get his airplane.

That afternoon several of us specked out from this little slope. Given the very slight breeze many people would have blown off the day (no pun intended). However, with a Chuperosa you can soar on days that most other ships would be grounded on. Having a Chup has saved the day for us so many times it's hard to remember.

The small slope adventure closed the day out for us and we returned to the motel to prepare for going out to dinner. Sal and I discussed the actions of the Park Ranger and decided that we could get around his order of "no flying during daylight hours" if we flew at night. Our plan was simple. It was close to Halloween and we were sure that there would be a shop in town that sells Cyalume sticks. These are the plastic sticks that when bent to break a chemical cylinder inside produce a chemical reaction that generates light.

Sure enough a joke shop in Provincetown had the sticks, and I purchased four of them: two blue ones for the tail and nose, a green one for the left wing tip, and a red one for the right wing tip. When we returned to the motel we took out Sal's two meter foam "piece-o-junk", activated the sticks, and taped them on the bottom side of the plane in the appropriate positions. We then drove back to the State Park slope.

The wind at the Park was blowing strong and the direction was perfect. It was pitch dark and we needed a flashlight to climb up the sand path to the top of the dune where we could fly our creation. I launched and Sal flew. Immediately the plane disappeared from sight as though it had activated a Klingon cloaking device. All we could see were the Cyalume sticks which were bobbing around erratically and looked like a UFO in the night sky. We both flew the plane and found it to be highly unstable. We attributed this instability to the nature of the wind, but a week after the trip we figured out that the Cyalume stick on the tail screwed up the COG. Boy, did we feel like dummies. Next year we plan on doing the same thing, but we'll take COG into account!

The next day it was time for us to return home to Vermont. We considered the trip a great success, and felt lucky that the wind conditions were so varied and directionally forgiving. Also, although we did break airplanes the body count was relatively low considering. We met and flew with many fine folks while we were there, and look forward to seeing them next year.

Cape Cod is a wonderful place to slope soar, and our October trip is always a barrel full of monkeys. If you are interested in joining us, then drop us a line in early October and we'll let you in on our plans. All that we require you to bring is a combat ship and a sense of humor. Leave the rest to us.

Until next year....Stan ■

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Lift Off!

...by Ed Slegers
Route 15, Wharton, New Jersey 07885

I was going to report on some new products and a new prototype plane, but at the last minute I decided to write about what I think is a grave error the AMA has made in their selection of events they will have this year at the NATS.

In the April issue of RCSD, I said that I was going to fly the Flite Lite Falcon electric at the NATS in the thermal class. Well...this is not to be. Not because I don't want to fly the Falcon, but because the powers that be (whomever that may be...) at the AMA have decided to drop almost all the electric events, except for F3E.

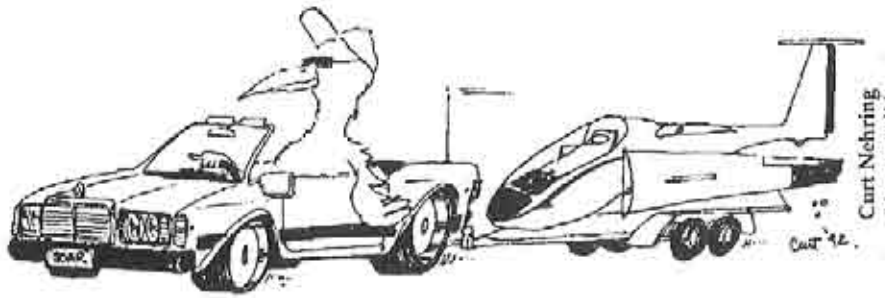
Personally, I think this is a very bad decision. For those that are not aware of what an F3E event is, it is an event that requires very high tech and expensive planes. This event is difficult because it requires a few people to help practice and there are few events to attend. All this makes it a very specialized event. Nationally, very few people fly F3E. Personally, I only know of two.

From what I can see, very few people will be entering this year's electric events at the NATS. This may lead some to believe that there are very few electric fliers. This could keep the industry from developing more and better products. To confuse things more, the AMA has decided to use 10 cell rules to run the 7 cell class. WHY?

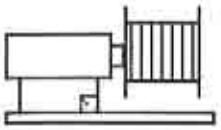
Why the AMA has decided to have only F3E and not the more popular thermal event, that can be flown by all levels of fliers, is beyond me. I am sure that more thermal and Old Timer pilots are AMA dues paying members than are the F3E. Is this not the reason for the AMA? To provide the majority of their members a chance to fly in the NATS?

If you feel that the electric fliers have been short-changed (or is that short-circuited?), write the AMA and let them know there are many more electric fliers than the AMA thinks there are. Although most people do not enter the NATS, the backlash of the decision to drop most electric events can only hurt all electric fliers. Maybe if enough people let the AMA know how they feel there may someday be an electric only NATS. ■

Ed Slegers has been an ardent modeler for over 40 years. Beginning with rubber band models, progressing to pattern flying and helicopters, Ed has spent the last 10 years collecting, building, modifying and flying gliders, specializing in electric assisted launching methods. Well versed in sailplane design, he has tested many of his theories through trial and error and has been instrumental in developing and testing prototypes for leading manufacturers of electric powered sailplanes. He shares the results of this research in his column "Lift Off!". ■



Curt Nehring
San Dimas, California



Winch Line ...by Gordon Jones

Gordon Jones, 214 Sunflower Drive, Garland, Texas 75041; (214) 840-8116

Bits & Pieces

Chuck Anderson's Model Plotting Software

Chuck Anderson has made a major upgrade to his Airfoil Plot and Model Design programs over the past year. The result is a bunch of new features that add to an already great program. Chuck has added mouse support so that you can point and click through most of the program. This makes it easier for those of us that are becoming used to using a mouse. But never fear you don't have to have a mouse to make it work as the arrow keys still work equally, as well. In addition to the mouse, the menus are all pull down like the majority of the programs that have been coming on the market for the last year or so.

The biggest improvement is the addition of that ability to use a laser printer with the program now. This has been sorely needed with laser printers dropping in price and most folks starting to go that way. One note is in order here; be sure that you run through the printer setup to set the printer for your system. In the old program you could just default through the printer sequence and it would whip out your plot or shape with no problem. If you ignore it now you will find funny shapes on the paper in the wrong dimensions. So be sure to pay attention to the instructions.

The other big change is the way that data entry is accomplished; again, just read the instructions and you will have no problems putting in the new data for your airfoils. Actually if you analyze the way it is accomplished you will note that it is easier to input now than before.

I have already heard some comments on the upgraded program and every one has been most favorable. It seems that Chuck has hit on the improvements that most folks have been wanting and done his usual outstanding job of putting them together in an improved program that makes life easier for the user. The old program, while very functional and very usable, was somewhat cumbersome to use and this brought the only negative comments about it. This has changed.

In addition, don't fear you can still use the airfoils that you have entered into the old program with just a name change and copying into the new program. That makes the compatibility issue go away. And yes, Chuck has some more ideas in the works but those will come later.

