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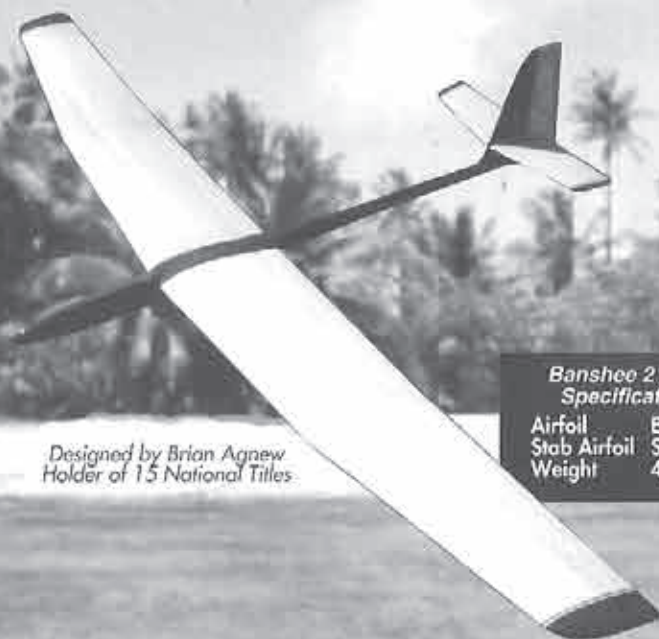
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R/C SOARING DIGEST

A Publication for the
R/C Sailplane Enthusiast!



R/C Soaring Digest (R/CSD) 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 contributed must be exclusive and original and not infringe upon the copyrights of others. It is the policy of R/CSD 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 R/CSD. We encourage anyone who wishes to obtain additional information to contact the author. R/CSD was founded by Jim Gray, lecturer and technical consultant. He can be reached at: 210 East Cluteau Circle, Payson, AZ, 85541; (602) 474-5015.

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R/CSD Staff

Jerry Slates - Editor/Technical Editor
Judy Slates - Desktop Publisher, General
Managing Editor, Subscriptions
Lee Murray - R/CSD Index/Database
[Material may be submitted via 3.5" Disk or
e-mail, and is most appreciated!]

Please address correspondence to:

Jerry & Judy Slates
R/C Soaring Digest
P.O. Box 2108
Wylie, TX 75098-2108 U.S.A.
(972) 442-3910, FAX (972) 442-5258
e-mail: rcsdgest@aol.com

Feature Columnists

Bill & Bunny Kuhlman (B²),
Robin Lehman, Fred Mallett,
Mark Nankivil, Dave Sanders,
Steve Savoie, Jerry Slates.

Artwork

Gene Zika is the graphic artist
who designs the unique ZIKA clip art.
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SPIRALING UPWARDS...

With Peter Canning, Fort Worth, Texas, and his Gentle Lady. On very calm days, she "gets the job done". Peter, who has logged in a 53 minute flight where he flies at Alta Vista, says, "I'm fanatically devoted to R/C soaring!"



Photo courtesy Peter Canning.

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The Soaring Site

Utah Contact

Bob Harman, sailplane enthusiast, friend, and volunteer sailplane contact for the Utah area, recently had a stroke. Tom Hoopes called to ask that we let you know, as there may be something each of you can do to help.

The family is receiving many calls regarding flying in Utah and, of course, in regards to Bob's business: Basic Aircraft Technology (B.A.T.). Tom Hoopes has volunteered to help the family by relieving them of as many calls as possible. So, please call Tom if you have any questions or need any help: (801) 571-4209 days, (801) 571-3702 eve.

"Get well soon, Bob!"

Positive Feedback

The cover of the April issue caught the imagination of David Steere who said, "Just a single, slender winged, beautiful white sailplane - in a clear sky, with me at the controls. Oh, dream on..."

Yes, we received other compliments on the cover, as well, which we quickly forwarded to David Garwood, photographer extraordinaire, along with a note asking if he had any more of those! We appreciate the feedback!

Notes 'N Things

E-mail has made our life easier in many ways. And, it also brings us many notes, jokes, and things that we probably would not otherwise have seen. Well, we don't answer every e-mail message, unless a question has been raised that requires a response, but some of those messages really make our day! Thanks!

MSSC Program

By the time you read this, the Program for the Mid-South Soaring Championships will be available. If you plan to attend the event in Huntsville, Alabama this year, or would like more information about the event, please contact Ron Swinehart at (205) 722-4311 (days), (205) 883-7831 (eve), or Jon Stone at (205) 772-2072. Spectators are

welcome to join in the "Fun and Competition, Southern Style"!

This year, the Memphis Area Soaring Society and the North Alabama Silent Flyers extend a warm welcome to the members of the Louisville Area Soaring Society. In 1998, the MSSC will held in Louisville, Kentucky, and back to Memphis the following year.

Happy Flying! Judy & Jerry Slates

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For additional information contact:

Gerry Knight, (905) 934-7451
Don Smith, (905) 934-3815
E-mail: Mistral@niagara.com



The Vintage Sailplane Association

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

Vintage Sailplane Association
Route 1, Box 239
Lovettsville, VA 22080
<http://www.iac.net/~feguy/VSA>

Improved Tape Hinges

...by Joe Enhuel
Laurenceville, New Jersey

Joe sent in the diagram along with the following note.

"I have read Martin Simons' article (December RCSD), about tape hinging long aileron/flap. I found that if pivot hinge is combined with tape hinge, that this is another alternative to effectively keep long aileron/flap from warping."



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1997 SSA National Convention

On January 28 - February 1, the Soaring Society of America (SSA) held its 25th Annual Convention, in Arlington, Texas. The Convention included discussions of flying techniques, sailplane design developments, and highlighted the "SSA Annual Awards Banquet". The members of The Texas Soaring Association, Dallas Gliding Association, Inc. and North Texas Soaring assembled more than 8500 square feet of meeting rooms, and over 48,600 square feet of exhibit hall space for exhibits, sailplanes, and trailers. Expert speakers from not only the U.S.A., but from 14 foreign nations were scheduled to speak! There was even a Youth Day, which included educational activities scheduled to help introduce area young people to soaring.

How did I find out about it? Well, I am a member of the Soaring League of North Texas, and the club was invited to take part in the convention activities by setting up a booth to display radio controlled models. I found myself in Arlington on Thursday. Since the traffic was light, I found time to wander around the auditorium, and take in the sights. It was delightful to touch and smell some of the most beautiful full size flying machines in the world! Upon entering the great hall, the first plane on display was an LS-8. My personal favorite, a DG-800 motor glider was sitting next to an ASW-27. Two that I couldn't resist walking around several times were quite exotic: Genesis and Windex. In all, there were 20 soaring machines on display which included L-23, L-33, I-26, SZD-50, SZD-51, SZD-59, and a Duo Discus. There were also two World Class sailplanes: Russia and PW-5. As you can see in one of the photographs, the Head Elf wasn't missing out on any of the excitement, either!



Bill Mumroe at the Soaring League of North Texas booth. Dale King photo.



It's a the wild paint job, with matching balloons, on the PW-5: red, white, and blue!



DG-800 motor glider



Genesis

If any of you are planning on building a scale R/C sailplane, and want to see the full-size beauties first hand, the 1998 SSA Convention is scheduled to take place in Portland, Oregon. And don't forget your checkbook. No, not to buy a full-size model, unless you really want one; they sell neat T-shirts, too!

"Guide to Computer Radio Control Systems"

Written by Don Edberg, Dynamic Modelling, I found this "Guide" to be an excellent reference book for



Russia, 12.6 meter World Class sailplane, with the Head Elf, Dale King, hoping for a ride. Photos courtesy of Dale King.



Windex motor glider



ASW-27

beginners and experts, alike. It covers all aspects of all brands of programmable, computer radio control systems. The "Guide's" 180 plus, comprehensive pages contain helpful illustrations, tables, and examples with valuable step-by-step procedures; it even includes a troubleshooting section.

If any of you have questions about computer programming, are not sure if the new technology is for you, have had difficulty understanding how computer radios work, or are thinking about upgrading your current radio system, then Don's "Guide" may provide the perfect answer(s) to all your radio questions. The cost is \$17.95 postpaid for US orders, plus \$1.20 tax in California.

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Review of the "Geek"



...by Ivan Via
Arlington, Texas



Jarrett Dorough and Geek.
Ivan Via photos.

chatting, dreaming of those 1000' slopes we hear about on the west coast. Several days later, I was talking to Judy, who asked if I would mind doing a review article... On a slope plane... (In Texas?) Hmmmm...

Let me see; I've been flying sailplanes since I was 12, and have read countless review articles. How hard could it possibly be? So, I said, "OK."

Arrival

Only four days later, I came home from work to find a first-class package from Oregon on my doorstep. I would have never believed that an airplane was in such a small box. But, it was all there, and I instantly started bench flying. I read over the instructions (a first), and made sure I had all the proper supplies on hand.

Construction

There are several pages of instructions and diagrams included with the kit; they are pretty straight forward and easy to understand. The kit consists of a hardware package, which includes control horns, spar joining tube and other parts, carbon spars, fiberglass tail-boom and, of course, foam fuse, wings and rudder.

The plane was built as per the instructions, with fixed rudder (full-flying is optional) and a JR 783 radio. A duck mixer is available from The Birdworks and was offered by Steve; however, he stated that it would reduce some of the available throw on the control surfaces. One point of confusion was the use of "cloth tape" on the wingtips and leading edges. After a trip to the hardware store, and some discussion, it was interpreted that cloth-tape is really duct tape that comes in widths from one to three inches and is available in various colors. In hindsight, we wondered if athletic tape would have been adequate, because it is just as strong and a bit lighter.

Assembling the Geek was quite unfamiliar to me, as this was the first plane I ever put together with contact cement. The wings were joined together with cement; the wing rod was epoxied into place inside the wing. In order to apply the tape to the wings and tail surfaces, you must prime the areas with contact cement. This simple task consists of spreading the contact cement on the places that you will apply the tape. This is mandatory! The tape will not stick to the foam unless this is done. The finished wing was cemented onto the fuselage, and the fiberglass tailboom was inserted into the fuse. All that was left was to install the radio and fly. Installing the radio was just a matter of pressing the gear into the pre-cut cavities, and adjusting the control linkages to the full span elevons. Instructions are provided for the construction of a mylar nose cone that can be slipped on. Although one was built, it was not used much, due to trim adjustments during the first flights. I do recommend, after trim has been established, that it be used to protect your radio equipment from dew, moisture and dust.

Flight

I find it to be quite surprising, given the durable nature of this plane's construction, that I was unable to just blindly throw it off a slope. The first test flights were actually hand-launch affairs, consisting of a brute launch to 30 or 40 feet, followed by a controlled fall back to earth. (I am a thermal pilot by nature.) Satisfied that I could fly

this plane, I called Jarrett and we headed for the slope with Geek and camera in hand. The slopes that we fly from are not slopes in the west coast sense, but lake dams, old garbage hills, and the occasional rock quarry. The slope we chose on this particular day was one of the junk mountain variety, that had been shoved off into a field after the construction of a nearby shopping mall. After several tosses, each followed by a hike to the bottom, the Geek was under control. We soon discovered that our CG was too far forward; upon correction, up-elevator was much more effective. As our flights grew longer and longer, we began to enjoy this plane and its ability to dive, climb and turn, all in the course of a few seconds, without much speed loss. I was not nearly as capable at the controls as my friend Jarrett, and I attribute this to the fact that his style of flying is the type of yank and bank that the Geek is readily capable of and, above all, is built for.

Overall Impressions

Although I have always flown conventional sailplanes, I found the Geek to be a blast to throw around the sky. It is a quick, responsive little airplane, that is almost impossible to break (almost like "flubber"). The only drawback I encountered was the lack of lift on the slopes in this area. The Geek needs wind and lift to be enjoyable, and even though wind was in abundance, our slopes aren't quite tall enough for this plane, on all but the most windy of days. Perhaps a new slope we have located will provide better flights. I understand that on the west coast, they play a type of slope plane bowling with two-liter bottles. However, intentionally diving my airplane into a standing object, seems to go against my upbringing. I am also aware that The Birdworks produces a very similar plane to Geek, called the Zipper. It has a fiberglass fuse and is available with a 60" wing that should do well on the light slopes I have around this area.

The Birdworks
P.O. Box 1302
Port Orford, OR 97465
(541) 332-0194

FIGHTING FOAM & HEAVY IRON

VOLUME 1, NUMBER 6

By David M. Sanders
34455 Camino El Molino
Capistrano Beach, CA 92624
(714) 248-2773

e-mail: 104271.3352@compuserve.com

COMING TO TERMS WITH FOAMIE CONSTRUCTION

No matter what may be said, foamie airframes are becoming a part of the flying environment almost everywhere in some way, shape or form and are probably here to stay. I remember when the now conventional wood-skinned, foam-core wings first made the scene in the 70's and the scuttlebutt that ensued. Can you imagine the present-day world without foam-core wings? I think that says it all.

So, the time has come to learn yet another method of making flying machines. As with wood, composite or molded structures, foamies have their own specific construction conventions and methodologies to be lived and learned. Also, most fliers go through a process of 'tweaking' or geometrically adjusting their airplanes to get the peak performance to suit their particular style of flying or site conditions, so this month I thought I would touch on some of those techniques, too.

RADIO INSTALLATIONS

When installing the radio gear in your airplanes, you want to be sure that all the components fit snugly in their holes. This may sound obvious, but myself and other manufacturers have frequently seen poorly fitted gear.

Why is this such a big deal? Well, the first and most direct consequence of poor fitting equipment, especially servos, is that they can move around and cause slop in the control surfaces. The second, and maybe even more important factor, is that a sloppy fitting component leaves a 'hole' in your airplane, which in turn leads to a stress riser. Keep in mind that the radio equipment in a foamie becomes a structural element in the airframe.



The battery compartment in one of my foamies. Notice that I've cut the cavity so the battery fits well below the surface of the fuselage. A foam plug will fill the hole and be cut away as required to install a switch and to access the charging jack.

One useful method of achieving the best fit is to use foam shims. If you've over-cut your openings, don't hesitate to use scrap foam of any variety to get the holes nice and snug, although not so tight as to cause distortion of the airframe's shape. My standard test to determine if my gear is properly fit is to squeeze the structure to feel for voids. Airspaces and voids will feel extra squishy, and are usually the places where a stress riser will allow the part to break. When I'm finished installing the gear in a plane, there's only enough airspace around the parts to achieve final hook-up of the control linkages; no more!

TAPING

By now, every foamie builder has figured out the part of construction they dislike the most... taping! I don't like to do it either, and my own kits show this in the conspicuous use of as little tape as possible. Here, I'll give you some tips to help ease your pain a little.

After spraying the parts with contact cement, let them sit for a minute or two. This will reduce the cement's initial, aggressive tackiness a great deal, making it much easier to handle the part as you go through the taping process. It's also a good idea to have a little paint thinner on a rag available to clean up your hands as you work.



Servo installation. Notice the tight fit of the servos in the foam. Also, the pushrod grooves have been cut with 80 grit sandpaper wrapped around the edge of a piece of thin plywood. The hole in the bottom of the fuselage is for the receiver, and will be capped similar to the battery cavity.

Don't struggle with a piece of tape that's obviously giving you a problem. If you start getting crooked, or the tape folds over on itself or wrinkles or something, pull it off and throw it away! Start fresh with another piece.

When doing long strips, like spar caps on a two-meter sized plane, cut a length of tape oversized, then hold it by its ends so it's in a gentle arc. Now, let the center of the arc touch the panel at the middle, and slowly let the tape lay down onto it as you move your hands downward. You'll be able to achieve good control of the tape this way and will avoid tensioning it. After the tape is laying in the proper position, gently smooth it down completely.

Don't use your finger directly over the tape to smooth it down onto the part! Your skin has a lot of friction against the tape's mylar matrix and you can easily stretch or wrinkle the tape, as well as potentially distorting the component due to the stretching of the tape. Instead, wrap a rag (cotton is best) around your hand to smooth the tape down. The cotton cloth will slide easily over the tape's surface without pulling it.

For areas where compound curves are tight and numerous, such as on fuselages, I like to split the tape into thinner width strips. You can easily take a six inch length of tape, stick one end to the bench, then start a tear between two of the filaments with your knife. Just tear off the resulting narrow strips to go around the nose of the plane or other tightly curved areas.

One last thing about tape. I like the kind with the thick, ropey filaments. At local home improvement stores, they carry a brand called 'Tesa Strap' which is my hands-down favorite. Some other folks also like the 3M 'Super Strength'. Both these brands work well. The main thing to keep in mind is that you do not want puny filaments, but rather the thick, twisted twine-like ones. If you find that type, no matter what brand, just buy a roll and take it back to the shop and investigate its properties.

COVERING AND TUNING

Almost every foamie flier is now using film to cover their planes. It looks nice, works well and is easy to fix. It also makes the airframe tunable, which to me is its biggest benefit. But first, how do you get it on there?

Here again, contact cement, like 3M 'Super 77' is your ally. I've also heard that the Europeans are using their own brands of photo-fixing cements with success. Your next best friend is heat. I'll tell ya'... I wish I had a nickel for every guy that asked me, "Won't the heat hurt the foam?" No, it won't; to a point. I run my Top Flite iron at the same setting (about 2.75) as I do for covering wood airplanes. The trick is to not let the iron stay stationary in one place for too long, and let the part cool for a moment if you feel it really getting hot.

To eliminate wrinkles, don't shrink the film until the entire component is surrounded by the covering. Since the substrate (foam) is flexible at all edges of the film, you'll never get it shrunk tight on its own. So, visualize the covering not as separate panels but as a heat-shrinkable 'bag' around the foam parts. For instance, I'll cover a wing top and bottom, left and right sides, before I ever completely shrink down any of the four individual panels. After everything's covered, then I lay in the heat and eliminate the wrinkles. Fuselages are done in a similar manner. This is also where I begin the process of tuning...

