



The Upstate Rocketeer

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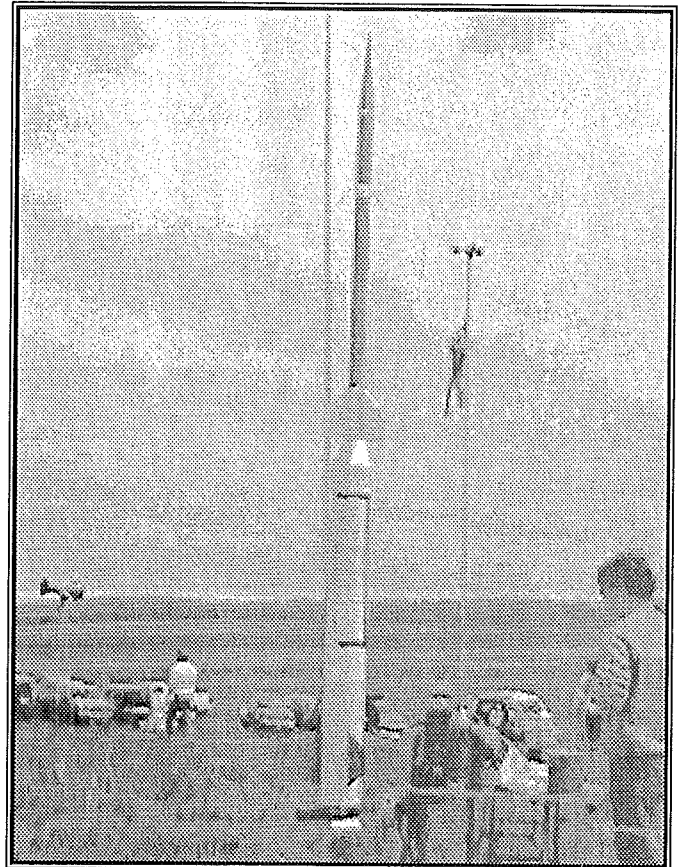


Dan Wolf poses with his 1/35 scale Little Joe I at ECRM-XXI.
"The monkey didn't survive." ➤

Meet Coverage by Dan Wolf and John Viggiano

ECRM-XXI was held under sunny Maryland skies the weekend of 23-24 April at Middletown Park, the site of last August's NARAM. MARS members in attendance were John DeMar, Ferenc Róka, John Viggiano, and Dan Wolf. We failed to repeat our stellar performance at ECRM-XX, settling for a few places (with no firsts).

Duration events (1/4A PD MR, A Helo, and C R/G MR) were flown on Saturday, with a light schedule (E Dual



John Viggiano's 1/12 scale Nike-Apache on the pad. ➤

Eggloft and Sport Scale) on Sunday. Event-by-event, the meet went as follows:

1/4A Parachute Duration (Multi Round)

Several people managed to get one max of 60 seconds. Only a team entry managed to get three. In C division, Ducky Klouser had two, sandwiched around a 37 second flight with a partially-opened chute. Ducky's models were fiberglass FAI-type models, about 35mm in diameter and boattailed down to a mini-engine-sized tail. His first flight was timed for over 22 minutes, a US record.

The MARS contingent had mixed results. Both Dan and Ferenc maxed in the first round. Both Johns had chute deployment problems in the first round. Dan's second flight was 57 seconds, just short of a max. The remaining Methane Men couldn't get their chutes open in the second round. In

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Op / Ed

Rhymes of the Range

NSL '94, the NAR's National Sport Launch, is history. From all accounts, it was a couple of days of rocket-flying fun. "NSL '94 — Where Pigs Fly" was the motto of the event, it refers to the "Pig-Lofting" fun contest. Organizer Buzz McDermott explains:

"After watching numerous attempts and seeing many approaches taken to get pigs to fly at NSL 94 I feel I may now, with great certainty, report to all interested parties that....

"PIGS CANNOT FLY....CANNOT AIM....DON'T EVEN CRASH WELL!!!

"No one even came close to getting a pig in the 40 foot square 'pig pen'. The attempts were hilarious, and most everyone had a wonderful time failing miserably. In the end, we decided there was no one to whom we could award a prize. The Aerotech Strongarm and Estes Optimas destined for the most accurate and best flying pigs ended up as door prizes.....It WAS fun, though."

Buzz and the rest of the NSL '94 committee deserve special recognition for excellence in the art of "fun events." This "Pig Loft" contest lives up to the letter and the spirit of fun events, mainly in that it was outside the domain of the Pink Book Lawyers. As a variation on a well-known event (Spot Landing), its rules were simple. It was structured so that as many people could participate as possible. Most importantly, it was FUN!!! Those planning fun events, take note! Look at some of the key ingredients for a successful fun contest:

1. People can participate without having to build a special rocket. The event can be flown with a "stock" rocket, or with just trivial modifications.
2. The rules are simple and easily understood. Remember the "Pin Head" criterion: "If you can't write the rules for the contest on the head of a pin, you've got a pin-headed idea." A sentence or two should describe the object of the event and what little rules you feel you need. Leave your loophole caulk next to your Pink Book; part of the fun can be the imaginative solutions people come up with!
3. Variations on familiar events, even those from other disciplines, can add to the fun. For example, the "Le Mans Eat" apes the Le Mans auto race (where the drivers run to their cars).
4. (This rule is the most important!) FUN must be the primary motivation. Remember what Howard Galloway said: "Model Rocketry is FUN!"

There are those who, though meaning well, want to take every opportunity to turn a fun event into a test-bed for a

provisional Pink Book event. This happened at the 1993 NSL held in Phoenix, where there were a slew of "fun" events, some with quite detailed rules. I wound up building a number of rockets just for these events, and I imagine that others did the same.

There is talk of a Rocket Photography "fun" contest at NARAM. The rules are quite detailed, and center around photographing a target on the ground. There is an entirely arbitrary limitation of 110 film only, which excludes many people with 35mm cameras. This type of contest fails all four criteria mentioned above. I urge NARAM CD Terry White to consider an alternative: Have a panel of judges (NAR "insiders," perhaps; the phrase means people who don't fly rockets themselves) decide, among the rocket-borne photographs taken at NARAM 36, which one they like best. Let them use their own judging criteria.

Voila! Simple rules, nice pictures (instead of some bed-sheet with a cross painted on it), FUN!

We'd like to have a fun contest at our waived sport launch, planned for August in Geneseo. What would YOU like to fly there?

Have fun & fly 'em high!

John

➤

Upstate Rocketeer is published by MARS™, Section 136 of the National Association of Rocketry, as a service to its members and rocket enthusiasts in Central and Upstate New York.

Submissions from all people are welcome. We prefer electronic form; please contact us for details. We accept photographic slides, prints, and Photo CD.

The photographs of ECRM-XXI were taken by John Viggiano using a Canon still video camera. The assistance of the Electronic Still Photography Laboratory at RIT is greatly acknowledged.

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As the Rocketry World Turns

*News and rumors heard 'round the hobby, by
Dan Wolf & Jay King*

Manufacturers News... Aerotech has received a shipping classification for its larger (greater than 62.5 grams per slug) reloads that allows them to be shipped the same as large single use motors. In the past, the only way get them (other than from a dealer at a launch) was to ship the casing to AeroTech and have them load it and ship it back (usually via FedEx to an airport that accepts them). Now the reloads can be shipped outside of the casings but the classification is 1.3C (old class B). This means FedEx to a nearby authorized airport (for Rochester that's Pittsburgh or Newark).

In a recent post on Modelnet Gary Rosenfield said "The 1.3C classification was something DOT was willing to grant without extensive testing, so we took it. ... AeroTech will attempt to get that classification reduced in the future through an exemption and/or package testing."

AeroTech has also announced a new 54mm reload. It is the J90W. The J90W is a White Lightning "moonburning" reload similar to the J100 single use motor. It has a total impulse of around 770 N-sec, burns for 7.5 - 8.0 sec. It has been submitted to the TMT and will be available shortly after certification (maybe in May?). AeroTech has also sent the G33 reload to NAR S&T for testing. The G33 is now split into a 2-grain kit so it can be shipped as a flammable solid like the other smaller reloads.

Ed LaCroix of Apogee also reports the availability of their new reloadable motors for R/C gliders. "Apogee has now received the first Aerotech 24mm RMS/RC hardware. Apogee has 50 of these cases. After these are gone, Aerotech will take over with supplying people with this product (Apogee is just priming the "interest" pump). The hardware has been shipped to NAR S&T for testing with four (4) different reload kits: D7 (20 N/s), E7 (30 N/s), E6 (40 N/s), and E11 (40 N/s).

