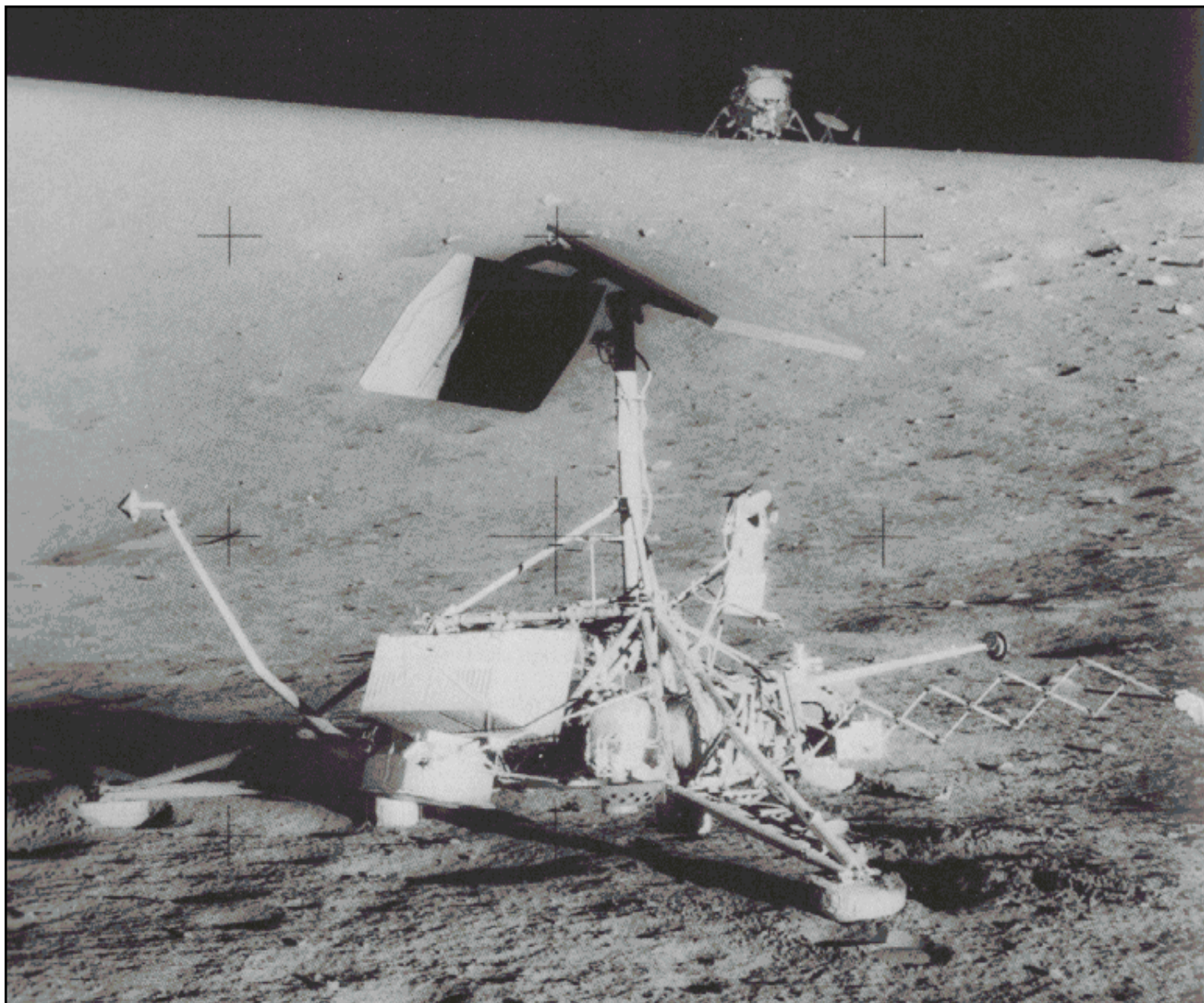


THE LEADING EDGE



Newsletter of the Northern Illinois Rocketry Association, Section #117

Volume 16, Number 3
May/June 1993

T MINUS 1 - NIRA'S CALENDAR OF UPCOMING EVENTS

MONTHLY MEETINGS

All meetings start at 7:30 PM, and include refreshments, entertainment and a brief business meeting. Don't forget a model for "Model of the Month" voting. We need volunteer speakers to entertain the troops after the business meeting, so call Mark Bundick at 708-293-9343 if you can help with ideas or can speak yourself.