The 'Razor' all EPP flying wings are tuned in their beds, per Jerry's instructions. One key thing to remember is to let the part cool in the beds after shrinking the film. This insures a correct setting which is critical to good perfor-

mance on a tailless model.

For conventional planes, where the wing is most often permanently affixed to the fuselage, tuning is a more free-style process. On my own planes, the first thing I check is the ailerons' neutral trim. I check that the ailerons are not raised or drooped relative to the wing panel near the root to insure that I'm not distorting the airfoil contour. After that, I sight down the panel from tip to root and check for twist. I usually tune for a little bit of washout, and at least be sure that both tips are angled the same amount. For adjustments, I just weight the plane on the bench, or hold it between my knees, while twisting the panel the desired direction and heating with the iron on the top and bottom. I remove most of the wrinkles induced by the twist. After heating, I hold that twist until the panel has cooled - usually about one minute. After that, you should see it hold its setting pretty well, and after the first couple of settings it'll start to 'relax' in the proper adjustment and becomes nearly maintenance-free from that point on.

Another common thing is bent fuselages. If you detect any bend, you can easily fix it even when the airplane is completely finished. Simply tweak the fuse back straight while applying a short strip of tape on the compression side of the bend and that will straighten it. Cover the tape with a patch of covering film and you've got it. This technique is also useful for adjusting decalage angles.

Hopefully, these little tips will help you to get your foamy planes flying at their best. As with any new technology, our collective experiences will help us zero in on the best methods.

FOAM TRIMMER

Chuck Howerton of Longmont, Colorado does not like carving EPP foam and has made his feelings clear to me on several occasions! Not to be deterred, he invented a miniature hot wire cutter from readily available materials to do the bulk shaping of EPP airframe components. The 'Foam Trimmer' can also be used on conventional foams and can significantly speed the time required to shape scale fuselages, in particular.



Here, I'm laying a long strip of tape on the top surface of a wing. By holding the ends and letting the middle drop down onto the panel in a gentle arc, it's easy to maintain control of the tape while laying it on smoothly.



The Foam Trimmer. If you really have an aversion to sanding EPP, this little gadget is pure salvation. See text for details.

Based on a rechargeable battery and ordinary cutting wire, it basically provides you with hand held, depth of cut controlled, mini hot-wire cutter. This tool can be VERY handy, especially if you build foamies frequently.

Chuck, who is a college professor, generously volunteers his time and expertise to the Civil Air Patrol, an official Auxiliary of the United States Air Force. One of the three primary missions of the CAP is to support aviation related activities in youth aged 12-20. This involves getting the kids into model and full-scale flying. He found that the kids were not getting to do enough flight oriented activities, so he designed a national-level achievement-oriented program to teach them how to fly R/C gliders. As you might imagine, he took to EPP airframes like a wolf takes to raw meat. The upshot is that the Cadets decided they would start making plans and complete kits for the Foam Trimmer available to raise money for buying new airplanes and equipment. So to get them, write to: Vane Brand Cadet Squadron, Civil Air Patrol, P.O. Box 2476, Longmont, CO 80502.

Plans for the Foam Trimmer are \$5.00 and a complete kit (minus battery) is \$10.00. This a bargain for such a handy tool and it goes toward helping a fresh new batch of R/C'ers earn their wings! Good job, Chuck!

Chuck sent me a copy of the plans to build one for myself; they are very well done; included is a complete bill of materials and detailed instructions on how to use the tool. It's worth the small price to have one!

ANOTHER HANDY TOOL

My friend, customer and flying buddy Wayne Aquino also has a favorite tool for cutting cavities in the foam for radio gear installation: an old hacksaw blade! Just snap the blade at an angle to form a point; then use it to cut the cavities perfect every time. It's neater and a lot less smelly than a soldering iron.

NO READER'S RIDE?

Nope, not this month. Too much stuff to cover. BUT... Next time, we'll have one in the mix.

Until next time, I'll see ya' in the battle zone. ■

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THE NEW JRXP8103 COMPUTER RADIO

PART II



...by Sherman L. Knight
Bellevue, Washington

Flaps and Landing Mode.

Now that the basic control surfaces of the aircraft have been completed, the remainder of this section will focus on various flight modes, which involve the use of flaps. These will include landing, launch presets, trailing edge reflex, and full span and camber charging.

Push the UP or DN button until [Sub Trim] appears in the upper left hand portion of the screen (page 114). Press the CH button until the cursor stops before **FLAP**. Touch the (+) or (-) button and adjust the servo arm in the direction that raises the flaps. You will need to disconnect the flap servo arms from the servo, as they will obviously have to be readjusted. A suggested value for the flap setting is UP-100. When complete, touch the CH button, and perform the same function for **AUX2**. **Failure to perform this function will reduce flap movement in landing mode to less than 45°.** Re-install the servo arm as shown on page 134 of the manual. Adjust the control linkage to the flaps so that the flap is in neutral on normal flight position.

Touch the UP or DN buttons until [Butterfly] appears in the upper left hand portion of the screen (page 121). Touch the CH button until the cursor stops before **SPOI OFFSET**. Push the throttle stick all the way to the top, and press the Clear button. A value should appear to the left of **SPOI OFFSET** between 160 and 180.

The switch on the upper left front corner of the radio is for switching between flight mode and landing

mode, or between various types of landing set ups. The manual refers to this switch as the butterfly switch (page 121). Again, I like to set up my radio so that all the switches, during normal flight mode, are either in the forward or down position. To set up the flaps for landing, and before performing the next step, push this switch towards the back of the radio. The switch must be in this position for the landing flaps to work.

Touch the CH button again until the cursor stops before **SPOI → FLAP**. Pull the flap stick (formerly the throttle stick) all the way to the bottom. Press the (+) or (-) button until the flaps move in the proper direction and in the desired amount. You should be able to obtain 90° flaps quite easily.

Touch the CH button again until the cursor stops before **SPOI → AILE**. If you want to add a little crow to your landing routine, again, pull the flap stick all the way to the bottom, and touch the (+) or (-) buttons until both ailerons move in the appropriate direction and the desired amount.

Finally, touch the CH button one more time before the cursor stops before **SPOI → ELEV**. Again, with the flap stick all the way at the bottom, touch the (+) or (-) buttons until the elevator provides the appropriate amount of down elevator to compensate for the pitch up moment created when the flaps are lowered. Every airplane is different, and the amount that you ultimately use will depend on your aircraft and your flying style. A recommended starting point is approximately 35%. Remember, the proper compensation is down elevator with full flaps. You must fly and experiment with the mix percentage, as 35% is only a possible starting point.

The XP8103 also provides for a specialized mix function which will completely eliminate that annoying bump that the airplane makes when you first pull the flaps down. That specialized mixing function is discussed later under specialized mixes.

Launch Flap Preset.

Launch flap preset is available on a long, three position switch, immediately above the flap stick. Move that

switch to the low position. Undoubtedly, you will have more launch flap than you desire. Touch the UP or DN buttons until [TRVL ADJ.] appears in the upper left hand portion of the screen (page 115). Touch the Select button to move to the second of the two screens that contain both **FLAP** and **AUX2**. Touch the CH button until the cursor moves before **Flap**. Move the launch switch to the low position, and the cursor should automatically appear beside the letter D. Touch the (+) or (-) button until the flaps move to the desired location for launch. Flipping the launch switch back to the center position should instantly return the flap to the neutral position.

Trailing Edge Reflex.

First, turn the receiver off. The factory default setting for reflex will push the flaps up to approximately a 40° angle. You probably don't have that much throw available, and you may wind up breaking a servo free or tearing up some gears.

Move the three position flap switch to the high position. The cursor should move from beside the letter D to the letter U on the screen. Touch the (-) button and reduce the setting to approximately 5%. Now go ahead and turn the receiver back on. Your flaps should immediately jump upward, but a very small amount. Adjust the setting to the desired amount of reflex.

Reflex doesn't work very well unless your ailerons match your flaps. But that is easy to accomplish. Touch the UP or DN button until [FLAP → AILE MIX] appears in the upper left hand portion of the screen (page 121). With the reflex switch in the high position, touch the (+) or (-) buttons until the ailerons match the flaps. At first, nothing will appear to happen. The percentage mix will probably exceed 100%.

Touch the CH button until the cursor moves to **SW**. Touch the (+) or (-) buttons until the display reads **F-U&D**. This turns the flap to aileron mix on whenever this switch is in the up or down position. You will now find that by flipping the switch to the low position, the ailerons also droop with launch flaps. You may want to

readjust your launch flaps accordingly.

Full Span Camber Adjustment.

The purpose of this function is to allow you to vary the camber or position of the trailing edge on your wings' airfoil while flying. This is one of those settings that you must experiment with over time to determine whether or not you wish to add it to your bag of tricks.

First, make sure the butterfly switch on the front upper left hand corner is in the forward position (normal flight mode, page 121). Touch the UP or DN buttons until [Butterfly] appears in the upper left hand portion of the screen. Touch the CH button until the cursor appears before **SPOI → FLAP**. Now pull the flap stick all the way to the bottom. Nothing should happen. Now press the (+) or (-) buttons until the flap droops the amount indicated in your model's instructions. (Recommended camber adjustments may vary from 1/16th to 3/8th of an inch.)

Touch the CH button again, until the cursor appears before **SPOI → AILE**. Again, pull the flap stick all the way to the bottom and touch the (+) or (-) buttons until the ailerons match the droop of the flaps.

The butterfly switch allows you to switch back and forth from normal flight mode (camber adjustment with switch in the forward position) to landing mode (90° flaps with the switch in the back position).

Multi-Point Programmable Mixing.

(Or, how to get rid of that annoying bump as you begin to pull the flaps down.)

Traditionally, mixing functions in computer radios only allow a linear mix between the master and the slave



The XP8103 as it arrives in the box.

channels. As an example, when the aileron to rudder mix is activated, and you push the aileron stick all the way to the stop, it mixes in a pre-programmed amount of rudder deflection. With multi-point programmable mixing, the XP8103 radio allows you to insert up to five different mix points anywhere on the curve. In other words, as you slowly push the aileron stick all the way to the stop, you could literally make the rudder waggle back and forth.

In the case of model sailplanes, this allows you to mix a larger percentage of elevator compensation during the initial part of flap movement and less elevator compensation as flaps approach 90°. This completely eliminates that bump your airplane takes on approach as you pull the flap stick down.

The XP8103 radio provides six extra programming functions that allow you to assign any slave to any master channel. The first two of these additional mix functions allow the multi-point programmable mixing. The remaining four provide the ability to do things like add additional rudder mix during launch, and automatically eliminate the rudder in reflex mode.

To eliminate that annoying bump on approach when you pull down the flap stick, there is a very deliberate sequence of steps that you should follow. First, program the radio as indicated above for flap and elevator compensation on approach. Launch the airplane and adjust the elevator compensation until you achieve the proper glide path at full flap. Ignore the bump for now. Some individuals want the airplane, at full flap, to continue on the same flight path before the flaps were lowered. Other individuals like the airplane to take a decidedly strong downward pitch when the flaps are lowered. This insures that you don't lose flying speed and stall your airplane. However, there is **no situation** where, after pulling the flaps all the way down, the plane should pitch upward. This situation is unacceptable and should be avoided.

Before you begin the multi-point programmable mixing, make sure that the amount of elevator compensation is



The dual rate and exponential rate screen on the XP8103. As the exponential rate is changed, the graph on the screen goes from a curved line to a straight line.

satisfactory at full flap.

It is important to now measure the amount of elevator compensation, at the elevator, with full flap. Make sure to write it down, or mark it on the fin.

Touch the UP or DN button until **[Butterfly]** appears in the upper left hand corner of the screen (page 121).

Touch the Select button again until the cursor appears next to **SW:**. Touch the (+) or (-) button until **BTY1** appears on the screen. This means that when the butterfly switch is in position one, this mix is active. Position one is towards the rear of the radio (landing mode).

Touch the CH button until the cursor appears before **SPOI → ELEV**. Make sure that the butterfly/crow switch (front upper left hand corner) is in the rear position. (This should be your landing mode.) Turning the switch back and forth moves the cursor from position 0 to position 1. With the butterfly/crow switch in the landing mode position, touch the (+) or (-) buttons until the percentage of mix is 0%. You just eliminated the linear elevator compensation, but you performed the important step of determining the proper amount of compensation at full flap.

To program compensation back in, but in a non linear fashion, touch the UP or DN button again, until **[PROG. Mix2]** appears in the upper left hand portion of the screen (page 125). Touch the Select button and notice how the cursor moves between the three selected portions on the screen. Stop the cursor when it is in the top position. Now touch the CH button and notice how an underline switches back and forth



This screen identifies with the black dot on the bar, the current location of the servo travel. By moving the control sticks, the black dot moves back and forth across the bar. You can determine instantly whether or not a lack of movement is because of a servo that's reached the end of its travel, or you have a mechanical linkage problem.

between the master and the slave channel. With the underline under the master channel (the one on the left), touch the (+) or (-) button until **SPOI** appears. Touch the CH button until the underline moves to the slave channel. Touch the (+) or (-) button until **ELEV** appears. You have now told the radio, that when the flap stick is pulled down, it should make adjustments to the elevator.

Touch the Select button until the cursor moves to the middle area. Touch the CH button until the display at the cursor reads **POINT-H**. Touch the (+) or (-) buttons until the value below the H becomes 0.

Touch the CH button again until the display next to the cursor reads **POINT-L**. Pull the flap stick all the way to the bottom. Touch the (+) or (-) buttons until the elevator moves in the appropriate direction. Using a ruler, or the mark on the fin, continue to touch the (+) or (-) buttons until you have achieved the same amount of down elevator compensation that you achieved earlier using butterfly mixing.

Again, touch the CH button until **POINT-1** appears next to the cursor. Touch the Clear button. This should inhibit programmable point-1 and the letters **INH** should appear.

Touch the CH button again until **POINT-2** appears beside the cursor. Set this adjustment to exactly half way between the points you have previously adjusted for **L** and **H**.

Touch the CH button again until **POINT-3** appears beside the cursor. Touch Clear to inhibit.

After all of that work, you have now accomplished exactly what the elevator compensation section in the butterfly mixing was able to perform with a single button. Now, let the magic begin.

Launch your aircraft and verify, at least three or four mistakes high, that the elevator compensation is correct at full flap. If it is not, land and adjust **POINT-1**, until you have achieved the proper amount of elevator compensation with full flaps.

Once adjusted, touch the UP or DN button until **[PROG. Mix2]** appears in the upper left hand portion of the screen. Touch the Select button until cursor appears in the middle of the three programmable functions. Touch the CH button until **POINT-3** appears on the screen. Touch the (+) or (-) buttons until a slight bump appears in the graphic display. As an example, if Point-3 was a +12, try increasing it to +16. Touch the CH button again until the display reads **POINT-2**. Add additional mix at this point until a straight line appears between **POINT-L** and **POINT-3**.

Launch the aircraft again. Three or four mistakes high, pull the flap sticks down to determine whether or not the bump has disappeared. It takes a while to get this right. You are not going to get it on your first try. You may have to increase or decrease the mixing at **POINT-3** until it is perfect. You may also need to adjust **POINT-2**. Variations in the size of flaps and effectiveness of different elevators will require experimentation. Two meter aircraft respond well to a single but strong bump on the curve at **POINT-3**. Unlimited aircraft respond to a more gentle curve by adding additional compensation at **POINT-2**. When it's perfect, it's sweet. It is worth the price of admission.

Increasing aileron to rudder mix during launch.

I trim my models to fly with very little aileron/rudder mixing. However, this means at launch that I have little if any rudder to recover from a bad throw.

It's easy to increase the rudder mix during launch by turning additional aileron to rudder mix with the launch flap switch.

Touch the UP or DN button until you see **[PROG. Mix4]** in the upper left hand portion of the screen. Touch the Select button until the cursor moves to the upper of the three lines. Touch the CH button until the underline appears under the master channel. Touch the (+) or (-) buttons until **AILE** appears. Touch the CH button to move the underline to the slave channel. Touch the (+) or (-) buttons until **RUDD** appears.

Touch the Select button twice until the cursor is before **SW:**. Touch the (+) or (-) buttons until **FLP-D** appears.

Touch the Select button again, until the cursor appears next to **RATE:**. Pull the launch switch to the low position (the three position switch just above the throttle stick). An arrow will appear before the two values. If you move the aileron stick left and right, the arrow will move from one value to the next. Move the aileron stick to the left and hold it there. If your aileron to rudder mix is turned on, the rudder will move according to that mix. Touch the (+) or (-) button to increase the amount of rudder mix. Stop when you think it has moved enough. Make sure that you now push the aileron stick all the way to the stop on the opposite side, and again touch the (+) or (-) button until you have added an equal amount of mix in the opposite direction.

The additional rudder mix is easily verified. Hold the aileron stick all the way to the stop. Move the launch flap switch from the down to the middle position. The rudder should move back and forth as the switch is moved.

Reduced Rudder with reflex.

The reduction of rudder throw when in reflex is virtually an identical exercise as that indicated for increasing the rudder mix during launch flap. First move the three position switch to the high (up) position. Touch the UP or DN button until you see **[PROG.Mix5]** in the upper left hand portion of the screen (page 125). Set **SW:** to **FLP-U**. Set the master to aileron and the slave



The XP8103 allows you to create a curve of any shape that you want. This screen represents flapped elevator compensation, and how the amount of elevator compensation would change as the flap stick is pulled down.

to rudder. Now, move the aileron stick to the stop, while pushing the (+) or (-) buttons to decrease the rudder throw. Make sure that you perform this exercise for both left and right rudder.

Elevator to Flap Mix.

