



max-Q HARA

Newsletter of the Huntsville Area Rocketry Association

Volume 9, Number 5, Oct/Nov 1995

Chariots Afire! HARA Rockets to Start Race

The Huntsville Track Club in charge of the annual Rocket City Marathon has again requested HARA fire rockets to start the race on Saturday morning, **December 9**. Race Director Harold Tinsly was so impressed with the club's performance last year he wants the thrusty salute to be a regular part of the event. It's already in the promotional literature being sent to runners.



The launch last year confirmed the feasibility of safely shooting models off the city streets. Runners will line up at the start on Williams Avenue. HARA will have the launchers set up across from the Civic Center where the trees end. The models will be aimed at the empty upper deck of the parking

garage where they will land. The effect is for the runners moving up the street to see and hear rockets taking off ahead of them along the race route.

Four rockets will be launched in sequence synchronized to the starting pistol fired at 8:00 am. *BigBertha* models will be used on C or D motors. Motors will be provided if needed, thanks to funding from the Track Club.

Several HARA members are working on this project, but a few more people can help. Volunteers are needed to be at recovery points to get back the rockets. Everyone should arrive before **7:00 am** to secure a parking spot before the roads close to cars. Call Vince at 881-2904 for details on what you can do. Come on out!



XIV and Counting

HARA pulled off its annual rocketfest despite the wind and some gremlins for another day of community fun. The often called "first weekend in October launch," the *Rocket City Classic* was actually September 30 this year due to the calendar configuration.

Brian Day, Kevin Cornelius, Dave Gannett, Vince Huegele, Scott Saint, Mark Tygeilski, Greg Warren, Mac Weathers, Tim Bennett, and Randy Kelling made the scene to do the thing. Wayne Hendricks, Tim Pickens, Gene Hornbuckle and George Gasaway were also on the premises, as well as the children and significant others of many of the above.

A steady strong southeast wind challenged the range crew who decided to move the launchers across the field from the traditional point to get the most downwind landing space at the old airport. The different range position changed the traffic flow from the drawing on the contestant instructions, but the arrangement still worked.

Several bugs bit the *Classic* this time. Greg's PA system croaked during set-up, forcing the backup hand-held bullhorn to be used for the countdown announcements. Batteries were suddenly discovered

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- > Remembering Ed

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From the President's Pad

Classic Congratulations

Thank you all again for coming through and putting on a great *Rocket City Classic*. It tends to be a bit of a job, but the personal flying we forego that day helps kids have a big time with their models. We don't know how many future scientists are inspired from our miniature Cape Canaveral we show off each year. The new schedule of events seemed to have worked well enough. If you have comments or improvements about the launch,

bring them forth; it's how we get better each year.

Board is Coming

The NAR board of trustees meets twice a year, once at NARAM in the summer, and then somewhere else in the winter. This year, Huntsville is the somewhere. The board is coming here at the recommendation of NAR secretary George Gassaway to hear Greg Warren's presentation for SEP to go national. The Tripoli board will also be here at the same time for the same show.

What does this mean for HARA? Well, you can come picket the meeting with your NAR gripes, but since most of us are not political animals, and many not even NAR members, you would pan on that. Better will be for everybody to get together for a **ROCKET PARTY! Saturday night, January 20**, we'll all gather to eat and tell rocket stories. The location is yet undetermined, somewhere affordable for families like Shoney's or Ryan's, but if you have a suggestion of where to go and how to make this a real "event" for our visitors, talk to me or Greg. We'll have further discussion at the regular HARA meeting **Thursday, January 11**.

Officer Positions

Last year I mentioned the creation of some new chairman positions for certain jobs within HARA. I wanted someone to work on club publicity, meeting programs, and newsletter assistance. These areas still need help. As the new year begins, think of what you're interested in, because I will be calling people to participate.

Another New Hobby Shop

Wilson's is gone, but in the same building is a new business with almost the same inventory. Called "Huntsville Hobby Shop," it specializes in plastic kits. There are some Estes products there and a few Aerotech kits.

Welcome to Brittany

The Robertsons have launched their newest scale project. Joe and Sondra had a girl October 24. At 9 pounds, 6 ounces, a flight waiver was needed.

MAX-Q

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Editor: Vince Huegele

Contributors: Greg Warren, Jerry Schaefer, Randy Kelling, Kevin Cornelius, Brian Day

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HARA officers

President: Vince Huegele
Vice President: Joe Robertson
Secretary: Greg Warren
Treasurer: Sharal Huegele

Upcoming HARA Events:

Saturday Dec 9, 7:00 am
Marathon Start Launch

Thursday Jan 11, 7:30 pm
HARA Meeting

Saturday Dec 20, 7:00 pm
Rocket Party

ED STLUKA 1928-1995

The Huntsville community lost a great friend on September 7 with the passing of Ed Stluka. He died three days before he would have been 67. Ed had a stroke in March, but it cancer that claimed him.

