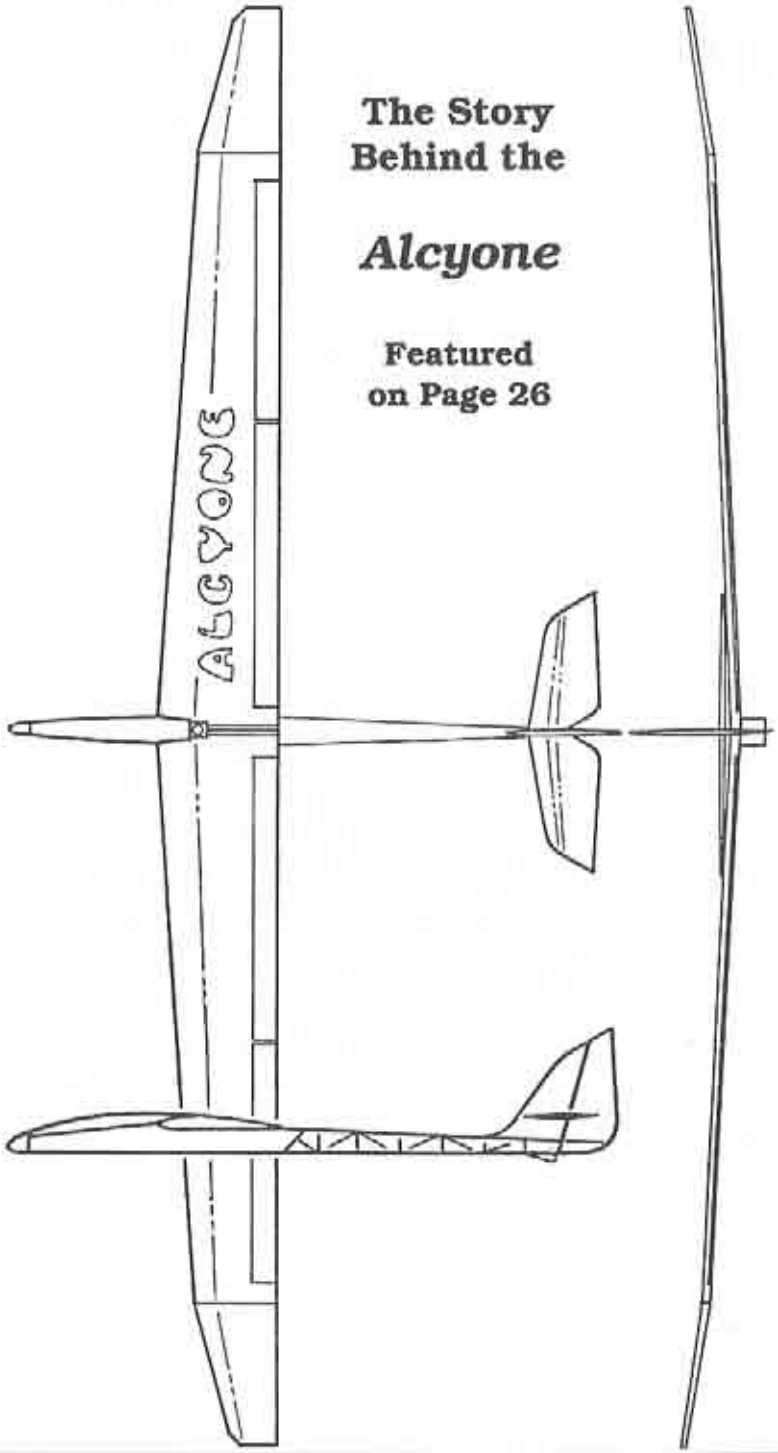


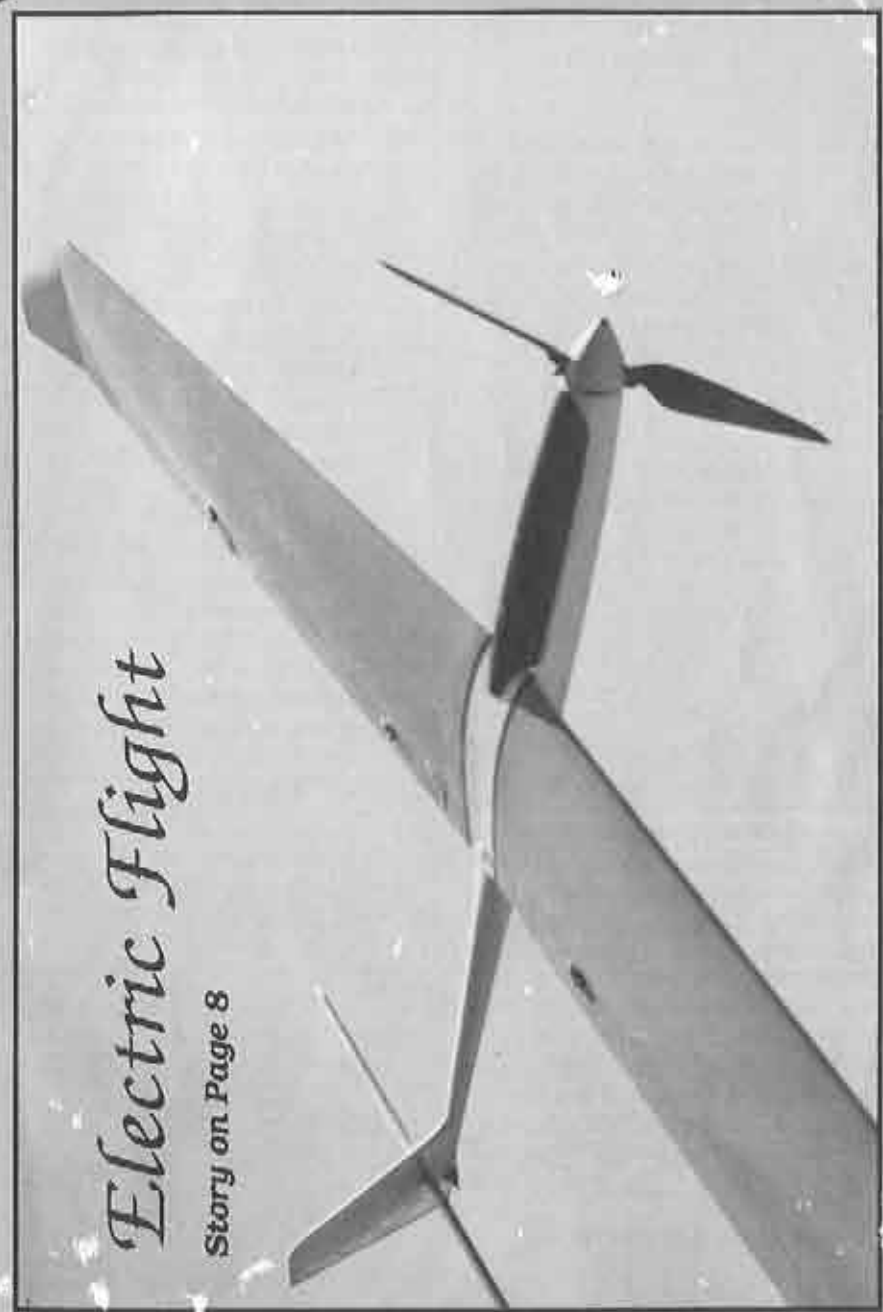
The Story Behind the

Alcyone

Featured on Page 26

R/C Soaring Digest

July, 1991
Vol. 8, No. 7



Electric Flight

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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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The Soaring Site

First place at the Annual Western States R/C Soaring Championships in California went to Mark Triebes. Congratulations, Mark! We hope to have more details including photos of the event in the next issue. Arlie Stoner, the contest director, and the Modesto R/C Club did a great job of keeping the contest running smoothly and on schedule.

We attended the event along with Gordon and Peggy Jones from Texas and Lee Murray from Wisconsin. All of us had an opportunity to chat with many of those in attendance and for those of you that we met who are reading this, we want to say thanks for a most enjoyable time! Lee said that it was a memorable occasion and, for Lee, it was in more than one way. It seems that bellcranks set off metal detectors at the airport...So, if you find yourself visiting another state or country, you might want to keep this in mind!

One of the most informative publications we have read on the subject of R/C soaring over the years is *The White Sheet*. Sean Walbank is the editor and Nic Wright is the technical editor. The publication, as many of you have probably already guessed, is from England. In recent correspondence with Sean, he tells us that he currently mails about 250 copies worldwide and does *The White Sheet* in addition to two other commercial columns which takes up a fair amount of his time! The subscription rates per annum or for a minimum of 6 issues are £6.00 (U.K.), £8.00 (Europe), £30.00 (U.S.A./Canada and other distant points). Sean Walbank's address is: 29, The Gardens, Acreman Street, Sherborne, Dorset DT9 3PD, England.

Happy Flying, Jerry & Judy

Jer's Workbench

Designing a Sailplane — Part II

It took me about 4 evenings to start the design of my sailplane and draw up a set of preliminary plans. Does this seem a long time? Well, yes and no. I knew basicly what I wanted in the design, but as I began to draw I found myself changing things around a bit and I'm sure that there will be more changes incorporated before the model is completed. The wing was laid out before the fuselage, because I have found that it is easier to design and fit the fuselage to the wing; everything else should fall into place.

Some Lessons Learned

One of the first airplanes that I designed was a powered pylon racer. I drew the plans while day dreaming and they flowed onto the paper at a high speed without doing much thinking. The engine thrust line was drawn at zero degrees; the airfoil section and stabilizer were also drawn at zero degrees. Why? I was looking for maximum speed less drag and it looked fast on paper. I built my pylon racer being very careful to follow the plans exactly as I had drawn them. If I say so myself, the racer looked outstanding sitting there in the pits, but it didn't fly worth beans. Let me illustrate with a few simple figures what I did and how I corrected the problem.

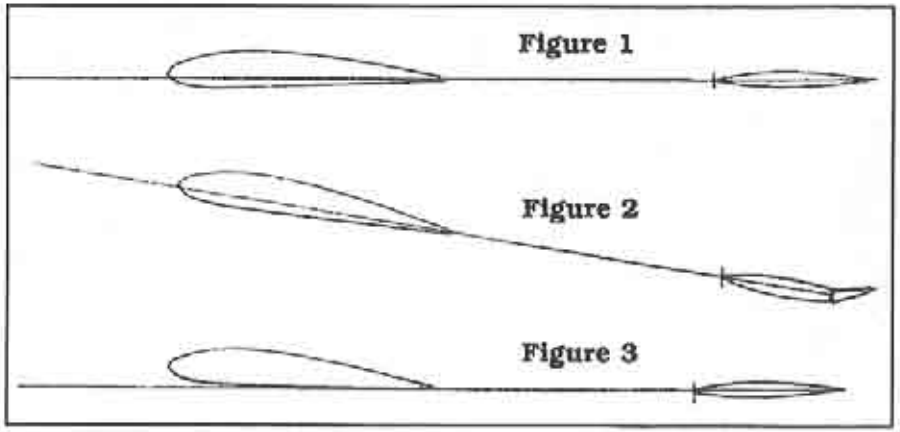
Figure 1 shows what I had drawn. The engine thrust line, airfoil section and stabilizer are all at zero degrees.

Figure 2 shows what I got when I tried to fly. A nose high attitude with a lot of up elevator resulting in a very unstable airplane.

All that was needed to correct the problem was a couple of degrees of angle of attack added to the wing as shown in figure 3. However, this was a major construction problem because the wing and fuselage were built as one. The wing was not removable, so it hung in my shop for a very long time before I got around to fixing the problem.

Angle of Attack

The angle of attack is a subject that can open a can of worms and start a lot of arguments. (There is also the angle of incidence, but that is another subject for another day.) I can give you a book full of formulas by Pankhurst or Munk, but then you'll need to know aspect ratio, drag coefficient, maximum lift coefficient and many more coefficients and factors. I do not want to get into the different coefficients and factors as this



a subject for engineers; I want to keep this first sailplane simple and fun. However, I'm going to stick my neck out and say that the angle of attack is one of many variables that will come up in designing a sailplane. Don't lose any sleep or worry about these variables as you will see later on that they will all work out.

