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**R/C**  
**SOARING DIGEST**  
*Radio controlled*  
THE JOURNAL FOR R/C SOARING ENTHUSIASTS



# R/C SOARING DIGEST

Radio controlled

## THE JOURNAL FOR R/C SOARING ENTHUSIASTS

### ABOUT RCSD

*R/C Soaring Digest (RCSD)* is a reader-written monthly publication for the R/C sailplane enthusiast and has been published since January, 1984. It is dedicated to sharing technical and educational information. All material contributed must be exclusive and original and not infringe upon the copyrights of others. It is the policy of RCSD to provide accurate information. Please let us know of any error that significantly affects the meaning of a story. Because we encourage new ideas, the content of all articles, model designs, press & news releases, etc., are the opinion of the author and may not necessarily reflect those of RCSD. We encourage anyone who wishes to obtain additional information to contact the author. RCSD was founded by Jim Gray, lecturer and technical consultant.

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### TABLE OF CONTENTS

3	"Soaring Site" .....	Judy Slates
	Editorial .....	Computer Crashes & New Technology
4	"On The Wing..." .....	Bill & Bunny Kuhlman
	Flying Wing Design & Analysis .....	FMA Direct M5 Receiver
6	"Jer's Workbench" .....	Jerry Slates
	Repair Technique .....	A Simple Design for a Paint Shield
7	"The Sloper's Resource" .....	Greg Smith
	Slope Flying Resources .....	A Sloping Vacation
	.....	A Quick Update from Lucas, Kansas
8	DLG Launching .....	Bill Kuhl
	Techniques .....	Yet Another DLG Launching Article
10	"Gordy's Travels" .....	Gordy Stahl
	EPP Planes .....	North County Flying 'Amazing' Machines
11	EPP Planes .....	Joe Gullett, Jr.
	.....	North County Flying 'Amazing' Machines
	.....	The Moth & Plasti-Coat
12	Promotional Tool .....	Bill Kuhl
	.....	Introduction to the Hobby of RC Model Sailplanes
	.....	A Web Based Presentation
14	"The Natural Side of Thermal Soaring" .....	Lee Murray
	Weather's Impact on RC Soaring .....	Unusual Weather Conditions
16	F3J .....	Uncle Sydney
	.....	BMFA F3J News

### Advertiser Index

3 Aerospace Composite Products  
6 B<sup>2</sup> Streamlines  
6 Cavazos Sailplane Design  
17 Hobby Club  
9 R/C Soaring Digest

Special Interest Groups  
19 Eastern Soaring League (ESL)  
19 International Scale Soaring Assoc.  
19 League of Silent Flight  
19 Sailplane Homebuilders Association  
19 T.W.I.T.T.  
19 Vintage Sailplane Association

### OTHER GOOD STUFF

19 Classified Ads  
18 New Products  
3 Schedule of Special Events

### RCSD ON THE WEB

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

**Monthly Feature Photography & Web Version of the Printed Article** (where appropriate)  
**Highlights & Mailing Status of the Current Issue**  
**About RCSD**

..... **Subscription Information**

..... **Advertising Rate Card** (Adobe Acrobat PDF format)

..... **RCSD Feature Columnists, Reporters, and Editors**

..... (E-mail/web addresses, plus general information about their areas of interest)

**"Getting Started in RC Soaring" .....** Getting started guide - Adobe Acrobat PDF format

**Links to Organizations, Special Interest Groups & Clubs**

**On-Line Articles** - Great articles originally written for the printed version of *RCSD*.

..... "Trimming Your Sailplane for Optimum Performance" by Brian Agnew

..... "Flies Faster" by Dr. Michael Selig

..... "The Square-Cube Law and Scaling for RC Sailplanes" by Dr. Michael Selig

..... "Modifying & Building the MB Raven (Parts 1-4)" by Bill & Bunny Kuhlman

**Bookshelf Listings** - A listing of recently published books of interest to aeromodelers.

**Complete RCSD Index, 1984-2001**



## The Soaring Site

### Computer Crashes & New Technology

Last month, we had no sooner mailed the April issue of *RCSD*, prepared to finalize the May issue, than my Mac said it had outlived its days and it was time for me to get with the program, joining the new age of technology! Well, sigh, as we quickly discovered this past month, that's easier said than done!

First, I want to say thank-you to everyone that sent e-mails and patiently waited until the new Macintosh arrived, and the new AOL software was up and running. My thanks also to Bill Kuhlman who sent messages to the *RCSD* team to let them know I was off-line. And, my thanks to the team for being patient with us, as well.

Second, because there are still quite a few things that are not working or looking quite like they should, such as EPS graphics, thanks to all of you that can ignore the little things. Please know that we're working to get them back looking like they should!

**Happy Flying!**  
**Judy Slates**

### SCHEDULE OF SPECIAL EVENTS

#### September 13-15, 2002

Last Fling of Summer Broken Arrow, OK  
Dave Register, (918) 335-2918  
regdave@aol.com

#### September 14-15, 2002

Pacific Northwest HL Redmond, WA  
Glider Contest  
Adam (Red) Weston, (206) 766-9804  
red@tgworks.com  
<http://www.reddata.com/sass>

#### October 18-20, 2002

Deep South Soaring Championships Houston, TX  
<http://home.houston.rr.com/kovacs/hawks/deepsouth.htm>

#### February 1-2, 2003

Southwest Classic Phoenix, AZ

Please send in your  
scheduled 2003 events  
as they become available!

Beautiful in full color, both  
cover photographs are  
available for downloading from  
the *RCSD* main web page.



**HAL & HIS BEAUTIFUL ASW-27**

A perfect Saturday morning at Eagle Butte, Washington, captured on film by Greg Smith, is covered this month in his column "The Sloper's Resource."



**BACK COVER**

### MIDWEST SLOPE CHALLENGE 2002

Another view over the pasture hill at the MWSC: Rich Loud's DAW P-51.

Photography by  
Loren Blinde, Lincoln, Nebraska.

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## EPP Foam

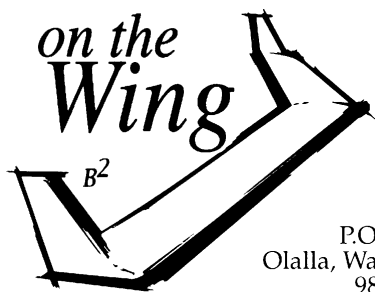
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bsquared@appleisp.net  
<http://www.b2streamlines.com>

## FMA Direct M5 Receiver

The FMA Direct M5 is an FM dual conversion five channel sub-micro receiver with impressive specifications. Just 1.3 inches long by 0.8 inches wide, it's 0.7 inches high with a foam protector on the back of the circuit board and shrinkwrap encasement. In addition to its small size it weighs just 0.3 ounce, and FMA Direct supplies the receiver with one of the lightest antennas we've seen.

