THE LEADING EDGE

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

Volume 23, Number 6
November/December 2000

Club News

Club Elections – At the January meeting, NIRA holds an election to decide the club officers for the year.

At the November meeting Rick Gaff and Ken Hutchinson were re-nominated for their current positions. Adam Elliot was nominated to fill the Vice President position. Bob Kaplow announced that he will be stepping down from his position as Safety Officer/RSO, with no nominations made for the position. The following is the current nominations:

President – Rick Gaff
Vice President – Adam Elliot
Secretary/Treasurer – Ken Hutchinson
Safety Officer/RSO – open (no nomination)

If you would like to run, or nominate someone else, nominations can be made up to the election at the January meeting.

Safety Officer/RSO – The club RSO position is an important one for the club (as are all officer positions). Bob Kaplow has done an outstanding job, holding the position since its inception,

The following is from the club bylaws and outlines the duties and responsibilities of this position:

Section 5 - Officers
Article E: Safety Officer: The Safety Officer shall establish and enforce the Association's range safety and operational procedures, including execution of qualification tests where required by sport rocketry Safety Codes. The Safety Officer may appoint other members to assist in the execution of these duties. The Safety Officer or his designated alternates must possess the appropriate required qualifications to administer any qualification tests.

R&D Contest? - Adam Elliot is thinking about holding a club-leveld R&D contest sometime in the spring. This would be a NAR sanctioned competition following the rules of the Pink Book. (available at www.nar.org)

If you would like more information or want to assist, please see Adam.

NIRA Holiday Party

In December NIRA holds it's annual Holiday Party. This year David Dornblaser has volunteered to open his home.

Call David at (630) 469-0653 (or email him at dornblaser@msn.com) to RSVP and to let him know what sort of munchies you can bring.

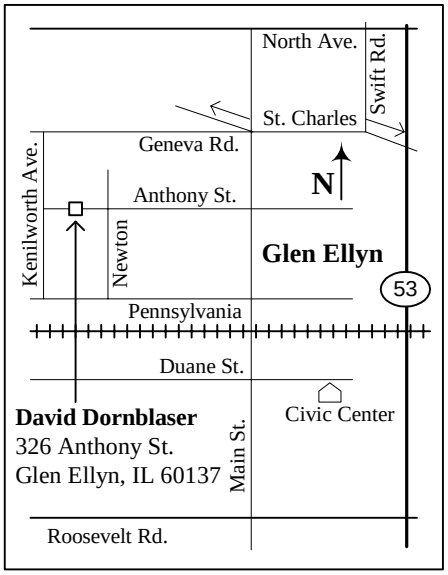
Where: David Dornblaser
326 Anthony Street
Glen Ellyn, Illinois 60137

When: Sunday, Dec 17th 1999, 4 pm to 8 pm

Bring: A dish to pass and whatever you are drinking.

RSVP: phone: (630) 469-0653
email: dornblaser@msn.com

Special thanks go out to the Piette family for hosting the party last year and to the Bundick family who hosted the Holiday party for **many** years!



Map to the Holiday Party at David Dornblaser's house.

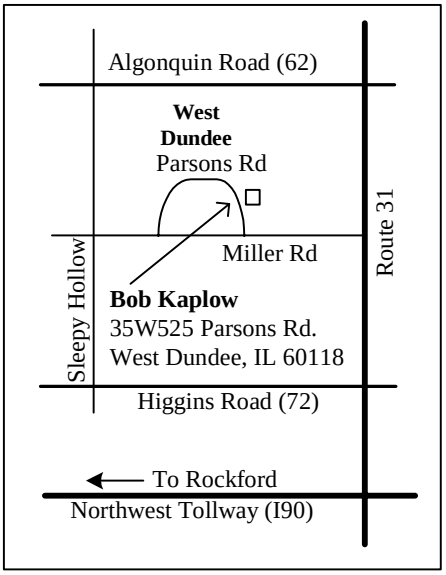
Winter Building Sessions

These are informal session to build rockets, talk rocket, look at rockets, or just hang out. Bring your favorite snacks and a rocket to build.

January Building Session
Bob Kaplow
35W525 Parsons Rd.
West Dundee, IL 60118

Usually once a year NIRA has a building session at Bob Kaplow's. "Bob's Hobby Shoppe" is worth the trip, as he has a basement full of various power tools, rocket supplies, built rockets, unbuilt rockets, plastic models, a large motor collection… This session usually includes NIRA's first flight of the year (in Bob's back yard – indoor launches being prohibited by the NAR's safety code).

February Building Session
March Building Session
These sessions still need a home (as of publication). If you'd like to host, please contact Rick Gaff or come to a club meeting. See the Jan/Feb issue for locations and maps.



Map to January's building session at Bob Kaplow's house.

THE LEADING EDGE

Volume 23, Number 6
November/December 2000

NIRA Officers

President – Rick Gaff
Vice President – Pierre Miller
Secretary/Treasurer – Ken Hutchinson
RSO – Bob Kaplow

Leading Edge Staff

Editor – Jeff Pleimling
Production – Julie, Beth & Brian Pleimling

This Issues Contributors

Mark 'Bunny' Bundick,
Jonathan Charbonneau, Rick Gaff,
Tim Johnson, Bob Kaplow
Mark Kotolski, Bob Wiersbe

THE LEADING EDGE is published bimonthly by and for members of the Northern Illinois Rocketry Association (NIRA), NAR Section #117, and is dedicated to the idea that Sport Rocketry is FUN!

Articles, plans, photos, other newsletters, and news items of interest should be sent to:

Jeff Pleimling
c/o The Leading Edge
245 Superior Circle
Bartlett, IL 60103-2029

or emailed to leadingedge@pleimling.org
Photos will be returned, other material returned upon requested.

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 notification 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).

January 5

February 2

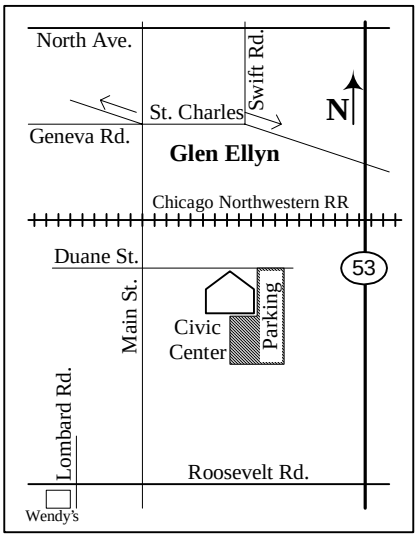
March 2

April 6

May 4

June 1

July 6



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.

