



THE LEADING EDGE

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

Volume 25, Number 2
March/April 2002

Club News and Notes

Flying Field – Basically, as of the newsletter printing, we don't have one.

This did cause us to cancel the March 24th club launch, but the Launch Site Committee has been talking with the DuPage Forest Preserve to try to get another field assigned.

The Forest Preserve did suggest a field, but its proximity to O'Hare Airport would cause problems. We've suggested several other possible locations including Blackwell Glen, Springbrook Prairie and Pratt Wayne Woods.

Anyone who has a possible non-Forest Preserve location should let either David Wallis or Ken Hutchinson know about it as soon as they can.

When a launch site has been found, the NIRA web site (www.NIRA-Rocketry.org) and the infoline will be updated with information for the next launch.

Midwest Regional Fun Fly – Cole Arntzen, our illustrious Vice-President, has agreed to coordinate MRFF preparation.

Bob Wiersbe and Mike Ugorek are the first people to volunteer to assist Cole, but more people are needed. Please talk to Cole if you are willing to help out.

One of the things that is needed, however, is a place to have MRFF. While Wisconsin's Bong Recreation Area is an option, a nice sizeable field in Illinois would be preferred. If you know of a possible site for use one weekend in June (preferably), please see Cole.

Park Forest R/C and Rocket Demo – Every year the suburb of Park Forest along with the Suburban Aeroclub of Chicago put on a combined r/c airplane and rocketry demonstration.

For the past several years, NIRA members have assisted by flying some of their rockets for the very interested spectators (see the Nov/Dec 2001 issue for some photos from last year).

At the March meeting, John Boren of the Aeroclub invited NIRA to take charge of the rocketry portion. The reason for this is that NIRA mem-

NAR - TRA Joint Statement on ATF Litigation - March 2, 2002

Posted to rec.models.rockets by Mark Bundick on March 4th 2002

In mid-January 2002, we received multiple reports of increased demands made by ATF inspectors on NAR and TRA members with Low Explosive User Permits. In particular, these inspectors demanded motor types whose propellant grains consisted of 62.5 gram and smaller units, generally referred to as "easy access", now be subject to the magazine and record keeping requirements of larger motors if the propellant are designed or intended to be combined and used in a rocket motor whose total propellant weight is greater than 62.5 grams. Our members received at least two instances of written notice of this completely unexpected change in regulation. After consultation with counsel, we also discovered that ATF had filed a motion for summary judgment against three out of four counts in our complaint.

After further review by counsel, on Wednesday, February 27, 2002, the NAR and TRA filed a motion for a preliminary injunction against ATF.

Members already do most of the flying anyways and most members of the Aeroclub aren't interested in rocketry.

The main change from prior years is that NIRA would also staff/run a small building session of about 150 rockets. Cally Soukup assisted with the building session last year and said it was much less demanding than the Hobby Show make-it-take-it.

The members attending the March meeting were in favor of us doing this. More information about the demonstration will be coming out soon - last year's was held on Sunday, July 22nd.

Illinois Storage News – In addition to the permits needed for using/possessing certain high power motors (classified 1.4, usually 54mm reloads and larger - see the Jan/Feb issue), Illinois also has storage regulation prohibiting garage storage. Due to this, the BATF has been revoking garage variances (and, therefore, LEUPs) for at least some Illinois LEUP holders.

(Club News and Notes continued on page 11)

We asked that this illegal change in regulation be rescinded and that any further attempts at unwarranted and illegal regulation of the sport rocket hobby be stayed while our complaint was before the court. Our counsel has been unusually thorough and complete in the preparation of our motion, and we believe we have an extremely strong legal case to present to the court, particularly in light of ATF's action against our members in January.

As we have further information on this situation, we will provide it at our websites. We appreciate your constant moral and financial support as we continue to work to secure an unregulated, safe sport rocket hobby.

Mark Bundick, President
National Association of Rocketry

Bruce Kelly, President
Tripoli Rocketry Association 

BATF busts Cartoon Character !

(UPN - California, 4-1-02) Marvin the Martian, age 53 of the planet Mars, but recently of Hollywood, was arrested on April First by over a dozen agents of the Bureau of Alcohol, Tobacco, and Firearms who stormed and ransacked his spaceship and dragged him off to an unknown location. BATF agents claim that he was found in the possession of an Illudium Q-36 Explosive Space Modulator without proper permits or storage. It was also disclosed that he had not kept proper records of explosive material, and failed to promptly notify the BATF when a small furry creature stole one of the devices. Various unregistered weapons were also confiscated.

Feds were led to Martian as a result of recent efforts to track down suspected terrorists in the US on extended alien visas. It appears that Martian has been in the US illegally for several decades. His plan allegedly was not to destroy a building or city, but the entire planet.

Additional charges are pending. 



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Secretary/Treasurer – Ken Hutchinson
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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:

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NIRA web site: <http://www.NIRA-rocketry.org>

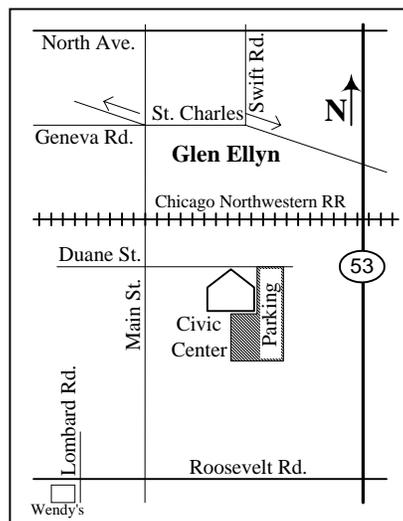
NIRA InfoLine: (630) 830-1587



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 usually the Glen Ellyn Civic Center, 535 Duane Street (check the board in the lobby for the room number).

April 5
May 3
June 7
July 5
August 2
September (time and/or place to be determined)



CLUB LAUNCH DATES

Launches are BYOL (bring your own launcher). Call the NIRA infoline for pre-launch information: 630-830-1587.

April 21 - Location: To Be Determined
May 19 - Location: TBD
June 15-16 - Midwest Regional Fun Fly (location: To Be Determined)
July 21, 2002 - Location: TBD
August 18, 2002 - Location: TBD
September 15, 2002 - Location: TBD
October 20, 2002 - Location: TBD
November 17, 2002 - Location: TBD

TBD



Model of the Month Winners! (photos by Jeff Pleimling)

February – Martin Schrader won the adult category with his scratch-built 'Just Plain Rocket' while Victoria House took the youth category with her Holverson/Fun Rockets 'Swinger.'

March – Mary Hojek holds her pair of winners - Estes Alphas for a school science fair. Andy Montag's crayon rocket is completely scratch - including the label he drew on his computer.

Bob's Basement - January 2002
by Jeff Pleimling

The January 2002 building session was held at Bob Kaplow's house. Meeting at Bob's in January has become one of the more recent NIRA traditions.

As with the rest of the 'winter activities,' the attendance was down from last years session with about 15 people in attendance.

Even though there weren't as many people as usual, there was plenty of rocket building, electronics designing, and munching to go around.

Bob Weirsbe brought several of the left over Quest Vipers left over from the hobby show to build. His idea is to build a fleet of rockets for launching at demonstrations. The five he built at the building session will look identical (on the outside) while sitting on the launch rack but will demonstrate the difference between motors by launching them on A through E motors.



