



THE LEADING EDGE

Newsletter of the Northern Illinois Rocketry Association,
NAR Section #117

Volume 24, Number 2
March/April 2001

Club News

Easter Launch – The date of our first launch (April 15th) was a topic of discussion at the March meeting since this is also Easter this year.

It was agreed in principle that we should try to keep the launch on the same (third) Sunday when at all possible since that's the date the club has launched on for many year.

In addition, since April 15th has been in the club flyers for several months, it was decided that it would be a bad idea to change the date now..

As Bob Kaplow said when someone asked what we were going to do about having a launch on Easter said, "Easter Egg Loft!"

MRFF 2001 – As reported in the last newsletter, Steve Piette will be heading up MRFF again this year after a fantastic job last year. Steve has Bong State Park reserved for Saturday, June 16th and is trying to get Sunday the 17th (the dog training people are already using that date).

Steve is still hoping to find a better location for this MRFF and for future launches. Anyone with a possible site that can handle High Power rockets should contact Steve.

In addition, anyone that wants to assist with MRFF should contact Steve as soon as possible since there is a lot of work to be done the launch.

Launch Signs – It was suggested at several recent meetings that there should be signs at our launches with NIRA's range rules as well as general procedures for NIRA launches. Cally Soukup took the idea and ran with it, bringing several proposed signs to the March meeting.

Everyone thought that the signs were a good idea, especially when Cally said that she could get the signs laminated.

Adopt-a-Road – Cally also followed up on another idea presented at an earlier meeting, seeing if we could adopt Greene Road, which runs next to our Greene Valley launch site.

She reported that the government body that owns the section just to the west of the launch site doesn't have an adopt-a-road program because

of liability concerns. She also said that the body that owns it on the south side of 75th Street (just to the south of the launch site) does have an adopt-a-road program and that she was hoping to have information on it for the April meeting so that we could decide if we wanted to investigate it further


Range Store – Also as reported in the last issue, Martin Maney is now running NIRA's 'Range Store,' freeing up a bit of space in Bob Kaplow's basement.

The range store mainly contains an assortment of tubes and components bought when the club has been able to make group buys from various manufacturers. An up-to-date list of the store's stock is on page 6

Cub Scout Launch – At the March meeting, it was announced that a scout master, who is also a member of NIRA, would like to hold a scout launch on the same day as MRFF.

Since most, if not all, available members of NIRA will probably be at MRFF, there was much discussion about how much experience it would take for a member to run a 'NIRA club launch' (i.e. using our insurance and/or name).

The general consensus was that the decision would have to be made on a case by case basis but that there should be at least two regular members there that were capable of running RSO/LCO at a regular club launch.

As we get more requests through the Forest Preserve, this will become a larger issue and will be discussed at future meetings. 

News NAR Records Procedures, From Dan Winings

From the NAR Records Subcommittee

I have been concerned for a long time about the lack of notification to the Records Subcommittee of some legitimate records; I am therefore implementing the following procedural changes in the notification of new records to the Subcommittee:

1) It is recommended that Contest Directors check all flights against existing records to determine if any records were surpassed. He may then notify the Records Subcommittee via mail or e-mail of any pending new records. The notification should include the aspirant's name, age division, date of flight and the actual record. The CD may also photocopy the flight card and the CB-170 of the contestant and forward them to the Records Subcommittee. Such notification should occur within 2 weeks of the record attempt.

2) A contestant if he feels he has set a record may also notify the Records Subcommittee via mail or e-mail. Notification must include the aspirant's name, age division, date of record attempt, and the actual performance achieved. He may also request a copy of his flight card and CB-170 so that he can forward it to the Records Subcommittee.

3) The Regional Contest Board Chairman must certify all record attempts and forward the name of the contestant, his age division, date of record and the actual performance with two week of receipt of the contest results.

Note these changes are procedural in nature and do not constitute a change in the Pink Book rules. It is still the obligation of the Regional Contest Board to certify new records a forward them to the Records Subcommittee. Unfortunately in some cases I have not been receiving record substantiation in a timely manner or in other cases at all. These new procedures will allow for some checks and balances. Any new record forwarded to me will be listed as pending until I receive a copy of both the flight card and the CB-170 of the contestant.

Forward any record substantiation to:

NAR Records Subcommittee
C/O Dan Winings, Chairman
12000 Falcon Ridge Drive
Fredericksburg, VA 22407

e-mail dwinings@erols.com 



Volume 24, Number 2
March/April 2001

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Photos will be returned, other material returned upon requested.

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Send membership applications (dues: \$6 per youth, \$8 per adult, \$12 per family, including a six issue subscription to the Leading Edge), non-member subscriptions (\$10 per six issues), and change of address notifications to:

Ken Hutchinson
82 Talcott Avenue
Crystal Lake, IL 60014-4541

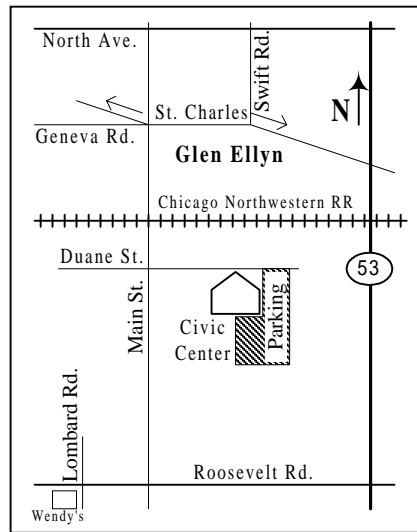
NIRA's web site is at: <http://nira.chicago.il.us/>



CLUB MEETING DATES

All meetings start at 7:30 pm. Bring a model for 'Model of the Month.' We always need volunteers for pre-meeting lectures, contact Rick Gaff if you want to schedule a date. The location is the Glen Ellyn Civic Center, 535 Duane Street (usually the 3rd floor, but check the board in the lobby).

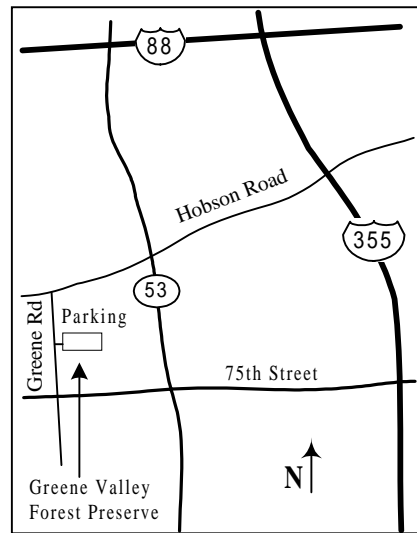
- April 6
- May 4
- June 1
- July 6
- August 3



CLUB LAUNCH DATES

Launches are BYOL (bring your own launcher). The location for our launches is the Greene Valley Forest Preserve (see map at right). Call the NIRA infoline for pre-launch information: 630-483-2468.

- April 15 – Greene Valley Forest Preserve
- May 13 – Youth Group Launch at Greene Valley
- May 20 – Greene Valley Forest Preserve
- June 16-17 – Midwest Regional Fun Fly
- July 15 – Greene Valley Forest Preserve
- August 19 – Greene Valley Forest Preserve
- September 9 – Youth Group Launch at Greene Valley
- September 16 – Greene Valley Forest Preserve



Model of the Month Winners!

