September, 2001
Vol. 18, No. 9
U.S.A. $3.50

R/C Radio controlled SOARING DIGEST

THE JOURNAL FOR R/C SOARING ENTHUSIASTS

R/C Radio controlled SOARING DIGEST

THE JOURNAL FOR R/C SOARING ENTHUSIASTS

ABOUT *RCSD*

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.

RCSD should not be considered to endorse any advertised products or messages pertaining hereto. An advertising rate card is available for businesses, and clubs.

R/C Soaring Digest
C/O 725 Camellia Court
Santa Rosa, CA 95407

e-mail: rcsdigest@aol.com
http://www.b2streamlines.com/RCSD.html

TABLE OF CONTENTS

Advertiser Index

OTHER GOOD STUFF

***RCSD* Index/Database**

Available from: <http://www.athenet.net/~atkron95/pcsoar.htm>. Or, send 3.5" high density disks & SASE with stamps for 2 oz. Lee Murray,1300 Bay Ridge Rd., Appleton, WI 54915; (920) 731-4848 after 5:30 pm weekdays or on weekends, <lmurray@athenet.net>.

RCSD ON THE WEB

http://www.b2streamlines.com/RCSD.html

Monthly Feature Photography & Web Version of the Printed Article (where appropriate)
Highlights & Mailing Status of the Current Issue
About RCSD
..... ***Subscription Information***
..... ***Advertising Rate Card*** (Adobe Acrobat PDF format)
..... ***RCSD Feature Columnists, Reporters, and Editors***
.....(E-mail/web addresses, plus general information about their areas of interest)
"Getting Started in RC Soaring" ..... Getting started guide - Adobe Acrobat PDF format
Links to Organizations, Special Interest Groups & Clubs
On-Line Articles - Great articles originally written for the printed version of *RCSD*.
..... "Trimming Your Sailplane for Optimum Performance" by Brian Agnew
..... "Flys Faster" by Dr. Michael Selig
..... "The Square-Cube Law and Scaling for RC Sailplanes" by Dr. Michael Selig
..... "Modifying & Building the MB Raven (Parts 1-4)" by Bill & Bunny Kuhlman
Bookshelf Listings - A listing of recently published books of interest to aeromodelers.
Complete RCSD Index, 1984-1999

The Soaring Site

Web Site Changes

There have been several changes during this last month. First, Bill & Bunny Kuhlman have a new e-mail address:

bsquared@appleisp.net

And, a new web site address:

http://www.b2streamlines.com

This means that *RCSD* also has a new address for our web pages:

http://www.b2streamlines.com/RCSD.html

Please send in your scheduled 2001 events as they become available!

Viking Models, U.S.A.

If any of you are looking for a glider model or canopy previously available from Jer at Viking Models, U.S.A., contact Mark Hambelton at DCU. We've included a copy of his business card on this page.

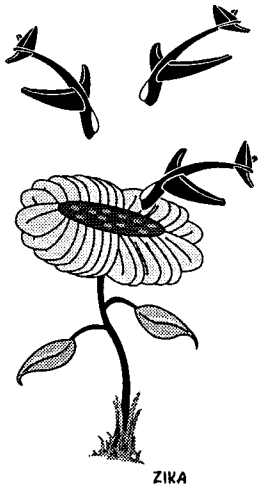
RCSD Temporary Address

It appears that our house is indeed sold, and we'll be moving to California this month. The current scheduled pick-up date by Allied Van Lines is Saturday, October 27th. Our temporary address in California is:

R/C Soaring Digest
c/o Ella Branscome
725 Camellia Court
Santa Rosa, CA 95407

When we find a permanent address, or if anything changes, we'll ask Bill & Bunny Kuhlman to post updates on the *RCSD* web pages. If applicable, we'll also ask Gordy to post *RCSE* for those of you that are members of the forum. If you don't have on-line capability, please be patient. We'll try to get back up and running as quickly as we can!

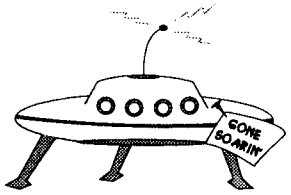
Happy Flying!
Judy Slates



ZIKA

SKY SAILING

Lee Murray shares one of his full size flying adventures this month. He and his wife enjoyed the comforts of Warner Springs in Southern California, which is adjacent to the Sky Sailing glider port.



ZIKA

DAVE JONES' R-2

Bill Kuhlman and the completed R-2 wing structure, prior to finish sanding. This month, Bill & Bunny discuss wing construction in their column, "On the 'Wing..."

Jer's Workbench

Jerry Slates
RCSDigest@aol.com

Beginning R/C
Step 1: Look for an Instructor

This article is intended for the new person who is just starting to fly gliders, someone who has already gone to the local hobby shop and purchased a radio, hi-start and a RTF glider. From there comes the trek over to the local school yard, where the beginner tries to fly their new toy. If they don't wreck the new toy, the first flight likely only lasted a few minutes. They know from hear say that the flights should be longer than that. They need help, so they look up the local glider club.

If you fit this criteria, then read on. My suggestions are meant for you.

OK, you found a club, and are now a member of the Local Soaring Society. The club has an instructor and you are ready to become a glider flyer.

You are now ready for your first flight with an instructor, but he doesn't know what you know and is probably as nervous as you are. Your instructor will probably tell you to launch your glider and to fly straight down the field. His main concern at first is to keep you out of trouble. Meaning, to keep you out of any trees, power lines and the parking lot. After a couple of minutes pass, you have everything under control. Your instructor says, "Look over to your left. So an so is in a thermal. Fly over there and join him." So, you turn left and head for so an so's thermal; but along the way, you hit a bump and your instructor quickly says, "Do a one-eighty and circle in that spot." You do and it's a thermal. You circle in the thermal for a bit and gain a lot of altitude; your hands are starting to shake. After 15 minutes pass and you have drifted down wind quite a bit, your instructor tells you to leave the thermal and fly back to the field and land. You are a king! Total time for that flight was 25 minutes.

Your instructor says, "That was a good flight; let's do it again." So, you launch your glider, with the instructor at your side but they're not saying anything. You circle around and 3 minutes later you land. You look at your instructor and say, "What did I do wrong?"

Your instructor says, "Let's go back to the pits and talk about it." He will explain what you did, which will include the good things, along with the things that you need to work on and the mistakes that you made. Take the bad news along with the good news; that's why you went to an instructor in the first place.

Your instructor gets out his note pad, draws Figure 1, and says, "This is what you did on your last flight. Your launch was good, you went to the right and cleared the launch area; that was good. You then flew up wind and across the field. That was good, but then you turned down wind and back across the field again. This was bad. The air that you went through on your up wind turn and across the field was bad; then you turned down wind and back across the field and flew through the same bad air again. This is what caused you to lose all of that altitude that you had."

"This is what you should do; look at Figure 2. Fly up wind to look for a thermal and don't fly through the same one twice. Just keep in mind that there are going to be days when the flying is all up and there are going to be days when the flying is not so good."

"But if you fly a pattern as shown in Figure 2, your chances of finding a thermal are better than flying in circles. Remember, don't fly down wind, as you may not make it back to the flying field. And don't fly through the same bad air twice."

"So, now let's go practice some more!"

■

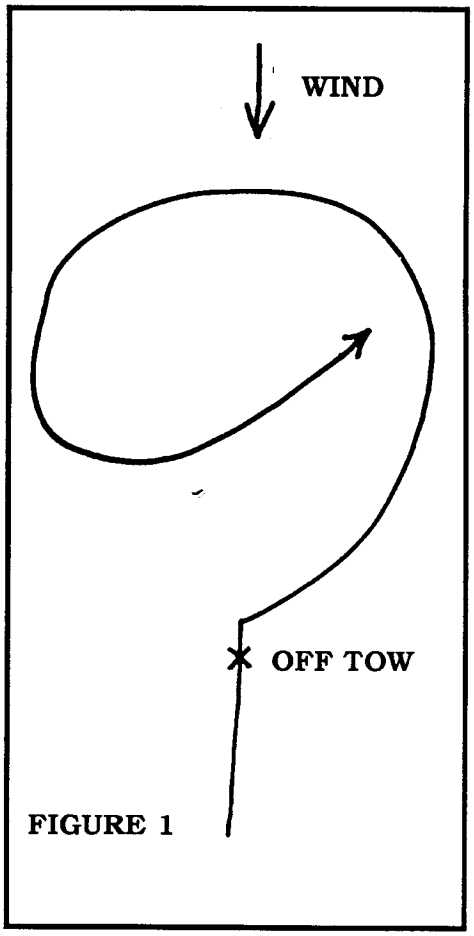


FIGURE 1

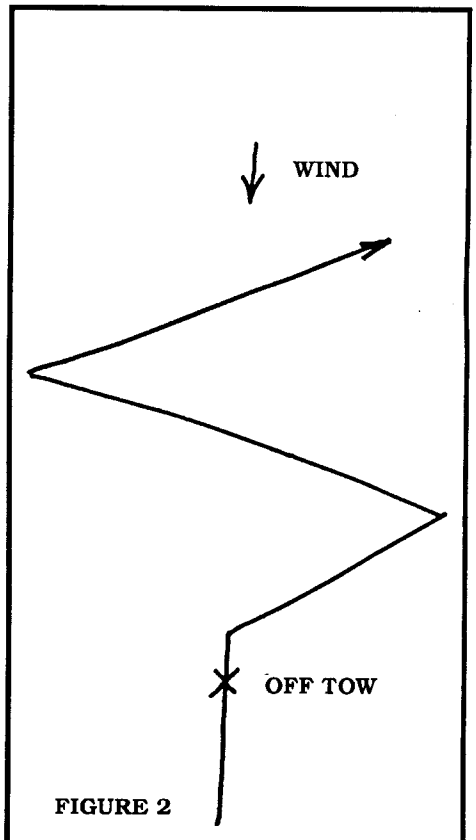


FIGURE 2

Captain Dale Willoughby USMC Retired, as actor in Buffalo Soldiers movie.

