

THE VINTAGE SAILPLANE ASSOCIATION

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

For more information write:

Vintage Sailplane Association
Scott Airpark
Lovettsville, Va. 22080.



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- EXCELLENT BUDGET FRIENDLY TEAM & LSF SOARING PROGRAM
- NSS IS INVOLVED IN THE ORGANIZATION AND OVERSEEING OF THE SOARING PORTION OF AMA EVENTS (INCLUDING AWARDS BANQUET)
- YEARLY DUES ARE \$12.00 (SPECIAL FAMILY RATES)
- NSS OFFICERS ARE FROM ALL 11 DISTRICTS

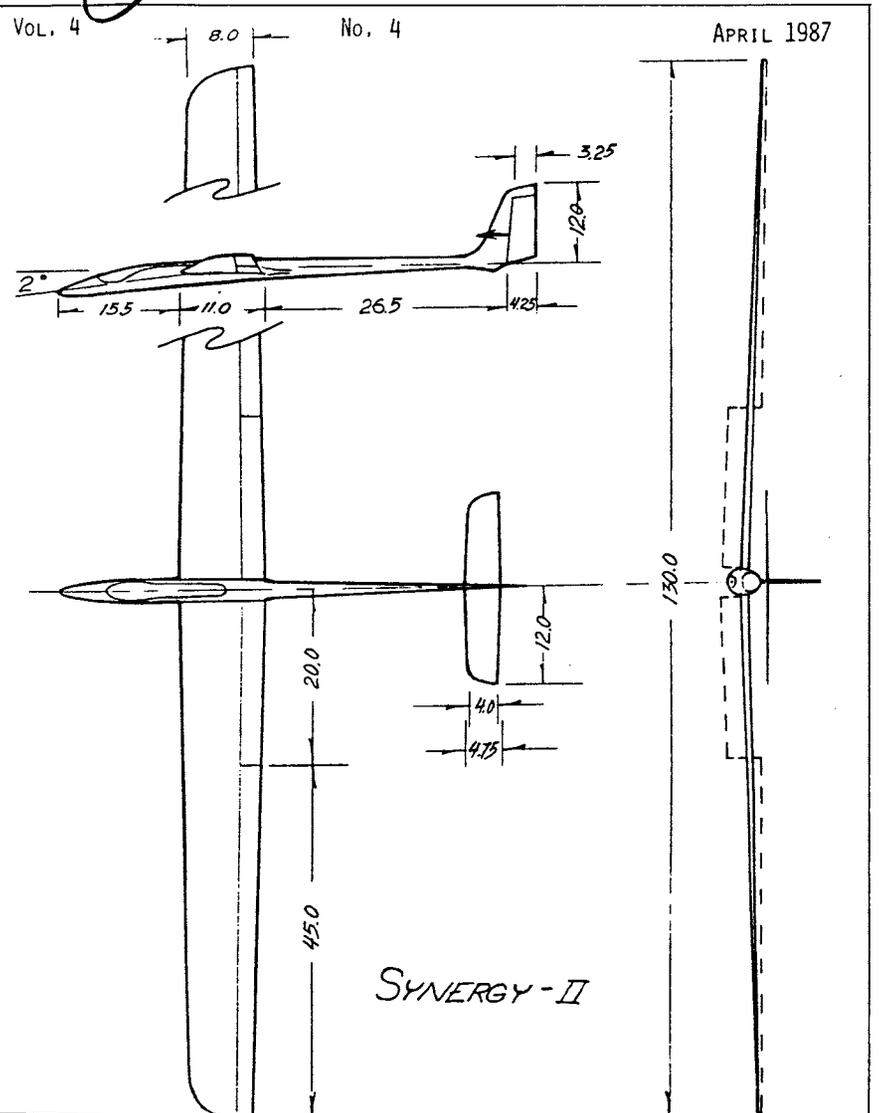
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HI START

To all of you loyal readers, contributors, advertisers and fans who have submitted letters and GREAT information, please be patient! This is an admission on my part of having been away on vacation for two weeks and letting the pile accumulate here on the desk. Just in case you think I've forgotten you, perish the thought! Far from it, I'm organizing the May issue now, and when it comes out you'll see your contributions there. Meanwhile, rather than trying to catch up with the huge stack of mail by sending out individual letters immediately, you'll find an explanation below.

Peggy and I flew from cold, miserable and snowy New England to the land of sunshine and soaring, and spent what may have been the best two weeks of Western weather so far in 1987. We landed in Phoenix where we were met by son Jim II and driven to his home in Chino Valley where lives a herd of Beefalo. We rested by just watching the sunsets, the mountains, and the grazing cattle...Yawn!

Since Jim is a flight instructor for Custom Pilot Service at the Prescott Airport (Love Field) he was able to get away for a couple of hours here and there, and fly us over to Payson to see some old Peterborough friends. We looked at homes and property for sale, with an eye toward picking a nice spot to live. Hey; who wouldn't want to enjoy the mile-long cumulus clouds with bases at 12,000 feet and thousand-foot-per minute lift in air so clear that you can see mountain peaks 100 miles away from ground level? You never tire of seeing the desert and the mountains.

Sure, we saw the Grand Canyon...and indeed it is GRAND. In fact, unbelievable to a flat lander like myself. Peggy and I had a nice motel room at the south rim overlooking the canyon, and enjoyed walking along the rim (but not too close) where anyone with vertigo had better tread very carefully. The colors of red, purple, tan and brown assault the eye.

Moving south, we visited Flagstaff and then drove along the Oak Creek Canyon to Sedona, marvelling at the magnificent scenery. Then, over Mingus Mountain to Jerome, a former Ghost Town after its mining hey days. Since then, it has become populated again, and there is a thriving group of artists and musicians in residence.

It took me awhile to get used to the altitude of between 5,000 and 7,000 feet where I had to learn to breathe all over again. About three or four days gets you used to exercising at those heights. Oh yes, you sleep for hours without trouble after you arrive. Ponderosa Pines are good for you!

There's a nice sailplane operation at Paradise Valley near Phoenix, and a beautiful Condo/airport complex owned by Woodson Woods at Carefree, just up the road from Phoenix. You'll find a restored Travelaire biplane, a wonderful Waco, beautiful Jungmeister and many others in a spotlessly clean hangar...just waiting to be admired, and factory-fresh or better.

Cottonwood, Montezuma, Camp Verde, Strawberry and Pine are just some of the town names you'll find there...all reminiscent of Zane Grey (no relation) and his stories of the Old West. Yep, I'm back in the saddle again here in Peterborough, but sure am serious about bringing RCSD to you from a new location every month. Hopefully, it will be Prescott or Payson, Arizona...and not too long from now. "Oh give me a home, where the Beefalo roam, etc., etc." and meanwhile, HAPPY SOARING, Jim

NEWS OF THE WORLD F3b CHAMPIONSHIP U.S. RC SOARING TEAM

Pilot - Steve Work

Pilot - Richard Spicer

Pilot - Stan Lewis

Manager - Phil Renaud

Asst. Manager - Seth Dawson

Field Operations Manager - Lynn King

Fund Raising Chairman - Thomas Thompson

Media Coordinator - Dave Williams

Assistant - Richard Tiltman

Assistant - Don Edberg

Donations are being requested to help fund the team's trip to Germany and to help meet other expenses not otherwise covered.

Team Practices

#1 Sunnyvale, California 21, 22 March

#2 Albuquerque, NM 23, 24, 25 May

#3 Sunnyvale, California 27, 28 June

For the Sunnyvale practices, contact Seth Dawson, 1761 Chetamon Ct., Sunnyvale, CA 94087 (408) 739-7404

For the Albuquerque practice, contact Phil Renaud, 8508 Cherry Hill Rd., N.E., Albuquerque, NM 87111 (505) 822-8307

The sailplanes to be used by the US Team are: Synergy (modified)
Sailplane to be evaluated by the US Team: Comet
Hand launch techniques will be evaluated; new winches will be built;
Radios will be chosen. Futaba will be one possibility, Becker, another.

In addition to the U.S. Team members, there will be others attending the contest at their own expense. The Hotel Hohenzoller in Osnabruck will probably be the official Team Hotel. The contest site will be in or near Osnabruck, and has been selected by the German Aero Club.

