

June, 1998

Vol. 15, No. 6

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1/5.5	all glass ASW15B	HQ3/14	235" (6m)





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A True Story

We received the following, short story sent in by Rick Allison of Washington.

"In the beginning of March of this year, I was flying my Sparrow slope glider, when I had a loss of control that resulted in a vertical dive into the lip of the cliff where I fly. The cliff is some 100 plus feet above Pudget Sound. I collected the pieces and went home. I never did find the canopy.

"On May 11th, I received a small package from Osaka, Japan. Inside was my canopy. (Yes, I had taped my name and address to it.) According to the note that was enclosed, a worker in the Osaka fish market cut open a tuna and found my canopy in its stomach. While he could not read English, his teenage child is studying English in junior high school. And so, thirteen year old Yoshiko Kanazawa of Osaka, Japan kindly returned my glider part to me."

In a later conversation with Rick, he said that the loss of control was caused by a broken wire in the battery plug. We're sorry to hear about the plane, but did enjoy the story, Rick. Thanks!

Welcome Aboard!

With this issue, another columnist joins the ranks: Dave Register of Oklahoma. Dave's another busy fellow, and his work frequently has him traveling around the globe. He's also the editor of the newsletter for the Tulsa RC Soaring Club, TULSOAR, and can be reached at RegDave@aol.com, or (918) 335-2918. Having several projects in mind, if you hear from Dave, he just may be researching a project for R/CSD's readers. Welcome aboard, Dave!

Happy Flying! Judy & Jerry Slates

R/C Soaring Digest (R/CSD) is a reader-written monthly publication for the R/C sailplane enthusiast and has been published since January, 1994. 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 Chateau Circle, Payson, AZ 85541; (520) 474-5015; <jimpeg@netzone.com>

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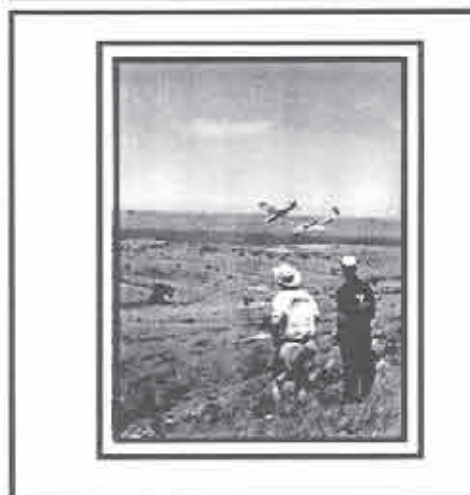
Artwork

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

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OTHER GOOD STUFF

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DAY OF THE FOAMIE

Dave Sanders (Capistrano Beach, California) and Joe Chovan (Syracuse, New York) fly foamy combat match with DAW FoamMe-109 and DAW Foam-51.

Lake Wilson Reservoir, Kansas.
Photography by David Garwood,
Scotia, New York



Jer's Workbench

Jerry Slates
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Pull-Pull Elevator Control Systems

Would you believe that photo 1 shows the profile of my latest model? No? You're right. I'm only kidding. Actually, it's a mock-up of a pull-pull elevator control system that I've been wanting to try out on my next model.

Why do I want to use a pull-pull elevator control system? To save weight.

I've been using the following push-pull cable systems: Sullivan, Gold-N-Cable, and #514. They're probably the same systems that most of us use. However, the weight of the Sullivan and Gold-N-Cable is 20 grams. While it doesn't sound like much, I found a small, neat, live, brass block that weighs less. That's mariner talk by the way; you may want to call it a pulley. The live, brass block was discovered in a model ship fitters catalog, so that's why I'll be referring to the pulley as a block.

The live, brass block with 10 feet of Kevlar™ thread weighs 1 gram. That's a weight savings of 19 grams! Or, 19 grams of weight have been removed from the tail of the model. Which, leads to less nose weight in balancing the model, which also leads to less overall gross weight.

For those of you that are weight conscious, don't rush down to the local ship fitting shop, because I should point out that this will not work in all models. If you look closely at the mock-up, you'll see what I mean. For example, some fuselages may have too much of a curve along the bottom, the Kevlar™ thread will rub along the bottom of the fuselage, or the wing rod may be in the road. So, if any of you decide to try out this method, study the fuselage you wish to try it on first.

So, with this in mind, let's move on to the installation. It was easy to do the mock-up, but working inside a long, thin fuselage is much more difficult.

The first step is to fit the rudder post in the fuselage. (See photo 2.) Then, mount the live, brass block onto the rudder post, and set it aside. Next, take a long piece of Kevlar™ thread; fold it in half, so you can find the middle. Now, tie the middle of the Kevlar™ thread onto the elevator control horn; apply a drop of CA to the Kevlar™ thread and the elevator control horn so that the Kevlar™ thread won't slip. Then, take one end of the thread and "thread" it down into the fuselage. Install the elevator control horn into the fuselage.

The other end of the thread is then run through the live, brass block, and down through the fuselage. Now, very carefully, glue the rudder post in place, taking care

not to get any glue on the thread. At this point, there should be two loose threads at the other end of the fuselage. Pull each thread in order to make sure that the elevator control horn moves freely. If the elevator control horn does not move freely, rip it out, and start all over again.

Photo 3 depicts refashioned Kwik-Links mounted on the servo. Working very carefully, find the center position for the elevator control horn, and tie each Kevlar™ thread onto the Kwik-Links; then, apply a drop of CA to each knot, to ensure that they won't come undone.

I have not yet used this system on an actual model, as yet. I made the mock-up first to see if it would work. I'd like to hear from any of you that try this method, and what you think.

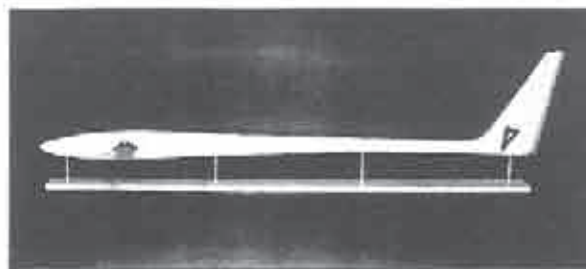
For those of you that want to purchase the same live, brass block that I used, it's part #MS1391, and costs \$2.69, from:

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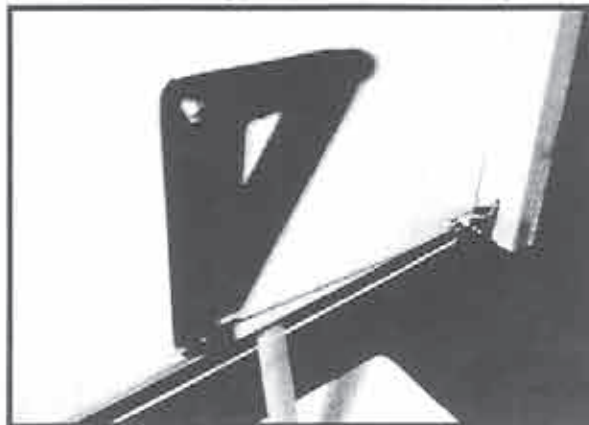
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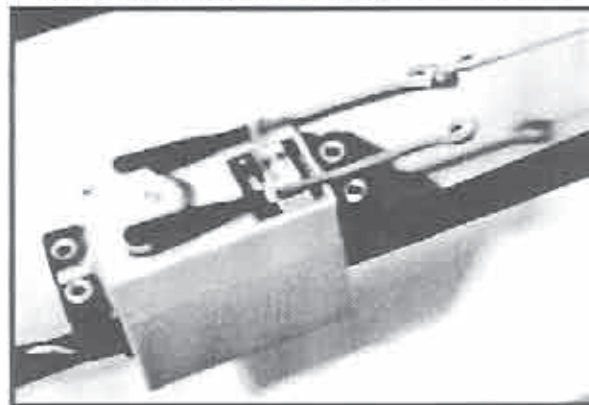
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Mock-up showing pull-pull elevator control system.



Elevator control horn with live, brass block mounted.



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COS Part 2 - The Airframe

Last month we described the airfoil used on Hans-Jürgen Unverferth's CO8, the RS004A. This month we will make some comparisons between CO8 and other models in the CO series, particularly CO7, its direct predecessor.

Sweep

The first and most obvious difference between CO8 and most of the other models in the CO series is more sweep back. The early CO models used 18 degrees of sweep. The EH 1.0/9.0 section, with its near zero pitching moment, allowed use of just one degree of twist on these earlier designs, despite the shallow sweep angle. Changing the airfoil to the RS004A, with its significant negative pitching moment, would have ordinarily dictated a very large increase in twist. To keep wing twist from being too severe, the CO team increased wing sweep to 25 degrees. This is the same wing sweep as on CO7, which uses the RS001 airfoil, another section with a moderate negative pitching moment.

Dihedral

Many of us have designed aircraft using visual cues rather than mathematical formulae. Unfortunately, this method seldom works well when designing tailless aircraft. While designing CO8, much care was taken to determine effective dihedral within certain flight regimes. This is because effective dihedral is directly related to sweep angle and lift coefficient. Effective dihedral increases with increasing sweep and increasing lift coefficient. (We are currently writing a comprehensive article on effective dihedral which will appear in a future issue of RCSD.) CO8 uses one degree of anhedral to counteract the adverse effects of excess effective dihedral.

Winglets

Hans-Jürgen, in his book "Faszination Nurfügel," devoted several pages to the results of research on winglet shape, size and location. CO8 benefits from that research. Rather than covering the entire wing tip, the leading edge of the winglet root is 50mm behind the wing leading edge. As in previous CO versions, the trailing edge of the winglet is simply an extension of the trailing edge of the wing, and both are swept 25 degrees.

	CO8	CO7
Span	2600 mm, 102.36"	3300 mm, 129.92"
Chord, root to sta. intermediate tip	180 mm, 7.1", to sta. 1300	220 mm, 8.7", to sta. 1290 180 mm, 7.1", at sta. 1550 100 mm, 3.9", at sta. 1650
Wing area	46.8 dm ² , 725.4 in ²	70.0 dm ² , 1085 in ²
Aspect ratio	14.4	16.5
Airfoil	RS004A	RS001 series
Wing twist, root first sta. second sta. third sta.	0.0 degrees, sta. 0 -1.0 degrees, sta. 433 -2.5 degrees, sta. 867 -4.5 degrees, sta. 1300	0.0 degrees, sta. 0 -2.1 degrees, sta. 1290 -2.6 degrees, sta. 1550 -3.1 degrees, sta. 1650
Sweep angle	25 degrees	25 degrees
Dihedral	-1.0 degrees	0.0 degrees
Construction	moulded composite of fiberglass and carbon fiber, with carbon fiber spar	moulded composite of fiberglass and carbon fiber, with carbon fiber spar

Aspect Ratio

CO8 is smaller overall than CO7, both in span and average chord. CO8 forgoes the multi-taper wing of CO7 and uses a constant chord planform, as CO2. There is also a small decrease in aspect ratio, from 16.5 for CO7 to 14.42 for CO8. This makes it easier to construct the stiff structure required.

Trim and Performance

As is usual with tailless sailplane design, wing twist is based on Cl_{CRUISE} and the static margin. For CO8, wing twist was based on a Cl_{CRUISE} of 0.35 and a static margin of 7.5%. Flying at a gross weight of 1400 g, the wing loading is 30 g/dm² (9.8 oz/ft²). The best glide ratio (L/D_{MAX}) is 22.5, a very respectable value. What is surprising, however, is the minimum rate of sink, V_{Ymin} , which is reported to be just 0.356 m/sec (14"/sec).

Hans-Jürgen's promise of CO8 being an excellent performer has certainly been fulfilled.

We are eager to hear from readers who have built and flown the PIBROS delta via the plans available on the internet. We are particularly interested in alternative building materials and how enlarging the model affects flight performance.

We can be contacted at P.O. Box 975, Olalla, WA 98359-0975, or by e-mail at bsquared@halcyon.com. ■

T.W.I.T.T.

(The Wing Is The Thing)