Bob Weirsbe constructing one of several Quest Vipers (no, the Dr. Rockets casing isn't for one of the vipers). (Jeff Pleimling photo)

The illustrious NAR president (and lifetime NIRA member) Mark 'Bunny' Bundick did his best to both build rockets (several Atlas rockets, of course) and get help designing some electronics to aid in winning NAR competitions.



Bunny using a compass to cut out many Atlas centering rings. (Jeff Pleimling photo)

Since Bunny's advanced electronics knowledge is more along the lines of finding someone to help him with advanced electronics, Rick Gaff, Ken Hutchinson and David Wallis all provided input. Besides aiding with the flying competition, the project will also make an excellent R&D project.



Bunny and electronic wizards David Wallis and Rick Gaff study schematics (Jeff Pleimling photo)

David Wallis also showed off the aerial photos he took from a friends airplane of several of the proposed DuPage Forest Preserve launch sites. There was plenty of discussion about which site would be the best one, and if we could persuade the Forest Preserve to let us use the one we finally decide on.



David Wallis sorting aerial photos (Jeff Pleimling photo)

Kent Ochs took good advantage of the tools Bob makes available to work on his latest rocket. It was a Binder Design kit, if I remember correctly. Kent was getting plenty of advice on the 'proper' techniques for building the rocket - and most of the advice was even consistent!

Tom Pastrick used the time to build a clone of the Estes Nighthawk glider. He made his usual modifications including adding a strip of spruce to the leading edge of the wings. The newer people present were amazed that Tom completed the glider during the building session - those of us used to watching Tom work weren't.

As we've done at every building session at Bob's house, we trooped out into his back yard to hold a not-too-impromptu launch. The



Kent Ochs test fits the motor mount into the tail code of his rocket. (Jeff Pleimling photo)

weather wasn't too bad (compared to prior years), but there was only 1 flight made. Bob launched his AOL CD flying saucer he calls AOL.CON. The flight was a success.

It might not have been one of the best attended building session in club history, but it was very fun. Hopefully Bob will continue with the tradition again next year - it's a great way to get to know people away from the constant activity of a club launch. 🚀



Rachael Kaplow waits while dad looks through his old rockets. (Jeff Pleimling photo)



Bunny recovering Bob Kaplow's AOL.CON after its midwinter flight. (Jeff Pleimling photo)

Adler Trip - February 2002

No real write-up on this club outing, just a short note from Bob Kaplow:

"The Adler trip was not well attended: the 3 Kaplow's, plus Rick Gaff, Tom Pastrick, and the House's."

Thanks to Rick Gaff, we do have photos. 📷



Tom Pastrick checks out the 'Universe of Planets' display. (Rick Gaff photo)



Victoria House at lunch with an excellent view of Lake Michigan. (Rick Gaff photo)



Bob Kaplow looks to see 'What Galileo Saw.' (Rick Gaff photo)



Nicolaus Copernicus catching some rays out in front of the Adler. (Rick Gaff photo)



A girl and a 1/3rd scale Gemini - always a touching photo... (Rick Gaff photo)



Tom Pastrick and Rachael Kaplow examine an exhibit about the planets. (Rick Gaff photo)



'Mars Rover' demonstration. (Rick Gaff photo)

AeroTech Extends RMS-Plus to 54mm Line

(ROL Newswire) -- AeroTech is pleased to announce its RMS-Plus™ technology has been extended into the full line of AeroTech 54mm RMS™ motors. This system, which has proven successful in existing 29mm and 38mm sizes, was developed to increase reliability and accuracy of delay burn time. Initially flight proven in the 54mm Redline™ motors, the RDK-Plus™ is now certified for all AeroTech 54mm propellant types.

In recognition of this event AeroTech is, for a limited time, giving a 10% rebate towards the purchase of any 54mm RMS-Plus™ motor reload kit when purchasing any AeroTech or Dr. Rocket 54mm motor hardware component. Any AeroTech authorized Restricted Access dealers will be able to provide the details of this offer.

For any questions regarding this press release please contact Mike Martens at mmartens@aerotech-rocketry.com 📷

O'Hare Closes Runways, Lets Rocket Club Use Airfield

(OOPS - Chicago, 4-1-02) In a surprising announcement today, the FAA stated that they will be closing O'Hare Airport one Sunday a month to allow a local rocketry club to use the airfield for their activities.

"We've been working with this particular group for years, and they've had a number of problems finding a good place to launch from. We've been having a number of problems ourselves, and closing the runways one day a month will help us solve a number of them. I'm sure the neighbors will enjoy the peace and quiet for a day too. It works out well for everyone", said a spokesperson for the FAA.

When questioned about what would happen with all the flights that would normally be routed through O'Hare on a Sunday, FAA officials responded by saying that they've noticed Sunday's are the slowest day in Chicago and that no one would even notice. Planes would be sent to Milwaukee, Midway, or even Lake Michigan if necessary.

Mayor Daley was reported to have "had a fit" when he heard the news, and has threatened a lawsuit. The FAA's response was "So sue us". Officers of the rocket club could not be reached for comment. Their "Hotline" phone message did contain the words "O'Hare Airport", but it was impossible to tell just what the message meant over all of the yelling and whooping in the background. 📷

LOC 4" V-2 Kit Preview Review by Bob Kaplow NAR 18L

I purchased one of the prototype LOC 4" V2 kits in October. Interestingly enough, I still had my old Mountainside Hobbies (MSH) 4" V2 kit un-build to compare it against. [Note: I've heard different comments from different people. Not all the prototype kits were identical. LOC is trying to get feedback on several different things.]

The LOC instructions are the same brief instructions LOC has had for years. I was hoping for an improvement. I found a couple typos in the LOC instructions. And there was no indication of where the kit CP is, or where the CG should be. The MSH instructions at least marked the CG location. Perhaps because there was no cover art for the LOC prototype, there is no list of recommended motors. None of this would bother an experienced modeler like myself, but the whole market isn't expert kit builders. I can see the V-2 attracting at least some beginning modelers.

Do read the instructions. Building this rocket, especially the tail cone, motor mount, and fin attachment, is **very** different from your standard 3FNC rocket construction. LOC recommends a particular 3M epoxy that apparently has an affinity for plastic. Not having that, I used the last of my System 3 trial kit to build the rocket, except as indicated.

Both kits use the LOC cone for nose and tail. The LOC tail cone is cut and slotted much cleaner than the MSH tail cone. The LOC slots appear to be punched, perhaps on the same machine that they use for the tube slots. One of my slots was slightly lower than the other 3. I used a scalpel to slightly lengthen the slot.

The LOC tube is close to the correct length per ROTW: the MSH tube is 1.75" longer than proper scale.