The Great *RCSD* Move

By the time you read this Jerry & Judy will have completed their move from California to Texas. This was an interesting move to watch . Actually, all went quite well except for a couple of hitches at paperwork time. The plan was for Judy to take care of the house in California and Jerry would drive to Texas and take care of the one here. Actually schedule-wise things were going extremely smooth. It all started with Jerry coming down with the flu and a bad back from moving boxes at the wrong time. Of course, this happened on the weekend just prior to when he was supposed to drive the van down to Texas and sign for the house. Needless to say the best laid plans had gone asunder in a hurry.

In talking to Judy about the problem it was decided that I would fly to California and drive Jerry back to Texas. Now remember Jerry was recovering from the flu and looked like death warmed over so I would get to do all the driving. Well I had made drives like this before so the driving part was not a problem; but I had to nurse Jerry along the way. This proved not to be a big problem; just keep him supplied with Gatorade (I didn't know it came in so many flavors.), and munchies at reasonable intervals and it worked out fine. (You would be surprised to see what this guy calls munchies.) Plus, he slept most of the time which speeded the recovery process. Actually, the trip went quite well and by the time we reached Texas Jerry was almost human again. Upon reaching Texas he took care of the paperwork and such in short order so it all worked out OK.

Now for the humorous part. (I should say humorous to some of us.) Usually when you buy a house the Realtors and title companies know the address of the house, right? Wrong! In this case the house is located in Lucas, but the mail goes through Wylie. This is due to proximity of the routing in that area. So, you start with one address change. OK. That is not too bad and calls to the companies that you deal with should take care of this in short order; but there was also another little hitch in things, as well. About a year back there had also been a house numbering change due to 911 being installed locally and the house number had been changed from 20 to 2, and no one knew about this change, either. Before calling everyone again Jerry made a trip to the Post Office and Court House to ensure that this was in fact correct. This required more calls to the companies they had just called. Needless to say this was not in the plan and should not have happened. With everything on both ends going so smoothly, it is amazing what can get in the way when you least expect it. It has been interesting to watch, but I am glad I didn't have to go through it all.

As of this writing most of the boxes have been unpacked and *RCSD* is back in operation. Jerry is working on getting a shop built and things are starting to resemble some sort of normalcy. The rest should take care of itself or so one would hope. Jerry and Judy have had all of moving they want for awhile. Now if Jerry could just get the shop built and get out of the house.

F3J is Official

As of April of this year F3J is an official international event! This means that the status of the event has changed from Provisional to Official and RC Soaring has two official events in which to compete. This was voted on at the CIAM meeting in April. The official rules will appear in the next printing of the FAI Sporting Code scheduled for distribution in 1993. Now a period of two years must elapse before the first international championships can take place. This means that the first international championships will not take place until 1994. During this period at least two international events must take place with a minimum of 5 FAI member nations participating. This should not be a problem as there are several major F3J events held in Europe and enough member nations participating to take care of this requirement. There are even several U.S. folks that have mentioned attending to help the cause along.

For those of you who are unfamiliar with F3J it is basically a Thermal Duration soaring event. The basic idea is to provide a man-on-man contest for competitors flying thermal duration gliders. In the contest a minimum of five qualifying rounds are flown. For each qualifying round competitors are divided into different groups flying in ten minute slots. The scores of each group are normalized to give meaningful scores irrespective of changing weather conditions during the round. The competitors with the top aggregate scores in the qualifying rounds then fly two further fly-off rounds as a single group to determine the final placings.

The launch is executed using hand-tow lines of not more than 150 meters (495 feet). Scoring is timed from the moment of release from the tow line at one point per full second of flight time. The landing task is a 15 meter landing

circle with graduated points from the center. The competitor who achieves the highest aggregate of points comprising of flight points plus landing points minus penalty points is the winner of the slot. The remaining competitors in the group are awarded a corrected score based on their percentage of the group winners' through normalization.

The event does not require specialized equipment or aircraft which makes it more affordable for the average flyer. In Europe contestants are flying large polyhedral ships for the most part so no special designs are really required. It does take a little practice to get used to the hand tow launch, but this is like learning to fly off a winch for the first few times and only takes practice. We have averaged two or three F3J contests a year here in the Dallas area for the past three years with growing enthusiasm. It does make for an interesting change of pace contest and one that most folks enjoy. If you are interested in more information on F3J give me a call or drop me a line; I will be more than happy to share the rules and provide hints that may help out with your contest. ■

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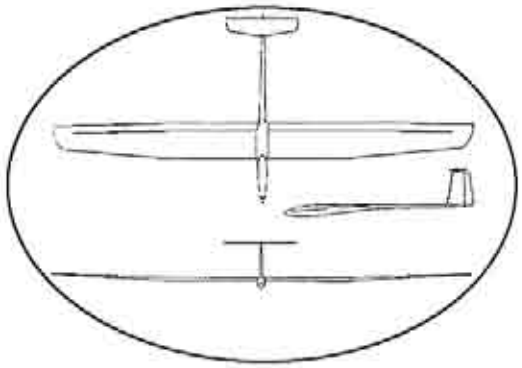

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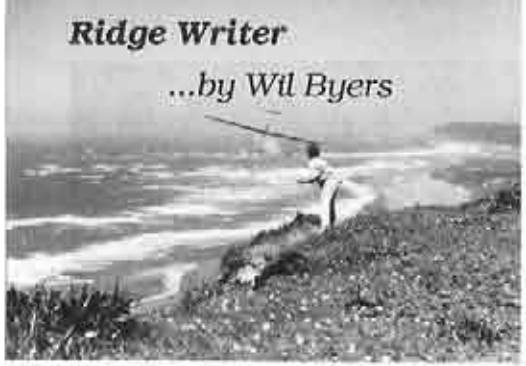
...by Wil Byers



RT. 4 Box 9544, W. Richland, Washington 99352; (509) 627-5224 (7:00 PM - 10:00 PM weekdays, after 9:00 AM weekends)

As you are well aware, there are many very good slope soaring model kits and completed aircraft available here in the good old U.S. of A. Nonetheless, European manufactured models seem to hold a special mystique for a sizable number of U.S. slope soaring enthusiasts. This is probably the result of the Europeans leading the way in full-sized soaring. It may also be because imported models were early on in this R/C soaring business bigger, faster, sleeker, more scale like, were made of composite materials ahead of most of those being produced in the U.S., employed techniques that were unique, and finally somehow seemed to have better performance. Well this is not necessarily the case today with our U.S. competitors taking home all the F3B marbles, but those European imports still seem hold a special attraction for U.S. flyers.

So, this month I want to provide you with some company names and addresses of European manufacturers that you as an avid sloper might want to do some business with. However, before I jump right into giving you those addresses and send you on a wild eyed spending spree, let me warn you somewhat about the pitfalls of buying from over the water. This is hopefully not to discourage you, but rather to inform you that when you send your money to some company outside the U.S. you may not get the service we have come to expect here in the land of red, white, and blue. On the other hand, it may result in a soaring product second to none, for your soaring addiction to savor. It may also result in the most complete model kit you will ever get.

