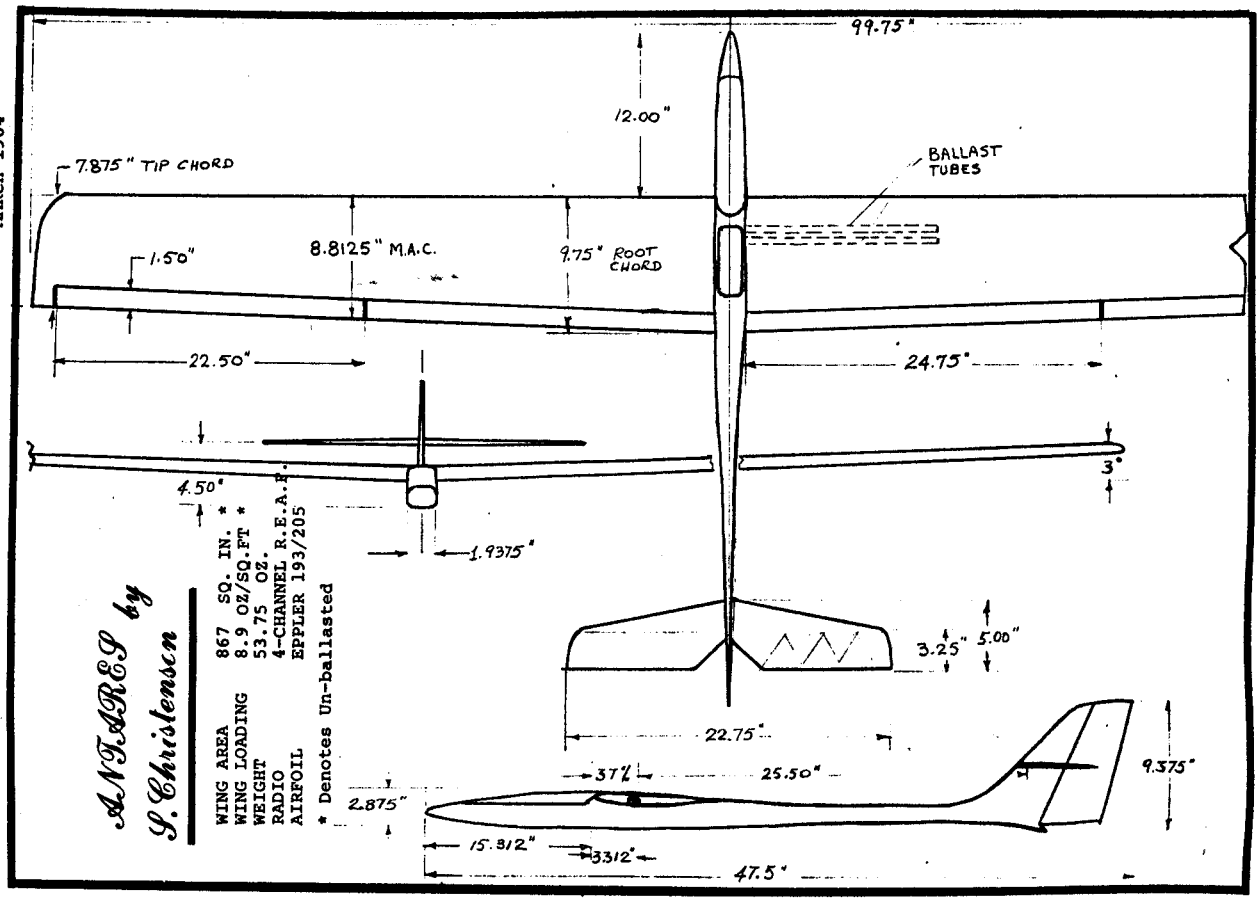
RC Soaring Digest
MARCH 1984
VOLUME 1 NO. 3



FLYSWAPPER

CLASSIFIED ADVERTISING:

RC Soaring Digest will take classified advertising from both individuals and from businesses. The INDIVIDUAL RATE will be 10¢ per word; the BUSINESS RATE will be 25¢ per word. Addresses free. Count only the words in the main ad. Copy must be typewritten and prepayment by check is required. Please submit all advertising copy before the second week of the prior month. For example, February issue ads must be in before January 15th. Checks payable to RCSD.

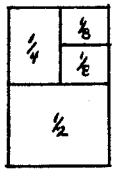
DISPLAY ADVERTISING:

RC Soaring Digest will take display advertising. The rate will depend upon the number of issues in which your ad is to appear, and the following schedule is based on frequency of appearance in RCSD. We suggest, to start, that all ads be typeset and ready for camera.

Ad sizes and formats are as shown in the table below, with the requested dimensions and formats. Full-page, half-page, quarter-page, and eighth-page sizes are available.

Note: All ads, classified or display, will be half price to all clubs and not-for-profit organizations. Ads received too late for publication in the desired issue will be held for the subsequent issue, unless requested otherwise by the advertiser. Publisher takes no responsibility for the accuracy, truthfulness, or credibility of offered merchandise. Any ad repugnant to common sensibility may be turned down by the publisher as unsuitable.

1 issue	3 issues	6 issues	9 issues	12 issues	Sz.
$10	$9	$8	$7	$6	1/8
$20	$18	$16	$14	$12	1/4
$40	$36	$32	$28	$24	1/2
$80	$72	$64	$56	$48	1



Note: Dimensions of ads - 1/8th page - 1/4th-page - 1/2-page

Full: 12"H x 7"W 3"H x 3.5"W 6"H x 3.5"W 6"H x 7"W

RC Soaring Digest
P.O. Box 186
Peterborough, NH.
03458

POSTMASTER: ADDRESS CORRECTION REQUESTED

HI START

It's a bit late to announce at this time, but the Soaring Society of America is holding its 1984 International Convention in Hartford, Connecticut on March 1 - 4, 1984. This will be the first time the SSA Convention will have been held in the Northeast, and the first time the SSA will have sponsored a convention truly international in scope. Hosted by the New England Soaring Council, the Convention will feature many Exhibitors and Speakers of International fame and recognition at the Hartford Civic Center. One of the most interesting symposiums will be the Low Speed Symposium dealing with the high technology of low-speed flight. Subjects include composite structures, aerodynamics and materials. The symposium is held two days prior to the Convention. RCSD hopes to present in future issues some of the interesting material and information gleaned at the Convention. Considerable interest has been expressed by RCSD subscribers for more information about full-scale soaring, so please be patient. We'll plan exactly that for future issues.

