

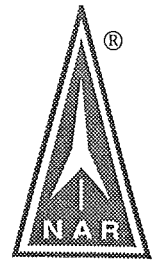


# The Upstate Rocketeer

Official Publication of MARST<sup>TM</sup>, the  
Section 136



Monroe Astronautical Rocketry Society,  
of the NAR<sup>®</sup>



March / April, 1995

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## Jets & Rocket Planes Issue

This issue of the UR is dedicated to Jets and Rocket Planes. While there is some emphasis on Plastic Model Conversion, we have an articles on Estes's Tomcat and their classic Nighthawk Flying Wing Boost Glider. Enjoy!

## New Year's Day Launch

### Coverage by Bill Owens

On the first day of the year, and the last day before winter really set in, hardy MARS members gathered for the traditional New Year's Day launch. Overcast skies and occasional light precipitation didn't keep anyone down, and we even set some new highs in impulse for the field.

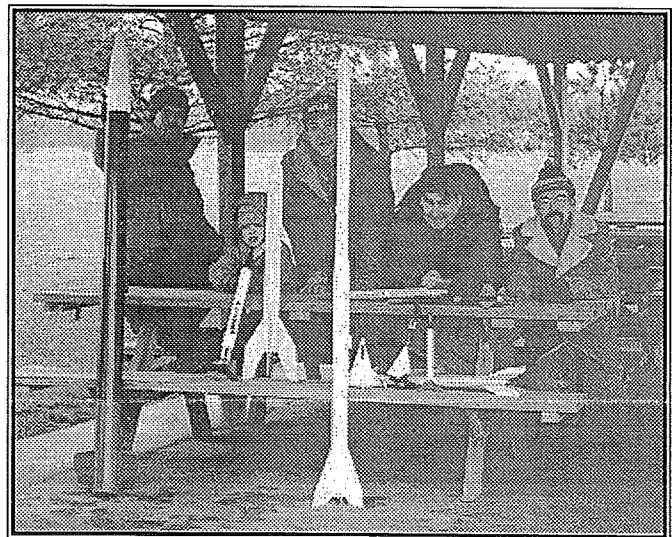
Many of the flyers also used the experimental Estes igniters, which appear to be Solar Igniters minus the black pyrogen on the tip. They worked flawlessly, and we'll be reporting the results back to Estes.

Before the launch began, everyone who had brought a new rocket gathered in the small shelter near the pads and posed with their birds for a couple of photos. With that out of the way, we quickly set up the launch system and started flying. This time around, the LCO started numbering the flight cards, so we can present the flights in the order they took place.

First off the pad, with a brand new Bail-Out on a B4-2, was Daniel Lewis-Rzesutek. It ejected an action figure at apogee, which drifted considerably farther than the rocket!

Ferenc Roka followed with the first flight of his scratch built Seneca on a B6-2, which recovered a little further downrange. Longtime member Roy Metz came by to fly some older models, starting with his Cobra 1500 on a C5-3.

Next up was Bill Owens with his Big Red One on an F24-7W reload. It flew well, with lots of flame and noise, but drifted just a little too far and hung up near the top of a tree at the edge of the park. Fortunately, the body tube blew



**NEW YEAR, NEW ROCKETS** — Here are some of the rockets flown for the first time on New Year's Day by MARS members, an annual tradition. Photo by Bill Owens. ➤

down the next day and was recovered, along with the reload casing.

Ken Kaleta made the first flight on his Alpha III with an A8-3, but it had some parachute problems and came down a little hard. John Viggiano fared better with his new FSI Micro on an A8-5. He followed with a Manta on A8-3 power, and the foam parasite glider almost beat the rocket back down! Ken's Super Shot was up next on a B4-4 and flew well.

Ray Lewis had brought freshly completed Broadsword, in the natural color scheme preferred by some club members, and it did very well on a D12-3. Ray nearly ran into the large puddle downrange trying to keep the rocket out of harm's way, but fortunately it drifted just wide.

Roy returned to the pads with an interesting setup; two identical Space Racers, both his, to drag race against each other. One had the new igniter and the other a conventional one, but the launch was too close to call. In a testament

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## Op / Ed

## Rhymes of the Range

friv·o·lous \ˈfriv-(e-)ləs\ *adj* [ME, fr. L *frivulus*] (15c) 1: of little weight or importance 2 a: lacking in seriousness b: marked by unbecoming levity

[from Merriam-Webster's 9th New Collegiate Dictionary]

This is no April Fools' editorial. It is about frivolity, however. There's too much of it among the businesses who supply us with the things we need in order to keep 'em flying. Of course, any ideas of mine that this will change anything are frivolous, too.

April Fools' Day has come and gone. So has New Year's Day. My resolution was to omit frivolous capitalization in the midst of words. It seems to be the trendy thing to do in technology: every time I look at a computer magazine, they're in my face. Some examples, chosen at random: PostScript, LetterPress, QuarkXPress, TrueType. A package sitting on my desk says, "DaynaPORT EasyNet". That's five frivolous capitals in two consecutive words. When will Andy Rooney get wise to this?

How did this get started? My guess is the computer programmers are responsible. Heck, I use this device when I program, too. It's great for readability — rarely can symbols contain embedded spaces, so it's easier to read "OutOfGamutFlag" than "Outofgamutflag". But I am not a computer, and I resent being treated like one. If someone wants to sell me an Ethernet (cool! no frivolous capitals!) transceiver, they'll have a better chance if they call it a "Dayna Port Easy Net Transceiver" instead.

Sad to say, it's become the rule in our little corner of the world.

Who has flown large rockets and hasn't heard of AeroTech? They're such computer jocks there they even date-code their engines in radix-16!

Of course, Aerotech is not limited to capitalization when it comes to frivolity. There's still an action pending, though it has been moved to Colorado. Estes Industries is a defendant. Vernon D. Estes, an individual who no longer has a financial interest in the company which bears his name, is named as a defendant, too. One could infer that Vern's best qualification for defendant status would be his reportedly deep pockets.

The most frivolous part of the complaint deals with the NAR, which is named as a co-conspirator. Why? It's quite simple: In order to prove conspiracy, you must have conspirators. Some jurisdictions require a minimum of five. Hence the frivolous claim of the NAR as a co-conspirator.

When it comes to frivolity, Aerotech is not alone. Pick up a recent Estes catalog. Look at some of the kit names: "Mercury-Atlas™, Phoenix™, Saturn-V™," etc. The Atlas was built by Convair (now General Dynamics) for the Air Force, and the Mercury was built by McDonnell (if Jim McDonnell named it, it would probably have been called the "Poltergeist," or something) for NASA. How does Estes Industries justify its claim to the name "Mercury-Atlas"? These names belong to all of us!

This is our special "Jets and Rocket Planes" issue. Ferenc has written a nice article on something to help you with Plastic Model Conversions of jets. The Squadron, Detail & Scale, and similar publications can help you learn about the plane you've selected, particularly the different variations. They also provide information needed for customization. If you're thinking about PMC competition, or just want to have fun doing a PMC, check out Ferenc's article.

Ed Norris has put together his tips on building the Estes Tomcat. While it has just been discontinued by Estes, it is still available in some stores. If we can build 'em to fly anything like Ed's, we may have to change our name to the Blue Angels! Thank you, Ed!

We also have an article on a PMC of the Revell X-15. Made to be flown on A10 mini engines, it's a fun conversion. The Nighthawk was a classic kit from Estes. As a boost-gliding flying wing, it fits in with our theme.

If there's sufficient demand (and contributions) we will run another issue with this theme next year. Please let me know what you think.

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. Subscriptions are currently \$6 per year.

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

Editors of other newsletters and journals are welcome to reprint material which appears in *Upstate Rocketeer*, provided they extend to us a reciprocal privilege and they cite the source, unless the article, plan, or what-have-you indicates something to the contrary. Please contact the author if that's the case.

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## As The Rocketry World Turns...

*news and rumors heard 'round the hobby, by Dan Wolf and Ferenc Róka*

**Manufacturer's News...** Ed LaCroix is the new Director of Sales and Marketing at Aerotech. In a recent news release Aerotech President Gary Rosenfield said, "Ed will be responsible for all phases of the management and implementation of the domestic, foreign and educational marketing and sales policies for the complete Aerotech Consumer Aerospace product line. This includes standard products, non-standard motors, high-power single use and reloadable rocket motors and rocket kits, and the upcoming RMS/Hybrid product release. Ed will also participate in the research and development of new Aerotech products."

"Ed brings with him a diverse background in fulfilling his position with the Aerotech staff. Ed founded and operated Apogee Components, the largest supplier of competition model rocket kits, parts and motors, for a period of seven years. He has also been employed as a Production Manager and Design Engineer for Quest Aerospace, a manufacturer of 'A' through 'C' model rocket kits, motors, parts and ground support equipment."