July 2, 1993 - Regular Monthly Meeting: Review our performance from MRFF. Still searching for a speaker. All helpful suggestions appreciated.

August 6, 1993 - Regular Monthly Meeting: Help plan the Labor Day Launch (we need a volunteer to organize the event, it's fun, it's easy!), and get ready for some fall flying. Bunny will be at NARAM, so VP Ed Thiel will be in charge. No harassment allowed!!!

1993 REGULAR CLUB LAUNCH DATES

All launches or other activities start at 2:00 PM. BYOL (bring your own launcher). Casualty insurance required or else RSO must inspect and launch your model. Location for our 1993 launches is Community Park in Lisle. Get off Route 53 at Short and head west. If you have questions prior to any launch, call either Mark Bundick at 708-293-9343, or Mike Jungclas at 708-910-1267.

July 18: You don't have to go to Las Vegas to try your luck if you fly "Random Spotlanding". Try to land inside a 100' square where the spot will be picked randomly AFTER all the flying is done.

August 15: Got an itch to build an old kit and do some scale modeling all with one rocket? Then fly "Catalogue Scale" where you scale up or scale down a design from a catalog.

OTHER ITEMS OF INTEREST

June 19-20, 1993 - MRFF 93, Midwest Regional Fun Fly, Pratt's Wayne Woods RC Flying Field. The nation's oldest NAR regional sport launch featuring a return of MWRC regional contact. Hey! It's more than a sport launch; it's a mini-NARAM/NSL! *Waiver has been obtained!!!* Fun for all rocket flyers. Contact Ric Gaff, 708-483-2468.

July 10, 1993 - Central Illinois Aerospace (CIA) high power launch. Chanute Air Force Base, Rantoul, IL. Contact Jonathan Sivier, 217-359-8225.

August 1-6, 1993 - NARAM-35, National Model Rocket Championships, Fredrick, MD.

CONTRIBUTORS

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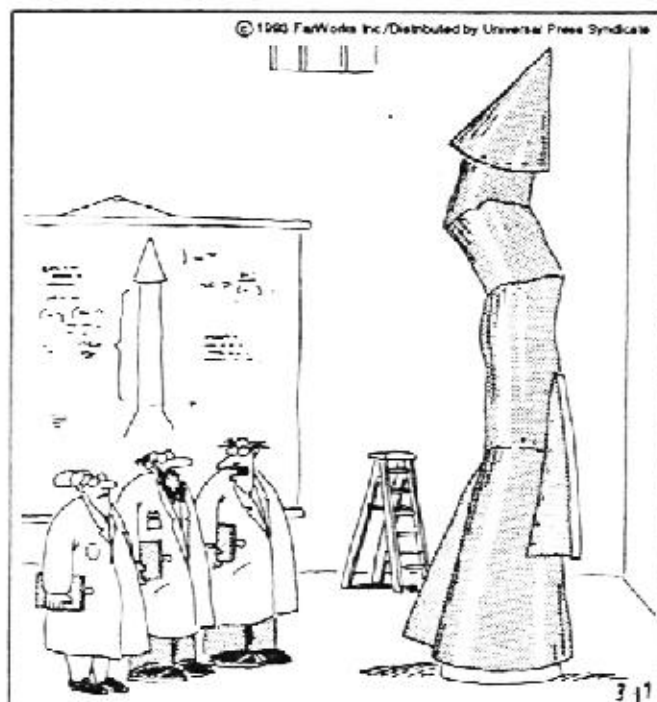
Mark Bundick - Typesetting/Wabbitus Rocketus

THE LEADING EDGE, published bi-monthly by and for members of the Northern Illinois Rocketry Association, NIRA, NAR Section #117, is dedicated to the idea that Sport Rocketry is FUN! Articles, plans, other newsletters, and news items of interest should be sent to Lawrence Bercini, Editor, 6033 Sheridan Rd. #33J, Chicago, IL 60660. Information can also be transmitted via CompuServe or Internet using CIS #70651,3147. Send membership applications (dues: \$3/year, including a six issue subscription to the Leading Edge) and non-member subscriptions (\$5 per six issues) to Ken Hutchinson, 84 Jefferson Lane, Cary, IL 60013. Any item appearing in the Leading Edge may be reprinted by American Space-modeling with proper credit given; all other uses require written permission of the Northern Illinois Rocketry Association. Nobody read this in the last issue. (I did!)