If any of you reading this report wish to attend the World Champs, it would be wise to make your reservations now. I'd also suggest that you contact any one of the three individuals listed earlier just in case you help and/or support might be required at the contest, as an ex officio team member. It is expected that the total attendance by teams and supporters will be the largest ever seen at any World Championship before now. It is anticipated that teams from 29 countries will attend, and - for the first time - representatives from Soviet block nations will be present, including East Germany and Poland...and perhaps even the Soviet Union itself!

A new sailplane - the EAGLE - is being developed by Mark Allen and Steve Work around a special Michael Selig airfoil. The design incorporates some of the features from the best of the European aircraft...and it is hoped that the result will be a top performer in all three tasks. More later on this and other subjects. Keep your eye peeled for the May issue of RCSD.

SYNERGY DATA

Dr. Dave Williams, Media Coordinator, U.S. F3b Soaring Team has sent us some extra information that will be of particular interest to RCSD readers because it details some of the "fine structure" of the Team Synergy sailplane -- one or more examples of which, in modified form, are being now readied for the trip to Europe. Read, study and enjoy...thanks to Dave.

THE ORIGINAL "SYNERGY" DESIGN WAS DEVELOPED SPECIFICALLY FOR FB3 COMPETITION PRIOR TO THE 1984 TEAM SELECTION FINALS BY RICHARD SPICER. IT HAD A WINGSPAN OF 120 INCHES WITH AN 11 INCH ROOT CHORD, AND A FUSELAGE LENGTH OF ABOUT 57 INCHES. THE AIRFOIL WAS A QUABECK HQ2.5-10 AT THE ROOT AND AN HQ2.5-9 AT THE TIP. THE BASIC CONSTRUCTION WAS FIBER-GLASS FOR BOTH THE WINGS AND FUSELAGE. THE WING HAD AN INLAYED SPRUCE LEADING EDGE AND A LAMINATED AIRCRAFT PLY SPAR WITH STEEL BLADE WING JOINERS AND BRASS RECEPTACLES.

THE BASIC DESIGN WAS MODIFIED TO TAKE ADVANTAGE OF THE 1987 F3B RULE CHANGES, PRIMARILY THE UNCAPPED DISTANCE TASK, AND RENAMED "SYNERGY II". THE WINGSPAN WAS INCREASED TO 130 INCHES AND A NEW AIRFOIL DESIGNED BY SETH DAWSON AND MICHAEL SELIG WAS SUBSTITUTED FOR THE ORIGINAL QUABECK. CONSTRUCTION CHANGES INCLUDED A GREATER UTILIZATION OF CARBON FIBER AND A MOLDED CARBON FIBER SPAR THAT ALSO PROVIDED THE WING JOINER.

THE PRINCIPAL DESIGNER AND MOVING FORCE BEHIND "TEAM SYNERGY" IS RICH SPICER. RICH FINISHED SECOND AT THIS YEARS TEAM SELECTION FINALS SCORING 14,107.8 POINTS. RICH HAS COMPETED VERY SUCCESSFULLY WITH BOTH THE ORIGINAL "SYNERGY" AND THE "SYNERGY II" SINCE THE 1984 TEAM SELECTIONS. THIS PILOT-AIRPLANE COMBINATION IS WELL SEASONED AND SHOULD PROVIDE A FORMIDABLE FORCE AT THE FINALS IN GERMANY.

THE OTHER MEMBER OF "TEAM SYNERGY" TO SECURE A PLACE ON THE UNITED STATES SOARING TEAM IS STEVE LEWIS. STEVE FINISHED THIRD AT THE TEAM SELECTIONS WITH A SCORE OF 14,051.7 POINTS. STEVE HAS FLOWN THE "SYNERGY" FOR SEVERAL YEARS, AND HE AND RICH SPICER HAVE CONTINUED TO REFINED THE DESIGN, ALONG WITH THE OTHER MEMBERS OF "TEAM SYNERGY", INTO A WORLD CLASS AIRPLANE.

SYNERGY II SPECIFICATIONS

WINGSPAN	130 INCHES
LENGTH	57.25 INCHES
TOTAL AREA	1,345 INCHES
WEIGHT(DRY)	7 LBS.(APPROX)
WEIGHT(FULL BALLAST)	10 LBS.(APPROX)
WING LOADING	13 OZ/SQ.FT(DRY)
	19 OZ/SQ.FT(BALLASTED)
RADIO	FUTABA 1990 FM, 7 CHANNEL G-SERIES (HIGHLY MODIFIED)
SERVO	SIX FUTABA FP-S130
CONTROLS	RUDED, ELEVATOR, AILERONS, FLAPS

MIXING FUNCTIONS

RUDDER	AFFECTS	RUDDER	0-100%
ELEVATOR	AFFECTS	ELEVATOR	0-100%
		FLAPS	% OF ELEVATOR
		AILERONS	% OF ELEVATOR
AILERONS	AFFECTS	AILERONS	0-100%
		FLAPS	% OF AILERONS

SYNERGY II SPECIFICATIONS CONTINUED

	RUDDER	THERMAL SET.COUPLED 0-100%
		SPEED 0%
BRAKES	AFFECTS	FLAPS
		AILERONS
		ELEVATOR
CHAMBER	AFFECTS	FLAPS
		AILERONS
		ELEVATOR
LAUNCH MODE	FLAPS	30 DEGREES
	AILREONS	10 DEGREES
	ELEVATOR	COMPENSATES

RATIO ON ALL MIXERS ARE ADJUSTABLE.
THE PERCENTAGES ARE ALL ADJUSTABLE.
AILERONS AND FLAP CHANNELS ARE AMPLIFIED TO 125% TO INCREASE SERVO TRAVEL AND REDUCE LINKAGE PRESSURES.

1987 U.S. R/C SOARING TEAM BUDGET

February 6, 1987

BUDGET LINE ITEM	FUNDING SOURCE			TOTALS
	AMA	FAI-F3B	DONATIONS*	
AIRLINE TRANSPORTATION				
a. 5 RT airline tickets US - Frankfurt	4945.00			4945.00
b. 3 RT airline tickets US - Frankfurt	1483.50		1483.50	2967.00
c. Excess baggage	500.00			500.00
d. 12 RT airline tickets ABQ - SFO (U.S. practice sessions)			1860.00	1860.00
AUTOMOBILE RENTAL				
a. 2 vans, 13 days each - W. Germany			1545.14	1545.14
b. Fuel			160.00	160.00
c. 1 van, 13 days each - W. Germany			772.56	772.56
d. Fuel			80.00	80.00
e. 3 vans, 1 day - W. Germany			178.30	178.30
LODGING - GERMANY				
a. 2.5 rooms, 13 days (2 persons per room)	2704.00			2704.00
b. 1.5 rooms, 13 days (2 persons per room)	811.20		811.20	1622.40
c. 4.0 rooms, 1 day (2 persons per room)			665.60	665.60
LODGING - U.S. PRACTICE SESSIONS (6 nights - 3 rooms per night)			1044.00	1044.00
FOOD (\$25.00 per day per person)				
a. 5 persons 10 days - Germany	1250.00			1250.00
b. 3 persons 10 days - Germany	375.00		375.00	750.00
c. 8 persons 4 days - Germany		800.00	600.00	800.00
d. 4 persons 6 days - U.S. practice			600.00	600.00
12 SPOOLS LAUNCH LINE FOR USE AT W/CH ONLY			600.00	600.00
TEAM UNIFORMS (8 @ \$120.00 each)		960.00		960.00
3 WINCH BATTERIES (delivered in Europe)			276.00	276.00
PINS, PATCHES, STATIONARY, MISC. SUPPLIES			1700.00	1700.00
MANAGEMENT RESERVE & CONTINGENCIES			1200.00	1200.00
GRAND TOTALS	13,082.70	1760.00**	13,785.30	28,628.00

* 1987 U.S. soaring team fund
** available funds from FAI-F3B \$1720.00

THE FUND RAISING EFFORT IS BEHIND SCHEDULE
AND OUR CONTRIBUTIONS ARE ABSOLUTELY NEEDED
TO FIELD THE U.S. TEAM.**



**PLEASE HELP
THE U.S. F3B
SOARING TEAM WIN**



THE DAN PRUSS MEMORIAL TEAM TROPHY

**in Osnabrück, West Germany
July 24 - August 2, 1987**

The 1987 F3B Team needs your support to send
the team to the World Championships.