February – Alex Wallis won the youth division with his Rattler 7 while Greg Cisco won the adult division with an excellent Estes Mercury Atlas. (February photo Rick Gaff)
March – It was an NCR month - both models started as NCR kits! Dean Hemmingsen took the adult category with his nicely fibreglassed Lance Beta while Joe Provenzano won the youth category with his Patriot. (March photo Jeff Pleimling)

Science Fair Launch - 03/03/01
by Martin Maney

A while ago, David Wallis, the club's RSO, got a phone call from Louis Philipson of the University of Chicago's department of endocrinology. His son Ben was working on a UC Lab School science fair project, investigating model rocket performance. After other potential launch sites proved unworkable, Louis approached the DuPage Forest Preserve District, who sent him to us. The Science Fair launch was originally scheduled for Saturday, February 24th, at the Greene Valley site, but the weather was hopeless: cold, driving rain, and much too windy. The FPD very kindly allowed us to take a rain date, and the following Saturday, March 3rd, was as lovely a day for flying rockets as a veteran of Chicago's weather would dare to hope for. By the time we all got out to the field at Greene Valley it was mostly sunny, around 40F, with light and variable winds, conditions that persisted for the next several hours.

We got two launch pads setup and launching began a little past 11:00. I think David started the show, but Cally and I tossed a few things up as well. The Philipson crew had to get several models prepped, then the principal investigator was dispatched with his altitrac to a location approximately 150M to the north (my notes don't include the conversion factor between meters and Ben-paces that was used for this). Soon we were all taking turns, prepping rockets and launching them, frequently with the assistance of David's son Nick, who did a fine job of counting down and helping everyone recover rockets all day long. Ben had the assistance of his father and his brother, Joe, who performed most of the research series launches.

The research launches consisted of three flights each of three different fin configurations on otherwise identical Estes Vikings. The results from the actual trials agreed well with the simulation results: more fins produce more drag, hence lower flights. Secondary observations were that the five fin version seemed to fly considerably straighter than the three fin, and that A8-3 motors don't have enough delay to let this model coast to apogee before ejection. Ben and Joe (with some help from Nick) launched about 8 more times after the research series was completed. Louis supervised and documented opera-

tions with both video and still photography; the photos here are captures from his video.

David recorded 10 flights with 3 models: 3 As, 1 B, 3Cs, and 3Fs. One very nice flight (his Initiator on an F25-4W) was done as a demo for the FPD officers who stopped by to see how we were doing. The research flights and some other smaller rockets continued to launch while David chatted with them, so the F25 was quite a change for all of us. A few minutes later the FPD departed in a haze of burnt AP and goodwill.

Sadly, David's RTF Astrocams suffered a separation on its only flight of the day. The camera seems to be okay, but the booster core sampled. Post-crash examination revealed that the motor mount had been held in place only by a hot melt glue, and, the glue warmed by the motor, it slid several inches forward on impact. David plans to build a real booster for the camera, of course.

Cally had her repaired Yankee (twice on A8-3), a generic E2X from the RCHTA show (A8-3), and yet another version of *Three Fins and Some Spare Parts* (A8-3 and B6-4). Somewhat unusually, they are all still flyable as recovered, and all the parts came back down. One fin on the Yankee got an odd scorch in the middle of its trailing edge, and it ejected the motor on one flight (but the streamer still deployed).

I launched my *Baffle-Oh!*, a 3FNC that I've used to practice several construction techniques on, a couple times, but most of my flights were of the two *Maple Seed* rockets. The larger model flew nicely on A8-3s, as usual, and the smaller one went so well on its customary 1/2A3 that I decided to try it with a full A. I'd never done this because the smaller *Seed* takes its own sweet time coming down, and a 1/2A is usually enough to make for a fair hike to recover it. But the winds were light, and the sky beckoned.

Adam Elliot says it was just that the *Seed* found a thermal, and I expect he's right. It went up and separated just like it was supposed to, and it was coming down slowly, as expected, and drifting a bit to the south towards 75th Street, so I guess that explains it. The darn thing just hung up there, spinning and drifting, drifting and spinning, and I was about ready to say goodbye when it must have fallen out of the updraft and finally came down. Cally and Nick had gone after it, and picked it up rather further from the



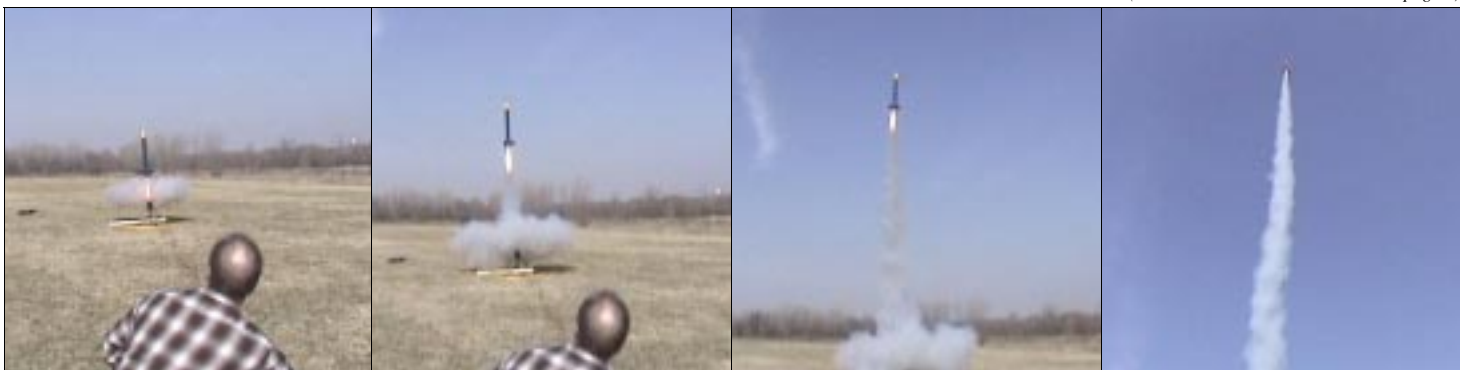
One of the launch crew pushes the button.
(Louis Philipson photo)

street than I would have expected, so it will fly again. Maybe even on a full A on another calm day.

Adam had stopped by on his way to work, and didn't really plan on launching anything, but he still had his *Monolith 2001* in the car. We scraped together a suitable motor and so forth, and were all wondering if we quite believed this finless rectangular solid would actually be stable. But a vital part came undone, and we had to leave the question unanswered this day. Another club member, whose name I have forgotten, had also joined us, and I recall a very pretty flight from his Skywinder, as well as the lovely automotive metallic finish on his Silver Streak.

It was somewhere around 1:00 we had all pretty much finished and decided to pack things up, and in fact the Indian pump had just been emptied, when Cole Arntzen came over the berm with a few good rockets and a mess of motors under his arm. The pump was refilled, and we had a couple of lovely launches to close out the day. First off was Cole's PML Ariel, *Big Blue*, sans payload section and just screaming off the pad on a G80-4FWL. That's the launch that is pictured here, thanks to Louis's VCR and image capture work. Cole worked his way down, launching *Grape Frost* on an F20-7W and his stretched-limo interpretation of a Fat Boy, *Fat Little Red Rocket*, on a mere D12-5. At this point we thought we were done, but there was one more launch to come.

(Science Fair Launch continued on page 4)



Louis Philipson catches the flight of Cole Arntzen's PML Ariel, *Big Blue* with his VCR.