GENTLE REMINDERS

Hey! There ain't no reminders here cause you guys haven't volunteered. Lend a hand running the range at the next club launch or spring for some refreshments at the next meeting and see your name in lights in this space. Contact Bunny if you can help out in either area.

The Far Side



"It's time we face reality, my friends. . . .
We're not exactly rocket scientists."

A Letter From the President

On behalf of the National Association of Rocketry and its Board of Trustees, I am pleased to announce that as of 11 May 1993 the DOT has classified the AeroTech reload kits (containing propellant modules up to 62.5 gm) as U.N. Hazard Class 1.4c. This is equivalent to the old Class C designation and permits the economical transport of the kits.

Also, at its 19-21 April 1993 meeting in Colorado Springs, CO the NFPA Committee on Pyrotechnics voted unanimously to submit a revised NFPA 1122 "Code for Model Rockets" to the full body NFPA. The revision comes before the full body for approval in October 1993; it includes the reloadable motor technology.

Since August 1992 the NAR Standards & Testing Committee has been testing for certification the AeroTech reloads (160 Ns or less). Approximately 80% of the reloads have been tested. All test results have been submitted to and discussed with AeroTech.

Standards & Testing will soon resume testing. Certification should be granted momentarily for those motors which have passed.

I want to thank AeroTech, the NFPA Committee on Pyrotechnics, the members of the Sport Rocket Caucus, and the NAR Standards & Testing Committee for the hard, intense work that resulted in this historic change to the hobby of model rocketry.

J. Patrick Miller, President

Windy Kickoff NIRA's April Launch by Bunny

NIRA members congregated at our new home, Community Park in Lisle on April 18 for the first launch of the 1993 season. If it had been a football game and we'd won the toss, we'd have taken the wind and kicked off. We set up in the same spot we used last fall, near the northeast corner of the park, and the games began.

The wind caused a few anxious moments for flyers. A couple of pads wobbled precariously in the breeze, and more than one flight weathercocked severely. But no models were lost to the stiff wind, and there weren't any prangs made worse by the wind.

The honor of 1993's first flight went to Jonathan Charbonneau's Wizard which worked perfectly. Jonathan also started using up a stash of old B14-5 motors; the rapid acceleration made most

of the old-timers think wistfully back to their experience with this motor.

The launch was thoroughly overrun with Bandit models, no surprise given we helped build about 200 of them at the RCHTA show. Five year old Jennifer Chaney flew her's twice on A8-3 and was quite happy about the entire event. Other members showed more creativity than perhaps the Estes design team would approve. Bullet Bob Kaplow kitbashed two kits to make a longer model, and it was promptly christened "Bandit-Bandit" or "Bandit Squared" depending on who you talked to. Ken Hutchinson went further with his "Bandit-Bandit-Bandit". You figure it out.

Longtime member (and 1986 B Division national Champion) Tim Marcy showed up and got in three nice flights spanning the full range of the hobby. His Mini-Dactyl glider did nicely on a 1/2A, his Jupiter C gave it a go in B Ping Pong Ball Duration, and his Mars Snooper, from the original Estes kit, was just for fun.

Kevin McKioui tried his latest RCRG creation, StingRay. The model did well on D11-P's even handling the wind well. We look forward to more RCRG flights later in the season, particularly at MRFF.

The Thiel family braved the winds and fought back with lots of total impulse. Bill had two nice flights with his Super Big Bertha and D12-3's. Ed resorted to a Mean Machine and an RMS D13-4. The bird swayed considerably on the pad and resulted in a lot of breath holding prior to the launch. We needed the practice because the resulting weathercocked flight also meant parachute deployment took place just a little lower than we'd like (whew). No damage though.

Brad Owen and Ron Husak set up their pad and proceeded to fire away all afternoon. Brad ended up as "Launch Leader" with nine flights total. His Sparrow in particular got a healthy workout with four 1/2A3-2t flights. Ron went for more variety, including some scale action with an Honest John and Patriot. His scratchbuilt Cyclone, from a hefty mailing tube, lived up to its name by coning into the skies successfully with D12 power.