Cirrus Tales

by Dale Willoughby
Winston, Oregon

In 1969, when I special ordered a metallic, green colored Mercedes 230S sedan for a factory delivery, I flew to Germany via "Space Available" and, upon arriving, drove it to Kirchheim-Tech to visit Graupner's factory. As I parked, another gray Mercedes arrived, and parked in the *Verbbieten* space. Johannan Graupner greeted me with "Herr Villobe" and hurriedly hastened through the door that was similarly marked.

In the visitor's office a nice looking secretary asked me in German-English what she could do for me. I replied that I wanted to speak with Herr Graupner. She said he was in a special meeting and could not be disturbed. So, I inquired about the availability of their latest R/C sailplane prominently displayed in a local hobby shop.

She disappeared and shortly returned, handing me a large box labeled CIRRUS, with specifications printed in German, French, and English. I was prepared to pay for it, but she determinedly repeated that it was a *gabe or beganben*. In return, I was to translate the instructions into the English language. My German is limited to around ten spoken words, however I am able to translate if it pertains to models with the aid of an English-German dictionary, and need the model for hands-on application. In about a week, I finished the task and, upon test flying, found the Cirrus to be an extremely good thermal soarer.

In fact, it was so efficient that I filed with AMA and FAI for an application for FAI F3B Class 33, World Record Altitude Records.

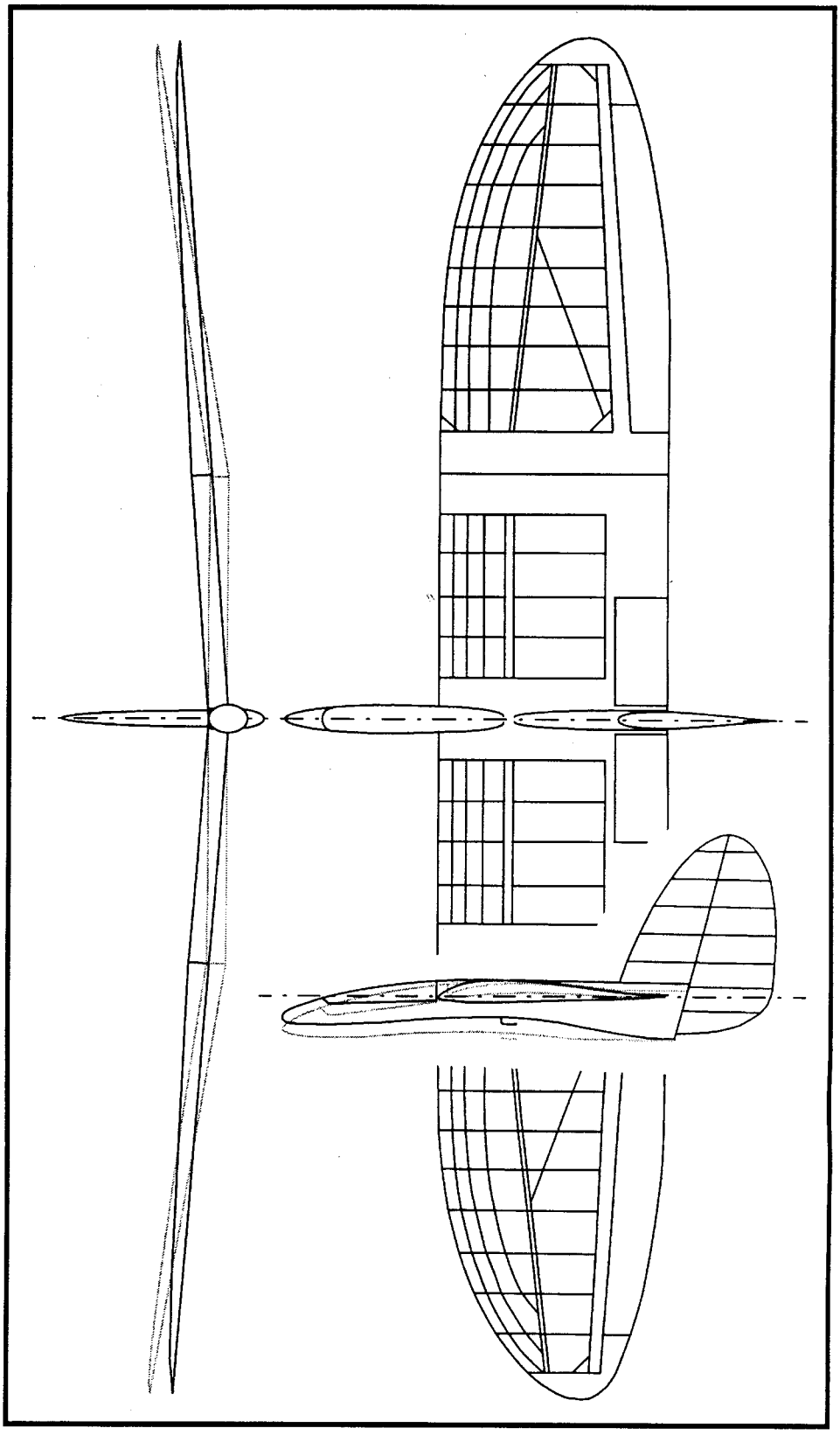
With one full size Cessna 172 on the ground, the other in the air, and radio contact, I hi-started the Cirrus into an early morning dust devil and, guiding it through the center, found my Cirrus barely visible in the cloudless sky. The trick was to hit it dead center. If not, the lift would flip the Cirrus to one side or the other. The airborne dirt was no longer in evidence.

The airborne Cessna reported that he could see the Cirrus on their altimeter. Then, someone on the dry desert caused a cloud of dust while the Cirrus was still climbing; when the dust cleared, I could no longer see it. (FAI rules require that a model sailplane must land within 150 meters from the spot of launching, so we aborted the attempt.) Two days later, Dr. Rolf McPherson and I spent almost two hours at low altitude searching in vain for the white Cirrus.

I could only presume that a motorcycle rider (Perhaps someone else?) had found it and taken it home. At least, I still had the transmitter. ■

on the Wing
B²

P.O. Box 975
Olalla, Washington
98359-0975
bsquared@appleisp.net
http://www.b2streamlines.com



Dave Jones' R-2, Part 2

This month's column will be devoted to wing construction. The planned modifications to the wing include a change of airfoil, reducing the original polyhedral to simple dihedral, and adding ailerons. The primary focus of this article will be how those modifications have been realized.

The airfoil

The airfoil shown on the R-2 plans is the CJ-3406. This section has 4% camber and is just 6% thick. The R-2 was not designed for high winch loads, yet the wing structure does reflect the structural difficulties incurred when using such a thin section. Notable is the use of 3/32 inch balsa sheet in those areas of high loads — the main wing center sections and the area where the wing rods are located.

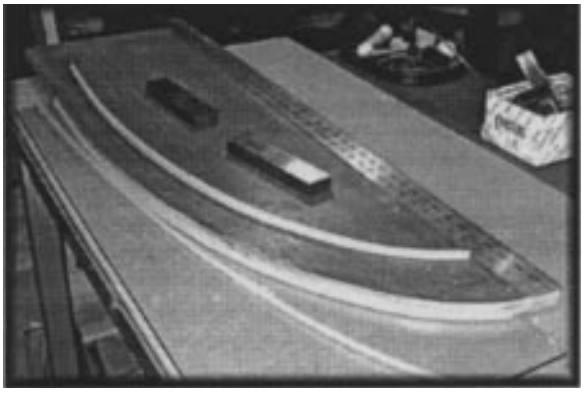
We decided early on to use the CJ-25209, a section with which we've had a lot of success. This allowed us to replace the 3/32 inch balsa sheeting with sheeting of 1/16 inch thickness, while using the same spar structure. The sheeted portion of the structure is thus significantly lighter, but that savings is partially offset by the larger ribs and the additional sheeting needed for the aileron structures.

Since we had already made nearly all of the templates for the various wing pieces, our first project consisted of cutting out all of the wing, elevator, and aileron ribs. This used up nearly five 4" by 48" pieces of 1/8 inch balsa. We put numbers on everything as we went along. Several templates are so similar to each other that having some means of rapid identification is necessary.

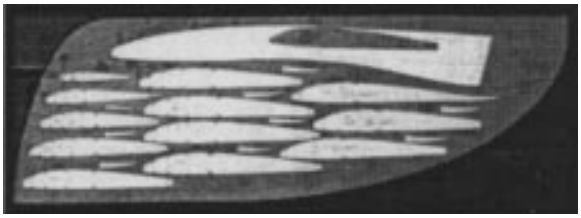
We've become accustomed to building on a large piece of ceiling tile and an equally large piece of glass, and the framework for the R-2 is being constructed on these two surfaces. For the R-2, we initially placed the plans on the ceiling tile and assembled the entire bottom surface first. This included the lower spar caps and all of the sheeting. Using a steel machinist's block, all of the ribs were then glued in.

