

THE 20G-43

The Newsletter of NARHAMS, NAR Section #139.
NAR National Champions 2001, 2004



NARHAMS Rocket Tips

Edited by Ed Giugliano, NAR 46086

Here is a rocket recovery tip from John McCoy. John writes:

One of the very best tips I have for micro, standard and large model rocket flyers is replacing that expensive tissue or dog barf wadding with either Teflon plumbers tape or PTFE military grade Teflon Tapes. The Teflon can be used for streamers or to make Teflon permanent wadding pompoms.

Regular old white Teflon plumbers tape is an excellent substitute for 1/2" to 2" wide streamers. 1/2" and 3/4" plumbers tape is commercially available at just about every hardware and home improvement center, any brand will work. The only trick to using

Teflon tape is to coat it with baby powder heavily before the first fold/rolling and periodically thereafter to keep the material from sticking to itself. Even this very thin white Teflon material will usually outlast the model.

Teflon streamer tied directly to Kevlar shock lines is the complete recovery system in most of my Micro-Maxx fleet. For larger models, McMaster-Carr company carry a line of PTFE Teflon tapes in military grade thickness that are also tinted in yellow, orange and red, these tapes are available in widths 1/2" to 2" and all come packaged on "43 must be a sign" yard rolls:)

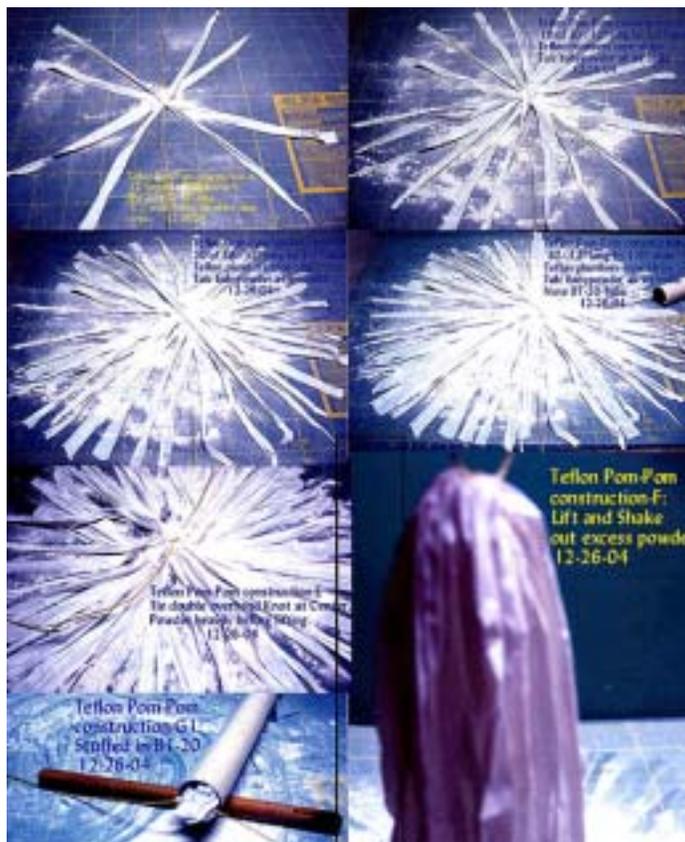
Pompoms are made from the very inexpensive 1/2" or 3/4" white Teflon plumbers tape and about 12" of 70 to 100lb test Kevlar line. Cut a piece of Kevlar laying it on the table top, cut and place 30 - 12" long pieces of Teflon tape crisscrossing the Kevlar line at about the center. Tie an overhand knot in the Kevlar capturing all the Teflon strips. Baby powder the strips before picking the pom-pom up. Shake out the excess powder and attach the pompom to the shock cord below the chute.

One pompom is usually plenty for models in the BT-5 to BT-50 body diameters. Two or three can be combined for BT-55 to BT-80 models. I use 2 in my Super Vega model currently. The pompoms and streamers are very durable and are generally not damaged by the hot ejection gases. Some of the ends may blacken a bit, but just wipe off this material. The bigger wear problem comes from stuffing the streamer into the body tube – please be careful as the thinner streamers can tear easily. I have several models where, with proper care, the streamers and pompoms have lasted for years. Please see the photos accompanying this article for additional information.

Another tip from Ed:

One of the best things to use on your workbench is a thick plastic cutting board found in millenary shops. These have one inch gridlines inked on them and greatly assist you in

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ZOG-43

Volume 27 Number 2
February 2005

ZOG-43 is the official newsletter of NARHAMS the National Association of Rocketry Headquarters Astro Modeling Section # 139

NARHAMS is the oldest model rocket club in the United States!

ZOG- 43 is dedicated to model rocketeers of all ages, abilities, and interest. We are committed to providing the most current, up-to-date information on model and real world rocketry, and to provide educational material as well as entertaining information. ZOG -43 is published monthly and is available to anyone on a subscription basis. Current rates are \$10 for meeting pickup or email or \$15 for postal mail U.S. Funds for 12 issues a year, payable to NARHAMS

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For more information.....

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ZOG-43 is edited by Kevin Johnson, and is an eight-time winner of the NAR/LAC "Rockwell" Trophy, recognized as the best NAR section newsletter.

