

Newsletter of the Huntsville Area Rocketry Association

MAX-Q

Vol. 2 No. 3 April/May 1988



1987 Section Reserve National Champions

"This BABE Flies!"

by Wayne McCain



Jimmy Williams shows off BABA-2 just prior to launch

The HARA sounding rocket carrying the Brookwood High School Advanced Biology Experiment (BABE-2) roared away from the launch pad at 12:20 pm, Saturday, April 9, 1988 and thus culminated a project which began for the high school group almost one year ago. Thanks to MICOM's Test and Evaluation group, principally Phillip Carmack, Wes Widner, and David Browning, the Army Test Area One (TA-1) located on a southwest parcel of Redstone Arsenal property served as the launch site. Many others played behind the scene roles, including Drs. Bill McCorkle and Dick Rhodes, who gave an early "thumbs up" to the educationally oriented endeavor. (Dr. McCorkle has participated in other local rocketry events as judge.)

Saturday morning greeted the launch team with beautiful skies and warm temperatures. The activities carried over from the flight readiness review meeting late the previous night and began hours before dawn. The local and Decatur Civil Air Patrol readied for their spotter aircraft role. HARA personnel prepared launch equipment and Marshall Space Flight Center Amateur Radio Club/ Huntsville Amateur Radio Club organized the communications network.

Wayne McCain (UAH) and David Babulski (Brookwood High) spent the last hours before meeting at the TA-1 range preparing the vehicle and payload. Cody Steele attended but had no comment.

As reported in the media state-wide, North Coast Rocketry (Matt Steele) donated airframe parts and served a consulting role in the vehicle design. The I 283 engine (1.5 in. dia., 11.5 in. long) was manufactured by Vulcan Systems of Colorado Springs and was purchased from North Coast. The motor represents a state-of-the-art design employing a filament wound

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and much more!!!

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Wadding Scraps

FROM THE PRESIDENT'S PAD

Congratulations to Wayne McCain for making lemonade out of a lemon situation. The flight of BABE was a successful salvage of the fizzled LOFT program. Scheduled to fly last October, LOFT was a test of some launch procedures at Canaveral that was going to give an opportunity to UAH and Brookwood High School to do real atmospheric research. Fall and winter came and went with everything ready but the prime contractor. With intense hustle, Wayne and other HARA members were able to put together BABE and fly it locally before everybody graduated (or died from old age.) Consequently, while LOFT remains in limbo, we achieved a significant milestone and impressed the local community. We may be taking on more projects like this, but not until after NARAM-30! And kids, this was professional stuff and not exactly model rocketry, so don't try it at home alone. Join a rocket club instead!

Vince

*Would you allow your daughter
to marry a rocketeer???*

MAX-Q Staff

Editor:	Vince Huegele
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LAUNCH SITE CHANGE

The June Jam launch will be held at the MSFC recreational area on June 19. The old airport is not available. Bring your rockets and your lunch, as we will eat in the picnic area at mid day. Restrooms, picnic tables, and shade are provided so you can stay all day. Non Arsenal employees should enter the Rideout Road gate 9 off highway 20 (Governor's Dr.) Pick up a visitors car pass from the guard and tell them you are going to the picnic area. Don't say you are there to shoot rockets; you will confuse them and get sent to the test range! Proceed south down Rideout until you get to Martin Rd. at the four way stop. The athletic fields are on the right. For more explicit directions or a map, contact Vince or Matt.

ALABAMA JUBILEE DEMO

HARA is 'go' for a demonstration launch and display at Point Mallard, Decatur on Saturday, May 28. All members are to meet at the prayer chapel (where you enter) at 9:00 am, to prepare for the 10:00am launch. Which end of the flying field we launch from will depend on the wind, but the display afterward will be in the vendor/crafts area at the south of the field above the parking lot. This should be the biggest crowd we have performed for yet and a great opportunity to contact modelers in Decatur. Bring your best rockets and show off your stuff. Fame and glory await us this Memorial Day.

WELCOME TO NEW MEMBERS

HARA would like to extend greetings to several people who have signed on in the past months. Gloria Johnson has brought on *Dick Wagschal* and *Timothy Mitchell*, all from TV station 54. Hello to *Steve Ferguson* and *Mike Williamson* who both work at Intergraph. *Peter Sin* is a councilor at Space Camp. *Patricia Buddington* comes to us from the Pacific coast where she was active in rocketry. The unseen third member of the Zunofark team is *Chas Russell*, currently on assignment in Belgium. *David and Mark Atkinson* have been at many launches and are now official members. Try to make these folks feel at home in our elite group.



Jimmy Williams and Dave Babulski load
BABE-2 into the launch tower

composite case, a machine graphite nozzle, and a .67 pound of HTPB propellant. Vulcan manufactures "one-of-a-kind" motors for DoD and universities and supplies North Coast with a line of hobby motors for model rocketry use.

