THE LEADING EDGE

Newsletter of the Northern Illinois Rocketry Association, **Volume 21, Number 5**
NAR Section #117, Proud Winner of the 1996 and 1997 Rockwell Newsletter Trophy! **September/October 1998**

Club News

NIRA Takes 4th Place at NARAM 40!

NIRA as a Section took 4th Place overall at NARAM this year! Congratulations to all who participated this year!

Place Name Points

A Division:
8 Pierre Miller, 938
12 Michael Guzik, 545

C Division
1 Kevin Wickart, 2883
15 Tom Pastrick, 931
36 Adam Elliott, 506
41 Ken Hutchinson, 403
53 John Guzik, 218
55 Mark Bundick, 207
59 Kimber Guzik, 98

Team Division
9 All The President's Men, 894

October Meeting Date Changed! - Due to more scheduling conflicts with the Glen Ellyn Civic Center, the October NIRA meeting will be held on the 9th instead of the 2nd. Please mark your calendars.

Dues Increase - After 30+ years of the same membership fee, it was bound to happen. At the September meeting we discussed and voted on a new dues structure that will take effect on January 1, 1999. President Ric Gaff presented us with facts and figures regarding club expenses, and income. The bottom line is that our current $3 membership fee doesn't even cover the expense of the newsletter. After some friendly debate the following fees have been established:

Youth (<18) - $6
Adult (>=18) - $8
Family - $12

Those who join as a family will receive only 1 newsletter, but each family member will get their own NIRA membership card. When your current NIRA membership expires you will need to renew at the new rate, but you don't need to do anything until then.

Chicago Hobby Show - It's Back! The dates are October 31st and November 1st, the place is the Rosemont Expo Center (NOT the Rosemont Horizon). What is it? Only the biggest hobby related show you'll ever see! There are "Hands On" RC trucks, cars, boats, demos of RC helicopters, slot cars, trains, plastic models, kites, tools, games, you name it (oh yeah, and rockets too). But, most important of all, the "Make It, Take It" booths!

This is where NIRA comes in. We staff the Estes booth and help people build a model rocket. Last year we did about 1500 rockets over the two days. That's a lot of rockets, and it required a lot of work by NIRA members. This is where you can help. Sign up to work a shift (or two!) on one of the days. It's fun, rewarding, and will really help out the club. If you've been looking for something that you can do for NIRA, this is it!

What's in it for you? Well, if you sign up to work you get into the show for FREE!! You'll get to see everything that's new (especially the rockets!), and spend some time helping people with their first rocketry experience. If you can help, give Cheri Chaney a call at (630) 462-0260.

But, that's not the end! The next Sunday (the 8th) we will be having a special launch at Greene Valley just for the people who build a rocket at the show. We need you to come out and help teach people how to prep a rocket and put it on the rack for flight. This launch is only for rockets from the Hobby show, our normal club launch is the next weekend. Again, your help would be greatly appreciated.

Editor Upgrade - After 6 years of being the editor of this newsletter, I've decided that it is time for me to step down. Jeff Pleimling has stepped up and volunteered to take over as editor, beginning with the January/February 1999 issue. I hope that you give Jeff the same great support that you have given me, and try not to give him a hard time as he learns the ropes. I'm certain that Jeff will do a great job.

Total Chaos - There will be a a three event Section Meet at the October 20th club launch. Once again Adam Elliott will be serving as your friendly Contest Director and Host.

The events scheduled are as follows:
1/2A Parachute Duration
Set Duration
A Boost Glider Duration

November 15th will be the rain/wind date. Come one, come all!

Sign Me Up! - NIRA has an email listserver set up so that messages can be sent to one address and be distributed to everyone on the list. The list is to be used for general club information, such as announcements, requests for information, etc., but not for general chit-chat. Getting on the list is easy. Just send a message to:

nira-subscribe@makelist.com

You don't need a subject or any message. The system will send you a message and ask you to reply to it to verify the data. Just do a reply (again, no subject or message) and you're done! The next time you're online, take a few moments to subscribe. If you have any problems, drop Jeff Pleimling a note at jap@interaccess.com. Jeff maintains the list (thanks, Jeff!).

Size ***does*** matter!

T MINUS 1 - NIRA'S CALENDAR OF UPCOMING EVENTS

1998 CLUB LAUNCH DATES

Launches are BYOL (bring your own launcher). The location for our 1998 launches is the Greene Valley Forest Preserve. If you have questions prior to any launch, call the NIRA Infoline at (630) 690-6353 and leave a message, I will call you back.

September 20 - Regular club launch.

October 18 - Regular club launch. CHAOS-1 contest.

October 31 - Nov 1 - RCHTA Show, Rosemont Expo Center

November 8 - RCHTA Launch.

November 15 - Regular club launch

December 13 - Holiday Party at Bundick's

Other Items of Interest

October 10 - HPR at Bong Recreation Area, Burlington, Wisconsin. 10am-6pm at Parking area "E".

November 7th & 8th - Danville '98.

STAFF

Bob "Lame Duck" Wiersbe - Editor
Ric "G-Man" Gaff - Photography and Production
Jeff "What have I gotten myself into" Pleimling - Editor in Training

CONTRIBUTORS

Mark Bundick, Frank Burke, Jonathan Charbonneau, Adam Elliott, Ric Gaff, Rick Kramer, Steve Piette, Greg Roman, Mark Soppet, Kevin Wickart, Bob Wiersbe

The challenge of designing a fail-safe Space Shuttle.

MONTHLY MEETINGS

All meetings start at 7:30 PM, and include 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 Ric Gaff at (630) 483-2468 if you can help with ideas or can speak yourself. The location is the Glen Ellyn Civic Center, 535 Duane Street (usually on the 3rd floor, but check the board in the lobby).

Currently scheduled meeting dates are: **October 9**, November 6, December 4, January 8, February 5, March 5, April 2, May 7, June 4, July 2 (subject to change), August 6, September 3, October 1 (subject to change), November 5, December 3.

THE LEADING EDGE, published bimonthly 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, photos, other newsletters, and news items of interest should be sent to Bob Wiersbe, 1835 Shetland Drive, Wheaton, IL 60187 (or electronically via Internet to wiersbe@lucent.com). Photos will be returned, other material returned if requested. Send membership applications (dues: $3/year, including a six issue subscription to the Leading Edge) and nonmember 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 Sport Rocketry with proper credit given; all other uses require written permission of the Northern Illinois Rocketry Association. Again, I was apparently mistaken in the last issue of this newsletter, and according to NIRA President Ric Gaff I'm not allowed to quit or charge for ad space. He did say that he would find someone to take my place while I'm in therapy, which shouldn't be for more than a decade or two. - The Management

Model of the Month Winners!

(from left to right, all photos by Ric Gaff)

August - Mark Soppet won in Youth with his Twister (I think that's right).

September - Tom Pastrick won in Adult with his BOMARC, which won Third Place at NARAM. Nick Piette won in Youth with his Sidewinder.

Congratulations!!!!