THIS MONTH'S COVER

ANTARES - the largest and brightest star in the constellation Scorpius; a red, super-giant; actually a double star with apparent visual magnitude of 1.22, located 250 light years from earth. Also, the newest 'star' of the Top Flite Constellation; a standard-class sailplane suitable for both fun flying and contest work, up to and including F3B tasks

Designed by Scott Christensen and produced by Top Flite, Antares is one of the few flat-wing, aileron ships produced in kit form on this side of the Atlantic.*

Multi-task capable, Antares was designed expressly to offer new levels of soaring capabilities. The design had to be efficient. Scott was looking for, and achieved a tremendous glide ratio by using a combination of an Eppler 193 upper profile 'married' to an Eppler 205 bottom profile, and adding flaps. Beyond that, he achieved control at all forward speeds from a slow walk to high speed. Antares is strong, designed to carry full ballast and to withstand heavy-duty winch launches at maximum gross weight. Very steep launches, excellent flight-path control, and precise speed control are available to the pilot. With ailerons and coupled rudder, you can take advantage of tight, flat turns without the worry of falling out of narrow thermals. Light lift is easily worked at low altitudes. Here are the specs: Horizontal surface area: 949.6 square inches; all-up weight 53.75 ounces dry, to 117.71 ounces fully ballasted; wing loading (nominal) 8.91 ounces per square foot; 4 channels of control; rudder, elevator, ailerons, and flaps; with rudder and ailerons electronically coupled when desired, or mechanically coupled; all-wood construction, Monokote covered; variable camber wings (through use of flaps) to provide -8 degrees to plus 60 degrees; provision for fixed or releasable tow hook; ballsat increase wing loading in increments to 19.55 ounces per square foot; span - 99.75 inches; chord at root -9.75 in., at tip - 7.875 in.; m.a.c. - 8.8125 in.; aspect ratio 11.3:1; wing area- 867 square inches; root airfoil thickness - 10.4%; Tip airfoil thickness - 9.75%; main wing/fuselage joiner: 5/16" diameter by 7.25" hardened steel rods. The tail is conventional with fin-rudder and full-flying stabilator, both of symmetrical cross-section; stab area is 82.6 square inches; rudder area is 32.22 square inches, and the fin area is 30 square inches; fuselage is made up of sheet balsa; tail moment is 25.5 inches, and the nose moment is 15.312 inches. Most of the radios on the market with that use standard, small, or mini servos will fit...but the kit manufacturer recommends that you check first to make sure that your radio will be suitable. Isn't it nice to have an inexpensive, 'home-grown' sailplane with such capability? We suggest you keep an eye on it in '84.

* We will present the Windsong Saratoga from Dodgson designs next month. This, too, is a flat-wing, multi-task sailplane which is capable of F3B task flying.

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Happy Soaring, Jim Jim Gray, Editor & Publisher

LAMINATED SHELL CONSTRUCTION BY A SIMPLE METHOD *

Foreward

In the short description of the reference by Ch. Baron, there was described a construction method for making laminated shell wings in a female mould or form. Without a doubt, this method is the best - provided the builder has a really precise, stable female mould at his disposition, so that the wing constructed therein will be very exact and have the correct profile. Unfortunately, it is the very expense of constructing the female mould in the first place that makes the aforementioned commercially laminated wing so costly. And it is for this reason that such a method is available to only a relatively small circle of specialists.

In the following contribution, Heiko Eberhardt describes two methods of making laminated shell wings without using such expensive female moulds. The technique is substantially simpler, and - with careful execution - the results are quite good.

CONCERNING THE GENERAL WING CONSTRUCTION METHOD

Next to the 'rib' method, the 'sandwich' method of wing construction is the most common - in which a plastic foam core is 'skinned' with a thin veneer of wood to provide strength and good surfaces. However, with wood-planked foam, it is seldom possible to achieve an absolutely exact profile (airfoil shape). Those who skin a foam core with fiberglass directly, seldom achieve satisfactory results for two reasons: the thin fiberglass-over-foam is unable to withstand compression, and wing bending often leads to separation of the fiberglass skin from the foam core.

On the contrary, with the laminated shell wing, the profile contour can be maintained sufficiently well, and the wing is easily capable of withstanding high stresses. The inherent strength obtained by means of the very stiff shells is enhanced by gluing them over a strong, transverse shear web to form two stable torsion boxes, as shown in illustrations 1 and 2. The shear web must be able to withstand the high shear stresses which are the result of the separate (upper and lower) shells trying to work against each other under tension and compression (during wing bending) forces. It is recommended in every case to make the shear web of balsa with its grain running spanwise, and on both sides of the web, laying up cloth at 45-degrees to the stress direction, to increase the strength (of the wing).

MAKING A LAMINATED FIBERGLASS SHELL WING BY THE 'POSITIVE' METHOD

Mark the outline of the wing on to the matte (frosty) surface of a piece of Mylar drafting film. Two films are to be prepared: one for the left wing and one for the right wing. The Mylar films are then attached (as by masking tape at edges beyond the wing outline) to a flat, even, rigid supporting plate (such as a piece of plate glass, or a flat plywood board) with the shiny sides up. (Most films of this kind have a smooth, shiny surface on one side and a dull, matte surface on the other side. Another type of film which is very smooth, and does not allow adherence to itself, is likewise suitable).

Over the visible outline of the wing (on the shiny side of the film, which is uppermost) apply a coating of'Schwabbellack' (white polyester plastic) to provide the previously untreated film with a parting agent. (Note: PVA is often used in the US for the same purpose...as is a coat of wax...Ed.) Be sparing, as each layer of parting agent degrades the surface which is to be preserved. By using the ready-made 'Schwabbellack' a pure, white (RAL 9010) surface is obtained.

Epoxy resin is now applied to the already-dried parting agent, followed by a thin layer of fiberglass cloth (approximately 2-oz. material) which has already been cut to the wing outline shape. To that, there is laminated a previously-cut-out 'substrate' or supporting layer (such as sheet balsa...Ed.) and the whole assembly is bonded together under reduced pressure (as in the vacuum bag method). This results in one wing 'skin.' This process is repeated four times to produce right upper and lower, and left upper and lower skins, each of which has one side covered with fiberglass and parting agent.