The most efficient way to turn is by using the wing, not the elevator. After an airplane has rolled, it is much more efficient to lift the airplane with the wing in the direction you wish to travel, rather than forcing the airplane into the turn with the elevator. This is accomplished by adding full span camber with up elevator.

Touch the UP or DN button until **[ELEV → FLAP Mix]** appears in the upper left hand portion of the screen. Touch the CH button until the cursor moves next to **SW:**. Touch the (+) or (-) button until **FLP-U** appears. This allows you to turn this function on and off by moving the launch/reflex switch into the high position. Unfortunately, you can place either elevator flap mixing or reflex on this switch, but you really can't place them both here. If you desire to have this mix on all the time, touch the (+) or (-) button until **ON** appears.

Move the launch flap/reflex switch into the high position. Touch the CH button until the cursor appears before **RATE:**. Notice that by moving the elevator stick up and down, the arrow moves from up to down. Move the elevator stick until the arrow appears beside **U**. Pull the elevator stick all the way to bottom, then touch the (+) or (-) buttons until you have mixed the

appropriate amount of flap. Model manufacturers have indicated that any where between 1/8th and 3/8th inch is appropriate. You need to do your own experimenting to determine whether or not this is a mix that you want to use.

If you haven't already done it earlier, you also want the ailerons to match the flaps. Touch the UP or DN button until **[FLAP → AILE Mix]** appears in the upper left hand portion of the screen. Press the CH button until the cursor appears beside **SW:**. Touch the (+) or (-) button until **F-U&D** appears. Touch the CH button until the cursor is beside **RATE:**. Touch the (+) or (-) buttons, until the ailerons match the flaps, as you move the elevator stick. The value of the mix should be around 100%.

V-tail Mixing.

Return to the System Setup Mode by turning the radio off, touching both the UP and DN buttons simultaneously, while turning the radio back on. Touch the UP or DN button until the cursor appears beside **WING TYPE** (page 112). Touch the UP and DN buttons simultaneously. Press the CH button until the cursor appears beside **V-tail**. Touch the (+) or (-) buttons until it reads **ACT**.

Touch both the UP and DN buttons again, which returns you to the general information screen. Touch both the UP and DN buttons simultaneously again to enter the function mode.

The two tail servos are connected to the receiver as follows: elevator servo to left ruddervator and the rudder servo to the right ruddervator. (Check to make sure that each servo is operating in the correct direction.) At this stage, the rudder stick (left) on your transmitter should move both ruddervators as rudders. The elevator stick (right) on your transmitter should move both rudder ruddervators as elevators. Make sure both control surfaces are moving in the proper direction in relationship to the transmitter sticks. If they are not, push the UP or DN buttons until you enter the screen identified by **[REV.SW]** in the upper left hand portion of the screen (page 114). Reverse whatever servos are necessary to make sure that they move

in the proper direction.

Control Throw Adjustments.

Review the instructions from your kit to determine the amount of control throw necessary for your model.

Adjust the amount of throw by using the dual rate functions (page 113). Press the UP or DN button until **[D/R & EXP]** appears in the upper left hand portion of the screen. Touch the CH button until **ELEV** appears in the upper portion of the screen. Touch the Select button until the cursor appears beside **D/R**.

Move the elevator stick all the way to the stop. Adjust for the proper amount of throw by touching the (+) or (-) buttons to match the elevator throw recommended in the model instructions.

Perform the same function for the rudder. (At this stage, use the rudder stick, the one on the left side of the model.)

Adjust the amount of rudder to be mixed into the aileron stick (the right stick) by using aileron rudder mix described above.

These instructions will only get you in the general area for the particular type, style and trim of your airplane. Use the dual rate function to modify the pitch or roll sensitivity of the aircraft to satisfy your personal taste. **I highly recommend, that once you have determined the optimum setting, that you program both switch positions for dual rate and exponential to be exactly the same.** This alleviates you from accidentally bumping a switch in flight and suddenly having an aircraft with different flying characteristics.

Placing both the rudder and elevator controls in the right transmitter stick.

Touch the (UP) or (DN) buttons until **[AILE → RUDD Mix]** appears in the upper left hand portion of the screen (page 120). Touch the CH button until the cursor appears alongside **SW:**. Touch the (+) or (-) buttons until **Mix** appears. This allows you to turn the rudder mixing on or off with the switch at the rear right hand corner of the radio.

If you are flying a polyhedral airplane with no control surfaces on the wing, continue to press the (+) or (-) buttons until **ON** appears on the screen. Now, no matter what buttons you push or switch as you flip during flight, your rudder and elevator controls will always be on the right hand stick.

Touch the CH button until the cursor appears beside **Rate:**. Move the aileron stick all the way to the left or the right. Touch the (+) or (-) buttons until the appropriate amount of rudder mix is encountered.

V-tail Differential.

To enhance the turning performance of your aircraft, you can now change the difference between the UP and DN deflection of the control servos on either side of the V-tail. This is performed by changing the end point adjustments for these two servos.

Up to this point, when adjusting elevator or rudder throws, both left and right ruddervators act in unison. End point adjustments now adjust the left and right ruddervators separately. For example with a rudder turn only, the nose of your aircraft may pitch up. Now, by modifying the end point to increase the amount of down throw of each ruddervator, up pitch can be eliminated. Different from the control throw adjustments above, adjusting end points requires that you adjust the throw of both the left (elevator servo) and right (rudder servo) ruddervators separately.

Touch the UP or DN button until **[TRVL ADJ.]** appears in the upper left hand portion of the screen (page 115). Touch the Select button until you obtain the screen that contains end point adjustments for elevator and rudder. Touch the CH button until the cursor appears alongside of elevator or rudder (Rudder = Right Ruddervator, Elevator = Left Ruddervator). Then, push the aileron stick all the way to the left or right and touch the (+) or (-) buttons until the control surface you wish to adjust moves the proper distance and direction.

The need for V-tail differential is a byproduct of not understanding the exact ducalage between the V-tail and the wing. Ducalage is the difference in

angle between the tail control surfaces and the wings. Even if the ducalage is perfect, changes in the CG, area and aspect ratio of the v-tail, and the angle between the v-tails may result in a aircraft that requires differential in the tail. Rudder deflection will not only cause the aircraft to roll, it may also cause the aircraft to pitch up or down. This same effect may occur if your rudder or servo control horns are not perfectly placed over the center hinge line (creating a built in mechanical differential).

To determine if your aircraft can benefit from differential, launch the aircraft and, in slow level flight, level with the ground, move the left control stick (rudder only) on the transmitter. If the aircraft begins to yaw or roll, **or if it pitches up or down**, you may wish to experiment with modifying the end point adjustments to compensate for that pitching motion. If the airplane pitches up with rudder only input, then you need to increase the end point adjustments on both sides of the ruddervator to increase the amount of down movement of the control surface. (In the alternative, try less up movement.) The opposite is true if the aircraft pitches down.

If you are flying a polyhedral airplane, you are done. For a full, six servo set up, you need to perform the same type of flight testing to insure that the V-tail is not inducing a pitching movement in the airplane with rudder only control. Other than that, all the remaining functions of the radio are still available, including elevator compensation for flaps, elevator to flap mixing, and all of the butterfly mixes. ■

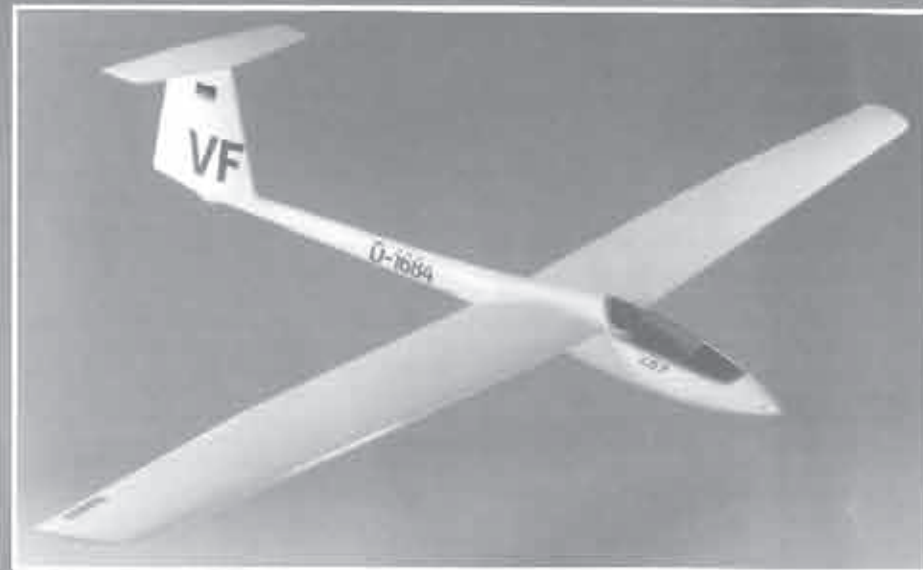
LSF



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MULTIPLEX LS 7

Almost-Completely-Finished
\$450.00 plus S&H, Part No. 21 4164

Technical Specifications:

Wingspan:	3,300 mm	Weight:	2800 - 3200 g
Fuselage Length:	1,380 mm	Wing Loading:	approx. 47 g/dm ²
Wing Area (FAI):	approx. 68 dm ²	Airfoil:	HQ 3, 5-12 modified

The LS 7 is modeled after the legendary LS 4. It is especially interesting for model pilots, as it is not a commonly seen plane. The LS 7 is not only beautiful, and performs well, but it excels in both distance and thermal duration flying, as well as on the slope. At peak performance, LS 7 handles well and is very forgiving. Easy to transport, this model is beautifully scaled.

Kit Contents:

Wings: Part No. 21 4166

Obechl sheeted, with finished leading and trailing edges, and 10 mm joiner tubes. Ailerons and spoilers cut out.

Elevator: Part No. 21 4167

Obechl sheeted, pre-drilled, with finished leading and trailing edges.

MULTIPOXY-fuselage: Part No. 21 4165

With a light, strong, brilliant white finish.

Canopy: Part No. 72 4168

Clear canopy & canopy frame, with pilot.

10 mm Wing Joiner Set: Part No. 72 4110

Decal Set: Part No. 72 4170

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World Championship Level Flying

This month, I'll take a different approach and pass on an interesting story from a friend in Australia, Scott Lennon. I started corresponding with Scott a number of years ago, when I became aware of his use of flying wings for electric pylon racing, and we have continued to send letters back and forth on a regular basis. Besides flying electrics and gliders, Scott flies and competes with his own full size sailplane, a Glasflügel Libelle. Scott flew as a member of the Australian F5B at the 1996 F5B World Champs in the Czech Republic, and I ask him for his views on flying on the team. I think that Scott's thoughts and words will be of interest to many of you, and give you an appreciation of the level of intensity, effort and focus (as well as cost) of competing on an international level. Be sure to thank the U.S. Team members - F5B and F3B - for their commitment in representing the U.S.A. on the world scene next time you see them at the flying field! So, in Scott's own words, here's his story.

"My assault on the 1996 F5B World Championships started when I flew a borrowed 27 cell Clash, loaned to me by our (then unsuspecting) future team manager, Richard Solomon. The day dawned in February 1995 when we went out to test this new beast. I had flown this model first with 14 cells on board, which made the trimming process much easier and gave a very good idea of the handling. I adopted this method of test flying on a lower power setup for all my new models, and it proved to be very worth while. Unfortunately, as this was the first 27 cell model I had built, I underestimated some of the construction methods required, and on the third flight, the elevator servo in the fin came loose at the top of a 1000 ft. climb, leaving me controlling the position of the servo in the fin, rather

than the elevator. It hit about 4 seconds later in the next paddock at about 250 kilometers per hour. I think we recovered enough to make a seven cell battery pack and two servos. That was my introduction to F5B.

"Despite this crash destroying more equipment than my previous ten years of modeling, I did actually enjoy the 10 minutes of flight that I had with this model and decided to give the 1996 Worlds a shot. I proceeded to build my own foam cored wings, and bought a variety of motors and equipment that would let me fly 27 cell models. This prototype flew quite well, but did have a few nasty tip stall habits that resulted in some damage along the way; the model is still flying, today. I used this model for the team selection trials along with a new Clash, as the selection rules required me to fly two aircraft. At that stage, we were pushing to get 27 laps, and my laps were between 24 and 26. The next big event was our Nationals, where our whole team performed rather badly and was thoroughly beaten by Ray Pike, who had competed in the 1994 World Champs, but had decided not to compete in the 1996 World Champs. My best at the Nats was 27 laps, but Ray made 28, which was three more laps than he managed in '94 with the same aircraft. I also severely damaged my Clash when I managed a high speed landing on the Limbo, setting my preparation back even further.

"Greg Voak and I elected to buy Clash airframes for the Worlds, and Brian Green decided to go his own way and build his own design. I reasoned that I would not be able to produce anything better than the Clash, and the time would be better spent flying. I decided that the brushless geared Aveox motor offered the best value for the dollar, being much cheaper and more available than the European equivalents. For the next five months, I was fighting off the effects of glandular fever, repairing the damaged Clash at the Nationals, and building the new Clash kits. Occasionally, I had a practice fly, but the glandular fever dulled my reactions to a point where it was not worth the risk to the model most of the time, as these models do require the utmost care to fly and even assemble. At this stage, the bank

account was holding up OK, but I still had three models and a new motor on order, and I had not even considered the expenses of travel and spending money, yet. My intention was to take three geared models, completely set up, and a spare direct drive as a last resort.

"To fully prepare for the World Champs, you really have to fly as a team, have a regular caller, and accurately measure out the 150 meter course. The Australian team was in an awkward situation of having three pilots and a team manager spread over 4000 kilometers and four different states. A site was chosen for the three official team practice sessions, and also involved practice for the F5D pylon team as both Greg and Brian were cross entered on the F5D team. I gained some extra practice by regular visits to our team manager, Richard Solomon's, flying field about 250 kilometers away, where a course and some light competition could be found.

"For the last two months before the World Champs, I spent a couple of hours nearly every night building and assembling models, or preparing some other equipment for use. If you have to travel overseas like we nearly always do, you need to address the transport of all equipment via airline baggage handlers. This means securely packing fragile items into boxes and bags, that can be carried and dragged through all sorts of train and aircraft terminals, by you alone. I managed to carry four aircraft and all my equipment and batteries in one large suitcase, one 6 ft. long model box, and one cabin bag.

"After we arrived at the World Champs site, we looked for a practice field to prepare our models. The first practice field turned out to be rather ordinary. You would not fly a handlaunch glider there, let alone an F5B rocket ship. The second field was only a little better. The landing strip was only about 5 meters wide and maybe 30 meters long, bounded by a hedge, a ploughed field, and the cars parked on the road side. This was the best of the three practice fields. This is where we first saw the U.S. team doing their two lap loops. While trying out the two lap technique that I eventually used in the Championships, I clipped the top branches of a tree

that was in the middle of the ploughed paddock, and destroyed my number three model. Steve Neu warned me I was getting close the previous lap, but I was concentrating so hard that I did not hear him.

"Later in the preliminary event, my first flight ended after four laps when the main battery shorted out, leaving me only 13 cells to try and fly on. This would barely climb and I was forced to abandon my effort and land. My second round flight resulted in a snapped wing turning base B on lap 3, so I completed the preliminary event with a total score of 4 laps for 40 points. As my number 4 airframe was not competitive enough, I borrowed the spare plane of Greg Voak, assembled enough bits from my downed ships and one of Steve Neu's speed controllers to make a flyable plane as my backup. After all that preparation, and breaking four expensive Clashes, the real event was finally starting. I had so much trouble getting to this point that I was now fairly relaxed about the whole event, and proceeded to fly some good rounds, some really good rounds, and some that could have been better. The net result that ended up in the final score sheet was 19th at an average that was better than my previous best single score, and the experience of being there and participating in the whole show. The downers: wrecking another two models for small mistakes, and realizing that despite our best efforts we are still far behind the top teams.

"Will I be there next time? Probably not in F5B, as the technology demands that you spend lots of money, have the right connections in Europe, are an expert motor developer, and have a team of model designers and builders on your side. It helps to be able to fly well, but this is not as important as the other areas. I have got an F3B model that I am enjoying, and the technology is fairly stable in this class. The F3B World Champs are scheduled in South Africa in 1999, and I am aiming at the team selections for that event."

There you have it, an inside look at what can occur in the competitive circles of World Championship level flying.

Good Health and Good Lift!! ■

Kit Review

GORDY'S TRAVELS



Midwest Essence

...by Gordy Stahl
Louisville, Kentucky



Pretty in the air, too! From a hand launch! Gordy Stahl on launch.

I want to begin this review by saying, "I was forced into it!" Well, I was **forced** in that I had to fly the currently available, two meter, starter sailplane kits belonging to new members of our club.

In general, I find these kits set up with so much decalage that they are "self correcting". That boils down to a plane that is constantly ballooning and impossible to trim for efficient flight. Now, don't go flaming me in defense of these ships, exclaiming their virtues, and telling me about the times you have had them skied.

Heck, in the right thermal, houses fly! This ship is different. First, the kit provides lots of options. I personally have progressed to the big-boy composite, computer-functioned ships; to be excited about a box of balsa should tell you that this ship is fun. All right, on with the review.

First the kit.

When you open it up, you find the same kind of excellent, organized packaging you may have seen in Airtronics kits. Midwest has always been a benchmark in quality, for die

cutters to be measured against. That boils down to everything being just right, cleanly cut, and as shown on the plan.

The instruction book starts with a list of tools, etc., needed to build the kit. The drawings are clear and plentiful. The step-by-step progression provides the new builder with the foundation that will help later for scratch building projects. Virtually every balsa construction technique is used in this kit. Shear webs, to string-wrapping a spar box, and stringing the spoilers are explained.