Years won: 1969, 1973, 1975, 1990, 1991, 1992, 2003, & 2004

Zog-43 staff typist is none other than Jennifer Ash-Poole a.k.a. Secretary to the Stars !

Photographs: by Kevin Johnson, except where noted.

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NARHAMS ON THE WEB

<http://www.narhams.org>

Send and receive E-mail with other NARHAMS members through NARHAMS Web page grouplist via yahoo-groups.



NARHAMS serves Baltimore, the state of Md., Washington DC and the surrounding Metropolitan areas. The club is a section of the National Association of Model Rocketry (NAR) and we are the oldest continuously active model rocket club in the United States, first established as a high school club in 1963, changing our name to NARHAMS when chartered as a NAR section in 1965. NARHAMS is the only five time winner of the NAR "Section of the Year" award.

Years won: 1997,1998,1999, 2001, 2004

NARHAMS members regularly fly their model rockets at NASA's Goddard Space Flight Center on Soil Conservation Rd. in Greenbelt Md. The launches are open to the public and are held the first Sunday of every month (weather permitting), starting at 1 PM.

Sport Launches are usually held the second Saturday of every month at Middletown Recreation Park in Middletown Md. Check the web page for updates.

NARHAMS welcomes all prospective new members to our monthly meetings. They are held on the first Saturday of the month from 5:30 to 9:30 PM at the College Park Airport Annex Building. Dues are 10 cents a week, with an initial 50 cents up front (good for 5 weeks) as a sign of good faith.

NEW: Monthly meetings available on-line via chat-room , simply go to the NARHAMS homepage and click on the link.

ZOG ROYAL COURT

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(Secretary)

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Khim Bittle 301-293-2399

Directions to College Park Airport:

Follow I-495 to Kenilworth Ave. South. Make a right onto Paint Branch Parkway, then make a right on Cpl. Frank S. Scott Dr. At the airport entrance go straight to the Operations Building, the annex building is adjacent to the "Ops" building.



A Valentine's President Message

Even though it's still winter, and only the second month of the year, there are a lot of things going on in the club in the next few months. We have a new cadet program starting, our 40th Anniversary to celebrate, several contests, and a tour!

If you have ever wanted to help with a building session, but weren't sure how to do it, come to the cadet building session at the airport.

Helping about 20 kids build a rocket is a learning experience. This is completely different from having several kids build one rocket, or only having a few kids build them.

We have also been asked to help the 4-H Flying Tigers with a field in Montgomery County. In Montgomery County, it is illegal to fly a rocket. Joe Shepis, a 4-H leader, has asked MARHAMS to help with a letter writing campaign. If you get the NARHAMS yahoo group e-mail, you will have seen Joe's plea and his link. Take a moment and look at the 4-H Flying Tigers page:

www.4h-flyingtigers.us and click on the For Parents link.

If you live in Maryland, help out a fellow club, and see if we can get them permission to fly in a Maryland Park.

So look at your calendar, and plan some rockets.

Zog Bubbles 🚀

RAMTEC-12 at Great Meadow

By Glenn Feveryear, NAR 24931

Hello fellow rocketeers, this is the official announcement that RAMTEC-12 will be held April 2 & 3, 2005 at Great Meadows, The Plains, VA. The NOVAAR section made provisions for SPAAR to take the RAMTEC road show to their field. All of the information you should need is available at www.spaar.org/ramtec, including directions and a registration form.

Time is short, please pass this information along to as many sections and contest flyers as you think would be interested. This will be a big departure from the normal scheduled dates for RAMTEC. We need to get the word out.

Events are: D Dual Egglofting Altitude, D Helicopter Duration, B Rocket Glider Duration, 1/4A Parachute Duration.

If you have any questions, please contact me via email at feveryear@verizon.net or by phone at 717-456-5570.

Looking forward to see all of you this spring. 🚀

Accessorize Your Car the Rocketry Way

Step 1. Tie these balloons to your car Step 2. Drive like mad .. hit 100 mph Step 3. Watch people freak out. Step 4. Tell the Highway Patrol you thought they were real. 🚀



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Show your NARHAMS membership card and receive a
20% discount off rocket kits, motors, and building supplies!!

Kit Review: Laser-X Semroc Astronautics

By: Jim Filler NAR #27862

Semroc Astronautics is a new “old” company located in North Carolina. The information on their website www.semroc.com states that the origins of the company started in November 1967 and after a 31 year “quiet phase”, Semroc now qualifies as a B.A.R.M. (Born-Again-Rocket-Manufacturer)

I ordered the Laser-X, a “retro repro” kit for only \$11.50 postage paid. The Laser-X was originally introduced by Centuri in 1968. The futuristic styling of that era produced many kits that are still revered by many as the classic era of model rocketry.



*The Laser-X awaiting its maiden flight.
Photo by Jim Filler*

The service from Semroc is excellent; I ordered on line and received my package in the mail a few days later. The kit came in a nice box with colorful artwork and good packaging to protect the parts within. Looking at all the parts, it is very clear that all the parts are of very good quality. The enclosed directions are written and diagrammed very well. The kit is reproduced as the original kit was, with a balsa nosecone, and a paper transition between the two body tube sections. The only items that are really different from the original kit are the decals, and the upgraded shock cord using Kevlar and elastic.