From polyhedral to dihedral

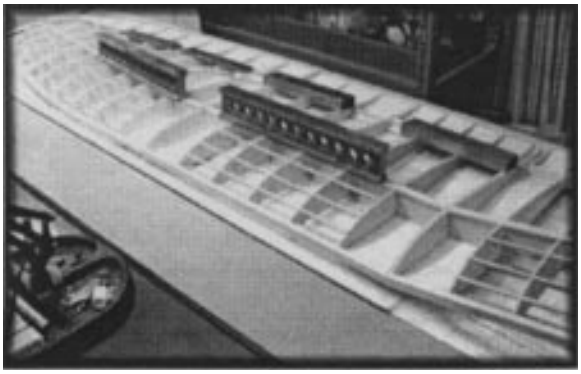
The R-2 was originally designed to use a flat center section and separate outer wing panels using five inches of dihedral at their tips (10.5 degrees).



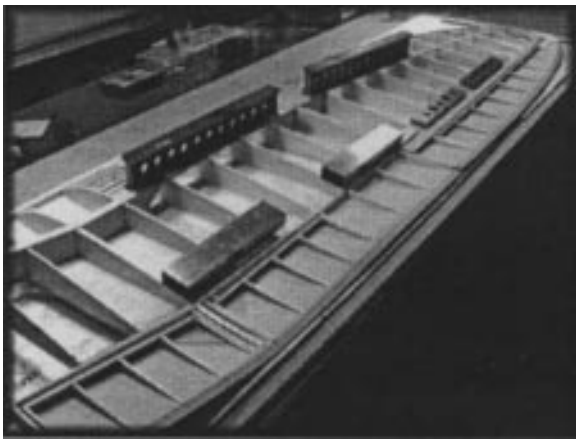
The leading edge form, cut from 3/4 inch plywood. One leading edge has already been completed and is resting on the form. Paraffin was applied to the open surface to prevent things from sticking.



The basic templates and forms: twelve wing ribs, aileron and elevator ribs and fuselage sides. The large piece of plywood serves as the form for the leading edge of the outer wing panel (lower right) and the leading edge of the fin (upper left). Not shown is the large template for the aileron sheeting and trailing edge stiffener.



View of the right wing from the leading edge. Open areas in front of the spar are ready for sheeting with 1/16 inch balsa.



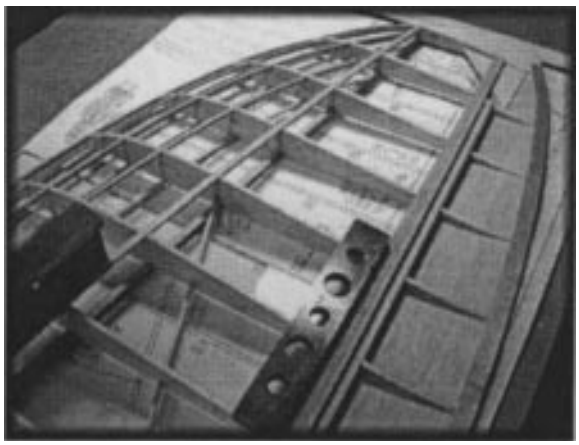
The right wing, set up for spar webbing and trailing edge sheeting. Note the tapered end of the center dihedral brace. The balsa spar webbing is still to be installed.

Our tack was to use simple dihedral, four inches (4.5 degrees) per side, with a break only in the center of the wing. A heavy plywood shear web made from two layers of 1/8 inch plywood and extending outboard two bays takes care of the anticipated loads. Webbing made from 1/8 inch vertical grain balsa is used for the remainder of the wing center section.

The plywood dihedral braces/wing rod receptacles in the outboard portion of the wing remain, made taller by the thicker wing section.

Spar webbing for the outer wing panels consists of 3/32 inch vertical grain balsa for the first open bay, then 1/16 inch vertical grain balsa for the second and third. Because the spar caps do not taper, and the airfoil is so thick, there is no spar webbing in the outer bays.

The outer right wing panel, viewed from the leading edge.



The outer panel of the right wing with partially completed aileron in place. The aileron upper sheeting needs to be glued on, as well as the sheeting behind the last rib bay and the supporting pieces of the wing tip.

Laminating the leading edge

The progressively curved leading edge of the outer wing panels is a lamination of four layers of 1/16 inch balsa sheet. As can be seen in a couple of the photos, we made a form for the laminating process. The inner outline of the leading edge was traced from the plans onto a large piece of 3/4 inch plywood, and a long arm jig saw was used to cut the curve. Some sanding with course PermaGrit attached to an aluminum T-bar smoothed the contour to final shape. Paraffin was then rubbed over the open edge to seal it against moisture and prevent the parts from sticking.

Long strips of 1/16 inch by one half inch balsa were cut from an appropriate sheet, wetted with warm water, and taped to the form. This preliminary lamination was allowed to dry overnight. Upon removing the tape strips, we found the curve to be fairly well set in all four laminations. The first lamination was taped to the form at the ends, and then other layers were progressively added using CA glue as the adhesive. A few minutes later, all of the tape was removed, and the formed leading edge compared with the contour on the plans - a nearly perfect match! The completed leading edges were glued directly to the ribs.

Adding ailerons

Sizing the ailerons posed little difficulty. We knew the portion of the span they were to cover, and simply computed a width of around 20% of the wing chord for the broader portion. The sheeted trailing edge depicted on the plans was extended forward about one inch so it could form a stiff trailing edge for the main wing and a hinge point for the aileron. A length of 1/8 inch balsa forms the trailing edge webbing for the

wing. The fronts of the aileron ribs were cut to a 30 degree angle before installation, and a second piece of 1/8 inch stock was trimmed and then glued in to form the leading edge of the aileron. A razor plane was used to get the upper portion of the aileron leading edge to match the rib contour across the span.

The entire wing was constructed on a flat surface so that the bottom of the wing forms a plane. This allows the ailerons to be hinged from the bottom, as has become our practice, despite the compound parabola of the wing.

A template for the aileron sheeting was made from aluminum flashing material. This template was also used when cutting out the 1/64 inch plywood trailing edge reinforcement.

JR 101 servos are being used to power the ailerons. These servos are slightly lighter than the JR 505s we're going to have in the fuselage to actuate the rudder and elevators.

The elevators

Since the center of the wing is bent to form the dihedral, it's somewhat difficult to fabricate and install a torque tube arrangement to drive the elevators. We chose instead to drive both elevators through a single servo using a forked control cable. This does pose some geometry difficulties when hooking up the connection to the servo. We'll cover both the problem and our solution in the next installment.

GoldenRods serve as the push-pull connections between the servo and the elevators. Because there is no area above the wing to run the pushrod assemblies, we drilled appropriately sized holes in the dihedral brace and leading edge sheeting. The photo of the completed wing may have enough detail that the elevator hook-up can be discerned.

The elevators on our version are somewhat simplistic affairs. The 1/8 inch ribs are between two layers of 1/16 inch balsa sheeting, and the control horns are glued to a rather large triangle of 1/32 inch plywood which spreads the loads over a greater surface. The trailing edge of the main wing is reinforced with 1/8 inch balsa webbing, and the elevator leading edge is 1/8 inch stock as well. The elevators are bottom hinged, as are the ailerons.

Completion

The plans show a curved trailing edge stiffener composed of two strips of 1/16 by 1/8 inch spruce, laminated to be 1/4 inch wide, and 1/16 inch plywood. This stiffener is placed between the upper and lower 1/16 inch balsa sheeting. Unfortunately, while it does make the trailing edge stiff and strong, it also makes the trailing edge thick enough to adversely affect performance. We've used 1/64 inch plywood for this purpose in the past, and so felt confident using the same materials and methods here as well. The completed ailerons are very stiff, and the trailing edge turned out to be more than sufficiently strong.

The upper surface sheeting was glued on once all of the internal structure was complete. It's imperative that the wing structure be firmly placed on a flat surface during this process, as any warps built into the wing at this point are extremely difficult, if not impossible, to remove. Appropriately sized pieces of trailing edge stock were used to maintain the proper reflex along the entire wing span as the sheeting was applied to the aft portions of the wing.

Rather than use a balsa block for the tip of the wing, we used 1/32 inch plywood for the bottom surface and then added sheet balsa triangles from the last rib to the wing tip outline. The resulting structure is lighter, and the transparent covering will allow this detail to be seen.

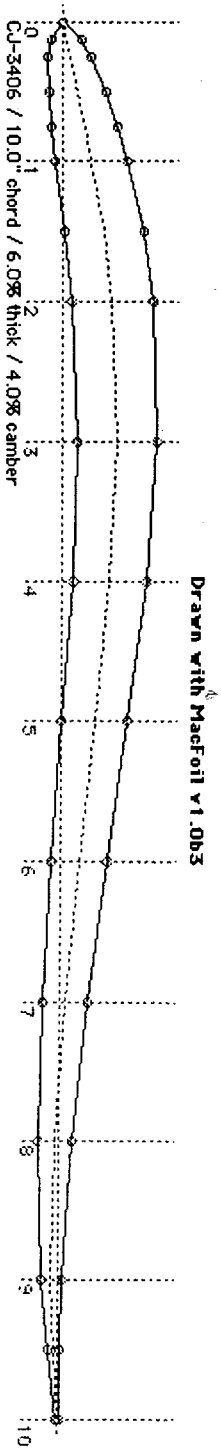
We're pleased with the final structure. It is very light — just 36 ounces including servos, wiring harness and wing rods, before covering. The curves are just as beautiful as we had anticipated!

The next installment

The next installment will cover construction of the remaining major parts. Special attention will be paid to the servo-elevator connections within the fuselage and the techniques used in putting together the fin and rudder.

