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September, 1998

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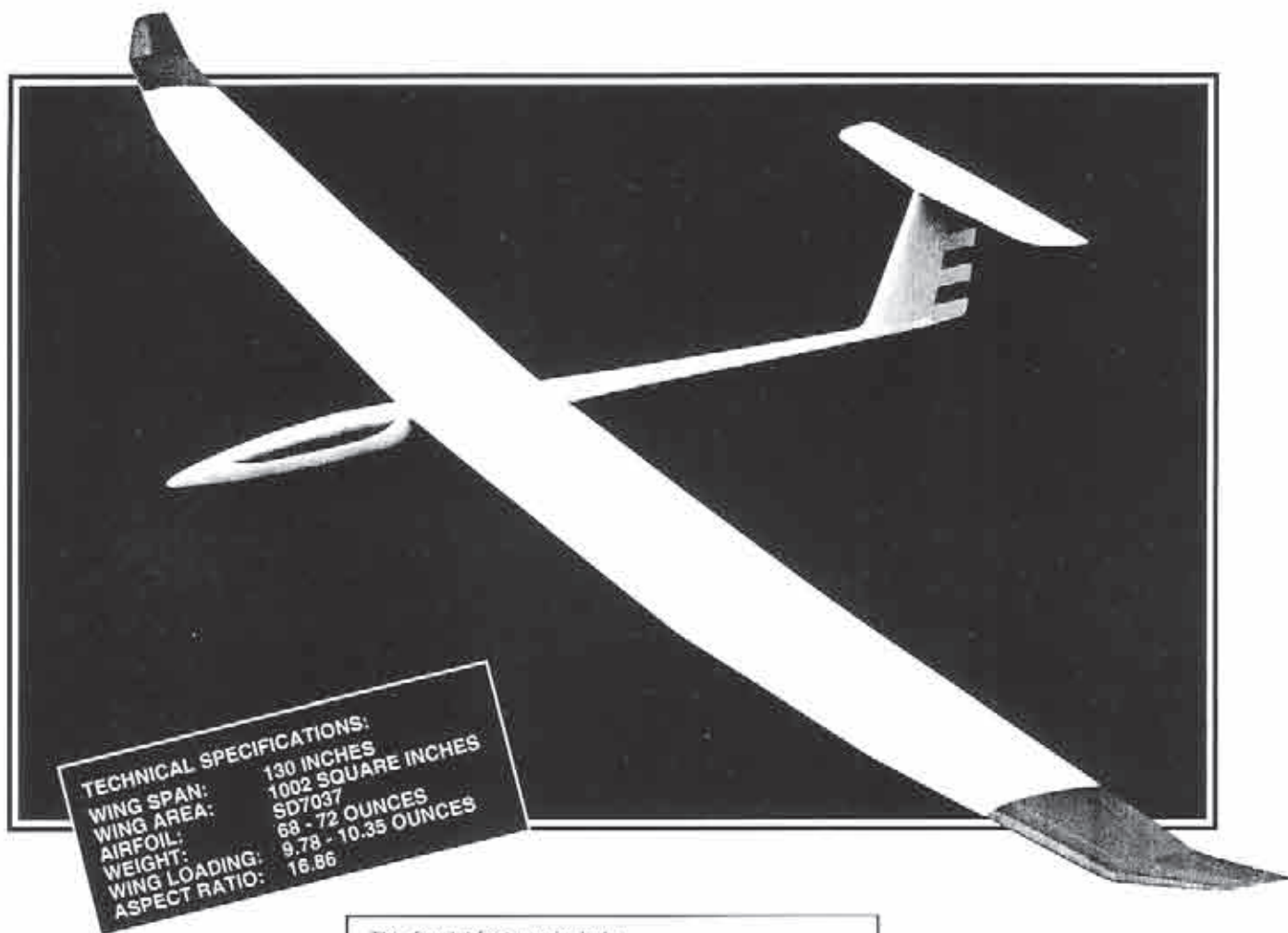
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**In the News**

As most of you know by now, Joe Wurts has been declared the 1998 F3J World Champion, and Team U.S.A. took first place.

Additionally, Mark Nankivil reports that F5B World Champion is Thomas Pils of the U.S.A. Jerry Bridgeman took 2nd, and Steve Neu took 9th; Team U.S.A. took 2nd place, overall. Team Germany took first place. In the F5D (Electric Pylon) World Championship results, Team U.S.A. finished second, Team Germany first.

Congratulations to all!

**Something New**

Yes, this issue is a bit different. We have included literature from Volz Modellbau, which describes their servos in detail. In addition, you'll find a drawing for Volz servos. Our thanks to Michael Volz for his suggestions and the opportunity to host this type of drawing, and to Bill & Bunny who volunteered to do all the work.

This rather sets a precedent, so for any advertisers that wish to discuss special mailing considerations, such as literature, brochures, fliers, mailing cards, or drawing, please contact us at RCSD. For you readers, please let us know what you think. We're always open to suggestions. As one subscriber said earlier this year, "When you open the pages of RCSD each month, you never know what to expect. It's always different, new and refreshing."

For those of you that surf the net, and find your way to the Bsquared web site, you've probably noted by now that the RCSD web page has a new look. We'll continue to post the status and highlights of the coming issue, in addition to any news tidbits we pick up during the month. If any of you have suggestions on further enhancements to the RCSD web page, please drop us an e-mail.

That's about it for this month. However, we are looking for a volunteer to coordinate the event schedule. If you are accurate with numbers, have e-mail and web browsing capability, and want to help out, please drop us an e-mail, and we'll let you know what we've got in mind.

**Happy Flying!**  
**Judy & Jerry Slates**

**LAUNCHING AT PETERSBURG PASS**

Steve Savoie launches his 90" Salto at Petersburg Pass, New York. Built from Viking Models, U.S.A. fuselage and plans. Detailed instructions on how to reach Petersburg Pass, flying conditions and cautions, will appear next month in Tom Nagel's travel column, "Have Sailplane, Will Travel!"

Photography by Dave Garwood, Scotia, New York.

**OTHER GOOD STUFF**

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R/C Soaring Digest (RCSD) is a reader-written monthly publication for the R/C sailplane enthusiast and has been published since January, 1984. It is dedicated to sharing technical and educational information. All material contributed must be exclusive and original and not infringe upon the copyrights of others. It is the policy of RCSD to provide accurate information. Please let us know of any error that significantly affects the meaning of a story. Because we encourage new ideas, the content of all articles, model designs, press & news releases, etc. are the opinion of the author and may not necessarily reflect those of RCSD. We encourage anyone who wishes to obtain additional information to contact the author. RCSD was founded by Jim Gray, lecturer and technical consultant. He can be reached at: 310 East Chateau Circle, Payson, AZ 85541; (520) 474-5015, <jimgreg@netzone.com>

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[Material may be submitted via 3.5" Disk or e-mail, and is most appreciated!]

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 Dave Register, Dave Sanders,  
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**Artwork**

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

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## Jer's Workbench

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### Too Darn Hot!!

It's been much too hot, down here in Texas, to do much of anything. So, I thought I'd share a couple of letters this month.

#### Pull-Pull Elevator Control Systems

John Cyr of Ames, Iowa says he has been using a pull-pull system similar to what we discussed in my June column. John made his pulley block out of plywood and mounted it onto the rudder post of his Sagitta. For cable, he used ACP coated Kevlar cord (Kevcord). He's been flying his Sagitta on and off for about 5 years with no problems.

Thanks for the input, John. I'm hoping to do some building, soon, and plan to use this system. Hope to see you at Lake Wilson next year.

#### Vilene®

The following is from Bruce Abell of Cessnock, NSW, Australia.

"I thought you might be interested in my latest material for covering. It's "Vilene®", commonly referred to as "interfacing", and is available from dress material shops. It comes in 2 or 3 weights, in either plain or iron-on. The samples are the light weight (red) and tissue (yellow). The material is only available in either black or white but, as you can see by the samples, takes "Dylon" dyes for synthetic materials quite well.

"There is a definite grain and is, in this respect, very like the old, pre-war bamboo tissue. It appears to be a polyester fabric, as it can be heat shrunk and takes dope quite well. When I'm using it, I treat it the same as I would tissue, and put it on wet, but care has to be used because, like tissue, it has very little strength when wet. It does "fur" a bit after doping, but a light sanding with 400 wet and dry paper (used dry) runs over most of this."

Bruce enclosed some samples with his letter. They reminded me of a medium weight silkspan, but stronger. The "Dylon" dyes that Bruce used resulted in a bright yellow, and a dark red.

So, I had to give this stuff a try. The one yardage shop that I included in my list of errands had never seen nor heard of Vilene® before. Not to be deterred, I checked out their stock of interfacing, finding one marked feather weight, which looks and feels like a heavy weight silkspan.

Back in the workshop, with 2 yards of interfacing, a test strip was prepared. On the first test, the interface material was applied wet. After the dope dried, a peel test was performed; the interface material peeled off with little effort, failing the test.

In the second test, I applied 2 coats of

"Balsarite" to the test strip; the interface material was ironed on just as I would apply iron-on film. Next, an iron was applied to the interfacing, and it shrunk up tight. So far, so good!

Now, at this stage, it was time to see if the interfacing would accept dope. This test also failed, to my way of thinking. The particular interface I chose soaks up dope like a paper towel!!

In conclusion, the interface material used in my tests works quite well when ironed on; but, there is a weight penalty based on the amount of dope and paint required in order to obtain a nice finish. So, I probably won't consider interfacing for my next model.

Thanks for sending in the Vilene®, Bruce. Sorry I couldn't find the product over here.

For any of you readers that are experimenting with new techniques, and have found things that work for you, please let us know. We'd really like to hear from you!

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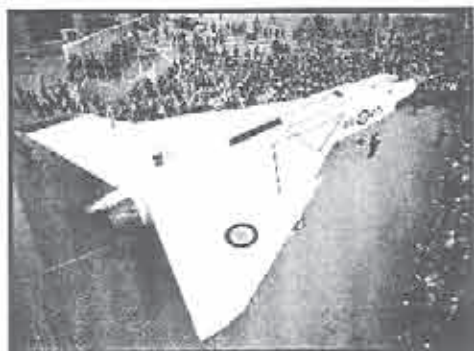
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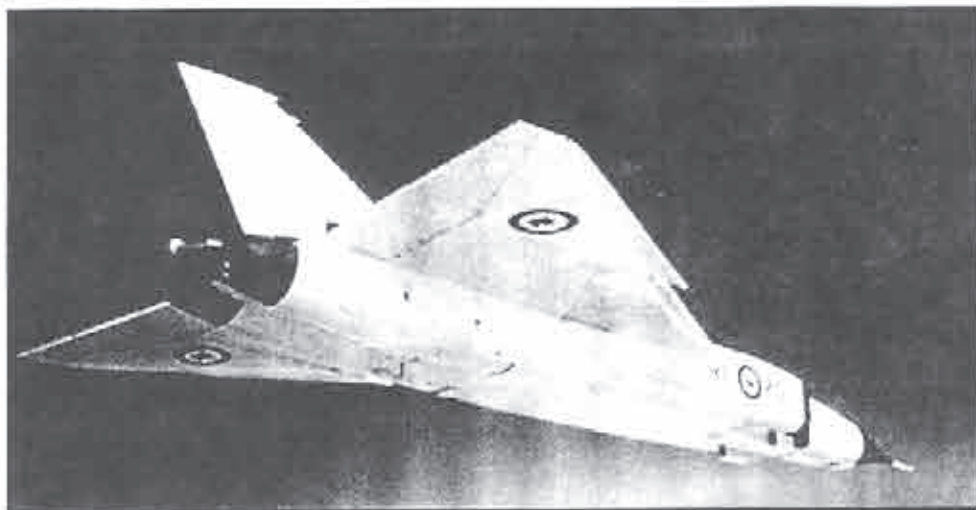
### The AVRO CF-105 "Arrow"

We recently had the opportunity to watch "The Arrow," a Canadian Broadcasting Corporation film depicting the history of the AVRO Canada CF-105. Originally presented as a two part series on Canadian television, the film is now available on video tape. Starring Dan Aykroyd as Crawford Gordon, president of AVRO Canada during Arrow development, the movie presents the technological and political circumstances leading to the cancellation of the Arrow development program on "Black Friday." Doug Clark, a Canadian, wrote,

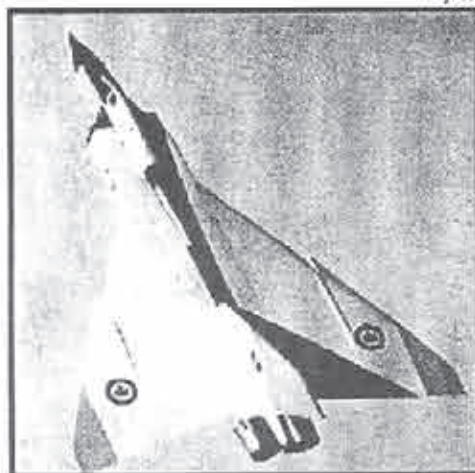
"I just watched the Arrow miniseries and I must say that it brought me to tears. I am 32 years old and I grew up in a country without a space program believing that we were second best. I never knew that we built such a machine. I had heard stories all my life from my father, but until now they didn't have an effect on me... seeing how we as Canadians once led the world makes so terribly sad. I can't express what knowing the truth has done to me. I am