The build was actually straight forward; the amount of balsa to be finished requires a lot of work. I personally do not care for the paper transition, but opted to use it anyway. After the construction was completed and the sanding and filling were where I wanted them, I decided to paint my model gloss white and add the colorful decals in no particular location as directed in the instructions. I would like to compliment Semroc on the quality of the decals that they provide. They were very easy to work with and I had no instances of the decals tearing under the normal adjustments made sliding decals around to a good alignment.

The scheduled sport launch for NARHAMS last September would be a chance for a first flight. I prepped my Laser-X with an A8-3 for a nice first flight. Wouldn't you know it, the famous Middletown breeze grabbed my rocket after a very nice flight profile and deposited the model right into the rocket eating trees? First Flight! Ughhh..... as Charlie Brown would say.

I took the club retrieval pole into the brush to get up close to the offending tree and was able to get the hook end over the elastic and Kevlar cord. After several yanks I got my nicely finished model back from the trees tore up, in pieces and damaged quite severely.

Feeling a bit disturbed, I rounded up all the parts from under the tree, proceeded back to my prep area and glued everything back together with some CA a la scale model repair at a contest. Then it hit me..... what am I doing? I'll just build another one.

When the Laser-X comes up on the build list again, I'll make a few changes. First I think I will use a balsa transition, and I will use bass wood for all the fin area to help with decreasing finish sanding and time. Last but not least, I'll fly with a larger motor and stay away from them darned trees!

Overall, I recommend the Semroc kit. The parts and instructions are done very well. This particular model is a sharp looking model when completed, and it does fly very well. ✨

LASER-X™
SPACE PROBE



2005 Top Ten NAR Contest Points Standings

As of January 3, 2005

Contact Tom Lyon <ZOG43Lyon@aol.com>

NAME	NAR#	SEC#	PTS	WF
A Div				
Katherine Humphrey	81367	139	1242	3
Michael Humphrey	75192	139	1140	3
Evan Jaramillo	83416	577	810	3
Kindra Bittle	76125	139	714	3
Matt Filler	71947	139	696	3
Connor Sesso	81518		636	2
Kate Bittle	79934	139	630	3
Nick Perhala	81581	113	548	2
Anita Rodgers	81124	139	546	3
Rick Heretick	84226	203	448	2

B Div				
NAME	NAR#	SEC#	PTS	WF
Kris Bittle	74626	139	1311	3
Zain Marvi	84252	672	1113	3
Chase Hrncir	83490	498	1080	3
Bryan Love	pend	672	966	3
Remon Maximos	84246	672	546	3
Jessi Muckelroy	82425	672	423	3
Chris Mook	84244	672	357	3
Sean Williams	84250	672	309	3
Stephanie San Luis	84253	672	231	3
Marcia Kennedy	84249	672	204	3

NAME	NAR#	SEC#	PTS	WF
C Div				
Bruce Markielewski	38377	482	2961	6
Russ Anthony	81741	482	2550	6
Steven Clapp	79622	482	2028	3
David Belhorn	59351		1890	3
Warren Benson	70956	365	1284	3
Tom Secrist	12463	113	1256	3
Larry Rice	33323	113	1192	3
Rick Boyette	31375	481	1128	4
Bruce Canino	39989	593	1116	4
Jim Hartman	22368	473	1074	3

Teams				
NAME	NAR#	SEC#	PTS	WF
Saenz, Saenz, evrywhr	SaenzT-300	672	1791	3
Slightly Harmful	T-609	139	1272	3
Krispy Kremers	T-890	473	1122	3
Calvin & Hobbes	T-721	205	876	3
Flying I-Beam Kids	T-473	473	690	3
Bud Lizards	T-025	203	444	2
Over 40 Victims of Fate	T-503	503	96	3
Battlerock Warriors	T-040	365	0	3

Sections				
NAME	NAR#	SEC#	PTS	WF
NARHAMS (MD)		139	9708	3
CRASH (CO)		482	9516	6
STARS (TX)		672	6033	3
PSC (PA)		473	3312	3
Vikings (VA)	203	3246	2	
CSAR (OH)		113	2436	3
NASA/Houston (TX)		365	2355	3
FLARE (NM)		577	2076	3
FSA (FL)		481	1988	4
NOVAAR (VA)		205	1833	3



More pictures from the January sport launch- L to R Richard Hickok's Fast Burning Menorah, Rob Edmonds' AcroShark, and Kevin Johnson preps an Honest John. Photos by Kevin Johnson and John McCoy.

The March Astrobulletin – Moon Madness

By Paul Miller, NAR 51615

As winter “marches” to the end this month, our heating bills have eclipsed all totals from previous years. So much for global warming, little Zogmeisters! Did you know that the highest recorded March temp in the NARHAMS region was 93°F on the 23rd in 1907? On March 15th, 1993 thermometers climbed all the way to 15°F! The astronomical spring equinox finally arrives Sunday the 20th of March at 7:34a.m. EST. Let’s SPRING our bodies ahead and welcome the warmth of the Sun climbing the sky a little higher each day.