At one time or another you have probably held your hand out of a car window while driving. With your hand held at zero degrees or zero lift your hand just sits there, but as you turn your hand a bit it starts to lift. An airfoil section does the same thing.

Each and every airfoil section has its own best angle of attack. As long as you design and build into your sailplane a wing angle of attack, you can correct or fine tune it at a later time by using an all flying stabilizer.

Unlike the stable condition of a wind tunnel we, the sailplane flyer, fly under very unstable conditions, up wind or down wind, and with each bump the angle of attack is ever changing. So, using all the charts and books that are available set your angle of attack, balance your model on paper and fine tune by using elevator trim.

Some examples of numbers taken from MTB German Airfoil books are as follows:

E-178	1.97 degrees
E-193	3.39 degrees
E-205	2.37 degrees
E-214	5.82 degrees
E-374	1.17 degrees
E-387	3.54 degrees
E-392	4.18 degrees

Experiment

If you are flying a model with a top of fuselage mounted wing that is held on with rubber bands and would like to do a little experiment, try this. Place a 1/16th shim under the trailing edge of the wing and give the model a hand toss. This should increase your airspeed and maybe increase the L/D. If your model is a little too fast, and you would like to decrease its airspeed, place 1/16th shim under the leading edge and note the difference. Make your changes slowly by using either a 1/32nd or 1/16th inch shim.

In Conclusion

On my plans, I drew the fuselage profile at an attitude that I would like my sailplane to fly at. I am using a S3021 airfoil section and have fixed the angle of attack at 2 degrees. By drawing the flying attitude of my sailplane on paper I'm hoping not to have a nose high or tail high attitude after trimming.

For more information on angle of attack and angle of incidence, both geometric and aerodynamic, there are two books you may want for your library: (1) "Theory of Wing Sections", by Ira H. Abbott and Alberte E. Von Doenhoff, and (2) "Model Aircraft Aerodynamics", by Martin Simons.

Air Adventure Day

Where have all the kids gone? Well, the Modesto Experimental Aircraft Association (EAA) Chapter 90, and the Modesto R/C Club co-sponsored an "Air Adventure Day", which is the 1st of what may become an annual event for the young people in Modesto, California.

The EAA Air Adventure Day was a full day of hands-on aviation and activities. As a guest, when I entered the wood working shop and class room at Thomas Downey High School, I knew instinctively that this was going to be a fun-filled and entraining day for the kids because I am also a kid at heart. In the class room there was a TV playing video tapes of the Oshkosh Fly-In and Oshkosh Museum, all the tables held photo albums of the adventures and activities of the different members of the local EAA chapter 90, and there were aviation books and magazines, some dating back into the 20's and 30's.

Air Adventure Day Group Photo (above)
They're having FUN (Right)!

As things got underway each of the young people was asked to stand up and introduce themselves and tell of their interest in aviation. Not too surprising, none of the young people had been exposed to radio control modeling but all shared the same interest. Most of them had built models of one type or another, read books, and all of them wanted to become pilots. This was followed by several brief talks. Eugene Sandburg, President of EAA Chapter 90, talked about full-size soaring and showed some pictures of his experiences. One was a picture which was taken at 30,000 foot altitude through a clear window of an ice covered canopy. Bob Hastings told a bit about construction of wood and fabric for home-built aircraft, and was followed by Shawn Lenci of the Modesto R/C club who talked on R/C soaring.

We then moved into the wood working shop where the young people were divided into two groups. Group one was to build a full-size wing rib of spruce and plywood using miscellaneous hand tools and a jig. Group two was to build a hand launch glider. After these were completed, we broke for lunch and there were more video tapes to watch for those who wanted to watch them or we could stay in the wood working shop and talk; there was a lot of that. After lunch the groups were reversed so that everyone built a full-size rib and a hand launch glider. As the projects were completed, the gliders were then balanced and we moved outside for test flights. Some flew quite well off the work bench and some of the others required a bit of adjusting and repairs. A good time was had by all.

A special THANK-YOU go to: Sharon Rohrke and Marlin Sumpter of the Modesto City Schools; Eugene Sandburg, Wayne Streeter, John Rudesill, Tom Carrilo, Bob Hastings, Renner Brewer, Ray McKinley, Tom Labade of EAA chapter 90; Larry Longacker, Shawn Lenci and Ron Lenci of the Modesto R/C club.

The EAA provided the kit containing the materials; the instructions are well done and specific. Should you or your club be interested in obtaining more information or want to talk to the EAA in your area, their address is: Experimental Aircraft Association, Wittman Airfield, Oshkosh, WI 54903-2591. Gene Sandburg's telephone number is (209) 524-0011.

"Building The Airtronics Legend"

After a long introduction, the Airtronics "Legend" is now in full production and available at your local hobby shop. D.O. Darnell of Model Construction Videos (MCV) managed to get one of the early pre-production kits of the Legend and offers a video on its construction called "Building the Airtronics Legend".

The Legend is a very sophisticated high tech kit, with its fiberglass fuselage, built-up top sheeted wing with flaps and ailerons, built-up rudder and stabilizer with a very interesting bellcrank system inside the fin and the hinging for the rudder. Tim Renaud (Airtronics) and D.O. take the viewer through one step at a time in its construction.

Tim builds the stabilizer, rudder and shows how to assemble and install what could be a complicated part. The elevator, bellcrank, rudder post and rudder hinges are all assembled into one unit and then installed into the fin of the fiberglass fuselage. D.O. goes step-by-step in the construction of the wing. First, is the main spar, with its many pieces. Then, he goes on to the spruce spar caps, balsa shear webbing and plywood facing. He then shows how to lay out the bottom sheeting, bevel the trailing edges, put the bits together for the wing hold down, servo rails and covers followed by sheeting the tops of the wing. The maiden flight concludes the video. I've heard that the Legend is a bear to build, but these guys made it look easy. ■

On The Wing

...by B^2

Bill & Bunny Kuhlman, P.O. Box 975
Olalla, Washington 98359-0975

Swept wings require both resistance to bending along the span, and torsional rigidity. Without resorting to a balsa skin, the first requirement has been an elusive goal for us. During construction of Penumbra.4, however, we had the opportunity to work with a new and unique type of unidirectional fiberglass cloth, and it now appears our elusive goal has been attained.

Unidirectional cloth usually consists of two sets of fibers. The first set, about 90% of the total, runs the length of the fabric; the second set is woven at 90 degrees to the main fibers and serves to hold the material together. These unidirectional fabrics are usually woven from threads, each consisting of many individual glass fibers. The lightest unidirectional cloth we were able to find was 6 oz./yd.^{2} – too heavy for our application.

Enter a 4 oz./yd.^{2} unidirectional S-glass fabric from Aerospace Composites and George Sparr. This fabric is beautiful! Rather than "ropes" of glass fiber, this Aerospace Composites cloth consists of ribbons of glass fibers. Each of these ribbons is about 3/32" wide and is the thickness of a single glass fiber. Spacing between the ribbons is about 1/32", held in place by very fine fibers of seemingly continuous length. These lightweight fibers, which may be of polyester, appear to have been sprayed on in a random way. There is no determinable pattern, but the coverage is very even and their strength is rather remarkable.

In our experience, all cutting was easily accomplished with ordinary plastic handled stainless steel scissors. Our application required cutting curves, so a cardstock template was made. No problems were experienced, regardless of cutting direction. Some minor curling was noticed, but this disappeared completely once we started applying epoxy. The epoxy, although on the thick side, flowed through the fabric quite easily. We used flexible plastic squeegees to spread it evenly. Those lightweight random fibers stayed in place throughout all of our scrapings, but we made sure we always moved the squeegees and blade with the grain so as not to apply too much stress to them.

Our layup consisted of two light coats of vinyl paint applied directly to the mylar, a layer of 3 oz./yd.^{2} bidirectional cloth oriented on the bias (45 degrees), then the Aerospace Composites unidirectional cloth. This was then vacuum bagged to a pink foam core.

The over all result is fantastic! The 3 oz./yd.^{2} bidirectional cloth provides an excellent exterior surface, particularly with the vinyl paint exposed, and imparts a large amount of torsional strength to the wing. The spanwise strength provided by the 4 oz./yd.^{2} unidirectional cloth is far greater than what was previously achieved with the two and three layers of 3 oz./yd.^{2} bidirectional cloth we previously used. Total weight remains the same. With an integral carbon fiber reinforced spar system, this wing is incredibly rigid.

The 4 oz./yd.^{2} unidirectional S-glass comes in a width of 30 cm (just under 12"). It is available from Aerospace Composites, P.O. Box 16621, Irvine CA 92714. Cost is $2.50 per linear foot, plus a flat fee of $3.00 for handling and shipping. Please mention *RCSD* and "On The Wing..." when ordering. Thanks!

* * *

Our nine JR micro servos are now humming along happily following the arrival of a dozen output shafts from Wil Byers of Mid Columbia R/C. The output shaft of the 305 became the weak link when JR incorporated metal gears in the train some years ago. Spending $6.95 for the whole gear set is no longer necessary as you can now obtain the output shafts alone for under $1.00 each! The JR 305 micro servo is a gem and needn't lie idle for lack of this critical part. Write to Wil at Mid Columbia R/C, Rt. 4 Box 9544, West Richland WA 99352. Please tell him B^2 sent you! ■

Snow Fly

...by Mike Stump

607 Washington, Cadillac, MI 49601

The 21st annual Greater Detroit Soaring and Hiking Society Snow-Fly was held on Sunday Feb. 17 in Plymouth, Michigan.

Jack Swint (Brighton, Michigan) launching his Duck. Jack's was one of 2 prototypes built with straight taper wings.

This contest, which is always held in February, has seen conditions ranging from warm weather and muddy fields to ice and blizzards. This season's event saw a snow covered field and temperatures near 40 with light winds. Lift was spotty and those who flew maxes found smooth efficient flying to be a key requirement. Contest Director Art Slagle set tasks of 6, 10, and 8 minutes for the three rounds that were flown. The landing task was a 25' radius circle with a 25 point bonus for landing within the circle. With the variety of task times and reasonably low landing scores combined with the light cycles of lift, this contest was one of getting the most out of the available air, not a landing contest as many TD contests can become.

The quality of competition for this event was very high. Of the 29 people attending (42 entries) there were at least 8 LSF Level 5 pilots entered. Planes ranged from basic 2 channel poly designs to full house glassed or sheeted wing sailplanes. Models flown (that I can recall) were: 2 METER - Gnomes, Spirits, Pixy, Falcon 600, Sagitta, Ducks and some original designs, as well. Flown in Std./Open were - Aquilas, Falcon 880 & 800, Synergy, Astro Jeff, Infinity, plus some 2 METERS and original designs. Also evident at this event is that most pilots have invested in 1991 approved equipment which is required for contests from now on. Visions and similar radios are noticeable in greater numbers.

The pilot traveling the furthest to participate was Mike Mc Gowan from Atlanta, GA. He drove the long way to the Detroit area by picking up Mike Fritz in Mohommet, Il. Mike is currently Product Manager (hope the title is right) for

Mike Fritz, Hobbico Product Manager from Illinois, launches for Mike Mc Gowan (far right) who traveled from Atlanta, Georgia for the Snow Fly. The beautiful Feb. weather made for one of the best Snow Fly contests, ever!

Hobbico and provided the contestants with prizes and Bullit CA (good stuff) and epoxy samples. Many thanks to Mike for these great gifts. Also attending from Champaign, Il. was Ed Whyte of Top Flite. Both Mike Fritz and Ed Whyte are former Michigan residents and SNOW-FLY veterans.

Troy Lawicki (left) with noted soaring pilot Ken Bates discussing performance design and construction. Ducks in foreground belong to Dave Ellis and Mike Stump. Pat Sullivan's standard plane is barely visible to Troy's right as it is all white. Pat used Dave's plane to place in 2 meter.