<http://www.odyssey.on.ca/~dmackechnie/ARROW2.GIF>



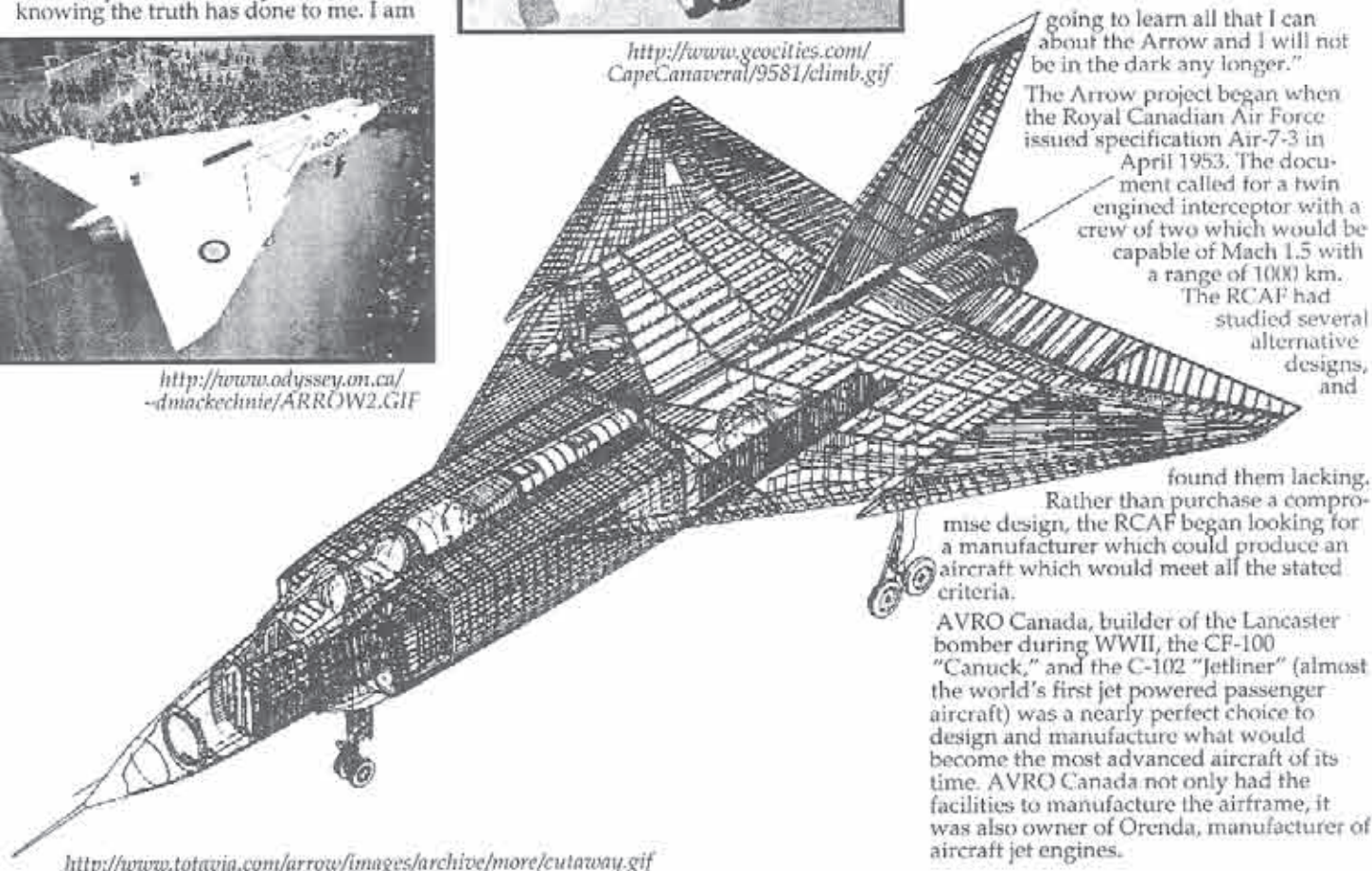
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<http://www.geocities.com/CapeCanaveral/9581/climb.gif>



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<http://www.totavia.com/arrow/images/archive/more/cutaway.gif>

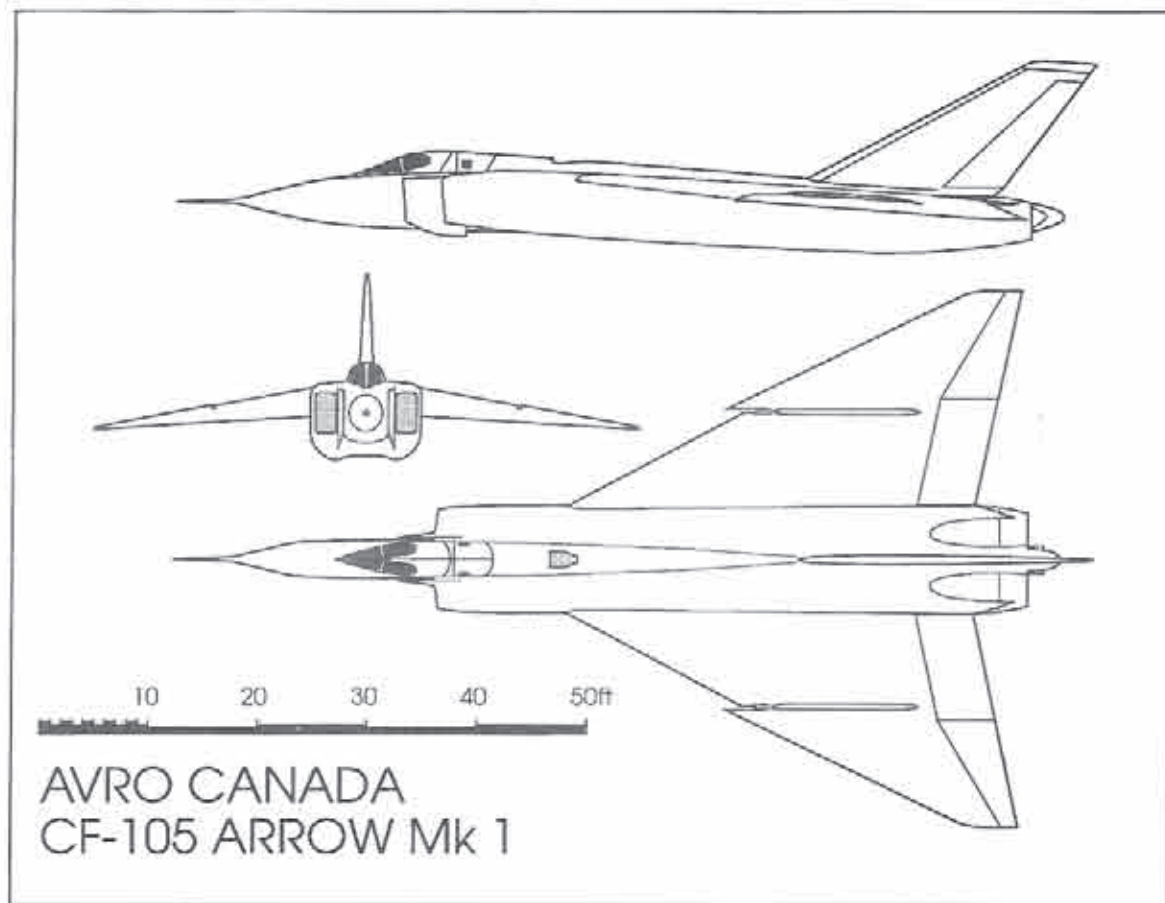
going to learn all that I can about the Arrow and I will not be in the dark any longer."

The Arrow project began when the Royal Canadian Air Force issued specification Air-7-3 in April 1953. The document called for a twin engine interceptor with a crew of two which would be capable of Mach 1.5 with a range of 1000 km.

The RCAF had studied several alternative designs, and

found them lacking. Rather than purchase a compromise design, the RCAF began looking for a manufacturer which could produce an aircraft which would meet all the stated criteria.

AVRO Canada, builder of the Lancaster bomber during WWII, the CF-100 "Canuck," and the C-102 "Jetliner" (almost the world's first jet powered passenger aircraft) was a nearly perfect choice to design and manufacture what would become the most advanced aircraft of its time. AVRO Canada not only had the facilities to manufacture the airframe, it was also owner of Orenda, manufacturer of aircraft jet engines.



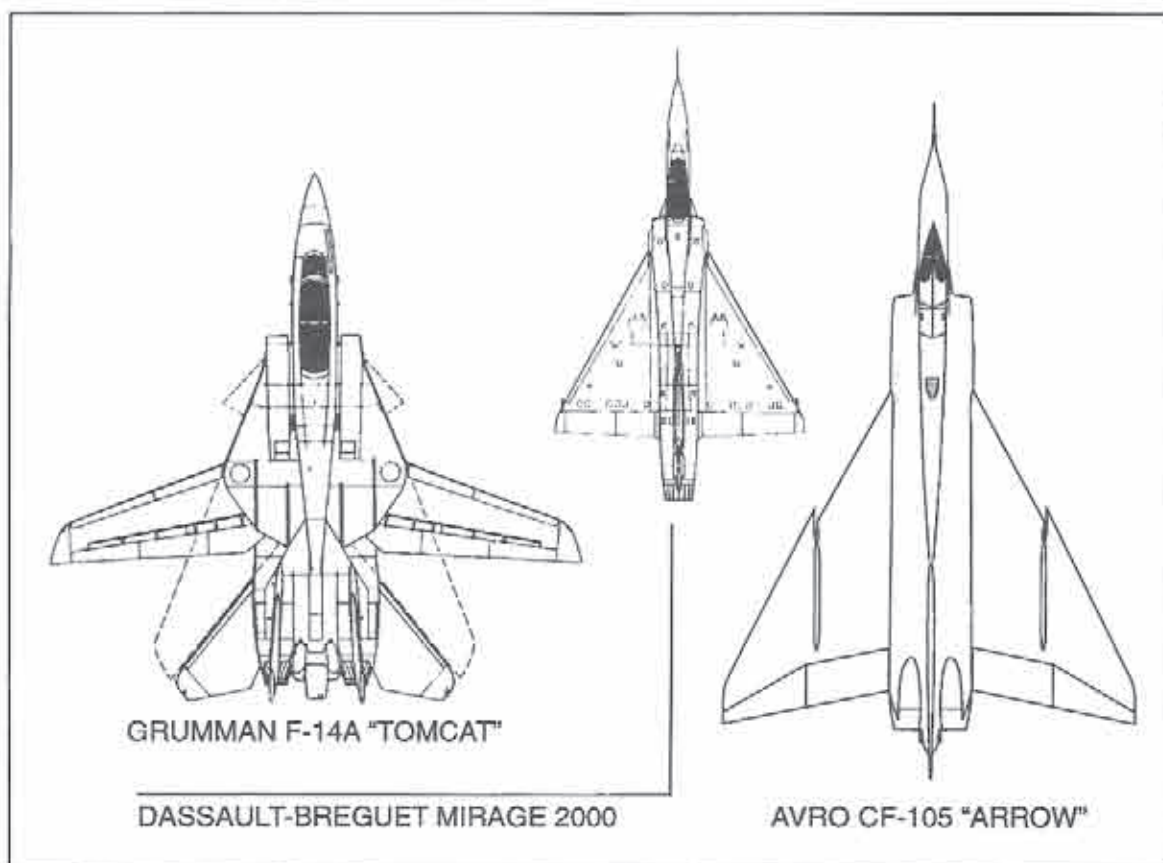
Several advanced concepts became part of the Arrow design. First was the Automatic Flight Control System (AFCS). This was not a true fly-by-wire design, but was a sophisticated control system which assisted the pilot by maintaining stability, acting as an autopilot, and preventing the aircraft from entering dangerous flight attitudes in case of engine failure or other serious difficulty. All control surfaces were driven by hydraulic actuators powered by a special high pressure system.

The Arrow was to be armed with missiles only, and all were to be stored internally to reduce drag to a minimum. Thus it had a very large weapons bay — more than 16 feet long, 9.5 feet wide, and 3 feet deep; more voluminous than the bomb bay of either the AVRO Lancaster or the Boeing B-29. The bay doors, on the fuselage bottom, could be opened at Mach 1.5 in just 0.3 seconds.

The twin engines were mounted at the rear of the airframe. This made maintenance extremely simple. Engines could be removed and replaced in less than 30 minutes by sliding them rearward out of the fuselage. Long ducts lead incoming air from the forward inlets to the aft-mounted engines. Special boundary layer fences mark the entrance ramps of the air intakes.

Because of the thin wing section (just 3% thick), a lot of fuel had to be stored in the fuselage, and the main landing gear had to use a tandem tire arrangement. The size of the weapons bay, and engine and fuel tank locations, dictated the Arrow be a very large aircraft. Its size relative to the Grumman F-14 Tomcat and Dassault-Breguet Mirage 2000 can be judged by the accompanying graphic comparison.