I’ve just read Dava Sobel’s *Galileo’s Daughter*. What a brilliant scientist, and thanks to an adoring and ingenious daughter, we know about their remarkable relationship. Sobel’s tome *Longitude* was equally compelling. Galileo’s 1609 Moon drawings are awesome. His 1610 log of observations of Jupiter and its “Galilean” moons are amazing. His records of January 1613 reveal that he probably observed Neptune as it passed in close proximity to Jupiter! This was merely 223 years prior to its formal “official” discovery in

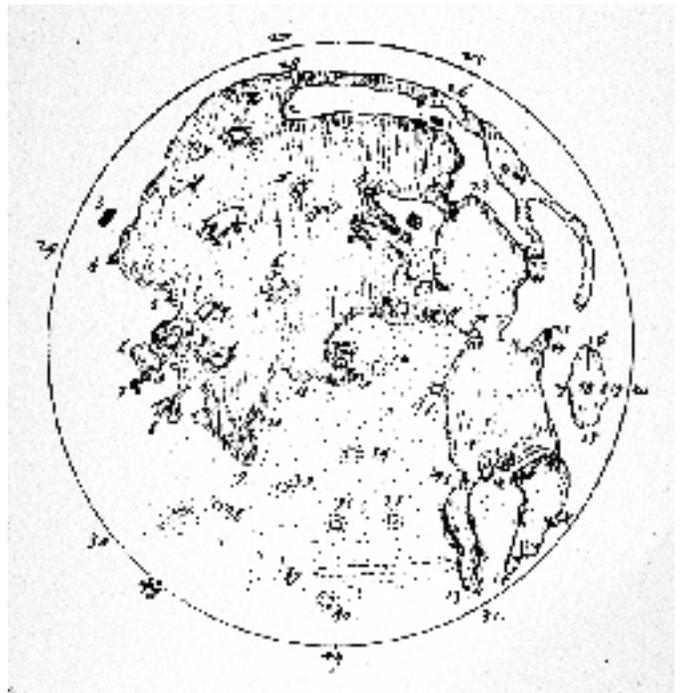
1846. Albert Einstein called Galileo “the father of modern physics – indeed of modern science altogether.”

Since Galileo’s Moon looks just like the one I’ve been talking to for the last 60 years, I’m making it my telescopic target this spring. The Moon was my nighttime companion from my crib in the early 40’s. I continue to share lunar observations with

students in the spring, summer and fall, but I seldom talk to it now. The Full “Worm” Moon for March arrives on the 25th, a.k.a. Good Friday. It’s tough to see stellar and lunar stuff during a Full Moon, so it’s best to look at other times.

Rand McNally and National Geographic made the best lunar maps I’ve seen. Orion makes quality, inexpensive Moon filters for your telescope that reduce glare and improve contrast. Universe Publishing provides a glow-in-the-dark calendar called *The Lunar Year*. Affordable guides for the Moon

include Peter Grego’s *Moon Observers Guide* (ISBN-1-55297-888-5) and Michael Kitt’s *The Moon – An observing guide for backyard telescopes* (ISBN-0-913135-09-7). The NASA information booklets for the Apollo lunar missions also prove interesting. Of the many popular Moon



wroks, Diana Brueton’s *Many Moons* (ISBN-0-13-553322-X) is my personal favorite, blending lunar fact and fiction with an historical perspective. The Farmers Almanac presents lots of lunar material as well. Finally, the terrific website at <http://skyandtelescope.com> gives the sky for every night of the year.

Some basic lunar stuff might improve your understanding of our heavenly neighbor. The Moon has a slow wobble in its rotation called libration which partially allows us to see up to 59% of its surface over time. This also means that we won’t see the exact same face from month to month. One month, or moonmonth, is about 29 ¼ days in length. In other words, it takes that many days for the Moon to return to the same phase. Using the Full “Worm” Moon of March 25th as an example, the next Full “Pink” Moon will occur on April 24th.

The Moon’s albedo, or reflected light from the Sun and Earth, also determines our ability to make lunar observations. The Moon reflects about 7% of the light falling on it, which turns out to be ultrabright.



Albedo makes features like the dark maria and bright lunar rays difficult to see with the Full Moon. Spotting craters and other landmarks are next to impossible at this time. Observations seem best when the lunar terrain is placed into high relief by low-angled sunlight. Try to target your telescope within 15° of the lunar terminator, the line that separates its night and day. Since the terminator moves about 12° each night, successive evenings may reveal new features in sharp contrast when our atmospheric conditions permit.

I use a 12mm Plössel eyepiece to view major lunar features. I make certain that the telescope is rock-solid on an equatorial mount with a clock drive and has been cooled down to ambient temperatures. My Orion polarizing filter tones down the brightness of the Moon. It screws into the bottom of the eyepiece. I have considered buying a zoom eyepiece, but a quality one is expensive and I'm saving for HP rocket motors. I guess I'm more than just a lunatic!

Atmospheric turbulence can play havoc with Moon watching. My first astronomy prof. called it schlieren-heat waves refracting light and making a visual experience just plain miserable. I attempt to avoid parking lots, buildings, and any other heat-radiating surface or object. I try to make lunar observations over trees, shrubs or meadows whenever possible. I usually wait until the moon is at least 45° above the horizon, thereby avoiding a thicker atmosphere.