The plywood parts in my LOC V-2 are cut from a less expensive 3-ply wood instead of the traditional 6-ply. While it doesn't really matter for the centering rings, I wonder if the fins might be more susceptible to warp as a result. And unfortunately, the grain was running the wrong way, parallel to the root. That only leaves one thin center ply, which is poorly positioned for resisting flex, supporting the fins. With swept back fins on the V-2, this is just waiting for something to break. In fact, I did break one fin tip on landing due to the grain direction. The MSH fins were cut from standard Midwest 1/8" plywood (I could still see the sticker residue) with the same grain direction error. I'm surprised at how often this gets ignored in HPR kits. It probably comes from buying the 6x12" plywood sheets, which won't allow for proper grain direction. I buy my plywood in 12x48" sheets; I can't believe that kit manufacturers don't get the largest sheets available, at which

LOC '4" V-2' Prototype Specifications: (final specifications may differ)

Length: about 35"
Diameter: 4"
Weight: 850-900g
Recovery: parachute
Fins: 4 plywood
Motor Configuration: 1 - 29 mm
List Price: unknown

point they should be able to cut fins with the proper grain direction. I also noticed the fins weren't cut with the precision of the old LOC fins, especially the curved edge that fits against the nose cone. I don't know if that's because the V-2 is a prototype, or if they've changed the way all LOC kits are now made.

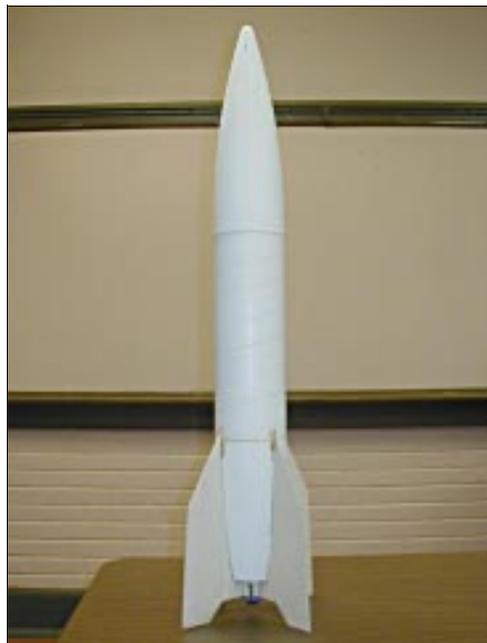
The LOC fins are closer to scale as well, except for an extra half inch span, and cut cleaner, except for that curved part that nests against the tube, and that will get covered with epoxy fillet. The notch at the tail end needed to be a bit deeper, and I had to clean up the vane tabs, easily fixable on the band saw. The MSH fins are **way** too big. Both fins have tabs that go all the way to the 29mm MMT. The LOC V-2 has 2 tabs, one in the middle of the fin root, and one in the "Vane" location.

As a result of the shorter tube and smaller fins, the LOC V-2 needs and includes some nose weight (122g). The MSH V-2 had none. Still, if you're going to make a scale V-2, I'd rather it be **scale** than well, it kinda-looks-almost-right, and if that takes nose weight, add the nose weight. If you refer to ROTW, the nose cone on the model is both the nose of the V2 and the upper tapered body section. The tip isn't quite the right shape. You could add a pointy extension to the LOC cone, like the Launch Pad kits use, and shorten the body tube by a similar amount. The airframe tube of both models is shorter than the V2 airframe, and obviously represents only the cylindrical portion of the rocket.

One tip I've used before you might want to try with the nose weight. Before I dump the lead in the cone tip, I drilled 4 holes in the tip, and then covered them on the outside with masking tape. Now pour in the lead, and the THIN epoxy, shake around, then tap on the workbench to settle everything into the tip. The holes become filled with lead & epoxy, becoming rivets to hold the weight slug in the nose. I did the same, drilling 4 holes at the base of the tail cone, in line with the fin slots, to give the epoxy something more to bite into while attaching the rear centering ring.

The LOC tail ring was a bit loose fitting into the tail cone. It barely stayed put, but epoxy filled everything in OK. I roughed up the inside of the tail cone with a rotary tool to give the epoxy something to bite. In addition to the recommended epoxy holes in the

tail cone shoulder, I did the same roughing up of both sides of shoulder, where the upper centering ring attaches, and where the whole thing will get glued into the body tube. The ID of each ring was a bit tight, and needed to be sanded. I have a dowel wrapped with coarse sandpaper for this purpose. The OD of the large ring was also a bit too tight, and needed sanding on the belt sander. The MSH rings were sloppy loose inside and out. This can't be fixed by unsanding, thus will need some tape on the OD of the ring and the



Bob's unpainted (un-monocoated?) V-2 at the November 2001 meeting (Jeff Pleimling photo)

MMT for them to hold in place. The LOC MMT tube is slightly longer than the MSH, but that doesn't matter much.

Somehow, the tail centering ring for both V-2s has been modified with 6-32 T-nuts for Kaplow Klips. Don't know how that happened :-)

The fins are epoxied to the motor mount at their tabs, and then glued in place. I tacked them in place with a few dots of hot melt glue to hold them while drying. They'd surely sag if held horizontal as the instructions describe. Not having the 3M epoxy, I made the inside Fin/Tail cone fillets with Dow Silicone bathtub caulk. I've used this successfully for the fins on my Crayon banks. For the outside of the fin/cone joints I used hot melt glue, also successfully used on the crayon banks.

Finally, the fin can was closed by gluing the top centering ring in place with slightly thickened System-3 epoxy, taped, and inverted over a 3" coupler to dry overnight. Then another batch of System-3 was used to fillet the top ring/MMT joint, plus to glue the body tube to the tail assembly. Don't forget to fill the 8 holes in the cone shoulder with epoxy, to help "rivet" the cone in place.

The LOC V-2 uses their traditional shock cord anchor, which has worked fine for me for the past 12 years. MSH used a "Gorilla" style mount. Both are adequate for a rocket this size.

Instructions say to secure the knots in the shock cord with a dab of epoxy. **Don't do this!!!** Both CA and epoxy will attack the rubber in the elastic. I double up my elastic, and tie a simple overhand knot to form the loop, then fish it through and around the shock cord anchor. If you want to put any type of glue on either elastic or shroud lines, use simple white or yellow glue, **nothing** else!

(LOC V-2 continued on page 11)

John Boren's Centuri Clones

John Boren showed up at the March club meeting to talk about NIRA helping the Suburban Aeroclub of Chicago with the Park Forest R/C and Rocket Demo (see *Club News and Notes* on the front page).

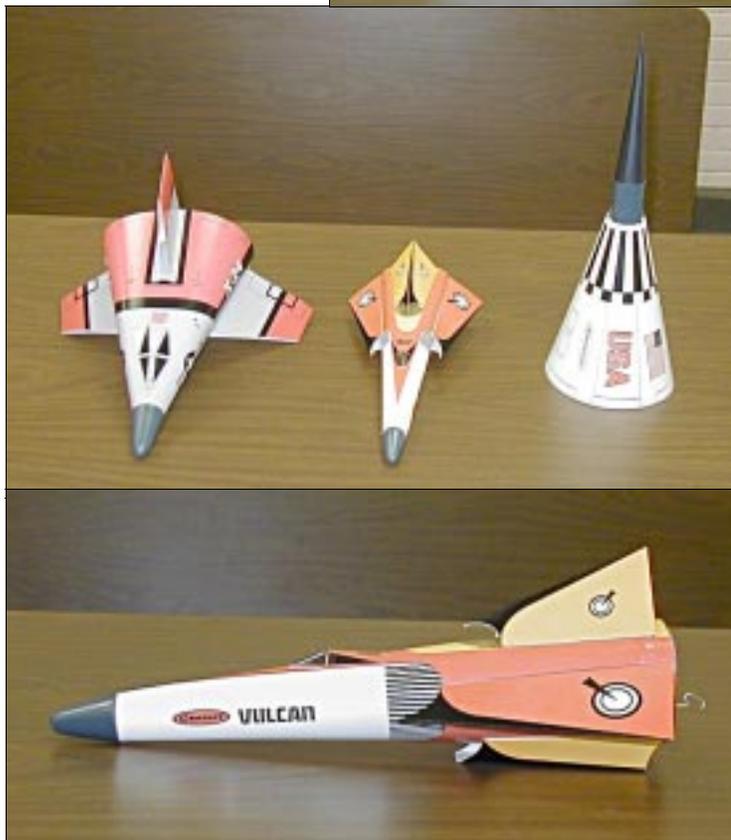
John also brought three cloned, upscaled Centuri rockets that he says that he constructed in just a couple of hours. These three rockets (pictured below) were the X-24, the Vulcan and the Point. As John explained it, all three were easy to build because they used pre-printed card-stock bodies.

