MAX-Q

VOLUME 16, NO. 1

SPRING 2002

FEBRUARY LAUNCH REPORT

The first February launch HARA has had in four years got underway on Saturday, February 23, 2002.

People came from as far north as Indiana and Kentucky and as far south as Birmingham and Anniston. You could not ask for prettier conditions. The ceiling was unlimited and not one single cloud appeared in the sky. Other than the wind and the cooler temps, it was a perfect day for launching rockets.

It was a surprise to welcome one of our vendors at the launch. Chad Ring of **Ring Rocketry™** was on hand to supply what Aerotech™ motors remained and for any other rocket related items anyone might need.

The launch began slowly but it wasn't very long before the big ones started to fly.

Chuck Pierce launched his SA-5 Gammon on an I211. The dual deployment didn't work exactly right but the main deployed for a ballistic recovery. He also launched his dual deploy V2 on an I357. That rocket sported an excellent camo paint job and made a perfect recovery.

A Level II certification was made by Phillip Cotton. Phillip and his brother Jeff, came from Riverside, Al, both with the intention of certifying NAR Level II. Phillip flew first with a Loc Bruiser EXP loaded with a J460 Redline® motor. The flight was flawless. On the flip side, Jeff Cotton tried Level II certification with his PML Ultimate Endeaver on a J415. The ascent was perfect but the rocket deployed at motor burnout and it began to rain "Ultimate confetti". Unfortunately, Jeff did not certify Level II but he did go on to enjoy several successful flights with some of his other rockets.

Max Gray, visiting from Birmingham, had many exciting flights at today's launch. He launched a 3" scratch-built rocket on a J180 long burn was very successful and his altimeter beeped out at 3,995 feet. His faithful Haley's

(Continued on page 6)

INSIDE THIS ISSUE:

Shannon Rollins and his Daedallus II at the Feb. launch.

-Photo courtesy of Jimmy Threadgill

More launch photos, pages 6&7.

MAX-Q

Volume 16, No. 1

Spring 2002

HARA OFFICERS

President - Chuck Pierce

Vice Pres. - Todd Lumpkin

Secretary - Johnnie Paul

Treasurer - Mark Tygielski

Tripoli Prefect –M. Tygielski

MAX-Q Editor: Beth Paul

This Issue's contributors: Chuck Pierce, Vince Huegle, Walt Stafford, Johnnie Paul, Todd Lumpkin.

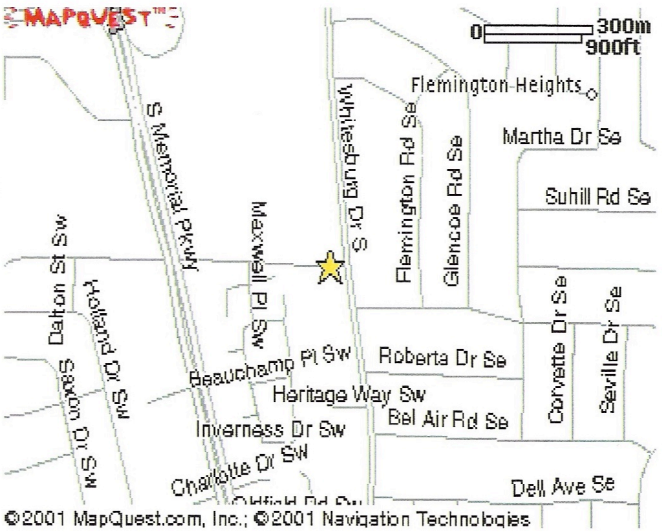
MAX-Q is the official newsletter of the Huntsville Area Rocketry Association (HARA), NAR section 403 and Tripoli Huntsville.

Membership dues are $12 a year for individuals, $20 a year for family and include a subscription to the newsletter. Checks are to be made out to HARA, 225 Park Stone Drive, Madison, AL 35758.

Articles, photos and news of interest should be sent to: bethletters@msn.com. Any errors or omissions are probably the fault of the editor and will be corrected in further issues.