The following two news items were "heard on the range" at ECRM. First, rumors are that Apogee may drop their exclusive line of Blackshaft tubing. It seems that new EPA regulations regarding the process that the manufacturer uses to make the tubing have caused the price to quadruple. Second, CMR plans to manufacture motors primarily for competition use. The motors are similar in size to Estes mini-engines but are a European design and are 11mm in diameter. Sizes and delays planned are 1/4A with a 4 second delay, 1/2A with a 5 second delay, and A with a 7 second delay. The motors produce a red tracking smoke. No word yet on as to when they will become available or who will certify them (NAR, AMA, ?).

Last but not least, Saturn Press is now taking advance orders for Peter Alway's new book, *The Art of Scale Model Rocketry*. Included in the book are sections on where to find scale data, commercially available scale kits, how to design a model to scale, construction techniques, detailing techniques, finishing techniques, contest documentation, flying tips, and a bibliography of scale data sources. Also included are complete plans for the following prototypes: Aerobee 150A, Astrobe 500, Asp, Black Brant V, Black Brant VI, D-Region Tomahawk, Juno II, Mercury-Atlas, Saturn I, Sparrow-Arcas, V-2, Vostok. The

book is 96 pages with dozens of illustrations and a wire binding so that it lays flat on your workbench. The cost is \$15.00 plus \$1.50 shipping and handling. Orders are being accepted now. Saturn Press, PO Box 3709 Ann Arbor, MI 48106-3709 Phone (313) 677-2321. Phone orders accepted with Visa/Mastercard.

NAR News.. The following news is from a post by Trip Barber on Compuserve's Modelnet: "I have completed the N.A.R. study on the safety of reloadable sport rocket motors which I announced on Modelnet last fall. My basic conclusion was that those reloadable motors which can pass NFPA 1127 certification standards are quite safe in the hands of responsible adult users.

The study identified a number of weaknesses in the current (initial) draft version of NFPA Code 1127 (High Power Rockets). This draft Code was not strict enough or exact enough to ensure that all future NAR/TRA certified reloadable motors would have to be as safe as today's certified products have proved to be in extensive testing.

The NFPA Committee on Pyrotechnics met in Salt Lake City 18-20 April and (on the recommendation of the Sport Rocket Caucus members of the Committee) adopted nearly all of the NFPA 1127 changes recommended by the N.A.R. study. One issue was referred for further testing, to be done jointly by NAR/TRA. The revised draft of NFPA 1127 has been approved for release for mail ballot vote by the full Committee. A public comment phase will then follow this summer. The final official Code could be out in 1995, depending on issues in the public comments.

Here are a few additional comments on the study by NAR President Pat Miller, "Trip did an outstanding job in this study. He proposed nine changes to the NFPA 1127...there are some other changes proposed for NFPA 1122 but these will be looked at by the Sport Rocket Caucus in October. Of these nine, seven were accepted as is with minor modification. Two others were accepted in part or resulted in changed wording to the 1127."

Regulatory News... I was hoping that this section of ATRWT would have faded away but in recent days, a new regulatory agency has decided that it will start regulating the hobby, particularly high power. Recently, the Bureau of Alcohol Tobacco, and Firearms (BATF) has announced its intention to regulate the storage and use of rocket motors. All motors containing less than 62.5 grams of propellant or reload kits where each propellant slug is less than 62.5 grams will be EXEMPT from the regulations. All motors that are above these limits will be regulated. Below is a summary of what's required:

1. The regulations require anyone purchasing or using motors above this limit to have an explosive user permit from the BATF. This permit costs \$20 the first year and is \$10 for each subsequent three-year period. A state and/or local permit may be required as well. A Federal permit would not be required if the motors were purchased and used at a launch in the state where the flyer resides.
2. The regulations also require that anyone storing these types of motors be required to store them in a Type 4 explosives magazine. This magazine can contain up to 1000 lbs. of propel-

lant. It must be located a minimum distance of 75 feet from any inhabited building, highway, or railroad.

3. Thermalite wick, the type included with FSI, some AeroTech, and other motors, is classified as an igniter cord by the BATF. Purchase and/or storage of igniter cord IN ANY QUANTITY requires an explosive license and must be stored in an approved storage facility (i.e. an explosives magazine).

Of all the above, number three is most likely to affect MARS members. Anyone who has FSI motors probably has some thermalite wick. Other people affected would be those with large Rocketflite motors and/or large single use AeroTech motors (size H and up). The BATF has given the rocketry community a 6 month to 12 month grace period to come into compliance with the regulations. Also, the High Power Rocket Manufacturers and Dealers Association, Tripoli, and the NAR are working to either change the regulations and/or obtain exemptions to portions of the regulations (i.e. exempt thermalite in small lengths when included with a rocket motor). A handout with more complete information on this matter will be given out at the next MARS club meeting.

NASA News . . . The space shuttle Endeavour recently completed a successful scientific mission, STS-59. This flight is especially significant to rocketeers as it carried former NAR Trustee Dr. Jay Apt on his third mission to space. The following report is condensed from NASA Mission Status summaries:

The six-member crew was divided into two teams, which worked in alternating 12 hour shifts. The Blue Team, which included Jay, Rich Clifford, and Tom Jones, reported good photography of a gigantic fire-scarred area in China that burned in 1987. This region is of special interest to the Measurement of Atmospheric Pollution (MAPS) experiment for studies of forest regrowth after a fire event. The MAPS experiment measures the carbon monoxide in Earth's lower atmosphere to help investigators determine how well the atmosphere can clean itself of "greenhouse gases," chemicals that can increase the atmosphere's temperature.

During mission, researchers watched televised downlinks of live X-SAR moving images of surface and subsurface structures in the Namib Desert in South Africa to improve researchers' understanding of radar back scatter. Scientists also viewed radar images of sea ice and seasonal melt in the Sea of Okhotsk off the coast of Siberia and a critical region of expanding drought in the Sahel area of the Sudan in Africa. At the high-priority calibration site at Matera, Italy, ground-based engineers measured the strength of the radar signals and the size of the swath being recorded on the radar tapes aboard Endeavour.

Jay conducted some work with the Shuttle Amateur Radio System. Early in the morning of Wednesday, 13 April, while Endeavour passed over Australia, Jay exchanged greetings with the Russian Cosmonauts aboard the MIR space station. Both crews used amateur radio equipment for the contact which was monitored real-time by many amateur radio stations via telebridge systems and rebroadcasts.

Later in the mission, he contacted fellow astronauts Norm Thagard and Bonnie Dunbar and two Russian cosmonauts at the Star City training center outside Moscow, Russia. At the Star City facility, Thagard is training as the prime U.S. crew member and Dunbar as a backup for a 1995 joint U.S./Russian mission aboard the Russian MIR space station.

Several NAR members were at the launch, including VP Mark "Bunny" Bundick, Secretary Chris Tavares, Trip Barber, and Bob Parks. Bunny filed the following report:

"The liftoff itself, a visual treat under any conditions, was particularly excellent this time. The winds cleared out the haze, and NASA's timing, two minutes before dawn, was perfect. The bird lit up the joint (again! — HUGE GRIN!), stayed in shadow for a while then burst into the sun. Managed to get good use out of my 8X binoculars this time, watched the SRB sep, and then saw three engines merge into one pinpoint of light. Followed things to 220 miles downrange 46 miles high, until Barb interrupted me with 'Look at the contrail.' The dawn made it look like a tall thin thunderhead, colored orange, purple, white. Truly a representative image of what I like to call the 'mystery and majesty of flight.'

"My children split votes on the launch. Jenny, right after the liftoff, said 'it's really pretty, Daddy,' but Lizzie, who doesn't like model rockets larger than about D, said 'Too noisy!' Clearly no accounting for 6 year old tastes, and they're stuck with a dad who's rapidly turning into a Shuttle launch addict.

"I trust, due to the low altitude, Jay got even more spectacular photos this time around, and I'd love to hear about his conversations with the "other guys" on MIR via ham radio. I'll be harassing Terry White, the NARAM CD to arrange for an appropriate presentation one evening at NARAM.

"Now that I've seen a few of these things, I think I have the 'drill' about down, so if any of you are ever interested in attending a Shuttle launch, drop me some email and I'll try to offer some hopefully helpful advice. As a rocket nut, I can pretty much guarantee you'll not be disappointed."