"Ed will be operating the Aerotech Sales and Marketing Department from an office in Phoenix, AZ. He can temporarily be reached at (602) 780-2946 (voice and fax), which is also the Apogee number. A new, exclusive Aerotech number will soon be established. Ed's mailing address is 19828 N. 43rd. Dr., Glendale, AZ 85308, and his e-mail Compuserve address is 71441,1111. Ed enthusiastically looks forward to the re-establishment of timely communications with all current Aerotech customers, dealers and distributors. Ed's efforts will be complemented by Aerotech's renewed ability to fill the majority of its orders from stock."

In other news from Aerotech, another news release from company President Gary Rosenfield:

"Aerotech successfully executed hybrid motor flights at "H" and "I" impulse levels for the Tripoli Rocketry Association Board of Directors today (2/4/95) at El Dorado Dry Lake near Las Vegas, NV. Aerotech dealer representatives and other high-power enthusiasts and manufacturers were also in attendance. Both of these flights followed closely on the heels of two other successful RMS/Hybrid flights launched earlier in the week. Aerotech is still batting 100% where the launch and recovery of hybrid boosted vehicles is concerned (six flights to date).

Aerotech has relied exclusively on the Pratt Hobbies ECS-2 for the recovery of its prototype hybrid motor vehicles, and has encountered nothing but reliable operation. The Aerotech RMS/Hybrid demonstration flights were conducted at the request of the TRA Board as they endeavor to further their knowledge of the rapidly developing technology of hybrid motors. These flights were also preliminary to the upcoming certification and beta-testing efforts planned by the Tripoli Board and the TRA Motor Testing committee."

"At this point in the development of the RMS/Hybrid, things look good for a late 2nd quarter introduction if all goes smoothly with the testing and certification of the RMS/Hybrid motors". Individuals with questions concerning this RMS/Hybrid News Release are invited to contact Ed LaCroix at the address above or Gary Rosenfield at Aerotech, Inc., 1955 S. Palm St., Suite 15, Las Vegas, NV 89104, phone (702) 641-2301.

In other hybrid news, the following information comes from Hypertek: "On Sunday February 5, 1995, the Tripoli board of directors voted unanimously to allow Hypertek to begin Beta distribution of our revolutionary hybrid rocket motor. The Hypertek system uses a simple, low cost flight motor with only three major components and no moving parts. The motor is coupled with our dedicated fueler/launcher system prior to flight. This design puts most of the cost, weight, and complexity of the hybrid motor on the ground, out of harm's way and for the entire club to use!

"Hypertek will select prefectures as Beta test sites based on a number of criteria. Important factors will be geographic distribution, frequency and altitude limits of launches, and the number of experienced rocketeers in each prefecture, willing to commit to the program. A minimum of four experienced participants will be required for a prefecture to be considered as a test site. The arrangement Hypertek will be offering Beta test clubs is as follows: The cost to each individual will be \$235.00 and each will receive a 700 Nsec motor with 5 fuel grains. (Additional fuel grains will be available for \$98.75 per 5 grains.) The club will then receive a free fueler/launcher system. If, as a result of the beta testing any changes are made to our production system, Hypertek will, of course, swap new updated flight hardware for any obsoleted Beta hardware free of charge. Any interested Tripoli Prefecture should contact Hypertek on Compuserve, Internet (comments @hypertek.com), or at (305) 439-4851. The Hypertek Hybrid Hipower system is the only hybrid rocket motor approved by Tripoli for Beta testing."

In another recent news release, Public Missiles announced the availability of their new 1995 catalog. New this year from Public Missiles are four new kits, three of them scale birds. (Are you listening Bud?) The first is an 8 foot tall version of the upper stage of the Black Brant X. The 4" diameter, 100 ounce model features a "Kwik-Switch" motor mount and a boattail! It is designed to fly with high impulse "H" through "J" motors. Next is a semi-scale version of the Black Brant VB. This one is a 2.6", 47.5" tall model designed to be flown with "G" through "I" motors. The last new scale offering is a D-Region Tomahawk. This one is 3.1" in diameter and 70.2" tall and designed to fly with "G" through "I" motors. The final new kit is the Cirrus, a 42" tall 38mm minimum diameter rocket. Designed for high performance, high altitude flights, this model is said to be capable

of 9000 ft. flights on an H125 and over 12000 ft. with an I284. To keep this high performance model together during flight, the fins are mounted in "dado" slots in the mainframe and fiberglassed in place. PML warns that several important construction steps must be adhered to. Pre-cut fiberglass cloth is supplied.

Saturn Press (Peter Alway) has announced some new products as well. First, the "Rockets of the World" poster, mentioned in last issue's column, is a 22" x 34" color poster with 155 different rockets in 1/300 scale, all pictured in ascending order of size. The poster comes with a 2 page information sheet on the pictured rockets, and is now available. Also, in response to the release of the Estes Mercury-Atlas kit, Saturn Press will be offering a Mercury-Atlas Color Photo and Data Set. The set includes 4 color prints of NASA photos in 4" x 6" size, a dimensioned scale drawing, and historical information. The photos are all of flight MA-6 (John Glenn's flight), and show the Friendship 7 insignia, the rocket before fueling and two launch shots. Saturn Press will also be coming out with a Mercury-Redstone set, with a close up of MR-1's spacecraft, including details of the adapter section, 2 liftoff shots of Shepard's MR-3 liftoff, and a shot of Grissom's MR-4 launch. Drawings and history are also included. Like the other Photo and Data Sets, these will cost \$6.00 plus 10% shipping and handling. Saturn Press has a \$10.00 minimum order. To order, or to receive a complete catalog, contact: Peter Alway, Saturn Press, PO Box 3709, Ann Arbor, MI 48106-3709, phone (313) 677-2321, Email: alway@tarle3.physics.lsa.umich.edu

**Association News...** While we've kept rather busy with our NARAM planning, there is another modeling event happening here of which we should be aware. The local chapter of the International Plastic Modeling Society (IPMS) is hosting "NOREASTCON 24," the Region 1 convention for plastic modeling. It will be held 5 through 7 May

at the Holiday Inn South (on the corner of Jefferson and East Henrietta roads). The contest theme is: "Victory! VE/VJ Day." There will be vendor tables, modeling seminars, a banquet, and more.

For further information, schedules, and applications, contact Stephen Mayer at 334-2361, or write him at 82 Citation Drive, Henrietta, NY 14467.

**Regulatory News...** The following "rule of thumb" is the easiest way to understand the BATF requirement for low explosives user permits as it pertains to rocket motors. Basically, if you can have it shipped to you by regular UPS or via US Mail, it is not a motor that requires a permit. Ed LaCroix, marketing director of Aerotech, recently divided their high impulse motor product line this way:

1. "Easy Access High Power" - DOT Class 1.4 single use motors and reload kits (those motors or reload kits that contain grains weighing 62.5 grams or less).

2. "Restricted Access High Power" - DOT Class 1.3 single use high power motors and reload kits whose grains weigh more than 62.5 grams ("H" and above single use motors, 54mm and 98 mm reloads, current 38mm Blackjack reloads, although Ed says these will be redesigned in the near future to make them 62.5 grams and DOT class 1.4).

The BATF does allow the use of DOT class 1.3 motors without a permit in one instance. That is, if you purchase them from a BATF legal dealer in your state of residence at a launch and use them at that launch. In the past, this usually meant making arrangements to buy them (pre-ordered) from Magnum at a launch in the state in which you reside. This approach may work for MARS members at NARAM (if we can get Ross to attend). There are rumors going around about various exemptions, waivers, etc. to the above rules but nothing is likely to change for the 1995 flying season. >

## Who Am I?

Last issue's "Who Am I?" was John DeMar. Nobody guessed correctly (again!). See if you can figure out this issue's Mystery Guest. The first member to leave the answer on my machine at 359-3869 wins a prize.

*My first rocket was an Estes Alpha. I bought it mail order from Estes as part of the Estes "Deluxe" starter set that included the Port-A-Pad, Astron Launch Controller, a couple of motors, and finishing supplies, all for \$8.50. I finished the Alpha with the red and white dope that came in the starter set, just like the catalog picture.*

*My favorite scale kit of all time is the Centuri Little Joe II. My favorite scale kit, just out of print, is the Estes Saturn V. I consider it a well-designed kit in that it is four inches in diameter and over three feet tall, yet it still weighs well under a pound. My favorite non-scale kit of all time is the Centuri Laser-X. My favorite non-scale kit currently available is the FSI Eos.*

*Of all the engines ever produced, my favorite is the Centuri Mini B. My favorite engine available today is the Aerotech F25,*

*though I also like the Rocketflite Silver Streak motors and the Apogee B7. One of my favorite high power motors is the H180 reload.*

*My favorite duration competition event is B Eggloft Duration. My favorite altitude events are those that are easy to track such as B and C Super Roc Altitude and D or E Dual Eggloft Altitude. My least favorite competition event is Super Roc Duration.*

*What I enjoy the most about the hobby is the people. What I like least about the hobby are Pink Book revisions. Just as when Congress passes a tax reform bill, we try to make the Pink Book simpler, but, in the end, each round of revisions makes it worse and more complicated than before.*

*Who Am I?*

*That number to call is (716) 359 - 3869. Leave your answer on the machine, along with your name and number. (So you don't forget, call before midnight tonight . . . )* >

... continued from Page 1

to his building ability, the rockets not only flew almost identically but recovered within a few feet of each other.