The launch was delayed from the original 10 am time due to Army tests scheduled that morning. In addition, an initial misfire (charge ejected from the motor) caused a 30 minute recycle period (and several red faces). After reworking the second flight igniter (Matt assisted Wayne McCain), the launch proceeded, this time successfully. BABE-2 was to go supersonic (Mach 1.4) at about 2 seconds into the flight. Observers did report hearing the characteristic "sonic snap" as the ve-

hicle climbed.

An anomaly occurred at altitude when the vehicle separated prior to the planned 20 second delay after motor burnout. Initial data suggests that aerodynamic and "g" forces contributed to a breakup of the vehicle airframe just forward of the SRM mount in a relatively unsupported section. The homing beacon ceased transmitting at this point.

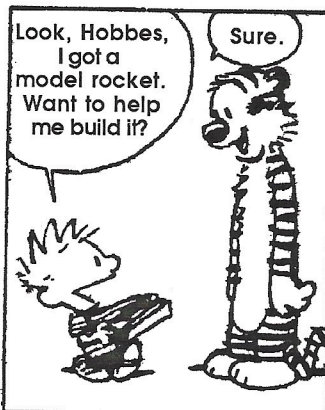
Nevertheless, the payload section with the BHS seed chambers intact was recovered within walking distance of the launcher and the flight has been termed a "qualified" success since the primary goal of retrieving the experiment package after flight was accomplished. The tail section was never found.

At last report, the experiment has been returned to Snellville where BHS students planted the seeds along with the control group. Flight data is being analyzed to support preparation of a final project report. All operations at TA-1 were conducted in a highly professional manner, much to the credit of the Army, UAH, HARA, CAP and all other groups. No definite future plans have been formulated, although several local schools have expressed interest in conducting a similar project.

All three local TV affiliates gave good coverage to the launch- up to two minutes on the 10 o'clock news. Several newspaper stories promoted the flight, giving HARA favorable recognition in the community and a substantial number of observers turned out from the community to watch the launch.

CALVIN AND HOBBS

Bill Watterson



HARA Members

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 4449 Millvale Dr., 35805
• Atkinson, David and Mark 882-0504
 3111 Holly Hill Rd 35802
• Baggett, Clay 881-2953
 8151 Oldfield Dr. #10 35802
• Buddington, Patricia 461-3955
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• Chambers, Richard 539-1448
 1901 Polk Dr. 35801
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 Rt2 Box 468 Lacey Springs, 35754
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 4209 Nolen Ave., 35801

• Mitchell, Timothy
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• Moser, David (615) 376-3653
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 10001 Willow Park Dr., 35803
• Olyniec, Lee 259-0173
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 3103 Holly Hill, 35802
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• Snyder, Chris 882-1905
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• Yeager, Carl & Jeff 539-2839
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Please contact Robyn Steele (883-6020) if your name, address & phone number do not appear here or if they are incorrect

Project STAR

Due to the success of BABE-2, Ed Stluka has proposed the formation of Student Training in Astronautics and Rocketry (STAR). Project STAR would be a program for school and university classes to launch experiments in high powered rockets. The schools would propose an experiment and HARA would evaluate, advise and coordinate the flight operations. "It would be like having a BABE flight every year, but with local schools doing different payloads," said Ed. Pat Buddington is assisting the project development. For more info, call Ed Stluka at 852-3850.

ET Comes Home

The External Tank is now mated to the Pathfinder Orbiter at SARC. The ceremony took place in early May when the ET arrived from New Orleans. Huntsville's shuttle is stacked before Kennedy's! The Skylab mockup, previously at MSFC, is now at SARC too. Also they have expanded the gift shop to cover most of the entrance lobby.

**ONLY 88 MORE
 PREPPING DAYS LEFT
 BEFORE NARAM!!**

Countdown 1988 Calendar

- APRIL:** 21 Apr; Meeting 7:30 PM
23 Apr; Sports Launch
- MAY:** 19 May; Meeting 7:30 PM
21 May; Redstone-1; NAR Open
28 May; Alabama Jubilee Demo,
10:00 am, Decatur
- JUNE:** 16 June; Meeting 7:30 PM
18 June; June Jam II; NAR Open
MSFC Picnic area (NOT Old Airport)
- JULY:** 16 July; NARAM SIM. Launch & Range
simulation test
21 July; Meeting 7:30 PM
- AUGUST:** 8-12 August; NARAM-30
Huntsville, Alabama
18 Aug; Meeting 7:30 PM
20 Aug: 5:30 pm POST NARAM
BLUES BASH (Steele's house)
- SEPTEMBER:** 15 Sept; Meeting 7:30 PM
17 Sept; Sport Launch
- OCTOBER:** 8 Oct; Rocket City Classic #7
20 Oct; Meeting 7:30 PM
- NOVEMBER:** 17 Nov; Meeting 7:30 PM
19 Nov; NAR Open

Meetings are held at the
Alabama Space & Rocket Center
Launches will be held at the Old Airport
unless otherwise announced.

