



MAX-Q HARA

Newsletter of the Huntsville Area Rocketry Association

Volume 9, Number 1, Jan/Feb 1995

On Your Mark.....

HARA Launches Marathon

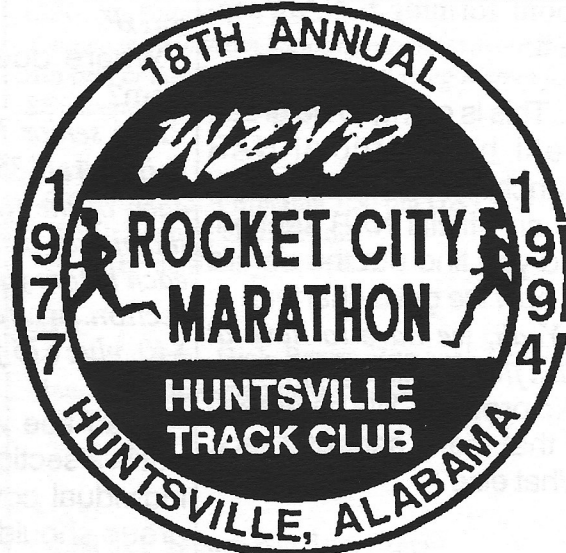
People who have decided in their mind to make their body run 26 miles in six hours in Huntsville's Rocket City Marathon have already decided they are not concerned about the weather. The HARA rocketeers standing in the rain, however, were concerned.

Any other day, no modeler would have left the house seeing the low ceiling and the off/on drizzle on the warm morning of December 10. But HARA had agreed to fire rockets at the race, and been given T-shirts and compensation for expenses, so Kevin Cornelius, Brian Day and Vince Huegele found themselves consulting under an umbrella a thousand yards from the starting line. The launch place was a ways ahead of the start so the racers could easily see the rockets taking off.

The launch window was very precisely known: 8:00:00 am to 8:00:30 am. The runners would go on time, regardless of the rain. So, since the team was out there, they set up four launchers and prepped four *Big Bertha* models on C6-3 motors. Vince set up an old *Starhawk* on an A8-4 motor for a test shot.

About ten minutes before eight, he put the bird up in mist to see what would happen. The system tested out good and the rocket came down according to the expected wind and rod angle. The *Berthas* were racked up and shrouded with clothes bags to stay dry.

As the count went down to the gun, the sprinkling rain stayed at bay, so the bags were retracted and the firing system armed. (Note: continuity is very good



when everything is wet.) A race official was on hand in radio contact with the starter.

When the time was right, the first *Bertha* was fired. It limped lamely into the air impeded by the heavy, wet atmosphere, but the flame on the tail stood out nicely. The chute deployed and the rocket was heading where it was supposed to go, which was anywhere not in the runners' path. A few moments later, the second one fired. The crowd of runners was beginning to spread out and converge toward the pads along the road. The third bird went off on command. With the leaders of the pack about a hundred feet away, the last rocket saluted. HARA had successfully logged a launch in the rain.

The runners paid little attention to the pads as they passed. At that moment the precipitation went to a full blown shower. Vince collapsed the launch gear and threw it into the trunk. Brian had gone off to recover the models, all conveniently landing in an empty parking lot.

Then the rocket people went home, while the runners were just beginning to follow the course of their amusement. Race officials were impressed at the effort and want to do the rockets again next year.

HARA's help was mentioned in the Huntsville Track Club News:

"Now we really are the ROCKET City Marathon. Thank you to every one who made the event a success. It is the volunteers that make it special."

INSIDE MAX-Q

- > Swimsuit Issue!
- > Rocket Review
- > Tennessee Thrust
- > Hybrid Research

From the President's Pad

The Price to Pay

Two people are talking about forming a NAR section:

...This is going to be great, we'll have official NAR launches out at the city park as an official NAR section. Did you find out the details of how we get a charter?

Yeah, we have to have at least five adults sign up.

No problem. We have easily that many serious flyers. What else?

send NAR \$335.00.

Say WHAT?

That's the total annual cost to exist.

Where does that come from?