Ferenc brought up his new FSI Nova with an Estes B4-2, and had the only bad example of the new igniters; this one was open across the fine resistance wire. However, since it had nothing covering the wire it was easy to see the problem and a replacement worked fine.

Ken's A.R.V. Condor was up next, with newly painted gliders. On B power it flew very well, and one of the gliders proved to have great trim, circling slowly out almost to the high power pad. Roy put his Big Bertha up on a C6-3, and Ray followed with a Quest Space Clipper (but with Estes parachutes — good choice on a cold day!). Bill's Nerf Rocket flew well but broke the shock line; being a Nerf, it recovered fine anyway.

After spending most of the afternoon prepping, Andy Schechter was finally ready for his first flight of the day, with his freshly rebuilt and painted Et Tu Brute. Because we had an FAA waiver for the launch, he was able to extend the body tube and install a Stu Barrett-style altimeter compartment; the beefed up bird launched on a spectacular I161-M and roared up to the edge of the clouds. The plan was to have the altimeter deploy a long streamer at apogee, backed up by the engine ejection charge, with a parachute at 250' to reduce drift.

Although only one ejection charge was heard, it appears that all three fired at once and the rocket came down all the way under the chute. Andy and Bill trekked through the woods to find it hung up on the far edge, but with the streamer dragging on the ground. They managed to yank it

free and schlepped it back through the brush. The altimeter reported 1680' altitude, not bad given the launch into the wind.

Coming back to the model rockets, Roy flew a Nike Smoke on a C6-7 and Ferenc launched his Custom Mk. I on a B6-4. Roy also flew an unnamed mystery rocket on a B4-2; sometimes filling out those flight cards takes a back seat to actually flying!

John had a very pretty flight of his new 1.5x upscale FSI Eos with an F25-6; it's a really nice looking rocket in any size. Curiously, the shock cord made strange noises on the way down (or so he claims; mysteriously, this phenomenon didn't appear on the video tape). He resisted the impulse to fly it on anything larger given the overcast skies and all-white paint job. Roy flew his Tri-Pac successfully on a classic A4-4M mini motor from Centuri Engineering! Ferenc's Astra-1 flew well on an A8-3. John's Stretch Big Bertha (his first and last, or so he says) flew well on a C6-5, but Ferenc's Tracer had worse luck than the Astra with a B4-4; although it ejected, the streamer didn't escape the body and it pranged. To finish the day, Andy launched his Red-Headed Skyecker with a D12-5. The flame was spectacular in the gathering dusk, but the rocket disappeared; after some searching it was found sitting on the mostly-frozen pond. Some creative work with a weighted line recovered it intact.

Once again, MARS had several firsts on one day; the first launch of 1995, the first waiver for the Parma site, and the first I-impulse class flight (which was also Andy's I-certification). Given the good turnout despite bad weather and partying the night before, we expect great things for the club sport launches this year. Make sure you don't miss them!

>

## MARS January Meeting

### Notes by Bill Owens

Starting out our first meeting of the year with only a brief delay while the previous occupants of the room cleared out, MARS members turned out in strength to see some great videos, talk about upcoming events, and vote for officers for the 1995 calendar year. With ten members (John Viggiano, Ray Lewis, Pat Finan, Merrell Lane, Ed Norris, Jay King, Andy Schechter, Bill Owens, Ferenc Roka and Jeff Ryan) and guest Hugh, the treasury was also swelled with lots of dues payments.

The program was presented by Andy Schechter, starting with a videotape of some of the rockets at the New Year's Day launch. It documented Bill Owens's Nerf Rocket, Andy's Et Tu Brute on the I161, John Viggiano's 1.5x upscale Eos on an F25, and Ferenc Roka's Tracer, as well as something about dogs (you just had to be there). The second tape was made by Wayne Anthony of Super-8 movie film taken from his camera rocket, and included flights from NYSPACE '94 at Geneseo. It was interesting to contrast the mix of impulse from small H to large I and the variation with different propellants and burn times. The views of our field also showed its size to good advantage, compared with the other locations on the tape (which

included well-known launch sites in Culpeper, VA and Argonia, KS).

For the usual show and tell, Ferenc had two of the new 1995 Estes models, a rubber-powered airplane and the Firestreak E2X kit. Merrell showed off a poster of the "Area S4 UFO" which is claimed to be hidden at a secret Air Force base, and some pictures of a recent NORROC launch at Delaware Park in Buffalo. Bill Owens brought his nearly completed 1.7x upscale Viper.

Committee reports started with Dan's updates on NARAM-37 (relayed by John): Trip Barber has given us good feedback on the budget, Dan has contacted the Museum to ask them to speak to the FAA on our behalf regarding the waivers for our activities this year, and the Ontario dormitory will be ours for the week, a good choice for its proximity to parking and the field, and the suite arrangement (space to work on your last-minute models).

Pat reported that the membership committee didn't have much activity in this past month, and John reminded us of the deadlines for material to be included in the newsletter. For technical publications, Jay discussed his plans to make an archive of the Upstate Rocketeer available on CDROM, and will report back on progress on the MARSCON '94 proceedings. Jeff says that work is progressing on the club's new range

equipment, and he has volunteered to chair the previously vacant contest and records committee.

John reminded everyone to save those Tops register tapes, and to get your friends and neighbors to hoard them too! Hugh and Bill contributed some receipts towards the goal, but we're still behind schedule.

Elections were held with a quorum of ten members, and all the 1994 officers present. In each case, one person was nominated for the office, and assent was unanimous (except for the nominee, who abstained each time). The 1995 club officers are:

President and Senior Advisor - John Viggiano  
 Vice President - Jeff Ryan  
 Treasurer - Ferenc Roka  
 Secretary - Bill Owens

Note that this is the same arrangement as last year, except that the responsibilities of Secretary and Treasurer are once again separate.

Under new business, John presented the budget for 1995, which was accepted as written. We also voted to keep 1995 dues at \$10/year for adults, \$5/year for 18 and under, these being the rates used for the budget.

## NARAM 37 Committee Report

### Update by Dan Wolf

Plans for NARAM 37 continue to go along well. At the January committee meeting, a schedule of the major tasks that must be completed prior to NARAM was reviewed by the committee. Ray Lewis volunteered to make all of the signs for NARAM. This includes direction signs, information signs, etc. Ed Reilly has provided us with a list of all of the Western NY TV stations and newspapers including addresses, phone numbers, etc. The NAR will be providing us the official NARAM press release form on April 1st. The "NARAM at Night" schedule was worked out at the meeting, making the full week agenda, both day and night completed. It looks good and it should be a terrific week.

John Viggiano showed the committee examples of the RSO/check-in/returns guidelines books that he is putting together. These look really good and should help the range operations go smoothly. John will present a draft version of the ground rules document for the next meeting.

The order for the patches will be placed soon. We have received most of the patch quotes and will make a decision once we have received the rest. The cost will probably be higher than we expected but we will offset the deficit by selling those left over after stuffing the participant packets. This additional income was not included in the income side of the NARAM budget.

A letter was sent to the Warplane Museum informing them of our activities. Even though we now go through Mr. Wadsworth for permission to use the field, we are keeping the Museum informed of our activities as a common courtesy. We

We turned to the event slate for NYSPACE '95; after much discussion, it was decided to use only NARAM-37 events, so that NYSPACE will serve as a practice session for NARAM, both for the contestants and the club. The event list was approved with one abstention, and is in the club calendar. It was also decided to start each day at 1000, finishing by 1800, with the altitude events scheduled on Saturday and Sport Scale on Sunday, and split sport and contest ranges.

Pat Finan noted that there was no sport launch scheduled for April, because the usual date conflicted with ECRM and the week previous with Easter, so we decided to amend the 1995 schedule by adding a launch on Saturday, April 8 at 1400.

In other club news, orders for Magnum, Belleville and BMS are being placed, and John volunteered to supply the hard-to-find tubing for the upper stage of a 1:9 sport scale Aerobee 300, which would make a good Giant SS entry for NARAM (or NYSPACE). John also volunteered to help NORROC run a contest this spring; they have expressed interest, but don't have many members with experience. Merrell will continue to act as the unofficial liaison between the two clubs.