DONATIONS

\$5 — Official FAI World Championship Pin \$10 — Official U.S. F3B Team Patch \$15 — Official FAI World Championship Pin & Team Patch

Model products donated to the team by the hobby industry will be distributed to contributors in a drawing to be held July 1, 1987.

Prizes for the drawing will consist of:

Radio Systems • Airplane Kits
Building Supplies • Model Accessories

Make your check payable to the U.S. RC Soaring Team

Send Your Donations To: U.S. RC Soaring Team
Post Office Box 9328
Albuquerque, NM 87119

**WITHOUT YOUR DONATIONS ...
THE TEAM CAN'T GO**

Typesetting Done by Laser Perfect, Inc.

PLEASE HELP SEND YOUR TEAM TO GERMANY
AND BRING THEM BACK AS WINNERS!

** Please forward your contributions to: United States R/C Soaring Team,
P.O. Box 9328, Albuquerque, NM 87119

- (1) \$5.00 brings you the official World R/C Soaring pin
- (2) \$10.00 brings you the official United States R/C Soaring Team patch
- (3) \$15.00 brings you both patch and pin.

Each individual who donates will have a chance to win prizes in the R/C Soaring Sweepstakes. Prizes will be donated by sponsors of the US Team, and will include radios, kits, and accessories. In addition there may be a "Grand Prize" consisting of an airline ticket to (and from) the contest. Solicitation of such a prize is underway at present.

ANNOUNCEMENT - 1987 DASH FOR CASH (2nd International F3H event).

The Central Ontario Glider Group is pleased to announce that their 7th Annual Cross-Country Contest known as the Dash for Cash has been accepted by the FAI as an International Contest. Before the F3H category becomes a World Championship event, there have to be six FAI-sanctioned International contests with at least 2 countries competing where the rules are fully tested. We would like to see Dan Pruss' dream of F3H becoming a World Championship event realized.

This will be the 2nd International F3H contest...the first was held in 1985 in South Africa, and was won by Larry Jolly from the USA.

With the Canadian Nationals being run immediately after the Dash for Cash, anyone coming our way will have a full week of flying. The dates are as follows:

DASH FOR CASH: July 16th, 17th - practice; July 18th, 19th, 20th contest days. C.D. Jack Nunn, RR#1 Midhurst, Ontario Canada L0L 1X0

CANADIAN NATIONALS: July 22nd to 24th (sailplanes)

For more information about these events and an information package, write to: Neil Tinker, 35 Cairnside Crescent, Willowdale, Ontario M2J 3M9, CANADA.

This information was provided by Neil in recent correspondence, and he had a few interesting comments in an accompanying letter: "In other news, there will be only one Canadian representative in Germany at the F3b World Championships -- Udo Rumpf. Howard Cameron will be his Team Manager, and Stan Shaw and myself will be manning the winches.

"We would appreciate it if you could pass the word around about the Dash for Cash going international. There will be a cash award as usual, plus a trophy for 1st place, and possibly cash awards to 3rd place. Not least, there will be a FREE barbeque!

Please note that FAI sporting licenses (available through your national model association) will be required, and your model entry should be processed before coming to the contest.

FAI SPORTING LICENSES FOR INTERNATIONAL EVENTS.....Jim Gray

Every competitor entering an international contest must possess an FAI Sporting License affixed with the FAI stamp for the current year (in this case 1987). The license is issued by the Aero Club of the competitor under the general section of the sporting code, and must bear the national identification mark. The competitor must be at least 10

years of age. (Supposedly this requirement applies only for a World Championship. For U.S. pilots, I would suggest that you contact the Academy of Model Aeronautics, 1810 Samuel Morse Drive, Reston, VA 22090. You might start with Assistant PR man Jeff Troy who can lead you to the proper person at HQ. Better safe than sorry, in case the rule is enforced.

* The U.S. national aero club is the N.A.A. which is a member of the FAI. The AMA has been delegated by the NAA as its representative in modelling matters to the FAI.

Makeup of Team: F3H

Each team shall include one timer who will be assigned by the organizers as an official timer for another team. The official timer shall also be responsible to certify distance travelled if less than the full course distance. Neil Tinker says that the Dash for Cash organizers will help each team to fulfil the timer requirement by providing personnel when and if necessary. However, if you can provide your own, it would be best to do so and thereby ease the burden for the organizers.

Good friend Julio Fairlie Silva from Lima Peru lends his talented pen to the soaring scene there. Not much different than here, eh?



LETTERS FROM READERS:

Mike Weirich, Elkhart, Indiana furnished the beautiful photo shown below, and wrote as follows:

"Dear Jim: I thought you might be interested in the picture me and my Good Old Flying Buddies; as you can see by the Q's, this day was one that keeps me flying sailplanes!

"The airplane in the foreground is a modified Paragon with vee tail and one-piece wing that belongs to Mike Cramer. Mike's flying wing won the best sailplane award at Toledo in 1986.

"The airplane in the background is a GEMINI built by Dave Eppich. All of us are members of the Elkhart Soaring Society. I am president, Mike is V.P., and Dave is secretary.

"On this particular day, I was attempting my LSF Level III cross-country with a Dodgson CAMANO...but was unsuccessful. Later, I achieved it to complete my Level III.

"Keep up the good work and thanks for a fine magazine. (Signed) Michael Weirich."

(Mike, all of us who read RCSD will enjoy your photo. Thanks for the nice words and for the beautiful picture. Here's hoping your Level IV will be accomplished soon...and on to Level V! Best of luck and Happy Soaring....JHG).



Dear Mr. Jim Gray,

I thought your readers might enjoy the photos and a brief summary of the Third Annual Eastern Iowa Soaring Society's Building and Soaring Seminar.

Sixty-four people from Iowa, Illinois, Minn., and Wisc. attended the seminar held February 7th in Cedar Rapids IA.

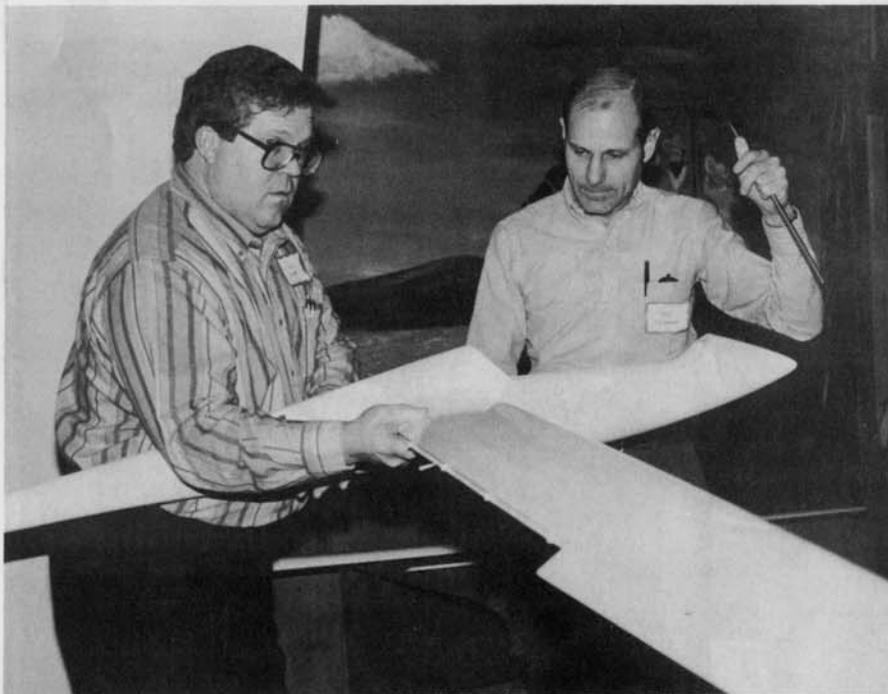
The program was organized by E.I.S.S. member Paul Jones. And as usual he did a very fine job in arranging talented speakers.

The seminar started promptly at 9:00 AM. Coffee and doughnuts were served for breakfast and a buffet style lunch was served at noon. During lunch a slide show by Pete Waters AMA District VII V.P. was presented showing the beautiful new AMA museum and headquarters.