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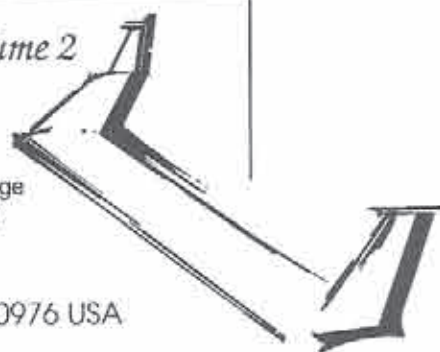
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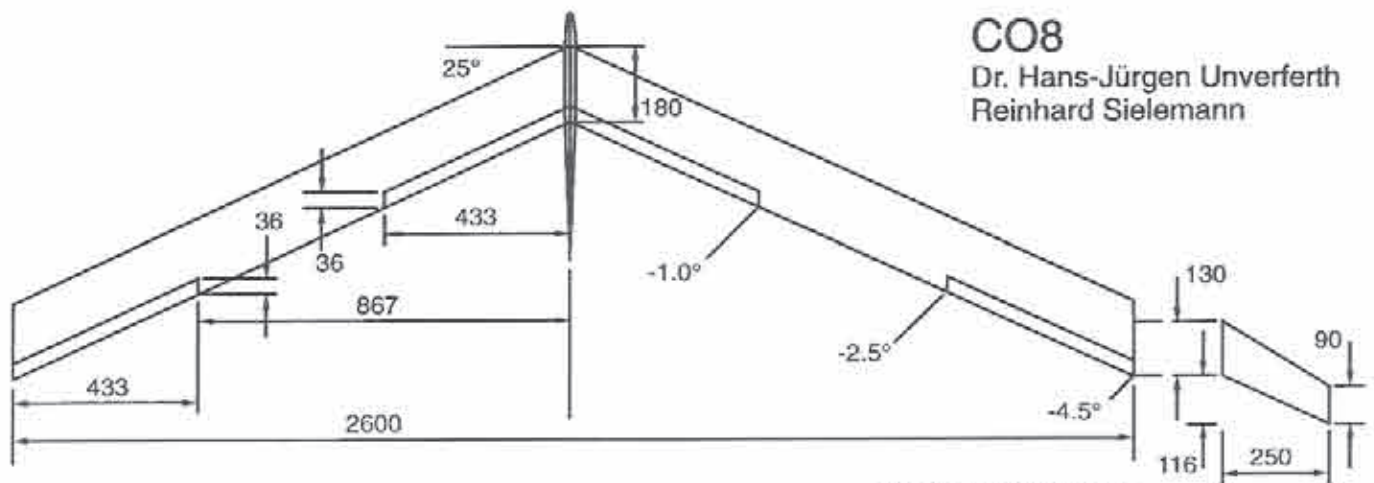
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WEIGHT	82 OZ.
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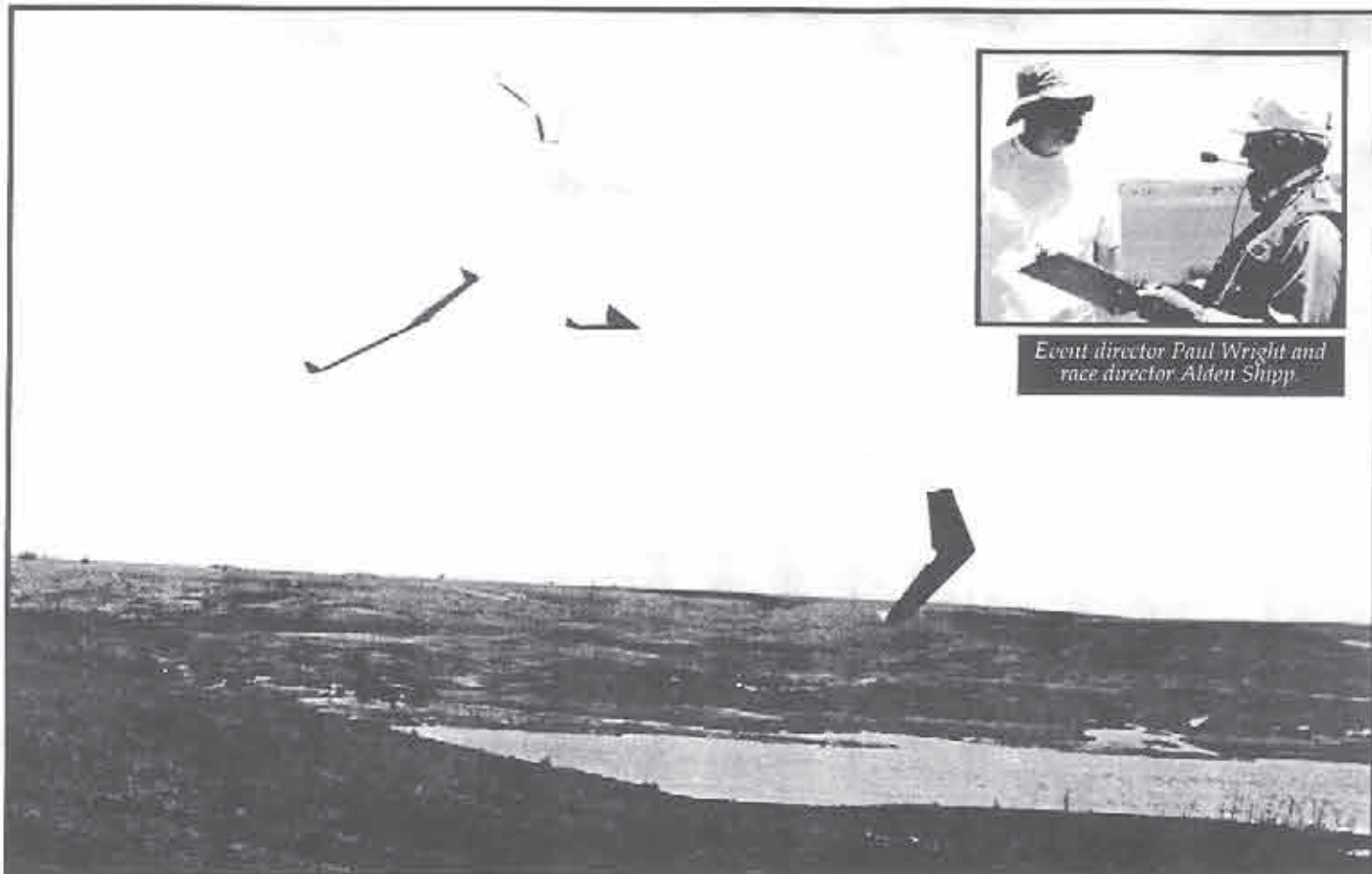
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Event director Paul Wright and race director Alden Shipp

(Below) Zagi cruises by local agricultural monument. View from the combat site overlooking Wilson Lake Reservoir.

A sky full of Zagis on the north-facing combat slope, looking across Wilson Lake to the main slope.



1998 Midwest Slope Challenge

By Jerry Slates
Wylie, Texas

Photography by Dave Garwood
Scotta, New York

Slope flying in Kansas? You bet, Todo!!

I started preparing for the 1998 Midwest Slope Challenge hosted by the Lincoln Area Soaring Society (LASS), months before the event was to take place. When the day arrived to leave for the event, I had two new Ninjas ready to fly, and for the heck of it, finished the Paragon, just in case. This was the first time I had been slope flying in years, and I was looking forward to having some fun.

The 8 hour drive up to Wilson Reservoir in Russell County, Kansas was uneventful. The site was easy to find. However, I wasn't prepared for the size of the lake; it's one of the biggest I've ever seen! With 9,000 acres of

water and 100 miles of shoreline, Wilson Lake has five parks, offering showers, boat-launching ramps, overnight camping pads, fresh water, picnic tables, grills, swim beaches, group shelters, sand volleyball courts, and playground equipment.

As most of you know, the weather has been extremely 'wild' this year, attributed





Jerry Slates launches Paragon from a Jim Frickey winch, while waiting for wind to come up on the main race day.



Dave Sanders (L) and Jerry Slates (R).

primarily to El Nino. And, that first night, a thunder storm moved through. The first morning of the event, Friday, I left the motel room only to find that strong winds from the storm had strewn large pieces of building material around the parking lot. One side window was shattered; my morning got off to a slow start, as I tried to collect the pieces, and tape the window closed. I was not about to be deterred. I had been away from slope soaring for far too long.

Organized Combat

It turned out to be a wonderful weekend. On Friday, I finally got to see, first hand, organized combat. I'd been looking forward for a long time to seeing combat

fliers in action, since Dave Sanders started his column "Fighting Foam & Heavy Iron". Being a more conservative flier, I just had to see if these planes could really walk away from a crash or kill, and be ready to fly almost immediately afterwards. I wasn't disappointed. There were combat planes bouncing all over the slope. I told myself that next time I would definitely have to give this sort of flying a try.

The contest director for the event was none other than our Dave Sanders, who flew out from California just to share his expertise and have some fun. He organized the contestants into a three group matrix that flew two rounds and then a final. Two preliminary rounds were qualifiers to sort the field out for the finale. So, if a flier made enough kills in the preliminaries, they made it to the final round. Then the slate was wiped clean, and everyone started out even.

One of the best fliers I've ever seen, Dave



Joe Chovan's DAW FoamE-109 and Todd Martin's "USPS Delivers" Sniper.

Garwood, won the event. He'd obviously been fine honing his strategies and, flying a Dave's Aircraft Works P-51 Mustang, was one of few fliers with a conventional aircraft, amidst a great number of Zagi competitors.

To me, slope combat is like watching a three ring circus with everything in the center ring. It is a marvelous spectator sport.

Race Day

Saturday dawned as a contest director's worst nightmare: no wind! The weather station said that would change in the afternoon so, in the meanwhile, out came the hand launch gliders, a few thermal ships, and electrics. By 12:30 p.m., the winds were back, and the racing contest director, Alden Shipp called for a pilots meeting. (Alden ran the races from the pilot's pylon, operated the clock, kept score, and judged the turns at that end. Jim Baker and Mike Green shared the task of

flag master at the far pylon, acting as judge and keeping consistency at the flag end.)

The Ninja Class was on first. Each model was first identified, then launched, flown into position, the clock was started, and the race began. As soon as the last model cleared the race course, the next heat began. Alden did a super job, which was obvious with 26 heats in under 3 hours; or, another way to say it is that there was a race every 6 1/2 minutes! Paul Wright flew his Ninja to first place.

60" Class

The 60" Class brought out a variety of entries, from foamies to pure bred racers.

Foamie Combat

- | | |
|----------------|-------------------|
| 1 Dave Garwood | DAW Foam-51 |
| 2 Mike Green | Trick R/C Zagi LE |
| 3 Jim Frickey | Foam-51, Zagi |

Ninja Class

- | | |
|-----------------|-----------|
| 1 Paul Wright | Sig Ninja |
| 2 Tom Wild | Sig Ninja |
| 3 Wayne Henning | Sig Ninja |
| 4 Dave Garwood | Sig Ninja |

Samurai Class

- | | |
|------------------|-------------|
| 1 Paul Wright | Sig Samurai |
| 2 Steve Rohman | Sig Samurai |
| 3 Wayne Henning | Sig Samurai |
| 4 Daryl Huelsman | Sig Samurai |

60" Class

- | | |
|-----------------|--------------------|
| 1 Paul Wright | Daryl Perkins Whip |
| 2 Wayne Henning | SIG Ninja |
| 3 Dave Garwood | Slope Scale Zero |
| 4 John Linke | Silent Squire |

Unlimited Class

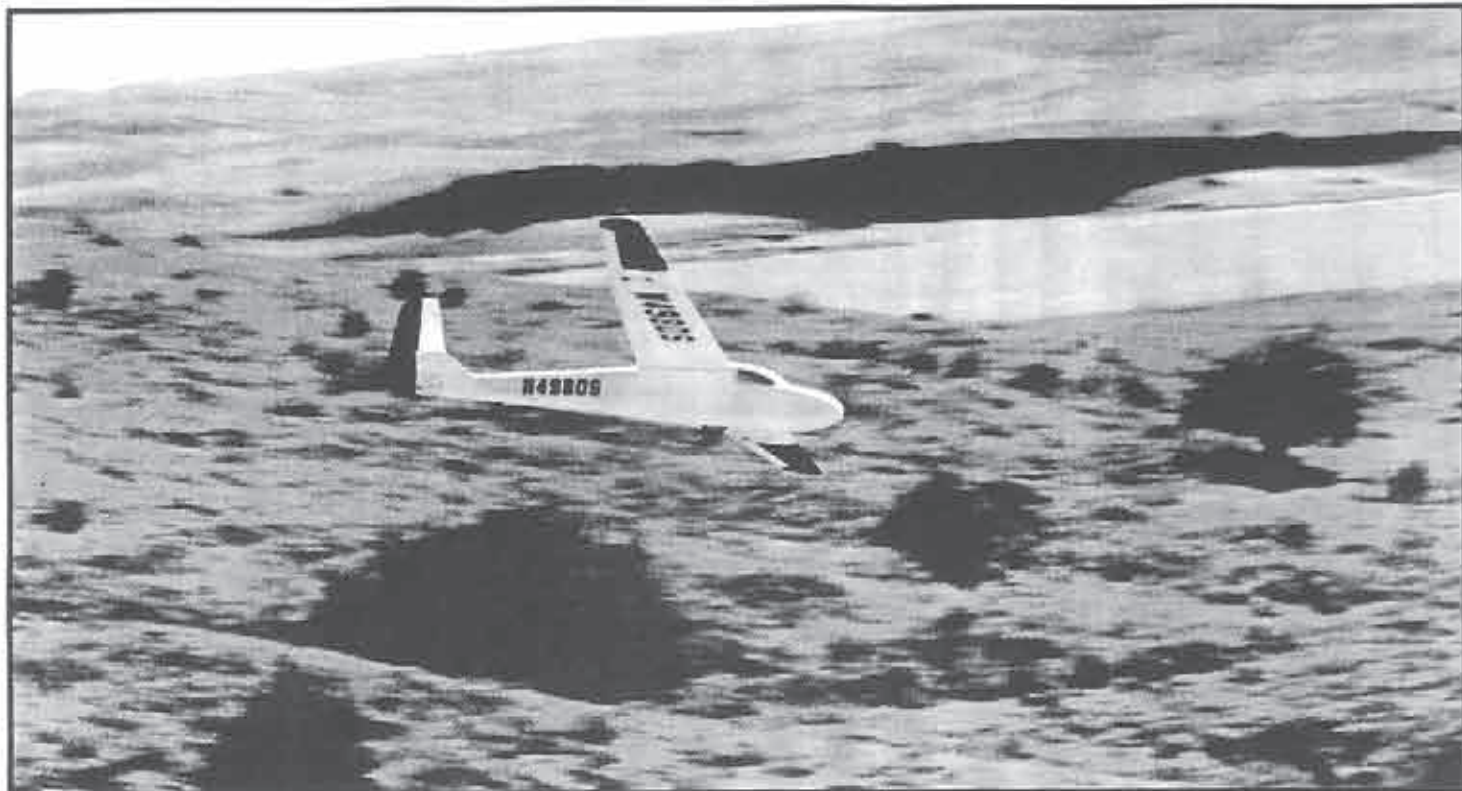
- | | |
|-----------------|--------------------|
| 1 Paul Wright | Daryl Perkins Whip |
| 2 Ken Hawkins | NSP Sparrow |
| 3 George Voss | Sig Samurai |
| 4 Wayne Henning | Sig Samurai |

Special Thanks go to:

US Army Corps of Engineers
& Ken Wade of the Wilson Reservoir Project
LASS Members & Participants
Dave Sanders (combat coordinator)
Alden Shipp (guest CD)
Soaring Central
Crittter Bits
Dave's Aircraft Works



LASS rocket scientists Steve Rohman and Paul Wright prepare to launch over the lake - a little entertainment for the crowd while waiting for the wind to turn on so that racing could start.



This class was flown as a "double elimination bracket". None of the pilots knew who they would be flying against, as the line-up was established as the race progresses. The bracket culminates with a final victor on the winner's side facing the victor who has fought back on the loser's side; a pilot with one loss competes against a pilot with no losses. Paul Wright demonstrated his expertise by taking first place flying a Daryl Perkins Whip.

Unlimited

The Unlimited Class was also conducted as a "double elimination bracket". The weight and wing loading limits established by the FAI applied. With the lake covered with white caps, and 30-35 mph winds, the winner, once again, was Paul Wright flying the Whip.

Samuri

As with the Ninja Class, Samuri Class was a one design contest, and was flown as a "double elimination". The racing was awesome, and culminated with a one on one between Paul Wright and Steve Rohman. When neither pilot saw their aircraft cross the finish line, because they were out of sight below the hill, we waited for Alden to call the winner. It was Paul Wright, again, by just inches!

Where to Next?

After a great dinner at a local restaurant, Dave Sanders, Dave Garwood, and George Voss gave short talks on the future of the event and slope soaring, in general. The group discussed the future of the event. We really like "one design racing", as it keeps the field even, and promotes the pilot over the aircraft. And, of course, "The Day of the Foamie" has indeed arrived; more events featuring the foamie may be in the mill for next year.

Well, the van window has since been easily repaired, but I'm not quite ready to tackle the 8 hour haul back to Kansas. In the meanwhile, I'm looking for a slope closer to home. I need to practice for the 1999 Midwest Slope Chal-

lenge. So, if any of you know a site with promise, closer to the Dallas/Fort Worth area or north into Oklahoma, please give me a call or shoot me an e-mail. And, if you're interested in attending the 1999 event, just call Paul Wright at (402) 796-

Dave Sanders' EPP-foam KA-6, which will soon be the largest span foam sailplane in production.

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The 1998 Los Banos Scale Sailplane Soar-In

By Donn Schifano
Hayward, California
(510) 8-581-2072 home
donnfano@flash.net

After a week of worrisome weather forecasts, my friend Payman Moussavi and I were on our way to Los Banos on I-5 from the San Francisco Bay Area. Stormy clouds surrounded us, dark gray and ominous. No patches of sun or blue skies were peaking through the overcast anywhere.