The meeting adjourned at 1045, with the usual contingent heading off for a late night snack.

also have requested them to support us in our efforts to secure a bigger waiver than we have received in the past. John Viggiano will be sending in the waiver application soon. If what the FAA gives us is not suitable, we will ask the Museum to "go to bat for us." They are aware of this plan.

Recent communication from the NAR Board of Trustees on the status of the BATF regulations has resulted in the following: the only persons who may fly DOT class 1.3 motors at NARAM are those persons holding a BATF Low Explosives Users Permit (LEUP). The one exception to this rule is if a DOT/BATF compliant dealer is present. Then, NAR or Tripoli certified high power consumers, who are New York state residents, may pick-up pre-ordered (no walk up sales) motors on the field and fly them THAT DAY on the field. No DOT class 1.3 motors will be allowed in the dormitories or other buildings on campus. Some new NFPA 1127 requirements will also be enforced at NARAM. No smoking within 25 feet of motors, prep areas, or launch areas for high-power rockets. Also, range store and other onsite vendors must store their motors in resealable, non-combustible containers.

Bill Owens reports that the NARAM Web Server is now operational and news of its availability has been publicized on the Internet.

We have been receiving two to three requests per week for NARAM information since the first of the year. All told, about 20 NARAM application forms have been mailed out to date. Mass mailings of NARAM information to be sent to all NAR sections, and to all NAR members located within a 4 hour drive of Geneseo will be mailed out at the end of February.

Last but not least, we are still asking all MARS members to help our cash flow situation by registering for NARAM and paying your NARAM fees as soon as possible.

## Building a Better Tomcat

### Construction tips by Ed Norris

In building the Estes Tomcat there are a few improvements in construction that will help you get better performance out of the finished model.

Proceed according to the kit instructions to Step 6E. Follow the steps in 6E, but add a light fillet of epoxy around the brass guide tube where it protrudes from the body tube, and spread a film of epoxy to strengthen tube. See Figure 1.

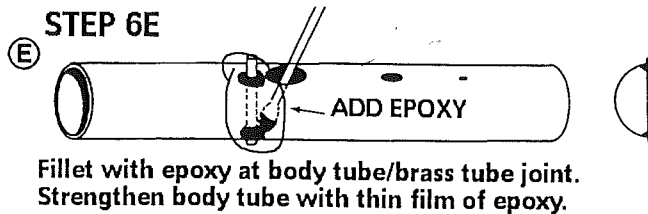


FIGURE 1: The joint and body tube are strengthened with epoxy in Step 6E. >

### STEP 9-I

Poke pin holes through dots of glue to strengthen joint.

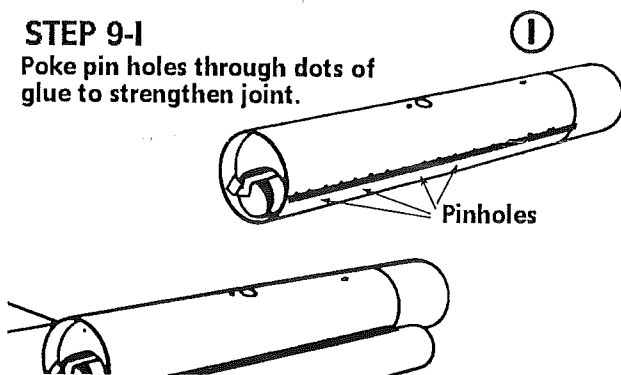


FIGURE 2: Pinholes are used to strengthen the joints between the body tubes. >

Continue following the instructions through Step 9I. Before applying the glue, poke small pin holes along the lines to strengthen the joint. See Figure 2.

In Step 10, the launch lugs should be beveled to reduce drag.

Keep on going up to Step 11J. The rubber band posts should be 1/2" (13mm) long, not 3/8" (10mm) long to help keep the rubber bands from slipping off. Make sure you put a film of epoxy around the pivot pin hole, post holes, and trigger pin holes to strengthen them so they don't wear to an egg shape. See Figure 3. If possible, make a gouge in the Rubber Band Posts to help keep the rubber bands on. Don't make the gouge too deep or the post will weaken. An alternative is to make a nail head on top of the post before mounting the post in the wing. You can do this by placing a dot of epoxy on wax paper, then

sticking the post in the epoxy and letting it cure. You don't need much epoxy for this.

In Step 12G, make sure the wire fits flat and straight against the tube.

### STEP 11 — WING ASSEMBLY

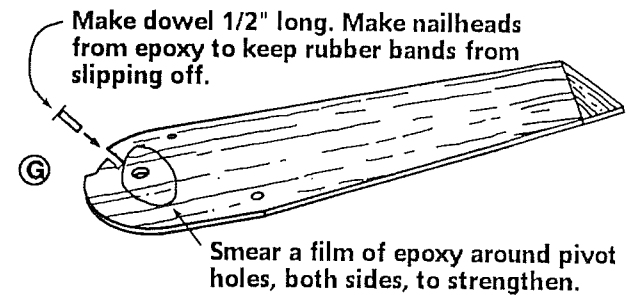


FIGURE 3: These tips will help keep the wings together and the rubber bands on in Step 11. >

### STEP 13:

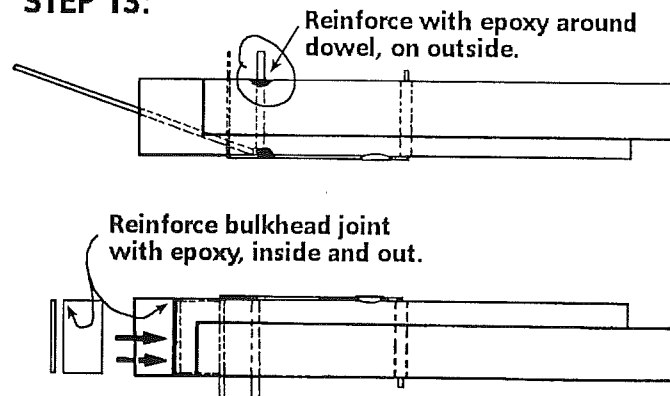


FIGURE 4: Reinforce these joints with epoxy in Step 13. >

In Steps 12P and Q, don't be afraid to use plenty of epoxy or it will loosen after a few flights.

Step 13B: After the glue has set, reinforce with epoxy around the Pivot Pin and spread a film of epoxy to strengthen the body tube. In 13F, use epoxy to make sure bulkhead doesn't blow out during ejection to actuate wing release. See Figure 4.

When balancing (trimming) your Tomcat (Step 22), start with half of the clay in the nose. Add a little at a time until you get a good test glide.

I hope these modifications and additional steps will be helpful in having a good flight.



## Revell X-15 Plastic Model Conversion



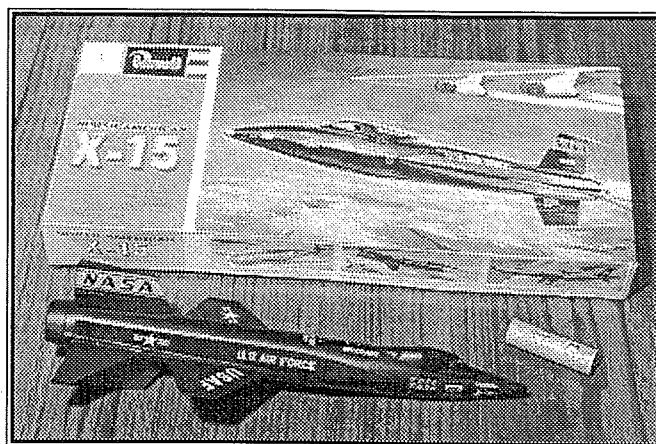
**PMC PLURALITY** — There are a number of space-related plastic models on the market which are excellent subjects for flight conversion. From top: Monogram Saturn V, Monogram US/USSR Missiles, Monogram Apollo CSM, Glencoe Juno-I, Revell Gemini, Revell X-15. Photo by John Viggiano. >

### Conversion article by John Viggiano

Revell's 1:64 scale X-15 is a good candidate for Plastic Model Conversion (PMC). It belongs to a series of older kits which Monogram/Revell (the former competitors are now one big happy family) has been re-issuing, often in the original box art. Other members of the series which are more challenging PMC subjects include the 1:24 scale Gemini spacecraft (wicked cool!), the V-2, a 1:144 Apollo-Saturn V, a huge 1:32 scale Apollo CSM. Models in the re-issue series which are cool, but less convertible (usually because they are too small) include a Mercury-Atlas, Nike-Hercules, Douglas Skyrocket, and a Lunar Module. There is also a re-issue of the US/Soviet missile display, with some extremely boring missiles, about a half-dozen of which are big enough to convert. They'll do in a pinch, and Will Safford did place at NYSPACE '93 with one. The list price on the X-15 is \$10.