The Arrow Mk.1 was powered by Pratt and



	AVRO CF-100 Canuck Mk.5	AVRO CF-105 Arrow Mk.1	AVRO CF-105 Arrow Mk.2	McDonnell F-101B Voodoo	Grumman F-14A Tomcat	Dassault-Breguet Mirage 2000
Engine	(2) Orenda 11	(2) Pratt & Whitney J75-P-3 or J75-P-5	(2) Orenda PS-13 Iroquois	(2) Pratt & Whitney J57-P-55	(2) Pratt & Whitney A-1F30-P-412A	(1) SNECMA M53-P2
Thrust, dry afterburner	3300kg /7275lbs	5670kg/12500lbs 8390kg/18500lbs	8390kg/19250lbs 11790kg/26000lbs	5438kg/11989lbs 6705kg/14782lbs	5670kg/12500lbs 9480kg/20900lbs	5600kg/12346lbs 9000kg/19842lbs
Wing span	17.75m/58' 0"	15.24m/50' 0"	15.24m/50' 0"	12.09m/39' 7"	19.54m/64' 1.3" 11.45m/37' 6.8"	9.0m/29' 6.3"
Wing area	54.9m <sup>2</sup> /391ft <sup>2</sup>	113.8m <sup>2</sup> /1225ft <sup>2</sup>	113.8m <sup>2</sup> /1225ft <sup>2</sup>	34.19m <sup>2</sup> /368ft <sup>2</sup>	52.5m <sup>2</sup> /565ft <sup>2</sup>	41.8m <sup>2</sup> /450ft <sup>2</sup>
Aspect ratio	8.6	2.04	2.04	9.28	2.58 — 7.2	2.04
Length	16.7m/54' 2"	23.715m/77' 9.65"	23.41m/76' 9.65"	20.54m/67' 4.7"	18.9m/62' 0"	15.0m/49' 2.5"
Height	4.76m/15' 6.5"	6.477m/21' 3"	6.477m/21' 3"	5.49m/18' 0.1"	4.88m/16' 0.1"	5.3m/17' 4.7"
Empty weight	10478kg/23100lbs	19935kg/43960lbs		12680kg/27995lbs	18112kg/39930lbs	8400kg/18110lbs
Max. weight	16800kg/37000lbs	3117kg/68600lbs		21170kg/46672lbs	33724kg/74348lbs	15000kg/33070lbs
Wing loading	94lbs/ft <sup>2</sup>	56lbs/ft <sup>2</sup>		126lbs/ft <sup>2</sup>	131lbs/ft <sup>2</sup>	73lbs/ft <sup>2</sup>
Cruise speed		1128km/h/700mph		950km/h/590mph	925km/h/575mph	
Max speed	1046km/h/650mph Mach 0.97	2103km/h/1307mph Mach 1.98	2549km/h/1584mph Mach 2.4	1678km/h/1043mph Mach 1.58	2549km/h/1584mph Mach 2.4	2495km/h/1550mph Mach 2.35
Climb rate		3082m (10112')/min	3464m (11365')/min	5184m (17008')/min	8784m (28819')/min	3750m (12303')/min
Ceiling	16461m/54000'	18290m/60000ft.		15850m/52000'	15250m/50000'	19800m/65000'
First flight	01-19-50 (Mk.1) 10-12-55 (Mk.5)	03-25-58	not flown	03-27-57	12-21-70	03-10-78

Data from various sources, at times conflicting. Some information estimated or not available.

Whitney J-75 engines. Despite being somewhat underpowered, RL-201 achieved Mach 1.1 on its maiden flight, and Mach 1.54 on its seventh flight. The Mk.1 version eventually reached Mach 1.97! Performance of the Mk.2, with the substantially stronger and lighter Orenda PS-13 engines, was predicted to be even better, with a maximum speed of Mach 2.4.

Flying at speeds of Mach 1.5 and above, friction heat was a significant problem. For this reason, a substantial number of key parts were made of titanium, and the crew required an environmental control system. On the ground, the airframe had to be able to withstand the extreme cold of the northern Canada winters.

The Arrow was truly an astounding achievement, as can be judged from the included table. It required a specialized hydraulic system which operated at extremely high pressures; the Iroquois engines, in addition to being extremely powerful for the time, made extensive use of titanium to save weight and handle high internal temperatures; the weapons and avionics systems utilized cutting edge technologies. Yet in just four years, and with around \$300 million, AVRO managed to incorporate all of these diverse systems, each with its own unique challenges, into five flying aircraft. A sixth (RL-206), equipped with the Orenda engines, was just days from completion.

Several governmental and political changes took place during Arrow development; the NORAD agreement in 1954, a change from conservative to liberal government in 1957, and promotion of the Bomarc missile defense system to name a few. Perhaps the major factor was the belief by many that the Soviet Union would not attack Canada and the U.S. by sending trans-sonic bombers over the North Pole. Rather, they

believed missiles would rapidly become the "weapon of choice," making the Arrow an expensive and useless artifact. Combined with the belief that Canadians were more interested in new social programs than an "expensive" national defense system, the new Prime Minister, John Diefenbaker, cancelled the Arrow program on 20 February 1959, now known as Black Friday.

The termination of the Arrow led to the loss of 14,000 jobs at AVRO Canada and roughly 35,000 at various subcontractors throughout Canada. The five fully operational aircraft, plus 30 in the process of being built, turned to scrap. Documents, manufacturing jigs and special tools were also destroyed. This despite the fact the first of the Mk.2 versions was less than two weeks from its maiden flight. Suggestions that a single Arrow should be kept as a testbed for the Orenda Iroquois engine were rejected.

A few ironies are worth noting.

- The cancellation of the Arrow forced the RCAF to eventually purchase American aircraft, the F-101 Voodoo. The RCAF purchased 64 copies of that relatively low performance fighter at a cost of \$260 million, near the expenditures already made on the cancelled Arrow program. The Voodoo was the option rejected in favor of development of the Arrow.
- The Bomarc missile system, envisioned to augment and eventually replace manned interceptors, did not achieve success, and was never fully deployed.
- The Tu-95 "Bear," the most likely target of Arrow missiles, was still in operational status in 1995.
- The powerful Orenda PS-13 Iroquois engine, eagerly anticipated by a large

and growing foreign market, was never put into production.

- Many of the senior engineers and designers within the Arrow program emigrated to the United States to work for NASA and major American aircraft manufacturers, while others moved to Europe where the Concorde program was just starting.

The forward fuselage of RL-206, the first of the Mk.2 series, and a few miscellaneous parts still exist. These items are currently stored at the National Aviation Museum (Canada) in Ottawa. Quotes from a couple of Canadians who have experienced that display firsthand:

"I have also been to the museum in Ottawa and I have seen the nose of 206... ..as well as right and left outboard wing sections. ...found it glorious and intensely saddening at the same time." — John Stuart

"I don't have any special Arrow stories to share, but I just came back from vacation down east and... yes, I touched THE NOSE SECTION!! In one way I found it disgraceful how what little remains of the greatest technological achievement in Canadian history is relegated to a dingy little corner of an old hangar that no one deems important enough to visit. On the other hand, I thought that it was a perfect memorial to the unforgivable act of treason perpetrated upon this nation by one John Diefenbaker. By the way, I hadn't cried since I was in grade school, but I wept when I touched that metallic skin." — Andrew Wilson

We often see requests for detailed 3-views of the Arrow within various newsgroups on the internet. Those requests, frequently posted by Canadians, often demonstrate an obvious pride in the tremendous accom-



plishment AVRO managed to achieve. Less obvious, but still inherent in each message, is the tremendous emotional tie between the Canadian people and what many consider to be the greatest airplane ever built.

A full size model of the Arrow, composed of a 304L stainless steel frame with 0.063 aluminum skin, is scheduled for completion in April of 1999 at the Toronto Aerospace Museum in North York, Ontario.

As a power scale slope soaring (PSS) subject, the Arrow is nearly ideal. Lots of wing area for a given span and a relatively simple fuselage structure make it an attractive choice. But it's the story behind the CF-105 Arrow which will hopefully entice you to model it.

Special thanks to Monique MacNaughton's Terminal AVRO Arrow Obsession Syndrome "graffiti" page, <<http://studio.watertower.com/~coydog/shrine.htm>>, for the three quotes included in this article.

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Monique MacNaughton's Terminal AVRO Arrow Obsession Syndrome, <<http://studio.watertower.com/~coydog/tpage.htm>>

Hugh Mackechnie, official AVRO photographer, <<http://www.odyssey.on.ca/~dmackechnie/CF-105.htm>>

The National Aviation Museum (Canada), <<http://aviation.nmstc.ca/exhibits/silverdart/sd015e.htm>>

Photographs of the Arrow, <<http://www3.sympatico.ca/lanmad/>> and <<http://www.angelfire.com/sc/avroarrow201/index.html>>

Photographs of the full sized (motorized) model used in the CBC movie "The Arrow," <<http://www.gray.mb.ca/gray/aviation.html>>

R. Kyle Schmidt's Homage to the Arrow, <<http://www.totavia.com/arrow/>>

Rich Thistle's "Dream Machine," <<http://www.richthistle.ore.ca/article13avroarrow.htm>>

The Toronto Aerospace Museum, <<http://tor-pw1.netcom.ca/~n.flight/small.html>>

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Jim Frickey (seated), Larry Purdy and myself take shelter from the breeze at Lake Wilson during the '98 Midwest Slope Challenge in Kansas. Check out the huge slopes all around! Great place to go slope soaring. Ed Harris photo.

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&  
HEAVY IRON  
VOLUME 2,  
NUMBER 7**

By David M. Sanders  
34455 Camino El Molino  
Capistrano Beach, California 92624  
(949) 248-2773  
daw1@access1.net

**Midwest Mosh Pit**

I'll tell ya'... To say that Kansas was no disappointment is a true understatement... MAN!! What a great place to fly!! There's hills practically everywhere you look and the wind absolutely howls! I had my first chance to check out Midwest slope soaring this year at the Lincoln Area Soaring Society's '98 Midwest Slope Challenge. I know, I know... Many of you are scratching your heads going, "What the heck is he talking about?!... There's no slopes in Kansas!"

Yes there is! Most decent, and some killer. They're also easy to recover planes from and present mild, foot and aircraft friendly flora. Not a bad deal at all. Indeed, these slopes are the seminal sites for some of the great slope designs of all time, like the Sig Ninja and Samurai. While these designs never took too strong a hold on the rapidly changing west coast scene, they've enjoyed

continuous popularity on the heartland's slopes and offer impressive performance year after year.

The relevance here is that we got to do a little combat as part of this year's program. Yours truly was invited to CD a combat contest by event directors Paul Wright and Alden Shipp. So off I went to go manage a good sized pack of beef eatin', blood thirsty Midwestern bashers!

All this took place on Friday, the day before the regular MWSC race schedule began. We all straggled out to the main slope early to check the air, but could see it wasn't going to be happening for that direction. What to do? Well, in the great tradition of slopers everywhere, start hunting for a slope with a face pointed the right way! As the wind began to pick up, it started to define into a strong west which led us a little ways around the reservoir where we found a suitable site and started warming up for the event. Having been skunked by the wind so many times in the past, I dragged my feet a little getting things going, but once it turned on solid, we got underway.

Usual California rules: two preliminary heats and a final round. The midwesterners fought hard, but were still taken by a New Yorker! Heh, heh, heh... I'll bet Garwood gets it bad next year! Final standings were as follows:

1st place, Dave Garwood; Dave's Aircraft Works Foam51D, 2 kills in the final round, 5 in the mains.

2nd place, Mike Green; Trick R/C Zagi-LE, 2 kills in the final round, 3 in the mains.

3rd place, Jim Frickey; DAW Foam51D in the mains and a Trick R/C Zagi-LE in the final, 2 kills in the final round, 1 in the mains.

For complete coverage of the '98 MWSC, take a look at Jerry's piece in the June issue of RCSD; he did a nice job covering it there and I don't wanna' step on it.

A few of us diehards stuck around the Lake Wilson area for some flying on Monday, which once again provided tasty, 20 MPH plus air for our enjoyment. One of the great things about Kansas is the wide open spaces and seemingly endless number of sites to explore - we flew four or five different slopes that day, all of which were superb in size and contour. Some were of such quality that you could just hang your ship in the lift on the ridgeline and do aerobatics within feet of your body without changing ground position at all. With this sort of lift, you can become totally

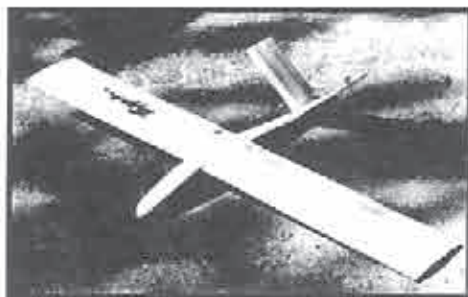
absorbed in every aspect of your maneuvers and really learn a lot about how your plane, and thumbs really work to do what we do... a pretty fun experience.

**Ed Harris' Fantastic Foamies**

Ed Harris of Ankeny, Iowa frequently sends us info. on his latest projects and I thought this month I'd show a few off so you could see some of his innovative methods of using EPP foam.