Please contact Vince Huegele, HARA President
(881-2904) or Matt Steele, Contest Director (883-6020)
if you have any questions about the schedule or the
contests. *Events subject to change*

May Anniversaries

Fifteen years ago, America launched its first and hopefully not last, space station, Skylab on May 14, 1973. The event was celebrated this month at MSFC by renewing the accomplishments made by Skylab. The orbiting laboratory was in an S IV-B upper stage of a Saturn V. FLIGHT crews were launched in a Saturn 1B. Skylab crashed on July 11, 1979.

It was on May 28, 1959 that Miss Baker, Huntsville's former primary primate, was launched into space on a Jupiter. Although HARA has a demo launch on this date this year in Decatur, no commemorative monkey shot is planned. But next year, being the thirtieth anniversary, a reenactment flight is possible. Watch this space!

1988 HARA Contest Season Events

Redstone-1 Open, May 21, 1988

- 1-Predicted Duration
- 2-Sport Scale
- 3-D INT BG (C Div)
- 4-A INT BG (A&B Div)
- 5-A Helicopter Duration
- 6-1/2A INT SD
- 7-1/2A BG

June Jam-2 Open, June 18, 1988

- 1-Predicted Duration
- 2-Sport Scale
- 3-D INT BG (C Div)
- 4-A INT BG (A&B Div)
- 5-1/2A INT BG
- 6-1/2A INT PD
- 7-1/2A SD
- 9-Open Spot Landing

NARAM-30, August 8-12, 1988

- 1- 1/2A International Parachute Duration
- 2- B Streamer Duration
- 3- B Eggloft Duration
- 4- A Helicopter Duration
- 5- B Rocket Glide
- 6- D International Boost Glide (flexies & RCs allowed)
- 7- Predicted Altitude
- 8- F Altitude (B & C Division)
- 9- D Altitude (A Division)
- 10- Research & Development
- 11- Sport Scale (A&B Division)
- 12- Giant Sport Scale (C Division)
- 13- Parachute Spot Landing

U.S. Internats Team Flyoffs, August 12-13

Friday and Saturday will be the flyoffs for all those rocketeers interested in trying out for the 1989 U.S. International Team.

FAI Events being flown for tryouts:

E Radio Controlled Rocket Glider

A Streamer Duration

A Parachute Duration

B Boost Glide

Scale and C Scale Altitude positions will be chose
by resume

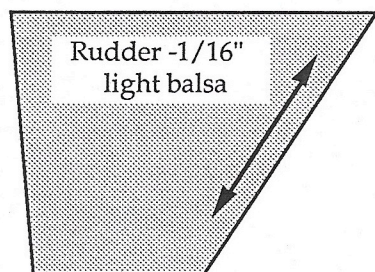
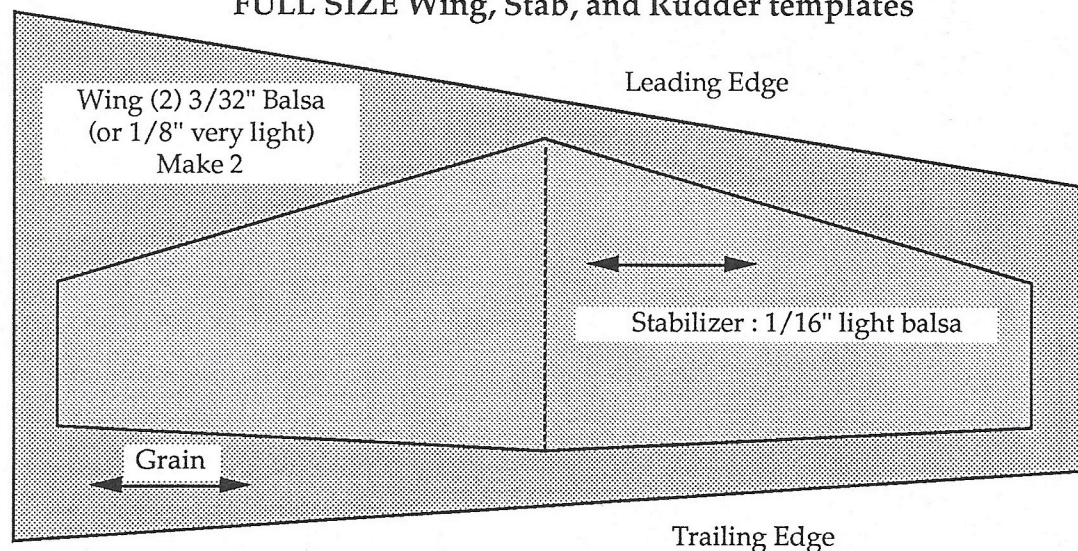
For additional information on NARAM or the Internats flyoff rules and registration, contact NARAM Contest Director and 1989 U.S. Team Manager, Matt Steele, 13011 Branscomb Rd, Huntsville, AL 35803 (205) 883-6020