December 17 – Holiday Party (details on page 1)

January 21, 2001 – Building Session at Bob Kaplow's (details on page 1)

February 18 – Building Session (details TBA)

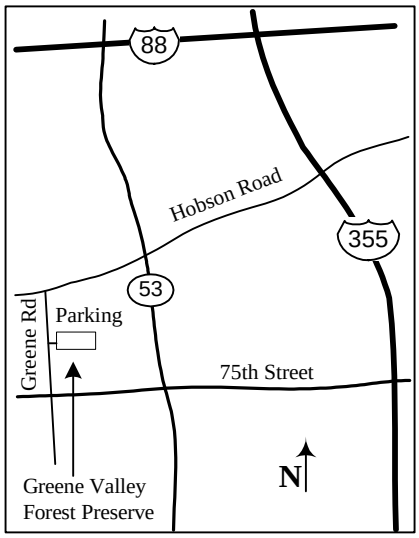
March 18 – Building Session (details TBA)

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



Model of the Month Winners! (Rick Gaff photos)

October – Mark Soppet won the youth category with a boost glider and Cal Justice won adult with an Orbital Transport.

November – A tie in the adult category between Norm Dziedzic's Mini Endeavor and Greg Cisko's Estes Honest John, Tim Cordes was the sole winner in youth with the Quest Courier he built for a science fair project.

2000 Hobby Show Report
by Bob Kaplow NAR #18L
(photos by Rick Gaff and Bob Kaplow)

Normally I spend 2 days at the show, working half of each day in the make-it take-it booth, and the other half wandering the show to report here. This time family obligations limited me to essentially one day, so I really didn't get to spend as much time digging into the tools and gadgets as usual. Sorry about that folks.

Quest
I was surprised and pleased to see Dane Boles at the show, but he left before I could chat with him in detail. I did speak with Frank Chernek, who will be the new head of the rocket product line. Quest definitely has plans to improve and expand the product line. New starter kits are built around their "best cheap launch controller in the industry" and the old Nike fin unit.

Quest's display – lots of RTF and Micro Maxx

The Micro Maxx motors will be undergoing a significant change. The injection molded casing and nozzle will go in favor of conventional paper and clay. A thinner casing will mean space for more propellant. That means more power for more performance for the overweight plastic rockets. No mention what this does to existing stability problems. Also on tap is an improved ignitor.

The gotcha is that the old motors will be extinct, and the new motors are expected to be almost twice as powerful. That means that if we create a new 1/8A category for Micro Maxx competition, by the time we do the paperwork there will no longer be an 1/8A motor to use :-(

PML
Had their usual display of nicely finished kits. There were 3 new to RCHTA kits that we've already heard about. They are also distributing 3-packs of 29mm motors made by Aerotech, suitable for use in PML rockets, including the new ignitors. Shorter delays of F50, G40, and G80 will be available from PML. The new CPR-3000 system was also on display.

Holverson
is now part of Fun Rockets, and all the balsa has been replaced by foam. Other than that, the product line appears about the same as last year.

Fun Rockets (formerly Holverson) on display

Apogee
Of course had the biggest news for the show: their huge 1/70 scale Saturn V and 1B. The display models were work in progress, but looked pretty cool. I notes a sign that said something like "no Ready To Fail rockets here" :-)

Bill from BMS was hiding around the Apogee booth most of the weekend.

Apogee's new Saturn IB and Saturn 5

Aerotech
Had their full line of kits, motors, RMS, and hybrid products on display. Of course they were featuring their new FirstFire ignitor replacing the copperhead. They also plan on introducing HPR kits suitable for certification and sport flying soon. Now available is the Rolf Rench for use on the 18/24/29mm RMS casings. Coming in 2001 is Redline propellant with "unique liftoff characteristics for larger airframes". Black Max will be coming to RMS motors soon.

Extreme Rocketry
Was displaying their magazine. I finally got to meet Brent McNeely, and had a nice chat with him. It seems he offered to take over HPR for Bruce, but was turned down. Bruce's loss is our gain. The magazine was also prominently displayed in the Aerotech booth. Not a copy of HPR was seen at the show.

Estes
The all new Estes "Physical Attack Droid" replaces last years "Verbal Assault Craft". This striking new product will grab you and practically knock you off your feet with its excitement, sound, and fury, despite its relatively small size and insignificance, or its arresting behavior. Battery included! Void where prohibited by law.

Several old rockets return, from the Mean Machine ($25), Comanche-3 ($17), Saturn-V ($75), Redstone, Black Brant (with recommended D12-5 only, no return of the D12-7), Nova payloader, and Phoenix. The 8 new rockets included the Echostar which clearly recycles heatseeker fins, a cruise missile like Menace, the Nightwing fighter that recycles some SR-71 parts including the nose cone, and by my count the 5th Estes product to be sold under the name "Sizzler".

I've heard rumors about impending problems with the Ready To Fail line, coupled with the Star Wars fiasco of the past couple years, the company needed a way to make quick money. So it's back to the traditional hobby line. The 8 new kits were thrown together in a couple months for the show, and the 7 reissues were off-the-shelf stuff.

The educator series restores both some kit and motor bulk packs to the line. The B6-0/B6-6 has been transmogrified to a C6-0/B6-6 combo, as the C6 is now the smallest booster available (insuring loss of Comanche-3 or Loadstar on every flight).

Land rockets are back, this time powered by D11-P instead of Freon. The Eagle claims scale speeds of 2000 mpg over a 1/10 mile track (that's 500'+, longer than a football field!) No price was given. It is unknown how they will handle safety code issues; clearly as of today this product would be illegal in NFPA 1122 compliant states.

Air powered airplanes and rockets were also featured.

The return of the D11-P is great news to me, as my stock is very low, and the return of this

*(**2000 Hobby Show Report** continued on page 4)*

Estes is bringing back Mean Machine, Comanche-3, Nova Payloader, Black Brant, Phoenix, Mercury Redstone and Saturn-V

*(**2000 Hobby Show Report** continued from page 3)*

motor is a first for the hobby from the "new" Estes and means my Happy Meals can remain flying for many more years.

No NCR stuff, in spite of what bean counter Brian Alleman told me last year. I must also retract something I said about Brian in my report last year: "This guy makes Barry Tunick seem nice".

Other neat new products:

SIG now has balsa dowels. These might find use in Stupidroc, HD, and even Scale.

Virtual tools showed a product that really sucked. It's a small vacuum pickup for handling small parts. It uses syringe like tips with silicone rubber cups that aren't affected by glue. Should be handy for assembling that scale or PMC.

The market now seems flooded with water slide decal paper for inkjet printers. I saw at least 3 displayed at the show, including Micro Format www.paper-paper.com

Pasco, a German company was showing a CA like glue that bonds instantly to a variety of materials, including rubber tubing and plastics. The stuff is VERY expensive, $20 for a small bottle.

Heller has plastic models of the International Space Station, MIR, and the Patriot Missile.

Polar Lights had a Dick Tracy Space Coupe that should be suitable for PMC.

Sandman Abrasives had some nice foam backed sanding blocks and pads. Their website is at www.sandmanabrasives.com.