Rain makes the Los Banos slope site a quagmire of mud and the rangers keep the gate to the site locked until it is dried out. Although I tried all week, it is hard to get a really accurate forecast on the weather in Los Banos, even on the Internet. Saturday morning, I wasn't real sure what site conditions to expect.

We drove down the interstate, talking, wondering about the weather, the planes we would see and what flying conditions we would have. It was an omen. It seemed to grow right out of the pavement. In huge letters over the freeway, about 10 miles from the site, was this flashing highway sign:

Caution: High Wind Warning!

The rest of the weekend just got better and better.

Let me describe this site for those who haven't been there. On the west side of the San Joaquin valley town of Los Banos, a dam has formed a reservoir by flooding a small valley. The hills surrounding the reservoir rise 200-400 feet above the surface of the reservoir. The flying site is on the top of the hills. Looking down over the

reservoir, we can "see" the wind direction on the surface of the water and we move to different slope faces accordingly. The long direction of the reservoir is east to west. West wind travels the length of the reservoir, hitting the main flying slope site head-on with smooth air. The short direction is north-south and north wind also hits a second flying site head-on. The second site is 100 feet or more higher than the main site. The reservoir and the land around it, including the area on top, is a park. Rangers patrol the area and permit us to use the site.

When we arrived at the gate, the ground was dry and firm. Driving the dirt road right to the site parking-pit area we found the site was busy with activity. Many beautiful sailplanes were already assembled and waiting for the 1998 Los Banos Scale Sailplane Soar-In to begin. The wind was strong, a bit cold, but very encouraging. In past years we have prayed for wind, any wind, but not this year. Saturday's wind was ordered special. Blowing from the west, right down the length of the reservoir, it hit the face of the main slope perfectly. Early arrivals were flying a bit of everything from Scale, to PSS, to just ordinary slopers, before the CD, Lynsel Miller, arrived.

I have to admit, I missed the pilots meeting



Dan Troxell's Ka6C, 1/3 scale, 5m, 22 lb., natural wood wings with black, red and gold stripes. Payman Moussavi photo.



Dan Troxell's Grunau IIb, Pilots Choice Award for Vintage Scale. Donn Schifano photo.



Willie Grundler's Krick SG-38.
Donn Schifano photo.

Jim Cutshall's scratch built Grunau IV.
Stunning craftsmanship! Donn Schifano photo.

somehow, but I know the event kickoff was about 10:30 - 11:00. The rules were simple. Fly for 20 minutes or so and return the pin for the next guy on the frequency. And fly they did. The wind was reported over 25 mph at one point. There was always a scale sailplane in the air. The clouds started to breakup and patches of blue could be seen. Later in the day we got sun in between the mostly cloudy skies. Flying continued until around 4 p.m., stopped for the pilots choice awards and raffle, then resumed until almost 6 p.m.

There were some periods of dead air. The lift cycled quickly in the early part of the day. The lift band could be real narrow, too. Ask Steve Dentz of Carnation, Washington. His stunning 6.75m Duo Discus, with full cockpit detail flew too far out from the slope face, and he couldn't get back into the lift zone. Luckily, Steve put this huge plane down on some very rough terrain and not in the water. One wing tip was next to the water line. Both the fuselage and wings suffered some damage. Later, after recovering from the hike (It is perhaps 200' down to the water's edge from the slope top.), Steve was upbeat and said he should be able to fix everything. I was glad I missed the pilots meeting, because we were talking to Steve and taking pictures of this beauty before this unnerving flight. It is here I should confess that the first roll of film we took with these photos on it didn't come out at all. I didn't shoot backup photos, being busy jotting down notes. A lesson learned by the cub reporter.

Built from a Ripo kit, Steve took 4 months to build the Duo Discus. Another pilot, Rick Briggs, was kind enough to provide Steve detailed pictures of a full scale Duo Discus cockpit. Steve then went to town, spending 3 of those 4 months on the cockpit detail! The plane weighs 42 lb., has a 9'6" fuse and uses 10 servos. Hinged on one side, the canopy opens like the real plane, and has a servo operated locking mechanism. The cockpit instruments looked exact, down to the tow line release handles and gauge faces. Microphones, seat belts, cockpit vent window, handles for flap and landing gear mechanisms were all there.

The pilot figures were an Axel from Germany and a pilot figure from John Derstine. Making his own molds, Steve made the seats. The headrest on the front seat is adjustable up and down. (Isn't it always that way on your plane??) Not being into micro photography himself, Steve carved a 35 mm camera for the cockpit! (You just have to have the pictures to prove you made the turn point!)

Another early bird visit I had was with Jim Cutshall, of Apple Valley, California. Jim was putting together a scratch built Grunau IV. I stopped dead in my tracks. It was built like a piece of fine furniture, with craftsmanship I only dream about. Sporting an orange fuse with orange and white wings, this vintage beauty made me drool. At 11' - 4" span, this plane is large enough to be impressive and small enough for mere mortal builders like me to consider it as a project. Jim used a QB 3.4 airfoil on this 14.7 lb. plane, giving it a 13.7 oz. wing loading. So what was so special about this plane?

The attention to detail in building and design were striking. The servo area under the cockpit was painted and he used

different colors for the air frame and servo tray. I asked about the aerotow release tube in the nose. NOPE, not the release but a way to hide the capture screw for the nose cone. To show me, he took the screw out (It is hidden inside the tube.), took the nose cone off, pointing out the battery and receiver box. Next to the box, WAS the aerotow release servo. The release mechanism was under the chin of the plane. Separating the battery and receiver there was a piece of ply as I recall. Jim mentioned he can take the ply out and replace it with a sheet of lead for balance. The box looked like it could hold more lead sheets in other spaces, too. But the best part was HE DIDN'T need ANY LEAD for balance. The meticulous planning and building Jim did on this model was so exact, the plane balances on the back of the main spar without any "help".

I saw the landing skid and said, "Cool! Plywood stained to look like hardwood!" Wrong; NOT on Jim's plane. He made an OAK skid. He made most, if not all the linkages for the servos and even designed a very clever pull-pull system with a drop-in pin for the elevator. The pilot sported sunglasses Jim made with wire and camera film. The wiring was hidden, so I didn't really see how he did that, but what I did see was very "sanitary". Impressive craftsmanship on a stunning craft. This is the second one he has built. He said he sold the first one too soon and built this one to replace it. (Forget it. I already asked. It isn't for sale. But I am first in line when he does change his mind! Right, Jim? Old Pal. Old buddy!!!)

As I left Jim to finish the assembly of his creation, I watched Mark Foster assist John King of Glendora, California. John was assembling a Desert Winds ASW-20. The wing span was 200 inches. Mark Foster did the piloting honors as John had never flown the monster. Mark was concerned over the control authority in the tail surfaces, but it flew without incident and its size had a commanding presence in the air.

Geppetto Bassetto stopped making us laugh long enough to tell me about his DFS-230 German Troop Transport. This built up scale sailplane has a 98" wingspan, weighs 5 lb., and is painted with, of course, camouflage markings. He said there are 70 ribs in the wing. The pilot figure looks to be sitting very high in the cockpit, but Geppetto said his research on the plane



David Pray with 1/4 scale Salto.



shows the pilot looked like that in the real plane. Aft of the wing is a cargo door that opens and he asked me to look inside. On the interior wall opposite of the door was a sign in German. It said, "Attention: No Smoking!"

By 2 p.m. there were 44 registered pilots. The flying was continuous, with a constant turnover of pilots and planes at the flight line. Scale ships, of all sizes, were everywhere. If you were distracted and didn't see a pilot walk up to the flight line and launch, you could be fooled as to the real size of the plane. Was it a 2 meter not too far away or a 5 meter a long way off? The flying was like this all day. I got the feeling the pilots actually got their fill of flying Saturday. The wind was strong, with cool and cold cycles of lift most of the day.

CD Lynsel Miller's veteran TG-3 was the victim of a mistake in the transmitter impound. When the transmitter was turned on, Lynsel's TG-3 went out of control, breaking one wing about 1/3 of the way from the tip. It will fly again, but Lynsel will have some work to do to match the paint scheme on the 10 year old wings.

The other mishap on Saturday occurred with one of the smaller planes brought to the event. I never got a chance to see this little gem up close or ask about it, but Gary Brokaw of Washington brought a diminutive glass slipper with perhaps a 36"



Nick Plumb with his scratch built DAS DoDo. Donn Schifano photo.

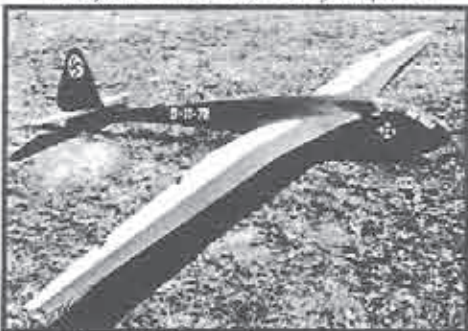


Pete Plumb with scratch built 1/16th scale 1-26A. Donn Schifano photo.

Los Banos '98 towplanes: Waco UPF-7 (Dick Miller), Bi-plane (Jerry Arana), and Post Grad School Test Plane (Don Meeks) with 12 hp, 50 lb. weight, and 25 lb. payload inside.



Geppetto Bassetto's DFS-230 German Troop Transport Glider. Donn Schifano photo.



Dennis Brandt's Fufnir II. Payman Moussavi photo.

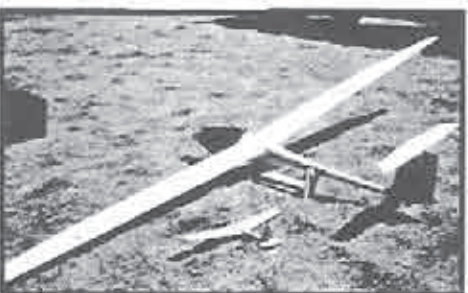


Frank Smith's 1/6th scale, 90" span, 10 year old Pilatus 4B. Sean Sharif launching. Donn Schifano photo.

Rick Briggs with ASW-27. Payman Moussavi photo.



Rick Briggs with Reiher. Payman Moussavi photo.



Frank Smith's BJ1B scratch built 10 year old Duster. Built from 3-views, 135" span, 7 - 8 lb., 1/2 oz. cloth, sheeted wing, painted in Krylon. Donn Schifano photo.



Frank Smith's 1/6th scale, 90" span, 10 year old Pilatus 4B. Sean Sharif launching. Donn Schifano photo.



Larry Jolly - Nimbus 3, 1/4 scale, 6.2m, 16 lb. Donn Schifano photo.



Mark Foster "pilot" in his ASH-26E. Donn Schifano photo.

(Left) Talk about size difference! Roger Hebner's ASH-26, and Pete Plumb's 1-26. Donn Schifano photo.

wingspan. I believe it was Michael Shelhart's 4 meter scale DG or ASW type ship that hit Gary's like a 18-wheeler hitting a bug on the freeway. Gary was philosophical about his loss. I decided not to ask a lot of questions about the planes or the incident right then and never did get to ask. I did see Gary packing the wreckage of his little bird for the trip home. The fuselage was split at the seams, from nose to tail. The wing was in a whole bunch of pieces and is probably a complete loss.

Dan Troxell of Southern California was either flying or assembling a new plane every time I passed by him. I think he got his van from a magician. He kept pulling new ships out of nowhere. I saw a 1/3 scale, 5 meter Ka6C weighing 22 lb., sporting distinctive natural wood wings with black, red and gold accent stripes, a Grunau IIB (about 4 meter), and a DG-600 that was at least 5 meter. Dan flies with a transmitter tray and his planes flew with smooth, realistic motions. A real pleasure to watch, as well as inspirational.

Rick Briggs also arrived with a full quiver of planes. Rick's 4.5 meter ASW-27 weighed in a 13.5 lb. It has a full figure pilot (I don't mean over weight either.), fully detailed cockpit instrumentation, microphone, seat belts, canopy vent window, camera and tattletale on the canopy. The pilot wears a sailor's hat turned inside out, and if I recall correctly, has zinc oxide on his nose for sunscreen. Amazingly life like.

Rick also had with him a Bob Sealy kit of the Reiher weighing 12 lb. at 4.8 meters. This vintage plane sported German markings in a grayish/brownish almost military color scheme. (I don't know much about this plane's history, so it may have been a military plane.) The greenhouse canopy and bent wing form are very distinctive. However, I passed by the FOR SALE sign once too often. I should have bought this plane on Saturday.

Brian Chan arrived with a ASK -13. A mere 5 meters and 42 lb! You have to go into weight training to slope launch that baby! Willie Grundler, of Castro Valley, California brought his 104" Krick SG-38, again. Flew well even in the strong wind. Willie flies at my home slope, but I have never seen him fly the SG-38. I was surprised to find out it is 6 years old. He has been holding out on us!

Mark Foster had his Grob Twin III. A Mueller kit at 5.3 meters, this 1/3 scale ship weighs 26 lb. The detailing in the cockpit is superb. Another impressive plane Mark brought was a 6 meter, 25 lb. ASH-26E. The all glass kit was from Schuler & Fleckstein. The pilot figure is none other than Mark himself complete with beard and ball cap! I finally stopped to talk with John Raley of Costa Mesa and his son. I have seen John at every Los Banos event, but never had the opportunity to talk at length with him. John and his son were very active all day. John owns one of the past Vintage Award winners, the PWS 101. A 1938 Polish design, John told me it flew against the German Reiher. Built from Martin Simons plans, the 5 year old plane weighs 13 lb. at 14.5 ft. wingspan. A beautiful ship.

Another father and son team was that of Pete Plumb and his son, Nick. Each had their own scale subject. I believe Pete had the smallest plane this year at 29.5" tip to tip. His scratch built Schweizer 1-26 was 1/

16th scale, and weighed 3.5 oz. Made from balsa, covered in Polyspan and painted with dope, he added a pilot figure using a Starwars figure. He found a color photo of an instrument panel and used a hole punch to cut out the instrument faces, gluing them to the cockpit instrument panel. It is flown on a Futaba receiver, two CS-20 servos and a 50 mAh battery. He flew about 20 minutes, recharged, and flew again. It had such a great response from the crowd, I think Pete is considering putting out a kit.

The son part of the team is 13 year old Nick Plumb. He liked the movie "The Birdmen". So much so, he made a model of the movie glider when he was 12. Called the DAS DoDo, Nick used drawings he made by playing the movie over and over. One scene shows the plane on a roof mounted launch rail. Using this shot (i.e., viewing the shot over and over), he compared the exposed roof members in the scene to the size of the plane and made the drawings. That is a tough way to make a scale drawing. The finished plane is 72" wing span. Covered in Monocoat, the DAS DoDo weights 24 oz. and flies very well. It has two figures in the open cockpit. Nick showed me some movie stills of the plane in a documentation book he brought. I couldn't see any deviation from scale in the plane. Look out everyone. Like his Dad, Nick has an eye for detail, and he has a long modeling career ahead. He is going to be a tough act to follow.