ARF (almost ready to fly) beginner models may look nice and fly great, but they cheat the modeler out of half of the satisfaction of our hobby. Plus, ARFs put more guys on the field quicker; many of the new guys spend your time asking FAQ's (frequently asked questions), using up air time, without having paid their dues learning building techniques, frequency etiquette, etc. What sort of information will they pass on to new,

future modelers? What contributions will they make to our hobby?

Where was I? Oh yeah, I think guys should build their first plane. Not buy it. Now, back to the review...

Most components of the Midwest Essence are keyed for assembly, and fit nicely. The kit builds quickly, simply, and comes out true and neat, without a bunch of sanding.

The material is excellent grade; all the hardware is there. The front former, where the balsa nose block fits, is already pre-drilled for an electric motor installation, a nice added value.

The wing saddle fuselage doublers are slotted, so that when glued to the fuselage, there are two sets of slots on either side of the inside fuse for installing and adjusting the servo rails to fit your particular servo choice. Even the hardwood rails are pre-cut to fit.

The V-tail choice is a sexy option that sets the plane apart visually from the other entry level kits. You can use the Du-Bro V-tail mechanical servo mixer, a sort of rocking device that fits on top of the aileron servo. The rocker has three ball joints on it. The two outside ones go to the ruddervators. The center ball joint is linked to the elevator servo. The elevator servo causes the ruddervator links to be pulled or pushed to cause both ruddervators to operate simultaneously, up or down. The twisting action of the aileron servo actuates the opposite action, similar to the ailerons' actions.

The simple built up structure of the ruddervators add to the visual treats when transparent covering is used.

Improvements?

I did find that some extra stringers should be added to reduce the span between the existing pieces. I found that the covering shrinking process warped the leading edge stock, causing a scalloped look. It did not cause any warping of the actual surfaces. Another improvement has to do with the base of each V-tail assembly. The base piece of each could use a piece of 1/16" balsa, with the grain laid opposite of the original, in order to cap it and stop the bass piece from cracking

along its grain. (Or, some 1/2 ounce glass to cap it.) The tail slapping the ground on a hard landing puts a lot of force on the bases, and mine cracked.

Since I am on the topic of improvements, the balsa leading edge of the wing tends to be crushed by the rubber bands, as does the top sheefing by squeezing during wing assembly and rubber band installations. I suggest glassing this area or embed a 1/4" dowel approximately 2" from the center on each wing panel. Also, add some extra balsa sheet underneath the original sheefing for the first four bays (each side) to protect this from finger pokes. It will add a minor amount of weight, but will also keep your ship looking nice for a long time. At the trailing edge, lay some 1/16" ply on top to protect that area from the rubber bands, too.

I put two standard Airtronic 102 servos directly under the leading edge of the wing in the fuselage. That left the entire, spacious front of the fuselage open for my RX and four 1000mah sub C's for power and balance. No lead was added. This makes the ship extremely light and, as you can see from the photo, hand launching this ship produces some great altitude.

I should have moved the servos forward so that the front held the RX, servos and battery in that order working toward the front. That way the whole package would be even lighter.

I left my set up as is, because that way it is in good position to convert the whole thing to electric power by simply removing the nose block and adding the 7 cell 1000mah motor battery, BEC controller, and 3 to 1 geared speed 600 motor combo.

I can then shift my servos to under the trailing edge, or the wing, to adjust for CG.

In order to get a realistic view of the ship's performance, I put a beginner's re-trimmed Spirit into a thermal, then put the Essence into the same thermal. I let the beginner play in the thermal for a while, coaching him on technique; then I handed him the Essence that I had just centered in the base of the thermal. I took his plane and brought

it down to the same height of the other ship, and then we attempted to not climb each other. He easily out climbed me, not real fast, but clearly. When I interviewed him afterward, he said things like, "It seemed more groovy, like it responded faster and more cleanly." He said that he never felt uncomfortable; landing seemed easier to set the approach.

I also gave the plane to an intermediate flier, who had recently progressed to handlaunch competitions and working on spot landings. He had the same sort of comments.

Aerobatics?

Nope. It's not set up for inverted flight or rolls. Loops are easy and straight.

I built both versions: standard tail and V. I definitely prefer the V, just 'cuz' it looks great... No other reason.

Lets talk spoilers.

I built them in, but never hooked them up.

Why didn't I bother hooking them up? First, the wing spar is tough, so I felt it could handle a blazing dive. Second, this ship proved it will spin out of altitude with no problem.

Should you bother? Yep. Even though de-thermalizing is no problem, you need to learn how to use landing devices, and this ship was made to teach. The construction of the spoilers, actuators, and string is there. I would also urge you to add some 1/8" strips along the edges around the spoiler bays, so that you have some extra areas to stick your covering onto, instead of just the top edge of a rib.

The two piece wing option is an easy build and worth doing. Transport and storage is a breeze when you are dealing with two wing halves. The joiner is a 1/2" aircraft ply, dihedral brace, pre-cut, and fits into the string wrapped, spar box.

The kit supplies and shows three blind nuts for tow hook locations; I found the center position very impressive for big pull, no elevator launches. It tracked straight up with the TX set on the ground, and transitions off the hook by itself. Very tight, up elevator, pivoting thermal turns, with no tendency to stall.



Midwest Essence: two piece wing, simple joiner, ample spoilers, and tough spar!

Airfoil:	3010
Span:	78"
Weight:	28 to 34 oz.
(Mine weighed 32 oz. with the 4, 1000mah sub-C's)	



The wing is then taped to hold the halves together, if using the two piece version. I would also add some 1/16" ply doubler to the trailing edge of the wing, where the rubber band passes over the wing to the dowels.

Covered with transparent covering, this bird is a beauty in the sky. The wing to stab alignment comes out just

right for a ship that, when balanced at the rear edge of the CG range, makes this ship a real performer. It penetrates well in strong wind. It's light and strong. It incorporates an airfoil (the 3010) which excels in this format. The kit teaches, satisfies, and does not frustrate new flyers at building, forcing them to rush to the Internet with obvious questions. For the low purchase price, it offers options for personalizing the end looks, without shorting the performance.

Here's a recap of the modifications I recommend:

- Beef up the leading edge sheeting, underneath, with extra sheeting, and two extra front ribs to protect the wing from your squeezing.
- After the wing is done, but not covered, carve out the leading edge and glue in some 1/4 dowels to protect against rubber band damage. Or, glass it.
- Glue on some 1/16" ply on the top of the wing's center top trailing edge, also to protect against rubber band damage. Or, glass it.
- Don't bother to install a bolt-on wing section. It's more work to put the bolts in than it is to pop on six rubber bands and off.
- If you do not intend to electrify it, take the time getting your servos, RX and battery up front, to take advantage of the reduced weight potential. The ship is already very light, so don't bother getting nuts on this point, but it is a simple way to leave out lead.
- I would also recommend installing a 1/16 ply popsicle stick to the top of the V-tail joint, and installing a 4/40 blind nut to make the tail assembly removable. That way, if you should damage your tail feathers, a spare could instantly be installed.
- Beef up the leading edges of the tail assemblies to keep them from bowing in under the stress of the covering.

The bottom line? This ship is great! I like it a lot. Midwest's years in the business and their quality cutting means all the parts are cut true; not

just the ribs, as in the case of laser cut kits.

I want to state that I am not saying that all the kits out there, in this class, are dogs or of less quality. What I am saying is that this kit is built for sailplaners, without the misalignment cut in to make it a good free flight model. This ship will handle a fairly heavy winch foot; it reacts to lift and speed like that next-model in the beginner's future will react. It's a true transitional base ship, with options!

Enjoy! Kits are available from your local shop; Tower Hobbies has them in stock. Want more detail? Post questions to <GordySoar@aol.com>. ■

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The X-36 "Backgrounder", Tailless Research Aircraft

All you modelers of tailless platforms, who have been asking about incorporating helicopter gyros to control yaw, now have a platform to test out your ideas!

The X-36 "Backgrounder" was developed jointly by McDonnell Douglas and the National Aeronautics and Space Administration over a 28 month period, at a cost of \$17 million. Rollout of the 28 percent scale X-36 at McDonnell Douglas Corp., St. Louis, took place on 19 March 1996. A six month testing program, consisting of 25 flights, was scheduled to begin that summer. High speed taxi tests were done in October.

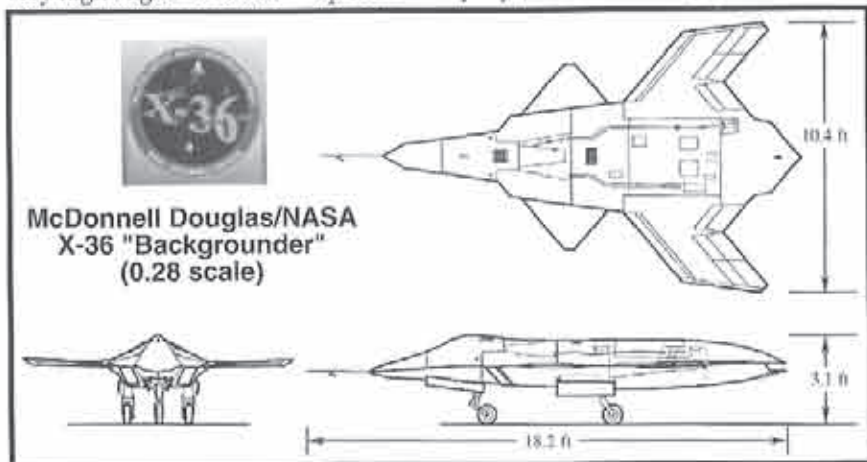
The "Backgrounder" is considered to be a tailless design, as it has no vertical or horizontal tail surfaces. The canard surfaces are apparently not moveable, but do control airflow over the wing at very high angles of attack — up to 35



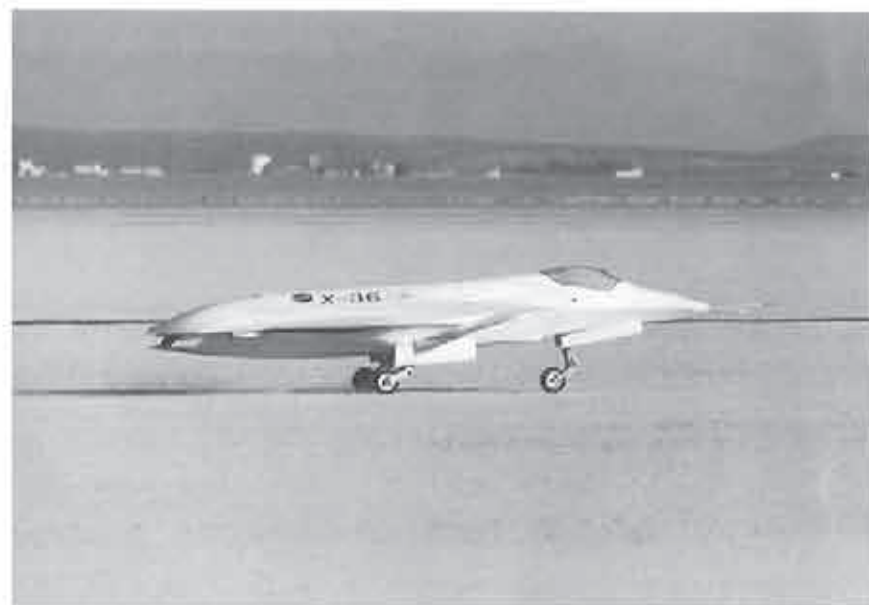
degrees. Yaw and pitch control are provided by split ailerons and thrust vectoring in this powered model. The result of this novel design concept is an airframe which is lighter and has less drag than conventional aircraft of the same size, with increased range as the result. It is anticipated that substantial increases in maneuverability and survivability will also be realized, together with a very small RADAR signature.

Manufactured in McDonnell Douglas Phantom Works, the X-36 is an example of rapid prototyping capabilities and was intended to demonstrate new technologies at far less cost than a full size manned aircraft. The subscale X-36 is remotely piloted through a HUD (Head Up Display) system. A video camera in the aircraft allows the pilot to fly from a ground based virtual cockpit.

The airframe of the X-36 is of machined aluminum, the skins are of carbon and epoxy (non-autoclaved). The X-36 is



McDonnell Douglas/NASA
X-36 "Backgrounder"
(0.28 scale)



Dryden Flight Research Center. EC96-43784-47 Photographed 10/96
MOVING ALONG--NASA/McDonnell-Douglas X-36 tailless research aircraft
during high-speed taxi tests on Rogers Dry Lake. NASA photo by Jim Ross

stressed for 5 g's. With a maximum speed of Mach 0.6, an approach speed of 110 knots, and the high maximum angle of attack, flight performance should be quite exciting. The aircraft weighs 1,300 pounds fully fueled and is 18.2 feet long, 10.4 feet wide, and 3.1 feet high with landing gear extended. A Williams Research F112 engine provides 700 pounds of thrust.

The X-36 should make a good PSS subject. We are sure some enterprising modeler will take advantage of the current state of electronics and include not only a helicopter gyro, but also an onboard video camera. This could be set up to mimic the integrated remote control system used by NASA on the original. We would very much like to hear from anyone modeling this "model", particularly if such technologies are included.

The 3-view and photographs included in this column are courtesy of McDonnell Douglas Corp. via the X-36 rollout web page at <<http://ccf.arc.nasa.gov/dx/basket/storieset/X36pixjo.html>>, and NASA Dryden

Flight Research Center at <<http://www.dfrc.nasa.gov/PhotoServer/X-36/contactSmall.html>>.

Suggestions for future columns are always welcome. ■

Sailplane Homebuilders Association (SHA)

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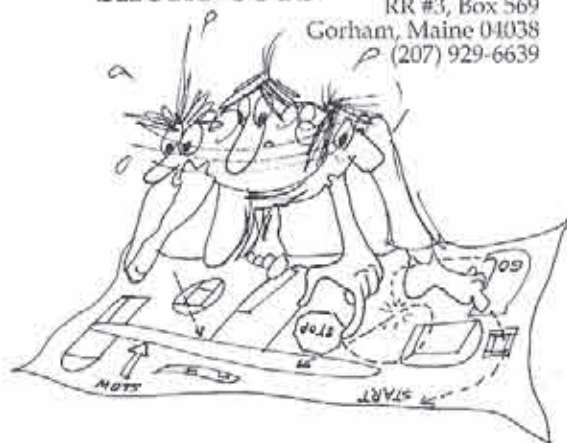
The purpose of the Sailplane Homebuilders Association is to stimulate interest in full-size sailplane design and construction by homebuilders. To establish classes, standards, categories, where applicable. To disseminate information relating to construction techniques, materials, theory and related topics.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

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

Sailplane Homebuilders Association
Dan Armstrong, Sec./Treas.
21100 Angel Street
Tehachapi, CA 93561 U.S.A.

"SHORT CUTS"

Steve Savoie
RR #3, Box 569
Gorham, Maine 04038
(207) 929-6639



DownEast Soaring Club Review ZAGI-LE Combat Wing

Photography by Jim Armstrong

Several months ago, I was approached by Jerry Teisan of Trick R/C and asked to do a review of their ZAGI-LE with its new EPP foam leading edge. Jerry was curious to see how well the ZAGI-LE would fly in light lift, on east coast slopes. I explained to him that I had just started a 1/5 scale Salto, was coordinating a new club slope plane construction project (7 sets of bagged wings and ruddervators), retiring from the Coast Guard and looking for a job in a new career field; I was a bit limited with free time. But how can you turn down a guy who wants to give you a kit to build and fly? Then it hit me. Why not have the Club collectively build, fly, and critique the kit? All I would have to do was assemble the comments and submit them in article format. So, it was settled, and we decided that the plane would be raffled off to one of the "active" participants that helped out, after all the written comments had been received.

The plane wing was built by six members of the Club in less than 3 hours, and flown the very same afternoon at one of our more challenging slopes: the 75' sand pit bowl with 50 degree slopes. Wind speed was 8-10 mph (including moments of calm); it was 16 degrees Fahrenheit, with a -6 degrees Fahrenheit wind chill; just an average winter slope day in Maine.

The Team Comments:

Ted McKibben

The construction was simple and the instructions were clear, even with six builders working at once. I'm not sure that the center section reinforcement step (optional EPP foam inserted in center nose area) did much good, since most of this foam gets cut out for the equipment bay. Weight could be saved on the elevons (behind CG) by using monokote, and any warpage could be easily corrected with an iron. When applying the tape, don't stretch it, as it will wrinkle. With what little wind we had, ZAGI-LE flew well. There was a

bit adverse yaw, but further trimming and more lift might make this less obvious. Winglets at the tips might make an interesting addition, although the weight penalty behind the CG would have to be considered. It would be interesting to see how a traditional vacuum bagged version would fly; would it be as durable as the EPP foam leading edge? Overall, I'd say for the money and the time invested it is a nice airframe. Combat, anyone?

Jim Armstrong

We deviated from the directions slightly by routing out the recesses for the electronics, servos, and antenna prior to taping, as it didn't make sense to tape over reference marks on the wing, and then try to cut through. The position of the CG on the plans was perfect for first flights; 3/8" throw on the elevons was also good for first flights, though a bit more was needed for loops. There was plenty of tape left over to handle future repairs if needed. It flew surprising well in the turbulent light lift conditions that day.

Mike Farnsworth

Construction was very straight forward. We used the alternate (combat) building method for a reinforced nose. This option used a plywood brace (not included in kit), with additional EPP foam (included) in the nose. Installation of the recommended battery pack (500mah) results in removal of much of the foam. We wonder if just the brace alone would have sufficed. We devi-



The first flight, Tim Teague launching; Mike Farnsworth flying.

The Team (L - R) Carl Trottier, Tim Teague, Mike Farnsworth, Aaron Ashcraft, Ted McKibben, Ken MacDonald (Jim Armstrong and Steve Savoie not shown)

ated from the directions and routed out for the servos, battery pack, receiver and antenna tube prior to taping. A nylon antenna tube was inserted to protect the antenna and make receiver change out easy. We found that a new hacksaw blade cuts the EPP foam easy. A soldering iron or gun could also easily melt out the recesses for equipment. A tip for taping the wing is to apply the tape without stretching it; creases and bubbles result when tensioned tape is released. There was ample tape left over to cover another wing; spare foam was also left over for repairs (EPP).