A Certifiable NARAM
by Steve Piette

The family decided to spend the weekend attending our first NARAM (if you can count the pre-contest sport flying as attending). Since I wasn't sure when I next would get a chance to fly such a large field, I wanted to get my level 1 certification there so that I could fly my Cosmodrome Vostok once I finished building it. (Min H242)

I wasn't sure what rocket I was going to use, I had a USR Stub 4.0 that I'd been flying that I was sure would handle a H128 but it was shorter than what I knew my cert team (unknown to them) liked to see and I had NCR Phantom 4000 that was almost identical to the often recommended LOC IV but unflown.

This is actually my daughters rocket we picked up at the Hobby Lobby half off sale, but she agreed to let dad fly it a few times. While building it I replaced the MT and didn't epoxy the rear CR until after I'd filleted the internal joints. I also added a 6-32 t-nut for a retainer clip to the rear CR for those motors that don't fit the supplied retainer.

We made two flights to qualify the newly built rocket's characteristics. If all went well I'd use it to certify with the Stub as backup.

My daughter Brittany had the honor of first flight after a long wait in line during the rush shortly after the range opened on the recommended NCR F62-4 DarkStar to about 500 ft. Ejection looked like at or a little before apogee. The nose cone manages to thread itself through the suspension lines and foul the parachute slightly but makes a good recovery on the soft grass about 500ft from the pad.

Second flight, dad loads up a G80FWL-4, wrapping a tape thrust ring and get the NCR motor lock to fit over it. The wind has picked up a little but we get a nice straight flight, ejects again just before apogee, and rips one of the suspension lines from the parachute. (NCR's supplied chutes are good material but really cheap sewing). On 5 suspension lines it descended much like the first flight to almost the same location a little farther out in the field.

I decided to watch everyone else for a while and see if the wind calmed before going for it. After getting a late lunch and browsing the vendors wares I picked up my H128W-S from Ross and borrowed a 29/180 casing from Bob Kaplow.

I asked Jonathan Charbonneau (Superman) to look over my shoulder while I assembled the reload and make sure I didn't miss anything. The HPR RMS's are just different enough from the consumer reloads that I wanted a little experience on tap. With the H128 installed and the rocket checked out by my cert team of Bob Kaplow and John Guzik, I made my way over to the range head, and straight to pad 12. After the morning rush the lines had disappeared just like the wind which had died down to a cooling breeze.

Load it up, snap a few photos, wait a second for the LCO to launch the other rockets on the pads, and I hear then call out for the cert team ready.

Pow, it leaps off the pad straight up. Engine burns out and it keeps coasting to almost the limit of my vision for an unpainted white rocket against a clouding sky, (wRASP predicted 1200ft) arcs over and ejects the new chute.

It just spins around under the chute winding the shock cord up and slowly descends to the right side of the range maybe 400ft from the pad. After returning the rocket to the cert team for post flight inspection, I cleaned Bob's casing and managed to pack things up before the late afternoon rain started.

We spent the rest of the weekend visiting, watching, and making vendor contributions. My Wife decided to mark the occasion by buying me a 29/180-240 motor set of my own. She liked the red Dr. Rockets ones.

Bunny's NARAM-40 Report
by Mark "Bunny" Bundick

Big Picture: a great field, great organization, possibly the best ever seen at a NARAM, and great flights.

Kudos: Thanks to Glen Feveyer, NARAM manager for pulling off the impossible, running a NARAM with grace and style when the field and facilities are 700 miles from home. Topping it off with a win in Scale must have been quite satisfying. Glen's team, including folks from AMOERA, SCAM and Launch Crue had every detail covered dead to rights. When I was wandering around the hotel Friday prior to the banquet, I stopped by a former NARAM CD and asked him to sign the thank you card I had for Glen. When I commented about the great job Glen had done, this ex-CD (who ran an excellent NARAM in its own right, BTW) replied "Yeah, he made it look easy and we both know it isn't."

Flying: The SCAM sport range, fresh from its NSL success, put over 1,400 flights up over the 7 flying days. The Hart's and the Stump's bore most of that burden, and kept smiling the whole time. My flying there consisted mainly of scale models: My Atlas and Juno II got good workouts, and my SPEV made its obligatory flight.

Saturday and Sunday brought out HPR flyers in force. One of the better efforts was Craig Utley's Level 3 certification attempt, a textbook effort. Someone apparently had the audacity to fly a 4" dia. Atlas Agena while I wasn't around. I spent the better part of half an hour scrounging the parking lot looking for the bird, but didn't find it or the owner. Anyone here got any idea who flew it and how Bunny can contact him??

On Sunday afternoon, I ran the First Annual NAR National RCRG Championships. While 10 people signed up in advance, only four showed up at the starting gun. The flyers and ships were:

Kevin Creamer	Stingray 3
George Gassaway	Stingray 6
Chad Ring	Stingray 3
Ryan Wokenberg	Cuda.

Everything from a C6 to E6 reloads went off, and nobody crashed. Chad came close on his first flight but got things sorted out in time. He retrimmed Flights 2 and 3 to constantly improving scores. Atta way to keep in there, Chad.

Ryan had a ship with the waviest TE I've ever seen, but flew decently enough for 3rd place. His good natured demeanor added a lot to the contest, IMHO.

Kevin got constantly better with patient coaching from George; his last flight centered in a booming thermal, and he came down only when a storm threatened. Got nearly 11 minutes on an E6. While George won, his main purpose and function was to coach the others. Great job of teaching, big guy.

Look for Wabbit to run the RCRG Champs next year and I wanna see more flyers coming out for this event.

Competition Flying Notes: It was a mixed bag for me, but tons of fun. My PD birds were 18MM vellum boattailed down to 10.5MM engine tubes. They flew fine, but my chutes don't open worth a hoot. Didn't fly BG, HD, SD, or Eggloft.

In B Altitude, I decided Pete Alway couldn't have all fun flying scale models, so I threw up my Juno II in response to his Saturn 1. For some reason, this ignited a competitive streak in Pete, so he responded with a second flight using a Thor Able, and whipped me by 3 meters. I wouldn't have minded, but he came all the way out to Tracking East to tell me about it. When my shift was over, I raced in, reprepped and tried for two more flights to beat him, all to no avail due to lost tracks and no closes. I stand appropriately humbled by the scale master....

My Atlas saga was written up for the NARScale SIG's listserver, but here are the highlights. I wanted a slow bird this year, and when Ric Gaff flew a 3" posterboard tube Nike Apache at the NSL in May, I got a crazed idea. I wanted a 3 D12 Atlas in 4" diameter. After checking the flight performance in RSIM, I decided it was worth a shot and started building a low tech model after 2 years of models using fiberglass and cast parts. It was a big change and a lot of fun.

I was particularly happy with two new techniques I used. My conical booster engine fairings were done in posterboard and I used water to soften the paper prior to rolling them. The

dampness worked just great, and the fairings came out pretty smooth with virtually no wrinkles. To simulate some of the panels and shading of the metallic portion of the bird, I covered the instrument pods with aluminum foil attached with a glue stick. Worked great, but requires a bit of patience lest you get wrinkles in it.