Larry Jolly had his quarter scale Nimbus 3 with him. This 6.2 meter plane weighs 16 lb. and sports XX (marks the spot) on the tail. However, Larry flew it so the whole plane looked like a spot. Flying to a tremendous height, Larry redefined the term "specking out" for me. Sunday he did the same thing and he had the whole crowd facing away from the slope watching his flight to cloud base. We don't get those kinds of flights at my home slope.

Around 4 o'clock, CD Lynsel Miller called for the pilots choice award voting to be completed and the ballots tallied up. Before making the announcements on who won, raffle prizes were given away. The sponsors of the raffle prizes were Castle Hobbies, D & J Hobbies (Campbell, California), Unbeaten Path Imports (Oconomowoc, Wisconsin), and Hobby Club (Irvine, California). Speaking for every pilot, we wish to thank them for their support.

The voting, in modern class, was won by Steve Dentz for his Duo Discus. The surprise was in vintage. Dan Troxell's Grunau II b and Jim Cutshall's Grunau IV were tied. So, Lynsel decided to have applause decide the winner. Would you believe another tie!!! So, he had the pilots who voted form two groups. After counting the heads in the groups the winner was Dan Troxell and his Grunau II b.

After the voting was over, everyone went back to the business of flying 'til your batteries were out. Frank Smith of Spokane, Washington flew his Platus 4B, a 1/6 scale Bauer kit. The 90" wingspan sports a 3074 airfoil. I was quite surprised to find out this plane is 10 years old. Still looked new!

Dave Pray from Southern California brought out his 6 year old 1/4 scale Salto with an interesting history. The fuselage is carbon fiber, glass, kevlar and the wings and tail are scratch built and obechi covered. Weighing 10 lb., the wingspan is 14' without tip extensions and 16' with tips.

Dave owned this plane once before and sold it. Another owner totaled it and Dave bought it back. He rebuilt it and it flew beautifully. Recycling at its best.

At about 6 p.m. the days flying was called and the slope opened to all pilots.

At dinner that night, 9 of us had a great meal, returned to our motel and talked still more about sailplanes. One great day.

Sunday was certainly a different day than Saturday. Stunningly clear, NOT a cloud in the sky type day, warmer but not hot. Wind was from the north, blowing constant. Aerotowing was the order of the day and there was a line of sailplanes waiting their turn from the start.

Three tow pilots turned out this year: Dick Miller with his WACO UPF-7, Jerry Arana and his Fred Flintstone piloted bi-plane, and Don Meeks with his tow plane. With so many pilots wanting a tow, I didn't get a chance to chat with Jerry or with Dick. I did manage to talk to Don about his unique tow plane.

Don teaches aeronautics at the Navy Post-Graduate School in Monterey, California to Naval Officers taking their Masters degrees in Aeronautics. His job is to fly RPVs for the Navy. The tow plane is used to carry instrumentation for the projects the students are doing. It can carry a 25 lb. payload in the cargo area. Built of balsa, and ply, it spans 12' and only weighs 50 lb. The Sachs 6.4 cu. in. engine puts out 12 hp and pulled the biggest sailplanes up with little effort.

Several planes were damaged on tow or had towing difficulties. One of the first planes towed up was Dennis Brandt's Crystal. Twice it had the tow line hang on the release. Dennis will put a more powerful servo in the Crystal for the tow release and try again next year.

Other pilots had scary takeoff problems. Steve Dentz damaged his DG-600 on takeoff with a ground loop type mishap. Steve's weekend of fun was getting a little tough on equipment! He did field repairs and was back to winch launch later in the morning. I told Steve, "Next year, I will bring my kits and have you 'field build' them." Boy, did that guy work fast. He wanted airtime and wasn't about to be denied.

Early in the morning I walked the pit area. I came upon a plane I never saw before. Two gentlemen were talking about it. One, the owner of the model was talking to a builder/pilot of a full size version of the same plane. Frank Smith scratch built the BJB Duster from 3 views. It weighs 7-8 lb.,

and spanned 135". Covered in 1/2 oz. cloth, the plane was painted with Krylon. Building time was 1 year. The plane is 10 years old. Sadly, shortly after I got photos and my information, the Duster ground looped on aero tow takeoff, breaking the horizontal and vertical struts off. Repairable damage, but I am sure Frank felt bad.

Gary Brokaw flew his 1/4 scale Bergfaulka from the slope Saturday, aerotow on Sunday. Made from Chris Williams' plans, the 4 m yellow and white plane is one of my favorites, and a Los Banos veteran.

While aerotowing is underway, the landing area is used for simultaneous landing and towing. Landings on the right and aerotow takeoffs on the left. During the aerotow operations on Sunday, Rick Briggs made a flight with his Reiher; it's majestic in the air, with its distinctive German markings and bent wing.

This year's Los Banos Scale Sailplane Soar-In was a great success. The format of only Modern or Vintage Scale Sailplanes changed the pace and general atmosphere of the Soar-In. The pilot turnout was smaller than last year, as can be expected with the change. Still, this was the most enjoyable, relaxing Los Banos event I have ever been to.

There was a "whole lotta flying going on" both days. I think everyone got to fly as much as they wanted. There was more variety in the scale planes and I think there were more planes per pilot this year. I didn't hear anyone say they didn't get enough stick time because the frequency pin was unavailable. Around noon Sunday, the airspace was occupied by only one or two planes at a time. The other pilots were changing planes, or charging batteries; they socialized, talked technical stuff, or bought and sold planes. By 1 p.m. Sunday, the vast majority of pilots were just about flown out. Many pilots had already started long treks home. By 2 p.m. the event was over, but not the flying. About 12 pilots moved to another location on the west side of the lake facing north and flew in tremendous lift. There were eight planes in the air when we left. Diehard fliers!

I want to thank Lynsel Miller, CD, and his team of Sean Sharif, Mike and Cindy Gervais and Chris Pratt for their efforts again this year. And a big thanks to the Rangers of the park who mowed (Yup, mowed!) a landing area and vehicle parking area out of the waist high grass. A great weekend with a lot of flying. That was the 1998 Los Banos Scale Sailplane Soar-In. Start your scale sailplane now and join us next year! ■

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'TECH TOPICS'

Sailplane Stability, Part II

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Bartlesville, Oklahoma 74006
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In the first article of this series, we discussed stability in pitch and yaw and the role of the horizontal and vertical stabilizer in controlling the flight path of your aircraft. We also compared 12 or so designs to obtain typical measurements for areas, moments, etc. Members of the Tulsoar club contributed to this by letting me measure their planes out at the field during an April contest.

Those measurements were converted into a table, which compared a number of different stability criteria used by various authors: Rudder Volume Coefficient (RVC), Tail Volume Coefficient (TVC), Neutral Point (NP), Instability Factor (ISF), dCm/dCl , and Planform Angle (PA). Those results were presented without comment. Now I'm gonna comment.

First, my statement of the conditions under which these comments apply:

- 1) You're designing your own ship and want to start with safe areas and moments which you will modify based on field trials, or
- 2) You're having trouble with a new plane and you want to check that the stabilizer areas are about right before messing around with other effects.

With those caveats in mind, my opinion is that the simplest and best metrics for good stability and controllability of a sailplane are the Planform Angle, Rudder Volume Coefficient and Tail Volume Coefficient. Any other calculation as a first cut at a design is either too complicated or too sensitive to small changes in geometry that don't seem to actually affect performance that much.

That said, what are good ranges for these values and how do you use them? Well, referring to the table in our last article:

TA	33° +/- 4°
RVC	0.046 +/- 0.010
TVC	0.440 +/- 0.150

Use the low end of these ranges for something that's a bit 'on the edge' and the high end for docile performance. Of course, airfoil selection is a factor with high pitching moment airfoils requiring a higher TVC value. However, most of the popular airfoils used today (SD7037, for example) are pretty modest pitching moment sections.

Let's do an example to see how to use this information. Suppose you want to design a high performance 2-meter ship. You've already settled on the wing layout - say a 9.5:1 aspect ratio with about 640 in² of area. This gives you an average chord of ~ 8.25 in. You're going to use the SD7037 airfoil, so you'll stick to the mid-range of

the design values.

To start the layout, you need an estimate of the tail moment (length from wing 1/4 chord to stab 1/4 chord). A longer tail moment tends to keep things a bit smoother, so let's put this a little on the high side of the range. If we choose a Planform angle of ~ 35°, we have:

$$\begin{aligned} \text{Tan}(35) &= \text{Tail Moment} / (\text{Span}/2) \\ \text{or} \\ \text{Tail Moment} &= \text{Tan}(35) * \text{Span} / 2 \\ \text{Tail Moment} &\sim 28 \text{ in.} \end{aligned}$$

There, now you know how far out your tail is hanging (metaphorically speaking). Next question is how big do you want to make it?

Let's look at the rudder first. We're going to run straight dihedral with ailerons, so we need decent yaw stability but not a whole lot of rudder authority. So, let's shoot for a slightly low value of RVC, say around 0.042. Remembering that:

$$\begin{aligned} \text{RVC} &= \text{Vert. Stab Area} * \text{Moment Arm} / (\text{Wing Area} * \text{Span}/2) \\ \text{and:} \\ \text{Wing Area} &= 640 \text{ in}^2 \\ \text{Span}/2 &= 39.5 \text{ in.} \\ \text{Moment Arm} &\sim 28 \text{ in.} \end{aligned}$$

we have:

$$\begin{aligned} \text{Vert. Stab. Area} &= \text{RVC} * \text{Wing Area} * \\ &\text{Span} / (2 * \text{Moment Arm}) \\ \text{Vert. Stab. Area} &\sim 38 \text{ in}^2 \end{aligned}$$

Hang in there, we're almost home free. Now, let's finish this off with the horizontal stab area. Since we've got a modest pitching moment and a decent moment arm, we can use a modest TVC of ~ 0.41 where:

$$\begin{aligned} \text{TVC} &= \text{Hor. Stab Area} * \text{Moment Arm} / (\text{Wing Area} * \text{Avg. Chord}) \\ \text{and} \\ \text{Avg. Chord} &= 8.25 \text{ in.} \end{aligned}$$

we have:

$$\begin{aligned} \text{Hor. Stab. Area} &= \text{TVC} * \text{Wing Area} * \\ &\text{Avg. Chord} / \text{Moment Arm} \\ \text{Hor. Stab. Area} &\sim 76 \text{ in}^2 \end{aligned}$$

There you have it, a good first shot at a design. If you REALLY want to refine it, do one of two things:

- 1) Get a program like Blaine Beron-Rawdon's "Plane Geometry" or the PC-SOAR program and optimize things around these starting points, or

- 2) Go build the plane, fly it and observe the handling characteristics. Read Martin Simons' excellent book "Model Aircraft Aerodynamics"¹ to understand the conditions you've observed (Dutch roll, yaw control, pitch 'hunting', etc.), and make the areas larger or smaller depending on the handling of the ship. My guess, however, is that if you used the average values found here, you'll be pretty close to where you want to be.

Now let's turn to the last of our stability targets: To Vee or Not to Vee. The answer to that question is somewhat subjective, so let's try and address the question factually and see where it takes us. First, consider the function of your tail group. The surfaces are called stabilizers, because that's what they do - stabilize the aircraft in pitch and yaw (Roll primarily responds to ailerons - or to yaw in a di/polyhedral ship due to yaw-roll coupling.).

Since pitch and yaw act along perpendicular axes, the stabilizers need to generate forces that can be resolved to act along upon these axes. In a cruciform tail group, that resolution is obvious. The horizontal stab controls the pitch axis and the vertical stab controls the yaw axis. In a V configuration, you can get the same effect but it takes a little more geometry.

Generally speaking, lifting forces on a flying surface act perpendicular to that surface. For a V, the situation is shown in figure 1 (viewed from the right-rear of the aircraft). For case 'A', both control surfaces are pointing down. The lift vectors point up and to the right, and left respectively for the left and right V surface. The horizontal values of lift cancel out leaving the vertical, or pitch axis, force. For case 'B', the left surface is deflected down, while the right is up. The vertical forces now cancel leaving a net yaw force.

The mechanical coupling for this set-up is a little complicated, but quite reliable once installed. However, even the most basic computer radio has V-tail mixing and that's really the way to go these days.

Having convinced ourselves (I hope) that this works OK, how do the rules for stabilizer sizes apply to this configuration? The best solution is to go with what works. Both Martin Simons¹ and DJ Aerotech² advocate using the same total area for the

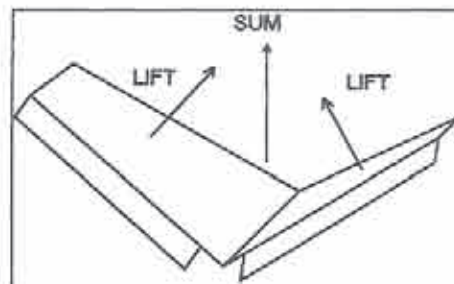


Figure 1-A: Pitch Action for a V-Tail

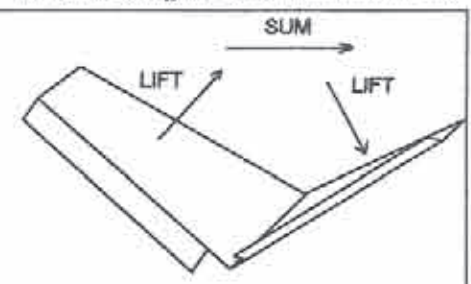


Figure 1-B: Yaw Action for a V-Tail

V-stabilizers as would be used for a conventional tail group. In addition to making good sense, experience has shown that this really works.

If we use this rule, we need to translate it into a simple means for calculating the area of the V-stabilizers and the included angle. Based on the rule given above, the area is simple

$$2 * V\text{-Stabilizer Area } (A_{VS}) = \text{Horizontal Stab Area } (A_H) + \text{Vertical Stab Area } (A_V)$$

To figure the angle. We'll use a technique first brought to my attention by Don Stackhouse² in some postings earlier this year on the *R/C Soaring Exchange*. The easiest way to figure the angle is to go back to trigonometry:

$$\text{Sin}^2(\text{Angle}) + \text{Cos}^2(\text{Angle}) = 1$$

If we let the angle be 1/2 the included angle in the V, we can combine our area rule with the trigonometry rule and we have:

$$\begin{aligned} A_H + A_V &= 2 * A_{VS} = 2A_{VS} (\text{Sin}^2(\theta/2) + \text{Cos}^2(\theta/2)) \\ &= 2A_{VS} \text{Sin}^2(\theta/2) + 2A_{VS} \text{Cos}^2(\theta/2) \\ &\text{or} \\ A_H &= 2 * A_{VS} * \text{Sin}^2(\theta/2) \\ A_V &= 2 * A_{VS} * \text{Cos}^2(\theta/2) \\ &\text{and} \end{aligned}$$

$$\tan^2(\theta/2) = (A_H/A_V); A_{VS} = 1/2(A_H + A_V)$$

Well, all this sounds nice, but does it work in practice? Let's go back to our 2 meter example. Remember that we came up with horizontal and vertical stab areas based on the RVC and TVC average we developed from our survey. Those calculated out to be:

Vertical Stab Area = 38 sq.in.
Horizontal Stab Area = 76 sq.in.