The warning I am going to give relates to an incident I experienced some 10 years ago. Quickly, I will tell you that I did not have all my buying facts in place before I placed an order with a German model manufacturer. As a result, there was a tremendous miscommunication between myself and the manufacturer. The story goes something like this; I told them to ship by air and they shipped by boat. Next, the cost of the model together with shipping was estimated at $300, however, after all was paid for it was more like $750. Now remember this was 10 years ago and what I got for that $750 was a very nice box, a set of plans, a fiberglass fuselage, and some balsa parts. When, what I had expected was an almost ready to fly high aspect ratio scale sailplane. And, one of the primary reason for this inflated cost was the shipping, which totalled almost $400.

Well, after taking about 3 years to recover from the shock of the whole incident, I built the model and it flies absolutely great. The lesson in this whole affair is, know the facts about your purchase and what you are getting for your money. If you do this important bit of homework first, I think you will be greatly rewarded with a superb flying machine in almost all cases. So, look at this list of manufacturers and then put pen to paper asking for the manufacturer or supplier to send some additional information about the silent airplane of your dreams.

Aero Fibre
45, rue Foch
71200 Le Creusot
France

Akro
Uberlandstr. 79
Ch-8050 Zurich
Germany

Arles Modelisme
14, avenue Sadi-Carnot
1300 Arles
France

CHK Modelle
Gewerbepark A 67
8400 Regensburg
Germany

Edmonds Model Products
Unit 20, Vernon Buildings,
Westbourne Street
High Wycombe HP11 2PX
ENGLAND

Frisch Modellbau
Im Lichtbuhl 1
6054 Rodgau
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Bremker Str.
4923 Extertal-Bremke
Germany

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6497 Steinau
Germany

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Ziegelstr 1
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Germany

Jager Modellbau
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8772 Marktheidenfeld
Germany

Klemm GfK-Modelltechnik
Wienenweg 3a
4005 Meerbusch-Osterath
Germany

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Mike Smart Designs
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Aylesbury, Bucks, HP18 OLP
ENGLAND

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7035 Waldenbuch
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6424 Grebenhain 1
Germany

Roebers Modellbau
Further Str 17
4048 Grevenbroich 4
Germany

Rolf Werner Modellbau
Postfach 1368
6203 Hochheim/Main
Germany

Schafer Flugmodellbau
Staufersbuch 28
8434 Berching
Germany

Silentflight
Lychgate House, 24, High Street
Ramsbury, Wilts SN8 2PB
ENGLAND

SMG
Edinger Berg 5
5501 Ralingen
Germany

TS-Modelle
Am Waldweg 16
7244 Waldachtal
Germany

Wanitschek Modellbau
Scharenstetter Str. 30
7928 Giengen/Brenz
Germany

Wolfgang Ruckert
Dobleweg 5
8391 Ringelai
Germany

Airworld Modellbau
Birkenweg 6
6074 Rodermark
Germany

Alro Modelltechnik
Hauptstr. 41
7211 Frittlingen
Germany

Beck Modellbau
Friedrichstr. 3
7435 Hulben
Germany

Claas Modellbau
Markplatz
6348 Herborn
Germany

Eismann Modellbau
Herzog-Georg Str. 78
8882 Lauingen/Donau
Germany

Geitner GFK-Flugmodellbau
A-8911 Admont 157
Germany

Gierke
Berweg 1
7161 Buhlerzell
Germany

Graupner Modellbau
Postfach 1242
D-7312 Kirchheim Teck
Germany

Gunther Modellebau
Aüweg 8B
8056 Neufahrn
Germany

IBA Flugmodellbau
Sudbau 1092
5628 Heiligenhaus
Germany

Jung Modellbau
Meisenweg 5
3575 Kirchhain 1
Germany

Krick Modelltechnik
Postfach 24
7134 Knittlingen
Germany

Matthias Hanell Modellbau
Postfach 1242
7500 Karlsruhe 21
Germany

Multiplex Modelltechnik
Neuer Weg 15
7532 Niefern
Germany

Paul Beck Modellebau
FriedrichstraBe 3
7435 Hulben
Germany

PB Modelisme
112, rue du Mont d'Arene
BP 1435
51066 REIMS Cedex
France

rk Vertrieb
Nordbahnstr. 54
4972 Lohne 3
Germany

Rodelmodelle
Lausangerweg 3
8939 Mattsies
Germany

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Rosenstr 2
7415 Wannweil
Germany

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7730 Villingen-Schwenningen
Germany

Sailplanes International
Unit 6, Cwmtillery Industrial Estate
Gwent, NP3 1LZ
England

Schlotterbeck-Modelle
Moerser Str 180
4100 Duisburg 17
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7134 Knittlingen
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Zannonia-Flyers
Oberringel 14
4540 Lengerich
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We hope you enjoy this list of sailplane manufacturers and suppliers. Also, these individual companies were not rated for you or graded in anyway because it doesn't seem very fair to judge their products on some personnel preference; however, you can rest assured there is a difference in quality and performance. That difference will also usually create a significant difference in price.

As a special note, if you are going to write to any of these glider suppliers please keep in mind to add $5.00 or so to any request for information. This will speed your reply and help the sender offset the cost of catalogs and postage. (Per Wil, the above listing was done in a Hypercard Stack on a Macintosh if you want a copy. ED.) ■

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Free instruction for beginners on construction and flight techniques. Sunday - Thursday. Bob Welch, 1247B Manet Drive, Sunnyvale, California 94087; (408) 749-1279

Fall & Winter 1 day seminars on composite construction techniques. Free with purchase of Weston Aerodesign plan set ($35.00) or kit. Frank Weston, 944 Placid Ct., Arnold, Maryland 21012; (301) 757-5199

Reference Material

Madison Area Radio Control Society (M.A.R.C.S.) *National Sailplane Symposium Proceedings*, 2 day conference, on the subject and direction of soaring. 1983 for $9.00, 1984 for $9.00, 1985 for $11.00, 1986 for $10.00, 1987 for $10.00, 1988 for $11.00, 1989 for $12.00. Delivery in U.S.A.is $3.00 per copy. Outside U.S.A. is $6.00 per copy. Set of 8 sent UPS in U.S.A. for $75.00. Walt Seaborg, 1517 Forest Glen Road, Oregon, WI. 53575

BBS

BBS: Slope Tech, Southern California; (310) 866-0924, 8-N-1

BBS: South Bay Soaring Society, Northern California; (408) 281-4895, 8-N-1

Reference listings of *RCSD* articles & advertisers from January, 1984. Database files from a free 24 hour a day BBS. 8-N-1

Bear's Cave, (414) 727-1605, Neenah, Wisconsin, U.S.A., System Operator: Andrew Meyer

Reference listing is updated by Lee Murray. If unable to access BBS, disks may be obtained from Lee. Disks: $10 in IBM PC/PS-2 (Text or MS-Works Database), MacIntosh (Test File), Apple II (Appleworks 2.0) formats.