The First Quarter Moon will be found in Taurus to Gemini and will achieve it's highest elevation for

Calendar of Events for 2005

Feb 5- 10 am - noon Cadet building session
College Park Aviation Museum
Feb 5- 5 - 10 pm Monthly meeting, A Cluster Altitude (John McCoy)
Feb 6- 1 - 2 pm Goddard Public Launch
Feb 12- 12 - 4 pm Sport launch, Red Rocket Day
Feb 26- 1 - 5 pm Udvar-Hazy Tour Dulles, VA
Mar 5- 10 am - noon Cadet building session
College Park Aviation Museum
Mar 5- 5 - 10 pm Monthly meeting, 40th anniversary party
Mar 6- 1 - 2 pm Goddard Public Launch
Mar 12- 10 am - 4 pm KATE-3 section meet
Apr 2- 10 am - noon Cadet building session
College Park Aviation Museum
Apr 2- 5 - 10 pm Monthly meeting, 1/8A techniques (John McCoy)
Apr 3- 1 - 2 pm Goddard Public Launch
Apr 16-17- 9 am - 4 pm ECRM-32 regional meet
Apr 24- 12 - 4 pm Rockville Consortium of Sciences Rockville, MD
May 1- 1 - 2 pm Goddard Public Launch
May 7- 5 - 10 pm Monthly meeting, NARAM models (Chris Kidwell)
May 14- 10 am - 10 pm OPOSSUM-9 open meet/ night launch
May 21- 8 am - 5 pm TARC Flyoffs Great Meadow, VA
May 28-30- Balticon-39 Baltimore, MD
Jun 4- 5 - 10 pm Monthly meeting, fiberglass tubing (Mark Petrovich)
Jun 5- 1 - 2 pm Goddard Public Launch

Jun 11- 10 am - 4 pm Sport launch, cluster/staging theme
Jul 2- 5 - 10 pm Monthly meeting, open building session, focus on staging
Jul 3- 1 - 2 pm Goddard Public Launch
Jul 9- 10 am - 4 pm Sport launch, airborne trooper spot landing, special prize for 40 troopers deployed
Jul 10- 12 - 4 pm Goddard building session, open to public, tie in to Goddard Contest
Jul 17- 10 am - 4 pm Goddard contest
Jul 30 - Aug 5 24/7 NARAM-47 OH
Aug 6- 5 - 10 pm Monthly meeting, pirates discussion (Alan Williams)
Aug 7- 1 - 2 pm Goddard Public Launch
Aug 13- 10 am - 4 pm Sport launch, pirate theme
Sep 3- 5 - 10 pm Monthly meeting, elections, night launch discussion (John McCoy)
Sep 4- 1 - 2 pm Goddard Public Launch
Sep 10- 10 am - 10 pm Record trial, FAI S6A (A SD), night launch
Sep 25- 12 - 4 pm AIAA Picnic Launch
Oct 1- 5 - 10 pm Monthly meeting, leftover parts scratch building (Jim Miers)
Oct 2- 1 - 2 pm Goddard Public Launch
Oct 8- 10 am - 4 pm Sport launch, Oktoberfest theme, microbrew launch
Nov 5- 5 - 10 pm Monthly meeting, glider building session (Robert Edmonds)
Nov 6- 1 - 2 pm Goddard Public Launch
Nov 12- 10 am - 4 pm OPOSSUM-10
Dec 3- 5 - 10 pm Monthly meeting, holiday party
Dec 4- 1 - 2 pm Goddard Public Launch
Dec 10- 10 am - 4 pm Sport launch

Sport launches are held at Middletown Park from 10am-4pm, waiver up to 3.3 lbs and "G" motors not exceeding 62.5 grams of propellant. All flights "E" power and above are restricted to 5 degrees from vertical and between the hours of noon and four PM. Call ahead to confirm launch and waiver availability.

Business meetings are held at the College Park Airport Annex Building. Meetings begin at 5pm with building sessions or presentations and last until 10:00pm or so.

Questions? Call Club President Jennifer Ash-Poole at 410-674-6262 or visit NARHAMS online at <http://www.narhams.org>

March. Looking high toward the south around 8p.m. on March 18-19, the Moon can be seen in Gemini with Saturn just below Pollux. Mercury reaches its greatest elongation on March 12th. It will be near the edge of its orbit, farthest from the Sun, just as its orbit slants upward from the horizon at its greatest angle. Attempt to spot Mercury 30 to 45 minutes after sunset, low in the west from February 27 to March 22.

Even if you aren't a Moon Child (born under Cancer), check out the Moon in March. Just follow this sequence for study or merely a quick glance:

- Last Quarter Moon: March 3
- New Moon: March 10
- First Quarter Moon: March 17
(No, the Moon isn't GREEN.)
- Full Moon: March 25

Will you see the Man in the Moon, the Lady in the Moon, or a Rabbit [or the Moon poodle, according to Peter Alway – kj]? Will your eyes meet Plato, Copernicus, or a Rabbit? Or is it still too cold to go outside and commune with the Moon? You may opt to stay inside and spend some time at these websites:

- The American Lunar Society-
www.otterdad.dynip.com/als
- Association of Lunar and Planetary Observers (ALPO)-
www.lpl.arizona.edu/alpo
- Chuck Taylor's lunar Observing Group on Yahoo-groups.yahoo.com/
group/lunar-observing
- Consolidated Lunar Atlas-
www.lpi.usra.edu/research/cla
- Digital Lunar Orbiter Photographic Atlas of the Moon-
www.lpi.usra.edu/research/lunar-orbiter
- The Lunar and Planetary Institute (LPI)-
www.lpi.usra.edu

- NASA Lunar Exploration-
nssdc.gsfc.nasa.gov/planetary/lunar/Apollo_25th.html
- The Lunar Observer-
users.adelphia.net/~dembowski
- Lunar lore and myth-
www.almanac.com (click on Almanac Links 2005)

"We will... gain a new foothold on the Moon and... prepare for new journeys to the worlds beyond our own."