(Louis Philipson photo)

(Science Fair Launch continued from page 3)

Cole had all these motors, and one of them was calling to David's Initiator. Well, not calling, exactly: Cole was waving it under David's nose, taunting him! There was some concern about the delay - it was an F20-7W motor - but after due consideration (and some more motor waving) David was persuaded that the delay, although longer than optimum, would be acceptable. The launch was lovely, and as we all watched and counted to ourselves, the Initiator made a big lazy turn to the west and started back down. Seven seconds really was a bit too much delay for this bird. Although it was well past apogee, the ejection was safe. Nick and David brought her back, the pump was emptied again, the fire blankets packed up, and we all left the field for lunch and, perhaps, an afternoon nap. ☞

Tripoli Certification Granted for Three Kosdon TRM by AeroTech Reload Kits

Las Vegas, NV (ROL Newswire) -- AeroTech, Inc. and Frank Kosdon of Kosdon Enterprises are pleased to announce that AeroTech has received certifications from the Tripoli Motor Testing (TMT) Committee for three designations of Kosdon TRM by AeroTech™ reload kits.

The motors tested and certified are the 38mm I310S-P, I370S-P and the 54mm K400S-P. California certification efforts are underway.

Granting of the certifications means that AeroTech will be able to demonstrate the new Kosdon TRM by AeroTech reload kits at the upcoming Springfest launch at El Dorado Dry Lake in Nevada on 3/17-18 and the ALRS launch in Switzerland on 3/23-25, 2001. AeroTech representatives plan on attending both launches and Frank Kosdon will be at Springfest to help demonstrate the new products.

The AeroTech website is being updated with downloadable PDF versions of the certifications.

Source: ROL Newswire Service ☞

USED CARS FOR SALE - AS IS

Cash from sale of these two vehicles goes to NAR legal fund.

1988 Acura Integra needs water pump and other maintenance

1991 Dodge Caravan needs transmission work

Both cars know their way to NIRA meetings and flying fields!

Best offer for either car.

Contact Bob Kaplow at:
kaplow_r@eisner.decus.org

Park Forest Rocket Launch and R/C show

From John Kallend, Secretary - Suburban Aeroclub of Chicago

The Village of Park Forest invited us back again to put on a launch and R/C show in the town park. Good publicity for the hobby, the site is quite centrally located and we get a whole lot of spectators.

Date: 7/22/01

Place: Park Forest, IL

All welcome. LMR notification will be made, but no HPR waiver. Site suitable for up to G power, but recommend keeping altitudes below 1000 ft. Sponsor will provide free Estes motors in common sizes for use at the event.

This will be 4th year. The event was started by Don McWhorter, proprietor of Don's Hobby World in Glenwood. He sells a lot of Estes stuff. The village of Park Forest's director of parks and recreation approached him and asked him to organize a launch and build-and-take for the kids. Estes donated the kits and motors.

Don asked our R/C club to put on a flying display, and provide general organizational support for the event (we have several rocketeers in the club). I ended up organizing it overall, and John Boren ran the launch.

Last year we had 200 kids build Alphas (I think). The show operates by alternating racks of rockets with periods of R/C flying. We have racks for 12 rockets and a heavy-duty multi-station launch controller.

The site is Central Park in Park Forest. It is around 200 acres, mostly treeless scrub. It is only about 3/4 mile from the town center and next to a busy street, so we get lots of spectators. The park authority has no objection to reasonable fund raising activities - the RC club sells sodas and hamburgers, and club hats. We probably had around 600 spectators last year. The park authority also supplies insurance coverage and indemnifies the participating clubs.

Biggest rocket flown last year was my NCR Bomarc on G64. Mostly they are B and C size stuff. Bob Wiersbe came down with a bunch of interesting rockets, and I also flew two RCRGs.

Don and/or Estes supplies a whole bunch of popular size motors (B6, C6, D12 etc.). ☞

[Editor's Note: Since there has already been some confusion - this is **not** a NIRA club event, but NIRA members are **very** welcome to participate. Bob Wiersbe's excellent report about last year's launch was in the September/October 2000 Leading Edge (available on the NIRA website). If you need specific information about this event, contact John Kallend via email at kallend@iit.edu]

Galileo Gets One Last Frequent-Flyer Upgrade

The resilient Galileo spacecraft doesn't know when it call it quits. So, NASA has outlined the details of one last mission extension, which includes five more flybys of the Jovian moons before a final plunge into the crushing pressure of the giant planet's atmosphere.

Galileo has been orbiting Jupiter for more than five years and survived radiation exposure more than three times what it was built to withstand. Galileo's mission has previously been extended twice and during that time it has returned an enormous wealth of scientific information, including evidence of a sub-surface ocean on Jupiter's moon Europa.

"We're proud that this workhorse of a spacecraft has kept performing well enough that we can ask it to keep serving science a little longer," commented Dr. Jay Bergstralh, Acting Director of Solar System Exploration at NASA Headquarters, Washington, DC.

For the complete press release, go to:
<ftp://ftp.hq.nasa.gov/pub/pao/pressrel/2001/01-041.txt> ☞

For Sale: Aerotech Mantis Pad with Interlok Launch Controller. New. \$60.00 or best offer for the set. This is a great deal - it normally costs \$70.00 for more just for the pad alone. See Jonathan Charbonneau at a launch or meeting for more information.

COLLECTABLE MOTORS FOR SALE

NOTE: Most are no longer certified, or will lose certification soon. They are believed to be good, but are being sold as collectibles only.

MOTORS CAN NOT BE SHIPPED. You MUST arrange pickup at a NIRA event.

Assorted old Estes motors from about 1970 in blue mailing tubes:

1/4A3-2, A8-5, B3-7, B4-6, C6-7, and more!

Assorted FSI motors: D18, D20, E5, E60, F7, F100

Assorted MRC motors: A8-3, B4-2, B4-4, C6-3, C6-5

One Rocketflite F50-9 Silver Streak.

Assorted Aerotech motors: D7, D8, E10, E28, E50, F9, G42 and more.

Contact Bob Kaplow at:
kaplow_r@eisner.decus.org

January 2000 Building Session by Jeff Pleimling

Bob Kaplow hosted the January building session. Bob's hosting of a building session is quickly becoming one of the longest traditions in NIRA – the March/April 1994 Leading Edge (among the earliest I have) has an article about the February 1994 building session in his basement.

Bob's basement, also known as "Bob's Hobby Shop" contains not only a very large collection of rocketry memorabilia but also plastic models and other, less identifiable, stuff. Even though Bob won't part with most of his stash, it was fun to wander around and look at it all. Bob brought out part of his motor collection this year - showing off motors from companies that I'd never heard of (and from some companies that didn't exist for very long).

Adam Elliot put Bob's band saw to work cutting quite a few tubes to the same length. I didn't find out what rocket he was working on, but evidently they're all for his scale model for NARAM this year. I assume either the rocket he's modeling has a lot of strap on boosters or he's planning on pranging several test models.

Rick Kramer made a pilgrimage up from Normal for the building session. (Does that make the Chicago suburbs 'abnormal'?) As usual, Rick brought several rockets to build with at least one using tube fins (also as usual).

NIRA's President Rick Gaff spent most of his time 'building' copies of past issues of the NIRA reprint series. Rick even talked about trying to find time to do a few new ones.

