



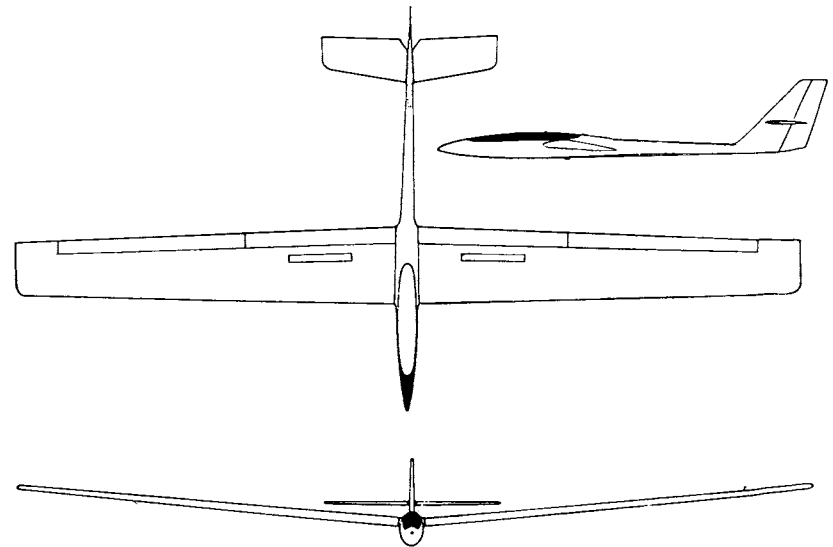
Vol 6.

No. 3

March 1989

RICHOCHET "UNLIMITED"

By Grant Finlay & Southern Sailplanes of Australia

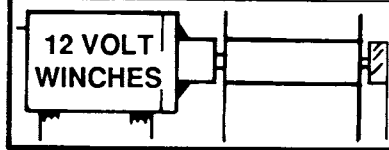


Span	108 inches
Area (est.)	985 sq. in.
Airfoil	Grinsberger RG-15
Weight	6 - 7 lbs.
Length	53 inches
Controls	A, E, F, R
Wing Loading	14 - 16+ oz./sq. ft.
Root Chord	10.25 inches
Tip Chord	8 inches

Featured on page 2

FLIGHT LINE SYSTEMS

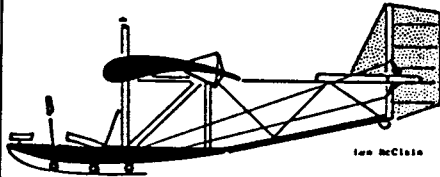
P.O. Box 1502, Lewiston, Me. 04241



For information Contact
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Lee McClise

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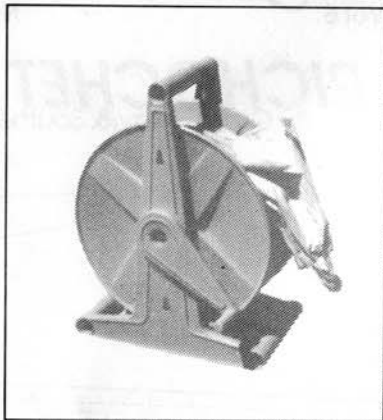
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High Start

This month we'll go for a little change of pace: no F3B, NSS, AMA or earth-shaking catastrophe...just a little ol' reminiscing and ruminating (Did I hear a sign of relief?).

Vacuum bagging is of current interest among builders because of the opportunity to achieve flawless surfaces on wings, tails and other relatively planer objects. Progress in the fine art of preparing a wing with cloth and resin, a suitable air-tight bag, proper inlet and outlet orifices, and all of the other "arcane" techniques has been nothing less than astounding! A couple of years ago only a handful of builders were using the system, but now it's widespread. You've seen Hi Performance Sailplanes ads in recent issues of RCSD, and - this month - you'll see an ad from Channel One Productions, on the subject of vacuum bagging.

Suffice it to say that the new techniques have replaced the "silk and dope" covering of yester year (and it took a real "artist" to do a fine job), or the banana oil and tissue of even further back, to produce strength and beauty that is unsurpassed - even in full-size sailplanes. Even I have been encouraged to (someday) try my luck at this gentle art without too great a fear of damaging or destroying something irreplaceable. Even Ye Ed might be able to do a creditable job, and all because of the HELP modelers are getting from knowledgeable masters of the art. A review of Channel One's video in this issue will bear reading for those of you who still fear a "hands-on" approach.