John downloaded the plans for the rockets from a site known to many - 'JimZ Rocket Plans' (www.dars.org/jimz/rp00.htm).

John does have an advantage in having access to an HP color printer that will handle 13"x19" paper. He printed them on regular cardstock and assembled them like the originals.

John did mention that he plans on reinforcing parts of the rockets since the larger motors he plans on using will probably stress the cardstock more than the originally recommended motors.

Even with printing them larger than the originals, the printed detail on the rockets was very clear even close up. 📷



Art Applewhite's Micro Maxx Flying Saucer

On February 19th, Art Applewhite posted plans for a Micro Maxx flying saucer to the alt.binaries.models.rockets newsgroup.

Since there are many NIRA members interested in both flying saucers and Micro Maxx rockets I asked Art for permission to print the plans in the *Leading Edge*. He (obviously) said 'yes' and the plan on page 7 is a refinement of his original plan.

Art did ask the following:

1. Please do not alter the original drawing in your publication without my permission. I will gladly approve any reasonable requests.
2. Individuals may make as many as they want as long as they don't sell them or use them for other commercial purposes.
3. I retain all rights to the design.
4. Although the design has been tested and is stable and safe, I am not liable for any injuries or damages from use of this design.

Since all the items are standard for any item published in the *Leading Edge*, I quickly agreed.

Art would also appreciate any comments and will answer questions if you email him at rocket877@aol.com. He said that he would be interested in any variations or improvements people come up with.

In addition, he now has Micro Maxx Flying Saucer Kits available at: www.geocities.com/artapplewhite

Each set is \$2.00 each and contains all the parts necessary to build two flying saucers (one decorated and one "plain" for practice and customizing). Each saucer is printed on high quality card stock and comes with a money back guarantee.

There are currently three different designs (all pictured on the website)

- Fantasy Scale
- Extreme Colors! (Red, Yellow, Blue or Orange)
- Smiley

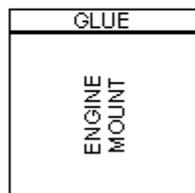
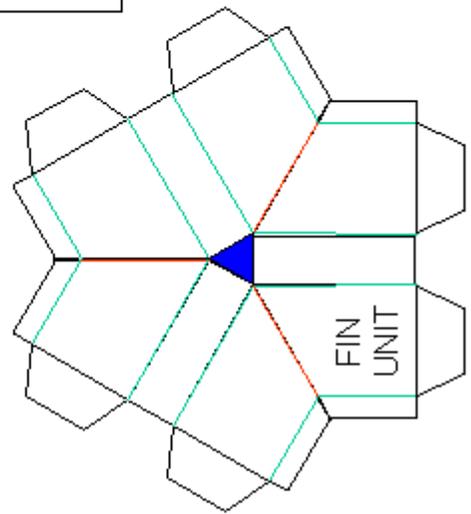
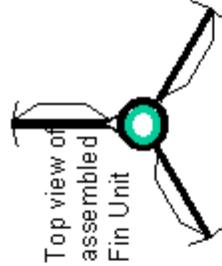
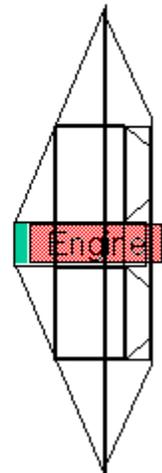
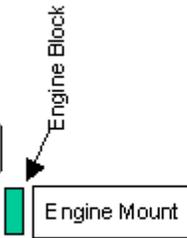
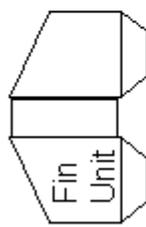
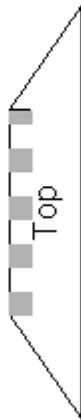
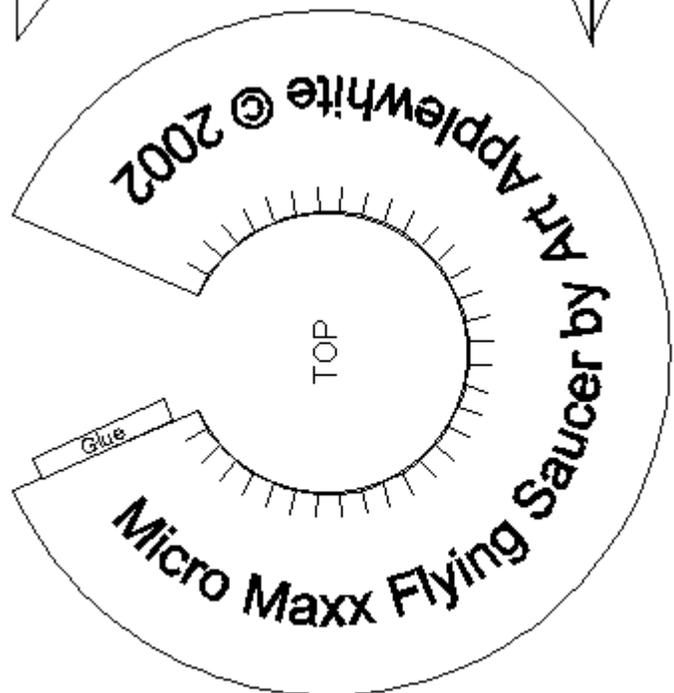
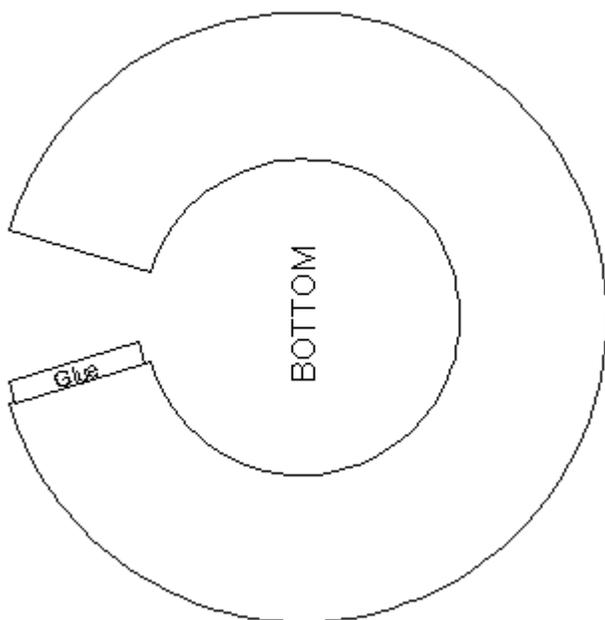
He is also thinking of developing larger versions using 13mm and 18mm engines and maybe a "D" version if there is any interest. 📷