BIG FISH N' CHIPS

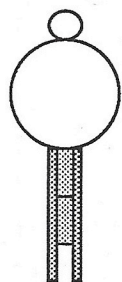
By George Gassaway

Adapted from Chris "Poot Face" Flanigan's original design

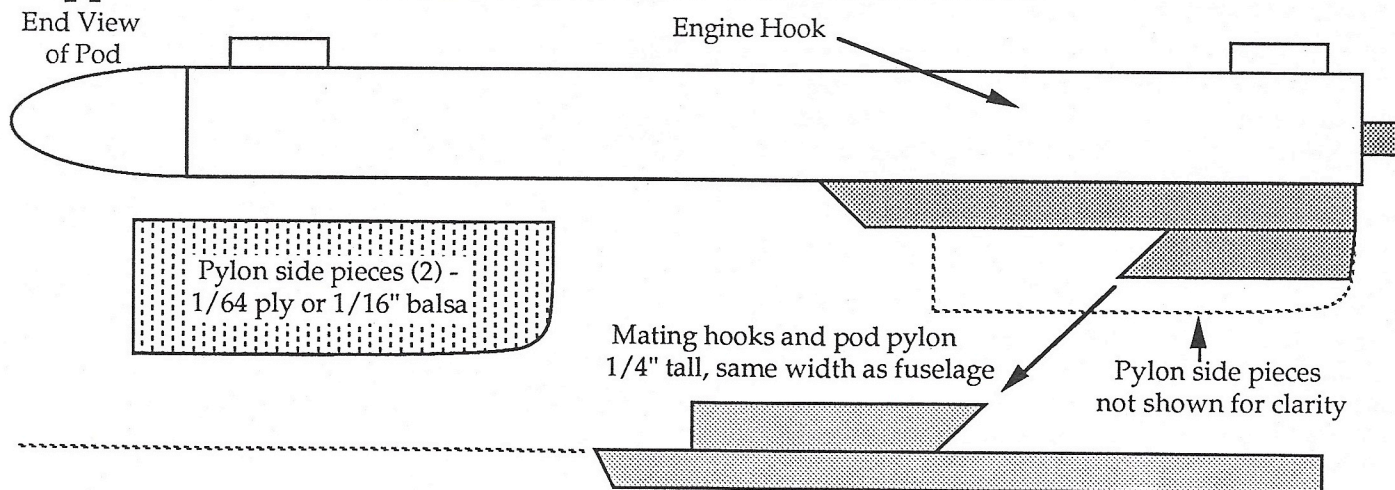
FULL SIZE Wing, Stab, and Rudder templates