Some of you may remember a great scale kit from Estes. Here's some sad news: An upcoming launch from California's Vandenberg Air Force Base will be the last for the SCOUT (Solid Controlled Orbital Utility Test), a dependable four-stage expendable launch system that has been in service since 1960. This launch will be the 118th for the SCOUT program in its 34 year career.

SCOUT, America's first solid-fueled rocket to propel a payload into orbit, was first launched on July 1, 1960. Since its first mission, SCOUT has proven itself as the workhorse among the solid propellant vehicles and is often referred to as the "unsung hero of space."

SCOUT's last mission will be to place the 355 pound MSTI-2 spacecraft into a 325 km by 375 km orbit at an inclination of 97.13 degrees. The satellite, an atmospheric studies spacecraft operated by DOD's Ballistic Missile Defense Organization, will perform orbit adjustment maneuvers in order to achieve the desired 425 km circular orbit.

SCOUT was manufactured by Loral Vought Systems of Dallas.

Costs to Orbit: The 11 April 1994 *Newsweek* listed some interesting costs for putting a pound of payload into low Earth orbit. All costs are in 1994 \$.

Shuttle original estimate - \$400
Shuttle - \$15,200
Ariane - \$8000
Proton - \$4000

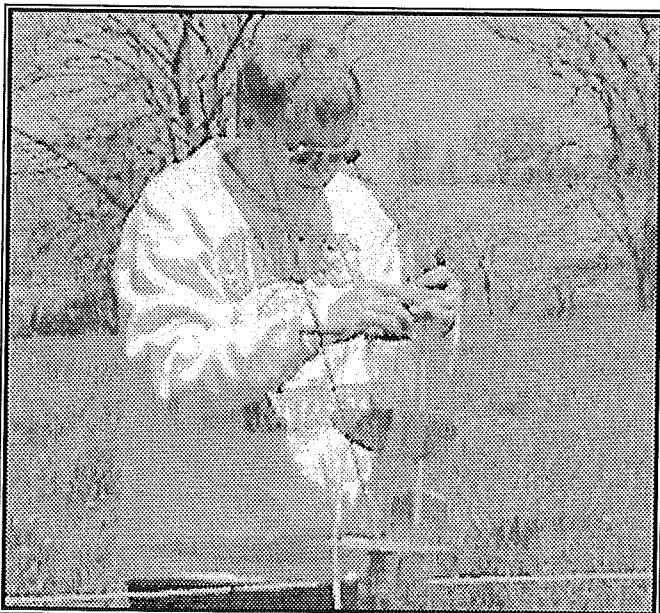
Space Station Freedom was originally intended to be self sufficient in water and air with full recovery from the life support system. The cost-cutting that resulted in Alpha included changing to a simpler life support system that requires regular replenishment. It will cost \$466,000,000 per year to deliver air and water to Alpha with the Shuttle.

Other News . . . Russell Groves passed along the following travel trip: "I saw something yesterday that would get your juices going. Kansas Cosmosphere in Hutchinson has a restoration shop in the west part of town. I just stumbled onto it - but wow!

"Stacked outside awaiting restoration: Agena, Honest John, Corporal, Nike-Herc, Titan 1 and lotsa shrouds and stuff for putting the stages together.



Ferenc Róka loads his Rotaroc for a contest flight. Ferenc's model, like many that day, recovered upside down with only a small loss in performance. ➤



John DeMar may be smiling as he readies his Hawk R/G for its first flight, but the glider was smiling when smiley-adorned plywood was used to bolster the wing for the second flight. ➤

If you're planning to travel to Argonia this summer, you might well enjoy seeing this stuff and the main Cosmosphere. In fact, I talked later to the curator who said they might be able to arrange a presentation if there's enough demand."

Do you want to be on TV? The Discovery Channel's "Next Step" program is looking for rocketry enthusiasts with interesting stories to tell and projects to show-off. If you are flying a unique payload or doing something that might appeal to a mass audience, (i.e. on-board video, radar, etc.) please drop a line to: Larry Shenosky, KRON-TV, in care of CIS: 70703,222.

ECRM XXI coverage continued from page 1

the third round, John Viggiano's fortunes improved as he switched to a smaller chute, reasoning it would be easier to open. The 45cm chute opened fully, resulting in a max over the cornfield to the north of the field. (John could feel the lift off the cornfield as he searched for the model.) John DeMar, Ferenc, and Dan were plagued in this round with partially-opened chutes.

A Helicopter Duration

Current C division National Champion Glenn Feveryear took first. Many of the models were recovering upside down. Shortened Rotarocs and a few Rose-a-rocs were the order of the day. Many of the contestants flew the QCR mini-engine model, which performed reasonably well.

John D. had a good first flight of 90 seconds on his Demar-a-roc. (When do we get plans for this bird, John?) His second flight went off at an angle (either it came out of the tower funny or had a problem with the small fins), resulting in a low altitude and a time to match.

Dan and Ferenc both managed to qualify but their times were mediocre. On at least one flight for each their Rotarocs descended upside down.

John V. shredded his QCR Rotaroc at the motel the night before . . .



FOREIGN POLICY-Internats flyers Phil Barnes, Trip Barber, and Dan Winings discuss Phil's impressive two-stage FAI-style altitude demonstration flights. ➤

C Rocket Glide

Once again, Glenn Feveryear took first with a Gull swing wing (switchblade-type) glider. The Gull, by the way, was designed by Dan's college schoolmate, Peter O'Neil. Glenn DQ'ed his first flight but had a very nice 180+ second flight to propel him to first place.

Among the Methane Men, Dan was most successful with his MIT-designed hollowed-out-and-silkspanned slide wing he last flew at NARAM 22, nearly 14 years ago! His first flight was good, though with a stalling problem caused by the wing sliding too far forward. The stalling worsened slightly with the second flight, and became a problem on the third, resulting in a short flight.

John V. test flew his new glider, which was a larger version of his successful NARAM model. It was not trimmed properly, and landed hard after a short flight on a B6-2. The boom was broken, and the glider was given up as lost for the meet. A poor first contest flight on his NARAM model was followed by much better second flight with a beautiful straight-up boost and a nice transition to glide, but the southerly winds carried the glider off to the north. Out of gliders, John did not make his third flight.

John D.'s glider shredded on his first flight for a DQ. The fast ride on the C engine broke the wing at the only point not tissue, which was right over the rail. He rebuilt the wing with some plywood. (It even had a smiley face on it for luck!) John had a good boost and transition, but he flew the same time as John V, and lost his glider, too. Both spent an hour or so looking for their gliders.



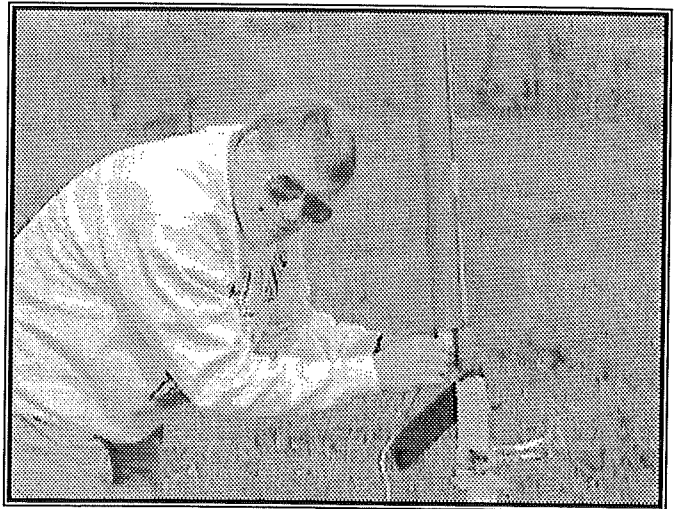
RAISING THE COLORS — NARHAMster Paul Miller has his hands full with all the flags going on that mast! >

Ferenc flew his NCR Nomad from NARAM. It did a spectacular loop and power pranged hard into the ground, right next to Tom Lyon's truck. (It might have hit it if it were the same color as Bud's.)