First, examine Ed's 48" span 'Eppik', an all EPP sport model of his own design. Its geometric configuration is simple: a straight chord wing and V-tail; but notice a few things. First, the stabilizers are constructed of EPP foam with balsa control surfaces, as we often see done on wings. They're wire cut with a symmetrical airfoil section which is considerably more efficient than the flat slab or corrugated plastics now in common use. Both the wing and tail also exhibit a unique and lightweight spar system in the form of polypropylene box strapping webs that are oriented vertically across the span and the full depth of the airfoil. A similar system is also found on Aerofoam's Corsair model, but utilizing 1/4 birch plywood (Mark Mech liked it as a solution to the Corsair's classic gull wing and it does indeed work well.). Ed takes the concept to its engineering limit by minimizing the mass of the spar using the strapping material in lieu of wood. Adhesion to the cores is by contact adhesive. The leading edge of the wing has a strip of the box strapping embedded in the leading edge to provide tear resistance, and there's also box strapping facings applied to both surfaces of the hinge line on the wings making it possible to utilize an EPP aileron, which does save a pretty substantial amount of weight over a balsa surface. There's a short section of balsa at the root ends of the ailerons to act as a hard point for the linkage attachment, and the ailerons are further reinforced by use of 1/16" diameter fiberglass rods running along the trailing edges; just look at how straight they are! Ed's reasoning on the box strapping is that if it could be held vertical with now allowance for twisting (by embedment in the foam), it could make a stiff spar structure... Seems to work pretty darn well.

Pretty radical, isn't it? Well, that's just half the story! The fuselage also exhibits some ingenious techniques. Instead of being a solid, monolithic block of foam, the fuselage is made up of 3/8" thick slabs of EPP in the same fashion as a wood box fuselage. At each corner, embedded in the intersection, is another strip of the box strapping material; you can see it as a thin, black line low on the side of the fuselage where the bottom panel meets the side panel. I had the chance to examine the Eppik at the Midwest Slope Challenge this year, and as improbable as it may seem, these structural methods yielded a surprisingly stiff and extremely lightweight airframe; this baby weighs only 13 1/2 ounces! That equates to a wing loading of only 6.75 ounces per square foot... Pretty amazing considering that most of us are resigned to seeing our foamies be a little heavier than their similar sized wood or glass counterparts. The other sterling benefit of this light weight is improved



Ed Harris' 'Eppik' all-EPP sport ship. Innovative materials and techniques make this 48" span ship weigh in at a scant 13 1/2 ounces!



Ed's 'Minut'. This 30 inch span gem is also an all-EPP model using an E374 section with only 160 sq. in. area. At 6 ounces flying weight, it hangs in even the lightest slope lift. Beautifully constructed little ship breaks down into a tiny package for travel.

durability as the airframe has just that much less energy to suck up in the event of pilot error.

Covering is ThermalSpan, which is an inexpensive, multi-directional fiber covering material popular in the freeflight community. It's applied over a light coat of 3M Super 77 contact adhesive, ironed tight, then coated with Minwax Polycrylic water based polyurethane. Ed uses this technique on all his foam planes; it gives a very light and tear resistant finish that provides more than enough torsional stiffness to the parts. As you can see, it follows the curves of the fuselage well with careful application. I've tried this stuff myself and it takes getting used to, but after a little practice you can get an impressive and very smooth finish with it. Might definitely be worth a try on a foamie project where you're shooting for light weight.

Radio equipment is installed in a very traditional manner in the nose, and there's a hatch to access it. Also embedded in the fuselage are hard points to accept 4-40 nylon bolts front and rear to fix the wing in position.

The little checkered job is another of Ed's designs, the 'Minut', a 30" span mini sloper. This plane utilizes similar techniques to those exhibited in the Eppik but with different materials; instead of the box strapping, 1/64" ply is utilized for load carrying members. The hatch area is also supported by a 1/64" ply plate to preclude buckling at this opening, and the elevator is made of EPP instead of balsa as used on the Eppik. Covering is again ThermalSpan, and the checkered pattern is airbrushed using red Sig dope. What's the damage you ask?... This little guy weighs only SIX ounces! It flew on the Lake Wilson slopes

in only 5 MPH of wind.. Very impressive! If anything, Ed's projects show that if you use the same amount of care and resourcefulness on an EPP project as you would with any other construction material you can meet challenging weight and structural goals. You might want to take a shot at some of these techniques for your next light-lift sloper project. To get ThermalSpan, contact Ed at Harris Design, 2000 NW 84th Ave., Ankeny, IA, 50021; (515) 965-5942.

#### DAW Ka6's...

I've had a jillion calls about the foamie Schleicher Ka6 my company, Dave's Aircraft Works, is developing right now, and thought I'd give you guys some info. on that schedule. We're working on some better methods to produce the kits that will save the builder a lot of time, but aren't sure if they're practical from a manufacturing standpoint. So... We're working on a test bed model of smaller proportions to test the concept. Once the methods are proven (we hope) or abandoned (hopefully not!), we'll begin making the production tooling for the big Ka6's. That's what's been takin' us so darn long. I still have the list of you guys that want 'em hot off the press in a safe place here, so you will get the confirmation call or E-mail when they're ready! Thanks for being patient.

#### Back To Work...

That's about it for this month. Yes, the column did lapse a month the last round here; we have tweaked the schedule so I don't have 2 deadlines in one month. So back to the shop with me to turn big blocks of foam into little blocks of foam! ■

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## THE ELECTRIC CONNECTION

Mark Nankivil  
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St. Louis, Missouri 63143  
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nankinc@ibm.net

I'll first pick up where I left off in the last column with additional photos and information from the Land of Lincoln E-Fly hosted by the Knights of the Air R/C club of Springfield, Illinois. Club President Tim McDonough passed on some digital photos taken by Joe Cannella with a Sony Mavica. The diversity and quality of the models just goes to show what can be done with electrics today. Those who want to be on the mailing list for next year's event can contact Tim at the home or e-mail address listed in the last column. Start working on what you'll bring to the event!

At our club's June R/C HLG contest, one of our club members, Brad Young, showed up with a Speed 400 powered model made out of blue foam. Brad had attended an electric "Freeze Fly" up in Ft. Wayne, Indiana this past February and this model, called the Blue Foamie, was used in a one design event at the contest. The models were built up on site and were to be used in a pylon race, streamer chase and an all up last down event. Brad's model flew quite well and was intriguing enough that I took some photos of it.

Well, at the Land of Lincoln E-Fly event was Darwin Garrison who happened to be selling the Blue Foamie and another model called the Push-E Cat. It turns out that the designer/fabricator of these designs is Pat Mattes who lives in Ft. Wayne. I talked with Pat by phone and he e-mailed me some additional information on the models he has available.

The Push-E Cat was noted in an earlier RCSD by Dave Sanders and is Pat's first shot at working with EPP foam. The idea was to develop a nearly indestructible trainer type model and Darwin is currently kitting the model. You can reach Darwin at Garrison Aerodrome at:

[www.rc-aero.com](http://www.rc-aero.com)

The Blue Foamie is available directly from Pat for \$12.00 plus \$3.00 S&H. Call Pat for rates on bulk purchases. \$12.00 is a real steal for the effort that goes into cutting the kits. Pat can be reached at:

Pat Mattes  
9732 Lafayette Center Rd.  
Yoder, IN 46798-9723

Or at:

[Pat-Ingrid-Mattes@juno.com](mailto:Pat-Ingrid-Mattes@juno.com)

Pat also has a few other designs nearing production such as a T6 Texan and a Cessna - both for Speed 400 - plus others in the design stage. Keep your eyes out for more in the near future.

The next column will have some preliminary info. on a multi-engine project I'm starting plus more on other electric goodies. Anybody out there with projects on the table or in the air, send some photos and info.!

Good Health and Good Lift!! ■



Brad Young holding his Pat Mattes designed Blue Foamie.



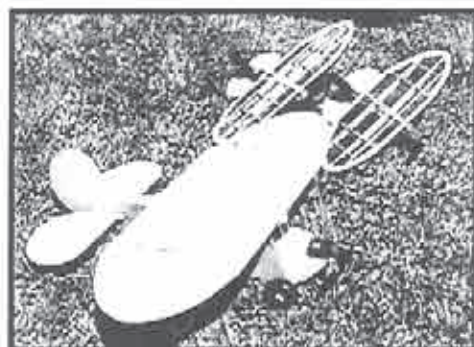
The radio and motor equipment lies exposed in the open top fuselage. From front to back is the Speed 400 6v motor, 7 cell Sanyo 500AR motor pack, aileron servo in the wing itself, Futaba receiver/speed controller unit and two micro servos for the tail feathers. Tail feathers are sheet balsa and wing has spruce spar caps, balsa ailerons and then is covered with tape ala foam slope combat models.



Ryan Aircraft semi-scale P-38 built and flown by Brad Everson, Kirkland, Illinois.



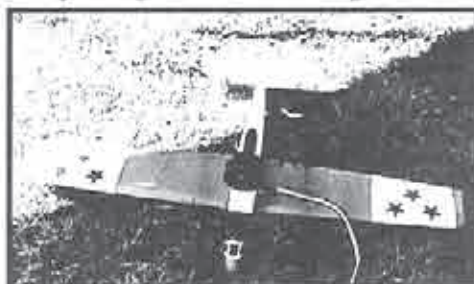
Keith Shaw's beautiful scale model of the Messerschmitt M35 powered by a MaxCim brushless motor with an Astro Flight Superbox. The original aircraft was used for aerobatics and as a light sportplane in 1934-35 and was flown by such famous pilots as Willie Stör and Ernest Udet. (Right) Peoria Breezy is a Breezy Jr. kit built and flown by Joe Dobb, Washington, Illinois.



Scratchbuilt Lazy Bees flown by Joe Price, Peotone, Illinois.



Aveox powered, scratchbuilt Tiger Moth built and flown by Ben Beard, LaGrange, Illinois.



Electric ducted fan model by Keith Shaw is powered by a prototype of Astro Flight's new 05 brushless motor. Awesome performance!



## Big Color

By William G. Swingle II  
Pleasanton, California  
bill\_swingle@electro-test.com

A scale covering/paint scheme looks great. There's no denying it. However, sometimes there's a down side. In a contest or anytime the sky fills with airplanes, it can become difficult to distinguish which plane is your own.

An older power pilot I once knew had some vision difficulties. To improve visibility, his planes always had a fluorescent color scheme. Often he'd use a different color for each wing!

It always amazed me how truly startling it was to see the left wing a different color than the right. It seemed a violation of some universal law of symmetry. To further the visual definition, he'd put a large circle of a third color on just one wing. His approach worked. On a bright day you could see his plane with your eyes closed.

Whether it's from my acquaintance's example or simply horrible taste I'll never know, but I've definitely been bitten by the visibility bug. I find myself drawn to loud, clashing colors. Though not with every plane (thank heavens), I occasionally succumb to these urges. My combat Mustang (DAW) was the recipient of this insult. I covered the wings with fluorescent green and the fuselage with blaze orange. Fortunately, I was able to restrain myself enough to use the same color for both wings. I do have my limits.

I flew my Mustang for some time on my home slope quite happily. But, I didn't learn the true value of my bright coloring until I attended the first Turkey Shoot in southern California. At the Turkey Shoot there were many Mustangs. Most with fancy scale covering schemes. They really looked good, but whenever several were in the air it was almost impossible to differentiate between them.

This was where my bright colors proved very helpful. There was never any doubt which plane was linked to my thumbs. As important as this is for all flying, in combat it's even more so. When combating the only plane whose position you can anticipate is your own. Thus your vision is predominately upon your opponents. The bright colors of the Mustang allowed me to keep it in my peripheral vision with less fear of losing sight of it.

The other benefit I've found is that opponents are more likely to attack an eye catching airplane. The loud colors not only make your plane easier to see. They bring the excitement to you!

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From here I could see Granite Chief Wilderness and Hellhole Reservoir to the west and Desolation Wilderness to the south.



South towards Rubicon Peak in the snowy distance.



The sturdy, packable, hikeable AGR 60" Python.

along the trail were in full bloom, and to see so much snow in July is a chance in a lifetime. What's better, the crest of the bowl has a meadow of low green leafy stuff, providing an ample landing area! Truly an awesome place for alpine sloping.

I hooked up the on-board digital camera, taped all the ballast I could find and hucked it. This was white knuckle slope flying like I had never experienced before. The Python shook and shuddered, elevated, sank, was flung up and flung down, was flapped around, then would settle into a glide — and then start the whole process again! It was the fastest flying I've done yet. The whole adventure added up to a near religious experience.

After about two hours of flying and exploring, I packed up and biked back down to the car, elated, grinning from ear to ear. Next stop was Tahoe Micro Brewing Co. for a robust beer to wind down and reflect on my Sierra soaring expedition — and most important — rejoice in the fact that I still had a glider in one piece.

For my skills and style of back-country sloping, the Advanced Glider Research Python 60 inch foamy is the ticket. This simple aileron/elevator plane is light and sturdy enough to disassemble and hold down on my pack with bungee webbing. I carry the transmitter, field tools, proper clothing, food and water on my back. A composite sloper would work for the experienced pilot, although it would not be as packable.



