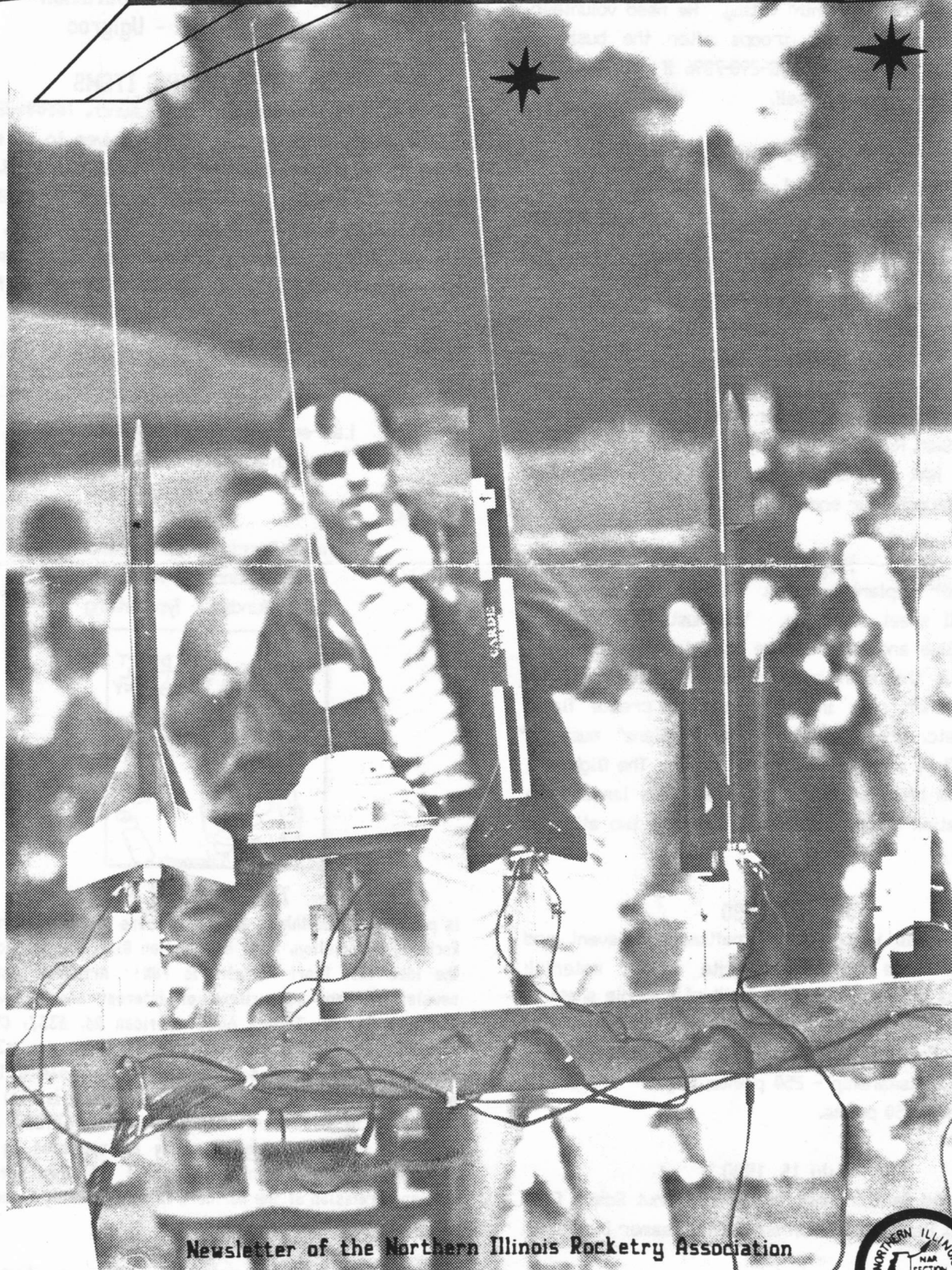


THE LEADING EDGE



Newsletter of the Northern Illinois Rocketry Association

Volume 13, No. 3
May/June 1990



T Minus 1 - NIRA Events

MONTHLY MEETINGS

All meetings start at 7:30 PM, and include refreshments, entertainment and a brief business meeting. Don't forget a model for "Model of the Month" voting. We need volunteer speakers to entertain the troops after the business meeting, so call Ric Gaff at 708-298-7896 if you can help with ideas or can speak yourself.