- George W. Bush, 43rd US President, 1/14/2004 



The January sport launch. Photo by John McCoy

Rocket Tips, from page 1

getting proper 90° angles when assembling a model. Some are marked with arcs and radials which is helpful when fabricating parachutes and flex wing boost gliders. The edge usually has a 1/8" ruler, so you are never in need of a ruler when cutting tubes and fins. Lastly, the thick plastic will protect your work surface when cutting material. They are a little pricey but they last practically forever and are worth the money.

John McCoy informs me that he uses the cardboard backs from 8 1/2" X 11" pads as "portable" disposable cutting boards. This cardboard stock is also useful in cutting centering rings. 



Stardust Up Close

by Patrick L. Barry
and Dr. Tony Phillips

Like discarded lumber and broken bricks around a construction site, comets scattered at the edge of our solar system are left-over bits from the “construction” of our solar system.

Studying comets, then, can help scientists understand how our solar system formed, and how it gave rise to a life-bearing planet like Earth.

But comets have long been frustratingly out of reach — until recently. In January 2004 NASA’s Stardust probe made a fly-by of the comet Wild 2 (pronounced “vilt”). This fly-by captured some of the best images and data on comets yet ... and the most surprising.

Scientists had thought that comets were basically “rubble piles” of ice and dust — leftover “construction materials” held together by the comet’s feeble gravity. But that’s not what Stardust found. Photos of Wild 2 reveal a bizarre landscape of odd-shaped craters, tall cliffs, and overhangs. The comet looks like an alien world in miniature, not construction debris. To support these shapes against the pull of gravity, the comet must have a different consistency than scientists thought:

“Now we think the comet’s surface might have a texture like freeze-dried ice cream, so-called ‘astronaut ice cream’: It’s solid and can assume odd, gravity-defying shapes, but it’s basically soft and crumbles easily,” says Donald Brownlee of the



The Stardust spacecraft used a grid holding aerogel to capture dust particles from comet Wild 2. In this test, high velocity dust particles are stopped unharmed at the end of cone shaped tracks in a sample of aerogel

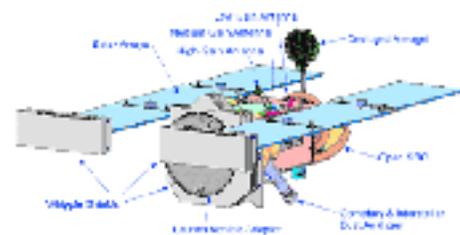
University of Washington, principal investigator for Stardust.

Scientists are currently assembling a 3-D computer model of this surface from the photos that Stardust took. Those photos show the sunlit side of the comet from many angles, so its 3-dimensional shape can be inferred by analyzing the images. The result will be a “virtual comet” that scientists can examine from any angle. They can even perform a virtual fly-by. Using this 3-D model to study the comet’s shape in detail, the scientists will learn a lot about the material from which the comet is made: how strong or dense or brittle it is, for example.

Soon, the Stardust team will get their hands on some of that material. In January 2006, a capsule from Stardust will parachute down to Earth carrying samples of comet dust captured during the flyby. Once scientists get these tiny grains under their microscopes, they’ll get their first glimpse at the primordial makings of the solar system.

It’s heading our way: ancient, hard-won, possibly surprising and definitely precious dust from the construction zone.

Find out more about the Stardust mission at stardust.jpl.nasa.gov. Kids can read about comets, play the “Tails of Wonder” game about comets, and hear a rhyming story about aerogel at <http://spaceplace.nasa.gov/en/kids/stardust/>.



This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

Entry Level Hybrid System Available

Pratt Hobbies is proud to announce a new product in their line of ground support equipment for rocket modelers: the Minitanker Combo.

The Minitanker Combo is a package designed to help modelers start using smaller hybrid rocket motors (in the G and H range) as economically as possible. The package includes a 5-pound tank for liquid N₂O, a custom-manufactured solenoid valve, and fittings to attach to all commercially-available floating-injector hybrid rocket motors. The Minitanker Combo is priced at \$195.00.

Floating-injector hybrid motors use a nylon hose to fill the motor with N₂O, and a small pyrotechnic igniter to preheat the combustion chamber and release the N₂O by cutting the hose. Popular motors of this type are made by RATT Works, Sky Ripper Systems, Propulsion Polymers and West Coast Hybrids.

The Minitanker Combo is easily connected to any typical club launch system that provides at least two circuits of 12 volts for ignition of conventional motors. One of the circuits controls the Minitanker solenoid valve, allowing the motor to be filled. The other circuit attaches to the motor's igniter and functions exactly as it would with a conventional solid fuel motor.

"Hybrid motors have grown in popularity over the last few years," said Doug Pratt, owner of Pratt Hobbies. "Our Modular RTLS (Remote Tanking and Launching System) ground support system has sold very well. The RTLS incorporates its own battery and electrical control system, and is an outstanding value because it is the only system that will fill and fire all



commercially-available hobby rocket motors, solid or hybrid."

