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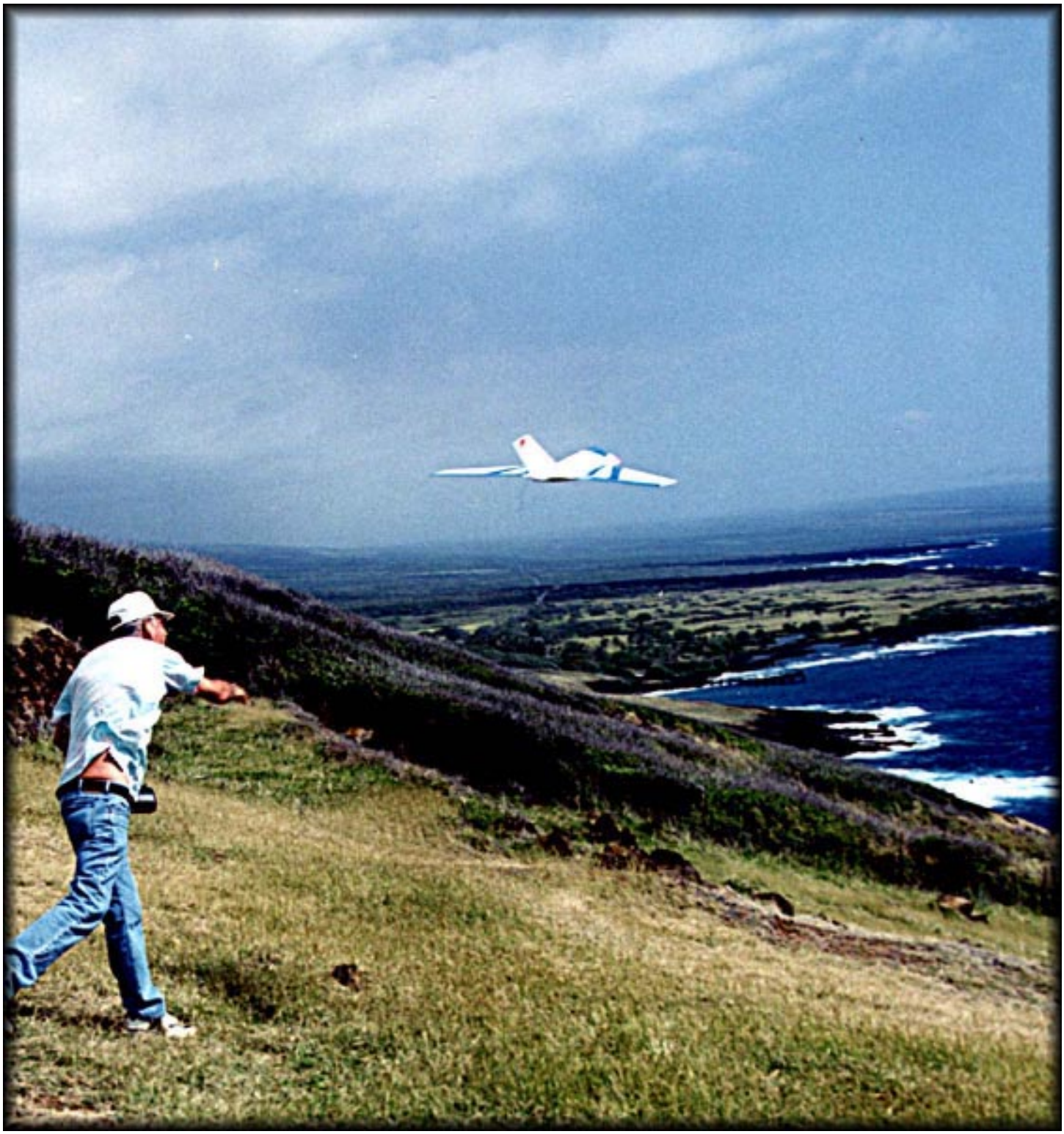
R/C Radio controlled SOARING DIGEST

THE JOURNAL FOR R/C SOARING ENTHUSIASTS



R/C Radio controlled SOARING DIGEST

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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.

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

TABLE OF CONTENTS

Advertiser Index

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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>.

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Highlights & Mailing Status of the Current Issue
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..... ***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
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..... "Trimming Your Sailplane for Optimum Performance" by Brian Agnew
..... "Flys Faster" by Dr. Michael Selig
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..... "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

Model Stuff Looking for a Home

We received the following notice from Tracy Stansfield of Ventura, California:

"My father, Theodore Off, passed away on May 10th. I have a number of unbuilt model airplanes, plus books and articles on the subject. If you know anyone interested or have any ideas on how to get rid of them, call me." Tracy at (801) 599-7511, <tracy@haaga.com>.

We're very sorry to hear about Ted! And, we're sharing your request with the other readers of RCSD, Tracy.

RCSD On the Web?

We received the following from Aaron Coffey down Arizona way:

"Please find enclosed another year of subscription to *RCSD*. I enjoy the articles on flying wings it has and occasionally articles on other subjects. I'd be nice if there was an on-line version of it as then, we the readers, could then have color photos instead of photocopied ones. I believe this opinion has already been debated and rejected?"

Thanks for the note, Aaron. No, the opinion has not been rejected. In fact, we still wish to go with a web version. However, we have not received sufficient information and input in order to logistically work through the transition, while still maintaining both snail mail and on-line subscriptions. And, time has been a major contributing factor delaying any additional work on the subject.

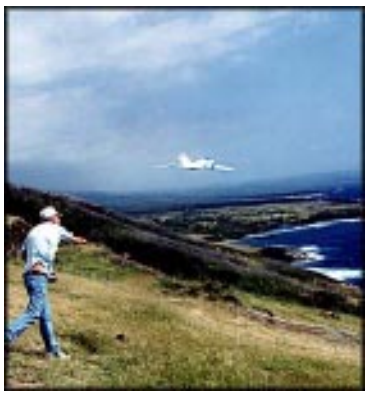
Many of our readers, through the *RCSE* forum, are already aware that Jerry and I have decided to move back to California. Viking Models, U.S.A. is no longer taking orders effective August 9, 2001, as Jer's retiring, gonna go flying, and have some fun! Hopefully, on some slope in California. We've already received a few e-mails offering assistance in locating an area acceptable to us in Northern California. (Anyone out there have a real estate agent that can get us fairly close to Santa Rosa at a half way reasonable price? Fixer-upper is likely in order. Or, if anyone can help us figure out how to load our 1 acre ranch house, plus workshop, on a moving van, we'd like to hear from you, too...) So, what does all this mean?

Viking Models, U.S.A. is closed. Tentative arrangements have already been made to sell the vacuum form machine and associated molds, other than glider type molds. In regards to the glider molds, you'll find the following ad in the business classified section:

Glider Business. Over 60 sets of molds, master drawings, inventory of fiberglass, epoxy mixers, and much more. Serious inquiries only. Contact Jerry Slates, Viking Models, U.S.A., phone (972) 442-3910.

OK, Viking is not moving back to California, but the plan is to move *RCSD* back, unless someone else wants to take on the editorial job. As I told one of the columnists awhile back, "You're still stuck with me... Ya all want a new editor, please find a volunteer who really wants the job." *(Might have to give them a few tall ones, first! Seriously, should any of you be interested, I just might consider retiring, as well!)*

So, where does 'time' fit into all of this? Well, moving in itself ain't that easy as most of you know. You gotta get the house ready for sale and get rid of the clutter in the barn, workshop, house, attics, and yard... You know how realtors are. (Thank goodness, we've got a really good one!) Then, set up a plan on retiring for Jer (Viking), and figure out what we want to do in regards to the copier and binding equipment for *RCSD*. Hold a shop sale. And, hope we don't find ourselves in a rental scenario. (Yuck!!)



HAWAII SOARING

Pete Bechtel launching his new bird at the Bowl on the big Island of Hawaii.

Photography provided courtesy of Pete Bechtel.

For all of you loyal readers and supporters out there, please bear with us through our transition. If we don't answer your e-mail requests right away, I'm likely just simply hyperventilating and walking around in a circle, someplace, somewhere! We'll keep you posted!

Happy Flying!
Judy Slates

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:

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A Bit of Trimming

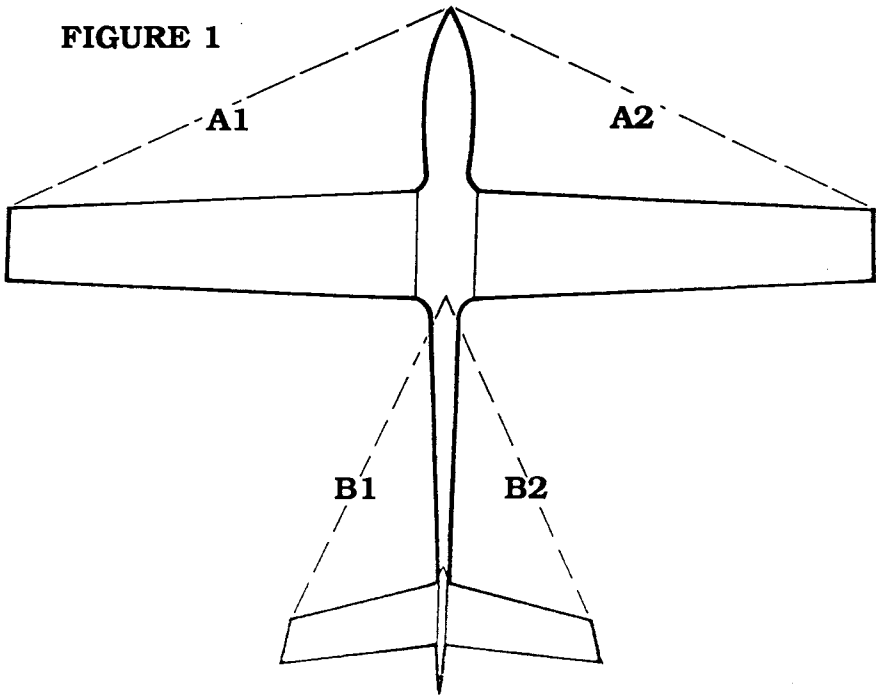
OK, we're well into the flying season. How is your model flying? Can you fly in a straight line without touching the controls, or does your model turn to the right easier than it turns to the left?