Five senior NAR memberships are \$35 each. Then, each of the five has to have individual insurance at \$21 each before you're able to get section insurance which is \$40, plus \$15 for the specific site.

I can see why someone not in a section would need individual coverage, but a group should only have to get only group insurance. That's the point of being in a group.

But we have to have both. It's like a mom and dad have to have individual coverage each before they can get family coverage for themselves and their kids.

Tell me again the big incentive to be a NAR section.

Mainly, to have insurance so we can use a field...

This is not idle chatter, but real issues about the cost of NAR affiliation. Any section wanting to be insured in 1995 has to pay the price given above. Specifically, five people get stuck for \$56 each so everybody else in the club, or who ever comes by to fly, can be covered by NAR's "secondary" insurance.

We have to

Still Ahead of Everyone

The SEP program continues to expand and enlarge to the point of wearing out Greg Warren. Payloads are coming in from many states, as the *Flamethrower* is going out now even to other countries. What do you do when your program gets this big?

In a sense, franchise and delegate.

Greg's plan is to offer the SEP program format to all NAR sections and interested aerospace organizations. Clubs in other areas could perform sanctioned SEP operations locally: solicit payloads, interact with schools, build and launch SEP rockets, report the results to SEP headquarters. Students could still get their experiments flown, and local rocket clubs would have a pre-organized, workable project that utilizes safe, high power rocketry.

The SEP program has proven itself as a great instrument for promoting rocketry. It's the kind of thing NAR needs to have been pioneering, instead of just now waking up to it. Without waiting for NAR, Greg is moving on to take SEP to a national level.

Many *MAX-Q* readers are also on the *Flamethrower* mailing list, so more about this will be said there. Huntsville is still definitely Rocket City.

MAX-Q

VOL 9. NO 1. Jan/Feb 1995

Editor: Vince Huegele

Contributors: Greg Warren, Jerry Schaefer, Kevin Cornelius, Greg Allison

Max-Q is the official newsletter of the Huntsville Area Rocketry Association (HARA), NAR Section 403. Subscriptions are included as part of membership dues, or available to non-members for \$10.00 per year (six issues.) The editor welcomes any material submitted for publication. Send all items or payments to 11108 Argent Dr., Huntsville, AL 35803.

HARA officers

President: Vince Huegele

Vice President: Joe Robertson

Secretary: Greg Warren

Treasurer: Sharal Huegele

NAR address: 1311 Edgewood Dr., Altoona, WI 54720.

Big Spring Launches Planned

HARA will start the 1995 flying season on March 18 with the first monthly launch. Besides being the first opportunity of the year to fly, SOAR will launch several student experiments on G motors. This event will herald Spaceweek, March 20-24, for area schools. A HARA launch will kick-off Spaceweek activities that Monday at Jones Valley Elementary.

The launch locations this year are including the Athens field. Instead of always being at the old airport, some monthly launches will be exclusively in Athens. See the schedule for the respective dates.

April Manchester Launch

The last *MAX-Q* announced the discovery of a wonderful field in Manchester, Tennessee. The Middle Tennessee Tripoli rocketeers have asked HARA to co-host a big launch there on April 1 and 2. Rockets of all sizes will fly, with participants from all adjoining states expected to attend. A ten thousand foot waiver is in place.

Rick Kauffman and company will oversee general operations and high power launches. HARA will supply launchers and manpower to control model rocket flights. The firing panels will be adjacent with two firing officers directed by one range safety officer, similar to what HARA has done at SEP launches. This way, small models can be flown efficiently and independently of the activity on the bigger pads.

The Spears Range is BIG, and worth a trip to see. The rockets there are of a class generally seen only out in the desert, but regular sizes will be in the air as well. All HARA members and area modelers are invited to bring whatever you have to fly: nothing you have is too big for this field.

TIME TO RENEW YOUR MEMBERSHIP and PAY YOUR DUES!

\$10 a year, due at the first of the year.

Send to the MAX-Q return address, payable to HARA.

COUNTDOWN '95

HARA meetings are second Thursdays (except December) at the Huntsville Association of Technical Societies (HATS) office, Suite 29, Building 4900, University Square, (off the Boardwalk.)