Steve Koszuta made the trip down from Milwaukee and made it worth his while. His original design "Calypso" won B Ping Pong Ball Duration by a wide margin, almost two to one over all other challengers. The B6 powered bird featured a home rolled shroud that just fit the ball. The shroud's drag reduction gave Steve an altitude advantage no one else could match. Steve also made the launch a family act, with the maiden flight of his "Little Lauren" Big Bertha, named after his infant daughter.

Pioneer Press dispatched a reporter to cover the launch. Louise Beecher found out about the launch from a Tribune "Go Guide" listing. We ended up with a nice article in the Press' western suburban locations. Thanks to the NIRA troops who spent time

talking to her and explaining the ins and outs of the hobby to her.

We welcomed some newcomers at the launch, too. Greg Roman, who prior to meeting Ken Hutchinson at the Danville HPR launch, "didn't know there were any rocket clubs around here" put in four nice flights and got caught up on some HPR tips. Nate Anderson thrilled us all with a breathtaking two stage flight on his Warp II Payloader. And Eric Burmester had two fine flights on his Bailout.

NIRA members proved their mettle by overcoming the winds for a very successful start to the 1993 flying season. We're coming to like our new home (and continuing to thank Mike Jungclas for his work in keeping in touch with the Park District) and settling comfortably in. Join the NIRA gang soon for more summer fun.

The Reload Watch

(From a posting on rec.models.rockets)
by **Buzz McDermott**

Aerotech has recently obtained Class C equivalent certification for many of their model rocket class reload systems. The following list of reloads was included in a letter from Aerotech in the Volume 4, Number 2, "Tripoli Report". All the reloads listed here may now be ordered and shipped the same as Class C disposable motors. Note that all delays are not available yet for all reload kits. This is especially true of reloads sold in '3-paks'.

Reload System	Reload Name	Shippable Delays	
18mm (18/20)	B6T	All delays	3-pak
18mm (18/20)	C6W	3	3-pak
18mm (18/20)	C12T	4	3-pak
18mm (18/20)	D24T	4	3-pak
18mm (18/20)	E27T	4	3-pak
24mm (24/40)	D15T	4	3-pak
24mm (24/40)	E28T	4	3-pak
24mm (24/40)	E18W	All delays	
24mm (24/40)	F24W	All delays	
29mm (29/40-120)	E16W	All delays	
29mm (29/40-120)	E23T	All delays	
29mm (29/40-120)	F22J	All delays	
29mm (29/40-120)	F40W	All delays	
29mm (29/40-120)	F52T	All delays	
29mm (29/40-120)	G65W	All delays	
29mm (29/60)	F37W	All delays	
29mm (29/60)	F62T	All delays	
29mm (29/100)	G54W	All delays	
29mm (29/100)	G104T	All delays	

For High Power reloads, according to Aerotech, UN Class 1.4c shipping classification has been obtained for the following 'High Power' motors:

Motor	Total Impulse	Fits Casing/Motor System
H128W-S,M,L	180NS	RMS 29/180
H238T-S,M,L	180NS	RMS 29/180
H180W-S,M,L	240NS	RMS 29/240
H123W-S,M,L	240NS	RMS 38/240
H242T-S.M.L	240NS	RMS 38/240
I161W-S,M,L	360NS	RMS 38/360
I357T-S,M,L	360NS	RMS 38/360
I211W-S,M,L	480NS	RMS 38/480
I284W-S,M,L	600NS	RMS 38/600

Note that NO BlackJack reloads are included in this list. Some repackaging may also be required before existing reloads at retailers/distributors may be shipped.

The above information has been gathered from a list posted to CIS, the letter from Aerotech published in the latest Tripoli Report, and phone conversations with Aerotech.

A Good 2-Channel S8e Rx

by **Kevin McKioui**

When I was faced with the decision of what receiver to buy for my S8e models I looked at about all the easily obtainable alternatives. If you want more than 2 channels, the RCD 535 micro FM receiver is a good choice, but it is fairly expensive at about \$80 and isn't the lightest Rx (about 20g without the case). Cannon makes a good (2/3/4-channel) micro AM Rx. It weighs about 15g with the case, but at \$90 a copy, it has limited appeal to me. Futaba also makes a good 4-channel micro AM Rx, the R114. It too is a bit weighty at about 20g without the case. But the price is better at about \$69 from Tower Hobbies.