In recent months I've noticed that another little nest of sailplanes has been fledged by Culpepper Models of Dubuque, Iowa. Here, we have a meter-and-a-half CHUPEROSA, a tiny hand-launch sailplane that has set a Class A distance record of over 6 miles! Then, there's Terry Edmonds' 2-meter IO and Standard Class CALLISTO being kitted by Culpepper. Soon, you'll see an ad in RCSD for them.

Speaking of hand launching, my arm hasn't been up to the task for many moons (or suns, for that matter), yet I absolutely enjoy these tiny sailplanes...possibly because of a long-held belief that "good things come in small packages". So, I up and ordered the plans for ZEPHYR, a 52-inch span hand-launchable sailplane designed by Bob Owens, and originally appearing in MA back in the early 80's. ZEPHYR also happens to be the only HLG that I've ever been able to soar successfully...and that's out of half a dozen different ones tried. So, with luck, I may have it ready for the coming season. One nice thing: it can sit in the back of the car, fully assembled, ready to go. Just pick it up, switch it on, and HEAVE...

For many of today's soaring pilots the BIGGEST event and most desired one is CROSS COUNTRY SOARING. This year, in California, there will be an International Cross Country contest, and you'll read about it in RCSD—both before and after the event.

Slope soaring has become almost as popular as thermal soaring—even more so, in areas where slopes are available. Read about a new Mark Foster video in this issue that covers the famous and not-so-famous slope soaring sites.

Finally, like me, you probably want to know what's next. Wanna know what I think? It's ELECTRIC-POWERED SAILPLANES and SOARING. Heck, they're here already, right in front of our eyes, yet there hasn't been an overwhelming urge on the part of "purists" to enter this fascinating new aspect of soaring. Let me put it this way: whether or not you're a purist, it will soon be the ONLY way to launch a sailplane. Yep, I'm serious, and here's why.

Available flying sites (and by that I really mean LAUNCHING sites) are becoming fewer and farther between. The greed for unused flat land has become astronomical among those who lust for land as a means of quick profit. Airports are going or have gone...dozens of them in every state each year. Park land is becoming scarce for our purposes, golf courses

The show stopper of the scale slope meet in Richland last May was a model of the Northrop YB-49. Many people take pride in recounting the experience of seeing the original YB-49 in flight, and anyone who has seen its graceful shape in the science fiction movies of the fifties can readily understand their awe. It was an absolutely beautiful airplane in the air, and the model at Richland was just as impressive. It was hard to imagine that it was a glider.

Nearly everyone now knows that the B-2 "Stealth" is a flying wing, and, based on the demise of the YB-49, there are of course questions as to the suitability of a flying wing as a bombing platform. To see the B-2 in proper perspective, it is wise to first get some facts about the YB-49. Along the way, perhaps we can learn something about the design and stability of our tailless models.

The YB-35 (propeller driven) and the YB-49 (jet powered) proved the span-load theory for large aircraft. In a conventional airplane, the fuselage and tail assembly produce a large weight and inertia load on the wing-fuselage junction. Since there is no fuselage and tail assembly on the flying wing, the weight and inertia distribution is along the entire wing, and the bending moments are much smaller. Surprisingly, maximum loads on the flying wing may occur during landing rather than maneuvering in flight or gusts. If an airplane is to always land and takeoff at the same speed, then its weight can increase only with the square of its size. The bending moments, however, increase by size cubed, as does weight. You can thus build a bigger airplane, and obtain the effects of increased Reynolds Number and greater payload, by going to an all wing design.

Some of the quirks of full sized flying wings don't appear in RC models. The primary example of this is elevon loading at high angles of attack. A wing stalls from the trailing edge forward and so the pilot of a full sized flying wing would feel the elevators/elevons being lifted by the vacuum. If he did not keep forward pressure on the stick the rising elevators would contribute to an even higher angle of attack and a worsening stall condition. During such a stall, the pilot would view the airplane as being longitudinally unstable. It is felt that the crash of the N9M (the one third size plywood forerunner of the YB-35) was due to just such a condition. The servos in our models don't perceive such feedback from the control surfaces, and we, as pilots, are infinitely removed from flight forces by virtue of the fact that we are on the ground rather than in the cockpit. The YB-35/YB-49 had devices installed which prevented aerodynamic forces from being transmitted to the pilot.