Yes, I know. Most everyone has a computer radio with all kinds of trim adjustments. Of course, if the model is constructed correctly, maybe you wouldn't have to make all those trim adjustments. In fact, if all the trims are set to neutral position, you'll likely find that your model is easier to fly, making better use of any good air that's been passing you by.

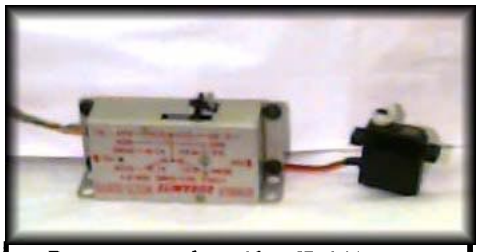
Let's take a closer look at an assembled model. We're assuming that there are no warps in the wings nor stabilizer. Looking at figure 1, let's measure the distance from the nose to the left wing tip. Then, measure the distance from the nose to the right wing tip. These two measurements should be the same. If not, well, they should be corrected.

Now, measure the stabilizer as shown in figure 1. Same deal. Both measurements should be the same.

FIGURE 1



A1 should equal A2
B1 should equal B2



Bonner servo alongside a JR-341 servo.

In the May issue of *RCSD*, I talked about the evolution and size of servos way back when. I mentioned that a set of Bonner servos was installed in my glider back in 1961, that they were BIG, and how I wished that I could get my hands on one to show you exactly how BIG really is! Well, I found one. The photo shows a Bonner servo alongside a JR-341 servo. The Bonner was indeed big and very slow as compared to the servos we enjoy, today.

While I did say they should be 'corrected', these are not easy fixes. Likely, it means that the wing rods in the fuselage will have to be redone; perhaps, the pivot rod on the stabilizer. Should you elect not to correct the problem on your present model, at least you'll know what to expect when you start the next model.

One more thought for this month, which is over looked by many flyers: a heavy wing tip. For example, let's say the model is sitting there on the table with one wing tip down on the table while the other is in the air. Try to tip the model so that the other wing tip is on the table and let go. Does the model roll back with the first wing tip returning to the table? If so, it's likely a heavy wing tip. And, this is an easy fix. Simply insert a small nail or two into the light wing tip until the wing tips are of equal weight.

That's it for this month. Keep your wing tips up and the nose into the wind!

Reference Notes:

"Radio Control Thermal Soaring" by George Stringwell
Published by RM Books, LTD., Guildford, Surrey, England

■

What a Good Hand Launch Glider Does for You

by Bill Kuhl
bkuhl@luminet.net

I often wonder if I have the mind of a child; besides playing with toy airplanes, I often need to know "why" something is. With model sailplanes, you hear that one plane is so much better than another, but it isn't often that you hear good reasons for one plane's superiority over another's. After reading the review of the Secret HL built by Oleg Golovidov (the plane's designer) in *RCSD* by Gordy Stahl, I jumped at the chance to purchase the plane that was reviewed. This article is my attempt to explain why the Secret HL is so much better than the HL's I have flown in the past.

An easy observation is that the Secret, at eight ounces, is lighter than the planes that I have flown in the past. The wing on my first glass plane, the CR Climmax, weighed 6 ounces, all-up weight was around 13 ounces, yet it thermalled fairly well. My next plane was a four-servo Epsilon that started fairly light, but took on weight from numerous repairs. I never did learn to use the potential of the Epsilon before it became too heavy. After that I built a couple of popular wood HL's that came in at around 11 ounces despite my attempts to keep the weight down.

Enter the Secret: 8 ounces, long tail boom, and small tail feathers. A very lightweight wing that tapers to a wing section that becomes very thin at the tips. This plane looked to have the lowest drag of any I had flown. The first gentle hand toss proved this to be true. The plane floated much farther than any plane I had owned before.

Observations When Flying the Secret HL

When lift is encountered it quickly picks up speed, more pronounced than other HL's I have owned. Stronger lift shoots the Secret upward, clearly marking the presence of the thermal.

As a wing passes through a thermal, the wing tip rises very quickly. Because the plane turns so quickly, there is less chance of flying too far past the thermal when trying to hit the core.

If you fly out of the thermal, there is more energy left to try to re-enter the thermal before the plane is too low.

The plane circles much tighter than other HL's I have flown. More often, I am finding that you must circle very tight to climb in the thermal.

You are able to thermal in the lighter lift found late afternoon, early evening. I have had good thermal flights after work, other planes I was very lucky to find useful lift after 4:00 pm.

The plane penetrates wind well, even at such a light weight.

Finding multiple thermals in one flight is much easier. Many times I will thermal up to a couple of

hundred feet high, head up wind, and find another thermal, climbing again.

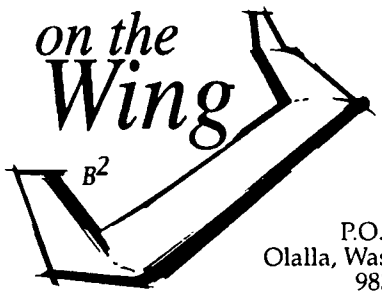
For a javelin-launch plane, I was getting good altitude without putting anywhere near full effort into the launch.

Even the guys at the power field have been impressed with this plane. With my other planes I would be throwing and throwing before I would be able to climb in a thermal.

Conclusion

Composite planes such as the Secret although more expensive than some sport HL's, are more fun for the sport flier. Not only will you spend more time climbing in thermals, you will learn more about low-level thermals. I am so impressed, Oleg's new discus launch plane the Taboo is on order.

■



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Dave Jones' R-2, Part 1

Introduction and initial considerations

Yes, another construction project is on the building table! We've always had a particular fascination with this design, due mainly to its beautiful parabolic wing planform.

Dave Jones' R-2 originated in the '80's, but its inherent beauty remains today. The R-2 was designed as a Standard Class glider under the initial rules for the class, so it has a 100" wing span and uses only rudder and elevator controls. The wing uses a lot of open framework, despite using the CJ-3406 (4% camber, 6% thickness), and so the wing sheeting is a bit thicker than what might otherwise be expected, 3/32" balsa. More about this later.

Planned weight for the model, as originally designed, is just 50 ounces. With 1500 square inches of wing area, the wing loading is a very low 4.8 ounces per square foot.

As is usual with a design two decades old, some modifications will be made as construction progresses. Here's a list of the major modifications we have planned:

- Airfoil changed from CJ-3406 to CJ-25^{2}09
- Fuselage transformed to a more "Raven-like" contour
- Elevator modified to use fabric hinge
- Wing converted from polyhedral to dihedral
- Addition of ailerons

Let's take a look at each of these in turn.

Airfoil changed from CJ-3406 to CJ-25^{2}09

As we mentioned at the start, the airfoil designated on the full size plans is the CJ-3406. This is a thin highly cambered section which was used on several other Western Plan Service designs. Over years of testing, Dave found that such airfoils offer no advantage over those with lower camber and more thickness. The CJ-25^{2}09 has 2.5% camber and is 9% thick. Because the lower surface is flat from 25% chord to 75% chord, a wing using the CJ-25^{2}09 across the entire span can be built on just about any flat surface which is large enough.

From a structural standpoint, this increased thickness means more rigidity. While we'll keep the spar sizes the same (they match those on the Raven), the balsa sheeting will be reduced in thickness from 3/32" to 1/16". This cuts one third off the weight of the balsa sheeting.

The wing trailing edge consists of upper and lower surface sheeting with 1/16" plywood between for stiffness. This makes the trailing edge very blunt. As has become our usual practice, we'll use 1/64" plywood between the skins. This is more weight saved, and will result in a more aerodynamically clean trailing edge.

Fuselage transformed to a more "Raven-like" contour

The fuselage of the *Model Builder* Raven is not only very slender, it is

R-2 Specifications

Span	100 inches
Root chord	17"
Wing area	1500 sq. in.
Airfoil	CJ-3406
Sweep	Apex of wing tip set back 12.75" from leading edge at root
Construction:	
• Wing	• Balsa ribs, spruce spar caps with balsa webbing, 3/32" balsa sheeting, 1/8" sq. spruce turbulator spars, and 1/16" plywood trailing edge core
• Elevator	• Balsa ribs and sheeting
• Fuselage	• Plywood sides, balsa block upper and lower
• Fin and rudder	• Open framework of balsa ribs with sheeting on root panel of fin, plywood trailing edge
Weight, projected	50 ounces
Wing loading	4.8 oz. per sq. ft.

also shaped so that the tow hook is mounted close to the vertical CG. The R-2 fuselage is twice as deep, and the distance between the wing and the tow hook is nearly five inches. During launch, the tensioned tow line tends to rotate the aircraft so that a line drawn between the CG and the forward part of the tow hook forms an extension of the tow line. This force is quite strong, and tailless aircraft have little damping in pitch. The result is that the wing is driven to an angle of attack above the stall point, leading to disastrous results. A method of overcoming this tendency is to move the tow hook more forward, but this places the weight and drag of the tow line well ahead of the CG, reducing launch height.