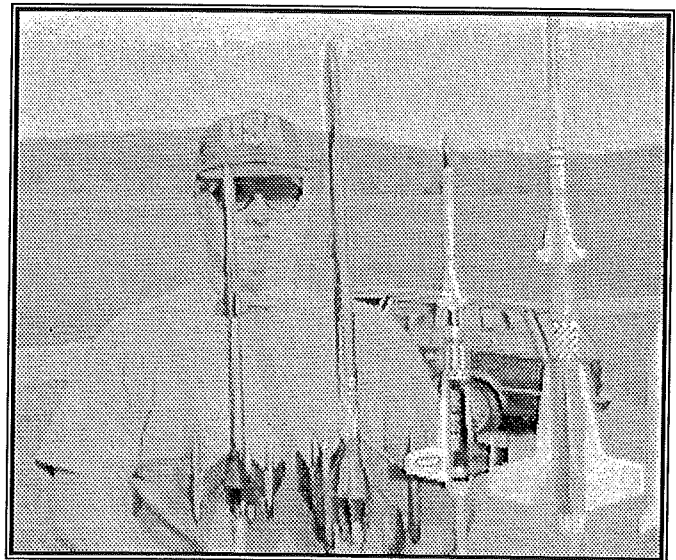
E Dual Eggloft Altitude

The winning strategy in this event combined a full 40 Newton-second engine (the Aerotech E15-7) with an efficient design, vertical boost, and tracking powder. Glenn Feveryear took top honors in C division with this formula. Both his flights were tracked to 595 meters, bringing Dan literally to his knees (at Tracking South) in order to record the 80°-plus elevation for one of the flights.

When Glenn was not busy beating us mere mortals, it was raining eggs in Middletown. As is usually the case with dual eggloft events, a paltry proportion of the flights quali-



ALWAYS A FIRST TIME — John DeMar is setting up to actually make an early flight at a meet. His Optima II flew on 2 Estes E15s, lost its fins, and landed in some oil drums. >



NARHAMS member John McCoy has built an impressive series of classic models in original and slightly scaled-up sizes. Shown here are two Mars Snoopers and two Laser Xs. >



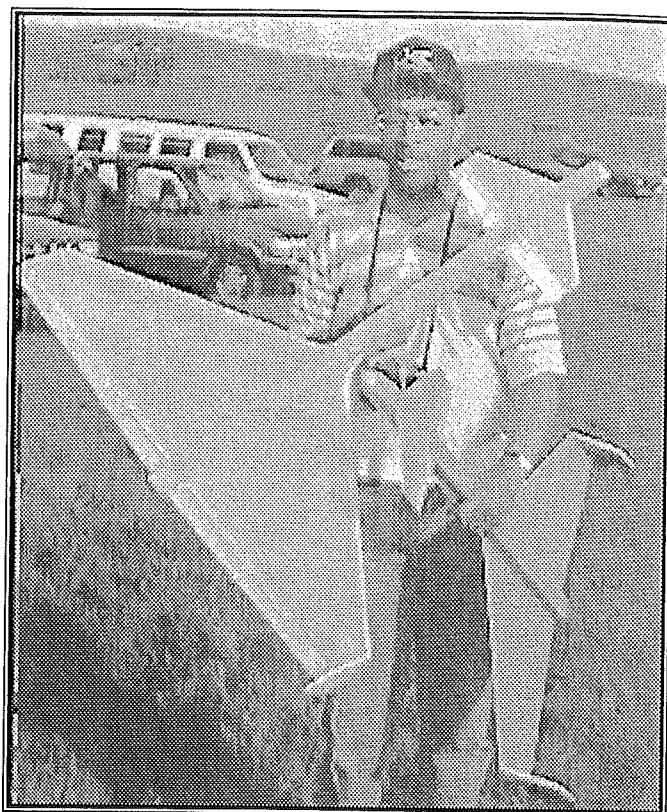
Dan Wolf's beautiful Little Joe I at liftoff.

fied. John V. was zero for two. A drag separation pulled the Apogee capsule off, causing the capsule itself to separate, ruining the first flight (and one brace of eggs). John flew his backup modified Eggspress with an E15-7, taping the nose on but good. Too good, in fact: the ejection blew a hole in the side of the body instead of kicking out the chutes, and the thing streamlined in. Ferenc didn't even recognize the Eggspress capsule after helping John dig it out of the ground!

Dan's unique model built around a CMR egg capsule suffered drag separation on its first flight, too, resulting in a damaged model and some broken eggs. His second flight was made with an improvised external shock cord mount. The mount held wonderfully, but the drag penalty meant Dan had to settle for second.

Ferenc made one very nice flight on his modified Eggspress, and finished in third. This is the same model Ferenc used to win D Dual duration at Upstate IV last year, so if you want to get started in dual egglofting, check one out (it is now called the Scrambler).

John D. had only his Glowing Chartreuse egglofter, which takes 18mm engines. John made his first flight on an E25-7, which is only a sneeze over a D at 22 N-sec. This was good enough for fourth place, so he made his second flight with a 24mm booster. A D12-0 provided the first stage power, and ignited a length of sheathed thermalite. This, in turn, ignited the second stage E25. Believe it or not, this complicated system worked beautifully, staging right on time — and when it did, it looked as if the rocket had gone into overdrive! It flew over and beyond the tracking baseline for a "Track Lost," but one of the eggs was recovered with a hairline crack, for a DQ. In fairness to John (and his kooky design), we'd like to point out that this egg had been along for John's first flight, too.



NO, THEY'RE NOT ASTRO-BLASTERS — Robert Edmonds had some impressive flights with his canard models, both large and small. Contestants using the smaller version did well in C Rocket Glide.

Sport Scale

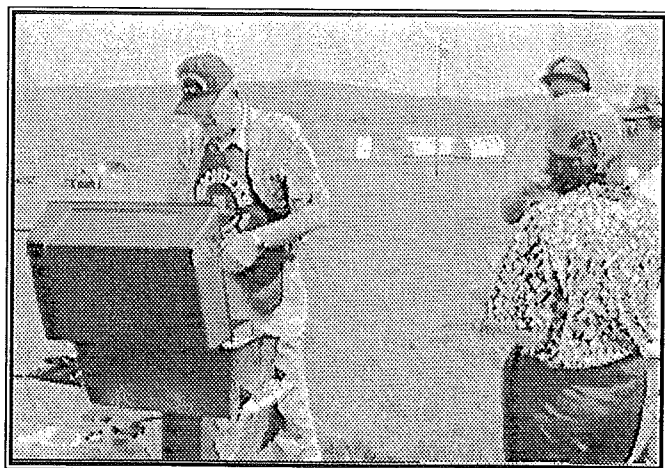
A team of judges was used for this event, and it proved inefficient. Although there were fewer models than at last year's ECRM, the judging took twice as long, with team entries (and some from C division) not judged until Sunday morning.

We finally got the opportunity to see Ken Brown fly his beautiful Javelin, which took first place in C division. Rather than risk landing damage, Ken caught his model (presumably with the CD's permission), and received maximum damage penalty. Still, it was a beautiful job, Ken!

John DeMar's Terrier-Sandhawk was the top entry from the Methane Men. John made the last flight of the meet (again!) with this bird, doing well enough to secure a place.

Dan Wolf's Little Joe I was not far behind. Built in 1/35 scale around the Centuri Mercury spacecraft, Dan used BT-70 for the main body, and tapered it to Centuri ST-20. The round Dan modelled had carried Sam the monkey in the spacecraft.

Reasoning that the model was draggy and heavy, Dan flew it with a B6-2 engine. Unfortunately, it was still coasting up when the ejection came, and the headwind kept the chute inside the body. A hard landing followed, with the tower breaking cleanly off. This prompted Dan to remark, "I think the monkey died." Dan used a B6-4 for the second flight, which was much better, and recovered without damage.



GENIUS AT WORK — Tom Lyon's dad ran the barbecue grill at the post-launch cookout, a NARHAMS tradition. >

John Viggiano unveiled his 1/12 scale Nike-Apache, built around Quest T35 and Estes BT-5 tubing. John scratch-built the nose cone and transition section, and even had scale antennae, made from nylon monofilament! The model flew well on a B6-4, but suffered a dent on the second stage at ejection, even though a 6-foot shock cord was used.

Ferenc christened his camouflage-painted BT-80 V-2, and had quite a nice flight on a D12. The scale judges refused to award him mission points for using a camo-green parachute, which made the rocket hard to find in the cornfield! All four Methane Men qualified in this event; the only other in which we did this was Parachute Duration.

Sport Flying

Sport flying was a big part of ECRM-XXI: Even Charlie Sykos made a sport flight on an Aerotech Mustang. Rusty

Whitman flew an FSI D18-powered bird, Robert Edmonds flew several of his Canard models, and Jim Filler made his NAR Certification flight with an NCR Archer with an Aerotech G.