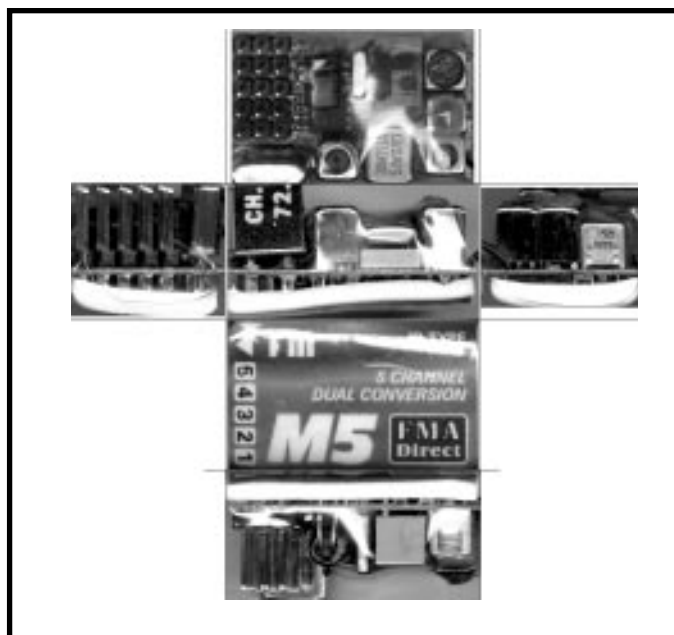
If you're curious to see just how small the M5 really is, cut out the included multi-pane photo and fold it into a box shape. To get an idea of the weight, attach three pennies and a dime inside before taping it together, but realize the result will be slightly heavier than

the actual receiver and antenna combination.

The M5 utilizes SMT (Surface Mount Technology) construction on a single glass-epoxy printed circuit board. The overall size has been reduced 22% from the FMA Extreme, and the volume is roughly 50% of the FMA Fortress Micro Universal receiver.

There are five sets of pins for servo connections. The battery, which can be any voltage between +3.5 and +16V, can utilize either a free servo plug or a Y-harness in conjunction with any one of the servos. The crystal sits against the pins for the fifth channel.

The M5 comes in two different versions — positive and negative shift — and is compatible with JR, Futaba, Ace, Hitec and Airtronics transmitters and servo plugs. (Older servos, specifically Airtronics, will need to be modified with new plugs.) This is a PPM re-



ceiver, and it is not PCM compatible.

The M5 looks very much like a modified Fortress Micro Universal receiver. The DIP pins which allow the Fortress to operate with both positive and negative shift transmitters are lacking on the M5. The servo pins on the M5 are oriented upward rather than protruding from the end of the receiver. A few parts, like the crystal, are in a different portion of the circuit board.

## FMA DIRECT M5 SPECIFICATIONS

Size	1.30"L, 0.8"W, 0.58"H (0.7"H with foam & heatshrink case)
Weight	9 gm/0.3 ounces, 11 gm/0.4 ounces
Design	Dual conversion, super heterodyne
Special circuitry	Microprocessor controlled decoder
Channels	1 through 5
Modulation	FM/PPM (Pulse Position Modulation)
Frequency	RC Channels 11-90, U.S. legal 72 and 75 MHz
Ultimate bandpass	±8.5 KHz @ >55dB down
Usable sensitivity	>-95 dBm
3OIP	+9 dBm
Failsafe	to last good frame
Operating voltage	+3.5V to +16V DC, limited only by servo requirements
Current draw	19 ma
Legal use	Meets AMA guidelines and FCC 1999 radiation requirements



View of receiver.



RF Board

away from the bank of receivers and across the yard, watching the flag waving servos the whole time. We live in the midst of a fairly dense forest, so we walked until trees started getting in the way. Despite having no antenna at all on the transmitter, all three receivers were still going strong at 160 feet.

We've purchased one M5 for our JR transmitters (positive shift) and another for our Ace Silver Seven single stick transmitter (negative shift). We are currently in the process of modifying a tailless A2 free flight glider for RC, and plan to use one in it. The light weight and small size of the M5 are very real benefits in this installation. We haven't decided where to use the other, but as FMA Direct states the M5 can be used in anything from an indoor model to IMAA quarter scale,

we're able to keep our options open.

We need to reiterate a major point — the M5 is not a range-limited receiver suitable only for indoor use or for park flyers which will stay inside the confines of a football field. The M5 is a full range receiver with an extremely narrow bandpass, and as such it is suitable for just about anything you can build. It also sports failsafe to last good frame. Because of its extremely narrow bandpass and interference rejection capability, it should behave very well in a contest environment.

The M5 sells for US\$69.95 without crystal. The recommended reduced height crystal we've been using is US\$12.95; a standard height crystal is available for US\$10.95.

Visit FMA Direct on the web at <[www.fmadirect.com](http://www.fmadirect.com)>. You can order anything in the FMA Direct catalog by using the secure shopping cart on the site or by calling their toll free number 800-343-2934. Technical information and service can be reached at 301-668-7615. FAX 301-668-7619. FMA Direct is located at 5716A Industry Lane, Frederick MD 21704.

#### **P.S.**

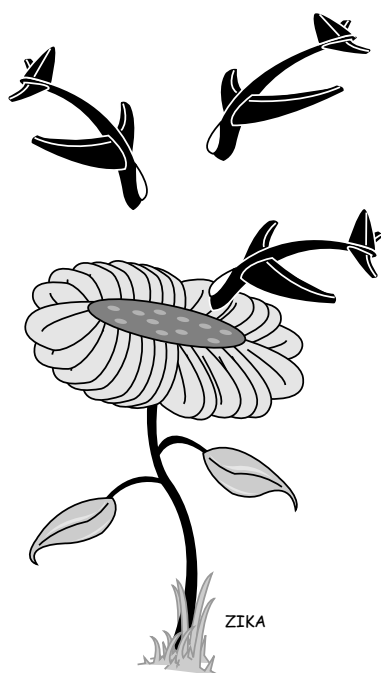
About the Ace single stick transmitter we mentioned... FMA Direct also

We do not have sophisticated testing equipment and our knowledge of electronics is fairly rudimentary, so our technical examination of the M5 consisted of comparing its range with that of a couple of other PPM receivers. The range check was performed in our yard alongside a Hitec RCD 3600 and an FMA Direct Fortress Micro Universal. The instructions for the M5 state a range of at least 200 feet should be obtained with the transmitter antenna collapsed. We used our JR PCM 10 as a signal generator, but since we use a JR base loaded antenna, we had to remove the antenna completely.

All three receivers were placed on the back of a chair and the antennae were allowed to hang vertically. Pieces of masking tape were attached to the servo arms as flags. Transmitter in hand, we walked

produces an RF board for the Ace Silver Seven Series transmitters. We were able to update our transmitter to FCC requirements by drilling four holes in the case, mounting the new RF board (2.5 x 1.5 inches) using the included standoffs, and connecting two Deans plugs. The included photo shows the completed installation. The update cost just US\$44.95 for the RF board and US\$12.95 for the transmitter crystal. Very cool.

Bill & Bunny Kuhlman  
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Olalla, WA 98359-0975



## Jer's Workbench

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### A Simple Design for a Paint Shield

When we find ourselves in a repair situation, once the repairs have been completed, paint touch-ups are likely required. This is usually accomplished with a can of spray paint. Spray paint, as most of you already know, can sure make a quick mess of a workshop. And, if the repairs are being done in the late night hours, who wants to attempt the paint job outside when it's obviously too dark, perhaps raining, or whatever?

So, having been in this sort of situation myself, when I wanted to do a paint touch-up recently, it was late at night, and there was no way that I could have the plane ready to go for the weekend unless I came up with an idea to overcome the obvious paint over spray that would occur.

What follows is my paint shield design:

- Start with a sheet of cardboard, 18" by 24" or larger.

- Find the center of the cardboard.
- Cut a small hole, approximately 3x6".
- Hold the paint shield a few inches above the model, with the hole in the paint shield over the area to be painted.
- Spray the paint through the hole.