The designers of the YB-35/YB-49 provided a means of achieving high lift for takeoff and landing. Although the airfoils used were symmetrical (NACA 6513-019 at the root, NACA 6513-018), the wing twist was 4°. This placed the root section at a positive angle during flight, with the wing tips exerting a small down force behind the CG. Flaps were used during take-off and landing to provide the high lift needed, and they could be lowered 50°. Since they were close to the CG their effect on the pitching moment was quite small.

Both the YB-35 and YB-49 were stable and controllable. The crash of the YB-49 piloted by Glen Edwards occurred during flight #25 of the testing program, while investigating low power stalls at high altitude. The airplane, whether due to excess weight, Edwards' piloting it outside the safe flight envelope, or another factor, flipped during a stall and somersaulted until crashing into the ground.

The demise of the YB-49 program probably was not due to the crash. Jack Northrop stated that while the YB-49 had won the competition with the B-36, the Air Force wanted the production lines to be at General Dynamics in Texas. There was a merger demand from

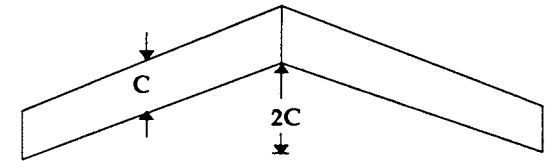
the secretary of the Air Force, Northrop claimed the terms to be unreasonable, and the YB-49 contract was cancelled. Why the Air Force crews with torches destroyed all of the remaining YB-49s, even those on the assembly line, is not known.

The B-2 "Stealth" takes advantage of many new technologies, including computer designed airfoil sections, composite construction techniques, and active flight controls. The resulting design is a high speed long range airplane. Add to all of this the fact that an all metal flying wing without radar defenses produces one tenth the radar image of its conventional counterpart. Constructed of low reflectivity composites and endowed with a unique outline the B-2's radar image will be very small, if it exists at all.

What, of all of this, can we apply to our tailless models?

Any fuselage parts should be eliminated, if at all possible, to both reduce drag and take full advantage of span loading.

Problems that full sized flying wings have with a shifting CG don't show up in our sailplanes. We have no fuel to use, no bombs to drop. If we're careful with CG placement, wing sweep and wing twist we needn't worry too much about instability. In an article in TWITT newsletter #4, Irv Culver (of Lockheed "Skunkworks" fame) promoted the idea outlined in the drawing below. Simply put, to assure that a flying wing doesn't get caught in its own lift circulation, make sure that the "crotch" is DOUBLE the average chord. (The YB-49's ratio was only 1/3 of this.) When properly designed, our aircraft have no need for "black boxes" to maintain stability.



Our aircraft are remotely piloted, meaning that flight loads are not transmitted to us; we navigate our models by their orientation in the sky, not by our perception of the horizon from inside the airplane. This can be an advantage.

Wings are very fast, considering their wing loading, and flaps are a very effective way of getting them to slow down. Flaps can and should be used. Remember to keep the flaps close to the CG, and use flap/elevator mixing if your transmitter has that capability, otherwise you may need to make provisions for a mechanical device.

One item which we have not addressed here is wing twist. There are three methods for achieving the twist required for stability. The first is the simple method that we use in making a foam core wing which results in a straight leading and trailing edge. The second method places most of the twist in the outer portion of the span. The third method, supported by Irv Culver, puts most of the twist at the wing root. This at first seems a rather strange thing to do, but it does optimize span loading and may provide other benefits. We'll discuss all three methods in a future article.

The YB-49 model that appeared in Richland was constructed of foam and covered with fiberglass and epoxy, spray painted aluminum. The fins that project both above and below the wing were made of lite-ply. Small diameter dowels extending from the lower fins were inserted in brass receiver tubes in the wing, holding them in place but allowing them to be knocked off during landing. The flight performance, as mentioned above, was sensational. Jack Northrop would have been proud!