Launches are 9:30 am Saturday mornings at the Old Airport, or the Athens field. Call Greg Warren for SEP launch site information.

MAR:

9 Thurs; HARA Meeting 7:30 pm HATS
18 Sat, Launch, Old Airport
20-24 Huntsville Spaceweek

APR:

1,2 Sat,Sun; High Power Regional Launch, Manchester, TN. map on back cover
13 Thurs; HARA Meeting 7:30 pm HATS
29 Sat; SEP Launch, Athens

MAY:

6 Sat SEP Launch rain date, Athens
11 Thurs; HARA Meeting 7:30 pm HATS
20 Sat; Launch, Old Airport

JUN:

8 Thurs; HARA Meeting 7:30 pm HATS
24 Sat; SEP HP Launch, Athens

JUL:

13 Thurs; HARA Meeting 7:30 pm HATS
15 Sat; Launch, Old Airport

AUG:

10 Thurs; HARA Meeting 7:30 pm HATS
12 Sat; Launch, Old Airport

SEP:

14 Thurs; HARA Meeting 7:30 pm HATS
30 Sat; Rocket City Classic XIV Contest

OCT:

12 Thurs; HARA Meeting 7:30 pm HATS
28 Sat; SEP HP Launch, Athens

NOV:

9 Thurs; HARA Meeting 7:30 pm HATS
11 Sat; Launch, Old Airport

DEC: 9 Sat; 7:30 am Launch Marathon Start
Von Braun CC

For more details call Vince at 881-2904 or Joe at 721-1338.

PUBLIC MISSILES LTD

EXPLORER

by Vince Huegele

PART 2

In the first installment, I described the construction and finishing of the rocket, and promised to report on the flight test.

My first chance to fly my new *Explorer* was at the Manchester launch in November. The weather was great and the field adequately large for this model on an Aerotech F motor.

The kit gave no recommended motor types, but I appraised the bird to use a F25-6, since it was comparable in dimension to other Aerotech kits.

The red rocket was very attractive going out to the pad and people said they liked the paint job.

When the motor fired the bird scampered into the sky on a normal profile. It eased up to apogee and continued a ballistic path toward the north forty. Down, down, until the crowd began to groan. About fifty feet above the ground the piston erupted like a cannon and the chute deployed catching the rocket to swing the tail around toward the ground. The motor end went into the mud right as the assembly reached normal decent velocity. The crowd cheered at the dramatic timing, but I was not pleased.

The rocket was undamaged except for a chip out of the phenolic piston coupler. Everything had just experienced a worst case ejection, but had functioned properly and survived. Credit good materials and rugged construction for that. The piston strap is a healthy length and width for just such events.

Observers noted that the motor was "a very long six seconds" at ejecting, but I

wanted to understand the complete problem. I cranked the numbers through an altitude prediction program and came up with about five seconds optimum coast time. The PM kit is really heavier than a comparable sized Aerotech kit, and the weight must be considered in motor delay selection.

Intending to play it safe, I had acquired a F25-4 from Larry Smith before I left Spears Range. I loaded this motor in the *Explorer* at the launch in Athens two weeks later. The piston system is easy to prep; you'll never care to do wadding on big rockets again. At ignition the bird slipped away from gravity, and only as it just nodded its resignation, sprouted the chute. The landing was very comfortable.

So, F25-4 is what I wrote on the nose cone shoulder. Now I need to check what other 29mm motors will do to it.

My concern about the polyurethane paint peeling turned out to be unfounded. So far, it's held up real well. The bright "sports car" red orange body is very striking on the pad and in the air.