Flight wise, my sticky chutes from PD held on here, but the first flight recovery was horizontal, and Tom Lyon, the RSO, was charitable enough to give me a qualified flight. Second flight came straight back in, so I have only bits left, but no matter. The bird finished a solid 6th, about what I deserved for what was about a 60-70 hour model. Next year it'll be the same prototype and scale, but higher tech, assuming I can keep the weight down. Tom Beach talked me into trying to do the booster drop on the Atlas on the ride back to Chicago and I think I've figured out how to do that.

Social Stuff: We had a blast looking at the video shot from Ray Halm's NSL ARCON flight. The launch video was particularly impressive, and we just KNEW Ed LaCroix couldn't resist mugging for the camera when installing the igniter for flight #2. The Wallace and Gromit tape rental also proved to be a big hit. Some of us abandoned the range early on Thursday for a run over to the AF Museum in Dayton. The trip was fun, and Joyce Guzik's running commentary about the details of the nuclear weapons on display must have had other museum patrons wondering who we were and what we did for a living.

On return, we joined the HUVAAR's picnic party around the pool. Guys, this was a highlight of my NARAM-40 experience. We has 20-30 people from all over the country sitting around, chowing down, sharing an "adult beverage" or two, discussing contests, NAR programs, HPR rockets in the works and NARAM trivia for the better part of two hours. Great fun, and an example of the reasons many of us return to NARAM year after year, knowing in advance we'll get our competitive clocks cleaned by the hard core competition. NARAM-41 will have even better facilities for this sort of outing; I'm hoping the HUVAAR's crew will spearhead the effort again.(hint, hint).

The NAR Auction raised $1,359 for the Cannon Fund. I came away quite happy with the FAI Scale Mercury Redstone drawings donated by George Gassaway, and Ric Gaff and I split the cost of a box of Modelar magazines from the Czech Republic. Some weird looking rockets in there, folks. My Cineroc I donated pulled in the second highest bid, $105; I'm glad it went for a good cause and to a new happy home.

Awards: While the competition results have already been posted and discussed, I'd like to add a few comments about the service awards. Chris Tavares has really done an outstanding job setting up and maintaining the NAR Web site. It's turned into a valuable source of information for all NAR members and rocketeers inquiring as to what the NAR 's all about. I only regret I wasn't able to give Chris his President's Award personally.

As for the Galloway Award, the nation's highest honor in sport rocketry, I can think of few more deserving than the hardworking troops at S&T. While many of us think of engine testing as fun, exciting and even glamorous, I'm sure it must get old when you're cleaning your 8th or 9th reload casing of the day and know you've got a few more hours of that to do. That they work steadily, without complaint (or pay), at a demanding job requiring precision makes their service all that more worthy of recognition.

Summary Thoughts: I really was lucky this year. I attended all three NAR National events, NARCON, NSL and NARAM, and had a blast at each and every one of them. Each one seemed to get better and better, and in the end, I had way too much fun at NARAM this year. (grin)

Rod Schafer and crew in Pittsburgh have already laid the groundwork for an outstanding NARAM 41. The site's obviously not 1000 acres of open country, but I have no doubt NAR members who make the journey to PA next August will be well rewarded with excellent sport flying, outstanding competition and the chance to meet and mingle with old and new friends for a week of sport rocketry fun. I hope you'll join me there.

Tom Pastrick readies his Bomarc, which took 3rd Place in Scale! (R. Gaff photo)

John Guzik with his Nike-Ajax, which won Model of the Month a little while ago (yeah, I said it was a Nike-Hercules). (R. Gaff photo)

Some very happy trophy winners!

These people are having *way* too much fun!

Pierre Miller contemplates his Mercury-Atlas before flying it to a 2nd Place finish in B Division.

Before and After:

Top: Mark Bundick's Atlas bites the dust after an ejection failure (no, he didn't forget the ejection charge this time)

Middle: Jonathan Charbonneau's Standard Arm formed a small crater after dual altimeters failed to eject the recovery system.

Bottom: Andy Waddle's model of something from Peter Alway's (left) "Retro Rockets" re-kitted itself into a neat pile of junk.

Right: Bob Wiersbe's Gemini-Titan planted itself into the ground after one motor lit and the clips hung on the other motor causing the rocket to yank horizontal just off the rod. The crew did not survive.

(All photos by Ric Gaff)

Manufactured News

Estes industries is proud to announce a new addition to their Maxi-Brute series of model rockets:

Vanguard 1

The Vanguard 1 employs the revolutionary new feather-weight recovery system designed by Estes. True to form, the Vanguard lifts off the pad powered by a Mighty D12 engine. As the rocket reaches a pre-programmed height in feet, the D12 explodes. The explosion blows the Vanguard into millions of pieces all of which gently return to Earth.

This rocket is a competition rocket, it's a true to life scale rocket, and it's a sure winner for spot landing too.

THE ONE-PAGE SCALE MODELER
Aries 1 at 1/32 scale
by Kevin Wickart

THE PROTOTYPE: The Aries 1 is a converted Minuteman I missile's second stage. It was developed in the early 1970's to carry much larger payloads than previous sounding rockets could. The design was altered prior to operational status; the model presented here is the first test flight. The Aries still serves NASA as the most powerful single-stage sounding rocket in use. For more information, see "Rockets of the World" by Peter Alway.

THE MODEL: I've done quite a bit of scale modeling in the last few years, and with the exception of my larger competition-quality models, my little Aries 1 gets more attention than any other rocket I have. This is one of my absolute favorite scale models. Because of the odd and detailed paint and markings, I think the Aries looks better the smaller it is. The model presented here is the smallest scale which can be built with off-the-shelf parts.

General Notes: Rather than write several paragraphs describing how to model the markings, I've provided a body wrap pattern. Have this page copied onto "clear one-up label" stock at your local print shop, and you can simply cut out the body wrap and stick it to your model. The three small T-shaped marks are placement marks for a U.S. Air Force star-and-bars decal. The wrap also includes enough overlap to allow for the conduit.

In drawing the cutaway view of the model, I have intentionally left out (for the sake of clarity) two parts: the stage coupler and the launch lug/conduit assembly.

The ideal nose for this model is the old Estes BNC-55F. If you don't have an old Estes V-2 kit you want to cannibalize, you can either turn your own or order one from Balsa Machining Service.

Because of the complexity of the model's markings, I strongly recommend you refer to Peter Alway's "Rockets of the World."

ASSEMBLY NOTES: There are three relatively difficult/odd assemblies to this model. The most important of these is the launch lug/conduit assembly, and requires you to decide in advance how you are going to accomplish it. There are three decent ways of doing this:

1) Make the conduit out of 5/32" dowel, sanding the lower end to match the angle of the shroud and rounding the top, and mounting a conventional lug on a 3/16" standoff elsewhere on the model. This is the easiest of the three methods.

2) Make the conduit of 1/8" launch lug, fitting it to the shroud angle as above. You will need to cut the shroud and notch the 5-60 centering rings to accommodate the launch rod. Cut the top of the lug at a slant to approximate the rounded end of the conduit.