### What You'll Need

- 1 Revell X-15, Kit H-164
- 1 BT-20, 95mm (3 3/4") long



The completed model is shown with an Estes Mini A10-3 engine. >

- 1 BT-5, 70mm (2 3/4") long
- 1 13mm engine block
- 1 18mm nose block
- 2 CR0520 Centering Rings
- Modeling Clay
- Metal Shot
- Scrap Balsa
- Shock Cord
- 2 Small Screw Eyes
- Plastic Model Cement
- Epoxy
- 20cm (8") Parachute

Start by following Step 1 of the kit instructions. I painted the pilot with a chrome-like bumper paint to simulate the appearance of the silvery full-pressure space suits worn by the X-15 pilots. Pack the area forward of the cockpit with shot and modeling clay. Pack the area 10mm behind the cockpit, as well.

Step 2 in the kit directions deal with the X-15 rocket engine. We'll be replacing the plastic kit engine with a real one, so disregard this step.

Cement the stabilizers in place. Glue the fuselage halves together with model cement, then the nose cap, as directed in Step 3 of the instructions. (Defer all decaling until the end.) While they dry, assemble the engine mount. Glue one centering ring flush with the end of the BT-5. This is the forward end of the tube. Mark the tube 53mm (2 3/32") from the aft end. Glue the other ring just forward of this mark. Use a mini engine casing to install the engine block, allowing the engine to stick out slightly.

### The Kindest Cut

Now comes the time to put aside your squeamishness and cut the fuselage. You will need to separate the fuse into two parts, one of which will function as the nose cone of your rocket. This is a feature in many aircraft PMCs. For the X-



15, the cut is made just aft of the cockpit cowling. Starting at the extreme aft end of the fuselage, measure 148mm forward. This will place the cut behind the cockpit and near the front of the side fairings, in a relatively round spot, which is good. (Some non-roundness on either side is important, as the shock cord will be stuffed into the side of the fuselage. I used a bandsaw with a very fine blade to make the cut. A razor-saw may be used if you carefully build up a ring of narrow tape on one side of the cut. This will guide your hand as you make the cut.

Put a small piece of 320 Silicon Carbide (Wet or Dry) sand paper on a flat surface, like the bottom of a sink or laundry tray, grit side up. Keeping the sandpaper wet, gently sand the cut, holding the fuselage so its main axis is perpendicular to the sandpaper. This removes burrs and smooths the surface. Do not remove any more material than needed to smooth the surface. Repeat for the nose piece. The water helps reduce the sandpaper's tendency to clog, and permits a neater result.

Continue with Steps 4 and 5 from the instructions, but use cement on all parts. Removable fins with movable surfaces is not a good idea for a flying model! I deleted the air brake actuators in Step 4.

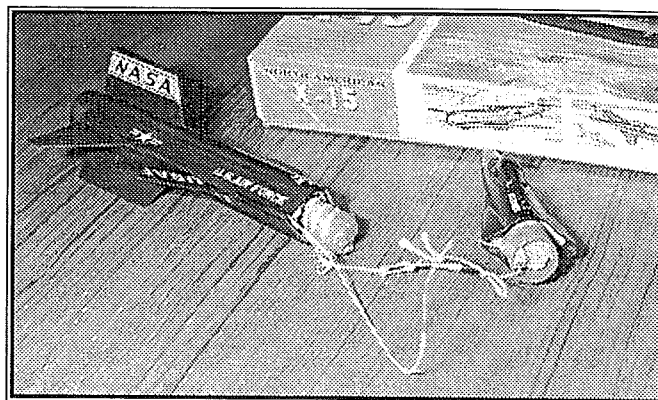
I skipped Steps 6 and 7, which dealt with the landing gear. You may want to glue the landing gear door in a closed position, or, if you're feeling brave, glue the landing gear in its landing position, but they'll only break off.

### Core Assembly

Finish the core tube assembly by gluing the engine mount tube into the BT-20 stuffer tube so the aft centering ring is just flush with the aft end of the BT-20. Tie one end of the shock cord around the BT-5 engine mount tube and add a few drops of wood glue. When this assembly is dry, test fit it in the fuselage. Build up the forward end of the BT-20 tube with masking tape until it fits snugly in the fuselage, with the forward ends of core and fuselage even.

Place the nose portion on a piece of 3mm (1/8") scrap balsa, and trace around it. Cut the balsa within the traced line to make a bulkhead. Test fit the bulkhead in the nose; shape and sand it until it is recessed by about 5mm (3/16"). Mark the side pointing up for identification, and remove. Drill a small hole in the center, and another near the edge, over to the left side. Pass a length of shock cord through both holes, so that both ends come out the aft end of the bulkhead. The end coming out the center hole is for the parachute and should be relatively short. The end coming out the hole on the left side connects the nose to the fuselage, and should be a little longer, perhaps 30cm (12") or so.

Mix some epoxy (5 minute has trouble sticking to plastic, so use at least a 15 minute variety) and place a few dabs inside the fuselage. Push the core assembly into the fuselage until the forward ends of the core and fuselage are even. The shock cord should come out the same side of the fuse as the shock cord coming out of the nose bulkhead — they will be



**FINISHED CONVERSION** — This photo shows the recovery system rigging. The chute is stuffed in the core tube, while the shock cord is stuffed along side it. >

tied together. Put a few more dabs of epoxy inside the nose and glue the bulkhead in place.

### Alignment

A critical step in assembly is bonding a tube coupler to the bulkhead plate. This coupler joins the two portions of the airframe, so its correct positioning is important. The first time I did this I used cyano, and was unable to re-align the fore and aft portions. A quick-setting epoxy is a better choice, but you do have to hold the two parts together while it sets. Place the coupler in the BT-20 so it extends enough to be pushed by the bulkhead when the two halves are joined, about half its length. Stuff the main shock cord into the left side of the fuselage, and the short cord for the chute in the core tube. Wet the forward edge of the coupler with some fresh epoxy, and gently join the two halves. Align them, and hold in place with the nose down for a few minutes. Then fillet the area inside the coupler, where it joins the bulkhead, liberally.

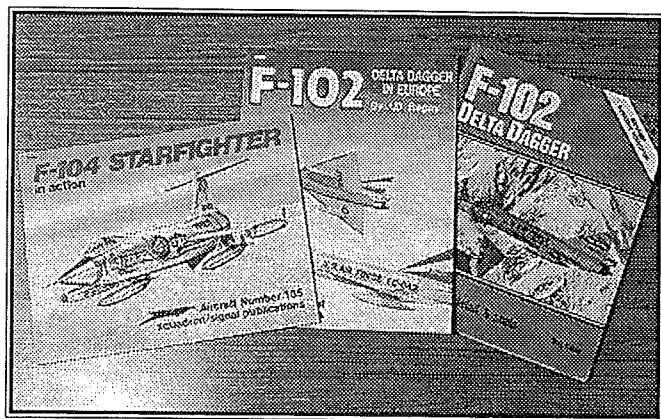
### Finishing Touches

With a loaded engine and the recovery system in place, the finished X-15 should balance even with the wing leading edge/root corners. If yours is tail heavy, add more weight to the front. (If you want, you can check the CP using the "Cardboard Cutout" technique.)

Follow Step 8 in the instructions, but be sure to glue the canopy in place. Those of you who saw my first X-15 fly at Finger Lakes Fall Classic IV in Geneseo know what I mean! Tie the two halves of the main shock cord together. If desired, paint your X-15, and add decals. Attach a small parachute to the short center cord in the nose. To fly it, use an A10-4T, and put the parachute over two squares of wadding in the core tube. Stuff the main shock cord into the area between the core and the fuselage, and push the forward and aft portions together.

I had fun doing this conversion; it's a little bit different, yet it has an immediate recognition factor.

## Review: *In Action*, *Detail and Scale*, and Similar Publications



THREE PUBLICATIONS — Books like these have proven popular in plastic modeling, both static and flying. Left, Squadron/Signal "In Action". Center: Squadron/Signal Special Edition. Right: *Detail and Scale*.

### By Ferenc Gy. Róka

Whether you're looking for a subject for Plastic Model Conversion, or unique markings for one you've decided on, or even if you just want to read an interesting book on a particular airplane without going broke, there are several sources available.

One of the most prolific is a company called Squadron/Signal. Their most popular line is the "In Action" series. This includes titles such as *F-15 Eagle In Action*, *P-51 Mustang In Action*, etc.

The "In Action" books are in a 11" by 8 1/4" landscape format. Each book runs about 50 pages, with color front and back covers and color profiles in the centerfold. In between are scale drawings, of both the complete aircraft, as well as special details, and more photographs than you can imagine. All photographs are well captioned. Some of the detail drawings highlight the differences between the different variants of that aircraft.