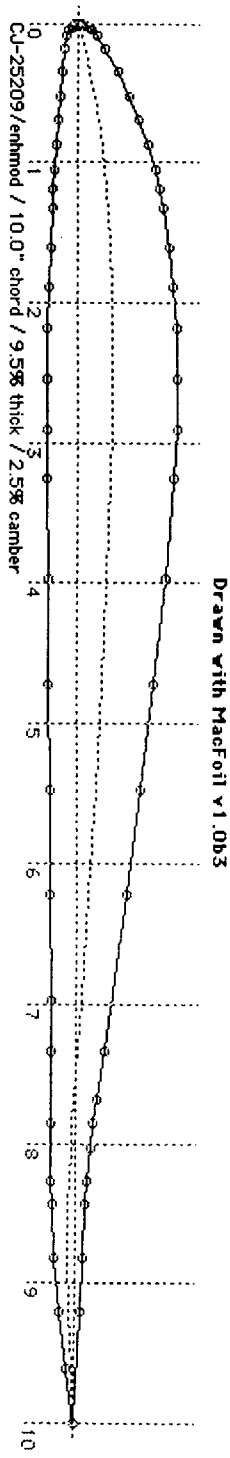
CJ-3406	
1.00000	0.00100
0.95000	0.00120
0.90000	0.00230
0.80000	0.01000
0.70000	0.02090
0.60000	0.03450
0.50000	0.04910
0.40000	0.06250
0.30000	0.06910
0.20000	0.06650
0.15000	0.06010
0.10000	0.04770
0.07500	0.04010
0.05000	0.03130
0.02500	0.02050
0.01250	0.01350
0.00000	0.00000
0.01250	-0.00850
0.02500	-0.01050
0.05000	-0.01030
0.07500	-0.00810
0.10000	-0.00510
0.15000	0.00190
0.20000	0.00650
0.30000	0.01090
0.40000	0.00790
0.50000	-0.00030
0.60000	-0.00750
0.70000	-0.01290
0.80000	-0.01480
0.90000	-0.01230
0.95000	-0.00760
1.00000	-0.00100

cm = 0.0241
zla = -0.4669



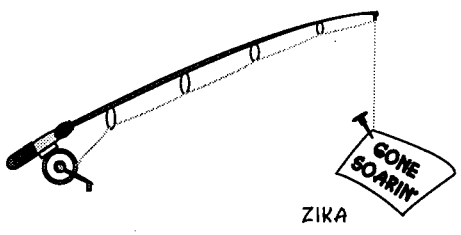
CJ-25^{2}09	
1.00000	0.00000
0.92144	0.00372
0.88191	0.00513
0.84238	0.00727
0.82618	0.00888
0.80286	0.01088
0.78535	0.01296
0.76782	0.01530
0.73279	0.02045
0.62275	0.03675
0.54773	0.04644
0.47273	0.05591
0.39771	0.06413
0.32568	0.06963
0.28967	0.07153
0.25366	0.07250
0.21765	0.07159
0.18953	0.06980
0.16136	0.06714
0.13325	0.06308
0.11918	0.06026
0.10510	0.05691
0.08760	0.05163
0.07006	0.04498
0.05256	0.03718
0.03503	0.02903
0.01755	0.01990
0.00876	0.01400
0.00438	0.01023
0.00282	0.0081
0.00125	0.00512
0.00040	0.00284
0.00000	0.00000
0.00057	-0.00230
0.00219	-0.00460
0.00438	-0.00628
0.00876	-0.00786
0.01755	-0.00919
0.03503	-0.01116
0.05256	-0.01272
0.07006	-0.01418
0.08760	-0.01570
0.10510	-0.01707
0.11918	-0.01791
0.13325	-0.01861
0.16138	-0.01974
0.18953	-0.02077
0.21765	-0.02177
0.25366	-0.02252
0.28967	-0.02221
0.32568	-0.02171
0.39771	-0.02113
0.47273	-0.02045
0.54773	-0.01973
0.62275	-0.01904
0.69775	-0.01835
0.73279	-0.01804
0.78530	-0.01746
0.82618	-0.01746
0.84238	-0.01733
0.88191	-0.01534
0.92144	-0.01117
0.96092	-0.00571
1.00000	0.00000

cm = 0.0460
zla = 0.4159



As usual, if you have questions, comments, suggestions for future columns, or want to share a project of your own, please contact us at P.O. Box 975, Olalla WA 98359-0975 or <bsquared@appleisp.net>.

■



Photography is over a place called "Magic" taken by Bobbie Murray in "Whisper". Second glider manned by Lee's instructor, Dante, and Lee: "Wisher".

THE NATURAL SIDE OF THERMAL SOARING

By Lee Murray
1300 Bay Ridge Rd.
Appleton, WI 54915
(920) 731-4848 (after 5:30 p.m.)
lmurray@athenet.net
http://www.athenet.net/~atkron95/pcsoarhtm

Sky Sailing Vacation

I had a business meeting in San Diego, California the last week in August. My wife, Bobbie, and I flew out early to celebrate our 35th wedding anniversary by doing something special. On two other occasions when traveling to San Diego, I went to Warner Springs where the Sky Sailing glider port is located to get a glider flying lesson. More accurately, I went to fly a glider in the secure hands of an expert. While making the arrangements, I discovered that there was a package arrangement with Warner Springs Ranch, a popular resort right near the glider port. The hot springs for which the location is named has been there for the last 6,000 years when Indians found the mineral waters of the springs a great resource[1]. Today, Warner Springs is owned by 2000 shareowners with opportunities for others to rent a cabin for a week or weekend. Initially we were told that Warner Springs was booked up, but Jennifer at Sky Sailing kept checking and got us a cabin. We found the accommodations to be very comfortable and without distractions of TV and telephones.

Warner Springs

The base package normally includes a ride for two in a Schweizer 2-33 for 20 minutes. That package can be upgraded, which is what we did, to a 20 and 30 minutes in high performance Grob 103As. Not only did we go up on similar sailplanes but, also with the cooperation of our instructors, we arranged a rendezvous in the air. We opted for a 10:30 launch time and a 4,000 AGL launch for me and 3,000 launch for Bobbie. Her launch time was 10 minutes later. My instructor was Dante who was vacationing this particular weekend. Dante flies a twin-engine turboprop for the racers and crews of the A.J. Foyt Racing Team. Dante learned to fly sailplanes at Sky Sailing and has flown RC sailplanes as well. He and I seemed to relate very well. During the tow, I learned how to keep the Grob squarely behind the tow plane. It took much more rudder than aileron control. It seemed much more difficult than flying off tow. I managed to circle in the thermal without much difficulty.

On tow, we flew through a thermal on the sunny side of Hot Springs Ridge near the Hot Springs Mountain lookout tower. I released a few moments later in the vicinity of that thermal. We got a close in photo of the observation tower and later from a much higher altitude. Note the photo, along with a map showing the proximity of the tower and the glider port.

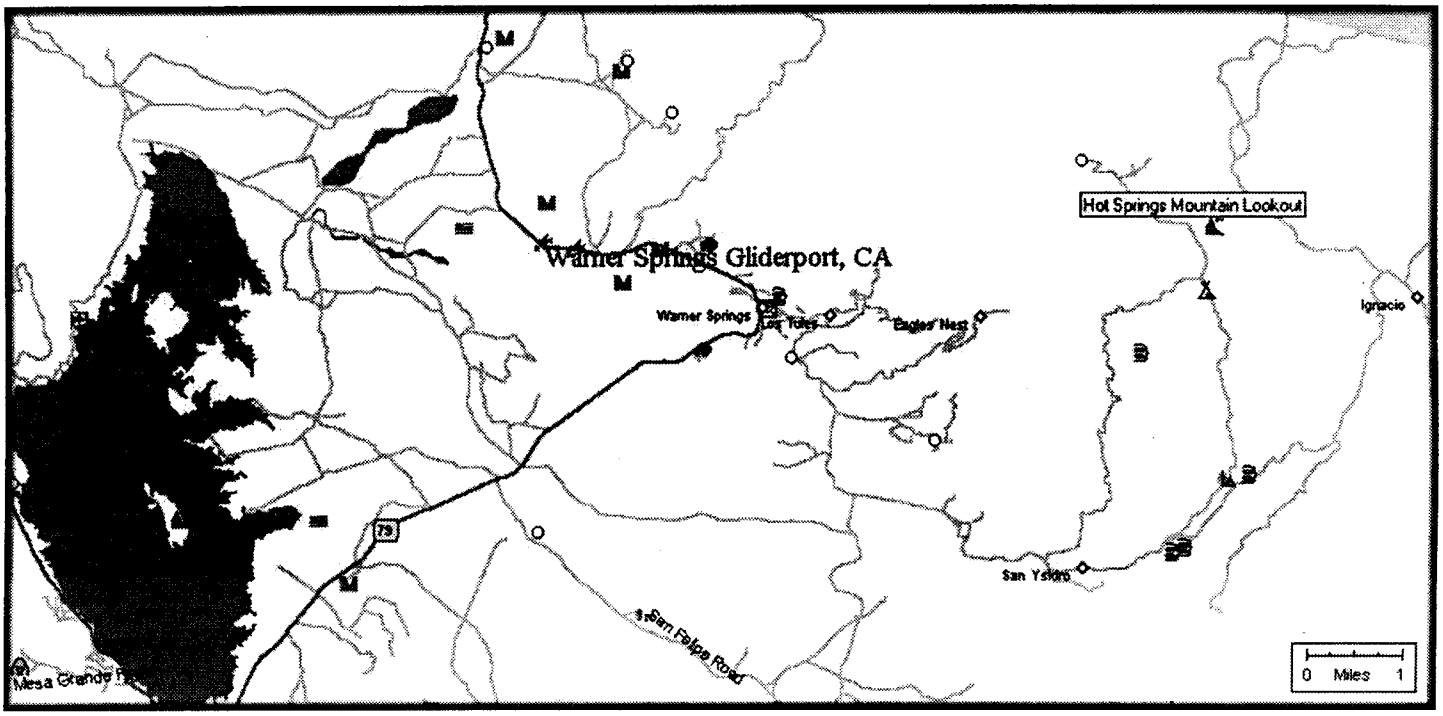
Dante let me core the thermal with a 45° bank and I was thrilled to get the variometer showing a 6 knot vertical velocity that took us to 9,500 (6,600 AGL) when we bailed out in order to meet Bobbie and her instructor, Rolf, climbing up in the thermal. We popped spoilers and soon we were taking photos of each other (videos and stills) climbing in the thermal. Time passed quickly and soon we were heading back for a pass over Warner Springs Ranch, into the pattern and onto final approach. Dante arranged to fly parallel but slightly behind Rolf on the landing approach. We got a great video of Bobbie and Rolf landing that excited the two instructors as much as it did me.