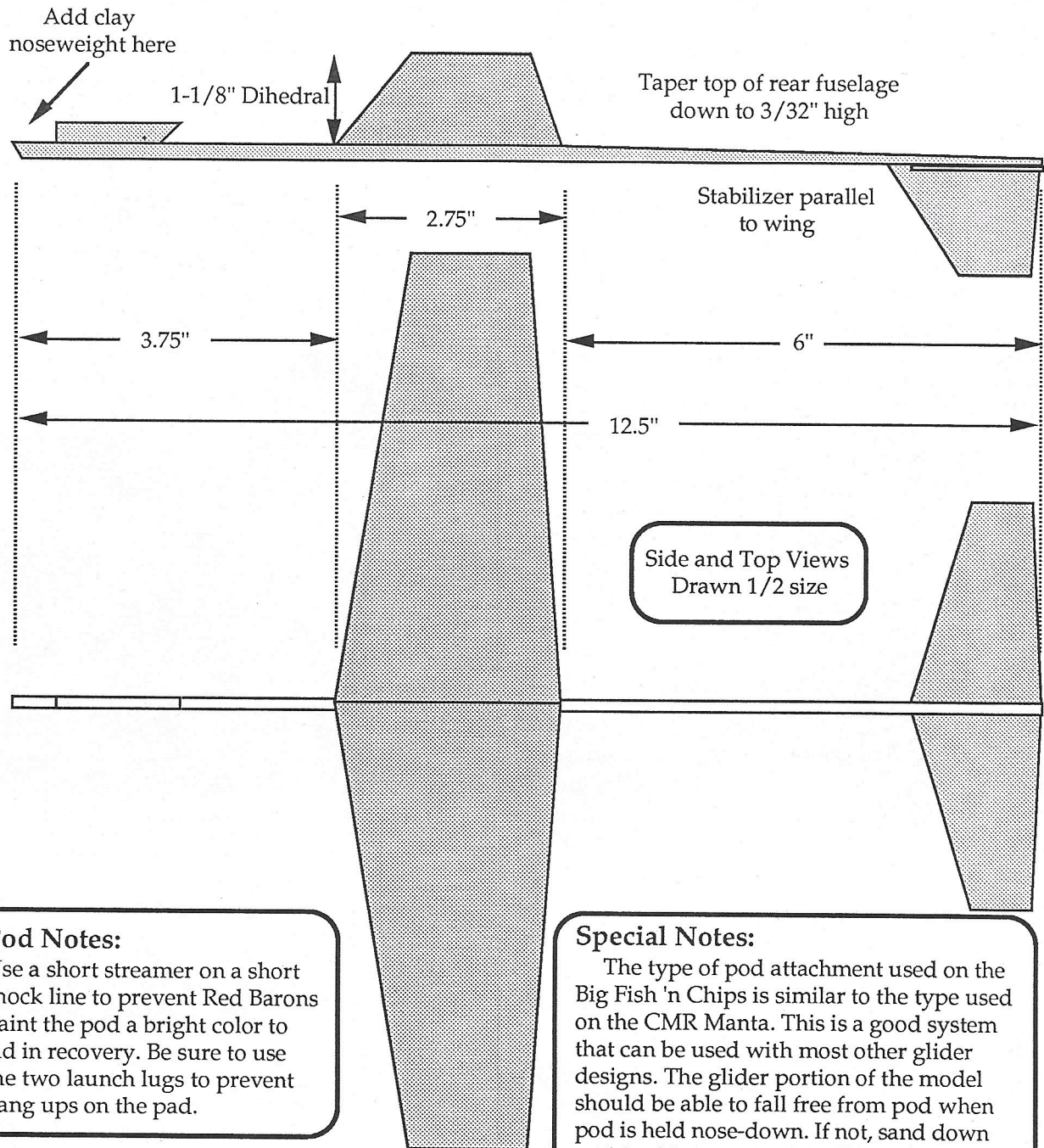
For 1/2A and A power: 1/2A3-2t and A3-2t
(possibly A3-4t, but not A10-3T!).



FULL SIZE Pod, pylon, hooks, and forward fuselage
Typical pop-pod, 6-8" of BT-5 with short nose cone, using
streamer recovery. Note two short launch lugs along top!



Fuselage - 3/32" wide spruce or 1/8" wide hard balsa, 3/16" high, 12.5" long



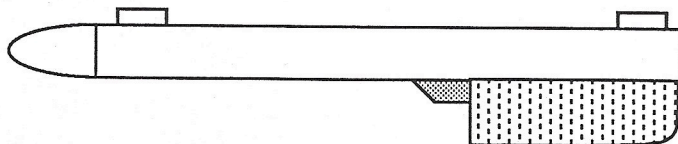
Pod Notes:

Use a short streamer on a short shock line to prevent Red Barons
Paint the pod a bright color to aid in recovery. Be sure to use the two launch lugs to prevent hang ups on the pad.

Special Notes:

The type of pod attachment used on the Big Fish 'n Chips is similar to the type used on the CMR Manta. This is a good system that can be used with most other glider designs. The glider portion of the model should be able to fall free from pod when pod is held nose-down. If not, sand down width of forward fuselage slightly. Do not sand too much, or you will get a side to side wobble that is undesirable.

The glider's stabilizer should be parallel to wing, but warp trailing edge of stab up slightly (about 1° or so) to provide just enough up elevator effect. This will help prevent the glider from death diving in.



March Spring Fling

by Matt Steele

March 19, 1988 dawned bright and sunny, but cold. This was the first of three spring meets for HARA in 1988, and most members were ready to flex their competitive muscles. Jimmy Williams, Marty Williams, John Kmetz and Wayne Hendricks had built and flown all winter in order to get ready. Others, like David Atkinson and Colin Reasoner attended the club building session in order to get a competitive edge. Even the Zunofark Team showed up with new models!

The meet turned out to be the largest open meet to date, with 18 contestants. Rob Demopolus and Dave Babulski from the GAMMA section traveled all the way from Atlanta to compete. Each age division had at least 4 competitors, making sure no one would walk off with "easy" points.

The first event up was predictable...Predicted Duration. David Atkinson showed everyone how to fly, with a perfect prediction on a 55 second flight. Jimmy Williams also scored a perfect zero to lead C Division, indicating how tough the event has become. Wayne Hendricks, the Zunofark Team and the Randy (Kelling) and Robyn (Steele) Team all came in under 10% in C Division. Marty Williams won in B Division with a 7.9% score.