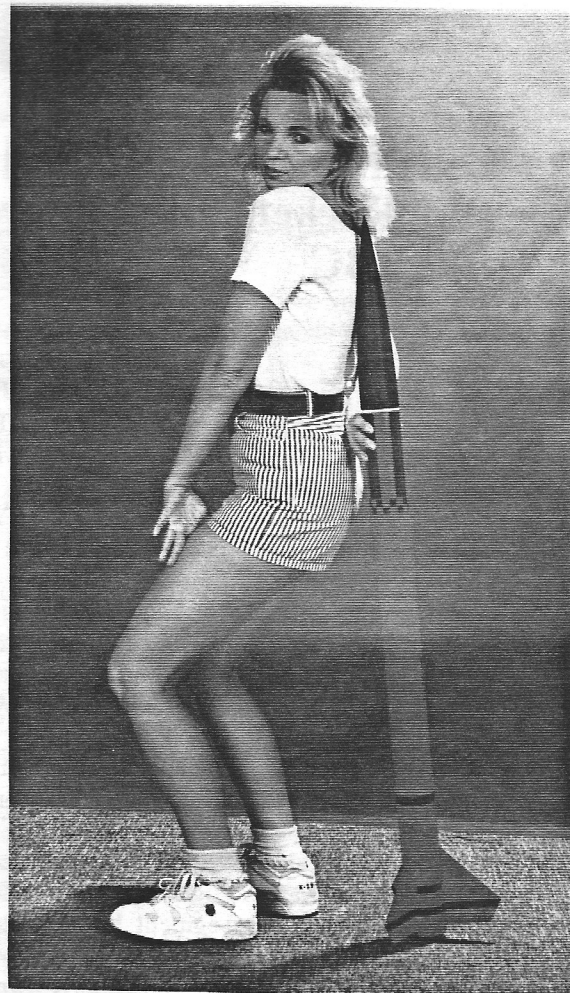
As a particularly attractive rocket, I lent the *Explorer* to Jerry Schaefer, who had wanted one for a photography exercise. His results are shown on the other page. (Brian Day took the one of me in the Manchester field.) Jerry has been to many HARA launches and contributed excellent pictures to *MAX-Q*. These poses show a rocket photography potential often desired but rarely delivered in the hobby.

Would you like your model rocket photographed with one of Jerry's models? Bring it to the next HARA meeting, wrapped and boxed if you can for general handling protection, and it'll get taken to the studio for his next shoot. He may even bring his models to one of our "shoots".

Opposite page: Several view of the Explorer.

Rocket Modeling

Photos by Jerry Schaefer



Big Rockets, Big Motors and the BBC

by Kevin Cornelius

Middle Tennessee Tripoli opened its 1995 launch season at Spears Range near Manchester Tennessee on January 21. Why in the middle of the winter? Big rockets, big motors and the BBC.

Rick Kauffman, leader of Mid - Tenn Tripoli was contacted only two weeks prior by Dennis LaMothe of Tampa, Florida. Dennis was looking for a suitable site in the Eastern U.S. to launch his latest project, a half scale Aerobee (shown in the photo below.) This 165 pound brute would be hurled into the heavens using a Dragon's Breath N motor of his own design and manufacture.

This project would be videoed by a film crew under contract of the BBC to be a documentary on rocketry in the U.S. It would be shown in the U.K. and then eventually on cable in the states sometime this year. The film crew was on a tight schedule and this launch would be their last segment before returning to Britain.

With permission from the property owners, Rick eagerly agreed to host the launch. Word of this historic event spread like wildfire through the high power community, Rocketeers from all over the country would be there to witness the launch and to fly their own rockets. It was extremely short notice, or more HARA folks would have been there.

Saturday came at last. The weather was warm and mild for January. Some forty flyers registered from all over. After a group photo for the BBC and HPR

magazine, the pads were loaded and 1995 was off to a blazing start. Beautiful rockets filled the air, on E to M motors. Tim Pickens was there discussing hybrid motor designs with other experts.

The most memorable flight Saturday was Mike Ward's minimum diameter M rocket of his own design. After the countdown, the M came to life and the rocket roared off the pad trailing a huge pillar of fire and white smoke. The five second boost was as straight as an arrow. All eyes strained to keep track of the rocket as it rose to its projected 10,000 foot altitude. At T + 35 seconds a thunderous boom was heard as the rocket impacted in the field, an apparent victim of recovery failure. Later that night rocketeers met at a local restaurant to talk rockets.

Sunday came with bone chilling temps, high winds and a 500 foot ceiling. The Aerobee was loaded onto its launch tower while the BBC crew filmed, in hopes the weather would clear enough for a safe launch. By mid-day conditions had improved. Because the film crew was pressed for time and a launch attempt Monday was not possible, it was decided to go for launch. Clearance was given by Memphis Air Traffic Control, and spectators retreated. When the launch button was pushed - nothing happened.