May 4, 1990 - "Idea Box"

Lawrence Bercini will lead off with his ideas on postflight operations. Other ideas on any other topics are welcome.

June 1, 1990 - Currently open

July 6, 1990 - Currently open

1990 "LAUNCH" DATES

All launches or other activities start at 2:00 PM. Our launch site is located at Ackerman Park, intersection of St. Charles and Swift Roads in Glen Ellyn. BYOL (bring your own launcher). NAR Insurance required or else RSD must inspect and launch your model.

May 20, 1990

A Engine Paper Airplane Duration. You will be supplied with a 8 1/2 x 11 sheet of paper. You must FOLD a paper airplane. Glue and tape can be used to keep the plane together, but the main mode of construction must be FOLDING. Minor cuts in the paper to create flaps, elevators, etc. are allowed. The "airplane" must be carried aloft by a rocket with an "A" motor. The flight will be timed from liftoff until the paper airplane lands. The longest duration on a single flight wins and two attempts are allowed.

June 17, 1990

Posterroc. This is our first craftsmanship event and features Lawrence Bercini's favorite oddroc material: poster board. The model must be built of a single sheet of poster board, with actual design left to the imagination of the builder. Points will be awarded as follows: Creativity - 500 points; Craftsmanship - 250 points; Flight - 500 points; Safety/Damage - 250 points.

July 15, 1990

NAR Sanctioned Section Meet featuring Peanut Scale, Open Spot Landing, Random Duration and 1/2A Streamer Duration.

August 19, 1990 - Structural Separation
September 16, 1990 - Sports Scale and Rendevous
October 21, 1990 - Team Duration
November 18, 1990 - Uglyroc

OTHER INTERESTING ITEMS

August 4-11, 1990 - National Sport Launch, NARAM-32, and USA-USSR Team Flyoffs, Dallas, TX; FAA Waiver to be sought for the Sport Launch, but only NAR legal models (3.3 lbs) please. NARAM events: 1/2A PD (Multi Round), 1/2A HD, B RG, A SD (Multi Round), D DEL Alt., B SR Alt., C Alt., R&D, B BG, Sport Scale (A&B Div), Giant Sport Scale (C Div), Pred. Dur.; FAI Flyoff events: S3A (A PD), S4B (B BG), S6A (A SD), S8E (E RC RG), to select 5 members for the team; Contact Scott Hunsicker, Box 551592, Dallas, TX 75355.

CONTRIBUTORS

Lawrence Bercini, Bunny Bundick
Rich McBroom, Ric Gaff

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Barb Bundick - Artist
Bunny Bundick - Typesetting



THE LEADING EDGE

is published bi-monthly 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, other newsletters, and news items of interest should be sent to Lawrence Bercini, Editor, 6033 Sheridan Rd. #33J, Chicago, IL 60660. Send membership applications (dues are \$3.00/year, including a six issue subscription to the Leading Edge) and non-member subscriptions (\$5.00 per six issues) to Mark Bundick, 1350 Lilac Lane, Carol Stream, IL 60188. Any item appearing in the Leading Edge may be reprinted by American Space modeling with proper credit given; all other uses require written permission of the Northern Illinois Rocketry Association.

On the Cover

Mark "Bunny" Bundick announces a line up during NIRA's annual Labor Day Demo Launch

Box Score

Some NIRA members have suggested it would be an good, simple club project to keep a "box score" of our launches this season. All we'd like to do is count the number of flights we make at our monthly club launches, with a goal of making 500 flights this season. This is a simple way for you to get involved in a club project! Just make sure the RSD records your flight at the club launches. That's all there is to it! What could be simpler? As we progress through the flying season, we'll post the "Box Score" in the Leading Edge. Our current launch total is 46. Bring an extra engine or two to the next launch and help us reach our goal of 500 flights this summer.

Club Records

NIRA members are invited to try and set club records in competition events. We're talking duration only, but you can try at any club launch. We'll maintain records for "Youth" and "Adult" division, and publish them right here in the Leading Edge. Just let Lawrence Bercini know you're trying for a record, and we'll arrange for the timers and record keeping.

Welcome to the Club!

NIRA welcomes the following new members: Dave Klever, Lisle; Christopher Mays, Wheaton; David Nelson, Chicago.

