

Newsletter of the Huntsville Area Rocketry Association

MAX-Q

Vol. 2 No. 1 December/ January 1988



1987 Section Reserve National Champions

Explorer-1 30th Anniversary

Note : January 31st of this month will be the 30th anniversary of the orbiting of Explorer-1, an event of great importance to the United States and the rest of the world. It held great meaning for one city in particular, Huntsville, where the basic Redstone booster was designed and built.

America's first satellite was launched at 10:48 PM, EST, on January 31st, 1958. The following is a description of the events and vehicles leading up to that achievement.

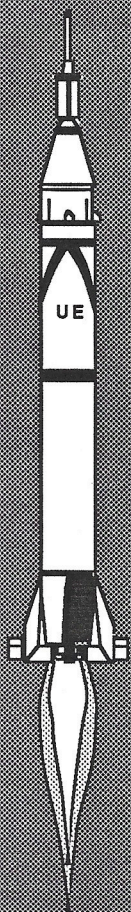
Project Orbiter:

Launching of artificial satellites had been proposed for many years, but by the end of World War II the German V-2 rockets had proven that large rocket vehicles were indeed feasible (The V-2 was quite large for it's time). Most rocket research of the late 1940's and 1950's was to develop more powerful and longer-range missiles, not to launch satellites. By mid-1954, Wernher Von Braun seriously proposed using a modified Redstone Short Range Ballistic Missile (SRBM) to launch a satellite. This proposal, called Project Orbiter, eventually lost out in August 1955 to Project Vanguard as backed by the Office of Naval Research.

Meanwhile, the Army Ballistic Missile Agency (ABMA) was developing the Jupiter Intermediate Range Ballistic Missile (IRBM) as well as conducting continuing flight tests of the Redstone missile. As the Jupiter IRBM had a higher priority for launch pad assignments than the Redstone, the modified Redstone missiles used for testing Jupiter missile components were given "Jupiter" names such as Jupiter-A and Jupiter-C.

Redstone to Jupiter-C:

The Redstone missile, developed at Redstone Arsenal in the early to mid 1950's, was utilized in modified form to test re-entry nose cone shapes for the Jupiter missile. This modified form of the Redstone



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- Countdown: 1988 Contest Schedule and Events
- Real Life Adventures at Space Camp
and much more!!!

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Wadding Scraps

From the President's Pad

There isn't any off season for rocketry in HARA. Things didn't slow down much in the fall and we're still going on through the holidays. I'm talking about the commemorative launch of the Explorer I satellite we're doing at ASARC. This should be one of HARA's finest achievements and will certainly set the pace for 1988.

We've also been making more plans on this NARAM thing. Stay tuned for announcements on what your involvement will be as we play host to rocketeers from all over America. A NARAM in Rocket City should be the best ever.

Check out our calendar for 1988. Already we've got plenty of meetings and launches scheduled to keep us all busy and out of trouble (or into trouble perhaps). I hope you will be able to participate in most of these events to maximize your enjoyment of model rocketry. It's going to be a full year and we need everyone to continue the fine support you've given in the past.

A music video being seen alot recently features some excellent NASA footage along with the typical rock audio. As the rockets lift off, the rap band sings "pump up the volume". That's our theme for '88. Pump up the volume, HARA!

Vince

Dues due for a few!

If your address label on this issue of MAX-Q has a "Nov 87" on it, it's time to pay up if you want to continue your subscription and HARA membership. If we don't receive your funds, we will have to drop you off the list. This is your only notice! HARA dues are \$6.00 each per year for the first family member, \$3.00 each for the next two family members for a maximum of \$12.00. Only one MAX-Q per family address. Send checks to HARA, 11108 Argent Drive, Huntsville, AL 35803

HARA T-Shirts

A second order of club T-shirts has come in. A good selection of sizes is available now, so call the McCains at 536-2241 to place your order.

The following is a contribution from a HARA member who shall remain anonymous.

Two verses From "The Man of Steele Blues"
The new hit song by; The Southern Flexwings

Ole Matt was a white ma,
with rocket singed hair.
When he had a fifth of wine
he did not have a care.
He used to own a ole launcher,
used to launch'em cross his knee.
I'd give ole Matt my money
he's launch all day for me.
Chorus (see note below)
He looked to be thirty,
maybe I was ten.

Mama used to whip me,
but I's go see him again.
He's launch me an F or two,
then take another drink of wine.
For full length tape (including two more verses and chorus) send ten dollars cash to MAX-Q. Your money is non-returnable and we guarentee absolutely nothing.

MAX-Q Staff

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Building Session

Instead of a launch in January, a building session will be held at Jimmy and Marty William's on Saturday, January 30th at 10:00 am. Learn how to build those helicopter duration models for the next contest! For further information contact one of the club officers.

Special thanks to Pat Saucier and Dave Dooling of the Alabama Space and Rocket Center for providing a meeting place for our monthly meetings. We are the envy of clubs everywhere!

Explorer I 30th Anniversary (cont.)

was called Jupiter-C. The modifications involved stretching the Redstone fuel tanks by more than 5 feet, altering the guidance section, and adding a spin-launcher for solid-propellant powered upper stages. The Jupiter-C used two upper stages, consisting of an outer ring of eleven scaled down 6" diameter Baby Sergeant motors for the second stage and a telescoped inner cluster of three Baby Sergeant motors for the third stage. These upper stages were located inside the "tub" portion of the spin-launcher, spun up to about 750 RPM by the time of second stage ignition. The spin launcher and upper stages were developed by the Jet Propulsion Laboratory (JPL). As none of the upper stages had any form of guidance, the spinning was necessary to "even out" any unequal thrust from the clustered rocket motors. This also had the net effect of providing a form of gyroscopic stability as has been used more recently in "PAM-D" type shuttle satellite deployment/launches.

There were three Jupiter-C flights testing nose cone shapes for the Jupiter missile, including a 1/3 scale nose cone successfully recovered. Notably, the very first test flight of the Jupiter-C included a dummy "4th" stage similar to the eventual Juno-I/Explorer configuration. This 4th stage was an inert dummy filled with sand, not propellant. Indeed, the Army had been ordered NOT to orbit a satellite, and the 4th stage was inspected before launch to ensure it was not

loaded. This first test flight was successful, flown September 20th, 1956 (more than a year before Sputnik-1).

Sputniks and Vanguard:

With the objectives of the Jupiter-C program being successfully met in August 1957, General Medaris of the ABMA had the remaining vehicles set aside for possible use in orbiting a satellite.

October 4th, 1957, the world's first artificial satellite was launched by the Soviet Union. This was a major technological achievement which carried even more political implications. This was a two-pronged form of political clout showing that not only was the Soviet Union capable of meeting or beating the United States in some technical challenges, but they also had a rocket vehicle which could be used to carry a nuclear warhead over very long ranges (An ICBM, which the U.S. was just starting to develop with the Atlas program). The Russians proved they could back up Sputnik-1 by the November 3rd launch of Sputnik-2, which was heavier and carried a dog into orbit.

The public response to the second Sputnik had been so intense that president Eisenhower was compelled to make a nationally televised address, reassuring that the U.S. was not in danger of missile attack and that we would have our own satellite in orbit soon. As evidence of U.S. capabilities was the Jupiter nose cone recovered from a Jupiter-C launched in August. On November 8th, the Department of Defense announced that the Army-JPL Juno project had been given approval for a satellite launch attempt.

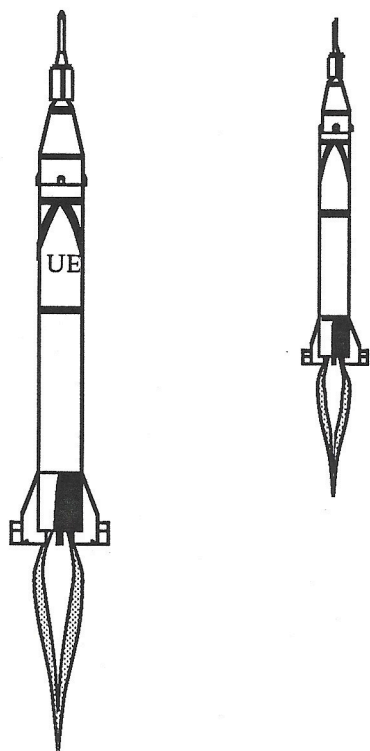
Although intended as a vehicle test launch, the launch of Vanguard-1 on December 6th, 1957 carried a heavier burden than a grapefruit-sized satellite. Rightly or wrongly, it was seen as the U.S.'s response to the Russian Sputniks. The vehicle rose a few feet, lost thrust, and fell into a fireball explosion on live radio and television.