Most of the over spray should wind up on the shield and not all over your shop.

Remember, when doing any kind of spray painting, work in a well ventilated area. Wear a mask. Think safety first!



*Structural Dimensioning of Radioguided Aeromodels*  
*Aerodynamics and Flight Mechanics of Aeromodels*  
*Aerodynamic Design of Radioguided Sailplanes*  
*Gliding With Radio Control*  
*Tailless Tale*  
*On the 'Wing...*  
*On the 'Wing..., Volume 2*  
*Balsetta - small balsa aircraft*  
*RC Soaring... A Laughing Matter*  
*Understanding Polars Without Math*

SAE Design and Construction Manual to be published soon!

Catalog available!

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# "The Sloper's Resource"

By Greg Smith of slopeflyer.com  
greg@slopeflyer.com  
<http://www.slopeflyer.com>

## A Sloping Vacation!

I went on a 2-1/2 week family/flying vacation in late June and early July; sorta cut into the writing time. My wife Wendy, daughter Sydney and I did a whirlwind tour of the West. We saw Mt. Rushmore, the Badlands, Glacier National Park and Yellowstone. I also managed to get in some flying!

Our first flying related stop was in Chamberlain, SD. I met Rob, Mirko, Emil, Dave, Brett and Ib there. Special guest and DS wiz, Pat Bowman, also showed up. Pat's wife had some business in the Twin Cities so Pat accompanied her there and then drove down to meet us for several days of flying and a bit of walleye fishing with local fishing expert and slope guide extraordinaire, Rob Hurd. The only bummer of the stop for me was cracking the fuse on my Viper while landing after a very memorable flight with 3 pounds of ballast in 45-50 mph winds at the ranch site. Can you say speed? I can and that was what the flight was all about, more lift than a Wonder-Bra, so it was definitely worth it. I've said it before and I'll probably say it again. South Dakota sloping rocks!

After a couple of days in the Chamberlain area we headed west. Our first stop was the Badlands. I tried the SH-50 at a promising looking spot but the wind was not strong enough and the thought of losing the plane to the very inhospitable terrain cut this flying day short.

We spent several days at Glacier National Park and there are some awesome spots for sloping, however, since we were there on the first day that the Going to the Sun Road was open this year, along with about 10,000 other cars, I thought it prudent not to draw attention away from the masses with a slope flying demonstration. I could just see some doorknob gawking at the plane and driving off the narrow road!

The next real flying I got in was at May 2002

Eagle Butte in Southeast Washington where I met up with Eric and Hal from Oregon. I arrived late in the afternoon on Friday and got in a nice flight with the Extreme and the Wizard Compact.

The following morning I met Dieter and Marcella from Shred-air at Eagle, as well as Hal and Eric again. Marcella was doing some photos of new planes that Dieter was flying and Hal and Eric were flying scale planes. Hal had an especially nice looking ASW-27. 4.5 to 5 meters I believe. It really flew well. I flew the Wizard Compact and the McLean Extreme again and marveled at the lift available at Eagle; it is truly world-class.

Later in the day we headed over to Chandler Butte. I lucked out and ran into several luminaries from the slope soaring fraternity: Dave Reese, Craig Toutolmin, and Barry and Gavin Baskin. They were there to get in some practice for the upcoming Viking Race in Slovakia, which is the defacto world championship for F3F slope racing. All the guys were very helpful and they talked me into flying a full 10-round F3F event. It was great! I used the Wizard Compact and had a blast. I managed to lower my personal best by a good margin and it was really informative to be able to fly with some of the world's best. Good luck in Slovakia, guys.

I also made a stop near Boise, ID to do a little flying with Mike Goldston. Mike has a super site about 15 minutes from his house. The wind was coming in nicely and we had very good flying. Mike had a couple of Bluto's from Northcounty Flying Machines. These planes fly really well and have been getting great reviews from a lot of slopers. I got a bit of stick time on the bigger version and I thought it was a good flying plane for an EPP wing. He also flew a 2-meter Omega from NE sailplanes. I flew my trusty SH-50 and the Wizard Compact, two of my favorite planes.

We made a final stop in Chamberlain, SD on the way home to take a rest and get in a flight on my birthday. We also saw what turned out to be one of the few fireworks displays in about a 200-mile radius. South Dakota has had a major lack of rain this year so many of

## This month's links:

Mike Bailey and Kansas F3F  
[www.midwestslope.com](http://www.midwestslope.com)

Midwest Slope News Group  
[midwestslope@yahoo.com](mailto:midwestslope@yahoo.com)  
(go to [groups.yahoo.com](http://groups.yahoo.com) to join)

the small community shows were canceled.

## A quick update from Lucas, Kansas

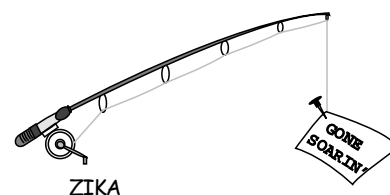
The Kansas F3F events are gathering steam. As of this writing Mike Bailey has hosted 3 events with a couple more coming this fall. Come on out all you Midwesterners! There is a Yahoo Groups e-mail list for more info at [midwestslope@yahoo.com](mailto:midwestslope@yahoo.com).

By the way, if you do not see a report on your event, and you think you should, then you should be contributing to this here column. Y'all contribute now ya hear?

I got a few new planes in the last couple of months and I will try to get some words down about one or two of them for next time. I've also been working on a major revision of the slopeflyer.com website and I'll fill you in on that project as well. Meanwhile, if you want a sneak preview, check out <http://www.slopeflyer.com/artman/publish/>.

Finally, something else to look forward to: *Slope Trash Magazine* will be back on the web! More on that next month, as well. Oh, all right, if you want a sneak preview of that as well, go to: [http://www.slopeflyer.com/artman/publish/cat\\_index\\_10.shtml](http://www.slopeflyer.com/artman/publish/cat_index_10.shtml)

Say Bye!





## Yet Another DLG Launching Article



by Bill Kuhl  
bkuhl@luminet.net

You are probably thinking, why another article on discus launching. Haven't we been through this all before? Reading every article I could find and practicing what I read, still my launches were not high consistently. Hopefully, I can offer a couple of tips that I have discovered the hard way that could help other frustrated DLG pilots.

Watching someone discus launch it looks so simple, but if not done correctly the height will not be as high as a

good javelin launch. There is also more risk that your plane will go crashing into the ground with an improper launch. It is easy to get really frustrated which makes the launch even worse. Then you try to make up for poor technique by using more force, which only makes the launch worse.

### What are the Characteristics of a Good Launch?

From what I have read and my own experience launching, a good launch

technique includes the following:

Keeping the whole arm and wrist rigid.

Getting your whole body to turn in a coordinated manner.

Releasing the plane without imparting too much of a yawing motion.

Getting the plane to go almost vertical right after launch.

The two things that I have learned the hard way were: gripping the launching peg properly with my fingers and how important it is to have slop-free control linkages.

### Getting the Grip

My first attempts at discus launching were without using a launching peg, simply gripping the wing tip. This worked well, but I realized to get maximum height I would have to use the launching peg. Biggest problem when using the launching peg, was that the plane would hook to the left. The problem seemed to be worse in low wind conditions. At times I came real close to crashing from a launch that veered way too much to the left or the height was less than a javelin launch. This really frustrated me. I would try harder and that made it worse.