In addition to 2 METER and Std/Open a Sportsman class was also flown combining all wingspans. This class drew 5 entries and gave less experienced pilots a chance to compete amongst themselves. This class was won by R. Milio flying a gnome. His score would also have won expert 2 METER. 2nd in sportsman went to A. Weintraub and 3rd to J. Schroeder. Expert 2 METER was won by Pat Sullivan flying a Duck, 2nd place went to Troy Lawicki (THE DUCKMASTER), and 3rd to Mike Fritz flying a Great Planes Spirit. Expert Std/Open was won by Pat Flinn with his Astro Jeff, 2nd went to Noel Rossow with an original design and 3rd to Gino Pastori.

Launches were provided by winches using mechanical retrieving systems which performed reliably all day. With the cooler weather the batteries ran down a bit faster in both the launch systems and sailplanes. Contest Director Art Slagle asked that I convey thanks to all contestants and to all whose efforts helped to make this a great event in 1991. ■

Electrics

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

In the June issue of RCSD I wrote an article about the planes I've converted to electric and why. I also mentioned that if anyone was interested in what I did to convert some of the sailplanes to electric and the results, to get in touch with either RCSD or myself. The number of phone calls and letters has been unbelievable!

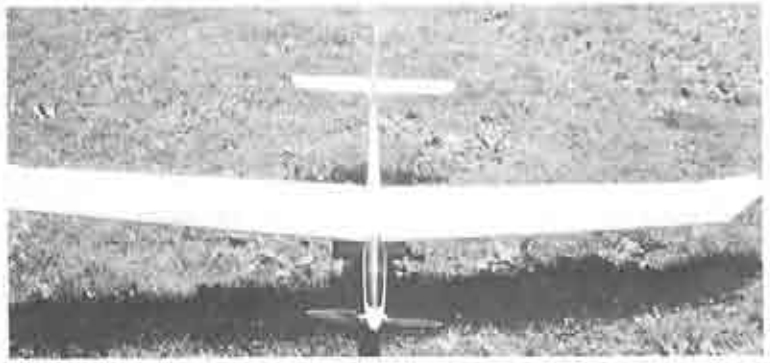
The sailplane most asked about is the FALCON 600; next, the SWIFT 400. So, this month I will discuss what is needed to convert the FALCON. I won't go into detail on constructing the FALCON, because Gordon Jones wrote an excellent article on its construction last month. I agree with Gordon — the FALCON is an excellent sailplane. It flies great, handles well, builds easily and looks super. For these reasons, I have three: one stock, one converted to electric and one I use as a test model to try different motors, props and even a few different wings. I've tried five different wings and found that Mark Allen's original is still the best.

The conversion of the Falcon to electric is really quite simple. Photo 1 shows the items needed. They are: Keller 35/5 or 35/6 motor, prop adapter, spinner, mounting rig, 7 cell battery pack, and speed controller or on-off switch. I used a speed controller, but an on-off switch will work just fine.

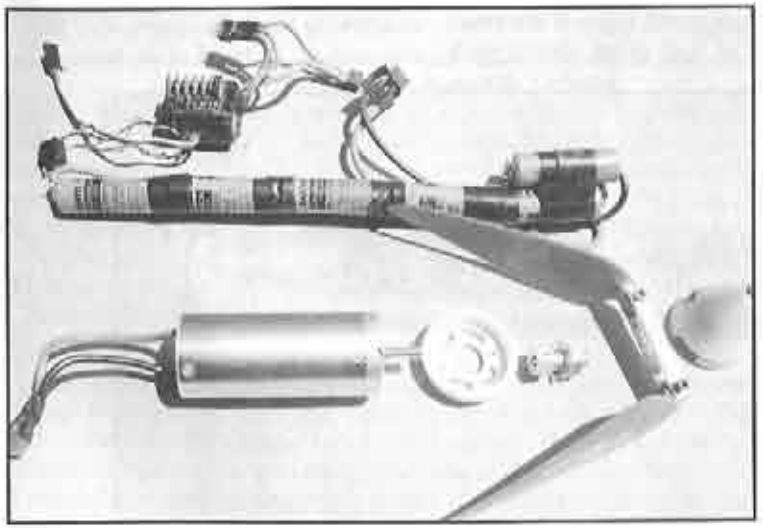
The first thing you have to do is cut the nose off. I know it doesn't seem right to cut this beautiful fuselage, but the end result is worth it. If you change your mind at a later date and want to go back to non-powered flight, you could epoxy the nose back on or replace the fuselage. Flite Lite Composites sells fuselages separately. Or, better yet, get a spare fuselage and share one set of stabs and wing for both fuselages and enjoy both electric and non-electric flight.

Photo 2 shows where to cut the nose off. The best way to do this is to wrap a piece of masking tape around the fuselage and draw a line on the tape, making sure you have 0 side thrust and a little down thrust — about 1-2 degrees (about 1/16 of an inch). When you're sure everything is measured properly, cut the nose off. I use a fine tooth hack saw.

The next step is to install a plate to mount the motor. You can make a mount out of plywood or use, as I do, a neat little mounting ring with holes already drilled that is available from Robbe. (A list of parts and where to get them is at the end of this article.) If you use the plywood mount, make sure to drill all the holes for the shaft and mounting screws before installing it in the fuselage. If you use the Robbe mounting ring, trial fit and sand the fuselage until the lip of the ring fits inside the fuselage. Next, epoxy either mount, using 15 minute epoxy and microballoons into the fuselage. Do not



Electrified Falcon 600



Parts

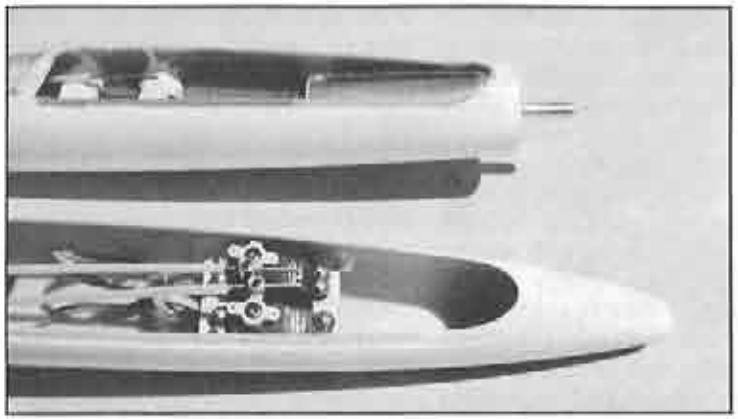


Photo 2

make too large a fillet on the inside of the fuselage. If you do, the motor will not bolt squarely up against the mount.

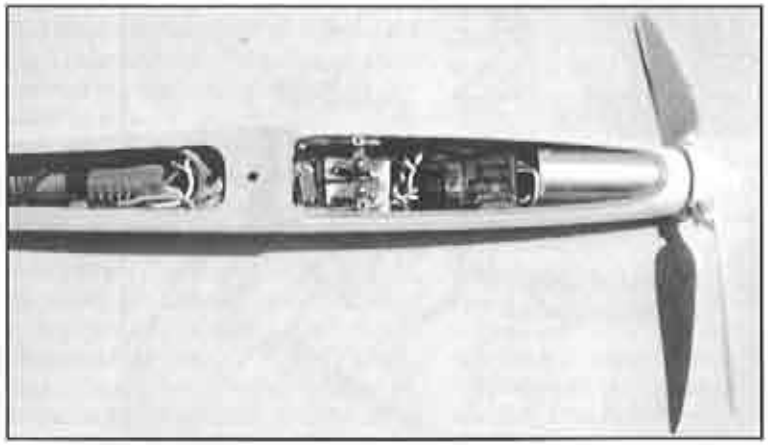
When the epoxy has dried, mount the motor. The motors that I've found to work very well are the Kellers or Astro Flites. In the case of the Falcon 600, I used a Keller 35/5 on 7 cells. You could also use the 35/6. The Keller just fits and will swing an 11 X 6.5 Freudenthaler direct drive. In many of my planes I use an Astro Flite, but it will not fit in the Falcon without major modification to the fuselage.

Next, install your servos, receiver, battery and either a speed controller or an on-off switch. Most any speed controller or on-off switch will work if it's small enough. I've had good results with NOVAK and TEKIN — available at most hobby shops that sell RC car equipment. JOMAR is another good speed controller and, for really small and inexpensive units, I've found the BENSON on-off switch to be excellent.

Last, wire up a battery pack as per the photos. Install it in the fuselage and slide them either forward or backward to get the same C.G. as you had before you electrified the Falcon.

When wiring the system, I use DEANS connectors, mainly because of their size. The choice is yours, but be careful not to use large connectors. There is not much room to work with in the fuselage.

Charge your battery and check that everything works properly, WITHOUT the prop on. A word of caution:



Ready to fly!

Do ALL your testing with the prop REMOVED!

A 7 cell Keller or Astro Cobalt with an 11 inch prop can be very dangerous, especially with an on-off switch because it is just that — either off or full on! Believe me! I've learned the hard way. Be careful!

When everything checks out, it's time to fly. Launch with a firm level push. You're going to be amazed at how well it climbs. As you can see, it's really not that difficult to convert to electric, but if you do run into a problem, get in touch with me and I'll try to help.

Falcon 600

Flite Lite Composites
466 Primero Ct. Suite E
Cotati, CA 94931
(707) 792-9174

Speed Controllers, On-Off Switch

Benson Products
7119 N. Chimney Rock Rd.
Tucson, AZ 85718
(602) 299-2631

Keller Motor, Prop Adapter, Spinner Mounting Ring, Prop, Batteries

Weston Aerodesign
944 Placid Court
Arnold, MD 21012
(301) 757-5199

Because of the growing interest in electric, some new planes are in the works. Frank Weston of Weston Aerodesign has just finished a new .15 cobalt 10 cell F3E type plane with glass-bagged wings and a Kevlar fuselage. Reports from Frank are excellent. By the time you read this, I should have a prototype to fly. Will let you know how it goes. Frank is just about ready to produce a V-tail 7 cell DURATION model with an 89 inch span, glass bagged wing, and glass fuselage with a flying weight of 38 oz. I think this will make an excellent choice for both beginner and expert. From the West Coast, Mark Allen and Brian Agnew of Flite Lite Composites are about to finalize a 7-10 cell fiberglass fuselage foam wing plane that will have a choice of wings depending on the buyer's skill level. Hope to see this soon. Richard Jarel of J.A.D.E. knew that I had an electric version of his plane, the Impulse, and wanted to do the same. After a few phone calls back and forth to each other, he converted his Impulse to electric. I think it's safe to say the Richard is hooked on electric, and that he is going to offer an electric version to his customers.

If you're looking for more performance and have the room in the fuselage, try the new Astro Flite .15 10 cell motor.

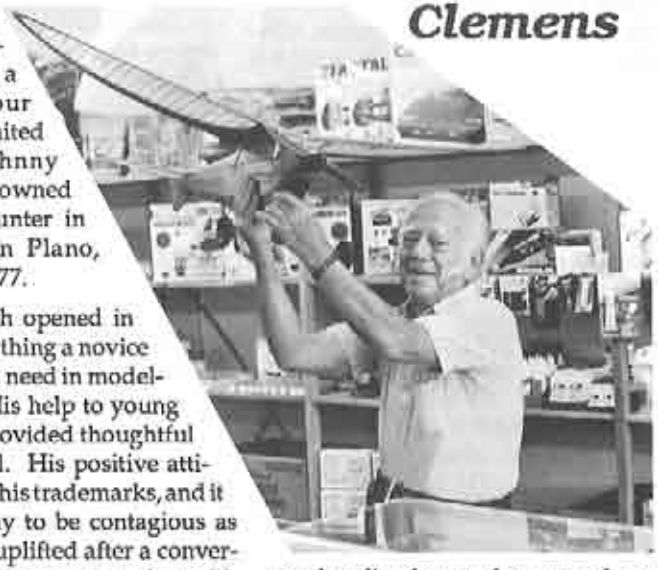
Happy Flying!■

Last Minute Notes & Things

On the Subject of Composites..."Composite Materials for Modeling Applications", an article written by Matt Gewain, was published originally in the National Free Flight Society *Sympo 88*. Much of the information that more directly addresses R/C issues was included in the September and November 1990 issues of *R/C Report*, LeRoy Satterlee's column "With Hawks and Eagles". Gail Gewain furnishes a free copy of this four page document when requested with an order or it is available for $1.00 by writing Composite Structures Technology, Dept. M2, P.O. Box 4615, Lancaster, California 93539. Additionally, they have a 52 page translation on shell construction which is available for $10.00.