Jupiter-C to Juno-I:

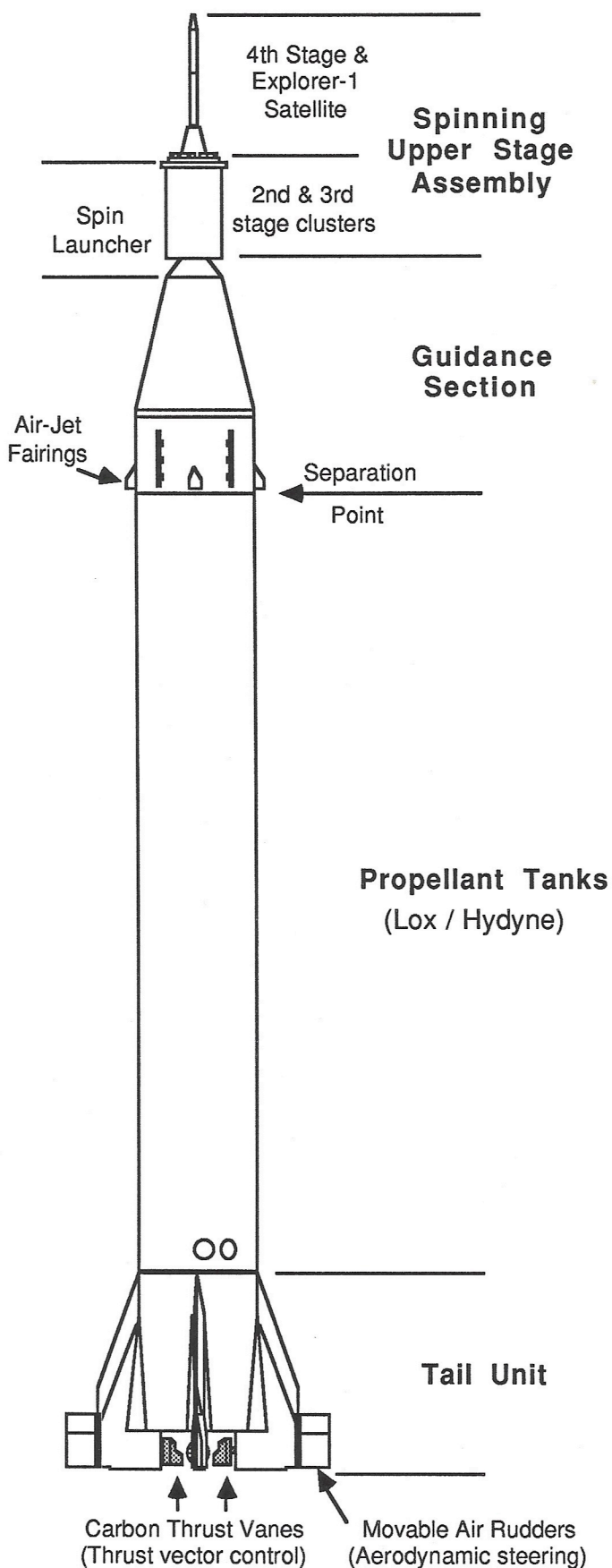
As the Jupiter-C name was meant for the nose cone re-entry tests, the name Juno was adopted for the version used for orbiting a satellite (later this was called Juno-I when the Juno-II was developed). The modifications consisted primarily of adding a 4th stage, in the form of another Baby Sergeant motor fitted with the satellite section on top. The fuel for the basic Redstone type booster was changed from alcohol to Hydyne, which increased both thrust and burning time. By mid-December the booster "UE" and guidance assembly were ready, and flown from Huntsville to the Cape.

When the JUNO-I program was announced on November 8th, the satellite had not been developed. In addition to their work on the upper stage assembly, JPL also had to quickly devise a satellite. While Vanguard and Sputnik-1 were spherical, this was not prac-

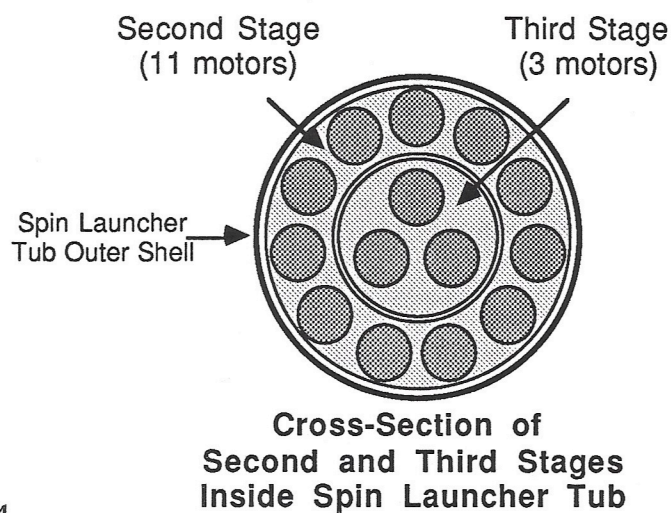
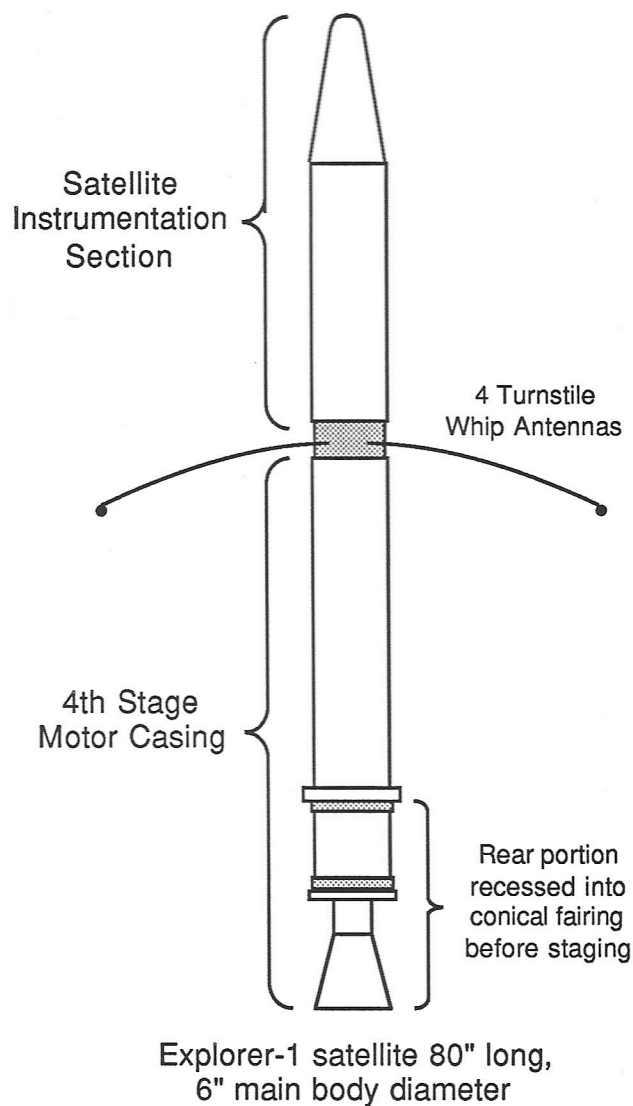
Juno-I



JUNO I Vehicle



Explorer I Satellite



tical for the limited capabilities of the Juno-I. The satellite design chosen was a cylinder 6" in diameter, the same as the Baby Sergeant 4th stage motor as it would fit atop the 4th stage motor like a sounding rocket payload section. Scientific instruments carried were to measure cosmic ray intensity, temperature, and micro-meteoroid impacts. Other phenomena could also be examined, such as ionospheric polarization effect, geomagnetic field density, and atmospheric density, by ground observation of the receiver radio signal and satellite orbital motions. Two independent transmitters were used to send information, one on a VHF frequency that "civilians" around the world could hear if they had the proper receiver. When all was ready, JPL sent the upper stage assembly and satellite to the Cape in early January.