*(Translated from an article by H. Eberhardt in Flug + modelltechnik October 1983...JHG)

Markings for ailerons and spoilers (or flaps) may be scratched on to the film ahead of time, making later installation easy. Using the well-known hot wire method, a foam core piece is now cut to the desired airfoil shape. The quality of the foam is unimportant, whether it be large-or small-cell material because it serves only for the imparting the exact desired profile to the substrates.

A layer of glass cloth is usually laminated to the foam core, and - if necessary - additional reinforcement, for example at the aileron, may be provided. A wooden, or at the very least a solid, shear web is built into the foam core.

The previously prepared substrate or stiffener will next be laminated to the foam core by bonding to each other, under reduced pressure, using epoxy resin as the adhesive.

The wings are almost ready, so only the differing thicknesses from profile to profile remain to be fixed. In this respect it is to be noted that the nose radius of the profile is not to be altered, but in the pressing of the skins it is not possible to press in the profile nose shape. Therefore, the nose portions of the skins are to be sanded back enough to glue a wooden (obechi) leading edge to them. This should be very slightly smaller than is required, so that the final contour can be obtained by applying several coats of Schwabbellack (parting agent) and then final-sanding it to contour. In this way it is almost impossible to discern the attachment of the wood nose piece to the shell.

In this way a laminated shell wing is achieved which, admittedly, has a foam core. But, in a wing for a 4-meter (160") sailplane, the excess weight due to the superfluous foam core amounts to about 100 grams (4 ounces) for both wing halves...a difference that is scarcely noticeable.

Wing Shells From A Female Foam Mold

In this method we work with a foam plastic negative, or female, mold which is very simple to make. The core is cut from a block of dense, stable foam plastic (Exporit, or similar) and the negative halves removed from the core serve as the female mold halves; the core itself being used only for pressing.

The negative, or female mold-half must be protected from damage, so each one is glued to a flat wooden board or baseplate. Wood strips are then glued around the sides of the mold form, and a thin fiberglass layer, about half as thick as the slot made by the hot wire, is glued to the exposed upper surface of each foam mold half. (See Fig.3) Note: do not allow this fiberglass layer to extend into the mold cavity; it is for surface protection only.

Now we must make a negative-profile shell from each negative mold half prepared in this way. To do this, we take a piece of plastic film, previously cut to the exact outline shape of the wing, and place it with matte (dull) side down into the foam mold cavity. Next, we apply a gelcoat (Schwabbellack) to the exposed, smooth film surface, after which we lay on a glass cloth with the fibers oriented at 45 degrees, followed by a stiffener material (balsa or foam sheet, for example). The stiffener is cut into at least two span-wise strips and layed in such a way as to leave a span-wise slot between the two strips whose width is the same as the spar web and whose location is at the highest point of the profile (position of maximum thickness on the finished wing) to receive the wing spar.

Then, laminate on to the stiffener material a glass cloth with the fibers oriented at 45 degrees.(Cover the structure formed in this manner with a very thin, protective film such as plastic wrap used for covering food to be placed in the refrigerator, and then place the foam core over this). Weight the foam core and allow to cure. After pressing and curing the wing half-shell is ready.(Note: the other half shell is made in exactly the same way, using the other negative foam mold-half.)

Attachment between the upper and lower shells is accomplished by means of a laminating strip layed into the inner nose radius of both shells (See No. 8 in Fig. 2). These upper and lower shells are separated as in the previous method by a spar web. First, the spar is epoxied into the lower shell, and then the upper shell is epoxied on to it. The gluing steps, in sequence, are: nose radius, spar, and trailing edges. After curing for at least 24 hours, the wing shell is finished.

In both methods it is desirable to use plastic film that is at least 0.2 mm (0.080") thick, and one that does not react with the resin that is applied to it. Suitable materials are MYLAR® and HOSTAPAN® which are comparable products.

H. Eberhardt

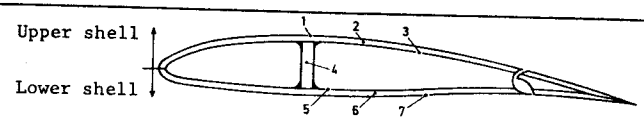


Fig. 1: Wing shell, Type A.

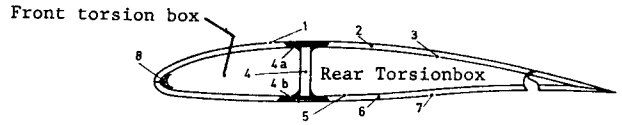


Fig. 2: Wing shell, Type B.

1. Upper shell, outer layer (glass, carbon, aramid fiber)
2. Stiffener material (foam, balsa sheet; veneer)
3. Upper shell, inner layer (same as outer layer)
4. Spar web (glass-foam-glass; or glass-balsa-glass)
5. Bottom shell, inner layer (same as top shell)
6. Stiffener material (same as top shell)
7. Bottom shell, outer layer (same as top shell)
8. Nose radius attachment piece (fiberglass)

Note: Difference between A and B types:
Wing strength is further improved by building in the spar reinforcement caps 4a and 4b...a mthod also used by manufacturers of full-size sailplanes.

Mechanical Properties of Upper and Lower Shells

To insure that the upper and lower shells will be comparable, the fibers of the lacquer-and-fiberglass covering layers(1, 7) are oriented at 45 degrees to the flight path; a high compression strength stiffener material is added (2, 6) and the fibers of another lacquer-and-fiberglass covering layer (3, 5) are also oriented at 45 degrees to the flight path.

The lacquer (Schwabbellack) surface coating has several functions: improvement of the wing surface quality, improvement of laminar airflow, and protection of the moderately strong underlying glassfiber laminate (plastic and fiberglass cloth).

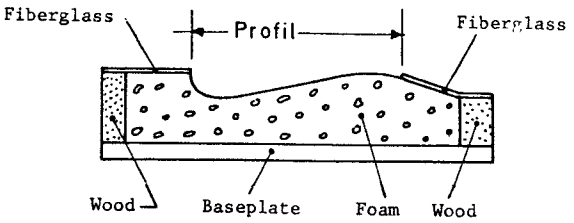


Fig. 3: Schematic of the Foam Mold

(negative method)

Translation from Flug + modelltechnik October issue 1983

MORE ON WINCH "TURNAROUNDS"

After the article (or rather suggestion) in the January RCSD, I received several comments and replies from those who have had experience, and the consensus is don't use a bicycle wheel for a turnaround. Here's why:

From Byron Blakeslee, Colorado: "Regarding the idea of using a whole bike wheel as a turnaround - the wheel (even a smaller one) would have such a large amount of inertia that it would not allow the winch to wind in the line rapidly. If the wheel could get going without breaking the line, the same inertia would severely dampen the 'pulsing' action we like to use on the 12-volt winches.