At one point most of the gang trooped outside to launch several rockets in Bob's back yard. Several people, myself included, stayed in the basement not wanting to brave the normal January

weather. The rockets all appeared to be the typical micro-maxx or ¼ A rockets that are usually launched at Bob's building session.

Another highlight was watching several video tapes including one of a young Mr. Bundick giving a rocketry talk and another of an Arcas(?) flying/flopping around the beaches of Wallops.

After the 'formal' building session was over, some of the gang went to the Texan BBQ in Algonquin for supper and more rocket talk. The trip to the Texan BBQ is becoming as much of a tradition as Bob's building session.

There were plenty of other builders and kibitzers, but unfortunately my notes have disappeared since the building session (my apologies to all of those slighted).

February 2000 Building Session by Jeff Pleimling (including photos)

For the second year in a row, Bob Wiersbe and family opened their basement for a NIRA building session. Bob has a good basement for building sessions with a good workshop for building, comfortable chairs/couch for socializing, and a kitchen area for getting snacks.

David Wallis, NIRA's new Safety Officer, and his son Nick brought along a couple of models to work on including a Big Daddy that was finished except for the fillets. His use of the new epoxy putty from Apogee for fillets started a long discussion of filleting techniques.



Bob Kaplow and David Wallis discuss filleting techniques with David's Big Daddy.



Tom Pastrick cutting out a wing for another of his boost gliders.



Rick Gaff and Bob Wiersbe taking advantage of the comfortable chairs to talk rocketry for a while.

Joe Nowak brought along a Launch Pad kit to work on. He was doing an excellent job of building/fitting the many paper transitions that this kit required to make it scale rather than just semi-scale.

At one point, Bob Wiersbe brought out 'Mother' to show off. Mother is a rocket Bob built several years ago for demo launches (and for fun at regular launches). When launched,

Mother blows off its nose cone and a small 'child' rocket launches from out of the inside. Several of the people at the building session had never seen Mother in action and were fascinated as Bob went through the building of it as well as the many preparatory steps need to get Mother ready for a launch.

Adam Elliot showed up to continue working on his scale model for NARAM. Evidently all of the tubes he cut at January's building session are for strap-on boosters. He didn't say if he was planning on actually putting engines in the boosters for extra mission points or if they were just for show.

Two out of town members showed up for this building session, Rick Kramer and Norm Heyen. Rick had also shown up at January's building session and continued to build the rockets he started back then. Norm didn't bring any rockets to build (that I saw) but was happy to show up and talk about rockets and about flying conditions at Bong.

There were, of course, several other builders in attendance including Bill Thiel working on a

square rocket, Tom Pastrick working on yet another boost glider and Steve Piette working on a large high power rocket. Among the 'just talking' crowd were Rick Gaff, Bob Kaplow, Cally Soukup, Martin Maney, Martin Schrader and Ken Hutchinson.

There was, of course, a not-quite-impromptu launch held. I decided to stay inside where it was warm - maybe next year...



Bill Thiel working on a square rocket from Stellar Dimensions (are they still in business?)

NIRA Range Store - Under New Management

Martin Maney volunteered to take over NIRA's 'Range Store' from Bob Kaplow. The range store exists to serve club members with parts, kits and general stuff accumulated through club purchases and to generate funds for the treasury through their sale.

Most of the current stock is left from a club buy from Totally Tubular. With the size of the order, the club was able to stock the range store at a very low cost.

In the past, the range store has been stocked in many different way - including buying all of the display kits from the Custom Rockets booth at the Chicago Hobby Show at a large discount (after the show was over, of course).

Ordering Instruction:

The range store is available to any member of NIRA. To check if something is still available, or to order, contact Martin in person at a meeting/launch or email him at: maney@pobox.com.

Delivery of orders is preferably at either a club meeting or launch, but should be arranged with Martin when ordering. ☺

Range Store Inventory - As of March 13th 2001

Item	Price	Quant	Comments	Item	Price	Quant	Comments
CR2-4	.10	lots	CR2-3 with a snugly fitted -4	T-2	.80	25	
CR2+-3	?	none	NEW! \$0.15 list	T-2+	.80	none	
CR2+-4	?	none	NEW! \$0.15 list	T-3	.80	15	
CR2+-5	?	none	NEW! \$0.15 list	T-4	.80	31	10.5mm motor tube
CR3-4	.10	lots		T-4+	.80	none	
CR4-5	.10	lots		T-5	.80	42	T motor tube
CR5-20	.10	lots		T-5+	.80	8	
CR20-50	.10	111		T-.700	?	none	NEW! .700 OD, .013 wall, \$2.00 list
CR50-52H	.10	36		T-20	.95	17	"standard" BP motor tube
CR50-55	.13	118		T-20+	.95	none	
				T-30	?	none	NEW! .765 OD, .021 wall, \$2.00 list
CPL3-4	.18	112	1" long outside for T-3, inside for T-4	T-.908"	1.05	none	Centuri ST-8
CPL3-4	.18	35	1.5" long outside for T-3, inside T-4	T-50	1.05	24	"D" and some AP motor tube
CPL5	.18	36	2" long	T-50mf	?	none	NEW! 24mm motor, .021, foil, \$2.50
CPL20	.18	44	3" long	T-1.04"	1.05	none	Centuri ST-10
CPL-.908-4"	?	none	NEW! \$0.50 list	T-52H	2.10	32	29mm motor tube (heavy like LOC)
CPL50	.35	45	4" long	T-55	1.40	20	
CPL-1.04-4"	?	none	NEW! \$0.50 list	T-56	?	none	NEW! 1.346 OD, .021 wall, \$7.00 list
CPL55	.35	33	4" long	T-60	2.10	21	
CPL60	.45	2	4" long	T-1.88"	2.60	none	Aerotech (.040 thick)
CPL2.04"	.55	4	4" long	T-2.04"	2.30	4	Centuri ST-20
CPL70	.55	8	4" long	T-70	2.30	15	
CPL80	.70	none	4" long	T-80	4.20	10	
CPL-101-6"	?	none	NEW! \$3.00 list	T-101	?	none	NEW! 3.938 OD, .021 wall, \$7.00 list
CPL4.476"	3.00	1	6" long	T-4.476"	4.60	1	
				?	?	16	1" slices of T-4.476 - ring fins!
				LL-1/8-3"	.20	15	
				LL-3/16-3"	.20	15	

Notes:

- I have filled in some items and prices that weren't in the official spreadsheet listing. These have been shown at the "rightmost column" price, which seems to be correct for all the items that had prices in the old stock list. Whether we would get those prices on a new purchase may depend on the size of the new order.
- For dimensions and other sizes and items, see Totally Tubular's price list: <http://www.buyrockets.com/buyrockets/tt.html>
- I've added some NEW! items. This is from an emailed parts list, and it didn't give all the info that's in the old web-page price list. I assume the prices shown in that are for the 1-x column. I have **not** included some centering rings where I am unsure just what's being described
- updated 4 March to reflect parts ordered for delivery & pickup.