Construction took 3 hours and 15 minutes from start to completing radio installation. The first flight was great; the plane (wing) flew great in the light lift conditions, and didn't need any trim. Flying a wing into the sun was a unique experience, as we just waited a few seconds for it to exit the other side,

The recommended throws were fine, stalls (forced) were straight forward, mush with no tip stall. With dual-rates on high, the wing performed loops and rolls with ease in relatively light lift. The high rate deflections were 5/8". We all enjoyed the flights, especially since none of us had ever flown a wing before. The flying ended on a turn into the slope, where the servo arm on the right side was shattered on impact. (16 degrees is tough on plastic.) The plane itself was undamaged; we just didn't have a spare servo arm that day, nor fingers capable to conduct the repairs (-6° wind-chill). The damage was not too bad for hitting frozen ground at +20 mph at 16 degrees F. The wing was later flown several other times in heavier wind that produced great results. Even after hitting a tree at 30+ MPH, the Zagi recovered nicely from the in-flight flip, and continued to fly without any ill effects.

Aaron Ashcraft

"Built Easy, Flew Great." My only complaint was that the cores were a bit banged up on the edges. I was impressed at the smooth joint between the two types of foam. The directions could be a bit more detailed where discussing how to cut out recesses for electronics. The ZAGI-LE flew great in our light lift conditions.

Tim Teague

The elevon balsa stock arrived gouged up; better packaging was needed. We did not epoxy the foam beds together as required by the directions, rather they were just taped. The recesses for the electronics were cut out with a dremel router.

A bare, hacksaw blade was used effectively to trim the EPP foam block backing L.E., at root for construction option. The opaque tape obscures the radio/control locations; cut outs were made prior to covering. Three hours after opening the box, we were setting up elevon throws; not too bad.

Stephen Savoie

Unfortunately, I could not attend the building and flying sessions, but I did get to open the kit and inspect the contents, as well as review the directions. The foam cores and beds were in good shape upon arrival, although the elevons were a bit mangled, which was caused by the two rolls of tape with sharp edges, that were included in the kit. The directions were well illustrated, but I felt they needed some updating. From pictures that I've seen, the original Zagi used clear tape, which allowed the builder to see the servo reference marks in the foam (flair pen), once covered with tape. Since our Zagi LE came with bright orange and black tape, the group determined that it would be best to make the cut outs prior to covering with the tape, and possibly get a better product.

The directions also called to slit the wing along its length (after covering), in order to install the antenna. Once again, why cut into the structure after it's taped up? The group decided to route a slot and insert the antenna tube to provide an easy way to change out receivers and possibly afford greater protection for the antenna. Though I



Ted McKibben (L) and Tim Teague (R) covering elevons.



Tim Teague (L) and Mike Farnsworth (R) installing electronics.

was not present for the initial flights, I was quite pleased to hear how well the plane flew for the pilots present, especially since none of them had ever flown a wing before. This can be credited to the wing's design, airfoil, sweep and washout. Look out East Coast; the Zagi's are coming! ■

Correction

An error was made in my recent construction article on the DG-800 due to a misunderstanding on my end with another builder. The tow hook location as described in the article is about 3/8" behind where it should be. I'll research this subject, and do a more comprehensive follow-up in the near future.

Steve Savoie



Mike is mating up L & R panels.

Routing for antenna, servos, and electronics. Note plywood and EPP foam insert.

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Our event this year will be breaking new ground. We will be holding it at the full scale glider field atop Harris Hill. The field will be shared with full scale sailplanes, including ASK-21's and Schweizer Trainers. Rides will be available during the event. The emphasis will be on fun and practicing aerotow techniques. Tow planes and experienced pilots will be there to tow you to altitude. Bring your 3 meter (118") or larger aileron sailplane, with nose release, and join the growing aerotow movement. Scale gliders are recommended, but not required. Pilots are encouraged to bring their 1/4 scale, or larger, tow planes (with release). This may be the "year of the scale tow plane". We will have a few scale sailplanes available on site for those who can't bring their own. This year we are going to have a pilots choice award, and a special award for the best Schweizer scale sailplane. Other prizes to be announced. We will have an evening Banquet Saturday night at the National Soaring Museum.

Paul Schweizer will be a featured guest speaker, with others to be announced. More exciting plans are in the works, so keep an eye out for further developments as they become available. Current AMA membership is required. There will be a \$25.00 pilot registration fee.

For details & registration info. (including shipping your sailplane to Elmira), contact:

John Derstine
717-596-2392
johnders@postoffice.ptd.net



SWIFT-S1 (1.9m)

Wingspan: 75" (1.9 m)
 Weight: 39 oz.
 Wingarea: 457 sq. in.
 Wing loading: 12 oz./sq. ft.
 Airfoil: S7012
 ARC wing kit:
 Sugg. retail price: 229.00 US
Intro. offer: 209.00 US +15.00 US S+H

ASK-21 (2m)

Wingspan: 83" (2.1m)
 Weight: 42 oz.
 Wingarea: 516 sq. in.
 Airfoil: E374
 ARC wing kit:
 Sugg. retail price: 199.00 US
Intro. offer: 185.00 US +15.00 US S+H



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 WING AREA 935 SQ. IN.
 SURFACE AREA 100 SQ. IN.
 AIRFOIL RA-12
 ASPECT RATIO 13.50
 WEIGHT 75.00 OZ.
 WING LOADING 13.5-17 OZ./SQ. FT.

Disciplines	F3B	Thermal Duration	Slope	XC	SLO
* F3B EAGLE	X	X	X	X	X
* SYNERGY 911	X	X	X	X	X
* SYNERGY 1	X	X	X	X	X
* SYNERGY HASE	X	X	X	X	X
* SYNERGY 91-SI	X	X	X	X	X
* STRUCTURE	X	X	X	X	X
* GLASS/SE	X	X	X	X	X
EVOLUTION	X	X	X	X	X
REOLUTION	X	X	X	X	X
XBAC	X	X	X	X	X

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Wing span 48"
 Wing area 408 sq. in.
 Airfoil Zagi 12/2
 Loading 8.48 oz./sq. ft.
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 Airfoil HQ3513



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ELECTRIC STORM

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*Electric Storm & Storm
designed by Mark Allen*

Wingspan: 78"
Airfoil: SD 7037 modified
Weight: 44-49 oz
Recommended for 7-10 cell
Fuselage will accommodate either
direct drive or gear drive.

- ✓ Fiberglass and Kevlar™ reinforced fuselage.
- ✓ Elevator servo located behind trailing edge of wing under a unique hatch.
- ✓ Wing comes pre-sheathed in obeci, carbon fiber reinforced.
- ✓ Wing hold-down bolts hard points installed under sheathing, eliminating crushing wing when bolting to fuselage.
- ✓ Ailerons pre-routed. Servo holes are pre-routed. Wing has flat center section with turned up outer panels, making it easy to install flaps, for nominal fee, flaps and the flap servo hole can be pre-routed at the factory.
- ✓ Conventional stab and elevator pre-machined.
- ✓ Complete hardware package and instructions.

STORM

A HIGH TECH, 2 METER AIRPLANE FOR THE INTERMEDIATE TO EXPERT FLYER THAT DOES NOT REQUIRE A COMPUTER RADIO!

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FAZER 2-METER

SPECS. **2 METER** **OPEN**
Airfoil: SD7037 modified SD7037 modified
Stab airfoil: SD8020 SD8020
Weight: 41-44 oz 62 oz
OPEN CLASS FAZER wingspan: 112"

- ✓ Fazer is an all new, 2-meter, which replaces our discontinued Laser. With subtle enhancements, we continue to improve upon our already well-proven sailplanes.
- ✓ Fazer features slight airfoil wing platform and wing area changes.
- ✓ Fuselage has been slightly changed to improve builder's radio installation.
- ✓ Kit features a fiberglass and Kevlar™ reinforced fuselage.
- ✓ Pre-sheathed obeci wings with flaps; ailerons pre-routed; servo pockets pre-routed; pre-sheathed obeci stabs; all necessary bass wood needed to complete the wing.
- ✓ Kit includes full hardware package and deluxe 19-page illustrated instruction manual.

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Designed by Brian Agnew

- Glass, reinforced with kevlar, fuselage accommodates standard servos
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- Wing incorporates a poly break sheathed with one piece of obeci without a seam
- Full flying stabs
- Pre-routed flap & aileron and servo holes.

Kit includes: full instructions, Squires wing rod, Byron Blakeslee control cables, Ziegelmeyer control horns and tow hook. All wood and hardware is of highest quality available.

Specifications

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

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

For Sale - Business

PC-Soar Version 3.5 Sailplane Performance Evaluation Program Optional Sailplane Library now expanded to 54 models including: Alyone, Anthem, Genesis, Mako, Probe, Thermal Eagle, and Synergy-91. Free Library Upgrades. PC-Soar Upgrade to Ver. 3.5 \$10, PC-Soar New Purchase \$40. New Libraries of Sailplanes and Airfoil Polars \$30. Please include \$3 P&H for all purchases & upgrades. Also available: Laser cut airfoil templates. IJM Associates, 1300 Bay Ridge Rd., Appleton, WI 54915; ph: (414) 731-4848 after 5:30 pm weekdays or on weekends; <http://dataex.com/~atckron95/pcsoar.htm>.

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

A.M.P. Aerial Model Products, sport, slope, race prototypes - all airfoils. 60" Del Valle Snake, 94" I&K Cobra, AMAP Flair, Kevin Cutler's full house Davenport Monitor. All race tested. Butch Hollidge, (510) 680-0589, eve, California.

VACUUM BAGGERS! Build the unique, slick, aesthetic, competitive 140" GENIE sailplane by Harley Michaelis, LSF 023. Send \$ASE and \$1 for pics, details on ship and on parts package. 26 S. Roosevelt, Walla Walla, WA 99362; (509) 529-2562.

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PLANS - R/C Sailplanes - Scale, Sport & Electric. Old Timer & Nostalgia - powered, rubber, and towline. Scale - rubber. All models illustrated. Catalog: \$2.00. Cirrus Aviation, P.O. Box 7093 Depot 4, Victoria, BC V9B 4Z2, Canada.

RAHM'S, Winches, & Line Retrievers, (310) 866-2405.

For Sale - Business

PARACHUTES: \$10. Dale King, 1111 Highridge Drive, Wylie, TX 75098; (972) 475-8093.

Cronus Stopwatches, model C609 TCL, \$25.00 + \$1.00 S&H. NC Eagle fuses, new version w/ smooth nose cone, no skeg, \$100.00 + \$11.00 S&H. 7.75% CA sales tax. See <www.ocpapsydc.com/ml.htm> for more info & photos. Manny Tau, 2490 S. Ola Vista #28, San Clemente, CA 92672, (800) 618-9176, taucm@kaiwan.com.

For Sale - Personal

Multiplex Schaumpup set up for Airtronics, RTF, 3m w/ tip extensions, scratch-built stab (half weight of original), airtowable... \$400.00 w/o servos, or \$575.00 w/ 6 standard servos. NIB kits: 2m Duck, S-3021... \$200.00; Std Duck, S3021... \$225.00; 2m Lil Scorpion, SD-7037 (no wing sheeting)... \$175.00; Falcon 600 (balsa skin full kit)... \$200.00; Wasp HL, full kit... \$75.00; two Falcon 880 wing kits, S-3021, balsa... \$75.00 ea. All items plus shipping. Jim Thomas, (916) 984-5123, California.

ACE Quasoar, unlimited ship with A/P/E/R, not the poly version, wing spar has been carbon reinforced, excellent condition, cub yellow gloss fabric covering, w/ 6 servos, battery ready for RX... \$300.00, or w/o servos, but all linkages... \$200.00. Shipping is \$30.00. Gordy, (502) 491-5001, GordySoar@aol.com, Kentucky.

Airtronics Whisper, 2m full house 7037, 3 piece wing, removable rudder & elevator, very transportable, built for display but contest flown, white & red gloss fabric covering, red lacquered fuse, all balsa construction, full pedal winchable... \$150.00 w/o servos, or \$300.00 w/ servos. Plus shipping. Gordy, (502) 491-5001, GordySoar@aol.com, Kentucky.

Original Bird of Time, transparent red covering, excellent condition, ready for RX, Nostalgia legal... \$225.00. Includes shipping. Gordy, (502) 491-5001, GordySoar@aol.com, Kentucky.

AMD A-T6, partially assembled... \$75.00; Bob Martin Talon, RTF, custom paint, panel lines set up for flaperons & elevator... \$75.00; Pixy fuse, built, needs paint... \$25.00; Windfree, RTF... \$125.00; Mark Allen Skyhawk, just add servos... \$275.00; AMD Phoenix wingeron sloper, glass wing & fuse, NIB... \$75.00. George Voss, (405) 692-1122, 8am - 8pm, Oklahoma.

NIB 1/4 scale kits: Buchele, Nimbus-4, 6.2m... \$1200.00; Roebers, Grob G103 Twin III, 4m... \$500.00; Rodelmodel, ASK 21, 4m... \$500.00; Krause, Discus, 4m... \$700.00. Excludes shipping from Long Beach, California. Rick Briggs, (562) 434-8446 days, (562) 433-6327 eve., 75754.1422@compuserve.com.

1:4 Grob 103 Twin Acro, new... \$600.00; moulds: 1:4 ASH 26, 1:5 Pilatus B-4, 1:5 Grob 103 Twin, 1:5 Ventus, 1:5 DG-600, new fuselage Graupner 1:4 Grob Twin 103, 1:4 ASH 26. Peter Zak, (305) 687-7706, Florida.

Falcon w/ Spectrum wings, 105" span, S-3021... \$375.00, or \$575.00 with servo, bat & switch; Oden fuselage, semi-scale, foam cores, S-3021, 10.25" cord, 130" span... \$120.00; Outrider, my original prototype, modified SD 7080 wings, somewhat beatup, but still flies great... \$250.00. Dale, (972) 475-8093, Texas.

J.R. Galaxy Computer Flight Tx, PCM-PPM, plus five, eight channel mini PCM Rx's, all in great shape, in original box, all on ham 50.920 mhz... \$250.00. Don, (619) 571-5893, California.

1/4 Roebers Pilatus B4, 3.75 meter span (147"), wing profile Ritz 3, NIB... \$495.00; 1/4 Rodel Super Cub (towplane), 2.687 meter span, wing profile Clark Y mod. (suitable motors are 160 T, 300 T, OS BGX-1, Brison 3.2 or similar), NIB... \$385.00; 1/4 Rosenthal Ralley Morane (towplane), 2.78 meter span (109"), NIB... \$495.00; 1/5 Wik Twin Astir, all glass, NIB... \$595.00. Contact Robin Lehman, 63 E. 82nd St., New York, NY 10028; (212) 879-1634.



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Schedule of Special Events

Date	Event	Location	Contact
May 10	15th Annual ISS HLG Contest	ISS Riverside, CA	Robert Cavazos, (909) 485-9563 RCAV@aol.com
May 10	CSS Club Contest	Cincinnati, OH	Ed Franz, (606) 586-0177 edkim_franz@msn.com
May 16-18	Los Banos Slope Scale Soar-in	Los Banos, CA	Lynsel Miller, (408) 275-6403
May 16-18	SIG-LASS Midwest Slope Challenge	Lucas, KS	Paul Wright, (402) 796-2175 PaulW@isco.com
May 17-18	CSS Memorial Contest	Cincinnati, OH	Ed Franz, (606) 586-0177 edkim_franz@msn.com
May 18	Open TD Contest	San Diego, CA	Patrick Dionisio, (619) 586-7997
May 24	2 Meter TD Contest	San Diego, CA	Patrick Dionisio, (619) 586-7997
May 31	HL Meet	Lafayette, IN	Adam Weston, (765) 742-7558
May 31 - June 1	7th Annual Spring Fling	Davis, CA	Glenn Sembroski, (765) 463-6306
June 7-8	Spring Soar	Bristol, VA	Mark Hilliard, (916) 878-4478
June 7-8	IHLG*	San Diego, CA	Bernard Leonard, Jr., (423) 878-2094 Ron Scharck, (619) 454-4900 Scharck@aol.com
June 14	SHA Central Div. Workshop	Shawnee, OK	David Magerstadt, (512) 251-5388 dmag@mail.utexas.edu
June 14	CSS Club Contest	Cincinnati, OH	Ed Franz, (606) 586-0177 edkim_franz@msn.com
June 14	60" Slope Race	San Diego, CA	Bob Matheson, (619) 754-2657
June 15	F3J	San Diego, CA	Mike Ziaskas, (619) 484-7596
June 13-15	Elmira Aerotow 97	Elmira, NY	John Derstine, (717) 596-2392 2076482@mcimail.com
June 15-21	SW Antique & Classic Soaring	Rally Moriarty, NM	(505) 832-0755
June 19-22	1997 MSSC	Huntsville, AL	Ron Swinehart, (205) 883-7831
June 21-22	Rosebowl Soaring Festival	Pasadena, CA	Mike Ratner, (818) 871-6891
June 28-29	1st Annual Sailplane Weekend	Washington, MI	Ray Hayes, (810) 781-7018
June 29	SC2/TPG TD Contest	San Diego, CA	Patrick Dionisio, (619) 586-7997
July 6	2 Meter TD Contest	San Diego, CA	Patrick Dionisio, (619) 586-7997
July 12	CSS Club Contest	Cincinnati, OH	Ed Franz, (606) 586-0177 edkim_franz@msn.com
July 12	60" Slope Race	San Diego, CA	Bob Matheson, (619) 754-2657
July 13	Open TD Contest	San Diego, CA	Patrick Dionisio, (619) 586-7997
July 18-20	SHA Eastern Div. Workshop	Elmira, NY	Mat Redsell, (607) 569-2776 71750.2350@compuserve.com
July 19	CSS Family Fun Fly & Picnic	Cincinnati, OH	Ed Franz, (606) 586-0177 edkim_franz@msn.com
July 19-20	Masters of Soaring	Covina, CA	Don McColgan, (909) 626-1451
Aug. 2	HLG Contest	San Diego, CA	Tom Clarkson, (619) 486-4068
Aug. 2	Slope Combat	San Diego, CA	Arthur Markiewicz, (619) 753-3002
Aug. 3	2 Meter TD Contest	San Diego, CA	Patrick Dionisio, (619) 586-7997
Aug. 9	RCHLG	Orlando, FL	Ed White, (407) 321-1863
Aug. 9	CSS Club Contest	Cincinnati, OH	Ed Franz, (606) 586-0177 edkim_franz@msn.com
Aug. 9	60" Slope Race	San Diego, CA	Bob Matheson, (619) 754-2657
Aug. 10	Gentle Lady	Orlando, FL	Rick Eckel, (407) 365-9795
Aug. 9-10	Summer Soar	Bristol, VA	Bernard Leonard, (540) 669-4387
Aug. 17	Open TD Contest	San Diego, CA	Patrick Dionisio, (619) 586-7997
Aug. 30-1st	SHA Western Div. Workshop	Tehachapi, CA	Dan Armstrong, (805) 822-8852 danarmstro@aol.com
Sept. 6	HLG Contest	San Diego, CA	Tom Clarkson, (619) 486-4068
Sept. 6	Slope Combat	San Diego, CA	Arthur Markiewicz, (619) 753-3002
Sept. 7	F3J	San Diego, CA	Mike Ziaskas, (619) 484-7596
Sept. 13	60" Slope Race	San Diego, CA	Bob Matheson, (619) 754-2657
Sept. 14	Open TD Contest	San Diego, CA	Patrick Dionisio, (619) 586-7997
Sept. 13-14	Sailaire One Design Contest	Cincinnati, OH	Paul Siegel, (513) 561-6872
Oct. 4-5	CSS Pumpkin Fly	Cincinnati, OH	Ed Franz, (606) 586-0177 edkim_franz@msn.com
Oct. 4-5	24th CVRC Fall Soaring Festival	Visalia, CA	Phil Hill, (209) 686-8867
Oct. 11	60" Slope Race	San Diego, CA	Bob Matheson, (619) 754-2657
Oct. 12	Open TD Contest	San Diego, CA	Patrick Dionisio, (619) 586-7997