3) Make the conduit of 1/8" launch lug and notch the shroud and motor mount to allow the lug to pass completely through the lower part of the model. Since the thickness of the lug is exactly the same as the difference between the outer radii of the tubes, the BT-60 will bulge out. You will need to cut a narrow strip out of it to allow for the lug, then use filler to fill the gaps and return the lower tube to a smooth finish. This is the method I used on my original model.

The next unusual step is the motor mount/shroud assembly. Slit the motor tube so that the motor hook will extend 1/4" beyond one end. Glue the BT-5-to-60 centering rings to each end of the stage coupler, making sure to cut a notch in one of them for the motor hook clearance. When dry, glue this assembly onto the motor tube with the notched ring flush with the exhaust end. Glue one BT-5-to-55 ring on the motor tube butted against the top of the coupler assembly; glue the other ring so it holds down the top end of the hook. When dry, glue the mount into the BT-55 as far as it will go.

Form the shroud and slide it down the BT-55 until it butts against the coupler assembly, gluing it in place. Let dry. If you are using conduit assembly option #2 or #3 above, now is the time to cut the shroud and coupler assembly as needed. Glue the BT-60 in place over the coupler assembly, butted against the shroud.

The last unusual assembly is the fin shaping. Please take my advice and use basswood for the fins--they are stronger and hold an edge better than balsa. The balsa fins on my Aries look like a dog got to them. For an accurate scale, sand the fins to a double-wedge cross-section as shown, using the dotted lines as guides. The small section to the inside of the vertical guideline does not get sanded--it remains squared-off. While this is to true scale, it makes fin alignment more difficult. An alternative is to sand only the upper part of the double-wedge, leaving the bottom half of the fins square. Whichever you do, protect your edges right away by applying thin CA.

Below the body wrap pattern is a BT-55 sized fin alignment guide. Cut this out and line up the appropriate marks with your conduit location. Attach the fins and install the conduit.

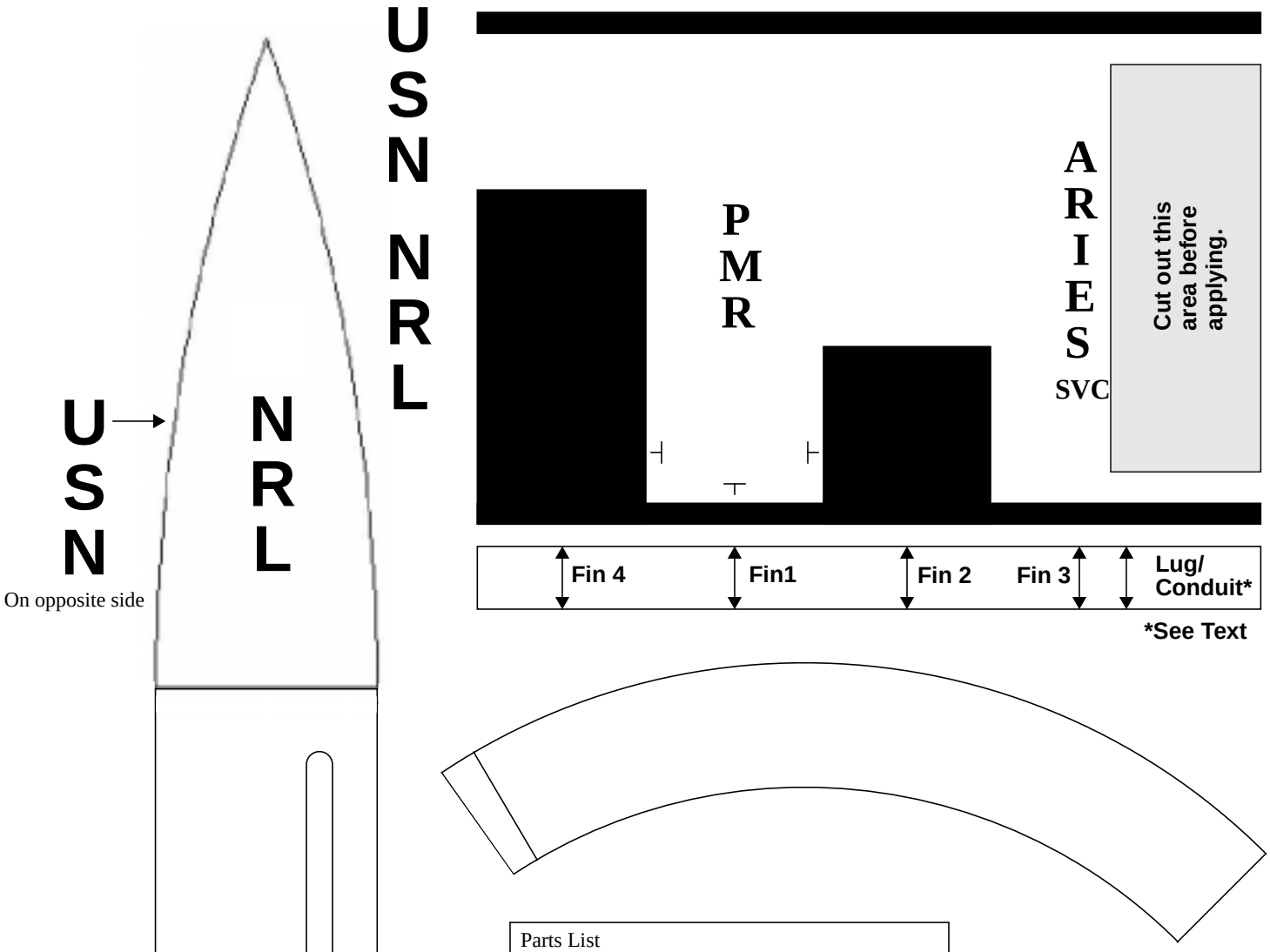
FINISHING: Now the REAL fun begins. Prep the wood and paint the model gloss white overall. Paint fins #1 and #3 gloss orange, and the other two fins gloss black. Paint the top 1/2" of the nose gloss red. Cut out the body wrap from the clear label paper, making sure to cut out the indicated area next to the ARIES lettering. This is the part that goes over the conduit, and cutting out the excess will make application easier. Line up the left edge of the body wrap with the line between fins 3 and 4, leaving about a one millimeter space between the bottom of the wrap and the top of the shroud. Apply carefully around the body, smoothing out bubbles and wrinkles as you go.

The final touches are the Air Force insignia and the nose decals. Once you've got a good idea of the placement of the star-and-bars decal, you may remove the guide marks from the body wrap with a pencil eraser. The nose lettering is a little more problematic, since you will be applying them to a curve in two dimensions. You can cut them from the label paper and stick them to opposite sides of the nose, eliminating wrinkles by cutting them lengthwise with a hobby knife and overlapping the edges. You can photocopy the sheet onto decal paper and apply as per the paper manufacturer's instructions. Or, you can use my own secret trick. Buy rub-on lettering in the appropriate size and style at your local office supply superstore. Apply the lettering to clear decal paper (available at hobby shops). Cut out and apply as you would any water-transfer decal. The rub-on lettering is waterproof and responds to decal setting solution, producing wonderful decals over complex curves.