Our first speakers were Gunther Frank and Kevin Collins of Cedar Rapids. They gave a presentation on the whys and hows of silicon hinges. They have been using these hinges in Europe for quite some time now but it is just catching on around here in the last year or so.

The second speaker was Paul Carlson of Off The Ground Models. He spoke about airfoil design for sailplanes and especially about the Selig airfoils which he used on his 1986 Nats winning Prodigy.

Next was Craig Christensen on the topic of electrics. Some of you might recognize Craig as being one of the top F3E pilots in the country. This topic seemed to generate a lot of interest among the seminar attendees.



Terry Edmonds one of the few LSF V and a former Nats winner himself spoke next on European sailplane design and building techniques. He has been working on a quarter scale ASW 22 German kit which incorporates many new and different construction ideas than what we normally are not use to seeing.

One of the most unusual and entertaining talks was given by Jim Porter, again another distinguished LSF V level holder, and Ed Harris from the Department of Art at the University of Northern Iowa. They talked about the visual impact of sailplanes on the ground and in the air. They covered aircraft forms and decoration in relationship to flying visibility.

We were treated to many beautiful slides emphasizing their points, both good and bad. Some of the most interesting ones were from Ed's work on a project entitled Flight As Art which he was given a grant to study in the mid 1970's. He has some wild looking flying wings with equally wild color schemes.

Last but not least and probably one of the most important speakers was Pete Waters president of Kraft Midwest and AMA V.P. of district VII. He set everyone straight on the upcoming frequency changes for 1988 and 1991. He also brought with him a spectrum analyser which was used to test everyone's transmitters. There were many unhappy faces in the crowd when people found out their transmitters were not up to specs.

Afterwards there was a table clinic and swap shop and as usual a lot of hanger flying. Next years seminar is already in the works and hopefully we will be able to increase attendance.

An upcoming event of interest which will be put on by the Eastern Iowa Soaring Society is a national soaring skills symposium. This will be held at the National Antique Airfield in Blakesburg Iowa. Further information and dates will be available when plans have been finalized.

Thank You,
John C. Thomas
E.I.S.S.
1537 Hillside Dr. NW
Cedar Rapids, IA 52405

Dear Jim,

What I want to tell you deals with computers.

I am presently in the final phase of developing a computer program for plotting airfoils, full size, on a printer. It is intended for use on the IBM PC, XT, AT, and compatibles. This program renders obsolete the usual tedious task of hand plotting airfoils on graph paper, with all the laborious computations it implies. The program will be ready when you read this.

The program features high resolution graphics; any airfoil can be drawn on screen in true proportions, and can be overlaid by others for comparing them.

You can have the program calculate maximum camber of an airfoil and maximum thickness.

The program is menu driven and user friendly; it supports the most popular printers: Epson FX, LX, RX, IBM printers and compatible printers. You don't need a plotter - just a simple dot matrix printer. A color graphics card is needed to see the screen graphics. The funniest part is that it can even be used to draft full size ribs of ultralight or homebuilt aircraft if the wing

has a maximum thickness of less than 8 inches (the paper width). The chord itself is unlimited with continuous paper.

You can plot a single airfoil on paper, specifying chord, or you can go through the design of all ribs for a new wing. In the latter case you choose wing planform, span, root chord and tip cord. If you wish, you can also use different airfoils at the root and tip, in which case the program "mixes" the airfoils for the intermediate ribs between root and tip, in proportion to their distance from root/tip. This is a very handy feature that saves much time while designing sophisticated wings. You have your choice of specifying rib spacing or total number of ribs.

The program is equally suited for balsa built-up wings or foam core wings. There is provision for rectangular, tapered, or elliptical planforms, although most any planform can be used, including swept back or swept forward wings. A graphical representation of the completed wing with all ribs is made.

A library of over 50 different airfoils is provided, and you can add any of your own. The data of each file can be viewed on screen or printed on paper.

Copies of the program will be available at \$ 25.00, U.S. or \$ 32.00 CAN., in 3 weeks. Full instructions provided.

I decided to write you instead of other columnists in Model Airplane News because I felt my program was best suited for glider and competition enthusiasts, who are more likely to experiment with different airfoils than the Sunday flier.

I am a student of mechanical engineering about to graduate. I originally developed the first version of the program for use in drafting the ribs of a cargo aircraft, which we designed and flew at the Society of Automotive Engineers' first annual student chapter Radio Controlled Cargo Aircraft Competition, which took place on May 24, 1986. I was part of a team of four people who represented Ecole Polytechnique de Montreal, our school. We took second place. This competition proved a most rewarding experience, and I am looking forward to this year's edition!

Well, I would be pleased to have some feedback from you, Jim, if you have any questions or anything.

Yours truly, Francois Ayotte 6217 Robert Blvd,
St-Leonard, QC
H1P 1N2, Canada

SELIG NEEDS HELP!

Michael Selig has built a special low-speed, low-turbulence wind tunnel at Princeton University, and he is planning to re-test most of the popular sailplane airfoils in use (and some not in use) to provide consistency of measurement and data. He needs samples to test, and would like to have volunteers build these sections. Each sample will have a 12-inch constant chord, and will be 33-5/8" long, with wing rod size and location specified. The sample may be conventional construction (built-up, that is) with sheet covering, or foam core with sheet covering. Surface finish may be Monokote or fiberglass and resin. The latter is preferred for strength. Foils to be tested include Clark Y; Quabeck, Wortmann, Eppler, and Selig. The work must be done by July '87. Templates will be provided for those who wish to participate. Write or call Michael at the address shown on the attached sheet.

1/10/87
Michael Selig & John Donovan
Gas Dynamics Lab
Dept of Mech and Aero Eng
Princeton University (609) 452-5263 work
Princeton, NJ 08544 (609) 683-4716 home (late)

LOW REYNOLDS NUMBER AIRFOIL TEST AT PRINCETON UNIVERSITY

I am searching for a group of experienced modelers to build a variety of wind tunnel models for tests at Princeton University. John Donovan, my co-worker, and I have fully instrumented a large, low-speed, low-turbulence wind tunnel to take accurate measurements of lift and drag on airfoils at low Reynolds numbers, but we lack a generous supply of wind tunnel models. If you can help us, it will be acknowledged in the final report to be published in Soartech and any other publications which may follow. Also during the tests, our preliminary results will be mailed directly to you as they become available.

For several years now I have wanted to set aside a large block of time and money to test airfoils specifically for R/C sailplanes, but could not escape from my academic responsibilities or find the support, until now. For this I have Prof. Smits, my thesis advisor, and Prof. Curtiss to thank. Also, without the experimental expertise of John Donovan this whole endeavor would have remained just talk. To take full advantage of this unique situation we need your help.