Postal Delivery... The use of third class/bulk/surface mail postal service, although provided at a fairly reasonable cost when compared to first class or airmail, means that it will take longer for a letter or parcel to reach its destination. NorthEast Sailplane Products is experiencing this delay and have found that it may take up to 8 weeks for postal delivery to customers who have ordered their catalog. Consequently, they now offer either 3rd class ($5.00) or 1st class ($7.00) delivery.

Johnny Clemens



On the 13th of June the modeling world lost a patriarch of our hobby in the United States. Johnny Clemens, who owned the Hobby Counter in Dallas, died in Plano, Texas. He was 77.

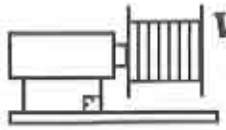
His shop, which opened in 1940, sold everything a novice or expert would need in modeling supplies. His help to young and old alike provided thoughtful guidance for all. His positive attitude was one of his trademarks, and it seemed to many to be contagious as they would be uplifted after a conversation about their current project with Johnny.

Over the years Johnny went out of his way to make people happy and laugh. "Fun" was the key word in his outlook on the hobby and was the most important aspect of modeling to him. He had a one-liner for every situation. Comments from Johnny were always free. He said, standing in front of the counter of his store, that "he preached here every Saturday". A sermon from Johnny was an experience in itself as he was one to speak his mind on any number of subjects from modeling to politics.

Even when fire destroyed the Hobby Counter in 1987 Johnny remained optimistic. Through the help of friends he was able to open the store in four months. One person donated some light fixtures, another provided glass display cases, and others donated time and money to rebuild. One manufacturer even donated merchandise to help restock the shelves. In addition to the merchandise that was lost were planes that had been on display from years gone by that could never be replaced. Through it all Johnny maintained that positive attitude and optimism that it would all work out.

Johnny was a charter member of the Academy of Model Aeronautics and was known internationally as an expert in most forms of our hobby. From 1971 through 1978 he was President of the AMA and provided the inspiration and leadership that brought the hobby to new plateaus. During his tenure, technological advances caused numerous changes in the structure of competition and rule changes to keep pace with these advances. Johnny was a pioneer in using "special interest" groups to gain the grass roots ideas and feelings of the modeler. His influence on the modeling community has left an indelible mark on those who knew him.

Johnny Clemens will be greatly missed by all of us. ■



Winch Line ...by Gordon Jones

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

Federation Aeronautique Internationale (FAI) Its Role In Sport Aviation

Most members of the modeling community are aware of an international aviation organization referred to as the FAI, but few know much about the FAI, or what the initials stand for.

The Federation Aeronautique Internationale (FAI) is an eighty member organization founded in 1905. The National Aeronautic Association was a founding member representing the United States, and is today the FAI's most active member. All of the major aviation countries in the world are members, including the U.S.S.R. and China. For the most part, the "national aero club" of each country is the designated member of the FAI. The National Aeronautic Association represents the United States in FAI matters.

The FAI has many responsibilities, but two stand out above all others. First, the organization of world and continental championships and air sport events. This involves the establishment and enforcement of rules for international air sport competitions in each of the air sport disciplines recognized by the FAI. The second major responsibility is the establishment of regulations for the evaluation and verification of all international air and space records. The FAI is the world's record keeper. As you can see, all international air sport competition and record setting falls under the FAI. The FAI is to sport aviation what the International Olympic Committee is to general sports.

Most of the work of the FAI is carried out through specialized air sport "commissions" set up to promote the aims and objectives in their specific disciplines. Air sport commissions exist for:

Ballooning Gliding Parachuting
Aerobatics Microlights
General Aviation Helicopter
Aeromodeling Hang Gliding
Amateur-built Aircraft

Each of these sport commissions deals with the technical issues involving their discipline. They establish the international rules under which all international competitions are held. Each national aero club designates a delegate to each of these air sport commissions unless that discipline is not active within its country. In the case of the United States, the president of the NAA appoints the persons nominated by the air sport commission.

The General Conference is the supreme body of the FAI, and has overall responsibility for the conduct of all FAI business. It meets annually, with the meetings rotating among member countries. In 1989, the General Conference met in Bulgaria, and in the fall of 1990, in Hungary.

In addition to the General Conference, there is also a Council that meets twice a year between meetings of the General Conference. Among other duties, the Council oversees the work of the various air sport commissions.

For the Aeromodeling commission, the FAI competition classes are broken into four major categories: F1 - Free Flight, F2 - Control Line, F3 - Radio Control, and F4 - Scale. These categories are further subdivided into specific disciplines within each category. For example F3B is the Thermal Soaring division within the F3 Radio Control category. Each category has special interest groups within that category that range from two groups in F4 Scale to eight groups in the F3 Radio Control category. These same divisions, under different designations, apply to all other commissions.

As you can see the FAI plays a dominant role in the establishment of uniform air sport rules and regulations which all countries follow. The FAI has a fairly modest organization as far as size and visibility are concerned, but for the past eighty-five years its impact has extended far beyond its size or visibility. It has been a potent force for world peace and understanding by bringing together men and women in intense but friendly competition from all corners of the world.

National Aeronautic Association (NAA) Its Role In Sport Aviation

Most members of the modeling community have heard of an international aviation organization known as the NAA, but few are aware of what the NAA is or what function it serves the modeling community.

The National Aeronautic Association (NAA) is the National Aero Club of the United States. Its primary mission is the advancement of the art, sport, and science of aviation and space flight. The NAA represents the United States aviation interests as the member of the Federation Aeronautique Internationale (FAI). The NAA was a founding member of the FAI and is the FAI's most active member today.

The NAA was founded in 1905 when it started as the Aero Club of America. It is the nation's oldest aviation organization. The founders of the Aero Club of America concluded very early that one of the most effective ways to encourage the advancement of aviation was through competition. Competition encouraged individuals and organizations to push the science of aeronautics to the limit of existing technology. This is true today as it was in the early days of aviation.

Until 1926, the National Aeronautic Association was the only source of pilot licenses in the United States. NAA was principally responsible for the enactment of the National Aviation Act of 1926, which was the beginning of our nation's structured air transportation system.

The NAA is a unique organization. It is a non-parochial, charitable organization. It has as its members individuals and organizations representing all segments of American aviation. Key among its members are the nine independent air sport organizations that have chosen to become "division" members of the NAA. These nine air sport organizations represent all major air sport disciplines in the United States. The air sport divisions are:

Academy of Model Aeronautics
Soaring Society of America
Balloon Federation Of America
Experimental Aircraft Association
Helicopter Club of America
International Aerobatic Club
U.S. Hang Gliding Association
U.S. Parachute Association
U.S. Ultralight Association

Each of these divisions deals with the technical issues involving their discipline. They assist and represent their division through the NAA in the establishment of international rules and competitions. The representative of the division is nominated to the NAA and appointed to represent the United States in international rule making conferences. In this fashion, the most technically knowledgeable member of the aviation discipline represents his division and its interests.

In addition to the divisional members, the NAA includes corporate members who recognize that the function performed by the NAA can best be performed in the private sector. The companies have concluded that the NAA is in a unique position to do so. Most major aerospace organizations are corporate members (a few include: Boeing, Lockeed, Rockwell, Gulfstream, and General Electric).

There are also individual Aero Clubs, which are independent clubs located in certain geographical sections of the United States. Affiliates, which are independent aviation organizations principally associations - that are concerned with specific segments of aviation. Lastly, there are Individual Members who support NAA because of the mission and heritage.

The NAA, on behalf of the FAI, sanctions, aids and documents all record-making flights - private, commercial, military, and space. Before a flight can be considered as an official record, nationally or internationally, it must be observed, timed and certified by NAA personnel.

As you can see the NAA plays an important role in the establishment of air sport rules and regulations. While it is not a well known organization to some, its impact on air sport both in the United States and the world is considerable. ■

The DCU Dragonfly & Super Dragonfly

...by Greg Maiers
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The DCU Dragonfly and Super Dragonfly slope ships are constructed of balsa covered foam wings and very well made fiberglass fuselages.

The two ships are almost identical in outline, with the Dragonfly having a wingspan of 50", length of 30", 257 square inches of wing area, and an 8% (fast!) Eppler 374 airfoil. The Super Dragonfly has a 70" wingspan, is 45" long, 560 square inches of wing area, and uses an un-thined Eppler 374 section. The wing loading of both ships comes to about 10 oz./sq. ft. However, under high lift conditions, ballast will increase the speed and stability (and landing speeds) of these aircraft. Control is derived from conventional ailerons and elevator.

Building

I built the Super Dragonfly first, so I will start with its construction. The smaller Dragonfly is very similar, with only minor differences. The materials in these kits are absolutely first rate. The foam cores are well cut, all balsa is excellent, and the fiberglass needs little work in preparation for painting. This is the first foam/glass ship I have built, and I had very little trouble with it. An easy week of evenings will have it ready for the slope. The wings are sheeted with 1/16" balsa; I used epoxy and a simple board with weight on it with excellent results. The only modification I made was to add .007 carbon fiber laminate between the skin and cores, 1/2" wide for the Dragonfly, 1" for the Super. (Make sure you sand off all the gloss,) This probably is not necessary, but I have yet to break a wing in my sometimes less than perfect "landings". The spruce leading edges are added, and hardwood T. E. stiffener is added to the balsa trailing edge stock. The aileron torque rods are added, and tip blocks, and the wings are ready for joining.

It is highly recommended that you build a miter tray, as featured in *RCSD*, as this is quite a useful tool for preparing the wings for joining, sanding the miter on the tips, and especially for joining the wings. The procedure I use is to set the angle on the trays, put the bottom foam beds on it, epoxy the wing halves together and tape them tightly together with masking tape top and bottom (stretch the tape across to the other half), place the wing on the foam beds, add the top beds, and add some weight. Viola! Perfectly aligned wing halves with a very strong center joint. The Super uses a ply spar for reinforcement, while the smaller ship uses fiberglass tape.

Make or buy some end milled fiberglass to mix in the epoxy to install the wing mounts, and also the servo mounts. Although I did not do this, I would rec-

about adding a rudder, and he said he knew of fellows who have done this to add more maneuvers, but did not recommend it.

When covering the wings, use either Oracover (Great fluorescent colors!) or UltraCote, as these apply to sheeted surfaces well. I tack, then seal the covering to the leading edge first, then carefully tack and seal the trailing edge, and finally use your heat gun, starting in the middle, and use a soft cloth to press the covering to the wing, working the air bubbles out to the tip and root of the wing. This results in a tight, no sag finish. On the small Dragonfly, I used white on the top of the wing and stab with large black contrast stripes, and black on the bottom with fluorescent orange contrast strips, and orange fin. This results in very good orientation, even when the ship appears as a tiny speck in the distance. Make sure you seal the aileron gaps with covering. Balance everything laterally, as well as fore and aft. I mark the balance range on the fuse with trim tape for easy checking when changing ballast. Use the balance point in the instructions, not on the plans for the small Dragonfly.

ommend adding kevlar tape to the fuse along the lip under the wing saddle. The large plane uses a very nice ABS fillet on the tail, but make sure you add an epoxy fillet for the small ship. Bob Violett pin hole filler works great for preparing the fuse for painting. I used Hobbypoxy epoxy paint, which has proved durable, but automotive lacquer would probably be slightly lighter.

There were a couple of very minor problems, one being that page three of the instructions were missing. Also, the hatch on the Super Dragonfly was twisted approximately 180 degrees. A call to Mark Hambelton of DCU was most helpful. To fix the hatch, simply carefully heat it with your heat gun, twist it to shape, and then hold it under cold water to set it. The missing page was sent forthwith. (I didn't think this was a flying wing!) I also asked Mr. Hambelton

Now the fun stuff -- flying.