Oct. 11-12	Fall Intergalactic HLG	Cincinnati, OH	Paul Siegel, (513) 561-6872
Oct. 11-12	Fall Soar	Bristol, VA	Greg Finney, (540) 645-5772
Oct. 25	TPG Fun Fly	San Diego, CA	Don Richmond, (619) 587-0226
Nov. 2	2 Meter TD Contest	San Diego, CA	Patrick Dionisio, (619) 586-7997
Nov. 8	CSS Turkey Fly	Cincinnati, OH	Ed Franz, (606) 586-0177 edkim_franz@msn.com
Nov. 8	60" Slope Race	San Diego, CA	Bob Matheson, (619) 754-2657
Nov. 15	New England R/C Soaring Convention	Portland, ME	Steve Savoie, (207) 929-6639 Jim.armstrong@acornbbs.com
Nov. 16	Open TD Contest	San Diego, CA	Patrick Dionisio, (619) 586-7997
Nov. 28-30	24th Tangerine	Orlando, FL	Don Cleveland, (407) 696-7516
Dec. 6	HLG Contest	San Diego, CA	Tom Clarkson, (619) 486-4068
Dec. 6	Slope Combat	San Diego, CA	Arthur Markiewicz, (619) 753-3002
Dec. 7	Open TD Contest	San Diego, CA	Patrick Dionisio, (619) 586-7997
Dec. 13	60" Slope Race	San Diego, CA	Bob Matheson, (619) 754-2657
Dec. 14	F3J	San Diego, CA	Mike Ziaskas, (619) 484-7596

Schedule of Special Events - Outside U.S.A.

May 10-11	Elekrosegler-Dauerflug, MSC	Testerberge, Germany, DMV*	Egon Döschner 011-49-4721 62727
May 10-11	Glider Tow	Wanna, Germany	Etienne Dorig, (514) 449-9094 ICARE@telts.com
May 16-19	Coupe du Quebec Slope Race	Leclercville, Qc, Canada	DMV*
June 7-8	DM Motorsegler, MFG	Libelle, Germany	Steve Holmes, +44 121 353 7487 steveman@cyberphile.co.uk
June 21-22	BARCS Interglide F3J International	Aldridge Airport, Walsall, Staffordshire, England	Jack Nunn, (705) 728-4467
June 28-29	Ontario Grand Prix Soaring	Cookstown, Ont.	(Model Club Lichtenstein)
June 28-29	IGG Airtow Weekend	Bendam, Switzerland	Peter Aeberli, 011-41-1-915 37 53 Jack Kagi, 011-41-1-926 2187 Bob Sherliker, (905) 820-2799
July 5-6	F3J	Brantford, Ontario, Canada	DMV*
Aug. 1-3	Akro Cup Semi-Scale Segler, FSV	Dreieich, Germany, Deutscher Modellflieger Verband*	Gerry Knight, (905) 934-7451 Don Smith, (905) 934-3815 Mistral@niagara.com
Aug. 1-3	Int. DM Scale/Semi-Scale Segler, MFG	Kranish Simmerath, Germany, DMV*	
Aug. 16-17	Scale Fun Fly (GNATS)	Niagara Peninsula, Canada	DMV*
Aug. 21-24	Int. DM Semi-Scale-Motormodelle, MSC	Condor Göttingen, Germany, DMV*	
Aug. 23-24	IGG Slope Soaring Weekend	Hahnenmoos, Switzerland (near Adelboden)	Peter Aeberli, 011-41-1-915 37 53 Jack Kagi, 011-41-1-926 2187
Sept. 13-14	DMFV Scale Masters Motor Glider - Germany		Winfried Olgard, or Bernd Wich 011-49-2 28 97 85 011 (direct line) Turkey Aeronautical Association**
Sept. 13-21	World Air Games	Turkey	Lars Biermann 011-49-5173 1377
Sept. 20	R/C Glider Euro-Cup	Uetze, Germany	Winfried Olgard, or Bernd Wich 011-49-2 28 97 85 011 (direct line)
Sept. 19-20	DMFV Scale Masters Scale Sailplane - Germany		
Aug. 1998	F3J World Championships, organized by BARCS		

* Deutscher Modellflieger Verband - tele. 011-49-2 28 97 85 00, fax 011-49-2 28 9 78 50 85
** Turkey Aeronautical Association - tele. 903123104456/903123104840

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1st WORLD AIR GAMES - TURKEY 1997

THE 1ST WORLD AIR GAMES are one of the greatest events the FAI is going to produce. The Turkish Aeronautical Association was entrusted to organize the Games in Turkey between the dates of 13-21 September 1997.

The World Air Games will be a first in the history of Aviation as well as in the history of the world. There will be 17 different Championships in various aviation categories, such as Aeromodelling & Spacemodelling, Ballooning, Hang-gliding, Paragliding, Aerobatics, Helicopters, Microflights, Formation Skydiving, Skydiving, Style and Accuracy Landing, Gliding, Air Rally Flying and Long Range Air Rally Flying.

All these events will be run simultaneously at eight different venues in Turkey.

Last year the Turkish Aeronautical Association held the 1st World Air Games Test Competitions. The test competitions for the Aeromodelling and Spacemodelling Championships were held at the Ankara Gölbaşı flying venue. The competitions were organized in the same categories that will be run at the WAG in 1997, which are FF F/A-B-C (Senior/Junior), F3C, F3B and SM S/B-S3A-S4B-S5C-S6A-S7-S8E.

The Gölbaşı flying venue at Ankara is very suitable with regard to surface and meteorology and is about 55 km away from Ankara where the accommodation facilities are established. 98 competitors from seven countries (Israel, Kazakhstan, Ukraine, Poland, Germany, Russia and Turkey) participated in the test competitions. Participation at the WAG in 1997 is estimated to be 4 times larger.

The 1st World Air Games Aeromodelling and Spacemodelling Championships '97 will be run in 4 different categories:

World Cup	F/A-B-C (Seniors)
Open European Championships	F/A-B-J (Juniors)
World Championships	F3B
World Championships	F3C
Open European Championships	SM (S/B-S3A-S4B-S5B-S6A-S7-S8E)

Between the dates of 7 - 13 September '97 the F/F and F3C Championships and between the dates of 14 - 21 September '97 the F3B and SM Championships will be conducted.

Due to a decision taken by the organizers of the Championships there will be both an individual and team classification in the F/F World Cup. In the Open European Championships there will be two different classifications, a general classification and a classification that applies only for competitors from Europe.

Apart from having the honour to participate in an event that is to be the first in aviation history, the competitors will also have the chance to enjoy the historical and natural beauties of Turkey.

As the organizers, our greatest ambition is to make a success out of the 1st World Air Games Aeromodelling and Spacemodelling Championships.

* For further information about the 1st WAG '97 Aeromodelling and Spacemodelling Championships you can contact the Turkish Aeronautical Association.

TURKISH AERONAUTICAL ASSOCIATION

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There is hardly anything more gratifying than introducing a beginner to your particular area of enthusiasm. There's nothing quite like watching somebody "get it", and then go off and infect others.

In the January issue of *RCSD*, I read with interest David Godfrey's comments about how much fun it is to have different skill levels available in a contest. I wholeheartedly agree with what David had to say, and would encourage all of you who plan to run any sort of competition to find a place for the beginners to compete, if you don't already! These very beginners you have encouraged may well come back and teach the rest of us a thing or

"Hot Air"

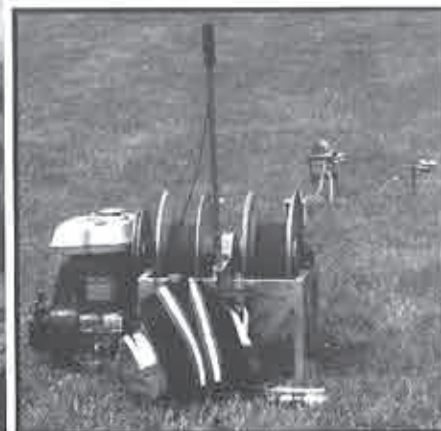


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I.G.G. - On Tow with
Ka6E. Photo courtesy
of Jack Kagi,
Switzerland.



I.G.G. - Photo courtesy of Jack Kagi.



I.G.G. - Home built power winch for the big ones: 65 hp motor from Honda, with dual drum system to retrieve tow line. Photo courtesy of Jack Kagi.

Scale Nationals

As of mid-March, there are already 11 entries for sailplane sport scale at the NATS this year! It will be run according to existing AMA rules. We are trying to line up a couple of competent pilots to airtow. There is a strong possibility that this event will have airtow for launch (winch, as well), but nothing is certain, as yet. There will not be a (new) demo airtow event this year.

Quite A Stun!

I never realized how useful it is to know how to fly inverted, until I saw Fred Rettig do a loop on a high start. Yes, you read right! A loop! Down elevator, while inverted, saved the day! What's next? Aerobatics, while on a winch, or while being towed?

More Refinements on Proposal for New Scale Event.

The February issue of *RCSD* included guidelines for an AMA scale event. After trying out flat field aerobatics with a (Roedelmodell) Fox, several of us decided that 10 maneuvers was too many, and too complicated to deal with. How about five, and a mandatory landing? Any suggestions?

The AMA scale event proposal is for a flat field event using airtow as a means of launching. However, a similar and highly successful event could be held on a slope (no airtow necessary), with

two, which is what it's all about!

For example, just three years ago, John Derstine had never seen a towplane, and look what he's doing for the rest of us now. We are all eagerly looking forward to the next Elmira airtow event, this time to be held at the full-sized glider port (June 13-15, 1997)! Thank you, John!

And speaking of Elmira, although it's a fun fly, don't be surprised to see some of the top sailplanes in the world show up. I recently had a chance to see Rusty Rood's soon to be completed (Prißek) ASW 27, which is one of the best finished sailplanes I've yet seen. And, Pete DeStephano is planning to bring his 1996 and 1997 WRAM winning TG-3. We expect to see gaggles of sailplanes, which will include: ASK-21, ASK-18, Discus, ASW-24, Ka6E, Nimbus 4, LS 4, ASH 26, Fox, DG 800, DG 600, etc. And who knows what the Germans plan to bring, complete with "show team"! As for scale towplanes, expect to see Wilga, Spacewalker, Husky, Yak 112, Pilatus Porter, Flybaby bi-plane, and others.

May 1997



the added advantage that most of the aerobatics could take place much lower and be much more visible. There are excellent, large, slope soaring sites scattered throughout the USA, but certainly seem to dominate the western half of the country.

I hear through the grapevine that some of you competitive types now have scale sailplanes and are raring to go. So, why not organize a fun aerobatic competition, choosing whatever format and guidelines you wish to, and try out your skills?

For you excellent, hot-blooded pilots, you will get a chance to duel it out! For you newcomers, this will be an eye-opening experience and a good chance to learn how to make your ship perform.

Sooner or later, somebody's going to get the bug and what an event it will be! Please let me know when and where! I cannot imagine better entertainment for the spectators!

An Update On Scale Sailplane Competition In Germany

As you well know, the Germans have had a long and rich heritage in full-sized sailplanes, and so it's no surprise that Germany is the world center for scale sailplanes, as well. With a

I.G.C. - It's not real; it's a model of the Duo Discus. Only the pilot is missing. Photo courtesy of Jack Kagi.

population of some eight million people, and approximately the size of New England, New York and one-third of Pennsylvania put together (or Newfoundland plus Florida plus Georgia plus South Carolina), one can quite easily drive from one end to the other in a long day. When they hold a scale competition event, it's attended by people throughout the country, as well as from Switzerland, France, Great Britain, Italy and elsewhere. The problem we have in America is we're just too big - but that's another story!

There are numerous scale fun fly, slope and airtow events held throughout the country almost on a weekly basis, but there are also some very interesting competitive scale events, as well. Three in particular are outstanding, and judging from what I can glean from the German magazines, scale competition is becoming more and more popular.

Deutsch Meisterschaft Scale und Semi-Scale Contest

This 2 day competition is held at a different location each year, and is a must! Run along somewhat similar



I.G.C. - Two large Mosway 4, Swiss design from 1943. Photo courtesy of Jack Kagi.



Motor Gliders - ASH 25 with 6.25m - 6.5 cm³ motor type OS. Pilot E. Reiff; model from EMS. Photo courtesy of Rolf Scheifele, Germany.

lines to the scale airtow format outlined in the February issue of RCSD, last year's competition had 37 entries and seems to be growing every year. Hosted by the DMI/V, roughly the equivalent of our IMAA here in the USA, this competition was started some 10 years ago, and is extremely well attended and popular with pilots and spectators alike.

Scale is judged up close and personal, while semi-scale is judged some distance away. The flying portion for both is identical, with the sailplanes being towed up as high as they want, in order to complete required maneuvers and, of course, a landing. Interestingly, no "builder of the model" rule applies, and a scratch-built sailplane can compete with an A.R.P., or a "team" (the pilot is not the builder). So, anyone can take any scale sailplane and can still compete.

The way the rules are written, a non-aerobatic Minimoa can do just as well as a fully aerobatic Fox. This is very important, because it means that EVERYONE has a good time.

With airtowing as the means of launching, pilots tend to bring very large (great flying) sailplanes and hence you will find an assembly of huge, superbly finished and excellently



Motor Glider Masters - Motor Glider type G-109; Grob 109, Falke, EMS DG 800, ASH 25, and Janus. Photo courtesy of Rolf Scheifele.

detailed scale sailplanes, which look and fly like the real thing. What a show!

To give you some idea of the variety and scope of what you are likely to see, last year's top nine finishers in each class are as follows:

Semi-scale: ASK 18, Ka 6, Rhönbussard, ASK 13, ASH 26, Fox, Ka 6E, Ventus IIc, Grob G 103 Twin

Scale: Ka 8b, Kobuz-3, DG 300 Elan, Gö-4 II, Astir CS, ASK 23 b, Gö-2 Minimoa, Rhönadler 35

Team Scale Airtow

This is another very interesting 2 day, scale sailplane event. Picture 25 or so incredibly finished scale sailplanes with 25 scale towplanes, any of which



Minimou from EMS (4,8--), pilot Walter Petes. Photo courtesy of Rolf Scheifele.



The three biggest gliders at the German Masters: ASH 26 (6m), ASW 15 (6m), and ASW 24 (5,40--). Photo courtesy of Rolf Scheifele.



Ventus 2C, started in semi-scale. 4,80-wing span. Pilot: Vogt, EMS team. Photo courtesy of Rolf Scheifele.



Kobuz 3, winner of 1995, first place in scale. Photo courtesy of Rolf Scheifele.

would be a worthy Scale Masters competitor here in the USA!!!!!! Each sailplane pilot flies with his own tow-pilot and competes in this event as a team. They are required to take-off, do a figure eight on airtow, and tow to height; then the towplane must drop its towline on the spot, come in, and do a perfect landing, also on the spot. His teammate, the sailplane pilot, is required to do certain maneuvers, as well. Also hosted by the DMFV, this event has recently become extremely popular and very well attended.

If ever you wanted to see which towplanes will tow what sort of sailplanes, this is an event not to be missed. You will find everything from a vintage biplane towing a Minimou, to a Wilga towing a Fox. And again, as you might expect, the sailplanes and towplanes are 1/3 and larger in size, with some gliders spanning over seven meters! Spectacular!!!!!!