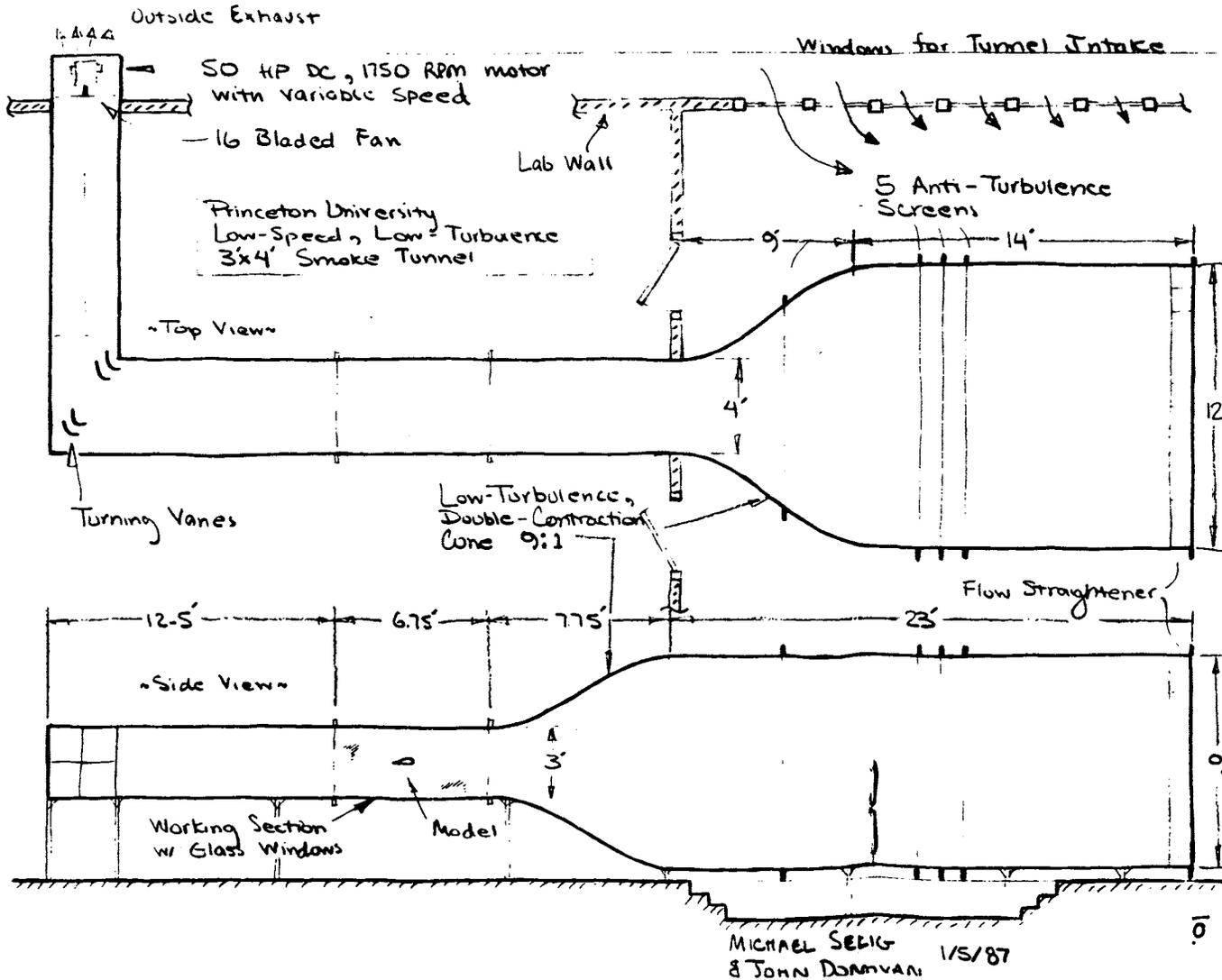
We want to test thirty or more airfoils. Our goal is ambitious but possible. We will be limited only by the number of wind tunnel models we receive. Unlike previous tests by others, the focus of our experiments will be not only on testing known airfoils but also on developing by experiment a new and better class of airfoils for R/C sailplanes. This we are sure to achieve since the project will be done on such a large scale. Without your support, progress in this area will remain slow. With it we can settle many issues and ultimately accelerate the quality of our sport.

The wind tunnel models will be 33 5/8" in span with a 12" chord and can either be built-up or foam core. For built-up models two plots of the 12" chord airfoil will be plotted by Doug Dorton and supplied to you. So that the contour is true, they need to be fully sheeted. To be consistent, we would like to have them covered with Super-monokote. For foam core models, two 12" chord wing templates laser cut by Lee Murray with funding from Ray Olsen can be supplied; however, there may be a short delay. The surface finish can be either fiberglass or monokote, although fiberglass is preferred for its durability.

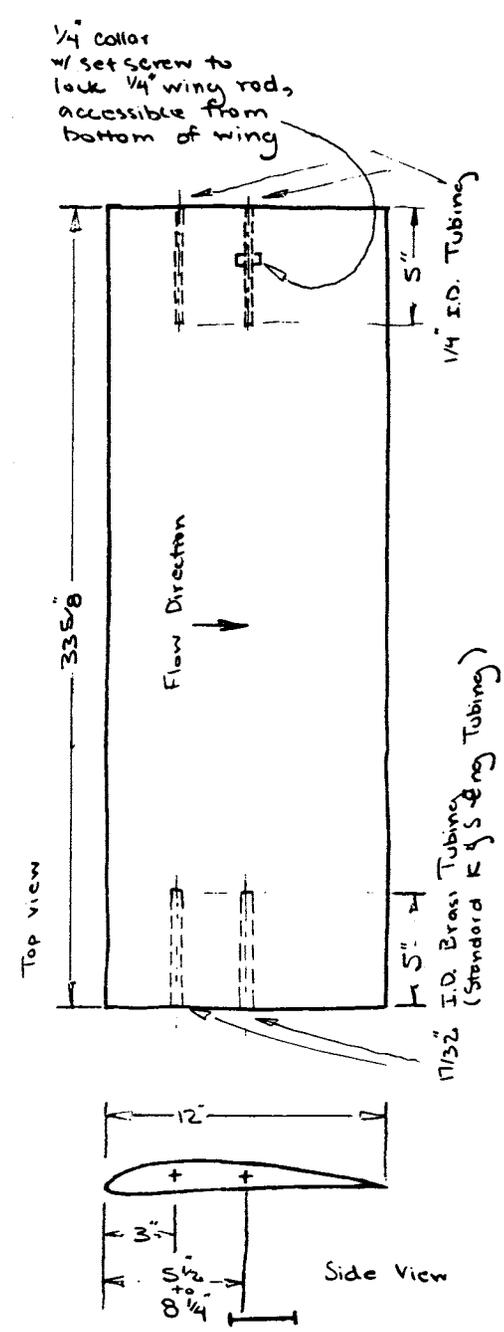
The models attach to the wind tunnel balance by standard model wing rods. The details are given on the enclosed drawings. As for the strength, they should be able to support 15-20 lbs lift when pinned at both

ends. Standard model construction techniques will provide the necessary strength, especially when sheeted.

I have enclosed a drawing of our wind tunnel. It is capable of speeds up to 45 ft/sec. So for the one foot chord we can test up to 300,000 in Reynolds number. As the drawing reveals, this is a large wind tunnel and therefore highly suitable for testing models with small forces. We have measured the turbulence (using a hot-wire) to be .0003 (.03%) at 3.5 ft/sec and .0012 (.12%) at 36.5 ft/sec. With the improvements that we are making, this already low-turbulence level should decrease.



Low Reynolds Number Wind Tunnel Model



The following is a tentative list of airfoils that we plan to test along with a brief description of our motive for testing it. If you feel the we have left out an important airfoil, please write to us.

CLARK-Y

No matter where you look this airfoil seems to crop up. When this airfoil was tested by Althaus it showed a very low drag - lower than that predicted by Eppler. I would like to know who is right and so would Stan Watson who has already started construction on a CLARK-Y wind tunnel model.

E193

The main reason for testing this one is to compare the results with Althaus' tests.

E205

The 205 is basically a decambered 193 so it should perform similarly, but with lower lift. This is what we expect but will it be shown by experiment. I wonder also if the 205 is truly as good as its fame suggests or is it sheer momentum that keeps it going.

E214

After seeing this airfoil on the Windsong, I have been curious about it ever since. Right away the shape of this airfoil should tell you something. It is not designed like the rest of the Eppler pack (193, 201, 203, 205, 207, 209, 385, 387) with the exception of the 211. It needs to be stripped off the mighty Windsong's back and inspected more closely.

FX 60-100

Like the CLARK-Y, this airfoil came in with flying colors when tested by Althaus and did better than predicted by Eppler. Is there something special about the FX 60-100 and the CLARK-Y or have we entered into the world of experimental error? And why isn't this airfoil popular since it has such low drag experimentally compared with other more popular airfoils.

HQ 1.5/9.0 & 2.5/9.0

These airfoils impress people and I want to know why. From what Quabeck has published, these airfoils were not designed in any sophisticated way. Apparently they were designed like the old NACA series airfoils, except this time Quabeck did it without a wind tunnel! I would like to shed some light a this very grey area.

MB253515

This airfoil has always had my attention. If anything the intense E205 vs. MB253515 debate of the 80's started my interest in airfoils. Frankly, I thought those on the 15% thick side were 100% crazy because the really believed that thicker was better. And my Eppler results "proved" it. Now, however, after comparing an inadequate theoretical model with experiment for airfoil after airfoil, I'm not so quick to believe the Eppler results anymore. It is time to put the two in a wind tunnel and compared them without bias. I have a hunch that the MB does have some surprises in store for us.