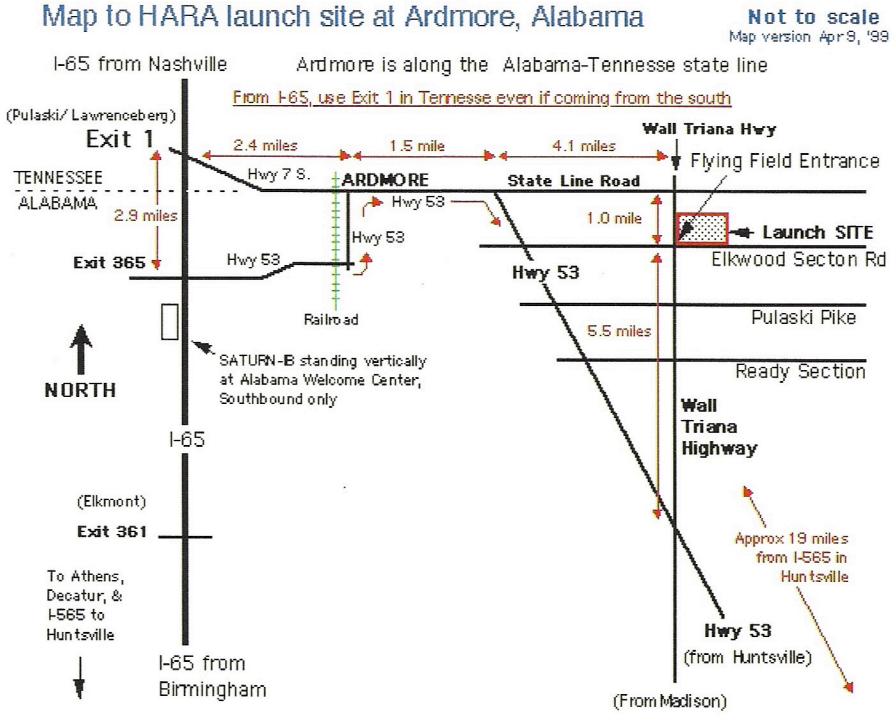
HARA MEETINGS

HARA has monthly meetings the second Thursday at 7:00 p.m. at the Huntsville Area Technical Societies Office at 2003 Byrd Spring Road. This year the meetings are on: March 14, April 11, May 9, June 13, July 11, August 8, September 12, October 10, November 14 and December 12. For further information, contact any of the members.



HARA LAUNCH SCHEDULE

Launches are scheduled the fourth Saturday of every month at Ardmore, Alabama. The dates for this year are: March 30, April 27, May 25-27, June 29, July 27, August 31, September 28, October 26-27 (Rocket City Blastoff) and November 30. Tripoli experimental launches are also held at the Ardmore launch site on April 20-21, May 25-27, July 20-21, Oct. 20-21.



LEVEL 3: A CROWD PLEASER

By: Walt Stafford

Once I certified Level 2, there wasn't much desire for me to take the next step. The cost alone was a deterrent. In addition, there was the problem of finding a field large enough to fly a 10-foot rocket. Last but not least was the challenge of designing and building a massive rocket.

A fellow HARA member, Johnnie Paul, had started a large rocket for a Level 3 Certification attempt. He would bring the rocket to the HARA launches and meetings. I learned quite a lot from watching the booster section take shape. Thinking that Johnny might want to test fly the rocket with an experimental "L" motor, Chuck Andrus and I had our eye on the project. As fate would have it, Johnny decided to get out of the project and traded the rocket to Chuck. At the time, the project was about 50% complete. I jumped at the chance to finish it. I set a goal to fly this bird at the May 2001 Experimental Launch. This gave me enough time to finish building the rocket, as well as time to develop fuel and ground test the "L" motor with the help of Chuck Andrus.

May rolled around and I was ready. I chose a fast blue fuel to quickly lift the rocket off the pad. On a dead calm day, I pushed the launch button on this fifty pounder and the rocket snapped off the pad like an I357 in a 3" airframe. At apogee (2610 feet) the rocket separated, the 16-foot chute opened and the rocket floated gently to the ground, about 150 yards from the launch pad.

Chuck and I suddenly realized that we had outgrown our experimental motor class. If we were to progress further with larger motors and bigger rockets, then someone would need to certify Level 3. So I decided to start from scratch and build a Level 3 rocket. Since the previous rocket performed well, I saw no reason to stray very far from the original design plans. I only made a few modifications; a 98 mm motor mount instead of 75 mm, and ¾" rings instead of ½". I also added airframe support, which increased the weight of the rocket by 40%. The extra weight was needed to keep the flight below 5000 feet. This was necessary to be in compliance with the Tripoli alternate safe sight dimension, in order to be able to fly this rocket in the HARA field.

Construction of the second rocket went quickly. The launch date was set for October 27, the 2001 RCBO. A large pivoting platform was designed and fitted with 12 feet of 1.5"xtreme rail.

The crowd at the RCBO was the largest that I had seen. After carefully completing the checklist twice, I slid the rocket onto the platform and pivoted it into launch position. The crowd was moved back to a safe distance. Most people there had never before seen an "M" flight. Once the wind calmed down the button was pushed on the M 1315. In a huge cloud of smoke, the rocket took off. The crowd cheered. At 3643 feet, the drogue was deployed. The shock of the deployment caused sheer pins to break and out came the main chute. This caused the rocket to drift into the next field; nevertheless, the rocket had a safe landing. As a result, I achieved my Level 3 Certification.