Additionally, the R-2 fuselage is straight sided when viewed from above. This is not aerodynamically clean. As well, there's room for a doored ballast box capable of holding one and a half pounds of lead.

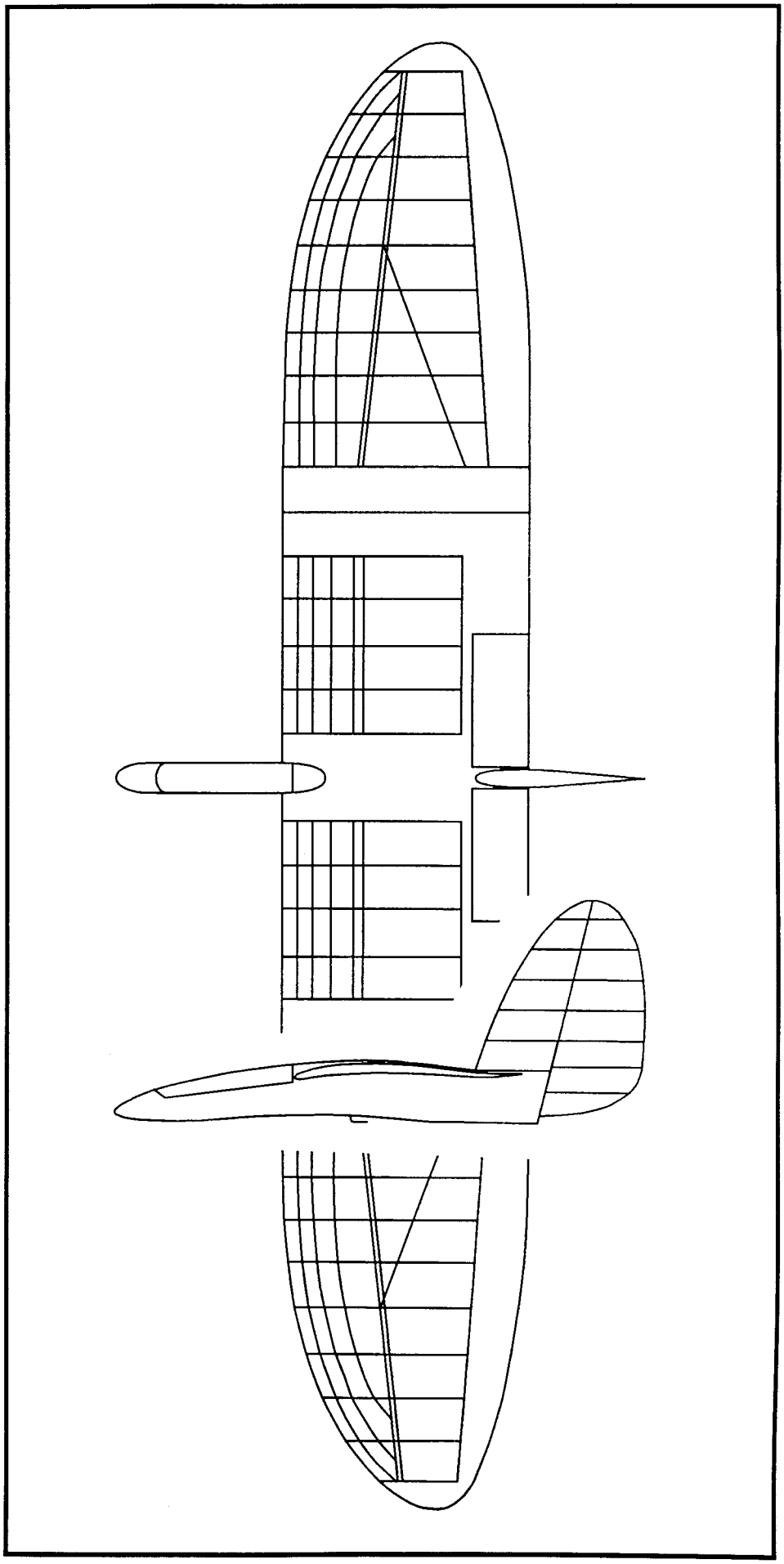
Rather than a ballast box which resides in the fuselage on the CG, we're going to place ballast tubes in the center wing panel, as is done on the Raven. The fuselage will be made a bit wider in front of the wing so it has more of a streamlined teardrop shape. With the RC equipment of today, there's little need for such a deep fuselage, so a lot of slimming will be done in the vertical dimension. This will have the added advantage of placing the tow hook closer to the wing. An additional benefit is a substantial reduction in fuselage weight.

Using the Raven fuselage as a pattern, we've drawn up a new fuselage for the R-2 and constructed a template for cutting out the plywood sides.

Elevator modified to use fabric hinge

The rudder and elevator hinges as shown on the plans are complicated and somewhat labor-intensive affairs, due mainly to the fact that they are designed to be removable.

The rudder uses two 1/16" music wire pins to hold it in place — one at the bottom and one at the top — and has a semi-D-tube leading edge. It looks like it will be fairly light. At this point we've made the decision to build the structures as on the plans, but forego



the ability to remove them.

The elevator is in two pieces which are connected with a rather large music wire and sheet metal control horn assembly. The elevator is removed by pulling out two 1/16" music wire pins through the outboard end of the center section. The fin must be off the model for the elevator to be removed entirely.

A more simple solution, and one which makes construction more accurate, is to construct the elevator and wing together, as if using foam core construction. When complete, the elevator will be cut free, faced as necessary, and a MonoKote hinge will be used. There is sufficient torsional strength if the connection between the two elevators is made as a spar, and the control horn may then be fabricated of plywood.

Wing converted from polyhedral to dihedral

The R-2 wing planform is so beautiful, we just hate to muck it up with a dihedral joint. So we're going to use straight dihedral. Since the R-2 wing uses essentially the same construction method as the Raven, this modification is pretty straight forward. We'll cover the details as we go through the construction process.

Addition of ailerons

Since a large portion of the trailing edge of the wing is sheeted with balsa, we've decided to reconfigure the sheeted area in order to add ailerons. This means extending the forward edge of the sheeting about 1.5", but we're going to remove some sheeting from the ailerons themselves to make them lighter. Over all, the weight should be about the same, but the distribution will be closer to the CG. Since we're using a thicker airfoil, we can place the aileron servos in the wing forward of the inboard edge of the control surfaces. This has worked extremely well for us in the past.

This is an exciting construction project for us, as we're updating a beautiful design without going high-tech. In fact, some of the construction methods are straight from old free flight techniques. It will be a learning experience, that's for sure.

This will be a four part series. We'll get the wing and elevator completed in Part 2, and in Part 3 we'll construct the fin and the fuselage. In Part 4 we'll describe 'glassing, painting, and covering (yes, we already have the colors picked out), plus, of course, the flying!

We're always eager to hear about readers' projects. If you've built or are building something which you think may be of interest to other *RCSD* readers, please let us know. We're also on the lookout for suggestions for topics for future "On the 'Wing..." columns. Contact us at P.O. Box 975, Olalla WA 98359-0975 USA or by e-mail at <bsquared@halcyon.com>.

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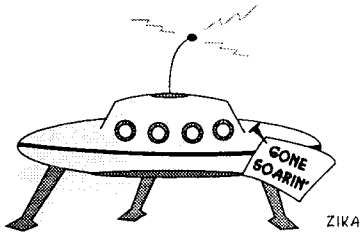

Bob Lawhead catching a D.A.W. ME 163 under the limbo at the Bowl.
Pete Bechtel photo.

Pete Bechtel's new, off the bench, D.A.W. ME163, 48", MH 45.

HAWAII SOARING With Pete Bechtel

(We plan to include these photos, along with the cover, of course, on the web site. Ya gotta see them in color! Ed.)

Pete Bechtel's new Porta Chicken, designed by Bob Lawhead. Pete says, "This is one of the best foamies I have flown yet! It does it all!" The Porta has plug-in wings, 50" span, MH 64 foil.

Bob Lawhead and his Rooster at the Bowl site in Hawaii. Bob has the record for the most limbos in a row - 28 in all. (Plane: modified Zagi LE.)

TULSOAR

TULSA RC SOARING CLUB

AMA CLASS A SANCTION 01-1581

20th ANNUAL LAST FLING OF SUMMER

BLUE SPRINGS SOD FARM, Broken Arrow, Oklahoma
September 14, 15 and 16

Friday, Sept 14th, 2PM:	Class A: Handlaunch	6 Rounds
Saturday, Sept 15th, 9AM:	Class D: Unlimited	6 Rounds
Sunday, Sept 16th, 9AM:	Class B: 2 Meter	4 Rounds

(Expert and Sportsman Class for each Event)

Awards:

1st Place Overall	Trophy For Combined 2m and Unl scores (Flyoff in case of tie)
Handlaunch	1st thru 3rd, 1st place for Sportsman (Certificates and cash awards)
2m and Unlimited	1st thru 5th. 1st place for Sportsman (Certificates and cash awards)

Event	Entry Fees	
Friday Handlaunch	$10.00	Attached
Saturday Unlimited	$20.00	T1(modified) / L6
Sunday 2 Meter	$20.00	T1(modified) / L6
Event Discount	-$5.00 (More than 1 event)	
PreRegistration Discount	-$5.00 (By 9/08/00)	
Total:	$_____	

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e-mail: dmiller@sitemaster.com

ENTRY FORM
Name:_____
Street:_____
AMA:_____
Frequency (1st/2nd) HL:_____/_____
Amount Enclosed:_____

Date:_____
Phone:_____
City_____
Open/Sport:_____
2M: _____/_____
(To: Tulsa RC Soaring Club)

e-mail (optional):
_____
St/Zip:_____

Unlimited: _____/_____
(Return Entry to CD)

Cancellation prior to September 10th will receive a full refund. Mail or e-mail to Dave Register

TulSoar's 20th Annual Last Fling of Summer will be held September 14th, 15th and 16th at the Blue Spring's Sod Farm in Broken Arrow. Oklahoma. The Blue Springs site is one of the finest soaring fields in the Midwest with plenty of open space, generous thermal activity and occasional wave lift from the hills to the South across the river. TulSoar is fortunate to have Rusty Shaw and Mike Fox attending this year. Both are well known in both HLG and national soaring competition and should provide an excellent level of experience for this year's event. Dale Nutter (former USA-F3B team member) as well as the TulSoar AMA national championship team (1999) will be on hand to give Rusty and Mike a challenge. We're hoping a few vengeful Texans will come up after TulSoar recently took TNT honors. And the guys from KSS and the Frickey brothers are always tough to beat. 2001 should be the best 'Fling' yet.