The Super Dragonfly was my first aileron ship. When I first chucked it, the roll rate seemed, well, crisp. After toning down the throw a bit, it did not take long to get comfortable with the stable, yet maneuverable flying characteristics. This thing is a blast! Do make sure you have adequate lift, however. I have made several "long distance" landings. (Watch that shadow coming up!) This is not to say that the Super Dragonfly needs massive lift. It will tool around in a fairly light breeze, but do not expect to do acrobatics in these conditions. Flying the small Dragonfly is, well, exciting. It is very fast. It does not like to fly slow. When up to speed, it is like it is on a rail; just think where you want it to be, and there it is. If it is difficult to hold in position for launching at my favorite site (Bear Creek Lake Park), then the wind is about right (30 - 50 mph?). If you stall, make sure you have a real good amount of airspace below you. Loops are kind of large, but you could fit a larger elevator or more throw if you wish. Snaps are quite snappy. The main thing going through my mind after launching is, how will I get this thing down in one piece? Usually, however, I am successful, as these are quite rugged ships.

The Super Dragonfly is suitable for learning aileron control, and the Dragonfly will appeal to the more experience flyer. It is quite easy to carry around with you, but it performs best when flown in good lift. These are both wonderful kits; the fun factor is first rate with either one. ■

Mounting Servos in Foam Core Wings

...by Taylor Collins

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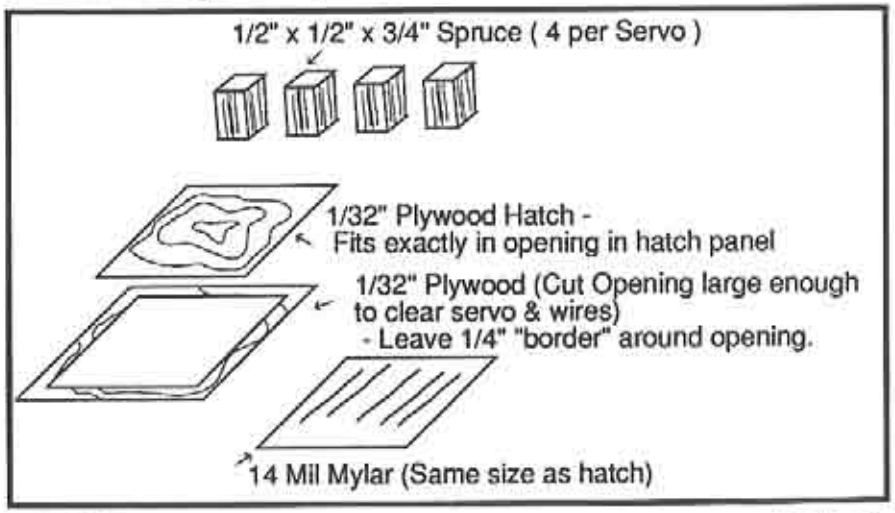
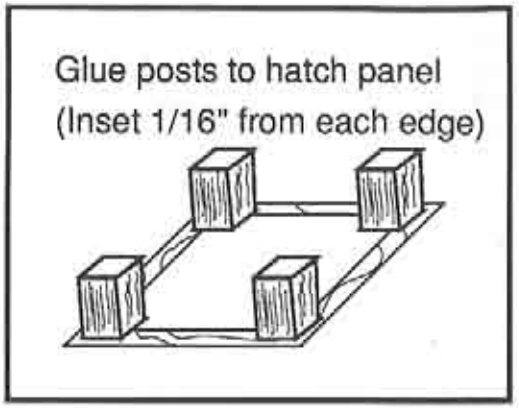
After building several "sophisticated" sailplanes, each with four servos in the wing, I realized that the one really weak link in the system was the servo installation. I had an assortment of jury rigged solutions to the problem, and each was either heavy, sloppy, made the servos hard to remove, or just plain didn't work! This system has fixed most all of those problems, and isn't particularly difficult or time consuming to accomplish.

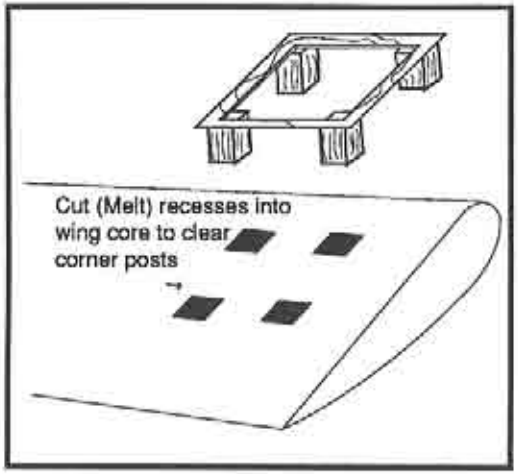
1) Cut out the necessary pieces, as per the drawing. Obviously, if you're going to install four servos, you will have to increase the recipe times four. The "window frame" hatch panel needs to be large enough for your servo to fit comfortably inside the "window". That is the only really critical dimension involved. The perimeter of the "frame" should be about 1/4" wide. Cut one extra plywood "window frame". It will be used to make the flush fitting ledge for the other frames. Cut the actual 1/32" ply hatch, and the 14 mil mylar "dummy hatch" to fit exactly inside the "window frame". The spruce posts are to secure the screws that hold the hatch and servo in place.



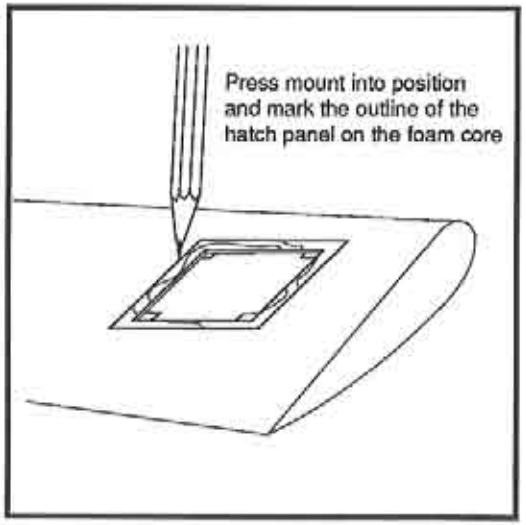
2) Glue the spruce post to the hatch frame. I use cyano glue, but if you're nervous about such things, use epoxy. Inset the posts from the edges of the frame about 1/16". That will leave a generous area to accept the screws in the corners of the hatch cover.

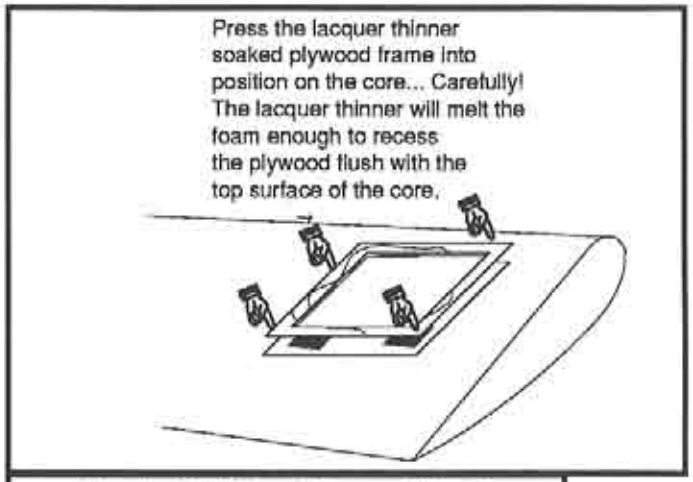


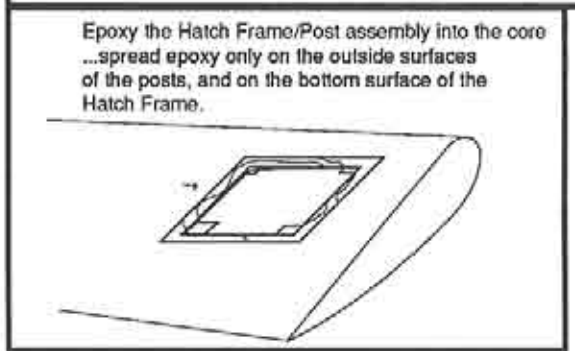
3) Place the assembly (which now looks like a miniature table) onto the wing core where you want the servo to go...mark around each of the posts with a felt tip pen. Now, using a pen-type soldering iron, melt out a pocket for each post. Make sure you don't go all the way through the core. If you do, it isn't the end of the wing...just patch the hole with lightweight spackle, let it dry, and sand flush.



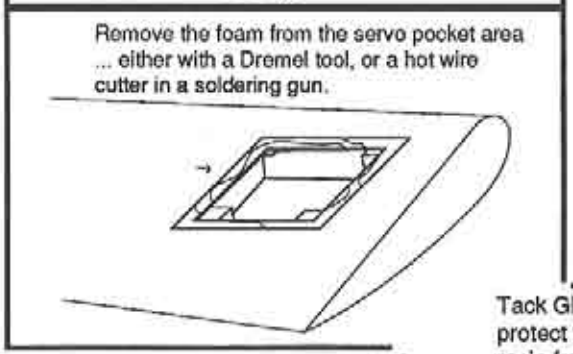
4) Push the posts down into the pockets in the wing core, and mark around the edges of the hatch frame with a felt tip pin. Remove the frame assembly and set it aside. Fill a saucer or small bowl with lacquer thinner. Soak the extra frame piece in lacquer thinner for a few seconds...lift it out...shake off the excess lacquer thinner...and then place the soaked frame piece onto the core, within the marks that you made. Press lightly on it, and within a few seconds the lacquer thinner will melt a recess into the core. If it doesn't recess far enough...resoak the plate and try it again. This sounds really scary, but it really works pretty nicely. Within a couple of minutes you should have a nice recess for the frame plate to set in.



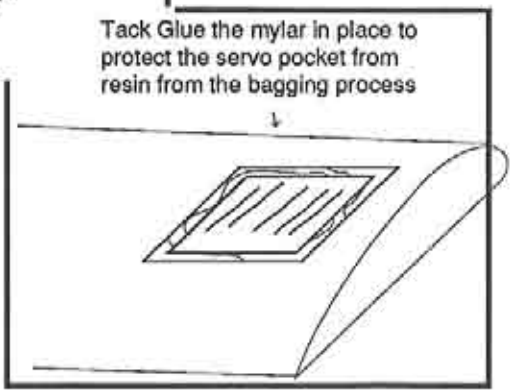




5) Using 5-Minute epoxy, glue the posts and under surface of the plate into the pockets and recess in the foam core. You only need to apply glue to the outside surfaces of the posts...the inner surfaces will face into the open servo pocket, anyway.



6) Now you can remove the foam from the servo pocket...use a formed piece of wire in a soldering gun, or use a dremel tool with a milling cutter. Again, be careful not to cut all the way through the wing.

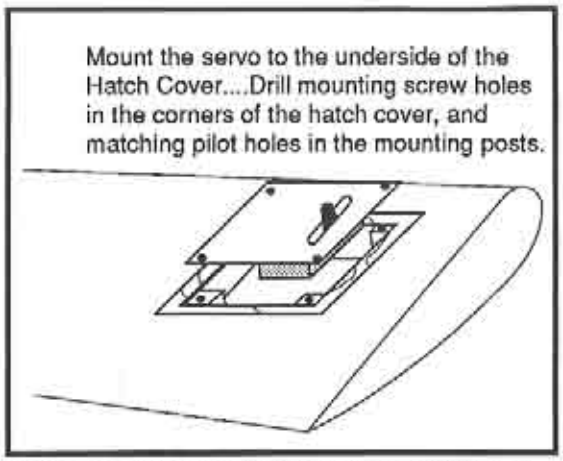


7) Tack glue the mylar temporary cover into place. Its only purpose is to keep the resin out of the servo pocket while you vacuum bag or sheet the wing.

8) After the wing is bagged (or sheeted), cut out the mylar temporary hatch. Obviously, it is much easier to find if you are bagging the wing with fiberglass. If you are sheeting with wood, probably the best way to locate the hatch would be with some sort of template that you made before you sheeted over the hatch.