Model of the Month Winners

Congratulations to the March Model of the Month Winners: Mark Slusar and his Estes Crusader swing wing in Youth Division, and Lawrence Bercini and his Alien Explorer in Adult Division. Way to go, Mark and Lawrence!

Congratulations to the April Model of the Month Winners: Mark Slusar and his Geo Sphere I in Youth Division, and Rich McBroom and his Phoenix in the Adult Division. Nice models, Mark and Rich!

Refreshment Reminder

May - Recknagel Family

June - Sam Mulvey

July - Pee Bee's

Building Bullet's Basement

by Lawrence Bercini

NIRA's second installment of christening basements saw the regular gang descending on Bullet Bob's new workshop. Bob has an enviable set up with ample workspace, enough to handle the dozen modelers who showed up, armfuls of models, and plenty of chips, dips, cookies and M&M's.

V-3's were the favorite project at the session, with both Ric Gaff and Matt Price busily gluing fins. Ric even airfoiled his! Lawrence Bercini brought a large box of previously completed birds, and spent the entire session sanding "Stuff" off the balsa parts. One of the models was the new Estes Super Vega which generated lots of nostalgia interest from older members

Bunny had the loudest project. He and Bullet Bob were literally up to their armpits, trying to grind out the thrust ring of Bunny's Phantom. The Rabbit planned to get the model ready for an 1 1/2 inch long I motor at Darville Dare.

Sam Mulvey quickly completed his Tornado and spent time helping Don the Younger turn an Interceptor into something even more exotic. Andy Linder completed his Stealth quickly, then spent the remaining time practicing for Paper Airplane Duration.

Don the Elder laid claim to the second loudest project when he discovered the decals didn't fit his Gemini Titan paint pattern. He then turned to running his RC four wheel drive car around the tables and chairs. Thomas Price continued his Tasmanian Devil from the 1989 4-H building session.

Of course, no NIRA gathering would be complete without the wise-cracking, free flowing "humor" that superbly characterized this March "launch". OK. Somebody out there find a basement for next year!

NIRA Quotable Quote - Bunny, discussing the February NAR Board meeting: "I'm trying to find something meaningful!"

Basic Techniques

by Lawrence Bercini

In the last installment of "Basic Techniques", the topic of selecting and using sandpaper was covered. This next chapter deals with how to deal with problems that crop up during sanding and shaping.

The Enemies

The enemies you will encounter while you sand are: the edges of the sandpaper, grunge under the sandpaper, and nearby sharp objects. Any one of these enemies can gouge, dink, dent, scratch and otherwise screw up your beautiful smooth job.

A piece of used sandpaper will begin to crinkle and curl up at the corners and edges. Beware! As you move the paper across the fin, one of these edges can roll under and gouge as you go along sanding. Knowing that this may happen, you can prevent it by holding your sandpaper a different way.

Fold the paper in half, and hold the paper so that the two loose edges are held against your hand by your thumb. The folded edge is guided across the wood by the balls of your three middlemost fingers. If you can recall from the first part of "Basic Techniques", you also need to beware of the edges of the sandpaper on a sanding block for the same reason.

The second enemy lurks under the sandpaper as you work with it. The tiny particles being sanded off the wood's surface will roll around under the paper and the otherwise soft material will begin to clump into little hard knots that can scratch soft wood. This becomes even more of a problem each step closer to a finished model.

Sanding wood that has been filled or has a base coat of paint on it will form those little knots faster. Just keep in mind that this grunge is being formed all the time while you sand, and develop the habit of stopping frequently, blow and brush off the surface being sanded. While you're at it, hold the surface up so that light glares off the surface. This reveals any areas you missed in your sanding. Then take the

piece of paper, and wipe off any of the grunge that has stuck to its surface.

The last enemy, sharp objects, is one that can be avoided altogether with a little common sense. It's not too smart to be working with soft wood while wearing any type of jewelry. There you are sanding on one fin with one hand while your watchband on the other hand is doing a little shaping of its own. Also beware of fingernails, pets, children and where you lay your unfinished model. All these can be invitations to ruin your wood.

Dealing with the Problems

Now suppose that with all your care, old Murphy caught you and you scratched up your wood. What can you do?

The first thing that you can do is simply apply water to the area. Do this sparingly; you don't want to warp a fin. In many cases, the damage is merely a dent, and the water causes the wood fibers to swell. Often, when the water is dried up, the dent is gone. In more severe cases, the water will not cure completely, but will lessen the damage leaving less work to do to reinstate the smooth finish.