Ferenc had a beautiful flight with his LOC Onyx on an Estes E15. Some spectators seemed partially disappointed when the predicted cato failed to materialize, and the model descended under the 14" canopy. John V. flew his "Stretchinator" on an FSI F100-6, and, again, some of the crowd seemed to question the engine choice. Again, a beautiful flight was the result: at ignition, the 6-foot rocket leapt from the pad with a roar. John made another flight with this combination the following day and also test flew his Quest Zenith II payload on Quest B6-0 and A6-4 engines to close Saturday's flying.

Contrary to form, John D. made one of the first flights of Sunday on his Optima II, modified to take two E15s. Although the fins were glued on with epoxy, the flush-mounting job was no match for the thrust of the twin E engines. Two of them stripped off near the end of the thrust phase (right about at Max-Q), and the large model did some pirouettes a couple of hundred meters up. The chute popped right on schedule, however, and the model landed in two 55 gallon drums in a fenced-in area. The fins were also recovered.

Results

We would have put the results here, but we haven't received them yet from the C.D. We didn't do as well as we did last year (or would have liked to have done this year), so perhaps it's all for the best . . .

>

Who Am I?

Last issue's "Who Am I" was Ferenc Róka. Bud Piscini left the first message on my answering machine with the correct answer (there were others), so he's the big winner.

This issue's "Who Am I:"

My first rocket to fly was scratch-built from a paper towel core, was orange, and had big triangular fins. I called it the "FAB-6," and it flew in 1972.

My favorite kit of all time is the Centuri Vulcan-X. I loved the colored airframe. Along these lines, I'm looking forward to getting a Quest X-30, which would be my favorite current kit when it becomes available. My favorite Scale model kit is the Estes LTV Scout, long out of print..

My favorite engine of all time is the Centuri Mini-B, and of those currently available, the AeroTech F25.

Of all the contest events, I like 1/2A Altitude the best, and Helicopter the least.

My favorite rocketry related book is Carrying the Fire, by Michael Collins. I am enjoying Peter Alway's book, too.

Getting recognition for doing something well is my favorite aspect of the hobby, and being able to understand some of the physics is my proudest accomplishment in rocketry. My pet peeve is the AeroTech / Vulcan / Estes fiasco, and if I could change anything about the hobby it would be to have more people participate.

Who Am I?

The first member to notify John by phone or letter with the correct answer wins a great prize. If nobody guesses correctly before the next issue, our "Who Am I" member gets the prize.

Last issue had the "Who Am I" questionnaire. We still need replies from a member or two. You may call John at 359-3869 if you'd like to participate.

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Club News

by Bill Owens

April Club Meeting

The April MARS meeting was called to order by John Viggiano at 7:00 on the evening of April 12. Old business included John's report on MARSCON; while the final figures are not in, it appears that we at least broke even financially. Writeups for the magazines are in progress, and proceedings are to be available by NYSPACE.

Discussion of NYSPACE followed, centering on the choice of field; Dan Wolf sent a letter to the Director of the Warplane Museum asking for use of the field again this year, but had not heard anything in return. The sport field in Parma may be a backup. Prizes, including gift certificates and kits are on hand, and some may be reserved for the NYPOWER launch. The club also needs scale judges for NYSPACE, Bill Owens and Merrell Lane may volunteer. Finally, John will contact NARHAMS and ask about obtaining an FAA waiver with no weight limit (as at ECRM).

John reported that the Greece Ridge Mall Aviation Show was a success, with at least one new member, John Moak.

John also mentioned that our charter renewal has been sent in to NAR HQ, and that we are obtaining site owner's insurance for the Parma and National Warplane Museum fields.

The question came up of whether NYPOWER should be an official Regional Sport Launch. The consensus was that while this would require more commitment, it would be good preparation for bidding on NARAM-37. John will also call a meeting of the Executive Board to set up Ground Support and NARAM committees. This meeting may take place on the way to ECRM.

In new business, the top item was election of a new Vice President to fill the spot vacated by Dan Wolf. John nominated Jeff Ryan, and he was approved by unanimous voice vote.

Ferenc reported seeing the 6th edition of G. Harry Stine's Handbook of Model Rocketry, and John had a copy to pass around. John was also placing a group order to Magnum, and announced that he has 'beefy' body tubes available, in BT-20, BT-60, FSI 21.5mm and 29mm inside diameters and heavier wall thickness; contact him for details.

A poll was taken on interest in April's informal get-together, scheduled for the Friday before the Sport Launch. It was decided to cancel the get-together for lack of interest, and because we had another event scheduled so soon afterward.

The meeting was adjourned at about 9:30, and several members retired to Oregano's.

April Sport Launch

A hardy group of MARS members braved the early spring weather on April 17 to christen the new launch site at the Municipal Park in Parma. Die-hards John Viggiano and Ferenc Roka were joined by yours truly, and by three new faces: Andy Schecter and a friend (whose name escaped me, sorry!), and Tim Eastman, who drove three hours from Utica through light snow to fly with us.

Temperatures were in the 40's but the wind was blowing from the west at 15-25 MPH with substantially higher gusts, resulting in a windchill of about 28 degrees! Defying the wind, John and Tim set up their pads and we were able to fly a number of rockets, most of which landed within a surprisingly short distance. The wind was high enough that Tim's tall Aerotech pad had to be staked down to prevent it from blowing over.

After waiting in vain for a break in the wind, Ferenc started the day with a couple of older rockets flying well on A and B power. John then launched a long rocket made from the special 21.5mm tubes he ordered on an FSI E5 flight, but the wind foiled him and sent the long bird into a series of loops, and it crashed into the nearby parking lot. John also flew his Mini Viper IV on two A3's.

Tim brought along a carload of homemade rockets to show off and fly. Most were built out of common materials like mailing tubes and styrofoam, and painted in unusual, eye-catching schemes. These should be real crowd pleasers at any demo fly, and they flew very nicely despite the wind. Unfortunately a recovery failure caused one core sample, and some of the other rockets were damaged by being dragged across the gravel.

Andy Schecter didn't fly anything, but showed around a very nice scratchbuilt Jayhawk, complete with silkspanned body tube (much to John's delight). He began building it in the late 60's, and expects to complete it soon. If anybody has scale data on the Jayhawk, it would be a big help to Andy.

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Contest News

MARS Point Standings

Name	NAR	WF	Pts
1. John DeMar	52094	2	1472
2. Jay King	19799	2	852
3. John Viggiano	25615	2	736
4. Ferenc Roka	11077	2	582
5. Bud Piscini	54692	2	268

Alan Williams, ECRM XXI CD and NARHAMS Court Jester, hasn't sent the results to us yet. Hopefully, the correct totals will appear in the next issue of UR.

➤

Tapered Shrouds on a Desert Island (well, almost!)

A no-think way to boat tail heaven, by John Viggiano

Paper transition sections, or tapered shrouds, are an important component of rocket design, and I've had a love/hate relationship with them for years. The flexibility tapered shrouds offer is wonderful, but it can be a pain to lay them out. When I started in rocketry, this was definitely in the realm of "gray" (not entirely black) art for me. I eventually derived equations which are similar to those which later appeared in the last few editions of G. Harry's *Handbook*, so it became a little clearer how to proceed. But they were still a pain in the neck.

Last year I wrote a PostScript system for laying them out, and I use this for many of the tapered shrouds I make. Still, there are times when the back of an envelope is handy, and the PostScript printer isn't, and I want that shroud. . . . These calculations are user-friendly, don't bite, and are the most convenient way to make paper transition sections on a desert island, with only a compass and a drafting triangle or protractor.

The Low-Tech route

The Estes TS-1 tapered shroud card was made before personal computers (heck, pocket calculators were something out of Buck Rogers back then), and is a low-tech way to go, particularly if you're working with Estes tubes only. Nevertheless, it's easy to adapt to other sizes. Here's how:

Rolling your own

There are two skills needed to lay out shrouds of this type for arbitrary diameter tubes. First, you must be able to draw two intersecting perpendicular line segments. You can do this with a drafting triangle, available in most stationery stores. Secondly, you must be able to set a compass to twice the diameter of the tube you're working with. If you have a tube with a 19mm outside diameter, for example, you have to set your compass to 38mm. If you can do these two things, you can make this type of shroud.