Ed was an avid radio amateur. He started playing with radio in the Navy and then went to graduate from Tennessee with a BS in EE. Ed got into NASA at MSFC and managed electrical systems development on the Saturn V. He later was an integration engineer for several shuttle payloads. His favorite projects were using amateur band experiments on getaway specials.

I first met Ed in 1986 in HARA when we reformed. He served as HARA V.P. in 89-90 and started several programs for rocketry education. He helped form SOAR in 1989 and was the current Treasurer. In his retirement years, Ed was continually active in many community science programs.

Ed's talent was in organization. All his experience with shuttle payloads was revealed as he shared it with students trying to learn how to get their experiment to fit into the rocket. Ed's government background was also seen in his massive collection of detailed viewgraphs that he brought to the student briefings.

When I was helping his wife, Barbara, clean out Ed's boxes, I found Ed was meticulous in filing multiple copies of everything he ever printed. It made for a lot of paper disposal! Among all the rocket literature were only two actual rockets, an old Ranger with a fin broken and a small model with a misfired ignitor still taped in the motor. For as many meetings and launches Ed attended all these years, he was really not a model builder. But he came and he contributed.

Ed wasn't just involved in many activities, his leadership and work held them together and moved them forward. HARA didn't have a radio net at the Classic this year without Ed. SOAR has come to a halt without Ed. Space Camp will be late getting its ham radio station set up without Ed. It's not just his enthusiastic face we'll miss. We're having a hard time going on without him.

--Vince Huegele

Above: Ed instructs a ham in tracking techniques.

Left: Ed with his famous viewgraphs.



dead in one of the radios, negating a communication net with the tracking stations. Adjustments were made for these problems and the launch proceeded. The launchers and firing system were 100% functional as Greg served as firing officer with Vince at launch control.

Another matter was the scheduling conflict with the Academy of Science and Foreign Language. The school usually has their super science Saturday the week after the contest, but this year it hit on the same day and possibly interfered with some kids attending the launch.

A new event schedule was tried this year. Rather than allowing a contestant to fly any event at any time and forcing all judges and officials to be constantly on alert, the events were flown in sequence. The contest started for the first hour flying duration only. The timers kept score while the trackers were being set up and aligned. At 10:00 the stopwatches were put down and the tracking powder was brought out. Kevin and Randy manned the tracking stations. Toward eleven o'clock, contestants took their craftsmanship birds to the judges' table. After those models were flown, the rest of the morning was dedicated to spot landing. Dave and Mark paced off the distances from the target to the models. The process allowed scorekeeper Brian to comfortably and accurately sort and rank the flight cards. As intended, the work load on the officials was better balanced.

Regular Estes models and motors were the thing for contestants, with no particular kits appearing preferable. Twenty-three rocketeers signed up to fly for points, a number consistent with previous years. Hans Ford was best in craftsmanship with his *Honest John*, a kit he had won as a *Classic* prize last year. Kaitlyn Holloch's two stage *Delta Clipper* went high enough to claim the maximum altitude, but then got minimum as it was recovered with car tire tracks over it. Mike Toelle was within forty feet of the pole to win spot landing, and Jaclyn Webb's 3:45 time brought victory in duration.

There were several good demo flights to show the crowd what a composite motor looked and sounded like, but the wind was very discouraging for large models and most just stayed in the box. George flew his Sunseeker, a research project that successfully developed an active guidance rocket.

The *Classic* has always been a rallying point for local rocketeers to get out on an organized club range to fly instead of doing it solo. The field of entries this year was a few familiar faces with many new ones. The contest works in getting kids to build their third or fourth rocket with an extra special paint job, or grow bold enough to put a C motor in their *Alpha*. Here's the chance to find out really "how high it goes." The

more experienced fliers, however, have learned things like a two-staged *Hercules* that gets tracked is better than a three-staged *Commanche* that gets lost.

Funding for prizes was provided by the Mississippi-Alabama section of the AIAA.

CLASSIC PHOTOS next four pages by: Jerry Schaefer and Randy Kelling

Opposite Page, Clockwise:

Composite motors look great. George's Sunseeker sidewinder in action. Nominal events at the control table. The winners pose with the loot. Dave Gannett and Mark Tygielski stand at ground zero for spot landing.