YOLKY

Plan #052096

Designed by Mark Kotolski (NAR 35707)

Parts List:

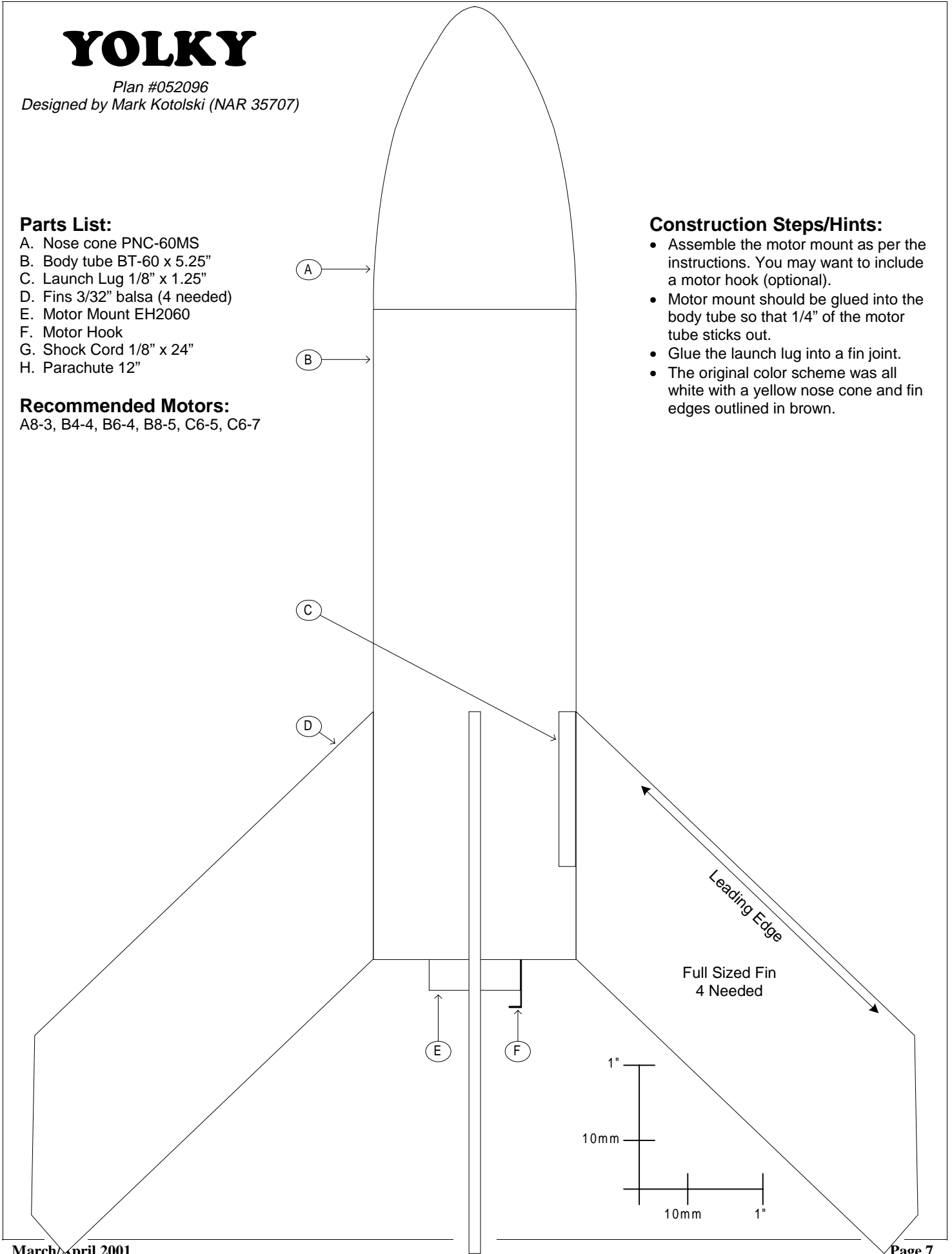
- A. Nose cone PNC-60MS
- B. Body tube BT-60 x 5.25"
- C. Launch Lug 1/8" x 1.25"
- D. Fins 3/32" balsa (4 needed)
- E. Motor Mount EH2060
- F. Motor Hook
- G. Shock Cord 1/8" x 24"
- H. Parachute 12"

Recommended Motors:

A8-3, B4-4, B6-4, B8-5, C6-5, C6-7

Construction Steps/Hints:

- Assemble the motor mount as per the instructions. You may want to include a motor hook (optional).
- Motor mount should be glued into the body tube so that 1/4" of the motor mount sticks out.
- Glue the launch lug into a fin joint.
- The original color scheme was all white with a yellow nose cone and fin edges outlined in brown.



Space Launch Report for January-February 2001

by Tim Johnson

The 21st Century's first space launch put China's crew-capable Shenzhou 2 (Divine Wind) into orbit from Jiuquan Satellite Launch Center on January 9. Europe, Russia, and the United States added eight more launches during January and February. Among these were two International Space Station (ISS) missions, the final dual-payload Ariane 4 flight, a \$1.2 billion Titan 4 mission, and Progress M1-5; launched on a "doomsday" mission to deorbit Russia's 15 year-old Mir station.

Shenzhou 2

A two-and-one-half stage Chang Zheng (Long March) 2F rocket launched Shenzhou 2 from Jiuquan in Gansu Province on January 9, beginning a one week mission to test China's human space flight hardware. The 8,400-kg spacecraft carried biological and materials science experiments during its flight. Shenzhou entered an initial 197 x 335 km x 42.6 degree orbit, but soon raised its perigee to 328 km.

Like 1999's Shenzhou 1, Shenzhou 2 consisted of an aft propulsion module with twin solar panels, a central descent module, and a forward orbital module. On this flight, the cylindrical orbital module sported a pair of solar panels and an independent propulsion system.

On January 16, after 108 orbits, the orbital module separated to remain in orbit. The propulsion module then performed a retro burn and separated. The dumbbell-shaped descent module parachuted to a landing in the Inner Mongolian desert.

The orbital module, a spacecraft in its own right, subsequently raised its orbit several times, beginning a somewhat mysterious mission that could last six months or longer.

ISS Missions

The three-man ISS Expedition 1 crew - Bill Shepard, Yuri Gidzenko, and Sergey Krikalyov - orbited Earth continuously during January-February to mark four months in space. After filling Progress M1-4 with three month's worth of garbage, they released the Russian cargo ship from Zarya's

nadir (Earth facing) port for destructive reentry on February 8. This cleared the Unity nadir port to allow shuttle Atlantis to dock one day later.

Atlantis lifted off from Kennedy Space Center Launch Complex (LC) 39A on February 7. The STS-98/ISS-5A crew; Commander David Cockrell, rookie Pilot Mark Polansky, and Mission Specialists Marsha Ivins, Robert Curbeam, and Thomas Jones; brought fresh fruit and the \$1.4 billion, 14,500 kg Destiny module. Space veteran Ivins, on her fifth space flight, used the Shuttle Remote Manipulator System to attach Destiny to Unity's forward port the next day.

When Atlantis undocked on February 16, it left behind a 112-ton station. After a two-day weather delay, the shuttle diverted to an Edwards AFB landing on February 20.

A Russian Soyuz-U rocket launched Progress M-44 (ISS-3P) to ISS from Baikonur LC 1 on February 26. The ship carried food, water, propellant, and other supplies. Progress M-44 docked automatically to the aft Zvezda port two days later. In preparation, the ISS crew had moved Soyuz TM-31 from Zvezda's aft port to Zarya's nadir port on February 24.