- Sierra Nevada mountains above Lake Tahoe, California
- A mountain bike, some maps and directions
- A good stiff wind

July 10, 1998

I must have stood there with my plane in hand for at least ten minutes, just feeling it out. Holding the glider, I could feel gusts of wind trying to wrench the plane from my grasp. I was at 8271 feet, and the day had BIG alpine wind. This was my first real attempt at alpine soaring, and I felt inexperienced and undergunned.

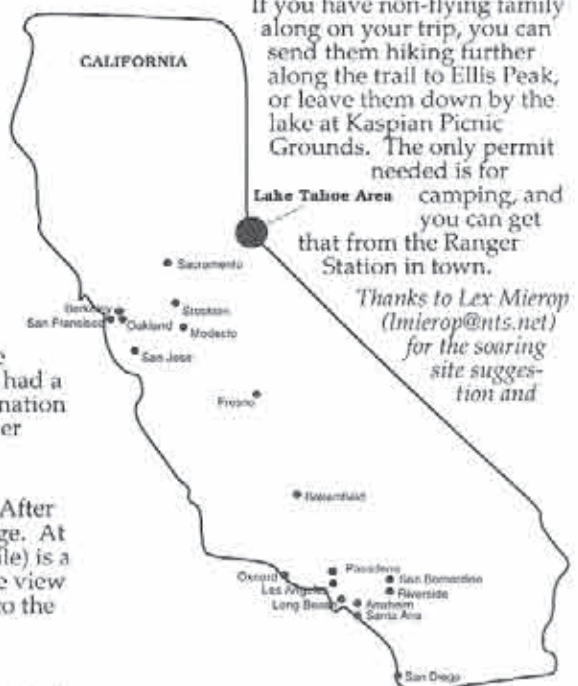
Hesitating, sweaty, and a little shaky, I had to toss it — if for no other reason but to say I had flown there! I remember thinking, "Even if I completely munch my plane, I'll have pictures to show that I did fly."

The place was Cothrin Cove, on the trail to Ellis Peak, near Lake Tahoe, California, a beautiful 1000 foot bowl overlooking Desolation Wilderness. A road had brought me up about 7700 feet to a trailhead. When I went, in July 1998, the road was closed to cars due to snow and water runoff. Luckily I had a mountain bike to get me to my destination fairly quickly. Still, I had to climb over stretches of snow banks.

At the trailhead is a set of killer switchbacks, for maybe half a mile. After that, it's a gentle climb along the ridge. At the top of this climb (another half mile) is a west facing bowl, Cothrin Cove. The view from here is incredible. Lake Tahoe to the east, Granite Chief Wilderness and Hellhole Reservoir to the west, and Desolation Wilderness to the south. Because of the late thaw, most of the plants

If you have non-flying family along on your trip, you can send them hiking further along the trail to Ellis Peak, or leave them down by the lake at Kaspian Picnic Grounds. The only permit needed is for camping, and you can get that from the Ranger Station in town.

Thanks to Lex Mierop (lmierop@nts.net) for the soaring site suggestion and



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904 Neil Ave.  
Columbus, OH 43215

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This column is dedicated to soaring vacations. This month, Bill Mulder takes us to the Sierra's. Bill lives in the San Francisco Bay area (Berkeley, California) where he is the layout editor for *Computer Currents* magazine. You can check out his other work by viewing his web site. Bill volunteered to write the first guest column for "Have Sailplane, Will Travel!" because of his belief that "the lift is out there".

### Sierra Alpine Soaring

by Bill Mulder

bmulder@dnai.com

<http://www.dnai.com/~bmulder/BayGliders/BayGliders.html>

#### The setup:

- A 60" Advanced Glider Research Python foam sloper

David L. Stone (dlstone@compuserve.com) for turning me on to the Radio Control Soaring Exchange.

**Directions to Ellis Peak, Ellis Lake and Cothrin Cove:** (courtesy of Great Outdoor Recreation Pages on the World Wide Web) [http://www.gorp.com/gorp/resource/us\\_national\\_forest/ca/bik\\_taho.htm](http://www.gorp.com/gorp/resource/us_national_forest/ca/bik_taho.htm)

- Mileage: 4 miles one way from trailhead
- difficult due to steepness
- type of route: single track/dirt road
- use level: heavy
- topographic map: Homewood

**Access:**

From I-80 in Truckee, California, take Hwy 89 south to Tahoe City. Continue south on Hwy 89 another 4.2 miles to Kaspian Picnic Area. Drive or ride west on Blackwood Canyon Road, a seven mile climb to Parker Pass.

Ellis Peak Trailhead is located on the south side of the road where the pavement ends on the summit.

From the trailhead this motorcycle/hiking/biking path is very steep going until you reach the ridge. The grind is worthwhile, because the view from the ridge (where the trail becomes rideable again) is breathtaking. Follow the ridge for .5 miles through open forest and flowered groves. The first large meadow you reach is the top of Cothrin Cove. The trail continues onward toward Ellis Lake and Ellis Peak. Don't expect to find a sign telling that you are there, instead face west and look for the obvious cove shape of the topography below. It's a graceful 1000' bowl that allows the predominant wind to funnel straight up.

If you wish to reach the summit of this wonderful hike, continue on for another mile to a fork in the road.

To reach Ellis Lake follow the road to the left for two tenths of a mile.


To reach Ellis Peak, follow the road to the right for about 100 yards, where another road will take off to the east (left) for another three tenths of a mile. Stash your bike at the end of the road, and hike the last few steps to Ellis Peak (8640').

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Thanks, Bill!

If you have a favorite sailplane travel saga, consider writing it down for RCSD. If you are planning a vacation that includes your plane and transmitter, consider making notes as you go, and working up an article later. Take photos. Collect maps. And send your story to Tom Nagel at [tomnagel@freenet.columbus.oh.us](mailto:tomnagel@freenet.columbus.oh.us) for gentle editing and suggestions. Tom ■



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Wt.:	9 oz./11 oz. \$139.95/\$159.95	10.5 oz. \$149.95	15 oz. \$159.95	200 oz. \$1199.95	123 oz. \$899.95	54 oz. \$499.95

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## SIDESLIP



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### Aerobatics coming in October!

Hello you aerobatic enthusiasts! By the time you read this, the Fayetteville Aerobatic contest will be just around the corner. I don't know about the rest of you, but I wasn't able to practice the aerobatic routine over the summer and in fact, since Filmira, I haven't flown a sailplane! I must admit that I have had ample opportunity to fly my nifty Extra, and so to some extent I have had some aerobatic practice, although not of the silent kind.

I rather suspect that many of you haven't had a chance to practice either, so we're all in good company.

The whole purpose of this event is to get together and have a good time. The sportsman aerobatic routine (straight and level flight, three turn thermal, split-S, a roll, chandelle, an inside loop, a procedural turn, cross wind and set up for landing, and landing) is well within the skills of anyone who has flown a sailplane for a minimal amount of time. It's also well within the performance ability of any scale sailplane. This routine was specifically designed to be fun while at the same time, giving the pilot a little taste of discipline.

### The benefits of judging and being judged

I had the good fortune to judge a Scale Masters qualifier event this summer, and I must say that this experience gave me a much more critical approach to my own flying. It made me much more aware of what a perfect maneuver should look like. It has certainly made me a better pilot.

### Take it as far as you want!

I know that I have said this many times before, but the wonderful thing about scale sailplanes is you can "take them as far as you want". You can buy a ready-made scale airplane and go fly it the next day, while at the other end of the spectrum, you could completely scratch build your own unique model and totally scale it out with every detail.

### PURSUIT OF PERFECTION

You can take aerobatics as far as you want to. It's easy to do a loop, but it's not so easy to do a perfect loop. Basically, this whole love affair with flying scale sailplanes can be summed up in three words: pursuit of perfection. If flying were too easy, I suspect that many of us would be less interested. It's the challenge and those rare instances when everything is

Excerpted from the  
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going right that  
makes the juices  
flow!

Flying aerobatics is after all precision flying, and the better you can fly them the easier it is to do them. Once again I have to say, "Practice, practice, PRACTICE!" But in this case the practice can be a lot of fun, and when you're finally rewarded with that one perfect maneuver, it's a rush - it really feels great!

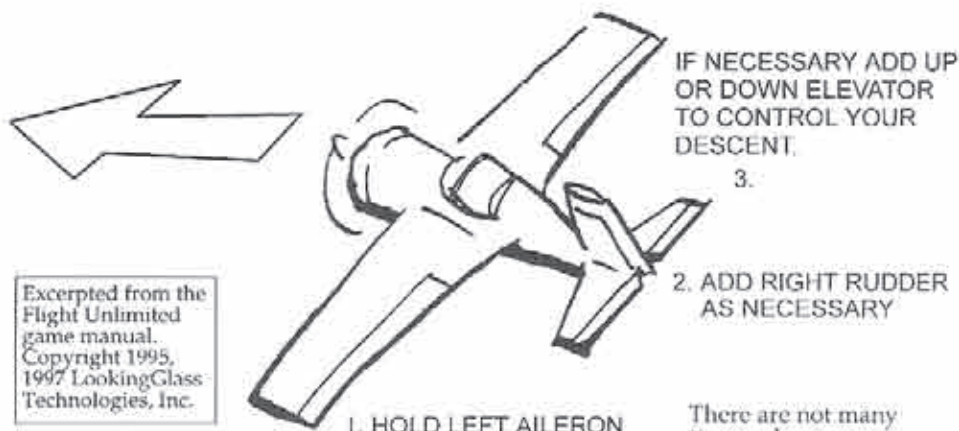
Interestingly, in the Scale Masters Competition I just mentioned, there were very few 10's awarded in the scoring. Those who did achieve perfect 10s did manage to fly maneuvers with nothing wrong - that perfect maneuver certainly gave the pilots a great sense of accomplishment and achievement.

To make a long story short, any of you who might be interested in coming and flying with us in Fayetteville, PLEASE DO COME! Don't hesitate just because you think you're not going to fly so well - you might just surprise yourself and win! But winning is not the most important thing. Flying the best you can fly IS what it's all about, and even more important, having a good time while you're at it.

### Advanced aerobatic routine

As you probably know, there's going to be an advanced category of aerobatics for those of you who wish to try a more demanding aerobatic routine (three turn spin, Cuban-8, split-S, 4 point roll, stall turn, square loop, sideslip, and landing). This aerobatic routine was specifically designed so that any moderately aerobatic sailplane would have no problem flying these maneuvers. As I said before, the rest of us haven't had very much practice time and so have no fear - you'll be in good company no matter how you fly. By the way, if you have two sailplanes, one a high-performance aerobatic machine and the other something more docile, don't be bashful; you can enter in both the sportsman and the advanced categories.

It will be the first ever in the USA.



1. HOLD LEFT AILERON

IF NECESSARY ADD UP OR DOWN ELEVATOR TO CONTROL YOUR DESCENT.

3.

2. ADD RIGHT RUDDER AS NECESSARY



There are not many times when you can share and experience a first ever event of this kind. This will be an excellent learning experience for all concerned, and your input will be more than welcome. We look forward to seeing you on October 2nd through 4th for what might prove to be a most

interesting and rewarding experience. We look forward to seeing you in Fayetteville!

### The Sideslip

The sideslip is a very handy maneuver that can get you safely out of trouble. Let's say that you're coming in for a landing and Ooops! You're too high, but you're too low to do a 360 and make another approach; your only option is to dive or to do a sideslip. Sometimes when you point the nose down you pick up a lot of speed, which can cause you to miss your landing strip. What to do? The sideslip, of course!

With a gentle sideslip you can lose height without gaining a lot of speed and safely land your sailplane.

If your sailplane is a real floater, you will find the sideslip to be a very gentle and manageable maneuver. If on the other hand your sailplane flies rather on the fast side, the sideslip might be a bit more difficult. In either case, the sideslip will sooner or later come in very handy.

Most of the time the sideslip is used when you're coming in for a landing, so let's run through it as though you were on a landing approach. Let's say that you are doing a left hand circuit and have just lined up on the runway with your left wing tilted down (and your right wing up). You've not yet leveled out from your turn. At this point, add right rudder, and hold left ailerons so that the wings stay tilted (as much as 45 degrees).

Each sailplane will require a different proportion of ailerons and rudder to hold the wings at a stationary tilt in the sideslip. It takes just the right combination of ailerons and opposite rudder to hold the



### 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. (Issue includes Sportsman & Advanced Routines.)

#### July 1998

- Practice the Chandelle & Procedural Turn.

#### August 1998

- Practice the Two Point & Four Point (Hesitation) Rolls.

#### September 1998

- Practice the Sideslip.

#### 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.

wings steady.

When sideslipping, some sailplanes point their noses up and some pitch down; consequently, you will need to add either up or down elevator as necessary in order to maintain a nice gentle descent. If you're lucky enough to have a sailplane which will sideslip with no elevator input, you will find this a very easy maneuver and you will be able to make very controlled and steep descents with ease. If it turns out your sailplane requires a combination of aileron and opposite rudder with either up or down elevator, the sideslip will take a bit more practice to perfect.