I could not have advanced so quickly in sport rocketry without the experience of being a HARA member for the last 2 years.

Note:

Walt and Chuck Andrus are currently preparing hardware and propellant for 4" N motor static tests and hopefully, will be able to use that motor to fly Walt's L3 rocket at LDRS in July.

PRESIDENT'S MESSAGE

Hello HARA and Friends!

As HARA's newly elected president, I want to express a special thanks to Brian Day and the other officers and down-and-in supporters of HARA for their efforts in making HARA the wonderful club that it has become. Without their leadership and willingness to pitch in and work their tails off, HARA wouldn't be half the club that it is today.

Those of you who read the Usenet newsgroup news:rec.models.rockets, probably know that I've been one of the regulars there for the last year or so. I've thoroughly enjoyed discussing rocketry and miscellaneous items of interest in that forum. Lately, I've received some very nice feedback from several country-wide rocketeers that have been reading the RMR posts of Vince Huegele, George Gassaway, Brian Day, and mine. Several folks have told me that their newly formed clubs have been modeled after HARA, specifically, our embracement of sub-A rockets, as well as big-motored behemoths; our willingness to take rocketry into the schools; and our participation in national and local rocketry programs and projects. It's obvious that HARA is viewed very favorably within the hobby rocketry community. We should give ourselves a big pat on the back for that!

With this thought in mind, I wanted to focus this editorial on HARA's participation in the education of the future engineers and scientists that are school children today. For a number of years, HARA has been out front in the education of school kids and scouts in the principles of rocketry. Giving rocketry lectures and making flight demonstrations is a wonderful service that HARA provides for our community. I've personally given 3 or 4 lectures/demos in the last year or so, and have enjoyed it as much as the children have. I've found that the elementary and middle school kids are genuinely interested in the basic physics of rocket flight and in watching the application of those principals in a flight demonstration. Children are a sponge for information that is of interest to them, and rocketry certainly falls into that category! Helping the students build and fly their own rockets is one of the best ways to help them grasp/understand the principals of rocket construction and flight. HARA receives quite a few requests for rocket classes/demos each year. Several of us have been doing the lion's share of classes/demos, but it'd be really nice to have a few other volunteers in the lecture/demo cue. HARA has a nice Powerpoint presentation on Model Rocketry that can be used or plagiarized for each audience. HARA and members also have a variety of launch equipment that can be borrowed, if needed. I'd urge each of you to please consider volunteering to help. I can assure you that you won't be called on more than once, unless you'd like to do it more often. If there's a particular school or two at which you'd be interested in teaching/demo'ing, please let me know, and I'll certainly accommodate your wishes. Also, we don't have to wait for the schools to come begging us for help. The schools are generally very receptive to offers to bring rocketry lectures/demos into the schools, especially during space week and for gifted programs and school-wide enrichment. If you're interested in helping with rocketry demonstrations, please let me know (with any caveats you might have), and I'll make up a list of volunteers to call as new requests come in.

In closing, I want to say that I'm really looking forward to this launch season and to meeting those of you that I may not have met yet. For those of you that I may have already met once or twice, I have to admit that I'm really horrible at remembering names and faces; so, when you see me at a launch or around town, please stop me to say 'Hi,' and if I have a blank look on my face, please tell me your name again. Finally, as a final note, please be safe in everything (not just rocketry) that you do this year, and don't hesitate to let me know if I can do anything for you.

Chuck Pierce

President, HARA 403

pierce@knology.net

Editor's Intro

I don't "do" rockets.

I don't build them.

I don't fly them.

And I certainly don't sit and watch videos of them over and over again. So why am I the editor of a newsletter about rockets?

Good question.

I have certainly learned a lot so far.

Of course, I learned some things when Johnnie became a BAR (I learned what that means!) a few years back. I learned that turning off the Weather Channel the night before a scheduled launch is not a good idea. I've learned that the launch is always too (take your pick here) hot/cold, mud/dusty, windy/still, cloudy/bright. I learned that seeing a man go through my sewing box does NOT mean he's getting in touch with his feminine side, just that something of mine is going to end up on his work table. I learned that there is an extra supply of baby wipes in the garage. I learned that Tripoli is NOT a card game. I learned that a BB gun will get a parachute out of a tree very efficiently, that the longest hang time for a rocket in a tree is approximately three years and that cows will gather to see what is floating in their pond. I also learned that laughing out loud and clapping when a rocket blows up on the launch pad will get you quickly escorted off the flying field.