S2027

This airfoil is a redesigned MB253515, but is it better as theory suggest? Can you believe the theory for this airfoil? From the letters I have received it seems just as good or better, but only experiment can say for sure.

S3002

I have been told by a reliable source that this airfoil won't get out of its own way! I'd like to get this one in a wind tunnel and re-evaluate the reliability of my source - no hard feelings.

S3021

This airfoil was designed to be an improvement over the E205. From the recent wind tunnel tests by Althaus on this airfoil and flight tests on the Algebra 2.5 m equipped with this airfoil, it seems to have accomplished its goal. But to be more certian, Althaus needs to test the 205 for comparison. In any event we plan to test them both here at Princeton to convince ourselves.

S4061

Is this a thoroughbred or could Paul Carlson fly a flat-plated Prodigy at any NATS and win? After building and flying a Prodigy of my own, I think it's a super airfoil/plane with a great L/D that must come from the airfoil. If this doesn't show up in wind tunnel tests we are all in trouble.

S4062

This is a new lower drag, higher Rn version of the 4061 for large cross-country sailplanes. According to the Eppler program, it is possible to design an airfoil with lower drag and a higher L/D than this new one. Is this true in the real world however. Only by wind tunnel experiments can we push and find the limits. The 4062 is a start and will be the first candidate in this new line of nonconservative airfoils. Stan Watson has started construction on this one too.

If you would like to contribute to our efforts, please write or call. The sooner the better. I plan on finishing at Princeton by July 87; so there is not much time to complete all that we want to do. In any case would you please indicate your interest on the enclosed self-addressed postcard and mail it back to me. This way I will have some feeling as to what we can expect and can plan accordingly. If you like, feel free to circulate this letter on to someone who might have an interest in our plans.

Sincerely,

MICHAEL SELIG
Michael Selig



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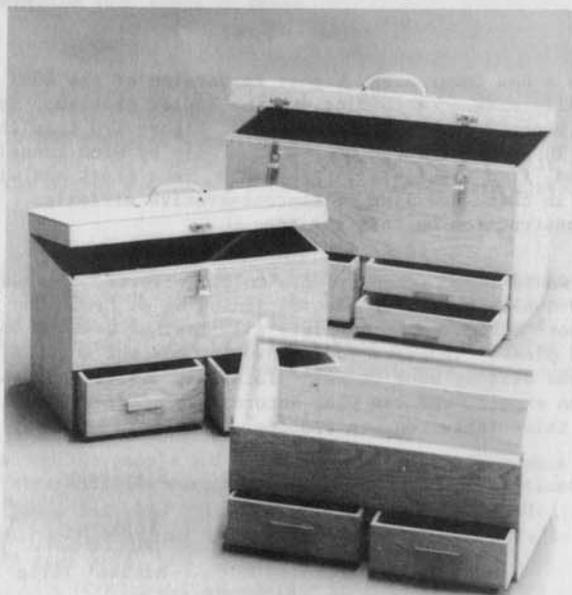
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SOURCES - Precision foam cores

Dave Acker, 850 Concord Street, Pleasanton, CA 94566 will be taking over the foam core business presently handled by Jerry Slates of Viking Models USA. You'll recall that Jerry has part of the Hi Johnson line, but has decided to turn the foam core part over to Dave. If you wish to call Dave and find out just what he can do for you in terms of custom or stock foam core wings, try (415) 462-0672. Just for fun, let him know that you heard about it in RCSD.

- Hobby boxes (see separate News Release and photo below). Boxes Plus, P.O. Box 176, Canby OR 97013. Telephone (503) 263-6281 Here's a great way to keep tools, accessories and spare parts organized. You can order a complete line of fully assembled hobby boxes made from sturdy plywood - ready for finishing with your own personal color scheme. The most popular hobby box is the largest model which measures 22" x 10½" x 14". It features a lockable top compartment and three handy drawers. Send a self-addressed business-size stamped envelope to receive your FREE catalog. Dealer inquiries are welcome.



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TIPS and HINTS Jim Gray

I've noticed that a lot of you send pictures to me with ball-point pen writing on the backs of the prints. That's a NO-NO! What happens is that the ball-point ink gets on to the front of the adjacent print, making marks all over the photo, and ruining it for publication. I ran into this a long time ago when I started writing for M.A.N., and Walt Schroder (bless him) told me that my pix were coming through the mail all marked up. Here's what he told me to do:

1. Place the prints front-to-front and back-to-back in alternating fashion, so that no two prints ever have the ink touch the fronts. Believe it or not, this works. (See #5)

2. Place sheets of tissue paper between the prints so that they don't ever touch each other.

3. Don't use ball-point pens to write on the prints. The print paper isn't "paper" - it's plastic, and the ink smears.

4. Some writers type out the captions on labels of the peel-and-stick variety, and place those on the back of each photo. That works pretty well...but if you use a pen, see #1 or #3 above.

5. In dry climates where there is not much heat or humidity, you can place the prints face-to-face, as in #1 above, but if the weather between you and the magazine is humid and hot, the prints placed face-to-face will often stick together, as the emulsion softens and makes a good glue! In that case, use #2 method.

All of this means that photo prints are delicate little items, and if you care about saving them for the future, or want to send them to a magazine, please heed the comments above. I've lost perfectly good sets of prints by not knowing what to do, so profit by my experience. The best advice I could give is NEVER, NEVER WRITE ON THE BACK OF YOUR PHOTO PRINTS!!!!

WHEN TO S.A.S.E.

When writing to a magazine, many of you include self-addressed and stamped envelopes. That's a good practice, and much appreciated by everyone. On the average, I receive five or ten letters each day, and try to answer all letters within two or three days. It's much simpler for me (saving time and postage) if the letter includes an s.a.s.e. If your letter does not require an answer, or if you don't want an answer, then don't spend the money on a stamp or envelope enclosure. By the way, just in case you are interested, my personal correspondence postage cost runs in the neighborhood of \$100 per month!!! Think of what that would buy in building supplies, kits and radios! Be as considerate as possible, and try to put yourself in the other guy's shoes when you write. Not just to me, but to anyone where an answer is expected. Thanks!

BACK ISSUE SELL-OUT:

By the way, I'd also like to mention while on the subject of RCSD that we have TONS of back issues for sale. Not always the entire production of all issues, but those issues we do have in stock are well represented. I am thinking of offering a very special deal on these back issues because they are beginning to bury me in my office, and I need the space.

Here's the deal: one copy \$1.25; five copies \$5.00; ten copies \$9.50, and an entire year's worth \$10.00. Please include postage with your order: 39¢ per single copy; 72¢ for five copies; and \$1.00 for 10 or 12 copies.... THIS OFFER GOOD UNTIL WE RUN OUT!!!

ALSO...

By adding another dollar, I'll ship you three RCSD decal sheets! Jim

LETTERS TO RCSD: -- SAGITTA "MODS" AND OTHER GOOD INFORMATION

Mike Fritz, Ypsilanti, Michigan wrote a letter that has to be shared with you because it contains so MUCH INFORMATION you will be able to use. Here's Mike:

"...Enclosed you will find two pictures, one of which is my now-completed Sagitta XC that I took to Toledo. Also in that picture is my two-meter Sagitta which is a direct copy of the big one. Both ships are just incredible...but I am getting ahead of myself as there is quite a story behind both ships.

"The XC started out two years ago as I thought that I could build a very competitive Unlimited Class ship from the very cumbersome XC kit. Well, modifications included flaps, ailerons, shorter-span (12.5 feet), shortened stab. (by 8 inches), removal of overbalanced rudder, and the addition of vertical gate-type spoilers such as those made by Multiplex (also RC Design & Development...see ad this issue...JHG). Final changes included lots of graphite sheet, carbon tow, and thickening of the stab by 100%. Since this was to be my big attempt at a Toledo-caliber ship, I also covered the whole thing with Monokote. Projected weight was 8.5 pounds; never quite made it, and wound up at 9.5 pounds! Wing loading is about where I wanted it at 13.5 ounces per square foot.

"The wings are fully sheeted and very stiff. The first flight was on a late evening in June, and was over 5 minutes in almost dead air. To say that I was pleased would not be quite enough! In two contests with this ship, I've had seven flights and seven maxes. However, I have only one spot landing, as it is a most difficult task with a large, fast, and heavy sailplane...but I'm working on it, (landings, that is).