My salvation came when I realized that there was something wrong with the grip of my fingers around the launching peg. I would wrap my fingers around the launching peg in a half circle and straighten out my fingers at release. In my mind the

Fingers  
should NOT  
curl in front of  
launching peg.



This is  
the grip  
that works  
for me.





plane would get away from me too soon with a lesser grip.

I described my problem in detail on *RC Soaring Exchange* and had several responses. It was Denny Maize that set me straight:

"Do not "hook" your fingers around the peg. Try to throw without hooking the first joint of your fingers around the peg and release will be much better." It certainly was! Thank You, Denny!

### Slop-Free Control Surfaces

During one of my flying sessions I happened to notice that the rudder of my DLG was not centering very well. Upon closer inspection I noticed that the wire that went through the holes in the HS-55 servo arms was way too small for the holes in the servo arms. Looking for an easy fix, I inquired on *RCSE* again and received several suggestions. As the servos were glued to the bottom of the plane on their sides, I chose the easiest method, dribbling CA in the hole and breaking the wire loose from the CA. When building a new plane I will use a wire diameter that more closely matches the

size of the hole.

Another problem that was causing slop was that the thin fiberglass cloth that was vacuum-bagged on the tail feathers was coming loose on the edge of the vertical fin that joins with the rudder. Ran CA carefully in this spot and now the controls are much stiffer. Back to the flying field and I noticed not only does the plane control more positively, it appears to launch higher, also.

Another e-mail inquiry on *RCSE* and I find that control flutter can reduce launch height by a significant amount. In extreme cases it could reduce launch height in half!

### Quotes to End By

Flying alone most of the time, I often have to rely on the Internet to get my questions answered. As in the computer work I do, it helps to carefully prepare your questions. State exactly what equipment you are using and the situation precisely. Include steps that you have tried to resolve the problem and the outcomes. There are many people willing to help you out if you attempt to help yourself first.

The following quotations I found helpful and amusing:

"You can do 100 feet easily, but getting higher is the hard part. It is all in the dance." Chris Adams

"I have found that consistent form is the most important." Mike Kovacs

"You can get height from 3 sources. The first is rotational speed. The second is brute force. The third is timing, like a good golf swing. Number one is hard on your feet. Number two is hard on your plane. Number three you either get or not by practice and critique." John Erickson

### Resources on the Internet

Mike Kovacs Webpage - <http://home.houston.rr.com/kovacs/hlg/>

Oleg Golovidov's HLG Seminar Notes – Mid-South Championship <http://olgol.com/TabooXL/hlg-clinic.html>

IHLGF 2001 videos on Web - <http://www.silentflyer.org/ihlgf01.html> (follow the Quicktime instructions)



## R/C *Radio controlled* SOARING DIGEST

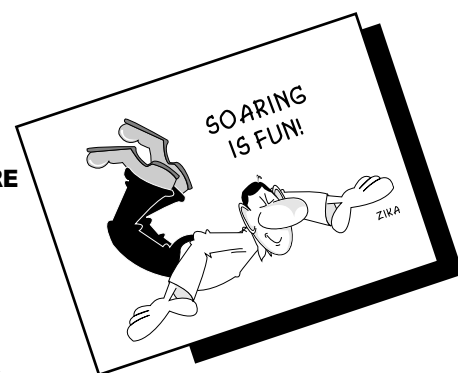
THE JOURNAL FOR R/C SOARING ENTHUSIASTS

A MONTHLY LOOK INTO THE WORLD OF SAILPLANE ENTHUSIASTS EVERYWHERE

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

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

There are *RCSD* subscribers worldwide.



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# GORDY'S TRAVELS



Bluto



Gordy Stahl  
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GordySoar@aol.com

## North County Flying 'Amazing' Machines

The EPP craze has produced some wild flying models, and I have managed to fly just about all of them. Now I am not a foamie kind of guy, preferring open class ships of glass and carbon, but that doesn't mean I don't own some!

Of course I am always looking for neat planes and foamies aren't excluded. Recently, on the *RC Soaring Exchange*, I noticed a post from Joe Gullet of Spring Hill, Tennessee, which prompted me to check out NCFM's web site to find out more about their planes.

What I found was not only some pretty

amazing soaring EPP planes, but also some really interesting history about their planes. It is a really interesting read regardless of the products. The basis of their plane designs is Harris Nelson, a model builder, and innovator since 1950. Harris is the man who brought us SpyderFoam, the very hard but light foam used in our bagged ships.

NCFM offers three planes at this time, all from EPP and all for the slope: the 48" Moth and two Bluto's, 48" and 56".

There is a neat section showing the "Evolution of the Moth" from the first, 100" glass and foam version first shown in a *Model Builder* 1977 Magazine, to the current EPP model at 48".

The Bluto is very distinctive in its class of foamie wings, with an added lifting surface 'nose', designed for extreme slope fun.

You can find North County Flying Machines at <http://www.northcountyflyingmachines.com> or by calling California at (760) 439-7037. Tell Derrick you read about them in *RC Soaring Digest* Magazine!

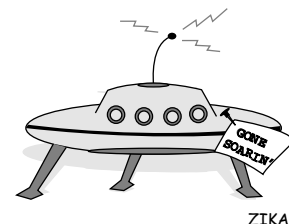
Take a look at Joe's article, and you'll find just what I was looking for (Cuz I

just ordered two!): a small foamie that could fly on small hills yet rip in Dynamic Soaring conditions. All of the NCFM planes are highly prefabricated. (Yep, I can build them in a motel room!)

If you are looking for a fun foamie EPP sailplane that thermals and rips the slope, the Moth is probably the machine for you.

I'm looking forward to more 'trips' with my Moths in the near future! Think Toronto will let me in with a Moth in my luggage?

See you on my next trip!





## The Moth & Plasti-Coat

By Joe Gullett, Jr.  
Spring Hill, Tennessee  
jgullett@charter.net

I was looking for a new slope ship and saw a reference to the Moth on RCSE, a great resource for the soaring junkie. The Moth is a 48" span, flying wing sold by Derrick Choice of North Country Flying Machines ([www.northcountryflyingmachines.com](http://www.northcountryflyingmachines.com)). I ordered mine on a Monday and had the nicely packed kit in my sweaty little hands when I got home from work Thursday. If you have built a "foamie" before, this little ship is pretty straight forward and I estimate it took about 5 to 6 hours to complete.

One big difference from my previous "foamies" is there is much less strapping tape required. Basically just some 1" strips on the leading edge. The wing spars are very nice carbon fiber tubes that slide into the pre-cut holes and are then capped with balsa to seal the gap. This makes for some very stiff wings; well, stiff for a foam plane for sure. There is also a carbon fiber tube longeron that inserts in the pre-cut hole in the fuse and this also adds great stiffness to the fuse. Balsa stock to cut the fin and nicely matched balsa elevon stock completes the major kit items. Hardware includes everything you need to complete the ship: control horns, threaded control rods, wing joiner rod, and basswood drag spar stock including a titanium drag spar joiner.

I installed a pair of HS-85MG's servos and the antenna in the wings per the directions. Derrick includes a nice antenna coupling that allows you to install the antenna wire in the wing without the receiver hanging on. The wings were sprayed with 3M77 adhesive and the wing and elevons were covered with ultracover. I installed the flight pack, FMA Fortress receiver and a 270 mAh battery in the pre-cut fuse opening and trimmed the middle out of the opening slug as directed.