A Helicopter proved to be very interesting. All of the models were Rotorocs, and most were built during the club building session. Mostly a tribute to the design skills of George Gassaway, they all worked, except John Kmetz's (who forgot to hook up the rubber bands!). David Atkinson also dominated

A cold Jimmy and Marty Williams and David Atkinson prepared to launch Jimmy's 2 Liter special at the May contest.



George Gassaway prepares to launch a boilerplate of a model he is preparing for R&D at NARAM-30



this event, scoring 49 and 57 seconds on successive flights. Colin Reasoner thermalled away his only Rotoroc at 84 seconds, but his backup, built on the field DQ'd and took him out of the running. Kathy Kmetz surprised the boys in B division with 2 great flights of 51 and 48 seconds to take first place. C Division saw Crocodile edge the Zunofark Team on the strength of 2 thermal assisted flights. Jimmy Williams came in third and the Randy and Robyn Team 4th all with good showings.

The wind started to come up as the B SD birds took to the air. There were no real surprises here, as standard Ozone Babies and Micafilm or paper streamers were used. Colin Reasoner had two flights over a minute to win in A division, closely followed by Mark Atkinson. Mark took second with a 58 second flight on his Estes Hercules upper stage, a paper streamer and a whopping thermal. David Atkinson took third. B division saw Marty Williams edge Jason Haynes, and in C division, Rob Demopolus scored a win. The field ate a number of good flights, with Vince Huegele and the Randy & Robyn Team failing to get a return on very competitive flights.

The wind picked up and the temperature dropped, so CD Matt Steele dropped the International events to 2 rounds. The flexwings came out in droves for both BG events. It's no surprise what folks worked on over the winter!

The wind really tossed the light 1/2A gliders around and no one in A division got a qualified flight. Marty Williams out dueled Lee Olyniec by 4 seconds to capture the top spot in B division. The Zunofark Team won on the strength of 2 maxes to win C. Crocodile Wayne just missed forcing a 3d flight flyoff when his second flight dropped out 4 seconds short of max. Rob Demopolus also had a max to take 3d.

A International BG saw Matt Sias win in A division and Marty Williams win in B. The Zunofarks, forced to use flexies rather than RC, had a max and a near max to win, closely followed by...guess who? Yessiree, Crocodile Wayne took second. Jimmy Williams had a strong 1st flight with his flexie, before a 2nd flight DQ forced him to settle for 3d. John Kmetz and Rob Demopolus flew balsa gliders and took 4th and 5th respectively.

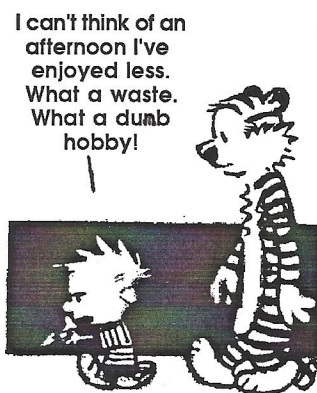
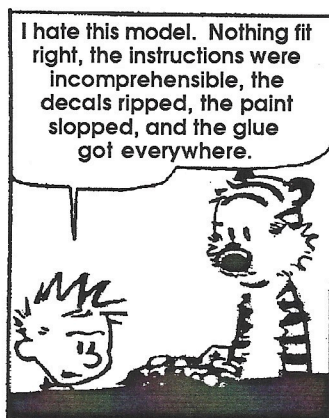
Sport Scale got considerably tougher, as everyone spent the winter building new models for this event. The wind took its toll on this event, as John Kmetz and Jimmy Williams lost birds out over the Parkway. Jimmy's F41 powered Santa Maria was particularly impressive. Matt Sias edged Colin Reasoner in A Division with both flying Estes Nike Apaches. Marty Williams won B division with a Nike Apache followed by Kathy Kmetz (Bullpup), Lee Olyniec (Black Brant II) and Jason Haynes (D Region Tomahawk). The venerable small Juno I of the Zuno (hey, that rhymes!) fark Team won C division. Crocodile broke out out his very nice 3 C6 powered Estes honest John to place 2nd. The Randy & Robyn Team took 3d with a nice BT-5 sized Asp, & Vince's V-2 placed 4th, so 3 of the 4 top models had Huntsville connections.

The champions were: Matt Sias, A division with 544 points, Marty Williams, B division, 992 pts, and Zunofark Team, C division with 960 pts. Both Marty and the Zunofark's put themselves in a strong position for the national championship; Matt Sias, Crocodile Wayne and Lee Olyniec also appear destined to place high in the final standings. HARA collected 5738 points which also should keep the club in contention for a national championship.