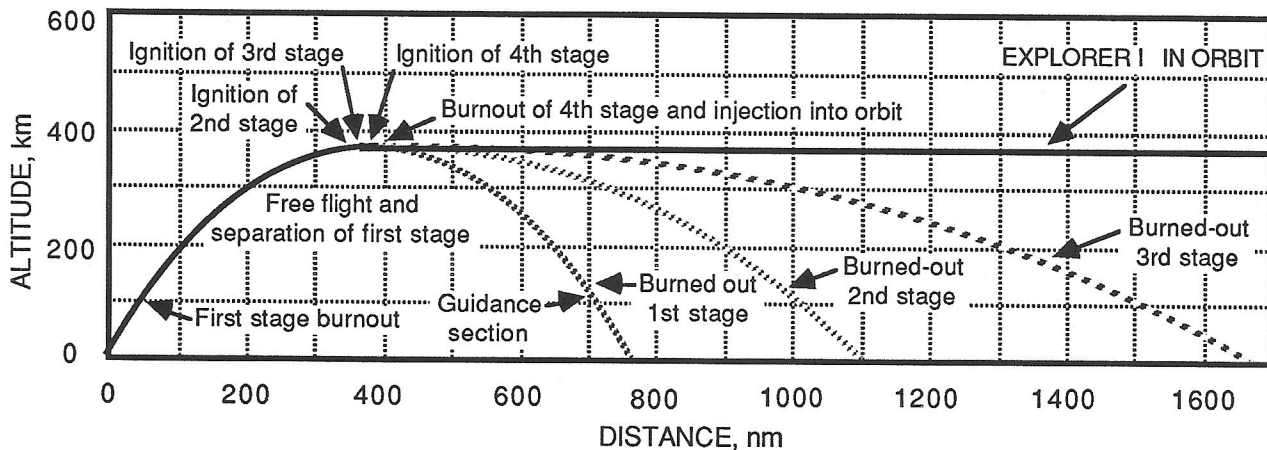
Launch:

After a good simulated test rehearsal and a 2-day delay due to high altitude winds, the Juno-I vehicle "UE" and satellite were ready for launch on January 31st, 1958. Unlike the open live coverage given to the Vanguard attempt (and later on NASA launches), this launch attempt was not even announced in advance. Some members of the news media were on hand, but could not release any news until after the launch. The vehicle was literally kept "under wraps" until shortly before launch, in part by intent and by necessary pre-launch gantry equipment. Thus, there are no daytime photos of vehicle "UE".

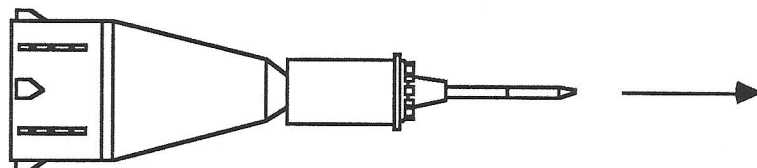
At T-13 minutes the upper stage assembly rotation

began. Before launch it would reach a spin rate of over 500 RPM, and vary in flight to a maximum near 750 RPM. Finally the count reached zero and the Juno-I roared to life, with liftoff at 10:48 PM EST. It climbed quickly out of the shine of the spotlights, with only the exhaust flame and a small light on the guidance section visible. It pitched over for a nearly constant climb angle of 40 degrees, along an east south-east azimuth path. Booster cutoff occurred at about 156 seconds. A few seconds later, the Guidance section along with the upper stages separated from the booster, pushed from the booster by large springs.

The guidance and upper stage section coasted up for an intended apogee altitude of about 220 miles. Shortly before apogee, the upper stages would be fired in order to achieve the necessary orbital velocity. To ensure the upper stages were aimed straight ahead and horizontal when fired, the guidance section used low thrust air-jets to orient the entire assembly to the proper attitude. Just after T+403 seconds the 11 motors of the second stage ignited, pushing itself out of the tub and accelerating the upper stages. Shortly after the second stage motors burned out the 3 motors of the third stage ignited, as the ring of second stage motors slipped off and was left behind. After third stage burnout the 4th stage motor was fired, finally pushing itself and the satellite to orbital velocity. At 10:55:05PM the motor had burned out, the velocity was 17,680 mph, and the altitude was 228 miles. The 4th stage and attached satellite were in orbit. The burned out weight of the entire motor/satellite was 30.8 pounds, of which 10.63



Guidance section
and upper stages
separated from booster,
pointed horizontally for
staging near apogee



pounds were satellite instruments.

It would take a full orbit along with tracking from different points along the way to confirm the orbit. Finally the orbit was determined to have an apogee of 1594 miles, perigee of 225 miles, and orbital period of 114.78 minutes. Interestingly enough, an official name for the satellite had not been chosen until after the launch. The name chosen was Explorer, this first one being Explorer-1.

How Explorer-1 was launched into orbit

Overview:

The Juno-I series went on to put two more Explorer satellites, III and IV, into orbit. Attempts to orbit three others were unsuccessful. Explorer-II failed to fire the 4th stage motor. Explorer-V apparently failed due to the guidance section being hit from behind by the Redstone booster portion, so the upper stages were not fired in the proper direction. Explorer-VI failed as the spinning upper stage assembly apparently broke off about 2 minutes into the flight. Later the Juno name was given to a spinning upper stage variation of the Jupiter IRBM, called Juno-II, which launched another series of Explorer satellites. Thus the Redstone, Jupiter, and Juno names were all intermixed and shared by distinctly different launch vehicles.

The greatest scientific achievement by Explorer-1 and the successful Explorer-III and IV satellites was the discovery of the Van Allen radiation belts. These are regions of powerful cosmic radiation beginning about 600 miles above the Earth. The belts are named after Dr. James Van Allen, who designed and built the small cosmic ray portion of the Explorer-1 experiment package.

The successful orbiting of Explorer-1 finally gave the United States something to cheer about, something needed even more after the Vanguard failure. Sputnik had caught the U.S. off guard, and at least we were now able to orbit satellites, albeit small ones. But this was just the beginning of the "space race", which in the U.S. would lead to the formation of NASA, planetary exploration, and manned spaceflight. Wernher Von Braun became a national hero and his other Huntsville colleagues went on to have a great influence in the development of the powerful Saturn booster vehicles necessary for the Apollo program. This included the creation of Marshall Space Flight Center, which, along with Redstone Arsenal's missile work, were primary factors for Huntsville's explosive growth into the city that it is today.

Huntsville connections:

Huntsville played a very large part in the launching of America's first satellite. The Army Ballistic

Missile Agency, which included Wernher Von Braun's group, was based at Redstone Arsenal. Huntsville was where the Redstone vehicles were designed and built, and in particular where the Juno-I boosters were put together and checked out.

With the news that Explorer-1 had been orbited, a large celebration broke out in Huntsville. The launching confirmed Huntsville as "Rocket City, USA". Five years ago *The Huntsville Times* reprinted a 25th anniversary version of the edition which gave multipage coverage of the successful launch, with the headline "JUPITER-C PUTS UP MOON!". Hopefully they will have another reprint for the 30th anniversary, be sure to get and keep a copy if they do.

Ever wonder what the letters "UE" were for? It was a letter code intended to mask the actual number of Redstone missiles being developed and tested. The code was based on the nine letters in Huntsville, with the addition of "X" to represent zero as shown below:

Redstone Vehicle Letter Code:

H	U	N	T	S	V	I	L	E	-	X
1	2	3	4	5	6	7	8	9	0	

Therefore, vehicle "UE" was booster vehicle number 29 of the Redstone program. Jupiter-C booster "TX", which launched the 1/3 scale Jupiter nose cone that was recovered, was vehicle number 40.

There are a few Juno-I/Jupiter-C vehicles on display around the country. Three actual Juno-I vehicles were left over after the end of the program. One is in the National Air and Space Museum in Washington D.C., realistically and immaculately (perhaps too clean?) detailed and painted. Another is on display at the Kennedy Space Center visitor's center. Apparently the third is on display in Huntsville, at Redstone Arsenal. The vehicle on display at the Alabama Space and Rocket Center is an odd collection of genuine leftover parts and non-realistic (even non-rocket) parts and does not represent any vehicle that actually flew. For example, the Jupiter-C/Juno-I was about the height of a Redstone missile (approximately 70 feet), and 13 feet shorter than the Mercury-Redstone, yet the ASRC Jupiter-C towers above the Redstone missile and even the Mercury-Redstone on display.

Sources: Space Frontiers, JPL Technical Reports, The Huntsville Times, "Mercury Project Summary including results of the fourth manned orbital flight (NASA)", 1/96 model-maker blueprints (MSFC), Louis Chinal, Ralph Perrill (Redstone Arsenal), and Ted Talay.