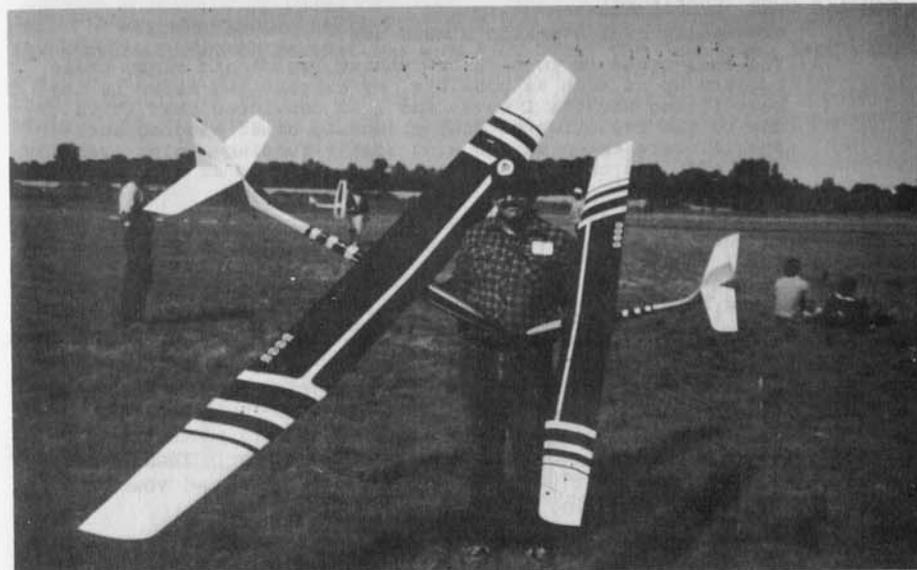
"Well, to continue with this saga, in late June I was at a contest in Northern Michigan and managed to trash two sailplanes in less than 20 minutes! How? Simple: I use the same transmitter but different modules for my different sailplanes. I had changed transmitter battery packs earlier in the week, and in so doing, I inadvertently switched the servo-reversing switch. In my pre-flight check, I usually look to see if the controls are moving, but don't usually check the direction. This oversight proved to be very costly as I rolled both planes into the turf!

"The rest of the story is that I borrowed a Windsong with the new Airtronics module radio and proceeded to win first place in Unlimited! At the end of the contest during the awards, I was given a plaque and a hacksaw -- so I could share my trophy with my very thoughtful friend -- Jim Thomas. I owe a very large thanks to him, as during that day not only did I beat him with his own equipment, but he totalled his two-meter PIXIE to boot!

"I spent the rest of the summer without any ships, and my confidence was getting a bit shaky. In early August I began thinking about the State Champs to be held September 7th, so construction was begun on a two-meter Sagitta with the same format as on my XC. Although it would not have flaps, I strove to make it the cleanest Sagitta I had ever done (of which I have had 5 aileron Sagittas to date). I shortened the stab. and thickened it by 50%. I used internal aileron horns, carbon fiber everywhere, and even buried the antenna in the wing. I glassed the fuselage and painted it, and covered the wings and tail with Monokote...resulting in a ready-to-fly wing loading of 13 ounces per square foot. With the paint still tacky, I gave it a few test flights on September 6th - the day before the contest. What a DOG! I was so discouraged that I took it home and swore off Sagittas forever.

"Well, after a soothing drink I went out into the garage workshop and tried to figure out what was wrong, and worked from 7PM to midnight. Next morning, I packed up the car and headed out with my friends.

"My test flight that morning was an official flight. We began with a 5-minute first round, and as luck would have it I had to be one of the first call-ups. The launch was dreadful because the tow hook was too far forward, and I got a crummy zoom at the top. With the plane in need of major trim changes, I had to hold half down



stick just to keep it level, but managed to max and hit the spot on time. I went back to the 'pit' area and made the changes I thought were needed. We flew between five and ten 10-minute maxes that day, and I maxed all six flights with those two ships! So you see, I am happy again as I seem to have found two craft that really suit me.

"However, I must tell you that on this particular day almost everyone was doing well. At one point there were nine planes in the same thermal...just one of those days when the weather was perfect.

"After the contest, I had a chance to fly a THERMAL KING owned by Noel Rossie who had gotten it from Dan Pruss sometime before. Anyway, four of us passed the transmitter around for almost an hour. One of us would dive it down to about 100 feet and then pass the TX to someone else and then watch as that person would work the light lift and 'sky out'. A most remarkable sailplane, but too bad it is so difficult to get. My own Eismann GENTRON is now a little closer to completion. After I saw the Thermal King, and how smooth the wings were with just a coat of resin on them, I decided to resin also and forget the normal Monokote routine.

"In the past you have always been interested in development of the Sagitta line, so here are some things I've observed from the many Sagittas on the contest circuit:

- a. Fully sheeted wings (upper surface) seem to be the norm, especially if zoom-launched.
- b. Textured coverings seem to do better on the more lightly loaded ships, and Monokote or similar film covering on the more heavily wing-loaded ships.
- c. Ailerons vs. polyhedral; the jury still seems to be out on this, however it seems that the pilots who have flown power ships appear to favor ailerons.
- d. A reduced stabilizer area is beginning to show up on many Sagittas, but not everyone is making them thicker. I feel that both mods are more important than just one or the other.
- e. The use of carbon tow and/or graphite sheet is really beginning to show up, even in the Old Timer's ships; guys who like to melt celluloid for glue!
- f. The overbalanced rudder is really disappearing, and I am seeing some form of internal fuselage bracing near the area where the wing root trailing edge meets the fuselage...a very common place for breakage when (or if) they break.
- g. I have been using a carbon-ply fuselage doubler in the wing joiner area of the fuselage to increase the strength for sur-

vivability over a season's hard use.

- h. The real trend is to hide everything inside and clean these buggers up as much as possible. My current two-meter is the best flying Sagitta I have, and I am convinced that it is due to the reduction of drag-producing stuff hanging out. Special care taken at the wing root - fuselage joint area pays off, and things ought to be smoothed up as much as possible.

"Finally, on to RCSD: I just want to say that there seems to be change with each issue, and that change is what keeps it fresh and interesting. I truly enjoy the work you are producing, and for the most part the information is timely and well presented. Keep up the good work, and hopefully we'll see you at the Nats one of these years! (Signed) Mike."

----- oo0oo -----

WINGERON PRODIGY

TY SAWYER

After flying my Aquila for over a year, I started to feel that it's flat bottom airfoil was missing the boat when it came to contest flying in high winds and its polyhedral turns went out to lunch in turbulence. I caught the "New Airplane Blues" and gave the Aquila away. I vowed to never build another bent wing glider.

After some research I found the Prodigy. A couple of kit reviews commenting on the quality and construction features convinced me to order one from Tower Hobbies. An examination of the kit told me that Airtronics may be in danger of losing it's throne as the standard of quality, it included everything except adhesive, covering and the kitchen sink.

Enough about the kit, that has been reviewed before. The intent of this article is to describe how to build a prodigy that is so maneuverable that the old Aquila now looks like a loaded school bus on the autobahn. The magic word is "WINGERONS". Paul Carlson's trailing edge was too well designed to cut up for ailerons and I have long wanted to try wingerons.

The kit is built close to the stock plans with most of the modifications being in the servo locations and the addition of linkages to rotate the wings on the main wing rod.