For a V configuration we would then have:

V-stab area = 57 sq.in.
Included Angle = 109.5°

which is essentially the same as that measured on the 2 meter Super-V, as reported in the survey from the May issue. (Umm, I cheated - I already knew the answer!)

Although this is a good example of the technique, does it really work in practice? The Super-V certainly works well, as do any of the V-tail HLG put out by DJ Aerotech. At the same time, I've messed with 6 V-tail designs in the last 2 years. The current 'Romulan' is on its third V to check out areas and angles. The current version pretty much hits the middle of the RVC and TVC range, and it's definitely the best so far. I've also used the same rules in switching a HL from a cruciform tail to a V

with no perceptible change in stability or control authority.

The one case that didn't work well for me was the 'Wild Thing' from 2 years back (Aptly named after its first flight!). WT's V-tail was based on projected areas (sin/cos terms) rather than the technique used here and it was a handful to fly. In all other respects (moments, areas, etc.), the current 'Romulan' is nearly identical.

Let's close with a few comments on V-tail experience. First of all, don't expect to save a lot of weight by using a V. As you can see, since the total areas are the same, the weights of the tail surfaces will be nearly the same. Might save a bit on linkage, but that's all. You might convince yourself that you've got lower parasitic drag. But the real reason to try it is 'cause it looks really neat.

Next, since each surface of a V is controlled independently, you have to be careful that the throws are set up the same. Pitch (and yaw) response relies on canceling the horizontal (or vertical) lift components. If the throws aren't the same on both surfaces, that won't happen, and you'll start mixing controls.

Finally, there is an effect I'll call adverse torque for a V in yaw control. This is due to the yaw forces being applied above the yaw axis. In Figure 1-B, note that the horizontal lift forces are generated in the middle of the stabilizer area and thus are applied at a moment arm above the yaw axis of the fuselage. In this case, it introduces a clockwise 'twist' while inducing a left yaw to the aircraft. Although this is a small effect, some pilots can detect this force and use differential in the V controls to compensate. For most of us, a proper set up of aileron differential takes care of this effect.

Well, that's it for tailgroup stability from this old boy. Even if you don't go out and design your own ship. I hope these articles have helped to understand why tail surfaces are built the way they are.

1. Martin Simons, "Model Aircraft Aerodynamics", Argus Books Limited, England (1985) ISBN 0-85242-441-8

2. DJ Aerotech's web site contains a lot of useful information on V-tails. Take a look at <http://www.bright.net/~djerworks/>

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The Condor is designed by Mark Allen, who is considered one of the best model sailplane designers in the United States, if not the world. Mark has taken all of his previous experience in competition thermal duration flying, plus all the knowledge he has gained from his earlier contest and sport designs, to design the Condor. Mark Allen's previous planes, to name only a few, are: Falcon 880 and 800, Falcon 600, Swift, Thermal Eagle, Vulcan, Night Hawk, Sky Hawk, Electric Hawk, Falcon 550E, Rocket, Pocket Rocket and, of course, the molded, world championship F3B Eagle. By taking the best of these designs and the new construction techniques available today, Mark has come up with what we feel is the absolute best open-class sailplane available.

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

CONDOR

*Tomorrow's Sailplane,
Technology Today*

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

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

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

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

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(Top) The tug pulls the banner to open the demonstration flights. Dave Wenzlick certainly has his banner technique perfected; the bottom has to be ballasted so that the banner "flies" upright!

(Bottom) Darrell Johnson draws a lot of attention with his EMS Duo Discus at the Williams Field show.

The First Aerobatic Contest in the USA

Of particular note is the aerobatic contest to be held in Fayetteville, North Carolina, October 2-4. Practice sessions will be held on Friday, while the event takes place on Saturday and Sunday. Hosted by the Piedmont Aeromodelers and run by Wayne Parrish, this event is sure to be a winner.

On this side of the ocean, we're really beginners at all this sort of thing, and so the idea is to have a contest where any type of scale sailplane and every pilot will feel right at home - whether a beginner with a Minimoa or a hotshot with a Fox. This contest will have a required stunt routine for a Sportsman class (for sailplanes and pilots who wish to test their skills in a modest way), and another stunt routine for more adventurous souls.

The required maneuvers are to be performed in consecutive order, just like the full-sized gliders. Not only will each



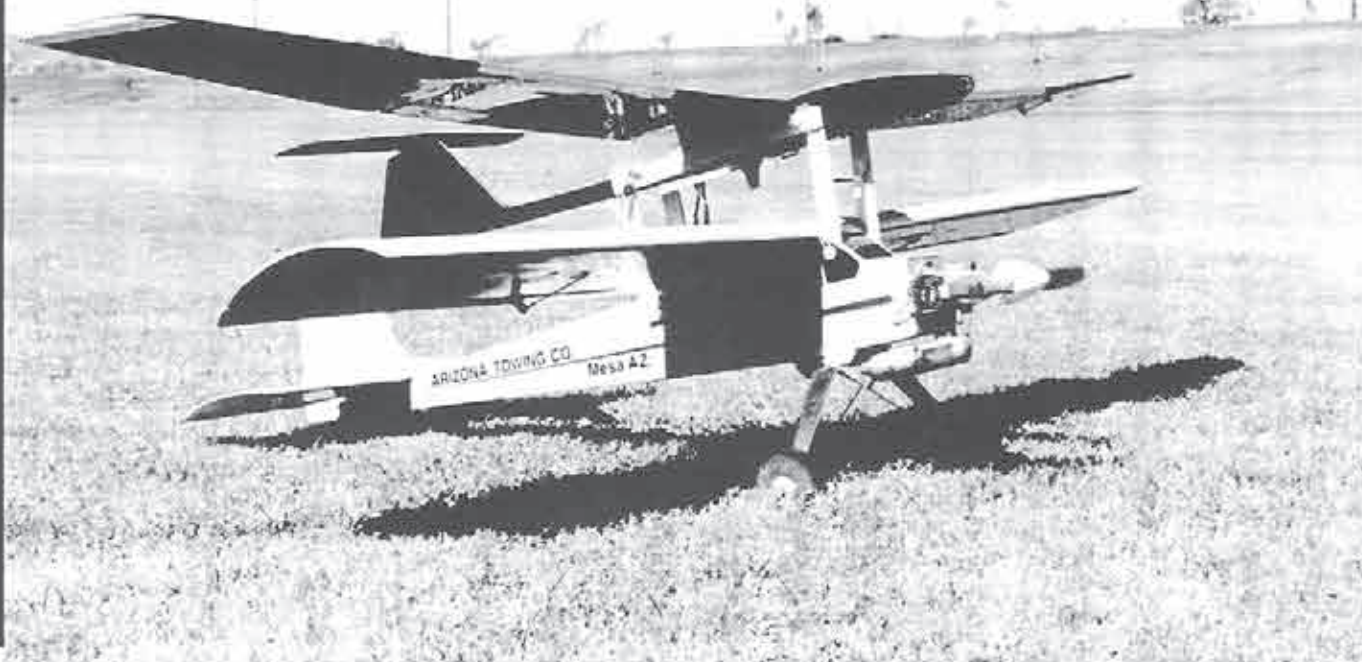
Arizona Flying Eagles Show Team display area at the Williams Field show. Obviously, Dave has been doing airshows for a while and has help from other club members. It takes a bit of organization to do airshows, but it's well worth the effort. Keep up the good work, Dave and Darrell!



"Hot Air"

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

By the time you read this, Elmira will have come and gone and we will all be in post partum depression, but this year, happily, not for long. There are a growing number of scale sailplane events to look forward to over the summer and well into the fall.



Trusty Telemaster with an OS BGX-1 with a Mystery ship is ready for a piggy back launch. This Telemaster also serves as a tug.



maneuver be judged, but an over all artistic presentation will also count.

For those interested, the two stunt routines are published in this issue. This should give you plenty of time to practice them over the next few months.

Launching will be by airtow. The sailplanes will be towed high enough to complete all the required maneuvers, but not so high as to be difficult to see. The "proper" release altitude will be left up to each individual pilot.

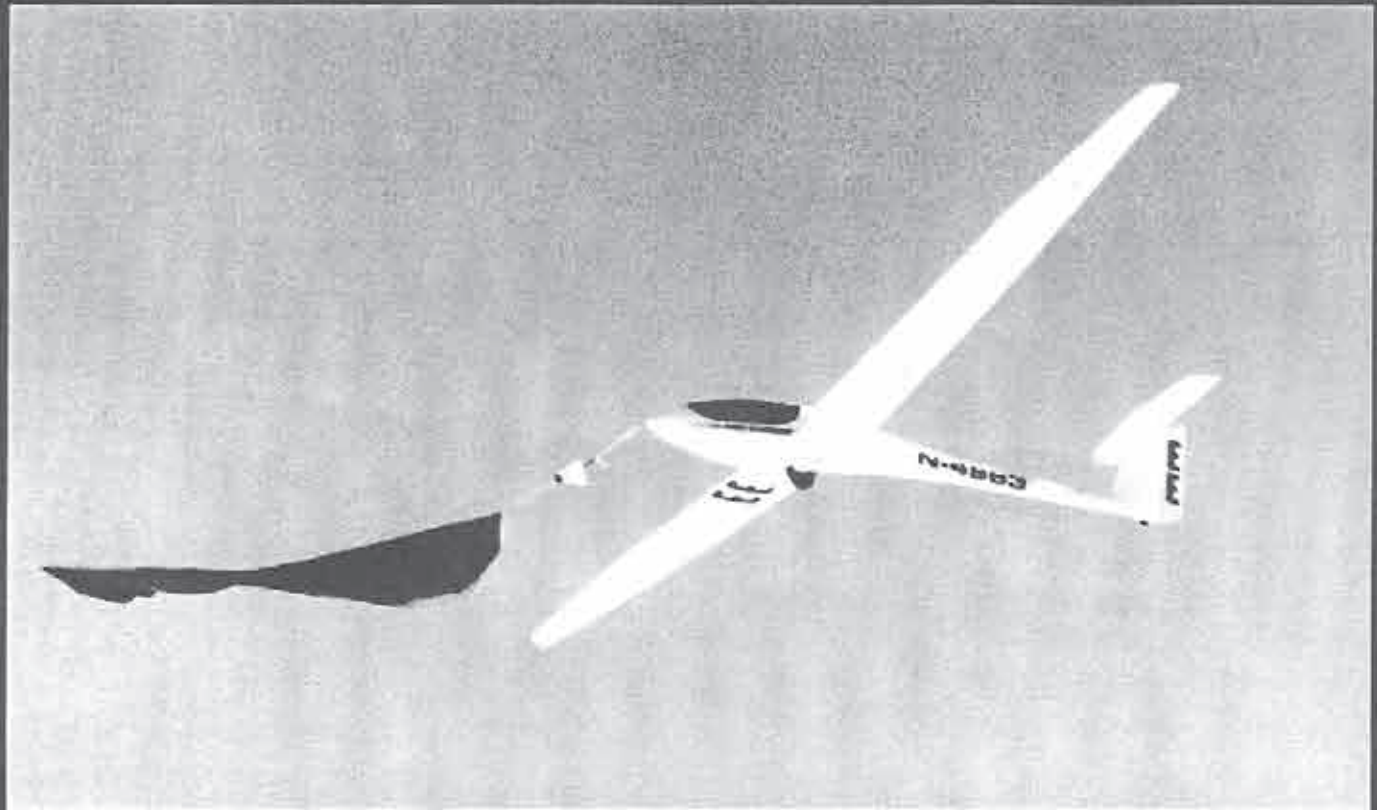
As you will see, you won't need to be a hotshot or fly a Fox to win! For that matter, I have the feeling that everyone who comes to this first ever aerobatic event will be a winner.

Nose Weight to the Rescue!

You may have read recently that we had a little trouble with what should have been an excellent towplane - a new 1/3 Spacewaker. It flew great when not towing, but was a real pig with a glider hooked up. Although well within the safety zone, we found that the CG might be a little far back, so added some nose weight and voila, from beast to beauty! We had no idea that just a few ounces of lead would make such a difference!

Well this lesson came in very handy just a few weeks ago when I visited Asher and Rusty in Pensacola for a weekend. We tried out a new towplane - my 35% Extra (with a 3W 80 up front). This bird was balanced for aerobatics so that it would fly upside down with the same elevator trim setting as right side up. Perhaps it was a little tail heavy, but it sure flew great, when not towing...

You can probably guess the rest of the story. We towed all day the first day and, although we got a couple of flawless tows, the Extra was really too difficult to fly with a glider behind. Although fairly high, most of the tows had to be prematurely aborted. This was definitely not a good towplane in its present state. But what a pity! It towed the 27+ lb. gliders up at about a 40 degree climb angle and, in short order, were really high. Once released, the Extra (on low throttle) was able to dive straight down and be ready for another tow in seconds. It's otherwise very docile and easy to fly. It would make a great towplane



ASH 26 on tow. An airshow is a great way to introduce many folks to our wonderful hobby. You may remember that several years ago we put on an airshow demonstration at the Vintage sailplane meeting in Elmira. We towed a 1/2.5 LS-4, a 1/3 Ka6E, and a Roedelmodell ASK-12. Much to our surprise, the pilots of the full sized towplanes were most enthusiastic, as were

the other pilots in attendance. We were very well received by the general public, as well. As most of you know, Elmira has become quite the international event. Little did we know where this fifteen minute demonstration would lead. Our first demo paved the way for what has now become one of the classic international sailplane events of the year.

Aerobatic Flight Plan

October 1997

- Uncouple your rudder & ailerons.
- Practice flying Straight & Level.
- Master airspeed.
- Practice the Inside Loop.
- Determine what rudder & aileron adjustments are required to fly a perfect loop.
- Tackle Inverted Flight.

November 1997

- Practice the Split-S or Wing-over.
- Practice gaining sufficient airspeed to be able to complete a 360° Roll.
- Practice The Roll.
- Combine maneuvers to develop your personal, custom, aerobatic sequence.

December 1997

- Practice 1/2 Cuban 8.
- Practice the Cuban 8.

January 1998

- Practice the Outside Loop.

February 1998

- Practice the Immelmann and Reverse Immelmann.

March 1998

- Practice the Hammerhead, Reverse Cuban 8, and Reverse Half Cuban 8.

April 1998

- Practice the Spin.

May 1998

- Practice the Tail Slide.

June 1998

- Practice the Humptybump.

Notes:

- Establish and maintain a "Sailplane Diary" for each plane.
- Review monthly progress.
- Practice flying with a knowledgeable friend or expert, and remember that safety comes first.
- Practice with a flight simulator program such as Flight Unlimited (April, 1997-RCSD).
- Definition of "One Mistake High": Be darn sure you're high enough to complete the maneuver and make one mistake, before hitting the ground.

if only it wasn't so darned hard to fly on tow...

While riding home that night, I tried to figure out what to do. Was the tow attachment position too far aft? It's just behind the cockpit on top of the fuselage, but the cockpit ends way behind the wing. I had never towed with the release so far back. Was this the problem? Maybe I should try a loop around the landing gear and over the top of the canopy, which would put the tow attachment point much further forward; would that solve the problem? With a bit of extra towline it would be very easy to find out! And then I remembered our experience with the Spacewalker; why not try adding a bit of nose weight?