Sling Wing had a cute toy foam glider that will make a nice parasite glider, or fit inside many 2" and larger big models. www.slingwing.com

The aluminum and plastic Unimat-1 was on display, but they had no literature for me.

Not at the show this year included Glencoe models and Foredom tools. And still no Wallace and Gromit moon rocket from Airfix.

Polar Lights shows off its plastic models including the 'Dick Tracy Space Coupe' and the Jupiter 2.

Hobby Show Make-It-Take-It and Launch Report

by Bob Kaplow NAR #18L

I didn't cover an important part of the Hobby show in my report: the make-it take-it building session hosted by NIRA. Once again we had 1500 Windy City (generic) rockets, and hordes of boy scouts, cub scouts, girl scouts, and other kids eager to build them. Jane Piette did a great job of organizing the operation. For a change, we actually had everything we needed for the building. With about a dozen members staffing the tables, the line was never very long.

Today was the launch, and maybe 60 +/- kids showed up with their rockets to fly. Some brought their own rockets as well, plus some of the NIRA folks came to fly instead of help with the kids (boo), and we put up about 270 flights this afternoon. We quit early, around 4 pm, as now that we're on Daylight Wasting Time it gets dark not too long after 4 pm, and we need to get off the field while it's still light.

Steve Piette helps some scouts build rockets (Kaplow or Gaff photo)

November 19th Launch Report

by Bob Kaplow NAR #18L

Well, the weather held out, and a couple dozen brave and/or foolish rocketeers flew a total of about 50 flights. Much smaller than a typical NIRA launch, about 20% of the typical numbers, but not to surprising for freezing temperatures and moderate breezes. We even had a few new faces show up for the launch.

Personally, I made 7 flights. The Happy Meal probably made its last flight, unless it gets a transfusion of Duct Tape this winter. Have no fear, I've got at least a dozen more! I flew a couple relatively new rockets, a scratch built Maxi Alpha on a FSI D20-3 and Maxi Windy City on an AT D15-4, both with Curious George "first monkey in space" paratroopers from Wendy's. My Sound and Fury upscale tazmanian devil flew successfully on an E5-4, and I flew an old clunker 3FNC on an E60-4 to burn up some more FSI motors before they all turn into pumpkins next summer. The Area 51 UFO on a D24-10 and AOL.CON on an A3-4T rounded out the day for me.

Around 3:30 the weather started looking nasty, so we packed up and bugged out just as a burst of sleet or something came through. Another hit me just after I got home.

In Like A Lion – April 2nd Launch Report

by Bob Wiersbe

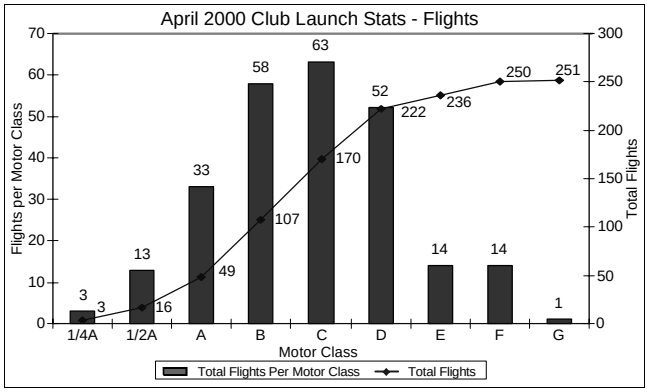
[Editor's Note: Isn't email wonderful? Bob thought he submitted this several months ago but I never received it. Now that the 2000 launch season is over it is interesting to look back and see how the year started.]

A few months ago we decided to hold a launch on what would normally be an off day for NIRA, the first Sunday of the month. The reason was that our insurance was going to expire on April 5th, and we didn't know when we would get insurance again. After a long midwestern winter we were ready to get out and launch some rockets.

The weather around here is unpredictable, as most of you know, so it was a gamble that we'd be able to launch without getting rained or snowed on. The gamble paid off, it was cloudy, but not much wind and mild temperatures. It was also a gamble that any NIRA members would be able to make it on such short notice, but fifty fliers actually launched something and there were at least that many spectators enjoying the show.

Piere Miller's Bumper-Wac at liftoff (Rick Gaff photo)

It was a good show too. Over 250 flights were made, including 1 staged and 8 clustered flights. Food containers, UFO's, Military Leaders, boost gliders, radio controlled rocket gliders, Sputnik's, Alpha's, Star Wars, and blood sucking mosquitos were just a part of the amazing amount of diversity that is evident in this club. I saw at least 4 drag races, one really cool CATO where the burning propellant and the rocket body went about the same height; there were no fires, and everyone had a really great time.



The top 5 fliers were: Will Hirsbrunner (26), John Barrett (16), Jonathan Charbonneau (15), Ken Goodwin (12), and Bill Piva (10). I don't know if Will was flying alone or with his family, there were a lot of drag races on his flight cards so I suspect he wasn't alone. It doesn't matter though, that's still an impressive number of flights in just a few hours. There were many families out flying together, which is something that NIRA encourages.

Ben Romashko put up three flights on his Initiator, two using F20 Econojets and one with an F50 Blue Thunder. I wasn't paying attention to the LCO on one of the flights and the sound of the F20 really startled me. Another flight that got a lot of attention was Norm Dziedzic's "F.A.O. Schwartzkopf". This is one of those big lawn ornaments you see at Christmas, the soldier. Norm used fins shaped like Christmas trees, and the finished "oddroc" really looked fantastic. For the first flight Norm used an F62-4. The rocket boosted perfectly, with a straight flight, a little bit of a tail slide, and had a good recovery. He flew it again later in the day with a G80 Fast White Lightning. Once again, I had my back to the pads and was caught by surprise at the sound.

There were at least 13 glider flights made during the day, including several Flat Cats, a Zoomie, a Deltie, an HL20 Lifting Body, a Transwing, an SR-71, and Tom Pastrick's Tantrum – a folding wing RCRG. The SR-71 belonged to Larry Biegel, and I'm assuming it was the Hobby Labs model since he was flying it on E15-PW motors (plugged White Lightning). According to the flight cards he made 4 flights with this model!

For those of you who like to know these things, above is a graphshowing the breakdown in impulse and flights (for staged and clustered flights the total impulse of the motors used was calculated).

Adam Elliot holds the results of one of his flights – sorry.… (Rick Gaff photo)

Sadly, no one flew a Micro Maxx. If they had then we would have covered the impulse range that Greene Valley can support.

Our next launch won't be until May, but the good news is that we have new insurance! This will give us time to build more rockets, so expect the May launch to be a busy one.