While the meet was cold, the turnout was great. It is obvious that rocketry in Huntsville had gained popularity over the winter and HARA is beginning to reap the benefits. NARAM-30 should be very exciting for all club members who have contributed!



CALVIN AND HOBBS



THE OZONE BABY

A B/C INTERNATIONAL SD BIRD

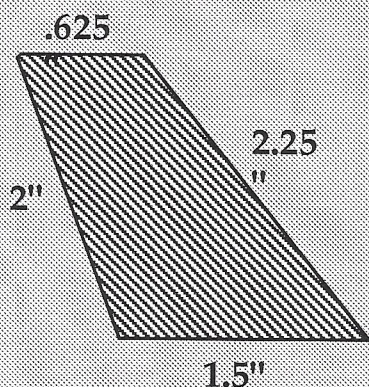
BY "THE MAN OF STEELE"

The "OZONE BABY" is a solution to the problem of the B and C International Streamer Duration events. Typically, the novice has had problems picking the right design for this event, whereas the more experienced modeler has been plagued with reliability problems such as shock cord separation, engine ejection, and stability.

The "OZONE BABY" is constructed entirely from Estes parts, a rarity these days. The primary reason for this was the widespread availability of parts. CMR parts can be substituted, if you desire. Be careful if you chose a CMR nose cone though; while they are light and require no finish, they are prone to separation if not properly glued together.

An 11" length of BT-20 should be cut to start construction. While a shorter length could be used, this length insures that there is enough space to pack the recovery system time and time again. The nose cone should be an Estes BNC-20B.

Fin Pattern



The fins should be chosen from light, but hard 3/32" balsa. Be picky when choosing wood, as you want light wood, but not weak wood. Models with broken fins don't fly second and third rounds very well. Take your time and sand in a good, symmetrical airfoil into the fins. Mark off the three fin lines, insuring that they are straight, and leave a 1/4" space between the end of the tube and the fins. This will be important when prepping the model. Use a jig to glue the fins, and preferably a "slow" super glue such as Hot Stuff Super T or CA+ "Zap-A-Gap". A light fillet of the same glue will provide a clean, strong joint.

Since Estes, hence balsa, parts were chosen, it means a lot of time with sandpaper. Take your time to sand and seal the balsa surfaces properly. I like to use SIG sanding sealer, but Pactra and other types work as well. Apply two coats before sanding. Usually, good results can be obtained with only three sandings. Be sure to start with 220 grit, then work down to 320, 400, and finish off with 600. Also, sand the body tube, and give it two coats of sealer. It doesn't take that much extra work, but the results are well worth it.

Cut a 24" length of white elastic shock cord, and glue it into a fin/body joint. Use an aliphatic resin glue here, not a super glue, as the super glues cause the cord to become brittle and possibly break. Also, glue the screw eye in carefully, adding extra glue to insure that it is secure. The streamer should be a heavy duty paper one, about 5"x50". Run the shock cord through the screw eye, and tie it off. Knot one end of a 28" section of 30 lb test cord. The cord will be attached to the narrow end of the streamer. Using a 2" wide strip of adhesive mylar, lay 1" on the back of the streamer, then lay the line on the top, and fold the mylar over. Then securely tie the line to the screw eye.

The "OZONE BABY" was designed to be launched from a tower, but a standard lug or a pop lug can be added if desired.