I own one of each of the above receivers, but, most of my S8e models are only Rudder-Elevator controlled, so more than 2 channels is a waste of money and weight. I hit my price/performance optimum with the Futaba R112JE receiver. It is available by itself from Tower Hobbies for about \$49. It is available in the FP-2V system for about \$45 (go figure!). If you buy the FP-2V system you not only get the R112JE, but also two FP-S14B (cheapo) servos which you can put in your Sunday-flyin' sport glider. I don't know what to do with the transmitter, but since the whole system costs less than just the Rx, I don't care! Here are a few specs on the Rx

R112JE Rx 1991 20KHz certified 30 ma current drain
Dimensions: 46.6mm x 31.5mm x 15.7mm Weight: 20.5g with the case (12g without the case!!!)

This has turned out to be my favorite Rx for S8e. It's cheap, it has respectable range (farther than I can see), it's light weight and compact. The one modification I have made to the R112JE is to lay the crystal down flat. Then the overall thickness without the case is reduced to about 12mm. Actually, I modify the crystal and not the Rx. I just solder little L-shaped pieces of wire to the prongs of the crystal so it is rotated 90 degrees when plugged into the socket. Be careful when soldering. I ruined one crystal by overheating it.

If you are interested in purchasing a R112JE (or better yet, the FP-2V system), you can contact your local hobby shop, look through a model airplane magazine for the dozens of vendors or contact Tower Hobbies at 1-800-637-4989 (orders only) or 1-800-637-6050 for order assistance.

May Demo Launch

by Bunny

1993's second launch sported a public demo that was extensively advertised in local papers. We even had a reporter from the Naperville Sun show up on the field for a story. That's two for two in the newspaper coverage of launches this year. Thanks to Mike Jungclas for putting out the press releases again.

Lawrence Bercini got unchained from his "Project from Hell" at work, and made a big splash by flying 14 models, all different! Nice to see NIRA's past president back on the field enjoying instead of running the launch for a change. I found his well built and finished Starship Vega the nicest of the bunch; a perfect D12-3 flight. At the other end of the spectrum was "Mighty Mouse" SD test model. Its streamer never whipped around any, and thus the duration was not up to Lawrence's usual standards. (That'll teach you to fly those Canadian designs!) His "Flying Pencil" also wowed the demo crowd with a nice flight.

Brad Owen tied Lawrence's flight total with a series of multiple flights on his Sentinel, Iris and ever present Sparrow. The sparrow in particular is getting a good workout this year with 7 flight to date. Wonder if it'll outlast Matt Price's Tasmanian Devil?

Jonathan Charbonneau flew some more of those nice B14 motors, and all the long time modelers got all weepy eyed remembering their childhoods where B14's were the "big" motor in the Estes line. Jonathan had less luck with his Mega Sizz/Superman combo. The MRC motor's ejection was quite a bit more than the advertised 3 seconds, and Superman suffered a facial strawberry on the parking lot. Not major, but frustrating.

Ken Hutchinson continued the MRC curse by pranging his nice Nike Tomahawk into the parking lot, too. The Nike was sorta OK, but the Tomahawk was in need of some serious work. His flights of the new Quest Space Clipper were much better. I think we'll see a lot more of these models in future launches. With

their interesting smoke patterns and low altitudes, they're perfect demo models. Maybe we'll add it to our future salutes to manned spaceflight?

The Hulina family joined our ranks and flew three very nice flights. Brian's Scout III set off another discussion among the old timers about THEIR first Scout flights. Brian followed with an Athena, and dad Tom tried the Patriot. Also joining us was Bill Larry. His two stage Magnum was particularly impressive on D12/B6 power. Welcome aboard, folks!

Marty Fackleman, after last year's absence, returned with the new Estes Tomcat. I don't think the resulting flight path was that predicted by Estes Engineering. The model made one very large arc into the ground for a prang. Ouch! The Sloubers were back with more rockets and more flights. Rosella's Gnome had just been finished that morning, and it had a perfect maiden flight. Kleve's scratch built Knight from Christmas paper tubing wowed the crowd on an FSI D18 motor. Its long burn got everyone's attention.

Greg Roman learned a lot from his first launch the prior month and showed up with his own three pad rack launcher. He had good success with a variety of Estes kits and finished off the launch with a home brewed model that also worked well. Ron Husak also keep up his pace with another excellent flight on his homebrew Cyclone. Save that model for Labor Day, Ron. I think those D12's are crowd pleasers!