Lee Murray, 1300 Bay Ridge Road, Appleton, Wisconsin, 54915 U.S.A.; (414) 731-4848

Contacts & Special Interest Groups

California - California Slope Racers, John Dvorak, 1638 Farringdon Court, San Jose, California 95127 U.S.A., (408) 259-4205.

California - Northern California Soaring League, Mike Clancy (President), 2018 El Dorado Ct., Novato, California 94947 U.S.A., (415) 897-2917

Canada - Southern Ontario Glider Group, "Wings" Program, dedicated instructors, Fred Freeman (416) 627-9090 or David Woodhouse (519) 821-4346

Texas - Texas Soaring Conference (Texas, Oklahoma, New Mexico, Louisiana, Arkansas), Gordon Jones (Contact), 214 Sunflower Drive, Garland, Texas 75041 U.S.A., (214) 840-8116.

Maryland - Baltimore Area Soaring Society, Steve Pasierb (President), 21 Redare Court, Baltimore, Maryland 21234 U.S.A., (410) 661-6641

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

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T.W.I.T.T.

(The Wing Is The Thing)

T.W.I.T.T. is an organization of engineers, scientists, pilots, sailplane enthusiasts, model builders and many other persons having an interest in flying wing/tailless aircraft technology. Write to T.W.I.T.T., P.O. Box 20430, El Cajon, CA 92021 to find out how you can participate.

Send SASE for membership application and flyer: "What is T.W.I.T.T." or, send $2.00 for full information package including one back issue of our newsletter, postpaid. Full membership is $15.00 per year and includes twelve issues of the newsletter. Back issues of newsletter are $.75 each, postpaid.

The Vintage Sailplane Association

VSA is a very dedicated group of soaring enthusiasts who are keeping our gliding history and heritage alive by building, restoring and flying military and civilian gliders from the past, some more than fifty years old. Several vintage glider meets are held each year. Members include modellers, pilot veterans, aviation historians and other aviation enthusiasts from all continents of the world. VSA publishes the quarterly magazine BUNGEE CORD. Sample issue $1.-. Membership $10.- per year. For more information write:

Vintage Sailplane Association
Route 1, Box 239
Lovettsville, VA 22080

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*.

Nova

...from RnR Products

The Nova is an unlimited class slope racer. This is one of the fastest commercial sailplanes available today, maintaining an outstanding record in R/C slope racing. Current achievements include 1st and 3rd places in the California slope racers 1991 season championships, as well as 3rd and 4th places in the 1991 Mid-Columbia slope race.

Although the Nova is extremely fast and competitive it is also stable and easy to fly for the intermediate flyer. The high performance of the Nova is achieved using the HQ 1.0/8 airfoil section in combination with today's computer radios. Full span camber changing of the flaps and ailerons is utilized to provide a wide speed envelope for varying slope conditions. At $295, the NOVA achieves a maximum price to performance ratio.

RnR Products' complete kit concept features:

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HQ 1.0/8 airfoil, servo wiring installed, no shaping of leading edge required, vacuum formed wingtips.

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Specifications

Airfoil:	HQ 1.0/8
Wing Span:	94"
Wing Area:	900 sq. in.
Weight:	90 oz., 170 oz. fully ballasted

For further information, contact: *RnR* Products, 1120 Wrigley Way, Milpitas, CA 95035; (408) 946-4751. ■

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Thermal Modi

...from Greco Technologies

Greco Technologies in its effort to introduce new products is now announcing its thermal version of the Modi. The original Modi 900 is made with composite materials to withstand the riggers of F3B type competitions. The resulting plane is extremely strong, although, heavy compared to the sailplanes used for thermal contest. Greco's new plane, the Thermal Modi, is made of foam and laminated wood, and strengthened with composite materials. It is ideal for thermal duration type contest.

For those not yet familiar with Greco Technologies, they are developing a new line of radio controlled airplane kits. This engineering and technical consulting firm based in Pasadena, California is using its expertise to create these planes. Greco's staff includes both aerospace engineers and sailplane enthusiasts. This combination allows them insight into the technical aspects of aerodynamics, the latest technical advances in materials, along with knowing the wants and needs of the hobbyist.

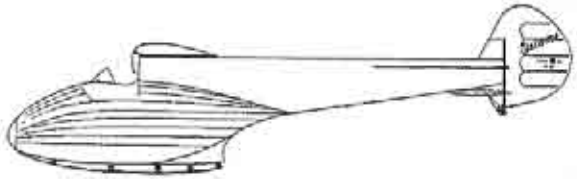
For a thermal sailplane the Thermal Modi is extremely strong, while still being light enough for thermal competitions. The Thermal Modi is an open-class competition airplane. Its fuselage is 50 inches long, made out of fiberglass with two strips of Kevlar in the boom for added strength and to help reduce stress fractures. The inside structure of the wing is made of high compression blue foam, that withstands 25 psi. The root ribs and sub ribs are 1/4" plywood, to insure endurance. There is a layer of unidirectional carbon fiber and fiberglass laminated within the wing. This addition of composite materials greatly enhances the strength of the sailplane. The outer-layer is comprised of laminated wood. Probably the most impressive feature of this sailplane is the finish of the wood wings. The finish resembles that of fine furniture. The grain of the wood is visible through the rock hard, mirror like finish.

The wing planform is a triple taper, Shuman planform. This is designed to add surface area to the wing, reduce tip stalls, and retain esthetics. The Thermal Modi is available with several airfoil profiles the S3021, SD7037, and RG-15. The S3021 is excellent for the pilot who wants a basic airfoil for thermaling and landing. This airfoil is good at low speeds, has excellent speed range, it responds well to lift and will climb quickly, the stall is gentle, and it has good overall characteristics for contest performance. The S3021 is also good for the pilot who is learning how to fly aileron sailplanes. In addition, the S3021 wings, with slight modification, can be used as replacement wings for Falcons and Legends. The SD7037 is an airfoil for the slightly more advance pilot who want a bit more speed. It has great flying characteristics, it has enhanced speed range, it thermals well with a good L/D, has good penetration, and the ability to use trailing edge camber. The RG-15 is for the advanced pilot, who is able to take advantage of the benefits of this airfoil. Its is a relatively low drag airfoil, making the plane extremely fast. This airfoil also retains energy well, is great at thermaling, has an excellent medium to high speed range and will slow down moderately well, provides superb penetration, and camber changing considerably improves the speed envelope. It is an excellent multi-purpose airfoil for multi-tasking competitions, thermaling, and slope flying. This airfoil is ideal for the pilot who can make use of every advantage attainable, but he must keep on this toes to stay ahead of his plane with this airfoil.