Micro Maxx Flying Saucer by Art Applewhite©2002

1. Print on letter sized, 8 1/2" x 11", 110 lb. card stock. Cut out parts.
2. Use a small amount of white glue on the seams for the TOP, BOTTOM & CORE.
3. Fold the glue tab "fingers" down sharply on the TOP. Turn the TOP upside down and place the CORE inside it. Glue TOP to CORE with the "fingers" so that the fingers are not be visible on outside of the completed rocket.
4. Using an engine roll the ENGINE MOUNT into a cylinder and glue. Roll the ENGINE BLOCK into a tight coil and glue inside the end of the ENGINE MOUNT.
5. Cut the small triangle from the center of the FIN UNIT and a small cut at the end of each fin then fold on colored lines, red lines fold in, green lines fold out.
6. Glue the fins together. Insert the ENGINE MOUNT until it is even with the top of the FIN UNIT. Glue into place.
7. While the glue is still wet, push a stiff wire between one leg of FIN UNIT and ENGINE MOUNT to form a channel for the launch rod.
8. Bend the bottom tabs on FIN UNIT clock wise (counter-clockwise in the Southern Hemisphere ;-), as seen from above.
9. Place the BOTTOM over the TOP & CORE until it touches the TOP all the way around. Run a smooth fillet of glue into the TOP/BOTTOM & CORE/BOTTOM seams.
10. Slide the FIN UNIT into the CORE and glue. If the fit is too tight, try bending each fin slightly clockwise as seen from above before inserting into the CORE.

Send questions & comments to rocket877@aol.com



Space Launch Report for January-February 2002

by Tim Johnson

Eight rockets from four countries boosted payloads into earth orbit during January-February 2002. They included the first Atlas 3B, the second NASDA H-2A, two Ariane 4s, a Titan 4B, a Soyuz-U, a Delta 2, and a Pegasus-XL. Half of the flights orbited commercial communication satellites. Military satellites accounted for two missions.

Atlas 3B

AC-204, the first Atlas 3B and the second Atlas 3 with a Russian RD-180 engine, successfully carried 4,026 kg Echostar 7 into supersynchronous transfer orbit from Cape Canaveral's Space Launch Complex (SLC) 36B on February 21. The 57 meter tall, 3.3 meter diameter rocket used the first stretched "Common Centaur" second stage powered by two RL10A-4 LOX/LH2 engines. The stage will also be used by Lockheed Martin's soon-to-debut Atlas 5 atop a new 4.1-meter diameter first stage.

H-2A

NASDA, Japan's space agency, launched its second H-2A rocket from Tanegashima Space Center's Yoshinubu Complex on February 4. During the TF-2 test flight, the 57-meter tall 2024 variant flew for the first time with two big SRB-A solid boosters and four smaller Castor 4 solid strap-on boosters (SSBs) attached to the cryogenic core stage. Both SRB-As ignited on the pad to augment the LE-7A core engine.

The SSB boost sequence was unique. Since the launch pad was not designed to handle SSB thrust, the first SSB pair did not ignite until the launcher cleared the tower. After one minute, the first SSB pair burned out and the second pair



H-2A F-2 Launch

(NASDA photo)



AC-204 Atlas 3B Launch

(ILS photo)

started. The first pair did not separate, however, until the SRB-As separated nearly 2 minutes after liftoff.

The rocket carried the 33-kg VEP-3 monitoring payload and the 89-kg DASH reentry test vehicle in the upper position of the dual fairing. The 450-kg MDS-1 payload flew in the lower position. H-2A's LOX/LH2 second stage performed two burns to put itself and its payloads into geosynchronous transfer orbit (GTO), but a payload-wiring flaw prevented DASH from deploying.

Two Ariane 4s

Arianespace launched the 108th and 109th Ariane 4 rockets from Kourou ELA-2 during January-February. L4108, a 42L model with two liquid strap-on boosters, put 2,750 kg Insat 3C into GTO during mission V147 on January 23. L4109, a 44L with four boosters, sent 4,722 kg Intelsat 904 into GTO on V148 on February 23. Only seven Ariane 4s remained after the latter flight.

Titan 4B

On January 16, Titan 401B-38 lifted off from Cape Canaveral's SLC 40. The \$453 million rocket's TC-19 Centaur third stage performed three burns to put the \$800 million, 4,670 kg Milstar-5 payload into geosynchronous earth orbit. It was the 34th of 39 planned Titan 4 launches. The last Titan 4 will be delivered to the Cape in April for a planned 2003 mission.

Delta 290

Delta 290, a Boeing Delta 2-7920-10, put five Iridium comsats into polar low earth orbit (LEO) from Vandenberg AFB SLC-2W on February 11. The launch was performed for Iridium Satellite LLC, a company formed to operate the original bankrupt Iridium constellation. Altogether, 93 Iridium satellites have now been launched on 12 Deltas, 12 CZ-2s and 3 Protons.

Soyuz-U

A Soyuz-U put Kosmos-2387, a military imaging satellite, into LEO from Russia's Plesetsk Northern Cosmodrome LC 43/3 on February 25. According to Russian authorities, Kosmos-2387 was the 1,926th satellite launched from Plesetsk and the rocket was the 1,666th launch by an R-7 based booster.

Pegasus XL

A winged Orbital Sciences Pegasus XL boosted NASA's 293 kg HESSI solar telescope into LEO on February 5. The three-stage rocket was drop-launched from L-1011 "Stargazer" over the Atlantic after staging at Cape Canaveral's Skid Strip. It was the first Pegasus launch since October 2000.

Launcher News

Three Lockheed Martin Atlas vehicles stood on Cape Canaveral launch pads in mid-February. Atlas 3B AC-204 was at SLC 36B. Atlas 2A AC-143 was at nearby SLC 36A prepping for launch of NASA's TDRS-I in March. AV-001, the first Atlas 5, was several miles north in the SLC 41 Vertical Integration Facility (VIF). The 63 meter tall 400-series Atlas 5 was to perform a series of "wet dress rehearsals" prior to its launch no earlier than May 9 with Eutelsat's Hot Bird 6.

Meanwhile, the first and second stages of Boeing's first Delta 4 were mated in the Horizontal Integration Facility (HIF) at SLC 37. After several countdown rehearsals and a flight readiness firing of the RS-68 main engine, the rocket will carry a Eutelsat comsat aloft no earlier than July.

Cape Canaveral now has seven active space launch pads, but three or four will soon be retired as Atlas 5 and Delta 4 replace existing

(Space Launch Report continued on page 11)



Close-up of Ariane 44L/V148 first stage engines

(Arianespace photo)

Kosdon and Tripoli Sign Agreement

El Dorado Dry Lake Bed, NV (ROL News-
wire) -- 3/16/2002

In an agreement negotiated between Frank Kosdon and Bruce Kelly (on behalf of Tripoli Rocketry Assn (TRA) pending approval of the Tripoli Board of Directors). The following agreements were made:

- 1) Frank Kosdon returns to the Tripoli Rocketry Association as a Member in Good Standing.
- 2) Frank Kosdon acknowledges he was selling motors at the November ROC Launch. This was in violation of an agreement between Frank Kosdon and TRA. Frank ensures the TRA that he will not sell motors at TRA Sanctioned Launches until his motors are certified by the TRA.
- 3) Both parties agree that Frank Kosdon had a valid waiver for his January 2002 launch. But, there may have been confusion on how 2 valid waivers affect each other. The 2 valid waivers were that of Frank Kosdon and ROC.
- 4) A copy of this agreement will be posted on the Web Pages of both TRA and Shadow Composites.