Just after landing we shot a video of a young man, Dan, ending his first solo flight in a Schweizer 2-33 and the celebration of being 'baptized' in a deluge of cold water. It was just great.

I'm writing this article for *RCSD* because I think this is the way to live the fantasy of many RC glider fliers. To relate the skills of RC soaring with full size soaring and to know what it is like to fly full size. I have a goal of getting a license upon retirement and then do more soaring after that. It wouldn't be such a bad thing to do it gradually. Even if I never solo, I will have enjoyed myself immensely.

If you are considering a trip to Southern CA, consider the Sky Sailing Warner Spring Ranch combo package.

http://www.skysailing.com



(Above) Dante (Below) Hot Springs Mountain Lookout

What to do at Warner Springs Ranch

Warner Spring Ranch has the following amenities: a spa (providing massages, body wraps, manicures or pedicures for the wife), a golf course, tennis courts, swimming pools (two very large pools of mineral water, hot and cool), an equestrian center where you can rent a horse, a recreation and fitness center, and hiking trails. We also saw fields for volleyball and soccer. The plan includes a dinner and a breakfast. The food was very good and the service was warm and friendly. I was VERY satisfied. We didn't miss the phone or TV one bit. We sat outside after dark watching the stars come out in a very quiet place. I can see why this resort is thriving and we recommend it and this package.

Tips on taking pictures & videos

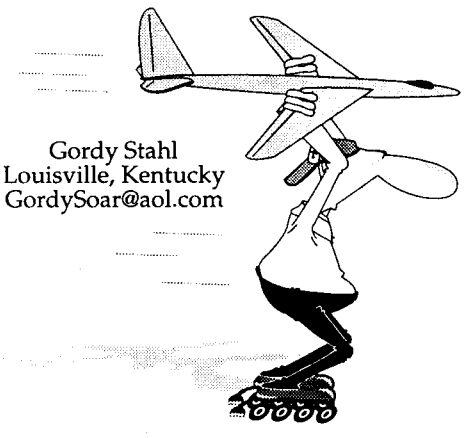
Set the video camera focus to manual and from 30 to infinity. I didn't and found the video camera hunting for focus at the start of sequences. Point and shoot cameras are good but when shooting through the canopy, you may get the canopy in focus and not the scenery. Shoot through the open air hatch when appropriate. Bobbie may have taken the sharpest shots with the point and shoot automatic camera. Use low speed film, e.g. 100-200 ASA for the most detail and great color. My old SLR camera with a 28-70 mm zoom lens got the best-framed pictures. Im looking forward to several poster size enlargements coming from this trip as well as some screen saver photos.

---

1 From *Legend of Land* provided by the resort: "In 1830, at the age of 23, young John Warner, weary of cold New England winters and ill health, journeyed from Connecticut to St. Louis to join a trading expedition headed by the famed mountain man, Jedediah Smith. Warner became a Mexican citizen and in 1844 applied for a land grant that awarded him ownership of the 48,000-acre Valle de San Jose in San Diego, which he had first visited 12 years earlier. He changed the name of the region to Warners Ranch and officially changed his own name to Juan Jose Warner."

■

GORDY'S TRAVELS



Gordy Stahl
Louisville, Kentucky
GordySoar@aol.com

Fly'n Brian's Hands-off Launcher

Recently, I found that launching a sailplane can be a real challenge for some of us. Dave Hauch of Michigan shared his Self-Launcher, and no sooner than the article appeared in *RCSD*, Brian Smith of Tennessee posted a note on the *RCSE* about his Hands-off Launcher. So, I asked him to provide some detail for this article. Brian is one of the Mid States top RC Sailplane pilots, but his launch arm isn't what it used to be.

While both launchers use the same release mechanism, Dave's uses a spring to provide release tension, Brian's uses three #64 rubber bands. Brian's approach was to create a system that was very low cost and one that could be disassembled from his trailer, should he decide not to use it.

All of the components were purchased at Lowe's Builder's Supply, but would also be available at any large hardware chain store. The parts cost is approximate $23, and assembly time is just a few hours. Four metal threaded stand-offs are bolted to the trailer's bed. The 4 3/4" plastic pipe up-rights are simply pushed into the threaded holes in the metal stand-offs and can be pulled out during transport. All of the plastic parts are glued together **EXCEPT** for the two cross member pipes, they are just pushed into the two upright assemblies.

The plywood launch deck houses the Launch Release Pivot Rod. It is bolted to the two Cross Members. Four 1/4" blind nuts are inserted into the top of the plywood Launch Deck, and four 1/4" Wing bolts are used to bolt through the Cross Members into the Deck's Blind Nuts. Each #64 rubber band equals 5 lb. of launch tension. Experimenting with the amount of rubber bands will tell you how much tension is best for your sailplane's airframe. Brian uses 3 to launch his open class sailplanes.

The system is simple. The winch line has two 1" key rings, one about 12" forward of the other. The forward key ring is hooked on the Release Pivot Rod, the other to your plane's tow hook (adjust the length to fit without slack between the two. When the winch is operated to cause tension on the line, that tension builds 'til it overcomes the force of the rubber bands. This tension pulls the Release Pivot Rod forward and its key ring slides off allowing the sailplane to be pulled up with excellent, uniform speed and force. The Pivot Rod is pulled back to its 'cocked' position ready to receive the winch line for another launch.

One of the great benefits of using this launcher is the guarantee of a flat launch, no exciting swerves and sways that often lead to a trashed sailplane, and no harsh, wing snapping releases from over tensioning the winch line.

Important Tip: The four plastic pipe T's used to join the Launch Rails to the Uprights, need to have the upper third of the T's cut off BEFORE gluing them to the Uprights and the Launch Rails. The reason is to keep the tops of the Launch Rails smooth so that your wings don't scrape on the T's. The Pivot rod is 3" x 1/2" x 1/8" steel flat stock with a pivot hole in its middle. Two 1" wooden blocks are glued in place to act as bearing blocks for the

FB's Self Launcher

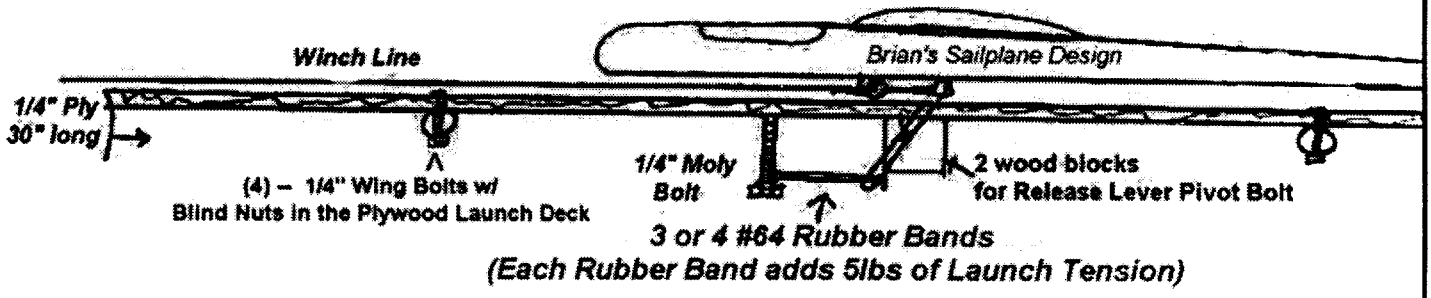
Ready To Launch

Front View

(Left) Release View *Rear View*

"Fly'n Brian's" Self Launch System

Wings rest/ride on the Launch Rails.
Rails are 6' x 3/4" PVC tubing (not shown).
Rails are 12" apart.



Frame is made of 3/4" PVC, 8 PVC T's.
12" wide andabout 36" high
(Just high enough to clear the Retriever).

The Launch Rails are 6' long and 12" apart.

The 'feet' are threaded metal Stand-offs.
All parts were purchased from Lowes Building Supply.
Total parts cost $22.

Pivot Rod's bolt. The blocks are drilled for the Pivot Rod's bolt and placed very close together, sandwiching the Pivot Rod snuggly between them. The Pivot Rod is not notched on the top side as you want the winch line to slide off of it easily. The rear end of the slot in the Plywood Launch Deck keeps the Pivot Rod from over rotating allowing the rubber bands to fall off. It should rest ready to receive and hold the winch line key ring.

If you have some detail questions feel free to post an e-mail to Brian at briansmith1@charter.net; he's been using it (with a retriever, too) for a few months. ■

TECH TOPICS

Dave Register
Bartlesville, Oklahoma
regdave@aol.com

SCORING PROGRAMS WITH MICROSOFT EXCEL

This month, let's have a discussion about scoring programs you can write in Microsoft Excel. The genesis for this review is the use of these tools for our major club contest this year and some observations and discussions over using this technique at neighboring contests.