But that is just basic knowledge. My education in model rocketry has grown by leaps and bounds in recent weeks. I know all about HARA, NAR, AIA, ROL, LDRS and RCBF now and I'm relieved to know that Johnnie's not just talking in some secret code with his buddies in the garage so that I won't understand that they're really saying. I know than I ever wanted to know about centering rings and altimeters, payloads and deployment, couplers and nosecones. And I can sit and listen to two guys discussing their motor mounts and ejection charges all day without cracking a smile.

With all this knowledge, does that mean I'll be out on the flying field come launch day?

Good question...

OUT LINES:

OUT the new HARA hats...

They are black with the HARA logo embroidered in gold. They're $10 each. See Brian Day for more information.

OUT the new exhibit in town...

...A fully restored World War II era V-2 rocket at the U.S. Space and Rocket Center. One of the very first vertikants, the 46-foot, 28,500 pound rocket is the centerpiece of the series of new exhibits at the USSRC museum.

Editor's Note:

Due to the space constraints of this issue of the newsletter, the Minutes for the HARA monthly meetings in January and February were not included. They can be found on the HARA website in their entirely or a written copy will be provided upon request from one of the board members.

NAR and TRA In Litigation with BATF

Mark B. Bundick, President of NAR and Bruce Kelly, President of Tripoli Rocketry Association issued a joint statement on March 2, 2002 pertaining to litigation filed by NAR and TRA against BATF. Increased demands have been made by BATF inspectors on NAR and TRA members with Low Explosive User permits and other actions prompted the NAR and TRA to file a ppreliminary injunction against the BATF.

For the complete statement, go to the NAR website.

On a Personal Note...

"P'rfesser" Aiming Rocket Interest in New Direction.

(ROL Newswire)--

Dr. Terry "P'rfesser" McCreary has submitted his nomination as a candidate for the 2002 election of the Tripoli Rocketry Assocation Board of Directors. Those present at the HARA launch in February may have met and spoken with Dr. McCreary as he flew some of his experimental rockets. Dr. McCreary is an associate professor of chemistry at Murray State University of Kentucky. He has been flying high power rockets for seven years and has written a book on motor design and testing entitled "Experimental Composite Propellant." His complete mission statement can be found on the ROCKETRY ONLINE™ website.

Launch of a Different Kind...

Congratulations go out to Phillip Burroughs, HARA member and his lovely bride Myong Jackson as they celebrate their nuptials on March 23, 2002.

(Continued from page 1)

Comet launched on a J570 and unfortunately, suffered a separation. Only the "Comet" came home, he lost "Haley's"…

Congratulations to Shannon Rollins from Anniston as he also certified NAR Level II with an excellent flight of his Daedalus II on a HyperTEK™ J250. To show how easy it was, he flew the Daedalus II twice, resulting in another perfect dual deployment.

Tom Butler arrived later in the day and flew his modified NCR Phantom 4000 on a G64. He also flew a rocket that resembled flying broomstick.

I've never attended a launch without flying something and today, I flew my MissileWorks Bullpup on a G80 which had a nice flight and recovery.

The "P'rfesser", Dr. Terry McCreary, paid a visit to our launch and flew a few very nice scratch built rockets. We hope to see him back again at the April experimental launch.

Judging by the year's first launch, it's going to be a great year for flying rockets.

-Submitted by Johnnie Paul

-Launch photos courtesy of Johnnie Paul and his 35mm camera.

Launch Photos

Shannon Rollins and Oscar Valent prepare Daedalus II for Shannon's L2 cert. flight.

Max's preflight pose...

Tom Butler's modified Phantom 4000 on a G64.

Max Gray's Haley's Comet on J570.

Left: Unidentified Flying Rocket...I did not get the owner's name on this one.

February 2002

As P'rfesser looks on, Chuck Pierce arms the electronics in his Black-Hawk R&D SA-5 Gammon.

The remains of Jeff Cotton's L2 attempt.

Phillip Cotton's L2 flight on a J460 REDline.

Scratch built on a G80.

One of Terry McCreary's scratch built rockets on an H motor.

Strongarm on an F20.