//signed by:
Frank Kosdon
Bruce Kelly BOD

As witnessed by:
Gary Rosenfield
Robin Meredith BOD
Mark Clark Prefect
Ron Weigel Prefect
Kevin Harness Prefect
Tom Blazanin
Tracy "Woody" Wood

[Editors Note: Before Frank Kosdon and Tripoli settled this current disagreement, I was prepared to print both the Tripoli statement on Frank's suspension and Frank's rebuttal. This would have taken the entire page (really).

This is in the Leading Edge because, while we (NIRA) are currently a NAR section, it wasn't too many years ago that we were also a Tripoli Prefecture (before Bob Kaplow's ejection from Tripoli and the following club vote to not be a Prefecture). In addition, many NIRA Members are still Tripoli members.

*There are many people running for the three Tripoli Board of Directors seats this year in addition to Frank (yet another person announced their candidacy today). If you are a current Tripoli member I urge you to look at **all** of the candidates and decided who **you** thing would be the best for the organization - and if you're a NAR member I urge you to do the same thing when the NAR Trustee elections roll around. --jp]*

AeroTech Files Suit Against Clark County Fire Department

Las Vegas, NV (ROL Newswire) -- AeroTech, Inc., the nation's premier manufacturer of composite propellant hobby rocket motors, today filed a lawsuit against Clark County, the Clark County Fire Department (CCFD), two fire investigators and a private company that worked with the County in responding to an October 15, 2001, fire at AeroTech's Las Vegas facility.

The Complaint alleges that, contrary to the County's published report, there were two separate fires at the AeroTech facility. The first, which resulted in the death of AeroTech employee Avelino Corpuz, was quickly extinguished. However, CCFD management ignored information gathered during prior inspections and poured water on materials that, they knew, catch fire when water is applied to them, endangering the lives of the firefighters they supervised.

Not only did their actions endanger the lives of its employees, their actions also began a series of reactions that resulted in an explosion and fire that erupted three hours after the first fire was extinguished. The second fire destroyed the entire building and disrupted all businesses in it.

The suit alleges that, following the second fire, agents of CCFD repeatedly entered the former AeroTech facility without a warrant and, over AeroTech's repeated objection, seized an unknown amount of property. In violation of AeroTech's civil rights, they refused to return the property to AeroTech or even report what was taken. They also disturbed the scene to such an extent that AeroTech cannot conduct a meaningful investigation of the cause and origin of the fire.

In attempting to respond to rumors and allegations about the fire, AeroTech repeatedly requested the return of its records and records of all prior inspections of its facility. Shortly after one of the requests was made, on November 6,

CCFD Chief Greene admitted that documents were shredded. No one has yet disclosed the contents of the now shredded records.

Finally, although it repeatedly stated that it was conducting an investigation of the fire, CCFD issued a four paragraph report stating that the origin of the "fire" was "accidental," completely failing to acknowledge that there was a second fire and strongly implying that the first fire resulted in the building's destruction.

The property seized from AeroTech has lost much, if not all, of its evidentiary value. The seizures and disturbances have severely impeded AeroTech's ability to conduct a meaningful, independent investigation. In addition, CCFD followed its botched investigation by shredding documents and issuing a misleading report. As a result, AeroTech has been unable to defend itself from both the allegations made by the other tenants of the building, accusations leveled by CCFD, and most recently, the state legislature.

Plaintiff's attorney Mark N. Savit said, "AeroTech, its employees, its fellow tenants in the building and the firefighters who risk their lives every day to protect us are all victims of the outrageous conduct of Chief Greene and CCFD.

"The lawsuit filed this morning seeks not to enrich AeroTech, but to help it and the others who shared in the tragic loss of October 15, 2001, to get on with their lives and livelihoods.

"More importantly, it seeks to restore public trust in CCFD by putting an end to the mismanagement, deception and destruction that led to the disruption of so many lives and businesses and the insidious attempt to hide that conduct."

Mr. Savit is partner with Patton Boggs LLP. The firm has offices in Washington D.C., Northern Virginia, Dallas, Denver, Boulder and Anchorage.

LOC Precision Electronics Bays

(ROL Newswire) -- LOC Precision announces the availability of its new electronics bays. EB-3.0 and EB-3.9 kits are now in stock and ready for immediate shipment. These bays include the company's new "Stiffy™" line of tube coupler stiffeners for those demanding applications. Also included are electronics mounting "sleds" that are interchangeable between the 2 bays allowing for quick turn around between rocket flights. These bays are designed around the company's LOC-TRONICS flight altimeters and timers and can accommodate many other manufacturer's units. LOC-TRONICS come with mounting hardware and are manufactured and serviced by TRANSOLVE – the first name in rocket electronics. An informational "HOW TO" video describing electronics and their mounting into hobby rockets is being edited and will be available soon. See the LOC Precision site at www.locprecision.com for more info.

Top Flight Recovery Celebrates 11th Years with New Products

(ROL Newswire) -- Gary & Miki Pletzer, owners of Top Flight Recovery, are celebrating their 11th year of manufacturing recovery related items for rocketry. For their 11th anniversary, TFR is introducing two new recovery items:

1. Ultra Xtype- This is a heavy duty, reinforced Xtype chute with flat braided shroud lines.
2. Ultra Streamer- This streamer is reinforced also and is to be used for high altitude descent or for a drogue on a two step recovery.

Details on these two new products may be found at: www.TopFlightRecoveryLLC.com

Stage 23 - A Response by Bob Kaplow (NAR 18L)

I must respond to several items in “Confused Stages - Stage 23” from the last newsletter. That’s what happens when you write about glue!

1) Yellow carpenters glue is much more than just improved white glue. It’s the ideal glue if the materials are paper, balsa, and plywood from 1/4A up through HPR! A double glue joint (apply glue to both surfaces, let dry until clear, apply second coat to one surface, stick together) filleted all with yellow glue is at least as strong as the same bond made with epoxy, and will not fail before the paper or wood being bonded.

Even for a rocket the size of a LOC Magnum flown on a K, yellow glue should be the adhesive of choice. It soaks into the wood and paper fibers, which poor epoxies won’t do at all, and good epoxies won’t do any better. I’ve got a THOY Hornet (2.6” diameter, 29mm MMT, similar to a LOC Graduator) that I built using nothing but Titebond. It’s flown on H238 motors with no problem. If it had a bigger motor mount, and I had a huge field, I’m sure it would hold up to an I357! I’m not so sure the rest of the rocket would hold up to a J350, but it wouldn’t be the glue joints that failed.

Don’t knock yellow glue!

2) Do NOT use CA debonder on skin. CA is non-toxic, in spite of the irritating fumes it can emit. Debonder is **very** toxic, and can be absorbed through the skin. Use debonder when you stick your rocket to a pair of pliers, not if something is stuck to your skin. In almost 30 years of using CA, I’ve never got so stuck to something that I couldn’t get my fingers unstuck without debonder. Usually rolling or twisting rather than pulling will be successful.