Handlaunch will be held Friday afternoon with a pilot's meeting at 1PM and flying beginning at 2PM. A minimum of six rounds will be flown. 10 minute flying window for each event with unlimited launches:
- 10 flights, 1 minute max.
- 5 flights, 2 minute max.
- 10 second ladder event (20 sec., 30 sec., 40 sec., etc.)
- 4 flights, 1, 2, 3, and 4 minute maxes in any order
- 3 flights, 3 minute max.
- 1 flight, longest flight wins

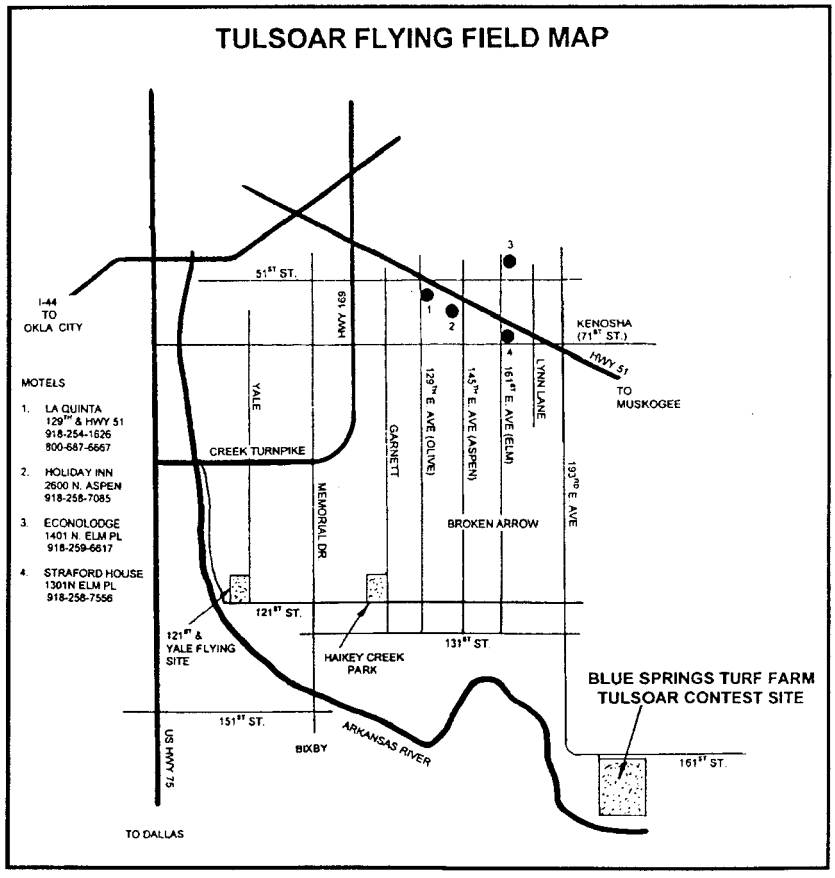
Unlimited will be held on Saturday. Pilot's meeting at 9 AM, 1st flight starts at 10:00 AM. 6 rounds of International Duration. Time target to be determined by weather conditions. If more than 50% of the pilots meet the target time, the next round target time will be increased by 2 minutes (up to a maximum time of 9 minutes). Lane landings will be scored at 100 points (max)/round.

2-Meter will be held on Sunday. Pilot's meeting at 9 AM, 1st flight starts at 10:00 AM. 4 rounds of International Duration. Time targets as described for Unlimited.

Overall Championship will be determined as the sum of Unl and 2M scores. In case of a tie, a fly-off between the tied pilots will be held.

Awards:
Trophy for Overall Champion

Unlimited, 2-meter and Handlaunch will consist of a certificate and cash awards.



GORDY'S TRAVELS

Gordy Stahl
Louisville, Kentucky
GordySoar@aol.com

Chatting Soaring on the Internet Via the "RC Soaring Exchange"

During my travels, I meet people in the hobby, lots of them. Like most people we meet in life, they each have different personalities. With some, I have developed a type of matter of fact friendship that when I show up in town, I can give a call and it's an automatic dinner date or a meet to do some soaring. (Sometimes, it's an emergency visit into their shop for repairs to my planes!)

Names like Stan in Tennessee, AJ or Tim in Atlanta, Pat K. or Rich in Orlando, Mirko or Russ in Milwaukee, Fran in Greenbay, George in San Diego, Edgar in Anaheim, Randy or Doug in Charlotte, Rob in Huntsville, Jack in Cincinnati, Joe in Dayton, err, okay you get the picture; my list of great guys goes on and on, so you can see why I tend to have no problem doing some soaring whereever I end up.

The *RC Soaring Exchange* has been a great help in setting up contacts for soaring adventures. I just post a note to the group (Soaring@airage.com) saying, "Gordy's heading to ..." in the title and give the details of my schedule and interests in the body of the e-mail. *RCSE* is sponsored by *Model Airplane News* and is moderated by one of our top sailplane guys. He stays way in the background, as do many of our leading experts.

You'll find good deals on used sailplanes and equipment and can get real hands-on info. on just about anything in the hobby of RC soaring. Pretty much, someone there has read an article in *RCSD* and remembers the answer to your question!

Be warned! There can be up to 100 new postings each day to the exchange, so expect to get swamped with e-mails you have no interest in reading. Subscribing can take a few days and so can un-subscribing. There are two versions of the exchange: a regular where you get everything posted each day, and a 'digest' version which condenses the postings into a single post that has all of the posts in its body. I prefer the regular as I know what to delete and who to read.

Where did I find out about the *RCSE*? *RCSD* of course! Just look on the back page under BBS/Internet; it's been there for a long time!

Suggestions for participation on the *RCSE*:

Always remind yourself that it is the only place on the entire WWW set aside for RC soaring and sailplane discussion, so ....

- Do not post jokes, virus alerts, complaints about suppliers or shippers or deals gone bad, AMA insurance, AMA in general, really neat full scale stuff, horror stories about RC accidents, pictures of fighter jets making really low passes next to a carrier, info-posts about how the government is going to tax your e-mails, or chain letters, etc.

- Do not post one-liner like "Atta-boy", "I agree", "Way to go", "That's telling him", "That was really good,"... etc.

- Do not post solutions to questions if your response is going to start with, "Well, I have no experience with this, but in my opinion..." or, "I have never flown that plane, but it's my guess that..." or, "While I have never flown a full house ship, I think the solution to your problem is..." Those kinds of posts are welcome - off line.

- Do not feel a need to post every comment or solution to the group; think about who is asking, decide if it is worth adding another post to the hundred for the majority to wade through, or to post it off line directly. There are plenty of 'off-line' discussions going on all the time among small groups of specific interest.

- Do post things RC Soaring stuff to sell.

- Do post short stories about what you are currently building.

- Do post stories or tips of general RC soaring interest.

The site was developed by some RC soaring guys who found that, when they attempted to chat RC soaring topics on other RC sites, it became too congested and often impossible to get quality answers. That group of guys thought long and hard about what to call the site so that anyone coming there would be clear about what topic would be welcome, so that no one would be confused about what this site would be about. So, before you sign on and before you push that send button to post something, ask yourself this question, "Is this about having fun in my hobby and is this about RC soaring and sailplanes?" Follow that up with a repeat of, "Is this about having fun on my hobby?"

If you intend on getting the most out of the *RCSE*, then remember the 'Boy who cried Wolf' – Often this lesson is forgotten on newsgroups and forums. New subscribers are excited about being able to 'shout out in class', posting every thought and idea to the exchange. Members seeing that screen name so often, quickly become immune, and start ignoring posts from that sender; then, when that guy really wants information, he finds he doesn't get any answers, almost as if his posts aren't being listed. So, be miserly with your offerings, lurk for a while, and do most of your replies off line.

Keep in mind that e-mail is a terrible form of communication. It's great for supplying information, but lousy for discussions. Why? Because while the

Gordy at work.

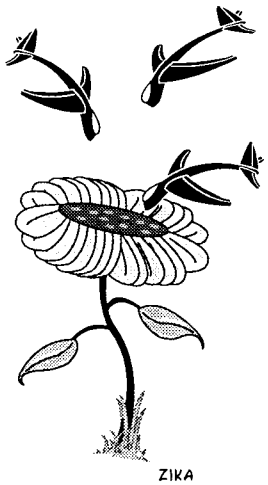
CD Ron Swinehart leaves nothing to interpretation as he indicates which way is up!