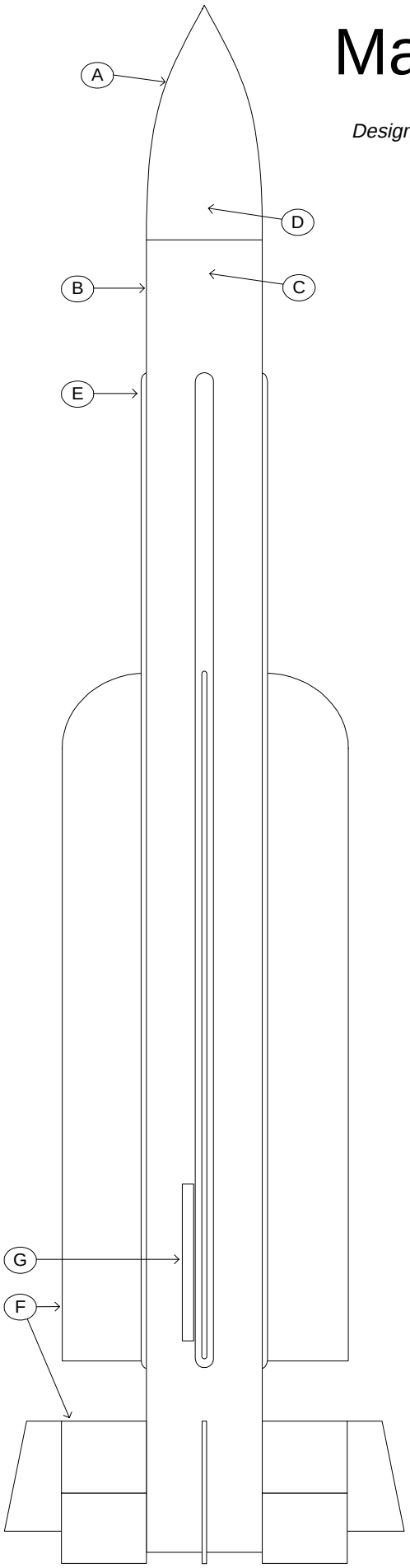
Norm Dziedzic, his F.A.O. Schwartzkopf and a friend watch a flight. (Rick Gaff photo)

Pierre Miller preps his Bumper-Wac, a model of the month winner. (Rick Gaff photo)

Matra Super 530d

French Air-to-Air Missile

Designed by Mark Kotolski (NAR 35707), Plan #021599



Parts List:

A. Nose cone BNC-20B *
B. Body tube BT-20 x 211mm
C. Small Screw Eye
D. Lead Shot (nose weight)
E. Index Card Stock
F. 2mm Balsa Fin Stock
G. Launch Lug, 4mm x 25mm
H. Motor Tube, BT5 x 45mm
I. CR520 Centering Rings (2 needed)
J. EB5 Thrust Ring
K. Shock Cord, 300mm Kevlar String
L. Shock Cord, 4mm x 300mm Elastic
M. Parachute, 300mm

* or turn your own to scale shape shown

Specifications:

Length	250mm w/scale nose cone
	260mm w/stock nose cone
Diameter	18.4mm
CG	102mm from front edge of body tube

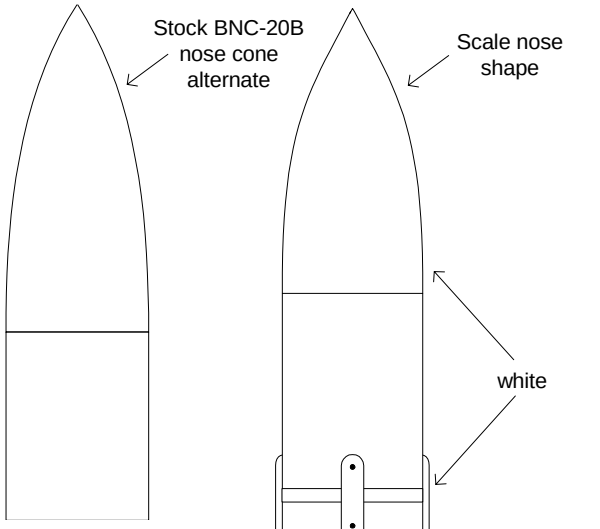
Recommended Motors:

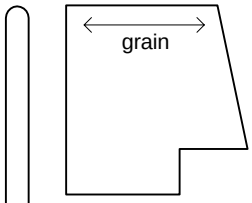
1/2A3-2t A3-4t A10-3t

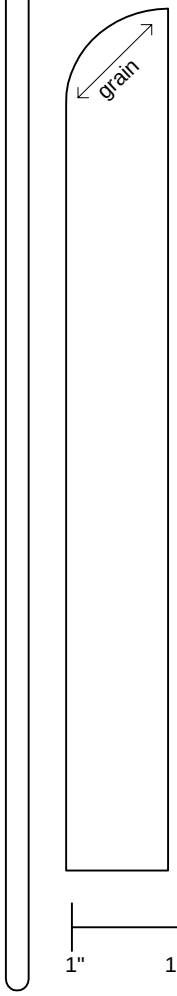
Construction Steps/Hints:

- Tie the elastic shock cord to the Kevlar cord ala Quest.
- Tie the Kevlar cord to one of the 520 centering rings.
- Assemble the motor mount as shown in the diagram. Position the thrust ring so 6mm of the motor will stick out.
- Glue the ring with the Kevlar cord attached to the same end of the tube as the thrust ring, and flush with the end of the tube.
- Glue the motor mount into one end of the BT20 body tube.
- Mark the body tube with four fin lines extended the full length of the body tube.
- From index card stock, cut out the 3mm x 161mm fin standoff strips. Round off both ends of the strips.
- Glue the standoff strips, centered on the fin lines with the bottom end 29mm from the motor end of the body tube.
- Cut out four each of the rear and forward fins. Sand the fins smooth and round the edges as desired.
- Glue the bottom fins on first. The leading edge of the fins are positioned 22mm from the motor end of the tube. Make sure the fins are positioned 90 degrees to the tube.
- Glue the forward fins on next. These are centered on the standoff strips with the bottom of the fin positioned 32mm from the motor end of the tube. Make sure these fins line up with the rear fins as close as possible.
- Apply glue fillets to all the fin joints.
- Glue the launch lug to one of the fin/tube joints just forward of the end of the forward fin.
- Decide if you will use the stock nose cone or a scale cone. To balance the model, weight will be needed in the nose cone. On the prototype, four holes were drilled into the base of the nose cone as deep as possible and then filled with lead shot and CA'd in place. The screw eye was then inserted and also CA'd in place.
- Tie the elastic shock cord to the screw eye.
- Attach the parachute to the nose cone.
- Sand and seal the nose cone and fins until satisfied with the finish.

The Matra Super 530d as painted for the Indian Air Force. The nose cone is white with three yellow bands around a gray body.