"However, as hybrid motor technology has matured, smaller motors have come on the market. I am very excited about the new 29mm G and H motors coming soon from Sky Ripper Systems, and the RATT Works H70 remains our best selling hybrid motor. That inspired me to think about a 'minimalist' ground support system, something that would make it easier and cheaper for folks to start flying these small hybrids," said Pratt.

If your club has a multi-pad 12 volt launch system, or you have two standard launch systems of your own, the Minitanker Combo is all you need to start flying G and H hybrids. The 5 pound supply tank is adequate for 6-8 flights of an H motor, depending on conditions. The solenoid valve is custom manufactured to Pratt Hobbies specifications and is guaranteed for life. Fittings are included to connect to all floating-injector hybrids in the G-H range currently on the market.

The Minitanker is not suitable for motors that are larger than H, because there is no "dump" valve to vent the tank in the event of a misfire. When you decide to upgrade to bigger motors, you can trade in the Minitanker valve assembly toward the cost of an RTLS-M2 system, which

is suitable for any hybrid motor.

Complete descriptions and documentation of the Minitanker and RTLS systems are available on the Pratt Hobbies web site.

The Minitanker Combo is available for immediate shipment from the Pratt

Hobbies catalog web site, www.pratthobbies.com. Mastercard and Visa are accepted on the secure shopping cart.

Pratt Hobbies is a small manufacturer of kits and accessories for rocket hobbyists. Now in its tenth year, Pratt Hobbies is known for being

the first to offer braided Kevlar® shock cords, Nomex® heat shields, and other unique and innovative products. Doug Pratt is the author of nine hobby books, including "Basics of Model Rocketry," and is currently writing a new book tentatively titled, "Hybrid Rocket Motor Operations Manual." He plans to publish it along with revised editions of some of his earlier books through a new publishing company, Robin Hill Press.

For more information, see the web site at www.pratthobbies.com, or send email inquiries to info@pratthobbies.com. 



Pratt Hobbies is proud to announce that we are now a QUEST dealer! Contact us for all your Quest and MicroMaxx products.

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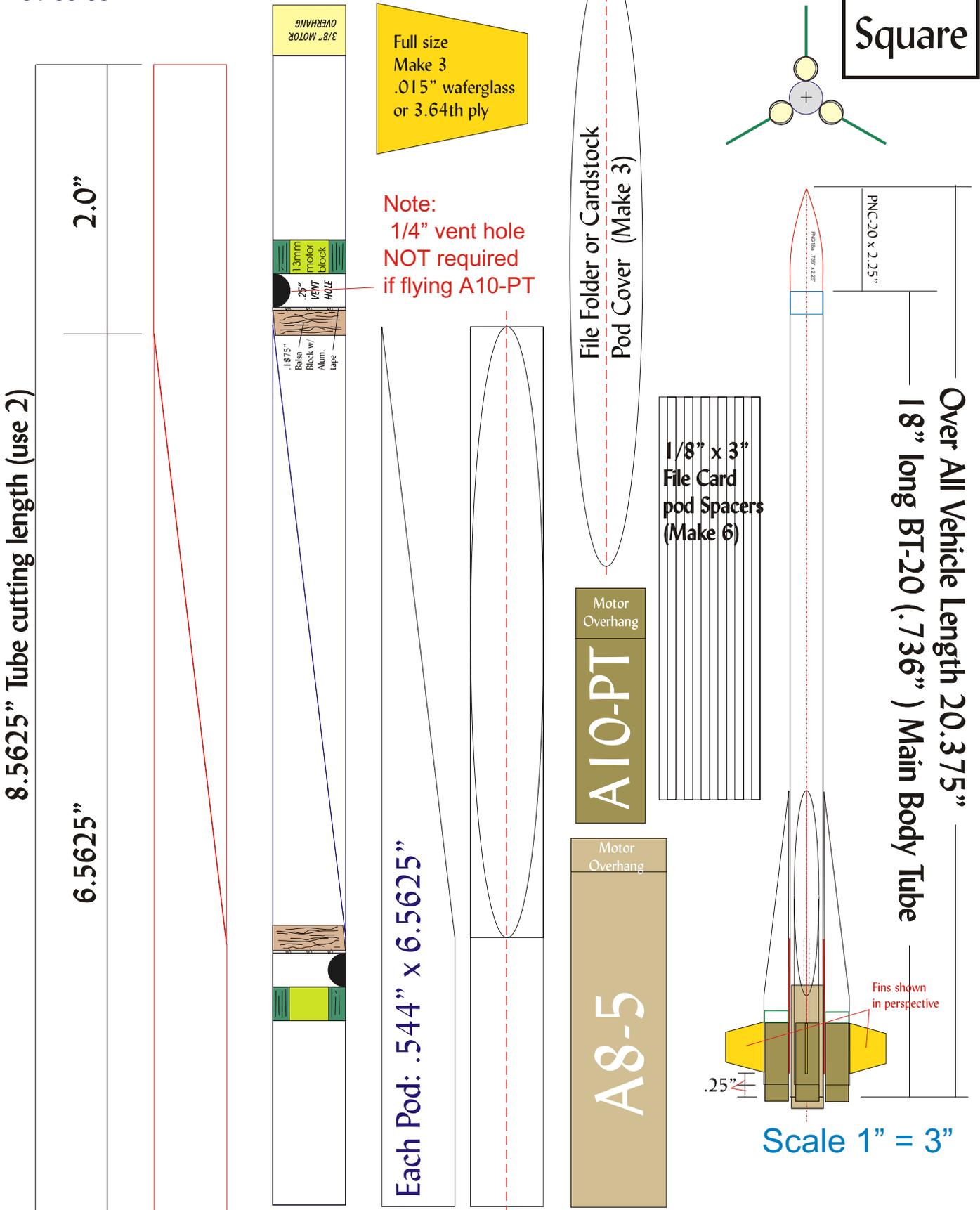
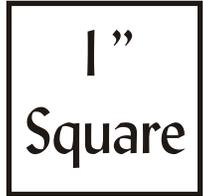
NARHAMS members get special brother-in-law discounts!!