After tests were made on the firing system, a faulty relay was found and corrected, but not before the film crew reluctantly packed up their gear and headed for the airport. The launch was scrubbed, and no other rockets flew that weekend.

Not to be beaten, Dennis will bring his Aerobee back to Spears Range on April 1 for another attempt. Better weather and better timing will help everyone get to enjoy this launch. See you there!





A Summary of HAL5's Project HALO

by Greg Allison

Project HALO, for "High Altitude Lift Off," was conceived to explore the scientific and economic potential of high altitude balloon launch platforms for rockets.

The balloon-launched rocket concept, known as "rockoon," was first put to use by Dr. James Van Allen in the 1950's. Rockoons allowed Dr. Van Allen to conduct pioneering studies of the upper atmosphere. Because of increased efficiency for small rockets above the drag of Earth's atmosphere, Dr. Van Allen was able to boost the altitude attained by the Deacon rocket from 60 thousand feet to over 300 thousand feet. As larger military rockets capable of reaching orbit from the ground became available, rockoons were for the most part abandoned. The Van Allen Radiation Belt was discovered by a ground launched probe.

HAL5 (Huntsville Alabama L5 Section of the National Space Society) has started Project HALO as a means to use today's better balloon and small rocket technology to push the rockoon concept to its full potential as an economical means of reaching high altitudes.

Project HALO Phases

Project HALO will consist of several distinct phases, each of which in itself will provide opportunities for HAL5 to build the managerial and technical skills and resources to proceed to the next step. Each step will provide unique opportunities for student involvement, original research on the edge-of-space environment, and perhaps suggest commercial uses of rockoons.

Phase 0 - Subsystem Test - Balloons carrying rocket components and subsystems to altitudes of 20 miles.

Phase I - Proof of Concept - Rockets launched from high altitude balloons.

Phase II - Operational - Sub-orbital rockoons providing routine cheap access to space and the near earth micro-gravity environment.

HALO Phase 0. Subsystem Test

This step takes advantage of well developed and cheap balloon technology for carrying payloads above 99 percent of Earth's atmosphere. It consists of attaching a payload to a helium filled balloon and allowing it to rise to an altitude of 20 miles or more. A balloon borne platform will be the basis of all HALO missions.

Because of the low cost, this phase can be repeated many times during the overall program to prove the space worthiness of components of subsequent phases. It is in Phase 0 that student participation is likely to be broadest. Principles of radio and satellite communication can be demonstrated. Student conceived experiments having to do with ozone and other atmospheric phenomena are anticipated.

Since this phase allows access to temperature extremes and near vacuum conditions similar to those encountered in orbit and beyond, experiments in space life support systems could be carried out here. Astronomy from such a platform could take advantage of conditions similar to those enjoyed by the space telescope.

HALO Phase I. Proof of Concept

This phase will use balloons as launch platforms. Its objective will be the development of the family of vehicles which will carry HALO to completion. Small, experimental rockets previously tested on the ground will be evaluated for performance, safety and practicality at high altitude. (*Tim Pickens is representing HARA in this by developing a hybrid motor.*) Systems integration and launch procedures will be perfected.

Student experiments during this phase will likely deal with rocket technology, effects of acceleration, vehicle tracking and possible recovery. For safety reasons, most Phase I missions will be flown from coastal regions.

HALO Phase II. Operational

As proficiency with high altitude rocket launches is achieved, a major milestone for HALO Phase II will be to meet or exceed the altitude record for ground launched, privately developed rockets. Our goal would be to reach such a height with a larger payload and smaller budget than is practical for a rocket that must plow through Earth's atmosphere.

Unique opportunities for experiments exist in this phase as well. On-board cameras could take photographs or transmit live video from this vantage point which would cover hundreds of square miles of the planet's surface. Microgravity payloads would experience a "weightless" environment for at least a minute or two--enough time to do some short experiments. Again, the emphasis is on cheap access to space for student and private experimenters on tight budget.