This concept is not a new idea from me. The NATS and many large regional contests routinely use computers for contest management and scoring. In a few of the cases I've been able to examine, these applications still require a modest amount of hand labor. So this month we'll walk through setting up a simple scoring system in Excel and next time we'll discuss the use of macros to automate some of the sorting and other work.

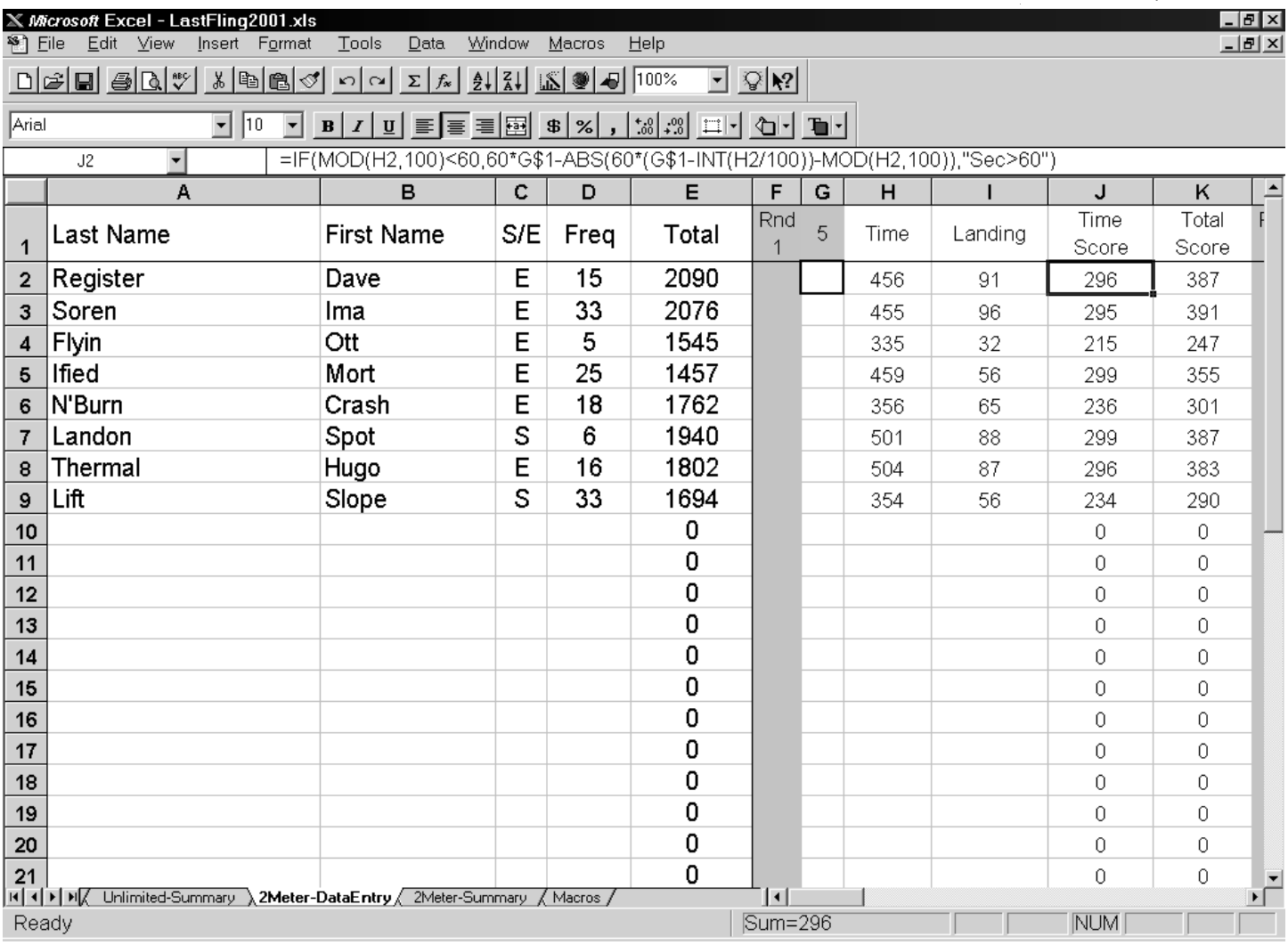
For a club contest, there is almost always someone who has a laptop. A scoring workbook can be easily loaded from a floppy (virus scanned, of course). If there are pre-entries, these can be set up before the event. Even if a hard copy of the results is not printed at the field, the contest can be scored and final results written on the scorecard. The chances for errors in scoring are greatly minimized which eliminates a phone call like this on a Sunday evening:

> 'Fred, this is Joe-Bob. You remember. I CD'ed yesterday's contest? Ummm … That first place award we gave you yesterday …. it needs to go to Sam now. I re-checked all the scores tonight and, instead of you beating Sam by 3 points, he wound up beating you by 1 point……. Now Fred, there's no reason to use language like that where Lynda and the kids can hear ……!"

As many people know by now, a spreadsheet program such as Excel or Lotus 1-2-3 is simply a way of keeping track of a large amount of related data organized by rows and columns. Each intersection point of a row and column is called a cell. A key feature of cells in most workbooks is that they can hold both data and calculations. The calculations can use formulae that draw data from other cells. Therein lies the capability of adding a scoring formula based on time, landing, etc.

Another neat feature of spreadsheet programs is the use of pre-programmed code to automate some of the tasks you want to perform once the data is entered. For instance, for most contests you would like to enter name,

Figure 1: Excel Time Scoring Formula



	A	B	C	D	E	F	G	H	I	J	K
1	Last Name	First Name	S/E	Freq	Total	Rnd 1	5	Time	Landing	Time Score	Total Score
2	Register	Dave	E	15	2090			456	91	296	387
3	Soren	Ima	E	33	2076			455	96	295	391
4	Flyin	Ott	E	5	1545			335	32	215	247
5	Ified	Mort	E	25	1457			459	56	299	355
6	N'Burn	Crash	E	18	1762			356	65	236	301
7	Landon	Spot	S	6	1940			501	88	299	387
8	Thermal	Hugo	E	16	1802			504	87	296	383
9	Lift	Slope	S	33	1694			354	56	234	290
10					0					0	0
11					0					0	0
12					0					0	0
13					0					0	0
14					0					0	0
15					0					0	0
16					0					0	0
17					0					0	0
18					0					0	0
19					0					0	0
20					0					0	0
21					0					0	0

frequency and skill level (Sportsman/ Expert). Once all the entries are in, you would like to do something to help sort out frequency conflicts. You would also probably want to put the names in alphabetical order so the contestant's name can be quickly found once the scorecard is submitted to the scorekeeper. Finally, you might want to sort the 'end of round' and 'end of contest' results by scores so you can easily find the winners.

All of the above functions can be automated using a macro (a pre-programmed piece of code, or instructions). A neat feature of today's spreadsheets is that these macros can be given descriptive names and added to a Menu item. No secret 'ctrl-alt-shift-q' keys are required (although they are allowed).

The T1 event (AMA rule book) is perhaps the easiest task to score with a computer. It's a very simple event and lends itself well to this application. We've also written scoring programs using Max-Man type scoring and other, more complicated tasks so the technique we'll illustrate is not at all limiting.

There are two steps to this process:

- Setting up the scoring algorithm in the separate cells for each round, and
- Writing macros that carry out the sorting and printing functions automatically.

Let's tackle item 1 by an example. In Figure 1 we've printed a screen image of a sample worksheet for the T1 event. The names and scores are fictitious - or at least my score is fictitious at any rate! We've highlighted the scoring formula in cell H2. Let's see how we got to this equation.

What we have are 5 columns for:
Last Name,
First Name,
Entry Class (S/E)
Channel Number and,
Total Score.

The next 6 columns are:
- a separator that identifies which round is being scored,
- the target time for the round,
- the time achieved,
- the landing value,
- the calculated points for time and,
- the total score for that round (time + landing).

Once the contest has started, you would like to lock all the columns in this spreadsheet except the data entry (time and landing) cells. That way it's hard to make a mistake and over-write a cell containing important data or a formula. That can be done by setting cell properties, which we'll cover a little later.

For right now, let's assume we have time and landing entered. How do we do the calculations?

Figure 2: Excel Total Score Formula

Microsoft Excel - LastFling2001.xls

File Edit View Insert Format Tools Data Window Macros Help

Arial 10 100%

K2 =IF(INT(H2/100)-G$1>0,J2,J2+I2)

	A	B	C	D	E	F	G	H	I	J	K
1	Last Name	First Name	S/E	Freq	Total	Rnd 1	5	Time	Landing	Time Score	Total Score
2	Register	Dave	E	15	2090			456	91	296	387
3	Soren	Ima	E	33	2076			455	96	295	391
4	Flyin	Ott	E	5	1545			335	32	215	247
5	Ified	Mort	E	25	1457			459	56	299	355
6	N'Burn	Crash	E	18	1762			356	65	236	301
7	Landon	Spot	S	6	1940			501	88	299	387
8	Thermal	Hugo	E	16	1802			504	87	296	383
9	Lift	Slope	S	33	1694			354	56	234	290
10					0					0	0
11					0					0	0
12					0					0	0
13					0					0	0
14					0					0	0
15					0					0	0
16					0					0	0
17					0					0	0
18					0					0	0
19					0					0	0
20					0					0	0
21					0					0	0

Unlimited-Summary | 2Meter-DataEntry | 2Meter-Summary | Macros

Ready Sum=387 NUM

The rules for T1 are:

- 1 pt/sec up to the target time.
- 1 pt/sec over the target time (down to zero).
- No landing points if flight time exceeds target time by more than 60 seconds.
- Target time can be changed by the CD for each round with a minimum target of 5 minutes and a maximum target of 9 minutes.