Official Results of Classic XIV

Champion Rocketeer - Kitric Holloch

Duration

1. Jaclyn Webb
2. Scott Winfree
3. Robyn Harper

Altitude

1. Kaitlyn Holloch
2. Kenneth Newton
3. Steph Holloch

Craftsmanship

1. Hans Ford
2. Cathy Hendrix
3. Newton Banks

Spot Landing

1. Mike Toelle
2. Kyle Cornelius
3. John Bryant





Model Rocketry is a family sport!

Clockwise from top, this page.
The Wassenbergs, Prescotts, Hollichs and
Redmonds fly by twos.

Reach for the clouds

Next page: Hans Ford, Jaclyn Webb, Patrick
Lancaster, and Cathy Hendrix load the birds.
A cluster rocket ascends.







CLASSIC Scenes

Clockwise from top.

Range overview. Sharal Huegele registers a contestant. Stephanie and Kaitlyn Hollich. Ashley Prescott and her Helicat. Jaclyn Webb with something new to build. Alpha departing pad 5.

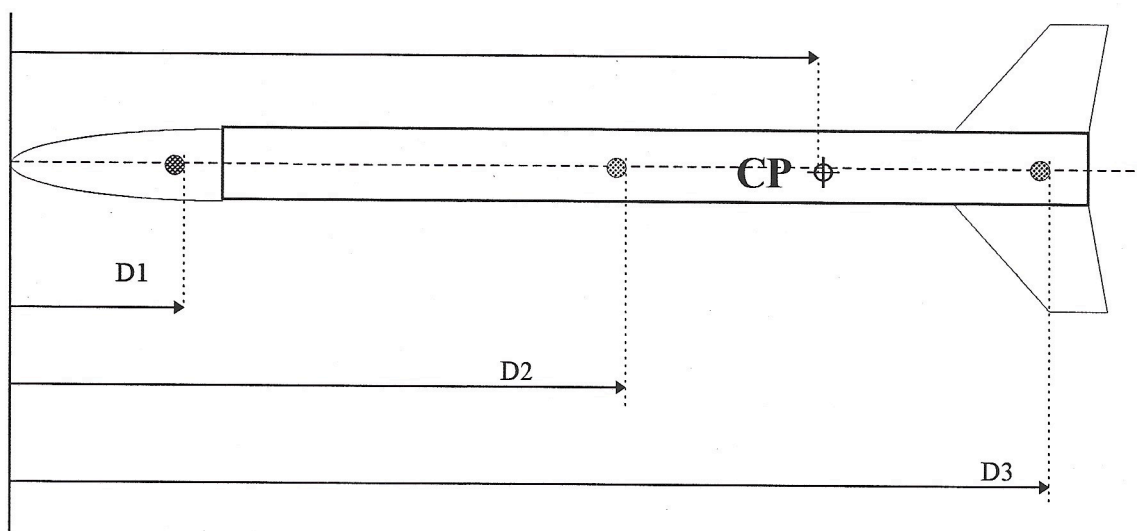


DETERMINATION OF THE CENTER OF PRESSURE

Every designer has to find the *center of pressure* (CP) for the rocket to know if it will be stable in flight. There are many nice computer programs that calculate the CP by just entering the rocket dimensions and nose shape. It is instructive to know how to determine the CP with pencil and paper.

You will have to know the area of the exposed components. The body tube area will just be the length times the diameter. The fin area can be figured by breaking the shape up into rectangles and triangles and finding those areas. The nose area can be approximated by a triangle, ($A=1/2bh$), but a more accurate way would be to draw out the nose outline on graph paper and counting the enclosed squares. That's good for complicated fin shapes, too.

The centroids of the sections will be the point on a center line that divides half the area. The body tube is simple to figure, but for the nose and fins you may have to go back to the graph paper. When you have the values, fill in the table below. The CP is the linear distance from the nose tip of the moment sums divided by the total area.

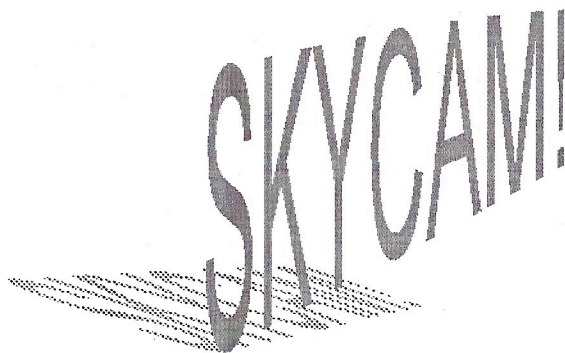


<u>ITEM</u>	<u>AREA</u>	<u>DISTANCE</u>	<u>MOMENT</u>
Nose Cone	$A_1 =$	$D_1 =$	$A_1 D_1 =$
Body Tube	$A_2 =$	$D_2 =$	$A_2 D_2 =$
Fins	$A_3 =$	$D_3 =$	$A_3 D_3 =$
	$\Sigma A =$		$\Sigma AD =$

$$CP = \Sigma AD / \Sigma A$$

Calculation Steps

1. List the exposed cross section area of each item.
2. Sum up the individual areas to get the total area.
3. List the distance of the center of area of each item from the reference line at the nose.
4. Multiply each respective area times the distance to get the moment.
5. Sum up all the moment products.
6. Divide the total moment by the total area to get the distance to the center of pressure.