Soaring Alabama style with Morris & Jim.

Two of the South's best TD sticks (Stan & Morris).

sender supplies the CONTENT — the reader gets to guess at the INTENT of the text. NEVER read any emotion into posts you receive and never respond with emotion, especially in front of a group. The best response to a 'flame' is no response. You are not obligated to respond to anyone or any post. Letting a post die that you don't like is always the best response.
all that said, you will find that the *RCSE* is a great extension of *RC Soaring Digest* Magazine. If you travel it will allow you to meet some of the great RC soaring guys I get to meet. You might even meet me!

To subscribe to the *RCSE*, simply send and e-mail to Soaring-Request@airage.com or Soaring-digest@Airage.com for the digestified version. In the SUBJECT box (title box), put the word "SUBSCRIBE" and the same in the body of the e-mail, also. To unsubscribe, use the word "Unsubscribe" in the same places. When you send either, it must be to the addresses I show above. ■



TECH TOPICS

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Discus Launch - DLG

Well, this is crash and burn month. I promised I'd relate beginning experiences with DLG. You may ask, why does someone who doesn't really know what they're doing want to write about their failures?

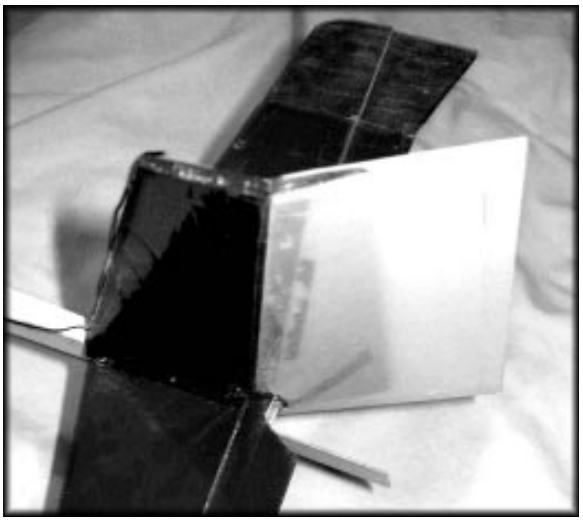
Well, with the help of correspondence from a couple of guys who are vastly more knowledgeable in this area, I finally got it to work. Since there are probably plenty of other folks out there wanting to try this, we won't have to ask an expert to reveal their more embarrassing moments going up this learning curve.

From web browsing, it appears my naive attempts (and preliminary solutions) are not atypical. So let's see what happened, following which we'll add some thoughts based on these disasters. Then cover how to set up a Futaba 7 for 5 channel operation (including some launch presets for DLG). And then wrap up with a few methods for more precisely calculating HLG launch conditions.

First of all, you DON'T want to start DLG with a plane that you really love to fly and which is not specifically designed for this launch mode. My favorite T2/GF is now reduced to a pile of glass shards and wood. My original T2 is mangled. The only undead HLG now flying in the Register stable is (you won't believe this) my original converted Skeeter. About all that's left of the Skeeter part is the fuselage and even that's highly modified.

Tom Clarkson of TPG (Torrey Pines Gulls) was very helpful in comments on DLG set-up and ideas to correct the initial problems encountered. Mike Garton's web site contains a wealth of information on DLG and his correspondence about the problems I was having was also very timely. So with credit to those guys, and a certain lack of common sense to me, here goes.

First attempt at DLG was with the T2/GF. This is a pod and boom design of ~ 11:1 aspect ratio with the Schuemann ellipse planform discussed a number of columns ago. Calculated sink rate (polar evaluations described over the last several columns) is ~ 0.95 ft/sec. This is a polyhedral ship with V-Tail. It weighs in at 7.8 oz. with 2-S90s and a 110maH pack. For these trials I switched to the new FMA Extreme 5 channel receiver and found it to be a real gem. This ship can normally attain > 45 sec flights on a typical javelin launch in dead air.



Skeeter DLG fin/rudder with mylars. Note rudder offset for launch.

On the way to the field, the temperature at the bank registered 108. Ya gotta be nuts to go out in this weather. It couldn't POSSIBLY be that hot. However, science demanded experimental data and we were going to get it!

First tosses in javelin mode were fine. Caught a couple of light thermals and got several 2-3 minute rides. Dive test gave a long shallow pull-out which is about where I like it. So CG, trim, etc. were still nicely dialed in. Next (big gulp), gotta try the spin move.

Based on watching the videos referenced on Mike's site, the guys who know what they're doing just give about a 1/3 whip turn and it's off to the wild blue yonder with spectacular altitude. Upon advice from Tom, I decided to do a full rotation so I could get a feel for the plane and then try and release level and smooth for a start.

After a couple of tentative twirls, we tried the Full Monty. Full outboard rudder (right in this case). Plane facing into the prevailing wind, 360 degree rotation and release with plane approximately into the wind and level. Plane then rotates in a large barrel roll to an inverted position with no residual airspeed at about 20 feet of altitude.

Now the nice thing about this dilemma is there's absolutely nothing you can do about it. There's no way to save this plane. It's upside down with no flying speed. There's no air flow over any control surface to save it. You just have to stand there in awe and evaluate the structural integrity.

Of course, the ground is hard as a rock, but the cotton's a bit high at the field so the resulting crash simply dislodges a couple of sleeping sparrows in a nearby tree who then fall off the branch with what must be the avian equivalent of gales of laughter.

Close inspection of the ship reveals nothing more serious than a crunch in the balsa nose. So with the birds resettled, we give it another try. This time with more 'oomph' thinking that we just ran out of control authority due to the tentative launch speed.

This gives about 30 feet of inverted flight with enough forward velocity to seriously frighten the sparrows before the ship hits the dirt inverted again. Sparrows now leave for a distant tree. The heat must be the cause of their somewhat wobbly flight. Surely they couldn't still be laughing?

After about 10 attempts, with remarkably similar results, the last one finally splits the fuselage and breaks the wing in about 5 places. The sign at the bank on the way home says it's 109. This stinks.

Post mortem analysis: the tail boom is a high modulus fiber arrow shaft and the speeds were not sufficient to torque it that seriously. So that's not likely to be the problem. Tail moment is ~ 23 inches which should have been

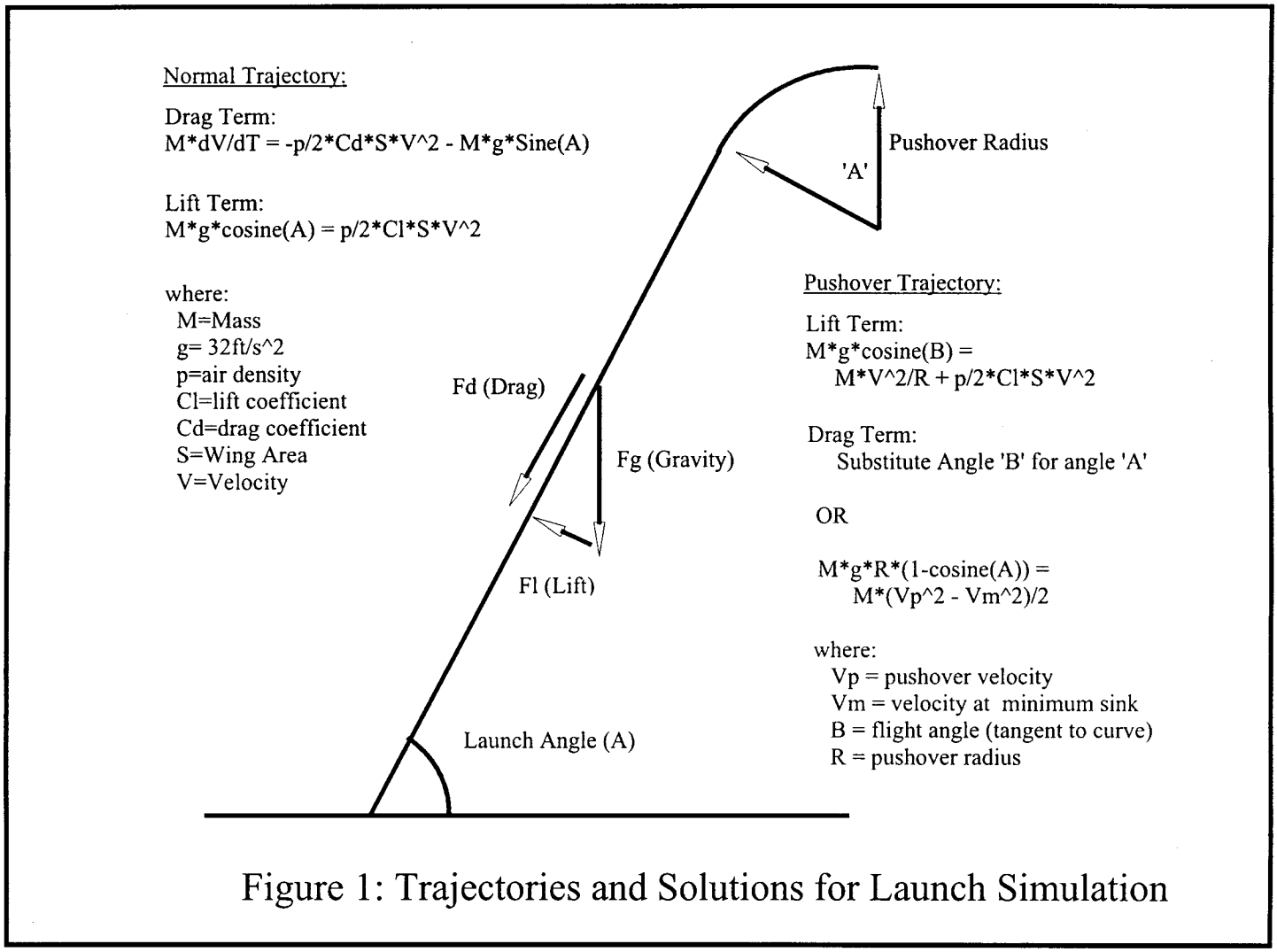


Figure 1: Trajectories and Solutions for Launch Simulation

sufficient. Elevator control was fine but there was simply not enough rudder authority to overcome the roll effect from the polyhedral. Some down elevator might have helped but the basic flaw appeared to be insufficient rudder authority for the polyhedral angle. This ship is (was) set up with tight yaw-roll coupling to facilitate turn initiation.