Let's build these rules into the spreadsheet score columns. First, notice that in the time column, the minutes and seconds are entered with no separator or punctuation. Most programs have to enter minutes in one column and seconds in the next. For the CD or scorekeeper, that's a couple of extra key strokes and tabs. So my first hint is to just enter it as a straight number in the time cell and let the program work it out from there. As a scorekeeper or CD you have plenty of other things to do.

To get the time score, there are three Excel functions that are very useful:

- MOD function - which returns the remainder after a number has been divided by a divisor,
- INT function - which returns a number down to the nearest integer, and
- ABS function - returns the absolute value of a number (the number without a sign).

As an example, say the time score is 6 minutes and 58 seconds. If this is entered as the number 658 in the time column, then we can extract the total number of minutes and seconds as:

Total Minutes = INT(658/100)
Remaining seconds = MOD(658,100)
Total Time (seconds) = 60*INT(658/100) + MOD(658,100)
Total Time (seconds) = 418

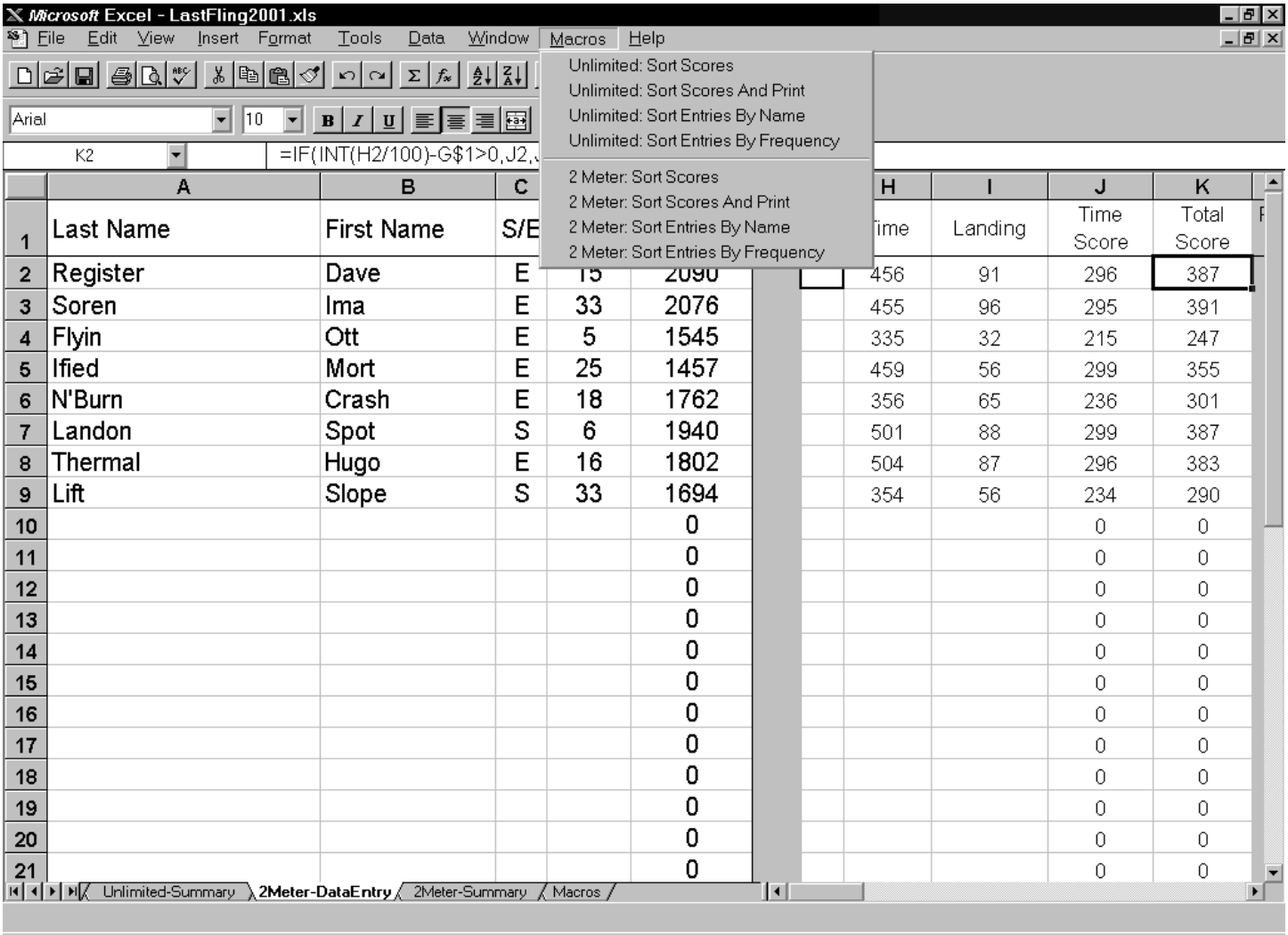
If you have Excel on your PC, go ahead and try it. To be consistent with figure 1, first set up the Last Name, First Name, Entry Class, Frequency and Total Score columns as we've done in Figure 1. Then enter 'Rnd 1' or some other descriptor you like in the top cell of column 'F'. Then add the target time for the round in the top cell of column 'G'. You might also mark the top cells of columns H, I, J and K as illustrated.

With all the headers entered, now place the following statement in cell J2 (everything inside the quotation marks):

"=60*INT(H2/100)+MOD(H2,100)"

Go ahead and try a bunch of different times in cell H2 and play with it a bit. Note that this equation is accurate for time up to and including the target time but does not work for values above the target time (it keeps adding the points). As an example, if the target time is 7 minutes, then a time of 6 min., 58 sec. (418 points) should score the same as 7 min., 02 sec. (422 using the above equation). So we need to fix

Figure 3: Excel Macros Custom Menu



	A	B	C			H	I	J	K
1	Last Name	First Name	S/E			ime	Landing	Time Score	Total Score
2	Register	Dave	E	15	2090	456	91	296	387
3	Soren	Ima	E	33	2076	455	96	295	391
4	Flyin	Ott	E	5	1545	335	32	215	247
5	Ified	Mort	E	25	1457	459	56	299	355
6	N'Burn	Crash	E	18	1762	356	65	236	301
7	Landon	Spot	S	6	1940	501	88	299	387
8	Thermal	Hugo	E	16	1802	504	87	296	383
9	Lift	Slope	S	33	1694	354	56	234	290
10					0			0	0
11					0			0	0
12					0			0	0
13					0			0	0
14					0			0	0
15					0			0	0
16					0			0	0
17					0			0	0
18					0			0	0
19					0			0	0
20					0			0	0
21					0			0	0

things a bit to cover both cases.

We could do that by creating equations for the different conditions (above or below the target time). If we try just a little bit of thinking on it, we can come up with a single equation that handles everything at once. If you've tried all the cases you'd like with the first equation, let's now re-write cell J2 as (everything inside the quotation marks):

"= 60*G$1 - ABS(60*G$1 - (60*INT(H2/100) + MOD(H2,100)))"

(the terminology 'G$1' forces the formula to always point back to Row 1 when the equation is copied to another cell. In this case, the column value, 'G', can change. To lock the formula to cell G1 all the time, type 'G1').

Now if you enter any time within the limits of the task, you should get the correct score no matter if it's over or under the target time. What we've done is simply taken the difference between the perfect score and the actual score and subtracted that from the perfect score. For times greater than the target time, the differential term would be negative which would actually ADD it to the perfect score. So we use the ABS function to knock off the sign of the difference so it always winds up subtracting from the perfect score.

So far so good. But what if you inadvertently type in a value for seconds that is greater than 60 (688 instead of 658 in the example we've used). This is a very common error using a numeric keypad and we have to protect ourselves against it.

There is an easy way to test for that error by using what is called the IF statement. What the IF statement does is check a condition that you define. If it's true, it places one result in the cell. If it's not true, it places another value in the cell.

So how would we prevent this kind of typo? Probably the easiest way would be to look at the last two digits in cell H2 and see if they are less than 60. If so, then proceed with the calculation. If not, put a little warning in the cell. The code would look something like:

IF(MOD(H2,100)<60, Do the scoring calculation, "Seconds>60")

What this form will do is check to see if the seconds that were entered are acceptable. If so, it runs the scoring calculation we've defined previously. If not, it puts a little message in the scoring cell warning that something's amiss. When combined with the actual scoring calculation, the formula in cell J2 should look like (everything within the outer quotation marks):

"=IF(MOD(H2/100)<60, 60*G$1 - ABS(60*(G$1 - INT(H2/100)) - MOD(H2,100)), "Seconds>60")"

where we've re-arranged the formula slightly to simplify it a bit (use a few less parentheses this way!).

Now that you have the basic equation for T1, we also need to check the landing score. Remember T1 specifies a 0 landing if more than a minute past the target time. We can do this with our 'IF' statement again and we'll put this result in cell K2 (everything inside the quotation marks):

"=IF(INT(H2/100) - G$1 > 0, J2, I2+J2)"

This equation simply compares the number of minutes flown with the target time. If it exceeds the target time by more than a minute, only the time score is entered in this cell. If it's less than 1 minute over target, the sum of time and landing is placed in the cell. An example of this formula is in Fig. 2.

Now you have the score for that round fully automated. If you have 20 or 30 entries, simply copy these two columns (Time Score and Round Score) down the J and K columns until you have as many entries as you want. All of the cell references will shift correctly. Remember that we kept the target time pointing back to cell G1 by using the G$1 notation. So that reference will stay pointing to the correct location.