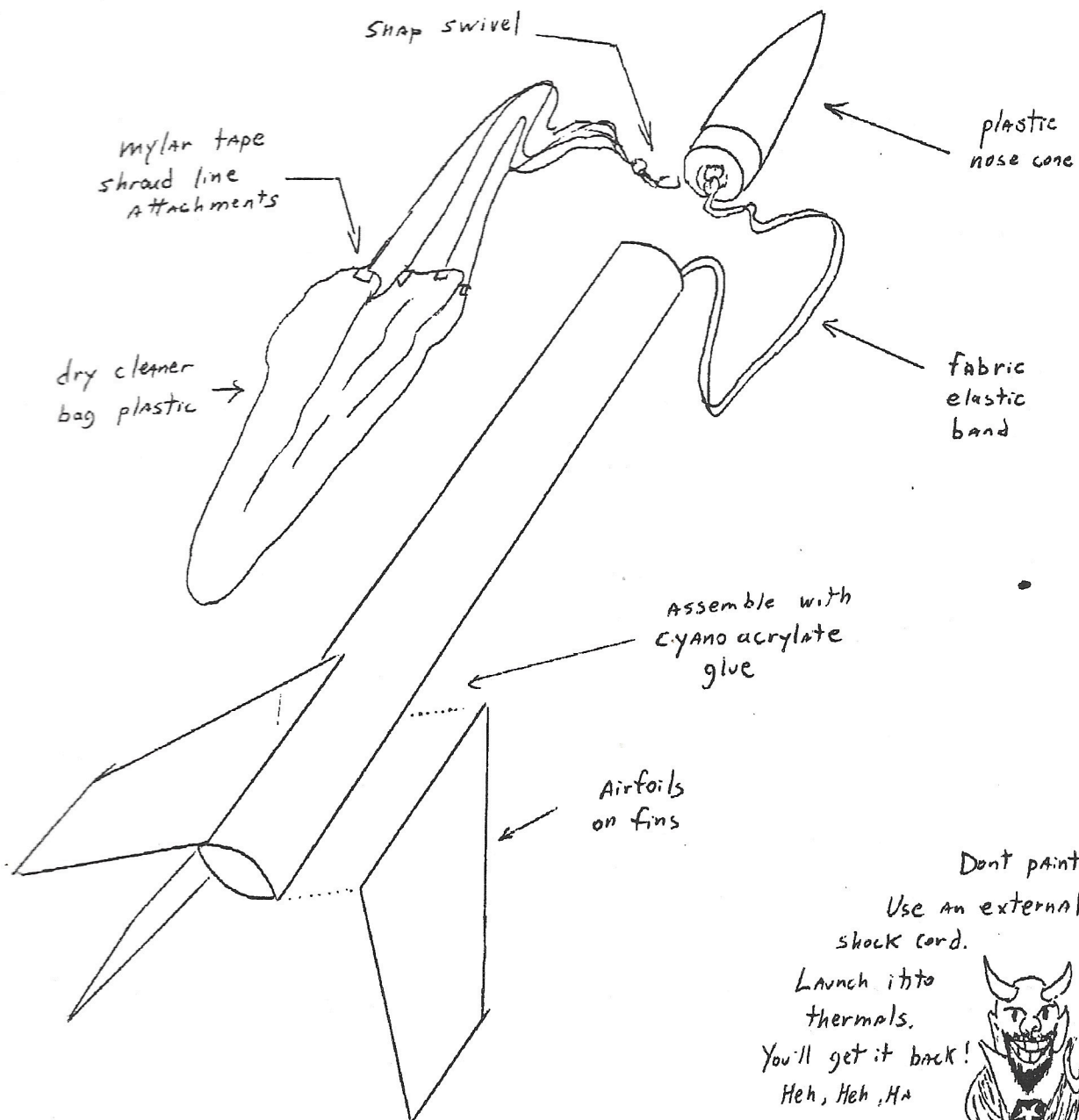
Launch Chat

WITH THE

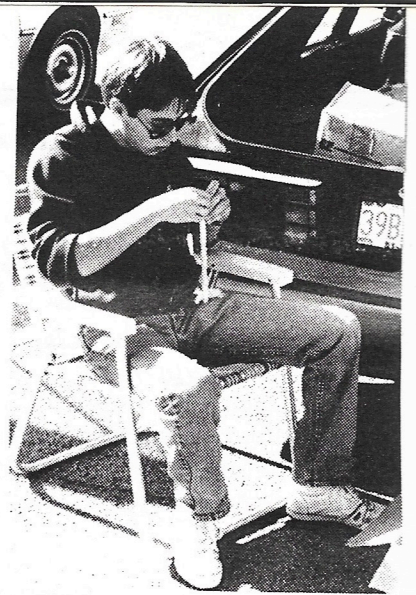
Launch Lady



So, you think you're a good rocketeer do you? Well, maybe you are, maybe you aren't, who am I to judge? But wouldn't you want your rockets to be just a little bit better than everyone else's? Here are some ways to make your rocket SUPERIOR!



HARA



Above:
Winners of the Rocket City Classic.
back row, l-r, Bill Anglin, Colin Reasoner, John Anglin, Jason Haynes, Marty Williams, Lester Johnson, Sandy Campbell, and Jimmy Williams.
front row, John McCain, Jeff Yeager, Russ Cowart, Josh Magnusson, Brian Campbell, and Greg Forsythe.



Countdown 1988 Calendar

- JANUARY:** 21 Jan; Meeting 7:30 PM
31 Jan; Commemorative launch of Explorer I, ASARC 2:00 p.m.
- FEBRUARY:** 18 Feb; Meeting 7:30 PM
20 Feb; Sport Launch
- MARCH:** 17 Mar; Meeting 7:30 PM
19 Mar; Spring Fling II; NAR Open
- APRIL:** 21 Apr; Meeting 7:30 PM
23 Apr; Sports Launch
- MAY:** 19 May; Meeting 7:30 PM
21 May; Redstone-1; NAR Open
30 May; Alabama Jubilee Demo, Decatur
- JUNE:** 16 June; Meeting 7:30 PM
18 June; June Jam II; NAR Open
- 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
- SEPTEMBER:** 15 Sept; Meeting 7:30 PM
MSFC picnic demo- TBA
- 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,
North end by the stadium

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*

*Model Rocketry- it's not just a hobby,
it's a way of life!*

WARNING!

The Surgeon General has determined
that breathing composite rocket motor
exhaust can be expensive!

1988 HARA Contest Season Events

Spring Fling-2 Open March 19, 1988

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

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, F Altitude
- 8-D Altitude (A Division only)
- 9-Research & Development
- 10-Sport Scale (A&B Division)
- 11-Giant Sport Scale (C Division),
- 12-Parachute Spot Landing

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 chosen by resume

For additional flyoff rules and registration, contact 1989 U.S. Team Manager, Matt Steele, 13011 Branscomb Rd, Huntsville, AL 35803 (205) 883-6020

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• Anglin, John 4449 Millvale Dr., 35805	534-7971
• Atkinson, David and Mark 3111 Holly Hill Rd 35802	882-0504
• Baggett, Clay 8151 Oldfield Dr. #10 35802	881-2953
• Chambers, Richard 1901 Polk Dr. 35801	539-1448
• Clark, Al & Chris 124 Liza Lane, Madison, 35758	772-8466
• Dennis, Jay	
• Dooling, Dave Alabama Space & Rocket Center, 35807	837-3400
• Gassaway, George and Margaret P.O. Box 59012; Homewood, AL 35259	879-3649
• Halbritter, Markus 9016 Cannstatt Dr., 35802	883-5299
• Hall, Chuck 3120 Andros Dr., 35805	883-6369
• Haynes, Jason Rt 4, Box 200, Scottsboro 35768	
• Hendricks, Wayne (HARA Treas.) Box 4922, 35815	n/a
• Hoffman, Luke 6509 D Whispering Pines, 35806	837-6467
• Huegele, Vince, (HARA Pres.) 11108 Argent Dr., 35803	881-2904
• Johnson, Lester & Gloria (HARA Sec) PO Box 5491, 35814	837-3640
• Jordan, P.R. & Adam 3614 Greenbriar Dr., 35810	852-5649
• Kelling, Randy P.O. Box 153, Mt Olive AL 35117	
• Kmetz, John L., Kathy & John Jr. Rt2 Box 468 Lacey Springs, 35754	883-7378
• McCain, Wayne, Dana, John, Scott and Matthew 4209 Nolen Ave., 35801	536-224

• Mitchell, Timothy 3303 Belcrest 35801	(615) 376-3653
• Moser, David 1468 Shady Lane, Kingston, TN 37763	
• Nolin, Damon & Derek 10001 Willow Park Dr., 35803	880-8197
• Olyniec, Lee 1109 Hood Ave, Scottsboro, AL. 35768	259-0173
• Papa, Byron 6319 Robin Hood Lane, 35806	837-1206
• Reasoner, David & Colin 3103 Holly Hill, 35802	883-7629
• Russell, Chas 3741 Longstrw Dr., Ft Worth, TX 76137	
• Shulz, Eric 1013 Riviera Ave., 35802	n/a
• Sias, Mathias and Frank 871 Moontown Rd, Brownsboro, 35741	852-8771
• Snyder, Chris 14009 Percivale Dr. 35803	882-1905
• Steele, Matt (HARA VP) & Robyn 13011 Branscomb Rd., 35803	883-6020
• Stluka, Ed & Thomas, Michael 2802 Brett Rd, 35801	852-3850
• Stubblefield, Katie 1714 Sandlin Ave., 35801	534-5359
• Tygielski, Mark 406 Green Acres, 35804	837-7486
• Wagschal, Dick 6206 Rime Village 35806	837-9325
• Williams, Jimmy & Marty 3203 Fairacres Rd., 35803	539-4801
• Williams, Ron 5637 Crestview Drive, Hixon TN 37343	n/a
• Wingate, Jason 2908 Azalea Circle, 35805	539-6707
• Yeager, Carl & Jeff 4316 Shelby Ave. 35801	539-2839

Explorer I Anniversary

In cooperation with the Alabama Space and Rocket Center, HARA will launch a Juno-I model to commemorate the 30th anniversary of the orbiting of America's first satellite. The launch is scheduled for 2:00 pm on Sunday, January 31, 1988 at the ASARC. A reception for the original members of the launch team and other dignitaries will proceed the launch.