In the instructions Derrick mentions an alternate method to finish the fuse using thinned (with Toluene) Marine Goop (available from Home Depot). This

Moth Continued on page 13...

## About the Moth

### Flight:

Excellent spiral stability  
Extremely fast and agile  
Fast and stable DS'er  
Great inverted flight  
Highly responsive  
Aerobatic in light lift  
Excellent thermal machine!!!  
"EPP durable"

### Kit Includes:

- Carbon fiber wing spar + secondary spar system for added impact strength (new 6/1/02)
- New Larger I.D. Longeron - Glaspar G50 Full-Length Fiberglass/Epoxy Tubing
- 1.3 lb. EPP Precision-cut, "de-slugged" EPP foam wing and 1.9 lb. EPP fuselage (new 6/02)
- Quality, consistent weight balsa elevon material
- Basswood Drag Spar Material
- Balsa Fin and Spar Cap Material
- New - Heavy-Duty 6061-T6 Aluminum Spar Joiner
- New - Titanium Drag Spar Joiner
- All control horns and linkages
- Comprehensive manual with detailed graphics

### Technical Info:

Span:	48"
Wing Area:	336 Sq. In.
Flying Weight:	14-22 Ounces
Wing Loading:	6 to 9 Oz./Sq. Ft.

Download Moth Photo Manual  
(PDF File - 1.2MB)

### Recommended Flight Equipment:

Transmitter:	Elevon Mixing with End-Point Adjust and/or Dual Rates
Receiver:	Hitec Micro 555/similar size
Servos:	HS-85/similar size
Battery:	270mAh/similar

# Introduction to the Hobby of RC Model Sailplanes



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Opening Screen

## Introduction to the Hobby of RC Model Sailplanes

### A Web-based Presentation

by Bill Kuhl  
bkuhl@luminet.net

URL is <http://www.luminet.net/~bkuhl/sld027.htm>

"Introduction to the Hobby of RC Model Sailplanes" web presentation was created as a promotional tool for the RC soaring hobby. My way of giving back to the hobby that has given me so much, in no way was profit a motive. Graphics and writing are also hobbies of mine, so I tried to put it all together in one project.

Thought was to create a presentation that other RC sailplane enthusiasts could use to promote soaring, taking advantage of the work that I had done. Their effort could be better spent giving the presentation to interested groups instead of "re-inventing the wheel". The text is rather brief and really requires that the presenter give additional explanations.

### Image Contributions

Several individuals donated images or information to this project. Special Thanks goes out to Paul Naton, Robert Bingham, Bob Harold, Klaus K. Weiss, Steve Henke, and Dr. Michael Selig.

### Power Point Format

I call this a presentation because it was created with Microsoft's presentation software – Power Point. Power Point is used to create slide shows of images and text with bullet points. Often a laptop computer is connected to a LCD projector (device that displays computer images on a screen) and the presentation is given to a group of people.

Another feature of Power Point, is the ability to create HTML code, the format used for Internet web pages. This makes it easy to put the presentation on the Internet with jump forward and jump backward features built-in.

The first web presentation I had done in this manner was "Model Aviation – Educational Activity for Young People" a brief history of model rubber

powered airplanes, construction, pictures of flying, and educational aspects of these models. Pressing the top button on the screen containing a "<<" will bring you to the first slide of this presentation. Basically parts of my AMA Cub/Delta Dart web page were put in a more condensed format. I learned that sometimes less is more, as I received more praise from the condensed web page.

### Selection of Topics

Realizing that I could not cover every aspect of RC soaring, I tried to give a good sampling. First I started with a few reasons why I thought this was a good hobby. The main points conveyed are that it is an educational hobby that you can start out rather inexpensively and always find new challenges.

Next section deals with the origins of soaring, which dates back a couple of hundred million years ago when large creatures flew off lift from mountains. Another important point I wanted to bring out was the importance of gliders in the development of powered planes.

With the lack of interest in math and science in the United States, I thought it good to present this as a hobby that relies heavily on those areas. Much of soaring is about increasing efficiency, a skill that is valuable in almost every aspect of our lives.

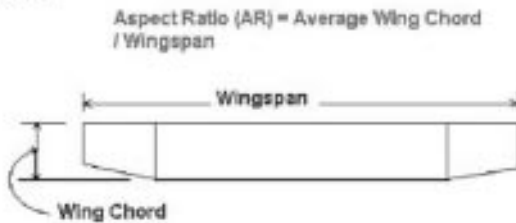
Not present in the presentation are aspects of soaring that might be considered more dangerous. You will not find any reference to 180 mph + DS runs or even combat flying though I do not consider it dangerous.

To give the hobby more scientific credibility, information about the airfoil research that has been done at universities was included. Examples of composite construction were also included to further reinforce that this was a hi-tech hobby. Also included were examples of aerodynamics such as aspect ratio and glide ratio.



## The Need for Efficiency

Normally flying in thermal lift and often under slope conditions, there is no excess lift, so a sailplane needs to be as efficient as possible. This means creating adequate lift while creating the least amount of drag, known as the Lift/Drag ratio.



Wings of sailplanes are normally long and narrow, the ratio of wing's length (wingspan) to wing's width (chord); is known as the "aspect ratio" or AR. Wings with higher aspect ratios have a better glide ratio, but require strong construction.

Very basic information is included about what are thermal and slope lift, methods for getting sailplanes aloft, and learning to fly. The final section is a sampling of different sailplane competitions.

### How Could This be Used?

Hopefully, there will be many uses for this presentation that I have not thought of. Someone that had contacted me thought it would be useful in making a pitch for a new flying field. Most common use will be to send the link to anyone that might be interested in RC soaring. If anyone would like the Power Point file, I can send this as an e-mail attachment, although this would require you to own the Power Point program and the file is a few megabytes. This would make printing out the presentation in booklet form easier.



Moth Continued...

sounded appealing since I have never produced a decent looking EPP fuse using ultracoat. I'm just not good at getting around those compound curves.

So I headed out to the local Home Depot to find some Marine Goop and the Toluene. I could not locate any of the recommended thinner but, in searching, came across a product called Plasti-Coat which is used to dip tool handles in and provides a rubber type grip. It came in a variety of colors and was very inexpensive, so I bought a can with the thought of trying this as a fuse finish.

When I got home, I popped the top on the Plasti-Coat and brushed some on a scrape piece of EPP. When I checked in the morning, I found a bright red piece of EPP that now had a finish that seemed almost dent proof. I brushed a light coat on the fuse and headed off to work. About 10 hours later, I brushed on a second light coat and did the same the next morning. That evening I gooped the wing into the fuse, hooked up the flight pack, and balanced it per the instructions. I left the sides of the fuse opening loose and just rubber banded them on for the test flights.

Then, headed to bed with thoughts of flying my new toy at lunch the next day.

Winds were very light at the dam for the initial trim flights and although it flew better than I had hoped, it was nose heavy. In discussing the CG with Derrick at NCFM, he said the CG in the instructions was very conservative and suggested that I move the CG back as far as I felt comfortable with. I started out with about 1/4 oz. in the nose to put the CG at the recommended location about 1 1/4" from the LE. I ended up taking that 1/4 oz. out and adding 1/8 oz. at the tail to get it flying the way I liked. The plane became much more responsive. When you get yours out the first time, I think you will see what I mean. 1/16" does make a difference!