Most of the information on the YB-35/YB-49 was found in an article by William R. Sears, a professor in the Department of Aerospace and Mechanical Engineering of the University of Arizona, and published in *Aerospace America*, July, 1987. ...continued on page 10

Here's something you absolutely MUST know about — a great hour and a half video that shows you how to vacuum-bag foam-core wings, using fiberglass and epoxy. It shows everything, leaving not the slightest "how to" detail to the imagination.

I used to be very much afraid to try new methods and techniques for fear of spoiling good materials and good equipment...but after seeing this great "how to" lesson, I would be confident that with one or two tries, I'd be able to turn out a satisfactory wing.

Julian Tamez tells all: what materials to buy, what tools to use, where to get them, and why you need them instead of substitutes. What is the best way to begin, and what you need in the way of an assistant at the critical points...it's all there.

Not only that, you'll want to watch it again and again because of its fascination in watching a true professional at work. Haven't you always delighted in seeing a craftsman turn out an exceptional product? Well, then, you'll really enjoy this video for its entertainment value alone. I'll warn you, though, it will make you want to head for the shop and turn out some wings yourself — right NOW!

One more thing: this is only the beginning. Julian's next one will deal with making a mould for building fiberglass fuselages...and the video will be out by the time you read this. With the materials, techniques and knowledge you need to build a "Modern" sailplane with space-age materials, there's no reason you can't have a competitive machine in any category you wish. Only one thing: the pilot has to be up to the machine...and maybe Julian will do a video on that, too, one of these days. For only \$34.50 plus S&H you will get several hundred dollars' worth of value and knowledge as well as dozens of hours of time saved by doing things right the first time. (Julian Tamez, Channel 1 Productions, 19827 Bishops Gate, Suite No. 1, Humble, TX 77328; Telephone (713) 278-4575)

Pilot Error

In the February 1989 issue of RCS, please refer to page 10: Eppler Airfoils continued...line 8 should read: "...low sink rates as long as the Reynolds Number is NOT lower than 100,000. However its..." The meaning is clear: to get a low sink rate, you have to have a R.N. over 100,000. One of those Gremlins grabbed the not and ran off with it at a crucial moment in the proceedings. Sorry 'bout that...

A Change of Address

...by Ben Trapnell

NEWS FLASH!! League of Silent Flight members: If you haven't received your latest issue of LSF Short Lines (because you haven't achieved level III status or haven't communicated with the LSF in some way during the last calendar year), you probably don't know that the LSF has changed addresses. Complaints were surfacing concerning the turn-around time on level vouchers. After looking into the situation, it was found that changing the address was the solution. So, if you've got a level voucher, get it out RIGHT NOW. Cross out the old address and write in the new one:

League of Silent Flight
P.O. Box 517
Winfield, Illinois 60190

According to the LSF front office, "We know this will take a week off the processing time so all the hassle will be worth it, we assure you. We promise not to change addresses again. Ever!"

From
Ben Trapnell's column
"Silent Flight" in R/C
Report, March, 1989

Mark Foster's done it again! "It" being a new video entitled SLOPE SOARING SITES OF THE WEST or THE EIGHT BEST SLOPE SOARING SITES OF THE WEST or...furnish your own title for this spectacular video, available in VHS or BETA format. I have a VHS format VCR, and when I inserted the cassette into the machine, I frankly had some trepidation about what I was going to see. Well, I watched it (about an hour and 20 minutes) and feel compelled to tell you about it as honestly as I can.

First: it's well worth watching, and I enjoyed (almost) every minute! The video itself is thoroughly professional with interesting graphics, reminiscent of some of the work done on the Sports News Network. There is nice music, and 'though my personal taste does not always run to contemporary style, it is well done — and even pleasing!

The scenery is spectacular, and the soaring is some of the best slope soaring I've seen...extremely enjoyable...and Mark's own ASW-20 soaring at Malibu looks for all the world like a full-size machine; smooth, scale-like soaring at its best.

Some of the featured sites are: Malibu, Point A, Mount Washington, Big Sur, Aspen (Colorado), Morro Bay, and Kawai-Hui "swamp" in Hawaii.

Vintage scale buffs will find the in-flight shots of a Schweizer TG-2 (SGS 2-28) all dressed up in Army Air Force colors a real delight to the eye.