Motor Gliders

The third competitive event is for motor gliders, and is also sponsored by the DMFV. As you might well expect, with a very enthusiastic following,

many different completely scaled out and very large motor gliders are to be seen. Everything from the earlier vintage types to the more modern DG 800s with retracting motor pods.

A bit similar to the Scale Masters (powered aircraft) competition we hold here, the motor gliders are put through their paces!

Fun-Flys in Switzerland

As you might well expect, there are numerous very interesting scale fun-flys which take place not only in Germany, but throughout Switzerland and Austria, as well.

Certainly, many of you have now heard about the long standing I.G.G. (which roughly translates to "those interested in large scale sailplanes") get-togethers held in Switzerland each year. There are two events, one being an airtow event and the other a slope soaring event. Each of these draws over 50 very large scale sailplanes, some spanning well over seven meters and weighing up to 50 pounds. At least one American attended each of these events last year and came back wildly enthusiastic.

Fun-Flys in Germany

Not to be outdone, the Germans also hold many, very interesting fun-flys throughout the country; new ones are springing up all the time. These are the "usual" airtow events, as well as slope soaring; there are also at least two specialized events that I know of. One of these was a very well attended vintage event - nothing but vintage scale gliders, and judging from the photographs I saw in the magazines, they were absolutely superb. And the other? What else could there possibly be? How about flying wings? Although not strictly scale, I thought this was unusual enough to merit mention here. Picture a field filled with nothing but flying wings - many of them in the four to five meter class.

If any of you plan to travel abroad this year, I will try to keep you posted as to what noteworthy scale events will be taking place in Germany, Switzerland and elsewhere. Watch the events calendar in RCSD.

Judging from the comments of those few who were able to attend these spectacular get-togethers last year, they are well worth rearranging your vacation or business trip, so that you can attend.

Research

If you have a business or pleasure trip already planned, and are not going to be across the pond when these listed events will be taking place, don't despair! There are many fun-fly and local events which you might catch. Pick up the equivalent of our model magazines from any newsstand (FMT, MFI, Aufwind, Modell), and have a German-speaking friend peruse the

calendar of events; you may well find something happening just an hour's drive away or less! Also, don't forget the model shops - these people can often point you in the right direction. If you have time, a little sleuthing can pay rich rewards.

Oh, and by the way, don't forget to bring your camera and plenty of film!

Good flying! ■

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- 1/4.2 FiberClassics Nimbus 4 - 6.28 meter span (246"), wing profile E 68-66, ca. 18 lbs.
- 1/3.6 Roedelmodell DG 800 - 4.15 meter span (163"), wing profile E 207, ca. 11 lbs.
- 1/3.75 Roedelmodell Fox MDM-1 - 3.8 meter span (149"), wing profile RG 12, ca. 15 lbs.
- 1/4 Roebbers Pilatus B-4 - 3.75 meter span (147"), wing profile Ritz 3, approx. 8 lbs.
- 1/4 Roedel Piper Super Cub (scale towplane) - 2.687 meter span (105"), wing profile Clark Y mod., approx. 15 lbs. This airplane is partially built. It requires additional building and covering. Suitable motors are OS 160 T, OS BGX-1, Brison 3.2, or similar.
- 1/4 EMS DG 800 with electric pop-up motor installed - 3.7 (145") to 4.2 (165") meter span, wing profile HQ 2.5/14, ca. 7.5 lbs.
- 1/2.77 PriBek ASW 19 - 5.4 meter span (212"), wing profile Ritz 3 mod., ca. 20 lbs.
- 1/3 ASK 13 - 5.33 meter span (209"), wing profile E 68-67-66, ca. 32 lbs. Completely built & ready to fly with all servos installed, brand new, unflown.
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- Orfa all glass ASW 24 (1/3.3, 4.50 m/177" span), mint condition, includes retract, nose release, all Futaba servos installed, completely ready to fly.

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Wind Tunnel Tests of Wing Profiles

...by Martin Simons
Stepney, South Australia

(An expanded version of a talk given at the LSF Conference held at Jerilderie, New South Wales, Australia, Easter 1996.)

Part I

Among the various topics I am asked to comment about, the one that seems to attract most interest is the wind tunnel test results coming from Michael Selig's group. Probably many readers of *R/C Soaring Digest* have already obtained the volumes concerned and have studied them. If you have done this, I can add very little. What I may be able to do is draw attention to a few important issues and encourage a little more support from model fliers for the continuing research program. It does depend substantially on financial contributions and personal sponsorship.

For those who have not yet seen them, **Soartech 8** entitled **Airfoils at Low Speeds**, was written by Michael Selig, John Donovan and David Fraser; it was published by Herk Stokely in 1989. This was a compilation and thorough explanation of the test and profile design work carried out at Princeton University during the late eighties.

The more recent volumes, **Summary of Low-Speed Airfoil Data, Volumes 1 and 2**, appeared respectively in mid 1995 and April 1996, the authors being Michael Selig, James Guglielmo, Andy Broeren, Philippe Giguere, Christopher Lyon and Cameron Ninham, also published by Herk Stokely. These describe the first stages in a new program of research being done under Selig's leadership, he now being a Professor of Aeronautical Engineering at the University of Illinois at Urbana - Champaign (UIUC).

All these important works and new volumes, as they are ready, can be bought by writing directly to Herk Stokely at 1504 North Horseshoe Circle, Virginia Beach, VA 23451, USA. Selig's information coordinator can be reached on **e-mail: c-lyon@uiuc.edu**, or by **fax [USA] (217) 244-0720**.

It has to be said immediately that the modeller who is looking for a wing profile that will give a sailplane or any other type of model a superior performance will not find an easy answer by a quick skimming through these volumes. It is rightly pointed out in the text that the choice of section for a model will always depend on the judgment of the designer. For the multi task type of contest, one profile may seem to have an advantage in speed, another in soaring and perhaps another for distance tasks. Yet another may seem preferable for launching. (Flaps, of course, allow a lot of variations. One reason for supporting the researchers is that we need more data on the effects of flaps.) Which profile is finally chosen depends on how much importance the pilot places on each phase of the contest.

New types of model sailplane contest are invented from time to time. Hand launched gliders, for example, are entering a new phase; the [3] type of competition is now popular, and electric powered sailplanes are becoming common. Each has its own special needs. What sort of models will be required if cross country competitions, with aero towed launching, controlled by electronic height measuring devices, are introduced?

We might consider also the likely effect of changing the rules of those contests that are already well established, but which are subject to criticism for various reasons. For example, what different wing profiles would be required if the duration task in the F3B competition was eliminated entirely and the time available for the distance task extended to fifteen minutes? Or, suppose the speed task was to revert to two laps, only.

After any alteration or extension of the rules, the emergence of a new type of model follows, perhaps after a few seasons. The rule makers, in fact, tend to push fashion in certain directions, often with unforeseen consequences.

An appreciation of just what is required of the sailplane in a particular kind of flight, and hence what is needed for success in any particular type of competition or task, is vital. Serious thought will still be required and, as always, a great deal will depend on fundamental understanding of aerodynamic principles.

Phillips airfoil sections patented 1884

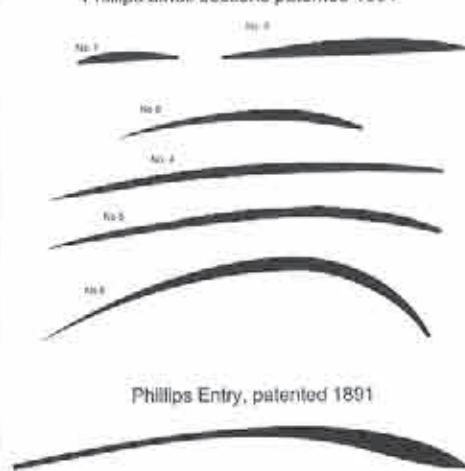


Figure 1. Horatio Phillips, a pioneer of wind tunnel testing, invented the double surface airfoil and patented his designs. The Phillips entry was patented in 1891.

Historical background

To emphasize the importance of the new work, a little historical background is needed. When I began in 1974 writing my book **Model Aircraft Aerodynamics** (first edition published in 1978), I wanted to include an appendix with reliable wind tunnel test results on wing profiles.

I was forced to recognize that most research work that had ever been published before was virtually useless for modellers. There was, and of course still is, a vast amount of information about the thousands of wind tunnel tests, which were done in all sorts of places around the world, from the time of Horatio Phillips (inventor of the Phillips entry), a hundred years ago, until the mid nineteen thirties (Fig. 1). Almost all of these were done in small wind tunnels with small test models at very low airspeeds. They were really not what the aircraft industry wanted, but they were the best that anyone could do at the time. The sections were usually tested at only one airspeed, the measuring equipment was unsophisticated, and the results subject to serious experimental errors. They provided only a very rough guide to designers of full scale aircraft, but were better than nothing.

The disadvantages from the industry's viewpoint seemed to be advantages for model fliers. The defects of the early tests,

slow speeds and small sizes, made it appear that the results could be applied directly to model aircraft. They frequently were used, as old modelling books and magazines prove. The models did fly, although it was soon realized that the existing wind tunnel results were at best a very crude guide.

For example, many of the tests on the famous Göttingen wing sections were done with supporting wires actually running crosswise in the airflow ahead of the leading edge. These, unknown to the engineers, introduced fine-grained turbulence into the air and this did make, and does make, a difference. These 1920 to 1930 results were very unreliable.

Postscript

Much remains to be done by the researchers and they deserve support of every kind and from every possible direction. Let's see that they get it. Donations may be sent to Professor Michael Selig at:

Department of Aeronautical and Astronautical Engineering
University of Illinois at Urbana-Champaign (UIUC)
306 Talbot Laboratory
104 S. Wright St.
Urbana, IL 61801-2935 USA
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Part II continues the discussion with Reynolds Numbers. ED ■



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A Fitting End The End of a Vacation

...by William C. Swingle II
Pleasanton, California
bill_swingle@electro-test.com

My flying vacation (i.e., work in the morning and fly in the afternoon) was coming to a close, and I wondered how I should end the 4 week vacation. The answer came to me by both common sense and fate: Los Banos, of course.

For those of you unfamiliar with Los Banos, it is a state park built around the San Luis Reservoir located near Los Banos, California, roughly 120 miles east southeast of San Francisco and 80 miles northwest of Fresno.

It appears to be the perfect place to build a dam. The river carved a deep, wide canyon, which is roughly "L" shaped. The canyon walls of the dam extend several hundred feet above the water, are very steep, and generate good lift. The lake surface keeps the lift very smooth. The dam is on the eastern edge of the foothills, which form the western boundary of the San Joaquin Valley. The location is good for wind, because it is right in the path of the cool air from the Pacific Ocean, as it rushes in to replace the hot, rising air in the valley. The prevailing wind blows right over the dam, up the lake and into the canyon walls. A park ranger I spoke with said, "...The winds are always changing." My experience has been that the wind is deceptive. I've seen it flyable from two separate slopes, which face 90 degrees apart. Neither was very good, though.

I arrived mid-afternoon. The wind was too westerly to use the usual flying location. So, I stopped just inside the gate and tossed. I'd never flown that slope and it was definitely weird: places of huge, monster lift, and places of turbulent sink. I found it interesting, to say the least. The landing area was large, but I like to land at my feet. Where I was standing, the rim was flat enough only for the road. So, I had to walk 40 feet to pick up the plane. Obviously, not noteworthy, I was reminded that a car, parked right on the ridge, can make the behind-the-ridge rotor worse. A minor point, but one I'd forgotten.

The winds not being optimum at my first location, I drove further down Rim Drive, stopping any time a section of the rim looked interesting. I flew 4-5 times before I got to the bend of the "L". Each location was flyable and had places of decent lift, but weren't enjoyable. The wind direction was difficult to determine. The ripples on the water seemed to come from two different directions. I continued along Rim Drive. I flew several times between the bend of the "L" and the end of the road, including what appeared to be the typical flying site. Each was the same: good lift, good sink and bumpy. The flying was actually best at the end of the road, but still not good. I continued roaming the rim and flew two previous locations, watching the winds as the afternoon progressed.

At about 4:00, the wind seemed to settle. It started blowing straight up the north facing slope, which is the most often used. It soon settled to about 20 mph. Beautiful. Lots of lift with very little horizontal component. I was having a great time, and had the place all to myself. Soon thereafter, Mr. Ranger showed up. Nice enough fellow. He checked that I had put my \$5 in the slot at the gate. I asked what the fine was for not paying and was told, "Well, the parking ticket is \$44." I was surprised he took the time to drive all the way up the ridge, just to check one park user, especially considering how obvious it was that he didn't really want to be there.

I had landed when the ranger arrived, noticing just how smooth and "slippery" the slope was. A decent landing would result in a 20 foot slide. Then, the idea hit me: Touch and Go's! Without wheels and a decent runway, touch and go's hold a bit of challenge. I do them rarely at my local hill, Del Valle, because the pavement and gravel chews up the fuse. I had tried them on the coast, Tick Hill, but each blade of grass had a little tuft on it that was a tremendous energy killer. Sorta like politically correct grappling hooks. Here at 'Banos' it was perfect.

My thanks to the organizers of the recent scale competition at 'Banos'. I imagine they were the architects who cut the grass so nicely. The remains of the grass had also been trampled down so well, that it was like a firm bed of straw, smooth and slippery (hay haulers will fully under-

stand the slippery part).

With such a perfect surface, it was easy. I did many. I did learn though that a flat bottom fuse, with no wheels, will not easily perform a "Touch-R(slide)OG-Go". Once the fuse sets down, there's no way for it to rotate back up and achieve an angle of attack sufficient to lift off. Also, it became readily apparent, that sliding bleeds off energy VERY fast (go figure). I was unable to do a decent "touch-slide-go" maneuver. It was close, because the irregularities of the ground often pitched the nose up while sliding; but it was never enough. However, bouncing the fuse on the ground worked well, and proved the best method. I'm no thermal pilot, but would assume that it could be described as a soft, nearly aborted dork. Then, I thought of a better idea: a DOUBLE touch and go. I'd come in fast, bounce the fuse on the rear of the landing area, pull it up, and then bounce it again, shooting over the edge of the ridge. So, I made my approach (ugly air back here), bounced, held level (Wow, those bounces lose a lot of energy!), and bounced, again. (Hey, looks good, but what about the grass on the edge...) As it turned out, I found out that if you hit 20 inch tall grass, at an altitude of about 6 inches, it will make a dandy arresting net. Hmmm, I could have made good use of that at a coastal cliff a few times. Kind of a neat trick, if I'd planned it. But, I didn't. I tried again.

Try number two was successful: double bounce, clear the grass, and end with a really ugly, low airspeed victory roll. (It looked pretty to me.) I was able to successfully complete several more doubles; the most difficult part was maintaining sufficient energy to pull out after the second bounce.

This was challenging, and I flew myself silly, feeling like a maniac clown on a pogo stick. Occasionally whooping and hollering, it was a great day.

It was getting late and departure time was approaching when I caught myself making that ubiquitous mistake. I started thinking, "How should I end the day? What last maneuver would be fitting to end such an incredible month of flying?"

Warning bells sounded in my head! Danger! Danger!

I instantly realized the danger of the "last flight" thought, remembering the "one last flight" thought that we've all had end in disaster. But after such a great month, it was deserved. A tribute was in order, so I continued with my perilous thinking.

Being an engineer, I'm creativity challenged. I had a hard time looking for the fitting tribute. I settled on something I hadn't done before (more perilous thinking): an inverted hand catch. Twenty or so passes later, with the sun setting over the foothills, the nose of the plane slid into my hand, inverted, coming to a stop with the leading edge smacking into my thumb and fore finger. Hooray! Hooray... Smack? Smack??

No. This wasn't good enough. Not appropriate. It didn't feel right. It didn't have character. "Ah hah," I thought. I had been looking for razzle-dazzle when, in reality, STYLE was what was needed here. Oooh boy, style, which is not my forte. Being the only one there, I pressed on. Then it hit me; how about a very slow roll, the type where you really should have a rudder, but that you can fake if you don't? So, down the ridge, smooth turn, approach right to left, eye level, 50 feet off the slope, crack the ailerons slightly, and modulate elevator... It was gorgeous.

I landed, took a few pictures, and cracked an ice cold soda, as I eased out the clutch. ■

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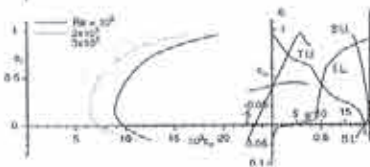
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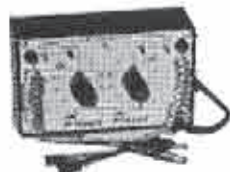
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Tweak Your Trim Tabs at TV Time

...by Robin Lehman
NYC, New York



Why do some pilots always seem to find lift, while others seem to find sink all the time? Very probably the better pilots are always experimenting and trying to get the best out of their sailplanes.

Using the trims on the radio, and especially the elevator trim with ease when desired, will often greatly enhance a sailplane's performance.

Why change trim at all? Here are a few examples. While thermalling, or on a light air day at the slope, you might want to fly with a little up-trim; when you go on to the next thermal, or when it's windy on your hill, or when you start your landing pattern, you might want a little down-trim; when you are on airtow you might want to alter the trim to get the best possible rate of climb; if you are in a thermal for a long time, you might want to dial in a little turn with elevator, and let your ship fly itself.

I noticed at a recent fly-in, how difficult it was for some pilots to adjust their trim tabs while flying. Many had to look down at the radio, which is not a good idea under any circumstances, and a terrible idea when the sailplane is specked out and a tiny dot in the sky, because you could easily lose sight of it.