9) You are now ready to attach your servo to the bottom side of the 1/32" ply hatch. I cut small spruce blocks and epoxy them to the hatch. Then, I use #4 sheet metal screws to attach the servo to the blocks.

10) With the servo hatch assembly in place and the servo plugged into its extension lead, drill holes through the corners of the hatch plate, into the spruce blocks. Enlarge the holes in the corners of the hatch plate to clear the screws that you will be using, and attach the plate. ■



Understanding Thermal Soaring Sailplanes

Part 4 of 4 Parts Continued

(This column began in January, 1990. Each part covers several months.)

...by Martin Simons

Martin Simons, 13 Loch Street, Stepney, South Australia 5069

The horizontal tail

Figure 44 shows how the drag of the model in the previous figure may be analysed further, using the Fraser program. The vertical distance between the upper (wing only) curve and the middle curve here indicates the contribution of the horizontal tail: at minimum sink trim, 6% of the total drag, at 15 m/s, 15%.

If the horizontal stabiliser area could be half the size, its drag would be practically halved. Moreover, since the serious contest model will be built up to the largest allowable total area, a reduction of stabiliser surface frees some surface to be transferred to the mainplane, thus improving the efficiency of the wing at the same time as the tail drag is cut. By doubling the moment arm, a half sized tailplane could be achieved, but fuselage drag would increase and the other problems associated with excessively long moment arms would arise. Suppose, then, that the tail area was simply halved without any other alterations.

The kind of improvement that can result from this is indicated in Figure 45. Here, two models with the SD 8000 wing profile are compared. One has the 10% (0.15 sqm) stabiliser area as before, shown by the broken line on the polar chart. The other model has a stabiliser of half the size (5% of the total) on the same moment arm. The area saved from the tail has been added to the wing, resulting in a slightly greater span (4.62 m) at the same aspect ratio. There is a noticeable, and tempting, improvement in the polar throughout the speed range.

Stability?

Such an improvement in drag is not, of course, without penalty. A stabiliser area of only a little over 5% of the wing area would be considered very small by most model fliers and even a scale model of a full-sized sailplane would probably not have a stabiliser less than 7 or 8% of the wing area. The point remains that tail drag can be reduced most effectively and simply by reducing tail areas. Stability raises some other issues.

If a model sailplane has too little stability in pitch, it becomes excessively sensitive or 'twitchy' on the elevator and extremely exhausting for the pilot, requiring constant corrective control action. At some distance away, or at great heights, it is impossible to judge flight attitudes and speeds, with the result that the model may easily get totally out of control.

On the other hand, if the pitch stability is too great the elevator becomes sluggish and unresponsive. This is safer, since the pilot may let the model fly 'hands off' for fairly long periods, confident that nothing very drastic can go wrong. However, an over-stable sailplane is not pleasant to fly and may sometimes refuse to respond swiftly in an emergency. Excessively stable models may also pass rather solidly through thermals without giving much indication of the change of air, whereas a less stable trim might signal the situation by reacting more vigorously.

In Figure 45, the stability factor of the model is indicated by the figure for dCm/dCl, a large negative figure here indicating a stable model. A positive figure for dCm/dCl means the model will be practically uncontrollable and may be expected to crash within a few seconds of launching. A stability factor of zero is the so called 'neutral' static stability which in flight becomes almost impossible to cope with. Stability factors of about -0.04 would be considered reasonable. and there would be no harm in going to -0.7 or -0.08.

By halving the stabiliser volume in the example, the stability factor has been reduced from -.065, which is safe, to -.024. which is verging on the dangerous.

If the tail volume is regarded as fixed,

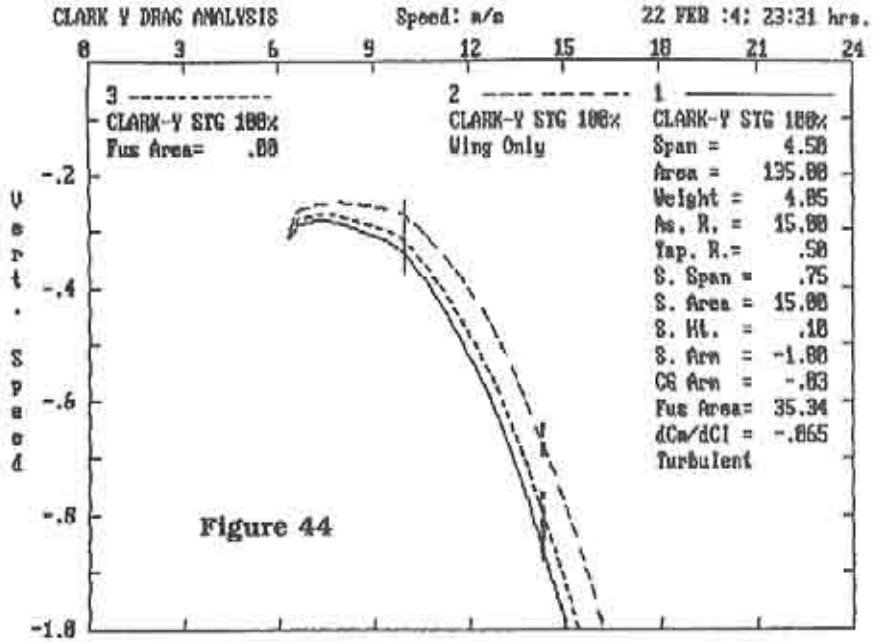


Figure 44

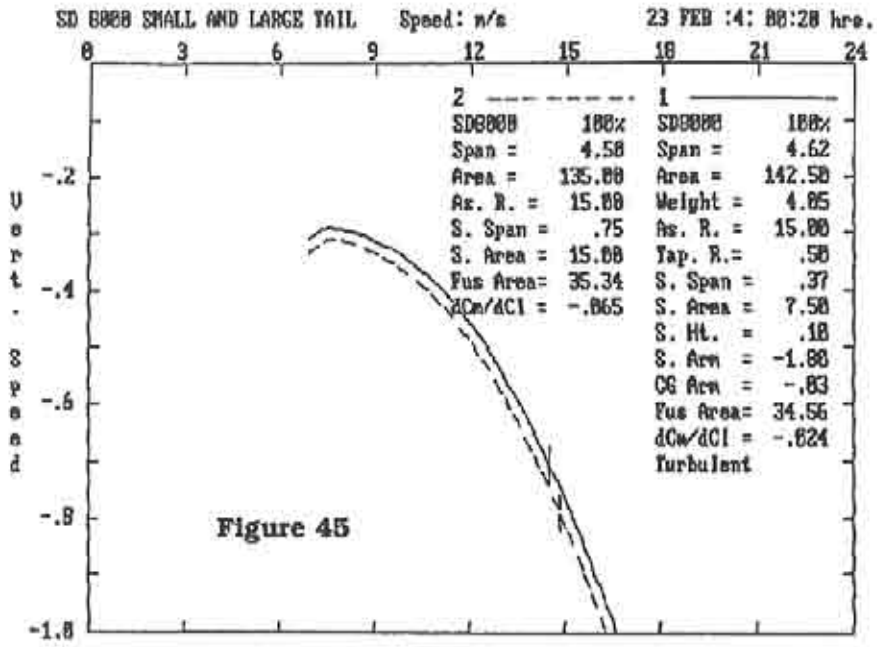


Figure 45

the pitch stability factor depends mainly on the centre of gravity position. The further forward the c.g. goes, the more stable the sailplane becomes. Moving the c.g. aft decreases stability and, as may be found by experiment with any existing model, will produce dangerously sensitive or 'twitchy' elevator response if carried too far.

Other factors enter the equations, such as tailplane efficiency, which can be improved by using a T tail to get the stabiliser out of the wing and fuselage wake, and by designing tail surfaces with moderately high aspect ratios, but these are relatively far less important than c.g. position.

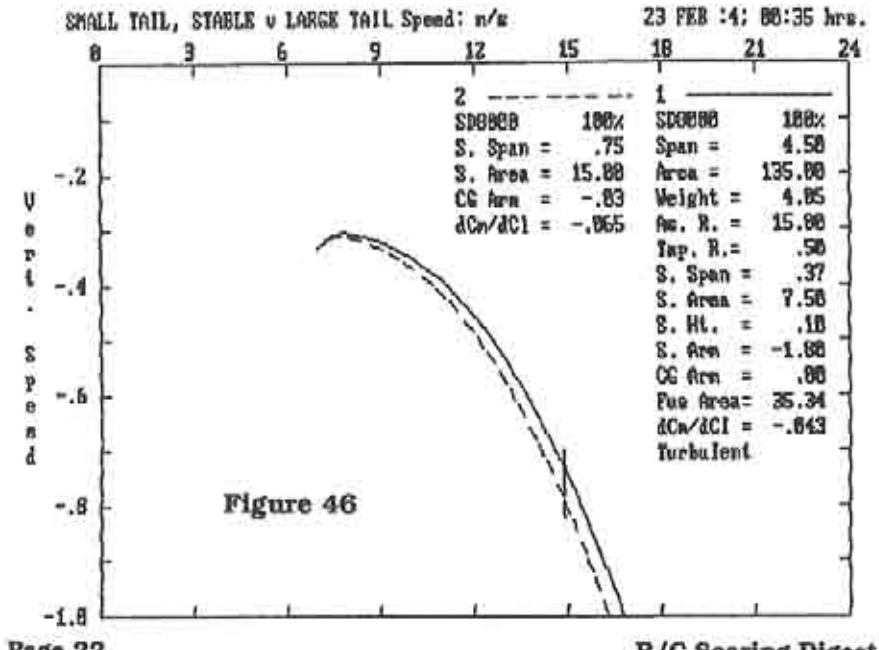


Figure 46

To restore a safe margin of stability with a halved tail volume, the simplest solution is therefore to move the centre of gravity forward. In the next diagram (Figure 46), the c.g. has been moved to coincide with the wing's aerodynamic centre, i.e., the c.g. is placed at about 25% of the mean wing chord. (In practice this simply means putting more trimming ballast in the extreme nose of the sailplane until it balances at the quarter mean chord position.) The c.g. arm has been reduced to zero, as shown in the tabulated figures. Even with the small stabiliser, the stability factor has been improved to -.043 by this. Some stability has been sacrificed for the sake of drag saving, but the outcome is not unreasonable. ■

Ridge Writer

...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)

The Mid-Columbia Cup slope races recently past (May 24 & 25) with Joe Wurts coming out on top of the heap, and one thousand dollars richer. Joe is a great R/C glider flyer who is an extremely good race pilot. You will have an opportunity to read more details about the race in another article in this publication, but I want to talk about the question most asked of winning pilots. That question is of course, "What airfoil are you using?"

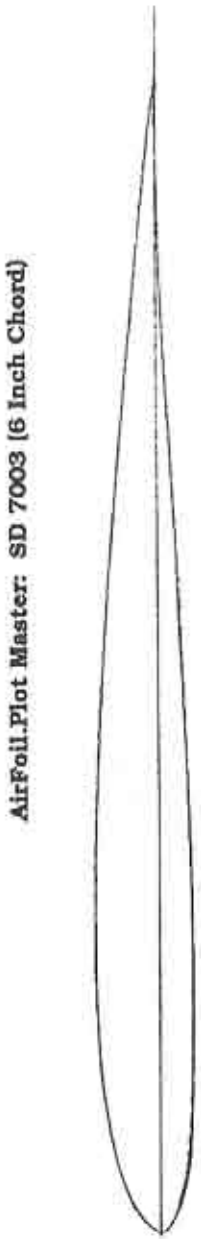
"What airfoil?" is a very interesting question indeed and one which most soaring pilots highly emphasize. They emphasize airfoils because so many of these pilots are also interested in the design of their models and what physical features cause them to fly as they do. Undoubtedly, they are right, the most important of these features is going to be the airfoil, even though a number of other design parameters play a vital role in the model's overall performance. So this month, because so many would be designers are interested in airfoils, I'm dedicating most if not all of my column to the airfoils that were used at the Cup race. You can study these sections and decide for yourself what would be an appropriate choice for your "World Beater". Remember, however, that the most important ingredient for a winning design is a competent pilot, who knows their model very well.