The model will be a large scale Juno-I, similar to the rocket that George Gassaway flew at the Rocket City Classic. Matt Steele is providing the materials and he, along with several club members will be assembling the model.

As a HARA function, all members are welcome and encouraged to attend the launch to watch or help in prep and recovery. For more details, call Vince or Matt. Hope for good weather!!

*Would you want your sister
to marry a rocketeer?*

Just Say No

The biggest blow to high power rocketry was struck today as Nancy Reagan initiated her "Just Say No to Composites" campaign. Nancy stated, "...high power rocketry was an acceptable form of recreation until it began to be abused." The campaign against high power is a serious threat as it depicts all high power flyers as addicts to composites. As we all know, this is not true (in most cases).

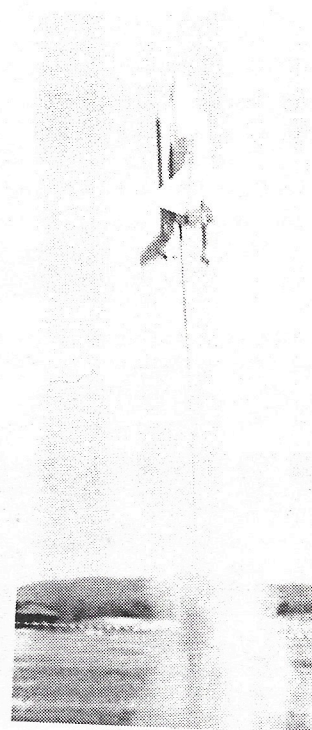
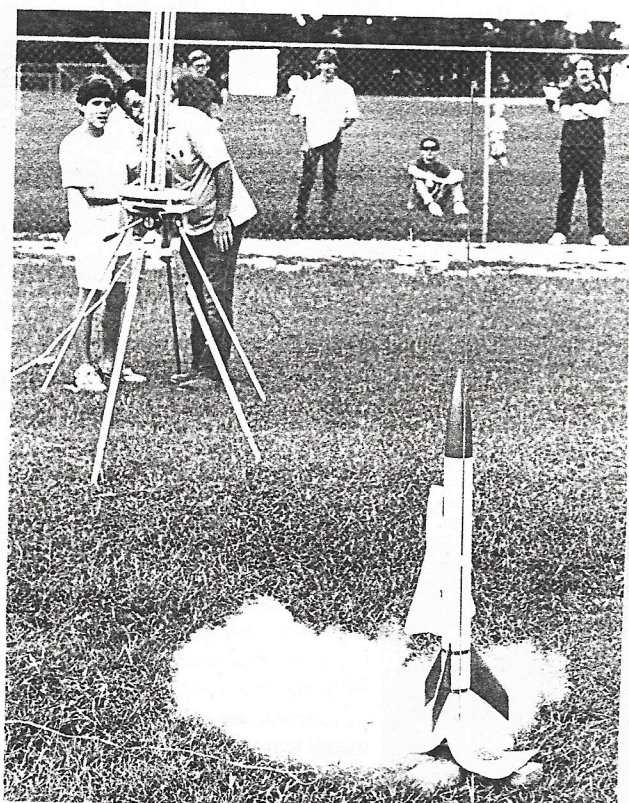
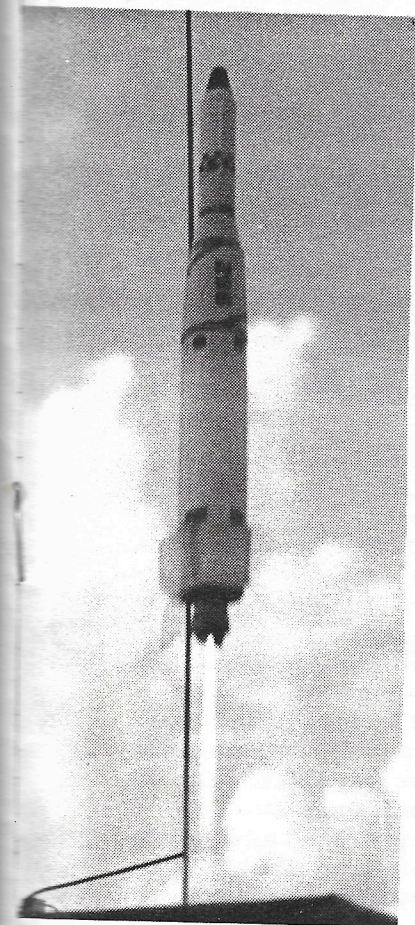
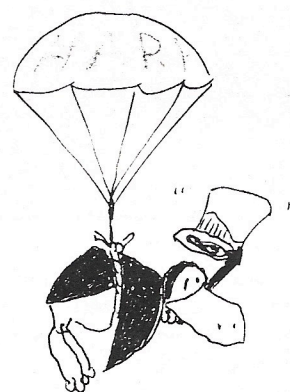
If you are a user, we suggest you follow these tips. Remember the next time you fly your F or G powered bird, please resist the temptation to sniff the fumes from the motor as soon as you recover the model. Instead, do all flyers a favor and carry a box of ziploc storage bags. As soon as you recover your model, extract the motor and place it immediately in a ziploc bag. This method will keep the intoxicating vapors fresh all day long on the field and when you get home, you can sniff the casings in privacy. This practice will lessen the chances of you getting caught and will preserve the good name of high powered rocketry...

...oh, sorry, I just got a few ounces of some good s..t from my supplier (NCR, don't tell the feds or Nancy) and I'm off to the field to "sniff out" this new stuff.

*a B Divisioner (who shall remain nameless)/
composite junkie*

clockwise:

Jason Haynes preps a 1/2A PD bird. A sport scale Agena. Colin and David Reasoner load a tower as a Hendricks maxi Alpha takes off at the MSFC demo. George Gassaway experiments with a twin D shuttle stack. There was good attendance at the Rocket City Classic #6. All ages enjoy rocketry in Huntsville.





Turkey Shoot-I

NOV 14, 1987

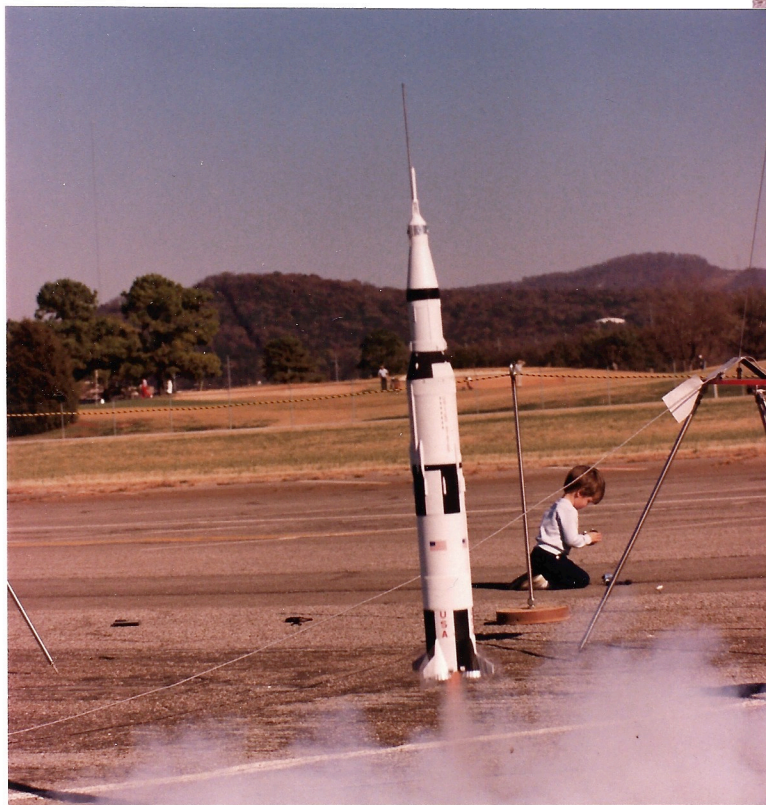


HARA 12 — Turkeys 0

If there was a day in November, 1987 to fly rockets in North Alabama, it was the 14th, the day of HARA's Turkey Shoot. in a month when the weather is often blustery, overcast, and more suitable for hot chocolate by the fireplace, Huntsville modelers found a clear day, in the high 60° 's, with winds less than 3 mph. It was a very good day for the record number of twenty contestants to fly in a HARA NAR open.