I doubt that you have seen many model airplane sideslip. This is very probably because almost nobody ever attempts this maneuver. Hopefully, this introduction will change all that! With just a little bit of practice you should be able to achieve an excellent and spectacular sideslip. And once you get to know this maneuver you will wonder how you ever landed without it! You will be able to slip your sailplane 'til just above the ground, then level off and grease it in.

Let's have no dorks with scale sailplanes! A sideslip together with spoilers will help you achieve a very steep and controllable descent and should help you achieve excellent precision landings whenever you want to.

As always, practice makes perfect, and if

your glider is one of the more difficult ones to sideslip well, you will have to invest more time than the lucky fellow who has a 1/3 ASK-18 or 1/3 Ka6E, for example. Both of these are extraordinarily gentle and extremely easy to sideslip. The 1/4 size ASK-18 is also equally gentle; you will find that side slipping on landing will add spice to your otherwise run of the mill garden variety approach.

If you have been around full-sized aircraft and especially smaller types, you will see the sideslip used quite often - especially by the hot shot tow pilots who are in a hurry to land, hook up and get another sailplane airborne.

When watching the full-sized aircraft do a sideslip, you will be impressed by how gentle and how slow the controlled descent actually is. When doing a sideslip yourself with a smaller sailplane, this is basically what you wish to achieve.

Some sailplanes may require much more rudder than aileron, and vice versa. It can be safely said, depending on what aircraft you happen to be flying at the time, that the sideslip is bound to require different input from one sailplane to another. Just remember, start your practice sideslip one mistake high and on the gentle side. As you get more and more used to the maneuver, you will be able to achieve a steeper and steeper descent.

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## TECH TOPICS

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### Tahlequah A 2 Channel RC HLG

In 1839, the Cherokee nation was nearing the end of the "Trail of Tears" - the long march from their homelands in the East to their final destination in what is now Oklahoma. Three commissioners were selected from the tribe to choose a site for the Western settlement. Only two survived the journey. They chose the rolling hills and clear rivers in Northeastern Oklahoma for their new capital. When convinced the third commissioner would not arrive, one turned to the other and said: "Tah-le-quah" which means "two is enough" in Cherokee. The new town of Tahlequah became the tribal headquarters for the Western Cherokee nation.

This name also summarizes my feelings about the simple side of HLG. Multi-function may be the way to go for competition, but for just plain enjoyment, two is enough. So we name this little polyhedral design Tahlequah. To keep things real simple, this will be a polyhedral pod and boom design. To minimize damage to tail surfaces (and I just think it looks neat), it's also a V-tail.

Remember that the purpose of this design is to provide a platform for testing airfoils, tail groups, etc. There are many excellent suppliers of quality HLG kits that can get you into this side of the sport with much of the work already done for you. About the simplest entry with the least \$\$\$ is still BOB by Joe Galletti (see ads for Torque & Recoil Club in RCSD as well as the RCSD review a few months back). I've used some of Joe's wing construction ideas so, if you want something pre-packaged that has really nice performance, please support our manufacturers so they can keep coming up with more neat stuff.

If you're still determined to scratch build and maybe try some different airfoils, here goes. The materials list you'll need is in Table 1. Carbon fiber arrow shafts are a great way to go for the boom. You can get them from a local archery supplier or mail order from Cabela's or Bass Pro Shop. In the latter cases you have to buy the arrows and then lop off the fletches and points. Most CP arrows come in 15/64" or 16/64" OD (Yeah, I know; that last one is 1/4", but the arrow guys seem to quote them that way.). They come in different wall thickness (for added stiffness), which means added weight. Going from a 35/45 rating to a 80/100 rating adds around nine grams to the tailboom without any significant advantage in stiffness for this application. The rest of the material can be obtained from your local hobby shop.

Finding 15" long 1/64" ply can be a trick. Most hobby stores have this as 12" x 12" sheet. If that's your easiest source, add a 3" splice in the battery area with the wood joined on a diagonal cut. 1/32" ply also comes in larger sheets. The list just indicates you don't need very much of it. The 1/16" ply is simply for the control horns

and can be made by laminating two pieces of the 1/32" ply together. The foam cores will have to be cut by someone in your club that does that. The mains and tips are each 15" long. Main is constant chord (6") with the tips tapering from 6" to 4.5". The trailing edge is straight with all the sweep in the LE (sometimes loosely called a Schuemann planform).

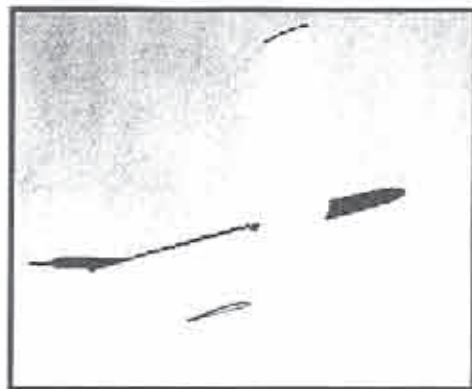
The plan outline is shown in Figure 1. When I first drew this up 6 months back it looked a bit ugly. But in the air it looks pretty cool, so give it a try as is. The battery compartment is long enough to accommodate the cylindrical cell packs and deep enough to accommodate a standard square pack. The Rx compartment is deep enough for an RCD535 (in the case) and long enough for an FMA Tetra. I use a 225mAh square pack and either an FMA Tetra or RCD535. The nose moment is a little long to ease any concerns about wood selection in the tail. Lighter is better back there, but sometimes you can't always get contest grade balsa.

Servos are either the CS21BB (Hobby Shack) or FMA 90s. That's for low weight and conventional mounting. They're set up in a side-by-side arrangement under the wing. After some initial problems with early versions of these little jewels (output arm slipping), they seem to have settled down and I haven't had a lick of trouble with either type in the past year.

Let's start with the pod. The drawings are to scale, but I can't guarantee the dimensional accuracy through various reductions and enlargements. So get some fan-fold paper from your dot-matrix printer and lay it out for your equipment. Dimensions for the bulkheads are specified and those are the key to aligning the structure. The nose-block bulkhead and nose block should be drilled out as indicated to allow for a weight compartment for trimming the CG.

The sides are 1/16" balsa with 1/64" ply doublers. Since a standard 1/64" ply sheet is 12" long and the overall boom length is a little over 14", you may need to splice the ply. This should be done in the battery compartment. After cutting out left and right sides, laminate the balsa and ply together (slow CA works well and allows some time to align properly). Before going any further, mark the location of the bulkheads on the fuse sides. All bulkheads (as well as the hatch) are 1/4" balsa. Now mount the servos on the 1/4" dowel rails. Pre-drill the dowels (1/16" drill) so the wood won't split. Now line up the forward dowel just behind the #3 bulkhead location being sure the servos clear the floor of the fuselage and the lower wing surface. Mark this spot and the rear dowel location. Also spot the 1/4" throwing dowel behind the #4 bulkhead. With the left and right surfaces taped together, drill all three of these holes and you'll be assured of good alignment of these components when you put it all together.

The arrow shaft forms the reference line for the fuselage and wing. So be sure to drill the #4 and #5 bulkheads properly for this reference line. The wing is set at a 2 degree angle (positive) with respect to the reference line. Before finishing the #5 bulkhead, drill out a 1/16" hole just to either side of



The final product. All photography by Adele Register.

the arrow shaft hole. Also drill one at the top center. These are for the cable rods and antenna. You should also drill 1/16" holes in the #4 bulkhead for the cables so they are aligned with the center of your servo arms.

CA the bulkheads to the sides at the proper locations. The #3 and #4 bulkheads are the same width so start here. Then add the #1 and #2 and let everything set. Then add the #5 bulkhead being sure the arrow shaft is aligned properly between the #4 and #5 bulkheads. Once all that's done, use 1/16" balsa (cross grain) to complete the fuselage bottom and the small rear deck. Glue on the nose block and 1/4" hatch cover and round it all off until you're happy. Add the servo rails and throwing dowel.

The hardwood wing mount block can be either drilled and tapped for a 6-32 nylon bolt, or use a blind nut. You may need to trim off one side of the flange to get it to fit OK but that works well also. A shallow hole for the arrow shaft will lock this piece in place so it will never pull out. Finish the inside of the fuselage by adding 1/8" wing saddles on the inside of the fuselage. This isn't absolutely necessary but does make a better seat for the wing.

For the tail surfaces, cut each V surface from the 1/8" sheet as indicated. Use some of the scrap to cap the outer surface for a little extra stiffness. The V-block is made in two parts. A small table saw or sanding disc is very useful here. The V-angle is 105 degrees. That's 52.5 degrees on each side. Set your hobby saw or sanding disk/belt sander angle to the complement (37.5 degrees) and cut/sand the triangle stock along the hypotenuse side at the 37.5 degree angle. Since you're starting at 45 degrees in the stock, this doesn't require a lot of material to be removed. If you don't have a table saw or sander, you can make a template from 1/64" ply and glue it on the ends of the triangle stock and sand to this angle.

Before gluing to the stabs, bevel the root of the stabs at around 20 degrees (out for each surface). This gives a very convenient opening for mounting the V-tail to the boom and will save you work later on. Now glue the cut side of the triangle stock to the inside base of each stab. After that's set, align and glue the two stab blocks together and you've got a very well aligned V-tail ready to go on the boom.

Wrap a thin sheet of ~200 grit sand paper

**TABLE 1 - Materials**

1 ea	36 x 3 x 1/16 balsa
1 ea	36 x 3 x 1/8 balsa
1 ea	36 x 3 x 1/4 balsa
1 ea	15 x 14 x 1/64 ply
1 ea	6 x 4 x 1/32 ply
1 ea	- 2 x 2 x 1/16 ply
2 ea	36 x 1/8 x 1/8 spruce
2 ea	#507 Gold-n-Cable
1 ea	Beeman's 35/45 x 15/64" arrow
1 set	Foam Cores
1 roll	3/4" prismatic tape (O'Reilly Automotive)
1 roll	2" wide clear packaging tape
1 roll	3/4" to 1" wide clear vinyl tape
1 roll	1" wide glass filament strapping tape
Several	6-32 x 1" pan head nylon screws
1 ea	6-32 tap or blind nut
scrap	pine or hardwood for wing bolt

around the rear of the boom and swipe the bottom groove in the stabs along this a few times to round out the surface. Rough up the boom surface a tad and then join with thin CA. Use a little baking powder as a filler/kicker if needed and the stabs will grab the boom like a cat on a tuna fish.

Bevel the mounting area of the moving surfaces of the elevons so the control horns point straight down. Drill the 1/32" control horns for the pushrod (a 1/32" hole is just right for the cable) and then CA them in place. A little fillet of baking soda here makes for a very strong joint. Now mount the surfaces on the stabs using felt type CA hinges (CG, Great Planes and others sell these types of hinges. Actually, I take one and cut it into three pieces for each stab. It's plenty strong enough.). At this point, the stab and boom are finished, but **DON'T** mount the boom on the fuselage just yet.

For the wings, I use 1.5 lb. density extruded foam. The center section is 6" constant chord. The tip section is constant taper from 6" to 4.5". I've used the SD7080 with no washout and that's a good place to start. When cutting the core, it helps to leave a slightly thicker TE (maybe 0.020" to 0.032"). The TE is the most delicate part before covering and the extra thickness will save you some gnashing of teeth later on. Also cut the angle on each end by elevating each tip 1.5" and then cutting straight down through the core end (a right angle ruler makes a convenient guide on the edge of your cutting table). After the core is cut, a 1/8" wide by 1/8" deep channel is routed on the top and bottom of the MAIN PANELS ONLY with a Dremel routing tool. These channels are 2" back from the LE. Using thick CA (foam safe), glue in the 1/8" spars. After the spars are secured, use a small coping saw to remove a 2" long channel immediately behind the spar at the root of each section. This will be for the 1/32" wing joiner.