A problem water will not correct will need to be filled in. Balsa fillercoat and sanding sealer are usually ineffective in correcting deep scratches. A balsa putty is better. When using putty on a damaged area, use the putty only a little at a time, forcing it into the scratch. Let it dry thoroughly, sand it down, and inspect for places that need more filling. Repeat if necessary. Whenever filling dents in already painted wood, you must first sand the area all the way down to the wood, then apply the putty.

In summary, a little care will help you ward off your wood's enemies. Even still, with a bit of patience you can even correct their dirty work.

the Long Walk

a B SRD design by Robert and Rick McBroom

The name of this rocket is a take off on the PRC Long March vehicle, but it proved apt as a successful flight does indeed require quite a hike for recovery. It was first flown at the CSAR sponsored Red Baron meet last September, and Robert took first place with a 949 point series.

It is unusual in that it is not a maximum length design, the overall length being 169.5 cm with the engine installed. This does not appear to be a handicap, as it is capable of making up in duration what it lacks in length. However, if used for Altitude competition, I would suggest stretching it to the 200 cm max by substituting a PT-1830 for one of the PT-1818 tubes.

All the parts are from Apogee Components, except items 11-13. Items 11 and 12 can be obtained at your local hardware store. Surprisingly, no one lists a 13mm solid balsa bulkhead. You can either turn your own, or simply cut the shoulder off of one of Estes' balsa nose cones.

Start construction by installing the engine block in one of the PT-18 tubes. Attach the fins so that the trailing edges are set 1/4" forward of the end of the airframe. Use a jig to insure they are perfectly aligned. Use Hot Stuff initially, and then add SMALL fillets with 5 min epoxy. Use the AC-18 to join the second PT-18 to the assembly.

The AT-1318 transition is the separation point, so install the bulkhead flush into the PT-13, and then assemble the AT-1318 on the same end, spacing the CR-1318 rings 1" apart. Assemble the nose cone and glue it into the opposite end. Sand the nose cone to airframe joint smooth with extra-fine grit. Install the screw eye into the bulkhead to complete the assembly.

Rig the shock line externally, using the "Lariat Loop" method as explained in Apogee's catalog. Be sure to drill the hole in the airframe at least 1/4" aft of the engine block so that the shock line is not exposed to the ejection charge. Notch the CRs on the forward assembly so that the shock line doesn't cause it to bind and prevent ejection.

Make a 28" dia. octagonal parachute. It is essential that 1/4 mil material be used, for a 28" chute will not eject reliably if it is made of anything thicker. Using 1/4 mil material you can get reliable ejection of up to a 36" chute. Just be sure to use plenty of powder, especially if temperatures are low.

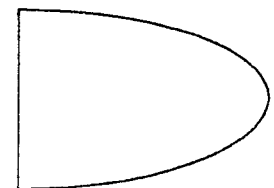
The lower airframe assembly should be suspended horizontally during recovery. Put a double wrap of mylar tape around the airframe at the burnout CG to accomplish this.

Use a B4-4 for propulsion, and a tower launcher. And be sure to have your walking shoes on!