"It's true that a bike hub has to withstand a lot of punishment, but a good one has several advantages: *good bearings to withstand high loads; *low inertia, *and chrome finish to allow slippage of the line during the times when the line is accelerating faster than the hub can speed up.

" A corollary to the above is: a cheap hub has cheap bearings and will quickly wear out. Pulleys that you can buy in hardware stores are not made for the high loads and speeds that turnarounds must withstand...they don't work!"

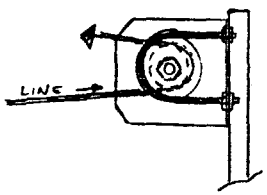
From Terry James of Pembroke, Ontario: "A few years ago, my OFB Ron Davis built a super turnaround with aluminum pulley (custom made) running on dual ball races. Guide rollers insured that the line would center properly, even in cross-wind launches. The whole thing was mounted on a stake which included an integral stake-driving weight. Great!

"The problem was inertia. First, the line made grooves in the pulley during acceleration and then, after release, the 'chute was pulled down, and the line piled up near the turnaround. Launches tended to be less than zippy!

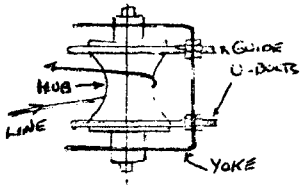
"I think that the bicycle hub has the advantage of low inertia, but of course it's final rotation speed will be very high. Perhaps a light-weight, larger diameter pulley could be optimized for this job."

The next response was from Ted Davey of Davey Systems Corporation: "The problem with a bike wheel is that a guide is required to keep the line in place, particularly when you fly off the line and it is falling free in a down- or cross-wind situation. A larger wheel is certainly desireable because it saves wear on the line and - because of this - I have done some work on the problem, but at this point I am not satisfied with results. To me, a large consideration is the potential for using any new design with my equipment, consequently it must be economically produceable and also work very well. To dat, I have nothing, primarily because it gets too expensive. Anything that is used must absolutely have a ball bearing pivot because of the speed involved; and it must be serviceable. Therefore, it becomes a number of assemblies - and expensive. It can be done with a 16" bike wheel made of fiberglass.nylon, as are my larger RETRIEVER wheels, but no one would pay for it...a top view of the guide technique is shown below... (omitted here, because we all know what a bike hub turnaround looks like...JHG).

" A really good hub should be like this - with ball bearings and, of course, the guides. I'm trying to pin this down, but no luck so far - again, price is the problem, particularly since the center should be about 1½" minimum diameter."



SIDE VIEW



TOP VIEW

The Minnesota RC Soaring Society newsletter, edited by Bob Sealy, brought out some very interesting information in its January 1984 issue...information that may be of great help to those who may be considering a one-design season this year.

"PURPOSE: To allow all club members to compete at a casual level without spending megabucks on the latest super-whiz bang multi-wing everything sailplane. Remember, the basic purpose is to encourage the newcomer and to provide a casual atmosphere for everyone, and to have FUN at low cost.

"RULES:

1. All participants are to fly an Airtronics Olympic 650
2. Aircraft may be scratch- or kit-built. Scratch-built planes must conform to Olympic 650 plans.
3. Basic design must be per plans and not altered in any way; i.e., wing shape and airfoil, fuselage shape,fin-rudder and stab-elevator. Fuselage cross-sectional area may be increased, but not decreased.
4. Non-functional items may be as desired; i.e., fuselages may be glassed, hardware may be any type.
5. Controls are limited to rudder and elevator. Releasable tow hooks are not permitted; however, adjustable Airtronics type may be used.
6. Covering must be Super Monokote.
7. Control surface hingeing may be as desired.
8. Minimum weight, ready to fly will be 26 ounces.
9. Options shown on plans, such as bolt-on wing, removeable tail group and landing skid type, may be included if desired.
10. Contests will be held over the 1984 season on dates to be announced in the newsletter. All tasks are to be of the duration type which may vary at each meet. A minimum of six dates will be announced, of which any pilot must participate in four. If more than four dates are flown, a pilot's lowest score may be discarded, leaving the four highest scores to determine the overall winner. A fee of $3.00 for the season will be collected to purchase prizes or for cash awards for the top three places."

This looks like a good idea, and we'll be watching to see how it works, Bob. Please let me know, and I'll pass it on ... There's no reason, either, that another type of sailplane couldn't be chosen by your club. Some clubs may already have members who fly some other ship. It's up to the membership. However, the OLY 650 has a very good reputation for kit quality, consistency, and good performance. Not a bad choice...JHG.

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F3B PROGRAM APPROACHING DEFINITION (From January 1984 TMSS News)

Since your editor (Herk Stokely) is the district rep and chairman for the AMA's F3B Soaring Team Selection Program, I am fairly up to date on what's happening in the 1984 program developments. The committee is right now voting on the final proposals that will define how we run the US Team selection process this year. There are two proposals before the group which will choose between a new and different speed/duration qualification system and the old quarter/semi-final elimination system. Also on the ballot are decisions about the conduct of the finals, including a man-on-man scoring system for distance and duration. The World Championship in 1985 will be held in Australia in April. There may be a real problem getting enough money to send the team down there. There was a bad over-run in expenses for the 83 team, and AMA hasn't been very understanding about it. We can't afford to get into that fix in 85. We could decide to pass up this World Championship rather than go in the hole and have the over-run put on the backs of the team members as has been done this year. We have begun raising funds already, and I have asked Dan Pruss to undertake the job of beginning the necessary planning for the Australian trip now. We want to know what it will really take to go there so we can decide on a solid basis whether we can afford it. Contrary to popular opinion, AMA does not routinely provide team funding, and if the team goes it will be because of our efforts and preparation. If you'd like to help provide some seed money to help get started with letterhead printing, patch design, and postage needs, send a contribution to Helen Olson, 8875 Ovieda Plaza, Westminster, CA 92683. 'Phone (714) 897-7569.