When the decals are dry, give the model a couple of coats of clear gloss paint.

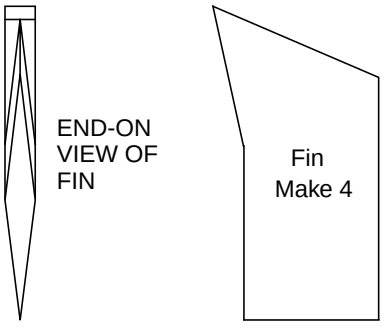
FLYING: Your Aries will be unstable as all get-out as assembled. The calculated Center of Pressure is indicated on the plan. Add nose weight to bring the model's loaded Center of Gravity forward of this point; I recommend by at least 1/2". My own model was built with an 18mm motor mount, and balances about 3/4" to the rear of the top of the body tube.

Even with the nose weight your Aries should weigh in at under 2 oz. at liftoff. You can fly it on any short-to-mid-delay 13mm motor, 1/2 A or above. Keep in mind, though, that this model has a lot of surface drag, so a 1/2 A motor may give a hairy flight.



Parts List

BNC-55F Nose Cone (see notes)
BT-55 Body Tube, 119.5mm
BT-60 Body Tube, 23mm
BT-5 Motor Tube, 45mm (1.75")
BT-60 Coupler, 15.5mm
2 Centering Rings, BT-5 to BT-55
2 Centering Rings, BT-5 to BT-60
1.75" Motor Hook
3/32" Basswood Fin Stock
Launch Lug, 126mm long
OR
5/32" Dowel Rod, 103mm
Nose Weight
Recovery System (8" Chute or 2x20" Streamer)



Bong Launch Report
by Greg Roman

Tripoli Wisconsin hosted a high power launch at Bong State Recreation Area, 15 miles west of Kenosha, on Saturday, August 29. The wind was strong for most of the day and didn't calm down till the late afternoon. The sky was almost cloudless.

I don't have any flight card statistics, but a rumor was circulating that this day had the most registered fliers of any launch at Bong to date. I counted almost a million people, fliers and spectators. Mostly kids. Each kid came equipped with two giant, rocket-crushing feet. To make matters worse, some brought bicycles.

I spent the three weeks since the last launch at Bong (August 8-9) scrambling to put together a new rocket, so I could fly my first H motor. It is a scratch built, plain old rocket, rocket design. It is 6 feet 6 inches long and 3 inches in diameter. I used an H242-6, which gave a nice straight boost, but deployed a little early. As it descended it appeared that the full length of shock cord did not pull out of the airframe. I'll never know. The rocket landed near the parking lot. Before I could get to it, two kids picked it up. They re-packed the parachute and walked it away from the spot where it landed. I know my opinion may be an unpopular one, but I wish people would leave there kids at home.

If you love watching high power rockets, Bong is the place to go. Nearly every flight was an H, I, or J motor. There were even a few K's. After every launch a cloud of smoke descended on the people standing in the flight line. The wonderful aroma of burnt A.P. filled the air (*sniff sniff..ahhhhh!*). I wonder if the motor manufacturers put nicotine in the propellant?

A PML ***Sudden Rush*** was flown with a K550 for an estimated altitude of 10,000 feet. The rocket was recovered and flown again with a K1100. It broke the speed of sound.

There were at least 3 rockets flown with long burning I65's, and many flights with fast burning I435's and J800's. Instead of the usual *whoooshhh*, the fast burning motor let out a loud bang, *zoooommmm.*

There were even a few Kosdon, and Vulcan motors used at this launch. I don't know where they were purchased. Al's Hobbies was the only vendor on site. (Did you hear that J.R., hint, hint)? We should not allow Aerotech to monopolize the high power motor industry.

Norm Heyen was the only other NIRA member I saw at the launch. He had a nice flight with one of his veteran rockets, but spent most of the day talking to people, volunteering, and taking pictures. While recovering a rocket, I came across Norm on the field. He was setting up his camera to take a picture of Dave Miller's nicely finished Saturn V taking off on an I211. We started talking and Norm missed taking the picture. Sorry, Norm. The Saturn V had a remarkably straight boost, for a rocket that has small fins, but suffered some minor damage when it ejected early.

I have a copy of the special "Tool Time Edition" of the Estes Sidewinder. It features a larger motor mount, a layer of lightweight fiberglass laminated throughout, 1/4" launch lugs, and a LOC type shock cord mount anchored to the third (plywood) centering ring. It had a unique flight profile on a D12-7. It arched over and headed toward the parking lot under power. The offset fin layout (Estes design, not mine) produced a slight roll, which allowed the rocket to remain horizontal throughout the entire 7 second delay! It had enough forward momentum to clear the parking lot and one million people, and recovered safely. It looked like it was tracking an enemy MIG. Cool! I prefer good engineering, but I'll take good luck when I can get it.

Tripoli Wisconsin had twelve high power pads, a long sawhorse filled with model rocket pads, and a launch control system that seemed to work flawlessly. Still, the flight line more slowly. A long time lapsed between the last flight of the previous rack and the first flight of the next rack. They need a more efficient system. I wish I had a suggestion to offer, not just criticism. Maybe they should consult with the crew at Three Oaks, Michigan. Their turnover rate is faster. Perhaps fewer pads are better? I hope a solution is implemented soon. The hobby is growing exponentially.

Despite the stress of flying a new rocket, my first H motor, strangers handling my rockets, the $17 just to register, long lines, and high winds..it was still a good day. A bad day flying rockets beats a good day doing almost anything else.

The Frugal Rocketeer
by Mark Soppet

Are you fed up with how expensive rockets are these days? Want to free up some extra cash to buy more engines? Then fear not, frugal friend! I have decided to write this column in order to help thrifty rocket scientists. Although I may not be as qualified to speak on this topic as some others, whose names rhyme with Pierre Miller, I have had some experience in the field. Before I start, keep this in mind: SAVE EVERYTHING! You never know when it will come in handy, as you will soon see.

Body Tubes:

When you think of parts of a rocket, body tube usually comes to mind first. There are several ways to obtain cheap body tubes. First, you can make your own tubes. Competition flyers usually roll them from vellum paper, which I shall not go into detail about. Another way is to use toilet paper and wrapping paper tubes. I know for a fact that T. P. Tubes are the same size as BT-60. Another good source is from paper towel tubes. Finally, you can obtain cheap tubes directly from NIRA. You can buy 3 foot lengths of certain sizes for as low as $1.00.

Nose Cones:

Nose cones are the most expensive part about the rocket, except for the engines. After all, you can end up paying $2.50 for an NC-5! One way to obtain a cheaper nose cone is to buy them in bulk from Balsa Machining Service. They also offer a fine line of specialty nose cones from discontinued Estes kits. A much cheaper way is to make them yourself. Sometimes you can find some blister packaging that will be the right size for your tube. Other times, you will need to use a lathe, or carve it and sand it down. Remember that you will need a stand-off for the nose. If you can find a disposable engine casing that fits the tube, saw off the nozzle and use the hole to place the screw eye into.