Do you want to solve this problem? Here's a very simple exercise which will take but a few moments, and you don't have to wait for perfect flying weather outside! Get your radio while watching the evening news - or whatever - on TV, and holding your

radio in the usual flying mode, and WITHOUT LOOKING - find your trim tabs. Keep your hands on both sticks and continue to find your trim tabs. Do not look down at your radio, but keep feeling for where your trim tabs are. A few minutes a day for just a couple of days should suffice. When you can instantly find any trim tab - and especially your elevator trim - by feel alone, you are ready to use your new found skill for real. If you get used to doing this, it will serve you well, and help you get the

most out of your scale sailplane.

When you can find your trim tabs instantly, while continuing to fly and WITHOUT LOOKING DOWN, you've probably solved your problem and given yourself a wonderful new tool to use. If you have never used your trims very much before, you will be amazed at how much better your sailplane will perform, if you trim it to fly itself!

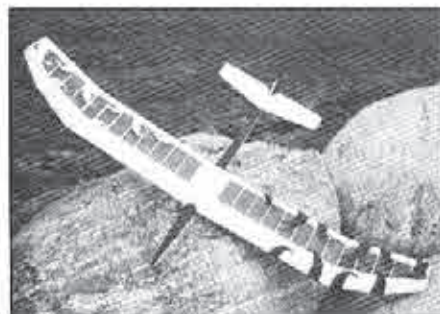
For what it's worth, with every scale sailplane I fly, I always change the (elevator) trim several times during each flight. And when airtowing, it's all the more important when flying the towplane. I find that each glider requires its own rate of climb, and the towplane has to be trimmed accordingly. For example, a very light glider on tow might require more up-trim on the tow plane, so as to get a very steep rate of climb, while a heavier glider will require much less up-trim to achieve a gentle, stall-free rate of climb. The idea is to get the tow plane and the glider to fly themselves. The less they have to be flown, the better will be the airtow (and the same holds true for thermal duration, extremely windy conditions, etc., etc., etc.). You get the idea!

To make a long story short, learn to fly so that you don't have to fly your sailplane, and you may well find that you will be getting the best performance out of your ship. The trim tabs (especially the elevator) are a very important tool, and if you can use them quickly and easily, you might well improve your flight performance.

Good flying! ■

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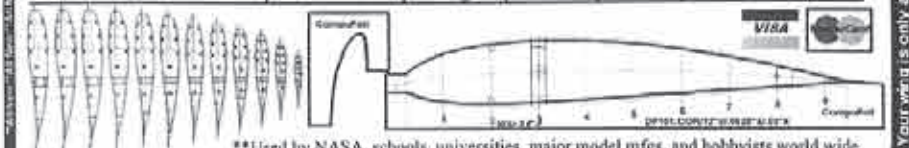
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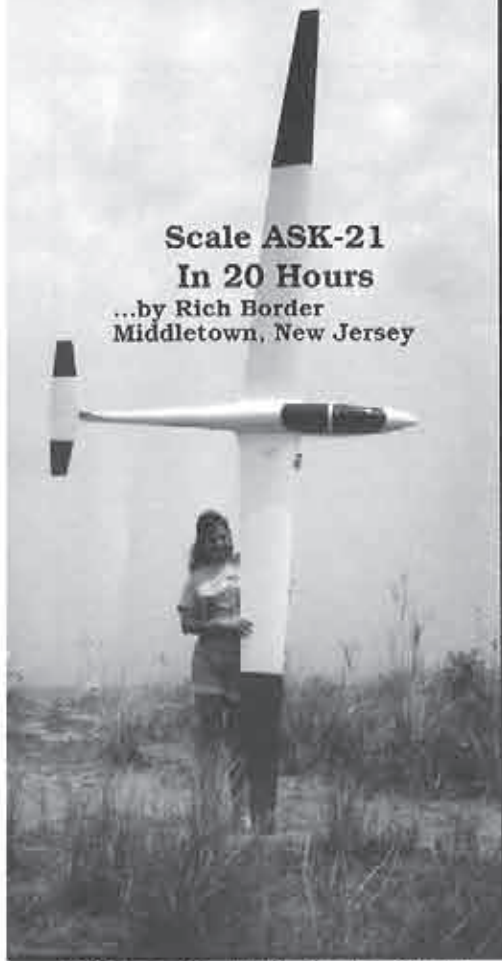
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In January of last year, my flying buddy, Ed Lightcap, talked me into going to the First Annual Northeast Aerotowing Fly-In, which was held on June 1 - 2, 1996. I figured that this wouldn't be a problem, as that gave me six months to build my cross country ship. First, I went on vacation; then, I found myself working overtime at work during the months of February, March, and April. There was no time to build!

Well, May rolls around, and finds me just starting to make templates and cut cores. I told myself, "Better get moving!" And, then, Ed calls and wants to know if I want to buy back my Comet fuselage; he suggests that, maybe, I should also look into the big

sailplanes imported by Sailplanes Unlimited, Ltd. "No," I said. "I'm a scratch builder!" Well, I stopped and thought about it. I realized that it's the middle of May, and my girlfriend wants to go away for a mini-vacation. So, I changed my mind and said, "Great! I'd love to!"

I dug out my copy of *RCSD*, found the telephone number, and called Sailplanes Unlimited, Ltd. They had an ASK-21 in stock, and it seemed to be the most bang for the buck. Sharon said I could stop by and pick it up; they're on 82nd street in Manhattan, and I work in southern Manhattan. The next morning found me ringing the doorbell at 9 o'clock; the third floor greeted me with a room full of huge boxes. I asked myself, "Have I died and gone to heaven? There were ASK-21's, ASK-18's, ASW-24/27's, and others. Plus towplanes, too.

I opened a box containing an ASK-21, which is an ARF; great workmanship! This was for me, so I paid Sharon, and took off down Park Avenue, dodging taxis, as the huge box was hanging out my side window!

Building the ASK-21

The plans and instructions are in German. I don't read German, but this is basically only a six or seven part plane. So, in my best accent, I said to myself, "Plans! I don't need no stinking plans!" I checked to see just exactly what needed to be done.

The first thing I did was install the wing tube sheaths in the wings, which is a straight forward operation. Then, I cut out the holes for the wing tube and alignment dowels. In order to install the wing tube sheath, I slipped the wing tube through it, while in the fuselage, which held it firm; then, I wrapped it with Kevlar™, with the ends cut, so that the pieces looked like a flower's petals. I poured on the CA, and worked the petals against the fuselage's sides. Next, the alignment dowel was installed in the wing root, and waxed; the wing was placed on the fuselage. Standing on a chair, with the wing down, I applied 5 minute epoxy and microballoons over the dowel, inside the fuselage; five minutes later, I pulled the wing off.

Next, I wired up long leads for all four servos. To save time, the spoiler bays

were filled with balsa; each were sanded flush with the wings. The hole in the bottom of the wings was filled with blue foam, and sanded flush. The foam was then covered with brown paper, soaked with a solution of water and white glue. I mounted an aileron servo in each wing; then, covered the wings to finish them. The ailerons were hinged with 3M Crystal Clear tape. It's .002" thick by 3/4" by 650" for \$1.95, and works great!

I covered the elevator and stab, and then hinged them. The stab was used as a template to put the "T" nuts in the fin. I had to cut a 1/2" notch in the rudder in order to clear the elevator linkage, which had not been installed, yet. The canopy was trimmed, and everything was thrown into the car; I was supposed to meet Ed in New York the following day.

The next day, when Ed arrived at the motel, I asked him to install the aileron linkages and program my Vision radio for spoilerons. While Ed watched the toothless, Canadian, ice boxing semi-finals, he did what I asked; I mounted both the elevator and rudder servos in the fin. The servos were epoxied to 1/8" ply plates; the plates were attached to the fin from the outside, with servo mounting screws. The linkage for the elevator is internal, but the rudder servo arm sticks out the side of the bottom of the fin. This is a little ugly, but it is quick and very positive.

Flying

The day of the event finally arrived. In a demo flight for us, Robin Lehman towed John Derstine up, all the while explaining the do's and don'ts of aerotowing. I found myself thinking about my first flight. It would be the first flight for this plane, the first scale, and the first 1/4 scale; it was also my first flight in 1 1/2 years, and only the 8th or 9th since '91. It was also my first aerotow. I confidently told myself, "Piece of cake. Let's go."

I let Ed go first. He flew a 150" Libelle that he built with a fuselage from Viking Models, U.S.A.; it flew great. It was his first aerotow, too; he told me it was easy, and even I could do it.

I hooked up my ASK-21, said, "I'm ready," and down the runway my plane

went. "What an anti-climax," I thought. "It's just like taking a power plane off. No big deal." Well, I released from the towplane, and started to trim the plane out. And, there was another first for me. I was surprised to find that this is the first plane I've built that didn't need at least one kick of trim on any control! I thermalled for awhile; then, I gave it two kicks of down trim. "WOW," I thought. "This plane looks like it has afterburners; this thing really scoots." I slowed the plane down to landing speed, testing its low speed handling. It was rock solid, with absolutely no tip stalling. If you can fly ANY aileron plane, you can fly this plane!

Conclusion

- 1) This plane is a steal at \$450.00.
- 2) It is so easy to build and fly, it could be used as a trainer, as long as you don't put in down trim.
- 3) I would install spoilers, if I were to build another.
- 4) Big airplanes fly better.

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R/C Soaring Resources

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

Contacts & Soaring Groups - U.S.A.

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

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

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

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

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

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

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

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

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

California - South Bay Soaring Society, A.J. Angelo, P.O. Box 2012, Sunnyvale, CA 94087; (415) 321-8583, fax (415) 853-6064.

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

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

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

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

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

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

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

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

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

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

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

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

Kansas - Aerotowing, Jim Frickey, (913) 585-3714.

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

Kentucky - Louisville Area Soaring Society, Ed Wilson (Contact), 5308 Sprucewood Dr., Louisville, KY 40291; (502) 239-3150 (eve), e-mail Jay_Burkart@hp.com.

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

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

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

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

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

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

Missouri - Independence Soaring Club (Kansas City area, Western Missouri), Edwin Ley (Contact), 12904 E.36 Terrace, Independence, MO 64055; (816) 833-1553, eve.

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

Nebraska - B.F.P.L. Slopers, Steve Loudon (contact), RR2 Box 149 E1, Lexington, NE 68850; (308) 324-3451/5139.

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

Nebraska - Ken Bergstrom, R.R. #1, Box 69 B, Merma, NE 68856; (308) 643-2424, <abergst@neb-sandhills.net>

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

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

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

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

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

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

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

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

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

Northwest Soaring Society (Oregon, Washington, Idaho, Montana, Alaska, British Columbia, Alberta), Sandie Pugh (Editor - NWSS Eagle), 1119 SW 333rd St., Federal Way, WA 98023, e-mail: parrot2luv@aol.com, (206) 874-2429 (H), (206) 655-1167 (W).

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

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

Ohio - Mid Ohio Soaring Society (MOSS), Hugh Rogers, 888 Kernet Ct., Columbus, OH 43220, (614) 451-5189, e-mail tomage1@freenet.columbus.oh.us.

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

Oklahoma - Tulsa R/C Soaring Club (TULSOAR), http://www.mccserv.com/tulsoar

Oregon - Portland Area Soaring Society (PASS), Pat Chewning (Secretary), 16766 NW Yorktown Dr., Beaverton, OR 97006, (503) 645-0323, e-mail: patch@sequent.com, web page: www.europa.com/~patch/

Oregon - Salem Soaring Society, Al Szymanski, (contact), (503) 585-0461, aszy@teleport.com, www.teleport.com/~aszy/sss.html

Oregon - Southern Oregon Soaring Society, Jerry Miller, 3431 S. Pacific Hwy., TRLR 61, Medford, OR 97501, e-mail Milljer@aol.com, ph/fax (541) 535-4410.

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

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

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

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

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

Utah - Intermountain Silent Flyers, Tom Hoopes, (801) 571-3702 (eve), "Come Fly With Us!"

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

Virginia - Appalachian Soaring Association, Virginia's Southwest (Bristol area), Greg Finney, 106 Oakcrest Circle #5, Bristol, VA 24201; (540) 645-5772, e-mail <gfinney@naxs.com>

Virginia - West Virginia & Western PA area, Chip Vignolini, 1305 Perry Ave., Morgantown, WV 26505; (304) 598-9506, ycdne30a@prodigy.com.

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

Wisconsin - Valley Aero Modelers, Lee Murray, 1300 Bay Ridge Rd., Appleton, WI 54915; (414) 731-4848, <74724.65@compuserve.com>

Outside U.S.A.

Australia - Southern Soaring League, Inc., Mike O'Reilly, Model Flight, 42 Maple Ave., Keswick SA 5035, Australia. Phones: ISD+(08)293-3674, ISD+(08)297-7349, ISD+(018) 882-156 (Mobile), FAX: ISD+(08) 371-0659.

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

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

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

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

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

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

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

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

Seminars & Workshops

Free instruction for beginners on construction & flight techniques, week-ends (excl. contest days), "AJ" Angelo, South Bay Soaring Society (San Jose area), (415) 321-8583.

BBS/Internet

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

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

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

R/C Soaring Web Site & E-Mail Addresses Directory, one stop search for URL's and e-mail addresses. Submit your cyber address free. Updated constantly: <http://mccserv.com/dozone/rcwebpgs/>

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U.S.A., Canada, Mexico: \$2.50 Per Issue + Tax (Texas Only: 7.25%)
United Kingdom/Europe: \$3.75 Per Issue
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Reference Material

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

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

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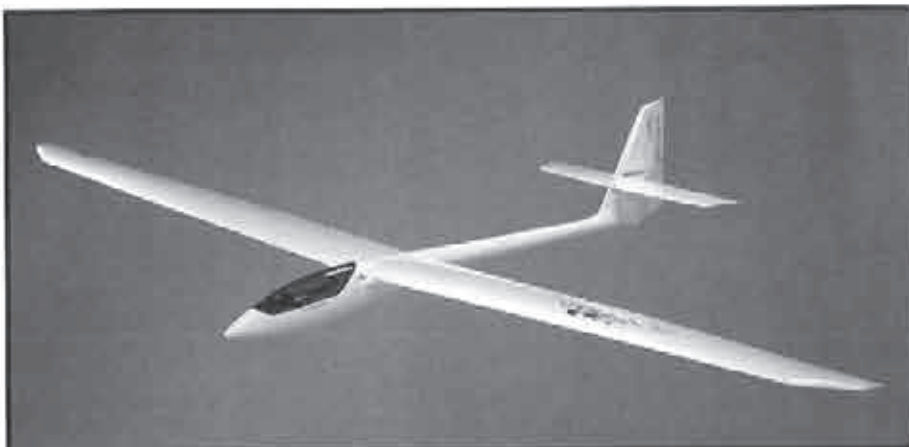
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Wingspan:	2,850 mm	Weight:	2300 - 2600 g
Fuselage Length:	1,345 mm	Wing Loading:	approx. 42 g/dm ² and up
Wing Area (FAI):	approx. 55 dm ²	Airfoil:	HQ 3, 2-11 modified

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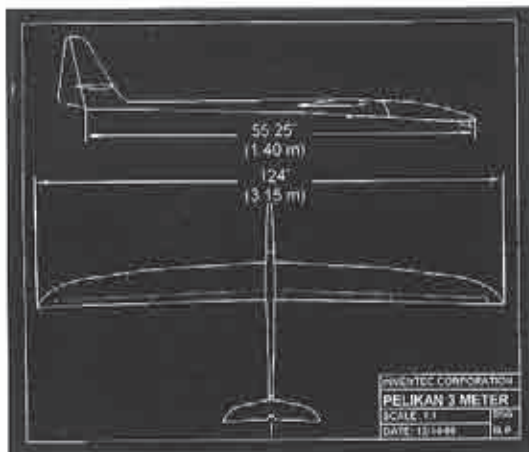
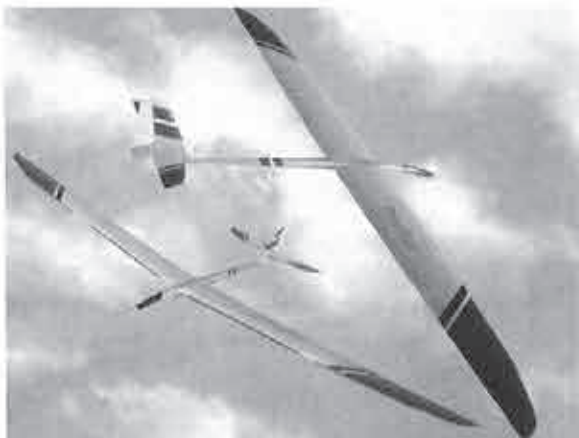
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Fuselage Length:	55.25 inches (1.40 meters)
Wing Span:	124 inches (3.15 meters)
Wing Area:	965 square inches
Wing Airfoil:	80% constant thickness 7080, transitioned 40% 7084 stock
Stabilizer Area:	98 square inches
Stabilizer Airfoil:	Eppler 374, 6% thick, 0.8% camber, upswept trailing edge
Total Flying Area:	1,063 square inches
Fin Area:	66 square inches
Rudder Airfoil:	SD8020 stock
Flying Weight:	62 to 70 ounces

Construction: Fiberglass/Kevlar fuselage. Wings: blue foam cores, carbon fiber and fiberglass laminate, with carbon fiber tube spars and carbon fiber joining rod. Stabilizer: carbon fiber/fiberglass over blue foam cores.

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shown in our catalog.

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SPECS:

Airfoil: SD7037 Mod & Thinned Tips

Wing Span: 118"

Wing Area: 960 sq. in.

Weight: 65 - 68 oz.

Wing Loading: 9.75 - 10.19 oz/sq. ft.

Planform: Triple taper/Two piece

Complete Kit:

\$379 + \$15 S&H

Perret's Studio

1780 Prytania Street • New Orleans, LA 70130

(504) 524-3442



Advertising Note

Please note that the cut-off date for classified & display ads is the 1st of the month.

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