www.pratthobbies.com

4xA cluster Altitude: 13mm ~~0.3~~ - 18mm co

Design-a: Part&FSize - model view 1"=3" scale

01-05-05



NEXT ISSUE'S SUBMISSION DEADLINE IS FEBRUARY 28!

March 6th

Visitor's Center
Goddard Space Flight Center
PUBLIC LAUNCH

Feb 12th

10:00AM-4:00PM
Middletown Park
Red Rocket Theme
SPORT LAUNCH

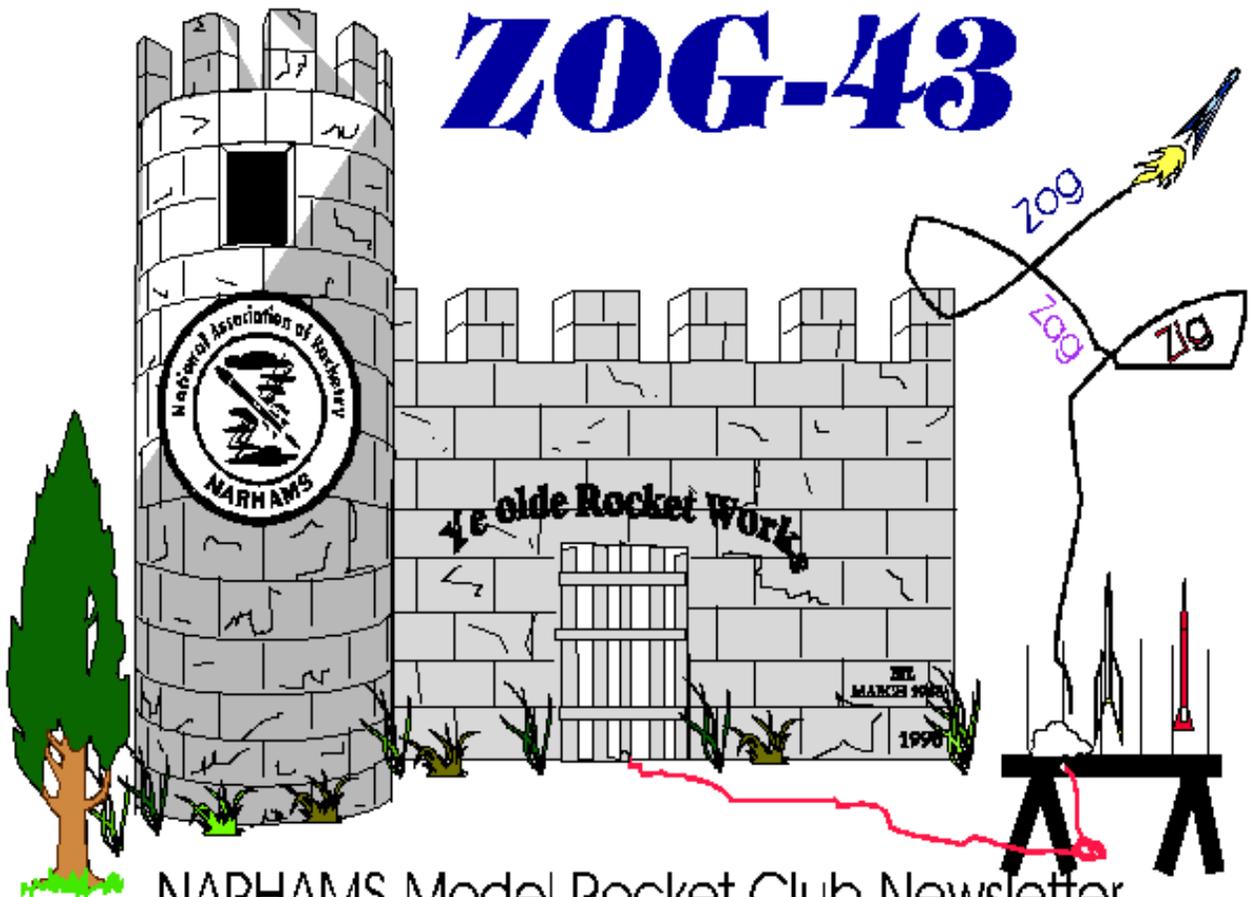
Feb 6th

Visitor's Center
Goddard Space Flight Center
PUBLIC LAUNCH

Launch Schedule

206 - FORTY THREE
5269 RIVENDELL LANE, APT 5
COLUMBIA, MARYLAND 21044

ZOG-43



NARHAMS Model Rocket Club Newsletter