Fins:

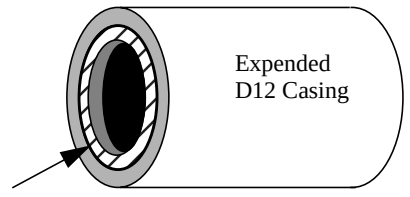
You can get creative with the fins. The recommended method is to go to the hobby store and buy a sheet of balsa. If you are making small, light rockets, you can use sturdy cardboard. Also keep in mind that you can use some of the cheap tubing from earlier to make tube fins.

Recovery:

The cheap recovery system substitutes are simple household items. Use thread for shroud-lines. Streamers can be made from crepe paper, and parachutes can be made from plastic bags. You can also use old mylar balloons if you don't mind your parachute saying "Happy Birthday!". You can get elastic from old pairs of underwear and kevlar shock cord from American Science and Surplus.

Engine Mounts:

You've probably heard that you can make thrust rings and centering rings from expended engine casings. I'll go one step further, showing you how to make the entire mount from engine casings.



Thrust ring made from expended 18mm casing

You can also make a mini engine mount from a standard engine and a mini- engine thrust ring.

Launch Lugs:

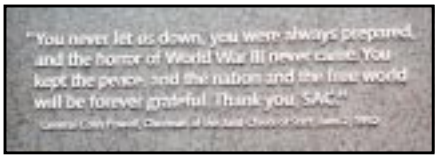
You can get creative with lugs, too. I've heard

of people using thin paper straws, but I have yet to locate them in my local grocery store. I would not recommend drinking straws because they are very flimsy. Besides, there are tougher plastic tubes out there. Mr. Pastrick recommends using aluminum tubing because there is less friction between two pieces of metal than metal and plastic. One thing you'll have to consider is the diameter of the launch rod.

As I have demonstrated, there are many creative ways to save money and build nice rockets. The saved earnings will go a long way towards purchasing more engines. Evidence of this is Mr. Kaplow's Happy Meal UFO, a flying saucer UFO made from an ancient vacuformed spaceship that was given away by McDonald's. The possibilities are endless. Now get out there and fly some cheap rockets!

The SAC Museum
by Bob Wiersbe

This past May I was able to a tour of the Strategic Air Command Museum located between Omaha and Lincoln, Nebraska. The Museum has been relocated, and is now just off of I-80. The Museum is brand new, and just opened to the public in May. The aircraft are all indoors now, protected from the harsh mid-western environment.



There are a couple of missiles on display outside of the museum, but the Atlas was in the restoration shop when we were there. The first thing that greets you when you step through the doors is an SR-71 Blackbird suspended from the ceiling. Hiding off to the left and right of this marvelous plane are two massive hangers full of aircraft.

The beauty of this museum is that you can walk up to, under, around, into the bomb bays, and even touch the planes. There aren't any ropes to keep you at arms length. The only downside is that you can't get into the cockpits of the planes to see what they are like.

There are may types of fighter planes, bombers, and reconnaissance aircraft on display, including the B-29 "Superfortress", B-36 "Peacemaker", B-52 "Stratofortress", U-2 spy plane, British "Vulcan", Russian "Mig", just to name a few. The "Peacemaker" is a really unique aircraft, it features both jet and propeller engines, and the props face backwards. This aircraft has the distinction of having never dropped a bomb during wartime, and only 4 remain in the world today (another one is at the Air Force Museum in Dayton).

Along with the planes are many artifacts and displays from pilots, manufacturers, and the history of the Strategic Air Command. Several theaters tell the story of SAC, the men and the machines. Kids will find a gallery just for them, with displays that will help them understand what planes are all about.

If you're heading through Nebraska along I-80 sometime, plan to stop at the museum for a couple of hours. It will be time well spent.

Museum Info: Exit 426 on I-80 1-800-358-5029 Hours: 9am-6pm, closed Thanksgiving, Christmas Day and New Years Day Adults - $6, Children 5-12 - $3, Under 5 free.

Astronaut Alan Shepard dies at 74

Astronaut Alan Shepard, the first American to fly in space and one of only 12 Americans to walk on the moon, died July 21st at a hospital in California. He was 74.

The former Navy test pilot made a 15-minute suborbital flight -- five of those minutes in space -- on May 5, 1961, aboard the Freedom 7 spacecraft.

Ten years later, Shepard returned to space for his second and last flight as commander of Apollo 14 on January 31, 1971. Shepard spent 33 hours on the moon during the third lunar landing mission and became the only lunar golfer, playfully whacking golf balls with a six-iron. On that flight, Shepard, Edgar Mitchell and Stuart Roosa spent nine days in space;

Mitchell and Shepard stayed on the moon for two days.

Alan Shepard's wife, Louise, dies

Louise Shepard, the wife of pioneering Mercury astronaut Alan Shepard, died Tuesday August 25th on an airline flight to her hometown, officials said.

NASA officials said Louise Shepard was on a flight from San Francisco to her home in Monterey. She was returning from a visit with her daughter, Laura Churchley, in Colorado. She is believed to have died of a heart attack, friends said.

"Louise was probably one of the finest women you'd ever meet," said Howard Benedict, a friend of the Shepards and executive director of the Astronaut Scholarship Foundation in Titusville. "She was just a peach of a woman."

Benedict said he called the remaining Mercury astronauts and others Wednesday to tell them about Louise Shepard's death. "They all thought so much of Louise," Benedict said. "It was a feeling of great loss."

"Louise was the quintessential lady" said Jay Barbree, a friend who joined Shepard and Benedict to write Moon Shot, a book about NASA's Apollo missions. "She was just class. Just the perfect person."

Kit Review: Neubauer Micro Juno 1
by Frank J. Burke
(shamelessly stolen from the Internet)

I just saw these at Discount Rocketry on Monday, and so decided to try the online ordering, which worked great, and I had the kit on Friday. I have all of the other micro kits, from when they were Boyce Aerospace, and knew this would make a great addition.

The kit is 8.5" long, and 18mm diameter, and uses 13mm motors. It has plastic fins, and resin cast nose cone pieces, and a streamer for recovery. The kit comes with a full length body wrapper for the markings, so the only painting is on the nose cone, and the black for the appropriate fins.

The kit went together in about 3 hours including painting, and looks great. There were a few

minor things that needed fixing. The nose cone sections needed some sanding to get rid of some mold marks on the ends, and a small void had to be filled. The most annoying thing was that the hole that is molded into both nose sections for the dowel that connects the main cone and the satellite booster, and also acts as the satellite, was molded off center and took some appropriate drilling to make them line up correctly. The body tube was poorly trimmed, and I had to re-cut it.

The body wrapper went on fine, although one antenna marking was on the side that is supposed to be overlapped, and would have been covered, so I had to trim the other side so it could be seen. The nose was glued together with thin CA after it was assembled. The thin CA just wicks in to the joint. The clear launch lug is attached with epoxy after drilling small holes in it along the glue joint so that the epoxy will form little rivets and hold it in place.