SCORING SYSTEM
by
Dr. Ed Granger

I devised this system to accommodate a wide range of skill levels. It peaks on the 'odd' minutes like the normal triathalon. Many skilled fliers do not like to have to worry about the two-minute planning that is normally involved in the Triathalon-type contest. I call my scoring system the NOVATHON SCORING SYSTEM. It has odd-minute peaks and even-minute valleys, giving equal odds to pilots using either the straight-line normal score (Score Curve A) or the sawtooth NOVATHON (Score Curve B). Therefore, on the random average, there is no advantage to either "A" or "B" scoring. Obviously, the skilled pilot would elect "B" scoring to take advantage of the possibility of terminating his flight on a 'peak' minute. However, it is easily seen that a little bad planning (luck) can erase the great expectations.

We have tried this system at our contest last fall (Rochester, New York) and everyone seemed to enjoy the flexibility of the system. I also stopped the scoring at 8 minutes, because contestants like to FLY at a contest. Notice that the NOVATHON system tends to encourage shorter flight times. Using this system this past fall (1983) we had 30-36 contestants, and each was able to fly 6 times each day.

I am including the computer program for an H.P. (Hewlett-Packard) type calculator. The code is for the H.P. 15C but can be quickly translated to others. I recommend the programmable calculator to run this event because it is much easier than looking up scores in a table. I include two possible landing scores: the first is just to add 100 points if the landing is within a 50-foot diameter circle; the second awards 100* (% of max score) points for the same circle. I think the large-circle in/out scoring of landing is very encouraging to new pilots and stops the carnage that often occurs with a graded landing circle. No - we did NOT get a lot of 'ties' with this scoring system. This in/out landing was used at the "Nats" for three days and, during that time, we did not see a single tied score.

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SCORE"A"          SCORE"B"          LAND 100          LAND %          CUM SCORE
LBL A             LBL B             LBL C             LBL C           LBL D
SF 2              GSB A             F? 1              F? 1            RCL 0
CF 1              CF 2              RTN               RTN             +
→ H               F? 1              RCL 5             RCL 0           RTN
RCL 3             RTN               RCL 0             F? 2
X                 RCL 0             +                 GTO 2
RCL 1             RCL 4             STO 0             RCL 5
TEST 8 (X<Y)      /                 RTN               X
GTO 1             FRAC                                INT
R ↓               RCL 4                               STO 0
RCL 2             X                                   RTN
-                 RCL3              CONSTANTS         LBL 2
ABS               -                 R 0 = SCORE       RCL 6
CHS               ABS               R 1 = 480         X
RCL 2             2                 R 2 = 420         INT
+                 X                 R 3 =  60         STO 0
STO 0             -                 R 4 = 120         RTN
RTN               RCL 3
LBL 1             +                 LAND 100          LAND %
SF 1              STO 0             R 5 = 100         R 5 = 1.21
0                 RTN                                 R 6 = 1.24
STO 0                     ENTER TIME AS
RTN                       MIN.SEC AND HIT EITHER KEY A OR B FOR SCORE
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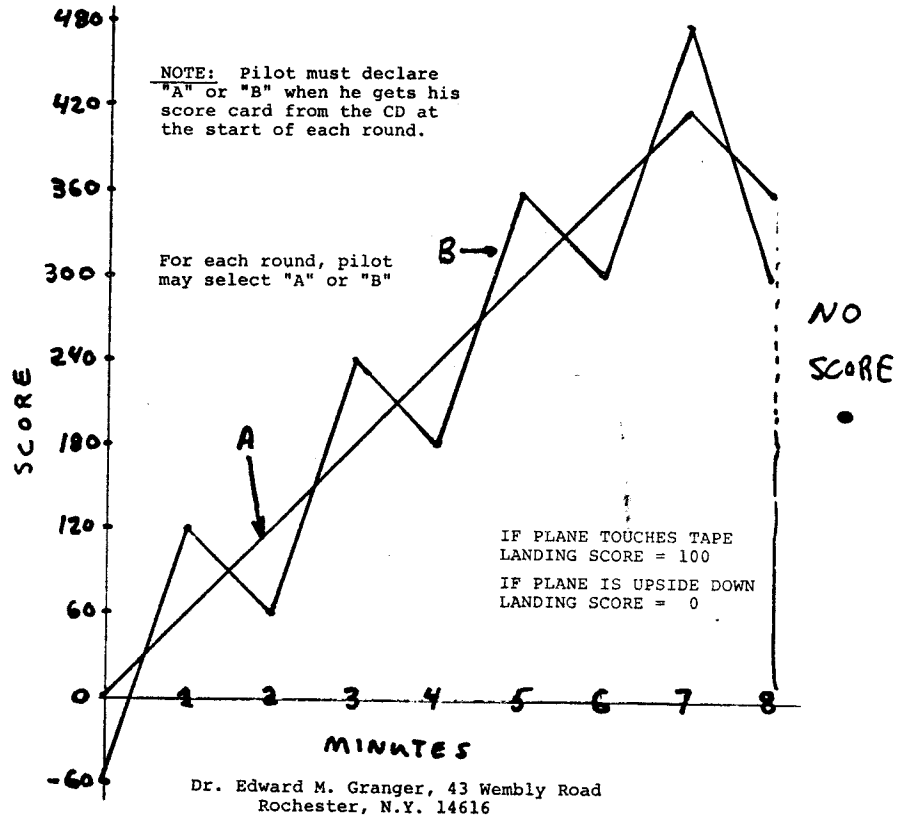
Bob Sealy Reports: (In the Minnesota RC Soaring Society newsletter)

Airtronics has also discontinued four of the sailplane kits. These included the AQUILA, AQUILA GRANDE, SQUARE SOAR (my first sailplane), and the SAGITTA XC.

In the making are two new kits. The first is a polyhedral wing that uses the Sagitta 900 fuselage. The airfoil is yet to be determined. This one appears to be identical to the 900 with a possible change in airfoil and planform.

The second kit in the works is another Standard Class sailplane. It will be more FAI oriented with flat wings, flaperons, fiberglass fuselage, and undetermined airfoil. Wing construction possibilities are balsa/spruce or foam cores. Expected May or June.