Power slope scale soarers will enjoy seeing the WWII Spitfire perform on the slopes, too.

The video shows Torrey Pines (rated the #2 spot) and Eagle Butte (the #1 rated site) and others such as Coyote Hill in the S.F. Bay area, and even Crater Lake in Victoria Australia (still photos). The site in Newport, Oregon is shown, too, and one of the best features of the video (aside from the soaring and scenery, of course) is the narration.

The narrator describes the good and bad points of each site; the best time of year to soar the slope; preferred landing spots and approaches; prevailing winds; and the ease or difficulty of soaring at each site...plus much more.

The price is \$25, including postage, from Mark Foster, 826 Oneonta Drive, South Pasadena, CA 91030; telephone: (213) 257-4573.

In my opinion, it's worth having the video for its entertainment value alone, but if you're a dyed-in-the-wool slope soaring pilot, and would like to know which slope to try next, you'll find this video a ready and excellent reference.

The 1989 International Model Show...continued

have to say it is easy to use and works great. More people should try it.

Jarel Aircraft Design and Engineering (TELOS canard sailplane) gave two new kits coming soon. Not shown in the booth.

ACER/C has a great new radio called the Olympic V single stick. It is a 5-channel with optional dual rates and can be purchased with a Model 91, 1991 receiver for about \$185. Mike and I will most likely end up with one.

All in all, my first trip to Pasadena was great, but I couldn't make up my mind what to buy...so I didn't buy anything! The only drawback of the show for me was that I didn't see anything new in thermal gliders — which makes me wonder why not?

California has a lot of great designers and manufacturers...and I'd like to see some of this talent put to use in new F3B and Thermal sailplane designs...Yeah!

Any takers on the RCS F3B CHALLENGER?

Rick Palmer



**League of Silent Flight
and the
South Bay Soaring Society**

presents

1989 LSF SOARING-NATIONALS

DATE: May 6, 7, 1989
PLACE: South San Francisco Bay Area (Morgan Hill)
TIME: 8:00 AM check in
 9:00 AM pilots' meeting
TASK 1: Precision: AMA task T5 & L4 landing
TASK 2: International Duration: AMA task T1 & L3 landing
ROUNDS: Eight round minimum
TROPHIES: 10 places for overall placement
 Three places for each class (A, B, C, D, Scale)
 Best team
 Best youth
EQUIPMENT: 4 12 volt winches & ground-based line retrievers
FIELD: 15 acre flying site & 7 acres mowed grass
BANQUET: Saturday Evening, Flying Lady Restaurant
REGISTRATION: 1 entry per pilot (1 class only)
 For registration materials call or send SASE to
 Contest Directors:

Alan Peterson
 1115 Seena Avenue
 Los Altos, CA 94022
 (415) 941-0623

Michael Forster
 30 Vista Verde Way
 Portola Valley, CA 94025
 (415) 851-3834

1989 LSF SOARING NATIONALS Entry Form

NAME: _____
Street: _____
City: _____ **State:** _____ **Zip:** _____
AMA Number: _____ **LSF Number*:** _____ **NSS Number*:** _____
AMA License is required! * LSF and NSS membership is not necessary.
Club Affiliation: _____
Frequency Choices: 1st _____ 2nd _____ 3rd _____
Banquet Dinner Choice: Chicken Kiev Filet Mignon (circle choice)
(Special diet requirements: _____)

General Entry Fee: \$18.00 Contest Only
 \$36.00 Contest and Banquet
Youth Entry Fee: \$10.00 Contest Only
 \$25.00 Contest and Banquet
Entry Fee at Contest, please add \$4.00

Make Checks Payable to South Bay Soaring Society

Mail check with application to: Alan Peterson
 1115 Seena Avenue
 Los Altos, CA 94022

Contest Description:

The pilot will choose which task was flown at the conclusion of the task. Each pilot scored on the best four rounds of each task automatically by the scoring computer. All additional rounds will be thrown out. As many rounds as possible will be flown to enable contestants to improve their score.

A backup plane will be allowed only when the primary is determined to be unflyable by the CD. No frequency change will be allowed. If the backup plane is in a different class, the larger of the two planes will determine the pilot's entry classification.