AERIAL PHOTOGRAPHY

By Brian Day

I've always wanted to fly a "real" payload in one of my rockets, and November 18 at HARA's Athens launch I finally got my first chance. I decided several months ago that I wanted to fly a 35mm camera, modified to take a sequence of shots during the flight, and spent several hours building my payload.

The camera I would select needed to be inexpensive, have an electronic shutter switch and motor-driven film advance, and be inexpensive, small, inexpensive, lightweight and inexpensive. I came across the Vivitar "Opus 35" camera at a local discount store, and the project began to take shape in earnest.

I needed to modify the camera to be triggered by a small timing circuit, so I opened the case and soldered some wires to the shutter switch contacts. These would later be shorted by a small relay, which was in turn driven by a 555 timer IC configured to take a picture every 1.5 seconds. While I had the camera case open, I also removed the flash capacitor and the "Red-eye" LED (now just dead weight and power sinks) and shorted out the photocell (to attempt to get the highest possible shutter speed). I then mounted the camera with Velcro™ onto a small piece of aircraft plywood, which slides into guides which I epoxied into a 4" tube coupler. The timer circuit, battery holder and some switches and wiring finished off the electronics. I cut a hole in the side of the coupler and payload section for the lens to fit through, used some plywood bulkheads for "lids," and held it all together with two pieces of threaded rod and some wingnuts. The resulting payload is a cylinder about 4" in diameter by 6" long, and slides inside a 4" diameter payload section. (The camera itself is small enough that, with some ingenuity, could fit into a 3" or even 2.6" diameter body tube). I also built a removable

cowling and mirror assembly which would allow the camera to look "aft" for some interesting effects shots.

I shouldn't have shorted the photocell. For some reason, the shutter wasn't opening at all (which I found out by shooting a test roll the week before the flight). Removing the short fixed the problem, but then I had to drill another big hole in the payload section so the photocell would be exposed to the outside light. Oh well, it seems to have worked OK.

The only 4" rocket I've got so far is a THOY Falcon, a sporty-looking rocket about 5 feet tall, with a 54mm motor mount and 1/2" launch lug. Since the rocket with the camera payload turned out to be pretty heavy (I'd guess around 4 or 5 pounds - I REALLY need to get one of those scales), I decided to also attempt my first "I" motor flight and use an Aerotech I161W-10 motor, which produces around 40 pounds of thrust.

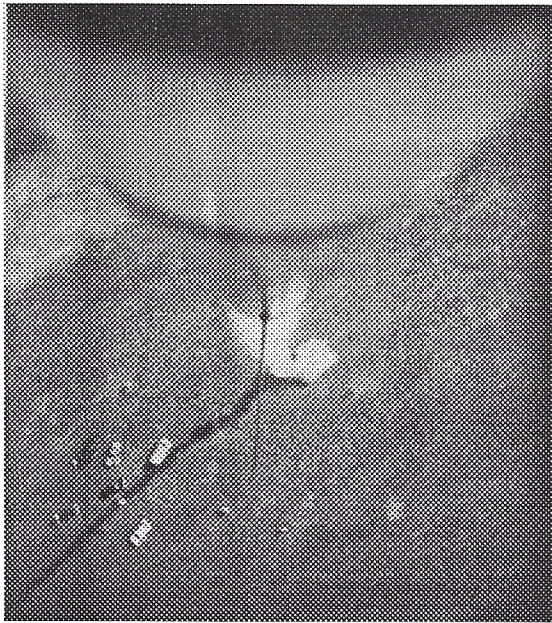
What a great flight! The Falcon took off straight as an arrow, and did it ever move! Computer simulations predicted that it would reach around 1800 feet, and I'd say it got there easily. The delay was a little long (they don't make an 8 second delay, which would have about optimum), but the parachute came out nicely and the rocket didn't drift very far. After it landed, I noticed that 2 of the AA batteries (I couldn't find a holder for AAA's) were rolling around loose in the payload section, but when I saw that the camera had shot the whole roll of film, I figured that this must have happened on landing. (Mental note: either strap the batteries into the holder, or better yet, change to a 9V battery and a zener or regulator to save some weight.)