3) Epoxy is also toxic. Rubber or latex gloves are advised when working with epoxy.

4) 5 minute epoxy is worthless for sport rocketry. All epoxy is heat sensitive, 5 minute seems to be the worst. It’s too sensitive to poor mixing and bad ratios. And it gets brittle with age. Back when I used it on A SD models, I recovered models and found it was as strong as peanut butter after the flight. I don’t use it any more.

5) Epoxy will NOT bond almost anything to almost anything. It’s particularly poor on smooth surfaces, so rough up anything to be epoxied, especially fiberglass fins. And it just won’t stick at all to many plastics, including lexan, plastic crayon banks, and food containers.

6) The best epoxies I’ve found are the ones used by the home built aircraft and boat folks. Among them are West, System3, Raka, and others. System 3 (www.systemthree.com) offers a great sample kit with resin, slow hardener, mixing cups, filler materials, and some scraps of fiberglass for \$10 postpaid. It’s a bargain; their free epoxy book alone is worth the cost of the sample kit. Raka has a similar but not as extensive sample kit with both slow and fast cure hardeners.

Confused Stages – Stage 24 by Jonathan Charbonneau

In the last stage I wrote about the pros and cons of each type of adhesive. This stage is about the pros and cons of different shapes on noses, fins and airfoils.

While I have mentioned about which shapes are aerodynamically best in stage 15, aerodynamics aren’t the only factor to consider. There’s a reason why many professional rockets and missiles are made with less than optimum aerodynamics.

First, the nose. While the conical nose is best for minimum drag at supersonic speed, it is structurally weak. The best nose shape for structural strength is the dome. True, the drag forces on a dome are greater, but the dome **can** handle these high drag forces better than the conical nose can handle the smaller drag forces it bears. The ogive is very common. It is a compromise between the strong structure of the dome and the low drag of the cone. It also provides more payload space than the cone.

On to the fins. At supersonic speeds, swept fins with diamond airfoils are lowest in drag, but they are not very strong. At subsonic speeds, elliptical fins with teardrop airfoils are least

None of these epoxies are mixed 1:1 like the junk you get in drug and hardware stores. I’ve used stuff that is 7:3, 5:2, and 2:1. You can either use an accurate balance and mix by weight, or measure and mix by volume. I find that veterinary syringes make ideal tools to mix small batches by volume. With no filler added, these are perfect for fiberglass or other composite lay-ups. With these resins you add whatever filler you want to reduce weight, prevent running, or add strength. Without any filler they are about the consistency of maple syrup.

7) Don’t dismiss hot melt glue! To dismiss it because you might get burned is as sensible as not using CA because you might get stuck to your model. I’ve found it to be one of the few adhesives that will stick to plastic like the crayon banks, shampoo bottles, and food containers. It sticks to Lexan fins too. And it’s great for tacking things into place or assembling payloads. And it flexes a bit for places that need flexibility. Obviously don’t use it for your motor mount!

Bob’s rules of glue:

1) My first choice for wood and paper is yellow glue. Elmers, Titebond, Sig are all good. I’m sure there are others as well.

Note that unlike white glue, yellow glue won’t easily wash out of clothing after it has cured.

2) Never buy CA in a drug store, hardware store, or super store. It’s all inferior stuff, usually a useless gell-like goo. Get CA from a hobby shop. In most cases, the thin water-like CA works best. Occasionally you may need the medium or thick CA. Store CA away from heat and moisture. Refrigerate unopened bottles, but NEVER after they are opened.

draggy, but they don’t stabilize very well. Rectangular fins have the best ability to stabilize but are draggy. Clipped delta and trapezoids are therefore common. They make a good compromise of good stability, high strength and low drag.

The same situation applies to airfoils. The best airfoils for low drag – diamond for supersonic flight and teardrop for subsonic flight – aren’t very strong. Hence the common sight of bi-convex airfoils in supersonic and rounded plano airfoils in subsonic. These shapes are stronger yet still provide good aerodynamics.

Conclusion: When designing a rocket, don’t just look at the drag issue. Structural strength and good stability characteristics are also important. It doesn’t do any good to minimize drag if the rocket is going to suffer a structural failure at or before Max “Q.” There are always decisions and design trade-offs to be made.¹ This is what makes rocketry a constant challenge.

Keep on flying! Follow the safety code. 

1. From G. Harry Stine’s *Handbook of Model Rocketry*, page 161

Remember that CA violates one of the fundamental American principles: that if something is good, more is better. A drop of CA will hold, a puddle of CA won’t cure. The best way to apply CA is to wick it onto a perfectly fitting joint.

I use CA mostly for repairs, or for tacking things in place while the slow epoxy cures.

3) Never buy epoxy in a drug store, hardware store, or super store. It’s all inferior stuff. (Sound familiar?) Get epoxy either from a hobby shop, or better, the aircraft builder resins listed above. Look for the thin resins with the unusual mix ratios. Wear gloves!

4) Do not add more hardener to epoxy in an attempt to get it to harden faster. It will never harden right if you do.

5) Hot melt has it’s place in rocketry! I’ve also used silicone caulk for bonding clear plastic fins to plastic crayon banks.

6) Experiment. Whenever I find something new, I buy it and try it. You never know what some odd glue will be good for. In my workshop, I call my glue drawer “Heinz 57.” I once counted, and including the various glues elsewhere that don’t fit in the drawer, 57 was an understatement. 

Welcome to the Club!

John and Karen Boren, Duane J. Gosa, Mary, Emily and Anna Keehn, Venita McDonald, Stu Pickard, and Cody Pinchot have all joined NIRA in the past few months. Welcome to the club! If you've joined recently and I somehow missed your name, please let me know! 🐸

(Space Launch Report continued from page 8)

boosters. Only about seven more Delta 3, six Atlas 3, five Titan 4, and eight or nine Atlas 2As remain.

The slumping commercial launch market has led Boeing and Lockheed Martin to ask the US Air Force for more Atlas 5 and Delta 4 development funding. Boeing spent \$1.5 billion and Lockheed \$750 million on the effort, but the government has had to match those totals to get the rockets built.

All of the world's big commercial launchers required public funding for development. The European Space Agency funded the Ariane series. NASDA paid for H-2A. The Soviet government developed Soyuz, Zenit, and Proton. Today, there are too many rockets for the dwindling commercial launch market. Several rocket types may vanish during the next few years as a result. 🐸

Team America High School Rocketry Challenge

The National Association of Rocketry (NAR) and the Aerospace Industries Association (AIA) are sponsoring a rocketry design challenge for U.S. high school student teams as part of the Centennial of Manned Flight celebration in 2003. The "Team America Rocketry Challenge" involves designing, building, and flying a multi-stage model rocket (less than 3.3 pounds liftoff weight, 125 grams propellant in NAR certified model rocket motors) that takes two raw eggs and an electronic altimeter as close as possible to exactly 1500 feet. Of course, the rocket must fly safely and the eggs must return undamaged!

Winners will be selected at a flyoff competition, to be held in Northern Virginia in April 2003. The top 5 student teams will receive shares of a total prize pool of approximately \$50,000 in savings bonds, and the total prize pool for the winners' sponsoring schools is approximately \$9,000 in cash.