Full of excitement, the very next day, we were back at it. This time, the Extra had about 8 oz. of lead added to the front end. Guess what? Although not as easy to fly on tow as our beloved Wilgabeast, the Extra made about 20 tows, most of them releasing at maximum height. It's now a great towplane!

Stunts in the Real Thing?

No Thanks!

I enjoy aerobatics. I guess I don't have to tell you that. But what you may not know, is there was a time when I learned to fly sailplanes, the real things - the kind you get into. Sure it's fun and, at first, a challenge to keep the glider in position behind the towplane, but from the very first day I really disliked the feeling of flying in the glider, especially when practicing stalls and spins. (It was an ASK 13 by the way.) Yuk!

By contrast, I just know that my six-year old is going to love flying in airplanes. I can tell. He loves roller coasters and will always get on the very biggest one he can find - as long as they will let him get on that, is,

he has to be tall enough. They let him ride two out or three at Busch Gardens. Whether right side up or upside down, he's really in heaven. Not me, I hate the feeling. This summer he's going up in his first glider ride. A stall turn or a loop should make him feel right at home.

As for me, after my first loop, I decided I really hated flying *in* them. What really fascinated me was watching sailplanes fly. So eventually, I took up R/C and many years later, here we are. I can have my cake and eat it too. I do all these stomach-wrenching maneuvers and don't feel a thing.

My son would really love the Humptybump. The very name of this maneuver must have been invented by someone who got sick in the cockpit. Happily, we can do it with impunity, as long as we don't run out of airspeed on the way up.

The Humptybump

(possible for all types of sailplanes)

Airspeed, airspeed, airspeed. You've heard this before! Airspeed and energy management are the key to this

maneuver. If you come into it with plenty of airspeed and your glider is heavier rather than lighter, you should have enough inertia to carry you up into the Humptybump. You must quit while you are ahead, and before you run out of steam you must give down elevator so that the glider rotates downward. Once the nose is pointed down, you're home free.

The illustration should give you a very good idea of what to do. The glider flies level briefly, then pulls up 90 degrees into a vertical climb, holds that line briefly, then pushes down into a (180 degree) half loop and briefly noses straight down, then pulls up 90 degrees into level flight.

There are a few variations on the Humptybump theme which might be useful for you to know if you have a very aerobatic sailplane. You can do a half roll either going up or coming back down. These are called, as you might expect, "Humptybump with a half roll", or "Humptybump with options". What's interesting about this? Humptybump now becomes a turnaround maneuver.

As I have said before, many maneuvers are

simply rolls and loops (or parts there of) added together. As you can see, the Humptybump with options is no exception.

Here is another quite interesting turnaround variation - you go up, then you go down, and instead of pulling up elevator at the end to level flight as illustrated, you push in down elevator and exit inverted to level, going in the opposite direction. That would certainly be a novel and spectacular turnaround!

Remember, practice makes perfect. The Humptybump might at first seem difficult because of its vertical component, but with practice you will find that your sailplane can climb to vertical for a time. Remember also, that you don't have to do the whole maneuver the first time you try it. You can try the first part, then the middle and then the end - all separately to become familiar with what you want to do. Then you can start adding the parts together until you are comfortable flying the whole maneuver.

If you approach your whole aerobatic learning and practice sessions by mastering each part and then adding them together, you will be surprised at how easy some of these are.

It should also be said that some gliders will be more at home with some maneuvers than others. The bottom line is, go out and see what you can do. You might be quite surprised at what you can accomplish with just a little practice in a short time.

Sod Farms and Motor (tow) Planes

If you have noise problems or if the owner of the sod farm you fly on doesn't like to have his grass eaten up by gas or glow fuel, and that's why he won't let you fly towplanes, my experience might help you change that.

Mufflers

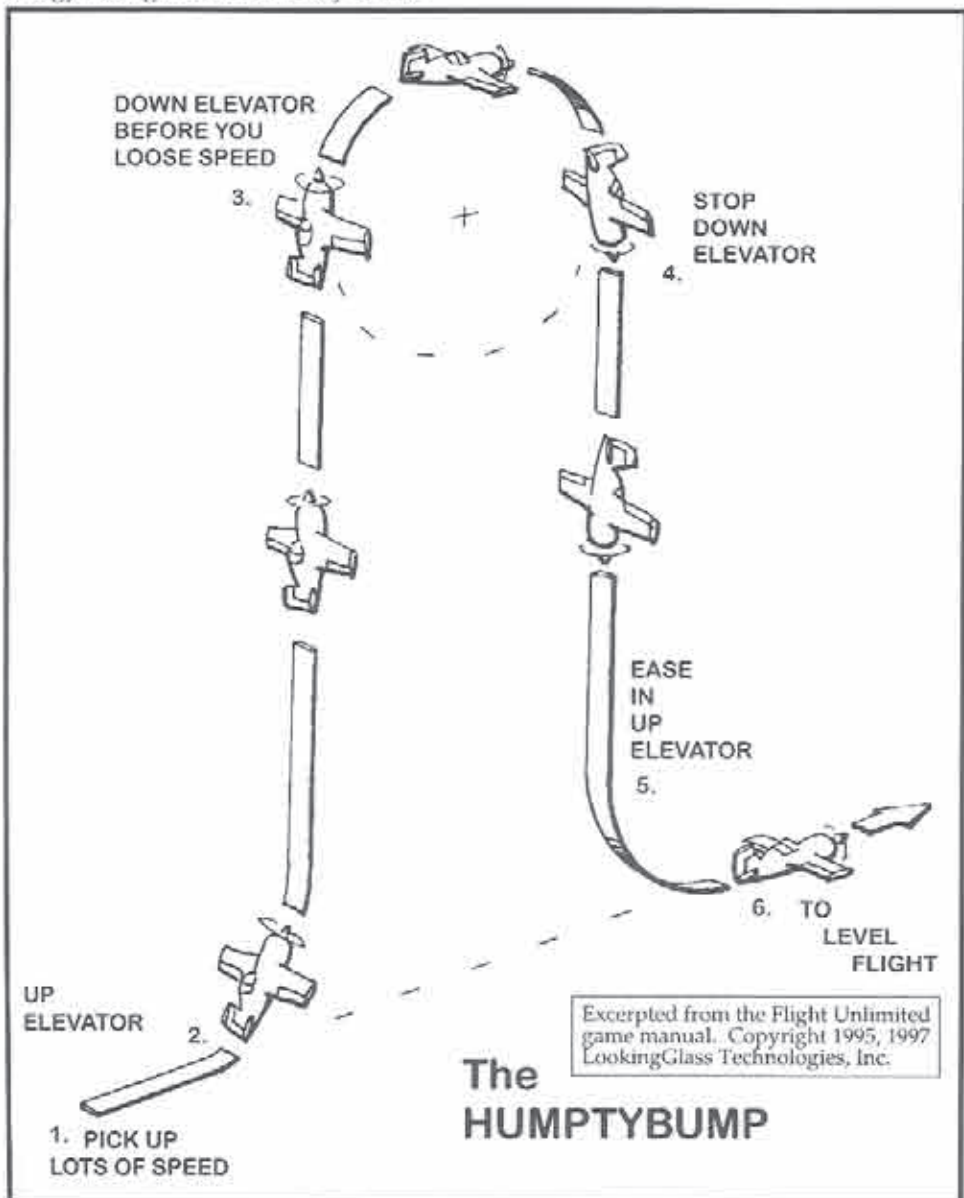
Most 4 stroke glow motors, and especially the OS 300 can be muffled so that they sound almost as quiet as electrics. In the case of the OS 300, for example, you can install flexible metal tubing leading mufflers, which make this motor so quiet that you hear the prop noise.

In the USA, it would seem that no one pays attention to try to get large gas motors QUIET! Well that can be done, also. I got a muffler from King motors in Germany which fits the 4.2 Saks and, again, it really quiets the motor right down. Even quieter is the muffler which is installed through the fuselage and exits the bottom. (You can put it on the outside of the fuselage, as well.) We have this system on a 3W 120R. This is the way the Germans quiet their motors; when you have heard what those mufflers (don't) sound like, you will be most pleasantly surprised!

So if sound is your problem, you might find that a very well-muffled motor will help you out!

Burned up Sod

I've heard it said many times, "We can't fly motor planes at the sod farm because it burns the grass in places." Well, it's certainly true that gas and glow fuel will burn holes in the grass - especially when you fill your tank (the fuel spills out when



the tank is full), or run your motor at full throttle (tuning it up) for a while in one spot.

We found a very simple solution to the burned grass problem. Buy some sod from the owner of the sod farm, mark the place where you own the grass, and fill all tanks and run the motors always in this same place every time. How many yards of grass do you need to start an airplane? Five or ten square yards will do very nicely. That's a very small investment for a huge return!

When you taxi your towplane out, hookup to a glider and takeoff, you won't harm the grass at all.

We had this experience with a 50 member power club and things worked out very well for us. I don't imagine that you will be running more than one or two tugs at a time, so the solution to the burned grass problem should be even easier for you! I hope this helps!

Good flying and, above all, happy landings!

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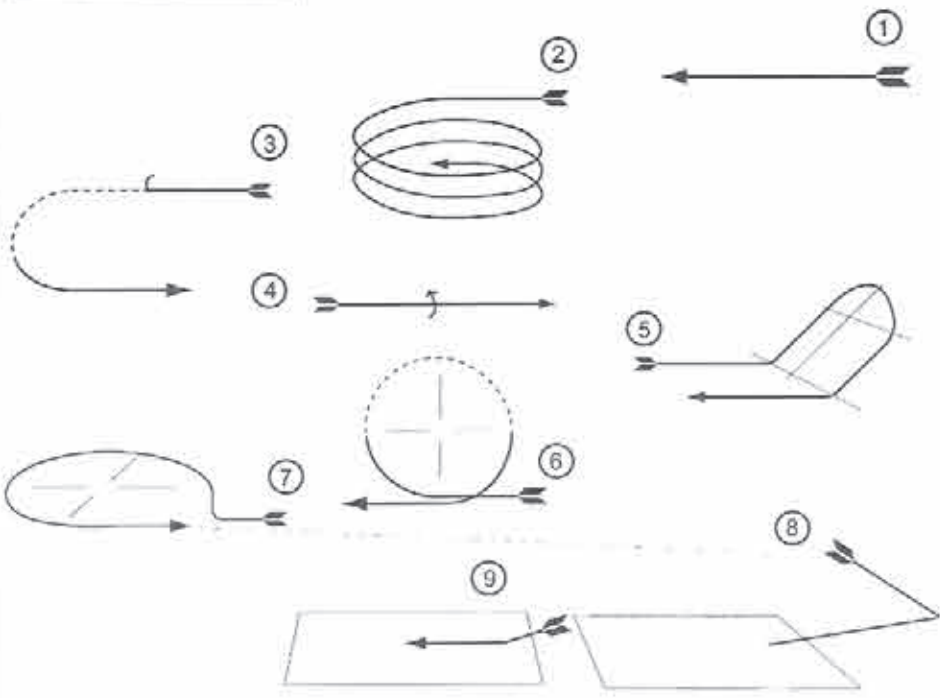
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SPORTSMAN AEROBATICS

wind →



1. Straight & level flight at least 10 seconds (into the wind) [difficulty k=1]
2. Three 360 degree thermal turns [k=3]
3. Split-S (turnaround maneuver) [k=4]
4. One roll [k=3]
5. Chandelle (turnaround maneuver) [k=3]
6. Inside loop [k=3]
7. Procedural turn (turnaround maneuver) [k=2]

...take whatever time you need to get into position for...

8. Crosswind & setup for landing [k=1]
9. Landing [k=5]

Aerobatic Routine for Fayetteville Scale Aerobatic Sailplane Contest October 2 - 4

The idea behind this event is to have an easier and a more difficult aerobatic routine, so that there will be something for everyone at every skill level. The Sportsman aerobatics should be well within the abilities of ANY scale pilot. The Advanced routine is more demanding, but any good pilot with just about any scale sailplane should be able to perform these maneuvers.

The maneuvers should be performed one after the other (just like the full-sided gliders). Notice that there is a starting maneuver (into the wind), then a middle maneuver, a turnaround maneuver, etc. All turnarounds should be performed on the right and left sides of the flight "box", and the middle maneuvers should be performed directly in front of the judges and pilot.

Each sailplane will be towed high enough to complete all the required maneuvers, but low enough so that the aerobatic performance can easily be seen and judged. Pilots will decide for themselves where and when to release. There will be a 6 minute time limit for each flight once the glider has been released at altitude. Each sailplane will be towed aloft in clear airspace and only one aerobatic routine will be flown at a time.

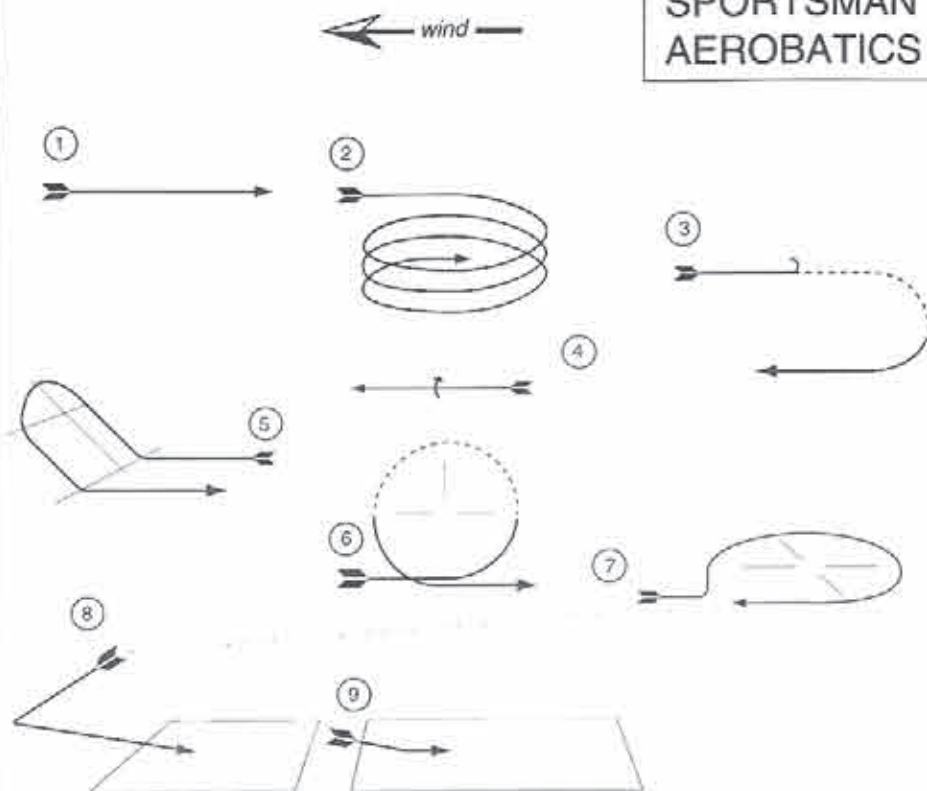
Each routine is depicted here with wind from the right, and from the left.