Next victim was the original T2 again with the Schuemann ellipse planform with an AR of ~ 10. This is a slightly heavier (~ 8.5 oz.) ship with a conventional tail. I've found V-tails to be fast on elevator and a little slow on rudder so the conventional tail did not require as much poly angle to get my preferred turn authority.

To make a long story short, the sparrows had their fun but we had three attempts out of ~ 15 that actually popped out right side up, but just on the ragged edge of stall speed. At least they were recoverable.

One thing noted was that upon release, there's a natural tendency to pull your arm in towards your chest. In a normal clockwise turn, this tends to accentuate the yaw axis spin of the aircraft at the moment of release. For a poly ship, you now have the outboard tip traveling much faster than the inboard and that's going to trigger a strong roll reaction. This seems to be the cause of the barrel roll maneuver. It's fascinating to observe from the inside radius of the barrel but it's really hard on the plane. So a lesson learned from this trip was that more rudder throw was needed and the release technique needs to made at arms length with a smooth follow-through to minimize the excess yaw on release.

After a few too many encounters with the turf, there was enough damage to call it a day. The nice thing about these adventures is they don't last more than about 30 minutes. The bank says it's 107 and this still stinks.

Well, we're out of horsepower in the basement scrap pile. I'm convinced (Tom's notes to the contrary) that polyhedral is a fundamentally bad idea at this point. But lurking over the edge of the storage cabinet is a dihedral wing with vacuum bagged obechi covering. What's this?

A few tugs and several pounds of dust later and an old dihedral Skeeter wing appears. Meanwhile, a random neuron fires in the memory circuits and reminds me that the old Skeeter fuselage (minus tail group) is somewhere in the rubble. It gets located and some ideas start moving.

OK - dihedral is good. But flaperons would be better. I'd have direct control of the roll axis at that point. Also need a bigger fin and rudder to get the tail volume coefficient up a bit. Then we'll need aileron-rudder coupling and a few other things.

So a few days later the Skeeter goes to the DLG altar for sacrificial ablutions. Now this plane weighs in at 15 ounces and is built like the proverbial brick outhouse. Sparrows and small children beware - we're movin' some dirt today!

First few javelin launches show excellent roll authority, somewhat weaker than expected rudder control and pretty flaky elevator stability. Too late, we're here and it's gonna get the old heave-ho. And lo and behold it sort of works! For the first time it goes off right side up, stalls at the top but with barely enough altitude to recover. It's still got a wicked initial roll to the left but there's enough aileron offset to compensate.

After a few more tries, and at least two roll-overs to inverted, we decide to head home while we have enough pieces left to figure out what's going on. Bank says it 103 - still a bit stinky but we're making progress!

Several things were learned on this adventure. The first of which was that the designer forgot to compensate for the elevator volume coefficient. That was quickly fixed with some elevator extensions. Further reading suggested a sub rudder would help so a generous one was added. This was made with 1/16 ply and has the advantage (in addition to not being blanked on launch) of keeping the tail feathers out of the weeds and strengthening the repair to the fuselage break at the LE of the stabs (forgot to mention that one - the sparrows had some chuckles there!).

I really didn't like having the presets on the launch switch, so I moved it over to the crow channel (ch 3 - more on this later). This had the advantage of dialing in full right rudder for launch by putting the ch 3-4 stick at the full lower right position. Releasing the stick re-centers the rudder but leaves the rest of the presets active (a Futaba 7 idiosyncrasy).

With these repairs in hand (and now carrying 17 oz. due to the sub-rudder and larger elevator), it was back to the field. Javelin launches showed the elevator problem to be cured and the presets gave a hard right turning dive which seemed a good place to start. CG looked good.

Full turn and release and — it flew! Not great, but generally where I wanted it. Not very high, but definitely controllable. It was clear that there was still not enough rudder authority but the roll preset in the ailerons helped compensate. Rather than a detailed blow by blow, here's the conclusions from this session:

1) A smooth release parallel to the ground is a good start. Even with some down elevator preset, there's still a pitch up tendency that needs to be overcome. Eventually you need a steep climb out (~ 60 or 70 degrees) but it will take awhile to work up to the velocity where that can be effective.

2) More vertical area is better. Both in the fin and the control surface. I'm not sure the sub-rudder is critical but it won't be blanked on launch and provides good protection from the weeds if done right.

3) Lower dihedral/polyhedral seems better. I'm sure poly will work but yaw-roll coupling effect with a large fin/rudder now switches from the poly angle to the fin/rudder size. This may make for some sliding in the turns under normal flying conditions but steep poly angles don't seem to be good since there's a strong initial yaw potential for this launch style that will quickly couple to the roll axis if the poly angle is high.

4) Launches were DEFINITELY more predictable when grasped at the extreme LE of the wing. I tried several locations several times, including grasping at the TE of the wing. I don't really understand this, but experience clearly says the farther ahead of the CG you can grab it, the better things will be. This wing has very little sweep back - which is a major difference from the T2 wings as well.

By the end of this session, DLG launches were about 2/3 of my usual javelin launches. But at this point, it's time to reassess the presets and come up with more rudder authority. Since we also hit a log on the last landing and stripped the gears in one of the flaperon servos, it was time to quit. Oh yeah, the stress riser at the flaperons also caused a crack in the wing. That's been noted for DLG and it certainly happened here as well. The bank said it was 101. Things are looking up!

About this time, Tom sent a note about using a LOT of rudder and taping on mylar to test it out. So about 30% more vertical area was applied using some old mylars from vacuum bagging scraps. The sub-rudder was also hinged to get some rudder control below the fuselage. The gear set was replaced in the S60s, the stress riser glassed up and off we went.

Javelin launches showed way too much aileron-rudder coupling so this was trimmed back until normal control response was dialed in. Then it was time for the spin move.

What could have been a beautiful launch was somewhat degraded by standing there and gaping at the plane as it rocketed into the sky on an essentially straight trajectory. Something not seen before in all this pilot's experience. A wondrous sight, indeed, but not conducive to good flight alignment when it ran out of gas at the top and started back down with all the presets still set. A quick flip of the ch 3 stick got it sorted out in time. But it took a little while to get over the shock of having the darn thing actually work!

After about 30 more launches (with no crashes or inverted flights), we're up to a bit higher than a normal javelin launch. Now it's definitely worth spending some money (or design time) to do this up right!. On the way home, it's 8 PM in the evening, the temperature at the bank is 102 - but this is way cool!

I won't bore you with any more details. I'm a neophyte and other folks have much more worthwhile things to tell you about DLG. But it CAN be done by someone with essentially no experience with this launch mode. Things that appear to be critical are:

1) Generous vertical volume coefficient, on the order of 0.07 or greater. Around 30% of this being the sub-fin with a moving

rudder component,

2) Generous rudder value and throw. Make the rudder ~ 60% of the vertical area with up to 2" of throw at the extreme end of the range,

3) Sweep forward in the wing would seem to help. Use the 'Lift-Roll' spreadsheet to figure out how to get this back to a near elliptical lift distribution,

4) Reduced poly or dihedral angles are probably more forgiving,

5) Maintain high stiffness throughout, especially in the boom and linkage.

6) Both Tom and Mike highly recommend a gyro. We'll look into that and give you the beginner's view of the experience in another couple of months.

Clearly, you will be better off working with someone who already knows how to perform this technique properly and can guide you on setup and choice of plane, presets and details of the launch method. But I hope this little lesson, by one unskilled in the technique, encourages you to give it a try even if you've got to figure it out on your own. It CAN be done. Picture 1 shows the Skeeter tail with mylar extensions and typical rudder preset.

USING A 5 CHANNEL RECEIVER WITH A FUTABA 7 CHANNEL TRANSMITTER

Although this seems like a simple variant on the application, I ran into several minor complications which may be useful to know. In particular, I found trying to do presets for DLG mode rather challenging using the launch preset switch. Flaperon differential was also a problem. The solution that seemed to work best is as follows.

Glid2F Setting
Channel 1 - Left Flaperon
Channel 2 - Elevator
Channel 3 - Battery Input
Channel 4 - Rudder
Channel 5 - Right Flaperon

Aileron differential cannot be programmed in this setup. Instead use the ATV settings to control the aileron differential. About 2:1 seems close.

Aileron trim also can't be done symmetrically with the channel 1 trim tab. Do it with the sub-trim settings for channel 5 (right flaperon).

Use 1-4 coupling for adverse yaw correction as in a normal 7-channel setup.

I use the two programmable mixers to couple the flaperons to elevator. In this case, use one mixer for each flaperon surface. Program for coordinated down deflection only when up elevator is applied. About 1/8" total travel is more than sufficient. This provides very nice camber coupling for turns. It can be conveniently switched off for launch.

Use Aileron-flap mixing to get the 1-5 setup so the flaperons act in aileron mode.