A couple of examples: The color profiles in *MiG-21 Fishbed In Action* offer 11 different national markings. In *F-104 Starfighter In Action*, besides all the detail photos and drawings of the regular aircraft, you even get information on the target drone version and the rocket-powered NF-104. (A PMC kit of the F-104 is available from Ken Brown at QCR.)

Squadron also publishes a series of aircraft specials, in the same size but in the "Portrait" format. These provide an even wider variety of subjects and markings. Titles run from *The USAF in Europe* to *Arab Air Forces*. Their latest release is on the SR-71 Blackbird. This book contains more photographs of the D-21 Drones than I have ever seen!

Another series of books is called "Detail & Scale." They're similar in content to the Squadron books, but go into more detail and run longer, typically 72 pages.

This publisher has another line called "Colors and Markings." These books are not intended to provide specifica-



**MiG-21 IN ACTION** — Most centerfolds in the Squadron/Signal "In Action" books feature 10 beautifully painted versions of the subject aircraft, in color. Here, the MiG-21 is shown. Ohh, I bet John wants to do that post-reunification Luftwaffe version in the middle!

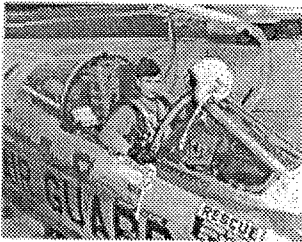
tions; rather, they concentrate on all the guises and paint schemes ever applied to a particular aircraft. Naturally, they contain lots and lots of photographs, both in color and black & white.

Also appearing in the "Landscape" format are the offerings from Schiffer Military History. These books first appeared in Germany, then were translated to English and published here. The titles are more varied than those offered by the two previous publishers. The latest one I picked up is on the Bachem Ba-349 "Natter" rocket-powered interceptor. The cover painting shows the craft at liftoff from its launch ramp set up in the woods.

Another book in the Schiffer series is entitled *German Guided Missiles*. The cover depicts a Dornier bomber just after releasing a Fritz-X guided bomb. Other books in the series cover the V1 and V2, as well as more conventional aircraft.

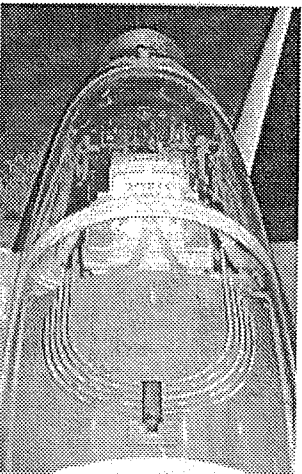
Lastly, I must mention the Profile publications. They were published in England (alas, no more), and in two dozen pages packed a lot of information. Their color profiles were the best

## CANOPY DETAILS

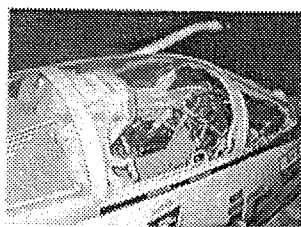


The F-104 was unique among USAF fighters in that it had a canopy hinged on the left side. This showed the way in the cockpit was from the right side as opposed to the left side, as was the norm for other USAF fighters. This photograph shows the hinged canopy, the intercom and its wiring, and the air canopy glass to good effect.

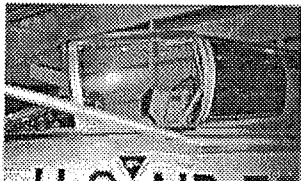
(Taylor collection)



This is the air canopy shown with the hinged portion as viewed from behind. The intercom wiring in the air glass is clearly visible.



A closed canopy is seen in this shot.



The open canopy is shown from the left side in this photograph. Note that the air canopy glass is on a hinged portion of the upper fuselage that can be opened to provide access to the intercom box behind the cockpit as much the same way as the earlier canopy section.



The typical F-104 hovering ladder is illustrated here, and the right side entry to the aircraft is being demonstrated.

(Taylor collection)

**DETAIL & SCALE** — This page from the *Detail and Scale* book on the F-104 Starfighter concentrates on canopy detail. It shows how the canopy opens, how it's mounted, how the pilot enters, and some detail, like the radio wires in the picture at the lower left. This information can help you add winning detail to your model.

➤



**SCHIFFER PUBLICATIONS** — Schiffer publishes books of this type. This one on the Ba-349 Natter is of particular interest to rocketeers.

➤

in their day, and a good value for the money. The subject matter I can't begin to cover. There were over 200 titles which covered subjects from the esoteric to the common. They can still be found on the used market. Check out local plastic contests, too.

The next time you try a PMC, consider doing something a little different. These publications are certain to give you some ideas, and they're interesting reading, as well.

### Sources

Local hobby stores carry many of the Squadron/Signal, Detail and Scale, and Colors and Markings publications. They can also special order titles they don't have in stock. They also stock, or can special order, "after market" decals from Super Scale and other vendors, for many of the variants featured in the books.

➤

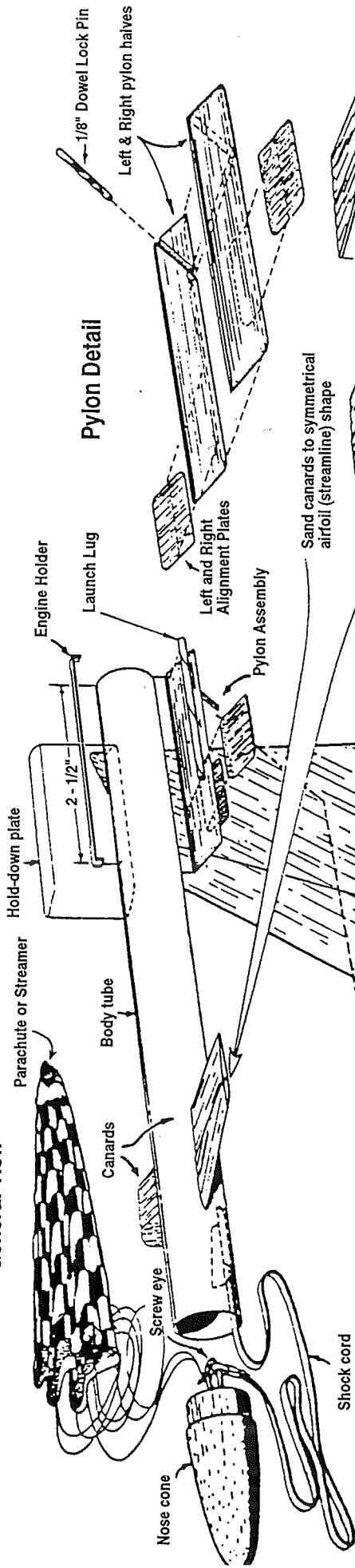
## Flying Wings, Jack Northrup, and the Estes Nighthawk

### Article by John Viggiano

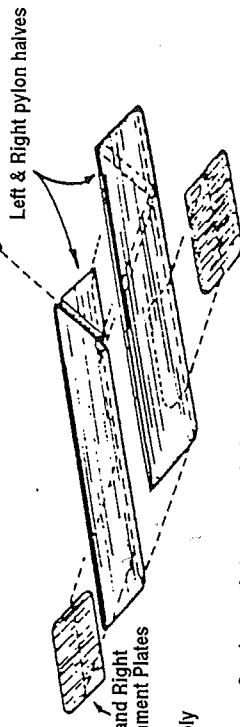
Half a century ago, aviation giant Jack Northrup built a plane that was all wing. Called the Flying Wing (surprise!), it was to be the proof of Northrup's lifelong belief that an aircraft that was purely wing would be most efficient. Unfortunately, the Flying Wing was decades ahead of its time: the computerized flight control systems used in today's aircraft would have cured some of the Flying Wing's stability and control problems. As it turned out, several crashes (including a fatal one involving test pilot Glenn Edwards, in whose honor Muroc Air Base was renamed) prompted the Air Force to call it a day. A story relates that after one of these crashes, Russ Schlee, Edwards's replacement, extracted himself from the burning hulk then tried to stop the firefighters, in hopes that the plane would burn to cinders.

Flying Wing designs have long enjoyed popularity in model aviation, and are experiencing a rebirth of interest. Frank Zaic wrote about one in 1964, and Rol Klingberg is currently selling kits based on the flying wing principle (including a rocket-boosted version). This latter development reminds us of an earlier incarnation of the flying wing in model rocketry. The Estes Nighthawk is fondly remembered by old-timers, and Nighthawk kits are sought by collectors. The flying wing portion attached to a booster that had small fins. Although Estes called them "canards," they were there to counteract the glider's control surfaces during boost, and remained on the booster. So there were no canards on the glider, which was a flying wing in the truest sense of the word. Here's a simplified set of Nighthawk plans, drawn especially for readers of the Upstate Rocketeer.