When all was like I wanted, I tack gooped the sides in and brushed some of the Plasti-Coat into the cracks. I have had this ship for almost three months now and it is always in the back of my truck for any opportunity to get a quick slope fix. I haven't seen any apparent UV effect on the Plasti-Coat. We fly over rocks a lot and I have hit my share, but the fuse doesn't

show it. I did not weigh the fuse prior to adding the finish but do not feel there is a great penalty. In any event, this will be my preferred method of fuse finish for all my future "foamies" unless someone comes up with something easier and better.

Mine weighs in at just over 1 lb. when weighed on my fish scale. I have had the pleasure of flying this little sloper in light (5 to 8 mph) winds and more buoyant (15 to 20 mph) conditions and haven't felt the need to add ballast. Simply a click or two of trim and it performs as well or better than any of the other slope ships I have owned. This thing will turn on a dime and the local buzzards at the dam hate it since they can't run away from it. (Never played tag with a buzzard? Okay, okay, that's another story.) Anyway, for about \$65.00 delivered to your door, this is one fun plane! My advice, GET ONE!!



# THE NATURAL SIDE OF THERMAL SOARING

By Lee Murray  
Appleton, Wisconsin  
lmurray@athenet.net

## Unusual Weather Conditions

Saturday, June 15th, was the date of the first joint Green Bay Appleton Sailplane contest. The weather conditions gave us an unusual set of conditions that made the day a great teaching tool for understanding the weather. The event was under the threat of scattered showers that kept the attendance down to about 10 people. The jet stream that controls so much of Wisconsin weather was just to the north as it dipped down from Canada in a near stationary pattern giving us a weather system of below normal temperatures and above normal rainfall. A low-pressure system to our northeast brought winds from the WNW with some instability in the atmosphere. The contest started with light breezes and a nearly clear sky over standing water covering much of the sod farm and surrounding low land. The flying tasks were developed for the many power fliers in our clubs that also flew sailplanes infrequently. The task durations were 3, 6, 9, and 12 minutes, to be flown in order. To make it really easy, one could continue to attempt a task until it was achieved without penalty. There was an in/out landing circle as well, but that doesn't relate to the story. Everyone did the 3 minute task without difficulty but then there was some difficulty in getting the 6 minute task and lots of trouble getting the 9 minute task. Things changed about 1:30 when the sky started to build clouds. Dale Uecker, looking at the black clouds developing, commented, "This looks like the sky the other day when Dave Beck and I thought we would never get out of a thermal." The air temperature dropped and I launched looking for that 9 minute flight thinking that big thermals were finally breaking loose. Fortunately, I had no trouble getting my time. Matt Barbian and Bob Hawkins launched when I was in the air going for their 12 minute flights. What they found was very strong lift. Matt's model went into a cloud with Matt and his timer, Dale, wondering if they would ever see it again. Shortly

after their flights, it started to rain.

Because we had 10 people flying frequently on an open winch and without discrete rounds, there was a constant evaluation of how the lift was going. Weak lift, building gradually until about 1 O'clock, was really great for a few minutes before the rain. This is my analysis of what happened. I'm going to be as specific as possible about what information was gathered and how it is used, because I know some of you readers are trying this and some are having trouble using the information.

I first got the lapse rate information from <http://raob.fsl.noaa.gov/>. From that page I selected the parameters on the screen<sup>1</sup>:

### I. Input Dates: (UTC units)

From here I loaded Soarcast<sup>2</sup>. I select Open on the pull down menu bar. Select the saved file in the directory you used. After the data loads, I go to the Tools pull down menu and click on "Set Max. Temp / Elevation." Here I set the observing station altitude in feet and also set the high temperature for the day. If you are doing this after the fact, you can get the last 24 hours of temperature history by hour from the NOAA<sup>3</sup>. That output of the report for June 15th is shown below.