Dr. Edward M. Granger, 43 Wembly Road
Rochester, N.Y. 14616

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MORE CONTEST INFORMATION - TENTATIVE ESL SCHEDULE: 1984

6-9/10	Lancaster, PA	LASS THERMAL DURATION	Denny Gerlach
6-16/17	Syosset, NY	LISF THERMAL DURATION	Gordon Stratton
6-23/24	Valley Forge, PA	VFSS (NSS MEET?)	Jeff Troy
6-23	" " "	ESL DINNER	" "
6-30/7-1	Washington, DC	CASA 2-METER/SCALE	Skip Schow
7-7/8	York, PA	YORK THERMAL DURATION	D. Goughnour
7-14/15	Reading, PA	DBSF THERMAL DURATION	J. Zeigenfuse
7-21/22	Pinebush, NY	SKST THERMAL DURATION	Ken Hazen
7-28/29	Lakehurst, NJ	MVSF THERMAL DURATION	Rick Wyckoff
8-11/12	Lincroft, NJ	MMAC THERMAL DURATION	Jim Harmer
8-18/19	Valley Forge, PA	LSF REGIONALS	Jeff Troy
9-8/9	Washington, DC	CASA THERMAL DURATION	Skip Schow
9-15/16	Reading, PA	DBSF 2-METER/SCALE	J. Zeigenfuse
9-22/23	Bainbridge, NY	FALL THERMAL DURATION	D. Ellingson

Call Gordon Stratton 1-212-847-8299 for further information. Info from LI SILENT FLYER, January 25, 1984.

LEAGUE OF SILENT FLIGHT LEVEL V's AS OF AUGUST 14, 1983

1.	John Baxter	024	July 3, 1975
2.	Steve Eork	571	Dec. 15, 1975
3.	Fred Weaver	283	Sept. 17, 1976
4.	Neil Nolte	586	May 30, 1977
5.	Marvin Qualls	1639	Feb. 19, 1978
6.	John Newman	1632	Aug. 17, 1978
7.	Don Harris	810	Aug. 27, 1978
8.	Chris Adams	348	Oct. 15, 1978
9.	Tom Christian	074	June 24, 1979
10.	Dwight Holley	2259	July 8, 1979
11.	Howard Sears	294	July 12, 1979
12.	Ken Bates	604	Aug. 26, 1979
13.	Paul Wedeking	2540	Nov. 4, 1979
14.	Craig Foxgord	882	Jan. 27, 1980
15.	Pat Flinn	2160	Aug. 8, 1980
16.	Jack Hiner	383	Oct. 12, 1980
17.	Keith Kindrick	1693	May 17, 1981
18.	Gerald Zeigenfuse	944	June 13, 1981
19.	Don Clark	082	June 28, 1981
20.	Don Goughnour	595	June 28, 1981
21.	Jim Porter	194	July 12, 1981
22.	Don Paterson	1365	Aug. 23, 1981
23.	William Meleske	1227	March 4, 1982
24.	Otto Heithecker	170	July 4, 1982
25.	James Bohmer	1460	Aug. 8, 1982
26.	Warren Plohr	334	Aug. 8, 1982
27.	Robert Steele	800	Aug. 15, 1982
28.	Walt Good	063	March 22, 1983
29.	Mike Reagan	193	July 3, 1983
30.	Bob Robinson	402	Aug. 14, 1983

CONGRATULATIONS TO THESE LEVEL V LSF FLIERS. MORE TO COME!
The above list was transcribed from LEAGUE LINES, the official newsletter of the League of Silent Flight, Box 647, Mundelein, Illinois 60060. If you're not a member, be sure to write and ask for the application papers.

SOARCES

SCOTT'S MODELS from Mission Viejo, California is kitting the Tempest in both 60" and 72" sizes He also sells the Jack Chambers airfoil packet for $9.95. It contains 32 pages of airfoils, including 14 root 'foils and 16 tip 'foils...all in many sizes between 3.5" and 8" chord. The Tempest is a true thermal sailplane featuring a 7% thick solid-balsa wing with Phillips entry and high point at 34% of chord (Jack Chambers design). It has a fiberglass graphite fuselage with molded wing fairing and canopy lip; removeable wing and elevator; all-up weight of 21 oz. with 7 oz. of radio gear; length 38", span 60"; wing area 305 sq. in.' and all-flying stabilizer-elevator. The kit contains 4 solid-balsa pre-machined wing panels with spruce leading edges, 6 root airfoil templates and 2 tip airfoil templates for finishing; 2 wingtip blocks, fiberglass for wing center section, 5 hold-down screws and dowels; pr-joined fiberglass graphite fuselage with carbon-fiber tailboom installed; fiberglass canopy and wing turtledeck; finished fuselage bulkheads; complete hardware including 2 cables, 4 quick links, horn assemblies, etc.; precut and finished vertical fin and T-tail mechanics; wood for elevator and rudder framing; 7 pages of detailed instructions (11" x 17" size). The Tempest, according to Scott Metze is a true thermal soarer. He says you can slow-turn to the top of a thermal and then dive out at 70+ mph to penetrate the sink, and then use the stored energy to reach the same height in the next thermal. You can separately order a flush-mounted tow hook assembly. Tempest kit $125, all postage paid in continental U.S. California residents add 6% sales tax. Write or call SCOTT'S MODELS, 24755 Acropolis, Mission Viejo, California 92675. Telephone (714) 581-6664. This sailplane looks like a very streamlined pod-and-boom modern soarer with a high T-tail and sleek lines. I'm waiting for the 72" span version, scheduled soon.

MORE SOARCES...

In a recent Eastern Soaring Lines, Gordon Stratton reported that he got two volumes of Eppler profiles from Wilshire Hobbies, 3006 Wilshire Boulevard, Santa Monica, CA 90403. Tel: (213) 823-9362. Volume I contains the Eppler 205, 207, 209, 374, 385, 392, 180, 182 (which was used to set the speed record) 184, 186, and some lesser-known profiles. Volume II contains the Eppler 193, 195, 197, 201 and 203 airfoils There are at least two pages on each profile, (in a dozen or more sizes) as well as polar curves and text showing which families of airfoils to use when using several airfoils on a single wing (tip, mid-span and root, for example). The text is in German. Also, Wilshire (which does not discount) has many other 'goodies' for the sailplane and electric enthusiast, including those hard-to-find German linkages, etc. Send for your catalogs ($1.50 for sailplane stuff and $2.00 for electric stuff). The Eppler profile books are $7.50 each. Send enough to cover postage and handling, too.