Depending on how many contestants show up, 5 or more flights for each pilot will be scored (with one or more throw outs permitted).

There will be plenty of flying and lots to see at this first ever aerobatic event to be held here in the USA! Come one, come all; you never know - you just might win! ■

The Chandelle and Procedural Turn will be included in the July issue. ■

SPORTSMAN AEROBATICS



1. Straight & level flight at least 10 seconds (into the wind) [difficulty k=1]
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7. Procedural turn (turnaround maneuver) [k=2]
...take whatever time you need to get into position for...
8. Crosswind & setup for landing [k=1]
9. Landing [k=5]

Sky Dancing

By William G. Swingle II
Pleasanton, California
bill_swingle@electro-test.com

I've noticed myself flying different recently. Specifically, when I'm flying combat, I've started to take great pleasure in avoiding collisions. I try to fly through the middle of the furball, while purposely avoiding other airplanes! Strange, yes. I realize it is.

Initially, I tended to gravitate to one on one fighting. I'd pursue a single target for long periods of time until I scored at least a hit. The downside to this is that kills come slowly and it leaves you too busy to pay sufficient attention to the other participants. Never-the-less it is great fun and I've made some dear friends doing it.

Now, though, I tend to just dance through the other combatants as I'm swooping through the lift band. Even more enjoyable to me is when others decide I'm the target and direct their attack upon me. Evasive maneuvering is great fun! Drop the nose and try to accelerate away; raise the nose and try to float above them; or, dodge and dance with aerobatics. Each is effective and has its place in my bag of tricks. By judiciously choosing the most appropriate method, I begin to feel like Fred Astaire dancing through the sky, reveling in the failed attempts of my attackers. Long live the dance! ■



Bowman's Hobbies The Ruffnecks	
<p>The newest Ruffneck EPP glider is the Cutlass. A scale version of the Navy fighter bomber, F3U Cutlass. This plane was specifically designed for use with a Zip serv. It also flies great off the slope!</p> <p>Wing Span 44" Fuse 20" Wing Area 408 sq. in. Airtail E103120 modified Weight 20-24 oz. Wing Loading 6-7.7 oz/sq. ft. \$59.95 + \$7.54H + Tax in CA.</p>	<p>The Javelin is BIG that you can gorilla launch without folding the wing and fuselage. Built to a competitive 16 OZ. light air efficient, 4 channel (flapron, rudder, elevator) made of EPP with the durable nature of the Ruffnecks. Competition or training, the Javelin is only a hand toss away.</p> <p>Wing Span 60" Fuse 33" Wing Area 420 sq. in. Airfoil 7027 Weight 16 oz. Wing Loading 4 - 6 oz/sq. ft. \$49.95 + \$7.54H + Tax in CA.</p>
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L-Spatz 55 Scale Model

By Jim Blum
Danville, New York

Background

The L-Spatz 55, designed and built by Egon Scheibe, was well suited for training and performance flights. It was used by many soaring clubs during 1955 - 1962. In fact, about 300 planes were built in Germany. L-Spatz is light weighing 342 pounds; the glide ratio is 28:1. It was relatively inexpensive, as some were actually built by owners working out of their home workshops.

The greatest success was achieved by Baptist Hoffman, who built his Spatz in his workshop; then during the inaugural flight on May 26, 1957, he set a new German distance record of 661.6 Km. This record stood for three years. Not bad for a "do-it-yourselfer". The Spatz has, of course, been replaced on the soaring scene by today's

more potent fiberglass racers. Only at old-time meets does the L-Spatz 55 appear now and then.

My scale model is pretty true to the original in approximately 1/4 scale. Now, the Spatz will endure, at least as a model. The award winning plans were drawn by Mario Raab, and are available in the U.S.A. from Bob Holman Plans Service. Fortunately, my son-in-law provided a good translation of the five page building text, along with an excellent stocklist of materials. This came in handy from time-to-time, since there are a lot of parts and pieces to identify and assemble.

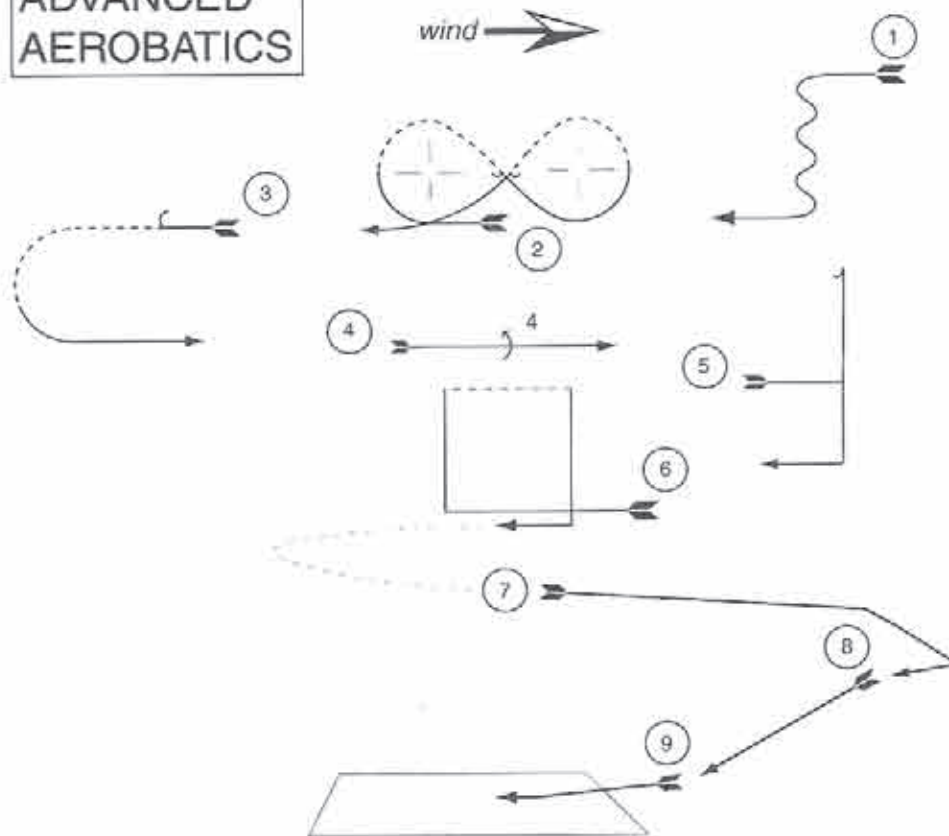
Fuselage Construction

Fuselage construction came first, made up from plywood formers, spruce and balsa longerons, diagonals, and cross pieces. This was pretty straight forward



work, resulting in a strong, light structure. (Incidentally, all the metric measurements can be ignored by using 3/16", 1/8", 3/32", etc., stock.) I used standard JR 507 servos in the fuselage for rudder, elevator, and airtow release. The skid (no wheel on this version) is fully sprung with a coil spring. The forward nose section from the trailing edge forward is sheeted with 1/32" plywood over the spruce frame. I did

ADVANCED AEROBATICS



1. Three turn spin (into the wind) [difficulty k=2]
2. Cuban-8 [k=3]
3. Split-S (turnaround maneuver) [k=2]
4. 4 point roll [k=5]
5. Stall turn (turnaround maneuver) [k=4]
6. Square loop [k=5]
- ...take whatever time you need to get into position for...
7. Downwind, crosswind, line up for landing [k=1]
8. Slideslip
9. Landing [k=5]

deviate slightly from the plan in making up the canopy. A Viking Models U.S.A. canopy was adapted to give a more modern look. Blown canopies were common on the later model Spatz.

Now, the fuselage is looking real nice. Tow release is installed, center section with wing joiner blades is ready to go, rudder pull-pull mechanism is installed, elevator pushrod is supported and installed, antenna tube located, and the stabilizer hold down is glued in place. Lastly, the 1/4 scale latex pilot bust now takes his place on board.

Wing Construction

The wings were conventionally constructed with spruce spars top and bottom, balsa ribs with cap strips, 1/16" balsa D-tube structure. I did substitute Graupner Teck spoilers for the DFS type indicated on the plans. These, as well as the ailerons, are actuated by micro servos installed in the wings.

One of the chores which took some time was the grading of the wing ribs. The plans show only the root and tip ribs. All the rest must be arrived at by your own favorite method. I used the sandwich method making each rib template of 1/64" plywood; not an easy task, but a set of suitable ribs evolved and were, at last, glued in place. About 1/4" washout was built in, even though none was called for in the plans. This was added insurance against any tip stalling tendencies. One other modification that I made in order to simplify wing construction was to hinge the ailerons along the top with vinyl tape. Since this was my first go at a large-plans scale model, I made a few alterations to make things go somewhat easier.

The tail feathers require the usual careful makeup, as they have an airfoil configuration, as well as a taper in spar depth. These are hinged per the plans with Robart hinge points to achieve the scale look. The skid is

completely sprung and also removable, so any maintenance can easily be performed. The framework is entirely covered with Black Baron 21st Century Fabric. The top of the wings, fuselage, and stab are covered in white, with black on the bottom surfaces to aid in visibility at altitude.

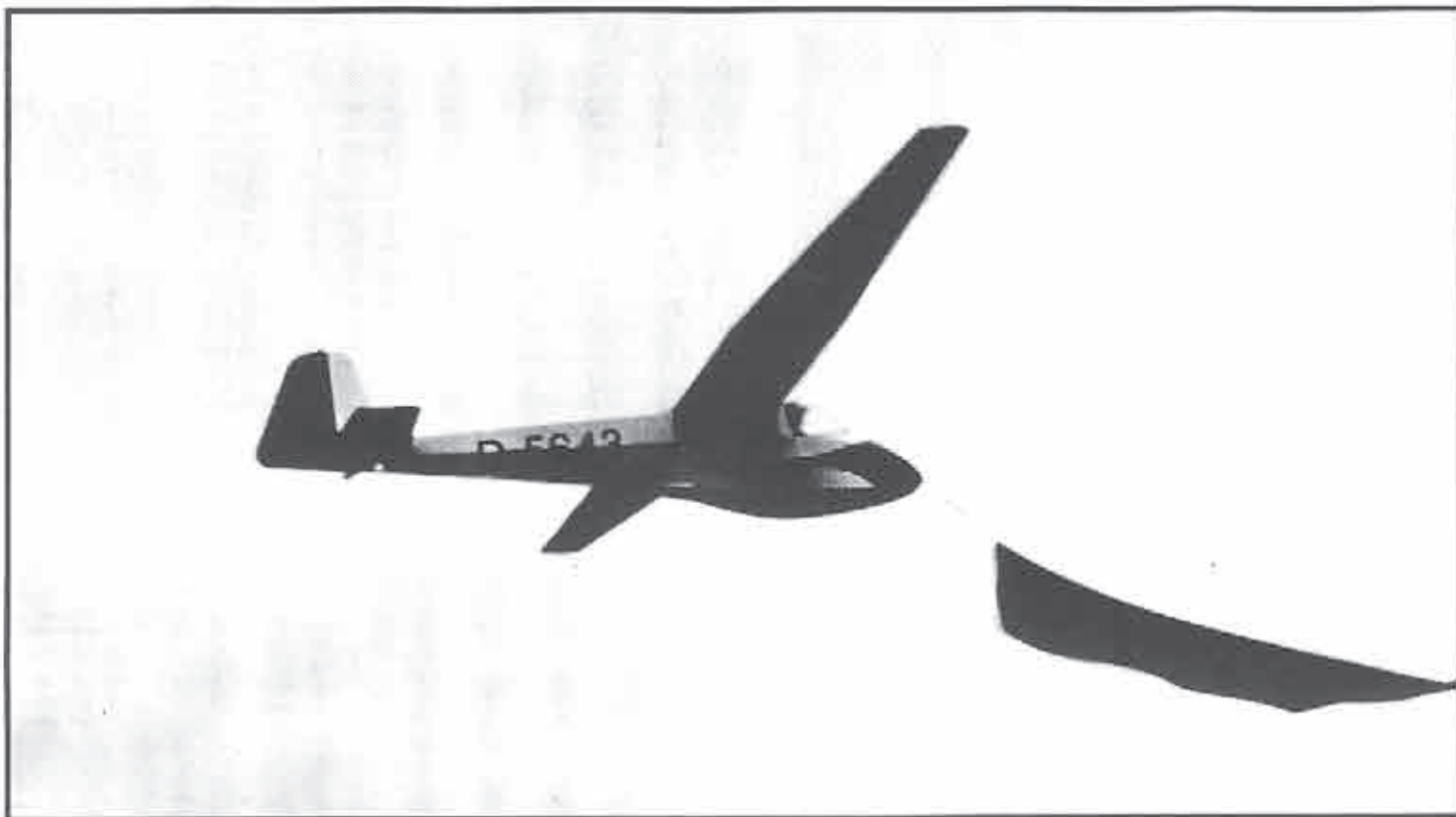
Flying

So, after some time on the building board (I didn't keep track of exactly how long it took.), we were ready for the inaugural flight. Fortunately, I had the welcome help of Robin Lehman and my son, Jim, when it came time to launch this vintage beauty on its maiden flight. Robin hand launched the Spatz of see if any problems were observed. None were found; it floated out there very smoothly, indeed.

Jim fired up the towplane, the all out signal was given, and away she went, into the smooth summer air! A little trim adjustment for proper tow position and, soon, the

ADVANCED AEROBATICS

1. Three turn spin (into the wind) [difficulty k=2]
2. Cuban-8 [k=3]
3. Split-S (turnaround maneuver) [k=2]
4. 4 point roll [k=5]
5. Stall turn (turnaround maneuver) [k=4]
6. Square loop [k=5]
- ...take whatever time you need to get into position for...
7. Downwind, crosswind, line up for landing [k=1]
8. Slideslip at least 5 seconds [k=4]
9. Landing [k=5]



Technical Data

Span: 3.9 meters
 Length: 1.63 meters
 Weight: 8 lb.
 Wing Area: 1472 sq. in.
 Wing Loading: 12.6 oz./sq. ft.
 Airfoil: E207 - E205

Spatz was just a speck in the sky. Robin gave a nod of approval as to how she handled the thermal turns, stall behavior, responsiveness, etc. At an all-up weight of 8 pounds, the Spatz is truly a floater. Slow and majestic, just like the real thing. Amidst the smiles, those long hours in the basement paid off. Entering the landing pattern with an extra margin of speed to ensure good control response, the Spatz turned final with spoilers, adjusting for touchdown.

Since the inaugural flight, some fine tuning has been done to further refine the handling characteristics. While not a windy day flier, the Spatz is fine in winds of 8 - 10 mph. I believe this would be an excellent first scale sailplane, or a gentle, slow, good, light thermal ship. And so, just as Baptist Hoffman had an eventful inaugural flight with his home-built Spatz, so too did I!