*(Time, Temp., Dew Pt., Pressure, Wind Direction, Weather)*

11 AM (16) Jun 15  
68 (20)  
55 (13)  
29.71 (1006)  
WNW 12

Noon (17) Jun 15  
71 (22)  
53 (12)  
29.7 (1005)  
WNW 16

1 PM (18) Jun 15  
73 (23)  
51 (11)  
29.69 (1005)  
WNW 16

2 PM (19) Jun 15  
60 (16)  
50 (10)

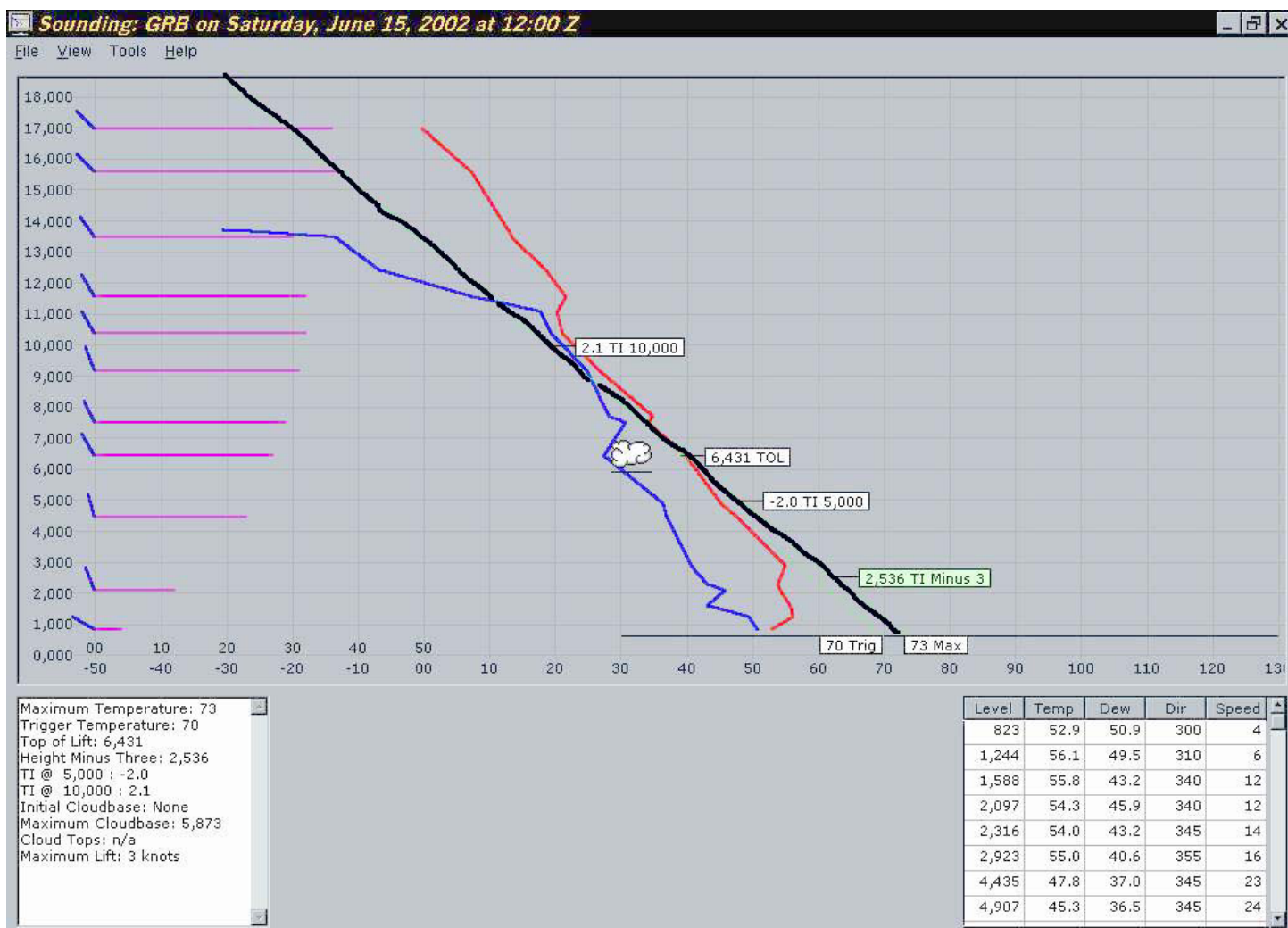
29.7 (1005)  
NW 9  
light rain

3 PM (20) Jun 15  
66 (19)  
53 (12)  
29.69 (1005)  
NW 12

4 PM (21) Jun 15  
68 (20)  
53 (12)  
29.7 (1005)  
N 16

## The Analysis

The lapse rate data was very interesting in that it showed that the trigger temperature was 70°F and the high for the day briefly reached 73°F. That happened at 1 PM just as the lift was getting real good. Before noon, the lift was light and elusive. Most everyone, expert and novice alike were scratching for lift. The rising air off the paved road running by the sod farm and some wave lift from tree lines were the likely options. When clouds started forming over the field, this was an indication that the thermals were finally breaking through the nocturnal inversion. (The noon balloon was going up.) The moisture laden air from the surface condensed the moisture when it hit the dew point creating the cloud that Matt Barbian was getting his plane lost in. The dew point of the rising air had to be higher than the 51°F reported because it was coming off wet soil. Matt was probably at about 2,500 feet when he went into the cloud. I compute that the dew point of the air in the thermal would have been 60°F, also the temperature of the air at 2 O'clock after the light rain. The latent heat<sup>4</sup> in the moist air raised the temperature of the air in the cloud when it condensed and created the thunderstorm situation that visited us just minutes later. The difference between a normal thermal cloud development and the development of a thunderstorm cloud is the supply of humid air near the ground being forced aloft<sup>5</sup>. The cold, subsiding air rushing in to fill in under the rising thermals and the new developing dark clouds, encouraged me to launch and



go down wind in search of that big thermal.

### Common Sense Prediction of Good Lift

Most of the readers of this column are ready to hear some easier ways to recognize an approaching good weather condition for soaring. If you have been RC soaring for some time, I won't be telling you anything you haven't already noticed. However, it is a common question from the new RC sailplaner. The basic elements needed to develop good useable thermals were discussed in my article on the energy budget<sup>6</sup>. These elements include:

- Good solar heating from an early clear sky (high pressure systems, low cloud cover and low haze).
- Low moisture levels and lack of green vegetation in some area you can reach.
- Having a larger difference between the low and high temperature for the day (diurnal temperature

range).

- Having low winds that will permit the organization of thermals and allow you to recognize when a thermal is approaching or going by.

So if you want to know if tomorrow will be a day to fly ask yourself these questions:

1. Is the location (areas with low surface moisture) within flying distance?
2. Is the time of year right for good thermals (late spring to early fall)?
3. Is a high-pressure system in or moving into the area?
4. Will the winds be low tomorrow?

If the answer to most of these questions is yes, it will probably be a good soaring day. It may still be a good soaring day with many of the answers being no, but this is where more data is needed to make a good prediction.

<sup>1</sup> 12z stands for Noon on this day at Greenwich, England on the International Date Line. This happens to correspond to 9 AM in Green Bay Wisconsin. (A convenient time since this is just before I would be soaring.)

<sup>2</sup> Soarcast Version 1.0.4 was used. There are newer versions available from the SSA website.

<sup>3</sup> <http://weather.noaa.gov/weather/current/KATW.html> KATW is the descriptor for Appleton's Outagamie Airport, about 5 miles away.

<sup>4</sup> Heat released when water vapor condenses into droplets.

<sup>5</sup> Pagen, Dennis Understanding the Sky, 1st Ed. (1999), Published by Dennis Pagen, P.O. Box 101, Mingoville, PA 16856, pg 239

<sup>6</sup> Murray, Lee, The Natural Side of Soaring, *R/C Soaring Digest*, V16, #2, Mar 99

# BMFA F3J News

Uncle Sydney's gossip column – 15  
Dateline: July 2002

*(This gossip column (F3J gossip  
from FAI) was forwarded by B<sup>2</sup>.)*

Three weeks from now, the third World Championships in Lappeenranta will be all over. Last year I ventured a few predictions on likely results for the Eurochamps at Holic. Why not try a few forecasts for Finland – surely not as hard to guess as World Cup matches in Korea and Japan.

News from F3J WC 2002 contest director Erkki Arima since January has been sparse, and Internet checks in mid-June showed only six national teams entered. Bulletin 2 then made amends showing 24 teams plus a query from Israel. Saddest news, unless a last minute change emerges, is that traditionally keen Hungary, Portugal and Austria will not be there.

If any teams - other than the Finns - should know what Lappeenranta flying will be like, it must be the Scandinavians. Norway, Sweden and Denmark are sending teams with previous international experience. For a long odds bet, I fancy Jesper Jensen, probably flying an own design. They always bring beer too!

Norway's Inge Balswick who has flown in all WCs to date and looks after the FAI Soaring Digest (best soaring forum on the net), will be among the full team of seniors and juniors crossing to Finland. Sweden has three experienced seniors aiming for top honours, and the team has probably the easiest route to the championships via Stockholm.

Alex Hoekstra returns to boost Dutch team chances, but R. Van Vondel is the only junior. Another long shot bet would be Egbert van der Laan who topped the juniors at Holic last year, but makes the senior team for Finland. His quick reactions, like Simon Jackson's, could win a fly-off place.

Turkey has entered a full senior team, competing for the first time I believe, and therefore unknowns. They'll no doubt take heart from their country's

third place in football's world cup, and might surprise everyone.

Australia's three seniors were all in Corfu and are all highly competitive in spirit if not soaring. Their journey is probably longer than any team's and my guess is that this will take the edge of results.

South Africa's trip is not so easy either, this time with three Goodrums in the team, including Michelle who must be the most likely woman to win any world F3J or B champs. They have a junior, Ian Lessem too.

The Poles are back, having missed Slovakia reputedly due to lolly shortage, with a full team of seniors and juniors, but only one, Mieczyslaw Slovik, has flown in previous F3J champs. Their models are getting lighter and better each year and could provide a surprise. Lithuania has three seniors and one helper, so they will need help if anyone can speak the lingo.

Italian models and flyers always have flair but somehow come unstuck with flat field soaring. This year could be different. Managed again by "Big Man" Paolo Panfilo, Marco Salvigni is flying in his third champs and might pull a trick.

Brazil has another team full of style and enthusiasm and one previous champ contender in Alexandre Morassi Souza. Unlikely to be rated but again, football could give a leg up or a red card.

Finland the host nation has three seniors and one junior, Janne Savolainen flew at Upton and the Savolainen family is represented again with Janne this time, unless he's changed his name from Markku. I suspect they will give first priority to helping the competition organisers, and as Upton showed, home advantage doesn't count for many points.

The Swiss will be there in strength with Konrad Oetiker, Rudi Baumgartner and Beat Imboden, a experienced well-knit champ team. I hope is that Ueli Nyffenegger and his wife will be there too, for TUN Modellbau gives valuable backing.