The usual contingent of club members were on hand to fly, others to watch. Jimmy Williams made his debut as a contestant, rather than just ground support to son Marty. Kathy and John Kmetz Jr. entered their first contest following their dad, John Sr. Jason Haynes from Scottsboro (and winner of the Rocket City Classic) was there and besides flying for himself, also proxy flew for Lee Olyniec who was out of town interviewing at Texas A&M. From Memphis, Rich Brandon and Charles Tucker attended. The Moser contingent attended from Kingston, TN and this time, they added Thomas to the ranks of David, Barbara, William, Samantha and Aaron as contestants. George Gassaway coming up from Birmingham to fly for the Zunofark's rounded out the slate.

Every HARA contest this year has started with Predicted Duration and the performance shows it. All 20 competitors were in this event. Marty Williams aced B Division with a perfect score. One second off won for John Kmetz Jr. in A



Div. where the average was 16%. But 3 seconds off in C Division was only good enough for flight points as the Zunofark's led the pack with 3%, Barbara Moser had 3.3% and David 4.3% representing 1, 1 and 2 second differences.

The air must have been good for parachutes since seven maxes were recorded in 1/2A Int PD where a max is 2 minutes. Marty got one to win in B while John Jr. won again by 2 seconds over William Moser in A Division. The special rule adjustment made by Contest Director Matt Steele to limit the international events to two flights set up what happened next. Wayne Hendricks and George (Zunofark) maxed both flights to tie for first. John Sr. and David Moser both had maxes but David DQ'd one flight to drop to third. Chutes were made from cleaner bags or drop cloth (<.3 mil) plastic carried in BT20 rocket bodies.

More maxes were repeated in B Int PD which meant 6 minute flights. William got one to win A Division with brother Aaron only a minute behind. Mylar chutes were popular in this event. Kathy Kmetz and Marty Williams both got a max but her first flight was 2 minutes longer than Marty's, to give Kathy her first taste of glory. Jimmy Williams came out of nowhere to double max on the adults (and his first contest too!) Crocodile Wayne's total was more than John Sr.'s even though John was able to max one flight. Other people were getting good flights, but not good enough for today. You had to max to win.



Maxes appeared in the glider department where A&B Division flew A Int BG (2 minute) and the big kids flew D Int BG (4.5 minutes). Samantha Moser took first with two over a minute glides and Matthias Sias was only 8 seconds behind her with balsa models. In B, Kathy won, 7 seconds ahead of Marty who maxed one of his flexie flights. Lee with a flexie was 6 seconds in front of Jason.

Instead of flying his usual upscaled Flat Cat, Crocodile Wayne unleashed a pair of maxie flexies to double max in C Division. They were still aloft all the way to K Mart. His search the next day was negative, but a Moser model did turn up near Kroger. Zunofark's RC bird was caught in Wayne's backwash (figuratively that is) and left in second place. Vince Huegele's *Terrodactyl* flights were good enough to take third and, "I finally got one back to take home!" he said. Wayne McCain and Jimmy scored points on parasite shuttle models. David Moser got the "Prang of the Day" when the ignitor leads hung on his bird's wings and the model vectored back toward the control table.

No one maxed in B Int SD or even broke 200 second total. In fact Marty and the Zunofark's DQ'd both flights! (Sorry guys, but that's news!) David and Barbara were on top in C followed by Crocodile Wayne and John Sr.. The Moser's have experimented with a monocote strip as streamer material. Folded tracing paper is popular with the other HARA flyers. Lee was ahead of Jason by 90 seconds in B while William led Thomas Moser to claim the first place points in A.

Sport Scale had 15 entries, giving judges Wayne McCain and Gloria Johnson a big job. William's *Sandhawk* was first for A just as it was at the June Jam. Aaron's Nike *Apache* and Matthias' *Phoenix* took second and third. B Division saw Marty win with a Nike too, and Jason and Lee followed with *Mercury Redstones*. Crocodile's *Saturn V* ("It makes me nervous to even take it out of the box") topped the Zunofark's *Juno I* with John Sr.'s *Black Brandt* behind that. Vince

had an old twin engine *Gemini Titan* that flew well, as did Jimmy's *Santa Maria* on a composite.

To finish off the day, those with any engines left entered the turkey drag race. Division winners were left at that, with no flyoffs to pick an overall drag king (or queen). Besides, the drag race is the lowest point weighted event in the pink book.

When the exhaust from all the engines had settled, Wayne Hendricks had defeated the Zunofarks, who were reigning champions in C Division, having won all four of HARA's past contests. They came in second, with David Moser taking third. Marty had a good day to take first in B Division and Kathy captured second in an impressive rookie performance. A Division was all Mosers, in the order of William, Aaron and Samantha.

HARA accumulated 5292 points for the day and the Moser's section, Smokey Mt Rocket Club, getting the rest. Point totals to date show HARA with 16,414. Leading members are Marty Williams (B) 2,624; Zunofark (C Team) 2,518; Wayne Hendricks (C) 2,112; and Matthias Sias (A) 1,712. HARA still has 3 NAR opens planned before NARAM.

It had been a long day for CD Matt Steele, having to control flight traffic of 175 launches. The events averaged 17 entries and most of those had double flights. Two timing crews were drafted to handle the load. Robyn Steele kept the flight cards straight along with the point totals. "We're going to have to schedule more help on these contests if they're going to be this big or bigger," said Matt. "But bigger is better. I've heard from many more folks outside Huntsville who want to fly with us this spring. It may be like this all the way to NARAM 30."



Photos courtesy Charles Tucker of Memphis, TN



Turkey Shoot-I



ame	N	Points
PREDICTED DURATION	Performance	
A Division		
1) John Kmetz Jr.	(40/41) 2.5%	100
2) Aaron Moser	(45/41) 9%	60
3) Thomas Moser	(50/43) 14%	40
3) William Moser	(50/57) 14%	40
4) Matthias Sias	(35/42) 20%	20
Q) Samantha Moser	(39/31) 20.5%	10
B Division		
1) Marty Williams	(50/50) 0%	100
2) Jason Haynes	(36/29) 19.4%	60
3) Kathy Kmetz	(45/35) 22.2%	40
4) Lee Olyniec	(30/38) 26.7%	20
C Division		
1) Zunofark Tm	(33/32) 3%	100
2) Barbara Moser	(30/29) 3.3%	60
3) David Moser	(47/45) 4.3%	40
4) Wayne Hendricks	(48/45) 6.3%	20
Q) Vince Huegele	(43/46) 7.0%	10
Q) Rich Brandon	(44/35) 20.5%	10
Q) Charles Tucker	(30/18) 40%	10
Q) Wayne McCain	(85/120) 41.2%	10
Q) John Kmetz Sr.	(40/58) 45%	10
DO) Jimmy Williams	SEP	
1/2A INT PD	(sec)	
A Division		
1) John Kmetz Jr.	101 (66/35)	160
2) William Moser	99 (99/DO)	96
3) Samantha Moser	34 (34)	64
4) Thomas Moser	32 (17/15)	32
Q) Aaron Moser	26 (26)	16
B Division		
1) Marty Williams	217 (97/MAX)	160
2) Kathy Kmetz	99 (19/80)	96
3) Lee Olyniec	73 (38/35)	64
4) Jason Haynes	4 (4)	32
C Division		
1) Wayne Hendricks	240 (MAX/MAX)	160
1) Zunofark Tm	240 (MAX/MAX)	160
2) John Kmetz Sr.	168 (MAX/48)	96
3) David Moser	120 (MAX/DO)	64
4) Vince Huegele	116 (36/80)	32
Q) Jimmy Williams	106 (23/83)	16
Q) Barbara Moser	15 (15)	16
DO) Charles Tucker	SEP	
A INT BG	(sec)	
A Division		
1) Samantha Moser	139 (71/68)	240
2) Matt Sias	127 (55/72)	144
3) William Moser	94 (34/60)	96
4) Aaron Moser	70 (70)	48
Q) John Kmetz Jr.	69 (22/47)	24
Q) Thomas Moser	63 (23/40)	24
B Division		
1) Kathy Kmetz	162 (100/62)	240
2) Marty Williams	155 (MAX/35)	144
3) Lee Olyniec	99 (70/29)	96
4) Jason Haynes	93 (61/32)	48
D INT BG		
C Division		
1) Wayne Hendricks	540 (MAX/MAX)	280
2) Zunofark Tm	299 (133/166)	168
3) Vince Huegele	275 (162/114)	112
4) Wayne McCain	136 (77/59)	56
Q) Jimmy Williams	128 (45/83)	28
Q) John Kmetz Sr.	102 (45/57)	28
DO) David Moser	PRANG/UNSAFE POD	
B INT PD	(sec)	
A Division		
1) William Moser	429 (69/MAX)	180
2) Aaron Moser	372 (169/203)	108
3) Matthias Sias	116 (68/48)	72
4) Samantha Moser	79 (79/DO)	36
Q) Thomas Moser	40 (DO/40)	18
B Division		
1) Kathy Kmetz	552 (192/MAX)	180
2) Marty Williams	438 (78/MAX)	108
3) Jason Haynes	99 (78/21)	72
C Division		
1) Jimmy Williams	720 (MAX/MAX)	180
2) Wayne Hendricks	634 (317/317)	108
3) John Kmetz	472 (112/MAX)	72
4) David Moser	334 (175/159)	36
Q) Vince Huegele	319 (207/112)	18