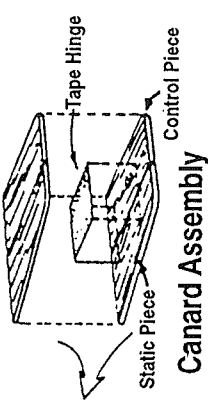
## General View



## Pylon Detail



Sand canards to symmetrical airfoil (streamline) shape



Wing "Land" (where wing is joined to body assembly)

Pin receiver liner OPTIONAL

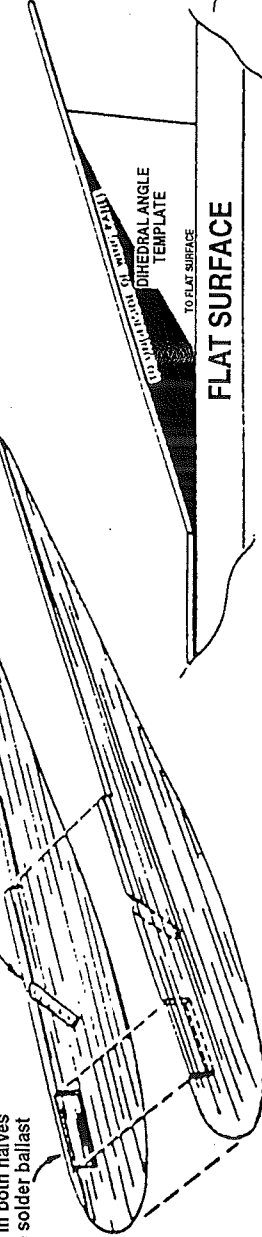
Solder - Insert in slot



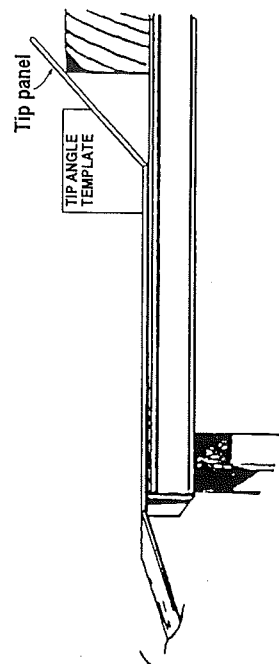
## Body Section

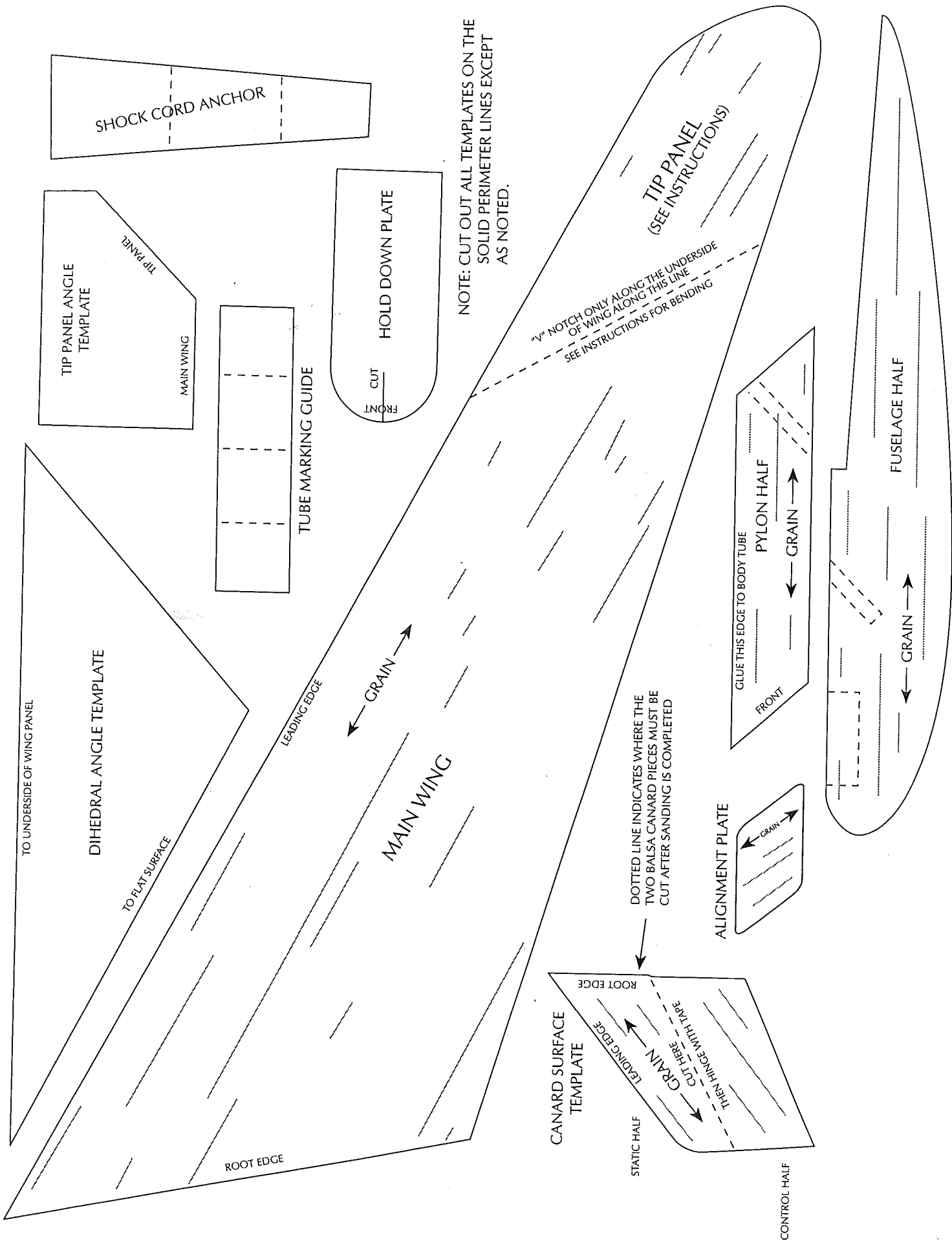
Recesses in both halves to receive solder ballast

Recesses in both halves to receive lock pin



## Use of Templates





## Parts List

- 1 Nose Cone BNC-20B (1 11/16" long)
- 1 Body Tube, BT-20, 220mm (8.65") long
- 1 sheet Balsa, 1/8" x 3" x 36"
- 1 Maple Dowel, 1/8" diameter x 1" long
- 1 Engine Hook or Engine Block

Launch lug, screw eye, shock cord, streamer or parachute, glue, tape, solder

## Glider Assembly

Begin assembly by copying the patterns onto heavy paper and cutting them out. The patterns with a balsa grain shown should be traced onto the balsa sheet, paying attention to the balsa grain. Note that each canard is in two sections. You need two copies of the wings, fuselage (fuse), pylon, and canards.

The fuse is laminated from two pieces of 1/8" wood. Small recesses are made on both halves to hold the solder ballast and the pin from the booster. Make these with a knife or a motorized tool like a Dremel. Check the alignment of these halves, and glue together, being careful to keep the glue out of the recesses.

The wing is done next. Because of the sweepback, the usual practice of cutting both halves as one piece is not recommended. Cut both halves out separately, leaving the tips in place for the moment. Airfoil the wings, and glue the two halves together at the dihedral joint, using the dihedral template as a guide.

The wing template has a dashed line, which indicates where the wing is to be notched. A V-shaped cut is made on the bottom surface of each wing panel. Put some white glue (don't use carpenter's glue or CA; you may need to adjust this joint later) in one notch, and allow it to soak in for 3 minutes. This will allow the wood to soften so it may be bent. Gently bend the tip into the notch, tape the wing down, and place a block under the wing tip, as shown in the illustration. Some glue will be squeezed from the notch; smooth this glue into a fillet. Use the Wing Tip Template to assure you have the correct amount of bend, and allow the glue to dry. Repeat for the other wing tip.

The wing is then glued to the fuse. You can flatten the bottom of the dihedral joint slightly with sand paper before gluing. Use carpenter's glue or CA.

## Booster Assembly

The Pylon is laminated from two thicknesses of 1/8" balsa, just like the fuse. (It has to be the same thickness.) Form a recess in each half for the lock pin (dowel), as indicated on the pattern sheet. Glue the halves together, with the dowel between them. One end of the dowel should protrude from the bottom of the pylon; the other end should be flush with the back. Glue the alignment plates near the front of the pylon, keeping the area between the plates clear of glue (which would interfere with the positioning of the fuse between the plates).

Test fit the pylon on the glider. The lock pin (dowel) should fit nicely into the recess in the fuse, and the alignment plates should fit loosely about the glider fuselage. If the fit is too tight, the glider will remain attached to the booster; sand the alignment plates from the inside using a piece of sand paper wrapped around a piece of 3/32" balsa. The glider should disengage from the pylon if the assembly is given a solid shake in the forward direction.