Goals for Project HALO

It is our hope that Project HALO will demonstrate that extreme altitudes can be reached by amateurs; that by pushing rockoon technology to its limits, we will inspire ourselves and those who participate with us as student experimenters or commercial developers to push technology ever higher.

While we at HAL5 support and applaud the achievements of NASA and other national space programs, we believe that the scale of human space activity we envision will come about only when the public has frequent, affordable access to space. With Project HALO, we hope to help lay the groundwork of organization, technology, and imagination that will make cheap access to space a reality for us all.

M

A

X

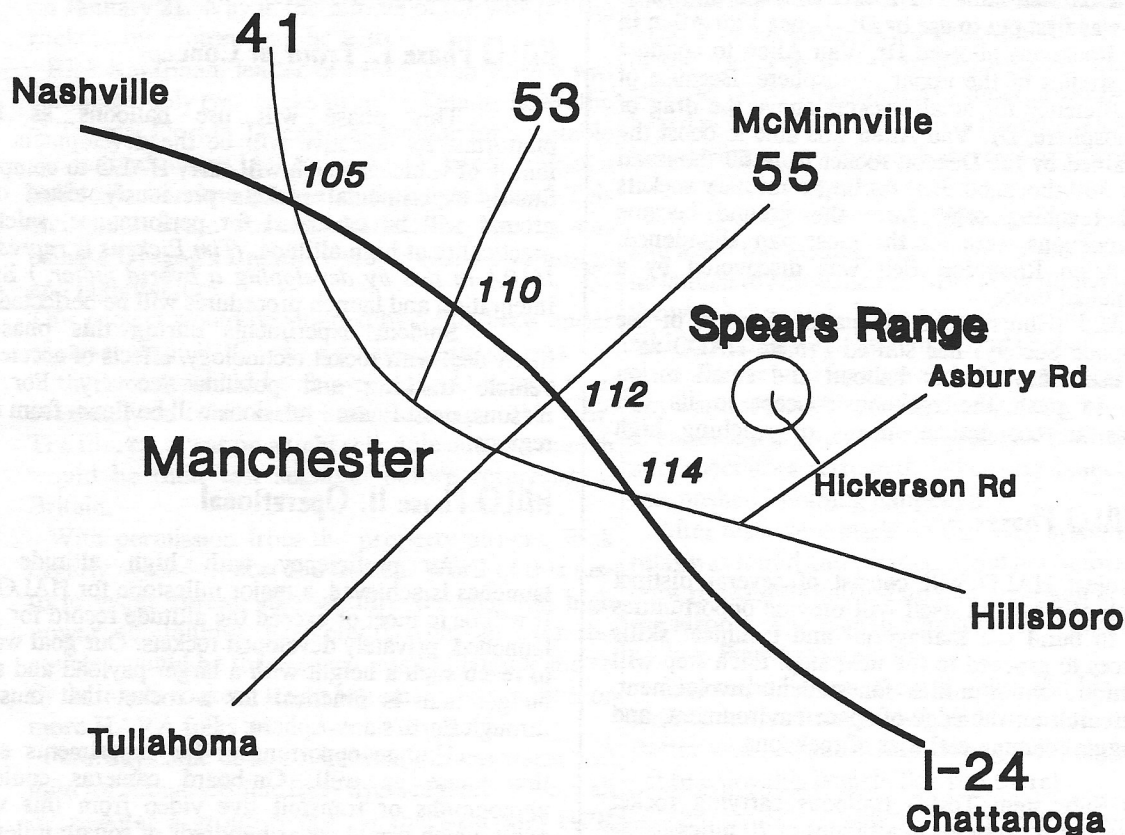
-

Q

Launch at Spears Range

April 1 & 2, 1995 Manchester, Tennessee

Sponsored by Tripoli Middle Tennessee and HARA



10,000' Waiver * Vendors * Auction * Regional Rocketeers * Hybrids
Contact Rick Kauffman (615) 890-3935 or Compuserve 75277,1165
Motel Reservations (615) 728-9720

Huntsville Area Rocketry Association
11108 Argent Drive
Huntsville, Alabama 35803

First Class Delivery to

Return Requested