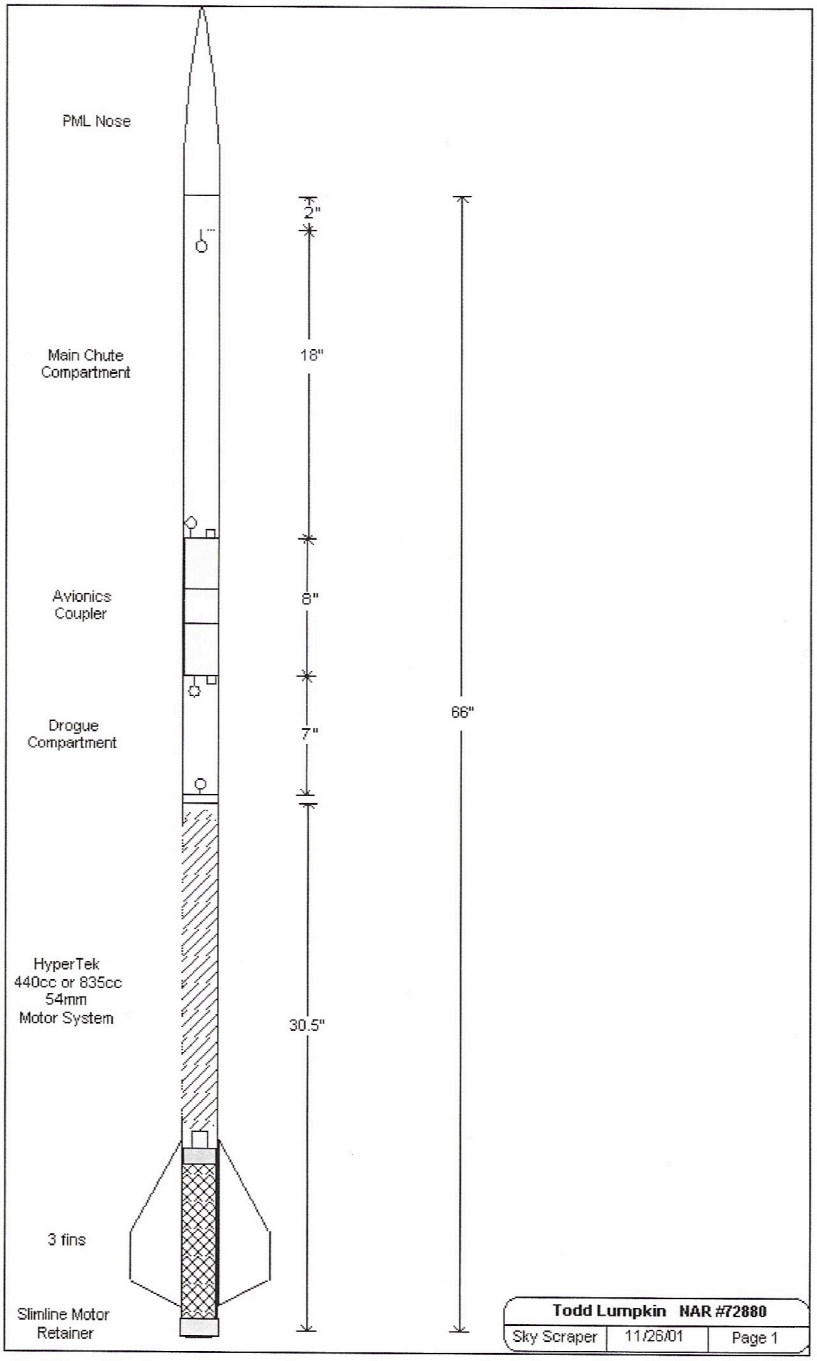
Below: Another unidentified flying rocket on an F motor

Project Pages

This issue: "SkyScraper"

Submitted by Todd Lumpkin

Fig. 1



"SkyScraper" is an original design that features an all fiberglass, Kevlar reinforced construction. Detailed specifications follow the text. Figure 1 is the design drawing for this rocket. This is a "minimum diameter" design in that the airframe tubing accommodates the largest motor diameter possible. Motor retention is made possible by use of the Slimline™ motor retainer which eliminates the need for taping, friction-fitting, or other drag-inducing methods of motor retention.

Fin attachment was accomplished by butt-joining the fins to the airframe tubing with epoxy, applying a generous fillet (figure 2), and fully laminating the fins to the airframe tubing with 1.7 oz Kevlar™ cloth (figures 3 and 4). This lamination was followed by two laminations of 2 oz fiberglass cloth to achieve a somewhat sandable surface. Note the dark spots around the fin edges. These are JB Weld™ which I used as a rigid filler where the belt sander gouged a little too much when I was making the fin bevels. JB Weld™ can be shaped and sanded. This creates an integral "fin canister" (or fin can). The fin can will be filled with Bondo™ and imperfections will be sanded out before primer is applied. Since the fin can will be painted a different color, I will probably dispense with the idea of creating a smooth transition from the laminated airframe tubing to the unreinforced airframe tubing and simply square off the ends of the fin can and paint.