The Thermal Modi has several other features that set it apart from the competition. The sailplane comes almost ready

to fly (ARF). All that is left to install is the radio equipment, servos, and linkage. The wing joiner rod is a 1/2" carbon fiber rod laminated within a brass tube giving it the tensile strength of steel at a fraction of the weight. Aluminum shaft hinges with Teflon inserts for the flaps and ailerons are included and installed. This hinge design withstands much more pressure and moves smoother than the standard method of tape and mylar hinges. The control horns are made out of 1/16" aluminum to reduce play in the control surfaces. The bellcrank is also constructed out of 1/16" machined aluminum with a precision bearing to prevent slop in the stabilator and allow for the most fluid movement possible.

Other vital statistics of the Thermal Modi include: Span: 116 in. wing, 50 in. fuse; Wing Area: 949.21 sq.in.; Airfoils: RG-15, SD7037, or S3021 wing, SD8020 stabilizer. For more information contact Greco Technologies at: P.O. Box 10, South Pasadena, California, 91031; or call: 1-800-34-GRECO. ■



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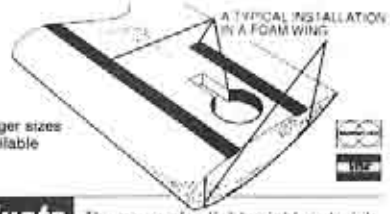

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3 Feet Big!

...by Greg Vasgerdsian
Concord, California

(Once upon a time, in R/C Soaring Land...there was a purely fictional character who loved to fly for fun. His name was Doc and he was always thinking...ED.)

Doc had just settled down after a long day at work. Today, he was telling Jack, a co-worker, about his latest two meter sailplane. Jack was amazed. "Six feet? Wow! That's big!" Doc went on to explain that six feet wasn't really that large for a sailplane. How many times he'd made his small speech about R/C sailplanes, he couldn't count. To Doc six feet was small.

Of course, he could remember that day some time ago when he purchased a Thermic 36 free flight kit. The box proclaimed in bold type "3 FOOT WINGSPAN"! Back then, for Doc, this was a big glider. He had the box of wood and tissue home and opened in no time. Between learning to read the plans, and using tissue and dope, he managed pretty well. The Thermic 36 flew rotten, but then it was his first built-up flying model.

As Doc's interest in gliders rose, there seemed to be no end to the fascinating models that could be built. He knew of radio control airplanes and gliders, but they were only models to dream about.

After the Thermic 36, Doc built a Thermic 50-X. Now, that was a wonderful glider, and a whopping 4 feet in span! The "X" designated that the fuselage was a pod and boom structure. Like the Thermic 36, the 50-X also had those ever so graceful elliptical wing tips and tail feathers. Doc could still remember trying to tow it up with kite string while friends tried, in vain, to hoist the model with spears made of dead branches.

It was about this time that Doc's neighbor, Dave, noticed his interest in model gliders. He gave Doc a Windfree kit and some advise on building it. "Wow!" Doc thought. This was indeed a quantum leap, all the way up to a 98" radio control sailplane.

Doc built the Windfree with care and precision. The lessons learned building the Thermic models proved to be invaluable. Seven months later, Doc had saved enough money for a three channel radio and was ready to go flying.

The Windfree was short-lived, however. A competition sailplane, it had a very light fuselage and, in Doc's inexperienced hands, it didn't last long. Regardless, it got Doc into R/C soaring and there were lots of models to follow.

At eight feet, the Windfree seemed a large glider, but Doc would see an ad in a magazine advertising planes with 118", 123" and 144" wingspans. Now, this is ridiculous! He thought, "I'll never build something that big!" It seems to be only a few years ago, but it was more like fourteen. He would never forget the day he first laid eyes on a Craftaire Sailaire. It had twelve feet of wing, a four digit number for wing area, and a fuselage that you could hide a cow inside! It really was an impressive glider, and it flew magnificent.

Doc got up from his chair to get a couple of cookies. He smiled, thinking of his near complete 1/4 scale Pilatus B4. Before building it he didn't think a 148" wingspan would be that big. Then, he built the wings and put them together! Yes, he had created a monster! In fact, lately, the sport models seemed so small...especially, the fuselages. Doc thought, "Well, I guess it is all in what you're used to!" ■

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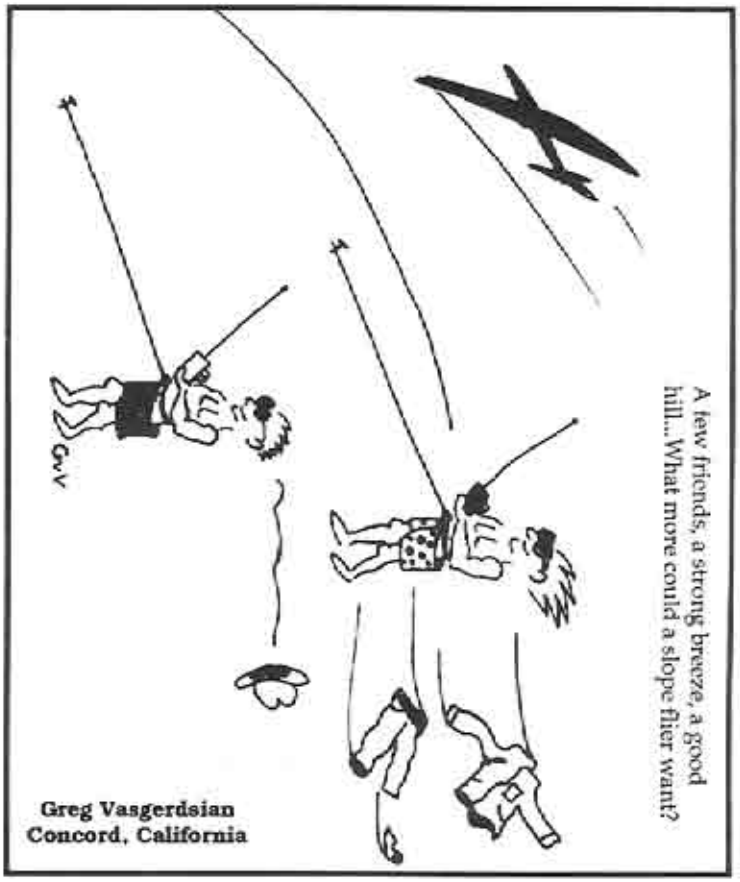
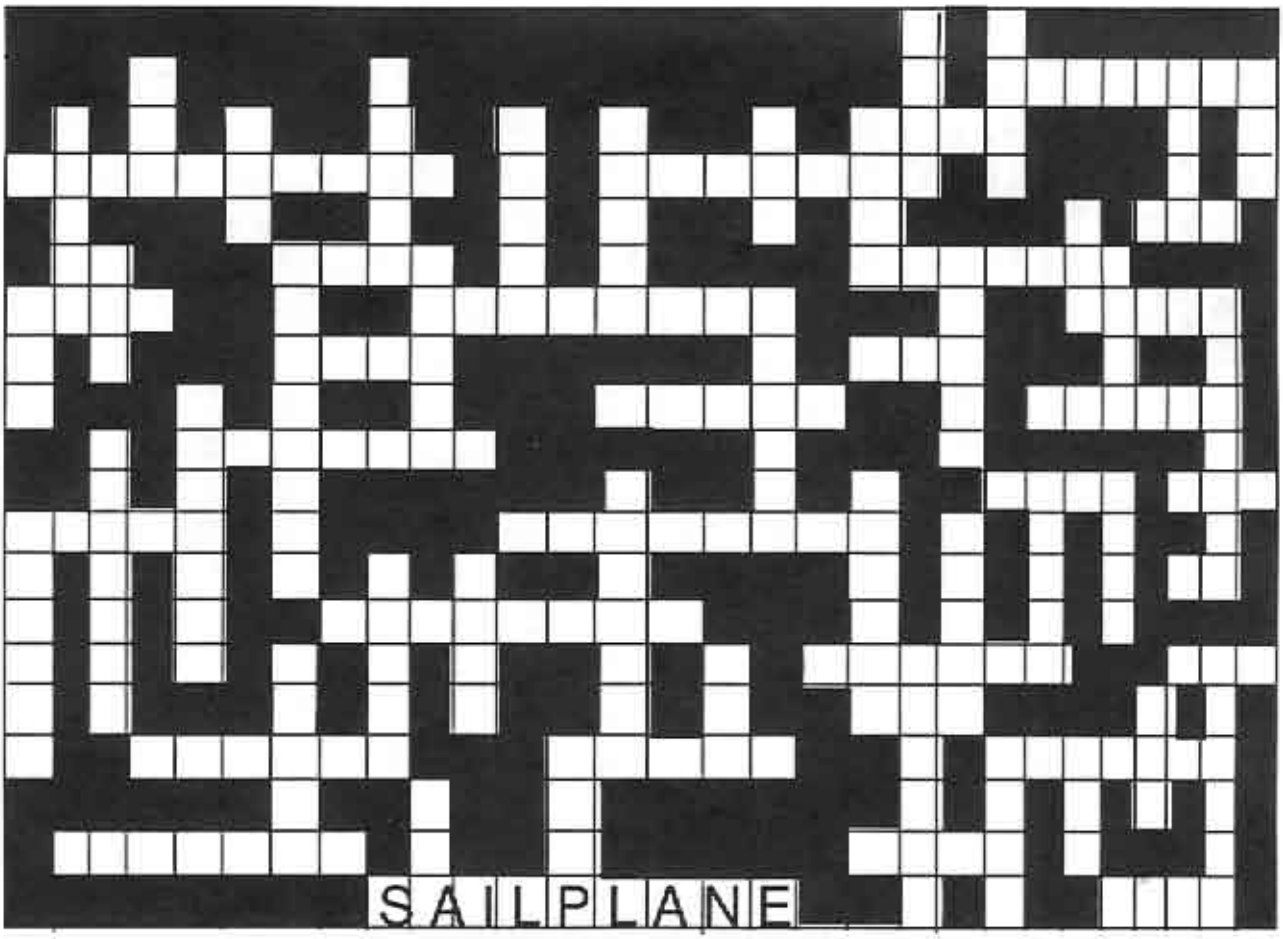