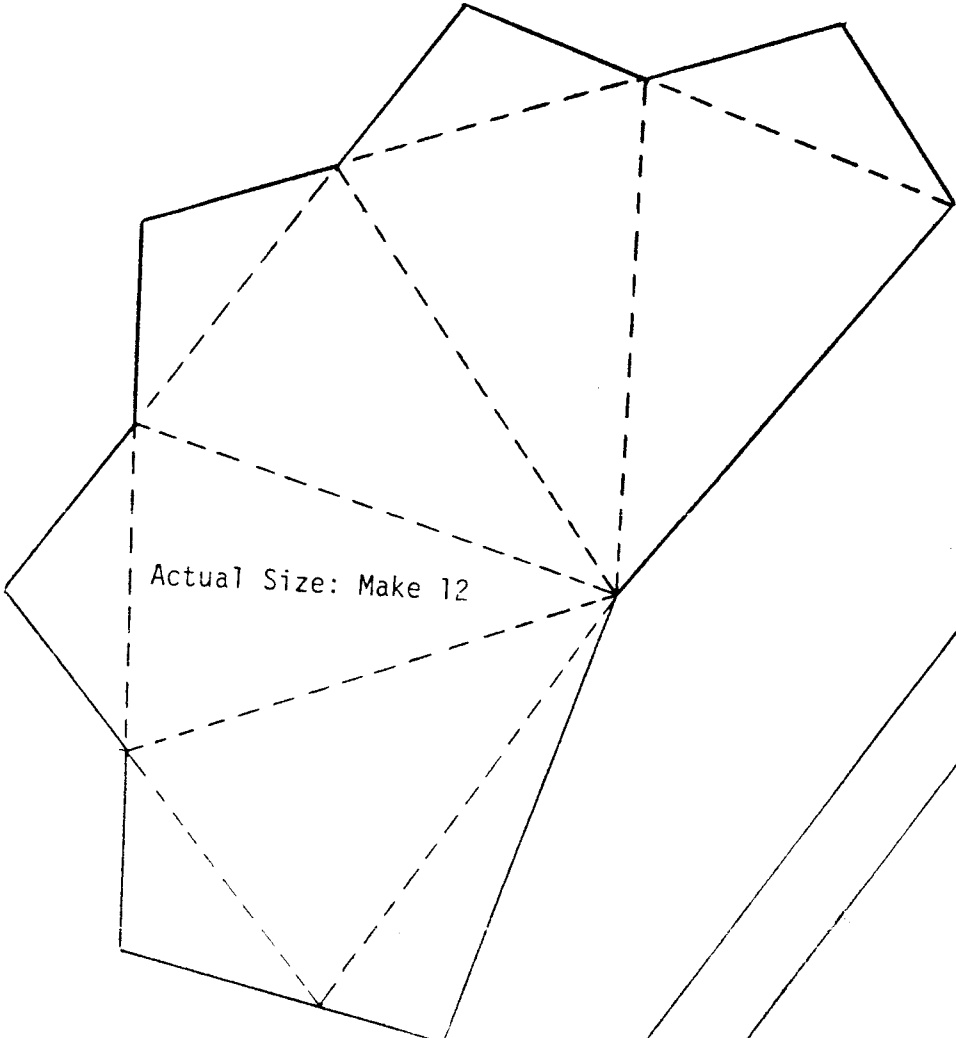
PARTS LIST

1. PT-1330 airframe tube, 1 pc.
2. PT-1818 airframe tube, 2 pcs.
3. PNC-13 nose cone, 1 pc.
4. GBS-15 fin stock, 1 pc.
5. AT-1318 airframe transition, 1 pc.
6. AC-18 airframe coupler, 1 pc.
7. EB-18 engine block, 1 pc.
8. KSL-50 shock line, 15 ft.
9. SL-1 shroud line, 28.5 ft.
10. AMT-50 mylar tape, 4.65 in.
11. 1/4 mil poly drop cloth 'chute mat'
12. small screw eye
13. 13mm dia. balsa bulkhead

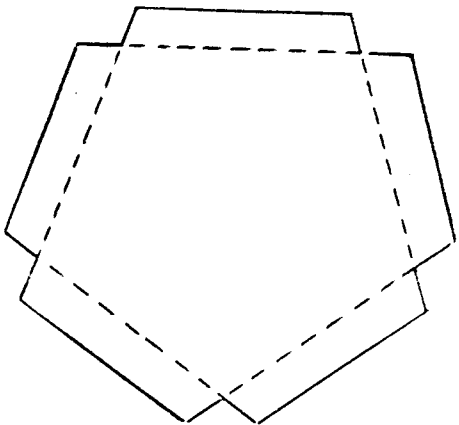
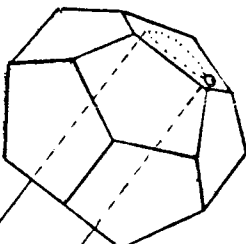
Full size fin template,
make three fins.



TRY
THIS ONE
FOR
POSTERROC!