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Length	28.3 in./28.3 in.	29.5 in.	28 in.	74 in.	62.5 in.	46 in.
Wt.	9 oz./11 oz. \$139.95/\$159.95	10.5 oz. \$149.95	15 oz. \$159.95	200 oz. \$1199.95	123 oz. \$699.95	54 oz. \$499.95

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Wing Span 1900mm
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 Length : 930 mm
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 Wing Area : 490 in²
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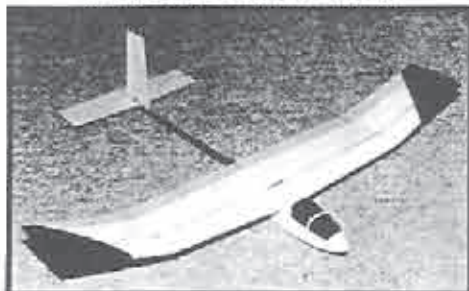
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NEW PRODUCTS

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

Dragonette

...from Dave's Aircraft Works



The Dragonette is a foamie, micro hand launch glider with a 29 1/2 inch span, 150 sq. in. area, and a 7% thk. MH32 airfoil. The length is 22 1/2" and, depending on radio equipment installed, the weight is 3.8 to 4.6 oz.

Control is 2 channel, rudder/elevator. Recommended radio equipment includes (2) FMA S-80 sub-micro servos (or equal), 75 to 100 mah NiCd pack and 27 mhz micro receiver (with Hitec SSII Tx). Weight can be reduced from an estimated 4.5 oz., by using smaller equipment.

The kit includes Expanded Polypropylene foam wing panels with pre-cut spar slots, machine cut Expanded Polypropylene fuselage pod and CF/FG tail boom, pre-cut balsa tail group, basswood spars and dihedral brace, balsa trailing edge stock, complete hardware package including all pushrods and miscellaneous material, block of scrap EPP foam for construction and repairs, comprehensive instruction manual including CAD figures and instructions for flight trimming. In order to finish the Dragonette, the builder needs 5 minute epoxy and thick CA adhesives, reinforcement tape, radio equipment, tail covering material (Silkspan or tissue applied with dope).

Price is \$39.95 + \$4.00 S&H in continental U.S.A., CA residents add \$3.10 tax. Dave's Aircraft Works, 34455 Camino El Molino, Capistrano Beach, CA 92624; (949) 248-2773, 104271.3352@compuserve.com, <<http://ourworld.compuserve.com/homepages/davesaircraftworks>>. ■



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The Guide is \$8.00 (Canada/Mexico \$10.00, Overseas \$15.00 - includes Air Post). Scale Model Research, 3114 Yukon Ave., Costa Mesa, CA 92626, (714) 979-8058, <<http://imt.net/~ims/scale.html>>. ■

use the PlaneTalk Active Matrix 4" color LCD monitor to view it on. The airborne system with alkaline battery pack weighs 10 oz. PlaneTalk's Pan and Tilt adapters allow the system freedom of looking around during flight.

Specific details include: 2 channels, 5 mile range, built-in audio, built-in Tx antenna, built durable and light, no vibration problems, technical support line, broadcast quality video, nothing to build or assemble, no airborne receiver interference, mounted with unique velcro system, 100% FCC legal for use anywhere in the U.S.A., amateur no-code technician license is required in the U.S.A.

Price is around \$1795.00. For more information, or to obtain a catalog (\$4.00), contact PlaneTalk, 16201 Westminster, CA 92683, (714) 650-5004, <<http://www.planetalk.com>>. ■

CMS's 3-in-1 Simulator

...from Horizon Hobby Distributors, Inc.

CMS's 3-in-1 R/C Simulator uses complex mathematical algorithms to accurately simulate aerodynamic forces on a model. The newest release, Version 10, as with older versions, allows you to use your own transmitter, trying out different mixes and trims, or getting the feel of a new maneuver. Glider software allows four-servo wing mix capability, as well as thermal simulation. Enhanced 256 color graphics and 13 levels of shading provide crisp, sharp model edges, which can be customized.

To support the new software, CMS will utilize a new interface adapter (Version 9 interface is not compatible with Version 10) that can support up to 12 channels, and features improved printer support and compatibility. Suggested retail price is \$209.95.

CMS is exclusively distributed by Horizon Hobby Distributors, Inc., 4105 Fieldstone Road, Champaign, IL 61821, (217) 355-9511, <<http://www.horizonhobby.com>>; available through hobby shops/distributors. ■



XP642

...from Horizon Hobby Distributors, Inc.

The JR XP642 is a six channel radio with four model memory, allowing the storage of data for 4 different airplanes using a three letter abbreviation. Exponential Control feature helps smooth out stick control by decreasing the response around neutral, and increasing control authority as the stick is moved away from the center, allowing enough punch for aerobatics, if so desired. Programmable Mixing makes it easy to "dial out" unwanted pitch or roll, by assigning a little compensating aileron and/or elevator input to the rudder channel.

The XP642 comes complete with a full set of ball-bearing servos, and is exclusively distributed by Horizon Hobby Distributors, Inc., 4105 Fieldstone Road, Champaign, IL 61821, (217) 355-9511, <<http://www.horizonhobby.com>>; available from most hobby shops/distributors. ■

SCHEDULE OF SPECIAL EVENTS



Fayetteville '96, Lehman photo.

July 4
Red, White & Blue HLG Redmond, WA
Adam (Red) Weston, awagner@blarg.net
(425) 806-0175

July 11-12
SOAR '98 Redmond, WA
Jeff Johnson, jeffmj@microsoft.com

July 19
HL Series Event Dayton, Ohio
David Rice, David_Rice@reyrey.com

July 25 - August 1
LSF/AMA NATS Muncie, IN
Cal Posthuma, CALPLSF@aol.com
Aldin Shipp, alden@ocl.net

August 22-23
SESS Summer Classic/AMA EXPO '98 Gilroy, CA
Mike Gervais, (408) 683-4140
Scott Meader, (408) 244-2368

August 22-23
Mid America Soaring Championship Lexington, KY
Thermal Duration & HL Golf
Frank Foster, (606) 273-1817
l02246.1017@compuserve.com

August 29
AMA HLG Redmond, WA
Joseph Conrad, conrad@namezone.com

August 29-30
HL Series Event Columbus, OH
Paul Wiese, pwiese@avcomsmt.com

August 29-30
Cape Blanco Inaugural Slope Fly-In Port Orford, OR
Larry Broman, (541) 751-8847

September 5-7
Soar Utah '98 Salt Lake City, UT
Kent Petersen, (801) 254-5018, petersek@wipd.com
<http://www.wordplace.com/soaring>

September 12-13
Sallaire One Design Contest Cincinnati, OH
Ed Franz, (606) 586-0177, ejfranz@fuse.net



Los Banos, Lehman photo.



September 19-20
442-444 Tullahoma, TN
Herb Rindfleisch, (931) 455-1836

October 2-4
Airtow Aerobatic Sailplane Contest Fayetteville, NC
Wayne Parrish, (919) 362-7150

October 3-4
25th CVRC Fall Soaring Festival Visalia, CA
Phil Hill, (209) 686-8867

October 3-4
CSS Fall Intergalactic Cincinnati, OH
HL Series Event
Paul Siegel, (513) 561-6872, psiegel@fuse.net

October 17
LSF South East Regional Contest Huntsville, AL
Ron Swinehart, (205) 722-4311
ron.swinehart@lmco.com

October 17-18
Pumpkin Fly Cincinnati, OH
Ed Franz, (606) 586-0177, ejfranz@fuse.net

November 7
Turkey Fly (Winch & HL) Cincinnati, OH
Ed Franz, (606) 586-0177, ejfranz@fuse.net

1999 - June 25-27
MSSC '99 Memphis, TN
Bob Sowder, (901) 751-7252

Outside U.S.A.

May 1-3 or May 16-18
Coupe du Quebec Slope Race Leclercville, Qc, Canada
Jacques Blain, (514) 652-6167

July 11-19
Canadian Soaring Nationals St. Jean, Qc, Canada
Jacques Blain, (514) 652-6167 eve.
<http://www.riq.qc.ca/users/pthiou/c2vm/index.htm>

Aug. 1998
F3J World Championships, organized by BARCS
August 14-16

GNATS Scale Fun Fly Niagara Peninsula, Canada
Gerry Knight, (905) 934-7451
Don Smith, (905) 934-3815
mistral@niagara.com, linden@niagara.com



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Gerry Knight, (905) 934-7451
Don Smith, (905) 934-3815
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Alabama - Central Alabama Soaring Society, Ron Richardson (Treas.), 141 Broadmoor Ln., Alabaster, AL 35007, <ron_mail@bellsouth.net>.
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California - California Slope Racers, John Dvorak, 1063 Glen Echo Ave., San Jose, CA 95125; (408) 287-0375.
California - DUST, Buzz Waltz, 68-320 Concepcion, Cathedral City, CA 92234, (760) 327-1775.
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California - Inland Soaring Society, Robert Cavazos, 12901 Forman Ave., Moreno Valley, CA 92553, RCAV@aol.com.
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California - Southern Calif. Electric Flyers, John Raley (President), 1375 Logan Ave., Costa Mesa, CA 92626; (714) 641-1776 (D), (714) 962-4961 (E), e-mail: E-Flyer@ix.netcom.com.
California - Torrey Pines Gulls, Ron Scharck, 7319 Olivetas Ave., La Jolla, CA 92037; (619) 454-4900.
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Florida (Central) - Orlando Buzzards Soaring Society (www.specs-usa.com/~ingo/OrlandoBuzzards), Jerre K. Ferguson (Pres.), 4511 Pageant Way, Orlando, FL 32808, (407) 295-0956, <jerre@bellsouth.net>.
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Hawaii - Maui Island Slope Soaring Operation (MISO), Duane A.K. Asami, 262 Kamila St., Kula, HI 96790, pgr. (888) 932-6247, <dhasami@mauigateway.com>.
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Ohio - Mid Ohio Soaring Society (MOSS), Hugh Rogers, 888 Kennet Ct., Columbus, OH 43220; (614) 451-5189, e-mail tomnagel@freenet.columbus.oh.us.
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Oregon - Salem Soaring Society, Al Szymanski, CD, (503) 585-0461, http://home.att.net/~aszyl/sss/> for club's home page.

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

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Tennessee - Soaring Union of Nashville, Terry Silberman, PO Box 17946, Nashville, TN 37217-0946, (615) 299-0846.

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

West Virginia - Chip Vignolini, 1305 Perry Ave., Morgantown, WV 26505; (304) 598-9506, <cydne30a@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; (920) 731-4848, <74724.65@compuserve.com>.

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Australia - Southern Soaring League, Inc. Mike O'Reilly, Model Flight, 42 Maple Ave., Keswick SA 5035, Australia. Phons: ISD+(08) 8 293-3674, ISD+(08) 8 297-7349, ISD+(018) 8 082-156 (Mobile). FAX: ISD+(08) 8 371-0659.

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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.

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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, <pclark@osk3.web.ne.jp>

http://www3.osk3.web.ne.jp/~pclark/skypilot/
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Reference Material

"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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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 msg. containing the word "subscribe" to soaring-request@airage.com. The "digestified" version that combines all 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 mike@airage.com.

Clubs, events, major contest scores, pilot chat board, classifieds, picture gallery: <<http://www.rcsoaring.com>>.


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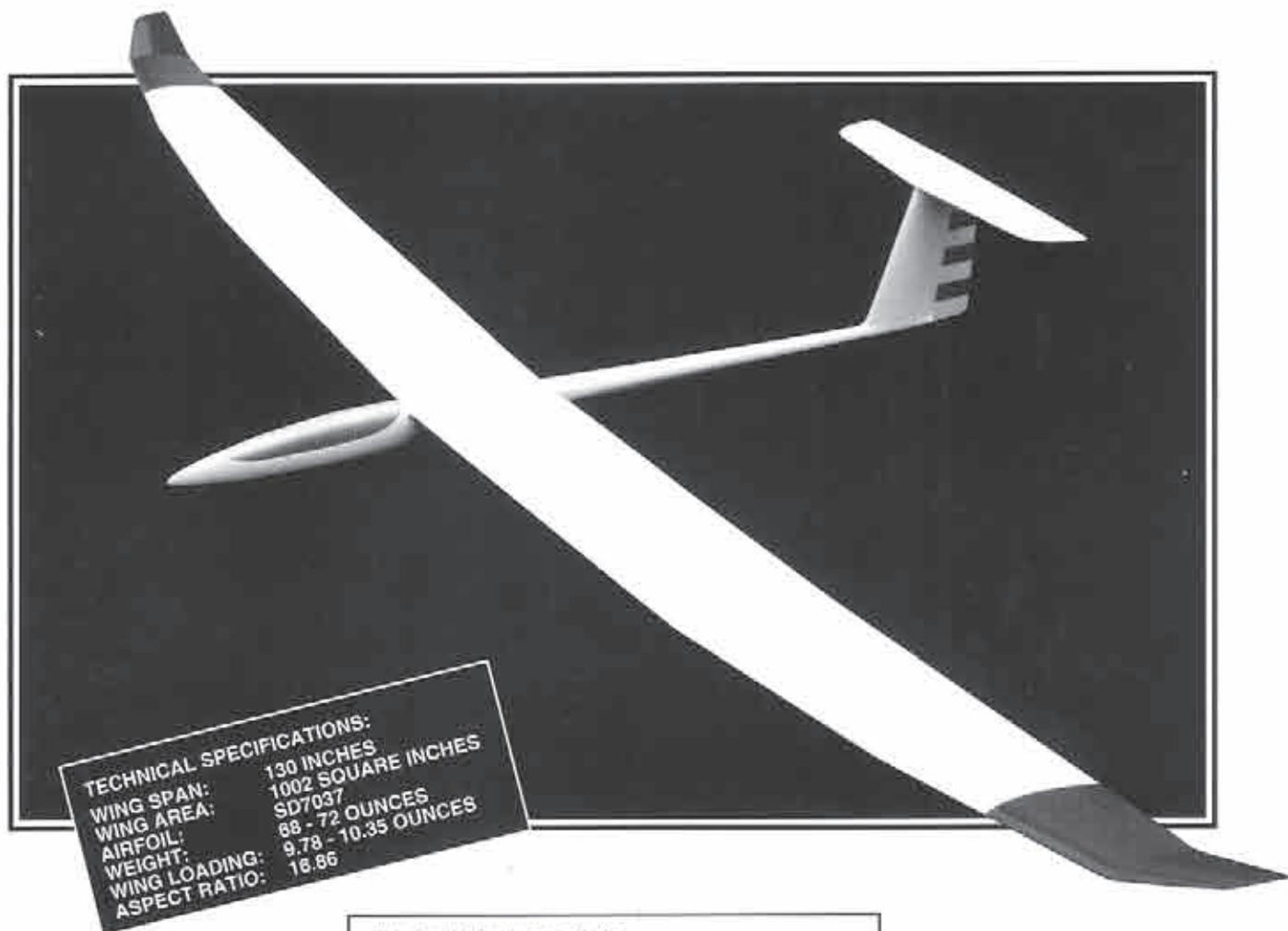
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