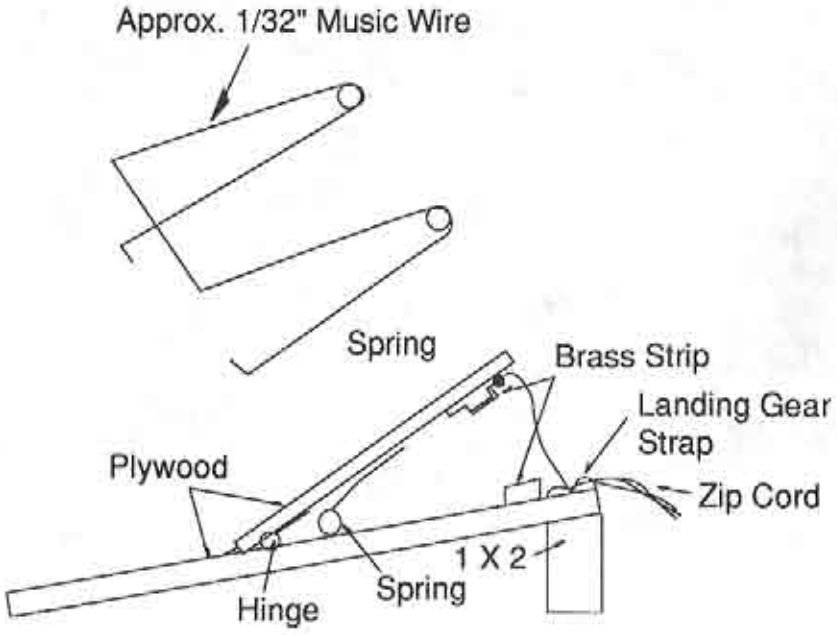
Budget R/C
Super High Tech Winch Pedal

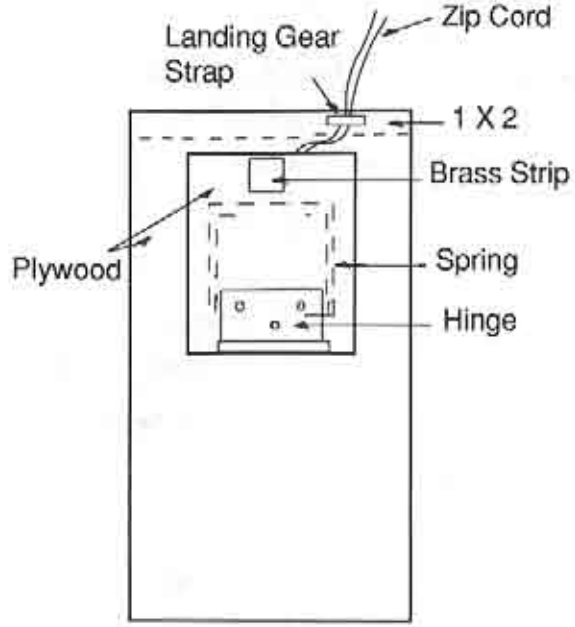
...by Pancho Morris
Mesquite, Texas

Here at the Hobby Counter we always have people coming in looking for some wild item that they thought of and hoped to find. They seem to figure that if they can think of it, it should be out there waiting for them, somewhere. We say that we have never heard of or seen such a thing, and that it doesn't exist. Their next question is always, "Then where will I find one?" They leave, disappointed because we did not give them the answer they wanted, saying, "I know there is one out there. I'll just keep looking!" I would say to myself that, while he's looking for something that doesn't exist, "I would make something that will work."

What this is all leading up to is winch pedals. For several years we were using a small remote microphone foot pedal that Radio Shack handles. These were basicly a plastic clamshell housing a small micro switch. These worked fine but, after about a year of abuse in the field, they would fail. At one time we had several fail about the same time in our club including the one I had on my personal winch. (I fly with a group of well-heeled professionals that will not look at anything unless it is of LEXUS quality and price.) We were discussing where we could find a better pedal that would stand up to our use. I thought of the materials we had at the hobby shop and the requirements of a winch pedal and thought, "While they're looking for the ideal pedal, I'll have one built and be out flying!" I went to the hardware store for a good door hinge, grabbed some K&S brass strip out of the rack, a piece of music wire (about 1/32"), some electrical cord and terminal eyelets, plywood and a piece of 1X2 and went to work.