Not to be outdone, "Bullet" Bob Kaplow loaded his Graduator with an E60-4. After warning everyone on the possible cato effect, Bullet pushed the button and off the beast went. The motor worked as advertised, and after a slight coning at the start the Graduator got the idea and went on to a perfect flight.

Another successful launch that pushed our total for 1992 to 162, with MRFF yet to come. Mike Jungclas did a booming business in club memberships (three in total, plus more names from the three raffles we did) and range store kits dug out of Bunny's basement. If you're not flying, you're missing the fun, so make sure you circle June 19 and 20 on your calendar and join us at Pratt's Wayne for MRFF 93.

Baseloading Your Rx Antenna

(How to put a 39" antenna in a 20" wing)

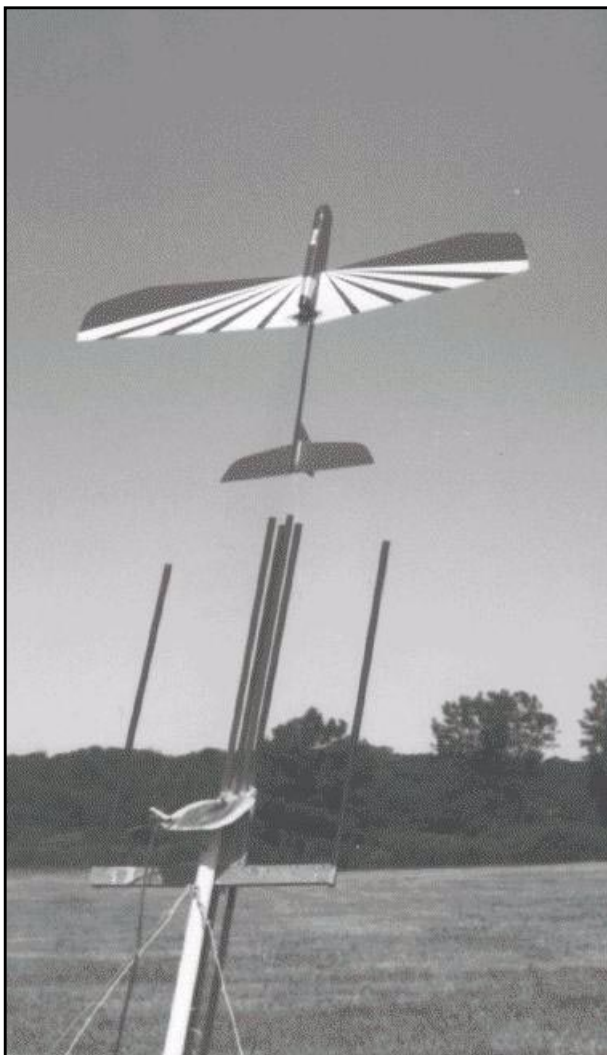
by Kevin McKioui

When I decided to take some steps to reduce the drag of my S8e model, I was faced with the "receiver antenna dilemma". Until now, I just taped my Rx antenna on the bottom of my tail boom and let it trail the rear of the model. I knew that it was a bit like trailing a streamer behind the model, but what could I do if I wanted good reception? I decided that the place to put the antenna was inside my wing. My closest contact for a solution was George Riebesehl.

George uses Cannon gear and feeds his Rx antenna down a NyRod from the pod into the wing. This actually works fairly well since the Cannon Rx has a short antenna. He is able to fully extend the antenna. However, I want to use a Futaba Rx which has a 39" antenna and my wing is only 20" long! I came up with what I think is a good solution: baseloading. But, before I tell you about that, let me tell you about some of the other options, just in case you're thinking "Why didn't he try _fill in your favorite option_?"

I could think of the following options for the antenna:

1. Extend the antenna 20" and just wad up the extra.
2. Fully extend the antenna but make a big arc up the leading edge and back down trailing edge.
3. Just shorten the antenna to 20"
4. Baseload the antenna
5. Put the antenna in the boom instead of the wing. Corollaries: Use a pushrod as the antenna or the boom itself.