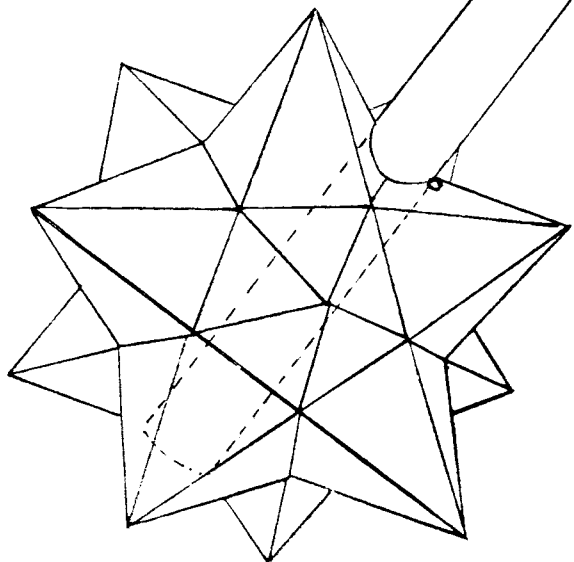


Actual Size: Make 12



Actual Size: Make 12

Cut on solid lines, Fold on dotted lines.



GRAVITATION

Robert H. Forbis II
NAR # 19519

Heard on the Street

Rumors and such, with apologies to the Wall Street Journal

Tally Ho - NIRA members wondering where Mike Junglass has disappeared to need look no farther than that hotbed of Estes expansionism, Great Britain. Assigned to a project in London by Bell Labs, Mike will probably be visiting there all during the summer. Somehow he's managed to squeeze in the development of a USENET bulletin board section on mod rocs between all those trips overseas.

Damn It, Jim! I'm A Doctor - Hearty and sincere congratulations to Tom "Sheik of the Payload Sands" Beach, who announced the receipt of his Doctor of Physics degree from Iowa State.

Tally Ho II - Our latest news from long-time member Larry London is that he has switched jobs from Volvo to a small research firm doing work in superconductivity in Radford, VA. His wife, Carol, continues work on her doctorate by studying composite structure thermal buckling at NASA's Langley Research Center in Hampton, VA.

Marcy Matriculates - Congratulations are due Tim Marcy on his graduation from Wheaton College with a BS in Chemistry. Ceremonies will be held 2 PM, May 20, in Edman Chapel, with overflow in Pierce Chapel via closed circuit TV. An open house follows at 5 PM at the Marcy Residence, 714 North Stoddard, Wheaton. Tim plans a year's work at the College's Honey Rock Camp in northern Wisconsin prior to grad school in aerospace engineering.

Going Higher - Aerotech announced price increases on many motors recently. The company also announced it will discontinue several motor offerings, including the D7, D8, E10, E28, E50, F15, F20, F41, and the non certified F101 and G60. Modelers need to order these discontinued motors while stocks are still available. Aerotech's "standard" line now runs from the D21 (\$695) to the G25 (\$1895).

Doggie Want a Bone? - JPL engineers tested a Mars rover vehicle prototype last month. The self-navigating vehicle, about the size of a small car, can pick up samples or manipulate tools and equipment with its robotic arms. Further tests will see if artificial intelligence can assist the vehicle since radio commands take 30 minutes to reach Mars. Initial tests went well, and plans are being made to move from the prototype to a fully operational production model of the planetary rover.