Q) Zunofark Tm	248 (210/38)	18
Q) Barbara Moser	148 (148)	18
Q) Wayne McCain	110 (57/53)	18
DO) Rich Brandon	NO CHUTE/UNSTABLE	
B INT SD	(sec)	
A Division		
1) William Moser	136 (77/69)	180
2) Thomas Moser	109 (52/57)	108
3) Aaron Moser	96 (53/43)	72
4) John Kmetz Jr.	78 (DO/78)	36
Q) Matthias Sias	53 (33/20)	18
Q) Samantha Moser	51 (DO/51)	18
B Division		
1) Lee Olyniec	199 (39/160)	180
2) Jason Haynes	103 (43/60)	108
3) Kathy Kmetz	72 (72)	72
DO) Marty Williams	SEP/SEP	
C Division		
1) David Moser	198 (123/75)	180
2) Barbara Moser	163 (87/76)	108
3) Wayne Hendricks	156 (73/83)	72
4) John Kmetz Sr.	142 (60/82)	36
Q) Vince Huegele	138 (78/60)	18
Q) Jimmy Williams	129 (56/73)	18
DO) Zunofark Tm	SEP/SEP	
DO) Wayne McCain	ENGINE KICK	
Drag Race		
A Division		
1) John Kmetz Jr.	1st	10
2) Aaron Moser	2nd	6
B Division		
1) Marty Williams	1st	10
2) Jason Haynes	2nd	6
C Division		
1) Zunofark Tm	1st	10
2) Vince Huegele	2nd	6
SPORT SCALE		
A Division		
1) William Moser (Sandhawk)	783	220
2) Aaron Moser (Nike-Apache)	745	132
3) Matthias Sias (Phoenix)	633	88
4) Thomas Moser (Gemini Titan)	616	44
Q) Samantha Moser (Nike-Apache)	614	22
B Division		
1) Marty Williams (Nike Apache)	830	220
2) Jason Haynes (Merc-Redstone)	616	132
3) Lee Olyniec (Merc-Redstone)	608	88
C Division		
1) Wayne Hendricks (Saturn V)	1000	220
2) Zunofark Tm (Juno-1)	993	132
3) John Kmetz Sr (Black Brant II)	941	88
4) David Moser (Merc-Redstone)	868	44
Q) Vince Huegele (Gemini Titan)	739	22
Q) Barbara Moser (D Region)	714	22
Q) Jimmy Williams (Santa Maria)	625	22

POINT TOTALS:

A Division	
1) William Moser	812
2) Aaron Moser	442
3) Samantha Moser	390
4) Matthias Sias (HARA)	342
5) John Kmetz Jr. (HARA)	330
6) Thomas Moser	266
B Division	
1) Marty Williams	742
2) Kathy Kmetz	628
3) Jason Haynes	458
4) Lee Olyniec	448
C Division	
1) Wayne Hendricks	860
2) Zunofark Tm	588
3) David Moser	364
4) John Kmetz	330
5) Jimmy Williams	264
6) Barbara Moser	224
7) Vince Huegele	218
8) Wayne McCain	84
9) Rich Brandon	10
10) Charles Tucker	10



It's Called Shuttle-C

NASA and MSFC's next rocket design is a heavy lift launch vehicle tentatively known as Shuttle-C (for cargo). The design is to use existing SRB, ET, and SSME technology and facilities to launch an unmanned cargo element in place of the orbiter. How this will all be done and if it will be worth it, i.e. cost effective, is part of the initiated study.

The models shown here were displayed outside MSFC headquarters during a recent contractors meeting on Shuttle-C. Vince Huegele had his camera ready to catch these pictures outside before the models were moved to the space station mockup building. These 1:15 scale shuttles were as big as a car and stood up over 10 feet. They don't fly, but they make a great lawn decoration. Other Shuttle-C models that were 1:100 size have been displayed in the lobby, yet these big ones photograph better and show the design differences more clearly.

It's called Shuttle-C, but it looks like kit-bashing. And some modeler will probably have one flying before NASA does!

Photos above:

Pictured are 1:15 scale models of a full stack Space Shuttle and Shuttle-C vehicles. *Left:* The side mounted configuration. *Above left:* Another view comparing the proposed form to the present. *Above right:* The in-line configuration of Shuttle-C.

A Disastrous Week at Space Camp

by John Anglin

[Editors Note: A big part of Space Camp is playing different roles as part of a shuttle mission. But, as John explains, sitting behind a console or in a simulator with a checklist in front of you is a bigger challenge than expected.]

It started as just a normal sign in day at Space Camp. We met our teammates and found our bunks and then went to explore the museum. Later that night, we were given our caps and notebooks. We were told not to remove our caps or walk on the grass, but being the crazy idiots we are, each night after we had been to the Spacedome, we would walk on the grass and wave our caps over our heads.

The notebooks were one of the other toys we were given to play with. It had an evaluation sheet which we filled out at the end of each day. It had a category on how we felt about the food. This stuff tasted like Army food from WWI. When we were asked about the food, we all circled #5 on the sheet which meant poor. The notebook was also our supposed "life support system". We were to carry it with us at all times. Well, is that was the case, we were all dead.

The real faux pas was our shuttle missions. This is where everyone screws up. On one mission, just as the shuttle was in orbit and it was time for Main Engine Cut Off (MECO), the pilot shut down the engines in 1-2-3 order instead of all at once like instructed. The shuttle then veered from a northern heading to a northwestern heading sending the crew hundreds of miles off course.

There was one disaster after another. It was time for our flight at 5:30 am. We had a perfect lift-off and when it was time to deploy the satellite, Mission Control told us "three minutes to deploy". The idiot in charge thought he was three minutes late on deploying and pushed the button. At that moment, the payload bay was facing Earth, which is exactly where the satellite deployed to- the atmosphere. Oh well, scratch another 7.5 billion dollar satellite!

I was in the payload bay doing my experiments as a mission specialist on EVA when we looked at the clock and decided to request permission to power down and come in. Again, Mission Control screwed up. They wanted us to first report the data from our experiment. We were going to die if we didn't return to the cabin immediately, so I told control to shove it in their ear and we left. We got back in the cabin just in time to hear "4-3-2-1-OMS burn".

Then on the last day, I was on the ground crew. This mission's/flight lost a mission specialist who was in between the payload bay doors when they closed. So much for him! The rest of the crew got theirs when the landing gear was deployed at 30,000 feet on descent traveling at around mach 5. This ripped the gear off. Needless to say what happened when they hit the concrete runway at Edwards. The last words on the flight recorder were, "This Bud's for you." I was the Public Affairs Officer and had to tell the whole world that the crew had been squashed flatter than a pancake into the ceiling of the orbiter.

Around 3:00 the next day, we bid each other farewell, hoping we could all come back and fly another shuttle. This Bud's for you Atlantis Team!