The motor mount went together fine and was installed. The fins were pre-cut from a much thinner material than the Boyce kits, and needed minor scoring to come free. They needed just a touch of sand paper. They should make the kit more stable since they are adding less weight than the thicker Boyce fins on the Redstone kit, but they are too thin to get any angles on the edges like in the real thing. They epoxy on, and then you paint the appropriate sides black to match the roll pattern. The instructions are very clear, and easily show you how to paint the right fins. I painted the nose, and added the black paint stripes, and gave it a shot of krylon clear coat to protect the body wrapper.

In conclusion, I think that this is one of the better micro kits, and really looks great when finished. I have no worries about stability, since the boyce redstone is slightly more tail heavy, and flies straight with the stock fins. Try one!

Improving the New Quest 9 Volt Launch Controller

by Rick Kramer

At the July launch I showed Bob Kaplow the new Quest launch controller. I fired off a few small rockets with it using only a standard 9 volt alkaline battery. The controller refused to light a “Copperhead” ignitor. Bob advised using a rechargeable nickel cadmium battery for more current to fire the “Copperheads.”

I found a 7.2 volt ni-cad at Radio Shack and charged it up for my Quest launcher. It handled the Estes ignitors OK but would not fire a “Copperhead.” Moving on, I had to hold the button down for 3 seconds before a successful ignition of a North Coast “Lazer Fire” ignitor.

I then proceeded to my junk box and found a set of battery clips designed for an automobile battery. The hook-up wire was just long enough to reach the ground while holding the Quest launch controller chest high.

I soldered the battery clips from a discarded 9 volt battery to the ends of the hook-up wire (making sure of correct polarity of course.) I filed a small notch in the end of the controller to accept the hook-up wire.

I then hooked the battery clips to the 12 volt pair of Panasonic gel -cells that Tom Pastrick sold me two years ago. The voltage was not excessive for the internal electronics, in other words, the led still flashes and the piezio buzzer still beeps. And of all things, those Copperheads now fire like Estes Solar ignitors!

This is a neat little gadget that works fine out of the box with an alkaline 9 volt battery for most of the rockets flown at club launches. To fire “Copperheads” or “Lazerfire” and possibly home dipped “Fire Star” ignitors it takes more than one ni-cad to provide the punch to get the job done.

Confused Stages Part 7

by Jonathan Charbonneau

You probably have heard about speed traps for cars. They catch motorists who speed red handed. Did you know that there's a speed trap in rocketry? Sounds hard to believe but true. This speed trap in rocketry is what this stage in the series is about.

What is this speed trap in rocketry?

Hyperterminal velocity is it's name and it's a robber of performance. As a rocket increases speed, the drag force due to the air friction increases directly with the square of speed. This is why the highest thrust engine isn't always best. Due to the direct square relationship between velocity and drag, drag increases faster than velocity during powered flight. With continued thrust, there comes a point where the drag force is equal to the net thrust. When this happens, the forces of thrust, gravity and drag cancel each other out and the rocket's velocity remains constant. This is terminal velocity. Hyperterminal velocity is when the rocket is flying so fast that the drag force is stronger than the net thrust. Hence, the thrust isn't strong enough to keep the rocket from losing velocity to drag.

When does hyperterminal velocity occur?

Single engine rockets never reach hyperterminal velocity. It happens in complex rockets that are equipped with grossly mismatched engines, e.g. E60/E5 or G80/F10. The booster engine has so much thrust that the sustainer engine's low thrust cannot maintain the velocity imparted by the booster. When the booster burns out, the rocket begins to lose speed despite the run of the sustainer engine. All the sustainer engine does is slow the rate of speed loss until it burns out or the rocket has slowed to terminal velocity, which ever comes first. If the latter, the rocket cruises at terminal velocity for the rest of the sustainer engine's burn.

How to beat hyperterminal velocity.

Just as a motorist can avoid losing in a speed trap by obeying the speed limit, there is a way to beat the speed trap of rocketry. To do this you need to first calculate the rockets velocity at booster burnout and the terminal velocity of the upper stage. The necessary equations can be found in some versions of rocketry software. I don't know which ones (I don't have a computer), but they must be out there somewhere. Once the two velocities (booster burnout and upper stage terminal) are known, calculate how long it will take for the upper stage to slow down to terminal velocity from booster burnout velocity. Do not include the sustainer engine's thrust in this calculation, because the sustainer engine will be delayed until the rocket has slowed to terminal velocity so that it can push the rocket at terminal velocity for the duration of its burn. This last calculation will reveal how long to delay the firing of the sustainer. The booster should still be dropped when it burns out. Use a staging timer in the upper stage to airstart its engine at the proper time. By delaying sustainer ignition until the upper stage has slowed to terminal velocity, the upper stage engine isn't faced with insurmountable drag forces and operates more efficiently. This in turn means more altitude.

Superman's Words of the Wise

1. Do not attempt to delay ignition of upper stage without an electronic timer. Thermalite without a timer is unreliable.

2. Use an altimeter in the upper stage for recovery system deployment, just in case the upper stage misfires.

3. If you haven't read Stage 5 of this series, be sure to read it. It has valuable information that is needed on timers and altimeters.

4. Most important. Always follow the NAR rocketry safety code.

Help Wanted

Been working on an interesting project?

Built a newly released rocket lately?

Got a plan you’d like to have published?

Been to a really cool launch?

Then let us know! You don’t have to write a 90 page essay about it, just a few paragraphs will do! The newsletter needs that kind of material to continue to meet the needs of the club.

Plans can be hand drawn, with simple instructions and a stock list. We’ll do the rest!

Heard on the Street
(with apologies to the Wall Street Journal)

Welcome to the Club! - John Anderson, Jason Bowman, David Esbrook, Vern Fish, Dennis Fitzpatrick, Jim Hanak, Ken Keim, Michael Martschinke, Charles Nozicka, Michael Pennisi, Joe Tiscareno, Ken Volin, and Don Wende have joined NIRA recently. Welcome!

So it GOES - Just a month after the government stored an extra weather satellite in space, the spare is being called on to replace a failing active one. The GOES-10 satellite, placed in storage in orbit in mid-June, after a launch last year was being activated last week. The GOES-9 satellite's momentum wheels, used to keep the satellite stable, appear to be failing. NIRA members will remember Bunny's ill fated NARAM-39 model was of the GOES 10 launch attended by NIRA VP Steve Smith.

Final Flights - The ranks of Wernher von Braun's German rocket team -- which after the war helped put Americans on the moon -- has grown even more sparse with the deaths of three scientists last week. Max Nowak, 89, Heinrich Paetz, 88, and Albert Schuler, 83, all living in the Huntsville, AL area, were original members of von Braun's team of engineers who developed the V-1 and V-2 rockets for Germany during World War II. Only roughly 30 of the original 127 members of von Braun's team are alive today. All three died of natural causes.

Fall Preview - Alan Bean, the Apollo 12 astronaut who came home to create amazing pictures and paintings of the lunar surface and astronauts traveling to it, has written a new book. Entitled "Apollo", it discusses his experiences with his illustrations, and additional text by Andrew Chaikin, author of "Apollo: A Man on the Moon - The Journeys of the Apollo Astronauts". The book should be in stores in September.