Now the good part -- The pictures turned out really well! Having the camera looking aft reduces the blur, since the scenery doesn't change as fast as if it were looking out to the side, which I think was important since the max shutter speed of this camera is fairly slow at about 1/150 sec. The sequencer was activated by a lever switch pressing against the launch rod, so I got a good shot right after liftoff with lots of flame and smoke, 4 good shots of vertical flight with smoke trails, 2 cool "arching over apogee" shots, and a bunch of shots of the sky with the shock cord in them. Only 1 shot had just a corner of the parachute, which was a little disappointing. (Mental note: Next flight, use

separate parachutes for the booster and payload sections. This should result in cooler pictures, as well as reducing the probability of whacking the two "moderately heavy" sections together).

I was generally elated over how well the pictures turned out. I was hoping to get one or two cool shots to show off, and I got about 9 good shots from this first flight alone. The only other camera I've ever flown is an Estes Astrocam, and the quality of 35mm (even with a cheap camera) is in another league altogether.

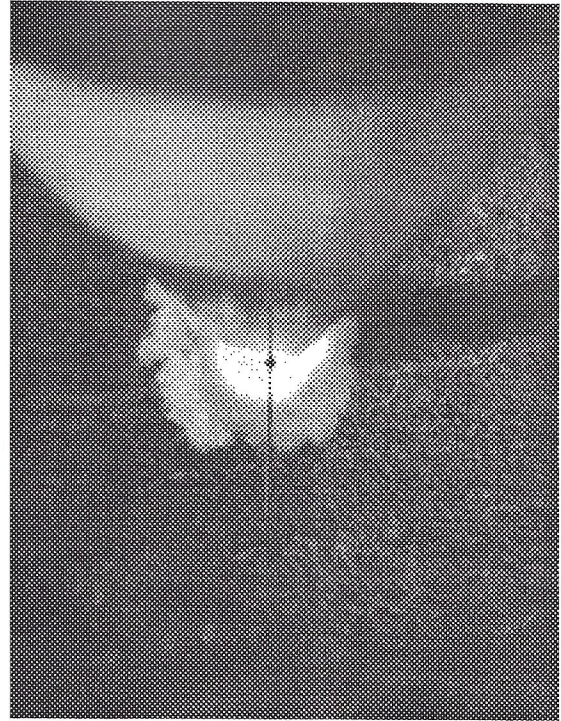
Two thumbs up!



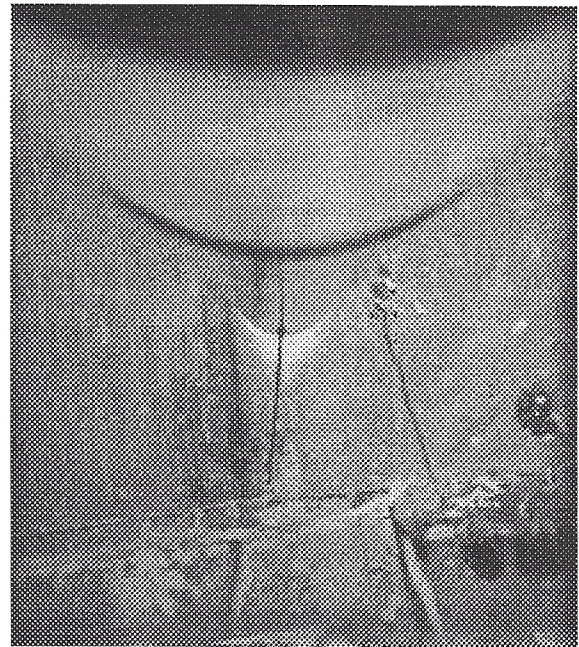
2

1. Ignition and Lift off. The camera is rolling!
2. The smoke column connects Skycam to the immediate launch area.
3. Mystic Crop circles become apparent in the cow pasture. Is that Kevin's Cheetah in the tree?

(Originals in color, some resolution loss due to digitizing and reproduction.)



1



3



Dave Dieter/Huntsville Times

Father-son project

Ken Winfree of Madison helps his son, Scott Winfree, 8, attach the electrical leads to the firing mechanism to launch his Athena rocket. It was the last they saw of their rocket, because gusty winds blew it out of sight. Several model rocket enthusiasts met at the old airport in Huntsville on Saturday to launch their models.

Huntsville Area Rocketry Association
11108 Argent Drive
Huntsville, Alabama 35803

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