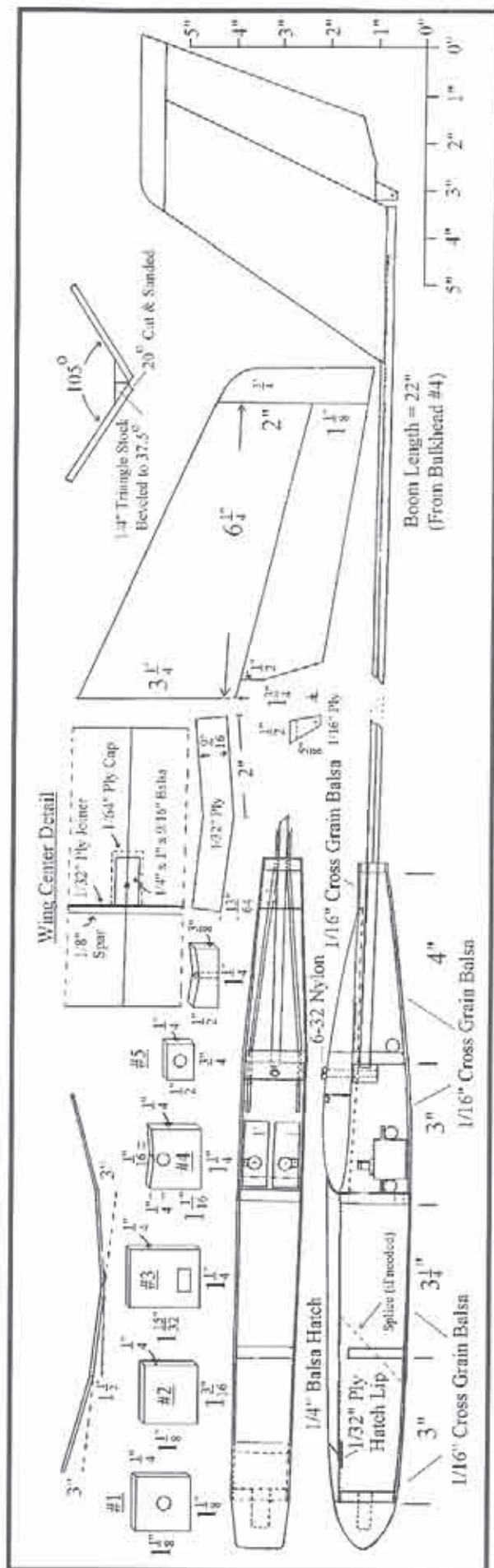
**VERY carefully** sand off any angel-hair or rough material from the surface of the cores. This can be done by lightly sanding from the middle of the core to the edge in one direction. Circular motion will ball up stuff and gouge the surface. If you do put a gouge in the surface, fill it with spackling compound, go have a beer, relax and then come back later when you're calmed down. When you're finished with this part, lightly

spray the core with rubbing alcohol and wipe off any dust or fuzz with a cotton cloth or tack rag. I glue a 1/16" cap rib on the outer tip at this point to provide a little protection. If you do that, sand it down to the core surface and tack off any dust. Run a 1" strip of strapping tape over the top and bottom spar. Also run a strip on the top and bottom of the tips starting at the root chord spar location and running to the tip approximately 1-1/2" back from the LE. This adds just enough stiffness to the tip sections and also helps with the load on the mains.

The covering technique is only slightly modified from that used by Joe Galletti with his BOB. Start by lightly marking each core at the root and tip on the lower surface 1" forward from the TE. Using this as a reference, lay down a 2" wide strip of clear package wrapping tape on the surface and smooth it out to the TE. At this point, 1" of the tape width should be hanging out past the TE. Work the tape around the TE by rolling the TE along a counter top until it's flipped over. Now smooth the tape on the upper surface and trim it off at the edges. Work your way forward to the LE by laying successive 2" wide strips along the surface parallel to the starting strip. A little gap here is better than an overlap. At the LE, roll the upper surface over the LE and trim it off, maybe 1/4" back from the front. The overlap can be done quite easily by laying an 18" plastic ruler at the 1/4" position and tacking the tape to that as you come around the surface. Then simply lift up the ruler and trim the tape at the edge. Now do the lower surface on each core the same way and also roll it around the LE with maybe 1/4" overlap on the top.

Take that roll of 3/4" wide prismatic tape that you got from the auto supply store and cut it into 15" long strips. Fold it in half (lengthwise) to make a crease for the LE and then apply it to the LE of each core. Once this is done, trim off any overhanging tape at the tip and the root of each core. As a final piece of insurance, I use a 1" wide strip of clear vinyl tape wrapped around the ends of each core to keep the packing tape from working loose.

Before joining all the cores, use some of the scrap 1/4" balsa to make a vertical grain insert at the root where the mounting screw will be placed. Glue these in and sand flush with the surface. Glue the tips to the mains first. All angles are the



same, so elevate each section 3" with respect to its neighbor and you'll have ~ 10 degree included angles throughout.

Before gluing the center sections together, screw the 6-32 nylon pan head bolt into the block in the fuselage, set a wing half in the saddle and mark the position of the screw on the balsa block. Make a small V-groove along this line (both wing halves) and then glue the wing halves together. Now you can take a clearance drill and clean out this channel to accommodate the wing hold down screw. Now glue the mains together and then add the 1/32" ply joiner using foam safe CA.

To finish the job, cap the vertical grain balsa with a piece of 1/64" ply, wrap the whole root joint with a piece of 1" wide wing mounting tape and then drill through the 1/64" ply and tape for the mounting screw. I also add about a 3" piece of 3/8" wide x 1/4" thick spongy weather stripping (the real open pore, cheap stuff) on the underside of the wing along the center joint starting from the TE. This will compress along the arrow shaft and minimizes any twisting of the wing during normal flying. In a hard landing, however, it will allow the wing to twist on the saddle to minimize breakage.

Finally, mount the wing on the fuselage, insert the boom, align the tail properly and CA the boom in place at the two bulkheads. If you've roughed the surfaces a bit, these glue joints are all you'll ever need.

Last step is to mount the servos and run the cable rods. I let about 1/2" of the cable jacket stick out from the #4 bulkhead in the servo direction. The cable jackets can be snaked through the pre-drilled side holes and run along the boom to within ~1" of the end. CA these in place at 4 or 5 spots along the boom.

Tin about 1 inch of the end of the 1/32" cable with solder. Then make a small z-bend with a pair of small needle nose pliers. Work these z-bends through the plywood control horns and you're now set at that end. Now take the small threaded metal couplers in the Sullivan package and cut off the threaded part. Cut that in half and solder each piece onto the servo end of the cable. Screw on a small nylon snap link, drill out the servo arm with a 1/16" drill and you're done.

As usual, wrap the battery and Rx in foam. If the battery compartment is too long for your battery pack, cut a piece of scrap styrofoam to fit between the battery and the No 2 bulkhead so it won't move around. Snake the antenna back through the fuselage and out along the top of the boom. Tape it in place at 2 or 3 locations with clear vinyl tape. I run it to the end of the tail boom and leave the excess loosely curled up in the rear compartment of the fuselage.

One last thing. You may be wondering how do you keep the batteries from sailing out through that 1/16" balsa floor on a hard landing? Remember that the fuse is pretty squared up in this area, so take a

piece of that 2" wide clear packing tape and run them around the fuselage from one edge of the hatch to the other. Do this for both the battery and Rx compartment and you have instant and invisible reinforcement. Well, to be honest, I launched the battery through the bottom of the fuse once and then discovered the tape would solve all these problems. It then seemed like a pretty clever idea to have left the pod squared off the way it was! I also run a piece of 1" wide wing mounting tape around the top of the nose and about 4" back on the bottom of the fuselage. Helps with all the little dents and dings.

CG is spotted at around 3-3/4" ahead of the TE. I like it a little rearward to get near neutral stability. You have to play with the CG at the few gram level on these light ships to suit your taste. Use pretty light tosses to get about where you want.

Now using your best throwing technique, let 'er rip (read Dave Garwood's interview with Joe Hahn in the October *Model Aviation* magazine to get a real feel for his throwing technique.). It's very important to catch this ship just before the top of the climb to push it over level. This transition is one of the more critical aspects of the launch. Since I can't throw very high, I've got to get good efficiency from the transition. A stall at the top will take quite a few seconds off your time.

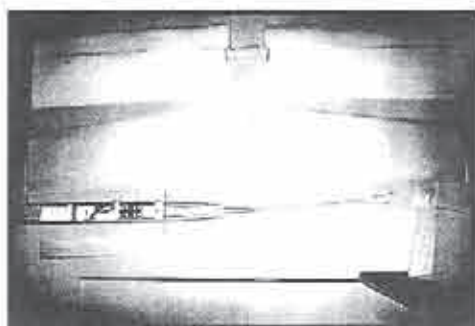
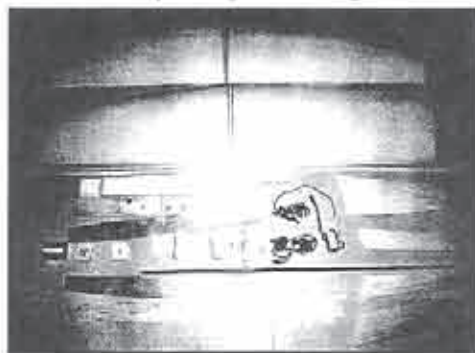
Control throws that work pretty well for me are ~ 3/8" left and right and about 3/16" up and down throw. Each computer radio handles ATV and coupling a little differently, so you'll have to sort it out with your system. But those throws are about right. The relatively large control surfaces make this plane very maneuverable so you may find that exponential or dual rates are of use for different flying/launching conditions to suit your style.

I've made several of these planes and they're coming in around 9-1/2 oz. if built as outlined above. Compared to the 12 oz. jobs I used to make, this makes an incredible difference in sensitivity and response to lift. A 9 oz. ship just seems to get the shakes all over when lift is nearby. The 12 oz. ones often plow right through it.

Well, I've run on too long here. Drop me an e-note if you've got any questions or problems. 5 to 10 minute flights have been pretty easy to come by with this design. But the real purpose is to provide a good, stable platform for trying out your own wing and tail designs. If that's successful, or it just helps to get you hooked on HLG and then you move on to a more professional kit, then I think we've accomplished a positive objective. ■



All parts before assembly.



Sub-assembly all components.



Pressing wrapping tape around the L.E.

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## 1998 MVSA Gateway

### Soaring Open

Mark Nankivil  
7411 Canterbury Ave.  
St. Louis, Missouri 63143  
(314) 781-9175  
nankmc@ibm.net

The Mississippi Valley Soaring Association (MVSA) held their annual spring meet over the Mother's Day weekend at the Keeven's Emerald View Sod Farm outside of St. Louis, Missouri. Though the weatherman had us worrying about rain, conditions turned out to be just fine on both days with plenty of sun and a steady 10-15 mph breeze. Lift was there to be found, but the contestants had to go look hard for it - no freebies here! 31 contestants from 8 states took part each day in either the Sportsman (7) or Open (24) class.

Four rounds were flown on Saturday with 5, 7, and 9 minute target times. Each round was flown within a 1 hour 15 minute window, which gave plenty of time for everyone to pick their time to fly and go do it. This format made for a relaxed atmosphere, yet the quality level of the flying did not suffer. With a 400+ acre sod farm as a flying site, contestants could range far and wide in the search for lift. Some found the boomer thermals and there were a fair number of models that were specked out against the clouds and blue skies. Rusty Shaw from Ottumwa, Iowa was in fine form for his first contest of the year and put in a couple of perfect flights with the father/son team of Charlie and Mike Fox chasing him to the finish. In Sportsman, Dave Miller pretty much ran away from the rest of the pack. Final scores (with 2080 points possible) for Saturday were:

#### Sportsman

1 <sup>st</sup>	Dave Miller	1468
2 <sup>nd</sup>	Ken Bergstrom	934
3 <sup>rd</sup>	Art Ingraham	908

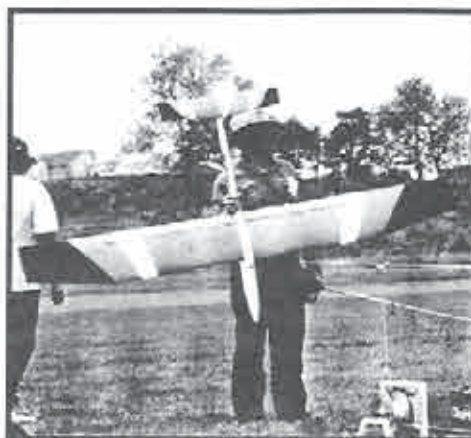
#### Open

1 <sup>st</sup>	Rusty Shaw	2046
2 <sup>nd</sup>	Mike Fox	1910
3 <sup>rd</sup>	Charlie Fox	1795
4 <sup>th</sup>	John Cyr	1789
5 <sup>th</sup>	Alan Oliver	1737

The weatherman had painted a picture of rain Saturday night carrying into late Sunday morning, but thankfully was way off the mark with his forecast. Sunday dawned clear and blue and with the quick pace of Saturday's flying, the idea of adding a fifth round was brought up at the pilot's meeting. This was unanimously accepted and an additional 9 minute round was added to the day's flying. From an observer's view, the lift was, shall we say, "interesting", as fliers had to stay with the bubble some distance downwind before the lift would break loose and the model could climb away. This did not always happen, yet most of the fliers were able to scratch it out at low altitude and make it back to the field. Not everyone got their landing points though and this made a difference to quite a few. By the 4<sup>th</sup> round, the lift really started to boom and for those who could find it, it was more a matter of how good their eye sight was rather than the lift petering out.

Sunday's results were (with 2720 points

September 1998



John Berlin waits to launch with his 2 meter Troy Lawycki designed Duck.



Mike Fricke caught in the act of launching his Levoe Super V 110.



Art Frost's O/D model called the Missouri Eagle. Uses a modified Thermal Eagle fuselage with a triple taper wing planform using the SD/080 airfoil. As this landing shows, an excellent flier and model! Photo by Gene Trevino.

possible):

#### Sportsman

1 <sup>st</sup>	Eric Lund	1791
2 <sup>nd</sup>	Tracy Wagoner	1576
3 <sup>rd</sup>	Dave Miller	1454

#### Open

1 <sup>st</sup>	Rusty Shaw	2661
2 <sup>nd</sup>	Art Frost	2601
3 <sup>rd</sup>	Jim Frickey	2459
4 <sup>th</sup>	Mike Fox	2387
5 <sup>th</sup>	John Berlin	2169

The weekend overall trophies went to Rusty Shaw in Open and Dave Miller in Sportsman.