Mir Deorbit Prep

On January 24, a Soyuz-U launched Progress M1-5 from Baikonur LC 1 on a long-delayed mission to deorbit Mir. The 7,250 kg cargo ship climbed to Mir's 300 km x 51.6 degree orbit before docking to the station's aft Kvant-1 port on January 27. Progress M-43

had undocked from that port two days earlier. The new Progress carried 2,677 kg of fuel for a final deorbit burn planned to drop the station into the South Pacific in mid-March.

Arianespace

Arianespace launched two Ariane 4 vehicles during January-February from Kourou ELA2. The launches extended the Ariane 4 consecutive success streak to 61, a commercial record. The first launch, by an Ariane 44P flying the V137 mission, carried 3,535 kg Eurasisat 1 into geosynchronous transfer orbit (GTO) on January 10. The second flight, by a 44L model with four liquid strap-on boosters, boosted 1,489 kg Skynet 4F and 2,596 kg Sicral 1 into GTO on February 7. This all-military V139 mission used the 103rd of 116



Shenzhou 2 being prepped for launch.
(CSA photo)



Eurasisat 1 launch on Ariane 4
(Mission 137) (Arianespace photo)



"Gus" lifts off with Milstar 2-F2.
(Lockheed Martin Missiles & Space photo)

ordered Ariane 4 vehicles. It was probably the last dual-payload Ariane 4 flight.

"Gus" the Titan

Lockheed Martin Titan 401B-41, named to honor Gus Grissom, orbited \$750 million Milstar 2-F2 for the U.S. Air Force on February 27. The \$455 million rocket lifted off from Cape Canaveral SLC40 on the 1,542,000 kgf total thrust of two Alliant SRMU solid rocket motors. After SRMU burn out, the two K-30 core vehicle stages burned in succession to push the third stage, Titan-Centaur 22 (TC-22), to suborbital velocity. TC-22 then boosted itself into a parking orbit. After a one-hour coast, the stage fired a second time at the first ascending node (northbound equator) crossing to boost itself into GTO. About 6.5 hours after liftoff, TC-22 fired a third time to put the 4,670 kg communication satellite into near-geosynchronous orbit.

It was the 31st of 39 planned Titan 4 launches and the 27th success. The last Titan 4 launch should take place in 2003.

Other Launches

Delta 283, a 7925 model with a Star 48D solid fuel third stage, launched GPS 2R-7 into a high transfer orbit from Cape Canaveral SLC 17A on January 30. A four stage Start-1 launcher put 250 kg Odin-1, an atmospheric science satellite, into sun synchronous low earth orbit for the Swedish Space Corporation on February 20. The 50,000 kg United Start rocket, based on a decommissioned three-stage SS-25 "Topol" solid fuel ICBM, lifted off from Russia's Svobodny Cosmodrome.

Launch Vehicle News

In February, Lockheed Martin President/CEO Robert Stevens announced that "Lockheed Martin's growth opportunities are not going to be in

(Space Launch Report continued on page 9)

(Space Launch Report continued from page 8)

space". The company has lost satellite manufacturing market share, its new Atlas V launcher order book trails that of Boeing's Delta IV, and its much heralded "Venture Star" reusable launcher seems a fading dream. Now, the company is thinking about cutting its financial exposure to the commercial space market.

Government export controls have pummeled the U.S. satellite business. U.S. manufacturers once built 75% of the world's commercial satellites, but during 2000 U.S. builders Lockheed Martin, Boeing/Hughes and Space Systems Loral only received 13 orders versus 16 by Europe's Astrium and Alcatel Space.

In February, Boeing completed the first test firing of a tandem RS-2200 linear aerospike engine at NASA's Stennis Space Center. Boeing/Rocketdyne developed the LOX/LH2 engine for the X-33, a program rumored to be facing imminent cancellation.

Alliant Techsystems, builder of Titan 4 SRMUs, Delta GEMs, and Pegasus/Taurus stages, will buy Thiokol, builder of STS SRBs, Castor, and Star motors for \$685 million. Meanwhile, Pratt & Whitney's purchase of Aerojet has fallen through.

Boeing plans to phase out its Delta 3 booster after 2005. No Delta 3 launches are planned this year, but 4-5 may fly in 2002.

A Sea Launch Zenit 3SL suffered an abort in early January when satellite engineers called a halt at T-11 seconds. Since the RD-171 engine pre-ignition sequence had begun, the Sea Launch "fleet" had to return to port, a two-week sail. The rocket's RD-171 engines had to be refurbished in a process that included replacing pre-valve seals. Last second aborts are common in the West, but Energomash engines are not designed for such events. ☞☞

Galileo Gets One Last Frequent-Flyer Upgrade

The resilient Galileo spacecraft doesn't know when it call it quits. So, NASA has outlined the details of one last mission extension, which includes five more flybys of the Jovian moons before a final plunge into the crushing pressure of the giant planet's atmosphere.

Galileo has been orbiting Jupiter for more than five years and survived radiation exposure more than three times what it was built to withstand. Galileo's mission has previously been extended twice and during that time it has returned an enormous wealth of scientific information, including evidence of a sub-surface ocean on Jupiter's moon Europa.

"We're proud that this workhorse of a spacecraft has kept performing well enough that we can ask it to keep serving science a little longer," commented Dr. Jay Bergstralh, Acting Director of Solar System Exploration at NASA Headquarters, Washington, DC.

On May 25, Galileo should pass about 123 kilometers (76 miles) above the moon Callisto, the second largest of Jupiter's 28 moons. The effects of Callisto's gravity will set up the space probe for a swing over both polar regions of the intensely volcanic moon Io in August and October.

Galileo will take pictures, measure magnetic forces, and study dust and smaller particles. Science goals include studying the extent of volcanism on Io, both in new and previously active sites; determining whether Io generates its own weak magnetic field; and gaining a better understanding of a doughnut-shaped ring, the Io Torus, that encircles Jupiter and contains electrically charged gases.

In 2002, having completed its imaging mission, Galileo will continue studies of Jupiter's magnetic field with seven instruments. In January, the orbiter will fly near the equator of Io.

In November, it will swing closer to Jupiter than ever before, dipping within about 500 kilometers (about 300 miles) of the moon Amalthea, which is less than one-tenth the size of Io and less than half as far from Jupiter. Scientists will use Galileo measurements to determine the mass and density of Amalthea. They will also study dust particles as Galileo flies through Jupiter's gossamer rings and seek new details of the magnetic forces and the densities of charged particles close to the planet.

Galileo's final orbit will take an elongated loop away from Jupiter. Then in August 2003, the spacecraft will head back for a direct impact and burn up as it plows into Jupiter's 60,000 kilometer-thick atmosphere. This final act was approved by the National Research Council of the National Academy of Sciences last December.

"Galileo has already succeeded beyond expectations, and we have the opportunity to learn still more in coming months, but it is sad to see the end of the road up ahead," said Eilene Theilig, Galileo project manager at NASA's Jet Propulsion Laboratory, Pasadena, CA. "Exposure from Jupiter's intense radiation belts has impaired some of Galileo's instruments, but it is still producing valuable scientific results."

The science program for the Galileo mission extension was recommended to NASA by a blue-ribbon panel of planetary scientists, who met last July, and will cost \$9 million. "This mission extension accomplishes the highest priorities of the review panel in a cost effective way," said Paul Hertz, Galileo Program Executive at NASA Headquarters.