A new team is entered from Japan where F3J - all soaring modes - attract many flyers; the country imports more moulded models from Europe than any other. They rank as outsiders, mainly because language makes contacts difficult. Best of luck!

Croatia is another country with recent troubles and fanatical determination to get into the EC. Its team is exactly the same as Upton and Holic - Damir Kmoch, Damir Kosir and Sasa Pecinar.

Bojan Gergiz is another who flew at Upton and Holic, heading up a full Slovenian team of seniors and juniors plus 11 registered helpers. Middle Europe is certainly the centre of F3J activities today despite BARCS's roots.

And although its team is small, Ukraine has its regular group of three seniors, one doubling up as team manager. Olexiy Nadashkevych and Vladimir Gavrilko attended Corfu and Holic, and Vladimir has made a significant contribution to soaring and F3J with his ever developing Graphite series, as well as Simply the Best and now Saga hlg.

France struggles to run Eurotour events and yet produces a regular full team headed by dynamic team manager Stephane Mazot of Norbert Dentressangle fame. Jean Michel Fraisse and Lionel Fournier, seniors, and Alexandre Gahide and Christophe Lenain, juniors, all competed at Holic and three of them in Corfu, and Lionel flew at Upton.

So onto the heavyweights - Germany, the United States and the Czech Republic - all with the familiar teams, all with proven track records of successful championship places in all categories. Who could deny that the odds are that top places will fall to any one or two of them.

They also succeed whatever the weather conditions. Apart from being gifted pilots with magic fingers, what explains their consistency? Only one answer: they are trained teams.

Every member is dedicated to others in the team and alert to respond to the slightest need or wish. Only when the last slot each day is over do they relax



and plan the next round. Rival teams might contain flyers with repeated experience of the heat and nerves of a World or Euro champs, but none as yet match the discipline of the heavy-weights.

Individual team news from the Czechs is that Jan Kohout flies as reigning world champ, so the senior team of four has Jaroslav Tupec, Lubos Pazderka and Martin Gregor, a junior at Holic. Big surprise is that Michal Vagner didn't make the team, but he'll be there as team manager. You can bet that their three juniors will also be experts. All the seniors are in the business of moulded models.

Germany has a new team manager in Alex Wunschheim, but all the rest are who'd you'd expect. Karl Hinsch is again flying, not managing, Philip Kolb is unlikely to bomb out again as he did in Corfu, and Reinhart Vallant, Upton's junior champion, has proved just as formidable as an over-18 year old. Stephan Lammlein is junior team manager with his son Tobias, Thomas Fischer and Michael Frey making up the team. The only time I have seen Team Germany show any weakness was in Deva, 1999, although Dieter Kohler became Eurochamp. Could that happen again? I doubt it.

New team manager for USA is Mark Taylor, but then it's all familiar faces. Easiest tip is the legendary Joe Wurts, who is unlikely to bomb out in the fly-offs as in Corfu. I would bet a £ to a penny that he will make the final four rounds again, and place in top three. Skip Miller goes back many years to early days of F3B – 1977 world champ with Aquila – and finds little trouble in getting 9.50 plus in F3J these days. Gordon Jennings knows his thermals too, in or out of the team. Paul Griebenow was Corfu's smallest if not youngest junior pilot, full of fun and daring; two years on, this time he'll be a force. David McCarthy makes up the juniors, a new face I believe.

Slovakia is a force in F3J and perhaps they should be included with the heavyweights. Yet somehow they don't quite take their share of medals. Team manager Jaro Muller, manufacturer of Ellipses, Esprits, Escapes and still setting the world's highest quality standards, leads a full team of experienced seniors and juniors.

If you've got this far, you'll have noticed that I've missed two teams, Great Britain and Canada. They're my pick to contain at least one pilot at least who springs the biggest surprise.

It's hard to comment on our own team, but one fact is for sure: they have had little chance to hone their skills together due to factors well beyond their control – weather. When they've had a chance, they have all had a mixed year so far, what with hitting haystacks, landing out and in trees, and even missing landing tapes. I hope that mixed bag puts them all on their mettle, adrenalin and guts on full display. All three can all do well. My hunch is that Simon will make the final rounds this time – fingers crossed.

Canada has three seniors and one junior entered, and all are new to the champs circuit apart from Arend Borst.


They will be up to prove that CIAM's choice for the next 2004 WCs was sensible, and what better way than to have a reigning champion.

Formbook tells me that that can only be Arend, and he is my hot tip to win the grand prize. He deserves it too. Both Upton and Corfu should have seen him top of the rostrum, which even the winners would not deny. But Lady Luck is rarely kind!


Whatever happens, one matter is for sure, we shall all enjoy ourselves and the happy international spirit of F3J will be boosted again. Watch this space!

End of gossip.





**Nimbus 4-D**  
130" Wingspan  
\$599.95



**Duo Discus**  
98" Wingspan  
\$499.95

**Gallery of Gliders**

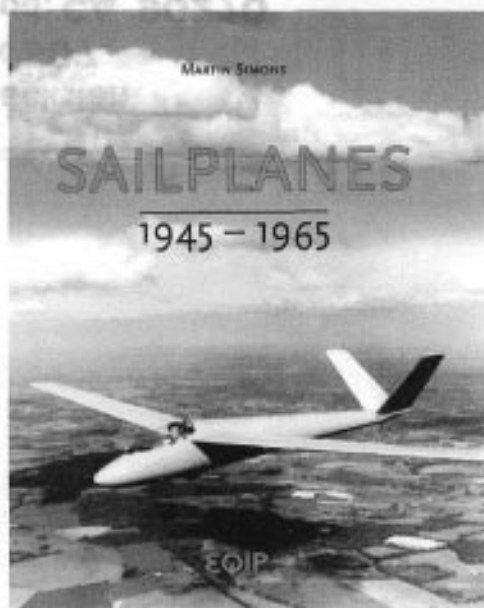
Specs.	ASW-24	PILATUS B-4	LUNAK LF-107	DISCUS (1:3.5)	DG 800 (1:4.5)	NIMBUS 4-D
Wing Span:	64 in.	57 in.	66 in.	168 in.	137/165 in.	130 in.
Length:	28.3 in.	29.5 in.	28 in.	74 in.	62.5 in.	46 in.
Wt:	11 oz. \$159.95	10.5 oz. \$149.95	15 oz. \$159.95	200 oz. \$1395.95	123 oz. \$999.95	54 oz. \$599.95

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# They're Here

## Sailplanes, 1945-1965

by MARTIN SIMONS



As in Volume 1, the drawings illustrating this work are on a scale of 1:50, with cross sections and dimensions. Color shading indicates materials used. Numerous color and b & w photographs are included, many of them are rare or previously unpublished. The text contains descriptions of the 120 or more sailplanes included.

This, the second volume of *Sailplanes* by Martin Simons describes the extraordinary transformation that took place from 1945 to 1965. To take advantage of discoveries in low drag aerodynamics it became necessary to develop new structures and methods of construction. Almost every combination of materials and techniques was tried with varying success. A great variety of sailplane types appeared. Towards the end of the period, glass reinforced plastics were achieving great advantages in performance.

In parallel, sophisticated electronic instruments and radios were introduced, training methods and piloting techniques changed, records undreamed of before were set, broken and broken again. Competition tasks, formerly simple distance or goal flights, changed to closed circuit races over hundreds of kilometers.

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**Sailplane Homebuilders Association**  
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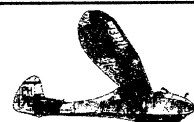
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