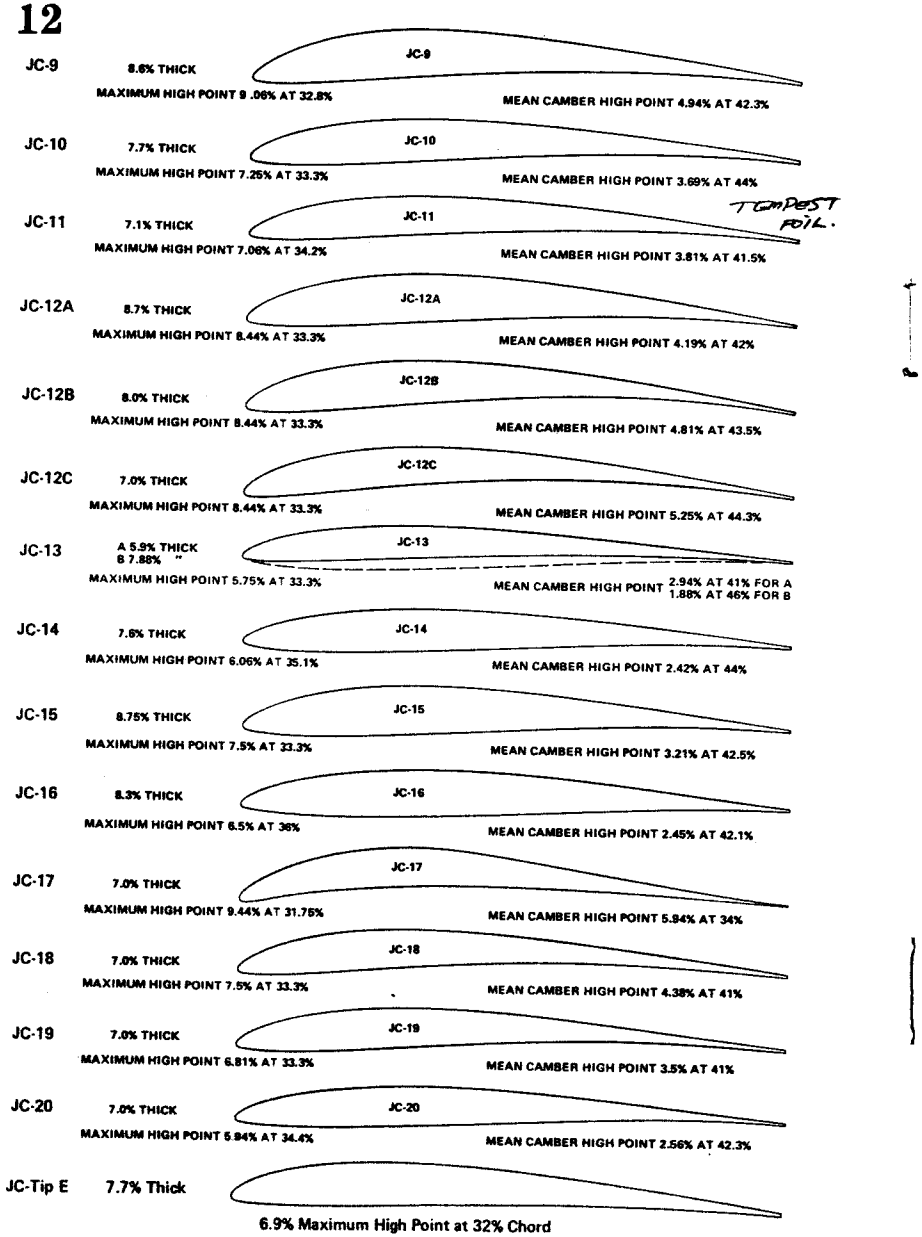
COMPUTER - DRAWN, LASER-CUT AIRFOILS are available from Lee Murray, 1300 Bay Ridge Road, Appleteon, Wisconsin 54915. If you are looking for accurate profiles of the Eppler 214 and others, call or write Lee for information. These are cut in plywood about 3/8" to 1/2" thick, and have superbly smooth edges, ideal for using to foam-cut wings, for tracing around to build ribs, or about anything you could imagine. They come on (or in) a mother board, taped in place for protection. To remove a single profile from the board, merely lift the tape, and the airfoil will drop right out, neat and clean. Lee will supply sizes of your choice, but standard sizes are 6" to 12" in one-inch increments. You get the full range of sizes on one board...seven profiles in all. The cost is $25 for the Eppler 214, and $50 for a custom-cut 'foil. Lee can also adjust the profile for the thickness of 'skin' you plan to use for covering the wing. Incidentally, Lee gave a talk at the Soaring Symposium in Madison, Wisconsin* The subject was Computer-aided Wing Design and Construction, and covered the use of a theoretical velocity polar for design evaluation; the use of laser-cut airfoil templates for precise reproduction of airfoil contours; and a versatile plotting program where the positions of wing skins, spars, shear webs, leading and trailing edges are noted. These plots are precisely scaled to individual ribs and a specific airfoil for which co-ordinate data are available. Listings of the"basic"programs are provided, some of which have been run on the Atari, TI,and TRS-80 home computers. A paper on the velocity polar is provided. Reprints of the symposium are available from Al Scidmore, 5013 Dorsett Drive, Madison, WI 53711. The entire day-long program featured Dan Pruss on sailplane design; Design criteria and airfoil selection by Star. Watson; Contests panel moderated by John Lusk; Launching Systems by Al Scidmore; Hand-launch RC Gliders by the Milwaukee Thermal Soarers; Record Attempts and Cross-Country Soaring Panel; Sailplane Kits by Scott Christensen (Antares designer); R/C Electronics by Peter Waters of Kraft; New Construction Techniques and Materials by Keith Scidmore; plus a general Show and Tell featuring sailplanes, winches and gadgets.

* The Madison Area Radio Controlled Soaring group (M.A.R.C.S.) sponsored and hosted the symposium.