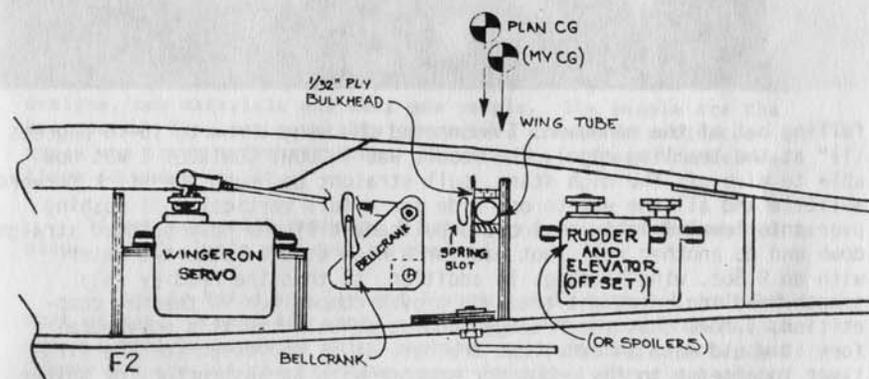
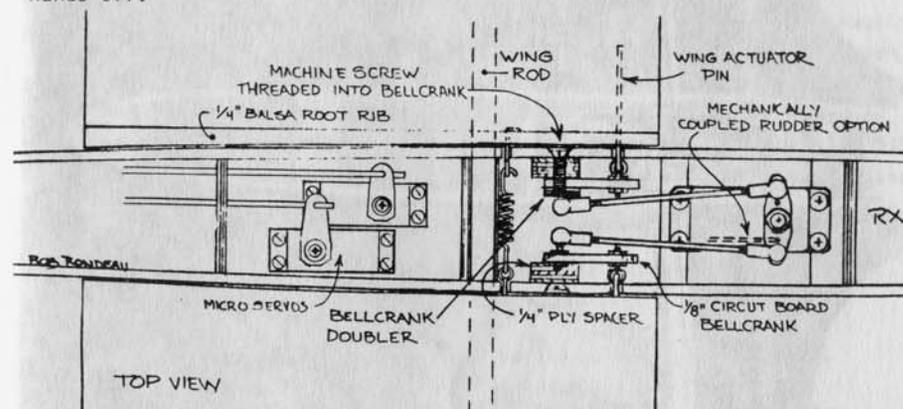
The polyhedral bend was straightened and each wing was built as one panel and without washout, i.e. the whole wing was built at once and the L.E. sheeting continues unbroken where the poly-bend used to be. The other change is that the wing locating tube was moved from the trailing edge to 9/16" back from the L.E. (Please note that this and all other dimensions are those which I have measured on my plane AFTER construction, and not necessarily the best.) The spoilers were not installed and their bays were sheeted over. The wing root fairing will be described later.

When building the fuselage I found that the second bulkhead had to be moved back 1/8" to accommodate my Airtronics module receiver.

The diagrams best explain the installation of the wingeron bellcranks and the servo placement. After the fuse was built, the 1/4" balsa root fairing rib was glued to the wing.



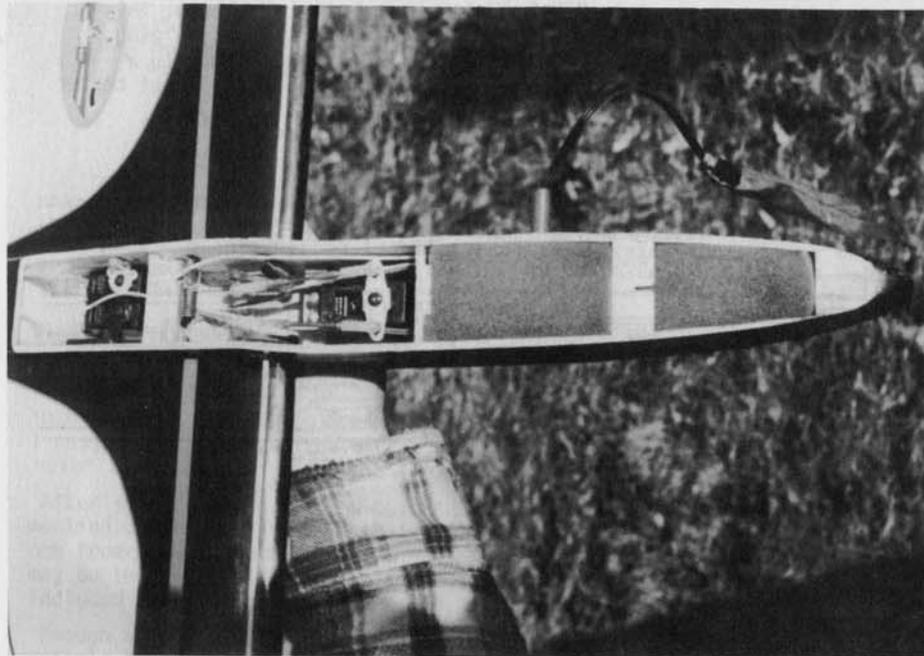
This rib was then sanded until it didn't rub against the fuselage when the wing is pushed on so that the wing tube meets the fuse tube. This prevents binding and minimizes the gap between the fuse and the wing. Experience with my Prodigy has shown me that slop must be kept to a minimum and that binding must be eliminated, or the wings will not center properly and it will be difficult to get the plane to fly straight hands off.



The final ready-to-fly weight of my Prodigy, with a couple ounces of nose weight, was 31 oz. The wings were originally set up with 10-12 degrees of throw (1 inch at the trailing edge) and no differential. The rudder was electronically coupled on the transmitter. It was balanced on the back edge of the spar, giving nearly neutral stability at most flight speeds and a bit of a tuck in steep dives. I have tried, and would not recommend, moving the C.G. back any farther than this.

I have found that the forward towhook location was too far forward to expect any kind of decent launch. The rear position works very well. The best launches are achieved by climbing straight, steep and a little bit fast. If it is allowed to veer off to the side it will be difficult to get back on track and launch height will be noticeably lower. A light but quick hand is required for a good launch, but with a little practice it is not difficult. I think that the reason it likes to launch fast is the small wing tends to load up under the tension of the tow.

In flight the Prodigy responds like a jet fighter; here and NOW! Rolls, stall turns, loops, split S's, immelman turns, Cuban eights, reverse Cuban eights, rolling vertical eights and cobra rolls are all part of it's repertoire. One maneuver I had hoped to be able to do is a vertical roll. Though I tried many times, I couldn't get a full roll before



falling out of the maneuver. I increased the wing throw to 16-18 degrees ($1\frac{1}{2}$ " at the trailing edge). The result was THOUGHT CONTROL! I was now able to dive off the high start, pull straight up, push the stick forward a little and all the way to one side for a full vertical roll pushing over into level flight, or I could pullback till the nose pointed straight down and do another roll. Not bad for a high aspect ratio two meter with an 8.5oz. wing loading. In addition to this the Prodigy is a smooth handling, straight tracking proven competitor in thermal competition. I feel that the Prodigy handles so well in it's polyhedral form it would make an excellent trainer. It is too clean for the first timer to attempt to fly, but for someone with an instructor, or anyone looking for a second, third or 50th plane to take them to the top, the Prodigy will do the job.



SLOPE SCENE

Harry Finch is RCSD's newest (and first) regular columnist. Welcome!

(Harry has taken on this responsibility at my request (read "arm-twisting") and is planning to cover the slope scene as thoroughly as possible. He will need your comments, photos, interest and support. For those of you who have been subscribers for awhile, or those who may have acquired some back issues, please have a look at Harry's review of the Phantom F-4 Power Scale Slope Soarer that appeared in the July 1986 issue. Back issues are available to those who may need this particular one. I've asked Harry to send me a short biographical sketch of himself and his soaring activities, and with any luck I'll be able to present it to you in the next issue. I'm just as excited as you are to see what the next columns will bring....JHG).

As the title implies, this is the introduction of a monthly column which will deal with slope soaring exclusively. We who fly slope are blessed with a generally more dynamic lifting force which allows a much broader spectrum of aircraft types and flying techniques.

Nearly everytime I go to a new slope to fly, I see new model designs, new materials and meet new people. The people are the best part. They are generally aggressive, creative, motivated types who crave a dynamic arena in which to express themselves. Slope is where its at.

If you are still reading, I take it you must be interested in slope. Well, let's get down to reality.

I love to build and fly and I work a full time job just like most of you. I need and want lots of help and input from all of you. I will be happy to edit, rewrite, make drawings, etc., but I know you are all the creative types described above and we can work together to make this a valuable forum from which to share.

We can do kit reviews. All you manufacturers and dealers out there, send in your kits. We will do a preliminary evaluation, we will publish a review or we will return your kit intact. More about this in future columns.

Club events for slope, races, and other contests. Send in the information well in advance and we will try to publish it.

Let's keep this column fun, easy to read and positive. I am not interested in politics, griping, etc. After all we are into this hobby just for fun, right?

HARRY FINCH
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