NAR S&T News

R50: NEW MOTOR CERTIFICATIONS

The following motors have been certified by NAR Standards & Testing as of August 5, 1998 for general use as high power rocket motors. They will not be certified for NAR contest use as they are not model rocket motors.

The following are Kosdon reloadable motors, also known as "Kosdon Truly Recyclable Motors." They are certified only with the indicated size casing and manufacturer supplied nozzle, end closures, delays, and propellant slugs:

Kosdon:
J275-6.5 (1150 N-Sec total impulse, 625 grams propellant mass)
K450-12 (2400 N-Sec total impulse, 1080 grams propellant mass)
K777-11 (2400 N-Sec total impulse, 1080 grams propellant mass)

R51: NEW MOTOR CERTIFICATION

The following motor has been certified by NAR Standards & Testing as of September 1, 1998 for general use as a model rocket motor. It is certified for contest use effective October 31, 1998.

North Coast Rocketry (by Estes):
29mm x 103mm:
G70-10 (90 N-sec total impulse, 62.0 grams propellant mass)

R52: MOTOR DECERTIFICATIONS

This announcement contains three types of model rocket motor decertifications.

NAR Contest Decertifications

The following motors will lose their certification for NAR contest use effective July 1, 1999 but are certified for use at NARAM 41. They remain certified for general sport flying for a period of three years, until July 1, 2002.

Aerotech: D15-8 E11-4 E16-10 E18-10 E28-8 F39-3T

NAR General Use Decertifications (3 year notice)

The following motors, while not contest certified, will be decertified for general use three years after July 1, 1999 (i.e. July 1, 2002) in their "classic propellant" formulations. Please note the "Blue Thunder" propellant formulations of these motor remain certified indefinitely for contest and general use.

Aerotech: F25-4,6,9 G40-4,7,10

NAR General Use Decertifications (7/1/99)

The following motors, having been out of production for more than three years, will lose their NAR certification for general use effective July 1, 1999.

North Coast Rocketry (NCR): F30-4,6,P

R53: NEW MOTOR CERTIFICATIONS

The following motors have been certified by NAR Standards & Testing as of September 1, 1998 for general use as model rocket motors. They are certified for contest use effective October 31, 1998.

The following are Aerotech reloadable motors, certified only with the indicated size casings and manufacturer supplied nozzles, end closures, delays, and propellant slugs.

Aerotech:
24mm x 70mm RMS-24/40 Casing:
D9-4,7 (20.0 N-sec total impulse, 10.1 grams propellant mass)
F12-5 (45.0 N-sec total impulse, 30.3 grams propellant mass)

29mm x 124mm RMS-29/40-120 Casing:
E23-5,8 (37.0 N-sec total impulse, 17.4 grams propellant mass)
F22-7 (65.0 N-sec total impulse, 46.3 grams propellant mass)
F52-6,8,11 (78.0 N-sec total impulse, 36.6 grams propellant mass)

Jim Cook, Secretary for NAR Standards & Testing <JimCook@AOL.COM>

Jack Kane, Chairman

Manufacturer News

Estes Industries Introduces The 30th Anniversary Apollo 11 Saturn V
from Rocketry On Line Newswire

Penrose, Colorado, USA (ROL Newswire) -- Estes Industries is proud to announce the release of the Apollo 11 Saturn V in commemoration of the 30th anniversary of man's landing on the moon.

Return with Estes to the days of 1969, when Neil Armstrong and Buzz Aldrin first set foot on the moon. Now you can relive those exciting times with the Apollo 11 Saturn V™ by Estes. This kit has been the most requested release by modelers over the past five years. This Masters-level kit is huge, over 43" long, and features intricate detailing from the tip of the escape tower to the five powerful first stage nozzles. Apollo 11 Saturn V is powered by a single D12-3 engine and can fly to almost 300 feet. It also features vacu-form fins and wraps for easy construction and superb detailing.

The 30th ANNIVERSARY APOLLO 11 SATURN V will be priced at $69.99 and will be released in December 1998. See this exciting new rocket at your nearest hobby retailer.

Specifications:
Length: 43.25" (110 cm)
Diameter: 3.9" (10 cm)
Weight: 10.2 oz (288g)
Recommended Engine: D12-3
List Price: $69.99

For further information: Kathleen Greer or Matt Steele 719-372-6565

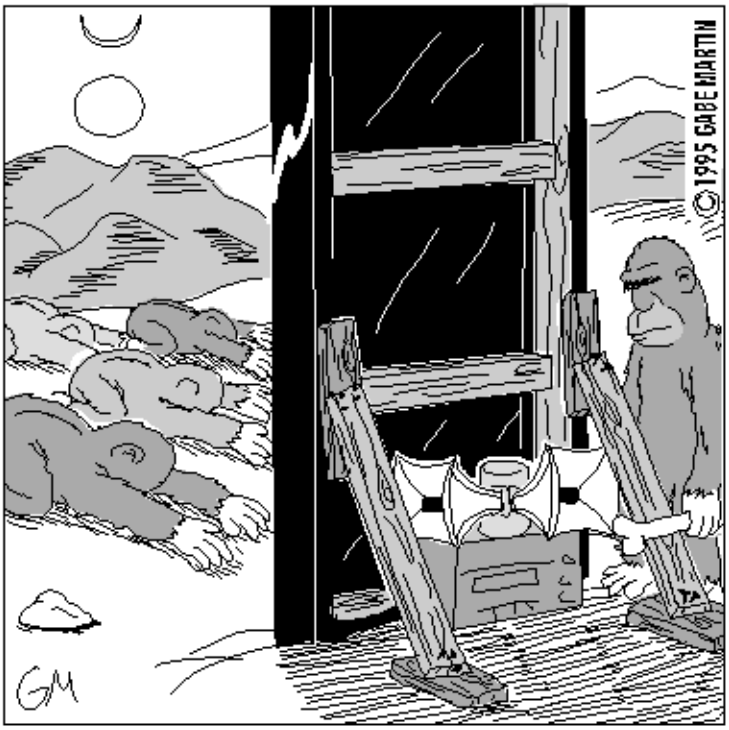
ESTES News

Estes has announced several new rockets.

Description	Due Date	Retail
Outlaw Mighty Mite	1/99	$16.99 RTF SS
Blitz and Sizzler MM	1/99	8.99 RTF
Torque and Fury MM	1/99	8.99 RTF
Snitch	1/99	9.99 Mini
Jinx	1/99	9.99 Mini
Marz Lander	1/99	9.99 Mini
Moondog	1/99	9.99 Mini
Astron Alpha 4 IV	10/98	10.99
Apollo 11 and Saturn V	11/98	69.99
Fire Flash	10/98	13.99
Exo-Skell	1/99	24.99
1/4A3-3T (4)	10/98	4.79 Motors
Laser Launch Controller	1/99	19.99

NORTH COAST ROCKETRY

Orbit Launch Set 2/99 $59.99
F62-9 Dark Star Motor 10/98 $12.99



Seconds after Moon-Watcher's discovery, the tribe's entire theological perspective was suddenly turned upside-down.