GOOD BOOK

If you want a splendid book, written in an easy-to-understand manner, by an expert, get LOW POWER LAMINAR AIRCRAFT DESIGN. It was authored by Alex Strojnik, 2337 East Manhattan Avenue, Tempe, Arizona 85282. It costs $19.50, and can be the best book in your library. Alex has put his ideas into practice and has built a powered sailplane using the information described in the book. The information contained is a revelation because it can help you understand engineering design and aerodynamics, simply and clearly. It will be ideal for scale builders, and any other having an interest that goes beyond the "Insert tab A into slot B" school of building.

R/C SAILPLANE AIRFOILS AS DEVELOPED BY JACK CHAMBERS



Recommended for use with JC-9, JC-10, JC-11, JC-12A, JC-12B, JC-12C, JC-15, JC-18 and JC-19

Information about Jack Chambers' airfoils provided by Scott Metze of SCOTT'S MODELS, 24755 Acropolis, Mission Viejo, CA. (714) 581-6664

From THE THERMALIST, newsletter of
The Soaring Society of East Tennessee
January 1984

RELATIVE STRENGTH OF WING RODS

The strength of a wing rod is proportional to the cube of its diameter. This fact can be used to compare the relative strengths of rods of different diameters. We will work with the diameters in sixteenths of an inch because this simplifies the calculations. For example, a 1/4" rod has a diameter of four sixteenths, so we take the cube of 4:

4 X 4 X 4 = 64 = "relative strength"

Now, doing the same thing for a 5/16" rod, we get:

5 X 5 X 5 = 125 = "relative strength"

Thus the relative strength for the 5/16" rod compared to a 1/4" rod is 125/64, or about 1.95. This means that a 5/16" rod is as strong as 1.95 1/4" rods. Actually, it is better than this, because when multiple rods are used it is almost impossible to load them equally; thus they cannot both be loaded to their maximum strength. So the 5/16" rod is probably stronger than two 1/4" rods.

Another advantage of single-rod construction is that it eliminates the annoying problem of lining up the rod tubes exactly parallel when building the wing. Also, the structural design is simplified, since the problem of transferring the load from the main beam to the sub-spar is eliminated. The total bending load is handled directly by the main beam and by the rod box and rod within the main beam, which is a much more efficient method.

Continuing with our calculations, we see that the relative strength of a 3/8" rod is:

6 X 6 X 6 = 216

and this is equivalent to more than three 1/4" rods (because 216/64 = 3.37). Thus in a Sailaire a 3/8" rod would give ample strength for a strong tow.

If the rod diameter is 7/32" we can express the diameter as 3.5 sixteenths and take the cube of 3.5:

3.5 X 3.5 X 3.5 = 42.9 = "relative strength"

A factor that hasn't been mentioned yet in this article is the hardness of the rod. Most wing rods are made from tool steel drill rod, which is sold in the "soft" condition and which must be "hardened" by heat-treating to develop adequate strength. The relationship between hardness and strength is given by the following table, which was obtained by Ed Dumas from a steel properties handbook:

TOOL STEEL DRILL ROD

Table 1. Hardness vs. strength

Hardness, Rockwell-C	Tensile strength (LB/IN^2)
56	313,000
54	292,000
52	273,000
50	255,000
48	237,000
46	222,000
44	208,000
42	194,000
40	181,000
38	171,000
36	162,000
24	120,000

OBSERVATIONS FROM THE IMS IN PASADENA

Ted Davey attended the International Model Show in California a few weeks ago, and had these things to say:

"A really fine hall for the show; nice, high ceilings for the blimps, rubber jobs, electric C/L and indoor electric; yes, you read that right, they flew a 4' or 5' job right over the crowd in great big Figure 8's.

KRAFT had their new Channel Master set with frequency synthesis to let you simply dial in the frequency, including those that become legal in 1991. I don't know the price.

BOB MARTIN had his usual display, plus cloth bags for TX and Hobie Hawk boxes and a few completed Hobie Hawks for $250.

HOUSE OF BALSA had emphasis on gliders; the 2X2, 2X6 & 2T.

SCOTT'S MODELS had their solid-wing gliders which are rather small (see elsewhere this issue).

CRAFTAIR had no Sailaires or Vikings orSD-100's or Golden Eagles or Windrifters; only the Freedom and a NEW Fiberglass Freedom, and a Drifter, plus a couple of new powered jobs.

SIG showed the usual line but no new gliders; the AstroHog is finally priced at $79.95, but is still two months off.

CALIFORNIA SLOPE SOARERS had a neat slope soarer on display.

LEISURE AND ASTRO were both pushing cobalt-magnet motors.

SAILPLANES OF THE WORLD from Modesto had a huge pile of the nicer imported kits, and appeared to do well. The prices are higher than those of Hobby Lobby, but -for a Californian - the cost of shipping from the East is high anyway. Probably come out even.

LARRY JOLLY had more new kits, including a big one.

HOBBY HORN'S Bob Schliff says he is close to having more 'electric' kits available...hopefully for sport flying.

All in all, it was a good show, with 84 exhibitors and about 130 booths, and good crowds...particularly on Saturday.

TOWER, ACE, FUTABA, TOP FLITE are a few of the 'biggies' I did not happen to see there."

HELP WANTED

Terry James of Ontario asks for helpTO SOLVE THIS PARTICULAR PROBLEM:

"What is the best way to cut KEVLAR cloth? My method is to use a new, sharp X-acto blade in a stout holder, and use a pine board as backing for the cut. Results are not always neat & tidy! Help is needed.

SUGGESTIONS

Bob Sherliker of Ontario would like to see a North American F3B Championship to be held on 'off years' when the World Championships are not being held. Sounds like a good idea, Bob, and I wonder if perhaps that might be a way of selecting the U.S. and Canadian W.C. teams? Bob thinks the midwest might be a possible venue, drawing a lot of interest from both US and Canadian fliers. What say, gang?

Boron Fiber

Curt Stevens
24692 Nympha
Mission Viejo, CA 92691

Boron fiber is a relatively new material to modelers, although it has been used for industrial purposes for some time. It is stronger and lighter than carbon fiber. If you need some, write to Curt.

MISCELLANEOUS INFORMATION-WINGTIPS

NEED A WINCH QUICK-DISCONNECT? Use welding connectors, available for about $2.00 (per male-female pair). They will take 600 amps without trouble. One part on battery lead, other part on motor lead.

NEED SPECIAL AWARDS PLAQUES? Write to Dave Davidson of PLAQUES INTERNATIONAL, 1113 Naples Drive, Orlando, FL 32804. Mention RCSD.