Also use flap aileron mixing and flap-trim to allow camber change on the camber knob. In this mode you must turn on the amount of flap trim (~ 15% seems OK) before setting the neutrals since an offset is generated when you turn on this mode. This allows camber adjustment during normal flight conditions.

Now the tricky part (and the reason for this setup): launch preset. For the Futaba launch presets, there is no channel 4 capability. In normal launch the rudder is normally centered so that limitation makes sense. But for DLG, this is a real pain. There is also no channel 4 adjustment on the crow stick (channel 3). Finally, if you have the presets on the launch switch, you'll spend some time fumbling around trying to take it out after launch. And when it comes out, it's all the way out.

Instead, use channel 3 (Crow) for all the presets except rudder. A slight amount of down elevator and right roll with the flaperons is a good starting place. The amount of throw can be adjusted so that full deflection (up-down) of the channel 3 stick gets you just what you want. Then use the rudder stick (channel 4: left-right) to hold in the rudder offset for launch.

The advantage here is two-fold:

1) You can ease out the channel 3 preset gradually by varying the stick position. Since you should have your thumb on this stick at launch anyway, you're not fumbling around trying to find the preset switch.

2) By using full throw on channel 3, and full right on channel 4, you wind up with the left stick at the lower right corner of the bale for launch. That's a very easy setting to maintain during launch. It now gives you adjustable roll and elevator preset and controlled release of rudder offset (channel 4). After the first fractional second, release the rudder offset, and then gradually dial out the Crow value until you pushover at the top.

I'm sure there are other ways to tackle this problem but this allowed me to not lose contact with the stick while launching and made the transition from launch to flight a lot more gradual and controllable.

LAUNCH SIMULATION REDUX

In the past few columns we've referred to launch simulations for HLG/DLG. The approximations used previously were quite simple and were intended for comparative purposes. Let's take a quick look at some of the possible solutions to this problem.

In my polar program, two types of launch simulations are now available:

1) Polar Launch - this just follows the Cl, Cd launch profile from the polar calculation back up the glide slope. The advantage is that it automatically accounts for the pushover at the top. The disadvantages are that it introduces higher than needed induced drag early in the launch and does not allow for adjustment of the launch angle,

2) Directed Launch - this uses the profile and parasitic drag values from the polar calculation for each specific velocity point along the trajectory. The launch angle can be specified which then determines the required Cl at that speed and launch angle to obtain the induced drag term.

The non-linear velocity equation can then be solved for the launch trajectory. This method requires developing a pushover model which can be done in several ways (noted a little later).

The forces and equations at work are shown in Figure 1. These apply to either launch simulation. If the launch angle relative to horizontal is specified, then the force equations that must be satisfied along the launch trajectory are as shown in the figure. In this case, note that the solution to the velocity in the drag term requires knowing the velocity in the first place (thus a non-linear, non-local solution method is required).

The easiest way to solve this is with brute force. If you go back to calculus, you know that the velocity derivative is expressed in terms of finite differences taken to the limit of infinitesimally small time steps. So we just use that but with time steps that are small enough that the square of the time step is negligible. For physicists and other assorted types you'll recognize this as a Taylor series expansion.

We can do something similar for the distance traveled along the trajectory (at the launch angle). But in this case, if the time increment is small and constant, we can get a sufficiently accurate value by simply averaging the velocity through each time step and then multiplying by the time step.

Add up all the little time intervals to get the launch time. Project the launch trajectory to its vertical component based on the launch angle and you now have the launch height. The only detail left unmentioned is that the Cl and Cd values are backward interpolated from the polar data using a moving three point cubic spline. Simple and accurate.

Now the pushover. As mentioned, the polar launch covers this automatically. For the directed launch, there are two approaches that are comparably accurate:

1) Since the velocity is low, lift and drag forces are small for this part of the trajectory so just assume a radius of curvature for the pushover and use a kinetic to potential energy conversion, or

2) Add a centripetal term to the force equations and solve as before using an assumed radius of curvature for the pushover.

For the pushover radius, I've limited the choices in my program to somewhere between 5 ft. to 20 ft. That's based on asking the question: "Am I comfortable doing an inside loop from a standard javelin launch height?" Some fraction of that maneuver is exactly what you're doing in the pushover maneuver.

I know I can do about 4 inside loops from a standard launch (~ 40 ft.) but I can just barely make one inside loop from that height. And that's still pretty scary. (Ok, I'm a bit nuts. But there just aren't that many people flying HLG in Oklahoma so you have to amuse yourself somehow!) At any rate, that's my selection criteria.

The equations for the energy conversion approach as well as the centripetal force addition are also noted in the figure. Playing around in a spreadsheet suggests the latter adds computational intensity with not much increase in accuracy. Worst case difference between the two methods appears to be less than a foot of altitude. So I've used the energy basis for the calculation. Not perfect, but it gives a good guideline. Someday I'll add the centripetal option in the program.

At this point, the polar program provides Cl and Cd estimates based on the UIUC database and the methods we've described over the past several months. Those now feed directly into the launch simulation. Based on the launch height and launch time, along with minimum sink value from the original polar, an estimate of flight time can now be made. That closes the loop on this about as much as I can do for now. If anyone wants the program, drop me a line and the source code is yours. I'll try and package it as a stand alone distribution application and will post a note when that's available.

One interesting result of the directed launch analysis is that a launch angle much steeper than about 60 degrees really doesn't buy you a significant altitude gain. 70 degrees might be a good target but there's just not that much difference beyond 60.

With velocities of around 55 mph at release, flights approaching two minutes in dead air should be achievable. What's missing from these calculations is the initial rotation after launch. This is likely to be a high drag penalty part of the trajectory so getting the launch angle established immediately should be a significant advantage. But that's all in the wrist and I haven't learned that yet!

Web Sites of Interest for DLG:

Torrey Pines Gulls:
www.TorreyPinesGulls.org

EISS Web Site (Mike Garton):
http://www.eiss.cnde.iastate.edu/

Todd's Model's (piezo gyro):
http://www.toddsmodels.com/

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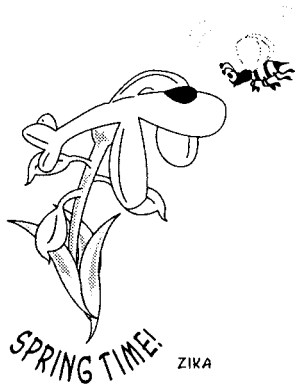

R/C SOARING DIGEST

Radio controlled

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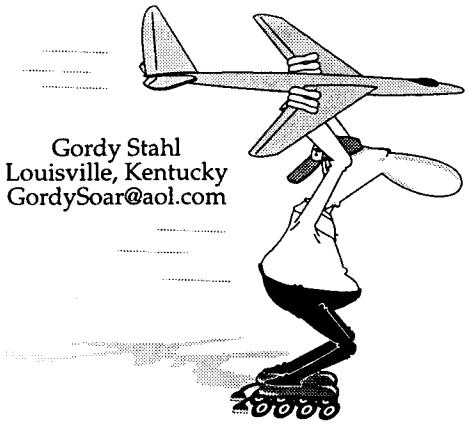
GORDY'S TRAVELS



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"The Hands-Off Winch Launch System By Dave Hauch"

With all my travels and relative good health, I guess I tended to take some things for granted. For instance, winch launching my plane.

I never thought that something so simple might be a problem for others. I mean, all it takes is to step up to the winch, hold the plane in my left hand and radio in the other, then pump up the line tension. Sure, things can get squirrelly holding onto the plane when it's windy, but for the most part no big challenge.... Right? Wrong!

All that is correct, IF you have two strong arms, two strong hands, a strong back, firm legs, sound feet and, thanks to a great, young modeler in Michigan, I woke up to understand that not all of us have all those things.

I was cruising through the hobby, taking it for granted that all we sailplaners had to worry about was our plane's airfoil, or how we set up our landing pattern to time our landings, or what air clues to be aware of, to get those minutes in. But for some of us, it's a challenge just to hook up to the winch line, with all of that other stuff and all.

David Hauch and I had talked sailplanes via e-mail; he mentioned that he flew alone a lot and had built a self-launching winch system, based on a trailer. I have to admit it didn't register why someone would 'want' to have a 'self-launching' system, as in 'not hold your plane during the launch'. I think my first reaction was mixed between, "How lazy can a guy get?" And, "Sounds like a dumb idea!" I guess I just assumed that Dave was some older, frail guy. It just didn't register that someone might enjoy his soaring hobby so much, but had a physical limitation that kept him from just grabbing his plane like most of us.

That was when I realized that his invention would be a great aide to others in the hobby. It's simple to build, safe, cheap, and it's not difficult to machine components and works!

Here's the gist of it:

- The sailplane is set up on top of a box trailer. Mounted in the deck is a winch line retaining rod. It has no special shape to its end, just rounded smooth to allow the winch line-retaining ring to slip off.

- Under the trailer's launching deck, the other end of the pivoting retaining rod has a spring attached. The spring is set with approximately 24 lb. of tension (measured at the top of the retaining rod).

- When the winch line tension builds beyond 24 lb., the spring is overcome and the retaining rod pivots forward allowing the plane to be pulled off the launch-deck and into the air.

- Every launch is flat, uniform and carefree, regardless of wind speed or direction... And that, all while you are flying alone!

- Two pieces of soft foam rubber pad are cut deep enough to support each wing panel off of the launch deck (approximately 5" deep – 12" long); but, not so tall that wind can get under the plane to flip it over. Tapering the foam so that the front edge is slightly less tall than the back, will keep the plane's nose tipped down while it rests, ready for launch.