Put the point of the compass at the intersection of the two perpendicular lines. Draw an arc from one line to the other. Add a little extra for a glue tab. Reset the compass to twice the diameter of the other tube you're using, and repeat the process. Voilà! A beautiful shroud for any pair of tubes your heart desires.

The taper angle of these shrouds is 14.48° . This is a little abrupt for most purposes, but the shroud was easy to lay out. We shall soon see how to lay out more streamlined shrouds just as easily.

I have used index card stock, manilla file-folder material, oak tag, and heavy paper for shrouds. All these materials will

work well for smaller shrouds of this type. I have also used thin poster board for larger shrouds, BT-80-sized or so.

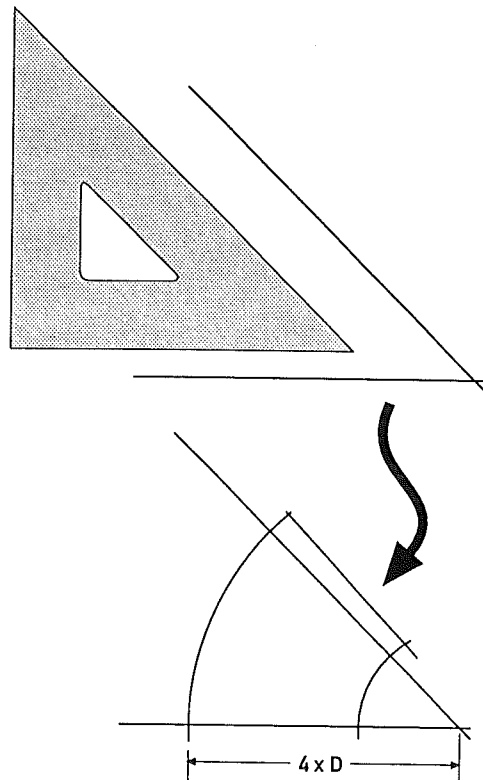
Shapes & Sizes

In developing this desert island approach to shrouds, I have found the ratio of the compass setting to the body tube diameter to be a key parameter. I refer to this ratio as the *shroud ratio*; its value is related to the shape of the finished shroud. In the case of the TS-1 shrouds, and the shrouds whose rendering we have already discussed, this ratio is 2: the compass is set to twice the diameter of the body tubes you're using.

Changing the shroud ratio changes two things. First, you must change the angle between the two lines which bound the shroud; the *subtending angle* of the shroud depends on this ratio. Secondly, the taper angle will change. Larger ratios mean a gentler taper. Smaller ratios mean a more abrupt taper. (If you use a ratio of $1/2$, you're making centering rings rather than tapered shrouds.)

A ratio of 4 makes a fine taper: 7.18° , which is quite nice for boat tails and other general applications, and it is just as easy to make a shroud with this gentler taper. A 45° - 45° - 90° drafting triangle may be used to draw the two intersecting lines, as a 45° subtending angle is required for this shroud.

If you buy a 30° - 60° - 90° triangle, you can make shrouds with three different taper angles quite easily. The 90° angle is used for shrouds with shroud ratios of 2; the 60° angle is needed for shrouds with shroud ratios of 3, and a 30° subtending angle is correct for a shroud ratio of 6. These last



If you can draw two lines which intersect at 45° , multiply by 4, and drive a compass, you can make a cool shroud! >

two shrouds have taper angles of 9.59° and 4.78°. These are also quite nice for general use.

The accompanying table contains some Shroud Ratio / Taper Angle / Subtending Angle combinations which are easy to work with. Factors of 2/3, 3/4, and 1 are all good for "flying saucer" applications: flat shrouds with lots of drag. Shrouds with factors of 8 through 12 are great for "2 Minute Egg" type designs. Unless you remembered how to bisect angles from geometry, or are extremely handy with drafting triangles, you'll need a protractor for most of the other shroud ratios.

For Better Accuracy

The thickness of the shroud material can affect the fit if it is more than a few thousandths of an inch thick. The finished shroud may fit the smaller tube too snugly, and the larger tube too loosely. The thickness of the shroud material will be magnified by the shroud factor when the compass settings are computed, so this effect is most noticeable with gently tapered shrouds.

You can compensate for this by adding the thickness of the shroud material to the outside diameter of the smaller tube, and subtracting the thickness of the shroud material from the outside diameter of the larger tube.

As a rule of thumb, most thin shroud materials (heavy paper, oak tag, etc.) are about 0.010" or 0.25mm thick. The poster board I use for heavy shrouds and egglofters is about twice this thickness. For a 2-Minute Egg shroud, these modest thicknesses become significant when the compass settings are determined.

How-To Summary

In order to make a tapered shroud the painless, no-think way, here's what you do:

- Select a Shroud Ratio from the table. Base this on how sharp or gentle a taper you want, how much room you have (large shroud ratios require a long sheet of paper), and how easily you can draft the subtending angle.
- Read the subtending angle from the table.
- Draw two lines which intersect at the subtending angle. The lines must be longer than the shroud ratio times the larger tube diameter.
- Add the thickness of the shroud material to the outside diameter of the smaller tube, multiply the result by the Shroud Ratio, and set your compass to this distance.
- Put the point of the compass at the intersection of the two lines, and draw an arc connecting them. Continue past one of the lines in order to allow for a glue tab.
- Subtract the thickness of the shroud material from the outside diameter of the larger tube, multiply this by the Shroud Ratio, reset the compass to this distance, and repeat the last step.

Shroud Ratio	Taper Angle	Subtending Angle
2/3	48.59°	270°
3/4	41.81	240
1	30.00	180
1.5	19.47	120
2	14.48	90 *
2.5	11.54	72
3	9.59	60 †
4	7.18	45 †
4.5	6.38	40
5	5.74	36
6	4.78	30 †
7.2	3.98	25
8	3.58	22.5
9	3.18	20 ‡
10	2.87	18
12	2.39	15 ‡
15	1.91	12

Legend: * Estes TS-1 Shroud
 † Easy General Purpose
 ‡ Easy for Egglofter

Cut this out, put it under your pillow, and you'll dream of a rocket with a boattail!

- Carefully cut the shroud out.

For the Adventurous

In case you're wondering what the relationship between the columns in Table 1 is, here are the equations:

$$\sin(\text{Taper Angle}) = 0.5 / \text{Shroud Ratio}$$

$$\text{Subtending Angle} = 180^\circ / \text{Shroud Ratio}$$

But you don't need these in order to make tapered shrouds on a desert island. You only need a compass, a drafting triangle or a protractor, and some heavy paper. Admittedly, there are times when a shroud is required to have a specific taper, such as with scale models, and the required taper isn't in the table. In these instances you can use the ShroudCAD package I made for PostScript printers, or the equations in the *Handbook*. But this simplified approach should hit the spot for most applications. It sure beats the "black art" view many people have of tapered shrouds.

Have fun and fly 'em high!

Contest Plan: Knight Star 5 Radio Controlled Rocket Glider

By Kevin McKiou

Editor's Note: This is a little different from the plans we have featured here before, but I have seen a growing interest in Radio Control. Further, the US Internats Team had a recent practice at the AMA's field in Muncie, IN, and will be on their way to Poland (once the FAI has decided what the rules will be!) The winner's plane will probably have much in common with this one.

Once I learn how to fly R/C with that Gentle Lady-in-Waiting (she's still a kit in my basement) I'd like to give this a try. Bob Parks, legendary designer of the Aerotech Phoenix, called the Knight Star 5 "probably the best 'modern' beginners S8e class RG design I have seen, at least if you use the 'simple' wing." Interesting, because Parky himself designed the airfoil for the "Contest" wing. One of the flyers from the US team informed me, "After your first flight on an E6, you'll forget about other types of rocketry." Well, we'll just have to see about that!

These plans should be sufficient for an experience modeler to build KnightStar V (KS5). It is not intended for a novice mainly because I do not have the time to devote to creating the required instruction manual. If you are a novice, I advise you to get help building and flying KS5.

Note that the wing is removable. It is attached with a spruce dowel at the leading edge (inserted into a bulkhead in the pod) and a 6-32 nylon screw at the trailing edge. There is also a towhook designed into the model which attaches below the wing mount. This addition allows you to get stick time with a highstart before flying with a rocket motor.