The Canards are cut from the balsa sheet. Each consists of a fixed part and a control part. Cut each canard in one piece and sand to a symmetric streamline shape. Cut the canards as indicated

on the template; note that the control (aft) portion does not extend all the way to the body tube. The two halves are hinged with tape.

Cut the tube marking guide from the pattern sheet, and extend all three marks the length of the body tube. Glue the pylon flush with the aft end of the tube, and glue the launch lug on one side of the pylon, at the pylon/body joint. The Canard surfaces will have about 20° total dihedral. Glue the canards so their leading edges are 45mm (1 3/4") from the front of the body tube.

Cut a short slit in the body tube 65mm (2 1/2") from the aft end of the booster, directly opposite the pylon. Fit one end of the engine hook in this slit. Trace the hold down plate onto heavy paper, cut it out, and make a notch 11mm (7/16") long in the rounded end as indicated on the pattern. Glue it over the hook, with the end of the notch even with the end of the engine hook. The notch permits easier gluing. Note that the hold down plate does not extend to the rear of the engine clip. This permits easier engine changes.

## Trimming

This is probably the hardest part of building the Nighthawk. Estes provided a small piece of lead foil. My calculations indicate that it was about 2.4 grams. A piece of thin solder, folded in four and inserted in the slot in the fuse, makes a reasonable starting point. Use a piece of tape over the slot while trimming for a good glide. Estes recommended a balance point 1" forward of the wing trailing edge at the root.

On a calm day, give the glider a gentle, level toss. If it noses up, try tossing it a little slower. If it dives, it may have been launched too slowly and dove to gain speed, so try launching it a little faster. Don't add or subtract nose weight until you've tried a variety of launching speeds and are confident that none of them work well. Only then should you add weight to the nose if the nose pitches up, and subtract weight if the glider consistently death-dives.

A gentle turn is quite acceptable in a glider. If the glider turns too tightly, you need to adjust one or both the wing tips. Heat the tip over an 80 Watt table lamp. Because you used white glue for the tip joints, the glue will soften, permitting adjustment. Be cautioned that straightening one or both tips out will cause the glider to lose stability — the static margin will be reduced as the angle between the tips and wings is flattened. Changing the tip angles will also affect the trim.

## Finishing

The Nighthawk featured in the Estes catalog photos, 1972 & ca., show it with a snazzy yellow and black paint job. However, if you're concerned about weight, you can use marking pens for decoration. Tissue and dope make a light, smooth, strong, and colorful finish. Whatever finish you choose, be careful to keep the pin/socket and alignment plate/fuse areas clean.

Re-trim your Nighthawk, and glue the ballast in place.

## Flying the Nighthawk

Hold the body tube horizontally. With the pylon on the bottom, the trailing edges of the canard control surfaces should be about 2mm (3/32") higher than their leading edges — about 6 degrees of "negative incidence." This will offset the lifting tendencies of the glider in back, which, if uncorrected, might cause the Nighthawk to loop under power.

First flight should be on a 1/2A6-2. If the rocket boosts straight, reset the canards to this position for each subsequent flight. If the

rocket noses up during boost, add more elevation to the control surfaces. If the rocket noses down during boost, make the canards flatter; reduce the magnitude of the incidence. Don't change the incidence by more than a millimeter at a time.

When you're satisfied with the boost, an A5-2 engine is recommended, though it is no longer offered by Estes. You can use an A8-3, which might be a little too much thrust, an A3-2T in an adapter (should be just right), or a Quest A6-4 (the delay might be too long). The instructions recommend: "For all-out duration use the B4-2." If built and trimmed well, you'll probably lose the glider on a C6-3.

### How do they work?

How do flying wing designs work? In the free flight mode, which is to say there is no pilot (either aboard or via radio control), swept wings are used. The tips are usually canted upwards, so they actually behave like stabilizer/elevators, called "stabilators." The

Nighthawk uses a different mechanism. The wing tips droop in a gull-wing mode, and they have some wash-out. (Or is it wash-in?) The anhedral (negative dihedral) of the wingtips makes them behave as if they were at a lower angle of attack whenever the plane is disturbed. The foreplane (main wing panels) is flying at a positive angle of attack, generating lift up, while the tailplane is flying at a negative angle of attack, generating lift down. These two lifting forces cancel at a point a short distance aft of the CG. This is in direct analogy to a rocket which must have its CP a short distance aft of its CG. The result is a stable flight.

What became of Jack Northrup's idea for an all-wing warplane? It has resurfaced, nearly half a century after the last flight of the original Northrup Flying Wing design, in the form of Northrup's B-2 Stealth Bomber. It seems Jack Northrup was right, all along! While not especially stealthy, the Nighthawk owes a nod to the most vocal proponent of flying wing designs.

&gt;

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| <input type="checkbox"/> Building Workshops | <input type="checkbox"/> Photography           | <input type="checkbox"/> Social Events       |
| <input type="checkbox"/> Computers          | <input type="checkbox"/> Plastic Modeling      | <input type="checkbox"/> Video               |
| <input type="checkbox"/> Contests           | <input type="checkbox"/> Radio Control         | <input type="checkbox"/> Writing             |
| <input type="checkbox"/> Other _____        |  |  |

How did you hear about MARS? \_\_\_\_\_

Dues are \$10 per calendar year for adults, \$5 a year for Juniors / Leaders (under 18 years). Please make checks payable to: Ferenc Róka / MARS, and mail completed application to:

Patrick Finan, Membership Chair  
144 S. Fitzhugh Street, Apt. 5  
Rochester, NY 14608

or bring it to the next club function. Welcome to MARS!



## 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.

**22-23 April, Sport Launch, 2:00 PM**

Parma Corners Park, Route 259, Parma.

We may schedule a BYO picnic for one of these days.

**29-30 April, ECRM 22, Regional Meet.**

Middletown, MD. Events: 1/2A Alt., A B/G (MR), A Flexi (MR), C Eggloft Alt., Sport Scale, Open Spot Landing. Contact: Tom Lyon, (301) 855-9457. Note: A MARS contingent is planning a road trip to this launch. Contact Dan Wolf at 458-3848.

**9 May, MARS Club Meeting, 7:00 PM**

Regular club meeting.

**20-21 May, NYSPACE '95, Regional Meet.**

National Warplane Museum, Geneseo, NY

Events: 1/2A Parachute Duration, A Flex Wing (MR), A Boost/Glide, C Eggloft Altitude, D Super-Roc Altitude, Sport Scale, Parachute Spot Landing. Contact: Dan Wolf, 458-3848.

**23 May, NARAM Committee Meeting, 7:00PM**

Those who wish to be involved with NARAM-37 are invited to attend.

**27-29 May, National Sport Launch**

Amesbury, MA, hosted by CMASS, Section #363. Three days of

model and HPR flying. Contact: Chris Tavares, 339 Crawford St., Northboro, MA 01532. Note: A MARS contingent may attend the NSL, contact Dan Wolf at 458-3848 for details.

**11 June, Dumb Xtra Local, Local Meet, 12:00 Noon**

Parma Corners Park. Events: Random Duration, B Helicopter Duration, 1/2A Rocket Glider, Sport Scale, Drag Race.

Contact: Dan Wolf, 458-3848

**13 June, MARS Club Meeting, 7:00 PM**

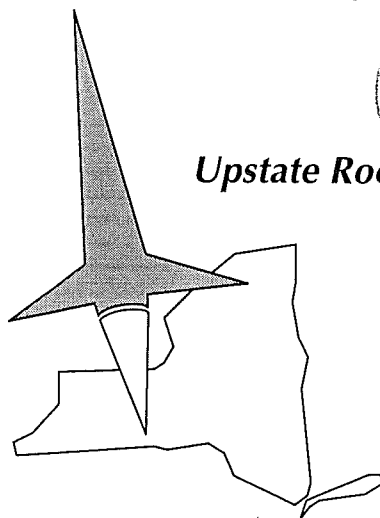
**27 June, NARAM Committee Meeting.** Note new date. 7:00 PM

**22 - 28 July 1995, NARAM 37, Geneseo, NY, The Nats.**

Events: 1/2 A Altitude, 1/2 A Parachute Duration, A Boost Glide, A Flex Wing (Multi-Round), C Streamer, C Eggloft, D Super Roc, Giant Sport Scale (Div. B, C, T), Peanut Sport Scale (Div. A), Open Spot Landing, Research & Development. Fun Events: Team Rendezvous, Ping Pong Ball Spot Landing, G Hairy Stein, H Waterloft, Radio Controlled Glider. There will be a separate range just for sport flying. Join us for a week of rocket flying fun! Contact: Dan Wolf, 458-3848.

MARS Meetings are normally held the 2nd Tuesday of the month at 7:00 PM at the RIT Research Corporation, 125 Tech Park Drive, Henrietta. (Note new location. It is just two doors from the old one.) 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.

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



**Upstate Rocketeer**