The drawing should be pretty self-explanatory. The spring is about the most confusing thing and I tried to draw a decent isometric of it. I also put a





rubber pad on the pedal and you can use the plug of your choice.

The pedal has a good solid feel to it and has worked very well. The 1X2 block puts it at a good angle and keeps it from skating around on you. There are no dimensions on the drawings as they are not critical. ■

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SPECIFICATIONS:
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Length: 31"
Wing Area: 260 sq. in.
Airfoil: Selig S3016
Flying Weight: 15-20 oz.
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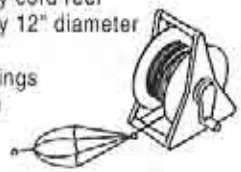

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Date	Event	Location	Contact
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June 13	9th Annual Hand Launch	Riverside, CA (After 6:00 P.M.)	Ian Douglas (714) 621-2522
June 13/14	S.O.A.R. Great Race	Osewego, IL.	Lee Sheets (708) 748-8934
June 27-28	MASS-NASF Mid-South Soaring Championships	Memphis, TN	Bob Sowder (901) 757-5536
June 28	Hand Launch - 1st Annual Rocky Mtn.	Denver, CO	Lenny Keer (303) 737-2165
July 4	Fun Fly 4th Annual	Long Beach, CA	Bob Reynolds (310) 866-2104
July 18-19	CSS Mid-Summer Contests	Cincinnati, OH	Chuck Lohre (513) 731-3429
July 18-25	LSF R/C Soaring National Championships	Vincennes, IN	Mike Stump (616) 775-7445
July 25/26	World Inter- Glide 92	Fairlop, London	Les Sparkes 81-505-0191
Aug. 22	MASS Soaring Unlimited	Memphis, TN	Bob Sowder (901) 757-5536
Aug. 29-30	BASS Open for 444	Baltimore, MD	Guy Dickes (410) 484-0808
Oct. 3-4	CSS Pumpkin Fly	Cincinnati, OH	Chuck Lohre (513) 731-3429

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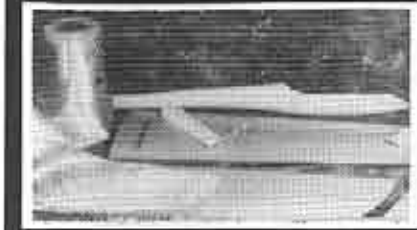

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Where Did It All Begin?

...by George G. Siposs
Costa Mesa, California

The first successful man-carrying glider was probably the one built by Otto Lillienthal in Germany around 1885. He glided down from a man-made hill until one day when he lost his balance and crashed. "Sacrifices have to be made" were his last words. Others built gliders around the turn of the century, including a California pioneer. The Wright brothers built a glider which was based on systematically conducted scientific experiments in a home-made wind tunnel. They flew it from a hill down to the beach and that's why it was called a glider; it glided down.

Subsequent experiments were aimed at providing engine power for the glider because nobody knew how to make a glider stay up for more than a few seconds.

World War I produced great advances in aeronautics as planes became more powerful and faster. The treaty with Germany at the end of the war forbade Germany-Austria-Hungary to build motorized airplanes, let alone military planes. Itching to get into the air, young men decided to build gliders and explore the unknown.

Around 1921, university students in Germany had built a glider and were looking for a smooth treeless mountain top to fly it from. They located a range of very high hills with gentle slopes that were void of tree, near Fulda, about 175 miles northeast of Frankfurt. The mountain was called the "Wasserkuppe" and it became the cradle of modern gliding. The young men carried their glider up the mountain in a horse-drawn cart. They pitched their tents in a meadow and spent the whole summer "flying" and, mostly, repairing. Their awkward slides developed into more graceful glides as the year progressed. More gliders were built as the professors got into the act. The planes became more streamlined and better constructed. Around 1922 they organized the first contest. The winner flew for about five minutes. Next year the winner's time was about 2 hours and the following year they made a great discovery. Whereas they used to fly the ridge lift and never left the slope-hugging winds, one day a flier found himself much higher than before. They figured that a bubble of hot air (which they named "termic") carried him up there. From there on, they hunted for thermals. The following year, the winner of the contest flew about 350 miles and spent almost 24 hours in the air! Gliding became soaring.

Gliding and soaring captured the imagination of other young men in Austria and Hungary. It was an inexpensive hobby that opened new frontiers and hopes for the young generation that was looking for a creative outlet.

Model airplanes also became popular in the 1930's. Gliders and rubber-powered planes were built by the thousands. Each country had a magazine devoted to models. They corresponded with Americans and exchanged information until the beginning of World War II.

I began building model airplanes in Hungary in 1940. As luck would have it, I became acquainted with George Benedek, a mechanical engineer, who happened to be a cousin of a classmate of mine. Benedek had the most innovative designs and he won every contest he entered. He also set world records in several FAI categories. His work eventually led to the development of several new wind sections, airfoils for gliders, which still bear his name. (The airfoils are number B-xxxx.) He taught me all about indoor models (microfilm covered, weighing a fifth of an ounce and flying at about 2 mph). One of his models was a two-meter glider, a copy of which I built in 1944. The Russians invaded us in 1945. In September, I was flying my two-meter "Uborka". (I don't know why Benedek called it that; it means cucumber in Hungarian.) After thermalling for 15 minutes it landed gracefully; my longest flight ever. Imagine my surprise when a Russian soldier trotted up to me, pointed a machine gun at my head, and demanded that I hand over the model to him. I learned several lessons that day.

In subsequent years, I competed in model airplane contests in Czechoslovakia, Austria and Canada. When the first R/C gliders appeared, I met Mark Smith, designer of the Windfree with which he became National Champion, and Dale Willoughby, who was the first importer of glider models from Germany. Up to those days, I saw many models with escapements and, later, with so-called "bang-bang" actuators which controlled only the rudder. They flew off the hills in Newport Bay. Their flyers belonged to the Harbor Soaring Society. That was about 25 years ago. Our models have come a long way since then...

Recently, I have been corresponding with a German modeler who told me that they hold a vintage model airplane contest in June on the Wasserkuppe! Needless to say, I arranged a business trip to coincide with the date. I met my friend on that famous hill on a bitterly cold and rainy Saturday. In spite of the fog and cold that tore into my bones, we walked around to see the famous sites. My friend showed me the original flying sites and the tent camp. He pointed out the spot where they used to have the latrine; the grass was greener over that spot. He showed me a rock cairn, which was the memorial, with a bronze tablet, to the six pioneer glider pilots who died during those halcyon days.