There are two wing options: a contest wing and a training wing. If you are a novice flyer, I suggest you start with the training wing and get comfortable with RC rocket flight before flying the "hotter" contest wing. The wing construction is typical balsa over foam. The key to a light weight airplane is the choice of light balsa for the wing skins. Use absolutely the lightest 1/16" balsa or very light to medium 1/32" balsa for the wing skins. Two dihedral options are also shown. I have tried both and really can't say which is better. Supposedly the 6 panel parabolic dihedral is better non-steady state turning and the V dihedral is better for constant speed turning. Unless you really want a cool 6 panel wing, save yourself time and weight; build the V dihedral. The wing is joined in the center with a 4" strip of 1.5 ounce fiberglass cloth. Cover the wing with dope and tissue or a low temperature film covering such as Econokote. Foam cutting equipment, vacuum bagging equipment, fiberglass and laminating epoxy is available from Aerospace Composite Products, 14210 Doolittle Dr., San Leandro, CA 94577. If you don't have access to foam cutting and bagging equipment and don't want to buy your own, I am willing to provide you a set of foam wing cores for \$25 plus \$5 shipping or a set of cores sheeted with contest grade 1/32" balsa for \$100 plus \$5 shipping. You can also sheet the cores by using 3M77 spray adhesive and stacking weight on the wing cores

while in the foam "saddles". But use the 3M77 spray sparingly. It is heavy.

The tail should be made from very light 1/8" C-grain balsa. Note the grain direction on the plans. The elevator and leading edge and tip of the fin should be made from hard C-grain. The tips of the stabilizer should be made from medium C-grain. Note that the fin is mounted on the side of the boom. This is for added strength and easier linkage hookup. I typically make strip hinges by sandwiching a piece of fiberglass/kevlar/mica film/Monokote between two strips of 1/16" hard balsa and then gluing the sandwich to the stab/fin to make a strong tight hinge. A typical Monokote hinge is also ok, but is heavier. Control horns are made from a piece of fiberglass printed circuit board (available at Radio Shack). Push rods are either 1/32" music wire in a Golden Rods sleeve or you can use the Sullivan Golden Rod very flexible cables #507 (available at most hobby shops).

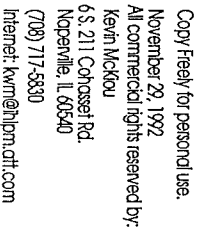
The boom can be made from a fiberglass pushrod or from a carbon fiber arrow shaft. The arrow shafts are lighter and stronger. If you cannot obtain them locally, they are available very economically from Taylor Falcon Archery, Rt 4 Box 75C, Jonesboro, AR 72401 (501) 935-3559.

Build the pod sides from light 1/16" balsa backed with 1/64" aircraft plywood. The top and bottom are made from medium C-grain 1/8" balsa. Study the internal structure carefully. There are two servo rails, a 1/16" plywood bulkhead (for the wing hold-down), and collar that slips around the end of the boom. The top of the pod is designed to be held in place by two screws which are caught/captured by two slotted pieces of 1/32" plywood attached to the pod top hatch. The top hatch then is attached and released by sliding it forward and backward. There is also a small hatch in the bottom of the pod which is used for adjusting the linkages. Once the linkages are adjusted, it can be taped shut since is only necessary to open again if adjustment is needed. The nose block is shaped from medium balsa.

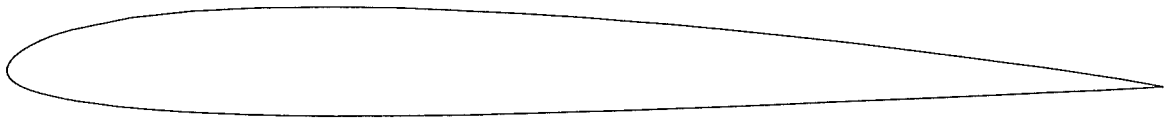
The radio gear is readily available from Tower Hobbies, P.O. Box 9078 Champaign, IL 61826-9078 (800)637-4989 or through your local hobby shop. The servos are Futaba S133s. The receiver is the Futaba R112JE. The battery should be between 80 and 110 mah. A 110 mah battery will typically give about 1 hour of flying time. The 80 mah battery will be good for about 45 minutes. This assumes that they are fully charged and the outside temperature is above 70 degrees. The flight time is significantly reduced as the temperature drops. So be sure to check the batteries often. If your radio gear is a little bigger than that which is shown, you can adjust the size of the pod accordingly. The motor tube is a piece of BT-50 model rocket body tube, positioned to give the motor 3 degrees of downthrust. There is almost no loss in altitude (about 0.2%) and it keeps the tail out of the high speed rocket exhaust.

Take care in assembly to balance the model between the limits identified for the CG. It will be quite sensitive at the

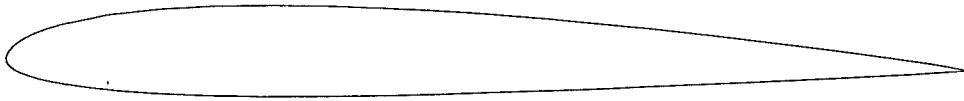
***Estes Industries**
1265 H. Street
Perrone, CO 81240
(800) 525-7563



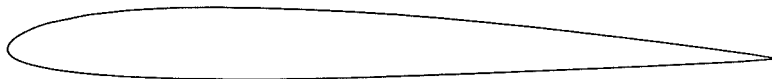
Use these templates for the "contest" wing.



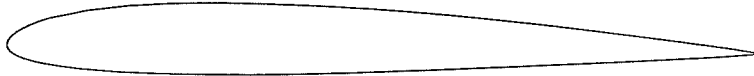
Section A-A



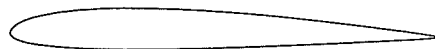
Section B-B



Section C-C



Section D-D



Section E-E

Knight Star V Full-Size Wing Templates: "Contest Wing" — Patterns D & E are thickened slightly, so the airfoil will have the correct thickness when the oblique cuts are made.

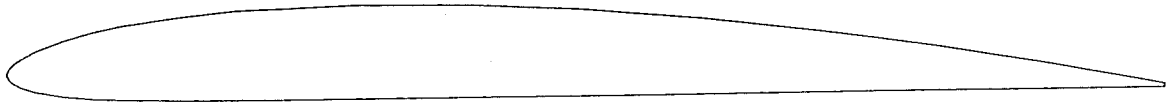
rear limit and significantly easier to fly balanced at the front limit. The pod can be moved forward/rearward a bit to make adjustments and the motor tube can be lengthened/shortened as well. Just be sure to leave plenty of boom sticking out in front so you can do the final trimming after you have located the CG.

I would suggest you trim the model by doing some hand tosses over high grass. Once you have it flying flat and fast,

you are ready to launch it. The first time, leave the trims alone and launch it about 70 degrees above the horizon with an Estes D12-3 (with the ejection charge removed). It should either fly straight up and away from you or arc up a bit when the motor quits. Make adjustments in small increments after each flight until you have it boosting the way you want. For a real kick (and contest flying) I use Aerotech E6-P motors. They are low thrust and long burn motors

Use these templates for the "trainer" wing.

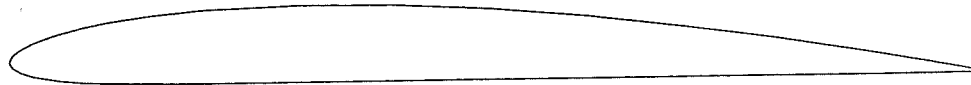
GO 795 Airfoil



Section F-F



Section G-G



Section H-H



Section I - I

(about 8 seconds). If you have built the model light (about 225g glide weight), you should get nearly 1000 feet of altitude on an E6 motor and nearly 10 minutes of dead air duration. By the way, you should get between 300 and 400 feet on a D12 and about 3 minutes in dead air duration.

Good luck and have fun flying KS5. If you have questions, call me. I don't mind answering questions (as long as it's your nickel <grin>).

One final note; you are free to copy the plans and give them to a friend or use them in your club newsletter. If you

want to use them for a commercial venture, give me a call and we can work something out.