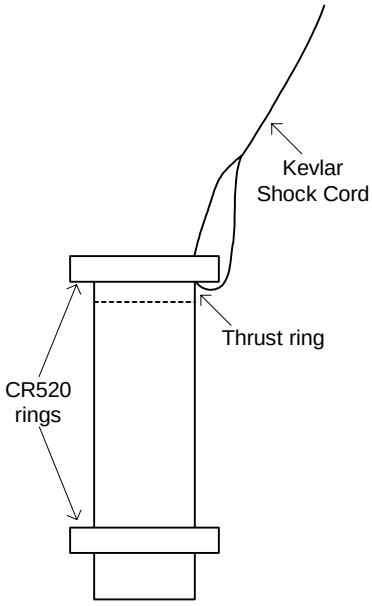


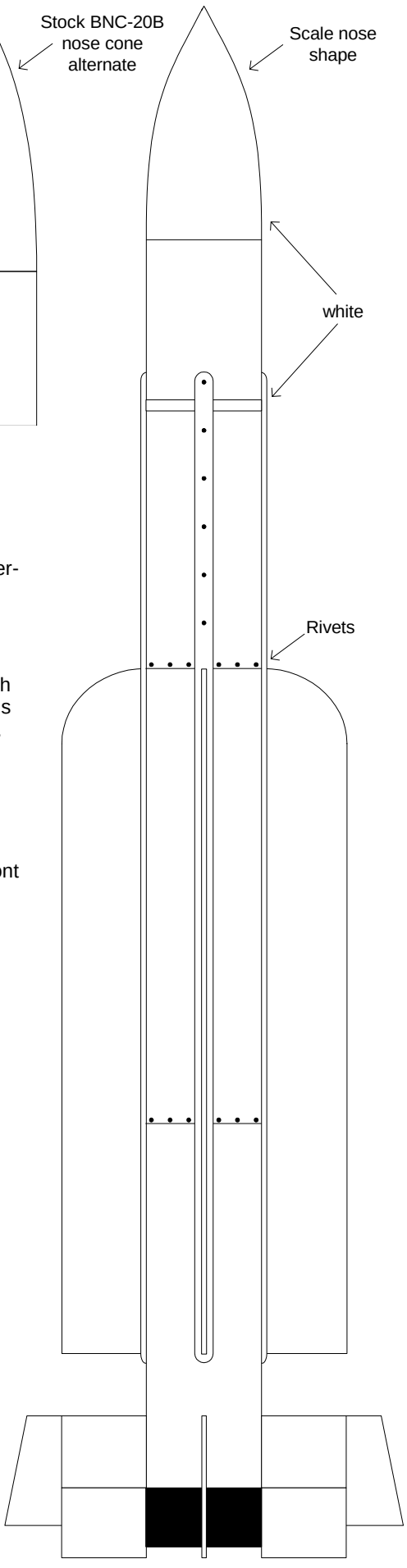
Painting and Details:

- The Matra is painted medium blue or light gray overall, except the nose cone which is painted white..
- The read 10mm of the body tube is flat black.
- The forward stripe on the tube is white, 2mm wide and positioned 29mm from the front of the tube.
- The joint lines on the body tube were drawn on with an Extra Fine Tip Black Sharpie Marker at positions 68mm and 144mm from the front of the body tube. The rivets and the bottom fin lines are done with marker also.

Before Flying:

Balance the model with an A3-4t or A10-3t motor in place. The Matra should balance 102mm from the front of the body tube, **not** from the tip of the nose cone.





Space Launch Report for September-October 2000
by Tim Johnson

There were 21 successful space launches during September-October. Recently dormant launch pads at Kennedy Space Center (KSC) buzzed with International Space Station (ISS) activity. Kourou, French Guyana also sprang to life, starting what has become an annual ritual for Arianespace - the end of year commercial launch surge. Busiest, however, was Baikonur Cosmodrome, Kazakhstan, which hosted nine launches during the period to reemerge as the world's busiest spaceport. The final Baikonur launch orbited the first permanent ISS crew.

Atlantis at takeoff for mission STS-106
(NASA photo)

NASA ISS Logistics Missions

NASA Space Shuttle program embarked on a long-delay, once- per-month ISS logistics effort when Atlantis (OV-104) lifted off from KSC LC 39B with a crew of seven on September 8. Mission STS-106/ISS-2A.2b continued preparation of ISS for permanent occupancy. Aboard were Commander Terrance Wilcutt, Pilot Scott Altman, and Mission Specialists Edward Lu, Richard Mastracchio, Daniel Burbank, Yuri Malenchenko, and Boris Morukov. Atlantis docked with ISS on September 10, undocked September 18, and landed at KSC on September 20. The crew performed a space walk to connect cables to the newly arrived Zvezda Service Module, delivered nearly 3,000 kg of supplies, and installed batteries, power converters, a toilet and a treadmill on the station.

Shuttle Discovery (OV-103) lifted off from LC39A on October 11 for the vital STS-92/ISS-3A mission. Crew members included Commander Brian Duffy, rookie Pilot Pam Melroy, and Mission Specialists Leroy Chiao, Bill McArthur, Dr. Jeff Wisoff, Mike Lopez-Alegria, and Koichi Wakata of Japan's NASDA. STS-92, the 100th Space Shuttle launch and Discovery's 28th mission, docked with ISS in its 380 km x 51.6 deg orbit on October 13 at Pressurized Mating Adapter 2 (PMA-2) on Unity's Y+ port. The crew performed four space walks to attached the 8,765 kg Z1 truss base structure to Unity's +Z port and the 1,156 kg PMA-3 to the -Z port. Discovery undocked on October 20 and, after a two-day delay caused by bad weather at KSC, landed at Edwards AFB, California on October 24. It was the first Edwards shuttle landing in 4.5 years.

Proton-K/DM3 flight with the Sirius 2 communication satellite.
(International Launch Services photo)

Arianespace Fall Launch Surge

Four Arianespace missions orbited five satellites during the period. On September 14, the sixth Ariane 5G (A506) performed dual payload mission V130 from Kourou ELA 3. The 2.5 stage rocket put 2,070 kg GE-7 and 3,307 kg Astra 2B into a 560 x 35,926 km x 7 deg geosynchronous transfer orbit (GTO). Astra 2B separated first. GE-7 deployed later from within the Sylda dual payload carrier.

Ariane 4s flew from ELA2 on September 6, October 6, and October 29. The first, an Ariane 44LP, put 3,250 kg Astrium-built Eutelsat W1 into GTO on mission V132. The second, an Ariane 42L, put Japan's N-SAT-110, a 3,531 kg Lockheed Martin A2100-AX, into GTO on mission V133. The 100th Ariane 4, a 44LP model, orbited $300 million Europe*Star on the third launch. The 4,167 kg SSLoral/Alcatel satellite also entered GTO. It was the 58th consecutive Ariane 4 success. 97 of the 100 Ariane 4s launched since 1988 have now succeeded.