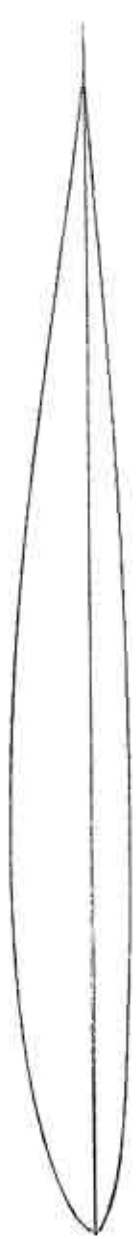
I've also included the airfoil section that set the F3F speed record in Europe, at the Viking Cup, this last year. That section was the Quabeck 1.0-9. As noted by its number it has a camber of 1% and is 9% thick. The combination of airfoil, model design, and pilot turned in a very impressive 29 second run on the course. Remember, in F3F it is a combination of speed and the ability to perform good turns at the end of each 100 meter leg that turns in fast times and winning performances.

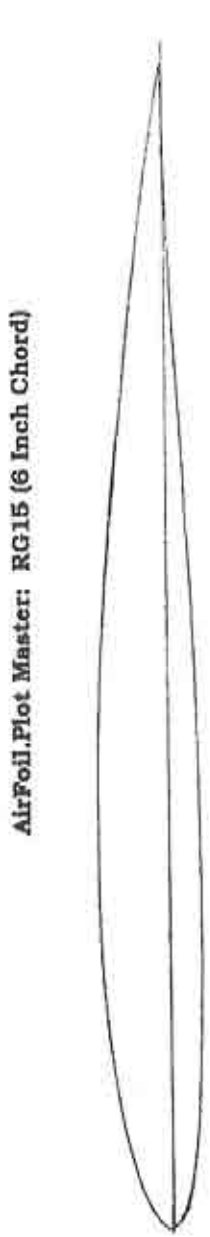
If you would like the coordinates for any of these airfoils I will be glad to provide them. Just send me a SASE to my address

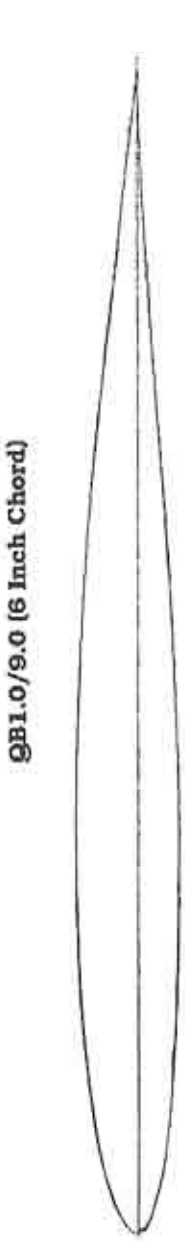
Slope Scenes

On a recent business trip to Virginia, I had the opportunity of flying (flat field) with Herk Stokely and Bob Champine. Herk Stokely as many of you know is the contributing editor for *Flying Models*. Herk was kind enough to loan me one of his models and I was even able to enter their contest. It was a great deal of fun and gave me an opportunity to meet many interesting fellows. One of these individuals is Bob Champine. Bob is, if









you don't know already, the second man to climb into the X-1 and fly it past the speed of sound. So, it isn't surprising to find he loves flying things and especially model gliders. The exciting thing for me was that he has also discovered slope soaring.

Bob tells me his group flies on the best ridge in the world. In terms of lift it must be, because the world's goal and return distance record for full size soaring was set on the ridge. That ridge is part of the Allegheny Mountains where Karl Striedieck flew his ASW-17 greater than 600 miles. And, his record setting flight was over 10 years ago. Bob also tells me that even though the lift is great they have a bit of a landing problem in that the landing zone is small. Nonetheless, his group of soaring enthusiasts have found a place to fly slope and therefore are enjoying the slope.

If any of you Easterners would like to fly this site I'm sure Bob would be most glad to share it with you. His address is Bob Champine, 205 Tipton Rd., Newport News, VA 23606. Have a good month of slope soaring and keep me posted as to what is happening on your hill. ■

The Story Behind the Alcyone Sailplane

...by LeRoy Satterlee...Designer

In order to tell the story of the Alcyone sailplane, I have to give a little background to the story for those who don't know her history.

In 1987 I had a construction article published in *R/C Modeler* Magazine on a hand launched sailplane called "Chuperosa". Chuperosa was designed from an idea given to me by Rusty Shaw from Ottumwa, Iowa. Rusty's airplane showed a lot of promise of being a fine airplane, but two basic problems persisted, especially with the aileron version. First, the only plans that existed were on two sheets of 8 1/2 X 11 graph paper. Secondly was the difficult way in which one had to hook up the ailerons when the wing was installed.

I asked Rusty's permission to make a marketable design out of his original idea, and it was granted. The resulting design was published and was an instant hit. I cut and sold a ton of foam cores to the people who wanted to build her, and had a "GUT" feeling that a bigger version would have to be designed right away.

About this time, I was approached by Mel Culpepper, of Culpepper Models, about kitting the Chuperosa. I agreed to go ahead, as did Rusty, and proceeded to make minor changes to the design to make it easier to manufacture.

As soon as the plans and instructions for the kit version of the Chuperosa were out of the way, I built the first "Alcyone" prototype. This was in late 1987. She was originally a 100" span standard class ship with a Selig 3021 airfoil and spoilers. I only fly competition occasionally, so I didn't design Alcyone as a competition ship. I was looking for something which combined sheeted foam wing techniques with an all wood fuselage. Glass composites, graphite, and carbon fiber are not my idea of "fun" materials to work with, so the Alcyone fuselage was patterned after the Chuperosa design. It utilizes light ply sides and bulkheads ahead of the wing trailing edge, and is Warren truss construction behind the wing T.E.

The wings of the original Alcyone attached to the fuselage in a manner similar to a Sagitta, in that they slipped onto a wing rod and butted up against the sides of the fuselage. The aileron linkage was very similar to that used in Terry Edmonds Callisto. This worked very well and was easy to hook up as the wing was put on the ship, but the router work required to the foam cores was quite complex and would not be easy to manufacture.

I wanted to design in a way to use the aileron hook-up used in the Chuperosa, which is a cable drive. In order for this to work, I had to reconsider how the wing was attached to the fuselage to make the cable hook-up easier. With the Chuperosa cable system, the cables make an "S" curve, with one end of the cable attached to the aileron horn, and the other exiting the wing leading edge and hooking up to an aileron servo sitting in the fuselage. This same servo drives the rudder for a mechanically coupled system. On the Chuperosa, the wing is simply placed on top of the fuselage and attached with a single nylon screw. The aileron cable hook-up is accomplished through BuBro nylon ball joints. This is all quite easy with a 59" span wing, but a one piece wing was out of the question for a standard or open class ship. What I needed was a slick was to join two wing panels together, and hold them on the top of a fuselage, while still leaving access to the leading edge for the cables to exit freely.

After considerable experimentation, I

came up with a unique system which did all of the things that I wanted to accomplish. It was also time to see how Alcyone behaved as an Unlimited class ship, so some serious re-design was started. In the meantime, I continued to fly the original prototype for sport, in fun-flys, and in an occasional competition. The original ship has won some contests by beating Windsongs, Thermal Kings, Sagittas, and what not. Everyone who flew her wanted one, but I wasn't ready to release her yet, because I knew she could be better.

There are a lot of good sailplanes on the market. There are also some "not so good" products out there. What I had in mind for Alcyone was that she be easy to build out of common materials. She must be able to fly on the type of radio system that most people already own. I didn't want to force the prospective buyer to go out and spend an additional $600 for a radio system. She must employ the most modern airfoil technology. She must be FUN to own and fly. She must be able to compete in local level contests on an occasional basis, and have a decent chance of winning in capable hands. She must be AFFORDABLE.

That's a pretty tall order isn't it? Well, after three years of effort, many changes, many crashes, and many sets of plans, she is almost ready. The new Alcyone is an open class ship with a span of 121". Her airfoil is a combination suggested by Sal DeFrancisco from NorthEast Sailplane Products (NSP). It is an SD7032 at the wing center line, which gently transitions to a SD7037 at the polyhedral break. "Polyhedral Break" you say!! Well, yes and no. Alcyone is an aileron ship, but uses a small poly section at the end of the wing to allow her to fly with a little less pilot input than is usually the case with aileron ships. This makes her much more friendly to the folks flying aileron for the first time. Her wing shape is a triple taper leading edge and a straight trailing edge. Her wing is two piece and yet attaches with only one 1/4" nylon bolt, with an additional #6-32 being utilized for positive alignment. The wing rod between the two halves is 5/16" music wire. She is designed to fly on simple, three channel radio systems, and has elevator, coupled rudder and aileron, and humongous flaps. The flap linkage is very simple to hook up and is sturdy. Alcyone's wing, including the flap and

aileron hook-ups, can be installed in about 45 seconds.

Alcyone was introduced to the public at the WRAMS show by the NSP guys in February of 1991. From all indications, the design is going to be a winner with the public. The newest prototype continues to amaze me in what it can do. It responds to lift very positively, and will turn VERY sharply without tip stalls. This makes it easy to work small diameter thermals. Speed increases very noticeably as the flaps are reflexed slightly. If you don't want to adjust your linkage for flap reflex, a touch of down trim works equally well in getting out of sink. Launches are as easy as pie. Alcyone flies up the line on the wing. Slingshot launches are not necessary, as she climbs very steeply and gets great launch height without high speeds.

The flaps are very effective, but down elevator is necessary to avoid ballooning. A flap/elevator mixer is really great here. This might just be the ideal airplane for you guys that are ready to try your first aileron ship. Alcyone is easy to fly, and does not require your constant input. She gives you a little breathing space.

For you "all out competition" folks out there, Alcyone can be fitted with the latest computer radio system very easily. The wing sections are thick enough for your wing mounted servos, and you can have flaps and crow and all of your other favorite mixtures. The spar in the Alcyone wing is very strong as it is, but the addition of carbon fiber tape would improve it even further. If you buy an Alcyone, I encourage you to experiment with her, as she seems to have great potential.

As this is being written (16 April 1991), Mel Culpepper is working very hard to get the first kits on the market by early May. Sal DeFrancisco is already taking orders at NorthEast Sailplane Products, and is really excited about her. (Sal is easily excited.)

Alcyone should be affordable for the majority of flyers at $149.95. If you should decide to try an Alcyone, and I hope you will, I encourage you to write to Mel Culpepper, or myself, and let us know what you think of her. Only with your input, can we provide the kind of products that YOU would like to have. ■

In addition to being the designer of the Alcyone, LeRoy Satterlee writes a column called "With Hawks and Eagles" for *R/C Report*. Ed. ■

Flying in Stormy Weather

...by Lee Murray
1300 Bay Ridge Road, Appleton,
Wisconsin 54915 U.S.A.

After reading the safety literature that my employer shared about the dangers of lightning, I just had to pass some of this very appropriate information along.

About 120 people a year are killed by lightning and many more are injured as a result of a lightning strike. Most people (2/3) struck by lightning eventually recover. Seventy percent of these accidents occur between June and August. Outdoor recreationists (like us) account for 23% of the deaths.

Because many of us fly on flat land without trees and buildings of any significance around, we are prime candidates to be hit by lightning when a thunder storms occur. I am tempted to stay out longer than I should since the soaring often gets fantastic before a storm. Others might be tempted to get that last flight in before having to pack up and go home.