Task scoring will be normalized to have the same basis. Precision (task 1) will be three minutes. International duration (task 2) will be seven minutes.

The distance from winch to turn-around is 200 meters. The pilot may choose others to launch the airplane and operate the winch. However, the pilot must operate the transmitter during the entire flight.

The flying site will be open the weekend and Friday prior to the contest for guests to fly and become familiar with the area and equipment.

Camping and motor homes are permitted on the site. Completely equipped restrooms are available for your convenience. Local motel and visitor information will be included in your contest information packet.

**1989 International Scale RC Soaring
FUN FLY
MAY 26, 27, & 28, 1989**

Pre-Registration Form

PRE-REGISTRATION DEADLINE APRIL 29

NAME: _____
 ADDRESS: _____
 CITY: _____
 STATE: _____ ZIP: _____
 AMA# _____ PHONE: _____
 FREQUENCIES: _____
 ENTRY FEE: Includes one entry to raffle & Banquet Dinner \$30.00
 ADDITIONAL MODELS: QUANTITY _____ @ \$5.00 ea. _____
Each additional model entered is eligible for raffle ticket

**BANQUET DINNER
CLOVER ISLAND MOTOR INN
MAY 27, 1989 • 7:00 P.M.**

Banquet will include entree, salad, choice of potato,
choice of vegetable, roll, butter, and beverage.

Also included:
No Host Bar, Guest Speaker, Slide Presentation & Raffle

ADDITIONAL BANQUET GUESTS: Number _____ @ \$18.00 ea. _____
 Total \$ _____

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**Mid-Columbia RC Soaring Scale
FUN FLY and SOARING SOCIAL**

AMA Sanctioned

**MAY 26, 27, 28, 1989
TRI-CITIES, WASHINGTON, U.S.A.**

**Must be
Scale Gliders and
Power Scale Slope Planes**
No Documentation Required

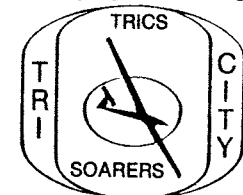
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Contestant Fee - \$30.00
 - Banquet Included!!
 Guest Speaker and
 Presentation
 Additional Entries
 \$5.00 per plane

No Judging
 No Rules
 No Hassles

Only flying, looking,
 swapping and talking



**AMA Membership & Participation Required
THIS IS STRICTLY A FUN FLY!!**

*FCC Approved 1988 Frequencies only!!
Pre-Registration Required*



Dear Jim,

Thanks for the quick response to my last letter. It's nice to know you have the time and interest to respond; it's most appreciated.

This missile is in reference to your one-design F3B plane. Since I'm basically lazy when it comes to designing sailplanes, I'd like to recommend a design that's already available: Paul Carlson's QUASOAR, from his Off the Ground Models line. With a little tweaking, this ship/kit could be turned into an excellent entry-level F3B sailplane.

There are several reasons for choosing the QUASOAR. *First*, it is available now, and is within the price range you suggest. I see in a recent RCM that Omni Models is selling the kit for \$109.99, which is a real bargain. I paid more than that for my introductory model kit. For that money, it deserves serious consideration.

Second, it is about the right size and weight you proposed. My first design mod would be to limit the wingspan to 111 inches, which is right in the middle of the 99 to 123 inch range, and the parts are already there. (Happened to be talking to Rich Spicer recently about the concept and the plane, and he agreed that a 123" span version would be too large.) *Next*, I would definitely add ailerons.

Third, it utilizes a fine Selig airfoil, one with a wide speed range.

Fourth, it is a new and modern design, a sharp looking airplane. He has also incorporated foam wings and CF reinforcement. There is sufficient room in the fuse for most any radio installation, yet there is some room under or in the wing for the ballast necessary during the speed runs.

I have one of the kits, which I have just started putting together. John Dvorak has been bugging me to see the kit, so I'll have to let him drool over it within the next few days. If it flies anything like the Prodigy does, it should be a very good sailplane.