A506 lifts-off on mission V130
(Arianespace photo)

Busy Baikonur

Nine space launches originated from Baikonur during September and October. As of October 31, the Cosmodrome had hosted 28 space launches during 2000, more than twice as many as runner up Cape Canaveral. Baikonur's launch total is starkly at odds with the oft-reported "Russian space collapse" story.

Launches included three commercial Proton-K/DM3 flights for International Launch Services (ILS), one military Proton- K/DM-2 launch, a military Zenit-2 flight, and one ISC Kosmotras Dnepr-1 demonstration launch. In addition, three Soyuz-U rockets flew. The first launched a military satellite. The second boosted the Progress M43 tanker to the Mir space station. The third launched Soyuz TM-31 with the first three-man ISS crew.

The Proton-K/DM3 launches carried the Sirius 2, GE-1A, and GE-6 communication satellites into orbit on September 5, October 1, and October 21, respectively. All three launches departed from Area 81 Pad 23, also known as LC81L. Two Block DM3 fourth stage burns put the 3,800 kg Sirius 2 digital radio satellite into a 6,192 x 47,057 km x 63.4 deg elliptical orbit. The latter two Protons carried out more standard DM3 two-burn GTO missions. GE-1A weighed 3,552 kg at liftoff. GE-6 weighted 3,800 kg. The GE-6 mission was the 17th successful ILS Proton flight in 18 attempts, and the 13th Proton launch of 2000.

A Proton-K/DM-2 put three 1,451 kg Global Navigation Satellite System (GLONASS) spacecraft into circular 19,120 km x 64.8 deg orbits on October 13. The three-stage Proton put the Block DM-2 stage and payloads into a parking orbit. Block DM-2 then performed two burns to put the three spacecraft into operational orbits.

A two-stage NPO Yuzhnoe 11K77 Zenit 2 launched Kosmos 2372, a Russian Ministry of Defense satellite, into a 64.8 degree inclination LEO from LC45L on September 25. Analysts said the spacecraft might be a new digital image reconnaissance platform named "Enisea".

The second Kosmotras Dnepr-1, a converted R-36M ICBM, orbited five small satellites from Area 109 on September 26. The rocket lifted off from an underground silo, using a "cold launch" procedure that blasted the missile 40 meters into the air where the first stage ignited. An ICBM maneuvering bus third stage orbited and deployed the payloads, which included SaudiSat-1A and 1B, MegSat-1, UniSat, and TiungSAt-1, experimental microsats from Saudi Arabia, Italy, and Malaysia.

Kosmos 2373 was boosted into a 70.4 degree LEO by a Soyuz-U launched from LC 31 on

*(**Space Launch Report** continued on page 9)*

(*Space Launch Report* *continued from page 8)*
September 29. The satellite may have been a military geodetic spacecraft.

Another Soyuz-U launch Progress M43 from LC1 on October 16. Progress M43 carried 2,318 kg of fuel and 532 kg of supplies to the unmanned Mir space station. Progress boosted Mir's orbit to extend station's life into early 2001.

Yet another Soyuz-U orbited the Soyuz TM-31 spacecraft toward ISS from LC1 on October 31 with the first ISS crew. Cosmonauts Yuriy Gidzenko and Sergey Krikalyov and astronaut Bill Shepherd docked with ISS two days later to begin the Expedition One mission.

Expedition One crew leaving for the ISS. (AP Photo)

Titan 23G-13 Launches NOAA-L
A refurbished Titan 2 ICBM boosted National Oceanic and Atmospheric Administration's NOAA-L into sun synchronous low earth orbit (LEO/S) on September 21. Titan 23G-13, a two stage Titan fitted with a Star 37XFP apogee kick motor third stage, launched the 2,232 kg environmental monitoring satellite from Vandenberg AFB SLC 4W. The rocket was the 10th refurbished Titan 2 ICBM launched by the U.S. Air Force since 1988. Only four more remain.

Pegasus / HETE-2
The 30th air-launched Pegasus rocket orbited NASA's 130 kg High Energy Transient Explorer 2 (HETE-2) on October 9. It was the first space launch staged from Kwajalien Missile Range, located in the mid-Pacific Marshall Islands. From Kwajalien, the 6th Pegasus launch site, the 10th Orbital Science Standard Pegasus was able to boost HETE-2 into near-equatorial LEO. It was the 16th consecutive Pegasus success.

Atlas 2A (AC-140)/DSCS B11
AC-140, a Lockheed Martin/ILS Atlas 2A, launched DSCS III B-11 into GTO from Cape Canaveral's SLC 36A on October 20. The $80 million rocket, with a 3.4 meter diameter payload fairing, used a standard two-burn Centaur mission to orbit the $200 million, 2,692 kg satellite. AC-140 was the 6th Atlas 2A launch of 2000, the 50th consecutive Atlas 2/2A success, the 130th Atlas Centaur launch, and the 53rd consecutive success overall. Only 10 more Rocketdyne- powered Atlas 2A rockets remain.

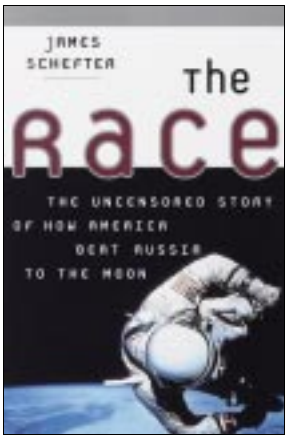
Sea Launch Zenit 3SL/Thuraya 1
The fifth Sea Launch Zenit 3SL orbited the heaviest-ever commercial comsat from LP Odyssey on October 21. Thuraya 1, a 5,108 kg Boeing Satellite System (formerly Hughes) HS-GEM satellite, separated from the Ukrainian/Russian rocket's Block DMSL third stage into a 6.3 deg GTO about two hours after liftoff. Thuraya 1 has a big 12.25 meter deployable antenna possibly derived from classified U.S. military spacecraft. It was the fifth Zenit 3SL flight and the fourth success.

The 5th Sea Launch rocket sits on Launch Platform Odyssey. (Sea Launch photo)

Two Launches from China
A Long March 4B (CZ-4B) orbited the China Resource 2 (ZY-2) satellite from the Taiyuan Satellite Launch Center on September 1. The three-stage rocket was the third of its type. The 2,000 kg-class spacecraft entered LEO/S. A CZ-3A launched the Beidou ("Northern Dipper") experimental navigation satellite into GTO from Xichang LC1 on October 30.

Bunny's Book Beat: "The Race: The Uncensored Story of How America Beat Russia to the Moon", by James Schefter

Review by Mark 'Bunny' Bundick



Our story begins in the wilds of Grand Forks, North Dakota, with four teenage boys discussing the American humiliation from Sputnik's launch. They gaze up into the night sky, and watch the Russian satellite pass over, then debate their upcoming futures. All four went on various distinguished careers, in science, business. Author Jim Schefter went on to journalism school and then received a plum assignment. He became one of Time-Life correspondents covering the space race. Time-Life, in the early 60's had front row and behind the scenes access to America's space program, both astronauts and engineers.