The recovery system is dual deployment using a drogue (possibly drogueless) and a main chute. The altimeter will be mounted in the avionics coupler with the drogue compartment in the aft portion of

Fig. 2

Fig. 3

Fig. 4

Fig. 5

the airframe and the main chute compartment in the forward portion of the airframe (figure 1). The avionics coupler is made of flexible phenolic tubing which is fiberglass reinforced (figure 5). A 1/4" threaded rod and 1/4" eyebolts provide secure mountings for the shock cords and altimeter mount (figure 6). The altimeter mount construction was accomplished using 1/8" aircraft plywood and 1/4" launch lug tubing (figure 7). The altimeter mount is secured via the 1/4" threaded rod as shown in figure 8.

Ejection charges for both the drogue and main chutes will be mounted on either endplate of the avionics coupler. A section of 1/2" brass launch lug tubing forms the ejection charge holder. I construct ejection charges myself using Oxral ematches and cardboard "hanger" tubes. These cardboard tubes fit snugly in the holders with a couple of wraps of masking tape. The parachutes will be protected from the hot ejection particles using Nomex™ cloth. "Shear pins" (#2 nylon screws) will be utilized to ensure that drag separation of the airframe sections does not occur.

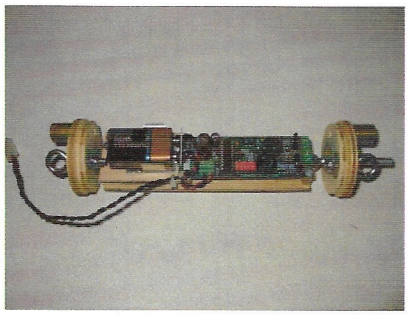


Fig. 6

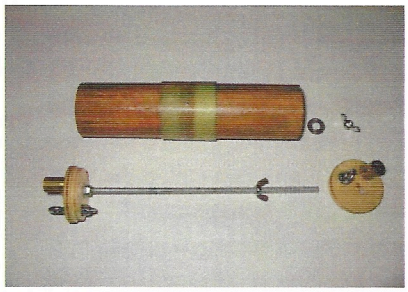


Fig. 7

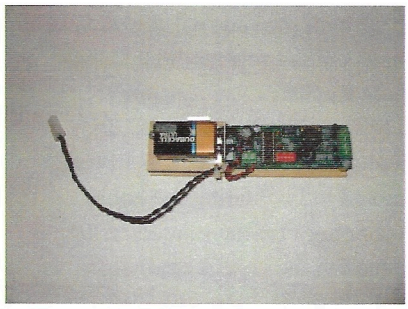


Fig. 8

Specifications:----------

Length: 75 inches

Diameter: 2.1 inches (54mm)

Airframe: Filament wound fiberglass

Fins: G-10 sheet fiberglass

Nose: PML 2.1"

Motor Mount: 54mm (minimum diameter) with slimline motor retainer

Motor: HyperTEK™ 835cc Hammerhead 54mm tank and J fuel grain

Electronics: Missile Works™ RRC2X

Recovery: Dual deployment drogue/main

Weight: 6 lbs. (sans motor)

Predicted Altitude: 8K feet with HyperTEK™ J300

NASA's Student Launch Initiative

MSFC uses High Power Rocketry for Education

By Vince Huegele

Model rocketry has always been a miniature version of NASA operations and flight vehicles. The Marshall Space Flight Center (MSFC) is formally operating a miniature version of it's Space Launch Initiative (SLI) in a program called the Student Launch Initiative (SLI') where future rocket scientists are designing, building and flying large NAR rockets. The program began in late 2000 and culminated in October 2001 with the successful launch of three student rockets. The Huntsville Area Rocketry Association (HARA), NAR section 403 in Huntsville, Alabama, was instrumental in facilitating the hobby technology for the schools to accomplish the NASA challenge.

Just like the SLI, the SLI' began by soliciting proposals. In this case, they were for rocket designs from local high schools. The objective stated was "to build a reusable rocket to carry a half-pound payload to a mile altitude." Five schools responded and gave proposal presentations to MSFC. Three of them received funding to do the work, which began in January 2001. Just like government contractors, the school teams gave monthly status reports and showed their progress to formal Critical Design Review (CDR) and Flight Readiness Review (FRR) NASA panels. Not only did the students have to do the technical work, but they also had to document and present it. The student rocket team that did the best job would receive the honor of having their rocket carry the sanctioned payload designed by another student science team.

HARA was involved in the SLI' from its inception through MSFC scientist Vince Huegele. Vince was HARA president from 1986 to 1996 and has been working with the NASA education office since 1988. He served on the SLI' planning committee and review panels. Vince encouraged the MSFC education office to use the established NAR concepts for implementing the student work. "The students will learn the full scope of rocketry intended by the SLI' by just building and flying the same large hobby rockets used by adult NAR members," Vince told them. MSFC agreed that they should follow NAR standards for safety and reliability.