Need to run 5 or 6 rounds? You will need 6 columns for each round (as noted above). Simply copy columns F, G, H, I, J and K into the next 6 sets of columns (L and higher). These columns will now look to cell M$1 for the target time. That's because the target time column value was not tied down and so it moves correctly with the other columns when they're copied like this.

Keep copying the columns for each individual round and adding to the end of the previous round until you have all the rounds you need. You'll need to manually go back in and change the Round value in cell L1, R1, etc.

To add the total contest score in column 'E' just put in a formula that adds the individual round scores for each contestant. For the example used here - 6 rounds - that would look like the following formula in cell E2 (everything within the outer quotes):

"=K2+Q2+W2+AC2+AI2+AO2"

To use this formula for all contestants, simply copy it to all the number of expected entries in this column.

To wrap up for this month, let's do some formatting and locking of cells. First, to format the cells for how you want them to look, you need to set the fonts, font size, centering, etc. for the selected cells. I'm assuming most folks know which tools and menus to use for that.

For those cells that are numbers, you need to highlight those columns (this can be done by clicking on the column letter). Then in the format menu, click on the 'Cells' selection and this will bring up a tabbed selection box for setting cell properties. If you click the 'Number' tab, you should find a list of options for the type of values that can be entered into these cells. You want to highlight 'Number' and normally set the number of decimal places to '0'.

Before leaving this selection box, you also want to click on the 'Protection' tab. If this column is a calculation (such as the total score, time score or round score), then you would probably like to check the 'Locked' option box.' Locked is often the default setting. So for those columns that you want to change (such as names, time and landing data) you'll probably need to highlight them and turn off the 'Locked' option.

Once you have protected all the columns or cells you think are appropriate, click on the 'Tools' menu and select the 'Protection' option. This allows you to protect the worksheet so that all the 'Locked' cells can no longer accept any keyboard entries (as long as

the 'Protect' option is on).

If you've made it this far, go ahead and try and type into one of those locked cells. It should give you an error message that says you can't do that. If you've done all of the above as planned, you should now be protected against entering good data in bad columns and this part of the exercise is now finished.

Finally, in Figure 3, there is a list of options on a new menu for Sorting and Scoring the 2-Meter and Unlimited events. You may also notice that there are more worksheets in there which appear to be 'Summary' type results. We'll discuss where those came from next month - those are our macros for automating the scoring function and they make a very nice complement to the 'Data-Entry' spreadsheet we just created.

Although all versions of Excel allow you to set up a 'Custom' menu like this, the techniques are different depending on which version you are using (Office 95, 97 or 2000). We will cover those differences and also show several examples of macros created in the language used by Excel (Visual Basic). ■

R/C Radio controlled SOARING DIGEST

THE JOURNAL FOR R/C SOARING ENTHUSIASTS

A MONTHLY LOOK INTO THE WORLD OF SAILPLANE ENTHUSIASTS EVERYWHERE

R/C Soaring Digest (RCSD) is a reader-written monthly publication for the R/C sailplane enthusiast. Published since 1984, *RCSD* is dedicated to the sharing of technical and educational information related to R/C soaring.

RCSD encourages new ideas, thereby creating a forum where modelers can exchange concepts and share findings, from theory to practical application. Article topics include design and construction of RC sailplanes, kit reviews, airfoil data, sources of hard to find items, and discussions of various flying techniques, to name just a few. Photos and illustrations are always in abundance.

There are *RCSD* subscribers worldwide.

R/C Soaring Digest
C/O 725 Camellia Court
Santa Rosa, CA 95407

e-mail: RCSDigest@aol.com
http://www.b2streamlines.com/RCSD.html

***R/C Soaring Digest* Subscription Form**

USA: $30 First Class
(CA res., please add $2.18 tax.)
Canada & Mexico: $30 Air
Europe/U.K.: $45 Air
Asia/Africa/Pacific/Middle East: $52 Air
Check or Money Order, only, please. U.S. funds.

Name_____
Address_____
_____
_____

Classified Advertising Policy

Classified ads are free of charge to subscribers provided the ad is personal in nature and does not refer to a business enterprise. Classified ads that refer to a business enterprise are charged $5.00/month and are limited to a maximum of 40 words. *RCSD* has neither the facilities or the staff to investigate advertising claims. However, please notify *RCSD* if any misrepresentation occurs. Personal ads are run for one month and are then deleted automatically. If you have items that might be hard to sell, you may run the ad for 2-3 months.

For Sale - Business

PARACHUTES: $12.50 (includes S&H U.S.A.) Send check or money order to Dale King, 1111 Highridge Drive, Wylie, TX 75098; (972) 475-8093.

DesignAire: EASY TO USE AIRCRAFT DESIGN SOFTWARE (PC). 3-D sketch, performance, Wt/Bal, inertias, color graphs, panel analysis, static stability, airfoils, FAR 23A loads and envelope. Runs "airfoil ii". $119. JammAero POBox 69, Wallops Island VA 23395. www.jammaero.com.

BUZZ WALTZ R/C DESIGNS: Kits & plans. www.buzzwaltzrc.com or phone: 760-327-1775.

Reference Material

Summary of Low-Speed Airfoil Data - Volume 3 is really two volumes in one book. Michael Selig and his students couldn't complete the book on series 3 before series 4 was well along, so decided to combine the two series in a single volume of 444 pages. This issue contains much that is new and interesting. The wind tunnel has been improved significantly and pitching moment measurement was added to its capability. 37 airfoils were tested. Many had multiple tests with flaps or turbulation of various configurations. All now have the tested pitching moment data included. Vol 3 is available for $35. Shipping in the USA add $6 for the postage and packaging costs. The international postal surcharge is $8 for surface mail to anywhere, air mail to Europe $20, Asia/Africa $25, and the Pacific Rim $27. Volumes 1 (1995) and 2 (1996) are also available, as are computer disks containing the tabulated data from each test series. For more information contact: SoarTech, Herk Stokely, 1504 N. Horseshoe Circle, Virginia Beach, VA 23451 U.S.A., phone (757) 428-8064, e-mail <herkstok@aol.com>.

BBS/Internet

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

Books by Martin Simons: "World's Vintage Sailplanes, 1908-45", "Slingsby Sailplanes", "German Air Attaché", "Sailplanes by Schweizer". Send inquiries to: Raul Blacksten, P.O. Box 307, Maywood, CA 90270, <raulb@earthlink.net>. To view summary of book info.: http://home.earthlink.net/~raulb

International Scale Soaring Association

There is a growing interest in scale soaring in the U.S. We are dedicated to all aspects of scale soaring. Scale soaring festivals and competitions all year. Source for information on plans, kits, accessories and other people interested in scale. For more information, write to:

International Scale Soaring Association
37545 Oak Mesa Drive
Yucaipa, CA 92399-9507
e-mail: 70773.1160@Compuserve.com
web site: www.soaringissa.org

T.W.I.T.T.

(The Wing Is The Thing)

T.W.I.T.T. is a non-profit organization whose membership seeks to promote the research and development of flying wings and other tailless aircraft by providing a forum for the exchange of ideas and experiences on an international basis. T.W.I.T.T. is affiliated with The Hunsaker Foundation which is dedicated to furthering education and research in a variety of disciplines. Full information package including one back issue of newsletter is $2.50 US ($3.00 foreign). Subscription rates are $20.00 (US) or $25.00 (Foreign) per year for 12 issues.

T.W.I.T.T., P.O. Box 20430
El Cajon, CA 92021

Sailplane Homebuilders Association (SHA)

A Division of the Soaring Society of America

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

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

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

The League of Silent Flight

The League of Silent Flight (LSF) is an international fraternity of RC Soaring pilots who have earned the right to become members by achieving specific goals in soaring flight. There are no dues. Once you qualify for membership you are in for life.

The LSF program consists of five "Achievement Levels". These levels contain specific soaring tasks to be completed prior to advancement to the next level.

Send for your aspirant form, today:

League of Silent Flight
c/o AMA
P.O. Box 3028
Muncie, IN 47302-1028 U.S.A.

http://www.silentflight.org

The Vintage Sailplane Association

Soaring from the past into the future! The VSA is dedicated to the preservation and flying of vintage and classic sailplanes. Members include modelers, historians, collectors, soaring veterans, and enthusiasts from around the world. Vintage sailplane meets are held each year. The VSA publishes the quarterly BUNGEE CORD newsletter. Sample issues are $2.00. Membership is $15 per year. For more information, write to the:

Vintage Sailplane Association
1709 Baron Court
Daytona, FL 32124 USA

ESL

The Eastern Soaring League (ESL) is a confederation of Soaring Clubs, spread across the Mid-Atlantic and New England areas, committed to high-quality R/C Soaring competition.

AMA Sanctioned soaring competitions provide the basis for ESL contests. Further guidelines are continuously developed and applied in a drive to achieve the highest quality competitions possible.

Typical ESL competition weekends feature 7, or more, rounds per day with separate contests on Saturday and Sunday. Year-end champions are crowned in a two-class pilot skill structure providing competition opportunities for a large spectrum of pilots. Additionally, the ESL offers a Rookie Of The Year program for introduction of new flyers to the joys of R/C Soaring competition.

Continuing with the 20+ year tradition of extremely enjoyable flying, the 1999 season will include 14 weekend competitions in HLG, 2-M, F3J, F3B, and Unlimited soaring events. Come on out and try the ESL, make some new friends and enjoy camaraderie that can only be found amongst R/C Soaring enthusiasts!

ESL Web Site: http://www.eclipse.net/~mikel/esl/esl.htm

ESL President (99-00): Tom Kiesling (814) 255-7418 or kiesling@ctc.com