Galileo was launched Oct. 18, 1989, aboard NASA's Space Shuttle Atlantis. On Dec. 7, 1995, a probe released earlier from Galileo made measurements while dropping through Jupiter's upper atmosphere. More information about Galileo is available on the Internet at:

<http://galileo.jpl.nasa.gov/> ☞☞

NASA Administrator Marks Dr. Goddard's Vision

The following is a statement by NASA Administrator Daniel S. Goldin regarding the 75th anniversary of Dr. Robert H. Goddard's first successful liquid-fueled rocket launch.

"Once publicly ridiculed for his vision to boldly expand the frontier of space, Dr. Robert Goddard inspired a new generation of explorers on this date in 1926. Dr. Goddard initially expressed interest in rockets in 1899, when he was just 17 years old. By 1915, he had developed the detailed mathematical theory of rocket propulsion and proved rocket engines could produce thrust in a vacuum, making space flight possible.

"Dr. Goddard's first work on rockets made little impression on the scientific community and government leaders. Only through modest subsidies and leaves of absence from his university duties was he able to sustain his lifetime of devoted research and testing.

"At the time of his death in 1945, Dr. Goddard held 214 patents in rocketry, and in memory of this brilliant innovator, NASA's Goddard Space Flight Center was established in 1959 in Greenbelt, Maryland.

"Dr. Goddard once said every vision is a joke, until the first man accomplishes it. NASA honors his vision through our continued leadership in aerospace technology and Earth and Space sciences. We work each day to expand knowledge of our planet and its environment, the solar system and the universe. This Agency is committed to future excellence in scientific investigation, the advancement of education, the safe development and operation of space systems, and in providing the inspiration for the next generation of rocket scientists."

Additional information is available on the Internet at:
<http://www.gsfc.nasa.gov/75th/history.htm> ☞☞

R/C R/G ITEMS FOR SALE

ITEM 1: Futaba FP-T7UAF "Super 7" transmitter, good condition with FP-TP-FM module on channel 22, 700mah battery pack, spare 500mah battery pack, manual
Price \$100

ITEM 2: New in unopened box Estes Astro Blaster R/C R/G kit
Price \$50

ITEM 3: New in unopened box Estes Sweet Vee R/C R/G kit
Price \$75

ITEM 4: New in box VectorAero 'Cuda R/C R/G kit
Price \$80

Above prices do not include shipping if necessary. Please contact "Jedi" George Riebesehl at: geonsan@home.com or call 630-830-3960 after 5:30 pm.

Confused Stages – Stage 18

by Jonathan Charbonneau

Ever wondered what the term “Ogive” means? Parabolic? In this stage, I will clarify these and other terms so that everybody nose about the different kinds of proboscis found on rockets. (Pun intended)

An Ogive (“O”-jive) is the intersection of two circles having the same radius. Rotate this intersection about its major axis and you get a shape from which an ogive nose is made. There are three kinds of ogives: tangent, secant and bulbous. Cutting the ogive exactly in half will result in two tangent ogive noses. Cutting it unequally will result in a secant ogive and a bulbous ogive.

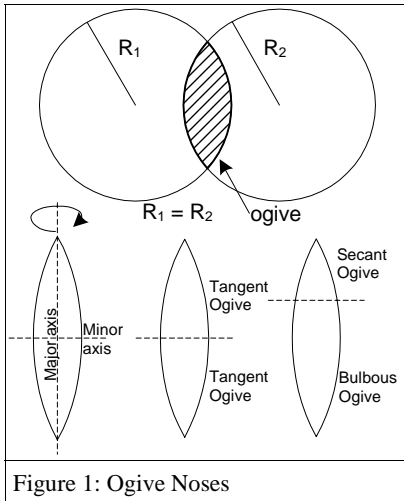


Figure 1: Ogive Noses

A parabolic nose is derived from the parabola. A parabola is a set of points in a plane where each point is equidistant from a given point (focus)

and a given line (directrix). Rotating this curve about its axis forms the parabolic nose shape.

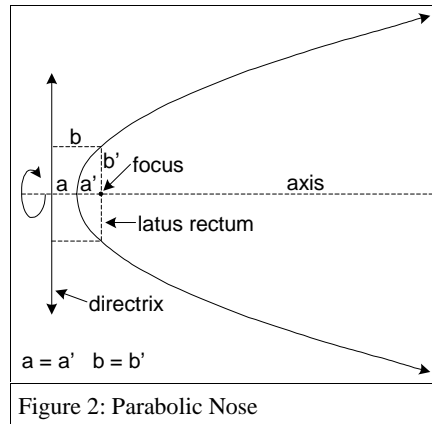


Figure 2: Parabolic Nose

An elliptical nose is derived from an ellipse. An ellipse is a set of points in a plane where the sum of the distances of each point from two fixed points (foci) is constant. Rotating an ellipse about its major axis forms the shape that can be cut into two elliptical noses: in half to make two

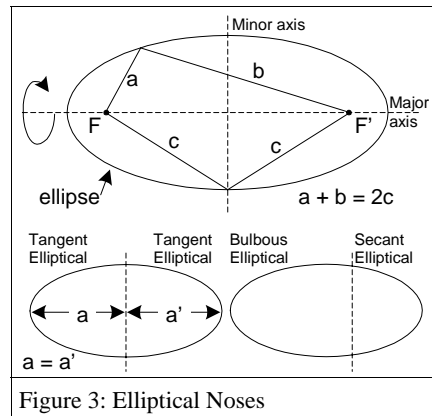


Figure 3: Elliptical Noses

tangent elliptical noses, uneven to make a secant elliptical and a bulbous elliptical.

A hyperbolic nose is derived from a hyperbola. A hyperbola is a set of points in a plane where the difference between the distances of each point from each of the two fixed points (foci) is constant. Rotating either branch of the hyperbola about the axis running through the foci forms the hyperbolic nose shape.

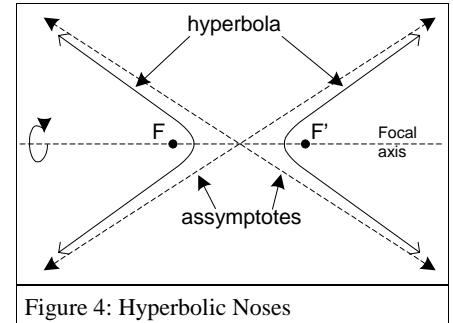


Figure 4: Hyperbolic Noses

The hemispherical nose is simply half a sphere - or hemi sphere as it is called.

The conical nose is a true cone.

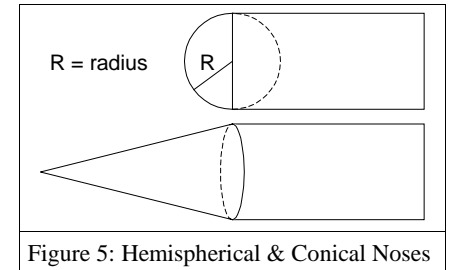


Figure 5: Hemispherical & Conical Noses

Annual Trustee Election Announcement

From: Mark Bundick, President - National Association of Rocketry

In accordance with the by-laws, the NAR has annual elections to fill three of the nine board positions. The three positions to be voted on in July 2001 will be for 3 year terms.

If you wish to run for the board, or know someone you feel is qualified and will accept, the NAR is soliciting nominations. If you nominate someone other than yourself, you must include a letter from the nominee indicating his or her acceptance.