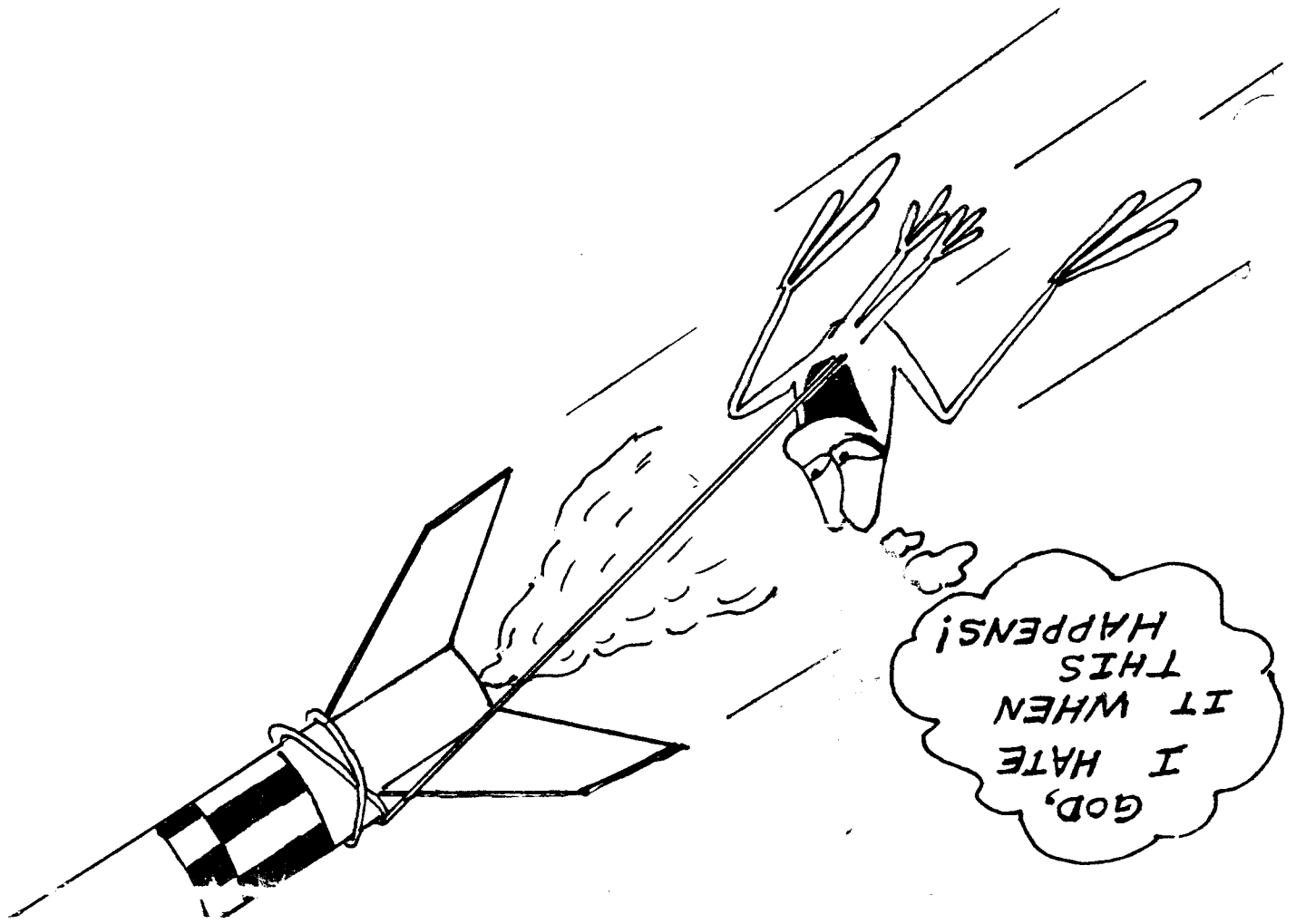
Small is Beautiful - Rocketflite, makers of the HPR G100 black powder HPR motor, are developing a Class C F motor. The motor is projected to contain 62 grams of propellant, burn for about 9/10 second and become NAR Certified. Also discovered at Danville DARE was LOC/Precision's discontinuation of some larger kits. The 7.6 and 5.5 inch tubing used in those kits has been exhausted, and LOC is considering downscaling some offerings. Rumors also abounded about an LOC scale line.

Damon Notes - Damon divested another subsidiary, its medical equipment manufacturer, for \$12.3 million. Funds from this sale and the sale of Estes will enable Damon to pay off a \$50 million bridge loan from A. G. Becker Paribas prior to the May 31 expiration of that loan.

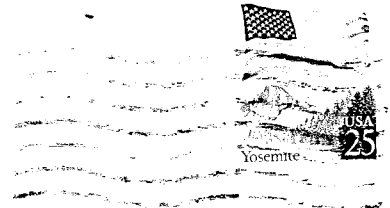
FBI Happenings - Reports continue to filter in about the FBI's investigations into Tripoli members. Recent efforts center on possible RC guidance systems using standard hobby shop helicopter gyros and Radio Shack components. Some of this research made its way into an 1986 RC magazine. Apparently, the FBI is simply gathering information about possible terrorist techniques, and further inditements are unlikely for now.

Take a Hike - NASA's Space Station Freedom program management officials are reviewing EVA requirements for the station, and will review their findings with Congress. Some engineers are suggesting routine maintenance will require 2,000 EVA hours per year and suggest that space walks totaling those hours will be too risky.

Taxi, Please - Rockwell and Lockheed lead the two teams contending for the design and construction of Space Station Freedom's Assured Crew Return Vehicle (ACRV). The basic contracts plus options, with the potential value of \$6 million each, will support efforts leading to the planned initiation of full-scale design and development of an ACRV system in 1992. The ACRV vehicle, continuously berthed at Space Station Freedom, would return crew to Earth in the event of crew illness or injury or other contingencies which cannot be supported by the Space Shuttle.



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