Kevin McKiou
6 S. 211 Cohasset Rd.
Naperville, IL 60540
(708) 717-5830
Internet: kwm@ihlpm.att.com

The Plumber's Delight

A nifty launch pad design by Bill Owens

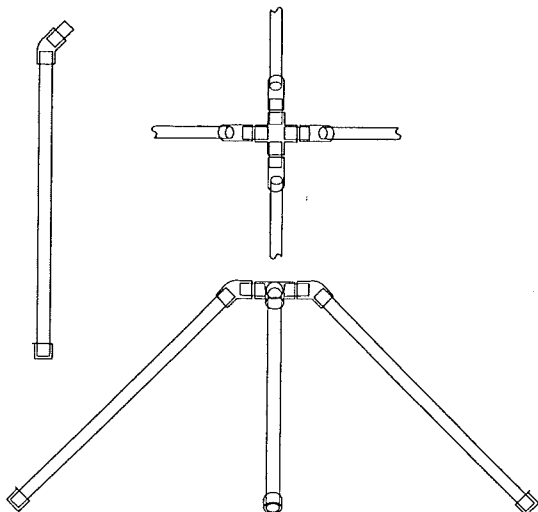
The Plumber's Delight is a 4-legged pad design with a wide stance for maximum stability, but which stands almost two feet off the ground for convenience. It has an easy to use tilt head and can accept launch rods up to 1/4" diameter with quick and easy rod changes. It can be broken down into a very small package for transport (about 6" dia x 28" long, without the launch rods) and assembled at the field in seconds. It can also be made light or have weight added to make it as heavy as desired. Finally, all the parts can be easily obtained (in Rochester, Builder's Square has all the parts except the rod and the steel plate, and ChasePitkin has those). I purchased everything necessary for under \$20.

Construction

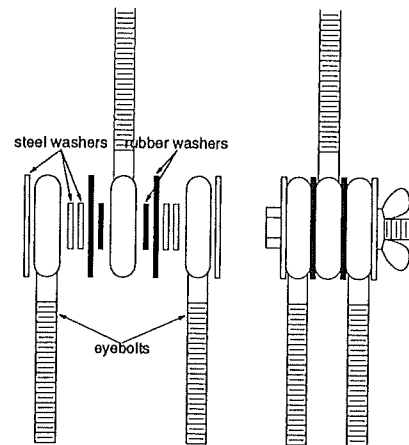
The base of the PD is a 1" CPVC pipe 4-way crossover fitting. It looks like a cross, with four female fittings at 90 degrees to each other. Each leg consists of a 24" piece of 1" CPVC pipe, with a cap at one end and a 45 degree elbow at the other. If you can find street elbows (female one end, male the other), so much the better; if not, cut 2" lengths of pipe and attach them to the elbows (see Figure). Using CPVC cement, glue the caps and elbows on the legs, and glue the 2" sections into the elbows. For your own sake, please do this in a very well ventilated area or outside, the cement consists of some nasty chemicals!

To make the tilt head, assemble the eyebolts, rubber and steel washers as shown in Figure 1 (fender washer, eyebolt, two small steel washers, large rubber washer, two small rubber washers, eyebolt, large rubber washer, two small steel washers, eyebolt, fender washer) and clamp the whole stack together with the 1/4x20 bolt and wingnut. The small rubber and steel washers are optional; they help to keep the eyebolts centered on the 1/4x20 bolt. If you leave them out, check that the stack is centered before tightening (or use a larger center bolt, with correspondingly larger washers).

With the tilt head assembled, swing the outside eyebolts so that they face one direction, with the middle eyebolt facing opposite. Measure the distance between the ends of the outside bolts (should be about 1/2") and drill two 1/4" holes in the center of the 4-way fitting (through one side of the fitting only). Check the inside of the fitting before drilling; the one I used was molded with thicker plastic in one direction, so I chose that location for the holes. Place a nut on each bolt and insert them into the holes, then place nuts on the inside and tighten both bolts. The nuts on the outside of the fitting help to lock the bolts in place (and are easier to reach with a wrench).



Left: Plan for launcher base.
Right: Tilt head detail.



Next, clean any oil or dirt off one end of the launch rod and wrap it with about 9 layers of masking tape. The resulting cylinder of tape should be about 1/4" in diameter. Using pliers if necessary, twist the taped end of the rod halfway into the 1/4" rod coupler. The rod should project straight out of the coupler, and should fit quite tightly.

Attach the legs to the 4-way fitting, drop on a blast deflector, and your pad is complete!

Options

If you don't need a tilt head, just drill one hole all the way through the center of the 4-way fitting and insert a 1 3/4" long 1/4x20 bolt. Place a nut on the bolt to hold it in, drop the blast deflector on and attach the launch rod.

For a heavier, more stable pad, fill the legs with your choice of steel shot, sand, or concrete and plug the open ends if necessary. Personally, I use clothes hangers bent to form U-shaped stakes, and simply stake the legs down.

Additional launch rods can be added by the tape wrap method above for up to 3/16" dia; 1/4" rods can simply be threaded with an appropriate die.

Parts List

Description	Quantity
For pad:	
1" CPVC pipe	10'
1" CPVC 4-way crossover	1
1" CPVC 45 degree elbow	4
1" CPVC cap	4
CPVC cement	1 bottle
1/8"x3' steel rod	1
1/4" threaded rod coupler	1
16ga steel sheet	1
For tilt head:	
1/4"x20 eyebolt	3
1/4"x20x1 1/4" bolt	1
1/4" fender washer	2
1/4" steel washer	4
1/4" large rubber washer	2
1/4" small rubber washer	2
1/4"x20 nut	6

>

Come fly . . .

NYSPACE '94

The New York State Model Rocket Championships and
Sport Launch

4 & 5 June 🍷 Geneseo, NY

Contest Events:

- 1/2A Streamer Duration
- 1/2A Boost Glider
- A Super Roc (need I say Altitude?)
- D Dual Eggloft (need I say it again?)
- Scale (the McCoy!)
- Open Spot Landing

Fun Events:

- Sport Cluster: *Bring your cluster birds, and we'll see who can make the smokiest flight!*
- Sport Stage: *Who can stage the straightest & highest?*

FAA Waiver Applied for: 5000' AGL, 5 pounds GLW,
225g propellant

NAR High Impulse Certification available

For further information, contact:

John Viggiano, 359 - 3869 (H), 475 - 2792 (W)

Upstate Rocketry Calendar of Events

Rocketry related events in the Upstate New York area, or of interest to rocket enthusiasts of this area, are listed below.

15 May, Sport Launch, 2:00 PM
Town Park, Route 259, Parma

21-22 May, Battle Park, High-Impulse Launch.
Location: Culpeper, VA.

The East Coast's largest high-impulse rocket launch.
A MARS contingent is planning a road trip to this launch.
See Dan or John.

4-5 June, NYSPACE '94, Regional Meet, the "States."
Sport flying encouraged, FAA Waiver applied for!
Events: 1/2A Streamer, 1/2A Boost/Glide, A SuperRoc
Altitude, D Dual Eggloft Altitude, Scale, Open Spot
Landing.
Contact: John Viggiano 359-3869

11-12 June, RAMTEC-II, Regional Meet, Center Valley, PA
C Super Roc Duration, B Eggloft Duration, E Helicopter, A
R/G MR, PMC. Contact: Glenn Feveryear, 717-456-5570.

14 June, MARS Club Meeting, 7:00PM
Regular Club Meeting.

19 June, Sport Launch, 2:00 PM
Parma Corners Park, Route 259, Parma.

12 July, MARS Club Meeting, 7:00PM
Regular Club Meeting.

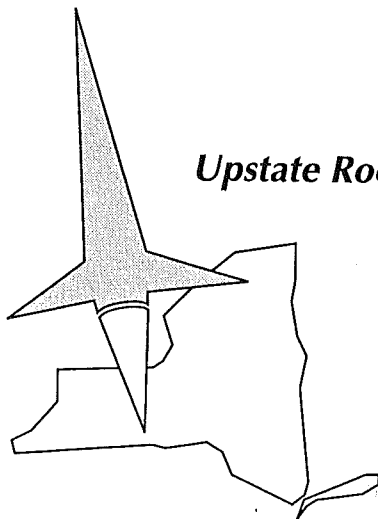
17 July, Sport Launch, 2:00 PM
Parma Corners Park, Route 259, Parma.

25 - 28 July, NARAM 36, Clear Lake, TX, The Nats.
Events: 1/2 A PD MR, F Streamer, C R/G MR, A HD, E
Dual Egg Altitude, D Altitude, Scale, R&D.

MARS Meetings are normally held the 2nd Tuesday of the month at 7:00 PM at the RIT Research Corporation, 75 Highpower Road, Henrietta. MARS Sport Launches are normally on the 3rd Sunday of the month at 2:00 PM at Parma Corners Park, Route 259, Parma. Contact John Viggiano at 359 - 3869 for more information on these club functions.

Please Note New Address:

Upstate Rocketeer
c/o John Viggiano
35 Mickens Bend
West Henrietta, NY 14586



Upstate Rocketeer