After reading this book, you'd wonder how Time-Life got any decent or accurate reporting on spaceflight with this guy at ground zero.

The book follows the standard Mercury, Gemini and Apollo timeline. The storyline weaves between Houston, Washington and Balkinour through the standard events most of us rocket buffs know: The Sputnik launch, the Vanguard failure, Yuri Gagarian's flight, Alan Shepard and John Glenn, the speedy triumph of Gemini, the Soyuz 1 and Apollo 1 disasters and the Apollo 11 landing.

If you'd not heard this story before, you might find the account here perfectly reasonable and entertaining. For us space buffs, it is a sad disappointment in two respects. Scattered throughout the story are annoying factual errors. The B-29 was a perfectly adequate airplane but it no more dropped the X-15 than the Wright Flyer. Also, for a Time-Life reporter, Mr. Schefter offers no new stories, no insightful commentary or humorous incidents to space history. It's the play by play with no color analysis at all. You'd think if anybody would have had the inside track, it would have been Life magazine, right? Can't tell it by this book.

Bunny's Rating: 1 out of 4 rockets. If you really must read this, try the local library (or buy my copy!) You can safely pass this lukewarm rehash of the standard Apollo chronology and save the money for some engines, or certainly better books.

The Race : The Uncensored Story of How America Beat Russia to the Moon
by James L. Schefter
Hardcover - 304 pages (06/1999)
Publisher: Doubleday
ISBN: 0385492537
List Price: Out of Print

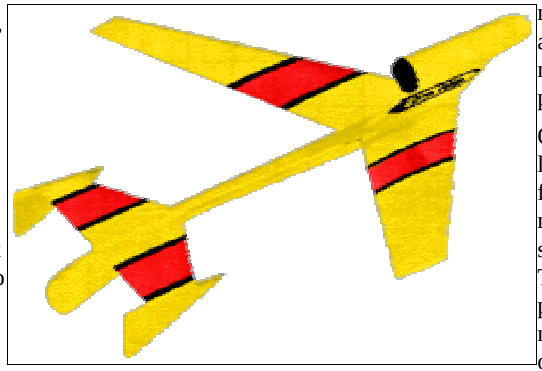
Paperback - 336 pages (06/2000)
Publisher: Anchor Books
ISBN: 0385492545
List Price: $14.00

Estes Falcon Revisited
by Mark "Bunny" Bundick

When Ric Gaff and I discussed models for NARAM-42, to be held on property owned by Vern Estes, we agreed we should fly as many old classic Estes kits as we possibly could in the contest. Given the A Boost Glide event, that meant revisiting a model I've long thought had great potential for NAR contests, the Astron Falcon.

Longtime NIRA members will recall I wrote an earlier Leading Edge series on a Falcon "upgrade", which I named the "Millenium Falcon." Nearly 40% larger, the model, when it worked did well, but boost trim was inconsistent. I couldn't sort it out at the time, so I went back to conventional models.

I still thought the Falcon type model held great potential. A Falcon has only 10 parts if you drop the tip plates, including the nose cone, body tube and launch lug. There's no pop pod to get hung up on the model, and prepping is a breeze. How can I make them boost right?



In a visit to NAR HQ, I had a conversation about BG's with Kevin Stumpe, longtime NAR member and husband to hard-working NAR HQ manager, Marie. He let me in on his secret for getting Falcon's to boost and glide properly. When he found out I was warping my stabilizers to get glide trim, he laughed and said "put the incidence all in the wings, Bunny". By putting the incidence in the wings, closer to the boost CG, you reduce the moment arm the incidence operates through. When the engine ejects, you shift the CG to the rear, extending the moment arm for the incidence to work and get good glide trip. I vowed to apply Kevin's advice in my next Falcon.

How much incidence? I started with 3 degrees, and that turned out to be roughly 1/8" over the Falcon's wing root edge. I thought that was too much so reduced it to 3/32". How to make sure that I got exactly 3/32" of incidence, and more importantly, got it exactly the same on both sides of the model?

I cut two rectangles of 1/16" balsa as long as the root edge of the wing. I traced the Falcon airfoil of the completely sanded wings onto these two rectangles. I then cut the 3/32" slope into the top portion of the rectangle, cut out the airfoil tracing, and glued the rectangles onto the fuselague in the wing positions. After those dried, I glued on the wings into these cutouts. Voila! Instantly equal incidence!

Two final modifications were made in the Falcon's engine pod set-up.

When I attached the BT-20 to the pylon, I first constructed an alignment jig to get things pointed in the right direction. I centered a 1/8" dowel into an expended engine casing. I installed the dummy casing into the BT-20 and then used the dowel to make sure the thrust line was in the right spot. To roll out any misalignments, I canted the pod to the left, with the dowel displaced off the center line about 1 1/2" or so.

To accomodate mini-engines, I built an engine mount out of two centering rings, and a piece of BT-5. I wrapped a 1" wide crepe paper streamer between the centering rings for a "Pink Book legal" recovery, then wrapped lead foil around the forward section of the BT-5 to move the boost CG even further forward. Solder would also have worked here. By adding that weight, my mini-engine / pod combination weighed within 3 grams of what an 18MM A8-3 did, and I thought the boost would be OK.

Onto the field. Glide trim required a fair amount of tailweight. Next time, I'll hollow out the nose cone, and switch to that 1/8" of incidence! The boosts were fantastic, nicely rolling, so the next model I try will have a bit less displacement in the engine pod alignment.

One bad glide trim left us with a 20 sec. flight, but the second model drifted out of sight in 66 seconds. The two flight total put us about 6th or so, not bad for a 35 year old design. I think this bird's got a lot of life left in it as a simple, but reliably competitive BG for local and even regional meets. The only downside to the model is its size. At only 22 sq. in., it's kind small for even A BG, and if you built one stock using 18MM engines freely ejected, I can't imagine seeing one of these at ejection under B4-2 power! This bird really scoots and gets up there!

Long gone from any Estes catalog listing, you can still find the plans at the famous Jim Z website. Point your browser to:

http://www.dars.org/jimz/estes/k-13.pdf

and get a complete set of instructions, a parts lists and the patterns for the balsa bits. If you build the Falcon, I recommend building two at once. You'll not spend that much more time than it takes to build one. Even if you chose not to fly it as your primary contest glider, you'll have a reliable backup in the model box if you lose or break your main BG. You'd also have a nice sport glider to fly at Green Valley next summer.

"Gaffer, what to fly in SD? Hey! Look at this old catalog. Let's try the Astron Mark...."