It began to rain and we went inside the restaurant. The walls were full of pictures of gliders, and models hung from the rafters everywhere. Then we visited the brand new glider museum where you can see the actual gliders that were part of the development process in the old days. We saw the handmade instruments, the wicker seats, the cotton material covering and homemade tools. Well, they had to start somewhere.

Suddenly, the weather cleared up and we went outside. A nearby hill was full of radio controlled modern gliders. It seemed to me that this was a hill designated to models, only. Their equipment was similar to ours except that it was mainly German made. Radios were Graupner; the gliders were kit-built with a few scratch built models here and there. All of them had about eight foot wingspans. As the hill was quite gentle, they did not fly very high, but they exhibited great skill.

Next, they had the vintage model glider contest. It seems that there is quite a movement afoot in Europe to hold vintage model contests at least once a year. It was interesting to see some designs which were familiar to me from the pages of magazines I used to read as a youngster. All had at least a single channel radio (servo) in them for this contest so they could be flown with some degree of control. Contestants came from several countries. It is a matter of time before a U.S. modeler takes part in the contest as antique flying is quite popular in this country. The Society of Antique Modelers (refers to the models, and not just the fliers) or SAM could give you more information.

At Frankfurt Airport, I had some time to wander around before my flight took off. I had heard about the airport museum before but, when I saw it, it nearly blew my mind. All over the airport halls are vintage airplanes hanging from the very high ceilings. There is a very nice club glider of about 1930 vintage which is nicely constructed and looked like I would like to fly it at the drop of a hat. There was also a replica of the Lillienthal glider, full-size, in the airport coffee shop, appropriately named the Lillienthal Res-

taurant. If you want to pay a small admission fee, the innards of the museum on the top floor have beautifully restored examples of airplanes from the pre-war period as well as German war planes such as a HE 111 bomber, a Stuka, a ME 109 and others, including a DC-3. So, if you are ever stuck at Frankfurt airport, plan to spend a pleasant few hours browsing among airplanes.

During a stop-over in Vienna, I hear an ear-splitting roar of several engines. Looking outside, I saw a Junkers 52 taking off; shades of WW II. It turned out they were taking aloft a few passengers for a demonstration flight in a real vintage passenger plane, reminiscent of the Ford Tin Lizzie.

In Budapest, I also visited the airplane museum which concentrates mainly on pre-war sport planes and gliders. There is a special exhibit devoted to model gliders, including world record setters. Because gliders were made from wood and canvas, they could be built in small workshops. Many Hungarians learned to fly them as a Government sponsored sports activity.

The Wasserkuppe museum is really worth seeing. It reminds me of the glider museum in Elmira, New York, the birthplace of American soaring. The Elmira site was chosen by U.S. pioneers because of the favorable wind directions and gentle hill formation. It seems that a German immigrant, around 1938, brought a plane with him and instructed the Americans on how to take advantage of not only slope lift, but thermals, as well. Elmira became the site of the first glider factory, Schweitzer, in the U.S.

My memories also include a visit to a Hungarian glider factory in 1943, near Budapest. Knowing my interest in aviation, an Uncle of mine took me to the Rubik factory. Erno Rubik was a washed out mechanical engineering student who didn't like structured instruction and preferred to let his imagination fly. A Hungarian Apple computer story, if you will, Rubik designed several gliders, trainers, intermediate and high performance types which set several records. Gliding in Europe was a highly developed art in the 1930's and 40's. Polish fliers were also very famous for their exploits. Rubik's son IS the inventor of the Rubik's Cube, by the way.

During my last visit to Hungary last year, I visited the site of the first glider airport in the hills near Budapest. There was a commemorative plaque at the spot where they launched the first plane in 1934. They used to tie the tail to a rock and hooked a long rubber rope to the hook at the front. Eight young men ran to stretch the rope. When it was fully stretched, they released the tail and the flight began. Don't laugh! They had to start, someplace!

I recall building my models using spruce, only, and thin plywood, and a coping saw to cut out each rib. Our planes were drafting paper-covered. No dope; nothing like this was available. But they flew well and taught us a lot. Balsa was only available whenever a large plane crashed and we got the wing struts to cannibalize. When a rubber tow rope wore out, we used the strands to power our models. Microfilm for indoor models was hand mixed from chemicals and poured into the bathtub to solidify before the plane could be covered.

So, when you feel like complaining about the winch retrieve line not being fast enough, or about the foam core wing not setting up fast enough because the vacuum bag is leaking...think about the pioneers who had to create flying machines virtually from nothing. And, yet, nothing is new under the sun, is it?

I have a feeling that my next business trip will coincide with a trip to Kill Devil Hill in North Carolina where fully controlled powered flight was born. ■

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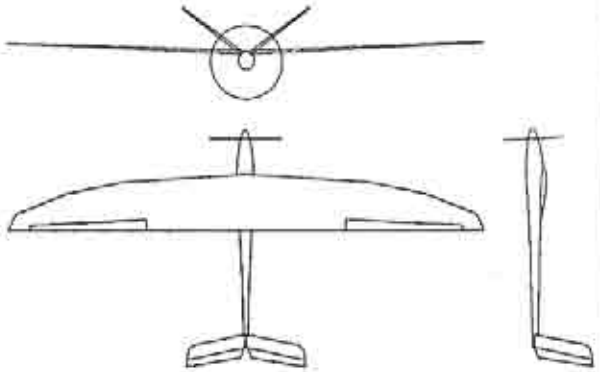

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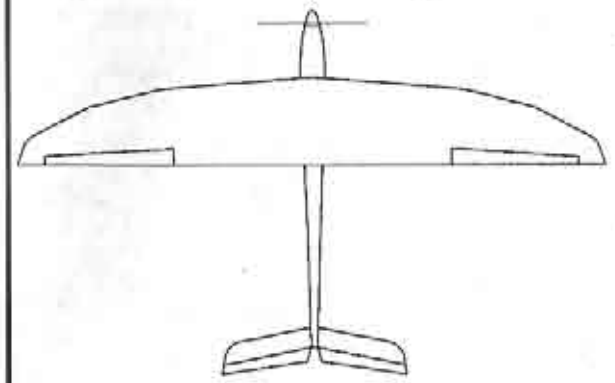

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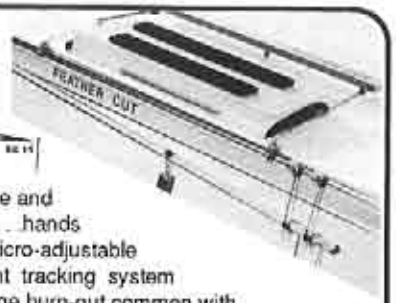

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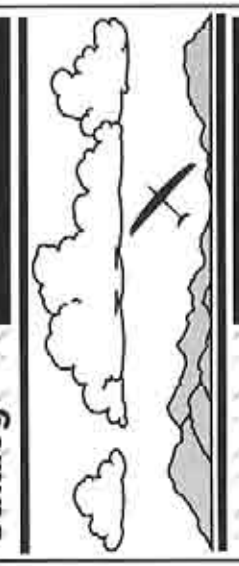

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