Kevin's Knightstar takes off under E6 power

Let's dispense with number 5 right away. The boom is no longer than a wing and I still end up with a short antenna. Plus, the boom is made of carbon fiber, so putting anything inside it is very doubtful since the conductive CF will likely act as shielding - at least partially. I didn't give this option serious consideration. I did try the other four options.

The first thing I did was to build a mock-up of my wing on a board so I could get my geometry correct. This was nothing fancy. I just taped a piece of foam to the board which was the size of the wing. I could have just as easily drawn an outline of the wing on the board. The important thing is that the mock-up has the approximate geometry and electrical characteristics of the wing.

The first thing I did was a range check with the Rx antenna fully extended and the transmitter antenna collapsed. I was able to get 30 paces from my mock-up before I could no longer control the servo I had attached to the Rx. This is my baseline for comparison.

Now I began trying the options. Here are my results:

1. Extended antenna 20" and wadded the remainder at the Rx. I was able to get a ground range of 9 paces. I tried wadding the remaining antenna randomly and in a coil. Nothing helped the range.
2. Loop the antenna in an arc. Forget it. This is just like shortening the antenna - maybe worse.
3. Just shorten the antenna to 20". The result was identical to number 1.

So, my only remaining option was to try baseloading the antenna. It turns out that Ben Roberto happen to have a commercial version of a baseloaded antenna made by Deans. However, it only had a 9" antenna, it was heavy (relatively speaking) and awkwardly shaped. Besides, I figured a 20" antenna would be a better signal collector than a 9" antenna. Plus, I didn't like just taking Deans' solution as the best for my geometry. Ric Gaff took the Deans antenna to work and looked up the color bands on the baseloading inductor and found that it was a 1.5 micro-henry inductor. Ok! Now I had a value to work with. I obtained 9 inductors ranging from 0.4 uh to 1.9 uh for my "design by experimentation".

I cut the antenna lead to my Rx down to 1.5" and soldered a 1" micro-clip to it. I also added a 4" lead with a 1" micro clip to my 20" antenna which was taped to the mock-up of my wing. So, it's time to start trying different coils between the Rx and the antenna. The micro-clips were added simply as a convenience for changing inductors and the lead wires helped me approximate the final geometry.

Here are the results of my experimentation:

Inductor value (uh)	Range (paces)
0.41	4
0.50	6
0.58	7
0.62	8.5
0.79	19
0.89	28
1.22	19
1.42	5
1.93	4

There you have it, the range of inductor values for my geometry looks like it is between 0.8 and 1.2 uh.

I built my wing with an antenna wire embedded in it and performed a final check with the exact geometry and lead lengths before I committed to the final inductor value. It turned out that the .79 uh was the best choice in the end. As you can see, my ground range is very close to the full antenna ground range. I am quite pleased with the results. And will be putting all my antennas in the wing from now on. By the way, the total weight of my antenna and inductor coil is only about 2g.



"I wonder how high this could take my brother...."

1993 Launch Box Score

We're off to a good start on our 1993 goal of 1,000 flights for the season. The April and May launches have put us about 16% of the way there with the best part of the flying season yet to come. With MRFF coming up just around the corner, you can join the fun and put your name up among the leaders, too. If you'd like a complete listing of your flights for the 1993 season, just ask Mark "Bunny" Bundick. His PC will quickly spit out a complete list of your 1993 flights you can pick up at the next meeting or launch.

Club Leaders	4/18	5/16	Total
Owen, Brad	9	14	23
Charbonneau, Johnathan	7	7	14
Bercini, Lawrence	0	14	14
Hutchinson, Ken	7	6	13
Husak, Ron	6	6	12
Roman, Greg	4	6	10
Thiel, Bill	8	0	8
Thiel, Ed	8	0	8
Koszuta, Steve	6	0	6
Kaplow, Bob	1	5	6
All Members	76	86	162

Heard on the Street

Rumors and Such, with Apologies to the Wall Street Journal

New Kids on the Block - NCR has submitted their F30 and G50 motors to DOT for shipping certification. NCR would still have to get the appropriate stay of enforcement from the CPSC in order to sell their G motors at retail (this won't be done until AFTER/IF NCR gets a Class C/U.N. 1.4 classification for the F and G motors. Until that point the CPSC cannot rule on them... they cannot be sold at retail if they come back Class B, etc.).

On the cover: Apollo 12 Lunar Lander Intrepid sits just 535 feet behind Surveyor 3.

THE LEADING EDGE
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