- The Retaining Bridle hooks to the winch line with a swivel; its end a simple, strong, steel ring (the release ring). The Bridle's length is just long enough so that its swivel rests on the launch deck.

- The winch line hookup to the plane is the usual, chute and key ring. Make sure that the winch line extends far enough beyond the Pivot Release Rod so that the chute doesn't block easy access to the

Bottom view of mechanism.

Plane ready to launch.

Side view ready to launch.

Dave launching with retriever.

Inside the launch trailer.

Release Rod hook up.

The Trailer 'box':

- Dave fashioned it out of 1/2" outdoor 4'x 8' sheets of plywood. The launch deck is 4'x 4' as are all the sides. The back of the trailer box hinges up to provide extra deck length to support the plane's tail section, and is supported by a drop-leg, made from a car extending clothes rod. You can find them at Wal-Mart and they're basically a metal tube with a tightening nut to hold the correct length. (It's rigged to the box backboard so that it can't slip off.)

If you have questions on some detail feel free to contact Dave; his e-mail address is djunruh@qtm.net. Take a look at the photos, as they show quite a bit and you'll see that it really is very simple.

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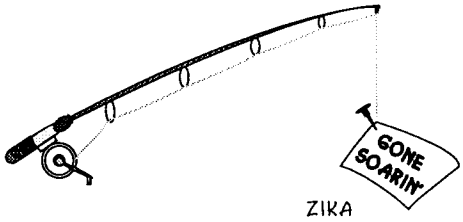

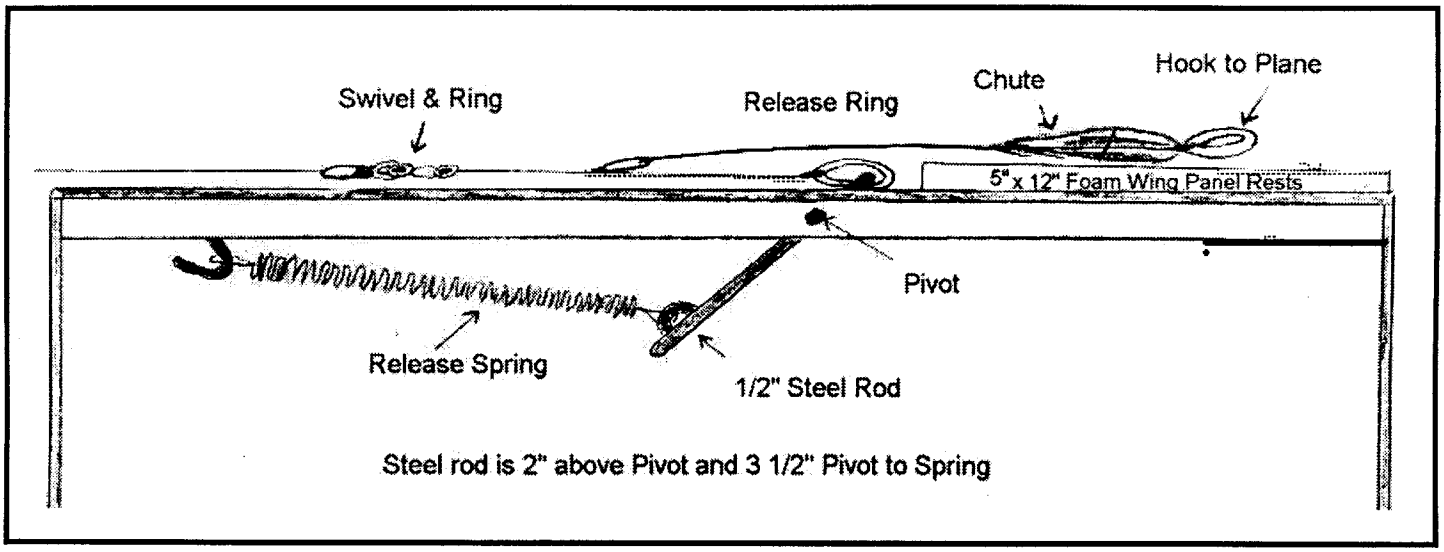

NEW PRODUCT

Auto-Triever(A do it yourself project.

by Jerry Miller
Medford, Oregon

Do you get tired of that long walk to retrieve the chute before you can launch your toy sailplane or other glider?

That can be all over now, as I have developed, designed and produced a really neat set of instructions and CAD drawn plans with some full sized templates for you in order to build an Auto-Triever(winch line retrieval system. If you weld, it will be easy and more cost effective for you. If you don't weld, you can, more than likely, be able to assist a welder of your choice, saving that way.

The retriever system is semi-automatic, hence the name. The unique thing with the Auto-Triever(is that you do not have to touch or handle the retriever line in order to begin the retrieve process. It is automatic, with a specially designed bail and cone that guides the line onto a rotating wheel that stores the line. Simply lift the handle when the glider/sailplane releases from the winch line at the top of the launch, in order to start the retrieve action.

Most all the parts and metal needed for this project are readily available, and the instructions include a complete parts list, with some places they can be purchased. One item that is not: the unique bail and cone. The plans for this new product include a very detailed set of CAD drawings that any machinist can turn it out for you in short order. It can be done by regular machine work or, as mine was done, by CNC machining. Just so you are forewarned, this will be the most expensive part on this retriever, but that is because of the special design and the action of it in the operation of the Auto-Triever(.

I decided to develop the instructions and plans after receiving a set of hand drawn pictures from an old friend in San diego, Sal Peluso. Sal, a welder by trade and a member of the Torrey Pines Scale Soaring Association and Torrey Pines Gulls, sent a video tape of one he had built, asking my thoughts on the design. I told him that I really liked it; that's when I asked for, and he sent, the hand drawn pictures. (I have a Wonder Winch, also designed and built by Sal, which I have had for about 5 years.)

I am not a welder, so I had to pay a local welder here to do that part of the job, too. However, he let me use his drill press and saws to drill holes and cut where needed before he did the actual welding. (He also has a Shot-Blasting machine that can really make aluminum look great.) The instructions explain this and what to do after it is done, if you chose to go that way. The local welder I chose does mainly pontoons for house boats, boat docks, and aluminum fishing boats. On hand, he had a great supply of foam, like the kind we use for building wings. (Another source for all you guys looking for something like that.)

The written instructions, CAD drawings, and completed package was reviewed by Sal recently, and approved to market. Of course, we have worked out a deal on that. Sal, with his business, just does not have the time to handle this, as well. He wants to fly when not working, and he rides dirt bikes, too.

After building mine, and loading #9 braided twine, we tried it out at our local soccer field one Sunday. The only early problem we had was needing to adjust the cone in relation to the center of the wheel width, because it was too far forward and caused the line to build up. Then, under the tension, it would roll back over itself on the wheel drum. Minor tweaking, which included a slight re-bending of the bail, to allow the cone to be moved aft, corrected the situation. It works great now. The only thing you really must pay attention to is how fast it does in fact retrieve the winch line, as you must get off the switch before the chute/strap (whichever you use) gets to the cone. It should stop just before getting to the line guide.

The instructions contain pictures of my completed and tested Auto-Triever(. One picture shows what we use as a line guide, which is placed about 10 feet in front of the retriever, in order to keep the line from that point to the cone constantly in alignment. Other types are in use, such as the one Rahm supplied with their retrievers; my only problem with that one is that it uses a flat plate on the ground using nails to hold it in place. In damp or wet ground, I have found it will be easily pulled from the ground, become wobbly after a couple of over zealous retrieves, or by the person operating the retriever not paying close attention to what he is doing.

With the wicker type line guide, when properly installed into the ground, it has little chance of being pulled loose. You just have to remember to take it home with you when you are done after a day of flying.

Further information about this set of plans os available from me at: Milljer@aol.com or by phone at 541-535-4410 (leave msg.) The plans sell for $31.95 plus $5 S&H in CONUS and $8.00 S&H, internationally. I can accept payment with PayPal at the above e-mail address, money order or check. Shipped when check clears, immediate with money orders and within 48 hours with PayPal.

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

SCHEDULE OF SPECIAL EVENTS

September 1-2, 2001
Tangerine Soaring Championships Orlando, FL
www.orlandobuzzards.org

September 14-16, 2001
Last Fling of Summer Broken Arrow, OK
Dave Register, regdave@aol.com

September 28-29, 2001
Oc-Tow-Berfest 2001 St. Louis, MO
Peter George, (314) 664-6613
twometer@worldnet.att.net

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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.

Auto-Triever(Do-it-yourself plans now available. $31.95 plus $5.00 s&h CONUS, $8.00 s&h Internationally. Auto-Triever(, 3431 S. Pacific Hwy. #64, Medford, Oregon 97501, 541-535-4410, Milljer@aol.com.

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

Glider Business. Over 60 sets of molds, master drawings, inventory of fiberglass, epoxy mixers, and much more. Serious inquiries only. Contact Jerry Slates, Viking Models, U.S.A., phone (972) 442-3910.

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

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
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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:

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

http://www.silentflight.org

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 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

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.

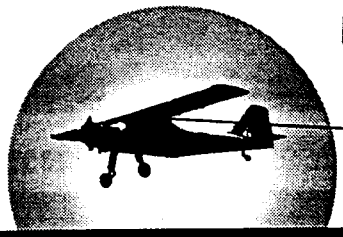
AMA Sanctioned soaring competitions provide the basis for ESL contests. Further guidelines are continuously developed and applied in a drive to achieve the highest quality competitions possible.

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



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Event Coordinator Peter George

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twometer@worldnet.att.net

Flying begins after 9AM pilots meeting.