Nominees themselves should provide a resume and statement no longer than 300 words to be published with the ballot material. Be sure to include your name, address, and NAR # on your resume. By NAR policy, Sport Rocketry magazine will not publish any other campaign-related material, either paid or unpaid.

All nomination material (letters and resumes) must be received no later than May 1, 2001 by the NAR secretary. Send to:

NAR Secretary,
GEORGE RACHOR
33380 NW Bagley Road
HILLSBORO, OR 97124

In addition nominations and resumes may be transmitted electronically to the following mail address: george@racsys.rt.rain.com. Clearly indicate in the subject heading that the email is for “NAR Nominations”.

NSL has an official hotel

From: David Urbanek


The Quality Inn in American Fork, Utah is the official host hotel for the 2001 NAR National Sport Launch. The NSL web site has been updated to reflect this information. We've also included the information for eight other local hotels so there's quite a selection. We strongly encourage anyone who is planning on attending NSL to get their registration in soon and to make room reservations sooner. Utah is a popular vacation destination and hotels do fill up.

See the NSL lodging page at:

<http://public.surftee.com/urbanek/rockets/UROCNSSLodging.htm>

If you're planning on an especially cool, radical, extreme or otherwise noteworthy rocket flight at NSL, please e-mail me the details. I would like to get your information up on our Featured Flights page!

Welcome to the Club!

Charles Hammerslough, Loni and Stella Howard, Nancy, Paul and Zachary Michalak and Sandra Ugorek have all joined NIRA in the past few months. Welcome to the club!
(If I somehow missed your name, please let me know!) 

NAR Offers Scholarships, Grants

The NAR is proud to announce two new educational programs.

The new NAR Scholarship Program awards college scholarships to NAR members.

For the 2001 academic year, \$1,000 has been allocated to this program. Dependent on the number of applications received, this amount may be split and awarded to several individuals.

The applicant must be a NAR member in good standing between the ages of 17 and 22 who is planning to attend, or is currently enrolled in a college, university or technical school.

Full requirements and application instructions are included on our online application form at: <http://www.nar.org/cabinet/scholarship.pdf>.

In addition, to recognize science educators, grants are now being offered as part of the Robert L. Cannon Educational Program to teachers who use rocketry, in either a structured program during the school day or as an after-school activity.

Robert L. Cannon was the educational director for Estes for many years. He promoted the hobby by taking it directly to teachers, schools and youth groups. He realized that a safe program of rocketry in schools would enhance the learning experiences of youth and his efforts resulted in a great number of teachers using model rocketry in the classroom, which continues today.


The NAR board, in its spring 2001 meeting, approved the implementation of this award, which is funded with a part of the proceeds of our annual NARAM auctions.

Initially, the Board approved two \$500 grants to be awarded annually to educators who currently have a rocketry learning activity. Any educator in an elementary, middle or secondary school may qualify for the grant. One of the primary requirements for receiving this award is to submit an article (preferably with photographs) for inclusion in Sport Rocketry.

The grants will be announced at NARAM-43 in Geneseo NY.

If you are a teacher interested in the Cannon award, or know of one who would qualify, obtain an application from:

Stew McNabb, NAR Treasurer
12574 Timberline Drive
Garfield, AR 72732.

An online application for a Cannon Grant is expected to be available soon. 

March/April 2001

New, Simpler Model Rocket Safety Code Announced

On February 10, The National Association of Rocketry Board of Trustees approved a new NAR Model Rocket Safety Code which is significantly clearer and easier to understand than the previous Code, as well as being quite a bit shorter. This new Code is the authoritative document for governing model rocket activities conducted in the US. Nothing in the new Code contradicts or changes any specific requirements of the old Code, so those who fly under the old one are still following all the provisions of the new one.

The Board also authorized manufacturers of model rocket products to distribute a simplified, shortened version of this Code (the "Basic Safety Code") with products intended for beginning, first-time model rocketeers.

My thanks to all the NAR volunteers who were involved in the development of this new Code, for your enthusiasm and assistance.

Trip Barber, NAR Vice President

Model Rocket Safety Code

- 1. Materials.** I will use only lightweight, non-metal parts for the nose, body, and fins of my rocket.
- 2. Motors.** I will use only certified, commercially-made model rocket motors, and will not tamper with these motors or use them for any purposes except those recommended by the manufacturer.
- 3. Ignition System.** I will launch my rockets with an electrical launch system and electrical motor igniters. My launch system will have a safety interlock in series with the launch switch, and will use a launch switch that returns to the "off" position when released.
- 4. Misfires.** If my rocket does not launch when I press the button of my electrical launch system, I will remove the launcher's safety interlock or disconnect its battery, and will wait 60 seconds after the last launch attempt before allowing anyone to approach the rocket.
- 5. Launch Safety.** I will use a countdown before launch, and will ensure that everyone is paying attention and is a safe distance of at least 15 feet away when I launch rockets with D motors or smaller, and 30 feet when I launch larger rockets. If I am uncertain about the safety or stability of an untested rocket, I will check the stability before flight and will fly it only after warning spectators and clearing them away to a safe distance.
- 6. Launcher.** I will launch my rocket from a launch rod, tower, or rail that is pointed to within 30 degrees of the vertical to ensure that the rocket flies nearly straight up, and I will use a blast deflector to prevent the motor's exhaust from hitting the ground. To prevent accidental eye injury, I will place launchers so that the end of the launch rod is above eye level or will cap the end of the rod when it is not in use.
- 7. Size.** My model rocket will not weigh more than 1,500 grams (53 ounces) at liftoff and will not contain more than 125 grams (4.4 ounces) of propellant or 320 N-sec (71.9 pound-seconds) of total impulse. If my model rocket weighs more than one pound (453 grams) at liftoff or has more than four ounces (113 grams) of propellant, I will check and comply with Federal Aviation Administration regulations before flying.
- 8. Flight Safety.** I will not launch my rocket at targets, into clouds, or near airplanes, and will not put any flammable or explosive payload in my rocket.
- 9. Launch Site.** I will launch my rocket outdoors, in an open area at least as large as shown in the accompanying table, and in safe weather conditions with wind speeds no greater than 20 miles per hour. I will ensure that there is no dry grass close to the launch pad, and that the launch site does not present risk of grass fires.
- 10. Recovery System.** I will use a recovery system such as a streamer or parachute in my rocket so that it returns safely and undamaged and can be flown again, and I will use only flame-resistant or fireproof recovery system wadding in my rocket.
- 11. Recovery Safety.** I will not attempt to recover my rocket from power lines, tall trees, or other dangerous places.
(Revision of February, 2001)

Launch Site Dimensions

Installed Total Impulse (N-sec)	Equivalent Motor Type	Minimum Site Dimensions (ft.)
0.00--1.25	1/4A, 1/2A	50
1.26--2.50	A	100
2.51--5.00	B	200
5.01--10.00	C	400
10.01--20.00	D	500
20.01--40.00	E	1,000
40.01--80.00	F	1,000
80.01--160.00	G	1,000
160.01--320.00	Two Gs	1,500

Photos from Febuary's Building Session
(Jeff Pleimling photos)



Jeff Pleimling, Editor
245 Superior Circle
Bartlett, IL 60103-2029

**This may be your last newsletter! Check your label for the expiration date.
If it says Membership Expired or Membership Expiring, this will be your last newsletter!**