Since starting this letter I have had the opportunity to go over the QUASOAR plans with John, carefully, and we would suggest the following changes for the F3B version:

- Reduce the wingspan to approx. 111 inches
- Add capability to add ballast
- Replace the supplied towhook and mount with a heavier one
- Lengthen the servo tray, filling the entire fwd. area, for strength
- Replace all balsa LE materials with spruce/bass, for durability
- Fully sheet the stabs and rudder
- Make the "optional" fiberglass tape sub-TE a must, rather than an option (could substitute 1/64" ply or CF matt strip)
- Hide rudder cable by hinging rudder on one side and moving the horn in
- Add ailerons, for better high-speed turning capability
- Put aileron servos (micros) in wing, to avoid long cumbersome linkages
- Flatten the inboard sections of the wing some, and reduce tip dihedral

For a little extra pizzazz, I may change the TE's of the tip sections, sweeping them back so all TE's are straighter. Then to go one step further, I may add the Schuemann tips that are the rage right now.

Well, Jim, what do you think? Take an existing airplane (QUASOAR), make the mods listed above, and there you have it, an entry level F3B model. The average thermal modeler with a few kits under his belt could easily make these mods himself. Also, I have written a similar letter to Paul Carlson to see if he is interested. My problem now is which version of the kit to build: stock for thermal and cross-country or the F3B version as modified above? Who knows, I could probably talk Rich into wringing it out for me! Being a little anxious and curious, I've so far made all the mods for a 111" F3B version.

Keep in touch, and let me know how the effort is coming along, and if there is anything I can do to keep the momentum going. (signed) Sincerely, Earl Levin, 8356 Charbono Ct., San Jose, CA 95135

Response: Earl, that's a neat idea, and has real merit. As we've seen in Don Edberg's letter, HUSTLER has been suggested as the RCSD challenger. The judges haven't decided yet, and won't until all bids are in. One of the drawbacks (emotional, perhaps) is the idea of using an off-the-shelf design already in being. I had hoped for an original one-design sailplane to be developed for the challenge. However, I will admit that an off-the-shelf design does have a practical and timely appeal, so we'll leave it to the jury to decide. First, I'd like a lot more input before we begin deliberations, though. JHG * * *

Bernard Henwood, editor of the BARCS (British Association of RC Soarers) newsletter SOARER dropped me a line recently to let us know what's happening across "The Pond".

Dear Jim,

A long time since I last wrote, but I seem to have had very little time what with work and SOARER. Correspondence is not the only thing to have been neglected. The house also needs a great deal of attention. The hall has had oddments of carpet nailed to the floor and partly plastered walls for nearly eighteen months now and the need to do something to make the place civilized is becoming rather urgent.

To make amends for not writing here are a couple of SOARERS and an SSA Newsletter. Hope you enjoy them. I have just spent a good proportion of the Christmas holiday finishing another SOARER and dispatched it to the printer this morning, so that ought to be with you in the near future.

Building and flying have suffered a bit too and it has been about five weeks since I last

flew. I did manage to get in about two hours yesterday, however, which was great. We had intended to fly thermal, but the wind was on the local slope and as that was where the rest of the club was, I went, too. It was very, very light, so I flew my 136 RE Stiletto and thoroughly enjoyed myself. I always feel that the old skills will have suffered after any sort of lay off, but I suppose it is a bit like swimming. Once the model is in the air it all comes back and, at the end, I felt quite pleased with myself. The lift dropped away and most people still in the air ended up having to retrieve models from down the slope. I managed to put the Stiletto down onto a ledge next to me that was just big enough for the model. When you get it right, you feel good, which I suppose is what keeps us going. Must finish now to drop a line to Byron.

(signed) Good flying, happy landings, Happy New Year, Bernard Henwood, 219 Highcliffe Rd., High Storrs, Sheffield, South Yorkshire, S11 7LQ

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Gentlemen:

The following is submitted for your "letters" feature:

It's a pity that airplane designers do not have access to the computer program referenced in the article "Flyweights VS. The Lead Sleds", as published in December issue of "Soaring Digest"! If they did, they would surely realize the mistake being made in not designing in cast iron or perhaps something more efficient such as depleted uranium. By doing so, they could take advantage of the increases in L/D, the measure of overall flight efficiency, that comes with increased weight.

This is, of course, nonsense, as are the conclusions drawn in the referenced article, and points out the already recognized concept that a little knowledge is dangerous; especially if one is going to generalize on the basis of parametric studies performed with a computer program characterized by limited scope.

...continued on page 24