Besides being aware of our danger, there are things that we can do to protect ourselves. Stay away from higher objects such as the buildings, sod farm tractors or other equipment, and trees that may exist at the edge of your field. Stay away from the sod farm sprinkler system or metal fences which can bring the effects of a lightning strike to you. It wouldn't be a great idea to stand there with your radio antenna extended into the air above your head. Staying in your metallic car will give you excellent protection. Corvettes, Transport/Lumina Vans and Saturn owners are not as well protected because of the plastic body panels. If you waited too long and are hopelessly isolated on the field when you feel your hair stand on end, drop to your knees and bend forward. (I'm tempted to embellish a little more here.) This will reduce your chances of being hit by lightning even more than laying down. If several of you are together, spread out in order to minimize the chances of everyone getting hurt at one time. If someone is hit, you can often restore breathing and heart beat by CPR. Those who already have a heart beat will probably recover by themselves, so deal with the apparently dead ones first. Anyone stunned by a lightning strike should get medical attention even though no injuries are apparent. ■

Schedule of Special Events

Date	Event	Location	Contact
July 5-6	F3B - 1st Annual SW Classic	McIntosh, NM (505) 848-0939 (wk)	Phil Renaud (505) 271-8720 (h)
July 6-7	Unlimited Thermal	Seattle, WA	W. Volhard (206) 774-8840
July 13	Slope Race	L.A. Area, CA	Rich Beardsley (805) 934-3191
July 13-21	AMA NATS	Vincennes, IN	Gil Gauger
July 14	Handlaunch	Dallas, TX	Gordon Jones (214) 840-8116
July 14	10 Minute Precision	Houston, TX	Julian Tamez (703) 540-3944
July 20	ARE Brown Memorial	San Antonio, TX	Tom Meeks (512) 590-3139
July 26-28	F3J First Thermal Soaring Convention	Czechoslovakia	(Details avail.)
July 27-28	Western MI Sailplane Championships	Nunica, MI	Cal Posthuma (616) 677-5718
July 28	Hand Launch Man-on-Man	Dayton, OH	Ken Allen (513) 236-6849
Aug. 3-4	Dual Soar-In	Grand Ledge, MI	Larry Storie (517) 626-2290
Aug. 3-4	13th Annual Garden State Soaring Classic	Allentown, NJ	Tony Matyl (609) 275-0549
Aug. 10	Thermal Festival	Maple City, MI	Jim Johnston
Aug. 10	Slope Race	Davenport, CA	Rich Beardsley (805) 934-3191
Aug. 10-11	Unlimited Thermal	Seattle, WA	S. Pugh (206) 874-2429
Aug. 10-11	2 Meter & Unlimited	Lakeland, FL	F. Strommer (813) 938-6520
Aug. 11	Multi-Task	Dallas, TX	Gordon Jones (214) 840-8116
Aug. 17	Canyon Lake Thermal	Austin, TX	Tom Meeks (512) 590-3139
Aug. 17-18	OHIO Cup Man-on-Man	Dayton, OH	K. Davidson (513) 864-1774
Aug. 17-18	F3J Second Thermal Soaring Convention	Belgium	(Details avail.)
(In 1995, it is hoped that the World Air Games to be held in Athens, Greece will include F3J.)			
Aug. 18	Canyon Lake Slope	Austin, TX	Tom Meeks (512) 590-3139
Aug. 18	Hand Launch	Dallas, TX	Gordon Jones (214) 840-8116
Aug. 24-9/2	F3B World Championships	Holland	Don Edberg

Aug. 24-25	2 Meter (Only) Champs - Man-On-Man	Nunica, MI	Cal Posthuma (616) 677-5718
Aug. 30-9/1	2 Meter & Unlimited	Ocala, FL	K. Goodwin (904) 528-3744
Aug. 31	Northern MI Sailplane Championships	Tustin, MI	Mike Stump (616) 775-7445
Aug. 31-9/1	Champs. 2M +	Farragut State Park, ID (Athol)	R. Kirkpatrick (509) 489-5841
Sept. 7-8	Open , Thermal/ Soaring Task T1	Gaithersburg, MD (National Geographic Society)	Bill Krajci (301) 884-5004
Sept. 14	Slope Race	L.A. Area, CA	Rich Beardsley (805) 934-3191
Sept. 14-15	TNT 2 Meter & Open	San Antonio, TX	A. Coher (512) 599-4031
Sept. 15	Distance	Houston, TX	Julian Tamez (703) 540-3944
Sept. 15	F3b Speed Trials	Denver, CO	John Wyss (303) 494-0363
Sept. 22	Hand Launch	Dallas, TX	Gordon Jones (214) 840-8116
Sept. 24	2 Meter & Unlimited		L. Montgomery (407) 793-8179
Sept. 28-29	ESL 2-Meter Contest	Pottstown, PA Bob McKeever (609) 538-8368	Joe Krajci (215) 632-4215
Sept. 29	Old Timers	Dallas, TX	Gordon Jones (214) 840-8116
Oct. 5-6	Visalia Fall Soaring Festival	Visalia, CA	Ed Hipp (209) 625-2352
Oct. 5-6	2 Meter & Unlimited	Lakeland, FL	Bob Wargo (813) 938-6582
Oct. 6	SMT Contest	Denver, CO	Lenny Keer (303) 737-2165
Oct. 12	Slope Race California State Champs	Santa Maria, CA	Rich Beardsley (805) 934-3191
Oct. 13	Dual Elimination	Dallas, TX	Gordon Jones (214) 840-8116
Oct. 19	Duration 2M & Open	San Antonio, TX	Tom Meeks (512) 590-3139
Oct. 20	Hand Launch	Dallas, TX	Gordon Jones (214) 840-8116
Nov. 9	Duration 2M & Open	San Antonio, TX	Tom Meeks (512) 590-3139
Nov. 10	3-6-9 2M & Open	Dallas, TX	Gordon Jones (214) 840-8116
Nov. 10	Dual Elimination	Houston, TX	Julian Tamez (703) 540-3944
Nov. 17	Hand Launch	Dallas, TX	Gordon Jones (214) 840-8116

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*.

Great Northern Skyhook

...from Great Northern Model Engineering Company

Great Northern Model Engineering Company is pleased to announce the Great Northern Skyhook. As discussed on these pages and elsewhere, the forward/aft position of a tow hook greatly affects the height attained during a hi-start or winch launch. If the hook is placed too far forward, the launch angle and resulting model attitude is too low to obtain optimum launch height. If the hook is placed too far aft, then a wing could stall resulting in a crash.

Our solution to this problem is to provide ample tow hook travel in the forward/aft direction so that the glider's tow hook position may be fine tuned for optimum launch height. The total forward/aft travel provided by the Great Northern Skyhook is a generous 1.5 inches which is more than enough to achieve optimum tow hook position.

The Skyhook is fastened to the glider's fuselage bottom using two #6-32 steel machine screws, as shown in our ad this issue. These screws are inserted into any two adjacent t-nuts in the row of five provided with the Skyhook system. The five t-nuts are located inside the glider fuselage on 1/2 inch centers, thereby providing 1.5 inches of infinitely variable adjustment. This adjustment scheme was designed by Frank Zaic.

As manufacturers of the Skyhook, we have stressed quality and reliability throughout each manufacturing step. For example, the steel tow hook is heat treated for maximum strength. In addition, the tow hook receives special surface preparation prior to plating. Plating consists of three steps to apply copper, nickel, and bright chrome. The result of these extra manufacturing steps is an outstanding finish on the Skyhook, which enhances the appearance of your glider.

In spite of its sturdy steel construction, the entire Skyhook system weighs less than 1/2 ounce. The Skyhook system may be installed in new or existing glider fuselages constructed of wood or fiberglass, and easily launches gliders up to four meters in wing span.

Gain that competitive edge with the new Skyhook system! The complete Skyhook system is modestly priced at $2.50 each or five for $10.00, plus $.65 PH&I either way in the lower 48 states. Elsewhere, please add appropriate postage.

For more information, see our ad in this issue, or contact Great Northern Model Engineering Company at P.O. Box 9145, North St. Paul, MN 55109-9145.

RC Magazine Indexes

...from MODEL MANIACS

Finally, there's an index that will save you hours of thumbing through your RC magazines looking for that great article you read several months ago. MODEL MANIACS has combed the magazines for you, and put together a set of indexes that will lead you right to the article you're looking for. Each topic discussed in each article and column is listed by category and sub-category. Columns and articles that discuss several topics are represented by several listings, one per topic. Want to know how to stop that engine leak? Look under ENGINES - LEAKS for a list of all discussions of engine leaks. Each index covers a year of your favorite RC magazine, and contains over 500 individual entries. Currently available are 1990 indexes for MAN, RCM, and MA. Indexes for 1991 will be available in December, and earlier indexes (1989 and before) will be assembled if there is sufficient interest. Price is a very reasonable $8.00 each (includes P&H). Contact: Model Maniacs, 5663 Balboa Ave, Ste. 242, San Diego, CA 92111.

R/C Soaring Resources

Do you hold seminars and workshops? Would you like to be included as a contact to answer questions on soaring sites or contests in your area? If so, please contact *RCSD*. Our address and telephone numbers are on page 1.

Seminars & Workshops

Free instruction for beginners on construction and flight techniques. Friday & week-ends (Excluding contest days) Bob Pairman, 3274 Kathleen St., San Jose, California, 95124; (408) 377-2115

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. Third class postage included. For 1st class include additional $1.50 per issue. (U.S. funds) Walt Seaborg, 1517 Forest Glen Road, Oregon, WI. 53575

BBS

BBS: Slope SOAR, Southern California; (213) 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, Rich Beardsley (Director), 2401 Country Lane, Santa Maria, California 93455 U.S.A., (805) 934-3191

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

Eastern U.S.A. - Eastern Soaring League (Covers North Eastern U.S.A.), Frank Weston (Editor), 944 Placid Court, Arnold, Maryland 21012 U.S.A., (301) 757-5199

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

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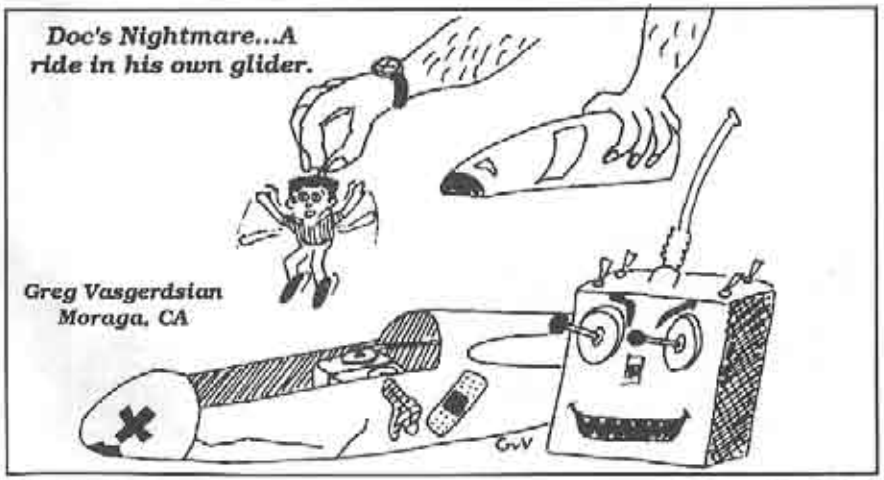

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Advertising Policy

Classified ads are free of charge to subscribers provided the ad is personal in nature and does not refer to a business enterprise. Classified ads that refer to a business enterprise are charged $5.00 per month and are limited to a maximum of 40 words. The deadline for receiving advertising material is the 5th day of the month. (Example: If you wish to place an ad in the March issue, it must be received by February 5th.) *RCSD* has neither the facilities or the staff to investigate advertising claims. However, please notify *RCSD* if any misrepresentation occurs.

For Sale

KITS - all new in box - Prices incl. U.P.S. JMG PENETRATOR Deluxe...$50.00; Wanitschek ORLICE 3.4M...$175.00; Vernon COBRA 17 3.1M... $150.00; Ace Thermal Sniffler - new...$110.00; Edmonds ALGEBRA 2.5M Racer w/RG-14 airfoil & 3.0M S-3021 wing set...$200.00. Call Ron Carter wk. (801) 298-0406 or hm. (801) 298-2139.

Wanted

Canyon Models styrofoam 126. Popular in late 60's. Call Mike Bamberg wk. (800) 388-2022 or hm. (503) 640-5926.