For more information, visit the NAR website or the AIA website www.aia-aerospace.org. Entry applications will be posted on the AIA website by April 2002; all teams must go there to enter. Entry fee of \$160 will include an Adept A1 electronic altimeter, a copy of the Apogee RockSim 5.0 computer design and flight simulation program, and a copy of G. Harry Stine's Handbook of Model Rocketry. Special NAR membership packages and launch site owner insurance support will be made available to teams that enter.

Event manager for the NAR is Trip Barber, NAR Vice President, at: ahbarber@alum.mit.edu 🐸

Editor's Ranting and Ravings

Not a great name for a section, but this stuff isn't really news, just stuff I want you to know about.

Deadline for Next Issue - the deadline is the NIRA meeting in May (the 3rd). This is the normal deadline - the meeting day for the 'cover month.' If you're not done by then, let me know and I can work around it until you're finished.

If you have something ready before the deadline, please get it to me as soon as you can! The earlier I get articles, the sooner I can finish the newsletter.

The Leading Edge needs Articles - This should go without saying, but almost all of the articles for the Leading Edge are written by NIRA members. The newsletter needs technical articles, plans, kit reviews, **launch reports**, and whatever else **you** want to write about.

I'd love to print some launch reports from members attending non-NIRA launches. Besides being interesting reading it's also a way to let NIRA members know about other launches.

If you're disappointed in the quantity of non-NIRA material in this issue, it's because I can only publish what's been sent to me. If you want

to write an article but have questions, or need help, please contact me! I'm always willing to help someone who doesn't know where to start or when to stop.

NIRA's Email List - NIRA does have an email list where club information is sent out and where we talk about rockets. It's hosted on Yahoo's Yahoogroups and to join you can either send a blank email to nira-subscribe@yahoogroups.com or go to the list's web site at

<http://groups.yahoo.com/group/nira>

NIRA's New Website - Not really 'new' anymore, but a reminder the NIRA website is at: <http://www.NIRA-Rocketry.org>

Our old web site has been turned off, so please update your bookmarks and also please let anyone know who is still pointing to the old one.

Comments/Compliments/Complaints - I really don't get too many. Please let me know if you either don't like something and want me to change or if you do like something and want me to continue - this is **your** newsletter, after all (that is until I decided to take it private and make millions from it). 🐸

(LOC V-2 continued from page 5)

I didn't see my MSH parachute. It probably got tossed into my parachute stock years ago when I first got the kit. The LOC chute was OK, but not quite up to the LOC chutes I have from 10 years ago. And certainly not up to PML or Rocketman. But more than adequate for this kit. I added a Swivel from Into The Wind and a QuickLink to connect to the plastic cone lug.

LOC doesn't document CG/CP information. I calculated the Barrowman CP at 20.3" from the nose. My model empty has a CG around 18", and loaded with a SU G around 20". Others reported Barrowman at 22.6: and Rocksim at 26.8", with a CG around 19.6". Obviously there is some disagreement here.

Given the weight of the rocket (850-900g), I'd recommend a minimum of an F motor and a minimum average thrust of at least 45 newtons. The F50 expendable or F52 reload is probably the minimum motor for this rocket. I'd be a bit leery of the F40, and certainly wouldn't even consider the F25 or Econojet Fs (F20, F23) motors for this rocket. I've flown mine once (unpainted) on an F52-5, which worked perfectly.

At the upper end, this rocket should be flyable on just about any of the 29mm HPR reloads. Do watch the CG location with the bigger motors. For that reason, I would **not** recommend upgrading this rocket for 38mm motors. The amount of nose weight that would require is beyond what the shock cord and parachute could handle. LOC did offer a final round of this kit with the 38mm MMT, but I don't know what other changes they made to go with it.

I've long wanted a 4" V2 for my fleet, and am quite pleased with the LOC edition. With a few changes in the final production version, like the fin material and grain direction, this kit will be a great addition to the product line. 🐸

(Club News and Notes continued from page 1)

February Model of the Month contest - Martin Schrader - 'Just Plain Rocket' scratch (Adult Winner)

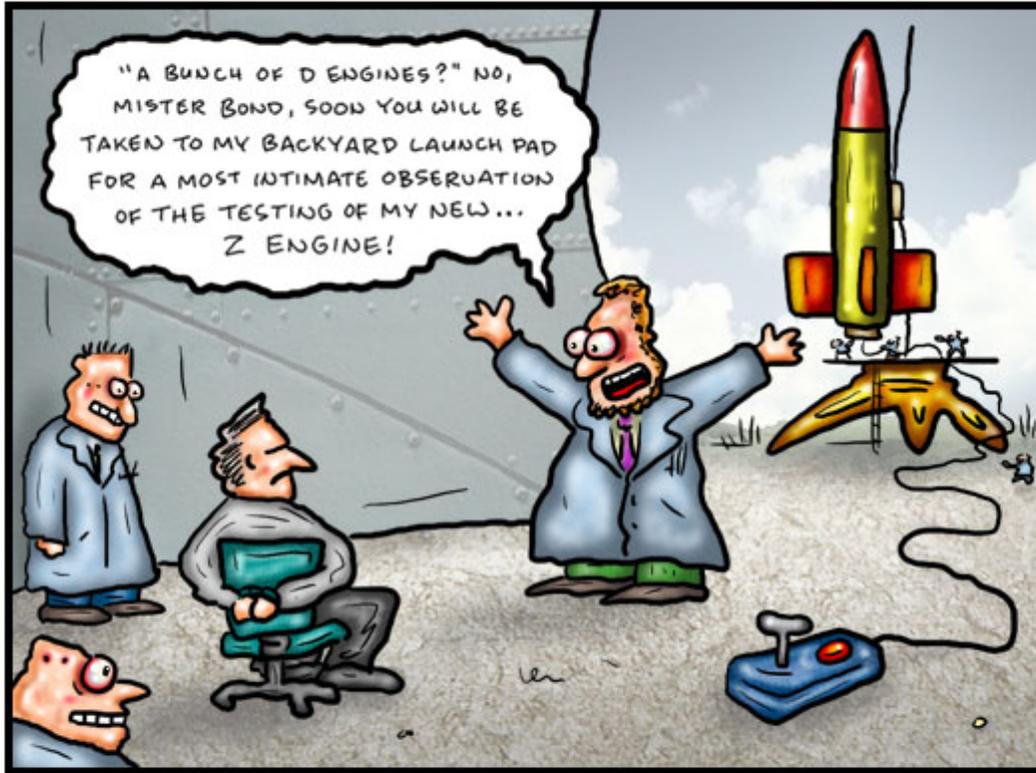
Victoria House - Holverson/Fun Rockets 'Swinger' (Youth Winner)

Alex Wallis - Estes Menace.

March Model of the Month contest - Mary Hojek - 2 Estes Alphas (Youth Winner) Andy Montag - Crayon Rocket (scratch built) (Adult Winner)

Martin Schrader - Research Platform 2 (scratch with Venus Probe parts)

John Boren - cloned, upscaled Centuri X-24 Bug Bob Kaplow - Marvin Rocket (scratch) 🐸



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<http://ibiblio.org/Dave/drfun.html>

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(Doctor Fun used in the Leading Edge by permission of David Farley)

Vern Estes returns to the big screen as James Bond's latest nemesis in the eponymous "Balsafinger".



Jeff Pleimling, Editor
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