The Gateway Soaring Open is becoming a great way to get into the swing of the new contest season and mix it up with some of the best fliers in the Midwest. Come join us next May and partake in the fun! ■



Finishing in 1<sup>st</sup> on both days of the contest, Rusty Shaw holds on to his Viper while looking over the air.



Jeff Pfeiffer of Springfield, Missouri with his O/D 2 meter model. Nice flying model though Jeff had some radio problems that put him out of contention.



Robert Samuels gripping his Slegers Carbon Condor. Beautifully made model that flies as well as it looks.



Eric Lund took 1<sup>st</sup> in Sportsman on Sunday flying his Spirit 100. MVSA club President Stacey Thaler hams up along side.

## 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.



ASW-27

...from Sailplanes Unlimited, Ltd.

This 1/3.75 (weight ~12 lb., wing profile HQ3/12), 4m span (158"), all glass scale sailplane is completely finished - install control horns, nose weight and radio, check the hinges and go fly! Suitable for winch, slope and airtow.

White glass fuselage comes with retract and wheel installed. Glass rudder is hinged and fitted to the rudder post. Wing alignment and joiner tubes are glued in place. Canopy is completely finished and glued to the canopy frame and fitted to the fuselage. The glass stab/elevator is hinged and ready to bolt to the fuselage. All glass wings come with spoilers installed and capped, flaps and ailerons are tape hinged, and wing tube and wing alignment holes drilled and installed. The wings come with winglets which have a very clever wing skid molded in.

Servos required: 2 ailerons (mini), 2 flaps (mini), 1 spoiler (in the fuselage), 1 retract, 1 rudder, 1 elevator, 1 airtow release (optional).



Sealing Iron

...from Hangar 9

Heat sealing iron, HAN101, has a new Teflon® coated shoe, which has contoured edges to prevent damage to the covering. 2 year warranty, cost is \$19.95. Available through local hobby dealers, exclusively distributed by Horizon Hobby Distributors, Inc. ■



ASW 24

...from Sailplanes Unlimited, Ltd.

1/3.75 scale ASW 24 (weight ~12 lb., wing profile HQ 3/12), 4m span (158"), comes completely finished - install control horns, add nose weight and radio, check the hinges and go fly. Suitable for intermediate and expert pilots, this scale sailplane will winch, slope and airtow.

ASW 24 comes with a beautifully molded white glass fuselage with retract and wheel installed, rudder post and (styro-balsa) rudder hinged and wing alignment joiner tubes glued in place. The canopy is completely finished, glued to canopy frame and fitted to the fuselage. Exceptionally light styro-obechi Oracovered stab/elevator is hinged and ready to bolt onto the fuselage. The styro-obechi wings are finished in Oracover with spoilers installed and capped and wing tube and alignment holes in place and cutouts for servos.

Servos required: 2 ailerons (mini), 2 flaps (mini), 1 spoiler (in the fuselage), 1 retract, 1 rudder, 1 elevator, 1 airtow release (optional).



Ventus 2C

...from Sailplanes Unlimited, Ltd.

This is a completely finished, 1/3 scale, 6m span (237"), all glass scale sailplane (weight ~26 lb., wing profile HQ 3/15, 3/12/, 3/10, 3/8). Suitable for slope and airtow; superb thermal sailplane with a very wide speed range.

White glass fuselage comes with rudder post installed; wing rod and alignment tubes glued in place. Rudder post is finished with the glass rudder hinged and in place. All glass elevator/stab is ready to bolt onto fuselage. The counterbalanced retract wheel is installed. Canopy is finished and glued to the canopy frame and fitted to the fuselage. Gelcote polyhedral all-glass wings come in 4 pieces for easy transport with ailerons divided into 3 parts. All ailerons and flaps are hinged (not tape hinged) with simulated pushrod exit covers molded into top of wing. Wings are absolutely mirror-gloss finished as is elevator and fuselage. The elevator/stab is completely finished with elevator hinged and ready to bolt onto fuselage fin. This Ventus comes with a molded seat & instrument panel. The only work required to get this Ventus flying is install control horns & radio gear, add nose weight and check and glue all hinges.

Servos required: 6 ailerons (mini), 4 flaps (mini), 2 spoilers (mini), 1 retract, 1 elevator, 1 rudder, 1 airtow (optional).

Contact Sailplanes Unlimited, Ltd., 63 East 82nd St., NYC, NY 10028; (212) 879-1634, <www.sailplanes.com>. ■

## Glider Stands

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<http://www.emeraldnet.net/~guil/soaring.htm>



Web site has lots of pictures

## SCHEDULE OF SPECIAL EVENTS



Fayetteville '96, Lehman photo.

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

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

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

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

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

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

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

Please send in your scheduled events as they become available!



Pensacola, Lehman photo.



Los Banos, Lehman photo.



Elmira '96, Lehman photo.

### MARKET PLACE LISTINGS

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#### Closet Scale Stuff At Sailplanes Unlimited, Ltd.

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1/4.2 FiberClassics Nimbus 4 - 6.28 meter  
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1/3.6 Roedelmodell DG 800 - 4.15 meter span  
(163"), wing profile E 207, ca. 11 lbs.  
1/3.75 Roedelmodell Fox MDM-1 - 3.8 meter  
span (149"), wing profile RG 12, ca. 15 lbs.  
1/2.77 Pribek ASW 19 - 5.4 meter span (212"),  
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### For Sale - Business

**PC-Soar Version 3.5 Sailplane Performance Evaluation Program** Optional Sailplane Library now expanded to 54 models including: Alcione, Anthem, Genesis, Mako, Probe, Thermal Eagle, and Synergy-91. Free Library Upgrades. PC-Soar Upgrade to Ver. 3.5 \$10, PC-Soar New Purchase \$40. New Libraries of Sailplanes and Airfoil Polars \$30. Please include \$3 P&H for all purchases & upgrades. Also available: Laser cut airfoil templates. LJM Associates, 1300 Bay Ridge Rd., Appleton, WI 54915; ph: (920) 731-4848 after 5:30 pm weekdays or on weekends; <<http://www.athenet.net/~atcron95/pcsoar.htm>>.

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

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

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

### For Sale - Personal

End of the season clearance. If you want a beautiful sailplane, ready to fly or in kit form, check out these great deals! Schuller & Fleckstein 1/3 scale ASW 24, all glass, gleaming finish, completely scaled out, mint condition... \$2250.00 w/servos, German bags, retract, pilot, etc. Grunau IV, 1/4 scale vintage beauty, unbelievable craftsmanship... \$950.00 includes all servos, aero-tow, pilot, and custom mahogany case with foam cradles, brass hardware, and hand-rubbed lacquer finish. ASW 27, 3.5 scale, all glass Ripito kit, the finest molded ship of its size, brand new kit... \$1595.00, E.M.S. type, 5.3 meter Duo-Discus, brand new kit... \$1695.00 (compare at \$2000.00). Roke 7 meter Grob Twin-Astir, all glass version; new, these kits cost \$4600.00; I have 2 versions available; one needs paint and new canopies... \$2250.00; one is in mint condition... \$3295.00; both are completely ready to fly and include all servos, German wing and tail bags, retract, and (2) 1/2 scale pilots. Dan Troxell, (949) 831-8013, Southern California.

1/4 Roedel Super Cub (towplane), 2.687 meter span, wing profile Clark Y mod. (suitable motors are 160 T, 300 T, OS BGX-1, Brison 3.2 or similar), NIB... \$385.00. Contact Robin Lehman, 63 E. 82nd St., New York, NY 10028; (212) 879-1634.

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## R/C Soaring Resources

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

### Contacts & Soaring Groups - U.S.A.

Alabama - North Alabama Silent Flyers (NASF), Ron Swinehart, (205) 722-4311, <ron.swinehart@imco.com>, or Rob Glover at AMA3655@aol.com, <http://shl.ro.com/~santfara/>

Alabama - Central Alabama Soaring Society, Ron Richardson (Tres.), 141 Broadmoor Ln., Alabaster, AL 35007, <ron\_mail@bellsouth.net>

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

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

Arizona - Southern Arizona Glider Enthusiasts, Bill Melcher (contact), 14260 N. Silwind Way, Tucson, AZ 85737; (520) 825-2729. SAGE welcomes all level of flyers!

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

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

California - DUST, Buzz Waltz, 68-320 Concepcion, Cathedral City, CA 92234, (760) 327-1775.

California - High Desert Dust Devils, Stan Sadori, 14483 Camrose Ct., Victorville, CA 92392; (760) 245-6630, <Soareyes@aol.com>.

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

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

California - Sacramento Valley Soaring Society, Lee Cooper, 4856 Rockland Way, Fair Oaks, CA 95628, (916) 966-2672, <www.svss.org>.

California - South Bay Soaring Society, Mike Gervais, P.O. Box 2012, Sunnyvale, CA 94087; (408) 683-4140 (H), (650) 354-5469 (W).

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.

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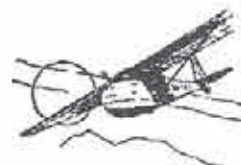
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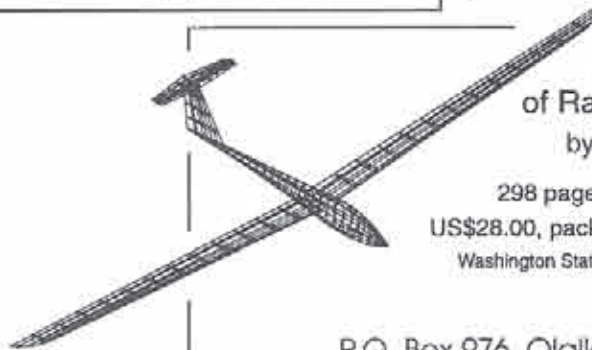
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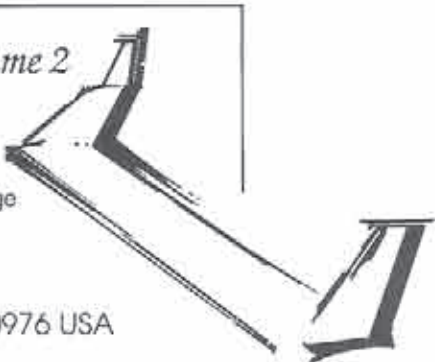
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WING LOADING 9.7 - 10.3 OZ./SQ. FT.

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-sheathed 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.

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

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## SLEGERS INTERNATIONAL

P.O. Box 364, Long Valley, NJ 07853  
Shipping: 35 Hacklebarney Rd., Long Valley, NJ 07853



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<http://www.slegers.com>

# SAILPLANES UNLIMITED, LTD.

## In stock

### **Krause**

1/2.75	Discus	HQ2.5/12	158" (4m)
1/2	Salto	HQ3/14	179" (4.53m)

### **Roedelmodell**

1/4.5	ASK 21	E393	165" (4.2m)
1/2.5	Ka6E	E392	165" (4.2m)
1/2.75	Fox	RG12	149" (3.77m)
1/2.5	DC 800	E207	163" (4.15m)

### **Buechele**

1/2.75	Fox	HQ1.5/10-12	149" (3.77m)
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### **FiberClassics**

1/2	Nimbus 4	E68-66	246" (6.28m)
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### **PriBeck**

1/2	ASW27	HQ2.5/12	196" (5m)
1/2.7	ASK18	E203-201-193	209" (5.33m)
1/2	Ka6E	E207-205-205	196" (5m)
1/2.7	ASW19	Ritz3 mod.	212" (5.4m)

### **Schueler & Fleckstein**

1/2	all glass ASW24	E203	196" (5m)
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### **Bruckmann**

1/2	Salto	Ritz 2	176-203" (4.5-5.2m)
1/2.8	ASK 18	E 203	165" (4.2m)
1/2	FOX	E 374 SD 6060-6062	183" (4.66m)

## **Czech these out!**

All completely finished with retracts installed:

1/2	all glass Ventus 2C	HQ 3/15, 13, 12, 10, 8	237" (6m)
1/2.75	all glass ASW 27	HQ 3/12	158" (4m)
1/2.75	foam-obechl ASW 24	HQ 3/12	158" (4m)
1/2.8	all glass Kestrel T 19	HQ 3/15-10	196" (5m)

## **TOWPLANES**

**Frisch:** 1/4 Wilga 109" (2.78m)

**Brauer:** all glass 1/4.5 Pilatus Porter Turbo 139" (3.52m)

**Roedelmodell:** 1/4 Jodel Robin 86" (2.18m)

## **SPECIAL ORDER**

### **PriBek**

1/2	ASW24	E203-201-193	196" (5m)
1/2	ASW27	HQ2.5/15	294" (7.5m)
1/2	Fox	E374	183" (4.66m)

### **Bruckmann**

1/2.5	Fox		222" (5.65m)
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### **Schueler & Fleckstein**

1/2	all glass Fox	RG12	183" (4.66m)
1/2	all glass ASH 26	HQ3/14-10	235" (6m)
1/2.5	all glass ASW15B	HQ3/14	235" (6m)



1/2.5 Fox



1/2 ASK18



1/2.5 ASK21



Nimbus 4



1/4 & 1/2 Ka6E



1/4 Wilga



1/4.5 Porter