Pizza Highlights SEDS Launch

HARA took its flying circus to UAH Saturday November 7, 1987 during the school's Space Awareness Week, sponsored by the Students for the Exploration and Development of Space (SEDS). The launch was a contest primarily for college students, but anyone was eligible to enter. UAH and SEDS planned, promoted and staged the activity, with HARA only providing the range equipment and personnel. Being only two weeks after the Rocket City Classic, that was about all HARA could provide.

The contest, managed by Ray Cronice of SEDS, was essentially a predicted duration event. Trophies was designated for novices, experienced modelers, and campus clubs. The non-NAR contest was so informal, modelers were allowed to 'time trial' their rockets before making an 'official' predicted flight! Besides trophies, SEDS and their sponsors had pizza and drinks on hand for all present.

The flying was low key, but the college guys did show some creativity. The non-novice winner put a four foot mylar chute in a D model and got a ten minute flight that landed across campus on its second shot. The first flight did not completely deploy, but landed ok and after a consultation from William's Jimmy & Marty and Kmetz' John & Kathy, the second flight succeeded. The fraternity winners also flew a D superroc bird that had several good flights, but one. A D12 cato turned the tube into a smokestack, much to the amusement of the coed audience. HARA members were not as amused noting the dry grass and were quick to stomp out other hazards. One entry appeared with the fins only taped on and didn't even make it to the check-in table. The rejected students retired to the other end of the field for their own test launch. From a distance, we watched as the rocket ignited, then turned on its creators before demising in the dust. Maybe they learned something.

While the contest proceeded, Wayne Hendricks regularly launched his Astrocams to take up a roll of film. "This is strange not flying at the Old Airport," he said. (The results were good, but the pictures don't reproduce well enough to show here.) One contestant's errant round cratered in only feet from Wayne's new truck.

Marty Williams made the day memorable at the cost of his SR71. Too long an ejection delay brought the model down in the dirt. The rocket stuck upright in the ground for a millisecond until the body impotently ejected from the nose. In consolation, Marty did win the scale trophy for the day, but as the only entry. "It sure made the judging easy," said Vince Hugel.

Overall, the day was more like a sport launch to HARA, unlike the drama of the NAR competitions. But the college crowd claimed it to be a great success and so it was. Any calm, sunny day flying in an open field works for us.

and more Wadding Scraps

**Next HARA meeting
February 18th: 7:30**

PICTURE CAPTION CONTEST

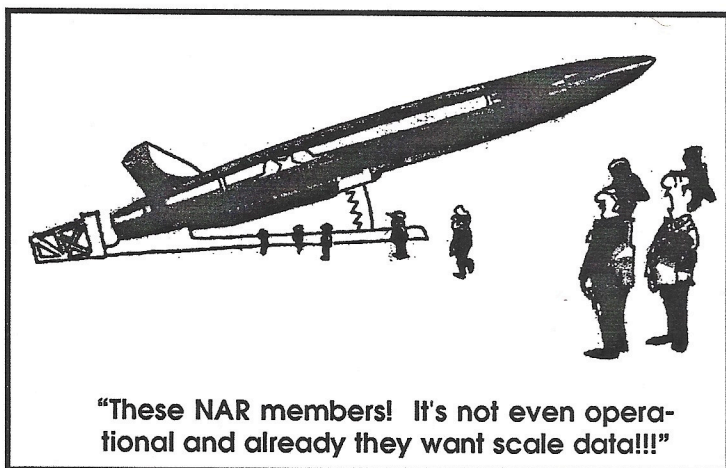
If you know Crocodile Wayne Hendricks, then you know that he flies a lot of D12 engines. He flies enough to have valid statistical samples of their failure rate. And now he has photodocumentation as well. Shown here are pictures of two of Wayne's D12 flights (which are not a sequence, but could be.) The flight in the picture at lower right has an anomaly. "I lose about three out of a hundred," Wayne says.

MAX-Q would like to use this cato picture (lr) to initiate the "MAX-Q Caption Contest". What do you think is a good caption for this photo? Something like "thar she blows" or "obviously a major malfunction" or even "this Buds for you" are all possibilities. Send your entries to Vince or Robyn, as many or as often as you like. The best entries or maybe all of them, will be printed (if printable) in the next MAX-Q. Deadline is Feb 29, 1988. Employees of Estes Industries, their families, pets or houseguests are ineligible for prizes because there aren't any and they would just be Estes kits anyway.



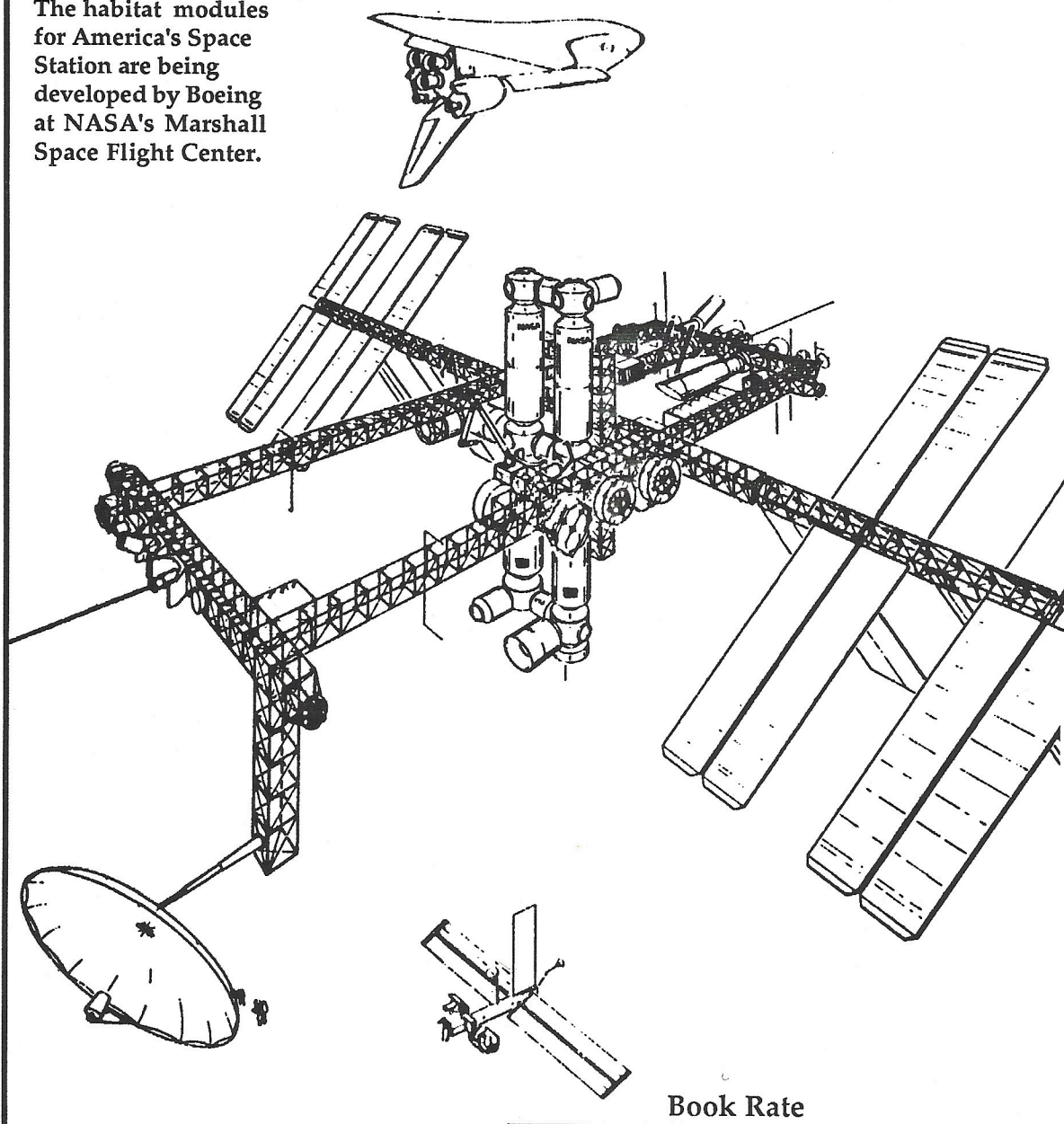
"Now is the time to take longer strides, time for a great new American Enterprise, time for this nation to take a clearly leading role in space achievement, which in many ways may hold the key to our future on earth."

*John F. Kennedy
25 May 1961*



HUNTSVILLE AREA ROCKETRY ASSOCIATION
11108 Argent Drive Huntsville, AL 35803

The habitat modules
for America's Space
Station are being
developed by Boeing
at NASA's Marshall
Space Flight Center.



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NARAM-30