As technical rocketry issues developed in the program, Vince consulted with other HARA members to create the design criteria for the student vehicles. HARA was then formally engaged by MSFC to conduct the flight operations and provide range equipment for the SLI' because of their extensive experience in this type of rocketry. HARA mentors were the RSO's who would inspect and approve the rockets for flight. HARA President Brian Day wrote an FRR guideline document for them to use based on the NAR level 2 certification checklist and Trained Safety Officer (TSO) training program.

Brian and Chuck inspect Randolph's motor mount.

As the 2001 flying season began, SLI' students started watching HARA at the monthly club launches and meetings. They were soon bringing their own models out to test on F and G motors to acquaint themselves with mid power technology and formal range operations. The students scoured the internet learning about products, processes and possibilities for their rocket. They found the wealth of information that hobby rocketry provides. Designs began to emerge iterated through simulations and calculations. The designs were matched with existing rocketry hardware where

(Continued on page 11)

(Continued from page 10)

available, but custom parts were fabricated where needed. The entire invention process unfolded in the classroom, not from a lesson plan, but from the necessity of the mission.

In April the students showed their designs and what they had built so far to the MSFC CDR panel. Each school had a different rocket design which was their own proprietary plan to be the best and win the honor to fly the payload. They were back in September to show the FRR board the assembled vehicle, and defend their design with actual property values and test results. One rocket was created from an AMRAAM kit. The next was a scratch built scale model of a Tomahawk reinforced with carbon fiber. The other was an original configuration of standard parts.

Since the students had no experience with rockets this big, they relied heavily on computer simulation for flight performance predictions. Two schools decided they could get to a mile altitude on a J class motor. The third school opted for a K size. HARA members knew a K was the better choice, but left it to the students to find out. All rockets were four-inch diameter bodies with an altimeter dual deployment recovery system. A payload section was designated in each rocket to contain the flight computer and a fertilized chicken egg.

Phillip and Rich work on Johnson's altimeter.

A week before the launch date, HARA held its own FRR to inspect the progress on all three assemblies. The schools still had details to complete and needed help in finishing the altimeter integration, so the review became a building session. Brian Day, Chuck Pierce, Rich Gramly and Phillip Burroughs of HARA brought out the epoxy, solder and hand drills to get the job done. This was really the beginning of the RSO checklist with a HARA member serving as a dedicated mentor to the respective school. When the students brought their rockets to the field to fly, their RSO knew what to check since the last review and could be confident the rocket was ready inside and out. MSFC safety personnel were also involved in the final inspection, and were quick to nod to the proficiency and thoroughness of the NAR HPR guidelines HARA used.

The weather was very threatening the day of the launch. A cold front had just gone through and al-

(Continued on page 14)

Vince counts down the time for Brian to push the button.

Chuck Pierce of HARA does RSO inspection of the engine retainer with Randolph teacher Bob Kirchner and student lead Chris Lee.

The Sparkman HS team verifies their recovery connections at the flight readiness review.

RSO Rich Gramly of HARA assists Johnson HS students in flight preparations.

The Johnson HS team programs their rocket's flight computer.

Rachel Hamblin, Instructor David Tonne and Mark Christensen of Sparkman HS check their rocket before launch.

(All photos for this article by Emmett Given, NASA.)

Randolph school built their own rail tower launcher.

The Johnson HS AMRAAM rocket looks scale in flight on a J135.

(Continued from page 11)

though the rain had passed, the clouds were still low and the wind was brisk as the flight crew came to the field. In co-operation with NASA, the Army Missile Command Redstone Technical Test Center had offered the open up-range portion of the Test Area One to use for the SLI' flights. HARA set up the firing system and handled the launch operations. The students prepped the rockets and marched to the pads where the motors and ignitors were installed well away from the large contingency of classmates, parents, school administrators, NASA officials and spectators. The MSFC Center Director who had initiated the SLI' program, Art Stephenson, and his executive staff were present in the cold wind to watch the flights. With so many dignitaries attending, the MSFC education office had set up bleachers, exhibits, and a podium to formally introduce the school teams and announce the launch proceedings.

At the first of the year the Johnson High School team was the least familiar with rocketry and made the most progress in getting a rocket to the field. They were very nervous as the clock counted down, but as their J powered rocket roared off the pad, the team burst into cheers as if they were at a football game. Their rocket hit 3270 feet in a nominal flight profile. "It all worked," said Rich, who had put in many hours with the kids to 'make it so.' They showed the recovered rocket to the officials to demonstrate its reusability as part of the SLI' objective.

Sparkman High School was next with the same type J135 motor. The rocket ascended well at first but it began fishtailing until it flipped over at 1651 feet and spilled out its drogue chute. The vehicle extended a tangled main chute and tumbled to an awkward but recoverable landing. Although all the static calculations showed the model had a positive stability, the students got a bonus lesson in aerodynamic dampening and undersized fins. They were disappointed in the altitude, but proud that they had gotten off the ground.