Confused Stages – Stage 16
by Jonathan Charbonneau

Half Scale? Semi-Scale? Full Scale? Whole Scale? Super Scale? Sports Scale? Fun Scale? Discombobulated over all of these "scale" terms? Read on, this stage will put everything to layperson's scale.

Semi-scale: This term refers to a model rocket or high power rocket that isn't exactly scale, but is a good representation of an actual rocket. Its fins may be oversized and/or placed farther back then where they should be. Its airframe may be overly long. Its nose may be too long or too short. Such scale errors are done intentionally to make the rocket stable.

Half Scale: This refers to a scale model that is one half (1/2) the size of the real rocket. One inch (centimeter) on the model represents two inches (centimeters) on the real rocket.

Full scale: This means that the model is a dully accurate and true scale model. All parts are in the same proportion on the model as they are on the actual rocket.

Whole scale: This refers to a scale model that is the same size as the real rocket. Literally. One centimeter on a whole scale model represents one centimeter on the real rocket.

Super Scale: Perhaps the most challenging of all NAR scale events. A scale launcher is required in addition for the scale model rocket.

Sports scale: This is the easiest of the scale events. Simi-scale models can be flown in this event. A photo of the actual rocket is all that is required for substantiating data. Also, mission points can be earned for things like staging, clustering, spin, payload, returning data, etc.

Fun scale: This is a scale model rocket that isn't competition worthy (e.g. missing the lower stage). Fun scale models are built just for the fun of it.

Welcome to the Club!

Brett Crapser; Sam Martinez; Paul, Trudy, Luke, Carolyn and Mark Regan; Scott, Shari, Ian, Rachel and Colin Town; Bridgette, Lee and Jack Vission have all joined NIRA in the past few months.

Welcome to the club!

NAR Call for Agenda Items
Mark Bundick, President NAR

The NAR Board of Trustees will hold its Winter meeting February 9-10, 2001, in Phoenix, AZ. NAR members who wish to place items on the agenda are invited to email those to me not later than January 10, 2001.

Email: mbundick@earthlink.net

Pegasus-XL Scale Model Now Shipping from Rocket Vision!

(Rocket Vision Press Release) Rocket Vision announces the long-awaited release of its flying 1:17 scale model of the Pegasus-XL Booster. The Pegasus is the first of the company's Space-Now line, which models cutting-edge private sector space technology. The model, which has a non-spiral phenolic airframe and injection-molded plastic components, is available exclusively from us and retails for $79.95. To see the Pegasus, go to: www.rocketvision.com

The Pegasus marks several landmarks for Rocket Vision.

- First of the Space-Now line
- First of our models to be designed using computerized solid modeling techniques
- The most complex tooling of any Rocket Vision kit
- The heaviest of Rocket Vision's kits, weighing in at 3 lbs. (Grymm, the next-heaviest is a comparatively light 1 lb.)

The mid-body wing fairing presented a significant challenge to Rocket Vision's engineering team. Kevin Reed, Pegasus Project Lead, commented, "Although the kit is 'sport scale,' the model is close enough to the original rocket's configuration that we reproduced many of the same aerodynamic effects Orbital Sciences had to deal with to make their prototypes fly correctly as rockets. Where Orbital was able to use active guidance, we had to use passive aerodynamic techniques for our solutions. It was a challenge that took many iterations to solve."

Rocket Vision's Pegasus will make a strong impression at any launch. It stands 38.7" tall, has a 2.88" airframe diameter, and the center wing has a 14.85" diameter. The three rear fins create a footprint of 8.7". The model comes equipped for 24mm propulsion and the recommended motor is a Flight-Star G55-5, which will produce flights of 900-1000'.

NARAM-42 Announcement
John Viggiano, Contest Director

This is an official announcement from the NARAM-43 Committee

NARAM-43 will be held 4-10 August 2001 in Geneseo, NY, home of NARAM-37, NSL-97, NSL-2000, and NYPOWERs '93, '94, '96, '97, '98, '99, and 2000.

We are pleased to announce the events card for NARAM-43 has been approved by the NAR Contest Board. We shall be flying:

- 1/2 A Boost Glide Duration
- 1/2 A Flex Wing Duration
- A Streamer Duration
- D Helicopter Duration
- A Altitude
- C Eggloft Altitude
- B Super Roc Altitude
- Research & Development
- Sport Scale

Please note that Streamer Duration has been changed from C, as planned and announced as pending Contest Board approval. The NAR Contest Board has approved the card of events which appears here. We apologize for any inconvenience which the change may cause.

The official meet hotel is the Rochester Ramada Inn, 800 Jefferson Road, Rochester, NY 14623. (It is actually located in Henrietta, with convenient expressway access.) The phone number is: (716*) 475 - 9190. We have negotiated a group rate of $62 per night for a block of 80 rooms to be held until 1 July 2001. Mention that you are a participant in "NARAM" when you make your reservations directly with the Inn in order to obtain the group rate (pending availability).

If you have further questions, please do not hesitate to e-mail jsvrc@rc.rit.edu, or phone (716*) 239 - 6046.

John Viggiano
NARAM-43 Contest Director

***** Please note that the area code for the NARAM-43 area will change in early 2001. We shall include the new area code in a future announcement.

TIP: Make 'Estes' nose weights
Mark Kotolski (NAR 35707)

Make your own lead nose weight discs like the old Estes type. Use Water Gremlin brand (or similar) Round Split Shot (various weights available), flatten it with a few mild hammer blows on a flat, hard surface. Drill an appropriate size hole through the middle for the screw eye.

I figured this out too late for the Matra, but have used it on several other models with small diameter balsa nose cones. Much easier than drilling holes in the nose cone and trying to stuff shot into them.

NAR S&T News

R66: NAR S&T NEW MOTOR CERTIFICATIONS

The following motors have been certified by NAR Standards & Testing for general use as model rocket motors effective October 12, 2000. All are certified for contest use effective December 11, 2000.

Public Missiles Ltd. Thrusters:
29mm x 98mm:

F50-6T (80.0 Newton-seconds total impulse, 37.9 grams propellant mass)

29mm x 124mm:

G40-4,7W (120.0 Newton-seconds total impulse, 55.1 grams propellant mass)

G80-4,7t (120.0 Newton-seconds total impulse, 56.9 grams propellant mass)

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

Jack Kane, Chairman

R67: NAR S&T NEW MOTOR CERTIFICATIONS

The following motors have been certified by NAR Standards & Testing for general use as model rocket motors effective October 25, 2000. All are certified for contest use effective December 24, 2000.

Rocket Vision Flight-Star:
24mm x 124mm:

F32-5,10,15 (80.0 Newton-seconds total impulse, 37.7 grams propellant mass)

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

Jack Kane, Chairman

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.

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

More Photos from the Rocket Make-it-Take-it at the 2000 National Model and Hobby Show

(Bob Kaplow and RickGaff photos)

C/O Jeff Pleimling
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!