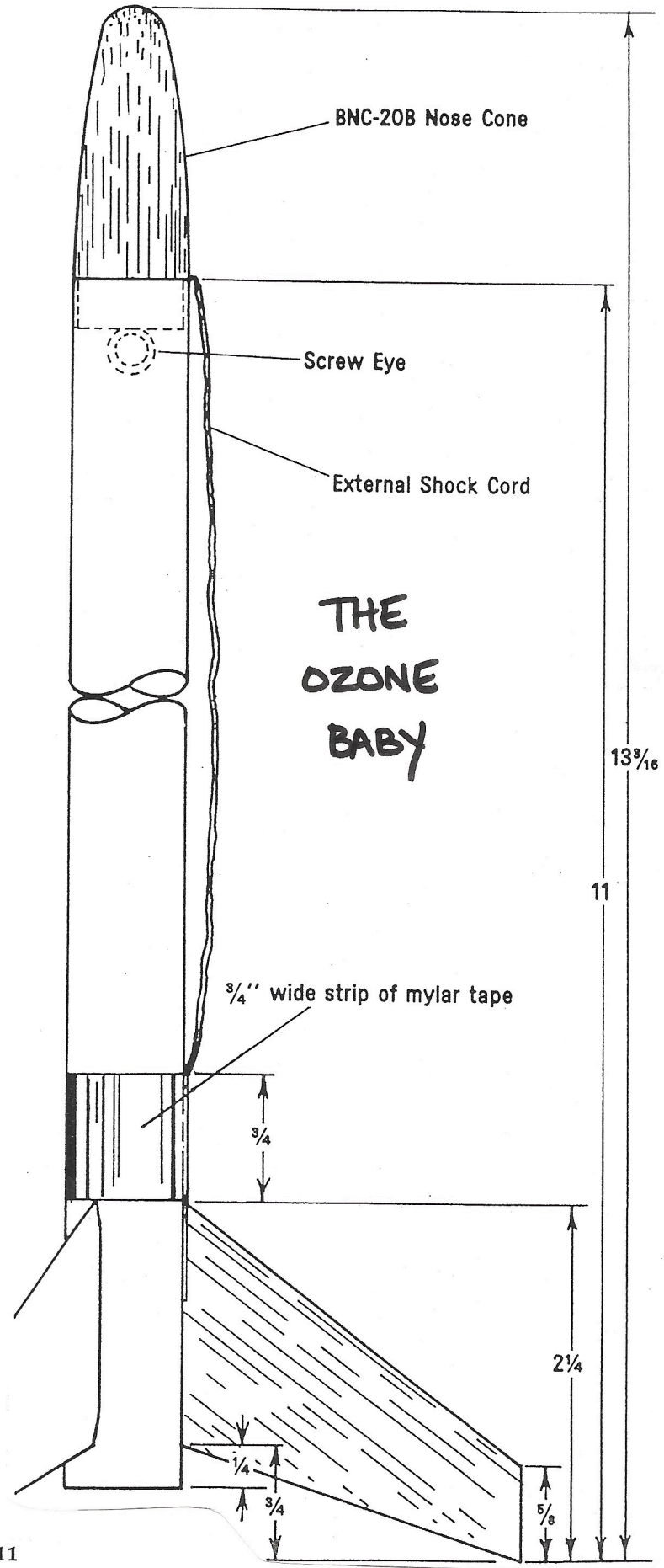
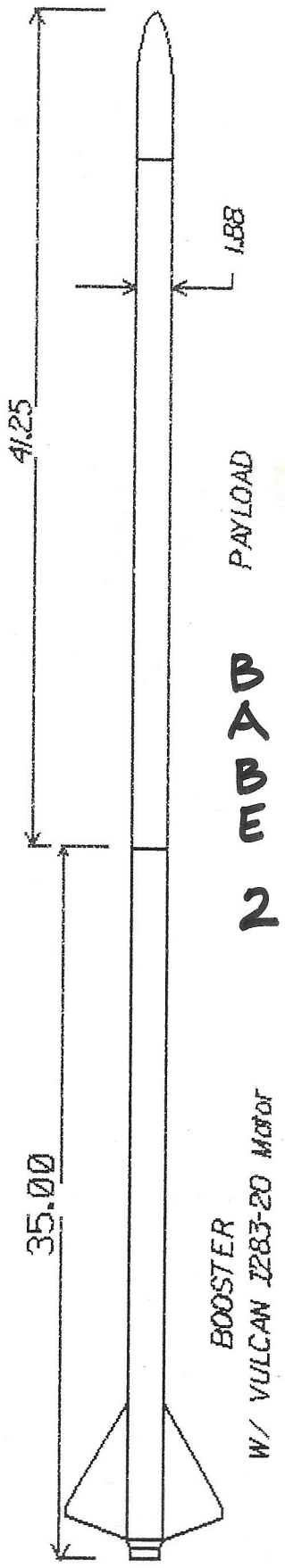
Paint the model in a high visibility color, but don't get paint on the shock cord. The original model was painted Raven Black with Pactra's polyurethane "Formula U" spray paint. When the paint is dry, add a 3/4" wide strip of aluminized mylar just above the fins. This will help prevent the shock cord stripping off.

To prep the model for flight, select either a B6-6 or a C6-7. Friction fit the engine into the model, leaving at least 1/4" hang out. Wrap a 1/2" wide strip of mylar around both the engine and the rear of the body tube to act as sort of an "engine hook". Fold the streamer with accordion folds for 2/3 of the way, then roll it the rest of the way, and wrap the attachment line around it. This will help prevent the streamer from ripping upon deployment. Insure there is plenty of wadding in the model, and that the streamer doesn't bind inside the tube. If it binds, repack the streamer or replace it with a smaller one.

The OZONE BABY's construction is relatively straightforward and should be a snap. Keep in mind that the OZONE BABY will also work well in B and C International Parachute Duration, as well as the "standard" SD and PD events. Remember to construct two models as the rules allow. It's not that much harder to do two than it is to do one. Good luck on the flying field!

BROOKWOOD ADVANCED BIOLOGY EXPERIMENT - 2

In Inches



THE
OZONE
BABY

HUNTSVILLE AREA ROCKETRY ASSOCIATION
11108 Argent Drive Huntsville, AL 35803