Randolph School flew last with a single use K250. Patches of blue were beginning to show in the October sky as the clouds broke just as the team cleared the pad area. The motor lit up authoritatively and soared away from the special launch tower Randolph had built. The long burn motor was still making noise as the rocket found the bottom of a passing cloud fragment and slipped from sight. Everyone held their breath and looked for the rocket to return below the cloud. The moment

(Continued on page 15)

Johnson HS team members celebrate a successful mission

NAR announces National Rocketry Challenge

The National Association of Rocketry (NAR) and the Aerospace Industries Association (AIA) are sponsoring a rocketry design challenge for US high school student teams as part of the Centennial of Flight celebration in 2003.

The Team America Rocketry Challenge involves designing, building, and flying a multi-stage model rocket (less than 3.3 pounds liftoff weight, 125 grams propellant in NAR-certified model rocket motors) that takes two raw eggs and an electric altimeter r as close as possible to exactly 1,500 feet. Of course, the rocket must fly safely and the eggs must return undamaged!

Winners will be selected at a flyoff competition to be held in Northern Virginia on April 12-13, 2003. The top five student teams will receive shares of a total prize pool of approximately $50,000 in savings bonds, and the total prize pool for the winners' sponsoring schools is approximately $9,000 in cash.

This is a great opportunity for NAR members to "pay forward" and help encourage the next generation of America's aerospace talent. NAR Sections and members are asked to spread the word about this event, and to provide advice on the hobby of model rocketry and access to launch sites (but no direct help on entry designs!) to teams in their local areas.

See http://www.nar.org/TAguidelines.html for more details.

Student Launch Initiative Update

The MSFC committee has selected the morning of April 27, '02 as the date for a reflight of the SLI' high school student rockets at the army test range. This is the same date as the HARA launch, but as it is a re-flight, RSO approving the rockets and prep should be much easier and quicker. Also, this second attempt to go up a mile is dependent on K motor availability, and level 2 certification of the teachers. The objective is to 'demonstrate reusability', but also it's to have another launch on this program since the next one won't be until April '03 as it aligns with the school year.

That afternoon, UAH will attempt to launch the A&M payload on their hybrid M rocket also at the army range with fewer spectators and tighter safety than with the high school crowd. They have still not completed the actions from the FRR board and the launch status is tentative. No HARA support is needed for that launch.

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had the intensity of the 'radio blackout' that manned flights used to experience on reentry. Then the rocket reappeared, descending in its proper phase one configuration. The crowd breathed in relief as they saw it, and then cheered as the main parachute flourished right on time. "It was a really nice flight," said Brian. Randolph's altimeter read an apogee of 6110 feet, easily achieving the mile high goal and proving they were worthy to carry the trophy payload. The egg was intact, too.

MSFC was extremely pleased with the flights and will continue to support the SLI'. The program was just what officials had wanted: a miniature version of the full scale SLI. The students were ecstatic from their success, eager to plan another mission and build another rocket. Many parents told happy stories of how their children were more involved and focused in their schoolwork from being on this project. Several students announced they had made career and college study choices such as chemistry and electronics based on this experience. The HARA team was gratified that everyone got to fly and enjoy the same thrill of liftoff that they and other NAR members across the country enjoy as part of hobby rocketry. This SLI' establishes NAR High Power Rocketry in an educational NASA program.

Randolph's K250 lights up for a long burn.

All photos for this article by Emmett Given, NASA.

HARA

The **H**untsville **A**rea **R**ocketry **A**ssociation, based in Huntsville, Alabama, home of America's first adventures into space. Founded in 1979 as a section of the National Association of Rocketry (NAR). **HARA** maintains an active launch schedule coupled with an ongoing commitment to rocketry's educational applications.

SEND TO:

HARA's website:

Http://www.hararocketry.org

Anybody Going To....

NSL? NAR's launch is being held Memorial Day Weeknd, May 25-27 in Rainbow Valley, Goodyear, Arizona, which is located west of Phoenix, AZ. The land is privately owned and they have announced waivers for night launches. Go to the NAR website for more information, see pictures of the site, etc.

LDRS? Tripoli's launch is being held in Amarillo, Texas on July 11-16, 2002 with the 15th and 16th being "mini balls" or experimental launches. See the website for registration info, maps, lodging, other places of interest, etc.

Anyone attending these launches (or others), please contact editor on return for complete launch report. -Ed.

Max Gray's **Haley's Comet** on a J-420 Redline at the RCBO last year.

- Photo courtesy of Storey.